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C H A P T E R **5**

Getting Started with CWCS

CWCS is a collection of subsystems, execution environments, engines, and shared code libraries. This collection represents a software platform that provides services to web-based network management applications. CWCS allows you to:

- Create custom applications and add them to the desktop navigation tree.
- Use the CWCS backend services to include additional functionality in your application.
- Use the CWCS support services to manage your build environment or improve application startup time.

The following topics provide basic information on how to integrate your applications with CWCS:

- How CWCS Works
- Installing CWCS
- Enabling CWCS Services
- Interacting with CWCS

How CWCS Works

When you install your application into CWCS, your application:

1. Integrates with the CiscoWorks Home Page (CWHP). CWHP provides:
   - User authentication by means of a single user login.
   - Launch points for tasks, tools and administrative interfaces, including other CWCS-based and third-party applications.
   - Navigation between components in a suite of applications.
   - Registration of third-party applications not built with CWCS.

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   Note CWHP can be accessed using both Netscape and Microsoft Internet Explorer browsers.

2. Enables any necessary CWCS service layers (system, network, and core layers). For more information about enabling CWCS service bundles, see the "Enabling CWCS Services" section on page 5-3.

   When you enable the system layer, remember that you are enabling only a specific service subset. The only elements of the system layer that are documented in the SDK are the JRM and the database engine.

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3. Integrates with the CWCS Daemon Manager (also known as the Process Manager). Applications and CWCS backend services rely on the Daemon Manager for:

- Initial startup following server boot or manual startup.
- Restarting after a failure.
- Starting only when the necessary prerequisite programs are up and running.

At runtime, your application can:

- Perform security verifications.
- Use other CWCS services as needed.

All interactions between CWHP and application services pass through the web server. Typically, clients interact with the server using a URL, which points to a servlet or web application, or a static web page. To add your application to CWCS, see the .

Installing CWCS

To start working with the CWCS code, you must install Common Services 3.0.5. The prerequisite for Common Services 3.0.5 is Common Services 3.0.3.

Use the CiscoWorks Common Services 3.0.3 (Includes CiscoView) Installation CD (commonly known as "CD One"). This CD contains the base Common Services software, CiscoView and the Integration Utility. This CD is commonly known as the CWCS "CD One" edition because it replaces the previous CD One, which included CMF and CiscoView CWCS installation disk. All CiscoWorks applications require the installation.

When you install, you must select one or more of the following three installation options:

1. CiscoWorks Common Services (CWCS): Installs CWCS, which including md, perl, xml4j, hlp, xsl, web, tomcat, xrts, cam, jext, jcht, snmp, jgl and jre2.

2. CiscoView: Installs both CiscoView and Common Services.

3. Integration Utility: Installs the Integration Utility (formerly known as the Network Management Integration Module, or NMIM).

Due to software dependencies, you must install option 1 if you install option 2. This selection is enforced on Windows platforms automatically. On Solaris platforms, you must select each option manually.

After you have installed Common Services 3.0.3, mount the LMS 2.6 CD-ROM to install Common Services 3.0.5. The LMS 2.6 CD-ROM has the software updates for all applications in the LMS Bundle.

The version of CWCS components included in SDK downloads are intended for developers who want to create new CWCS-based applications. The downloads usually include only the CWCS base software, plus source code (per-product SDK downloads will contain only the software and source for that per-product component).

Related Topics

- See CWCS Installation Guides:

  - *Installation and Setup Guide for CiscoWorks Common Services 3.0.5 (includes CiscoView) on Solaris*.

  - *Installation and Setup Guide for CiscoWorks Common Services 3.0.5 (includes CiscoView) on Windows*.

- See Chapter 21, "Using the Installation Framework."

Enabling CWCS Services

The following topics describe CWCS service bundles and how to use them to access various CWCS services:

- Understanding CWCS Service Bundles
- Using CWCS Service Bundles
- Registering for CWCS Services
- Enabling New Service Bundles from the Command Line
- Using CMFEnable

Understanding CWCS Service Bundles

CWCS services are grouped into the following service bundles:

- CWCS Base Services: Basic CWCS components necessary to support a web-based application. These components include the web server, CWCS security, the servlet engine, and JRE.
- CWCS System Services: CWCS components that add services such as JRM and the database engine.
- CWCS Network Services: CWCS components that enable ANI discovery and other network services.

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> **Note**   The Network Services layer is provided for backward compatibility with older applications that require network services. ANI has been deprecated and is not included in CWCS 3.0. Next Generation Discovery is available on a per-product basis as an ANI replacement. For information, see the *SDK Developer's Guide for Next Generation Discovery 1.0*, EDCS-368448.

- CWCS Core Services: CWCS components that enable VPN and security administration and the TIBCO events engine.

At installation, the installation framework makes a call to the CWCS service bundles enabling mechanism, CMFEnable (see the "Using CMFEnable" section on page 5-5). This call provides CMFEnable with the list of CWCS service bundles required by the application suites that are being installed. Note that these service bundles exist to support an always-installed/running-as-needed service model. Applications that do not require all services can avoid wasting CPU cycles on them.

Using CWCS Service Bundles

The following are some tips you can use while working with CWCS services:

- The CWCS Base Services are enabled by default; no explicit request for this bundle is required.
- Network service bundles include System service bundles. If you enable Network services, all System service bundles are also enabled.

- If your application needs a system or network service, then you must register the required service layer. For example, if your application needs the Sybase engine, then your application will need to register the system services layer of CWCS. This layer may contain many other services that you do not need, but you must register that layer to get any services from that layer (see the "Registering for CWCS Services" section on page 5-4).

- Application suites that have not registered for a CWCS service bundle at install time can use the CWCS service bundles enabling mechanism, CMFEnable, to enable CWCS service bundles (see the "Enabling New Service Bundles from the Command Line" section on page 5-5).

- When a bundle is enabled, it remains enabled until
    – A bundle or suite that enabled those CWCS service bundles is uninstalled.
    – A service bundle is manually disabled using CMFEnable.pl

- Note that installation of other products can reset the service registrations back to those registered for a suite of applications installed on the service.

Registering for CWCS Services

At installation, use the packaging information file to register for CWCS service bundles.

To register for a service bundle at installation:

Step 1   Edit the *tag*.pkgpr file in the /install directory. This file is described in the "Getting Started with the Installation Framework" section on page 21-4.

Step 2   Add a line that contains the CMFSERVICES keyword. This keyword has the valid token values System, Network, and Core. For example:

- The Campus Manager file includes the line:

      CMFSERVICES=Network,System

    Multiple tokens must be separated by a comma; spaces are not allowed.

- The SLM file includes the line:

      CMFSERVICES=System

- If you are registering an MC application that requires explicity registration of Core services, the file includes the line:

      CMFSERVICES=Core

Note   The following MC applications do not require explicit registration of the Core service layer: PIXMC, QPM, IOSMDC, Router MC, IDSCFG, IDSMON, and AutoUpdate. If one of these applications is installed and registered with the Core Client Registry, the `CMFSERVICES` line will include a `Core` value.

Related Topics

- Understanding CWCS Service Bundles, page 5-3
- Adding Your Application to the CiscoWorks Home Page, page 5-8

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Enabling New Service Bundles from the Command Line

Application suites that have not registered for a CWCS service bundle at the time of installation must shut down both CWCS and all application services before enabling new CWCS services.

For example, to access the CWCS database engine service, you must enable the CWCS System Services bundle. To start the System Services manually:

Step 1 Stop the Daemon Manager:

- On a Solaris platform, enter:

  `/etc/init.d/dmgtd stop`

- On a Windows 2000 or Windows NT platform, enter:

  `net stop crmdmgtd`

Step 2 Start the CWCS System Services bundle:

NMSROOT`/bin/perl` *NMSROOT*`/conf/cmf/bin/CMFEnable.pl -FORCE system`

where *NMSROOT* is the directory in which the product was installed.

Step 3 Start the Daemon Manager:

- On a Solaris platform, enter:

  `/etc/init.d/dmgtd start`

- On a Windows platform, enter:

  `net start crmdmgtd`

Step 4 In this example, to be sure that you have access to the CWCS database engine service, verify that the CmfDbEngine and CmfDbMonitor processes are running:

NMSROOT`/bin/pdshow`

where *NMSROOT* is the directory in which the product was installed.

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Caution If you start system services, you also disable network services. Also note that enabled service bundles may be reset if you install a new product on the server.

Related Topics

- Understanding CWCS Service Bundles, page 5-3
- Using CMFEnable, page 5-5

Using CMFEnable

The CMFEnable Perl script enables CWCS service bundles. This script is used at install time and is also available from the command line. For more information about services bundles, see the "Understanding CWCS Service Bundles" section on page 5-3.

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If CMFEnable finds that the Daemon Manager is still active, it displays a warning message which contains the command the user must enter to shutdown the Daemon Manager. CMFEnable aborts after displaying this warning message.

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Caution   If you start system services, you also disable network services.

Name	CMFEnable.pl	
Description	Enables CMF service bundles	
Syntax	*NMSROOT*`/lib/perl/install` *NMSROOT*`/conf/cmf/bin/CMFEnable.pl {-FORCE|-INSTALL|-CURRENT} [arg1]`	
	Name	**Description**
	force	Enables a service bundle without verifying the system configuration.
	install	Forecasts the packages to be installed. This information is used by the installation facility.
	current	Enables and disables service bundles based on the current system configuration.
Syntax Arguments	arg1	• *arg1* is a token of comma-separated service bundle names. • With -force, if *arg1* is missing, all services are disabled. • Valid service bundle names are Network and System. • No spaces are allowed in the token.
	0	Success
Output	Non-zero	Failure. Values >0 may contain other interesting information depending on the routine.
Examples	• To have ANI running, but not install the Campus Manager software to get this functionality, use the following command to enable ANI services: *${NMSROOT}*`/conf/cmf/bin/CMFEnable.pl -INSTALL Network` • To enable the database without ANI, use the following command to enable System services: *${NMSROOT}*`/conf/cmf/bin/CMFEnable.pl -INSTALL System`	

For example, consider this installation model:

Step 1   Install CWCS.

Step 2   Then install Essentials.

Step 3   Then other applications.

The INSTALL option is used to enable the service bundles before the Essentials packages are copied to the system.

This CURRENT option is called by the installation framework after all packages are installed on the system. The *.info files for all packages are examined to determine the required service bundles (System or Network), and the corresponding action (enable or disable) is performed. For example:

- If Network is required and the previous setup is System, then Network is enabled.

- If none is required and the previous setup is System, then System is disabled.

Related Topics

Specifying Package Properties, page 21-6

Interacting with CWCS

The following topics describe the ways you and your application can interact with CWCS:

- Designing the User Interface
- Adding Your Application to the CiscoWorks Home Page
- Using the Backend Services on the CWCS Server
- Using the CWCS Support Tools
- Getting Up to Speed Quickly

Designing the User Interface

Your application interface must present a consistent look and feel to the user. To help you achieve that goal, CWCS supports the User Interface Infrastructure (UII). The CWCS team recommends that you use the latest release of the User Interface Infrastructure (UII) to build your application interface. Version 6.1 and later of this UII are compatible with CWCS 3.0, and are available for download at http://picasso.

If you cannot use the UII, be aware that:

- Many CWCS 3.0 features, such as the CiscoWorks Home Page, depend on the UII for effective implementation. Implementing them without UII can be done, but is difficult, and should be undertaken in consultation with the CWCS team.

- Your interface should attempt to follow the User Experience guidelines, which are standard for Cisco network managment applications, and useful for any application developer trying to write intuitive, learnable, and usable user interfaces. The Guidelines are also available at http://picasso.

Adding Your Application to the CiscoWorks Home Page

The CiscoWorks Home Page (CWHP) allows users to navigate between components in a suite of applications, and serves as the launch point for both CWCS-based and third-party applications. To integrate your application with the CWHP, start by learning more about the CWHP support files and processes:

- To understand how your application will launch, see Chapter 4, "Understanding the CWCS Execution Environment."

- To determine where your application and tasks will appear, see Chapter 7, "Using the CiscoWorks Home Page."

- To determine what user roles will be able to access your application tasks and ensure that users authenticate before using your application, see Chapter 10, "Using the Security System."

- To determine how you will provide online help to your users, see Chapter 16, "Adding Online Help."

Using the Backend Services on the CWCS Server

You can use the following backend services to add additional functionality to your application:

- The Daemon Manager (also known as the Process Manager) ensures that your application handles its own processes, as well as other CWCS-based processes, efficiently. It provides the following services:

  - Initial startup following server boot or manual startup.

  - Restarting after a failure.

  - Starting only when the necessary prerequisite programs are up and running.

  The Daemon Manager also includes the cwjava command, which provides a controlled daemon environment for CWCS-based Java server applications. For more information about the Process Manager, see Chapter 17, "Using the Daemon Manager."

- The CWCS database engine and management tools store data used by your application, including license data, and provide backup and restore functions. For more information about data storage , see Chapter 11, "Using the Database APIs." For more information about the backup and restore functions, see Chapter 12, "Using Backup and Restore." For more information about licenses, see Chapter 34, "Using the Licensing APIs."

- Event Services Software (ESS) provides an XML-based, publish/subscribe messaging service between client desktops and the CWCS Server. It replaces the Event Distribution Service (EDS). For more information about the ESS, see Chapter 19, "Using Event Services Software." (If you are still using EDS, see Chapter 20, "Using the Event Distribution System,")

- Applications that use Job and Resource Management services can schedule an activity (a job) to occur under several conditions ,including launch readiness, scheduling options, resource locks, and event notification. For more information about the Job and Resource Manager, see Chapter 18, "Using the Job and Resource Manager."

- CWCS also supplies backend tools to add specialized capabilities to your application:

  - A generic Object Grouping Service to help you group any kind of data item, from user IDs to devices, into hierarchical picklists in your application. For more information on this service, see Chapter 30, "Using Object Grouping Services."

  - A fully distributed interprocess communication service called CSTM. For more information on CSTM, see Chapter 31, "Using the Common Services Transport Mechanism"

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Using the CWCS Support Tools

Additional CWCS support services include installation tools, Java Plug-ins, and support utilities:

- The installation framework tools are free and can save your team time. Using them:
  - Allows you to consider dependencies and features such as uninstallation, thus making it easier for your package to work like other network management packages.
  - Helps you ensure that prerequisites, such as version dependencies, are set and followed.

  For more information about this framework, see Chapter 21, "Using the Installation Framework."

- To improve applet startup time and reduce the time required to download class files into the browser for each page, the Java Plug-in loads the following files locally on the client machine:
  - Java classes
  - Third-party libraries (such as JGL and Swing)
  - Images
  - Data files

  For more information about the Java plug-in, see Chapter 22, "Using the Java Plug-in."

- CWCS provides support utilities to speed the process of customer problem resolution. For more information about these utilities, see Chapter 23, "Using the Diagnostic and Support Utilities."

Getting Up to Speed Quickly

CWCS represents a fairly extensive set of tools. Each engineer who is new to it will need time to match its capabilities against application requirements .

If CWCS is completely new to you, here is one reliable path to getting oriented quickly:

1. Start by install CD One as indicated in this chapter. Then open your browser, and get to know CWCS.

2. Read chapter 10 and get to know your security options.

3. Read chapter 32 to understand what the licensing APIs offer.

4. Skip around as needed until you feel you understand the basic CWCS design: A loosely coupled web infrastructure with built-in security, database, and administration capabilities, and some network features (such as discovery and device grouping) added in.

5. Begin planning your application, bearing in mind that it:
   a. Should be implemented as a web application that plugs into the CWCS environment.
   b. Must use some form of login and security.
   c. Must use some form of licensing.
   d. Should implement the User Interface Infrastructure, but *must* follow User Experience standards. UII is an easy way to implement UE. But in any case, CWCS is intended to support application suites, and customers expect to have a common user experience across applications.

6. Choose the other CWCS features you want to implement – database, backup and restore, the ESS event bus, JRM, etc. -- as needed. Keep in mind the service bundles you will need, because some services will run only if your application registers for the corresponding bundles.

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