# Cisco Workload Automation and Adapters

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# 1. Cisco Workload Automation

## Product Overview

Data center automation is critically important to IT departments that are focused on unifying and standardizing their operations management. Automation technology supports data center initiatives because it helps simplify day-to-day operations, reduces costs, and promotes IT and business flexibility.

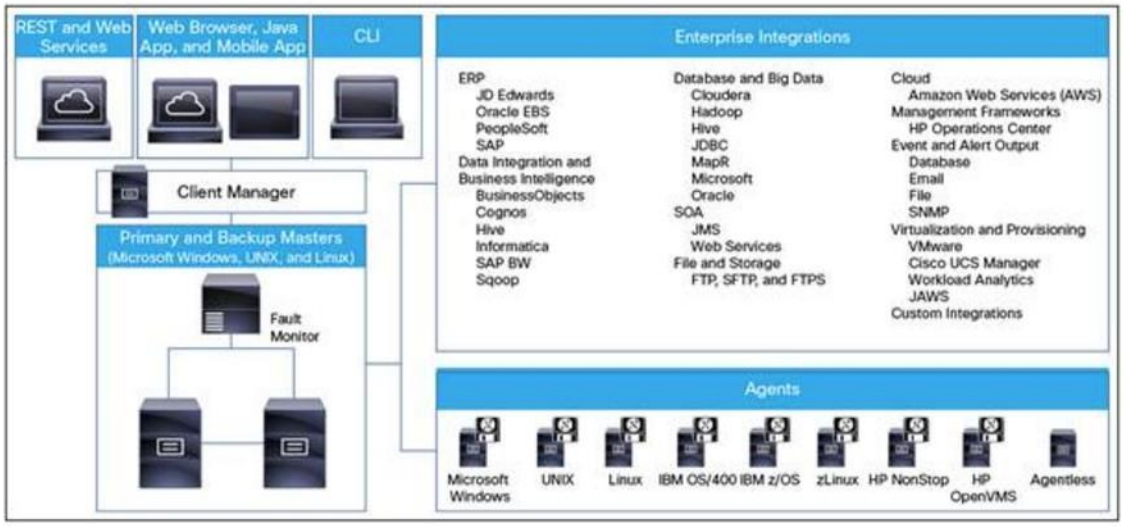
Workload scheduling is an important category of IT operations management that gives organizations the control and visibility necessary to operate today's dynamic data centers. Automation of business process workloads is essential to complex data centers because it helps them operate more efficiently and reliably. Cisco® Workload Automation (CWA) is the industry-standard workload automation (WLA) solution, transparently automating critical scheduled and event-based interdependent business processes.

Cisco Workload Automation connects to heterogeneous environments, creating an infrastructure service platform, providing end-to-end management of critical operation tasks and data throughput. With this enterprise wide scheduling solution that automates complex processes and adapts to changing environments, IT managers can quickly add business value by improving the quality of service-level agreement (SLA) delivery, reallocating resources to business-critical projects, and supplying the accurate data-processing results necessary for strategic decision making. This approach to workload management dramatically reduces human errors and the inefficiencies of script management.

Cisco Workload Automation can easily configure and run scheduled workloads and event-based business processes, integrate the commercial and custom applications these processes use, and determine which tasks to run - and where and when to run them - without the need for human intervention, customization of existing tools, or knowledge of new scripting languages. Additionally, Cisco Workload Automation provides a single view and point of control for all business processes and the jobs that comprise them.

Developed as an n-tier Java architecture application, Cisco Workload Automation can scale to meet the most demanding SLAs. It is currently in production worldwide, handling hundreds of concurrent users, managing thousands of connections, and running hundreds of thousands of jobs a day. Cisco Workload Automation connects to and can manage complex workloads on many popular OS platforms and integrates with major enterprise applications and standards-based technologies (Figure 1). Cisco Workload Automation can be implemented quickly, allowing users to accelerate time-to-value while simplifying their entire workload-processing environment.

**Figure 1.** Support for Cross-Application and Cross-Platform Workload Management




## Features and Benefits

Cisco Workload Automation offers a range of features that work together to meet IT's needs for enterprise visibility, scalability, and coverage and the daily creation and management of complex workload schedules.

By automating complex workloads with Cisco Workload Automation, IT can positively affect SLA delivery in the following ways:

- Increase efficiency by simplifying batch processing across the distributed enterprise
- Enhance SLA reliability and reduce expensive downtime through workload analytics, alert automation, and a high-availability failover platform
- Support a proactive mode of operation by complete workload visibility, predictive analytics, self-service job implementation, environmental awareness, and automated error remediation
- Improve comprehensive auditing and tracking information in support of compliance with IT policies and procedures
- Improve IT staff productivity through web, mobile, and Java clients and customized self-service portals

**Extensible and Scalable Design**

Cisco Workload Automation gives IT managers a global view of their enterprise workloads through a single-pane view, regardless of how many applications or systems are touched by the defined workload. Cisco Workload Automation accommodates multiple levels of dependencies and complex groupings, making it

possible to automate extremely complex job streams, while scheduling them through a hierarchy of standard and custom-defined calendars and programmable events.

Cisco Workload Automation uses a multitier architecture to provide a single solution that meets enterprise needs for performance, extensibility, and scalability. Separate architecture layers provide a stable, extensible framework, allowing it to handle challenging workloads reliably.

Cisco Workload Automation master focuses primarily on the business logic, management, and implementation of job schedules. One or more client managers orchestrate user interactions. This n-tier architecture and the decoupling of core functions enable organizations to scale both up and out, allowing them to support a large number of concurrent users and jobs without degrading management or processing performance.

Jobs and job streams are defined and managed through an intuitive GUI through which administrators can define the many dependencies of enterprise business processes (Figure 2). Users can also access detailed performance statistics for all jobs, past and present, and monitor processes as they occur. Cisco Workload Automation supports real-time event and alert management, increasing uptime and SLA delivery levels.

Cisco Workload Automation allows control of jobs and management functions from mobile devices. The Cisco Workload Automation mobile app lets you manage adapter and agent connections and override, hold and stop, and release and resume jobs. Management functions also include the capability to filter and view jobs, alerts, events, schedules, connections, queues, and logs.

**Figure 2. Web interface with Mobile Management: Single Point of Control for Enterprise-wide Workload Automation**

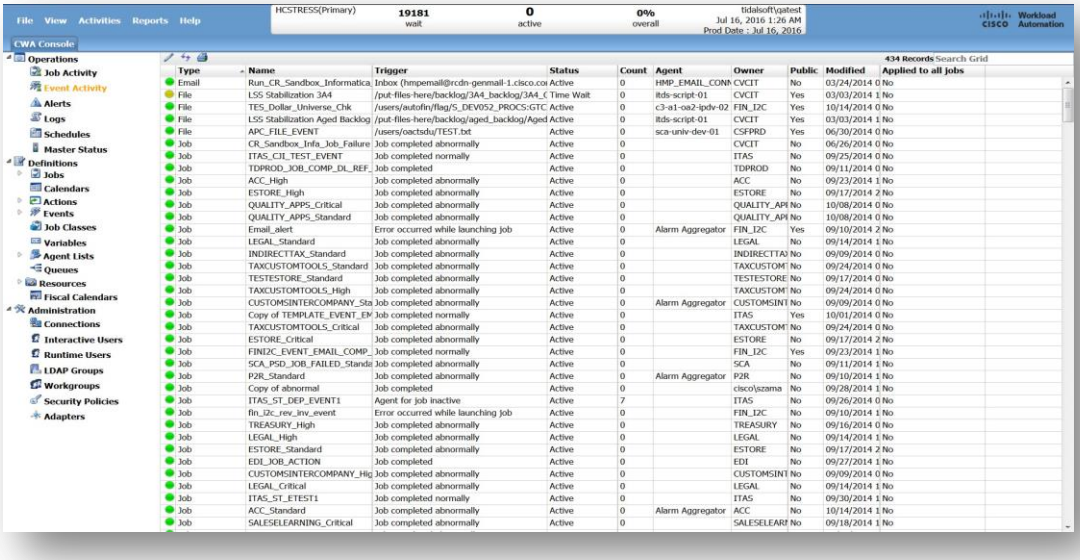
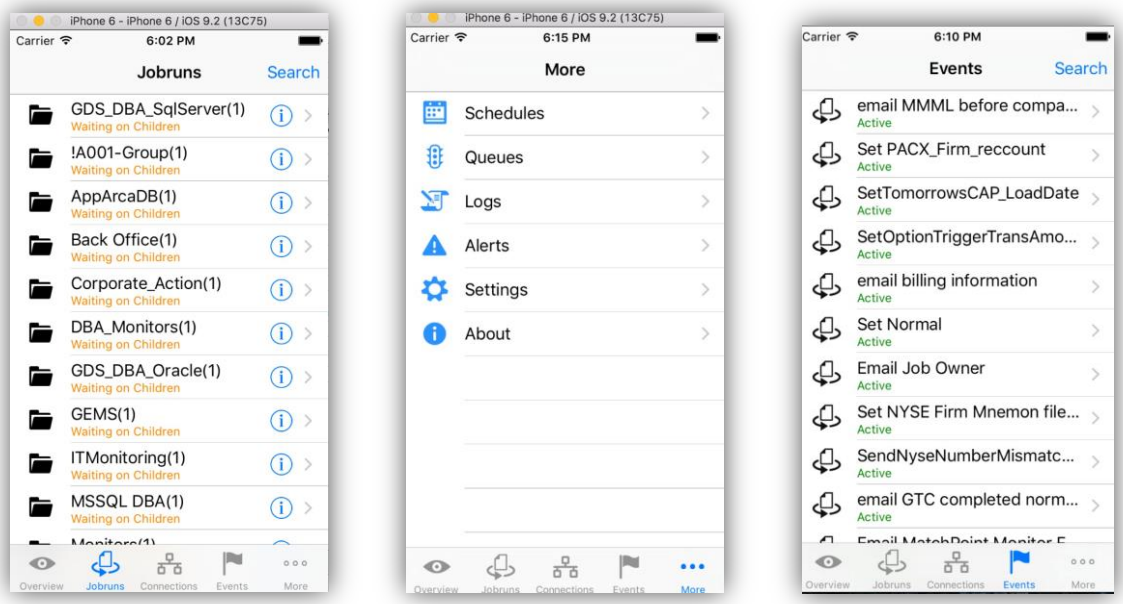


**Figure 3. Web Interface with Mobile Management: Single Point of Control for Enterprise-wide Workload Automation**




**Enterprise Application and Database Coverage**

In the heterogeneous and virtualized environments that characterize today's data centers, flexibility and reach are critical. Cisco Workload Automation automates the scheduling of traditional enterprise applications, as well as complex, decoupled, and often widely distributed service-oriented architecture (SOA) applications, which frequently run on different OS platforms.

Cisco Workload Automation integrates transparently with leading applications, such as SAP, Oracle, JD Edwards, PeopleSoft applications, and databases, such as Microsoft SQL Server and Oracle databases, using specifically developed application adapters. Adapters for scheduling custom Java applications and web services connections extend the reach of Cisco Workload Automation, offering detailed control and simplified access.

Cisco Workload Automation can also manage process integration through the use of agents running at the OS level. Cisco Workload Automation supports many popular operating systems, including Microsoft Windows, UNIX, Linux, IBM z/OS, IBM OS/400, HP NonStop (NonStop Kernel [NSK]), and HP OpenVMS, and offers agentless adapters for Secure Shell (SSH) and Microsoft Windows systems.

Increasingly, businesses are using workload scheduling and batch-process automation technologies to integrate the business operations of their partners and customers. Cisco Workload Automation simplifies inter-enterprise data exchange through a powerful, script-free solution for file transfer, including FTP, SSH FTP (SFTP), and FTP SSL (FTPS). Database activities and process steps can also be automated in Microsoft, Oracle, or any Java database connectivity (JDBC) - compliant database environment, with process steps even running on various enterprise data warehouse appliances.

**Data and Business Intelligence**

From data collection to storage, retrieval, analysis, and reporting, business processing depends on the capability to move data between systems and applications both inside and outside your company. For many years, advances in infrastructure and operations solutions kept pace with the growing amount of data. But with the accelerated growth of unstructured data such as voice, text, and video, traditional data analytics solutions have broken down. Today's challenge is to accurately manage vast amounts of data, quickly moving it into and out of new data processing applications such as Hadoop.

Cisco Workload Automation provides a comprehensive platform to manage business intelligence workflows and offers detailed management of data applications. Cisco Workload Automation offers a Hadoop adapter that allows detailed control over data loading and flow management (Sqoop and Data Mover), Hadoop core data processing (MapReduce), and the data interface layer (Hive) that allows input of SQL-like data query and analysis commands. The value of using the Cisco Workload Automation Adapter for Hadoop is that it allows you to define, schedule, and manage Hadoop jobs with multiple layers of dependency mapping and nesting of parent and child jobs, drop-down parameter selections, highly specific alerts and automated job rerun functions, resource awareness for workload prioritization, and predictive analytics to eliminate SLA delivery guesswork.

Cisco Workload Automation can define and run Data Mover jobs for MapR, Cloudera, and Hortonworks Hadoop distributions. Connect to a Hadoop instance and define workloads as you would any other in your job stream. For all Cisco Workload Automation Hadoop jobs, the job tracker and task tracker process the jobs as they would any other Hadoop job, eliminating the overhead required to manage multiple schedulers, handle static scripts, and manually run complex workflows without the benefit of audit trails or dependency mapping.

Cisco Workload Automation is also well suited to managing data integration (extract, transform, and load [ETL]), database, and enterprise data warehouse workloads and the report generation and delivery tasks that comprise integrated business intelligence (BI) solutions. Cisco Workload Automation supports IBM Cognos Business Intelligence, SAP Business Information Warehouse (BW), SAP BusinessObjects, and Informatica out of the box with complex API integrations for each. Each interface has been carefully developed and tested to work transparently with each application. Combining these third-party application partnerships with Cisco's WLA solution has the added benefit of providing a low-risk path to transition data experimental projects from rogue IT to your process-based data center test and production environments.

**Management of Physical, Virtualized, and Cloud Resources**

Cisco Workload Automation enables IT staff to define and schedule workloads in ways that adhere to strict infrastructure resources governance. Cisco Workload Automation allows for the prioritization of jobs, job groups, and entire business-critical workloads. It can also configure individual servers and processing resources to allocate the necessary resources to meet SLAs on time. And if unplanned jobs are introduced or unforeseen environmental events arise, Cisco Workload Automation can adjust capacity using its adapters for virtualized computing resources to manage public cloud processing and storage resources.

IT is moving increasingly toward virtualization and decoupling of the core, OS, and application stacks, whether inside the company firewall or outside in public cloud environments. Cisco Workload Automation is an excellent solution for automating the management of these computing environments. Cisco Workload Automation can automate the tasks performed by specific virtual machines within the firewall as well as manage Cisco Unified Computing System™ (Cisco UCS®) servers, VMware instances, and Amazon Web Services (AWS) instances and storage buckets, and the data movement in and out of these cloud resources.

Cisco Workload Automation Adapter for UCS Manager can bring up additional servers to meet workload bursts and shut them down when high-need workloads are complete, reducing the burden on the infrastructure management team to field requests for provisioning and decommissioning. Cisco Workload Automation can also help the infrastructure teams manage scheduled server maintenance windows. Using Cisco Workload Automation agents, Cisco UCS customers can now build complete server maintenance workflows and trigger them according to the maintenance window (calendar) defined in Cisco Workload Automation

Cisco Workload Automation Adapter for VMware makes it possible to perform a wide array of management tasks on hypervisors using the VMware vCenter server. You can power virtual machines on and off and suspend and resume their use, manage snapshots, adjust resources, and perform VMware vMotion activities. All these activities can take place as individual jobs or grouped workloads according to business process demand. This unique capability makes it possible for the state of a virtual environment to be balanced and optimized, helping guarantee performance and resource availability for essential business process steps.

Cisco Workload Automation Adapter for AWS gives you the capability to automate these public cloud resources. Managed Amazon Elastic Compute Cloud (EC2) resources include start, stop, and delete instances and Amazon Machine Images (AMIs) and Elastic Block Store (EBS) volumes. Cisco Workload Automation also allows the management of Amazon Simple Storage Service (S3) storage buckets and data copy and move processes.

**Intuitive User Interface: Browser Based, Java Client, and Mobile App**

Cisco Workload Automation provides intuitive browser-based and Java user interfaces that deliver all aspects of administration, definition, and operation of the schedule through a single pane. Job creation, stop and start, calendaring, fallback, and event dependency mapping can all be achieved within this interface, which has the same look and feel as in previous versions of the product. From a single console, users can view the workloads for past, current, and future job runs in real time, allowing disparate systems to be centrally managed without scripts. Out-of-the-box integrations also support a remotely accessible command-line interface (CLI) for UNIX, Linux, and Microsoft Windows systems.

For power users who are managing thousands of workloads and associated objects in their databases, the Java client syncs data directly from the master, but it is many times faster than the client manager because all data is stored in memory on the Java virtual machine rather than to an external database. The performance of many interactions through the Java client will increase, providing, for example, smooth scrolling with zero latency and faster searches and filtering.

Cisco Workload Automation's iPhone and iPad mobile app also provides control capabilities, allowing override, hold and stop, and release and resume commands. Mobile management capabilities also include the capability to filter and view adapter and agent connections, jobs, alerts, events, schedules, queues, and logs.

Because Cisco Workload Automation management tools are accessible through a browser and security access is managed by Lightweight Directory Access Protocol (LDAP) and Microsoft Active Directory integration, control of specific processes can be quickly distributed to various workgroups and individuals in the data center. Control can even be given to business unit IT managers for self-service job planning and implementation.

**Self-Service Management**

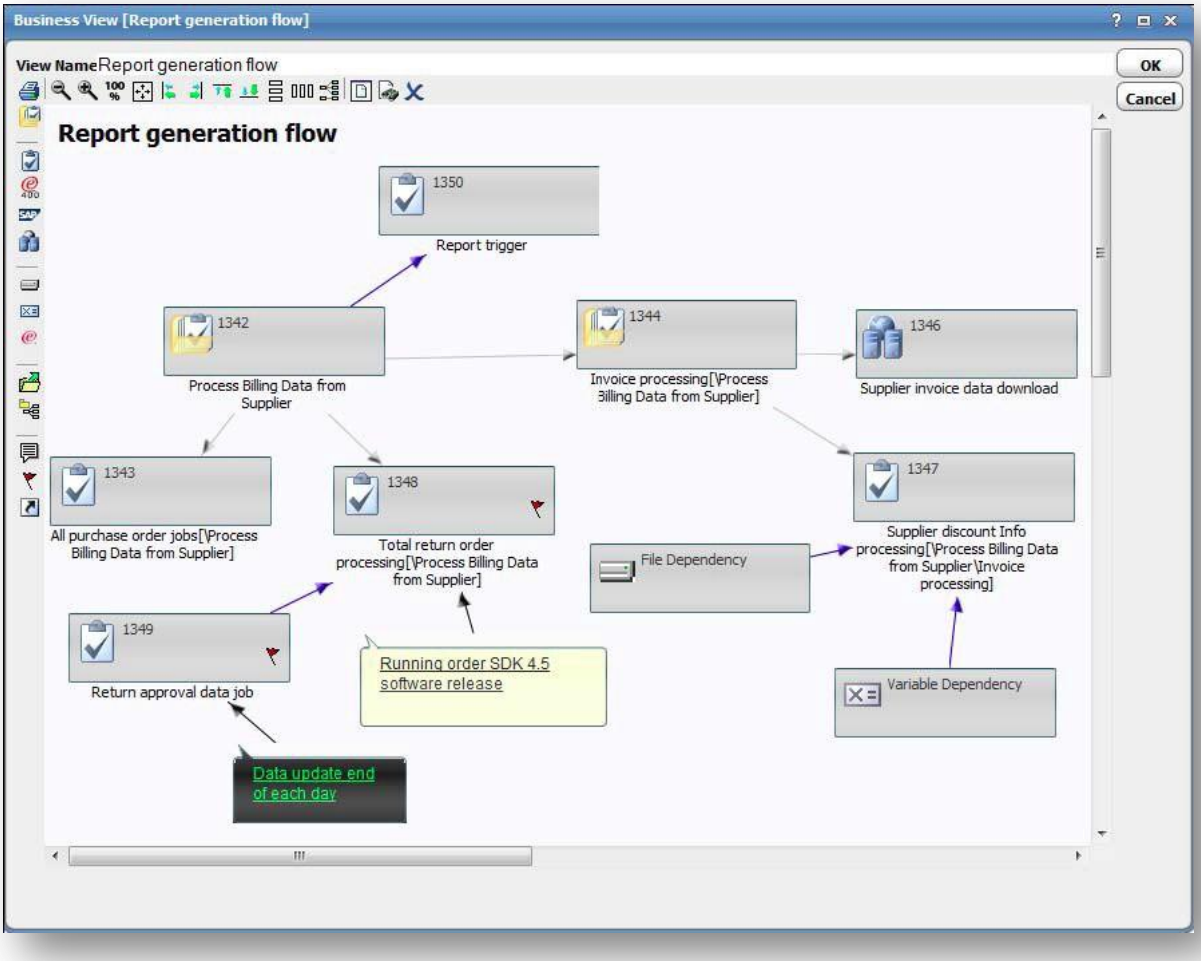
Now you can eliminate the need for 24-hour staffing to accommodate a business unit manager's impromptu request to change, cancel, or delay the running of a business process. You can deliver higher service levels to your business end users without the need for them to escalate job insertions or changes to IT for such requests.

Cisco Prime™ Service Catalog for Workload Automation (Figure 3) gives business users and IT administrators continuous controlled access to approved services without the need to allocate additional IT staff. Business users manage jobs and receive services without IT involvement and without the need for specialized skills because the processes and complexity are abstracted through a user-friendly web portal.

**Business Views**

Alignment of IT with business goals is critical to the successful development and delivery of SLAs. To accomplish this, IT must understand how specific workflow tasks relate to an overall business process. Cisco Workload Automation supports this understanding through its business views (Figure 4). These views graphically display the tasks included in a business process, their dependencies, and their status. Using business views, IT staff can define, understand, and control not only individual job steps, but also the overall workflow process. Business views can also be used to show business unit managers exactly what will be delivered based on the SLA.

**Figure 4. Graphical Business View for Displaying the Tasks in an Entire Business Workflow**




**Enterprise-Class APIs**

Cisco Workload Automation provides a comprehensive set of APIs that allows access to core scheduling and operation activities. These APIs are provided as a set of representational state transfer (REST) and Web Services Description Language (WSDL) access methods. These APIs are exposed from Cisco Workload Automation's client manager, making them scalable and capable of delivering peak performance even under heavy workloads. In addition, they are designed to support transparent failover using the same approach as for all other application interaction points.

**Comprehensive Calendaring**

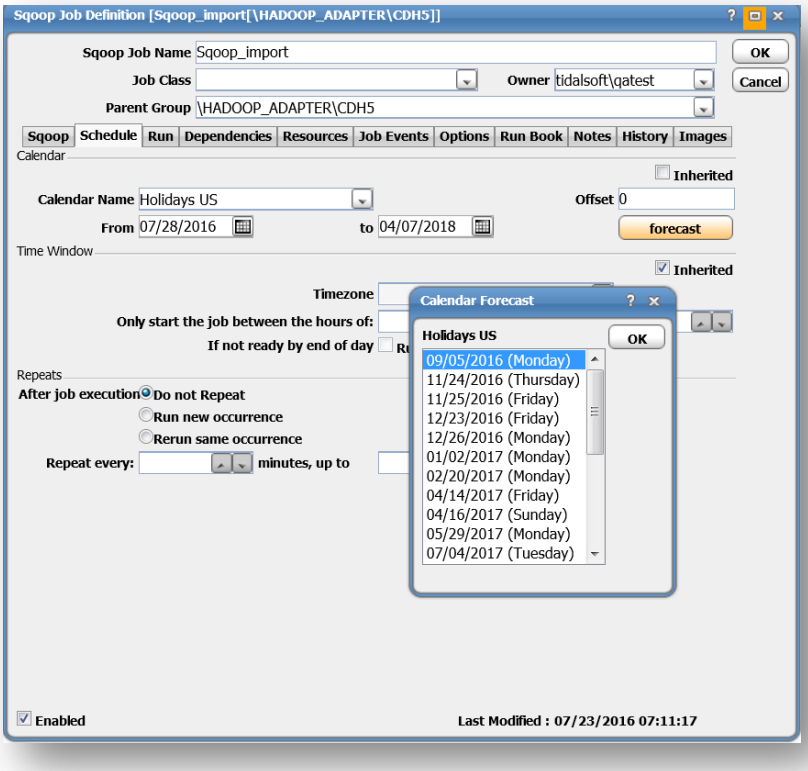
Cisco Workload Automation delivers multiple preconfigured calendars and also permits calendar combinations that meet specific date-based business requirements. It can support rules that govern complex scheduling

needs based on a hierarchy of dependent calendars, including the capability to manage calendars configured to accommodate global workdays, holidays, and unplanned date dependencies.

Cisco Workload Automation is delivered with workday and financial calendars that can meet the most complex processing needs. When users need to modify or make an impromptu change to a calendar, these changes can be made dynamically without requiring the schedule to be recompiled. These new custom calendars can be saved for future use.

Enterprise business processes are often global, with various steps of the process running in different parts of the world with different time zones. Cross-time-zone scheduling is a factor because modern businesses operate in multiple theaters and must be aware of time-zone idiosyncrasies, such as Daylight Savings Time changes at irregular intervals. Cisco Workload Automation can account for these situations and allows the user to specify the time zone on a per-job basis (Figure 5), helping ensure that a job will be launched correctly no matter where the job resides.

**Figure 5. Defining Job Schedules Based on a Variety of Preconfigured Calendars**




## Event-Based Processing

In addition to performing calendar-based scheduling, Cisco Workload Automation can dynamically introduce jobs - and entire complex workloads - into a schedule when the job is initiated by business or system events

from a wide range of application adapters and platform-supported agents. Cisco Workload Automation's capability to respond to these events removes latency from workloads.

Cisco Workload Automation's provides script-free support for event-based scheduling. Events supported include the following:

- Job triggers (such as system events, exit codes, and jobs that run longer than expected)
- File arrivals and changes
- Database changes (without requiring creation of database triggers)
- Email
- Simple Network Management Protocol (SNMP)
- Variables (managed internally or externally)
- Enterprise applications, business intelligence, data integration, and enterprise data warehouses

**Flexible Monitoring and Alerting**

To simplify alert management, Cisco Workload Automation also offers a specialized alert console that allows users to see all defined alerts within the scheduling system, view their status, and manage their behavior. It can also send alerts to browser-enabled devices for anytime, anywhere status delivery.

The Cisco Workload Automation can alert users to a wide variety of events, often acting in conjunction with the capability to configure auto recovery steps. If a job fails, Cisco Workload Automation can initiate a recovery action, send an email to the appropriate owner, generate a message to the central console, and trigger an incident report to an IT support technician through the appropriate ITIL-based operations systems. Ease of use and flexibility are primary features, as well as the capability to generate specific alerts without the need for custom scripts.

**Comprehensive Security and Audit Capabilities**

Cisco Workload Automation offers detailed security management through comprehensive LDAP and Active Directory integration. Security policies (and their controls) are tied to enterprise security management tools and processes. Cisco Workload Automation lets administrators control access to scheduling functions as a whole or to specific jobs, events, or actions on an individual user or workgroup basis.

To further support alignment with enterprise security management policies and processes, Cisco Workload Automation creates audit trails that allow operations personnel to monitor and control the scheduling environment: a crucial requirement in today's rapidly changing production and regulatory environments.

**Enabling DevOps Practices**

Cisco Workload Automation Transporter enables copying Job, Calendar and other object definitions between different environments – for example, from Dev/QA environment to Stage or Production environment.
The Transporter Export/Import utility lets you export data from CWA in the form of XML files to make it possible to archive versions of the data in a version control system. The exported data can be imported to a CWA system at any time, removing the need to connect to two different CWA systems (source and destination) to effect a transport of data. The utility also helps to compare and validate delta between the source and destination.
The Transporter also provides an option to discover Cron jobs defined on the Agents configured with CWA and import them into CWA creating Jobs and Calendars seamlessly.

**Reporting and Analytics**

Informed decision making about the performance of business processes is a major concern in today's complex IT environments. Efficient management of complex workloads and enhanced accuracy and reliability of job processing have significant positive effects on an organization's capability to meet business demands.

Business managers, IT executives, operations managers, and front-line staff all need ongoing access to timely and accurate information to understand the performance of their scheduling environments and to comply with IT policy and audit requirements. Cisco Workload Automation delivers out-of-the-box reporting features that provide insight into the enterprise-wide scheduling environment through in-depth historical data. This data helps IT managers develop strategies to improve scheduling performance.

In addition to its detailed native reporting features, Cisco Workload Automation integrates with Terma Labs JAWS Historical and Predictive Analytics. You can get historical, real-time, and predictive job-run analysis to help IT staff gain greater visibility into the performance of the workload automation environment and the SLAs that govern the delivery of business processes. Rapid access to accurate job stream reports and critical-path analytics can help IT detect problems proactively so that service levels are not compromised. The insight that these sophisticated analytics modules provide supports the auditing and compliance processes and promotes new strategies to help improve SLA delivery.

**Reduced Total Cost of Ownership**

For most IT departments, total-cost-of-ownership (TCO) analysis is now mandatory when making new project decisions. Reduced cost of ownership of existing capital and operating resources through increased efficiency and higher use rates is a key performance indicator (KPI). Cisco Workload Automation delivers outstanding benefits in the following categories, making it possible to meet internal SLAs on a more consistent basis and reduce overall TCO:

- Integrated solution design: Allows operations to be in production in days through components that install quickly and work together transparently
- Broad coverage: Simplifies scheduling and management of jobs in enterprise wide, heterogeneous environments, even when some jobs are outside the firewall
- Swift notification and recovery capabilities: Reduces downtime from hours to minutes
- Automated analysis: Supports management of complex dependencies and helps users quickly resolve workflow bottlenecks with detailed analytics

Companies in a variety of industries rely on Cisco Workload Automation to keep their daily operations running smoothly. Cisco Workload Automation, combined with Cisco's cloud and infrastructure provisioning and management solutions, can deliver even greater levels of automation and optimization to the data center than conventional scheduling tools.

**Feature Summary**

- Integrated FTP, SFTP, and FTPS scheduling support
- Web-based, Java client, mobile app, and CLI user interfaces
- Sophisticated business calendar and event processing
- Nested schedules to manage the dependencies in a long sequence of tasks
- Capability to design and run jobs without the need to manage scripts or multiple development tools
- Role-based security integrated tightly with LDAP and Active Directory
- Historic and predictive analytics

# 2. Cisco Workload Automation Adapter for SAP

## Adapter Overview

**Cisco Workload Automation Adapter for SAP**

Cisco Workload Automation Adapter for SAP offers a powerful SAP scheduling solution designed for those who want the efficiency, visibility, and control offered by an enterprise-wide, heterogeneous job automation solution. The adapter makes the process of scheduling SAP jobs simpler and readily accessible through Workload Automation itself. SAP users can add this adapter to their Workload Automation solution and manage their SAP jobs in the context of other enterprise jobs, leveraging powerful enterprise scheduling capabilities that include exception-based management, scalability, role-based security, and enhanced manageability.

Cisco Workload Automation for SAP provides users control over batch, ad hoc, and on demand jobs, and it ultimately helps improve efficiency. The adapter enables users to increase the productivity gains of SAP jobs by setting dependencies to and from other platforms and programs, including non-SAP applications and leading third party databases. This means that all SAP jobs can now be part of larger business process workflows and can all be managed through a single pane of glass. As a result, application automation, job management, and detailed reporting can be consolidated under one enterprise-class solution that will increase staff productivity, decrease downtime, and increase service level agreement (SLA) performance metrics.

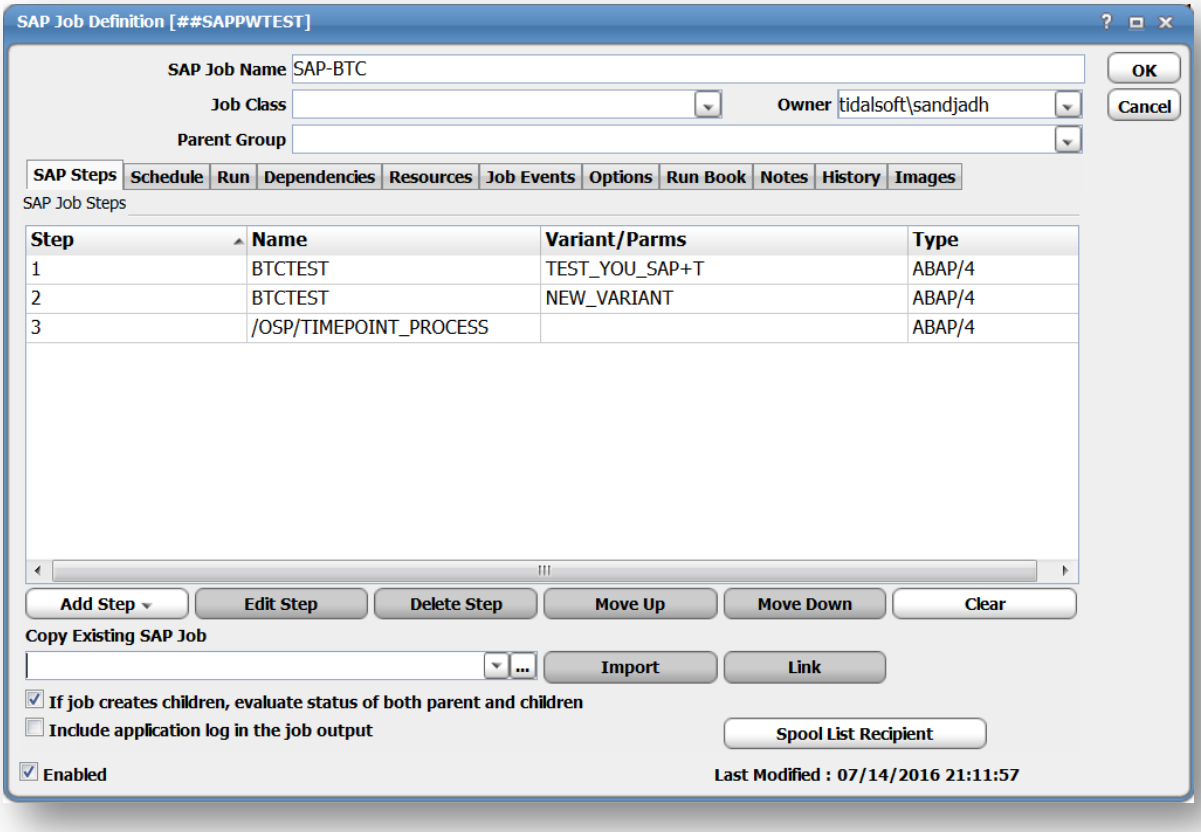
**How Cisco Workload Automation Adapter for SAP Works**

Cisco Workload Automation Adapter for SAP interfaces to CCMS using SAP XBP technology. And it integrates with SAP Business Information Warehouse (BW) and SAP Advanced Planning and Optimization (APO) using the InfoPackage and Process Chain application program interfaces (APIs). Both interfaces are SAP-certified, meeting its rigid specifications for integration and security.

The adapter uses an automated installation with customizable options to meet specific requirements. No scripting or manual intervention is required, nor are changes to SAP instances. Once the adapter is configured, users can define and maintain the details of SAP jobs from within the Workload Automation web-based management console. Workload Automation can also launch and monitor jobs already created within SAP.

The full functionality of this heterogeneous automation solution is accessible to SAP users, who can leverage powerful capabilities such as extensive, informative alerts about job abnormalities or the unavailability of resources or machines, real-time status information from a single console, and the ability to interact with current and future jobs as needed.

**Figure 6. Cisco Workload Automation Job Definition dialog box automatically presents SAP data to the user, eliminating the need to remember and type in step names and parameters.**




## Features and Benefits

The adapter tailors SAP environment information and access that staff requires to schedule SAP jobs are available through the Workload Automation interface.

**Broad SAP Job Coverage** – The adapter enables automation of schedules for all SAP process types: advanced business application programming (ABAP) programs, external programs, external commands, InfoPackage, and BW process chains.

**Multi-level Job Control** – Users can monitor, set dependencies in, and interact with child processes as well as parent processes. Logs and output are grouped to show parent-child relationships.

**SAP Integration Certified** – The adapter simplifies incorporating existing SAP jobs into Workload Automation and allows SAP users to control their jobs through the following capabilities:

- Imports SAP job steps directly into Workload Automation

- Supports multiple SAP instances and environments
- Enables point-and-click selection of SAP job variables through an easy-to-use graphical interface
- Supports cross-application, cross-platform job dependencies
- Utilizes Workload Automation and user-defined variables in ABAP variants
- Triggers job streams based on SAP events
- Transfers immediate knowledge through seamless integration with SAP by displaying familiar SAP job names, valid commands, and job steps from Workload Automation screens
- Delivers the same print and archive parameters as the SAP GUI using pick lists.
- Links SAP and Workload Automation events to create enterprise-wide event-driven launch dependencies
- Integrates the SAP job interception function seamlessly with Workload Automation queue management to balance production jobs with user-submitted jobs
- Integrates SAP BW process chains and InfoPackages with drill-down functions to customize business intelligence (BI) processes
- Combines SAP and non-SAP real-time job status information
- Creates user-defined, filtered, real-time browser-based views of past, present, and future SAP jobs
- Uses automatic alert notification for SAP job processing, machine, authorization, and job status problems
- Offers granular calendar options for scheduling SAP jobs
- Captures and displays error messages on SAP runs, providing more informative error messages and logging
- Handles the heaviest SAP processing loads with a multi-threaded adapter

**Benefits of Comprehensive Scheduling**

Cisco Workload Automation Adapter for SAP makes it possible for IT to standardize on an enterprise scheduling solution and enjoy the benefits of a single point of control and a comprehensive view of enterprise-wide job scheduling. These benefits include reduced costs, increased efficiency, and improved performance. Companies can realize those benefits by using this solution to:

- Leverage SAP investments to create a comprehensive business automation solution that has broader, integrated workflows with unlimited dependencies and steps by connecting SAP applications to other platforms, business applications, and other SAP instances
- Consolidate SAP application automation under one corporate-wide job scheduling solution with one staff and one run book
- Reduce training and operational support staff to one application automation environment
- Improve efficiency and productivity with more granular automation and management functions than found in the native SAP CCMS
- Decrease downtime by providing monitoring and sophisticated alert mechanisms for SAP components and events

# 3. Cisco Workload Automation Adapter for SAP BusinessObjects

## Adapter Overview

**Cisco Workload Automation for SAP BusinessObjects**

Cisco Workload Automation Adapter for SAP BusinessObjects is an interface between Workload Automation and the SAP BusinessObject business intelligence (BI) platform where users can define, launch, and monitor SAP BusinessObjects tasks and job steps within a workload automation environment. The combination of Cisco Workload Automation and the adapter for SAP BusinessObjects offers superior functionality and process granularity over native SAP scheduling tools.

By incorporating Cisco Workload Automation Adapter for SAP BusinessObjects into enterprise-wide job scheduling environments, organizations can add complex scheduling functions to their BI solutions, while consolidating their environment via a single pane of glass. The adapter offers complete graphical user interface (GUI) job definition capabilities, the ability to set complex, system-wide dependencies, and custom calendar creation without the need to use multiple tools or cumbersome scripting methods which must be managed throughout their entire lifecycle.

Cisco Workload Automation provides virtually unlimited flexibility in developing and defining SAP BusinessObjects processing steps, giving IT staff the ability to create complex job streams that utilize the adapter to merge any BI, extract, transform, and load (ETL), and data warehouse processes.

**The Challenges of Scheduling Data Flows for SAP BusinessObjects BI Environments**

SAP BusinessObjects BI is a powerful software suite designed to allow business managers to access, format, analyze, navigate, and share all types of information. SAP BusinessObjects solutions enable data discovery, delivery, and management, as well as query, reporting, and sophisticated numeric and text data analysis capabilities.

Without effective process automation, running the tasks needed to support BI operations may not occur correctly or in the correct order. With many moving parts, such as job steps and data transformation tasks, workflows can break down, and poor environmental monitoring can leave operations staff in the dark about what part of a process failed and why. As a result, when process interactions between ETL services and BI reporting functionality are less than optimal, business operations and strategic decision-making can be negatively impacted.

**How the Adapter Works**

Cisco Workload Automation Adapter for SAP BusinessObjects is powered by an agentless application program interface (API)-level integration developed using the native SAP BusinessObjects software developer's kit (SDK) to embed SAP BusinessObjects functionality into Workload Automation. It allows users to connect to SAP BusinessObjects servers and define jobs using standard Workload Automation dialog screens. Because SAP BusinessObjects jobs are defined like any other Workload Automation job, users can leverage job, file, and variable dependencies, calendars, events, monitoring, and error notifications. In addition, they can benefit from detailed runtime error detection, alerts, and automated remediation.

Users can create and schedule jobs in Cisco Workload Automation to perform tasks in a variety of SAP BusinessObjects applications, including Crystal Reports, SAP BusinessObjects Web Intelligence, Desktop Intelligence, Data Services, Data Integrator, and XBRL Publishing. The adapter also queries SAP BusinessObjects InfoStore to access folders and objects, which then can be brought into the automated scheduling environment with full variable and parameter support. Based on defined scheduling criteria, the adapter submits a SAP BusinessObjects task to run through the native job scheduling service.

The adapter enforces SAP BusinessObjects security rules by authenticating user access through associations between Workload Automation runtime users and SAP BusinessObjects users. Creating a SAP BusinessObjects job in Workload Automation is highly secure and is as simple as creating any other job.

Once a job has been submitted, Cisco Workload Automation Adapter for SAP BusinessObjects monitors the workflow through to completion. It returns the final completion status—which then can be used to control downstream jobs and details associated with the workflow—to the central console. In addition, it allows users to cancel, hold/resume, abort, and rerun tasks from Cisco Workload Automation. This feature provides significantly more control over the environment than offered by scripting or other nonintegrated scheduling solutions.

## Features and Benefits

The adapter extends Workload Automation to incorporate the SAP BusinessObjects information and access that staff requires to schedule jobs through the Workload Automation interface. It simplifies scheduling and respects the integrity and security of the SAP BusinessObjects environment.

Cisco Workload Automation Adapter for SAP BusinessObjects, with Workload Automation, delivers standardized, centralized, and scriptless scheduling for both simple and complex processes, as well as thorough tracking and alerting. These capabilities increase efficiency, reduce errors, and support enterprise objectives, enabling IT staff to focus on innovation and strategic initiatives. Specific capabilities include:

**Robust Event Monitoring and Alert Notifications** – Cisco Workload Automation Adapter for SAP BusinessObjects is event-based. It launches processes based on defined calendars, schedules, or event triggers and provides thorough monitoring, enabling users to see status changes in real time and to control those processes as they execute.

The adapter notifies users via email or other alerting mechanisms when new content from reports or SAP BusinessObjects Web Intelligence is available. When a job is complete, output can be attached or, for greater security, can be referenced through a hyperlink, requiring that users present credentials before being able to access information. Trace logs give IT staff the ability to determine where an execution failed, whether execution steps occurred in the expected order, and which parts of the execution took the most time to run.

**Seamless Support for Ad Hoc and Scheduled Jobs** – Business managers frequently make ad hoc BI requests that must be run immediately. Gradually, these jobs are reused and fall into predictable patterns. For efficiency, they should be organized into calendars or schedules. With Cisco Workload Automation and the Adapter for SAP BusinessObjects, these ad hoc jobs can be easily transitioned into standard production runs, eliminating manual intervention in the scheduling process. In addition, because this solution offers a single point of control for all enterprise-wide job scheduled and processes, it simplifies adherence to prescribed policies and allows IT operations staff to seamlessly incorporate SAP BusinessObjects workflows into established schedule updates.

**Enterprise-wide Coverage** – Cisco Workload Automation and the Adapter for SAP BusinessObjects support cross- application, cross-platform job dependencies, enabling integration of a wide variety of SAP jobs into other data flows.

**Single Web-portal Interface** – The solution offers a single point of control for company-wide job scheduling through its portable, browser-based interface. It delivers robust and scalable scheduling functionality, including integrated job definitions and seamless handling of events, dependencies, resources, calendars, and output. It also provides exception-based control and role-based security. In addition, its intuitive graphical interface requires no scripting. Ultimately, this solution can accelerate ROI by increasing efficiency, as well as reducing errors and issues, through better automation and process visibility.

**Cisco/SAP Partner Integration**

Workload Automation is part of the SAP BusinessObjects Partner program, the only job scheduling solution to have earned this close relationship with SAP BusinessObjects.

# 3. Cisco Workload Automation Adapter for Oracle E-Business Suite

## Adapter Overview

**Integrating Oracle Applications into Enterprise Workflows**

Oracle E-Business Suite allows organizations to deliver many key processes critical to running a successful business. Even so, many organizations make the strategic decision to retain legacy applications and non-Oracle applications solutions, even in the most widely deployed Oracle E-Business environment. By implementing Cisco Workload Automation Adapter for Oracle E-Business Suite, organizations can now consolidate and combine the processing of legacy applications with all Oracle E-Business applications to deliver one business process automation solution, using one common interface, throughout the enterprise.

**Advanced Scheduling Automation for the Enterprise**

Cisco Workload Automation Adapter for Oracle E-Business Suite expands and extends Oracle E-Business workflows to other platforms, applications, and even other instances of Oracle E-Business Suite. The Cisco scheduling solution for Oracle e-Business Suite dramatically simplifies job scheduling, reduces errors, and pinpoints potential issues, all of which combine to deliver faster ROI for Oracle applications. The adapter easily incorporates and manages ad hoc jobs submitted from multiple Oracle-defined jobs, offering granular control by site, application, responsibility, and user. By seamlessly integrating Oracle Concurrent Manager functions with Workload Automation queue management, the adapter gives IT operations staff the ability to balance production and user-submitted jobs. With Cisco Workload Automation Adapter for Oracle E-Business Suite, Workload Automation platform provides users with an enterprise-wide solution and more advanced scheduling functionality than the native Oracle scheduler.

**Figure 7. Cisco Workload Automation Adapter for Oracle E-Business Suite provides industry-leading integration; including drop-down lists of existing Oracle E-Business Suite request data.**

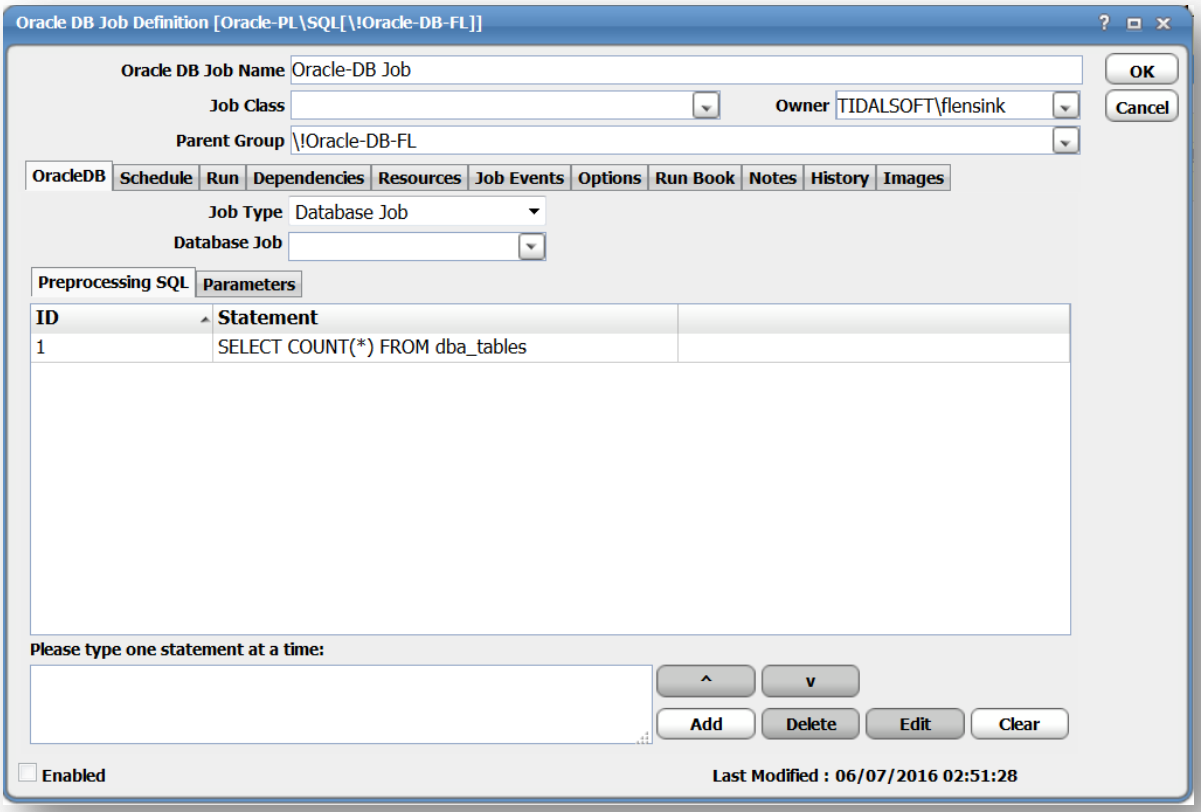
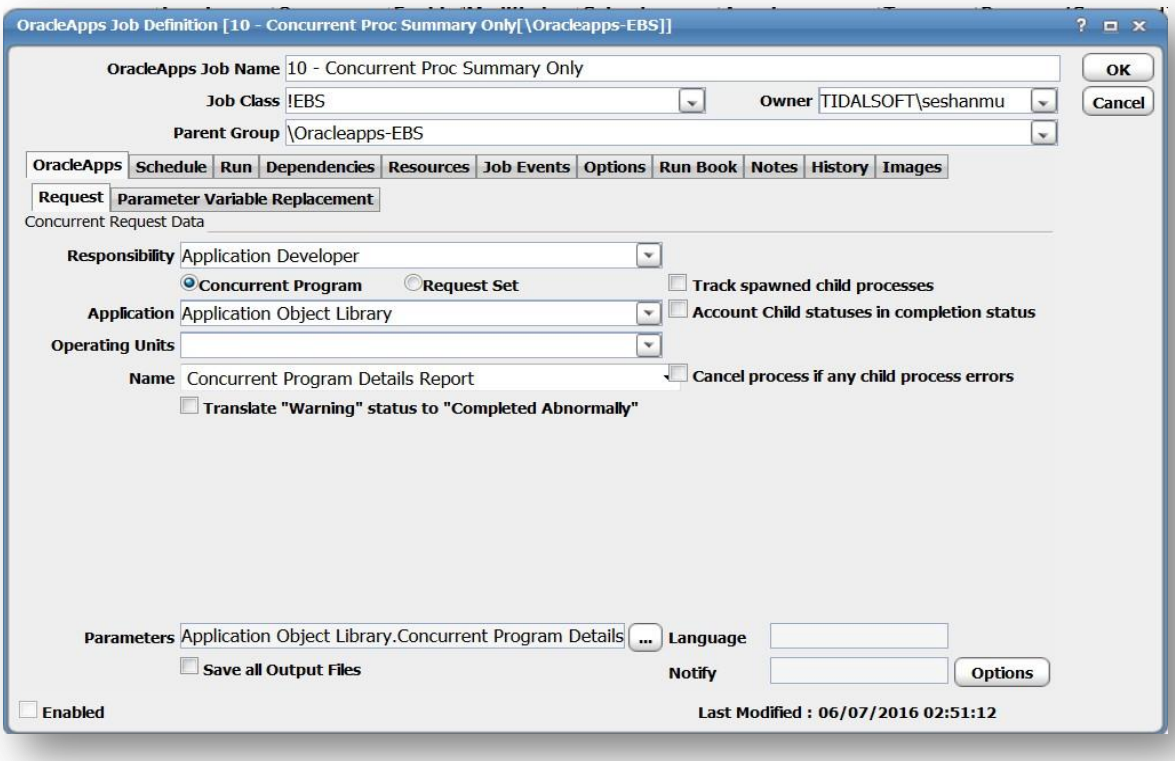


**Figure 8. Configuring a job for Oracle apps.**




### How Cisco Workload Automation Adapter for Oracle E-Business Suite Works

Installed on the Oracle E-Business forms server, the adapter is used to create request sets of E-Business Suite jobs. To help prevent errors, the adapter comes pre-configured with lists of requests and report sets. The adapter automatically brings up Oracle forms used to request jobs and define parameters. Workload Automation variables can be added so that once created, report forms do not need to be accessed repeatedly to enter new parameters. If, for instance, a report must run weekly or monthly, the form retains these parameters. Dependencies can also be set and managed, and priorities and queues can be allocated. Abnormal behavior is reported in the scheduler console to enable user intervention.

By leveraging the Oracle native scheduler, Workload Automation can support all Oracle process types, including Oracle reports, procedural language/structured query language (PL/SQL) stored procedures, Java stored procedures, Java concurrent programs, and SQL*Plus. Because the familiar Oracle request form is used and reports have the same names and syntax as they do in Oracle E-Business Suite, users can be scheduling Oracle jobs in minutes. Workload Automation and Oracle work as one integrated solution, even supporting non-Oracle users who can input Oracle processes and run native Oracle jobs using the same Workload Automation interface across multiple systems and applications environments.

## Features and Benefits

This scheduling solution for Oracle E-Business Suite delivers full enterprise scheduling capabilities that enable organizations to manage Oracle E-Business Suite processes in the broader context of heterogeneous IT environments. Oracle users can have greater control over and visibility into the execution of their processes and understand their relationship with other technologies in the data center. Key capabilities include the following:

**Universal Workflow Management** – Workflow management is an essential part of any enterprise resource planning (ERP) solution, because it allows critical transactions from various databases and applications to occur at the right time, every time. Workload Automation provides immediate problem detection and, in many cases, will automatically launch error resolution steps, enabling Oracle E-Business Suite jobs to be delivered efficiently and accurately. By leveraging Workload Automation workflow automation, organizations have seen rapid ROI from their Oracle applications investments.

**Event-Driven Processing** – In addition to time- and date-based job scheduling, the adapter can dynamically introduce single jobs and entire workflow processes into a schedule when triggered by business events from a wide range of application adapters and platform-supported agents. Also, using Cisco Workload Automation Adapter for the Oracle E- Business Suite, users can define events that can be used for alerting and invoking an automated response through email and/or inserting additional jobs into the schedule.

**Flexible Monitoring and Alerting** – Job status and output is automatically logged and can be viewed using the scheduler console. Alerts can be automatically sent to browser-enabled devices for anytime, anywhere status information and can be configured to initiate process recovery steps. Automated actions are extensive and are easily defined.

**IT Policy Alignment** – Each job can contain several process definitions, allowing granular controls and error recovery procedures that make it possible for IT staff to consistently follow documented best practices. Information Technology Infrastructure Library (ITIL) processes in the areas of request fulfillment, incident management, and change management can be supported and can include interfaces and integration techniques available for a range of ITIL-oriented operations environments.

**Robust Security and Audit Support** – Security policy—and changes to it—are tied to enterprise security management tools and processes. The Integrated security management features of Workload Automation can be applied to the implementation of Oracle applications connections, various roles, and jobs to enable secure management and use of required security credentials. Security features include:

- Validation of username and password against the Oracle E-Business Suite database during job definition and submission
- Confirmation of user responsibility rights before a run request is submitted
- Password encryption when invoking Oracle E-Business Suite forms
- Add and edit capabilities for an Oracle E-Business Suite job within Workload Automation

Features Summary

- Seamless application program interface (API Integration) with the Oracle Concurrent Manager
- Support for multiple Oracle E-Business Suite instances
- Connection of Oracle E-Business Suite to other platforms and applications with unlimited dependencies for Oracle requests and report sets
- Synchronized monitoring of all Oracle E-Business Suite report run requests
- Real-time status reports and real-time interaction with Oracle jobs
- User-defined and searchable views of past, present, and future Oracle jobs
- Support for parameter substitution for E-Business Suite processes
- Queue and priority management for all job instance requests
- Enhanced re-run functionality to overcome common database lockout errors

# 4. Cisco Workload Automation Adapter for Informatica

## Adapter Overview

**Managing Complex ETL Processes in the Enterprise**

Data integration software from Informatica plays a crucial role for businesses. It links and reports on database, supply chain management (SCM), accounting, human resource (HR), and sales information. Accessing and integrating large amounts of data from sources both inside and outside the firewall, and even from within the cloud, is complex and requires that many elements work together to deliver accurate and timely information that support the right strategic decisions.

In many cases, complex data pathways and their associated moving parts break, dependencies cannot be met, networks fail, systems go offline and, without visibility into each process, reports will be incorrect, late, or both. Workload Automation and Cisco Workload Automation Adapter for Informatica work together to deliver mission-critical data to the right place at the right time for all Informatica extract, transform, and load (ETL) pathways.

**Cisco Workload Automation Adapter for Informatica**

Cisco Workload Automation Adapter for Informatica allows users to schedule Informatica jobs through Workload Automation, enabling them to leverage its capabilities to automate, simplify, and improve job scheduling and ETL performance. With Cisco Workload Automation Adapter for Informatica, IT operations can add complex scheduling functions to their Informatica data pathways and consolidate multiple job routines into one centralized enterprise solution. The adapter can define, launch, and monitor data workflows within an Informatica PowerCenter environment. It allows Informatica administrators to integrate all data pathway executions into an automated, repeatable, and schedulable solution that delivers a high degree of visibility and control over steps in the ETL process.

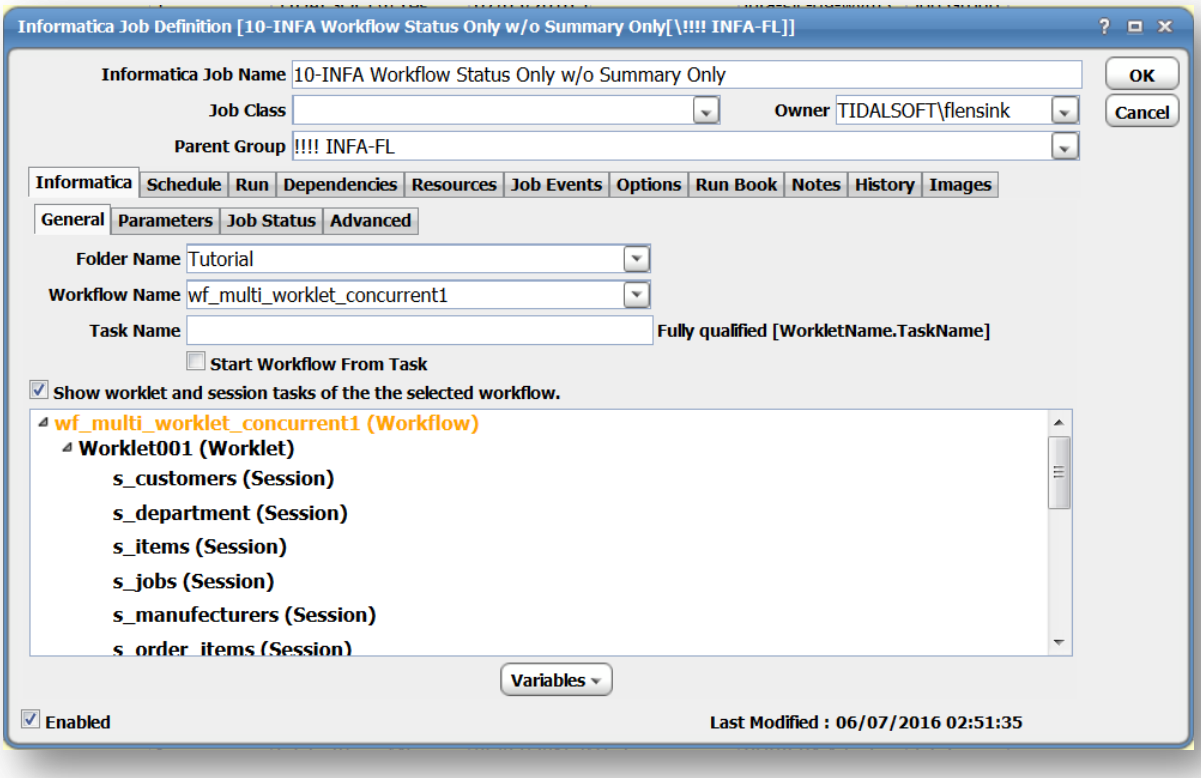
**How Cisco Workload Automation Adapter for Informatica Works**

Cisco Workload Automation Adapter for Informatica creates an interface between Workload Automation and Informatica PowerCenter, which gives IT operations staff a robust scheduling solution that incorporates cross-platform, cross-application dependency support, real-time interaction, and centralized control of Informatica data integration, ETL, and data warehouse processes.

Cisco Workload Automation Adapter for Informatica integrates with the PowerCenter server using Informatica Load Manager application program interfaces (APIs). Through these interfaces, the adapter communicates with Informatica PowerCenter to define, run, and monitor workflows.

Users can schedule, monitor, and manage PowerCenter workflows from the Workload Automation browser-based console, which provides rich scheduling features that include granular calendaring, events management, and access to enterprise-wide dependencies. Each Cisco Workload Automation Adapter for Informatica job definition encapsulates workflows loaded from the PowerCenter repository and permits parameter value overrides. Then, based on defined scheduling criteria, the adapter submits a workflow to the PowerCenter Integration Service. Job execution is authenticated against Workload Automation runtime user definitions and PowerCenter namespaces, roles, and users. After a workflow instance has been submitted, the adapter monitors all job steps and interactions until completion.

**Figure 9. Informatica PowerCenter workflows are viewed and managed using the Cisco Workload Automation job definition screen.**



## Features and Benefits

Cisco Workload Automation Adapter for Informatica extends Workload Automation, enabling IT staff to schedule Informatica jobs through the Workload Automation interface. It simplifies job scheduling and respects the integrity and security of the Informatica environment.

This adapter, with Cisco Workload Automation, delivers standardized and centralized scriptless scheduling for both simple and complex processes and thorough tracking and alerting capabilities. These capabilities work in conjunction to increase efficiency, reduce errors, and support enterprise objectives, allowing IT staff to focus on innovation and strategic initiatives. Specific capabilities include:

**Control and Visibility** – Cisco Workload Automation provides robust flexibility in developing ETL processing steps, giving users the ability to develop complex workflows that merge any ETL process and enterprise resource planning (ERP) application into a cohesive, centrally managed business process.

During execution, real-time task status details are visible from the job activity console of Workload Automation. Additionally, the adapter permits Informatica users to cancel, abort, recover, or rerun workflows from Cisco Workload Automation, a feature that provides added control over the Informatica environment.

When a job is complete, the adapter returns its final output, which can then be used to control downstream jobs, as well as details associated with the job run. Because Informatica jobs are defined like any other Workload Automation job, users can take full advantage of job, file, and variable dependencies, calendars, events, monitoring, and error notifications. In addition, they can benefit from detailed runtime error detection, alerts, and automated remediation.

**Seamless Support for Ad Hoc and Scheduled Informatica Jobs** – Business unit managers frequently make ad hoc ETL job requests that must be run immediately. Gradually, these jobs begin to be reused and fall into predictable patterns. For efficiency, they should be organized into calendars or schedules. Workload Automation, in conjunction with Informatica PowerCenter, allows ad hoc jobs to be easily transferred to standard production runs, eliminating manual intervention in the ETL job scheduling process. Working together, these two solutions also enable IT operations staff to incorporate Informatica data management processes into established IT policies and to seamlessly update run book operations.

| Features Summary | Benefits Summary |
|---|---|
| Defines, launches, and monitors any Informatica service request | Leverages existing technology and increases the return on investment in Informatica |
| Connects Informatica to other platforms, other applications, and other Informatica instances with unlimited dependencies | Reduces costs by consolidating Informatica workflows under one corporate-wide scheduling console with one set of internal procedures |
| Eliminates the need for scripting to integrate Informatica workflows | Reduces maintenance requirements and accelerates ROI |
| Provides advanced error control and failure notification | Expedites problem resolution, improves trouble ticket clearance rates, and enables IT to adhere to service legal agreements (SLAs) |
| Collects and consolidates log file data and captures Informatica process exit codes from jobs tasks and workflows | Makes workflows more efficient by adding a rich source of data for process trending and bottleneck remediation |
| Captures FTP files from outside the firewall, e.g., data from software-as-a-service (SaaS) applications or external partners | Integrates business partners and service providers into extended workflows |
| Creates standard Informatica data collection and ETL process templates | Customizes and reuses Informatica-store jobs to save time and reduce costs |

Ultimately, using Cisco Workload Automation Adapter for Informatica, in conjunction with Workload Automation, makes it possible to leverage existing technology and investment in Informatica and enables companies to increase efficiency and focus their resources on supporting strategic business initiatives.

# 5. Cisco Workload Automation Adapter for Oracle Database

## Adapter Overview

**Cisco Workload Automation Adapter for Oracle Database**

Cisco Workload Automation Adapter for Oracle Database provides job automation for mission-critical Oracle9i, 10g, and 11g databases. It is tightly integrated with Workload Automation to bring the automation, manageability, and reliability of a premier enterprise automation and management solution to this leading enterprise database platform. Cisco Workload Automation Adapter for Oracle Database maximizes throughput and minimize the time consumed by Oracle database jobs driven from within Oracle itself or from data that comes from other parts of an enterprise.

Cisco Workload Automation Adapter for Oracle Database enables users to schedule PL/SQL commands, Oracle database jobs, and stored procedures. In addition, the adapter can be used to pre-process and translate data generated by an Oracle application or module before data is processed by another Oracle application.

With Cisco Workload Automation, Oracle jobs can be integrated into larger, enterprise-wide workflows that are managed from within a single pane of glass. Dependencies within database workflows can now encompass events from all of other business-critical applications. As a result, data and application management can be automated and consolidated under one solution, reducing staff effort and expense while increasing productivity.

**How Cisco Workload Automation Adapter for Oracle Database Works**

Cisco Workload Automation Adapter for Oracle Database provides customizable options to meet special schema requirements. No scripting, manual intervention, or changes to an Oracle database or configuration parameters are needed. Once the adapter is configured, users can define and maintain the details of Oracle jobs and scheduled tasks—even launching and monitoring jobs already created within the Oracle scheduler—from within Workload Automation.

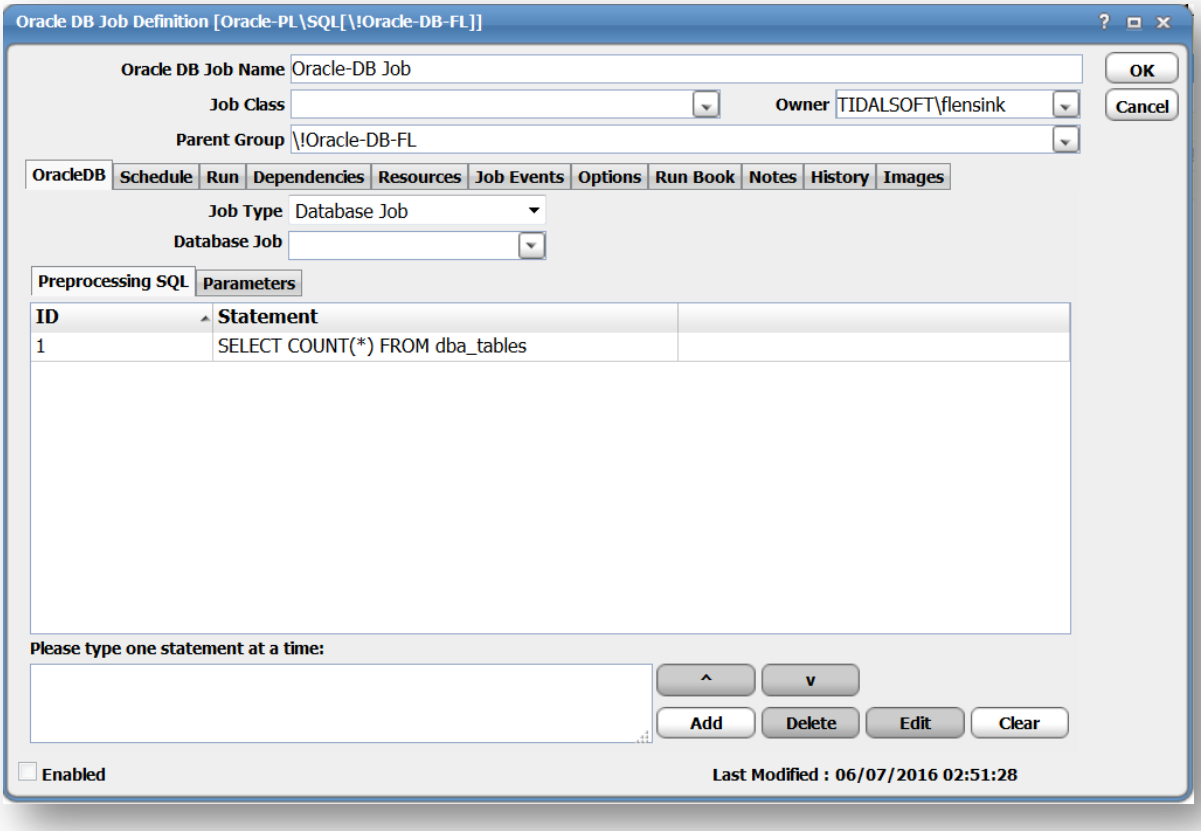
The full functionality of this heterogeneous automation solution is now available to the Oracle database, offering functions, such as extensive alerts on job abnormalities, unavailable resources, real-time status information, load balancing, and the ability to interact with current and future jobs.

## Features and Benefits

Because this adapter adds the ability to control Oracle jobs to Workload Automation, its feature set is accessed from the Workload Automation interface. Oracle job automation-related capabilities and advantages delivered through Cisco Workload Automation Adapter for Oracle Database provide richer, more advanced automation and management functions than Oracle's native toolset due to the following capabilities and advantages:

**Flexible Oracle Job Definition Options** – Within Workload Automation, users can define and run Oracle database jobs in two different ways. They can specify PL/SQL statements as job parameters and load them into job definitions—a capability not available through Oracle Enterprise Manager—which is helpful in generating reports. They can also load and run jobs by selecting ones that already exist in Oracle Enterprise Manager. Cisco Workload Automation Adapter for Oracle Database also offers an option to run a set of defined SQL statements against data to allow users to pre-select or modify data prior to executing a job. In addition, Workload Automation offers different ways to display job output, including aligned columns and XML options.

**Figure 10. Cisco Workload Automation offers a pre-processing SQL option to execute SQL code that should run before a job is activated.**



**Simpler Approach to Defining and Running Oracle Database Events** – Cisco Workload Automation Adapter for Oracle Database makes processing events simple. Granular Oracle database events can be captured and can respond to events, such as table modification, index creation, or database row activity. The complete range of Workload Automation actions also enables any database event to drive the workflow that transforms business processes into administrative action—efficiently and automatically. As part of an integrated events management system, Workload Automation makes it possible to view all runtime database events, which supports the creation of event-based job dependencies quickly and efficiently.

Users can easily pass variables from Cisco Workload Automation to an Oracle database job. With this capability, they can automatically initiate an Oracle job based on an external event, such as the arrival of a file from a trading partner or changes in a table from within another data store.

Workload Automation combined with Cisco Workload Automation Adapter for Oracle Database helps to deliver maximum job throughput, minimum processing time, and rock-solid reliability for an Oracle-centric workload—without the need to create cumbersome scripts. This powerful duo accomplishes these objectives by providing a single integrated enterprise job schedule solution that balances the service requirements of all batch workloads, whether they were created from within Oracle or exist in support of other applications within the enterprise.

**Feature Summary**

The following Oracle-specific features make the power of this scheduling solution easily accessible to Oracle users and enable them to quickly become productive:

- Oracle database job execution automation, including jobs created within Oracle, Oracle Enterprise Manager, or Workload Automation
- A pre-processor step for any Oracle database job that supports passing parameter values, such as selection criteria, to the job prior to execution
- The ability to schedule and run both native Oracle jobs and PL/SQL definitions
- The capacity to monitor, set dependencies, and interact with parent-child processes and to group logs and output to show parent-child relationships
- Launching of Oracle jobs based on an external events
- Oracle job output provided in XML and other formats without the need for additional coding
- Online access to PL/SQL jobs output without the need to create an intermediary file
- Job response to Oracle DDL and DML events without coding or database triggers
- The ability to import Oracle Enterprise manager jobs directly into Workload Automation
- Support for both Workload Automation and Oracle-defined events
- Seamless integration and streamlined knowledge transfer through the ability to display familiar Oracle job names, valid commands, and steps in the Workload Automation interface
- Print and archive parameters used by pre-existing oracle jobs
- Robust support of multiple Oracle instances and environments
- User-defined, filtered, real-time web browser views of past, present, and future Oracle database jobs

- Automatic alert notification for Oracle processing, machine, and job status problems
- A full range of Workload Automation calendaring features for calendar options that are richer and more extensive than those offered by Oracle native products
- Error messages that support extensive logging and BI data gathering
- Support for the heaviest processing loads and the ability to incorporate automated load-balancing functions through a multi-threaded architecture
- Script-free design tools

The most obvious benefit of this scheduling solution is that it improves overall IT efficiency by enabling organizations to adopt a single enterprise scheduling solution. Oracle database customers can confidently standardize on this scheduling solution because it makes it possible for them to:

- Centralize training and operational support staff in one environment
- Consolidate Oracle automation through a single console managed by a single IT group with a set of policy- driven run book procedures
- Link an Oracle database with other applications, databases, and business workflows, allowing unlimited dependency mapping and a broader, integrated job scheduling environment

# 6. Cisco Workload Automation Adapter for Microsoft SQL Server

## Adapter Overview

**Adding SQL Server Processes into Cisco Workload Automation Workflows**

When businesses require an enterprise-wide, heterogeneous automated job scheduling solution that incorporates SQL Server workflows, Workload Automation, combined with Cisco Workload Automation Adapter for Microsoft SQL Server, is the right choice. This powerful combination brings the reliability and flexibility of Cisco's Workload Automation enterprise workflow automation solution to this industry-standard database.

The adapter enables scheduling automation of new or existing SQL Server database job or job steps to be added to an enterprise-wide scheduling environment. SQL Server jobs can now be integrated into a larger business process workflow environment managed through a single pane of glass. Database dependencies that affect job steps can now be managed across the entire enterprise, and IT staff can quickly and easily pass variables to and from SQL Server database jobs. As a result, application and database automation and management can be consolidated in one solution, reducing staff effort and expense, while increasing productivity.

**How Cisco Workload Automation Adapter for SQL Server Works**

The adapter offers advanced scheduling and monitoring capabilities without scripting, manual intervention, or changes to SQL Server configuration parameters. Once the adapter is configured, SQL Server jobs are defined and maintained through the Workload Automation web user interface. This heterogeneous automation solution provides detailed control of SQL Server jobs through extensive alerts about job abnormalities, resource availability, load balancing, and machine functions. It also provides real-time status information from a single console and gives IT operations staff the ability to interact with current and future jobs.

## Features and Benefits

The adapter allows SQL Server jobs to be handled through the Cisco Workload Automation user interface. Users can access SQL Server job information and build workflows through a visual interface that allows them to define dependencies among SQL Server jobs alone or SQL Server jobs and jobs running on other systems and applications.

Important scheduling capabilities for SQL Server users include:

- **Database Job Definition and Scheduling** – The adapter enables three types of SQL Server jobs to be defined in Workload Automation:
- **Direct SQL Jobs** – Makes SQL Server calls using T-SQL statements
- **Database Jobs** – Includes one or more steps of various database task types, including the following:
    - ActiveX
    - Operating system commands
    - Replication distributor, merge, queue reader, snapshot, and transaction log reader
    - SQL Server analysis services command and analysis services query
- **Existing Database Jobs** – Adds, imports, or links to jobs already defined to run under the SQL Server agent
- **Detailed Job Monitoring and Controls** – Once database jobs are defined and scheduled, the solution provides real- time status information and gives IT staff the ability to interact with current and future jobs. Users can access detailed job step controls—hold job instances, abort, delete, re-run, and make ad hoc changes to a job instance before it has run. In addition, IT staff has constant communication with SQL Server workflows through the use of extensive alert capabilities which can be defined to send detailed messages regarding job abnormalities, resource availability, load balancing, and machine functions. In addition, Cisco Workload Automation offers different options for displaying job output, including aligned columns, CSV, raw, and XML. Users can also re-direct the output to a local file or log it to a database table.
- **Defining and Running SQL Server Events** – Cisco Workload Automation Adapter for SQL Server simplifies processing database events and does not require scripting or managing database triggers. The adapter gives users the ability to capture and respond to database activities, such as table modification, index creation, or database row activity. And Workload Automation permits views of all runtime database events, which users can then leverage to create events- based job dependencies quickly and efficiently.

The adapter can easily pass variables from Cisco Workload Automation to any SQL Server database job, pass job information across the entire batch job scheduling environment, and pass completed SQL Server jobs to other downstream workflow operations, such as extract, transform, and load (ETL) report creation. In addition, specific events—the arrival of a file from a trading partner, for example—can be used to initiate a new SQL Server action or job step automatically. Users can also assign alert actions to an event, making it possible for administrators to know when that event has been triggered. Users can assign alerts to the database user who triggered an event, the database object that triggered it, and the output of the event selected.

| Features Summary | Benefits Summary |
|---|---|
| Links SQL Server with other RDMBS and business applications and consolidates the automation of those jobs through a single console | Leverages an investment in SQL Server database to create a comprehensive business automation solution |
| Provides management functions that eliminate scripting, thereby allowing unlimited dependencies, integrated workflows, and scalability | Supports greater efficiency and productivity through a single enterprise-wide scheduling automation environment |
| Creates, schedules, and runs T-SQL queries and SQL Server jobs and monitors events without requiring database triggers | Reduces the margin for error and enables better resource utilization through fewer steps |
| Defines SQL Server jobs or imports existing jobs and runs them across multiple SQL Server instances | Enables SLAs to be met faster, by providing access to pre-tested steps |
| Supports jobs that include steps in various database tasks, including ActiveX scripts, OS commands, and direct inclusion of T-SQL statements | Eliminates expensive script generation and ongoing script management by supporting extensive calls |
| Monitors Table Create, Modify, and Delete; Index Create, Modify, and Delete; Row Add, Modify, and Delete | Reduces manual intervention through alert and even trigger automation |
| Creates a pre-processor step for any SQL Server job that supports passing parameter values, such as SQL selection criteria, to a job before running it | Save time with automated out-of-the-box processing steps |
| Launches SQL Server jobs based on external events, such as the arrival of a file | Create an enterprise-wide workflow solution through upstream and downstream job handoffs |
| Generates output of T-SQL queries in XML and other formats without additional coding | Helps administrators correct errors quickly and resolve job step bottlenecks via historic logs |
| Provides Workload Automation calendaring features with more extensive options than those offered by Microsoft tools | Aligns workflows to user demands without expensive manual calendar manipulations |

Cisco Workload Automation Adapter for Microsoft SQL Server helps IT staff deliver maximum database job throughput, rock-solid reliability, and comprehensive coordination of database activities as part of an enterprise-wide business process automation solution. This powerful solution accomplishes these objectives by providing a single integrated enterprise job scheduler that balances the service requirements of batch or on demand workloads, whether they were created from within SQL Server or exist in support of other applications and technologies across the enterprise.

# 7. Cisco Workload Automation Adapter for Web Services

## Adapter Overview

**Cisco Workload Automation Adapter for Web Services**

In service oriented architecture (SOA) environments, business process management (BPM) engines expose workflows enabled by Web Services. Workload automation solutions must support these types of connections in order to drive complex job runs to completion. Cisco Workload Automation Adapter for Web Services does just this - by automating and simplifying the scheduling of web-enabled and SOA-based deployments to provide control over jobs of all magnitudes and complexities.

**The Web Services Integration Challenge**

Typically, complex process scheduling is developed and tested offline before being migrated to production environments. Moving job scheduling definitions from development to test to production environments must be carefully managed in a structured and repeatable way.

Automating job scheduling across Web Services-enabled environments is very challenging because, unlike traditional enterprise resource planning (ERP) systems, Web Services environments provide an array of point services that must be coordinated and deployed. In addition, the boundaries between the composite applications based on these services are loosely defined, which allows the underlying components that provide the services to be quickly changed and recombined to serve business units as they evolve. As a result, these environments create significant complexities for enterprise wide scheduling solutions.

The capabilities of Cisco Workload Automation Adapter for Web Services, in combination with the broad coverage and rich functionality of the Cisco Workload Automation itself, work to reduce these complexities and enable IT organizations to realize the benefits of standards-based, end-to-end scheduling.

## Features and Benefits

The feature set and capabilities of this adapter not only reduce the effort and simplify the process of scheduling jobs in web services-enabled environments, but also allow those jobs to be viewed and managed in the context of other enterprise jobs through a single view. Enterprises can increase efficiency and improve business process execution by taking advantage of the following Cisco Workload Automation Adapter for Web Services functionality.

Cisco Workload Automation Adapter for Web Services gives you the flexibility of two of the most common types of Web Service integrations: representational state transfer (REST) and Simple Object Access Protocol/Web Services Description Language (SOAP/WSDL).

**REST Method Scheduling**

REST-based architectures allow system resources to be addressed in a stateless, client-server architecture where clients access and manipulate web resources through the HTTP protocol. The Web Services environment consumes the request in the most efficient manner, sometimes parsing the request as it is fulfilled. REST APIs are commonplace - by integrating the REST methodology in the Cisco Workload Automation, we give our customers an easy-to-use Web Services interface that does not need additional environmental modifications.

**SOAP/WSDL Operations Visibility**

Complementary to REST, SOAP creates a predefined contract with the client that describes how the service will be called, what parameters it expects, and what data structures it returns. The SOAP/WSDL job instance is an invocation of a Web Services operation defined for the connection. When the job instance runs, the SOAP request— with the operation name and its arguments (WSDL) - is sent to the Web Services endpoint, and the output of the event is returned as a SOAP response. The response can be modified and passed on to subsequent jobs across the entire range of scheduled job types available.

One of the key strengths of the adapter is that once the components of the Web Services Description Language (WSDL) have been parsed, all the operations inherent in the WSDL become available for scheduling design through the standard graphical job definition screens, extending the standardized operations approach across the full range of environments that are SOAP-enabled.

**Rich Web Services API**

Web Services permit the deployment of standard service-based architectures across an underlying range of current and legacy platforms and applications. Cisco Workload Automation is able to define jobs and run job instances against these services and therefore against any application endpoint (Java, .NET, or application platform) or on any OS platform (Windows, UNIX, or Linux, and so on) that have been enabled for REST or SOAP Web Services.

**Workload Automation Integration**

Cisco Workload Automation Adapter for Web Services extends the reach of Cisco Workload Automation with critical capabilities that simplify scheduling for web services environments:

- Allows jobs to be defined that invoke Web Services operations

- Supports any REST and SOAP Web ServiceParses the WSDL to discover all the defined operations and arguments
- Imports WDSLs directly into the adapter from an existing services library
- Supports standard PUT, GET, POST, and DELETE syntax for REST methods
- Uses variables as input arguments to Web Services calls, allowing the passing of information across job flows
- Supports the passing of web services call responses to jobs of any type in larger business flows, including the ability to modify output via XML style sheet language for transformations (XSLT)

Because Cisco Workload Automation Web Services jobs are defined like any other Cisco Workload Automation job, you can take full advantage of job, file, and variable dependencies, calendars, events, email notifications, and all other Cisco Workload Automation capabilities to manage the most complex Web Services scheduling environments in your enterprise.

**Move to a Single Scheduling Environment**

Cisco Workload Automation provides IT operations staff with an integration platform for all job scheduling needs. With Cisco Workload Automation Adapter for Web Services, IT operations staff can include a vast array of Web Services-based deployments in a single standard scheduling environment, regardless of the types of applications and systems deployed across the enterprise. These solutions eliminate multiple tools, scripting, protracted resolution times, and many other costly and time-intensive issues.

Cisco Workload Automation Adapter for Web Services demonstrates the ongoing support that Cisco Workload Automation scheduling solutions provide to dynamic, evolving IT environments.

# 8. Cisco Workload Automation Adapter for PeopleSoft

## Adapter Overview

**Integrating PeopleSoft into the Enterprise**

Workflow scheduling complexity and cross-application functionality are major challenges facing IT operations professionals today. The native PeopleSoft Process Scheduler has limited or no processing or monitoring support for other enterprise resource planning (ERP) applications, web services, or extract, transform, and load (ETL) processes when a PeopleSoft instance does not exist on a target resource. Fortunately, there is a way to integrate PeopleSoft with other applications, services, and processes through an enterprise-wide, heterogeneous automation product that expands and leverages existing PeopleSoft workflow functionality.

**Bringing Automation Power to PeopleSoft Applications**

Cisco Workload Automation Adapter for PeopleSoft brings a highly scalable, cross-application, workflow automation solution to the PeopleSoft ERP platform. PeopleSoft jobs can now be part of larger business process workflows that are managed from a single console. Users can extend the productivity gains of the PeopleSoft scheduling environment by setting dependencies to and from other programs, including Oracle, SAP, or custom Java applications.

The integration of PeopleSoft processes using the adapter leverages the investment in both products, because training and staff can be minimized and enterprise-wide application automation and management can be consolidated under one solution to deliver better security, productivity, and higher service level performance.

**Cisco Workload Automation Adapter for PeopleSoft Functionality**

Changes within the PeopleSoft environment are not required, and it is not necessary to install extra routines when implementing the adapter. Cisco Workload Automation Adapter for PeopleSoft can be installed on the same system as Workload Automation and be directly connected to the PeopleSoft Process Scheduler. Users can begin scheduling PeopleSoft jobs in a matter of minutes, because a simple connection dialog box enables the adapter to recognize those jobs and their status.

Workload Automation can define complex dependences among data from external applications, results files, or a PeopleSoft process from a different instance when running business intelligence reports such as PeopleSoft SQR Reports, PSnVision, or Cobol SQL.

Workload Automation and PeopleSoft work as an integrated solution. Users of other ERP solutions can manage PeopleSoft processes and run PeopleSoft Process Scheduler using the same Workload Automation console interface. Workload Automation provides a way to connect PeopleSoft applications with cross-platform, cross-application, enterprise-wide workflow processing.

## Features and Benefits

This adapter bridges the gap between a data center's PeopleSoft applications and its other ERP environments, and it increases the manageability of the PeopleSoft environment.

The following discussion provides more detailed descriptions of core features that deliver high-level business benefits, as well as many day-to-day usability-related benefits:

**Batch and On Demand Processing** – The adapter is designed to accommodate batch and on demand job processing for PeopleSoft applications, providing comprehensive support for the traditional date and time scheduling model, as well as complex event- and dependency-based processing.

**IT Policy Alignment** – Each job group can contain several job definitions that enable detailed control and error recovery procedures. These procedures make it possible for IT staff to follow documented best practices consistently. Information Technology Infrastructure Library (ITIL) processes in the areas of request fulfillment, incident management, and change management can be supported, with interfaces and integration techniques available for a range of ITIL-oriented operations environments,

**Event-Driven Processing** – In addition to time- and date-based scheduling, the adapter can dynamically introduce jobs—and entire business processes—into most computing environments when triggered by business events from a wide range of application adapters and platform-supported agents.

**Flexible Monitoring and Alerting** – Cisco Workload Automation Adapter for PeopleSoft allows users to view and manage real-time alerts within the scheduling system. Alerts can be automatically sent to email-enabled devices for anytime, anywhere status connectivity and can be configured to initiate process recovery steps. Automated actions are extensive and can be easily defined. These actions include sending an email message to the appropriate owner, generating a message to the central console, or triggering an incident to an IT support technician via the appropriate ITIL-oriented operations systems.

**Robust Security and Audit Capabilities** – Security policy—and changes to it— are tied to enterprise security management tools and processes. For example, access can be controlled in the areas of scheduling functionality as a whole or tied to specific jobs, events, or actions. Access can also be linked to an individual user or a workgroup.

| Feature Summary | Benefits Summary |
|---|---|
| Consolidates PeopleSoft application automation under one corporate-wide console solution, with one staff and one set of internal procedures | Leverages an investment in PeopleSoft to create a comprehensive business process automation solution for the entire enterprise |
| Enables user to monitor files that are used as event triggers for the initiation of run requests | Provides broader coverage of integrated workflows |
| Supports all PeopleSoft process types, including SQR Reports, Cobol SQL, Crystal Reports, PSnVision, and the Message Agent API | Delivers greater efficiency and more reliable data |
| Provides richer, more advanced scheduling function than the native PeopleSoft Process Scheduler | Increases efficiency and productivity |
| Connects PeopleSoft applications to other platforms, business applications, and PeopleSoft instances, with unlimited dependencies | Consolidates scheduling across the enterprise with broader, integrated workflows |
| Supports multiple PeopleSoft instances and application servers | Increases flexibility and scalability |
| Seamlessly integrates with the PeopleSoft Process Scheduler | Minimizes maintenance and increase ROI |
| Facilitates the use of FTP to access PeopleSoft job output | Provides broader coverage of integrated workflows |
| Permits users to view and interact with PeopleSoft application process steps as well as jobs | Leverages an investment in PeopleSoft |
| Handles the heaviest PeopleSoft processing loads through multi-threading capabilities | Increases flexibility and scalability |
| Enables validation of user names and passwords against the PeopleSoft database user | Consolidates and strengthens security across the job scheduling topology |

# 9. Cisco Workload Automation Adapter for HP Operations Managers

## Adapter Overview

**Cisco Workload Automation Adapter for HP Operations Manager**

Consolidating Business Process Execution and Event Management Business process automation has evolved from managing routinely scheduled batch jobs to handling continuous mission-critical workflows that encompass cross-platform, cross-application processes. IT operations staff is under constant pressure to deliver highly complex services with constrained budgets and resources. Given this scenario, dealing with application problems and other infrastructure issues, managing resource availability, and monitoring the performance of important data center processes have become mission-critical.

To strengthen IT's ability to manage data center operations, Cisco Workload Automation Adapter for HP Operations Manager extends the functionality of HP Operations Manager tools that monitor and maintain IT services. Working with the adapter, Workload Automation delivers complex dependency- and schedule-driven workflow status information to HP Operations Manager. Together, they function as one continuous events-and-workflow-management system.

Accessed through the HP Operations Manager console, Workload Automation delivers sophisticated benefits that include workflow automation, uptime reliability, n-tier scalability, and advanced error notification. These increase IT management's confidence in its ability to adhere to service-level agreements (SLAs).

**Two-Way Communication in One Solution**

Cisco Workload Automation Adapter for HP Operations Manager provides two-way communications between the HP Operations Manager console and Workload Automation, using the HP native messaging protocol (opcmsg). The adapter delivers Workload Automation environmental information to the HP Operations Manager console and allows administrators to control Workload Automation job functions. To streamline integrating Workload Automation and HP Operations Manager, the following components are provided with the adapter:

- Application templates for accepting messages sent by Workload Automation
- Message, monitor, and action templates
- Templates for monitoring Workload Automation services

## Features and Benefits

This adapter makes it simpler for users to manage enterprise scheduling through HP Operations Manager. The adapter also simplifies the integration of Workload Automation into HP Operations Manager, making it possible to view scheduling within the management framework. HP Operations Manager users can leverage Cisco Workload Automation Adapter for HP Operations Manager to help them streamline the management of their broader environment.

The adapter offers the following capabilities:

**Advanced Events Management** – When an abnormality, such as a job that runs too long, occurs in the Workload Automation environment, job process information, including log files, is delivered to the HP Operations Manager console. When exceptions or abnormal events take place, the pre-programmed Workload Automation job definition notifies the HP Operations Manager console of the condition. An operator can then create custom messages and severity levels that can be associated with specific application jobs and conditions. Supported severity levels include critical, major, minor, warning, normal, and unknown. In addition, messages generated by Workload Automation and displayed in the HP Operations Manager console are annotated and include help text.

**Automated Response Initiation for Priority Events** – For all jobs, especially those of the highest priority, custom messages and recovery actions can be configured from the HP Operations Manager console. Some of the messages provided by Workload Automation have embedded actions associated with them. Clicking "Perform Action" in the HP Operations Manager console sets them in motion.

To strengthen processing throughput and accelerate events resolution, ad hoc and user-initiated actions can also be saved and reconfigured to become automated HP Operations Manager tasks. These pre-programmed actions can be grouped and linked, creating a cascade of diagnostic or recovery tasks that pinpoint the root cause of a workflow problem.

**Job Control from HP Operations Manager** – The integration of Workload Automation and HP Operations Manager enables IT operations staff to control jobs scheduling from the HP OM console. An administrator can start or restart Workload Automation jobs, stop and start agents, and perform other workflow automation functions from HP Operations Manager. These functions can be performed manually or incorporated into the earlier-discussed events management solutions. Events can be prioritized, issues can be diagnosed, and jobs can be restarted or terminated—automatically.

**Centralized Point of Control** – Linking Workload Automation workflow information, alerts, automated error remediation, and job process controls to this industry-leading event management framework gives IT operations staff unprecedented visibility and control over the enterprise-wide job processing environment, saving time through increased efficiency and delivering to service levels by significantly reducing mean time to resolution (MTTR).

Cisco Workload Automation Adapter for HP Operations Manager helps organizations to streamline operations by providing new ways in which to increase automation, visibility, and control over processes. As a result, these organizations can focus valuable IT resources on strategic tasks and initiatives rather than job scheduling activities.

| **Features Summary** | **Benefits Summary** |
|---|---|
| Offers a single point of control for both enterprise-wide business process automation and event management | Improves visibility into the workflow processing and event management |
| Delivers continuous monitoring of Workload Automation workflow performance and availability | Enables organizations to meet SLAs through faster, easier problem resolution |
| Sends alert notifications from 40 different event triggers directly to the HP Operations Manager console | Minimizes service disruptions, improving incident management and accelerating service restoration |
| Provides out-of-the-box monitoring of the health of the Workload Automation infrastructure | Minimizes disruption to mission-critical processes |
| Integrates workflow automation into HP Operations Manager or a third party service desk for documented incident/case history | Provides cross-platform, cross-application event support for better visibility and control |
| Interacts with native Workload Automation alert-triggered processes | Eliminates expensive script development and management |
| Delivers pre-defined job process information and allows operators to customize alert responses for automated error recovery | Improves workflow efficiencies and substantially reduces MTTR |

# 10. Cisco Workload Automation Adapter for Java Database Connectivity (JDBC)

## Adapter Overview

**Integrating Database Connectivity for Enterprise-Wide Job Scheduling**

To improve their competitive advantage, businesses are investing in applications, databases, and data warehouse appliances that increase operational efficiency. These solutions manage critical data and logic from various functional areas including financials, inventory, procurement, and order fulfillment.

Processing the right data at the right time, managing dependency logic, and automating job sequencing are critical to the smooth operation of the enterprise. To achieve these goals, two conditions are necessary:

- Broad enterprise-wide visibility of the entire application, storage, and database landscape
- The ability to automate a wide range of functions, from dependency mapping, to application and database job steps, to event and alerts management

**End-to-End Workload Automation with Cisco Workload Automation**

Built for the needs of database processing, the Cisco Workload Automation Adapter for Java Database Connectivity (JDBC) is the interface between Cisco Workload Automation and JDBC-compliant database management systems. Together, they provide IT organizations with comprehensive cross-platform, cross-application job scheduling functionality, real-time interaction, and centralized control. With the adapter for JDBC, IT organizations can add the workload automation, manageability, and reliability of Cisco Workload Automation to JDBC- compliant databases. Users can manage all workload processes from a central console and integrate database processes into the wider enterprise job-processing environment to reduce errors and increase resource efficiency.

**How Cisco Workload Automation Adapter for JDBC Works**

Once the adapter has been implemented within the Cisco Workload Automation environment, administrators can define, launch, monitor, and control standard database processing such as Structured Query Language (SQL) statements and stored procedures. Cisco Workload Automation allows IT staff to quickly resolve job failures, incorporate multiple cross-application dependencies, and use process models, which include JDBC-compliant databases. Cisco Workload Automation Adapter for JDBC can submit predefined SQL processes or stored procedures to Cisco Workload Automation and monitor the status of each process as it runs. Cisco Workload Automation can be used to monitor database events, which can then be used to trigger other

scheduling activities such as enterprise resource planning (ERP) execution or data integration tasks. Modifications to the database management system (DBMS) environment are unnecessary because Cisco Workload Automation uses the vendor's specifically defined JDBC drivers.

## Features and Benefits

Cisco Workload Automation Adapter for JDBC and Cisco Workload Automation can deliver rapid return on investment (ROI) to organizations investing in database solutions. Working together, these products bring job scheduling in JDBC-compliant environments into an enterprise context and provide greater automation, visibility, control, and reliability. The following capabilities are crucial to delivering the benefits that users can expect from this solution.

**Event-driven processing:** In addition to time- and date-based job scheduling, the adapter can dynamically execute single jobs and entire workloads when triggered by business events from a wide range of adapters and platform-supported agents. Also, using the adapter, Cisco Workload Automation users can define database events that can be used for alerts and for invoking an automated response through email and inserting additional jobs into the schedule.

**Flexible monitoring and alerting:** Job status and output are automatically logged and can be viewed using the Cisco Workload Automation console. Alerts can be automatically sent to browser-enabled devices for anytime, anywhere status information and can be configured to initiate process recovery steps.

**IT policy alignment:** Each JDBC job can contain several process definitions, allowing for granular controls and error recovery procedures. Information Technology Infrastructure Library (ITIL®) processes in the areas of request fulfillment, incident management, and change management can be supported and can include interfaces and integration techniques available for a range of operational environments.

**Comprehensive security and audit capabilities:** Security policy and changes to it are tied to enterprise security management tools and processes. The integrated security management features of Cisco Workload Automation can be applied to the implementation of JDBC connections, roles, and jobs to help ensure secure management and use of required security credentials.

# 11. Cisco Workload Automation Adapter for OS/400

## Adapter Overview

**Mainframe Business Processing in a Distributed Environment**

Managing application processes within OS/400 mainframe environments is mission-critical even in many modern enterprise business process infrastructures. These environments can also include growing numbers of applications running on a wide range of distributed servers. Integrating, automating, and managing business-critical applications in such environments can be difficult, expensive, and time consuming. Cisco Workload Automation Adapter for OS/400, combined with Workload Automation, is a proven and scalable solution that excels in making complex workflow processing infrastructures simpler to manage.

**The Power to Expand and Automate OS/400 Workflows**

The investment in enterprise-wide applications requires a comprehensive job scheduling solution to meet the challenge of managing complex workflows across heterogeneous environments, which include the OS/400 platform. Using Cisco Workload Automation Adapter for OS/400, IT operations staff can bring script-free, job automation functionality to the IBM OS/400 environment and expand its capabilities through the use of exception -based management, fault tolerance, and enterprise-wide ERP integration—features that most OS/400 job schedulers do not offer.

Using Cisco Workload Automation Adapter for OS/400, batch jobs, job dependencies, and file events can be defined, launched, monitored, and controlled without modifying existing OS/400 jobs or job definitions. This non-invasive adapter also enables dependencies from other systems to be combined with existing OS/400 applications or schedules.

This adapter, combined with Workload Automation, offers an easy-to-use, single point of control for monitoring and interacting with OS/400 jobs and the flexibility to integrate those jobs into enterprise business workflows that involve applications on other ERP platforms, such as SAP, PeopleSoft, and Oracle. Cross-platform, cross-application dependencies, variables, and exceptions can be embedded into event- or time-based jobs or attached to native OS/400 jobs managed within Workload Automation. The result is greater productivity and reliability and reduced implementation and operations costs.

**Protecting an Investment in OS/400**

As the needs of the enterprise expand, the OS/400 platform must be able to integrate its business process data with other systems and applications. This requires a comprehensive solution to meet the challenge of application automation across heterogeneous environments. Most mainframe environments are the hub of IT operations, and the investment in this infrastructure is a substantial part of the overall computing budget. Workload Automation, combined with the OS/400 adapter, allows IT managers to leverage their investment in the mainframe infrastructure by expanding its processing power across the entire enterprise.

Furthermore, IT organizations can no longer afford to manage data processing among these applications manually, especially in the face of increased business demands for efficiency and competitive advantage. By automating internal batch jobs, distributed workflows, business intelligence reporting, and sophisticated alerts management, efficiencies are realized and complex services are executed faster with minimal down time.

Because of these imperatives, many organizations have turned to Workload Automation to fill the gap between the OS/400 platform and their Windows, UNIX, Linux, OVMS, and z/OS environments, as well as to increase the manageability of their OS/400 environment.

**Batch and On Demand Processing** – The adapter is designed to accommodate batch and on demand job processing on the OS/400 platform, providing comprehensive support for the traditional date and time scheduling model, as well as complex event and dependency-based processing.

**IT Policy Alignment** – Each job group can contain several job definitions that enable detailed control and error recovery procedures. These procedures make it possible for IT staff to follow documented best practices consistently. Information Technology Infrastructure Library (ITIL) processes in the areas of request fulfillment, incident management, and change management can be supported, with interfaces and integration techniques available for a range of ITIL-oriented operations environments,

**Event-Driven Processing** – In addition to time- and date-based scheduling, the adapter can dynamically introduce jobs and entire business processes into a mainframe environment when triggered by business events from a wide range of application adapters and platform-supported agents.

**Flexible Monitoring and Alerting** – Cisco Workload Automation Adapter for OS/400 allows users to view and manage alerts within the scheduling system. Alerts can be automatically sent to email-enabled devices for anytime, anywhere status connectivity and can be configured to initiate process recovery steps. Automated actions are extensive and can be easily defined. They include sending an email message to the appropriate owner, generating a message to the central console, or triggering an incident report to an IT support technician via the appropriate ITIL-oriented operations systems.

**Robust Security and Audit Capabilities** – Security policy, and changes to it, are tied to enterprise security management tools and processes. For example, access can be controlled in the areas of scheduling

functionality as a whole or tied to specific jobs, events, or actions. Access can also be linked to an individual user or a workgroup.

| Features Summary | Benefits Summary |
|---|---|
| Delivers unified, enterprise-wide application scheduling automation for OS/400, Windows, UNIX, Linux, OVMS, and z/OS environments | Leverages and extends an existing investment in the IBM OS/400 platform |
| Provides a single user interface to monitor and control workflows regardless of platform, allowing a centralized staff to be used for business operations | Reduces training time and costs by providing a single, enterprise-wide solution |
| Runs OS/400 commands, RPG, and CL scripts | Leverages an existing investment in IBM mainframe technology |
| Manages any batch jobs, including third-party applications from Oracle, PeopleSoft, and SAP | Centralizes and consolidates business operations, creating greater efficiencies |
| Scans output for particular values or exit codes to enable setting system-wide dependencies | Increases productivity through granular automation capabilities |
| Enables the setting of multiple, conditional dependencies on OS/400 jobs | Saves time and money by automating advanced workflows |
| Allows OS/400 jobs to be run based on the File Exists condition on other platforms | Saving time and money by automating advanced workflows |
| Offers robust fault tolerance | Prevents the disruption of critical processes |

# 12. Cisco Workload Automation Adapter for VMware

## Adapter Overview

**Cisco Workload Automation Adapter for VMware**

Cisco Workload Automation Adapter for VMware enables companies that use Cisco Workload Automation to execute a set of VMware processes via a single point of control. The adapter allows users to connect VMware operations to the enterprise schedule, define them as part of a business process, and monitor VMware operations, as well as to define and leverage VMware events. Working in concert, this enterprise adapter for VMware and Cisco Workload Automation schedule and run business processes and manage their required virtual resources, and incorporating them into the enterprise computing environment.

When virtualization is part of data center topology, this adapter for VMware is used in conjunction with Cisco Workload Automation to build intelligent automation around managing virtual machine (VM) resources and their associated operations, and to align the IT infrastructure with business process requirements. In this way Cisco Workload Automation and Cisco Workload Automation Adapter for VMware can help reduce infrastructure and software costs by optimizing virtual resources and increasing administrative efficiency.

**The Challenges of Workload Automation in a Virtualized World**

Businesses are progressively deploying service-oriented architecture (SOA)-based applications and virtualized environments. Administering these decoupled resources presents tremendous challenges in tracking and delivering optimum SLA performance for workload management, because in these fluid, dynamic models computing resources vary in state and physical location. Complexity is increased by the existence of multiple virtualization vendor tools that are not unified via single pane of glass. Ultimately, these two factors significantly impact an enterprise's ability to gain the most efficiency from their virtualized workload processing environments.

A simple way to gain visibility into and control over business processes in these new environments is to link the execution of business processes and data center operations tasks. In this way, users can have increased confidence that business processes will be available, run smoothly and reliably. Optimizing the configuration state of VMs in the context of a scheduled workload can result in higher data center resources efficiencies and ultimately, lower VM management costs. This adapter for VMware, combined with Cisco Workload Automation, addresses these challenges.

**Bringing Virtual Machine Orchestration into the Workload Automation Environment**

In a virtualized environment, host servers often support anywhere from dozens to hundreds of VMs. Coordinating the availability of hosts through power management, preserving and restoring machine states through snapshots, and configuring servers for specific tasks can be challenging. As a result, managing workloads in virtualized environments create significant issues for a scheduling solution. Using Cisco Workload Automation can access all applications and systems and supports the reliable functioning of the virtualized environment itself becomes more critical than ever to the successful execution of business processes.

Cisco Workload Automation Adapter for VMware connects to both ESX Server and VMware virtual infrastructure web services. In so doing, it manages VM, and hosts operations, and it brings them into the framework of the enterprise workload processing environment. VMware operations are managed through the Cisco Workload Automation browser-based interface through which all workloads are managed.

Use of the adapter extends the reach of Cisco Workload Automation by simplifying workload management in virtualized environments. In addition, the adapter supports events that can be used to automate a response to changes in power states and/or host and guest performance conditions.

Table 1 below lists the VMware operations that the adapter can manipulate and add to complex automated workload that include ERP, business intelligence, data integration, data exchange and database jobs.

| | |
|---|---|
| **Power Tasks** | • Query Power State<br>• Power On<br>• Power Off<br>• Suspend<br>• Reset<br>• Reboot Guest<br>• Shutdown Guest<br>• Standby Guest |
| **Snapshot Tasks** | • Create Snapshot<br>• Rename Snapshot<br>• Remove Snapshot<br>• Remove All Snapshot<br>• Revert to Snapshot<br>• Revert to Current |
| **Configuration Tasks** | • Reconfigure<br>• Migrate(VMotion)<br>• Upgrade Virtual Hardware<br>• Install/Upgrade Tools |
| **Host Tasks** | • Power Up Host |

- Power Down Host
- Reboot Host
- Enter Maintenance
- Exit Maintenance

For example, consider that a automated workload requires a dedicated machine with a unique configuration of CPU, memory, and applications only four times a year to produce quarterly tax reports. If this machine is virtualized the necessary cores can remain powered off until the job schedule demands it. Knowing when to power a VM on or off or when to take a snapshot for checkpoint backups is the job of a scheduler. Automating this task within the context of the larger business workload environment is an important capability provided by this solution.

## Features and Benefits

Cisco Workload Automation Adapter for VMware provides easy-to-use graphical views that allow administrators to bring the scheduling of VM operations into the Cisco Workload Automation framework through a straightforward process. With the adapter, users have a unified view of an entire schedule, regardless of environment.

VMware customers will find that this adapter is specifically designed to meet their service delivery needs. Specific features that automate VMware operations include the following:

**Ability to Schedule ESX Actions within** Cisco Workload Automation - Users can automate the scheduling of power on/off, snapshot, and configuration actions within the ESX hypervisor. This eliminates the need to manually perform ESX actions as business conditions and workloads change. This automation significantly reduces processing errors and “swivel-chair” management.

**Trigger Actions Based upon Power and Performance Data from ESX** - Both ESX processes and business application jobs can be triggered by power state and performance data; operations such as keeping a rogue VM offline; running an application workload when resources are available; or running an ERP job when a VM is turned on. This allows resources such as servers, applications, operating systems (OS), databases, and VMs to be managed for maximum efficiency.

**Integration with vCenter for Workload Automation** - Connection to vCenter enables Workload Automation to manage key tasks such as VM cloning, and cold, hot, and storage migration. With vCenter/Workload Automation integration, users can automate and orchestrate cross-ESX server tasks that make it possible to better manage resources based on workload context and need. This capability increases workload efficiency, because resource availability can be automated and directly applied to critical job schedules. Manual operations and outages can be minimized by allowing the scheduler to control which VMs are at which resource state for a particular job run.

**Application of Core Workload Automation Features for VMware** - VMware users can leverage all the features of Cisco Workload Automation to define and manage VM processes, create dependencies, and collect output. In this way, VMware operations become part of enterprise-wide business processes, and virtualized environments can be more easily managed through the deep integration capabilities of Cisco Workload Automation. IT gains greater control of all workloads run in the virtualized environment and the state of the virtual environment itself.

**Users and Security** - Cisco Workload Automation for VMWare incorporates and extends the VMware security model for consistency and ease of use.

**Defining VMware Configurations as Part of a Business Workload** - Ultimately, data center automation and efficiency initiatives must define VMware operations as part of the workload infrastructure. Cisco Workload Automation and for this adapter for VMware enable business workloads managed in virtualized environments to be easily integrated into the enterprise.

**Enterprise Coverage** - Cisco Workload Automation provides the integration platform for all enterprise job scheduling needs, and this adapter for VMware offers ongoing support for changing IT environments. This solution eliminates multiple tools, manual intervention, protracted resolution times, and many other costly operations issues. It also provides a single interface for managing jobs and dependencies across the enterprise. Through the adapter, users can manage VMware's capabilities, as well as the enterprise-class functionality provided by Workload Automation.  Adapter for VMware enables organizations to integrate business workload execution and virtualization process management in VMware environments.

Ultimately, not only does workload automation increase operational efficiency by simplifying job scheduling, but it can also increase VM efficiency, because users can:

- Reduce manual operations, misprocessing, and "swivel-chair" integration by scheduling ESX processes directly from Workload Automation
- Use resources effectively by setting a schedule to trigger actions based on power and performance metrics from ESX
- Automatically migrate critical resources through the Cisco Workload Automation integration with vCenter

# 13. Cisco Workload Automation Adapter for zLinux

## Adapter Overview

**Cisco Workload Automation Adapter for zLinux**

Cisco Workload Automation Adapter for zLinux works with Workload Automation to bring Linux-based mainframe jobs into a single enterprise view. The adapter simplifies the process of defining and scheduling Linux-based mainframe jobs and job groups and seamlessly integrates jobs and processes into enterprise workflows. Cisco Workload Automation brings ease of use and a high degree of scalability to job scheduling for the zLinux environment. Its capacities include the ability to execute millions of jobs a day, exception-based management, role-based security, and the extensibility to include other technologies in heterogeneous environments.

Together, Cisco Workload Automation Adapter for zLinux and Workload Automation create a functionally rich, easy-to-use enterprise job scheduling solution that can leverage specific mainframe attributes—24x7 reliability, fast I/O processing, and enhanced security features—to support continuous, enterprise-class business operations.

**How Cisco Workload Automation Adapter for zLinux Works**

Cisco Workload Automation Adapter for zLinux extends the power of Workload Automation to IBM zSeries mainframe computing environments running the zLinux operating system (OS). This highly scalable and flexible solution allows IT scheduling administrators to create, manage, and monitor jobs and their dependencies across complex enterprise workflows that may include zLinux instances and other z/OS mainframe instances, as well as Windows, UNIX, OS/400, and other Linux systems. The adapter enables script-free scheduling functionality for mainframe job processing in the zLinux environment, building on the inherent fault tolerance of the core scheduler itself. In addition to managing schedules across multiple OS platforms, application-specific jobs can also be run across a range of enterprise resource planning (ERP), database, business intelligence (BI), and web services integration platforms.

The adapter gives users the ability to manage cross-platform, cross-application workflows via a single pane of glass and to automate mainframe batch jobs by setting time, file, or a range of inter-job dependencies. Using Cisco Workload Automation Adapter for zLinux reduces operating costs and improves service levels, because there is no need for ongoing script management or costly manual intervention to coordinate job executions across the zLinux environment and beyond.

## Features and Benefits

Cisco Workload Automation Adapter for zLinux can dramatically simplify the process of scheduling, tracking, and managing job workflows regardless of the number of dependencies, systems, and applications involved. This adapter, in combination with Workload Automation, offers the following capabilities:

**Increased Mainframe Reach** – The adapter makes it possible to manage dependencies among existing mainframe applications and other distributed job processes. Jobs running on the zLinux platform can be triggered by status changes, by the results of jobs running on other platforms, or by processes running in other applications. Users can define, launch, monitor, and control application and database jobs and can respond to file events without modifying existing jobs or schedules.

**Batch and On Demand Processing** –The adapter is designed to accommodate batch and on demand job processing on the zLinux platform, providing comprehensive support for the traditional date and time scheduling model, as well as complex event- and dependency-based processing.

**zLinux Virtualized Environments** – Cisco Workload Automation Adapter for zLinux is well suited to the rapid changes within a virtualized mainframe environment. Whether zLinux instances are implemented in individual logical partitions(LPARs) or z/VM virtual machines (VMs), the zLinux adapter allows users to schedule jobs effectively, and it scales to accommodate the growth and expansion of a zLinux infrastructure.

**IT Policy Alignment** – Each job group can contain several job definitions, enabling detailed control and error recovery procedures. These procedures make it possible for IT staff to consistently follow documented best practices. Information technology infrastructure library (ITIL) processes for request fulfillment, issue management, and change management can be supported, with interfaces and integration techniques available for a range of ITIL-oriented operations environments,

**Event-Driven Processing** – In addition to time- and date-based scheduling, the adapter can dynamically introduce jobs—and entire business processes—into a mainframe environment when triggered by business events from a wide range of application adapters and platform-supported agents.

**Flexible Monitoring and Alerting** – Cisco Workload Automation Adapter for zLinux allows users to view and manage alerts within the scheduling system. Alerts can be automatically sent to browser-enabled devices for anytime, anywhere status connectivity and can be configured to initiate process recovery steps. Automated actions are extensive and can be easily defined, enabling users to send an email message to the appropriate owner, generate a message to the central console, or trigger a support incident via the appropriate ITIL-oriented operations systems.

**Robust Security and Audit Capabilities** – Security policy—and changes to it— are tied to enterprise security management tools and processes. As an example, access can be controlled to scheduling functionality as a whole or tied to specific jobs, events, or actions—on an individual user or workgroup basis.

| Features | Benefits |
| --- | --- |
| Unifies enterprise-wide application scheduling automation for zLinux, z/OS, Windows, UNIX, OS/400 and other OS environments | Centralizes and consolidate business operations |
| Leverages and extends an existing investment in IBM zSeries mainframes via a single pane of glass | Increases productivity and reliability and reduces operating costs |
| Eliminates the needs to write scripts to create job schedules and cross dependencies | Saves time and money by automating advanced workflows |
| Manages job status output and scanning this output for particular values or exit codes to enable setting additional dependencies downstream based on job status | Increases productivity and provides granular automation capabilities |
| Sets multiple, conditional dependencies on zLinux jobs, job steps or condition codes | Increases job interdependency reach |
| Provides a fault-tolerant scheduling platform | Significantly improves uptime and execution to service level agreements (SLAs) |

# 14. Cisco Workload Automation Adapter for z/OS

## Adapter Overview

**Mainframe Business Processing in a Distributed Environment**

Managing z/OS batch processes is a mission-critical function in enterprise businesses. IT data centers now include a growing number of applications running on a wide range of highly distributed devices, but mainframe batch schedulers cannot manage enterprise-wide workflow processes and workflow automation needs. Integrating, automating, and managing business-critical applications is a difficult, expensive, and time-consuming operation, but a proven, scalable product—Cisco Workload Automation—can deliver enterprise-wide automation and integrate z/OS jobs and dependencies, even from the most demanding IT infrastructures.

**Integrating Mainframe Applications Automation into the Enterprise**

Cisco Workload Automation for z/OS brings the power of business process automation to IBM mainframe batch processing and links it to the entire enterprise-computing environment. This industry-leading product can create, manage, and monitor jobs and job dependencies among z/OS environments and a wide range of databases and application resources, while bringing expanded functionality to z/OS batch processing.

IT operations staff can leverage the scheduler's capabilities, such as exception-based management, fault tolerance, and a high-degree of scalability for z/OS-based jobs. This easy-to-use platform gives users the ability to monitor and interact with all types of batch jobs, even if they have been defined using other mainframe schedulers. More importantly, users gain the ability to integrate mainframe jobs into larger business workflows that involve enterprise resource planning (ERP), business intelligence, and extract, transform, and load (ETL) processes running on a wide variety of operating systems—even in service-oriented architecture (SOA) environments. Data files from partners and supplier can also be managed and integrated into z/OS jobs, and job dependencies originating from anywhere in the enterprise can be defined and managed via a single pane of glass.

**Cisco Workload Automation for z/OS**

Workload Automation for z/OS has two components. Each component is an independent entity that offers different functions.

The first component is an OS-level agent running under OpenMVS that uses UNIX System Services (USS) provided by the z/OS operating system. Via the agent, Workload Automation can submit jobs, run system commands, and execute programs and shell scripts. The agent transfers output to Cisco Workload Automation and manages file dependencies for files and datasets.

The second component is the Gateway for z/OS that runs locally as a set of processes in the z/OS environment that interact directly with the z/OS System Management Facility (SMF). The Gateway operates in the background, relaying job and job step information to Cisco Workload Automation These are output logs that record the stages in the life cycle of a z/OS job. The extraction of this information allows Workload Automation to track job dependencies based on condition codes of any submitted z/OS job.

### Protecting an Investment in the z/OS Infrastructure

As the needs of the enterprise expand, IT managers must be able to integrate z/OS business process data with other ERP applications. Most mainframe environments are the hub of IT operations, and the investment in this infrastructure is a substantial part of the overall IT budgets. This requires a comprehensive product to meet the challenge of workflow automation across heterogeneous environments.

Cisco Workload Automation allows IT managers to leverage their investment in the mainframe infrastructure by expanding their reach and visibility across the entire enterprise and to increase the manageability of their mainframe environment. Cisco Workload Automation for zOS enables IT managers to leverage their investment in the mainframe infrastructure by expanding its processing power across the entire enterprise.

Furthermore, IT organizations can no longer afford to manage data processing among workflow processes manually, especially in the face of increased business demands for efficiency and competitive advantage. By automating internal batch jobs, distributed workflows, and business intelligence reporting, efficiencies of scale are realized and complex services are executed faster with minimal down time.

## Features and Benefits

### Increasing Mainframe Reach and Processing Capabilities

Users can define, launch, monitor, and control z/OS jobs and job dependencies and respond to file events without modifying existing mainframe jobs or schedules. The following discussion provides more detailed descriptions of core features that deliver high-level business benefits, as well as many day-to-day usability-related benefits:

**Batch and On Demand Processing** – Cisco Workload Automation is designed to accommodate scheduled batch and on demand job processing on the z/OS platform, providing comprehensive support for the traditional date and time scheduling model, as well as complex event-and dependency-based processing.

**IT Policy Alignment** – Each job group can contain several job definitions that enable detailed control and error recovery procedures. These procedures make it possible for IT staff to follow documented best practices consistently. Information Technology Infrastructure Library (ITIL) processes in the areas of request fulfillment, incident management, and change management can be supported with interfaces and integration techniques available for a range of ITIL oriented operations environments,

**Event-Driven Processing** – In addition to time- and date-based scheduling, Cisco Workload Automation can dynamically introduce jobs—and entire business processes—into a mainframe environment when triggered by business events from a wide range of application adapters and platform-supported agents.

**Flexible Monitoring and Alerting** – Cisco Workload Automation allows users to view and manage alerts within the scheduling system. Alerts can be automatically sent to browser-enabled devices for anytime, anywhere status connectivity and can be configured to initiate process recovery steps. Automated actions are extensive and can be easily defined. They include sending an email message to the appropriate owner, generating a message to the central console, or triggering an incident to an IT support technician via the appropriate ITIL-oriented operations systems.

**Robust Security and Audit Capabilities** – Security policy—and changes to it—are tied to enterprise security management tools and processes. For example, access can be controlled in the areas of scheduling functionality as a whole or tied to specific jobs, events, or actions. Actions can also be linked to an individual user or on a workgroup basis.

| Features Summary | Benefits Summary |
|---|---|
| Unifies enterprise-wide job scheduling automation for z/OS Windows, UNIX, Linux, and other mainframe environments | Increases productivity and reliability and reduces implementation and operations costs |
| Provides a single user interface to monitor and control jobs regardless of platform, allowing a centralized staff to be used for business operations | Leverages and extends an existing investment in mainframe scheduling and reduces training time and management costs |
| Eliminates the need to write scripts in order to set up job cross-dependencies | Increase productivity and reliability and reduces operations costs |
| Runs JES, JCL, MVS commands and z/OS Unix System Services (USS) jobs | Leverages an existing investment in IBM mainframe technology |
| Supports dual directional FTP file transfers among the mainframe and another servers | Increase productivity through expanded reach and granular automation capabilities |
| Offers robust fault-tolerance | Prevents the disruption of critical processes |
| Sets multiple, conditional dependencies on z/OS jobs, job steps or condition codes | Centralizes and consolidates business operations, creating greater efficiencies |
| Allows mainframe jobs to be run based on the File Exists condition on another server | Saves time and money by automating advanced workflows |

# 15. Cisco Workload Automation Adapter for FTP

## Adapter Overview

**Cisco Workload Automation Adapter for FTP, SFTP, and FTPS**

Enterprise Adapter for FTP reduces many of the complexities associated with incorporating file transfer protocol (FTP), secured file transfer protocol (SFTP), and file transfer protocol SFTP (FTPS) jobs or batch processes into enterprise job schedules. Built on the industry-leading Workload Automation, it offers an easy-to-use, powerful solution for managing FTP dependencies within job schedules and the application integration they support. IT operations staff can manage file transfers as an integral part of a critical workflow business processes.

This is an excellent scheduling solution for environments that handle FTP jobs, because it can improve efficiency by directly addressing critical FTP-related scheduling challenges discussed in the following section.

**The File Transfer Challenge**

Increasingly, businesses are working to integrate their internal operations and also to develop closer links with partners and customers. Companies in financial services, insurance, healthcare, and retail, among other industries, depend on seamless data exchange to integrate their operations with others and to allow them to respond with the speed and accuracy the market demands. Today, approximately 70 percent of data and application integration is accomplished through batch jobs. As a result, automated application integration and file transfer capabilities are vital to accomplishing the twin goals of reliability and cost effectiveness.

FTP is the technology most commonly used to exchange data or transfer files among applications and partners. As the enterprise extends business processes across its value chain, the reliability and security of data exchange with partners and customers is increasingly important in meeting business goals. Transmission delays, breached security, and corrupt data can impact not only the business but also relationships with partners and customers. The exchange of data between applications, partners, and customers must be so reliable and secure that it can be taken it for granted. To achieve these objectives, data and file exchange must be an integral part of the enterprise-wide business process. And because there is a close relationship between data exchange and batch job processes, both must be seamlessly and simultaneously managed to attain high levels of automation, security, speed, recovery, and accuracy.

**Manual FTP Management: Error-prone and Insecure**

In many companies, processing file transfers is still a manual process. For example, a company may have a workflow in which a customer sends a file containing all orders for the day via FTP. During the day, IT

operations staff manually checks to see if the file has arrived. If it has, they submit a series of jobs that process the order, or they may use scripts they have written to manage this process.

This manual business process creates the following issues, and failure to meet service level agreements (SLAs) with customers and partners may incur costly financial penalties and erode end-user satisfaction:

FTP is not secure and transfers data without encryption. User names, passwords, FTP commands, and the files themselves can be viewed using packet sniffers. The process of recognizing that the file has arrived and then incorporating it into a job step is inherently error prone and time consuming. Scripts are costly to create, document, and maintain. If scripts are used, user IDs and passwords may be embedded in them, creating additional exposure to security risks. If the process of managing FTP is related to financial reporting, additional issues are involved in auditing it. ne operator may be required to implement the manual procedure and another to verify that it was followed. The need for a job scheduler and an FTP product adds unnecessary cost and complexity. FTP may require that an additional agent is installed on both the sending and receiving ends, increasing system complexity. No single point of control manages both FTP requirements and the job scheduling process.

## Features and Benefits

Using Cisco Workload Automation Adapter for FTP can dramatically simplify the process of scheduling, tracking, and managing workflows with FTP dependencies, because the solution:

- Incorporates FTP processes into the larger enterprise-wide workflow management environment
- Supports both FTP and SFTP using SSH2 and FTPS using SSL/TLSAvoids sending data “in the clear” by supporting Advanced Encryption Standard (AES), Data Encryption Standard (DES), Triple DES (3DES), and Blowfish encryption techniques
- Provides “script-free,” scheduled FTP processing to avoid further security exposure created by embedded user IDs and passwords when scripts are used
- Supports FTP job dependencies based on number of files and volume of data transferred, dropped files, and duration of transfer
- Manages file attributes and their directories
- Requires a single FTP server rather than an FTP agent on the sending and receiving ends
- Provides a single point of control for managing business processes dependent on FTP and batch jobs

Workload Automation provides an integration platform for all job scheduling needs. When batch jobs finish, users can automatically transfer files as part of a larger business process. In addition, when files arrive, they can trigger one or more jobs to process the data transferred. Users can now eliminate the manual steps and scripting that undermine service levels and inflate the costs of managing IT. And Workload Automation makes it easy to accomplish these objectives by using the same interface to manage FTP jobs and dependencies that it uses for all jobs and dependencies.

# 16. Cisco Workload Automation Adapter for JD Edwards

## Adapter Overview

**Cisco Workload Automation Adapter for JD Edwards**

IT operations that focus on the automation of business processes involve integrating a wide range of custom and enterprise applications and the infrastructure on which they run, often with complex interdependencies. In such environments, IT typically uses job scheduling tools to control batch and on demand event processing, which are vital to the success of a range of business operations from sales to manufacturing to financial management.

For the past decade, Cisco Workload Automation has been defining standards for job scheduling usability, scalability, and breadth of coverage. The role of the many adapters available for Cisco Workload Automation is to make connectivity, control, and visibility of diverse technologies accessible directly through the Cisco Workload Automation user interface (UI). The breadth of coverage these adapters provide simplifies end-to-end scheduling of processes across the enterprise.

## Product Overview

**Integrating JD Edwards Enterprise Resource Planning (ERP) into the Enterprise**

In order to increase competitive advantage, businesses are investing in applications that improve operational efficiency, such as JD Edwards EnterpriseOne and World ERP solutions. These applications manage critical data from various functional areas, including financials, inventory, procurement, and order fulfillment. While the JD Edwards internal scheduler can manage native batch processes, it is not built to accommodate enterprise-wide scheduling environments.

This adapter is designed for the unique needs of the JD Edwards application suite, and functions as the communications interface between Cisco Workload Automation and the EnterpriseOne/World process management engines. Together, they provide IT organizations with robust cross-platform, cross-application scheduling functionality, real-time interactivity, and centralized control.

**Simplify Job Scheduling with Cisco Workload Automation**

With this Cisco adapter for JD Edwards, EnterpriseOne/World customers can add the automation, manageability, and reliability of Cisco Workload Automation to these leading ERP applications. With CWA, IT operations staff can manage all workload processes within JD Edwards EnterpriseOne/World environments

from a centralized console and integrate those processes into the wider Cisco Workload Automation scheduling environment. Leveraging the Cisco Workload Automation's advanced automation features and single pane-of-glass management console immediately translates into reduced training costs and the consolidation of key skills required for scheduling operations. This ability, in turn, reduces errors and increases productivity.

### How the Enterprise Adapter for JD Edwards Works

Once implemented, the adapter allows users to define, launch, monitor, and control JD Edwards processes using Universal Batch Engine (UBE), which is then used to execute these processes. Cisco Workload Automation and the adapter enable JD Edwards users to quickly resolve job failures, incorporate multiple cross-application dependencies, and utilize process models for JD Edwards UBE programs. The adapter submits the predefined JD Edwards processes into the schedule and monitors the status of each process as it runs. In addition, the adapter facilitates the distribution of JD Edwards reports through its advanced alert capabilities. Modifications to the JD Edwards environment are unnecessary because CWA uses both UBE and the application program interfaces (APIs) in the JD Edwards EnterpriseOne/World application suite. Native JD Edwards function calls are therefore used for the integration.

## Features and Benefits

The adapter and Cisco Workload Automation have successfully delivered rapid ROI to organizations investing in JD Edwards solutions. Working together, they bring job scheduling for JD Edwards solutions into an enterprise context and provide greater automation, visibility, control, and reliability. The following capabilities are crucial to driving the benefits that users can expect from this solution:

**Universal Workload Management** - Workload management is an essential part of any ERP solution, because it allows critical transactions from various databases and applications to occur at the right time, every time. Cisco Workload Automation provides immediate problem detection, and in many cases, automatically launches error resolution steps, enabling JD Edwards EnterpriseOne/World services to be delivered efficiently and accurately.

**Event-Driven Processing** - In addition to time- and date-based job scheduling, the adapter can dynamically introduce single jobs and entire workloads into a schedule when triggered by business events from other adapters and platform-supported agents. Also, with the adapter, users can define events that can be used for alerting and invoking an automated response through email and/or inserting additional jobs into the schedule.

**Flexible Monitoring and Alerting** - Job status and output is automatically logged and can be viewed using the Cisco Workload Automation console. Alerts can be automatically sent to browser-enabled devices for anytime, anywhere status updates and can be configured to initiate process recovery steps. Automated actions are extensive and easily defined.

**IT Policy Alignment** - Each job can contain several process definitions that support granular controls and error recovery procedures, making it possible for IT staff to consistently follow documented best practices. Information Technology Infrastructure Library (ITIL) processes in the areas of request fulfillment, incident

management, and change management are supported and can include interfaces and integration techniques available for a range of ITIL-oriented operations environments.

**Robust Security and Audit Capabilities** - Security policy - and changes to it - are tied to enterprise security management tools and processes. The integrated security management features of Cisco Workload Automation can be applied to the implementation of JD Edwards connections, various roles, and jobs to provide secure management and support the use of required security credentials.

# 17. Cisco Workload Automation Adapter for Cognos

## Adapter Overview

**Cisco Workload Automation Adapter for Cognos**

IT operations that focus on the automation of business processes involve integrating a wide range of custom and enterprise applications and the infrastructure on which they run, often with complex interdependencies. In such environments, IT typically uses job scheduling tools to control batch and on demand event processing, which are vital to the success of a range of business operations from sales to manufacturing to financial management.

For the past decade, Cisco Workload Automation has been defining standards for job scheduling usability, scalability, and breadth of coverage. The role of Cisco Workload Automation is to make connectivity, control, and visibility of diverse technologies accessible directly through the Cisco Workload Automation user interface. The breadth of coverage these adapters provide simplifies end-to-end scheduling of processes across the enterprise.

**Cisco Workload Automation Adapter for Cognos**

Cisco Workload Automation for Cognos allows users to schedule relevant Cognos jobs in the context of all other enterprise jobs. It puts stored reports and configuration items automatically into the UI so users can then define Cognos jobs via point-and-click functionality without the need for custom scripting. As a platform-independent solution, the adapter can run on any OS platform where Cisco Workload Automation master runs.

**Improving Data Integration and Business Intelligence (BI) through Greater Workload Automation**

Cognos Business Intelligence delivers a complete range of BI capabilities: reporting, analysis, dashboard management, and scorecard creation. Cognos users can author, share, and use reports that draw on data across many sources to make better business decisions. But without effective workload automation, data that supports Cognos Business Intelligence reporting may not arrive at the right place at the right time. In addition, poor visibility can make it difficult to see where processing bottlenecks exist. As a result, when process integration between data integration; data warehouse; extract, transform, and load operations (ETL); and BI reporting functionality is less than optimal, business decisions can be negatively impacted.

Cisco Workload Automation Adapter for Cognos enables the definition of workloads that keep data flowing smoothly between source systems and the data warehouse. This powerful solution then coordinates and triggers the running of reports in the correct order and with the correct data to meet business reporting service

level agreements (SLAs). With this adapter, users can load, define, launch, and monitor tasks in a Cognos environment, while Cisco Workload Automation manages the moving parts in a BI infrastructure in the right order and delivers them at the right time to the right person. The result is saved time, reduced errors, and the ability to create ad hoc reports in an environment that normally requires considerable planning and a significant level of control over service level management.

## Features and Benefits

Using Cisco Workload Automation Adapter for Cognos can dramatically simplify the process of scheduling, tracking, and managing all BI workloads regardless of the number of dependencies, systems, and applications involved. This adapter, in combination with Cisco Workload Automation, offers the following capabilities:

**Complex Dependency Management** – BI operations staff can create job definitions that manage the most complex Cognos dependency and runtime requirements.

**Centralized View and Control** – Cisco Workload Automation enables users to develop process streams and manage the information flow from a centralized console, thereby providing greater control over all aspects of a Cognos job environment, including its relationship to all other enterprise jobs.

**Cognos Security Enforcement** – The adapter enforces Cognos security policies by authenticating with Cognos through associations between Cisco Workload Automation runtime users and Cognos security settings. Creating a Cognos job from Cisco Workload Automation is highly secure and as simple as creating any other Enterprise Scheduler job.

**Complete Cognos Job Tracking** – A Cisco Workload Automation job definition for Cognos refers to report-and-query data that is retrieved from the Cognos content store. The job definition can be augmented with format, print, save, and e-mail disposition options, as well as parameter value overrides that can refer to enterprise-wide scheduling variables. Once a job has submitted a task to the Cognos environment, the adapter monitors the process until it is completed. It then returns the final completion status, as well as details associated with the job run, to Cisco Workload Automation. This information can then be used to trigger downstream jobs or other dependent workloads.

**High Visibility and Fine Control** – Cisco Workload Automation Adapter for Cognos enables users to cancel, abort, or rerun tasks from Cisco Workload Automation, a feature that provides better control over the scheduling environment than that afforded by scripting or other non-integrated solutions.

**Usage Scenario**

Cisco Workload Automation Adapter for Cognos users can leverage all the workload definition flexibility provided by Cisco Workload Automation. They can use this comprehensive solution to merge BI system and enterprise resource planning (ERP) application processes into a cohesive, centrally managed job stream, which also provides error detection, automated remediation, and alerts management.

As an example, users can define a process flow that confirms the receipt of data from a business partner. On arrival, this data triggers appropriate ERP processes, which upon completion drives the execution of data warehouse loading, downstream reporting, and online analytical processing (OLAP) cube generation.

Because the Cognos request set is defined like any other Cisco Workload Automation job, users can take full advantage of job, file, and variable dependencies; calendars; event and email notifications; and all other Cisco Workload Automation capabilities to manage Cognos scheduling in the context of the enterprise.

| **Features Summary** | **Benefits Summary** |
|---|---|
| Leverages the Cognos BI web services application program interface (API) for a tighter agentless integration between Cisco Workload Automation and Cognos report and query execution than possible through scripting alone | Leverages an investment in Cognos to enhance and extend an enterprise scheduling solution |
| Packages all implementation details in the interface that connects Cisco Workload Automation to Cognos | Reduces costs and increases efficiency by confining training and operational support to one application automation environment |
| Provides a content browser that locates reports and queries to schedule and that can be restricted to specific packages and/or folders | Increases productivity and timely results with richer, more advanced scheduling features than offered by the native Cognos scheduler |
| Enables any report or query parameter to be set dynamically using Cisco Workload Automation variables, including calculated dates | Enables any report or query parameter to be set dynamically using Tidal variables, including calculated dates |
| Controls formats, such as hypertext mark-up language/portable document format (HTML/PDF), as well as disposition and destination through extensive output options | Supports data integrity and accuracy through comprehensive process scheduling and complete failure detection |
| Enforces Cognos user and role security associated with Cisco Workload Automation runtime users | Provides security through the use of industry-standard lightweight data access protocol (LDAP) and Active Directory integration |
| Provides security through the use of industry-standard lightweight data access protocol (LDAP) and Active Directory integration | Increases visibility and enables users to understand business process workloads in real time, easily audit them, and document what has occurred, helping to reduce production processing time windows |
| Increases visibility and enables users to understand business process workloads in real time, easily audit them, and document what has occurred, helping to reduce production processing time windows | Reduces costs and increases efficiency through the use of one enterprise-wide workload automation environment |

# 18. Cisco Workload Automation Adapter for JMS

## Adapter Overview

**Cisco Workload Automation Adapter for JMS Introduction**

**to Cisco Workload Automation and Adapters**

IT operations that focus on the automation of business processes involve integrating a wide range of custom and enterprise applications and the infrastructure on which they run, often with complex interdependencies. In such environments, IT typically uses job scheduling tools to control batch and on demand event processing, which are vital to the success of a range of business operations from sales to manufacturing to financial management.

For the past decade, Cisco Workload Automation has been defining standards for job scheduling usability, scalability, and breadth of coverage. The role of the many adapters available for Cisco Workload Automation is to make connectivity, control, and visibility of diverse technologies accessible directly through the Cisco Workload Automation user interface. The breadth of coverage these adapters provide simplifies end-to-end scheduling of processes across the enterprise.

## Product Overview

**The Challenge of Managing Dynamic Messaging Environments**

Automating job scheduling across message-driven environments can be a challenge. Unlike traditional enterprise-level systems, message-based topologies require integration with an enterprise service bus (ESB) or other messaging backbone that acts as a message delivery brokerage service to consumers that are connected to the various messaging distribution points. A wide array of message queues and message types must be understood and supported to enable effective application integration within these types of environments.

**Cisco Workload Automation Adapter for JMS**

Cisco Workload Automation Adapter for (Java Messaging Service) JMS extends the capabilities of Cisco Workload Automation to the message-enabled platform, making it possible to define and execute jobs for a variety of message bus and enterprise service bus technologies and to integrate them into an existing enterprise-wide job scheduling architecture. This adapter helps users overcome the challenges of scheduling in message-driven environments.

Cisco Workload Automation Adapter for JMS enables IT operations staff to integrate message-based application services into the broader enterprise scheduling environment, allowing users to create, send, and receive messages that are transmitted through an enterprise messaging architecture.

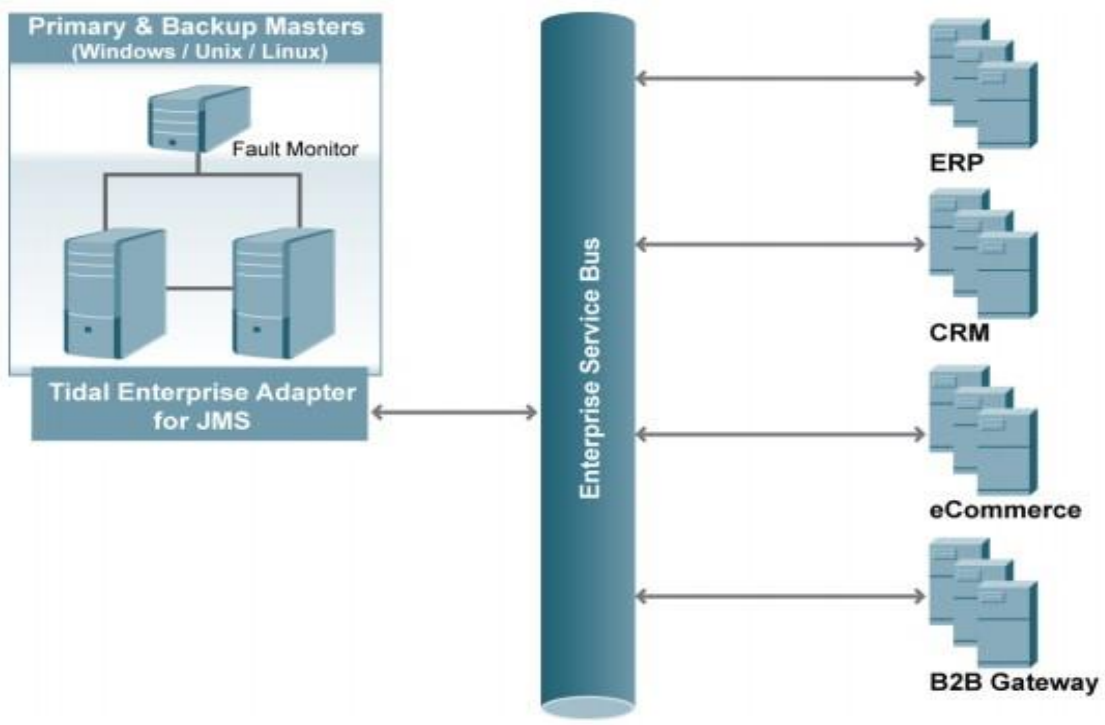
**Features and Benefits**

Cisco Workload Automation Adapter for JMS comes preconfigured with connection settings for many standard messaging architectures. The following capabilities and benefits encompass detailed features that users can access in order to simplify job scheduling in message-enabled environments.

**Message-Enabled Job Definitions** – By using the Cisco Workload Automation web interface to create message-enabled job definitions, the adapter makes it possible for users to connect to and deliver instances to the messaging brokerage, which then places messages into the message bus. In addition, messages can be received by Cisco Workload Automation and can trigger other jobs or activities as defined within the larger scheduling environment. Messages can be delivered via ―point-to-point‖ queues or ―publish-and-subscribe‖ topics.

In point-to-point mode, only one target ―consumes‖ the message, which has the added benefit of allowing the producer and consumer to work asynchronously. Publish-and-subscribe topic queues are mechanisms where a JMS producer can publish messages and a group of JMS consumers can subscribe to a topic. Subscribers are registered to receive messages on specific topics and routinely poll the message bus. When topics are promoted to the bus, subscribers consume the message and take action on the contents.

**Figure 10.** Cisco Workload Automation Adapter for JMS enables job scheduling across message-based environments.



**Cisco Workload Automation Schedule Integration** – One of the key strengths of the adapter is that the messaging integration approach is made available for scheduling designs via Cisco Workload Automation job definition screens. This extends standardization of operations across the full range of environments under Cisco Workload Automation management, giving IT operations staff a robust and sophisticated tool with which to incorporate messaging-based processes into the enterprise. In addition, as with other Cisco Workload Automation adapters, the Adapter for JMS jobs can be executed through granular calendar, ad hoc, and on demand scheduling techniques, bringing message-driven topologies into the enterprise scheduling framework for the first time.

**Accelerated Automation** – Cisco Workload Automation Adapter for JMS can drive IT-wide process automation by giving IT operations staff the tools to orchestrate enterprise-wide job schedules and event-driven activities from a portable, browser-based single pane of glass. The adapter also allows IT operations staff to accelerate the delivery of service level agreements (SLAs) by making all scheduling activities more efficient and by accelerating the ability to respond to business changes.

Cisco Workload Automation Adapter for JMS consolidates message-based scheduling automation with other distributed processes, making it easier to comply with enterprise IT policies and standard operational processes. Integrated security management features support required credentials authorization when implementing JMS connections, enforcing process adherence to IT security rules as well. To add flexibility to Cisco Workload Automation, the adapter can be used as a full-featured scheduling alternative to Cisco Workload Automation for Web Services in distributed message-driven environments—particularly where adding a web services layer or integrating into a SOA-based framework is not otherwise required.

# 19. Cisco Workload Automation Adapter for UCS Manager

## Adapter Overview

**Cisco Workload Automation Adapter for UCS Manager**

IT operations that focus on business process automation involve integration of a wide range of custom and enterprise applications and the infrastructure on which they run, often with complex interdependencies. In such environments, IT typically uses workload scheduling solutions to control batch and event-based data processing and infrastructure operations. These are vital to the success of sales, manufacturing, and financial-management business tasks.

Cisco Workload Automation has defined standards for workload usability, scalability, and breadth of coverage. The role of the many adapters available for Cisco Workload Automation is to make connectivity, control, and visibility of diverse technologies accessible directly through the Cisco Workload Automation user interface. The breadth of coverage these adapters provide simplifies end-to-end scheduling of processes across the enterprise.

**Managing Complex Component Infrastructure in the Enterprise**

Data center resource management has become difficult, time-consuming, and error-prone. It requires careful coordination among a number of subject-matter experts, including server, network, and storage administrators. Today, even in organizations striving to move toward methodologies based on Information Technology Infrastructure Library (ITIL) concepts, administrators often must use separate element managers to configure each component manually. Cisco UCS® Manager provides unified and embedded management of all software and hardware components of the Cisco Unified Computing System™ (Cisco UCS). It integrates computing, networking, storage access, and virtualization resources in a single, cohesive system.

**Cisco Workload Automation Adapter for Cisco UCS Manager**

Cisco Workload Automation Adapter for Cisco UCS Manager allows users to schedule Cisco UCS Manager component infrastructure jobs through Cisco Workload Automation. They can use its capabilities to automate, simplify, and improve job scheduling and workload performance. The adapter integrates with Cisco UCS Manager using the XML API. It automates Cisco UCS Manager activities for blade and rack server management in the form of Cisco UCS Manager jobs.

Cisco Workload Automation Adapter for Cisco UCS Manager enables users of Cisco Workload Automation to

run a set of Cisco UCS Manager processes through a single point of control. The adapter allows users to connect Cisco UCS server operations to enterprise workloads and define them as part of a business process. It also allows them to define and use Cisco UCS server events. Users can schedule and run business processes, manage their required server resources, and incorporate them into the data processing environment. In this way, Cisco Workload Automation and its adapter for Cisco UCS Manager can help reduce operating costs by optimizing server resources and administrative efficiency.

**How Cisco Workload Automation Adapter for Cisco UCS Manager Works**

Cisco UCS Manager exposes full-featured XML API objects, providing powerful ways to customize the behavior of Cisco UCS. This allows Cisco Workload Automation to add, reboot, shut down, and reset Cisco UCS server instances. Through the adapter's easy-to-use interface, users can choose servers from a list of service profiles or use the management tree interface to visually locate individual servers in the data center.

Users can schedule workflows from the Cisco Workload Automation browser-based and Java console, which provides comprehensive scheduling features. These include detailed calendaring, events management, and access to enterprise-wide dependencies.

Ultimately, Cisco Workload Automation Adapter for Cisco UCS Manager, in conjunction with Cisco Workload Automation, allows organizations to use their existing technology and investment in Cisco UCS Manager. The combination enables them to increase efficiency and focus resources on strategic business initiatives.

# 20. Cisco Workload Automation Adapter for Hadoop

## Adapters Overview

**Cisco Workload Automation Sqoop Adapter Overview**

The Cisco Workload Automation (CWA) Sqoop Adapter provides easy import and export of data from structured data stores such as relational databases and enterprise data warehouses. Sqoop is a tool designed to transfer data between Hadoop and relational databases. You can use Sqoop to import data from a relational database management system (RDBMS) into the Hadoop Distributed File System (HDFS), transform the data in Hadoop MapReduce, and then export the data back into an RDBMS. Sqoop Adapter allows users to automate the tasks carried out by Sqoop.

The Sqoop Adapter allows for the definition of the following job tasks:

- **Code Generation** – This task generates Java classes which encapsulate and interpret imported records. The Java definition of a record is instantiated as part of the import process, but can also be performed separately. If Java source is lost, it can be recreated using this task. New versions of a class can be created which use different delimiters between fields or different package name.
- **Export** – The export task exports a set of files from HDFS back to an RDBMS. The target table must already exist in the database. The input files are read and parsed into a set of records according to the user-specified delimiters. The default operation is to transform these into a set of INSERT statements that inject the records into the database. In "update mode," Sqoop will generate UPDATE statements that replace existing records in the database.
- **Import** – The import tool imports structured data from an RDBMS to HDFS. Each row from a table is represented as a separate record in HDFS. Records can be stored as text files (one record per line), or in binary representation such as Avro or SequenceFiles.
- **Merge** – The merge tool allows you to combine two datasets where entries in one dataset will overwrite entries of an older dataset. For example, an incremental import run in last-modified mode will generate multiple datasets in HDFS where successively newer data appears in each dataset. The merge tool will "flatten" two datasets into one, taking the newest available records for each primary key. This can be used with both SequenceFile-, Avro- and text-based incremental imports. The file types of the newer and older datasets must be the same. The merge tool is typically run after an incremental import with the date-last-modified mode.

**Cisco Workload Automation MapReduce Adapter Overview**

Hadoop MapReduce is a software framework for writing applications that process large amounts of data (multi-terabyte data-sets) in-parallel on large clusters (up to thousands of nodes) of commodity hardware in a reliable, fault-tolerant manner. A Cisco Workload Automation MapReduce Adapter job divides the input data set into independent chunks that are processed by the map tasks in parallel. The framework sorts the map's outputs,

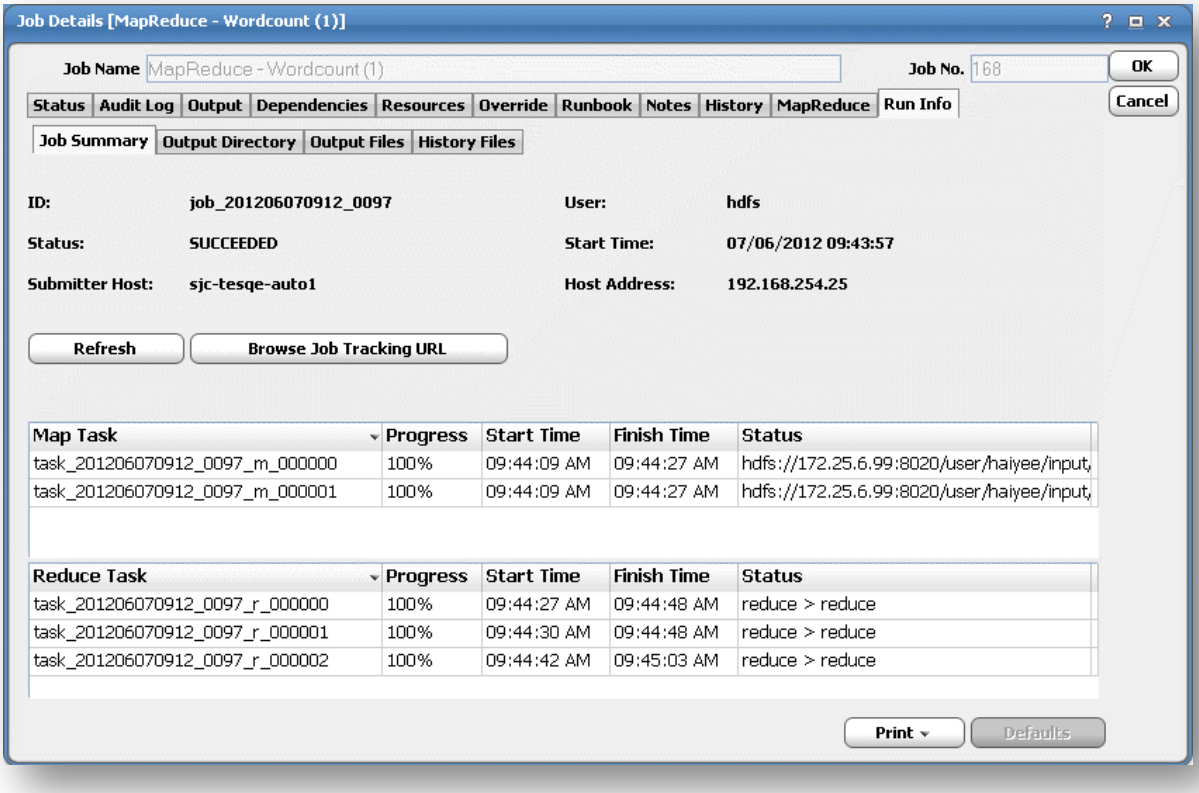
which are then input to the reduce tasks. Typically, both the input and output of the job are stored in a file-system. The framework schedules tasks, monitors them, and re-executes failed tasks. Minimally, applications specify the input/output locations and supply map and reduce functions via implementations of appropriate interfaces and/or abstract-classes. These, and other job parameters, comprise the job configuration. The Hadoop job client then submits the job (jar/executable etc.) and configuration to YARN. The client then assumes the following responsibilities:

- Distributes the software/configuration to the slaves
- Schedules and monitors tasks
- Provides status and diagnostic information to the job -client

The MapReduce Adapter serves as the job client to automate the execution of MapReduce jobs as part of a Cisco Workload Automation (CWA) managed process. The Adapter uses the Apache Hadoop API to submit and monitor MapReduce jobs with full scheduling capabilities and parameter support. As a platform independent solution, the Adapter can run on any platform where the CWA master runs.

The MapReduce Adapter provides real-time information on the execution of MapReduce job as it is running.

**Figure 11 Jobs detail for a Maps Reduce program.**



**Cisco Workload Automation Hive Adapter Overview**

The Cisco Workload Automation Hive Adapter provides the automation of HiveQL commands as part of the cross-platform process organization between Cisco Workload Automation (CWA) and the CWA Hadoop Cluster. The Adapter is designed using the same user interface approach as other Cisco Workload Automation adapter jobs, seamlessly integrating Hadoop Hive data management into existing operation processes.

The Hive Adapter allows you to access and manage data stored in the Hadoop Distributed File System (HDFS™) using Hive's query language, HiveQL. HiveQL syntax is similar to SQL standard syntax. The Have Adapter, in conjunction with Cisco Workload Automation, can be used to define, launch, control, and monitor HiveQL commands submitted to Hive via JDBC on a scheduled basis. The Adapter integrates seamlessly in an enterprise scheduling environment.

The Hive adapter includes the following features:

- Connection management to monitor system status with a live connection to the Hive Server via JDBC
- Scheduling and monitoring of HiveQL commands from a centralized work console with Cisco Workload Automation
- Dynamic runtime overrides for parameters and values passed to the HiveQL command
- Output-formatting options to control the results, including table, XML, and CSV
- Defined dependencies and events with Cisco Workload Automation for scheduling control
- Runtime MapReduce parameters overrides if the HiveQL command results in a MapReduce job.