Cisco Workload Automation User Guide

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Preface

This guide describes all components, concepts, and how to use Cisco Workload Automation (CWA). It also describes all menus and the options on the CWA panels and dialogs.

Audience

This guide is for engineers who use CWA for workload automation tasks, and who troubleshoot CWA.

Conventions

This document uses the following conventions.

Conventions	Indication
bold font	Commands and keywords and user-entered text appear in **bold** font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
courier font	Terminal sessions and information the system displays appear in courier font.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note: Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution: Means *reader be careful.* In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning: IMPORTANT SAFETY INSTRUCTIONS

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

Related Documentation

See the *Cisco Workload Automation Documentation Overview* for a list of all CWA guides.

Note: We sometimes update the documentation after original publication. Therefore, you should also review the documentation on Cisco.com for any updates.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at: http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html.

Subscribe to *What's New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.

Document Change History

The table below provides the revision history for the *Cisco Workload Automation User Guide*.

Version Number	Issue Date	Reason for Change
6.2.1 (SP2)	August 2015	Some bug fixing. General editing. Added component overview to Introduction. Added documentation for the Java Client.
6.2.1 (SP3)	January 2016	Minor edits and bug fixing.
6.3	July 2016	Rebranded Cisco Tidal Enterprise Scheduler (TES) to Cisco Workload Automation (CWA). Miscellaneous edits throughout.
6.3.1	May 2017	■ Variable Support for Private Keyfile Location in the Jobs/Job groups. ■ Color coding on banner. ■ Miscellaneous bug fixes.

1

Introduction

Overview

Welcome to Cisco Workload Automation (CWA), the premiere enterprise job scheduling solution. CWA automates repetitive computer-related tasks and can be easily tailored to your specific business needs. If your business requires small or large amounts of batch processing on a regular basis, CWA is the software for the job.

Cisco Workload Automation Design Concepts

The sections below describe some of the key features in CWA.

CWA Scheduling Layer

CWA exists as a scheduling layer above your jobs to control when, where, and how they are run. CWA is expandable to many users and can run many jobs throughout your network, all from a centralized master production schedule.

CWA makes it easy to run your jobs on a repeating schedule. Daily, weekly, monthly, or even yearly schedules can be created easily, and can be tested in advance before jobs are run on them. Jobs can even depend on the status of other jobs and files, to make sure that all your resources are in place before running the jobs.

Network Support

CWA has all the tools for controlling and organizing jobs on your network. It includes a fully configurable queue feature to distribute, prioritize, and queue up jobs so that your network load is optimized at all times. It includes smart agent communication that runs jobs on behalf of the system, and reports back when the jobs finish. Agents are available on Windows, Unix, MPE/iX, OpenVMS, and z/OS platforms and dependencies can be set up between them. CWA integrates your network to run like a giant processing machine, maximizing throughput.

Monitoring and Messaging Services

CWA includes exception-based job monitoring and messaging services. It monitors the progress of each job that is submitted, and can provide user-defined messaging when jobs enter phases of the production schedule. For example, if your job stops for some reason, you can be automatically notified of the problem, then diagnose it from a remote location, and start the job again. Messaging services include console alerts, email notifications, SNMP traps for network management systems, and telephone and pager notifications. Using CWA tools, you can achieve previously unequaled levels of scheduling efficiency.

Additionally, CWA includes a complete messaging and auditing system that fully tracks all actions taken by users, all error messages, and all system messages. Within CWA, search tools and filters enable you to diagnose and cure problems quickly.

Security

CWA supports a secured, configurable working model through security policies and per-agent passwords. You can subdivide scheduling tasks among various types of users based on their scheduling responsibilities. Agents can be restricted to specific users. Scheduling activity can be filtered for a production environment that is safe and customized to accommodate your expanding business.

Flexibility

CWA supports the way people work on scheduling projects with its workgroups feature. Users can configure their own workgroup environment, enabling a group of users to have access to a set of jobs and other supporting data objects like calendars that are owned by the group. Users can be insulated from the vast scheduling activity that is possible. All users can change and view only the information that is allowed by their security profile.

Fault Tolerance

Fault tolerance is an optional module for CWA. Fault tolerance ensures that you have uninterrupted scheduling when a Primary Master goes down. It includes a fault monitoring system that will automatically and seamlessly transfer control to a backup master. If your scheduling activity is mission critical, you need fault tolerance.

Note: To add fault tolerance to your CWA network, you need to purchase a license agreement. You must also install the Fault Monitor and Backup Master as described in the *Cisco Workload Automation Installation and Configuration Guide*.

CWA Components

Overview of CWA Components

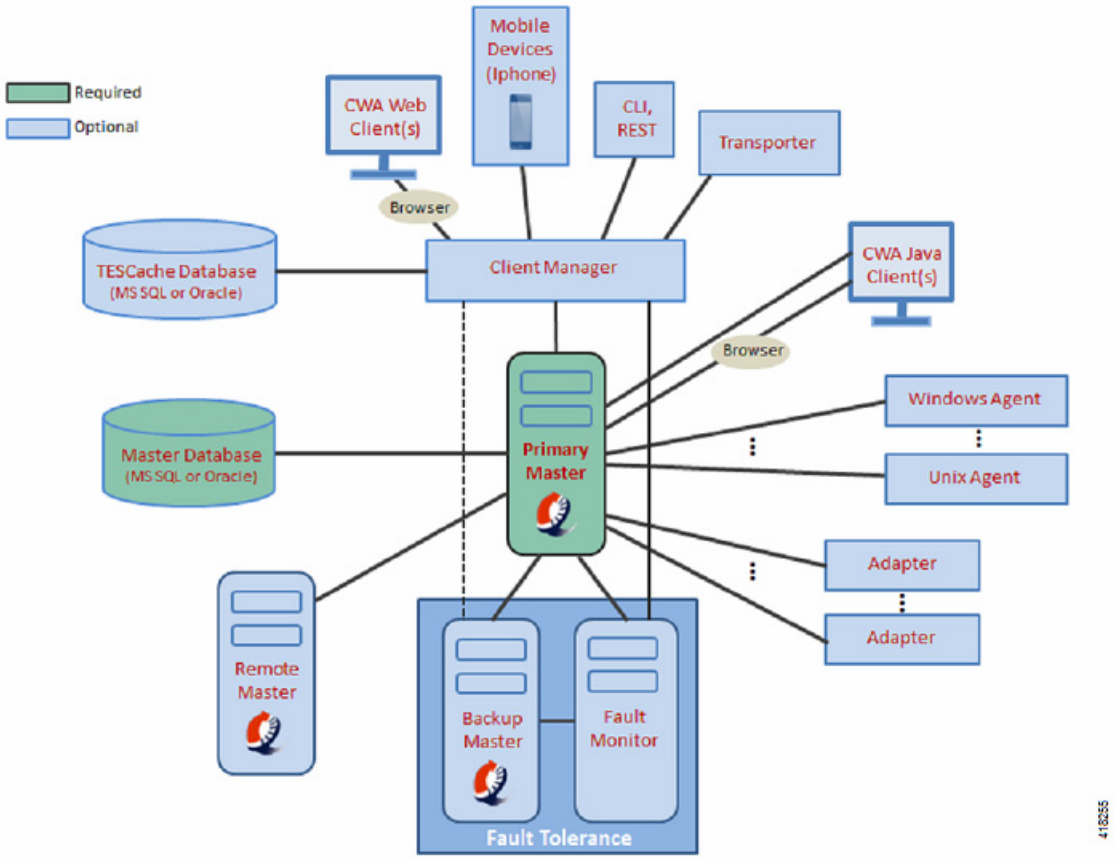
CWA has many different components and provides the flexibility to support many different customer environments. You can tailor your own system to have multiple Masters, multiple agents, additional adapters, install fault tolerance for each Master, and so on.

The diagram below shows the basic CWA system components potentially involved a system installation. There are two required CWA components:

- Primary Master
- Client Manager OR Java Client

All other CWA components are optional and depend on your environment and job scheduling needs.

Figure 1 Overview of CWA Components



Note: When using Fault Tolerance, the connections between the components can change from what is depicted above. Initially, the connections are as shown. However, when the Backup Master takes over as the Primary Master, the Master Database, Agents, and Adapters connect to the Backup Master. See the *Cisco Workload Automation Installation and Configuration Guide* for details.

The sections below define each component.

Master Database

The database is where CWA stores the job scheduling objects and metadata. CWA supports Microsoft SQL Server and Oracle depending on your platform:

- Windows platforms can use either Microsoft SQL Server or Oracle.
- Unix platforms must use Oracle.

The default Master database name is “Admiral”.

CWA Cache Database

The database where the Client Manager stores the job scheduling objects and cache data. CWA supports Microsoft SQL Server and Oracle depending on your platform:

- Windows platforms can use either Microsoft SQL Server or Oracle.

- Unix platforms must use Oracle.

The default CWA Cache database name is “TESCache”.

Master (or Primary Master)

The Master is the primary CWA component that conducts all scheduling tasks. You can have one or more Masters in your network. The Master can be installed on either the Windows platform or the Unix platform. The basic functionality of CWA remains the same regardless of the platform of the Master.

Client Manager

The Client Manager allows the Master to achieve higher performance and scalability. The purpose of the Client Manager is to service requests from user initiated activities, such as through the CWA Web Client, CWA Transporter and from other external sources that utilize the Command Line Interface (CLI) or published CWA Web services. The Client Manager allows the CWA Master to focus more capacity on core scheduling needs related to job execution and job compilations, while the Client Manager addresses demands from activities such as users viewing/configuring scheduling data and output. The Client Manager constantly syncs the information from the Master database into its own TESCache database that it then uses to provide all CWA Web Client users with current information. Multiple Client Managers connected to the same Master can be deployed to address additional performance needs.

The Client Manager is required if you want to use the CWA Web Client, the Transporter, the Command Line Interface (CLI), REST, or mobile applications. The Client Manager is not required if you are only using the Java Client.

CWA Web Client

The CWA Web Client is the main user interface for managing CWA jobs, scheduling, connections, configuration, and so on. The CWA Web Client connects to the Client Manager using a browser.

You can use both the CWA Web Client and the CWA Java Client with the same Master.

CWA Java Client

The CWA Java Client is a standalone application that provides the same user interface as the CWA Web Client to manage CWA jobs, scheduling, connections, configuration, and so on. However, the Java Client connects directly to the CWA Master and not through the Client Manager. You can run the Java Client as an application, or you can launch it using a browser.

The CWA Java Client is typically more responsive than the CWA Web Client because it is connected directly to the Master. However, this increases the RAM used by the Master process as the Master is now doing the work instead offloading it to the Client Manager.

You can use both the CWA Java Client and the CWA Web Client with the same Master. Note that an environment exclusively using the CWA Java Client will not be able to utilize features that require the Client Manager like the Transporter, Command Line Interface, and the WebService API.

Mobile Devices

CWA supports accessing the Master and scheduling data using a mobile IOS device. You must install the CWA application on your device that you obtain from the Apple store.

Command Line Interface (CLI)

The Command Line Interface program provides access to CWA using the *sacmd.cmd* (Windows) or *sacmd.sh* (Unix/Linux) program through the MS-DOS command prompt or Unix command utility. You can do things like automate CWA job control functions by including commands in scripts or by embedding job control functions in the code running your company processes. The command line program can also be used from the CWA Web Client.

The Command Line Interface program is fully documented, including installation, in the *Cisco Workload Automation Command Line Program Guide*.

Agents

An agent is a separate installation of CWA that runs jobs on behalf of the Master. Agents help you to automate the execution of jobs that you know need to be performed on a regular basis, Offloading jobs to agents frees the Master for intensive scheduling tasks such as production compiles. Agents exist for various platforms. For the current list of the types of agents available for CWA, see “Installing Agents” in the *Cisco Workload Automation Installation and Configuration Guide*. The Windows Agent and the Unix Agent are the two most commonly used agents.

Each agent can connect to a Master by specifying the Master-to-agent communication port and the Master-to-agent file transfer port numbers.

Adapters

CWA provides adapters for many software products to enable connectivity to and access by CWA. The Master has an Adapter Host it uses to manage the adapters and is the interface that the adapters use to connect to the Master. Adapters are provided with the base CWA installation but must be licensed. In some cases, adapters need to be installed or configured. For a list of the adapters provided for CWA, see “Installing Adapters” in the *Cisco Workload Automation Installation and Configuration Guide*.

Backup Master

The Backup Master is used in a fault tolerance configuration. Fault tolerance requires one Backup Master for each Primary Master. The Backup Master operates exactly like the Primary Master, but is activated only if the Primary Master experiences a system, network or —machine failure. The Backup Master must run on the same platform and version of software used by the Primary Master. The hardware specifications of the backup machine should be equal or greater than the specifications for the primary machine.

The Backup Master must specify the Backup-to-Master port number for transferring scheduling data from the Primary Master to keep the Masters synchronized.

Fault Monitor

The Fault Monitor is part of the CWA fault tolerance configuration. The Fault Monitor continually monitors a Primary Master and Backup Master for error conditions. If a failure indicator appears on the Primary Master, the Fault Monitor transfers control to the Backup Master. The Fault Monitor must be installed on a separate machine independent from the primary and backup machines.

Remote Master

A Remote Master is simply an additional CWA Master that is installed in a different environment. The Remote Master allows a connection to another CWA Master for sharing global CWA variables between CWA environments. Variables definitions must have “Publish value to remote masters” selected in the CWA environment where they reside prior to being available through a remote master connection.

Transporter

The CWA Transporter application transports scheduling objects from one CWA instance (source) to another CWA instance (destination). For example, you can use the Transporter to promote jobs from a test instance to a production instance. The primary strength of CWA Transporter is its ability to automate the copying of job data, although it can copy other data types as well.

The Transporter is fully documented, including installation, in the *Cisco Workload Automation Transporter User Guide.*

Network Configuration

Overview of Network Configuration

CWA can be configured on a network in many different ways. You can connect any number of licensed masters using any number of licensed agents, each located anywhere on your network.

Fault Tolerance Configuration

Fault tolerance can be added to a CWA network to provide an extra degree of scheduling reliability. In a fault tolerant environment, each primary master is connected to a dedicated backup master and a fault monitor machine.

In this setup, the primary master periodically shares data with the backup master during normal operation. Only one master (normally the primary master) has control of scheduling at any time. If the primary master has a network, power, or software failure, control is transferred to the backup master.

System Requirements

Note: Contact support or your account manager for the latest information on the system requirements for CWA.

There are different requirements for the Windows and Unix platforms. Both platforms use the Client Manager.

See the *Cisco Workload Automation Product Compatibility Matrix Guide* for the minimum system requirements for installing and running CWA. The specified quantities of CPU, memory and disk space must be available for exclusive use by CWA. Use additional RAM and disk space as necessary for your particular environment.

2

Getting Started

This chapter explains where to get licensing information, introduces the CWA Web/Java Client user interface, and explains basic procedures like configuring connections, starting and stopping, and system configuration:

- Licensing, page 7
- CWA Web Client and Java Client Features, page 8
- Configuring Connections, page 15
- Starting and Stopping CWA Components, page 24
- System Configuration, page 31

Licensing

About Licensing

Before you can run Cisco Workload Automation, you need to make sure that your CWA components are licensed. This topic is covered in the *Cisco Workload Automation Installation and Configuration Guide* in these chapters:

- "Installation Overview"–See the "Obtaining the Software" section for a list of CWA software packages and which components require licenses.
- "CWA Licensing"–Describes the license types and how to license a component using the CWA Web or Java Client.

The licensing interface is described in:

- Registered License Dialog
- Master License Tab
- Licensed Agents Tab

Registered License Dialog

The Registered License dialog displays by selecting **Activities>Registered License**.

This dialog contains the following elements:

- **Company Name** – Your company name. The company name used here appears in all Scheduler reports. If you have a demo license, this text field displays Demonstration Copy.
- Master License Tab
- Licensed Agents Tab

Master License Tab

This tab displays the following information about the Master:

- **Company Name** – Your company name. No company name displays if you have a demo license. The company name displayed here is used in all CWA reports.
- **Master License for Machine** – The licensed Master machine name.
- **Serial Number** – The unique identification number of the Master machine.
- **Operating System** – The operating system of the CWA Master machine.
- **Database** – The type of database used. This field will show either Oracle or Microsoft SQL Server.
- **Expiration** – The license's expiration date. You may need to renew your license before the expiration date.
- **Options** – Displays added purchased software options that complement CWA (e.g. fault tolerance).
- **Connections** – Contains the available connections associated with the license.

Licensed Agents Tab

The Licensed Agents tab displays information about the agents licensed to work with the Master.

Note: Only non-floating agents are displayed on the Licensed Agents tab. If your license has a floating agent provision, you can define your own agents, but the Licensed Agents tab displays no information.

This tab displays the following information about the agents:

- **Agent** – The machine name for the licensed agent.
- **Serial** – The serial number of the licensed agent.
- **Floating** – Specifies if the license is floating or not.
- **Operating System** – The operating system type of the licensed agent. CWA supports MPE/iX, MVS, z/OS, OS/400, Windows and Unix platforms.
- **Expiration** – The license's expiration date. You may need to renew your license before the expiration date.
- **Max Jobs** – The maximum number of jobs that you can run on the agent concurrently. You can configure a lower value for the agent from the Connections pane, but this value cannot exceed your licensed value.
- **Jobs** – Displays the current count of jobs, tracking the number of jobs to enforce the license restriction on an agent as shown in the Max Jobs column.
- **CPU** – The number of CPUs on an agent machine. If the number of CPUs on a machine exceeds the authorized number, the Master disables the agent connection and logs a licensing error. The licensing discrepancy must be resolved by contacting the Licensing Administrator for Cisco before the agent connection can be re-established.

Regulatory: Restart the Client Manager after a new license has been loaded.

CWA Web Client and Java Client Features

These topics are covered:

- Overview of Web and Java Client Features
- Main Menu Bar
- Status Bar

- Navigator Pane
- Current Pane
- Main Menus
- Search Field
- Searchable Columns
- Create Schedule Dialog
- Job Activity Pane

Overview of Web and Java Client Features

You can access the CWA Master and perform many of the necessary activities using either the CWA Web Client or the CWA Java Client. They have the same user interface which provides many built-in features designed for productivity and easy access to your production data. They differ in that the CWA Web Client requires a Client Manager; the CWA Java Client connects directly to the CWA Master as a standalone application or using a browser. Both the CWA Web Client and CWA Java Client are provided with your system and can be used interchangeably to manage CWA.

These sections describe the user interface of both the CWA Web Client and the CWA Java Client. Because the features are mostly identical between these clients, they are referred to here as simply the “CWA Client”.

Note: The CWA Java Client must be separately installed and configured, whereas the CWA Web Client is automatically installed and configured with the main CWA product installation. See the *Cisco Workload Automation Installation and Configuration Guide* for more information about installing and configuring the CWA Java Client.

Main Menu Bar

The Main Menu bar is accessible from any pane. However, some menu options are not available from all panes. For more information about the main menus, see Main Menus, page 11.

Note: Context menus, available when you right-click the Navigator pane or current pane, are context-sensitive. The menus change according to your current, active pane.

Status Bar

To identify the different CWA environments, you can set the status bar background, font color, and custom message of the Client Manager and the Java Client in the **master.props** file which is located under the Master’s config directory.

You must add/edit the following properties in the **master.props** file:

```
# DisplayPanel.Color=<Color code>
# DisplayPanel.Message=<Custom Message>
# DisplayPanel.FontColor=<Color Code>
```

If the properties are entered as blank values, the CWA environment would default to the basic system behavior.

Note: To uncomment each property that starts with “`# DisplayPanel.`”, remove the leading pound sign ‘#’ character.

Navigator Pane

The **Navigator** pane lists all the components of the CWA Client in a hierarchal format. Each function has a different pane.

An arrow sign next to a folder indicates that there are folders hidden underneath. Click the plus sign to expand the listing. A solid arrow sign next to a folder indicates that the listing is expanded. Click the minus sign to collapse the listing.

This panel contains the following containers:

- **Operations** – A container for the **Job Activity**, **Event Activity**, **Alerts**, **Logs**, **Schedules** and **Master Status** panes. These panes are dynamic, displaying data that continually changes. CWA updates the information in the pane to provide an accurate picture of the current state of your productions operations.
- **Definitions** – A container for the **Jobs**, **Calendars**, **Actions**, **Events**, **Job Classes**, **Variables**, **Agent Lists**, **Queues**, **Resources** and **Fiscal Calendars** panes. These panes list the definitions for various items that you create through CWA.

  In addition, **Actions**, **Events** and **Agent Lists** both have sub-panes that correspond to different types of actions, events and agent lists.
- **Administration** – A container for the **Connections**, **Interactive Users**, **Runtime Users**, **LDAP Groups**, **Workgroups**, **Security Policies** and **Adapters** panes. These panes concern the administration of your CWA network and CWA users.

New Root Folder Dialog

You can create 'custom' folders in the Navigator pane by right-clicking on an existing item and selecting New Root Folder from the context menu. The New Root Folder dialog displays.

See also New Sub Folder Dialog and Folder Properties Dialog.

There are three folder types:

- Root (Grouping)
- URL
- Grid View (JAC and Job Definition)

To create a Root folder:

1. In the Name field, enter a name for the new folder.
2. From the Type list, select Group.
3. In the Ownership section, select an owner for the folder from the Owner list.
4. Select the Public option if you want this folder to be available to others.
5. Click OK.

To create a URL folder:

1. In the Name field, enter a name for the new folder.
2. From the Type list, select URL.
3. In the Folder Settings section, enter the URL into the URL field.
4. In the Ownership section, select an owner for the folder from the Owner list.
5. Select the Public option if you want this folder to be available to others.
6. Click OK.

To create a Grid View folder:

1. In the Name field, enter a name for the new folder.
2. From the Type list, select Grid View.

3. In the Folder Settings section, select a grid type from the Grid Type list.
4. In the Ownership section, select an owner for the folder from the Owner list.
5. Select the Public option if you want this folder to be available to others.
6. Click OK.

New Sub Folder Dialog

You can create 'custom' subfolders in the Navigator pane by right-clicking on an existing item and selecting New Sub Folder from the context menu. The New Sub Folder dialog displays.

To create a new sub folder:

1. In the Name field, enter a name for the new sub folder.
2. From the Type list, select Group.
3. In the Ownership section, select an owner for the folder from the Owner list.
4. Select the Public option if you want this folder to be available to others.
5. Click OK.

Folder Properties Dialog

The Folder Properties dialog is displayed by selecting the Folder Properties option in the context menu available after creating a new folder or sub folder in the Navigator pane. You can modify the folder settings such as folder name, Owner and Public status.

This dialog contains the following elements:

- Name – It is recommended that a folder be given a descriptive name to help identify its purpose and usage.
- Type – Contains the type of folder, Group, URL or Grid View.
- Owner – Folders can be owned by individuals or by a workgroup.
- Public – Select this option to make the view available for other users.

Current Pane

The console pane that is currently active is considered the current pane.

Main Menus

See these topics for documentation of the menu options:

- File Menu
- View Menu
- Activities Menu
- Reports Menu
- Help Menu

File Menu

The **File** main menu has the following options:

- **Images Repository** – Displays the **Images Repository** tab. This tab allows for the selection of an alternative icon for a job or group. This image is displayed on the Jobs pane or Business Views window.
- **Print** – Displays the **Reports** pane to view and print the CWA report that corresponds to the current pane.

  Note: The **Print** option on the **File** menu provides the same functionality as the **Print** button on the **CWA** toolbar.
- **Log Out** – Logs you out of the CWA Client.

View Menu

The **View** main menu has the following options:

- **Show Master Feedback** – Displays or hides a confirmation dialog whenever a request is sent to the master.
- **Auto Refresh** – Automatically refreshes the CWA Client.
- **Refresh** – Updates all of the information in the CWA database.
- **Preferences** – Displays the **Preferences** dialog for the current pane. The Preferences dialog is used to configure a pane. For more information about a **Preferences** dialog, see the documentation for the pane you wish to configure.

Activities Menu

The **Activities** main menu has the following options:

- **Create Schedule** – Displays the **Create Schedule** dialog to manually recreate a schedule for selected days.

  Note: After selecting **Create Schedule**, a dialog denotes the success or failure of the compilation.
- **Insert Job Into Schedule** – Inserts an unscheduled job into the schedule. (This option is only applicable if the job or group's definition has the **Unscheduled Allowed** option set.)
- **Pause Scheduler** – Pauses the CWA until you select the **Resume Scheduler** option. This is especially helpful when making changes or at other times when you need a temporary interruption of service.
- **Resume Scheduler** – Resumes CWA after pausing CWA.
- **Pause Job Launching** – Pauses job launching until you select the **Resume Job Launching** option. Jobs can be defined and scheduled but they cannot run until job launching resumes.
- **Resume Job Launching** – Resumes job launching after it is paused.
- **Start Today's Schedule** – If the master was configured to wait until the previous schedule completes before starting a new schedule (on the **Master** tab of the **System Configuration** dialog), selecting this menu option overrides that setting and starts the new schedule whether the previous production schedule completed or not.
- **Shutdown Scheduler** – Stops the master service. Your master will be down until you restart the master service from either the **CWA Service Manager** for a Windows master or from the command line for a Unix master. This option is only available to authorized users. For more information about the **CWA Service Manager**, see CWA Service Manager, page 24.
- **System Configuration** – Displays the **System Configuration** dialog. You can change system-wide parameters such as defaults, mail, logging options and master properties from this dialog.
- **Register License** – Displays the **License Registration** dialog.
- **End Impersonation** – Ends the impersonation of another user.

Reports Menu

See Reports in CWA, page 313 for more information about the **Reports** menu selections: **Job Last Status**, **Schedule Summary**, **Dependency Cross Reference** and **Event History**.

Help Menu

The **Help** main menu has the following options:

- **Help Topics** – Displays the online help for CWA.
- **About** – Displays copyright information about the CWA version.

Search Field

Enter text that you want to search for within the columns displayed.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13 below.

Searchable Columns

The following table contains all columns that are searchable.

Pane	Column Name
Job Activity	Name
Event Activity	Name, Agent, Owner
Alerts	Job Name, Alert Message, Response
Logs	Log ID, Time, Type, Message, Source, Message ID, Computer
Jobs	Name
Calendars	Name, Type, Owner
Actions	Name, Owner, Description
Events	Name, Owner
Job Classes	Name, Description
Variables	Name, Owner
Agent Lists	Name, Description (on search on Agent List, not Agents
Queues	Name
Resources	Name, Owner, Description
Fiscal Calendar	Name
Connections	Name, Machine, Time Zone, Version
Interactive Users	Full Name, Name, Domain
Runtime Users	Full Name, Name, Domain
LDAP Groups	Full Name, Name, Domain
Workgroups	Name, Owner
Security Policy	Name, Description
Adapters	Name, Version, GUID

Create Schedule Dialog

The **Create Schedule** dialog displays by selecting **Activities>Create Schedule** from the main menu bar. You can also right-click in the **Schedules** pane and select the **Create Schedule** option (and other options) from the context menu to recompile a schedule but the options in the context menu do not provide as much control when creating a schedule. It is recommended to use the **Create Schedule** dialog when creating a schedule.

Use the **Create Schedule** dialog to recreate the production schedule invoking the compilation process for the dates specified. Only jobs whose calendars include the date(s) specified are included in the schedule.

Caution: All unscheduled jobs that were added manually will be lost if you recreate the schedule. Also, if you are creating today's schedule, all jobs whose dependencies have already been satisfied will run as soon as resources are available.

This dialog contains the following elements:

- **From** – First date to include in the schedule.
- **To** – Last date to include in the schedule.
- **Forecast Only** – If selected, the master will recompile your schedule for the specified date. By default, the forecast date is tomorrow. A forecast is a schedule created as a model of what a potential production schedule may be. The forecast schedule is never used, as the master recompiles the production schedule at the beginning of the production day.

  A forecast schedule is not automatically updated when jobs are modified. If a job within the forecast schedule is modified, the job's runs within the forecast are deleted rather than modified. The information contained within the forecast schedule is only relevant for the moment that it was created. You must recompile a new forecast schedule to account for modifications to any job parameters since the original forecast was created. The production schedule is recompiled at the beginning of each production day for this reason.
- **For today's repeating jobs with no time window, start repeating ASAP** – Normally repeating jobs with no time window begin at midnight. If you create the schedule after midnight, a portion or all of the repeating jobs may be excluded from the schedule unless you select the **For today's repeating Jobs with no time window, start repeating ASAP** option. By choosing this option, all repeating occurrences are added. If you select this option, all repeating instances are added to the schedule and begin repeating as soon as possible.

  For example: If a job repeats every five minutes, for a total of five times, and no time window is specified for the job, the job will normally run immediately after the automatic compilation at midnight. The result would run separate job occurrences at 12:00 AM, 12:05, 12:10, 12:15 and 12:20. If you manually create the schedule after 12:20 without this setting checked, none of the occurrences will be added to the schedule.

  By selecting the **For today's repeating Jobs with no time window, start repeating ASAP** option, all five occurrences will run after the schedule is re-created. For example, if you create the schedule at 4:00 PM, separate occurrences run at 4:00 PM, 4:05, 4:10, 4:15 and 4:20.

Job Activity Pane

These topics describe accessing and features of the Job Activity pane:

- About the Job Activity Pane
- Context Menu
- Display Customization
- Job Control

About the Job Activity Pane

The **Job Activity** pane is the key to monitoring and controlling job operations. Within the bounds of your security policy, you can view either the jobs and job groups that are owned by you and owned by any workgroups to which you belong or all the jobs and job groups on the master. For detailed information about the **Job Activity pane**, see Job Activity Interface, page 82.

To display the **Job Activity** pane, select **Operations>Job Activity** from the **Navigator** pane.

Context Menu

Right-clicking in the **Job Activity** pane displays a context menu providing easy access to job control functions.

Display Customization

The **Job Activity pane** display can be customized to suit your monitoring needs. You can:

- Sort jobs alphabetically by any column or intelligently by a status order you specify.
- Filter jobs by job status, job name, agent assignment or owner. This can be used to view only the job occurrences that are important to you.
- Modify column widths to accommodate long or short text.
- Modify pane sizes. You can adjust any pane to accommodate the desired information.

Job Control

From the **Job Activity pane**, you can perform job control functions (rerun a job, check dependencies, hold a job, etc.). For example, if a job requires Operator release (such as when the job must ensure that an external resource is free before the job starts), you (as the Operator) can manually release the job from the **Job Activity pane** using the **Release** control command.

Configuring Connections

About Configuring Connections

After installing masters, agents, and clients on various machines, you must still configure the connections. You configure your CWA network connections through the **Connections** pane. You can also update each machine's name, activate or deactivate agents for scheduling, change the communication port numbers and adjust the number of jobs that can run concurrently from an agent.

The agent architecture promotes fast processing of jobs. The agent sends status reports to the master without prompting, allowing the master to concentrate on other tasks thus reducing network traffic.

Besides the port number and the job limit, there is not much to configure with the agent.

The following sections describe the connections interface and the procedures for configuring agents:

- Connections Interface
- Adding Connections
- Connection Definition Dialog
- Changing Existing Connections

Connections Interface

About the Connections Interface

From the **Navigator** pane, select **Administration>Connections** to display the **Connections** pane.

When you select an existing connection, these buttons appear above the **Connections** table:

- **Add Connection** – Displays a list of connection options. Selecting which type of connection to define opens the appropriate **Connection Definition** dialog for that connection.
- **Edit Connection** – Displays the **Connection Definition** dialog to edit the selected connection.
- **Delete Connection** – Removes the selected connection definition from the CWA database.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print the connection definitions. For more information, see Monitoring Production, page 313.

  Note: You must select a connection for the **Edit** and **Delete** connection buttons to appear in the **Connections** pane.

The **Connections** table contains the following columns:

- **Status Light** – The status light indicates the status of the connection.
  - A green light indicates that the connection is healthy (but does not indicate whether a fault tolerance failover occurred).
  - A yellow light in front of the backup master is normal when in fault tolerant mode and indicates that the backup master is in standby mode. A yellow status light also temporarily displays when a master first starts up but changes to green as the master comes online.
  - A red light indicates that the connection has failed.
  - A gray light indicates that a connection is disabled.
- **Name** – The name of the agent or master connection.
- **Machine** – The name of the computer where the component resides.
- **Type** – Indicates the type of connection, whether an agent, adapter, master, backup master, remote master or fault monitor.
- **Platform** – The operating system or type of adapter of the connection.
- **Enabled** – Indicates if the connection is enabled.
- **Modified** – Indicates the last time the connection definition was modified.
- **Load** – Indicates the percentage of the agent machine's CPU capacity currently being used.
- **Time Difference**
  - If **Type = Master**, the number of minutes of difference between the master and the Client Manager.
  - If **Type = Agent**, the number of minutes of difference between the master and the agent from the point of view of the master.
  - If **Type = Remote Master**, the number of minutes of difference between the local master and the remote master.
- **Floating** – Indicates if the component has a floating or non-floating license.

- **Active** – Only applies to agents; indicates if the agent is active or not.
- **Limit** – Indicates the number of jobs the component is licensed to run simultaneously.
- **Version** – Indicates the version number of the listed component.
- **Out Until** – If the connection is offline on a scheduled basis, this column displays the time when the outage pane will end. This column is blank if no scheduled outage is occurring.
- **Time Available** – If the connection is scheduled to be offline, this column displays the number of minutes remaining before the outage pane begins. This column is blank if there is no scheduled outage.

Search Field

Above the **Connections** table on the right is a search field. Enter text that you want to search for within the columns displayed. CWA immediately filters the data, only displaying the rows that contain the text you typed. Delete the text and all rows are displayed.

Note: The search field only searches text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Connections Preferences Dialog

From the **View** menu, select **Preferences** while viewing the **Connections** pane to display the **Connections Preferences** dialog.

From the **Connections Preferences** dialog, you can select which columns display in the **Connections** pane and arrange the order they appear.

- A checkmark to the left of a column title indicates that the column will be displayed in the pane. No checkmark indicates that column will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Connections** pane, the Navigator context menu displays.

The **Connections Navigator** context menu contains the following options:

- **Add Connection** – Displays a list of the different connection types that can be defined. Has the same function as the **Add Connection** button. Selecting an option from the list displays the appropriate **Connection Definition** dialog for that connection.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print your connection definitions. For more information, see Connections Report, page 319.
- **Select All** – Selects all connections currently displayed.
- **Export** – Saves the data in the current pane as an HTML file.
- **Preferences** – Displays the **Preferences** dialog for the **Connections** pane.
- **New Root Folder** – Allows you to create a new root folder for the **Navigator** pane.

Connections Pane Context Menu

When you right-click in the **Connections** pane, the **Connections** pane context menu displays.

Note: A connection must be selected in order for the Edit and Delete options to be available in the context menu.

The **Connections** pane context menu contains the following options:

- **Add Connection** – Displays a list of the types of connections that can be defined. Selecting a connection type displays the **Connection Definition** dialog for that type of connection.
- **Edit Connection** – Displays the **Connection Definition** dialog to edit a selected connection.
- **Delete Connection** – Deletes the selected connection's definition.
- **Refresh** – Refreshes the **Connections** pane.
- **Print** – Prints a report of existing connections.
- **Print Selected** – Prints a report of selected connections.
- **Select All** – Selects all connections currently displayed.
- **Disable** – Temporarily inactivates the connection.
- **Enable** – Activates the connection from a disabled state (available only after having selected the **Disable** option, below). You can also enable a connection through the **Enabled** option in its definition dialog.
- **Reconnect** – Re-establishes a connection that failed. Reconnect is also available for an enabled connection that is not fully established.
- **Test** – Checks to see if the selected connection is working properly.

  Note: The **Test** option is not available for all connection types.

Adding Connections

You use the **Connections** link in the **Navigator** pane to add and manage connections. These connection types can be added:

To add a connection to a new adapter:

1. From the **Navigator** pane, choose **Administration>Connections**.
2. Above the **Connections** table, click the **Add** button or choose **Add Connection** from a context menu.
3. Select the connection type: one of the Agents, the Remote Master, or one of the Adapters.
4. Provide the name, connection information on each tab, and check the options as desired,

   The tabs and options displayed on each tab vary depending on the connection type. See Connection Definition Dialog, page 20 for more information.
5. Click OK.

Connection Definition Dialog

About the Connection Definition Dialog

The **Connection Definition** dialog displays when you add a connection using the **Add Connection** option on the context menus or the **Add** button at the top of the **Connections** pane. After you select the connection type from the list of the possible licensed components in your CWA network, the **Connection Definition** dialog displays. The type of connection being defined displays at the top of the **Connection** dialog.

Connection Definition - Common to All Tabs

- **Name** – The name that will be used to refer to the connection throughout CWA panes and dialogs.
- **Enabled [check box]** – Allows you to enable (activate) and disable (deactivate) agents. Jobs cannot run on agents that have been deactivated. If they try to run on agents that have been deactivated, they enter into the **Agent Disabled** status. Jobs already running on agents that are disabled will run to completion; however, their completion status will not be returned until the agent is re-enabled.
- **Use as default for <connection_type> Jobs [check box]** – For many connection types, this option is available to let you use the new definition as a starting point for any connections you add of this type.

Connection Definition - General Tab

The **General** tab contains the following elements:

- **Job Limit** – Displays the maximum number of jobs that CWA can run on the agent.

  Windows agents have a concurrent job execution limitation based on the amount of memory the agent has. It is recommended that you do not set the agent job limit to a value higher than this limitation. In most instances, it is recommended to limit agents to running no more than 80 concurrent jobs. In general, agents should have 5 MB of memory for each concurrent job. Some jobs may require additional memory to process depending upon the needs of the job.

- **Default Runtime User** – Specify a default runtime user for the agent being installed.

Connection Definition - Connection Tab

On this tab, the machine name and port number are specified for the connection. The fields and field names vary according to the type of connection being defined.

Depending on the connection type, this tab contains the following elements:

- **Machine Name** – The host name of the computer. This name is case-sensitive and can be found in the DNS section of the TCP/IP protocol of your network configuration. Consult with your System or Network Administrator for help with DNS and TCP/IP.
- **Master-to-Agent Port** – The **Master-to-Agent Port** field displays when defining an agent connection. The port used to communicate with the **cqd** process of an agent machine. The default is **5912**. This number is specified during installation.
- **Backup-to-Master Port** – The **Backup-To-Master Port** field displays when defining a backup master connection. This port is used to communicate between the backup master and primary master for fault tolerance purposes. The default is **6704**. This number is specified during fault tolerance installation.
- **Fault Monitor Master Port** – The **Fault Monitor Master Port** field displays when defining a fault monitor connection. This port is used to communicate between the fault monitor computer and the primary master and backup master for fault tolerance purposes. The default is **6703**. This number is specified during fault tolerance installation.

- **Agent-to-Master Port** – The port used when defining a master connection. The default is 5591. This number is specified during installation.

  Do not use port values that are in use by other software programs. Connection performance will be unpredictable.

- **Host Environment Log** (This option only appears for a master connection if you are using an adapter offered by Cisco for CWA.) – Sets the detail level for the logging in the adapter host environment. Like the logging levels set on the **Logging** tab of the **System Configuration** dialog, there are seven progressively more detailed levels of detail available that range from **None** to **High Debug**. The Severe level is the default option. When the log reaches 1 MB in size, it is archived and a new log file is started. The log file is named *AdapterHost* with a date and time stamp and a *.log* extension. After 25 log files are created, the oldest log file is deleted to make room for a new log file. These *AdapterHost* files are stored in the same directory as the master's log files at **Program Files\Tidal\Scheduler\master\log**.

  There is also a Service log file named *Service.log* for each corresponding adapter. This log is located inside of the corresponding adapter GUID. For example, the SAP Service Log location would be:

  C:\Program Files\TIDAL\Scheduler\Master\services\{51C57049-3215-44b7-ABE1-C012FF786010}\log.

  Changing the level of the Host Environment Log will directly effect the debug level of every adapter.

- **Remote Primary Master Machine Name** – The **Remote Primary Master Machine Name** field displays when defining a remote master connection. Type the machine name of the remote master that is managing the intermaster dependency.

  If you are defining a remote connection, then your **Connection** tab is slightly different. There are two machine name fields and a **Communication Port** field.

- **Remote Backup Master Machine Name** – The **Remote Backup Master Machine Name** field displays when defining a remote backup master connection. Type the name for the backup master if the remote master managing the intermaster dependency is in fault tolerance mode. If the remote master is ***not*** fault tolerant, leave this field ***blank***.

- **Communication Port** – The **Communication Port** field displays when defining a remote master connection. This port is used to communicate between the local master and the remote master (and its backup machine if fault tolerance is being used). The default is **6215**. This communication port should be the same number that Client Manager(s) of the remote master use.

Connection Definition - Outages Tab

This tab only appears in the **Connections Definition** dialog when defining an agent or adapter connection and allows you to add, edit, and delete an agent or adapter outage.

This tab lists the time windows when the agent/adapter will not be available. The actual parameters of the outage are defined from the **Outage Definition** dialog (see Outage Definition Dialog). CWA will use the information entered here to manage jobs that may not complete before an outage window begins. From a system configuration viewpoint, use the **Defaults** tab to configure how CWA handles jobs at risk of failing due to a planned outage.

This page contains the following elements:

- **Calendar** – Displays either the name of the calendar assigned to the outage or the date that the outage begins. One time outages would not have a calendar but if an outage occurs regularly, it should be assigned a calendar.

- **From** – The start time of the outage window.

- **Until** – The time that the outage ends. If the outage extends more than one day, the date that the outage ends is also displayed.

- **Suspend/Disable** – Indicates if the connection is disabled or suspended during the outage. A suspended connection will automatically enable at the end of the outage while a disabled connection must be manually enabled at the end of the outage. An agent/adapter connection in an outage window can always be enabled to end the outage.

- **Add** – Displays the Outage Definition dialog to define a new outage.
- **Edit** – Opens the Outage Definition dialog to modify the parameters of the selected outage.
- **Delete** – Deletes the selected outage.

Outage Definition Dialog

The Outage Definition dialog displays by adding a new outage period or editing an existing one from the Outages page in an agent's connection definition. An outage may be a one-time event or define a reoccurring outage by assigning the outage a calendar.

This dialog contains the following elements:

- **Specific Date Interval** – Select this option to define a specific time interval for a single outage. Click on the drop-down arrow in the first From field to display a calendar to select a start date for the outage period. In the adjacent text field, enter the time that the outage should start on the designated day. In the Until field, select the date and time that the outage should end. The Until field is unavailable if the Disable connection during outage option is selected.
- **Calendar** – Select this option to define a reoccurring outage on multiple dates by assigning an existing calendar. Once the outage is assigned a calendar of dates, enter the starting time of the outage in the From field and an ending time in the Until field. The Until field is unavailable if the Enable connection at end of outage time window option is selected.
- **Enable connection at end of outage time window** – This option enables the connection when the outage window ends. By default this option is selected, suspending a connection during an outage so that when the outage ends, the connection will automatically enable itself. Clearing this option ensures that the connection is disabled at the start of the outage window. The connection will not be enabled until an operator manually enables it. If this option is not selected, then the Until options used to define the end of the outage are disabled since the outage cannot end until the connection is enabled manually by an user.

Connection Definition - Resources Tab

This tab only appears in the **Connections Definition** dialog when defining an agent connection and displays all the system resources and current values collected for the connection.

Connection Definition - Options Tab

This tab only appears in the **Connections Definition** dialog when defining an agent connection and allows you to add, edit, or delete name/value connection parameters. When you click the Add button, you see the Parameter Definition Dialog.

Parameter Definition Dialog

You can configure parameters for connections and jobs via the Parameter Definition dialog. Select the parameter, then click Add or Edit to display the Parameter Definition dialog.

This dialog contains the following elements:

- **Parameter Name** – The name of the new parameter.
- **Parameter Value** – The value of the new parameter.
- **Variables** – If displayed, click to use a predefined variable.

Connection Definition - Variables Tab

This tab only appears in the **Connections Definition** dialog when defining a remote master.

This tab lists the various names and types of variables published by the specified remote master. The actual value of a variables is only determined when needed as the job processes. The list of variables published by the remote master is regularly updated and cached by the subscribing master with the intermaster dependency.

Changing Existing Connections

The following sections describe how to edit existing connections.

Changing the Computer Name Displayed in CWA

To change the name of the computer:

1. From the **Connections** pane, double-click the licensed computer to edit or select the computer and click the **Edit** button. The licensed computer's **Connection Definition** displays.
2. In the **Name** field, change the computer's name. This name is used when referring to the computer on CWA panes and dialogs.
3. Click **OK**.

Changing the Computer Hostname

To change the hostname of the computer:

1. From the **Connections** pane, double-click the licensed computer to edit, or select the computer and click the **Edit** button to display the licensed computer's **Connection Definition** dialog.
2. Click the **Connection** tab.
3. In the **Machine Name** field, update the computer's name.

This name can be found in the DNS section of the TCP/IP protocol of your network configuration. See your System Administrator for more information.

Changing the Connection Port Numbers

You can update communication port numbers for licensed connections if they conflict with other programs that use the same numbers.

To change the connection port numbers:

1. From the **Connections** pane, double-click the desired connection or select the connection and click the **Edit** button to display the licensed computer's **Connection Definition** dialog.
2. Click the **Connection** tab.
3. Different fields are displayed, according to the type of connection selected:
   - **Master** – The **Agent-to-Master Port** field is used when defining a master connection. The default is **5591**. This number is specified during installation. Update this port if it conflicts with other programs.
   - **Agent** – The **Master-to-Agent Port** field is used when defining an agent connection. Update this port number if it conflicts with other programs. The default is **5912.**
   - **Backup Master** – The **Backup-To-Master Port** field is used when defining a backup master connection. Update this port if it conflicts with other programs. The default is **6704**.
   - **Fault Monitor** – The **Fault Monitor Master Port** field is used when defining a fault monitor connection. Update this port if it conflicts with other programs. The default is **6703**.

The **Fault Monitor Client Port** field is a JMS port used by the Client Manager to communicate with the Fault Monitor. The default is **6705**.

- **Remote Master** – The **Communication Port** field on this tab is used for communicating between the local master and the remote master. There is always one remote master that will use this port but this port is also available to the remote backup master if the remote master is in fault tolerant mode. The default port for this connection is **6215**, so change the value if there is a conflict. This same JMS Port is also used for the Client Manager to Master communication.

Deleting an Agent Connection

To delete an agent connection:

1. From the **Connections** pane, select the agent to delete.
2. Click the **Delete** button on the CWA toolbar.

Starting and Stopping CWA Components

About Starting and Stopping CWA Components

To operate CWA, ensure that the master, Client Manager and agent are running on their respective machines. Once installed, the master, its database, the Client Manager and agents should remain running. If any of these components stop, you can restart them on the Windows platform by using the CWA Service Manager. If you are running fault tolerance, you also need to start the backup master and fault monitor.

The Unix platform does not use the CWA Service Manager. Controlling the Unix master and its components is done from the command line of the specific machine. The commands for starting, stopping and checking the status of the Unix master, Client Manager and agent are noted.

CWA Service Manager

The CWA Service Manager is a central point of control for stopping and starting CWA services on the Windows platform. Any CWA component on the Windows platform running as a service can be manipulated from the service manager. Through the CWA Service Manager, you can also configure various aspects of how the component service runs.

To display the CWA Service Manager

Click the Windows **Start** button, and select **Programs>Cisco Workload Automation>CWA Service Manager.**

This dialog contains the following elements:

- **Service** – Choose the CWA service you wish to start or stop.
- **Start** – Click to start a service.
- **Stop** – Click to stop a service.

The selected service's status displays at the bottom of the CWA Service Manager.

Service Configuration Dialog

Accessing the Service Configuration Dialog

Clicking the **Browse** button while in the initial dialog of the CWA Service Manager opens a **Service Configuration** dialog where settings for the master or other services can be adjusted.

Service Configuration - Service Tab

The **Service** tab contains the following elements:

- **Name** – The name of the Windows system service.
- **Display Name** – The label for the service displayed in the main dialog of the **CWA Service Manager.**
- **Path** – The full path to the binary file associated with the service.
- **Parameters** – The parameters, if any, applied to executing the binary.
- **Startup** – Configures how the service starts. There are three options:
  - **Automatic** – The service starts upon every reboot.
  - **Manual** – The service is only started when you manually start it, for example, through the **CWA Service Manager.**
  - **Disabled** – The service will not start as long as the **Disabled** option is selected.

Service Configuration - Logon Tab

The **Logon** tab contains the following elements:

- **System Account (LocalSystem)** – The service runs under the standard system account for services.
  - **Allow Service to interact with Desktop** – The service runs with the local desktop.
- **Other Account** – When the **Other Account** option is selected, you must type the name of the account under which you want the service to run.
  - **Password** – Type the password for the account specified in the **Other Account** field.
  - **Confirm Password** – Retype the password.

Service Configuration - Dependencies Tab

The **Dependencies** tab is only available when the service is *stopped*. You create services dependencies on this tab. Select a service listed in the **Available Services** column and click the arrow button to move it to the **Depends On** column.

Master

Controlling the Master

Normally, after installation and after a reboot, the CWA master is automatically started. On Unix, the master is NOT automatically started. You can check the status, start, and stop the master service manually from the CWA Service Manager for a Windows master or from the command line for a Unix master.

Note: If you are using an Oracle or MSSQL Server, ensure that your database is running prior to starting the master service.

Checking the Status of the Master

To check the status of the master:

Unix

1. From the command line of the master machine, type:

   ./tesm status

Windows

1. On the machine with the master installation, click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the CWA Service Manager.
2. Verify that the **Scheduler Master** displays in the **Service** field.

The master status displays at the bottom of the CWA Service Manager.

Starting the Master

To start the master:

Unix

1. From the command line of the master machine, type:

   ./tesm start

Windows

1. On the machine with the master installation, click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the CWA Service Manager.
2. Verify that the **Scheduler Master** displays in the **Service** field.
3. Click **Start**.

Stopping the Master

To stop the master:

Unix

1. From the command line of the master machine, type:

   ./tesm stop

Windows

1. On the machine with the master installation, click the Windows **Start** menu button, then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the **CWA Service Manager**.
2. Verify that the **Scheduler Master** displays in the **Service** field.
3. Click **Stop**.

Defining a Master Timezone

You can define timezones where target application environments are based. This allows you to schedule a job or job group across a different timezone. For example, if the Master associated with your job is based in the PST timezone and you want the job to run in an alternative timezone, you can select the defined timezone. The Master internal process will self-adjust the scheduled time or DST (Daylight Savings Times) period differences.

To configure the Master timezone for a job:

1. From the **Activity** menu, select **System Configuration** to display the **System Configuration** dialog.
2. Click the **Timezone** tab.
3. Click **Add** or **Edit** to display the **Timezone for Job Definition** dialog.
4. In the **Name** field, enter a unique name to represent job timezone.

   Note: If the Use Agent Time Zone is selected, the following step does not apply.
5. From the **Timezone** list, select the timezone ID.

   Note: As of CWA 6.0.3, this option has been relocated from the **Master** tab to the new **Timezone** tab.

   The following fields pre-populate depending on the **Timezone** list selection:

   - **Timezone Full Name** – Java build-in timezone long name.
   - **Master Timezone Offset** – The time differences between Master timezone and selected Java timezone.
   - **UTC/GMT Timezone Offset** – The time differences between standard UTC/GMT and selected Java timezone.
   - **Current in DST Timezone Period** – Checked if current in Daylight Saving Time (DST) period for this selected timezone.
   - **DST Time Differences** – The amount of time to be added to selected timezone if it is in DST period.
6. Click **OK**.

See System Configuration – Timezone Tab, page 38 for further instruction.

Agents

About Agents

You can start and stop agents, check agent status, change an agent's job limit and perform other agent-related tasks in your network at any time as described in this section.

Note: For Windows agents, before starting or stopping the agent, check the agent's status using the CWA Service Manager.

Changing an Agent's Job Limit

You can change an agent's job limit to specify the number of jobs that can run on it concurrently. You can also control the number of jobs running concurrently using queues. Refer to Controlling Production, page 253 to learn more ways of controlling job execution.

To change an agents job limit:

1. From the **Navigator** pane, select **Administration>Connections** to display the **Connections** pane with the licensed computers.
2. Double-click the agent to edit or select the agent and click the **Edit** button on the CWA toolbar to display the agent's connection definition.
3. Click the **General** tab if it is not showing.
4. In the **Job Limit** field on the **General** tab, change the job limit to the desired value. See your agent-related documentation on setting the job limit.
5. Click **OK**.

Enabling/Disabling an Agent

You can disable an agent if you do not want it to run jobs submitted by CWA. If a job tries to run on a disabled agent, its status changes to **Agent Disabled**.

To enable or disable an agent:

1. From the **Navigator** pane, select **Administration>Connections** to display the **Connections** pane.
2. Double-click the agent to edit or select the agent and click the **Edit** button on the CWA toolbar to display the agent's connection definition.
3. Do one of the following:

- To enable the agent, select the **Enabled** option.
- To disable the agent, clear the **Enabled** option.

4. Click **OK**.

Starting the Agent (Windows)

To start the agent:

1. Click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager**.
2. Select the correct agent if it is not displayed in the **Service** field and click the **Start** button. The light will turn green when the agent starts.

Stopping the Agent (Windows)

To stop the agent:

1. Click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager**.
2. Select the correct agent if it is not displayed in the **Service** field and click the **Stop** button. The light will turn red when the agent stops.

Checking Agent Status (Windows)

To check the agent status:

1. On the agent machine, click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the CWA Service Manager.
2. In the **Service** drop-down list, select the agent you wish to check so that it displays in the **Service** field.
3. At the bottom of the CWA Service Manager, the status of the selected service displays.

Starting, Stopping, and Checking Agent Status (Unix)

To start, stop and check the status of a Unix agent, use these commands:

Start a Unix agent:

./tagent <agent name> start

Stop a Unix agent:

./tagent <agent name> stop

Check the status of a Unix agent:

./tagent <agent name> status

Client Manager

Controlling the Client Manager

You can check the status, start, and stop the client manager manually from the CWA Service Manager or from the command line.

Checking the Status of Client Manager

To check the status of Client Manager:

Unix

1. From the command line of the master machine, type:

   ./cm status

Windows

1. On the machine with the master installation, click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the CWA Service Manager.
2. Verify that the **Client Manager** displays in the **Service** field.

   The Client Manager status displays at the bottom of the CWA Service Manager.

Starting Client Manager

To start the Client Manager:

Unix

1. From the command line of the master machine, type:

   ./cm start

Windows

1. On the machine with the Client Manager installation, click the Windows **Start** button and then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the CWA Service Manager.
2. Verify that **Client Manager** displays in the **Service** field.

3. Click **Start**.

Stopping Client Manager

To stop Client Manager:

Unix

1. From the command line of the master machine, type:

   ./cm stop

Windows

1. On the machine with the Client Manager installation, click the Windows **Start** menu button, then select **Programs>Cisco Workload Automation>CWA Service Manager** to display the **CWA Service Manager**.
2. Verify that **Client Manager** displays in the **Service** field.
3. Click **Stop**.

Fault Monitor

Fault Monitor Interface

The Fault Monitor folder displays in the Navigator pane only if you have installed and configured fault tolerance for Scheduler. See the Fault Tolerance Guide for information about how to configure Client Manager for fault monitor.

Note: To see the Fault Monitor folder, you must be properly licensed for fault tolerance and your security policies must allow access to the fault monitor option.

Accessing the Fault Monitor

In the Navigator pane, select Operations>Fault Monitor to display the Fault Monitor pane.

Buttons

This window contains the following buttons:

– Pauses the scrolling display of fault monitor messages.

– Saves the messages displayed in the Fault Monitor pane to a file.

– Prints the messages displayed in the Fault Monitor pane.

Context Menu

Various functions for the fault monitor can be accessed from a context menu. Right-click anywhere in the Navigator pane or the Fault Monitor pane to display a context menu.

This context menu contains the following options:

- Pause Fault Monitor – Pauses the display of messages in the Fault Monitor pane. Select Resume Fault Monitor to resume the display of messages.
- Stop Fault Monitor – Stops the fault monitor. When you select this option, a Confirm dialog displays. Click Yes to continue and No to abort. When the fault monitor is not running, failover is not possible.
- Switch To Backup – Switches to the backup master. When you select this option, a Confirm dialog displays. Click Yes to continue and No to abort. Use this option before doing planned maintenance on your primary master.

- Stop Backup and FaultMon – Stops the operation of the backup master and the fault monitor. When you select this option, a Confirm dialog displays. Click Yes to continue and No to abort. When the backup master and fault monitor are stopped, the primary master continues without being fault tolerant.
- Stop All – Stops the operation of the primary master, the backup master and the fault monitor. When you select this option, a Confirm dialog displays. Click Yes to continue and No to abort.
- Disconnect from FaultMon – Disconnects the machine from the fault monitor. New messages no longer display. The options in the Fault Monitor are still available. Select Connect to Fault Monitor to reconnect to the fault monitor.
- Print – Prints the messages displayed in the Fault Monitor pane.
- Save As – Saves the messages displayed in the Fault Monitor pane as a file.
- Clear – Clears the Fault Monitor pane of all displayed messages.

System Configuration

Overview

Before using CWA on a regular basis, you should spend some time in the **System Configuration** dialog. By tailoring CWA's configuration to your needs, you will receive greater benefits from using the product.

You can configure the following options:

- Job and job group definition default field values. This lets you specify many of the default field values, such as the default agent, job priority, and concurrency that is automatically entered each time you create a new job or job group.
- Timezones where target application environments are based. You can schedule a job or job group across a different timezone.
- Mail parameters for email messaging services. This lets you define your email service so that CWA can use it.
- The audits, errors and diagnostic logging messages to include and/or exclude. As you become more familiar with CWA, you might want to filter the messages that appear in the **Logs** pane, but initially we recommend keeping all default settings.
- How job occurrences are sorted when the status sort is selected. This feature helps you to sort job occurrences based on the status order you choose, helping you more clearly organize jobs in the **Job Activity** pane.

System Configuration Dialog

Accessing the System Configuration Dialog

Select **Activities > System Configuration** from the menu bar of the CWA Client to display the **System Configuration** dialog.

System Configuration - Master Tab

The **Master** tab configures actions managed by the master. This tab contains the following elements:

- **Future Days to Include in Schedule** – Controls the number of future days to include in the production schedule when the master does its daily compilation. Larger values let you schedule jobs farther into the future. Lower values reduce compilation time.

Note: When you change the **Future Days to Include in Schedule** value, the new value will not take effect until the production schedule is compiled. Compilation will take place at midnight, by default.

- **Operator Alert Retention (in days)** – The number of days to keep operator alert information in the **Job Activity pane**.

  Note: By default, alerts are kept for seven days. Alerts that are older than the Operator Alert Retention value are purged daily.

- **Trigger History Retention (in days)** – Sets the default number of days to maintain event trigger history on the **Trigger History** tab of the **Event Details** dialogs. The maximum length of time to keep trigger history information is 9,999 days but this length of time requires ***very large amounts of hardware and resources*** and hampers performance. The default setting is for 30 days.

- **Use Passwords to Run Windows Jobs** – Enables (if checked) Windows agents to use Windows passwords. Windows agents can be configured to use a per-job password. Each scheduled job can be configured to run under a specific username and password (runtime users). The job inherits the permissions and resources of the assigned user account. This means that all runtime users require valid passwords. Any jobs that log on as users with invalid or missing passwords will fail with a status of **Error Occurred**.

  CWA stores the passwords in encrypted form within its own database. At no time is an unencrypted password echoed to the screen or made otherwise accessible to any user. Passwords are also encrypted when passed from a master to an agent.

  Caution: Checking the passwords of multiple users when running jobs restricts the Windows agent to only processing 30 jobs concurrently. If passwords are not used when running Windows jobs, the Windows agent can handle up to 80 concurrent jobs.

  CWA stores the passwords using 64-bit block cipher encryption within its own database. At no time is an unencrypted password echoed to the screen or made otherwi se accessible to any user. Passwords are also encrypted when passed from a master to an agent.

- **Automatic Daily History Cleanup** – When this option is selected, CWA automatically purges the database everyday. By default, the purge is executed at the beginning of the new production day.

  Note: The master will log any errors when purge is performed automatically.

  When this option is not selected, CWA will not automatically purge your database of old information history.

- **FTP Local User Mandatory** – Requires that a local (or runtime) user be selected on the **Run** tab of FTP job definitions. Using a runtime user adds additional security to FTP jobs. The default is to not use a runtime user (unselected). If this option is selected, any previous FTP jobs that were defined without assigning a local user, will error out until a local user is assigned to the job.

- **None (except Launched/Active Jobs)** – Do not transfer any jobs from the current production schedule to the next production schedule unless the jobs have already launched or are in active status. (On an individual basis, jobs can be prevented from carrying forward by selecting the **Disable carryover** option from the **Options** tab of the **Job Definition** dialog.)

- **Successors only (unless disabled for job)** – Transfers to the following production schedule any successor jobs from active jobs in the current production schedule unless the **Disable carryover** option was selected in a job's definition.

- **All Unfinished Jobs (unless disabled for job)** – Transfers any jobs that did not run in the current production schedule to the following production schedule unless the **Disable carryover** option was selected in a job's definition.

- **Wait until previous schedule completes before starting new schedule** – This option prevents any jobs from a new production schedule regardless of their priority from running until all of the jobs from the previous schedule are completed or canceled. If the production day rollover is held up while waiting for the previous day's jobs to complete, a warning is recorded in the Audit log. To rollover to a new production schedule after selecting this option, you must either cancel the previous day's jobs that are still running or change the jobs' status to completed.

- **Days to Carry Over** – Use this option to specify the number of days to carry over unfinished jobs. When the number you specify is reached, CWA will no longer include the unrun jobs in the next production schedule.

- **Production Day Offset [+/- hh:mm]** – The **Production Day Offset** value adjusts the beginning of the production "day" to start the specified number of hours/minutes before or after midnight of the "real" day. For example, if you enter a **+03:00**, your calendar for the day will not start until 3:00 am.

  Note: If the production day offset is modified, you must recompile the current and future production schedule for the changes to take effect. If a negative offset is specified, the master should be restarted and then the current and future production schedules must be recompiled.

- **Compile Offset [+/- hh:mm]** – This option adjusts your compile time to start the specified number of hours/minutes before or after the beginning of the production day. The default compile time is midnight, because midnight is the default time for the beginning of the production day. If you have set a **Production Day Offset** value (above) the **Compile Offset** value will be adjusted from the new beginning of the production day.

- **Week Begins** – This option affects the starting date of all subset calendars that use weekly definitions. After changing the value in this field, select **Recalculate** from the **Calendars** pane context menu to have the changes take effect. For more information, see Calendars Interface, page 263, in this manual.

System Configuration - Defaults Tab

Displays default settings for job definitions. The **Defaults** tab also configures whether job events, system events, actions, variables and calendars will default to public availability.

This tab contains the following elements:

- **Agent Name** – Sets the default agent for the **Agent Name** setting in the **Job/Group Definition** dialogs.

- **Job History Retention (in days)** – Sets the default number of days of job history to keep. The **Job History Retention** setting can be individually configured for jobs on the **Options** tab of the **Job/Group Definition** dialogs. The maximum length of time to keep job history information is 9,999 days but this length of time requires ***very large amounts of hardware and resources*** and hampers performance.

- **Job Priority** – Sets the default for the **Job Priority** setting in the **Job/Group Definition** dialogs.

- **If job is currently running** – Sets the default for the **If job is currently running** setting (concurrency) in the **Job Definition** dialog. There are four options:

  - **Run Anyway**– Run another job instance even if the previous instance is still running.

  - **Skip** – Do not run another job instance if the previous instance is running.

  - **Defer until Normal** – Run another job instance only if the current job instance completes with a Normal status.

  - **Defer until Complete** – Run another job instance only after the current job instance completes.

- **Base time needed to run job on** – Sets the default basis for evaluating whether jobs will complete before a scheduled outage. Whether jobs have adequate time to run can be based on either of the following factors:

  - **Estimated Duration** – The estimated duration for the command or executable as specified in the job definition. If the job has run more than once with the same command or executable, the estimated duration is the historical average of the job's previous run times. You can also manually set the estimated duration time of a job in its definition.

  - **Maximum Duration** – The maximum duration for the command or executable as specified in the job definition.

- **If not enough time before outage** – Sets the default for the **If not enough time before outage** setting in the **Job Definition** dialog. There are three options:

  - **Run Anyway** – Run the job anyway.

  - **Skip** – Do not run the job.

  - **Defer** – Wait and run the job after the connection outage has ended.

- **Unscheduled allowed** – Sets the default for the **Unscheduled Allowed** setting in the **Job Definition** dialog.
- **Disable carryover** – Prevents any jobs that did not run during the current production schedule from being carried over to the next production schedule. If you wish to carry over jobs to the next production schedule, refer to the **Carryover Options for Unfinished Schedule** section on the **Master** tab to configure which jobs should carry over to the next day's production schedule.
- **For Unix, source user's profile** – Allows you to execute Unix user profiles. This global option provides for the execution of all variables in a Unix user's profile. This option is available in individual job definitions on the **Options** tab so that job instances do not have to default to a source user's profile. Without this option, any Unix user profile variables that are referenced by scripts will not be executed, causing a job to fail in CWA.
- **Save Output Option** – Sets the default handling of job output. There are three options:
  - **Discard** – Does not save the job output. (Default)
  - **Append** – Saves the complete output from each job instance, adding the output to the previous job instance's output.
  - **Replace** – Saves the complete output from each job instance, overwriting the previous job instance's output.
- **Summary Only for ERP Jobs** – This option only applies to some adapter jobs. Selecting this option saves the job output in a summary form. This option is useful when ERP jobs have long job output and you do not want the entire output file. Not available if the **Discard** option is selected.
- **Override 'Rerun each time dependency is met' for disabled jobs** – If a job is disabled, the system will override the option to rerun the job each time a dependency is met.
- **Public** – Sets the public option default where public option is used. Public items are available to all users of CWA with an appropriate security policy.

System Configuration - Mail Tab

The **Mail** tab of the **System Configuration** dialog displays email settings. CWA uses actions to send email to users about job scheduling information.

Note: For more information about using email with CWA, see Actions and Alerts, page 175 in this guide and the *Cisco Workload Automation Installation and Configuration Guide.*

This tab contains the following elements:

- **Mail System** – The email system used by your network. You can choose from the following email system types:
  - **None** – No mail system is selected.
  - **Internet Mail SMTP** – Simple Mail Transfer Protocol. Used with Netscape and the Internet Explorer browsers.
  - **SMTP server address** – The complete path to your SMTP server. Scheduler can process an entry of up to 60 characters in this field.
  - **Return address** – The email account the master will use. Scheduler can process an entry of up to 60 characters in this field.
- **Address Separator** – You may want to notify more than one person when an action occurs. Use the address separator when listing several email addresses so CWA can distinguish between individual addresses. You may use any character that the designated mail system recognizes as a separator as long as the separator is a single character. Most of the time you would use a comma or a semi-colon as a separator.
- **Timeout** – If no response, enter the time (in milliseconds) you want the mail to timeout.

System Configuration - Logging Tab

The **Logging** tab configures the length of time to keep audit and error messages. You can also choose to suppress messages from a specific source. More information on diagnostic logging is available in Troubleshooting, page 355. For more information about logging and log messages, see Monitoring Production, page 313.

Caution: Be careful using diagnostic logging as excessive diagnostic logging consumes large amounts of disk space and affects the timeliness of processing requests and the launching of jobs

This tab contains the following elements:

- **Audits** – The length of time to keep audit information. The maximum length of time to keep audit information is 9,999 days but this length of time requires very large amounts of hardware and resources and hampers performance. The default is 7 days.
- **Errors** – The length of time to keep error information. The maximum length of time to keep audit information is 9,999 days but this length of time requires very large amounts of hardware and resources and hampers performance. The default is 30 days.
- **Audits option** – Select this option to activate audit logging. When checked, auditing information will be collected and can appear in the **Logs** pane. The following is a list of available auditing sources.
  - **Master** – Displays audit messages that originate from the master.
  - **Client** – Displays audit messages that originate from all CWA Clients connected to the master.
  - **Agent Manager** – Displays audit messages that originate from licensed agents that run jobs. The **Agent Manager: CQD** category displays messages dealing with the underlying agent communications protocol.
  - **Fault Tolerance** – Displays audit messages from the Fault Monitor machine.
  - **Dependency Manager** – Displays messages about when dependencies for jobs and job groups are met.
  - **Job Manager** – Displays messages about the status of jobs.
  - **Action Manager** – Displays messages about all configured actions.
  - **Queue Manager** – Displays messages about queue activity.
  - **Agent Messenger: CQD** – Displays messages regarding the agent communications protocol, CQD. The **Agent Manager** category displays other messages originating from licensed agents.

  Note: Because of the volume of CQD diagnostic messages, you can clear the Agent Messenger: CQD source for messages while still gathering information regarding your agent(s) from the Agent Manager source.

Often the error messages displayed in the CWA Clients that are generated by a problem provide an indication of the source of the problem revealing which component should be monitored. If no source is indicated in the error message, check the messages in the system log for clues to the source of the problem. Once the source of the problem is identified, you can enable diagnostic logging for that system component. Be careful when using the diagnostic logging function as logging messages can consume a large amount of disk space very quickly. Carefully monitor the size of the log file being created as excessive logging consumes system resources as well as disk space. Try to repeat the scenario that produced the problem, so system activity can be recorded for Cisco Technical Assistance Center (TAC) to interpret. Once the problem occurs again, contact TAC and send them the log file.

If you are enabling diagnostics before contacting TAC, start at the **Info** level and TAC will provide additional instructions after receiving the diagnostic files.

The following components are monitored:

- **Scheduler Log** – Records system level messages regarding the master.

- **Client Manager Log** – Records messages about Client Manager activity.
- **Agent Manager Log** – Records messages from agents running jobs.
- **Compiler Log** – Records messages about the status of production schedules being compiled.
- **Job Manager Log** – Records messages about the status of jobs.
- **Event Manager Log** – Records messages about events defined in CWA.
- **Queue Manager Log** – Records messages about queue activity.
- **Database Log** – Records messages relating to the state of the database.
- **Communications Log** – Records messages concerning all defined connections and sockets. Be aware that setting this component to a high level of logging results in a large amount of information that consumes large amounts of disk space.

Each component has a drop-down list with seven levels of progressively more detailed logging. Each level includes the messages of the previous levels of logging. The levels of logging are:

- **None** – No logging for the component.
- **Severe** – Logs only serious problems for that component. (default)
- **Warning** – Logs potential problems for the component as well as messages from the **Severe** logging level.
- **Info** – Logs status messages about the normal operation as well as messages from lower logging levels.
- **Low Debug** – Logs important debugging messages as well as messages from lower logging levels.
- **Medium Debug** – Logs an increasing amount of debugging information as well as messages from lower logging levels.
- **High Debug** – Logs the largest amount of debugging information as well as messages from lower logging levels.

Caution: Do not delete the current log file, which is always the log file with the latest timestamp. Even if the file does not exist, the master will continue to relay diagnostic information to the log file until it has relayed 1 MB of information. At that point, the master starts a new log file but any diagnostic information from the time between the deletion of the current log file and the creation of a new log file is lost.

System Configuration - Audits Tab

Lists all the audit messages CWA can issue. All audit messages can be viewed from the **Logs** console view. From this tab, you can include or exclude audit messages for CWA to record.

Job audit messages can be viewed by individual job from the **Job Details** dialog for that job (accessed from the **Job Activity** pane). The first audit message listed (with the 1000 ID number) is blank because it is available for creating a custom audit message.

This tab contains the following elements:

- **Msg ID** – The ID number associated with the specific audit message.
- **Exclude** – Excludes the audit message from being issued by CWA.
- **Message** – The text of the audit message. Message strings consist of two string types–the message text and the substitution string placeholders. Substitution string placeholders are denoted by a double-percent sign and the string number. For example, the first substitution string place holder is **%%1**, and the second, **%%2**.

  Double-click the message to display the **Audit Message** dialog.

- Instead of individually selecting or excluding audit messages, you can right-click the **Audits** field to display a context menu providing all or nothing options as noted below:
  - **Exclude Selected Messages** – The selected audit messages will not be issued.
  - **Exclude All Messages** – None of the audit messages listed on this tab will be issued.
  - **Include Selected Messages** – The selected audit messages listed on this tab will be issued.
  - **Include All Messages** – All of the audit messages listed on this tab will be issued.
  - **Log Selected As Windows Event(s)** – The selected audit messages listed on this tab will be logged as Windows Events.
  - **Log All As Windows Events** – All audit messages listed on this tab will be logged as Windows Events.
  - **No Windows Event Logging For Selected** – The selected audit messages listed on this tab will not have Windows Event logging.
  - **No Windows Event Logging** – All audit messages will not have Windows Event logging.

For more information about audit messages, see Monitoring Production, page 313.

System Configuration - Errors Tab

Lists all the error messages CWA can issue. Error messages can be viewed from the **Logs** pane. The first error message listed (with the 2000 ID number) is blank because it is available for creating a custom error message. Here you can instruct CWA to exclude specific error messages.

(For more information about error messages, see Monitoring Production, page 313.)

This tab contains the following elements:

- **Msg ID** – The ID number associated with the specific audit message.
- **Exclude** – Excludes the error message from being issued by CWA.
- **Message** – The text of the error message. Message strings consist of two string types–the message text and substitution string placeholders. Substitution string placeholders are denoted by a double-percent sign and the string number. For example, the first substitution string place holder is **%%1** and the second, **%%2**.

  Double-click the message to display the **Error Message** dialog.
- Instead of individually selecting or excluding error messages, you can right-click the **Errors** field to display a context menu providing all or nothing options as noted below:
  - **Exclude Selected Messages** – The selected error messages will be issued.
  - **Exclude All Messages** – None of the audit error listed on this tab will be issued.
  - **Include Selected Messages** – The selected error messages listed on this tab will be issued.
  - **Include All Messages** – All of the error messages listed on this tab will be issued.
  - **Log Selected As Windows Event(s)** – The selected error messages listed on this tab will be logged as Windows Events.
  - **Log All As Windows Events** – All error messages listed on this tab will be logged as Windows Events.
  - **No Windows Event Logging For Selected** – The selected error messages listed on this tab will not have Windows Event logging.

- **No Windows Event Logging** – All error messages will not have Windows Event logging.

System Configuration - Job Status Order Tab

Lists the job statuses and lets you change the job status order used for sorting jobs and job groups by status in the **Job Activity** pane.

This tab contains the following elements:

- **Job Status Sort Order** – To change the job status sort order, select the status you want to move up or down, and click the up and down arrow buttons.

  The sort order defaults to alphabetical, but you may want to change that if there is a sort order that makes more sense to you. For example, jobs always enter the **Launched** status before they enter the **Active** status. Thus, you may want to place **Active** after **Launched** in this list.

System Configuration - Fault Tolerance Tab

The **Fault Tolerance** tab of the **System Configuration** dialog allows you to turn on fault tolerance and configure the settings.

Note: The **Fault Tolerance** tab is not displayed if you are not licensed for fault tolerance.

This tab contains the following elements:

- **Enable Failover** – Turns on fault tolerance. The default is disabled.

  The following fields do not display unless the **Enable Failover** option is selected.

  - **Machine Name (Backup Master)** – The name of the machine the backup master is on.
  - **Backup-To-Master Port** – The port number for the backup master to primary master connection.
  - **Machine Name (Fault Monitor)** – The name of the machine the fault monitor is on.
  - **Fault Monitor Master Port** – The port number for the fault monitor to master connection.
  - **Fault Monitor Client Port** – The port number for the fault monitor to Client Manager connection.

System Configuration - Timezone Tab

The **Timezone** tab of the **System Configuration** dialog allows you to define timezones where target application environments are based. This allows you to schedule a job or job group across a different timezone. See also Defining a Master Timezone, page 27, Working with Timezones, page 171, and Timezone for Job Definition Dialog.

This tab contains the following elements:

- **Use Master Time Zone** – Selecting this option indicates that CWA will assume any times specified in job scheduling should be in accordance with the master machine's time zone. If you want a job-based timezone, you must select this option.
- **Use Agent Time Zone** – Selecting this option indicates that CWA will assume any times specified in job scheduling should be in accordance with the agent machine's time zone. This means that a job running at the same time on all of the agents will appear from the master to run at different times because of the different time zones that agents may reside in.

  It is not recommended to use the **Agent Time Zone** option with the **Production Day Offset** option unless you thoroughly understand the scheduling complexities. Using the master time zone means that the agents reference the same time zone when launching jobs but using the agent's time zone means that each agent launches jobs according to the time zone that the agent resides in. Due to the time zone differences, from the agents' perspective a 11 am job launches correctly but from the master's perspective the 11 am job may launch at noon, 1 pm, 2 pm, etc.

Adding a production day offset to a system network spread over a large geographic area encompassing multiple time zones vastly complicates scheduling. A production day offset may entail that jobs will be launching on different days from the master's perspective. Cisco's consulting services can help resolve complicated scheduling issues.

Timezone for Job Definition Dialog

The Timezone for Job Definition dialog allows you to configure the Master timezone for a job. Click Add or Edit from the Timezone tab of the System Configuration dialog to access this dialog.

This dialog contains the following elements:

- **Name** – enter a unique name to represent job timezone.
- **Timezone** – select the timezone ID from this list.

  The following fields are prepopulated depending on the Timezone list selection:

  - **Timezone Full Name** – Java build?in timezone long name.
  - **Master Timezone Offset** – The time differences between Master timezone and selected Java timezone.
  - **UTC/GMT Timezone Offset** – The time differences between standard UTC/GMT and selected Java timezone.
  - **Current in DST Timezone Period** – Checked if current in Daylight Saving Time (DST) period for this selected timezone.
  - **DST Time Differences** – The amount of time to be added to selected timezone if it is in DST period.

System Configuration - Other Tab

The **Other** tab controls how schedules are compiled, sets time zones, length of alert retention, offsets and job carryover.

This tab contains the following elements:

- **Confirm Job Enable** – Displays a confirmation message whenever a job is enabled.
- **Confirm Job Disable** – Displays a confirmation message whenever a job is disabled.
- **Allow Job Rerun on any Completed Normally and Completed Abnormally states** – Allow jobs to be rerun on when the job state is either **Completed Normally** or **Completed Abnormally**.
- **Send message text with quotes** – When using HP OpenView, send all messages with quotes around the text.
- **Wait.... seconds for connection to recover before alerting on "Lost connection to agent/adapter"** – Specified interval in seconds after a connection is lost to either an agent or an adapter before the system event Lost connection to agent/adapter is triggered. The default value is a zero delay.
- **Runtime users associated with the workgroup only** – Allows only the runtime users associated with the workgroup to be available for jobs owned by the workgroup. This is the default option for a new workgroup.
- **Runtime users associated with the current logged on user and runtime users associated with the workgroup** – Allows the runtime users associated with the current logged-on user along with the runtime users associated with the workgroup to be available for jobs owned by the workgroup.
- **Every member's runtime users in the workgroup and runtime users associated with the workgroup (caution required)** – Allows the runtime users associated with every member in the workgroup along with the runtime users associated with the workgroup to be available for jobs owned by the workgroup. Selecting this option allows a workgroup member to access the runtime users associated with other members in the same workgroup. So, please select this option cautiously.

3

Users

Overview

You add, edit and delete CWA users from the **Users** interface. CWA validates login names against its own user database. Before a person can operate CWA, they must have a CWA user account. Once a user name is registered, the user must log into Windows with that user name. Other user information includes their assigned security policy, their contact information, and the runtime users for whom the user can run jobs.

This chapter covers these topics:

- User Types and Authentication, page 41
- Users Interface, page 42
- User Configuration Procedures, page 47
- Workgroups Interface, page 49
- Security Policies, page 55

User Types and Authentication

About Users

There are three distinct entries for adding users, “Interactive Users”, “Runtime Users” and “LDAP Groups”. CWA 6.0 and later allow the setup of a user that authenticates against Active Directory (AD) and Lightweight Directory Access Protocol (LDAP). CWA also supports AD/LDAP only users.

At login, user credentials are validated against AD/LDAP. Once authenticated, CWA obtains the user’s AD/LDAP groups and other information such and phone number and email. CWA then creates a record to represent the AD/LDAP only user if it is not already present and only if the user belongs to an AD/LDAP group defined in CWA. All user activity logging is then performed against this new user record allowing for correct auditing and reporting.

AD/LDAP only users are allowed to create and own jobs and other objects if their security permissions permit.

Interactive User

During installation of the Windows master, you provide an existing user in the AD/LDAP User Account. CWA creates the first CWA user account for you with this information, and automatically assigns you **Super User** capability. Having the **Super User** option selected in a User Definition provides access to all CWA functions, and supersedes all security policies because it encompasses all security permissions. From this point on, you can set up other users, and specify their user data.

Along with specifying other user data, you need to specify a security policy for each user. CWA comes with default security policy templates to help specify the appropriate functions available for each user based on a default network scheduling model.

Note: You cannot remove Super User capability from the initial CWA user account until at least one more user has been defined and given Super User capability.

When a new user launches CWA, CWA checks to see if the user's login name is listed in the CWA database. If the user is not listed, it displays an error message, and prevents the user from entering CWA.

Runtime Users

If you are going to schedule jobs for other users, you can specify those users on the **Runtime Users** tab of the **User Definition** dialog. This is necessary to access commands and environments created by those users for whom you are scheduling.

LDAP Groups

LDAP users can be imported into CWA for improving user audit trails. These imported users inherit security from multiple LDAP groups. Imported LDAP user information is stored into a user definition that includes email, telephone, etc. Imported LDAP users are allowed to be owners of scheduling constructs such as jobs if their security permits.

Users and Workgroups

Workgroups help organize users according to job function, security level, geographical area or any other category that may be helpful. CWA workgroups can correspond to Windows workgroups, but they certainly do not have to. When you create a workgroup, you must always remember to add yourself to the workgroup. Creating a workgroup does not automatically make you a member of the workgroup. The extent of control you can wield over a workgroup is also dependent upon your individual CWA security policy. For more information about security policies, see Security Policies, page 55.

Note: When you install CWA, you are automatically placed in the *Schedulers* workgroup. *Schedulers* is CWA's default workgroup.

Impersonating a User

Impersonating a user is one of the higher-level security permissions. When you impersonate another user, you have access to their CWA jobs, job actions, job events, system events, user variables, calendars and workgroups as if you had logged on as that user.

Contact Information

You can specify and update user contact information such as phone number and email address. CWA or another user can use this contact information to inform you of the status of a job.

Users Interface

The Users interface includes these elements:

- Accessing Users and Groups
- Buttons
- Search Field
- Columns

- Users Preferences Dialog
- Navigator Context Menu
- Users Context Menu
- User Definition Dialog for Interactive Users
- User Definition Dialog for Runtime Users
- LDAP Group Definition Dialog

Accessing Users and Groups

From the **Navigator** pane, choose **Administration>Runtime Users/Interactive Users** or **LDAP Groups** to display the **Users/LDAP Groups** interface.

To change how the list of users/groups is sorted, click the head of a column to use it as a sort key.

Buttons

The **Users** interface contains the following buttons:

- **Admd** – Displays the **User/LDAP Group Definition** dialog to add a new user/group.
- **Edit** – Displays the **User/LDAP Group Definition** dialog to edit a user/group.
- **Delete** – Removes the selected user/group definition from the CWA database.
- **Copy** – Creates a copy of the selected user/group definition from the CWA database. You can rename the user/group definition and save time when creating several user definitions with the same security profile.
- **Print** – Displays the **Reports** pane to view and print your user/group definitions. For more information, see Monitoring Production, page 313.
- **Refresh** – Updates the data in the current pane.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

Note: The **Users** interface contains the following columns:Depending on the selected user, some columns may not display.

- **Full Name** – The user's full name.
- **Name** – The name of the user.
- **Domain** – The user's domain.
- **Security** – The security policy assigned to the user.
- **Super User** – Indicates if the user has **Super User** capabilities.

- **Modified** – The last time this user definition was modified.

Users Preferences Dialog

If you choose **View>Preferences** from the main menu bar while viewing the **Users/LDAP Groups** interface, the **Users Preferences** dialog displays.

From the **Users/Group Preferences** dialog, you can select which columns are displayed in the **Users/LDAP Groups** interface and in what order the columns appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

With a user/group selected, right-click in the **Interactive/Runtime Users** or **LDAP Groups** pane to display the context menu.

Depending on the user/group selected, the context menus contains the following elements:

- **Add User/Group** – Displays the **User/LDAP Group Definition** dialog to add a new user/group. Has the same function as the **Add** button.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print your user/group definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an HTML file.
- **Preferences** – Displays the **Preferences** dialog for the **User/LDAP Group** pane.
- **New Root Folder** – Allows you to create a new root folder for the **Navigator** pane.

Users Context Menu

With User/Group selected, when you right-click in the **Interactive/Runtime Users** or **LDAP Groups** pane, the context menu displays.

Depending on your selection, the context menus contain the following elements:

- **Add Interactive/Runtime Users/Group** – Displays the **User/LDAP Group Definition** dialog to add a new user/group.
- **Edit Interactive/Runtime Users/Group** – Displays the **User/LDAP Group Definition** dialog to edit the selected user/group. You can double-click a user/group name as an alternative to selecting this menu item.
- **Delete Interactive/Runtime Users/Group** – Deletes the selected user/group.
- **Copy Interactive/Runtime Users/Group** – Duplicates the selected user/group definition. You can use this option to efficiently create multiple users/groups with similar characteristics.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays a report with a list of selected users/groups with the option to print to a printer.
- **Print Selected** – Displays a report with a list of selected users/groups with the option to print selected users/groups only to a printer.

- **Add to all super users** – Adds a selected user/group record to all user records.
- **Impersonate User** – Impersonate another user, you have access to their CWA features as if you had logged on as that user.
- **End Impersonation** – Ends the impersonation of another user.

User Definition Dialog for Interactive Users

Accessing the User Definition Dialog (Interactive Users)

The **Users** interface for Interactive Users displays by choosing **Administration>Interactive Users**. To view the **User Definition** dialog, click the **Add** or **Edit** buttons from the **Interactive Users** interface or right-click in the **Navigator** pane and choose **Add Interactive Users** or **Edit Interactive Users** from the context menu. You can also double-click an Interactive user to display that user's definition.

See also Common to All Tabs.

Common to All Tabs

- **User Name** – Type a logon name for the user. This field is integrated with Windows to display existing users defined for the selected domain.

  You can use an active directory name in this field if you want but you must leave the **Domain** field blank for this to work. (An active directory name would be in this format, *username@domainname*, such as *jjohn@Tidalsoft*.)
- **Full Name** – The name of the user as displayed in CWA panes consisting of up to 30 characters. This name must be unique.
- **Domain** – Specify a domain associated with this user account.

User Definition - Security Tab

- **Super User** – Click this radio button to provide the user with access to all available CWA functions.
- **Other** – Click this radio button to assign one of the other defined security policies from the drop-down menu.

User Definition - Runtime Users Tab

Typically the runtime users option is used by users with the responsibility of running jobs for others such as Schedulers or Operators. When you select runtime users for a user definition, the user gains the rights and access to all of the runtime users' commands and environments, but only when scheduling and running jobs. This tab lists the defined users and user groups. The user being defined can only be a runtime user for a user if that user name is selected. User groups work the same way. You can either display the defined users or the defined user groups but not both at the same time.

This tab contains the following elements:

- **Show Users** – Displays all defined users for this installation. The runtime users (users for which this user can schedule and run jobs) are indicated by a checkmark to the left of the listed name.
- **Show Groups (Windows)** – Displays all defined user groups.

User Definition - Agents Tab

This tab contains the following elements:

- **Untitled Text Field** – This field displays all defined CWA agents for this installation. The agents which this user can use to run jobs are indicated by a checkmark to the left of the listed name.

- **All Agents** – Select the **All Agents** option when you want the user to have access to all available agents. When the **All Agents** option is selected, the check boxes to the left of each listed agent disappear.

Note: If the **All Agents** option is not selected, and no individual agents are selected, the user will be unable to run any jobs.

User Definition - Notification Tab

This dialog contains the following elements:

- **Phone Number** – The user's phone number.
- **Pager Number** – The user's pager number.
- **Email Address** – The user's email address. The email address entered here is used to receive notification during email actions and to log in for anonymous FTP.

User Definition - Passwords Tab

This tab contains the following elements:

- **Windows/FTP Password** – This field is used for running jobs on Windows/FTP machines.
- **Confirm Password** – Retype the password you entered in the **Windows/FTP Password** field to verify its accuracy.
- **Adapter** – Contains the adapter name.
- **Password** – Contains the password for the associated adapter.
- **Add** – Click to add a new record via the **Change Password** dialog.
- **Edit** – Click to edit an existing record via the **Change Password** dialog.
- **Delete** – Click to delete a selected record.

See also Change Password.

Change Password

The **Change Password** dialog displays by clicking **Add** on the **Passwords** tab of the **User Definition** dialog.

This dialog contains the following elements:

- **Password Type** – Select the adapter type from this list.
- **Password/Confirm Password** – Enter the password for the adapter the user will be using and confirm.

User Definition - Kerberos Tab

From the User Definition dialog, select the Kerberos tab if using a Hadoop cluster that is Kerberos secured.

This page contains the following elements:

- **Kerberos Principal** – Enter the Authentication URL to Hadoop.
- **Kerberos Key Page File** – Enter the path to the Key Page file. This file is relative to the Master's file system and contains one or more Kerberos principals with their defined access to Hadoop.

User Definition - Workgroups Tab

This tab contains the following elements:

- **Workgroup** – The names of the workgroups under which the user is a member. To be a member of a workgroup, you must be added into that workgroup by the workgroup's owner.
- **Owner** – The owners of the workgroups of which the user is a member.

User Definition - Description Tab

A free text field for any comments regarding the user, up to 255 characters long.

User Definition Dialog for Runtime Users

The **Users** interface for Runtime Users displays by selecting **Administration>Runtime Users**. To view the **User Definition** dialog, click the **Add** or **Edit** buttons from the **Users** interface or right-click in the **Navigator** pane and select **Add Runtime Users** or **Edit Runtime Users** from the context menu. You can also double-click a Runtime user to display that user's definition.

LDAP Group Definition Dialog

The **LDAP Group** interface displays by selecting **Administration>LDAP Groups**. To view the **LDAP Group Definition** dialog, click the **Add** or **Edit** buttons from the **LDAP Group** interface or right-click in the **Navigator** pane and select **Add Group**. You can also select **Edit Group** from the context menu of the **LDAP Groups** pane or double-click an LDAP group to display that group's definition.

Note: Features associated with LDAP Groups are common to other Users. See Adding Interactive Users, page 48

User Configuration Procedures

Adding Runtime Users

To add a Runtime user:

1. From the **Navigator** pane, select **Administration>Runtime Users** to display the **Runtime Users** pane.
2. Click the **Add** button or right-click in the **Navigator** pane and select **Add Runtime Users** from the context menu to display the **User Definition** dialog.
3. If this is a new user definition, enter the new user name in the **User Name** field.
4. For documentation, enter the **Full Name** or description associated with this user.
5. In the **Domain** field, select a Windows domain associated with the user account required for authentication, if necessary.
6. In the **Windows/FTP Password** field, enter the password for the user account provided by the Administrator.
7. In the **Confirm Password** field, retype the password.
8. If the passwords entered in the **Windows/FTP Password** and **Confirm Password** fields do not match, you must re-enter the password in both fields.
9. Click **OK** to add or save the user record in the CWA database.

Adding Interactive Users

To add an Interactive user:

1. From the **Navigator** pane, select **Administration>Interactive Users** to display the **Interactive Users** pane listing all CWA users.

If the CWA users do not appear, you do not have the appropriate rights to view users.

2. Double-click the name of an user account that you want to be able to run jobs to display the **User Definition** dialog.
3. Click the **Runtime Users** tab in the **User Definition** dialog and select the check box(es) beside the name(s) of the Interactive user(s) you want to include in this CWA users authorized user list.
4. If you wish to restrict this user's access to specific servers, click the **Agents** tab and make the appropriate selections.
5. Click **OK**.

Deleting a User

Note: You cannot delete a user that presently owns a job, job event, system event, action, user defined variable or calendar. Open each item's dialog and reassign the ownership of the items before deleting the user

To delete a user:

1. From the **Navigator** pane, select **Administration>Interactive Users** or **Runtime Users** to display the **Users** interface.
2. Select the user to delete and click the **Delete** button on the CWA toolbar or right-click the user record and select **Delete User** from the context menu.
3. When a dialog asks you to confirm your choice, click **OK**.

Editing a User Definition

To edit a user definition:

1. From the **Navigator** pane, select **Administration>Interactive Users** or **Runtime Users** to display the **Users** interface.
2. Double-click the user record to edit or select the user name and click the **Edit** button or right-click the user record and select **Edit User** from the context menu to display the **User Definition** dialog.
3. Edit the **User Name** if it does not match the Windows login name. Remember that the user name is case-sensitive.
4. Edit the **Full Name** if necessary.
5. To change the **Security Policy** for an Interactive user, select a new one from the drop-down menu on the **Security** tab. If you have the **Superuser** option set, the list is disabled. Click the **Superuser** option if you want the user to have access to all CWA functions. To add or remove specific functions to a security policy, see Security Policy Configuration Procedures, page 78.
6. To add or remove runtime users for an Interactive user, click the **Runtime Users** tab.

   Select the runtime users to add to the user's definition from the **Available Users** list.

- To include users, select the check box next to the user you want to include.
- To exclude users, clear the check box next to the user you want to exclude.

  The user will have access to the commands and environments of the runtime users you assign.

7. If you wish to change an Interactive user user's access to specific servers, click the **Agents** tab and make the appropriate selections.
8. Click the **Notification** tab to edit contact information for the Interactive user.
9. Edit the password information, if necessary.

   Note: You cannot edit Workgroups information from the **User Definition** dialog. For more information on CWA workgroups, see Workgroups Interface, page 49.
10. Click the **Description** tab to edit the user's description (up to 255 characters).
11. Click **OK**.
12. Jobs in the production schedule that have not run yet will reflect the changes to the user data. Jobs that are running or that have completed retain the old user information.

Impersonating Another User

To impersonate a user:

1. From the **Navigator** pane, select **Administration>Interactive Users** to display the **Interactive Users** pane.
2. Right-click the user you want to impersonate and select **Impersonate User** from the context menu.
3. When a dialog asks you to confirm your choice, click **OK**.

Ending User Impersonation

To end user impersonation:

1. From the **Navigator** pane, select **Administration>Interactive Users** to display the **Interactive Users** pane.
2. Right-click the user and select **End Impersonation** from the context menu

   -or-

Select **Activities>End Impersonation** from the main menu bar.

Viewing Users

From the **Navigator** pane, select **Administration>Interactive/Runtime Users** or **LDAP Groups** to display the **Users/Groups** interface. If the users/groups do not display, you do not have the appropriate rights to view these items.

Workgroups Interface

About the Workgroups Interface

A workgroup is a set of users categorized under a communal name for the purpose of sharing items (jobs, actions, events etc.) which are owned by the workgroup. Each user in the workgroup has access to these items based on their own individual security policy.

If you have appropriate rights in your security policy you can create your own workgroups from the **Workgroups** pane. This pane displays all existing workgroups (within the bounds of your security policy). When you create a workgroup, you become its owner, and can add users to it; however, you must be a **Super User**. To belong to a workgroup created by another user, you have to be added by that user.

Note: If you own a workgroup and do not include yourself in it, the workgroup's associated items would not be accessible to you.

You can change the name and the members of any workgroup that you own. You cannot edit a workgroup that was created by another user unless you impersonate that user.

Workgroups help focus the information CWA displays to each user. When you open the **Jobs**, **Actions**, **Job Events**, **System Events**, **Calendars**, or **Variables** panes, you will see only the items belonging to you and belonging to the workgroup(s) to which you belong.

For example, if you belong to a Payroll workgroup, you can see all the jobs, actions, etc., that are owned by the Payroll workgroup and were created by you or other members of the workgroup.

The following figure shows a generic workgroup structure using five users and two workgroups. Note that, in this figure, **User 3** belongs to both workgroups, and therefore has access to all items (calendars, jobs, etc.) shown.

From the **Navigator** pane, select **Administration>Workgroups** to display the **Workgroups** pane.

The workgroups interface includes these elements:

- Buttons
- Search Field
- Columns
- Workgroups Preferences Dialog
- Navigator Context Menu
- Workgroups Pane Context Menu
- Workgroup Definition Dialog

Buttons

- **Add Workgroup** – Displays the **Workgroup Definition** dialog to add a new workgroup.
- **Edit Workgroup** – Displays the **Workgroup Definition** dialog to edit an existing workgroup.

  Note: You can change the name and the members of any workgroup that you own. You cannot edit a workgroup that was created by another user unless you impersonate that user.
- **Delete Workgroup** – Deletes the selected workgroup as long as the workgroup does not currently own any CWA items.
- **Copy Workgroup**– Creates a copy of the selected workgroup definition from the CWA database. You can rename the workgroup definition and save time when creating several workgroup definitions with the same security profile.
- **Print Workgroups** – Displays the **Reports** pane to view and print your selected workgroup definitions. For more information, see Monitoring Production, page 313.
- **Refresh** – Updates the data in the current pane.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Name** – The name of the workgroup.
- **Users** – The users that are included in the workgroup.
- **Owner** – The owner of the workgroup.
- **Modified** – The last time the workgroup definition was modified.

Workgroups Preferences Dialog

If you select **View>Preferences** from the main menu bar while viewing the **Workgroups** pane, the **Workgroups Preferences** dialog displays.

From the **Workgroups Preferences** dialog, you can select which columns are displayed in the **Workgroups** pane and in what order the columns appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Workgroups** pane, the **Navigator** context menu displays.

The following describes the items in the Workgroups **Navigator** context menu:

- **Add Workgroup** – Displays the **Workgroup Definition** dialog to add a new connection.
- **Preferences** – Displays the **Preferences** dialog for the **Workgroups** pane.
- **Print** – Displays the **Reports** pane to view and print your workgroup definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an HTML file.
- **Refresh** – Updates the data in the current pane.

Workgroups Pane Context Menu

When you right-click in the **Workgroups** pane, the **Workgroups** context menu displays.

The following describes the items in the **Workgroups** context menu.

- **Add Workgroup** – Displays the **Workgroup Definition** dialog to add a new workgroup. If you add a workgroup, it displays in the **Jobs**, **Actions**, **Job Events**, **System Events**, **Workgroups**, **Calendars** and **Variables** panes.
- **Edit Workgroup** – Displays the **Workgroup Definition** dialog to edit the selected workgroup. You can double-click the workgroup as an alternative to selecting this menu item. Only a Super User or the selected workgroup's owner can edit a workgroup.
- **Delete Workgroup** – Deletes the selected workgroup.
- **Print** – Displays the **Reports** pane to view and print your workgroup definitions. For more information, see Monitoring Production, page 313.

Workgroup Definition Dialog

Accessing the Workgroup Definition Dialog

The **Workgroup Definition** dialog displays when adding or editing a workgroup from the **Workgroups** pane.

Common to All Tabs

- **Workgroup Name** – The name of the workgroup, as displayed in the **Workgroup** pane (up to 30 characters). Each workgroup must have a unique name.
- **Owner** – The owner of the workgroup.

Workgroup Definition - Users Tab

Displays a list of all defined CWA users and allows you to assign security policies for each user within the workgroup, in addition to the user's existing security policy.

Note: Editing a user's security policy while defining a workgroup does not remove permissions that the user already has. You can only assign additional security policies as part of the specific workgroup.

Workgroup Definition - Groups Tab

Displays a list of all defined CWA groups. A checkmark indicates groups that are assigned to the current workgroup.

Workgroup Definition - Runtime Users Tab

This tab lists the defined runtime users that you can associate with the workgroup. This tab also lets you configure the runtime users available for jobs owned by the workgroup using these options.

- **Runtime users associated with the workgroup only** – Allows only the runtime users associated with the workgroup to be available for jobs owned by the workgroup. This is the default option for a new workgroup.
- **Runtime users associated with the current logged on user and runtime users associated with the workgroup** – Allows the runtime users associated with the current logged-on user along with the runtime users associated with the workgroup to be available for jobs owned by the workgroup.
- **Every member's runtime users in the workgroup and runtime users associated with the workgroup (caution required)** – Allows the runtime users associated with every member in the workgroup along with the runtime users associated with the workgroup to be available for jobs owned by the workgroup. Selecting this option allows a member in a workgroup without runtime users to use the runtime users associated with other members in the same workgroup. So please select this option cautiously.

Workgroup Definition - Agents Tab

The **Agent** tab displays all the CWA agents that the owner of the workgroup is authorized to use. The agents which the workgroup can use to run jobs are indicated by a checkmark to the left of the listed name.

This tab displays the following element:

- **All Agents for <workgroup owner>** – Select the **All Agents for <workgroup owner>** option when you want the workgroup to have access to all the agents available to the workgroup's owner. When this option is selected, the check boxes to the left of each listed agent disappear.

  Note: If the **All Agents for <workgroup owner>** option is not selected and no individual agents are selected, the workgroup cannot run any jobs.

Workgroup Definition - Description Tab

The **Description** tab contains a free text field where you can enter comments about the workgroup (up to 255 characters).

Select Group Dialog

The Select Group dialog displays when you edit a group via that Workgroup Definition dialog's Groups page.

This dialog contains the following elements:

- **Name** – Contains the name of the selected group.
- **Domain** – Contains the domain associated with the selected group.

Workgroups Configuration Procedures

The typical tasks you can perform are covered in these sections:

- Adding a Workgroup, page 53
- Deleting a Workgroup, page 54
- Editing a Workgroup, page 54
- Viewing Workgroups, page 54

Adding a Workgroup

To add a workgroup:

1. From the **Navigator** pane, select **Administration>Workgroups** from the main menu bar CWA to display the **Workgroups** pane.
2. Click the **Add** button on the CWA toolbar or right-click and select **Add Workgroup** from the context menu to display the **Workgroup Definition** dialog.
3. Type a unique name for the workgroup in the **Workgroup Name** field (up to 30 characters).
4. Click the **Members** tab.
5. Select the users to add to the workgroup from the **Available Users** list.
   - To include users in the workgroup, select the check box next to the user.
   - To exclude users from the workgroup, clear the check box next to the user.

   Note: Always include yourself in the workgroups you define; otherwise, you cannot access its definition or owned items.
6. Click the **Agents** tab.
7. Select the agents to add to the workgroup.
8. To enter a description for this workgroup, click the **Description** tab and type in the description. You can enter up to 255 characters.

Deleting a Workgroup

You can delete a workgroup from the **Workgroups** pane. Workgroups can be deleted *only* when they no longer own jobs, actions, job events, system events, calendars and/or variables. (Go to each item owned by the workgroup and change the ownership.)

To delete a workgroup:

1. From the **Navigator** pane, select **Administration>Workgroups** from the main menu bar CWA to display the **Workgroups** pane.
2. Select the workgroup to delete and click the **Delete** button on the CWA toolbar or right-click the workgroup and select **Delete Workgroup** from the context menu.
3. Click **Yes** in the **Confirm** dialog.

Editing a Workgroup

You can change the name and the members of any workgroup that you own. You cannot edit a workgroup that was created by another user unless you impersonate that user.

When you change the members of a workgroup, updates for affected users will occur the next time they reopen the **Jobs**, **Actions**, **Job Events**, **System Events**, **Calendars** and/or **Variables** panes.

To edit a workgroup:

1. From the **Navigator** pane, select **Administration>Workgroups** from the main menu bar CWA to display the **Workgroups** pane.
2. Select the workgroup you would like to edit and click the **Edit** button on the CWA toolbar or double-click the workgroup you would like to edit or right-click the workgroup you would like to edit and select **Edit Workgroup** from the context menu.
3. The **Workgroup Definition** dialog displays.
4. To change the name of the workgroup, edit the **Workgroup Name** field.
5. To include users in the workgroup, select the check box next to the name of the user you want to include.
   To exclude users from the workgroup, clear the check box next to the name of the user you want to exclude.

   Note: Always include yourself in the workgroups you define; otherwise, you will not have access to its definition or owned items.
6. To edit the agents of the workgroup, click the **Agents** tab.
   - To exclude agents from the workgroup, clear the check box next to the name of the agent you want to exclude.
   - To include agents to the workgroup, select the check box next to the name of the agent you want to include.
7. To edit the description of the workgroup, click the **Description** tab.
8. Edit the description text for the workgroup. You can use up to 255 characters.

Viewing Workgroups

In the **Workgroups** pane, you can view all the workgroups that you own. When in the **Jobs**, **Actions**, **Job Events**, **System Events**, **Variables** and **Calendars** panes, all the workgroups that you own and belong to can be seen. Workgroup association can also be seen in the **User Definition** dialog.

From the **Navigator** pane, select **Administration>Workgroups** from the main menu bar CWA to display the **Workgroups** pane.

Viewing Members of a Workgroup

To view members:

1. From the **Navigator** pane, select **Administration>Workgroups** from the main menu bar CWA to display the **Workgroups** pane.
2. Double-click the workgroup you would like to examine to display its definition.

Viewing the Workgroups to Which You Belong

To view a workgroup to which you belong:

1. From the **Navigator** pane, select **Administration>Workgroups** from the main menu bar CWA to display the **Workgroups** pane. If the CWA users do not appear, you do not have the appropriate rights to view users.
2. Double-click the user name to display its **User Definition** dialog with the user information.
3. Click the **Workgroups** tab. All the workgroups that the user belongs to are listed.

Security Policies

About Security Policies

Security policies restrict access to certain CWA functions. The defined access rights can be saved as a security policy, and then assigned to one user or multiple users.

For example, there might be different sets of users who:

- Administer CWA
- Create and schedule jobs for themselves and others
- Operate the job schedule

You may have a set of users that creates jobs, a set of users that schedule jobs and another set that works with the job schedule. Using security policies, the users creating jobs can be restricted from inserting them into production and changing the schedule. The other users can be restricted from creating jobs.

CWA includes default security policy templates that can be modified to create your own security policies. Each user within the supplied working model has a defined set of CWA functions. When all the default security policies are in use, all aspects of scheduling are covered and available.

The following table lists the system features available for each of the default security templates:

Default Security Policy	Available System Features
Scheduler_Administrator	The default for new installations. This includes all available functions.
Administrator	Configures users.
User	Creates, edits, and submits jobs. Creates workgroups and user-defined variables.
Scheduler	Edits and tests job schedules.
Operator	Runs and controls jobs. Responds to alerts that jobs may issue.
Inquiry	Views jobs and resources. Cannot perform modification.

Each security policy has its own name, description, and set of CWA functions that it comprises it. Functions are chosen from a list of available functions and listed in the **Security Policy Definition** dialog. Once defined, security policies can be assigned to users from the **User Definition** dialog.

You can override security policy restrictions for a user by selecting the **Super User** option in the **User Definition** dialog. Users with Super User authority have access to all CWA functions.

Note: If you are the only defined CWA user, you will not be allowed to remove the Super User option from your profile until you have defined at least one other CWA user with Super User capability. This is a safety feature to prevent inadvertent exclusion from CWA, which would require you to reinstall the product.

Security Policy Templates

CWA includes a set of default security policy templates. Inherent in these templates is the default network scheduling model where each user has a defined set of scheduling tasks. When all the security policies are assigned to users, the result is a complete enterprise network scheduling solution. Each user makes their contribution to the entire scheduling process. Each user can be insulated from tasks that are not relevant to their scheduling role.

You can modify these templates to create your own scheduling model based on the needs of your organization. Use caution so that vital functions are not inadvertently left out of a particular profile.

Note: Selecting the Super User option in a User Definition supersedes any security policy previously assigned. The Superuser option provides full and unrestricted access to *all* CWA functions. Some functions, such as calendars supersede even SuperUser privileges and are controlled by the function's owner and available only to members of a workgroup. A SuperUser may access a function but can not modify the function if not a member of the workgroup.

Default Security Policies

The following table summarizes the functions that are available for each user account using the security policies provided with CWA. If the function has been included in the security policy assigned to your user account then you have the capability described in that function.

Default Security Policy	Available Functions
CWA Admin	All CWA functions are available.
Administrator	Functions for configuring CWA including configuring users, security, queues, agent lists, connections, and licenses.
Scheduler	All functions except adding users.
Operator	Functions for end-user support such as schedule control and queue and agent list configuration. Ability to edit job information as necessary.
User	Functions for end-user activity excluding configuration and schedule control, but including the tools necessary for creating, editing and submitting jobs.
Inquiry	Functions for viewing jobs and other items, but not for creating, editing, or deleting.

CWA Functions

About CWA Functions

Each security policy includes the CWA functions that a user with that policy can perform. You can create new security policies from the **Security Policy Definition** dialog, or add and remove CWA functions to an existing security policy. When you finish defining a security policy, you assign it to a user through the **User Definition** dialog.

Note: To use a job as a job dependency, you must have the ability (security policy permission) to View the job. However, View permission alone does not enable you to perform job control functions on the job.

Function Descriptions

The following are descriptions of each CWA function, grouped by category, that can be added to or removed from a security policy:

Agent Lists Category

Function	Description
Add Agent List	Specify a group of agents for the purpose of agent fault tolerance (dynamic rerouting), workload balancing and job broadcasting. The list will be available to all users that schedule jobs.
Edit Agent List	Edit the properties of an agent list.
Delete Agent List	Delete any agent list that exists in theScheduler database.
View Agent List	View the properties of any agent list.

Alerts Category

Function	Description
Acknowledge Alert	Acknowledge a console alert generated by a job event or system events.
Close Alert	Complete the response to a console alert.
View Alert	View alert details.

Calendar Category

Function	Description
Add Calendar	Create a calendar of dates that determines when to run jobs. You can also create calendar groups and make calendars and calendar groups public if you have the **Add Public Data** function.
Edit Calendar	For calendars owned by you or your group you can change the dates within a calendar. You can also add and delete the calendars in calendar groups.
Delete Calendar	Delete your own calendars and calendar groups.
View Calendar	View the dates defined for a calendar.

Configuration and Licensing Category

Function	Description
Edit Configuration/License	Access to the **System Configuration** dialog. You can change master configuration data, update licenses, configure mail, job defaults, and other system-wide settings.
View Configuration/License	View alert details.

Connections Category

Function	Description
Add Connection	Add a new connection definition.
Edit Connection	Edit a connection definition.
Delete Connection	Delete a connection definition
View Connection	View the details of connection information.
Edit Agent Job Limit	Change the number of jobs that can run on an agent at the same time.
Edit Machine Name	Edit the agent machine designation.

General Category

Function	Description
Add Public Data	Add events, actions, calendars, and variables so that they can be used by anyone who schedules jobs. You must have the security rights to add and/or edit these items to make them public.
View Logs	View the audit trail of all scheduling activity, error messages, and diagnostics from the **Logs** pane. You can view all messages generated by the sources specified in the **System Configuration** dialog, **Logging** tab.
View Reports	View the results of CWA reports.
View History	View the audit trail of CWA activity.
View Master Status	Access to the **Master Status** pane, where you can view all the statistics related to the CWA master.
Move Jobs to Production	Use Transporter to copy all jobs to other databases whether the user owns them or not.
Move Own Jobs to Production	Use Transporter to copy only the jobs that the user owns to other databases.

Job Actions Category

Function	Description
Add Job Actions	Create actions (messages, jobs, variable updates) to support specific job events and system events.
Edit Job Actions	Edit the properties of an action that is owned by you or your workgroup.
Delete Job Actions	Delete an action that you own.
View Job Actions	View the specifics of all actions available.

Job Classes Category

Function	Description
Add Job Class	Create a class to which jobs can be assigned. Job classes are available to all schedulers.
Edit Job Class	Edit a job class.
Delete Job Class	Delete a job class.
View Job Class	View the description of a job class.

Job Console (Activity) Category

Function	Description
View All Jobs	View the activity of all job occurrences as they are scheduled and run. You will also be able to view console alerts created by jobs. to add and/or edit these items to make them public.
View Own Jobs	View the activity of your own job occurrences or those owned by your workgroup(s) as they are scheduled and run. You will also be able to view console alerts created by those jobs.
Edit All Jobs	Edit the definition of any job or job group.
Edit Own Jobs	Edit job and job group definitions that are owned by you or your workgroup(s).
Control All Jobs	Apply job control to all jobs and job groups, within any limits set in the job control functions.
Control Own Job	Apply job control to jobs and job groups owned by you or the workgroup(s) you belong to, within any limits set in the job control functions.

Job Control Category

Function	Description
Ad Hoc Job Control	Manually add an unscheduled job to production.
Cancel/Abort	Manually cancel or abort a job occurrence from the **Job Activity** pane. Canceled and aborted jobs cannot be resumed. They must be rerun.
Hold/Stop	Manually hold or stop a job occurrence from the **Job Activity** pane. The job can be restarted at a later time.
Override	Override a job's dependencies, allowing it to run even though its predefined dependencies have not been satisfied.
Release/Resume	Release a job requiring operator release, and resume a job that has been stopped or held.
Rerun	Rerun a job.
Set Status	Set a job's completion status.

Job Events Category

Function	Description
Add Job Event	Set up conditions to trigger job alert messages and/or recovery procedures (job events).
Edit Job Event	Edit the properties of a job event owned by you or your workgroup(s).
Delete Job Event	Allows a user to delete job events that the user created or are owned by a workgroup to which they belong.
View Job Event	Allows a user to view the specifics of all job events (messaging service and recovery procedure constructs) available.
Allow All Jobs	Enables/disables the **Apply this event to all jobs** check box in the Job Event definition. If you do not have this enabled in your security policy, you cannot apply a job event to all jobs.

Jobs Category

Function	Description
Add Jobs	Create new job and job group definitions. You have full control over what, where, and when the job or group runs. You can also specify dependencies for your definitions.
Assign Job Events	Assign predefined job events to a job or job group from the **Job** or **Job Group** definition dialogs.
Edit Jobs	Edit jobs for yourself or for your workgroup(s). You have full control over what, where, and when the job or group runs. You can also specify dependencies for your definition.
Delete Jobs	Delete jobs belonging to you and your workgroup(s).
View Jobs	View all the properties of the jobs and groups that you and your workgroup(s) own.
Enable Jobs	Enable (activate) jobs and job groups. A job cannot run unless it is enabled.

Queues Category

Function	Description
Add Queue	Create job queues to tune the throughput and allocation of system resources.
Edit Queue	Edit job queues to tune the throughput and allocation of system resources.
Delete Queue	Delete a job queue.
View Queue	View all queues and their properties.
Edit System Queue	Edit the system queue, including setting the overall limit of the number of jobs run on the network concurrently. With the **Edit System Queue** function, users can also edit all other queues.
Edit Native Priority	Edit the CPU scheduling priority for jobs in a queue. This function applies to Nice values in Unix and to job classes in SAP.

Resources Category

Function	Description
Add Resources	Create new resources.
Edit Resources	Edit resource definitions.
Delete Resources	Delete existing resource definitions.
View Resources	View all the properties of the resources that you and your workgroup(s) own.

Schedule Category

Function	Description
Shutdown Scheduler	Stops the master service.

Function	Description
Create Schedule	Manually generate job occurrences for the next production schedule period.
Pause/Resume Schedule	Prevent all jobs in the production schedule from launching. Also allows you to resume the schedule if it is paused.
Refresh Schedule	Updates the production data.

Security Category

Function	Description
Add Security Policy	Allows a user to create a set of Scheduler functions that can be assigned to a user.
Edit Security Policy	Allows a user to add and remove functions to/from a Scheduler functions set.
Delete Security Policy	Allows a user to delete a Scheduler function set.
View Security Policy	Allows a user to view the function set associated with a security policy.

System Events Category

Function	Description
Add system event	Set up conditions to trigger actions based on events generated by the system (system events).
Edit system event	Edit the properties of a system event that belongs to you or your workgroup(s).
Delete system event	Delete system events that belong to you or your workgroup(s).
View system event	View the specifics of all system events (messages, jobs, variable updates) available.

Users Category

Function	Description
Add Users	Add a new user definition to the Scheduler database.
Edit Users	Edit all properties of a user definition except for Assign Security Policy, Assign Runtime Users and Assign Agents.
Delete Users	Delete any user from the Scheduler database.
View Users	View all user information.
Edit Personal Data	Update the personal data properties (**User Definition** dialog, **Other** tab) of your user definition.
Assign Security Policy	Specify the functions that will be available to another user.
Assign Runtime Users	Assign access to other user accounts for the purpose of running jobs.
Impersonate User	Operate Scheduler as another user. You assume all characteristics of that user, including their security policy.
Assign Agents	Designate the agent(s) on which a user is allowed to run jobs.

Workgroups Category

Function	Description
Add Workgroup	Can create a group of users to share data.
Edit Workgroup	Can redefine the users who belong to a workgroup.
Delete Workgroup	Can delete a workgroup, disabling the sharing of data between users.
View Workgroup	Can view workgroup definitions.

Variables Category

Function	Description
Add Variable	Create variable definitions.
Edit Variable	Edit variable definitions that belong to you and your workgroup(s).
Delete Variable	Delete user-defined variables that belong to you and your workgroup(s).
View Variable	View variables that belong to you and your workgroup(s).

Fault Monitor Category

Function	Description
Control Fault Monitor	Enables a user to use the control options in the context menu in the **Fault Monitor** pane.
View Fault Monitor	Enables a user to view the **Fault Monitor** pane

OracleApps Jobs Category

Function	Description
Add OracleApps Job	Create and add OracleApps jobs to the CWA production schedule.
Edit OracleApps Job	Edit OracleApps job definitions.

Variable Events Category

Function	Description
Add Variable Events	Create and add variable events to the CWA production schedule.
Edit Variable Events	Edit variable events that belong to you and your workgroup(s).
Delete Variable Events	Delete variable events that belong to you and your workgroup(s).
View Variable Events	View all the properties of the variable events that you and your workgroup(s) own.
Suspend Variable Events	Suspends the variable events that you and your workgroup(s) own.
Resume Variable Events	Resumes suspended variable events that you and your workgroup(s) own.

File Events Category

Function	Description
Add File Events	Create and add file events to the CWA production schedule
Edit File Events	Edit file events.
Delete File Events	Delete file events that belong to you and your workgroup(s)
View File Events	View all the properties of the file events that you and your workgroup(s) own.
Suspend File Events	Suspends the file events that you and your workgroup(s) own.
Resume File Events	Resumes suspended file events that you and your workgroup(s) own.

Email Events Category

Function	Description
Add Email Events	Create and add Email events to the CWA production schedule
Edit Email Events	Edit Email events.
Delete Email Events	Delete Email events that belong to you and your workgroup(s)
View Email Events	View all the properties of the Email events that you and your workgroup(s) own.
Suspend Email Events	Suspends the Email events that you and your workgroup(s) own.
Resume Email Events	Resumes suspended Email events that you and your workgroup(s) own.

Oracle DB Events Category

Function	Description
Add Oracle DB Events	Create and add Oracle DB events.
Edit Oracle DB Events	Edit Oracle DB events.
Delete Oracle DB Events	Can delete Oracle DB event definitions.
View Oracle DB Events	Can view Oracle DB event definitions.
Suspend Monitoring	Can suspend the operation of the Oracle DB monitor.
Resume Monitoring	Can resume the operation of the Oracle DB monitor.

Oracle DB Jobs Category

Function	Description
Add Oracle DB Jobs	Create and add Oracle DB jobs to the CWA production schedule.
Edit Oracle DB Jobs	Edit Oracle DB job definitions.

SAP Jobs Category

Function	Description
Add SAP Job	Create and add SAP jobs to the CWA production schedule.
Edit SAP Job	Edit SAP job definitions.
Delete SAP Job	Delete SAP job definitions.
View SAP Job	View SAP job definitions.
View Job Log	View job's job log.
View Job Spool	View job's job spool.

SAP Variants Category

Function	Description
Add/Edit Variants	Create and edit SAP variants.
Delete Variants	Can delete SAP variants.

SAP Process Chains

Function	Description
Enable Planning View	Can enable planning view.

MSSql Events

Function	Description
Add MSSql Events	Create and add MSSql events.
Edit MSSql Events	Can edit MSSql events.
Delete MSSql Events	Can delete MSSql event definitions.
View MSSql Events	Can view MSSql event definitions.
Suspend Monitoring	Can suspend the operation of the MSSql monitor.
Resume Monitoring	Can resume the operation of the MSSql monitor.

MSSql Jobs

Function	Description
Add MSSql Jobs	Create and add MSSql jobs to the CWA production schedule.
Edit MSSql Jobs	Can edit MSSql job definitions.
Delete MSSql Jobs	Can delete MSSql job definitions.
View MSSql Jobs	Can view MSSql job definitions.

PeopleSoft Jobs Category

Function	Description
Add PeopleSoft Job	Create and add PeopleSoft jobs to the CWA production schedule.
Edit PeopleSoft Job	Edit PeopleSoft job definitions.
Delete Workgroup	Delete a workgroup, disabling the sharing of data between users.
View Workgroup	View workgroup definitions.

PeopleTools Category

Function	Description
Enable PeopleTools Access	Can access PeopleTools.

WebService Jobs Category

Function	Description
Add WebService Jobs	Create and add WebService jobs to the CWA production schedule.
Edit WebService Jobs	Can edit WebService job definitions.
Delete WebService Jobs	Can delete WebService job definitions.
View WebService Jobs	Can view WebService job definitions.

Horizon Jobs Category

Function	Description
Add Horizon Jobs	Create and add Horizon jobs to the CWA production schedule.
Edit Horizon Jobs	Can edit Horizon job definitions.
Delete Horizon Jobs	Can delete Horizon job definitions.
View Horizon Jobs	Can view Horizon job definitions.

Default Security Policies and Their Associated Functions

The following shows which CWA functions are associated with each default security policy, grouped by function category

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Agent Lists category						
Add agent list	✓	✓	✓	—	—	—
Edit agent list	✓	✓	✓	—	—	—
Delete agent list	✓	✓	✓	—	—	—
View agent list	✓	✓	✓	✓	✓	✓
Alerts category						
View alert	✓	—	✓	✓	✓	✓
Acknowledge alert	✓	—		✓	—	—
Close alert	✓	—	—	✓	—	—
Calendars category						
Add calendar	✓	—	✓	—	—	—
Edit calendar	✓	—	✓	—	—	—
Delete calendar	✓	—	✓	—	—	—
View calendar	✓	—	✓	✓	✓	✓
Configuration/Licensing category						
Edit configuration/license	✓	✓	—	—	—	—
View configuration/licensing	✓	✓	—	—	—	—
Connections category						
Add connection	✓	✓	—	—	—	—
Edit connection	✓	✓	✓	—	—	—
Delete connection	✓	✓	—	—	—	—
View connection	✓	✓	✓	✓	—	—
Edit machine name	✓	✓	✓	—	—	—

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Edit agent job limit	✓	✓	✓	—	—	—
General category						
Add public data	✓	✓	✓	—	—	—
View logs	✓	✓	✓	✓		✓
View reports	✓	—	✓	✓	✓	✓
View history	✓	—	✓	✓	✓	—
View master status	✓	✓		✓	—	—
Move jobs to production	✓	—	—	—	—	—
Move own jobs to production	✓	—	—	—	—	—
Job Actions category						
Add job actions	✓	—	✓	—	—	—
Edit job actions	✓	—	✓	—	—	—
Delete job actions	✓	—	✓	—	—	—
View event actions	✓	—	✓	✓	✓	—
Job Classes category						
Add job class	✓	—	✓	—	—	—
Edit job class	✓	—	✓	—	—	—
Delete job class	✓	—	✓	—	—	—
View job class	✓	—	✓	✓	✓	✓
Job Console (Activity) category						
View all	✓	—	✓	✓		✓
View own	✓	—	✓	✓	✓	✓
Edit all	✓	—	—	—	—	—
Edit own	✓	—	—	—	—	—
Control all	✓	—	✓	✓	—	—
Control own	✓	—	—	—	✓	—
Job Control category						
Ad hoc job control	✓	—	✓	✓	✓	—
Cancel/abort	—	—	✓	✓	✓	—
Hold/stop	✓	—	✓	✓	✓	—
Override	✓	—	✓	✓	—	—

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Release/resume	✓	—	✓	✓	—	—
Rerun	✓	—	✓	✓	✓	—
Set status	✓	—	✓	✓	—	—
Job Events category						
Add job events	✓	—	✓	—	—	—
Edit job events	✓	—	✓	✓	—	—
Delete job events	✓	—	✓	—	—	—
View job events	✓	—	✓	✓	✓	✓
Allow all jobs	✓	—	✓	✓	—	—
Jobs category						
Add jobs	✓	—	✓	—	✓	—
Edit jobs	✓	—	✓	—	P	—
Delete jobs	✓	—	✓	—	—	—
View jobs	✓	—	✓	✓	✓	✓
Assign job events	✓	—	✓	✓	✓	—
Enable jobs	✓	—	—	—	—	—
Queues category						
Add queue	✓	✓	✓	—	—	—
Edit queue	✓	✓	✓	✓	—	—
Delete queue	✓	✓	✓	—	—	—
View queue	✓	✓	✓	✓	✓	✓
Edit system queue	✓	✓	✓	—	—	—
Edit native priority	✓	✓	✓	—	—	—
Resources category						
Add resources	✓	✓	✓	—	—	—
Edit resource	✓	✓	✓	✓	—	—
Delete resource	✓	✓	✓	—	—	—
View resource	✓	✓	✓	✓	✓	✓
Schedule category						
Create schedule	✓	—	✓	—	—	—
Pause/resume schedule	✓	—	✓	✓	—	—
Shutdown Scheduler	—	—	—	—	—	—

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Security category						
Add security	✓	✓	—	—	—	—
Edit security	✓	✓	—	—	—	—
Delete security	✓	✓	—	—	—	—
View security	✓	✓	—	—	—	—
system events category						
Add system event	✓	—	✓	—	—	—
Edit system event	✓	—	✓	✓	—	—
Delete system event	✓	—	✓	—	—	—
View system event	✓	—	✓	✓	✓	✓
Timezone category						
Add Timezone	—	—	—	—	—	—
Edit Timezone	—	—	—	—	—	—
Delete Timezone	—	—	—	—	—	—
View Timezone	—	—	—	—	—	—
User Administration category						
Add users	✓	✓	—	—	—	—
Edit users	✓	✓	—	—	—	—
Delete users	✓	✓	—	—	—	—
View users	✓	P	✓	✓	—	—
Edit personal data	✓	✓	✓	✓	✓	—
Assign security policy	✓	✓	—	—	—	—
Assign runtime users	✓	✓	✓	✓	—	—
Impersonate user	✓	✓	✓	—	—	—
Assign agents	✓	✓	—	—	—	—
Variables category						
Add variables	✓	✓	✓	—	—	—
Edit variables	✓	✓	✓	✓	—	—
Delete variables	✓	✓	✓	—	—	—
View variables	✓	✓	✓	✓	✓	—
Workgroups category						
Add workgroup	✓	✓	✓	—	✓	—

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Edit workgroup	✓	✓	✓	—	✓	—
Delete workgroups	✓	✓	—	—	—	—
View workgroups	✓	✓	✓	✓	✓	—
Fault Monitor category						
Control FaultMon	—	—	—	—	—	—
View FaultMon	—	—	—	—	—	—
PeopleSoft Jobs category						
Add PeopleSoft Jobs	✓	✓	✓	—	—	—
Edit PeopleSoft Jobs	✓	✓	✓	✓	—	—
Delete PeopleSoft Jobs	✓	✓	—	—	—	—
View PeopleSoft Jobs	✓	✓	✓	✓	✓	✓
OracleApps Jobs category						
Add OracleApps Jobs	✓	✓	✓	—	—	—
Edit OracleApps Jobs	✓	✓	✓	✓	—	—
Delete OracleApps Jobs	✓	✓	✓	—	—	—
View OracleApps Jobs	✓	✓	✓	✓	✓	✓
Remote Jobs Jobs category						
Add Remote Jobs Jobs	✓	✓	✓	—	—	—
Edit Remote Jobs Jobs	✓	✓	✓	✓	—	—
Delete Remote Jobs Jobs	✓	✓	✓	—	—	—
View Remote Jobs Jobs	✓	✓	✓	✓	✓	✓
SSH Jobs category						
Add SSH Jobs	✓	✓	✓	—	—	—
Edit SSH Jobs	✓	✓	✓	✓	—	—
Delete SSH Jobs	✓	✓	✓	—	—	—
View SSH Jobs	✓	✓	✓	✓	✓	✓
JMS Jobs category						
Add JMS Jobs	✓	✓	✓	—	—	—
Edit JMS Jobs	✓	✓	✓	✓	—	—
Delete JMS Jobs	✓	✓	✓	—	—	—
View JMS Jobs	✓	✓	✓	✓	✓	✓
JMS Events category						
Add JMS events	✓	—	✓	—	—	—

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Edit JMS events	✓	—	✓	✓	—	—
Delete JMS events	✓	—	✓	—	—	—
View JMS events	✓	—	✓	✓	✓	✓
Suspend Monitorings	✓	✓	—	—	—	—
Resume Monitorings	✓	✓	—	—	—	—
Variable Events category						
Add Variable Events	✓	✓	✓	—	—	—
Edit Variable Events	✓	✓	✓	✓	—	—
Delete Variable Events	✓	✓	✓	—	—	—
View Variable Events	✓	✓	✓	✓	✓	✓
Suspend Variable Events	✓	✓	—	—	—	—
Resume Variable Events	✓	✓	—	—	—	—
File Events category						
Add File Events	✓	✓	✓	—	—	—
Edit File Events	✓	✓	✓	✓	—	—
Delete File Events	✓	✓	✓	—	—	—
View File Events	✓	✓	✓	✓	✓	✓
Suspend Monitorings	✓	✓	—	—	—	—
Resume Monitorings	✓	✓	—	—	—	—
Email Events category						
Add Email Events	✓	✓	✓	✓	—	—
Edit Email Events	✓	✓	✓	✓	—	—
Delete Email Events	✓	✓	✓	✓	—	—
View Email Events	✓	✓	✓	✓	✓	✓
Suspend Email Events	✓	✓	—	—	—	—
Resume Email Events	✓	✓	—	—	—	—
Horizon Jobs category						
Add Horizon Jobs	✓	✓	✓	✓	—	—
Edit Horizon Jobs	✓	✓	✓	✓	—	—
Delete Horizon Jobs	✓	✓	✓	✓	—	—
View Horizon Jobs	✓	✓	✓	✓	✓	✓

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
MSSQL Events						
Add MSSql Events	✓	✓	✓	—	—	—
Edit MSSql Events	✓	✓	✓	✓	—	—
Delete MSSql Events	✓	✓	✓	—	—	—
View MSSql Events	✓	✓	✓	✓	✓	✓
Suspend Monitorings	✓	✓	—	—	—	—
Resume Monitorings	✓	✓	—	—	—	—
MSSql Jobs category						
Add MSSql Jobs	✓	✓	✓	✓	—	—
Edit MSSql Jobs	✓	✓	✓	✓	—	—
Delete MSSql Jobs	✓	✓	✓	✓	—	—
View MSSql Jobs	✓	✓	✓	✓	✓	✓
Oracle DB Events						
Add Oracle DB Events	✓	✓	✓	—	—	—
Edit Oracle DB Events	✓	✓	✓	✓	—	—
Delete Oracle DB Events	✓	✓	✓	—	—	—
View Oracle DB Events	✓	✓	✓	✓	✓	✓
Suspend Monitorings	✓	✓	—	—	—	—
Resume Monitorings	✓	✓				
Oracle DB Jobs						
Add Oracle DB Jobs	✓	✓	✓	✓		
Edit Oracle DB Jobs	✓	✓	✓	✓		
Delete Oracle DB Jobs	✓	✓	✓	✓		
View Oracle DB Jobs	✓	✓	✓	✓	✓	✓
PeopleSoft Jobs						
Add PeopleSoft Jobs	✓	✓	✓	✓		
Edit PeopleSoft Jobs	✓	✓	✓	✓		
Delete PeopleSoft Jobs	✓	✓	✓	✓		
View PeopleSoft Jobs	✓	✓	✓	✓	✓	✓
People Tools						
Enable People Tools Access	✓	✓	✓			
SAP Events						
Add SAP Events	✓	✓	✓			

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Edit SAP Events	✓	✓	✓	✓		
Delete SAP Events	✓	✓	✓			
View SAP Events	✓	✓	✓	✓	✓	✓
Suspend Monitorings	✓	✓				
Resume Monitorings	✓	✓				
SAP Jobs						
Add SAP Jobs	✓	✓	✓			
Edit SAP Jobs	✓	✓	✓	✓		
Delete SAP Jobs	✓	✓	✓			
View SAP Jobs	✓	✓	✓	✓	✓	✓
View Job Log						
View Job Spool						
SAP Variants						
Add/Edit Variants	✓	✓	✓			
Delete Variants	✓	✓	✓			
SAP Process Chains						
Enable Planning View	✓	✓	✓			
WebService Jobs						
Add WebService Jobs	✓	✓	✓			
Edit WebService Jobs	✓	✓	✓	✓		
Delete WebService Jobs	✓	✓	✓			
View WebService Jobs	✓	✓	✓	✓	✓	✓
Agent Lists category						
Add agent list	✓	✓	✓			
Edit agent list	✓	✓	✓			
Delete agent list	✓	✓	✓			
View agent list	✓	✓	✓	✓	v	✓
Alerts category						
Acknowledge alert	✓			✓		
Close alert	✓			✓		
View alert	✓		✓	✓	✓	✓

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Calendars category						
Add calendar	✓		✓			
Edit calendar	✓		✓			
Delete calendar	✓		✓			
View calendar	✓		✓	✓	✓	✓
Configuration/Licensing category						
Edit configuration/license	✓	✓				
View configuration/licensing	✓	✓				
Connections category						
Add connection	✓	✓				
Edit connection	✓	✓	✓			
Delete connection	✓	✓				
View connection	✓	✓	✓	✓		
Edit machine name	✓	✓	✓			
Edit agent job limit	✓	✓	✓			
General category						
Add public data	✓	✓	✓			
View logs	✓	✓	✓	✓		✓
View reports	✓		✓	✓	✓	✓
View history	✓		✓	✓	✓	
View master status	✓	✓		✓		
Move jobs to production						
Job Actions category						
Add job actions	✓		✓			
Edit job actions	✓		✓			
Delete job actions	✓		✓			
View event actions	✓		✓	✓	✓	
Job Classes category						
Add job class	✓		✓			
Edit job class	✓		✓			
Delete job class	✓		✓			
View job class	✓		✓	✓	✓	✓

Function	Scheduler-Admin	Administrator	Scheduler	Operator	User	Inquiry
Job Console (Activity) category						
View all	✓		✓	✓		✓
View own	✓		✓	✓	✓	✓
Edit all	✓					

Security Policies User Interface

These topics describe the security policies user interface:

- Accessing Securities Policies
- Buttons
- Search Field
- Columns
- Security Policies Preferences
- Navigator Context Menu
- Security Policies Context Menu
- Security Policy Definition Dialog

Accessing Securities Policies

From the **Navigator** pane, select **Administration>Security Policies** to view the **Security Policies** pane.

All existing security policy names are displayed. If security policies do not appear, you do not have the appropriate rights to view security policies.

Buttons

The **Security Policies** interface contains the following buttons:

- **Add Security Policy** – Displays the **Security Policy Definition** dialog to add a new security policy.
- **Edit Security Policy** – Displays the **Security Policy Definition** dialog to edit an existing security policy.
- **Delete Security Policy** – Removes the selected security policy definition from the CWA database.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print your security policy definitions. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

The **Security Policies** interface contains the following columns:

- **Name** – The name of the security policy.
- **Description** – A description of the security policy. The **Description** field in the **Security Policy Definition** is optional, so there may not be any data in this column.
- **Modified** – The last time the security policy was modified.

Security Policies Preferences

Select **View>Preferences** from the main menu bar while viewing the **Security Policies** pane to display the **Security Policies Preferences** dialog.

From this dialog, you can select which columns are displayed in the **Security Policies** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Security Policies** pane, the **Navigator** context menu displays.

This context menu contains the following options:

- **Add Security Policy** – Displays the **Security Policy Definition** to add a new security policy. Has the same function as the **Add Security Policy** button.
- **Preferences** – Displays the preferences for the **Security Policies** pane.
- **Print** – Displays the **Reports** pane to view and print your security policy definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an HTML file.
- **Refresh** – Updates the data in the current pane.

Security Policies Context Menu

When you right-click in the **Security Policies** pane, the **Security Policies** context menu displays.

This context menu contains the following options:

- **Add Security Policy** – Add a new security policy definition by displaying the **Security Policy Definition**.
- **Edit Security Policy** – Edit the selected security policy by displaying the **Security Policy Definition**.
- **Delete Security Policy** – Deletes the selected security policy.

- **Print Security Policies** – Displays the **Reports** pane to view and print your security policy definitions. For more information, see Monitoring Production, page 313.

Security Policy Definition Dialog

The **Security Policy Definition** displays when you edit or add a security policy from the **Security Policies** pane.

The **Security Policy Definition** dialog has these tabs:

- Functions Tab
- Description Tab

Common to All Tabs

Security Policy Name – The name of the security policy (up to 30 characters). Each security policy name must be unique.

Functions Tab

This tab contains the following elements:

- **Category** – Functions are grouped into categories, as shown in the tables in CWA Functions, page 56.
  - No checkmark to the left of the category means that none of the functions in that category are assigned.
  - A gray checkmark to the left of the category means that some of the functions in that category are assigned.
  - A black checkmark to the left of the category means that all of the functions in that category are assigned.
- **Functions Assigned** – The list of functions assigned to the security policy.

  For more information about CWA functions, see CWA Functions, page 56.

Checklist Context Menu

Double-clicking a function category displays a small checklist context menu in the **Functions Assigned** column. The checklist context menu displays all the functions that belong to that category. Clicking the **Browse** button to the far right of the category, next to the **Functions Assigned** column, will also display the checklist for that category. Click **Close** in the checklist to return to the **Functions** tab. A black checkmark to the left of a function signifies that the function has been selected. No checkmark to the left of a function signifies that the function has not been selected.

Functions Tab Context Menu

Right-clicking the **Functions** tab of the **Security Policy** definition displays the following context menu of options for granting and revoking basic functions in all categories simultaneously in the security policy:

Note: The options in the Functions context menu to grant or revoke all of a type of function only apply to the basic functions. More advanced functions must be granted/revoked individually. For example, the **Grant All Edit** option grants the **Edit Queue** function but not the more advanced functions of **Edit System Queue** or **Edit Nice Queue Value**.

- **Grant All Functions** – Enables all functions in all categories, in effect, giving the user Superuser privileges.
- **Grant All Functions for Category** – Enables all functions in a selected category.
- **Grant All Add** – Enables each of the basic **Add** functions in each category.
- **Grant All Edit** – Enables each of the basic **Edit** functions in each category.
- **Grant All Delete** – Enables each of the basic **Delete** functions in each category.

- **Grant All View** – Enables each of the basic **View** functions in each category.
- **Revoke All Functions** – Cancels all functions in all categories.
- **Revoke All Functions for Category** – Cancels all functions in a selected category.
- **Revoke All Add** – Cancels each of the basic **Add** functions in each category.
- **Revoke All Edit** – Cancels each of the basic **Edit** functions in each category.
- **Revoke All Delete** – Cancels each of the basic **Delete** functions in each category.
- **Revoke All View** – Cancels each of the basic **View** functions in each category.

Description Tab

Description – Any user comments regarding the security policy, up to 255 characters.

Security Policy Configuration Procedures

The typical procedures you perform to set up security policies are covered in these sections:

- Adding a Security Policy, page 78
- Assigning Functions to a Security Policy, page 79
- Deleting a Security Policy, page 79
- Editing a Security Policy, page 79

Adding a Security Policy

Though each user must have a security policy, not all security policies need to be assigned to users. It is recommended that the administrator assign functions to a security policy on a need-to-use basis. New user definitions are assigned the **Operator** security policy by default.

To add a security policy:

1. From the **Navigator** pane, select **Administration>Security Policies** to display the **Security Policies** pane.

All existing security policy names display. If security policies do not appear, you do not have the appropriate rights to view security policies.

2. Click the **Add** button or right-click and select **Add Security Policy** from the context menu to display the **Security Policy Definition** dialog.
3. In the **Security Policy Name** field, type the name of the security policy.
4. The name must be unique and the length must not exceed 30 characters.
5. Click the **Functions** tab and select the functions to assign to the security policy.
6. For more information about CWA functions, see CWA Functions, page 56.
7. Click the **Description** tab and type a description for the security policy, up to 255 characters. (optional)
8. Click **OK** to close the security policy.
9. The security policy is added to the CWA database. The security policy can now be assigned to users.

Assigning Functions to a Security Policy

To assign a function:

1. From the **Navigator** pane, select **Administration>Security Policies** to display the **Security Policies** pane.

All existing security policy names display. If security policies do not appear, you do not have the appropriate rights to view security policies.

2. Double-click the security policy, or select the security policy record and click the **Edit** button or right-click the security policy and select **Edit Security Policy** from the context menu to display the **Security Policy Definition** dialog.
3. All function categories appear in the **Category** column on the **Functions** tab.
4. Double-click a category to display a drop-down list of available functions.
5. Click the individual check box for each function to add or remove the function or right-click a category and select the **Grant All Functions** option from the context menu to select all functions of a category. (Conversely, select the **Revoke All Functions** option to remove the functions for a category.)
6. Click **Close** in the checklist context to return to the **Functions** tab.

Deleting a Security Policy

Note: You cannot delete a security policy that is being used by any user. You must assign a different security policy to each user using that security policy before you can delete it.

To delete a security policy:

1. From the **Navigator** pane, select **Administration>Security Policies** to display the **Security Policies** pane.

All existing security policy names display. If security policies do not appear, you do not have the appropriate rights to view security policies.

2. Select the security policy you want to delete.
3. Click the **Delete** button on the CWA toolbar.
4. Click **OK** in the **Delete Confirmation** dialog.

Editing a Security Policy

With appropriate security rights, you can change functions available to a user by editing the user's security policy.

To edit a security policy:

1. From the **Navigator** pane, select **Administration>Security Policies** to display the **Security Policies** pane.

All existing security policy names display. If security policies do not appear, you do not have the appropriate rights to view security policies.

2. Double-click the security policy to edit or select the security policy and click the **Edit** button or right-click the security policy and select **Edit Security Policy** from the context menu.
3. The **Security Policy Definition** dialog displays.
4. You can change the name, description, and set of functions available to the user who has the security policy.
5. To change the functions assigned, click the **Functions** tab and add or remove functions.

6. For information about how to assign functions, see Assigning Functions to a Security Policy, page 79.

4

Job Activity

This chapter covers these topics:

- Overview, page 81
- Job Activity Interface, page 82
- View Time by Agent Dialog, page 88
- Job Details Dialog, page 89
- Job Filter Dialog, page 95
- Job Statistics Dialog, page 98
- Job Activity Configuration Procedures, page 98
- Viewing a Job's Output, page 104

Overview

The **Job Activity** pane displays information about jobs presently in the production schedule. To see jobs that have been defined but that are not currently scheduled, you need to open the **Jobs** pane. For more information about the **Jobs** pane, see Jobs and Job Groups, page 105.

Note: Remember that the security rights of a user will always affect what they are allowed to see in CWA. The Job Activity pane may show all jobs currently scheduled or only the jobs owned by the user and the user's workgroup, depending on the user's security policy.

The messages that display information about each job and group use different colored text to indicate their status, with a row background color of white. For example, carry over job rows display a background color of light gray.

Job groups are presented in bold with an expand or collapse button in the first column. All jobs in a job group are slightly indented and can be collapsed into and expanded from the group.

Use the scroll bars to view all the columns in the **Job Activity** pane. The **Job Activity** pane makes a large amount of important job information easily accessible. In the case of estimated start times and durations, the values displayed are periodically updated as new data becomes available. You can also press the **F5** key for an instant refresh.

The **Job Activity** pane displays can be customized through the **Preferences** dialog. For more information on how to customize the **Job Activity** pane, see Job Activity Preferences Dialog, page 84.

If the schedule in the **Job Activity** pane is a "forecast" for a future date (**Forecast Only** option selected when creating a schedule), then the word "Forecast" displays after the date in the pane title bar.

Note: See Job Life Cycle, page 199 in the Events chapter to understand the phases a job goes through in CWA.

This chapter covers these topics:

- Job Activity Interface, page 82
- View Time by Agent Dialog, page 88
- Job Details Dialog, page 89
- Job Filter Dialog, page 95
- Job Statistics Dialog, page 98
- Job Activity Configuration Procedures, page 98
- Viewing a Job's Output, page 104

Job Activity Interface

Accessing the Job Activity Interface

From the **Navigator** pane, select **Operations > Job Activity** to display the **Job Activity** pane.

You can double-click a job in the **Job Activity** pane to open its **Job Details** dialog.

Note: When you view a particular day in the production schedule, all jobs that have not been launched on previous days will also appear (unless you have filtered them out). This includes jobs in Active, Waiting On Resources, Waiting On Operator, Waiting On Dependencies, Stopped, Held, Agent Unavailable and Agent Inactive states.

See also:

- Buttons
- Search Field
- Columns

Buttons

The **Job Activity** pane contains the following buttons:

- **Refresh** – Refreshes the **Job Activity** pane.
- **Filter** – Displays the **Job Filter** dialog to customize the data that displays in the **Job Activity** pane.
- **View Time By** – Displays the **View Time By** dialog. Allows you to view jobs according to the time zone of the master doing the scheduling, the CWA client you are using or an agent that you select.
- **Prior Day** – Displays the production schedule for the day before the one currently displayed.
- **Next Day** – Displays the production schedule for the day after the one currently displayed.
- **Select Day** – Displays the production schedule for "today" or any other day.
- **Print** – Displays the **Reports** pane to view and print the contents of the **Job Activity** pane. For more information, see Monitoring Production, page 313.
- **Graphical View** – Displays a graphical view of the **Job Activity** pane.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

The order of the columns listed in the **Job Activity** pane can be rearranged from the **Job Activity Preferences** dialog.

The **Job Activity** pane contains the following columns:

- **Job No.** – The job number is the instance identification number of the job or group occurrence. Each occurrence or instance of a job is assigned a unique tracking number when it is added to the schedule to distinguish it from any other occurrences of the job. It is possible that the same job may run several times during a day.
- **Name** – The name of the job.
- **Status** – The present status of the job. The color of text used for each job and Job Group is based on its status. You can customize the status colors and sort order using the **Preferences** dialog.
- **Current Est Start** – The estimated start time as of the current moment in time. This start time value is updated every minute.
- **Est Duration** – The estimated duration for the command or executable as specified in the job definition. If the job has run more than once with the same command or executable, the estimated duration is the historical average of the job's previous run times. You can also manually set the estimated duration time of a job in its definition.
- **Reruns** – Tracks the number of times that a job has run.
- **Est Start** – The estimated job time calculated using the estimated launch times and estimated durations of preceding jobs. This value is created at the time the production schedule is compiled.
- **Time Zone** – The assigned job timezone. The time value adjusts the timezone offset into Master time.
- **Job Time Zone** – The timezone the job was run in.
- **Act Start** – The job's actual start time after it has launched.
- **Act End** – The actual ending time and date for the job occurrence.
- **Act Duration** – The actual time that it took for the command or executable to run. The actual duration is used to calculate the historical average of the **Est Duration** field in the job's definition. The actual duration value is 0 until after the job completes.

  Note: The displayed value for the Actual Duration value of a job is updated every 90 seconds.
- **Date** – The production date of the job. If the job does not execute until the next day, this date stays the same, since it represents when the job was scheduled to run based on its calendar or when the job was inserted as an unscheduled job.
- **Time window** – The time window during which the job can run as defined in the job's definition. The default, 12:00 AM to 11:59 PM, effectively means the job is eligible to run anytime during the day.
- **Agent** – The name of the agent or agent list associated with the job, as specified in the job definition. This field displays the agent list name prior to the job running and then displays the chosen agent from the list after it is launched.
- **Queue** – The queue that the queue manager assigns to the job. The queue to which the job is assigned depends upon the job's properties, and the way that the queues are configured to assign jobs using queue filters.
- **Priority** – The job priority as defined in the job's definition. Job priorities are only relative to the job priorities of other jobs within its queue before running.
- **Runtime User** – The user account that the job runs under when it executes.
- **Scheduled By** – How the job entered the schedule. There are three options:

  - **Event** – The job was inserted by an action that was initiated by an event.
  - **Calendar** – The job was compiled into the schedule according to its calendar.
  - **On Demand** – The job was an ad hoc insertion through either operator action or the command line.
- **Owner** – The user who owns the job. If the job is owned by a workgroup, the owner of the workgroup. Note that this column does not display the workgroup name itself, but the owner of the workgroup.
- **Parent Group(s)** – All of the parent job groups that the job or job group belongs to. If the job or job group belongs to several job groups, the group path is shown.
- **Command** – The command, program or script that the job will execute, as specified in the job's definition. The command path is relative to the agent machine on which the job runs. The command data includes any command parameters.
- **Exit Code** – The exit code that the command returns when the job is complete. The exit code is one way of determining whether the completion status of the job is **Completed Normally** (the exit code equals 0) or **Completed Abnormally** (the exit code does not equal 0). The exit code value can range from 0 to 30,000.
- **Job Full Name** – The full directory path to the job and its job group name.
- **Job Type** – The type of job.
- **Parent Group** – The immediate parent job group that the job or job group belongs to.
- **Job Class** – The job class the job is assigned to, if any.
- **Alias** – An alternate name for the job, as set in its job definition. The job alias is limited to eight characters and due to this limitation is often used in the command line mode to refer to a job.
- **Predecessors** – The job dependencies that have to be fulfilled before this job can run. This job will not run until the **Predecessors** have fulfilled the conditions set in this job's definition.
- **Successors** – Jobs that use this job as a job dependence. This job must fulfill a certain condition before **Successors** can run.
- **Group Instance** – The group instance number applies only to jobs and groups with a parent group. As opposed to the day instance number (also known as the job ID) which is unique, the **Group Instance** is relative to other jobs in the parent group.
- **Agent Instance** – The agent instance number applies only to broadcast jobs. For more information on broadcast jobs, see Controlling Production, page 253. The **Agent Instance** is relative to other jobs run by the same agent.
- **Ext ID** – This number corresponds to the **External ID** field in a job's **Job Details** dialog. This number is the process ID number that the Windows operating system assigns to the highest level process within the job. If this is a SAP or PeopleSoft job, the Ext ID is the same as the SAP or PeopleSoft job ID.
- **WaitOp** – Indicates if a job is waiting for the operator to release it.
- **Calendar** – Displays the name of the calendar associated with the job instance.

Each column can be sorted in either ascending or descending order. Click any column name to change the column sort. For example, click **Name** on top of the **Name** column. The items in the column alphabetize from **z** to **a**. Click **Name** again and the items alphabetize from **a** to **z**. For a column that is numerical, the sort changes from earliest to latest time, or latest to earliest time.

Job Activity Preferences Dialog

Select **View>Preferences** from the main menu bar while viewing the **Job Activity** pane to display the **Job Activity Preferences** dialog.

Columns Tab

From the **Columns** tab, you can select which columns are displayed in the Job Activity pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Status Color Tab

The **Status Colors** tab lists every possible status a job can have. From the drop-down menu to the right of each field, you can select the color to represent that status in the **Job Activity** pane.

Grid Background Color Tab

On the **Grid Background Color** tab select an option from the drop-down menus to the right of each field. You can select the color to represent the grid background color in the **Job Activity** pane.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Job Activity** pane, the Navigator context menu displays.

This context menu contains the same options displayed when you right-click in the Job Activity pane (see Job Activity Pane Context Menu) in addition to these options:

- **Save View As** – Displays the **Save View** dialog to name the view that you would like to save. See Save View Dialog.
- **Export** – Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Preferences** – Displays the **Preferences** dialog for the **Job Activity** pane. See Job Activity Preferences Dialog.
- **New Root Folder** – Displays the **New Root Folder** dialog to name the new root folder that you would like to create in the **Navigator** pane.

Save View Dialog

The **Save View** dialog is displayed by selecting the **Save View As...** option in the context menu available after selecting the **Job Activity** option in the Navigator pane. Use this feature to save the user's viewing preference settings for the current state of the Job Activity pane.

Saved views are listed in the navigator pane beneath the Job Activity option. A user can use only the views they own, that are owned by a workgroup that they belong to or made available to the public.

- **Name** – It is recommended that a view be given a descriptive name to help identify its purpose and usage.
- **Owner** – Views can be owned to individuals or to a workgroup.
- **Public** – Select this option to make the view available for other users.

Once a view has been saved, additional context menu options to delete or update changes to an existing view are available to any selected view. A user can only modify or delete views owned by that user although a superuser can delete other user’s views by impersonating that user.

Job Activity Pane Context Menu

When you right-click in the **Job Activity** pane, the **Job Activity** context menu displays.

The **Job Activity** context menu contains the following options:

- **Details** – When in the **Jobs** pane, displays the **Job Details** dialog for the selected job occurrence. Alternately, you can display these dialogs by double-clicking the individual job record.
- **Statistics** – Displays the **Job Statistics** dialog showing the number of scheduled and unscheduled jobs in the present day's production schedule.
- **Goto Now** – Sets the job pane's date to the current date.
- **Job Control** – Displays a submenu with options for manipulating jobs. For more information on job control menu options, see Job Control Submenu, page 87.
- **Insert Job into Schedule** – Adds one new occurrence of the selected job into the production schedule regardless of the job's (or job group's) calendar setting or number of times the job is scheduled to repeat during the day. When a job or a job group is added, and the job or job group already resides in the production schedule, an incremented occurrence number appears next to the job occurrence in parentheses, i.e., **Job A (2)**.
- **Remove Job(s) from Schedule** – Removes the selected job occurrence from the production schedule. If you wish to remove all future occurrences of the job within the schedule, select the **All** option in the **Confirmation** dialog. The job occurrence cannot be removed unless it has a pre-launch status.
- **Require Operator Release** – Holds the job until an operator releases it. The job will not run until it is released. When all the job's dependencies are met, and it is ready to run, its status is **Waiting On Operator**. The information in the **Operator Instructions** field (**Description** tab) can inform the operator of any external requirements that need to be met before the job is released.
- **Refresh** – Updates the data in the **Job Activity** pane.
- **Filter** – Displays the **Job Filter** dialog to filter the job occurrences that are displayed in the **Jobs** pane according to criteria you select. You can also custom-sort job occurrences. For more information about the **Job Filter** dialog, see Job Filter Dialog, page 95.
- **Print** – Displays the **Reports** pane to view and print your jobs. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Print Selected** – Displays the **Reports** pane to view and print your job selections.
- **Select All** – Selects all records in the Job Activities pane.
- **View Time By** – Selecting **View Time By** displays the **View Time by Agent** dialog. From here, you can choose to view job times according to the time zone of your master, current CWA client or an agent that you specify.
- **Group Display** – Selecting **Group Display** brings up the **Group Display** submenu. The menu options are as follows:
  - **Expand Selected** – Expands one level on the selected job group, displaying its child jobs. If multiple groups are selected, only the first group selected is expanded.
  - **Collapse Selected** – Collapses one level on the selected job group, hiding its child jobs. If multiple groups are selected, only the last job group selected is collapsed.
  - **Expand All** – Expands all levels on the currently selected group, respectively.
  - **Collapse All** – Collapses all levels on the currently selected job groups to hide all child jobs.
- **Prior Day** – Displays the production schedule for the day before the one currently displayed.
- **Next Day** – Displays the production schedule for the day after the one currently displayed.
- **Select Day** – Displays a calendar to select the date whose production schedule you want to view.
- **List Instances** – Lists all job instances

- **Successors** – Advises which jobs, if any, are dependent on the currently selected job.
- **Graphical View** – If you selected the **Use New Graphical View Layout Manager** option on the **Other** tab of the **System Configuration** dialog, this option displays instead of the View option. Select this option again to return to the original view. (Refer to Business Views Pane Interface, page 223 for more information.) If this option is selected (a check mark is beside the option), the following menu options also are available.

Job Control Submenu

When you select **Job Control** from the **Job Activity** context menu, a submenu displays.

Note: After selecting a job control action from the menu, a context dialog confirms the success or failure of the action.

This submenu contains the following options:

- **Override** – Overrides all unmet dependencies and changes the selected job status from **Waiting On Dependencies** to **Waiting on Resource** or **Waiting On Operator**. The job must have the status of **Waiting On Dependencies** for this job control function to be available. (For information on overriding individual dependencies, refer to Job Details - Dependencies Tab, page 91.)
- **Hold/Stop** – When a job is in the **Held** or **Stopped** state, the execution of the job will not begin or continue until it is manually released. Because Windows does not support the pausing and resuming of a process, the **Hold/Stop** option is not available for Windows jobs.
- **Hold** – Changes the selected job status from **Waiting On Dependencies**, **Waiting On Resource, Agent Inactive**, or **Agent Unavailable** to **Held**. When a job group's occurrence is selected, places all waiting jobs in **Held** status, and all active jobs in **Stopped** status.
- **Stop** – Changes the selected job status from **Active** to **Stopped**.
- **Release/Resume** – This command recommences the execution of a job at the point at which it was stopped (suspended). On non-Windows agents, the **Release/Resume** command can also take a job in the **Held** state and release it so that it will launch once all of its dependencies have been met. Because Windows does not support the pausing and resuming of a process, the **Release/Resume** option is not available for Windows jobs.
  - **Release** – Changes the selected job status from **Waiting On Operator** or **Held**, to **Active** (with an intermediate **Scheduled** state). When a job group's occurrence is selected, **Release** changes the job group's status from **Waiting On Operator** to **Active** (with an intermediate **Scheduled** state), and changes all child job statuses from **Waiting On Group** to **Scheduled**.
  - **Resume** – Changes the selected job status from **Stopped** to **Active**. Also changes the selected job status from **Held** to **Waiting On Dependencies** (with an intermediate **Scheduled** state). When a job group's occurrence is selected, changes its status from **Held** to **Active** (with an intermediate **Scheduled** state). All child jobs that were **Stopped** become **Active**, and all that were **Held** become **Waiting On Dependencies**.

- **Cancel/Abort** – Prevents or stops a job from running in the production schedule. CWA agents react differently when a job with child jobs is aborted, depending upon the agent type and operating system.

Type of Agent	Abort Behavior of Jobs
Agent for Windows	When CWA launches a job, a Windows Job Object is created that spawns the actual job process. Aborting the job in CWA, destroys the job object and kills the job process. If you abort a job on Windows, all of its child processes are aborted also.
Agent for Unix	Aborting a job sends a SIGTERM (request to terminate) message to the job and its child processes before sending a SIGKILL message that actually kills all of its child processes. The interval between the SIGTERM and SIGKILL signals can be configured. More information on configuring agent parameters is available in *Installing AgentS* chapter of the *Cisco Workload Automation Installation and Configuration Guide*.

  - **Cancel** – Changes the selected job status from **Agent Inactive**, **Agent Unavailable**, **Deferred**, **Held**, **Waiting On Dependencies**, **Waiting On Operator**, or **Waiting On Resource** to **Canceled**. Canceled jobs do not run in the production schedule.
  - **Abort** – Changes the selected job status from **Active** or **Stopped** to **Aborted**, and kills the active job process on the system.

  Caution: Avoid excessive aborting of job processes as this may lead to system instability. Instability may appear after more than 10 job aborts. Restore system stability by rebooting the agent machine.

  When selecting **Cancel/Abort** you can choose to release the selected job's dependents. If you choose to release, the dependent job will no longer be dependent on the job you are canceling or aborting.

- **Cancel Pending** – Stops or prevents a job instance from running but overrides the dependencies in the job stream so that children of the job will consider the parent to have completed normally. In a job group, all of the children also go to **Cancel Pending** status. Once all of the dependencies of the jobs in **Cancel Pending** status complete, the jobs end in a **Cancel Normally** status which is considered the same as **Completed Normally**.
- **Cancel/Abort All** – Prevents all occurrences of a job that are not complete from running in the production schedule. When you select **Cancel/Abort All**, you can choose whether to release the selected job's dependents. If you choose to release, the dependent job will no longer be dependent on the jobs you are canceling or aborting.
- **Rerun** – Changes the selected job status from **Aborted**, **Completed Normally, Completed Abnormally** or **Error Occurred** to **Active** (with an intermediate **Scheduled** state). A new instance ID of the job is not created. You cannot rerun a job with the status of **Externally Defined**, **Orphaned** or **Skipped**.
- **Set** – Changes the selected job or job group completion status. The selected status can affect all other jobs dependent on that job or job group. When a status is changed with this command, an asterisk appears after the new status. For example, **Completed Normally***. You can choose from the following: **Completed Normally**, **Completed Abnormally**, **Externally Defined**, **Error Occurred**, **Orphaned** or **Skipped**.

View Time by Agent Dialog

The **View Time by Agent** dialog displays by clicking the **View Time By** button on the CWA toolbar while in the **Job Activity** pane.

This dialog configures the times displayed in the schedule according to the time zone of one of the system components. CWA may be managing a production schedule that includes components that are spread out over a wide geographic area. This geographic area may encompass several time zones. When you are scheduling jobs over diverse timezones you have to account for the fact that the master, agent and CWA client may be in different time zones.

Note: You can configure the jobs to run according to the timezone used by the master or by the agent from the Timezone tab of the System Configuration dialog. Master and Job Based Timezone offset will be applied into all time value for that job.

You can configure the CWA client to display the estimated and actual times of jobs from the viewpoint of one of the following components:

- **Master** – The master controlling the production schedule
- **Client** – The CWA client being used
- **Job** – The job being run
- **Agent** – The agent running the job

Job Details Dialog

Accessing the Job Details Dialog

The **Job Details** dialog displays when you double-click a job occurrence record in the **Job Activity** pane or right-click and select **Details** from the context menu.The details shown for a job differ from the details for a job group, thus while the **Job Details** dialog for a job group is very similar, it does not have the same tabs as a job does.

Common to All Job Details Tabs

- **Job Name** – The name of the job as defined in its job definition.
- **Job No.** – The job's instance number.
- **Print** – Clicking this button displays a report that lists the same fields of information contained within on the various tabs of this **Job Details** dialog. This report can be saved or printed. You can elect to display the report with or without the job output if the job has run.
- **Defaults** – This button becomes available whenever you make a change to the job's parameters from the **Override** tab. Clicking the **Defaults** button after a change returns all the fields on the **Override** tab to their original values. The **Defaults** button is then unavailable until the next override change. This button is unavailable from the other tabs of the dialog.

Job Details - Status Tab

This tab contains the following elements:

- **Status** – The job's current status.
- **Est. Start Time** – Estimated job launch time based on its time dependencies and the launch times and estimated durations of preceding jobs. You can view all the dependent jobs on the **Dependencies** tab.
- **Act. Start Time** – The time the job became active. Until the job is active, this field is empty.
- **Est. Duration** – The estimated time it will take for the job to run. If the job has never run before, it contains the value in the **Estimated Duration** field in the job's definition. Otherwise, it contains a historical average of the **Actual Duration**.
- **Act. Duration** – The actual time the job took to run.
- **Job Owner** – The user that owns the job.

- **Scheduled By** – Indicates how the job entered the production schedule. Three possible values may be displayed here:
  - **Calendar** – Compiled into the schedule based on an assigned calendar.
  - **Event** – Inserted by a job action based on an event trigger.
  - **On Demand** – Inserted by an operator via the CWA client, command-line, API or Web Service.
- **Exit Code** – The exit code of the completed job (if the job has not completed, this field is blank). This field is not displayed for a job group. Exit code values mean:
  - if the value equals 0, the job has completed normally
  - if the value does not equal 0, the job has completed abnormally
- **External ID** – By default, this is the ID number assigned to the job process by the operating system. Certain job types have an **External ID** assigned by third party software, such as SAP or PeopleSoft.
- **Reruns** – The number of times the job has rerun for the day.
- **Disable Carryover** – Selecting this option prevents the job from being carried forward to the next day's schedule if the job does not run on its scheduled day. If the **Try again tomorrow option** in the **If not ready by end of day** field on the **Schedule** tab of a job definition is selected, it will override the **Disable Carryover** option and the job ***will*** run on the next day.

Job Details - Audit Log Tab

Displays both user-initiated job interaction and production schedule audit trail messages for the job including job control actions, job occurrence status changes and errors.
Double-click a record to display its details more clearly.

This tab displays the following information:

- **Time** – The date and time the audit was recorded.
- **Description** – The job audit or error message describing the change/error to the job. Audit information is retained according to the audit retention setting in the **System Configuration** dialog.
- **User** – The user that submitted the job.

Job Details - Output Tab

Displays the standard output of the job. CWA can be configured to save or discard job output by default from the **Defaults** tab of the **System Configuration** dialog. Regardless of the system default, any individual job instance can be configured from its job definition to override the system default.

- If the **Append** option in the **Save Output** field on the **Options** tab of the job definition is selected in the job's definition, the job's standard output file is transferred to the master and displayed on this tab. Each time a job is rerun that run's output is separated by a block of number signs (#).
- If the **Replace** option in the **Save Output** field is selected, then only the output from the last job instance that ran is saved. The output from the previous time that the job ran is overwritten.
- If the **Discard** option of the **Save Output** field is selected than this tab will not have any job output displayed here.

If a job is canceled before it can complete, any partial output that was generated during the processing of the job displays on the **Output** tab. Note that a job group does not have an **Output** tab in its **Job Details** dialog.

Note: CWA's default is to discard job output. To save or append job output or to specify that the output be produced in summary format, change the system default on the Defaults tab of the System Configuration dialog. This can be adjusted for individual jobs from the Options tab of that job's Job Definition dialog.

You can refresh the output if parameters have been changed after runtime by clicking **Refresh output**.

Job Details - Dependencies Tab

About the Dependencies Tab

Shows all predecessors (job, file, time and variable dependencies) needed before a job can run. It also displays all successors occurring after the job runs.

From the **Dependencies** tab, you can override individual job dependencies for a job instance (but not for a job group). (To override all of a job instance's dependencies, refer to the override section of the Job Control Submenu, page 87.) Other instances of the job are not affected when you override a dependency.

There are three ways to override a dependency:

- Select the dependency in the **Predecessors** field and click the **Override** button.
- Select the dependency in the **Predecessors** field, right-click to display the context menu and choose the **Override** option.
- Select the dependency in the **Predecessors** field and use the keyboard shortcut, **Ctrl+O.**

This tab contains the following elements:

- **Include dependencies already satisfied option** – When not checked, only dependencies that have not been met are displayed. Otherwise, met dependencies are displayed with a green box outlining the dependency's icon. The default is checked to show all predecessors and successors.
- **Predecessors** – Displays files, times that must be met and hierarchical trees of earlier jobs that must reach a particular status before this job can run. Jobs on higher levels of the hierarchies depend upon jobs in lower levels.
- **Override Button** – Select a specific dependency and click the **Override** button to override the dependency for a job instance.
- **Successors** – Displays a hierarchical tree of jobs that are dependent on the job in question. Jobs on lower levels of the hierarchies depend on the jobs above.

File Dependencies

File dependencies are defined in the job's definition dialog, and are displayed with a file icon, the file's path name and the dependency expression (Exist, Not Exist, etc...).

Job Dependencies

Job dependencies are defined in the job's definition dialog and are displayed with a job icon, the job's name, the selected logical operator (=, <>, etc...), its target status, and the present status. If the job is not currently in the production schedule, the icon changes to the not-in-schedule icon.

Note: To have a job ignore a job dependency when the dependency is not in the schedule, select the Ignore dependency if job not in schedule option in the Job Dependency Definition dialog.

Time Dependencies

Time dependencies are displayed with a time icon, and indicate the time when the time dependency will be met.

Variable Dependencies

Variable dependencies are defined in the job's definition dialog and are displayed with a variable icon, the variable's name, its dependency expression and its present value in parentheses.

Job Details - Resources Tab

The **Resources** tab of the **Job Details** dialog displays information about any resources assigned to a job. The current and required system resource values, with a column showing the status of the resource, displays on this tab. In the case of a job that uses an agent list and has not yet been assigned an agent from the list, the current and status columns are grayed out.

The possible statuses for the resource are:

- **Available** – The resource is available. The job cannot use the resource until all of its needed resources are available at the same time.
- **Unavailable** – The resource is unavailable.
- **Waiting** – The resource is not available because another job is using the resource.
- **Locked** – The job is running. All of the listed resources will display the Locked status. A job cannot run until all of its assigned resources are simultaneously available. When the resources do become available to the job, the job locks up its share of each resource until the job completes and the resource is released for use by other jobs.

  A resource in a **Locked** status cannot be overridden to release it but a user could modify the resource's definition to temporarily increase its limit and make more of the resource available to other jobs.

  Note: Resources cannot be assigned to a job group. If this is a job group definition, then the Resources tab is not displayed.

The **Resources** tab contains the following elements:.

- **Resource Consumption**
  - **Type** – The kind of resource that is being used, **Virtual** or **Agent**.
  - **Resource Name** – Displays the name of the resource associated with the job.
  - **Amount Used** – The amount of the resource's specified limit that the job uses. This number cannot exceed the number shown in the **Amount Available** column.
  - **Amount Available** – The amount of the resource that is available to be used. This number is derived by subtracting the amount of the resource currently in use from the limit specified in the resource's definition.
  - **Status** – Denotes the status of a resource assigned to the job. There are three possible statuses:

  Available – The resource is available for the job.

  Waiting – The resource is not currently available. The job is unable to run until the specified amount (shown in the **Amount Needed** column) of the resource is available.

  Locked – The resource is being used by job. The amount of the resource being used by the job (shown in the **Amount Used** column) is unavailable to any other job until this job completes. If multiple resources are required for the job, then an all or nothing approach is used. No resource is locked up until all of the required resources are available and can be locked simultaneously.

A resource in a locked status cannot be overridden to release it but a user could modify the resource's definition to temporarily increase its limit and make more of the resource available to other jobs.

- **Resource conditions**
  - **Type** – The kind of resource that is being used, **Published** or **Custom**.
  - **Resource Name** – Displays the name of the resource associated with the job.
  - **Current** – Displays the current value.
  - **Condition** – Contains the conditional operators depending on the data type of the resource.
  - **Required** – Displays the amount of the resource needed by the job. This amount is defined in the **Resource Requirement Definition** dialog.
  - **Status** – Denotes the status of a resource assigned to the job. There are three possible statuses:

Available – The resource is available for the job.

Waiting – The resource is not currently available. The job is unable to run until the specified amount (shown in the **Amount Needed** column) of the resource is available.

Locked – The resource is being used by job. The amount of the resource being used by the job (shown in the **Amount Used** column) is unavailable to any other job until this job completes. If multiple resources are required for the job, then an all or nothing approach is used. No resource is locked up until all of the required resources are available and can be locked simultaneously.

Job Details - Variables Tab

Displays the variables used by the job group. These variables are isolated from any changes to their values that occur outside of this job group and its parent or child groups. The **Job Details** dialog for a job does not have a **Variables** tab.

Job Details - Override Tab

Displays job properties that can be changed for this occurrence at any time while the job is waiting to run. After a job runs, it is only useful to change these values if you rerun the job. Changes made only affect the instance and not the rule as defined in the **Job Definition** dialog. The **Job Details** dialog for a job group does not have an **Override** tab.

Note: After changing any of these values and clicking OK, you are prompted to confirm the changes, and you are given the choice to apply the changes to all occurrences of the job in today's schedule if this is a repeating job. This applies to all repeating jobs that have not run yet, and all additions of this job that were inserted manually.

This tab contains the following elements:

- **Agent** – The agent that the job runs on. This is useful if the job failed on one agent and you want to rerun it on another. You can select from a list of active agents only. Be sure to choose an agent platform that will support the command in the command field.
- **Agent List** – The list of available agents that can run the job. The master assigns an agent to the job only when the job's dependencies are met and the job is ready to run. The master assigns an agent according to demands of the production schedule and the agent's job limit at the time that the job is ready to run.

  Note: Since the agent is not assigned to a job until the last minute, if a user looks at a Job Details dialog before the job runs (e.g., the job is in a Waiting on Dependencies state), the Agent field on the Override tab is empty. The master does not select an agent from the agent list displayed in the Agent List field until the job's dependencies are met and the job is ready to run. Only then is the agent selected and the name of the agent displayed in the Agent field. If the job reruns, the master may assign a different agent from the agent list according to the demands of the production schedule.

- **Queue** – Normally, jobs are automatically assigned to queues. You can use this field to override the automatic assignment. You may want to do this if the present queue is too full to run the job any time soon.
- **Runtime User** – The runtime user, if any, assigned to the job. If that user account is currently experiencing problems, you can select another runtime user in this field.
- **Priority** – The job priority. This value ranges from low (0) to high (100). This value is used to prioritize job execution by comparing with other jobs within the job's destination queue.
- **From Time** – The start of a job instance's time dependency pane. By modifying the time within this field, you can override the time dependency.
- **Until Time** – The end of a job instance's time dependency pane. Modifying the time in this field overrides the jobs's time dependency.
- **Remove Time Dependency** – This button clears the values entered in the **From Time** and **Until Time** fields, removing the time dependency for this job instance.
- **Defaults** – This button becomes available whenever you make a change to the job's parameters from the **Override** tab. Clicking the **Defaults** button after a change returns all the fields on the **Override** tab to their original values. The **Defaults** button is then unavailable until the next override change.

Job Details - Runbook Tab

The **Runbook** tab is intended to supply any instructions for the user relative to the execution of this job. This field can be used effectively with the **Require operator release** option in the job's definition.

Job Details - Notes Tab

Use this field to enter other notes concerning the job.

This tab contains the following elements:

- **Other Notes** – A free text field where you can type any instructions for the operator, up to 255 characters long or enter a web address that provides relevant information about the job. If you selected the **Require operator release** option on the **Options** tab, you could use this field for detailed reminders about the circumstances under which to run this job with the **Require operator release** option selected.

  A web address or network directory address can be entered here and if the **Load URL** option is selected, the specified directory or web page from an internet site or a company intranet site displays. The web page or directory pane that displays here is an active pane that can be refreshed and whose links and folders can be accessed by clicking. You can right-click a web page in this field to display a context menu of the same options available in the web browser.
- **Load URL** – If a web URL is entered in the text field and this option is selected then that web page displays in the text field. This web address can be for an internet site or a company intranet site. This can be very useful if information pertaining to a job is stored on a company intranet.

Job Details - History Tab

Details the job run history of every occurrence of this job in the production schedule sorted by **Start Time** and then by job number in descending order. The history includes jobs that have completed and jobs currently waiting to run either as repeated jobs and/or in future days of the production schedule. The history is retained according to the retention history setting in the job's definition.

Note: Columns in the History tab can be resized by clicking the right border bar and dragging left or right.

This tab contains the following elements:

- **Job No.** – The unique number assigned to the job occurrence (day instance).
- **Date** – The date on which the occurrence was scheduled to run.
- **Status** – The present or final status of the occurrence. For a description of job statuses, see Jobs and Job Groups, page 105.
- **Act Start Time** – For past or present jobs, the actual time the job occurrence started. For future jobs, this field is blank.
- **Act End Time** – For past jobs, the actual time the job occurrence ended. For jobs currently running or future jobs, this field is blank.
- **Act Duration** – The actual duration of the job.
- **Est Start Time** – For past or present jobs, the time the job was estimated to start. For future jobs, the estimated time the job occurrence is expected to start. The start time may vary due to system resource utilization, and job dependencies.
- **Reruns** – The number of times the job has been rerun.
- **Command** – The command path, name and parameters that were executed for the occurrence of the job.
- **Priority** – The priority of the job when the job ran.

Job Filter Dialog

About the Job Filter Dialog

The **Job Filter** dialog displays by right-clicking in the **Job Activity** pane and selecting the **Filter** option from the context menu.

The **Job Filter** dialog allows you to perform the following tasks:

- View only the jobs that have the statuses that you want to see.
- View jobs using wildcards to specify the job name.
- View jobs that are running or ran on a specific agent.
- View jobs that are owned by a specific user.
- View jobs that are run as a specific user.
- View jobs that belong to a specific job class.
- View jobs that will run in a certain queue.
- View jobs that run a certain command
- View only jobs, only job groups, or both.

Note: Filters only apply to jobs within groups, not to groups themselves. Groups are only displayed if at least one child within the group passes the filter criteria. If, according to the criteria, the group would be empty, the group is not displayed. If the Show Groups option is not selected, groups are ignored completely, and filters apply to the individual jobs which are now displayed outside of their group.

See also:

- Status Filter

- Hours
- Other Filters

Status Filter

Use this filter to view only jobs with the statuses you are interested in. The default is all statuses (all selected).

The **Job Filter** dialog contains the following status viewing options:

- **Aborted** – Shows all jobs that were actively running and were aborted by the operator.
- **Active** – Shows all jobs that are currently running in the production schedule. Jobs that run longer than a day are shown on the day it started.
- **Agent Disabled** – Shows all jobs that could not launch because their assigned agent is inactive.
- **Agent Unavailable** – Shows all jobs that cannot run because their assigned agent is either not online or not presently connected.
- **Canceled** – Shows all jobs that were canceled by the operator.
- **Completed Abnormally** – Displays all jobs that completed with an exit code outside the designated normal range of values.
- **Completed Normally** – Displays all jobs that completed with an exit code within the designated normal range of values. This is configured on the **Run** tab of the job definition. The default exit code is 0 if a range of values is not specified.
- **Deferred** – Shows all jobs that were deferred because another occurrence of the job was running when the job was launched. These jobs have their concurrency option set to **Deferred** in their job definition.
- **Error Occurred** – Shows all jobs where an error occurred that prevented the job from running. Error messages can be examined in the **Job Details** dialog.
- **Externally Defined** – Shows all jobs that have a completion status defined by an external program.
- **Held** – Shows all jobs that were put on hold by an operator.
- **Launched** – Shows all jobs that are being launched by the Queue Manager.
- **Orphaned** – Shows all jobs where the connection between the agent and master failed while the job was running, and thus the job's status is unknown.
- **Scheduled** – Shows all jobs that have been scheduled to run on future days, and jobs running today where the status has not yet been determined.
- **Skipped** – Shows all jobs that were skipped because another occurrence of the job was running when the job was launched. These jobs have the **Skip** option set in the **If job is currently running** field on the **Options** tab of their job definition.
- **Stopped** – Shows all active jobs that were stopped by an operator. Jobs can be resumed by using the **Release** job control menu item.
- **Timed Out** – Shows all jobs that could not launch during their date and time window and will never run because **Timeout** is selected in the **If not ready by end of day** field on the **Schedule** tab of the **Job Definition** dialog.
- **Timed Out for Day** – Shows all jobs that missed or could not launch during their time window and cannot run for the rest of the day. These jobs will be carried forward to the next day because the **Try again tomorrow** option is selected in the **Schedule** tab of the **Job Definition** dialog.
- **Waiting on Children** – Shows all parent job groups that are waiting for their children to reach the necessary status.

- **Waiting on Dependencies** – Shows all jobs that are waiting on time, variable, file or job dependencies. You can view all the job dependency information from the **Job Details** dialog by double-clicking the job in the **Jobs** pane.
- **Waiting On Group** – Shows all jobs that are waiting on their job group's dependencies to be satisfied. You can view the job group dependencies information from the **Job Details** dialog by double-clicking the group in question in the **Jobs** pane.
- **Waiting on Operator** – Shows all jobs that have passed their dependency tests, and are waiting for an operator to release it. The job can be released using the **Release/Resume** job control command.
- **Waiting on Resource** – Shows all jobs that are waiting for an agent to free resources so that the job can run.

Note: When the Status column is sorted, the sort order is defined by the sort order listed in the System Configuration dialog. For more information about the System Configuration dialog, see, "System Configuration" on page 68.

Hours

Use this section to filter for jobs that run only during certain hours. Select the check box for each hour you wish to filter for.

Other Filters

- **Job** – Shows all the job occurrences matching the wildcard string specified. You can use the following wildcard characters.
  - ***** (Asterisk) The asterisk character masks any number of characters on and to the right of the location it is placed. For example, **A*** will match (allow in) **AB**, **ABB**, and **ABBB**.
  - **?** (Question Mark) The question mark masks one character in the location it is placed. For example, **A?A** will match **ABA** and **ACA**, but not **ABB** or **ABBA**.
  - **[x, y, z]** The brackets with commas let you specify a set of characters to filter in to that location in the string. For example, **A[X,Y]B** accepts **AXB** and **AYB** but not **AAB**.
  - **[a-z]** You can also specify ranges within brackets. For example, **A[X-Z]B** filters in **AXB**, **AYB**, and **AZB** but not **AWB**.
- **Group** – In this text field, type the name of a group filter. The groups configured with this filter are displayed as well as their children.
- **Agent** – Shows all job occurrences that run under the selected agent. When no agent is selected, all agents are assumed.
- **Owner** – Shows all job occurrences that belong to the selected user or workgroup.
- **Runtime User** – Shows jobs assigned to the selected runtime user.
- **Job Class** – Shows jobs belonging to the selected job class.
- **Queue** – Shows all job occurrences that run in the selected queue.
- **Command** – Shows all jobs that execute the selected command.
- **Calendar** – Displays all jobs that use the selected calendar.
- **Show Jobs** – Displays all jobs meeting the defined filtering criteria. No jobs display if this is not selected, though job groups display if the **Show Groups** option is selected.
- **Show Groups** – Displays a job group if it meets the defined criteria. No job groups are displayed if this option is not selected.

- **Show Carryover** – Displays any jobs that carried over from previous production dates.
- **Show Scheduled Only** – Displays jobs that were compiled as part of the original production schedule. The **Show Ad Hoc Only** option cannot be selected if this option is selected.
- **Show Ad Hoc Only** – Displays jobs that were not part of the original production schedule but were manually inserted into the schedule by an operator.The **Show Scheduled Only** option cannot be selected if this option is selected.

  Note: Jobs that did not finish on their production dates carry over only if the Carry Over Unfinished Schedule option was selected on the Master tab of the System Configuration dialog.
- **Server Side Filter** – Select this option if the job filter criteria does not change very often. This option improves performance by reducing network traffic. With this option selected, only jobs meeting the defined criteria are downloaded to the CWA client when the **Job Activity** pane is selected. Once the filter criteria is changed, jobs are filtered again according to the new criteria and downloaded again.

  If the option is not selected, all jobs are downloaded first and then filtered by the CWA client to meet the defined criteria. After the initial download it is quicker to refilter the jobs from the CWA client since they do not have to be downloaded again.
- **Defaults** – Resets the job filter criteria to the default options. The defaults include all statuses, all hours, and the **Show Jobs**, **Show Groups** and **Show Carryover** options. The criteria in the **Other Filters** section is cleared.

Job Statistics Dialog

Accessing the Job Statistics Dialog

The **Job Statistics** dialog displays by right-clicking in the **Job Activity** pane and selecting **Statistics** from the context menu. The **Job Statistics** dialog shows statistics regarding job occurrences for the day currently displayed in the **Job Activity** pane. You can view statistics for All Jobs, Production jobs and Unscheduled jobs on the respective tab.

See also:

- All Jobs, Production and Unscheduled Tabs

All Jobs, Production and Unscheduled Tabs

These tabs contain the following elements:

- **Completed Normally** – Shows the number of jobs that completed normally.
- **Completed Abnormally** – Shows the number of jobs that completed abnormally.
- **Launch Errors** – Shows the number of jobs that have a status of **Error Occurred**.
- **Total Reruns** – Shows the number of jobs that have been rerun manually.
- **Number of Filtered Jobs** – Shows the number of jobs that have been filtered into the **Job Activity** pane using the job filter.

Job Activity Configuration Procedures

This section covers the typical tasks you perform to configure job activities:

- Adding or Removing Columns in the Job Activity Pane, page 99
- Adding a New Job or Group Occurrence to the Schedule, page 99
- Adjusting Column Widths in the Job Activity Pane, page 100

- Deleting Jobs or Groups from the Production Schedule, page 100
- Filtering Jobs in the Job Activity Pane Based on Job Status, page 100
- Moving to Different Dates and Times in the Job Activity Pane, page 100
- Pausing the Production Schedule, page 101
- Rearranging Columns in the Job Activity Pane, page 101
- Recreating the Production Schedule, page 101
- Refreshing the Job Activity Pane, page 102
- Resuming the Production Schedule or Job Launching, page 102
- Saving a Job's Output on the Master, page 102
- Selecting or Removing All Job Filters in the Job Activity Pane, page 102
- Setting the Completion Status of a Job, page 102
- Sorting Jobs in the Job Activity Pane Using Column Headers, page 103
- Sorting Jobs Using the Job Filter Dialog, page 103
- Stopping or Starting Jobs in the Job Activity Pane, page 103
- Viewing Other Dates in the Production Schedule, page 104

Adding or Removing Columns in the Job Activity Pane

To add or remove columns:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Select **View>Preferences** from the main menu bar or right-click the **Navigator** pane and select **Preferences** from the context menu to display the **Preferences** dialog.
3. Click the **Columns** tab. By default, all columns are used.

- To remove columns, clear the check box to the left of the column name.
- To include columns, click the check box so that a black checkmark appears.

Adding a New Job or Group Occurrence to the Schedule

To add a new job or group occurrence:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Right-click the job or job group occurrence to add to the production schedule and select **Insert Job Into Schedule** from the context menu or click the job or job group, and from the **Activities** main menu, select **Insert Job Into Schedule**.
3. Click **Yes** at the confirmation prompt.

Another occurrence of the selected job or job group is added to today's production schedule regardless of its calendar dates (if any). If the job is defined to repeat, only one occurrence of the job enters the schedule. Note that a job must have the **Unscheduled Allowed** option selected in its **Job Definition** to be added in this manner.

Adjusting Column Widths in the Job Activity Pane

To adjust a column's width:

1. Place the cursor on the right vertical border of the column heading. The mouse pointer turns into the separator icon.
2. Hold down the left mouse button and resize the width.

Deleting Jobs or Groups from the Production Schedule

To remove jobs that have not yet launched from the production schedule:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Right-click the job or job group occurrence to remove, and from the context menu select **Remove Job(s) from Schedule**. In the resulting confirmation dialog, select **Yes** if you only want to delete the selected job occurrence. If you wish to delete all future scheduled occurrences of the job, select the **All** option.

You can select multiple jobs or job groups simultaneously.

- To select more than one job or job group that are adjacent to each other, hold down the Shift key and select the first and last jobs.
- To select more than one job or job group that are not adjacent to each other, hold down the Control key while selecting the desired job occurrences.

3. Click **Yes** at the confirmation prompt.

Remove Job(s) from Schedule will remove any pre-launch job occurrence from the schedule, for any date. Only the job occurrence you select is removed. If a job group occurrence is selected, all of the group's child jobs are removed.

Filtering Jobs in the Job Activity Pane Based on Job Status

To filter a job:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Click the **Filter** button on the CWA toolbar or right-click the Navigator pane and select **Filter** from the context menu to display the **Job Filter** dialog.

The statuses that are presently displayed are the ones with a check mark.

3. Select the agent, owner and job statuses to view.

Moving to Different Dates and Times in the Job Activity Pane

You can view job occurrences for past, present or future days. Each job's retention history value in its job definition determines how far back you can see its job occurrences. The **Future Days** value in the **System Configuration** dialog determines how far you can see into the future.

Note: When you are viewing the current day in the Job Activity pane, you may also see jobs from previous dates if those jobs have not yet completed.

To move to different dates and times:

From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.

- To move backward one day in the production schedule, right-click in the **Job Activity** pane and select **Prior Day** from the context menu.

- To move forward one day in the production schedule, right-click in the **Job Activity** pane and select **Next Day** from the context menu.
- To move to today's date and time, right-click the **Job Activity** pane and select **Goto Now** from the context menu.
- To move to a job's graphical start location, right-click the job's record and select **Goto Job Time** from the context menu to display the job's start time.

Pausing the Production Schedule

You can pause and then resume the production schedule at any time. You can also pause and resume job launching without having any affect on scheduling.

When you pause a production schedule, the master service is stopped and waiting jobs are prevented from running, even if their dependencies are met. Jobs that are already in **Active** status will continue to run on their respective agents; however, their updated status (for example, **Completed Normally**) will not be displayed in the **Job Activity** pane until the master service is restarted.

When you pause job launching, jobs can still be scheduled and calendars compiled, but jobs will not actually launch until job launching is resumed.

To pause the production schedule or job launching:

1. From the **Navigator** pane, select **Operations>Job Activity>** to display the **Job Activity** pane.
2. From the **Activities** main menu, select **Pause Scheduler** or **Pause Job Launching**.

Rearranging Columns in the Job Activity Pane

To rearrange columns:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. From the **View** main menu, select **Preferences** or right-click the **Navigator** pane and select **Preferences** from the context menu to display the **Preferences** dialog.
3. Click the **Columns** tab.
4. Select the column and click the up or down arrows to arrange the titles into the desired order.

Recreating the Production Schedule

To recreate the production schedule:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. From the **Activities** menu, select **Create Schedule** to display the **Create Schedule** dialog.
3. Select the date range for which to create the schedule.
4. If you want repeating jobs with no time window to start immediately, rather than after midnight, select the **For today's repeating jobs with no time window, start repeating ASAP** option.
5. CWA searches for all qualified jobs to add to the production schedule for the selected dates.

Warning: All job occurrences that were added manually and all records of jobs that ran will be lost. Furthermore, the Create Schedule recreates the schedule at the time you issue the command. This means that jobs whose dependencies have not been met can qualify to run immediately. Use this command with caution.

Refreshing the Job Activity Pane

To refresh:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. From the **View** main menu, select **Refresh**.

Resuming the Production Schedule or Job Launching

To resume the production schedule or job launching:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. From the **Activities** main menu, select **Resume Scheduler** or **Resume Job Launching**.

Saving a Job's Output on the Master

You can view the output of a job after the job finishes running. In order to view the output of a job from the **Job Activity** pane, you must save the output for the job on the master (this is the default).

To save a job's output on the master:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Select the job for which to save output.
3. Click the **Edit** button to display the **Job Definition** dialog.
4. Click the **Options** tab.
5. In the **Save Output** option, select **Append** or **Replace**.
6. Click **OK**. The next time the job completes, you can view its output from the **Job Details** dialog.

Selecting or Removing All Job Filters in the Job Activity Pane

To select or remove all job filters:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Click the **Filter** button on the CWA toolbar or right-click the Navigator pane and select **Filter** from the context menu to display the **Job Filter** dialog.
3. Right-click in the **Statuses** section and select **Check All** or **Uncheck All** from the context menu.

Setting the Completion Status of a Job

Note: You should only set the completion status of jobs that have already finished running. Setting completion status of a job that is still active, may adversely affect job activity.

To set the completion status:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Select the job on which to perform job control.
3. Right-click the job to open the **Job Activity** context menu.
4. From the **Job Control** submenu, select **Set** and from the **Set** submenu, select the desired job completion status.

Note: When job completion statuses are changed in this way, an asterisk appears to the right of it, for example, Completed Normally*.

Sorting Jobs in the Job Activity Pane Using Column Headers

You can sort the job occurrences displayed in the **Job Activity** pane by two different sorting criteria. You can sort on a primary criteria and in turn, organize the primary sort by secondary criteria. The sorts are done by column header in either alphabetical or numerical order depending on the type of data contained in the column.

To sort a job using a column header:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Click the column header to select it for a primary sort. The jobs sort alphabetically (in text data) or numerically (if numerical data). A single arrow displays beside the column header to denote the primary sort.

If you click the header more than once, the sort order toggles back and forth from ascending to descending order.

3. To perform a secondary sort, hold down the **ALT** key while clicking the column header. The secondary sort displays a double arrow in the column header.

For example, click the **Name** column heading. The items in the column are alphabetized from a to z (because the column contains alphabetical data). Clicking again reverses the order z to a. Click the **Time** column header while holding down the **ALT** key and the jobs remain in alphabetical order but are now organized also by numerical order (since this column contains numerical data). Now the jobs are arranged in alphabetical order and each numerical segment is organized from earliest time to latest time. Clicking again on the secondary sort column while holding down the **ALT** key reverses the secondary sort to latest time to earliest time.

If you click the header more than once, the sort order toggles back and forth from ascending to descending order.

Sorting Jobs Using the Job Filter Dialog

To sort jobs using the Job Filter dialog:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Click the **Filter** button on the CWA toolbar or right-click the **Navigator** pane and select **Filter** from the context menu to display the **Job Filter** dialog.
3. Checking or clearing the options for status or hours enables you to sort jobs using those criteria. You can also sort using other criteria listed including by job name, by agent, by queue, by command, etc.

   Note: The Job Filter dialog includes filter options that affect sorting. For example, if you want to sort by the status column, and some statuses have been filtered out, those statuses will not be used for sorting.

   Note: When a Status column is clicked for sorting within the Job Activity pane, the order is defined by the settings on the Job Status Order tab in the System Configuration dialog.

Stopping or Starting Jobs in the Job Activity Pane

To stop or start a job:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Select the job on which to perform job control.
3. Right-click the job to display the **Job Activity** context menu.
4. From the **Job Control** submenu, select one of the following job control options:

- Select **Override** to override a job's dependencies. The job enters a queue and becomes active. **Override** ignores all dependencies and launches the job immediately.
- Select **Hold/Stop** to stop a job from running or to keep a job from launching. The job enters the **Held** or **Stopped** status. If the job cannot be held or stopped, you cannot select this menu item.

  Note: Windows jobs cannot be suspended, therefore this menu item is unavailable for active Windows jobs.
- Select **Release/Resume** to release a held job, or a job waiting for operator release or to start a stopped job. The job enters the **Active** or **Waiting On Dependencies** status. If the job can't be released or resumed, you won't be able to select this menu item.
- Select **Cancel/Abort** to cancel a job before running or to abort a job while running (**Canceled** jobs cannot be rerun). The job enters the **Canceled** or **Aborted** status. If the job can't be canceled or aborted, you won't be able to select this menu item.
- Select **Cancel/Abort All** to cancel all occurrences of a job before running or to abort all occurrences of a job while running. All occurrences of the same job enter the **Canceled** or **Aborted** status.
- Select **Rerun** to rerun a job. The job re-enters the schedule and is re-executed with the same job ID number. A new occurrence ID is not created. If the job can't be rerun, you won't be able to select this menu item.

Viewing a Job's Output

About Viewing a Job's Output

You can view the output of a job after the job finishes running. In order to view the output of a job from the **Job Activity** pane, you must first have the **Save Output** option selected in the job's or job group's definition.

Note: CWA's default is to discard job output.

To view a job's output:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Double-click the completed job to display the **Job Details** dialog.
3. Click the **Output** tab to view job output.

Viewing Other Dates in the Production Schedule

To view other dates:

1. From the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.
2. Click the **Select Day** button or right-click in the **Job Activity** pane and select the **Select Day** option to display a **Calendar** tab.
3. Click the date to go to. You can use the arrow controls in the title bar to move to different months.

5

Jobs and Job Groups

This chapter covers these topics.

- Overview, page 105
- Life Cycle of a Job instance, page 109
- Jobs Pane Interface, page 118
- Defining Jobs Interface, page 122
- Setting Dependencies on Jobs, page 151
- Job Procedures, page 157

Overview

A CWA *job* is a set of instructions about how, when and where to perform an automated task. In the job definition, you can specify a short name for the job (job alias), a command or script to run, where to run the job (*agent*), the days and times to run the job, the dependencies that need to be satisfied before it can run, and other runtime criteria.

You can organize jobs into CWA job groups, where each job in the group can inherit properties from its parent group. Job groups themselves can belong to other job groups. You can view the entire hierarchical structure of all defined jobs and job groups from the **Jobs** pane.

A job's or job group's definition can be added to the production schedule either manually on demand or automatically through a calendar. Each entry of the job into the production schedule is called a *job instance*; it is an instance of the job definition at a specific time. Job instance history can be reviewed for auditing purposes.

Job and Job Group Concepts

This section covers these concepts:

- Job Hierarchy
- Job Groups and Inheritance
- Job Commands
- Agents
- Scheduled vs. Unscheduled Jobs
- Job, File, Variable and Time Dependencies
- Intermaster Dependencies

- Job Events
- System Events
- Actions
- Job Scheduling Options
- Jobs and Job Groups Panes
- Job History

Job Hierarchy

Jobs are built on a hierarchy of job and job group ownership. A job group is a container for a set of jobs, usually part of a common application or department. The job group has its own name and set of runtime instructions.

You can use job groups to submit jobs that either depend on each other, or should run together. For example, all the jobs in payroll can belong to a group called Payroll. The job group can provide default settings to all the child jobs that belong to it. Jobs and job groups are displayed in the Jobs pane. Job groups can save you the time it takes to set up job definitions because each job in the job group can inherit the characteristics of that job group. When you want to create several jobs with similar scheduling characteristics, you can define those jobs within a job group and set the scheduling characteristics in the job group definition. It is also possible to change scheduling characteristics at the job level even though the job belongs to a group.

For example, if a job group is defined to run every Friday, then every job in that job group is automatically defined to run on Friday. If one job in the job group must run on Saturday, then that one job can be changed to the proper run day without affecting the other jobs – as long as you disinherit the job group calendar and change the calendar from within that job.

The ultimate ownership of a job or job group belongs to either the user or a workgroup. A workgroup is a collection of users who can share access to the same jobs. Workgroups are displayed in the Workgroups pane.

Job Groups and Inheritance

You can organize related jobs into groups. Using job group inheritance saves you time and reduces the possibility for error by having jobs automatically inherit properties from the job group to which they belong. You need only change the job properties that are unique to each job. For example, if a job group is defined to run every Friday, then each job that belongs to the job group can inherit the job group's calendar to run on Fridays as well. Note that when you schedule a job group, every job in the group is scheduled as well, unless you choose not to inherit the calendar property.

Note: If a job within a job group does not inherit the parent group's calendar (the **Inherited** option on the job's **Schedule** tab is not selected), then the calendar assigned to the job must be a subset of the dates within the job group's calendar. In other words, the job's calendar cannot contain any dates that are not part of the job group's calendar.

Job Commands

Each job is assigned one command or script file. The command can be an executable file, a shell script, a batch file, a command file or any other executable file available to the agent that will run the job. You can also specify parameters to be passed to the command. This allows you to create different variations of a definition, based on the parameters that you pass to it. You can even use system or user variables in the command name or parameters.

Agents

You can choose which agent will run your job. You can run your job on a specific agent in your network or you can have CWA pick an agent based on a list of agents called an **agent list**. By running jobs using an agent list, you can take advantage of workload balancing, broadcasting and dynamic rerouting.

Scheduled vs. Unscheduled Jobs

Jobs and job groups can run either automatically on a regular schedule when you assign a calendar or on an unscheduled basis whether or not it has an associated calendar. For example, a job could run automatically on the 1st and 15th of every month. The job could also be inserted into the schedule as needed throughout the month. When a calendar is not assigned, the job will only run when you manually insert the job into the schedule. Calendars are created from the **Calendars** pane and can be applied to a job or job group from the **Job Definition** or **Job Group Definition** dialog.

Job, File, Variable and Time Dependencies

You can create job dependencies, file dependencies, variable dependencies and time dependencies for a job or job group.

A **job dependency** is a dependency on another job reaching a certain status. For example, you can set a job to run only after a previous job has completed normally.

A **file dependency** is a dependency on the existence of a file, on whether or not a file has been modified, or on the size of a file. This feature ensures that your jobs run when the appropriate data is available.

A **variable dependency** is a dependency on the value of a variable. You can use a preset CWA variable or define your own. Variables can be used to track resource usage and can be updated automatically using variable update actions. For more information about variable update actions, see Actions and Alerts, page 175.

A **time dependency** sets a specific time window for the job to run.

Intermaster Dependencies

You can implement intermaster dependencies by combining different CWA tools and areas of functionality, such as job events. The methodology can be extended to apply to dependencies between any number of jobs on any number of masters. For more information on intermaster dependencies, see *Intermaster Dependencies, page 150*.

Job Events

Job and job group definitions can include exception-based *actions* triggered by *job events*. These actions can provide different types of notification as well as perform some additional task(s) in response to certain conditions. For example, a job event could be defined for a job that completes abnormally or when a job stops. You can associate one or more job events with a job. You can also assign multiple actions to each event. For more information about job events and actions, see Actions and Alerts, page 175.

System Events

CWA also watches for *system events*, such as when the master stops or when the production schedule finishes compiling. Job and system events can then trigger actions in response to the event condition. Job events can also be defined at a system level so that any job will trigger a set of actions when a particular job event occurs. For example, CWA can email you if any job runs longer than a predefined maximum allowable time.

Actions

CWA can respond to events using multiples and combinations of the following action types:

- **Email** – Notifies you and/or others of your job event via email.
- **SNMP** – Sends SNMP messages to SNMP managers that monitor network activity.
- **Alert** – Sends an alert message to the operator's console regarding the event.
- **Job Control** – Performs job control, such as stopping an active job, or rerunning a job that completed abnormally.

- **Job** – Inserts a new job into the production schedule, such as a recovery task.
- **Log** – Posts a user-defined message to the CWA log and, if desired, to the Windows application log. You can then view the logs through the CWA **Logs** pane and the Event Viewer.
- **Variable** – Updates a user-defined variable to help you control when and how jobs run, or what email messages convey.

Job Scheduling Options

As part of scheduling a job, you can specify the following criteria, which further determine how your job will run:

- Enable or disable jobs and job groups, allowing or preventing them from being added to the production schedule.
- Assign job priority so that higher priority jobs run first, before lower priority jobs, in a busy production schedule.
- Determine how to handle a job that is ready to run when a previous instance of the job is already running.
- Require the operator to release a job before it can run. You can include operator instructions for the operator to follow prior to releasing the job.
- Automatically save and view the job's output.
- Specify the length of time to keep job history.
- Keeps internal notes and descriptions about the job.

Jobs and Job Groups Panes

CWA shows all of your jobs in the **Job Definition** panes. A job consists of instructions that are associated with carrying out an automatic task such as running a script or program. Jobs and job groups can be owned by a user or workgroup. When you own a job, only you have access to its properties. No other user can edit or view your job. If a job is owned by a workgroup, anyone belonging to that workgroup has access to it, within the limits of their *security policy*. For more information about security policies, see *Security Policy Configuration Procedures, page 78*.

Job History

As each job enters the production schedule, an instance of that job is created. CWA allows you to view the history of each job instance. Job history lists the time and date when each instance ran and its resulting completion status. Job history can be retained for a specified length of time. For example, you could define your job to save the history of all its instances within the past 90 days. All instances that were run prior to this period are purged automatically.

Automatic Job Compilation

While jobs can be added manually to a schedule that is running at the time, in an ad-hoc fashion, the more common method is to use automatic compilation. Automatic compilation works by assigning a calendar to a job to designate on which dates a job should run. This method creates a production schedule for each day by adding jobs and job groups according to the calendars associated with each job's definition.

The production schedule contains scheduling data for a limited number of future and past days. At midnight every night, CWA automatically compiles the next leading day (day out) of the production schedule and purges data for the trailing day (the oldest date in the schedule). The purging is done on a different thread than the production work so that production can continue throughout the purging process. The production schedule date range is determined based on various settings found in the **System Configuration** and **Job/Job Group Definition** dialogs. These settings include:

- **Job Retention History** – Defines how long to keep job instances for each job. There is a system setting on the **Defaults** tab of the **System Configuration** dialog to configure that default setting for retaining job history. However, the period of time to retain a job's history can also be configured on an individual basis for each job. This setting

(**History Retention**) is located on the **Options** tab of the **Job Definition** dialog of each job in question. You can have different settings for different jobs. For example, **Job A** could have instances kept for 30 days, while **Job B** could have instances kept for 60 days.

- **Future days to include in Schedule** – Defines how far in the future to schedule jobs. For example, if this setting is set to three days and today is June 1st, you can view jobs in the production schedule out to June 4th. Set the number of future days to include in the production schedule on the **Master** tab of the **System Configuration** dialog.

  When you create a job or job group with a calendar that specifies a date within the current production schedule range and click **OK**, the **Effective Date** dialog displays to choose the date to begin running the job or job group. Each day, the automatic compilation process compiles incrementally for the next leading day, checking the calendar information of each job or job group to see if it should run on that day.

  Note: Because only the leading date of the production schedule (or forecasted schedule) is compiled automatically, if you choose not to schedule a job or job group using the **Effective Date** dialog, the job or job group will only enter the schedule on the next compile. For example, if Job D is scheduled to run daily, you can choose **Cancel** from the **Effective Date** dialog, and if the production schedule presently spans11/1/04 to 11/5/04, the job or job group will be scheduled to run starting on 11/6/04.

  If you want to remove the job from the production schedule, you can disable the job from the **Jobs** pane by right-clicking it and selecting the **Enable** option from the context menu. You can also right-click it from the **Job Activity** pane and select the **Remove Job(s) from schedule** option from the context menu.

- **Automatic Daily History Cleanup** – If you are automatically creating production schedules, you should also automatically clean up the production history. This option ensures that the CWA automatically purges outdated job history data from the system database. When it is time to purge data (by default at the beginning of the production day), CWA looks for all job information that is older than the retention history settings. If this option is not selected, you must manually purge the database of outdated job information at regular intervals by scripting.

Life Cycle of a Job instance

This section covers these topics:

- About the Job Instance Life Cycle
- Job and Job Group Statuses
- Job Group and Child Job Statuses
- Job Group Inheritance
- Environment Files
- Adding Jobs to the Production Schedule

About the Job Instance Life Cycle

Each CWA job instance has its own life cycle in the production schedule. The job's current status indicates where it is in its life cycle. A typical life cycle is one where the job:

- Waits in the production schedule for its dependencies to be met.
- Enters a queue and waits for an execution slot to become available.
- Launches on its designated agent.
- Starts execution successfully on its designated agent.

- Completes normally.

Each phase corresponds to the statuses **Waiting On Dependencies**, **Waiting On Resource**, **Launched**, **Active** and **Completed Normally**, respectively. Other statuses are also possible depending on certain conditions and exceptions.

Note: For more information on error job conditions, see Monitoring Production, page 313.

Job and Job Group Statuses

The following table describes the different job statuses that CWA can assign to a job or job group:

Status	Job Description	Job Group Description
Aborted	The job was aborted and cannot be resumed. A job can be aborted if it is **Active** or **Stopped** status.	Not applicable.
Active	The job is running.	At least one job in the group is active. If no jobs in the group are active and there are still jobs in the group that need to run, the status will be **Waiting on Children**.
Agent Disabled	The agent where the job is supposed to run is not enabled, and the job cannot run. If a job is using an agent list, all agents in the agent list have been disabled. To allow the job to run, select an alternative agent override or enable the agent from the agent's **Connection Definition** dialog (**Connections** pane).	Not applicable.
Agent Unavailable	The agent where the job is to run is not connected or is not running. If the job is using an agent list, all agents in the list are unavailable. To get the job to run on the agent, determine why the agent is not available and correct the problem. For information about making an agent available, see *Starting and Stopping CWA Components, page 24*.	Not applicable.
Canceled	The job was canceled by an operator and cannot be resumed. A job can be canceled while it is waiting in the production schedule (**Waiting On Dependencies** status) or in a queue (**Waiting On Resources** status).	The job group is canceled by an operator and cannot be resumed. Jobs in the group that were waiting were also canceled. Jobs in the group that were active were aborted, if possible.
Canceled Pending	The job is canceled but its dependencies are released to run to completion. Once the dependencies are satisfied, the job status changes to **Canceled Normally**. If any of the dependencies do not complete, the job remains in the **Canceled Pending** status. This status only occurs from a user-initiated job control action or a job action.	The job group is canceled but all of the dependencies placed on its child jobs are released. In essence, this status is like the **Waiting on Dependencies** status. Once the dependencies are satisfied, the jobs go to the **Canceled Normally** status. If any of the dependencies are not fulfilled, the job group remains in the Canceled Pending status.

Status	Job Description	Job Group Description
Canceled Normally	A job that was in the **Canceled Pending** status ends in the **Canceled Normally** status once the job's dependencies are fulfilled. The job is considered to have completed normally.	Any job in a job group that ends with a **Canceled Normally** status is treated as if the job completed normally.
Completed Abnormally	The job completed with a non zero exit code indicating abnormal operation.	All jobs in the group ran and at least one job in the group completed abnormally.
Completed Abnormally (output pending)	The job has completed abnormally but the job output is still being gathered and is not yet available.	The job group remains in **Active** status until the output is posted.
Completed Normally	The job completed normally with an exit code of 0.	All jobs in the group completed normally.
Completed Normally (output pending)	The job has completed normally but the job output is still being gathered and is not yet available.	The job group remains in **Active** status until the output is posted.
Deferred	Another instance of this job was running when this instance was ready to launch, and the concurrency option for the job was set to **Defer**. This job instance will run after the previous instance completes.	Not applicable.
Error Occurred	An error occurred when launching the job and it did not run. There is no exit code. The specific error can be viewed in the CWA logs and will show in the **Job Details** dialog. For more information about logs, see Monitoring Production, page 313.	An error occurred for at least one job in the group. If another job has a **Completed Abnormally** status, the **Error Occurred** status will still be set at the group level.
Externally Defined	The job completion status is defined manually, and has not been set yet.	Not applicable.
Externally Defined (output pending)	The job status was determined by an external user or program and the job output is still being gathered and is not yet available.	Not applicable.
Held	The job is restricted from running by an operator or an action. A job can be held up until the time it becomes active.	All active jobs in the group have stopped, and all waiting jobs have been held.
Launched	A request to launch the job has been sent to the agent, and is pending notification from the agent that the job has started executing. This state is between **Waiting On Resource** and **Active**.	Not applicable.
Orphaned	The agent on which the job was running is no longer in communication with the CWA master. The master does not know its final status. The agent, network or master may be down.	Not applicable.

Status	Job Description	Job Group Description
Scheduled	This is the initial status of a job when it is added to the schedule. If it is scheduled to run today, the job will enter either the **Waiting On Resource**, **Waiting On Operator**, or **Waiting On Dependencies** status, depending on the job's properties. Otherwise, it will stay in the **Scheduled** status. A job also temporarily enters this status when it is released by the operator.	This is the initial status of a group when it is added to the schedule. If it is scheduled to run today, the group will enter either the **Waiting On Resource, Waiting On Operator**, **Waiting On Children** or **Waiting On Dependencies** status, depending on the group's properties. Otherwise, it will stay in the **Scheduled** status. A group also temporarily enters this status when it is released by the operator.
Skipped	Another instance of this job was running when this instance was ready to launch, and the concurrency option for the job is set to **Skip**. This job instance will never run.	Not applicable.
Stopped	Execution of the job has been suspended. A job can enter **Stopped** status only when it was previously **Active**.	See **Held**.
Timed Out For Day	The job missed its time window today. An attempt will be made to run the job tomorrow. A job cannot time out when it is in a queue (**Waiting On Resources**) or when it is **Active**.	The group instance has timed out for the day.
Timed Out	The job missed its date and time window. No attempt will be made to run the job tomorrow. A job cannot time out when it is in a queue (**Waiting On Resources**) or when it is **Active**.	The group instance has timed out.
Waiting On Children	Not applicable.	The group is waiting for its children's dependencies to be met.
Waiting On Dependencies	The job is scheduled and it is waiting on job, file or variable dependencies to be met in order to run.	The job is scheduled and it is waiting on job, file or variable dependencies to be met in order to run.
Waiting On Operator	All the job's dependencies are met, and it is waiting for the operator to release it.	All the group's dependencies are met, and it is waiting for the operator to release it before its children can run.
Waiting On Group	The job's parent group is waiting for operator release.	The group's parent group is waiting on operator release.

Job Group and Child Job Statuses

The status of a job group is determined by its children. The following table demonstrates the order of precedence and correlation between the status of a group and the status of its children. For more information on a particular status, see the table *Job and Job Group Statuses, page 110*.

Note: The final status of a job group is determined by the statuses of all of its children, whether the child job ran on the current day or started on another day as a carryover job. This means if a child job that started on the previous day completed abnormally and other child jobs ran on the current day and completed normally, the job group is considered to have completed abnormally.

Status	Priority
Active	If any child has a status of Active or Launched, the parent group will have Active status.
Waiting on Children	If any child has a status of Held, Waiting on Dependencies, Canceled Pending, Waiting on Operator, Agent Unavailable or Agent Disabled, and no children are Active or Launched, the parent group will have Waiting on Children status.
Completed Abnormally	If any child has a status of Completed Abnormally, and no children have an Active, Waiting on Children or Error Occurred status, the parent group will have Completed Abnormally status.
Orphaned	If any child has a status of Orphaned and no children have an Active, Waiting on Children, Error Occurred or Completed Abnormally status, the parent group will have Orphaned status.
Timed Out	If any child has a status of Timed Out or Timed Out for Day, and no children have an Active, Waiting on Children, Error Occurred, Completed Abnormally or Orphaned status, the parent group will have a Timed Out status.
Canceled	If any child has a status of Canceled or Aborted, and no children have an Active, Waiting on Children, Error Occurred, Completed Abnormally, Orphaned or Timed Out status, the parent group will have Canceled status.
Externally Defined	If any child has a status of Externally Defined, and no children have an Active, Waiting on Children, Error Occurred, Completed Abnormally, Orphaned or Timed Out or Canceled status, the parent group will have Externally Defined status.
Normal	If no children have an Active, Waiting on Children, Error Occurred, Completed Abnormally, Orphaned or Timed Out or Canceled or Externally Defined status, the parent group will have Normal status. A parent group with Normal status can include children with statuses of Canceled Normally, Scheduled, Skipped, Deferred and Completed Normally.
Canceled Normally	If no children have a priority an Active, Waiting on Children, Error Occurred, Completed Abnormally, Orphaned, Timed Out, Externally Defined or Normal status, the parent group will have Normal status. A parent group with Canceled Normally status can include children with statuses of Scheduled, Skipped, Deferred and Completed Normally.

Job Group Inheritance

CWA lets jobs inherit properties from its parent job group. When you create a job group and add a job, key properties of the job will default to its parent group's properties. You can then save time by changing only the individual job properties needed for each job.

For example, let's say you have a job group called **Payroll Jobs** containing four jobs: one job collects wage data, one job formats the data into a management report, one job finalizes and registers the data in the payroll database and one job prints payroll checks. Since these jobs are similar, they can inherit many properties of the parent job group, **Payroll Jobs**, such as on which days to run and on what machine. All you need to do is specify each command to run, and their dependencies on each other. For example, **Job 2** depends on the completion of **Job 1**, and **Job 3** depends on the completion of **Job 2**, etc. Thus, by using inheritance, you save the time it takes to specify job data common between the jobs.

Note: If a job is assigned a calendar that conflicts with its parent group's calendar, and the **Inherited** option on the **Run** tab is not selected, that job will NOT run.

Jobs can inherit a particular set of group properties. Not all properties are inherited. The following table shows which job properties can be inherited from the group:

Property	Inheritable	Comments
Common Properties		
Job Name	No	Every job must have a unique name.
Job Class	Yes	A job will inherit the job class of its parent group.
Owner	Yes	A job will have the same owner as the group unless the **Owner** field in the **Job Definition** dialog is changed manually.
Parent Group	N/A	This is the parent group from which the job inherits its properties.
Enabled	Yes	If the group is enabled, the child jobs will be enabled. the parent group is disabled, the child jobs will also be disabled.
Program Tab Properties		
Command	No	A group definition does not include a command.
Command Parameters	No	A group definition does not include parameters.
Environment File Name	No	A group definition does not include an environment file.
No Inheritance		A group definition is not inherited.
Output File Name	No	A group does not create output
Working Directory		A directory is specified for a program or script to run in.
Schedule Tab Properties		
Calendar settings	Yes	All jobs can run on the same dates.
Time Window settings	Yes	All jobs can run in the same range.
Repeat settings	No	These values are implicitly, not directly, inheritable. If the group runs 5 times in one day, so will the job. However, the job isn't set to run 5 times automatically within the group. This would cause the job to run 25 times (5 times per each group run) in one day.
Run Tab Properties		
Agent Information settings	Yes	All jobs can run on the group's agent or agent list.
Agent Name	Yes	All jobs can use the group's agent.
Agent List	Yes	All jobs can use the group's agent list.
Runtime User	Yes	All jobs can use the group's runtime user.
Tracking settings	Yes	Tracking is specific to each job.
Duration (in minutes) settings	No	Job runtime is specific to each job. Groups can have their own duration which is a combination of all its child jobs.
Dependencies Tab Properties		
Dependencies/Type	No	This is implicit. If a group's dependencies are met, all its child jobs can start. However, the group holds the dependency, not the child jobs.
All must be met	No	This is implicit.
At least one must be met	No	This is implicit.
Resources Tab Properties		
Resources	No	Resources can only be assigned to individual jobs.
Job Events Tab Properties		
Job Events/Event Triggers	No	Job events are specific to each job and group, with exception of events applying to All Jobs.
Options Tab Properties		

Property	Inheritable	Comments
Job Alias	No	The job alias is specific to the job.
Job Priority	No	Job priority is specific to jobs.
If job is currently running	No	Concurrency is specific to jobs.
Save Output Option	No	Not available from group.
Allow Unscheduled	No	You must set this for each job (default is checked).
Require Operator Release	No	You must set this for each job (default is not required).
History Retention (in days)	No	History data is specific to each job.
Base time needed to run job on	No	Sets the default basis for evaluating whether jobs will complete before a scheduled outage.
Allow operator rerun	No	Allows the operator to rerun a job.
Disable Carryover	No	Any job from the current production schedule that is not in an Active or a Launched status when the next production day starts, will not be carried over to the next production day.
For UNIX, source user's profile	No	Provides for the execution of all variables in a UNIX user's profile.
Run Book Tab Properties		
Operator Instructions	No	Each job has its own operator instruction (optional).
Notes Tab Properties		
Other Notes	No	Each job has its own description (optional).
History Tab Properties		
All properties	No	History data is specific to each job or group.

Environment Files

About Environment Files

CWA allows you to make environment variables available to each job that you launch by entering the name of an environment file in the **Job Definition** dialog. For more information, see *Job/Job Group Definition Dialog, page 123*. The file should be a plain text file and can have any name, as long as the correct path to the file is entered in the **Environment File** field of the **Job Definition** dialog. No commands are allowed in the file, only variable designations.

All environment variables are specified in the environment file in the following format:

VARIABLE=value

For example,

```
TZ=PST8PDT
```

Note: Do not leave any space between the variable and its value. If you leave spaces, the variables will not be read correctly.

Environment Variables

The following table lists available environment variables that you can use in your environment file:

Variable	Description
HOME	The home directory of the runtime user.
OCS	The path to CWA.
OCSJNUM	The job ID number.
OCSJNAME	The name of the job.
OCSFJNAME	The full name of the job.
OCSJUSER	The owner of the job.
OCSJEUSER	The runtime user.
OCSJHOST	The host on which the job was scheduled.
OCSJEHOST	The runtime host where the job is running.
OCSECODE	Exit code of the job.

Adding Jobs to the Production Schedule

Adding a Job or Job Group to the Schedule

Jobs and job groups are added to the production schedule in various ways:

- **Method 1** – After defining a job or job group, click **OK** in the definition dialog.

  If you assigned a calendar, the **Effective Date** dialog displays, under certain conditions as explained below.

  Note: The **Effective Date** dialog displays when first adding a job to the schedule or when modifying certain job parameters that affect how the job runs. Changing a job's command, calendar or agent parameter displays the **Effective Date** dialog while changing the owner, job class or notes of the job does not.

  If you did not assign a calendar, a dialog displays a message that the job can only be added manually to the production schedule.

  The **Effective Date** dialog is only displayed when accepting scheduled jobs whose next scheduled calendar date falls within the production schedule range and only when the master is running.

  For example, if the current production date range is 12/10 to 12/20, and the next calendar date to run the job is 12/30, the **Effective Date** dialog will NOT appear. However, the job will be added to the schedule automatically on 12/30 through the automatic compile feature.

  You can choose the day that the first instance of the job should run by selecting from the **Scheduled Dates** list when the **Effective Date** dialog displays. The **Scheduled Dates** list only includes dates that are currently in the production schedule and match the job's calendar.

  Note: Any changes made to a job definition do not apply to the current production schedule if the job has already run, even if the current date is selected in the **Effective Date** dialog. The following examples help illustrate the circumstances where modifications to a job definition do not apply to the current production schedule:

  - If the job being saved has already started to run (any status other than **Scheduled**, **Waiting on Dependencies** or **Waiting on Resources**) or the job has completed.
  - If the job being saved is a repeating job and has already run once.
  - If the job being saved belongs to a job group where any of the other jobs of that job group have already started to run or have completed.

- If the job being saved belongs to a job group where any of the other jobs inside that job group are a repeating job and have already run once.
  In these circumstances, to make the modified job definition run in the current day, you should use the Insert Job into Schedule option. Be aware that inserting the job manually will give the job a higher job instance number which may affect job dependencies within other job definitions.

If a job or job group repeats a specified number of times or if a job group contains jobs that repeat, the **Start today's repeating job(s) now** option will appear in the **Effective Date** dialog. Selecting this option will create the first repeating instance now; otherwise, the instances will start at the beginning of the job's time window. If you do not select this option, your job or group will enter the schedule on the date shown in the **Effective Date** dialog. If no time window is specified, it is assumed to be 12:00:00 AM to 11:59:59 PM. This may result in partial or even no scheduled instances of repeating jobs or groups if the current time is past the last repeat of the job.

If the master starts after the job has been created, the job will only enter the schedule on demand through the **Effective Date** dialog for the day or the next eligible day that is compiled.

If you submit a child job through the **Effective Date** dialog and the parent group is not in the production schedule, the parent group is automatically added as well.

- **Method 2** – Right-click a job or job group in the **Jobs** pane or the **Job Activity** pane and select **Insert Into Schedule** from the context menu. Or, select a job or job group, then select **Insert Into Schedule** from the **Activities** menu. The **Insert Into Schedule** dialog displays.

  Note: The first selected job is the default for the **Insert Into Schedule** dialog. You can use this selection or select a different job using the **Job Search** dialog as explained in the **Job Search** dialog section.

  Insert Into Schedule inserts one instance of the selected job or job group into the production schedule to run today, including its dependency criteria.

  The job or job group must have the **Unscheduled allowed** option selected in its definition before the Insert Into Schedule method is available.

  When a job group is selected to **Insert Into Schedule**, all of its members are also inserted. Only one instance will be added, even if the job or job group is defined to repeat during the day.

  If a child job is added using **Insert Into Schedule**, the job will not have a parent group in the production schedule. If the parent already exists in the schedule, the **Insert Into Schedule** method will **not** associate the child job with it and will not reflect its duration and status. If the parent does not already exist in the production schedule, the **Insert Into Schedule** method will not include it.

  If the job or job group already exists, a new instance will appear in the schedule, followed by a sequence number in parentheses, e.g., Job A (2).

- **Method 3** – Select **Create Schedule** from the **Activities** menu.

  The **Create Schedule** method **deletes** all instances in the production schedule for the dates you specify, and **recreates** the schedule with qualifying jobs as determined by the rules defined in the **Job Definitions** pane. All completed, active and previously scheduled jobs are removed. Extreme caution should be used with this method to prevent the inadvertent deletion of critical jobs.

  Jobs that are not enabled, do not have associated calendars, or whose time windows have passed are not included in the production schedule when you use the **Create Schedule** method. Also, all jobs that were added to the production schedule manually for the selected day(s) are lost and must be re-inserted.

  If you select the **Start today's repeating Job(s) now** option with the **Create Schedule** method, the first instance of a repeating job will be the current time. Otherwise, they start according to their time window. If no time window is specified, it is assumed to be 12:00:00 AM to 11:59:59 PM. This may result in partial or no scheduled instances of repeating jobs or groups if the current time is past the last repeat of the job.

- **Method 4** – The master compiles automatically at midnight.

At midnight, a new day is automatically added to the end of the current production schedule (determined by the configuration of how many future days to include). Whether the new day compiled is “tomorrow” depends on your configuration of **Future Days to Include in Schedule.** For more information on compilation options, see *Getting Started, page 7*. Qualifying jobs are added for the new day and the oldest day of history is removed.

Note: The parameters for compilation are determined by your job and job group definitions and System Configuration settings. For more information on automatic compilation, see *Defining Jobs Interface, page 122*

- **Method 5** – The master automatically inserts a job into the schedule by a system or job event (new job action).

  The new job action method is discussed in Actions and Alerts, page 175. The operation of this method is similar to using **Insert Into Schedule,** as described for Method 2.

Modifying a Job Occurrence in the Production Schedule

Following are the ways to modify the properties of an existing job instance:

- Change any of the original job’s properties except its name and CWA will purge and replace job instances with the new property data.

  Jobs that have not run and whose properties were changed are replaced with the new instances of the job when they re-enter the schedule. If the job’s **Enabled** option or calendar is removed, the job will be deleted and not replaced. Changes do not affect jobs that are rerun.

- Double-click a job in the **Job Activity** pane or right-click and select **Details** from the context menu to display the **Job Details** dialog.

  Use the **Job Details** dialog to override the **Agent** or **Agent List**, **Queue**, **Job Priority**, **Command**, **Environment** file or **Output File Name** of an individual instance. This is very useful when the job does not run correctly using the original parameters, and you want to adjust them and rerun the job or job group without affecting the original job definition.

Jobs Pane Interface

- About the Job Pane Interface
- Buttons
- Search Field
- Columns
- Navigator Context Menu
- Jobs Pane Context Menu
- Job Preferences Dialog

About the Job Pane Interface

A *job* is the set of rules that governs the running of an executable. A *job group* is a collection of jobs. The job group itself does not have an executable associated with it.

Because of the nature of jobs and job groups, the CWA console pane that displays job and group definitions can be correctly referred to as either the **Jobs** pane.

From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.

Note: The **Jobs** pane displays only those jobs that are owned by you or owned by a workgroup to which you belong.

You can change the sort order of the jobs display by clicking the head of the column that you want to use as a sort key. You can also re-order and select columns from the **Preferences** dialog.

The number of jobs and groups that are currently displayed (that you have access to) displays in the upper right corner of the **Jobs** pane. You can see at a glance the number of records without having to count each row. Note that a group will be counted as one record when it is collapsed, and as one plus each child within it when it is expanded.

Buttons

The **Jobs** pane contains the following buttons:

- **Add Job** – Displays the **Job Definition** dialog (in insert mode) to add a job/job group.
- **Edit Job** – Displays the definition dialog (in edit mode) for the selected jobs.
- **Copy Job** – Creates a copy of the selected job definition from the CWA database. You can rename the job definition and save time when creating several job definitions with the same security profile.
- **Delete Job** – Deletes the selected jobs.
- **Refresh** – Updates the data in the current pane.
- **Filter** – Displays the **Job Filter** dialog to filter the jobs being displayed using multiple criteria. For more information, see Defining Jobs Interface, page 122.
- **Print** – Creates a report of the data for the selected jobs and/or job groups.
- **Top** – Click to bring **Jobs** folder view to top level.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

The **Jobs** pane contains the following columns:

- **Expand/Collapse** – The control button for expanding and collapsing the display of jobs.
- **Name** – The name of the job definition.
- **Owner** – The owner of the job definition. By default, the owner is the creator.
- **Enabled** – Whether or not the job definition is enabled.
- **Modified** – The last time the job definition was changed.
- **Calendar** – The calendar assigned to the job definition.
- **Agent** – The agent or agent list assigned to run the job definition.
- **Type** – Indicates if this definition is a job or job group.
- **Program/Command** – If the definition is a job, this column displays the full path to the program or command. Note that any arguments or parameters will not be listed. If the definition is a group, this column is blank.

- **Job Class** – The job or job group's job class. Classifications help to further categorize the job or job group. For example, you can have a classification for all Payroll jobs, or all Accounting jobs.
- **Job Alias** – An unique eight-digit number that serves as an alternate name for the job. The job alias is often used in the command line mode when referencing a job. A job that runs several times a day would be referenced by the alias to distinguish it from the other times it runs, since each time the job runs, it runs under the same name.
- **Job From** – The earliest date that the job should run. The job will run starting with the first date in the calendar that is on or after this date.
- **Job Until** – The last date the job can run based on the calendar. If not specified, and your calendar includes repetitive dates, your job will run indefinitely.
- **Job ID** – Also referred to as the job number. This is the identifying number for the job definition and may also be called the job ID.
- **Runtime User** – The runtime user assigned to the job.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Jobs** pane, the **Navigator** context menu displays.

The following describes the items in the **Jobs** pane **Navigator** context menu:

- **Add Job**– Displays a submenu of the licensed job options available to the user.
- **Filter** – Displays the **Job Filter** dialog to filter out by multiple criteria which jobs are displayed. For more information, see Defining Jobs Interface, page 122.
- **Group Display** – Displays the **Group Display** submenu with its four options:
  - **Collapse All** – Closes all of the job groups.
- **Preferences** – Displays the **Preferences** dialog.
- **Print** – Creates a report of the data for the selected jobs and/or job groups.
- **Export** – Saves the contents of the Jobs pane as a text file.
- **Refresh** – Updates the data in the **Jobs** pane.
- **New Root Folder** – Allows you to create a new root folder for the **Navigator** pane.
- **Save View As** – Creates sub-folder within the **Jobs** folder, displaying jobs under currently selected folder settings.

Jobs Pane Context Menu

The **Jobs** context menu displays by right-clicking a job or job group record in the **Jobs** pane. The menu options may be different according to the user's security policy.

This context menu contains the following options:

- **Add Job** – Displays a submenu of the licensed job options available to the user. CWA inserts the job under the selected job group (if any).

  Note: Some job options only display in the submenu if you are licensed for that adapter.
- **Edit Job** – Displays the **Job Definition** or **Job Group Definition** dialog to edit an existing job or group.
- **Delete Job** – Deletes the selected job or job group and removes all its instances from the production schedule.

- **Copy Job** – Creates a copy of the selected job or job group with the same information as the selected job, except for the name.
- **Refresh** – Refreshes the data on the **Jobs** pane.
- **Filter** – Displays the **Job Filter** dialog to filter out by multiple criteria which jobs are displayed. For more information, see Defining Jobs Interface, page 122.
- **Print** – Creates a report of the data for the jobs and/or job groups.
- **Print Selected** – Creates a report of the selected data for the selected jobs and/or job groups.
- **Group Display** – Displays the **Group Display** submenu with its four options:
  - **Expand Selected** – Expands the selected job groups to display the individual jobs.
  - **Collapse Selected** – Closes the expanded job group that is selected.
  - **Collapse All** – Closes all of the job groups.
- **Disable** – Temporarily disables (or makes inactive) all selected jobs and job groups. A disabled job cannot run. If the job being disabled is a dependency for another job, a confirmation dialog displays. Clicking **Yes** in the confirmation dialog, means that this job dependency will be overridden in all unrun dependent jobs. For more information, see **Enable** (above) and the Job/Job Group Definition Dialog, page 123.
- **Enable** – This option enables all selected jobs and job groups. When a job or job group is defined, it is **Enabled** by default unless you clear the **Enabled** option. When a group is enabled, a prompt asks if you want to also enable the group's children. If you click **No** to the prompt, the group itself is enabled but its children are not enabled. This menu option corresponds to the **Enabled** option in the **Job** and **Job Group Definition** dialogs. For more information, see Job/Job Group Definition Dialog, page 123.
- **Successors** – If the selected job has successors, a report listing the successor jobs displays. If there are no successors, an **Information** dialog states that no other jobs depend on this job.
- **Create Business View From Group** – Creates a Business View from a selected job group to graphically illustrate the dependencies and relationship between the jobs within the group.
- **Insert Into Schedule** – Displays the **Insert Into Schedule** dialog to insert the selected job (or a different job) into the production schedule. There is some job data that can be overridden for the insertion. Through the **Insert Into Schedule** dialog, you can insert an instance of the selected job or group into the production schedule on an as-needed basis for the day. This occurs regardless of whether the job or job group was inserted automatically via a calendar and regardless of how many times the job or job group is defined to repeat within the day. When a job or a job group is added, and the job or job group already resides in the production schedule, an incremented instance number appears in parentheses next to the record to indicate the exact instance number.

  Note: To add a job to production with the **Insert Into Schedule** menu option, the **Unscheduled Allowed** option must be set in the job definition.
- **Breadcrumbs** (Job Groups only) – Click to bring **Jobs** folder view down to the child job/group level of the selected job group.

Job Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Jobs** pane, the **Jobs Preferences** dialog displays.

From the **Jobs Preferences** dialog, you can select which columns are displayed in the **Jobs** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the **Jobs** pane. No checkmark indicates that it will not be displayed.

- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

You can specify whether the default view shows job groups expanded for easy viewing or collapsed to save screen space. Click the **Other** tab and make the appropriate selection.

Defining Jobs Interface

This section describes the job definition interface in these topics:

- About Defining Jobs
- Job/Job Group Definition Dialog
- FTP Job Definition Dialog
- DataMover Job Definition Dialog
- Effective Date Dialog
- Calendar Forecast Dialog
- Insert Job into Schedule Dialog
- Job Rule Filter Dialog
- Job Search Dialog
- Intermaster Dependencies
- Job Dependency Definition Dialog
- File Dependency Definition Dialog
- Variable Dependency Definition Dialog
- z/OS JES Job Dependency Definition Dialog

About Defining Jobs

Job definition is central to job scheduling. The job definition defines:

- Which command to run
- Where the command runs
- When to run the job
- How to handle dependencies
- Whether to issue actions based on pre-defined job events
- The job priority relative to other jobs

When you want to schedule a command to be executed, you use a job. Once a job is defined, you can keep the definition and run the job repetitively according to its specified calendar, or as needed.

Each job is assigned to only one command. The command can be an executable, a batch file (Windows only), a shell script, a command file or any other executable process. You can specify parameters to be passed to the command. This enables you to use one command in different ways, based upon the parameters that you pass to it.

For example, a job can back up files to tape, run a program to post transactions to a database or run a set of reports. In CWA, you give each job a name, and, if the job is repetitive, a calendar by which it runs. You can also define dependencies that must be met before the command is executed. Using the calendar, CWA automatically launches jobs each time they are scheduled to run, but only after all of their dependencies have been met.

All jobs are defined using the same basic **Job Definition** dialog. The standard **Job Definition** dialog can define the attributes of most scheduled jobs but some types of jobs have unique properties that require special fields to fully define what the job does. These jobs include FTP, MapReduce, SAP, PeopleSoft jobs and Oracle Application jobs. These jobs have their own page to define attributes unique to this type of job.

Job/Job Group Definition Dialog

Accessing the Job/Job Group Definition Dialog

The **Job Definition** and **Job Group Definition** dialogs appear when you add or edit a job or job group from the **Jobs** pane. These dialogs are used to define the properties of each job and group that is scheduled.

Common to All Tabs

- **Job Name or Job Group Name** – The name you choose for your job or job group, limited to 256 characters. The name must be unique within a group.

  Note: Do not use the text characters of “, / or = in the name that you assign to a job.

- **Parent Group** – The name of the job group to which the job or job group belongs. By default, a job inherits certain properties of its parent group. When a job group is added to the production schedule, all of its jobs are added automatically. Note that job groups are created using the **Job Group Definition** dialog.

  Note: You can clear the **Parent Group** list by right-clicking it and selecting **Clear Selection** from the context menu or by pressing the **DELETE** key.

- **Job Class** – The job’s or job group’s job class. Classes help categorize the job or job group. For example, you can have a classification for all **Payroll** jobs, or all **Accounting** jobs. Queues can be set up with queue filters to accept jobs of a particular classification or a set of classifications.

  Note: You can clear the **Job Class** list by right-clicking it and selecting **Clear Selection** from the context menu or by pressing the **DELETE** key.

- **Owner** – The owner of the job or job group. This can be an individual user or a CWA workgroup. Every job and job group must have an **Owner**.

  Note: If you are nesting a job group within another job group, it is recommended to use the same owner for all the jobs within the nested job groups. A job filter may have difficulty viewing the job groups correctly.

- **Enabled** – Clear the **Enabled** option to deactivate the job or job group definition. When a job definition is **Enabled** (active), it can be added to the production schedule. When a job is not **Enabled** (inactive), it will not be added to the production schedule during compilation.

  Note that if the job has been previously submitted to the production schedule, and if the job is presently in a pre-launch status, clearing this flag will remove the job from the production schedule. Furthermore, if the job had dependents, those dependencies are released.

- **Last Modified Date** – If you are editing the job or job group, on the bottom right of the **Job/Group Definition** dialog is the last modification date of the job. This date and time reflects the last time you saved the **Job/Group Definition** dialog data by clicking **OK**.

Program Tab

The **Program** tab displays in the **Job Definition** dialog. On this tab you specify the parameters and directories to be used as the command designated in the job runs.

This tab contains the following elements:

- **Command/Parameters** – The absolute path and filename of the command, script, batch file or executable that you want the job to run, from the perspective of the agent that it runs on. Do not use a mapped drive in the pathname. Follow UNC conventions when entering the pathname. Notice that there is a separate field for command parameters that is below the **Command** field. Do *not* add parameters to your command in the **Command** field.

  Note: You can view and edit the contents of command files by right-clicking the file from the **Select Program** dialog, then selecting **Edit** from the context menu.

  You should specify the full path to the file you want to run. The format is **\\<computer name>\<folder name>\<file name>** or **<drive>:\<folder name>\<file name>**. You will only need the computer name if the job is running on a different computer from the CWA Web Client. To insert a variable into your path specification, click **Variables** and then select the variable you want to use.

  Another way to specify this command would be to define a variable called **`paydir`** whose value is the **Payroll Executables** directory. Then, you could specify your command line like this: **`<paydir>\payrolldat.exe`**. If the location of the payroll executables ever changes, you would need only to update the definition of the **`paydir`** variable for all the jobs using the **`paydir`** variable (rather than the literal location of the directory) to be updated.

  CWA runs any command that is an executable such as files with the extensions *.exe*, *.bat* and *.cmd* or script files on the Unix platform.

- **Command Parameters** – Command parameters supply essential information that the command requires to run, and are passed to it when it is executed. Command parameters are appended to the command exactly as entered. This field will accept up to 1,024 characters.

  Command parameters allow a single command file to be used for multiple purposes. For example, a command that processes data from a certain file could be given the file's name as a command parameter. You can type all your parameters on a single line. CWA will wrap the text display so that it is easier to read.

  CWA uses the standard MS-DOS command syntax for command parameters. The command parameters are substituted into a command file containing the variable names **%1**, **%2**, etc. When the command is issued, command parameters are passed exactly as you specify them. You should separate each parameter value with a space so that the first value replaces **%1**, the second value replaces **%2** when the batch file is executed.

  Note: Any argument that either explicitly has a space in it or could have a space in the argument should be enclosed in quotation marks; otherwise, the argument is returned as separate arguments wherever the spaces occur. For example, a job called Section 59 Tally would be returned as separate arguments, "Section," "59" and "Tally." Similarly, if a variable like **<jobname>** could return an argument containing a space, it also should be enclosed in quotation marks.

  The following batch file is an example of how Windows accepts and handles command parameters. Listed below are the contents of the *Argdemo* batch file, found in the CWA Agent **Tutorial** directory.

```
@ECHO OFF
title ArgDemo.bat
ECHO This job will run the sleep program for 60 seconds
ECHO then echo back the first three job parameters
%Tidal%\agent\tutorial\SLEEP.EXE 60
echo Program Parameter 1 = %1
echo Program Parameter 2 = %2
echo Program Parameter 3 = %3
ECHO done
ocsexit 0
```

Note: Variables will be replaced by actual values when the command runs. If the variable is used with a repeating job, *the value of the variable assigned the first time that the job runs remains the value* each time the job runs. Since the variable values are determined as when the command runs, do not use job runtime variables in the command parameters. The true value for variables like Start Time and Finish Time cannot be determined until after the job completes.

You can type in command parameters or specify **Job**, **System**, **Public** or user-defined variables. For convenience, you can right-click inside the **Command Parameters** field to display a context menu. This menu offers the following options to manipulate text: **Undo**, **Cut**, **Copy**, **Paste**, **Delete** and **Copy All**.

- **Environment File Name** – In this field, type the directory path to a file containing a list of environment variables and their values for the job. The format of the file must be specified in name=value pairs. For example, variable1=<its value>, variable2=<its value>. This field is optional. For more information about environment files, see *Environment Files, page 115*.
- **Working Dir** – In this field, a directory can be specified for a program or script to run in. Type the pathname for the directory that the program or script specified in the **Command** field should execute in. If this field is left blank, the default is for the script or program to run in the same directory that it is located in (unless the script or program automatically changes to a different directory).
- **Capture Alternate Output File** – If a file is specified in this field, the agent looks for the output file in the location specified and reads it as text, returning that text as the output of the job instead of gathering the job process's standard output. A job process's "standard output" is the text that would be returned to the screen if you were to run the process manually via a command line interface. However, some applications do not return any "standard output," resulting in a blank **Output** tab in the **Job Details** dialog if run by CWA.

  For example, if your job produces a small report in plain text format, you can specify that file's pathname here. (Refer to the **Load URL** feature on the **Runbook** or **Notes** tab for details on presenting a non-text file for viewing via CWA. If this field is not used, CWA provides the default standard output file produced by the process launched on the agent.
- **Variables** – Click this button to display a context menu of variables categorized according to **Job**, **System**, **Public** or specific to a remote master that can be used with the command. There may be several remote masters with their own variables. You can use these variables in the **Command**, **Command Parameters**, **Environment File Name** and **Output File Name** fields.

Schedule Tab

This tab of the job definition determines when and how often a scheduled job will run by controlling its calendar and time window.

Calendar Section

You can specify the days and times when the job will run and any calendar offset.

- **Inherited** – When selected, all properties on this tab, except those in the Repeats section, are inherited. If you want to explicitly set these properties, clear the **Inherited** option (which only appears when there is a Parent Group specified in the definition).
- **Calendar Name** – The calendar or calendar group indicating which days the job should run. You must select a calendar for the job to be scheduled automatically. Select the **Calendar Name** from the drop-down menu. A calendar can encompass one or more days. You do not need to select a calendar if you plan to use this as an unscheduled job.

  Note: You can clear a calendar by right-clicking the **Calendar** field and selecting **Clear** from the context menu, or by pressing the **DELETE** key.

- **From** – The earliest date that the job should run. The job will run starting with the first date in the calendar that is on or after this date. You can choose a date using the built-in calendar dialog by clicking the drop-down button next to the field.
- **To** – The last date the job can run based on the calendar. If not specified, and your calendar includes repetitive dates, your job will run indefinitely. You can choose a date using the built-in calendar dialog by clicking the drop-down button next to the field.
- **Timezone** – The timezone for the job or job group.

  You can configure timezones where target application environments are based. This allows you to schedule a job or job group across multiple timezones. If a timezone value is not specified in a job or job group definition, the master will default to the master timezone.
- **Offset** – The job will run a given number of days before or after every day in the calendar. Each day in the calendar is adjusted by the offset you provide. For example, if the job is using the **Fiscal Month End** calendar with an offset of **2**, the job will be inserted into the schedule 2 days after **Fiscal Month End** date. If you use an offset of **-2**, the job will be inserted 2 days before the **Fiscal Month End** date.
- **Forecast** – Click this button to display the **Calendar Forecast** dialog for the selected calendar (adjusted by offset, if provided) showing all the dates for which the job will be scheduled. For more information, see *Calendar Forecast Dialog, page 147*.

Time Window Section

- **Only start the job between the hours X and Y** – Start the job on or after time **X**, but no later than time **Y.** If you do not type a value in either field, the time defaults to the start of the production day or the end of the production day, as the case may be:
  - If only **X** (the first time value) is specified, for example **5:00 PM**, the job can launch between **5:00 PM** and **11:59 PM** of the same day.
  - If only **Y** (the second time value) is specified, for example **3:00 PM**, the job can launch between **12:00 AM** (midnight) and **3:00 PM** of the same day.

  The time window function is a little more complicated with job groups. The time window of any child job of a job group, must be confined within the time window of its parent job. By selecting the **Inherited** option in the **Time Window** section of a job within a job group, a child job would inherit the same time window as its parent job. Even if the child job does not inherit the time window of its parent than its default time window remains the time window of its parent job. The time window of a child job can be within than the time window of its parent but it cannot be larger than the time window of its parent job.

  The time format that appears in these fields is determined by the settings in the Windows **Control Panel, Regional Settings**.
- **If not ready by end of time window** – These options are not available until time values are entered in the fields above.
  - **Do not timeout** – Select this option if you want to carry the job forward to the next day if it fails to start by the end of the time window specified.
  - **Run again tomorrow** – Select this option if the job has not run by the end of the time window specified, and you want to carry it forward to the next day. After the time window has passed, the job has the status **Timed Out For Day**. With this option selected, the job is eligible to run on each subsequent day, until it does run. You can set up a job action to notify you if your job does not run on the originally scheduled day.

  If **Do not timeout** and **Run Again Tomorrow** are both unchecked, the job will timeout at the end of the time window.

  If **Do not timeout** is checked, but **Run Again Tomorrow** is unchecked, the status of the job will not be set to **Timeout**. However, any job events running that are based on the end of the time window are triggered at the end of the time window.

If **Do not timeout** and **Run Again Tomorrow** are both checked, the status is set to **Timed Out For Day** and the job carries over to the next day and run then.

Note: Each instance of the job that is scheduled through the **Repeats** section will recheck the dependencies of the original job. For more information, see *Dependencies Tab, page 130*.

Repeats Section

After job execution

- **Do not repeat** – Only one instance of the job will be compiled for each production day that the job is scheduled to run.
- **Run new occurrence every X minutes up to Y times** –
  - **X** – The interval between consecutive job start times in minutes relative to the beginning of the time window.
  - **Y** – The number of instances to create for the job. A job will not launch after the end of its time window. If this field is left blank, the job continually repeats until the end of the time range specified above, or if the time window is omitted, until 11:59 PM of that day.

  The following rules govern this function:

  - If the job is defined to run at specific intervals relative to a time window, the resultant run times are fixed.

    For example, if a job's time window begins at 12:00 PM, and the job is defined to run every hour up to 4 times, the job will run 12:00 PM, 1:00PM, 2:00PM and 3:00PM. If the Create Schedule command occurs at 1:30PM, this job will run twice, once at 2:00 PM and once at 3:00 PM (unless the **Start today's repeating jobs now** option is selected in the **Effective Date** dialog).
  - If no time window is supplied, the job will begin at 12:00 AM and will repeat the number of times specified.
  - If you change the job definition while one of the repeat jobs is running, and the repeat count is changed, all job instances in pre-launch statuses will be removed from the Production Schedule, and the number of job instances added will equal the total number of instances specified minus the number of job instances that have already launched.

    For example, if you specify that **Job A** runs 4 times, and the 2nd instance has started, then you change the repeat count to 5, the 2 instances that already ran will remain in the schedule, the 2 jobs that have not run yet will be removed, and 3 jobs will be added to run in sequence after the 2nd instance finishes.
  - The **Run new occurrence every... minutes up to... times** option is ignored for jobs manually added to the schedule. Only one instance of the job will be scheduled.
  - If the job is manually added to the schedule, and other jobs depend on the last instance of this job, the dependencies will be updated to reflect the new instance.
- **Rerun same occurrence after... minutes up to... times** – This option is similar to the one above with a few exceptions. Only one instance of the job is created. Rather than creating a new job instance, the same job instance will rerun after *x* number of minutes up to the prescribed *y* number of times. *x* is the interval between completion of the previous run and the beginning of the next one. This means that the actual rerun frequency is *x* plus the actual job runtime interval. The **Rerun same occurrence after... minutes up to... times** option also applies to repeating jobs that are manually added to the schedule (from the **Insert Job into Schedule** context menu option).

Jobs dependent on a job using the **Rerun same occurrence after... minutes up to... times** option may or may not have their dependency satisfied, even if it should be, yielding potentially inconsistent results. Setting job dependency this way is not recommended.
Instead:

- Put both jobs under the same group.

- For the group, select the **Rerun same occurrence after... minutes up to... times** option on the **Schedule** tab of the **Job Group Definition** dialog.
- For each job, select the **No repeat** option on the **Schedule** tab of the **Job Definition** dialog.

  If you do not specify how many times a job should repeat, it will repeat throughout the day at the designated interval. The option to begin today's repeating jobs when the job is submitted is not offered in the **Effective Date** dialog.

Note: If a job group configured with the rerun same occurrence option has already completed some jobs, do not modify its definition. Modifying the parameters of the job group after some of its jobs complete will result in some jobs not rerunning as they should.

Run Tab

The **Run** tab of the **Job Definition** dialog manages where the job will run, the duration of the job and how to determine if the job completes successfully. The **Run** tab for a job group definition does not have a **Tracking** section to determine a job's successful completion.

Note: If the job exists under a parent group, by default, all properties in the **Agent Information** section are inherited from its parent job group. If you want to override any one of these properties, clear the **Inheritance** option.

Agent/Adapter Information Section

- **Agent/Adapter Name** – The agent machine on which the program or script runs. You must use an agent that corresponds to the platform where your program or script can run. This value defaults to the agent name specified in the **System Configuration** dialog, **Defaults** tab. Note that if you select an agent name, the **Agent List Name** field is reset.

  Note: The CWA Agent for Unix runs as the agent owner with the same security rights as its owner. By default, the agent does not have access to all of the dependent files, scripts and environment variables it may need. A Unix job cannot complete successfully unless you ensure that the agent has the proper access rights to all of the files needed during the processing of a job.
- **Agent List Name** – An agent list is a set of agents that can run the program or script, or the agent machines on which you want the program or script to run. Agent lists allow for workload balancing, broadcasting, and dynamic rerouting. You must select an agent list for the platform on which your program or script can run. Note that if you select an agent list, the **Agent Name** field is reset.
- **Runtime User** – The logon name of the user under whose account the program or script needs to run. If you are creating the job for another user and you are authorized to do so, you can select the user for this field from the drop-down. If the user does not appear on the drop-down menu, the user needs to be added to your list of **Runtime Users** in your **User Definition**. See the following section for information on creating a special type of runtime user account called local system.

  Note: If you are selecting a runtime user for an agent list, the user must exist on all agents in the agent list. The job will fail if it runs on an agent where the user is not defined.

Note: You can clear the above fields by right-clicking them, and selecting **Clear** from the context menu or by pressing the **DELETE** key.

Tracking Section (job only, does not apply to job group)

- **Exit Code** – The job completion status is determined by the job's exit code. An exit code of 0 sets the job status to **Completed Normally**. Any other exit code sets the job status to **Completed Abnormally**.

  The exit code of a job is set depending on the type of agent and script you are using. The exit code is determined by using the `ocsexit` command at the end of the batch or command file run by a job. The exit code value can range from 0 to 30,000.

- **External** – Selecting this option means that the status of a completed job is determined externally by a user or program. CWA will set the job status to **Externally Defined** when the job completes. You can then have the active job completion status set through an action, or use the **Set** command from the **Job Activity** pane context menu. For more information, see Actions and Alerts, page 175.

- **Exit code of cmd pipe** – Select this option if you want to pipe the output of your job as input to a command and use the exit code of the last command in the pipe to determine the success of the job. This scanning of output is case-sensitive unless the *Master.Props* file is modified to make scanning insensitive to case. Refer to the Parameters, page 349 chapter for more information.

  Note: You cannot reference the output from the command pipe in the same job that creates it. Only a different job can use the current job's output.

  This allows you to use output analysis tools to determine the job status. If you use this option, type the command pipe in the associated field.

  Note: A maximum of 1024 characters of output can be piped to another command.

- **Scan Output: Normal String** – Select this option if you want a particular text string in the output from a job to determine that a job completed normally. In the associated field, type the text string that will signify "normal." To use the text string as a whole, *enclose the text in quotation marks*; otherwise, CWA treats the text string as a list of random words and any single word of the text signals "normal."

- **Scan Output: Abnormal String** – Select this option if you want a particular text string in the output from a job to determine that a job completed abnormally. In the associated field, type the text string that will signify "abnormal." To use the text string as a whole, *enclose the text in quotation marks*; otherwise, CWA treats the text string as a list of random words and any single word of the text signals "abnormal."

  Note: You can scan job output for multiple strings. Listing multiple text strings separated by commas means any one of the listed text strings can signal that the job completed normally or abnormally. Listing text strings separated by plus signs means all of the text strings must appear in the job output to determine if the job completed normally or not. If the text strings contain commas or pluses, enclose the text string in quotation marks. You cannot mix commas and pluses together as separators.

Duration (in minutes) Section

- **Estimated** – The estimated duration for the job specified in minutes, or a fraction thereof. The estimated run time is used to create the forecast shown in the **Job Activity** pane. It is also referenced by the **Job finished later than expected** job event trigger. You can use the **Estimated Duration** field to monitor jobs that run for a shorter or longer time than expected. For example, you could set up a job event triggered by **Job finished later than expected**, with an associated email action that will notify you when a certain job that normally runs for 5 minutes, runs for more than one hour. For more information about job events, job event triggers and actions, see Actions and Alerts, page 175.

- **Minimum** – The minimum duration that you expect your job to run. You can create a job event to monitor and perform an action if the job completes in less than the minimum time. For example, you could set up a job event and job action that would run a diagnostic tool if it completes in less than the **Minimum** time.

- **Maximum** – The maximum duration that you expect your job to run. You can create a job event to monitor and perform an action if the job runs over the maximum time. For example, you could setup a job event and job action to stop the job if it runs past the **Maximum** time.

- **Exclude Completed Abnormally when calculating Estimated Duration** – Prior to CWA 6.0, the calculation of the Estimated Duration of time that a Job should run includes the previous execution time for both Jobs that completed normally and abnormally. Selecting this option allows you to control which Jobs are included in that calculation.

Using Local System Accounts for Windows Jobs

Usually, jobs running on a Windows agent use the user account configured for that agent. Jobs can also be run under specific runtime user accounts using Windows passwords if configured on the **Master** tab of the **System Configuration** dialog. An alternate method is to use runtime Local System accounts for some or all Windows jobs that are generic by nature and do not require a password. Using the **Domain** field, you can make Local System available globally or restrict its use to specific machines or some combination of both.

To use a local system account:

1. From the **Navigator** pane, select **Administration>Users** to display the **Users** pane.
2. Click the **Add** button or right-click and select **Add User** from the context menu to display the **User Definition** dialog.
3. Type **LocalSystem** in the **User Name** field.
4. Type **LocalSystem** in the **Full Name** field. This name is used in CWA reports and some dialogs.
5. If you wish the Local System account to be available to all machines, leave the **Domain** field blank; otherwise, type the name of the machine.
6. Select the **Runtime User Only** option.

   The **Runtime Users**, **Workgroups** and **Other** tabs of the **User Definition** dialog disappear when the **Runtime User Only** option is selected, since this user is only launching jobs, not logging in to use CWA.
7. After creating the Local System account, you need to grant or deny each user the right to use the Local System runtime user account.
   a. From the **Navigator** pane, select **Administration>Users** to display the **Users** pane.
   b. Double-click each user account to open the **User Definition** dialog and click the **Runtime Users** tab.
   c. Select the **Local System** option and click **OK**.

Now authorized users can run jobs without passwords using the local system account if the user has that runtime user right.

Dependencies Tab

The **Dependencies** tab of a job definition manages a job's interaction between the various job, file and variable dependencies that a job may require to run to completion.

Note: Each instance of the job will include the dependencies you define on the **Dependencies** tab.

This tab contains the following elements:

- **Dependency Name Column** – The name of the job, group, file or variable dependency.An intermaster variable displays in the following format, *variable name@master.* If the connection to the remote master is lost then the variable shows a current value of **Unavailable** though the value is updated as soon as the connection is restored. An intermaster variable deleted from the remote master or no longer published has a value of **Not Published**.
- **Type Column** – The type of dependency.
- **All must be met** – When selected, all the dependencies in the above list must be met before the job can run. This option does not include time dependencies. **All must be met** means that each dependency condition must be met at the same time for the job's dependencies to be satisfied.

  If a dependency's state changes from met to not met while other dependencies are still not met, and the other dependencies subsequently change state from not met to met, the **All must be met** condition option is still not satisfied. All dependencies must be in the met state simultaneously.

- **At least one must be met** – If selected, when any one of the dependencies in the above list is met, the job can run. This option doesn't include time dependencies. Time dependencies are set using the **time window** section on the **Schedule** tab.
- **Rerun each time dependencies are met** – The job will run every time that all its dependencies are met, with these exceptions:
  - The **Rerun each time dependencies are met** option cannot be used in conjunction with the **Rerun same occurrence...** option on the **Schedule** tab, **Job Definition** dialog.
  - If your job is dependent on a job with multiple instances, the dependency is set only to the first instance. The **Rerun each time dependencies are met** option will only be triggered if the first instance of the dependency is rerun.

  If the master goes down (or fails over if running in a fault tolerance configuration) while a job with this option runs, the job will run again when the master restarts if all of the job's dependencies are still met. To prevent the job from rerunning when the master restarts, modify one of the dependencies to keep it from being met. For example, delete a file if the job has a job dependency so that only a new file will meet the job's dependency

  Note: Jobs dependent on a job using the **Rerun same occurrence after... minutes up to... times** option will never be satisfied. Instead:

  a. Put both jobs under the same group.

  b. For the group, select the **Rerun same occurrence after... minutes up to... times** option on the **Schedule** tab of the **Job Group Definition** dialog.

  c. For each job, select the **No repeat** option on the **Schedule** tab of the **Job Definition** dialog.
- **Add** – Click this button to display a drop-down menu for you to add a job, file, variable or z/OS JES dependency.
- **Edit** – Click this button to edit the selected job, file, variable or z/OS JES dependency.
- **Delete** – Click this button to delete the selected job, file, variable or z/OS JES dependency.
- **Clear** – Click this button to delete all of the listed dependencies regardless of type.

Setting Dependencies on a Job

The CWA Agent for Unix runs as the agent owner with the same security rights as its owner. By default, the agent does not have access to all of the dependent files, scripts and environment variables it may need. A Unix job cannot complete successfully unless you ensure that the agent has the proper access rights to all of the files needed during the processing of a job.

Each type of dependency set on a job has its own definition dialog:

- Job Dependency Definition Dialog, page 151
- File Dependency Definition Dialog, page 153
- Variable Dependency Definition Dialog, page 155
- z/OS JES Job Dependency Definition Dialog, page 156

Resources Tab

The **Resources** tab appears in the **Job Definition** dialog but not in the **Job Group Definition** dialog since resources cannot be assigned to a job group. Resources for a job, *Virtual* or *System*, are added and edited from this tab.

Virtual resources are resources that already exist. By adding an existing resource to the **Resources** tab, you are able to manage the use of the resource by CWA users.

System resources are either *Published* or *Custom*. Agents that support published system resources provide information about those resources when a connection is established. You can create custom system resource definitions by specifying commands that will periodically run on an agent machine to obtain the resource values.

System resource definitions are automatically created for published resources if they do not already exist for that connection type and the Published command displays.

A resource can be quantified and the sharing of the resource can be limited to a designated number of shares. A resource can be either a software resource such as a database or network or it can be a hardware resource like a machine. The job will not run until all of the resources listed on this tab are available for the job when it runs. A job can still use a resource that is not listed on this tab, but if a resource is listed on this tab of a job's definition, it creates a “reservation” for the job to use a set amount of the resource.

This tab contains the following elements:

- **Virtual Resources** – You can add, edit, and delete virtual resources from this tab.
  - **Resource** – Displays the name of the virtual resources associated with the job.
  - **Amount Required** – Displays the amount of the resource needed by the job. This amount is defined in the **Resource Requirement Definition** dialog.
  - **Add** – Click this button to display a **Resource Requirement Definition** dialog to associate an existing resource to this job.
  - **Edit** – Click this button to display the **Resource Requirement Definition** dialog of the selected resource to edit it.
  - **Delete** – Click this button to delete the selected resource.
  - **Clear** – Click this button to delete every resource listed for the job definition.
- **System Resources** – You can add, edit, and delete system resources from this tab.
  - **Resource** – Displays the name of the system resources associated with the job.
  - **Condition** – Contains the conditional operators depending on the data type of the resource.

  For Integers, the conditions supported are:
  - Equals (=)
  - Does Not Equal (<>)
  - Greater Than (>)
  - Greater Than Or Equal To (>=)
  - Less Than (<)
  - Less Than Or Equal To (<=)

  Strings support all of the conditions above and the following:
  - Contains
  - Does Not Contain
  - Matches Pattern
  - Does Not Match Pattern

- Matches Regular Expression
- Does Not Match Regular Expression
- **Value** – Contains the value for the condition.
- **Add** – Click this button to display a **System Resource Requirement Definition** dialog to associate an existing system resource to this job.
- **Edit** – Click this button to display the **System Resource Requirement Definition** dialog of the selected system resource to edit it.
- **Delete** – Click this button to delete the selected system resource.
- **Clear** – Click this button to delete every system resource listed for the job definition.

See also:

- Published Resource Definition Dialog (read-only)
- Resource Requirement Definition Dialog
- System Resource Requirement Definition Dialog

Published Resource Definition Dialog (read-only)

System resources are either Published or Custom. This dialog displays the name, data type and operating system of a Published resource and is read-only. Agents that support published system resources provide information about those resources when a connection is established.

Resource Requirement Definition Dialog

When you click **Add** on the **Resources** tab of the **Job Definition** dialogs, the **Resource Requirement Definition** dialog displays.

The **Resource Requirement Definition** dialog is used to add or edit an existing resource to a job from the **Resources** tab. From this dialog, you specify which resource and how much of the resource is needed by a job. If the **Enabled** option is not selected in the resource's definition, then the resource does not display in the drop-down list.

This dialog contains the following fields:

- **Resource** – The name of the defined resource. Only resources that are enabled are available from this field. Once the resource is selected, its maximum limit displays beside the **Amount Needed** field.
- **Amount Required** – The amount of the resource's specified limit that the job requires. This number cannot exceed the limit of the resource noted as (Max) beside the field.

System Resource Requirement Definition Dialog

When you click **Add** on the **Resources** tab's **System Resources** section of the **Job Definition** dialogs, the **System Resource Requirement Definition** dialog displays.

The **System Resource Requirement Definition** dialog is used to add or edit an existing system, resource to a job from the **Resources** tab. From this dialog, you specify which resource and how much of the resource is needed by a job. If the **Enabled** option is not selected in the resource's definition, then the resource does not display in the drop-down list.

This dialog contains the following fields:

- **System Resource** – The name of the defined resource. Only resources that are enabled are available from this field. Once the resource is selected, its maximum limit displays beside the **Amount Needed** field.
- **Operator** – Select the conditional operator depending on the data type of the resource.

- **Value** – Enter the value for the selected resource.

For more information about defining a resource, refer to *Resources in CWA, page 285*.

Variables Tab

The **Variables** tab appears in the **Job Group Definition** dialog but not in the **Job Definition** dialog. This tab is used for specifying that a job group use certain variables instead of global variables. When multiple instances of a job group using global variables run concurrently, data values cannot be preserved since the variable value changes as each job group instance runs. By assigning variables to the **Variables** tab, the variable becomes "localized" or isolated from the changes that occur outside of the job group. These variables can be either variables hard-coded to specific values or global variables available from the **Variables** button menu. Child groups have access to parent group variables through the **Variables** button menu.

A job that is a regularly scheduled production job uses the default values for its variables. However, a job group inserted into the schedule manually can specify values to be used only by that run of the job group.

The ad hoc job group instance and any child job groups associated with it will use the variable values specified at insertion regardless of other occurrences of the same job group that may be running and using a different set of variable values.

Job Events Tab

This tab is used to assign predefined job events to a job and to arrange the job events into a desired sequence. You can only associate predefined job events to a job from this tab. To create or modify a job event, you need to open the job event's definition in the **Job Events** pane.

This tab contains the following elements:

- **Event Name column** – The name assigned to the job event.
- **Event Trigger column** – The condition that triggers the associated job event.
- **Insert** – Click this button to display the **Select Job Event** dialog where you can select one or more predefined job events to assign to your job. Job events are created from the **Job Events** pane.
- **Edit** – Click this button to display the **Job Event Definition** dialog of the job event that was selected to modify the event.

  Note: Any changes you make to a job event from the **Job Events** tab of the **Job** or **Job Group Definition** dialogs affect *all* jobs to which the event is assigned, not just the current job or group.
- **Delete** – Click this button to remove the selected job event from the list.

  Note: When you assign a job event to your job, the job event no longer appears in the **Select Job Event** dialog. When you delete a job event from the **Job Events** tab, the job event returns to the **Select Job Event** dialog.
- **Clear** – Click this button to delete all of the defined job events clearing the tab.
- **Move Up** – Click this button to move the selected job event up in the sequence of job events.
- **Move Down** – Click this button to move the selected job event down in the sequence of job events.

Job Events That Apply to All Jobs Section

This section is read-only. These are job events that apply to all jobs. They are not individually assigned. You can only change a system-wide job event from the **Job Event Definition** dialog.

- **Event Name column** – The name assigned to the job event.
- **Event Trigger column** – The condition that triggers the associated job event.

Select Job Event Dialog

When you click **Insert** from the **Job Events** tab of the **Job** or **Job Group Definition** dialogs, the **Select Job Event** dialog displays.

This dialog shows the available job events you can assign to your job. Visible are all the job events you own, and the ones owned by workgroups of which you are a member.

The **Select Job Event** dialog contains the following columns:

- **Event Name** – The name(s) of the job events you can associate to the job.
- **Event Trigger** – The job event triggers that issue the job events. You can select more than one event. After you click **OK**, each selected event is added to the job event list.

When you click **Edit** from the **Job Events** tab of the **Job** or **Job Group Definition** dialogs, the **Job Event Definition** dialog displays.

Group's Events Tab

The **Group's Events** tab is only displayed in the **Job Group Definition** dialog. This tab lists job events that are designated to be inherited by the children of the job group. The job events that are associated with the job group can be configured to occur either before or after the job events assigned to each individual child job occur.

This tab contains the following elements:

- **Before tab** – Lists the job events that must occur before the job instance's own job events. You arrange the order of the job events listed here to specify the sequence that the job events should follow.
- **After tab** – Lists the job events that must occur after the job instance's own job events. You arrange the order of the job events listed here to specify the sequence that the job events should follow.
- **Event Name column** – The name assigned to the job event.
- **Event Trigger column** – The condition that triggers the associated job event.
- **Level column** – The generations of job children that will inherit the listed job event. This is specified by clicking in the field and entering the number of the child generation. Level 1 events are only triggered for up to the child job/group. Level 2 events are triggered for grandchild job/group as well as child job/group.

  Example

  If a Job Group is set up this way:

  A1: Parent

  A2: Job whose parent is A1.

  B1: Subgroup whose parent is A1.

  B2: Job whose parent is B1.

  In this scenario, Level 1 would be B2, and Level 2 would be A2/B1.

  If B2 fails with the Event on Level 1, there will be 1 event triggered on B2.

  If B2 fails with the Event on Level 2, there will be 2 events triggered – one on B1, and B2.
- **Insert button** – Displays the **Select Job Event** dialog where you can select one or more predefined job events to assign to the job class. Job events are created from the **Job Events** pane.

- **Edit button** – Displays the **Job Event Definition** dialog to modify the selected job event.
- **Delete button** – Removes the selected job event from the list.
- **Clear button** – Deletes all of the defined job events clearing the field.
- **Move Up button** – Moves the selected job event up in the sequence of job events.
- **Move Down button** – Moves the selected job event down in the sequence of job events.

Job Definition - Options Tab

The **Options** tab provides fields that enable individual job instances to override various global settings that control a job's properties such as output handling, history retention, carryover, priority and operator control. The **Options** tab for a job group does not have all of the fields that are available for a job definition.

This tab contains the following elements:

- **Job Alias** – A short one- to eight-character identifier for this job or job group. For convenience, many of the commands in the command-line interface refer to the job or job group using its alias name.
- **Job Priority** (**Job Definition** dialog only) – The priority of the job within its assigned queue. The job priority determines which job runs first within a queue, when the queue limit only permits launching of one additional job. Queue priorities determine which queues get preference. The larger the priority number, the higher the actual priority (i.e., all other things being equal, a job with a priority of 75 would run before a job with a priority of 50). For example, a job with a priority of 75 in a queue with a priority of 50 will generally run after a job with a priority 50 in a queue with a priority of 75, even through the job priority is greater.
- **If Job is currently running** (**Job Definition** dialog only) – Determines what to do to if a job is ready to launch and an instance of the same job is already running:
  - **Run Anyway** – Runs a new instance of the job even though a previous instance is already running.
  - **Skip** – Skips the job if a previous instance of the job is already running. This setting will not run the job when the prior instance finishes. A skipped job cannot be rerun.
  - **Defer until Normal** – Runs the job only after the previous instance of the job completes with a **Completed Normally** status. If the previous instance does not complete normally, this job will not run.
  - **Defer until Complete** – Runs the job only after the previous instance completes regardless of the final status of the previous job.
- **Base time needed to run job on** – Sets the default basis for evaluating whether jobs will complete before a scheduled outage. Whether jobs have adequate time to run can be based on either of the following factors:
  - **Estimated Duration** – The estimated duration for the command or executable as specified in the job definition. If the job has run more than once with the same command or executable, the estimated duration is the historical average of the job's previous run times. You can also manually set the estimated duration time of a job in its definition.
  - **Maximum Duration** – The maximum duration for the command or executable as specified in the job definition. If the job has run more than once with the same command or executable, the estimated duration is the historical average of the job's previous run times. You can also manually set the estimated duration time of a job in its definition.
- **If not enough time before outage** – Sets the default action for occasions when a job may run into an outage window as based on the evaluation option set in the Base time needed to run jobs on text field. There are three options:
  - **Run Anyway** – Run the job instance even at the risk that the job may not complete before the outage window.
  - **Skip** – Do not run the job instance if it may run into an outage window.

  - **Defer** – Wait to run the job until after the outage window has ended.

- **Save Output Option** (**Job Definition** dialog only) – Specifies what will happen to the job's output. If you save the output, you can view it by double-clicking the completed job in the **Job Activity** pane. The **Job Details** dialog appears, displaying the output text.

  - **Discard** – To **Discard** is the CWA default setting for job output. Output is not saved for viewing after the job runs.

  - **Append** – Saves the output of the job in the master database, adding to the first output file every time the job runs.

  - **Replace** – Saves the output of the job in the master database, overwriting the existing output file with a current one every time the job runs.

  Note: Standard output and standard error output are combined in CWA job output files. You cannot separate **stdout** and **stderr**.

- **Allow Unscheduled** – Enables the job to be inserted into the production schedule on an as-needed basis. The default is that unscheduled instances are allowed. If you do not want the job to run on an ad hoc basis, you can clear this option to prevent non-scheduled submissions.

- **Require Operator Release** – Holds the job until an operator releases it. The job will not run until it is released. When all the job's dependencies are met, and it is ready to run, its status is **Waiting On Operator**. The information in the **Operator Instructions** field (**Description** tab) can inform the operator of any external requirements that need to be met before the job is released.

- **Allow operator rerun** – Allows the operator to rerun a job. The default is allow operator reruns (box checked).

- **Disable carryover** – Disables the job carry forward feature that appends the jobs that did not run in the current production schedule to the next day's production schedule. Any job from the current production schedule that is not in an **Active** or a **Launched** status when the next production day starts, will not be carried over to the next production day. The default is to enable job carry forward (unchecked).

- **For Unix, source user's profile** – Allows you to execute Unix user profiles. This option provides for the execution of all variables in a Unix user's profile. Without this option, Unix user profile variables that are referenced by scripts are not being executed, causing errors in CWA.

- **History Retention (in days)** – The retention of the job history data, including job output. Use this field to adjust the job history data displayed on the **History** tab of the definition dialog. CWA will automatically purge all job instance history older than this retention history setting if the **Automatic Daily History Cleanup** option is enabled on the **Master** tab of the **System Configuration** dialog.

Run Book Tab

The **Run Book** tab provides a place in the job definition to display operator instructions pertaining to running the job. provides a place for instructions or information pertaining to the job. Text instructions can be provided but a Web page can also be loaded and displayed. A page on your company's intranet with relevant information or a PeopleSoft login page could be displayed.You can also enter a pathname to a directory on the network to display the directory's contents to verify that a file exists in the directory.

This tab contains the following elements:

- **Operator Instructions** – A free text field where you can type any instructions for the operator, up to 255 characters long or type a web address that provides relevant information about the job. If you choose the **Require operator release** option on the **Options** tab, you could use this field for detailed reminders about the circumstances under which to run this job with the **Require operator release** option selected. While text instructions can be provided, a web page can also be loaded and displayed.

- **Load URL** – First, type a web URL in the **Operator Instructions** field and then select this option. This Web address can be for an internet/intranet site or a directory on the network. This can be very useful if information pertaining to a job is stored on a company intranet or a login page must be accessed.

  Note: In order to use Load URL feature to load contents of files, located on the network Windows shares, following rules should be utilized:

  - You will need to supply file:// as the protocol indicator.
    For example,
    file:///\\<yourcomputer>/Share_here/<JobID>.txt
  - Loading the content through file:// protocol works without any intervention from Internet Explorer. However, Firefox, by default, does not allow the browser to load content from local system for security reasons. Modify the Firefox browser setting to allow it.

- **Variables** – The drop-down list available from this button provides access to the following three job variables for customizing CWA to your application:

  - **Job Name** – The name of the job.
  - **Job Alias** – The alias of the job.
  - **Job Run ID** – The job run ID of the job.

If your application uses other files with its jobs, using one of these variables in the file name can provide access to the file from the **Job Activity** pane. Enter the network pathname of the file on this tab and select the **Load URL** option. For example, entering `file://\<JobID>.txt` on this tab will display the contents of this file on the **Runbook** tab of the **Job Details** dialog.

Job Definition - Notes Tab

The **Notes** tab is very similar to the **Run Book** tab. This tab provides a space to display additional information about a job, either as written text or as a Web page.

This tab contains the following elements:

- **Other Notes** – A free text field where you can type any instructions for the operator, up to 255 characters long or type a web address that provides relevant information about the job. While text instructions can be provided, a web page can also be loaded and displayed. A page on your company's intranet with relevant information or a PeopleSoft login page could be displayed. You can also enter a pathname to a directory on the network to display the directory's contents to verify that a file exists in the directory.

- **Load URL** – First, type an internet or network directory URL in the **Other Notes** field and then select this option. This Web address can be for an internet/intranet site or a directory on the network. This can be very useful if information pertaining to a job is stored on a company intranet or a login page must be accessed

  Note: In order to use Load URL feature to load contents of files, located on the network Windows shares, following rules should be utilized:

  - You will need to supply file:// as the protocol indicator.
    For example,
    file:///\\<yourcomputer>/Share_here/<JobID>.txt
  - Loading the content through file:// protocol works without any intervention from Internet Explorer. However, Firefox, by default, does not allow the browser to load content from local system for security reasons. Modify the Firefox browser setting to allow it.

- **Variables** – The drop-down list available from this button provides access to the following three job variables for customizing CWA to your application:

  - **Job Name** – The name of the job.

- **Job Alias** – The alias of the job.
- **Job Run ID** – The job run ID of the job.

If your application uses other files with its jobs, using one of these variables in the file name can provide access to the file from the **Job Activity** pane. Enter the network pathname of the file on this tab and select the **Load URL** option. For example, entering `file://\<JobID>.txt` on this tab will display the contents of this file on the **Run Book** tab of the **Job Details** dialog.

History Tab

The **History** tab displays status changes using history data for the job as far back as the retention period allows, sorted by job start time with the most recent first. It also shows scheduled jobs that have not run yet. If the job definition is new and the job has not ever run, then there is no **History** tab because there is no job history yet.

This tab contains the following elements:

- **Date** – The production date of the job instance.
- **Status** – The status of the job instance.
- **Estimated Start Time** – For job instances that have already run or are running, the estimated start time that was predicted before the job or job group became active. For jobs that have not yet run, the estimated time that the job will become active.
- **Actual Start Time** – For job instances that have already run, or are running, the time the job or job group became active. For jobs that have not yet run, this field is empty.
- **Actual End** – For job instances that have already run or are running, the time that the job or job group ended.
- **Duration** – The runtime duration of the job in minutes. For job groups, the duration reflects the duration from the time the first job started to the time the last job ended.
- **Reruns** – The number of times that the job has run.
- **Command** – The command, program or script that was run.
- **Priority** – The priority assigned to the job.

Images Tab

The **Images** tab of the **Job Definition** dialog allows for the selection of an alternative icon for a job or group. This image is displayed on the **Jobs** pane or **Business Views** window. See also Images Repository Interface.

FTP Job Definition Dialog

About FTP Job Definition

For a remote FTP (File Transfer Protocol) to work, the following limitations apply:

- FTP server must exist
- FTP server on the local and remote side must be configured

Note: Some FTP jobs may require that the domain name be part of the user name. If a FTP job requires the domain be part of the user name, before you can run the job you must modify the user name by adding the domain to the **User** field in the following format, *domain\user*.

When you select the **Add FTP Job** option, you will find that the **FTP Job Definition** dialog differs from the standard **Job Definition** dialog in two ways:

- Instead of a **Program** tab, there is an **FTP** tab
- Some of the fields on the **Run** tab are different to accommodate FTP requirements

These two tabs with their differences are described below. The other tab and fields in the **FTP Job Definition** dialog are the same as the normal **Job Definition** dialog. For information on the other tabs and fields refer to the section on *Defining Jobs Interface, page 122*.

FTP Tab

The **FTP** tab contains the following fields:

- **Protocol** – Select one of the following FTP protocols to use in this job:
  - **FTP** – The job will use the normal FTP protocol. No file encryption is used with this option.
  - **FTPS** – The job will use FTPS or FTP Secure and FTP-SSL.
  - **SFTP** – The job will use SFTP or Secure File Transfer Protocol. The file is encrypted when transferred between hosts using SSH2. SFTP can only use the binary format so the ASCII format is unavailable if this option is selected. The FTP Quote feature that assigns file formatting to a file being transferred between a mainframe and non-mainframe platform is unavailable with SFTP.
- **FTP Operation** – Define what the FTP job will do by selecting an option from the **FTP Operation** drop-down list. Select from the following options:
  - **PUT File** – Copies the designated file from the agent to the FTP server.
  - **GET File** – Copies the designated file from the FTP server to the agent.
  - **MPUT File** – Copies multiple files using wildcards from the agent to the FTP server. (For more information on wildcards, refer to *Wildcards in File Dependencies, page 153*.)
  - **MGET File** – Copies multiple files using wildcards from the FTP server to the agent. (For more information on wildcards, refer to *Wildcards in File Dependencies, page 153*.)
  - **RENAME File** – Changes the name of the file on the FTP server.
  - **DELETE File** – Removes the designated file from the FTP server.
  - **MDELETE File** – Deletes files on remote computers.
  - **LIST Directory** – Lists the files within a designated directory on the FTP server.
  - **MAKE Directory** – Creates a designated directory on the FTP server.
  - **DELETE Directory** – Deletes a designated directory on the FTP server.

The remaining fields on the **FTP** tab vary according to which **FTP Operation** option was selected.

- **Format** – There are two file formats available to use with FTP
  - **ASCII** – This format maintains the line returns within a file but loses most other formatting. This format option is not available if the SFTP protocol option is selected.
  - **Binary** – This format saves formatting within the file.
- **Filename** – Type the name of the file for the FTP operation.

- **Replace Files** – Select this option if you wish to overwrite existing files when using the MPUT or MGET options; otherwise, existing files are skipped.
- **Local Path** – This is the pathname to a directory on the local or agent machine.
- **Remote Path** – This is the pathname to a directory on the FTP server.
- **Quote** – Type the formatting attributes for a file being transferred between a main frame platform and another platform, e.g., Windows to z/OS. The field is limited to 255 characters. This option is not available if the **SFTP protocol** option is selected.
- **New Filename** (Only used with the **Rename File** option.) – Designate the new name to be used when renaming the remote file.
- **SFTP Options** – The only secure shell option currently supported is SSH2 only.
- **Advanced** – Clicking this button displays the **SFTP Advanced Settings** dialog with the standard encryption options. Use this feature to configure the order to be used when cycling through the encryption protocols as the agent searches for the protocol used by the remote machine. The **Encryption Cypher Selection Policy** field displays the four most commonly used encryption methods:
  - **AES**
  - **Blowfish**
  - **3DES**
  - **DES**

  Any of these encryption methods may be used during the file transferal between two machines with the secure FTP procedure.

  Like strangers traveling in a foreign land attempting to communicate with one another, server machines do not know which encryption “language” is being used by the other. CWA will try each of the listed encryption protocols to establish a common encryption protocol. A user can configure the order that CWA tries when it attempts to find the encryption protocol recognized by the other machine. If the user knows which encryption protocol is used by the other system, the user can select that protocol and click the up and down arrows to move it to the top of the list where it will be the first protocol attempted during file transferal. Moving the correct protocol to the top of the list will eliminate guesswork and save time during the FTP process.
- **User/Password** – The user account and password used to logon to the FTP server. This could be a Windows or Unix account. If this option is selected then the **Pass Phrase** and **Private Keyfile Location** fields are not displayed.
- **Private Key File** – Indicates that a private key file is being used with this job instead of system login by the user. The key file must be generated by an SSH open system. To use a private key file, you must supply the password and directory location of the private key file.
- **Pass Phrase** – The password needed to access the private key file.
- **Private Keyfile Location** – The directory pathname to the private key file for the agent. This should be a local directory rather than a network directory.
- **Variables** – When you choose a SFTP protocol, the **Variable** drop-down list is enabled on clicking the **Private key File Location** field. You can choose the following variables from the **Variable** drop-down list:
  - **System Variables** – Using these variables, you can provide the details such as System Time, System Date, and so on, in the resource path.

  Example:

  <SysTime.H:mm>

This example provides the system time in resource path, where H is Hour and mm is minutes.

- **Job Variables** - Using these variables, you can provide the details related to jobs such as Job name, Job Owner, Job Command, Agent Name, Earliest Start Time, Latest Finish Time, and so on, in the resource path.

Example:

<JobName>

This example provides the name of the job in the resource path.

- **Job Run Variables** - Includes the variables such as Job Output, Job Exit Code, Job Status, Start Time, Finish Time, and so on.

Example:

<JobOutput>

In this example, the output of the job is taken as the input of the resource path.

- **User defined Variables** - Includes the variables that are created for the particular user.
- **Public Variables** - Includes the variables which are defined as Public.

You can save a single variable or multiple variables along with the string. The FTP job output obtained when you choose a variable or when you manually enter the location of the private key file will be the same.

If you create an action that is tied to an FTP job, you can click the **Variables** button to use a variable listed under **Job Variables** in the **FTP Statistics** submenu. There are four FTP job variable options available:

- **# of Files** - Details the number of files transferred.
- **# of Bytes** - Details the size of the file (in bytes) that was transferred.
- **# Skipped** - Details the number of files within a designated directory that were not FTP'ed.
- **Duration (Seconds)** - Details how long (in seconds) that it took to perform the FTP operation.

Run Tab (FTP)

- Agent Information
- Tracking Section
- Duration Section

Agent Information

In the **Agent Information** section you define the agent, the user account to be used and the FTP server information.

- **Agent (Local Host)** - The agent machine that will act as an FTP CWA client. You must select an agent from the drop-down list.
- **Agent List** - An agent list is a set of agents that can run the FTP job. Agent lists allow for workload balancing, broadcasting, and dynamic rerouting. If you select the **Agent List** option, the **Agent Name** drop-down list displays agent lists instead of agents. Be sure to select an agent list for the platform on which the FTP job can run.
- **Local User** - A runtime user account that the job runs under. Provides an additional layer of security since the user must be added to the runtime user's list. If the **FTP Local User Mandatory** option on the **Master** tab of the **System Configuration** dialog is selected, an FTP job cannot run without an authorized local user.

- **FTP Host** – The name of the machine that hosts an FTP server. If the FTP server uses a port that is not the default port, 21, you may also specify the port number immediately after the host machine name, separated by a colon, such as **sputnik:5621**.
- **FTP User** – Specify a user from those defined to CWA that has an associated password to log on to the FTP server. A user account may not be necessary if the FTP server offers Anonymous login.
- **Anonymous** – Select this option if you know that the remote FTP server has been configured to accept this option. Using anonymous as a FTP login does not normally require a user account and password. You must supply a CWA user with an email account before using this option.

Tracking Section

In the **Tracking** section, select a method to determine that a job has completed. Four options are available:

- **External** – This option requires an external application or user to signal that the FTP task completed.
- **Exit code** – This option bases the status of the job on the success or failure of the FTP operation.
- **Scan Output: Normal String** – If you select this option, type a text string in the field below that signals a job completed normally if the text string appears in the job's output.
- **Scan Output: Abnormal String** – If you select this option, type a text string in the field below that signals a job completed abnormally if the text string appears in the job's output.

Duration Section

In the **Duration** section, specify the time parameters for job completion. These parameters are used to send an alert to the console if a job is not completing as expected.

- **Estimated** – This value configures the forecast next to the **Job Activity** pane.
- **Minimum** – If the job completes before the specified number of minutes, an alert can be created to notify the operator.
- **Maximum** – If the job completes after the specified number of minutes, an alert can be created to notify the operator.

DataMover Job Definition Dialog

DataMover Tab

The fields displayed on this tab depend on the Protocol selected, Hadoop or Amazon S3.

Hadoop Protocol

The **Data Mover** tab contains the following fields:

- **Protocol** – select the **Hadoop DFS** protocol from this list.
- **Operation** – choose the operation within the protocol.
  - **Copy To Local File** – select to copy a Hadoop Source file to a local destination file.
  - **Copy From Local File** – select to copy a local source file to a Hadoop Source destination file.
- **File Details** – define the files for the operation. This section changes depending on which Hadoop DFS Operation is selected.

  - **Local Source Files** – the Local file(s) to be copied to the Hadoop file system. When copying multiple Local Source files, the failure of any file to be copied does NOT cause the entire copy to fail; an attempt is made to copy every file. When specifying multiple Local Source Files, use a comma separated list of file
  - **Hadoop Destination File** – where the Local Source File(s) are copied. The Hadoop Destination File can specify a Hadoop directory. When multiple Local Source files are specified, the Hadoop Destination File must specify a Hadoop directory.

- **Delete Source File After Copy** – When this checkbox is checked, the source file will be deleted after being copied.
- **Overwrite Destination** – When this checkbox is not checked, the copy fails if the file already exists in the Hadoop file system.
- **Connection Details** –
  - **Use Connection Details From** – Select the predefined connection you want to use to pull connection details from.
  - **Name Node** – Enter the HDFS node name

  Note: When defining a DataMover Job using MapR Hadoop, set the **Name Node** field to "maprfs:///".
- **Use Kerberos Authentication** – The Adapter supports both Simple and Kerberos authentication. Click this option to use Kerberos authentication.
- **Variables** – Click this button to insert predefined CWA variables into fields.

Amazon S3 Protocol (Get Object, Put Object and Put Multiple Parts)

The **Data Mover** tab contains the following fields:

- **Protocol** – select the **Hadoop DFS** protocol from this list.
- **Operation** – choose the operation within the protocol.
  - **GET OBJECT** – retrieves objects from Amazon S3
  - **PUT OBJECT** – adds an object to a bucket
  - **PUT MULTIPLE PARTS** – adds multiple parts of an object to a bucket
- **Amazon S3 Host Name** – enter the Amazon S3 connection server name. Currently, the only connection supported is s3.amazonws.com.
- **File Details** – enter the following information regarding the file you want to move.

  Note: The fields in this section change depending on which Amazon S3 Operation is selected.

  For the **GET** and **PUT** operations:
  - **Bucket Name** – Enter the name of an already existing bucket on Amazon S3 owned by the user identified by the Access Key and Secret Key provided on the **Run** page.
  - **Object Name** – Enter the name of the object in the bucket that you want to retrieve/add.
  - **Local File** – Enter the location and file name where you want to store the retrieved/added object.

  For the **PUT** MULTIPLE PARTS operation:
  - **Bucket Name** – Name of an already existing bucket on Amazon S3 owned by the user identified by the Access Key and Secret Key provided on the **Run** page.
  - **Object Name** – Name of the Object in the Bucket that you wish to store the file as.

- **Local File(s)** – A comma separated list of the locations and file names that you would like to upload to the specified bucket and object. All of the files must be at least 5MB in size except for the last one.

- **Options** section – Click the **Options** button to add additional job options via the **Amazon S3 Objects** dialog.

  Depending upon the selected AS3 operation selected on the Data Mover page, this dialog contains the following elements:

  - **AS3 Protocol** – Select the protocol you want to use to communicate with Amazon server.

  The default is HTTPS, but HTTP can be used.

  - **Maximum Connections** – Enter the maximum number of allowed open HTTP connections.
  - **Maximum Retries** – Enter the maximum number of retry attempts for failed retry-able requests.
  - **Maximum Timeout** – Enter the amount of time to wait (in milliseconds) for data to be transferred over an established, open connection before the connection is timed out and closed.
  - **GET OBJECT** –

  Object Version – Enter the specific version of an object to be the target of the get operation.

  Matching ETag(s) – Enter the MD5 hash of the object. It can be used to select a specific version of an object to be the target of the get operation.

  Non Matching ETag(s) – Enter the MD5 hash of the object. It can be used to non-select or preclude a specific version of an object as the target of the get operation.

  - **PUT OBJECT & PUT MULTIPLE PARTS** –

  Target File Name – This is a way to set a 'suggested' filename for the contents of the transfer. There is no guarantee that the 'request' will be honored.

  Expiration Rule Id – Enter the Bucket Configuration rule ID for this object's expiration.

  Encoding – Select the content type from the drop down list if you desire to specify the content type.

  Content Type – When uploading files, Amazon S3 will attempt to determine the correct content type if one hasn't been set yet. If no content type is provided and cannot be determined by the filename, the default content type "application/octet-stream" will be used.

  Server Encryption – Select from the drop down list whether you want no Server Side Encryption or the object to be encrypted using AES-256 (the only encryption algorithm currently available from Amazon S3).

  Expiration Time – If you want the object that is being uploaded to expire after a set time, provide the time delta here in milliseconds.

  MD5 – Select whether you want an MD5 hash to be generated for the transfer for validation of the contents when received by the Server.

  Custom Metadata – Specify **name=value** pairs that you want to attach to the object as metadata when it is uploaded. Click **Add** to add metadata via the **Add Metadata** dialog or edit to edit existing metadata via the **Edit Metadata** dialog. See Add Metadata Dialog.

  - (*Optional*) **Variables** – Click to insert a predefined CWA variable into a selected field.

Add Metadata Dialog

Part of virtual disk information is metadata, a number of key=value pairs describing configuration of the virtual disk

The Add Metadata dialog displays when you click Add on the Data Mover Job page of the Job Definition dialog. Specify key=value pairs that you would like to be attached to the object as metadata when it is uploaded.

This dialog contains the following elements:

- **Key** – The name of the metadata key.
- **Value** – the value of a given key from disk metadata .

Run Page (DataMover)

- Agent Information
- Tracking Section
- Duration Section

Agent Information

In the **Agent Information** section you define the agent, the user account to be used and the FTP server information.

- **Agent (Local Host)** – The agent machine that will act as a DataMover CWA client. You must select an agent from the drop-down list.
- **Agent List** – An agent list is a set of agents that can run the DataMover job. Agent lists allow for workload balancing, broadcasting, and dynamic rerouting. If you select the **Agent List** option, the **Agent Name** drop-down list displays agent lists instead of agents. Be sure to select an agent list for the platform on which the DataMover job can run.
- **Local User** – A runtime user account that the job runs under. Provides an additional layer of security since the user must be added to the runtime user's list. If the **FTP Local User Mandatory** option on the **Master** tab of the **System Configuration** dialog is selected, a DataMover job cannot run without an authorized local user.
- **FTP Host** – The name of the machine that hosts a DataMover server. If the DataMover server uses a port that is not the default port, 21, you may also specify the port number immediately after the host machine name, separated by a colon, such as **sputnik:5621**.
- **FTP User** – Specify a user from those defined to CWA that has an associated password to log on to the DataMover server. A user account may not be necessary if the DataMover server offers Anonymous login.
- **Anonymous** – Select this option if you know that the remote DataMover server has been configured to accept this option. Using anonymous as a DataMover login does not normally require a user account and password. You must supply a CWA user with an email account before using this option.

Tracking Section

In the **Tracking** section, select a method to determine that a job has completed. Four options are available:

- **External** – This option requires an external application or user to signal that the DataMover task completed.
- **Exit code** – This option bases the status of the job on the success or failure of the DataMover operation.
- **Scan Output: Normal String** – If you select this option, type a text string in the field below that signals a job completed normally if the text string appears in the job's output.
- **Scan Output: Abnormal String** – If you select this option, type a text string in the field below that signals a job completed abnormally if the text string appears in the job's output.

Duration Section

In the **Duration** section, specify the time parameters for job completion. These parameters are used to send an alert to the console if a job is not completing as expected.

- **Estimated** – This value configures the forecast next to the **Job Activity** pane.
- **Minimum** – If the job completes before the specified number of minutes, an alert can be created to notify the operator.
- **Maximum** – If the job completes after the specified number of minutes, an alert can be created to notify the operator.

Effective Date Dialog

The **Effective Date** dialog appears after either modifying the parameters of a job or job group contained in one of the compiled schedules or modifying a calendar used by one of the jobs contained in the compiled schedules. From this dialog, you specify the date when the changes should apply. The **Effective Date** dialog only appears if you are connected to the master.

This dialog contains the following elements:

- **Scheduled Dates** – Displays all dates in the compiled production schedule. Those dates in the compiled schedule that coincide with the dates associated with the modified job or calendar are displayed in bold type. If there are no bolded dates than the job or calendar is not used on any of the dates that have already been compiled. Select one of the listed dates to be the **Effective Date**.
- **Effective Date** (Web client only) – Displays the date you selected from the **Scheduled Dates** list.

  If the job is already in the schedule and has just been modified, all instances of the job that have not yet run before the effective date will not reflect the change. All existing schedules going forward from the selected effective date, will be recompiled to account for the modifications to the job or calendar. The default effective date is the first date listed in the **Scheduled Dates** list that the job will run on.
- **Start today's repeating job(s) now** – Displayed when the job or group has a designated number of times to repeat. Normally, a job or group will begin repeating at midnight if no time window is specified. By selecting this option, you can start the first repeating instance as soon as the job or group is added to the production schedule; otherwise, it is possible that no instances of the repeating job will be added for today if the number of repeats completed between midnight and the current time configured.

  Note: Any instances of a job that has not yet run will be replaced.

  If you create a repeating job without specifying how often the job should repeat, the **Start today's repeating job(s) now** option is not displayed in the **Effective Date** dialog. The job will be continually repeated at the designated intervals all day; thus, the job automatically starts at the beginning of the production day.

Click **OK** in the **Effective Date** dialog after you select the effective date, but use with caution if you have selected a large group hierarchy.

Note: This action results in immediately compiling the selected group hierarchy which might cause excessive load on the Master. Also, choosing today's date as the effective date might have an impact on your current day's schedule.

Click **Cancel** in the **Effective Date** dialog to have your production schedule take effect at the next automatic or manual compile.

Note: The default beginning of the production day is midnight. This default can be changed in the System Configuration dialog. For more information, see *Getting Started, page 7*.

Calendar Forecast Dialog

The **Calendar Forecast** dialog displays by clicking the **Forecast** button on the **Schedule** tab of the **Job Definition** or **Job Group Definition** dialog.

This dialog displays the dates the job will be scheduled to run based on the selected calendar, adjusted by the offset (if any).

Insert Job into Schedule Dialog

The **Insert Job Into Schedule** dialog displays whenever you select the **Insert Into Schedule** option from the **Jobs** pane context menu or by selecting the **Insert Job Into Schedule** option from the **Activities** main menu.

The fields in this dialog vary slightly depending upon what is highlighted in the **Jobs** pane. The dialog for inserting individual jobs into the schedule has a **Parameters** field for modifying parameters of the job instance being inserted. See Inserting Job Groups Into the Schedule and Inserting Multiple Jobs Into the Schedule for variations to this dialog.

This dialog contains the following elements:

- **Job/Group** – The name of the job or group to insert into the production schedule. If the job or job group being inserted is a child job/job group, then the pathname to the parent is provided in brackets [ ]. For example, *Scheduler2 [\WinTest\Grp1\Grp2]*.
- **Date** – The date on which you want the job or group inserted.
- **From ___ Until___** – The time window in which you want the job or group inserted.
- **Parameters** – The parameters to add to the job's execution.
- **Override job's dependencies** – Select this option to have the job or group run whether or not its dependencies have been met. Selecting this option when inserting a job group, overrides job dependencies on all jobs within the job group. Note that if any of the child jobs are dependent upon one another, then all of these jobs would begin running once inserted.

Inserting Job Groups Into the Schedule

The dialog for inserting a job group has the same fields as the dialog for inserting individual jobs except the **Parameter** field is replaced with a **Variables** field that lists the name of the group variable listed on the **Variables** tab of the job group definition and its default value. The default values can be modified as needed when inserting the job group into the schedule.

Inserting Multiple Jobs Into the Schedule

The dialog for inserting multiple job/job group selections has the same basic fields as the other dialogs. However, instead of a **Parameter** or **Variables** field, the selections are listed. When inserting a multiple selection of jobs and/or job groups, the dialog displays the name and pathname of each selection to illustrate the parent-child nesting level. The selections cannot be modified from this dialog.

Job Rule Filter Dialog

You can filter the jobs that appear in the Jobs pane to screen out the jobs that you do not want to see. The **Job Rule Filter** dialog provides various fields to filter out undesired jobs. The more fields used to filter the jobs displayed in the **Jobs** pane, the more specific the results.

The **Job Rule Filter** dialog displays in the **Jobs** pane when the **Filter** option is selected in that pane's context menu or the **Filter** button is clicked.

This dialog contains the following elements:

- **Job** – Shows all the job instances that match the text string specified. You can use the following wildcard characters in all fields that use text strings:

  *** (Asterisk)** – The asterisk character masks any number of characters on and to the right of the location it is placed. For example, A* will match (allow in) AB, ABB, and ABBB.

? (Question Mark) – The question mark masks one character in the location it is placed. For example, A?A will match ABA and ACA, but not ABB or ABBA.

[x, y, z] – The brackets with commas let you specify a set of characters to filter in to that location in the string. For example, A[X,Y]B accepts AXB and AYB but not AAB.

[a-z] – You can also specify ranges within brackets. For example, A[X-Z]B filters in AXB, AYB, and AZB but not AWB.

- **Group** – Filters for all job groups and their child jobs matching the criteria specified in this field.

  Note: The **Show Groups** option must be selected before you can use this field.

- **Command** – Filters for jobs using the specified command.
- **Agent** – Filters for all job instances that run under the agent selected from the drop-down list. When no agent is selected, all agents are assumed. The default is to show all agents.
- **Owner** – Filters for all job instances that belong to the user or workgroup selected from the drop-down list. If left blank, jobs belonging to all of the various owners are displayed.
- **Calendar** – Filters for all jobs using the calendar selected from the drop-down list. If left blank, jobs using any calendars are displayed.
- **Job Class** – Filters for all jobs belonging to the job class selected from the drop-down list. If left blank, jobs belonging to all job classes are displayed.
- **Enabled** – Selecting **Yes** option filters for all jobs that are enabled. Selecting the **No** option filters for all jobs that are disabled. Leaving this field blank includes all jobs, whether enabled or not.
- **Show Groups** – Filters for job groups. Leaving this option unchecked, means that the job groups will not be displayed (though the child jobs are displayed) and you cannot filter by group.
- **Defaults** – Clicking this button resets the job filter criteria to the default options. This clears all fields of their criteria though the **Show Groups** option is selected by default.

Job Search Dialog

Accessing the Job Search Dialog

The **Job Search** dialog is accessed from various dialogs by clicking the **Browse** button. Use the **Job Search** dialog to set the criteria used to find jobs.

Common to All Tabs

- **Find** – Click this button to search through all jobs for jobs matching the search criteria.
- **All** – Click this button to display all jobs regardless of the search criteria.
- **Clear** – Click this button to clear all of the previous search criteria.
- **Job Search Results** – Displays the jobs that match the search criteria.

Job Search Criteria Tab

This tab contains the following elements:

- **Name** – Search for a job by the name of the job.
- **Owner** – Search for jobs owned by a particular user.

- **User** – Search for jobs that run as a particular user.
- **Agent** – Search for jobs that run on a particular agent.
- **Class** – Search for jobs that belong to a particular job class.

You must select at least one of the check boxes in the following categories. You may also select both check boxes to search in both categories.

- **Group(s)** – Search by job group.
- **Job(s)** – Search by jobs.

You must select at least one of the check boxes in the following categories. You may also select both check boxes to search in both categories.

- **Enabled** – Search for jobs that are enabled.
- **Disabled** – Search for jobs that are disabled.

Advanced Criteria Tab

This tab contains the following elements:

- **Command** – Use this field to search for a job that uses a particular script or executable.
- **Agent List** – Use this field to search by the list of agents that can run the job.
- **Parent group** – Use this field to search for jobs that are children to a particular group.
- **Requires operator release** – Select this option to search for jobs requiring operator release.
- **Does not require operator release** – Select this option to search for jobs that do not require operator release.
- **Unscheduled allowed** – Select this option to search for jobs that can be inserted into a schedule on an ad hoc basis.
- **Unscheduled not allowed** – Select this option to search for jobs that can only be run on a scheduled basis.

Intermaster Dependencies

You can create jobs with variable dependencies that are determined by jobs processed on another master. A job with an intermaster dependency resides on a local master subscribing to a remote master that publishes the value of a variable.

For the purpose of an intermaster dependency, the local master becomes a type of client to the remote master. The variable is defined on the remote master and made available to other masters. The local master subscribes to a variable managed by another master by creating a special remote master connection. Because the local master is a client to the remote master, the communication port is the same one used by the client of the remote master. If the remote master is using fault tolerance than the connection is configured to automatically switch to the backup machine of the remote master if a failure occurs. This connection displays in the **Connections** pane as a **Remote Master** connection. The **Connection Definition** dialog also displays the variables that the remote master is publishing. These variables are regularly updated and cached on the local master and the actual variable values are published at the time required by the specific job.

When defining a variable dependency, you specify which master manages the variable. If no remote connections have been set up, then the local master is the default. If you selected a remote master, you can select a published variable from a drop-down list of variable names.

You control which variables are available for remote master use through the **Variable Definition** dialog. You can keep a variable for use only on the local master or publish the variable for use by remote masters. You can also elect to either publish the variable in unalterable form or allow others to modify the variable.

A system event can be created to notify a user if connection between the remote and local master is lost. A lost connection prevents a job from completing since the variable value cannot be determined. A user can also check on the status of an intermaster variable by studying the **Dependencies** tab of the **Job Details** dialog. An intermaster variable will show a value of **Unavailable** if the connection to the remote master is lost.

Note: It requires a separate license to use intermaster dependencies. You cannot define a remote master or publish intermaster variables without a license for intermaster dependencies.

The methodology described here can be extended to apply to dependencies between any number of jobs on any number of masters. In brief, the technique to implement intermaster dependencies uses a job event on one master to set a variable value on another master whose job(s) will depend on that variable.

For example: **Master2:JobB** depends on **Master1:JobA**

1. Install an agent on the same machine as **Master2** or one of its clients. This agent will service **Master1**. (If there are cross-dependencies such that **Master1:JobC** depended on **Master2:JobB**, you would install an agent on the same machine as **Master1** or one of its clients to service **Master2**). An agent is required for each unique intermaster relationship. Remember, more than one agent can be installed on a single machine to service multiple masters.
2. On **Master1** create a linking job that runs on the agent installed on **Master2** (or one of its CWA Web Clients). This job will run the **`varset`** command from the client's command line interface to set the value of a variable on **Master2** to indicate that the dependency has been met; for example, the job definition for the linking job would contain the following:
   - In the **Command** field, type

     C:\Program Files\Tidal\TESCmdLine\bin\sacmd.bat
   - In the **Command Parameters** field, type

     varset –n master1_joba –v “normal”
   - In the **Agent Name** field, type

     Master2
3. On **Master2**, create a string variable called **master1_joba** and create a variable action to initialize it to blank whenever **JobB** is added to the schedule.
4. On **Master1**, associate the job created in step 2 with a job action, and associate that action with a job event triggered by **JobA** completing normally. To make it easier to work with multiple jobs, create one linking job as in step 2 and override the command parameters here.
5. On **Master2**, add a variable dependency to **JobB** so that **JobB** depends on **master1_joba = “normal”**.

   When **JobA** completes normally, it triggers the linking job that sets the **master1_joba** variable value on the other master to satisfy **JobB's** dependency.

The actions and events used in this scenario can be defined generically for reuse in working with any number of jobs that have inter-master dependencies. The CWA API can also be used to set CWA variables on any master programmatically. For more information on the CWA API, see the CWA *API Guide*.

Setting Dependencies on Jobs

Job Dependency Definition Dialog

The **Job Dependency Definition** dialog displays when you add or edit a job dependency from the **Dependencies** tab of the **Job** or **Job Group Definition** dialogs.

Note: For instructions on how to implement inter-master dependencies, see *Intermaster Dependencies, page 150*.

This dialog contains the following elements:

- **Job/Group** – The job(s) or job group(s) that the current job depends on. You can search for jobs or job groups by clicking the **Browse** button, which opens the **Job Search** dialog. You can also view a job/group drop-down list by clicking the down-arrow button. If you narrowed your search for jobs using the **Job Search** dialog, the list displays the subset of jobs found. Otherwise it displays all jobs you or your workgroups own.

  If you choose more than one job or job group, dependencies will be created for each one selected, and when you click **OK**, they appear on the **Dependencies** tab. You can then update individual job dependency criteria by double-clicking them from the **Dependencies** tab.

  Note: You cannot type a job or job group name in this field directly.

- **Operator** – Defines whether the dependency should be satisfied when the preceding job equals or does not equal the specified status.

- **Status** – The status of the job dependency. Select **Launched**, **Active**, **Completed Normally**, **Completed Normally (Output Pending)**, **Completed Abnormally**, **Completed Abnormally (Output Pending)**, **Error Occurred**, **Externally Defined**, **Externally Defined (Output Pending)** or **Completed** as the condition for which the job dependency is satisfied.

- **Occurrence** – Used if the job dependency is a job that repeats within a production day.

  - Select **First Occurrence** when the first instance of the job should be used to satisfy the dependency.

  - Select **Last Occurrence** when the last instance of the job should be used to satisfy the dependency.If the job does not repeat, the last instance of the job dependency is used. If the dependent job has more repeating instances, the last instance of the job dependency is used to satisfy the dependency for the trailing instances of the dependent job.

  - Select **Match Occurrence** when both jobs (predecessor and successor) repeat within a day, and the instance of the job dependency should match the instance of the job that depends on it.

- **Offset** – The number of instances to offset from either the First or Last instance. When set from the **First Occurrence** setting, the dependency is met using the **offset+1** job instance. For example, if the offset is set to 1, the dependency is met using the second instance.

  When set from the **Last Occurrence** setting, the dependency is met using the **Last Occurrence – offset** job instance. For example, if a job is repeated 10 times, and the offset is 1, then the dependency is met using the ninth instance.

  Note: The **Offset** option does not apply to Match Occurrence.

- **Relative to group (otherwise for day)** – Indicates whether this dependency refers to a group instance or a day instance. Use this option to establish job dependencies within separate instances of a repeating group. Job dependency is then defined by a group instance number. If this option is not selected, job dependency is defined by the day instance, using the total number of jobs that run that day.

  Note: With repeating groups, this option should be selected most of the time.

- **Date Offset** – The number of days in the past to find the job dependency. For example, if **Job A** runs daily, and you want the job to depend on the instance finishing three days ago, specify **3**. This value should not exceed the retention history for the job. If it does, the job dependency is never met.

- **Ignore this dependency if job not in schedule** – If the job dependency is not in the schedule, the job dependency is automatically satisfied. If this is not checked and the job dependency is not in the schedule, the dependency will not be met until the job dependency is added to the schedule.

File Dependency Definition Dialog

About the File Dependency Dialog

The **File Dependency Definition** dialog displays when adding or editing a file dependency from the **Dependencies** tab of the **Job** or **Job Group Definition** dialogs.

This dialog contains the following elements:

- **File Name** – The file that the underlying job depends on. The filename should be an UNC (Universal Naming Convention) pathname from the agent running the job. (Do not use a mapped drive in the file name.) For more information on file dependencies, see *Wildcards in File Dependencies*.
- **Agent Name** – The agent on which the file is located. The agent doesn't have to be the same agent on which the job runs.

  Note: If the job being defined uses an agent list, then the **Inherit Agent from Job** option is automatically selected and the agent list name displays in the **Agent Name** field.
- **Inherit Agent from Job** – Select this option if you want the dependent file to use the same agent as the job or job group you are adding or editing. The default for this option is unchecked.

  If the job uses an agent list instead of a specified agent, the dependent file uses the first agent in the agent list unless the agent list is the broadcast type. (The order of the agents on the selected list is determined by the sequence they were added to the agent list.) If the agent list is a broadcast type, then the dependent file uses the same agent the job runs on.
- **Exists** – The file dependency is satisfied when the file exists at the specified path on the specified agent.
- **Does Not Exist** – The file dependency is satisfied when the file does *not* exist at the specified path on the specified agent.
- **Has Changed In DD:HH:MM** – The file dependency is satisfied when the file has changed within the specified time in days, hours, and minutes prior to when the job entered the production schedule. For example, if the job entered the schedule at 1:00 PM, the period specified is 6 hours, and the file changed after 7:00 AM (or later), the dependency is met.
- **Stable For DD:HH:MM** – The file dependency is satisfied when the file contents have not changed for the specified time in days, hours and minutes from the present time. For example, if the file's modified time is 1:00 PM, the period specified is six hours and the job enters the schedule at 3:00 PM, the dependency is satisfied in four hours, i.e., 7:00 PM.
- **Size >=** – The file dependency is satisfied when the file size increases to or exceeds the value specified in bytes. The maximum file size is 4,294,967,296 bytes.
- **Size <=** – The file dependency is satisfied when the file size decreases to or drops below the value specified in bytes.

Wildcards in File Dependencies

The question mark (**?**) and the asterisk (*****) are supported as wildcards in the filenames of file dependencies.

Wildcard Usage Summary

- The question mark (**?**) wildcard represents any single character in a string
- The asterisk (*****) wildcard represents any character or group of characters in that position in the string
- You may combine the wildcards (for example, **T?dal.***)

- UNC paths must be used if the user account under which the agent runs has the required access to the network share
- Wildcards are accepted in filenames only, not elsewhere in the path specification

Note that if the **Has Not Changed For** or **Stable For** option is selected with a wildcard file dependency, a large match set may result, delaying the check for file dependencies for other jobs.

FAQs on Wildcard Functionality

What are the benefits of using wildcards in file dependencies?

There are programs, applications, scripts and batch files that need to depend on the existence of a file. In some situations, the exact name of the file that the program depends is unknown. The filename may include a date or time stamp, or a sequence number may be appended to the filename at the time of creation of the file. For example, an order file might be named **ORD<sequence_number>.RDY**.

The wildcard enhancement makes it quick, easy and efficient to set up and manage file dependencies where the filename is not constant.

How are the wildcards structured?

Usage of wildcards in CWA is consistent with the standard wildcard practice. A combination of the question mark (**?**) and asterisk (*****) can be used. For example, a file dependency can be set on any files meeting the following wildcard criteria, L??d?n*.dat. The file, London101.dat, would make this dependency true.

Can you use wildcards in the path as well as in the filename?

No. The path to the file must be known. The wildcard functionality does not support wildcards in the path to a file.

You should enter file dependencies in UNC format:

\\servername\directoryname\filename

i.e.

\\bpssch2\bpapps\files\ord????.dat

as well as in the format of a mapped drive if on the same machine:

driveletter:\directoryname\filename

i.e.

c:\files\ord*.dat

This gives you the flexibility to detect the existence of files on any shared server in the domain.

What is the logic applied in fulfillment of wildcard file dependencies?

Once a file arrives whose name qualifies based on the wildcards, the dependency is marked true and the job with the dependency is released. Wildcards are cleanly implemented with the **Exists** and **Does Not Exist** options as well as CWA's advanced file dependency features.

What if more than one file fulfills the dependency?

Multiple files may qualify for a wildcard file dependency. For example, the query *ORD*.RDY* may result in three files: *ORD100.RDY, ORD105.RDY* and *ORD200.RDY.* A dependency could be set on files that have changed in the last 30 minutes. *ORD105.RDY* might have changed in the last 30 minutes while the other two files did not. In this type of situation, if one file meets the condition, then the dependency has been met.

What happens when dependencies cross day boundaries?

A job can be scheduled to run daily depending on a file. You can use a wildcard in the file dependency to look for the file. For example, the job may need *ORD9T.RDY* on Tuesday and *ORD10W.RDY* on Wednesday. You can define this job to have a dependency on file *ORD*.RDY. ORD*.RDY* matches both *ORD9T.RDY* and *ORD10W.RDY*.

What if ORD9T.RDY arrives late, after the end of the day?

If Tuesday's job is set to carry over to the next day, both Tuesday's and Wednesday's jobs will be looking for the existence of a file that matches *ORD*.RDY*. If *ORD019.RDY* arrives before *ORD024.RDY*, both jobs will launch on its arrival. To avoid this, you can set the job to reschedule itself when another file is found.

Can you have a dependency on a file that exists on a non-agent machine?

Yes. You are not limited to files on servers with active CWA agents. If the agent machine can see and connect to another machine (the machine has a share), it can determine if a file exists on it.

Can we use the wildcard characters as literal characters?

No. CWA will interpret the**?** and * characters as wildcards.

Are wildcard file dependencies supported on all platforms?

No, currently this enhancement applies to Microsoft Windows and Unix systems only.

Are the wildcards supported from the* CWA *command line and API?

Yes. The wildcard functionality is the same for the CWA Clients, command line and the CWA API. The**?** and ***** characters can be typed at the command line or API and will be treated as wildcards.

Variable Dependency Definition Dialog

The **Variable Dependency Definition** dialog displays when adding or editing a variable dependency from the **Dependencies** tab of the **Job** or **Job Group Definition** dialogs.

This dialog contains the following elements:

- **Master** – The master that manages the variable dependency being created. If creating an intermaster dependency, select the appropriate remote master from the drop-down list; otherwise, leave the default.
- **Variable Name** – The variable that the current job depends on. You select the variable from a list of user-defined variables that you or your workgroup own. If the master is a remote master, these variables are a list of published variables cached within the local master.
- **Operator** – The relative operator used to determine whether the variable's value satisfies the dependency.
  - **Equals (=)**
  - **Does not equal (<>)**
  - **Less than (<)**
  - **Less than or equal to (<=)**
  - **Greater than (>)**
  - **Greater than or equal to (>=)**

  When text strings are used in comparison, higher letters of the alphabet are greater than lower letters. For example, **A < Z**. If the first letters of the string match, succeeding letters are used for comparison. For example, **AA < AZ**. The operation works similar to sorting strings.

- **Variable Value** – The value of the variable that satisfies the dependency. Using the drop-down menu, you can also select from a list of **System** and **User-defined** variables that should be used for comparison.

z/OS JES Job Dependency Definition Dialog

About the z/OS JES Job Dependency Definition Dialog

The **z/OS JES Dependency Definition** dialog displays when adding or editing a z/OS JES dependency from the **Dependencies** tab of a job's definition.

This dialog contains the following elements:

- **z/OS Gateway Adapter** – Select the appropriate Gateway adapter that is connected to the z/OS mainframe machine that is running the z/OS job you are interested in. Each z/OS machine requires its own Gateway adapter so you must select the machine you are interested in.
- **JES Job Name** – The name of the job running on the selected z/OS machine that you wish to use as a dependency.

Job Occurrence Section

Since the CWA job you select could run multiple times during the day, you must specify which job occurrence you are interested in.

- **First** – Select this option if the first instance of the job in the production day should be used to satisfy the job dependency.
- **Latest** – Select this option if the most recent occurrence of the job should be used to satisfy the job dependency.
- **Match** – Select this option if both jobs (predecessor and successor) repeat within a day, and the instance of the job dependency should match the instance of the job depending on it. If the job does not repeat, the first instance of the job dependency is used.
- **Specific** – Select this option to use a specific job instance. Type a number or use the arrow buttons to denote which instance of the repeating job instances should be used.
- **Offset** – Select this option to specify the number of job instances to offset from the instance of the dependent job. Type a number or use the arrow buttons to enter how many job instances to offset. A positive number adds the specified number from the dependent jobs' instance number. A negative number subtracts the specified number of job occurrences from the dependent jobs' instance number.
- **Ignore if questionable** – Any instance number of a job that the Gateway did not track from the start of the production day is considered questionable because the Gateway cannot verify that the job did not run before the Gateway started tracking it. This might occur if the Gateway is not running at some point during the production day or if the job is not registered with the Gateway at the start of the production day.

  Select this option if the dependency is critical to a specific instance of the job and there is any uncertainty about the exact instance number. The dependency cannot be met during the day if the z/OS job instance number is questionable.

Dependency Condition Section

In the **Dependency Condition** field, you specify the condition of the CWA job or one of the job steps that comprise the job that will signal that the dependency is satisfied. The condition is based on the state or status of the CWA job or job step. A variety of conditions can denote a satisfied dependency.

- **Job (or Step) Completed** – The dependency is satisfied when the job completes or a specified job step has completed with the a condition code within the range of condition codes specified in the **Condition Code Range** field.

- **Highest Condition Code** – The dependency is satisfied only when the job completes with the highest code within the range of condition codes specified in the **Condition Code Range** field.
- **Any Step Condition Code** – This dependency is satisfied whenever any job step within the z/OS job completes with a condition code within the specified range in the **Condition Code Range** field.
- **Job Started** – The dependency is satisfied if the job or job step starts.
- **Job (or Step) Abended** – The dependency is satisfied if the job or job step results in a system or user abend.
- **Job Flushed (JCL/Alloc Errors)** – The dependency is satisfied whenever the job fails to start.
- **Job (or Step) Canceled (by SMF Exit)** – The dependency is satisfied whenever a job or job step is canceled.
- **Job Abended due to Condition Code** – The dependency is satisfied whenever the job completes with an abend condition based on condition code handling.
- **Optional (PROC.) Step** – This field is optional, but if you wish to specify a particular step within the job, type the name of the job step. The dependency that was specified in the **Dependency Condition** field will apply only to the job step you specify here. The condition of any other job steps or the overall job is irrelevant once this field is used. (You can include a PROC prefix, if necessary.)
- **Condition Code Range** – Use this section to set the condition code that signals that the dependency is true. You can use a specific number or type a range of numbers so that anything within the given range means that the dependency is satisfied. The condition code can range from 0 to 4095. This field only applies if you selected the following dependency condition options:
  - **Job (or step completed)**
  - **Highest Condition Code**
  - **Any Step Condition Code**
  - **Job Abended due to Condition Code**
- **Include Abend** – Selecting this option, adds the **Abend** status to the specified condition code options. If a job or job step either completes inside the specified range of condition codes or completes with an **Abend** status then the job dependency is satisfied.

Job Procedures

These topics describe the tasks you perform with jobs:

- Adding a Job or Job Group
- Adding Jobs Automatically to the Production Schedule
- Adding a Job or Job Group Dependency
- Adding a File Dependency
- Adding a Variable Dependency
- Adding Parameters to a Command
- Adding Notes or Operator Instructions to a Job
- Assigning an Agent or Agent List to a Job
- Assigning Job Event(s) to a Job

- Copying Jobs or Job Groups
- Creating a Public Job
- Deleting Jobs or Job Groups
- Deleting a Dependency
- Deleting a Job Event From a Job
- Determining the Result From the Exit Code Automatically
- Determining the Completion Status Manually
- Disabling Automatic Job Insertion
- Editing a Job Event Assigned to a Job
- Editing a Dependency
- Managing Simultaneous Occurrences of the Same Job
- Overriding a Dependency
- Preventing a Job from Being Submitted Manually
- Removing Jobs from the Production Schedule
- Requiring Manual Release before a Job Can Run
- Running a Job for Another User
- Scheduling Jobs According to a Calendar
- Scheduling Jobs to Repeat within a Day
- Setting a Job or Job Group's Priority
- Specifying a Time Window for Jobs
- Working with Timezones
- Specifying a Command or Batch File
- Specifying How a Job Determines Its Completion Status
- Specifying Durations for a Job
- Using CWA Variables
- Using an External Program to Determine Completion Status
- Viewing Job/Job Group Properties
- Viewing Job/Job Group History

Adding a Job or Job Group

You can add a job or group rule and have it added to the production schedule simultaneously. Adding a job to the production schedule is optional. When jobs are added to groups, many properties can be inherited from the parent group.

To add a job or job group:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.

a. To add a job or job group under a job group, right-click the job group under which you want to add your job or job group.

b. To add a job or job group at the root level of the hierarchy, right-click a root-level job or on a white section of the pane.

2. Select **Add Job** or **Add Job Group** from the context menu or click the **Add Job o**n the CWA toolbar.

3. Depending on your selection, the **Job Definition** or the **Job Group Definition** dialog appears. For more information on the definition dialogs, see *Jobs Pane Interface, page 118*.

Adding Jobs Automatically to the Production Schedule

About Adding Jobs Automatically

Jobs with associated calendars are automatically added to the production schedule through the CWA automatic compilation process. Jobs with calendars are only added to the schedule for days that are in the set of days defined for the calendar. No intervention is necessary, but you can customize its operation to tailor compilation to your needs. For more information, see *Defining Jobs Interface, page 122*). Another way of automatically adding jobs to the production schedule is through new job actions. For more information about new job actions, see Actions and Alerts, page 175.

Adding Jobs Manually

To add a job manually:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.

2. Right-click the job or job group to add to the production schedule and select **Insert Into Schedule** from the context menu.

   Or, select the job or job group to add to the production schedule, and from the **Activities** main menu select **Insert Into Schedule.**

   The **Insert Job Into Schedule** dialog displays. The **Job/Group** field should contain the name of the job or group you right-clicked, and the **Date** field should contain the current date. If the job or group you selected has a time window, this will be displayed in the **From** and **Until** fields. Any parameters that were set in the job's or group's definition will be listed in the **Parameters** field. If the job or group has dependencies, you may want to select the **Override job's dependencies** option so that your job or group will enter the schedule without checking for its dependencies.

3. Click **Yes** at the confirmation dialog.

   The job is added to today's production schedule regardless of its calendar dates (if any). If the job is defined to repeat, only one instance of the job will be added to the schedule. Only jobs with the **Unscheduled Allowed** option selected (definition dialog, **Options** tab) can be added in this manner.

Adding a Job or Job Group Dependency

Jobs can depend on the status of other jobs and job groups. For example, you can set **Job B** to run when **Job A** completes normally using a job dependency for **Job B**.

To add a job or job group dependency:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.

2. Double-click the job or job group that you want to edit.

3. Click the **Dependencies** tab.

4. Click **Add** and select **Add Job Dependency** from the drop-down menu.
5. In the **Job/Group** field, click the **Browse** button to open the **Search** dialog to search for the job that this job will depend on. You can also view a drop-down list of jobs by clicking the down-arrow button. If you used the **Browse** button to narrow your search for jobs, the drop-down list will be that job subset.
6. In the **Operator** field, select whether the file dependency **Equals** or **Does not equal** the following status to satisfy the dependency. For example, you can set the job dependency to **Equal** the **Completed Normally** status.
7. In the **Status** field, select the status to use to satisfy the dependency. You can choose between **Active**, **Completed Abnormally**, **Completed Normally**, **Error Occurred**, **Externally Defined** and **Completed.**

   Note: A job group becomes active when any of its associated jobs become active. If all jobs in a job group depend on the job group becoming active, no jobs will launch.
8. If the job repeats during the day, select which instance of the job will trigger the dependency from the **Occurrence** drop-down menu.
   a. Select **First Occurrence** if you want the first instance of the preceding job to match the status criterion.
   b. Select **Last Occurrence** if you want the last instance of the preceding job to match the status criterion.
   c. Select **Match Occurrence** when both jobs repeat during the day, and the dependency should match instance numbers.

   There are two ways to apply the **First/Last/Match** dependency logic: by day instance or group instance.
9. To specify an instance offset, you can do so in the **Offset** field. This field only applies to **First Occurrence** and **Last Occurrence**. When applied to **First Occurrence**, specifies which instance after the first to use in satisfying the dependency. When applied to **Last Occurrence**, specifies which instance from the last.
10. If you want to specify an instance of a job that occurred a certain number of days in the past, go to the **Date Offset** field, and type the number of days in the past for the required job dependency. For example, if **Job A** repeats daily, but you want your job to be dependent on **Job A's** instance 3 days ago, specify **3** in this field.
11. Select **Ignore this dependency if Job not in schedule** if the dependency only applies when the job is part of the production schedule.
12. Click **OK** to add the job dependency.

Note: If your job has more than one dependency (file, job, variable or time), all dependencies must be satisfied for the job to run. It is possible for a dependency's state to change from satisfied to unsatisfied. If this occurs, the job will only run when all dependencies have been satisfied at the same time.

Adding a File Dependency

You can have a job that depends on the status of a file on any system in your network. For example, **Job A** can be defined to run only when file *data.txt* exists in the **c:\data** directory.

To add a file dependency to a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit to display the **Job** or **Job Group Definition** dialog.
3. Click the **Dependencies** tab.
4. Click **Add** and select **Add File Dependency** from the dependency context menu to display the **File Dependency Definition** dialog.
5. Type the path and filename for the required file or click the **Browse** button to select a file on the local CWA Web Client.

–or–

Click the **Variables** button to add **System** or **Job** variables as a file name.

6. Select the agent where the file needs to exist.
7. Select the dependency type for the file from the following options:
   - **Exists** – The file exists at the path and on the agent specified.
   - **Does Not Exist** – The file no longer exists, or is not found at the path or on the agent specified.
   - **Has Changed In DD:HH:MM** – The file dependency is satisfied when the file changed within the specified time in days, hours, and minutes after the job entered the production schedule. For example, if the job entered the schedule at 1:00 PM, the period specified is 6 hours, and the file changed after 7:00 PM (or later), the dependency is met.
   - **Stable For DD:HH:MM** – The file dependency is satisfied when the file size has not changed for the specified time in days, hours, and minutes from the present time. For example, if the file's modified time is 1:00 PM, the period specified is 6 hours, and the job enters the schedule at 3:00 PM, the dependency is satisfied in 4 hours, i.e., 7:00 PM.
   - **Size >=** – The size of the file is greater than or equal to the specified amount in bytes.
   - **Size <=** – The size of the file is less than or equal to the specified amount in bytes.
8. Click **OK**.

Note: If your job has more than one dependency (file, job, variable or time), all dependencies must be satisfied for the job to run. It is possible for a dependency's state to change from satisfied to unsatisfied. If this occurs, the job will only run when all dependencies have been satisfied at the same time.

Adding a Variable Dependency

You can make a job depend on the value of a user-defined variable. For example, **Job A** should only run when the variable `RunVar` is equal to ten. For more information on variables, see *Variables, page 237*.

To add a variable dependency to a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Dependencies** tab from the **Job Definition** dialog.
4. Click **Add** and select **Add Variable Dependency** from the drop-down menu to display the **Variable Dependency Definition** dialog.
5. If you are creating an intermaster dependency, select from the **Master** drop-down list a master to manage the variable dependency. Leave the default field selection, if you are not creating an intermaster dependency.
6. In the **Variable Name** field, choose a variable from the drop-down menu that the job or job group will depend on.
7. In the **Operator** field, select from the drop-down list an operator to make the appropriate comparison to the value of the variable.

8. When text strings are used in comparison, “lower” letters of the alphabet are of greater value than “higher” letters. For example, Z > A. If the first letters of the string match, succeeding letters are used for comparison. For example, AZ > AA. The operation works similar to sorting strings in ascending order. Upper versus lower case is not considered (i.e., a=A, b=B, etc.).
9. In the **Variable Value** field, enter the value of the variable required for the dependency to be met. You can also select from a list of **system**, **job**, **user-defined** and **public** variables to which the variable should be compared. For example, suppose you are using a variable dependency to repeat a job a specific number of times, and this amount changes periodically. You can define how many times to repeat the job by changing its variable value instead of changing its job definition.

Adding Parameters to a Command

You can specify command parameters that are appended to the command when the command is run. Consult the author of the script or program or refer to documentation about the command you are running for specific information on the type of command parameters you can pass to it.

You can enter fixed parameters, or you can use system, job, public, and user variables using the **Variables** button. At runtime, the current variable values will be used.

Note: Command parameters must be added to a job definition through the **Command Parameters** field on the of the **Job Definition** dialog. CWA will not recognize any parameters appended to a command in the **Command** field. For more information about the **Command Parameters** field or the **Command** field, see *Program Tab, page 124*.

To add a parameter to a command:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit to open its **Job Definition** dialog.
3. Click the **Program** tab.
4. In the **Command Parameters** field, type the parameter text as it should appear in the command.

Adding Notes or Operator Instructions to a Job

For every job or job group that you create, you can add notes on the **Notes** tab to describe the job or group. You can also add instructions intended for the operator during the execution of the job on the **Run Book tab**. This information has no direct effect on how the job or job group runs, but is for informational purposes only. The notes or instructions can be written text or can be a web page of information displayed from the internet or a company intranet.

To add a note or operator instruction to a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click either the **Runbook** or the **Notes** tab.
   a. To add text, type the information in the text field. The text can contain up to 255 characters.
   b. To display a web page from the internet or a company intranet with information relevant to the job, type a web URL in the text field and select the **Load URL** option.

Assigning an Agent or Agent List to a Job

You can select an agent or an agent list to run your jobs but be sure to choose an agent or an agent list for a platform on which your command or batch file can run.

To assign an agent or agent list to a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group you want to edit to open its definition. Selecting an agent or agent list for a group results in assignment of the agent to the children that inherit this property.
3. Click the **Run** tab.
4. The default agent is the agent specified in the **System Configuration** dialog, **Defaults** tab. To change this agent, select either:
   a. An agent from the **Agent Name** drop-down menu to run your job on a specific agent.
   b. An agent list from the **Agent List Name** drop-down menu to run your job on one or more agents in the agent list, depending on the type of list. Note that agent lists allow you to do workload balancing, broadcasting, and dynamic rerouting.

Note: If you select an agent list, make sure that the user has logon access to each agent in the agent list. If the job tries to run on an agent that the user cannot access the job will fail with an **Error Occurred** status.

Assigning Job Event(s) to a Job

You can assign predefined job events to jobs to notify the operator or take actions based on exception conditions. You can issue email, console alerts, SNMP traps, ITO messages, job control commands, or even run a new job through the job event's associated actions.

To assign a job event to a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Job Events** tab.
4. Click **Insert** and the **Select Job Event** dialog appears.
5. Select the job event(s).
6. Click **OK** to add the job event to the job or job group definition.

Copying Jobs or Job Groups

To create a job or job group that has many of the same properties as an existing job or job group, you can save time by copying the job or job group first, and then editing its properties.

Note: Copying a job group will copy all the jobs and job groups belonging to that job group.

To copy a job or job group:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Right-click the job or job group to copy and select **Copy Job/Group** from the context menu.
3. A copy of the definition of the job or job group you selected will appear. The properties will be the same except for the name, which will be prefaced with **"Copy of"**. Note that you should give each copy a new name.

Creating a Public Job

To allow all users access to a job or job group, make the **Owner** field a *public workgroup*. A public workgroup is a workgroup that contains all CWA users.

To create a public job:

1. Create a CWA workgroup and add all users:
   a. From the **Navigator** pane, select **Administration>Workgroups** to display the **Workgroups** pane.
   b. Click the **Add** button on the CWA toolbar to display the **Workgroup Definition** dialog.
   c. In the **Workgroup Name** field, type **Public** (or whatever name you choose to use).
   d. Click the **Members** tab and select all CWA users to join the workgroup.
   e. Click **OK**.
2. To add a job or job group to the public workgroup:
   a. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
   b. Double-click the job or job group that you want to edit.
   c. In the **Owner** field, select the public workgroup from the drop-down menu.

Job and job groups owned by the public workgroup will be available to all users of CWA.

Note: The members of the public workgroup should be kept updated as CWA users are added or deleted.

Deleting Jobs or Job Groups

To delete a job or job group:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.

   Note: If you delete a job group, all child jobs and job groups that are under that job group are also deleted.
2. Select the job or job group to delete and click the **Delete** button on the CWA toolbar. You could also right-click the job or job group and select **Delete Job/Group** from the context men or select the job or job group to delete and press the **DELETE** key on your keyboard.

   To select multiple jobs or job groups, hold down either the **SHIFT** or the **CTRL** key on your keyboard while you click your selections.
3. Click **Yes** in the **Confirmation** dialog to delete the job or job group.

Deleting a Dependency

To delete a dependency:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Dependencies** tab.
4. Select the dependency and click **Delete**.

   If you click the **Delete** button without selecting a dependency, then the last listed dependency is deleted.

Note: Deleting a dependency from a job or job group definition does not delete the actual job, file or variable the dependency refers to. It only removes that dependency from the definition you are editing.

Deleting a Job Event From a Job

To delete a job event from a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Job Events** tab.
4. Select the job event to remove.
5. Click **Delete**. The job event is removed from the job or job group definition.

Determining the Result From the Exit Code Automatically

To determine the result from the exit code automatically:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Run** tab.
4. In the **Tracking** section, select the **Exit Code** option.

   The **Job Activity** pane displays the job's completion status based on the job's exit code.

Determining the Completion Status Manually

To determine the completion status manually:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Run** tab.
4. In the **Tracking** section, select the **External** option.

   The **Job Activity** pane displays the job's completion status as **Externally Defined**. Note that you will need to set the job's status manually using the set status option, or the CWA command line program `jobset`. For more information about `jobset`, see the CWA *Command Line Reference Guide*.

Disabling Automatic Job Insertion

To disable automatic job insertion:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Right-click the job and select **Disable** from the context menu or double-click the job that you want to edit, and remove its calendar or clear the **Enabled** option.

If the job is already in the schedule, but has not run yet, the job will be removed. If the job had dependents, the dependencies on the job are released. Jobs that are active or are completed cannot be removed in this fashion, and can only be removed using the normal purging process.

Editing a Job Event Assigned to a Job

To edit a job event assigned to a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Job Events** tab.
4. Double-click the job event that you want to edit.

Editing a Dependency

Note: When you edit a job event definition, ***all*** jobs that have been assigned to the job event are affected by the change.

You can edit any existing dependencies associated with jobs or job groups. Editing dependencies is similar to adding dependencies.

To edit a dependency:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Dependencies** tab.
4. Select the dependency and click **Edit**.
   a. If you selected a job dependency, the **Job Dependency Definition** dialog appears.
   b. If you selected a file dependency, the **File Dependency Definition** dialog appears.
   c. If you selected a variable dependency, the **Variable Dependency Definition** dialog appears.
5. Edit the values of the selected **Dependency Definition** dialog as described previously.
6. Click **OK** to save the changes.

Managing Simultaneous Occurrences of the Same Job

You can control how your job runs if a previous instance of it is already running. You can skip the job, defer it until after the other instance completes, or run it anyway.

Note: The concurrency setting does not apply to job groups.

To manage simultaneous occurrences of the same job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Options** tab.
4. In the **If Job is currently running** section, select one of the following:
   a. **Run anyway** – If a previous instance of the same job is already running, the job tries to launch and run it anyway. You may have two or more instances of the same job running at the same time.

b. **Skip** – If a previous instance of the same job is already running, the job is assigned the **Skipped** status and will not run.

c. **Defer until Normal** – If a previous instance of the same job is already running, the job is assigned the **Deferred** status until the previous instance completes with a **Completed Normally** status, at which time CWA launches the job. The job will not run if the previous job instance does not complete normally.

d. **Defer until Complete** – If a previous instance of the same job is already running, the job is assigned a **Deferred** status until the previous instance completes, at which time CWA launches the job.

Overriding a Dependency

You can override one or more dependencies when running a job instance. This is useful if you need to modify the parameters of a job for just one instance. Instead of creating a new job, you can select a job that closely matches the job required and override the dependencies until the job meets your requirements. The overridden job dependency only applies to that particular job instance. The job returns to its original dependencies after the modified job instance runs.

To override a dependency:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group that you want to edit.
3. Click the **Dependencies** tab.
4. Select each dependency you wish to override and right-click to display the context menu. There is only one context menu selection called **Override**.

   As an alternative, you can use the shortcut, **Ctl+O**, to override the dependencies you selected.

Preventing a Job from Being Submitted Manually

You can prevent a job from being added manually into the production schedule.

To prevent a job from being submitted manually:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Options** tab.
4. Clear the **Unscheduled Allowed** option.

Removing Jobs from the Production Schedule

There are several ways to remove a job and job group instances from the production schedule:

- Select **Create Schedule** from the **Activities** menu.

  The **Create Schedule** option recreates the existing production schedule for the date(s) specified and creates new instances based on qualifying jobs. *All jobs that were added manually are removed as well.*

- If the **Automatic Daily History Cleanup** option on the **Master** tab of the **System Configuration** dialog is selected, the master automatically purges history during daily maintenance at midnight. (Otherwise, the operator must manually purge the job history at regular intervals.)

Each job and job group has a retention period, after which its job instances are automatically purged from history. The default retention period is set on the **Defaults** tab of the **System Configuration** dialog, but individual jobs can customize their retention period on the **Options** tab of the **Job Definition** dialog.

- Disable the job by deselecting the **Enabled** option in the job's or job group's definition or by using the **Disable** option from the context menu.

  If the job (or job group) has a pre-launch status, disabling the job removes the job from the schedule. Job instances that are active or have completed already are not removed. If any jobs depend on the removed job, that dependency is no longer required.

- Right-click a job or job group in the **Job Activity** pane and select **Remove Job(s) from Schedule** from the context menu, or, select a job or job group, then select **Remove Job(s) from Schedule** from the **Activities** menu.

  If the job (or job group) has a pre-launch status, selecting **Remove Job(s) from Schedule** will remove the job from the schedule. You are prompted for whether you want to release the dependency from dependent jobs or job groups.

- Delete the job or job group from the **Jobs** pane.

  Select the job or job group, then click the **Delete** button on the CWA toolbar or the **DELETE** key on your keyboard. When the job or job group definition is deleted, all instances (past, present and future) of the job or job group are removed from the production schedule.

Requiring Manual Release before a Job Can Run

You can set a job so that an operator must release it before it runs. All dependencies must be satisfied before the job is made available for release. Before releasing the job, the operator can view instructions regarding it.

To set a job so that an operator must release it before it runs:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Options** tab.
4. Select the **Require operator release** option.
5. Click the **Notes** tab. Type any information and instructions the operator might need to see before releasing the job.

Running a Job for Another User

You can run a job using a specific user logon account by selecting the **Runtime User** in the **Job** or **Job Group Definition** dialog. When you specify a **Runtime User**, you must be authorized to do so. Your job has access to that user's environment on the agent. This may be required for your job to run successfully.

To run a job for another user:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group you want to edit.
3. Click the **Run** tab.
4. In the **Agent Information** section, select the user name from the **Runtime User** drop-down menu. If the user name you need doesn't appear, it must be added to your list of **Runtime Users**. For more information, see *Users, page 41*..

   Note: If you select an agent list and a runtime user, make sure that the runtime user has logon access to each agent in the agent list. Otherwise, the job might fail with an **Error Occurred** status.

   You also need to select the **Use Passwords to Run Windows Jobs** option on the **Master** tab of the **System Configuration** dialog. For more information, see *System Configuration, page 31*.

Scheduling Jobs According to a Calendar

To schedule a job according to a calendar:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group you want to edit.
3. Click the **Schedule** tab.
4. If the job or job group has a parent job group:
   a. To use a calendar other than the parent's calendar, clear the **Inherited** option in the **Calendar** section.
   b. From the **Calendar Name** drop-down menu, select the **Calendar** for the job.
   c. To use the calendar assigned to the parent job group, select the **Inherited** option in the **Calendar** section.

   Note: A child job must use a calendar that is a subset of the parent job's calendar. Any job assigned a run date that is outside of the date range of the parent job's calendar cannot be scheduled.
5. You can view the specific dates of the selected calendar by clicking the **Forecast** button.
6. If you want to offset the dates specified in the calendar, you can type the offset in days next to the **Calendar** drop-down menu. For example, if the job is using the **Fiscal Month End** calendar with an offset of 2, the job will be inserted into the schedule 2 days from every date in the **Fiscal Month End** calendar.
7. To specify the date pane during which the job should run, type dates in the **from** and **to** fields. You can leave either field blank. If you leave the **from** field blank, the Calendar takes effect immediately. When you leave the **to** field blank, the Calendar is effective indefinitely.
8. You can use the built-in calendar context dialog to help you select dates. To use the calendar function, click the down-arrow button next to the **from** and **to** fields.

For more information about CWA Calendars, see *Controlling Production, page 253*.

Scheduling Jobs to Repeat within a Day

You can repeat your job or job group as many times as you like within the day that it is scheduled.

To schedule a job to repeat within a day:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group you want to edit.
3. Click the **Schedule** tab.
4. In the **Repeats** section, there are three options to choose from:
   - **Do not Repeat** – Only one instance of the job will be compiled for each production day that the job is scheduled to run.
   - **Run new occurrence** – Runs a new occurrence of the job after the number of minutes specified in the **minutes** field passes. In the **up to** field, specify the number of times to repeat the job. If this field is left blank, the job repeats until the end of the time window or until the end of the day, whichever occurs first.
   - **Rerun same occurrence** – Run the same job instance after the number of minutes specified in the **Repeat every** field elapses. In the **up to** field, select the number of times to repeat this job instance. If this field is left blank, the job repeats until the end of the time window or until the end of the day, whichever occurs first.

The following rules govern this function:

– The interval always begins at the start of the time window (12:00 AM if blank).

For example, if a job's time window begins at 12:00 PM, and the job is defined to run every hour up to four times, the job will run 12:00 PM, 1:00PM, 2:00PM and 3:00PM. If the create schedule command occurs at 1:30PM, this job will run twice, once at 2:00 PM and once at 3:00 PM, unless you choose to start repeating the jobs ASAP within the **Create Schedule** dialog, in which case the job would run at 1:30, 2:30, 3:30 and 4:30.

– If you change the job definition while one of the repeat jobs is running, and the repeat count is changed, all job instances that have not run yet will be removed from the Production Schedule. The number of job instances added will equal the total number of instances specified minus the number of job instances that have already run.

For example, if you define job A to run 4 times, and the 2nd instance has started, and then you change the definition so the repeat count is 5, the 2 jobs already launched will remain in the schedule, the 2 other jobs will be removed, and 3 jobs will be added to run in sequence after the 2nd instance finishes.

– When you manually insert a repeating job into the schedule (via the **Insert Into Schedule** menu item), only one instance of the job will run as soon as possible after insertion.

– If the job is manually added to the schedule (via the **Insert Into Schedule** menu item), and other jobs depend on the last instance of this job, the dependency will then reflect the added job.

– You can create a perpetual job by using the **Rerun same occurrence, Repeat every... minutes up to... times** option. The same job instance will be rerun after each interval, rather than a new instance of the job being run. Only one instance of the job will be displayed in the **Job Activity** pane, but the instance number will increment every time the job is run. The **History** console pane will also show every instance of the job and every status changes. For more information about the **History** pane, see *Diagnostic Messages, page 328*.

Setting a Job or Job Group's Priority

You can specify a job's priority in the **Job Definition** dialog. The job's priority value is relative to other jobs in the same queue, and not with all other scheduled jobs. When CWA looks for the next job to run, it searches first for the queue with the highest priority, and then for the job with the highest priority in the queue. For more information, see *Queues in CWA, page 292*.

To set a job or job group's priority:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Options** tab.
4. In the **Job Priority** field, enter the job priority, from **0** for lowest priority to **100** for highest priority.

Specifying a Time Window for Jobs

You can specify the time window during which your job or group is allowed to run. For example, you can specify that your job will run after regular business hours, an ideal time to run processor-intensive commands because it frees up system resources during the day.

To specify a time window for a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group you want to edit.
3. Click the **Schedule** tab.

4. Use the arrow buttons on each field in the **Time window** section to type the time window, or type the time in each field. If the job or job group has a parent job group, clear the **Inherited** option in the **Time window** section to use a different time window.

   Note: If you leave the **To** and **From** fields blank, CWA assumes 12:00 AM. You can use the **From** field alone to have your job run at the time specified. The time format can be changed in the Windows Regional Settings Control Panel.

5. Click the option that indicates what to do if the job cannot run within the time window specified.

   - **Do not timeout** – Select this option if you want to carry the job forward to the next day if it fails to start by the end of the time window specified.
   - **Run again tomorrow** – Select this option if the job has not run by the end of the time window specified, and you want to carry it forward to the next day. With this option selected, the job is eligible to run on each subsequent day, until it does run. You can set up a job action to notify you if your job does not run on the originally scheduled day.

Note: Using job events, you can be notified if your job does not run within the time window or if the duration exceeds its time window. For more information on job events, see Actions and Alerts, page 175.

Working with Timezones

You can configure timezones where target application environments are based. This allows you to schedule a job or job group across multiple timezones. For example, if the Master associated with your job is based in the PST timezone and you want the job to run in an alternative timezone, you can set the time differences between the timezones and the amount of time to be added to selected timezone if it is in DST (Daylight Savings Time) period.

To specify a timezone for a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group you want to specify the timezone for.
3. Click the **Schedule** tab.
4. From the **Timezone** list, select the appropriate timezone you defined in the **System Configuration** dialog.
5. Save the job.

See also, System Configuration - Timezone Tab, page 38

Specifying a Command or Batch File

Each CWA job runs a single executable, such as files with *.exe*, *.cmd*, and *.bat* extensions. You can also specify run parameters.

To specify a command or batch file:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit to open its **Job Definition**.
3. Click the **Program** tab.
4. In the **Command** field, type the path to the executable file.

   - To specify a file on a remote agent:

   If your job runs on a remote agent, you must specify the command from the perspective of the agent. You can use the following naming convention to specify the file you want to run:

\\<computername>\<shared-directory-name>\<filename>.

For example, if you want to run a command named *payrolldat.exe* that is located on the computer named **accounting**, in the shared directory **Payroll**, specify the command as follows:

\\accounting\Payroll\payrolldat.exe

You can also use the **Variables** button to insert a user-defined path variable.

Note: Remote Windows agents must run under a user account and not as a system account. More information is available in the installation prerequisites for the Windows agent in the *Cisco Workload Automation Installation and Configuration Guide*.

5. In the **Command Parameters** section, type the parameters to be used in running the command file. Note that CWA appends command parameters, in the order that they appear on this list, separated by a space.
6. In the **Environment File** section, specify the file containing environment variables for your job. Note that this option only applies to jobs run on Unix agents. For more information about environment files, see *Environment Files, page 115*.

Specifying How a Job Determines Its Completion Status

You can determine how to set the completion status of a job in one of the following ways:

- Have CWA set the status automatically based on the exit code of the command or batch file. If the exit code is 0, the job's status is **Completed Normally**; if the exit code is not 0, the status is **Completed Abnormally**. (The exit code value must range between 0 and 30,000.)
- If the job's completion status is more difficult to determine than a simple exit code, you can determine the status yourself, and then manually set it.
- Use an external output analysis program to determine the job's status upon completion.

Specifying Durations for a Job

You can specify minimum, maximum, and estimated durations for a job. You can also create job events to notify you if the job's duration exceeds the maximum value, or if the job completes before its minimum value. Once the job has run, the estimated duration value reflects the average duration value based on the number of times the job has run. For more information, see Actions and Alerts, page 175.

To specify duration for a job:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Run** tab.
4. Go to the **Duration (in minutes)** section and type the values for the **Estimated, Minimum**, and **Maximum** run times.

Using CWA Variables

To use a CWA variable:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit to open its **Job Definition**.
3. Click the **Program** tab.

4. While in the field and at the point where you want to insert a CWA variable, click **Variables**. From the drop-down menu, select the variable you want to use.

Using an External Program to Determine Completion Status

To use an external program to determine completion status:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job you want to edit.
3. Click the **Run** tab.
4. In the **Tracking** section, select the **Exit code of cmd pipe** option.
5. In the **Scan Output** section, select the option for a particular text string in the output from a job to determine that a job completed normally or abnormally.
6. Specify the external command in the adjacent field. The final results are determined by the success of that command, and the exit code from the command displays in the **Job Activity** pane. For more information refer to the *Tracking Section (job only, does not apply to job group), page 128*.

   For example, if you type **Find Passed** in the **Exit code of cmd pipe** field for an Windows job, the output is passed to the **Find** command. If the text **Passed** is found in the output, **Find** returns an exit code of 0, and the job's completion status will be **Completed Normally**. If **Passed** is not found, **Find** returns 1, and the job's completion status is **Completed Abnormally**.

Viewing Job/Job Group Properties

To view the properties of a job or job group:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click a job or job group to view the **Job Definition** or **Job Group Definition** dialog.

Viewing Job/Job Group History

To view the history of a job or job group:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the job or job group to view to display the **Job Definition** or **Job Group Definition** dialog.
3. Click the **History** tab. The job's or job group's history displays.

Note: For jobs only, you can change the number of days of history to retain using the **Retention (in days)** field on the **Options** tab when the definition dialog is in **Edit** mode.

6

Actions and Alerts

Overview

CWA can respond automatically to unusual situations that may arise while running a production schedule. Users can create predefined responses called actions. There are various types of actions ranging from sending an alert to the CWA client to running a specific job when a designated condition occurs.

Certain job or system conditions have been designated by CWA as “event triggers.” The occurrence of these conditions can be used to initiate or trigger a job and/or an action a user has defined.

By linking an event trigger to an action or a job, an automatic response called an event is created. When this event is associated with a condition that affects an individual job or all jobs in general, this defined response is known as a job event. If the event is associated with a condition that affects the entire system and not just jobs, this defined response is known as a system event.

Job and/or Action + Event Trigger = Event

Jobs, job events and actions are constructed in dialogs using a three-tier hierarchy. Each job can have any number of job events associated with it, and in turn, each job event can have any number of actions associated with it. A job triggers a job event only when its exception condition becomes true, which then triggers all of its associated actions.

Jobs, job events and actions can all be created separately and linked at any time. The job-job event-action hierarchy can be linked from the **Job Event Definition** dialog and from the **Job Definition** or **Job Group Definition** dialog. In the **Job Event Definition** dialog, you can assign multiple jobs and actions to a single job event. In the **Job Definition** or **Job Group Definition** dialog, you can assign multiple job events to the job or job group, but you cannot assign actions to job events.

This chapter covers these topics:

- Action Concepts, page 176
- Actions Interface, page 177
- Action Procedures, page 187
- Alerts Interface, page 192
- Alerts Procedures, page 196

Action Concepts

Actions

An *action* is a task or notification that is automatically performed by CWA in response to a job event trigger that occurs for a specific job or job group or system event trigger. Actions are customized tasks and messages linked to a job or system event through the **Job Event Definition** and **System Events** dialogs. The job or system event is then associated with a job or job group. For example, an action to send email to the owner of a job that failed can be tied to a **Job Completed Abnormally** job event trigger. Another action that sends an alert message to the console can also be linked to the same job event so that two actions occur simultaneously when the job fails.

Note: When multiple actions are defined for a single event, the actions are completed as the conditions to satisfy the event trigger are fulfilled.

Action Types

From the **Actions** pane, you can view the actions that belong to you or your workgroups.

The types of actions you can choose from are:

- **Email** – Use an email message action to notify users via email that an event occurred.
- **Log** – Use a log message action to post a message to the CWA and system logs to record that a specified condition occurred. Each CWA log message has a unique numerical identifier. You can view CWA logs from the **Logs** pane and view Windows event logs using the Windows Event Viewer.
- **Job** – Use a new job action to add special recovery, pager activation or ad hoc jobs to the production schedule when a job event or system event occurs. For example, you can add a recovery job into the schedule if the underlying job fails.
- **Alert** – Use an alert action to send an alert message to the **Alerts** pane of the CWA client. These alerts generated by the action can be assigned varying levels of severity. Once these alert messages are sent to the CWA client, the Alerts status light turns yellow to notify a user that a condition in the system has generated an alert. The alert must be acknowledged and eventually closed, forcing the CWA operator to respond to them. The **Alerts** pane is discussed in more detail later in this chapter at Alerts Interface, page 192
- **SNMP** – Use an SNMP message action to send an SNMP message (trap) to an SNMP manager such as Hewlett Packard's OpenView application.
- **HP OV Message** – Use a HP OpenView message action to send a message to HP OpenView Operations software application.
- **Variable** – Use a variable action to change a user-defined variable. This action will not affect system, job or job event variables.

Variables

CWA lets you use system, job, job event and user-defined variables in action messages, making them applicable to many jobs. For instance, you could create an action called **Job Stopped Email Notification**, with variables in the message text that will be replaced at runtime with the job name and runtime. When you create a job and want to be notified if it stops during execution, you can associate the action with the job from the **Job Event Definition** dialog. If the job stops during execution, you receive an email referring to the job that triggered the event. You could even include in the message a variable representing the exit code at the time of completion.

Actions Interface

About the Actions Interface

From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane. You must select one of the types of actions to display its pane to create or modify an existing action.

The **Actions** pane contains the following actions:

- **Email** – Create an email message action by displaying the **Action Definition: Email** dialog. For more information about email actions, see Action Definition: Email Message Dialog, page 179
- **Alert** – Create a console alert action by displaying the **Action Definition: Alert** dialog. For more information about alert actions, see Action Definition: Alert Dialog, page 180.
- **Job** – Create a new job action by displaying the **Action Definition: Job** dialog. For more information about new job actions, see Action Definition: Job Dialog, page 184.
- **SNMP** – Create an SNMP message (also known as an SNMP trap) action by displaying the **Action Definition: SNMP** dialog. For more information about SNMP message actions, see Action Definition: SNMP Dialog, page 181.
- **SAP Event** – Create an action that sends a notification to an SAP instance when a designated event occurs in CWA by displaying the **Action Definition: SAP Event** dialog. For more information about SAP Event message actions, see Action Definition: SAP Dialog, page 185.
- **Log** – Create a log message action by displaying the **Action Definition: Log** dialog For more information about log message actions, see Action Definition: Log Message Dialog, page 185.
- **Variable** – Create a variable update action by displaying the **Action Definition: Variable** dialog. For more information about variable update actions, see Action Definition: Variable Dialog, page 186.

Buttons

Note: Buttons are only enabled after a type of action has been selected from the **Actions** pane.

This pane contains the following buttons:

- **Add Action** – Displays the **Action Definition** dialog for the selected type of action to create a new action.
- **Edit Action** – Displays the **Action Definition** dialog for the selected type of action to edit an action.
- **Copy Action** – Creates a copy of the selected action with the same information as the selected action, except for the name.
- **Delete Action** – Removes the selected action definition from the CWA database.
- **Refresh** – Updates the data in the actions pane.
- **Print** – Displays the **Reports** pane to view and print your action definitions. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out.

Columns

This pane contains the following columns:

- **Name** – The name of the action.
- **Owner** – The owner of the action.
- **Public** – Whether or not the action is public, that is, available to all CWA users.
- **Description** – A description of the action. The **Description** field in the **Action Definition** dialogs is optional, so there may not be any data in this column.
- **Modified** – The last time the action was modified.

Actions Preferences Dialog

Select **Preferences** from the **View** main menu while viewing an **Actions** pane to display the **Actions Preferences** dialog for actions.

From an **Actions Preferences** dialog, you can select which columns are displayed in the pane for the selected type of action and in what order the columns appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing an **Actions** pane, the **Navigator** context menu displays.

The **Navigator** context menu contains the following options:

- **Add Action** – Displays the **Action Definition** dialog for the selected type of action to create a new action. Has the same function as the **Add Action** button.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print your connection definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Preferences** – Displays the **Preferences** dialog for the selected type of action.
- **New Root Folder** – Allows you to create a new root folder for the **Navigator** pane.

Actions Pane Context Menu

After selecting a folder associated with one of the six action types, if you right-click in the **Actions** pane, the **Actions** context menu displays.

The following describes the items in the **Action Types** pane context menu. The same menu appears for each type of action.

- **Add Action** – Creates a new action definition.
- **Edit Action** – Edits the selected action by displaying the its **Action Definition** dialog.
- **Delete Action** – Deletes the selected action definition. The action is removed from any instance where it has been used.

- **Copy Action** – Creates a copy of the selected action with the same information as the selected action, except for the name.
- **Refresh** – Updates the data in the actions pane.
- **Print** – Prints a list of the available actions.
- **Print Selected** – Prints the selected action(s).

Action Definition: Email Message Dialog

About the Email Message Dialog

The **Action Definition: Email Message** dialog displays when you add or edit an email message action. An email action sends an email message in response to a job event or system event. You can send email to any individual or group with a valid email address in the mail system you have chosen. A user without a valid email address (provided on the **Other** tab in the **User Definition** dialog) cannot receive notification from an Email action. The individual receiving the email does not have to be a user of CWA. For more information about setting up CWA for email, see Getting Started, page 7, and the *Cisco Workload Automation Installation and Configuration Guide.*

Note: To send email to a CWA workgroup, that workgroup (not just the individual members) must have a mailbox, or be defined as a mailing list, in your email system. For help setting up a mailbox or mailing list, see your System or Mail Administrator.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variable** – When you are in the **Subject** or **Message** fields, this button inserts one or more variables. Appropriate values replace these variables when the action is triggered.

Note: When creating an email message for a system event about losing your database connection, do not use variables that will not work without a connection to the database, i.e., **<JobName>** or **<JobStatus>**.

Details Tab (Email Message)

- **From:** – The **From:** field cannot be edited from this dialog.
- **To:** – The recipient(s) of the email. To add and remove recipients in this field, you must use the **Mailing List** dialog, displayed by clicking the **Browse** button. For more information about the **Mailing List** dialog, see Mailing List Dialog, page 180.

  Note: The **To**: field can accommodate no more than 1024 characters. If you attempt to enter one or more email addresses whose total characters exceed this limit, your address(es) will be truncated automatically. Your email action will then fail to reach all its intended recipients. The solution is to create a mailing list through the CWA **Mailing List** dialog.
- **Subject** – The subject of the email. You can type a combination of text and/or variables in your subject. Use the **Variables** button to select variables from the **Variables** context menu.
- **Message** – The message to send to the recipient. You can type a combination of text and/or variables in your message. Use the **Variables** button to choose variables from the **Variables** context menu.

- **Attachment** – Type a pathname to locate a file on the network to attach to your email. You must type the pathname from the perspective of the master, not from the perspective of the CWA client.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Mailing List Dialog

The **Mailing List** dialog displays by clicking the **Browse** button in the **To:** field in the **Action Definition: Email** dialog. You can select one or more addresses for email actions from this dialog. Each recipient of the email action that is selected will be highlighted in the list of available email addresses in each field.

Note: To select multiple consecutive addresses, click the first email address and while holding down the **SHIFT** key, click the last consecutive address.
To select multiple non-consecutive email addresses in each field, click individual desired addresses while simultaneously holding down the **CTRL** key.
Remove existing recipients in the same way by also clicking their individual addresses while simultaneously holding down the **CTRL** key.

CWA **Email Addresses** Use this field to select the email addresses of CWA users. In the case that no email address is assigned to a user, their CWA user ID appears in the list and is used as a local email address. Email addresses are defined in the **Other** tab of the **User Definition** dialog.

You can also use the following variables in this field:

- **<JobOwner>** – Use the email address of the owner of the job that triggers the job or system event.
- **<JobRunUser>** – Use the email address of the user whose login was used to run the job.
- **<ActionOwner>** – Use email address of the owner of the action. For example, if you are a member of a workgroup that owns a job, you can associate a specific action to the job's event so that email is sent only to you, the owner of the action.
- **<EventOwner>** – Use the email address of the owner of the event. For example, if you are a member of a workgroup that owns a job, you could associate a specific event that sends an email only to you when its event condition occurs.
- **Other Email Addresses** – Use this field to specify the email address(es) of people outside of the CWA network.

Action Definition: Alert Dialog

The **Action Definition: Alert** dialog displays when you add or edit an alert action. An alert action can be assigned one of four severity levels: **Critical**, **Error**, **Warning** and **Information**.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public** – When selected, the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variable** – When you are in the **Alert Message** field, this button inserts one or more variables. The values of the variables are substituted when the action is triggered by the job event or system event.

Details Tab (Actions Alert)

- **Severity Level** – The severity level of the alert. You can select from four different severity levels–**Critical**, **Error**, **Warning** and **Information**. Console alert colors are configurable from the **Colors** tab of the **Alerts Preferences** dialog.

  Note: Critical level and **Error** level alerts can be associated with an alert sound. However, the computer that receives the alert must have a sound card and speakers for the alert sound to be effective. Alert sounds are configured from the **Sound** tab of the **Alerts Preferences** dialog.

  - **Critical** – Sends the highest priority alert to the **Job Activity** pane when the action is triggered.
  - **Error** – Sends a high priority alert to the **Job Activity** pane when the action is triggered.
  - **Warning** – Sends a medium priority alert to the **Job Activity** pane when the action is triggered.
  - **Information** – Sends the lowest priority alert to the **Job Activity** pane when the action is triggered.

- **Alert Message** – The message the operator receives when viewing the alert message from the **Alert Details** dialog in the **Alerts** pane. You can type a combination of text and/or variables in your message. Use the **Variables** button to choose variables from the **Variables** context menu.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Action Definition: SNMP Dialog

About the SNMP Dialog

The **Action Definition: SNMP** dialog displays when adding or editing an SNMP Message action. An SNMP action sends a message (also known as a trap) to an SNMP manager when the associated job or system event occurs. The computer which hosts the SNMP manager does not need to have CWA installed.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variables** – When you are in the **Message** field, this button inserts one or more variables. The values of the variables are substituted at the time that the action is executed.

Details Tab (SNMP)

CWA uses the SNMP community, port, and host/IP address as set in the Windows **SNMP Properties** dialog.

- **Severity Level** – The severity level of the SNMP message. You can choose **Critical**, **Major**, **Minor**, **Warning** or **Normal**. Severity levels can be used by an SNMP manager to alter the representation color of the alert.
- **Community** – The SNMP community that you want to send the SNMP trap to. This value is case-sensitive so type the name exactly as it is defined.
- **Message** – The message for the SNMP trap. You can type a combination of text and/or variables in your message. Use the Variables button to choose a variable from the Variables context menu. CWA is limited to messages of 255 characters or less. Any message text that extends beyond 255 characters is not sent.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Configuring SNMP on the Master

By default, the SNMP action sends the trap to just the “public” community but CWA can be configured to send SNMP traps to multiple communities and hosts. Older versions of CWA used the *Master.Props* file to configuration the use of SNMP traps. The designated recipients of the SNMP traps are now specified in an XML file called *snmpconfig.xml*.

To create the configuration file, the following information must be gathered beforehand:

- A list of the communities that will receive traps from CWA
- A list of the hostnames of the machines in each community
- The port number, if a host machine is not using the standard port number (162) for receiving the traps

From the information that you have gathered, you must designate a default community, host machine and port number, in that order.

- The default community is the community that the trap will be sent to when the action definition of the trap is not filled in.
- The default host is the hostname that the trap will be sent to if the default community contains no hosts. The hostname is only used if the default community is unavailable or incorrectly defined.
- The default port is the port number that the trap will use unless the host is specifically configured for a different port. The default port number used in SNMP trapping is 162, though this could have been configured differently in your system.

The information in the *snmpconfig.xml* configuration file is organized as follows, first the default properties and then a listing of the communities and their host members, if any.

The following rules must be followed when creating the *snmpconfig.xml* file:

- The default attributes for community, hostname and port number must be defined.
- There can only be one default designated for each attribute and the defaults must be listed in the correct order.
- The default community and its attributes must be listed first.
- The community name is case-sensitive. Type the community name in the configuration file exactly as it is defined.
- No other community besides the default is necessary in the configuration file but as many communities as needed can be defined after the default.
- Communities cannot nest inside each other. Instead each community should be listed in individual blocks of its attributes.
- Hostnames are optional in the other communities listed, but if used, they must be placed in the community they belong. Note that a host machine can belong to multiple communities.
  If the same host machine is named twice in a community block, then that host machine will receive two copies of every trap sent to that community.
- Define a port number attribute if the designated host machine is using a port number for its traps that differs from the default port number. Any host machine without a port attribute will receive traps via the designated default port.

An example of an *snmpconfig.xml* file illustrating the proper file formatting and using the rules stipulated above is shown below. In this example, the default community=*public*, the default hostname=*localhost* and the default port number=*162*.

```
<?xml version=”1.0” encoding=”UTF-8”?>
```

```
<snmp_config>
<default_community value=”public”/>
<default_hostname value=" localhost" />
<default_port value=”162”/>
<community id=”public”>
<host hostname=”localhost”/>
<host hostname=”trapreceiver.mycompany.com” port=”362”/>
<host hostname=”networkaudit.mycompany.com”/>
</community>
<community id=”support”>
<host hostname=”offsite.techsupport.com”/>
</community>
</snmp_config>
```

Installing the snmpconfig.xml File

Once the configuration file is created, it needs to be placed onto the master.

To install the file:

1. Save the configuration file as *snmpconfig.xml.*
2. Stop the master.

   Place the *snmpconfig.xml* file into the CWA master's **config** directory.
   If you installed the Windows master in the default location, this directory is at **`C:\Program Files\Tidal\Scheduler\master\config`**.
   If the Unix master was installed in the default location, this directory is at **`/opt/Tidal/master/config`**.
3. Restart the master.

After the CWA master restarts, it will reconfigure the SNMP settings according to the information in the *snmpconfig.xml* file. If you previously used the *Master.Props* file to configure SNMP, that configuration information is overridden. Examine the log file on the master to verify that the configuration was successful. If the *snmpconfig.xml* file cannot be used, the master will use the configuration specified in the *Master.Props* file.

Action Definition: HP OpenView Operations Dialog

The **Action Definition: HP OpenView** dialog displays when adding or editing an HP OpenView message action. An HP OpenView message action sends an HP OpenView message to an HP OpenView Operations software management node.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.

- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variables** – When you are in the **Message** field, this button inserts one or more variables. The values of the variables are substituted at the time that the action is executed.

Details Tab (HP OpenView Operations)

- **Severity Level** – The severity level of the message. You can choose **Critical**, **Major**, **Minor**, **Warning** or **Normal**. Severity levels alter the representation color of the icons and message indicators in the HP OpenView software.
- **Message** – The text for the HP OpenView message. You can type a combination of text and/or variables in your message. Use the **Variables** button to choose a variable from the **Variables** context menu.

Note: If you do not type a message here, there will be no content for the HP OpenView message when viewed from the HP OpenView Message Browser.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Action Definition: Job Dialog

The **Action Definition: Job** dialog displays when adding or editing a job action. A job action adds a new job or job group to the production schedule when the associated job or system event occurs.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variables** – When you are in the **Override** field of the **Parameters** section, click this button to select a defined variable. The values of the variables are substituted when the action is executed.

Details Tab (Job)

- **Job Name** – The name of the job or job group to add to the production schedule. Click the **Browse** button to select a job or job group using the **Job Search** dialog. You cannot type directly into this field, which prevents the typing of non-existent jobs and job groups.
- **Agent** – The agent on which to run the job. If this field is left blank, the agent or agent list specified in the job's definition is used. You can clear an agent you selected by right-clicking the **Agent** field and selecting **Clear Agent** from the context menu or by selecting the agent and using the **DELETE** key on your keyboard.
- **Runtime User** – The user account under which the job runs. If this field is left blank, the runtime user specified in the job's definition is used. If the runtime user is not defined in the job definition, then the job runs under the account of its **Owner**. You can clear the **Runtime User** by right-clicking the **Runtime User** field and selecting **Clear User** from the context menu or by selecting the text and pressing the **DELETE** key on your keyboard.
- **Parameters** – If the job has command parameters assigned to it from the **Job Definition** dialog, the parameters are displayed here. Command parameters are text strings placed after the command when it runs to modify how the command is executed.
- **Default** – Displays the default command parameter(s) from the original job definition.
- **Override** – The command parameter(s) to be passed to the job's command when the job is inserted into the schedule by the action. You can use this column to add or to override the existing values shown in the **Default** field by typing in the new values or variables.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Action Definition: Log Message Dialog

The **Action Definition: Log** dialog displays when you add or edit a log message action. A log action posts a message of your choice to the CWA log when a job or system event occurs. Optionally, the same message can be recorded to the Unix console if on the Unix platform. The message can be defined as **Error**, **Audit** or **Diagnostic**.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variables** – When you are in the **Log Message** field, clicking this button accesses predefined variables to incorporate into your message. The values of the variables are determined at the time that the action is executed.

Details Tab (Log Message)

- **Log Level** – The type of log message. You can filter messages based on their **Log Level** setting: **Error**, **Audit** or **Diagnostic**.
- **Window** – Specifies that instead of just logging the message from the action to the log in CWA, that the log message should also be written to the console in Windows. All CWA messages are logged under the application, CWA. This section contains the following fields:
  - **Log as Windows Event** – Enable this option to log events to the console in Windows.
  - **Event ID** – Assign an event number in CWA for the logging of the message to the Windows console.
- **Log Message** – The message you want entered in the CWA log. Error and audit level messages are accessible through the CWA Logs pane. Diagnostic level messages are recorded into the master's *sadiagsall.txt* file, if diagnostics logging for the Action Manager has been enabled. For more information, see Monitoring Production, page 313)

Description Tab

The **Description** field is a free text field for up to 255 characters.

Action Definition: SAP Dialog

The **Action Definition: SAP** dialog displays when adding or editing an SAP action. An SAP action sends a notification to the CCMS of a designated SAP instance that a specified event has occurred in CWA.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.

- **Variables** – When you are in the **Event Parameters** field, click this button to enter a system, job or job event variable. You can use this function to set the value of the variable to the value of another variable. You can also set the variable to a string based on the values of other variables. The values of the variables are substituted at the time that the action is executed.

Details Tab (SAP)

- **SAP Instance** – Specifies which SAP instance will receive the event notification.
- **SAP Event ID** – Specifies the name of the event that will initiate this action.
- **Event Parameters** – If necessary, you can define the parameters of the event that triggers this action. You can use defined variables by selecting them from the **Variables** drop-down list.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Action Definition: Variable Dialog

The **Action Definition: Variable** dialog displays when adding or editing an update variable action. A variable action updates a user-defined variable when the job or system event occurs.

Note: Only user-defined variables can be used for variable actions. Therefore, if you have not yet created your own variables, this action will not be available.

Common to All Tabs

- **Action Name** – The name of the action (up to 30 characters). The name must be unique.
- **Owner** – The owner of the action. The default owner is the creator.
- **Public flag** – When selected, this option ensures that the action is available to all CWA users (within the constraints of their security policy). You can select the default condition for this option from the **System Configuration** dialog.
- **Variables** – When you are in the **Value** field, click this button to enter a system, job or job event variable. You can use this function to set the value of the variable to the value of another variable. You can also set the variable to a string based on the values of other variables. The values of the variables are substituted at the time that the action is executed.

Details Tab (Variable)

- **Master** – The master that the variable is related to. This is used mostly with intermaster dependencies.
- **Variable Name** – The name of the variable to update. The displayed variable name includes the type of variable it is, i.e., string, number or date. Choose from the drop-down list of user-defined variables.
- **Type of Update** – Use this drop-down menu to choose the type of update for the variable:
  - **Set Variable Value** – Sets the variable's value to the value given in the **Value** field. The value can be either a number, date or string.
  - **Increment Variable Value** – If the variable is a number or date, increments the variable's value. If the variable is a string, appends the new string value to the present string.
  - **Decrement Variable Value** – If the variable is a number or date, decrements the variable's value. If the variable is a string, then this option is unavailable.
- **Value** – The value used for the update. When updating a number type, you can use any real number (including negative numbers). When updating a string type, any set of characters (including numbers) are treated as a string. When updating a date type, the format will conform to the same format as set in the operating system of the master.

For example, a variable can refer to the name of the primary printer being used. If the printer goes down, a job can track it and issue a job event that sends an email message to users explaining that the primary printer has gone down. The variable update can then be issued to change the default printer name.

Description Tab

The **Description** field is a free text field for up to 255 characters.

Action Procedures

Adding an Email Message Action

You can send an email message to anyone with a valid email address in response to a job event or system event by creating an email action. You cannot send email to a workgroup unless that workgroup (not just the individual members) has a mailbox, or is defined as a mailing list, in your email system.

Note: When creating an email message for a system event about losing your database connection, do not use variables that will not work without a connection to the database, i.e., **<JobName>** or **<JobStatus>**.

To add an Email Message action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the **Email** folder.
3. Click the **Add** button or right-click and select **Add Action** from the context menu to display the **Action Definition: Email** dialog.
4. In the **Action Name** field, type a name for this action (up to 30 characters). The name must be unique.
5. To make the action public, select the **Public** option. When an action is public, the action is available to all CWA users, within the bounds of their security policy.
6. Select the desired **Owner** from the drop-down menu in the **Owner** field.
7. Click the **Details** tab.
8. In the **To** field, click the **Browse** button to display the **Mailing List** dialog and select the recipients of this email action when it is triggered.

   Note: The **From:** field will be the name specified in the **Mail** tab of the **System Configuration** dialog.
9. In the **Subject** field, type a subject title for your email message. In this field you have the option of inserting one or more CWA variables.

   To insert a variable, click where you want to insert the variable, and then click the **Variables** button and select a variable from the variables context menu.
10. In the **Message** field, type the message to send when this email action is triggered. In this field you have the option of inserting one or more CWA variables.

    To insert a variable, click where you want the variable, and then click the **Variables** button and select a variable from the variables context menu.
11. To enter a description for your email action, click the **Description** tab, and type your description in the **Description** field.
12. Click **OK** to accept the action.

The action displays in the **Actions** pane and is available from the **Job Event Definition** and **System Events** dialogs.

Adding a Console Alert Action

You can send an alert to the **Job Activity** pane in response to a job event by creating an console alert action.

To add a Console Alert action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the **Alert** folder.
3. Click the **Add** button or right-click and select **Add Action** from the context menu to display the **Action Definition: Alert** dialog.
4. In the **Action Name** field, type a name for this action (up to 30 characters). The name must be unique.
5. If you wish to make the action public, select the **Public** option. When an action is public, the action will be available to all CWA users, within the bounds of their security policy.
6. Select the desired **Owner** from the drop-down menu in the **Owner** field.
7. Click the **Details** tab.
8. In the **Severity Level** section, select the severity level for the alert you are defining. Different severity levels can be represented in different ways. For example, Critical and Error level alerts can be made audible. Alerts of different severity levels appear in different colors on the Job Activity pane by default.
9. In the **Alert Message** section, type the message to send.
10. In this text field, you have the option of inserting one or more CWA variables. Click where you want to insert the variable, and then click **Variables** to choose a variable from the variables menu.
11. To enter a description for your alert, click the **Description** tab, and type your description in the **Description** field.
12. Click **OK** and the action appears in the **Actions** pane and is available from the **Job Event Definition** and **System Events** dialogs.

Adding an SNMP Action

You can send an SNMP message (trap) to an SNMP manager in response to a job event or system event by creating an SNMP action.

To add an SNMP action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the **SNMP** option.
3. Click the **Add** button or right-click and select **Add Action** from the context menu to display the **Action Definition: SNMP** dialog.
4. In the **Action Name** field, type a name for this action (up to 30 characters). The name must be unique.
5. If you wish to make the action public, select the **Public** option. When an action is public, the action will be available to all CWA users, within the bounds of their security policy.
6. Select the desired **Owner** from the drop-down menu in the **Owner** field.
7. Click the **Details** tab.

8. In the **Severity Level** field, select the severity level for the SNMP message from the drop-down menu. (Refer to your SNMP manager software documentation for an explanation of how the severity level is interpreted.)
9. In the **Message** field, type the SNMP message. In this field you have the option of inserting one or more CWA system variables. Click where you want to insert the variable, and then click **Variables** to choose a variable from the **Variables** menu.
10. To enter a description for your SNMP action, click the **Description** tab, and type your description in the **Description** field.
11. Click **OK** and the action appears in the **Actions** pane and is available from the **Job Event Definition** and **System Events** dialogs.

Adding a New Job Action

You can submit a new job or job group to the production schedule in response to a job event or system event by creating a new job action. You can specify on which agent it will run, the runtime user, and override the default command parameters in the job or job group that is submitted.

To add a new job action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the **Job** option.
3. Click the **Add** button or right-click and select **Add Action** from the context menu to display the **Action Definition: Job** dialog.
4. In the **Action Name** field, type a name for this action (up to 30 characters). The name must be unique.
5. If you wish to make the action public, select the **Public** option. When an action is public, the action will be available to all CWA users, within the bounds of their security policy.
6. Select the desired **Owner** from the drop-down menu in the **Owner** field.
7. Click the **Details** tab.
8. In the **Job Name** field, click the **Browse** button to display the **Job Search** dialog.
9. Select the job or job group to add and click **OK**.
10. Adding a job group submits all the child jobs with one action. To achieve a similar result, you can assign multiple actions, each adding a separate job, to the same job event or system event.
11. From the **Agent** drop-down menu, select the agent on which to run the added job or job group. If no agent is selected, the job or job group runs on the agent that is defined in the job or job group definition. To clear an agent, right-click the **Agent** field, and select **Clear Agent** from the context menu, or use the **DELETE** key on your keyboard.
12. From the **Runtime User** drop-down menu, select the runtime user.
    a. If no user is defined, the runtime user in the job or job group definition is used. If the runtime user is not defined in the job or job group definition, the owner of the job or job group is used.
    b. To clear the runtime user, right-click the **Runtime User** field and select **Clear User** from the context menu or use the **DELETE** key on your keyboard.
13. To override the default values (if any) in the **Default** field, you can enter your own values or assign variables. If an added job contains command parameters, the **Override** field will display them.
    a. Select the parameter to override from the **Override** field.

b. Type the new value. You can choose from a menu of CWA variables using the **Variables** button.

Note: To override the agent used by a job, create a job action for the same job and assign a different agent. You can also use an ordered agent list, which will cause the job to use the next agent in the list if one fails.

14. To enter a description for your job action, click the **Description** tab, and type your description in the **Description** field.
15. Click **OK** and the action appears in the **Actions** pane and is available from the **Job Event Definition** and **System Events** dialogs.

Adding a Log Message Action

You can post a log message of your choice to the CWA log based on a job or system event. You can configure the log message's text, log level and whether or not it should also be logged in the Windows Event Log.

To add a Log Message action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the **Log** folder.
3. Click the **Add** button or right-click and select **Add Action** from the context menu to display the **Action Definition: Log** dialog.
4. In the **Action Name** field, type a name for this action (up to 30 characters). The name must be unique.
5. If you wish to make the action public, select the **Public** option. When an action is public, the action is available to all CWA users, within the bounds of their security policy.
6. Select the desired **Owner** from the drop-down menu in the **Owner** field.
7. Click the **Details** tab.
8. In the **Log Level** section, select the log level.
   - **Error** – Places the log into the error message class. Use this log level when your message explains an error that occurred.
   - **Audit** – Places the log into the audit message class. Use this log level when your message explains normal activity.
   - **Diagnostic** – Places the log into the diagnostic message class. Use this log level when your message contains detailed information, useful for diagnostic purposes.
9. In the **Windows Event Log** section, select whether you want the message to be logged to the Windows Event Log and assign an event number as an ID for the logging action. You can view these messages using the Windows **Event Viewer** application log.
   (If using an Unix master, this section is called the **Unix Console** and if the **Log to Unix Console** option is selected than events are recorded to a log file using the ID number assigned.)
10. In the **Log Message** field type the message. In this text field you can insert one or more CWA variables. Click in the location where you want to insert the variable and then click the **Variables** button to choose a variable from the variables menu.
11. To enter a description for your log action, click the **Description** tab and type your description in the **Description** field.
12. Click **OK** and the action appears in the **Actions** pane and is available from the **Job Event Definition** and **System Events** dialogs.

Adding a Variable Update Action

You can update a user-defined variable using an action. If the variable is a string, you can update its string value. If it is a number or date variable, you can increment, decrement, or simply change its numerical value. When editing a variable update action, you define which variable to update, the update value, and when to update the variable.

To add a Variable Update action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the **Variable** folder.
3. Click the **Add** button or right-click and select **Add Action** from the context menu to display the **Action Definition: Variable** dialog.
4. In the **Action Name** field, type a name for this action (up to 30 characters). The name must be unique.
5. If you wish to make the action public, select the **Public** option. When an action is public, the action is available to all CWA users, within the bounds of their security policy.
6. Select the desired owner from the drop-down menu in the **Owner** field.
7. Click the **Details** tab.
8. In the **Variable Name** field, select the name of the variable to affect with the action. (The variable must have been previously defined.)
9. In the **Type of Update** field, select how to update the variable:
   - **Set variable value to** – Replaces the existing variable's value to the value specified in the **Value** field.
   - **Increment variable value by** – If the variable is of the number or date type, increments the variable by the number in the **Value** field. If the variable is a string type, appends the string in the **Value** field to the variable.
   - **Decrement variable value by** – If the variable is of the number or date type, decrements the variable by the number in the **Value** field. If the variable is a string type, replaces the variable by the string in the **Value** field. In the UI, we have only "Set Variable Value to" option only available for string type.
10. In the **Value** field, type either a numeric value or a string to use for the update.

Type of Update	Set Variable Value to	Increment Variable Value by	Decrement Variable Value by
Number	Any real number	Any real number	Any real number
Date	Date string*	Any integer	Any integer
String	Any string	Not Applicable	Not Applicable

* The date format corresponds to the format configured in the operating system of the master.

11. In the **When to Update** field, select when the variable should update, before or after all other actions. If you want to use the variable's updated value in other actions that are triggered by the same event, select the **before other actions** option. For example, if you wanted to track how many times a job completes normally, you could create a variable called `Comp_Norm`. Then, you would have a variable update action increment `Comp_Norm` before other actions. You could then notify users how many times the job completed successfully with an email action that includes the `Comp_Norm` variable.

Changing an Action's Ownership

To change an action's ownership:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the folder for the type of action you want to see: **Email**, **Alert**, **SNMP**, **Job**, **Log** or **Variable**.
3. Double-click the action whose properties you want to change, or right-click the action and select **Edit Action** from the context menu or select the action and click the **Edit** button on the CWA toolbar.
4. In the **Owner** drop-down list, select a different owner.

Deleting an Action

You can delete an action that you no longer need. When you delete an action, it is removed from all associated job events and system events.

To delete an action:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the folder for the type of action you want to delete: **Email**, **Alert**, **SNMP**, **Job**, **Log** or **Variable**.
3. Right-click the action and select **Delete Action** from the context menu or select the action and click the **Delete** button on the CWA toolbar.
4. Click **OK** in the confirmation dialog to delete the action.

Viewing an Action's Properties

To view an action's properties:

1. From the **Navigator** pane, select **Definitions>Actions** to display the **Actions** pane.
2. Select the folder for the type of action you want to see: **Email**, **Alert**, **SNMP**, **Job**, **Log** or **Variable**.
3. Double-click the action whose properties you want to view, or right-click the action and select **Edit Action** from the context menu or select the action and click the **Edit** button on the CWA toolbar.

Alerts Interface

About the Alerts Interface

From the **Navigator** pane, select **Operations>Alerts** to display the **Alerts** pane.There cannot be any data in this pane until at least one alert action has been defined and triggered.

The **Alerts** pane lists the console alerts that were generated by alert actions. Alerts are a special type of action to bring specific conditions to the attention of the CWA operator. Alerts can also be used as a diagnostic tool to decipher the cause of the abnormal condition. For more information about alert actions, see Action Definition: Alert Dialog, page 180. More information on an alert is available by double-clicking it to display its **Alert Detail** dialog.

The **Alerts** pane displays all console alerts that are present on the system, up to the alert retention history as defined on the **Master** tab in the **System Configuration** dialog.

- **Alerts status light** – This light displays in different colors based on the status of the alerts in the **Alerts** pane.
  - **Red status light** – One or more **Critical** or **Error** alerts have not yet been acknowledged.

- **Yellow status light** – One or more **Warning** alerts have not yet been acknowledged, or one or more **Critical**, **Error** or **Warning** alerts have not yet been closed.
- **Green status light** – There are alerts present, but none need to be closed or there are no alerts present; alert actions may have been defined, but none have been triggered.

Buttons

- **Filter** – Displays the **Alert Filter** dialog to customize the data that displays in the Alerts pane.
- **Prior Day** – Displays the alerts for the day before the one currently displayed.
- **Select Day** – Displays the alerts for "today" or any other day.
- **Next Day** – Displays the alerts for the day after the one currently displayed.
- **Print** – Displays the **Reports** pane to view and print the contents of the **Alerts** pane. For more information, see Monitoring Production, page 313.

Columns

Note: Time – The date and time that the job event occurred triggering the alert. Alerts do not display for jobs that have been purged from history.

- **Status** – The status of the alert. A console alert can have a status of the following:
  - **Open** – The alert is new or has not yet been acknowledged or the status of the alert has been reset to open from an acknowledged or closed state. To reset the status of an alert to open, double-click the alert record to open the **Alert Detail** dialog, then select **Open** from the **Status** field drop-down menu.
  - **Acknowledged** – The alert has been acknowledged. To acknowledge an alert, right-click the alert and select **Acknowledge** from the context menu or double-click the alert record to open the **Alert Detail** dialog, then select **Acknowledge** from the **Status** field drop-down menu. To acknowledge multiple alerts at the same time, hold down the **SHIFT** key or the **CTRL** key on your keyboard while clicking your selections.
  - **Closed** – The alert has been closed. To close an alert, right-click the alert and select **Close** from the context menu or double-click the alert record to open the **Alert Detail** dialog and then select **Closed** from the **Status** field drop-down menu.
- **Job No.** – The job number of the job that issued the alert.
- **Job Name** – The name of the job that issued the alert.
- **Alert Message** – The alert message as defined in the alert action definition.
- **Level** – The severity level of the alert. Possible severity levels are critical, error, warning and information. Severity levels can be used to filter and sort the data in the **Alerts** pane.
- **Response** – The response entered by the operator in the **Alert Detail** dialog. The **Alert Detail** dialog is available by double-clicking the alert in the **Alerts** pane.
- **Response Time** – Displays the time the alert was acknowledged or closed. If the alert is in the open state, this field is blank.

Alerts Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Alerts** pane, the **Alerts Preferences** dialog displays.

Columns Tab

From the **Columns** tab of the **Alerts Preferences** dialog, you can select which columns are displayed in the **Alerts** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Colors Tab

On the **Colors** tab of the **Alerts Preferences** dialog, select the color to be used for alerts of that type from the drop-down menu in the **Critical Alert**, **Error Alert**, **Warning Alert** and **Information Alert** fields.

Sound Tab

On the **Sound** tab of the **Alerts Preferences** dialog, specify the following:

Note: Audible Critical/Error Alerts – Specify if **Critical** and **Error** level alerts should be audible. If several alerts occur in less than 30 seconds apart, the alert will sound only once.You must specify a *.wav* file in the **Wave File** field for the **Audible Critical/Error Alerts** option to take affect. Most Windows installations will include some *.wav* files.

- **Wave file** – Select the **.wav** sound file to play when the **Critical** or **Error** alert occurs. You can click the **Browse** button to select a file using the **Open** dialog.
- **Duration ... (in seconds)** – Specifies how long the alert sound will play.
- **Test** – Click to play the sound specified in the **Wave file** field.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Alerts** pane, the **Navigator** context menu displays.

The **Alerts Navigator** context menu contains the following options:

- **Filter** – Displays the **Alert Filter** dialog to filter the job occurrences whose alerts are displayed. Has the same function as the Filter button on the toolbar. You can also custom-sort the alerts. For more information on the alert filter, see Alert Filter Dialog, page 195.
- **Prior Day** – Displays the alerts for the day before the one currently displayed. Has the same function as the **Prior Day** button on the toolbar.
- **Next Day** – Displays the alerts for the day after the one currently displayed. Has the same function as the **Next Day** button on the toolbar.
- **Select Day** – Displays a calendar to select the date whose alerts you want to view. Has the same function as the **Select Day** button on the toolbar.
- **Preferences** – Displays the **Preferences** dialog for the **Alerts** pane.
- **Print** – Displays the **Reports** pane to view and print your alerts display. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** – Updates the data in the current pane.

Alerts Context Menu

When you right-click in the **Alerts** pane, the **Alerts** context menu displays.

The **Alerts** pane context menu contains the following options:

- **Details** – Displays the **Alert Detail** dialog. This menu option is available only when an alert has been selected.
- **Filter** – Displays the **Alert Filter** dialog. The **Alert Filter** dialog allows you to manipulate the **Alerts** pane display. For more information on the **Alert Filter** dialog, see Alert Filter Dialog, page 195.
- **Prior Day** – View the alerts generated the day before the one you are currently viewing.
- **Next Day** – View the alerts generated for the day after the one you are currently viewing.
- **Select Day** – Select a specific date for which to view the generated alerts.
- **Acknowledge** – Sets the status of an alert to **Acknowledged**. This menu option is available only when an alert has been selected.
- **Close** – Sets the status of an alert to **Closed**. This menu option is available only when an alert has been selected.
- **Job Details** (available only for alerts generated by a job or job group) – Displays the details about the job that generated the alert.
- **Insert New Job Instance** (available only for alerts generated by a job or job group) – Inserts a new instance into the schedule of the job or job group that generated the alert.
- **Job Control** (available only for alerts generated by a job or job group) – Displays the same job control context menu available in the **Job Activity** pane for user convenience to perform job control functions on the job or job group that generated the alert. This allows you to override dependencies, release or rerun a job, cancel a job or set the status of a job that generated the alert.
- **Print** – Prints a report of all current alerts to the screen in a CWA **Report window**. You can then print this report to a printer, or just close the pane.

Alert Detail Dialog

The **Alert Detail** dialog displays when you double-click an alert record in the **Alerts** pane. Alerts are generated by alert actions that are associated with job or system events.

This dialog contains the following elements:

- **Time** – The date and time the alert action issued the alert.
- **Level** – The alert's severity level, as defined in the alert action's definition.
- **Description** – The text of the alert, as specified in the alert action definition's **Alert Message** field. (Any variables used in the **Alert** message have been replaced with their values.)
- **Job No.** – The job occurrence number associated with the alert.
- **Job Name** – The name of the job that issued the alert.
- **Status** – The status of the alert: **Open**, **Acknowledged** or **Closed**.
- **Response** – This field, if the alert was generated by a job or job group, displays audit information about any job control actions taken in response to this alert. Any messages, if any, entered at the time of acknowledgement or closure of an alert are also displayed.

Alert Filter Dialog

The **Alert Filter** dialog displays when you select **Filter** from the **Alerts** pane context menu. Use the **Alert Filter** dialog to limit the alerts that you see according to different parameters.

This dialog contains the following elements:

- **Open** – Shows all alerts that have just been generated or have not yet been acknowledged or closed.
- **Acknowledged** – Shows all alerts that have been acknowledged.
- **Closed** – Shows all alerts that have been responded to and closed.
- **Critical** – Shows all alerts with a severity level set to critical, indicating that the console alert should be responded to immediately.
- **Error** – Shows all alerts with a severity level set to error, indicating that an error occurred on the associated job.
- **Warning** – Shows all alerts with a severity level set to warning, warning the operator of a potentially damaging situation regarding the associated job.
- **Information** – Shows all alerts with a severity level set to information, indicating that the operator should take notice of the information given regarding the job.

  Note: If **Critical** and **Error** alerts are filtered out, any associated audible alert will not sound.
- **Current Day** – Shows all the alerts that have been generated on the current day.
- **Date Range from ... to ...** – Shows all alerts generated during the time period specified.
- **Last ... Day(s) ...Hour(s) ...Minute(s)** – Displays all alerts generated during the specified time period.

Alerts Procedures

Acknowledging an Alert

To acknowledge an alert:

1. From the **Navigator** pane, select **Operations>Alerts** to display the **Alerts** pane.
2. Right-click the alert that you want to acknowledge and select **Acknowledge** from the context menu. To acknowledge more than one alert at the same time, hold down the **SHIFT** or the **CTRL** key on your keyboard while clicking your selections.

   -or-

Double-click the alert to acknowledge to display its **Alert Detail** dialog.

3. From the **Status** drop-down menu, select **Acknowledged**. You may also want to type notes in the **Response** field. CWA's auditing mechanism will log the change in status of the alert.
4. Click **OK** to close the dialog and save the changes.

Closing an Alert

To close an alert:

1. From the **Navigator** pane, select **Operations>Alerts** to display the **Alerts** pane.
2. You can right-click the alert and select **Close** from the context menu or double-click the alert to display the **Alert Detail** dialog and select the **Closed** option.

Filtering Console Alerts

You can define which alerts the **Alerts** pane displays by using the **Alerts Filter** dialog. You can filter alerts by status and severity level, or include alerts generated on the current day only or from a specified range of days.

To filter console alerts:

1. From the **Navigator** pane, select **Operations>Alerts** to display the **Alerts** pane.
2. Click the **Filter** button on the CWA toolbar or right-click and select **Filter** from the context menu to display the **Alerts Filter** dialog with all the available alert types.
   a. To filter alerts based on status, select **Open**, **Acknowledged** and/or **Closed**.
   b. To filter alerts based on severity level, select from the following: **Critical**, **Error, Warning** or **Information**
   c. To filter alerts based on date, select from **Current Day** or **Date range from... to...**
3. Click **OK**. The **Alerts** pane displays only alerts that fall within the parameters set in the **Alert Filter** dialog.

Note: For more information about the **Alert Filter** dialog, see Alert Filter Dialog, page 195.

Rearranging Columns in the Alerts Pane

To rearrange columns:

1. From the **Navigator** pane, select **Operations>Alerts** to display the **Alerts** pane.
2. From the **View** main menu, select **Preferences** or right-click the **Alerts** pane and select **Preferences** from the context menu to display the **Alerts Preferences** dialog.
3. Click the **Columns** tab.
4. Select the column and click the up or down arrows to arrange the titles into the desired order.

Selecting/Deselecting All Alert Filters

To select/deselect all alert filters:

1. Right-click in the **Statuses** or **Levels** section of the **Alert Filter** dialog.

Note: Select **Check All** or **Uncheck All** from the context menu.Selecting **Check All** or **Uncheck All** does not affect the **Days** section.

Sorting Console Alerts

You can sort the alerts displayed in the **Alerts** pane to change the order in which they are listed.

From the **Navigator** pane, select **Operations>Alerts** to display the **Alerts** pane.

- To sort alerts by status, click the **Status** column heading. The alerts are primarily sorted alphabetically by status, and secondarily by time.
- To sort console alerts by severity level, click the **Level** column heading. The alerts are primarily sorted alphabetically by severity level, and secondarily by time.

Note: To sort console alerts by job number, click the **Job** column heading. The alerts are sorted numerically in descending order by job occurrence number. Clicking column headings more than once toggles the sort order between ascending and descending.

7

Events

Overview

This chapter contains these topics:

- Job Life Cycle
- Events Definition Interface
- Event Types
- Event Activity Interface
- Event Procedures

Job Life Cycle

When a job enters the production schedule, it begins a life cycle consisting of five general phases:

1. The job waits in the schedule for its dependencies to be met.
2. The job enters a queue and waits for an execution slot to be available.
3. The job is launched on an agent.
4. The job runs.
5. The job completes and enters history.

Throughout the life cycle of a job, it goes through a variety of conditions that affect it. Some of these conditions arise from factors that occur within the job process and other conditions arise from factors outside of the job's life cycle. Some conditions are recognized as key occurrences within the process of job scheduling by designating them as event triggers.

Once the event condition is defined, a predefined action must be associated with it. In effect, an event defines a cause and effect–when this condition occurs, do this. Defining events allows you to create automatic responses to conditions within your system.

Some of these event triggers are predefined by CWA as internal events and some events are defined externally by users as conditions to be monitored by event monitors during designated times periods.

These event triggers are grouped into different categories according to the type of conditions that create the events.

Events Definition Interface

From the **Navigator** pane, select **Definitions>Events** to display the **Events** pane.

Buttons

- **Add Event** – Displays the **Event Definition** dialog to define a new event.
- **Edit Event** – Displays the **Event Definition** dialog to edit an existing event.
- **Copy Event** – Creates a copy of the selected event with the same information as the selected event, except for the name.
- **Delete Event** – Removes the selected event definition from the CWA database.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print your event definitions. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Name** – The name of the event.
- **Owner** – The owner of the event.
- **Enabled** – Whether or not the event is enabled for use.
- **Public** – Whether or not the event is public, that is, available to all CWA users.
- **Trigger** – The event condition that triggers the job event.
- **Modified** – The last time the event definition was modified.
- **Agent** (Available only with variable, file and email events) – Denotes the connection that is being monitored for the defined event conditions.

Event Types

About Event Types

- **Job Events** – Job events are caused by conditions that affect specific jobs. These conditions are often associated with the various statuses and changes that jobs go through during their life cycle. See Job Events, page 202 for a description of the user interface.
- **System Events** – System events are caused by conditions that affect multiple jobs. Unlike job events that are limited in their influence to specific jobs, system events have more global ramifications throughout your system. Examples are connection failures and problems with masters, queues and schedule compilations. See System events, page 207 for a description of the user interface.
- **Variable Events** – Variable events are user-defined variable conditions. A defined event condition will monitor a designated master during certain time periods for a predefined variable to match a specified value. See Variable Events, page 208 for a description of the user interface.
- **File Events** – File events are user-defined conditions that affect specified files during designated time periods. See File Events, page 210 for a description of the user interface.

Job and system events are defined as conditions that occur within CWA while variable, file and email are defined as conditions that occur outside of the system that CWA will monitor for.

- **MSSql Events** – MSSql events are defined as events that are triggered on Windows SQL Server for table, index, and row creation, modification and deletion.
- **OracleDB Events** – OracleDB events are defined as the detection of a change within a monitored Oracle datatable. This change can be the addition, modification or deletion of rows, indexes and tables.
- **Sap** – An SAP monitor is defined from the **SAP Event Definition** dialog. This dialog displays whenever you add or edit an SAP event.
- **Email Events** – Email events are user-defined conditions for monitoring for defined conditions within email. The condition is a specified text string in an email originating from a designated email server.
- **JMS Events** – You can define events acting as a "consumer" that can be used for monitoring selected topics or queues in the JMS systems.

Windows Event Log IDs

Every job or system event log action generates a entry to the CWA log. If you are running CWA on Windows, you can also choose to write to the Windows application log. Each Windows log message generated by a CWA event has a unique event ID number. The unique IDs make it possible to interact with other third party software. (These event IDs do not apply to the Unix platform.)

A complete list of both job and system event triggers and their event ID numbers is provided in Event ID Tables, page 343.

Events Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Events** pane, the **Events Preferences** dialog displays.

From the **Events Preferences** dialog, you can select which columns are displayed in the **Events** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Events** pane, the **Navigator** context menu displays.

The **Events Navigator** context menu contains the following elements:

- **Add Event** – Displays the **Event Definition** dialog for the selected type of event to add a new event. Has the same function as the **Add Event** button on the CWA toolbar.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print the selected type of event definitions. Has the same function as the **Print** button on the CWA toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane in HTML format.
- **Preferences** – Displays the **Preferences** dialog for the **Events** pane.
- **New Root Folder** – Allows you to create a new root folder for the **Navigator** pane.

Events Context Menu

When you right-click in the **Events** pane, a context menu displays.

The **Events** pane context menu contains the following elements:

- **Add Event** – Adds a new event by displaying the **Event Definition** dialog for the type of event selected.
- **Edit Event** – Edits the selected event by displaying its **Event Definition** dialog.
- **Delete Event** – Deletes the selected event.
- **Copy** – Creates a copy of the selected event with the same information as the selected event, except for the name.
- **Refresh** – Updates the data in the current pane.
- **Print** – Prints the event data.
- **Print Selected** – Prints the selected event's data.
- **Disable** – Deactivates the selected event making it unavailable for use.
- **Enable** – Activates the selected event making it available for use.

Job Events

About Job Events

A *job event* connects job event triggers to actions. For example, you can create a job event that sends you an email message (an email action) if any of your jobs complete with a **Completed Abnormally** status. Each job event that you create is associated with a particular event trigger, and can result in one or more actions that you select. You can make job events generic for assignment to multiple jobs. Job events can also be made public for all users of CWA to use. You can only view job events that belong to you and any workgroups you belong to.

The job event is created in the **Job Event Definition** dialog by linking predefined actions to the job event triggers that CWA provides.

CWA monitors every point of a job's life cycle to trigger job events. These job event triggers are associated with a job event from the **Job Event Definition** dialog.

The three general categories of *job event triggers* are:

- **Status Change** – The status of a job changes as it is processed.
- **Schedule Irregularity** – A job runs outside of its expected runtime, possibly affecting the schedule of other jobs

When a job is stuck in the launch status for more than five minutes (default time), an event is triggered. Right-click the job in the **Job Activity** pane and choose the **Job Control** option from the context menu. You can change the status of the job that is stuck in the launch status to the final status (**Completed Normally**, **Completed Abnormally**, **Externally Defined**, **Error Occurred**, **Orphaned**, and **Skipped**) using the **Set** option. The **Set** option will be disabled until the default time elapses. The default time can also be changed as desired by adding new *sysval* integer value (ID = 159) in sysval table.

Job Event Definition Dialog

The **Job Event Definition** dialog displays when you add or edit a job event.

Common to All Tabs

- **Event Name** – The name of the job event (up to 30 characters).

- **Event Trigger** – The condition that triggers the associated action(s).
- **Owner** – The user with full control over the event. By default, the owner is the creator of the event.
- **Apply this event to all jobs** – When this option is selected, the **Associated Job(s)** tab disappears and the actions are associated with all jobs. For example, if you want to always notify users if their agent is not available for their job, you can set up a job event with the **Agent for Job Unavailable** event trigger, an email action and then enable the **Apply this event to all jobs** option. If the agent goes down, all users with jobs scheduled to run on that agent will be notified.
- **Public** – Makes the event available to all users of CWA.
- **Enabled** – Makes the event active and available for use. When this option is disabled, you can still assign the event but it will not be triggered when the job runs.

Associated Action(s) Tab

This tab associates action(s) to the job event. An event must have at least one associated action before it can be enabled. The actions that are available are the actions that are predefined in the **Actions** pane. If you are defining a job event, then job control actions are also available. The associated actions will occur in sequence that they are listed.

- **Selected Action(s)** – The action(s) to issue when the event occurs. You can specify one or more actions for each event. The actions will occur in the order they are listed. You can rearrange the sequence of multiple actions by selecting an action and clicking the up or down arrow.
- **Available Action(s)** – The actions that you can assign to the job event. To assign an action, select the action and click the right arrow button. To select more than one action at the same time, hold down the **SHIFT** key or the **CTRL** key on your keyboard while clicking your selections.

  You cannot add the same action more than once. Although you can assign multiple actions to a job event, you can apply only one job control action to an event. Adding a second job control action will replace the original job control action displayed in the **Selected Actions** field. The actions available to use may be limited by your security policy.

  You can choose from the following types of job control actions that CWA provides (for Job events only):

  – **Cancel Pending** – Cancels the job occurrence but passes the job's dependencies to any successor jobs. In essence, the job goes into a **Waiting on Dependencies** state as the dependencies run. Once all of the job's dependencies are satisfied, the job ends with a **Cancelled Normally** status that is equivalent to a **Completed Normally** status.

  – Cancel/Abort

  Abort – Terminates the job if it is active, resulting in the job completing abnormally.

  Cancel – Cancels the job occurrence if it has not started yet.

  – Hold/Stop

  Hold – Prevents your job from running when its dependencies are met. The job changes its status to **Held**. You can release the job at a future time. (Not available for jobs running on Windows agents).

  Stop – Stops the execution of an active job. You can restart the job at a future time using the **Resume** job control. (Not available for jobs running on Windows agents).

  – **Operator Release NOT Required** – Specifies that when the event occurs, the operator does not need to release the job.

  – **Operator Release Required** – Specifies that when the event occurs, the operator must release the job.

- **Override** – Overrides any dependencies for which your job is waiting. It is recommended to use this option only with the **Job not ready by end of its time window** and **Job might not be ready by end of time window** event triggers.
- Release/Resume

Release – Releases a job that has the **Waiting On Operator** status.

Resume – Resumes a job that has either a **Held** or **Stopped** status.

- **Rerun** – Sets the maximum number of job reruns. To set the number of reruns, double-click **Rerun** in the **Available Action(s)** pane in the **Job Event Definition** dialog to display the **Event Parameter** dialog (see Event Parameter Dialog).

Maximum Reruns – Use to set the number of reruns. The default is 0. The maximum number the field can accommodate is 9999.

- **Set To Completed Abnormally** – Sets the job's completion status to **Completed Abnormally**.
- **Completed Normally** – Sets the job's completion status to **Completed Normally**. For example, when your process completes with a non-zero exit code, CWA assumes the job has completed abnormally. Using this action, with a **Job Completed Abnormally** job event trigger, the job will be reset with a final status of **Completed Normally**.

Note: Although job status can be changed using the **Set Status** action, the actual exit code of a job (0 for **Completed Normally**, non-zero for **Completed Abnormally**) is not changed.

- **Set To Error Status** – Sets the job's completion status to **Error Occurred**.
- **Set To External Status** – Sets the job's completion status to **Externally Defined.**
- **Set To Orphaned Status** – Sets the job's completion status to **Orphaned**.
- **Set To Skipped Status** – Sets the job's completion status to **Skipped**.

Event Parameter Dialog

The **Event Parameter** dialog displays by double-clicking on the **Rerun** action in the **Available Action(s)** pane in the . This dialog sets the maximum number of job reruns. To set the maximum number of times a job can rerun, enter a number in the **Maximum Reruns** field or use the arrow keys. Use zero if the job can rerun an unlimited amount of times. The maximum number of reruns available is 9999. The default value is zero.

Available Actions Context Menu

When you right-click in the **Available Action(s)** field on the **Associated Action(s)** tab of the **Job Event Definition** dialog, the **Available Actions** context menu displays.

The **Available Action(s)** context menu contains the following elements:

- **Add Mail Action** – Displays the **Action Definition: Email Message** dialog to send email to specified users when the event occurs. The action will be added to the **Actions** pane and to the **Available Action(s)** field. For more information about email actions, see Action Definition: SNMP Dialog, page 181.

  Note: When creating an email message for a system event about losing your database connection, do not use variables that will not work without a connection to the database, i.e., **<JobName>** or **<JobStatus>**.

- **Add Console Alert** – Displays the **Action Definition: Alert** dialog to send an alert to the **Job Activity** pane. The action will be added to the **Actions** pane and to the **Available Action (s)** field. For more information about console alert actions, see Action Definition: Alert Dialog, page 180.

  Note: Fundamental master and agent connection information is automatically logged by CWA, so you do not have to create a separate alert action for master or agent start or stop.

- **Add SNMP Action** – Displays the **Action Definition: SNMP** dialog to send an SNMP trap (or message) to an SNMP manager such as HP OpenView NNM. The action will be added to the **Actions** pane and to the **Available Action (s)** field. For more information about SNMP trap actions, see Action Definition: SNMP Dialog, page 181.
- **Add Job Action** – Displays the **Action Definition: Job** dialog to submit unscheduled jobs in response to the event. The action will be added to the **Actions** pane and to the **Available Action(s)** field. For more information about job actions, see Action Definition: SNMP Dialog, page 181.It is possible to create an infinite loop that continually submits jobs if a job inserted with a new job action is also listed in the **Associated job(s)** tab.
- **Add Log Action** – Displays the **Action Definition: Log** dialog to post user defined log messages to the CWA log or the Windows Event Viewer. The action will be added to the **Actions** pane and to the **Available Action (s)** field. For more information about log actions, see Action Definition: SNMP Dialog, page 181.
- **Add Variable Action** – Displays the **Action Definition: Variable** dialog to update a variable whenever a designated job action occurs. The action will be added to the **Actions** pane and to the **Available Action(s)** field. For more information about variable actions, see Action Definition: Variable Dialog, page 186.
- **Add SAP Event Action** – Displays the **Action Definition: SAP Event** dialog to send an SAP Event notification to a designated SAP instance when the action occurs in CWA. The action is added to the **Actions** pane and to the **Available Action(s)** field. For more information about SAP event notification actions, see Action Definition: Variable Dialog, page 186.
- **Edit/View Action** – Displays the **Action Definition** dialog for a user-defined action. This option is available from the context menu only if the action was selected as you right-click to open the context menu.

Associated Job(s) Tab

This tab is used to link the job event to any number of jobs. This tab does not appear if you selected the **Apply this event to all jobs** option. You can also assign job events in the **Job** and **Job Group Definition** dialogs. The specified event trigger is monitored for all jobs that are listed in this tab.

This tab contains the following elements:

- **Browse** – Displays the **Job Search** dialog where you can find and select a collection of jobs or job groups. You can also use the **Job Search** dialog to create a filter to restrict which jobs are listed in the drop-down menu.
- **Down-arrow** – Displays all jobs and job groups belonging to you and your workgroups in a drop-down menu. To narrow the number of jobs displayed, use the **Browse** button to display the **Job Search** dialog. When the **Job Search** dialog is closed, whatever jobs were found in the **Job Search Results** list are displayed in the drop-down menu. To select a job, you can select it and click **Add**.
- **Add** – Links a job(s) or job group(s) to the event trigger. The job(s) and/or group(s) that are linked are the ones you select from the drop-down menu, or **Job Search** dialog.

  The jobs that are added are displayed in the field below but they are not added (or associated with the job event) until the **Add** button is clicked.
- **Remove** – Removes a job or job group from the **Associated Job(s)** field when the job or job group is selected.

Description Tab

This is a free text field where you can provide a description and notes about this particular event, up to 255 characters.

Trigger History Tab

The **Trigger History** tab lists all of the instances when the event was triggered during the trigger history retention period. This retention period is configured on the **Default** tab of the **System Configuration** dialog.

There are usually only four columns of basic information about each time that the event occurred but a job event has two additional columns to identify the job that was triggered by the event.

This tab contains the following elements:

- **Trigger Time** – The date and time (in 24 hour format) when the event occurred.
- **Run Date** – The date and time (in 24 hour format) when the triggered action actually occurs. Normally this time will be the same as the Trigger Time but if there is some lag time built into the associated action, the Run Date will be later.
- **Job No.** – The instance number of the job that was triggered by the event. (job event only)
- **Job Name** – The name of the job triggered by the event. (job event only)
- **Connection** – The connection that the event monitor is watching. This could be the connection to a master, to a database or to an agent.
- **Status** – The current status of the event trigger. There are several statuses used.
  - **Scheduled** – The event trigger is scheduled for the current day
  - **Suspended** – The event trigger is scheduled for the current day but has been suspended using the **Suspend Monitoring** option in the **Monitor Control** context menu in the **Event Activity** pane.
  - **Outside time window** – The event trigger is scheduled for the current day but is currently outside of the event monitor's specified time windows and is thus inactive.

You can drill down to get additional information about each event instance listed in this **Trigger History** tab. Right-click any of the listed event triggers to either update the information with the **Refresh** option or you can display details about the trigger with the **Trigger Details** option.

Trigger Details Dialog

The **Trigger Details** dialog displays more information about an event instance that occurred. The **Trigger Details** dialog displays by selecting an event trigger listed in an **Event Details** dialog and right-clicking and selecting the **Trigger Details** option.

Trigger Details Dialog - Details Tab

The **Details** tab displays basic run information about the event trigger.

This tab contains the following elements:

- **Trigger Date** – The date and time when the conditions that triggered the event occurred.
- **Run Date** – The date and time that the event actually occurred. Most of the time this date and time will match the information in the **Trigger Date** field. Sometimes though there is a lag time between when the conditions defined as the event occur and when the actual event occurs. An example would be an event such as compiling a production day schedule. The event condition might be the start of a new production day at the designated time yet there might still be some period of time pass before the actual compilation of a new schedule occurs as the master takes care of prerequisite maintenance tasks.
- **Status** – The current status of the event.

Trigger Details Dialog - Triggered Actions Tab

The **Triggered Actions** tab provides information about the action(s) that the event initiated:

- **Trigger Time** – The date and time when the action was triggered.

- **Run Date** – The date and time that the action actually ran. Most of the time this date and time will match the information in the **Trigger Time** field. Sometimes though there is a lag time between when the action is triggered and when the action actual runs.
- **Action Type** – The type of action that ran.
- **Action Name** – The name of the action.

If an action triggered is a job action, you can display additional details about the job that was triggered.

The **Triggered Details** dialog displays by double-clicking on a trigger listed on the Triggered Actions page of the **Trigger Details** dialog or by selecting a trigger and selecting the **Job Details** option from the context menu. You can study details about the job that was triggered by the event from this dialog.

Right-click the job to display a context menu. You can update the details about the job by clicking the **Refresh** option.

Exit Codes Tab

This tab displays in the **Job Event Definition** dialog only if the **Job completed with specified exit code(s)** option is selected in the **Event Trigger** field. If you are creating a job event that is triggered by a specific exit code or a range of exit codes, type the exit code(s) on this tab. You can create several actions using different job event triggers keyed to different exit code ranges to denote various job statuses. The exit code you use is determined by the script you are using. The exit code value can range from 0 to 30,000.

Use the operator field to select an operator for comparing the exit code(s) specified in the adjacent fields.

- **=** – The exit code must match the specified value or within the range of values. This operator enables both value fields and is the *only* operator that can specify a range of values.
- **< >** – The exit code must be anything but the specified value. Essentially greater than or less than the specified value.
- **<** – The exit code must be less than the specified value.
- **<=** – The exit code must be less than or equal to the specified value.
- **>** – The exit code must be greater than the specified value.
- **>=** – The exit code must be greater than or equal to the specified value.

System events

About System Events

System events assign actions to events generated by the CWA master. For example, if the master is shutdown, you can notify users via email that jobs will not run until the master has started again. System events are useful for notifying interested users of conditions with system-wide effects.

You create system events much like job events, except that they are not associated with particular jobs, since they are applicable to all jobs. Each includes a system event trigger, and one or more actions to take when the event occurs. The system event is created in the **System Event** dialog by linking predefined actions to the system event triggers that CWA provides.

The CWA master is constantly monitoring for the conditions that trigger system events. The four categories of *system event triggers* monitored by CWA are:

- **Agent** – Agent connection and job execution information
- **Queue** – System and individual queue limit adjustments and job execution information

- **Production Schedule** – Compiling start and finish times and new production day information
- **Master** – Master start, stop, pause, resume and information

System Events Dialog

The **System Events** dialog displays when you add or edit a system event.

Common to All Tabs

- **Event Name** – The name of the system event (up to 30 characters).
- **Event Trigger** – The condition that causes CWA to trigger the assigned (associated) action(s).
- **Owner** – The owner of the system event. By default, the creator is the owner.
- **Public** – Makes this event available to all users of CWA as allowed by their security policy. You can create a default for this option on the **Defaults** tab in the **System Configuration** dialog.
- **Enabled flag** – Makes the system event available for use. When this option is cleared, the event cannot be triggered by the master. If the system event is inactive, the system event cannot be monitored by the master. Note that there are some major events that are always reported, with or without specifically defined system events.

Associated Action(s) Tab

This tab associates action(s) with the system event. An event must have an associated action before it can be enabled. For information about the fields on this tab, refer to Associated Action(s) Tab, page 203

Description Tab

This is a free text field where you can provide a description and notes about the system event (up to 255 characters).

Trigger History Tab

The **Trigger History** tab lists all of the instances when the event was triggered during the trigger history retention period. This retention period is configured on the **Default** tab of the **System Configuration** dialog. For information about the fields and options on this tab, refer to the Trigger History Tab, page 205.

Variable Events

About Variable Events

An event monitor can be defined to watch a designated variable on a master. Whenever the variable matches a specified value it becomes an event that triggers an assigned action.

Variable Event Definition Dialog

A variable monitor is defined from the **Variable Event Definition** dialog. The **Variable Event Definition** dialog displays whenever you add or edit a variable event.

In the **Navigator** pane, select **Definitions>Events>Variable Events** to display the **Variable Events** pane. To display the **Variable Event Definition** dialog, either right-click in the pane in the **Variable Events** pane and select **Add Event** from the context menu or click the **Add Event** button.

Common to All Tabs

- **Event Name** – The name of the system event (up to 30 characters).
- **Owner** – The owner of the system event. By default, the creator is the owner.

- **Public** – Makes this event available to all users of CWA as allowed by their security policy. You can create a default for this option on the **Defaults** tab in the **System Configuration** dialog.
- **Enabled** – Makes the event available for use. When this option is cleared, the event cannot be triggered by the master. If the event is inactive, the event cannot be monitored by the master.

Variable Monitor Tab

The **Variable Monitor** tab of the Variable Event Definition dialog designates a variable to be monitored and defines the characteristics of the variable that will trigger an action.

Monitor Section

In this section, designate a variable, a master associated with the variable and a value to be monitored for.

- **Master** – The local master where the variable resides.
- **Variable Name** – The name of the variable to update. The displayed variable name includes the type of variable it is, i.e., string, number or date. Choose from the drop-down list of user-defined variables.
- **Operator** – The relative operator used to determine whether the variable's value satisfies the dependency.
  - Equal (=)
  - Not Equal (<>)
  - Less Than (<)
  - Less Than or Equal To (<=)
  - Greater Than (>)
  - Greater Than or Equal To (>=)

  When text strings are used in comparison, higher letters of the alphabet are greater than lower letters. For example, **A** < **Z**. If the first letters of the string match, succeeding letters are used for comparison. For example, **AA < AZ**. The operation works similar to sorting strings.
- **Value** – The value used for the update. When updating a number type, you can use any real number (including negative numbers). When updating a string type, any set of characters (including numbers) are treated as a string. When updating a date type, the format will conform to the same format as set in the operating system of the master.
- **Variable** – Select this option to compare the value of the Variable Name to the value of another variable.
- **Master** – Select the remote master that this variable event will monitor.
- **Variable Name** – Select the variable associated with the remote master to be monitored.

Schedule Tab

The **Schedule** tab displays when the event monitor is scheduled to monitor for the defined event conditions. The fields on these tabs are the same fields that are on their respective tabs in their **Event Definition** dialogs. Refer to the Configuring the Schedule Tab on an Event Monitor, page 220 for more information about the fields on this tab.

Associated Action(s) Tab

This tab associates action(s) with the variable event. An event must have an associated action before it can be enabled. For information about the fields on this tab, refer to Associated Action(s) Tab, page 203.

Description Tab

This is a free text field where you can provide a description and notes about this particular event, up to 255 characters.

Trigger History Tab

The **Trigger History** tab lists all of the instances when the event was triggered during the trigger history retention period. This retention period is configured on the **Default** tab of the **System Configuration** dialog. For information about the fields and options on this tab, refer to the Trigger History Tab, page 205.

File Events

About File Events

An event monitor can be defined to monitor for a designated file and trigger an associated action whenever that file meets the defined conditions.

File Event Definition Dialog

A file event monitor is defined from the **File Event Definition** dialog. The **File Event Definition** dialog displays whenever you add or edit a file event.

In the **Navigator** pane, select **Definitions>Events>File Events** to display the **File Events** pane. To display the **File Event Definition** dialog, either right-click in the **File Events** pane and select **Add Event** from the context menu or click the **Add Action** button.

Common to All Tabs

- **Event Name** – The name of the system event (up to 30 characters).
- **Owner** – The owner of the system event. By default, the creator is the owner.
- **Public** – Makes this event available to all users of CWA as allowed by their security policy. You can create a default for this option on the **Defaults** tab in the **System Configuration** dialog.
- **Enabled** – Makes the event available for use. When this option is cleared, the event cannot be triggered by the master. If the event is inactive, the event cannot be monitored by the master.

File Monitor Tab

The **File Monitor** tab defines the file and the event characteristics that a file monitor will watch for.

This tab contains the following elements:

Monitor Section

- **Agent Name** – Enter or select the name of the agent that will process the file.
- **Directory** – Designates the directory where the file being monitored is located.
- **File Mask** – A specific file name can be entered or a mask using the asterisk (*) and question mark (?) characters can be created to filter for certain files to be monitored.

Any combination of the following criteria options can be selected to apply to the file.

- **Wait until file is at least this size (bytes):** – The file must reach the size (in bytes) that is specified here.
- **Milliseconds delay before processing:** – The event monitor must wait the number of milliseconds specified here before it can react to the defined event.

- **File size stable for (milliseconds):** – The file size must remain unchanged for the specified number of milliseconds before the event conditions are met.

Disposition Section

- **Operation** – There are two options that can be done to the file being monitored when the specified conditions are met:
  - **Move file to target directory** – Moves the monitored file to the directory that is specified in the **Target** field. This does not replace any of the existing files in the target directory.
  - **Delete file from source directory** – Deletes the monitored file from the directory designated in the **Source** field once the specified conditions are met.
- **Target** – Designates the directory location where the monitored file should be moved once the specified conditions are met.
- **Return file contents as output** – The contents of the file being monitored will be returned to the master as job output.

Schedule Tab

The **Schedule** tab displays when the event monitor is scheduled to monitor for the defined event conditions. The fields on these tabs are the same fields that are on their respective tabs in their **Event Definition** dialogs. Refer to the Configuring the Schedule Tab on an Event Monitor, page 220 for more information about the fields on this tab.

Associated Action(s) Tab

This tab associates action(s) with the file event. An event must have an associated action before it can be enabled.

- **Selected Action(s)** – The action(s) to issue when the file event occurs. You can specify one or more actions for each event. The actions will occur in the order they are listed. You can rearrange the sequence of multiple actions by selecting an action and clicking the up or down arrow.
- **Available Action(s)** – The actions that you can assign to the file event. You can:
  - Assign an action – Select the action and click the right arrow button. To select more than one action at the same time, hold down the **SHIFT** key or the **CTRL** key on your keyboard while clicking your selections.

  You cannot add the same action more than once. Although you can assign multiple actions to a file event.The actions available to use may be limited by your security policy.
  - Create a new action – Right click in the Available Actions box, then choose one of these action types. The action types are described in Available Actions Context Menu, page 204.
  - Edit an action – Select an action in the Available Actions box, right click, and choose Edit/View Action.

Description Tab

This is a free text field where you can provide a description and notes about this particular event, up to 255 characters.

Trigger History Tab

The **Trigger History** tab lists all of the instances when the event was triggered during the trigger history retention period. This retention period is configured on the **Default** tab of the **System Configuration** dialog. For information about the fields and options on this tab, refer to the Trigger History Tab, page 205.

Event Activity Interface

About the Event Activity Interface

The **Event Activity** pane displays information about the status and activity of each event that has been defined. A user can only view events in this pane that are made public to all users or that belong to that user or the workgroups that the user is a member of. A user can drill down through each event record for more details about the circumstances of each event.

From the **Navigator** pane, select **Operations>Event Activity** to display the **Event Activity** pane. You can double-click any of the listed events to display its details.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Status Light** – The status light provides an at-a-glance graphic indicator of the current status of the event monitor. There are three colors used to indicate status:
  - **Green** – Scheduled status
  - **Yellow** – Outside time window status
  - **Red** – Suspended status
- **Times Triggered** – The number of times that the event monitor has been triggered during the current day.
- **Status** – The current status of the event monitor. There are three possible statuses:
  - **Scheduled** – The event trigger is scheduled for the current day
  - **Suspended** – The event trigger is scheduled for the current day but has been suspended using the **Suspend Monitoring** option in the **Event Control** context menu in the **Event Activity** pane.
  - **Outside Time window** – The event trigger is scheduled for the current day but is currently outside of the event monitor's specified time windows and is thus inactive.
- **Name** – The name of the defined event monitor.
- **Owner** – The user account that owns the event. By default, the user that defined the event is the owner.
- **Public** – Indicates if the event monitor is available to other users.
- **Trigger** – Displays the trigger assigned to the event monitor.
- **Modified** – Displays the last date and time that the parameters of the event monitor were changed.
- **Type** – Displays the type of event monitor.
- **Agent** – Displays the name of the connection that is being monitored.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Event Activity** pane, the **Navigator** context menu displays.

The **Navigator** context menu for the **Event Activity** pane contains the following options:

- **Preferences** – Displays the **Preferences** dialog for the **Job Activity** pane.
- **Print** – Displays the **Reports** pane to view and print your connection definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an HTML file.
- **Refresh** – Updates the data in the current pane.
- **New Root Folder** – Adds a new root folder to the **Navigator** pane.
- **New Sub Folder** – Adds a new sub folder to the **Navigator** pane.

Event Activity Pane Context Menu

When you right-click in the **Event Activity** pane, the **Event Activity** context menu displays. The **Monitor Control** options only apply to external events such as file, email or variable events that have defined a monitor. The **Event Activity** context menu has the following options:

- **Monitor Control** – The **Monitor Control** submenu has the following control options:
  - **Suspend Monitoring** – Suspends the monitoring activity of the selected event monitor.
  - **Resume Monitoring** – Resumes the monitoring activity of the event monitor that was suspended.
- **Details** – Displays the **Event Details** dialog for the selected type of event occurrence. Alternately, you can display these dialogs by double-clicking the individual event monitor record.
- **Print** – Displays the **Reports** pane to view and print your connection definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **New Root Folder** – Adds a new root folder to the **Navigator** pane.
- **New Sub Folder** – Adds a new sub folder to the **Navigator** pane.

Event Activity Preferences Dialog

Select **Preferences** from the **View** main menu while viewing the **Events Activity** pane to display the **Event Activity Preferences** dialog.

This dialog contains the following elements:

- **Columns** – From the **Columns** tab, you can select which columns are displayed in the **Job Activity** pane and in what order they appear.
  - A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
  - To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Event Details Dialog

The details for any event listed in the **Event Activity** pane can be displayed by either double-clicking it or by right-clicking it and selecting **Details** from the context menu. Those events that define monitors have additional tabs to provide details specific to that type of event.The fields on the tabs of the **Event Details** dialog are read-only though a user can update the information in the fields at any time by selecting the **Refresh** option from the context menu.

Common to All Tabs

- **Event Name** – The name of the event (up to 30 characters).

- **Event Trigger** – The condition that causes CWA to trigger the assigned (associated) action(s).
- **Owner** – The user account that owns the event. By default, the user that defined the event is the owner.

See also:

- Event Details – Status Tab
- Event Details – Variable, File and Email Monitor Tabs
- Event Details – Schedule Tab
- Event Details – Description Tab
- Event Details – Triggered Today Tab
- Event Details – Trigger History Tab
- Event Details – Time Window Dialog

Event Details - Status Tab

The **Status** tab provides details on the current status of the event trigger.

- **Current Status** – The event's current status.
- **Times Triggered** – The number of times that this event has been triggered.
- **Last trigger condition time** – The date and time of the last time the event was triggered.

Event Details - Variable, File and Email Monitor Tabs

These tabs appear depending upon the type of event selected. Job and system events do not have these tabs because they do not require a monitor. The fields on these tabs are the same fields that are on their respective tabs in their **Event Definition** dialogs.

Event Details - Schedule Tab

These tabs only appear for variable, file and email events. The **Schedule** tab displays when the event monitor is scheduled to monitor for the defined event conditions. The fields on these tabs are the same fields that are on their respective tabs in their **Event Definition** dialogs. Refer to the Configuring the Schedule Tab on an Event Monitor, page 220 for more information about the fields on this tab.

The **Schedule** page of an Event Details dialog only appears when defining events that occur externally. External events such as in an e-mail, file and variable events, require a monitor and the monitor requires a calendar to schedule when the monitor should operate. Job and system events do not have a monitor because they respond to internal conditions and thus do not need a schedule. From the **Schedule** page, you define when the event monitor operates. On this page, you can assign a defined calendar, limit how frequently the event monitor responds to defined conditions and restrict the event monitor to designated time windows. This same page is displayed in the Event Details dialog for the defined event except the text fields are read-only to provide information about the event that occurred. This page has the following options:

- Calendar Section
- Time Window Section

Calendar Section

You can specify scheduling criteria to assign the days that the event monitor will run and provide a calendar offset.

- Calendar Name – The calendar or calendar group indicating which days the event monitor should run. You must select a calendar for the event monitor to be scheduled automatically. Select the Calendar Name from the list. A calendar can encompass one or more days. If you do not select a calendar than the event monitor will run every day.

  You can clear a calendar by right-clicking on the **Calendar** field and selecting **Clear** from the context menu or by pressing the **Delete** key.

- Offset – The job will run a given number of days before or after every day in the calendar. Each day in the calendar is adjusted by the offset you provide. For example, if the event monitor is using the Fiscal Month End calendar with an offset of 2, the event monitor will be inserted into the schedule 2 days after Fiscal Month End date. If you use an offset of -2, the event monitor will be inserted 2 days before the Fiscal Month End date.

- From – The earliest date that the event monitor should be active. The event monitor will operate starting from the first date in the calendar that is on or after this date. You can choose a date using the built-in calendar dialog by clicking the adjacent drop-down arrow.

- To – The last date the event monitor can operate based on the calendar. If not specified, and your calendar includes repetitive dates, your event monitor will run indefinitely. You can choose a date using the built-in calendar dialog by clicking the adjacent drop-down arrow.

- Forecast – This button displays the **Calendar Forecast** dialog for the selected calendar (adjusted by offset, if provided) showing all the dates for which the event monitor will be active.

Time Window Section

Selecting this option will limit the event monitor to being active only during the defined time windows that are listed here. If this option is not selected then the event monitor will always be active. This section lists multiple time windows that the event monitor will monitor for the defined conditions. Any number of time windows can be created.

- Only start the job between the hours of:...and – A sequence number for the defined time window.

- If not ready by end of time window

  - Do not time out – Select this option if you want the job to continue to run without timing out.

  - Run again tomorrow – Select this option if the job has not run by the end of the time pane specified, and you want to carry it forward to the next day. After the time pane has passed, the job has the status **Timed Out For Day**. With this option selected, the job is eligible to run on each subsequent day, until it does run. You can set up a job action to notify you if your job does not run on the originally scheduled day.

  Note: Each instance of the job that is scheduled through the Repeats section rechecks the dependencies of the original job.

- No repeats – Only one instance of the job is compiled for each production day that the job is scheduled to run.

- Run new occurrence every X minutes, up to Y times

  - X – The interval between consecutive job start times in minutes relative to the beginning of the time window.

  - Y – The number of instances to create for the job. A job does not launch after the end of its time window. If this text field is left blank, the job continually repeats until the end of the time range specified above, or if the time window is omitted, until 11:59 PM of that day.

The following rules govern this function:

  - If the job is defined to run at specific intervals relative to a time window, the resultant run times are fixed.

  For example, if a job's time window begins at 12:00 PM, and the job is defined to run every hour up to 4 times, the job runs at 12:00 PM, 1:00PM, 2:00PM and 3:00PM. If the Create Schedule command occurs at 1:30PM, this job runs twice, once at 2:00 PM and once at 3:00 PM (unless the Start repeats now option is selected).

If no time window is supplied, the job begins at 12:00 AM, and repeats the number of times specified.

- If you change the job definition while one of the repeat jobs is running, and the repeat count is changed, all job instances in pre-launch statuses are removed from the production schedule. The number of job instances added equal the total number of instances specified minus the number of job instances already launched.

For example, if you specify that Job A runs four times, and the second instance has started, and then you change the repeat count to 5, the two instances that ran remain in the schedule. The two jobs that have not run yet are removed, and three jobs are added to run in sequence after the second instance finishes.

- The **Run new occurrence every ... occurrence** option is ignored for jobs manually added to the schedule. Only one instance of the job is scheduled.
- If the job is manually added to the schedule, and other jobs depend on the last instance of this job, the dependencies are updated to reflect the new instance.

- Rerun same occurrence after ... minutes up to ... times – This option is similar to the one above with a few exceptions. Only one instance of the job is created. Rather than creating a new job instance, the same job instance will rerun after **x** number of minutes up to the prescribed y number of times. **x** is the interval between completion of the previous run and the beginning of the next one. This means that the actual rerun frequency is **x** plus the actual job runtime interval. The Rerun same occurrence after ... minutes up to ... times option also applies to repeating jobs that are manually added to the schedule (from the Insert Job into Schedule context menu option)

  Caution: Jobs dependent on a job using the **Rerun same occurrence after ... minutes up to ... times** option will never be satisfied. Instead:

  - Put both jobs under the same group.
  - For the group, select the **Rerun same occurrence after ... minutes up to ... times** option on the Schedule page of the Job Group Definition dialog.
  - For each job, select the **No repeat** option on the **Schedule** page of the **Job Definition** dialog.

  If you do not specify how many times a job should repeat, it will repeat throughout the day at the designated interval. The option to begin today's repeating jobs when the job is submitted is not offered in the **Effective Date** dialog.

Note: If a job group configured with the rerun same occurrence option has already completed some jobs, do not modify its definition. Modifying the parameters of the job group after some of its jobs complete will result in some jobs not rerunning as they should.

Event Details - Description Tab

Displays any description about the use and purpose of the event.

Event Details - Triggered Today Tab

The **Triggered Today** tab lists all of the instances when the event was triggered during the current production day. The columns of information on this tab is the same as the ones on the **Trigger History** tab. Once the current production day ends, the information on this tab is moved to the **Trigger History** tab. Like the **Trigger History** tab, you can also drill down to get more information about the event trigger, and, if a job event, more information about the job that the event was associated with. Refer to the Trigger History Tab, page 205 for more information about the fields on this tab.

Event Details - Trigger History Tab

The **Trigger History** tab lists all of the instances when the event was triggered during the trigger history retention period configured in the **System Configuration** dialog. The fields on this tab are the same fields as on the **Triggered History** tab of the **Event Definition** dialog. Refer to the Trigger History Tab, page 205 for more information about the fields on this tab.

Event Details - Time Window Dialog

The Time Window dialog displays when defining an event and you want to limit how frequently the event monitor responds to defined conditions and restrict the event monitor to run only during designated time windows.

This page contains the following elements:

- **Row** – The date and time when the event occurred.
- **From Time** – The time you want the event to run.
- **Until Time** – The time you want the event to stop running.

Event Procedures

Adding Jobs and Job Groups to Job Events

You can link any number of jobs or job groups to a job event.

To add a job/job group to a job event:

1. Select one of the defined job events in the **Job Events** pane.
2. Double-click the job event to edit from the **Job Events** pane, or right-click the job event and select **Edit Event** from the context menu, or select the job event and click the **Edit** button on the CWA toolbar to display the **Job Event Definition** dialog.
3. Click the **Associated Job(s)** tab.
4. The drop-down arrow button lists all the jobs you own and that are owned by workgroup to which you belong.
5. Select the job(s) and/or job group(s) you want to associate to this job event and click the **Add** button.

Associating Actions to Events

You can associate any number of actions to an event. However, if you are using a job control action type (Job events only), then only one job control can be associated (or combined with the other action types) at any time. When the event trigger occurs, all the actions that are associated with the event will occur.

To associate actions to events:

1. From the **Navigator** pane, select **Definitions>Events** to display the **Events** pane.
2. Double-click the event or right-click the event and select **Edit Event** from the context menu, or select the event and click the **Edit** button on the CWA toolbar to display the **Event Definition** dialog.
3. Click the **Associated Action(s)** tab.
4. In the **Available Action(s)** field, select the action(s) to associate with the event.

You can select the actions and then use the left arrow button (<). To select more than one action at the same time, hold down the **SHIFT** key or the **CTRL** key on your keyboard while clicking your selections, then click the left arrow button.

Job control actions are displayed in the **Available Actions** field if you are working on a Job event.

Note: It is possible to create an infinite loop that continually submits jobs if you assign a new job action that inserts a job that is also listed in the **Associated job(s)** tab.

Changing the Ownership of Events

To change the ownership of an event:

1. From the **Navigator** pane, select **Definitions>Events** to display the **Events** pane.
2. Double-click the event to edit from the **Events** pane or right-click the event and select **Edit Event** from the context menu, or select the event and click the **Edit** button on the CWA toolbar to display its **Event Definition** dialog.
3. From the drop-down menu in the **Owner** field, select a new owner of the event.

Creating a Job Event

You can create a job event that connects an event trigger to one or more actions. You can link jobs or job groups to job events at any time either from the **Job Event Definition** dialog or the **Job Definition** or **Job Group Definition** dialogs. Actions are associated with a job event only from the **Job Event Definition** dialog.

To create a job event:

1. From the **Navigator** pane, select **Definitions>Events>Job Events** to display the **Job Events** pane.
2. Click the **Add** button or right-click and select **Add Event** from the context menu to display the **Job Event Definition** dialog.
3. In the **Event Name** field, type a name for the job event (up to 30 characters).
4. If you do not want to own this job event, select another user or workgroup from the drop-down menu in the **Owner** field.
5. If you want this job event to be associated with all jobs, select the **Apply this event to all jobs** option; otherwise, you must click the **Associated Jobs** tab to select a job(s) to associated with the event.
6. If you want the event to be public, select the **Public** option. Note that if an event is public, all users of CWA with the appropriate security policy have access to that job event.
7. If you want to define the event now, but you are not ready to have it triggered, clear the **Enabled** option

Defining an Email Monitor

To define an email monitor:

1. From the **Navigator** pane, select **Definitions>Events>Email Events** to display the **Email Events** pane.
2. From the **Email Events** pane, right-click and select the **Add Event** option from the context menu, to display the **Email Event Definition** dialog.
3. In the **Event Name** field, enter a name for the email event.
4. By default, the user defining the event is the owner but you can select one of the other listed users from the drop-down menu as the owner.
5. In the **Email Connection** field, select a connection to an Exchange server. The connection must be already defined before it will appear in the drop-down list.
6. In the **Folder** field, enter the name of the mail account to be monitored.
7. In the **Conditions** section, designate what text is to be considered an event when it is detected.
8. Click the adjacent **Insert** button to add a line to the **Conditions** section.
    a. In the **Scan for Text** column, enter a text string that the monitor will scan for in the email going to the designated mail account.

b. In the **In** column, select from the drop-down list where in the email that the monitor should look for the text.

c. In the **Case Sensitive** column, designate whether the text match is dependent upon case.

d. In the **Disposition** section, select what will occur once the monitor detects the specified text. From the drop-down list in the **Operation** field, select an option. If you select the **Move message to folder** option, in the **Target** field, enter the pathname to the folder where you want the message stored.

e. If you want to access the message text from within CWA, select the **Return message body to Scheduler** option.

Defining a Variable Monitor

To define a variable monitor:

1. From the **Navigator** pane, select **Definitions>Events>Email Events** to display the **Email Events** pane.
2. From the **Email Events** pane, right-click and select the **Add Event** option from the context menu, to display the **Email Event Definition** dialog.
3. In the **Event Name** field, enter a name for the email event.
4. By default, the user defining the event is the **Owner** but you can select one of the other listed users from the drop-down menu as the owner.
5. In the **Master** field, select the master that owns the variable.
6. In the **Variable Name** field, select the variable to be monitored.
7. In the **Operator** field, select the operator to be used with the specified value.
8. In the **Value** field, specify the value that the variable needs.
9. If defining an intermaster variable so that the monitor will watch for a variable published from another master, select the **Variable** option and specify the **Master** and the **Variable Name**.

Defining a File Monitor

To define a file monitor:

1. From the **Navigator** pane, select **Definitions>Events>Email Events** to display the **Email Events** pane.
2. From the **Email Events** pane, right-click and select the **Add Event** option from the context menu, to display the **Email Event Definition** dialog.
3. In the **Event Name** field, enter a name for the email event.
4. By default, the user defining the event is the **Owner** but you can select one of the other listed users from the drop-down menu as the owner.
5. In the **Agent Name** field, enter the
6. In the **Directory** field, enter the path to the directory to be monitored for the file's appearance.
7. In the **File Mask** field, you can enter a file mask using wild card characters.
8. If needed, you can configure the monitor to delay its response or to only respond after the designated file is stable for a stated interval of time or reaches a certain size.
9. In the **Disposition** section, specify what should be done with the file when it meets the monitor's criteria.

10. In the **Operation** field, you can either delete the file or move it to another directory that is designated in the **Target** field.

11. If needed, you can select the **Return file contents as output** option include the file's contents as part of the job output.

Configuring the Schedule Tab on an Event Monitor

Whenever an event monitor is defined, it must be configured to watch for the defined event criteria at the crucial times. This is done by scheduling when the monitor should be active.

To configure the Schedule tab:

1. Select the **Schedule** tab in the event being defined.

2. In the **Calendar** section, select and configure a calendar as needed.

3. If you want to restrict how often events can be triggered:

a. Select the **Trigger Constraints** option and configure how often the event can be triggered within a designated interval:

- Set the maximum number of occurrences using **Trigger maximum of .**
- Set the number of minutes as the maximum threshold in **occurrences in ____ minutes.**

f. Optionally, select the **Ignore occurrences that exceed the limit** option to ignore occurrences that exceed the specified maximum.

Note: The trigger constraints apply to all time periods.

4. If you want the event monitor to operate only during certain periods of the day, select the **Time window** option and specify the time periods as described below. Otherwise, the event monitor operates all of the time.

a. Click **Insert** to create a row in the **Time window** field.

g. Enter a starting time in the **From Time** column and an ending time in the **Until Time** column.

h. Create as many time windows as needed.

Deleting an Event

You can delete an event that is no longer in use. When you delete an event, the job event is removed from the jobs and job groups associated with it.

To delete an event:

1. From the **Navigator** pane, select **Definitions>Events>Job Events** to display the **Job Events** pane.

2. Select the job event to delete and press the **DELETE** key on your keyboard or click the **Delete** button on the CWA toolbar or right-click the job event and select **Delete Event** from the context menu.

3. Click **OK** in the confirmation dialog to delete the job event.

Removing Actions from Events

To remove an action from an event:

1. Select an event in the **Events** pane.

2. Open the event definition by double-clicking the event or right-click the event and select **Edit Event** from the context menu, or select the event and click the **Edit** button on the CWA toolbar to display the its **Event Definition** dialog.
3. Click the **Associated Action(s)** tab.
4. In the **Selected Actions(s)** field, select the action(s) to remove from the job event, and click the right arrow button (>).

Removing Jobs/Job Groups from Job Events

To remove a job or job group from a job event:

1. From the **Navigator** pane, select **Definitions>Events>Job Events** to display the **Job Events** pane.
2. Double-click the job event to edit from the **Job Events** pane or right-click the job event and select **Edit Event** from the context menu, or select the job event and click the **Edit** button on the CWA toolbar to display the **Job Event Definition** dialog.
3. Click the **Associated Job(s)** tab.
4. From the **Associate Job(s)** field, select the job(s)/job group(s) to disassociate from the job event.
5. Click **Remove**

.Viewing Events

You can view all the events available to you according to your security policy and all public events in the **Events** pane. You can also view the job events for a job from the **Job Events** tab of the **Job Definition** and **Job Group Definition** dialogs.

From the **Navigator** pane, select **Definitions>Events>Job Events** to display the **Job Events** pane.

Viewing Jobs and Groups Associated With a Job Event

To view a job or job group associated with a job event:

1. From the **Navigator** pane, select **Definitions>Events>Job Events** to display the **Job Events** pane.
2. Double-click the desired job event from the **Job Events** pane, or click the **Edit** button on the CWA toolbar to display the **Job Event Definition** dialog.
3. Click the **Associated Job(s)** tab to display the jobs and job groups associated with the job event.

Viewing Job Events Associated With a Job or Job Group

To view a job event associated with a job or job group:

1. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
2. Double-click the desired job or job group or right-click and select **Edit Job/Group** from the context menu to display its **Job Definition** (or **Job Group Definition**) dialog.
3. Click the **Job Events** tab to display all job events associated with the job or job group.

8

Business Views

This chapter covers these topics:

- About Business Views
- Business Views Pane Interface
- View Properties Dialog
- Business View Procedures

About Business Views

The **Business Views** pane is a subset of the **Jobs** pane. It provides an alternate method of defining jobs. The **Business Views** pane offers a graphical way to create and modify jobs and their dependencies by clicking function buttons and dragging-and-dropping object icons from a toolbar. Using the mouse cursor, you can create workflows, rearrange the sequence of jobs and link dependencies to jobs as required.

Business Views Pane Interface

Accessing Business Views

From the **Navigator** pane, select **Definitions > Jobs > Business Views** to display the **Business View** window. The window is blank if you have not saved any Business Views.

If you have created and saved Business Views, they are listed in the window.

The **Business View** window contains the following columns of information about each listed View:

- **Name** – The name of the View.
- **Owner** – The user that owns (or created) the View.
- **Public** – Indicates if the View is available to other users.
- **Groups** – Indicates if the View depicts a job group and its children.
- **Jobs** – The number of jobs depicted in the Business View.
- **Modified** – The date and time that the View was last modified.

Business Views Preferences Dialog

While viewing the **Business View** window, select **View > Preferences** or right-click **Business Views** in the **Navigator** pane and select **Preferences** from the context menu to display the **Business Views Preferences** dialog.

Business Views Preferences - General Tab

The **General** tab manages the recursive behavior of jobs in the **Business Views** screen.

This tab contains the following elements:

- **Default View** – Specifies that the selected Business View is the default View. This option assigns the properties of the default View to new Business Views.
- **Add Children** – Automatically includes the immediate child jobs of any existing job group that is added to a View.
- **Add Children Recursively** – Automatically adds successive generations of the children of all child job groups. If this option is selected, the **Add Children** option is automatically selected also.
- **Add Predecessors** – Automatically includes the immediate predecessor jobs of any existing job or job group that is added to a View.
- **Add Predecessors Recursively** – Automatically includes the immediate predecessors of a job and includes all other ancestors of those predecessors. If this option is selected, the **Add Predecessors** option is automatically selected also.
- **Add Successors** – Automatically includes the immediate successor jobs of any existing job or job group that is added to a Business View.
- **Add Successors Recursively** – Automatically includes the immediate successors of a job and includes all other descendants of those successors. If this option is selected, the **Add Successors** option is automatically selected also.

Columns Tab

The **Columns** tab specifies which columns are displayed in the **Business Views** window and in what order the columns are arranged.

This tab contains the following elements:

- A check mark to the left of a column title indicates that it will be displayed in the window. No check mark indicates that the column will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while **Business Views** is selected, the **Navigator** context menu displays.

This context menu contains the following options:

- **Add Business View** – Displays a new **Business View** screen.
- **Preferences** – Displays the **Preferences** dialog for the Business View window.
- **Print** – Displays a print preview screen of the information listed in the columns shown in the **View** window. From this screen, you can print a report of the information in the columns.
- **Export** – Saves the data in the current window as an ASCII text file. You can then use the file data in other applications.
- **Refresh** – Updates the data in the current window.

Business View Window Context Menu

You create, modify and delete Views from the context menu that displays by right-clicking the mouse from inside the **Business View** window or by clicking the **Add Business View** button on the toolbar of the **Business View** window.

This context menu contains the following options:

- **Add View** – Displays a new **Business View** screen.
- **Modify View** – Displays the selected View.
- **Delete View** – Deletes the selected View.
- **Print** – Displays a print preview screen of the information listed in the columns shown in the **View** window. From this screen, you can print a report of the information in the columns.

Business View Canvas

Clicking an existing View listed in the **Business View** window or selecting the **Add View** option displays the Business View canvas.

From the Navigator pane, select Definitions>Jobs>Business Views to access any Views that you have saved. The window is blank if you have not saved any Views.

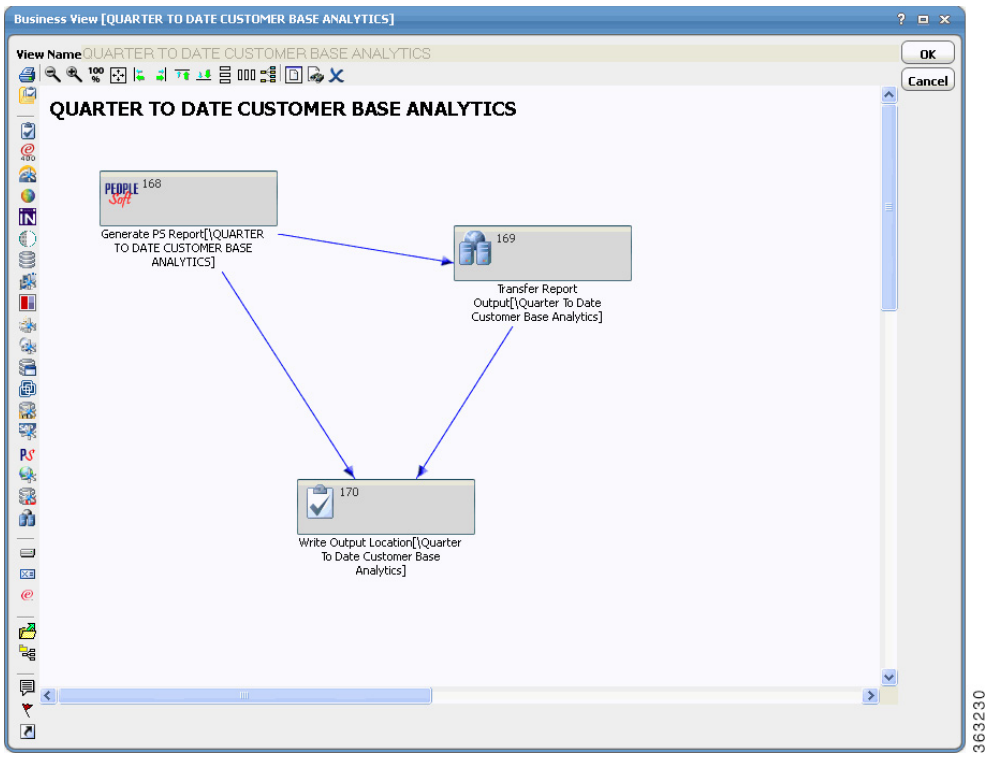
The View's canvas functions are controlled from the icons that run in a toolbar along the top of the screen. The creation and linking of job and dependency objects is controlled from a column of icons that run down the left side of the canvas.

The location of these toolbars can be adjusted. You can click on a toolbar and drag it from the top of the screen and dock it at the opposite side of the screen or leave it floating in the middle of the canvas. The new position of each toolbar is remembered in subsequent sessions.

Many of the toolbar options are available from a context menu so you can hide (or display a hidden toolbar) by right-clicking in the canvas area to display the context menu and selecting Hide/Show>Toolbars and selecting one of the listed toolbars.

- If a check mark is displayed beside the toolbar, selecting the option hides the toolbar.
- If a check mark is not displayed beside it, selecting the option displays the toolbar.

You can drag-and-drop from most of the buttons to the View canvas to create objects. The same functions provided by these buttons are also available as options in the Business View Window Context Menu that is displayed by right-clicking anywhere on the View canvas.



Images Repository Interface

The Image Repository page of the CWA client allows for the selection of an alternative icon for a job or group. This image is displayed on the Business Views window. See also Image Repository Procedures.

This page contains the following elements:

Buttons

The Images Repository page contains the following buttons:

- **Add** – Displays the to add a new image.
- **Rename** – Displays the to edit the image name.
- **Replace Image –** Displays the Replace Image dialog.
- **Delete** – Deletes the selected image.

Columns

To vary the way the list of users is sorted, click on the head of the column that you want to use as a sort key.

The Users pane contains the following columns:

- **Name** – The name of the image.
- **Type** – The image type (.jpg, .gif etc.).
- **Size** – The image size.

Context Menu

Right-clicking in the Image Repository page displays the context menu.

This context menu contains the following options:

- **Add** – Displays the Add Image dialog to add a new image.
- **Rename** – Displays the Rename Image dialog to edit/rename the selected image.
- **Delete** – Deletes the selected image.
- **Replace Image –** Replaces the selected image via the Replace Image dialog.

Rename Image Dialog

The **Rename Image** dialog displays when you click the Edit button or select the **Rename** option from the context menu of the **Images Repository** page.

To rename an image:

1. On the **Images Repository** page, select the image record you want to rename.
2. Click the **Edit** button or select **Rename** from the context menu.

   The **Rename Image** dialog displays.
3. Enter the new name for the image in the **Rename** to field.
4. Click **OK.**

Replace Image Dialog

The **Replace Image** dialog displays when you click the **Replace** button or select the **Replace Image** option from the context menu of the **Images Repository** page.

To replace an image:

1. On the **Images Repository** page, select the image record you want to replace.
2. Click the **Replace** button or select **Replace Image** from the context menu.

   The **Replace Image** dialog displays.
3. Click the **Browse** button and navigate to the location of the image.
4. Select the image, then click **Open**.

   The full path to the image displays in the **Select image to be uploaded** field.
5. Click **Upload**.

Image Repository Procedures

To add a new image:

1. Click the Add button or select the Add option from the context menu of the Image Repository page.
2. Click Browse to select an image from a specific location.
3. Select the image, then click Open.

The full path to the image displays in the Select image to be uploaded field.

4. Click Upload.

   This image will display on the Image Repository page.

To rename an image:

- See Rename Image Dialog.

To replace an image:

- See Replace Image Dialog.

To delete an image:

1. On the **Images Repository** page, select the image record you want to delete.
2. Click the **Delete** button or select **Delete** from the context menu.

View Properties Dialog

Accessing the View Properties Dialog

The basic properties governing the appearance and operation of the View canvas are controlled from the **View Properties** dialog. The **View Properties** dialog displays when right-clicking on the Business View canvas and selecting the **View Properties** option in the context menu.

General Tab

The **General** tab controls the general properties of the Business View.

This tab contains the following elements:

- **Owner** – The user that owns (or created) the current View. If the owner is a workgroup, any member of the workgroup can work with this View.
- **Zoom Scale** – Select the zoom percentage of the View screen.
- **Height** – The total height (in pixels) of the **View** screen.
- **Width** – The total width (in pixels) of the **View** screen.
- **Calculate Size to Fit** – Configures the current View size to fit all graphical objects within the View.
- **Show Captions** – Selecting this option will display the full job name underneath the job bars.
- **Public** – Selecting this option makes the View available to all users of CWA when viewing the **Jobs** pane. If this option is not selected, only the owner (whether an individual user or workgroup) can use the Business View.

Auto Arrange Tab

The **Auto Arrange** tab controls the behavior of the Automatic Arrangement feature applied to the Business View layout. Selected objects that are scattered randomly in the View are rearranged according to the properties specified on this tab.

The options in the **Advanced Options** section are used to configure the arrangement logic used in the most complicated Business View that contain many defined objects. Unless you thoroughly understand these options, it is recommended to use the defaults.

Depending upon the number and relationship of objects in a View, use of the advanced arrangement configuration options can slow down the display performance when using the **Auto Arrange** feature. The arrangement properties specified on this tab are applied to the selected objects in the View by clicking the **Auto Arrange** button .

This tab contains the following elements:

- **Column Spacing** – Specifies the horizontal distance (in pixels) between objects that are arranged in a column in the View.
- **Direction Option** – Specifies the directional orientation of the workflow displayed in the View. The linking arrows will point in the designated direction, e.g., the Up option flows from bottom to top.

Callouts Tab

The **Callouts** tab controls the default properties for the text callouts. Callouts are used to display additional information about an object.

This tab contains the following elements:

- **Width** – Specifies a default width (in pixels) for the callout. This width can be adjusted from the individual callout as necessary.
- **Row Height** – Specifies a default size (in pixels) for each line of text. This text size can be adjusted from the individual callout as necessary by dragging the green squares of the selected callout.
- **Background Color** – Clicking this button displays a **Color** dialog where the a background color for the callout can be selected from predefined colors or a new color can be created.
- **Text Color** – Clicking this button displays a **Color** dialog where a color for the callout text can be selected from predefined colors or a new color can be created.
- **Font** – Select the font to be used for the callout text from the list.
- **Italic** – Selecting this option displays the callout text in italic type.
- **Underline** – Selecting this option displays the callout text in underlined type.
- **Bold** – Selecting this option displays the callout text in bold type.
- **Custom Text** – Selecting this option displays any text that is typed in the box below.
- **Job Runbook** – Selecting this option displays any operator instructions that are entered on the **Runbook** tab of the job definition. If the **Load URL** option is selected on the **Runbook** tab after typing an URL for an internet or intranet site (or even a directory path on your system's network) then that Web page (or directory) displays. If you click the URL displayed in the caption, a separate window displays to show the Web page or directory contents of that URL.
- **Job Notes** – Selecting this option displays any notes about the job that are typed on the **Notes** tab of the job definition. If the **Load URL** option is selected on the **Notes** tab then the URL of the tab displays.
- **Sample of Chosen Font** – Displays the selected font as its appearance is currently configured.
- **Hide All Callouts** – Hides all callouts. You can also use the **Hide All Callouts** option from the context menu to hide the callouts.

  To display a specific callout that is hidden:

  a. Select the bar icon and right-click to display the context menu.

  b. From the **Add/Edit Extras** submenu, select the **Callout** option to display the **Callout Properties** dialog.

c. Clear the **Hidden** option.

Canvas Interface

About the Canvas Interface

The View's Canvas functions are controlled from the icons that run in a toolbar along the top of the screen. The creation and linking of job and dependency objects is controlled from a column of icons that run down the left side of the Canvas.

Many of the toolbar options are available from a context menu.

Layout Toolbar

The buttons in the toolbar that runs along the top of the Canvas have the following functions:

- **Align Left** – Aligns selected objects by their left side boundary. All objects will align with the left side of the leftmost selected object. To align other objects with another designated object, click the anchor object (a green boundary box will surround the object) and while holding down the CTRL key, select the other objects by either clicking them individually.
- **Align Right** – Aligns selected objects by their right side boundary. All objects will align with the right side of the rightmost selected object. Refer to the **Align Left** button section for details on aligning objects.
- **Align Top** – Aligns selected objects by their top boundary. All objects will align with the top of the highest selected object. Refer to the **Align Left** button section for details on aligning objects.
- **Align Bottom** – Aligns selected objects by their bottom boundary. All objects will align with the bottom of the lowest selected object. Refer to the **Align Left** button section for details on aligning objects.
- **Equal Vertical Spacing** – Spaces selected objects an equal distance apart in a column format.
- **Equal Horizontal Spacing** – Spaces selected objects an equal distance apart in a row format.
- **Auto Arrange** – Automatically arranges selected objects according to the properties configured on the **Auto Arrange** tab of the **View Properties** dialog.

Objects Toolbar

Along the left side of the **View** window are a column of buttons with various icons. Dragging-and-dropping these buttons onto the View canvas creates objects.

This toolbar contains the following buttons:

- **Job Group** – Clicking this button and dragging to the View canvas creates a job group bar. Double-click the job group bar to display a dialog to define the job group parameters.
- **Job** – Clicking this button and dragging to the View canvas creates a job bar. Double-click the job bar to display a dialog to define the job parameters.
- **OS/400 Job** – Clicking this button and dragging to the View canvas creates an OS/400 job bar. Double-click the OS/400 job bar to display a dialog to define the job parameters.
- **Horizon Job** – Clicking this button and dragging to the View canvas creates a Horizon job bar. Double-click the Horizon job bar to display a dialog to define the job parameters.
- **BusinessObjects Job** – Clicking this button and dragging to the View canvas creates a BusinessObjects job bar. Double-click the BusinessObjects job bar to display a dialog to define the job parameters.
- **Informatica Job** – Clicking this button and dragging to the View canvas creates a Informatica job bar. Double-click the Informatica job bar to display a dialog to define the job parameters.

- **JD Edwards Job** – Clicking this button and dragging to the View canvas creates a JDE job bar. Double-click the JDE job bar to display a dialog to define the job parameters.
- **JDBC Job** – Clicking this button and dragging to the View canvas creates a JDBC job bar. Double-click the JDBC job bar to display a dialog to define the job parameters.
- **SSH Job** – Clicking this button and dragging to the View canvas creates a SSH job bar. Double-click the SSH job bar to display a dialog to define the job parameters.
- **Cognos Job** – Clicking this button and dragging to the View canvas creates a Cognos job bar. Double-click the Cognos job bar to display a dialog to define the job parameters.
- **JMS Job** – Clicking this button and dragging to the View canvas creates a JMS job bar. Double-click the JMS job bar to display a dialog to define the job parameters.
- **Remote Job Job** – Clicking this button and dragging to the View canvas creates a Remote Job job bar. Double-click the Remote Job job bar to display a dialog to define the job parameters.
- **Oracle Applications Job** – Clicking this button and dragging to the View canvas creates an Oracle Applications job bar. Double-click the Oracle Applications job bar to display a dialog to define the job parameters.
- **VMWare Job** – Clicking this button and dragging to the View canvas creates an VMWare job bar. Double-click the VMWare job bar to display a dialog to define the job parameters.
- **MSSql Adapter Job** – Clicking this button and dragging to the View canvas creates a MSSql job bar. Double-click the MSSql job bar to display a dialog to define the job parameters.
- **SAP Adapter Job** – Clicking this button and dragging to the View canvas creates a SAP job bar. Double-click the SAP job bar to display a dialog to define the job parameters.
- **PeopleSoft Adapter Job** – Clicking this button and dragging to the View canvas creates a PeopleSoft job bar. Double-click the PeopleSoft job bar to display a dialog to define the job parameters.
- **WebService Job** – Clicking this button and dragging to the View canvas creates a WebService job bar. Double-click the WebService job bar to display a dialog to define the job parameters.
- **Oracle Database Adapter Job** – Clicking this button and dragging to the View canvas creates an Oracle Database job bar. Double-click the Oracle Database job bar to display a dialog to define the job parameters.
- **FTP Job** – Clicking this button and dragging to the View canvas creates a file dependency job bar. Double-click the FTP job bar to display a dialog to define the job parameters.
- **File Dependency** – Clicking this button and dragging to the View canvas creates a file dependency job bar.
- **Variable Dependency** – Clicking this button and dragging to the View canvas creates a variable dependency bar.
- **z/OS Dependency** – Clicking this button and dragging to the View canvas creates a z/OS dependency bar.
- **Get Jobs** – Clicking this button and double-clicking in the View window displays the **Job Search** dialog to enter search criteria to locate existing jobs to add to the View. (Refer to the Business Views Preferences Dialog, page 224 for information about recursive options for parent-child jobs.)
- **Create View from Group** – Select a group and then click this button to create a new View that displays only the selected job group and its children jobs with their respective dependencies. The selected group job bar receives a link icon to link to the new View and the parent group job bar in the new View also receives a link icon. By clicking the link icon , you can jump back and forth between the two Business Views. This option is only available if a job group bar is selected. (Refer to the Business Views Preferences Dialog, page 224 for more information about recursive options for parent-child jobs.)

- **Callout** – If a job or job group is selected when clicking this button, a text balloon that points to the selected job displays. By clicking anywhere on the text balloon you can move it around to reposition the callout text. The text balloon is bounded by little boxes.

  The callout can be repositioned around an object by clicking it and dragging the callout to the desired location.

  Double-clicking the callout displays the **Callout Properties** dialog.

  The **Callout Properties** dialog largely duplicates the **Callout** tab of the **View Properties** dialog. The difference is that the **Callout** tab of the **View Properties** dialog sets the universal properties for all callouts while the **Callout Properties** dialog configures the properties for the individual callout that was selected. Refer to the Callouts Tab, page 229 for more information on the options in this dialog.

  Notice that there is an option to hide the callout text. The showing and hiding of an individual callout is controlled from either the **Hidden** option in this dialog or one of options in the **Hide/Show** submenu in the **View** context menu.

- **Flag Job** – If a job or job group is selected when clicking this button, the **Flag Properties** dialog displays. You can then assign a colored flag to the selected job as a marker.

  You can designate a red, green, blue, yellow or black flag. If a flag is already assigned you can also delete it from this dialog. You can also type up to 4,000 characters of text about the flag to explain or describe it. These remarks are displayed by pausing the cursor on the flag.

- **Create Hyperlink** – Creates a Link bar icon and displays the **Choose a View for Link** dialog to create a link from the current View to another existing View. You click the link icon to display the linked View. To add the hyperlink to an existing job or dependency bar icon, select the bar icon and click this button (or use the **Hyperlink** option in the **Add/Edit Extras** submenu). To close the displayed dialog without creating a hyperlink, click **Cancel**.

Context Menu Options

Right-clicking the mouse anywhere on a View canvas displays a context menu of options. Many of these menu options replicate the functions of the various buttons on the toolbars along the Canvas edge. Some of the options are not available until a job or job group is selected. The options in the context menu are:

- **Add** – Selecting this option displays a submenu of the following options:

  – **Job** – This option displays a submenu of the following options:

  Select from Existing Jobs – Displays the **Job Search** dialog to enter search criteria to locate a defined job.

  Group – Creates a job group bar. Double-click the bar icon to define the parameters of the job group.

  Job – Creates a job bar. Double-click the bar icon to define the parameters of the job.

  – **Dependency** – Selecting this option displays a submenu of the following options:

  File – Creates a file dependency bar. Click the dependency icon and drag the cursor to a job bar to associate the dependency to that job. Once the dependency is associated to a job, a dialog displays to define the parameters of the file dependency.

  Variable – Creates a variable dependency bar. click the dependency icon and drag the cursor to a job bar to associate the dependency to that job. Once the dependency is associated to a job, a dialog displays to define the parameters of the variable dependency.

  – **Link Node** – Displays the Link bar icon and the **Choose a View for Link** dialog to create a link from the current View to another existing View. Click the link icon to display the linked View. To add the hyperlink to an existing job or dependency bar icon, select the bar icon and use the **Hyperlink** option in the **Add/Edit Extras** submenu. To close the displayed dialog without creating a hyperlink, right-click in the list and select the **Delete** option.

  - **View from Group** – Creates a separate View of a selected group bar and its children jobs. The selected group job bar receives a link icon to link to the new View and the parent group job bar in the new View also receives a link icon. By clicking the link icon , you can jump back and forth between the two Business Views. This option is only available if a job group bar is selected.

- **Add/Edit Extras** – Selecting this option displays a submenu of the following options:
  - **Callout** – Displays the **Callout Properties** dialog to add or modify the callout associated with a selected object.
  - **Flag** – Displays the **Flag Properties** dialog for the object you selected.
  - **Hyperlink** – Displays the **Choose a View for Link** dialog to add or change which defined View is linked.
- **Edit** – Displays the definition dialog for the selected object to modify its parameters.
- **Delete** – Deletes the selected object after you confirm that it should be deleted. If you wish to just remove the object from the View but not delete the actual job or dependency, select the **Remove from View** option.
- **Copy** – Copies the selected job or job group.
- **Rename Alias** – Changes the eight character name that appears inside the job object bar and updates the job alias in the job's definition.
- **Save** – Saves any changes to the current View.
- **Print** – Displays a **Print** dialog to configure the printing parameters.
- **Index** – Displays a list of the objects in the View with their names and the appropriate icons. Double-click a listed item to display it (with a green selection box).
- **Select All** – Selects all objects in the current View.
- **Show Missing** – Displays a list of children or dependencies that exist but are not displayed in the current View. Children and/or dependencies may not be displayed in the View because they were deleted from a View (but not from the database), they were added to a job or group that co-exists in another View or they were created in the CWA console instead of the View.
  - **Children** – Displays a list of child jobs that belong to the groups in the current View but are missing from the View. You can add missing children by dragging-and-dropping any of the listed items into the current View.
  - **Dependencies** – Displays a list of dependencies that are missing from the current View.
- **Remove from View** – Deletes the selected object from the View though the object remains in the database and can be seen in the Jobs window or on the **Dependencies** tab of the associated job definition.
- **Hide/Show** – Selecting this option displays a submenu of the following options:
  - **Hide Selected Objects** – Grays out the selected objects so they are only faintly visible. The objects will not show in the **Job Activity** pane.
  - **Hide All Callouts** – Hides all callouts to reveal more of the View canvas.
  - **Show Selected** – Shows the hidden objects that were selected, restoring them to the normal bold lines instead of the grayed out format.
  - **Show All** – Displays all jobs and dependency objects that have been hidden.
  - **Show All Callouts** – Displays all callouts that have been hidden.
  - **Show Unhidden Callouts** – Displays only those callouts that are not hidden individually.

- **View** – Selecting this option displays a submenu of the following options:
  - **Align** – Selecting this option displays a submenu of the following alignment options:

    Left – Aligns selected objects by their left side boundary.

    Right – Aligns selected objects by their right side boundary.

    Top – Aligns selected objects by their top boundary.

    Bottom – Aligns selected objects by their bottom boundary.
- **Refresh** – Updates the screen with recent changes to display the most current status of the View Canvas.
- **Properties** – Displays the **View Properties** dialog to configure the basic properties of the View window.

Business View Procedures

Create Jobs/Job Groups in the View

To create a job or job group in the View:

1. From the Object toolbar, select the appropriate job/job group icon and drag it onto the Business Views Canvas.
2. Double-click on the job/job group object to display its definition dialog and define its parameters.
3. Save the definition dialog.

Add a Child Job to an Existing Group

If a defined job in the View does not already belong to a job group, it can be added to any defined job group in the View.

To add a child job to an existing group:

1. From the Object toolbar, select the appropriate job icon or the **Get Job** icon and drag it onto the Business Views Canvas.
2. From the canvas, double-click the job object to display its definition dialog.
3. From the **Parent Group** list, select the job group you want the job assigned to.
4. If defining a new job, define the remaining parameters.
5. Save the definition dialog.

Create Dependencies in the View

To create a dependency in the View:

1. From the Object toolbar, select the appropriate job icon and drag it onto the Business Views Canvas.
2. Double-click on the job object to display its definition dialog and define its parameters.
3. Save the definition dialog.
4. From the Object toolbar, select the appropriate dependency icon and drag it onto the Business Views Canvas.

   Note: You cannot define a dependency until you have associated or linked it to an existing job object, so the object displays grayed out.

5. Select the job object, then press CTRL+ALT simultaneously.

   While continuing to press CTRL + ALT simultaneously, click the dependency object.

   A red arrow displays between the objects when they are linked successfully. Once linked, you can double-click the dependency to define it. Once defined, a green arrow displays between the objects.

Create/Modify a Callout

To create or modify a callout:

1. Click an object to select it. (A green border will appear around the object.)
2. Click the **Callout** button in the object toolbar to attach a caption to the object.
3. Double-click the callout to display its **Callout Properties** dialog.
4. Type the text you wish to appear in the callout and format it as needed.

Hide/Show All Callouts

To hide or show all callouts:

1. Right-click in the **Canvas** screen to display the context menu.
2. Select the **Show/Hide** menu option.

- To hide all callouts, select the **Hide All Callouts** option.
- To show all callouts, select the **Show All Callouts** option.

Hide Individual Callouts

To hide an individual callout:

1. Double-click a callout to display its **Callout Properties** dialog.
2. Select the **Hidden** option.

Show Individual Callouts

To show an individual callout:

1. Click an object to select it.
2. On the object toolbar, click the **Callout** button to display the **Callout Properties** dialog for the object's callout.
3. Clear the **Hidden** option.

Create/Modify a Flag

To create or modify a flag:

1. Click an object to select it.
2. Click the **Flag Job** button in the object toolbar to display its **Flag Properties** dialog.
3. Select a color for the flag and type any text you wish to appear when the mouse cursor pauses over the flag.

Create/Modify a Hyperlink

To create or modify a hyperlink:

1. Click an object to select it.
2. Click the **Create Hyperlink** button in the object toolbar to display the **Choose a View for Link** dialog.
3. Link the selected object to a View by selecting a View from the list.

   A link icon will be placed on the object that when clicked displays the specified View.

   You can change the linked View at anytime by selecting the object, clicking the **Create Hyperlink** button and choosing a different View from the **Choose a View for Link** dialog.

Change the View Properties

To change a View's properties:

1. Display the **View Properties** dialog by selecting the **Properties** option in the Canvas context menu.
2. Modify the parameters in the dialog as needed. Click the **Defaults** button to return to the original default values after changing the values.

Delete Objects

There are two degrees of object deletion. With one type of deletion, you may wish to just delete an object from the View Canvas yet leave the object still available in the database. With the other form of deletion, an object is not only removed from the View but is permanently removed from the database.

To delete an object from the View Canvas and the database, select the object and press the **DELETE** button on your keyboard. A confirmation message displays.

Deselecting Currently Selected Objects

You can click on a empty spot of canvas to deselect all currently selected objects in the canvas. This is helpful if you want to recover or reset from previous selection mistakes during a job dependency or parent job relationship procedure.

Find Jobs

There are two different types of job searches available. All of the existing jobs that are defined in the database and just the jobs that are included in the current View, which can be difficult to find as the workflow in a View becomes more complicated and populated with objects.

- To find a particular object within the current View, right-click on the canvas and select **Index** from the context menu to display the **Job Index** dialog that lists the various objects contained in the current View. Double-click one of the listed objects to close the dialog and to display the selected object, highlighted in a green bounding box.
- To find an existing job (or job group) in the database that is not in the current View, click the **Get Jobs** button in the object toolbar to select it and double-click anywhere in the Canvas to display the **Job Search** dialog. Enter criteria in the various fields to find the desired job. For more information on the **Job Search** dialog, refer to Job Search Dialog, page 149.

9

Variables

This chapter covers these topics:

- Overview
- Types of Variables
- Variables Interface
- Variables Procedures

Overview

CWA provides a rich set of variables representing system, job and job event data points. In addition, users can define their own variables to represent dynamic information. You can use variables for command parameters, in various action messages and in job and job group dependencies. You can update user-defined variables through variable actions. For more information about jobs and job groups, see Jobs and Job Groups, page 105.

Variables are useful for specifying information that continually changes or is only available at certain times. For example, if you want to know which queue your job enters when it runs, you can use the **Queue Name** variable to specify that information. Using the **Queue Name** variable in a mail action message, you can email yourself the name of the queue your job enters at every runtime.

CWA's variables function is a blend of power and flexibility that you expect in a world-class application.

Note: Any argument that either explicitly has a space in it or could have a space in the argument should be enclosed in quotation marks; otherwise, the argument is returned as separate arguments wherever the spaces occur. For example, a job called Section 59 Tally would be returned as separate arguments, "Section," "59" and "Tally." Similarly, if a variable like **<jobname>** could return an argument containing a space, it also should be enclosed in quotation marks.

This chapter covers these topics:

- Types of Variables
- Variables Interface
- Variables Procedures

Types of Variables

CWA supports these variable types as documented in this section:

- System Variables, page 238
- Job Variables, page 238

- Parent-Child Variables, page 238
- Event Variables, page 238
- User-Defined Variables, page 239
- Public Variables, page 239
- Dependencies Variables, page 239

System Variables

System variables cover general information such as:

- Current date
- Current time
- System name

Job Variables

You can use job variables to use the information that pertains to a specific job in its definition. Job property information is represented by many variables. Some of these variables are:

- **`Job ID`** – The identification number of the job occurrence. Each job ID is unique.
- **`Job Name`** – The name of the job or job group.
- **`Job Owner`** – The owner (workgroup or user) of the job or job group.
- **`Job Occurrence`** – Information such as job status, exit code, and start time
- **`Job Parent`** – The parent job group that the job belongs to (if any).
- **`External ID`** – The job's ID number on the agent platform. For example, the External ID for a job run on a Unix agent would be the Unix process ID. The External ID for an SAP job would be the job's unique SAP instance number.

In addition, to the variables for the job being defined, if a job is dependent on another job, then the variables for job "A" also show under the job variables for job "B." That is, the same variables defined for Job "A" become available for use in the dependent job "B."

Parent-Child Variables

In the same way, child jobs can access the job variables of their parent. The job variables of the parent and higher-level job groups appear as a submenu of the Job Variables menu under the name of the job group.

When the parent variable is selected, the level within the parent-child hierarchy is denoted by a suffix of a period and the letter p (**.p**). (Some variables without a time or date format may have two periods.) When the child job uses the parent variable, it is distinguished as a parent variable by a **.p** suffix. A grandparent variable would be **.p2**, a great-grandparent variable would be **.p3**, and so on.

Job variables can also be used to help communicate and/or diagnose the condition under which a job's action was triggered.

Event Variables

Event variables include event and action information such as:

- Event Name

- Event Owner
- Action Name
- Action Owner

User-Defined Variables

You can define your own variables to use as command parameters or in action message text.

By using the same user-defined variable in multiple job and action definitions, you can update all the jobs and actions by just updating the variable you created.

Public Variables

You can declare any user-defined variable as public. Any CWA user can refer to a public variable. For example, you could use public variables to refer to key employees by their title. For example, if you had a public variable named **Payroll Manager** which refers to the name of the Payroll Manager, you would update the variable definition when a new employee takes that position, and all instances of **Payroll Manager** would be updated.

Dependencies Variables

You can use variables as dependencies to prevent jobs from running until their value qualifies. Variable dependencies are defined as a part of a job or job group definition. In the definition, you specify the value a variable must have before the job or job group can run. You can change variables manually to satisfy dependencies or they can change automatically when a job event or system event triggers a variable action. Thus, you can use variables to trigger the start of a job based on any system or job event.

For example, assume Job A needs to run 100 times, and when it runs, it saves a file. Job A also increments a variable from 1 to 10. When the variable reaches 10, Job B starts, resets the variable to 1, and transfers the files created by Job A to another location, freeing up disk space. CWA repeats this process 10 times until Job A has run 100 times.

Variables Interface

These topics describe the Variables interface:

- Accessing the Variables Interface
- Buttons
- Search Field
- Columns
- Variables Preferences Dialog
- Navigator Context Menu
- Variables Pane Context Menu
- Variable Definition Dialog
- Date Calculation Variable Dialog

Accessing the Variables Interface

From the **Navigator** pane, select **Definitions>Variables** to display the **Variables** pane.

Buttons

The **Variables** interface contains the following buttons:

- **Add Variable** – Displays the **Variable Definition** dialog to add a variable.
- **Edit Variable** – Displays the **Variable Definition** dialog to edit a variable.
- **Copy Variable** – Creates a copy of the selected action with the same information as the selected variable, except for the name.
- **Delete Variable** – Removes the variable definition from the CWA database.
- **Refresh** – Updates the data in the current pane.
- **Print** – Displays the **Reports** pane to view and print your variable definitions. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

The **Variables** interface contains the following buttons:

- **Name** – The name of the variable.
- **Owner** – The owner of the variable.
- **Public** – Specifies that the variable is public, that is, available to all CWA users.
- **Type** – The type of variable; whether **`String`**, **`Date`**, **`Number`** or **`Boolean`**.
- **Value** – The value of the variable.
- **Published** – Shows whether the variable is available for use with remote masters.
- **Modified** – The last time the variable definition was modified.

Variables Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Variables** pane, the **Variables Preferences** dialog displays.

From the **Variables Preferences** dialog, you can select which columns are displayed in the **Variables** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it displays in the pane. No checkmark indicates that it is not displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Variables** pane, the **Navigator** context menu displays.

The following describes the items in the Variables **Navigator** context menu:

- **Add Variable** – Displays the **Variable Definition** dialog to add a new connection. Has the same function as the **Add Variable** button.
- **Preferences** – Displays the **Preferences** dialog for the **Variables** pane.
- **Print** – Displays the **Reports** pane to view and print your variables definitions. Has the same function as the **Print** button on the CWA toolbar. For more information, see Monitoring Production, page 313.
- **Export** – Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** – Updates the data in the current pane.

Variables Pane Context Menu

When you right-click in the **Variables** pane, the **Variables** pane context menu displays.

The **Variables** pane context menu contains the following options:

- **Add Variable** – Displays the **Variable Definition** dialog to add a new variable.
- **Edit Variable** – Displays the **Variable Definition** dialog to edit an existing variable.
- **Delete Variable** – Deletes the selected variable.
- **Print** – Displays the **Reports** pane to view and print your variables definitions. Has the same function as the **Print** button on the CWA toolbar. For more information, see Monitoring Production, page 313.

Variable Definition Dialog

The **Variable Definition** dialog displays when adding or editing a variable.

This dialog contains the following elements:

Note: Name – The name of the variable that displays in the variable pane and in the variable selection context menus. The name of a variable cannot include the following five characters: <, >, :, . or @.

- **Owner** – The owner of the variable. By default, the creator of the variable is the owner.
- **ID** – The variable's identification number. The ID number is automatically appended to the variable name so that variables with the same name can be created between users and workgroups. You cannot edit the ID.
- **Type** – The data type of the variable. You can choose from the following types of data:
  - **String** – The value of the variable will be a text string consisting of no more than 255 characters. Note that if you type a number when the STRING type is selected, the result will still be a string, not a numerical value.
  - **Number** – The value of the variable must be a number (base 10).
  - **Date** – The value of the variable will be a date string and must conform to the same format as set in the operating system that the master is running.
  - **Boolean** – The variable uses Boolean logical operators to determine a true or false value.

- **Value** – The value of the variable. Do not use quotation marks unless you want them to be a part of your text string (when the **STRING** type variable is selected). If Boolean was selected in the **Type** field, **True** or **False** are presented as the options in this field.
- **Calculated** – This check box appears only if the **Date** option is selected in the **Type** field. Select this option to make the variable calculate a date based on a formula. Selecting this check box, makes the **Value** field unavailable since the value will be calculated and displays a **Browse** button at the end of the field. Clicking this **Browse** button displays the **Date Calculation** dialog.
- **Description** – This is an empty text field for typing a description or notes about the variable.
- **Public** – When selected, this option makes the variable available to all CWA users on the master. You can make this option default to either selected or cleared from the **System Configuration** dialog, **Defaults** tab.
- **Publish this variable to remote masters** – The variable is available for use by other masters.
- **Read only** – The defined variable is available to other masters but the variable can not be modified. (This option is only available if the **Publish this variable to remote masters** option was selected.)

Date Calculation Variable Dialog

If you wish to use a specific calendar date for the date value then simply enter the date in a specified format. The date format is defined on the **Date** tab of your computer's **Regional Options** setting (**Start>Settings>Control Panel>Regional Options**).

If you wish to calculate a date, then you must configure the formula to be used in creating the date variable. You associate a date calculation with a variable from the **Date Calculation** dialog.

To display the **Date Calculation** dialog:

1. Select the **Date** option in the **Type** field of the **Variable Definition** dialog.
2. Select the **Calculated** option.
3. Click the drill-down button in the **Value** field to display the **Date Calculation** dialog.

This dialog contains the following elements:

- **Calendar Start Section** – The fields that are available in the **Date Calculation** dialog vary according to the option selected in the **Starting with** field in the **Calendar Start** section. Some fields are unavailable with certain options while other options display new fields.
  - **Starting with** – The starting point of the date calculation. All defined offsets are offset from this date. As soon as an option is selected from the drop-down list, the resulting date displays in parentheses to the right of the field.

  The possible starting points of the date calculation and their definition are listed in the following table:

Date Calculation Starting Points	Definition
System Date	The date displayed in the computer system. Usually this is the same as the current date.
Production Date	The date used when scheduling production schedules. This may differ from the current date if a production offset has been configured.
Job's Actual Run Date	The date that the job actually runs. This may be different than the scheduled date due to production carryover.
Job's Scheduled Date	The date assigned to a job to run.

Date Calculation Starting Points	Definition
Last Sunday	The Sunday that occurred before the current date.
Last Monday	The Monday that occurred before the current date.
Last Tuesday	The Tuesday that occurred before the current date.
Last Wednesday	The Wednesday that occurred before the current date.
Last Thursday	The Thursday that occurred before the current date.
Last Friday	The Friday that occurred before the current date.
Last Saturday	The Saturday that occurred before the current date.
Specific Date (m/d/yy)	A date is specified within a designated year.
Specific Date (m/d)	A date is specified within the current year.
Fiscal Month	The current month within a selected fiscal year.
Fiscal Week	The current week within a selected fiscal year.
Fiscal Quarter	The current quarter within a selected fiscal year.
Fiscal Year	The current year within a selected fiscal year.
Calendar Month	The current calendar month.

  - **Using** – This field displays only when the **Specific Date** options and the **Fiscal** period options are selected in the **Starting with** field. This field varies according to the option selected in the **Starting with** field.
  - **Specific Date (m/d/yy)** – Click the drop-down arrow to display the current monthly calendar tab. Click the desired date to select it. You can advance or roll back the calendar month by clicking the side arrows in the header bar. Alternately, you can click the month to display a list of the months to select from. You can also click the year and click the up or down arrow to advance or roll back the year.
  - **Specific Date (m/d)** – The **Using** field is split into two fields. The first field is a drop-down list of months. Once a month is selected, click the second field to select a day of the month. The current year is assumed.
  - **Fiscal periods** – click the drop-down arrow in the **Using** field, to display a list of predefined fiscal calendars. This field displays only if one of the following options is selected in the **Starting with** field: **Fiscal Month**, **Fiscal Week**, **Fiscal Quarter** and **Fiscal Year**.

- **Offset section** – Date offsets are optional but you may require one or more offsets from the starting date to calculate the desired date. The offset units used when calculating dates in a variable vary from a specific number of days to fiscal periods and calendar periods. You select a unit of offset from the drop-down list of unit options, select how many units to use and whether the offset is positive or negative.
  - **Positive/Negative Offset** – Select whether the offset is positive (+) or negative (–).
  - **Number of Offset Units** – The number of the selected offset units to use. Type a number or use the arrow keys to increase or decrease the value. A zero offset value whether positive or negative has special significance in date calculations.
  - **+ 0 (Positive zero offset)** – If the start date is the same as the selected offset unit then use that unit's date/day. If the start date and the selected offset unit do not coincide than use the next occurrence of that unit.

    For example, if the date offset is + 0 Sunday, and the start date falls on a Sunday then use that Sunday, but if the start date falls on a day other than Sunday use the next occurrence of Sunday. If the start date is March 10th, then because the start date falls on the same date as the date unit (Sunday), the calculated date is March 10th. If the start date was on a different day within the week, say on the 12th, then the calculated date would be March 17th.
  - **– 0 (Negative zero offset)** – If the start date is the same as the selected offset unit then use that unit's date/day. If the start date and selected offset unit do not coincide than use the previous occurrence of that unit.

For example, if the date offset is – 0 Sunday, and the start date falls on a Sunday then use that Sunday, but if the start date falls on a day other than Sunday use the previous occurrence of Sunday. If the start date is March 10th, then because the start date falls on the same date as the date unit (Sunday), the calculated date is March 10th. If the start date was on a previous day within the week, say on the 9th, then the calculated date would be March 3th.

- **Offset Units** – Select from the drop-down list of unit options. These options range from specific days of the week to fiscal and calendar periods of time.
  - **Calendar (Custom Calendar unit only)** – This field only appears if the **Custom Calendar** option was selected in the **Offset Units** field. The field has a drop-down list of calendars that are available from your defined Calendars.
  - **Fiscal (Fiscal periods only)** – This field only appears if one of the fiscal units is selected (**Fiscal Quarter**, **Fiscal Month**, **Fiscal Week** and **Fiscal Year**). This field has a drop-down list of predefined fiscal calendars.
- **Calendar Offset** – This column lists the defined calendar offset parameters.
- **Offset End** – This column lists the calendar date derived from the defined calendar offset relative to the starting date if the variable were to be calculated now.
- **Add** – Click this button to add the calendar offset parameters that are displayed to the list of calendar offsets.
- **Edit** – Click a listed calendar offset to select it. Click the **Edit** button to display and, if desired, to modify the existing parameters.
- **Delete** – Click this button to remove the selected calendar offset.
- **Test** – Click this button to test the specified date offset. Clicking this button displays a calendar tab dialog. Click a date in the calendar month to apply the offset to that date and display the resulting calculated date. The Test button is unavailable if an offset date is not selected.

See Examples of Calendar Offsets to get an understanding of how calendar offsets work.

Examples of Calendar Offsets

A few examples may illustrate some important points about how calendar offsets work.

Fiscal calendar offsets key off both the quarter breakdown and the starting date of the fiscal calendar used in the date calculation variable. A fiscal period is often independent of a calendar period. For example, assume that the fiscal calendar being used for a fiscal quarter offset is defined to start on a Monday, January 1st with a 4-4-5 quarter breakdown. If the starting date is February 2, 2001 and the calendar offset is "+ 1 Fiscal Quarter" then the calculated offset date is April 2, 2001. This is calculated from the starting point of January 1st and counting 13 weeks (4-4-5).

Using the same fiscal calendar parameters as the preceding example, for a fiscal month with a starting date of February 2, 2002 and a "+ 1 Fiscal Month" offset calculates an offset date of February 26, 2002. It seems odd that the next fiscal month begins in the same month but the fiscal calendar is counting months according to the designated quarter breakdown and not according to the calendar month. Counting from the start of the fiscal quarter (January 1, 2002), a 4-4-5 quarter breakdown means that the months of the first fiscal quarter start on 1/1, 1/29 and 2/26 respectively. The fourth fiscal month (and second fiscal quarter) begins on 4/2.

You can also use multiple offsets. Each listed calendar offset uses the date calculated from the preceding offset to build upon when calculating its result.

In the multiple calendar offsets in the example, there are three calendar offsets used to arrive at the date offset.

- The first offset, + 1 "full month," adds a calendar month to the current date (4/30/02) giving a date of 5/30/02.
- The second offset, – 0 "Monday," moves the calculated date to the previous Monday unless the calculated date already falls on a Monday, giving a date of 5/27/02.

- The third offset, + 0 “Custom Calendar–Workdays,” advances the calculated date by one day by using a custom calendar that defines the workdays for a company. The calculated date from the previous offset, 5/27/02, does not fall on a workday according to the custom calendar because 5/27/02 is Memorial Day, a holiday. This offset ensures that the calculated date is a workday.

A table of more calendar offset examples is provided for the user to study how calendar offsets work.

Calendar Offset	Definition
Add 0 “Monday”	The next Monday following the Starting with date. If today is a Monday, then today’s date is returned.
Add 1 “Monday”	Always the next Monday following the Starting with date.
Subtract 1 “Monday”	Go back to the Monday previous to the Starting with date.
Add 2 “Monday”	Move ahead two Mondays from the Starting with date.
Add 2 “Days”	Move ahead two days from the Starting with date.
Add 1 “Week”	Move ahead one week following the Starting with date.
Add 1 “Month”	One month following the Starting with date.
Subtract 2 “Month”	Go back two months previous to the Starting with date.
Add 1 “Calendar Week”	A calendar week begins on Sunday so this offset goes to the next Sunday from the Starting with date.
Add 1 “Fiscal Quarter” Fiscal	The beginning of the next fiscal quarter following the Starting with date. This varies according to the way the fiscal calendar being used is defined. The quarters are calculated according to when the fiscal year starts.
Add 1 “Fiscal Week”	The beginning of the next fiscal week following the Starting with date. This varies according to the way the fiscal calendar being used is defined. The weeks are calculated according to when the fiscal year started.
Add 1 “Calendar Month”	The beginning of the next calendar month following the Starting with date.

Variables Button Context Menu

About the Variables Button Context Menu

The **Variables** button context menu displays when you click the **Variables** button in the **Job**, **Job Group** or **Action Definition** dialogs.

When selecting a variable for a command parameter, the **Variable Search** dialog displays when there are too many variables to list in a context menu.

You can scroll down the list of variables and make a selection or you can start typing in the name of the variable to display the variables that match your entry.

Click **OK**.

System Variables on the Context Menu

The following describes the **System Variables** available from the **Variables** button context menu.

This context menu contains the following options:

- **System Date** – The date on the CWA master. You can select from a list of predefined date formats, or construct your own format using the **Date Format Selection** dialog. For more information about using the **Date Format Selection** dialog, see Date Format Selection Dialog, page 248.

- **System Time** – The time according to the CWA master when the variable is replaced with a value. You can select from a list of predefined system time formats. For more information about time formats, see Time Format Submenu, page 249.
- **System Name** – The name of the CWA master.
- **User Name** – The account under which the CWA master is running. If it is not running under a specific account, but as part of the system, the value of this variable will be **SYSTEM**.
- **Production Date** – The current production date for the master. This is the same as the **System Date**, unless you are running a schedule from a day other than the current day. You can select from a list of predefined date formats, or construct your own format using the **Date Format Selection** dialog. For more information about using the **Date Format Selection** dialog, see Date Format Selection Dialog, page 248.
- **Queue Name** – The name of the queue that triggered the system event.
- **Queue Limit** – The job limit of the queue that triggered the system event.
- **Connection Name** – The name of the connection relevant to the variable. If you are defining a job, the connection name variable relates to the agent that will run the job. If you are defining an intermaster dependency, the connection name variable refers to the connection to the remote master.
- **Agent Limit** – The job limit on the agent that triggered the system event.
- **Remote Master Name** – The name of the remote master that triggered the system event.

Job Variables on the Context Menu

The **Variables** button context menu contains the following Job variables:

- **Job Rule ID** – The identification number for the job. The job rule ID may be shared by numerous job instances that were created from the same job. Compare to Job Instance ID.
- **Job Name** – The name of the job as defined in the **Job Definition** dialog.
- **Job Parent** – The parent job group that the job belongs to (if any).
- **Job Owner** – The owner of the job. The owner can be a user name or a workgroup name.
- **Job Command** – The command that the job executes.
- **Agent Name** – The name of the agent that the job runs on. If the job has an agent list, it is the name of the agent in the agent list to which the job was assigned.
- **Estimated Runtime** – The estimated time that it takes for the command executable to run. If the job has run more than once, this value is a historical average of its actual duration. The time is expressed in minutes in decimal format. This means that a job that runs for one minute and 15 seconds is shown as 1.25.
- **Earliest Start Time** – The beginning of the job's time window. You can select from a list of predefined system time formats. For more information about time formats, see Time Format Submenu, page 249.
- **Latest Finish Time** – The end of the job's time window added to its estimated duration. You can select from a list of predefined system time formats. For more information about time formats, see Time Format Submenu, page 249.
- **Owner's Phone Number** – The job owner's phone number, as defined in the owner's user definition.
- **Owner's Pager Number** – The job owner's pager number, as defined in the owner's user definition.
- **Job Alias** – The alias of the job.
- **Job Run ID** – The number that identifies the individual job instance. A job may run numerous times and each time the job runs it has a different job instance ID. Compare to Job Rule ID.

- **Job Status** – The status of the job.
- **Exit Code** – The exit code of the job when it completed.
- **External ID** – The job's ID number on the agent platform. For example, the external ID for a job run on a Unix agent would be the Unix process ID. The external ID for an SAP job would be the job's unique SAP instance number.
- **Runtime User** – The user name under which the job is running.
- **Job Output** – The output from the job that triggered the job event, up to 1024 characters. If this variable is used in a Windows log message, it is limited to 255 characters. This variable does not apply to system events.
- **Scheduled Date** – The date on which the job is scheduled to run. You can select from a list of predefined date formats, or construct your own format using the **Date Format Selection** dialog. For more information about using the **Date Format Selection** dialog, see Date Format Selection Dialog, page 248.
- **Actual Runtime** – The length of time that the job ran or has been (if still active) running. The time is expressed in minutes in decimal format. This means that a job that runs for one minute and 15 seconds is shown as 1.25.
- **Start Time** – The time that the job entered **Active** status. You can select from a list of predefined system time formats. For more information about time formats, see Time Format Submenu, page 249.
- **Finish Time** – The time that the job completed. You can select from a list of predefined system time formats. For more information about time formats, see Time Format Submenu, page 249.
- **Error Message** – For jobs that complete abnormally, the error message currently associated with the job.
- **Queue Name** – The queue in which the job ran.
- **FTP Statistics** – Select from four options that offer details about the FTP operation.
  - **# of Files** – Details the number of files FTP'ed.
  - **# of Bytes** – Details the size of the file (in bytes) that was FTP'ed.
  - **# Skipped** – Details the number of files within a designated directory that were not FTP'ed.
  - **Duration (Seconds)** – Details how long (in seconds) that it took to perform the FTP operation.

Event Variables on the Context Menu

Job event variables are only available when you are composing a message in the message field of an action.

The **Variables** button context menu contains the following Event variables:

- **Event Name** – The name of the job event that triggered the action.
- **Event Owner** – The owner of the job event that triggered the action.
- **Action Name** – The name of the action triggered by the job event.
- **Action Owner** – The owner of the action triggered by the job event.

User Variables on the Context Menu

If you are the owner (by default, the creator) of any variables, this menu selection (replaced with your user name) appears. The submenu lists all your user variables.

Workgroup Variables on the Context Menu

If you or the workgroup to which you belong own any variables, this menu selection will appear. The submenu lists all the variables owned by that workgroup.

Public Variables on the Context Menu

This menu item appears if there are any public variables. Any variable can be made a public variable by selecting the **Public** option in its definition.

Date Format Selection Dialog

About the Date Format Selection Dialog

The **Date Format Selection** dialog displays when you choose to change the format of a date variable that was selected from a **Variables** button context menu. You could be in a **Job**, **Job Group** or **Action Definition** dialog.

This dialog contains the following elements:

- **Date Format** – The date format to be applied to a date variable. The drop-down menu shows a list of predefined date formats. You can choose from this list or create a custom format. The drop-down menu offers six common date formats:
  - **ddd (Abbreviated day of the week)** – Use this date format for abbreviated days only. The first letter (of three) is capitalized. For example: **Mon**, **Tue**, **Wed**, etc.
  - **dddd (Day of week)** – Use this date format for days only. The first letter is capitalized. For example: **Monday**, **Tuesday**, etc.
  - **dddd, mmmm dd, yyyy** – The long date format. Use this format to exclude any abbreviations. For example: **Friday, October 6, 2006**.
  - **mmmm dd, yyyy** – Letterhead date format. For example: **October 6, 2006**.
  - **dddd, dd mmmm, yyyy** – An alternative long date format. Use this format to exclude any abbreviations. For example: **Friday, 6 October, 2006**.
  - **dd mmmm, yyyy** – An alternative letterhead date format. For example: **06 October, 2006**.
- **Sample** – An example of the format you selected, using the current date.
- **Custom Format** section – Use this section to define your own date format:
  - **Order** – Arranges the order of the day, month, and year in the date format as follows:

    Month, Day, Year – For example: **October 6, 2006**

    Day, Month, Year – For example: **6 October 2006**

    Year, Month, Day – For example: **2006 October 6**

    Year, Day, Month – For example: **2006 6 October**
  - **Separator** – The character to use to separate your format into year, month and day. You can have only one separator character. The default is a forward slash **/**.
  - **Month/Qtr** – Select this option to include the month or quarter in your custom date format. The default is selected.
  - **Day** – Select this option to include the day in your custom date format. The default is selected.

- **Year** – Select this option to include the year in your custom date format. The default is selected.
- **Month, Day and Year drop-down menus** – Selects the format for each of the date elements.
- **Fiscal Calendar (For Fiscal Month, Quarter or Year)** – If a fiscal format was selected in either the **Month/Qtr** or **Year** fields then select a predefined fiscal calendar from this drop-down list.
- **Apply** – Click this button to display the custom date format in the **Date Format** field, and show an example using the current date in the **Sample** field.

Time Format Submenu

The time formats available from the time format submenu use the following conventions:

Format	Description	Example
h:mm AM/PM	Standard time without preceding '0' showing hours and minutes using ante meridiem (AM) or post meridiem (PM)	7:12 PM
hh:mm AM/PM	Standard time with preceding '0' showing hours and minutes using ante meridiem (AM) or post meridiem (PM)'	07:12 PM
H:mm	Military time without preceding '0' showing hours and minutes	7:12
HH:mm	Military time with preceding '0' showing hours and minutes	07:12
h:mm:ss	Standard time without preceding '0' showing hours, minutes and seconds	7:12:31
hh:mm:ss	Standard time with preceding '0' showing hours, minutes and seconds'	11:32:44
H:mm:ss	Military time without preceding '0' showing hours, minutes and seconds	15:16:59
HH:mm:ss	Military time with preceding '0' showing hours, minutes and seconds	06:54:07

Note: By default the characters that comprise the time format are separated by colons but you may replace the colon with a period or manually delete the separator if desired.

Date Format Conventions

Date formats use the following conventions:

Format	Description	Example
d	Date	1, 2, ..., 31
dd	Date with leading '0', if applicable	01, 02, ..., 31
ddd	Abbreviated day	Mon, Tue, ..., Sun
dddd	Long day	Monday, Tuesday, ..., Sunday
j	Julian date	9, 41, 121, ..., 365
jjj	Julian date with leading '0,' if applicable	009, 041, 121, ..., 365
m	Numerical month	1, 2, ..., 12
mm	Numerical month w\ leading '0', if app.	01, 02, ..., 12
mmm	Abbreviated month	Jan, Feb, ..., De
mmmm	Long month	January, February, ..., December
yy	Abbreviated year	99, 00, ..., 02
yyyy	Full year	1999, 2000, ..., 2006
fm	Fiscal Month	1, 2, ..., 12

Format	Description	Example
fmm	Fiscal month w/leading '0,' if app.	01, 02, ..., 12
q	Calendar quarter	1, 2, 3, 4
fq	Fiscal Quarter	1, 2, 3, 4
fyy	Abbreviated fiscal year	99, 00, ..., 02
fyyy	Full fiscal year	1999, 2000, ..., 2006

Variables Procedures

- Adding Variables
- Deleting Variables
- Editing Variables
- Viewing Variables
- Viewing the Value of Variables

Adding Variables

When you create a variable definition, you can use it as a command parameter or as part of the message text in an action.

To add a variable:

1. From the **Navigator** pane, select **Definitions>Variables** to display the **Variables** pane.
2. Right-click and select **Add Variable** from the context menu or click the **Add** button on the CWA toolbar to display the **Variable Definition** dialog.
3. In the **Name** field, type a name for the variable you are defining.
4. In the **Owner** field, if you want to change the ownership of the variable, select a new **Owner** from the drop-down menu.
5. In the **Type** field, from the drop-down menu, select the type of variable you are defining:
   - **String** – This setting accepts any string up to 255 characters, including numerical strings. Note that **STRING** types cannot be incremented with a variable update action.
   - **Number** – This setting accepts only values in numerical format, including those in exponential format (i.e., **1E5**). It does not accept algebraic formats such as **1+2**.
   - **Date** – This setting accepts only date values. You can only enter dates in the format defined in your Windows control panel. For example, if you have selected the short date style **m/d/yy** in the **Regional Settings** control panel, you cannot enter the date here as **10-6-07**.
   - **Boolean** – The variable uses Boolean logical operators to determine a true or false value.
6. In the **Value** field type a starting value for the variable. You do not have to use quotation marks. You can type up to 255 characters.
7. In the **Description** field, type a description for the variable (optional).
8. If you want the variable to be public, select the **Public** option. This makes the variable accessible to all CWA users, within the limits of their security policy.

You can edit a variable when you want to change its current value. The new value will be used everywhere that the variable is referred to, such as in the job definition, or an action definition.

Deleting Variables

Note: By default the characters that comprise the time format are separated by colons but you may replace the colon with a period or manually delete the separator if desired.

You can delete variables that are no longer used. If there are references to the variables in jobs and actions, they will be replaced with an empty string.

Note: If the variable to be deleted is already in use, you will lose that variable's value in all those instances. You can disturb your production schedule, depending on how the variable was used. Once a variable definition is deleted, it will not be automatically replaced in any instances where it has been used, even if the new variable is given exactly the same name.

To delete a variable:

1. From the **Navigator** pane, select **Definitions>Variables** to display the **Variables** pane.
2. Right-click the variable and select **Delete Variable** from the context menu or select the variable and click the **Delete** button on the CWA toolbar or the **DELETE** key on your keyboard.
3. When the **Confirmation** dialog displays, click **Yes** to delete the variable.

Editing Variables

To edit a variable:

1. From the **Navigator** pane, select **Definitions>Variables** to display the **Variables** pane.
2. Double-click the variable or right-click the variable and select **Edit Variable** from the context men, or select the variable and click the **Edit** button on the CWA toolbar.
3. In the **Name** field, edit the name of the variable.

   Note: If you change the name of the variable, the new variable name does not automatically get updated in all job and action definitions where it was previously used. However, the correct substitution will still occur.
4. In the **Type** field, edit the type of variable:
   - **STRING** – This setting accepts any string up to 255 characters, including numerical string types. Note that **STRING** types cannot be incremented with a variable update action.
   - **NUMBER** – This setting accepts only values in numerical format, including those in exponential format (e.g., **1E5**). It does not accept algebraic formats such as **1+2**.
   - **DATE** – This setting accepts only date values. You can only enter dates in the format defined in your Windows control panel. For example, if you have selected the short date style **m/d/yy** in the **Regional Settings** control panel, you cannot type the date here as **10-6-06**.
   - **Boolean** – The variable uses Boolean logical operators to determine a true or false value.
5. In the **Value** field, edit the variable's value. You do not have to use quotation marks. You can type up to 255 characters.
6. In the **Description** field, type a description for the variable (optional).

7. If you want the variable to be public, select the **Public** option. This makes the variable accessible to all CWA users, within the limits of their security policy. To limit use of the variable to yourself and your Workgroup, clear the **Public** option.

Viewing Variables

You can view all the user-defined variables available to you from the **Variables** pane.

From the **Navigator** pane, select **Definitions>Variables** to display the **Variables** pane.

Viewing the Value of Variables

To view the value of a variable:

1. From the **Navigator** pane, select **Definitions>Variables** to display the **Variables** pane.
2. The **Variables** pane includes a **Value** column. If the **Value** column is not visible in the **Variables** pane, select **Preferences** from the **View** main menu to display the **Variables Preferences** dialog.
3. On the **Columns** tab, select the **Value** option.
4. For more information about the **Variables Preferences** dialog, see Variables Preferences Dialog, page 240.
5. You can also double-click the variable, or right-click and select **Edit Variable** from the context menu, or select the variable and click the **Edit** button on the CWA toolbar to open the **Variable Definition** dialog and view its value.

10

Controlling Production

This chapter covers these topics:

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- Defining a Production Day, page 254
- Scheduling Based on Agent Time Zone, page 256
- Using a Positive Production Day Offset, page 257
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- Defining a Compile Offset, page 259
- Calendars in CWA, page 260
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- Fiscal Calendar Interface, page 277
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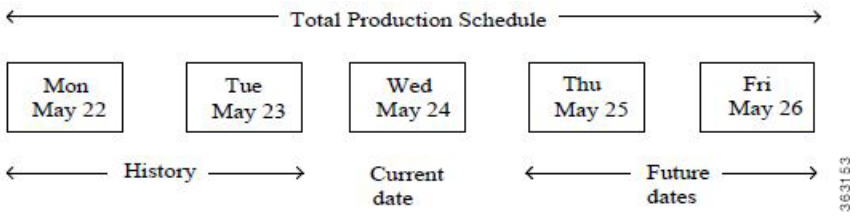
Overview

Cisco Workload Automation follows certain concepts when it compiles a production schedule. The concepts are basic but can result in complicated timing scenarios with date shifts that cause confusion among users when put into practice. The most complex timing issues arise from the shifting of the start of the production day through a series of time offsets as scheduled jobs run.

CWA compiles a *production schedule* from your job rules for each master. This production schedule covers at least the current day but may extend to multiple days. You determine the duration of each schedule by specifying the number of days to include. Each master in your network has its own production schedule, so schedule durations can vary. The active production schedule for a master includes history data (for dates past), the current date and any remaining days in the schedule (future).

Figure 1 Example of a Normal Schedule Length



The *production day* contains all of the job rules that are scheduled to run during the production day. A production day always contains 24 hours and by default starts at midnight and ends at 23:59:59 PM. (For simplicity's sake, we will use the 24-hour time format in this discussion so 11:59 PM is 2359.) To accommodate all of the processing needs of a business, a production day often differs from the calendar day. You can designate that the production day start at any time. For instance, you might specify that the production day starts at 0500 instead of starting at midnight to allow for the completion of the previous day's jobs. This is called a *production day offset*.

If the offset is positive, the fiscal day begins at some time after midnight and continues into the next calendar day. If the offset is negative, the fiscal day begins at some time before midnight. The maximum offset that you can define is 23 hours and 55 minutes. CWA uses the designated start of the production day to determine when the production day starts, and to select and launch jobs accordingly.

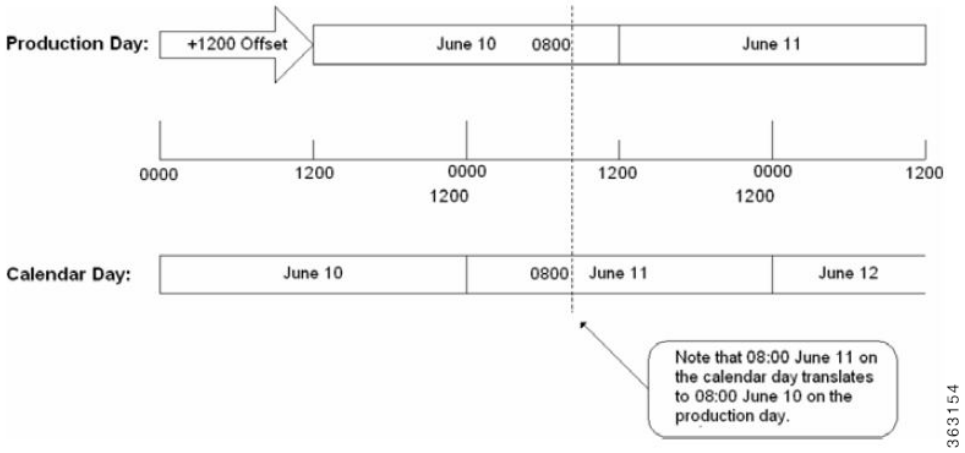
Defining a Production Day

Positive Offset (Late Start)

If you want your production day to begin at 1200 noon and continue until 1200 noon the following day, you define the start of the production day as 1200 (+1200). When offsetting the start time, it is important to remember that no time is lost, the hours between the start of the calendar day and the start of the production day are merely shifted from the beginning of the production day to its end. There are still 24 hours in the day.

The following figure compares the calendar day to a production day with an offset of +1200. Using this production offset, a job scheduled to launch at 0800 (8:00 A.M.) on June 10th (production date) will not actually launch until 0800 on June 11th (calendar date).

Figure 2 Production Offset Defined As +1200 (Master/Agent in Same Time Zone)

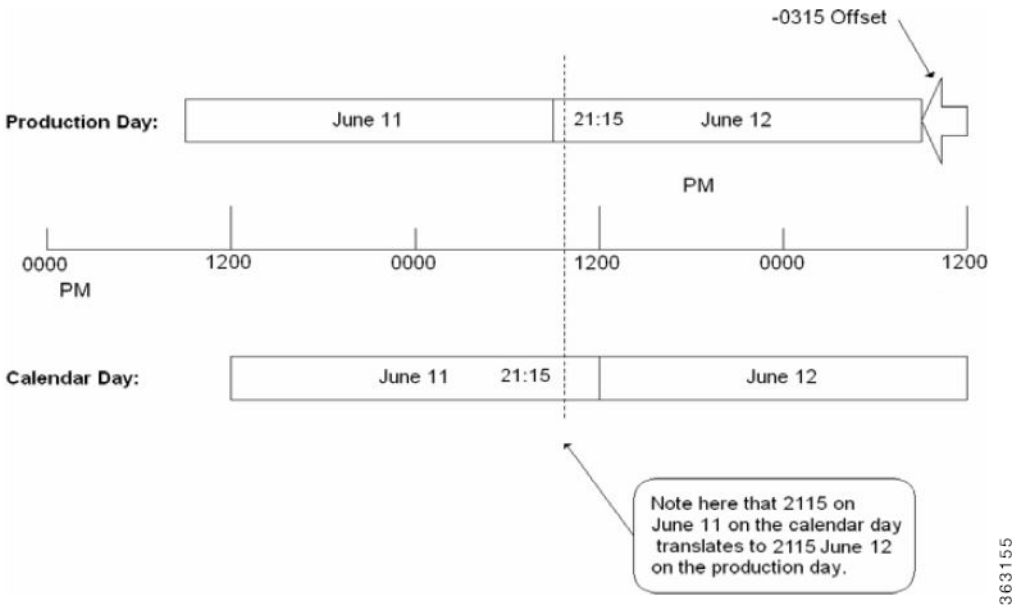


Negative Offset (Early Start)

If you want your production day to begin at 2045 (8:45 P.M.), and continue until 2045 the following day, define the production day offset as -0315.

The following figure illustrates the calendar and production days with an offset of -0315. Using this production day offset, a job scheduled to launch at 2115 on June 12th (production date) launches at 2115 on June 11th (calendar date).

Figure 3 Production Offset Defined As -0315 (Master and Agent in Same Time Zone)



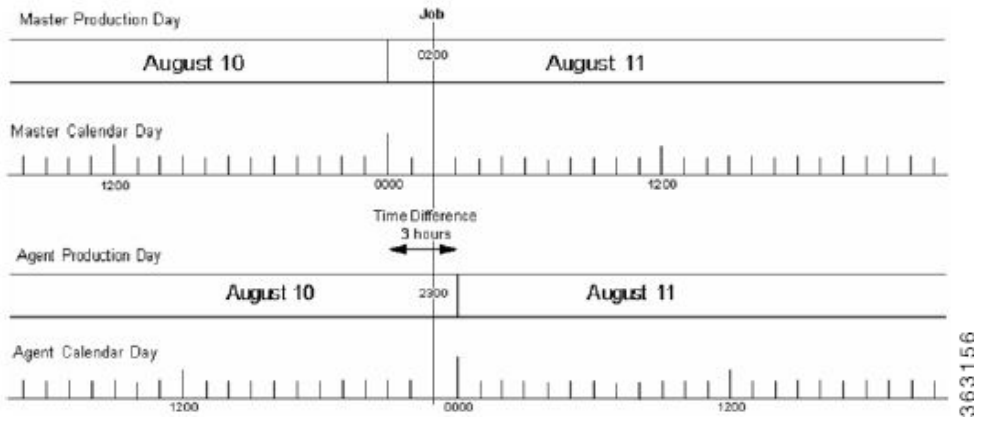
Scheduling Based on Agent Time Zone

While jobs normally run from the master's time reference, you can launch jobs according to what time it is in the agent's time zone. Selecting the **Use Agent Time Zone** option on the **Master** tab of the System Configuration dialog will launch jobs according to the time where the agent resides. This change will take effect the next time any schedule is compiled. While the jobs will launch at the intended times in the agent's time zone, the master's viewpoint will be compiled in for the job time windows and start time. Since the master will compensate for the offset, users should not think about the difference between the different master and agent time zones when defining jobs rules. In a nutshell, using the master time zone imposes an absolute time reference while using the individual agent time zones imposes a relative time reference.

Caution: The master will be unable to predict shifts in times when compiling future schedules. Times will be calculated as an offset to the master time based on the timezone of the agent. If the agent shifts times, the master will not be able to predict this shift, as international daylight savings time laws constantly change, country to country. The schedule must be compiled under the influence of the new agent times.

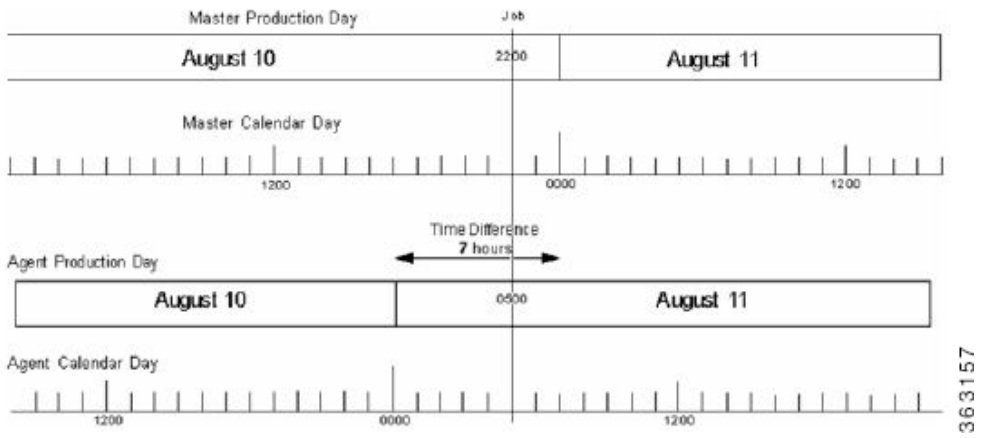
The following example illustrates the differences to be accounted for when the master and the agent reside in different time zones. The master in this example is three time zones ahead of the agent. A job defined to run at 2300 on the production day of August 10th will actually be launched by the master at 0200 on the production day of August 11th to account for the difference in time zones.

Figure 4 Agent Residing Three Time Zones Behind Master (No Production Date Offset)



Below is another example of the master and agent in different time zones without a production offset. This example shows a master that is seven hours behind the agent. A job defined to run at 0500 on the production day of August 11th is actually launched by the master at 2200 on the production day of August 10th to account for the difference in time zones.

Figure 5 Agent Residing Seven Time Zones Ahead of Master (No Production Date Offset)

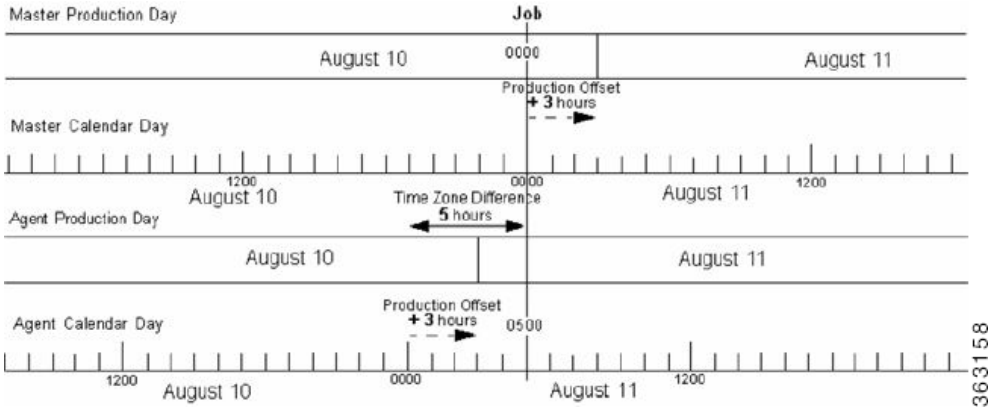


Using a Positive Production Day Offset

Agent Running Ahead of the Master

Setting a positive production day offset moves the start of the production day forward. In the example below, the difference between time zones is shown in a solid line and the production day offset is shown in a dotted line.

Figure 6 Positive Production Day Offset With the Agent Running Ahead of the Master

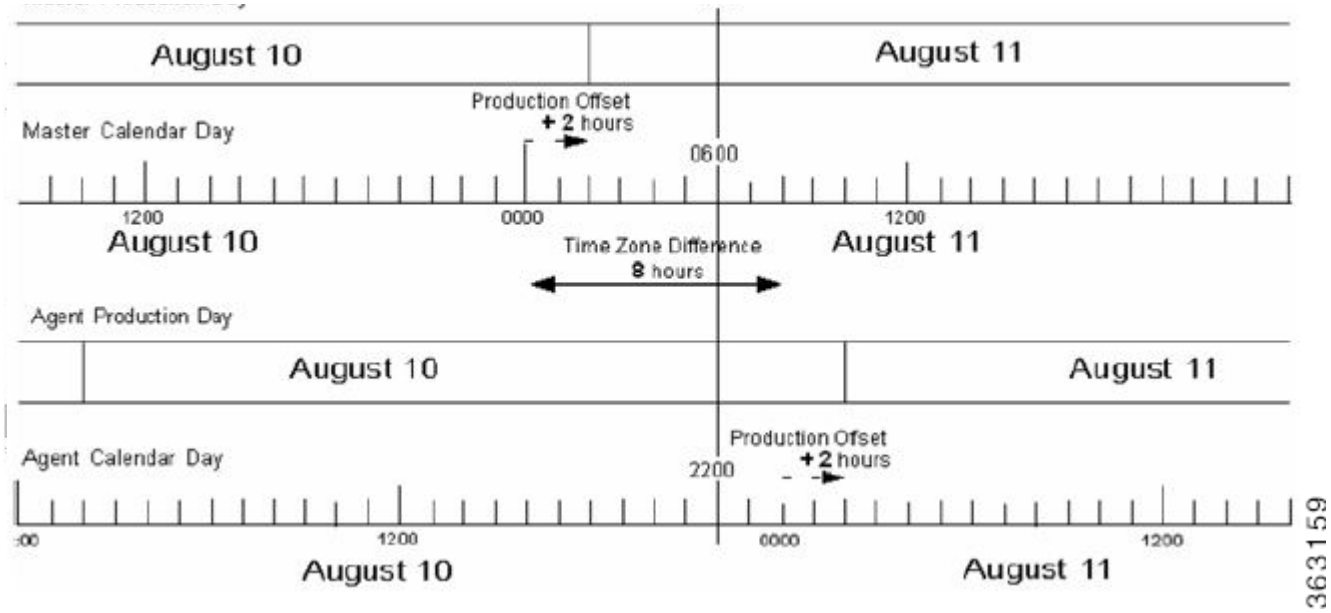


This example shows an agent that is five hours ahead of the master. A production day offset of positive three (+3) shifts the start of the production day (0000) three hours ahead in calendar time for both master and agent. A job defined to run at 0500 on the production day of August 11th launches at 0000 on August 10th on the master's production day.

Agent Running Behind the Master

Setting a positive production day offset moves the start of the production day forward. In the example below, the difference between time zones is shown with a solid arrow and the production day offset is shown with a dotted arrow. This example has a positive production day offset of two hours ahead with the agent running eight hours behind the master. Thus a job defined to run at 2200 on the production day of August 10th is launched at 0600 on August 11th due to the difference in time zones.

Figure 7 Positive Production Day Offset With Agent Running Behind Master

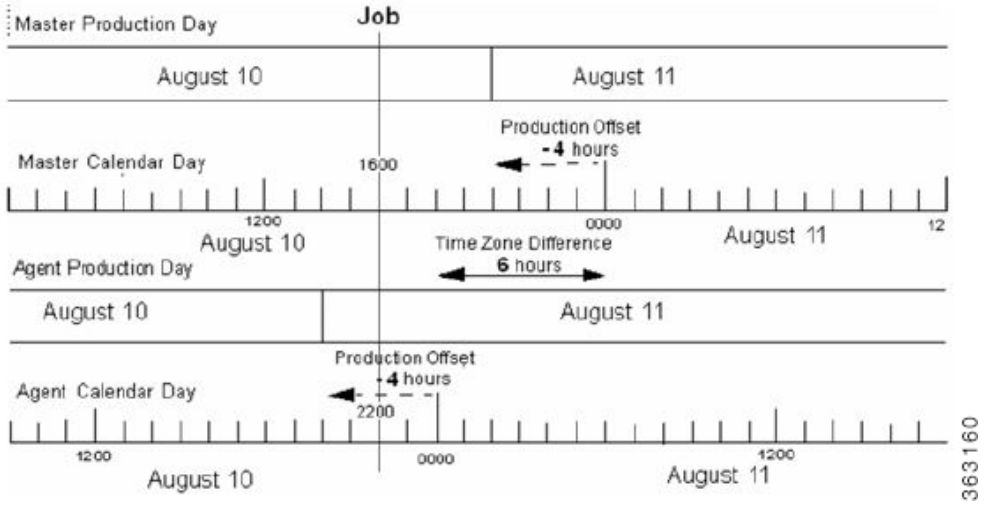


Using a Negative Production Day Offset

Agent Running Ahead of the Master

Setting a negative production day offset moves the start of the production day back from midnight. In the example below, the difference between time zones is shown with a solid arrow and the production day offset is shown in a dotted arrow. The example shown below has a negative 4 offset so the start of the production day is moved back four hours behind the start of the calendar day. A job defined to run at 2200 on the production day of August 11th is launched at 1600 on August 10th on the master due to the time difference.

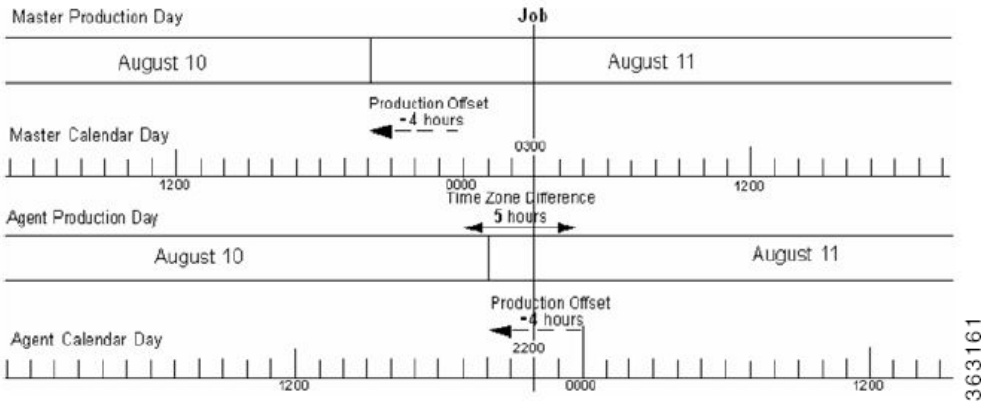
Figure 8 Negative Production Day Offset With Agent Running Ahead of Master



Agent Running Behind the Master

Setting a negative production day offset moves the start of the production day back from midnight. In the following example, there is a negative four hour production offset moving the start of the production day four hours behind the start of the calendar day. In the example below, the difference between time zones is shown with a solid arrow and the production day offset is shown with a dotted arrow.

Figure 9 Negative Production Day Offset With Agent Running Behind Master

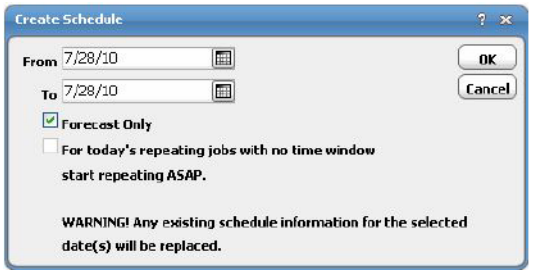


This configuration has an agent that is running five hours behind the master. A job defined to run at 2300 on the production day of August 10th is launched by the master at 0300 on August 11th.

Defining a Compile Offset

Compiling the production schedule may consume enough CPU resources to seriously affect your system's performance and hinder other work that may be going on concurrently. It may be better to schedule such a resource-intensive operation like compiling your schedule, at a more convenient time when your system has a lighter workload. Once the schedule is compiled, it is saved until needed when the new production day starts. You can manually compile a new schedule at any time by selecting the **Create Schedule** option in the **Activities** main menu.

Figure 10 Create Schedule Dialog



The compile offset is calculated from the start of the production day. The schedule will be compiled for the current day and all days that belong to the future days to include in the schedule. Any future day that was already scheduled (not forecast) will not get recompiled to reflect any job modifications or additions that were not committed to the schedule after the operation. To include any modifications that were not committed to the schedule, we must either recompile the already scheduled days or revert these schedules to a forecast type to force a compile before the day rolls into production.

Calendars in CWA

About Calendars

Cisco Workload Automation's Calendars function enables you to specify dates on which to run jobs on a regular basis. Calendars are the backbone of an automated production schedule. You can create a calendar that holds specific dates of your choice, or a relative calendar that repeats on a daily, weekly, or monthly basis. You can also combine calendars into calendar groups where logic is used to include or exclude the dates of the calendars in the group. You can then use the calendar group as a whole to schedule jobs.

CWA provides many pre-defined calendars and calendar groups. Most are **Public** and belong to the default workgroup **Schedulers** so that anyone can use them. You can customize these examples or create your own entirely new calendar. Once you select a calendar, CWA calculates the matching dates for the remainder of the current year, plus three more years.

All calendars are fully configurable. For example, after specifying the repetitive rules for the calendar, you can forecast the results to ensure that the rules are correct. You can then add or delete special days to the resulting set, giving you full control over the scheduling process.

List Calendars

You can select unique days to run jobs with a list calendar. List calendars are useful when you do not want your job to repeat continually. Once defined, the calendar can then be assigned to a job definition from the **Job Definition** or **Job Group Definition** dialogs.

Daily Calendars

With a daily calendar, you can specify your job to run based on an interval of days. Once defined, the calendar can then be assigned to a job definition from the **Job Definition** or **Job Group Definition** dialog.

Weekly Calendars

With a weekly calendar, you can specify your job to run based on an interval of weeks. Once defined, the calendar can then be assigned to a job definition from the **Job Definition** or **Job Group Definition** dialog.

Monthly Calendars with Days

With a monthly calendar with days, you can specify common days of the week in various months to run your job; for example, the 1st and 15th of January, February and April. You can also add and remove unique days and weeks from the calendar.

Monthly Calendars with Weeks

With a monthly calendar, you can specify common days in various months to run your job. For example, the first and third Wednesday of October and November. You can also add and remove unique days and weeks from the calendar.

Subset Calendar

You can use subset calendars to extract exactly the dates that you need from an existing calendar, "borrowing" the calendar logic already in place.

Fiscal Calendars

CWA gives special attention to fiscal calendars, acknowledging their vital role in production in business environments. They are treated in a slightly different way than other types of CWA calendars and have a section devoted to them in this chapter.

Calendar Types

The following table lists the types of calendars (other than fiscal calendars) available in CWA..

Type	Description	Examples
List Calendar	A calendar of dates you choose specifically. Use this type of calendar to specify a finite set of dates to run your job.	January 15th and 16th. March 29th through April 1st
Daily Calendar	Automatically chooses dates that repeat using the specified interval in days. You can also choose to exclude certain days of the week, using condition logic from the **Condition** dialog. Use this type of calendar when your jobs should run on a specific daily interval.	Every 3rd day unless the 3rd day is Sunday, in which case it should run on Monday. Every day except Saturday and Sunday.
Weekly Calendar	Automatically chooses dates that repeat using a specified interval in weeks. You can also choose the days within the week to run. Use this type of calendar when your jobs should run on a specific weekly interval.	Every 3rd week on Wednesday and Friday Monday and Wednesday of every week.
Monthly Calendar with Days	Automatically chooses dates that repeat yearly in the months and dates specified. Use this type of calendar when your jobs should run on a consistent yearly schedule.	Every January, April, July, and October on the 1st and 15th of each month. The 1st of every month.
Subset	A subset of dates selected from existing calendars.	The 1st weekday of the fiscal quarter.
Monthly Calendar with Weeks	Automatically chooses dates that repeat yearly in the months and occurrence of days specified (i.e. first Monday, third Wednesday). You can also choose to offset all forecasted dates by an amount you specify. Use this type of calendar when your jobs should run on a consistent yearly schedule, and you want to specify the days on which it will run.	Every January, April, July, and October on the first and third Monday of each month. The second Friday of every month.
Group Calendar	Groups calendars of the above types, and excludes or includes their dates.	Include dates in calendar Workweek. Exclude dates in calendar holidays.

Note: The **Condition** dialog makes it possible to alter the functionality of calendars to precisely satisfy customized needs. For more information about calendar conditions, see Condition Dialog (Calendar Definition), page 272.

Default Calendars

The following table lists all the predefined calendars provided with CWA.

Calendar	Type	Examples
Christmas	Monthly (Days)	This calendar consists of Christmas Day (December 25th).
Christmas Eve	Monthly (Days)	This calendar consists of Christmas Eve (December 24th).
Christmas Holiday Group	Group	Includes Christmas and Christmas Eve
Daily	Daily	Every day including weekends and holidays.
Easter	Easter	This calendar consists of Easter.
Every other Friday	Weekly	Friday every two weeks.
Every other Friday except Holidays	Group	Includes every other Friday except for Fridays that fall on a holiday.
Every Wednesday and Friday	Weekly	Wednesday and Friday of every week, including holidays.
Holidays	List	Christmas Holiday Group, Independence Day, Labor Day, Memorial Day, New Years, Presidents Day and Thanksgiving Holiday Group. This calendar definition contains those holidays most requested for inclusion by users.
Friday	Daily	Fridays
Independence Day	Monthly (Days)	July 4th of every year.
Labor Day	Monthly (Weeks)	The first Monday in September.
Memorial Day	Monthly (Weeks)	The last Monday in May.
Monday	Daily	Mondays
Monday to Friday	Weekly	All days except Saturday and Sunday.
Month Begin	Subset	The first day of each month.
Month End	Subset	The last day of each month.
New Years	Monthly (Days)	First day of January.
Pay Day	Monthly (Days)	First and fifteenth day of the month.
Presidents Day	Monthly with weeks	The third Monday in February.
Qtr 1	Monthly (Days)	All days in the months of January, February and March.
Qtr 2	Monthly (Days)	All days in the months of April, May and June.
Qtr 3	Monthly (Days)	All days in the months of July, August and September
Qtr 4	Monthly (Days)	All days in the months of October, November and December.
Quarter Begin	Subset	The first day of each quarter.
Quarter End	Subset	The last day of each quarter.
Saturday	Daily	Saturdays
Sunday	Daily	Sundays
Thanksgiving Day	Monthly (Weeks)	The fourth Thursday in November.
Thanksgiving Holiday Group	Group	Thanksgiving Day and the next day.
Thursday	Daily	Thursdays
Tuesday	Daily	Tuesdays
Wednesday	Daily	Wednesdays
Week Begin	Subset	First workday of the week.

Calendar	Type	Examples
Week Ending	Subset	Last workday of the week.
Weekend	Weekly	Every Saturday and Sunday.
Workdays	Group	Every Monday through Friday except for holidays.
Year Begin	Subset	First workday of the year.
Year End	Subset	Last workday of the year.

Note: Be aware that these predefined calendars are only examples of calendars that you can create. They may not include the dates that you may expect because they may use other conditions to illustrate calendar principles. *Before using these calendars for production purposes, verify that a calendar includes the dates that you expect* and modify it for your needs if necessary.

Calendars Interface

About the Calendars Interface

From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.

Buttons

- **Add** –Displays the **Add Calendar** sub-menu to choose the type of calendar (including group) that you want to create. For more information about the **Add Calendar** sub-menu, see Add Calendar Submenu, page 265.
- **Edit Calendar** –Displays the **Calendar Definition** dialog to edit an existing calendar.
- **Copy Calendar** –Creates a copy of the selected action with the same information as the selected action, except for the name.
- **Delete Calendar** –Removes the selected calendar definition from the list database.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** pane to view and print your calendars. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Name** –The name of the calendar.
- **Type** –The type of calendar. For more information about calendar types, see Calendar Types, page 261.
- **Owner** –The owner of the calendar.
- **Public** –Whether or not the calendar is public, that is, available to all CWA users.
- **Modified** –The last time the calendar definition was modified.

Calendars Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Calendars** pane, the **Calendars Preferences** dialog displays.

From the **Calendars Preferences** dialog, you can select which columns are displayed in the **Calendars** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Calendars** pane, the **Navigator** context menu displays.

The **Calendars Navigator** context menu contains the following options:

- **Add Calendar** –Displays the **Add Calendar** sub-menu to choose the type of calendar (including group) that you want to create. Has the same function as the **Add** button. For more information about the **Add Calendar** sub-menu, see Add Calendar Submenu, page 265.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** pane to view and print your calendar definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Preferences** –Displays the **Preferences** dialog for the **Calendars** pane.
- **New Root Folder** –Allows you to create a new root folder for the **Navigator** pane.

Calendars Pane Context Menu

About the Calendars Context Menu

When you right-click in the **Calendars** pane, the **Calendars** pane context menu displays. The following describes the items in the **Calendars** pane context menu:

- **Add Calendar** –Add a calendar definition. Selecting this menu option leads to the **Add Calendar** sub-menu from which you can choose the type of calendar (including group) that you want to create. For more information about the **Add Calendar** sub-menu, see Add Calendar Submenu, page 265.
- **Edit Calendar** –Edit the selected calendar definition.
- **Delete Calendar** –Delete the selected calendar.
- **Copy Calendar** —Copies the selected calendar.
- Refresh —Refreshes the data on the **Calendars** pane.
- **Print** –Prints the calendar(s) in a grid format to a new pane. You can then exit the pane or print the calendar to a printer.
- **Print Selected** –Prints the selected calendar(s) in a grid format to a new pane. You can then exit the pane or print the calendar to a printer.
- **Where Used** –Displays a submenu of **By Jobs** or **By Calendars.** Selecting **By Jobs** will display a report of which jobs are associated with the selected calendar. Selecting **By Calendars** will display a report of which calendars are using the selected calendar, for example, in a subset.

- **Change type to** –Change the selected calendar's type to another type.
- **Recalculate** –Recalculates the dates for all calendars. Useful if dates have been manually added or subtracted from the normal calendar.

Note: When you use the **Recalculate** feature, any days you have manually added or removed from the calendar(s) will be lost. Recalculating calendars do not affect the production schedules that have already been created. You must recompile the existing production schedules before the changes can take effect in those schedules.

Add Calendar Submenu

When you select **Add** from the **Calendars** pane context menu, the **Add** submenu displays. This menu also appears in a context form when you click the **Add b**utton on the CWA toolbar from the **Calendars** pane.

The following describes the items in the **Add Calendars** submenu:

- **Group** –Add a calendar group, combining two or more calendars and including or excluding their associated dates.
- **List** –Add a list calendar to specify any set of non-repeating dates.
- **Daily** –Add a calendar that repeats at a daily interval that you specify. For example, **every 2 days, every 3 days**, etc. You can also exclude certain days, i.e. **Saturday** or **Sunday**, from the calendar.
- **Weekly** –Add a calendar that repeats at a weekly interval that you specify. For example, **once a week, every 3 weeks**, etc. You can also include the days in the week to run the job, i.e., **Monday through Friday**.
- **Monthly with Days** –Add a calendar that repeats in the months you specify. For example, **January, April, July,** and **October**. You also specify on which date(s) of the selected months to run jobs. For example, **the 1st and the 15th** of the specified months.
- **Monthly with Weeks** –Add a calendar that repeats on the months you specify. For example, **January and June**. You also specify on which day(s) of the selected months to run jobs. For example, **the first and last Friday of each month**. You can also specify offsets to the specified date. For example, **3 days before the 1st Monday of each month**.
- **Subset** –Add a new calendar which is a subset of the dates encompassed by existing calendars. You can use calendar logic to target the exact dates that you want to include.

Calendar Group Definition Dialog

The **Calendar Group Definition** dialog displays when you add or edit a calendar group from the **Calendars** pane.

Common to All Tabs

- **Calendar Name** –The name of the calendar group (up to 60 characters). The name must be unique.
- **Owner** –The owner of the calendar group. By default, this is the creator of the calendar group. An owner can be a CWA user or Workgroup.
- **Public** –The **Public** option makes the calendar accessible by all CWA users within the boundaries of their Security Policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (Calendar)

- **Inc/Exc** –Lists whether the dates of the calendar or calendar group are to be included in or excluded from this calendar group.When CWA calculates the calendar, included dates are added first, then excluded dates are removed.

Note: When using the Inc/Exc calendar group feature, dates that are excluded have priority. If a date has been both included and excluded, the final result will be that it is excluded.

- **Calendar** –A calendar or calendar group to be associated with the calendar group, whether included or excluded.
- **Include common days only** –Includes only the dates that are common to all the calendars selected to be part of the calendar group.
- **Add** –Associates a calendar or calendar group to this calendar group and defines whether the dates are included or excluded.
- **Edit** –Changes whether to include or exclude the selected calendar's or calendar group's dates from the calendar group and/or changes the calendar associated with the calendar group.
- **Delete** –Removes the selected calendar from the calendar group.

Note: You can include or exclude individual dates by selecting a listed date and right-clicking to display a context menu providing the opposite option for the selected date, e.g., an included date has an **Exclude** option.

Details Tab Calendar Dialog

The **Calendar** dialog displays when you click the **Edit** or **Add** button in the **Details** tab of the **Calendar Group Definition** dialog.

This dialog contains the following elements:

- **Calendar** –Offers a drop-down menu to select the calendar for which the dates are included or excluded from the calendar group. Calendar groups cannot be selected.
- **Adjust by... days** –You can select a positive or negative number to shift the calendar forward or backward (respectively) by the specified number.
- **Include Dates** –Includes the dates of the selected calendar into the calendar group.
- **Exclude Dates** –Excludes the dates of the selected calendar into the calendar group.

Note: Exclude Dates takes precedence over **Include Dates**. For example, if "Calendar A" contains January 3rd - 6th and is included, and "Calendar B" contains January 5th and is excluded, the resulting calendar group will contain January 3rd, January 4th and January 6th.

Conditions Tab (Calendar)

This tab contains the following elements:

- **If conflicts with** –The **If Conflicts With** column works in tandem with the **Action** field. **If conflicts with** means "if a date matches." In other words, if the calendar definition you are working with (the one named in the **Calendar Name** field) includes dates that are the same as those in another calendar that you specify, then you can take the action specified in the **Action** field.
- **Action** –The **Action** column works in tandem with the **If Conflicts With** field. In this field, you specify the action to take if a date included in the calendar definition you are working with (the one named in the **Calendar Name** field) conflicts with (is the same as) those in the calendar you specify in the **If Conflicts With** field.
- **Add** –Displays the **Condition** dialog to add a condition (to select an **If Conflicts With** calendar and an action to take). For more information about the **Condition** dialog, see Condition Dialog (Calendar Definition), page 272.
- **Edit** –Displays the **Condition** dialog to change the specifications of the selected condition. For more information about the **Condition** dialog, see Condition Dialog (Calendar Definition), page 272
- **Delete** –Removes the selected condition from the calendar group definition.

Forecast Tab

Displays the dates in the calendar that were automatically generated using the settings configured on the **Details** tab. Dates that appear in red text on the **Forecast** tab are part of the calendar and are listed in the **Selected Dates** field. Dates in black text are not part of the calendar. Calendar dates can be added or removed from the calendar by double-clicking that date on the displayed **Calendar** tab (except on subset calendars).

This tab contains the following elements:

- **Calendar Section** –Displays the forecasted dates in a calendar format for the calendar. The title bar displays the day, month and year of the present calendar view. Forecasted dates are displayed in red.
- **Calendar control bar** –Changes the month that displays in the **Calendar** section. The outer buttons move the dates in one-year increments. The inner buttons move the dates in one-month increments.
- **Selected Dates Section** –Displays a forecast of dates that are generated from the **Details** tab.

Selected Dates Context Menu

When you right-click in the **Selected Dates** section of the **Forecast** tab in any calendar definition dialog, the **Selected Dates** context menu displays.

- **Delete** –Deletes only the date highlighted in the selected dates section.
- **Delete All** –Deletes all the dates in the selected dates section.

Note: The **Forecast** tab data is regenerated every time there is a change to the **Details** tab of the calendar definition. Therefore, if you add or remove dates through the **Forecast** tab, then make further changes from the **Details** tab, your original edits (from the **Forecast** tab) will be lost.

Description Tab

Description –A free text field for up to 255 characters (optional).

List Calendar Definition Dialog

The **List Calendar Definition** dialog displays when you add or edit a **List** calendar.

Common to All Tabs

- **Calendar Name** –The name of the calendar (up to 60 characters). The name must be unique.
- **Owner** –The owner of the calendar. By default, this is the creator of the calendar. An owner can be a CWA user or workgroup.
- **Public** –The **Public** option makes the calendar accessible to all CWA users within the boundaries of their Security Policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (List Calendar)

The **Details** tab contains the following elements:

- **Calendar Section** –Displays the forecasted dates in a calendar format for the calendar group. The title bar displays the day, month, and year of the present calendar view. Forecasted dates are displayed in red.
- **Calendar control bar** –Changes the month that displays in the **Calendar** section. The outer buttons move the dates in one-year increments. The inner buttons move the dates in one-month increments.
- **Selected Dates Section** –Displays a forecast of dates that are generated from the **Details** tab.
- **Delete** –Deletes dates that are selected in the **Selected Dates** section.

Description Tab

Description –A free text field for up to 255 characters (optional).

Daily Calendar Definition Dialog

The **Daily Calendar Definition** dialog displays when you add or edit a **Daily** calendar.

Common to All Tabs

- **Calendar Name** –The name of the calendar (up to 60 characters). The name must be unique.
- **Owner** –The owner of the calendar. By default, this is the creator of the calendar. An owner can be a CWA user or workgroup.
- **Starting on** –Sets the starting date by which the dates are automatically selected for the calendar. Any dates before the starting date are not selected. Though the forecast is limited to a finite period, the calendar has no ending date. CWA calculates calendars for the remainder of the current year, plus three more years.
- **Public** –The **Public** option makes the calendar accessible to all CWA users within the boundaries of their security policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (Daily Calendar)

The **Details** tab contains the following elements:

- **Frequency** –Sets the frequency in days by which the days are automatically selected for the calendar.
- **Include the following days** –Includes the selected days of the week in the date generation process. Excluded days will not be used as production dates, but will be counted during calendar calculation. When the calendar production date is calculated to fall on an excluded day of the week, the date generation process chooses the next included day and restarts the count starting from that day.

  For example:

  If you set the frequency to 2 days, starting Monday, and exclude Saturday and Sunday, you will get Mon, Wed, Fri, (Sun skipped, go to next available day)

  Mon (reset count), Wed, ‚Ä¶.

  - Although Saturday and Sunday were excluded days of the week, they were counted during date generation.
  - Because Saturday and Sunday were excluded, when the next calendar production date was calculated as Sunday, the next non-excluded day of the week (Monday) was selected.
  - Since the count for date generation is restarted after an excluded day is skipped, the next calendar date was Wednesday.

Conditions Tab

Refer to the **Conditions** tab for a group calendar on Conditions Tab (Calendar) for a description of the fields on this tab.

Forecast Tab

Refer to the **Forecast** tab for a daily calendar on Forecast Tab for a description of the fields on this tab.

Description Tab

Description –A free text field for up to 255 characters (optional).

Weekly Calendar Definition Dialog

The **Weekly Calendar Definition** dialog displays when you add or edit a weekly calendar.

Common to All Tabs

- **Calendar Name** –The name of the calendar (up to 60 characters). The name must be unique.
- **Owner** –The owner of the calendar. By default, this is the creator of the calendar. An owner can be a CWA user or Workgroup.
- **Starting on** –Sets the starting date by which the dates are automatically selected for the calendar. Any dates before the starting date are not selected. Though the forecast is limited to a finite period, the calendar has no ending date.
- **Public** –The **Public** option makes the calendar accessible by all CWA users within the boundaries of their Security Policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (Weekly Calendar)

The **Details** tab contains the following elements:

- **Frequency** –Sets the frequency in weeks by which the dates are automatically selected for the calendar.
- **Include the following days** –Sets the days of the week that should be included in the automatic week selection. The job repeats on each day selected.

Conditions Tab

Refer to the Conditions Tab (Calendar) for a group calendar on for a description of the fields on this tab.

Forecast Tab

Refer to the Forecast Tab for a daily calendar on for a description of the fields on this tab.

Description Tab

Description –A free text field for up to 255 characters (optional).

Monthly Calendar with Days Definition Dialog

The **Monthly Calendar Definition** dialog displays when you add or edit a monthly calendar with days.

Common to All Tabs

- **Calendar Name** –The name of the calendar (up to 60 characters). The name must be unique.
- **Owner** –The owner of the calendar. By default, this is the creator of the calendar. An owner can be a CWA user or Workgroup.
- **Starting On** –Sets the starting date by which the dates are automatically selected for the calendar. Any dates before the starting date are not selected. Though the forecast is limited to a finite period, the calendar has no ending date.
- **Public** –The **Public** option makes the calendar accessible to all CWA users within the boundaries of their Security Policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (Monthly Calendar with Days)

The **Details** tab contains the following elements:

- **Months** –Select the months for which the calendar will generate dates.

- **Days in Month** –Select specific date occurrences in the month(s) for which the calendar will generate dates.

Note: You must have months selected in the **Months** section with corresponding dates selected in the **Days in Month** section in order to automatically generate the dates.

Monthly Calendar Definition Context Menu

The **Monthly Calendar Definition** dialog context menu displays when you right-click the **Details** tab of the **Monthly Calendar with Days Definition** and the **Monthly Calendar with Weeks Definition** dialogs.

This context menu contains the following options:

- **Select All Months** –Selects all months in the **Months** section of the **Details** tab.
- **Clear All Months** –Clears all months in the **Months** section of the **Details** tab.
- **Select All Days** –Selects all days in the **Dates in Month** (or **Days in Week**) section of the **Details** tab.
- **Clear All Days** –Clears all days in the **Dates in Month** (or **Days in Week**) section of the **Details** tab.

Conditions Tab

Refer to the **Conditions** tab for a group calendar on Conditions Tab (Calendar) for a description of the fields on this tab.

Forecast Tab

Refer to the **Forecast** tab for a daily calendar on Forecast Tab for a description of the fields on this tab.

Description Tab

Description –A free text field for up to 255 characters (optional).

Monthly Calendar with Weeks Definition Dialog

The **Monthly Calendar with Weeks Definition** dialog displays when you add or edit a monthly calendar with weeks.

Common to All Tabs

- **Calendar Name** –The name of the calendar (up to 60 characters). The name must be unique.
- **Owner** –The owner of the calendar. By default, this is the creator of the calendar. An owner can be a CWA user or workgroup.
- **Starting On** –Sets the starting date by which the dates are automatically selected for the calendar. Any dates before the starting date are not selected. Though the forecast is limited to a finite period, the calendar has no ending date.
- **Public** –The **Public** option makes the calendar accessible by all CWA users within the boundaries of their security policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (Monthly Calendar with Weeks)

The **Details** tab allows you to control how to automatically generate dates for the calendar.

This tab contains the following elements:

- **Months** –Allows you to choose the months for which the calendar generates dates.
- **Days in Week** –Choose the days of the week for which the calendar generates dates.
- **Occurrence** –Choose which occurrence(s) of the days selected in the **Days in Week** section for which the calendar will generate dates. For example, if **January** is selected in the **Months** section, **Monday** is selected in the **Days in Week** section, and **1st** is selected in the **Occurrence** section, the resultant set will be the first Monday in January.

- **Adjust By**—Allows you to shift the resultant date set forward or backward by the amount shown in this field. You can adjust dates forward and backward up to 31 days.

Note: You must have a month(s) selected in the **Months** section, with a corresponding day(s) selected in the **Days in Week** section, and an occurrence(s) selected in the **Occurrences** section in order to automatically generate dates.

Monthly Calendar Definition Context Menu

The **Monthly Calendar Definition** dialog context menu displays when you right-click the **Details** tab of the **Monthly Calendar with Days Definition** and the **Monthly Calendar with Weeks Definition** dialogs.

This context menu contains the following options:

- **Select All Months** —Selects all months in the **Months** section of the **Details** tab.
- **Clear All Months** —Clears all months in the **Months** section of the **Details** tab.
- **Select All Days** —Selects all days in the **Dates in Month** (or **Days in Week**) section of the **Details** tab.
- **Clear All Days** —Clears all days in the **Dates in Month** (or **Days in Week**) section of the **Details** tab.

Conditions Tab

Refer to the **Conditions** tab for a group calendar on Conditions Tab (Calendar) for a description of the fields on this tab.

Forecast Tab

Refer to the **Forecast** tab for a daily calendar on Forecast Tab for a description of the fields on this tab.

Description Tab

Description —A free text field for up to 255 characters (optional).

Calendar Subset Definition Dialog

Common to All Tabs

- **Calendar Name** —The name of the calendar (up to 60 characters). The name must be unique.
- **Owner** —The owner of the calendar. By default, this is the creator of the calendar. An owner can be a CWA user or workgroup.
- **Starting On** —Sets the starting date by which the dates are automatically selected for the calendar. Any dates before the starting date are not selected. Though the forecast is limited to a finite period, the calendar has no ending date.
- **Public** —The **Public** option makes the calendar accessible by all CWA users within the boundaries of their security policy. When cleared, only the calendar's owner can see and use the calendar.

Details Tab (Calendar Subset Definition)

The **Details** tab allows you to control how to automatically generate dates for the calendar.

This tab contains the following elements:

- **Occurrence** —From the **Occurrence** drop-down menu, select the instance of the dates of the calendar that you want to use. For example, if you want to use all the days this calendar includes, select **Every**.
- **Calendar** —Select the calendar for which this calendar will be a subset. The drop-down menu lists all available calendars.

- **Time Frame** –From the **Time Frame** field, you can select the exact time period for your subset calendar to run. For example, you can select the **13th week**, or the month of **March**.
- **Based on Fiscal** –If you have any Fiscal calendars defined, they are listed and available from the **Based on Fiscal** field drop-down menu.
- **Adjust by... days** –The number of days by which to shift the new calendar you created forward (positive numbers) or backward (negative numbers).

Note: With subsets, it is important that the source calendar include historic dates where necessary. For example: If you create a calendar called **Daily** that includes every day of the week, by default that calendar starts today. If you then create a subset that is the 1st Daily of the quarter, the first date in the current quarter ends up being today, since that is the first date in the calendar Daily. In this example, it is necessary to modify Daily's starting date to January 1.

Conditions Tab

Refer to the **Conditions** tab for a group calendar on Conditions Tab (Calendar) for a description of the fields on this tab.

Forecast Tab

Refer to the **Forecast** tab for a daily calendar on Forecast Tab for a description of the fields on this tab.

Description Tab

Description –A free text field for up to 255 characters (optional).

Condition Dialog (Calendar Definition)

The **Condition** dialog displays when you add or edit a condition from the **Conditions** tab of any calendar definition dialog.

This tab contains the following elements:

- **If conflicts with calendar** –Offers a drop-down menu listing all available calendars.
- **Take action** –The **Take action** field offers a drop-down menu with the following possible actions:
  - **Skip** –Skips this date. Essentially, if there is a conflict between the two calendars, skip the date and do not take any action.
  - **Previous Day** –Use the previous date before the conflicted date.
  - **Next Day** –Use the next date after the conflicted date.
  - **Closest Calendar** –Selects the date in the calendar specified in the **Calendar** field that is closest to the conflicted date, whether the date occurs before or after the conflicted date. A calendar offset can also be specified.
  - **Previous Calendar** –Selects the date in the calendar specified in the **Calendar** field that occurs previous to the conflicted date. A calendar offset can also be specified.
  - **Next Calendar** –Selects the date in the calendar selected in the **Calendar** field that next occurs after the conflicted date. A calendar offset can also be specified.

  Note: The **Closest Day**, **Previous Day** and the **Next Day** action options only apply to a specific day within a conflicting calendar-not to the entire calendar. If there is a conflict with more than one day within the calendar, you must individually apply the appropriate action to each day that conflicts with the calendar.
- **Calendar** –The first field can optionally be used to select the number of days to offset the calendar selected in the second field. The second field displays a drop-down list of available calendars to be used in conjunction with the **Closest Calendar**, **Previous Calendar** and **Next Calendar** options of the **Take Action** field.

Calendar Procedures

Adding a Calendar

To add a calendar:

1. From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.
2. Click the **Add** button on the CWA toolbar or right-click and select **Add Calendar** from the context menu.
3. Select the type of calendar you want to add, then follow the instructions for editing a calendar in Editing Calendars, page 274. For more information about a specific type of calendar, see its definition dialog description:
   - **List Calendar** – For more information about list calendars, see List Calendar Definition Dialog, page 267.
   - **Daily Calendar** –For more information about daily calendars, see Daily Calendar Definition Dialog, page 268.
   - **Weekly Calendar** –For more information about weekly calendars, see Weekly Calendar Definition Dialog, page 269.
   - **Monthly Calendar with Days** –For more information about monthly calendars with days, see Monthly Calendar with Days Definition Dialog, page 269.
   - **Monthly Calendar with Weeks** –For more information about monthly calendars with weeks, see Monthly Calendar with Weeks Definition Dialog, page 270.
   - **Subset Calendar** –For more information about subset calendars, see Calendar Subset Definition Dialog, page 271.

Editing Calendar Groups

A calendar group is a combination of individual calendars each of which have their dates either included into or excluded from the group. The calendar group can then be used for scheduling jobs just like any other calendar.

When combining calendars in a calendar group, date exclusions always take precedence over date inclusions. For example, if in one calendar in a calendar group you include the days Monday - Friday, and in another, you exclude the days Tuesday, Wednesday, and Thursday, the calendar group's final set of run dates will be Monday and Friday.

To edit a calendar group:

1. From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.
2. Double-click the calendar you want to edit or select the calendar and click the **Edit** button or right-click the calendar and select **Edit Calendar** from the context menu.
3. To make the calendar public, select the **Public** option. Public calendars can be used by all CWA users, within the restrictions of their Security Policy.
4. To add a calendar to your calendar group:
   a. Click the **Details** tab.
   b. Click **Add** to display the **Calendar** dialog.
   c. From the **Calendar** field drop-down menu, select the calendar to add to your calendar group.
   d. After selecting a calendar, click either:

   Include Calendar to include the dates in the selected calendar into the calendar group.

Exclude Calendar to exclude the dates in the selected calendar from the calendar group.

e. Click **OK**. The calendar is now a part of the calendar group.

5. Edit a calendar in your calendar group:

   a. Select the calendar to edit in the **Details** tab.

   b. Click the **Edit** button to display the **Calendar** dialog.

   c. From the **Calendar** field drop-down menu, select the calendar to associate with your calendar group.

   d. After selecting a calendar, click either:

   Include Calendar to include the dates in the selected calendar into the calendar group.

   Exclude Calendar to exclude the dates in the selected calendar from the calendar group.

   e. Click **OK**.

6. Click the **Conditions** tab and set any conditions you want to place on your calendar group. For more information about conditions, see Condition Dialog (Calendar Definition), page 272.

7. Click the **Forecast** tab to see the resultant dates for the calendar group are shown.

   Note: You cannot add or delete unique dates from the **Calendar Group Definition** dialog. To add or delete special dates, do so in the calendar's individual calendar definition dialog. The group will automatically reflect the updates.

8. Click the **Description** tab. You can add or edit a description for the calendar group (up to 255 characters).

Editing Calendars

Note: Whenever you edit a calendar that has already been assigned to a job, or is being used by another calendar (for example, as a subset) you will be presented with a warning message informing you that the calendar is in use. When you modify a calendar assigned to a job, the **Effective Date** dialog displays providing options for when the changes to the already compiled production schedule should take effect. You can select a date during the current production schedule for the calendar changes to take effect or let the changes occur during a manual or automatic compilation.

To edit a calendar:

1. From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.

2. Double-click the calendar you want to edit or select the calendar and click the **Edit** button or right-click the calendar and select **Edit Calendar** from the context menu.

3. Type the name of the calendar in the **Calendar Name** field (up to 60 characters). The name must be unique.

4. To make the calendar public, select the **Public** option. Public calendars can be used by all CWA users, within the restrictions of their Security Policy.

5. Select dates for a calendar:

   a. Use the calendar control bar to select the month for which to add or delete dates.

   b. The outer buttons move the calendar in one year increments.

   c. The inner buttons move the calendar in one month increments.

   d. Double click the dates in the calendar section to select and deselect the dates for your calendar. The date cell text turns red, and the date appears in the **Selected Dates** section.

6. Remove dates from a calendar:

a. Click the **Details** tab.

b. Select the date to remove from the **Selected Dates** section.

c. Click **Delete**. The date moves back to the **Calendar** section and the date cell text turns black.

Note: This option is not available for subset calendars.

7. Specify repetition in weeks for a calendar (weekly calendar only):

   a. Click the **Details** tab.

   b. In the **Frequency** drop-down menu, select the frequency of the interval (in weeks).

   c. In the **Starting On** field, type the date that the interval starts.
   A seven-day period begins on the date you specify. For example, if you select an interval of every two weeks, starting on Wednesday of this week, and include Monday through Friday, you will get Wednesday through Friday of this week, and Monday and Tuesday of next week, which completes the seven day period. The seven-day period is then repeated every other Wednesday. (You can select a starting date from the calendar pane.) The calendar has no ending date.

   d. In the **Include the following days** section, select the days to include in the seven day period.

8. Specify common monthly dates for a calendar:

   a. Click the **Details** tab.

   b. In the **Months** section, select the months when the job should run.

   c. In the **Days in Month** section, select the dates in the month(s) when the job should run.

9. Specify repetition in months for a calendar (monthly with weeks):

   a. Click the **Details** tab.

   b. In the **Months** section, select the months when the job should run.

   c. In the **Days in Week** section, select the days of the week when the job should run.

   d. In the **Occurrence** section, select the occurrence for the day(s) selected. For example, **2nd** means the second time the day(s) selected in the **Days of Week** section occurs in the month.

   e. In the **Adjust by field**, select the number of days by which to offset all the dates forecasted. For example, three days after the last Friday of each month. If the last Friday is the 31st, the job will run on the 3rd day of the next month.

   f. Click the **Forecast** tab. The results of the computation from the specification made on the **Details** tab are shown.

10. Set the **Details** tab for a subset calendar:

    a. From the **Occurrence** drop-down menu, select the instance of the dates of the calendar that you want to use. For example, if you want to use all the days this calendar includes, select **Every**.

    b. From the **Calendar** field drop-down menu, select the calendar for which this calendar will be a subset. The drop-down menu lists all available calendars.

    c. From the **Time Frame** field, select the exact time period for your calendar to run. For example, you can select the **13th week** or the month of **March**.

d. If you want to base your list calendar on a fiscal calendar, you must already have a fiscal calendar defined. If you have any fiscal calendars defined, they will be listed and available from the **Based on Fiscal** field drop-down menu.

e. In the **Adjust by... days** field, you select the number of days, if any, by which to shift the list calendar forward (positive numbers) or backward (negative numbers).

11. Click the **Conditions** tab, and set any conditions you want to place on your calendar. For more information about conditions, see Condition Dialog (Calendar Definition), page 272.

12. To type a description for the calendar, click the **Description** tab. You can add or edit a description for the calendar (up to 255 characters).

Deleting Calendars

You can delete a calendar that is no longer in use. You cannot delete a calendar that is associated with a job. Before deleting a calendar, you must first verify that the calendar is not associated with any jobs.

To delete a calendar:

1. From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.

2. Ensure that the calendar can be deleted.

   a. Right-click the calendar you want to delete and select **Where used** from the context menu to display the **Jobs Using** pane.

   b. If an information dialog confirms that no jobs use the calendar you can delete the calendar.
   If the calendar is used in any jobs, a Jobs Using Calendar report displays that lists the jobs that use that calendar.

   c. Go to the jobs listed in the Jobs Using Calendar report and change the calendar the job uses.

3. When no jobs are using the calendar, right-click the calendar and select **Delete Calendar** from the context menu or select the calendar and either press the **DELETE** key on your keyboard or click the **Delete** button on the CWA toolbar.

4. Click **Yes** at the **Confirmation** prompt to delete the calendar.

Determining Which Jobs are Using a Specific Calendar

You can determine which jobs are presently using a calendar. The jobs do not have to be in the production schedule.

To determine which jobs are using a specific calendar:

1. From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.

2. Right-click the calendar and select **Where Used** from the context menu

3. Choose either **By Jobs** or **By Calendars**.

4. In the **Information** pane, click **OK**.

Viewing Calendars

To view a calendar:

From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane. This pane displays all the calendars that are **Public**, owned by you and owned by workgroups to which you belong.

Viewing Calendar Dates

To view calendar dates:

1. From the **Navigator** pane, select **Definitions>Calendars** to display the **Calendars** pane.
2. Double-click the calendar to view, or right-click and select **Edit Calendar** from the context menu.
3. If the calendar is a list calendar, the dates appear in the **Details** tab of the definition dialog. Otherwise, the dates appear in the **Forecast** tab.

Fiscal Calendars in CWA

Many companies start their financial (fiscal) year on a date other than January 1. They may also have more than one fiscal calendar, for example, one calendar for the accounting department and one calendar for the operations department.

CWA's fiscal calendar functionality allows you to set up one or multiple fiscal calendars. You can then use a fiscal calendar as a base for subsequent calendars that you create, instead of basing your calendars on the January-December year.

Fiscal Calendar Interface

From the **Navigator** pane, select **Definitions>Fiscal Calendars** to display the **Fiscal Calendars** pane.

Buttons

- **Add Fiscal Calendar** –Displays the **Fiscal Calendar Definition** dialog to add a fiscal calendar.
- **Edit Fiscal Calendar** –Displays the **Fiscal Calendar Definition** dialog to edit a fiscal calendar.
- **Copy Fiscal Calendar** –Creates a copy of the selected calendar with the same information as the selected calendar, except for the name.
- **Delete Fiscal Calendar** –Removes the fiscal calendar definition from the CWA database.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** pane to view and print your fiscal calendars. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Name** –The name of the fiscal calendar.
- **Starting Month** –The month that begins your fiscal calendar year.
- **Starting Day** –The day of the month that begins your fiscal calendar.
- **Quarter Breakdown** –The quarterly divisions of your fiscal calendar.

Fiscal Calendars Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Fiscal Calendars** pane, the **Fiscal Calendars Preferences** dialog displays.

From this dialog, you can select which columns will be visible in the **Fiscal Calendars** pane and in what order they will be displayed.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Fiscal Calendars** pane, the **Navigator** context menu displays.

The **Fiscal Calendars Navigator** context menu contains the following options:

- **Add Fiscal Calendar** –Displays the **Fiscal Calendar Definition** dialog to add a new fiscal calendar. Has the same function as the **Add Fiscal Calendar** button.
- **Preferences** –Displays the **Preferences** dialog for the **Fiscal Calendars** pane.
- **Print** –Displays the **Reports** pane to view and print your fiscal calendar definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** –Updates the data in the current pane.

Fiscal Calendar Pane Context Menu

When you right-click in the **Fiscal Calendar** pane, the **Fiscal Calendar** pane context menu displays.

The **Fiscal Calendar** pane context menu contains the following options:

- **Add Fiscal Calendar** –Displays the **Fiscal Calendar Definition** dialog to add a new fiscal calendar.
- **Edit Fiscal Calendar** –Displays the **Fiscal Calendar Definition** dialog to edit an existing fiscal calendar. You can change the dates, whether the calendar is public, and/or the name of the selected calendar.
- **Delete Fiscal Calendar** –Deletes the fiscal calendar selected.
- **Modify Fiscal Year** –Displays the **Fiscal Year Definition** dialog (see Fiscal Year Definition Dialog) to change the fiscal year. You can select which quarter to add a week to and change how the quarter is broken down.
- **Print** –Displays the **Reports** pane to view and print your fiscal calendar definitions. For more information, see Monitoring Production, page 313.

Fiscal Calendar Definition Dialog

The **Fiscal Calendar Definition** dialog displays when you add or edit a fiscal calendar from the **Fiscal Calendars** pane.

This dialog contains the following elements:

- **Fiscal Calendar Name** –The name of your fiscal calendar here.
- **Fixed Start** –Checking this box ensures that the fiscal year always starts on the same date. Since a **4-4-5** quarter adds up to 91 days and 91 x 4 (quarters) = 364 days, the following fiscal year would begin a day early without an additional day being included. Checking this option also accounts for the additional day during leap years.
- If **Fixed Start** is not selected (specifying rolling fiscal or no fixed start), then the **Effective Year** option becomes available.
- **Effective Year** –This is a read-only field and automatically defaults to the previous year. **Effective Year** is to allow for the year 2000 dates when compiling calendars that use fiscal years.

- **Starting Month** –The month when your fiscal calendar begins.
- **Starting Day** –The day of the month when your fiscal calendar begins.
- **Quarter Breakdown** (Weeks in each month of quarter) –The number of weeks in each month of each fiscal quarter. A quarter has three months with one month consisting of 5 weeks and the other two months containing four weeks. You can rearrange the sequence of the weeks within the quarter.

  The default for the **Quarter Breakdown** field is **4-4-5**. The **4-4-5** value indicates:

  - There are **4** weeks in the first month of a quarter.
  - There are **4** weeks in the second month of a quarter.
  - There are **5** weeks in the last month of a quarter.

  This adds up to 13 weeks per quarter: 13 weeks x 4 (quarters) = 52 weeks (one year).

Fiscal Year Definition Dialog

The Fiscal Year Definition dialog displays when adding or editing a fiscal year from the Fiscal Calendars pane.

This dialog contains the following elements:

- Fiscal Calendar Name – The name of the fiscal calendar. This is read-only.
- Year to Change – Select the fiscal year you want to edit.
- Quarter to Change – Select the fiscal quarter you want to edit.
- Quarter Breakdown (Weeks in each month of quarter) – The number of weeks in each month of each fiscal quarter. A quarter has three months with one month consisting of 5 weeks and the other two months containing four weeks. You can rearrange the sequence of the weeks within the quarter.

  The default selection for the Quarter Breakdown list is 4-4-5. It indicates:

  - There are 4 weeks in the first month of a quarter.
  - There are 4 weeks in the second month of a quarter.
  - There are 5 weeks in the last month of a quarter.

  This adds up to 13 weeks per quarter:

  13 weeks x 4 (quarters) = 52 weeks (one year)

Fiscal Calendar Procedures

Adding Fiscal Calendars

To add a fiscal calendar:

1. From the **Navigator** pane, select **Definitions>Fiscal Calendars** to display the **Fiscal Calendars** pane.
2. Click the **Add** button on the CWA toolbar or right-click and select **Add Fiscal Calendar** from the context menu.
3. The **Fiscal Calendar Definition** dialog appears. For more information about the **Fiscal Calendar Definition** dialog, see Fiscal Calendar Definition Dialog.

Editing Fiscal Calendars

To edit a fiscal calendar

1. From the **Navigator** pane, select **Definitions>Fiscal Calendars** to display the **Fiscal Calendars** pane.
2. Select the calendar to edit and click the **Edit** button on the CWA toolbar or right-click the calendar and select **Edit Fiscal Calendar** from the context menu to display the **Fiscal Calendar Definition** dialog.

   For more information about the **Fiscal Calendar Definition** dialog, see Fiscal Calendar Definition Dialog.

Editing the Fiscal Year

If the **Fixed Start** option is not selected for a fiscal calendar, the fiscal year must be modified to correct calendar progression. To compensate for the annual loss of a day (two days during leap year), a week must be added to one of the fiscal years.

To edit a fiscal year:

1. From the **Navigator** pane, select **Definitions>Fiscal Calendars** to display the **Fiscal Calendars** pane.
2. Select one of the fiscal calendars and right-click to display a context menu.
3. Select **Modify Fiscal Year** to display the **Fiscal Year Definition** dialog (see Fiscal Year Definition Dialog).

Viewing Fiscal Calendars

To view a fiscal calendar, from the **Navigator** pane, select **Definitions>Fiscal Calendars** to display the **Fiscal Calendars** pane.

Job Classes in CWA

Job classes are used to organize and group jobs into categories. Job classes can be used in a queue's filter to ensure that only jobs belonging to that class will run in that queue. This lets you control how jobs of a certain class run.

For example, if you had a set of payroll jobs and a set of manufacturing jobs, you could categorize those jobs (and job groups) into a **Payroll** job class and a **Manufacturing** job class. Define two queues: one that only accepts jobs in the **Payroll** job class and one that only accepts jobs in the **Manufacturing** job class.

If the **Manufacturing** jobs have a higher priority than the payroll jobs, you can set the manufacturing queue's Queue Priority to a higher value than the **Payroll** queue.

Note: If you assign a job class to a job group, all child jobs within that job group without an assigned job class are automatically assigned the group's job class.

You can also associate job events to a designated job class so that those job events will apply to all members of the job class. The sequential order of these job events that are assigned to the job class can also be managed. The timing of the job events for the job class can divided into those job events that occur before and after the job's individual job events. The sequence of these job class events that occur before and after can also be arranged in the order needed.

Job classes cannot be owned by any particular user or workgroup and do not have a **Public** option since they are intrinsically public; that is, available to all CWA users. Anyone can use job classes unless their security policy expressly prohibits it.

CWA does not provide any pre-defined or default job classes.

Job Classes Interface

Accessing the Job Classes Interface

From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.

Buttons

- **Add Job Class** –Displays the **Job Class Definition** dialog to add a new job class.
- **Edit Job Class** –Displays the **Job Class Definition** dialog to edit an existing job class definition.
- **Copy Job Class** –Creates a copy of the selected job class with the same information as the selected job class, except for the name.
- **Delete Job Class** –Removes the selected job class definition from the CWA database.
- **Print** –Displays the **Reports** pane to view and print your job class definitions. For more information, see Monitoring Production, page 313.
- **Refresh** –Updates the data in the current pane.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Name** –The name of the job class.
- **Description** –The description of the job class. Since the **Description** field of the **Job Class Definition** dialog is optional, this column may remain blank.
- **Modified** –The last time the job class definition was modified.

Job Classes Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Job Classes** pane, the **Job Classes Preferences** dialog displays.

From this dialog, you can select which columns are displayed in the **Job Classes** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Job Classes** pane, the **Navigator** context menu displays.

The **Job Classes Navigator** context menu contains the following elements:

- **Add Job Class** –Displays the **Job Class Definition** dialog to add a new job class. Has the same function as the **Add Job Class** button.
- **Preferences** –Displays the **Preferences** dialog for the **Job Classes** pane.
- **Print** –Displays the **Reports** pane to view and print your job class definitions. Has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** –Updates the data in the current pane.

Job Classes Pane Context Menu

When you right-click in the **Job Classes** pane, the J**ob Classes** pane context menu displays.

The **Job Classes** pane context menu contains the following options:

- **Add Job Class** –Displays the **Job Class Definition** dialog to add a new job class.
- **Edit Job Class** –Displays the **Job Class Definition** dialog to edit an existing job class.
- **Delete Class** –Deletes the selected job class definition.
- **Print** –Displays the **Reports** pane to view and print your job class definitions. For more information, see Monitoring Production, page 313

Job Class Definition Dialog

The **Job Class Definition** dialog displays when you add or edit a job class.

This dialog contains the following elements:

- **Job Class Name** –The name of the job class (up to 60 characters). The name must be unique.
- **Job Events tab** – See Job Class Definition - Job Events Tab.
- **Images tab** – See Job Class Definition - Images Tab.
- **Before tab** –Lists the job events that must occur before the job instance's own job events. You arrange the order of the job events listed here to specify the sequence that the job events should follow.
- **After tab** –Lists the job events that must occur after the job instance's own job events. You arrange the order of the job events listed here to specify the sequence that the job events should follow.

The following fields are available on both tabs.

- **Event Name column** –The name assigned to the job event.
- **Event Trigger column** –The condition that triggers the associated job event.
- **Insert** –This button displays the **Select Job Event** dialog where you can select one or more predefined job events to assign to the job class. Job events are created from the **Job Events** pane.
- **Edit** –This button displays the **Job Event Definition** dialog to modify the selected job event.
- **Delete** –This button removes the selected job event from the list.
- **Clear** –This button deletes all of the defined job events clearing the field.
- **Move Up** –This button moves the selected job event up in the sequence of job events.

- **Move Down** –This button moves the selected job event down in the sequence of job events.
- **Description** –This tab is used to enter a description of the job class and its purpose.

Job Class Definition - Job Events Tab

The Job Events tab displays by adding or editing a job class in the Job Class pane and allows you to assign job events to the job class.

This dialog has a Job Events page for assigning job events to the job class and a Description page.

- Job Class Name – The name of the job class (up to 60 characters). The name must be unique.
- Before page – Lists the job events that must occur before the job instance's own job events. You arrange the order of the job events listed here to specify the sequence that the job events should follow.
- After page – Lists the job events that must occur after the job instance's own job events. You arrange the order of the job events listed here to specify the sequence that the job events should follow.
- Event Name – This column lists the name assigned to the job event.
- Event Trigger – This column lists the condition that triggers the associated job event.
- Insert – Clicking this button displays the Select Job Event dialog where you can select one or more predefined job events to assign to the job class. Job events are created in the Job Events pane.
- Edit – Clicking this button displays the Job Event Definition dialog to modify the selected job event.
- Delete – Clicking this button removes the selected item from the list.
- Clear – Clicking this button deletes all of the defined job events clearing the text field.
- Move Up – Clicking this button moves the selected job event up in the sequence of job events.
- Move Down – Clicking this button moves the selected job event down in the sequence of job events.

Job Class Definition - Images Tab

The Images tab of the Job Class Definition dialog allows for the selection of an alternative icon for a job class.

This page contains the following elements:

- Select – Click to assign the selected image.
- Clear – Click to clear the assigned image.
- Name – Name of the image.
- Type – Image type, such as .gif, .jpg etc.
- Size – Size of the image.
- Context menu – You can add a new image or rename, delete and replace a selected image from this menu.

Job Classes Procedures

Adding Job Classes

To add a job class:

1. From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.
2. Right-click and select **Add Job Class** from the context menu or click the **Add** button on the CWA toolbar to display the **Job Class Definition** dialog.
3. In the **Job Class** field, type a name for your job class. This is the name that you refer to when assigning a job class in the **Job Definition** or **Job Group Definition** dialog.
4. Associate job events with a job class by clicking **Insert** on the **Job Events** tab to display the **Select Job Event** dialog and the defined job events. You can designate that these job events run before or after the job's own job events. Use the **Move Up** or **Move Down** buttons to arrange the sequence that the job events should run.
5. Type a description of the job class in the **Description** field (optional).

Deleting a Job Class

You cannot delete a job class that is presently in use by a job.

To delete a job class:

1. From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.
2. Right-click the job class and select **Delete Job Class** from the context menu or select the job class to delete and click the **Delete** button on the CWA toolbar.

Editing a Job Class

To edit a job class:

1. From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.
2. Double-click the job class whose properties you want to view, or select the job class and click the **Edit** button or right-click the job class and select **Edit Job Class** from the context menu to display the **Job Class Definition** dialog.
3. In the **Job Class** field, you can edit the name of the job class. This is the name that you refer to when assigning a job class in the **Job Definition** or **Job Group Definition** dialog.
4. Edit the description of the job class in the **Description** field (optional).

Viewing the Properties of a Job Class

To view the properties of a job class:

1. From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.
2. Double-click the job class whose properties you want to view, or select the job class and click the **Edit** button or right-click the job class and select **Edit Job Class** from the context menu.

Viewing Job Classes

Job classes are displayed in the **Job Classes** pane using a three-column table in alphabetical order. Job classes can also be viewed from the **Job** or **Job Group Definition** dialogs when assigning a job class to a job or job group.

From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.

Resources in CWA

Jobs often require external resources to run to completion. The term, resources, can be used to refer to any physical or virtual asset that is used during the processing of a job. This resource may be a piece of hardware such as a printer or it may be software like a database. Agents and queues are also considered resources that are used during the processing of a job. By officially designating an asset as a resource, the use of that resource can be quantified to limit how many jobs can use it at once.

It is important to remember that a resource can still be used in CWA even if it is not designated as a resource. Designating something as a resource is just a more effective way to manage access to it. While multiple jobs can use the same resource at the same time, a numerical limit is imposed on the resource during its definition to restrict access by quantifying how much of the resource is available to each individual job.

While a job can still use an asset even if it is not specifically assigned to it, access management of that asset is bypassed. The purpose of designating an asset as a resource is to prevent the resource from being overwhelmed by simultaneous demand from multiple jobs and to impose order on the use of the resource. Once an asset is defined as a resource the operator should ensure that the resource is assigned to all jobs that need that resource to ensure that proper management of the resource is enforced. Jobs that use the resource without the constraints imposed by resource management negate the benefits gained from this feature and receive the lowest priority for access.

If a resource is assigned to a job then that job cannot run without the resource. The resource is managed by imposing a limit to the number of jobs that can simultaneously use it, ensuring a more efficient allocation of the resource. A job with an assigned resource is guaranteed the use of that resource until the job completes. When the job runs, it locks up its share of the resource so that no other job can use that portion of the resource until the job is done. When the job completes, its share of the resource is released for other jobs to use. While a job can have multiple resources assigned to it, the job cannot run until all of the resources assigned to it are available. None of the resources are locked up by the job until all of the resources are available and the job can run. This “all or nothing” approach prevents resources from being tied up needlessly if they cannot be used.

Note: If you assign a job class to a job group, all child jobs within that job group without an assigned job class are automatically assigned the group’s job class.

System inefficiencies are created when too many jobs try to use a resource at the same time. Assigning a specific amount of a defined quantity of a resource to each job ensures that the resource is not deluged with more work than it can handle. Queues and dependencies can be used to control how many jobs access a resource at the same time but they are insufficient in certain instances.

Queues offer a way to manage access to a resource if the job does not require more than one resource to run to completion. However, queues are ineffective at managing a job's access to a resource if the job requires more than one resource as it processes. On the other hand, if variable dependencies are constructed to control the use of a resource by a job, if the job rolls over to the next production day, then a situation arises where two copies of the job will be updating the variable.

When defining a resource, a limit or numeric quantity is specified. If the limit is one, then the resource is single-threaded and only one job at a time can use it. If the limit is six then up to six jobs can use the resource at once. However, a job may require multiple quantities of the resource at a time. For example, one job may require three licensed connections to a database resource while another job needs two parts of the possible accesses to the resource. Even if a single use is available it is possible that it may go unused even if jobs are waiting to use the resource because the other jobs may require more than one access to the resource.

Resources Interface

- Accessing the Resources Interface
- Buttons

- Search Field
- Columns
- Resources Preferences Dialog
- Navigator Context Menu
- Resources Pane Context Menu

Accessing the Resources Interface

From the **Navigator** pane, select **Definitions>Resources** and then select either Virtual Resources or System Resources to display the **Resources** pane.

You can double-click a resource listed in the **Resources** pane to display its definition dialog to view information about it.

The **Resources** pane has the following features:

Buttons

- **Add Resource** –Displays the **Resource Definition** dialog to can add a new queue.
- **Edit Resource** –Displays the **Resource Definition** dialog to edit an existing queue.
- **Copy Resource** –Creates a copy of the selected resource with the same information as the selected resource, except for the name.
- **Delete Resource** –Removes the selected resource definition from the CWA database.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Report** window to view and print the defined resources that are listed.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Name** –The name of the resource.
- **Owner** –The name of the owner of the resource. The user who defines the resource is the default user but ownership can be transferred by modifying the **Owner** field in the **Resource Definition** dialog.
- **Limit** –Indicates the quantity of a defined resource. Usually the limit is one but it can be any quantity. For example, a resource that is a database may be licensed for up to three simultaneous connections. Then that resource would have a limit of three.
- **In Use** –Indicates how much of the resource's limit is used by a job.
- **Enabled** –Whether or not the resource is enabled (or active) and available for use.
- **Public** –Whether or not the resource is available to other users.
- **Description** –The description of the resource.

Resources Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Resources** pane, the **Resources Preferences** dialog displays.

From the **Resources Preferences** dialog, you can select which columns are displayed in the Resources pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

Right-clicking in the **Navigator** pane while viewing the **Resources** pane, displays a context menu.

The **Navigator** context menu contains the following elements:

- **Add Virtual Resource** –Displays the **Virtual Resource Definition** dialog to add a new queue. This option has the same function as the **Add Resource** button.
- **Add System Resource** –Displays the **System Resource Definition** dialog to add a new queue. This option has the same function as the **Add Resource** button.
- **Preferences** –Displays the **Preferences** dialog for the **Resources** pane.
- **Print** –Displays the **Reports** pane to view and print your resource definitions. This option has the same function as the **Print** button on the toolbar.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** –Updates the data in the current pane.

Resources Pane Context Menu

Right-clicking in the **Resources** pane, displays the **Resources** pane context menu.

This context menu contains the following options:

- **Add Virtual Resource** –Displays the **Resource Definition** dialog to add a new resource. Once defined, a resource is assigned to a job from the **Resources** tab of a job definition.
- **Add System Resource** –Displays the **Resource Definition** dialog to add a new resource. Once defined, a resource is assigned to a job from the **Resources** tab of a job definition.
- **Edit Virtual Resource** –Displays the **Virtual Resource Definition** dialog to edit the selected queue.
- **Edit System Resource** –Displays the **System Resource Definition** dialog to edit the selected queue.
- **Delete Virtual Resource** –Deletes the selected virtual resource.
- **Delete System Resource** –Deletes the selected virtual resource.
- **Print** –Prints the selected resource's data.

Virtual Resource Definition Dialog

These topics describe the Virtual Resource Definiition dialog:

- Common to All Tabs
- Description Tab (Virtual Resource Definition)
- Jobs Tab (Virtual Resource Definition)
- Locked Virtual Resources Tab (Virtual Resource Definition)

Accessing the Virtual Resource Definition Dialog

The **Virtual Resource Definition** dialog displays when adding or editing a virtual resource in the **Resources** pane.

Common to All Tabs

- **Virtual Resource Name** –The name of the virtual resource.
- **Owner** –The owner of the virtual resource. This can be an individual user or a CWA workgroup. By default the owner is the user that defined the resource.

  From this field, the ownership can be transferred to another owner.
- **Limit** –Indicates the quantity of a defined resource. By default, the limit is one but it can be any quantity. For example, a resource that is a database may be licensed for three simultaneous connections. Then that resource would have a limit of three.
- **In Use** –Indicates how much of the resource's limit is currently being used. This is a read-only field.
- **Available** –Indicates how much of the resource is still available to be used. This is a read-only field.
- **Requested** –The number of requested resources.
- **Actual** –The actual number of offline resources.

Description Tab (Virtual Resource Definition)

The Description page of the Virtual Resource Definition dialogs is used to describe the resource and its purpose and how it might be used. A user can check the Jobs page to view a list of the jobs that have this resource assigned to them. If the Enabled option is not selected then the resource is not available in lists.

Note: A defined job will still run even if the resource assigned to it is disabled. The master will ignore a job's need for the disabled resource and release the job to run when its dependencies are met and its other required resources are available. If you want to prevent any jobs using a particular resource from running, change the limit in the resource's definition to 0. The job will remain in a Waiting on Resource status and never be released.

Jobs Tab (Virtual Resource Definition)

The **Jobs** tab is a read-only tab providing information on the jobs that access this resource.

This tab contains the following elements:

- **Job** –The name of the job using this resource.
- **Amount** –The quantity of the resource allotted to the job. This is assigned from the **Resources** tab of the job's definition.

Locked Virtual Resources Tab (Virtual Resource Definition)

This tab lists the job instance that is currently locking up the virtual resource. When a job has all of its required resources and is ready to run, the job locks up the assigned resources for its exclusive use until the indicated job completes. Once a job starts running the resources assigned to it cannot be modified or deleted until the job completes. Once the job completes, the assigned resources are released to be used by other jobs. Any job listed without a value in this column is not currently running.

System Resource Definition Dialog

These topics describe the System Resource Definition Dialog:

- Accessing the System Resource Definition Dialog
- Common to All Tabs
- System Resource Definition - Command Tab
- System Resource Definition - Agents Tab
- System Resource Definition - Agent Lists Tab
- Description Tab (Virtual Resource Definition)

Accessing the System Resource Definition Dialog

The **System Resource Definition** dialog displays when adding or editing a system resource in the **Resources** pane.

Agents that support published system resources provide information about those resources when a connection is established. System resource definitions are automatically created for published resources if they do not already exist for that connection type. The command displays “Published”.

You can view a read-only dialog when you double-click a published resource from within the **System Resource** pane.

You can create new system resource definitions by specifying commands that will periodically run on the agent machine to obtain the resource values.

Common to All Tabs

- **Resource Name** –The name of the system resource.
- **Apply to all connection** –Select this option if you want to apply the system resource to all connections.
- **Variables** –When you are in the **Value** field, click this button to enter a system, job or job event variable. You can use this function to set the value of the variable to the value of another variable. You can also set the variable to a string based on the values of other variables. The values of the variables are substituted at the time that the action is executed.

System Resource Definition - Command Tab

In the **Command** tab, provide the command to be executed, whether to use the command output or the exit code of the command as the resource value, the data type of the resource value, and the refresh rate.

This page contains the following elements:

- **Command** – contains the command to be executed.
- **Parameters** – contains the command parameters for the resource

- **Use** – Select one of the following to use as the resource value:
  - **Command Output** – select to use the command output of the command as the resource value
  - **Exit Code** – select to use the exit code of the command as the resource value.
- **Type** – Select the resource type from this list. Supported types are Integer and String. If Exit Code is selected as the resource value, the Type is set to Integer only.
- **Refresh every __ minutes** – set the refresh rate for published system resources in minutes.

System Resource Definition - Agents Tab

The **Agents** tab allows for the selection of an agent(s) to collect the resource for.

- If “Apply to all <type> connections” is selected, then the resource is collected for all agents of this type.
- If “Apply to all <type> connections” is not selected, then the agents to collect this resource for must be selected in this tab.

Agents that support published system resources will provide information about those resources when the connection is established.

System Resource Definition - Agent Lists Tab

The **Agents Lists** tab allows for the selection of an agent list(s) to collect the resource from.

- If “Apply to all <type> connections” is selected, then the resource is collected from all agent lists of this type.
- If “Apply to all <type> connections” is not selected, then the agent list(s) to collect this resource from must be selected in this tab.

Agents that support published system resources will provide information about those resources when the connection is established.

System Resource Definition - Description Tab

This tab is used to describe the resource and its purpose. This field can be used for notes about how the resource should be used and any special requirements or prerequisites.

Related Agents Dialog

The **Related Agents** dialog is accessed via the context menu on **System Resource** pane and contains a list of agents related to the selected system resource.

This dialog contains the following elements:

- **Agent Name** – the name of the agent related to the selected resource
- **Current Value**– the current value of the selected resource for each agent
- **Refresh Rate**– the refresh rate for the resource. When the connection to the agent is made, the master will tell the agent what the refresh rate should be for published system resources. The refresh rate will be kept globally for all agents, but this can also be overridden for individual agents.
- **Last Refresh**– the date of the last refresh for the resource

Resource Requirement Definition Dialog

The **Resource Requirement Definition** dialog is used to add or edit an existing virtual resource to a job from the **Resources** tab of a job definition. From this dialog, you specify which resource and how much of the resource is needed by a job. If the **Enabled** option is not selected in the resource's definition, then the resource does not display in the drop-down list.

This dialog contains the following elements:

- **Resource** –The name of the defined resource. Only resources that are enabled are available from this field. Once the resource is selected, its limit displays beside the **Amount Needed** field.
- **Amount Needed** –The amount of the resource's specified limit that the job requires. This number cannot exceed the limit of the resource noted as (Max) beside the field.

System Resource Requirement Definition Dialog

The **System Resource Requirement Definition** dialog is used to add or edit an existing virtual resource to a job from the **Resources** tab of a job definition. From this dialog, you specify which resource and how much of the resource is needed by a job. If the **Enabled** option is not selected in the resource's definition, then the resource does not display in the drop-down list.

This dialog contains the following elements:

- **System Resource** –The name of the defined resource. Only resources that are enabled are available from this field.
- **Operator** —Select the conditional operator depending on the data type of the resource.
- Value —Enter the value for the selected resource.

Resources Procedures

Defining a Resource

Just about anything can be defined as a resource. The resource can be a physical item like a disk partition or a virtual item like a database. Normally you would not define something as a resource unless you want to manage the amount of access to that resource.

To define a resource:

1. From the **Navigator** pane, select **Definitions>Resources** to display the **Resources** pane.
2. Click the **Add Resource** button or right-click in the **Resources** pane and select the **Add Resource** option to display the **Resource Definition** dialog.
3. In the **Resource Name** field, enter a name for the resource that helps you identify the resource.
4. In the **Owner** field, select a user to own the resource.
5. In the **Limit** field, specify a maximum number of shares on the resource. The value entered here will limit access to this resource to no more than the designated amount. The default is one but any number up to 32,767 can be entered here.

   The **In Use** field will display the quantity of designated shares of the resource is being currently used while the **Available** field displays how much of the resource is still available to be used.

Determining Which Jobs are Using a Resource

You can determine which jobs are using a resource by examining the **Jobs** tab in the **Resource Definition** dialog. This is handy when you need to determine where a resource's shares are being used, especially if you have a job that is waiting on access to that resource before it can run.

To determine which jobs are using a resource:

1. From the **Navigator** pane, select **Definitions>Resources** to display the **Resources** pane.
2. Double-click the desired resource to display its definition.
3. click the **Jobs** tab to display a list of the jobs that are assigned the resource.
4. The number of resource shares assigned to the job is listed in the **Amount** column. Only the jobs that are currently running will display a value in the **Locked** column. This value is the job instance ID number.

Restricting Use of a Resource

To restrict the use of a resource to only designated users, clear the **Public** option at the bottom of the **Resource Definition** dialog. You can than assign ownership of the resource to a specific user account or assign it to a workgroup so that only members of that workgroup can access the resource.

Overriding a Locked Up Resource

If a resource is running at its designated limit, no other jobs can run until one of the currently running jobs completes, freeing up its share of the resource. If you are unable to wait until shares of the resource open up, you can always increase the number of shares of the resource.

Queues in CWA

About Queues in CWA

CWA includes a queue manager to optimize throughput and the allocation of system resources for both scheduled and unscheduled jobs. The queue manager assigns jobs to queues when they are ready to run and makes decisions about when to launch them based on available execution slots. The capacity that is available is determined either by the system queue limit or the sum of the job limit values for each licensed agent, whichever is smaller.

Queues can limit the number of jobs running on a computer (or network of computers) at any given time. The queue manager always decides which jobs to launch based on a priority structure that includes queue hierarchies, queue limit, job limits, queue priority levels and job priority levels.

Queues are the main factor used to control when and how a job runs but there are other factors that influence when a job actually runs. Even if the queue manager releases a job to its queue, the job will not necessarily run at that time unless other factors that restrict the release of jobs are met. If the system is not running at the system queue's capacity limit, if a slot is available on the job's designated queue, if a slot is available on the job's designated agent and if any resources the job requires are available, then a job with all its dependencies met can run immediately.

Queue Concepts

Hierarchical Queue Structure

Queues are hierarchical. You can see the level of each queue in the **Queues** console pane by observing the level of indentation from the left edge of the pane. System Queue, the default queue, is at the root level of the hierarchy. All other queues fall below the system queue.

You can expand or collapse parts of the queue tree using the collapsed and expanded signs, the same way you use the **Navigator** pane of the CWA Client. Each queue in the hierarchy can contain jobs, job groups and other queues.

A parent queue displays above and to the left of its children on the **Queues** pane. All queues to the left of a queue are parent queues. A child queue is nested below and to the right of a queue. All queues to the right of the system queue are child queues. Child queues are restricted by the limits and priority level of their parents.

The queue record also shows each queue's limit and priority level. The limit defines how many jobs can run from that queue at the same time. The priority indicates which queue takes precedence when the Queue Manager searches for the next job to run.

Queue Filters

Queue filters determine how jobs are assigned to queues when they are ready to run. Queue filters include and/or exclude jobs based on the job's properties. When a job is ready to run, the queue manager uses the filters to find a queue for the job. If there is more than one queue that the job can be assigned to, the queue with the highest priority is chosen. If there is no queue that matches the job's properties, the job will enter the system queue and will be evaluated with the lowest priority.

How Jobs are Assigned to Queues

The queue manager is responsible for assigning jobs to queues. You cannot directly assign a job to a queue in the job definition, but you can set up queues so that you control which jobs get assigned to them. By setting up queues to accept jobs based on their job class (using job class queue filters), you can indirectly assign jobs to queues by directly assigning them to a job class in the job definition.

When a job is ready to run, the queue manager begins its search through the queue hierarchy to find the most appropriate queue to assign the job to. Starting one level below the system queue, in priority order (high to low) it chooses the first match of job properties with queue filters, then moves to the next level, if any. This process is repeated until there are no more levels, or until there are no more queues that will accept the job. If a job cannot be matched with any queue, it is added to the system queue.

For example, the figure below shows how four jobs are assigned to four different queues. The second level of queues uses queue filters that accept either scheduled jobs or unscheduled jobs. The third level, under the queue that accepts scheduled jobs only (Queue A), has three queues that accept jobs based on their job class. There is a third catch-all queue (Queue E) in this level that accepts all scheduled jobs that are not of the Payroll or Accounting job class. Jobs can be assigned to the parent if no child queue qualifies.

The following table describes the job assignments:

Job	Queue	Reason
Job A	Queue D	**Job A** is a scheduled job that is assigned to the Accounting job class. It qualified for **Queue A** before reaching its final destination **Queue D**.
Job B	Queue C	**Job B** is a scheduled job that is assigned to the **Payroll** job class. It is also qualified for **Queue A** before reaching its final destination **Queue C**.
Job C	Queue B	**Queue B** is the only queue that accepts **unscheduled** jobs.
Job D	Queue E	**Job D**'s job class doesn't match with **Queue C** or **Queue D**. **Queue A** isn't chosen because **Queue E** has a higher priority than **Queue A**. If **Queue E** did not exist, **Job D** would be assigned to **Queue A**, because **Queue A** only requires that the job is scheduled.

How the Queue Manager Selects the Next Job to Run

The queue manager determines which job to run next according to a series of checks. The following list describes each check in order.

- **Launch immediately** —The queue manager continually monitors for jobs entering queues with this option set. When a job enters this queue it is run immediately, even if the system is running at full capacity (at the system queue limit, or at an agent's job limit).
- **System queue limit** —The queue manager then monitors the total number of jobs running and compares it to the system queue limit value. If the system queue limit value is greater than the number of jobs currently running, the queue manager begins its search for the highest priority job starting with the following search criteria.
  - **Queue hierarchy** —The queue manager recursively evaluates all active and open queues in priority order to determine whether it can launch jobs that are waiting in the queue. Queues with the same priority are selected at random.
  - **Queue limit** —The queue manager compares the number of jobs running in the queue with the queue's limit. Queues running at their limit are skipped. Queues not running at their limit use the job priority check.
  - **Job priority** —The job with the highest priority that is to be run on an agent not running at its limit is selected. If two or more jobs exist with the same priority, the job that was ready the earliest is the job that is run first.

  The system queue is used for all default jobs and is the queue with the lowest priority.

Job Selection Examples

The following examples use a simple queue hierarchy made up of four queues. The examples assume that we have not reached the agent limits. The queue principles can apply to hierarchies of any size.

Example 1: Job Selection Based On Queue Hierarchy

In this queue setup, the system queue has a job limit of 10. This means that no more than ten jobs can run at the same time, no matter where they are run. The system queue has no queue priority level setting because no other queue can exist at the same level in the hierarchy. All queue limits and queue priorities are constant throughout the examples. The system is currently running at its limit.

If any one of the running jobs complete, the queue manager selects the highest priority job of the four waiting in Queue C, even though Queue A has a higher queue priority, because Queue C is at the lowest level in the hierarchy, is not running at its limit and has jobs waiting.

Example 2: Job Selection Based On Queue Limits and Queue Priority

Job Selected Based On Queue Limit

If a job completes in Queue B, the next job selected will be the highest priority job in Queue B, even though it is a lower priority queue than Queue C, and Queue C has jobs waiting in it. This is because Queue C is already running at its limit.

Job Selected Based On Queue Priority

Queue B is not running at its limit (10). This is because Queue B has a lower queue priority than Queue C. The queue manager has selected as many jobs as possible from the highest priority queue —up to it's queue limit (5). What is remaining of the overall system limit is then run from the lower priority queue (10 —5 = 5).

Compound Queue Filters

You can create compound queue filters by mixing queue filter types. Repeat the steps for creating each queue filter. With compound filters, all filter conditions must be true for a job to qualify for the queue.

If you include multiple queue filters of the same type, a job qualifies for the queue if any one of the conditions match for that type.

Successive Compounding of Child Filters

When jobs are assigned to queues, they pass through each parent filter before they reach their destination queue. The job in the destination queue therefore meets all the criteria of the destination queue's filter plus each of its parent's and grandparent's queue filters. During the search for the right queue to assign to a job, each successive queue filter acts using AND logic, further narrowing down which queue will become its destination queue.

Assigning Jobs to Specific Queues

You cannot directly assign a job to a queue. However, you can configure your definitions to consistently assign jobs to run in specific queues. CWA is designed with intelligent queue software that determines the best queue based on each job's properties. Once the queue structure has been set up for your business cases, jobs will automatically enter the appropriate queue. For details on how to send a job to a specific queue, see Sending Jobs to a Specific Queue, page 304.

Guidelines for Creating Queues

The following are a set of guidelines to help you create queues that meet your scheduling needs. These guidelines are suggestions, not requirements. The way your queue hierarchy is structured is entirely up to you.

- **Queue Names** –Use queue names that define what the queue is used for. A queue named Manufacturing Jobs makes more sense than a queue named A1.
- **Queue Hierarchies and Queue Filters** –Hierarchies, combined with queue filters let you create specific queues for specific types of jobs, giving you more task management control. Hierarchies also help you avoid mistakes by visually organizing how jobs run in the overall schedule. For example, you could have each queue parent only accept jobs of a particular class. You could then subdivide child queues by having each accept jobs that are owned by a particular workgroup or user.
- **Child Queue Priority Levels** –Give all sibling queues under the same parent different priority levels, otherwise the queues are selected randomly when a job is assigned.
- **Job Limits and Queue Limits** –The settings that control the number of jobs that run on a machine or network are the agent's job limit and the queue's queue limit. Consider these limits carefully. Though the system queue limit controls how many jobs can run overall at any one time, make sure it is large enough to accommodate the sum of all the agents' job limit values.

  You could set queues in hierarchies with limits reflecting the maximum acceptable load for the queue, and then regulate the entire system load by setting the system queue limit to a percentage of its maximum.

  For example, suppose the system queue has three child queues only, Queue A, Queue B, and Queue C with a queue limit of 10 each. Thus, the maximum possible load is 30 jobs. However, you could set the system queue with a limit of 20, 66% of maximum, and only 20 jobs will run at one time, but the underlying queue functionality is the same. In effect, you decrease (or increase) your scheduling load with one control.
- **Hours Available** –You can submit jobs that do not need to be run immediately to a queue that is set to operate after hours. An example is to use this option to free up resources during the day.

  When the time comes to operate, the jobs begin to run. When the queue closes, it continues to finish jobs that are being run, and halts all waiting jobs until the next time it is open.
- **Launch Immediately** –Create one or two queues with the **launch immediately** queue option for those emergency situations where a user absolutely needs a job to run as fast as possible. You will be able to use this for manually overriding a given assignment or for queue bumping.
- **Queue Bumping** –Add queue bumping for queues where some jobs never launch or wait too long to launch. The queue that is bumped to should have a higher priority than the previous queue, or the jobs may wait even longer to start.

- **Catch All Child Queues** –Lower-priority child queues with no queue filters at each family level will catch jobs accepted by the parent queue, but not accepted by its children's queue filters. This reduces the chances that the system queue (the lowest priority queue) will run these jobs.
- **Single Threading** –You can use a queue to single-thread jobs that require exclusive access to a particular resource, such as to a database. For example, you can set up a queue with a job name mask queue filter to accept all jobs with the **r1_*** job name mask and give the queue a limit of 1. When you set up jobs that require the resource, add a job name prefix **r1_** before the job name. The jobs with that particular prefix can now safely share the resource.

Queues Interface

Accessing the Queues Interface

From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.

Queues Interface Features

Buttons

- **Add Queue** –Displays the **Queue Definition** dialog to create a new queue.
- **Edit Queue** –Displays the **Queue Definition** dialog to edit the selected queue.
- **Copy Queue** –Creates a copy of the selected queue with the same information as the selected queue, except for the name.
- **Delete Queue** –Removes the selected queue definition from the CWA database.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** pane to view and print your queues. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Status Light** –Shows whether the queue is accepting jobs or not.
- **Name** –The name of the queue.
- **Priority** –The queue's priority number.
- **Limit** –The maximum number of jobs the queue will accept.
- **Active** –How many jobs in the queue are active.
- **Waiting** –How many jobs in the queue are waiting to run
- **Enabled** –Whether or not the queue is enabled.
- **Modified** –The last time the queue definition was modified.

Queues Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Queues** pane, the **Queues Preferences** dialog displays.

From the **Queues Preferences** dialog, you can select which columns are displayed in the **Queues** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Queues** pane, the **Navigator** context menu displays.

The **Queues Navigator** context menu contains the following elements:

- **Add Queue** –Displays the **Queue Definition** dialog to add a new queue. Has the same function as the **Add Queue** button.
- **Preferences** –Displays the **Preferences** dialog for the **Queues** pane.
- **Print** –Displays the **Reports** pane so that you can view and print your queue definitions. Has the same function as the **Print** button on the toolbar.For more information, see Monitoring Production, page 313.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** –Updates the data in the current pane.

Queues Pane Context Menu

When you right-click in the **Queues** pane, the **Queues** pane context menu displays.

The following describes the items in the **Queues** pane context menu:

- **Add Queue** –Creates a new queue through the **Queue Definition** dialog. CWA will insert the queue as a child of whichever queue is selected at the time. (All queues have a parent, except the system queue.)
- **Edit Queue** –Edits the selected queue by displaying the **Queue Definition** dialog.
- **Delete Queue** –Deletes the selected queue.
- **Enable** –Reactivates the queue after having been disabled.
- **Disable** –Prevents the queue from accepting jobs.
- **Print** –Prints the selected queue's data.

Queue Definition Dialog

Accessing the Queue Definition Dialog

The **Queue Definition** dialog displays whenever adding or editing a queue. The queue can be available all of the time or it can be limited to operating only during a specified time window.

Common to All Tabs

- **Queue Name** –The name of the queue (up to 30 characters).
- **Parent** –The queue one level above in the queue tree. The queues above another queue are called parent queues. Queues below another queue are called child queues. If no queue is named in the parent field, the queue will be a child of the system queue.
- **Limit** –The number of jobs that can run in the queue at the same time.

  Note: The limit of the system queue determines the overall number of jobs that CWA can run at any time. Limit values are displayed after the queue name in the **Queues** pane.
- **Priority** –Sets a queue priority relative to other sibling queues (child queues with the same parent). If all child queue priority values are the same, there is no queue precedence. The job could equally go to any of the child queues.

  Priority values are displayed after the queue name in the **Queues** pane. Jobs in queues with higher priority values will be launched before jobs in queues with lower priority values.
- **Hours Available** –Sets the time window during which the queue operates. For example, you can set queues to run only at night or only during the day. When a queue closes, the queue manager attempts to reassign jobs in that queue to another qualifying queue that is open. If it cannot reassign the jobs to another queue, the job will remain in the closed queue and will not launch until it reopens.

  Specify times by either using am or pm after typing the time (with colon), e.g., 1:15pm for 1:15 pm or using the 24-hour clock (with colon) to separate the hours and minutes, e.g., 13:30 for 1:30 pm.
- **Always** –Sets the queue's availability to 24 hours a day. If no times are specified in the **From** and **To** fields, the queue is assumed to be available at all times and the **Always** option is automatically selected.
- **Enabled** –The **Enabled** option makes the queue active or inactive. You cannot make a queue that has jobs in it inactive.

Queue Definition Dialog - Filters Tab

The **Filters** tab of the **Queue Definition** dialog displays queue filters associated with the queue. Queue filters define how jobs are assigned to queues. A combination of queue filters can provide precise control of which jobs run in a particular queue.

The **Filters** field displays queue filters associated with the queue. These queue filters define how jobs are assigned to queues. You can combine queue filters in any way you choose.

Each defined filter is marked with a blue diamond and lists its criteria. If the filter has excluding criteria, it shows a red minus sign. If the filter has including criteria, it displays a green plus sign.

This tab contains the following elements:

- **Add** –This button creates a new filter to the queue definition.
- **Edit** –This button edits an existing queue filter.
- **Delete** –This button deletes an existing queue filter from the queue definition.

See also:

- Queue Filter Context Menu
- Queue Filter Conditions

Queue Filter Context Menu

When you right-click in the **Filters** field on the **Filters** tab of the **Queue Definition** dialog, the Queue Filters context menu displays.

The menu options echo the functions of the **Add**, **Edit** and **Delete** buttons.

The **Queue Filters** context menu contains the following elements:

- **Add Filter Condition** –Displays the queue filter condition menu to select a queue filter. Selecting one of the queue filters displays its **Queue Filter Condition** dialog.
- **Edit Filter Condition** –Displays the **Queue Filter Condition** dialog to edit the selected queue filter.
- **Delete Filter Condition** –Deletes the selected queue filter.

Queue Filter Conditions

The **Queue Filter Conditions** menu displays when adding a queue filter. CWA provides precise control of which jobs run in a particular queue through the use of queue filters.

The Queue Filter Condition dialog displays by selecting a queue filter from the Add button submenu on the Filters page of the Queue Definition dialog. Precise control of which jobs run in a particular queue is achieved by using a combination of queue filters wisely to include or exclude various conditions.

This menu contains the following options:

- **Job Name** –Includes or excludes only jobs with the given job name(s). Jobs need to be defined in the CWA database. You can click the Browse button inside the dialog to search for a job name.
- **Job Name Mask** –Includes or excludes all jobs with the job name mask(s). You can include the wild cards ***** and**?** in the job name mask. An asterisk masks one or more characters or numbers, and a question mark masks a single character.
- **Job Group** –Includes or excludes only jobs that are members of a particular job group. You need to define a job group before you can refer to it in a filter.
- **Job Class** –Includes or excludes jobs based on their job class. You need to define a class before you can refer to it in a filter.
- **Command Name** –Includes or excludes all jobs that execute that command.
- **Command Name Mask** –Includes or excludes all jobs that execute a command that matches this mask.
- **Command Path** –Includes or excludes all commands that execute from the specified directory or subdirectory. Note that you must specify the full path name; you cannot use relative path names.
- **Job Owner** –Includes or excludes all jobs owned by a user or workgroup.
- **Runtime User** –Includes or excludes jobs whose command and environment are owned by the runtime user. The job definition may or may not be owned by that user.
- **Agent** –Includes or excludes jobs that run on the agent specified. You can use this filter to manage jobs that run on a particular agent.
- **Agent List** –Include or exclude jobs associated with an agent list. You can use this filter to manage jobs that run on the agents listed in the agent list.
- **Priority Range** –Includes jobs within a given job priority range. Job priority values range between 0 and 100, where 100 is the highest priority.
- **Estimated Duration** –Includes jobs that have an estimated duration within a range of two specified values (in minutes).
- **Scheduled vs. Unscheduled** –Select either scheduled jobs or unscheduled jobs only. You can use this setting to control the submission of unscheduled jobs.

- **Operator Release vs. Automatic** –Select either jobs that are set to be released by an operator or only jobs that enter the schedule automatically.
- **SAP Job (Intercepted)** –Selects (or intercepts) SAP jobs according to specified criteria based on the SAP instance, user and/or job name.

Queue Definition Dialog - Bumping Tab

The **Bumping** tab of the **Queues Definition** dialog is used to specify the launch priority of a queue which determines which jobs the queue will launch or dispatch.

- **No priority bumping** –Disables priority bumping (default).
- **Launch immediately** –Bypasses other queues, overriding all launch priority criteria and limit tests. Jobs assigned to a queue with this option will launch immediately, regardless of how many jobs are currently running.
- **Increase job priority** –Ensures lower priority jobs eventually launch if they have been waiting for a long time. Jobs that are waiting in a queue will increase their priority by a designated number of priority points in proportion to the length of time spent in the queue.

  When a job's priority reaches 100, it can optionally bump to a higher priority queue, queue *Z*, with a job priority of 0. The job then bumps its priority level according to that queue's bumping allowance.

  Note: When using this option, make sure that the designated queue where the job is being bumped to has a higher queue priority value than the original queue; otherwise, the jobs will wait even longer to launch.
- **Nice Value** –Defines the CPU scheduling priority assigned by CWA for Unix jobs. CWA uses a 0 to 40 scale to rate the nice value. The value of one provides the lowest scheduling priority and 40 the highest priority with 21 as the default value. A value of zero means that CWA does not modify the nice value assigned by the process's operating system.

  The following formula is used to convert the CWA nice value to the Unix nice value as displayed by the `ps` command for the Solaris, HPUX and AIX operating systems: **`40-(CWA nice value-1) = Unix nice value`**. As an example, a CWA value of 24 converts to a Unix nice value of 17, 40-(24-1) = 6.
  If using the Linux operating system, the formula used by CWA is **`20-(CWA nice value-1) = Unix nice value`**. As an example, a CWA value of 15 converts to a Unix nice value of 6, 20-(15-1) = 6.

  This setting only applies to jobs that run on Unix agents.

Queue Definition Dialog - Current Jobs Tab

The **Current Jobs** tab of the **Queue Definition** dialog displays details on the jobs currently residing in the queue. You can also release unscheduled jobs that are waiting from this tab.

This tab contains the following elements:

- **Active Jobs** –Selecting this option displays all jobs that are currently active in the queue. The adjacent number indicates the total of jobs currently active in the queue.
- **Waiting Jobs** –Selecting this option displays all jobs that are currently waiting in the queue to be launched. The adjacent number indicates the total of jobs currently waiting in the queue.

  If neither of the options are selected, no jobs are displayed in the **Current Jobs** field. Each job displayed in the field has a color-coded status light to appraise a job's status at a glance. The color green indicates a job that is in active or launched status, the color yellow indicates a job in a waiting status and the color red indicates a job unable to run due to an unavailable resource. The field listing the current jobs in the queue has the following columns of information about the jobs:
- **ID** –The identification number assigned to the job by CWA.
- **Job** –The name of the job.

- **Status** –The current status of the job in CWA.
- **Pri** –The priority number assigned to the job.
- **Duration** –The time in minutes that a job has remained in its present status within the queue.
- **External ID** –The identification number assigned by jobs created in applications other than CWA.
- **Agent** –The name of the agent assigned to the job.

A context menu displays by right-clicking within the list of queued jobs. It has the following options:

- **Release** –Launches the selected job that is in waiting status.
- **Refresh** –Updates the information for the current jobs in the queue.
- **Auto Update** –Automatically updates the information for the current jobs in the queue.

Queue Definition Dialog - Description Tab

A free-text field of up to 255 characters (optional), for describing the queue.

Queue Procedures

About Queue Procedures

Queues let you optimize throughput and allocate system resources for scheduled and unscheduled jobs. The CWA queue manager assigns jobs to queues when all their dependencies have been met, and decides when to launch jobs based upon the available system resource slots. The maximum number of slots available is determined either by the limit that you set in the system queue, the sum of each queue's limit or the sum of each licensed agent's job limit.

Queues can limit the number of jobs running on a computer or a network of computers at a given time.

- If the system is not running at its capacity, a job can run immediately provided that all of its dependencies are met.
- If the system is running at its capacity, the CWA Queue Manager decides which jobs launch based on a priority structure that includes the following in order of importance:

Status	Description
Queue priority levels	Jobs in active and open queues at higher priority levels run first.
Queue limits	Only jobs in queues not running at their allowable limit can be launched.
Agent job limits	Only jobs assigned to agents not running at their allowable limit can be launched.
Job priority levels	Jobs with the highest priority (assigned in the job definition) in the queue are run first.

- Queues are displayed in a hierarchy. Each item in the hierarchy is a queue and can contain jobs. You define the queue limit to set the number of jobs that can launch from any individual queue. You also define a priority for each queue.

Adding a Queue

You can add a queue anywhere in the queue hierarchy. When you add a queue it is positioned under the parent queue that you select. The jobs that the queue can accept must first match the parent's queue filter.

To add a queue:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
2. Select the parent queue under which you want to place your queue.
3. Click the **Add** button on the CWA toolbar or right-click and select **Add Queue** from the context menu to display the **Queue Definition** dialog.
4. Specify values in the **Queue Name**, **Parent**, **Limit** and **Priority** fields. For more information, see Queue Definition Dialog, page 297.

   Note: It is best if no two sibling queues have the same queue priority value.
5. Specify the queue filter(s) you want to be associated with this queue. For more information, see Queue Filters, page 293 and Queue Filter Conditions, page 299.
6. Click the **Bumping** tab.
   a. If you want your queue to launch jobs immediately, select the **Launch immediately** option. Jobs will launch regardless of whether the system is running at its capacity or not.
   b. If you want jobs to be bumped to different priorities and to different queues if they are waiting for a long time, specify the **Priority bumping** options. Be sure that the queue to which jobs bump has a higher priority than the current queue.
   c. If you are running Unix jobs, you can select the **Nice Value** which defines the CPU scheduling priority for jobs from this queue. The value must be an integer from 1 to 40. The default value is 21. Higher nice values result in lower execution priority.
7. In the **Hours** fields at the bottom of the dialog, type the queue's hours of availability.
8. Click the **Description** tab and type a description for the queue.
9. To save the queue, click **OK**. The queue is added to the **Queues** pane and displays below the specified parent queue.

Adding a Queue Filter

Queue filters determine how jobs are assigned to queues. You can add filter criteria (conditions) to a queue at any time.

To add a queue filter:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
2. Right-click the queue and from the context menu select the **Edit Queue** option or double-click the queue to display the **Queue Definition** dialog.
3. Click the **Filters** tab and click the **Add** button.
4. Select the type of queue filter you want to add from the context menu For more information about queue filters, see Queue Filter Conditions, page 299. The specific queue filter dialog appears. Note that most queue condition dialogs contain an option to *exclude* the jobs with the specified criteria. This option lets the queue accept all jobs that do *not* match the criteria.
5. To accept the filter, click **OK**. Click **Cancel** to discard the filter.
6. The filters you select will be added to the queue definition. They are displayed in the **Filter** field on the **Filter** tab of the **Queue Definition** dialog as follows:
   - The filter name is marked by a diamond symbol.
   - Included criteria are marked with a plus (+) symbol.

Deleting Queues

A queue can only be deleted if no jobs are waiting in it or currently running from it.

To delete a queue:

1. Disable the queue:
   a. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
   b. Right-click the queue and from the context menu select **Disable Queue** or double-click the queue, and clear the **Enabled** option in the **Queue Definition** dialog.
2. When the queue is empty of jobs, select the queue to delete.
3. Right-click and select **Delete Queue** from the context menu or click the **Delete b**utton on the CWA toolbar or press the **DELETE** key on your keyboard.
4. Click **OK** in the confirmation dialog to delete the queue.

Deleting Queue Filters

Queue filters determine how jobs are assigned to queues. You can delete queue filter criteria from a queue definition at any time.

To delete a queue filter:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
2. Right-click the queue and from the context menu select the **Edit Queue** option or double-click the queue to display the **Queue Definition** dialog.
3. Click the **Filters** tab.
4. Select the filter you want to delete and click **Delete**.

   Excluded criteria are marked with a minus (-) symbol.

Disabling Queues

If you disable (deactivate) a queue that is currently in use, it will no longer accept new jobs, but all jobs that are currently running in it will run to completion.

To disable a queue:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
2. Right-click the queue and from the context menu select **Disable Queue** or double-click the queue and clear the **Enabled** option in the **Queue Definition** dialog.

Editing a Queue

You can change the properties of a queue at any time, even while it is in use.

To edit a queue:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.

2. Double-click the queue whose filters you want to view or right-click and from the context menu select the **Edit Queue** option to display the **Queue Definition** dialog.
3. Edit the **Queue Name** field to change the name of the queue.
4. Edit the **Parent** field to move the queue to the new parent. Remember that jobs must match the parent's filter before a child queue is evaluated.
5. Edit the **Limit** to increase or decrease the number of jobs that can run in the queue.
6. Edit the **Priority** field to increase or decrease the priority relative to sibling queues. Remember not to assign the same priority to multiple queues with the same parent.
7. Select the **Enabled** option to enable the queue. Clear this option to disable the queue (make it inactive). Note that inactive queues cannot accept jobs.
8. In the **Filters** field, add/edit the queue filter(s) as desired.
9. Click the **Bumping** tab. On this tab, set whether you want your queue to **Launch immediately** or if you want to enable **Priority Bumping** and its parameters.
10. If necessary, adjust the queue's hours of availability in the **Hours** fields.
11. Click the **Description** tab to edit the queue's description.

Editing a Queue Filter

Queue filters determine how jobs are assigned to queues. You can modify queue filter criteria for a queue at any time.

To edit a queue filter:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
2. Right-click the queue and from the context menu select the **Edit Queue** option or double-click the queue to display the **Queue Definition** dialog.
3. Click the **Filters** tab.
4. Select the filter you want to edit and click the **Edit** button.

   The **Queue Filter Condition** dialog for the queue filter displays. You can now edit the filter criteria.

Moving a Queue to a New Parent

You can move a queue to any location in the queue hierarchy below the system queue.

To move a queue:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
2. Double-click the queue that you want to move, or right-click and from the context menu select **Edit Queue** to display the **Queue Definition** dialog.
3. Change the name of the parent queue in the **Parent** field using the drop-down menu.

Note: Keep in mind that a child queue can only accept jobs that first pass the filter criteria of its parent.

Sending Jobs to a Specific Queue

You can indirectly send jobs to a queue by using the job class feature.

To send a job to a specific queue, follow this example:

1. Define a job class called **To Queue B**.
   a. From the **Navigator** pane, select **Definitions>Job Classes** to display the **Job Classes** pane.
   b. Right-click and select **Add Job Class** from the context menu.
   c. In the **Job Class Name** field, type **To Queue B**.
   d. In the **Description** field, type **This Job Class is used to route Jobs to Queue B**.
   e. Click **OK**.
2. Create **Queue B** with a **To Queue B** job class filter.
   a. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.
   b. Select **System Queue**.
   c. Right-click and select **Add Queue** from the context menu.
   d. In the **Queue Name** field, type **Queue B**.
   e. Set the **Limit** value and queue **Owner** as desired.
   f. Set the **Priority** value to a value higher than the queue that would normally accept the job. For example, if the default queue, **Short Unscheduled Jobs**, normally accepts the job and its priority is at the default of **50**, set **Queue B's** priority to **55**.
   g. On the **Filters** tab, click **Add** and select **Job Class** from the drop-down menu.
   h. Select the **To Queue B** job class.
   i. Click **OK** to close the **Queue Filter Condition** dialog.
   j. Click **OK** to close the **Queue Definition** dialog and return to the **Queues** pane.
3. Edit the definition for your job by associating it with the **To Queue B** job class.
   a. From the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.
   b. Double-click the job you want to run from **Queue B**.
   c. In the **Job Class** field, select **To Queue B**.
   d. Click **OK**.

   The job will now type **Queue B**, even though you did not directly assign it to the queue.

Viewing Queues

From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.

Viewing a Queue's Filters

To view a queue's filters:

1. From the **Navigator** pane, select **Definitions>Queues** to display the **Queues** pane.

2. Double-click the queue whose filters you want to view, or right-click and from the context menu select **Edit Queue**. The **Queue Definition** dialog displays.

3. Click the **Filters** tab. The filters associated with this queue are listed in the **Filters** field.

Agent Lists in CWA

About Agent Lists

An *agent list* is any set of licensed nodes in your network. You can assign jobs to run using agent lists similar to the way you assign them to individual agents. With agent lists, however, you have access to useful functions not available with individual agents. You can specify alternate agent(s) to run your jobs if the primary agent is unavailable, you can balance the workload of many jobs among the agents in the list, or you can broadcast jobs to run on all the machines in the agent list at the same time.

The master does not pick an agent from the agent list assigned to a job until that job is ready to run. Because the agent is not assigned to a job until the last minute, if a user looks at a **Job Details** dialog before the job runs (e.g., the job is in a **Waiting on Dependencies** state), the **Agent** field on the **Override** tab is empty. The master does not select an agent from the agent list displayed in the **Agent List** field until the job's dependencies are met and the job is ready to run. Once the job is submitted to run and the agent is selected, the name of the agent displays in the **Agent** field. If the job reruns, the master may assign a different agent from the agent list according to the demands of the production schedule. If you make a change to the **Agent** field, then the **Agent List** field is cleared since you, not the agent list, are selecting the agent.

CWA supports Windows, Unix, z/OS (formerly MVS or OS/390) and O/VMS agent platforms, but you cannot combine agents of different platform types in one agent list.

Types of Agent Lists

- **Ordered Agent List** –You can use an ordered agent list to provide alternative agent(s) in case the primary agent is not available when a job is ready to run. When there is a network or machine failure on the primary agent, the job is automatically routed to the next available alternate agent in the list. Agents are tried in the order that they appear in the list until an operational agent is found. The primary agent is always the first in the list. Alternative agents follow the primary agent.

- **Broadcast** –Simultaneously runs a job on every agent in the list. For example, you might use a broadcast list to backup each machine's files.

- **Workload Balancing** –You can use workload balancing to distribute jobs evenly among all the agents in the list. There are three kinds of agent lists that support workload balancing:

  - **Balanced** –Launches jobs on the agent which currently has the lightest load. Use this type of list with CWA agents on platforms that provide load information.

  - **Rotation** –Launches jobs by selecting agents successively. When the end of the agent list is reached, CWA starts at the beginning of the list again.

  - **Random** –Launches jobs by selecting agents randomly. Use this type of list to approximate workload balancing with remote shell agents.

Agent List Hierarchies

You can manage your agent lists by placing them into hierarchies of parent agent lists and child agent lists. A job using a parent agent list uses all agents belonging to the child agent lists.

Agent list hierarchies are a convenient way to organize a large set of agents into smaller more manageable sets. When a job is slated to run on an agent list, each child agent list in the parent agent list is treated as if it were a single agent list. For example, in a lightest load agent containing four child agent lists, the child agent list with the lightest load is chosen. The job then chooses among the agents with the lightest load inside the child agent list.

An agent list hierarchy can only consist of agent lists of the same type. For example, you can have balanced lists under balanced lists, but not ordered lists under balanced lists.

Agent Lists Interface

From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.

- Buttons
- Search Field
- Columns
- Agent Lists Preferences Dialog
- Navigator Context Menu
- Agent Lists Pane Context Menu

Buttons

Note: Buttons will not be available until you open a platform folder.

- **Add Agent List** –Displays the **Agent List Definition** dialog to add an agent list.
- **Edit Agent List** –Displays the **Agent List Definition** dialog to edit an agent list.
- **Delete Agent List** –Removes the agent list definition from the CWA database.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** pane to view and print your agent lists. For more information, see Monitoring Production, page 313.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13

Columns

Note: There are no columns in the **Agent Lists** pane until you open a platform folder.

The console view for each platform type contains the same columns:

- **List Type Icon** –An icon that represents the type of agent list.
- **List Type** –The type of agent list: **Ordered, Random, Balanced, Broadcast** or **Rotation**.
- **(Expand/Collapse)** –This column indicates whether or not the agent list is expanded to show all agents in the list, or collapsed to show only the agent list name.

- **Name** –The name of the agent list.
- **Description** –A description of the agent list. Since the **Description** field of the **Agent List Definition** dialog is optional, this column may be blank.
- **Modified** –The last time the agent list definition was modified.

Agent Lists Preferences Dialog

Note: Preferences will not be available until you open a platform folder.

If you select **Preferences** from the **View** main menu while viewing an **Agent Lists** pane, the **Agent Lists Preferences** dialog displays.

From the **Agent Lists Preferences** dialog, you can select which columns are displayed in the **Agent Lists** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the pane. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

Right-click in the **Navigator** pane while viewing the **Agent Lists** pane, to view the Navigator context menu.

The **Agent Lists Navigator** context menu contains the following options:

- **Add Agent List** –Displays the **Agent List Definition** dialog to add a new agent list. This option has the same function as the **Add Agent List** button.
- **Preferences** –Displays the **Preferences** dialog for the **Agent Lists** pane.
- **Print** –Displays the **Reports** pane to view and print your agent list definitions. This option has the same function as the **Print** button on the toolbar. For more information, see Monitoring Production, page 313.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** –Updates the data in the current pane.

Agent Lists Pane Context Menu

Right-click in one of the **Agent Lists** platform panes to display the **Agent Lists** pane context menu.

The **Agent Lists** pane context menu contains the following options:

- **Add Agent List** –Displays the **Agent List Definition** dialog to create a new agent list.
- **Edit Agent List** –Displays the **Agent List Definition** dialog for the selected agent list.
- **Delete Agent List** –Deletes the selected agent list.
- **Print** –Prints the selected agent list.

Agent List Definition Dialog

The **Agent List Definition** dialog displays when adding or editing an agent list definition.

- Common to All Tabs
- Agent List Definition - Context Menu
- Agent List Definition - List Tab

- Agent List Definition - Description Tab

Common to All Tabs

- **List Name** –The name of the agent list (up to 60 characters). The agent list name must be unique. Note that the type of agent platform (operating system) you initially selected displays next to the **List Name** field. To select a different platform, cancel the dialog, select the folder of the correct platform type, and **Add** a new agent list.
- **Parent List** –From the drop-down menu in the **Parent List** field, you can select a parent agent list. If you specify a parent agent list, the agent list you are editing will be a child agent list of the parent and will appear below its parent in the agent list hierarchy.
- **List Type** –The type of agent list based on how you want jobs assigned to the agents in the list:
  - **Ordered** –CWA chooses the first available agent to run the job based on the order in which the agents appear in the **Agents Selected** field. For example, if the first (primary) agent listed is not available, CWA tries the second (alternative) agent in the list. You might want to use this list type for critical jobs –specifying substitute agents in case the primary agent becomes unavailable.
  - **Random** –CWA chooses agents from the **Agents Selected** field randomly. This is a form of workload balancing that works well with Unix *rsh* agents. However, if you are working with CWA agents on platforms that track load information, you should choose the **Balanced** option.
  - **Balanced** –CWA chooses an agent from the **Agents Selected** field based on lightest load when the job is ready to launch. You can choose this option to balance your workload on all the available agents in the list. If you are working with Unix *rsh* agents, you should choose the **Random** or **Rotation** option.
  - **Broadcast** –CWA runs the job on every agent in the **Agents Selected** field. For example, you can use this option to schedule backups on each machine in the list using the same job.
  - **Rotation** –CWA cycles through the list of agents in the **Agents Selected** field and launches jobs assigned to that list in rotation. When the end of the agent list is reached, the first agent in this list is chosen. This is a form of workload balancing where you can predict where the next job will run.

Agent List Definition - Context Menu

The **Agent List Definition** context menu displays by right-clicking in the **Agents Selected** field in the **Agent List Definition** dialog.

This context menu contains the following options:

- **Remove from List** –Returns the selected agent to the **Agents Available** field so that it is no longer a part of the agent list.
- **Remove All from List** –Clears all agents from the **Agents Selected** field.

Agent List Definition - List Tab

- **Agents Selected** –Displays the list of agents that comprise the agent list selected from the list of licensed agents.
- **Agents Available** –Displays the list of available licensed agents of the platform type shown in the **Platform** field. All agents that are inactive have a red **X** over the agent icon.
- **Up Arrow** –Click to move the selected agent in the **Agents Selected** field up in the list (for ordered lists).
- **Down Arrow** –Click to move the selected agent in the **Agents Selected** field down in the list (for ordered lists).
- **Left Arrow** –Click to move the selected agent in the **Agents Available** field to the **Agents Selected** field.
- **Double Left Arrow** –Click to move all agents in the **Agents Available** field to the **Agents Selected** field.

- **Right Arrow** –Click to move the selected agent in the **Agents Selected** field to the **Agents Available** field.
- **Double Right Arrow** –Click to move all agents in the **Agents Selected** field to the **Agents Available** field.

Agent List Definition - Description Tab

Description –A free text field for up to 255 characters (optional).

Agent Lists Procedures

Adding an Agent List

You can add an agent list under a parent agent list of the same type, or under the root platform folder. When you add an agent list under a parent agent list, the parent agent list treats the agent list as if its agents were direct members of the list.

To add an agent list:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Right-click and select **Add Agent List** from the context menu to display the **Agent List Definition** dialog. Specify the properties for the agent list. For more information, see Agent List Definition Dialog, page 308.
3. Click **OK** to add the agent list. The agent list appears in the **Agent Lists** pane.

Changing the Order of the Agents in the List

To change the order of the agents in the list:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Double-click the agent list you want to edit or right-click the agent list and select **Edit Agent List** from the context menu.
3. In the **Agents Selected** field, select the agent whose position you want to change.
4. Click the up-arrow (**^**)or down-arrow (**v**) button(s) to move the agent up or down in the list or right-click and use the context menu selections to move the agent up or down in the list.

Note: If you are specifying an ordered list, the first agent in the list is considered the primary agent. All subsequent agents are alternate agents if the primary agent or other alternate agents are unavailable

.Deleting an Agent List

You can delete an agent list from an **Agent Lists** pane. You cannot delete the platform folder that contains the agent lists. If you delete a parent agent list, you also delete its child agent lists.

To delete an agent list:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Click the agent list to delete and click the **Delete** button on the CWA toolbar, or right-click the agent list and select **Delete Agent List** from the context menu.
3. Click **Yes** in the confirmation dialog to delete the agent list and all its child agent lists (if any) from the CWA database.

Editing an Agent List

You can edit an agent list to add or remove agents, to change its name, or to change its parent agent list. You cannot change its platform type, agent list type, nor can you change its parent to a list of a different type.

To edit an agent list:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Double-click the agent list you want to edit, or right-click the agent list and select **Edit Agent List** from the context menu.
3. Edit the properties for the agent list. For more information, see Agent List Definition Dialog, page 308.
4. Click **OK** to update the agent list in the CWA database or **Cancel** to discard your changes and close the dialog. The update takes effect the next time the master is refreshed.

Moving an Agent List

You can move agent lists to a different location in the agent list tree. You cannot move agent lists from one platform to another, nor can you move agent lists to an agent list of a different list type (**Ordered**, **Random**, **Balanced**, **Broadcast**, or **Rotation**), nor can you move a parent agent list into one of its own child agent lists.

To move an agent list:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Double-click the agent list you want to edit, or right-click the agent list and select **Edit Agent List** from the context menu.
3. In the **Parent List** field, select a new parent agent list from the drop-down menu.

Selecting Agents for an Agent List

You select the agents that belong to an agent list from the **Agent List Definition** dialog. You can also order the selected list. This is necessary for ordered list types where you can specify the primary agent by placing it first in the list.

To select an agent for an agent list:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Double-click the agent list you want to edit, or right-click the agent list and select **Edit Agent List** from the context menu.
3. From the **Agents Available** field drop-down menu, select the agent(s) to include in the agent list. The agents shown in this field are all licensed agents on your system with the specified platform. Note that any agents with a red X are not available for use, although they are licensed agents.
4. To add agents to the agent list, click:
   a. The left arrow button (<) to transfer the selected agent(s) to the **Agents Selected** field.
   b. The double left arrow button (<<) to transfer all agents to the **Agents Selected** field.
5. To remove agents from the agent list, click:

a. The right arrow button (>) to transfer the selected agent(s) from the **Agents Selected** field.

b. The double right arrow button (>>) to transfer all agents from the **Agents Selected** field.

Viewing Agent Lists

Agent lists are displayed in a hierarchical format in the agent lists panes. Each platform that CWA supports has its own agent lists pane. Each agent list displays its associated agents as child nodes, and displays any child agent lists.

From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.

Viewing Agent List Properties

To view an agent list's properties:

1. From the **Navigator** pane, select **Definitions>Agent Lists** to display the **Agent Lists** pane. Then, select a type of agent folder.
2. Double-click the agent list you want to view, or right-click the agent list and select **Edit Agent List** from the context menu.

11

Monitoring Production

This chapter covers the user interface you use to view various reports for monitoring production in these topics:

- Reports in CWA, page 313
- Logs in CWA, page 326
- Schedules in CWA, page 335
- Master Status Pane, page 338

Overview

CWA includes a reporting mechanism that supports numerous reports to help you monitor production including:

- Data displayed in every window
- Operator alerts and responses
- Job statuses
- Event history
- Dependency cross-references
- Production schedule summary

These topics describe the reports interface:

- Reports in CWA
- Logs in CWA
- Schedules in CWA
- Master Status Pane

Reports in CWA

About CWA Reports

CWA reports let you print out information that exists in the CWA database. A report can be generated from the information displayed in any **CWA** pane by clicking the **Print** button that is placed in each button bar. (In some windows, you must select a sub-category in the window to display the button bar.) Clicking the **Print** button displays a preview of the report. You can print the report by clicking the **Print** button in the preview toolbar.

There are also specialized reports available from the **Reports** main menu. The four reports available are **Job Last Status, Schedule Summary, Dependency Cross Reference** and **Event History**.

Note: For reports to display and print properly, your machine must have a default printer configured. It is recommended that reports be printed in the landscape configuration.

CWA supports numerous reports, such as:

- Data displayed in every window
- Operator alerts and responses
- Job statuses
- Event history
- Dependency cross-references
- Production schedule summary

Reports Interface

Accessing the Reports Interface

From the **Reports** main menu on the CWA client, select the type of report that you want to see or print.

- **Job Last Status**
- **Schedule Summary**
- **Dependency Cross Reference**
- **Event History**

You can reach the **Reports** interface for other types of CWA reports by clicking the **Print** button while in those areas.

Buttons

- **First Page** –Displays the first tab of the report.
- **Prior Page** –Displays the previous tab of the report.
- **Next Page** –Displays the next tab of the report.
- **Last Page** –Displays the last tab of the report.
- **Print** –Prints the report using the current print settings.
- **Zoom to fit** –Fits an entire report tab onto the screen. If you change the window size, the contents resize to show a complete tab.
- **Save Report** –Saves the report to a text file.
- **Open Report** –Allows you to open a previously saved report.
- **Help** –Accesses the online help system for relevant context information.

Note: You can also use the tab **UP**, **TAB DOWN**, **HOME** and **END** keys on your keyboard to navigate any **Reports** window: Tab Up = next tab, tab Down = previous tab, Home = first tab, End = last tab.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based.

Columns

The set of columns displayed in a **Reports** window depends on the specific report that is being previewed.

Reports Window Context Menu

When you right-click in any **Reports** preview window, the **Reports** window context menu displays.

The **Reports** window context menu contains the following element:

- **First Page** –Displays the first tab of the report. This option has the same function as the **First Page** button.
- **Next Page** –Displays the next tab in the report. This option has the same function as the **Next Page** button.
- **Previous Page** –Displays the previous tab in the report. This option has the same function as the **Previous Page** button.
- **Last Page** –Displays the last tab of the report. This option has the same function as the **Last Page** button.
- **Zoom** –Fits an entire report tab onto the screen. This option has the same function as the **Zoom to fit** button. If you change the window size, the contents resize to show a complete tab.
- **Print** –Prints the report using the current print settings. This option has the same function as the **Print** button.
- **Save** –Saves the report to a text file. This option has the same function as the **Save** button.
- **Open** –Loads a previously saved report. This option has the same function as the **Open** button.

Main Menu Reports

Job Last Status Report

The **Job Last Status** report shows a snapshot of the status of all the latest occurrences of jobs in the production schedule and reveals actual start times vs. estimated start times.

Column Name	Description
Job No	The job occurrence number.
Job Name/Command	The name of the job as defined in the job's definition and the executable file specified in the **Command Name** field.
Parent	The parent job group (if any) to which the job belongs.
Status	The last status of the job at the time the report was generated. If the job has not yet run, this field will be blank.
Time	The actual date and time the job started.
Prod. Date	The production date for which the job was originally scheduled.
Est. Time	The estimated job start date and time based on the job's dependencies and time window.

Schedule Summary Report

This report provides a general understanding of job throughput in the production schedule. It reveals the number of successful jobs vs. failed jobs and shows all the current statuses. If you report on multiple days, daily job totals and an overall sum total are given.

Column Name	Description
Date	Displays the date of the schedule covered by the summary report.
Scheduled	Displays the number of jobs and job groups that were scheduled using a calendar.
Inserted	Displays the number of jobs that were manually added to the schedule.
Failed	Displays the number of jobs that failed (statuses of **Error Occurred** and **Completed Abnormally**).
Timed Out	Displays the number of jobs that didn't run within their time window.
Reruns	Displays the number of jobs that were rerun by an Operator (through the job control menu **Rerun** option).
Current Statuses	Lists all the current statuses in the production schedule.
Count	Number of schedules of each current status type. Reruns are not included.

Dependency Cross Reference Report

This report provides information about dependencies on jobs that are in the production schedule.

Column Name	Description
Job Name	Displays the root job for which to show dependencies.
Direct Dependents	Displays all the dependencies that are last in line to be completed before all other dependencies are met.
Indirect Dependents	Displays all the dependencies that must be completed before the direct dependents can complete.

Direct dependents are jobs that are directly dependent on the job defined by job name. Indirect dependents are all other jobs in the dependency chain that are affected by the direct dependents.

For example, if **Job A,Job B,J C,J D** were the dependency chain, and **Job A** was listed, **Job B** would be the direct dependent, and **Job C** and **Job D** would be the indirect dependents.

Event History Report

This report displays information about the events that occurred in the time interval specified in the **Event History Selection** dialog. Optionally, you can include in the report details about the action that was triggered by the event.

Column Name	Description
Trigger Time	Displays the time that the event was triggered.
Event Name	Displays the name of the event that was triggered.
Trigger	Displays the condition that triggered the event action that was taken in response to the event.
Status	The current status of the event.
The fields below are displayed only if the **Include Action Detail** option is selected.	
Action Time	Displays the status of the action.

Column Name	Description
Action Name	The name of the action that was triggered by the event.
Action Type	Displays the type of action that was taken.
Action Status	Displays the status of the action.

Event History Selection Dialog

The **Event History Selection** dialog displays by selecting **Event History** from the **Reports** main menu. In this dialog, you select the criteria to be used as the report is compiled.

This dialog contains the following elements:

- **All Days** –Includes each day of available event history in the **Event History** report.
- **Date Range** –Specifies a range of dates and a starting time and ending time. To compile a report on a specific time window, specify the same date in the **From** and **Until** fields and enter the starting and ending times of the time window.
- **All Types** –Includes all types of events in the **Event History** report.
- **By Type** –Specifies a single type of event to exclude the other event types from the **Event History** report.
- **Include Action Detail** –Includes details about the action that the event triggered in the **Event History** report.

Report Range Dialog

The **Report Range** dialog displays by selecting **Schedule Summary** from the **Reports** main menu.

The **Report Date Range** dialog is used to select the dates that are used for the report. The default date is today (the current day). You can either type dates directly in the fields or click the down-arrow button to select a date from the graphical calendar. No information displays for dates that extend beyond your job history (past or future).

Individual Pane Reports

These reports are available:

- Actions Report
- Agent Lists Report
- Alerts/Response Report
- Calendars Report
- Connections Report
- Event Activity Report
- Fiscal Calendars Report
- Job Activity Report
- Job Classes Report
- Job Events Report
- Job Run Detail Report

- Jobs Report
- Queues Report
- Resources Report
- Schedules Report
- Security Policies Report
- System Events Report
- System Logs Report
- Users Report
- Variables Report
- Workgroups Report

About Individual Pane Reports

Most pane reports will not print reports on individual items listed in the pane. These reports require a minimum of two items or more in the report. If you select just one item before selecting the **Print** button, the entire contents of the pane are included in the report. The only panes that allow a report on a single item are the **Job Activity**, **Jobs** and **Calendars** panes.

- You can select multiple items in a window that are adjacent to each other by holding down the **SHIFT** key and clicking the first and last items in a desired range of items.
- You can select multiple items in a window that are non-adjacent to each other by holding down the **CTRL** key and clicking the desired item.

Actions Report

The **Actions Report** preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in any **Actions** pane.

The **Actions** report contains the following columns:

Column Name	Description
Owner	Displays the owner of the action.
Action Name	Displays the name of the action.
Public	Indicates if the action is available to other users.
Action Description	Displays any description that is entered on the **Description** tab of the action's dialog.
Modified	Displays the date and time that the action was modified.

Agent Lists Report

The **Agent Lists** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Agent Lists** pane.

The **Agent Lists** report contains the following columns:

Column Name	Description
List Name/Agent Name	Displays the name of the agent list with the names of the agents.
List Type	Displays the type of agent list. Agent lists can be **Ordered**, **Random**, **Balanced**, **Broadcast** or **Rotation**.
Modified	Displays the date and time that the agent list was modified.

Alerts/Response Report

The **Alerts/Response** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu within the **Alerts** pane.

The **Alerts/Response** report contains the following columns:

Column Name	Description
Time	Displays the time the alert was issued.
Status	The last status of the job at the time the report was generated.
Job No	The job occurrence number.
Job Name	The name of the job as defined in the job's definition.
Alert Message	The message the operator receives when viewing the alert.
Response	The response entered by the operator.

Calendars Report

The **Calendars** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu within the **Calendars** pane.

The **Calendars** report contains the following columns:

Column Name	Description
Name	Displays the names of the calendar.
Type	Displays the type of calendar.
Public	Indicates if the calendar is Public; that is, available to all CWA users.
Modified	Displays the date and time that the calendar was modified.
Rules/Conditions	Displays any rules or conditions applied to the calendar.

Connections Report

The **Connections** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu, from the **Connections** pane.

The **Connections** report contains the following columns:

Column Name	Description
Name	Displays the name of the machine displayed in CWA panes and dialogs. This is not necessarily the same name the machine uses on the network.
Type	Displays the CWA component type. This column can show either master, agent, adapter, backup master, or fault monitor.
Platform	Displays the operating system used by the component.
Active	Displays whether the connection is active and available to be used.
Limit	Displays the job limit for an agent or adapter connection.
Machine Name	Displays the machine name as recognized by the network.
Port	Displays the port number(s) the component uses to communicate with the master. The master row contains the port number that CWA Web Clients use to communicate with it.
Modified	Displays the date and time this connection was modified.

Event Activity Report

The **Event Activity** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu, from the **Event Activity** pane.

The **Event Activity** report contains the following columns:

Column Name	Description
Name	Displays the name of the event.
Type	Displays the type of event.
Count	Displays how many times the event occurred.
Modified	Displays the last time that the event definition was modified.
Trigger	Displays the event trigger that initiates the job event.
Status	Displays the current status of the event.
Agent	Displays the name of the connection being watched by the monitor. Job and system events do not monitor a connection so this column is blank for those event types.
Owner	Displays the user that owns the event.

Fiscal Calendars Report

The **Fiscal Calendars** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu, from the **Fiscal Calendars** pane.

The **Fiscal Calendars** report contains the following columns:

Column Name	Description
Name	Displays the name of the event.
Starting Month	Displays the month that the fiscal calendar begins in.
Starting Day	Displays the first day of the starting month of the fiscal calendar.
Quarter Breakdown	Displays the number of weeks in each month of a quarter in the fiscal year.

Job Activity Report

The **Job Activity** report displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Job Activity** pane.

Note: There are four job activity reports that are not available from the Print button. These reports are the **Job Last Status**, **Schedule Summary**, **Dependency Cross Reference** and **Event History** reports. For information about the **Job Last Status**, **Schedule Summary**, **Dependency Cross Reference** and **Event History** reports, see Main Menu Reports, page 315.

The **Job Activity** report contains the following columns:

Column Name	Description
Job No	Displays the job instance identification number.
Job Name	Displays the name of the job or job group as defined in the job's or job group's definition.
Status	Displays the present status of the job.
Parameter	Displays the associated parameter.
Start Time	Displays the time the job is (or became) active.
Duration	Displays the estimated or actual runtime duration.
Agent	Displays the name of the agent on which the job runs.
Queue	Displays the queue from which the job runs.
Runtime Use/Owner	Displays the runtime user and/or owner the job or job group runs as.

Job Classes Report

The **Job Classes** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Job Classes** pane.

The **Job Classes** report contains the following columns:

Column Name	Description
Job Class Name	Displays the name of the job class.
Description	Displays the description of the job class (optional), as specified in its definition.
Modified	Displays the date and time that the job class was modified.

Job Events Report

The **Job Events** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Job Events** pane.

The **Job Events** report contains the following columns:

Column Name	Description
Owner	Displays the owner of the job event.
Event Name	Displays the name of the job event.
Event Trigger	Displays the event trigger associated with the job event.
Enabled	Indicates if a job event is enabled and available to use.
Modified	Displays the date and time that a job event was modified.

Job Run Detail Report

The J**ob Run Detail Report** preview is displayed by clicking the **Print** button in a **Job Details** dialog. This report provides details about an individual job instance that ran. The following table describes each column in the **Job Run Detail** report.

Column Name	Description
Job	Displays the name of the job or job group as defined in the job's or job group's definition.
Job ID	Displays the job instance identification number.
Status	Displays the present status of the job.
Command	Displays the path of the command that ran.
Estimated Start Time	Displays the estimated time (derived from previous runs of the job) that the job will go active.
Parameters	Displays the parameters used when the command ran.
Actual Start Time	Displays the time that the job actually started.
Environment File	Displays the path of the environment file assigned to the job, if any.
Estimated Duration	Displays the estimated runtime duration.
Output File	Displays the path of the output file if an output file was produced.
Actual Duration	Displays the actual length of time that the job ran.
Agent	Displays the name of the agent on which the job ran.
Reruns	Displays how many times that the job has been rerun.
Agent List	Displays the name of the agent list if an agent list was assigned.
Exit Code	Displays the exit code value that the job completed with.
Runtime User	Displays the runtime user the job or job group ran as.
Original Status	Displays the job status that the original job instance had when it first completed.
Priority	Displays the priority that was assigned to the job.
Queue	Displays the queue where the job ran.
Predecessors	Displays the jobs and dependencies that needed to be fulfilled before this job could run.
Successors	Displays the jobs and dependencies that cannot run until this job ran.
Audit Log	Displays the audit log of the major events during the running of the job.
History	Displays the history of this job including the job ID, date, final status, start time, duration and priority of previous job instances.
Output	Displays the output of the job if the option to display job output was selected.

Jobs Report

The **Jobs** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Jobs** pane when a job or job group is selected.

The **Job Events** report contains the following columns:

Column Name	Description
Job Name	Displays the name of the selected job or job group.
Parent	Displays the name of the parent job group for the selected job or job group.
Enabled	Displays whether the job is active or inactive. The job must be enabled before it can run. It has nothing to do with the status of the job or job group in the production schedule.
Job Class	Displays the job class that this job or job group belongs to.

Column Name	Description
Command	Displays the command and its parameters that is associated with the job. Commands cannot be associated to job groups
Environment File	Displays the environment file that is associated with the job. Environment files cannot be associated to job groups.
Working Directory	Displays the pathname for the working directory for the program or script specified in the **Command** field.
Calendar	Displays the calendar name that is associated to the job or job group.
Time Window	Displays the time window in which the job or job group can run, as specified in the job or job group definition.
Repeat	Displays the number of times the job or job group repeats.
Agent Name	Displays the name of the agent on which the job runs.
Runtime User	Displays the runtime user name that is used to run the job.
Description	Displays the description of the job or job group. This is the user-defined description that exists on the **Description**(s) tab.

Resources Report

The Resources Report preview displays by clicking the Print button from the Resources pane. The following table describes each column in the Resources report.

Column Name	Description
Resource Name/ Description	The name of the resource and any description that is entered on the Description page of the resource's definition.
Owner	Displays the owner of the resource.
Limit	Displays the name of the resource.
In Use	Indicates if the resource is being used at the time when the report is compiled.
Offline	Indicates if the resource is offline.
Enabled	Indicates if the resource is available to be used.
Public	Indicates if the resource is available to other users.
Modified	Displays the date and time that the resource was last modified.

Queues Report

The **Queues** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Queue** pane.

The **Queues** report contains the following columns:

Column Name	Description
Queue Name	Displays the name of the queue.
Active	Displays whether the queue is active or disabled.
Limit	Displays the number of jobs that can run from the queue at one time.
Priority	Displays the priority value assigned to the queue with respect to other queues in the system.

Column Name	Description
Bumping	Displays whether jobs can migrate from this queue to other higher priority queues if jobs are not being launched after a certain period of time.
Hours Available	Displays the hours of operation assigned to the queue.
Modified	Displays the date and time that the queue was modified.

Schedules Report

The **Schedules** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Schedules** pane.

The **Schedules** report contains the following columns:

Column Name	Description
Date	Displays the date of the production schedule.
Compile Start	Displays the date and time when the schedule compile began.
Compile End	Displays the date and time when the schedule compile finished.
Duration	The overall length of time of the compile.
Scheduled Jobs	The number of scheduled jobs.
Adhoc Jobs	The number of unscheduled jobs.
Reruns	The number of jobs that were rerun jobs (not original instances).
Carry-Over	The number of jobs that were carried forward from a previous schedule.

Security Policies Report

The **Security Policy** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Security Policies** pane.

The **Security Policies** report contains the following columns:

Column Name	Description
Security Policy	Displays the name of the security policy.
Modified	Displays the date and time that the security policy was modified.
Category	Displays the function categories that are included in the security policy.
Functions	Displays the functions that are included in each selected category.

System Events Report

The **System Events** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu, in the **System Events** pane.

The **System Events** report contains the following columns:

Column Name	Description
Owner	Displays the owner of the system event.
Event Name	Displays the name of the system event.
Event Trigger	Displays the event trigger associated with the system event.
Enabled	Displays whether the system event is enabled for use.
Modified	Displays the date and time that the system event was modified.

System Logs Report

The **System Log** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Logs** pane.

The **System Logs** report contains the following columns:

Column Name	Description
Log ID	Displays the Log ID number for the log message. This number is always unique.
Time	Displays the date and time the log message was generated.
Message	Displays the text of the log message.
Sender	Displays the system component that was the source of the log message, e.g., master, agent, CWA Web Client, Job Manager, etc.
Job Name	Displays the name of the job that generated the message. This field is blank for user edits.
Job ID	Displays the unique ID number of the job (if any) that generated the log message.
User	Displays the user name of the job that generated the log message. User names appear on audit messages relating to login/logout of users and any edits made by users.
Agent	Displays the name of the agent if the log message originated from an agent.

Users Report

The **Users** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Users** pane.

The **Users** report contains the following columns:

Column Name	Description
User	Displays the login name of the CWA user. This is the name CWA uses to validate a user. When specifying a runtime user, it is this user name that is referred to.
Full Name	Displays the name specified as the user's full name in their user definition.
Security Policy	Displays the user's assigned security policy name.
Email	Displays the user's email address.
Phone	Displays the user's phone number.

Variables Report

The **Variables** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Variables** pane.

The **Variables** report contains the following columns:

Column Name	Description
Owner	Displays the owner of the variable. Owners can be users or workgroups.
Variable Name	Displays the name of the variable including its id number.
Type	Displays the type of variable (string, number or date).
Variable Value	Displays the current value of the variable.
Modified	Displays the date and time that the variable was changed.

Workgroups Report

The **Workgroups** report preview window displays by clicking the **Print** button or by right-clicking and selecting **Print** from the context menu in the **Workgroups** pane.

The **Workgroups** report contains the following columns:

Column Name	Description
Workgroup	Displays the name of the workgroup.
Users	Displays a list of users belonging to the workgroup.

Logs in CWA

About CWA Logs

You can use the **Logs** pane to view and print a history of **Error**, **Audit**, **Warning** and **Diagnostic** messages that were generated by CWA. These messages are part of normal CWA operations but diagnostic messages are logged only when troubleshooting.

If there are a lot of logging messages, it may take a long time to load them when this window is selected. If there are more than 10,000 messages in the **Logs** pane, a dialog with the following message displays when the window displays:
`There are <number> log messages for the current production day. It is recommended that you enable Server Side Filtering and redefine your selection criteria. Would you like to display the Log Filter dialog now?`

It is recommended that you select the **Yes** option and filter the log messages from the Server Side to download and display only the messages that you are interested in. If you do not use the Server Side filter with the log messages, all of the log messages are downloaded and it may take a long time to display these messages. For more information on filtering the logs, refer to the Log Filter Dialog, page 330.

With each message, CWA includes a message source to help you determine where the error occurred.

The possible sources are:

- Clients
- Masters
- Agent Manager
- Fault Tolerance
- Dependency Manager
- Job Manager
- Action Manager
- Queue Manager
- Users
- Fault Tolerance
- Client Manager
- Compiler
- Database

- Communication

Error Messages

Error messages all concern a failure or abnormal operation of some kind. Origins include agent problems, fault tolerance components, and actions that were not executed. An **Error** message gives you information that helps you determine where to look to resolve the error. By default, error messages appear in red text but this color can be modified in the **Preferences** dialog.

Audit Messages

Audit messages generally relate routine details of CWA operations. Operating system errors are the exception, and are included under CWA audit messages. By default, **Audit** messages appear in green text but this color can be modified in the **Preferences** dialog.

Audit messages fall into the following categories:

- **Master** –Records all accounts of when the master started and stopped.
- **Purging** –Records all accounts of when job occurrences and audit messages are purged from the database.
- **Production Schedule** –Records all accounts of when jobs change status, and of when the production schedule is recreated.
- **User Actions** –Records when CWA items are added or edited, such as jobs, job groups, job events, job actions, etc. Impersonate User activities are also logged.
- **Operator Actions** –Records job control performed on job occurrences in the production schedule.
- **Fault Tolerance** –Records activities of the fault tolerance mechanism when installed.

Audit messages include:

- Master status
- Purging of old jobs from the production schedule
- Purging of audit, error, and diagnostic messages
- Production date turnover
- Job occurrence status change
- Add, edit and delete actions from different CWA panes
- Job control performed by a user or through an action
- Normal fault tolerance activities
- System error messages

Warning Messages

Warning messages are generated by conditions that can lead to potential problems. They are precautionary alerts to a user to investigate a condition before it becomes a problem. Warning messages always appear in the log in gray text because their color cannot be configured.

Diagnostic Messages

Diagnostic messages are used for internal debugging purposes as a tool for better analysis of product code. Diagnostics for the various system components that comprise CWA are configured from the **Logging** tab of the **System Configuration** dialog. The level of diagnostic logging detail can be configured for each individual component. While the default diagnostic setting is Severe, the settings range from **None** to **High Debug**. The higher settings should only be used under the supervision of Cisco's Support personnel. The amount of information collected on the higher settings can consume large volumes of disk space on your machine.
The default location for diagnostic logs on a Windows master machine is `C:\Program Files\Tidal\Scheduler\master\logs`.
The default location for diagnostic logs on a Unix master machine is: `opt/Tidal/master/logs`.

Selecting the **Client Diagnostics** option on the **Logging** tab will collect diagnostic information on the connection socket between the master and the CWA Client.

Note: Other information about the CWA Client is collected from the **Poll Activity** pane in the **Master Status** pane. Right-clicking in this pane and selecting the **Client Debug** option enables the CWA Client diagnostic logging that gathers information into a file in the **Master** directory called *sadiags.txt.* Refer to Troubleshooting, page 355 for more information.

Logs Pane Interface

Accessing the Logs Pane Interface

From the **Navigator** pane, select **Operations>Logs** to display the **Logs** pane.

You can change the sort order of the display by clicking the head of the column that you want to use as a sort key.

Buttons

- **Filter** –Displays the **Logs Filter** dialog to customize the data that displays in the **Logs** pane.
- **Prior Day** –Displays the log records for the day before the one currently displayed.
- **Select Day** –Displays the log records for today or any other day.
- **Next Day** –Displays the log records for the day after the one currently displayed.
- **Print** –Displays the **Reports** window to view and print the contents of the **Logs** pane. For more information, see System Logs Report, page 325.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based.

Columns

- **Log ID** –The identification number of the message. This identification number is unique to each message. Any log ID with a minus sign refer to log entries from a backup master. The minus sign helps identify log entries that occurred during a failover.
- **Time** –The date and time the message was logged.
- **Type** –The type of log message (**Error**, **Audit** or **Warning**).
- **Message** –The text of the log message.
- **Source** –The source of the message.
- **Job Name** –The name of the originating job.

- **Job No.** –The unique job ID number.
- **User Name** –The name of the originating user.
- **Agent** –The name of the originating agent.
- **Msg ID** –The message number that corresponds to the message text (also corresponding with the **Message** drop-down list log filter). You can search for all messages based on the message number.
- **Computer** –The computer from which the log message originated.
- **Job Alias** –The unique code that identifies a job or job group.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Logs** pane, the **Navigator** context menu displays.

The **Logs Navigator** context menu contains the following options:

- **Filter** –Displays the **Log Filter** dialog. Has the same function as the **Filter** button on the toolbar. You can filter the job occurrences that are displayed in the **Jobs** pane according to criteria you select. You can also custom-sort log records. For more information about the **Log Filter** dialog, see Log Filter Dialog, page 330.
- **Prior Day** –Displays the logs for the day before the one currently displayed. This option has the same function as the **Prior Day** button on the toolbar.
- **Next Day** –Displays the logs for the day after the one currently displayed. This option has the same function as the **Next Day** button on the toolbar.
- **Select Day** –Displays a calendar to select the date whose logs you want to view. This option has the same function as the **Select Day** button on the toolbar.
- **Preferences** –Displays the **Preferences** dialog for the **Logs** pane.
- **Print** –Displays the **Reports** window to view and print your log records. This option has the same function as the **Print** button on the toolbar. For more information about the **Reports** window, see Reports Interface, page 314.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Refresh** –Updates the data in the current pane.

Logs Pane Context Menu

When you right-click in the **Logs** pane, the **Logs** pane context menu displays.

The **Logs** pane context menu contains the following options:

- **Details** Displays the details of a selected log message.
- **Filter** –Displays the **Log Filter** dialog to filter the job occurrences that are displayed in the **Jobs** pane according to criteria you select. This option has the same function as the **Filter** button on the toolbar. For more information about the **Log Filter** dialog, see Log Filter Dialog, page 330) You can also custom-sort log records.
- **Prior Day** –Displays the logs for the day before the one currently displayed. This option has the same function as the **Prior Day** button on the toolbar:
- **Next Day** –Displays the logs for the day after the one currently displayed. This option has the same function as the **Next Day** button on the toolbar:
- **Select Day** –Displays a calendar to select the date whose logs you want to view. This option has the same function as the **Select Day** button on the toolbar.

- **Print** –Displays the **Reports** window to view and print your log records. This option has the same function as the **Print** button on the toolbar. For more information about the **Reports** window, see Reports Interface, page 314.
- **Auto Update** –Sets the **Logs** pane display to refresh automatically.

Logs Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Logs** pane, the **Logs Preferences** dialog displays.

- Logs Preferences – Columns Tab
- Logs Preferences – General Tab

Logs Preferences - Columns Tab

From the **Columns** tab of the **Logs Preferences** dialog, you can select which columns are displayed in the **Logs** pane and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the window. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Logs Preferences - General Tab

The General page of the Logs Preferences dialog contains the following elements:

- **Error Messages** – Specifies the text color of the error messages.
- **Audit Messages** – Specifies the text color of the audit messages.

From the list in each text field, you can select a color to assign to each type of log message for easy visual identification among the other messages listed in the log. At the bottom of the list of colors in each list is a Custom option to create other colors that are not provided as a default color.

Selecting the Custom color option displays a Color dialog with a color matrix tool to create a custom color using red, green and blue numerical values or hue, saturation and luminescence numerical values.

To create a custom color:

1. Click on one of the color squares in the Basic colors section of the Color dialog.
2. Either enter numerical values in the values text fields or click on the cross hairs pointer and drag it around the color matrix to display the color that the pointer is resting on in the Color|Solid text field.
   - Move the pointer horizontally to change the color's hue.
   - Move the pointer vertically to change the color's saturation.
   - Move the pointer up or down the adjacent vertical bar of color to adjust the color's luminescence.
3. When satisfied with the color you have defined, click Add to Custom Colors to add the new color to the Custom Colors section.
4. Select the desired custom color and click OK to close the dialog and apply the new color to the chosen messages.

Log Filter Dialog

To open the **Log Filter** dialog, click the **Log Filter** button on the CWA toolbar from the **Logs** pane, or select **Filter** from the **Logs** pane context menu. The settings in this dialog are the parameters for which log messages are displayed in the **Logs** pane.

Note: All times within the logs are adjusted relative to the master's time zone.

This dialog contains the following elements:

- **Source** –The source of the message. Leaving this field empty includes messages from all sources.
- **Agent** –From the drop-down menu, you can select a specific agent whose messages you want to see. Making no selection in this field includes all agents' messages.
- **Job Name** –You can select or manually type the name of any job whose messages you want to see. Leaving this field empty includes messages from all jobs.
- To search for a job, click the **Browse** button, to open the **Job Search** dialog.
- **Errors** –Selecting this option includes CWA error messages in the **Logs** pane (according to the other filters specified). Error messages note failures or abnormal CWA operations.
- **Audits** –Selecting this option includes CWA audit messages in the **Logs** pane (according to the other filters specified). Audit messages primarily track normal status changes and actions that affect CWA operations though operating system errors are also noted.
- **Warnings** –Selecting this option includes CWA warning messages in the **Logs** pane (according to the other filters specified). Warning messages are precautionary alerts to potential problems.
- **Hours** –Displays messages that occurred only during the hours selected. The default is to have all hours selected.
- **Current day** –Messages from today only.
- **Date Range... From ... To ...** –Select a specific period of days to see log messages. You can type directly into these fields using the date format specified in your Windows Regional Settings Control Panel or click the **Browse** button to select dates from a graphical calendar.
- **Computer** –The name of the computer where the message originated.
- **User** –The user who owns the event that generated the message.
- **Message Text** –Type text here if you want to see only logs containing certain text strings. Leaving this field blank displays all messages.
- **Last** –Select this option to start filtering from the most recent entry in the log.
- **Minutes** –Specify how far back in time within the current log to filter. Clicking the arrows changes the minutes in increments of 60.
- **Server Side Filter** –This option can improve performance by reducing network traffic. Select this option if the log filter criteria does not change very often. With this option selected, only logs meeting the defined criteria are downloaded to the CWA Client when the **Logs** pane is selected. Once the filter criteria is changed, logs are filtered again according to the new criteria and downloaded again.

  If the option is not selected, all logs are downloaded first and then filtered by the CWA Client to meet the defined criteria. After the initial download it is quicker to refilter the logs from the CWA Client since they do not have to be downloaded again.
- **Defaults** –Resets the criteria to both **Errors** and **Audits** types and all hours.

Log Details Dialog

To open the **Log Details** dialog, double-click any individual record in the **Logs** pane.

You can view messages that are too long to be displayed in the log message viewer and you can copy the message text to the clipboard for use in other applications such as e-mail. The information in the Log Details dialog is read-only.

This dialog contains the following elements:

- **Type** – The type of log (Error or Audit).
- **Computer** – The computer from which the log message originated.
- **Date** – The date the message was logged.
- **Source** – The Scheduler component that was the source of the message.
- **Time** – The time the message was logged.
- **Job ID** – The unique job ID number.
- **User** – The name of the originating user.
- **Job Name** – The name of the originating job.
- **Msg ID** – The message number that corresponds to the message text (also corresponds with the Message list log filter).
- **Agent** – The name of the originating agent.
- **Log Message** – The text of the log message.

Log Messages

Error Messages

The following table lists the CWA errors that may appear in log messages

Column Name	Log #	Description
Job %%1 terminated on signal.	2101	The job on the agent was aborted by the CWA system or terminated in some other manner.
Problem with spool file for job %%1.	2102	There was a problem with the job script or the environment file for the given job: The job's script file does not exist or cannot be read. The job data string sent by the master was corrupt. There was an error transferring the job script from the master to the agent. There was an error transferring the environment file from the master to the agent.
Effective user was not found on agent for job %%1.	2103	The effective or runtime user (the user for whom the job runs) does not exist on the agent.
Job name was not provided for job %%1.	2104	The system attempted to launch a job that had no name.
Could not set group id for job %%1.	2105	The agent could not set the group id of the process executing the job to that of the runtime user.
Could not set user id for job %%1.	2106	The agent could not set the user id of the process executing the job to that of the runtime user.

Column Name	Log #	Description
Could not change to home directory for job %%1.	2107	The agent could not change directories to the product directory on the agent.
Could not execute user script for job %%1.	2108	The agent could not execute the script for the job.
Was not able to fork child process for job %%1.	2109	The agent was not able to create a process to run the user's script.
Job %%1 is already running on agent.	2110	The named job is already running on the agent.
Pipe to output command failed for job %%1.	2111	The agent failed to run the output command for the job.
SAP failure launching job %%1.	2112	The SAP job failed to launch.
Failure launching PeopleSoft job %%1.	2113	The PeopleSoft job failed to launch.
Status Update query failed for job %%1.	2150	The job status could not be updated.
Launch failure for job %%1 [%%2].	2151	The job could not be launched.
Failed to send mail regarding %%1 to %%2 for alert (Error %%3).	2160	There was an error in the mail system that prevented mail from being sent.
Failed to make SNMP connection to send message: %%1.	2170	There was an error in the SNMP system that prevented the SNMP connection from being made.
Failed to send SNMP message: %%1	2171	There was an error in the SNMP system that prevented the SNMP message from being sent.
Primary master lost connection to FaultMon.	2200	This error occurs when the fault monitor machine or connection fails.
Primary master lost connection to backup.	2201	This error occurs when the backup master machine or connection fails.
Primary master lost connections to FaultMon and backup master,Äìshutting down.	2202	The backup master and fault monitor machine or connection fail at the same time.
FaultMon not responding.	2203	Fault monitor connection is up, but fault monitor does not respond to polls. This is an intermediate error message that precedes **Primary master lost connection to FaultMon**.
Backup master not responding.	2204	Fault monitor connection is up, but backup master does not respond to polls. This is a temporary error message and precedes **Primary master lost connection to backup**.
Backup master lost connection to FaultMon.	2205	This error occurs when the backup master machine loses connection to the fault monitor. There is no fault tolerance until this problem is corrected.
FaultMon lost connection to backup master.	2206	This error occurs when the Fault Monitor machine loses connection to the backup master. There is no fault tolerance until this problem is corrected.
Backup master is taking over all master functions.	2207	Primary master is down. The backup master is taking over.
Incomplete configuration for fault tolerance.	2208	There is incomplete information about the primary backup or faultmon components in the database.
Unable to start backup master because fault tolerance is disabled	2209	Fault tolerance is not in operation so the backup master could not be started.

Audit Messages

The following table lists CWA **Audit** messages:

Message	Log #	Description
Master Audit Messages		
Master starting.	1001	A record of when the Master attempted to start.
Master started.	1002	A record of when the Master completed its initialization.
Master shutdown.	1003	A record of when the Master was shut down. You cannot run a job on a Master that has been shut down.
Purging Audit Messages		
Purged jobs older than their retention date.	1004	CWA purged occurrences of jobs that are older then the retention specified in the job's definition.
Purged audit messages from logs older than %%1.	1005	CWA purged audit messages according to the audit log message retention setting in the **System Configuration** dialog.
Purged error messages from logs older than %%1.	1006	CWA purged error messages according to the error log message retention setting in the **System Configuration** dialog.
Production Schedule Audit Messages		
New production date %%1.	1008	A create schedule was performed on this date and time, recreating job occurrence in the production schedule.
Job %%1[%%2] status change to %%3.	1100	The specified job occurrence has changed its status. This audit message occurs for all jobs in the production schedule.
Sent request to insert job %%1.	1215	Records when a job was added to the schedule for a particular date only. The job may or may not have an associated calendar.
Production Schedule Audit Messages		
Sent request to replace job %%1 in schedule.	1217	Records when a job scheduled to run at a future time is replaced by an updated version of the job.
Added %%1 %%2.	1201	This audit is generated whenever a user adds a job, job group, job action, job event, security policy, user, variable, workgroup, queue, agent list, or job class.
Modified %%1 %%2 %%3.	1202	This audit is generated whenever a user modifies a job, job group, job action, job event, security policy, user, variable, workgroup, queue, agent list, or job class.
Deleted %%1 %%2.	1203	This audit is generated whenever a user deletes a calendar, job, job group, job action, job event, security policy, user, variable, workgroup, queue, agent list, or job class.
User %%1 impersonated user %%2	1218	Records when a user impersonates another user. Both users are shown.
User %%1 stopped impersonating user %%2	1219	Records when a user stopped impersonating another user. Both users are shown.
User Action Audit Messages		
Sent request to override job %%1.	1204	Records when the operator manually performed job control to override the job's dependencies.
Sent request to cancel job %%1.	1205	Records when the operator cancelled the job while it was waiting to run.

Message	Log #	Description
Sent request to set job status for %%1 to %%2.	1206	Records when the operator changed the completion status of the job.
Sent request to stop job %%1.	1207	Records when the operator stopped a job while it was running in the production schedule.
Sent request to hold job %%1.	1208	Records when the operator put a job on hold, preventing it from running when its dependencies are met.
Sent request to rerun job %%1.	1209	Records when the operator reran the job.
Sent request to abort job %%1.	1210	Records when the operator aborted the job while it was running.
Sent request to release job %%1.	1211	Records when the operator released the job that was specifically waiting on the operator to release it before launch.
User Action Audit Messages		
Sent request to restart job %%1.	1212	Records when the operator restarted the stopped job.
Run data for job %%1 has been modified.	1213	Records when the run data for the job has been modified from the production schedule. The modified data is not reflected in the job's definition.
Fault Tolerance Audit Messages		
Primary Master connected to FaultMon	1250	Records when the Primary Master connects to the Fault Monitor during startup. This message indicates normal operation.
Primary master connected to backup	1251	Records when the Primary Master connects to the backup master during startup. This message indicates normal operation

Diagnostic Messages

Diagnostic messages are intended for Cisco's Technical Assistance Center troubleshooting purposes only.

Schedules in CWA

About CWA Schedules

The **Schedules** pane displays a record of CWA production statistics. The **Schedules** pane uses a matrix format rather than a graphical approach to provide much the same information as the **Master Status** pane provides in the **General Information** pane.

Each time a production schedule is compiled, CWA adds a log entry to the **Schedules** pane. Each record includes the date, beginning and end times of the compile and totals for different types of jobs.

There are two types of schedules, **Scheduled** and **Forecast**. The scheduled type are actual compiled schedules ready to run. The forecast type is more of a prototype of a production schedule and is used as a beta model of a proposed production day. The forecast schedule is recompiled into an actual production schedule when it is time to run.

Double-clicking any schedule listed in the **Schedules** pane displays the selected schedule in the **Job Activity** pane.

Schedules Pane Interface

These topics describe the Schedules Pane interface:

- Accessing the CWA Schedules
- Buttons
- Search Field
- Columns
- Schedules Preferences Dialog
- Navigator Context Menu
- Schedules Pane Context Menu

Accessing the CWA Schedules

From the **Navigator** pane, select **Operations>Schedules** to display the **Schedules** pane.

You can change the sort order of the display by clicking the head of the column that you want to use as a sort key.

Buttons

Print –Displays the **Reports** window to view and print the contents of the **Schedules** pane. For more information about the **Schedules** pane report, see Schedules Report, page 324.

Search Field

Enter text that you want to search for within the columns displayed into this field.

Note: This field at the top right of the grids will only search text columns that are not grayed out and are string-based. See Searchable Columns, page 13.

Columns

- **Date** –The date of the compile.
- **Compile Start** –When the compile began.
- **Compile End** –When the compile finished.
- **Duration** –The overall length of time of the compile.
- **Sched Jobs** –The number of scheduled jobs.
- **Adhoc Jobs** –The number of unscheduled jobs.
- **Reruns** –The number of jobs that were rerun jobs (not original instances).
- **Carry-Over** –The number of jobs that were carried forward from a previous schedule.
- **Compile Type** –The compile type of schedule. If a *scheduled* compile, the schedule will run as soon as the production day starts. If a *forecast* compile, the schedule is recompiled at the start of the production day before the schedule runs.

Schedules Preferences Dialog

If you select **Preferences** from the **View** main menu while viewing the **Schedules** pane, the **Schedules Preferences** dialog displays.

From the **Schedules Preferences** dialog, you can select which columns are displayed in the **Schedules** console window and in what order they appear.

- A checkmark to the left of a column title indicates that it will be displayed in the window. No checkmark indicates that it will not be displayed.
- To rearrange the order in which the columns are displayed, select the column and click the up or down arrow.

Navigator Context Menu

When you right-click in the **Navigator** pane while viewing the **Schedules** pane, the **Navigator** context menu displays.

The **Schedules Navigator** pane context menu contains the following options:

- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** window to view and print your schedules records. This option has the same function as the **Print** button on the toolbar.
- **Create Schedule** –Recompiles the selected schedule. If the current day's schedule is selected, then a warning displays requesting confirmation that you want to completely replace today's schedule.If you replace today's schedule, then any repeating jobs in today's schedule without a time window will begin repeating as soon as possible. More control over creating schedules is available from the **Create Schedule** dialog accessed from the **Activities** main menu.
- **Export** –Saves the data in the current pane as an ASCII text file. You can then use the file data in other applications.
- **Preferences** –Displays the **Preferences** dialog for the **Schedules** pane.
- **New Root Folder** –Allows you to create a new root folder for the **Navigator** pane.

Schedules Pane Context Menu

When you right-click in the **Schedules** pane, the **Schedules** pane context menu displays.

The **Schedules** pane context menu contains the following options:

- **Edit Schedules** —Allows you to edit the selected schedule.
- **Refresh** –Updates the data in the current pane.
- **Print** –Displays the **Reports** window to view and print your schedules records. This option has the same function as the **Print** button on the toolbar.
- **Print Selected** –Displays the **Reports** window to view and print the selected schedules records. This option has the same function as the **Print** button on the toolbar.
- **Create Schedule** –Recompiles the selected schedule. If the current day's schedule is selected, then a warning displays requesting confirmation that you want to completely replace today's schedule.If you replace today's schedule, then any repeating jobs in today's schedule without a time window will begin repeating as soon as possible. More control over creating schedules is available from the **Create Schedule** dialog accessed from the **Activities** main menu.
- **Accept Schedule** –When you first create a schedule it is a projected schedule and is only tentative. Selecting the **Accept Schedule** option confirms the projected schedule should become the actual schedule.

- **Revert to Forecast** –Changes a schedule to tentative.
- **Remove Schedule** –Deletes the selected schedule.

Master Status Pane

Accessing the Master Status Pane

From the **Navigator** pane, select **Operations>Master Status** to display the **Master Status** pane.

Master Status Pane Interface

The **Master Status** pane displays CWA production activity and statistics. It is divided into tabs, with each tab displaying a different area of activity. The Master Status display is automatically updated every 60 seconds. The master version number displays at the top of the **Master Status** pane.

The master status interface contains these elements:

- Master Status – Overview Tab
- Master Status – Queue Tab
- Master Status – Connections Tab
- Master Status – Messages Tab

Master Status - Overview Tab

General Information Pane

The **General Information** pane shows important production data. Listed are the total number of jobs scheduled to run and also breakdowns into different categories.

This pane contains the following elements:

- **Start Time** –When the master was brought online.
- **Last Poll** –The last time this CWA Client polled the master for information.
- **Production Date** –The current date of production. Note that this date may differ from the current date (today) depending on the settings on the **System Configuration** dialog, **Master** tab. For more information about the **System Configuration** dialog, see Getting Started, page 7.
- **Scheduled Jobs** –The number of jobs that are scheduled to run.
- **Adhoc Jobs** –The number of jobs inserted into the schedule manually.
- **Jobs Carried Forward** –The number of jobs carried forward from the previous day.
- **Carry Forwards to Go** –The number of jobs carried forward from the previous day that have not run yet.
- **Reruns** –The number of rerun jobs. This value does not include the original instance of a job, or jobs with new instance numbers.
- **Total Jobs** –The total number of jobs to be run.
- **Jobs Done** –The total number of jobs that have completed.
- **Jobs To Go** –The number of jobs that are waiting and still eligible to run.

- **Jobs Cancelled** –The number of jobs that have been cancelled.

Columns

- **Description** –The statistic to be counted.
- **Value** –The value for the statistic.

Poll Activity Pane

The CWA master continually polls CWA Clients to determine if jobs are ready to launch, to check job status, to process CWA Client requests, etc. The **Poll Activity** pane gives you a real-time view of polling activity within the last two or three minutes. You can scroll through the list of poll activity.

- **Time** –The time of activity.
- **Activity** –The master activity.

Poll Activity Pane Context Menu

This context menu displays when you right-click in the **Poll Activity** pane.

This context menu contains the following options:

- **Refresh** –Updates the data in the **Poll Activity** pane.
- **Print** –Prints the status data in the **Poll Activity** pane.
- **Print Selected** –Prints the status of the selected data in the **Poll Activity** pane.

Within the **Polling Activity** pane, various four-letter command codes are used to indicate master activity.

Poll Code	Description
AG88	An OpenView client connected to the master.
DCHG	Generic data changed.
DNOD	The master deleted the node.
DSTA	The job dependency status was checked.
IMST	Intermaster dependency status was checked.
JADD	A new job definition was added.
JCAN	The job was cancelled.
JCNA	All selected job instances were cancelled.
JDEL	The job was deleted.
JHLD	The job was placed in HOLD status.
JINA	The job is inactive.
JINS	An ad-hoc job was inserted into schedule.
JOVD	The job's dependencies were overridden.
JOVR	The job was overridden.
JREL	The job was released.
JREM	The job instance was removed.
JRMA	All job instances within specified date range were removed.
JRRN	The job was rerun.
JRRS	The job step was rerun.

Poll Code	Description
JREL	The job was released.
JRPL	The job rule was changed-replaced job instance.
JSET	The job status was set manually.
LICN	The license was checked.
PING	The master was pinged.
QZRO	The queue limit was set to zero (used with alerts).
RAGT	The master reconnected to the node.
RCON	The configuration status of the agent was refreshed.
REQD	The agent requested data.
REST	The agent requested estimate times.
RJBR	The agent refreshed job run.
RLST	The master's agent list was refreshed after the agent list is modified.
RNOD	The master refreshed the node.
RQCL	The master shut down the system queue.
RQOP	The master opened the system queue.
RQUE	The master refreshed the system queue.
RVAR	The master refreshed the variables.
RVCA	The master refreshed the cache.
RVUP	The master updated the variables.
SCMP	The master compiled the schedule.
SNDC	The master sends the CWA Client a message.
SPAU	The master stopped the production schedule.
SRES	The master resumed the production schedule.
SRFR	The master was refreshed.
STOP	The master was stopped.
TRMC	The master terminated the CWA Client connection.
UNOD	The master updated the node.

Master Status - Queue Tab

The **Queue** tab lists each CWA queue and the queue's limits, and shows how many jobs are currently active in the queue as well as how many jobs are waiting to run in it.

- **Name** –The name of the queue.
- **Priority** –The queue priority order.
- **Limit** –The maximum number of jobs the queue is allowed to accept.
- **Active** –How many jobs in queue are active.
- **Waiting** –How many jobs in the queue are waiting to run.
- **Enabled** –Whether the queue is available. If the current time is outside of the hours of operation specified in the **Hours** field of the **Queue Definition** dialog, the queue displays **No**.
- **Modified** –Last modified date.

Master Status - Connections Tab

Connected Users Pane

The **Connected Users** pane shows which users are currently running a CWA Client connected to the master.

- **User** –Displays the user name and domain of origin.
- **Connected** –Displays the time the user started working with CWA.
- **Client Version** –Displays the version number of the connected CWA Client.
- **Computer** –Displays the name of the CWA Client machine.

Connected Users Pane Context Menu

Select a connection within the **Connected Users** pane and right-click to display a context menu.

This context menu contains the following options:

- **Send Message** –Opens a text field to send a message to the specified CWA Client/user.
- **Broadcast Message** –If an agent connection is not selected, this option opens a field that will broadcast the message to all connected CWA Clients.
- **Terminate Session** –Terminates the selected CWA Client connection.

Unavailable Connections Pane

The **Unavailable Connections** pane displays which connections are currently unavailable for use, if any.

- **Connection** –The name of the connection.
- **Type** –The type of connection that is unavailable.
- **Port(s)** –The port(s) the connection uses.

Master Status - Messages Tab

The **Messages** pane displays contains a log of the last 200 messages shown in the digital display.

The **Messages** pane contains the following columns:

- **From** –The sender of the message.
- **Time** –The time when the message was received.
- **Text** –The text of the message.
- **Untitled** field –The text of the message.

Messages Pane Context Menu

When you right-click in the **Messages** pane, the **Messages** pane context menu displays.

The **Messages** pane context menu contains the following options:

- **Send Message** –Sends a message to a CWA Web Client.
- **Broadcast Message** –Broadcasts a message to all CWA Web Clients.

Send Message to Client Dialog

From the **Messages** tab on the **Master Status** pane, double-click a message to send a new message to a CWA Web Client or to broadcast a message.

-or-

Right-click a message and select **Send Message** or **Broadcast Message** from the context menu.

The **Send Message to Client** dialog displays.

Type your message and click **Send**. Your message displays in the **Messages** tab.

12

Event ID Tables

This chapter covers these topics:

- Job Event Triggers
- System Event Triggers

Job Event Triggers

The following table lists the event triggers for various job events supported by CWA.These event triggers are supported throughout the various integration channels.Using the event ID number displayed in the Windows application log you can reference its meaning from this table. All job events have an ID number that begins with **12**. (These event ID numbers do not apply to the Unix platform.)

Event ID	Job Event Trigger	Event Type	Description
12000	Job added to schedule on demand	Status Change/Job Control	The job was added to the production schedule on an unscheduled basis.
12001	Job completed	Status Change	The job completed with a **Completed Normally** or **Completed Abnormally** status.
12002	Job completed abnormally	Status Change	The job completed with a **Completed Abnormally** status. The job's exit code is non-zero.
12003	Job completed normally	Status Change	The job completed with a **Completed Normally** status. The job's exit code is 0.
12005	Job waiting for operator release	Status Change	All the job's dependencies have been met. This event trigger only occurs when you select the **Require operator release** option in its job definition. The job is now waiting for the operator to release it.
12006	Job put on hold	Job Control	The operator put the waiting job on hold.
12007	Job waiting on resource	Status Change	All the job's dependencies have been met and the job is waiting for an execution slot to become available.
12008	Job not ready by end of its time window	Schedule Irregularity	The end of the job's time window was reached before its dependencies were met.
12009	Job launched	Status Change	The queue manager released the job from its queue to an agent, and the job entered the **Launched** status. Launch is the status prior to the job becoming **Active**.
12010	Job Active	Status Change	The job started running.
12011	Job Stopped	Job Control	The job was stopped by an operator.

Event ID	Job Event Trigger	Event Type	Description
12012	Error occurred while launching job	Status Change	The job status changed to **Error Occurred**. The job did not run.
12013	Job skipped	Schedule Irregularity	The job did not run because another occurrence of this job was already running. The job must have the concurrency option set to **Skip** in its job definition for this to occur.
12014	Job deferred	Schedule Irregularity / Status Change	Because another occurrence of this job was running when this job was ready to launch, the job is waiting for the previous occurrence to complete. The job must have the concurrency field set to **Defer until completion** in the **Job Definition** dialog box for this to occur.
12015	Agent unavailable for job	Status Change	The agent or the network has gone down prior to the job running. Therefore, the job cannot complete on this agent. If the job uses an agent list, this event trigger occurs in different ways based on the agent list: **Ordered, Random, Balanced, or Rotation Agent List:** If the job uses any of these lists, the event trigger occurs when all agents in the list are unavailable to run the job. **Broadcast Agent List:** If the job uses a broadcast list, the event trigger occurs for each agent in the list that is unavailable to run the job.
12016	Agent for job inactive	Status Change	The agent's **Enabled** flag is set to disabled, or inactive. As a result, the job cannot launch on this agent. If the job uses an agent list, this event trigger occurs in different ways based on the agent list: **Ordered, Random, Balanced, or Rotation Agent List:** If the job runs on any of these agent lists, the event trigger occurs if all agents in the agent list are inactive. **Broadcast Agent List:** If the job runs on a broadcast list, the event trigger occurs for each agent in the agent list that is inactive.
12017	Job status changed	Status Change	Your job status changed. You can use this event trigger to catch all status changes for this job. The associated action occurs for all changes to the status of a job.
12018	Job might start later than expected	Schedule Irregularity	Other jobs which the job depends on are running behind schedule. This could cause your job to run later than expected. This event trigger occurs when one or all of the prerequisite jobs run longer than their estimated duration. The job might start later than originally forecast.
12020	Job might not be ready by end of its time window	Schedule Irregularity	The end of the job's time window might not be reached before its dependencies are met. This trigger is activated approximately 7 seconds before the job's estimated start time becomes later than the end of the job's time window.
12021	Job running longer than expected	Schedule Irregularity	The job is running longer than its estimated duration value. The job continues to run unless you stop it with a Job Control action that is associated with this event trigger, or unless an operator stops it. You initially set the **Estimated Duration** value in the **Job Definition** dialog box when you create the job. CWA adjusts the value to a historical average after each run of the job.
12022	Job running past end of its time window	Schedule Irregularity	The job is running past the time window set for it in its job definition. The job continues to run unless it is stopped with an associated job control action, or unless it is stopped by an user.

Event ID	Job Event Trigger	Event Type	Description
12023	Job might run past end of its time window	Schedule Irregularity	The job might run past the time window set for it in its job definition. The job will continue to run unless it is stopped with an associated job control action, or unless it is stopped by the user. This trigger is activated at the end of the job's time window minus the job's estimated duration.
12025	Job finished later than expected	Schedule Irregularity	The job ran longer than the time specified in the **Estimated Duration** field in its job definition.
12026	Job running longer than its maximum time	Schedule Irregularity	The job is running longer than its **Maximum Duration** value, as defined in its job definition. The job continues to run unless you stop it with a job control action that is associated with this event trigger, or unless it is stopped by an user.
12027	Job ran shorter than its minimum time	Schedule Irregularity	The job ran in less time than the time specified in the **Minimum Duration** field in its job definition.
12028	Operator reran the job	Job Control	The operator ran a job again after it already completed. Once set, this trigger will only apply to jobs that were not already in the schedule.
12029	Operator cancelled the job	Job Control	The operator cancelled the job before it had a chance to run.
12030	Operator aborted the job	Job Control	The operator aborted the job while it was running. The job could have taken too many resources, or some other problem could have occurred to justify the abort.
12031	Operator override of job dependencies	Job Control	The operator launched the job, even though all of its dependencies weren't met.
12032	Job status is LAUNCH on startup.	Job Control	A job status of Launched means that a request to launch the job has been sent to the agent, and is pending notification from the agent that the job has started executing.
12033	Job added to schedule based on calendar	Status Change/Job Control	The job was added to the production schedule automatically.
12034	Job orphaned	Status Change	The master lost connection to the agent running the job and can not determine the job's current status.
12035	Job rerun would exceed maximum reruns	Job Control	Rerunning the job would exceed the maximum reruns allowed.
12036	Job completed with specified exit code(s)	Job Control	The job completed within the specified exit code range. The exit code can denote normal or abnormal status for a job to trigger different actions.
12037	Job completed normally (output pending)	Job Control	Job completed normally (output pending) The job has completed normally but the job output is still being gathered and is not yet available.
12038	Job completed abnormally (output pending)	Job Control	Job completed abnormally (output pending) The job has completed abnormally but the job output is still being gathered and is not yet available.

Event ID	Job Event Trigger	Event Type	Description
12039	Job externally defined (output pending)	Job Control	Job externally defined (output pending) The job status was determined by an external user or program and the job output is still being gathered and is not yet available.
12043	Job not ready by start time	Schedule Irregularity	The job's scheduled start time was reached before the job was ready to launch due to other dependencies.
12044	Job in launch status longer than expected	Job Control	The job is stuck in the launch status for longer time than the expected time.

System Event Triggers

The following table lsystem eventists the event triggers for various system events supported by CWA.These event triggers are associated with system events through the **System Event Definition** dialog.These event triggers are supported throughout the various integration channels.Using the event ID number displayed in the Windows application log you can reference its meaning from this table. All system events have an ID number that begins with 20.

Event ID	Job Event Trigger	Description
20001	System queue limit set to zero	The system queue's (master queue under which all other queues reside) limit has been set to zero, eliminating the possibility for any jobs to enter the production schedule.
20002	Any queue limit set to zero	A queue's limit was set to zero. This may have been done to prevent jobs of a certain class from running. Note that a queue can be set to accept a certain class of jobs based on the queue's filters. To refer to the queue in an alert message, use the **Queue Name** variable in the assigned action.
20003	System queue reached its job limit	The number of jobs running in the overall system queue has reached the overall system queue limit, and no other jobs can run until a slot becomes available. Slots become available when a job running in the queue completes, or the queue's limit is increased. When this trigger occurs, it indicates that either too many jobs are being scheduled for the capacity of the system, or the system capacity has been underestimated, and the system queue limit needs to be raised.
20004	Any queue reached its job limit	A queue cannot launch any more jobs until a slot becomes available in the queue. This may indicate that a certain class or type of job is overloading the system. To refer to the queue in an alert message, use the **Queue Name** variable in the associated action.
20005	Agent reached its job limit	The number of jobs an agent is executing is equal to its job limit. The agent cannot start any more jobs until other jobs complete. To refer to the agent in an alert message, use the **Agent Name** variable in the assigned action. This system event can notify users when an agent is operating at capacity.
20006	Compile started	The production schedule compile has started. Compiling usually begins at midnight, when the master is started on a new day, or when you select the **Create Schedule** menu item from the **Operations** menu. You can use this system event to notify users that a new schedule is being created.
20007	Compile finished	The production schedule compile has completed. Compiling time is based on, among other factors, the number of jobs. Use this system event to alert users that a new schedule is in effect.

Event ID	Job Event Trigger	Description
20008	Master paused.	The master was paused. Waiting jobs are suspended until the master resumes operation. You can use this system event to notify users that the master was temporarily paused, and jobs will not launch until the master resumes.
20009	Master resumed.	The master has been resumed from paused state. You can use this event to notify users that the master has resumed launching jobs. Depending on how long the master was paused, many jobs may have their dependencies met at once, which may cause a spike in system resource utilization.
20010	Lost connection to agent/adapter	An agent/adapter network connection was lost. To refer to the agent, use the **Agent Name** variable in the assigned action. You can use this event to warn users that an agent/adapter is no longer connected.
20011	Master program shut down	The master has been shut down normally. You can use this system event to notify users that all waiting jobs will not run until the master restarts.
20012	Backup master took over	A fault occurred on the primary master (such as the master going down, or a network failure occurred) which caused scheduling to be transferred to the backup master. You can use this system event to warn users that the backup master took over the scheduling process. Any jobs that were manually updated after the last database replication update prior to the takeover will have to be re-entered. See the CWA *Fault Tolerance Guide* for more information on Fault Tolerance.
20013	Primary master started.	The primary master has started. You can use this system event to notify users that jobs will resume being launched. Depending on how long the Master was stopped, many jobs may have their dependencies met at once, which may cause a spike in system resources.
20014	New production day	The master has recognized a new production day for which jobs are automatically compiled. You can use this event to trigger initializing variables used in dependencies.
20015	Lost connection to fault monitor	The network connection to the fault monitor was lost.
20016	Lost connection to backup master	The network connection to the backup master was lost.
20017	Lost connection to database	The connection to the database was lost. Operator alerts and CWA logging actions are not available because they access the database. However, the logging action can be used with the Windows event log.
20018	Lost connection to remote master	The network connection to the remote master was lost.
20019	Connection brought offline due to planned outage	The agent/adapter connection has entered a scheduled outage window.
20020	Connection brought online after planned outage	The agent/adapter connection suspended during a scheduled outage window has ended its outage. (Does not apply to connections that are disabled during the outage.) This event could apply to either the automatic enabling of the connection at the scheduled end of the outage or when an administrator manually enables the connection early.

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Parameters

This chapter describes many of the properties that are specified in the master.props file in the Master config directory. The default values are provided in parentheses.

The properties are grouped by type:

- Base Properties, page 349
- Master Properties, page 350
- Fault Monitor Properties, page 351
- Data Source Provider (CM Plugin) Properties, page 351
- Client Manager Properties, page 352
- DSP Properties, page 354
- General Property Info, page 354
- SSL Properties, page 354

For usage information and an alphabetized list of most properties, see “Configuring the Master Parameters (master.props)” in the “Basic CWA Configuration” chapter in the *Cisco Workload Automation Installation and Configuration Guide*.

Base Properties

JMX

- **JmxRmiHost** (`localhost`) – The host of the RMI registry where the JMX Agent is registered
- **JmxRmiPort** (`1100`) – The port of the RMI registry where the JMX Agent is registered
- **JmxRmiPath** – The path in the RMI registry where the JMX Agent is registered
- **JmxDefaultNamespace** (none) – The default setting is recommended.
- **JmxSecurityPasswordsFile** (none) – The path to a properties-based text file specifying username/password pairs for authenticating incoming JMX connections
- **JmxSecurityAccessRulesFile** (none) – The path to a properties-based text file specifying username/access level pairs.

Message Broker

- **MessageBroker.MemoryLimit** – The amount of memory (in MB) to allocate to ActiveMQ for storing in-flight messages. If queues become full, ActiveMQ will page messages to disk, which is more expensive than keeping them in memory. Default is low. Increasing is recommended.
- **MessageBroker.TempLimit** – The amount of memory (in MB) to allocate to ActiveMQ for storing temporary messages. If queues become full, ActiveMQ will page messages to disk, which is more expensive than keeping them in memory.
- **MessageBroker.StoreLimit** – The amount of disk space (in MB) to allocate to ActiveMQ for storing in-flight messages when memory is full.

Master Properties

General

- **JmsPort** (6215) – The port where the ActiveMQ Broker listens on. All communication from the DSPs will be through the ActiveMQ broker.

JMX

- **JmxRmiPath** (Scheduler) – The path in the RMI registry where the JMX Agent is registered.

ActiveMQ

Tuning for DSP to Master Message Traffic (All DSP Connections)

- **MinSessionPoolSize** (5)
- **MaxSessionPoolSize** (10)
- **MaxConcurrentMessages**(10)

Tuning for Master to DSP Message Traffic (per DSP Connection)

- **ClientConnection.MinSessionPoolSize** (2)
- **ClientConnection.MaxSessionPoolSize** (5)
- **ClientConnection.MaxConcurrentMessages** (5)

Tuning for Remote Master to Master Message Traffic (per Remote Master)

- **RemoteMasterClient.MinSessionPoolSize** (2)
- **RemoteMasterClient.MaxSessionPoolSize** (5)
- **RemoteMasterClient.MaxConcurrentMessages** (5)

Tuning for Master to Remote Master Message Traffic (per Remote Master)

- **RemoteMasterServer.MinSessionPoolSize** (2)
- **RemoteMasterServer.MaxSessionPoolSize** (5)

- **RemoteMasterServer.MaxConcurrentMessages** (5)

Fault Monitor Properties

General

- **ToleranceTime** – The number of minutes before FM treats a connection as down.
- **CMDMasterPort** (6600) – The command line listening port on the master and on the fault monitor.
- **FMMasterPort** (6703) – The port on FM that Master connects to.
- **FMClientPort** (6705) – The ActiveMQ port on FM that DSP connects to.

ActiveMQ

Tuning for DSP to FM Message Traffic (All DSP Connections)

- **MinSessionPoolSize** (2)
- **MaxSessionPoolSize** (5)
- **MaxConcurrentMessages** (5)

Data Source Provider (CM Plugin) Properties

General

- **ClientType** (default) – The folder inside ClientManager/cache containing the DSP to install. This is usually configured automatically during CM installation.

Data Cache

- **DataCache.ReadConnectionsMin** (2) – The minimum number of JDBC connections kept pooled to read from the data cache. Having connections always available to handle read requests reduces the cost of allocating connections on demand.
- **DataCache.ReadConnectionsMax** (4) – The maximum number of JDBC connections allowed to be allocated concurrently to read from the data cache. If this number is exceeded, read requests will be queued and blocked. It is recommend that you increase this setting to handle more concurrent users.
- **DataCache.WriteConnectionsMin** (4) – The minimum number of JDBC connections kept pooled to write to the data cache. Having connections always available to handle write requests reduces the cost of allocating connections on demand.
- **DataCache.WriteConnectionsMax** (8) – The maximum number of JDBC connections allowed to be allocated concurrently to write to the data cache. If this number is exceeded, write request will be queued and blocked. Recommend increasing to handle more data update activity between the Master and DSP.
- **DataCache.PageCacheSize** (50000) – The number of pages (of size DataCache.PageSize) in memory allocated to the data cache. The in-memory data cache allows for the fastest possible read/write access. Thus, for very large data caches, it is recommended that the data cache be given as much memory as possible.

- **DataCache.PageSize** (`4096`) – The size (in bytes) of each page in the data cache. The data cache stores records in page-size chunks. Larger pages may improve read/write access when the data cache needs to fetch records from disk, with the added cost of a larger data cache in-memory and on disk. Another factor to keep in mind is the OS disk block size. Usually, it is recommended to keep the data cache page size the same as the OS disk block size.
- **DataCache.PageReservedSize** – The recommend default setting.
- **DataCache.CacheSizeDefault** (`1000`) – The number of objects each table in the data cache is allowed to keep in memory. More objects equals faster read/write access from and to the data cache.
- **DataCache.CacheTypeDefault** (`SoftWeak`) – The default setting is recommended.
- **DataCache.CacheShared** (`true`) – The default setting is recommended.

Cache Synchronization

- **CacheSynchronizer.Purge** (`N`) – `Y` to purge leftover deleted records during sync. Leftover records may exist in the cache if the Master deletes the records from its database when the CM is not connected.
- **CacheSynchronizer.NumThreads** (`4`) – The number of concurrent threads spawned to sync the cache. More threads increase throughput, but use more CPU and memory. Recommend to set at or below number of physical cores on machine.
- **CacheSynchronizer.StreamCommitSize** (`1000`) –The number of records committed to the cache in a batch. Larger batches improve throughput, but use more memory.

ActiveMQ

Tuning for Master to DSP Message Traffic

- **ClientNode.MinSessionPoolSize** (`5`)
- **ClientNode.MaxSessionPoolSize** (`10`)
- **ClientNode.MaxConcurrentMessages** (`10`)

Tuning for FM to DSP Message Traffic

- **FTNode.MinSessionPoolSize** (`2`)
- **FTNode.MaxSessionPoolSize** (`5`)
- **FTNode.MaxConcurrentMessages** (`5`)

Client Manager Properties

JMX

- **JmxRmiPath** (ClientManager) – The path in the RMI registry where the JMX Agent is registered.

ActiveMQ

Tuning for DSP to a User's Browser Session Message Traffic (per Browser Session)

- **ClientSession.MinSessionPoolSize** (`4`)

- **ClientSession.MaxSessionPoolSize** (8)
- **ClientSession.MaxConcurrentMessages** (8)

Tuning for a User's Browser Session to DSP Message Traffic (All Browser Sessions)

- **DataSource.MinSessionPoolSize** (4)
- **DataSource.MaxSessionPoolSize (8)**
- **DataSource.MaxConcurrentMessages** (8)

Security

- **Security.Authentication** (LDAP) – The method to use for authenticating users. Can be LDAP or ActiveDirectory.

ActiveDirectory (Security.Authentication = ActiveDirectory)

- **ActiveDirectory.Host** (blank) – The ActiveDirectory server URL.
- **ActiveDirectory.Port** (389) – The ActiveDirectory server port.
- **ActiveDirectory.AuthenticationMethod** (simple) – How users will be authenticated against the AD server. Currently support only simple method.
- **ActiveDirectory.UserSearchPrefix** (blank) – The prefix of AD node containing user records. The CM will scan these records when authenticating a user.
- **ActiveDirectory.GroupSearchPrefix** (blank) –The prefix of AD node containing group records. The CM will scan these records when determining the groups a user belongs to.

LDAP (Security.Authentication = LDAP)

- **LDAP.HostName** (localhost) – The LDAP server URL.
- **LDAP.Port** (389) – The LDAP server port.
- **LDAP.ContextFactory**
- **LDAP.BindDN**
- **LDAP.UserBindDN**
- **LDAP.GroupBindDN**
- **LDAP.BindPassword**
- **LDAP.AuthenticationMethod**
- **LDAP.ForceBindingLogin**
- **LDAP.UserObjectClass**
- **LDAP.UserRdnAttribute**
- **LDAP.UserIdAttribute**
- **LDAP.UserPasswordAttribute**
- **LDAP.RoleObjectClass**

- **LDAP.RoleMemberAttribute**
- **LDAP.RoleNameAttribute**

DSP Properties

- **BackupServer** – Backup Master hostname & port (Backup_Master_Hostname:6215)
- **PrimaryServer** – Master hostname & port (Master_Hostname:6215)

General Property Info

ActiveMQ

- **MinSessionPoolSize** – The minimum number of ActiveMQ sessions kept pooled. Having sessions available to handle requests reduces the cost of allocating sessions on demand.
- **MaxSessionPoolSize** –The maximum number of ActiveMQ sessions kept pooled. **Note:** if more sessions are needed to process messages, the system will still allocate them. This setting only limits the number of sessions allowed to be pooled.
- **MaxConcurrentMessages** – The maximum number of ActiveMQ messages allowed to be processed concurrently. This setting is important for increasing throughput and utilizing all the cores on a system when there are many messages waiting in the ActiveMQ queues.

SSL Properties

- **MessageBroker.SSL.enabled**
- **MessageBroker.SSL.keyStore**
- **MessageBroker.SSL.keyStorePassword**
- **MessageBroker.SSL.keyPassword**
- **MessageBroker.SSL.trustStore**
- **MessageBroker.SSL.trustStorePassword**

14

Troubleshooting

This chapter covers these topics:

- Overview
- Collecting Diagnostic Information
- Troubleshooting the Master
- Troubleshooting the Client Manager
- Troubleshooting the Agent

Overview

This chapter describes the steps you should take to troubleshoot problems that might arise during CWA operations.

Note: See also the *Cisco Workload Automation Essential Knowledge Guide*, available on cisco.com, which provides more information about troubleshooting and how to work with TAC (Cisco's Technical Assistance Center).

When issues arise during CWA operations, the operator must gather as much information as possible to troubleshoot the problem. Each release of CWA undergoes rigorous testing before it becomes available to customers. Problems that are discovered during in-house testing can be resolved but the large variety of system configurations that exist outside our Quality Assurance labs mean that unknown issues inevitably arise as CWA enters the field.

Some difficulties commonly reported by our customers are noted later in this troubleshooting section but most of the issues that users encounter are unknown until they are discovered in a customer's individual system environment.

Cisco's Technical Assistance Center (TAC) team works with our developers to diagnose and fix issues as they are reported. A vital part of this process is collecting diagnostic information on the processes occurring in CWA at the time of the problem. While any information that the operator can recall during the time is useful, the best method is to turn on diagnostic logging and record in detail information on system processes when the problem occurs.

If a problem occurs during operation of CWA, Support will ask you to enable the diagnostic logging for the system component that seems most likely as the source of the problem. To be proactive and to reduce our customers downtime as much as possible, we recommend that you follow the procedures provided below for turning on diagnostic logging. Try to reproduce the problem so the state of the system can be recorded when the problem occurs.

Collecting diagnostic information before you contact the Cisco Technical Assistance Center provides a head start to resolving the problem. When you are experiencing problems with CWA as indicated by error messages, turning on diagnostic logging for that system component collects information that can be used to pinpoint the problem.

Note: If an anti-virus program will be scanning folders where CWA components reside, configure the program to avoid scanning the log and diagnostic files of the master and client components. The constant updating that these files undergo will consume a large amount of processing resources.

Collecting Diagnostic Information

About Logging in CWA

The **Logs** pane in CWA shows basis auditing information and some error gathering from normal operation. This is enough to tell us that there is a problem, but it is usually not enough to explain *why* there is a problem.

The term, logging, generally refers to an auditing level of information that is always available without special configuration. Diagnostic logging refers to information that is gathered only for troubleshooting purposes and is not normally turned on.

When trying to troubleshoot an issue with the master, client, or agent components of CWA, the diagnostic and logging tools that come standard with the application can narrow down and pinpoint where the existing problem might be.

Other systems that CWA is working with such as SAP, PeopleSoft, Oracle Applications and various operating systems provide their own diagnostic and logging information. This diagnostic information may be needed to get to the root of any given problem, so working with the appropriate system administrators is crucial to troubleshooting success. Anything from a database trace or a network sniffer to the operating system's own internal logging can be helpful.

Diagnostic Logging

When a problem occurs that prevents CWA from running correctly, diagnostic logging collects information about the various processes that are running on the system as the problem occurs. You collect information to find clues in the various system messages about the cause of the problem.

Often the error messages displayed in the client console that are generated by a problem, provide an indication of the source of the problem revealing which component should be monitored. If no source is indicated in the error message, check the messages in the system log for clues to the source of the problem. Once the source of the problem is identified, you can enable diagnostic logging for that system component. Select the level of logging detail for the system components being monitored from the **Logging** tab of the **System Configuration** dialog.

Be careful when using the diagnostic logging function as logging messages can consume a large amount of disk space very quickly. Carefully monitor the size of the log file being created as excessive logging consumes system resources as well as disk space. Try to repeat the scenario that produced the problem, so system activity can be recorded for the Cisco Technical Assistance Center to interpret. Once the problem occurs again, contact the Cisco Technical Assistance Center and send them the logging file that is generated.

Note: It is recommended that anti-virus software either be disabled during diagnostic logging or configured to not check the diagnostic files that are created during diagnostic logging. The constant writing of diagnostic information to these files will consume too much attention from the anti-virus software and consume an extensive amount of system resources. The default location for diagnostic logs on the master machine is C:\Program Files\Tidal\Scheduler\master\logs.

Performance Issues and Your CWA Database

Be sure to check that your CWA database is up, running efficiently, and is not overloaded.

Troubleshooting the Master

Verifying the Master's Version Number

The Cisco Technical Assistance Center needs to know which version of the CWA master is being used. This information is available in the **Master Status** window.

To verify the master's version number:

1. In the **Navigator** pane of the client, select **Operations>Master Status** to display the **Master Status** pane.
2. The version of the master being used is noted at the top of the **Master Status** pane.

Diagnostic Logging for the Master

If you are enabling diagnostics before contacting the Cisco Technical Assistance Center, start at the **Info** level and the Cisco Technical Assistance Center will provide additional instructions after receiving the diagnostic files you have recorded.

The following components are monitored:

- **Scheduler Log** – Records system level messages regarding the master.
- **Client Manager Log** – Records messages about client activity.
- **Agent Manager Log** – Records messages from agents running jobs.
- **Compiler Log** – Records messages about the status of production schedules being compiled.
- **Job Manager Log** – Records messages about the status of jobs.
- **Event Manager Log** – Records messages about events defined in CWA.
- **Queue Manager Log** – Records messages about queue activity.
- **Database Log** – Records messages relating to the state of the database.
- **Communications Log** – Records messages concerning all defined connections and sockets. Be aware that setting this component to a high level of logging results in a large amount of information that consumes large amounts of disk space.

Each component has a drop-down list with seven levels of progressively more detailed logging. Each level includes the messages of the previous levels of logging. The levels of logging are:

- **None** – No logging for the component.
- **Severe** – Logs only serious problems for that component (default).
- **Warning** – Logs potential problems for the component as well as messages from the **Severe** logging level.
- **Info** – Logs status messages about the normal operation as well as messages from lower logging levels.
- **Low Debug** – Logs important debugging messages as well as messages from lower logging levels.
- **Medium Debug** – Logs an increasing amount of debugging information as well as messages from lower logging levels.
- **High Debug** – Logs the largest amount of debugging information as well as messages from lower logging levels.

Diagnostic data is recorded to the log file until it reaches one megabyte in size. Once the log file reaches a megabyte in size, it is saved, named and another log file is started. The diagnostic log files are located in the **Log** directory of the master. The current log file is named *Master-YYYYMMDDHHMMSS.xmllog* where the name provides the year, month, day, hour (24 hour clock), minute and second of the log file, e.g., *Master-20020814042231.xml log*.

There are two reasons why a log file may be less than one megabyte in size.

- The master shut down (whether by design or not) before the log file could reach one megabyte.

- It is the current log file that the master is still creating.

Note: Do not delete the current log file, which is always the log file with the latest timestamp. Even if the file does not exist, the master will continue to relay diagnostic information to the log file until it has relayed 1 MB of information. At that point, the master starts a new log file but any diagnostic information from the time between the deletion of the current log file and the creation of a new log file is lost.

Diagnostic Logging Tasks

Adjusting the Log File Retention

Each time the log file for the master reaches one megabyte in size, it is saved and another log file started. By default, the master is configured to store the 25 most recent log files. When the log files exceed the maximum number, the oldest log file is automatically deleted to make room for a newer log file.

You may need to adjust the log file retention number whenever you are running diagnostic logging. A higher level of diagnostic detail will create log files that add up quickly. Increase the log file retention number whenever you run diagnostic logging to compensate or you will start deleting the earliest log files before you have a chance to examine them.

To adjust the log file retention:

1. From the command line of the master machine, stop the master:

   tesm stop

2. Locate the *Master.Props* file in the **config** directory of the master machine and open it.

3. Add the following line to the *Master.Props* file:

   MaxLogFiles=<number of log files>

   where **<number of log files>** is the maximum number of log files to retain before deleting the oldest file.

   The minimum number of log files to be retained is three. There is no maximum number.

4. From the command line, restart the master:

   tesm start

Purging Old Job Data

On occasion, the CWA database and CWA schema will not stop growing in size and very old data builds up in the database. This old data should be purged on a regular basis or the database will continue to bloat.

To purge old job data:

1. Select the **System Configuration** option from the **Activities** main menu to check the data retention value in the **System Configuration** dialog.

2. On the **Master** tab, verify that the **Automatic Daily History Cleanup** option is selected and select it if it is not already selected. If you are using a database alias other than the default “Admiral,” this feature may not operate correctly.

Running Diagnostic Logging as a Job

If a problem is occurring at a time that is difficult for an operator to monitor, say when a certain job deep in the production schedule runs, you can run a job to enable diagnostic logging just as the suspected job runs. You can create a logging job from the command line using a Java utility that CWA provides. Configure the job to run just before the problem occurs

and then create another similar job to return the diagnostic logging levels to their original settings after recording the system information. This job will limit how long the diagnostic logging runs to prevent massive amounts of information from clogging your disk space.

To run diagnostic logging as a job:

1. Click the **Add Job** button on the CWA toolbar or right-click in the **Jobs** pane and select **Add Job** to display the **Job Definition** dialog.
2. Type a name for the job.
3. In the **Command** field on the **Program** tab, type `java`.
4. In the **Command Parameters** field, modify the following command parameters as needed:

   java -DTidal_HOME=/opt/Tidal/master -cp/opt/Tidal/lib/scheduler.jar com.tidalsoft.scheduler.SetDebugLevel
   -m <Master Machine Name>
   -p ClientPort(defaults to correct number)
   -S (Scheduler Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -CL (Client Manager Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -A (Agent Manager Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -CO (Compiler Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -J (Job Manager Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -E (Event Manager Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -Q (Queue Manager Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -D (Database Log) SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH
   -COM(Comununcations Log)SEVERE|WARNING|INFO|LOW|MEDIUM|HIGH

   Do not include any of the explanatory text that is in parentheses or brackets. Replace the text in brackets with the name of the machine that the master resides upon. The section of the first line “opt/Tidal” should be the directory location where the master is installed. Select just one of the logging levels to use with only the components you wish to enable for diagnostic logging. Any component log that is not included in the parameters is not affected by the logging job and retains its original setting. Don’t forget to run another job to return the diagnostics to the original setting.

Running the Windows Master in Debug Mode

Even if you have configured the master to log diagnostic information, there is still a period of time between when the master starts and when it begins logging information. If the issue you are trying to troubleshoot occurs in this time window before diagnostic information is recorded than you should configure the master to run in debug mode. This will ensure that information is collected the entire time the master runs.

To run the Windows master in **Debug** mode:

1. Open a command prompt screen from the **Start** button menu by selecting **All Programs>Accessories>Command Prompt**.
2. Type the directory path to the master executable file and then place a debug parameter after, e.g.,

   “C:\Program Files\TIDAL\Scheduler\Master\saMaster64.exe” -debug

   Turn off the debugging mode by killing the **saMaster64.exe** process that you started.

Running the Unix Master in Debug Mode

Even if you have configured the master to log diagnostic information, there is still a period of time between when the master starts and when it begins logging information. If the issue you are trying to troubleshoot occurs in this time window before diagnostic information is recorded than you should configure the master to run in debug mode. This will ensure that information is collected the entire time the master runs.

From the command line program on the Unix master machine, type:

tesm -debug start

Turn off the debugging mode by killing the debug process that you started.

Resolving Errors with OCSEXIT Jobs

If you find that jobs created using the **OCSEXIT** variable, and that run on Windows agents, consistently end in **Completed Abnormally** you may need to update your system path.

To update your system path:

1. Click the Windows **Start** menu button and select **Settings>Control Panel**.
2. Start the **System Properties** control panel.
3. Click the appropriate tab and append **%systemroot%\system32** to your system's **Path** variable.

Resolving a Master Error

The Windows CWA master runs as a Windows service. Services need to be started and controlled through a service manager, such as the CWA Service Control Manager utility. Double-clicking directly on the *samaster.exe* file or an icon shortcut associated with the **samaster** executable will result in application errors and an access violation.

To resolve this issue, always start and stop the CWA master through the Service Control Manager or the Windows Services program.

Email Problems

About Email Problems

If you are having trouble sending email through CWA, examine the Windows Event Viewer for application errors attributed to TidalSAMASTER. The information provided in these logs can help diagnose the problem.

Internet Email

For CWA to use internet mail effectively, the master machine must have a continuous internet connection. If the mail system goes offline, you will miss email notifications. Verify that you have followed the email prerequisites and configured the email functions of CWA.

Microsoft Exchange and Novell GroupWise

To use email in CWA with Microsoft Exchange and Novell GroupWise, the master service must run as a user with access to the mail system and the advanced user right **logon as a service**. If the user account does not have administrative capabilities, an Administrator must run the **dcomcnfg** utility on the CWA master machine to add the user to the access and launch permissions for the **idsMail** server. If this is not done, CWA and the Windows Event Viewer will log an error attributed to **idsMail32** and email will not function properly.

See Making the Master Service Run as a User and Adding Access Permissions to an Account with dcomcnfg for more information.

Making the Master Service Run as a User

To make the master service run as a user:

1. Click the Windows **Start** menu button, then select **Programs>Cisco Workload Automation>Scheduler>Master>Service Control Manager.**

2. Select the **Scheduler Master** service from the **Service** field drop-down menu.
3. Click **Configure** to display the **Service Configuration** dialog.
4. In the **Logon Information** section, select the **Other Account** option.
5. Type the complete user account (include domain) and password information.
6. Click **OK**, then exit the **Service Control Manager**.

Adding Access Permissions to an Account with dcomcnfg

Note: This procedure must be run as Windows Administrator.

To add access permissions to an account:

1. Click the Windows **Start** button, then select **Run** and type `dcomcnfg` in the **Open** field.
2. Click the **Applications** tab in the **DCOM** dialog.
3. Select the idsMail server from the **Applications** list (listed as **This server object provides a universal Email send/receive...**) and click **Properties**.
4. When the **idsMail** dialog displays, click the **Security** tab.
5. In the first section on the tab, select the **Use custom access permissions** option.
6. Click the **Edit** button for access permissions to display the **Registry Value Permissions** dialog.
7. Click **Add** to display the **Add Users and Groups** dialog.
8. Select and add the CWA master user account from the **Add Users and Groups** dialog.
9. Click **OK** and click **OK** again in the **Registry Value Permissions** dialog to return to the **Security** tab.
10. In the second section on the tab, select the **Use custom launch permissions** option.
11. Click the **Edit** button to display the **Registry Value Permissions** dialog.
12. Click **Add** and select the CWA master user account from the **Add Users and Groups** dialog.
13. Click **OK** and click **OK** again to close the **Registry Value Permissions** dialog.
14. Click **OK** to exit the **idsmail** dialog.
15. Click **OK** again at the **DCOM** dialog to save your changes and exit.
16. Reboot the master machine.

Database Connectivity Loss

If database connectivity is lost, the Master **pauses itself** and continues to poll for connectivity. When the Master finds connectivity working, **it resumes (on its own)** and continues job processing as usual. During normal operation, database connectivity is checked every 15 seconds. If connectivity is lost, the Master checks every 5 seconds for connectivity.

Troubleshooting the Client Manager

Client Manager Cache Database

About the Client Manager Cache Database

With CWA version 6.2.0, you must deploy a stand-alone CWA cache database using one of the supported databases listed in Supported Databases, page 362. Derby is no longer used as the default cache database and is not supported for production use. Having a stand-alone cache database allows for faster synchronization time upon Client Manager startup. Additionally, a stand-alone cache database improves the overall UI experience by offering faster filtering and scrolling response times.

Supported Databases

Supported CWA stand-alone databases for the Client Manager are listed below. These same database versions are currently supported by the CWA Master.

- Windows
  - SQL Server 2008 R2
  - SQL Server 2012
  - SQL Server 2014
  - Oracle 11g
  - Oracle 11g R2
  - Oracle 12c
- Linux
  - Oracle 10g
  - Oracle 11g
  - Oracle 11g R2
  - Oracle 12c

Note: See the *Cisco Workload Automation Compatibility Guide* for database version compatibility for the recent releases of CWA and for possible updates to the list of supported databases.

Database Sizing

The Client Manager cache database maintains the same data in a slightly different format compared to the Master database. The sizing of the cache database should be identical to that of the Master database.

Database Location

For ideal performance, it is recommended that the stand-alone CWA cache database be located exclusively on its own server and have optimal network connection between the Client Manager server and the CWA cache database server.

How to Clear the Cache When Needed

Clearing the cache involves truncating all tables in the schema except the table CACHEPROPERTY. CACHEPROPERTY holds the value of Cache.Version. Optionally, dropping all tables in the schema can also clear the cache. A SQL script will be provided to the customer for clearing cache via table drops.

To clear the cache:

1. Locate the *clearcache.sql* script.
2. Execute script as the user for the cache database.

Verifying the Version of the Client Manager

When consulting with the Cisco Technical Assistance Center about a problem with the Client Manager, one of the most basic pieces of information they need is which version of the Client Manager is being used.

To verify the version of the Client Manager:

In the Client Manager **log** folder, open any log file. Verify at the top of the file the four digit version number. For example, 6.0.0.1192.

You can also check the *clientmgr.out* file located in the same folder.

Diagnostic Logging for the Client Manager

clientmgr.props file contains several logging categories. The following two are the main logging categories that apply to the Client Manger:

- **DspLog** – For items related to the DSP module.
- **CommonsLog** – For items related to core component logging, such as the Jetty embedded Web server.

The following is an example *clientmgr.props* file:

```
PrimaryServer=tcp://server:6215

Security.Authentication=ActiveDirectory

ActiveDirectory.Host=adhost

ActiveDirectory.Port=389

ActiveDirectory.UserSearchPrefix=DC=testdomain,DC=local

ActiveDirectory.GroupSearchPrefix=DC=testdomain,DC=local

JAVA_HOME=C:\Program Files\Java\jre6

JVMARGS=-Xms8192m -Xmx8192m -XX:PermSize=128m -XX:MaxPermSize=128m

MaxLogFiles=1000

JmxRmiPort=1100

JmxOn=Y
```

<DSP>.dsp contains the following properties for the DSP:

- **CacheLog** – Applies to writing to the cache during synchronization.

- **DspLog** – For items related to the DSP module.
- **RequestLog** – Relates to all requests of the DSP.
- **RPCLog** – Communication between the Client Manager and Master.
- **ClientLog** – Client related logging.
- **CommonsLog** – Relates to core component logging.

The following is an example *<DSP>.dsp* file:

```
BackupServer=<BackupServer>:6215

ClientType=tes-6.0.0.0

PrimaryServer=<PrimaryServer>:6215

DspLog=FINEST

CacheLog=FINER

RequestLog=FINE

RpcLog=WARNING

ClientLog=SEVERE
```

Monitoring the Client Manager

To turn JMX monitoring on:

1. In *clientmgr.props*, set the JMX setting to yes, **JmxOn=Y**.
2. Stop the Client Manager.
3. Restart the Client Manager.

Configuring the DSP

The DSP config file, *<DSP>.dsp,* needs to know where the primary master and backup master is located.

To point the ClientManager/DSP to a different primary and/or backup master:

Modify the PrimaryServer and BackupServer settings in the *<DSP>.dsp* file. For example:

PrimaryServer=tcp://<hostname>:<port>

BackupServer=tcp://<hostname>:<port>

Note: These settings are automatically set by the installer when you install the ClientManager. Modify these only if you wish to change the primary and backup master locations after install or if you did not specify them during the install.

Synchronization

Synchronizing may take a while. If a record is not synched for any reason, set the CacheLog level to **FINEST**. This will log every record synchronized from the master.

To check the status of the synchronization, see the *clientmgr.out* file in the **logs** folder.

Web Client Is Slow

If the Web client is slow, change the logging levels of the following log settings in the DSP configuration file, *<DSP>.dsp*. This allows for more verbose logging details.

- DspLog
- ClientLog
- RequestLog
- CommonsLog

Working with JConsole

If adjusting the logging levels fails to fix a problem, you can point JConsole to the Client Manager JVM to monitor the internals.

To configure:

1. From the **JConsole:Connect to Agent** dialog, select the **Advanced** tab.
2. Input the JMX URL to the destination.

   For example:

   [hostname]:[port]

   -or-

   service:jmx:rmi://[hostname]/jndi/rmi://[hostname]/ClientManager
3. Enter the username and password for the connection.
4. Click **Connect**.

Monitoring Memory Usage and Thread State of CM and DSP

You can use this to diagnose situations where the CM appears to be stuck or non-responsive. Refer to the JMX Guide for further information.

Troubleshooting the Agent

Verifying the Version of the Agent

When consulting with the Cisco Technical Assistance Center about a problem with an agent, one of the most basic pieces of information they need is which version of the agent is being used.

To verify the version of the agent:

1. In the **Navigator** pane of the CWA Client, select **Administration>Connections** to display the **Connections** pane.
2. In the various connections listed in the pane, locate the agent with the problem.
3. Look in the **Version** column of that agent to see the version of the agent being used.

Windows Agents

Proper Configuration of Windows Agents

The Agent for Windows should have been configured properly at the time of installation but sometimes the configuration is unintentionally changed and causes problems.

The Agent for Windows will not operate correctly unless it is configured as follows:

- The agent service must be configured to run as a Windows user, either as local to the agent server or a domain user.
- This Windows user must be an administrator on the local machine and have the following four user rights assigned
  - Act as part of the Operating System
  - Logon as a batch
  - Logon as a service
  - Replace a process level token
- All runtime users must have the **Logon as a batch user** right on every Windows server that the runtime user will run jobs on.

  Note: If you have to change any of the above, it is best to restart the server, as Windows does not always make those changes effective without rebooting.
- In the Client Manager, edit each runtime user (and regular user if those are being used to run jobs) and type the Windows password on the **Passwords** tab of the user's definition. If a Windows domain is not specified, a runtime user is assumed to be local to the agent where it is running a job.
- Also in the Client Manager, from the main menu, select **Activities>System Configuration** to display the **System Configuration** dialog and select the **Use Passwords to Run Windows Jobs** option.

After confirming that the agent service has been configured as recommended, run this test job from a command prompt:

C:\WINNT\system32\cmd.exe
/c set

Look at the output for the **Username** variable to see if the runtime user's name listed. If that is working, then you should be able to run jobs wherever the Windows Authentication is accepted.

Diagnostics for a Windows Agent

To run diagnostics for a Windows agent:

1. Login to the agent console as the same user that the agent service is configured to run as.
2. Create a shortcut by right-clicking the Windows Desktop and selecting **New>Shortcut** from the context menu to display the **Create Shortcut** dialog.
3. In the **Type the location of the item** field, type the following command path:

   " C:\Program Files (x86)\TIDAL\Agent\bin\TidalAgent.exe" Agent=TidalSAAgent_0 Port=5912 Verbosity=Tidaldebug Debug=Yes sysadmiral=yes

   Note: Your installation path and port number may be different.
4. Using the Service Control Manager, stop the agent.
5. Double-click the agent shortcut you created to start the agent in debug mode.

A window named after the agent displays scrolling messages as the agent does its work. The same data displayed in the window is also logged to the Application Log of the Windows Event Viewer. The system must remain logged on and the agent must continue to run in this Application Mode to gather diagnostics.

It is important to modify the properties for the Application Log so it saves an appropriate amount of data.

To modify the properties:

1. In the **Event View** tree, select the **Application Log**.
2. Right-click and select the **Properties** option to display the **Application Log Properties** dialog.
3. In the **Log size** section, adjust the value in the **Maximum log size** field.
4. The value will vary significantly from agent to agent, depending on the environment and usage. Start with 5-10 megabytes of data and increase as needed. You can configure the Event Viewer to either overwrite the previously written data or stop logging when the log size reaches the maximum size.

To stop diagnostics, close the agent application window and restart the agent from the Service Control Manager.

Unix Agents

Proper Configuration of Unix Agents

The first line of every Unix agent shell script must adhere to standard Unix scripting guidelines and refer to a shell; for example, **#!/bin/sh**. For more information, refer to your Unix system documentation or consult your System Administrator.

Diagnostics for a Unix Agent

When an Agent for Unix generates errors and doesn't operate properly, you need to contact the Cisco Technical Assistance Center to help you resolve the technical issues. However, the Cisco Technical Assistance Center requires specific information on how the Agent for Unix is operating before they can track down the source of the problem. Before contacting the Cisco Technical Assistance Center about an agent issue, you should turn on diagnostic logging to collect information about the way the agent is functioning. This is the first step that the Cisco Technical Assistance Center will have you do, if you have not done it before contacting them.

To turn on diagnostic logging:

1. On the agent machine type the following command to stop the agent:

   ./tagent <agent name> stop

2. Go to the **/bin** directory and locate the *tagent.ini* file for the desired agent.
3. Inside the *tagent.ini* file, under the port setting, type the following:

   ovb=Tidaldebug

4. Save the file and its changes.
5. Start the agent:

   ./tagent <agent name> start

   Ideally, you want to reproduce the situation that caused the issue so the diagnostics can log what occurred in the system at that time. As soon as the problem reoccurs, contact the Cisco Technical Assistance Center.

6. Once the problem repeats itself and the diagnostic information is recorded, turn off the agent diagnostics by commenting out the debugging parameter:

#ovb=Tidaldebug

7. Go to the **Log** directory to get the diagnostic file to send to the Cisco Technical Assistance Center:

   cd <agent directory>/<agent name>/logs

   Each agent instance has its own directory. The diagnostic files are named *<agent name>.log* and *<master server>.log*.

   Restarting the agent does not override the recorded information. Though only a small amount of information is normally recorded without the debug parameter, the file will continue to grow in size. You should delete or rename the file after you finish debugging the agent.

   Note: Whenever diagnostic logging is being used, you must carefully monitor the amount of disk and database space being consumed. Diagnostic logging can generate large amounts of data and affect system performance.

GLOSSARY

A	
Aborted status	The job occurrence was deliberately aborted and cannot be resumed.
action	An action is a user-defined response to a job or system event. An action can be an email message, an SNMP message (trap), an operator alert, the insertion of a new job, a log update, a variable change or a job control action.
Active status	The job occurrence is actively running in the production schedule.
adapter	A component that integrates one application with another application. An adapter provides connectivity and business logic so two different applications can work together.
agent	Agents are licensed computers with CWA installations that are attached to a CWA master and are licensed to run jobs for the CWA master. Every agent facilitates the execution of scheduled and unscheduled jobs, and relays vital information back to the Master (i.e. workload data, job output, and job status). CWA agents provide dynamic rerouting fault tolerance, workload balancing and a central point of schedule maintenance and control. Each agent has a job limit value, and communication port specifications which can be set from the CWA client **Connections** window.
Agent Disabled status	The agent for the job is disabled, and the job occurrence cannot run. If a job is using an agent list, no agent in the agent list is active. An agent can be changed to enabled by selecting its **Enabled** property in the **Agent Definition** dialog.
agent limit	The number of jobs that are allowed to run on an agent, specified in the agent's definition in CWA.
agent list	An collection of agent names which define a group of computers that jobs can run on. Agent lists are used for workload balancing, dynamic rerouting fault tolerance, and for broadcasting.
Agent Unavailable status	The agent is not connected, or is not running, and therefore the job occurrence cannot run on its agent. If the job is using an agent list, this status indicates that all agents in the list are unavailable.
agentd	Agent daemon (service). Handles file transfers and remote connections from master to agents.
audit message	A record of a CWA activity, such as:
A user adds, edits or deletes a CWA object.	A job is overridden by a user using the **Job Details** dialog while the job is in the schedule.

Job control is performed by a user or through a manual job control action.	All audit messages, error and diagnostic messages can be displayed from the **Logs** pane. Alternatively, you can view audit messages from the Job Activity window via the **Job Details** dialog.
auto arrange	A set of properties in the **View Properties** dialog that configures the logic used to arrange how objects in a graphical View are displayed.
Available status	The status of a defined resource that indicates it is available for use. Even if a resource needed by a job is available, a job may still not run. That job may require a greater amount of the resource than is currently available or one of the other resources that the job requires is not available. If a resource is not in an **Available** status, it is in either an **Locked** status or a **Waiting** status.

B	
backup master	A computer licensed to run the CWA master software in Fault Tolerance mode. The backup master is available to run master processes if the primary master fails.
batch (.bat) job or file	In Windows, series of commands that are batched (or bunched) together in a single file to run in sequence without further user interaction. The equivalent in Unix is a shell script. In z/OS, an EXEC file serves the batch file function. A batch file ends with a *.bat* file extension.
broadcasting	An agent list function where a job is run on every agent in the list.

C	
calendar group	A collection of calendars that is used to specify a set of dates to run jobs. The calendar group includes and/or excludes the dates specified by each individual calendar in the group.
callout	A text balloon associated with one of the objects defined in a graphical View. A callout provides additional information that can consist of text or a hyperlink to an associated website or directory. Callouts are created and configured for individual objects using the **Callout Properties** dialog.
Canceled status	The job is canceled and cannot be resumed. A job can be canceled before it becomes active while it is in the **Waiting On Dependencies** or **Waiting On Resources** statuses. A job that is active cannot be canceled but must be aborted.
Canceled Normally status	The job was previously placed in a **Canceled Pending** status while the job dependencies were released. Once the job's dependencies were satisfied, the job goes to a **Canceled Normally** status. This status is treated by other jobs as a **Completed Normally** status.
Canceled Pending status	The job is canceled but the job's dependencies are released so the job stream can be maintained. In essence, the job goes into a Waiting on Dependencies state as the dependencies run. Once all of the job's dependencies are satisfied, the job ends with a Canceled Normally status that is equivalent to a Completed Normally status. This status only occurs through a user-initiated job control action or a predefined job action.
child agent list	An agent list that belongs to a parent agent list. Child agent lists may also be parent agent lists if they contain other child agent lists. A child agent list must be the same type as its parent, i.e., rotational, workload balanced, ordered, etc.
child job	A job that is a member of a job group. By default, a child job inherits scheduling and run properties from its parent job group. When a parent job group is submitted, all of its qualified child jobs are submitted.
child job group	A job group that is a member of another job group. By default, child job groups inherit scheduling and run properties from their parent job groups. When a parent job group runs, all of its children (jobs and job groups) are run.

child queue	A queue that is a sub-queue of another, called the parent queue. The number of jobs that a child queue can run is constrained either by its own limit setting, or by the job limit setting of its parent, whichever is smaller. Child queues can only accept jobs that have passed through it parent's queue filter.
command	The executable file that is run by a job. For Windows, commands can be.*bat*, *.cmd*, *.exe* or other executable files and DOS scripts. For Unix, commands can be shell scripts, programs and commands. Commands can include command parameters are passed to the executable file when it runs.
command parameters	The runtime parameters that are passed to a command before CWA runs the command.
Completed Abnormally status	The job completed with a non-zero exit code indicating that it did not run normally.
Completed Normally status	The job completed normally. If the status is determined within CWA, the exit code is 0. If the status is set by an external program, the exit code may be non-zero.
concurrency	Refers to the situation when more than one occurrence of the same job is running at the same time, regardless of which agent they are running on. For each job, you have the option to **Skip**, **Defer until completion**, or **Run anyway** when an occurrence of the job is already running. The default is **Skip**.
Connector	The Connector is a component that allows a Windows machine to translate the Unix master's job requests. If you are using a Unix master and you intend to run PeopleSoft, SAP or Oracle Applications jobs, then you must install the Connector. If you are using a Windows master with a Windows adapter than you do not need the Connector.
console alert	A notification to the CWA console that a job's pre-defined Job Event has occurred. An alert often indicates that the operator should view the alert message from the **Alert Information** dialog and take an appropriate action.
cqd	The communications queue daemon is responsible for network communication between the different modules of CWA and between multiple CWA masters and agents.
create schedule	**Create Schedule** compiles all the jobs that are scheduled to run and creates a production schedule. Schedule creations are incremental, that is, only jobs that were not previously added through a schedule creation, are added. Schedule creations can also delete jobs from the production schedule if they are deleted from the CWA database, and they haven't run yet.
Create Hyperlink	A feature in the graphical View that creates a hyperlink by displaying the **Choose a View for Link** dialog to create a hyperlink from the current view to another existing view. You click the link icon to display the linked view.

D	
default working model	The default working model comprises a set of default Security Policy Templates of which you can designate one to each type of user of CWA. When all templates are assigned within a network of CWA users, each user operates and is responsible for a piece of the entire scheduling process. When taken as a whole, the entire scheduling process is complete.
Deferred status	Another occurrence of the job was running when a new occurrence tried to execute, and the concurrency option for the job was set to **Defer until completion**. The job occurrence will run after the running occurrence completes.
dependency	A dependency is a condition that must be met before a Job can run. Dependencies are specified in a job's definition. CWA includes time dependencies, job dependencies, variable dependencies and file dependencies.
diagnostic message	A diagnostic message is a type of message used for internal debugging purposes and help-desk support.
dynamic rerouting	The ability of an ordered agent list to reroute a job from a primary unavailable agent to another available agent in the list.

E	
environment file	A file that includes a set of constants that define the environment for a command or executable. The command or executable refers to the environment file for information such as local path names. Environment files allow a command or executable to be portable among different machines.
error message	A message indicating that an error occurred somewhere in CWA. All CWA error messages are defined in the **System Configuration** dialog. All error messages, audit and diagnostic messages can be displayed from the **Logs** pane.
Error Occurred status	An internal computer error or security breech occurred that prevented the job from running.
estimated duration	The part of a job's definition where you enter an estimate of how long a job should run. If a job has run one or more times, this value is the historical average of actual run durations.
event trigger	CWA monitors every point in a job's life cycle, and changes in a job's status are event triggers. Other triggers include schedule irregularities such a job running shorter or longer than expected, and operator job control such as stopping, starting, and overriding jobs. (also see Job Event triggers)

execution slot	An execution slot is an opening for a job to run. The total number of available slots are determined either by the system queue limit, the sum of all the queue limits, or the sum of all the job limits that are on every licensed CWA agent in your network, whichever is less.
exit code	An exit code is the value returned at the end of every completed process. A CWA agent relays this value to the master to be used in deciding what status to assign the completed job. The job definition usually defines what job status is denoted by a specified exit code. Normally, an exit code is 0, but the **OCSEXIT** command can be used to specify a different exit code at the end of a script. The exit code can range from 0 to 30,000. If you are running a batch script, only the last process that completed is used by the operating system to set the exit code.
Externally Defined status	The job is waiting for the status to be set externally.

F	
fault monitor	The component of CWA Fault Tolerance that monitors the primary master for system, network, or hardware faults. If a fault occurs, the fault monitor switches scheduling control over to the backup master.
fault tolerance	A fail safe mechanism that ensures uninterrupted scheduling. Fault Tolerance is software that is optionally supplied with CWA on a licensed basis. It uses a primary and backup master with replicated databases and uses a fault monitor system that monitors the primary master for a network or system failure. If failure occurs, scheduling control is switched over to the backup master until the primary master is fixed.
file dependency	A condition associated with a job where a file must exist, not exist, be less than a certain size, be greater than a certain size, or be stable for a certain amount of time before the dependency is resolved.
flag	A flag-shaped icon that is assigned to individual objects defined in a graphical View. Flags serve as markers to highlight designated objects. A text message can be attached to the flag that can be read by pausing the cursor over the flag.

G	
Gant-style chart	A chart containing visual styles, wallpapers, application skins, etc.
Grant All Edit option	The **Grant All Edit** option grants the **Edit Queue** function but not the more advanced functions of **Edit System Queue** or **Edit Nice Queue Value**.
Group option	If the **Group** option is selected then the **User/Group Name** drop-down list only displays the groups that belong to the selected domain.

H	
Held status	The job occurrence was temporarily put on hold by an operator. A job can be held only when it has the **Waiting On Resources** or **Waiting On Dependency** statuses.

I	
intermaster dependency	You can create jobs with variable dependencies that are determined by jobs processed on another master. A job with an intermaster dependency resides on a local master subscribing to a remote master that publishes the value of a variable. The variable is defined on the remote master and made available to other masters.

J	
job	A job is the basic scheduling unit in CWA. Also called a job definition, or a job, a job consists of a command script or executable, and a set of scheduling criteria and runtime instructions, including dependency information. Command executables can include any number of system activities. Scheduling criteria include when and how often to run the executable file.
Job Activity pane	The central point of control for monitoring and controlling jobs. The **Job Activity** pane lists each job occurrence in the production schedule. It also shows and lets you take action on operator alerts that are generated by jobs.
job alias	A unique 8-digit code that identifies a job or job group. Job aliases are particularly useful when using the command-line interface, since some operating systems still have an 8-character restriction, and because a job name can specify more than one job.
job class	Job classes are be used to organize when, where and/or how jobs are run, and are created from the **Job Classes** pane.
job control	CWA lets you manage jobs in the Job Activity window including aborting, stopping, holding, and releasing jobs, overriding job dependencies, rerunning jobs, and setting job completion statuses. Job control can be performed by an user or through a job control action.

job dependency	A job that prevents a job from running until an associated job reaches a particular status.
job event	A feature of CWA that provides a link between job event triggers and actions. Each job event responds to a single job event trigger, but can respond with multiple actions, which can be sending an email, an SNMP message (trap), an alert, adding a new job, controlling a job, changing a user-defined variable, or posting a log message. A job can also respond to system events.
job event trigger	A condition such as a job occurrence status change, schedule irregularity, or job control action which causes a job event to occur and subsequent actions to be issued. CWA continually monitors for event triggers.
job group	A set of jobs and other job groups which have properties and runtime instructions inherited from the job group to which they belong. Job groups allow for the hierarchical organization of jobs. You can define dependencies that refer to job groups as well as individual jobs.
job ID	The job ID is used interchangeably with the term job number. Both terms are often loosely used and refer to two distinctly different things depending upon the context the terms are used in. When used in association with job definitions, the term job ID (or job number) refers to the job ID, the unique identifier of the job definition. When job ID (or job number) is used in association with the Job Activity window, the term refers to the job instance ID, the unique identifier that distinguishes between different instances or occurrences of the same job. See the definition for job instance.
job instance	The basic unit of a production schedule used in the **Job Activity** pane to designate a specific occurrence of a job within the schedule. A job may run numerous times during the day so the job instance distinguishes between different instances or occurrences of the same job. Each job instance is given a job instance ID number to uniquely identify it.
job limit	A value assigned to a licensed CWA agent that limits the number of jobs it can run concurrently. Job limits are defined from the Connections window.
job number	See **job ID definition**.
job occurrence	The basic unit of a production schedule that represents a specific occurrence of a job within the schedule. The production schedule can have more than one occurrence of a job running at the same time. Also called the job instance.
job pane	The portion of the **Job Activity** pane which displays the status and other properties of each job occurrence in the schedule.
job priority	A job's launch importance set in the job's definition. This value is relative only to other jobs in the same queue.
job tree	The hierarchical structure CWA uses to display jobs and job groups in the **Jobs** pane.
JVM	Java Virtual Machine (JVM) is needed by the CWA components that run on the Unix platform so they can respond to Java commands. Verify that the correct version of JVM is used with CWA. Check the installation prerequisites for each component for the recommended version of JVM. The JVM can be downloaded for free from the Sun Microsystems website.

K	
Key File	The key file must be generated by an SSH open system. To use a private key file, you must supply the password and directory location of the private key file.

L	
Launched status	The job occurrence is in the process of being started on its agent. This status is between **Waiting On Resource** and **Active**.
life cycle	A job occurrence life cycle consists of all the phases that the job occurrence enters into and exits while it is in the production schedule. Each phase is determined by the job's status. A job occurrence begins its life cycle when it is added to the production schedule, and ends when it completes its execution or exceeds its schedule time frame.
Locked status	The status of a defined resource that indicates the resource is being used to its defined limit. No other job may use the resource until the current jobs using the jobs complete and release a sufficient amount of the resource. If a resource is not in a **Locked** status, it is in either an **Available** status or a **Waiting** status.
log message action	A log message action is a type of Action that posts a message of your choice to the CWA Logs window when a job event occurs. You can also route the message to the Windows Event Viewer utility.
log viewer	see **logs pane**
logs pane	A CWA window that enables the user to view and to search through a record of all audit, error, and diagnostic messages created by CWA throughout the process of creating, scheduling and running jobs. In CWA releases prior to v2.2, logs were viewed through the Log Viewer.

M	
mask	A string with wildcards used to search for job names from the **Job Search** dialog and in queue filters. Masks include the ***** and **?** wildcard characters. The ***** wildcard is a mask for any number characters, while the **?** wildcard is the mask for a single character. For example, AA* masks AA, AAB and AAB1, but not ABB. AA? masks AAB, but not AABB or ABB.
master	Any Windows system running the CWA scheduler with its own database and production schedule.

Master.Props File	The properties of the Unix master are managed in a file called *Master.Props* that resides in the **config** directory on the master machine. You change the configuration properties of the Unix master by manually adding a new property or modifying the value for an existing property. The *Master.Props* file stores information on the machine names, port numbers and drivers used by the Unix master.
maximum duration	The maximum length of time you will allow your job to run. CWA has an event trigger that monitors whether the job ran past its maximum duration. This event trigger can be used to trigger an action(s) of your choice.
minimum duration	The minimum length of time you expect the job to run. CWA has an event trigger that monitors whether the job's run duration was less than its minimum duration. This event trigger can be used to trigger an action(s) of your choice.

N	
new job	A type of action that inserts a job with optionally modified properties into the production schedule. A new job action can be used to run recovery jobs in case the primary job fails.
nice value	Relative CPU scheduling priority, assigned when CWA launches a job on a Unix agent, and determined from the job's assigned queue. See the Unix manual page under nice (1) for more information.

O	
OCSEXIT	The command, **OCSEXIT**, is used to set a batch job's completion status to **Completed Abnormally** by specifying a non-zero exit code when a job finishes. Any non-zero exit code means the job completed abnormally. If the **OCSEXIT** command is omitted, the exit code is assumed to be **0** and the job completed normally. The **OCSEXIT** command should be the last executed statement in the script.
operator	A CWA user with a security policy that enables access to the Job Activity pane, and Job Control actions. According to the Default Working Model, the Operator is responsible for compiling and running the production schedule, monitoring job occurrences, watching for and responding to operator alerts, and controlling jobs as necessary.
operator alert	see **console alert**
Orphaned status	The master lost track of the job's status while the job was running and the job's final status is unknown. This status occurs when either the agent goes down or the connection between the agent and the master fails.
override	The job control which allows a job to run by ignoring all dependencies and making the job available for immediate launching.
owner	The user or workgroup that created the CWA object (job, calendar, event, etc.).

P	
parent agent list	An agent list containing other agent lists called child agent lists. A child agent list must be of the same type as a Parent Agent List.
parent job group	A job group that includes other jobs or job groups. A job or job group, by default, inherits its scheduling and run properties from its parent job group.
parent queue	Any queue that has subqueues, called child queues.
primary agent	In a primary alternate agent list, the primary agent is the agent of choice to run jobs. Alternate agents function as substitutes for the primary agent if it becomes unavailable.

primary master	The master from which normal scheduling operations are executed. When using CWA Fault Tolerance, the primary master accompanies a backup master which can take over scheduling operations should the primary master fail.
production schedule	The database of all jobs selected to run within a given production date range. CWA compiles a production schedule by using your job definitions to create job occurrences that will run within the production period. Dependency and progress information is included with the schedule and updated according to the master's polling interval.
purge frequency	The frequency in days when CWA looks for job occurrences to purge from the production schedule. Purging takes place for job occurrences which are older than their respective job's **Retention Period** option setting.

Q	
qualified job	A job that has the qualifications that allow it to be added to the production schedule when the schedule is created. Qualified jobs have their active flag set, and have an associated calendar such that the job's next run date falls within the days that are included for the schedule creation.
queue	Controls job execution priority and sequencing by allowing limited collections of jobs to run with different priorities. Queues are assigned job quantity limits and queue priorities in a hierarchy of queues. All jobs are assigned to a queue according to their job properties using queue filters.
queue filter	Queue filters contain definitions used to determine the jobs that will be assigned to the queue when all their dependencies are met. The queue manager assigns jobs to queues based on each job's properties. Using queue filters, you can control and organize when and where to launch jobs.
queue limit	The maximum number of job occurrences a queue can run at any time.
queue manager	The part of CWA that controls job launch activity. The queue manager is responsible for assigning jobs to queues based on the match between each job's properties and each queue's queue filter criteria. If more than one queue can accept a job, the queue with the highest queue priority value is chosen.
queue priority	The priority rank of a queue relative to other queues at the same level in the queue hierarchy. Jobs in higher priority queues are generally run before jobs in lower priority queues.

R	
remote shell agent	A Unix computer that has remote shell *(rsh, remsh*, or *rcp*) services. CWA can run Unix-only jobs on these types of agents, but cannot take advantage of some of the advanced features such as workload balancing, and fault tolerance that CWA agents offer.
resource	A system asset that is required by a job for its successful completion. This resource can be either hardware like a printer or simply access to a designated database. Though a job can still run if an asset is not defined as a resource in CWA, by defining the asset as a resource, access to that resource can be managed. Limiting the simultaneous demand on a resource can streamline production and improve efficiency.

resource limit	A value designated during the definition of a resource that determines the quantity of a resource available for jobs, similar in principle to agent limit. A quantity of the resource is allocated to each job as required by a job's definition until the resource limit is reached. No other jobs can use the resource until jobs currently running complete, freeing up enough of the resource for another job to run.
retention period	The number of days that job occurrence data is retained in the production schedule. Job occurrences that have occurred beyond the retention period are automatically purged according to the **History Retention** setting on the **Options** tab of a job definition.
runtime user	The user logon used for a job. The **Runtime User** option gives the job the user's environment when running a job. Runtime users are defined on your agents and in the **User Definition** dialog.

S	
Scheduled status	The initial status all jobs and job groups enter when they have just been compiled into the production schedule, before their true status is determined.
scheduler	An CWA user who schedules jobs for another user. CWA users have access to the applications and environments of other users listed in their **Runtime User** list. **Runtime Users** are defined in the **User Definition** dialog.
script	In Unix terminology, a file containing Unix commands for the shell to execute as a job. A script can also be a file containing MS-DOS commands.
security policy	A list of system features that can be assigned to a CWA user. CWA has default security policy templates you can customize to fit the needs of CWA users in your organization.
security policy template	Security policy templates contain a predefined set of system features. Each default security policy can be used to help you create your own security policies. The default working model comprises all the default security policy templates.
Skipped status	Another occurrence of this job was running when the agent tried to launch the job, and the concurrency option for the job was set to **Skip**. This job occurrence never runs.
SNMP	SNMP (Simple Network Management Protocol) is a messaging protocol used for sending network management data. Actions can include messages (also called Traps) that are collected by SNMP agents, and sent to managers that make the information available to network administrators, and/or display the messages on an SNMP console.
Stopped status	The job has been stopped by a user or through a job control action. A job can be stopped only if it is **Active**.
super user	A user with a security policy containing all available application functions. **Super User** is an option in the **User Definition** dialog.
CWA database	The central repository for storing all CWA scheduling data. The database is stored on the master system and is shared between all users of the CWA system.
CWA desktop	The desktop on which all CWA windows appear as tab pages.
CWA toolbar	The toolbar is located above the CWA desktop. For more information about the CWA interface, see Getting Started.
system administrator	The user of CWA who has a **System Administrator** security policy. The System Administrator is usually responsible for configuring CWA for the needs of users. Can also mean the site's System Administrator, the person in charge of computer security and other critical responsibilities.
system event	A feature of CWA that provides a link between system event triggers and actions. Each system event responds to a single system event trigger, but can respond with multiple actions, such as sending an email, an SNMP message (trap), an operator alert, adding a new job or controlling a job. A job can also respond to job events.

system event trigger	An event that originates from the system, as opposed to originating from a job, that can be used to issue an action associated with the job.
system queue	The queue at the top of the queue hierarchy. The number of jobs running on CWA at any given time can be limited to the queue limit value assigned to this queue. The system queue has the lowest queue priority, and is used as the default queue for jobs that cannot be accepted into other queues according to their queue filters.
system queue limit	The system queue value that determines the overall number of jobs CWA can run at any given time. This value must be less than the sum of all the agent's Job Limit values and the sum of all the individual queue limit values for this control to work effectively, since the job scheduling capacity is limited to the system queue value, the sum of the Job Limit values, or the sum of all of the individual queue limit values, whichever is smaller.

T	
time dependency	A condition where time controls whether a job is ready to run not. A time dependency is determined by a job's calendar and time window.
time window	A job property that specifies the period of time during the day (24 hour period) when the job can run. The **Time Window** setting is optional. The default is 24 hours.
Timed Out for Day status	The job's dependencies were not met by the end of its time window today. The job will be a candidate to run tomorrow during its time window if its dependencies are satisfied.
timed out status	The job's job or file dependency was not met by the end of its time window. The job will not run.
tracking method	The part of a job's definition that instructs CWA how to determine whether a job completed successfully or not.

U	
unscheduled job	A job that is not scheduled to run on a regular basis, and is added to the production schedule on an "as needed" basis. You can add unscheduled jobs to the production schedule any time while production is running. Unscheduled jobs include all job definition properties, except a calendar.
user	A registered user of CWA. Users can have ownership (along with workgroups) of jobs, job events, actions, variables, and calendars. Each user has access to a limited set of CWA features as defined by the user's security policy.

V	
variable	A data item that can be added to action message text, or as a command parameter. The variable's value is based on the type of variable used. Variable types include system variables, job variables, job event variables, action variables, and user-defined private and public variables.
variable dependency	A dependency that prevents a job from running until a specified user-defined variable has a specified value. Variables can be updated manually, or by other jobs through a variable update action.
variable update action	A variable update action is a type of action that changes a user-defined variable when a job event occurs. The variable's value can be used as the criteria to meet a variable dependency.

W	
Waiting on Dependencies status	The job occurrence has been scheduled and is waiting on dependencies to be satisfied before it will run.
Waiting on Group status	The status a job occurrence enters when it is waiting on its parent job group's dependencies.

Waiting on Operator status	All the job occurrence's dependencies have been met, and it is waiting for a user to release it.
Waiting on Resource status	All the job occurrence's dependencies have been met, and it is in a queue waiting to be launched.
Waiting status	The status of a defined resource needed by a job displayed on the **Resources** tab of a job's **Job Details** dialog. This status indicates a job is waiting to use the resource. Anytime that the amount needed of the resource exceeds the amount available of the resource it will show a **Waiting** status. If a resource is not in a **Waiting** status, it is in either an **Locked** status or an **Available** status.
workload balancing	The ability of CWA to distribute jobs among a group of agents in an agent list, thereby reducing the load on any single agent. There are three types of workload balancing: 1) Lightest Load, 2) Random, and 3) Rotation. Lightest load distributes a job on the machine in the list with the lightest load. Random distributes a job on a machine in the list randomly. Rotation distributes a job on the next machine in sequence on the list.
workgroup	A collection of users who can share jobs, job events, system events, actions, variables, and calendars. Any user can create a workgroup and invite other users into it. In order to belong to a workgroup, you must be invited in by its owner, the originator of the workgroup.

X	
XML file	The Extensible Markup Language (XML) is a W3C-recommended general-purpose markup language that supports a wide variety of applications.

Y	
Year option	Select this option to include the year in your custom date format.

Z	
Zoom In/Zoom Out	This is a toggle option controlling the view perspective of the job flow