CA Service Catalog

Integration Guide
Release 12.8.00

CA Technologies Product References

This documentation set contains references to the following CA Technologies products:

- CA Service Catalog, which includes Accounting Component (formerly CA Service Accounting)
- CA Embedded Entitlements Manager (CA EEM)
- CA Server Automation
- CA Server Automation Reservation Manager (Reservation Manager)
- CA Business Service Insight (CA BSI, formerly CA Oblicore Guarantee)
- CA Open Space
- CA Role & Compliance Manager (CA RCM)
- CA Service Desk Manager, which includes CA CMDB
- CA SiteMinder®
- CA Asset Portfolio Management (CA APM)
- CA MICS® Resource Management
- CA JARS®
- CA Storage Resource Manager (CA SRM)
- CA Workflow
- CA Process Automation (formerly CA IT PAM)
- CA Business Intelligence
- CA Anti-Virus (formerly eTrust Antivirus)
- CA Threat Manager (formerly eTrust Integrated Threat Management [eTrust ITM])

Contact CA Technologies

Contact CA Support

For your convenience, CA Technologies provides one site where you can access the information that you need for your Home Office, Small Business, and Enterprise CA Technologies products. At http://ca.com/support, you can access the following resources:

- Online and telephone contact information for technical assistance and customer services

- Information about user communities and forums

- Product and documentation downloads

- CA Support policies and guidelines

- Other helpful resources appropriate for your product

Providing Feedback About Product Documentation

If you have comments or questions about CA Technologies product documentation, you can send a message to techpubs@ca.com.

To provide feedback about CA Technologies product documentation, complete our short customer survey which is available on the CA Support website at http://ca.com/docs.

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Chapter 1: Introduction

This section contains the following topics:

Overview of CA Technologies Common Components and Integrations

The products that integrate with CA Service Catalog can be grouped according to those that are supplied and licensed with CA Service Catalog and those that are supplied and licensed separately.

Common Components Supplied on the CA Service Catalog Installation Media

The following CA Technologies common components are included when you purchase CA Service Catalog and are licensed with it. These components are supplied on the CA Service Catalog installation media.

CA Management Database (CA MDB)

Many CA Technologies products, including CA Service Catalog, share a common, required database schema named the CA Management Database (CA MDB or the MDB).

When you configure Catalog Component, the MDB is automatically created or updated (if necessary) and is configured in the database management system (DBMS).

Note: You must install SQL Server or Oracle before installing CA Service Catalog. For more information on supported versions of the DBMS, see the *Release Notes*.

Typically, we recommend that CA Service Catalog and all CA products that integrate with it share the same CA Management Database (CA MDB). CA Service Catalog embeds CA MDB r1.5. To integrate CA Service Catalog with other CA products that embed CA MDB r1.5 or CA MDB r1.0.4, verify the CA MDB version compatibility for your integrations (see page 16).

CA Embedded Entitlements Manager (CA EEM)

CA Service Catalog uses CA EEM to manage authentication and authorization. You can optionally use CA SiteMinder instead of CA EEM for authentication. We recommend that CA Service Catalog and all CA products that integrate with it share the same installation of CA EEM.

You install or upgrade CA EEM *before* you install or upgrade CA Service Catalog.

Common Components Supplied With CA Service Catalog

The following integrating products are included when you purchase CA Service Catalog and are licensed with it. These products are supplied on their own installation media, and are included with CA Service Catalog. You install these products individually, *either* before or after you install CA Service Catalog.

CA Process Automation

CA Process Automation uses graphical processes created by system administrators to execute operational processes automatically. It supports a fully integrated development and administrative environment to manage, create, and configure CA Process Automation components on your system. CA Process Automation also supports client applications that enable operators and other personnel to schedule, start, and monitor automated processes.

BusinessObjects Enterprise

CA products leverage the most extensive set of business intelligence capabilities, ranging from reporting, query and analysis, by using BusinessObjects Enterprise. BusinessObjects Enterprise is a flexible, scalable, and reliable business intelligence reporting system that can be tightly integrated into your information technology infrastructure.

For instructions to install and configure these components, see their documentation sets. For instructions to set up and use the *integration* between these components and CA Service Catalog, see the *Integration Guide*.

For further information about these components, see their documentation sets. The CA Process Automation documentation set is included on the CA Process Automation installation media, and the BusinessObjects Enterprise documentation is included on the BusinessObjects Enterprise installation media.

CA Workflow

CA Workflow is a common component that automates business processes. CA Service Catalog uses either CA Workflow or CA Process Automation to automate approval and fulfillment process for items requested from the catalog.

Note: For best results, including more efficient process automation, install and use CA Process Automation rather than CA Workflow. CA Process Automation is described earlier in this topic.

Important! CA Workflow is no longer being enhanced, and its maintenance and technical support are scheduled to be discontinued as of December 31, 2013. Therefore, we strongly recommend using CA Process Automation as your process automation tool.

Note: For details about installing and using CA Workflow, see the *Installing CA Service Catalog* scenario. This scenario is in the *Implementation Guide* and on http://ca.com/support. For instructions to set up and use the *integration* between CA Workflow and CA Service Catalog, see the *Integration Guide*.

Integrations Supplied Separately

The following integrating products are supplied and licensed separately from CA Service Catalog. They are purchased separately from CA Service Catalog and are supplied on their own installation media. All of these integrations are optional. Unless noted otherwise, you install these products individually, before or after you install CA Service Catalog.

CA Service Desk Manager, which includes CA CMDB

CA Service Catalog integrates with CA Service Desk Manager in several ways. CA Service Catalog can automatically open CA Service Desk Manager tickets and attach associated configuration items (assets) using CA Workflow. CA Service Catalog events can also cause a CA Service Desk Manager ticket to be created automatically.

CA Service Catalog can integrate with CA CMDB by associating catalog services with CA CMDB configuration items.

Note: For best results, CA Service Desk Manager and CA Service Catalog must share the same CA MDB and the same installation of CA EEM.

CA BSI

CA BSI automates, activates, and accelerates the management, monitoring, and reporting of business and technology service level agreements (SLAs) and service delivery agreements for enterprises and service providers. CA BSI enables organizations to understand the performance and cost implications of these agreements in real time.

Reservation Manager

Reservation Manager is a separate utility with its own user interface that integrates with CA Server Automation to provide on-demand resources to users for reserving Windows, Linux, AIX, and Solaris systems. You can use Reservation Manager to reserve physical and virtual systems from a pool of available resources in your data center.

CA Asset Portfolio Manager (CA APM)

CA Service Catalog can integrate with CA APM by connecting catalog entries with CA APM Models and connecting requested items with CA APM assets.

Note: To integrate successfully, CA APM and CA Service Catalog must share the same CA MDB.

CA SiteMinder

CA SiteMinder provides web-based single signon and enhanced authentication of CA Service Catalog users.

CA Storage Resource Manager (CA SRM)

Through the integration between Accounting Component and CA Storage Resource Manager (CA SRM), usage data that indicates storage used by a user can be invoiced to users' accounts.

CA MICS and CA JARS

Using data from CA Mainframe Information Control System Resource Management (CA MICS) or JARS to supply usage data to Accounting Component, accounts can be invoiced for using services recorded by CA MICS or JARS.

For instructions to install, set up, and use these products, see their documentation. For information about which versions of these products integrate with CA Service Catalog, see the *Release Notes*. For instructions to set up and use the *integration* between these components and CA Service Catalog, see the *Integration Guide*.

How to Verify CA MDB Version Compatibility for Integrations

CA Service Catalog embeds CA Management Database (CA MDB) r1.5. CA Service Catalog integrates with other CA products that embed either CA MDB r1.5 or r1.0.4. For best results, verify that CA Service Catalog and all integrated CA products share the same CA MDB, as follows:

Review the following scenarios for integrating with other CA products that run either CA MDB r1.5 or CA MDB r1.0.4. Determine the scenario that matches your environment and follow the accompanying instructions.

- You want to integrate CA Service Catalog with *only* other CA Technologies products that also embed CA MDB r1.5, such as the current release of CA Service Desk Manager.

  Install CA Service Catalog and these other products. The same CA MDB r1.5 database is automatically shared among all these CA Technologies products and runs in single-version MDB mode.

- You want to integrate CA Service Catalog with CA Technologies products that embed CA MDB r1.0.4. You have already installed at least one of them, but you have not yet installed CA Service Catalog. The CA MDB r1.0.4 products include CA CMDB r11.2, Unicenter Service Desk r11.2, and CA APM r11.3.

  When you install CA Service Catalog, the embedded CA MDB r1.5 installer automatically upgrades CA MDB r1.0.4 to CA MDB r1.5. The database is automatically shared among all these CA Technologies products and runs in mixed-version MDB mode.

■   You want to integrate CA Service Catalog with CA MDB r1.0.4 products. You have already installed CA Service Catalog, and you plan to install one or more CA MDB r1.0.4 products later.

Do the following:

1. Apply the CA MDB r1.0.4 Compatibility Patch to enable the integration between both versions of the CA MDB.

    Note: For details about installing this patch, see the *Integration Guide*.

2. Install any of these CA Technologies products that you have not yet installed.

    The database is shared among all these CA Technologies products and runs in mixed-version CA MDB mode.

Chapter 2: Integrating with CA EEM and External Directories

This section contains the following topics:

Plan Your Integration

CA Embedded Entitlements Manager (CA EEM) is used for authentication and authorization of users. CA EEM is provided on your CA Service Catalog installation media. CA EEM can be configured to use an external directory, such as Microsoft Active Directory, for authentication of users.

You can use the CA EEM user interface of CA Service Catalog to manage CA EEM users and groups as well as to configure CA EEM. Start CA EEM from the Administration, Tools, Links option, from Administration, Users option, or from the Users option of the Administration Quick Start dashboard.

Note: For instructions to install or upgrade CA EEM, see the *Implementation Guide*. For more information about using CA EEM, see the remainder of this chapter and the CA EEM *Online Help*.

Integrating with embedded CA EEM and optionally with an external directory (such as Microsoft Active Directory) is the only required integration for CA Service Catalog. You use CA EEM and optionally an external directory to manage the CA Service Catalog user database.

After installing CA Service Catalog, its required components (including embedded CA EEM), and your external directory (if used), do the following:

1. Ensure that your user database in CA EEM is populated. For instructions, see the documentation for CA EEM and your external directory (if used).

2. Import users from CA EEM into the CA Service Catalog user database.

3. Regularly synchronize the CA Service Catalog user database with the CA EEM or an external directory.

    Important! If you use an external directory, you must configure CA EEM and CA Service Catalog to work with it, as explained in this chapter.

4. Create users and use groups in CA EEM or your external directory for CA Workflow. To use CA Workflow, CA Service Catalog users must be defined as CA Workflow users and in some cases must belong to CA Workflow user groups.

5. Periodically, after CA Service Catalog has been installed and running for some time, you may need to update the host name of the CA EEM computer or the application names it uses. For instructions to do so, see the chapter "Ongoing Maintenance" in the *Implementation Guide*.

Important! The CA Service Catalog installation media includes CA EEM r12 (the recommended version). For the latest support information for CA Service Catalog, CA EEM, and related CA products and components, see the Support Matrix for each product or component on http://ca.com/support.

Upgrade to CA EEM r12 CR06 (CA EEM r12.0.6.56), if you use either of the following setups:

- Multiple Active Directory domains
- One or more Active Directory domains that use Single Socket Layer (SSL)

Configure CA EEM to Use an External Directory

CA EEM can be configured to use an external directory, such as Microsoft Active Directory or CA Directory. Before you configure CA EEM to use an external directory, ensure that the external directory contains at least one user ID that matches the user ID of a Service Delivery Administrator in CA Service Catalog. To do so, log in to CA Service Catalog as the spadmin user (its default password is spadmin) and create at least one user ID with the Service Delivery Administrator role. This user ID must match a user name in the external directory.

If CA EEM configured multiple active directories, create a user ID as Domain Name\userid in CA Service Catalog. Verify that domain must be the part of the principal name of the CA EEM user ID in the CA EEM active directory.

Important! If CA EEM references an external directory, then users are *not* created automatically in CA Service Catalog, because the external directory is used *only* to authenticate users, not to create users or assign their attributes.

Follow these steps:

1. Log in to the CA EEM UI as the CA EEM administrator (EiamAdmin) user using the Application <Global>.

2. Select Configure, User Store.

3. Click User Store link.

4. Click the option button that is labeled Reference from an external directory.

   Select the value as Multiple Microsoft Active Directory from the Configuration Type drop-down list.

5. Click the Add Directory link. Enter and validate the settings, and click save.

   Similarly, add another external active directory to configure multiple active directories and then validate the settings and save.

   After you add the active directories the status icons show the configuration as Bind succeeded.

6. If you are using single sign-on, verify that the domain name for Active Directory matches the domain name of the single sign-on user.

   Note: For information about configuring CA Service Catalog to use single sign-on, see the *Implementation Guide*.

7. Select Manage Identities, Users, and validate that the users returned from a search are from the external directory. If your user base is large, limit the list of users returned.

8. Restart the CA Service Catalog service.

9. Log in to CA Service Catalog as the Service Delivery Administrator whose user name matches a user name in the external directory.

10. Create users and assign managers in CA Service Catalog, as follows:

   a. Create users that match the external directory user IDs. You can optionally use the createuser() web service method to create bulk users.

   b. Assign a manager to each user created; ensure that you comply with your business workflow requirements. You can optionally use the edituser() web service method for setting the manager for bulk users.

   You can iteratively execute these web service methods for creating users or assigning managers.

   Note: For more information about using web service methods, see the CA Service Catalog Web Services API Documentation. To view it online, select CA, CA Service Catalog, Documents, Web Service API from the server Start menu.

How to Import Users into the Database

Importing users from your user database (CA EEM or an external directory) is required to populate the CA Service Catalog user database. After you install CA Service Catalog, its user database is empty. To populate it, configure and run the CA EEM synchronization utility. Running the utility populates your CA Service Catalog database with all the users defined in your implementation of CA EEM. If you are using an external directory, CA EEM acts as an intermediary between your external directory and CA Service Catalog. To run the CA EEM synchronization utility, follow this process:

1. Specify the configuration file properties (see page 29) used by the CA EEM synchronization utility.

   Important! The configuration file includes placeholder values that you *must* customize before running the utility!

2. Run the utility (see page 31).

   If you encounter unexpected results, review the Troubleshooting (see page 32) *and* Known Issues (see page 32) sections.

3. Verify that the database has been populated correctly by logging in to CA Service Catalog as a user-defined in CA EEM. A successful login indicates that the database was populated correctly.

After populating the CA Service Catalog user database initially, you run the utility regularly synchronize it with the CA EEM or an external directory, as explained in How to Synchronize Changes from CA EEM to CA Service Catalog (see page 26).

User-Defined Groups

User-defined groups (UDGs) are groups that you create, in either your external directory (if applicable) or CA EEM.

You can optionally create user-defined groups (see page 24) in CA EEM so that you apply the same action to many CA Service Catalog users at once instead of modifying the users individually. Once you create the UDG in CA EEM, it is available in CA Service Catalog, and you can administer the UDG much like you would administer an individual user.

One of the most important applications of administering UDGs is assigning permissions to services, reports, and other objects to the UDG. When you set the permissions for the UDG, those settings are applied to all individual users in the group. For example, you may want to assign read-write access to a service to a group with few people, while you may want to assign read-only access to the service to one or more groups that have hundreds or even thousands of users. Thus, you may use UDGs, to group users according to their function and purpose.

As an administrator, you can optionally assign users to one or more UDGs. The product does not require that users belong to any UDG. User who belong to multiple UDGs have access to all resources authorized by their UDG memberships. In other words, if any UDG membership provides a user with access to a resource, then the user is granted access to that resource, regardless of whether other UDGs also grant access to the resource.

Create User-Defined Groups

You can create and maintain user-defined groups (UDGs) (see page 23) in either CA EEM or your external directory (if applicable). You cannot create and maintain UDGs in CA Service Catalog directly. You may create UDGs for various administrative reasons, such as grouping users according to function and purpose or for applying the same action to several users in a single operation.

To create user-defined groups

Note: CA Service Catalog supports multiple versions of CA EEM; for a complete list of these versions, see the *Release Notes*. If the following steps do not match your version of CA EEM, see your CA EEM documentation for more information about assigning users to user groups in CA EEM.

1. Log in to the Service Delivery application of CA EEM; do *not* log in to the global application of CA EEM.

   The CA EEM home page appears.

2. Click Manage Identities, Groups.

   The Groups page appears.

3. In the Search Groups box on the left side of the screen, click Show Application Groups and click Go.

   The list of groups is expanded in the tree of the User Groups box, which appears under the Search Groups box.

4. In that tree, locate the Application Groups folder; this folder contains the CA Service Catalog user groups, including the UDGs.

5. At the top of that folder, find and click the "people" icon at the top left of the folder, next to the plus (+) or minus (-) sign for expanding or collapsing the Application Groups folder.

   On the right side of the screen, in the General box, enter the name and description for the new group in the fields provided.

6. Click Save to save your changes.

Note: For instructions to add users to UDG, see your CA EEM documentation.

Assignment of Rights to User-Defined Groups

One of the most important administrative uses of user-defined groups (UDGs) is assigning rights to CA Service Catalog objects, such as a service or report, to a UDG. When you set permissions for a UDG to an object, those permissions are applied to all individual users in the group. As an administrator, you can set permissions by UDG to any object for which you can set permissions by role. In other words, if you can set permissions to a specific object (such as a service) according to a user's role, then you can also set permissions to that object according to UDG.

The objects to which you can set permissions for UDGs include the following:

- Reports, including the data, data view, and layout objects

- Services, service options, and service option groups, including rights to edit, request, and subscribe to them

- Documents

- Dashboards

For example, you can open a service in the CA Service Catalog, Service Offerings, Offerings, click Permissions, and search for a UDG or all users with a specific role. Next, you can assign rights to the service for the users and groups returned in the search results.

Note: When you search for UDGs, CA Service Catalog searches its own portions of CA EEM.

If a user has *either* a role or a group membership for which a permission has been set, the user is granted that permission. Similarly, If a user has *both* a role and a group membership for which a permission has been set, the user is granted that permission.

For details about how to set permissions for specific types of objects, see the *Administration Guide*.

As a confirmation step that your permission-related changes for a UDG have taken effect, you can optionally view the profile of an individual user who is a member of the UDG. While this step is not practical for verification on a large scale, it may be helpful for spot checks. For instructions to view user profiles, see the *Administration Guide*.

Assign Rights to User-Defined Groups

You can assign rights to user-defined groups as an efficient method to assign the same rights to all members of the group in a single operation.

Follow these steps:

1. Verify that the user-defined group exists. If necessary, [create](#) (see page 24) it.

2. Open the Set Permissions dialog for the Catalog object (such as a service) and click Groups.

3. Click Search EEM Groups to display the EEM Group Name Search box.

4. Search for the group.

5. Click the group name in the search results.

   The dialog displays a new EEM Group list below the search results. The new list includes the group name that you clicked. The adjacent columns show the rights of the group to the object.

6. Select or unselect the options in the columns to grant or remove rights for the group to the object.

You have assigned right to the user-defined groups.

How to Synchronize Changes for Individual Users from CA EEM to CA Service Catalog

To update individual users in CA Service Catalog, administrators have these options:

- Use the User Management GUI for the CA Service Catalog database to maintain the users directly.

- Use CA EEM to maintain the users in a local CA EEM repository.

- Use CA EEM to connect to an existing external directory (such as Microsoft Active Directory) in which the users are maintained.

Note: When you create and update user-defined groups (UDGs), the updates do not need to be synchronized with CA Service Catalog, because they are available to CA Service Catalog immediately. In contrast, however, when you create and update *individual users*, the updates must be synchronized with CA Service Catalog, as described in this topic.

If you are using CA EEM with an external directory, you must synchronize updates in user data *from* CA EEM *to* CA Service Catalog. Instead of synchronizing these updates manually, you can use the CA EEM synchronization utility. When you run the utility, it checks the CA EEM database for the following updates and makes the same updates in the CA Service Catalog database:

- New users that have been added

- Existing users whose attributes have been modified

- Existing users that have been deleted--You choose whether to keep these users active in CA Service Catalog; for details, see the description of the EIAMUser.Deactivate=False parameter in Configuration File Parameters.

As a CA Service Catalog administrator, work with managers and other administrators in your organization to determine how often you must run this utility. For example, large organizations or those with frequent personnel changes may want to run the utility daily. However, other organizations with fewer personnel changes may find that running the utility weekly or every two weeks is sufficient. This utility is a standard command line utility; therefore, you can schedule it using any standard scheduler, such as Windows Scheduler.

To synchronize changes from CA EEM to CA Service Catalog, perform these tasks:

1. Specify the configuration file properties (see page 29) used by the CA EEM synchronization utility.

   Important! The configuration file includes placeholder values that you *must* customize before running the utility!

2. Run the utility (see page 31).

3. If you encounter unexpected results, review the Troubleshooting (see page 32) *and* Known Issues (see page 32) sections.

Configure the Synchronization Utility to Use HTTPS

If you have configured CA Service Catalog to use Secure Socket Layer (SSL), you have changed its communication method from HTTP to HTTPS. In that case, you also configure the synchronization utility to use HTTPS.

Note: For information about configuring CA Service Catalog to use SSL, see the *Implementation Guide*.

Follow these steps:

1. Open the syncuputility.bat file for editing. This file is in the USM_HOME\scripts folder.

   USM_HOME specifies the CA Service Catalog installation directory on this computer. For 32-bit computers, the default path name is C:\Program Files\CA\Service Catalog. For 64-bit computers, the default path name is C:\Program Files (x86)\CA\Service Catalog.

2. Add the rem statement to comment the following line, as shown:

   rem SET JAVA_OPTS=%USM_JAVA_OPTS%
   -Dlog4j.configuration="file:///%USM_HOME_FWD%/scripts/syncuputil.log4j.xml" -Dfile.encoding=utf-8
   -Xms512m -Xmx1024m

3. Remove the rem statement to un-comment the following line, as shown:

   SET JAVA_OPTS=%USM_JAVA_OPTS% -Dfile.encoding=utf-8 -Xms512m -Xmx1024m
   -Djavax.net.ssl.trustStore="%USM_HOME%\.keystore" -Djavax.net.ssl.trustPass=123456(i.e.<keystore
   password>)

4. Update the same line as follows:

   ■ Replace .keystore with the name of your keystore file.

   ■ Replace 123456 with the value of your keystore certificate password.

   ■ Delete the following phrase: (i.e.<keystore password>).

You have configured the synchronization utility to use HTTPS.

Specify the Configuration File Properties

Before running the utility, review the configuration file properties and adjust the values--especially the placeholder values--to meet your needs.

The configuration properties file is named Syncuputil.properties. It is located in the USM_HOME folder.

USM_HOME specifies the CA Service Catalog installation directory on this computer. For 32-bit computers, the default path name is C:\Program Files\CA\Service Catalog. For 64-bit computers, the default path name is C:\Program Files (x86)\CA\Service Catalog.

In the Syncuputil.properties file, you can set the following parameters:

EIAMUser.filter=<filter-name>

Use this property to import all users names that start with a specific character or characters. For example, use a* for all user names that begin with *a*, or mc* for all user names that begin with *mc*. Replace <filter-name> with the filter that you want to use; for example, EIAMUser.filter=a*.

Important! You *must* specify a value for this parameter; do *not* specify an asterisk alone (*). Otherwise, attempts to run the utility may fail due to out-of-memory errors.

EIAMUser.MaxSearchSize=<value>

Specifies the maximum number of users returned by searches in CA EEM. Keep in mind the following important points:

■   This value cannot be less than 100. If you specify a value less than 100, it is automatically set to 2000.

■   If this value is *less than* the number of users returned by the EIAMUser.filter=<filter-name> property, the EE_MAXSIZEEXCEEDED error occurs.

■   If this value is *greater than* the number of users returned by the EIAMUser.filter=<filter-name> property, the search results return all users.

EIAMUser.DefaultBusinessUnit=<BU-name>

Use this property to set the default business unit of the users being imported. Replace <BU name> with the default business unit that you want to use; for example, EIAMUser.DefaultBusinessUnit=SystemSoftware.

EIAMUser.DefaultRole=<default-role>

Use this property to set the default role of the users being imported. Replace <default-role> with the default role that you want to use, for example, the following:

- EIAMUser.DefaultRole=enduser

  where enduser means End User

- EIAMUser.DefaultRole=catalogenduser

  where catalogenduser means Catalog User

- EIAMUser.DefaultRole=administrator

  where administrator means Administrator

- EIAMUser.DefaultRole=catadministrator

  where catadministrator means Catalog Administrator

- EIAMUser.DefaultRole=requestmanager

  where requestmanager means Request Manager

- EIAMUser.DefaultRole=spadministrator

  where spadministrator means Service Delivery Administrator

  Note:This role can only be assigned to the users in Root Business Unit.

- EIAMUser.DefaultRole=stadministrator

  where stadministrator means Super Business Unit Administrator

EIAMUser.Deactivate=False

Use this property to specify whether users that were deleted from the external directory remain active in the CA Service Catalog database.

If this property setting is False (the default), then users that were deleted in the external directory are *not* deactivated in the CA Service Catalog database and retain their existing access rights in it.

Keep this property set to False if you are running the CA EEM synchronization utility for the first time or if you are certain that no users were deleted in the external directory since the last time you ran the utility.

If this property setting is True, then users that are deleted in the external directory are deactivated (but not deleted) in the CA Service Catalog database and in the MDB. These users lose all their existing access rights in CA Service Catalog.

EIAMUser.Hostname=<USM-Host-Name>

Use this property to specify the host name of the computer on which the Catalog Component service is running. Replace <USM-Host-Name> with this host name.

EIAMUser.Domain=<Domain-Name>

Use this property to specify the service provider business unit for connecting to the web services that the CA EEM synchronization utility uses. Replace <Domain-Name> with this value; for example, ServiceProvider.

EIAMUser.Port=<USM-Port-Number>

Use this property to specify the port on which the Catalog Component service is running. Replace <USM-Port-Number> with this port; for example, 8080.

EIAMUser.Country.*country-code=country-name*

Use this property to specify the country. If country fetched from the external active directory is not matched with the country ca_country table, then we can map the country details using this property. We can have multiple entries with this property. An example is EIAMUser.Country.IN=India.

EIAMUser.*country.city=location*

Use this property to specify the location name. Location details must be mapped using this property. You can specify multiple entries with this property. An example is EIAMUser.India.Hyderabad=ITC.

EIAMUser.SearchType={UserName|GroupMembership}

Specifies whether to search the user data according to user name (UserName) or user group (GroupMembership).

Note: Search type GroupMembership is not supportedin CA EEM r12. Searching users based on GroupMembership works only with CA EEM 8.4

Run the Utility

To run the CA EEM synchronization utility, enter the following command at the command prompt or from the CA Service Catalog Scheduler utility:

syncUpUtility *username password*

Where:

Username

Specifies the CA EEM user ID for running the utility. This user ID must exist in both the external directory and the CA Service Catalog user database. When you configure the multiple active directory, specify the principal name of the CA EEM user ID. The user must be assigned the Service Delivery Administrator role in CA Service Catalog to access the CA Service Catalog web services to create users.

Password

Specifies the password for the CA EEM user ID.

Troubleshooting

After you run the CA EEM synchronization utility, search the view.log file for the key word "SYN001" in the view.log file. If that key word is present, the adjacent text may explain why a user was not properly added or modified. Use this information (if applicable) to correct any errors and then attempt to import the user again.

When you run the utility, you may encounter a memory error like this one: java.lang.OutOfMemoryError'. If you encounter such an error, increase the java memory allocated in the SyncUpUtility batch file.

If you do not specify the location parameter (EIAMUser.*country.city=location*) in the configuration properties file, the location is not included in the user details. For details about setting this parameter, see Specify the Configuration File Properties (see page 29).

If a user's phone format is not valid, then phone numbers are not included in the user details. To fix this problem, work with other managers or administrators to have the format corrected, then run the utility again.

Note:If you notice the error User does not have access to read web services, verify that the user provided as part of command line parameter with the syncUpUtility command has Service Delivery Administrator role in CA Service Catalog.

Known Issues

When you run the CA EEM synchronization utility, job titles are not included in the user details.

How to Add Failover Support

As a CA Service Catalog administrator, you can optionally implement "failover" protection for CA EEM. Failover protection means that if one computer malfunctions, becomes heavily loaded, or loses power, its workload is transferred to the other computers in the cluster, retaining users' sessions. Users of the system see no interruption of access. Thus, processing continues and the loss of performance on users and business functions is minimized, even when computer availability is "lost" or "reduced."

Follow these steps to add failover support for CA EEM instances used with CA Service Catalog:

1. Set up failover support for CA EEM: Cluster CA EEM using operating system level clustering. For more information, see the chapter "Configuring Failover" in the CA EEM *Getting Started Guide*.

2. Add failover support between CA EEM and CA Service Catalog (see page 34).

3. If you are using CA Workflow, configure CA Workflow to support CA EEM failover (see page 35).

Note: If you have installed other CA products that use CA EEM, see the documentation for each of those products for information about setting up failover support for CA EEM.

Add Failover Support Between CA EEM and CA Service Catalog

Adding failover support between CA EEM and CA Service Catalog is a required task in the process of adding failover support (see page 33) for CA EEM.

Follow these steps:

1. On every CA Service Catalog computer, do the following:

   a. Open the EIAM.properties file in the USM_HOME folder.

   b. Add the eiam.failover.backends property, and set it to the comma-separated list of failover computer names, as shown in the following example:

   eiam.failover.backends=mybackup01,mybackup02

   The failover computer names are the computers on which you have installed backup versions of CA EEM for failover, when you set up CA EEM clustering.

2. On any CA Service Catalog computer that has Catalog Component installed, do the following:

   a. Open the CA Service Catalog command prompt by selecting Start, Programs, CA, CA Service Delivery, Command Prompt.

   b. At the CA Service Catalog command prompt, run the following command, once for each failover computer:

   Bin\safex\safex.exe –h host -u user -p password -f
   view\scripts\EIAM\Safex\usm_create_global_data.xml -sdkconfig *pathname*

   host - Specifies the name of the failover computer.

   user - Specifies the CA EEM administrator (EiamAdmin).

   password - Specifies the administrator password.

   -sdkconfig pathname - Specifies the pathname to the eiam.config file. A sample pathname is USM_HOME\eiam.config.

   For example, consider the following sample command:

   Bin\safex\safex.exe –h NYC112 -u EiamAdmin -p ca -f
   view\scripts\EIAM\Safex\usm_create_global_data.xml -sdkconfig USM_HOME\eiam.config

   NYC112 - Specifies the name of the CA EEM host.

   EiamAdmin - Specifies the user name of the administrator.

   ca - Specifies the administrator password.

   -sdkconfig USM_HOME\eiam.config - Specifies the pathname to the eiam.config file.

You have added failover support between CA EEM and CA Service Catalog.

Configure CA Workflow to Support CA EEM Failover

Configuring CA Workflow to support CA EEM failover is a required task in the process of adding failover support (see page 33) for CA EEM.

To configure CA Workflow to support CA EEM failover

1. On every CA Workflow computer, do the following:

    a. Shut down the CA Service Fulfillment service, which is the Windows service for CA Workflow.

    b. Open the pm.xml and wl.xml files for editing.

    These files reside in the fulfillment\conf\Catalina\localhost folder. The pm.xml file is a configuration file for the process manager (pm) web application of CA Workflow. The wl.xml file is a configuration file for the wl (worklist) web application of CA Workflow.

2. In both files, do the following:

    a. Locate the following line:

    `<Environment name="authorityURL" override="true" type="java.lang.String" value="host01,host12"/>`

    b. In the value="host01,host12" portion, specify the names of the CA EEM failover hosts; use a comma to separate host names.

3. Verify that the CA Workflow application starts correctly from all CA EEM computers.

4. Start the CA Service Fulfillment service.

5. Log in to CA Service Catalog and click Administration, Configuration, CA Workflow, Test.

    A successful test verifies that CA Service Catalog and CA Workflow can communicate.

    Important! When you add multiple active directories in CA EEM, do not provide the domain name as \ or Domainname\ as it is a known issue in CA EEM.

You have configured CA Workflow to support CA EEM failover.

Chapter 3: Integrating with CA SiteMinder

This section contains the following topics:

Options to Authenticate Users

This section explains the two possible authentication flows for authenticating CA Service Catalog users. The first authentication flow uses CA EEM alone. The second authentication flow uses CA EEM with CA SiteMinder, enabling single sign on and providing enhanced security.

Authentication Flow Using CA EEM

By default, CA Service Catalog uses CA EEM to authenticate users. In this example of the basic authentication flow, requests from CA Service Catalog users pass through Tomcat, then pass through the MDB, and end at your authentication server, for example, Active Directory. The following diagram illustrates the basic authentication flow with CA EEM and Active Directory:
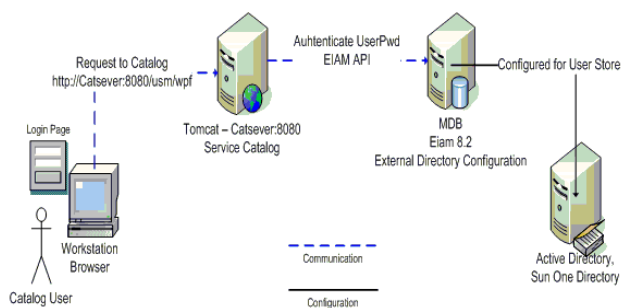
Authentication Flow Using CA SiteMinder

In this authentication flow with CA SiteMinder, requests from CA Service Catalog users go to CA SiteMinder for authentication. If the request is authorized, then the requests are forwarded to the Tomcat instance of Catalog Component by the web server hosting CA SiteMinder. Thus, in this flow, authentication requests from CA Service Catalog users are validated by CA SiteMinder. The following diagram illustrates the enhanced authentication flow with CA SiteMinder.

Note: As shown in the previous diagram, CA SiteMinder requires a web server: either Microsoft Internet Information Server (IIS) or Apache Tomcat. CA SiteMinder does *not* work directly with Tomcat and therefore relies on the request being redirected from the web server to the Tomcat instance.
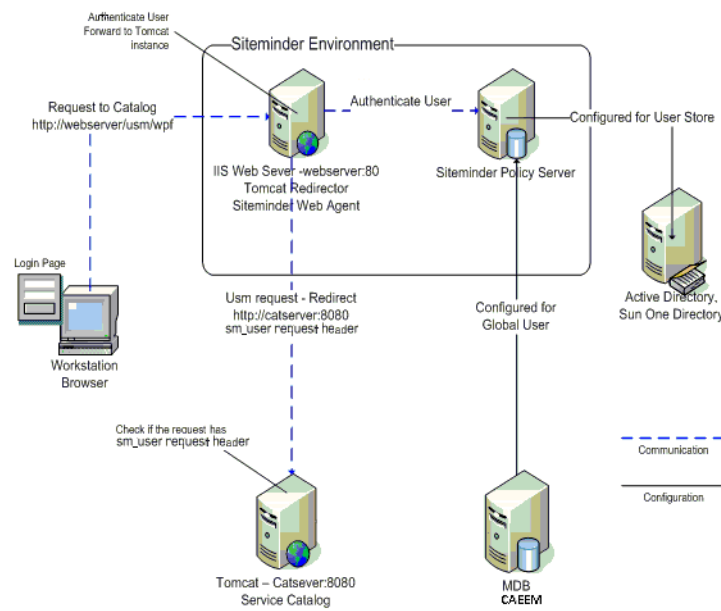
How to Set Up Web Single Sign-on

By default, CA Service Catalog uses CA EEM to authenticate users' requests. However, you can optionally use CA SiteMinder to provide web based single sign-on (SSO) and enhanced authentication to CA Service Catalog users; for conceptual details, see Authentication with CA SiteMinder (see page 37). To implement web based (SSO) and enhanced authentication to CA Service Catalog users, complete the following tasks:

1. Install and configure CA SiteMinder, including its Policy Server and CA SiteMinder Web Agent.

   For instructions, see your CA SiteMinder documentation.

2. Redirect authentication requests from your web server to Tomcat. Here, your web server (such as Apache or Microsoft Internet Information Server [IIS]) has the CA SiteMinder web agent installed.

   For instructions, see your web server documentation.

3. In the eTrust SiteMinder Administration GUI, configure CA SiteMinder to protect CA Service Catalog resources by performing the following tasks. For instructions, see your CA SiteMinder documentation.

   a. Open the policy server UI.

   b. Create an agent object for CA Service Catalog; do *not* check support 4.x Agents"

   c. Create an agent configuration object for the agent you just created.

   d. Create a host configuration object.

   e. Optionally, create an authentication scheme.

   f. Create a realm and a rule with the resource filter as usm/*.

   g. Create a CA Service Catalog domain and add the user directories, administrator, and realm to the domain.

   h. Create a policy and add the rule that you just created to the policy.

4. Configure Catalog Component to accept single sign-on from CA SiteMinder, as explained in Accept Web Single Sign-on (see page 40).

5. In the Administration, Configuration section of the CA Service Catalog GUI, configure the external authentication parameters to match CA SiteMinder; for details, see the *Implementation Guide*.

Accept Web Single Sign-on

Important! Before performing this procedure, you must complete the tasks in How to Set Up Web Single Sign-on (see page 38)!

Typically, users are presented with the login screen to access CA Service Catalog. However, when you integrate CA Service Catalog with CA EEM and CA SiteMinder, you can configure CA Service Catalog to accept single sign-on from CA SiteMinder. As a result, CA Service Catalog skips the login page for users who have already been authenticated by CA SiteMinder.

To accept web single sign-on

1. On each Catalog Component server, edit the files named USM_HOME\view\webapps\ROOT\index.html and USM_HOME\view\webapps\usm\index.html, using a text editor such as Notepad.

   In both files, use HTML commenting to comment out the use of Node=icguinode.login and enable the use of Node=iclaunchpad.pad, as shown for the following lines:

   ```
   <!--
   <meta http-equiv='Refresh' Content='0; URL=/usm/wpf?Node=icguinode.login'>
   -->
   <meta http-equiv='Refresh' Content='0; URL=/usm/wpf?Node=iclaunchpad.pad'>
   ```

Chapter 4: Integrating with CA Service Desk Manager

CA Service Catalog has integration with CA Service Desk Manager through catalog request fulfillment, which can be configured to automatically open CA Service Desk Manager requests or change orders.

If you are integrating CA Service Catalog and CA APM, the associated assets become configuration items on the related change order. The CA Service Desk Manager request and change orders can be viewed in the CA Service Catalog request's Related Tickets column.

Using the integration with CA Service Desk Manager, when a user requests a service from the catalog, such as a standard desktop computer, and it is approved, the fulfillment process could include identifying the correct existing asset and a CA Service Desk Manager change order could be opened assigning a configuration and delivery task to a technician for the asset.

Finally, you can also integrate CA Service Catalog and CA Service Desk Manager by configuring them to use the same common multi-tenant administration; for details, see the *Administration Guide*.

This section contains the following topics:

How to Plan and Perform the Integration

The major tasks to integrate CA Service Catalog and CA Service Desk Manager follow. These tasks are explained in detail in the sections that follow.

1. Meet the prerequisites.

   For details, see Prerequisites (see page 43).

2. Understand the key terms.

   For details, see Key Terms (see page 45).

3. Configure communication between CA Service Catalog and CA Service Desk Manager by ensuring that a CA Service Desk Manager primary server is properly defined to CA Service Catalog.

    A CA Service Desk Manager primary server is always required to view or open tickets or change orders. To configure CA Service Catalog so that a user can view a CA Service Desk Manager ticket (change order or request) while viewing a CA Service Catalog request, you must identify the CA Service Desk Manager host specified when you select Administration, Configuration, Service Desk.

    In those configuration options, you must also update configuration details for the CA Service Desk Manager primary server.
    If you plan to use CA Workflow to communicate with CA Service Desk Manager, configure communication between CA Workflow and CA Service Desk Manager by ensuring that the user name and password of the CA Service Desk Manager user are properly defined in CA Workflow. Change this user name or password in CA Workflow if any of the following conditions are met:

    ■   You want to use a different user name than ServiceDesk

    ■   The password for the ServiceDesk user has changed, or is different than ServiceDesk

    For details, see How to Configure a Server (see page 46).

    Note: The user that CA Workflow and CA Service Catalog use to communicate with CA Service Desk Manager must be a valid CA Service Desk Manager user, like the CA Service Desk Manager user, with the proper authorization for accessing CA Service Desk Manager Web Services; for details, see the CA Service Desk Manager documentation.

4. You can optionally bypass user login by configuring CA Service Catalog and the CA products with which it integrates to use single signin (also called single signon or single sign-on).

    To configure CA Service Desk Manager to use single signin, configure it to use either CA SiteMinder or NTLM authentication on Windows.

    Similarly, to configure CA Service Catalog to use single signin, configure it to use either CA SiteMinder (see page 37) or NTLM authentication on Windows, as explained in the *Implementation Guide*.

5. Optionally configure the integrating products to open CA Service Desk Manager change orders during request fulfillment (see page 50).

6. Optionally configure the integrating products to open CA Service Desk Manager service requests during request fulfillment (see page 60).

Prerequisites

To enable the integration between CA Service Desk Manager and CA Service Catalog, meet the following prerequisites:

- You must be familiar with the basic functions and administration of CA Service Desk Manager, including the critical integration-specific terminology.

- You must be familiar with the basic functions and administration of CA Service Catalog.

- Both CA Service Catalog and CA Service Desk Manager must be installed, configured, and running.

  Verify that CA Service Desk Manager has the latest service packs and patches applied.

- Verify the MDB version compatibility for all CA products that you plan to integrate, including CA Service Desk Manager r12.5, r12, or r11.2 (whichever is applicable).

  Typically, we recommend that CA Service Catalog and all CA products that integrate with it share the same CA Management Database (CA MDB). CA Service Catalog embeds CA MDB r1.5. To integrate CA Service Catalog with other CA products that embed CA MDB r1.5 or CA MDB r1.0.4, verify the CA MDB version compatibility for your integrations (see page 16).

  If one or both of the following conditions exist, ensure that CA Service Catalog and CA Service Desk Manager share the same MDB and the same installation of CA EEM:

  - You want to share users between CA Service Catalog and CA Service Desk Manager.

  - You want to use common multi-tenancy between CA Service Catalog and CA Service Desk Manager.

- If you are using CA Process Automation as the process automation tool for CA Service Catalog and CA Service Desk Manager, verify that you have performed the following tasks:

  - Installed and configured CA Process Automation.

    Verify that CA Process Automation has the latest service packs and patches applied.

    Note: For instructions, see the CA Process Automation documentation.

  - Integrated CA Service Catalog with CA Process Automation (see page 251).

    As part of this process, verify that you have loaded and configured CA Process Automation content in CA Service Catalog (see page 264) and that you have configured the content in CA Process Automation (see page 266).

  - Integrated CA Service Desk Manager with CA Process Automation.

    Note: For instructions, see the CA Service Desk Manager documentation.

- If you are using CA Workflow as the process automation tool for CA Service Catalog and CA Service Desk Manager, verify that you have performed the following tasks:

  - Installed and configured CA Workflow.

    Verify that CA Workflow has the latest service packs and patches applied.

    Note: For instructions, see the CA Workflow documentation.

  - Integrated CA Service Catalog with CA Workflow (see page 294)

  - Integrated CA Service Desk Manager with CA Workflow.

    Note: For instructions, see the CA Service Desk Manager documentation.

- If your implementation of CA Service Desk Manager uses CA Process Automation and the ITIL content pack, review the related best practices for using the CA Process Automation chapter and related support documents (see page 252). Also, read and follow the instructions in the related CA Support documents (see page 253) that apply to your implementation.

Key Terms

This section describes several key terms that you should know when implementing an integration between CA Service Desk Manager and CA Service Catalog. In CA Service Desk Manager, requests, change orders, and related items are the types of tickets that you can open. CA Service Desk Manager defines requests, change orders, and related terms from both an ITIL and non-ITIL perspective.

For a CA Service Desk Manager customer who is *not* running ITIL, the possible ticket types to open up are as follows:

■ Requests are requests for service from internal customers, or in the non-ITIL case could also represent a failure.

■ Issues are same as the above except they are meant for external customers.

■ Change orders are a request for some type of change to the environment.

For a CA Service Desk Manager customer who *is* running ITIL, the possible ticket types to open up are as follows:

■ Requests are requests for service for internal customers.

■ Issues are requests for service from external customers.

■ Change orders are a request for some type of change to the environment.

■ Incident is a disruption in service, meant to be restored as quickly as possible.

■ Problem is for getting to the root cause.

The following is a typical scenario to distinguish between these ticket types on an ITIL installation:

1. An end user opens up an incident with the helpdesk because of problems connecting to email.

2. At the same time, other end users also open up incidents complaining of the same.

3. To restore service as quickly as possible, the email server is rebooted.

   End users can now connect to email. The incident(s) is resolved. Although rebooting the email server got the end users up and running, we still need to determine and fix the root cause.

   From here a problem is opened and attached to the incident(s) for additional research.

After research, the root cause looks to be that there is not enough RAM on the email server, so a change order is opened for the proper approvals to go through to add the additional RAM, this change order is then linked to the problem.

How to Configure a Server

If the user name or password values that CA Service Catalog uses to communicate with CA Service Desk Manager change for any reason, perform either or both of the following steps, as applicable. Reasons for changing these values are explained in How to Plan and Perform the Integration (see page 41).

Both of the following procedures apply *only* if you are using CA Workflow to open change orders during request fulfillment; otherwise, skip these procedures.

1. Configure the authentication and logon methods CA Service Desk Manager primary server, as explained in Configure Server Authentication and Logon Methods (see page 47).

2. This step applies only if you are using PKI-based access control and if you are using CA Workflow to open change orders during request fulfillment.

   If both these conditions are true and if the user name or password value that the CA Service Catalog implementation of CA Workflow uses to communicate with CA Service Desk Manager changes for any reason, re-generate the access policy certificate file with the new CA Service Desk Manager user name and password values in the CA Service Desk Manager CA Workflow process definitions, as explained in How to Generate a Policy Key File (see page 49).

Configure Server Authentication and Logon Methods

This procedure applies *only* if you are using CA Workflow to open change orders during request fulfillment; otherwise, skip this procedure.

For details about when you may need to configure a CA Service Desk Manager server, see How to Plan and Perform the Integration (see page 41).

To configure a server

1. Select Administration, Configuration, Service Desk.

   The configuration options for the CA Service Desk Manager primary server appear.

2. Click the Modify (Pencil) icon next to each property that you want to update, using the following information:

   Enable HTTPS

   Specifies a web protocol, as follows:

   Select No (the default) to use HTTP to communicate with this CA Service Desk Manager server.

   Select Yes to use HTTPS to communicate with this CA Service Desk Manager server.

   Enable PKI

   Specifies the type of authentication to be used when communicating with CA Service Desk Manager, as follows. For more information, see the CA Service Desk Manager documentation.

   Select Yes (the default) to use PKI-based access control. Choose this option if the Web Services Policy has a public key associated with it. If it is PKI based, before continuing, ensure that you have completed the instructions in How to Generate a Policy Key File (see page 49).

   Select No to use user name-password-based authentication. Choose this option if the Web Services connection method uses user login-based access control.

   Important! Selecting No is for old CA Service Desk Manager legacy systems and is *not* recommended!

   Host Name

   Specifies the name of CA Service Desk Manager primary server.

   Port Number

   Specifies the port number used for CA Service Desk Manager on the host.

Key File Name

Specifies the key file name of the public key file.

If you are using PKI-based access control, this parameter is required. Ensure that the key file is located in USM_HOME folder by completing the instructions in How to Generate a Policy Key File (see page 49).

Policy Code

Specifies the CA Service Desk Manager policy code for the Web Services Access Policy used to define the types of interaction allowed between CA Service Catalog and CA Service Desk Manager

If you are using PKI-based access control, this parameter is required.

For more information, see the step for creating the policy code in How to Generate a Policy Key File (see page 49), and also see the CA Service Desk Manager documentation.

User ID

Specifies the login user ID of the CA Service Desk Manager Server Web Service access.

If Enable PKI is set to No and you are using user name-password authentication, this parameter is required. Otherwise, ignore this parameter.

User Password

Specifies login user password of the CA Service Desk Manager Server Web Service access.

If Enable PKI is set to No and you are using user name-password authentication, this parameter is required. Otherwise, ignore this parameter.

3. Verify that you are finished updating configuration properties.

4. Click Test button to test the web service access or click Launch button to start the CA Service Desk Manager Server web URL with the updated properties.

   The connection is tested, using the new values you specified. If the connection fails, try using a different value.

5. Recycle Catalog Component.

6. Select Administration, Configuration, CA Workflow option.

7. Click the Configure button.

   The CA Service Desk Manager server configuration details are updated with the new values that you specified.

How to Generate a Policy Key File

This procedure applies *only* if you are using CA Workflow to open change orders during request fulfillment; otherwise, skip this procedure.

If you are using PKI-based access control and if you need to update the user name or password values that CA Service Catalog uses to communicate with CA Service Desk Manager, updating them in the CA Service Desk Manager CA Workflow process definitions is required.

In CA Workflow, the CA Service Catalog process definitions in CA Service Desk Manager communicate with CA Service Desk Manager using the CA Service Desk Manager web services. The CA Service Desk Manager login web service is used to establish a session. By default, the user name and password for that web service are both *ServiceDesk*.

1. In CA Service Desk Manager, as the CA Service Desk Manager admin, create a new Web Service Policy (a new policy key file), according to the instructions in the CA Service Desk Manager documentation.

   Doing so create a certificate file that CA Service Catalog uses in all its CA Workflow process definitions and actors to log in to CA Service Desk Manager.

   The policy file name is based on the policy code specified in the CA Service Desk Manager configuration UI, for example, USM_SD_Policy.

2. Open a Windows command prompt and access %SERVICE_DESK_HOME%\bin.

3. Run the following command:

   pdm_pki -p USM_SD_Policy

   This action creates a policy file named USM_SD_Policy.p12.

4. Copy the policy file named USM_SD_Policy.p12 to USM_HOME.

Note: CA Service Desk Manager also provides other web service authentication mechanisms for maintaining user names and passwords. For details, see the CA Service Desk Manager documentation.

How to Open Change Orders During Request Fulfillment

During the fulfillment phase of the request life cycle, CA Service Catalog can open a CA Service Desk Manager change order. Be careful when activating rules to understand the full implications of your changes. For more information, including important requirements, see the information about the CA Service Catalog request life cycle in the *Administration Guide*.

To configure CA Service Desk Manager so that CA Service Catalog request fulfillment can open CA Service Desk Manager change orders, complete the major tasks that follow.

1. Add change order attributes (see page 51) in CA Service Desk Manager.

2. Add change order categories in CA Service Desk Manager for your process automation tool:

   ■ For CA Workflow

   ■ For CA Process Automation (see page 52)

3. If you are using CA Process Automation, update CA Process Automation-related settings (see page 53).

4. Enable rule actions (see page 55).

5. Import actor and process definitions (see page 56).

   This procedure applies *only* if you are using CA Workflow to open change orders during request fulfillment; otherwise, skip this procedure.

6. Configure CA Workflow server and actor settings (see page 58).

   This procedure applies *only* if you are using CA Workflow to open change orders during request fulfillment; otherwise, skip this procedure.

Add Change Order Attributes

For CA Workflow: When the process definition named USM_CreateITUSDChangeOrder opens a CA Service Desk Manager change order, it sets values for several new attributes in CA Service Desk Manager.

For CA Process Automation: When the SRF named FilledFromInventory_SDM opens a CA Service Desk Manager change order, it sets values for several new attributes in CA Service Desk Manager.

In order for the open change order step to work without error, the CA Service Desk Manager schema must be changed to include the following attributes for the "chg (Change Order)" object:

- usmrequestid (integer)
- usmrequestitemid (integer)

To make these changes to the CA Service Desk Manager schema, see the CA Service Desk Manager documentation.

Add Change Order Categories for CA Workflow

Note: This topic applies *only* if you are using CA Workflow as your process automation tool.

When the CA Workflow process definitions named USM_HW_Fulfillment_USD and USM_SW_Fulfillment_USD, which are installed with CA Service Catalog, open a CA Service Desk Manager change order, they use new Change Order Categories in CA Service Desk Manager. Although the process definitions will work without error if these Change Order Categories are not defined in CA Service Desk Manager, it is more useful if the Categories are defined. These Change Order Categories should be defined with the attributes shown:

- USM.Hardware
    - Symbol: USM.Hardware
    - Code: USMHW
    - Record Status: Active
    - Description: Used for change orders created by CA Service Catalog
    - Process Definition: USM_HW_Fulfillment

- USM.Software
  - Symbol: USM.Software
  - Code: USMSW
  - Record Status: Active
  - Description: Used for change orders created by CA Service Catalog
  - Process Definition: USM_SW_Fulfillment

Note: For instructions to add these Change Order Categories, see the CA Service Desk Manager documentation.

Add Change Order Categories for CA Process Automation

Note: This topic applies *only* if you are using CA Process Automation as your process automation tool.

When CA Process Automation SRFs open CA Service Desk Manager change orders, they use certain change order categories in CA Service Desk Manager. For best results, define the following change order categories with the attributes shown:

- USM.Hardware
  - Symbol: SLCM.Hardware
  - Code:
    - For CA Service Desk Manager Release 12.7: SLCMHWFFI
    - For CA Service Desk Manager Release 12.6 or 12.5: SLCM.HWFFI

    Important! For CA Service Desk Manager Release 12.7, the value must *not* contain a dot (.). Otherwise, errors can occur.
  - Record Status: Active
  - Description: Used for change orders created by CA Service Catalog
  - SRF: HWSW_FilledFromInventory
  - Group: The group to which CA Service Desk Manager assigns change orders from CA Service Catalog
  - Organization: The organization to which CA Service Desk Manager assigns change orders from CA Service Catalog

- USM.Software
  - Symbol: SLCM.Software
  - Code:
    - For CA Service Desk Manager Release 12.7: SLCMSWFFI
    - For CA Service Desk Manager Release 12.6 or 12.5: SLCM.SWFFI

    Important! For CA Service Desk Manager Release 12.7, the value must *not* contain a dot (.). Otherwise, errors can occur.
  - Record Status: Active
  - Description: Used for change orders created by CA Service Catalog
  - SRF: HWSW_FilledFromInventory
  - Group: The group to which CA Service Desk Manager assigns change orders from CA Service Catalog
  - Organization: The organization to which CA Service Desk Manager assigns change orders from CA Service Catalog

To add these Change Order Categories, see the CA Service Desk Manager documentation.

Update CA Process Automation Settings

Update these CA Process Automation-related settings to complete the process of configuring CA Process Automation to support the opening of change orders in CA Service Desk Manager during request fulfillment.

Follow these steps:

1. In CA Process Automation, perform these steps:
   a. Access the Service Desk SRF folder (CA SDM/SRF).
   b. Edit the HWSW_FilledFromInventory SRF.
   c. Add the <chgcat> tag to this SRF.

   This step updates the SRF to process change orders in CA Service Desk Manager.

2. In CA Service Desk Manager, perform these steps:
   a. Select Options Manager, Change order Manager, Category_Defaults.
   b. Install the Category_Defaults option.
   c. Restart CA Service Desk Manager.

   This step updates CA Service Desk Manager to process change orders from CA Service Catalog according to your specifications.

3. (CA Service Desk Manager Release 12.7 only) In CA Service Catalog, select Events-Rules-Actions, open the Request/Subscription Item Change event, and perform these steps:

   a. Edit the custom rule that you created by copying and modifying the rule named When Category is Hardware and Status is Filled From Inventory.

      Note: If you have not already created this custom rule, create it now. You must create this custom rule to be able to update the rule actions.

   b. Edit the action named Launch HWSWFilledFromInv_SDM SRF; this action is for the Hardware category.

   c. Verify that the value of the SDM_Category parameter of this action does *not* contain a dot (.). Otherwise, the system can fail to create change orders.

4. (CA Service Desk Manager Release 12.7 only) Also in the Request/Subscription Item Change event, and perform these steps:

   a. Edit the custom rule that you created by copying and modifying the rule named When Category is Software and Status is Filled From Inventory.

   b. Edit the action named Launch HWSWFilledFromInv_SDM SRF for Software.

   c. Verify that the value of the SDM_Category parameter of this action does *not* contain a dot (.). Otherwise, the system can fail to create change orders.

You have updated the CA Process Automation-related settings.

Enable Rule Actions

To cause CA Service Catalog to open a CA Service Desk Manager change order during request fulfillment, you must enable several rule actions that are disabled by default.

To enable rule actions

1. From the Home page, navigate to Administration, Events-Rules-Actions.

   The Events-Rules-Action screen is displayed.

2. Click the Event Type named "Request/Subscription Item Change."

3. Click the rule named When Category is Hardware and Status is Filled from Inventory (formerly WFHWFulfillment).

   The rule Actions list is displayed

   For CA Workflow, the list shows two actions named Launch USM_HW_PC_Fulfillment Workflow (formerly Workflow Hardware Fulfillment) and Launch USM_HW_Fulfillment_USD Workflow (formerly Workflow Hardware Fulfillment_USD), which is Disabled.

   For CA Process Automation, the list shows one or more CA Process Automation actions that you can use with this rule.

   Note: If you are integrating CA Service Catalog with Unicenter Service Desk r11.2, continue using the former rule and action names, both in this context and throughout your environment. For a detailed list of names changes for rules and actions in CA Service Catalog r12, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321) and related information the chapter "Integrating with CA Workflow."

4. Do one of the following:

   ■ If you are using CA Workflow, complete the remaining steps as shown.

   ■ If you are using CA Process Automation, use the remaining steps as a model to modify your start request forms (SRFs) and processes.

5. To enable the CA Service Desk Manager change orders, you must disable the Launch USM_HW_PC_Fulfillment Workflow action and enable the Launch USM_HW_Fulfillment_USD Workflow action.

6. Click the Edit icon for the action named Launch USM_HW_PC_Fulfillment.

   The Edit Action screen is displayed.

7. Select DISABLED from the Type drop-down list and click OK.

   The rule Actions list is displayed again.

8. Click the Edit icon for the action named Launch USM_HW_Fulfillment_USD Workflow.

   The Edit Action screen is displayed.

9. Select Workflow from the Type drop-down list and wait for the screen to reformat showing the workflow process definition to be started. Click OK.

   The Rule Action screen is displayed showing the Launch USM_HW_PC_Fulfillment Workflow action Disabled and the Launch USM_HW_Fulfillment_USD Workflow rule type as Workflow.

10. Repeat Steps 3 through 7 for the rule named When Category is Software and Status is Filled from Inventory (formerly WFSWFulfillment).

All rules except when Status is Pending Fulfillment (formerly WFAllUSDRequestFulfillment and WFALLSimpleFulfillment; these two rules have been combined) must be activated for the entire complex request life cycle involving CA Service Desk Manager to work correctly. In order to make changes to the rules, conditions, and actions, you should do a thorough analysis of your business processes and make changes carefully with a full understanding of the rules, conditions, actions, and CA Workflow process definitions installed with CA Service Catalog.

Import Actor and Process Definitions

This procedure applies *only* if you are using CA Workflow; otherwise, skip this procedure.

Importing the actor and the process definitions is a prerequisite for performing the other tasks required to configure CA Service Desk Manager for CA Service Catalog request fulfillment.

To import the actor

1. On the CA Service Desk Manager server computer, start the Workflow IDE program.

2. Log in to the Workflow IDE using the administrator user ID (ServiceDesk).

   The Process Manager, Process Definitions list is displayed.

3. Select the File, Import, Actors. The Open dialog box is displayed.

4. Navigate to the USM_HOME\fulfillment\scripts\service_desk\actors folder and select the file named USM_RequestService_en.xml for English. Otherwise, choose the correct language based on your server operating system language.

5. Click Open.

6. The actor is imported and appears in the Actors tab under the Web Service node.

   The name of the actor is USM_RequestService.

The XML files that define these process definitions are located in the USM_HOME\fulfillment\scripts\service_desk\processdefinitions folder. The XML file names are as follows:

- For CA Service Desk Manager r11.2:
    - USM_HW_Fulfillment.xml
    - USM_SW_Fulfillment.xml
- For CA Service Desk Manager r12, r12.1, and r12.5
    - USM_HW_Fulfillment_SD_r12.xml
    - USM_SW_Fulfillment_SD_r12.xml

To import the process definitions

1. On the CA Service Desk Manager server computer, start the CA Service Desk Manager, Workflow IDE program.

2. Log in to the Workflow IDE using the administrator user ID (typically ServiceDesk).

    The Process Manager, Process Definitions list is displayed.

3. Select File, Import, Process Definition.

    The Open dialog box appears.

4. Navigate to the USM_HOME\fulfillment\scripts\service_desk\processdefinitions folder and select the file named USM_HW_Fulfillment_en.xml for English. Otherwise, choose the correct language based on your server operating system language.

5. Click Open.

    The process definition is imported and appears in the Process Definition list.

Repeat the import steps for USM_SW_Fulfillment_en.xml for English. Otherwise, choose the correct language based on your server operating system language.

Configure CA Workflow Server and Actor Settings

This procedure applies *only* if you are using CA Workflow; otherwise, skip this procedure.

Configuring CA Workflow settings is required if you use CA Workflow to open change orders during request fulfillment.

If you are using CA Workflow, set these configuration parameters to help ensure that CA Workflow and CA Service Catalog work together correctly. This task is part of setting the administration configuration options.

To set the CA Workflow configuration parameters

1. Select Administration, Configuration, CA Workflow and specify values for the following parameters:

   Enable HTTPS

   Defines whether CA Service Catalog uses HTTPS when communicating with CA Workflow.

   Default: No

   Host Name

   Displays the host name on which CA Workflow is installed. Update this setting if necessary.

   Default: The host name on which this CA Workflow was installed.

   Port Number

   Specifies the port number used to communicate with CA Workflow.

   Default: The value specified when CA Workflow was installed.

   Retry Count

   Specifies the number of times to try again to complete a failed CA Workflow action.

   Default: 10

   Retry Interval

   Specifies the number of seconds between attempts to complete a failed CA Workflow action.

   Default: 300

2. Recycle the CA Service Catalog service.

3. Recycle the CA Service Fulfillment service.

4. Click Test to verify these parameters.

5. Click the Configure button to update the CA Workflow actors, if required. This action is required if you update any parameters in the Server Information section or the Service Desk section of the Administration Configuration parameters.

6. Verify whether *both* of the following conditions exist:

   ■ You are integrating CA Service Catalog with CA Service Desk Manager.

   ■ The related CA Service Catalog process definitions and actors are loaded in the CA Workflow implementation for CA Service Desk Manager.

7. If *both* of the conditions in the previous step exist, perform this step. Otherwise, skip this step.

   a. Do the following, if any Server Information settings for CA Service Catalog have changed: Reimport the USM_RequestService web service actor loaded in the CA Service Desk Manager CA Workflow implementation with the new Server information. To do so, do the following, sequentially:

      – Export the actor in the CA Workflow IDE.

      – Change the wsdl_url to the new Server URL.

      – Reimport the actor into the CA Workflow IDE.

   b. Update the USM_HW_Fulfillment_SD_r12 and USM_SW_Fulfillment_SD_R12 process definitions in the CA Workflow IDE. In each of these process definitions, select the Initialize Values function and set the USM_URL to the new Server URL, and set the USM_LoginBusinessUnit to the value that is being used by the CA Service Catalog Application.

   c. Save the changes to these process definitions.

8. Recycle the CA Service Fulfillment service again.

Note: You can optionally click Launch to start the CA Workflow Process Manager.

Configuring CA Workflow actor settings is required when you open change orders during request fulfillment.

To configure CA Workflow actor settings

1. Click Administration, Configuration, CA Workflow, and click the Configure button.

   The CA Workflow actor settings are configured.

2. Recycle Catalog Component.

How to Open Requests During Request Fulfillment

This procedure applies *only* if you are using CA Workflow; otherwise, skip this procedure.

During the fulfillment phase of the CA Service Catalog request life cycle, CA Service Catalog can open a CA Service Desk Manager request. Be careful when activating rules to understand the full implications of your changes. For more information, including important requirements, see the information about the CA Service Catalog request life cycle in the *Administration Guide*.

To open requests during request fulfillment, perform the major tasks that follow; for details, see the sections that follow.

1. Enable the When Status is Pending Fulfillment (see page 61) rule (formerly WFAllUSDRequestFulfillment).

2. Add a Request Area (see page 62).

In order to make changes to the rules, conditions, and actions, you should do a thorough analysis of your business processes and make changes carefully with a full understanding of the rules, conditions, actions, and CA Workflow process definitions installed with CA Service Catalog.

Enable the When Status is Pending Fulfillment Rule

This procedure applies *only* if you are using CA Workflow; otherwise, skip this procedure.

To cause CA Service Catalog to open a CA Service Desk Manager request, you must enable the When Status is Pending Fulfillment rule (formerly WFUSDAllRequestFulfillment), which is disabled by default.

Note: If you are integrating CA Service Catalog with Unicenter Service Desk r11.2, continue using the former rule and action names, both in this context and throughout your environment. For a detailed list of names changes for rules and actions in CA Service Catalog r12, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321) and related information the chapter "Integrating with CA Workflow."

Follow these steps:

1. From the Home page, navigate to Administration, Events-Rules-Actions.

   The Events-Rules-Action screen is displayed.

2. Click the Event Type named "Request/Subscription Item Change."

3. Check the action check box next to the When Status is Pending Fulfillment rule.

4. Click Enable.

   This enables all the checked rules.

Note: When the When Status is Pending Fulfillment rule is enabled, the only other rule that should be enabled is When Status is Submitted and Approval Process is Driven by Workflow (formerly WFAllSubmit). The other rules should remain disabled unless you alter their conditions. These rules fire for all requests and will therefore cause duplicate behaviors unless other rules are disabled.

Note: If you are integrating CA Service Catalog with Unicenter Service Desk r11.2, continue using the former rule and action names, both in this context and throughout your environment. For a detailed list of names changes for rules and actions in CA Service Catalog r12, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321) and related information the chapter "Integrating with CA Workflow."

Add a Request Area

This procedure applies *only* if you are using CA Workflow; otherwise, skip this procedure.

Adding a request area is a required task to configure CA Service Desk Manager for CA Service Catalog request fulfillment.

To add a request area

1. Log in to CA Service Desk Manager using the administrator user ID (ServiceDesk).

2. Select the Administration tab.

   The Administration tree view is displayed.

3. Select the CA Service Desk Manager, Requests, Request Areas node.

   The Request/Incident/Problem Area List is displayed.

4. Click the Create New button.

   The Create New Request/Incident/Problem Area screen is displayed.

5. Specify the following values:

   Symbol: USM

   Record Status: Active

   Description: Used for requests created by CA Service Catalog

6. Click Save in the Create New Request/Incident/Problem Area screen.

   The Request/Incident/Problem Area Detail screen is displayed.

7. Click Close Window in the Request Area Detail screen.

Chapter 5: Integrating with CA CMDB

This chapter explains how to integrate CA Service Catalog with the following:

- CA CMDB r12.1, r12, and r11.2

- CA CMDB included in CA Service Desk Manager r12.5

This section contains the following topics:

Prerequisites

- You must be familiar with basic functions and administration of CA CMDB, especially related to families, classes, configuration items, and relationships between configuration items. If you want to use the analysis tools, such as root cause analysis and impact analysis, you must understand how to use them.

- You must be familiar with basic functions and administration of CA Service Catalog, especially CA Service Catalog.

- Ensure that both CA Service Catalog and CA CMDB are installed, configured, and running.

- If you are using Accounting Component, ensure that it is installed, configured, and running.

- Use the same MDB installation for CA CMDB and CA Service Catalog.

Overview

A configuration management database (CMDB) is a repository of asset information defining the critical configuration items in your environment and their relationships. A service catalog fits into that framework as a tool to help with financial governance, workflow, management of service requests, service definition, and other important tasks. The closer the relationship between the infrastructure assets represented by the configuration items and the logical services consumed by users, the more useful the integration between the CMDB and the service catalog is to your organization.

CA CMDB is a comprehensive, integrated solution for managing an enterprise's IT components and services and their relationships, in heterogeneous computing environments. CA CMDB makes it possible to provide and store reliable, up-to-date details on assets, known as configuration items, and their relationships with each other. These relationships form the basis for impact analysis, an important tool for controlling change within an organization.

Using the Visualizer component of CA CMDB with the Request UI and Services UI components of CA Service Catalog, you can find the connections between IT and business. From these connections, you can follow the paths that lead to the details you need to determine a comprehensive impact analysis when any configuration item suffers a partial or total loss of operation.

When CA CMDB and CA Service Catalog are integrated, CA Service Catalog services are associated with configuration items in CA CMDB. Using the CA CMDB Visualizer, you can trace the dependencies of the services on other configuration items. You can therefore determine the impact of configuration items on services. One of the most important applications occurs when a configuration item used by one or more services either suffers loss of performance or stops working completely. You can visually pinpoint the impact of this event to the service.

When a specific change affects a configuration item, you can use the CA CMDB impact analysis tools to figure out which services are affected by the change. Then you can use CA Service Catalog to determine the organizations and users that have subscribed to the impacted services. This information helps you plan the change you need. Also, you can use the service level agreements between the subscribing organization and the providers to help plan the change. For example, if a heavily used server slows down or crashes, you can determine the impact on CA Service Catalog services by using the integration to help answer questions like the following:

- Which specific services use that server?

- Do those services use any other server?

- Are other servers available to replace the affected server?

- Which accounts and subscriptions are affected?

- What are the possible financial risks? For example: do the affected services or configuration items have associated service-level agreements (SLAs)? Do the impacted services help generate revenue?

Your analysis can include impact analysis, efficiency analysis, financial analysis and profitability, and ITIL considerations. Both CA CMDB and CA Service Catalog support ITIL principles.

How to Perform the Post-Installation Setup

After you have installed and configured CA Service Catalog and CA CMDB, integrate them by performing the setup tasks described in this section.

Perform Setup Tasks for CA CMDB

As a CA CMDB administrator, on the CA CMDB computer, log on to CA CMDB, access the CA CMDB Administration tab, and perform the following tasks.

1. Using the Web Services Policy option, create the Web Services Access policy. As part of this process, do the following:

   a. Assign a name. The suggested name and code are USM_CMDB_Policy, but you can use any name that meets your needs.

   b. Assign a proxy user to this policy.

      Important! This proxy user *must* have administrative access to CA CMDB.

   c. Verify that the Allow Impersonate property of CA CMDB is set to Yes.

   CA CMDB checks the access type of the CA Service Catalog user to be impersonated against the access type of the proxy user of the policy. If the access level of the CA Service Catalog user's access type is less than or equal to the grant level of the proxy user's access type, CA CMDB replaces the CA Service Catalog user with the proxy user. For further details, see your CA CMDB documentation.

2. Generate the policy key file for the Web Services policy that you created in the previous step, using the pdm_pki tool.

   The suggested name is USM_CMDB_Policy.p12, but you can use any name that meets your needs.

   Verify that the HasKey property is set to Yes in the newly created Web Services access policy. The system typically configures this setting automatically when you generate the policy key file, but you should verify the setting.

   For further details, see your CA CMDB documentation.

3. Copy the policy key file to the CA Service Catalog server and save it in the USM_HOME directory.

   Important! If you are using application clustering, you must copy the policy key file to the USM_HOME directory of *every* Catalog Component cluster node. For details about application clustering, see the *Implementation Guide*.

4. Verify that the Business Service class of the Enterprise Service family exists. This class is required for CA Service Catalog users to create a configuration item in CA CMDB. If this class does not exist, either create it manually or re-run the CA CMDB installation to load default data. For instructions to perform either task, see your CA CMDB documentation.

Perform Setup Tasks for CA Service Catalog

As a CA Service Catalog administrator, on the CA Service Catalog computer, log in to CA Service Catalog, access the Administration tab, and perform the following tasks:

1. Update the configuration settings for CA CMDB.

   For details, see Update the Configuration Settings (see page 67).

2. Verify the CA CMDB Configuration by clicking Test Connection.

   If the test fails, do the following:

   a. Verify that your settings are completed correctly, especially the host name and port number of the CA CMDB computer.

   b. Verify that the CA CMDB service is up and running.

3. Update the configuration settings for CA-CMDB Visualizer.

   For details, see Update the Visualization Settings (see page 68).

4. Verify the CA CMDB Visualizer by clicking Test Connection.

   If the test fails, do the following:

   a. Verify that your settings are completed correctly, especially the host name and port number of the CA CMDB Visualizer computer.

   b. Verify that the CA CMDB Visualizer service is up and running.

Perform Common Setup Tasks

The CA CMDB and CA Service Catalog administrators may decide to work together to perform the following common setup tasks, which are apply to both products:

1. Verify required access rights for CA Service Catalog administrators, as explained in Verify Access Rights (see page 68).

2. If applicable, configure CA CMDB, CA Service Catalog, or both for single signin, as explained in Configure for Single Signin (see page 69).

Update the Configuration Settings

Specifying the configuration settings for CA CMDB is a required task for enabling the integration between CA CMDB and CA Service Catalog.

To update the configuration settings

1. On the Administration tab of CA Service Catalog, click Configuration, CMDB.

   The CA CMDB configuration options appear.

2. Complete the Configuration settings, as follows:

   Enable HTTPS

   Select the option (Yes or No) that matches your implementation.

   Host Name

   Specify the host name of CA CMDB computer.

   Note: This recommendation applies after you have configured the integration and have started to use it: Do *not* change the host name of the CA CMDB computer or the CA Service Catalog computer, *unless* the two host computers share the same MDB. For information about the MDB, see the MDB documentation included on the CA Service Catalog installation media.

   Port Number

   Specify the port number on the CA CMDB computer that listens for incoming calls from CA Service Catalog.

   Key File Name

   Specify the name of the Web Services policy key file that you created earlier.

   The default value is USM_CMDB_Policy.p12.

   Policy Code

   Specify the name of the Web Services policy code that you created earlier.

   The default value is USM_CMDB_Policy.

   Default New CI State Inactive

   Specifies whether new configuration items that you create through this integration have a default state of *inactive* or *active*.

   Specify Yes for inactive or No for active.

Update the Visualizer Settings

Specifying the configuration settings for the CA CMDB Visualizer is a required task for enabling the integration between the CA CMDB Visualizer and CA Service Catalog.

To update the visualization settings

1. On the Administration tab, click Configuration, CMDB Visualizer.

   The CA CMDB Visualizer Configuration options appear.

2. Specify the following Visualizer Configuration settings:

   Enable HTTPS

   Select the option (Yes or No) that matches your implementation.

   Host Name

   Specify the host name of the CA CMDB Visualizer computer, typically the CA CMDB computer.

   Port Number

   Specify the port number of the CA CMDB Visualizer.

Verify Access Rights

CA Service Catalog administrators must ensure that CA CMDB administrators, analysts, and other users have the required access rights in CA Service Catalog to components (such as requests, subscriptions, business units, or accounts) that are associated to configuration items.

By assigning CA Service Catalog administrator roles to these CA CMDB users, you can ensure that they have required access rights. For example, CA Service Catalog administrators may need to assign CA CMDB administrators the CA Service Catalog Administrator role in CA Service Catalog. For details about users and roles, see the *Administrator Guide*.

Similarly, CA CMDB administrators must ensure that CA Service Catalog administrators have the required access rights to CA CMDB configuration items that are associated to CA Service Catalog components. For details about assigning access rights, see your CA CMDB documentation.

Configure for Single Signin

You can optionally bypass user login by configuring CA Service Catalog and the CA products with which it integrates to use single signin (also called single signon or single sign-on).

To configure CA CMDB, and CA CMDB Visualizer to use single signin, configure them to use either CA SiteMinder or NTLM authentication on Windows.

Similarly, to configure CA Service Catalog to use single signin, configure it to use either CA SiteMinder, as explained in , or NTLM authentication on Windows, as explained in the *Implementation Guide*.

How to Set Up the Integration

Processes and procedures that you need to do or verify to enable the integration between CA CMDB and CA Service Catalog:

1. Ensure that CA Service Catalog, Accounting Component (if used), and CA CMDB are installed, configured, and running.

2. If you plan to use Accounting Component, ensure that it is installed, configured, and running.

3. Ensure that you verify the MDB version compatibility for all CA products that you plan to integrate, including CA CMDB r12.1, r12, or r11.2, or the CA CMDB component of CA Service Desk Manager r12.5 (whichever is applicable).

   Typically, we recommend that CA Service Catalog and all CA products that integrate with it share the same CA Management Database (CA MDB). CA Service Catalog embeds CA MDB r1.5. To integrate CA Service Catalog with other CA products that embed CA MDB r1.5 or CA MDB r1.0.4, .

4. Review the level of maturity of each product in your environment. Major tasks include the following.

   ■ Review your organization's standard process and procedures, especially external standards that you must follow, such as ITIL, ISO, COBIT, CORA, and so forth.

   ITIL is especially applicable because both CA CMDB and CA Service Catalog support ITIL concepts.

   ■ In CA CMDB, review the configuration items in the Business Service class of the Enterprise Services family. Of the initial default configuration items, these are considered to be the most likely candidates for integration with CA Service Catalog services. Remember, however, that you can associate *any* configuration item or items with one or more CA Service Catalog services.

■ In CA Service Catalog, review the existing services.

■ In both, review the existing associations if any.

5. Review the key terms (see page 72) for the integration.

6. Review the types of association between services and configuration items (see page 72) that you can create.

7. Review the associations that already exist, if any; for details, see View Associations Between Services and Configuration Items (see page 78).

8. Determine any *new* Catalog-CA CMDB associations that make sense for your business. Ask these questions:

■ Which existing configuration items need to be associated with one or more services? Do those services already exist, or do you need to create new ones?

■ Which existing services need to be associated with one or more configuration items? Do those configuration items already exist, or do you need to create new ones?

■ Do you want to populate the CA CMDB service by service?

■ Have you started or finished populating the CA CMDB, using the guidelines for doing so in the CA CMDB documentation? If neither, do you want to start or resume by seeding CA CMDB with a small number of mission critical applications and business services?

■ Have you checked your organization's business continuity plan to determine which business services and respective components in your infrastructure are critical?

For details about populating CA CMDB, see the CA CMDB documentation.

As you answer the questions, consider the following factors:

■ Keep in mind that the goal of all associations is to use IT to support your business needs.

■ While the associations are created only *from* services *to* configuration items, thinking about the integration from both perspectives can help ensure that you cover all important considerations.

■ If applicable, begin thinking about associations starting from the perspective of the product that is most mature in your environment. For example, if you have a well developed CA CMDB implementation but have just started implementing CA Service Catalog, then CA CMDB is the more mature product. It is likely most efficient for you to start by viewing your existing configuration items in the Business Service class of the Enterprise Services family and determining which ones could use CA Service Catalog services, to better serve your business needs. In this model, it is likely that you will first create the needed services and next create the associations.

Conversely, if you have mature services but your CA CMDB implementation is just starting, you may want to create configuration items corresponding to the services. For example, for critical services connected to service level agreements, you may want to create configuration items based on the hardware or other infrastructure needed to support the CA Service Catalog services.

For example, you may define your email application and server as configuration items and associate them to an email service in CA Service Catalog. Similarly, you may also associate that email application and server with a service for requesting Blackberry units and subscriptions.

■ If you are using Accounting Component, consider creating and associating configuration items with the services related to your most important subscriptions and most important financial reporting items.

9. Create any new configuration items that you need for the integration.

   For details, see the CA CMDB documentation.

10. Create any new services that you need for the integration.

   For details, see the *Administration Guide*.

   Note: When a service is copied or inherited, its associations to CI s are *not* copied.

11. Consider service level agreements (SLAs).

   Whenever the availability of services is affected, the SLA may have a significant effect on impact analysis. For example, if a server used by a service that your company provides is down, you company's ability to meet the SLA obligations to your customers may be affected. Therefore, you want to set up your service-to-configuration item associations to include services and computers involved in meeting SLA obligations.

   For details about how CA Service Catalog uses SLAs, see the *Administration Guide*.

12. Associate services to configuration items. These associations are *from* CA Service Catalog *to* CA CMDB. These associations may be one-to-one, one-to-many, many-to-one, or many-to-many. You associate a CA Service Catalog service ID with a CA CMDB UUID (not a logical ID).

    For example, consider the New Hire Onboarding service, which is one of many services supplied with CA Service Catalog. It is intended to be used for requesting office equipment needed by a newly hired employee, such as a desktop or laptop computer, an office or cubicle, a telephone, email service, network access rights, and so forth. You could create a configuration item for each of these assets and associate them to the service. In this case, the association is many to one (many configuration items to one service).

13. Using the CA CMDB Visualizer, leverage the analysis tools of CA CMDB, such as impact analysis and root cause analysis. For details, see How to Leverage Information from Analysis Tools (see page 83).

Key Terms

CA Configuration Management Database (CA CMDB) is a functional data repository that unifies and simplifies the management of configuration information. CA CMDB consolidates and reconciles disparate sources of IT-related data in the context of business priorities. CA CMDB provides visibility into configuration item information such as resource attributes, relationships and dependencies.

Configuration items form the basis of configuration management solutions. Typically, a configuration item is a collection of objects related to the specific functionality of a larger system. Examples of these objects may be requirements, code, documentation, models, and other files.

Visualizer is the CA component that CMDB uses to provide a unified graphical view of relationships between configuration items and inter-dependencies in support of business processes. It helps you determine which CA Service Catalog services are connected to which CA CMDB configuration items.

Types of Association Between Services and Configuration Items

You can view, modify, and create associations between any CA Service Catalog services and any CA CMDB configuration items. Typically, the most suitable configuration items belong to the Business Service class in the Enterprise Services family. Several configuration items in this family and class are provided by default, but you can optionally create any new ones that you need.

The following types of association between CA Service Catalog services and CA CMDB configuration items are possible:

- One service to one configuration item

- One service to many configuration items

- Many services to one configuration item

- Many services to many configuration items

In today's complex IT environments, the many-to-many relationship between CA Service Catalog services and CA CMDB configuration items is the most commonly used.

You can also do the following:

- Associate existing services to existing configuration items

- Use an existing service to create one or more new configuration items

- Create a new service for one or more existing configuration items

Create a Configuration Item for a Service and Associate Them

Many of the associations that you create involve CA Service Catalog services and existing CA CMDB configuration items. However, you may optionally decide to *create* a configuration item specifically for a service, especially if no suitable configuration item exists already. You do not necessarily need to create and associate a configuration item for every service. Instead, create and associate such configuration items *only* when they support your business needs and goals.

Before associating a service to a configuration item, ensure that the service is *defined* in CA Service Catalog, meaning that the service's service option groups and service options have been specified. For details about defining services, see the *Administrator Guide*.

Note: If you associate a CA Service Catalog service with a CA CMDB configuration item that does *not* display the Attributes tab, you *cannot* view the service-related details of the configuration item from CA Service Catalog. For details, see the CA CMDB documentation.

For instructions to associate services with *existing* configuration items, see Associate Services with Configuration Items (see page 75).

Follow these steps:

1. From the CA Service Catalog home page, select Catalog, CMDB CI Association.

   The CMDB CI Association page appears.

2. Under the line "The current business unit is: *business-unit-name*," click the Catalog tab.

   The list of existing folders, sub folders, and services appears.

3. Expand the folders and sub folders as needed, until the services you want appear.

4. Check the box next to the service or services for which you want to create and associate a configuration item.

5. Click the right arrow next to the Selected Services box.

   The names of the selected services appear in the Selected Services box.

6. Click Next.

   The screen refreshes, and the CI List for Association appears, listing the names of any configuration items already associated with the selected service or services.

7. View the list of existing associations under the CI Name heading.

8. To *create* a configuration item for each selected service, click Create CI.

   For each selected service, a new configuration item is created in the Business Service class of the Enterprise Services family. Also, a one-to-one association is created between each service and its new, same-named configuration item.

   By default, the system also displays the names of several CA CMDB configuration item attributes. While the *names* of these attributes are listed by default, the *values* of these attributes are not populated by default. You can optionally populate these values. In addition, you can add and populate other attributes of your choosing. For instructions, consult your implementation team, including your CA CMDB administrator and CA Service Catalog administrator.

9. To associate the new configuration item and all selected services, click Save.

Note: Specify details for the new configuration item in CA CMDB; for instructions, see your CA CMDB documentation.

Associate Services with Configuration Items

Associating services with configuration items is a required major task to configure the integration between CA CMDB and CA Service Catalog. You could potentially create hundreds or even thousands of associations, but you should create only the associations that support your business goals and needs.

Before associating a service to a configuration item, ensure that the service is *defined* in CA Service Catalog, meaning that the service's service option groups and service options have been specified. For details about defining services, see the *Administrator Guide*.

Note: If you associate a CA Service Catalog service with a CA CMDB configuration item that does *not* display the Attributes tab, you *cannot* view the service-related details of the configuration item from CA Service Catalog. For details, see the CA CMDB documentation.

To associate services with configuration items

1. From the CA Service Catalog home page, select Catalog, CMDB CI Association.

   The CMDB CI Association page appears.

2. Under the line "The current business unit is: *business-unit-name*," click the Catalog tab.

   The list of existing folders, sub folders, and services appears.

   Note: If you know the name of the service or folder that you want, you can optionally use the Search tab (instead of the Catalog tab) to display services.

3. Expand the folders and sub folders as needed, until the services you want appear.

4. Check the box next to (on the left side of) the service or services that you want to associate with one or more configuration items.

5. Click the right arrow next to the Selected Services box.

   This action selects the services. The names of the selected services appear in the Selected Services box.

6. Click Next.

    The screen refreshes, and the CI List for Association appears, displaying the names of the service that you selected in the previous step. The services are listed in the service column. If any service is already associated to one or more configuration items, the item is listed next to the service in the CI Name column.

    You can associate each of these services (either individually or as a group) to one or more configuration items.

7. Check the service or services that you want to associate to one or more configuration items in the same action. Leave any other services unchecked; you can optionally associate such services to configuration items in a separate action.

    Note: To *create* a configuration item for each selected service and associate them, click Create CI, as explained in Create a Configuration Item for a Service and Associate Them (see page 73). If you click Create CI, new configuration item is created for each selected service. Also, a one-to-one association is created between each service and its new, same-named configuration item.

8. To associate a single service with a one or more existing configuration items, do the following; otherwise, skip to the next step.

    a. Check the service and click Associate CIs.

        The CI List dialog appears.

    b. Click Search to display the available configuration items. Optionally use a search string to delimit your search results.

        The search results appear.

    c. In the search results, check all configuration items that you want to associate with the service that you checked, and click OK.

        If you selected only one configuration item, a one-to-one association is created between the checked service and that item.

        If you selected two or more configuration items, a one-to-many association is created between the checked service and those items.

9. To associate two or more services with one or more existing configuration items, do the following; otherwise, skip to the next step.

    a. Check the services and click Associate CIs.

        The CI List dialog appears.

    b. Click Search to display the available configuration items. Optionally use a search string to delimit your search results.

        The search results appear.

    c.   In the search results, check all configuration items that you want to associate with the services that you checked, and click OK.

        If you selected only one configuration item, a many-to-one association is created between the checked services and that item.

        If you selected two or more configuration items, a many-to-many association is created between the checked services and those items.

10. When you are finished associating items, click Save.

Your associations are saved. They are used to help support and customize impact analysis, root cause analysis, and other analysis functions for your integration between CA CMDB and CA Service Catalog.

Maintain Associations between Services and Configuration Items

After you create associations between CA Service Catalog services and CA CMDB configuration items, you many need to modify or delete some associations to adapt to changing business needs. For example, if you associated a service with many configuration items, you may want to remove some associations that have become obsolete but keep others that are still needed.

To maintain associations between services and configuration items

1.   From the CA Service Catalog home page, select Catalog, CMDB CI Association.

      The CMDB CI Association page appears.

2.   Under the line "The current business unit is: *business-unit-name*," click the Catalog tab.

      The list of existing folders, sub folders, and services appears.

3.   Expand the folders and sub folders as needed, until the services you want appear.

4.   Check the box next to the service or services whose association you want to maintain.

5.   Click the right arrow next to the Selected Services box.

      The names of the selected services appear in the Selected Services box.

6.   Click Next.

      The screen refreshes, and the CI List for Association appears, listing the names of any configuration items already associated with the selected service or services.

7.   View the list of existing associations under the CI Name heading.

8. To *remove* an existing association for a service, do the following:

   a. Click the delete icon that appears after the name of the service.

   b. Confirm the removal.

   c. Click Save.

   The configuration item or items that you deleted are no longer associated with the service.

   If you are finished maintaining associations, skip the remaining steps.

9. You can also perform any of the following tasks:

   ■ Associate a single service with one or more existing configuration items

   ■ Associate a two or more service with one or more existing configuration items

   ■ Create a configuration item for one or more services and associate the item with the service or services

   For instructions to perform any of these tasks, see Associate Services with Configuration Items (see page 75).

View Associations Between Services and Configuration Items

You can quickly view existing associations from CA Service Catalog services to CA CMDB configuration items. It is helpful to see such quick views for many reasons, including saving time, avoiding duplicate associations, and gaining quick access to the CA CMDB Visualizer for the service and any associated configuration items.

Note: If your implementation requires you to log in to CA CMDB Visualizer, see your administrator to obtain a user name and password for accessing CA CMDB Visualizer.

To view associations between configuration items and services

1. Click Catalog, Service Offerings.

   The list of catalog folders and services appears.

2. Search the folders and services, expanding them if necessary, until you locate the service you want.

3. Under the Actions icons, click the CA CMDB Association icon. Its tooltip text is "CMDB CI Associations."

    The Service Offerings dialog appears, showing the configuration items currently associated with the service.

4. Optionally, do one of the following:

    ■   View each associated configuration item in the CA CMDB Visualizer by clicking the Visualizer icon. Its tooltip text is "CMDB Visualizer."

        Log in to CA CMDB Visualizer, if required.

    ■   Delete the association by selecting the configuration item or items and clicking Remove Association.

    Note: For instructions to create associations, see <u>Associate Services with Configuration Items</u> (see page 75).

View Relationships of Associated Configuration Items

After you view existing associations from CA Service Catalog services to CA CMDB configuration items, you may want to view the relationships between those configuration items and their related configuration items in CA CMDB: doing so can be a critical part of impact analysis and root cause analysis.

Note: If your implementation requires you to log in to CA CMDB Visualizer, see your administrator to obtain a user name and password for accessing CA CMDB Visualizer.

To view relationships of associated configuration items

1. Click Catalog, Service Offerings.

    The list of catalog folders and services appears.

2. Search the folders and services, expanding them if necessary, until you locate the service you want.

3. Under the Actions icons, click the CA CMDB Association icon. Its tooltip text is "CMDB CI Associations."

    The Service Offerings dialog appears, showing the configuration items currently associated with the service.

4. To view the relationships of those configuration items with other configuration items in CA CMDB, click the Visualizer icon. Its tooltip text is "CMDB Visualizer."

5. Log in to CA CMDB Visualizer, if required.

6. Use the Visualizer features to find and note the most critical relationships; you use this information for impact analysis, root cause analysis, and other analysis.

    Note: For instructions to use Visualizer, see the CA CMDB documentation.

View the Service-Related Details of a Configuration Item

The service-related details of a CA CMDB configuration item are the CA Service Catalog service or services associated with the item, the number of requests for each associated service, and any other related properties that your organization deems important. This information can be a critical part of your analysis activities for the associated services and configurations items. For example, a high number of associated requests, subscriptions, or accounts may indicate that a configuration item is very critical for business continuance and therefore merits special attention.

If your implementation requires you to log in to CA CMDB Visualizer, see your administrator to obtain a user name and password for accessing CA CMDB Visualizer.

Note: If you associate a CA Service Catalog service with a CA CMDB configuration item that does *not* display the Attributes tab, you *cannot* view the service-related details of the configuration item from CA Service Catalog. For details, see the CA CMDB documentation.

To view the service-related details of a configuration item

1. To begin in CA Service Catalog, do the following.

    You may want to begin in CA Service Catalog if you are *not* certain which configuration items are associated with the CA Service Catalog services of interest.

    a. Click Catalog, Service Offerings.

        The list of catalog folders and services appears.

    b. Search the folders and services, expanding them if necessary, until you locate the service you want.

    c. Under the Actions icons, click the CA CMDB Association icon. The tooltip text for this icon is "CMDB CI Associations."

        The Service Offerings dialog appears, showing the configuration item or items associated with the service.

    d. Click Visualizer.

    e. Log in to CA CMDB Visualizer, if required.

        The associated items appear in CA CMDB Visualizer. If these items have relationships with other configuration items, the related items and the relationships also appear.

2. To begin in CA CMDB Visualizer, do the following:

   You may want to begin in CA CMDB if you *are* certain which configuration items are of interest and therefore do not need to check the services in CA Service Catalog.

   a. Log in to CA CMDB Visualizer.

   b. Display the configuration items that are associated with the service of interest.

      If these items have relationships with other configuration items, the related items and the relationships also appear.

3. Right-click the configuration item and select View Properties.

   The Configuration Item Details dialog appears.

4. Click the Attributes tab and click the Service Catalog button, which is the managed data repositories (MDR) button for CA Service Catalog.

   Note: As a shortcut to replace this step and the previous step, you can optionally right-click the configuration item and select View, MDR. From the list of MDRs, select Service Catalog.

   The CA Service Catalog GUI opens.

5. If the CA Service Catalog GUI does not open, do the following:

   ■ Verify that the CA Service Catalog host name property specified in the MDR button is correct. If necessary, for instructions, see your CA CMDB documentation.

   ■ Verify that the CA Service Catalog services are started.

6. If necessary, log in to CA Service Catalog.

   The CI Associated Offering Details dialog appears.

7. View the count for the requests, subscriptions, accounts, and business units that are related to the configuration item and its associated service or services.

   If multiple services are associated to the configuration items whose properties are viewing, the counts for all associated services are listed.

   For requests, accounts, subscriptions, and business units, optionally click the links for further details about each count, as follows:

   ■ Click the number of request to view the request ID, name, creation date, and status of each request.

   ■ Click the number of subscriptions to view subscription-related details about the service, for example, the number of subscriptions for each service option.

- Click the number of accounts to view the name, opened date, and status of each account.

- Click the number of business units to view the business unit name and the number of requests and subscriptions.

- Click the name of the service to view additional details about the service.

8. Use this information along with any information you obtain from the CA CMDB Visualizer analysis tools. These tools are summarized in How to Leverage Information from Analysis Tools (see page 83) and are explained in detail in your CA CMDB Visualizer documentation.

Remove Associations Between Services and Configuration Items

You can quickly remove existing associations from CA Service Catalog services to CA CMDB configuration items. It is helpful to remove duplicate or obsolete associations to keep the integration running at peak efficiency.

To remove associations between configuration items and services

1. Click Catalog, Service Offerings.

   The list of catalog folders and services appears.

2. Search the folders and services, expanding them if necessary, until you locate the service you want.

3. Under the Actions icons, click the CA CMDB Association icon. This icon appears on the right side of the Features icon.

   The Service Offerings dialog appears, showing the configuration items currently associated with the service.

4. Select the configuration item or items and click Remove Association.

5. When prompted, confirm that you want to delete the association.

How to Leverage Information from Analysis

After you have established the relationships between configuration items, you can use the CA CMDB Visualizer for the following tasks:

- Provide a 360-degree view of the relationships between business-critical configuration items within your organization

- Perform root cause analysis for Incidents and Problems

- Perform impact analysis on changes to configuration items

You can also create filters in the CA CMDB Visualizer to customize your views of configuration items.

For more details about managing configuration items, see the CA Service Desk Manager *Administration Guide*.

Performing these tasks helps you detect and strengthen the connections between IT and business: specifically, between your IT components (configuration items) and business services. Each analysis also helps you understand the connections between configuration items and helps you maximize their value.

Note: For details about each analysis, see your CA CMDB documentation.

Remember that you can associate any CA CMDB configuration items to CA Service Catalog services. However, the most suitable configuration items to associate to services typically belong to the Business Service class in the Enterprise Services family. Several configuration items in this family and class are provided by default, and you can optionally create additional items, if necessary.

A service can both *be* a configuration item and can also involve *changing* the IT infrastructure. While the distinction sometimes seems obvious, distinguishing between these two types of services explicitly can be helpful.

Consider this managed application service example: A department requests that the IT department supply and maintain a server, install an application, and maintain and administer the application. The interaction with the CA CMDB is through a workflow. The workflow includes change orders for configuration items. The workflow also sets up relationships between the server, application, application service, and other configuration items.

Chapter 6: Integrating with CA BSI

This section contains the following topics:

Introduction

CA BSI automates, activates, and accelerates the management, monitoring, and reporting of business and technology *service level agreements* (*SLAs*) and service delivery agreements for enterprises and service providers. CA BSI enables organizations to understand the performance and cost implications of these agreements in real time. Using CA BSI, enterprises and service providers can leverage one solution to manage service delivery across the business and technology infrastructure, efficiently and with complete visibility.

CA BSI's top-down methodology for service level management begins with contracts that use business language and metrics. These contracts integrate with technical data sources for continuous measurement of service performance in relation to contract terms and conditions. The resulting transparency and control enable you to manage more efficiently both the expectations between IT and the business and your contracts with external service providers, such as CA Service Catalog.

Benefits of the Integration

In *addition* to the benefits that CA Service Catalog and CA BSI provide *individually*, the *integration* of the two products provides the following benefits:

■ As a CA Service Catalog administrator, when defining a service option, you can browse the list of contracts in CA BSI, select one, and associate it with the service option. At the same time, you select a service component, contractual metrics, and incentive metrics from that contract to associate it with the service option.

Together, they specify the quality of service expected for the service option. The service component specifies *what* is being monitored (a component related to the service option), while the metrics specify *which data* are being monitored (such as kilobytes per second or violations per month). You can select a contractual metric with a higher level of service quality that costs more, or you can select a contractual metric with a lower level of service quality that costs less.

■ Using the integration as explained in this documentation, you measure adherence to CA BSI contracts according to the service as a whole: all requests for the service during the time period specified by the metrics you selected.

■ This association of a service option with a contract and the monitoring provided by both products supports the transparency of service quality throughout the organization, especially for the request, fulfillment, invoice, and chargeback processes.

■ Moreover, the association of the service with a contract and the monitoring provided by both products also provide financial adjustments as specified by the contract. For example, the adjustments can include reduced charges when the service does not meet the terms of the contract or increased charges when the service exceeds the terms of the contract.

■ You can use either CA BSI or CA Service Catalog to view the level of compliance of a CA Service Catalog service to the terms of its associated CA BSI contracts.

■ You can use the billing features of Accounting Component to determine any financial adjustments required by a service either failing to meet or exceeding the terms of its associated contract.

Comparison to Request SLA

CA Service Catalog enables administrators to create request service level agreements (request SLAs) to monitor whether service options in a request are processed within the time period that you specify for each monitored state. Your request SLAs specify time to warning and time to violation for a selected service option. A single request SLA specifies the amount of time permitted between specified statuses, for example, the time taken to move from Submitted to Approved or from Approved to Completed.

Request SLAs are a feature of CA Service Catalog, while Quality of Service SLAs (QoS SLAs) are available only if CA Service Catalog is integrated with CA BSI. You define QoS SLAs in CA BSI.

The terms request SLA and QoS SLA are used when needed in the documentation to distinguish between the two types of SLAs. The documentation for this integration mostly describes QoS SLAs (contracts) that you administer through CA BSI.

Request SLAs remain in CA Service Catalog as a time metric during the request life cycle of an *individual* request. In contrast, QoS SLAs in CA BSI measure averages and other values for *all* requests of a specific service during a certain time period, such as one week or one month. Examples follow:

- The average approval time for Desktop procurement service must not exceed 15 calendar days during a single one-month period

- The maximum fulfillment time for the Desktop procurement service must not exceed 20 calendar days during a single one-month period

In addition, CA BSI also uses QoS SLAs to provide several additional metrics of various types, either during the request life cycle or after it has ended and while the requested service is being delivered. For example, a QoS SLA may stipulate that the service should be available an average of 99% of the time every day. Another QoS SLA may require that the maximum time that a service can be unavailable on any one day is 15 minutes.

Another difference between the two types of SLAs is that request SLAs in CA Service Catalog cover *business* days while QoS SLAs in CA BSI cover *calendar* days.

Note: For details about how to specify request SLAs, see the *Administration Guide*.

Metrics in Contracts and Services

Administrators in CA BSI can obtain request processing data from CA Service Catalog to evaluate whether service options in services met, exceeded, or failed to meet the metrics defined in the contract for the service. For example, a contract may define metrics for a laptop service to meet the following goals:

■ A service must be available for users 99% of each one-week period to meet a Gold metric, 95% for a Silver metric, and 90% for a Bronze metric.

■ Fulfill each request for a laptop computer in 15 or fewer calendar days. If a request for laptop service is not fulfilled in 15 or fewer business days, credit the requestor's (or business unit's) account with an adjustment of 5% of the laptop cost.

■ Fulfill all requests for a laptop computer in an average time of 10 or fewer calendar days. If the average fulfillment time of the laptop requests is more than business 10 days, credit the requestor's (or business unit's) account with a fixed adjustment of 1000 USD.

   Note: The fulfillment time starts when the request is approved and ends when the fulfillment process is completed.

Such metrics that define the maximum time period for requests to move from one status to another—either individually or on average—are named request SLAs (see page 87). Request SLAs may specify maximum time periods for any status change during the request life cycle. Additional examples include the following:

■ Average fulfillment time: from Approved to Fulfilled

■ Average completion time: from Submitted to Completed

■ Average approval time: from Pending Approval to Approval Done

■ Maximum fulfillment time: fewer than n business days, for example, 5 business days

Finally, administrators can optionally report on this data and publish it in dashviews in dashboards (see page 114).

How to Set Up the Integration

This topic explains how administrators of CA Service Catalog and CA BSI set up the integration between the products.

1. Verify that both CA Service Catalog and CA BSI are installed and running. For details, see each product's documentation.

    As part of this task, verify that both products support the browser you are using.

2. Verify that you have administrator rights in both products, specifically:

    ■   The Service provider role (SP administrator) in CA Service Catalog

    ■   The Super administrator role in CA BSI

    Note: You perform the next several steps in CA BSI.

3. Meet the prerequisites (see page 91) for the integration.

4. Verify that CA BSI includes contracts, service domains, and metrics useful for measuring the quality of the CA Service Catalog services with which you plan to use them.

    For example, you may want to monitor quality for services that include internet connectivity. In that case, you may want to verify that the metrics include related quality measures, such as maximum wait time to establish connections, refesh screens, change addresses, and so forth.

    Another example: you may want to monitor the "uptime" or percentage of time that the services are available. In that case, you may want to verify that the metrics include related quality measures, such as the amount of uptime and downtime for each service.

    Many other examples of using metrics in contracts and services (see page 88) are possible; you must determine and implement the ones that are useful to your organization.

    Consider the following:

    ■   In CA BSI, consider naming such contracts with a special prefix, such as "Catalog_" for easy reference from integrating products, such as CA Service Catalog.

    ■   If your implementation of CA Service Catalog, uses multi-tenancy, then consider mapping the contract parties in CA BSI to your CA Service Catalog business units.

        Alternatively, consider naming your CA BSI contracts with a special prefix, such as "Service_Provider_name_" or "Tenant_name" for easy reference.

5. Decide the time zone that you want to use, for example, Eastern USA.

6. Verify that all CA Service Catalog and CA BSI computers are set to the same exact date and time, to the minute, and are adjusted, if necessary, for the time zone that you have chosen. This requirement includes the DBMS server for both integrating products.

    For example, suppose that you decide to use the Eastern USA time zone. In that case, if the current time is November 11, 6:27 p.m. Eastern USA, then set all computers to November 11, 6:27 p.m. Eastern USA or its equivalent, regardless of the computer's physical or geographic location.

7. In CA Service Catalog, set the administration configuration parameters (see page 95) for connecting to CA BSI.

8. In CA Service Catalog, set the request management configuration parameters (see page 97) that specify whether certain CA BSI-related details are displayed to catalog users when they create requests using services that have CA BSI contracts associated.

9. In CA Service Catalog, for each applicable service option group, add the service option element for the CA BSI contract (see page 97) you want to associate. When you do so, you specify important details such as the contract name, the service component, metrics, and so forth.

10. Understand how the integration works after the request life cycle is completed (see page 105).

11. In CA BSI, import the adapter package (see page 109).

12. In CA BSI, create the adapter (see page 111).

13. Test the adapter (see page 112).

14. Review the best practices (see page 113) for using the integration and implement the ones that apply to your organization.

Meet the Prerequisites

Meeting the following prerequisites is a required task to set up the integration between CA Service Catalog and CA BSI. More specifically, this task is required to establish communication between the two products so that you can set and test the administration configuration parameters (see page 95) correctly.

1. Enable the CA BSI openAPI, so that CA Service Catalog can access the CA BSI secured web services.

   For details, see your CA BSI documentation.

   Note: If you require SSL support for this API, for assistance, if necessary, see the Windows Communication Foundation (WCF) documentation on the Microsoft MSDN web site, msdn.microsoft.com. At publication time, the most relevant article is named "How to: Use wsHttpBinding with Username Authentication and TransportWithMessageCredentials in WCF Calling from Windows Forms." In addition, for further assisitance enabling SSL support for the CA BSI openAPI, if necessary, contact CA BSI CA Support at http://ca.com/support.

2. Verify that you have a copy of the digital certificate that contains the CA BSI public key for the server certificate used to enable the openAPI.

3. In CA Service Catalog, import the CA BSI public key certificate into a Java keystore file, using the following sample command as a model:

   keytool -import -file publickey.cer -keystore oblicorekeyfile -alias oblicoreauthcert

   publickey.cer

   Specifies the client certificate file for communicating with CA BSI using the open API.

   oblicorekeyfile

   Specifies the name of the Java keystore file that this command generates. CA Service Catalog uses this file to access CA BSI.

   oblicoreauthcert

   Specifies the alias name for the publickey.cer file.

4. Enter the password you want to use for the keystore file created by this command.

   Record this password for future use.

   Note: Keytool is a utility that the Sun Java Development Kit (JDK) supplies.

5. Create reports to access metric-related SLA data (see page 92).

6. Verify that Microsoft Internet Explorer is installed on the computers from which you plan to access CA BSI. Even when you access CA BSI indirectly through CA Service Catalog, for example, to view the details of a contract that you want to associate to a service option element, you must use Internet Explorer.

Create Reports to Access Metric-Related SLA Data

This task is required to meet the prerequisites for setting up the integration. In CA BSI, create specific parameterized reports to access metric-related service level agreement (SLA) data from CA Service Catalog. CA Service Catalog requires these reports to obtain service level data from CA BSI. To create the reports, run the SQL queries in this procedure on the Oracle database of CA BSI.

To create reports to access metric-related SLA data

1. Open the Oracle database for CA BSI.

2. To create the Service Level by Metric report, run the following SQL query:

```
insert into t_report_galleries (report_id, report_name, report_type, report_description, report_xml,
is_executable, schedule_id, report_owner, report_hirarchy, is_grouped, report_gallery_create_date,
report_gallery_modify_date, is_inherit_parent_permissions, folder_id, is_ready_type, is_parameterized,
e2e_type, inherit_permissions)values(90000001, 'Service Level by Metric parameterized report', 'NORMAL',
'This report is parameterized report which return service level data by metric. This report is used by CA
Service Catalog. Please do not modify this report.','<REPORT_GROUP TYPE="NORMAL"
MARGIN="Y"><REPORT_ITEM><REPORT LOCALE="0" ORDER="ASC" ORDER_BY="VALUE"
TOP="0"><Y ID="PROVIDED" AGG="AVG" WITH_CORRECTION="1" SHOW_CORRECTION="1"
WITH_EXCEPTION="1" WITH_ADJUST="1" WITH_INCOMPLETE="1" INCLUDE_TARGET="1"
INCLUDE_FORECAST="0" WITH_THRESHOLDS="0" BUSINESS_DATA="1"/><X
ID="RULE"/><FILTER IS_PARAMETERIZED="Y"><TIME FORMAT="DD/MM/YYYY" TYPE="span"
IS_PARAMETERIZED="Y" IS_MANDATORY="Y"><SPAN
LAST="0"><UNIT>QUARTER</UNIT></SPAN></TIME></FILTER><STEPS
NUM="0"/><DISPLAY_PROPERTIES><GRID_COLOR>0</GRID_COLOR></DISPLAY_PROPERTIES>
<FILTER_DEFAULTS><CONTRACT IS_PARAMETERIZED="Y"
IS_MANDATORY="N">-1</CONTRACT></FILTER_DEFAULTS></REPORT></REPORT_ITEM><pdf><
!--<option><name>parameter name</name><value>parameter
value</value></option>--></pdf></REPORT_GROUP>', 1, null, 100, 1, null, sysdate, sysdate, 0, 500, 0, 1, 0,
0)
```

3. To create the Deviation by Metric report, run the following SQL query:

```
insert into t_report_galleries (report_id, report_name, report_type, report_description, report_xml,
is_executable, schedule_id, report_owner, report_hirarchy, is_grouped, report_gallery_create_date,
report_gallery_modify_date, is_inherit_parent_permissions, folder_id, is_ready_type, is_parameterized,
e2e_type, inherit_permissions)values(90000002, 'Deviation by Metric parameterized report', 'NORMAL', 'This
report is parameterized report which return Deviation data by metric. This report is used by CA Service
Catalog. Please do not modify this report.','<REPORT_GROUP TYPE="NORMAL"
MARGIN="Y"><REPORT_ITEM><REPORT LOCALE="0" ORDER="ASC" ORDER_BY="VALUE"
TOP="0"><Y ID="DEVIATION" AGG="COUNT" WITH_CORRECTION="1" SHOW_CORRECTION="1"
WITH_EXCEPTION="1" WITH_ADJUST="1" WITH_INCOMPLETE="1" INCLUDE_TARGET="0"
INCLUDE_FORECAST="0" WITH_THRESHOLDS="0" BUSINESS_DATA="1"/><Y_FILTER
CONDITION="GT"><NUM1>0</NUM1></Y_FILTER><X ID="RULE"/><FILTER
IS_PARAMETERIZED="Y"><TIME FORMAT="DD/MM/YYYY" TYPE="span" IS_PARAMETERIZED="Y"
IS_MANDATORY="Y"><SPAN LAST="0"><UNIT>MONTH</UNIT></SPAN></TIME></FILTER><STEPS
NUM="0"/><DISPLAY_PROPERTIES><GRID_COLOR>0</GRID_COLOR></DISPLAY_PROPERTIES>
<FILTER_DEFAULTS><CONTRACT IS_PARAMETERIZED="Y"
IS_MANDATORY="N">-1</CONTRACT></FILTER_DEFAULTS></REPORT></REPORT_ITEM><pdf><
!--<option><name>parameter name</name><value>parameter
value</value></option>--></pdf></REPORT_GROUP>', 1, null, 100, 1, null, sysdate, sysdate, 0, 500, 0, 1, 0,
0)
```

4. To create the Compound report that includes the Service Level by Metric and Deviation by Metric reports, run the following SQL query:

insert into t_report_galleries (report_id, report_name, report_type, report_description, report_xml, is_executable, schedule_id, report_owner, report_hirarchy, is_grouped, report_gallery_create_date, report_gallery_modify_date, is_inherit_parent_permissions, folder_id, is_ready_type, is_parameterized, e2e_type, inherit_permissions)

values(90000003, 'Compound report which has Service Level and deviation reports', 'COMPOUND', 'This report is compound report which return Service Level and Deviation data by metric. This report is used by CA Service Catalog. Please do not modify this report.','<REPORT_GROUP TYPE="COMPOUND" MARGIN="Y" ITEMS="2" INLINE="0"><REPORT_ITEM ID="-100"><REPORT LOCALE="0" ORDER="ASC" ORDER_BY="VALUE" TOP="0"><Y ID="DEVIATION" AGG="COUNT" WITH_CORRECTION="1" SHOW_CORRECTION="1" WITH_EXCEPTION="1" WITH_ADJUST="1" WITH_INCOMPLETE="1" INCLUDE_TARGET="0" INCLUDE_FORECAST="0" WITH_THRESHOLDS="0" BUSINESS_DATA="1"/><Y_FILTER CONDITION="GT"><NUM1>0</NUM1></Y_FILTER><X ID="RULE"/><FILTER IS_PARAMETERIZED="Y"><TIME FORMAT="DD/MM/YYYY" TYPE="span" IS_PARAMETERIZED="Y" IS_MANDATORY="Y"><SPAN LAST="0"><UNIT>MONTH</UNIT></SPAN></TIME></FILTER><STEPS NUM="0"/><DISPLAY_PROPERTIES><GRID_COLOR>0</GRID_COLOR></DISPLAY_PROPERTIES> <FILTER_DEFAULTS><CONTRACT IS_PARAMETERIZED="Y" IS_MANDATORY="N">-1</CONTRACT></FILTER_DEFAULTS></REPORT><NAME><![CDATA[Deviati on by Metric parameterized report]]></NAME></REPORT_ITEM><REPORT_ITEM ID="-101"><REPORT LOCALE="0" ORDER="ASC" ORDER_BY="VALUE" TOP="0"><Y ID="PROVIDED" AGG="AVG" WITH_CORRECTION="1" SHOW_CORRECTION="1" WITH_EXCEPTION="1" WITH_ADJUST="1" WITH_INCOMPLETE="1" INCLUDE_TARGET="1" INCLUDE_FORECAST="0" WITH_THRESHOLDS="0" BUSINESS_DATA="1"/><X ID="RULE"/><FILTER IS_PARAMETERIZED="Y"><TIME FORMAT="DD/MM/YYYY" TYPE="span" IS_PARAMETERIZED="Y" IS_MANDATORY="Y"><SPAN LAST="0"><UNIT>QUARTER</UNIT></SPAN></TIME></FILTER><STEPS NUM="0"/><DISPLAY_PROPERTIES><GRID_COLOR>0</GRID_COLOR></DISPLAY_PROPERTIES> <FILTER_DEFAULTS><CONTRACT IS_PARAMETERIZED="Y" IS_MANDATORY="N">-1</CONTRACT></FILTER_DEFAULTS></REPORT><NAME><![CDATA[Servic e Level by Metric parameterized report]]></NAME></REPORT_ITEM><pdf><!--<option><name>parameter name</name><value>parameter value</value></option>--></pdf></REPORT_GROUP>', 1, null, 100, 1, null, sysdate, sysdate, 0, 500, 0, 1, 0, 0)

5. To create the Revenue by Metric report, run the following SQL query:

insert into t_report_galleries (report_id, report_name, report_type, report_description, report_xml, is_executable, schedule_id, report_owner, report_hirarchy, is_grouped, report_gallery_create_date, report_gallery_modify_date, is_inherit_parent_permissions, folder_id, is_ready_type, is_parameterized, e2e_type, inherit_permissions) values (90000006,'Revenue by Metric used by CA Service Catalog','NORMAL','This report is parameterized report which return revenue by metric. This report is used by CA Service Catalog. Please do not modify this report.','<REPORT_GROUP TYPE="NORMAL" MARGIN="Y"><REPORT_ITEM><REPORT LOCALE="0" ORDER="ASC" ORDER_BY="VALUE" TOP="0"><Y ID="REVENUE" AGG="SUM" WITH_CORRECTION="1" SHOW_CORRECTION="1" WITH_EXCEPTION="1" WITH_ADJUST="1" WITH_INCOMPLETE="1" INCLUDE_TARGET="0" INCLUDE_FORECAST="0" WITH_THRESHOLDS="0" BUSINESS_DATA="1"/><X ID="RULE"/><FILTER IS_PARAMETERIZED="Y"><TIME FORMAT="DD/MM/YYYY" TYPE="range" IS_PARAMETERIZED="Y" IS_MANDATORY="N"><RANGE><FROM>01/01/2010 00</FROM><TO>26/08/2010 00</TO></RANGE></TIME></FILTER><STEPS NUM="0"/><DISPLAY_PROPERTIES><GRID_COLOR>0</GRID_COLOR></DISPLAY_PROPERTIES><FILTER_DEFAULTS><RULE IS_PARAMETERIZED="Y" IS_MANDATORY="N">-1</RULE></FILTER_DEFAULTS></REPORT></REPORT_ITEM><pdf><!--<option><name>parameter name</name><value>parameter value</value></option>--></pdf></REPORT_GROUP>',1,null,100,1, null,sysdate,sysdate,0,500,0,1,0,0)

You have created the reports for accessing metric-related SLA data.

Set and Test the Administration Configuration Parameters

Setting and testing the administration configuration parameters for CA BSI in the CA Service Catalog GUI is a required task to set up the integration between CA Service Catalog and CA BSI.

To set and test the administration configuration parameters

1. On the Administration tab of CA Service Catalog, click Configuration and click the CA BSI link under Options.

   The CA BSI configuration options appear.

2. Click the Modify (Pencil) icon to next to each property that you want to update, using the following information:

   Certificate Alias Name

   Specifies the alias name (logical name) of the CA BSI certificate stored in the trusted store.

   Note: If your CA Service Catalog implementation uses multiple certificates from other products, you can optionally merge all certificates into a single keystore file. You can do so with or without using Secure Socket Layer (SSL) and Hypertext Transfer Protocol Secure (HTTPS). For details, see the *Implementation Guide*.

Enable HTTPS

Specifies that CA Service Catalog and CA BSI use Hypertext Transfer Protocol Secure (HTTPS) to communicate, rather than Hypertext Transfer Protocol (HTTP).

Select Yes to use HTTPS to communicate with CA BSI; otherwise, specify No.

Important! If you specify Yes, verify that CA BSI is using HTTPS. If necessary, configure it to use HTTPS.

Host Name

Specifies the computer name on which CA BSI is hosted.

Keystore Name

Specifies the file name of the Java keystore file that includes the CA BSI public key certificate.

Important! This file *must* reside in the USM_HOME directory.

Keystore Password

Specifies the password for opening the keystore file, to read the certificate in the trusted store.

Organization

Specifies the name of the CA BSI organizational unit .

Port Number - {1-65535}

Defines the port on which the CA BSI host listens for incoming connections. The default is 80.

User ID and User Password

Specifies the user ID and password that CA Service Catalog uses to log in to CA BSI.

3. Verify that you are finished updating configuration properties.

4. Click Test to test all connections between CA Service Catalog and CA BSI, including the Open API and the login credentials.

   If you experience any errors, verify that you have completed the fields in this section correctly.

   If problems persist review the Prerequisites (see page 91).

5. Click the Launch button to open CA BSI.

   The CA BSI home page opens.

   The connection is tested, using the new values you specified. If the connection fails, try using a different value.

6. Recycle Catalog Component.

The CA BSI configuration details are updated with the values that you specified.

Set the Request Management Configuration Parameters

Setting the request management configuration parameters is an optional but recommended task when you set up the integration with CA BSI, so that catalog users who are requesting a service can view the related performance data for the service.

1. Select CA Service Catalog, Configuration, Request Management Configuration.

    The request management configuration parameters appear.

2. Click the Modify (Pencil) icon to next to each property that you want to update; verify the setting for the following parameter and update it if necessary.

    Display Service Health

    Specifies whether to enable catalog users requesting a service to view actual, current data regarding the quality or "health" of a service, based on the level of compliance of the service to its associated metrics. This data is determined by the contractual metrics, incentive metrics, and SLA health period specified in the contract-specific details for the service option elements (see page 98) in the service being requested.

    The metric data includes both the performance criteria and the actual number of violations, including the time increments measured.

    If you enable this option, catalog users can view this actual, current metric data for the service they are requesting. Conversely, if you do not enable this option, catalog users requesting a service cannot view this information for the service they are requesting.

    You have set the request management configuration parameters.

Add the Service Option Element for the Contract

A required task for integrating CA BSI and CA Service Catalog is creating a service option element that associates a meaningful CA BSI contract to a service option group.

You can associate *only one* CA BSI contract to a service option.

To add the service option element for the contract

1. Navigate to CA Service Catalog, Service Offerings, Option Groups tab.

2. Click the service option group name to which you wish to add the new service option element.

    The Service Option Group Definition window appears.

3. Double-click on the new row or column heading to add a new row or column of cells.

    a. Double-click on a new, empty cell to define a new service option element.

    b. Double-click on an existing service option element to edit the definition of an existing service option element.

    The Service Option Element Definition window is displayed.

    The Service Option Element Definition window is used to specify the characteristics of a service option element using two tabs, Definition and Options.

4. On the Definition tab, for Type, select CA BSI Contract and specify the contract-specific details (see page 98).

    This option associates a CA BSI service level agreement (SLA) and enables you to specify details for this association.

5. Also on the Definition tab, complete the remaining fields and click Update.

    These remaining fields are not related to the CA BSI integration but rather are required for all service option elements in CA Service Catalog.

    Note: For details about completing these fields, see the information about specifying service option element in the *Administration Guide*.

The changes to the service option element are updated.

Contract-Specific Details for the Service Option Element

A required task for integrating CA BSI and CA Service Catalog is specifying the contract-specific details when you add the service option element for the contract (see page 97). When you do so, the fields on the Definition window appear as shown in this topic, and you complete them to configure the contract for use with the service option group that you are editing.

Important! Complete these fields *only* if you know which details to specify because you are familiar with the service, the selected contract, and the details specified in the remaining fields, especially the service component and the metrics you choose to monitor. Otherwise, see an administrator with such knowledge for assistance to complete these fields. This knowledge is critical for specifying meaningful values that result in effective monitoring of the quality of services.

Display Text

Specifies a brief summary of the contract for the catalog user requesting the service.

Contract

Select the contract you want from the drop-down list. The list shows contracts that have been created, tested, and committed in CA BSI.

Typically, an organization has relatively few contracts, each with service components and metrics that you can associate to a service option element. Optimally, an organization develops services and contracts together.

Click the View link to see the contract details, especially the effective period (starting and ending dates) of the contract. Review the effective period of *both* the contract and the service option group. Ideally, verify that they match or that effective period of the service option group is contained within the effective period of the contract. If a conflict exists, you can still associate the contract to the service option element; however, you *cannot* measure performance (obtain metric data) during the discrepancy period.

Viewing the contract details also helps you make more informed decisions when you complete the other remaining fields on this dialog.

Service Component

Select the service component (service) to monitor the contract selected in the previous field. A contract typically covers one or more service components.

In each service option element, you can select one service component to monitor.

As with other fields, verify that this service component is meaningful for *both* the selected contract and the service option group you are modifying.

Click the View link to see details about the metrics that apply to the selected service component details and help you decide the metrics to select.

Service components are related to, but independent of, contracts.

Contractual Metrics and Incentive Metrics

Use the left and right arrows to select and remove metrics from the list of metrics used for the service option element.

Contractual metrics specify minimum quality-of-service requirements, such as an average response time of two business days to fulfill requests to fix or replace broken laptops. Another example is an average of 100 requests per hour resolved during normal business hours and 10 requests per hour outside of normal business hours.

Incentive metrics can specify one or both of the following:

- Discounts to the customer from the service provider, for the service provider failing to meet the minimum requirements of the contract. For example, an incentive metric can specify a discount of $100 each day the service provider fails to fulfill an average of 100 requests per hour during normal business hours and 10 requests per hour outside of normal business hours.

- Extra charges to the customer from the service provider, for the service provider exceeding the minimum requirements of the contract. For example, an incentive metric can specify an extra $100 charge for every day when the average response time is less than one-half of the maximum response time.

The specific metrics available depend on the selected contract and service component. Typically, you associate ten or fewer of each type (contractual and incentive) to a service option element.

The metrics you select determine both the financial adjustments for the associated service at invoice time (if any) and the health of each service that contains this service option element.

CA Service Catalog displays this data to catalog users requesting a service when they click the link to check the health of a service that contains this service option element. Using the next parameter, SLA Health Period, you determine the time increments used to filter and display the data.

SLA Health Period

Defines the time increments to use for filtering and displaying the metric-related SLA data. Examples include per hour, day, week, month, year, or a custom-specified time period. Use the controls in this field to specify the time increments you want.

Verify that the increments you select are meaningful for the contract, service component, and metrics selected by checking their details.

You can optionally configure the request management configuration parameters to display the selected contractual metrics and the SLA health period to catalog users when they request a service that contains this service option element.

Add the Service Option Element for the Contract

Charge for SLA

Specifies the charge for maintaining an SLA. If you check this box, additional fields open for you to specify the <u>details of the charge</u> (see page 101).

Note: These fields are intended for use by customers who formerly integrated CA Service Catalog with CA Service Assure and now want to integrate CA Service Catalog with CA BSI to achieve compatible results.

Associate Service Option Group

Indicates that a service option group is associated with this service option element. Checking this field exposes a list of tiered service option elements, allowing the administrator to select an associated service option element and <u>tier type</u> (see page 104).

Note: These fields are intended for use by customers who formerly integrated CA Service Catalog with CA Service Assure and now want to integrate CA Service Catalog with CA BSI to achieve compatible results.

Charge for SLA - Details

If you check Charge for SLA on the <u>Contract-specific Details for the Service Option Element</u> (see page 98), the following fields appear. These fields mainly provide a means of specifying charges or credits to an account, *either* instead of *or* in addition to the metrics specified in the contract.

Cost Type

Specifies the type of cost for the SLA. Select from the following list:

Specify Value

The administrator specifies the cost value that appears in the catalog and the requesting or subscribing user cannot change the value.

This setting exposes the following field:

Unit Cost - The cost per SLA that is to appear in the catalog.

User Specified

The administrator specifies the default cost value that appears in the catalog. The requesting or subscribing user can change the value.

This setting exposes the following field:

Default Unit Cost - The default cost value that is to appear in the catalog

Allocate Cost

The cost is allocated based on a Set as established in Budgeting and Planning in Accounting Component.

This setting applies only if Accounting Component is installed.

This setting exposes the following fields:

Default Unit Cost - This value in this field is set to 0, because the cost value is determined from the Set value specified and the associated value for this service option element in that set, together with the Allocation Method.

Set - List of Budgeting and Planning sets available through Accounting Component.

Allocation Method - The list of allocation methods for the value in the budgeting and planning set for this service option element.

> **Assign** - Use the value in the set for the total cost of this service option element.
>
> **Distribute by Subscribed Account** - Use the value in the set for this service option element divided by the number of accounts subscribed to this service option element.
>
> **Distribute by Subscription** - Use the value in the set for this service option element divided by the number of subscriptions to this service option element.
>
> **Weighted Distribution** - Use the value in the set for this service option element allocated according to actual usage by the account.

Standard Cost

The cost is allocated based on a Set value as established in Budgeting and Planning in Accounting Component.

This setting applies only if Accounting Component is installed.

This setting exposes the following fields:

Default Unit Cost - This value in this field is set to 0, because the cost value is determined from the Set value specified and the associated value for this service option element in that set, together with the Allocation Method.

Set - List of Budgeting and Planning sets in Accounting Component.

Allocation Method - The list of allocation methods for the value in the budgeting and planning set for this service option element.

Assign - Use the value in the set for the unit cost of this service option element.

Display Unit Type

Specifies the text value that appears with the cost value.

Billing Cycle

Indicates how the cost value is applied to an invoice if Accounting Component is installed. Select from the following list:

One-Time

The charge is applied one time.

Installments

Cost is applied on an "installment plan": the entire cost is spread across several payments over time, rather than a single payment of the entire cost.

This setting exposes the following fields:

■ Periodic Type: The type of interval to be used when applying the cost: Daily, Weekly, Monthly or N/A.

■ Periodic Type Interval: The frequency of the interval specified in Periodic Type field used to determine the billing interval of the cost.

■ Number of Installments: The number of times the cost should be applied.

Periodic

This setting exposes the following fields:

Periodic Type: The type of interval to be used when applying the cost: Daily, Weekly, Monthly or N/A.

Periodic Type Interval: The frequency of the interval specified in Periodic Type field used to determine the billing interval of the cost.

N/A - Not applicable

Specifies that this field does not apply.

Charge Type

Indicates whether cost value should appear as a Charge or a Credit on an invoice from Accounting Component.

Budget

Indicates whether the item is associated with a budget.

If Accounting Component is installed, the Administrator can associate a cost value with a Budgeting and Planning set value associated with this service option element.

If Accounting Component is not installed, this field serves as additional categorization for the service option element.

Tier Type - Details

If you check Associate to Service Option group on the Contract-specific Details for the Service Option Element (see page 98), the following fields appear. These fields mainly provide a means of specifying charges or credits to an account, either *instead of* or *in addition to* the metrics specified in the contract.

Tier Type

Specifies the name of the tier type that you select; the default is Lookup.

A tier is a single row in a tiered service option group. Association into a tiered service option group starts at the top row and moves down, with the top tier having the lowest tier values.

A service option element with a defined tier type matches the right tier in the specified tiered service option group (where the tier service option group is specified in the same service option element when the tier type is defined).

Lookup

Use the first tier that matches the value being passed to the tiered service option group.

Lookup Multiple

Use each tier that matches the value being passed to the tiered service option group.

How the Integration Works After the Request Life Cycle Is Completed

The CA Service Catalog-CA BSI integration is most meaningful after the CA Service Catalog request has been approved and fulfilled. At that point, the requested resource is made available to the requestor, and CA BSI begins to monitor whether the resource meets the terms of contract, for example, for availability, efficiency, or other metrics.

1. Once the request is fulfilled and the user attempts to begin using the requested service or services, CA BSI begins monitoring the following:

   ■ The resources specified in the service component

   ■ The metrics selected in the service option element or elements associated with a contract

2. CA BSI retains the contract metric-related data. CA BSI retrieves related data from CA Service Catalog to do the following:

   ■ Display service health, which is determined by the contractual metrics, incentive metrics, and SLA health period that are included in the contract-specific details for service option elements (see page 98).

   ■ Calculate SLA violations and adjustments (see page 106); when you run invoices in CA Service Catalog, it queries CA BSI for statistics regarding the contractual and incentive metrics, to determine any applicable extra charges or discounts to be included in the invoice.

Note: For general details about running invoices not specifically related to this integration, see the *Administration Guide*.

Create Billing Adjustments for Metric-Related SLAs

The metrics that you select when you specify the contract-specific details for the service option element (see page 98) essentially define service level agreements (SLAs) for the service that includes the service option element. These SLAs provide incentive payments (extra charges) for services that exceed contract terms and also provide discounts for services that fail to meet contract terms. To include these extra charges and discounts when you run invoices, you create an SLA violation adjustment for either all accounts or specific accounts. Once you create the adjustment, CA Service Catalog automatically includes it during invoice runs and adjusts the final amount of the invoice accordingly.

To create billing adjustments for metric-related SLAs

1. As a prerequisite, verify that the effective dates of the service, service option group, and service option element are included within the effective dates of the contract associated with the service option element (see page 98).

    Adjustments for the invoice do not include any discrepancy period between these effective dates. For example, suppose the effective dates for the service, service option group, and service option element include the entire calendar year, January through December, while the effective dates for the contract cover February through December. In this case, the invoice for January includes no extra charges and no discounts related to SLAs.

2. Click Accounting, Adjustments, SLA Violation, Add SLA Violation Adjustment.

    The Add SLA Violation Adjustment page appears. You specify the data that defines the adjustment.

3. Complete the fields on the page.

    Business Unit

    Specifies that this adjustment applies to all accounts in the service provider business unit.

    Adjustment Name

    Specifies an intuitive name for the adjustment, perhaps named for the account and the type of adjustment, such as 123456_hardware_services or 456789_software_services.

    You can optionally create a single adjustment for all accounts that use a specific service, or you can create individual adjustments for individual accounts that use that service. The latter approach is required if you want to specify different adjustment criteria for different accounts that use the same service.

Adjustment For:

Specifies either all accounts or a specific account.

Use the Search (magnifying glass) icon to search for a specific account.

If you select a specific account, the adjustment types described later (fixed or proportional) do not apply. Instead, the account you specify receives the entire adjustment and other accounts are not affected.

Description

Specifies a brief description for the adjustment.

Status

Specifies whether the adjustment is active or inactive.

Adjustment Type

Specifies whether the adjustment in the invoice is fixed or proportional.

Fixed adjustments divide the total extra charge or discount equally across all accounts, as illustrated in the example of fixed charges (see page 108).

Proportional adjustments divide the total extra charge or discount proportionally across all accounts, based on the number of subscribers per account, as illustrated in the example of proportional charges (see page 108).

Apply to Service

Specifies the service to which this adjustment applies.

Service Option Group

Specifies the service option group to which this adjustment applies.

Service Option Element

Specifies the service option element to which this adjustment applies.

The CA BSI contract, service component, and metrics that determine the adjustment are defined in this service option element.

4. Click OK.

The adjustment is saved. CA Service Catalog automatically includes it during invoice runs and adjusts the final amount of the invoice for any extra charges based on incentive metrics and any discounts based on performance metrics.

Note: For details about running invoices, see the *Administration Guide*.

Example of Fixed Charges

Fixed adjustments divide the total extra charge or discount equally across all accounts, as illustrated in this example.

The extra adjustment for a service is $20. Two accounts are subscribed to the service: Account-A and Account-B.

Account-A includes seven subscriptions, while Account-B includes three subscriptions.

Both Account-A and Account-B each receive a $10 adjustment.

Example of Proportional Charges

Proportional adjustments divide the total extra charge or discount proportionally across all accounts, based on number of subscribers per account, as illustrated in this example.

The extra adjustment for a service is $20. Two accounts are subscribed to the service: Account-A and Account-B.

Account-A includes seven subscriptions, while Account-B includes three subscriptions.

The adjustments are calculated as follows:

Total number of subscriptions = 7 + 3 = 10

Total number of accounts = 2

Adjustment for Account-A = (20x7)/10 = 14

Adjustment for Account-B = (20x3)/10 = 6

Thus, Account-A receives a $14 adjustment, while Account-B receives a $6 adjustment.

Import the Adapter Package

The adapter package contains two files that package the CA BSI-CA Service Catalog adapter (the adapter) and related files. The adapter enables you to connect CA BSI contracts (including metrics) with CA Service Catalog services, so that you can monitor whether the delivery of the requested services meets or exceeds the terms of the contract. With that data, you can adjust the billing for the services, as needed, to include any contract-related adjustments.

To import the adapter package

1. Locate the file named CAServiceCatalogRequestSLA.mpxx in the Utilities folder of the CA Service Catalog installation media.

   This file contains several CA BSI artifacts specially created for use with CA Service Catalog; these are listed in the verification step later in this procedure.

2. Log in to CA BSI as an administrator.

3. Import the CAServiceCatalogRequestSLA.mpxx file, as follows:

   a. Click Administration, Content Transfer, Packages.

   b. Click Upload Package.

      The Upload Package dialog opens.

   c. Browse to the CAServiceCatalogRequestSLA.mpxx file, select it, and click Upload.

      The package is uploaded and is available for import.

      Note: If the file already exists, you may receive an error message from CA BSI. If you receive such a message, verify that the file does exist, by opening the Import page mentioned in the next step and checking whether the file appears in the list of files available for import.

4. Import the CAServiceCatalogRequestSLA.mpxx file, as follows:

   a. Click Administration, Content Transfer, Import from Menu bar.

      The CA BSI Import page opens.

   b. From the drop down list, select the package named CAServiceCatalogRequestSLA.

   c. Select Skip and Continue as the On Collision option.

   d. Click Import.

   If the import process fails, verify that none of the artifacts being imported already exists on the target computer.

   This process requires a few minutes to complete.

5. Locate the SQL adapter configuration file for your DBMS, one of the following:

    ■   CA Service Catalog Request Mgmt Sys AdapterConfig_Oracle.xml

    ■   CA Service Catalog Request Mgmt Sys AdapterConfig_SqlServer.xml

    You use this file to read CA Service Catalog request data from your database. The SQL query to fetch the data from CA Service Catalog varies depending on whether you are using Oracle or Microsoft SQL Server (SQL Server).

    Verify that the file for your DBMS resides on the computer on which you open CA BSI.

6. Verify that the following artifacts are created:

    ■   A service domain named Request Management

    ■   Two domain categories named Number of times the Permissible Time Exceeded Target and Response Time

    ■   A Service component named Service Catalog Request Management System

    ■   An event type named Catalog Request Status Time Event Template

    ■   A resource type named Catalog Request Management System

    ■   Two translation tables named SOE_Resource_Map_Table and Catalog_Event_Transl_Table (SOE=service option elements)

    ■   Two translation scripts: one for creating resources from CA Service Catalog service option elements and another for creating event type for different statuses

    ■   Two business logic templates named Number of Violations and Average Time.

        The Average Time template calculates the average time for a request to transition from one status to another, for example, from Submitted to either Approved or Rejected, or from Pending Fulfillment to Fullfilled.

    These artifacts form a "framework" for holding contract-related data about CA Service Catalog services.

7. Obtain the ID of the event type named Catalog Request Status Time Event Template, which was created by the earlier steps. This ID is required when you create the adapter (see page 111). To obtain the ID, do the following:

    a. Open the Configuration menu and click Event Types.

    b. Move the mouse over the event type to display the ID.

        The event type ID appears in the browser status bar.

    c. Record the ID for use when you create the adapter.

You have imported the adapter package and are now ready to create the adapter.

Create the Adapter

After you have imported the adapter package (see page 109), you are ready to create the adapter. This task is required to enable the integration between CA Service Catalog and CA BSI.

To create the adapter

1. On the computer where CA BSI is hosted, open the SQL adapter configuration file for your DBMS, one of the following:

   ■ CA Service Catalog Request Mgmt Sys AdapterConfig_Oracle.xml for Oracle

   ■ CA Service Catalog Request Mgmt Sys AdapterConfig_SqlServer.xml for Microsoft SQL Server (SQL Server)

2. Locate the following line in that file:

   "FieldDisplayName="Catalog Request Status Time Event Template" AdditionalData="1500"

3. Verify that the value for the AdditionalData= expression in this file matches the ID you recorded for the event type named Catalog Request Status Time Event Template at the end of the procedure to import the adapter (see page 109).

   If the ID in the file is different than the ID you recorded, update the ID in the file to match the one you recorded.

   Save your changes (if applicable) and close the file.

4. Log in to CA BSI.

5. Click Administration, Configuration, Adapters.

   The Adapters page appears.

6. Click the Add New button and select the option named Create from configuration file.

7. Browse the local computer on which you opened the browser, select the SQL adapter configuration file for your DBMS (from Step 1), and click OK.

   After a short wait, the adapter is created, and a configuration window opens.

8. Configure the newly created adapter, as follows:

   a. Specify a suitable name to the adapter, such as CA Service Catalog Adapter.

   b. Select the address for the adapter.

      You typically specify the address of the CA BSI server.

      If applicable, select the Localhost option.

      Otherwise, click Add adapter address to create an address.

c. Select a time zone and click Next.

The default connection details appear.

d. Update the server name and user credentials for the database to match the CA Service Catalog database.

e. Click Test Connection and click Next.

The system tests the database connection, using a predefined query for the adapter.

f. Click Test Query and click Next.

Test data resulting from the query appear.

g. Verify that the results are valid and click Next.

The mapping screen appears.

9. Click Finish.

You have installed the adapter and can now test the adapter (see page 112).

Test the Adapter

After you have imported and installed the adapter, test it to verify that it works properly in your implementation. This task is required to enable the integration between CA Service Catalog and CA BSI.

To test the adapter

1. Open the Windows Control Panel and verify that the following CA BSI services are running. If necessary, start them:

    ■ Oblicore - AdapterDeployment

    ■ Oblicore - AdaptersListener

    ■ Oblicore - ScriptHost

    ■ Oblicore - TaskHost (For translation)

2. Verify that your CA Service Catalog implementation includes active services and requests.

3. Log in to CA BSI and use its scheduler to schedule the adapter to run every 30 to 60 minutes.

    For details about using this tool, see your CA BSI documentation.

4. Wait for the first scheduled run of the adapter to complete, log in to CA BSI, and select Configuration, Translation, Translation Entries.

5. Verify that the adapter has generated at least a few pending entries.

   Note: The adapter cannot process the pending entries now, because the event types and resources related to these entries are not yet created.

6. Wait for the next scheduled run to complete, log in to CA BSI, and select Configuration, Translation, Translation Entries.

7. Verify that the following have occurred:

   ■ The pending entries are translated.

   ■ New resources of the type named Catalog Request Management System are created. These represent service option elements in requests that CA Service Catalog users have submitted.

   ■ New event types are created, similar to the following examples:

      – 101-2-CatalogRequestStatusChangeEvent

      – 101-200-CatalogRequestStatusChangeEvent

      – 101-2000-CatalogRequestStatusChangeEvent

Using these event types, resources, and other imported artifacts, you can optionally create new contracts with metrics and link them to CA Service Catalog services.

Best Practices

Use these best practices to help you maximize the benefits of the integration between CA Service Catalog and CA BSI.

1. Publish dashviews in dashboards (see page 114).

   Dashviews are important components in CA BSI for publicizing metrics and other performance-related data. As an administrator, you can create dashviews in CA BSI and publish them in CA Service Catalog to help CA Service Catalog users better understand the quality or performance of services over time.

2. Whenever applicable, advise catalog users to verify the health of services (see page 116) that they want to request.

3. For individual services, verify that that the dashview data (from Step 1) matches the health-of-service data (from Step 2).

How to Publish Dashviews in Dashboards

Dashviews are important components in CA BSI for publicizing performance measurements from contracts, especially metric-related data. As an administrator, you can create dashviews in CA BSI and publish them in CA Service Catalog to help CA Service Catalog users better understand the quality and performance of services over time.

CA BSI administrators create dashviews as graphical representations of performance data for CA Service Catalog services. The performance data shows the quality of the services over time. Dashviews are containers that typically hold either a widget (speedometer) or a report that helps to organize information and support the integration.

You can embed dashviews in portals and resize them. You can configure dashviews to display a background image that helps represent the status of multiple entities, such as countries, organizational units, and stages of a process.

Note: For details about creating and managing dashviews in CA BSI, see your CA BSI documentation.

To implement dashviews in CA Service Catalog, complete these tasks:

1. In CA BSI, design your dashviews to meet your requirements, such as including the following data:

   ■ Service obligations

   ■ Service level data for a set of metrics that belong to a specific contract over certain duration.

   ■ Deviations

   ■ Reports

2. Identify the dashviews that you want to publish in CA Service Catalog; if necessary create new ones. Select dashviews related to services better understand the quality and performance of services over time.

   You can optionally do either or both of the following:

   ■ Select dashviews for one or more contracts linked to your most commonly used services

   ■ Select a dashview that highlights specific metrics in such a contract

3. Record the following information about the dashviews that you have chosen to publish in dashboards:

   ■ Dashview ID

   ■ User name who owns the dashboard

   ■ Organization to which the user belongs

   ■ Name of the CA BSI server on which the dashview resides

4. In CA Service Catalog, create a dashboard item of type External Web Content for each dashview that you want to display.

   If necessary, create a new dashboard for this item.

   Note: A dashboard is a personal page containing items (elements) from the dashboard library. Users can create personal dashboards and access shared dashboards to which they have access. Administrators can create shared dashboards and manage the dashboard library. For details about creating and managing dashboards and their items in CA Service Catalog, see the *Administration Guide*.

5. Using the information from Step 2, replace the text field named Content URL in each dashboard item with the following URL:

   http://[ServerName]/NewDashboard/DashboardWebPart.aspx?dashviewId=[ID]&username=[CA Oblicore Guarantee username]&organization=[Organization]

   For example:

   http://hesed333/NewDashboard/DashboardWebPart.aspx?dashviewId=32&username=sadmin&organization=CA

Sample Dashboard

The following is a sample dashview published in a dashboard item:
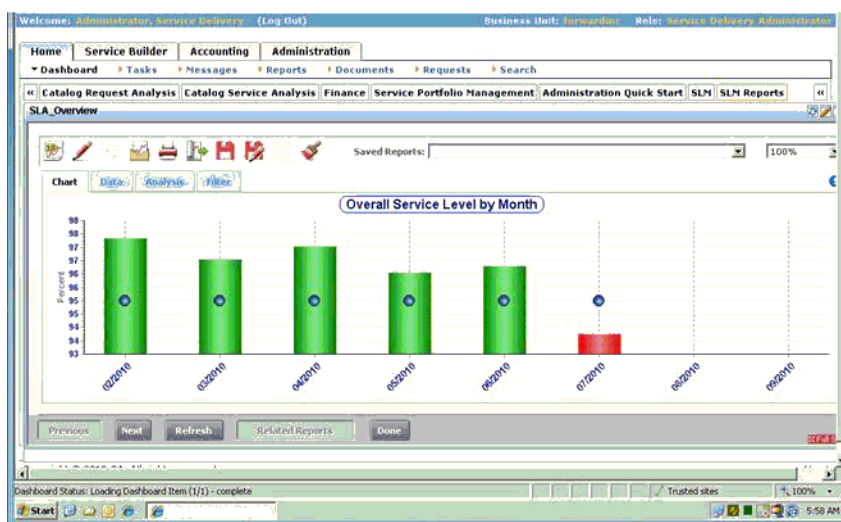
Verify the Health of Services

As an administrator, advise catalog users to view the health of a service when they create a request, if *all* of the following conditions are met:

■ The service is associated to metrics in an CA BSI contract

■ The association is configured to display the health of the service

Administrators optionally specify both of these settings when they configure the contract-specific details for the service option elements (see page 98) in the service being requested

■ The Display Service Health configuration parameter (see page 97) is enabled

When all of these conditions are met, catalog users can view the quality or "health" of a service, based on the level of compliance of the service to its associated metrics.

To verify the health of a service

1. Click Home, Requests.

   The page displays Browse, Search, and Features Services sections.

2. Find the service you want in the catalog, using one of these sections.

3. Open the service you want and view its details.

4. Click View Service Health.

   The metric data for the service appears. The data includes both the performance criteria and the number of violations during the time increments specified by the administrator. Time increments can be per hour, day, week, month, or year.

5. Review the data and decide whether the service levels meet your expectations.

Using the data, you can either finish and submit the request or cancel the request.

Chapter 7: Integrating with Reservation Manager

This section contains the following topics:

Introduction

You can use Reservation Manager to reserve systems from a pool of available resources in your data center. Reservation Manager enables you to reserve access to shared resources on demand for a specific time period. Reservation Manager integrates with CA Server Automation and uses its provisioning technology to make systems with the requirements you request available for the time period you request.

Reservation Manager is a component of CA Server Automation, which is included in some CA solutions, for example, CA Automation Suite for Clouds. Reservation Manager is a separate utility with its own user interface that integrates with CA Server Automation to provide on-demand resources to users for reserving Windows, Linux, AIX, and Solaris systems. When you create a reservation, you can specify what operating system image, software, and hardware that the system requires. You can request physical systems or create virtual machines in a reservation.

Note: For information about setting up and configuring Reservation Manager, see the *CA Server Automation Administration Guide* and *Implementation Guide*. For information about using Reservation Manager, see the *CA Server Automation Reservation Manager User Guide*.

Benefits of the Integration

In *addition* to the benefits that CA Service Catalog and Reservation Manager provide *individually*, the *integration* of the two products provides the following benefits:

- The addition to Reservation Manager of a formal request life cycle, including tracking of cost, usage, and charge back

- A single point of contact for catalog users to create, extend, and return (cancel) reservations of physical and virtual resources in a repeatable, efficient, transparent manner

- The addition to CA Service Catalog of predefined services and service option groups for enabling catalog users to make such reservation-related requests

- The flexibility for administrators to use these predefined services and service option groups as-is or customize them for business reasons or other reasons

- A single point of contact for administrators to track, charge back, fulfill, and report on such requests in an automated, efficient, transparent manner

- Increased governance and management of demand and fulfillment of physical and virtual resources

- Usage-based charge back for this provisioning, through Accounting Component

How to Set Up the Integration

Perform the following tasks to integrate CA Service Catalog and Reservation Manager, so that CA Service Catalog users can create, extend, and return (cancel) reservations for physical and virtual resources in Reservation Manager.

1. Install and configure CA Service Catalog, including Accounting Component.

    As part of this task, do the following: Install CA EEM (if it is not already installed) and plan to use the same instance of CA EEM for both CA Service Catalog and CA Server Automation. You *must* use the same instance for both, as noted in the next step.

    Note: For details, see the CA Service Catalog *Implementation Guide*.

2. Install and configure CA Server Automation, including Reservation Manager.

    As part of this task, use the same instance of CA EEM for both CA Service Catalog and CA Server Automation, so that users created through each product are accessible to the other product.

    By default, Reservation Manager assigns new users to its Public organizational unit. As a result, new users created in CA Service Catalog can access the resources of the Public organizational unit. As a CA Server Automation administrator, you may remove this access when you assign users to *other* organizational units. Therefore, define users to be members of specific organizational units based on the access policy for the associated resources.

    Note: For information about setting up and configuring Reservation Manager, see the CA Server Automation *Administration Guide* and *Implementation Guide*. For information about using Reservation Manager, see the CA Server Automation *Reservation Manager User Guide*.

3. Configure Reservation Manager to turn off automatic approval of reservation requests as follows:

    a. Log in to Reservation Manager as an administrator.

    b. Click Administer your Reservation Manager; this link appears under the Home tab.

    c. Click Manage your Resource Pools.

    d. Click the resource pool you want and open its Properties tab.

    e. Verify that the option to automatically approve reservation requests is not checked.

    f. Repeat the previous two steps for each resource pool used by CA Service Catalog.

4. As a CA Service Catalog administrator, set and test the administration configuration parameters (see page 121) for the integration with Reservation Manager.

5. Enable the rules for reservations (see page 122). The rules are named When Reservation Request Is Approved and When Reservation Request Is Rejected. By default, these rules are disabled, but their actions are enabled.

   CA Service Catalog uses these rules to synchronize its approval or rejection processes by calling approve or reject reservation processes in Reservation Manager. You can optionally customize these rules or copy and modify them; however, it is unlikely that you will need to do so for any reason.

6. Enable and configure the scheduled tasks for reservations (see page 123).

7. As a CA Service Catalog administrator, review the predefined services (see page 124), predefined service option groups (see page 125), and predefined forms (see page 129) for creating, extending, and returning reservations for physical and virtual resources through Reservation Manager. Determine whether these predefined services, service option groups, or forms meet your business needs.

8. As a CA Service Catalog administrator, if necessary, create custom services (see page 125), custom service option groups (see page 126), or custom forms (see page 130) to meet your business needs.

   As part of this process, consider the following for forms: mandatory required fields (see page 131), fields that you can configure as either optional or required (see page 132), and field attributes that you must not change (see page 134).

9. If you want to send email notifications to CA Service Catalog users to confirm their reservations, verify that the Reservation Manager server is set up for email notifications and optionally configure your forms to include the email notification field as a required parameter.

10. Verify that CA Service Catalog users can create, extend, and return (cancel) reservations for the physical and virtual resources available through Reservation Manager.

11. Verify that CA Service Catalog users with reservations can access and use the requested and approved resources through Reservation Manager for the duration of the reservation.

12. Decide whether to exclude future uninvoiced transactions in your invoice configuration. When you do so, you include only reservations for the current billing period when you run invoices.

    To set the option, select Accounting, Invoices, Invoice Engine Configuration, and set the Uninvoiced Transactions parameter to Exclude Future Uninvoiced Transactions.

    Note: For details about this parameter, billing, and invoice configuration, see the *Administration Guide*.

13. Verify that the user's account is billed for the cost of the resources for the duration of the reservation and the number of systems used, using the invoice configuration that you have specified.

14. If the provisioning of the reserved resource fails or is cancelled, verify that the user is notified and that the associated account is not billed for the resources.

    If any errors occur, they are logged on the Alerts page. To access this page, select Home, Messages, Alerts.

Set and Test the Administration Configuration Parameters

Setting and testing the administration configuration parameters for Reservation Manager in the CA Service Catalog GUI is a required task to set up the integration (see page 119) between CA Service Catalog and Reservation Manager.

To set and test the administration configuration parameters

1. On the Administration tab of CA Service Catalog, click Configuration and click the CA Server Automation Reservation Manager link at the top of the page.

   The configuration options appear.

2. Click the Modify (Pencil) icon to next to each property that you want to update, using the following information:

   Enable HTTPS

   Specifies a web protocol, as follows:

   Select Yes to use HTTPS to communicate with Reservation Manager.

   Important! Verify that Reservation Manager is using HTTPS. If necessary, configure it to use HTTPS; for details, see the *CA Server Automation* documentation.

   Host Name

   Specifies the computer name on which Reservation Manager is hosted.

   Port Number - {1-65535}

   Defines the port on which the specified server listens. The default is 443.

   UI Port Number - {1-65535}

   Specifies the port number used to log in to Reservation Manager. The default is 8443.

   User ID

   Specifies the user ID that CA Service Catalog uses to log in to Reservation Manager.

   User Password

   Specifies the password for the CA Service Catalog user to log in to Reservation Manager.

3. Verify that you are finished updating configuration properties.

4. Click the Launch button to test the connection between CA Service Catalog and Reservation Manager.

   The connection is tested, using the new values you specified. If the connection fails, try using a different value.

   The Reservation Manager configuration details are updated with the values that you specified.

Enable the Rules for Reservations

Enabling the rules for reservations is a required task to set up the integration (see page 119) between CA Service Catalog and Reservation Manager. These rules are disabled by default but their actions are enabled by default. When you enable the rules, verify that the actions are also enabled.

,fts>

1. From the Home page, select Administration, Events-Rules-Actions.

   The Events-Rules-Action window is displayed.

2. Click the Event Type named Request/Subscription Item Change.

   Its details appear.

3. Check the rules named When Reservation Request is Approved and When Reservation Request is Rejected, and click the Enable button; this button appears on the Rules bar.

   The rules are enabled.

4. Click the rule named When Reservation Request is Approved (the rule name is a hyperlink).

   The Rule Details page for this rule appears.

5. Verify that the action for this rule is enabled. The action is named Approve reservation in CA Server Automation Reservation Manager.

   If it is not enabled, do the following:

   a. Click the Enable button; this button appears on the Actions bar.

   b. Click Done.

   You return to the Event Details page.

6. Click the rule named When Reservation Request is Rejected.

   The Rule Details page for this rule appears.

7. Verify that the action for this rule is enabled. The action is named Reject reservation in CA Server Automation Reservation Manager.

   If it is not enabled, do the following:

   a. Click the Enable button

   b. Click Done.

The rules and actions are enabled.

Enable and Configure the Scheduled Task for Reservations

Enabling and configuring the scheduled task for reservations is a required task to set up the integration (see page 119) between CA Service Catalog and Reservation Manager. The scheduled task checks the job statuses of pending reservation requests in Reservation Manager and synchronizes these statuses with CA Service Catalog.

To enable and configure the scheduled task for reservations

1. On the CA Service Catalog GUI, click Home, Administration, Tools

   The Tools page appears, with Events Types from Events-Rules-Actions in focus.

2. On the top left side of the screen under the tabs, under the Menu heading, click Scheduler.

   The Scheduler page appears, displaying the existing scheduled tasks.

3. Check the job status task for Reservation Manager; it is named Reservation Manager Job Status Synchronizing and click the Edit (pencil) icon.

   The Scheduled Tasks Setting page for this task appears.

4. Do the following:

   ■ In the Status drop-down list, select Enabled.

     This setting enables the task, so that the task runs.

   ■ Set dates and times in the Valid From and Valid Until fields.

     This setting specifies the duration of the task in minutes, days, weeks, months, and years.

   ■ Select the value you want in the Recur drop-down list and define the recurrence rule in the Rule field.

     Together, these setting specify the frequency (how often) the scheduled task runs to check for the job statuses of pending reservations.

     For example, if you select Minutes in the Recur field and 15 in the Rule field, the task runs every 15 minutes; these are the default settings. Similarly, if you select Hourly in the Recur field and 1 in the Rule field, the task runs every hour, at the minute marker you specify, such as 0, 15, or 30 minutes past the hour.

5. Click OK to save your selections.

The scheduled task for reservations is enabled, using the configuration settings that you specified.

Predefined Services for Reservations

You can use the predefined reservation services as-is. By default, these services are located in the root business unit, in the Reservation Services folder. CA Service Catalog includes the following predefined services for creating, extending, and returning (canceling) reservations in Reservation Manager:

Reserve a Physical Machine

Creates a request to reserve a physical resource for a specified time period. The requester specifies details such as the operating system, software to be installed, and minimum hardware requirements.

Reserve a Virtual Machine

Creates a request to reserve a virtual resource for a specified time period. The requester specifies details similar to those for a physical resource.

Reserve using Reservation Template

Uses one of several templates to create a request to reserve either a physical or virtual resource for a specified time period. Most details of the template are pre-specified, so the requester must provide only minimal input.

Extend Reservation

Extends an existing reservation for a longer time period than originally specified.

Return Reservation

Returns an existing reservation.

This action cancels the reservation immediately. You cannot shorten a reservation; you can only return it. If you finish using a physical or virtual machine earlier than expected, return the related reservation to free the machine and make it available for other users in your organization.

Custom Services for Reservations

You can optionally create custom services for creating, extending, and returning (canceling) reservations in Reservation Manager. Reasons for doing so may include business requirements related to your company, business unit, or customers, or governance.

You can optionally modify the reservation services, for example, by adding a new service option group. As a best practice, if you need to modify a service before using it in your implementation, copy and modify the service rather than modifying it directly.

Note: For instructions to copy and modify a service, see the *Administration Guide*.

You can also create a new service. If you do so, it must include either a predefined service option group (see page 125) or a custom service option groups (see page 126) to create, extend, or cancel a reservation.

Predefined Service Option Groups for Reservations

You can use the predefined service option groups for reservations as-is, by adding them to new or existing services. These service option groups appear in the alphabetical list under the CA Service Catalog, Service Offering, Option Group tab. CA Service Catalog includes the following predefined service option groups for creating, extending, and returning (canceling) reservations in Reservation Manager:

Reservation – Physical System

Creates a request to reserve a physical resource for a specified time period. The requester specifies details such as the operating system, software to be installed, and minimum hardware requirements.

Reservation – Virtual Machine

Creates a request to reserve a virtual resource for a specified time period. The requester specifies details similar to those for a physical resource.

Reservation – Reservation Template

Uses one of several templates to create a request to reserve either a physical or virtual resource for a specified time period. Most details of the template are pre-specified, so the requester must provide only minimal input.

Reservation – Extend

Extends an existing reservation for a longer time period than originally specified.

Reservation – Return

Returns (cancels) an existing reservation.

This service option group cancels the reservation immediately. You cannot shorten a reservation; you can only return it. If you finish using a physical or virtual machine earlier than expected, return the related reservation to free the machine and make it available for other users in your organization.

Custom Service Options and Custom Service Option Groups for Reservations

If necessary, instead of using the predefined service, service options, and service option groups for reservations as-is, you can optionally customize them to meet your needs. Reasons for doing so may include meeting business requirements related to your company, business unit, or customers, or governance.

As a best practice, do *not* modify a predefined service, service option, or service option group directly. Instead, copy it, modify the copy, and rename the copy. Your customizations can include, for example, adding new service option elements to a service option, or adding a new service option to a service option group.

Note: For instructions to create, copy, and modify service options and service option elements, see the *Administration Guide*.

General Requirements for Custom Service Options and Custom Service Option Groups

The requirements for *all* service option groups documented in the *Administration Guide* apply to custom service option groups for creating, extending, or returning reservations. Such service option groups are considered custom only because they include one or more custom service options rather than including only predefined service options.

If you create a custom service option for creating, extending, or returning reservations, it must meet the following general requirements:

- The service option element for the reservation must have a type of Reservation

- The first service option element in the service option must use these values under its Options tab:

  - The category must be reservation.

  - The category class must be CA Server Automation Reservation Manager.

  - The category subclass must be one of the following, according to the purpose of the service option group:

    - Reserve Physical System

    - Reserve Virtual System

    - Reserve using Reservation Template

    - Extend Reservation

    - Return Reservation

- The service option element for the reservation must use one of the following catalog templates:

  - Reserve

  - Extend

  - Return

    If you select Reserve, you must also specify the list of statuses for the Scheduler to use when resource is available and when the reservation fails. When the reservation is updated in Reservation Manager, the requested reservation item is set to one of these statuses.

- The service option element for the reservation must have a type of Form.

  This service option element must include either a predefined reservation form (see page 129) or a custom reservation form (see page 130).

- If you create a custom reservation form, it must include all mandatory required fields (see page 131).

- The reservation form and the service option element for the reservation must be linked; On the Service Option Element dialog for the form, do the following:

    – Use the Search (magnifying glass icon), to select a reservation form

    – Check the Associate to Reservation box

Meet Cost-Related Requirements, If Applicable

You can optionally configure your custom service option for reservations to include a service option element of type Rate, to calculate the cost of the reservation and to bill that cost to the account of the user who requested the reservation. The predefined service option for reservation includes a rate service option element by default. However, you must link it to the reservation form field for cost.

To meet the cost-related requirements, if applicable

1. Select CA Service Catalog, Service Offerings, Option Groups tab.

2. Locate and open the reservation service option group that you want to edit, for example, Reservation - Physical System or Reservation - Virtual Machine.

    The Service Option Group dialog opens, displaying the rows (service options) that comprise the service option group.

3. On the reservation row (for example, Reservation - Physical System), double-click the Cost column to open it.

    The Service Option Element dialog appears.

4. Do the following on the dialog:

    a. Select Form Specified in the Quantity Specification drop-down list.

    b. Verify that the Related Form field displays the name of the form from the service option (row) that you opened in the previous step, for example, Reservation - Physical System.

    c. Select the name of the form field related to the reservation in the Form Field Name drop-down list.

       Select a form field that includes the numeric cost value, such as Reserve Cost. This field is predefined to calculate the cost metric by duration hours and number of systems for the reservation.

5. Save and close the service option element and the service option.

Predefined Reservation Forms

CA Service Catalog includes predefined Form Designer forms for creating, extending, and returning (canceling) reservations of physical or virtual resources in Reservation Manager.

When a CA Service Catalog user creates a request to perform one of these tasks, the catalog system displays the applicable form. For example, if a user creates a request to extend an existing reservation, the catalog system displays the form for extending a reservation.

You can use the predefined reservation form as-is, or you can customize (see page 130) it.

Predefined Reservation Form Template

Users can optionally enter custom data in a form and save the form with the completed fields as a personal template. Users who frequently reserve systems can thus use form templates to increase efficiency and accuracy across multiple reservations.

Custom Reservation Forms

While CA Service Catalog does provide a predefined reservation form (see page 129) for creating, extending, and returning (canceling) reservations, you may want to create custom forms; for example, to achieve a different look and feel, to add new fields, or to meet company-specific or department-specific business requirements.

When designing custom forms, meet these requirements:

- Model the custom form on the predefined form for accomplishing the same or similar task. For example, model a custom form for reserving a virtual computer on the predefined form for reserving a virtual computer.

- Include the same mandatory required fields (see page 131) in your custom form as those in the predefined form that you are using as a model. For example, *start date and time* and *end date and time* are two mandatory required fields for most forms, whether predefined or custom.

- In the fields on your custom form, do *not* modify any field attributes that you must not change (see page 134).

- Verify that the fields that you can configure as either optional or required (see page 132) are configured the same in Reservation Manager and all reservation forms in your implementation, both custom and predefined. For example, if you configure the automatic email notification field as optional in your custom and predefined forms, verify that this field is configured to be optional in Reservation Manager.

Important! Do *not* specify the same field more than once in the same form! Doing so could produce unpredictable results!

Mandatory Required Fields

If you modify a predefined reservation form (see page 129) or create a custom reservation form (see page 130), note that the required fields in the predefined forms are *always* required in all forms (predefined or custom), because Reservation Manager always requires them. These fields are called *mandatory required fields*. Some examples include the following:

■ Start date and time

■ End date and time

   The increment attribute in start time and end time fields (see page 132) is especially important in calculating the cost of the reservation.

■ Administrator Password and Retype Administrator Password

■ Drop-down lists for users to select templates, physical resources, or virtual resources from Reservation Manager

   The Form Designer uses a unique, dynamic field to fetch the data from Reservation Manager and populate each drop-down list.

Thus, as an administrator, you can optionally add more required fields to your custom form, but you *cannot* delete any of the mandatory required fields from the form.

Note: For the convenience of the catalog user or for standardization within your organization, you can optionally consider using the Form Designer to customize one or more of these fields by specifying a JavaScript expression to pre-fill the field with a valid value. For details about using the Form Designer to customize fields on forms, see the *Administration Guide*.

increment Attributes in Start Time and End Time Fields

The increment attributes in the *start date and time* and *end date and time* fields specify the level of granularity, in minutes, at which users can start and end reservations. You can specify a value from 1 to 60 for each attribute; however, a value of 30 or 15 is likely to be most useful. You can use the same or different value for each attribute.

For example, if you specify a value of 60 for both attributes, then users can start and end reservations only at 60-minute increments. Thus, users must specify all reservations to start and end on the hour, such as 5:00, 6:00, 7:00, 8:00 and so forth.

Similarly, if you specify a value of 30 for both attributes, then users can start and end reservations only at 30-minute increments. Thus, users must specify all reservations to start and end on the hour or half-hour, such as 5:00, 5:30, 6:00, 6:30, and so forth.

Finally, if you specify a value of 15 for both attributes, then users can start and end reservations at 15-minute increments, such as 5:00, 5:15, 5:30, 5:45 6:00, 6:15 6:30, 6:45 7:00, and so forth.

Regardless of the value you choose for the increment attributes, the cost of the reservation is calculated at the end of the request life cycle (see page 135) of the reservation, based on the total number of minutes used.

Fields that You Can Configure as Either Optional or Required

Typically, fields that are required by default in predefined forms must remain as required fields in both predefined and required forms. However, certain fields are exceptions to this rule. That is, you can configure these fields as either optional or required.

Verify that these fields are configured the same (optional or required) in Reservation Manager and in all reservation forms in your implementation, both custom and predefined. For example, if you configure the Project ID field as optional in your custom and predefined forms, verify that this field is likewise configured to be optional in Reservation Manager, as explained later in this topic.

If the CA Service Catalog and Reservation Manager administrators are not the same person, they must work together with any other stakeholders to decide whether these fields are required or optional in your implementation.

By editing your reservation forms using the CA Service Catalog Form Designer, you can configure the following fields to be either optional or required. To do so, set the value of the *required* attribute of the field to be either true (for required fields) or false (for optional fields).

■ Notification Email Address

Specifies the email address to use for automatic notification when Reservation Manager confirms a request for a reservation to be created, extended, or canceled.

If Reservation Manager is configured for automatic email notification, then make Notification Email Address a required field in your reservation forms.

If Reservation Manager is not configured for automatic email notification, then make this field optional in your reservation forms.

■ Project ID

Identifies the project associated with the reservation. If you specify Project ID as a required field in your reservation forms, then update the Project ID is Mandatory Setting (see page 134) in the Reservation Manager configuration options. Typically, this field is optional; however, many administrators find it useful in their Reservation Manager implementations.

■ Notes

Specifies important information to pass to Reservation Manager.

■ Any other optional fields (except mandatory required fields) that appear on certain forms by default or that you add. As an administrator, you may decide to make these fields required for users to complete, for reasons specific to your implementation or your business.

On the Virtual Machine form, such predefined fields include Save as Template, Template Description, Additional Disks, Project ID, and Notes.

On the Physical System form, such predefined fields include Project ID, Notes, Save as Template, and Template Description.

Note: For more information about editing Reservation Manager configuration options, see the CA Server Automation *Administration Guide* and *Implementation Guide*. For information about using Reservation Manager, see the CA Server Automation *Reservation Manager User Guide*. For details about modifying forms, including setting attribute values as described in this topic, see the CA Service Catalog *Administration Guide*.

Update the Project ID is Mandatory Setting

Update the Project ID is Mandatory Setting to make the project ID either required or optional. If you specify Project ID as a required field in your reservation forms, then update the Project ID Is Mandatory parameter in the Reservation Manager configuration options, then update the Project ID Is Mandatory parameter in the Reservation Manager configuration options. Similarly, if this field is optional in your reservation forms, then make the parameter optional in the Reservation Manager configuration options.

Update the Project ID is Mandatory Setting

1. Log in to Reservation Manager as an administrator.

2. Click Administer your Reservation Manager.

3. Click Manage your configuration settings.

   The Configuration Settings page appears.

4. Expand the options for Reservations.

5. Verify that the Project ID Is Mandatory parameter setting matches the setting in your reservation forms; update the value if necessary.

You have updated the setting.

Field Attributes that You Must Not Change

The Form Designer lets you update all attributes of all fields on all forms, including both predefined and custom forms. However, to keep the integration between CA Service Catalog and Reservation Manager running correctly, do *not* change the values of any of the following attributes for fields in any Reservation Manager forms:

- _id attributes of all fields (see page 134)

_id Attributes of All Fields

To maintain the integration between CA Service Catalog and Reservation Manager, do *not* change the value of the _id attribute of any fields in the Reservation Manager forms, whether these forms are predefined or custom. For example, the value of the _id attribute for the start date field of the form *must remain* as start_date_time. Similarly, the value of the _id attribute for the end date field *must remain* as end_date_time.

Important! This matching is required for CA Service Catalog and Reservation Manager to exchange the related data correctly. It is especially important for the mandatory required fields. If you change the value of the _id attribute of any of the mandatory required fields, the integration between CA Service Catalog and Reservation Manager may fail!

How the Integration Works During the Request Life Cycle

This topic explains how CA Service Catalog and Reservation Manager integrate during the request life cycle, after you have <u>set up the integration</u> (see page 119). These points apply to both initial requests for a reservation and requests for extensions of existing reservations.

1. A CA Service Catalog user creates and submits a request to create, extend, or cancel a reservation for a physical or virtual resource through Reservation Manager. While creating the request, the user enters the information required for provisioning the resource in the Form Designer form associated with the service.

2. When the user submits the request in CA Service Catalog, CA Service Catalog calls Reservation Manager to create the reservation. Reservation Manager checks whether a resource is available that matches the requirements specified by the user in the form. Based on the results, CA Service Catalog proceeds as follows.

   ■ If the requested resource is not available during the specified time period, Reservation Manager sends a message informing the user, and the request is not submitted. The user can choose from these options:

      – Adjust the specifications and re-submit the request; repeat this action as needed until the system finds an available resource and accepts the request

      – Save the cart as a request with a status of Not Submitted. Later, try adjusting the request and res-submitting it, as explained in the previous bullet

   ■ If the requested specifications are not available, CA Service Catalog displays an error message similar to one of the following:

      Cannot Connect to Reservation Manager...

      The requested resource(s) are not available for the selected dates. Please re-enter the dates and submit the request again...

      Consequently, the user cannot submit the request. The user must adjust the specifications in the request to meet these requirements:

Neither the initial request nor all extension requests together can exceed the maximum reservation time defined in Reservation Manager. For example, if the maximum reservation time is 15 days, Reservation Manager rejects all of the following:

– An initial request for a reservation of 16 or more days

– A single request for an extension of 16 or more days

– Multiple requests for extension whose total is 16 or more days; requests through 15 days inclusive are approved

In all these cases, the Catalog system rejects the request if another user has already reserved the resource for some or all of the time period specified.

Note: CA Service Catalog administrators can optionally consider customizing the fields in Reservation Manager forms to include JavaScript expressions and functions that perform validation checks implementing the Reservation Manager reservation policy. For details about using JavaScript expressions and functions in fields on Form Designer forms, see the *Administration Guide*.

■ If the requested resource is available during the specified time period and the request does not exceed the maximum reservation time defined for the requested resource, the following occur when the user submits the request:

– Reservation Manager creates the reservation

– The Catalog system updates the status of the request to Submitted and routes the request for approval

– The Catalog system updates the reservation form in the request with the reservation ID and the names of the reserved systems

3. CA Service Catalog coordinates the approval process according to the reservation-related event, rules, and actions; the CA Service Catalog administrator previously enabled the rules and actions (see page 122) when setting up the integration between CA Service Catalog and Reservation Manager.

Note: If any of the actions fail, the failure is logged as a system alert.

If the approver rejects the request, the following occur:

■ The Catalog system returns (cancels) the request for the resource in Reservation Manager, and the related reservation life cycle ends in Reservation Manager

■ The Catalog system updates the status of the requested reservation item or items to Rejected or Canceled

If the approver approves the request, the following occur:

- CA Service Catalog calls to approve the related reservation resource in Reservation Manager

- The Catalog system updates the status of the requested reservation item or items to Approved

- The request life cycle continues, as noted in the following steps

4. CA Server Automation initiates the job to provision the reserved resource.

   When the scheduled tasks for reservations (see page 123) detect that the job status for the reserved resource is ready, then it does the following:

   - If the resource provisioning succeeds, then the reserved resource is ready for use, and the status of the requested reservation item or items changes as specified by the associated service option element, typically to Fulfilled.

     Reservation Manager notifies users, so that they can begin using the reserved resource.

   - If the resource provisioning fails, then the reserved resource is not ready for use, and the status of the requested reservation item or items changes as specified by the associated service option element, typically to Fulfillment Cancelled.

     Users are notified and should contact their administrator to correct the problem.

5. When a requested reservation item reaches a status of Completed, Accounting Component charges the user's account for the total cost of the reservation, according to the duration of the reservation and the number of systems reserved.

   By default, the Catalog system calculates the cost of the reservation of each system on an hourly basis, using the following:

   - The start date and time, such as April 24 at 8:00 a.m.

   - The end date and time, such as April 28 at 12:00 a.m.

   - Extra charges, if applicable, for extending the reservation

   - Reduced charges if applicable, for returning the reservation before the end date and time

     For example, if someone has an existing reservation for 12 hours, and after using it for 10 hours returns it, then that user receives a credit for the remaining 2 hours.

   Note: To verify the charges, you can run billing for the account and check details of the invoice.

6. CA Service Catalog users can optionally return or extend an existing reservation made through CA Service Catalog; for details about extensions, see Step 2.

   For returns and extensions, the total charge to the user's account for the reservation is reduced by the cost of unused time or increased by the cost of the additional time.

Chapter 8: Integrating with External Reservation Services

This section contains the following topics:

Introduction

Product: CA Service Catalog

Release: 12.8.00

OS: All supported Windows operating systems

This scenario describes how a Service Catalog Manager creates and customizes services for an external reservation system (not Reservation Manager). After you create the base service, you can create additional services for adding a disk, adding memory, extending the reservation, and returning the reservation early.

Overview of Integrating with External Reservation Services

This scenario illustrates how service catalog administrators integrate CA Service Catalog with an external reservation system (not Reservation Manager, as follows:

■ Specify billing charges for reservation services using any options that CA Service Catalog supports for nonreservation services. Examples include periodic billing, one-time billing, and usage-based billing.

■ Create types and subtypes for resources used in reservation services. You specify charges for these resources when you create the services.

Users can select these resources when requesting the services. Moreover, users can modify or return these resources (in whole or in part) while the reservations are in progress. An example is a user requesting additional memory after the reservation has started and returning it before the reservation ends. You create services with modify and return features that *both* enable users to perform these tasks *and* update the charges to reflect these changes.

The modify, return, and extend operations use the new predefined API plug-ins to retrieve details about the resources used in reservations that are in progress.

■ Set up reservation services (see page 141) to reserve, modify, extend, and return resources, as described in the previous bullets.

■ Create JavaScript functions, rules, actions, CA Process Automation processes, forms, rate elements, and other catalog elements for each reservation service. You customize these elements to let users reserve, modify, extend, and return resources, and to bill users for the resources used.

■ Create or update reservations that specify no end date.

As you complete these tasks, you create services for the following purposes:

■ Reserve a computer

■ Add a disk to the computer

■ Add memory to the computer

■ Extend the length of the reservation

■ Return the computer or selected resources early

CA Service Catalog integrates with an external reservation system by exchanging data through web service calls from customer-written CA Process Automation workflow processes. The external reservation system uses the connection details specified on the Administration Configuration Parameters page for CA Process Automation in CA Service Catalog. Unlike CA Technologies products that integrate with CA Service Catalog, the external reservation system does *not* have its own Administration Configuration Parameters page in CA Service Catalog.

Note: For general information about reservations and for details about integrating with Reservation Manager, see the "Integrating with Reservation Manager" chapter in the *Integration Guide*. If you are using Reservation Manager, consider using the predefined services in the Reservation Services folder. The services in that folder are designed for use with Reservation Manager. Those services do *not* include the features (the resource types and enhanced modify, extend, and return operations) described in this scenario. However, you can use this scenario *as a model* to create or update services that integrate with Reservation Manager to include these new features.

Set Up Reservation Services

This scenario explains how a service delivery manager sets up basic end-to-end reservation services. Basic end-to-end reservation services enable users to reserve computers (or other resources) and to modify, extend, and return early reservations that are in progress. This scenario is for integrating CA Service Catalog with an external (third-party) reservation product.

In this scenario, you design services to address the following use case. Use these specifications as a model and adjust them to match your implementation.

- A managed service provider offers reservations of on demand virtual machines to its customers (users). The managed service provider is using CA Service Catalog with an external reservation product.

- Customers can do the following:

  - Reserve a virtual machine with preconfigured resources, for example, 2 GB of memory (RAM) and 50 GB of disk space. The customer specifies the length of time for reservation, for example, 15 days.

  - Modify the preconfigured resources, for example, to add additional memory or disk space.

  - Extend the length of the reservation, for example, to add five more days.

  - Return the reservation early, for example, to account for an unexpected event such as a cancellation.

    The Catalog system includes each of these options as a service, for example, a reservation service, an extend reservation service, and so forth. All services run at the same time.

- The total billing includes the charge or credit for each service. This scenario uses periodic (monthly) billing.

■ The cost of the service follows:

– The basic cost is $1 per virtual machine per day. This cost includes a basic system environment: a Windows operating system with 1 GB of memory and 50 GB of disk space.

– Users can request more memory or disk space for an additional charge. For example, each extra 0.25 GB of memory costs an additional $3 per day.

– If a user returns the virtual machine or some resources (such as extra memory) early, then the account is credited for the unused portion.

Set Up End-to-End Reservation Services

Service Delivery Manager

Meet Prerequisites → Set Up Resource Types

Set Up Custom Actions ← Set Up Custom Rules

Create Service to Reserve Computer
Steps

Create Service to Add a Disk to the Reserved Computer
Steps

Create Service to Add Memory to the Reserved Computer
Steps

Create Service to Extend the Reservation
Steps

Create Service to Return the Reservation Early
Steps

Steps – Customize for Each Service
- Create Form
- Create Service Option Group
- Create Reservation Element
- Create Form Element and Attach Form
- Create Rate Element

l

To set up basic end-to-end reservation services for this scenario, follow this process:

1. Meet the prerequisites:

   ■ Set up your third-party reservation product and follow its instructions for integrating with other products such as CA Service Catalog.

   ■ Be a proficient user of the following components of CA Service Catalog:

      – Service Offerings. Be able to create and configure services, service option groups, and, service option elements.

      – Forms. Be able to create and configure forms. Be able to create JavaScript functions for use in form fields.

      – The billing type that you specify for the service: periodic, one-time, or usage-based.

      Note: For details about these components, see the *Administration Guide*.

   ■ Verify that CA Service Catalog and CA Process Automation are installed and configured. This scenario uses CA Process Automation.

      Note: For details about installing and configuring CA Service Catalog, see the *Implementation Guide*. For details about installing, configuring, and using CA Process Automation, see the CA Process Automation documentation.

   ■ Be able to create and configure business processes in CA Process Automation to meet the needs of your implementation. CA Service Catalog does not provide the CA Process Automation processes for this scenario. You can create these processes, or you can copy and modify existing processes, for example, processes supplied by another CA Technologies product or solution.

2. Set up the resource types (see page 145) that you need, to match the resources in the reservation system that you are using.

3. Set up the custom rules and actions (see page 146) required for the end-to-end reservation services to function correctly.

4. Create the service for reserving a computer (see page 152).

5. Create the service for adding a disk to the existing reservation (see page 169).

6. Create the service for adding memory to the existing reservation (see page 186).

7. Create the service for extending the existing reservation (see page 203).

8. Create the service for returning selected resources or the entire reservation early (see page 219).

9. Make the services available and test them by requesting them.

Set Up the Resource Types

You create resource types to help manage the resources that users can reserve through reservation services. For each resource type that you create, you can also create subtypes. In reservation services, you specify the resource types in the rate element, to help define the cost of the service. For reservation services, you define at least one resource type.

Note: These resource types and subtypes are examples used *for illustration only* in this scenario. You can optionally define other types and subtypes as needed. Moreover, if you want to manage the reservation resources at the system level only, you can define only one resource type, without subtypes.

Follow these steps:

1. Create the resource type and subtype that you need for the reservation system that you are using, as follows:

   ■   If you use a flat rate to bill for the reservation, resource types and subtypes are not required.

   ■   If you use a calculation associated with the resource type to bill for the reservation, define *at least one* resource type. Define *additional* resource types and subtypes if you use them in your billing calculations.

2. Do the following:

   a.   Click Catalog, Configuration. In the left menu, click Resource Types.

   b.   Add the following as resource types:

      ■   Computer

      ■   Memory

      ■   Disk

      For each resource type, the system displays the resource type ID, a hexadecimal value. You specify this value later when you create the form for adding a disk (see page 170) and when you create the form for adding memory (see page 187).

3. Edit Computer and associate Memory and Disk as subtypes of Computer, as follows:

   a.   Click the resource type named Computer.

      The Resource Type Detail dialog appears.

   b.   Click Add Sub-Types button

      The Resource Type search pop-up dialog appears.

   c.   Select Memory and Disk, and Click Associate.

   You have defined Memory and Disk as sub types of Computer.

You have set up resource types and subtypes.

Custom Rules and Actions

As an administrator, you can create reservation services for resources (see page 145) that are fulfilled by an external reservation system. For these services, CA Service Catalog must associate requests by users with the related fulfilled resources. To create this association, you use custom rules and actions and custom CA Process Automation processes. Each custom rule and action uses event filter criteria to call a custom CA Process Automation process for a specific reservation operation, such as reserve a resource or modify a reserved resource. The custom CA Process Automation process calls the web service named addResourceToRequestItem method to associate a fulfilled resource with a request.

To create these associations, you create custom rules (see page 146) and create custom actions (see page 148).

Create Custom Rules

You can add a new rule for several reasons. For example, you can create and configure a rule to trigger an action. The action can be an email notification when an approver approves or rejects a request pending action. For this scenario, you create custom rules that associate resources (see page 145) to reservation services. You also create a custom action (see page 148) for each custom rule.

Note: For more information about events, rules, and actions, including parameter values, see the *Administration Guide*.

Follow these steps:

1. Select Administration, Events-Rules-Actions..

    The Event Types page appears.

2. Click the Request/Subscription Item Change event.

    The Event Type Details page appears.

3. Create a custom rule named Add Resource Item - Computer. Use the following specifications:

    ■   Description: Add Resource Item - for a computer, when the request to reserve a computer is fulfilled

    ■   Status: Enabled

    ■   Event Filter:

        rate_item_type = 15 AND status = 2000 AND status <> status_old AND rate_item_col = 0 AND sd_row = 1 AND category = 4 AND category_subclass >= 10 AND category_subclass <= 30

4. Create a custom rule named Add Resource Item - Memory. Use the following specifications:

   - Description: Add Resource Item - Memory - for memory (RAM), when the request to add memory to a reserved computer is fulfilled

   - Status: Enabled

   - Event Filter:

     rate_item_type = 15 AND status = 2000 AND status <> status_old AND rate_item_col = 0 AND sd_row = 1 AND category = 4 AND category_subclass = 60 AND external_id = 'mod.memory'

5. Create a custom rule named Add Resource Item - Disk. Use the following specifications:

   - Description: Add Resource Item - Disk, for disk space, when the request to add disk space to a reserved computer is fulfilled

   - Status: Enabled

   - Event Filter:

     rate_item_type = 15 AND status <> status_old AND rate_item_col = 0 AND sd_row = 1 AND status = 2000 AND category = 4 AND category_subclass = 60 AND external_id = 'mod.disk'

6. Click OK.

   The Catalog system saves your changes. The Event Type Details page appears, and it includes the new rules that you created.

Create Custom Actions

You can create a custom action for a rule to meet a need that the predefined actions and existing custom actions do not meet. For example, you create an action to run a command when a request from of a certain class changes the status from Pending Fulfillment to Fulfilled. For this scenario, for each custom rule that you created, you write a CA Process Automation process to call the web service named addResourceToRequestItem. The web service associates the fulfilled resource to reservation.

Note: For more information about creating custom actions, including parameter values, see the *Administration Guide*.

Follow these steps:

1. Complete the following steps for each <u>custom rule that you created</u> (see page 146). The custom rules are as follows:

   - Add Resource Item - Computer

   - Add Resource Item - Memory

   - Add Resource Item - Disk

2. (CA Process Automation) Create a CA Process Automation process and Start Request Form to call the CA Service Catalog web service named addResourceToRequestItem. The syntax follows:

   addResourceToRequestItem(String *sessionId*, int *requestItemId*, RequestResourceItem *resourceItem*)

   sessionId

   Specifies the security handle for calling web services.

   requestItemId

   Specifies the request item ID or subscription detail Id.

   RequestResourceItem

   Specifies the request resource item to associate.

   The following parameters apply:

   Id – Identifies the request resource ID. It is an automatically generated UUID.

   parentId – Specifies the request resource ID of the parent resource.

   (Required) resourceTypeId – Specifies the resource type id, for example, the UUID of a resource named Computer.

   status – Specifies the status of the request resource. Valid values are as follows: CREATED(100), READY(200), CANCELLED(300), and COMPLETED(400)

   (Required) requestItemId – Specifies the request item ID or subscription detail ID.

   createdDate – Specifies the date when the requested resource was created.

resourceId – Specifies the resource Id, for example, vm1234 or memory1234.

resourceName – Specifies the description of the resource, for example, virtual machines 1234.

resourceUrl – Specifies the URL to the external reservation system, for example, http://www.ca.com:8080/xyz/.

resourceItem

Specifies the request resource item to associate.

This call returns the following with updated details: com.ca.usm.soap.axisInterfaces.RequestResourceItem.

Note: For more information about creating CA Process Automation processes and Start Request Forms, see the CA Process Automation documentation. For more information about web services, see the *Administration Guide* and the Web Services API Documentation.

3. (CA Service Catalog) Edit and create a custom action for the rule. For example, for the rule named Add Resource Item - Computer, create a custom action named Add Virtual Machine.

    The Rule Details page appears.

4. Select CA IT PAM as the Type. This type links the action to a CA Process Automation process.

5. Select the appropriate Start Request Form for the CA Process Automation process, for example, Demo_AddResourceToRequestItemSRF.

6. Complete the parameters for the new action.

7. Click OK.

    The Catalog system saves your changes.

You have created the custom actions for the custom rules.

Example for Reserving a Disk

The following example is a web service call for reserving a disk, so that you can add the disk to an existing reservation.

```
<soapenv:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ser="http://services.soap.usm.ca.com">

  <soapenv:Header/>

  <soapenv:Body>

    <ser:addResourceToRequestItem soapenv:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">

      <sessionId xsi:type="xsd:string">dev_session</sessionId>

      <requestItemId xsi:type="xsd:int">10076</requestItemId>

      <resourceItem xsi:type="urn:RequestResourceItem" xmlns:urn="urn:usmRequestService">

        <parentId xsi:type="xsd:string">a42b178f5c68-1251880b131bfbcf114-7f511313189039046</parentId>

        <resourceId xsi:type="xsd:string">vm10466-disk1</resourceId>

        <resourceName xsi:type="xsd:string">vm10466-disk1</resourceName>

        <resourceTypeId
xsi:type="xsd:string">662d774349a0-54f958451317186e4a5-7ff51311871145702</resourceTypeId>

        <resourceUrl xsi:type="xsd:string">https://cat-dev-en2k8-3:8443/ssrm/</resourceUrl>

        <status xsi:type="xsd:string">100</status>

      </resourceItem>

    </ser:addResourceToRequestItem>

  </soapenv:Body>

</soapenv:Envelope>
```

Example for Reserving Memory

The following example is a web service call for reserving memory, so that you can add the memory to an existing reservation.

```
<soapenv:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ser="http://services.soap.usm.ca.com">

  <soapenv:Header/>

  <soapenv:Body>

    <ser:addResourceToRequestItem soapenv:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">

      <sessionId xsi:type="xsd:string">dev_session</sessionId>

      <requestItemId xsi:type="xsd:int">10469</requestItemId>

      <resourceItem xsi:type="urn:RequestResourceItem" xmlns:urn="urn:usmRequestService">

        <parentId xsi:type="xsd:string">a42b178f5c68-1251880b131bfbcf114-7f511313189039046</parentId>

        <resourceId xsi:type="xsd:string">vm10466-memory1</resourceId>

        <resourceName xsi:type="xsd:string">vm10466-memory1</resourceName>

        <resourceTypeId
xsi:type="xsd:string">662d774349a0-54f958451317186e4a5-7ff61311871100123</resourceTypeId>

        <resourceUrl xsi:type="xsd:string">https://cat-dev-en2k8-3:8443/ssrm/</resourceUrl>

        <status xsi:type="xsd:string">100</status>

      </resourceItem>

    </ser:addResourceToRequestItem>

  </soapenv:Body>

</soapenv:Envelope>
```

Create the Reservation Service

You create the reservation service by defining the service and its options, including all related service option elements. You also create a reservation form and attach the form to the reservation service option. Together, these elements comprise the service that users request to reserve a resource.

Follow these steps:

1. Create the reservation form (see page 153).

   You use this form when you define form element and the rate element mentioned in the next step.

2. Create the service option group (see page 160).

   As part of this process, you do the following:

   ■ Create the Reservation service option and attach the form (see page 161).

   ■ Create the Rate element (see page 164).

   ■ Attach the policies and CA Process Automation processes (see page 166).

   Note: The Reservation element, Form element, and Rate element are the service option elements that comprise the service option group. In the following topics, the field values for creating and configuring these elements are customized for this scenario. For details about the fields for these elements, see the *Administration Guide.*

3. Create the reservation service, as follows:

   a. Click Catalog, Services Offerings.

      The Services page appears. This page displays the folders containing services, organized hierarchically.

   b. Expand the tree and select the folder in which you want to add the new service.

      Note: To add a service at the service provider (top) level, click the plus sign without expanding the tree.

   c. Click Add, Offering and enter Reserve Computer as the name of the new service.

      The Details page for a new service appears.

   d. Complete the fields on the dialog and set the permissions.

      Note: For more details about these fields and about creating a service, see the *Administration Guide*.

4. Define the service, as follows:

   a. Expand the tree to display the service named Reserve Computer and click the Definition tab.

   b. Add the service option group named Reserve Computer to the service.

   c. Perform any additional actions that apply, for example, the following:

      ■ Add another service option group to the service.

      ■ Set permissions on which user roles can subscribe to or request the service option group.

      Note: For more details about these actions about defining a service, see the *Administration Guide*.

You have created the reservation service.

Create the Form

You create and customize a form for your service for reserving a computer. When users request that service, they use this form to specify the details of the computer that they want to reserve. These details include hardware and software requirements and the start and end dates of the reservation. As an administrator, you specify a cost field and related elements in the form to calculate the cost of the reservation.

Note: For details about adding elements to forms, see the *Administration Guide.*

Follow these steps:

1. Click Catalog, Forms.

   The Form Designer opens.

2. Create the folder where you want to organize the reservation forms. In that folder, create a form named Reserve Computer.

3. Add the elements that you want to the form, including elements for the following. Each element that you add becomes a field on the form. Unless otherwise noted in parentheses, add these elements as text fields. Text fields are basic elements of a form.

   ■ Reservation Name

      – Specifies a description of the reservation, for example, Reserves a computer for testing.

      – Value of the _id attribute: rname

         When you create forms to modify, extend, or return an existing reservation, you use this _id value to fetch all related reservations.

- The number of computers (select box and options)

  Specify the following values for this field:

  – Name: Number of Computers

  – Value of the _id attribute: number_of_vms

- Other technical specifications for the computer being reserved, for example, operating system, disk, memory (RAM), CPU, and password

- Start date and end date fields (Date Time field). Define these fields as follows:

  – Start Date: For the _id attribute, specify start_date_time.

  – End Date: For the _id attribute, specify end_date_time.

  Note: Reservation systems require the start date. Typically, reservation systems also require the end date. If your reservation system does not require end dates and if you are using periodic billing, then you can omit the end date field.

- User name and password fields

- The cost quantity field

  Specify the following values for this field:

  – Name: Reserve Cost Quantity (Hidden Field)

  – Value of the hidden attribute: true

  – Value of the _id attribute: cost_quantity

  The cost quantity field and the number of reservations field work with the related custom JavaScript function for your billing method. These items work together to calculate the cost of the reservation, as described in later steps in this topic

  Note: For details about adding elements to forms, see the *Administration Guide.*

4. Record the names of the following: the form, the cost quantity field, and the start date field. You reference these names when you create the form element and attach the form (see page 166).

5. Verify the billing method for the reservation service: one-time (up-front), periodic (pay-as-you-go), or usage-based.

   Note: This scenario uses periodic billing throughout but, for reference, describes one-time billing in these steps. Usage-based billing is outside the scope of this scenario. For details about all billing methods, see the *Administration Guide.*

6. Create a custom JavaScript functions to support your billing method, *one* of the following:

- Periodic billing (see page 157)

- One-time billing (see page 158)

The major difference between the two methods is that one-time billing includes duration in the cost calculation, while periodic billing does not.

7. Specify the name of your custom JavaScript function in the onSubmit attribute of the form. Use the following format:

ca_fd.js.*function-name*

An example follows:

ca_fd.js.calculateCostQty()

8. (Optional) Specify additional custom JavaScript functions for the form, using the previous step for reference. Consider the following examples and use them as models, as applicable.

The following example applies if you add both a password field and a confirm password field to your form. This example verifies that the user enters the same password in both field. For this example, you specify the name of the JavaScript function as the value the onValidate attribute of the confirm-password field.

The following example also sets the minimum start date for the reservation. For this example, you specify the name of the JavaScript function as the value the Minimum Value attribute of the Start Date Time field.

```
{
 samePassword : function(otherField, value) {
  var otherValue = ca_fdGetTextFieldValue(ca_fd.formId, otherField);
  if (otherValue && otherValue == value) {
   return null;
  } else {
   return "Passwords do not match";
  }
 },

 minStartDate : function() {
  if (_.serviceoption.status() >= 200) {
   return null;
  } else {
   var x = new Date();
   x.setHours(x.getHours() + 1);
   x.setMinutes(0);
   x.setSeconds(0);
   return x;
  }
 }
}
```

You have created the reservation form.

Note: Forms are *not* included in services. Instead, forms *link to* the service option groups that are included in services. Therefore, after you create and customize the form, you attach the form to the service option group.

Create a Custom JavaScript Function to Support Periodic Billing

If you are using periodic (pay-as-you-go) billing, create a custom JavaScript function to support it. This function calculates the cost of the reservation so that the Catalog system can use it in billing.

Follow these steps:

1. Click the name of the form in the Form Designer tree.

   The form attributes appear, and the Script button activates. The Script button appears on the toolbar with the Localize, Save, Restore, and other buttons.

2. Click the Script button.

   The Script dialog appears and displays the custom JavaScript functions already specified for the form, if any. You can enter new JavaScript functions before or after any existing ones.

   Note: To view a template for a function, click Show Help on the Script dialog. The template shows the product-specific implementation of a standard JavaScript function.

3. Specify a custom JavaScript function to support your implementation of periodic billing. Use the following example as a model.

   In the JavaScript function, use the cost quantity field to calculate the cost quantity factors of your service. This example uses only the number of computers (number_of_vms) for the reservation as a cost quantity factor. However, your implementation can vary. Customize the calculation to match your business rules.

```
{
 calculateCostQty : function() {
   var noVms = ca_fdGetTextFieldValue(ca_fd.formId,'number_of_vms');
   var costQty = noVms;
   ca_fdSetTextFieldValue(ca_fd.formId, 'cost_quantity', costQty.toString());
   return true;
 }
```

number_of_vms

   Specifies the number of computers in the reservation. Typically, users select this number from a drop-down list that you specify on the form. This variable specifies the quantity used for the cost calculation.

   Note: Periodic billing does *not* use duration in the cost calculation.

cost_quantity

Specifies the value of the_id attribute of the cost quantity field on the form.

Important! This variable *must* exactly match the value of the_id attribute of the cost quantity field on the form, including case. Otherwise, billing is *not* calculated correctly.

4. Save the JavaScript function and close the dialog.

You have created a custom JavaScript function to support periodic billing.

Create a Custom JavaScript Function to Support One-Time Billing

If you are using one-time (up-front) billing, create a custom JavaScript function to support it. This function calculates the cost of the reservation so that the Catalog system can use it in billing.

Follow these steps:

1. Click the name of the form in the Form Designer tree.

    The form attributes appear, and the Script button activates. The Script button appears on the toolbar with the Localize, Save, Restore, and other buttons.

2. Click the Script button.

    The Script dialog appears and displays the custom JavaScript functions already specified for the form, if any. You can enter new JavaScript functions before or after any existing ones.

    Note: To view a template for a function, click Show Help on the Script dialog. The template shows the product-specific implementation of a standard JavaScript function.

3. Specify a JavaScript function to support your implementation of one-time billing. Use the following example as a model.

    In the JavaScript function, use the cost quantity field to calculate the cost quantity factors of your service. This example uses the number of computers (number_of_vms) and the duration (duration) as the cost quantity factors. However, your implementation can vary. Customize the calculation to match your business rules.

```
{
 calculateCostQty : function() {
   var duration = (ca_fdGetDateFieldValueInMillis(ca_fd.formId, 'end_date_time') -
ca_fdGetDateFieldValueInMillis(ca_fd.formId, 'start_date_time')) / 86400000; //day duration
   var noVms = ca_fdGetTextFieldValue(ca_fd.formId,'number_of_vms');
   var costQty = duration * noVms;
   ca_fdSetTextFieldValue(ca_fd.formId, 'cost_quantity', costQty.toString());
   return true;
 }
```

number_of_vms

Specifies the number of computers in the reservation. Typically, users select this number from a drop-down list that you specify on the form. This variable specifies the quantity used for the cost calculation.

duration

Specifies the length of the reservation. In this example, in days. Typically, users specify this length by selecting values for the start date and end date fields that you include on the form.

cost_quantity

Specifies the value of the_id attribute of the cost quantity field on the form.

Important! This variable *must* exactly match the value of the_id attribute of the cost quantity field on the form, including case. Otherwise, billing is *not* calculated correctly.

duration * noVms

Specifies the calculation that determines the cost quantity of the reservation: The length of the reservation multiplied the number of computers reserved.

This example fetches the duration from the start date (start_date_time) and end date fields (end_date_time) on the form. The values of the _id attributes of these fields appear in parentheses.

Important! These variables *must* exactly match the value of the_id attributes of the date fields on the form, including case. Otherwise, duration is *not* calculated correctly.

This example also specifies the duration in days (not hours or minutes).

Therefore, the Rate element (see page 164) for this form must specify the unit cost and related fields as follows

- Unit Cost: 1

- Billing Cycle: One-time

- Periodic Type: Daily

- Periodic Type Interval: 1

- Quantity Specification: Form Specified

4. Save the function and close the dialog.

You have created a custom JavaScript function to support one-time billing.

Create the Service Option Group

Each reservation service in the catalog consists of one or more reservation-related service option groups. These service option groups are bundled groups of service option elements that specify the details that users can select for their reservations. You can create a service option group for each type of reservation that you want to support: Examples include creating, extending, modifying, and returning reservations of physical computers and virtual machines. In this scenario, the first service option group is for creating a reservation of a computer.

Follow these steps:

1. Click Catalog, Service Offerings.

   The Services tree appears and displays the folders containing services, organized hierarchically according to categories.

2. Click the Service Option Groups (SOGs) tab.

   The SOGs tree appears and lists alphabetically all service option groups for the business unit.

3. Click the Add icon and enter Reserve Computer as the name of the new service option group.

   The Service Option Group Details page appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field does not appear, specify a logical value of your choice.

   - Description: Reserve a computer
   - Type: Fixed

     Specifies the type of service option group. This value determines how you can include this service option group within other service option groups as a characteristic of a service option element. A fixed service option group presumes a fixed cost or a variable cost that is based on usage.

5. Click OK.

You have created the service option group.

Create the Reservation Service Option and Attach the Form

In the previous procedure, you created the service option group (see page 160) for reserving the virtual machine. Here, you create the reservation service option in that service option group. You customize the reservation service option to specify the type of reservation (for example, external or Reservation Manager) and other details.

Follow these steps:

1. Click Catalog, Service Offerings, SOGs, and click the service option group named Reserve Computer.

   The Details tab for this service option group appears.

2. Click the Definition tab.

3. Click Add Option.

   The Service Option Details tab appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field is not listed, specify a logical value of your choice.

   ■ Name: Reserve Computer

   ■ Description: Reserve a computer through an external reservation system

   ■ Reservation Service Option: Selected

   ■ Operation: Reserve

   ■ Reservation Ready Status: *your custom selection*

   Specifies the status of the request in CA Service Catalog when the external reservation system successfully completes the provision of the reservation.

   ■ Reservation Failure Status: *your custom selection*

   Specifies the status of the request in CA Service Catalog when the external reservation system fails to complete the provision of the reservation.

   ■ Reservation System: ca.catalog.DEMO1

   ■ Category: Reservation

   ■ Category Class: External Reservation System

   This scenario (see page 141) is designed for use when the Category Class is External Reservation System, not CA Spectrum Automation Manager Reservation Manager.

   ■ Category Subclass: Reserve

5. Perform the following actions in the Forms section:

a. Click the Add icon and attach the <u>form that you created earlier</u> (see page 153) for this reservation service.

A dialog for attaching the form appears.

b. In the Display Text field, enter Reserve Computer.

This text appears as a description for the form when administrators view this service option group in the Service Offerings, Option Groups.

c. In the Form Name field, click the magnifying glass icon to select a form.

The Form Tree pop-up dialog appears.

d. Navigate through this form tree and select the form that you want to attach: Reserve Computer.

You created this form earlier, as noted previously in this topic.

The preview of the form appears in the right pane.

e. Click the Select Form button.

You return to the dialog for attaching the form.

Note: You can add the same form to a service option only once. However, a service option can have multiple forms.

6. If you do not want to hide or disable the entire form under any conditions, leave the Hidden and Disabled fields empty. Also, skip this step.

   If you do want to hide or disable the entire form, enter the corresponding JavaScript expression in the Hidden or Disabled field. You can hide or disable the form according to the request status, the user role or business unit, or other criteria. Use the following format: $(_.object.property). The expression must return a value of true or false.

   Note: You can specify a JavaScript expression in the Hidden field, the Disabled field, or both. For instructions to specify a JavaScript expression, see the *Administration Guide*.

   Examples follow:

   ■ To hide or disable the form when the request status is Pending Approval, enter the following JavaScript expression in the Hidden or Disabled field: $(_.request.status == 400).

   ■ To hide or disable the form for the end user roles only, enter $(_.user.role == 'enduser').

   ■ To hide or disable the form from all business units except ca.com, enter $(_.bu.id != 'ca.com').

   ■ To disable the form when the request status is Fulfilled, enter $(_.request.status == 2000).

   Note: When an entire form is disabled, it is disabled but visible during all stages of the request lifecycle except checkout. During checkout, a disabled form is both disabled and hidden.

7. Click Update.

   The dialog closes. The Catalog system attaches the form that you selected to this reservation service option.

8. Click Save.

   The Catalog system saves the reservation service option.

9. Perform one of the following actions:

   ■ Click Return to Service Option Group.

      You return to the service option group, which now includes the reservation service option. You can continue the process of creating the reservation service later.

   ■ Create the Rate element (see page 164).

      You continue the process of creating the reservation service.

You have created the reservation service option and have attached the form. The service option group now includes both of them.

Create the Rate Element

Earlier, you created the service option group (see page 160) for reserving the computer. Here, you create the rate element in that service option group. You customize the rate element to specify cost-related fields for the service. You also customize the rate element to reference the related resource type (see page 145) and form (see page 153) for the service. All of these elements work together to determine the cost of the service.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option named Reserve Computer. You created this service option (see page 161) earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group named Reserve Computer.

      The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option named Reserve Computer.

      The Details tab for this service option appears.

2. In the Prices/Cost box, click the Add icon.

   The Service Option Element dialog for a rate appears.

3. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

   If a field is not listed, specify a logical value to match your implementation.

   ■ Display Text: Periodic (Monthly) Charge; $1 per day per Computer

   ■ Cost Type: Specify Value.

   ■ Unit Cost: 1

   ■ Display Unit Type: Per Computer per day

   ■ Charge Type: Charge

   ■ Budget: not selected

   ■ Billing Cycle: Periodic

   ■ Periodic Type: Monthly

   ■ Periodic Type Interval: 1

   ■ Quantity Specification: Form Specified

- Related Form: Reserve Computer

- Cost Quantity Form Field: Reserve Cost Quantity (Hidden)

  This field *must* match the field for calculating the cost quantity on the reservation form (see page 153).

- Charge Effective From Form Field: Start Date and Time

  This field *must* match the field for the reservation start date on the reservation form (see page 153). Billing begins on this date.

- Reservation Resource Type: Computer

  You created this resource type (see page 145) earlier.

4. Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

5. Click Update.

   The dialog closes. The Catalog system saves the rate information that you specified for this reservation service option.

6. Click Save.

   The Catalog system saves the reservation service option.

7. Perform one of the following actions:

- Click Return to Service Option Group.

  You return to the service option group, which now includes the updates that you made for the reservation service option. You can continue the process of creating the reservation service later.

- Attach the policies and processes (see page 166).

  You continue the process of creating the reservation service.

You have created the Rate element.

Attach Policies and Actions

Note: This scenario does *not* require attached policies or attached actions. Complete the steps in this topic only if you want to create (or have created) a custom policy or action for this service option. Otherwise, skip this topic.

By default, CA Service Catalog evaluates all global policies and all events, rules, and actions (global actions only) for every requested *service*. However, for individual service options, you can replace this default behavior. From the Policies & Actions tab of a service option, you can specify that the Catalog system apply the following specifications to that service option:

- For policies, one of the following options: global policies only, attached policies only, or both global and attached policies

- For actions (including CA Process Automation processes), one of the following options: global actions only, attached actions only, or both global and attached actions

Note: As a best practice, use attached actions and policies *only* if you are using a discrete request life cycle that includes discrete approval of service options. This precaution helps avoid the unintended application of policies and actions at *both* the service and service option levels. For details about using a discrete request life cycle, see the *Administration Guide*.

Important! Applying policies or actions at both the service and service option levels could produce conflicting, unintended, or unpredictable results. If you decide to use attached policies and actions without discrete approval, carefully think through the results for both service options and the service. Review and test the affected services thoroughly in a test system before using them in a production system.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option. You created this service option earlier. If you are already accessing it, skip to the next step.

    a. Click Catalog, Service Offerings, SOGs, and click the service option group for the service option.

    The Details tab for this service option group appears.

    b. Click the Definition tab.

    c. Edit the service option.

    The Details tab for this service option appears.

2. Click the Policies & Actions tab and specify one of the following options for policies: attached policies only or both global and attached policies.

3. Perform all of the following options that apply:

   ■ Click the Search icon to view and select the attached policies that are already created. Select the policy or policies that you want and attach them to this service option.

   ■ Click the Add icon to create an attached policy and attach it to this service option.

   The Catalog system opens the Policy Builder, which you use to create the policy.

   Note: For details about creating policies, see the *Administration Guide*.

   ■ Click the Remove icon to remove an attached policy.

   Note: Before you can delete an attached policy from the Catalog system, you remove the policy from all attached service options.

   ■ Click the Dependent Service Options icon to review the service options that are also using a policy.

   The Catalog system displays the service options that have the selected policy attached.

   Save your changes.

   The Catalog system saves your changes and attaches the policies that you specified to this service option.

4. Perform all of the following options that apply:

   ■ Click the Search icon to view and select the attached actions that are already created.

     The Catalog system opens the Request Events page.

     – Use this page to access the event and rule you want.

     – Select the action or actions that you want and attach them to this service option.

   ■ Click the Add icon to create an attached action and attach it to this service option.

     The Catalog system opens the Request Events page.

     – Use this page to access the event and rule you want.

     – If applicable, create a rule for the attached action.

     – Create the attached action and attach it to this service option.

     Note: For details about creating rules and actions, see the *Administration Guide*.

   ■ Click the Remove icon to remove an attached action.

     Note: Before you can delete an attached action from the Catalog system, you remove the action from all attached service options.

   ■ Click the attached action to review the other service options that are also using this action.

     A dialog appears and lists the other service options (if any) that have the selected action attached.

   Save your changes.

   The Catalog system saves your changes and attaches the actions that you specified to this service option.

5. Click Return to Service Option Group.

   You return to the service option group, which now includes the updates that you made for the reservation service option.

You have attached the policies and CA Process Automation processes.

Create the Reservation Service for Adding a Disk

You can create a service that lets users add resources, for example, a disk, to an existing reservation. You create this service by defining the service and its options, including all related service option elements. You also create a related form and attach the form to the service option. Together, these elements comprise the service that users request to add resources to an existing reservation.

1. Create the form for adding a disk (see page 170).

   You use the form and the rate element mentioned in the next step to define the cost for the service.

2. Create the service option group for adding a disk (see page 176).

   As part of this process, you do the following:

   ■ Create the Reservation service option and attach the form (see page 177).

   ■ Create the Rate element (see page 181).

   ■ Attach the policies and CA Process Automation processes.

   Note: The Reservation element, Form element, and Rate element are the service option elements that comprise the service option group. In the following topics, the field values for creating and configuring these elements are customized for this scenario. If applicable, you can customize field values to meet your requirements. For details about the fields for these elements, see the *Administration Guide.*

3. Create the reservation service, as follows:

   a. Click Catalog, Services Offerings.

      The Services page appears. This page displays the folders containing services, organized hierarchically.

   b. Expand the tree and select the folder in which you want to add the new service.

      Note: To add a service at the service provider (top) level, click the plus sign without expanding the tree.

   c. Click Add, Offering and enter Add a Disk to a Computer as the name of the new service.

      The Details page for a new service appears.

   d. Complete the fields on the dialog and set the permissions.

      Note: For more details about these fields and about creating a service, see the *Administration Guide*.

4. Define the service, as follows:

   a. Expand the tree to display the service named Add a Disk to a Computer and click the Definition tab.

   b. Add the service option group named Add a Disk to a Computer to the service.

   c. Perform any additional actions that apply, for example, the following:

      ■ Add another service option group to the service.

      ■ Set permissions on which user roles can subscribe to or request the service option group.

      Note: For more details about these actions about defining a service, see the *Administration Guide*.

You have created the service for adding a disk to an existing reservation.

Create the Form for Adding a Disk

You create and customize a form for your service for adding a disk to an existing reservation of a computer. When users request that service, they use this form to specify important details, including the size of the disk to add to the reservation. As an administrator, you specify a cost field and related elements in the form to calculate the cost of the reservation.

Note: For details about adding elements to forms, see the *Administration Guide.*

Follow these steps:

1. Click Catalog, Forms.

   The Form Designer opens.

2. Create the folder where you want to organize the reservation forms. In that folder, create a form named Add a Disk to a Computer.

3. Add the elements that you want to the form, including elements for the following fields:

   Reservation

   Specifies a select box and options that lists all reservations for the logged in user. The user selects one reservation from this list.

   Specify values for the following attributes:

   _id attribute

   Specify reservations.

Report/Plug-in Id attribute

Specify ca.catalog.reservations-select-plugin.

This predefined API plug-in retrieves the list of reservations for the logged in user. You can view this plug-in on the Administration, Tools, Plug-ins page.

Report/Plug-in Variables attribute

Specify the list of variables that the plug-in retrieves.

If applicable, open the API plug-in that you selected to display its details, including variables. On the details page, the Inputs section lists the ID values and descriptions of the input variables for the plug-in. Copy the Ids of the variables that you want from that page and paste them into the value of the Report/Plug-in Variables attribute.

For both, enter variables as a JSON expression, for example:

$({'<variable name>' : '<variable value>', ...})

$({'userId':_.user.id,'buId':_.bu.id,'reservationSystem':'ca.catalog.DEMO1','label':'rname'})

Important! Specify variables carefully. If you specify no variables, unpredictable results can occur.

This list of variables returns all reservations for the selected external reservation system (ca.catalog.DEMO1) for the specified user in the specified business unit.

The label (rname) specifies the _id value of the Reservation Name field on the [Reserve Computer form](#) (see page 153). This label helps fetch the descriptive reservation text for the reservations.

The reservationSystem (ca.catalog.DEMO1) specifies the value of the Reservation System fields for every reservation element for all services in this scenario.

On Change attribute

Enter following JavaScript function to fetch the value of the Virtual Machines field, which appears later on this form. This function initiates the fetch of the Virtual Machine drop-down list when the user selects the reservation. This function uses the _id attribute of that field (resource_id).

ca_fdFetchSelectData(ca_fd.formId,'resource_id');

Note: This following applies to the Select Reservation Id, Start Date, End Date, and Status fields: Each field value is prefilled with output data from ca.catalog.reservations-select-plugin when the user selects the reservation. This plug-in is described in the Report/Plug-in Variables attribute earlier in this step.

Select Reservation Id

Specifies the reservation selected by the logged in user.

Specify values for the following attributes:

For the _id attribute, specify reservation_id.

For the Hidden attribute, specify true.

Start Date

Specifies the reservation start date.

For the _id attribute, specify start_date.

End Date

Specifies the reservation end date.

For the _id attribute, specify end_date.

Status

Specifies the status of the selected reservation.

For the _id attribute, specify status.

Virtual Machines

Specifies a select box and options that lists all resources reserved for the selected reservation. The user selects one computer from this list.

Specify the values for the following attributes:

_id attribute

Specify resource_id.

Report/Plug-in Id attribute

Specify this value: ca.catalog.resources-select-plugin.

This predefined API plug-in retrieves the list of resources reserved for the selected reservation. You can view this plug-in on the Administration, Tools, Plug-ins page.

Report/Plug-in Variables attribute

Specify the list of variables that the plug-in retrieves, as follows. If applicable, copy the Ids of the variables that you want from the API plug-in, as described for the Report/Plug-in Variables attribute of the Reservation field. (The Reservation field appears earlier in this step.)

$({'resourceStatus':'100,200','reservationId':ca_fdGetTextFieldValue(ca_fd.formId,'reservation_id'),'**resourceType**':'662d774349a0-54f958451317186e4a5-7ff81311871077230'})

This list of variables returns all resources of the specified statuses (100-Created and 200-Ready) for the specified resource type (Computer), for the selected reservation.

The resourceType ID (662d774349a0-54f958451317186e4a5-7ff81311871077230) must match the [resource type ID](#) (see page 145) for Computer for your implementation. To verify the resource type ID, click Catalog, Configuration. In the left menu, click Resource Types.

Additional Disk (GB)

Specifies a select box and options for the amount in GB of the disk to add to the selected computer in the selected reservation. The user selects an amount, from the options that you provide.

In this field, specify the values for the following attributes:

_id attribute

Specify disk_size.

Cost Quantity

Specify the following values for this field:

– Name: Cost Quantity (Hidden)

– Value of the hidden attribute: true

– Value of the _id attribute: cost_quantity

The Cost Quantity field stores the quantity factor of the additional disk. This field works with the related custom JavaScript function for your billing method. These items work together to calculate the cost of the additional disk, as described in later steps in this topic.

4. Record the names of the fields that you created. You reference these names when you create the form element and attach the form.

5. Create a custom JavaScript functions to support your billing method, *one* of the following:

For periodic billing, use the following sample as a model:

```
{
  calculateCostQty : function() {
  var diskSize = parseInt(ca_fdGetTextFieldValue(ca_fd.formId, 'disk_size'));
  var costQty = diskSize;
  ca_fdSetTextFieldValue(ca_fd.formId, 'cost_quantity', costQty.toString());
  return true;
}
```

For one-time billing, use the following sample as a model:

```
{
 calculateCostQty : function() {
  var startDate = ca_fdGetDateFieldValueInMillis(ca_fd.formId, 'start_date');
  var now = new Date().getTime();
  var duration = (ca_fdGetDateFieldValueInMillis(ca_fd.formId, 'end_date') - Math.max(startDate, now)) /
86400000; //day duration
  var diskSize = parseInt(ca_fdGetTextFieldValue(ca_fd.formId, 'disk_size'));
  var costQty = duration * diskSize;
  ca_fdSetTextFieldValue(ca_fd.formId, 'cost_quantity', costQty.toString());
  return true;
}
```

In both calculations, the following applies:

■ The amount of additional disk space selected by the user is a cost quantity factor.

■ The attribute ID of the Additional Disk field (disk_size) is used.

Also consider for reference your custom JavaScript function for periodic billing (see page 157) or your custom JavaScript function for one-time billing (see page 158) for the Reserve Computer service.

The major difference between the two methods is that one-time billing includes duration in the cost calculation, while periodic billing does not.

Note: To view a template for a function, click Show Help on the Script dialog. The template shows the product-specific implementation of a standard JavaScript function.

Close the script dialog when you are finished.

6. Specify the name of your custom JavaScript function in the onSubmit attribute of the form. Use the following format:

ca_fd.js.*function-name*

An example follows:

ca_fd.js.calculateCostQty()

7. (Optional) Specify additional custom JavaScript functions for the form. For reference, if applicable, use any custom functions that you specified when you created the form for the Reserve Computer service (see page 153).

8. (Optional) Customize the form further, for example, to add organization-specific fields.

You have created the form for adding a disk to the reservation.

Note: Forms are *not* included in services. Instead, forms *link to* the service option groups that are included in services. Therefore, after you create and customize the form, you attach the form to the service option group.

Create the Service Option Group for Adding a Disk

Each reservation service in the catalog consists of one or more reservation-related service option groups. You create a service option group for each type of reservation that you want to support: Here, you add a service option group for adding a disk to an existing a reservation of a computer.

Follow these steps:

1. Click Catalog, Service Offerings.

    The Services tree appears and displays the folders containing services, organized hierarchically according to categories.

2. Click the Service Option Groups (SOGs) tab.

    The SOGs tree appears and lists alphabetically all service option groups for the business unit.

3. Click the Add icon and enter Add a Disk to a Computer as the name of the new service option group.

    The Service Option Group Details page appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

    If a field does not appear, specify a logical value of your choice.

    ■ Description: Add a disk to a computer

    ■ Type: Fixed

       This value determines how you can include this service option group within other service option groups as a characteristic of a service option element. A fixed service option group presumes a fixed cost or a variable cost that is based on usage.

5. Click OK.

You have created the service option group.

Create the Reservation Service Option and Attach the Form

In the previous procedure, you created the service option group for adding a disk (see page 176) to the reserved computer. Here, you create the reservation service option in that service option group. You customize the reservation service option to specify the type of reservation (for example, external or Reservation Manager) and other details.

Follow these steps:

1. Click Catalog, Service Offerings, SOGs, and click the service option group named Reserve Computer.

   The Details tab for this service option group appears.

2. Click the Definition tab.

3. Click Add Option.

4. The tab for the new service option appears.

5. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field is not listed, specify a logical value of your choice.

   ■   Name: Add a Disk to a Computer

   ■   Description: Add a disk to a computer already reserved through an external reservation system

   ■   Reservation Service Option: Selected

   ■   Operation: Modify

   ■   Reservation Ready Status: *your custom selection*

       Specifies the status of the request in CA Service Catalog when the external reservation system completes the provision of the reservation.

   ■   Reservation Failure Status: *your custom selection*

   ■   Specifies the status of the request in CA Service Catalog when the external reservation system fails to completes the provision of the reservation.

   ■   Reservation System: ca.catalog.DEMO1

   ■   Category: Reservation

   ■   Category Class: External Reservation System

       This scenario (see page 141) is designed for use when the Category Class is External Reservation System, not CA Spectrum Automation Manager Reservation Manager.

   ■   Category Subclass: Modify

   ■   External ID: Specifies a value to flag different resource types in the same Modify operation service. For example, your service includes two different resource types (see page 145) such as Disk and Memory. You create Modify services named Add Disk and Add Memory for existing reservations. You flag these services so that you can filter the event type in the rule condition according to the resource type. If this example matches your implementation, perform the following actions:

       –   Specify mod.disk as the value of this External ID field.

       –   Edit the custom rule (see page 146) named Add Resource Item - Disk. Append the event filter with the following phrase. Verify that the condition appears as shown after you save the rule:

           AND external_id = 'mod.disk'

       –   Complete the External ID field of the rate element of the service option group for adding a disk to an existing reservation (see page 181). Also, edit its related custom rule. These actions are similar to the actions in the previous two bullets.

   Note: For information about events, event filters, rules, and actions, see the *Administration Guide*.

6. Perform the following actions in the Forms section:

   a. Click the Add icon and attach the [form that you created earlier](#) (see page 170) for adding a disk to the existing external reservation.

      The dialog for attaching the form appears.

   b. In the Display Text field, enter Add a Disk to a Computer.

      This text appears as a description for the form when administrators view this service option group in the CA Service Catalog, Service Offerings, Option Groups tab.

   c. In the Form Name field, click the magnifying glass icon to select a form.

      The Form Tree pop-up dialog appears.

   d. Navigate through this form tree and select the form that you want to attach: Add a Disk to a Computer.

      You created this form earlier, as noted previously in this topic.

      The preview of the form appears in the right pane.

   e. Click the Select Form button.

      You return to the dialog for attaching the form.

Note: You can add the same form to a service option only once. However, a service option can have multiple forms.

7. If you do not want to hide or disable the entire form under any conditions, leave the Hidden and Disabled fields empty. Also, skip this step.

    If you do want to hide or disable the entire form, enter the corresponding JavaScript expression in the Hidden or Disabled field. You can hide or disable the form according to the request status, the user role or business unit, or other criteria. Use the following format: $(_.object.property). The expression must return a value of true or false.

    Note: You can specify a JavaScript expression in the Hidden field, the Disabled field, or both. For instructions to specify a JavaScript expression, see the *Administration Guide*.

    Examples follow:

    ■   To hide or disable the form when the request status is Pending Approval, enter the following JavaScript expression in the Hidden or Disabled field: $(_.request.status == 400).

    ■   To hide or disable the form for the end user roles only, enter $(_.user.role == 'enduser').

    ■   To hide or disable the form from all business units except ca.com, enter $(_.bu.id != 'ca.com').

    ■   To disable the form when the request status is Fulfilled, enter $(_.request.status == 2000).

    Note: When an entire form is disabled, it is disabled but visible during all stages of the request lifecycle except checkout. During checkout, a disabled form is both disabled and hidden.

8. Click Update.

    The dialog closes. The Catalog system attaches the form that you selected to this reservation service option.

9. Click Save.

    The Catalog system saves the reservation service option.

10. Click Return to Service Option Group.

    You return to the service option group, which now includes the reservation service option.

You have created the reservation service option and have attached the form. The service option group now includes both of them.

Create the Rate Element

Earlier, you created the service option group (see page 176) for adding a disk to an existing reservation of a computer. Here, you create the Rate element in that service option group. You customize the Rate element to specify cost-related fields for the service. You also customize the Rate element to reference the related resource type (see page 145) and form (see page 170) for the service. All of these elements work together to determine the cost of the service.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option named Add a Disk to a Computer. You created this service option (see page 177) earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group named Add a Disk to a Computer.

      The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option named Add a Disk to a Computer.

      The Details tab for this service option appears.

2. In the Prices/Cost box, click the Add icon.

   The Service Option Element dialog for a rate appears.

3. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

   If a field does not appear in the following list, specify a logical value of your choice.

   ■ Display Text: Periodic (Monthly) Charge; $2 per unit of extra disk space per day

   ■ Cost Type: Specify Value

   ■ Unit Cost: 2

   ■ Display Unit Type: Per GB per day

   ■ Charge Type: Charge

   ■ Budget: not selected

   ■ Billing Cycle: Periodic

   ■ Periodic Type: Monthly

   ■ Periodic Type Interval: 1

   ■ Quantity Specification: Form Specified

- Related Form: Add a Disk to a Computer

- Cost Quantity Form Field: Cost Quantity (Hidden)

  This field *must* match the field for calculating the cost quantity on the [form](#) (see page 170) for adding the disk.

- Charge Effective From Form Field: Start Date and Time

  This field *must* match the field for the reservation start date on the form for adding the disk. Billing begins on this date.

- Reservation Resource Type: Disk

  You created this [resource type](#) (see page 145) earlier.

4. Click Update.

   The dialog closes. The Catalog system saves the rate information that you specified for this reservation service option.

5. Click Save.

   The Catalog system saves the reservation service option.

6. Perform one of the following actions:

   - Click Return to Service Option Group.

     You return to the service option group, which now includes the updates that you made for the reservation service option. You can continue the process of creating the reservation service later.

   - Attach the policies and actions.

     You continue the process of creating the reservation service.

You have created the rate element.

Attach Policies and Actions

Note: This scenario does *not* require attached policies or attached actions. Complete the steps in this topic only if you want to create (or have created) a custom policy or action for this service option. Otherwise, skip this topic.

By default, CA Service Catalog evaluates all global policies and all events, rules, and actions (global actions only) for every requested *service*. However, for individual service options, you can replace this default behavior. From the Policies & Actions tab of a service option, you can specify that the Catalog system apply the following specifications to that service option:

- For policies, one of the following options: global policies only, attached policies only, or both global and attached policies

- For actions (including CA Process Automation processes), one of the following options: global actions only, attached actions only, or both global and attached actions

Note: As a best practice, use attached actions and policies *only* if you are using a discrete request life cycle that includes discrete approval of service options. This precaution helps avoid the unintended application of policies and actions at *both* the service and service option levels. For details about using a discrete request life cycle, see the *Administration Guide*.

Important! Applying policies or actions at both the service and service option levels could produce conflicting, unintended, or unpredictable results. If you decide to use attached policies and actions without discrete approval, carefully think through the results for both service options and the service. Review and test the affected services thoroughly in a test system before using them in a production system.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option. You created this service option earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group for the service option.

      The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option.

      The Details tab for this service option appears.

2. Click the Policies & Actions tab and specify one of the following options for policies: attached policies only or both global and attached policies.

3. Perform all of the following options that apply:

   ■ Click the Search icon to view and select the attached policies that are already created. Select the policy or policies that you want and attach them to this service option.

   ■ Click the Add icon to create an attached policy and attach it to this service option.

   The Catalog system opens the Policy Builder, which you use to create the policy.

   Note: For details about creating policies, see the *Administration Guide*.

   ■ Click the Remove icon to remove an attached policy.

   Note: Before you can delete an attached policy from the Catalog system, you remove the policy from all attached service options.

   ■ Click the Dependent Service Options icon to review the service options that are also using a policy.

   The Catalog system displays the service options that have the selected policy attached.

   Save your changes.

   The Catalog system saves your changes and attaches the policies that you specified to this service option.

4. Perform all of the following options that apply:

    ■   Click the Search icon to view and select the attached actions that are already created.

        The Catalog system opens the Request Events page.

        –   Use this page to access the event and rule you want.

        –   Select the action or actions that you want and attach them to this service option.

    ■   Click the Add icon to create an attached action and attach it to this service option.

        The Catalog system opens the Request Events page.

        –   Use this page to access the event and rule you want.

        –   If applicable, create a rule for the attached action.

        –   Create the attached action and attach it to this service option.

        Note: For details about creating rules and actions, see the *Administration Guide*.

    ■   Click the Remove icon to remove an attached action.

        Note: Before you can delete an attached action from the Catalog system, you remove the action from all attached service options.

    ■   Click the attached action to review the other service options that are also using this action.

        A dialog appears and lists the other service options (if any) that have the selected action attached.

    Save your changes.

    The Catalog system saves your changes and attaches the actions that you specified to this service option.

5. Click Return to Service Option Group.

    You return to the service option group, which now includes the updates that you made for the reservation service option.

You have attached the policies and CA Process Automation processes.

Create the Reservation Service for Adding Memory

You can create a service that lets users add resources, for example, extra memory (RAM), to an existing reservation. You create this service by defining the service and its options, including all related service option elements. You also create a related form and attach the form to the service option. Together, these elements comprise the service that users request to add resources to an existing reservation.

1. Create the form for adding memory (see page 187).

   You use the form and the rate element mentioned in the next step to define the cost for the service.

2. Create the service option group for adding memory (see page 193).

   As part of this process, you do the following:

   ■   Create the Reservation service option and attach the form (see page 194).

   ■   Create the Rate element (see page 198).

   ■   Attach the policies and CA Process Automation processes.

   Note: The Reservation element, Form element, and Rate element are the service option elements that comprise the service option group. In the following topics, the field values for creating and configuring these elements are customized for this scenario. If applicable, you can customize field values to meet your requirements. For details about the fields for these elements, see the *Administration Guide.*

3. Create the reservation service, as follows:

   a. Click Catalog, Services Offerings.

      The Services page appears. This page displays the folders containing services, organized hierarchically.

   b. Expand the tree and select the folder in which you want to add the new service.

      Note: To add a service at the service provider (top) level, click the plus sign without expanding the tree.

   c. Click Add, Offering and enter Add Memory to a Computer as the name of the new service.

      The Details page for a new service appears.

   d. Complete the fields on the dialog and set the permissions.

      Note: For more details about these fields and about creating a service, see the *Administration Guide*.

4. Define the service, as follows:

   a. Expand the tree to display the service named Add Memory to a Computer and click the Definition tab.

   b. Add the service option group named Add Memory to a Computer to the service.

   c. Perform any additional actions that apply, for example, the following:

      ■ Add another service option group to the service.

      ■ Set permissions on which user roles can subscribe to or request the service option group.

      Note: For more details about these actions about defining a service, see the *Administration Guide*.

You have created the reservation service.

Create the Form for Adding Memory

You create and customize a form for your service for adding memory (RAM) to an existing reservation of a computer. When users request that service, they use this form to specify important details, including the amount of memory to add to the reservation. As an administrator, you specify a cost field and related elements in the form to calculate the cost of the reservation.

Note: For details about adding elements to forms, see the *Administration Guide.*

Follow these steps:

1. Click Catalog, Forms.

   The Form Designer opens.

2. Create the folder where you want to organize the reservation forms. In that folder, create a form named Add Memory to a Computer.

3. Add the elements that you want to the form, including elements for the following fields:

   Reservation

   Specifies a select box and options that lists all reservations for the logged in user. The user selects one reservation from this list.

   Specify values for the following attributes:

   _id attribute

   Specify reservations.

Report/Plug-in Id attribute

Specify ca.catalog.reservations-select-plugin.

This predefined API plug-in retrieves the list of reservations for the logged in user. You can view this plug-in on the Administration, Tools, Plug-ins page.

Report/Plug-in Variables attribute

Specify the list of variables that the plug-in retrieves.

If applicable, open the API plug-in that you selected to display its details, including variables. On the details page, the Inputs section lists the ID values and descriptions of the input variables for the plug-in. Copy the Ids of the variables that you want from that page and paste them into the value of the Report/Plug-in Variables attribute.

For both, enter variables as a JSON expression, for example:

$({'<variable name>' : '<variable value>', ...})

$({'userId':_.user.id,'buId':_.bu.id,'reservationSystem':'ca.catalog.DEMO1','label':'rname'})

Important! Specify variables carefully. If you specify no variables, unpredictable results can occur.

This list of variables returns all reservations for the selected external reservation system (ca.catalog.DEMO1) for the specified user in the specified business unit.

The label (rname) specifies the _id value of the Reservation Name field on the Reserve Computer form (see page 153). This label helps fetch the descriptive reservation text for the reservations.

The reservationSystem (ca.catalog.DEMO1) specifies the value of the Reservation System fields for every reservation element for all services in this scenario.

On Change attribute

Enter following JavaScript function to fetch the value of the Virtual Machines field, which appears later on this form. This function initiates the fetch of the Virtual Machine drop down list when the user selects the reservation. This function uses the _id attribute of that field (resource_id).

ca_fdFetchSelectData(ca_fd.formId,'resource_id');

Note: This following applies to the Select Reservation Id, Start Date, End Date, and Status fields: Each field value is prefilled with output data from ca.catalog.reservations-select-plugin when the user selects the reservation. This plug-in is described in the Report/Plug-in Variables attribute earlier in this step.

Select Reservation Id

Specifies the reservation selected by the logged in user.

Specify values for the following attributes:

For the _id attribute, specify reservation_id.

For the Hidden attribute, specify true.

Start Date

Specifies the reservation start date.

For the _id attribute, specify start_date.

End Date

Specifies the reservation end date.

For the _id attribute, specify end_date.

Status

Specifies the status of the selected reservation.

For the _id attribute, specify status.

Virtual Machines

Specifies a select box and options that lists all resources reserved for the selected reservation. The user selects one computer from this list.

Specify the values for the following attributes:

_id attribute

Specify resource_id.

Report/Plug-in Id attribute

Specify this value: ca.catalog.resources-select-plugin.

This predefined API plug-in retrieves the list of resources reserved for the logged in user. You can view this plug-in on the Administration, Tools, Plug-ins page.

Report/Plug-in Variables attribute

Specify the list of variables that the plug-in retrieves, as follows. If applicable, copy the Ids of the variables that you want from the API plug-in, as described for the Report/Plug-in Variables attribute of the Reservation field. (The Reservation field appears earlier in this step.)

$({'resourceStatus':'100,200','reservationId':ca_fdGetTextFieldValue(ca_fd.formId,'reservation_id'),'resourceType':'662d774349a0-54f958451317186e4a5-7ff81311871077230'})

This list of variables returns all resources of the specified statuses (100-Created and 200-Ready) for the specified resource type (Computer), for the selected reservation.

The resourceType ID (662d774349a0-54f958451317186e4a5-7ff81311871077230) must match the [resource type ID](#) (see page 145) for Computer for your implementation. To verify the resource type ID, click Catalog, Configuration. In the left menu, click Resource Types.

Additional Memory (GB)

Specifies a select box and options for the amount in GB of memory to add to the selected computer in the selected reservation. The user selects an amount, from the options that you provide.

In this field, specify the values for the following attributes:

_id attribute

Specify additional_memory.

Cost Quantity

Specify the following values for this field:

–   Name: Cost Quantity (Hidden)

–   Value of the hidden attribute: true

–   Value of the _id attribute: cost_quantity

The Cost Quantity field stores the quantity factor for extra memory. This field work with the related custom JavaScript function for your billing method. These items work together to calculate the cost of the additional memory, as described in later steps in this topic.

4. Record the names of the fields that you created. You reference these names when you create the form element and attach the form.

5. Create a custom JavaScript functions to support your billing method, *one* of the following:

For periodic billing, use the following sample as a model:

```
{
 calculateCostQty : function() {
   var numMem = parseFloat(ca_fdGetTextFieldValue(ca_fd.formId, 'additional_memory')) / 0.25;
   var costQty = numMem;
   ca_fdSetTextFieldValue(ca_fd.formId, 'cost_quantity', costQty.toString());
   return true;
 }
 }
```

For one-time billing, use the following sample as a model:

```
{
calculateCostQty : function() {
   var duration = (ca_fdGetDateFieldValueInMillis(ca_fd.formId, 'end_date') - Math.max(new
Date().getTime(), ca_fdGetDateFieldValueInMillis(ca_fd.formId, 'start_date'))) / 86400000; //day duration
   var numMem = parseFloat(ca_fdGetTextFieldValue(ca_fd.formId, 'additional_memory')) / 0.25;
   var costQty = duration * numMem;

   ca_fdSetTextFieldValue(ca_fd.formId, 'cost_quantity', costQty.toString());
   return true;
}
}
```

In both calculations, the following applies:

■ The amount of additional memory selected by the user is a cost quantity factor.

■ The attribute ID of the Additional Memory field (additional_memory) is used.

Also consider for reference your custom JavaScript function for periodic billing (see page 157) or your custom JavaScript function for one-time billing (see page 158) for the Reserve Computer service.

The major difference between the two methods is that one-time billing includes duration in the cost calculation, while periodic billing does not.

Note: To view a template for a function, click Show Help on the Script dialog. The template shows the product-specific implementation of a standard JavaScript function.

Close the script dialog when you are finished.

6. Specify the name of your custom JavaScript function in the onSubmit attribute of the form. Use the following format:

ca_fd.js.*function-name*

An example follows:

ca_fd.js.calculateCostQty()

7. (Optional) Specify additional custom JavaScript functions for the form. For reference, if applicable, use any custom functions that you specified when you created the form for the Reserve Computer service (see page 153).

8. (Optional) Customize the form further, for example, to add organization-specific fields.

Note: For this scenario, customizing this form further is optional. However, if applicable, you can update the form to meet other requirements, for example, to match organizational standards. For details about specifying forms, see the *Administration Guide*.

You have created the form for adding memory to the reservation.

Note: Forms are *not* included in services. Instead, forms *link to* the service option groups that are included in services. Therefore, after you create and customize the form, you attach the form to the service option group.

Create the Service Option Group for Adding Memory

Each reservation service in the catalog consists of one or more reservation-related service option groups. You create a service option group for each type of reservation that you want to support: Here, you add a service option group for adding memory (RAM) to an existing a reservation of a computer.

Follow these steps:

1. Click Catalog, Service Offerings.

   The Services tree appears and displays the folders containing services, organized hierarchically according to categories.

2. Click the Service Option Groups (SOGs) tab.

   The SOGs tree appears and lists alphabetically all service option groups for the business unit.

3. Click the Add icon and enter Add Memory to a Computer as the name of the new service option group.

   The Service Option Group Details page appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field does not appear, specify a logical value of your choice.

   ■   Description: Add memory to a computer

   ■   Type: Fixed

      This value determines how you can include this service option group within other service option groups as a characteristic of a service option element. A fixed service option group presumes a fixed cost or a variable cost that is based on usage.

5. Click OK.

You have created the service option group.

Create the Reservation Service Option and Attach the Form

Earlier, you created the service option group for adding memory (see page 193) to the reserved computer. Here, you create the reservation element in that service option group. You customize the reservation element to specify the type of reservation (for example, external or Reservation Manager) and other details.

Follow these steps:

1. Click Catalog, Service Offerings, SOGs, and click the service option group named Add a Memory to a Computer.

   The Details tab for this service option group appears.

2. Click the Definition tab.

3. Click Add Option.

4. The dialog for attaching the form appears.

5. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field is not listed, specify a logical value of your choice.

   ■ Name: Add Memory to a Computer

   ■ Description: Add memory to a computer already reserved through an external reservation system

   ■ Reservation Service Option: Selected

   ■ Operation: Modify

   ■ Reservation Ready Status: *your custom selection*

   Specifies the status of the request in CA Service Catalog when the external reservation system completes the provision of the reservation.

   ■ Reservation Failure Status: *your custom selection*

   Specifies the status of the request in CA Service Catalog when the external reservation system fails to completes the provision of the reservation.

   ■ Reservation System: ca.catalog.DEMO1

   ■ Category: Reservation

   ■ Category Class: External Reservation System

   This scenario (see page 141) is designed for use when the Category Class is External Reservation System, not CA Spectrum Automation Manager Reservation Manager.

   ■ Category Subclass: Modify

   ■ External ID: Specifies a value to flag different resource types in the same Modify operation service. For example, your service includes two different resource types (see page 145) such as Disk and Memory. You create Modify services named Add Disk and Add Memory for existing reservations. You flag these services so that you can filter the event type in the rule condition according to the resource type. If this example matches your implementation, perform the following actions:

   – Specify mod.memory as the value of this External ID field.

   – Edit the custom rule (see page 146) named Add Resource Item - Memory. Append the event filter with the following condition. Verify that the condition appears as shown after you save the rule:

      AND external_id = 'mod.memory'

   – Complete the External ID field of the rate element of the service option group for adding memory to an existing reservation (see page 198). Also, edit its related custom rule.

   Note: For information about events, event filters, rules, and actions, see the *Administration Guide*.

6. Perform the following actions in the Forms section:

   a. Click the Add icon and attach the form that you created earlier (see page 187) for adding memory to the existing external reservation.

      The dialog for attaching the form appears.

   b. In the Display Text field, enter Add Memory to a Computer.

      This text appears as a description for the form when administrators view this service option group in the CA Service Catalog, Service Offerings, Option Groups tab.

   c. In the Form Name field, click the magnifying glass icon to select a form.

      The Form Tree pop-up dialog appears.

   d. Navigate through this form tree and select the form that you want to attach: Add Memory to a Computer.

      You created this form earlier, as noted previously in this topic.

      The preview of the form appears in the right pane.

   e. Click the Select Form button.

      You return to the dialog for attaching the form.

   Note: You can add the same form to a service option only once. However, a service option can have multiple forms.

7. If you do not want to hide or disable the entire form under any conditions, leave the Hidden and Disabled fields empty. Also, skip this step.

    If you do want to hide or disable the entire form, enter the corresponding JavaScript expression in the Hidden or Disabled field. You can hide or disable the form according to the request status, the user role or business unit, or other criteria. Use the following format: $(_.object.property). The expression must return a value of true or false.

    Note: You can specify a JavaScript expression in the Hidden field, the Disabled field, or both. For instructions to specify a JavaScript expression, see the *Administration Guide*.

    Examples follow:

    ■   To hide or disable the form when the request status is Pending Approval, enter the following JavaScript expression in the Hidden or Disabled field: $(_.request.status == 400).

    ■   To hide or disable the form for the end user roles only, enter $(_.user.role == 'enduser').

    ■   To hide or disable the form from all business units except ca.com, enter $(_.bu.id != 'ca.com').

    ■   To disable the form when the request status is Fulfilled, enter $(_.request.status == 2000).

    Note: When an entire form is disabled, it is disabled but visible during all stages of the request lifecycle except checkout. During checkout, a disabled form is both disabled and hidden.

8. Click Update.

    The dialog closes. The Catalog system attaches the form that you selected to this reservation service option.

9. Click Save.

    The Catalog system saves the reservation service option.

10. Click Return to Service Option Group.

    You return to the service option group, which now includes the reservation service option.

You have created the reservation service option and have attached the form. The service option group now includes both of them.

Create the Rate Element

Earlier, you [created the service option group for adding memory](#) (see page 193) to the existing reservation of a computer. Here, you create the Rate element in that service option group. You customize the Rate element to specify cost-related fields for the service. You also customize the Rate element to reference the related [resource type](#) (see page 145) and [form](#) (see page 187) for the service. All of these elements work together to determine the cost of the service.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option named Add Memory to Computer. You [created this service option](#) (see page 194) earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group named Add Memory to Computer.

      The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option named Add Memory to Computer.

      The Details tab for this service option appears.

2. In the Prices/Cost box, click the Add icon.

   The Service Option Element dialog for a rate appears.

3. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

   If a field does not appear in the following list, specify a logical value of your choice.

   ■ Display Text: Periodic (Monthly) Charge; $3 per unit of extra memory per day

   ■ Cost Type: Specify Value

   ■ Unit Cost: 3

   ■ Display Unit Type: Per 0.25 GB per day

   ■ Charge Type: Charge

   ■ Budget: not selected

   ■ Billing Cycle: Periodic

   ■ Periodic Type: Monthly

   ■ Periodic Type Interval: 1

   ■ Quantity Specification: Form Specified

- Related Form: Add Memory to a Computer

- Cost Quantity Form Field: Cost Quantity (Hidden)

  This field *must* match the field for calculating the cost quantity on the [form for adding memory](#) (see page 187).

- Charge Effective From Form Field: Start Date and Time

  This field *must* match the field for the reservation start date on the [form for adding memory](#) (see page 187). Billing begins on this date.

- Reservation Resource Type: Memory

  You created this [resource type](#) (see page 145) earlier.

4. Click Update.

   The dialog closes. The Catalog system saves the rate information that you specified for this reservation service option.

5. Click Save.

   The Catalog system saves the reservation service option.

6. Perform one of the following actions:

   - Click Return to Service Option Group.

     You return to the service option group, which now includes the updates that you made for the reservation service option. You can continue the process of creating the reservation service later.

   - Attach the policies and actions.

     You continue the process of creating the reservation service.

You have created the rate element.

Attach Policies and Actions

Note: This scenario does *not* require attached policies or attached actions. Complete the steps in this topic only if you want to create (or have created) a custom policy or action for this service option. Otherwise, skip this topic.

By default, CA Service Catalog evaluates all global policies and all events, rules, and actions (global actions only) for every requested *service*. However, for individual service options, you can replace this default behavior. From the Policies & Actions tab of a service option, you can specify that the Catalog system apply the following specifications to that service option:

■ For policies, one of the following options: global policies only, attached policies only, or both global and attached policies

■ For actions (including CA Process Automation processes), one of the following options: global actions only, attached actions only, or both global and attached actions

Note: As a best practice, use attached actions and policies *only* if you are using a discrete request life cycle that includes discrete approval of service options. This precaution helps avoid the unintended application of policies and actions at *both* the service and service option levels. For details about using a discrete request life cycle, see the *Administration Guide*.

Important! Applying policies or actions at both the service and service option levels could produce conflicting, unintended, or unpredictable results. If you decide to use attached policies and actions without discrete approval, carefully think through the results for both service options and the service. Review and test the affected services thoroughly in a test system before using them in a production system.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option. You created this service option earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group for the service option.

   The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option.

   The Details tab for this service option appears.

2. Click the Policies & Actions tab and specify one of the following options for policies: attached policies only or both global and attached policies.

3. Perform all of the following options that apply:

   ■ Click the Search icon to view and select the attached policies that are already created. Select the policy or policies that you want and attach them to this service option.

   ■ Click the Add icon to create an attached policy and attach it to this service option.

   The Catalog system opens the Policy Builder, which you use to create the policy.

   Note: For details about creating policies, see the *Administration Guide*.

   ■ Click the Remove icon to remove an attached policy.

   Note: Before you can delete an attached policy from the Catalog system, you remove the policy from all attached service options.

   ■ Click the Dependent Service Options icon to review the service options that are also using a policy.

   The Catalog system displays the service options that have the selected policy attached.

   Save your changes.

   The Catalog system saves your changes and attaches the policies that you specified to this service option.

4. Perform all of the following options that apply:

■ Click the Search icon to view and select the attached actions that are already created.

   The Catalog system opens the Request Events page.

   – Use this page to access the event and rule you want.

   – Select the action or actions that you want and attach them to this service option.

■ Click the Add icon to create an attached action and attach it to this service option.

   The Catalog system opens the Request Events page.

   – Use this page to access the event and rule you want.

   – If applicable, create a rule for the attached action.

   – Create the attached action and attach it to this service option.

   Note: For details about creating rules and actions, see the *Administration Guide*.

■ Click the Remove icon to remove an attached action.

   Note: Before you can delete an attached action from the Catalog system, you remove the action from all attached service options.

■ Click the attached action to review the other service options that are also using this action.

   A dialog appears and lists the other service options (if any) that have the selected action attached.

Save your changes.

The Catalog system saves your changes and attaches the actions that you specified to this service option.

5. Click Return to Service Option Group.

You return to the service option group, which now includes the updates that you made for the reservation service option.

You have attached the policies and CA Process Automation processes.

Create the Service for Extending the Reservation

You can create a service to extend the length of an existing reservation, for example, from 15 days to 20 days. You create this service by defining the service and its options, including all related service option elements. You also create a related form and attach the form to the service option. Together, these elements comprise the service that users request to extend the length of an existing reservation. For this scenario, you create a service named Extend a Reservation.

1. Create the form for extending the reservation (see page 204).

   You use the form and the rate element mentioned in the next step to define the cost for the service.

2. Create the service option group for extending the reservation (see page 208).

   As part of this process, you do the following:

   - Create the Reservation service option and attach the form (see page 209).

   - Create the Rate element (see page 212).

   - Attach the policies and CA Process Automation processes.

   Note: The Reservation element, Form element, and Rate element are the service option elements that comprise the service option group. In the following topics, the field values for creating and configuring these elements are customized for this scenario. If applicable, you can customize field values to meet your requirements. For details about the fields for these elements, see the *Administration Guide.*

3. Create the reservation service, as follows:

   a. Click Catalog, Services Offerings.

      The Services page appears. This page displays the folders containing services, organized hierarchically.

   b. Expand the tree and select the folder in which you want to add the new service.

      Note: To add a service at the service provider (top) level, click the plus sign without expanding the tree.

   c. Click Add, Offering and enter the name of the new service as Extend a Reservation.

      The Details page for a new service appears.

   d. Complete the fields on the dialog and set the permissions.

      Note: For more details about these fields and about creating a service, see the *Administration Guide*.

4. Define the service, as follows:

    a. Expand the tree to display the service named Extend a Reservation and click the Definition tab.

    b. Add the service option group named Extend a Reservation to the service.

    c. Perform any additional actions that apply, for example, the following:

        ■   Add another service option group to the service.

        ■   Set permissions on which user roles can subscribe to or request the service option group.

        Note: For more details about these actions about defining a service, see the *Administration Guide*.

You have created the service for extending the reservation.

Create the Form for Extending the Reservation

You create and customize a form for your service for extending an existing reservation of a computer. When users request that service, they use this form to specify important details, including the length of the extension. As an administrator, you specify a cost field and related elements in the form to calculate the cost of the reservation.

Note: For details about adding elements to forms, see the *Administration Guide.*

Follow these steps:

1. Click Catalog, Forms.

    The Form Designer opens.

2. Create the folder where you want to organize the reservation forms. In that folder, create a form named Extend Computer Reservation.

3. Add the elements that you want to the form, including elements for the following fields:

    Reservation

    Specifies a select box and options that lists all reservations for the logged in user. The user selects one reservation from this list.

    In this field, specify the values for the following attributes:

    _id attribute

    Specify reservations.

    Report/Plug-in Id attribute

    Specify ca.catalog.reservations-select-plugin.

    This predefined API plug-in retrieves the list of reservations for the logged in user. You can view this plug-in on the Administration, Tools, Plug-ins page.

Report/Plug-in Variables attribute

Specify the list of variables that the plug-in retrieves.

If applicable, open the API plug-in that you selected to display its details, including variables. On the details page, the Inputs section lists the ID values and descriptions of the input variables for the plug-in. Copy the Ids of the variables that you want from that page and paste them into the value of the Report/Plug-in Variables attribute.

For both, enter variables as a JSON expression, for example:

$({'<variable name>' : '<variable value>', ...})

$({'userId':_.user.id,'buId':_.bu.id,'reservationSystem':'ca.catalog.DEMO1','label':'rname'})

Important! Specify variables carefully. If you specify no variables, unpredictable results can occur.

This list of variables returns all reservations for the selected external reservation system (ca.catalog.DEMO1) for the specified user in the specified business unit.

The label (rname) specifies the _id value of the Reservation Name field on the Reserve Computer form (see page 153). This label helps fetch the descriptive reservation text for the reservations.

The reservationSystem (ca.catalog.DEMO1) specifies the value of the Reservation System fields for every reservation element for all services in this scenario.

On Change attribute

Enter following JavaScript function to fetch the minimum valid date value of the extension, which appears later on this form. This function prefills the minimum valid date value of extension when the user selects the reservation.

ca_fd.js.onReservationChange()

Note: This following applies to the Select Reservation Id, Start Date, End Date, and Status fields: Each field value is prefilled with output data from ca.catalog.reservations-select-plugin when the user selects the reservation. This plug-in is described in the Report/Plug-in Variables attribute earlier in this step.

Select Reservation Id

Specifies the reservation selected by the logged in user.

Specify values for the following attributes:

For the _id attribute, specify reservation_id.

For the Hidden attribute, specify true.

Start Date

Specifies the reservation start date.

For the _id attribute, specify start_date.

End Date

Specifies the reservation end date.

For the _id attribute, specify end_date.

Status

Specifies the status of the selected reservation.

For the _id attribute, specify status.

Extension Date and Time field

Specifies the Date Time field for the end date of the extension.

The user selects the end date of the extension.

For the _id attribute, specify extension_date_time.

Cost Quantity

Specify the following values for this field:

– Name: Cost Quantity (Hidden Field)

– Value of the hidden attribute: true

– Value of the _id attribute: cost_quantity

The Cost Quantity field and the quantity field work with the related custom JavaScript function for your billing method. These items work together to calculate the cost of the reservation, as described in later steps in this topic.

4. Record the names of the fields that you created. You reference these names when you create the form element and attach the form.

5. (Optional) Specify additional custom JavaScript functions for the form, if necessary, as follows:

   a. Enter the code for the function in the Script dialog of the Form Designer. The topic for creating the form for adding memory (see page 187) provides details about using the Script dialog. The following example sets the minimum date value of the extension. This code helps prevent the user from setting an invalid extension date.

   ```
   {
       onReservationChange : function() {
         var nextHour = new Date();
         nextHour.setHours(nextHour.getHours() + 1);
         nextHour.setMinutes(0);
         nextHour.setSeconds(0);
         nextHour.setMilliseconds(0);
         var minExtend = Math.max(ca_fdGetDateFieldValueInMillis(ca_fd.formId,'end_date'), nextHour);
         ca_fdSetDateFieldValue(ca_fd.formId, 'extension_date_time', minExtend);
         ca_fdSetDateFieldMinValue(ca_fd.formId, 'extension_date_time', minExtend);
       }
   }
   ```

   b. Specify the name of your custom JavaScript function in the appropriate attribute of the appropriate field on the form. Use the following format:

      ca_fd.js.*function-name*

      For the previous example for setting the minimum date value of the extension, enter the name of the function in the onChange attribute of the Reservation field described earlier in this topic, as follows: ca_fd.js.onReservationChange().

6. (Optional) Customize the form further, for example, to add organization-specific fields.

You have created the form for extending an existing reservation.

Note: Forms are *not* included in services. Instead, forms *link to* the service option groups that are included services. Therefore, after you create and customize the form, you attach the form to the service option group.

Create the Service Option Group for Extending the Reservation

Each reservation service in the catalog consists of one or more reservation-related service option groups. You create a service option group for each type of reservation that you want to support: Here, you add a service option group is for extending an existing a reservation of a computer.

Follow these steps:

1. Click Catalog, Service Offerings.

   The Services tree appears and displays the folders containing services, organized hierarchically according to categories.

2. Click the Service Option Groups (SOGs) tab.

   The SOGs tree appears and lists alphabetically all service option groups for the business unit.

3. Click the Add icon and enter Extend Computer Reservation as the name of the new service option group.

   The Service Option Group Details page appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field does not appear, specify a logical value of your choice.

   ■ Description: Extend the duration of the reservation of a computer

   ■ Type: Fixed

   This value determines how you can include this service option group within other service option groups as a characteristic of a service option element. A fixed service option group presumes a fixed cost or a variable cost that is based on usage.

5. Click OK.

You have created the service option group.

Create the Reservation Service Option and Attach the Form

In the previous procedure, you created the service option group for extending the reservation (see page 208) of the computer. Here, you create the reservation element in that service option group. You customize the reservation element to specify the type of reservation (for example, external or Reservation Manager) and other details.

Follow these steps:

1. Click Catalog, Service Offerings, SOGs, and click the service option group named Extend Computer Reservation.

   The Details tab for this service option group appears.

2. Click the Definition tab.

3. Click Add Option.

   The dialog for attaching the form appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field is not listed, specify a logical value of your choice.

   - Name: Extend Computer Reservation

   - Description: Extend an existing reservation of a computer through an external reservation system

   - Reservation Service Option: Selected

   - Operation: Extend

   - Reservation Ready Status: *your custom selection*

     Specifies the status of the request in CA Service Catalog when the external reservation system completes the provision of the reservation.

   - Reservation Failure Status: *your custom selection*

     Specifies the status of the request in CA Service Catalog when the external reservation system fails to completes the provision of the reservation.

   - Reservation System: ca.catalog.DEMO1

   - Category: Reservation

   - Category Class: External Reservation System

     This scenario (see page 141) is designed for use when the Category Class is External Reservation System, not CA Spectrum Automation Manager Reservation Manager.

   - Category Subclass: Extend

5. Perform the following actions in the Forms section:

   a. Click the Add icon and attach the [form that you created earlier](#) (see page 204) for extending the reservation.

      The dialog for attaching the form appears.

   b. In the Display Text field, enter Extend Computer Reservation.

      This text appears as a description for the form when administrators view this service option group in the CA Service Catalog, Service Offerings, Option Groups tab.

   c. In the Form Name field, click the magnifying glass icon to select a form.

      The Form Tree pop-up dialog appears.

   d. Navigate through this form tree and select the form that you want to attach: Extend Computer Reservation.

      You created this form earlier, as noted previously in this topic.

      The preview of the form appears in the right pane.

   e. Click the Select Form button.

      You return to the dialog for attaching the form.

   Note: You can add the same form to a service option only once. However, a service option can have multiple forms.

6. If you do not want to hide or disable the entire form under any conditions, leave the Hidden and Disabled fields empty. Also, skip this step.

   If you do want to hide or disable the entire form, enter the corresponding JavaScript expression in the Hidden or Disabled field. You can hide or disable the form according to the request status, the user role or business unit, or other criteria. Use the following format: $(_.object.property). The expression must return a value of true or false.

   Note: You can specify a JavaScript expression in the Hidden field, the Disabled field, or both. For instructions to specify a JavaScript expression, see the *Administration Guide*.

   Examples follow:

   ■ To hide or disable the form when the request status is Pending Approval, enter the following JavaScript expression in the Hidden or Disabled field: $(_.request.status == 400).

   ■ To hide or disable the form for the end user roles only, enter $(_.user.role == 'enduser').

   ■ To hide or disable the form from all business units except ca.com, enter $(_.bu.id != 'ca.com').

   ■ To disable the form when the request status is Fulfilled, enter $(_.request.status == 2000).

   Note: When an entire form is disabled, it is disabled but visible during all stages of the request lifecycle except checkout. During checkout, a disabled form is both disabled and hidden.

7. Click Update.

   The dialog closes. The Catalog system attaches the form that you selected to this reservation service option.

8. Click Save.

   The Catalog system saves the reservation service option.

9. Click Return to Service Option Group.

   You return to the service option group, which now includes the reservation service option.

You have created the reservation service option and have attached the form. The service option group now includes both of them.

Create the Rate Elements

Earlier, you created the service option group for extending (see page 208) the existing reservation of a computer. Here, you create the Rate element in that service option group. You customize the Rate element to specify cost-related fields for the service. You also customize the Rate element to reference the related resource type (see page 145) and form (see page 204) the service. All of these elements work together to determine the cost of the service.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option named Extend Computer Reservation. You created this service option (see page 209) earlier. If you are already accessing it, skip to the next step.

    a. Click Catalog, Service Offerings, SOGs, and click the service option group named Extend Computer Reservation.

    The Details tab for this service option group appears.

    b. Click the Definition tab.

    c. Edit the service option named Extend Computer Reservation.

    The Details tab for this service option appears.

2. In the Prices/Cost box, click the Add icon.

    The Service Option Element dialog for a rate appears.

3. Verify that the fields specify the following values. Update the values, if necessary, to match these specifications, and click Update.

    ■   Display Text: Periodic (Monthly) Charge; $1 per day per Computer

    ■   Cost Type: Specify Value.

    ■   Use Original Reservation Cost: Selected

    Note: This option applies only to service option elements for extending existing reservations or returning existing reservations early. If this option is selected, then the following applies: The reservation unit cost (for the extension or early return) is the original reservation cost for the resource type specified in the existing reservation.

    If you are creating or updating services that integrate with Reservation Manager, the following applies to the Use Original Reservation Cost option. This option is not available, because in the Reservation element, the Category Class is set to CA Spectrum Automation Manager Reservation Manager. This scenario is designed for use (see page 141) when the Category Class is set to External Reservation System, not Reservation Manager.

■ Unit Cost: 0

Note: This field is automatically disabled and its value set to zero when Use Original Reservation Cost is selected. If Use Original Reservation Cost is not selected, then The Unit cost field is enabled.

■ Display Unit Type: Per Computer per day

■ Charge Type: Charge

■ Budget: not selected

■ Billing Cycle: Periodic

■ Periodic Type: Monthly

■ Periodic Type Interval: 1

■ Quantity Specification: Form Specified

■ Related Form: Extend Computer Reservation

■ Cost Quantity Form Field: Cost Quantity (Hidden)

Note: The cost quantity is calculated automatically according to the resource type that the user selects while completing the request to extend or return the service.

■ Charge Effective From Form Field: End Date and Time

■ Reservation Resource Type: Computer

You created this resource type earlier.

4. Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

The rate element is added.

5. In the Prices/Cost box, click the Add icon.

The Service Option Element dialog for a rate appears.

6. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

■ Display Text: Periodic (Monthly) Charge; $2 per day per 1 GB Disk

■ Cost Type: Specify Value.

■ Use Original Reservation Cost: Selected

Note: This option applies only to service option elements for extending existing reservations or returning existing reservations early. If this option is selected, then the following applies: The reservation unit cost (for the extension or early return) is the original reservation cost for the resource type specified in the existing reservation.

- Unit Cost: 0

  Note: This field is automatically disabled and its value set to zero when Use Original Reservation Cost is selected. If Use Original Reservation Cost is not selected, the Unit cost field is enabled.

- Display Unit Type: Per GB per day

- Charge Type: Charge

- Budget: not selected

- Billing Cycle: Periodic

- Periodic Type: Monthly

- Periodic Type Interval: 1

- Quantity Specification: Form Specified

- Related Form: Extend Computer Reservation

- Cost Quantity Form Field: N/A

  Note: The cost quantity is calculated automatically according to the resource type that the user selects while completing the request to extend or return the service.

- Charge Effective From Form Field: End Date and Time

- Reservation Resource Type: Disk

  You created this resource type (see page 145) earlier.

- (Optional) Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

7. Double-click the fifth cell and define the service option element as Rate.

   The Service Option Element dialog Definition Tab for this cost cell appears.

8. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

   - Display Text: Periodic (Monthly) Charge; $3 per day per 0.25 GB Memory

   - Cost Type: Specify Value.

   - Use Original Reservation Cost: Selected

     Note: This option applies only to service option elements for extending existing reservations or returning existing reservations early. If this option is selected, then the following applies: The reservation unit cost (for the extension or early return) is the original reservation cost for the resource type specified in the existing reservation.

- Unit Cost: 0

  Note: This field is automatically disabled and its value set to zero when Use Original Reservation Cost is selected. If Use Original Reservation Cost is not selected, then The Unit cost field is enabled.

- Display Unit Type: Per 0.25 GB per day

- Charge Type: Charge

- Budget: not selected

- Billing Cycle: Periodic

- Periodic Type: Monthly

- Periodic Type Interval: 1

- Quantity Specification: Form Specified

- Related Form: Extend Computer Reservation

- Cost Quantity Form Field: N/A

  Note: The cost quantity is calculated automatically according to the resource type that the user selects while completing the request to extend or return the service.

- Charge Effective From Form Field: End Date and Time

- Reservation Resource Type: Memory

  You created this resource type (see page 145) earlier

- (Optional) Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

The dialog closes. The Catalog system saves the rate information that you specified for this reservation service option.

9. Click Save.

   The Catalog system saves the reservation service option.

10. Perform one of the following actions:

- Click Return to Service Option Group.

  You return to the service option group, which now includes the updates that you made for the reservation service option. You can continue the process of creating the reservation service later.

- Attach the policies and actions.

  You continue the process of creating the reservation service.

You have customized the rate element for extending the reservation.

Attach Policies and Actions

Note: This scenario does *not* require attached policies or attached actions. Complete the steps in this topic only if you want to create (or have created) a custom policy or action for this service option. Otherwise, skip this topic.

By default, CA Service Catalog evaluates all global policies and all events, rules, and actions (global actions only) for every requested *service*. However, for individual service options, you can replace this default behavior. From the Policies & Actions tab of a service option, you can specify that the Catalog system apply the following specifications to that service option:

- For policies, one of the following options: global policies only, attached policies only, or both global and attached policies

- For actions (including CA Process Automation processes), one of the following options: global actions only, attached actions only, or both global and attached actions

Note: As a best practice, use attached actions and policies *only* if you are using a discrete request life cycle that includes discrete approval of service options. This precaution helps avoid the unintended application of policies and actions at *both* the service and service option levels. For details about using a discrete request life cycle, see the *Administration Guide*.

Important! Applying policies or actions at both the service and service option levels could produce conflicting, unintended, or unpredictable results. If you decide to use attached policies and actions without discrete approval, carefully think through the results for both service options and the service. Review and test the affected services thoroughly in a test system before using them in a production system.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option. You created this service option earlier. If you are already accessing it, skip to the next step.

    a. Click Catalog, Service Offerings, SOGs, and click the service option group for the service option.

       The Details tab for this service option group appears.

    b. Click the Definition tab.

    c. Edit the service option.

       The Details tab for this service option appears.

2. Click the Policies & Actions tab and specify one of the following options for policies: attached policies only or both global and attached policies.

3. Perform all of the following options that apply:

   ■ Click the Search icon to view and select the attached policies that are already created. Select the policy or policies that you want and attach them to this service option.

   ■ Click the Add icon to create an attached policy and attach it to this service option.

      The Catalog system opens the Policy Builder, which you use to create the policy.

      Note: For details about creating policies, see the *Administration Guide*.

   ■ Click the Remove icon to remove an attached policy.

      Note: Before you can delete an attached policy from the Catalog system, you remove the policy from all attached service options.

   ■ Click the Dependent Service Options icon to review the service options that are also using a policy.

      The Catalog system displays the service options that have the selected policy attached.

   Save your changes.

   The Catalog system saves your changes and attaches the policies that you specified to this service option.

4. Perform all of the following options that apply:

   ■ Click the Search icon to view and select the attached actions that are already created.

      The Catalog system opens the Request Events page.

      – Use this page to access the event and rule you want.

      – Select the action or actions that you want and attach them to this service option.

   ■ Click the Add icon to create an attached action and attach it to this service option.

      The Catalog system opens the Request Events page.

      – Use this page to access the event and rule you want.

      – If applicable, create a rule for the attached action.

      – Create the attached action and attach it to this service option.

      Note: For details about creating rules and actions, see the *Administration Guide*.

   ■ Click the Remove icon to remove an attached action.

      Note: Before you can delete an attached action from the Catalog system, you remove the action from all attached service options.

   ■ Click the attached action to review the other service options that are also using this action.

      A dialog appears and lists the other service options (if any) that have the selected action attached.

   Save your changes.

   The Catalog system saves your changes and attaches the actions that you specified to this service option.

5. Click Return to Service Option Group.

   You return to the service option group, which now includes the updates that you made for the reservation service option.

You have attached the policies and CA Process Automation processes.

Create the Service for Returning Resources or the Reservation Early

You can create a service to return early all or some resources of an existing reservation. For example, you can let users return only the additional memory requested earlier but keep the remainder of the reservation. Conversely, you can let users return an entire reservation early, even if they requested an extension. All early returns become credits toward billing, so that users are not charged for resources that they returned. You create this service by defining the service and its options, including all related service option elements. You also create a related form and attach the form to the service option. Together, these elements comprise the service that users request to return early all or some resources of an existing reservation. For this scenario, you create a service named Return Computer Early.

Follow these steps:

1. Create the form for the early return (see page 221).

   You use the form and the rate element mentioned in the next step to define the cost for the service.

2. Create the service option group for the early return (see page 225)

   As part of this process, you do the following:

   ■ Create the Reservation service option and attach the form (see page 226).

   ■ Create the Rate element (see page 229).

   ■ Attach the policies and CA Process Automation processes.

   Note: The Reservation element, Form element, and Rate element are the service option elements that comprise the service option group. In the following topics, the field values for creating and configuring these elements are customized for this scenario. If applicable, you can customize field values to meet your requirements. For details about the fields for these elements, see the *Administration Guide.*

3. Create the reservation service, as follows:

   a. Click Catalog, Services Offerings.

      The Services page appears. This page displays the folders containing services, organized hierarchically.

   b. Expand the tree and select the folder in which you want to add the new service.

      Note: To add a service at the service provider (top) level, click the plus sign without expanding the tree.

   c. Click Add, Offering and enter the name of the new service as Return Computer Early.

      The Details page for a new service appears.

   d. Complete the fields on the dialog and set the permissions.

      Note: For more details about these fields and about creating a service, see the *Administration Guide*.

4. Define the service, as follows:

   a. Expand the tree to display the service named Return Computer Early and click the Definition.

   b. Add the service option group named Return Computer Early to the service.

   c. Perform any additional actions that apply, for example, the following:

      ■ Add another service option group to the service.

      ■ Set permissions on which user roles can subscribe to or request the service option group.

      Note: For more details about these actions about defining a service, see the *Administration Guide*.

You have created the service for returning early all or part an existing reservation.

Create the Form for the Early Return

You create and customize a form for returning early (before the original end date) an existing reservation of a computer or some of its resources. When users request that service, they use this form to specify important details. These details include the date of the return and the resources to return: all resources or only specific resources. As an administrator, you specify a cost field and related elements in the form to calculate the cost of the reservation.

Note: For details about adding elements to forms, see the *Administration Guide.*

Follow these steps:

1. Click Catalog, Forms.

   The Form Designer opens.

2. Create the folder where you want to organize the reservation forms. In that folder, create a form named Return Computer Early.

3. Add the elements that you want to the form, including elements for the following fields:

   Reservation

   Specifies a select box and options that lists all reservations for the logged in user. The user selects one reservation from this list.

   In this field, specify the values for the following attributes:

   _id attribute

   Specify reservations.

   Report/Plug-in Id attribute

   Specify ca.catalog.reservations-select-plugin.

   This predefined API plug-in retrieves the list of reservations for the logged in user. You can view this plug-in on the Administration, Tools, Plug-ins page.

Report/Plug-in Variables attribute

Specify the list of variables that the plug-in retrieves.

If applicable, open the API plug-in that you selected to display its details, including variables. On the details page, the Inputs section lists the ID values and descriptions of the input variables for the plug-in. Copy the Ids of the variables that you want from that page and paste them into the value of the Report/Plug-in Variables attribute.

For both, enter variables as a JSON expression, for example:

$({'<variable name>' : '<variable value>', ...})

$({'userId':_.user.id,'buId':_.bu.id,'reservationSystem':'ca.catalog.DEMO1','label':'rname'})

Important! Specify variables carefully. If you specify no variables, unpredictable results can occur.

This list of variables returns all reservations for the selected external reservation system (ca.catalog.DEMO1) for the specified user in the specified business unit.

The label (rname) specifies the _id value of the Reservation Name field on the Reserve Computer form (see page 153). This label helps fetch the descriptive reservation text for the reservations.

The reservationSystem (ca.catalog.DEMO1) specifies the value of the Reservation System fields for every reservation element for all services in this scenario.

On Change attribute

Enter following JavaScript function to fetch the minimum valid date value of the extension, which appears later on this form. This function prefills the minimum valid date value of extension when the user selects the reservation.

ca_fd.js.onReservationChange()

Note: The following applies to the Select Reservation Id, Start Date, End Date, and Status fields: Each field value is prefilled with output data from ca.catalog.reservations-select-plugin when the user selects the reservation. This plug-in is described in the Report/Plug-in Variables attribute earlier in this step.

Select Reservation Id

Specifies the reservation selected by the user completing the form.

Specify values for the following attributes:

For the _id attribute, specify reservation_id.

For the Hidden attribute, specify true.

Start Date

Specifies the reservation start date.

For the _id attribute, specify start_date.

End Date

> Specifies the reservation end date.
>
> For the _id attribute, specify end_date.

Status

> Specifies the status of the selected reservation.
>
> For the _id attribute, specify status.

Resources

> Specifies a select box and options that lists all resources reserved for the user. The user selects one virtual machine from this list.
>
> Specify values for the following attributes:
>
> **_id attribute**
>
> Specify resource_ids.
>
> **Report/Plug-in Id attribute**
>
> Specify ca.catalog.resources-select-plugin. This predefined plug-in retrieves the list of resources for the logged in user, for the selected reservation.
>
> **Report/Plug-in Variables attribute**
>
> Specify the list of variables that the plug-in retrieves, using the format and instructions explained earlier for the Reservation field, as follows:
>
> $({'resourceStatus':'100,200','reservationId':ca_fdGetTextFieldValue(ca_fd.formId,'reservation_id')})
>
> This list of variables returns all resources of the specified statuses (100-Created and 200-Ready), for the selected reservation.

Return Date and Time

> Specifies the Date Time field for the return (early end date) of either the specified resources or the entire reservation.
>
> For the _id attribute, specify return_on_date.

Cost Quantity

> Specify the following values for this field:
>
> - Name: Cost Quantity (Hidden Field)
> - Value of the hidden attribute: true
> - Value of the _id attribute: cost_quantity

4. Record the names of the fields that you created. You reference these names when you create the form element and attach the form to the service.

5. (Optional) Specify additional custom JavaScript functions for the form, if necessary, as follows:

   a. Enter the code for the function in the Script dialog of the Form Designer. The topic for creating the form for adding memory (see page 187) provides details about using the Script dialog. The following example sets the minimum date value of the return. This code helps prevent the user from setting an invalid return date.

```
{
    onReservationChange : function() {
      var nextHour = new Date();
      nextHour.setHours(nextHour.getHours() + 1);
      nextHour.setMinutes(0);
      nextHour.setSeconds(0);
      nextHour.setMilliseconds(0);
      var minReturn = Math.max(ca_fdGetDateFieldValueInMillis(ca_fd.formId,'start_date'), nextHour);

      ca_fdSetDateFieldValue(ca_fd.formId, 'return_on_date', minReturn);
      ca_fdSetDateFieldMinValue(ca_fd.formId, 'return_on_date', minReturn);
      ca_fdSetDateFieldMaxValue(ca_fd.formId, 'return_on_date',
ca_fdGetDateFieldValueInMillis(ca_fd.formId,'end_date'));
    }
}
```

   b. Specify the name of your custom JavaScript function in the appropriate attribute of the appropriate field on the form. Use the following format:

   ca_fd.js.*function-name*

   For the previous example for setting the minimum date value of the extension, enter the name of the function in the onChange attribute of the Reservation field described earlier in this topic, as follows: *ca_fd.js.onReservationChange().*

6. (Optional) Customize the form further, for example, to add organization-specific fields.

You have created the form for returning the existing reservation.

Note: Forms are *not* included in services. Instead, forms *link to* the service option groups that are included in services. Therefore, after you create and customize the form, you attach the form to the service option group.

Create the Service Option Group for the Early Return

Each reservation service in the catalog consists of one or more reservation-related service option groups. You create a service option group for each type of reservation that you want to support: Here, you add a service option group is for returning early all or some resources for an existing a reservation of a computer.

Follow these steps:

1. Click Catalog, Service Offerings.

   The Services tree appears and displays the folders containing services, organized hierarchically according to categories.

2. Click the Service Option Groups (SOGs) tab.

   The SOGs tree appears and lists alphabetically all service option groups for the business unit.

3. Click the Add icon and enter Return Computer or Resources Early as the name of the new service option group.

   The Service Option Group Details page appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field does not appear, specify a logical value of your choice.

   ■ Description: Return a reserved computer or some of its resources early

   ■ Type: Fixed

     This value determines how you can include this service option group within other service option groups as a characteristic of a service option element. A fixed service option group presumes a fixed cost or a variable cost that is based on usage.

5. Click OK.

You have created the service option group for returning early all or some resources for an existing a reservation of a computer.

Create the Reservation Service Option and Attach the Form

Earlier, you created the service option group (see page 225) for returning early all or some resources of the reserved computer. Here, you create the reservation element in that service option group. You customize the reservation element to specify the type of reservation (for example, external or Reservation Manager) and other details.

Follow these steps:

1. Click Catalog, Service Offerings, SOGs, and click the service option group named Return Computer Early.

   The Details tab for this service option group appears.

2. Click the Definition tab.

3. Click Add Option.

   The dialog for attaching the form appears.

4. Verify that the following fields specify the values shown. Update the values, if necessary, match these specifications.

   If a field is not listed, specify a logical value of your choice.

   - Name: Return Computer or Resources Early

   - Description: Return early an existing reservation of a computer or resources (such as an added disk or additional memory) through an external reservation system

   - Reservation Service Option: Selected

   - Operation: Return

   - Reservation Ready Status: *your custom selection*

     Specifies the status of the request in CA Service Catalog when the external reservation system completes the provision of the reservation.

   - Reservation Failure Status: *your custom selection*

     Specifies the status of the request in CA Service Catalog when the external reservation system fails to completes the provision of the reservation.

   - Reservation System: ca.catalog.DEMO1

   - Category: Reservation

   - Category Class: External Reservation System

     This scenario (see page 141) is designed for use when the Category Class is External Reservation System, not CA Spectrum Automation Manager Reservation Manager.

   - Category Subclass: Return

5. Perform the following actions in the Forms section:

    a. Click the Add icon and attach the form that you created earlier (see page 221) for returning the reservation early.

        The dialog for attaching the form appears.

    b. In the Display Text field, enter Return Computer or Resources Early.

        This text appears as a description for the form when administrators view this service option group in the CA Service Catalog, Service Offerings, Option Groups tab.

    c. In the Form Name field, click the magnifying glass icon to select a form.

        The Form Tree pop-up dialog appears.

    d. Navigate through this form tree and select the form that you want to attach: Return Computer or Resources Early.

        You created this form earlier, as noted previously in this topic.

        The preview of the form appears in the right pane.

    e. Click the Select Form button.

        You return to the dialog for attaching the form.

Note: You can add the same form to a service option only once. However, a service option can have multiple forms.

6. If you do not want to hide or disable the entire form under any conditions, leave the Hidden and Disabled fields empty. Also, skip this step.

    If you do want to hide or disable the entire form, enter the corresponding JavaScript expression in the Hidden or Disabled field. You can hide or disable the form according to the request status, the user role or business unit, or other criteria. Use the following format: $(_.object.property). The expression must return a value of true or false.

    Note: You can specify a JavaScript expression in the Hidden field, the Disabled field, or both. For instructions to specify a JavaScript expression, see the *Administration Guide*.

    Examples follow:

    ■   To hide or disable the form when the request status is Pending Approval, enter the following JavaScript expression in the Hidden or Disabled field: $(_.request.status == 400).

    ■   To hide or disable the form for the end user roles only, enter $(_.user.role == 'enduser').

    ■   To hide or disable the form from all business units except ca.com, enter $(_.bu.id != 'ca.com').

    ■   To disable the form when the request status is Fulfilled, enter $(_.request.status == 2000).

    Note: When an entire form is disabled, it is disabled but visible during all stages of the request lifecycle except checkout. During checkout, a disabled form is both disabled and hidden.

7. Click Update.

    The dialog closes. The Catalog system attaches the form that you selected to this reservation service option.

8. Click Save.

    The Catalog system saves the reservation service option.

9. Click Return to Service Option Group.

    You return to the service option group, which now includes the reservation service option.

10. You have created the reservation service option and have attached the form. The service option group now includes both of them.

Create the Rate Elements

Earlier, you created the service option group (see page 225) for returning early some or all resources of an existing reservation of a computer. Here, you create the Rate element in that service option group. You customize the Rate element to specify cost-related fields for the service. You also customize the Rate element to reference the related resource type (see page 145) and form (see page 221) for the service. All of these elements work together to determine the cost of the service.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option named Return Computer Early. You created this service option (see page 209) earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group named Return Computer Early.

      The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option named Return Computer Early.

      The Details tab for this service option appears.

2. In the Prices/Cost box, click the Add icon.

   The Service Option Element dialog for a rate appears.

3. Verify that the fields specify the following values. Update the values, if necessary, to match these specifications, and click Update.

   ■ Display Text: Periodic (Monthly) Charge; $1 per day per Computer

   ■ Cost Type: Specify Value.

   ■ Use Original Reservation Cost: Selected

      Note: This option applies only to service option elements for extending existing reservations or returning existing reservations early. If this option is selected, then the following applies: The reservation unit cost (for the extension or early return) is the original reservation cost for the resource type specified in the existing reservation.

      If you are creating or updating services that integrate with Reservation Manager, the following applies to the Use Original Reservation Cost option: This option is not available, because in the Reservation element, the Category Class is set to CA Spectrum Automation Manager Reservation Manager. This scenario is designed for use when the Category Class is set to External Reservation System. For details, see the initial topic for setting up reservation services (see page 141).

■ Unit Cost: 0

Note: This field is automatically disabled and its value set to zero when Use Original Reservation Cost is selected. If Use Original Reservation Cost is not selected, then The Unit cost field is enabled.

■ Display Unit Type: Per Computer per day

■ Charge Type: Credit

■ Budget: not selected

■ Billing Cycle: Periodic

■ Periodic Type: Monthly

■ Periodic Type Interval: 1

■ Quantity Specification: Form Specified

■ Related Form: Return Computer Early

■ Cost Quantity Form Field: N/A

Note: The cost quantity is calculated automatically according to the resource type that the user selects while completing the request to extend or return the service.

■ Charge Effective From Form Field: Return On Date and Time

■ Reservation Resource Type: Computer

You created this resource type earlier.

4. Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

The rate element is added.

5. In the Prices/Cost box, click the Add icon.

The Service Option Element dialog for a rate appears.

6. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

■ Display Text: Periodic (Monthly) Charge; $2 per 1 GB Disk per day

■ Cost Type: Specify Value.

■ Use Original Reservation Cost: Selected

Note: This option applies only to service option elements for extending existing reservations or returning existing reservations early. If this option is selected, then the following applies: The reservation unit cost (for the extension or early return) is the original reservation cost for the resource type specified in the existing reservation.

■ Unit Cost: 0

Note: This field is automatically disabled and its value set to zero when Use Original Reservation Cost is selected. If Use Original Reservation Cost is not selected, then The Unit cost field is enabled.

■ Display Unit Type: Per GB Disk per day

■ Charge Type: Credit

■ Budget: not selected

■ Billing Cycle: Periodic

■ Periodic Type: Monthly

■ Periodic Type Interval: 1

■ Quantity Specification: Form Specified

■ Related Form: Return Computer Early

■ Cost Quantity Form Field: N/A

Note: The cost quantity is calculated automatically according to the resource type that the user selects while completing the request to extend or return the service.

■ Charge Effective From Form Field: Return On Date and Time

■ Reservation Resource Type: Disk

You created this resource type (see page 145) earlier

■ (Optional) Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

7. Double-click the fifth cell and define the service option element as Rate.

The Service Option Element dialog Definition Tab for this cost cell appears.

8. Verify that the fields specify the following values. Update the values, if necessary, match these specifications.

■ Display Text: Periodic (Monthly) Charge; $3 per 0.25 GB RAM per day

■ Cost Type: Specify Value.

■ Use Original Reservation Cost: Selected

Note: This option applies only to service option elements for extending existing reservations or returning existing reservations early. If this option is selected, then the following applies: The reservation unit cost (for the extension or early return) is the original reservation cost for the resource type specified in the existing reservation.

- Unit Cost: 0

  Note: This field is automatically disabled and its value set to zero when Use Original Reservation Cost is selected. If Use Original Reservation Cost is not selected, then The Unit cost field is enabled.

- Display Unit Type: Per 0.25 GB RAM per day

- Charge Type: Credit

- Budget: not selected

- Billing Cycle: Periodic

- Periodic Type: Monthly

- Periodic Type Interval: 1

- Quantity Specification: Form Specified

- Related Form: Return Computer Early

- Cost Quantity Form Field: N/A

  Note: The cost quantity is calculated automatically according to the resource type that the user selects while completing the request to extend or return the service.

- Charge Effective From Form Field: Return On Date and Time

- Reservation Resource Type: Memory

  You created this resource type (see page 145) earlier.

- (Optional) Click the Options tab and complete the remaining fields on the Service Option Element Options Window--Options Tab. Click Update when you are finished.

The dialog closes. The Catalog system saves the rate information that you specified for this reservation service option.

9. Click Save.

   The Catalog system saves the reservation service option.

10. Perform one of the following actions:

- Click Return to Service Option Group.

  You return to the service option group, which now includes the updates that you made for the reservation service option. You can continue the process of creating the reservation service later.

- Attach the policies and actions.

  You continue the process of creating the reservation service.

You have created the rate elements for returning early all or some resources in the reservation.

Attach Policies and Actions

Note: This scenario does *not* require attached policies or attached actions. Complete the steps in this topic only if you want to create (or have created) a custom policy or action for this service option. Otherwise, skip this topic.

By default, CA Service Catalog evaluates all global policies and all events, rules, and actions (global actions only) for every requested *service*. However, for individual service options, you can replace this default behavior. From the Policies & Actions tab of a service option, you can specify that the Catalog system apply the following specifications to that service option:

- For policies, one of the following options: global policies only, attached policies only, or both global and attached policies

- For actions (including CA Process Automation processes), one of the following options: global actions only, attached actions only, or both global and attached actions

Note: As a best practice, use attached actions and policies *only* if you are using a discrete request life cycle that includes discrete approval of service options. This precaution helps avoid the unintended application of policies and actions at *both* the service and service option levels. For details about using a discrete request life cycle, see the *Administration Guide*.

Important! Applying policies or actions at both the service and service option levels could produce conflicting, unintended, or unpredictable results. If you decide to use attached policies and actions without discrete approval, carefully think through the results for both service options and the service. Review and test the affected services thoroughly in a test system before using them in a production system.

Follow these steps:

1. If necessary, perform the following actions to access the reservation service option. You created this service option earlier. If you are already accessing it, skip to the next step.

   a. Click Catalog, Service Offerings, SOGs, and click the service option group for the service option.

   The Details tab for this service option group appears.

   b. Click the Definition tab.

   c. Edit the service option.

   The Details tab for this service option appears.

2. Click the Policies & Actions tab and specify one of the following options for policies: attached policies only or both global and attached policies.

3. Perform all of the following options that apply:

    ■   Click the Search icon to view and select the attached policies that are already created. Select the policy or policies that you want and attach them to this service option.

    ■   Click the Add icon to create an attached policy and attach it to this service option.

        The Catalog system opens the Policy Builder, which you use to create the policy.

        Note: For details about creating policies, see the *Administration Guide*.

    ■   Click the Remove icon to remove an attached policy.

        Note: Before you can delete an attached policy from the Catalog system, you remove the policy from all attached service options.

    ■   Click the Dependent Service Options icon to review the service options that are also using a policy.

        The Catalog system displays the service options that have the selected policy attached.

    Save your changes.

    The Catalog system saves your changes and attaches the policies that you specified to this service option.

4. Perform all of the following options that apply:

■ Click the Search icon to view and select the attached actions that are already created.

The Catalog system opens the Request Events page.

– Use this page to access the event and rule you want.

– Select the action or actions that you want and attach them to this service option.

■ Click the Add icon to create an attached action and attach it to this service option.

The Catalog system opens the Request Events page.

– Use this page to access the event and rule you want.

– If applicable, create a rule for the attached action.

– Create the attached action and attach it to this service option.

Note: For details about creating rules and actions, see the *Administration Guide*.

■ Click the Remove icon to remove an attached action.

Note: Before you can delete an attached action from the Catalog system, you remove the action from all attached service options.

■ Click the attached action to review the other service options that are also using this action.

A dialog appears and lists the other service options (if any) that have the selected action attached.

Save your changes.

The Catalog system saves your changes and attaches the actions that you specified to this service option.

5. Click Return to Service Option Group.

You return to the service option group, which now includes the updates that you made for the reservation service option.

You have attached the policies and CA Process Automation processes.

Chapter 9: Integrating with BusinessObjects Enterprise

This section contains the following topics:

Introduction

CA Business Intelligence is a set of reporting and analytic software that is utilized by a variety of CA products for the purposes of presenting information and supporting business decisions. CA products use CA Business Intelligence to integrate, analyze, and then present, through a variety of reporting options, vital information required for effective enterprise IT management.

Included in CA Business Intelligence is SAP BusinessObjects Enterprise XI (BusinessObjects Enterprise), a complete suite of information management, reporting, and query and analysis tools.

CA Business Intelligence installs BusinessObjects Enterprise as a stand-alone component. The installation runs independently of any CA products, allowing a variety of CA products to share the same Business Intelligence services. The installation of CA Business Intelligence is a distinct and separate activity within the overall CA product installation process.

BusinessObjects Enterprise, which CA Business Intelligence packages and delivers, is a flexible, scalable, and reliable business intelligence reporting system that can be tightly integrated into your information technology infrastructure.

CA products leverage an extensive set of business intelligence capabilities including reporting, query, and analysis using BusinessObjects Enterprise technology. CA enables business users with additional self-service ad hoc power capabilities.

The BusinessObjects Enterprise installation media and documentation are packaged together with the CA Service Catalog installation media and documentation.

How to Integrate with BusinessObjects Enterprise

CA Service Catalog supplies the data you need to get started with BusinessObjects Enterprise reports. After you have installed CA Service Catalog and BusinessObjects Enterprise, you perform required setup tasks before running reports. To Integrate CA Service Catalog with BusinessObjects Enterprise, follow this process:

1. Become familiar with BusinessObjects Enterprise, including its documentation, so that you become a knowledgeable administrator and user of it. At minimum, you should be able to do the following:

   ■ Install and configure BusinessObjects Enterprise

   ■ Be able to run pre-defined reports in BusinessObjects Enterprise

   ■ Find the information you need in the BusinessObjects Enterprise documentation

2. Verify that BusinessObjects Enterprise is installed and running (see page 240).

3. In BusinessObjects Enterprise, import the BIAR file (see page 240) for CA Service Catalog.

4. In BusinessObjects Enterprise, set up the user database (see page 247) for CA Service Catalog users whom you want to have access to BusinessObjects Enterprise reports.

5. If you plan to use Secure Socket Layer between CA Service Catalog and BusinessObjects Enterprise, ensure that have performed the following tasks:

   ■ Configure BusinessObjects Enterprise for Secure Socket Layer (SSL)

   ■ Configure BusinessObjects Enterprise to communicate with CA Service Catalog using SSL

   For instructions to perform these tasks, see the *Implementation Guide*.

6. Set and test administration configuration parameters (see page 248) for integrating CA Service Catalog with BusinessObjects Enterprise.

7. Configure trusted authentication (see page 249) for single signin between CA Service Catalog and BusinessObjects Enterprise.

   CA Service Catalog uses standard BusinessObjects Enterprise login if trusted authentication is not set up or is not working properly.

   Note: The following login methods do *not* apply to BusinessObjects Enterprise: CA EEM token, CA SiteMinder integration, and NTLM authentication on Windows.

8. Become familiar with and run the pre-defined reports (see page 250).

9. Optionally view the pre-defined reports in localized format. To do so, set the language configuration in the Preferences, Preferred Viewing Locale section of BusinessObjects Enterprise Infoview.

    Note: Some fields remain in English even when you view reports in localized format. These fields include Request Status, Billing Status, Account Status, Account Type, and fields related primarily to payment and adjustment. In addition, in both English and localized reports, custom status values *do* appear in the reports; however, their descriptions do *not*. For a work-around, see the *Release Notes*.

10. Follow these best practices when maintaining and using BusinessObjects Enterprise:

    ■   Install and maintain one universe per CA product.

    ■   Do *not* modify the default universe. Instead, copy it and modify the copy. Otherwise, your customizations may be erased when you apply service packs, patches, and other updates.

    ■   Before applying service packs, patches, and other updates to your customized universe, back up all your customizations.

    ■   If reports stop running, verify that the Central Management Server (CMS) is running.

    ■   Do not overwrite pre-defined reports.

    ■   Always use a pre-defined report as a base to build a custom report. Doing so helps ensure consistent formatting in all reports.

    ■   Remember that administrators *can* modify all the reports and create new reports based on the existing universe. However, administrators *cannot* add any reports to the existing CA SLCM folder.

    ■   Both administrators and end users should *not* change pre-defined reports, because any changes to those reports are applied to all other users using the same CA Business Intelligence instance. Instead, both administrators and end users should create their own custom folders, copy the reports there, rename them, and customize them.

    ■   Both administrators and end users must add new reports that they create to their custom folders.

Verify that BusinessObjects Enterprise Is Installed and Running

If you want to use BusinessObjects Enterprise, install it either before or after you install CA Service Catalog. The installation media and documentation for BusinessObjects Enterprise are packaged together with the installation media and documentation for CA Service Catalog. The installation media for BusinessObjects Enterprise includes CA Business Intelligence, the CA product that you use to install BusinessObjects Enterprise.

If necessary, for instructions to install BusinessObjects Enterprise, see its documentation.

Note: You are likely to obtain the best system performance by installing BusinessObjects Enterprise and CA Service Catalog components on separate computers.

To verify that BusinessObjects Enterprise is installed and running, access the BusinessObjects Enterprise and start it.

How to Import the BIAR File

Importing the Business Intelligence Archive Resource (BIAR) file is a required task to set up BusinessObjects Enterprise reports for CA Service Catalog. The BIAR file includes several required components and CA Service Catalog-specific content for use with BusinessObjects Enterprise, including the CA Service Catalog universe, default objects, pre-defined reports, user groups, database schemas, locale strings, and other data that helps you customize your BusinessObjects Enterprise implementation, especially your reports.

To import the BIAR file, follow this process:

1. Verify that a data source name (DSN) and ODBC connection exists for the DBMS used by the CA MDB (MDB). If necessary, do one of the following:

   ■ Create a DSN and ODBC connection for the MDB on SQL Server (see page 241)

   ■ Create a DSN and ODBC connection for the MDB on Oracle (see page 242)

2. Use the biconfig utility to Import the BIAR file (see page 242).

   You can optionally use the BusinessObjects Enterprise import wizard to import the BIAR file, as explained in the BusinessObjects Enterprise documentation. However, we recommend that you use biconfig utility to import the CA Service Catalog universe.

Create a Data Source Name and ODBC Connection for the MDB on SQL Server

If you are using Microsoft SQL Server (SQL Server) as your DBMS for the MDB, a data source name (DSN) and ODBC connection for the MDB on SQL Server are prerequisites for setting up your BusinessObjects Enterprise implementation. If necessary, create them now.

To Create a Data Source Name and ODBC Connection for the MDB on SQL Server

1. From the Windows Control Panel, open ODBC.

    The ODBC Data Source Administrator appears.

2. Click Add on the System DSN tab.

3. Select SQL Server as the driver and click Finish.

4. Enter the following information and click Next:

    ■   Data source name (DSN)

    ■   Description

    ■   The name of the SQL Server server

5. Do the following and click Next:

    a.   Select SQL Server Authentication

    b.   Select the option to Connect to SQL Server to obtain default settings for additional configuration options, and enter the user ID and password to connect to the database.

6. Do the following and click Next:

    a.   Change the default database to the SQL Server database

    b.   Select the option to use ANSI quoted identifiers.

    c.   Select the option to use ANSI nulls, paddings, and warning.

7. For localized (non-English) environments *only*: check the option to use regional settings for currency, numbers, dates, and times.

8. Click Finish.

You have created the DSN and ODBC connection for SQL Server.

Note: For more details about creating DSNs and ODBC connections, see your Windows or SQL Server documentation.

Create a Data Source Name and ODBC Connection for the MDB on Oracle

If you are using Oracle as your DBMS for the MDB, a data source name (DSN) and ODBC connection for the MDB on Oracle are prerequisites for setting up your BusinessObjects Enterprise implementation. If necessary, create them now.

To Create a Data Source Name and ODBC Connection for the MDB on Oracle

1. From the Windows Control Panel, open ODBC.

    The ODBC Data Source Administrator appears.

2. Click Add on the System DSN tab.

3. Select Microsoft ODBC for Oracle as the driver and click Finish.

4. Enter the following information and click OK:

    ■ Data source name (DSN)

    ■ Description

    ■ DBMS user name

    ■ One of the following:

      – SID of the Oracle database, if you are using a standalone Oracle setup

      – Local Net Service Name, if you are using a distributed Oracle setup

    You have created the (DSN) and ODBC connection for Oracle.

    Note: For more details about creating DSNs and ODBC connections, see your Windows or Oracle documentation.

Use biconfig to Import the BIAR File

Importing the BIAR file is a required task to set up your BusinessObjects Enterprise implementation. We recommend that you use the CA Business Intelligence biconfig batch utility to import the BIAR file.

To use biconfig to import the BIAR file

1. Specify the JAVA_HOME environment variable; otherwise, you may receive a JAVA_HOME error while running biconfig. For assistance in setting this variable, see your Windows help for environment variables.

2. To help verify that JAVA_HOME is set correctly, enter **java** at the command prompt and confirm that the system displays details regarding Java parameters.

    While running biconfig, if you receive any unusual results or error messages, open a new command prompt and use it to run the biconfig utility again.

3. Copy the SLCM_universe.biar file from CA Service Catalog to the BusinessObjects Enterprise computer; record this path name for reference in the next step.

   The default location of this file on the CA Service Catalog computer is USM_HOME\reporting\CABI\biar.

4. Copy the contents of the biconfig folder on to the computer on which BusinessObjects Enterprise is installed.

   The location of this folder on the CA Business Intelligence installation media is <root folder>\Disk1\cabi\biconfig

5. In the samples folder of the biconfig folder, locate the xml_biar_import.xml file and set the following parameters:

   ■ Networklayer: ODBC

   ■ RDMS:

     – For Microsoft SQL Server (SQL Server): SQL Server 2005 or SQL Server 2008

     – For Oracle: Generic ODBC datasource

   ■ User name and password parameters for your database:

     – For SQL Server: Use *sa* for the user name

     – For Oracle: Use *mdbadmin* for the user name

     These users have access to all required tables in the MDB.

   ■ Path name of the SLCM_universe.biar file on the BusinessObjects Enterprise computer

   ■ Name of the DSN created previously in the datasource parameters

   ■ Server parameter: computer name of your Oracle or SQL Server server

   Review the <u>sample BIAR configuration files</u> to help you determine the correct values for these parameters.

   Note: You perform this step and all remaining steps on the BusinessObjects Enterprise computer.

6. Open a Windows command prompt and navigate to the BIConfig folder. Enter the following command:

biconfig -h "host" [-n "port"] -u "user" [-p "password"] -f "XML-config-file-name" [--help]

Note: The quotation marks (" ") *are* literally required as shown in the command. However, the brackets [ ] are *not* literally required; the brackets signify optional parameters.

The following parameters are required, unless noted otherwise.

host

Specifies the BusinessObjects Enterprise Central Management Server (CMS) host.

port

Optional. Specifies the BusinessObjects Enterprise CMS port. The default is 6400.

user

Specifies the BusinessObjects Enterprise CMS user.

password

Optional. Specifies the BusinessObjects Enterprise CMS password.

XML-config-file-name

Specifies the path name of xml_biar_import.xml, your BIAR configuration file.

If the file resides in the biconfig folder, you can specify the file name only; otherwise, specify the complete path name.

help

Optional. Displays the help for the biconfig utility. Check the help for additional details about running biconfig.

Enter *two* dashes to display the help.

Note: For more information about using biconfig, see the biconfig-readme.txt file in the biconfig folder that you copied in Step 4.

7. Verify the import, as follows:

    a. Review the biconfig.log file in the biconfig folder.

        This file lists the status of the import. This file also includes error messages if the BIAR file is not imported successfully. A return code of zero (0) indicates a successful import.

    b. Log in to InfoView as a BusinessObjects Enterprise administrator.

    c. In InfoView, verify that you can view the CA SLCM Reports under Public Folders/CA Reports/CA SLCM.

    d. After completing the remaining tasks to integrate with BusinessObjects Enterprise (see page 238), run a pre-defined report (see page 250) and verify that the report uses data from the database to which universe is currently pointing.

8. If you must re-import the BIAR file for any reason, for example, if an attempted import fails, delete the following from the BusinessObjects Enterprise Central Management Console *before* you re-import the BIAR file:

    ■   CA SLCM folder

    ■   CA SLCM Universe

    ■   CA SLCM Groups

    ■   SLCM Connection

9. In BusinessObjects Enterprise, specify a password for the spadmin user; this password is empty by default.

Sample BIAR Configuration Files

You can use these sample BIAR configuration files as models to help you customize your BIAR configuration file before you use biconfig to import your BIAR file (see page 242). Review the sample file for the DBMS you are using: Microsoft SQL Server (SQL Server) or Oracle.

Sample BIAR Configuration File for SQL Server

```xml
<?xml version="1.0"?>
<biconfig version="1.0">
 <!-- Import BIAR file -->
 <step priority="1">
  <add>
  <biar-file name="C:\SLCM_universe.biar">
      <networklayer>ODBC</networklayer>
      <rdms>MS SQL Server 2005</rdms>
      <username>sa</username>
      <password>sa</password>
      <datasource>SLM</datasource>
      <server>xyz-851-sqldb</server>
    </biar-file>
  </add>
 </step>
</biconfig>
```

Sample BIAR Configuration File for Oracle

```xml
<?xml version="1.0"?>
<biconfig version="1.0">
 <!-- Import BIAR file -->
 <step priority="1">
  <add>
  <biar-file name="C:\SLCM_universe.biar">
      <networklayer>ODBC</networklayer>
      <rdms>Generic ODBC datasource</rdms>
      <username>mdbadmin</username>
      <password>mdbadmin</password>
      <datasource>slmoracle</datasource>
      <server>abcdef-xp</server>
    </biar-file>
  </add>
 </step>
</biconfig>
```

How to Set Up the User Database

For CA Service Catalog users that you want to have access to BusinessObjects Enterprise reports, perform the following tasks in BusinessObjects Enterprise. This process provides access to BusinessObjects Enterprise reports to the CA Service Catalog users you select. It also helps ensure that CA Service Catalog users can access *only* the BusinessObjects Enterprise reports that their role authorizes.

1. Note that the BIAR file automatically provides the CA Service Catalog default administrative user named spadmin.

2. Verify that a matching user name exists in BusinessObjects Enterprise for each CA Service Catalog user.

    Optionally, import the users from your CA Service Catalog user database into your BusinessObjects Enterprise user database, for example, in LDAP or Active Directory. Alternatively, create the users with matching user names directly in your BusinessObjects Enterprise user database.

3. Assign those users to the BusinessObjects Enterprise user groups that provides the access rights you want.

    Typically, you assign the users to groups that match their roles in CA Service Catalog. For example, you typically assign CA Service Catalog administrators to administrator groups in BusinessObjects Enterprise.

    Important! All CA Service Catalog users who need access to BusinessObjects Enterprise reports must exist in the BusinessObjects Enterprise user database, no matter what method you use to populate the database. Also, these users must belong to the BusinessObjects Enterprise user group that provides the appropriate level of access rights.

    The CA Service Catalog Administrator groups are as follows:

    ■ SLCM Catalog Administrators

    ■ SLCM Administrators

    ■ SLCM Service Managers

    ■ SLCM Super Business Unit Administrators

    ■ SLCM Service Delivery Administrators

    The CA Service Catalog End User groups are as follows:

    ■ SLCM End Users

    ■ SLCM Catalog End Users

    ■ SLCM Request Managers

For instructions to perform these tasks, see your BusinessObjects Enterprise documentation.

Set and Test Administration Configuration Parameters

Specifying the configuration settings for BusinessObjects Enterprise is a required task for enabling the integration between BusinessObjects Enterprise and CA Service Catalog. If you are running multiple instances of BusinessObjects Enterprise, these settings apply to all instances.

To set and test administration configuration parameters

1. On the Administration tab of CA Service Catalog, click Configuration and scroll to the CA Business Intelligence section.

   The CA Business Intelligence configuration options appear.

2. Click the Modify (Pencil) icon to next to each property that you want to update, using the following information:

   Enable HTTPS

   Specifies a web protocol, as follows:

   Select No (the default) to use HTTP to communicate with BusinessObjects Enterprise.

   Select Yes to use HTTPS to communicate with the BusinessObjects Enterprise.

   Important! If you select Yes, verify that BusinessObjects Enterprise is using HTTPS. If necessary, configure it to use HTTPS; for details, see the BusinessObjects Enterprise documentation.

   Host Name

   Specifies the computer name on which the InfoView component of BusinessObjects Enterprise is hosted.

   Port Number

   Specifies the port number on which InfoView is running.

3. Verify that you are finished updating configuration properties.

4. Click the Launch button to test the connection between CA Service Catalog and InfoView.

   The connection is tested, using the new values you specified. If the connection fails, try using a different value.

5. Recycle Catalog Component.

The BusinessObjects Enterprise configuration details are updated with the values that you specified.

Configure Trusted Authentication

For best results, we suggest that you configure CA Service Catalog and BusinessObjects Enterprise to use trusted authentication for the integration between the two products. Trusted authentication provides single signin (also named single signon or sign-on). Single signin enables CA Service Catalog users to access the InfoView application of BusinessObjects Enterprise directly from the CA Service Catalog GUI, without logging in to BusinessObjects Enterprise and entering their user names passwords.

To configure CA Service Catalog and BusinessObjects Enterprise to use trusted authentication, follow this process:

1. Log on to the BusinessObjects Enterprise Central Management Console as a user with administrative rights.

2. Go to the Authentication Management area of the Central Management Console.

3. Click the Enterprise tab.

4. Enable trusted authentication.

5. Enter a "shared secret" password for your users.

   Note: Verify that the value of this password and the frequency with which you update it meet your organization's password security standards.

   The BusinessObjects Enterprise client and the Central Management Console use the shared secret password to create a trusted authentication password.

6. Perform the remaining steps on *every* Catalog Component computer.

7. Use a text editor to open the file named USM_HOME\reporting\CABI\TrustedPrincipal.conf.

   USM_HOME is the location where Catalog Component is installed.

8. Scroll to the following line:

   SharedSecret=*password*

9. For *password*, specify the same shared secret password that you entered on the BusinessObjects Enterprise Central Management Console earlier in this procedure.

10. Save the TrustedPrincipal.conf file.

11. Restart the Catalog Component computer.

Important! Whenever you update the password on the BusinessObjects Enterprise Central Management Console, make the same change to the password in the TrustedPrincipal.conf file on every Catalog Component computer also, as explained in this topic.

Run Pre-Defined Reports

You can run pre-defined reports to see the various types of CA Service Catalog data that you can access quickly and easily with BusinessObjects Enterprise reporting. The Infoview button appears on CA Service Catalog web pages so that you can start BusinessObjects Enterprise from within CA Service Catalog and run pre-defined reports quickly and easily.

1. In CA Service Catalog, select Home, DashBoard, Administration QuickStart, Infoview.

2. In BusinessObjects Enterprise, click Home, Document List, Public Folders, CA Reports, CA SLCM.

3. Click Admin Reports to open the Admin Reports folder, or click End User Reports to open the End User Reports folder.

   The Admin Reports folder and its reports are visible only to users who are members of the Administrator groups.

   The End User Reports folder and its reports are visible only to users who are members of either the Administrator groups or the End User groups. For details about both types of groups, see How to Set Up User Database (see page 247).

4. Double-click the report which you want to run.

5. When prompted, specify the parameters for your report.

6. Click Run Query.

7. View the report.

   When viewing reports, keep in mind the following points:

   - In a multi-tenant (business unit) implementation, your reports display only the data of tenants to which you have access.

   - If you run a report for an integrated product (such as CA Service Desk Manager or CA APM), but that product has not been installed and integrated with CA Service Catalog, then the report typically fails or retrieves no data.

For detailed instructions to run pre-defined reports, see your BusinessObjects Enterprise documentation.

Chapter 10: Integrating with CA Process Automation

This section contains the following topics:

Introduction

CA Process Automation uses graphical processes created by system administrators to execute operational processes automatically. It supports a fully integrated development and administrative environment to manage, create, and configure CA Process Automation components on your system. CA Process Automation also supports client applications that allow operators and other personnel to schedule, start, and monitor automated processes. CA Process Automation includes efficient graphical tools for viewing, monitoring, and debugging process at runtime.

In CA Process Automation, operators define policies and rules for self-managed processes. These processes include configuration, monitoring, optimization, repair, and protection. By integrating an enterprise's people, processes, and technology in an end-to-end, automated fashion, organizations will be able to reduce operational expenses, increase staff productivity, and deliver higher service level metrics. Examples of processes that CA Process Automation automates and manages include:

- Applications monitoring and restart

- Disaster recovery

- Virtual Infrastructure Management

- ITIL compliance

- Security

CA Process Automation is an optional integration for CA Service Catalog. This optional integration provides simple approval and fulfillment of CA Service Catalog requests.

Best Practices for Using This Chapter and Related CA Support Documents

Use this chapter and related CA Support documents (see page 253) as complementary tools to configure CA Process Automation to meet the specific needs of your implementation of CA Service Catalog and, if applicable, other CA Technologies products that you have installed and integrated with CA Service Catalog, such as CA Service Desk Manager.

In all cases, read this chapter to become familiar with the simple integration procedures and the simple predefined CA Process Automation content included with CA Service Catalog, such as processes, start request forms (SRFs), rules, and actions. Then proceed as follows:

■ To configure your implementation of CA Service Catalog, CA Process Automation, and any other integrated CA Technologies products primarily for an ITIL-based environment, review, and follow all applicable instructions in the related CA Support documents, especially the CA Service Catalog Quick Reference Guide that applies to your implementation. This setup uses *both* the simple predefined CA Process Automation supplied with CA Service Catalog and more ITIL-based CA Process Automation content.

In that case, use this chapter as a secondary reference tool for any information and procedures *not* supplied in the related CA Support documents.

■ To configure your implementation of CA Service Catalog, CA Process Automation, and any other integrated CA Technologies products primarily for an environment that is not ITIL-based, review, and follow all applicable instructions in this chapter. This setup uses the simple predefined CA Process Automation supplied with CA Service Catalog *only*, without any additional ITIL-based CA Process Automation content.

In that case, use the related CA Support documents as a secondary reference tool if any ITIL-related questions or concerns arise.

■ Typically, do *not* combine, substitute, or interchange procedures from this chapter and the related CA Support documents for performing a specific task, such as configuring the same process, SRF, rule, or action. Doing so may produce unpredictable or inconsistent results.

Related CA Support Documents

This chapter and related CA Support documents are complementary tools to help you configure CA Process Automation to meet the specific needs of your implementation of CA Service Catalog and, if applicable, other CA Technologies products that you have installed and integrated with CA Service Catalog, such as CA Service Desk Manager.

The related CA Support documents apply primarily to ITIL-based implementations. Such implementation use *both* the basic predefined CA Process Automation supplied with CA Service Catalog and additional ITIL-based CA Process Automation content.

To obtain these documents, access the CA Service Catalog product support page on http://ca.com/support.

At publication time, these documents and related downloads are included on that web page in the *CA Implementation Best Practices - Service Management release-number ITIL Content Pack.*

In that content pack, read and follow all applicable instructions for your implementation, *especially* the CA Service Catalog Quick Reference Guide that applies. At publication time, these documents are named as follows:

- *Deploying the CA Service Catalog pre-built CA ITPAM Workflows - solution set*

   Read and follow this guide if you are using CA Process Automation with both CA Service Catalog and other integrated CA Technologies products, such as CA Service Desk Manager

- *Deploying the CA Service Catalog pre-built CA ITPAM Workflows - standalone*

   Read and follow this guide if you are using CA Process Automation with CA Service Catalog *only*

For optimal efficiency, follow the best practices for using this chapter and related CA Support documents .

How to Integrate with CA Process Automation

To Integrate CA Service Catalog with CA Process Automation, follow this process:

1. [Perform the post-installation setup tasks](#) (see page 254).

2. Import the CA Process Automation processes, start request forms (SRFs), rules, and actions that you want to use for approval and fulfillment; this step includes loading content. For details, see the *Release Notes*.

3. [Set up rules, actions, and processes for approval and fulfillment](#) (see page 270) of CA Service Catalog requests using CA Process Automation.

   If you are upgrading to CA Service Catalog from an earlier release, you can optionally use both CA Process Automation and CA Workflow simultaneously as you gradually adopt CA Process Automation. For example, begin by adopting CA Process Automation for approval but keeping CA Workflow for fulfillment. Then gradually adopt CA Process Automation for fulfillment.

4. [Assign users to required CA Process Automation user groups](#) (see page 292) in CA EEM.

How to Perform Post-Installation Setup Tasks

Perform these tasks after installing CA Service Catalog and CA Process Automation:

1. Become familiar with CA Process Automation, including its documentation, so that you become a knowledgeable administrator and user of it. At minimum, you should be able to do the following:

   ■ Install and configure CA Process Automation

   ■ Write basic CA Process Automation processes that include re-usable operators; these operators enable communication between CA Process Automation and the products with which it integrates, including CA Service Catalog

   ■ Find the information you need in the CA Process Automation documentation

2. Verify that CA Process Automation is installed and running.

   If you want to use CA Process Automation, install it either before or after you install CA Service Catalog. The installation media for CA Process Automation is supplied with the installation media for CA Service Catalog.

   Note: If necessary, for instructions to install CA Process Automation, see its documentation, which is included on the CA Process Automation installation media.

   Important! For best system performance, do *not* install the CA Process Automation domain orchestrator and CA Service Catalog components on the same computer.

3. Verify that you have performed the following tasks:

   ■ You have installed the DBMS client (Oracle client or SQL Server client) locally, unless the local computer is the DBMS server

     Note: For instructions to install the DBMS client, see your DBMS documentation.

   ■ You have implemented CA Service Catalog clustering, if you have installed two or more instances of CA Service Catalog.

     Note: For instructions to implement CA Service Catalog clustering, see the *Implementation Guide*.

   ■ You have met the following naming requirements:

     – The CA Service Catalog computer name must *not* begin with a number.

     – If you are using a load balancer for CA Service Catalog or CA Process Automation, the computer name of the load balancer must *not* begin with a number.

     If you do not meet these requirements, web service calls for the integration can result in errors, for example:

     Caused by: com.sun.xml.messaging.saaj.util.JaxmURI$MalformedURIException: Host is not a well formed address!

4. If you plan to use Secure Socket Layer, perform the following tasks:

   ■ Configure CA Process Automation for Secure Socket Layer (SSL)

   ■ Configure CA Process Automation to communicate with CA Service Catalog using SSL

   Note: For instructions to perform these tasks, see the *Implementation Guide*.

5. Do one of the following to specify your login method:

   ■ If you plan to log in using standard login credentials, skip the next step.

   ■ If you plan to log in using a CA EEM token instead of standard login credentials, set up certificate-based login (see page 256); you must do so *before* you set the parameters in the next step.

6. Set and test the administration configuration parameters (see page 262) for CA Process Automation.

7. Load and configure content in CA Service Catalog (see page 264).

8. Configure content in CA Process Automation (see page 266).

Set Up Certificate-Based Login in CA Service Catalog

To enhance security, you can optionally set up CA Service Catalog to use certificate-based login to communicate with CA Process Automation. If you do not use this feature, CA Service Catalog uses user name and password login to communicate with CA Process Automation.

Note: The CA Process Automation integration with CA Service Catalog requires CA EEM certificates for certificate-based login. In previous releases of CA Service Catalog, these connections required certificates in .p12 format. However, the current release of CA Service Catalog requires these certificates in .pem format. Therefore, if you are upgrading CA Service Catalog and you already have a .p12 certificate for connecting to CA Process Automation, convert it to .pem format. Similarly, if you are installing CA Service Catalog for the first time, generate a new .pem file.

Follow these steps:

1. If other CA Technologies products integrated with CA Service Catalog are configured with Secure Socket Layer (SSL), then configure CA Service Catalog and CA Process Automation to use SSL. These tasks include creating and merging keystore files and adding self-signed certificates to the keystore.

   Note: For detailed instructions, see the *Implementation Guide*.

2. Edit %USM_HOME%\build.xml file, as follows:

   a. Locate the following line.

   ```
   <sysproperty key="javax.net.ssl.trustStore" value="${env.USM_HOME}/keystore/.keystore" />
   ```

   b. Verify that the file name and path name of the keystore file are correct. If necessary, update them.

   For example, if the keystore is located in USM_HOME and the keystore file name is .mykeystore, update this line as follows:

   ```
   <sysproperty key="javax.net.ssl.trustStore" value="${env.USM_HOME}/.mykeystore" />
   ```

   c. Locate the following line:

   ```
   <sysproperty key="javax.net.ssl.trustPass" value="changeit" />
   ```

   d. Verify that the keystore password is correct. If necessary, update it.

   For example, if the keystore password is mykeystorepw, update this line as follows:

   ```
   <sysproperty key="javax.net.ssl.trustPass" value="mykeystorepw" />
   ```

3. Verify that both CA Service Catalog and CA Process Automation are using the same CA EEM server.

   Typically, you completed this action when you set up the integration. However, you can verify the name of the CA EEM server in the following locations:

   ■ In CA Service Catalog, see the eiam.backend property in USM_HOME\config.properties file.

   ■ For CA Process Automation, consult the CA Process Automation documentation for your release.

4. Access the USM_HOME\scripts\eiam folder on any Catalog Component computer and edit the file named issueITPAMCertificatePEM.xml, as follows:

   a. Replace __USMHOME_ (a placeholder value) with the actual value of USM_HOME, for example, C:\Program_files\CA\CA Service Catalog.

   b. Replace ITPAMContext (a placeholder value) with the actual value of the application context name that CA Process Automation uses to connect to CA EEM, for example, ITPAM.

   c. Comment or Uncomment the GroupMembership command line depending on the CA Process Automation version.

5. If you are using CA Process Automation 3.1or higher, continue editing the file, as follows. Otherwise, save and close the file.

   a. Locate the following Safex section and the group membership lines highlighted in **bold**.

      For example:

      ```
      <Safex>
      <Attach label="ITPAM" />
      <IssueCertificate certtype="pem" certfile="C:/Progra~1/ca/servic~1/ITPAMCertfile.pem"
      keyfile="C:/Progra~1/ca/servic~1/ITPAMCertfile.key"/>
        <AddOrModify>
          <!--Add user and assign them to appropriate groups-->
          <User folder="/Users" name="CERT-ITPAM">
            <GroupMembership>ITPAMAdmins</GroupMembership>
            <GroupMembership>ITPAMUsers</GroupMembership>
          </User>
        </AddorModify>
      <Detach/>
      </Safex>
      ```

   b. Update the values in the group membership lines, as follows:

      ```
      <GroupMembership>PAMAdmins</GroupMembership>
      <GroupMembership>PAMUsers</GroupMembership>
      ```

   c. Save and close the file.

6. Verify that *filename* is the same in *filename*.key and *filename*.pem, for example, ITPAMCertfile.key and ITPAMCertfile.pem.

7. (Upgrades) Do the following actions to convert your existing .p12 file (if you have one) to a .pem file.

   Note: If you are upgrading and you do not already have a .p12 file, skip this step and perform the next step.

   a. Open the Windows command prompt on the computer where CA EEM is installed. Change to the folder named *drive*:\Program Files\CA\SharedComponents\iTechnology.

   b. Run the following command:

      ```
      igwCertUtil -version 4.6.0.0 -conv  -cert
      "<Certificate><certType>p12</certType><certURI>ITPAMCertfile.p12</certURI><certPW>ca</certP
      W></Certificate>" -target
      "<Certificate><certType>pem</certType><certURI>ITPAMCertfile.pem</certURI><keyURI>ITPAMC
      ertfile.key</keyURI></Certificate>"
      ```

   This action converts the existing .p12 file to a .pem file.

8. (New Installations) Do the following actions to create a .pem file:

   a. Open the command prompt by clicking usm.cmd

   b. Run the following command:

      ```
      safex.exe -u EiamAdmin -p <password> -h <eemserver> -f
      USM_HOME\scripts\eiam\issueitpamcertificatepem.xml -sdkconfig  USM_HOME\eiam.config
      ```

   This action creates the ITPAMCertfile.pem and ITPAMCertfile.key files. Both the files are necessary for the .pem file authentication to work.

9. Log in to CA Service Catalog. Click Administration, Configuration, CA Process Automation and do the following actions:

   a. Enter the name of the .pem file in the PEM Certificate File Name column. The .pem file is stored in USM_HOME.

   b. Select Yes for the option named Use Certificate for Authentication.

   c. Set the other configuration parameters for the properties..

10. Click Test button to test the web service connection from CA Service Catalog to CA Process Automation and from CA Process Automation to CA Service Catalog.

    The connection is tested, using the new values that you specified. If the connection fails, try using a different value.

11. Click Load (see page 264) and Configure (see page 264).

12. Click the Launch button to start the CA Process Automation Server web URL with the updated properties.

    Update the user password (see page 266) for CA Service Catalog in the CA Process Automation SLCM_GlobalDataset.

You have set up certificate-based login between CA Service Catalog and CA Process Automation.

Set Up Certificate-Based Login in CA Process Automation

To enhance security, you can optionally set up CA Process Automation to use certificate-based login to communicate with CA Service Catalog. If you do not use this feature, CA Process Automation uses user name and password login to communicate with CA Service Catalog.

Important! This procedure applies *only* if you are using CA Process Automation 4.0 SP1 CP2 or a higher version that also supports certificate-based login for CA Service Catalog. Other versions of CA Process Automation can use *only* user name and password login to communicate with CA Service Catalog.

Follow these steps:

1. Access the USM_HOME folder of the CA Service Catalog computer and verify that the following certificate files exist:

   ■ USMcertfile.key

   ■ USMcertfile.pem

   ■ USMcertfile.p12

   Note: The CA Service Catalog installation program creates these files automatically.

2. Decide which file or files to use with CA Process Automation:

   ■ If CA EEM is using FIPS mode, select USMcertfile.pem.

   ■ If CA EEM is using non-FIPS mode, select USMcertfile.p12.

   If CA EEM is using non-FIPS mode with CA Process Automation version 4.0 SP1 CP2, you can use either of the USMcertfile.pem or the USMcertfile.p12, however with FIPS mode, select the USMcertfile.pem only.

   Note: To verify whether CA EEM is using FIPS mode, log in to CA EEM. Click the About link on the top right corner of the page. An information dialog appears. Review the FIPS-related details on this dialog.

3. Log in as an administrator to CA Process Automation from the CA Service Catalog computer.

4. Perform the following actions:

   a. Click Configuration.

      The Configuration page appears.

   b. Click Manage User Resources at the left bottom portion of the page.

      The User Resource folder is selected in the Repository tree, and the User Resource page appears on the right pane.

5. Perform the following actions for the file or files that you selected in Step 2. If you selected USMcertfile.key and USMcertfile.pem, perform these actions individually, once for each file.

   a. Click New.

b. Click Browse in the Resource File field and navigate to the USM_HOME folder on the CA Service Catalog computer.

c. Select the file and specify the resource name. You can specify an arbitrary name of your choice.

d. Record the path names of the file or files. You require this information when you set the related administration configuration parameters (see page 262).

6. Save your changes.

7. If you are using multiple CA Process Automation domain servers with CA Service Catalog, repeat these steps on each one.

You have set up CA Process Automation to use certificate-based login to communicate with CA Service Catalog.

Set and Test Administration Configuration Parameters

Specifying the configuration settings for CA Process Automation is a required task for enabling the integration between CA Process Automation and CA Service Catalog. If you are running multiple instances of CA Process Automation, these settings apply to all instances.

Follow these steps:

1. Log in to CA Service Catalog.

2. Click Administration, Configuration.

   The categories of configuration options appear.

3. In the Options list, click CA Process Automation and complete the configuration options, as follows:

   Certificate File Path on CA Process Automation

   Applies only when you are using certificate-based login in CA Process Automation (see page 260) with USMcertfile.pem (for FIPS mode) or USMcertfile.p12 (for non-FIPS mode).

   If this condition exists, specify the path name of the appropriate file on the CA Process Automation server.

   Enable Automatic Retry

   Applies in cases when a request is created in CA Service Catalog that is not processed in CA Process Automation due to connectivity issues between CA Service Catalog and CA Process Automation. The request is placed in queued state and you have to manually retry to process the request to CA Process Automation. Specify Yes for automatic retry or No for manual retry.

   When the Automatic Retry is selected as Yes, the CA Service Catalog connection is established, and the ITPAM_QUEUE_FAILURE automatically gets deleted from the Home, Messages, Alerts, List All Failed Actions list.

   When the message disappears from the List All Failed Actions, verify that the request has changed to the appropriate status. For example, if the original status was Submitted (Queued) then the updated status should be Pending Approval.

   Key File Path on CA Process Automation

   Applies only when you are using certificate-based login in CA Process Automation (see page 260) with the USMcertfile.pem file.

   If this condition exists, specify the path name of the USMcertfile.key file on the CA Process Automation server.

   Password for Certificate on CA Process Automation

   Applies only when you are using certificate-based login in CA Process Automation (see page 260) with the USMcertfile.p12 file.

If you are using CA Process Automation 4.0 SP1 CP2, obtain the password from the USM_HOME\scripts\EIAM\issueCertificateP12.xml file. The password is a random-generated number specified in the IssueCertificate tag of the password attribute, as follows:

```
<IssueCertificate certfile="C:/Program Files/CA/Service Catalog/USMcertfile.p12"
password="password"/>
```

Enable HTTPS

Indicates whether CA Service Catalog uses HTTPS when communicating with CA Process Automation. Specify Yes or No.

Host Name

Specifies the host name of CA Process Automation computer (the Domain Orchestrator).

Note: After the integration has been configured and in use, do *not* change the host name of the CA Process Automation computer or the CA Service Catalog computer. The only exception occurs when the two host computers use the same MDB. For information about the MDB, see the MDB documentation included on the CA Service Catalog installation media.

PEM Certificate File Name

Applies only when you are using an CA EEM certificate for authentication, in other words, when the setting named Use Certificate for Authentication is Yes. If that setting is Yes, then PEM Certificate File Name specifies the name that you specified earlier when set up certificate-based login for CA Process Automation.

Port Number

Specifies the port number on the CA Process Automation computer that listens for incoming calls from CA Service Catalog.

Retry Count

Specifies the number of retry attempts; that is, the number of times for CA Service Catalog to try again to perform a failed CA Process Automation action. The default retry count value is 3.

If all retry attempts fail, CA Service Catalog logs a queue alert as ITPAM_FAILED, and ITPAM_QUEUE_FAILURE in Home, Messages, Alerts. You can manually retry the failed action by viewing the queue alerts in List All Failed Actions and clicking the Retry button.

Retry Interval

Specifies the number of seconds between the retry attempts described for the previous item, Retry Count. The default retry interval is 15 seconds.

For example:

If retry count is 3 and retry interval is 15 seconds.

■ 1 retry and wait 15 seconds

■   2 retry and wait 30 seconds

■   3 retry and wait 45 seconds

Use Certificate for Authentication

Indicates whether to use an CA EEM certificate for authentication. This certificate is used for communication from CA Service Catalog to CA Process Automation. Specify Yes or No.

User ID and User Password

Specifies the user ID and password for accessing the CA Process Automation computer. This user ID and password apply *only* when you are using standard login credentials. It does *not* apply when you are using an CA EEM certificate for authentication.

Important! Verify that the user ID you specify has administrative access to *all* CA Process Automation processes. The user ID requires the right to execute a CA Process Automation process.

The new parameter settings are in effect. As a best practice, verify that the request flow for a service that uses a CA Process Automation process works properly from approval to fulfillment.

Load and Configure Content in CA Service Catalog

The CA Process Automation *content* refers to the processes, SRFs, rules, actions, and related items that are supplied with CA Service Catalog. You load and configure this content in CA Service Catalog to activate it. Afterwards, you configure this content in CA Process Automation (see page 266).

Follow these steps:

1. Log in to CA Service Catalog.

2. Click Administration, Configuration.

    The categories of configuration options appear.

3. In the Options list, click CA Process Automation.

    The CA Process Automation configuration options appear.

4. (Optional) Click Test.

    The two-way connectivity is tested from CA Service Catalog to CA Process Automation and from CA Process Automation to CA Service Catalog.

    Note: If the former test fails, verify the configuration parameters and try again.

5. Click Load.

   The Load Configuration Dialog appears with two options:

   ■ Set imported version of CA Process Automation objects as the current version

   ■ Make the imported custom operators and sensors available

6. Select one or both options (as applicable) and click Load.

   The loading process typically requires a few minutes. This process loads the CA Process Automation content for use with CA Service Catalog. If the loading process completes successfully, a confirmation message appears. A successful load imports the CA Process Automation content, including processes, and related CA Service Catalog rules, actions, and services.

   Apart from all the mentioned processes the CheckSLCMConnectivity SRF that is introduced in CA Process Automation tests the two-way connectivity between CA Service Catalog and CA Process Automation.

   Otherwise, if error message appears, verify that the CA Process Automation server is available and that the configuration parameters are valid.

7. Restart CA Service Catalog.

8. Click Configure.

   The configuration process runs.

   Configures the CA Service Catalog configuration properties that are specified as CA Process Automation data sets (SLCM_GlobalDataset and SDM_GlobalDataset), by updating the values of certain parameters and application URLs.

9. Click Test to test the web service connection to CA Process Automation.

   The two-way connection is tested from CA Service Catalog to CA Process Automation and back from CA Process Automation to CA Service Catalog, using the CheckSLCMConnectivity SRF and the new values specified. If, the connection fails verify the configuration values provided.

   Note: The test connection can be performed not only while configuring CA Process Automation but any time when an issue is detected with processing CA Service Catalog requests. If the test connection fails, verify the view.log or error.log information for the possible reasons for failure.

You have loaded and configured the content in CA Service Catalog. Next, .

Configure Content in CA Process Automation

The CA Process Automation content refers to the processes, SRFs, rules, actions, and so forth, supplied with CA Service Catalog. This content was installed in CA Process Automation when you . Now you configure the content in CA Process Automation.

Follow these steps:

1. Log in to your CA Process Automation client.

2. Navigate to the CA SLCM folder in the Library Browser, and open the data set named SLCM_GlobalDataset.

   Click the checkout icon to enable the text fields.

3. Open the Login Parameters tab In the Value Definition palette of the data set and do the following:

   a. Verify that the values of the following options are correct for your implementation. Update these values as needed.

      ■ userID__ – Specifies an administrative user ID with the Service Delivery administrator role.

        As a best practice, create an administrative user in CA Service Catalog exclusively for this integration.

      ■ Password__ – Specifies the password for this administrative user.

        Important! This field is empty by default; therefore, enter a valid value.

      ■ BusinessUnit__ – Specifies the name of the Service Provider business unit, which is the highest level (root) business unit.

   b. Record these values for use in a later step.

   c. Open the APP URLs tab in the global data set and verify that the values of the following options are correct for your implementation. Update these values as needed.

      ■ SLCM_URL – Specifies the URL to launch CA Service Catalog, in the format http://*hostname:portnumber*.

        If CA Service Catalog runs in a clustered environment, enter the host name and port number of the load balancer.

      ■ SLCM_CONTEXT – Specifies the URL of the CA Service Catalog context, in the format */usm*.

        For example, http://*m:port/usm*

      Note: You can deploy CA Service Catalog in Tomcat web server, where the context name would be usm. If you deploy CA Service Catalog on other supported web servers, you can rename the context to a name of your choice.

      ■ SDM_URL – Specifies the URL to launch CA Service Desk Manager, in the format http://*hostname:portnumber*.

This field applies only if you are integrating CA Service Catalog with CA Service Desk Manager. Otherwise, leave this field empty.

- ITPAM_URL – Specifies the URL to launch CA Process Automation, in the format http://*hostname:port-number/*itpam.

- APM_Service_URL – Specifies the URL to launch CA APM, in the format http://*hostname:portnumber/*apmws/uapm.asmx.

    This field applies only if you are integrating CA Service Catalog with CA Unicenter Asset Portfolio Management. Otherwise, leave this field empty.

   d. Record these values for use in a later step.

4. To save your changes to SLCM_GlobalDataset, perform the following:

   - Click Save.

   - Click the checkin icon to update and save your changes to SDM_GlobalDataset.

5. Perform the following steps, If, you have integrated CA Service Catalog with service desk:

   a. Select the CA SDM folder in the Library Browser, and open the data set named SDM_GlobalDataset.

   b. Open the Login Parameters tab In the Value Definition palette of the data set. Verify that the values for its parameters match the values you specified earlier for the Login Parameters tab of the SLCM_GlobalDataset. Update these values as needed.

   c. Open the SoapCallPaths tab In the Value Definition palette of the data set. Verify that the values for its parameters match the values you specified earlier for the APP URLs tab of the SLCM_GlobalDataset. Update these values as needed.

6. Save your changes to SDM_GlobalDataset.

You are now ready to set up rules, actions, and processes for approval and fulfillment.

Note: For information about setting up these rules, actions, and processes, see the "Integrating with CA Process Automation" chapter of the *Integration Guide*.

Add Multiple CA Process Automation Instances in CA Service Catalog

There can be many rules that are written between departments in a business unit depending on the various services offered. When a rule is created, an action is allocated to the rule for the CA Process Automation instances to process. Multiple CA Process Automation instances can be added in CA Service Catalog for different services and different users. Add multiple CA Process Automation instances in CA Service Catalog to each domain for approval, fulfillment phases, and so forth, based on the category id, domain id, and so on. Adding multiples CA Process Automation instances support you to share work between multiple departments.

Follow these steps:

1. Log in to CA Service Catalog.

2. Click Administration, Configuration.

   The categories of configuration options appear.

3. In the Options list, click CA Process Automation.

   The CA Process Automation configuration options appear.

4. Click Add.

   The Explorer User Prompt appears:

   Enter a configuration name for the new CA Process Automation instance.

   You can only enter alphanumeric characters to add a CA Process Automation instance. All the properties that are associated with the default CA Process Automation instance imported into the new CA Process Automation instance. Configure the property values.

5. Click OK.

   Every new CA Process Automation instance that you add has its own Test, Launch, Load, and Configure buttons.

6. Click the Modify (Pencil) icon and update the values of each property (see page 262).

   Each instance that you add accepts the same configuration parameters as the original instance.

7. Repeat steps 4 through 6 for each new instance that you want to add.

   Note: Typically, for best performance, configure a maximum of ten CA Process Automation instances.

You have added a CA Process Automation instance to CA Service Catalog.

Delete Multiple CA Process Automation Instances in CA Service Catalog

You can delete the CA Process Automation instances that are created in CA Service Catalog. Delete the CA Process Automation instance if it is corrupted, or if you want to replace the CA Process Automation instance with a different CA Process Automation instance.

Note: The default CA Process Automation instance cannot be deleted.

Follow these steps:

1. Log in to CA Service Catalog.

2. Click Administration, Configuration.

   The categories of configuration options appear.

3. In the Options list, click CA Process Automation.

   The CA Process Automation configuration options and instances appear.

4. Expand the CA Process Automation instances that you want to delete by clicking the arrow pointing downwards on the CA Process Automation instance.

   Note: You cannot delete the CA Process Automation instance without expanding it.

5. Click Delete.

   A confirmation message appears.

6. Click OK.

   The selected CA Process Automation instance is deleted.

   You have successfully deleted the CA Process Automation instance in CA Service Catalog.

   Note: All the requests are in inconsistent state when you delete a CA Process Automation instance. All requests must be in a canceled or completed state before deleting a CA Process Automation instance.

How to Set Up Rules, Actions, and Processes for Approval and Fulfillment

To use CA Process Automation for approval and fulfillment of CA Service Catalog requests, you set up rules and actions in CA Service Catalog, and you set up CA Process Automation processes for the actions that you select.

1. Verify that your service is set for workflow-driven approval, as explained in the instructions to add a service in the *Administration Guide*.

2. Review the important information about CA Service Catalog events (see page 271).

   Events are always enabled. For events, certain rules are enabled by default, and other rules are disabled by default. If enabled, rules are triggered and executed when the event occurs. You specify whether to keep or change the default settings for which rules are enabled or disabled.

3. Review the important information about CA Service Catalog rules (see page 272).

   For rules, certain actions are enabled by default, and other actions are disabled by default. If enabled, actions are triggered and executed when the conditions specified by the rule occur. For the *rules* that you either keep enabled or enable intentionally, you specify which *actions* to keep enabled or to enable intentionally.

   The rules and actions that you use depend on the CA Process Automation content that you load for use with CA Service Catalog. For details, see the *Release Notes*.

4. Review the important information about actions (see page 274).

   CA Process Automation actions apply only to the rules for the event named Request/Subscription Item Change. Each of these rules has two mutually exclusive actions, one for use with CA Process Automation (the recommended process automation tool) and one for use with CA Workflow.

   By default, for the event named Request/Subscription Item Change, for the rule named When Status is Canceled, an action is enabled that terminates CA Workflow and CA Process Automation instances when a request is canceled. For best product performance, keep this default setting.

5. Review the summary of approval and fulfillment rules (see page 273). Determine which rules are already used or may be useful to start using in your organization. For complete details about these rules, see the sections mentioned in the next steps.

6. Review and decide the rules, actions, and CA Process Automation process that you want to use for *approval*, as explained in CA Process Automation-Driven Approval (see page 275).

7. Review and decide the rules, actions, and CA Process Automation processes that you want to use for *fulfillment*, as explained in CA Process Automation-Driven Fulfillment (see page 277).

8. If any rules that you want to use are disabled, enable them, as explained in the chapter "Administration Tools" in the *Administration Guide*.

9. In addition, you may optionally create or customize rules or processes used in approval and fulfillment. Minimum customization is permitted for built-in (pre-defined) rules, but you can optionally create and customize new rules; for details, see the chapter "Administration Tools" in the *Administration Guide*.

   Similarly, you can optionally create or customize CA Process Automation processes; for details, see your CA Process Automation documentation.

Events

Events represent changes that occur within CA Service Catalog. Several *standard* events typically occur in various components. You can also add *custom* events.

Events can have *rules* that are associated with them. Rules can have a set of filter conditions that define when the rule applies. When the filter conditions are satisfied and the rule is enabled, the rule *actions* are launched.

Each standard event occurs when an action in CA Service Catalog causes it. For example, the User Create event occurs when an administrator adds new user, by using either the user interface or the createUser web service method.

Do one of the following when a *custom* event occurs:

■ Use one of the postEvent web service methods for the event type

■ Use a URL to post the event

The Events-Rules-Actions menu displays the event types and provides access to the rules and actions that are associated with each event type. You can use these menu options to do the following:

■ Add a custom event type

■ Post a logical event

■ Manage the rules for an event type

■ Manage the actions for a rule

Important! For specific information about using the built-in rules and actions in the CA Workflow simple or complex approval or fulfillment processes, see the *Integration Guide*.

Events are installed automatically when you install or upgrade CA Service Catalog. This chapter focuses on how events are used in the approval and fulfillment processes;. For more information about events and event types, including instructions to add event types and add event filters to rules, see the *Administration Guide*.

Rules

All rules are initially disabled. A rule must be enabled to be used. In addition, for some of the rules, there are two mutually exclusive actions, one for use with CA Service Desk Manager and one for use without CA Service Desk Manager. By default, the actions which interface with CA Service Desk Manager are disabled.

Similarly, for the event named Request/Subscription Item Change, there are several rules. Each of these rules has two mutually exclusive actions, one for use with CA Process Automation (the recommended process automation tool) and one for use with CA Workflow.

The rule conditions that are shipped with CA Service Catalog may not completely match your business processes. They are generic and must be examined for applicability to your environment. In addition, some rules overlap in functionality. When activating rules, be careful to understand the full implications of your changes.

A rule can have one of more actions associated. When an event occurs and a rule filter is satisfied, the associated rule actions are executed. A rule action causes some task to be executed. A rule action can perform one of several action types such as run a command line command, send an email, start a CA Process Automation process or a CA Workflow process definition, or run a Java plug-in.

The When Status is Submitted and Approval Process is Driven by Workflow rule handles the approval process. The rest of the rules handle the fulfillment process.

The When Status is Pending Fulfillment rule handles *both* the Simple Fulfillment model and the CA Service Desk Manager Request Fulfillment model. These represent two of the three fulfillment models that are provided with CA Service Catalog.

The several remaining rules handle the Complex Fulfillment model. The rules governing each of the fulfillment models must not all be activated unless you alter their conditions or disable other rules. These rules are launched for overlapping types of requests and therefore cause duplicate behaviors unless other rules are disabled.

This chapter focuses on how specific rules are used in the approval and fulfillment processes. For more information about rules including instructions to create them, add them to events, and manage the actions in rules, see the *Administration Guide*.

Summary of Approval and Fulfillment Rules

This section contains a brief summary of the most commonly used approval and fulfillment rules. For a complete list of rules and complete descriptions of each rule, see the rules described in CA Process Automation-Driven Approval (see page 275) and CA Process Automation-Driven Fulfillment (see page 277).

When Status is Pending Fulfillment

This rule with filter is launched once for each request item when its status goes from the approval range to Pending Fulfillment.

When Status is Submitted and Approval Process is driven by Workflow

This rule with filter is launched once for each service when a request is submitted for approval.

When Category is Hardware and Status is Pending Fulfillment

This rule with filter is launched once for each hardware request item when its status goes from the approval range to Pending Fulfillment.

When Category is Hardware and Status is Filled From Inventory

This rule with filter is launched once for each hardware request item when its status goes to Filled From Inventory.

When Category is Hardware and Status is Not Filled From Inventory

This rule with filter is launched once for each hardware request item when its status goes to Not Filled From Inventory.

When Category is Hardware and Status is Received or Order Canceled

This rule with filter is launched once for each hardware request item when its status goes to Received or Order Cancelled.

When Category is None and Status is Pending Fulfillment

This rule with filter is launched once for each category None request item when its status goes from approval range to Pending Fulfillment.

When Category is neither Hardware nor Software and Status is Pending Fulfillment

This rule with filter is launched once for each non-hardware, non-software request item when its status goes from approval range to Pending Fulfillment.

When Category is neither Hardware nor Software and Status is Filled From Inventory

This rule with filter is launched once for each non-hardware, non-software request item when its status goes to Filled From Inventory.

When Category is neither Hardware nor Software and Status is Filled From Inventory

This rule with filter is launched once for each non-hardware, non-software request item when its status goes to Not Filled From Inventory.

When Category is neither Hardware nor Software and Status is Received or Order Canceled

This rule with filter is launched once for each non-hardware, non-software request item when its status goes to Received or Order Cancelled.

When Category is Software and Status is Pending Fulfillment

This rule with filter is launched once for each software request item when its status goes from approval range to Pending Fulfillment.

When Category is Software and Status is Filled From Inventory

This rule with filter is launched once for each software request item when its status goes to Filled From Inventory.

When Category is Software and Status is Not Filled From Inventory

This rule with filter is launched once for each software request item when its status goes to Not Filled From Inventory.

When Category is Software and Status is Received or Order Canceled

This rule with filter is launched once for each software request item when its status goes to Received or Order Cancelled.

Actions

Actions are invoked when a condition in a rule (see page 272) is satisfied. Actions include running a command line command, starting a Java process, sending an email, and starting a CA Process Automation process or a CA Workflow process definition. For more information about actions, see the descriptions of the rules.

This chapter focuses on how specific CA Process Automation actions are used in rules during the approval and fulfillment processes. For additional general information about CA Service Catalog actions, including instructions to add them to rules, enable them, and modify them, see the *Administration Guide*.

Processes and Start Request Forms

CA Process Automation processes for approval and fulfillment are mentioned throughout this chapter. Each CA Process Automation action that you use with a CA Service Catalog rule invokes a start request form (SRF). The SRF starts a CA Process Automation process that aligns to one or more business process or processes. For additional information about processes and SRFs, see your CA Process Automation documentation.

CA Process Automation-Driven Approval

CA Service Catalog supplies a pre-defined rule that fires once for each service when a request is submitted for approval.

In each rule, you specify a CA Process Automation action to initiate an approval CA Process Automation start request form (SRF). Each start request form initiates a CA Process Automation process that manages approval of requests.

Approval Rule, Condition, and CA Process Automation Action

The approval-related rule is associated with the Request/Subscription Item Change event. This event is launched when any service option element in any service in a request changes.

Because approvals are done at the service level, you must assign a rule to "act on" the status changes for every service in a request. You specify the conditions in the rule to help ensure that the rule actions are performed only for the first service option element in the first row of the first service option group in each service in the request. Thus, the rule launches only once for each service, regardless of the number of service options and service option elements in the service.

There is one rule associated with the approval process, as follows:

When Status is Submitted and Approval Process is driven by Workflow

> This rule is launched when a user submits a request and the following conditions are satisfied. The rule conditions help ensure that the rule is launched only when the user submits a request and the service approval is to be driven by a workflow.

- 100 <= old status < 200 - The old status is in the not submitted range

- 200 <= new status < 400 - The new status is in the submitted range

- approval_process = 2 - The approval process for the service is workflow-driven approval

- sd_row = 1 - This service option element is the first service option element in the service

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

Note: This rule is launched regardless of the category of any of the service option elements in a service.

Define a CA Process Automation action for approval and associate it with this rule.

This action uses the following values:

- Type – CA Process Automation

- Start Request Form (SRF) – click the Search icon and select your approval SRF from the list

- Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance.

- Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

The action launches the SRF, passing the information necessary to assign an approval task to the approvers defined in your CA Process Automation approval process. Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Pending Approval (400).

CA Process Automation-Driven Fulfillment

CA Service Catalog supplies rules, conditions, and actions that you can associate with CA Process Automation start request forms (SRFs). These SRFs initiate CA Process Automation processes that handle various fulfillment processes. While approval is handled at the service level, fulfillment is handled at the service option level. Which fulfillment process must be used is determined by the characteristics of the first service option element in a service option. The distributed rule conditions are based on the service option element Category field with separate rules for Hardware, Software, None and all other Category values.

A set of rules is associated with a complex fulfillment process and a simple fulfillment process. Another set of rules opens a CA Service Desk Manager request and leaves the fulfillment process to the CA Service Desk Manager workflow processes.

These fulfillment options may suit your business processes exactly but you may want to alter the distributed components to fit your business processes more accurately. Before altering the existing components or adding to them, it is important to understand their functions.

Note: Enabling all the rules related to all three options is not recommended, because the three fulfillment options overlap.

Complex Fulfillment Overview

The complex fulfillment process takes into account the current service option element status value to determine the next step in the fulfillment process with major fulfillment phases related to:

- Checking availability of the requested item when initially requested or when the item status is Received

- Optionally opening a CA Service Desk Manager Change Order (for Hardware or Software) or notifying appropriate fulfillment personnel when the item is found in available inventory

- Notifying Procurement personnel of the requested item when it is not found in available inventory, then Procurement personnel marks the item as Received when it arrives

Simple Fulfillment Overview

The simple fulfillment process notifies the appropriate fulfillment personnel that the item needs to be fulfilled with no special regard for fulfillment phases.

CA Process Automation Fulfillment Rules, Conditions, and Actions

The fulfillment-related rules are associated with the Request/Subscription Item Change event. This event is launched when any service option element in any service in a request changes.

Because fulfillment is accomplished at the service level, you must assign a rule to perform one or more actions the status changes for every service in a request. You specify the conditions in the rule to help ensure that the rule actions are performed only for the first service option element in the first row of the first service option group in each service in the request. Thus, the rule launches only once for each service, regardless of the number of service options and service option elements in the service.

Use the rule condition to help ensure that the rule actions are performed only at the appropriate time. For fulfillment, you want the fulfillment action to occur only for the first service option element in the first row for the first service option group in the request. This means the rule is launched only once for each service option regardless of the number of service option elements in the service option.

In addition, the fulfillment process takes different paths based on the category and status of the first service option element in the service option. The categories are Software (0), Hardware (1), None (-1) and any custom categories that you define.

The list of categories and their associated numeric values are defined in the following line:

USM_HOME\view\webapps\usm\locale\icusen\billing\category.xml

The list of statuses and their associated numeric values are defined in the following line:

USM_HOME\view\webapps\usm\locale\icusen\request\requestshared.xml

CA Process Automation Simple Fulfillment

Simple fulfillment consists of notifying the appropriate department that the requested item needs to be fulfilled. The assigned fulfillment users change the status of the requested item as appropriate until the status is changed to Fulfilled or Fulfillment Cancelled. Simple fulfillment uses the When Status is Pending Fulfillment rule.

CA Process Automation Simple Fulfillment Rule and Actions

There is one rule associated with the simple fulfillment process used for CA Process Automation: When Status is Pending Fulfillment.

Important! If you enable this rule, verify that *all other* fulfillment rules are disabled; otherwise, requests pending action may be duplicated.

When Status is Pending Fulfillment Rule

This rule is launched when a request item status changes and these conditions are satisfied:

- 800 <= old status <= 999 – The old status is in the approved range

- new status = 1000 – The new status is Pending Fulfillment (1000)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a request first enters the fulfillment phase.

Define CA Process Automation Action

Define a CA Process Automation action for simple fulfillment and associate it with this rule.

This action uses the following values:

- Type – CA Process Automation

- Start Request Form (SRF) – click the Search icon and select your simple fulfillment SRF from the list

- Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance.

- Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

When this action starts the Fulfillment (SRF), it passes the information necessary to assign a fulfillment needed task to the appropriate fulfillment user or group. Typically, you also use the CA Process Automation process called by the SRF to set the status of the requested item to Pending Fulfillment (1000).

CA Process Automation Complex Fulfillment

The first step of the complex fulfillment phase is for the appropriate department to check the availability of the requested item. For hardware and software this may be the IT Services department. For other categories, the department may be different.

For hardware and software items, if the requested item is found in available inventory, then you can optionally do one of the following:

- Notify the IT Services department to fulfill the request.

- Integrate with another product, such as CA Service Desk Manager, to perform an action, such as opening CA Service Desk Manager change order.

For items that are neither hardware nor software, if the requested item is found in available inventory, then the appropriate department is notified to fulfill the request.

For all items, if the requested item is not found in available inventory, then the Procurement department is notified that the requested item needs to be purchased. After the status of the requested item is set to Received, it is assumed that the item is then in available inventory and the appropriate department is to check the inventory as before.

If the IT Services department or other appropriate department is notified that fulfillment is needed, the user assigned the fulfillment task sets the request item status to Fulfilled. When all request item statuses are set to Fulfilled, the system changes their statuses to Completed, as appropriate. This allows billing from Accounting Component.

If you have integrated with another product, then you may configure an associated workflow process (a CA Process Automation process or a CA Workflow process definition) in that product to manage the rest of the fulfillment process. For example, if you configure the CA Process Automation process to create a CA Service Desk Manager change order, then, after the change order is closed, the associated workflow process in CA Service Desk Manager sets the request item status to Fulfilled.

If for some reason, the requested item cannot be fulfilled, then the status is set to Fulfillment Cancelled, which the system changes to Cancelled when all of the request item statuses are set to Fulfilled or Fulfillment Cancelled, marking the end of the fulfillment phase.

CA Process Automation Complex Fulfillment Rules and Actions

The following rules are associated with the complex fulfillment process:

- When Category is Hardware and Status is Pending Fulfillment
- When Category is Software and Status is Pending Fulfillment
- When Category is neither Hardware nor Software and Status is Pending Fulfillment
- When Category is Hardware and Status is Filled From Inventory
- When Category is Software and Status is Filled From Inventory
- When Category is neither Hardware nor Software and Status is Filled From Inventory
- When Category is Hardware and Status is Not Filled From Inventory
- When Category is Software and Status is Not Filled From Inventory
- When Category is neither Hardware nor Software and Status is Not Filled From Inventory
- When Category is Hardware and Status is Received or Order Canceled
- When Category is Software and Status is Received or Order Canceled
- When Category is neither Hardware nor Software and Status is Received or Order Canceled
- When Category is None and Status is Pending Fulfillment

Check Availability Rules for CA Process Automation

The Check Availability rules for use with CA Process Automation are as follows:

- When Category is Hardware and Status is Pending Fulfillment

- When Category is Software and Status is Pending Fulfillment

- When Category is neither Hardware nor Software and Status is Pending Fulfillment

When Category is Hardware and Status is Pending Fulfillment

The When Category is Hardware and Status is Pending Fulfillment rule is launched when a request item status changes and these conditions are satisfied:

- 800 <= old status < = 999 - The old status is in the approved range

- new status = 1000 - The new status is pending fulfillment (1000)

- category = 1 - The service option element category is Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item first enters the fulfillment phase.

When Category is Software and Status is Pending Fulfillment Rule

This rule is launched when a request item status changes and these conditions are satisfied:

- 800 <= old status < = 999 - The old status is in the approved range

- new status = 1000 - The new status is pending fulfillment (1000)

- category = 0 - The service option element category is Software (0)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item first enters the fulfillment phase.

When Category is neither Hardware nor Software and Status is Pending Fulfillment Rule

This rule is launched when a request item status changes and these conditions are satisfied:

- 800 <= old status < = 999 - The old status is in the approved range

- new status = 1000 - The new status is pending fulfillment (1000)

- category > 1 - The service option element category is not Hardware (1) or Software (0) or None (-1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition helps ensure that the rule is used only when a requested non-hardware or software item first enters the fulfillment phase.

Define CA Process Automation Action

For each Check Availability rule, define a CA Process Automation action and associate it with the rule.

Each action uses the following values:

■ Type – CA Process Automation

■ Start Request Form (SRF) – click the Search icon and select your Check Availability SRF from the list

■ Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance

■ Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

When this action starts the Check Availability SRF, it passes the information necessary to assign a check availability task to the appropriate fulfillment user or group. Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Check Availability (1001).

Fulfillment Rules and Actions for CA Process Automation

The fulfillment rules used by CA Process Automation are as follows:

■ When Category is Hardware and Status is Filled From Inventory

■ When Category is Software and Status is Filled From Inventory

■ When Category is neither Hardware nor Software and Status is Filled From Inventory

■ When Category is None and Status is Pending Fulfillment

When Category is Hardware and Status is Filled From Inventory Rule

The When Category is Hardware and Status is Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

■ old status <> 1002 - The old status is not Filled From Inventory (1002)

■ new status = 1002 - The new status is Filled From Inventory (1002)

■ category = 1 – The service option element category is Hardware (1)

■ rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item's status is changed to Filled From Inventory.

Define CA Process Automation Action

If you use the When Category is Hardware and Status is Filled From Inventory rule, define a CA Process Automation action and associate it with the rule. Define this action to pass the information to do one or more tasks, for example:

■ Assign a fulfillment needed task to the appropriate fulfillment user.

■ Integrate with another product; for example, open a CA Service Desk Manager change order.

Each action uses the following values:

■ Type – CA Process Automation

■ Start Request Form (SRF) – click the Search icon and select your Fulfillment SRF from the list

■ Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance.

■ Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Notified IT Services (1015).

When Category is Software and Status is Filled From Inventory Rule

The When Category is Software and Status is Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

■   old status <> 1002 - The old status is not Filled From Inventory (1002)

■   new status = 1002 - The new status is Filled From Inventory (1002)

■   category = 0 – The service option element category is Software (0)

■   rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested software item status is changed to Filled From Inventory.

Define CA Process Automation Action

If you use the When Category is Software and Status is Filled From Inventory rule, define a CA Process Automation action and associate it with the rule. Define this action to pass the information to do one or more tasks, for example:

■   Assign a fulfillment needed task to the appropriate fulfillment user.

■   Integrate with another product; for example, open a CA Service Desk Manager change order, associating any assigned assets.

Each action uses the following values:

■   Type – CA Process Automation

■   Start Request Form (SRF) – click the Search icon and select your Fulfillment SRF from the list

■   Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance.

■   Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Notified IT Services (1015).

When Category is neither Hardware nor Software and Status is Filled From Inventory Rule

This rule is launched when a request item status changes and these conditions are satisfied:

■   old status <> 1002 - The old status is not filled from inventory (1002)

■   new status = 1002 - The new status is filled from inventory (1002)

■   category > 1 – The service option element category is not None (-1), Software (0) or Hardware (1)

■   rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item's status is changed to Filled From Inventory and the category of the requested item is not hardware or software.

Define CA Process Automation Action

If you use the When Category is neither Hardware or Software and Status is Filled From Inventory rule, If you use the When Category is Software and Status is Filled From Inventory rule, define a CA Process Automation action and associate it with the rule. Define this action to pass the information to do one or more tasks, for example:

■ Assign a fulfillment needed task to the appropriate fulfillment user.

■ Integrate with another product; for example, open a CA Service Desk Manager change order, associating any assigned assets.

Each action uses the following values:

■ Type – CA Process Automation

■ Start Request Form (SRF) – click the Search icon and select your Fulfillment SRF from the list

■ Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance.

■ Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Notified IT Services (1015).

When Category is None and Status is Pending Fulfillment Rule

This rule is launched when a request item status changes and these conditions are satisfied:

■ 800 <= old status <=999 - The old status is in the approved range

■ new status = 1000 - The new status is Pending Fulfillment (1000)

■ category = -1 – The service option element category is None (-1)

■ rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item using the category None first enters the fulfillment phase.

Define CA Process Automation Action

If you use the When Category is None and Status is Pending Fulfillment rule, Define a CA Process Automation action for simple fulfillment and associate it with this rule.

This action uses the following values:

■ Type – CA Process Automation

■ Start Request Form (SRF) – click the Search icon and select your simple fulfillment SRF from the list

■ Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance.

■ Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

When this action starts the Fulfillment (SRF), it passes the information necessary to assign a fulfillment needed task to the appropriate fulfillment user or group. Typically, you also use the CA Process Automation process called by the SRF to set the status of the requested item to Pending Fulfillment (1000).

Procurement Rules for CA Process Automation

The procurement rules for use with CA Process Automation are as follows:

- When Category is Hardware and Status is Not Filled From Inventory

- When Category is Software and Status is Not Filled From Inventory

- When Category is neither Hardware nor Software and Status is Not Filled From Inventory

When Category is Hardware and Status is Not Filled From Inventory Rule

The When Category is Hardware and Status is Not Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1003 - The old status is Not Filled From Inventory (1003)

- new status = 1003 - The new status is Not Filled From Inventory (1003)

- category = 1 – The service option element category is Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item's status is changed to Not Filled From Inventory.

When Category is Software and Status is Not Filled From Inventory Rule

The When Category is Software and Status is Not Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1003 - The old status is not Not Filled From Inventory (1003)

- new status = 1003 - The new status is Not Filled From Inventory (1003)

- category = 0 – The service option element category is Software (0)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested software item's status is changed to Not Filled From Inventory.

When Category is neither Hardware nor Software and Status is Not Filled From Inventory

This rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1003 - The old status is Not Filled From Inventory (1003)

- new status = 1003 - The new status is Not Filled From Inventory (1003)

- category > 1 – The service option element category is not None (-1), Software (0) or Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item's status is changed to Not Filled From Inventory and the category of the requested item is not hardware or software.

Define CA Process Automation Action

For each procurement rule, define a CA Process Automation action and associate it with the rule.

Each action uses the following values:

- Type – CA Process Automation

- Start Request Form (SRF) – click the Search icon and select your procurement SRF from the list

- Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance

- Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

When this action starts the Check Availability SRF, it passes the information necessary to assign a procurement task to the appropriate procurement user or group. Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Pending Procurement (1012).

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Received or Order Cancelled Rules

The Received or Order Cancelled rules for use with CA Process Automation are as follows:

■ When Category is Hardware and Status is Received or Order Canceled

■ When Category is Software and Status is Received or Order Canceled

■ When Category is neither Hardware nor Software and Status is Received or Order Canceled

When Category is Hardware and Status is Received or Order Canceled

This rule is launched when a request item status changes and these conditions are satisfied:

■ old status <> 1007 - The old status is not Received (1007)

■ old status = 1008 - The new status is not Order Cancelled (1008)

■ 1007 <= new status <= 1008 - The new status is Received (1007) or Order Cancelled (1008)

■ category = 1 – The service option element category is Hardware (1)

■ rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item's status is changed to Received or Order Cancelled.

When Category is Software and Status is Received or Order Canceled

This rule is launched when a request item status changes and these conditions are satisfied:

■ old status <> 1007 - The old status is not Received (1007)

■ old status = 1008 - The new status is not Order Cancelled (1008)

■ 1007 <= new status <= 1008 - The new status is Received (1007) or Order Cancelled (1008)

■ category = 0 – The service option element category is Software (0)

■ rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested software item's status is changed to Received or Order Cancelled.

When Category is neither Hardware nor Software and Status is Received or Order Canceled

This rule is launched when a request item status changes and these conditions are satisfied:

■ old status <> 1007 - The old status is not Received (1007)

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- old status = 1008 - The new status is not Order Cancelled (1008)

- 1007 <= new status <= 1008 - The new status is Received (1007) or Order Cancelled (1008)

- category > 1 – The service option element category is not None (-1), Software (0) or Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item's status is changed to Received or Order Cancelled and the item's category is not hardware or software.

Define CA Process Automation Action

For each Received or Order Cancelled rule, define a CA Process Automation action and associate it with the rule.

Each action uses the following values:

- Type – CA Process Automation

- Start Request Form (SRF) – click the Search icon and select your Check Availability SRF from the list

- Configuration Name – All the CA Process Automation multiple instances are listed. Select the CA Process Automation to create the process instance

- Parameters – When you select an SRF, the required input parameters are automatically listed. Either enter one or more custom values or select one or more values from the list.

When this action starts the Check Availability SRF, it passes the information necessary to assign a check availability task to the appropriate fulfillment user or group. Typically, you use the CA Process Automation process called by the SRF to set the status of the requested item to Check Availability (1001).

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Assign Users to Required CA Process Automation User Groups

To be able to launch the CA Process Automation client from the CA Service Catalog request tracking page, assign users to the appropriate CA Process Automation groups in CA EEM. Otherwise, you cannot launch the client. It is most beneficial to launch the client in context to an active CA Process Automation process, for tracking, analyzing, and troubleshooting the flow of the request process.

When you install CA Process Automation 3.0, it creates the following user groups in CA EEM:

- ITPAMADMIN - the administrators user group

  By default, this group contains one member, named itpamadmin, but you can optionally add others.

  Users in this group have complete administrative access to CA Process Automation

- ITPAMUser - the user group for non-administrative users

  By default, this group contains one member, named itpamuser, but you can optionally add others.

When you install CA Process Automation 3.1 or higher, it creates the following user groups in CA EEM:

- PAMADMIN - the administrators user group

  By default, this group contains one member, named pamadmin, but you can optionally add others.

  Users in this group have complete administrative access to CA Process Automation

- PAMUser - the user group for non-administrative users

  By default, this group contains one member, named pamuser, but you can optionally add others.

After assigning users to one of these groups, verify that the users can launch the CA Process Automation client from the CA Service Catalog request tracking page.

Chapter 11: Integrating with CA Workflow

CA Workflow is an included component that allows your organization to model business processes as a series of executable steps which communicate with other systems, assign tasks to user, and more.

A CA Workflow process definition is the defined series of steps to automate a business process. A CA Workflow actor is a program, system, or person who is assigned an activity in the business process.

CA Service Catalog ship many process definitions and actors which are automatically loaded into CA Workflow during installation.

For more information on these process definitions and actors, see How to Configure CA Workflow Default Approval and Fulfillment (see page 304).

This section contains the following topics:

How to Integrate with CA Workflow

Before using CA Workflow, perform the following tasks:

1. Ensure that CA Workflow is installed or upgraded, as explained in the *Implementation Guide*.

2. If you plan to use Secure Socket Layer, ensure that have performed the following tasks:

   - Configure CA Workflow for Secure Socket Layer (SSL)

   - Configure CA Workflow to communicate with CA Service Catalog using SSL

   For instructions to perform these tasks, see the *Implementation Guide*.

3. Set the CA Workflow Configuration Parameters.

4. Verify that CA Service Catalog and CA Workflow are configured to use the same installation and application instance of CA EEM Release 8.4.

5. Decide whether to implement CA Workflow clustering (see page 297). To do so, follow the instructions in the *Implementation Guide*.

6. If you are using CA EEM, add failover support for CA EEM (see page 33); this process includes configuring CA Workflow to support CA EEM failover (see page 35).

7. If you are not an experienced CA Workflow user, review the CA Workflow Basic Concepts (see page 297).

8. Decide which rules, actions, and CA Workflow process definitions to enable and use for approving and fulfilling CA Service Catalog requests, as explained in How to Configure CA Workflow Approval and Fulfillment (see page 304).

   As part of this process, review the important information about events, rules, actions, and process definitions (see page 306). This information is *required* if you are upgrading CA Workflow and *beneficial* for learning purposes if you are installing CA Workflow for the first time.

9. If you are integrating CA Service Desk Manager with CA Service Catalog, review and perform any applicable actions described in CA Service Desk Process Definitions (see page 363) and the chapter "Integrating with CA Service Desk Manager."

10. If you need to use form attributes in your CA Service Catalog services, review and perform any applicable actions described in How to Pass Form Attributes to CA Workflow (see page 364).

    Note: For additional information about forms and form attributes, see the *Administration Guide*.

11. If you want to call a custom Java program from a CA Workflow process definition, review and perform any applicable actions described in Custom CA Workflow Java Object Actors (see page 370).

12. Test your customized rules, conditions, actions, and process definitions by using them in actual CA Service Catalog services.

Important! You set the connection parameters for the database and CA EEM when you install or upgrade CA Service Catalog and set up the CA Service Catalog components. If you are integrating CA Service Catalog and CA Workflow, *do not update* any connection parameters for the database or CA EEM after that time. Otherwise, CA Workflow and the integration may stop working properly.

Set the CA Workflow Configuration Parameters

Setting the configuration parameters is a required task to use CA Workflow.

If you are using CA Workflow, set these configuration parameters to help ensure that CA Workflow and CA Service Catalog work together correctly. This task is part of setting the administration configuration options.

To set the CA Workflow configuration parameters

1. Select Administration, Configuration, CA Workflow and specify values for the following parameters:

   Enable HTTPS

   Defines whether CA Service Catalog uses HTTPS when communicating with CA Workflow.

   Default: No

   Host Name

   Displays the host name on which CA Workflow is installed. Update this setting if necessary.

   Default: The host name on which this CA Workflow was installed.

   Port Number

   Specifies the port number used to communicate with CA Workflow.

   Default: The value specified when CA Workflow was installed.

   Retry Count

   Specifies the number of times to try again to complete a failed CA Workflow action.

   Default: 10

   Retry Interval

   Specifies the number of seconds between attempts to complete a failed CA Workflow action.

   Default: 300

2. Recycle the CA Service Catalog service.

3. Recycle the CA Service Fulfillment service.

4. Click Test to verify these parameters.

5. Click the Configure button to update the CA Workflow actors, if required. This action is required if you update any parameters in the Server Information section or the Service Desk section of the Administration Configuration parameters.

6. Verify whether *both* of the following conditions exist:

   ■ You are integrating CA Service Catalog with CA Service Desk Manager.

   ■ The related CA Service Catalog process definitions and actors are loaded in the CA Workflow implementation for CA Service Desk Manager.

7. If *both* of the conditions in the previous step exist, perform this step. Otherwise, skip this step.

   a. Do the following, if any Server Information settings for CA Service Catalog have changed: Reimport the USM_RequestService web service actor loaded in the CA Service Desk Manager CA Workflow implementation with the new Server information. To do so, do the following, sequentially:

      – Export the actor in the CA Workflow IDE.

      – Change the wsdl_url to the new Server URL.

      – Reimport the actor into the CA Workflow IDE.

   b. Update the USM_HW_Fulfillment_SD_r12 and USM_SW_Fulfillment_SD_R12 process definitions in the CA Workflow IDE. In each of these process definitions, select the Initialize Values function and set the USM_URL to the new Server URL, and set the USM_LoginBusinessUnit to the value that is being used by the CA Service Catalog Application.

   c. Save the changes to these process definitions.

8. Recycle the CA Service Fulfillment service again.

Note: You can optionally click Launch to start the CA Workflow Process Manager.

Clustering

As a CA Service Catalog administrator, you can optionally use *clustering* for CA Service Catalog to improve performance and provide *failover protection*. Here, the term *clustering* means multiple computers in a group that perform the same or similar function, essentially acting as one virtual computer. Specifically, clustering here refers to CA Service Catalog running on two or more computers. *Failover protection* means that if one computer malfunctions, becomes heavily loaded, or loses power, its workload is transferred to the other computers in the cluster. These computers retain and complete the active sessions.

Another advantage of clustering is *load-balancing:* If one of the cluster components is busy processing a request, the load is redirected to another component in the cluster. Users of the system see no interruption of access. CA Service Catalog processing continues. The loss of performance on users and business functions is minimized, even when computer availability is lost or reduced.

For instructions to implement clustering for CA Workflow and Catalog Component, see the *Implementation Guide*.

Basic Concepts

Before you can use CA Workflow with CA products, such as CA Service Catalog, to automate business processes, you must understand the following basic concepts about CA Workflow:

- User Applications (see page 298)

- Process Definition Tool (see page 298)

- Worklist (see page 299)

- Workflow Manager (see page 299)

- Automation of Business Processes (see page 300)

User Applications

CA Workflow contains the following user applications:

- CA Workflow Process Definition Tool (also referred to as the CA Workflow IDE) - Java Swing application used to create and edit process definitions, actors and other components as well as to manage process instances.

- Worklist - Web application used by users who have been assigned a task by a process instance.

- Workflow Manager - Web application used to manage process instances. CA Workflow Manager provides a subset of the functionality of the IDE.

Note: CA Workflow is included in several CA products. While all instances of CA Workflow can share the same MDB, each CA product provides its own installation of its own instance of CA Workflow. Each instance of CA Workflow provides its own copy of each CA Workflow application and has a separate context meaning it manages its own set of CA Workflow process definitions, actors, and process definitions.

Process Definition Tool

You use the CA Workflow Process Definition Tool, also referred to as the CA Workflow Design Environment (IDE), to create and manage workflows. It is your primary tool for creating and managing process definitions and workflow instances, and for controlling workflow participant interaction.

Your company creates a business process to identify the resources, manual and automated activities, and activity relationships to realize your business goals. A workflow partially or fully automates the business process by defining the business process activities in a process definition. A process definition is a representation of your business process. A process definition is comprised of nodes, events, roles, actors, activities and decision branches.

While process definitions represent what you want to happen in your business process, process instances represent a running instantiation of the business process. By running a process definition, you create a process instance. You can create multiple process instances of the same process definition.

The Process Definition Tool can be accessed by clicking the CA Workflow link from the Administration Quick Start dashboard or from the Administration, Tools menu. The user can use the Process Definition Tool only as a member of the CA EEM Workflow Admin group. The first time you click the link, Java Web Start is used to install the application on your client machine.

Workflow Manager

Workflow Manager provides web-based access to the administrative features of CA Workflow, which include starting/stopping running instances and viewing the status of an instance.

By default, any user that has access to the IDE has permission to log into the Workflow Manager.

The URL for Workflow Manager is

http://*wfhostname:wfport*/pm

Where *wfhostname* is the server where CA Workflow is installed and *wfport* is the CA Workflow port.

Worklist

The CA Workflow Worklist is a web-based application that allows workflow participants to manage assigned workitems (also called tasks or activities).

The Worklist application can be configured by each end user. The Configure button allows you to configure which columns are displayed and the criteria for which tasks must be displayed. If you are a member of the eIAM Worklist Process Initiator group, you can also start a workflow process instance from the Worklist Templates tab.

Note: For more information on Workflow Worklist, see Worklist Online Help.

The request lifecycle-related process definitions provided for use with CA Service Catalog components do not rely on the user's using the Worklist application to manage assigned tasks. The components automatically manage the user's assigned tasks through CA Service Catalog request Pending Action, Fulfillment and Approval user interfaces. Because of this feature, there is no link automatically provided on the CA Service Catalog user interface to launch Worklist. There is a Dashboard Library content element named My Tasks that does provide this link.

The URL for Worklist is

http://*wfhostname:wfport*/wl

Where *wfhostname* is the server where CA Workflow is installed and *wfport* is the CA Workflow port.

IPv6, Linux, and Login

CA Service Catalog supports Internet Protocol Version 6 (IPv6). IPv6 is supported whenever CA Service Catalog is running. Thus, this IPv6 support does *not* need to be configured, turned on, or turned off.

However, if you are using an Oracle database running on Linux and your Linux server is configured for IPv6 support, you may be unable to log in to the CA Workflow IDE after you have installed CA Service Catalog. In such cases, modify your CA Workflow configuration to enable login again; for details, see Cannot Log in to CA Workflow (see page 414).

Note: If Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) hosts co-exist on your network, ensure that the appropriate transition strategies, tools, and mechanisms to support both technologies are configured and running in your test and production environments.

Automation of Business Processes

You can use CA Workflow to automate your business processes. If your business process can be clearly defined and accomplished using tasks assigned to people and interaction with other systems, then it is a candidate for automation using CA Workflow. A business process is defined in CA Workflow as a process definition. A process definition has roles that represent people and other systems and activities connected by logical connectors. Each role uses an actor which is the CA Workflow element that represents a person or other entity which can perform an action.

Several process definitions and actors are provided with CA Service Catalog to handle several business processes related to request approval and fulfillment.

Note: Prior to using or altering any of the supplied process definitions, review CA Workflow-Driven Approval and Fulfillment for more details.

After a process definition is designed and built, it needs to be started to actually do its work and execute the business process it was meant to automate. A process definition can be started manually by using the CA Workflow IDE, Worklist, or Workflow Manager. Frequently it is useful for a process designer to use the IDE to start a process definition during the development and testing phase. An end user can use Worklist to start a process definition if it is clear which process definition is meant to be started to accomplish some business process.

With CA Service Catalog, a process definition can also be automatically started by using a scheduled task or an event rule action.

The first step in creating a process definition is to design it on paper. Identify the people and other systems which play a role in the business process you are trying to automate. The next step is to ensure that each role can be realized through an actor.

With CA Service Catalog, each role that represents a person (such as an approver) uses a Global User List actor. A role using a Global User List actor assigns a task to one or more CA EEM users or groups.

Each role that represents a system (such as an application or suite) typically uses a Web Service actor.

After the actors are defined, the next step is to define the activities or steps (nodes) in the business process being automated and the logical flow of those nodes.

Note: For more information and examples of how to use actors and nodes, see the *CA Workflow IDE Online Help*.

Actor Types

There are several other actor types available for use in a process definition to automate a business process. Each actor type permits its own set of operations allowing various functionalities.

JavaScript

A JavaScript actor can be used to execute custom JavaScript code.

User Lists

With CA Service Catalog, there is one User List actor, the Global User List actor.

Web Service

A Web Service actor provides a way for a business process to interact with another system that has a web service API. CA Service Catalog provides an extensive set of web services that allow programmatic access to its functions. CA Service Catalog provides a complete set of web service actors.

Simple Event

A Simple Event actor allows you to create your own send and wait events for inter-process definition communication.

Java Object

A Java Object actor uses a Java class made available to CA Workflow. The Java class can do whatever functionality is needed. CA Service Catalog includes one Java Object actor named USM_EiamHelper Actor. USM_EiamHelper Actor provides two operations that can be used to generate a string value. This string value can be used as either a CA Service Catalog web service session ID or a CA EEM artifact/token that can be used as authentication for other systems. The user represented by the session ID/token is the user for which there is a certificate on the CA Workflow server.

Processes

A Process actor makes an existing process definition an actor that can be called from a parent process definition. Process actors allow you to write modular process definitions and facilitate reuse.

Command Line

A command line actor can run a command on the server where CA Workflow is installed.

WebDAV

The WebDAV actor can be used to obtain and manipulate content from a CA Portal Library. To make use of this actor you must have the CA Portal product installed.

JDBC

A JDBC actor can be used to retrieve data from a database into Workflow attributes.

Process Definition Nodes

A process definition node represents one logical step in your business process. Nodes are connected by connection or transition lines that indicate the order the nodes are to be processed.

There are several types of nodes available for use. Each node provides different capabilities. In addition, with most node types, there is pre-processing, post-processing, and exception handling.

Activity Node

An Activity node indicates work to be done by a defined role.

Branch Node

A Branch node indicates the workflow process takes one path from a set of alternate paths; the path taken is the first transition where the guard condition evaluates to TRUE.

Comment Node

A Comment is a text annotation.

Evaluation Node

An Evaluation node is used to assign values to process attributes.

Fork Node

A Fork node indicates where the workflow takes parallel paths.

Join Node

A Join node indicates where parallel workflow processes join; all of the paths must be completed before the transition out of a Join occurs.

Merge Node

A Merge node indicates where alternate workflow process paths merge into a single path. If any one of the paths completes, the transition out of a merge where alternate workflow process paths merge into a single path, occurs.

Object Node

An Object node specifies an operation on an Object.

Send Event

Some actors have Send Events defined. For example, the Global User List actor has one Send Event defined: Send E-mail. A Send Event node allows you to use the Send Event for an actor assigned to a role in the process definition.

Note: The email address used is the one stored in the CA EEM user record, not the one in the CA Service Catalog user record.

Stop Node

A Stop node in a main process in the process definition indicates that the process definition ends. A Stop node in a sub-activity indicates the sub-activity processing ends and returns back to next step in the calling process.

Sub Activity Node

A Sub Activity node contains other process nodes. A Sub Activity can use iteration, repeatedly executing the contained process nodes until some end condition is reached.

Throw Exception Node

A Throw Exception node can throw an exception (either an Actor Fault or a user-defined exception) which can be caught by another node executing in parallel.

Timer Node

A Timer node pauses the execution of that path of the process.

Wait Event Node

A Wait Event node can receive a message from a Simple Event sent by another process definition.

How to Configure CA Workflow Approval and Fulfillment

CA Service Catalog provides a complete set of rules, conditions, actions, and associated CA Workflow process definitions to take user requests from submission to fulfillment. The major steps of configuring CA Workflow built-in approval and fulfillment for use with CA Service Catalog are as follows:

1. Verify that your service is set for workflow driven approval. For details, see the *Administration Guide*.

2. Review the important information about rules, actions, events, and process definitions (see page 306). This information is *required* if you are upgrading CA Workflow and *beneficial* for learning purposes if you are installing CA Workflow for the first time.

3. Keep in mind that each rules has two mutually exclusive actions, one for use with CA Process Automation (the recommended process automation tool) and one for use with CA Workflow. You must specify which action to use with each rule, based on which tool (CA Workflow or CA Process Automation) you are using for approval and fulfillment.

4. If you are upgrading, optionally enable and use the *new* versions of the rules you are currently using, as explained in Enable Rules (see page 310).

5. If you are upgrading, optionally enable and use the *new* versions of the process definitions you are currently using, as explained in Enable Process Definitions (see page 311).

6. Review the CA Workflow frequently asked questions (FAQs (see page 312)) and implement any answers that apply to your organization.

7. Review the summary of approval and fulfillment rules (see page 321). Determine which rules are already used or may be useful to start using in your organization. For complete details about these rules, see the sections mentioned in the next steps.

8. Review and decide the rules, actions, and CA Workflow process definitions that you want to use for *approval*, as explained in CA Workflow-Driven Approval (see page 323).

9. Review and decide the rules, actions, and CA Workflow process definitions that you want to use for *fulfillment*, as explained in CA Workflow-Driven Fulfillment (see page 327).

10. If any rules or process definitions that you want to use are disabled, enable them, as explained in Enable Rules (see page 310) and Enable Process Definitions (see page 311).

11. In addition, you may optionally create or customize rules or process definitions used in approval and fulfillment. Very little customization is permitted for built-in rules, but you can optionally create and customize new rules; for details, see the chapter "Administration Tools" in the *Administration Guide*. Similarly, you can optionally create or customize process definitions; for details, see the *CA Workflow IDE Online Help*.

12. Optionally, for related best practices, see the information about request and fulfillment automation with CA Workflow in the chapter "Best Practices" in the *Implementation Guide*.

Events, Rules, Actions, and Process Definitions

CA Service Catalog provides events, rules, actions, and CA Workflow process definitions for various purposes. This topic focuses on how events, rules, actions, and process definitions are used for handling the complete process of approving and fulfilling user requests (approval and fulfillment).

Updates in CA Service Catalog r12

All CA Workflow rules, actions, events, and process definitions were updated in CA Service Catalog r12 to be more efficient and robust. If you are upgrading to CA Service Catalog from a previous release and you have *not* already begun using the new rules, actions, events, and process definitions, follow this section to help you get started.

CA Service Catalog r12 included several enhancements to the main functional elements of CA Workflow, as follows:

- All rules, actions, events, and process definitions were updated to be more efficient and more robust.

- The built-in rules, actions, events, and process definitions are suitable for most implementations and can typically be used as-is. Therefore, very little customization is permitted in built-in rules, actions, events, and process definitions. However, you can optionally create new rules, actions, events, and process definitions based on the built-in ones and modify them as needed.

- For legibility and readability, rule names were updated. Rules names now have spaces between words, and words like All and None were removed. Also, abbreviations in rule names were expanded to complete text, as follows: WF is now Workflow; HW is now Hardware; SW is now Software, and so forth.

    Finally, the rules were expanded to a complete phrase describing the situation to which the rule applies. For example, the WFNoneFulfillment is now to When Category is None and Status is Pending Fulfillment. Similarly, WFHWCheckAvailability was renamed to When Category is Hardware and Status is Pending Fulfillment. Moreover, the WFSWCheckAvailability rule was renamed to When Category is Software and Status is Pending Fulfillment. Other rules were renamed in a similar manner.

- Process definitions have an incremented version number, to prevent accidental overwriting of any customizations that you may have made to your existing process definitions.

- Both the updated rules and updated process definitions are disabled by default, to prevent any accidental or unintended results involving your existing setup. When you are ready to use the updated rules and process definitions, enable them manually, one at a time.

To optimize the benefits of the CA Workflow enhancements, begin using the most recent rules, actions, events, and process definitions as soon as possible after you have installed and configured CA Service Catalog.

Updates in CA Service Catalog 12.6

For information about updates to events, rules, and actions in CA Service Catalog r12.6, see the *Release Notes*.

Events

Events represent changes that occur within CA Service Catalog. Several *standard* events typically occur in various components. You can also add *custom* events.

Events can have *rules* that are associated with them. Rules can have a set of filter conditions that define when the rule applies. When the filter conditions are satisfied and the rule is enabled, the rule *actions* are launched.

Each standard event occurs when an action in CA Service Catalog causes it. For example, the User Create event occurs when an administrator adds new user, by using either the user interface or the createUser web service method.

Do one of the following when a *custom* event occurs:

- Use one of the postEvent web service methods for the event type

- Use a URL to post the event

The Events-Rules-Actions menu displays the event types and provides access to the rules and actions that are associated with each event type. You can use these menu options to do the following:

- Add a custom event type

- Post a logical event

- Manage the rules for an event type

- Manage the actions for a rule

Important! For specific information about using the built-in rules and actions in the CA Workflow simple or complex approval or fulfillment processes, see the *Integration Guide*.

Events are installed automatically when you install or upgrade CA Service Catalog. This chapter focuses on how events are used in the approval and fulfillment processes;. For more information about events and event types, including instructions to add event types and add event filters to rules, see the *Administration Guide*.

Rules

All rules are initially disabled. A rule must be enabled to be used. In addition, for some of the rules, there are two mutually exclusive actions, one for use with CA Service Desk Manager and one for use without CA Service Desk Manager. By default, the actions which interface with CA Service Desk Manager are disabled.

Similarly, for the event named Request/Subscription Item Change, there are several rules. Each of these rules has two mutually exclusive actions, one for use with CA Process Automation (the recommended process automation tool) and one for use with CA Workflow.

The rule conditions that are shipped with CA Service Catalog may not completely match your business processes. They are generic and must be examined for applicability to your environment. In addition, some rules overlap in functionality. When activating rules, be careful to understand the full implications of your changes.

A rule can have one of more actions associated. When an event occurs and a rule filter is satisfied, the associated rule actions are executed. A rule action causes some task to be executed. A rule action can perform one of several action types such as run a command line command, send an email, start a CA Process Automation process or a CA Workflow process definition, or run a Java plug-in.

The When Status is Submitted and Approval Process is Driven by Workflow rule handles the approval process. The rest of the rules handle the fulfillment process.

The When Status is Pending Fulfillment rule handles *both* the Simple Fulfillment model and the CA Service Desk Manager Request Fulfillment model. These represent two of the three fulfillment models that are provided with CA Service Catalog.

The several remaining rules handle the Complex Fulfillment model. The rules governing each of the fulfillment models must not all be activated unless you alter their conditions or disable other rules. These rules are launched for overlapping types of requests and therefore cause duplicate behaviors unless other rules are disabled.

This chapter focuses on how specific rules are used in the approval and fulfillment processes. For more information about rules including instructions to create them, add them to events, and manage the actions in rules, see the *Administration Guide*.

Note: If you are integrating CA Service Catalog with Unicenter Service Desk r11.2, continue using the former rule and action names, both in this context and throughout your environment. For a detailed list of names changes for rules and actions in CA Service Catalog r12, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321) and related information the chapter "Integrating with CA Workflow."

Actions

Actions are invoked when a condition in a rule (see page 272) is satisfied. Actions include running a command line command, starting a Java process, sending an email, and starting a CA Process Automation process or a CA Workflow process definition. For more information about actions, see the descriptions of the rules.

This chapter focuses on how specific CA Process Automation actions are used in rules during the approval and fulfillment processes. For additional general information about CA Service Catalog actions, including instructions to add them to rules, enable them, and modify them, see the *Administration Guide*.

Process Definitions

You enable and disable process definitions individually, one at a time. For new installations of CA Workflow, all process definitions are enabled by default. When you upgrade CA Workflow, existing process definitions remain enabled, and new process definitions are disabled.

The version number of process definitions are incremented whenever you update them and when you upgrade to a new release of CA Service Catalog. Therefore, the longer a new installation or upgrade has been in use, the more it is expected that process definitions are at different version numbers.

Important! Your version numbers may be difficult to track for CA Workflow, as explained earlier. Therefore, if you are upgrading, it is strongly suggested that you enable and begin using the updated process definitions as soon as possible after an upgrade.

Process definitions for approval and fulfillment are documented throughout this chapter. For additional information about them, see the *CA Workflow IDE Online Help*.

Each process definition supplies pre-defined text for the automatic email notifications it sends to CA Service Catalog users. You can optionally use this pre-defined text as-is or customize it to better meet your needs. This pre-defined text is supplied in English. If you are implementing CA Service Catalog in a language other than English, customize the pre-defined text for each process definition for your language.

Enable Rules

Important! Before performing this step, whether you are upgrading or installing for the first time, review Events, Rules, Actions, and Process Definitions (see page 306) for important background information!

Enabling *only* the rules that you want to use is a required task to use CA Workflow features and functions, including CA Workflow-driven approval.

Follow these steps:

1. From the Home page, select Administration, Events-Rules-Actions.

    The Events-Rules-Action window is displayed.

2. Click the Event Type named Request/Subscription Item Change.

    Its details appear.

    Note: Request/Subscription Item Change contains most built-in rules provided by CA Service Catalog.

3. Check the name of each rule that you want to enable.

4. Click the Enable button.

5. If the rule that you want to enable is not in Request/Subscription Item Change, check another event type.

6. When you find the rule in another event type, enable the rule, as described in the previous steps.

The selected rules are enabled.

Enable Process Definitions

Important! Before performing this step, whether you are upgrading or installing for the first time, review Events, Rules, Actions, and Process Definitions (see page 306) for important background information!

Enabling process definitions is a required task to use CA Workflow features and functions, including CA Workflow-driven approval.

To enable process definitions

1. Select Home, Administration, Tools.

2. On the left pane, click Links.

3. In the CA Workflow box, click IDE.

    The CA Workflow IDE is started.

4. Click the Process Definition link on the top left section of the screen.

    The process definitions are displayed.

5. Scroll to the process definitions whose names begin with the "USD_" and "USM_" prefix.

    These are the CA Service Catalog process definitions. You may also have other process definitions installed for other CA products.

6. Click and select a process definition to see its list of versions.

    The version list appears under the name of the process definition, on the left side of the screen.

7. Select the version that you want to enable (typically the latest version), right-click, and select Properties.

    The Version dialog appears.

8. To enable this version, check Active. To disable it, un-check Active.

For more information about using the CA Workflow IDE, see the *CA Workflow IDE Online Help*.

Frequently Asked Questions

Question:

How do I change the text of emails sent from CA Workflow?

Answer:

The text of the emails sent during the approval and fulfillment phase of a request's life cycle are set in the associated CA Workflow process definition. The first step is to determine which process definition is sending the email whose text you want to change.

To change the text of an email sent from CA Workflow

1. Start the Workflow Process Definition Tool (IDE) by clicking the Administration Quick Start, CA Workflow link.

2. The CA Workflow IDE appears.

3. Click the Process Manager tab, Process Definitions menu icon.

   The list of process definitions appears.

4. Double-click the process definition that is sending the email whose text you want to change.

5. Identify the activity node sending the email. These are typically named something like "Email User" or "Email Approver".

6. Double-click the activity node sending the email.

   The Activity screen appears.

7. Click on the Workitem tab. The emails sent from CA Workflow use the CA Service Catalog Request web service sendRequestEmail operation.

8. Scroll down the list of Input Parameters until you see the entries for emailSubject and emailMessage.

9. To change the text of the email subject or email message, click the Value Expression field for the corresponding parameter.

10. You can either change the text in place or click the ellipsis "…" button that appears in the Value Expression column. Clicking the button displays the Expression Builder window which can make it easier to edit the text used.

11. Save and test the process definition.

Considerations for message text and CA Workflow

The Value Expression field must contain a valid XPath expression.

You can use HTML in the email message text to format the email.

A common cause of problems in CA Workflow process definitions is syntactical errors in XPath expressions. If your process instance is suspended, view the process instance history by double-clicking the process instance and selecting the History tab. The Event column shows the details of the execution of each node in the process instance. If there is an error in an XPath expression, you will see an Exception in the Event column that will help you identify the node in error. This exception may not be associated with the node in error but the Event column will reference the label of the node in error.

For example, the following message may appear on a Start or Timer node, but the Event text shows that the error occurred on the node labeled Email User:

Exception: Error parsing expression: concat("x","y",z) at node Activity: Email User

Question:

How can I tune CA Workflow?

Answer:

Several settings can be used to tune CA Workflow's ability to handle larger workloads.

First, ensure that the server where CA Workflow is running meets the specifications in the Release Notes. If you adjust the configuration settings mentioned here, the Workflow-related processes may use more memory.

After making any of the changes recommended below, restart the Service Fulfillment service.

Workflow Server

Using the Process Definition Tool (IDE), Server Configuration screen you can adjust the following settings.

- EnginePools (default 50) is the number of Process Manager engines available to handle process instance activity. The number of process instances that can be executing concurrently is determined by the number of process engines available within the Process Manager server.

- **Note**: The number of instances that exist in the CA Workflow server is not limited by this number, since an instance gives up its engine from time to time during its execution.

- Raising this number may help with throughput and reduce errors in starting process instances, but it may also consume large amounts of memory because each engine holds a process definition. When increasing EnginePools, you should also increase the Tomcat connection pool.

- MaxWorkItems (default 2500) is the number of workitems per process instance that are kept in memory before being stored in the database. This setting generally needs to be increased only if using very large process definitions or those that include a very large number of iterations.

- TimeOut (default 3000) is the number of milliseconds (default 3 seconds) that the Process Manager waits for an engine to become available before failing requests for work to be done (related to the number of engines specified in EnginePools). A Worklist user will receive a "Process Engine Busy" message and may just repeat the attempted action. An API caller will receive a "Process Exception", and should be able to handle this exception and retry the action, if appropriate.

- WebServiceTimeout (default 600) is the number of seconds (default 10 minutes) a web service activity in a process instance will wait for a response from the called server before declaring an actor fault. Reducing this timeout may cause service requests to fail that would otherwise succeed. Increasing the timeout slows the responsiveness of the server to web service failures.

Workflow Process Definition Tool (IDE)

The IDE can be started either from the Start menu on the server where the Service Fulfillment server is running or from the CA Workflow link on the CA Service Catalog GUI.

Using a text editor such as Notepad you can adjust the following setting in the ide.bat file in the USM_HOME\fulfillment\CA Workflow\Client folder to raise the amount of memory allocated to the Java virtual machine used by the IDE. The ide.bat file is used when the IDE is started from the Start menu on the Workflow server.

- set VMARGS=-Dsun.java2d.noddraw=true **-Xmx###m**

- Where ### is the number of bytes of memory allocated.

Using a text editor such as Notepad you can adjust the following setting in the wfide.xsl file in the USM_HOME\view\webapps\usm\explorer\workflow folder to raise the amount of memory allocated to the Java virtual machine used by the IDE. The wfide.xsl file is used when the IDE is started from the CA Workflow link in the CA Service Catalog GUI and uses Java Web Start.

- <j2se version="1.4" **java-vm-args="-Xmx###m"/>**

- Where ### is the number of bytes of memory allocated.

Extract the ide.jsp file from the usm_idews.war file in the USM_HOME\fulfillment\CA Workflow\Client folder. Using a text editor such as Notepad you can adjust the following setting in the ide.jsp file to raise the amount of memory allocated to the Java virtual machine used by the IDE. Update the ide.jsp file in the usm_idews.war file. The ide.jnlp file is used when the IDE is launched from a URL and uses Java Web Start.

- <j2se version="1.4" **java-vm-args="-Xmx###m"/>**

- Where ### is the number of bytes of memory allocated.

Application Server Context Database Connection Pool

The number of database connections available to CA Workflow is set in the pm.xml and wl.xml files located in the USM_HOME\fulfillment\webapps folder. These files configure the Process Manager and Worklist contexts and can be edited using a text editor such as Notepad.

- maxIdle (default 30) is the number of connections that will be in the pool even if none are being used. Pre-allocate a larger number if you expect to hit the server with many simultaneous process instances immediately upon start-up.

- maxActive (default 100) is the maximum number of connections that will be obtained before errors result. Set maxActive to provide at least two database connections for each engine in the EnginePools setting.

Application Server Tuning for Tomcat

The Tomcat servlet container offers several settings that can be adjusted to maximize throughput of CA Workflow. High values use more memory.

The settings in the server.xml file in the USM_HOME\fulfillment\conf folder control how many incoming requests for service Tomcat can handle. A request for service in CA Workflow terminology means a web service request coming from the outside world or from CA Workflow itself. Once acceptCount is exceeded, then the requester gets a "Connection refused" error returned.

- minProcessors=5 is the minimum number of threads Tomcat keeps available for use in processing incoming requests for service

- maxProcessors=75 is the maximum number of threads Tomcat will make available for use in processing incoming requests for service

- acceptCount=100 is the number of unprocessed incoming requests that will remain queued before Tomcat starts rejecting requests for service

The settings in the FulfillmentService.conf file in the USM_HOME\fulfillment\conf folder control how much memory is allocated to the Java virtual machine associated with the Service Fulfillment service (CA Workflow process manager).

- wrapper.java.initmemory=128 is the amount of memory in megabytes initially made available to the Java heap

- wrapper.java.maxmemory=512 is the maximum amount of memory in megabytes allocated to the Java heap

Note: For Windows the maximum amount of memory able to be allocated to a Java virtual machine is about 1 GB regardless of the amount of memory on the server.

To determine the maximum heap size that can be allocated for Windows

1. From a DOS window, run the following command:

    java -Xmx1000m

2. Keep raising the numeric value until an error occurs like this:

    java -Xmx2000m
    Error occurred during initialization of VM
    Could not reserve enough space for object heap
    Could not create the Java virtual machine

Note: Specify a value less than the amount of RAM in your system, so that the operating system and non-Java applications will have enough memory to run. If you do not, the system will use its disk-based swap space, and therefore overall performance will degrade, often severely. Some sources recommend allocating 80% of a machine's RAM to the Java heap, but this assumes almost complete dedication of the machine to the use of the Java virtual machine.

For more information on tuning, see Sun's Java Tuning White Paper on the Sun web site, sun.com.

For comprehensive Tomcat tuning options, see the Tomcat web site, tomcat.apache.org.

Question:

How do I debug my Workflow process definitions?

Answer:

There are several sources of information when debugging CA Workflow process definitions, as indicated in the following text.

Process instance list

The list of process instances is displayed in the Workflow IDE, Process Instance menu option. The IDE is accessed by clicking the CA Workflow link from the Administration Quick Start menu.

You can display the process instances based on their start date and the name of the process definition on which they are based. Click the Refresh Definitions List double arrow icon to refresh the drop-down list of process definition names. Click the Run Query green icon to refresh the list of running process instances based on the selection criteria.

The process instance list shows the current status of each process instance: Running, Suspended, Terminated or Completed.

Running or Completed are typically normal status values. Suspended usually indicates a problem and Terminated may or may not indicate a problem depending of the behavior expected. For example, if a request is deleted, all associated process instances will be terminated and therefore Terminated is an expected status in this case.

The process instance list also displays the values for any external attributes. For the process definitions provided with CA Service Catalog, there is usually an external attribute named RequestID to help determine which request is affected by the process instance. In addition, there are two error-related external attributes which can help diagnose a problem. These two attributes are named ErrorDesc and ErrorInfo.

Note: ErrorDesc and ErrorInfo may be populated, indicating there was an error at some point in the process instance. If the logic of the process definition determines that this error was not critical to the execution of the business process, the process definition may continue. For example, if sending an email to the user indicating an approval task was assigned fails because there is no email address for the user, the ErrorDesc and ErrorInfo fields will be populated but the process instance will not stop.

Process instance definition

For more details about a process instance, double-click its name in the process instance list. Doing so displays the Process Designer view of the process instance. Using this view you can:

- Examine the details about each node by double-clicking it.

- View the attribute values by clicking on the Attributes tab.

- View the history of the process instance by clicking on the History tab.

Process instance history

The process instance History tab shows each event for each executed node in the process instance. Depending on the type of node, you may see multiple history entries.

For example, for an activity node that assigns a task to a user, you may see history events such as the following:

- Workitem created

- Workitem dispatched

- WorkItem Info: Assigned to users:jmanager

- WorkItemInfo: Completed By:jmanager

- Workitem completed

The Event column of the History tab will show an exceptions encountered by the process instance. Depending on the exception handling logic of the node encountering an exception, the process instance may remove the problem workitem and continue on.

Errors in XPath expressions

A frequent cause of exceptions when developing and testing new or changed process definitions is an error in an XPath expression. These types of errors are also reported in the History tab but will not necessarily be associated with the node which uses the XPath expression in error. Instead, you may see the error associated with a Start or Timer node.

For example, the following message may appear on a Start or Timer node, but the Event text tells you that the error occurred on the node labeled Email User:

Exception: Error parsing expression: concat("x","y",z) at node Activity: Email User

Process instance attributes

The process instance Attributes tab shows all the attributes associated with the process definition and the current values for the process instance. Each attribute may have the property of Input, Output and/or External or none of these. The Input attributes are those passed to this process instance. The External attributes are those shown on the process instance list. The Output attributes are those available to be retrieved from a calling process instance.

Note: The values of the Input attributes may not reflect the value passed to the process instance because the logic of the process instance may have caused these values to change during execution.

CA Service Catalog Alerts

The process definitions provided with CA Service Catalog attempt to post a system alert when there is an error in a process instance.

For example, if the process instance tries to send an email to an approver but there is no email address for the approver, the process instance will continue, because this error is not a critical, however it will also post an alert.

Alerts will also be posted for critical errors. Viewing the alert may help you identify more details about the problem encountered in the process instance.

Alert messages can be viewed by using the Messages, Alerts menu option. Clicking the Show Summary icon displays detailed information about the alert.

Note: To post an alert, the process instance must be able to communicate with the CA Service Catalog web services.

If a rule action cannot start a process instance, an alert will be generated that uses the Type WFFAILED_ACTION. The Alerts screen enables you to show only these alerts for the filter specified by clicking List All Failed Actions. From the list of failed rule actions, you can attempt to start a failed rule action.

CA Service Catalog log files

If problems are encountered related to using CA Service Catalog web services, these messages will appear in the USM_HOME\logs\view.log file.

CA Workflow log files

Messages from Tomcat will appear in the USM_HOME\logs\fulfillment\FulfillmentService.log file. Check this file for messages related to Service Fulfillment service start-up and shut-down messages and Tomcat problems.

CA Workflow writes log files to the USM_HOME\logs\fulfillment folder. There are several types of log files produced. The file names in the following table will also be used for previous days' logs by including a date stamp in the file name.

File Name	Contents
wf_admin.log	Commands issued by users and systems. In this log you will see the Starts of all the process instances.
wf_debug.log	Internal messages and problems encountered by the Workflow process engines.
wf_process.name.log	Messages showing details of the execution of the process instances related to the process definition whose name is included in the file name. In this log, you will see details about problems encountered during the execution of a process instance.
Wf_security.log	Messages for each log in.
wsactorSoapRequest.xml	Last executed SOAP Request for any web service usage in any process instance.
wsactorSoapResponse.xml	Last executed SOAP Response for any web service usage in any process instance.

Question:

How do I cause CA Workflow to recognize a change in the WSDL for a web service actor?

Answer:

Follow these steps:

1. From the CA Service Catalog home page, select Administration, Configuration, CA Workflow.

2. Update the required attributes.

3. Recycle Catalog Component.

4. Click Configure.

The CA Workflow actors are updated with the new WSDL URL.

Note: If the signature for a web service operation that you are using in your process definitions changes, examine the process definition nodes that use the web service operation and retest the process definitions.

Question:

Can I cause CA Workflow to replace a current actor or process definition?

Answer:

Yes, follow the same steps from the answer to the previous question.

Summary of Approval and Fulfillment Rules and Name Changes

This section contains a brief summary of the most commonly used approval and fulfillment rules. For a complete list of rules and complete descriptions of each rule, see the rules described in CA Workflow-Driven Approval (see page 323) and CA Workflow-Driven Fulfillment (see page 327).

For readability, rule names were updated in CA Service Catalog r12. If have upgraded from CA Service Catalog r12, no rule names have changed. However, if you have upgraded from CA Service Catalog r11.2, the rule name changes in this topic apply.

Rules names now have spaces between words, and words like All and None are removed. Also, abbreviations in rule names are expanded to give the complete text, as follows: WF is now Workflow; HW is now Hardware; SW is now Software. Finally, the rules are expanded to a complete phrase describing the situation to which the rule applies, such as When Category is None and Status is Pending Fulfillment (formerly WFNoneFulfillment).

The following list provides both the new and old names, to help you more easily match the latest rules with your existing rules from earlier releases, if applicable.

When Status is Pending Fulfillment

formerly WFAllSimpleFulfillment and WFAllUSDRequestFulfillment; these two rules have been combined.

This rule with filter that is launched once for each request item when its status goes from the approval range to Pending Fulfillment.

When Status is Submitted and Approval Process is driven by Workflow

formerly WFAllSubmit. Rule with filter that is launched once for each service when a request is submitted for approval

When Category is Hardware and Status is Pending Fulfillment

formerly WFHWCheckAvailability. Rule with filter that is launched once for each hardware request item when its status goes from the approval range to Pending Fulfillment

When Category is Hardware and Status is Filled From Inventory

formerly WFHWFulfillment. Rule with filter that is launched once for each hardware request item when its status goes to Filled From Inventory.

When Category is Hardware and Status is Not Filled From Inventory

formerly WFHWProcurement. Rule with filter that is launched once for each hardware request item when its status goes to Not Filled From Inventory

When Category is Hardware and Status is Received or Order Canceled

formerly WFHWReceivedCancelled. Rule with filter that is launched once for each hardware request item when its status goes to Received or Order Cancelled

When Category is None and Status is Pending Fulfillment

formerly WFNoneFulfillment. Rule with filter that is launched once for each category None request item when its status goes from approval range to Pending Fulfillment

When Category is neither Hardware nor Software and Status is Pending Fulfillment

formerly WFOtherCheckAvailability. Rule with filter that is launched once for each non-hardware, non-software request item when its status goes from approval range to Pending Fulfillment

When Category is neither Hardware nor Software and Status is Filled From Inventory

formerly WFOtherFulfillment. Rule with filter that is launched once for each non-hardware, non-software request item when its status goes to Filled From Inventory

When Category is neither Hardware nor Software and Status is Filled From Inventory

formerly WFOtherProcurement. Rule with filter that is launched once for each non-hardware, non-software request item when its status goes to Not Filled From Inventory

When Category is neither Hardware nor Software and Status is Received or Order Canceled

formerly WFOtherReceivedCancelled. Rule with filter that is launched once for each non-hardware, non-software request item when its status goes to Received or Order Cancelled

When Category is Software and Status is Pending Fulfillment

formerly WFSWCheckAvailability. Rule with filter that is launched once for each software request item when its status goes from approval range to Pending Fulfillment

When Category is Software and Status is Filled From Inventory

formerly WFSWFulfillment. Rule with filter is launched once for each software request item when its status goes to Filled From Inventory.

When Category is Software and Status is Not Filled From Inventory

formerly WFSWProcurement. Rule with filter that is launched once for each software request item when its status goes to Not Filled From Inventory

When Category is Software and Status is Received or Order Canceled

formerly WFSWReceivedCancelled. Rule with filter that is launched once for each software request item when its status goes to Received or Order Cancelled

CA Workflow-Driven Approval

CA Service Catalog comes with a set of rules, conditions and actions together with associated CA Workflow process definitions that handles a simple one-level approval process. This may fit your business processes exactly but you may want to alter the distributed components to suit your business processes more accurately. Before altering the existing components or adding to them, it is important to understand their functions.

Approval Rules, Conditions, and Actions

The approval-related rules are associated with the Request/Subscription Item Change event. This event is launched when a *subscription detail item* changes. What this means is that this event is launched when the status of a service option element changes. Since approvals are done at the service level and a service may consist of multiple service option groups, each of which may contain multiple service option elements, the event will launch for each service option element in the service. The rule condition is used to ensure that the rule actions are only performed at the appropriate time. In the case of an approval, you may only want the approval action to occur for the first service option element in the first row for the first service option group in each service in the request. This means the rule will launch only once for each service regardless of the number of service options and service option elements selected as part of the service.

There is one rule associated with the approval process, as follows:

When Status is Submitted and Approval Process is driven by Workflow

(formerly WFAllSubmit) This rule is launched when a user submits a request and these conditions are satisfied:

- 100 <= old status < 200 - The old status is in the not submitted range

- 200 <= new status < 400 - The new status is in the submitted range

- approval_process = 2 - The approval process for the service is CA Workflow driven approval

- sd_row = 1 - This service option element is the first service option element in the service

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when the user submits a request and the service approval is to be driven by CA Workflow.

Note: This rule is launched regardless of the category of any of the service option elements in a service.

The action associated with this rule is named Launch USM_ManagerApproval Workflow. This action uses the following values:

- Type – CA Workflow

- Process Definition – USM_ManagerApproval

- Process Parameters –

RequestedForUserID = $req_for_user_id$
RequestDesc = $request_name$
BusinessUnit = $domain$
OfferingID = $offering_id$
OfferingName = $offering_name$
GroupID = $group_id$
RequestItemID = id
UserGetManager = $req_for_user_id$
RequestID = $request_id$

The Launch USM_ManagerApproval Workflow action launches the USM_ManagerApproval Workflow process definition, passing the information necessary to assign an approval task to the manager of the user the request is made for.

Approval Process Definitions

USM_ManagerApproval

There are two process definitions involved with the Workflow driven approval process provided with CA Service Catalog. USM_ManagerApproval is invoked from the rule action and it invokes USM_Approval.

USM_ManagerApproval does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ Retrieves the passed GetUserManager user's ID.

■ Adds the manager's user ID to the list of possible approvers, any of whom could approve the request. If there is no manager, then the Default User for Request Actions is used.

■ Launches the USM_Approval process definition.

■ Adds the launched USM_Approval process instance to those for the request for the tracking tab.

■ After the assigned approver is finished approving or rejecting the requested service and it is approved, sets the status to Approval Done.

■ Emails the user as to the outcome of the approval request.

USM_Approval

USM_Approval does the following:

■ Sets the status of the request service (all the service option elements in the service) to Pending Approval.

■ Adds a Worklist task is to each approver's Tasks task list which pauses the process instance.

■ Adds pending action records for each approver, which enables this request to appear in the Pending Action list for the approver.

   Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each approver and the Requested For user based on the email address on the CA Service Catalog user window.

■ If the approver performs the task and clicks Confirm without actually approving or rejecting the requested service, the status of the requested service is reset to Pending Approval and the approver gets another task and email.

■ When the service is either approved or rejected, the Requested For user is sent an email.

CA Workflow-Driven Fulfillment

CA Service Catalog comes with a set of rules, conditions and actions together with associated CA Workflow process definitions that handles various fulfillment processes. While approval is handled at the service level, fulfillment is handled at the service option level. Which fulfillment process must be used is determined by the characteristics of the first service option element in a service option. The distributed rule conditions are based on the service option element Category field with separate rules for Hardware, Software, None and all other Category values.

There is a set of rules associated with a complex fulfillment process and a simple fulfillment process. There is also a set of rules that merely open a CA Service Desk Manager Request and leave the fulfillment process to the CA Service Desk Manager workflow processes.

These fulfillment options may suit your business processes exactly but you may want to alter the distributed components to fit your business processes more accurately. Before altering the existing components or adding to them, it is important to understand their functions.

Note: Enabling all the rules related to all three options is not recommended, as there is overlap in the three fulfillment options.

Complex Fulfillment Overview

The complex fulfillment process takes into account the current service option element status value to determine the next step in the fulfillment process with major fulfillment phases related to:

■ Checking availability of the requested item when initially requested or when the item status is Received

■ Optionally opening a CA Service Desk Manager Change Order (for Hardware or Software) or notifying appropriate fulfillment personnel when the item is found in available inventory

■ Notifying Procurement personnel of the requested item when it is not found in available inventory, then Procurement personnel marks the item as Received when it arrives

Simple Fulfillment Overview

The simple fulfillment process notifies the appropriate fulfillment personnel that the item needs to be fulfilled with no special regard for fulfillment phases.

CA Service Desk Manager Request Fulfillment Overview

The CA Service Desk Manager Request fulfillment opens a Service Desk Request, notifies the appropriate fulfillment personnel that the item needs to be fulfilled and leaves the fulfillment process up to the CA Request logic.

Note: Process definitions use a token to log in to CA Service Desk Manager. For details about creating this token, see the chapter "Integrating with CA Service Desk Manager."

Fulfillment Rules, Conditions, and Actions

The fulfillment-related rules are all associated with the Request/Subscription Item Change event. This event is launched when a *subscription detail item* changes. What this means is that this event is launched when the status of a service option element changes. Since fulfillment is done at the service option level and a service option may consist of multiple service option elements, the event is launched for each service option element in the service.

The rule condition is used to ensure that the rule actions are only performed at the appropriate time. In the case of fulfillment, we want the fulfillment action to occur only for the first service option element in the first row for the first service option group in the request. This means the rule is launched only once for each service option regardless of the number of service option elements in the service option.

In addition, the fulfillment process takes different paths based on the category and status of the first service option element in the service option. The categories of interest are Software (0), Hardware (1), None (-1) and all other categories. The list of categories and their associated numeric values are defined in the following line:

USM_HOME\view\webapps\usm\locale\icusen\billing\category.xml

The list of statuses and their associated numeric values are defined in the following line:

USM_HOME\view\webapps\usm\locale\icusen\request\requestshared.xml

Complex Fulfillment

The first step of the fulfillment phase for this fulfillment model is for the appropriate department to check the availability of the requested item. For hardware and software this might be the IT Services department. For other categories, the department may be different.

For hardware and software items, if the requested item is found in available inventory, then there are two possible paths to follow. If CA Service Desk Manager is available, then a CA Service Desk Manager change order is opened. If it is not available, then the IT Services department is notified to fulfill the request.

For non-hardware and software items, if the requested item is found in available inventory, then the appropriate department is notified to fulfill the request.

If the requested item is not found in available inventory, then the Procurement department is notified that the requested item needs to be purchased. After the status of the requested item is set to Received, it is assumed that the item is then in available inventory and the appropriate department is to check the inventory as before.

If a CA Service Desk Manager change order is created, an associated CA Service Desk Manager CA Workflow process definition is launched to manage the rest of the fulfillment process. After the change order is closed, the associated process instance sets the request item status to Fulfilled. If the IT Services department or other appropriate department is notified that fulfillment is needed, the user assigned the fulfillment task sets the request item status to Fulfilled. When all request item statuses are set to Fulfilled, the system changes their statuses to Completed, as appropriate. This allows billing from Accounting Component.

If for some reason, the requested item cannot be fulfilled, then the status is set to Fulfillment Cancelled, which the system changes to Cancelled when all of the request item statuses are set to Fulfilled or Fulfillment Cancelled, marking the end of the fulfillment phase.

Note: The following graphics use the former names of several rules, as listed in Summary of Approval and Fulfillment Rules and Name Changes (see page 321). If you have already started using the new rules, note that they are represented in the following graphics by their former names.

The following is the flow for hardware and software items:

Workflow-Driven Software and Hardware Fulfillment

All services in request are approved and status is set by USM to Pending Fulfillment

Rule: WFHWReceivedCancelled
Workflow: USM_CheckAvailability
Rule: WFSWReceivedCancelled
Workflow: USM_CheckAvailability

Rule: WFHWCheckAvailability
Workflow: USM_CheckAvailability
Rule: WFSWCheckAvailability
Workflow: USM_CheckAvailability

Workflow sets status of request item to Check Availability and assigns task to IT Services user

Rule: WFHWProcurement
Workflow: USM_HW_Procurement
Rule: WFSWProcurement
Workflow: USM_SW_Procurement

IT Services user or UAPM integration sets status of request item to Filled From Inventory or Not Filled From Inventory

Rule: WFHWFulfillment
Workflow: USM_HW_PC_Fulfillment
Rule: WFSWFulfillment
Workflow: USM_SW_PC_Fulfillment

Rule: WFHWFulfillment
Workflow: USM_HW_PC_Fulfillment_USD
Rule: WFSWFulfillment
Workflow: USM_SW_PC_Fulfillment_USD

Status of request item set to Filled From Inventory?

Yes

No

Yes

Workflow sets status to Notified Procurement and assigns task to Procurement user

Over time Procurement user sets status of request item to reflect the state of the ordered item

Status of request item set to Received or Order Cancelled?

No

Status of request item set to Fulfilled or Fulfillment Cancelled?

Yes → Stop

No

Service Desk available?

No

Yes

Workflow sets status to Notified IT Services and assigns task to IT Services user

Over time IT Services user sets request item status to reflect the status of the requested item as it is being fulfilled

Status of request item set to Fulfilled or Fulfillment Cancelled?

Yes → Stop

No

Workflow creates Service Desk Change Order for request item

Over time Workflow in Service Desk sets request item status to reflect the status of the requested item as it is being fulfilled

Status of request item set to Fulfilled or Fulfillment Cancelled?

Yes → Stop

No

The following is the flow for non-hardware and software items:

Complex Fulfillment Rules and Actions

The following rules are associated with the complex fulfillment process:

- When Category is Hardware and Status is Pending Fulfillment (formerly WFHWCheckAvailability)

- When Category is Software and Status is Pending Fulfillment (formerly WFSWCheckAvailability)

- When Category is neither Hardware nor Software and Status is Pending Fulfillment (formerly WFOtherCheckAvailability)

- When Category is Hardware and Status is Filled From Inventory (formerly WFHWFulfillment)

- When Category is Software and Status is Filled From Inventory (formerly WFSWFulfillment)

- When Category is neither Hardware nor Software and Status is Filled From Inventory (formerly WFOtherFulfillment)

- When Category is Hardware and Status is Not Filled From Inventory (formerly WFHWProcurement)

- When Category is Software and Status is Not Filled From Inventory (formerly WFSWProcurement)

- When Category is neither Hardware nor Software and Status is Filled From Inventory (formerly WFOtherProcurement)

- When Category is Hardware and Status is Received or Order Canceled (formerly WFHWReceivedCancelled)

- When Category is Software and Status is Received or Order Canceled (formerly WFSWReceivedCancelled)

- When Category is neither Hardware nor Software and Status is Received or Order Canceled (formerly WFOtherReceivedCancelled)

- When Category is None and Status is Pending Fulfillment (formerly WFNoneFulfillment)

Check Availability Rules

The CheckAvailability rules have been renamed, as follows:

■ When Category is Hardware and Status is Pending Fulfillment (formerly WFHWCheckAvailability)

■ When Category is Software and Status is Pending Fulfillment (formerly WFSWCheckAvailability)

■ When Category is neither Hardware nor Software and Status is Pending Fulfillment (formerly WFOtherCheckAvailability)

The former names are retained here for compatibility, in case you have not yet started using the new rules.

When Category is Hardware and Status is Pending Fulfillment

(formerly WFHWCheckAvailability) The When Category is Hardware and Status is Pending Fulfillment rule is launched when a request item status changes and these conditions are satisfied:

■ 800 <= old status < = 999 - The old status is in the approved range

■ new status = 1000 - The new status is pending fulfillment (1000)

■ category = 1 - The service option element category is Hardware (1)

■ rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item first enters the fulfillment phase.

When Category is Software and Status is Pending Fulfillment Rule

(formerly WFSWCheckAvailability) This rule is launched when a request item status changes and these conditions are satisfied:

■ 800 <= old status < = 999 - The old status is in the approved range

■ new status = 1000 - The new status is pending fulfillment (1000)

■ category = 0 - The service option element category is Software (0)

■ rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item first enters the fulfillment phase.

When Category is neither Hardware nor Software and Status is Pending Fulfillment Rule

(formerly WFOtherCheckAvailability) This rule is launched when a request item status changes and these conditions are satisfied:

■ 800 <= old status < = 999 - The old status is in the approved range

- new status = 1000 - The new status is pending fulfillment (1000)

- category > 1 - The service option element category is not Hardware (1) or Software (0) or None (-1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested non-hardware or software item first enters the fulfillment phase.

The action associated with these rules is named Launch USM_CheckAvailability Workflow (formerly Workflow Check Availability, Workflow Software Check Availability, and Workflow Other Check Availability). The Launch USM_CheckAvailability Workflow action uses the following values:

- Type – Workflow

- Process Definition – USM_CheckAvailability

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$

This action launches the USM_CheckAvailability Workflow process definition, passing the information necessary to assign a *check availability* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the check availability task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_CheckAvailability process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

Example

If your business processes specify that Laptops are fulfilled by one user and Desktops by another, you can add a filter based on the *category_class* field or other relevant field and pass different user IDs in the FulfillmentUser1 and FulfillmentUserList fields.

Or if your business processes specify that all requests are fulfilled based on the requesting user's city, then logic can be added to the CA Workflow process definition to appropriately assign the fulfillment user.

Fulfillment Rules and Actions

The Fulfillment rules have been renamed, as follows:

- When Category is Hardware and Status is Filled From Inventory (formerly WFHWFulfillment)

- When Category is Software and Status is Filled From Inventory Rule (formerly WFSWFulfillment)

- When Category is None and Status is Pending Fulfillment (formerly WFNoneFulfillment)

- When Category is neither Hardware or Software and Status is Filled From Inventory Rule (formerly WFOtherFulfillment)

The former names are retained here for compatibility, in case you have not yet started using the new rules.

When Category is Hardware and Status is Filled From Inventory Rule

formerly WFHWFulfillment. The When Category is Hardware and Status is Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1002 - The old status is not Filled From Inventory (1002)

- new status = 1002 - The new status is Filled From Inventory (1002)

- category = 1 – The service option element category is Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item's status is changed to Filled From Inventory.

There are two actions associated with this rule:

- Launch USM_HW_PC_Fulfillment Workflow (formerly Workflow Hardware Fulfillment)

- Launch USM_HW_Fulfillment_USD Workflow (formerly Workflow Hardware Fulfillment USD)

These two actions are mutually exclusive and only one must be enabled.

Launch USM_HW_PC_Fulfillment Workflow is used to notify one or more fulfillers via email that action is needed to fulfill a requested item. Launch USM_HW_Fulfillment_USD Workflow is used to open a CA Service Desk Manager Change Order, associating any assigned assets.

Launch USM_HW_PC_Fulfillment Workflow Action

formerly Workflow Hardware Fulfillment. The Launch USM_HW_PC_Fulfillment Workflow action associated with this rule uses the following values:

■   Type – Workflow

■   Process Definition – USM_HW_PC_Fulfillment

■   Process Parameters –

RequestedForUserID = $req_for_user_id$
RequestDesc = $request_name$
BusinessUnit = $domain$
RequestItemName = $rate_item_name$
RequestItemID = id
FulfillmentUser1 = spadmin
FulfillmentUser2 =
FulfillmentUser3 =
FulfillmentUserList = spadmin
RequestID = $request_id$

This action launches the USM_HW_PC_Fulfillment process definition, passing the information necessary to assign a *fulfillment needed* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default USM system administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_HW_PC_Fulfillment Workflow process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

Launch USM_HW_Fulfillment_USD Workflow Action

formerly Workflow Hardware Fulfillment USD. The Launch USM_HW_Fulfillment_USD Workflow action associated with this rule uses the following values:

- Type – Workflow

- Process Definition – USM_HW_Fulfillment_USD

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  RequestByUserID = $req_by_user_id$
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$

This action launches the USM_HW_Fulfillment_USD Workflow process definition, passing the information necessary to open a CA Service Desk Manager change order.

When Category is Software and Status is Filled From Inventory Rule

formerly WFSWFulfillment. The When Category is Software and Status is Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1002 - The old status is not Filled From Inventory (1002)

- new status = 1002 - The new status is Filled From Inventory (1002)

- category = 0 – The service option element category is Software (0)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested software item status is changed to Filled From Inventory.

There are two actions associated with this rule:

- Launch USM_SW_PC_Fulfillment Workflow (formerly Workflow Software Fulfillment)

- Launch USM_SW_Fulfillment_USD Workflow (formerly Workflow Software Fulfillment_USD)

These two actions are mutually exclusive and only one must be enabled.

Launch USM_SW_PC_Fulfillment Workflow is used to notify one or more fulfillers via email that action is needed to fulfill a requested item. Launch USM_SW_Fulfillment_USD Workflow is used to open a CA Service Desk Manager change order, associating any assigned assets.

Launch USM_SW_PC_Fulfillment Workflow Action

formerly Workflow Software Fulfillment. The Launch USM_SW_PC_Fulfillment Workflow action associated with this rule uses the following values:

- Type – Workflow

- Process Definition – USM_SW_PC_Fulfillment

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$

This action launches the USM_SW_PC_Fulfillment Workflow process definition, passing the information necessary to assign a *fulfillment needed* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_SW_PC_Fulfillment process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

Launch USM_SW_Fulfillment_USD Workflow Action

formerly Workflow Software Fulfillment USD. The Launch USM_SW_Fulfillment_USD Workflow action associated with this rule uses the following values:

■ Type – Workflow

■ Process Definition – USM_SW_Fulfillment_USD

■ Process Parameters –

RequestedForUserID = $req_for_user_id$
RequestDesc = $request_name$
BusinessUnit = $domain$
RequestItemName = $rate_item_name$
RequestItemID = id
RequestByUserID = $req_by_user_id$
FulfillmentUser1 = spadmin
FulfillmentUser2 =
FulfillmentUser3 =
FulfillmentUserList = spadmin
RequestID = $request_id$

This action launches the USM_SW_Fulfillment_USD Workflow process definition, passing the information necessary to open a CA Service Desk Manager Change Order.

When Category is neither Hardware or Software and Status is Filled From Inventory Rule

formerly WFOtherFulfillment. This rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1002 - The old status is not filled from inventory (1002)

- new status = 1002 - The new status is filled from inventory (1002)

- category > 1 – The service option element category is not None (-1), Software (0) or Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item's status is changed to Filled From Inventory and the category of the requested item is not hardware or software.

The action associated with this rule is named Launch USM_Notify_Fulfillment Workflow (formerly Workflow Other Fulfillment). This action uses the following values:

- Type – Workflow

- Process Definition – USM_Notify_Fulfillment

- Process Parameters –

    RequestedForUserID = $req_for_user_id$
    RequestDesc = $request_name$
    BusinessUnit = $domain$
    RequestItemName = $rate_item_name$
    RequestItemID = id
    RequestByUserID = $req_by_user_id$
    FulfillmentUser1 = spadmin
    FulfillmentUser2 =
    FulfillmentUser3 =
    FulfillmentUserList = spadmin
    RequestID = $request_id$
    StatusFulfillment = 1000

This action launches the USM_Notify_Fulfillment Workflow process definition, passing the information necessary to assign a *fulfillment needed* task to the appropriate fulfillment user(s) (up to three) and set the status of the requested item as desired (the default is Pending Fulfillment (1000)).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_Notify_Fulfillment process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

When Category is None and Status is Pending Fulfillment Rule

formerly WFNoneFulfillment. This rule is launched when a request item status changes and these conditions are satisfied:

■   800 <= old status <=999 - The old status is in the approved range

■   new status = 1000 - The new status is Pending Fulfillment (1000)

■   category = -1 – The service option element category is None (-1)

■   rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item using the category None first enters the fulfillment phase.

The action associated with this rule is named Launch USM_Set_Fulfilled Workflow (formerly Workflow Set Fulfilled). This action uses the following values:

■   Type – Workflow

■   Process Definition – USM_Notify_Fulfillment

■   Process Parameters –

BusinessUnit = $domain$
RequestID = $request_id$
RequestItemID = id

This action launches the USM_Set_Fulfilled Workflow process definition, passing the information necessary to set the status of the request item to Fulfilled (2000). This means if a service option element has a Category of None, no fulfillment is needed.

Procurement Rules

The following procurement rules have been renamed

- When Category is Hardware and Status is Not Filled From Inventory (formerly WFHWProcurement)

- When Category is Software and Status is Not Filled From Inventory (formerly WFSWProcurement)

- When Category is neither Hardware nor Software and Status is Filled From Inventory (formerly WFOtherProcurement)

The former names are retained here for compatibility, in case you have not yet started using the new rules.

When Category is Hardware and Status is Not Filled From Inventory Rule

formerly WFHWProcurement. The When Category is Hardware and Status is Not Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1003 - The old status is Not Filled From Inventory (1003)

- new status = 1003 - The new status is Not Filled From Inventory (1003)

- category = 1 – The service option element category is Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item's status is changed to Not Filled From Inventory.

The action associated with this rule is named Launch USM_HW_PC_Procurement Workflow (formerly Workflow Hardware Procurement). This action uses the following values:

- Type – CA Workflow

- Process Definition – USM_HW_PC_Procurement

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$

This action launches the USM_HW_PC_Procurement CA Workflow process definition, passing the information necessary to assign a *procurement needed* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_HW_PC_Procurement process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

When Category is Software and Status is Not Filled From Inventory Rule

formerly WFSWProcurement. The When Category is Software and Status is Not Filled From Inventory rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1003 - The old status is not Not Filled From Inventory (1003)

- new status = 1003 - The new status is Not Filled From Inventory (1003)

- category = 0 – The service option element category is Software (0)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested software item's status is changed to Not Filled From Inventory.

The action associated with this rule is named Launch USM_SW_PC_Procurement Workflow (formerly Workflow Software Procurement). This action uses the following values:

- Type – Workflow

- Process Definition – USM_SW_PC_Procurement

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$

This action launches the USM_SW_PC_Procurement CA Workflow process definition, passing the information necessary to assign a *procurement needed* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_SW_PC_Procurement process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

When Category is neither Hardware nor Software and Status is Filled From Inventory Rule

(formerly WFOtherProcurement) This rule is launched when a request item status changes and these conditions are satisfied:

■   old status <> 1003 - The old status is Not Filled From Inventory (1003)

■   new status = 1003 - The new status is Not Filled From Inventory (1003)

■   category > 1 – The service option element category is not None (-1), Software (0) or Hardware (1)

■   rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item's status is changed to Not Filled From Inventory and the category of the requested item is not hardware or software.

The action associated with this rule is named Launch USM_Notify_PC_Procurement Workflow (formerly Workflow Other Procurement). This action uses the following values:

■   Type – Workflow

■   Process Definition – USM_Notify_Procurement

■   Process Parameters –

RequestedForUserID = $req_for_user_id$
RequestDesc = $request_name$
BusinessUnit = $domain$
RequestItemName = $rate_item_name$
RequestItemID = id
FulfillmentUser1 = spadmin
FulfillmentUser2 =
FulfillmentUser3 =
FulfillmentUserList = spadmin
RequestID = $request_id$
StatusFulfillment = 1012

This action starts the USM_Notify_Procurement CA Workflow process definition, passing the information necessary to assign a *procurement needed* task to the appropriate fulfillment user(s) (up to three) and set the status of the requested item as desired (the default is Pending Procurement (1012)).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_Notify_Procurement process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

Received Cancelled Rules

The Received Cancelled rules have been renamed, as follows:

- When Category is Hardware and Status is Received or Order Canceled (formerly WFHWReceivedCancelled)

- When Category is Software and Status is Received or Order Canceled (formerly WFSWReceivedCancelled)

- When Category is neither Hardware nor Software and Status is Received or Order Canceled (formerly WFOtherReceivedCancelled)

The former names are retained here for compatibility, in case you have not yet started using the new rules.

When Category is Hardware and Status is Received or Order Canceled

formerly WFHWReceivedCancelled. This rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1007 - The old status is not Received (1007)

- old status = 1008 - The new status is not Order Cancelled (1008)

- 1007 <= new status <= 1008 - The new status is Received (1007) or Order Cancelled (1008)

- category = 1 – The service option element category is Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested hardware item's status is changed to Received or Order Cancelled.

When Category is Software and Status is Received or Order Canceled

formerly WFSWReceivedCancelled. This rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1007 - The old status is not Received (1007)

- old status = 1008 - The new status is not Order Cancelled (1008)

- 1007 <= new status <= 1008 - The new status is Received (1007) or Order Cancelled (1008)

- category = 0 – The service option element category is Software (0)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested software item's status is changed to Received or Order Cancelled.

When Category is neither Hardware nor Software and Status is Received or Order Canceled

formerly WFOtherReceivedCancelled. This rule is launched when a request item status changes and these conditions are satisfied:

- old status <> 1007 - The old status is not Received (1007)

- old status = 1008 - The new status is not Order Cancelled (1008)

- 1007 <= new status <= 1008 - The new status is Received (1007) or Order Cancelled (1008)

- category > 1 – The service option element category is not None (-1), Software (0) or Hardware (1)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a requested item's status is changed to Received or Order Cancelled and the item's category is not hardware or software.

The action associated with these rules is named Launch USM_CheckAvailability Workflow (formerly Workflow Check Availability, Workflow Hardware Check Availability Received, and Workflow Other Check Availability). The Launch USM_CheckAvailability Workflow action uses the following values:

- Type – Workflow

- Process Definition – USM_CheckAvailability

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$

This action launches the USM_CheckAvailability Workflow process definition, passing the information necessary to assign a *check availability* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the check availability task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_CheckAvailability process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

Complex Fulfillment Process Definitions

USM_CheckAvailability

USM_CheckAvailability does the following:

■ Causes this process instance to appear in the list of process instances on the request's Tracking tab.

■ Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can check the availability of this request item. It is recommended that *spadmin* or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

■ Sets the status of the requested item to Check Availability.

■ Adds a worklist task to each fulfiller's task list, which pauses the process instance.

■ Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each fulfiller and the Requested For user

■ Sends the fulfiller another task and email, if the fulfiller performs the task and clicks Confirm without changing the status to a value other than Filled From Inventory or Not Filled From Inventory (or Fulfilled or Fulfillment Cancelled).

■ Sends the Requested For user an email, when the status of the requested item is set to Filled From Inventory or Not Filled From Inventory (or Fulfilled or Fulfillment Cancelled).

USM_HW_PC_Fulfillment

USM_HW_PC_Fulfillment does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ Gets basic information about the user and the user's manager.

■ Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can fulfill this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

■ Sets the status of the requested item to Notified IT Services.

■ Adds a worklist task to each fulfiller's task list, which pauses the process instance.

■ Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

   Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each fulfiller and the Requested For user.

■ If the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Fulfilled or Fulfillment Cancelled, the fulfiller gets another task and email.

■ When the status of the requested item is set to Fulfilled or Fulfillment Cancelled, the requested for user is sent an email.

USM_SW_PC_Fulfillment

USM_SW_PC_Fulfillment does the following:

- Adds this process instance to those for the request for the Tracking tab.

- Gets basic information about the user and the user's manager.

- Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can fulfill this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should be also set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

- The status of the requested item is set to Notified IT Services.

- Adds a worklist task to each fulfiller's task list, which pauses the process instance.

- Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

  Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

- Sends an email to each fulfiller and the Requested For user.

- If the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Fulfilled or Fulfillment Cancelled, the fulfiller gets another task and email.

- When the status of the requested item is set to Fulfilled or Fulfillment Cancelled, the Requested For user is sent an email.

USM_HW_Fulfillment_USD and USM_SW_Fulfillment_USD

- Adds this process instance to those for the request for the Tracking tab.

- Gets basic information about the user and the user's manager.

- Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can fulfill this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

  Note: The assignee of the CA Service Desk Manager change order is FulfillmentUser1 and the remaining fulfillment users are currently not used but could be if the customer's business processes could use this information.

- Launches the USM_CreateITUSDChangeOrder Workflow process definition.

■ Adds the launched USM_CreateITUSDChangeOrder process instance to those for the request for the Tracking tab.

■ Adds the change order information to the request item when the CA Service Desk Manager change order is created, so that it appears in the Related Ticket column when viewing the request.

■ Sets the status of the request item to USD Change Order Opened (1013).

■ Sends an email to the requested for user and the fulfillers.

USM_CreateITUSDChangeOrder

USM_CreateITUSDChangeOrder does the following:

■ Gets information about the request.

■ Creates a CA Service Desk Manager change order using FulfillmentUser1 as the Change Order Assignee.

■ Adds any assets assigned to the requested item to the Change Order.

USM_Notify_Fulfillment

USM_Notify_Fulfillment does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ Gets basic information about the user and the user's manager.

■ Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can fulfill this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

■ Sets the status of the requested item to the status passed in the StatusFulfillment input parameter passed by the rule action.

■ Adds a worklist task to each fulfiller's task list, which pauses the process instance.

■ Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

   Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each fulfiller and the Requested For user.

■ If the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Fulfilled or Fulfillment Cancelled, the fulfiller gets another task and email.

■ Sends the Requested For user an email, when the status of the requested item is set to something other than Fulfilled or Fulfillment Cancelled.

USM_HW_PC_Procurement

USM_HW_PC_Procurement does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ Gets basic information about the user and the user's manager.

■ Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can procure this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

■ Sets the status of the requested item to Pending Procurement.

■ Adds a worklist task to each fulfiller's task list, which pauses the process instance.

■ Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

   Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each fulfiller and the Requested For user.

■ Sends the fulfiller another task and email, if the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Received or Order Cancelled (or Fulfilled or Fulfillment Cancelled).

■ When the status of the requested item is set to Received or Order Cancelled (or Fulfilled or Fulfillment Cancelled), the Requested For user is sent an email.

USM_SW_PC_Procurement

USM_SW_PC_Procurement does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ Gets basic information about the user and the user's manager.

■ Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can procure this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

■ The status of the requested item is set to Pending Procurement.

■ Adds a worklist task to each fulfiller's task list, which pauses the process instance.

■ Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

   Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each fulfiller and the Requested For user.

■ If the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Received or Order Cancelled (or Fulfilled or Fulfillment Cancelled), the fulfiller gets another task and email.

■ When the status of the requested item is set to Received or Order Cancelled (or Fulfilled or Fulfillment Cancelled), the Requested For user is sent an email.

USM_Notify_Procurement

USM_Notify_Procurement does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ Gets basic information about the user and the user's manager.

■ Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can procure this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

■ The status of the requested item is set to the status passed in the StatusFulfillment input parameter passed by the rule action (Pending Procurement).

■ Adds a worklist task to each fulfiller's task list, which pauses the process instance.

■ Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

   Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

■ Sends an email to each fulfiller and the Requested For user.

■ If the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Received or Order Cancelled (or Fulfilled or Fulfillment Cancelled), the fulfiller gets another task and email.

■ When the status of the requested item is set to Received or Order Cancelled (or Fulfilled or Fulfillment Cancelled), the Requested For user is sent an email.

USM_Set_Fulfilled

USM_Set_Fulfilled does the following:

■ Adds this process instance to those for the request for the Tracking tab.

■ The status of the requested item is set to Fulfilled (2000).

Simple Fulfillment

Simple fulfillment consists of notifying the appropriate department that the requested item needs to be fulfilled. The assigned fulfillment users change the status of the requested item as appropriate until the status is changed to Fulfilled or Fulfillment Cancelled.

Note: The following graphic use the rule formerly named WFAllSimpleFulfillment; the new name of this rule is When Status is Pending Fulfillment. For details about the changes to rule names, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321). If you have already started using When Status is Pending Fulfillment, note that it represented in the following graphic by its former name.

The following is the flow for all types of items:
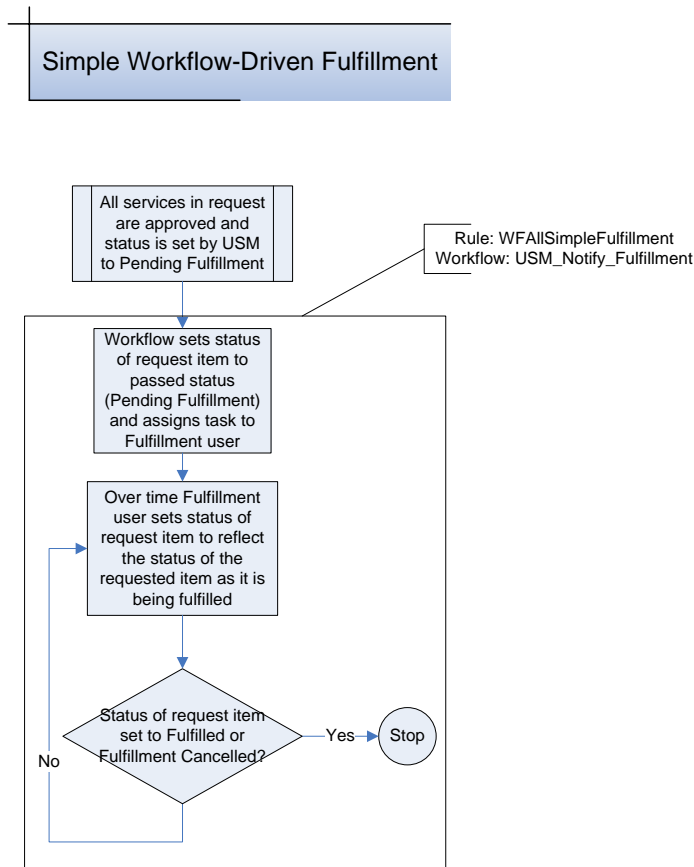
Simple Fulfillment Process Definition

USM_Notify_Fulfillment

Simple fulfillment uses the USM_Notify_Fulfillment process definition described in Complex Fulfillment Process Definitions (see page 348).

Simple Fulfillment Rules and Actions

There is one rule associated with the simple fulfillment process: When Status is Pending Fulfillment (formerly WFAllSimpleFulfillment and WFAllUSDRequestFulfillment).

When Status is Pending Fulfillment Rule

This rule is launched when a request item status changes and these conditions are satisfied:

- 800 <= old status <= 999 – The old status is in the approved range

- new status = 1000 – The new status is Pending Fulfillment (1000)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a request first enters the fulfillment phase.

The actions associated with this rule are named Launch USM_Notify_Fulfillment Workflow (formerly Workflow Notify Fulfillment) and Launch USM_FulfillmentUSDRequest Workflow (formerly Workflow Request Fulfillment USD).

Important! Ensure that only one of these two actions is enabled at a time.

These actions use the following value:

- Type – Workflow

- Process Definition – USM_Notify_Fulfillment or USM_Fulfillment_USD_Request

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  RequestByUserID = $req_by_user_id$
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  RequestID = $request_id$
  StatusFulfillment = 1000

When this action starts the USM_Notify_Fulfillment process definition, passing the information necessary to assign a *fulfillment needed* task to the appropriate fulfillment user(s) (up to three) and set the status of the requested item as desired (the default is Pending Fulfillment (1000)).

When this action starts the USM_Fulfillment_USD_Request process definition, passing the information necessary to assign a *fulfillment needed* task to the appropriate fulfillment user(s) (up to three) and set the status of the requested item as desired (the default is Pending Fulfillment (1000)), and a CA Service Desk Manager change order will be created and associated to this request.

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_Notify_Fulfillment or USM_Fulfillment_USD_Request process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters.

CA Service Desk Request Fulfillment

CA Service Desk Manager fulfillment consists of creating a CA Service Desk Manager Request from the requested item. In addition, the appropriate department is notified that the requested item (the first service option element in the first service option group in the service) needs to be fulfilled. The assigned fulfillment users change the status of the requested item as appropriate until the status is changed to Fulfilled or Fulfillment Cancelled.

Note: The following graphic use the rule formerly named WFUSDRequestFulfillment; its new name is When Status is Pending Fulfillment. For details about the changes to rule names, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321). If you have already started using When Status is Pending Fulfillment, note that it represented in the following graphic by its former name.

The following is the flow for all types of items:

Workflow-Driven Fulfillment to Create USD Request

All services in request are approved and status is set by USM to Pending Fulfillment

Rule: WFUSDRequestFulfillment
Worklfow: USM_FulfillmentUSDRequest

Workflow creates USD request and sets status of request items in service option to USD Request Opened

Workflow sets status of request items in service option to passed status (Pending Fulfillment) and assigns task to Fulfillment user

Over time Fulfillment user sets request item status to reflect the status of the requested item as it is being fulfilled

Status of request item set to Fulfilled or Fulfillment Cancelled?

No

Yes → Stop
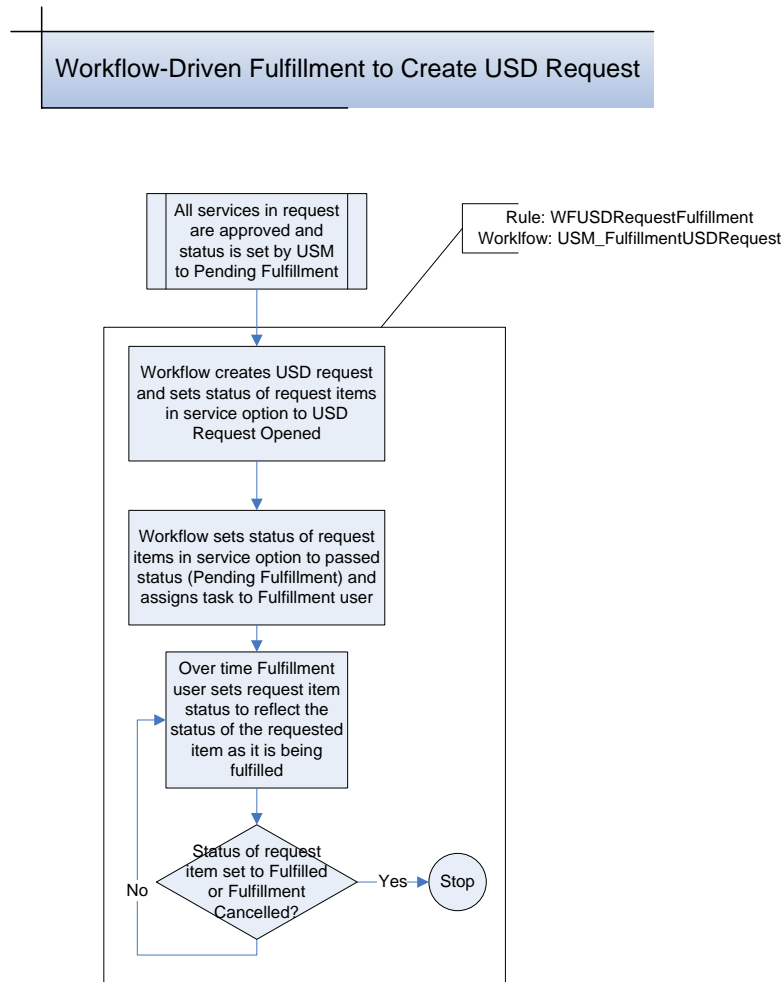
Note: Process definitions use a token to log in to CA Service Desk Manager. For details about creating this token, see the chapter "Integrating with CA Service Desk Manager."

CA Service Desk Request Fulfillment Rules and Actions

There is one rule associated with the CA Service Desk Manager request fulfillment process: When Status is Pending Fulfillment (formerly WFAllUSDRequestFulfillment and WFAllSimpleFulfillment). These two rules have been combined into one rule.

When Status is Pending Fulfillment

The When Status is Pending Fulfillment rule is launched when a request item status changes and these conditions are satisfied:

- 800 <= old status <= 999 – The old status is in the approved range

- new status = 1000 - The new status is Pending Fulfillment (1000)

- rate_item_col = 0 - This service option element is the first service option element in its row of service option elements

This rule condition ensures that the rule is used only when a request first enters the fulfillment phase.

The action associated with this rule is named Launch USM_CheckAvailability Workflow (formerly Workflow Check Availability Received). This action uses the following values:

- Type – Workflow

- Process Definition – USM_FulfillmentUSDRequest

- Process Parameters –

  RequestedForUserID = $req_for_user_id$
  RequestDesc = $request_name$
  BusinessUnit = $domain$
  RequestItemName = $rate_item_name$
  RequestItemID = id
  RequestByUserID = $req_by_user_id$
  FulfillmentUser1 = spadmin
  FulfillmentUser2 =
  FulfillmentUser3 =
  FulfillmentUserList = spadmin
  OfferingName = $offering_name$
  RequestArea = USM
  Template =
  Priority = 3
  OfferingID = $offering_id$
  GroupID = $group_id$
  RequestID = $request_id$

This action launches the USM_FulfillmentUSDRequest Workflow process definition, passing the information necessary to create a CA Service Desk Manager Request, assign a *fulfillment needed* task to the appropriate fulfillment user(s) (up to three).

Note: By default, the fulfillment user who is assigned the fulfillment needed task is *spadmin*, the default Service Delivery Administrator. If more than one fulfillment user is specified, all users must be indicated in the FulfillmentUserList field, separated by semi-colons. Also be aware that additional logic as to who the correct fulfillment user is can be added to the USM_FulfillmentUSDRequest process definition. Additional rules can also be created that assign this fulfillment task to different users based on other rule filters. The first fulfillment user (FulfillmentUser1) is the assignee of the CA Service Desk Manager Request.

CA Service Desk Request Fulfillment Process Definitions

USM_FulfillmentUSDRequest

USM_FulfillmentUSDRequest does the following:

- Adds this process instance to those for the request for the Tracking tab.

- Gets basic information about the user and the user's manager.

- Sets the fulfiller users. By default, the fulfiller values passed by the rule action are used. There is a step in the workflow that can be customized to identify up to three users who can fulfill this request item. It is recommended that spadmin or some other administrator ID be included in the list to allow for the situation where the fulfiller is unavailable to fulfill the request. Each fulfillment user should also be set in the FulfillmentUserList attribute, with the user IDs separated by semi-colons.

- Launches the USM_CreateUSDRequest Workflow process definition.

- Adds the launched USM_CreateUSDRequest process instance to those for the request for the Tracking tab.

- When the CA Service Desk Manager request is created, adds the CA Service Desk Manager request information to the request item so that it appears in the Related Ticket column when viewing the request.

- Sets the status of the requested item to USD Request Opened (1020).

- Adds a worklist task to each fulfiller's task list, which pauses the process instance.

- Adds pending action records for each fulfiller, which enables this request to appear in the Pending Action list for the fulfiller.

  Important! Verify that the worklist task ID and process instance ID are passed to the appropriate web service call in your process definition. Doing so helps ensure that the process instance resumes when its related pending action is completed.

- Sends an email to each fulfiller and the Requested For user.

- If the fulfiller performs the task and clicks Confirm without actually changing the status to something other than Fulfilled or Fulfillment Cancelled, the fulfiller gets another task and email.

- When the status of the requested item is set to Fulfilled or Fulfillment Cancelled, the Requested For user is sent an email.

USM_CreateRequest

USM_CreateUSDRequest does the following:

- Gets information about the CA Service Catalog request.

- Creates a CA Service Desk Manager request.

CA Service Desk Process Definitions

There are several CA Workflow process definitions provided with CA Service Catalog that are to be used with the CA Workflow instance supplied with CA Service Desk Manager. These process definitions are to be associated with CA Service Desk Manager change order categories and one is started when a change order with the associated category is created. These process definitions provide steps that could be used when a change order for a hardware request item or a software request item is opened. Although these business processes might match yours it is likely that you will need to modify these process definitions to more closely match your business processes.

Note: Process definitions use a token to log in to CA Service Desk Manager. For details about creating this token, see the chapter "Integrating with CA Service Desk Manager."

The USD process definitions are as follows, depending on whether you are using CA Service Desk Manager r12.5, CA Service Desk r12, or Unicenter Service Desk r11.2.

- For CA Service Desk Manager r11.2:
    - USM_HW_Fulfillment
    - USM_SW_Fulfillment
- For CA Service Desk Manager r12.5 or CA Service Desk r12:
    - USM_HW_Fulfillment_SD_r12
    - USM_SW_Fulfillment_SD_r12

USM_HW_Fulfillment (or USM_HW_Fulfillment_SD_r12)

The USM_HW_Fulfillment process definition is used when a hardware-related change order is created.

USM_HW_Fulfillment does the following:

- Sets the configuration and delivery users. By default, the change order Assignee value is used. There is a step in the workflow that can be customized to set other values for the configuration and delivery users.

- A Worklist task is assigned to the configuration user and an email sent to that user.

- When the configuration user completes the Worklist task, the status of the CA Service Catalog requested item is set to 1019 (Configured).

- A Worklist task is assigned to the delivery user and an email sent to that user.

- When the delivery user completes the Worklist task, the status of the CA Service Catalog requested item is set to 2000 (Fulfilled).

- The Close Ticket – CA Service Desk Manager process definition is used to close the change order.

USM_SW_Fulfillment (or USM_SW_Fulfillment_SD_r12)

The USM_SW_Fulfillment process definition is used when a software-related change order is created.

USM_SW_Fulfillment does the following:

- Sets the configuration and delivery users. By default, the change order Assignee value is used. There is a step in the workflow that can be customized to set other values for the configuration and delivery users.

- A Worklist task is assigned to the configuration user and an email sent to that user.

- When the configuration user completes the Worklist task, the status of the CA Service Catalog requested item is set to 1019 (Configured).

- A Worklist task is assigned to the delivery user and an email sent to that user.

- When the delivery user completes the Worklist task, the status of the CA Service Catalog requested item is set to 2000 (Fulfilled).

- The Close Ticket – CA Service Desk Manager process definition is used to close the change order.

How to Pass Form Attributes to CA Workflow

To retrieve attributes from a CA Service Catalog form and pass them to CA Workflow, perform these tasks:

1. Review the basic information and prerequisites (see page 364) for passing form attributes to CA Workflow.

2. Specify CA Workflow rules and actions (see page 365) for the sample process definition.

3. Create the service option group (see page 367) to use with the sample process definition.

4. Add and define the service (see page 368) for the new service option group.

5. Create and submit a sample request (see page 369) for the new service.

6. Verify form information in CA Workflow (see page 369).

7. Optionally review how the process definition works (see page 370).

Basic Information and Prerequisites

You can optionally use web services to retrieve one or more elements (also named attributes) from a CA Service Catalog form and pass these attributes to CA Workflow. Typically, users complete forms while requesting items from their catalogs. While users are entering data in the forms, the web services can retrieve the attributes you specify from the forms and pass them to CA Workflow.

The CA Workflow process definitions use a Global Actor named USM_Initializer to store all common attributes to pass from CA Service Catalog to CA Workflow. Every process definition first calls the Get Global Attributes activity, which retrieves the required common information from the Global actor. The common attributes include the CA Service Catalog URL, the CA EEM retry count, interval settings, and so forth.

This section explains how to retrieve selected attributes and pass them to CA Workflow, using as a model a sample process definition for hiring a new sales person. This sample process definition (USM_EX_FormGetVarValue.xml) fetches request-related information (the Employee Title) from a form (NewEmployee.xml form) associated to a service option (Salesperson) for a request (New Hire Onboarding).

To effectively learn and perform the tasks explained in this section, you must meet these prerequisites:

- You must be an experienced CA Service Catalog administrator who knows how to use CA Workflow.

- Ensure that the CA Service Catalog Best Practices, including Personnel Services, is installed.

Specify CA Workflow Rules and Actions

Linking a process definition with one or more CA Workflow rules and actions is required to instruct CA Workflow to do the following:

- Record all instances of the process definition running

- Perform the action you specify when an instance runs

To specify CA Workflow rules and actions

1. On the CA Service Catalog home page, select Administration, Tools.

   The Event Types window appears.

2. Select Request/Subscription Item Change in the list of event types.

   The Event Type Details for Request/Subscription Item Change appear.

3. In the list of rules, find the rule named When Status is Submitted and Approval Process is Driven by Workflow (formerly WFAllSubmit) and ensure that it is enabled.

   If necessary, enable the rule by checking its adjacent check box and clicking the Enable button.

   This rule is enabled by default.

   Note: If you are integrating CA Service Catalog with Unicenter Service Desk r11.2, continue using the former rule and action names, both in this context and throughout your environment. For a detailed list of names changes for rules and actions in CA Service Catalog r12, see Summary of Approval and Fulfillment Rules and Name Changes (see page 321) and related information the chapter "Integrating with CA Workflow."

4. Click the rule named When Status is Submitted and Approval Process is Driven by Workflow, so that you can modify it.

   The Rule Details for it appear.

5. Click Add to create a new CA Workflow action with the following specifications:

   Name

   Specify the name of your choice, preferably an intuitive name for the action you want to perform.

   Description

   Provide further details about the action you want to perform.

   Type

   Select Workflow.

   Process Definition

   Click the search icon to find and select the USM_EX_FormGetVarValue process definition from the list.

   Process Parameters

   Select the id parameter.

6. Click OK.

   The new rule action is saved, and you return to the Rule Details for Workflow Submit.

7. Click Done.

   You return to the Event Type Details window.

Create the Service Option Group

Each service requires a service option group. In this exercise, you create a new Service Option group and define a catalog form for that group. Doing so enables you to capture attributes from the form and pass them to CA Workflow.

To create the service option group

1. Log in to CA Service Catalog as a Service Delivery Administrator.

2. On the home page, click Catalog, Service Offerings, Option Groups tab.

3. On the Service Option Group page, select the New Hire Onboarding group, copy it, and paste it.

4. Click the Edit icon to edit the copy.

   The Edit Service Option Group dialog appears.

5. In that dialog, specify the following:

   Name

   > Enter a name of your choice.

   Selection Type

   > Select Automatically Chosen.

6. Click the new group to define it.

   The Service Option Group Definition window for that group appears.

7. In that window, do the following:

   a. Locate the row for the role for which you want to add the form.

      In this sample example, add a column to the first row (Salesperson) only.

   b. In the top row, double-click the empty column labeled "Dbl Click to Add Column" to create a new service option element (the form).

   c. In the new column, double-click the "Dbl Click to Add Header" label and enter a name of your choice.

   d. In Row 1, double-click the "Dbl Click to Add Value" label.

      The Service Option Element Definition window appears.

8. In the Service Option Element Definition window, specify the following:

   Type

   > Select CA Workflow Form.

Display Text

Specify the form title of your choice.

Form Definition File

Click the search icon to find and select NewEmployee.xml only.

When users of the specified role request the service, they must complete this form to complete the request.

9. Click Update to save the form element.

10. Click Save to save the updates to the Service Option Group definition.

The new service option group that you created based on the New Hire Onboarding group is saved.

Add and Define the Service

In this exercise, you add and define a service, which must include the new service option group. The service must have a CA Workflow driven approval process to use CA Workflow process definitions, rules, and actions. For clarity in this exercise, the service is limited to a single, fixed role.

Follow these steps:

1. In CA Service Catalog, create a new service in the Personnel Services folder.

2. In that folder, add a service to include the new service option group that you created (the modified New Hire Onboarding group) when you completed the steps in the previous section.

   Specify the following for the new service:

   Approval Process

   Select CA Workflow driven approval process.

3. Define the new service and include the new service option group with only the first row (Salesperson) selected.

   When users request the New Hire Onboarding service, Salesperson will be the only role available, and they are prompted to complete the form.

Create and Submit a Sample Request

In this exercise, you create and submit a sample request for the new service. Doing so enables you to verify that the service is available in the request catalog and includes the form.

To create and submit a sample request

1. On the CA Service Catalog home page, click Requests.

    The Request Lookup window appears.

2. In the Browse box, click the Personnel Services folder.

    The Catalog Services window appears.

3. Click the newly created service named New Hire Onboarding.

4. View the first service option offered (Salesperson) and verify that "*requires additional information" appears and the Next button is enabled.

5. Click the Salesperson check box and click Add to Cart and Checkout.

    Several input fields appear. All these fields are based on the NewEmployee.xml form. They appear because you specified in earlier sections that this form is attached when users request the New Hire Onboarding service and specify its Salesperson service.

6. Complete the fields and then click Save and Submit Cart.

The request is submitted and you return to the Request Lookup window.

Verify Form Information in CA Workflow

In this exercise, you check the catalog request that you submitted in the previous exercise, and you verify that the correct attribute is passed from the associated form to the corresponding instance of the sample process definition in CA Workflow. After verifying that the data is passed correctly, you can use the service with confidence in your catalog.

To verify form information in CA Workflow

1. Log in to the CA Workflow IDE and check the process instance list.

2. From the process instance list drop down, select the USM_EX_FormGetVarValue process definition and click the Run Query button.

3. Select the latest process instance that you submitted for USM_EX_FormGetVarValue.

4. Verify that the Employee Title data from the NewEmployee.xml form has been transferred to the CA Workflow external attribute named EmployeeTitle.

How the Process Definition Works

When an instance of the sample process definition USM_EX_FormGetVarValue.xml runs according to the specifications in this sample exercise, the instance performs the following operations:

1. Gets the common information it needs from the Global actor named USM_Initializer.

2. Uses the getRequestItemRow web service to get all the service option elements in the request row and puts the result into the RequestItemsRowXML attribute.

3. Extracts only the subscriptionType = "4" (Form) request items from the RequestItemsRowXML attribute and puts them into a list variable (the FormItemsList attribute).

   This list variable is analogous to a database record set containing multiple records.

4. Iterates through the FormItemsList attribute, using the FormItemControlXML attribute to hold each iteration request item.

   The control variable is analogous to a record in the record set.

5. Uses the getFormRateItemValues web service to get the form element information for the request item and puts the returned value into the FormItemXML attribute.

6. Gets the value for the form element with the ID of "emp_title" and puts it into the EmployeeTitle attribute.

Custom CA Workflow Java Object Actors

It is possible to write a custom Java program that can be used to perform any desired behavior from a CA Workflow process definition. The Java program is a standard Java program that exposes methods to be used from a CA Workflow process definition. The Java class must be set up correctly to be recognized by CA Workflow as a valid Java Object actor.

Note: The Java methods must use only primitive or String input and output parameters.

Make a Custom Java Class Available

To make your Java program available to be used as a Workflow Java Object actor

1. Create a JAR file containing your Java program named however you like, for example, myJavaClasses.jar.

2. Put an unsigned copy of your JAR file, myJavaClasses.jar, in the following folder on the CA Workflow server:

   USM_HOME\fulfillment\CA Workflow\Client (Windows)

   This is the copy used by the Workflow Process Manager and the server usage of the CA Workflow Process Definition Tool (IDE). When using the IDE on the server you must launch the IDE using the Windows Start menu which uses the ide.bat file, not by launching the ide.exe file.

3. Copy the JAR files and the usm_idews.war file from the Client folder in step 1 to another folder, say c:\tempWF.

4. Sign all the JAR files in the c:\tempWF folder. Your JAR file and all other JAR files must be re-signed with your own certificate by using the Java jarsigner utility.

5. Extract the ide.jsp file from the usm_idews.war file in c:\tempWF.

6. Edit the extracted ide.jsp file and add your JAR file, myJavaClasses.jar, to the list of JAR files in the resources section to tell Java Web Start to download your signed JAR file to the client machine which is trying to launch the IDE. This section of the ide.jsp file looks like this:

   ```
   <resources>
    <j2se version="1.4"/>
    <jar href="IDE.jar"/>
    …
    <jar href="sd_wf.jar"/>
    <jar href="myJavaClasses.jar"/>
   </resources>
   ```

7. Update the usm_idews.war file in the c:\tempWF folder with the updated ide.jsp file. The ide.jsp file is used when launching the IDE using a URL.

8. Update the usm_idews.war file in the c:\tempWF folder with the signed JAR files, including your new JAR file. This is the copy used by the remote Java Web Start usage of the IDE.

9. Stop the Service Fulfillment service.

10. Copy the usm_idews.war file back to the Client folder in step 2, replacing the usm_idews.war file already there.

11. Edit the USM_HOME\fulfillment\conf\fulfillmentService.conf (Windows) file on the CA Workflow server and add a line to the *Java Classpath* section to tell Fulfillment Service that your JAR file, myJavaClasses.jar, exists. Ensure that you use the proper path to your JAR file for Windows. This section looks similar to the following for Windows:

```
# Java Classpath (include wrapper.jar)  Add class path elements as #  needed starting from 1

wrapper.java.classpath.1=USM_HOME/lib/javaservice/wrapper.jar

wrapper.java.classpath.2=%USM_CATALINA_HOME%/bin/bootstrap.jar

wrapper.java.classpath.3=USM_HOME/lib/edbc.jar

wrapper.java.classpath.4=USM_HOME/lib/tools.jar

wrapper.java.classpath.5=USM_HOME/fulfillment/CA Workflow/client/Safe.jar

wrapper.java.classpath.6=USM_HOME/fulfillment/CA Workflow/client/sd_wf.jar

wrapper.java.classpath.7=USM_HOME/fulfillment/CA Workflow/client/myJavaClasses.jar
```

12. Edit the USM_HOME\view\webapps\usm\explorer\workflow\wfide.xsl (Windows) file on the Workflow server and add your JAR file, myJavaClasses.jar, to the list of JAR files in the resources section to tell Java Web Start to download your signed JAR file to the client machine which is trying to launch the Process Definition Tool (IDE). This section of the wfide.xsl file looks like this:

```
<resources>
 <j2se version="1.4"/>
 <jar href="IDE.jar"/>
 …
 <jar href="sd_wf.jar"/>
 <jar href="myJavaClasses.jar"/>
 </resources>
```

13. Start the Service Fulfillment service.

Create a Custom Java Object Actor

To reference your new JAR file as a new Java Object actor, start the CA Workflow Process Definition Tool and follow these steps:

1. Click the Actors tab.

2. Select the Java Object actor type and right click on the Java Object node.

3. Click Add Actor from the sub-menu displayed.

   The Java Object properties dialog box is displayed.

4. Enter values for the following fields:

   ■ Name – Choose a name for your Java Object actor.

   ■ Java Class – The name of your Java class including the full package name.

5. Click Build to display the available constructors for the class.

6. Click OK to save the definition of the new Java Object actor.

7. Right-click the new Java Object actor in the Actor Types / Actors tree and select Add Operation.

   The Java Object Operation window is displayed.

8. Select a method that serves as an operation available to be used in an activity node. You can rename the input and output parameters from the default values to better represent the meaning of the parameters.

9. Click OK.

   This adds the operation to the list of Java Object's Activity Operations.

Chapter 12: Integrating with CA APM

This section contains the following topics:

How to Integrate with CA APM

CA Service Catalog integrates with CA APM in several areas, including these areas:

- Requested items can be associated with CA APM Assets. Asset managers can associate CA APM assets with items requested from the catalog during request fulfillment.

- Catalog entries can be associated with CA APM Models. CA Service Catalog catalog administrators can associate one or more CA APM models with a service option. This association can assist with automated asset creation and association during request fulfillment using a workflow process and the CA Service Catalog web services.

Important! CA APM and CA Service Catalog must share the same MDB and the same CA EEM for this integration to work properly.

To integrate CA Service Catalog CA APM, do the following:

1. Create users in CA Service Catalog (see page 376).

2. Create or update administrator in CA EEM (see page 376).

3. Configure CA APM (see page 377).

4. Create new rules and actions, if applicable (see page 378).

5. Create a service and request (see page 380).

6. Configure for single signin (see page 381).

7. See the CA Service Catalog and CA APM *Release Notes* files for any last-minute information about the integration.

8. Ensure that you verify the MDB version compatibility for all CA products that you plan to integrate with CA Service Catalog and Accounting Component, including CA APM.

Create Users in CA Service Catalog

To enable the integration between CA APM and CA Service Catalog, you must create customized users in CA Service Catalog specifically for use with this integration.

To create users in CA Service Catalog

1. Log on to CA Service Catalog as the spadmin user or another user with the Service Delivery Administrator role.

2. Set up the following users:

    ■   Catalog User

    ■   Request Manager (Approver for the Catalog User)

    ■   Service Delivery Administrator, typically spadmin (Fulfiller)

    For more information about creating users in CA Service Catalog, see the *Administration Guide.*

3. Enable all rules for Event Type: Request/Subscription Item Change except When Status is Pending Fulfillment.

4. Log out of CA Service Catalog.

Create or Update Administrator in CA EEM

To enable the integration between CA APM and CA Service Catalog, you must create customized users in CA EEM specifically for use with this integration.

To create or update users in CA EEM

1. Log in to CA EEM as EiamAdmin; for Application, select Global.

2. Select Manage Identities, Users and click Go, without specifying any search criteria.

3. If the Administrator user already exists under the Users node, then skip this step.

    Otherwise, create the Administrator user under Users node, and specify Administrator for the Name and the Display Name.

    Set the password for this Administrator user to something you will remember and click Save.

    For details about creating users in CA EEM, see the CA EEM documentation.

4. Log out of CA EEM.

Configure CA APM

To enable the integration between CA APM and CA Service Catalog, configure CA APM for use with this integration.

Note: The CA EEM-related steps apply specifically to CA APM 11.3.4. For equivalent steps for CA APM Release 12.6, see the CA APM documentation.

To configure CA APM

1. Log in to CA APM as an administrator.

2. In CA APM Security, assign the Service Delivery Administrator (the Fulfiller created in Create Users in CA Service Catalog (see page 376)) to act as UAPM Fulfiller.

   For more information to perform this task, see the *CA APM Administration Guide*.

3. Start the CA APM Configurator and open CA APM.

4. In CA APM, under Option 3, Choose Your Security Type, select EIAM with Single DB Login.

5. Enter the host name of the computer on which CA EEM is installed for EIAM Host Name, click Update.

6. Start the CA APM Configurator and open CA APM Web Services.

7. In CA APM Web Services, under Option 3, Choose Your Security Type, select EIAM with Single DB Login.

8. Enter the host name of the computer on which CA EEM is installed for EIAM Host Name, click Update.

9. Exit from CA APM Configurator.

10. Reset Microsoft Internet Information Server (IIS) by opening the Windows command prompt window and entering iisreset.

11. Restart the following Windows services:

    ■ UAPM Cache Service

    ■ UAPM Tomcat Service

    ■ CA Catalog Component

Create New Rules and Actions, if Applicable

You may need to create new rule actions in CA Service Catalog to enable the integration with CA APM. As supplied, CA Service Catalog rules and actions can have only limited changes made by users. However, you can create new rules and actions, if required. For maximum efficiency, create new rules and actions by copying and modifying existing rules and actions. These steps illustrate how to copy and modify a predefined rule and its actions. You can optionally use these steps as a model to copy and modify other predefined rules and their actions.

Follow these steps:

1. Log in to CA Service Catalog as a user with the Service Delivery Administrator role.

2. Click Administration, Events-Rules-Actions.

   The Event Types page appears, listing all CA Service Catalog events.

3. Click the Request/Subscription Item Change event.

   The Event Type Details page appears, listing the rules for the Request/Subscription Item Change event.

4. Click the Copy icon for the rule that you want to copy and modify, for example, the rule named When Category is Hardware and Status is Pending Fulfillment. The Copy icon apears in the icon columns next to the Description field.

   A dialog appears prompting you to enter the name of the new rule.

5. Enter the new name and click OK.

   You return to the Event Type Details page. The new rule is added to the list of rules for the event.

6. Click the Edit icon (by default, a pencil) to edit the details of the rule, for example, its name, description, status, or event type.

   The Edit Rule page appears.

   a. Select Enabled in the Status drop-down list.

      The new rule is enabled. You must enable the new rule to activate it, because new rules are disabled by default.

   b. Update the remaining fields, as needed, to meet your requirements.

      Note: For details about modifying these fields, and for more information about modifying rules, see the *Administration Guide*.

   c. Click OK.

   You return to the Event Type Details page.

7. Click the new rule to open it.

   The Rule Details and Actions page opens.

   The rule details that you modifed earlier appear in read-only format.

   The actions for the rule also appear, so that you can view and modify them as needed: Actions that were enabled in the old rule are enabled in the new rule. Similarly, actions that were disabled in the old rule are disabled in the new rule.

8. Do one or more of the following, according to your needs:

   ■ Click the Add button on the Actions tool bar to add a new action to the rule.

      The Add Action page appears.

      Complete the fields on this page and click OK.

   ■ Click the Edit icon for an existing action to modify it.

      The Edit Action page appears.

      Update the fields on this page as needed and click OK.

   ■ Click the Copy icon for an existing action to create a new action based on the existing one.

      Enter the name of the new action when prompted and click OK.

      Edit the new action by clicking the Edit icon.

      Update the fields on this page as needed and click OK.

   Note: For details about modifying the fields for actions, and for more information about modifying actions, see the *Administration Guide*.

9. When you are finished modifying actions, click Done to close the rule.

   You return to the Event Type Details page.

10. Locate the original rule that you copied and click the Disable button; this button appears on the Rules bar.

    The rule is disabled. Disabling the original rule is important to help prevent duplicate rules and actions from being triggered.

Create a Service and Request

A required task of integrating CA APM and CA Service Catalog is creating at least one service and request that use the features enabled by the integration.

To create a service and request

1. Define a Service using a service option group

    As part of defining the service option group, do the following from the Options tab of the service option element:

    a. Ensure that Track As An Asset is checked.

    b. Specify the same category for the service option element as you specified in the rule condition associated with the service.

    For example, if you created a new rule and action (see page 378) using the Hardware category, then you *must* create your service option group elements as Hardware Category. For more information, see the *Administration Guide*.

2. Log out of CA Service Catalog.

3. Log on to CA Service Catalog as the Catalog User created earlier.

4. Submit a request using the service that you defined earlier. The request will proceed through its life cycle, including the approving stage, fulfilling stage, and so forth. For more information, see the *Administration Guide*.

5. Log out of CA Service Catalog.

6. Log on to CA Service Catalog as the Request Manager (Approver for the End User) that you created earlier.

7. Approve the request in the Pending Actions queue.

8. Log out of CA Service Catalog.

9. Log on to CA Service Catalog as the Service Delivery Administrator (Fulfiller) that you created in an earlier step.

10. To fulfill the request that you submitted in an earlier step, do the following:

    ■ Become familiar with the Assign Assets window.

    ■ Assign an Available Asset to a Requested Service Option.

    Note: For more information about fulfilling requests, see the sections that follow and the *Administration Guide*.

Configure for Single Signin

You can optionally bypass user login by configuring CA Service Catalog and the CA products with which it integrates to use single signin (also called single signon or single sign-on).

To configure CA APM to use single signin, see its documentation.

Similarly, to configure CA Service Catalog to use single signin, configure it to use either CA SiteMinder, as explained in the chapter "Integrating with CA SiteMinder" in this guide, or NTLM authentication on Windows, as explained in the *Implementation Guide*.

How to Work With Assigned Assets

When you are viewing the Fulfill Request or Edit Request window (and the request is past the approval phase of its life cycle), you may see the Assigned Assets gold brick icon in the Actions column for a requested service option. The gold brick icon indicates this service option is eligible to have one or more assets assigned to it, indicating it was filled from available inventory.

To search available inventory, click the Assigned Assets gold brick icon. The CA APM Assign Assets window is displayed. By default, the Assigned Assets action is selected so the list of assets already assigned to the requested service option is displayed.

Note: Whether or not you can use the Assign Assets window depends on your CA APM role. You must be in the CA APM Fulfiller role (or another role that has update access to the Asset Fulfillment object) to use the Assign Assets window during the fulfillment of a request. Therefore, ensure that the settings for the Asset Fulfillment security for your role match to those of the CA APM Fulfiller role.

Using the Assign Assets window, you can do the following:

- View the list of assets assigned to the requested service option by selecting Assigned Assets in the Actions list

- Search for and assign assets to the requested service option

- Indicate that an available asset could not be found in inventory

- Display assigned assets and remove the assignment

Assign an Available Asset to a Service Option for Software

Use the Search for Assets section of the Assign Assets window to search for available assets and assign one or more of them to the requested service option for software. Doing so is required to fulfill a service option for software.

To assign an available asset to a service option for software

1. Select an asset in the Search Results List to assign to the requested service option.

   The Asset window appears for the selected asset.

2. Navigate to the Entitlements for the Software asset and select an entitlement to assign or create a new entitlement.

3. Click the Assign and Save button.

   The Asset page refreshes and displays a confirmation message.

4. Click the Refresh button on the CA Service Catalog Fulfill Request window.

   The service option status is changed.

   Note: Do not change the status manually. After the Assign Assets window changes the status of the requested service option, you may no longer be assigned a fulfillment task for that service option. Therefore, you may no longer permitted to change its status.

Note: For more information about assets, see the CA APM documentation.

Assign an Available Asset to a Service Option for Hardware

Use the Search for Assets section of the Assign Assets window to search for available assets and assign one or more of them to the requested service option for hardware. Doing so is required to fulfill a service option for hardware.

To assign an available asset to a service option for hardware

1. Select an asset in the Search Results List to assign to the requested service option.

   The Asset window appears for the selected asset.

2. Click the Assign button.

   The Asset page refreshes and displays a confirmation message.

3. Click the Refresh button on the CA Service Catalog Fulfill Request window.

   The service option status is changed.

   Note: Do not change the status manually. After the Assign Assets window changes the status of the requested service option, you may no longer be assigned a fulfillment task for that service option. Therefore, you may no longer permitted to change its status.

Note: For more information about assets, see the CA APM documentation.

Mark a Requested Service Option as Not Filled From Inventory

If you have used the Assign Assets window to search the available asset inventory and have been unable to find an eligible asset, you can indicate that the requested service option could not be filled from inventory.

Follow the steps below to indicate the requested service option could not be filled from inventory:

1. Click the Not Assigned From Inventory button.

   The status of the requested service option is automatically changed to Not Filled From Inventory.

   Note: You must have conducted an asset search for the Not Assigned From Inventory button to appear.

2. Click the Refresh button on the CA Service Catalog Fulfill Request window.

   The service option status is changed.

   Note: Do not change the status yourself since once the Assign Assets window changes the status of the requested service option you may no longer be assigned a fulfillment task for that service option and therefore no longer permitted to change its status.

Remove Asset Assignment

If an asset has been incorrectly assigned to a requested service option, you can remove the incorrect assignment. Click Remove Assignment from the Actions drop down list on the Assign Assets window. The list of assigned assets is displayed.

To remove the assignment for one or more non-Software assets assigned to the requested service option:

1. Select the check box for each asset in the Search Results List for which assignment is to be removed for the requested service option.

2. Complete the Asset Information section of the Assign Assets window.

   The assets for which assignment is to be removed are updated with the specified information.

   Note: If a field is left blank, the associated field on the assigned assets is set to blank. For more information on the meaning of the asset-related fields, see the CA APM documentation.

3. Click the Remove Assignment button.

   The Remove Assignment list of assigned assets is displayed. The status of the requested service option is not affected by a remove assignment.

To remove the assignment for a Software asset assigned to the requested service option

1. Select an asset in the Search Results List for which assignment is to be removed for the requested service option.

   The Asset window is displayed for the selected asset.

2. Navigate to the Entitlements for the Software asset and select an entitlement for which to remove the assignment.

3. Click the Remove Assignment and Save button.

   The asset is removed from the list of assigned assets. The status of the requested service option is not affected by a remove assignment.

Note: For more information see the CA APM documentation.

Associate a CA APM Model with a Service Option

You can associate one or more CA APM models with a service option, if the following requirements are met.

Requirements

■   CA APM must be installed and must share the MDB with CA Service Catalog.

■   You must have a role defined in CA APM.

■   Verify that CA APM supports your internet browser.

■   Check whether the CA APM application and web servers reside on the same computer or different computers. If they reside on different computers, complete the CA APM web services section in the administration configuration settings on the CA Service Catalog GUI.

This information is available during workflow-driven fulfillment and can be useful if CA APM assets are automatically created or assigned to the request.

To associate one or more CA APM models with a service option

1.   Click Catalog, Service Offerings.

2.   Click the Option Groups tab.

3.   Select any service option group and click the Definition tab.

4.   Click the CA APM Model icon.

5.   Click Assign Models to display the Assign Models window and perform the following actions:

View the assigned models

Select Assigned Models from the Action list.

Assign models

Select Assign from the Action list. You can search for both active and inactive CA APM models that match the criteria you enter and check the ones you want to assign to the service option. Click Assign Models to save the assignment.

Note: To search for both active and inactive CA APM models, before running the search, do not select the option to include only active records.

Remove assigned models

Select View Assigned Models from the Action list. Check the models you want to remove from the Assigned Models list and click Remove Assignment.

6.   Click Close.

The Assign Models window is closed.

Chapter 13: Integrating with CA Storage Resource Manager

This section contains the following topics:

Overview

Using data from CA SRM to feed usage data to Accounting Component, accounts can be invoiced for usage of services recorded by CA SRM.

CA SRM can export its collected data in XML format for its data profile and its usage data. Through Data Mediation and the Repository Agent, the exported data can be imported to Accounting Component. The Repository Agent can help to automate the data importing process. After the data is imported, by defining aggregation logic and aggregating the usage data, the data can be processed by Accounting Component. Accounts can be invoiced for usage of services recorded by CA SRM.

Exported XML File

CA SRM can export usage data files in XML format. The following XML code shows a sample usage data output file. The XML should be well formatted, as shown in the following code.

Keep in mind the following important points:

- Date Mediation recognizes the <RESPONSE_TABLE><TBL_INFO><Name> value as the Data Profile Name and <RESPONSE_TABLE><TBL_INFO><DATE> as the usage date field.

- <COLS> values are created as fields for the profile definition.

- <RECS> values are its usage date for related fields.

- The name of the exported XML file cannot contain spaces and must use only characters or digits.

```
<RESPONSE_TABLE>
<TBL_INFO>
<NAME>USM_1</NAME>
<DATE>15/11/2008 02:42:49 PM</DATE>
</TBL_INFO>
<COLS>
<COL NAME="File System" TYPE="string" />
<COL NAME="Sum of Size" TYPE="uint32" />
<COL NAME="Sum of Space" TYPE="uint32" />
</COLS>
<RECS>
<REC>
<VAL>NTFS</VAL>
<VAL>19679675124</VAL>
<VAL>19932807168</VAL>
</REC>
<REC>
<VAL>EXT3</VAL>
<VAL>7011128943</VAL>
<VAL>7553843200</VAL>
</REC>
</RECS>
</RESPONSE_TABLE>
```

Configuration

The usage data import process can be automated by configuring the CA Service Repository Agent ("also known as Data Mediation Data Repository Agent"). Data share can be implemented by using these methods:

- Sharing the Repository Agent data folder, which is named USM_HOME/repagent/data

- Setting the FTP server configuration information in the configuration file named USM_HOME/repagent/config/repagent.cfg

When the CA Service Repository Agent service is started, it fetches data files from the CA Service Repository Agent data folder (USM_HOME/repagent/data), according to the interval specified by the repeat.interval.ms=value setting in the CA Service Repository Agent configuration file (USM_HOME/repagent/config/repagent.cfg). The default value is 900000 (900 seconds or 15 minutes).

If the FTP Sever connection configuration is set up, the repository agent connects to the FTP server at the configured interval time and moves the related XML and CSV files to the data folder using the FTP file GET mechanism.

Note: For more information about the CA Service Repository Agent, see the chapter "Data Mediation" in the *Administration Guide*.

Integration Process

CA SRM outputs data file (an xml file) to a data share location: either an FTP server or a file share.

Keep in mind the following important points:

- The XML file is used by the data mediation component to create a data mediation profile. The XML file consists of information to create a data mediation profile and information about each column of a matched data file.

- By an exported XML file, a data mediation profile is created, if it does not already exist. The related data file is created automatically from the output XML file and is named *filename*.csv. This CSV file is also automatically uploaded by Repository Agent into the database.

- Once the profile and its data are imported, the data can be processed by Data Mediation to produce aggregated results, by defining aggregation logic and running data aggregation.

Note: For more information about data mediation and the Repository Agent, see the chapter "Data Mediation" in the *Administration Guide*.

How to Integrate with the Sample Data Set

Through the integration between Accounting Component and CA Storage Resource Manager (CA SRM), usage data that indicates storage used by a user can be invoiced to the user's account.

Accounting uses the Data Mediation and Repository Agent to import SRM usage data and use for Service Accounting.

To integrate Accounting Component and CA SRM, perform the following tasks:

1. View and configure the application metric by selecting Administration, Data Mediation, Application Metric, Application, CA SRM Application.

   The CA SRM Application window appears. This application has been defined with following metrics.

Metric ID	Metric Name
10184	CA SRM Total File Usage
10290	CA SRM File Usage by User Name
10291	CA SRM File Usage by File System

   For these metrics, sample CA SRM usage data exported sample xml files are available in the CA Repository sample data folder. These sample files are for modeling and testing purposes.

   Note: You can optionally add new application metrics, as explained in the *Administration Guide*.

2. Copy and paste a sample CA SRM XML output file from the sample data folder (for example, USM_HOME\repagent\data\samples\BS_ChargebackByUser.xml) into the USM_HOME\repagent\data\ folder.

   Note: Actual CA SRM sample data is shipped in the folder named USM_HOME\repagent\data\sample.

3. Start the CA Repository Agent service, using the Windows Control Panel.

   The following results occur:

   ■ The repository agent reads the new CA SRM XML output file. if If the data mediation profile does not exist, the repository agent uses the XML definition of the new file to create the data mediation profile and creates extract-related data file (*filename*.csv) for the profile.

   ■ When the CA Service Repository Agent service is started, it fetches data files from the CA Service Repository Agent data folder (USM_HOME/repagent/data), according to the interval specified by the repeat.interval.ms=value setting in the CA Service Repository Agent configuration file (USM_HOME/repagent/config/repagent.cfg). The default value is 900000 (900 seconds or 15 minutes).

4. Select Administration, Data Mediation, Profile Management.

   The Profile Management window appears.

5. Confirm that the related profile is generated.

6. Select Administration, Data Mediation, Data Management.

7. Confirm that the related data file is imported.

8. Create an account that is related to the exported usage data, and storage charges will be invoiced for that account by aggregation logic definition.

   An account in Accounting Component is the entity that can be billed.

   a. Select Administration, Business Units, and click the Business Unit name where you wish to add an account.

   b. Click Add Account.

   The new account is created.

9. Select Service Builder, Services to create an Application-based Service with a related CA SRM Metric.

10. Define the Aggregation Logic by selecting Administration, Data Mediation, Profile Management, as follows:

    a. Select Administration, Data Mediation, Profile Management.

       The Profile Management window appears.

    b. Click the hyperlink of the profile name.

    The Aggregation Logic window appears.

    Note: Aggregation Metric should be matched what it defined in the service in the earlier related step.

11. Ensure that CA Service Accounting is running; if necessary, start its Windows service.

12. Aggregate the data in Administration, Data Mediation, Aggregation Status, as follows:

    a. Select Administration, Data Mediation, Aggregation Status.

    b. Select the aggregation period named "11/01/2008 to 11/30/2008".

    c. If the fiscal period (November 2008) is not defined, define it, by selecting Administration, Configuration, Fiscal Periods and supplying the required data.

    d. Click "Start Aggregation" Button.

    e. After the aggregation has completed, wait for Accounting Component to process the aggregated result for invoices.

    f. Review the invoices.

Note: For more information, see the chapters "Data Mediation" and "Using CA Service Accounting" in the *Administration Guide*.

Chapter 14: Integrating with CA MICS or JARS

This section contains the following topics:

Overview

Using data from CA Mainframe Information Control System Resource Management (CA MICS) or JARS product to feed usage data to Accounting Component, accounts can be invoiced for usage of services recorded by CA MICS or JARS.

CA MICS or JARS can export its collected data in XML or CSV format to an FTP server. Using data mediation, the data exported to the FTP Server can be imported. The import process can be automated. After the data is imported, you can use data aggregation to summarize the imported data. The imported or aggregated data can be used by Accounting Component.

CA Mainframe Information Control System Resource Management (CA MICS) or JARS can export its collected data in XML and CSV format for its data profile and its usage data. Through Data Mediation and the Repository Agent, the exported data can be imported to Accounting Component. The Repository Agent can help to automate data importing process. After the data is imported, by defining aggregation logic and aggregating the usage data, the data can be processed by Accounting Component. Accounts can be invoiced for usage of services recorded by CA MICS or JARS.

Data File Name Convention

The CA MICS or JARS service manager periodically uploads usage data files to an FTP Server. Before the file is uploaded, the file must be named following a specific naming convention.

Note: For more information on extracting information for use by CA Service Catalog, see the CA MICS or JARS documentation.

Two files are created by the CA MICS or JARS process. The data mediation profile definition is exported into an XML file (*filename*.xml). The XML file name must match the name of the related usage data in CSV format (*filename*.csv). For example, if the exported profile name is SampleProfileName.xml, then the paired usage data file is SampleProfileName.csv. The file name cannot contain spaces and must use only characters or digits.

Configuration

The usage data import process can be automated by configuring the CA Service Repository Agent ("also known as Data Mediation Data Repository Agent"). Data share can be implemented by using these methods:

- Sharing the Repository Agent data folder, which is named USM_HOME/repagent/data

- Setting the FTP server configuration information in the configuration file named USM_HOME/repagent/config/repagent.cfg

When the CA Service Repository Agent service is started, it fetches data files from the CA Service Repository Agent data folder (USM_HOME/repagent/data), according to the interval specified by the repeat.interval.ms=*value* setting in the CA Service Repository Agent configuration file (USM_HOME/repagent/config/repagent.cfg). The default value is 900000 (900 seconds or 15 minutes).

If the FTP Sever connection configuration is set up, the repository agent connects to the FTP server at the configured interval time and moves the related XML and CSV files to the data folder using the FTP file GET mechanism.

For more information about the CA Service Repository Agent, see the chapter "Data Mediation" in the *Administration Guide*.

Integration Process

CA MICS or JARS outputs data file to a data share location: either an FTP server or a file share. Exported data file consist of two file; a xml and a delimiter-separated file, a paired file set with same file name, for an example, sample.xml and sample.csv. An XML file is produced along with a delimiter-separated data files describing the data file's structure and content.

- The XML file is used by the data mediation component to create a data mediation profile. The XML file consists of information to create a data mediation profile and information about each column of a matched data file.

- By an exported XML file, a data mediation profile is created if it does not already exist. The related data file with a CSV file extension is uploaded by Repository Agent into the database.

- Once the profile and its data is imported, data can be processed by Data Mediation to produce aggregated results, by defining aggregation logic and run data aggregation.

Note: For more information about data mediation, see the chapter "Data Mediation" in the *Administration Guide*. That chapter also contains information about the profile XML file used by data mediation to create a data mediation profile.

Application Metric

To view the application metrics for CA NeuMICS, log in to CA Service Catalog and select Administration, Data Mediation, Application Metric, Application, CA NeuMICS Application. The following metrics are defined. You can also add more metrics.

Metric ID	Metric Name
100027	JOB TCB CPU TIME CONSUMED
100028	JOB SRB CPU TIME CONSUMED
100029	JOB STEP EXECUTIONS
100030	JOB TOTAL EXCPS

How to Integrate with Sample Data Set

An integration data sample is provided with Accounting Component in the USM_HOME%\accounting\scripts\neumicsintegration\NeuMICS_Demo_README.txt file.

The application metric for CA NeuMICS referenced in the previous section has been used for the sample integration.

For these metrics, the exported integration sample CA MICS usage data files are available in the USM_HOME\accounting\scripts\NeuMICSIntegration\sample folder. To perform the sample integration, follow these steps:

1. Import Business Units, Accounts, Rate Plans, and Offerings:

    a. Open the command window.

    b. Navigate to USM_HOME\accounting\scripts\NeuMICSIntegration\sample

    c. Run the script file importNeuMICSDemo

2. Import Data Mediation Profile and the related Data:

    a. Copy demo data files(xml and csv) from USM_HOME\accounting\scripts\NeuMICSIntegration\sample\data\ into USM_HOME\repagent\data

    b. Start the CA Repository Agent Service.

    The process will take time to import the profile and data file.

    c. To verify the profile is created, Goto View=>Administration=>Data Mediation=>Profile Management

    d. To verify the uploaded data, Goto View=>Administration=>Data Mediation=>Data Management

    Note: The data upload will be scheduled in the next polling cycle after profile creation (a 15 minute interval), if you do not want to wait, recycle the Repository Agent Service once again.

3. Define Aggregation Logic:

   a. Select View=>Administration=>Data Mediation=>Profile Management

   b. Click the hyper link of the profile name

   c. Define the logic like the following.

      Copy the following logic query into the SQL Statments.

      Specify the table name (usm_mr_itemp_001001) accordingly with the Data Source table name.

      Click Save and click OK to confirm.

   Note: If other profiles had been defined already, change the table name (usm_mr_itemp_001001) in the below query, with the source table of the PRF10010 profile in Data Mediation=>Profile Management.

```
<<< SQL Server >>>
insert into $TARGET_TABLE$
select a1.account_no,
    e1.event_id,
    o1.offering_id,
    t1.invoice_timestamp,
    t1.number_of_billable_items
from usm_mr_itemp_001001 t1,
    usm_billing_account a1,
    usm_offering o1,
    usm_cat_event_type e1
where t1.costctr2 collate database_default = a1.account_label collate database_default and
        t1.invoice_category__description_ = o1.offering_name and
        t1.billable_computation_code_desc collate database_default = e1.name
collate database_default
<<< ORACLE >>>
insert into $TARGET_TABLE$
select a1.account_no,
    e1.event_id,
    o1.offering_id,
    t1.invoice_timestamp,
    t1.number_of_billable_items
from usm_mr_itemp_001001 t1,
    usm_billing_account a1,
    usm_offering o1,
    usm_cat_event_type e1
where t1.costctr2 = a1.account_label and
        t1.invoice_category__description_ = o1.offering_name and
        t1.billable_computation_code_desc = e1.name
```

4. Aggregate the data:

   Ensure that Accounting Component is up and running before starting the aggregation)

   a. Select Administration=>Data Mediation=>Aggregation Status

   b. Select the aggregation period of "11/01/2008 to 11/30/2008".

      If the fiscal period (November 2008) is not defined, define it.

      To define the period, select Administration, Configuration, Fiscal Periods.

   c. Click "Start Aggregation" Button.

   d. After the aggregation has completed, wait for the Accounting to process the aggregated result for invoices.

   e. Review the invoices.

Note: For more information, see the chapters "Data Mediation" and "Using Accounting Component" in the *Administration Guide*.

Appendix A: Enabling Integration with CA Products that Use an Earlier Version of the MDB

This section contains the following topics:

Overview

The CA Management Database (CA MDB) is a common data store used by several CA products; it is embedded in the installation image of each of these products, including CA Service Catalog products.

There are multiple versions of the CA MDB. A specific release of a CA product embeds a specific version of the CA MDB. However, regardless of which CA MDB version is embedded in an adopter product, the product can be made to run with any version of the CA MDB. For details about CA MDB versions, see CA MDB Versions (see page 400).

CA Service Catalog and Accounting Component embed CA MDB r1.5. However, you may want to integrate CA Service Catalog and Accounting Component with other CA products that embed MDB r1.0.4, including the following:

- CMDB r11.2

- CA Service Desk Manager r11.2

- UAPM r11.3

In such cases, you must apply the CA MDB r1.0.4 Compatibility Patch to enable integration between both versions of the CA MDB. For details, see How to Determine if You Must Install the CA MDB r1.0.4 Compatibility Patch (see page 401).

CA MDB Versions

There are two versions of the CA Management Database (CA MDB):

- Some CA MDB-adopter products embed and run with MDB r1. MDB r1 is also referred to as MDB r1.0.4, MDB r1.0, or MDB version r1.0.4. CA MDB adopter products that adopt MDB r1.0.4 are referred to as CA "MDB-r1.0.4-adopter" products. Unicenter Service Management r11 products embed MDB r1.0.4.

- Some CA MDB-adopter products embed and run with the subsequent MDB release version, MDB r1.5. CA MDB adapter products that adopt MDB r1.5 are referred to as CA "MDB-r1.5-adopter" products. CA Service Catalog r12.6 embeds MDB r1.5.

Single-Version Installation

When the MDB does not already exist and an MDB-r1.0.4-adopter product installs, the entire MDB r1.0.4 schema is installed, even portions that are not used by that MDB adopter product. If the MDB is already installed and is at version r1.0.4, schema modifications that include those required by that MDB adopter product are installed via MDB r1.0.4 patches. When a different MDB-r1.0.4-adopter product is installed, the MDB already exists; in that case, only required MDB r1.0.4 patches that are included in the embedded MDB image are installed.

MDB r1.5 introduced the possibility of installing a partial MDB by designating a set of named schemas that define the MDB, rather than a single all-inclusive schema.

When the MDB does not already exist and an MDB r1.5-adopter product installs, only the portion of MDB r1.5 that is required by the adopter product may be installed. That portion consists of a subset of named schemas. These schemas include a few that must always be embedded in an MDB-r1.5-adopter product and at least one that applies only to the MDB-r1.5-adopter product. The required common schemas are named MDB Base and Common Asset; MDB104 is also a common schema and may be optionally included. Any subsequent patches that are installed apply only to the installed subset of schemas.

Mixed Version Installation

In a mixed version installation, CA products that embed that same version of the CA Management Database are currently installed while a CA product that embeds a different version of the CA Management Database is to be installed.

When only MDB r1.5 adopter products are installed and an MDB r1.0.4 adopter product is to be installed, the MDB r1.5 that is installed must be made compatible with MDB r1.0.4 so that the MDB r1.0.4 adopter product installs and runs successfully.

How to Determine if You Must Install the CA MDB r1.0.4 Compatibility Patch

CA Service Catalog and Accounting Component embed CA MDB r1.5. To integrate them with other CA products that embed MDB r1.0.4, you must install the CA MDB r1.0.4 Compatibility Patch once to enable integration between both versions of the CA MDB. If you do not know which CA products have been installed, which versions of the CA MDB have been installed, or whether the Compatibility Patch is required, do the following:

1. Determine the version of the existing CA MDB in your installation by entering the following SQL statement from within the existing CA MDB instance:

   For SQL Server: select * from mdb_version

   For Oracle: select * from mdbadmin.mdb_version

   If CA MDB r1.5 exists, the expected output from this command is:

   ```
   MDBMAJORVERSION MDBMINORVERSION BUILDNUMBER RELEASEDA INSTALLDA

   --------------------- --------------------- -----------

       1        5      1    01-FEB-07   21-MAY-08
   ```

   If CA MDB r1.5 does not exist, a message indicating that mdb_version is an invalid object name is displayed. In this case, it is not necessary to install the CA MDB r1.0.4 Compatibility Patch.

   CA MDB r1.5 may exist as a result of a previous upgrade from CA MDB r1.0.4 to CA MDB r1.5 or as a result of a previous compatibility-conversion of CA MDB r1.0.4 to CA MDB r1.5.

2. To confirm either of these situations, in addition to confirming that the existing version is CA MDB r1.5, enter the following SQL statement:

   For SQL Server: select * from mdb

   For Oracle: select * from mdbadmin.mdb

   If the following information is displayed, then it is not necessary to install the CA MDB r1.0.4 Compatibility Patch:

   ```
   MDBMAJORVERSION MDBMINORVERSION BUILDNUMBER RELEASEDA INSTALLDA

   ---------------- ---------------- ---- -----------

       1        4        30    12-JAN-06  20-MAY-08
   ```

   Otherwise, you must install the compatibility patch *before* installing a product that embeds CA MDB r1.0.4.

3. If installing the compatibility patch is *not* required, skip the remainder of this appendix.

   If installing the compatibility patch *is* required, install the patch according to the instructions provided in the section that applies to your environment, and skip the other sections:

   ■ Install the MDB r1.0.4 Compatibility Patch for SQL Server (see page 402)

   ■ Install the MDB r1.0.4 Compatibility Patch for Oracle on Windows (see page 404)

   ■ Install the MDB r1.0.4 Compatibility Patch for Oracle on Linux (see page 406)

Install the CA MDB r1.0.4 Compatibility Patch for SQL Server

If you are using SQL Server as your DBMS for CA Service Catalog and Accounting Component and you want to integrate them with other CA products that embed CA MDB r1.0.4, you must run the CA MDB r1.0.4 compatibility patch once, by performing the steps in this section. For details about determining whether you need to run this patch, see How to Determine if You Must Install the CA MDB r1.0.4 Compatibility Patch (see page 401).

To install the CA MDB r1.0.4 compatibility patch for SQL server

1. Ensure that you are performing these steps on *either* the SQL Server server *or* a server on which an SQL Server client and a CA product that embeds CA MDB r1.0.4 are installed.

2. Copy the Utilities\MDB\windows folder and its sub-folders from the CA Service Catalog installation media to a local folder. Record the name of the folder for reference.

3. In Windows Explorer, select the local copied \windows folder, all its files, and all its sub-folders, right-click, and select Properties.

    The Properties dialog appears.

4. On the General tab, in the Attributes box, ensure that Read-Only is not checked. Click OK.

5. Open a command window and navigate to the local copied \windows on the server.

6. Run one of the following commands to ensure that the CA MDB r1.0.4 compatible patch is installed. See the make_MDB_104_compatible.BAT file for more details.

    If the SQL Server server is installed locally, enter the following minimum command:

    make_MDB_104_compatible -DBVENDOR=mssql -DBUSER=sa -DBPASSWORD=sa

    If the SQL Server server is installed on a remote computer, enter the following minimum command:

    make_MDB_104_compatible.bat -DBVENDOR=mssql -DBNAME=mdb -DBHOST=myhost -DBPORT=1433 -DBUSER=sa -DBPASSWORD=sa [-MDB_EXIT_SCRIPT=no –batch]

    Important! For both commands, see the parameters explained in the following section, and optionally add additional parameters to the minimum command, as needed.

    A sample command follows:

    make_MDB_104_compatible.bat -DBVENDOR=mssql -DBNAME=mdb -DBHOST=myhost -DBPORT=1433 -DBUSER=sa -DBPASSWORD=sa -MDB_COMMON_DIR="C:\Program Files\CA\SC\Mdb" -MDB_EXIT_SCRIPT=no –batch

    Note: For logging information, see the install_mdb.log file in your installation directory.

Parameters

Important! Parameters that require explanation are as follows. If a parameter is not described in the following list, specify the complete parameter expression exactly as shown in the command syntax. Specify quotation marks around any path name or value that includes a space.

-DBVENDOR=mssql

Specifies that the DBMS is Microsoft SQL Server (mssql).

-DBHOST={*computername|computername\instance_name*}

Specifies the name of the SQL Server server and the instance name, if used. The default is localhost. If you are using instances, append the instance name to the computer name, as shown above. Otherwise, specify only the computer name.

-DBPORT=*number*

Specifies the JDBC database port number.

-DBUSER=*username*

Specifies the name of the SQL Server database user.

-DBPASSWORD=*password*

Specifies the password of the SQL Server database user.

-MDB_COMMON_DIR="*drive:path*"

Specifies the complete path name of the MDB common folder. The default is C:\"Program Files"\CA\SC\mdb or existing folder.

For example:

-MDB_COMMON_DIR="C:\Program Files\CA\SC\mdb"

Install the CA MDB r1.0.4 Compatibility Patch for Oracle on Windows

If you are using Oracle running on Windows as your DBMS for CA Service Catalog and Accounting Component and you want to integrate them with other CA products that embed CA MDB r1.0.4, you must run the CA MDB r1.0.4 compatibility patch once, by performing the steps in this section. For details about determining whether you need to run this patch,see How to Determine if You Must Install the CA MDB r1.0.4 Compatibility Patch .

To install the CA MDB r1.0.4 compatibility patch for Oracle on Windows

1. Ensure that you are performing these steps on *either* the Oracle server *or* a server on which an Oracle client and a CA product that embeds CA MDB r1.0.4 are installed.

2. Copy the Utilities\MDB\windows folder and its sub-folders from the CA Service Catalog installation media to a local folder. Record the name of the folder for reference.

3. In Windows Explorer, select the local copied \windows folder, all its files, and all its sub-folders, right-click, and select Properties.

   The Properties dialog appears.

4. On the General tab, in the Attributes box, ensure that Read-Only is not checked. Click OK.

5. Open a command window and navigate to the local copied \windows on the server.

6. Run one of the following commands to ensure that the CA MDB r1.0.4 compatible patch is installed. See the make_MDB_104_compatible.BAT file for more details.

   If the Oracle server is installed locally, enter the following minimum command:

   make_MDB_104_compatible -DBVENDOR=oracle -DBNAME=ORCL -DBUSER=sys
   -DBPASSWORD=sys -ORA_TBLSPACE_PATH=d:\oracle\product\10.2.0\oradata\orcl
   -MDB_ADMIN_PSWD=mdbadmin

   If the Oracle server is installed on a remote computer, enter the following minimum command:

   make_MDB_104_compatible.bat -DBVENDOR=oracle -DBNAME=orcl -ORA_SERVICE_NAME=orcl
   -DBHOST=receu01-vm2 -DBPORT=1521 -DBUSER=system -DBPASSWORD=mypass
   -MDB_COMMON_DIR="C:\Program Files\CA\SC\Mdb" -ORA_DATA_TBLSPACE=MDB_DATA
   -ORA_INDEX_TBLSPACE=MDB_INDEX
   -ORA_TBLSPACE_PATH="C:\oracle\product\10.2.0\oradata\orcl" -MDB_ADMIN_PSWD=ca
   -MDB_EXIT_SCRIPT=no -batch

   Important! For both commands, see the parameters explained in the following section, and optionally add additional parameters to the minimum command, as needed.

   A sample command follows:

   make_MDB_104_compatible.bat -DBVENDOR=oracle -DBNAME=orcl -ORA_SERVICE_NAME=orcl
   -DBHOST=receu01-vm2 -DBPORT=1521 -DBUSER=system -DBPASSWORD=mypass
   -MDB_COMMON_DIR="C:\Program Files\CA\SC\Mdb" -ORA_DATA_TBLSPACE=MDB_DATA
   -ORA_INDEX_TBLSPACE=MDB_INDEX
   -ORA_TBLSPACE_PATH="C:\oracle\product\10.2.0\oradata\orcl" -MDB_ADMIN_PSWD=ca
   -MDB_EXIT_SCRIPT=no -batch

   Note: For logging information, see the install_orcl.log file in your installation directory.

Parameters

Important! Parameters that require explanation are as follows. If a parameter is not described in the following list, specify the complete parameter expression exactly as shown in the command syntax. Specify quotation marks around any path name or value that includes a space.

-DBVENDOR=oracle

Specifies that the DBMS is Oracle (oracle).

-DBHOST=*computername*

Specifies the name of the Oracle server. The default is localhost.

-DBPORT=*number*

Specifies the JDBC database port number.

-DBUSER=*username*

Specifies the name of the Oracle database user.

-DBPASSWORD=*password*

Specifies the password of the Oracle database user.

-DBNAME=*connectionid*

Specifies the connection ID for Oracle, for example, orcl.

-ORA_TBLSPACE_PATH="*drive*:*path*"

Specifies the table space path for Oracle.

-MDB_ADMIN_PSWD=*password*

Specifies the mdbadmin password for Oracle.

-MDB_COMMON_DIR="*drive*:*path*"

Specifies the complete path name of the MDB common folder. The default is C:\"Program Files"\CA\SC\mdb or existing folder.

For example:

-MDB_COMMON_DIR="C:\Program Files\CA\SC\mdb"

Install the CA MDB r1.0.4 Compatibility Patch for Oracle on Linux

If you are using Oracle running on Linux as your DBMS for CA Service Catalog and Accounting Component and you want to integrate them with other CA products that embed CA MDB r1.0.4, you must run the CA MDB r1.0.4 compatibility patch once, by performing the steps in this section. For details about determining whether you need to run this patch, see How to Determine if You Must Install the CA MDB r1.0.4 Compatibility Patch .

To install the CA MDB r1.0.4 compatibility patch for Oracle on Linux

1. On the Oracle server computer, copy the Utilities\MDB\linux directory and its subdirectories from the CA Service Catalog installation media to a local directory, for example, /tmp/linux. Record the name of the folder for reference.

2. Navigate to the location where you copied the setup packages, for example, /tmp/linux.

3. Enter the following commands to change the owner of the copied directory to the Oracle database owner (for example, oracle) and group (for an example, oinstall is a group owner of Oracle files):

   chown oracle:oinstall /tmp/linux

   chmod –R 755 /tmp/linux

   Note: This document uses *oracle* as the name of the Oracle database owner. If your value is different, use your value instead.

4. If the CA MDB target directory does not exist already, create it, by entering the following commands:

   mkdir -p /opt/mdb1.5

5. Enter the following commands to change the owner of the CA MDB target directory to the Oracle database owner (for example, oracle) and group (for an example, oinstall is a group owner of Oracle files) as follows:

   chown oracle:oinstall /opt/mdb1.5

6. Navigate to the local copied /linux directory on the server.

7. Run the following commands to ensure that the CA MDB r1.0.4 compatibility patch is installed. See the .sh file for more details.

   make_MDB_104_compatible.sh -DBVENDOR=oracle -DBNAME=orcl -DBUSER=sys
   -DBPASSWORD=sys -ORA_TBLSPACE_PATH="/opt/oracle/oradata/orcl"
   -MDB_ADMIN_PSWD=mdbadmin

   Important! See the parameters explained in the following section, and optionally add additional parameters to the minimum command, as needed.

   A sample command follows:

   ./make_MDB_104_compatible.sh -DBVENDOR=oracle -DBNAME=orcl
   -DBUSER=sys -DBPASSWORD=sys -ORA_TBLSPACE_PATH="/opt/oracle/oradata/orcl"
   -MDB_ADMIN_PSWD=ca –batch

   Note: For logging information, see the install_orcl.log file in your installation directory.

Parameters

Important! Parameters that require explanation are as follows. If a parameter is not described in the following list, specify the complete parameter expression exactly as shown in the command syntax. Specify quotation marks around any path name or value that includes a space.

-DBVENDOR=oracle

Specifies that the DBMS is Oracle (oracle).

-DBUSER=*username*

Specifies the name of the Oracle database user, for example, system.

-DBPASSWORD=*password*

Specifies the password of the Oracle database user, for example, ca.

-DBNAME=*connectionid*

Specifies the connection ID for Oracle, for example, orcl.

-ORA_TBLSPACE_PATH="*path***"**

Specifies the table space path for Oracle.

-MDB_ADMIN_PSWD=*password*

Specifies the mdbadmin password for Oracle.

-MDB_COMMON_DIR="*drive:path***"**

Specifies the complete path name of the MDB common folder. The default is C:\"Program Files"\CA\SC\mdb or existing folder.

For example:

-MDB_COMMON_DIR="C:\Program Files\CA\SC\mdb"

Appendix B: Troubleshooting

This appendix contains *only* troubleshooting topics related to integrations of CA Service Catalog with other products. For additional troubleshooting topics that are not related to these integrations, see the *Implementation Guide*.

This section contains the following topics:

Integration Fails

Symptom:

The integration fails between CA Service Catalog and other products, such as, CA Service Desk Manager, BusinessObjects Enterprise, and CA APM.

Solution:

Verify that every computer with a product or component belonging to CA Service Catalog or an integrating product is set to the same exact date and time, to the minute and adjusted for the time zone. This requirement includes the DBMS server for CA Service Catalog and, if applicable, the DBMS servers for all integrating products.

For example, if one of these computers is set to November 11, 6:27 p.m. Eastern USA, then all computers should be set to November 11, 6:27 p.m. Eastern USA or its equivalent, regardless of the computer's physical or geographic location. Some examples of equivalent dates and times for November 11, 6:27 p.m. Eastern USA include the following:

- November 11, 3:27 p.m. Pacific USA

- November 11, 5:27 p.m. Central USA

- November 11, 9:27 p.m. Eastern Brazil

- November 11, 11:27 p.m. GMT

- November 12, 5:07 a.m. India Standard

- November 12, 7:27 a.m. China Standard

Methods for synchronizing the time and time zone on all computers include, but are not limited to, the following:

- Manually setting the time and time zone on each computer; for details, see your operating system documentation

- Configuring the Windows Time service to use an external time source or an authoritative time server; for details, see the Microsoft web site, microsoft.com

For CA EEM, Pending My Action page Is Not Refreshed Until User Logs Off

Symptom:

After you add or remove a user from a group in CA EEM, the Pending My Action page is not refreshed.

Solution:

You must log off and log in again to refresh the Pending My Action page.

Authentication Dialog Opens When CA Workflow Is Started from Administration Module

Symptom:

When you click Adminsitration, Tools, CA Workflow, an authentication dialog box opens, after installing JRE. Even after you enter valid credentials, the box remains open.

Solution:

1. Invoke Java Web Start by clicking Start.

2. Choose File, Preferences.

3. Choose None on the General tab.

4. Click OK.

You can now launch CA Workflow by clicking Administration, Tools, CA Workflow.

Emails Sent from CA Workflow Are Not Being Delivered

Symptom:

Approval or fulfillment related emails from CA Workflow are not being delivered.

Solution:

There are many reasons that emails would not be delivered properly.

Check whether the emails went to a "junk" folder. If so, do one of the following:

- Adjust the Catalog, Configuration, Request Management Configuration settings for Request Email: From Address and From Name to values that will be not handled as junk email.

- Adjust your email client's junk email rules to allow the emails to be received.

Ensure that the user expected to receive an email has a valid email address, as seen on the User Profile screen. When you use the out-of-the-box CA Service Catalog process definitions, the email address to which emails will be sent is viewed and changed using the Email field on the Edit User Profile screen. These process definitions use the Request Service sendRequestEmail web service operation.

Note: CA Workflow can also send emails by using a Send Event node. The email address for the user specified is taken from the CA EEM Email address field on the User screen. If CA EEM is configured to use an external directory such as Microsoft Active Directory, then that system provides the email address for the user when the Send Event node is used.

Ensure that the CA Service Catalog components are configured with the correct mail server name for your company. The mail server name was specified during installation and can be changed using the Administration, Configuration, Mail Server Configuration Host Name setting.

Note: The name of the mail server used by CA Workflow can be changed by using the Process Definition Tool (IDE) and altering the Server Configuration SMTPHost setting.

For the approval CA Workflow process definitions provided with the CA Service Catalog components, the approval is assigned to the manager of the user the request is for. If the user does not have a manager defined, the approval is assigned to the user specified in the Catalog, Configuration, Request Management Configuration setting Default User for Request Actions. You can view and change the Manager field using the Edit User Profile screen.

For the fulfillment CA Workflow process definitions provided with the CA Service Catalog components, the fulfillment steps are assigned to the user ID passed to the process definition handling each phase of the fulfillment process. The user ID is passed in the rule action that launches the CA Workflow process definition. By default, the user ID of "spadmin" is used which is the CA Service Catalog Administrator user ID installed with the product. By default, the Email value for the spadmin user is blank so that emails regarding pending actions assigned to spadmin would not be sent.

Note: The emails sent from the fulfillment process definitions used from CA Service Desk Manager use the CA Workflow Send Event node. As mentioned earlier, the email address used comes from CA EEM.

Cannot Start CA Workflow

Symptom:

You may not be able to start the CA Workflow IDE using Java Web Start, typically when you have Sun Java Runtime Environment (JRE) 1.6.0_14 installed locally. This problem typically occurs because of a JRE bug, as document on the Sun web site, www.sun.com.

Solution:

Do one of the following:

- If JRE 1.6.0_14 is installed locally, install a different JRE version. For best results, install and use JRE 1.6.0_03.

- Open the Windows Control Panel. On it, select Java, Settings, and un-check the option to keep temporary files on your computer.

After performing one of these actions, verify that you can start the CA Workflow IDE successfully.

Cannot Log in to CA Workflow

Symptom:

CA Service Catalog supports Internet Protocol Version 6 (IPv6). IPv6 is supported whenever CA Service Catalog is running. Thus, this IPv6 support does *not* need to be configured, turned on, or turned off. However, if you are using an Oracle database running on Linux and your Linux server is configured for IPv6 support, you may be unable to log in to the CA Workflow IDE after you have installed CA Service Catalog.

Solution:

To correct this situation, do the following:

1. Locate the ide.sh script file located in USM_HOME\fulfillment\CA Workflow\client folder.

2. Open the file and find the following line:

    VMARGS=

3. Update the line to read as follows:

    VMARGS=-Djava.net.preferIPv4Stack=true

4. Save the file.

5. Log in to the CA Workflow IDE.

Note: If Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) hosts coexist on the network, make sure the appropriate transition strategies, tools, and mechanisms to support these technologies are in place before you start the product configuration.

Proxy-related Message Appears When the Workflow IDE Is Started from the CA Workflow Link

Symptom:

I am getting an error message like "Unable to tunnel through proxy" when starting the Workflow IDE from the CA Workflow link in CA Service Catalog.

Solution:

Java Web Start (JWS) is used to launch the Workflow IDE and can be configured to use your proxy settings. The first time JWS is invoked, you will be prompted for your proxy settings. Your choices are:

- None - No proxy server

- Use Browser - Use proxy settings established in your browser

- Manual - Specify proxy server address and port

Note: You can also adjust these JWS settings by launching Java Web Start and configuring the File, Preferences General tab settings.

Data not uploaded using CA Repository Agent Service while configured with Active Directory

Symptom:

Data sets do not get uploaded if CA Service Catalog is configured for use with Active Directory. Exceptions are displayed in the RepositoryAgentService.log file.

Solution:

Install a secondary view server and do *not* configure this view server for use with Active Directory. Configure the CA Repository Agent services and files on this secondary view server to upload the data in CA Service Catalog.

Errors for integration with CA APM

Symptom:

I am unable to integrate CA Service Catalog with CA APM.

Solution:

If CA Service Catalog is installed first and CA APM is installed later, you must recycle the CA Service Catalog Windows service and then proceed with the integration.

Symptom:

I get an error when trying to assign CA APM assets to a CA Service Catalog request item or to view associated assets. The error text is similar to the following: "Warning: A connection to the database could not be established."

Solution:

The user does not have a role in CA Service Catalog. If the user is meant to be able to *assign* assets, then the user must use a role in CA APM that allows update access to the Asset Fulfillment security object. If the user is only meant to be able to *view* assigned assets, the user must use a role in CA APM which allows view access to the Asset Fulfillment security object, but not update access.

Symptom:

When trying to access CA APM, I receive a pop-up message saying "please wait" and CA APM opens very slowy or not at all. This error occurs when I use the Microsoft Internet Explorer browser. This error commonly occurs when I attempt to assign a CA APM model to a service option.

Solution:

Change your Internet Explorer settings to aviod the pop-up and the delay.

To change Internet Explorer settings

1. Open the Internet Explorer browser.

2. In the browser bar, select Tools, Internet Options.

   The Internet Options dialog appears.

3. Click the Security tab.

   The security options appear.

4. Click the Local Intranet zone to select it, and click Custom Level.

   The security settings dialog for this zone appears.

5. Scroll to the Miscellaneous group and locate the option named Access data sources across domains.

6. Click Enable or click Prompt; do *not* click Disable.

7. Click OK to close the local intranet security settings dialog.

8. Click OK to close the Internet Options dialog.

Symptom:

I get an error when trying to assign CA APM models to a CA Service Catalog service option.

Solution:

One reason for this error is that the user does not have a role in CA Service Catalog. The user must use a role in CA APM that allows access to the Model security object.

Symptom:

I get an error when trying to assign CA APM assets to a CA Service Catalog request item.

Solution:

Create separate application pools for CA Service Catalog web sites and ensure that the CA Service Catalog web sites are using the correct version of ASP.NET.

When using IIS 6.0 in 6.0 mode, follow these instructions to assign CA APM assets to a CA Service Catalog request item.

The error appears in the CA APM log (such as uapm20051215.csv) as an entry like this:
12/15/2005,9:15:35 PM,16,2452046,3676,1,jassetmgr,NETWORK SERVICE,,UAPM; Source: System.Web.Services; TargetSite: System.Object[]
ReadResponse(System.Web.Services.Protocols.SoapClientMessage; System.Net.WebResponse; System.IO.Stream; Boolean),0,System.Web.Services.Protocols.SoapException: System.Web.Services.Protocols.SoapException: Server was unable to process request. on -> System.NullReferenceException: Object reference not set to an instance of an object.
  on - End of inner exception stack trace on -
  at System.Web.Services.Protocols.SoapHttpClientProtocol.ReadResponse(SoapClientMessage message; WebResponse response; Stream responseStream; Boolean asyncCall)
  at System.Web.Services.Protocols.SoapHttpClientProtocol.Invoke(String methodName; Object[] parameters)
  at CA.Presentation.Web.Interfaces.Argis.InventoryService.InvService.setfulfillmentassignment(String sessionID; String assetuuid; String keys; String action)
  at CA.Presentation.Web.Interfaces.Argis.frmAsset.saveAsset_FulfillFromInventory(Boolean removeAssignment),"System.Web.Services.Protocols.SoapException: Server was unable to process request. on -> System.NullReferenceException: Object reference not set to an instance of an object.
  on - End of inner exception stack trace on -"

Solution:

Configure IIS properly for each CA APM-related web site listed under Web Sites, Default Web Site, as follows:

1. Select Administrative Tools, Internet Information Services (IIS) Manager from the Start menu.

2. Select the Application Pools node. Right click, select New > Application Pool. Select "Use existing application pool as template."

3. Name the application pool using the same name as the web site listed under Web Sites, Default Web Site. Click OK.

4. Select the Web Sites node. Right click each web site name under Web Sites, Default Web Sites and select Properties. Select the new application pool with the same name as the web site for Application pool and "Scripts and Executables" for Execute permissions.

5. Select the ASP.NET tab and ensure that the version of ASP.NET is 1.1.4322.

6. Click OK.

   The display is changed to reflect the new application pool configuration.

7. Right-click each application pool and select Recycle.

The change takes effect.