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- Web Services, Java & Messaging: only the Control-M Agent machine(s) upon which the plug-in is installed should be licensed.
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You can obtain technical support by using the BMC Software Customer Support website or by contacting Customer Support by telephone or e-mail. To expedite your inquiry, see “Before contacting BMC.”

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You can obtain technical support from BMC 24 hours a day, 7 days a week at (http://www.bmc.com/support). From this website, you can:
Read overviews about support services and programs that BMC offers
Find the most current information about BMC products
Search a database for issues similar to yours and possible solutions
Order or download product documentation
Download products and maintenance
Report an issue or ask a question
Subscribe to receive proactive e-mail alerts when new product notices are released
Find worldwide BMC support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

Support by telephone or e-mail

In the United States and Canada, if you need technical support and do not have access to the web, call 800 537 1813 or send an e-mail message to customer_support@bmc.com. (In the subject line, enter Supl D:<yourSupportContractID>, such as Supl D:12345). Outside the United States and Canada, contact your local support center for assistance.

Before contacting BMC

Have the following information available so that Customer Support can begin working on your issue immediately:

- Product information
  - Product name
  - Product version (release number)
  - License number and password (trial or permanent)
- Operating system and environment information
  - Machine type
  - Operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - System hardware configuration
  - Serial numbers
  - Related software (database, application, and communication) including type, version, and service pack or maintenance level
- Sequence of events leading to the issue
- Commands and options that you used
- Messages received (and the time and date that you received them)
  - Product error messages
  - Messages from the operating system, such as file system full
  - Messages from related software
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If you have questions about your license key or password, contact BMC as follows:

- (USA or Canada) Contact the Order Services Password Team at 800 841 2031, or send an e-mail message to ContractsPasswordAdministration@bmc.com.
- (Europe, the Middle East, and Africa) Fax your questions to EMEA Contracts Administration at +31 20 354 8702, or send an e-mail message to password@bmc.com.
- (Asia-Pacific) Contact your BMC sales representative or your local BMC office.

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For the provisions described in the BMC License Agreement and Order related to third party products or technologies included in the BMC Product, see https://docs.bmc.com/docs/display/workloadautomation/Control-M+Workload+Automation+Documentation and click Third-party software (TPS).
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Getting Started

Control-M, a digital business automation solution, simplifies and automates diverse batch application workloads. At the center of infrastructure, data, and applications, it improves SLAs and accelerates application deployment.

- View Getting Started Videos.
- Learn about Control-M (on page 8).
- Define and run your first job with Step-by-step scenarios (on page 31).
- Find your way in the Help with the Control-M tasks (on page 46).
Control-M architecture

The following diagram shows the logical architecture of a typical Control-M environment.

The components represent client applications, servers, a database, and other infrastructure that support the functionality, as described in Control-M components (on page 9).
## Control-M components

The following table describes the Control-M components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control-M/Enterprise Manager</strong> (on page 10) (Control-M/EM)</td>
<td>Provides a central point of access and control for Control-M/Servers. It also enables you to view, monitor, manage, and intervene in batch flow processing across the entire enterprise.</td>
</tr>
<tr>
<td><strong>Control-M/Server</strong> (on page 14)</td>
<td>Schedules jobs, manages job processing flows, and provides notification of job flow status.</td>
</tr>
<tr>
<td></td>
<td>Control-M/Servers are the scheduling engines that also schedule jobs on other computers through Control-M agents and remote hosts.</td>
</tr>
<tr>
<td><strong>Control-M/Agent and remote hosts</strong> (on page 15)</td>
<td>Runs and tracks jobs according to its Control-M/Server. Though Control-M/Servers are responsible for job scheduling and processing, they do not have to limit their activity to the computer on which they reside. They can schedule jobs on other computers that come under their control.</td>
</tr>
<tr>
<td></td>
<td>You can have a dedicated Control-M/Agent installed on each computer and is controlled by a Control-M/Server, or use agentless computers, known as remote hosts. Jobs are assigned to specific host IDs that identify the Control-M/Agents and remote hosts.</td>
</tr>
<tr>
<td></td>
<td>For information about Control-M/Agents that run other platforms, see Control-M/Agent and other platforms (on page 16).</td>
</tr>
<tr>
<td><strong>Application Plug-ins</strong> (on page 16)</td>
<td>Enables you to connect to external applications and run Control-M jobs.</td>
</tr>
<tr>
<td><strong>Control-M Add-ons</strong> (on page 23)</td>
<td>Enables you to use Business Service Management (BSM) features.</td>
</tr>
</tbody>
</table>
Control-M/Enterprise Manager

Control-M/Enterprise Manager (Control-M/EM) is a Control-M component that provides a central point of control for Control-M/Servers. Control-M/EM enables users to do the following:

- View status of job schedules and execution in Control-M environments
- Issue requests for additional information
- Make changes to Production
- Handle problems. Control-M/EM also passes global conditions among Control-M/Servers.

The following figure shows the main sub-components of the Control-M/EM component:

The Control-M/EM includes the following types of sub-components:

- **Control-M/EM clients** (on page 11): Enables you to configure your Control-M environment to generate reports, and define, run, and monitor your job flows.
- **Control-M/EM servers** (on page 12): Enables Control-M/EM components to communicate with Control-M/EM clients and other Control-M/EM components.
- **Infrastructure components** (on page 14): Enables Control-M/EM clients to communicate with the relevant Control-M/EM server and includes the Control-M/EM database.
Control-M/EM clients

The following table describes the interfaces to your real-time batch environment and consists of the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control-M</td>
<td>Enables you to define and schedule your production, which Control-M uses to control job processing and handling. You can monitor your production, and intervene when necessary.</td>
</tr>
<tr>
<td>Control-M Configuration Manager (CCM)</td>
<td>Enables you to manage, monitor, configure, and maintain all Control-M components, as well as define security settings and user authorizations.</td>
</tr>
<tr>
<td>Control-M Self Service</td>
<td>Enables you to view your services with a Web-based application and analyze the problematic services and jobs. After you have determined what the problems are, you can resolve them by performing various service and job actions, depending on your authorizations.</td>
</tr>
</tbody>
</table>
| **Control-M Workload Change Manager** (on page 29) | Enables you to:  
  - Request changes to business workflows in Control-M by creating and submitting requests in Control-M Workload Change Manager web application.  
  - Define standards that comply with your organization's standards when defining folder/job definitions in Control-M. |
| Control-M Reports | Enables you to view jobs running Control-M Reporting Facility jobs.  
  **NOTE:** These jobs cannot be run. If you want to run Control-M Report jobs in Control-M client, you need to define a Control-M Report job in Control-M Automation API and then add the command to an OS job type. For more information, see Introduction to Control-M Reports. |
| Utilities | Enable you to run batch commands to perform specific actions in Control-M. |
| Control-M API | Enables you to use the capabilities of Control-M/EM and Control-M in an open interface for external applications.  
  For more information about the API, see *Control-M/EM API*. |
Control-M/EM servers

The following table describes the Control-M/EM servers and their functionalities including handling communication between Control-M/EM clients and other Control-M/EM components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUI Server (GSR)</td>
<td>Handles communication between Control-M/EM clients and Control-M/Servers. You can configure multiple GUI Servers in one Control-M/EM environment for load balancing purposes. The GUI Server connects to each Gateway to transmit requests and receive responses to/from Control-M/Server.</td>
</tr>
<tr>
<td>Global Conditions Server (GCS)</td>
<td>Identifies and distributes global conditions used to create job dependencies between Control-M/Servers. The GCS connects to each Gateway to receive and transmit prerequisite conditions to the appropriate Control-M/Server.</td>
</tr>
<tr>
<td>Gateway</td>
<td>Handles communication between the Control-M/EM servers (GUI Server and GCS), to the Control-M/Server. A different gateway is defined for each Control-M/Server (including Control-M for z/OS).</td>
</tr>
<tr>
<td>Configuration Manager Server</td>
<td>Receives information from the configuration agents of Control-M/Server and Control-M for z/OS, and handles requests from Control-M Configuration Manager client.</td>
</tr>
<tr>
<td>BIM</td>
<td>Monitors critical batch services when your site uses the Control-M Batch Impact Manager Add-on.</td>
</tr>
<tr>
<td>Forecast Server</td>
<td>Helps you simulate job patterns to validate the schedules for running jobs on a future date. This is supported when your site uses the Control-M/Forecast Add-on.</td>
</tr>
<tr>
<td>Self Service Server</td>
<td>Monitors Self Service services when your site uses the Control-M Self Service Add-on.</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Web Server</td>
<td>Provides access for the following applications using HTTP/S protocol:</td>
</tr>
<tr>
<td></td>
<td>- Control-M client</td>
</tr>
<tr>
<td></td>
<td>- Control-M Web</td>
</tr>
<tr>
<td></td>
<td>- Control-M Configuration Manager</td>
</tr>
<tr>
<td></td>
<td>- Control-M Reports</td>
</tr>
<tr>
<td></td>
<td>- Control-M/EM API</td>
</tr>
<tr>
<td></td>
<td>- Automation API</td>
</tr>
<tr>
<td>Services</td>
<td>Services are a set of the following services, which expose shared functionality to various Control-M/EM applications and enable you to control and monitor them in the CCM or in the services-cli utility:</td>
</tr>
<tr>
<td></td>
<td>- Services Configuration Agent</td>
</tr>
<tr>
<td></td>
<td>- Apache Kafka</td>
</tr>
<tr>
<td></td>
<td>- Apache Zookeeper</td>
</tr>
<tr>
<td></td>
<td>- Services Health Monitor</td>
</tr>
<tr>
<td></td>
<td>- Protocol Translator</td>
</tr>
<tr>
<td></td>
<td>- Validation Service</td>
</tr>
<tr>
<td></td>
<td>- Reports Service</td>
</tr>
<tr>
<td></td>
<td>For a detailed description of each service, see services-cli.</td>
</tr>
</tbody>
</table>
Infrastructure components

The following table describes the Control-M/EM Infrastructure components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control-M/EM Configuration Agent</td>
<td>Provides Control-M/EM server information to the Control-M Configuration Manager (CMS) and handles administrator requests from the Control-M Configuration Manager.</td>
</tr>
<tr>
<td>Control-M/EM database</td>
<td>Provides a repository of operational data relating to the functioning of all Control-M installations. Contents of the database include Active Jobs folders (job processing definitions) and Resources/Conditions. The database is maintained by Control-M/EM.</td>
</tr>
<tr>
<td>Naming Service (NS)</td>
<td>Enables each client to locate and connect to the GUI server through the CORBA (Common Object Request Broker Architecture) communication protocol.</td>
</tr>
</tbody>
</table>

Control-M/Server

At the heart of Control-M processing is Control-M/Server, which is the scheduling engine that schedules jobs, manages job processing flows, performs load balancing, and handles requests from Control-M/EM. Each Control-M/Server is resident on a particular computer and is specific to its operating system. The following lists the Control-M Server types:

- **Control-M/Server**: Defines a distributed system component of Control-M that maintains the Control-M/Server database (including Active Jobs), schedules jobs, performs load balancing, sends job-handling requests to agent platforms and handles requests from Control-M/EM.

  One or more hosts can be controlled by a single Control-M/Server. In older implementations, a Control-M/Server can consist of a single computer. In a server/agent implementation of Control-M, Control-M/Server consists of a server platform and all the agents, and agentless platforms that it handles.
Control-M for z/OS: Defines a Mainframe system component that uses the Control-M client to define and handle job definitions and requests.

The following image shows Control-M/Server and Control-M for z/OS and its related components:

Control-M/Agent and remote hosts

Although Control-M/Server is responsible for job scheduling and processing, it does not have to limit the activity to the computer on which it resides. It can schedule jobs on other computers that comes under its control. Control-M/Agents are commonly used to place computers under the control of a Control-M/Server. Control-M/Agents submit jobs, perform requests from each Control-M/Server and perform post-processing analysis of completed jobs.

As an alternative to having a dedicated Control-M/Agent installed on each computer under the control of a Control-M/Server, Control-M/Server can submit jobs to agentless computers known as remote hosts. A remote host enables you to run jobs on a computer without having to install and update a Control-M/Agent, as well as less management.

The main advantages of Control-M/Agents over remote hosts are that agents support counters and multiple types of shouts:
Control-M/Agents can utilize features that require a Control-M counter. If you need any of these features, you should choose a Control-M/Agent over a remote host. For example, Control-M/Agents can use the File Watching feature, run jobs using Control-M/Agent utilities, and run jobs requiring Application plug-ins for Control-M/Agent.

Control-M/Agents support many types of shouts. (Remote host support is limited to e-mail shouts and Control-M/Server shouts.)

The Control-M/Agent manages the following job handling requests:

- Instructions to submit a job on the Agent computer
- Requests for information about jobs on the Agent computer that have been submitted, are currently executing, or have recently been completed
- Requests to view or edit job script statements
- Requests to view job output or job documentation
- Requests to stop jobs that are currently executing
- Group a number of Control-M/Agents together into a host group to balance processing load

Control-M/Agent and other platforms

Control-M supports the following Control-M/Agents that run on other platforms:

- **Control-M/Agent for UNISYS 2200**: Supports running jobs on other platforms and enables you to submit jobs for execution on the agent platform, monitor the jobs, and perform post-processing analysis of output files. The completion status of jobs and the results of post-processing analysis are transmitted to the Control-M/Server.

- **Control-M/Agent for MAPPER System for 2200**: Supports running jobs on other platforms and enable you to submit jobs for execution on the agent platform, monitor the jobs, and perform post-processing analysis of output files. The completion status of jobs and the results of post-processing analysis are transmitted to the Control-M/Server.

- **Control-M/Agent for IBM i (AS/400)**: Enables you to submit jobs for execution on the agent platform, monitor the jobs, and perform post-processing analysis of output files. The completion status of jobs and the result of post-processing analysis are transmitted back to the Control-M/Server. You can view and modify the following OS/400 type of jobs: External, Full, Multiple Commands, Program, VT.

- **Control-M/Agent for TANDEM Guardian**: Supports running jobs on other platforms, and enables you to define jobs, retrieve job parameters, and control jobs running on the Guardian operating system.

Application Plug-ins

To bring Control-M functionality to your external, packaged application environment (for example SAP and Oracle E-Business Suite), Control-M provides application plug-ins that enable Control-M/Agents to interface with the external applications.

Control-M supports the following application plug-ins:
Control-M for Advanced File Transfer

Control-M for Advanced File Transfer (AFT) is an FTP/SFTP client that enables you to watch and transfer files from a local host to a remote host, a remote host to a local host, or a remote host to another remote host.

Control-M for Databases

Control-M for Databases is a control module that enables you to do the following:

- Connect to any supported database from a single computer with secure login, which eliminates the need to provide authentication.
- Define and monitor Stored Procedure, SQL Script, SQL Server Integration Services (SSIS) Package, and Open Query database jobs.
- Integrate database jobs with other Control-M jobs into a single scheduling environment.
- Introduce all Control-M capabilities to Databases, including advanced scheduling criteria, complex dependencies, quantitative and control resources, and variables.
Control-M for Oracle E-Business Suite

Control-M for OEBS enables you to perform the following actions:

- Define and schedule new Oracle E-Business requests and request sets
- Extract Oracle E-Business Suite predefined jobs
- Intercept ad hoc jobs
- Monitor active Oracle E-Business Suite jobs
- Trigger Control-M jobs and conditions as a result of ad-hoc events occurring in the Oracle E-Business Suite system
- Integrate Oracle E-Business Suite jobs and other business processing (for example, z/OS jobs or UNIX shell scripts) into a single homogenous scheduling environment.
- Introduce all Control-M capabilities to Oracle E-Business Suite, including advanced scheduling criteria, complex dependencies, Quantitative and Control resources, and AutoEdit variables.

Control-M for PeopleSoft

Control-M for PeopleSoft is an Application Plug-in that brings Control-M enhanced scheduling and job handling capabilities to your PeopleSoft environment. It serves as an interface between Control-M and PeopleSoft and enables Control-M to manage PeopleSoft jobs and processes.

Control-M for SAP

Control-M for SAP provides a complete and SAP-certified interface between the worlds of Control-M and the specific SAP environments.

Control-M for SAP enables you to manage both the traditional SAP, planned and automated processes, and the unpredicted real-time, event-driven dynamic job submission. The Control-M for SAP user interface is designed to be based on SAP native terminology, using a similar look and feel. This is to make the Control-M for SAP interface an easy-to-use tool for SAP users, and therefore minimize end-user training needs.

Control-M for SAP also greatly increases batch processing and existing scheduling capabilities in SAP as follows:

- Integrates and manage large quantities of jobs
- Schedules and monitors capabilities between different SAP systems, and between SAP and non-SAP systems
- Networks between jobs
- Controls the workload using logical or real resource availability
- Integrates between my SAP (non R/3) and R/3 components

Control-M for SAP enables you to perform the following actions:
Control-M for SAP Business Objects

Control-M for SAP Business Objects is a control module that enables you to automate SAP Business Objects report generation for Crystal, Web Intelligence, Desktop Intelligence pre-defined reports and pre-defined Publications. You can also override various SAP Business Objects attributes for specific report instances.

Control-M for SAP Business Objects jobs are integrated with other Control-M jobs into a single scheduling environment. This enables you to control and operate the SAP Business Objects report generation within Control-M. All Control-M capabilities are available for SAP Business Objects jobs, including advanced scheduling criteria, complex dependencies, quantitative and control resources, and variables.

Control-M for IBM Cognos

Control-M for IBM Cognos is an application plug-in that enables you to automate report and job generation for pre-defined IBM Cognos reports and jobs.

Control-M for Oracle Business Intelligence

Control-M for Oracle Business Intelligence is an application plug-in that enables you to automate report and job generation for pre-defined Oracle Business Intelligence reports and jobs.

Control-M for Oracle Retail

Control-M for Oracle Retail enables you to schedule and monitor your Oracle Retail Merchandising System (RMS) and Oracle Retail Price Management (RPM) jobs.

Control-M for Oracle Retail jobs are integrated with other Control-M jobs into a single scheduling environment. This enables you to control and operate the Oracle Retail batch processing within Control-M, and enables you to do the following:
Control-M Getting Started Guide

- Define and monitor Control-M for Oracle Retail jobs, as described in Control-M for Oracle Retail job definition.
- Integrate Oracle Retail jobs with other Control-M jobs into a single scheduling environment, as described in Using Control-M.
- Introduce all Control-M capabilities to Oracle Retail, including advanced scheduling criteria, complex dependencies, quantitative and control resources, and variables, as described in Using Control-M.

Control-M for Informatica

Control-M for Informatica is a control module that enables you to automate Informatica workflows.

Control-M for Informatica jobs are integrated with other Control-M jobs into a single scheduling environment. This enables you to control and operate the Informatica workflows within Control-M. All Control-M capabilities are available for Informatica jobs, including advanced scheduling criteria, complex dependencies, quantitative and control resources, and variables.

Control-M for Hadoop

Control-M for Hadoop is an application plug-in that connects to the Hadoop framework, enabling the distributed processing of large data sets across clusters of commodity servers.

With Control-M for Hadoop, you can expand your enterprise business workflows to include tasks running in your Big Data Hadoop cluster from one central location. Control-M for Hadoop jobs are integrated with other Control-M jobs into a single scheduling environment. This enables you to control and operate the Hadoop jobs, query execution within Control-M.

Control-M for Cloud

Control-M for Cloud is a solution that enables you to automate the process of allocating and dynamically changing resources for virtual machines.

Control-M for Cloud can automate the following VMware tasks:

- Power
- Snapshot
- Configuration tasks

Control-M for Cloud can automate the following Amazon EC2 tasks:

- Create
- Start
- Stop
- Reboot
- Terminate

Control-M for Cloud can schedule BladeLogic jobs. Control-M for Cloud jobs are integrated with other Control-M jobs into a single scheduling environment. This enables you to control and operate Amazon EC2, VMware, and BMC BladeLogic tasks within Control-M.
Control-M for Web Services, Java, and Messaging

Control-M for Web Services, Java, and Messaging (Control-M for WJM) is a comprehensive integration solution enabling you to expand Control-M job scheduling to on-line and real-time applications and thus implement effective application integration and uses three main industry standard technologies to achieve application integration:

- Java classes and J2EE Enterprise Java Beans (EJBs)
- Web Services
- Message-Oriented Middleware

Control-M for WJM consists of two main components:

- **Control-M for Web Services, Java, and Messaging**: Enables you to schedule remote jobs that use the technologies mentioned above. You can therefore schedule a Java class or an EJB running on a J2EE application server (such as IBM WebSphere, BEA WebLogic, JBoss, SAP NetWeaver and so on). Similarly, the Control-M for WJM enables you to schedule standard Web Services via a new Control-M Web Service job type. Additionally, the Control-M for WJM allows you to create a job that sends a (JMS or IBM WebSphereMQ Series) message to another application’s message queue. After sending a message, the job can optionally wait for a response message back from the application.

- **Control-M Web Services and Messaging API**: Complements Control-M for Web Services, Java, and Messaging by allowing applications to interface with Control-M in order to request scheduling services such as submitting ad hoc jobs, ordering a group of jobs, raising conditions to trigger job flows, tracking jobs’ status and so on.

These functions are available through the use of a Java API, with both elements of Control-M Web Services and Messaging API. These powerful capabilities enable you to implement true event based scheduling. Once a business event occurs within an application, it can easily create or order Control-M jobs to process the event via Java, Web Service or messaging.

Control-M for IBM InfoSphere DataStage

Control-M for IBM InfoSphere DataStage is an application plug-in that enables you to run and execute pre-defined InfoSphere DataStage jobs.

Control-M for Backup

Control-M for Backup is an application plug-in that connects to a NetBackup or IBM Tivoli Service Manager (TSM) backup client and enables you to define backup jobs. Control-M for Backup simplifies the process of defining, monitoring, and troubleshooting backup jobs as well as reducing manual scripts and typing errors.
Control-M for Backup enables you to do the following job definition actions:

- Define an incremental or full backup
- Select the required backup policy from the list of policies that are already defined in your backup application, instead of manually typing a script per job (NetBackup)
- Perform a search (with wild cards) on the list of policies that might contain hundreds and more policies (NetBackup)
- Define backup jobs for a group of hosts (NetBackup)
- Automatically generate a job for backup clients which were added into existing policy (NetBackup)

Control-M for Backup enables you to do the following job monitoring actions:

- View native and configurable backup job output including readable error codes
- View backup job status
- Kill backup jobs
- Restart failed jobs on rerun (NetBackup)

Control-M for Backup jobs are integrated with other Control-M jobs into a single scheduling environment, which enables you to do the following:

- Integrate Backup jobs with other Control-M jobs into a single scheduling environment, as described in Planning.
- Introduce all Control-M capabilities to Backup, including advanced scheduling criteria, complex dependencies, quantitative and control resources, and AutoEdit variables, as described in Planning.

Control-M for SAP Process Integration

SAP Process Integration (SAP PI) is an integration broker which uses both ABAP and Java stacks to enable message based integration between SAP and non-SAP applications.

Control-M Application Integrator

The Control-M Application Integrator is a web based application that creates custom designed job types that are deployed to the Control-M environment. You can then define and monitor job types in the Planning and Monitoring domains in Control-M, Control-M Workload Change Manager and Control-M Self Service.
Control-M Add-ons

The following Control-M Add-ons are automatically installed in a trial version, which enables you to use the Add-on functionality. This mode is intended for testing and evaluation, not for use in production. For production, uninstall the trial version, re-install a non-trial version, and then activate the Add-ons from Add-on Activation CDs.

<table>
<thead>
<tr>
<th>Add-on</th>
<th>Description</th>
</tr>
</thead>
</table>
| Control-M Batch Impact Manager (on page 24) | Enables you to prevent batch-related failures or external events, such as hardware and network problems, which might cause delays in batch processing that affect the completion time and accuracy of business processes. You can analyze the potential delays before they adversely impact your business by doing the following:  
  ▪ Detect potential delays and errors in critical batch business services  
  ▪ Provide the status of critical batch business services  
  ▪ Allows corrective actions to take place before the business service is affected |
| Control-M/Forecast (on page 26)              | Enables you to simulate the processing of your batch flows and validate job dependencies and scheduling criteria for any future dates.                                                                        |
| Control-M Self Service (on page 28)         | Enables users to view services, which are containers of jobs, and analyze the problematic services and jobs through a flow diagram or list display in a Web-based application. After users have determined what the problems are, they can resolve them by performing various service and job actions based on their authorizations. |
| Control-M Workload Change Manager (on page 29) | Enables you to:  
  ▪ Request changes to business workflows in Control-M by creating and submitting requests in Control-M Workload Change Manager web application.  
  ▪ Define standards that comply with your organization's standards when defining folder/job definitions in Control-M. |
### Add-on

<table>
<thead>
<tr>
<th>Add-on</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control-M Workload Archiving</strong> (on page 29)</td>
<td>Enables you to automatically archive job log and output data, from both Mainframe and Distributed systems, in a secure and central repository that is separate from the production environment.</td>
</tr>
<tr>
<td><strong>Control-M Managed File Transfer</strong> (on page 30)</td>
<td>Enables you to watch and transfer files from a local host to a remote host, a remote host to a local host, or a remote host to another remote host.</td>
</tr>
<tr>
<td><strong>Control-M MFT Enterprise B2B</strong></td>
<td>Control-M MFT Enterprise B2B is an MFT add-on that enables you to securely transfer and receive files to and from external users outside of your organization. Internal users can transfer files externally with File Transfer jobs, while external users transfer files to and from your organization via a BMC-provided web application or third-party FTP client.</td>
</tr>
</tbody>
</table>

### Control-M Batch Impact Manager

Batch Impact Manager is a Control-M Add-on that lets you monitor critical batch services and intervene if delays or problems are detected or anticipated.

Every time a job executes, Control-M collects statistics that it uses to calculate the average run time for that job. This average run time becomes the expected run time for the job. When a job runs, and that job is defined in a business service, Batch Impact Manager compares its actual run time to its average run time from past executions. Based on this comparison, Batch Impact Manager calculates if the business service, is expected to finish on time.

Batch Impact Manager enables you to do the following:

- Create a BIM service, as described in BIM Service Definition (on page 25).
- Analyze run time statistics to predict the end time of defined job using one of the following methods:
  - Basic Statistics collection
  - Periodic Statistics definition
- Monitor services, as described in Service Monitor and Business Service Analysis Viewpoint.
BIM Service Definition

The following table describes the what jobs are in the service and provides information on defining, submitting, and tracking a batch service:

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
</table>
| Jobs in a BIM service (on page 26)  | Identifies the chain of jobs that comprise the critical service, and define a Control-M Batch Impact Manager job at the end of the chain. For more information about identifying the set of jobs in a critical batch service, see the following:  
  ▪ Critical Path  
  ▪ Job dependencies |
| Creating a regular folder           | Defines a folder for a service.                                              |
| Create a BIM job                    | Enables you to define a limitations and tolerances in a job that represents the BIM service. If the service appears to be delayed or late, you can make adjustments before the business is adversely affected. Consider the following when defining a BIM job:  
  ▪ **Delayed or Late service**: Enables you to set limitations at what point a delay in a service will adversely impact business. The time by which service must be completed is specified by either a specific time or relative to the ordering time.  
  ▪ **Run time tolerance**: Enables you to set status indicators for jobs in services to determine when to trigger a warning for jobs that finish running too quickly or run too long. This enables you to perform adjustments in Production before any adverse business impact. |
| Ordering jobs                       | Enables you to order the folder for the service that contains the chain of jobs and the BIM job at the end of the chain. |
| Analyzing active jobs               | Enables you to monitor the progress of the jobs in the service as they are ordered, as they run, and as they complete. |
| Control-M Self Service              | Enables non-Control-M users to monitor the progress of and extend deadlines for services as they run from a Web browser. |
| Service Monitor                     | Enables you to analyze services and locate and resolve problematic jobs. If you have Control-M Batch Impact Manager, the Service Monitor enables you to identify critical batch services that are expected to miss their deadline. |
Jobs in a BIM service

When defining a service, the first step is to identify a set of dependent jobs that represent a critical batch service that must complete by a certain time. Control-M Batch Impact Manager analyzes the performance of this set, or chain, of jobs to calculate if the service will end on time.

After you have identified the chain of jobs, a new Control-M Batch Impact Manager job must be defined so that it, too, depends on the other jobs. The Control-M Batch Impact Manager job must be defined as the last job in the chain. BMC Batch Impact Manager considers any jobs defined above the Control-M Batch Impact Manager job as part of a batch service, as shown in the following figure:

All jobs defined in this figure are part of the critical service because the BIM9559 BMC Batch Impact Manager job depends on them, either directly or indirectly.

Control-M/Forecast

Control-M/Forecast is an Add-on that you can use to validate your batch production modeling. Control-M/Forecast loads and simulates the processing of your batch flows, allowing you to validate job dependencies and scheduling criteria for any future dates.

Every time a job executes, Control-M collects statistics that it uses to calculate the average run time for that job. This average run time becomes the expected run time for the job in Control-M/Forecast.

If BMC Batch Impact Manager is installed, Control-M/Forecast shows all business services and their expected end time.
If you have Control-M/Forecast, you can do the following:

- Display when and how often jobs are scheduled by clicking **View Schedule**. For more information about scheduling jobs, see Job scheduling.
- Create dependencies between jobs and allocate resources, as described in Job prerequisites.
- Simulate your job flows for a day in the future, as described in Simulate your job flow.
- Analyze run time statistics to predict the end time of a defined job using one of the following methods:
  - Basic Statistics collection
  - Periodic Statistics definition
- Load and play back an archived event, as described in History.
- View Forecast reports, as described in Generate Forecast reports.
- Perform a Load Operation in batch mode, which enables you to receive Job information, and if you have Control-M Batch Impact Manager Add-on installed, you can receive service information.

### Control-M batch flow scheduling

Job processing definitions are stored in the Job Definition database and remain unchanged until you modify or delete them. When a job is ordered, a non-permanent copy of the job processing definition is copied to Active Jobs database (Production). You can monitor the status of jobs in all Control-M/Servers. Separating the Active Jobs from the Defined Jobs provides several advantages, including the following:

- The active jobs must only contain those jobs that are scheduled on that day rather than the total of all defined jobs.
- You can modify instructions in the active copy of the job processing definition (for that particular job execution) without modifying the permanent definition.

Jobs can be scheduled (that is, placed in Production) automatically or manually as follows:

- **Automated job scheduling**: Automatically schedules those jobs whose scheduling criteria (defined in its job processing definition) are met. This is the most efficient way to schedule jobs.
- **Manual job scheduling (ordering)**: Manually schedule jobs as needed. To manually schedule jobs or SMART Folder, you can order the job or SMART Folder as follows:
  - Schedule requested jobs whose scheduling parameters indicate that the jobs are eligible for scheduling that day.
  - Schedule requested jobs regardless of whether their scheduling parameters are met that day.

Both options are available from Control-M in Ordering jobs, Order in Control-M/EM API and the cli or em cli utilities, described in Ordering jobs in Utilities.

### Daily automation of job scheduling

Control-M/Server runs the New Day procedure at the same time each day. This procedure includes scheduling the day’s Automatic jobs and running maintenance and cleanup utilities, such as deleting the old jobs from the previous day.
To handle job automation, the New Day procedure utilizes Specific User Daily jobs defined for the jobs in a folder. The sole purpose of the jobs is to order jobs. Instead of directly scheduling production jobs, the New Day procedure can schedule the Specific User Daily jobs. For more information on setting up Order Method to Automatic or Specific User Daily, see Editing a folder and Defining a Specific User Daily job.

**EXAMPLE:** New Day time is at 5:00 a.m., but 10,000 jobs are not needed until 12:00, another 20,000 jobs are not needed until 3:00 p.m., another 30,000 jobs are not needed until 8:00 p.m.

Instead of all those jobs being scheduled by the New Day procedure at New Day time, the New Day procedure can schedule three specific User Daily jobs, defined as follows, at New Day time:

- One specific user daily job, which schedules the 10,000 jobs, would be submitted at noon.
- One specific user daily job, which schedules the 20,000 jobs, would be submitted at 3:00 p.m.
- One specific user daily job, which schedules the 30,000 jobs, would be submitted at 8:00 p.m.

The Specific User Daily jobs provide an additional advantage. The Control-M administrator is responsible for the New Day procedure, but a site can allow different departments to be responsible for their own Specific User Daily jobs.

On a regular clock, one day ends and a new day begins at midnight. However, you can set the New Day time according to your site’s actual business processing Working Day. For example, if New Day time is 6:00 a.m., then from 6:00 a.m. on August 4th, until 6:00 a.m. on August 5th, the Working Day is August 4th. The date that a job is scheduled in Control-M is called the Original Scheduling Date (abbreviated Order date) and it conforms to the Working Days, not midnight to midnight calendar days.

**Control-M Self Service**

Control-M Self Service is a Control-M Add-on, which enables you to view your services with a Web-based application and analyze the problematic services and jobs. After you have determined what the problems are, you can resolve them by performing various service and job actions, depending on your authorizations. The following tasks are included in setting up Control-M Self Service:

- Log in to Control-M Self Service through the URL on Windows as follows:
  
  ![](http://<Control-M/EM_Server_Host_Name>:<web_server_port>/SelfService)

  The default web server port is 18080.

- Configure the Self_Service_Server and Control-M Self Service system parameters from the Control-M Configuration Manager, as described in Control-M Self Service system parameters.

- Create service definitions or service rules from the Service Manager, as described in Service definition.

- Enable SSL security, as described in SSL Management.

For more information on Control-M Self Service, see Introduction to Control-M Self Service.
Control-M Workload Change Manager

Control-M Workload Change Manager is a Control-M add-on, which enables you to do the following:

- In Control-M Workload Change Manager web application, application developers/analysts or the web users, can request changes to business job flows by creating and submit them as requests to a Control-M scheduler or check them in to the Control-M Database. These change requests are related to your Control-M definitions in Control-M.

- In Control-M, a Control-M Administrator can create standards to assist schedulers and web users in defining folders/jobs according to your organization's standards.

A Control-M Administrator creates site standards, as described in Site standards management, and then assigns the standards to folders, as described in Assigning a Site standard to a folder/folders. This ensures that when web users, and schedulers define jobs, the job definitions comply with your organization's standards.

Using these standards, web users can create business job flows using a web interface. The web user can either submit the job flow as a request or check it in to be part of the Control-M Database.

If the web user submits the job flow as a request, the Control-M scheduler receives these requests through Control-M. The requests appear in the Planning-Home page along with his other Workspaces and workflow. For more information on the request workspace, see Request Workspace. The Control-M scheduler works together with the web user, easily communicating through Notes, to review and approve business workflow requests. After the request is approved, the Control-M scheduler checks-in the request to be part of the Control-M database.

For more information on how to setup Control-M Workload Change Manager, see Control-M Workload Change Manager Setup.

Control-M Workload Archiving

Control-M Workload Archiving is a Control-M add-on that enables you to automatically archive job log and output data, from both Mainframe and Distributed systems, in a secure and central repository that is separate from the production environment.

When Control-M/Server submits a job to run on an Agent, the Workload Archiving Server archives the job log and output in a separate PostgreSQL or Oracle database for a defined period based on Workload Archiving Policies, as described in Workload Archiving configuration. This enables you to meet organizational audit and compliance requirements, troubleshoot your environment using historical data, and enable/disable users from accessing the archived data based on Control-M/EM authorizations.

Control-M Workload Archiving is installed with a PostgreSQL or Oracle database. For more information, see Control-M Workload Archiving installation.

BMC recommends that you install Control-M Workload Archiving on a dedicated server.
The following procedures describe how to search, duplicate, compare, export, and save archive data:

- Searching for archive data
- Duplicating archive search results
- Comparing archived jobs
- Exporting archived data
- Saving archive data

Control-M Managed File Transfer

Control-M Managed File Transfer (MFT) is an FTP/SFTP client and server solution that enables you to watch and transfer files from a local host to a remote host, a remote host to a local host, or a remote host to another remote host.

Control-M MFT uses industry standard protocols, such as FTP (based on RFC 959) and SFTP and does not require installation on remote computers.

A File Transfer job can contain up to five different file transfer definitions, which are executed sequentially. Each definition can transfer one or more files, or an entire directory, with the option of including all of its subdirectories.

Control-M MFT contains the following additional functionality:

- Configure a built-in File Transfer Server that supports FTP/S and SFTP protocols with Windows, PAM or LDAP authentication, as described in Configuring the File Transfer Server.
- Deploy and update Control-M MFT on your Control-M Agents from the CCM, as described in Deploying Control-M MFT.
- Create a connection profile with secure encryption (FTPS/SFTP), configure MFT settings, generate SSH keys, authorize SSH hosts, and update mass connection profiles, as described in Connection profile management.
- Define File Transfer jobs by watching and transferring files to and from an FTP/SFTP server, rerun file transfers from point of failure, and monitor files in real-time, as described in Job definition.
- Monitor and track the traffic load, file status, and active connections of all file transfers in Control-M, as described in Control-M MFT Dashboard.
- Search for specific files using filters such as file name, application, source, destination, time frame, as described in Searching for a file transfer.
- Integrate File Transfer jobs with other Control-M jobs into a single scheduling environment.
- Introduce all Control-M capabilities to Control-M MFT, including advanced scheduling criteria, complex dependencies, quantitative and control resources, and variables.
Step-by-step scenarios

To get started using Workload Automation, you can complete the following step-by-step scenarios:

- **Job definition** (on page 31): Enables you to define and order a job in the Planning domain, and then view the running job in the Monitoring domain.

- **Editing jobs** (on page 43): Enables you to load jobs from the Definition database and check out the Workspace so that you can edit the jobs. You can save a Workspace so that you can keep working on it, even if you close it.

- **Editing a Workspace** (on page 44): Enables you to use Workspace functionality, and do the following actions:
  - Create a job in your Workspace
  - Use the Properties pane
  - Change the view of the job flow from a Flow Diagram to the List view
  - Search for a job based on specific parameters
  - Create dependencies between jobs
  - Drag and drop a job to another folder
  - Position the jobs within a folder and Workspace
  - Rearrange the Flow Diagram
  - Cut and paste jobs

- **Checking in your changes to the database** (on page 45): Enables you to commit your changes to the Jobs Definition database.

For more information on defining jobs, see Planning.

Job definition

When defining a job, you need to consider whether you can group jobs according to one of the following:

- **Scheduling criteria**: If jobs run on similar schedules or need to run at the same time, you should group them in the same folder. All jobs in a folder are ordered for scheduling at the same time. You may want to define a SMART folder, which uses more capabilities such conditions, post processing, and so on. For example, Folders contain end of year jobs, daily jobs, jobs that must produce reports for an audit, and jobs that must run as a group to handle emergency situations, such as backup procedures in the event of a natural disaster.
Applications: Provides a logical name for sorting groups of jobs, which is used to supply a common descriptive name to a set of related job groups, but do not necessarily have to run at the same time. For example, Applications such as Inventory, Accounting Payroll, etc.

Sub Applications: Indicates the name of the Sub Application where the job belongs logically. It is a sub-category of the Application that you can use to organize your jobs.

**EXAMPLE:**

- Jobs in an Accounting application might be divided into sub applications such as Budgets, Finance, Receivables, and Expenditures.
- Jobs in an Employees application might be divided into sub applications such as Pilots, Flight Attendants, Ground Crew, and Reservations.
- Jobs in any application might be divided into sub applications such as Managers, since processing of managers remains the same regardless of the department (application) in which they work. Jobs that calculate the bonuses of managers of the ground crew.
- Staff and managers of the reservations staff might be similar enough to include in the same sub application.

You should also consider the type of job you are automating (job script, or operating system command) and when (daily-specific days/cyclically) and where the job should run, on which computer and whether workload balancing on several computers is required. Does the job need resources and what specific action should be taken if the job finishes as expected or the the job does not finish as expected.

For Batch Impact Manager, decide whether any jobs represent batch tasks that will seriously impact critical business services if delayed. If so, define these jobs as a batch service, so BMC Batch Impact Manager can provide early warning.

Examples of critical batch business services are:

- A set of jobs that, if delayed, will cause a shipping company to miss the express mail delivery truck.
- A set of jobs that, if they finish way ahead of schedule, indicate that proper processing did not occur. A payroll application that finishes too soon might indicate that the proper calculations did not occur to process employees’ salaries.

You can define and run a new job by defining the job, ordering the job and ignore scheduling criteria. When the job starts running, you can monitor the job. The following examples describe how to define, order, and monitor a running job.

- **Defining a job** (on page 33)
- **Ordering a job** (on page 33)
- **Viewing a running job** (on page 34)

For a practical example, see **Job definitions examples** (on page 35).
Defining a job

This example describes how to define a Dummy OS job.

➢ To define a job:

1. From your desktop, select the Workload Automation icon.
2. Log in with your user name and password.
   For assistance with logging in, contact your Control-M Administrator.
3. Select the Planning domain, and click the  tab.
   A New tab appears. The tab is the Planning - Home page.
4. Select .
   A blank Workspace appears with a default name.
5. To view the job templates, from the Workspace tab, New group, click .
6. Drag and drop the Dummy job template into the Workspace, and select the job.
   The Properties pane for the created job appears on the right.
7. Edit the job.
   For example, you can change the job name and add a description.

Ordering a job

This example describes how to order jobs to be run in production.

➢ To order a job:

1. From the Workspace tab, click the Order drop-down, and select Order Workspace.
   The Please Confirm dialog box appears.
2. Click Yes to confirm the following message:
   The following message appears: Folder that is included within selection will be entirely ordered, including jobs that were not loaded into Workspace.
3. Click Yes.
   The Order dialog box appears.
4. In the Parameters section, select Ignore scheduling criteria.
5. Click .
The Check-in and Order stages appear.

6. Click Done.
   The jobs and folders in the Workspace were checked in and ordered.

Viewing a running job

This example describes how to view a running job that is in Production.

➢ To view a running job:

1. Click Monitoring.
   The Monitoring domain appears.
2. Click .
   A New tab appears. The tab is the Monitoring - Home page.
3. In the All Viewpoints section, click All Jobs.
   A default Viewpoint appears called All Jobs.
4. In the Viewpoint tab, Actions group, click Find.
   The Find fields appear on the top of the Flow Diagram in the middle pane.
5. In the drop-down list next to the . icon and the field, select the down arrow.
6. Clear all the fields except for Job Name.
7. In the field next to the . icon, type of Job Name you defined, and click OK.
8. To find the job in the field, click .
   Your job is viewable.
Job definitions examples

Control-M comes with a number of examples that you can open in Control-M. To import an example, click **Import**, go to BMC Software\Control-M EM\Default\Samples\Drafts and select **CONTROL-M EM Job Definition Examples 7.0.01**.

Control-M contains the following examples:

- **The Ex-Accounting application - organizing the company's accounting jobs** (on page 35)
- **The Ex-Flights application - organizing the airline company's flight jobs** (on page 37)
- **The Ex-ITMaintenance application - organizing the IT department maintenance jobs** (on page 38)

When working with this example, remember that although the jobs are organized into applications and sub applications, they represent only a small sample of the jobs one might expect to find in such applications, and the only purpose of these jobs is to highlight certain job definition tasks. Documentation (.txt) files located in the same subdirectory as the import file, which describe the jobs in the sample. (The name and path of a job's documentation file appear in the Doc File and Doc Path fields in the Job Properties pane).

The Ex-Accounting application - organizing the company's accounting jobs

Control-M comes with a number of examples that you can open in Control-M. To load this example into Control-M, see **Job definitions examples** (on page 35).

The accounting requirements of the company collectively fall into an application called **Ex-Accounting**. These accounting requirements, in turn, fall into the following sub-Applications:

- Ex-Invoicing: Contains invoice jobs
- Ex-Payroll: Contains payroll jobs

To handle its invoicing needs, the company must process several types of information on a daily basis. The company runs a set of batch jobs each day, each job responsible for a particular type of information. The following list indicates the types of information, and the jobs that process the information:

- **CalcRevenue** job: Calculate the day's revenues
- **CalcExpenses** job: Calculate the day's expenses
- **CalcProfits** job: Calculate the day's profits
- **DueInvoices** job: Determine which customer invoices should be billed that day

All three jobs generate a printout of the processing results, and therefore require an available printer.

You can see the following:

- The **CalcRevenue**, **CalcExpenses**, and **CalcProfits** jobs run daily. In the **Scheduling** tab, Every Day is selected.
- **CalcProfits** runs only after **CalcRevenue** and **CalcExpenses** have ended successfully.

**NOTE:** **CalcRevenue** and **CalcExpenses** can run in any order but both of those jobs must end successfully before **CalcProfits** can run.
The Conditions tabs of these jobs are filled in as follows:

- Both CalcRevenue and CalcExpenses have no predecessor jobs and therefore have no In conditions.
- When each job, CalcRevenue and CalcExpenses, ends successfully, it adds an Out condition (ExCalcRevenuOK and ExCalcExpensesOK, respectively). The date definition for these conditions Order Date, which ensures that the condition is added to the system with the original scheduling date of the job.
- CalcProfits runs only after both CalcRevenue and CalcExpenses have successfully ended. CalcProfits has ExCalcRevenuOK and ExCalcExpensesOK defined as In prerequisite conditions. To ensure that these In conditions are only satisfied by Out conditions from the same day, they are assigned a date value of Order Date, which resolves to the original scheduling date. To ensure that both conditions are satisfied, an AND relationship value is selected in the field above the In Conditions section.
- No job other than CalcProfits has CalcRevenue and CalcExpenses as predecessor jobs. To increase system efficiency, after CalcProfits ends successfully, it deletes the ExCalcRevenuOK and ExCalcExpensesOK prerequisite conditions from the system by defining them as Out conditions (instructs Control-M to delete, rather than add, the conditions). To ensure that only the conditions from that date are deleted, the Out conditions are defined with an Order Date date value.
- In case another job has CalcProfits as a predecessor job, after CalcProfits ends successfully, it adds ExCalcProfitsOK as an Out condition, with Order Date as the date reference.

- The printer required by each of the jobs is available before the job is submitted.
  Each of these jobs prints out a report of the data it processes (revenues, expenses, or profits). To ensure that the printer required for printing the reports is available, the Control Resources section in each of the jobs indicates that the job requires exclusive control of the printer (in this case, Printer1). The job is not submitted unless the printer is available.
- Define a job that prints invoices that become due:
  The DueInvoices batch job prints out the list of customers whose invoices have become due. In the General tab, the File Name and File Path fields identify the file name and location of the batch job. In the Scheduling tab, Every day is selected.
  The printer required by the job is available before job submission: The job prints out a report of the due invoices. To ensure that the printer required for printing the report is available, the Control Resources section indicates that the job requires exclusive control of the printer (in this case, Printer1). The job is not submitted unless the printer is available.

The company can now handle payroll, as described in Payroll processing needs (on page 36).

Payroll processing needs

The company runs a batch job (CalcSalaries) that calculates the salaries to be paid to employees for the month just ended. After these calculations are completed, the company can run a paycheck printing job to print the pay checks. (The sample draft does not contain the job processing definition for the check printing job, but does contain the salary calculating job, described in this appendix).

Define a job to calculate salaries

This batch job calculates employees’ salaries for the month just ended.
It should run once a month, on the first day of each month.

The job should only run after all employees have submitted their time sheets.

The job must run by a certain time to ensure that there is time for a different job (not in the draft) to print the pay checks.

You can see the following:

1. In the **General** tab, the **File Name** and **File Path** fields identify the file name and location of the batch job.

2. The job is scheduled on the first day of every month. In the **Scheduling** tab, the following values are selected: day 1 in the **Days of the month** (Month Days) area and select **ALL** in the **Order on Months** area.

3. The job runs in time for pay checks to be printed: In the **Time Settings** area, job can only be submitted between the hours of 1:00 and 3:00 AM, which ensures that the pay check printing job which follows has plenty of time to print the pay checks before they are needed.

4. The job is not submitted until all time sheets have been submitted: In the **Prerequisites** tab, the **In Condition** contains **EX_TimeSheetSubmitted**. This condition is actually a manual condition, which means that it is not added by another job and is instead added manually by the authorized manager from accounting, only after all time sheets have been submitted.

5. The jobs that depend on successful completion of this job can run after the jobs ends ok. In case other jobs depend on this job, after the job ends successfully, it adds the **Ex_CalcSalariesOK** Out prerequisite condition. The date definition for this condition is **Order Date**, which ensures that the condition is added to the system with the original scheduling date of the job. In addition, this job shouts a message to the appropriate location indicating that the pay checks can now be printed. This action is defined in the **Notifications after job completion** section.

The **Ex-Flights** application - organizing the airline company's flight jobs

Control-M comes with a number of examples that you can open in Control-M. To load this example into Control-M, see **job definitions examples** (on page 35).

The primary objective of this airline company is to keep its airline routes functioning according to schedule, its seats booked, and its airplanes flying. The IT jobs that help the company meet its goals fall collectively into an application called **Ex-Flights**. Though, in reality, jobs in this application would fall into several Sub Applications, for simplicity the sample draft contains one Sub Application (Ex-Communication, which contains communication jobs), and this Sub Application contains one job.

**Handling flight-related communication needs**

The airline company runs a number of communication jobs. The sample contains one job, UpdateFlightTimes, which updates flight departure and arrival times.

**Defining a job that updates flight departure and arrival times**

The UpdateFlightTimes job runs a program that distributes updated departure and arrival times to the airline company's travel agents and associated airport monitors and Internet sites.

This batch job should run repeatedly throughout the day (at one minute intervals from the start of the previous iteration).

**Defining the job type and other general information about the job**
The General tab defines the File Name and File Path fields, which identify the file name and location of the batch job.

Defining the job so that it is scheduled daily

The job is scheduled every day. In the Scheduling tab, the Every Day value is selected.

**Ensuring that the job cycles through every minute (from the start of the previous iteration)**

In the Rerun Settings field define the cycle interval as every one minute from the start of the job.

**Defining special handling if the job does not cycle through successfully**

It is critical that the job runs every minute, and if there is a problem, it is critical that notification be sent to the main monitor. The Actions tab contains the following definitions:

Add an On Do Action, if the job status is NOTOK (On statement = *, Code = NOTOK) do the following:

- Stop the job (Do StopCyclic).
- Shout a very urgent message, **Flight Updates cannot be sent**, to the main monitor.

**Providing notification that the job processed successfully**

Whenever the job ends successfully, a success message with the job’s runtime is shouted to the main monitor. The Shout message, **Flights updated and distributed at %%TIME**, is defined with a regular urgency in the Actions tab, Notification after job completion section. (The %%TIME variable resolves to the job's runtime.)

The Ex-ITMaintenance application - organizing the IT department maintenance jobs

Control-M comes with a number of examples that you can open in Control-M. To load this example into Control-M, see Job definitions examples (on page 35).

The IT department runs a number of maintenance jobs of different types that are collectively organized into the Ex-ITMaintenance application. Most of the jobs in the sample draft, perform tasks that must be performed in extreme emergencies (fire, floods, tornado watch, etc). The draft also contains a job for routine, non-emergency backups.

During an extreme emergency, it is imperative that emergency procedures be immediately implemented to get employees to safety, get the system backed up, and to shut down Control-M components. The sequencing of these jobs is important, and this, in turn, affects the Sub Applications of these jobs.

Jobs in this application fall into the following Sub Applications:

- **Ex-Backups**: Jobs to perform backup, in both non-emergency and emergency situations
- **Ex-EmergencyProcs**: Jobs to initiate emergency procedures in an extreme emergency
- **Ex-ComponentStopping**: Job to shut down Control-M components after the emergency procedures have been implemented

**Handling IT job backup needs**
The **Ex-Backups** Sub Application contains the following two jobs:

- **The Backups** job performs a standard backup of company data under normal circumstances, which executes an operating system command ("copy") to back up certain files from a directory to one of two tape drives. It should be scheduled every day (**Scheduling** tab - **Every Day**). Depending on the files being backed-up, this job copies the files to one of two tape drives. To ensure that these tape drives are available, in the **Prerequisites** tab, **Quantitative Resources** area indicates that two tape drives are required. The job is not submitted unless the drives are available and reserved for the job.

- **The BackupAllSystems** job is executed only in extreme emergencies. It is not scheduled to run but is instead manually forced when needed. Because this critical batch job can be very damaging to the company if misused, only the CIO (Chief Information Officer) can force it. The job requires a large number of tape drives, has no predecessor jobs, and must complete the emergency backups before other jobs can shut down all systems. Once submitted, this job is the highest priority (**Priority Very High**). Note the following:
  - In the **General** tab, the **File Name** and **Path** fields identify the file name and location of the batch job. As this job is intended only for an extreme emergency, it is created by the Chief Information Officer (**Created By** field). As already noted, this job is not scheduled (None (Manual Order)). Rather, it is manually forced if needed.
  - **BackupAllSystems** must back up all systems to tape. It requires 50 available tape drives before it run. These are defined as **Quantitative Resources** in the **Prerequisites** tab.
  - **BackupAllSystems** is a predecessor job to at least one other job. To establish the dependency between this job and its successor jobs, the following prerequisite conditions are defined (either can be used by the successor jobs):
    - An appropriate Out Condition is defined in the Actions tab. The date defined for this Out Condition is the keyword, Order Date, to ensure that the condition is added to the system with the working date the job was forced.
    - An additional On Do Action is defined as follows:
      - On Specific statement output (statement= *** Code=OK) is defined to instruct Control-M that the accompanying Do statement is performed if the job ends OK.
      - A Do statement adds a condition with a date value of Order Date, indicating that the job's task has been completed.
    - This condition could have alternatively been defined as an Out Condition.
    - After this job has ended successfully (that is, completed the backups), it shouts a very urgent notification to the CIO indicating that All Systems are backed up (**Notifications after job completion area**).

To handle emergency situations, see **Emergency situations** (on page 39).

---

**Emergency situations**

In the event of an emergency procedure, several tasks must be performed as a prelude to complete shutdown of the entire system.

- All users must log out and leave the office: The **AllUsersLogOut** job runs a program that instructs all employees to do this immediately.
NOTE: The purpose of the AllUsersLogOut job is to notify all users to log out and go home. It does this by shouting a very urgent notification message to this effect to all users. This shout action is defined in the job's Actions tab in the Notifications after job completion area.

- All data centers must be informed that this data center can no longer function: The SetUpEmergencyGlobalCondition job performs this task by running a program that sends out a global condition to this effect.
- An emergency backup of all systems must be performed: This is performed by the BackupAllSystems job in the Ex-Backup Sub Application.

Only after these tasks are completed can systems be stopped. The jobs that stop the systems belong to a different Sub Application.

To simplify defining dependencies for these predecessor and successor jobs, and to simplify dependency definition changes that might be needed in the future (such as adding an additional predecessor job), an intermediate job, ShutDownAllSystems, is defined in the Ex-EmergencyProcs Sub Application. ShutDownAllSystems is defined as the successor job to the above jobs, and the predecessor job to the jobs in the Ex-ComponentStopping Sub Application that shuts down Control-M/EM components.

Defining jobs to initiate user logout and notify other data centers that this data center has an emergency shutdown

The AllUsersLogOut and SetUpEmergencyGlobalCondition batch jobs are not scheduled to run; they are irregular, emergency jobs. To execute, these jobs must be manually forced. If misused, these jobs can be exceedingly damaging to the company. Therefore, only the CEO or someone with similar permissions can actually force these jobs. And to ensure that the CEO does not erroneously do so, these jobs require confirmation before submission.

Once submitted, these jobs are more critical than any other jobs. They are therefore defined as critical jobs having the highest priority.

Defining the job type and other general information about the jobs

- In the General tab:
  - The File Name and Path fields identify the file name and location of the batch job.
  - In the Priority area: Due to the critical and urgent nature of these jobs, these jobs are defined critical, and assigns them the highest priority (99).
  - In the Created field: Due to the potential for harm from these jobs if inappropriately run, the Created by field identifies the person who can automate these following jobs by having the New Day Procedure run them:
    - AllUsersLogOut job: The CEO
    - SetUpEmergencyGlobalCondition job: The CIO

- In the Scheduling tab: These jobs are not scheduled. Rather, they are manually forced if needed. Therefore, they have no parameters defined in the Scheduling tab.

- In the Prerequisites tab: Due to the potential for harm from these jobs if inappropriately run, they require manual confirmation before they can execute. Manual confirmation is defined by selecting the Wait for Confirmation check box.
In the Actions tab: An Out Condition is defined for each job (either condition can be used by the successor jobs) to establish the dependency between these jobs and their successor jobs. These jobs are predecessor jobs to at least one other job. The date defined for this Out Condition is Order Date, to ensure that the condition is added to the system with the working date the job was forced. An additional prerequisite condition is defined in the On Do Actions section as follows:

- An On Specific statement output (statement= *** code=OK) is defined to instruct Control-M that the accompanying Do statement is performed if the job ends OK.
- A Do statement adds a condition with a date value of Order date, indicating that the job’s task has been completed.

To initiate the shut down of all systems, see Initiating the shut down of all systems (on page 41).

Initiating the shut down of all systems

The ShutDownAllSystems batch job runs a program (through the setting of an Out Condition) that enables another set of jobs to shut down Control-M/EM components. ShutDownAllSystems can only run after its predecessor jobs have ended successfully.

Defining the job type and other general information about the job

- In the General tab:
  - The File Name and File Path fields identify the file name and location of the batch job.
  - The Created by field: Due to the potential for harm from this job if inappropriately run, the CIO is defined in the Created By field. Only the person named in the Created By field can automate this job by having the New Day Procedure run it.
  - Priority field: The job is treated with the highest priority because of the critical and urgent nature of this job.
- In the Scheduling tab: This job is not scheduled. Rather, it is manually forced if needed. Therefore, it has no parameters defined in the Scheduling tab.

Ensuring that this job does not run until its predecessor jobs have ended

ShutDownAllSystems initiates system shut down. It must not run until:

- All users have logged out (initiated by the AllUsersLogOut job)
- All system files have been backed up (initiated by the BackUpAllSystems job)
- All other data centers have been notified of the shut down (initiated by the SetUpEmergencyGlobalCondition job)

To ensure that it runs only after all its (above-mentioned) predecessor jobs have ended successfully, ShutDownAllSystems contains the following definitions:

- In the Prerequisites tab, In Conditions match the conditions defined in Do Condition statements in the predecessor jobs. These In Conditions are assigned Order Date.
- In the In Conditions area there is an AND relationship between the In Conditions.

Ensuring that successor jobs can run

This job is a predecessor job to most of the shut down jobs in the Ex-ComponentStopping Sub Application. To enable the successor jobs to run, after ShutDownAllSystems adds the following Out Conditions (with an Order Date) after it ends successfully:
ShutDownAllSystems-ENDED: This condition defines this jobs as a predecessor job for the remaining jobs in this folder (this Out Condition is defined as an In prerequisite condition for those jobs).

EX_ShutDownAll: This condition serves as an indicator that this job ended for any other jobs that might need to know.

To handle component shutdown needs, see Handling component shutdown needs (on page 42).

Handling component shutdown needs

The Ex-ComponentStopping Sub Application contains jobs that are used to shut down (stop) Control-M components. Normally, shut down of components is not required. However, situations can arise thuire component shutdown. These situations can range from extreme emergencies (as handled in this sample draft) to minor malfunctions, repairs, or maintenance.

Each job in this Sub Application shuts down a single component. With the exception of the job that shuts down the gateway, which must run last, the jobs in this Sub Application can run in any order or sequence.

Defining jobs that stop the GCS, and GUI servers and CMS and BI M

These following jobs should run only after ShutDownAllSystems (in the Ex-EmergencyProcs Sub Application) has ended successfully:

- **BIMStopped**: Stops the Batch Impact Manager Server
- **CMSStopped**: Stops the Configuration Management Server
- **GCSStopped**: Stops the Global Conditions Server
- **GUIServerStopped**: Stops the GUI Server

Defining jobs that implement operating system commands, and other general information about the jobs

The jobs contain the following:

- Each of these jobs issues an operating system shutdown command. For each of these jobs, in the General tab, the Command field contains the following operating system Stop command to be executed:

  `ctl -u emuser -p empass -C component -all -cmd stop`

  where component is the relevant Control-M component (GAS, GCS, etc).

- To ensure that these jobs will not run until their predecessor job has ended, In the Prerequisite tab, each of these jobs has ShutDownAllSystems-ENDED defined as an In Condition. (This condition is only added after ShutDownAllSystems has ended successfully.) The In Condition is assigned an Order Date.

Ensuring that successor jobs can run

- After each of these jobs ends successfully, it adds two Out Conditions (for example, EX_GCSStopped and EX_GCSStopped-ENDED), either of which can be used by successor jobs. The date definition for these conditions is Order Date, which ensures that the condition is added to the system with the original scheduling date of the job. (The successor job, GatewayStopped, uses the name-ENDED condition.)
Defining a job that stops the gateway

The **GatewayStopped** job stops the Gateway. It should only be run after the other components have been stopped. Like its predecessor jobs, this job issues an operating system Stop command.

The job contains the following:

- In the **General** tab, the **Command** field contains the following operating system Stop command to be executed:

  `ctl -u emuser -p empass -C Gateway -all -cmd stop.`

- To ensure that the job runs only after all its predecessor jobs have ended successfully, **GatewayStopped** contains the following definitions:

  - In the **Prerequisite** tab, the In Conditions that match the Out Conditions (the name-ENDED condition) are defined in the Conditions section of each of its predecessor jobs. These In conditions are assigned an **Order Date**. The Conditions Relationship defines an AND relationship between the In Conditions.

- To ensure that successor jobs can run, after GatewayStopped ends successfully, it adds the Out Condition **EX_GatewayStopped** (with an Order Date that can be used as an In Condition by other jobs.

Editing jobs

This example describes how to edit jobs and folders and save the intermediate version as a Workspace.

1. **To edit jobs:**
   1. Click the **Planning** domain.
   2. Click the **tab**.

      A **New** tab appears. The tab is the **Planning - Home** page.

   3. Do one or more of the following:

      - To load jobs and folders from the Job Definition database, click **Load Folders and Jobs**.
      - To view your jobs according to application or Control-M/Server, in the **Hierarchy** field, do one of the following:
        o To view your jobs and folders according to your application, select **Application** and/or **Sub Application**.
        o To view your jobs and folders according to the Control-M/Server definitions, clear **Application** and **Sub Application**.

        Folders are displayed according to the hierarchy you selected.

      - To filter your jobs and folders based on specific fields, do the following:
        a. To view the specific fields to filter, click **Filter**.
        b. Set the filter fields, as described in Filter parameters.
        c. Click **OK** where relevant.
        d. Click **Filter**.
The filtered entities appear in the Tree view.

4. Select the jobs and folders that you want to load to the Workspace, and click Open. The jobs and folders are loaded from database.

5. To check out the Workspace, click Check Out.
   If a message appears that the folder is already checked out exclusively, in another Workspace, repeat step 6, and select different jobs and folders.

6. To edit a job, do the following:
   a. Select a job to edit.
      The Job Properties appear in the right pane.
   b. In the Job Properties, click Edit.
   c. In the Job Name field, type a different name.
      The field is updated after you move your cursor to another field.
   d. Click Save.
   e. In the Workspace Properties dialog box, type a Name and Description, and click OK.
      The Workspace is saved as a workspace to the Job Definition database. You can close the Workspace, and later reopen it.

Editing a Workspace

This example describes how to implement some workspace functionality including, creating jobs, setting properties, changing the view, finding jobs, and creating dependencies between jobs.

➢ To edit a Workspace:
1. Click the Planning domain.
2. Click the tab.
   A New tab appears. The tab is the Planning - Home page.
3. To open a workspace, click My Work.
4. Select a workspace from the list.
   The jobs and folders are loaded into the workspace with the default Map view in the center pane.
5. From the Workspace tab, New group (Job palette), drag and drop a Folder into the center pane.
6. If the Control-M Server Selection dialog appears, select the Control-M/Server from the drop-down list, and click OK.
   A folder is created.
7. From the **Workspace** tab, **New** group (Job palette), drag and drop an OS job into the folder you created.

    An OS job is created.

8. To edit the fields, if the Synopsis view (summary view) is enabled, click 📝.

    A detailed view of the Job Properties appears in the right pane.

9. Do the following:
   a. In the Description field, type a short description.
      The field is updated after you move your cursor to another field.
   b. To create a dependency between jobs, select **Prerequisites** tab in the **Job Properties** pane.
      A detailed view of Prerequisites appears.
   c. To add conditions, in **In Conditions**, select 📊.
      The **Conditions Details** box appears.
   d. Type the name of the condition and select an Order date.
   e. Click **OK**.
      The Condition is created.
   f. Select a job from one folder and drag and drop it to another folder.

10. To change the view, in the **View** tab, select 📑.

    The center pane appears with the jobs defined in the **List** view. You can change the view to be **Map** view.

11. To rearrange the jobs and folders in the Workspace, click 🎨.

### Checking in your changes to the database

This example describes how to commit your changes to the Job Definition database. It enables your jobs to be eligible for job submission on the Order date, and when all the prerequisite conditions are met.

➢ **To check in your changes to the database:**

1. Click 📌.

    The **Check in** window appears.

2. Follow the check-in instructions until the check-in is complete.

3. Click **Done**.

    The folders are checked in to Job Definition database.
Control-M tasks

The following topics describe some common tasks in Control-M:

- Install and configure your environment (see "Installation and configuration of your environment" on page 47)
- Job tasks (on page 49)
- Services tasks (on page 50)
- Validate definitions using Forecast (on page 51)
- Batch production environment organization (on page 51)
- Daily job scheduling automation (on page 52)
- Monitor mission-critical batch services (on page 24)
- Administration tasks (on page 52)
Installation and configuration of your environment

The following table describes common Administrator tasks such as installing and configuring your Control-M environment:

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install Control-M</td>
<td>Enables you to install or upgrade Control-M with a single installation or install individual components:</td>
</tr>
<tr>
<td></td>
<td>- Control-M full installation</td>
</tr>
<tr>
<td></td>
<td>- Control-M upgrade</td>
</tr>
<tr>
<td></td>
<td>- Control-M/Agent installation</td>
</tr>
<tr>
<td></td>
<td>- Control-M client installation</td>
</tr>
<tr>
<td></td>
<td>- Control-M/Enterprise Manager installation</td>
</tr>
<tr>
<td></td>
<td>- Control-M/Server installation</td>
</tr>
<tr>
<td></td>
<td>- Control-M/EM API Installation</td>
</tr>
<tr>
<td>Customize for Languages</td>
<td>Enables you to configure Control-M products to support Western European and East Asian languages:</td>
</tr>
<tr>
<td></td>
<td>- Western European configuration</td>
</tr>
<tr>
<td></td>
<td>- East Asian (CJK) configuration</td>
</tr>
<tr>
<td>Introduction to Control-M Migration</td>
<td>Enables you to migrate Control-M/EM and Control-M/Server from a source environment while preserving your definition and active data, as described in the following topics:</td>
</tr>
<tr>
<td></td>
<td>- Control-M/EM Migration</td>
</tr>
<tr>
<td></td>
<td>- Control-M/Server Upgrade</td>
</tr>
</tbody>
</table>

The Control-M/EM migration procedure does not migrate Control-M/EM API.

Install and configure Control-M/EM API separately after upgrade, as described in the following topics:

- Control-M/EM API Installation
- Upgrading Control-M/EM API
- Control-M/EM API environment
## Tasks

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure Control-M</td>
<td>Enables you to manage, monitor, configure, and maintain Control-M components and define security settings and user authorizations:</td>
</tr>
<tr>
<td></td>
<td>▪ Defining a Control-M/EM component</td>
</tr>
<tr>
<td></td>
<td>▪ Define user authorizations</td>
</tr>
<tr>
<td></td>
<td>▪ Create and manage alerts</td>
</tr>
<tr>
<td></td>
<td>▪ Implement host restrictions</td>
</tr>
<tr>
<td></td>
<td>▪ Gather diagnostic information</td>
</tr>
<tr>
<td></td>
<td>▪ Manage database</td>
</tr>
<tr>
<td>Configure LDAP</td>
<td>Describes how to configure LDAP users in Control-M:</td>
</tr>
<tr>
<td></td>
<td>▪ Defining LDAP system parameters</td>
</tr>
<tr>
<td></td>
<td>▪ Defining LDAP Groups</td>
</tr>
<tr>
<td>Enhance communications security with SSL</td>
<td>Enables Control-M communications security through the Secure Sockets Layer (SSL) protocol.</td>
</tr>
<tr>
<td>Run Utilities</td>
<td>Enables you to run commands to do actions in Control-M.</td>
</tr>
<tr>
<td>Perform Control-M functions for external applications, see Control-M/EM API.</td>
<td>Enables you to perform Control-M functions in the Control-M Business Integrated Scheduling environment for external applications.</td>
</tr>
<tr>
<td>Log in to a Web server</td>
<td>You can log in to a Web server such as Self Service, through the URL on Windows by typing in the following, and substituting the relevant information:</td>
</tr>
<tr>
<td></td>
<td><strong>http://&lt;Control-M/EM_Server_Host_Name&gt;:&lt;web_server_port&gt;/&lt;Add-on&gt;</strong></td>
</tr>
<tr>
<td></td>
<td>The default web server port is 18080.</td>
</tr>
</tbody>
</table>
Job tasks

The following table describes common tasks for jobs:

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define a new job</td>
<td>Enables you to create a job processing definitions to define general job-specific parameters with information on what to run, where and how to run it. The following topics describe and provide links to common tasks related to defining jobs:</td>
</tr>
<tr>
<td></td>
<td>- Working in Workspaces</td>
</tr>
<tr>
<td></td>
<td>- Edit an existing job</td>
</tr>
<tr>
<td></td>
<td>- Schedule a job</td>
</tr>
<tr>
<td></td>
<td>- Import/Export job definitions</td>
</tr>
<tr>
<td></td>
<td>- Set job dependencies</td>
</tr>
<tr>
<td></td>
<td>- Allocate resources for a job run</td>
</tr>
<tr>
<td></td>
<td>- Control-M Variable facility: Enables you to use variable terms (such as user defined variables) and similar terms which you specify in place of values that change when the job is submitted</td>
</tr>
<tr>
<td>Run jobs</td>
<td>Enables you to order a job to be run on the Order date and when all other prerequisite conditions are met.</td>
</tr>
<tr>
<td>Monitor current active jobs</td>
<td>Enables you to monitor the processing of the jobs in your environment, perform critical user tasks, handle problems, and solve various issues. The following topics describe and provide links to common tasks related to monitoring active jobs:</td>
</tr>
<tr>
<td></td>
<td>- Working in Viewpoints</td>
</tr>
<tr>
<td></td>
<td>- Active Job analysis</td>
</tr>
<tr>
<td></td>
<td>- Intervention actions</td>
</tr>
<tr>
<td></td>
<td>- Alerts Monitor</td>
</tr>
<tr>
<td></td>
<td>- Service Monitor</td>
</tr>
<tr>
<td></td>
<td>- Business Service Analysis Viewpoint</td>
</tr>
</tbody>
</table>
## Task

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
</table>
| View reports                | Enables you to generate reports that provide information about your Control-M job flow, as described in the following topics:  
  - Generate general reports on alerts, audits, authorization, workload distribution, and extreme peak usage  
  - Generate reports on job definitions  
  - Generate reports on running jobs |
| View and replay job runs    | Enables you to analyze your accumulated job processing data over a particular period. |

### Services tasks

The following table describes common tasks for defining and view services:

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define a service</td>
<td>Enables you to view your services, analyze those services and jobs that are problematic. After you have determined what the problems are, you can resolve them by performing various service and job actions.</td>
</tr>
<tr>
<td>Monitor and analyze services from Control-M</td>
<td>Enables you to identify critical batch services that are expected to miss their deadline, analyze the services, and resolve problematic jobs, if you have Control-M Batch Impact Manager installed.</td>
</tr>
<tr>
<td>Monitor services from a web Browser</td>
<td>Enables you to view your work flows (services) and analyze those services and jobs that are problematic. After you have determined what the problems are, you can resolve them by performing various service and job actions.</td>
</tr>
<tr>
<td>Generate Batch Impact Manager reports</td>
<td>Enables you to gather information on SLA analysis, history, detailed business service, active jobs in a selected service, BIM services for a selected job.</td>
</tr>
</tbody>
</table>
Validate definitions using Forecast

The following table describes common tasks for forecasting definitions:

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Schedule (on page 26)</td>
<td>Displays when and how often jobs are scheduled.</td>
</tr>
<tr>
<td>Simulate job processing</td>
<td>Estimates your scheduling environment behavior with respect to specific dates in the future.</td>
</tr>
<tr>
<td>Generate Forecast reports</td>
<td>Gathers information on workloads, trend analysis, and job execution.</td>
</tr>
<tr>
<td>Run a Forecast utility</td>
<td>Performs a Load Forecast operation in batch mode.</td>
</tr>
</tbody>
</table>

Batch production environment organization

You can organize batch flows into the following hierarchies:

- **Application => Sub Application => Folder => Job**: Your site may have many different applications, such as Payroll, Accounting, Inventory, Customer Service. Each application has many jobs, and the jobs within an application may be further divided into Sub Applications. For example, the jobs in the Accounting application may be divided into Sub Applications such as Receivables, Expenditures, Government Reporting, etc. This hierarchy reflects how your site’s jobs are organized according to Application.

- **Control-M => Folder => Job**: Each application, (for example, the Accounting application) may have jobs that run daily, other jobs that run weekly or monthly, and still others that run once per year. Frequently, jobs that run together are interdependent. One job may need to complete before another job can run. They also generally run on the same Control-M. For this reason, you organize jobs that are generally scheduled together into a logical grouping called a Folder, with the Folder running on a particular Control-M.

When you view jobs in Control-M, View tab, you can select different types of views according to Application, Sub Application, Folder and Jobs.

Control-M’s Workload Policy Management and Host Group Management features help you to better control, manage and balance the workload on Control-M resources and hosts. This is done in three primary areas:

- Limiting resources available to groups of jobs in the active environment
- Routing groups of jobs to execute on specific resources
- Defining a resource’s availability in the dynamic environment according to specific times

For more information, see Workspace management and Host group management.
Daily job scheduling automation

At the same time each day (known as New Day time), each Control-M/Server runs a procedure known as the New Day procedure, which performs a number of tasks, including scheduling the day's jobs, and running maintenance and cleanup utilities. For example, before adding the day's jobs to the Active Jobs database, the New Day procedure deletes the old jobs from the previous day.

The New Day procedure can schedule all the current day's jobs. However, to handle job automation at large sites, it is more efficient to have the New Day procedure utilize User Daily jobs. User Daily jobs are job processing definitions. Instead of directly scheduling production jobs, the New Day procedure can schedule User Daily jobs, and those User Daily jobs can schedule the production jobs.

**EXAMPLE**

New Day time is at 5:00 a.m., but
- 10,000 jobs are not needed until noon
- another 20,000 jobs are not needed until 3:00 p.m.
- another 30,000 jobs are not needed until 8:00 p.m.

Instead of all those jobs being scheduled by the New Day procedure at New Day time, the New Day procedure can schedule three User Daily jobs, defined as follows, at New Day time:
- One user daily job, which schedules the 10,000 jobs, would be submitted at noon.
- One user daily job, which schedules the 20,000 jobs, would be submitted at 3:00 p.m.
- One user daily job, which schedules the 30,000 jobs, would be submitted at 8:00 p.m.

User daily jobs provide an additional advantage. The Control-M administrator is responsible for the New Day procedure, but a site can allow different departments to be responsible for their own User Daily jobs.

On a regular clock, one day ends and a new day begins at midnight. However, you can set the New Day time according to your site's actual business processing “working day.” For example, if New Day time is 6:00 a.m., then from 6:00 a.m. on August 4th, until 6:00 a.m. on August 5th, the working day is August 4th. The date that a job is scheduled in Control-M is called the order date. Order dates conform to the working days, not midnight to midnight calendar days.

For more information, see New Day procedure.

Administration tasks

Though your enterprise is a distributed environment across many computers, Control-M provides you with a single point of control. The Control-M Configuration Manager lets you administer, manage, monitor, configure, and maintain all Control-M components, including Control-M/Servers, Control-M/Agents, remote hosts, and so on.
The main administrative tasks that administrators perform include:

- Ensure that Control-M components are up, active, and connected.
- Ensure that maintenance, job scheduling and data backup is performed. Daily tasks are generally performed as part of New Day processing. You perform other maintenance, for example, extending the database size, as needed.
- Perform upgrades. You must ensure a smooth upgrade to a new release, including migration of data.
- Define new Control-M/Servers, and their corresponding Control-M/Agents and remote hosts.
- Ensure security by setting and assigning user and group permissions.

Control-M security is three-tiered. It is defined in the Control-M/EM, Control-M/Server and Control-M/Agent levels. Control-M/EM security and Control-M/Server security are centered around the user that is defined for each job. These security mechanisms authorize:

- The operations (for example, Hold or Rerun) that each user is allowed to perform.
- The entities (for example, jobs, resources, ViewPoints) that each user can view or modify

Control-M/EM interacts directly with Control-M/Server security. For each user request that Control-M/EM receives, it seeks authorization from Control-M/Server. If the Control-M/Server security modules determine that the user is not authorized, the operation is rejected and the application issues an appropriate message.

You define Control-M/EM security using the Control-M/EM Authorization window. Security can be defined at the user level and group level. Users can be associated with multiple groups. A Control-M/EM Audit facility records data about the occurrence of a wide variety of security-sensitive activities.

Security for communications between Control-M/Server and Control-M/EM components can be enhanced by using SSL. At Control-M for z/OS sites, the Control-M security mechanism interacts with external security tools used at the site (such as RACF, ACF2/SAF, and TOP SECRET). Control-M/Agents, which actually process the jobs, utilize operating system security; it is centered around the owner that is defined for each job. When a Control-M/Agent receives a job execution request, it submits the job on behalf of the owner, but only if the owner is defined to the operating system security.