



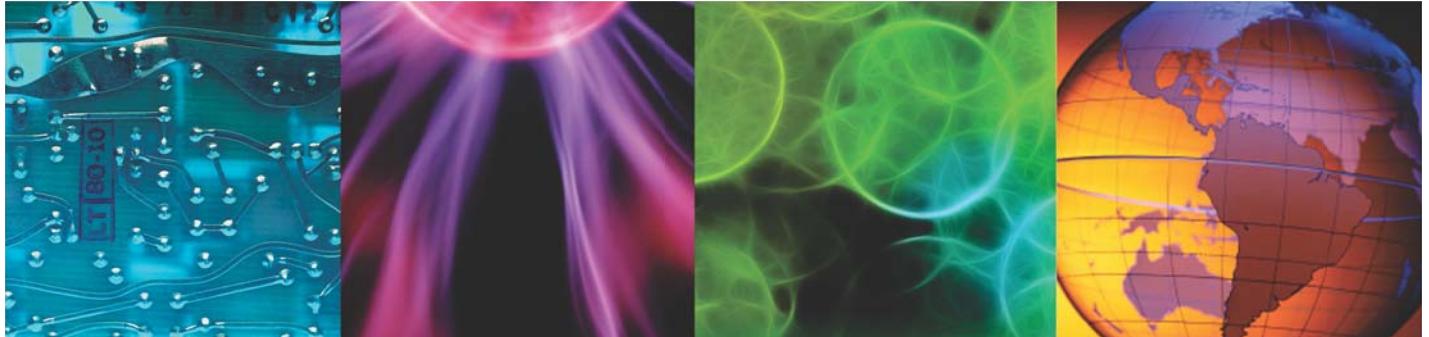
IBM Training

**IBM SmartCloud Control
Desk 7.5 Configuration,
Change, and Release
Management**

Student Exercises

Course code TP370 ERC 1.0

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Cloud & Smarter Infrastructure

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There are no student exercises for this chapter.



Starting and customizing the exercise environment

This course includes a virtual image that has IBM SmartCloud Control Desk installed. This image is a 64-bit Microsoft Windows 2003 Standard Server. If you need help starting the guest or accessing the operating system login screen, ask your instructor or consult the instructions that you received when you registered for this course.



Note: When running this image locally, the host computer must support 64-bit virtual machines. Most new computers can support 64-bit virtual machines. However, you might have to enable the virtualization technology in your BIOS. For more information, refer to the following VMware Knowledge Base article at
http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1003944.

Before you begin, you must ensure that the exercise environment is set up to support your preferences, that the required components are operational, and that you can successfully log in to the IBM SmartCloud Control Desk console.

Exercise 1. Logging in to the operating system

When the virtual system has started, you must log in to get access to the system. To get access to the desktop, complete these steps.

1. At the Windows login screen, press **Ctrl+Alt+Delete**.



Note: A different key sequence or menu selection might be used, depending on your local environment. For example, when running a virtual machine on a Windows host, you might press **Ctrl+Alt+Insert** to access the login screen on the virtual machine.

2. Enter the user name **Administrator** and password **object00**.
3. Click **OK** to log in to Windows 2003.

When you see the Windows desktop, you have successfully logged in.

Exercise 2. Customizing the exercise environment

IBM SmartCloud Control Desk uses a browser-based console. Before you start, you must ensure that the browser features are configured correctly to support certain functions that are needed throughout this course.

In addition, you might want to customize the virtual system to support your special preferences. The virtual system is been configured to support an en-US based environment. You can reconfigure the keyboard setup so that it matches the specific hardware you are using.

Configure browser preferences

When you use certain features of the product, pop-up windows are displayed. Before you start, you have to configure your browser to display pop-up windows without user intervention.

In addition, some exercises also require that you download files generated by IBM SmartCloud Control Desk. You need to ensure that the browser allows you to download these files. The browser prompts you to decide how you want to process the downloaded files.

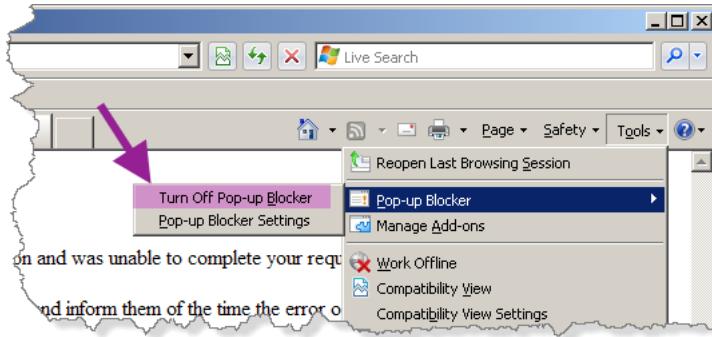
Disable the pop-up blocker

To disable the pop-up blocker in Microsoft Internet Explorer, complete these steps:

1. From the desktop, locate the Internet Explorer icon () and use it to start the browser.

When the browser starts, it will try to access the default home page, which is not available. You see the text *Internal Server Error*. You can ignore this message since the home page will be available once you have started IBM SmartCloud Control Desk.

2. When the browser has launched, locate the command toolbar, and click **Tools > Turn Off Pop-up Blocker**.

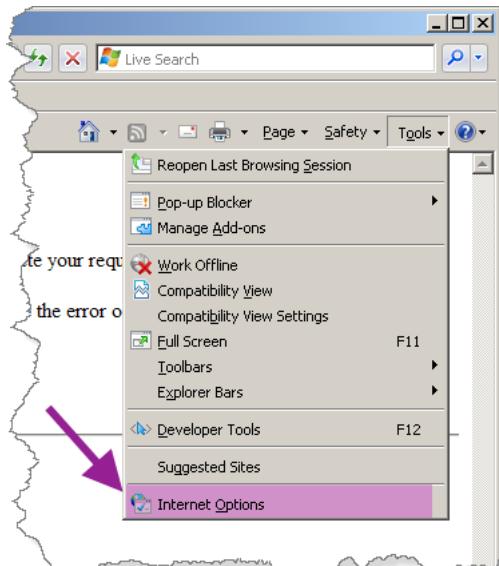


You have now ensured that pop-up windows can be displayed without confirmation.

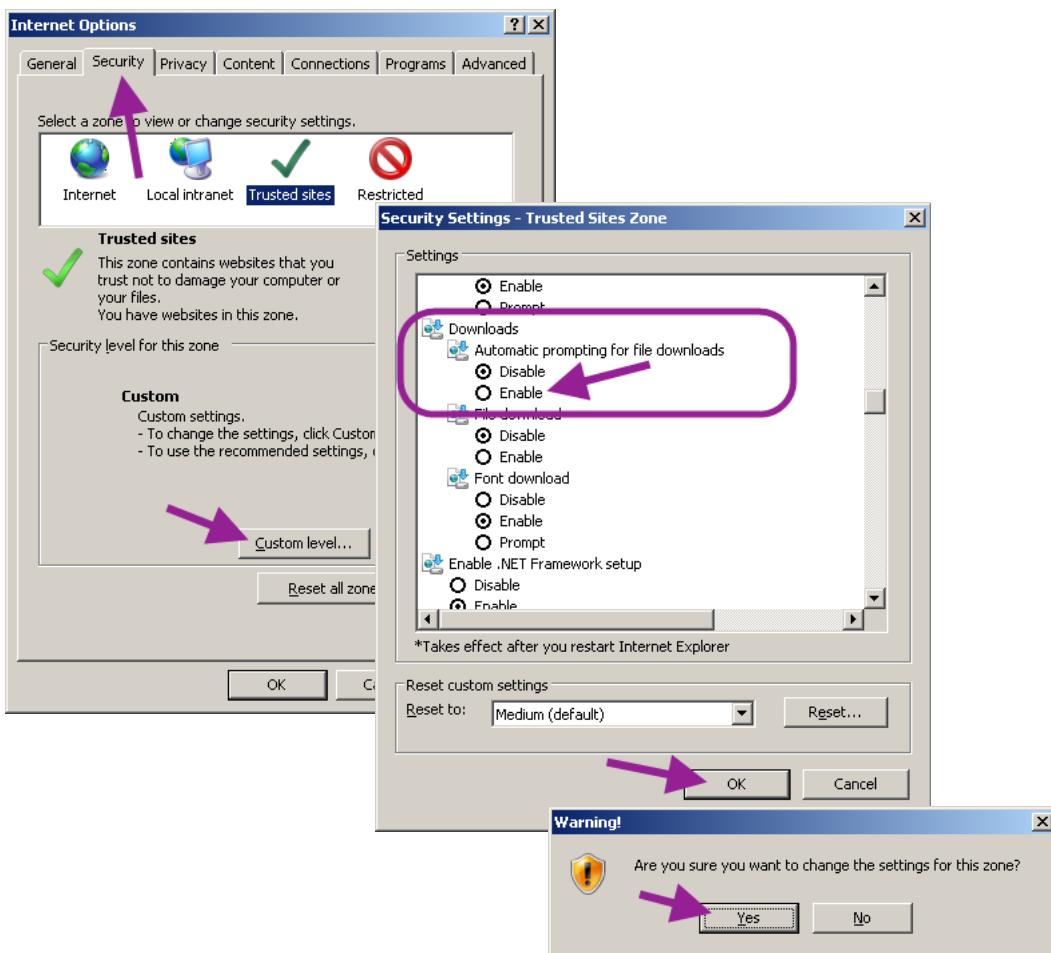
Setting download preferences

To enable the browser to allow you to download files and store them on your virtual image, complete these steps:

1. From the browser window, find the Tools option in the command toolbar, and click **Tools > Internet Options**.



2. When the Internet Options windows appears, follow these steps to enable downloading files:
 - a. Open the **Security** tab, and click **Custom Level**.
 - b. Scroll down in the Settings section until you find the option named *Downloads*, choose the **Enable** option, and click **OK**.
 - c. When the Warning window appears for you to confirm your choice, click **Yes**.



- d. When the two pop-up windows disappear, click **OK** to close the Internet Options window.

At this point, you have enabled the browser to accept download requests, and prompt the user to decide how to process the downloads.

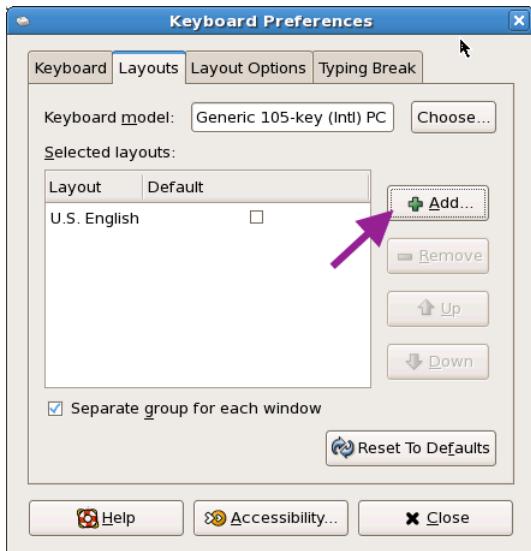
Configuring keyboard preferences

All the systems in the exercise environment have been configured to use US English keyboard settings. If you wish to use another keyboard layout, you can change it by following the procedures outlined below:

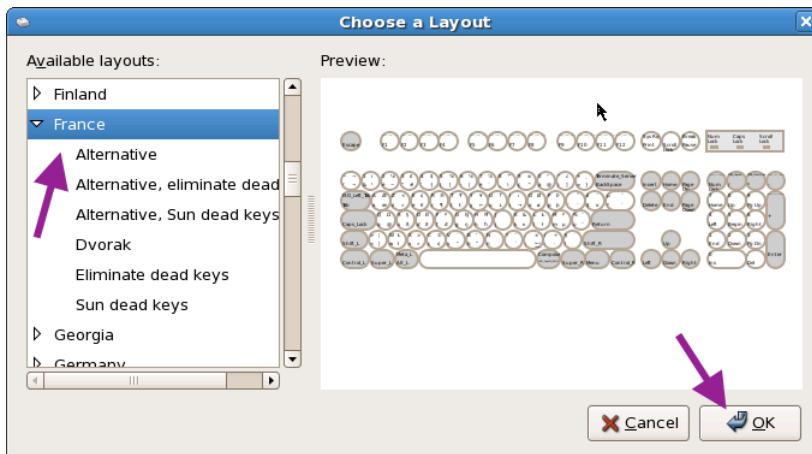
Linux

To change the keyboard layout on a CentOS system, complete these steps:

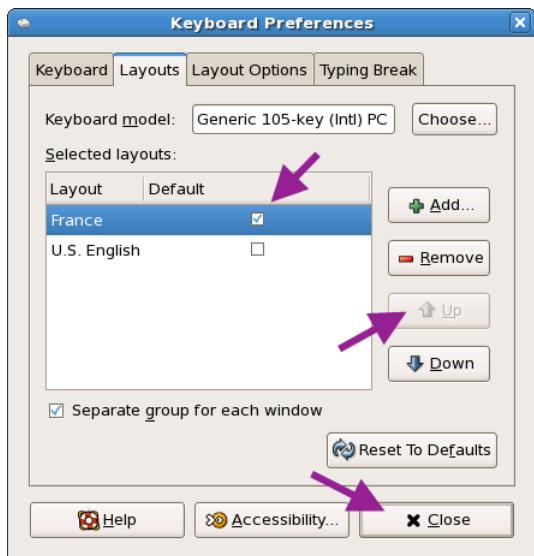
1. From the desktop of the system on which you want to change the default keyboard layout, select **System > Preferences > Keyboard**.
2. When the Keyboard Preferences window appears, open the **Layout** tab.



3. To add another keyboard layout, click **Add**, and select your preferred keyboard layout in the Available layouts section, and press **OK**.



4. To set the newly added keyboard layout as the default, select the **Default** check box next to your preferred layout. Then, to ensure that it is selected as the first keyboard, use the Up button to move your preferred keyboard layout to the top of the list.



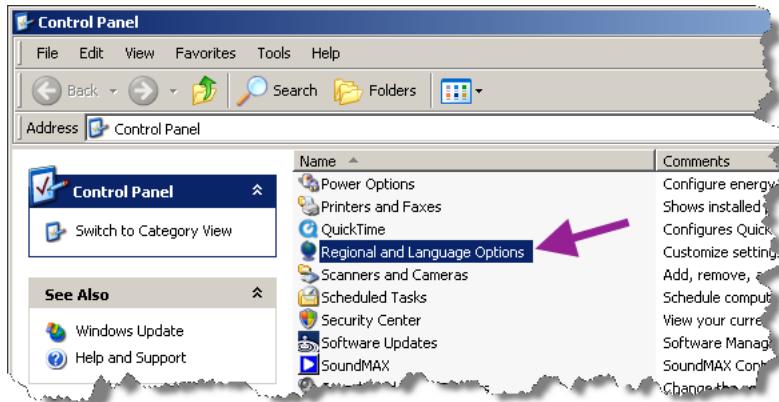
Click **Close** to save your settings.

When you return to the desktop, the new keyboard layout should be active in all the open windows.

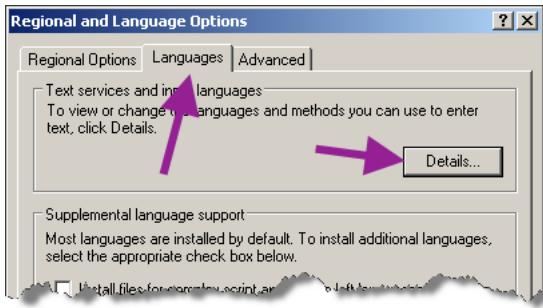
Windows XP or Windows 2000 Server

Follow these instructions to change the keyboard layout in a Windows XP or Windows 2000 Server image.

1. From the desktop, select **Start > Control Panel** to open the Control Panel.
2. From the Control Panel, click **Regional and Language Options** to open application that allows you to control the keyboard layout.



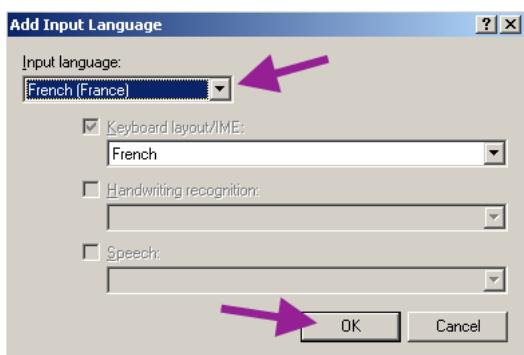
3. When the Regional and Language Options application launches, open the **Languages** tab, and click **Details**.



4. If your preferred language is not shown in the Installed Services section, click **Add**.



5. Choose your preferred language from the Add Input Language window, and click **OK** when you are done.



6. When you return to the Text Services and Input Languages window, ensure that you select the new language as the Default language.



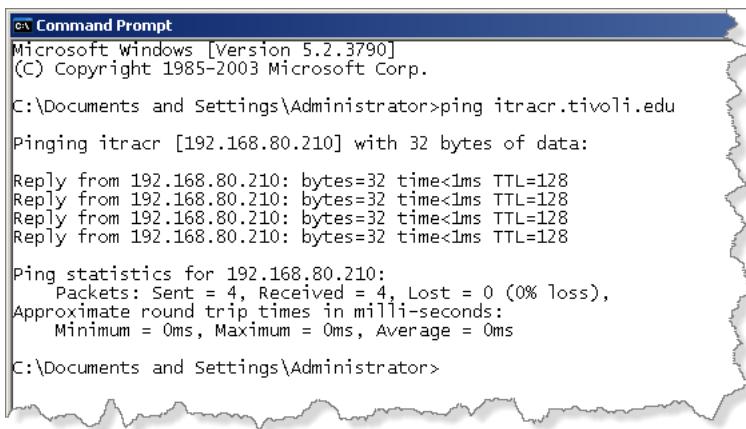
7. Click **OK** when you are ready.

When you return to the desktop, the new keyboard settings will be applied to all new windows that are opened. If you want to activate the new keyboard layout for existing windows, press the left Alt+Shift keys simultaneously to toggle between the available languages.

Exercise 3. Verifying image network configuration

The image for this course is designed to use the static IP address of 192.168.1.210 and the itracr.tivoli.edu host name. Changing the IP address or host name can cause the software not to operate properly. In this exercise, you verify the network configuration of the system you are using.

1. Double-click the command prompt icon () on the desktop.
2. Type the following command:
`ping itracr.tivoli.edu`
3. Verify that the fully qualified host name can be resolved. It is successful when you receive a reply:



```
Microsoft Windows [Version 5.2.3790]
(C) Copyright 1985-2003 Microsoft Corp.

C:\Documents and Settings\Administrator>ping itracr.tivoli.edu

Pinging itracr [192.168.80.210] with 32 bytes of data:

Reply from 192.168.80.210: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.80.210:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Administrator>
```

4. Repeat the test with the following commands. All commands must receive a reply.

```
ping itracr
ping 192.168.1.210
```

 **Note:** If you do not receive a reply, your operating system is not configured properly, either by a misconfigured network card or IP stack. Correct the virtual machine configuration. If you are using this system in a classroom or supported lab environment, contact your instructor or lab support personnel.

5. Close the command prompt.

If the commands you executed did not provide the expected results, contact your instructor to get assistance on how to ensure that your exercise environment has been set up correctly.

Exercise 4. Starting IBM SmartCloud Control Desk

The IBM SmartCloud Control Desk services are configured for a manual start in the exercise environment. Batch files are provided to start and stop the services as needed. The batch file starts Tivoli Directory Server, WebSphere Application Server, and the IBM SmartCloud Control Desk application server (MXServer). Notice that the database service is not started batch file, but should be started automatically when the exercise environment starts.

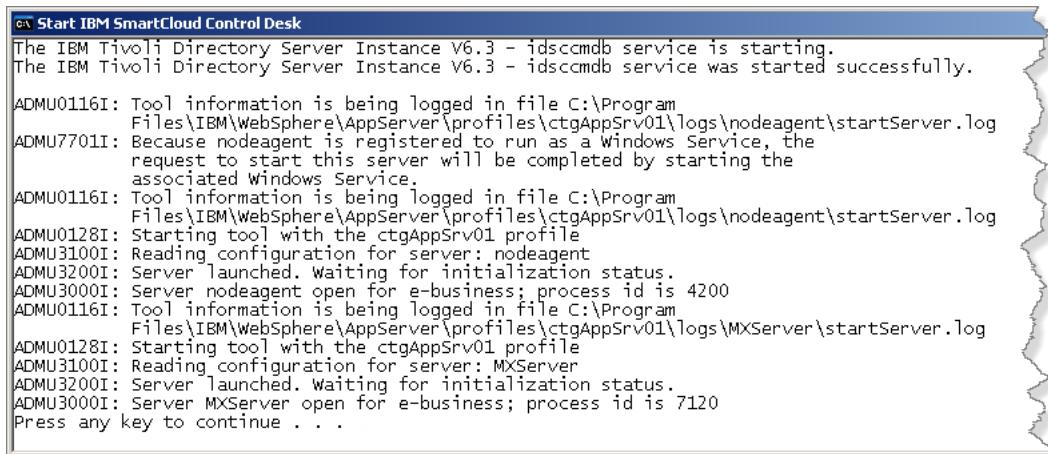
Complete these steps to start all the required services, as well as the IBM SmartCloud Control Desk system itself.

1. To ensure that the database service is started, follow these steps:
 - a. Open the Windows Services application using the **Services** shortcut () located on the desktop.
 - b. Verify that the service named *DB2 - DB2COPY1 - CTGINST1-0* service is started. If it is not, start it.
 - c. Close the Services application.

By now, the database should be operational.

You might notice that the DB2 icon () in the task bar indicates that DB2 is not running. This icon shows the status of a different instance of DB2, the one named *DB2*, so you cannot use this information to tell whether the DB2 instance used by IBM SmartCloud Control Desk is operational or not.

2. To start the remaining components that provide services to the IBM SmartCloud Control Desk environment, complete these steps:
 - a. Double-click the **Start IBM SmartCloud Control Desk** shortcut () on the desktop. It takes a few minutes for all the processes to start.
 - b. When the script completes, verify that the MXServer is open for e-business.



```
The IBM Tivoli Directory Server Instance V6.3 - idscmdb service is starting.  
The IBM Tivoli Directory Server Instance V6.3 - idscmdb service was started successfully.  
ADMU0116I: Tool information is being logged in file C:\Program  
Files\IBM\WebSphere\AppServer\profiles\ctgAppSrv01\logs\nodeagent\startServer.log  
ADMU7701I: Because nodeagent is registered to run as a Windows Service, the  
request to start this server will be completed by starting the  
associated Windows Service.  
ADMU0116I: Tool information is being logged in file C:\Program  
Files\IBM\WebSphere\AppServer\profiles\ctgAppSrv01\logs\nodeagent\startServer.log  
ADMU0128I: Starting tool with the ctgAppSrv01 profile  
ADMU3100I: Reading configuration for server: nodeagent  
ADMU3200I: Server launched. Waiting for initialization status.  
ADMU3000I: Server nodeagent open for e-business; process id is 4200  
ADMU0116I: Tool information is being logged in file C:\Program  
Files\IBM\WebSphere\AppServer\profiles\ctgAppSrv01\logs\MXServer\startServer.log  
ADMU0128I: Starting tool with the ctgAppSrv01 profile  
ADMU3100I: Reading configuration for server: MXServer  
ADMU3200I: Server launched. Waiting for initialization status.  
ADMU3000I: Server MXServer open for e-business; process id is 7120  
Press any key to continue . . .
```

- c. Press **Enter** to close the command prompt.

You should be ready to log in the IBM SmartCloud Control Desk console.

Exercise 5. Accessing and navigating the console

In this exercise, you log in to the IBM SmartCloud Control Desk console, and familiarize yourself with the major navigation elements it provides.

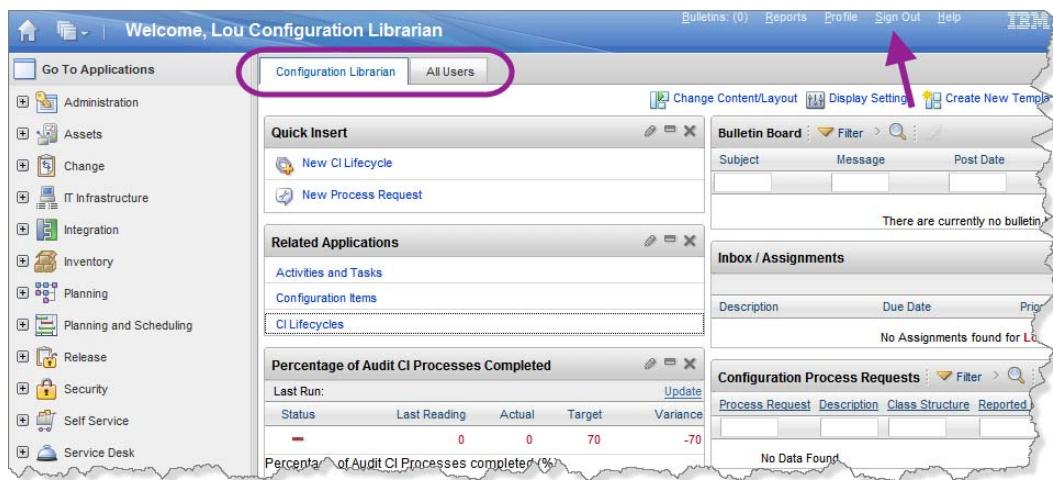
1. Open Internet Explorer and verify that the IBM SmartCloud Control Desk logon prompt is displayed.



The browser in the exercise environment has been configured to use the IBM SmartCloud Control Desk web address, `http://<hostname>/maximo`, as the home page. If you encounter an internal error, wait a few more minutes for the application server to load.

 **Note:** The home page for Internet Explorer is `http://localhost/maximo`. A bookmark named *IBM SmartCloud Control Desk Console* is also available.

2. To log on to the console provide a user name of `lou` and a password of `object00`. You might also want to choose your preferred language. Click **OK** when you are ready.
3. When the IBM SmartCloud Control Desk console is displayed, notice that it is made up of a header, a navigation pane, and one or more start centers:



The current user has access to two start centers. When you log in, the default start center for the current user is opened.

4. Now that you have verified that IBM SmartCloud Control Desk is operational, you can sign off in order to prepare for the configuration management exercises. Click the **SignOut** link at the right side of the header.
5. When the Logout window appears, click **Return** to reset the console, and reload the Welcome window.



You have completed the initial customization, and start of the exercise environment, and verified that it is operational. You are now ready to start working with the exercises.



1 Introduction to IBM SmartCloud Control Desk 7.5 configuration, change, and release management exercises

There are no student exercises for this chapter.



2 Organization of configuration item information

There are no student exercises for this chapter.



3 Configuration management with IBM SmartCloud Control Desk 7.5

Configuration management is a common term that describes the combined processes that are used to manage and control configuration of the resources in your IT infrastructure. The overall purpose for performing these processes is to ensure that the data that are the basis for the related change and release management processes are sound, and accurately reflects the state of your environment.

The accuracy of the configuration management database (CMDB) relies on these key activities:

- Identifying configuration items
- Controlling configuration items throughout their lifecycle
- Reporting Configuration status
- Verifying and auditing configuration items

In this context, the term *configuration item* is used to describe:

Any Component that needs to be managed in order to deliver an IT Service.

Configuration management plays a key role to create the foundation for the change and release management processes. Ultimately, change management has the final word in which types of resources, and which particular instances, can be managed through the change and release management processes.

Configuration items, as they exist in the CMDB, are logical representations of resources that exist in your IT Infrastructure, or resources that will materialize in the future. Configuration items are classified according to their capabilities, and associated with a specific set of attributes. In addition, the relationships between configuration items are recorded to document, and control the context in which any configuration item exists.

In order to plan for implementation of new hard- or software components, the configuration items must exist. Once the configuration items have been created, by configuration management, the planned configuration can be applied, and changes impacting these resources can be planned and implemented. When the changes have been implemented, and the physical resources have manifested themselves in the infrastructure, it is the responsibility of configuration management to assist change management in verifying that the implementation was performed in accordance with the planned configuration.

To verify the implementation, configuration management often leverages one or more discovery tools that can discover the configuration and relationships of the physical resources. After these data are gathered, they can be compared to the information in the CMDB and it can be verified whether the implementation matches the planned configuration. In addition to supporting the configuration item verification, the data gathered by the discovery tools can be used as the basis for creating configuration items for resources that have been discovered in the environment, but are not yet represented by a configuration item.

Throughout the life of a configuration item, configuration management tracks configuration items throughout their lifetimes. Configuration management is also responsible for the accuracy of the information in the CMDB. Occasionally, it happens that the configuration or relationships of a CI is modified without the involvement of or approval by configuration management. In order to identify these unauthorized changes, configuration management performs configuration management audits periodically to ensure consistency between the perception of the reality (as represented by the configuration items in the CMDB) and the real reality, as it is implemented in the physical infrastructure. To perform these audits, configuration management can once again leverage one or more discovery tools, and compare the two realities to identify and eliminate discrepancies.

IBM SmartCloud Control Desk provides facilities that enable you to implement these key configuration management processes in accordance with the ITIL specifications, and customize the processes to meet your particular needs.

Configuration management processes

IBM SmartCloud Control Desk 7.5 supports the following configuration management processes:

- Configuration item control
- Configuration status reporting
- Configuration item verification and audit

In order to support these processes, the configuration management framework, the organization, tools, and procedures used to operate and maintain the solution supporting configuration management, must also include facilities for:

- Configuration item discovery
- Configuration item reconciliation
- Configuration item lifecycle management

The following exercises focus on handling configuration process requests for controlling and auditing CI information.

In order to process such requests, it is assumed that data representing the discovered CIs, known as actual configuration items in the IBM SmartCloud Control Desk, has been loaded into the environment. Actual CIs represent the resources that exist (have been discovered) in the infrastructure. Configuration items, also known as authorized CIs, on the other hand, represent resources that are being actively controlled, and the attribute and relationship details related to CIs represent the desired state for each resource.

Configuration management is also responsible for baselining and verifying CIs and can thereby keep track of the changes to the CIs over time, and help identify unauthorized changes.

Configuration item management

Authorized CI attributes and relationships are maintained as part of change management processes, because they represent the planned, or desired, state of the CIs configuration *after* implementation of a change.

To help the verification and audit processes, IBM SmartCloud Control Desk relies on Tivoli Application Dependency Discovery Manager to discover the CI configurations as they exist, and uses reconciliation tasks to link Actual CIs and Authorized CIs. The reconciliation tasks help identify existing resources that are not actively being managed, as well as discrepancies between the actual and planned configuration. Using escalations, IBM SmartCloud Control Desk can automatically perform actions such as notifying CI owners, or auditors, synchronize configurations, or even automatically place Actual CIs under configuration management control.

Besides managing and auditing CI attributes, relationships and baselines, it is the responsibility of configuration management to manage the lifecycle states of the CIs. The lifecycle of a configuration item is the span of time that begins when the CI is created and ends when it is no longer available for use. During its lifecycle, a CI takes on different states, which reflect its operational status. For example, when a new application system has been tested, and put into production, it is the responsibility of configuration management to update the state of the related CIs from ‘test’ to ‘production’ to accurately report the use of the CIs.

Before you start working with the processes, you should take a few minutes familiarizing yourself with the role and responsibilities set up in the exercise environment.

Configuration management roles and responsibilities

As preparation for the following exercises, you should review the information in the following tables to gain an overview of the roles and responsibilities that applies to the exercise environment, and which users assume which roles.

The responsibilities for the various phases of the configuration management processing have been assigned to users and persons belonging to the groups (Security and Person groups) outlined in the following table:

Role	Security Group	Responsibilities
Configuration Administrator	PMCFGADM	Responsible for implementing the process defined by the configuration manager
Configuration Manager	PMCFGMGR	Owns the configuration process definition for the business
Configuration Librarian	PMCFGLIB	Responsible for tracking configuration documents and status and maintaining requested reports
Configuration Auditor	PMCGAUD	Responsible for implementing the requested CI audits

In the exercise environment, the users listed below have been associated with the groups (roles) shown in order to assign them different responsibilities pertaining to configuration management.

Security Group	Person Group	Role	User	Password
PMCFGADM	PMCFGADM	Configuration Administrator	MILLER	object00
PMCFGMGR	PMCFGMGR	Configuration Manager	JOEO	object00
PMCFGLIB	PMCFGLIB	Configuration Librarian	LOU	object00
PMCGAUD	PMCGAUD	Configuration Auditor	GRANGER	object00

You should now have the basic understanding of the processes and responsibilities used in the exercise environment, and should be ready to set up your CI lifecycles in order to prepare for the creation of CIs based on the actual CIs in your environment.

Managing configuration items

New configuration items are created in IBM SmartCloud Control Desk in one of four ways:

- As the result of a promotion of actual CIs.
- Manually through the IBM SmartCloud Control Desk console.
- As the result of importing CI information from external sources.
- As the result of the creation of an asset, if the automated creation of generic CIs has been enabled.

The most common method to create CIs is the promotion of actual CIs. During promotion, top level actual CIs, along with all their related CIs, are cloned to CIs in a single operation. This requires that you have populated the actual CIs and their relationships, which typically is done by importing Tivoli Application Dependency Discovery Manager data through the IBM Tivoli Integration Composer. In addition to promotion, you can also manually create CIs, either by creating entirely new CIs, or by duplicating existing CIs. You create entirely new CIs if you have not yet discovered any actual CIs, for example, if you plan to deploy a new application.

IBM SmartCloud Control Desk 7.5 tracks the history of CIs, including the change history of the attributes, as well as the requests for change (RFCs) and changes related to the CIs. When a CI has any history, or related records, associated with it, it cannot be deleted. One of the purposes of the configuration and change processes is to be able to report who did what to a CI and when, and enable auditing of the various subprocesses. Tracking CI history enables an organization to answer the following questions:

- Did anyone perform impact analysis on a change?
- Who approved the change?
- Who implemented the change – and when?
- Was the change implemented according to standards?
- Have you discovered changes for which there is no RFC, and identified unauthorized changes?
- What was changed last Sunday between 10pm and 2am?

It does make sense to track these changes, but it does provide restrictions in a test/education environment, where you sometimes would like to perform the same action against the same set of CIs more than once.

Exercise 1. Creating configuration items

As explained in the previous section, there are several ways for you to create CIs. Most of them create CIs based on information that is already available in actual CIs, Assets, existing CIs, or in a file that is imported.

When creating CIs manually, you must remember that most resources are made up of several subcomponents. Each subcomponent is a CI in its own right. For example, a computer system CI is related to an operating system CI and an IP interface CI. In addition, the IP Interface is related to an IP address, which in turn is related to a fully qualified domain name. The fully qualified domain name (FQDN) is also related to the OS. This simple example demonstrates the CIs and relationships used in the CDM to allow you to figure out which MAC address, IP address and FQDN has been assigned to an operating system.

In the following exercises, you explore the manual creation of configuration items, the import of several CIs from a flat file, as well as the promotion of actual CIs that have been loaded into the exercise environment. When you have completed the exercises, you will have built the CI structure that represents the basic resources you find in a virtual system:

- A computer system
- An operating system
- An IP interface
- An IP address
- A fully qualified domain name

The resources are created as authorized CIs. IBM SmartCloud Control Desk does not allow you to manipulate actual CIs, except from importing them from external sources. After actual CIs are in the system, they can only be updated through import of a new set of actual configuration data.

Manually created configuration items

Manual creation of CIs typically takes place when you have received a request for change to deploy new components into the infrastructure.

For example, if you are planning the deployment of a new virtual server, CIs will be manipulated according to this flow:

- A CI is manually created and capacity parameters such as architecture, number of processors, and memory should be specified. The same is true for identification attributes such as CI name, owner, organization, location and such.

- Child, or subcomponent, CIs, such as operational attributes such as operating system, IP address, and hostname can be added to provide the details necessary to configure the new virtual system.
- When the system has been implemented, it will be discovered, and all the configuration details will be loaded into the IBM SmartCloud Control Desk database as actual CIs.
- The actual CIs are reconciled and synchronized with the CIs which were manually created. At this point, additional child CIs will be created and related to the manually created computer system CI.

You can also create CIs manually, if they *cannot be discovered*. If, for example, you want to manage and control the changes to the software images in the Definitive Media Library, you need these images represented as CIs. Typically, these CIs are not discovered, and you will most likely not have these represented as actual CIs.

Creating a configuration item manually

To manually create the computer system CI for a virtual computer system with a single 64-bit processor, 4-GB memory, and a fully qualified hostname of *hermione.tivlab.austin.ibm.com* complete these steps:

1. Log on to the IBM SmartCloud Control Desk Console as a user that is authorized to use the Configuration Items application. In this case, the configuration librarian `Lou` is a good choice. Lou's password is `object00`.
2. From the IBM SmartCloud Control Desk console, click the Go To icon () in the Console header and navigate to **IT Infrastructure > Configuration Items**.
3. In the Configuration Items application, click the New CI icon () in the toolbar to create a new CI.

4. To specify the new CI, provide the following values in the **CI Summary** tab:

Configuration Item Name	EXERCISE VM 01
Description	Manually created system
Classification	CI-ROOT \ CI-ROOT.COMPUTERSYSTEM \ CI-ROOT.LINUXCOMPUTERSYSTEM
Configuration Item Number:	EXERCISE VM 01
Owner Group	PMCFGLIB

The screenshot shows the 'Configuration Items' screen with the 'View Record List > EXERCISE VM 01' title. The 'CI Summary' tab is selected. The configuration details are as follows:

- Configuration Item Name: EXERCISE VM 01
- Description: Manually created system
- Status: UNINITIALIZED
- Classification: CI-ROOT \ CI-ROOT.COMPUTERSYSTEM \ CI-ROOT.LINUXCOMPUTERSYSTEM
- * Configuration Item Number: EXERCISE VM 01
- Associated Asset: (empty)
- Physical Location: (empty)
- Site: (empty)
- Organization: (empty)
- CI Owner: (empty)
- Owner Group: PMCFGLIB

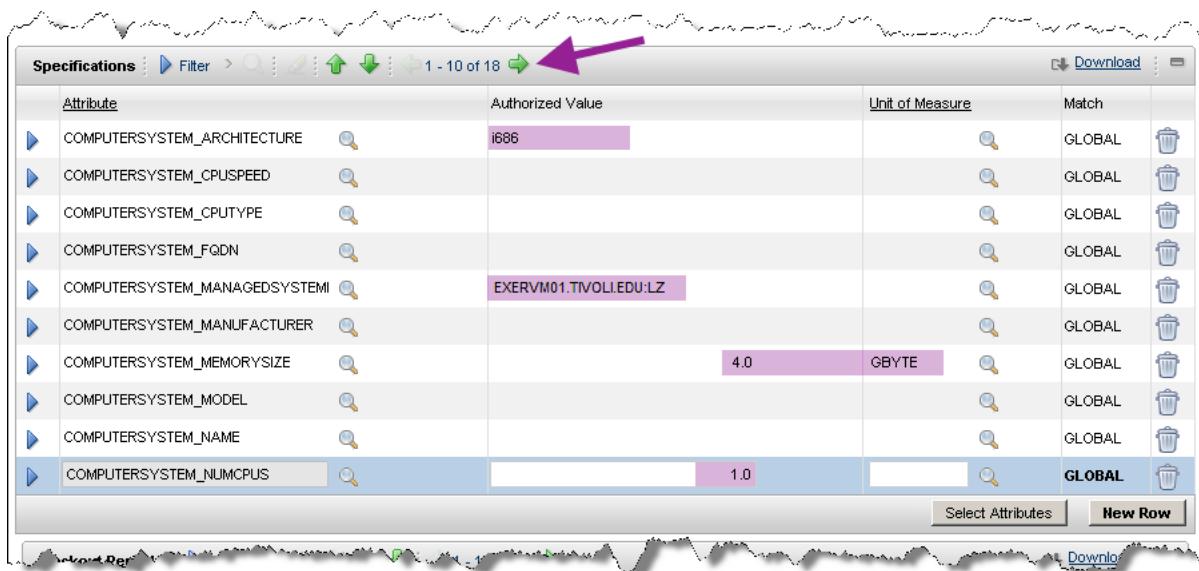
Notice that you are only creating a generic ComputerSystem CI at this point.

In this case, neither location, site, nor organization is assigned because the Configuration Librarian wants to wait to release the new system to the requester. In addition, ownership of the new resource is temporarily assigned the Configuration Librarian group PMCFGLIB.

The new CI has been assigned a status of UNINITIALIAED.

- To provide the specifications for the new system, move to the CI Details tab, and populate the CI attributes with the values shown below:

COMPUTERSYSTEM_ARCHITECTURE	i686
COMPUTERSYSTEM_MEMORYSIZE	4.0 GBYTE
COMPUTERSYSTEM_NUMCPUS	1
COMPUTERSYSTEM_VIRTUAL	TRUE
COMPUTERSYSTEM_MANAGEDSYSTEMNAME:	EXERVM01.TIVOLI.EDU:LZ



To be able to update the value for the COMPUTERSYSTEM_VIRTUAL specification, use the Next Page icon (➡) in the header of the Specification section.

By providing these specifications you only provide the desired configuration information. When the system is implemented this information is used to configure the system.

Later on, when the system is discovered, the actual CI will be promoted, and as a result a number of CIs related to the one you are creating (as specified in your promotions scopes) will be created from the actual CIs

In the Specifications, you could have provided more details regarding hostnames, fully qualified domain name, and other relevant information.

6. To save your new CI, click the Save icon () in the toolbar.

You have created your first CI.

Exercise 2. Associating a configuration item with an actual CI

For this exercise several assumptions are made:

- The CI you created is referenced in a change work order to implement the system.
- As a part of the change implementation, the system has been discovered, and discovered information has been loaded into the actual CI hierarchy in the IBM SmartCloud Control Desk database.

This means that the IBM SmartCloud Control Desk database now contains one representation of the system as it was planned (your CI), and another that represent the system as it has been discovered.

By linking the two representations of the resource, you can see how the system has been implemented, and you will have the option to update the CI information, so it matches the actual CI information. In a later exercise, you use IBM SmartCloud Control Desk reconciliation tasks to automate the linkage between authorized and actual CIs, as well as the capability to automatically synchronize the two sets of information. However, for you to understand the processes, you first perform these tasks manually.

Identifying the actual CI

The challenge you are faced with is to identify the new system among all the actual CIs.

First, list all the Linux-based systems in your environment, by completing these steps:

1. Open the Actual Configuration Items application by clicking the Go To icon (grid) in the Console header and navigate to **IT Infrastructure > Actual Configuration Items**.
2. Supply a value of `LINUXUNI` in the **Classification** filter field, and press Enter. This will reveal a list of more than 500 actual CIs that represent the discovered Linux systems in the environment.

Name	Classification	Top Level?	Author
APPSRV01.EU.TIDE.IBM.COM	LINUXUNI	<input checked="" type="checkbox"/>	
APPSRV02.EU.TIDE.IBM.COM	SYS.LINUX.LINUXUNITARYCOMPUTERSYSTEM	<input checked="" type="checkbox"/>	
APPSRV03.EU.TIDE.IBM.COM	SYS.LINUX.LINUXUNITARYCOMPUTERSYSTEM	<input checked="" type="checkbox"/>	
APPSRV11.EU.TIDE.IBM.COM	SYS.LINUX.LINUXUNITARYCOMPUTERSYSTEM	<input checked="" type="checkbox"/>	

3. To limit the list to only those systems that has only one i686-based processor and exactly 4 GB of memory, you can modify the where clause of the current query, by following these steps:
 - a. From the Advanced Search drop down menu, choose **Where Clause**.

- b. When you see the where clause, notice that it has already been populated to find only Linux systems. To find Linux systems that have 4 GB of memory, and a single i686 processor, and have been recently discovered, append the following code to the where clause:

```

and
lastscandt > DATE('2012-03-15')
and
actcinum in (select actcinum from actcisp where actcisp.assetattrid =
  'COMPUTERSYSTEM_NUMCPUS' and actcisp.numvalue = 1)
and
  
```

```
actcinum in (select actcinum from actcispes where actcispes.assetattrid =  
'COMPUTERSYSTEM_ARCHITECTURE' and actcispes.alnvalue = 'i686')  
and
```

```
actcinum in (select actcinum from actcispes where actcispes.assetattrid =  
'COMPUTERSYSTEM_MEMORYSIZE' and CAST  
(ROUND(actcispes.numvalue/power(1024,3),1) as DECIMAL(5,1)) = 4.0)
```

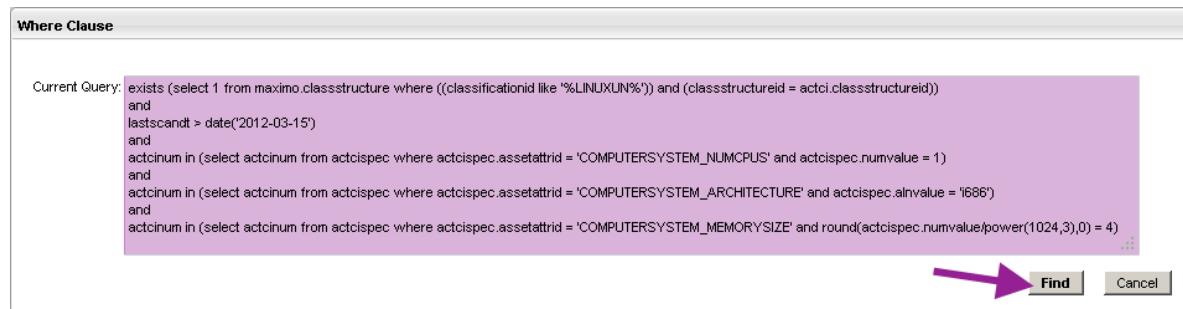


Note: To make your life easier, the entire where clause can be copied from the file E:\LabFiles\ccmdb\config\Linux_1_i686_4GB. You can open the file using a standard editor, copy the content to the clipboard, and paste it into the where clause window.

Notice that the new where clause filters the result set based on the specifications of the actual CIs. The MEMORSIZE is reported in bytes, so to get the gigabyte representation, you must divide by 1024 cubed. In addition, to account for rounding errors or incorrect input, the memory size is rounded to the nearest 100 megabytes to include systems in the list that have approximately 4 GB of memory.

In addition, a clause was added to limit the result set to recently discovered systems. Because the exercise environment uses pre-prepared data, you must use a cut-off date of March 15th 2012.

Click **Find** to limit the list of CIs to the ones you are looking for.



- c. Because you applied the last scan date value in the query, it returns only one actual CI, and therefore this CI will be opened immediately. Based on the name of the CI, you can assume that this is the CI that represents the test system that was requested, and for which you created a CI.

The screenshot shows the 'Actual Configuration Items' screen in IBM SmartCloud Control Desk. The top navigation bar includes 'Actual Configuration Items', 'Related Actual Configuration Items', and 'Operational Management Products'. The main panel displays the following information for the selected CI:

- Actual Configuration Item Number:** EXERVM01.TIVOLI.EDU-87615
- GUID:** DA645376A2DF323D959B742846AE3EB7
- DIS GUID:** DA645376A2DF323D959B742846AE3EB7
- Classification:** ACTUALCROOTCLASS \SYS LINUX LINUXUNITARYCOMPU
- Last Scan Date:** 3/16/12 13:10:50
- Last Modified Date:** 11/16/11 13:10:50
- Top Level?**
- Configuration Item Number:** (empty)
- Configuration Item Name:** (empty)
- Primary Customer:** (empty)
- Deployed Asset:** (empty)

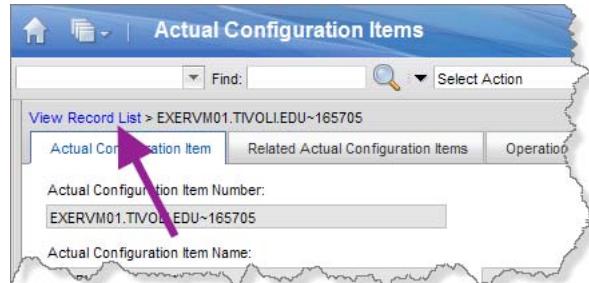
Below this, the 'Specifications' section shows 19 attributes for the computer system:

Attribute	Description	Value	Unit of Measure
COMPUTERSYSTEM_MEMORYSIZE	COMPUTERSYSTEM_MEMORYSIZE	4,247,781,376.0	
COMPUTERSYSTEM_CPUTYPE	COMPUTERSYSTEM_CPUTYPE	Intel(R) Xeon(R)	
COMPUTERSYSTEM_MODEL	COMPUTERSYSTEM_MODEL	Vmware Virtual Platform	
COMPUTERSYSTEM_NAME	COMPUTERSYSTEM_NAME	exervm01	
COMPUTERSYSTEM_MANUFACTURER	COMPUTERSYSTEM_MANUFACTURER	Vmware, Inc.	
COMPUTERSYSTEM_NUMCPUS	COMPUTERSYSTEM_NUMCPUS	1.0	
COMPUTERSYSTEM_ARCHITECTURE	COMPUTERSYSTEM_ARCHITECTURE	i686	
COMPUTERSYSTEM_FQDN	COMPUTERSYSTEM_FQDN	exervm01.tivoli.edu	
COMPUTERSYSTEM_SIGNATURE	COMPUTERSYSTEM_SIGNATURE	9.48.190.203(000C28DDB833)	
COMPUTERSYSTEM_TYPE	COMPUTERSYSTEM_TYPE	ComputerSystem	

Look at the attributes to verify that you found a system that corresponds to the requirements that were specified for the CI. If they all match, you have found the system that was created based on your request. Also notice the name of the actual CI. EXERVM01.TIVOLI.EDU resembles EXERCISE VM 01 so this actual CI must be the correct one.

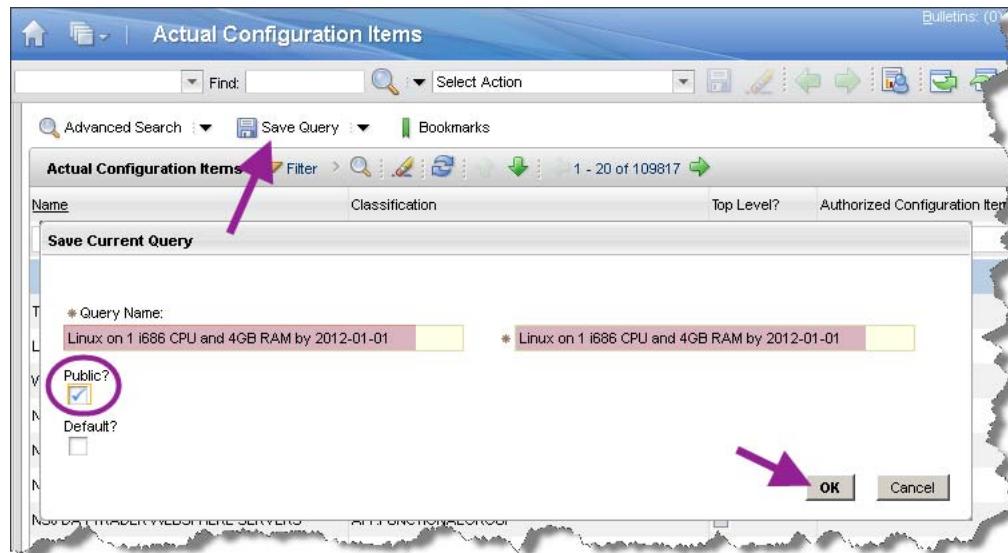
If you look at the attributes, you see that a lot of details has been discovered. You see information about the computer system name, the fully qualified domain name, and even the model and serial number. Take a few minutes to explore the level of detail that is provided.

4. Now that you have verified that the where clause delivers the expected result, you can save the query for future use. To save the query, complete these steps:
 - a. Click the **View Records** link immediately above the **Actual Configuration Item** tab.



This will take you back to the list of the actual CIs that were identified by the query.

- b. Use the **Save Query** link, and provide a meaningful description, for example *Linux on 1 i686 CPU and 4 GB RAM by 2012-01-01*. Also ensure that you make the query *Public* if you want it to be available to other users.



You will see that the query becomes available in the navigation bar, and you can now use this query as a template to search for CIs with a specific configuration.

- c. Before you return to the actual CI details, see if the EXERVM01 system is represented in *italics*. If it is, this is a visual indication that the data you are looking at are cached locally, and that the information you are working with may have been changed under the covers. To refresh the information, you can use the Reload icon ().

The screenshot shows the 'Actual Configuration Items' interface. At the top, there's a search bar with 'Find:' and a magnifying glass icon, followed by a 'Select Action' dropdown and various toolbar icons. Below the search bar are links for 'Advanced Search', 'Save Query', and 'Bookmarks'. The main area has a title 'Actual Configuration Items' with a filter icon, a search icon, and a pencil icon. To the right of the title are buttons for 'Classification' (with an arrow pointing to it), 'Details', 'Edit', and 'Delete'. A progress bar indicates '1 - 1 of 1'. Below the title, there are two columns: 'Name' and 'Classification'. Under 'Name', the value 'EXERV01.TIVOLI.EDU' is shown with a blue background and an arrow pointing to it. Under 'Classification', the value 'SYS.LINUX.LINUXUNITARYCOMPUTERSYSTEM' is shown. At the bottom left, there's a checkbox labeled 'Select Records'.

To return to the details of the EXERVM01.TIVOLI.EDU actual CI, click the link in the list.

- Actual CIs are stored in accordance with the Common Data Model, which provides a detailed logical model of IT resources. In the model resources are broken down to their minutest logical components, so for example, an IP Interface, an IP address and a fully qualified domain name are individual resources. To assign an IP address to a computer system, relationships are established to link one or more IP Interfaces to the computer system, and an IP address is related to the IP Interface.

To see which resources are related to the computer system, navigate to the **Related Actual Configuration Items** tab, and notice that for this particular computer system, resources such as file systems, and IP Interfaces are related.

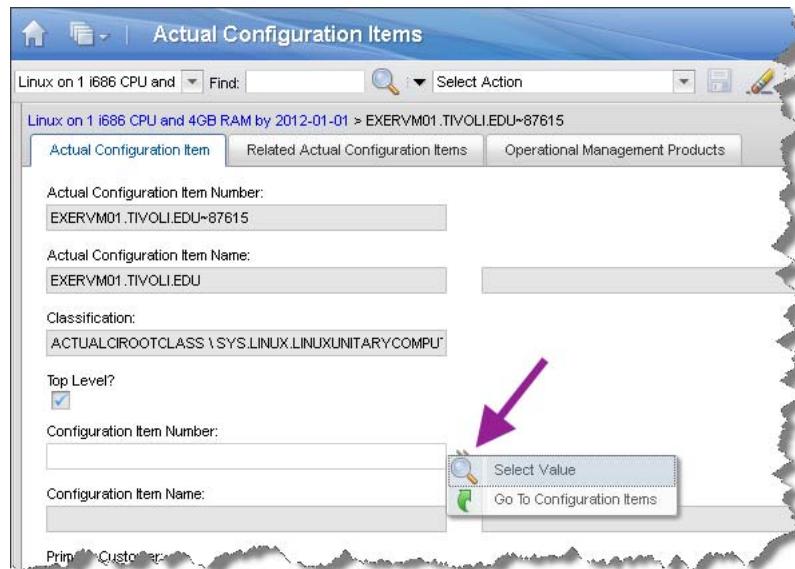
The screenshot shows the 'Actual Configuration Items' screen in a software application. A purple arrow points to the 'Actual Configuration Item Number' field, which contains 'EXERVM1.TVOLLEDU-H015'. The interface includes a toolbar with various icons, a top navigation bar with 'Actual Configuration Items' and 'Operational Management Products' tabs, and a main table displaying 16 rows of data. The table has columns for 'Source Active Configuration Item', 'Classification', 'StateID', and 'Target Active Configuration Item'. The last row of the table is highlighted with a red box.

Source Active Configuration Item	Classification	StateID	Target Active Configuration Item
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	/
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	#BOOT
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	94B190-203
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	F690.0.0.20C-29FF-FEDD-BE03
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	0.0.0.0.0.0.1
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	2002.500.9004.188.20C-29FF-FEDD-BE03
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	127.0.1
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	EXERVM1.TVOLLEDU-ETH0
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_ACCESSIVED VIA	EXERVM1.TVOLLEDU-ETH0
EXERVM1.TVOLLEDU	ACTUAL.ROOTCLASS SYS.UNIX.LINUX.RTARY.COMPUTERSYSTEM	RELATION_CONTAINS	EXERVM1.TVOLLEDU-L0
Classification			
Content?			

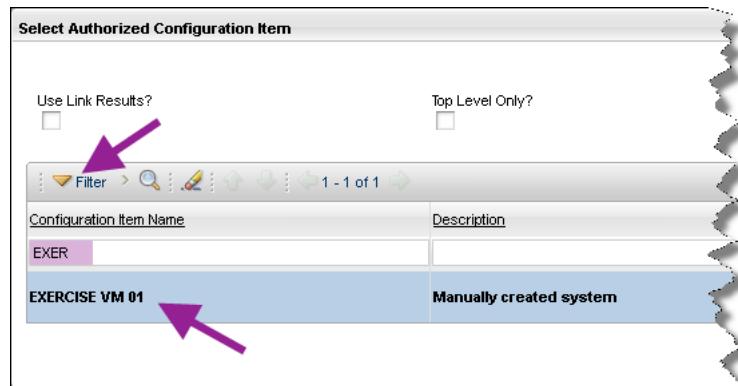
You only see the first level of related actual CI. To drill down, you can use the Move To icon () next to the resource you want to investigate.

When you have satisfied your curiosity, go back to the **Actual Configuration Item** tab.

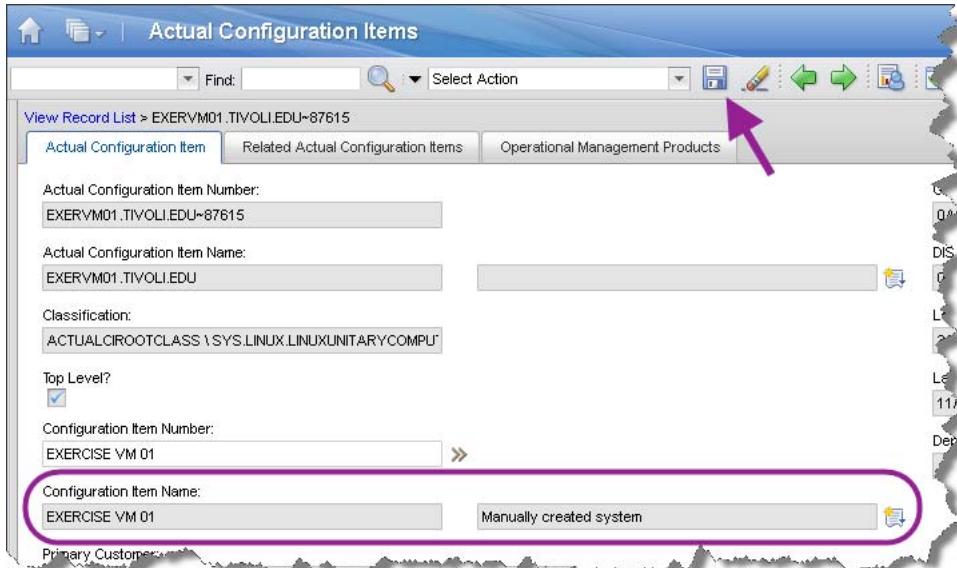
6. To link the actual CI you have found to the authorized CI that was created prior to the implementation, complete these steps:
 - a. Open the **EXERVM01.TIVOLI.EDU** actual CI, locate **Configuration Item Name**, and use the Detail Menu tool () next to the field to open the **Select Value** dialog.



- b. To find the CI that was created to represent the new test system, click the **Open Filter** icon () in the Select Authorized Configuration Item window, and supply a value of **EXER** in the **Configuration Item Name** filter field. When you see the results, click the CI named **EXERCISE VM 01** to select it, and thereby link it to the actual CI.



- c. When you return to the Actual Configuration Item application, click the Save icon (in the toolbar to store your updates in the database. Notice that at this point, the **Configuration Item Name** and **Description** fields are populated.



You have now linked the EXERVM01.TIVOLI.EDU actual to the EXERCISE VM 01 configuration item. By doing this, you have enabled the comparison and synchronization of discovered (actual) configurations to planned (authorized) configurations. This linkage is critical to not only the planning of new changes to the configuration, but also to the audit and verification of change implementation. In addition, this also allows you to identify unauthorized changes that have been applied to a resource outside of the change process.

7. To see effects of the linkage, open the CI by using the Detail Menu tool (next to the **Configuration Item Number** field, and select **Go To Configuration Items**.

When the Configuration Items application opens, you do not see any obvious changes in the CI Summary tab. However, look at the **CI Details** tab. Here you see the name of the actual CI in the **Actual Configuration Item** field. This is an indication that the link actually has been established.

Scroll down to the Specifications section, and examine the Discovered Variance column.

Attribute	Authorized Value	Discovered Variance	Unit of Measure	Match
COMPUTERSYSTEM_ARCHITECTURE	i686			GLOBAL
COMPUTERSYSTEM_CPLUSPEED		2,326,000,000.0		GLOBAL
COMPUTERSYSTEM_CPUTYPE		Intel(R) Xeon(R)		GLOBAL
COMPUTERSYSTEM_FQDN		exervm01.tivoli.edu		GLOBAL
COMPUTERSYSTEM_MANAGEDSYSTEM				GLOBAL
COMPUTERSYSTEM_MANUFACTURER		VMware, Inc.		GLOBAL
COMPUTERSYSTEM_MEMORYSIZE		4,247,781,376.0	GBYTE	GLOBAL
COMPUTERSYSTEM_MODEL		VMware Virtual Platform		GLOBAL
COMPUTERSYSTEM_NAME		exervm01		GLOBAL
COMPUTERSYSTEM_NUMCPUS	1.0			GLOBAL

The information in the Discovered Variance column shows the discrepancies between the authorized (planned) values and the actual (discovered) values for each of the attributes that are associated with classification of the CI. The attributes for which discrepancies have been found are highlighted in red to alert you about potential problems.

For the attribute named COMPUTERSYSTEM_MEMORYSIZE, you can see both the actual and the authorized value for the attribute side-by-side to help you take the appropriate action to resolve the discrepancy.

- To solve discrepancies, you must update the authorized value. Remember, actual CIs and their attributes are imported, and cannot be modified or deleted from IBM SmartCloud Control Desk.

To update the authorized value for the COMPUTERSYSTEM_MEMORY attribute, enter the exact value in the Discovered Variance column into the authorized Value field without numeric delimiters (.,). To make your updates effective, click the Save icon () in the toolbar.

COMPUTERSYSTEM_MANUFACTURER		VMware, Inc.	
COMPUTERSYSTEM_MEMORYSIZE	4,247,781,376.0	4,247,781,376.0	GBYTE
COMPUTERSYSTEM_MODEL		VMware Virtual Platform	
COMPUTERSYSTEM_NAME		exervm01	

Notice how the color of the information for the attribute you updated now changes to black, and the **Discovered Value** field is cleared. The attribute is now identical in both representations of the CI.

At this point you have created a new CI, linked it to a discovered CI and synchronized the value for a single attribute. If you look at all the attributes with discrepancies and you realize that most of the identified discrepancies are caused by the fact that the discovered CI attribute is populated and the authorized CI is not. You may decide to import all the discovered attributes into the authorized CI, overwriting any existing values. This action is called *synchronization*.

Exercise 3. Synchronizing CIs

By linking the actual and authorized CIs you have established a way to compare the discovered and planned configuration of the resource. When there are no planned changes to the resource, the configurations, attributes and relationships should be identical. In the exercise environment, they are not, even if you have no outstanding changes to the EXERCISE VM 01 configuration item.

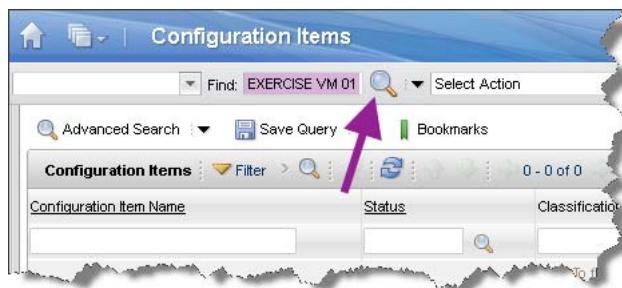
When you created the authorized CI, you did not provide all the attributes, only the attributes that were required to create the change, and implement the new system were provided. This was done because you did not know all the details when the CI was created, and in part because you did not want to spend the time entering all the attributes can be discovered, and easily populated from the actual CI. The population of CI attributes from the actual CI that is linked to the CI is known as synchronization.

Synchronization of the actual and authorized CI is a critical activity, especially when new CIs have been created. It is a one-way process that copies the attributes of the actual CI to the CI. It ensures that the planned state of the CI is updated to reflect what has been discovered, and thereby providing a base for planning future changes.

In the exercise environment, the EXERCISE VM 01 configuration item has been linked to the EXERVM01.TIVOLI.EDU actual CI, and so far, only a single attribute has been synchronized. This means, that the actual CI contains many more populated attributes than the CI. As the Configuration Librarian, it is your responsibility to make sure that the CI accurately represents the current state of the resource, so you need to synchronize the actual and authorized CIs.

To perform this synchronization, complete these steps:

1. If you are not currently looking at the EXERCISE VM 01 CI in the Configuration Items application, open it now using these steps:
 - a. Navigate to the Configuration Items application by clicking the Go To icon ( in the Console header and navigate to **IT Infrastructure > Configuration Items**.
 - b. To open the EXERCISE VM 01 configuration item directly, enter the full name (EXERCISE VM 01) in the Find field, and click the Find the icon ().



- c. When the EXERCISE VM 01 configuration item has been loaded into the Configuration Items application, navigate to the **CI Details** tab, and verify that you see a number of configuration discrepancies.
2. To synchronize the actual and authorized configuration items, follow these simple steps:
 - a. Choose the **Synchronize Authorized CI** option from the Select Action drop-down menu in the header of the application window.

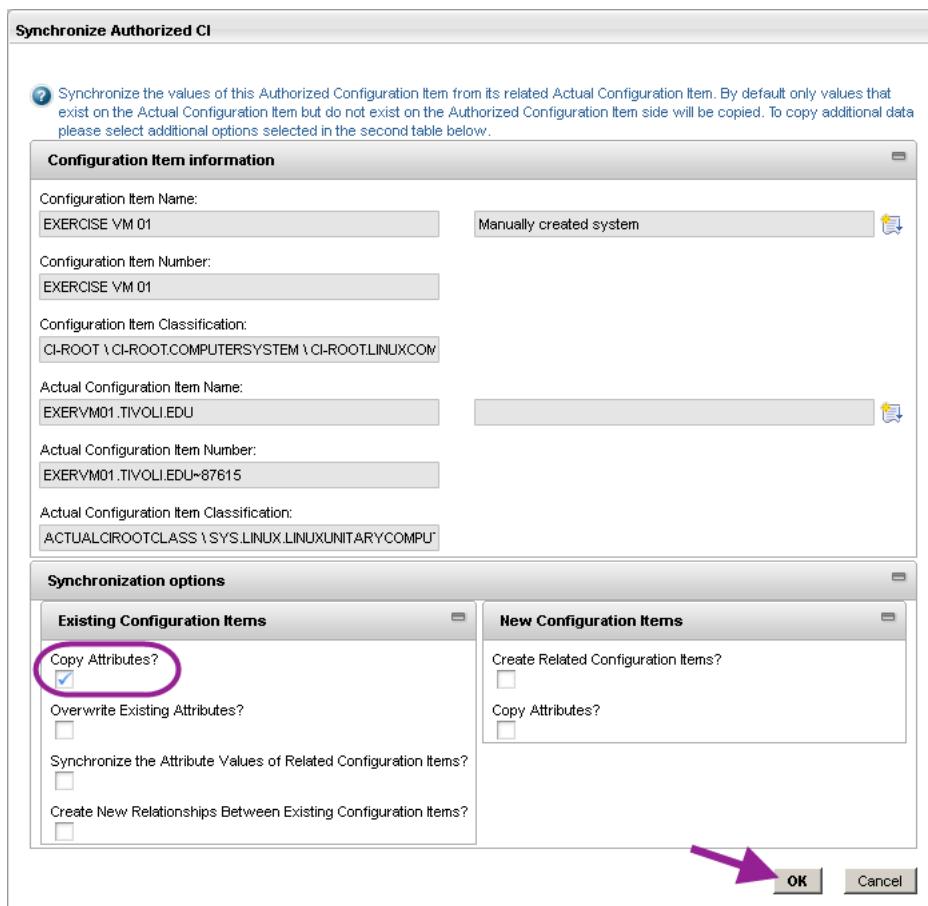


- b. When the Synchronize Authorized CI window appears you see at the bottom, that you have number of options available to control the synchronization.
- These options allow you to control if you want to copy relationships as well as attribute values, and whether to overwrite existing values.

Combined with the options to create a new CI for related configuration items and synchronize the relationship hierarchy, you can basically perform a full promotion using the correct synchronization options. The only difference between the full synchronization and promotion is, that synchronization require that the CI is linked to an actual CI.

Exercise 3. Synchronizing CIs

If you promote, the CI this link is created automatically, but the drawback is, that you can only promote top level actual CIs.



For the purpose of this exercise, you only want to synchronize the attributes related to the CI, so ensure that the only checked option is the *Copy Attributes* option in the Existing Configuration Items section. Click **OK** when you are ready.

- c. When the synchronization completes, you see in the **CI Details** tab that all the discrepancies have been resolved. Navigate to the **CI Summary** tab and notice that many details such as serial number, and CPU Type have been added to the Computer System Summary.

Hostname:	Serial Number:
VMware Virtual Platform	VMware-56 4d 42 a9 13 f5 6d f8-12 61 f9 84 50 dd b8 33
Model Number:	Architecture:
VMware, Inc.	i686
Manufacturer:	Number of CPUs:
4,247,781,376.0	1.0
Memory Size:	CPU Speed:
Intel(R) Xeon(R)	2,326,000,000.0
CPU Type:	Virtual Host:
Is Virtual Image:	»

You have now successfully synchronized a CI with its related actual CI. This ensures that the change management team has access to the most up-to-date details about the CI when planning changes related to the CI.

Even though the configuration information for the CI has been updated, you are not done yet. If you recall what you discovered when looking at the resources related to the actual CI, you discovered that the actual CI is related to a number of file system, and IP Interface CIs. Naturally you want these resources to be related to the authorized CI as well.

As you saw, you could easily have created related CIs and relationships as part of the synchronization process, but they will also be created when you promote an actual CI. The promotion process is used to create all the CIs and relationships related to a top level actual CI in one, simple process. Since the EXERVM01.TIVOLI.EDU actual CI currently is linked to the EXERCISE VM 01 configuration item, promoting the actual CI it will provide the same results as a full synchronization.

Exercise 4. Promoting actual configuration items

In the exercise environment you have manually created the CI that represents the authorized configuration of the new test system. You also discovered the actual configuration, and manually linked, and synchronized the two. This process is the typical process that is used when you want to control the implementation of new resources in the infrastructure.

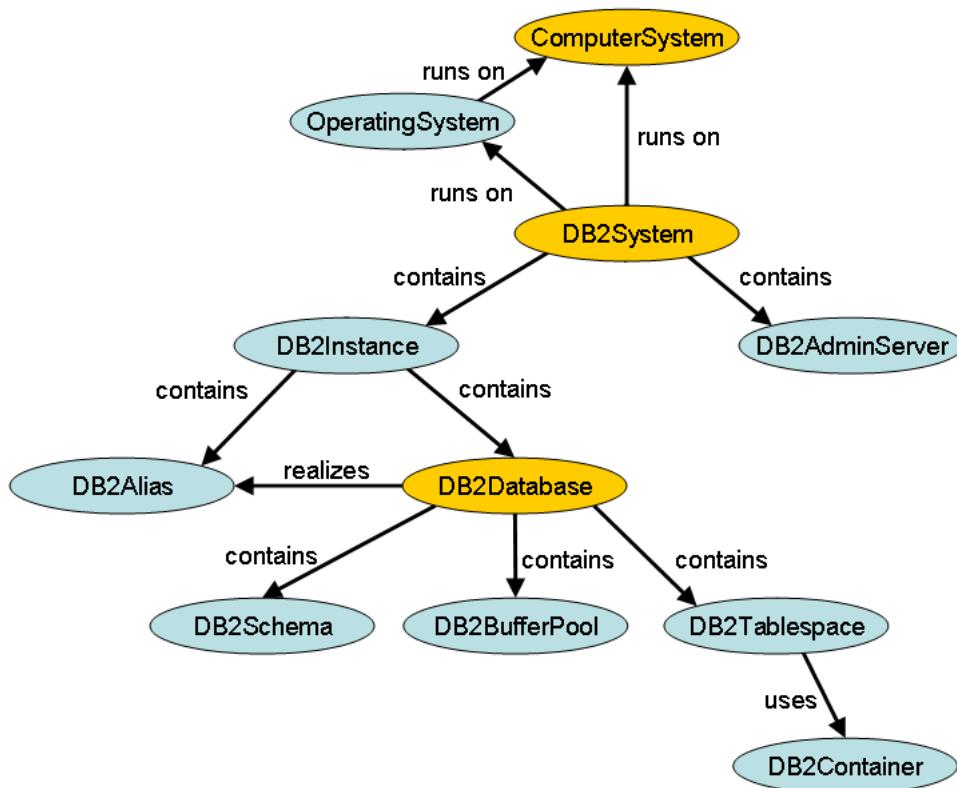
In some situations, you do not follow this process. For example, when you want to create CIs that represent your discovered infrastructure components at the time of initializing IBM SmartCloud Control Desk, you need a function to create CIs based on the actual CIs in the CMDB. You would also use this capability to start managing resources that are implemented outside your normal change process. This function is known as promotion.

As mentioned earlier, you can only promote top level actual CIs. The official definition of a top-level CI is:

a CI that is a container of other CIs... one that would be considered a major component

Notice the word **container**. This implies that a top-level CI always has at least one CONTAINS relationship to other CIs. However, this alone is not enough to make a top-level CI. For example, a DB2 instance is not a top-level CI, even though it contains DB2 databases. To be a top-level CI, the resource also needs to be implemented independently of other CIs except for computer system and operating system CIs. Looking at the DB2 instance example again, you realize that it cannot be a top-level CI because instances rely on the DB2 system resource that represents the installation of the DB2 code on a system. Even though both an operating system and a computer system are

required to install the DB2 system, the DB2 system is considered a top-level CI because it is considered a major component.



In the example above, the ComputerSystem, Db2Instance, as well as Db2Database are all top-level CIs. Each one of them represent a major component that contains other CIs. Once you have a Db2Instance, you can implement any number of databases in the instance, so again you are dealing with a subcomponent. However, this time it is optional, and you can have multiple similar instances.

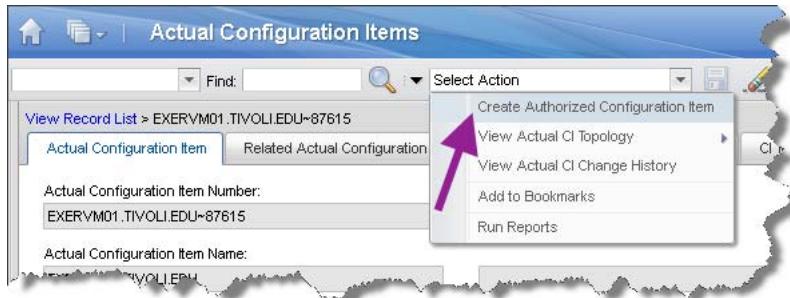
As mentioned, only top-level actual configuration items can be promoted. During promotion, you provide the classification of the corresponding authorized CI, and the promotion process will use the promotion scope associated with this classification to identify the related resources for which authorized CIs are created.

Promoting a linked CI

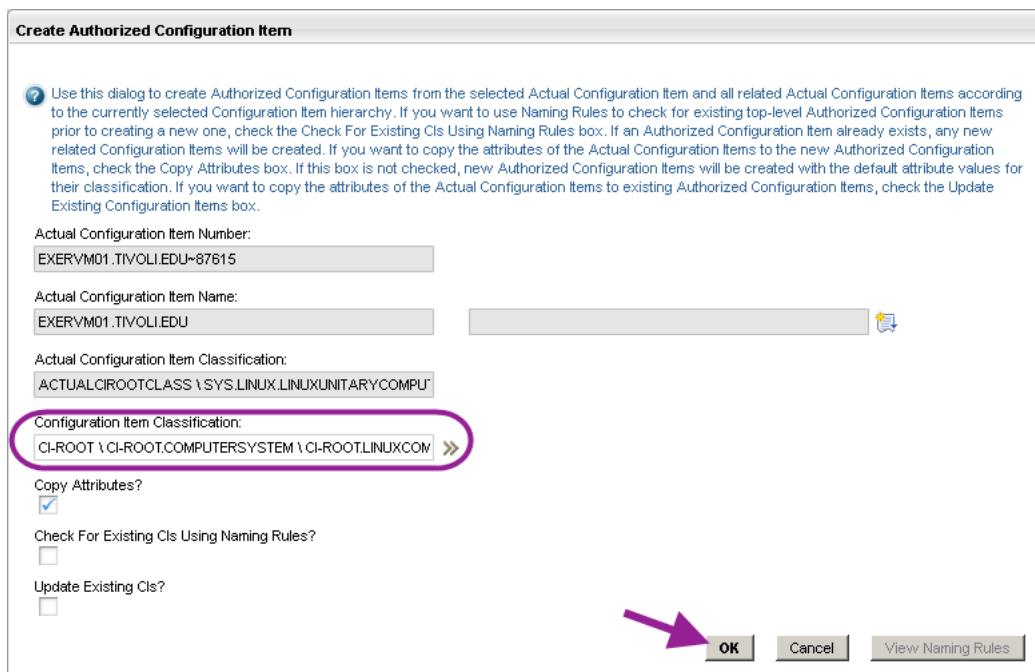
When promoting actual CIs, IBM SmartCloud Control Desk will create new CIs for the top-level CI that is promoted, as well as all the related CIs that are represented in the promotion scope. For actual CIs that are already linked to a CI, promotion yields the same results as a full synchronization. The only difference is that promotion is initiated from the actual CI, and synchronization is initiated from the authorized CI.

To promote the actual CI that represents the test system that were requested when you started these exercises, complete these steps:

1. Ensure that you are logged in to the IBM SmartCloud Control Desk console as the configuration librarian Lou, and load the actual CI named EXERVM01.TIVOLI.EDU into the Actual Configuration Items application.
2. To promote the CI, use the **Create Authorized Configuration Item** option from the Select Action drop-down menu in the header of the application.



3. When the **Create Authorized Configuration Item** window opens, notice that because the actual CI is already linked to a CI, the classification has been preselected.



If you use the default options, where *Copy Attributes* is selected, the promotion process will create new CIs for all the resources that are related downstream to the actual CI that is promoted, and copy the attributes from the actual CIs to the new authorized CIs. Notice that since the *Update Existing CIs* option is cleared, the attributes of the existing CI, EXERCISE VM 01, will not be updated, but new relationships will be created.

Click **OK** when you are ready.

- After a short while you are returned to the Actual Configuration Items application, and you do not see any obvious differences here. Everything that has happened has taken place on the authorized CI side.

To navigate to the authorized CI, use the Detail Menu tool (») next to the **Configuration Item Number** field, and select **Go To Configuration Items**.

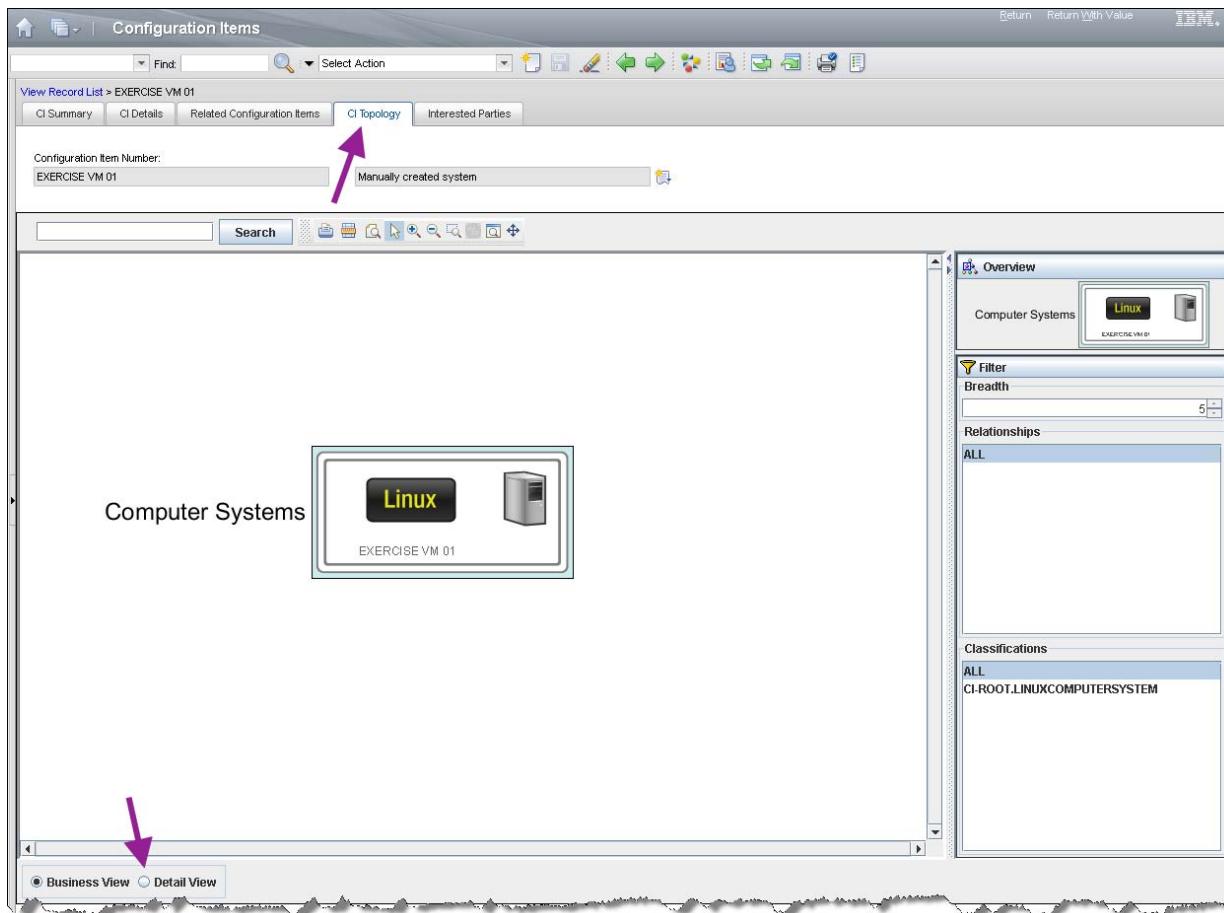
- When the Configuration Item application opens, the EXERCISE VM 01 configuration is automatically loaded. Open the **Related Configuration Items** tab, and notice that a number of CIs have been created, and related to the LINUXCOMPUTERSYSTEM configuration item. If you look at the Classifications column, you find types like IPINTERFACE, L2INTERFACE, and UNIXFILESYSTEM.

Source Configuration Item	Classification	Relation	Target Configuration Item	Classification	Containment?
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	EXERV01.TIVOLI.EDU:LO	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\L2INTERFACE	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	0:0.0:0.0:0.1	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\IPINTERFACE	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	127.0.0.1	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\IPINTERFACE	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	9.48.190.203	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\IPINTERFACE	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	\BOOT	CI-ROOT \ CI-ROOT\FILESYSTEM \ CI-ROOT\UNIXFILESYSTEM	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	EXERV01.TIVOLI.EDU:ETH0	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\L2INTERFACE	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	/	CI-ROOT \ CI-ROOT\FILESYSTEM \ CI-ROOT\UNIXFILESYSTEM	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.ACCESSIONDIA	EXERV01.TIVOLI.EDU:ETH0	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\L2INTERFACE	<input checked="" type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.ACCESSIONDIA	EXERV01.TIVOLI.EDU:LO	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\L2INTERFACE	<input type="checkbox"/>
EXERV01.TIVOLI.EDU	CI-ROOT \ CI-ROOT\COMPUTERSYSTEM \ CI-ROOT\LINUXCOMPUTERSYSTEM	RELATION.CONTAINS	2002:9B04:188:20C:29FF:FEDD:B832	CI-ROOT \ CI-ROOT\IPNETWORK \ CI-ROOT\IPINTERFACE	<input checked="" type="checkbox"/>

The Containment column shows the containment relationship attributes. These are used to determine which CIs to change when an ancestor CI changes status or is deleted. When the status of a CI changes, the status will also change for all the descendant CIs that can be reached through a containment relationship.

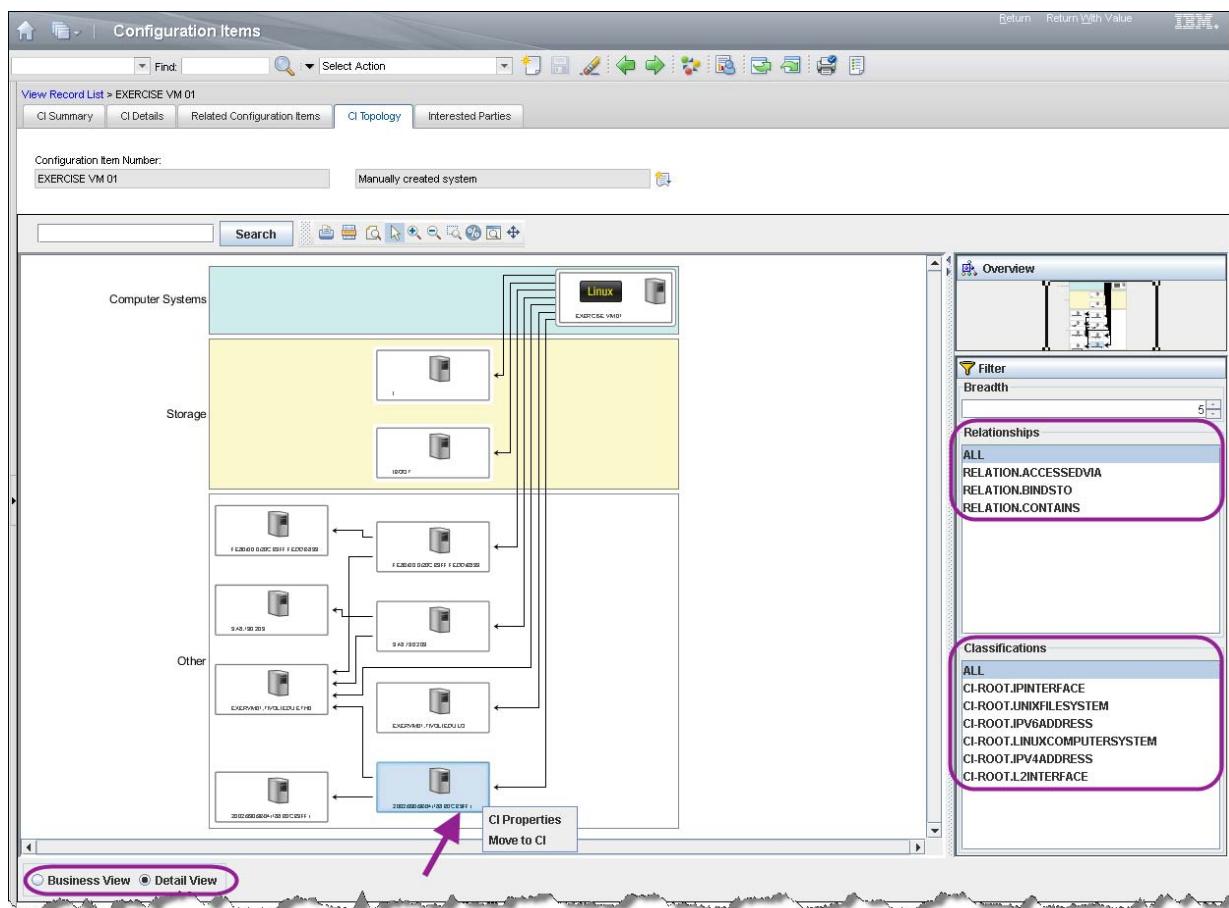
Note: The same rules apply when you delete CIs. This means, that if you have descendant CIs that cannot be reached through a path of containment relationships, these CIs will not be deleted with their parent CIs. Because the parents or ancestors may be deleted there is a chance that some CIs become orphaned.

6. To visualize the related CIs, open the **CI Topology** tab, and wait for a few moments while the topology map is rendered.



The default topology map that is opened when you look at the CI topology is the Business topology. The Business topology includes only CIs for which the *Show in Business View* option is enabled for the classification of the CIs. This means, that for this particular CI you do not see a lot of details, because the only CI that is enabled for the Business view is the Computer System CI.

Notice the two options at the lower left of the window. To see the Detail View, check that option, and wait until the new chart renders.



In the Detail View, you see three swimlanes in which similar resource types are grouped. For the selected computer system you see one swimlane for Computer Systems, one for Storage, and one for Other. Each swimlane is related to a group of classifications, and by controlling which classifications are members of which classification groups the CIs will be placed in the swimlanes in accordance with their classification.

The options in the Filter pane to the right allow you to control which resource types and relationships to visualize in the topology map, and the Breath controls how many levels of descendants to include.

If you right-click any CI in the chart, you can see the configuration details for that particular CI, and you can generate a topology map for that particular CI by selecting Move To CI.

Take a few minutes to experiment with the capabilities of the CI Topology application.

- At this point your job as the configuration librarian is done. Sign out of the console so you can log in as the configuration administrator. Click Sign Out in the upper right of the header.



You have now successfully promoted the resources that were related to the test system CI that had been discovered. Because you promoted the CI, and all its descendant CIs you can now manage the detailed configuration of the related CIs, and verify if the actual configuration is consistent with what you have planned.

Configuration item lifecycles

Configuration item lifecycles govern the valid states that can be assigned to a CI. Lifecycle management is the responsibility of the configuration management process. For most organizations, the CI lifecycle management is critical because it provides the means to enforce the requirement for an approved RFC in order to update or change a CI (through *protected* lifecycle states). In addition, lifecycle states can also be used to avoid accidental deletion of CIs.

In the previous exercise you created a configuration item with a status of UNINITIALIZED. When the CI was created, no special lifecycles existed, so the default lifecycle and default state was assigned to the CIs. As a result, the lifecycle assigned to the computer system is *Default*, and the status is *NOT READY*.

In the following exercise, you will change the default settings for the lifecycle setup, and assign this to the existing CIs that were promoted into your own CI root classification named CI-ROOT. All of these activities will be performed as the configuration administrator user miller.

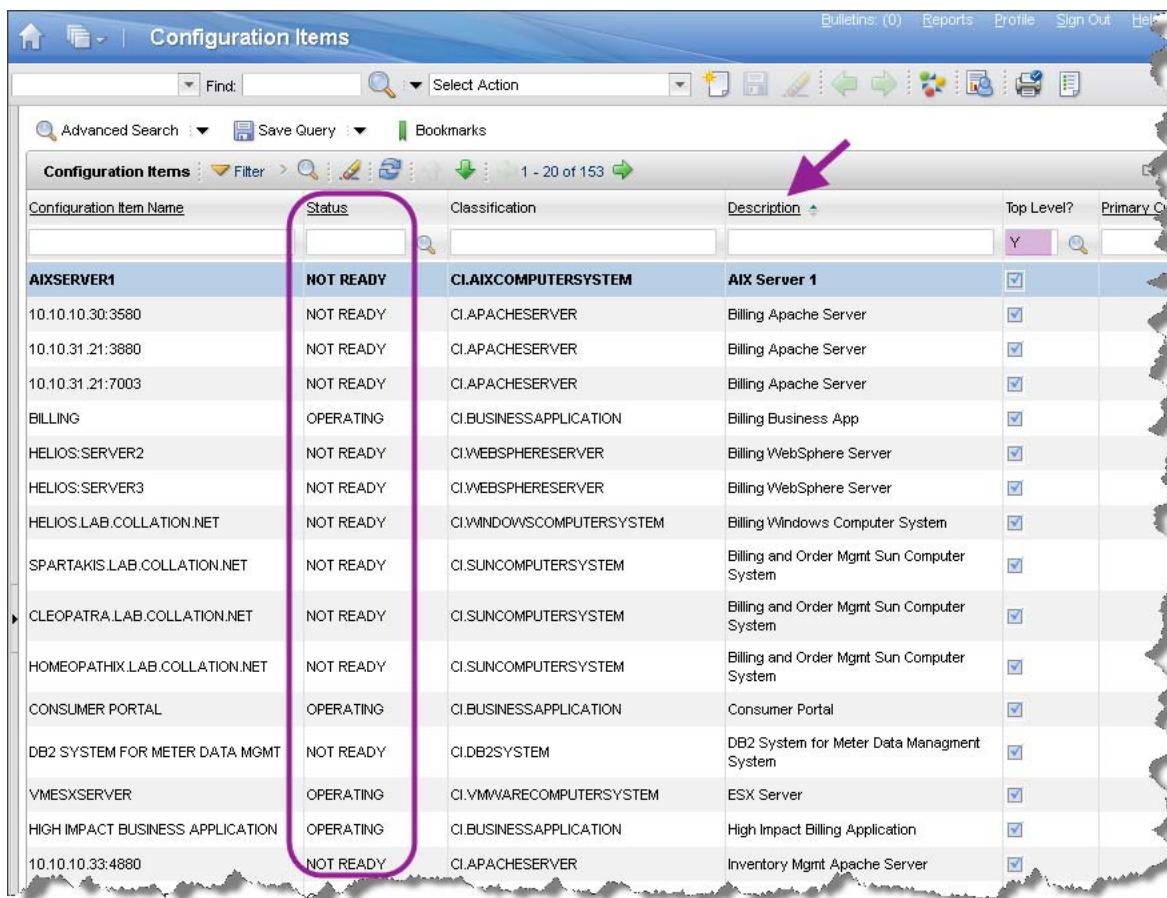
Exercise 5. CI lifecycles

Complete the following steps to take a closer look at the status of your current CIs.

1. Log in to the IBM SmartCloud Control Desk 7.5 Console at <http://localhost/maximo> as miller/object00.
2. From the Configuration Items Application, (click the Go To icon (grid) in the Console header and navigate to **IT Infrastructure > Configuration Items**) find all the top-level CIs by supplying a Y

Exercise 5. CI lifecycles

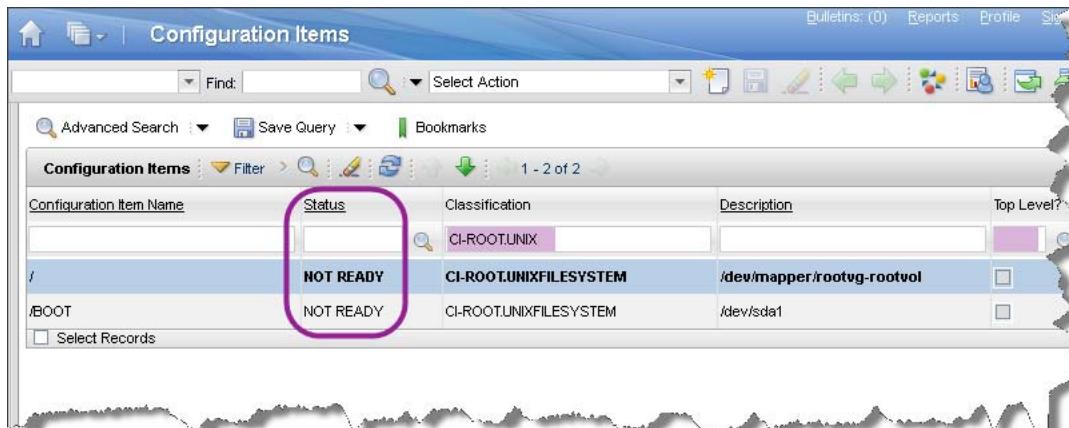
in the Top Level filter field, and pressing Enter. When the list of top-level CIs is revealed, sort the list according to Description by clicking the corresponding header field.



Configuration Item Name	Status	Classification	Description	Top Level?	Primary CI
AIXSERVER1	NOT READY	CLIAIXCOMPUTERSYSTEM	AIX Server 1	<input checked="" type="checkbox"/>	
10.10.10.30:3580	NOT READY	CI.APACHESERVER	Billing Apache Server	<input checked="" type="checkbox"/>	
10.10.31.21:3880	NOT READY	CI.APACHESERVER	Billing Apache Server	<input checked="" type="checkbox"/>	
10.10.31.21:7003	NOT READY	CI.APACHESERVER	Billing Apache Server	<input checked="" type="checkbox"/>	
BILLING	OPERATING	CI.BUSINESSAPPLICATION	Billing Business App	<input checked="" type="checkbox"/>	
HELIOS:SERVER2	NOT READY	CI.WEBSPHERESERVER	Billing WebSphere Server	<input checked="" type="checkbox"/>	
HELIOS:SERVER3	NOT READY	CI.WEBSPHERESERVER	Billing WebSphere Server	<input checked="" type="checkbox"/>	
HELIOS:LAB.COLLATION.NET	NOT READY	CI.WINDOWSCOMPUTERSYSTEM	Billing Windows Computer System	<input checked="" type="checkbox"/>	
SPARTAKIS:LAB.COLLATION.NET	NOT READY	CI.SUNCOMPUTERSYSTEM	Billing and Order Mgmt Sun Computer System	<input checked="" type="checkbox"/>	
CLEOPATRA:LAB.COLLATION.NET	NOT READY	CI.SUNCOMPUTERSYSTEM	Billing and Order Mgmt Sun Computer System	<input checked="" type="checkbox"/>	
HOMEOPATHIX:LAB.COLLATION.NET	NOT READY	CI.SUNCOMPUTERSYSTEM	Billing and Order Mgmt Sun Computer System	<input checked="" type="checkbox"/>	
CONSUMER PORTAL	OPERATING	CI.BUSINESSAPPLICATION	Consumer Portal	<input checked="" type="checkbox"/>	
DB2 SYSTEM FOR METER DATA MGMT	NOT READY	CI.DB2SYSTEM	DB2 System for Meter Data Management System	<input checked="" type="checkbox"/>	
VMESXSERVER	OPERATING	CI.VMWARECOMPUTERSYSTEM	ESX Server	<input checked="" type="checkbox"/>	
HIGH IMPACT BUSINESS APPLICATION	OPERATING	CI.BUSINESSAPPLICATION	High Impact Billing Application	<input checked="" type="checkbox"/>	
10.10.10.33:4880	NOT READY	CI.APACHESERVER	Inventory Mgmt Apache Server	<input checked="" type="checkbox"/>	

Notice the status of the CIs vary. Some have a status of NOT READY, and the status for others is OPERATING.

- To see the status of all your UNIX file system CIs, clear the Top Level filter field, and enter CI - ROOT.UNIX in the Classification filter field and press Enter. Make a mental note of the statuses of the CIs you see.



Configuration Item Name	Status	Classification	Description	Top Level?
/	NOT READY	CI.ROOT.UNIX		<input type="checkbox"/>
/BOOT	NOT READY	CI.ROOT.UNIXFILESYSTEM	/dev/mapper/rootvg-rootvol	<input type="checkbox"/>

Whenever a new configuration item is introduced to the IBM SmartCloud Control Desk 7.5 environment, the configuration librarian is responsible for assigning an appropriate CI lifecycle to the CI.

Review the system provided lifecycles

The lifecycle associated with a CI determines the valid operational state of a CI as well as rules for how the CI can transit from one state to the other. Some lifecycle states may even be *protected*, which indicates that all changes applied to a CI in this state have to be performed using the change control processes. For production CIs this would be the desired situation in order to ensure approvals, impact analysis as well as the documentation of the RFCs.

To investigate the lifecycles that are delivered out-of-the-box with IBM SmartCloud Control Desk 7.5, do the following:

1. Open the CI Lifecycles application, click the Go To icon () in the Console header and select **IT Infrastructure > CI Lifecycles** from the IBM SmartCloud Control Desk 7.5 console.
2. When the Lifecycle application launches, press **Enter** to list all the lifecycles in the environment.



Lifecycle Name	Description	Is Default?
Default	Default lifecycle	<input checked="" type="checkbox"/>
ITIL	ITIL-Compliant CMDB lifecycle	<input type="checkbox"/>

Notice that there are only two lifecycles, and that the one named *Default* has been assigned as the default lifecycle, which is the one that will be assigned to CIs for which no specific lifecycle has been associated with the classification of the CI.

3. Open the **Default** lifecycle to view the details, and when the dialog renders, expand the *NOT READY* state by clicking on the View Details icon (▶) next to it.

The screenshot shows the 'CI Lifecycles' interface with the 'Default' lifecycle selected. The main panel displays the lifecycle's ID (1), name ('Default'), and description ('Default lifecycle'). Below this is a table of states:

State	Description	Is Protected?	Is Default?
DECOMMISSIONED	Decommissioned state	<input type="checkbox"/>	<input type="checkbox"/>
NOT READY	Default state	<input type="checkbox"/>	<input checked="" type="checkbox"/>
OPERATING	Operating state	<input type="checkbox"/>	<input type="checkbox"/>

A purple arrow points to the 'NOT READY' row. A red circle highlights the 'Is Default?' checkbox in the same row. Below the table is a 'Lifecycle State Details' section with dropdowns for state and description, and checkboxes for protection and default status. At the bottom is a 'Transitions from NOT READY State' table:

Target State	Description
OPERATING	Operating state

A red circle highlights the 'OPERATING' target state in this table.

Here you see, that the Default lifecycle contains three states: NOT READY, OPERATING, and DECOMMISSIONED. In addition, you should notice, that the state named NOT READY has been assigned as the *default* state, so that is why the majority of your configuration items are in this state.



Note: The lifecycle state signifies the management state of a CI – not the *operational status*. The correlation between the two is defined in the synonym domain named CISTATUS. If you take a close look, you will see that multiple operational states can be associated with the same lifecycle state.

In the *Transitions from NOT READY State* section, at the bottom of the console, you see which transitions are allowed when you want to bring a CI out of the NOT READY state. As you see, for the Default lifecycle, the only allowed transition is to the OPERATING state. This prevents

the configuration librarian to send a CI in the NOT READY state directly to DECOMMISSIONED state.

- Now, expand the *OPERATING* state to see which transitions are available:

Target State	Description
DECOMMISSIONED	Decommissioned state
NOT READY	Default state

Set Transitions

As you see, the Default lifecycle allows you to go either way from the OPERATING state.

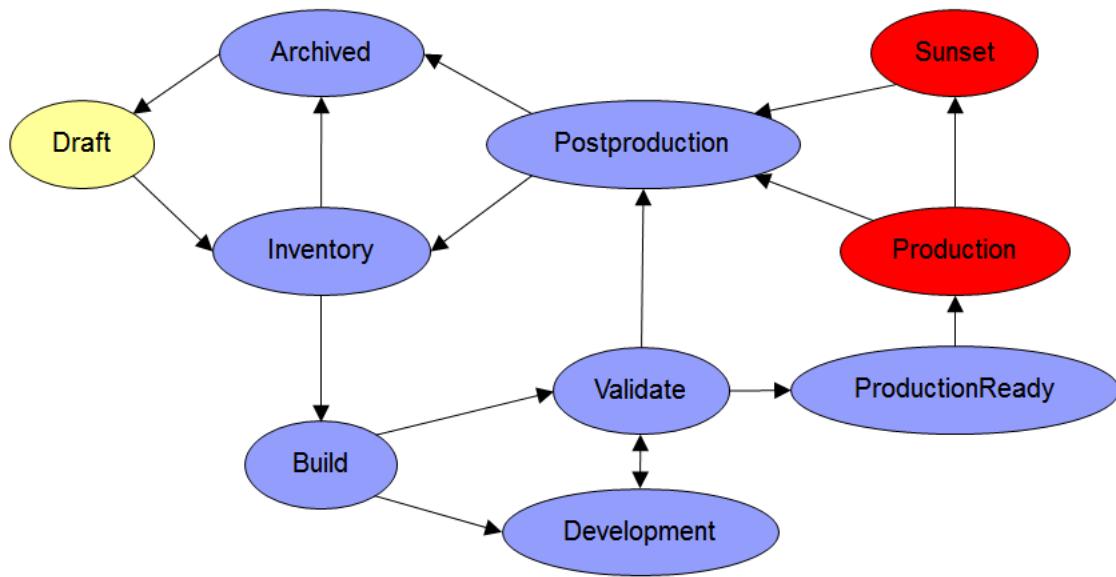
- In addition to the Default lifecycle, an *ITIL* lifecycle is provided with IBM SmartCloud Control Desk 7.5. This is meant as a template that strictly follows the ITIL specifications for lifecycle management.

State	Description	Is Protected?	Is Default?
ARCHIVED	Archived state	<input type="checkbox"/>	<input type="checkbox"/>
BUILD	Build state	<input type="checkbox"/>	<input type="checkbox"/>
DEVELOPMENT	Development state	<input type="checkbox"/>	<input type="checkbox"/>
DRAFT	Draft state	<input type="checkbox"/>	<input checked="" type="checkbox"/>
INVENTORY	Inventory state	<input type="checkbox"/>	<input type="checkbox"/>

Take a few minutes to familiarize yourself with the ITIL lifecycle, and try drafting the lifecycle states and transitions on a piece of paper.

Note: The ITIL lifecycle contains 10 states. Use the forward (and backward () buttons to see all of them.

Upon completion you should have a diagram similar to this:



You see that the default lifecycle state for the ITIL lifecycle is the *Draft* state, and that only the *Production* and *Sunset* states are protected.

At this point, you should be able to understand the purpose of the IBM SmartCloud Control Desk 7.5 lifecycles, and articulate their use.

Exercise 6. Assign lifecycles to CI classifications

Once you have decided which lifecycles you need, and how to use them, you can assign lifecycles to particular CI classifications. When a lifecycle is assigned, you can change the status of the CIs with that classification in accordance with the states and valid transitions defined in the lifecycle.

If you do not use the same lifecycle for all your classifications, you must ensure that the same states and transitions are represented in the lifecycles. IBM SmartCloud Control Desk uses the containment relationships to promote status changes to the descendant CIs when the status of the parent is changed. If the states and transitions are not consistent across your multiple lifecycles, you can inadvertently introduce inconsistencies between the statuses of parents and children.

In most cases, multiple lifecycles are only used if you want to be able to apply different lifecycle states for different environments. This situation may arise if, for example, you service multiple customers, or you want to have different states and transitions between test, quality assurance, and production environments. You may also find, that multiple lifecycles are used during initial implementation and configuration of your IBM SmartCloud Control Desk environment.

In the following, you will assign the *ITIL* lifecycle to the **LINUXCOMPUTERSYSTEM** CI type in your authorized CI hierarchy CI-ROOT. However, because the ITIL lifecycle does not contain the current state, *NOT READY*, you must add this state to the lifecycle before you apply the lifecycle to the classification. In addition, you must add one or more transitions to allow the change of the *NOT_READY* status, to another status. You will not apply the ITIL lifecycle to other classifications, so to avoid introducing inconsistencies in the exercise environment, you must also create the *OPERATING* state and related transitions. This is necessary because you have already promoted the computer system and its descendants, and most of them are related through a containment relationship.

Add states and transitions to a lifecycle

To add CI states, and the related transitions, to the ITIL lifecycle, complete the following steps:

1. Click the Go To icon (grid) in the Console header and navigate to **IT Infrastructure > CI Lifecycles**, and open the ITIL lifecycle.
2. To add the NOT READY state, do the following:
 - a. From the **CI Lifecycle** tab, click **New Row**.

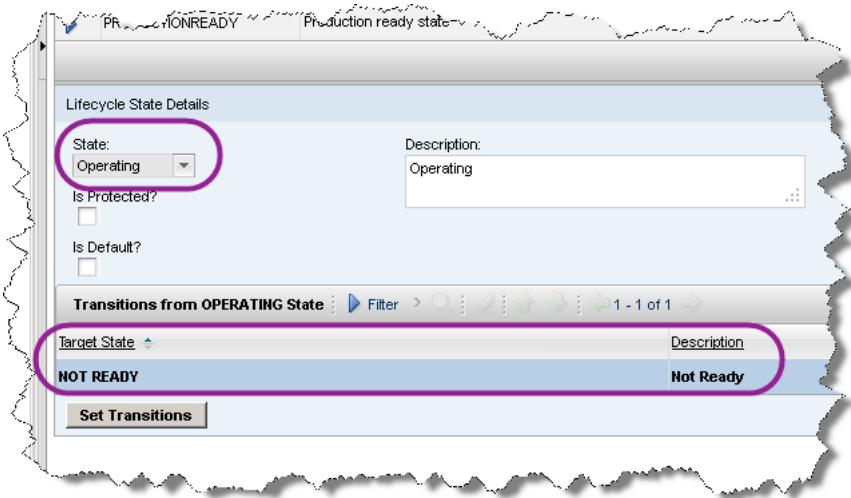


- b. Accept the default name **Not Ready**, and make sure that you select the **Is Default** check box.



- c. Save your new state by clicking the Save icon (floppy disk).

3. To add the OPERATING state, repeat the previous steps, choose *Operating* for the state name, and do not make it the default state.
4. To add the transitions to the OPERATING state, complete these steps:
 - a. Click **Set Transitions** to specify the state(s) CIs can be transferred *to*, from the selected state.
 - b. In the Set Transitions dialog, check the NOT READY state to allow CI in the OPERATING state to transition to the NOT READY state.



You may have to scroll to the next page in the Set Transitions dialog to find the state you need.

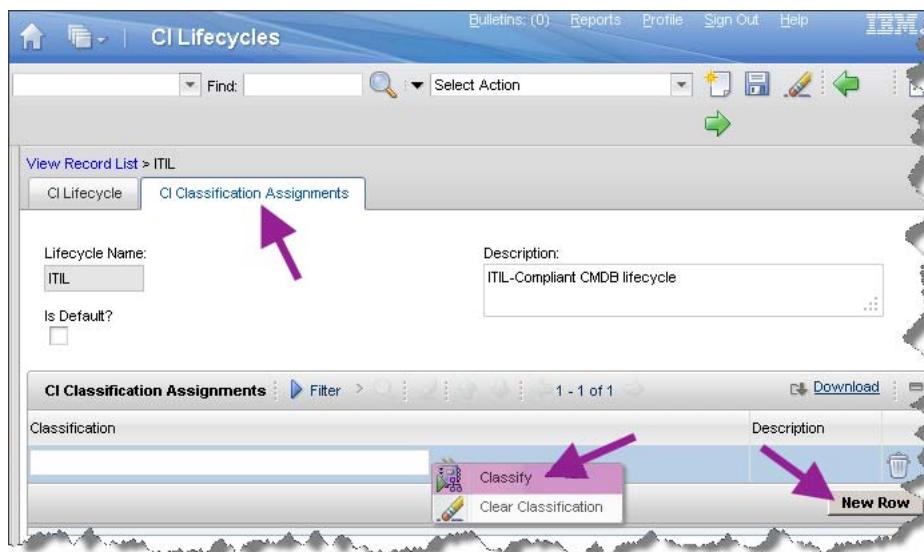
- c. Click **Save** then you are ready.
5. To add the transitions to the NOT READY state, select the NOT READY state and repeat the previous steps to create a transition that allows CIs to transition from the NOT READY state to the OPERATING state.

Now, you have defined a new default state and transitions that is consistent with the current states of your CIs.

Assigning a lifecycle to a CI classification

To assign the ITIL lifecycle to the CI-ROOT.LINUXCOMPUTERSYSTEM classification, complete the following steps:

1. From the ITIL lifecycle, click the *CI Classification Assignments* tab, and then click **New Row** to add a classification.



2. To select a classification, click the Detail Menu icon (») next to the *Classification* field, and select **Classify**. Now your authorized CI hierarchies are displayed.

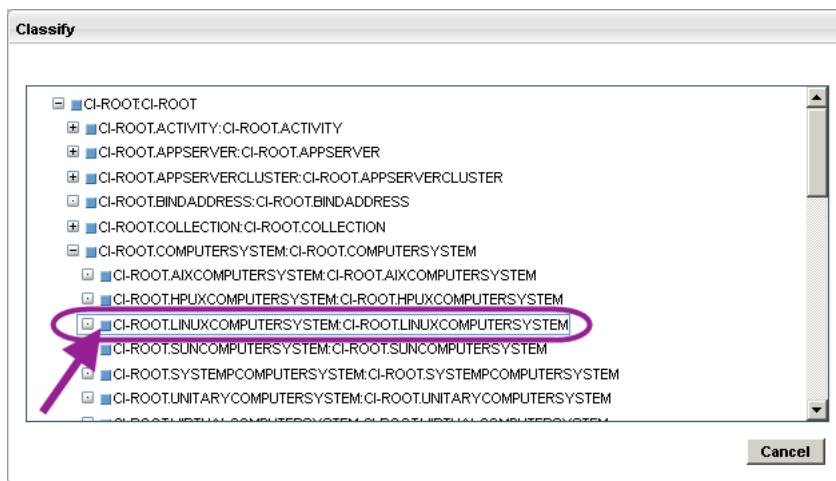
Expand the CI-ROOT:CI-ROOT hierarchy, and select the
CI-ROOT.COMPUTERSYSTEM:CI-ROOT.COMPUTERSYSTEM classification, which
you will find if you follow this path:

CI-ROOT:CI-ROOT

 CI-ROOT.COMPUTERSYSTEM:CI-ROOT.COMPUTERSYSTEM

 CI-ROOT.LINUXCOMPUTERSYSTEM:CI-ROOT.LINUXCOMPUTERSYSTEM

To select a classification, you must click the tiny blue square (■) next to the classification you want to select.



- Upon return to the CI Lifecycles application, click on the Save icon (■) to persist your work.

You have completed the preparation of the ITIL lifecycle so it can be applied in the exercise environment. In a real implementation, you would have added more transitions to allow the status to change from for example NOT READY to any of the states that are unique to the ITIL lifecycle.

Exercise 7. Change CI Status

Because you changed the lifecycle assignment of the LINUXCOMPUTERSYSTEM classification, you should test the effects of changing the status of the EXERCISE VM 01 computer system CI.

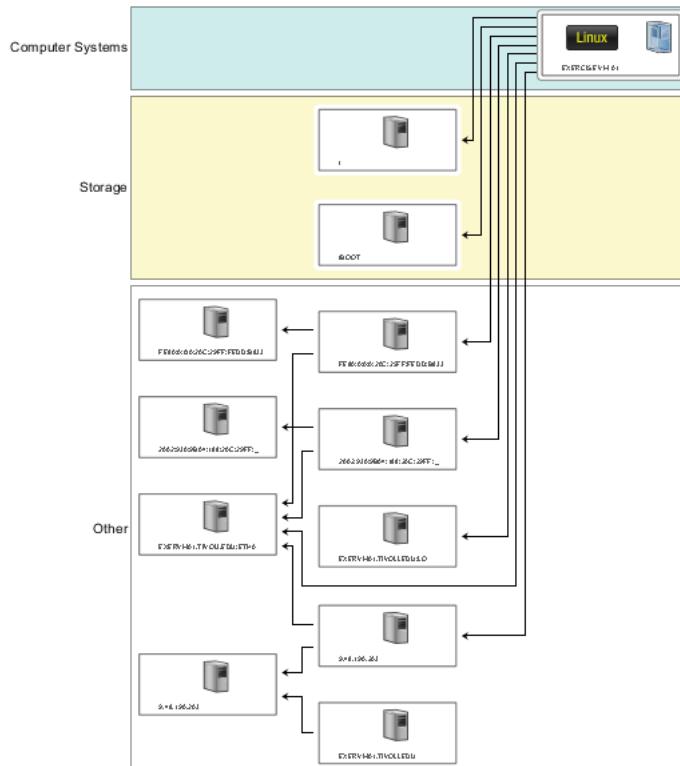
You may remember, that when changing the status of a CI, IBM SmartCloud Control Desk 7.5 will cascade the new status to all the descendants that can be reached through relationships that are defined with the *containment* option. The default value for this option is controlled in the promotion scopes, but you can use the Relationships application to modify and extend it.

Logically, this behavior seems to be correct, because when a computer system is decommissioned, it makes sense that all the components hosted on the computer system are decommissioned with it. On the other hand, just because a computer system is operating, it does not guarantee that any of the application servers hosted on the system are also operating. These are just a few of the issues you need to consider when defining promotions scopes and configuring lifecycles.

In the current EXERCISE VM 01 structure, there are containment relationships between the computer system CI and most of the components that are installed on the system. The exceptions are the IP address configuration items. Even though to manifest themselves IP addresses must be related to an IP interface, IP addresses can exist independently of the interface. For example if they are defined only in the domain name server.

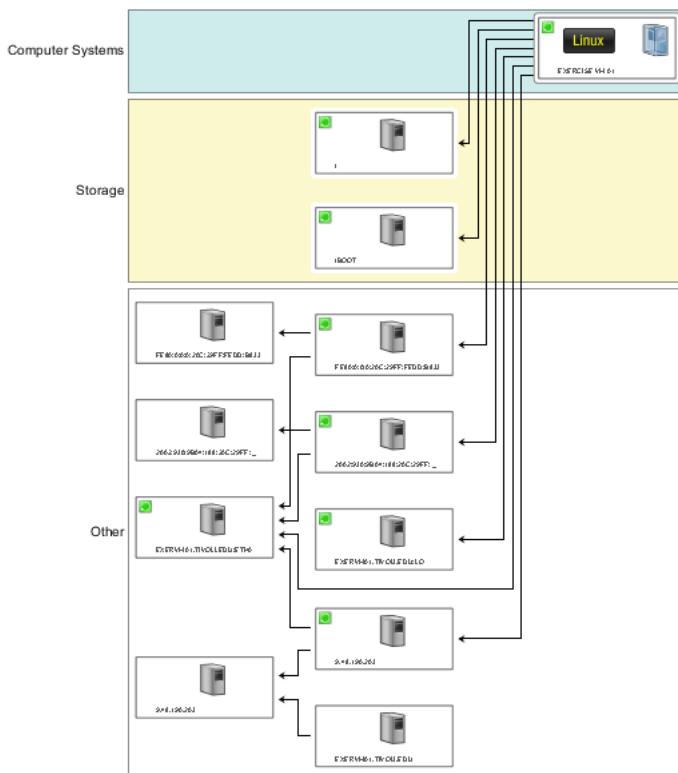
Now, try to change the status of the EXERCISE VM 01 to OPERATING, by completing these steps:

1. From the Configuration Items application, open Detail View in the CI Topology tab for the EXERCISE VM 01 system. You will see a topology similar to this:



From this topology you can only see the relationships, but not if they are containment relationships or not.

2. Use the Change Status icon () to change the status of the current CI, EXERCISE VM 01, to OPERATING. After a short while, the topology is rebuilt, and when you reopen the Detail View you now see the status of each CI in the topology.



Notice that except for the IP address configuration items, the status has changed to OPERATING, as indicated by the green symbol (green circle with a dot) in the upper-left corner of each CI, for all the CIs in the EXERCISE VM 01 structure.

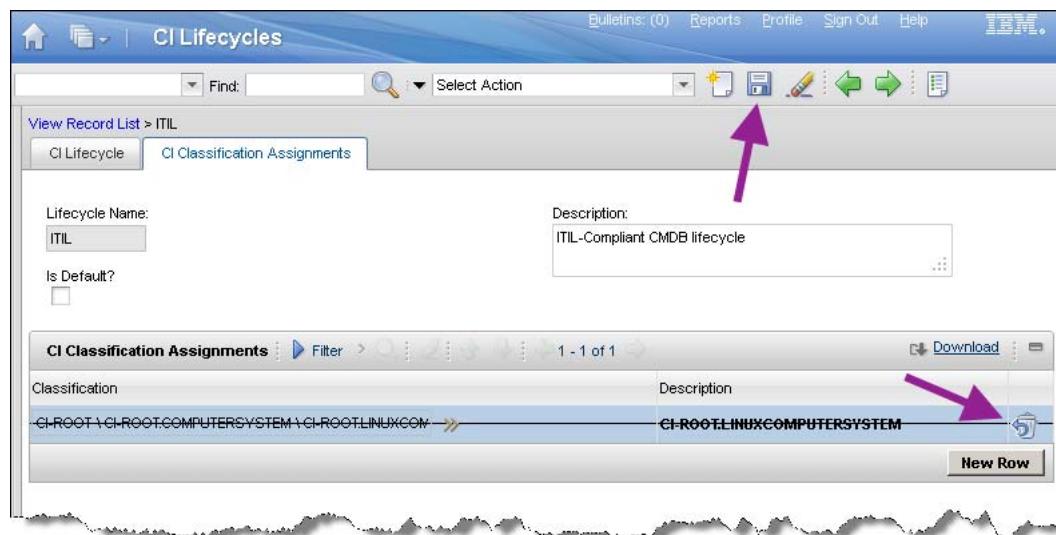
- To reset the environment to the state you found it in before starting these exercises, you must set the status of the EXERCISE VM 01 system back to NOT READY. In addition you need to remove the association between the ITIL lifecycle and the CI-ROOT.LINUXCOMPUTERSYSTEM classification.

To update the status of the EXERCISE VM 01 system, simply click the Change Status icon () and set the new status to NOT READY.

Follow these steps to allow the classification to use the default lifecycle:

- a. Open the CI Lifecycles application, by clicking the Go To icon () in the Console header and navigate to **IT Infrastructure > CI Lifecycles**.
 - b. Load the lifecycle named ITIL.

- c. From the **CI Classification Assignment** tab, click the Mark Row for Delete icon (at the end of the only line in the CI Classification Assignments section.



Click the Save icon (to save your changes.

As a final step, you should change the default state for the default lifecycle to *OPERATING* in order to make sure that newly promoted CIs will be assigned this state.

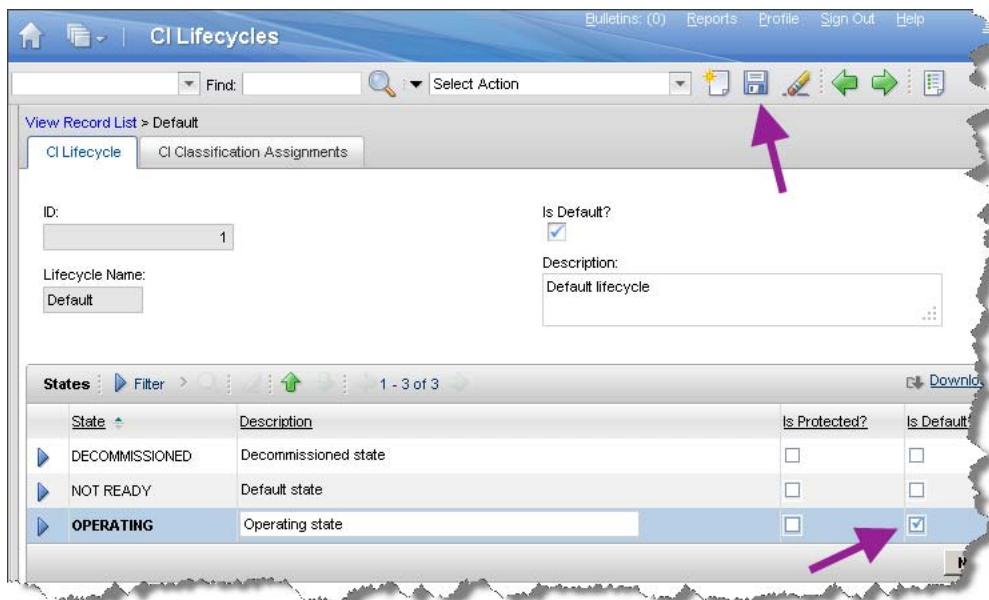
Exercise 8. Changing the default lifecycle state

You may have noticed that the lifecycle state of most of the CIs you have been working with is NOT READY. This status has been assigned through the lifecycle that is marked as the default lifecycle (the name happens to be *Default*). Within the lifecycle, one state is assigned the default state, and NOT READY is defined as the default state in the Default lifecycle.

In many of the applications that you will use in the following exercises for change management, it is assumed that the lifecycle state of the CIs you will be working with is *OPERATING*. Therefore it will make your life easier if you assign the *OPERATING* lifecycle state as the default state of the Default lifecycle. This change does not affect the existing CIs, but new CIs that you create will be assigned the new lifecycle state.

Complete the following steps to change the default lifecycle state:

1. In the CI LifeCycles application, load the lifecycle named **Default**.
2. Locate the state named OPERATING, and check the **Is Default** option.



Notice how the **Is Default** check box for the *NOT READY* state automatically is cleared.

3. Click the Save icon () when you are ready.
- You are done. The next time you promote an actual CI, the *OPERATING* state will be assigned.
4. To terminate the current session, so another user can log in, click the **Sign Out** link in the action bar of the IBM SmartCloud Control Desk 7.5 Console.



When you see the logout confirmation message, click **Return**.

This completes the introduction to CI lifecycles. Next, you take a closer look at the configuration management process requests and auditing of CIs.

Working with configuration control and update CI Requests

The CI update process is used to update CI attribute values and relationships in the IBM SmartCloud Control Desk 7.5 database, in order to update the database to reflect the current state of the CIs. In addition, the process is also used to create and delete CIs.

In IBM SmartCloud Control Desk CIs can be created in multiple ways.

- By promoting actual (discovered) CIs
- Automatically when a hardware-related asset is created.
- By importing CI information created by external sources, either through a Maximo Enterprise Adapter, or using the import facility
- Manually from the Console

It is important to remember, that high level authorized CIs should normally be created from a change. IBM SmartCloud Control Desk does allow you to create CIs directly in the database, but if you do, there will be no tracking to who requested the creation and who authorized it. The facilities used to create CIs directly are intended to be used only by the configuration management team who has the responsibility to ensure that the configuration information in the CMDB accurately reflects the real world.

Which method to choose to create CIs is determined by your process and the circumstances and conditions that prompted the request to create a new CI.

- If you want to start managing existing, discovered resources, for example an entire business application and its related resources, you would choose to promote the actual CI that represents the business application. In this process, all the CIs related to the application will be promoted as well.
- If you plan to deploy a new physical system into the infrastructure, you would probably create the asset as part of the procurement process, and have the related CI created as an integral part of that process. This may also apply to virtual system for which the procurement process is limited to registering the new virtual system and associate it with the appropriate site, organization, or owner to ensure correct licensing and accounting.
- If you need to add an existing CI that cannot be discovered, and therefore does not exist as an actual CI, you may consider exporting data from a system that manages the resource, and import these in order to represent the resource in the CMDB. The import/export feature can also be used to easily create multiple new CIs in a single operation, for example to create 20 new virtual system CIs that will be deployed through a change.

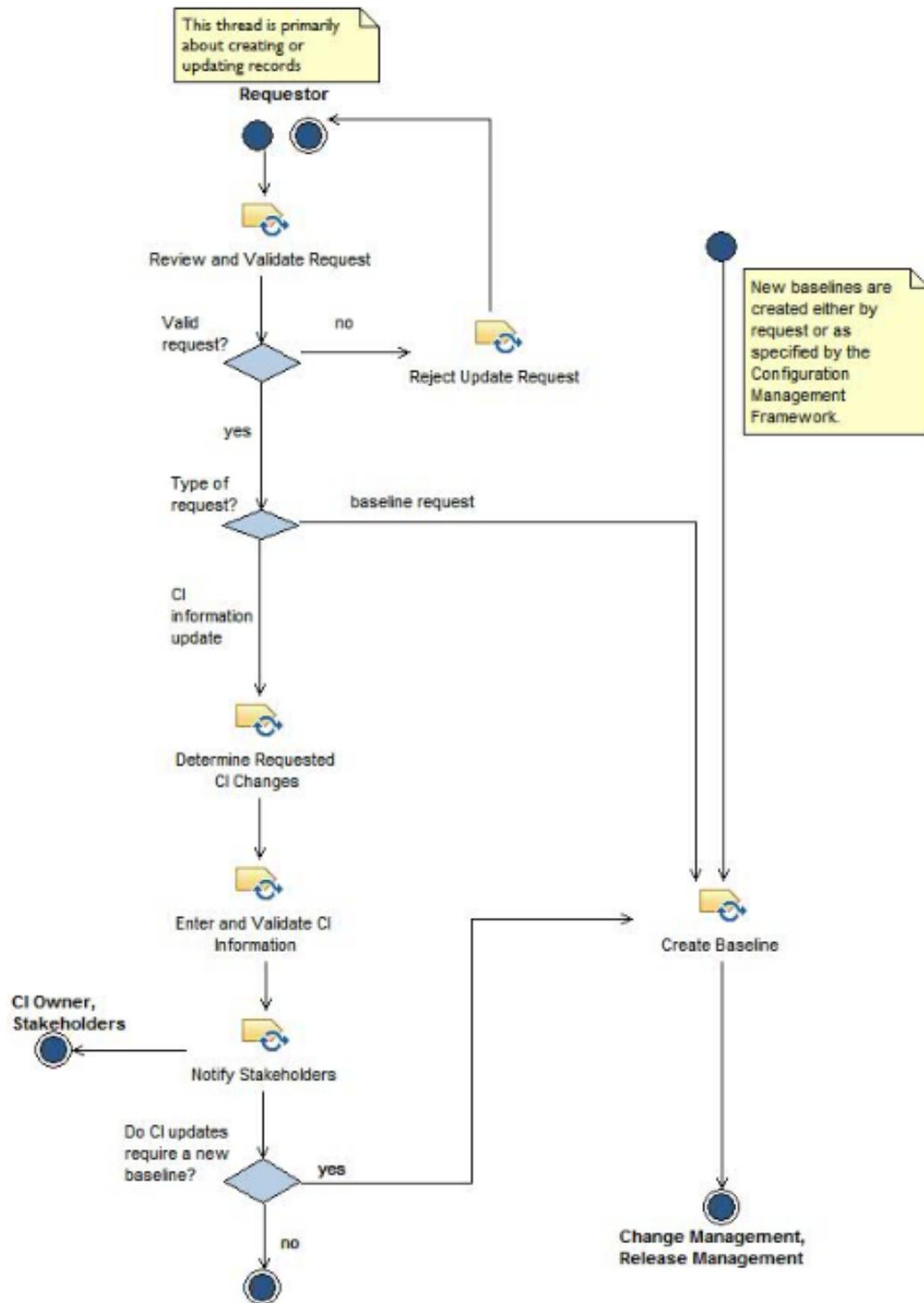
- If you need to deploy for example a new web server instance to an existing system, you would create the new CIs manually as part of the change, and provide configuration information and relationship to be used for the implementation.

By performing CI updates, you ensure first of all that an audit trail exists in order to keep track of who requested and who implemented the configuration changes. In addition, by recording the change number while updating the CI configuration information, you associate the updates with authorized changes, and thereby notify the change auditor that the changes had been approved. Linking the CI update to a change will also help the audit processing by making it much easier for the Configuration Auditor to identify unauthorized changes (discovered modifications for which no approved change request exists).

The configuration update process is also used to document updates performed based on failing audits, and as such, does not necessarily have to be linked to a change.

The processing of configuration requests is similar to that of the change request processing. However, for configuration control\update requests, a default job plan is assigned when the configuration process is created, which happens when the configuration control update request is accepted.

The processing of a configuration update request involves the following steps:



Typically, configuration control/update requests are originated as part of the provisioning of new services, or as part of the transition of services (from test to production to decommissioned). This also applies if the CI has been created automatically from an asset. In this case, the asset manager does not know all the configuration details, so a request should be submitted for the configuration librarian to supply the details. Normally, during processing of a change, the planned configuration changes are automatically applied to the CI when the change implementation tasks are completed.

However, status changes are not considered configuration changes so during change processing, submission of configuration control\update request can be included in order to ensure that the correct status is applied. The configuration control\update request can also be used from a change to ensure that newly implemented changes are discovered and verified, or to create a new baseline.

In addition, a configuration control\update request may be submitted as a result of a failing audit. When the configuration auditor inspects the audit reports and finds discrepancies between the configurations of the actual CIs and the related CI, the CI configuration should be updated. Since the auditor is not allowed to implement/approve his own work (according to ITIL) the CI update should be performed by the configuration librarian, based on a configuration control\update request submitted by the auditor.

Naturally, configuration control\update requests can also be submitted to reflect updates performed for resources that are not under strict change control, for example test systems. In this case, the requester would submit a request to make sure that the configuration information in the CMDB matches reality, and ensure that the resource passes the configuration audit.



Note: One important point to remember is that a configuration item number must always be referenced in the configuration control\update request. This CI number can either be added directly to the request, or referenced through associating the request with a change number. This implies, that configuration control\update request cannot be used to create new CIs. These are either created as part of the change, the asset reception, or from promotion of discovered CIs.

Exercise 9. Submitting a configuration request

In the following exercise, you will go through the steps of creating and processing a configuration control\update request. As the system owner Steve, you submit a configuration control\update request for the change of the operational state of a virtual system, in order to mark the system OPERATING. In addition, Steve will request that the memory of the virtual system is increased to 8 GB, because that was what was allocated when the system was moved to the staging environment. This modification could have been included in a change, but in the exercise environment, the movement of the virtual system was not part of a change.

To create and submit a configuration control\update request to request the updates to the virtual system, you (as Steve) must complete these steps:

1. Sign in as Steve, using a user id of `Steve` and a password of `object00`.
2. Open the Process Management Requester start center, and use the **New Process Request** link in the Quick Insert section to create a new request.



3. To specify the details of your request, provide the following values in the Process Request Details section:

Process Request	EXER CU_00
Description	Set OPERATING and update memory
Details	Please change the status to OPERATING and update the memory allocation based on the current implementation
Process Manager Type	Configuration

The screenshot shows the 'Process Requests' screen in IBM SmartCloud Control Desk. A specific record for 'EXER CU_00' is selected. The interface includes sections for User Information (Requestor: STEVE, Name: STEVE, Phone: [redacted], E-mail: [redacted], Reported Date: 5/3/12 17:38:38) and Process Request Details (Description: Set OPERATING and update memory, Details: Please change the status to OPERATING and update the memory allocation based on the current implementation). The 'Process Manager Type' field is set to 'Configuration'. Navigation buttons like 'Find', 'Select Action', 'Related Records', and 'Log' are visible at the top.

Note that you could have added more details, for example requested completion, and priority, but for this exercises, these fields can be ignored.

Scroll down until you see the Request Classification Details section, and provide the following values:

Classification	PMCFGUR				
Request Classification Details * Classification: <input type="text" value="PMCFGUR"/> >> Class Description: <input type="text" value="Cl Configuration Control / Update Request"/>					
Classification Attributes 1 - 5 of 5 <table border="1"> <thead> <tr> <th>Attribute</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>CMN</td> <td>Ch Num</td> </tr> </tbody> </table>		Attribute	Description	CMN	Ch Num
Attribute	Description				
CMN	Ch Num				

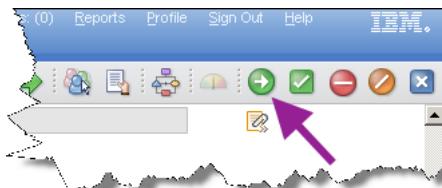
Scroll further down until you see the Target Cls section, and click **New Row**.

In the Details section, use the Detail Menu tool () next to the **Configuration Item Number** field to select the EXERCISE VM 01 configuration item.

Target Cls		
Asset	Location	Configuration Item Number
>>	>>	EXERCISE VM 01
Details Asset: Location: Configuration Item Number: <input type="text" value="EXERCISE VM 01"/> Manually added system Configuration Item Name: EXERCISE VM 01		
<input type="button" value="Select"/> <input type="button" value="Clear All"/> <input type="button" value="New Row"/>		

Now that the configuration request has been specified, click the Save icon () in the toolbar to save your request.

- To submit the configuration control\update request, click the Submit icon () in the toolbar.



Exercise 9. Submitting a configuration request

Behind the scenes, the ISMSUBMIT workflow is invoked, and validates your input. If you provided all the required information you will see that the Process State of the request changes from DRAFT to SUBMITTED, and the new status for the request is QUEUED.



At this point, the request has been properly submitted, and Steve will have to wait for the configuration management team to process it.

5. To log off so you can log in as the configuration manager to process the request, click Sign Out in the upper right of the header.



Your first process request has been submitted.

Exercise 10. Accepting a CI update request

The newly submitted request is now waiting to be processed. This involves that a member of the configuration management team, typically the configuration librarian or the configuration manager, must first validate and accept the request. Once the request is accepted, a new work order, called a configuration process, is created. This will then be scheduled and completed like any other work order. Once the work order has been completed, the request is closed.

To process the request, you should complete the following:

1. Log in to the IBM SmartCloud Control Desk 7.5 Console (at <http://localhost/maximo>) as the configuration manager Joeo (password object00) and take a look at the *Configuration Process Requests* section in the Configuration Manager start center.

The screenshot shows the IBM SmartCloud Control Desk 7.5 Console interface. The top navigation bar includes 'Welcome, Joe O. Configuration Manager', 'Bulletin Board (0)', 'Reports', 'Profile', 'Sign out', and 'Help'. Below the navigation bar are several panels: 'Quick Insert' (New CI, New CI Lifecycle, New Process Request), 'Related Applications' (Activities and Tasks, Actual Configuration Items, Configuration Items, CI Lifecycles), and 'Percentage of Requests Resolved' (Last Run: 25%, Status: 0, Actual: 70%, Target: -70%). The main content area features three tabs: 'Bulletin Board', 'Inbox / Assignments', and 'Configuration Process Requests'. The 'Configuration Process Requests' tab is active, displaying a table with columns: Process Request, Description, Class Structure, Reported By, Reported Date, Site, Process State, and Status Date. One row is highlighted with a red box and a pink arrow points to the 'Description' column which contains 'EXER CU 00 Set OPERATING and update memory'. Other columns show 'UPDATEREQ', 'STEVE', '5/3/12 17:38:38', 'PMSCRTP', 'SUBMITTED', and '5/3/12 18:16:05'.

Notice the UPDATE request that Steve submitted. In this example, the request number is EXER CU 00.

2. To access the request, open it by clicking the **EXER CU 00** link in the Configuration Process Requests section.
3. To ensure that the Configuration Process can be created correctly, you must assess and prioritize the request. This implies verifying that the request is correctly classified, that the correct target CI has been assigned, and optionally that the CI attributes to be updated are listed as attributes for the request. If you like, you can also update the Requested Completion information, but it will not have any impact for the example you are working with.

To ensure that the information is correct, do the following:

- a. Review the base information for the request and ensure that the following parameters have the values specified below:

Classification PMCFGUR

The classification determines how the configuration update process will be created and routed, so this is the most important property of the request.

- b. Steve supplied information for you to apply the requested updates to the directly in the Classification Attributes section.

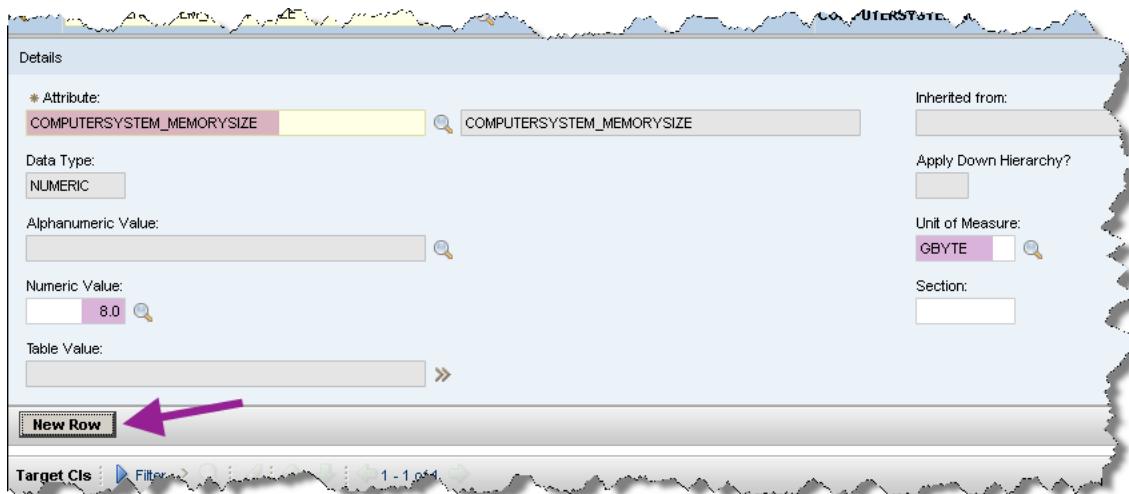
If you check the classification of the specified CI, you see that it is a CI-ROOT.LINUXCOMPUTERSYSTEM CI, and in this classification the memory size is specified in the COMPUTERSYSTEM_MEMORYSIZE attribute. The status is a property directly on the configuration item, so it is not represented by a particular attribute.

To update the specifications for the update request, focus on to the Classification Attributes section and use the **New Row** button to add a new attribute to the list.

Provide the following values in the attribute details section:

Attribute	COMPUTERSYSTEM_MEMORYSIZE
Unit of Measure	GBYTE
Numeric Value	8

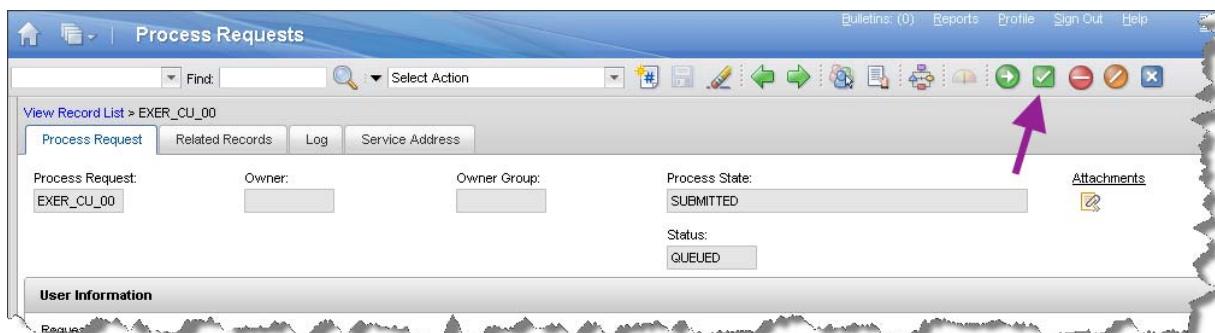
as shown below:



- c. Save the request by clicking on the Save icon (floppy disk) in the toolbar.

After successful classification and assessment, you are ready to accept the request.

4. To start the request processing press the Accept icon (checkmark) in the toolbar



By accepting the request, you create a work order for the requested updates, and the response plan that is associated with the request classification is applied automatically. By applying the response plan, many parameters are populated with default values.

- After the acceptance the only change you will see is that the status of the request has been updated. In addition, if you look at the **Related Records** tab, you will see a new configuration process work order (1218 in this example) of type PMCFGWO has been linked to the request.

The screenshot shows the 'Process Requests' application interface. At the top, there's a header bar with 'Process Requests' and various navigation links like 'Bulletins: (0)', 'Reports', 'Profile', 'Sign Out', and 'Help'. Below the header is a toolbar with icons for search, select action, and other operations. The main area shows a 'View Record List > EXER CU_00' for a 'Process Request' named 'EXER CU_00' with the description 'Set OPERATING and update memory'. The 'Site' is listed as 'PMSCRTP'. To the right, there are fields for 'Process State' (set to 'ACCEPTED') and 'Status' (set to 'INPROG'), both highlighted with a purple oval. Below this, the 'Related Tickets' section shows a table with one row: 'No rows to display...'. Further down, the 'Related Work Orders' section shows a table with one row. The 'Work Order' column contains '1218', and the 'Description' column contains 'Set OPERATING and update memory'. The 'Class' column is 'PMCFGWO', and the 'Status' and 'Relationship' columns are 'WAPPR' and 'FOLLOWUP' respectively. A blue arrow points from the text 'Go To Configuration Processes link from the Detail menu tool' to the 'Detail menu tool' icon (a right-pointing arrow) next to the work order number '1218'.

Related Work Orders	Work Order	Description	Class	Status	Relationship
	1218	Set OPERATING and update memory	PMCFGWO	WAPPR	FOLLOWUP

- To figure out who the configuration process work order has been assigned to, you can use the **Go To Configuration Processes** link from the Detail menu tool (>) next to the work order in

order to navigate to the Configuration Processes application and from there look at the **Plans** tab

The screenshot shows the 'Configuration Processes' application interface. The 'Plans' tab is selected. In the main area, there is a configuration process record for '1218 Set OPERATING and update memory'. The 'Job Plan' field contains 'UPDATECI'. Below this, the 'Audit CIs Details' section shows 'Children of Configuration Pr' and a 'Tasks' section. The 'Tasks' section displays five tasks for 'Configuration Process 1218': 1. Review Update CI request and work plan, 2. Determine requested CI changes, 3. Make CI attribute changes if it is requested, 4. Make CI relationship changes if it is requested, and 5. Send email notification to CI Owner. The 'Owner' column for all tasks is empty, indicated by a grey box with a double arrow icon.

Here you should notice the following:

- No owner has been assigned. This implies that the work order, also known as the Configuration Process, will be assigned to the default group: Configuration Librarians.
 - A default job plan, named UPDATECI, has been assigned to the configuration work order, and the tasks from this job plan have been copied to the work order.
 - The work order contains five tasks, some of which may not apply to the actual situation.
7. For this specific change, you have already identified the requested updates, so you can remove task 20. In addition, you know that there are no relationship changes to be applied, so you can rename task 40 to *Update CI status*.

To perform these modifications, complete these steps in the Tasks for Configuration Process section:

- To mark task 20, *Determine requested CI updates*, for deletion, click the Mark Row for Delete icon (>Delete) at the end of the line representing task 20.
- To rename task 40 simply enter **Update CI status** in the **Summary** field for the task.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
1	10	Review Update CI request and work plan	0:00	WAPPR	>>	>>
2	20	Determine requested CI changes	0:00	WAPPR	>>	>>
3	30	Make CI attribute changes if it is requested	0:00	WAPPR	>>	>>
4	40	Update CI status	0:00	WAPPR	>>	>>
5	50	Send email notification to CI Owner	0:00	WAPPR	>>	>>

- Click the Save icon (Save) in the toolbar so save your modifications.
- To specify who will be responsible for performing the tasks, assign ownership of all four tasks to the group named PMCFGLIB. This is the group of configuration librarians, and by assigning ownership to the entire group, any member of this group can work with this job.

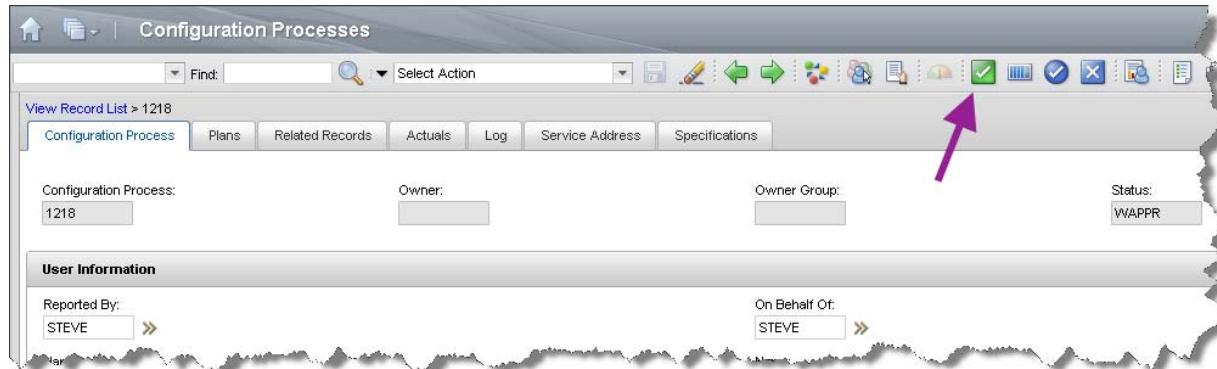
Estimated Duration	Status	Owner	Owner Group
0:00	WAPPR	>>	PMCFGLIB
0:00	WAPPR	>>	PMCFGLIB
0:00	WAPPR	>>	PMCFGLIB
0:00	WAPPR	>>	PMCFGLIB

Click the Save icon (Save) in the toolbar when all four tasks are updated.

- At this point you can approve the request.

In a real-world implementation which follows the processes outlined by ITIL, the configuration manager would have accepted the request. Then a configuration librarian would have reviewed and modified the job plan, which then would have to be approved by the configuration manager. In this exercise you made a shortcut, violating the process so Joeo now approves his own modifications.

To approve the job plan, simply click the **Approve Work Order** icon (✓) in the toolbar.



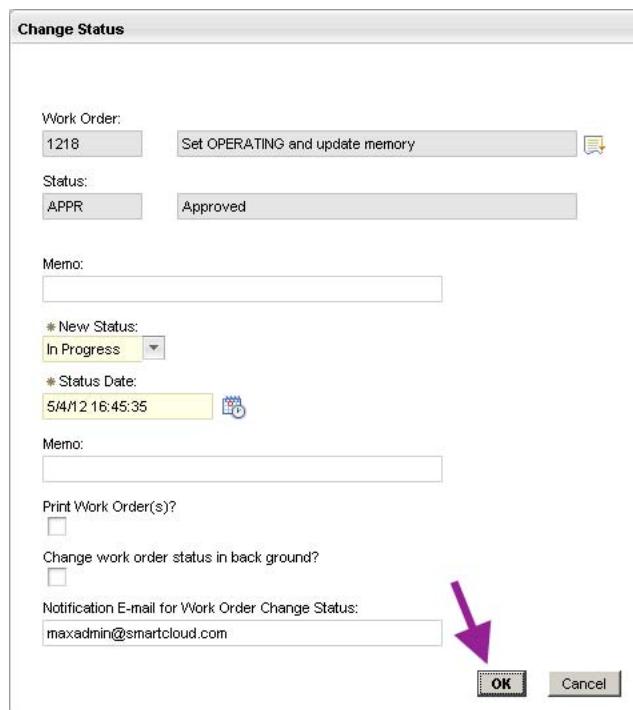
When the Change Status window appears click **OK** to accept the defaults.

Notice that the status changed to Approved, but the statuses of the tasks are still *waiting approval* (WAPPR). The task status will not change until the configuration work order is initiated.

10. You can let the configuration librarian that takes responsibility for the initiating the job, or you can do it immediately. When the job is activated, the status changes to in progress, and tasks with no predecessors are also put in the INPRG status. In this exercise, you, as the configuration manager, initiates the job immediately.

To initiate the job, click the **Initiate Work Order** icon (■) in the toolbar.

When the Change Status window appears, accept the defaults, and click **OK**.



Notice that the work order status changes to *in progress* (INPRG), and in addition, the status of the first two tasks is also changed to INPRG.



Note: When you deleted task 20, you removed the predecessor for task 30. Since it has no predecessors, its status is updated to INPRG. In a real-world scenario, you would have added task 10 as the predecessor for task 30, so task 10 must complete before task 30 can start.

11. Use the *Return* link at the top-right corner of the console to return to the Process Request.



12. Next, the configuration librarian Lou starts working on the job, so use the **Sign Out** link in the header to log off, so you can log in as Lou.

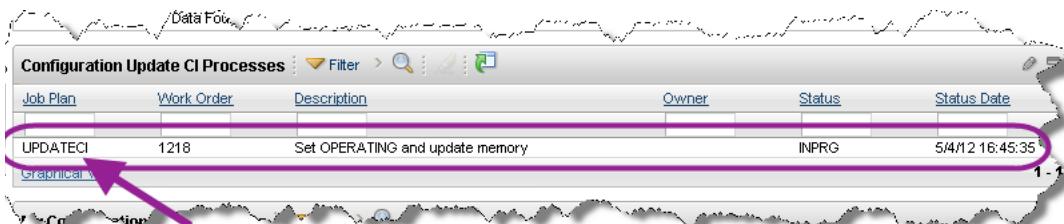


At this point you have accepted and planned the work related to updating the CI information to reflect the changes Steve requested.

Exercise 11. Implementing configuration updates

Now it's time to actually perform the update(s) to the CI specified in the work order, which now is called a configuration CI update process. Complete the following steps to apply the updates.

1. Sign In to the IBM SmartCloud Control Desk 7.5 console as `lou` (password `object00`) and focus on the *Configuration Update CI Processes* section of the Configuration Start Center.



You should see at least one process: the one related to the Configuration Update Request submitted by Steve.

Open the UPDATECI process, in this example work order 1218, by clicking the link in the Configuration Update CI Processes section, and then navigate to the Plans section in the Configuration Processes application. You see that both tasks 10 and 30 have a status of INPRG.

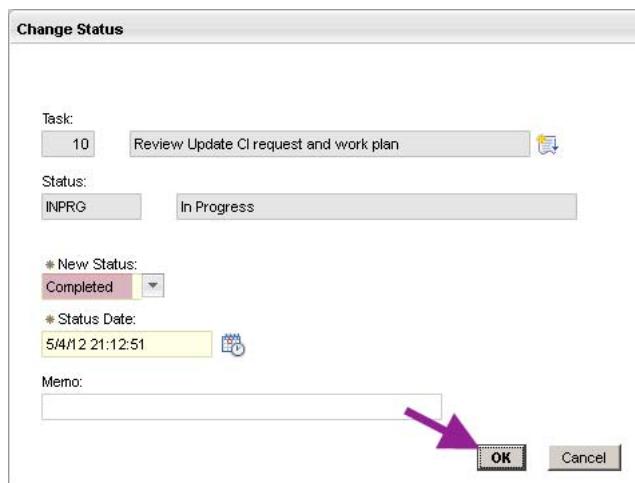
2. Now, to complete the first task, *Review Update CI request and work plan*, open the Specifications tab to see which updates to apply. Notice that besides the normal attributes that apply to the process, you see the COMPUTERSYSTEM_MEMORYSIZE attribute. Make a mental note of the new value that is requested, 8 in this example.

Attribute	Description	Data Type	Alphanumeric Value	Numeric Value	Unit of Measure
CHANGENUM	Change Number	ALN			
CHGRECD	All Updates Recorded	TABLE			
CIOOWNER	Primary CI Owner Person ID	ALN			
REASON	Reason to Update	ALN			
REQNOTE	Request Note	ALN			
COMPUTERSYSTEM_MEMORYSIZE	COMPUTERSYSTEM_MEMORYSIZE	NUMERIC		8.0	GBYTE

You have now familiarized yourself with the request and the work order, so navigate back to the Plans tab, locate task 10, and change the status of the task to COMPLETED by clicking the Change Status tool (a small icon with three colored circles) at the end of the line.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
1	10	Review Update CI request and work plan	0:00	INPRG		PMCFGLIB
3	30	Make CI attribute changes if it is requested	0:00	INPRG		PMCFGLIB
4	40	Update CI status	0:00	WAPPR		PMCFGLIB
5	50	Send email notification to CI Owner	0:00	WAPPR		PMCFGLIB

When the Change Status window appears, select a value of **Completed** for the New Status field, and click **OK**.

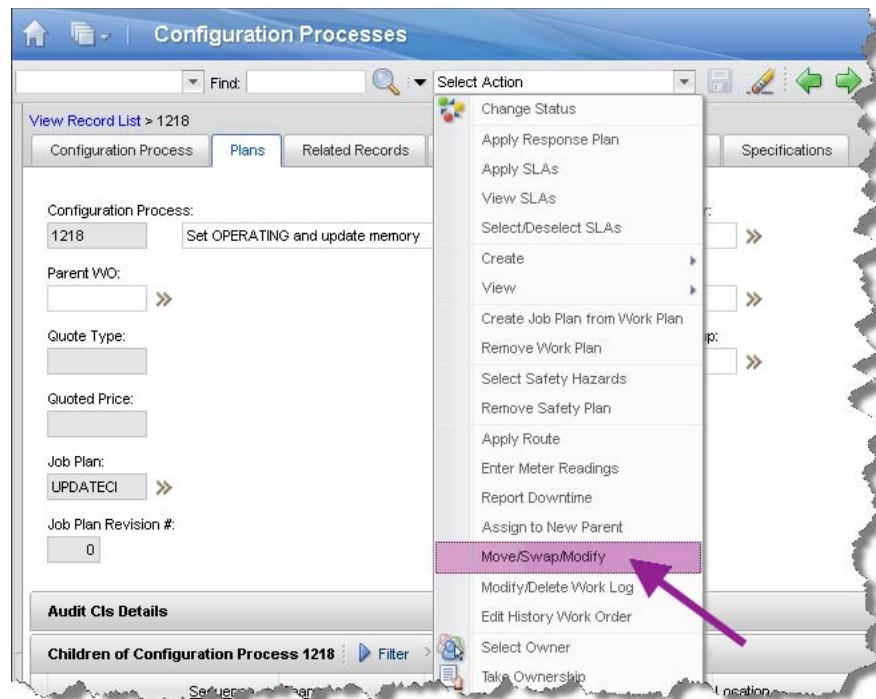


When the Change Status window disappears, you see that the status of the task has been updated, as expected.

3. For the next task, 30: *Make CI attribute changes if it is requested*, you should refer to the Specifications section. Since you already did this, and identified a single change for the CI referenced in the target section of the process, there is no need to it again.

To apply the updates to the CI, you use the Move/Swap/Modify application. Follow these steps to define the modifications:

- a. Activate the **Move/Swap/Modify** application by selecting it from the *Select Action* pull-down menu in the header.

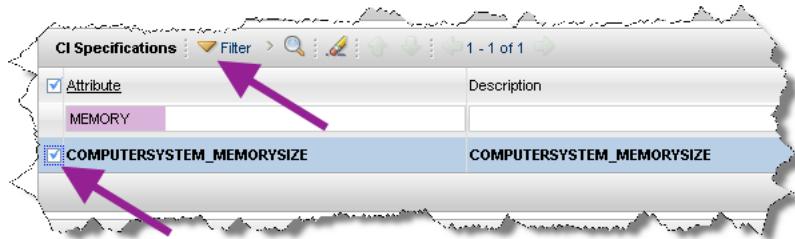


- b. Once the Move/Swap/Modify application opens, use the tabs to navigate to the **Modify > Configuration Item** section.



Notice that the Move/Swap/Modify application very conveniently opens in the context of the CI that was assigned the target of the configuration process.

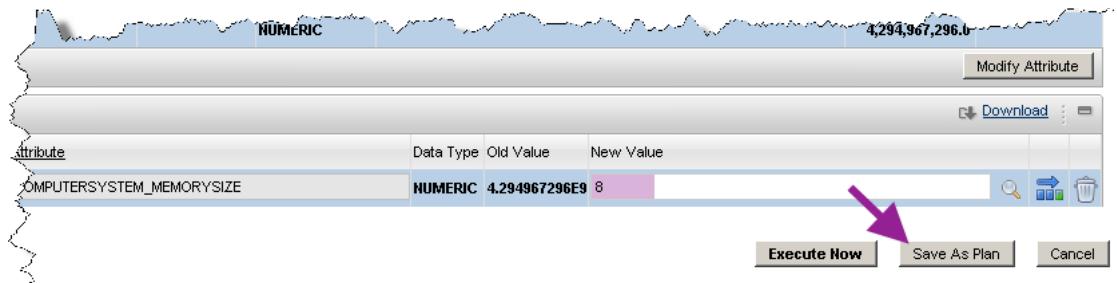
- c. To update the value of the COMPUTERSYSTEM_MEMORYSIZE attribute complete these steps:
- Select the CI for which you want to update the attribute. In this example, that would be the only CI listed: EXERCISE VM 01.
 - In the CI Specifications section, open the filter fields by clicking the Open Filter icon (▶), enter a filter value for the Attribute field of **MEMORY** and press Enter to generate the list of attributes.



- Check the check-box left of the COMPUTERSYSTEM_MEMORYSIZE attribute in order to select it.
- Click **Modify Attribute** to open the *Planned Modifications* section at the bottom of the window.

Configuration Item	Configuration Item Name	Attribute	Data Type	Old Value	New Value
EXERCISE VM 01	EXERCISE VM 01				
		COMPUTERSYSTEM_MEMORYSIZE	NUMERIC	4,294,967,296.0	

- v. Provide a new value of 8 in the **New Value** field, and click **Save As Plan**.



When saving the Move/Swap/Modify plan you are now returned to the Configuration Process dialog, at the point where you left it.



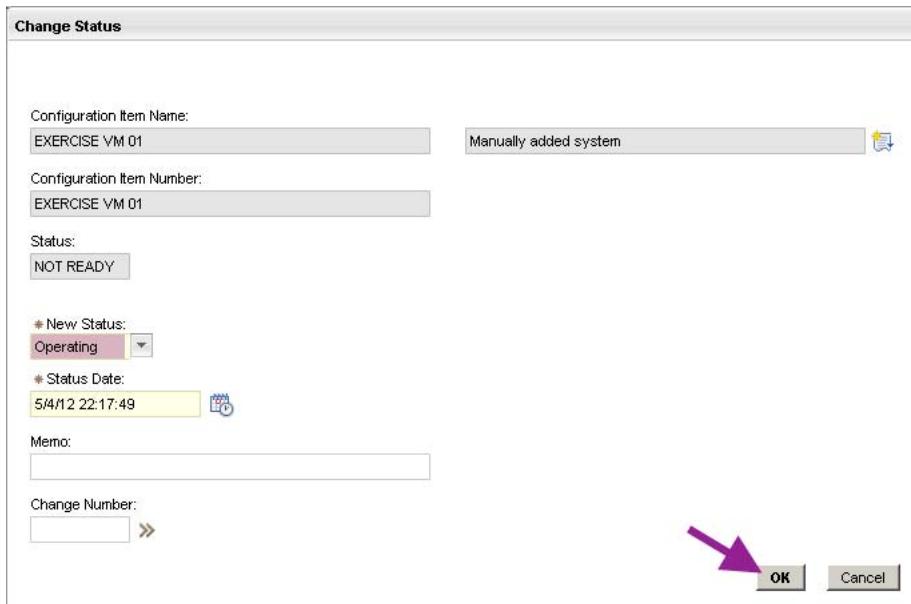
Note: If you had used the Execute Now option instead of Save As Plan, the CI attribute would have been updated immediately. By using Save As Plan option, you postpone the actual update until the point at which the status of the whole configuration CI update process (or work order) changes to **Completed**. This feature is especially important for complex updates that need to be synchronized and applied as a single unit-of-work.

- d. To mark your task as complete, use the tool (a small circular icon with colored dots) at the far right of the line representing the task (30) to change the status to *Completed*.

Notice that task 40, *Update CI status*, now has been started, because it was waiting for the predecessor task (30) to complete.

4. To update the status of the CI, complete these steps:

- a. Navigate to the **Configuration Process** tab, and choose **Go To Configuration Items** from the Detail Menu tool (») next to the **Configuration Item Number** field in the Target CIs section.
- b. When the Configuration Items application opens, use the Change Status icon (info) in the header to set the status of the EXERCISE VM 01 configuration item to Operating.

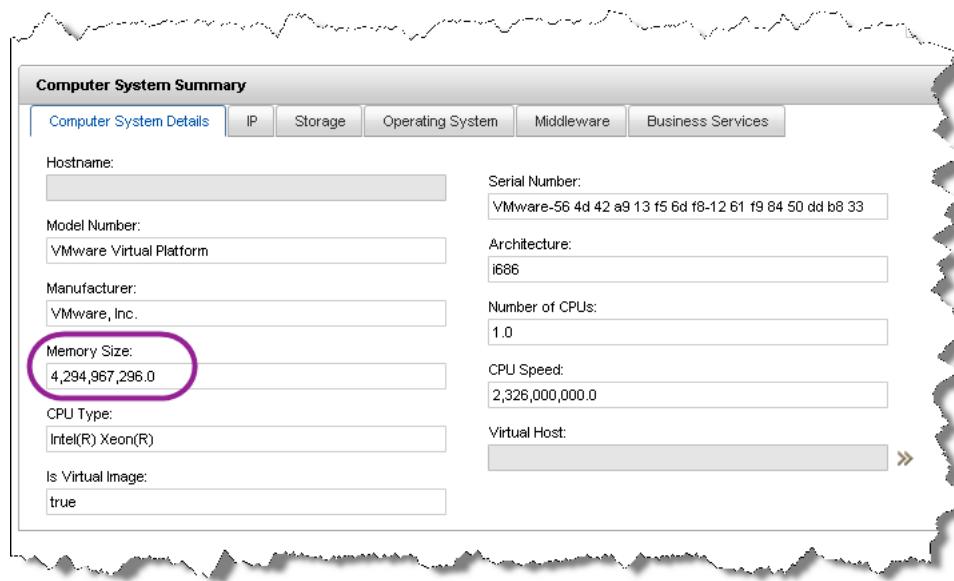


Click **OK** to apply the status change immediately.



Note: You cannot use the Move/Swap/Modify tool to update the status of a CI. You may have noticed the Change Status option when you modified the CI attribute, but this option only applies to assets.

- Before you return to the work order, look at the Computer System Summary section, and verify that the reported memory size still is 4,294,967,296.0.



The screenshot shows the 'Computer System Summary' page. At the top, there are tabs: Computer System Details (selected), IP, Storage, Operating System, Middleware, and Business Services. Below the tabs, there are several input fields:

- Hostname: [redacted]
- Serial Number: VMware-56 4d 42 a9 13 f5 6d f8-12 61 f9 84 50 dd b8 33
- Model Number: VMware Virtual Platform
- Architecture: i686
- Manufacturer: VMware, Inc.
- Memory Size:** 4,294,967,296.0 (This field is circled in red)
- Number of CPUs: 1.0
- CPU Speed: 2,326,000,000.0
- CPU Type: Intel(R) Xeon(R)
- Virtual Host: [redacted] >>
- Is Virtual Image: true

This proves, that the updates you planned in the Move/Swap/Modify tool has not yet been applied.

- Now, use the *Return* link at the top-right corner of the IBM SmartCloud Control Desk 7.5 console to return to the Configuration Processes application.



- You can mark task 40 complete. Open the **Plans** tab, and use the Change Status tool () at the end of the line that represents task 40, Update CI status, to set the status of the task to Completed.
 - Assume that you have sent an email to the CI Owner, and mark the last task (50) as completed. Notice that when all the tasks in the work order have completed, the status of the entire work order is changed to Completed as well. At this time, the attribute modifications you planned using the Move/Swap/Modify tool, will be applied. If you want to, you can open the CI and verify that the value of the COMPUTERSYSTEM_MEMORYSIZE attribute is 8.
- In addition, the status of the Configuration Update Request that Steve submitted, will be set to Resolved, and the state of the process is Completed.
- You have just completed your first configuration CI update process, but how did that affect the related Configuration Update Request?

Click the Home icon (in the Console header to return to the start center, and check the information in the Configuration Process Requests section.

Process Request	Description	Class Structure	Reported By	Reported Date	Site	Process State	Status Date
EXER CU 00	Set OPERATING and update memory	UPDATEREQ	STEVE	5/3/12 17:38:38	PMSCRTP	COMPLETED	5/4/12 22:50:34

Job Plan	Work Order	Description	Owner	Status	Status Date
		No Data Found.			

Job Plan	Work Order	Description	Owner	Status	Status Date
UPDATECI	1218	Set OPERATING and update memory		COMP	5/4/12 22:30:21

As you can see, both the Configuration Process and the Process Request that initiated the update have been set to **COMPLETED**.

8. Use the **Sign Off** link to log off, so another user can access the system.

This completes the exercise related to CI update requests.

Configuration management summary

In these exercises you experienced how the configuration management features of IBM SmartCloud Control Desk 7.5 can help you ensure that the information in the CMDB is accurate and consistent. This is extremely important because your change and release management processes rely heavily on this information. You can argue, that configuration management is the most important IT management process because of the reliance on the CMDB by all the related processes.

During the exercises, you understood the differences between actual and authorized CIs. You created CIs manually, and through promotion of actual CIs, and you learned how the synchronization process updates the authorized CIs with the information from the actual counterparts. You also defined lifecycles and CI status.

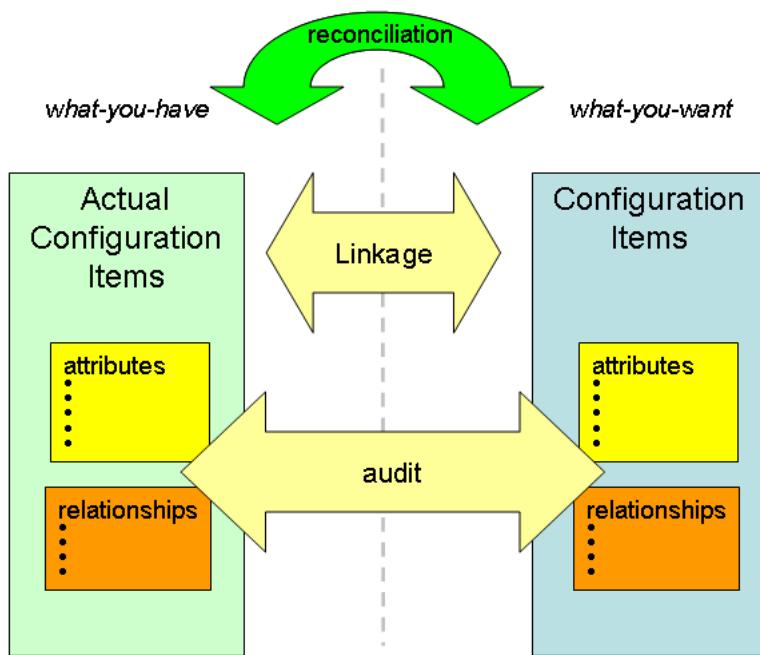


4 Configuration audit process

In the following exercises you will explore how IBM SmartCloud Control Desk supports the ITIL configuration item audit process, which is the primary process that supports the ultimate goal of the configuration management team to ensure the validity of the CMDB.

To help you achieve this goal, IBM SmartCloud Control Desk provides an audit capability that compares the actual CI (discovered) information with the authorized CI (planned) information. This facility builds upon another key capability that is built into IBM SmartCloud Control Desk reconciliation tasks. These tasks are used to identify different representations of the same resource, for example actual CIs and authorized configuration items, by comparing key attributes.

When the reconciliation tasks identify matching pairs of resources, these can automatically be linked, so that the CMDB contains references between them. When this linkage has been established, the audit task can compare all the attributes and relationships that are associated with each of the resources in the linked pair, and identify discrepancies between them.



The results of the audit are provided in a report which must be reviewed by the configuration auditor. When the discrepancies have been analyzed, the configuration auditor typically submits a CI control/update request so the configuration librarian can remedy the issue.

Configuration audits

The purpose of the configuration audit process is to verify that the authorized CI configuration, the planned state, has in fact manifested itself in the actual implementation. Typically, but not always, the audit is requested as part of the validation phase of a change, but naturally it can also be requested as a part of a wall-to-wall inventory exercise, or periodically just to verify that nothing has changed. If discrepancies are found, you have identified changes that were applied outside the control of the change process. These are often referred to as unauthorized changes.

To control which authorized CIs to audit the task used a task filter. The task filter provides information that helps the task identify the authorized CIs either directly, or through association to work orders, service orders, collections or other resources with which CI are associated. If any of the CIs that are identified are top-level resources, the entire hierarchy of promoted CIs is reconciled.

The reconciliation process is based on a cron task that runs periodically. During execution, the task identifies CI pairs by linking authorized CIs to their matching actual CIs using link rule. The link rule specifies attribute values that must be equal to one another in order for the linkage to be established. Once the CIs are linked, the attributes and relationships of the linked CIs are compared, and the result of this comparison is provided as reconciliation results. You can control the comparison by applying comparison rules that govern which attributes to compare, and to validate if they are compatible.

Once the reconciliation results have been produced, the configuration auditor must inspect them, and take action on the discrepancies that are reported. So, the configuration audit process is a two-step process:

- First the parameters required to control the linkage and comparison is defined
- The results must be validated and discrepancies resolved.

To control the reconciliation and auditing, you will work with objects such as task filters, link rules and comparison rules.

When defining reconciliation and auditing parameters you should note the following:

- The configuration audit process can be run against one or more CIs at a time based on the filtering criteria provided for the reconciliation task. The filter defines the subset of CIs that will be included in the analysis. In most cases, the audit will be performed in order to verify that the modifications documented in a change, have been implemented, which is why one of the most common filters used is the change work order ID. Since all the CIs that have been changed as part of the change implementation are tagged as work items for the change, this information can easily be leveraged in the filter to identify all the CIs related to a change.
- Besides providing filtering information to define the scope of the audit report, part of the configuration audit process preparation is to provide *link rules* that define which attributes to use

to identify how authorized CIs are represented by actual CI. Typically this linkage is performed based on the ID of the actual CI (ACTCI) or the combined attributes of a naming rule.



Note: An important, undocumented *feature* of the CI reconciliation is that the linkage is performed from a *top-level* CI. This implies, that if, for example, you want to audit a lower-level CI, you have to identify its top-level parent and make sure that this is assigned through the link rules.

- Once an actual CI has been linked to an authorized CI, a set of comparison rules is used to identify the attributes that should be compared. It will make sense to compare all the attributes defined for the authorized CI (remember that when defining the authorized CI hierarchy, you may have chosen to exclude certain attributes that you have deemed of no interest from a configuration management perspective). However, attributes like LastScanDate, LastChangeDate or ChangedBy will by the sheer nature of the information be different, so if you included these in your authorized CI hierarchy, every CI that has been scanned since it was promoted will fail the audit (discrepancies between the planned and implemented states are identified). To solve this issue, you can define *comparison rules* which specify which actual CI attributes to compare to which authorized CI attributes in order to verify that the attribute values are identical.
- When the reconciliation task has been prepared, a cron task used to create the audit report. This task must be scheduled. In addition, a related escalation must be activated. Because of the uncertainty of the run-length of the cron task, the escalation is used to identify when the audit report has been created, and automatically create a new work order (named AUDIT2) for the configuration auditor in order to review the audit report and resolve discrepancies.

So in summary, the Audit CI process has five steps:

- Create the configuration audit process request.
- Create the audit work order from the request.
- Perform the tasks in the work order to define the reconciliation (filters, and rules), cron tasks and escalation
- Receive notification that the audit occurred,
- Review the data, and resolve the differences.

In the following you will perform all of these steps to audit the EXERCISE VM 01 system that you have been working with. You may recall that you have not only changed a few attributes, but also associated an operating system with the system, and since you did not import fresh discovery data, chances are, that you may find discrepancies between the authorized and actual representation of the system.

Configuration audit requests

Configuration audit requests are the objects that trigger the audit of one or more CIs.

As for all other process requests, the audit request will be reviewed and accepted before the actual execution is driven through the process using a configuration work order which is created when the request is accepted.

As already mentioned, the creation of the configuration audit request would be a natural step of the processing of a change. However, you also use the audit function on a regular basis to identify unauthorized changes. Even though the process serves two different purposes, the steps needed to complete it are similar.

In this exercise, you first, as the change manager, create a quick standard change that represents the installation of the operating system on the EXERCISE VM 01 system. When the change is completed, you request the audit to verify if it was applied correctly.

Then, you log in as the configuration auditor to process the audit request.

Exercise 1. Create a standard change

Later on you will work with changes in detail, but to have a change for which you can request auditing you must create one now. The change you create is a simple standard change, and the main purpose of this exercise is for you to understand how the change management team can create new CIs as part of the change process, as well as experiencing how audit requests for a specific change can be submitted.

The standard you create is supposed to add an operating system to the EXERCISE VM 01 computer system. To specify the desired configuration attributes, a new CI representing the operating system must be created, and related to the EXERCISE VM 01 computer system. In this example, the new CI is created by the change manager, but it could just as well have been created in advance by a configuration librarian.

When creating the change, you use the operating system CI as the primary CI for the change, but also reference the computer system on which the operating system is installed. You do this in part because the computer system is also affected by the change, but also because the change must contain at least one top-level CI in order to successfully request a configuration audit for the change.

4 Configuration audit process

Exercise 1. Create a standard change

To create the change, and the new operating system CI complete these steps:

1. Log in to the IBM SmartCloud Control Desk Console as the user Lucy (password object00), and open the Change Manager start center.
2. Click on the **New Change** Quick Insert link to create a new change.



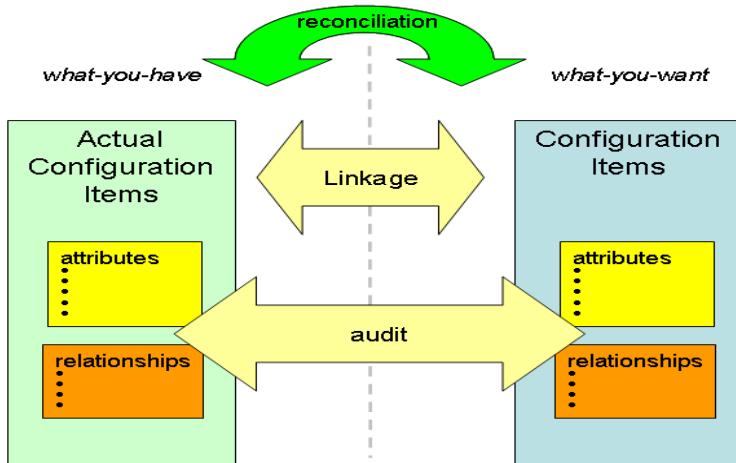
3. When the Changes application launches, you must specify the change. Complete these steps:
- Supply the following information in the top and Change Details section:

Change	EXER_SC_00
Summary	Install operating system on EXERCISE VM 01
Details	Install CentOS 5.5
Change Type	Standard

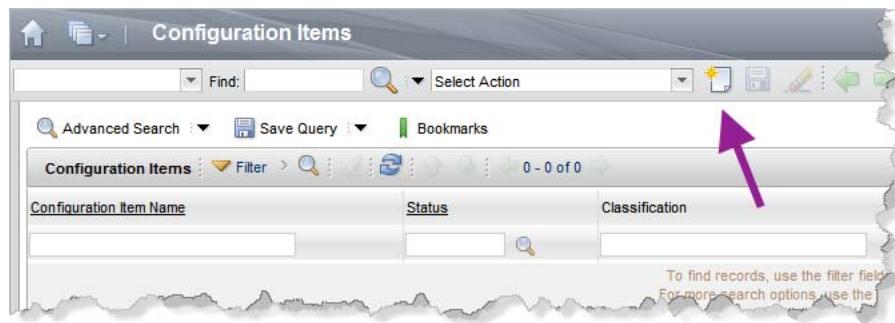
The screenshot shows the 'Changes' application window. At the top, there's a toolbar with 'Find:' and 'Select Action' buttons. Below the toolbar is a navigation bar with tabs: Change, Assessments, Impacts, Authorization, Schedule, Related Records, Actuals, and Log. The 'Change' tab is selected. A 'Progress Map' section shows a linear flow from 'ACC_CAT' to 'CLOSE' through 'IMPL', 'INPRG', and 'COMP'. In the main content area, there are several input fields:

- * Change: EXER_SC_00
- Status: WAPPR
- Owner: [empty]
- Owner Group: [empty]
- Summary: Install operating system on EXERCISE VM 01
- Details: Install CentOS 5.5
- Impact: 3
- Urgency: 4
- Priority: [empty]
- Risk: [empty]
- Change Type: Standard
- Classification: [empty]
- Class Description: [empty]

- b. To create the new CI for the operating system, scroll down a little until you see the Primary Target section. Use the Detail Menu tool (») next to the **Configuration Item Number** field in the Primary Target section, to Go To Configuration Items.



- c. Perform these tasks to add an operating system CI and relate it to the EXERCISE VM 01 computer system:
- From the Configuration Items application, click the New CI icon (New) in the toolbar.

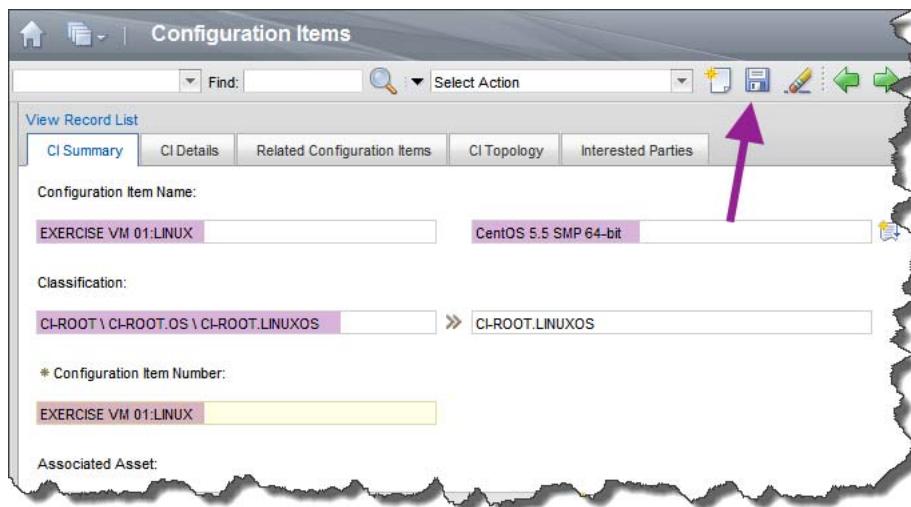


- In the CI Summary tab, provide the following information:

Configuration Item Name	EXERCISE VM 01:LINUX
Description	CentOS 5.5 SMP 64-bit
Classification	CI - ROOT.LINUXOS
Configuration Item Number	EXERCISE VM 01:LINUX

When you select the classification, follow this path to locate the correct classification:

CI - ROOT:CI - ROOT
CI - ROOT.OS:CI - ROOT.OS
CI - ROOT:LINUXOS:CI - ROOT.LINUXOS

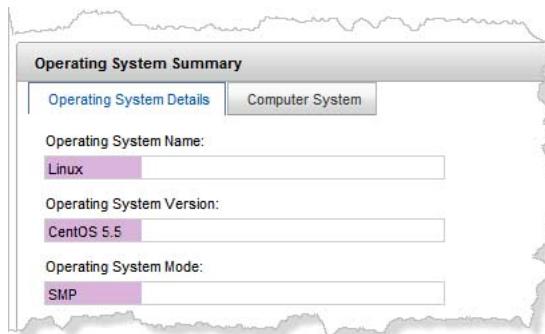


Click the Save icon (in the toolbar to save the new CI.

When the operating system CI is created, the attributes are populated with default values as defined in the CI classification hierarchy, along with the relationships defined in the promotion scope.

- iii. Notice the Operating System Summary section that appears at the bottom of the **CI Summary** tab. To provide values for the attributes that support the naming rules for operation systems, fill the fields in the **Operating System Details** tab according to the following list:

Operating System Name	Linux
Operating System Version	CentOS 5.5
Operating System Mode	SMP



4 Configuration audit process

Exercise 1. Create a standard change

- iv. To relate the new CI to a computer system, open the main **Related Configuration Items** tab, and click **New Row** to create a new relationship. In the Relationship Details section use the Detail Menu tool (**>>**) next to the relevant fields to provide these values:

Relation

RELATION.RUNSON

Target Configuration Item Number

EXERCISE VM 01

The screenshot shows the 'Configuration Items' interface with the 'Related Configuration Items' tab selected. The 'Source Configuration Item Name' field contains 'EXERCISE VM 01:LINUX'. The 'Relation' field contains 'RELATION.INSTALLEDON'. The 'Target Configuration Item Name' field contains 'EXERCISE VM 01'. The 'Classification' field contains 'CI-ROOT \ CI-ROOT.OS \ CI-ROOT.LINUXOS'. There are three purple arrows pointing to the 'Relation' field, the 'Target Configuration Item Name' field, and the 'Classification' field.

Notice how the information in the other fields is automatically populated when you as you provide values for the relation and target fields.

- v. Click **New Row** again and create another relationship. Use the RELATION.RUNSON as the value for the **Relation** field, and EXERCISE VM 01 as the value for the **Target Configuration Item Name** field.

When you are done, you see two relationships:

Source Configuration Item	Classification	Relation	Target Configuration Item
EXERCISE VM 01:LINUX	CI-ROOT \ CI-ROOT.OS \ CI-ROOT.LINUXOS	RELATION.INSTALLEDON	EXERCISE VM 01
EXERCISE VM 01:LINUX	CI-ROOT \ CI-ROOT.OS \ CI-ROOT.LINUXOS	RELATION.RUNSON	EXERCISE VM 01

When you are done, click the Save icon (in the toolbar to store the relationships.

- vi. If you navigate the **CI Summary** tab, and then open the Computer **System** tab in the Operating System Summary section, you see how the relationships are used to identify the computer system that hosts the operating system.

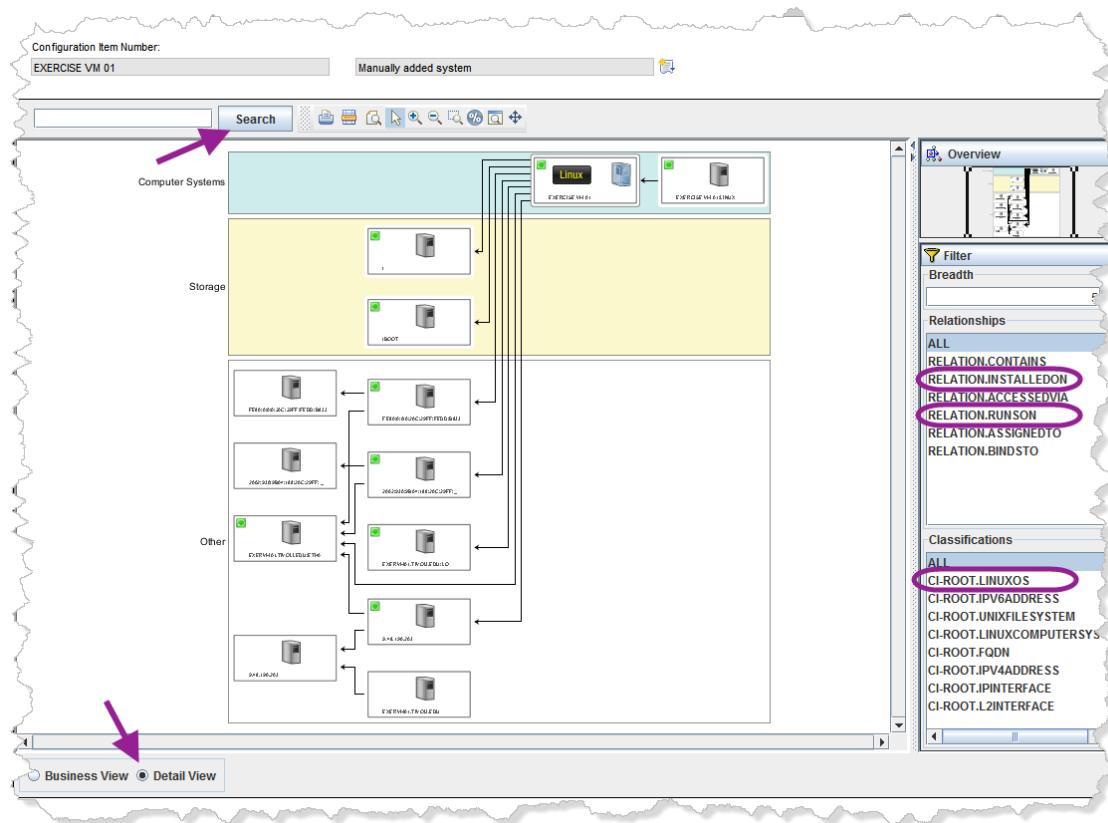
The screenshot shows the 'Operating System Summary' page with the 'Computer System' tab selected. A purple arrow points to the 'Computer System' tab tab itself. The form contains the following fields:

Hostname:	exervm01.tivlab.austin.ibm.com	Serial Number:	VMware-56 4d 42 a9 13 f5 6d f8-12 61 f9 84 50 dd b8 33
Model Number:	VMware Virtual Platform	Architecture:	i686
Manufacturer:	VMware, Inc.	Number of CPUs:	1.0
Memory Size:	8.0	CPU Speed:	2,326,000,000.0
CPU Type:	Intel(R) Xeon(R)	Virtual Host:	(empty)
Is Virtual Image:	TRUE	Description:	Manually added system
Computer System CI:	EXERCISE VM 01		

4 Configuration audit process

Exercise 1. Create a standard change

- vii. To see if anything has happened to the topology, open the **CI Topology** tab. When the Business View has rendered, click **Detail View** to see all the details.



Notice what happened in the Computer Systems swimlane.

- Are any CI-ROOT.LINUXOS resources represented in the topology?
- Do you see any INSTALLEDON or RUNSON relationships in the topology?

Try using the Search facility to find any resources with a name that contains the string LINUX.

You have successfully added an operating system CI to the planned environment, and related it to a computer system.

- viii. You can now return to the change to complete the specification using the newly created CI. Click **Return With Value** in the upper right corner of the header to add the EXERCISE VM 01:LINUX CI as the primary target for the change.



- d. Notice how the fields in the Primary Target section of the change have been populated.

Primary Target

The target that is the main focus of this Change Request

Configuration Item: EXERCISE VM 01:LINUX ➤ CentOS 5.5 SMP 64-bit

Configuration Item Name: EXERCISE VM 01:LINUX

CI Business Impact:

Outage: Offline

Target Description:

Pay attention to the values in the **Business Impact** and **Outage** fields. These are used to provide information related to the importance of the change to the business, and the nature of the service disruption of the primary CI caused by the change.

For this standard change to a test system, accept the default values.

- e. Scroll down again, until you see the Additional Targets section. Use the **Select > CIs > Select Value** option to select the EXERCISE VM 01 configuration item as an additional target.

Asset	Configuration Item Name	Configuration Item Number	Target Description	Business Impact
EXERCISE VM 01	EXERCISE VM 01			

Source CIs: 0 - 0 of 0

Software Image CIs that will be installed by this Change Request

CI number Configuration Item Name Classification ...No rows to display...

Select Value
Classification
Attribute

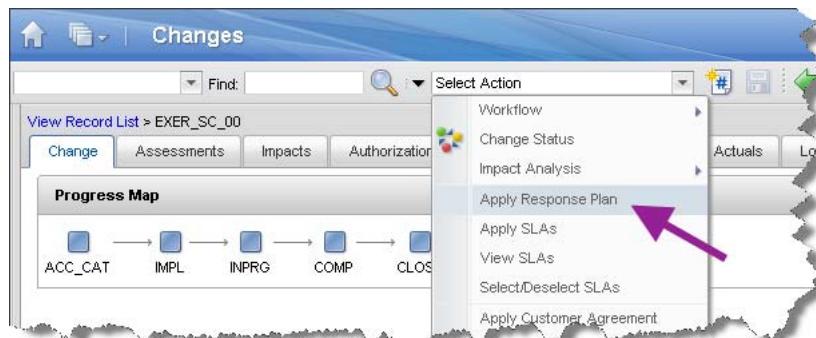
Assets
Locations
CIs
From Routes
From Collections
From WO Hierarchies and Relationships
Select
Clear All
New Row

- f. To save the change, click the Save icon (floppy disk) in the toolbar.

4 Configuration audit process

Exercise 1. Create a standard change

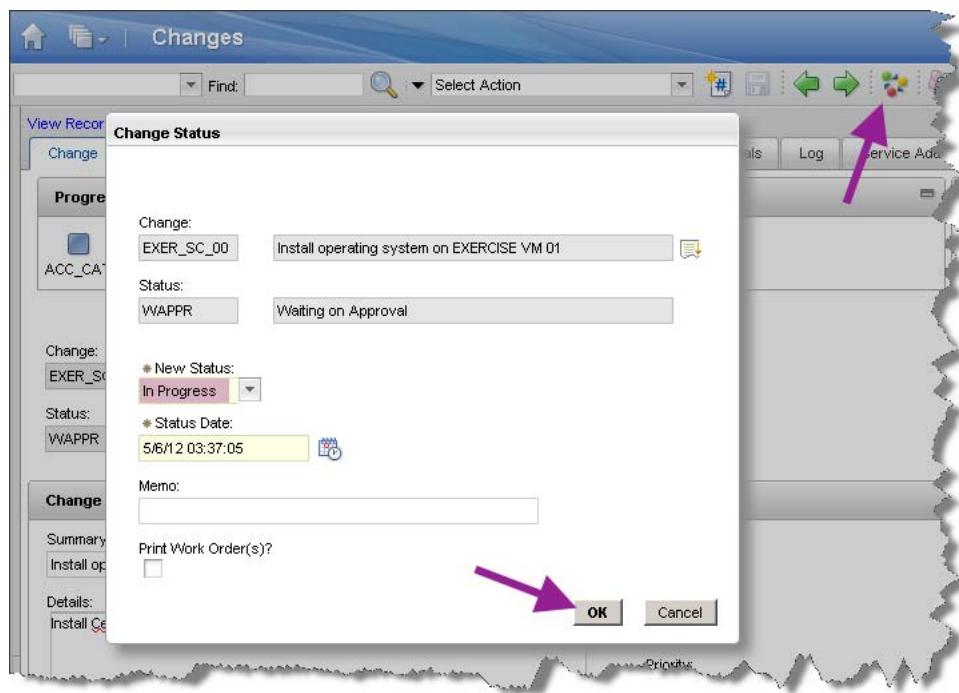
- g. Assign standard tasks to the change, by invoking the **Apply Response Plan** from the Select Action drop-down menu.



By applying the default response plan, you populate standard values into the change, including the default job plan, which only contains a single task.

- h. The purpose of creating the change is, for this exercise, to create the basis for submitting an audit request, so you take a short-cut to complete the change.

Use the Change Status icon (●) in the toolbar to set the status of the change to **In Progress**.



- i. To complete the implementation task that was added when you applied the response plan, navigate to the **Schedule** tab, scroll down until you see the Tasks for Change EXER_SC_00 section. Then, use the Change Status icon (●) at the end of the line that represents task 20,

Perform Standard Change, to change the status of the task to COMPLETED.

The screenshot shows a table titled 'Tasks for Change EXER_SC_00'. The table has columns: Sequence, Task, Summary, Estimated Duration, Status, Owner, and Owner Group. There is one row with Sequence 10, Task 'Perform Standard Change', Estimated Duration 1:00, Status INPRG, Owner PMCHGIMP, and Owner Group PMCHGIMP. The 'New Activity' button is highlighted with a purple arrow.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
10	20	Perform Standard Change	1:00	INPRG	PMCHGIMP	PMCHGIMP

If you scroll back to the top of the Changes application, you see that the status of the change has been updated to COMPLETED.

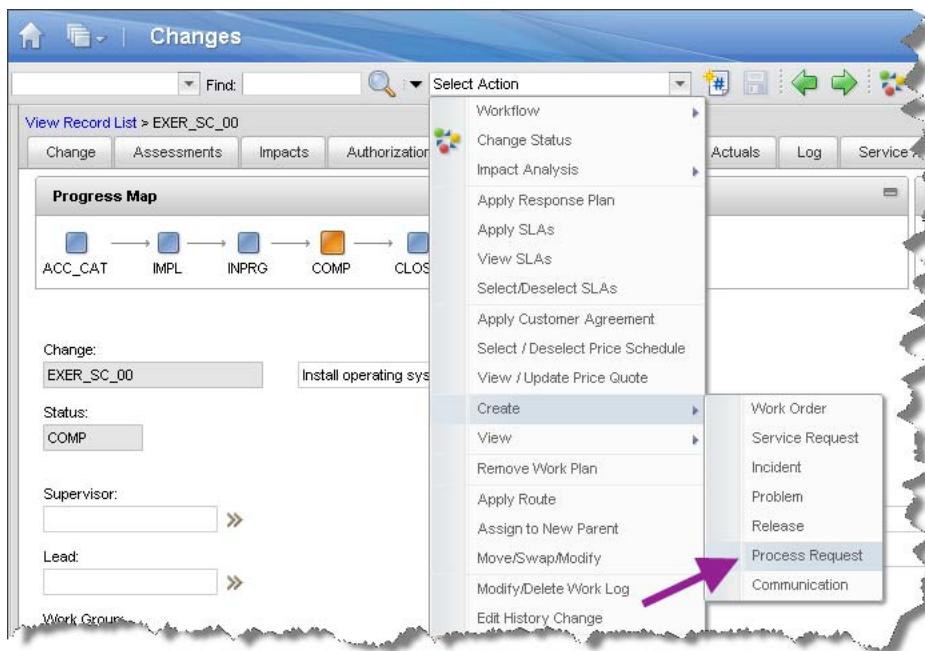
By creating the standard change for installation of an operating system on the EXERCISE VM 01 system, you have created a change for which you can request auditing. The auditing ensures, when the actual CI details have been discovered and loaded into the CMDB, that the implementation of the operating system has been performed in accordance with the plan, as it is specified in the attribute details of the authorized CIs.

This is the point where you would submit the audit request, so the change can be audited before you close it.

Exercise 2. Submit an audit request from a change

Now, to submit a configuration audit request for the EXER_SC_00 change, complete the following steps:

1. Use the **Create > Process Request** from the Select Action drop-down menu to launch the Process Requests application.



2. When the Process Requests application opens, notice that the request number has been automatically generated, and that the values for the **Process Manager Type** field have been pre-populated with a value of **Configuration**.

To specifically request an audit, and provide a reference to the change, complete these steps:

- a. Enter a meaningful description in the **Description** field. For example:

Audit OS Installation on EXERCISE VM 01

- b. Scroll down and locate the Request Classification Details section. Here you must provide this value:

The screenshot shows a 'Request Classification Details' section. On the left, there is a dropdown menu labeled 'Classification' with 'PMCFGAR' selected. To the right, under 'Class Description', it says 'Cls Configuration Audit Request'. Below this, there is a table titled 'Classification Attributes' with one row visible.

When you press the Tab key twice to leave the fields related to the classification, you notice that the Classification Attributes table is populated, based on the classification you selected.

- c. The attributes in the Classification Attributes section are used to instruct the configuration audit process to use the information from the change. To reference the current change, set the value for the CHANGENUM attribute to the change number you want audited:

The screenshot shows a 'Classification Attributes' table. A row for 'CHANGENUM' is highlighted with a red circle. The 'Value' column for this row contains 'EXER_SC_00'. There are other rows for attributes like COWNER, REPTFREQ, REQNOTE, REQSCNTM, and SCHSTRTM, each with a magnifying glass icon for details.

To open the attribute details, so you can provide a value, click the View Details icon (▶) to the left of the attribute for which to want to update the value.

- d. When you are done, click the Save icon (💾) in the toolbar to store your request.
3. You are ready to submit the request. Click the **Submit** icon (✚) in the toolbar to send the request to the configuration management team.

Notice that when the process has been submitted, the EXERCISE VM 01 computer system CI has been added as a Target CI section at the bottom of the audit request.

The screenshot shows a 'Target CI' section. It lists one item: 'EXERCISE VM 01' under the 'Asset' column. This row is circled in red.



Important: If you recall, the primary target of the change is the operating system CI, and the computer system CI is an additional target. When the audit request is submitted, and a change number is specified, the primary and additional target CIs of the change are copied to the Target CIs section in the request. However, **only** CIs that at the time of submittal are linked to actual CIs, will be copied, and additional targets specified for change tasks, are ignored. The implication of this behavior is, that in the current example only the EXERCISE VM 01 computer system CI appear in the Target CIs section of the request, because at this point you have not yet discovered, imported, and linked the new EXERCISE VM01:LINUX operating system CI.

Lucy has complete her part of the work. A change was processed, and an audit of the changes that were part of the change has been requested. All Lucy needs to do now, is to wait for the configuration management team to perform the audit, and provide the results.

4. Lucy can now sign off, so the configuration auditor can log in. Click the **Sign Out** link in the header.



At this point you are ready to start processing the audit request, but will you be working on the correct data?

Discovering changes

Because you have just completed a change, it would be fair to assume, that modifications have been applied to one or more resources within your IT infrastructure. Somehow you must find a way to discover the current configurations, and load them into the CMDB as updates to the actual CI resource hierarchy.

Typically, you discover IT configurations and relationships with Tivoli Application Dependency Discovery Manager (TADDM) and load actual CIs into the CMDB through the IBM Tivoli Integration Composer (ITIC) tool. However, in the exercise environment there is no active TADDM system, and it would not have helped since the change you completed used non-existing systems.

To simulate discovery and import of the new operating system that supposedly has been installed when the change implementation completed, you can use the import facility. This allows you to import actual CI definitions, including relationships, from an external file. For these exercises, an xml file that contains the operating system definitions has been prepared, so you can simulate the import of new discovery data.

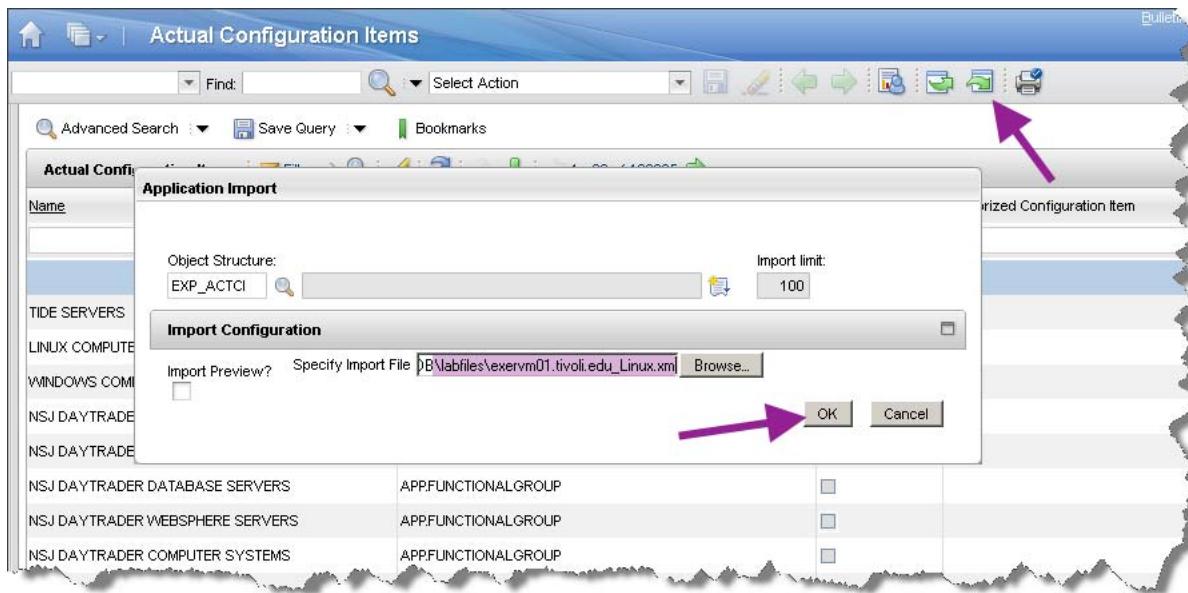
Complete these steps to import the actual CI definitions for the new EXERVM01.TIVOLI.EDU operating system instance and build the relationships needed to relate the operating system resource to the existing EXERVM01.TIVOLI.EDU computer system:

1. Log in as the system administrator, `maxadmin`, using password of `object00`.
2. Navigate to the Actual Configuration Items application by clicking the Go To (icon in the header, and selecting **IT Infrastructure > Actual Configuration Items**.

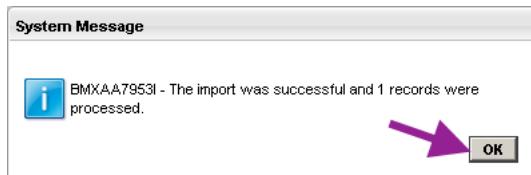
4 Configuration audit process

Discovering changes

- Click the Application Import icon (to start the import. When prompted, specify the file E:\LabFiles\CCMDB\config\exervm01.tivoli.edu_Linux.xml and press OK to import the file.

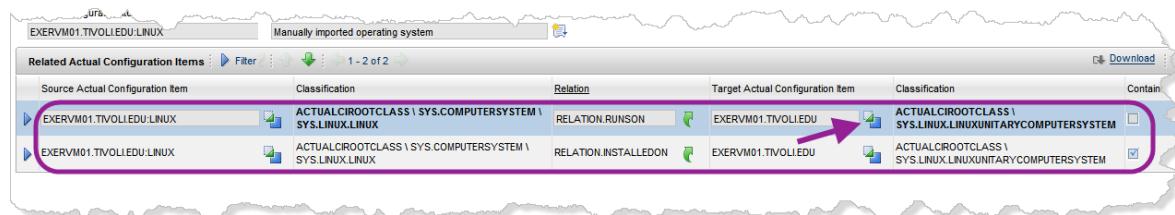


- When the import has completed, you are notified about the results:



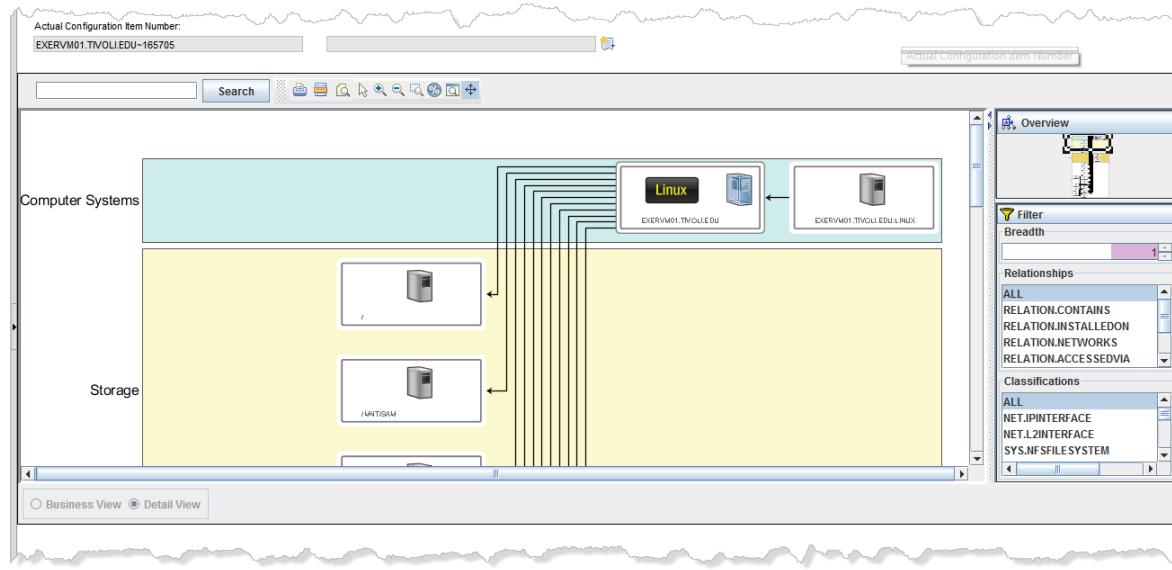
Press OK to dismiss the confirmation message.

- To verify that the operating system actual CI was created and linked to the EXERVM01.TIVOLI.EDU computer system CI, complete these steps:
 - Load the EXERVM01.TIVOLI.EDU:LINUX CI into the Actual Configuration Items application. Notice that the classification of the CI is SYS.LINUX.LINUX.
 - Open the **Related Actual Configuration Items** tab, and verify that you see both an RELATIO.INSTALLEDON and RELATION.RUNSON relationship from the EXERVM01.TIVOLI.EDU:LINUX CI to the EXERVM01.TIVOLI.EDU CI:



- To move to the newly imported resource, click the Move To icon (next to the computer system CI. Do you recognize the relationships at the top of the list?

- d. You can also view the CI Topology. To focus on the newly imported operating system and its relationship, set the breadth to 1 and look in the Computer Systems swimlane.



It looks as if the import produced the expected results.

6. To allow the configuration auditor to log in and process the audit request, use the Sign Out link in the header.



You have just simulated the collection of the latest configuration information for the resources that were part of the change for which a configuration audit was requested. At last, you are ready to process the request.

Exercise 3. Audit request processing

Configuration auditing is the responsibility of the configuration auditor. Remember, that ITIL prescribes division of responsibility, so the configuration librarians, who are in charge of performing configuration updates, should not perform the auditing of their own work. On the same note, configuration managers are responsible for approving requests.

In this exercise, however, you cheat and let the configuration auditor approve the request. You do this to avoid having to log in and out several times to perform a simple action. Granger, the

4 Configuration audit process

Exercise 3. Audit request processing

configuration auditor, is authorized to perform all the tasks related to configuration audit. Naturally, this might not be the case in a real-life scenario.

1. Log in to the IBM SmartCloud Control Desk Console as the user Granger (password object00), and open the Configuration Auditor start center.
2. In the start center, focus on the section named Configuration Process Requests, and notice that Lucy's request has been received.

Process Request	Description	Class Structure	Reported By	Reported Date	Site	Process State	Status Date
PR1027	Audit OS Installation on EXERCISE VM 01 EXERCISE VM 01 Set OPERATING and update memory	AUDITREQ	LUCY	5/8/12 13:59:19	PMSCRTP	SUBMITTED	5/8/12 14:03:44
-70		UPDATEREQ	STEVE	5/9/12 17:30:38	PMSCRTF	COMPLETED	5/9/12 22:30:34

To open the request, click the link.

3. In a real-life scenario, your process would most likely need to have a configuration manager accept the request, before it can be processed by the configuration auditor. For this exercise, you will let the configuration auditor accept the request.

To accept the request, click the Accept icon () in the toolbar to start the processing of the request immediately.

Process Request	Owner:	Owner Group:	Process State:
PR1027			SUBMITTED

User Information

Requestor: LUCY

Note the new state of the request. It has changed from SUBMITTED to ACCEPTED, and the status will have changed from QUEUED to INPROG. This indicates that the audit request is now awaiting processing by the configuration auditor, who happens to be Granger (your current user).

4. As a result of the acceptance, a new work order has been created. A default job plan named AUDITCI is cloned to the work order, and the work order is automatically assigned to the configuration auditor. To make sure that the configuration work order was created, open the **Related Records** tab, and review the work order of class PMCFGWO (work order number

1250 in the example below). In addition, even though the request is accepted, the work order is still in its initial state: *Waiting Approval* (WAPPR).

The screenshot shows the 'Process Requests' interface with the following details:

- View Record List > PR1027**
- Process Request:** PR1027, Description: Audit OS Installation on EXERCISE VM 01
- Site:** PMSCRTP
- Process State:** ACCEPTED
- Status:** INPROG
- Related Tickets:** 0 - 0 of 0
- Related Work Orders:** 1 - 2 of 2

Work Order	Description	Class	Status	Relationship
EXER_SC_00	Install operating system on EXERCISE VM 01	CHANGE	COMP	ORIGINATOR
1250	Audit OS Installation on EXERCISE VM 01	PMCFGWO	WAPPR	FOLLOWUP
- Related External Links:** 0 - 0 of 0

A purple arrow points to the 'Process Request' tab at the top left. A red circle highlights the 'FOLLOWUP' status of the second work order.

You should notice, that because the audit request was generated from a change, the change has also been associated with the request as the originator. However, if the CHANGENUM attribute you specified when creating the request is different from change from which you generated the request, the referenced change is not related to the request.

You are now ready to start the execution of the activities and tasks related to the audit work order.

Configuration audit work order processing

The processing of the configuration audit (AUDITCI) work order is similar to that of other work orders. The work order contains a number of tasks which, upon approval, will be executed in sequence.

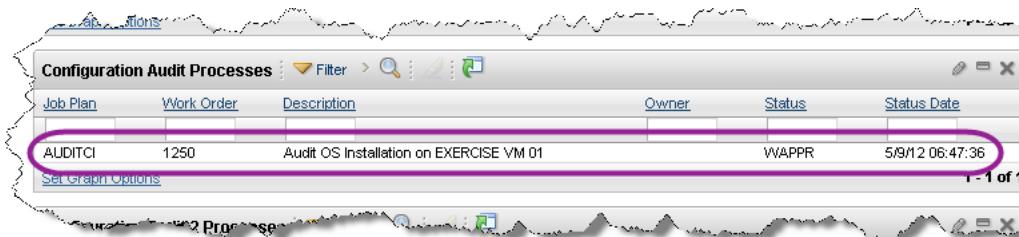
Contrary to most other processes you have been working with up till now, the purpose of the configuration audit work order is to create the individual IBM SmartCloud Control Desk definitions that in conjunction perform the audit. The tasks in the AUDITCI work plan take you through the definition of a reconciliation task, setup and scheduling of a cron task, and creation and scheduling of an escalation that controls the post-processing of the task execution.

If the reconciliation identifies discrepancies between the actual and authorized CI attributes, the escalation will automatically create a second audit work order (AUDITCI2) which is used by the configuration auditor to resolve the discrepancies.

Exercise 4. Audit work order approval

The first thing you need to consider for the configuration audit work order is the approval. When the request was accepted, the configuration audit work order was created, but it needs to be approved before you can work with it. Complete the following steps to do so:

1. From Granger's *Configuration Auditor* start center, locate the configuration audit work order that has just been created (1250 in this example) in the Configuration Audit Processes section. To open it., simply click the link.



Job Plan	Work Order	Description	Owner	Status	Status Date
AUDITCI	1250	Audit OS Installation on EXERCISE VM 01	VWAPPR	Approved	5/9/12 06:47:36

- To check if the job plan was successfully applied, navigate to the **Plans** tab, locate Tasks for Configuration Process section, and verify that four tasks have been applied. These were applied by a response plan when the request was accepted.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
1	10	Review Audit CI request and work plan	0:00	WAPPR		
2	20	Define the reconciliation, define and activate the cron task	0:00	WAPPR		
3	30	Define and activate the escalation	0:00	WAPPR		
4	40	Send the email notification to CI Owner	0:00	WAPPR		

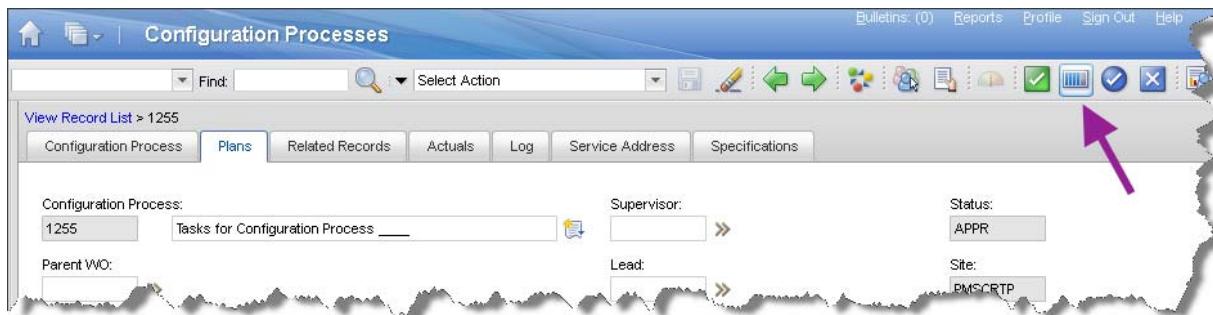
Familiarize yourself with the job plan. Since the audit work order has not yet been started, all the tasks are awaiting approval.

- To approve the configuration audit work order, click the Approve icon () on the toolbar. When the Change Status window appears, click **OK** to accept the defaults.
This will change the status of the work order to *Approved*.
- To assign responsibility for the execution of the tasks in the work order, update the *Owner* field of each task to *Granger*. This will ensure that Granger will see the tasks in the *My Configuration Process Tasks* section of the Configuration Auditor start center as the work order processing progresses.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
1	10	Review Audit CI request and work plan	0:00	WAPPR	GRANGER	
2	20	Define the reconciliation, define and activate the cron task	0:00	WAPPR	GRANGER	
3	30	Define and activate the escalation	0:00	WAPPR	GRANGER	
4	40	Send the email notification to CI Owner	0:00	WAPPR	GRANGER	

Make sure that you save the work order by clicking the Save icon () in the toolbar.

5. To initiate the processing, change the status of the work order to *In Progress* using the Initiate Work Order icon (blue square) in the toolbar. This will change the status of the work order to In Progress.



When you see the Change Status window, accept the default values, and click **OK**.

You have now approved and started the configuration audit work order.

Exercise 5. Audit process execution

Now it is finally time to perform the tasks in the work order one after the other.

As you may recall, from looking at the job plan, the configuration auditor must create a new reconciliation task, and the related cron task instance to run it. During specification of the reconciliation task the following resources can be associated with the task:

Link Rules	Specifies the types of resources to reconcile, and the attributes, used to link one type of resource to the other.
	In this context, the link rule will specify that you want to reconcile CIs and actual CIs, and use the configuration number to link authorized to actual resources.
Task Filter	Specifies which source CIs, or classifications of CI to include the task. The included CIs must be top-level CIs
	In this context, the task filter specifies that you will only reconcile the top-level CIs that were included in the change.
Comparison Rules	Rules that govern how to compare resources that are linked, to mark them as either identical or not identical.
	In this context, the comparison rules filter out certain attributes, for example GUID, and LastScannedDate, to compare only attributes that should have the same value in both of the linked resources.
Cron task	A background job that is scheduled to run according to a specific schedule. Each sub cron task executes a specific reconciliation task.
	In this context, the cron task instance must execute the reconciliation task you create, once.

Escalation

A trigger that looks for a specific set of conditions and performs an action when the condition is true.

In this context, the escalation looks for not identical status for CIs related to the actual work order, and if true, assigns a new work order to the configuration auditor in order for the auditor to review the reconciliation results.

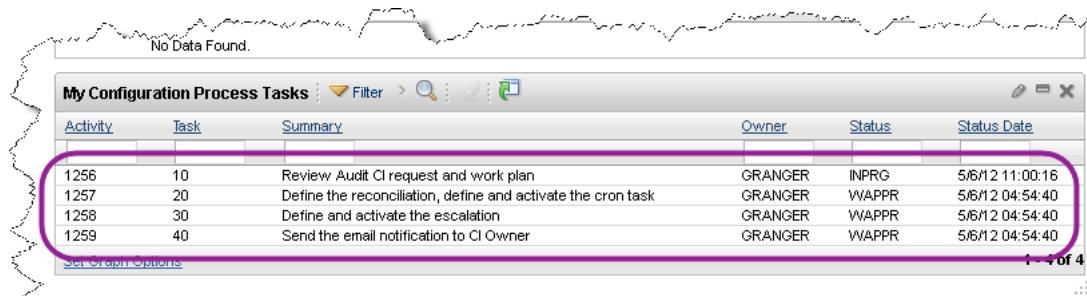
You are now ready to execute the individual tasks in the configuration audit work order one at a time.

Review configuration audit request and work plan

The first task in the configuration audit work order is intended to allow the configuration auditor to review and modify the plan, assign ownerships, and optionally add or remove tasks.

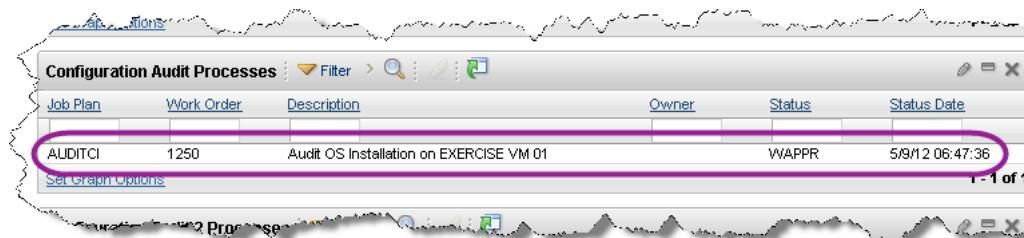
To complete this task, perform the following steps:

1. Click the Home icon () in the header of the IBM SmartCloud Control Desk console, to go back to Grangers start center.
2. In the Configuration Auditor start center locate the My Configuration Process Tasks section and notice which task has been assigned to Granger.



Activity	Task	Summary	Owner	Status	Status Date
1256	10	Review Audit CI request and work plan	GRANGER	INPRG	5/6/12 11:00:16
1257	20	Define the reconciliation, define and activate the cron task	GRANGER	WAPPR	5/6/12 04:54:40
1258	30	Define and activate the escalation	GRANGER	WAPPR	5/6/12 04:54:40
1259	40	Send the email notification to CI Owner	GRANGER	WAPPR	5/6/12 04:54:40

3. Since Granger has been assigned ownership of all the tasks for the configuration audit work order, he decides to use the AUDITCI work order itself as the *launch pad* for the work that has to be done. Instead of working with the tasks one-by-one, open the configuration audit work order (1250 in this example) from the Configuration Audit Processes section.



Job Plan	Work Order	Description	Owner	Status	Status Date
AUDITCI	1250	Audit OS Installation on EXERCISE VM 01	WAPPR	5/9/12 06:47:36	1 - 1 of 1

4 Configuration audit process

Exercise 5. Audit process execution

- When the Configuration Processes application opens, scroll down until you see the Target Cls section.

The screenshot shows a table titled 'Target Cls' with columns: Asset, Location, Configuration Item Number, and Configuration Item Name. The 'Configuration Item Number' column contains 'EXERCISE VM 01', which is highlighted with a purple circle. The 'Configuration Item Name' column also contains 'EXERCISE VM 01'.

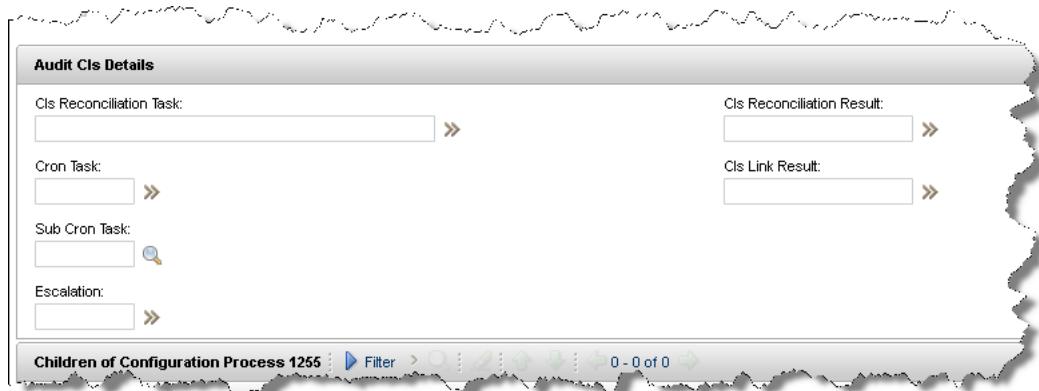
Notice that the target Cls were copied from the request, and you may remember, that the target Cls of the request were copied from the top-level Cls associated with the change work order you originally specified in the CHANGENUM attribute of the request.

- Navigate to the **Specifications** tab, and notice the value of the CHANGENUM attribute. Notice how the information provided in the audit request as been transferred to the work order to help the configuration auditor.

The screenshot shows the 'Specifications' tab of the Configuration Processes application. The 'CHANGENUM' attribute is highlighted with a green arrow. In the 'Details' section, the 'Change Number' field is highlighted with a purple circle and contains the value 'EXER_SC_00'.

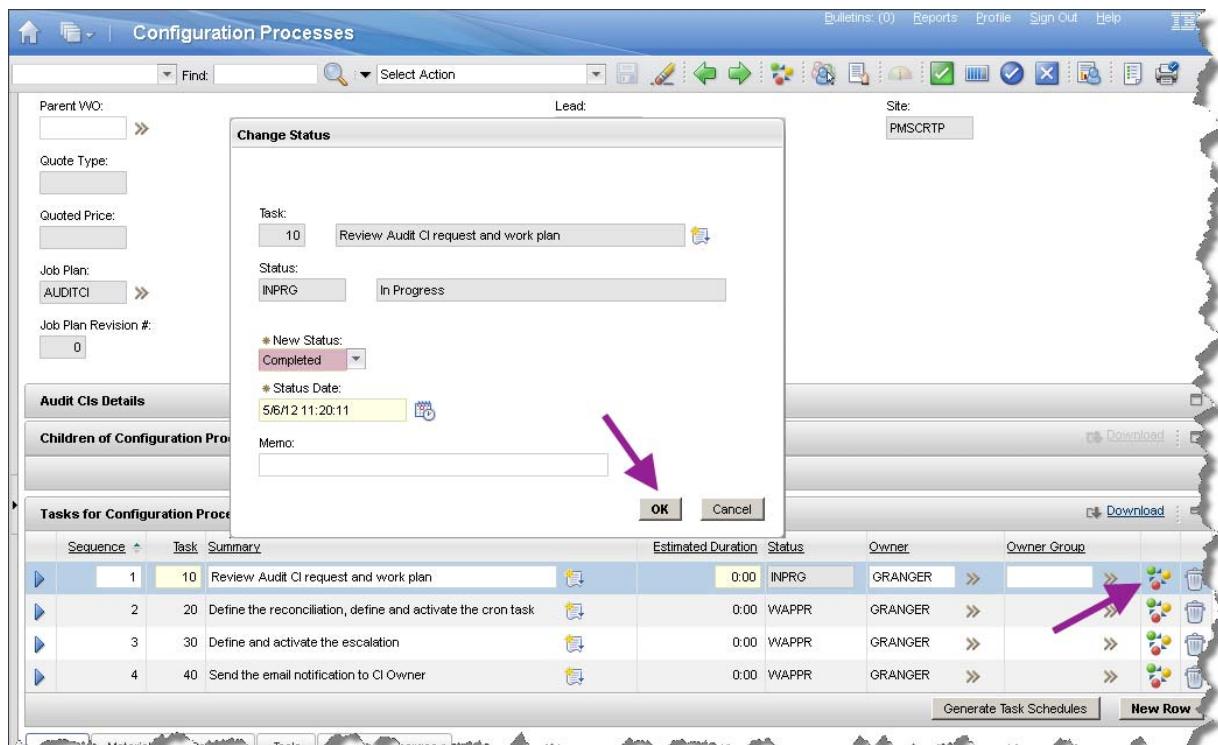
Make a mental note of the value of the CHANGENUM attribute. It should be EXER_SC_00.

- Now, navigate to the Plans section and take a look at the Audit CI Details section.



Notice, that the information displayed in the Audit CI Details section is empty. This is because the reconciliation task, cron task and escalations have not yet been defined. Once you create them, they will be populated into this section of the configuration audit work order.

- Scroll down a bit to find the Tasks for Configuration Process section, and review the plan. As a matter of fact, you already did, and at a first glance, it looks fine. You have now completed the first task in the plan, Review Audit CI Request and work plan. Use the Change Status icon (at the end of the line that represents the task (10) to change the status of the task to COMPLETED.



When the Change Status window appears, choose Completed as the value for the New Status field, and click OK.

You have completed the first task. The next one is the most important to set up the audit.

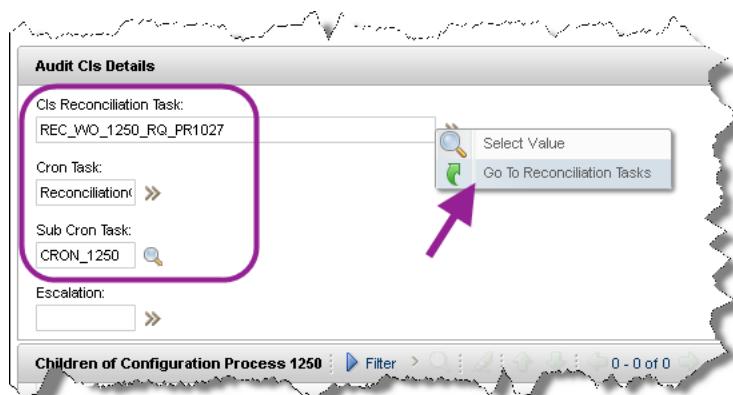
Define the reconciliation, define and activate the cron task

Defining the reconciliation is the single most important task of the configuration audit work order.

The reconciliation task specifies what to compare (authorized CIs and actual CIs), how to link source resources (authorized) to target resources (actual), which source resources process, and how to verify if the linked source and target resources are identical. Once all of this is specified, it is equally important to schedule the execution of the reconciliation task (using a cron task) to ensure that it is executed.

To complete all of this, complete the following steps:

1. Make sure that you are looking at the **Plans** tab of the configuration audit work order, and focus on the Audit CIs Details section.



Notice what has happened since you completed the first task: The information in the Audit CIs Details section, has been populated:

- A reconciliation task has been created. Notice that both the work order and the audit request numbers are included in the name
- The reconciliation cron task is referenced
- A sub cron task, named after the configuration work order, has been created for executing the current reconciliation task
- No escalation has been defined or created; yet

To see how the reconciliation task has been defined, use the Detail Menu tool (next to the Cls Reconciliation Task field, and choose **Go To Reconciliation Tasks**. This will open the Reconciliation Tasks application.

2. In the Reconciliation Tasks application you see that a number of default values have already been assigned to the task. The three key pieces of information are:
 - Filter Type
 - Task Filter
 - Comparison Results

- Type of Reconciliation
- Link Rule
- Comparison Rule

The screenshot shows the 'Reconciliation Tasks' interface. A task named 'REC_WO_1250_RQ_PR1027' is selected. The 'Type of Reconciliation' section shows 'CI' as the filter type and 'Failed' as the comparison result. The 'Link Rules' section shows a default rule 'PMCFGGAULINKRULE'. The 'Comparison Rules' section shows a default rule 'PMCFGAUComprule'. Several fields and buttons are circled in red.

In the Type of Reconciliation section you see that the reconciliation task has been defined to reconcile CIs with ACTUAL CIs. There is an active filter of type CI, used to limit the number of records selected from Data Set 1 (CIs), and only failing comparisons are reported.

In the Link Rules section, you see that the default link rule, PMCFGGAULINKRULE, has been applied, and in the Comparison Rules section, you see that the same is true for the default comparison rule, PMCFGAUComprule. All of these definitions help define, limit and control the resulting audit report.

In accordance with the nature of the audit, the Type of Reconciliation is set to compare CIs with actual CIs. Using CIs as the first data set makes sense since these are the objects and attributes that you actually manage, and the actual CIs only represent the currently implemented CIs and all available attributes.

Before continuing, take a look at some of the key definitions.

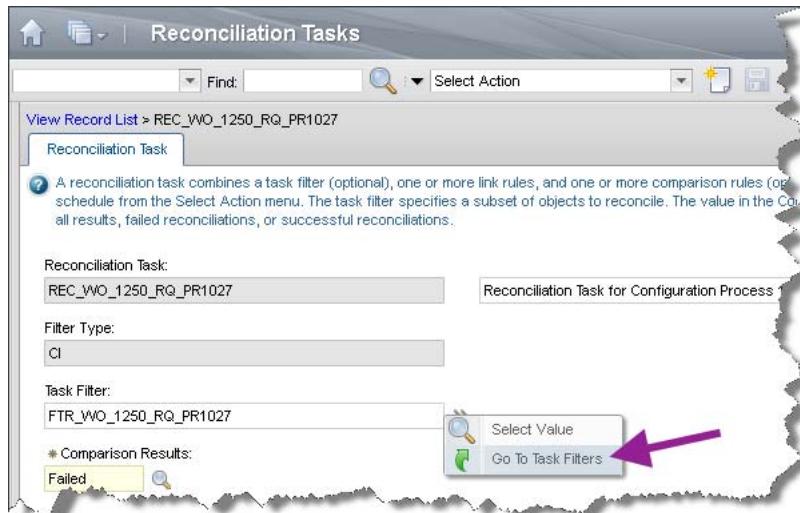
- a. First, focus on the Task Filter.
 - i. Notice that the Filter Type is CI. This relates to the fact that Date Set 1 represents CIs, so filtering on CIs will help narrow down the list of CIs and attributes that will be

4 Configuration audit process

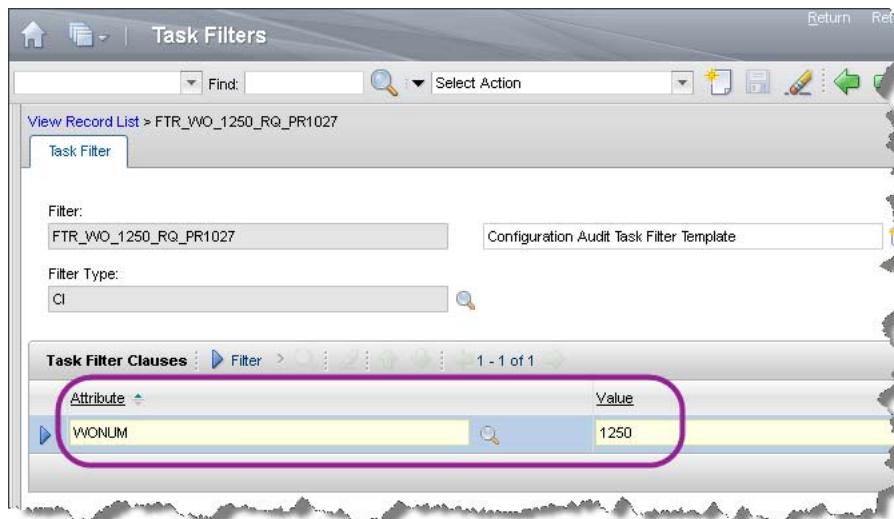
Exercise 5. Audit process execution

compared to the actual CI information (Data Set 2), and thereby limit the resources and time used to create the audit report.

- ii. To see how the filter is defined, use the **Go To Task Filters** from the Task Filter Detail Menu tool (»).



- iii. In the Task Filter for your reconciliation task you see that the default filter is set up to include the target CIs that are associated with the current configuration work order (1250 in the example below).



Remember, when you created the audit request from the change, the target CIs associated with the change were copied to the request, and this information was also transferred to the configuration audit work order when the request was approved.

You may also recall that only top-level CIs that were related to the change at the time the request was submitted were copied. The EXERCISE VM 01:LINUX operating system CI, which is the primary target of the change, does not appear as a target of the configuration process because it is not a top-level CI.



Note: When CIs are associated directly to changes or work orders (as is the case in this exercise) the relationships between the CIs and the process objects will be maintained in the CMDB, and this can be used to filter in only the CIs you are interested in.

To ensure that you audit ALL the CIs that are targets of the change Lucy created, you must change the task filter to refer to the correct change number, as specified in the CHANGENUM attribute, instead of the work order number for the current configuration audit process.

- iv. To change the task filter click on the Select Value icon (🔍) next to the Attribute field to see which options are available:

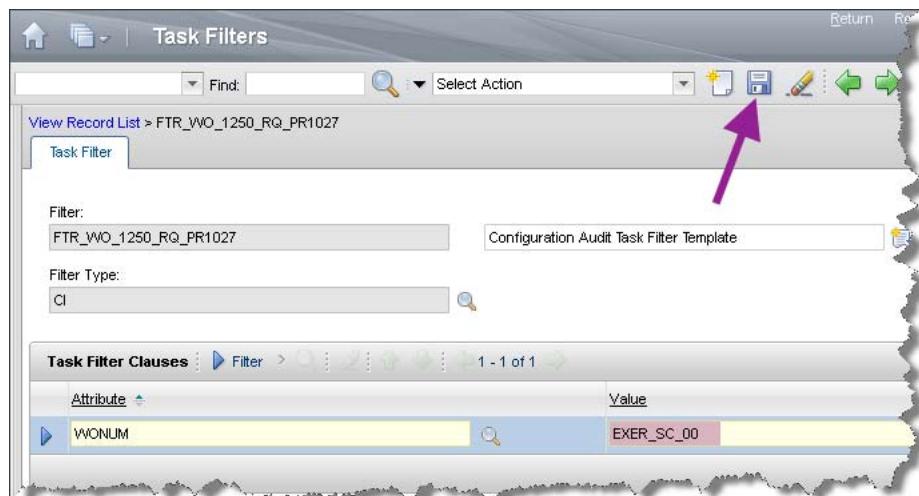
Select Value	
Filter	1 - 11 of 11
Value	Description
CINUM	CI Num
CLASSSTRUCTURE	Class Structure
COLLECTIONNUM	Collection
ITEMNUM	Item
LOCATION	Location
ORGID	Org ID
SERVICE	Service
SERVICEGROUP	Service Group
SITEID	Site ID
STATUS	Status
WONUM	Work Order

As you can see, you do not find the change ID among the allowed attributes. This is because changes, under the covers, are treated just like work orders, so to create the task filter for a specific change, you would simply use the WONUM type. Click **WONUM**.

Because the value already was WONUM, you do not see any immediate changes.

To assign the real change number to be referenced by the task filter, recall the value for the CHANGENUM attribute you memorized earlier: EXER_SC_00. Enter that value in

the Value field (replacing the work order number of the current process) and click the Save icon (💾) in the toolbar.



Notice that instead of replacing the current reference to the AUDITCI work order, you could have added a new reference to the change. In the task filter, you can reference as many work orders as you want.

- v. Use the Return link at the top-right of the dialog to return to the reconciliation task definition.



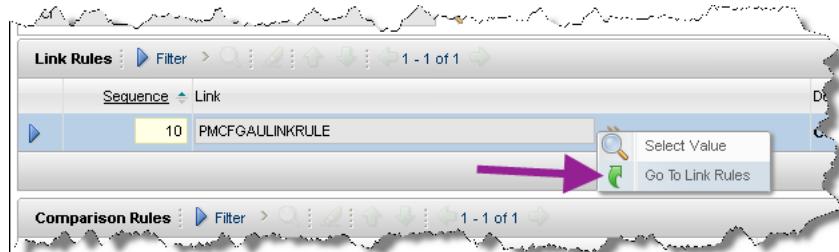
You should now be able to explain how the task filter has been configured for the CI audit reconciliation task, and anticipate which CIs will be included in the reconciliation.

- b. Next, focus on the link rule.

Link rules are used to determine how information from records in Data Set 1 (CIs in the case of audit reconciliation) is used to identify the related records in Data Set 2 (actual CIs in the case of audit reconciliation). When the audit reconciliation task was defined, a default link rule was automatically applied.

Complete the following steps to understand how the linkage works:

- i. From the Reconciliation Tasks application click on the Detail Menu tool (») next to the PMCFGALINKRULE in the Link Rules section and select **Go To Link Rules**.



- ii. The Link Rules application will now open and show the details of the PMCFGGAULINKRULE.

The screenshot shows the 'Link Rules' application interface. At the top, there's a toolbar with various icons. Below it, a navigation bar shows 'View Record List > PMCFGGAULINKRULE'. The main area is titled 'Link Rule' and contains a note about link rules. It shows 'Link:' set to 'PMCFGGAULINKRULE' and 'Configuration Audit Link Rule Template'. Under 'Type of Reconciliation', 'Data Set 1:' is 'CI' and 'Data Set 2:' is 'ACTUAL CI'. The 'Link Clauses' section has a table with one row highlighted by a purple circle. The table columns are 'Sequence', 'Data Set 1 Attribute', 'Operator', and 'Data Set 2 Attribute'. The row shows '10', 'ACTCINUM', '=', 'ACTCINUM'.

As you would have expected, for each CI that is included in the task filter, the ACTCINUM attribute of the CIs is used to identify the corresponding record in the actual CI hierarchy. Because the ACTCINUM is maintained automatically when you promote an Actual CI (or synchronize a CI) you can trust that this link rule will correctly link the records.



Note: Since this Link Rule is applied automatically by the system, you should not modify it.

- iii. Now that you understand the linkage, use the Return link to navigate back to the Reconciliation Task.



You should now be able to explain how the CI information is used to identify the correct Actual CI information that will be used for the comparison.

- c. Second to last, you should take a look at the comparison rule applied to the reconciliation task.

Comparison rules are used to determine which attributes from the records extracted from Data Set 1 (CIs) to compare to which attributes in the corresponding records linked in from Data Set 2 (actual CIs). The comparison rule basically allows you to compare apples to oranges (should you choose to do so) for example by comparing the value of the LOCATIONID attribute from Data Set 1 to the value of the MEMORIESIZE attribute from

Data Set 2. This somewhat ridiculous of example demonstrates the flexibility of the comparison rules.

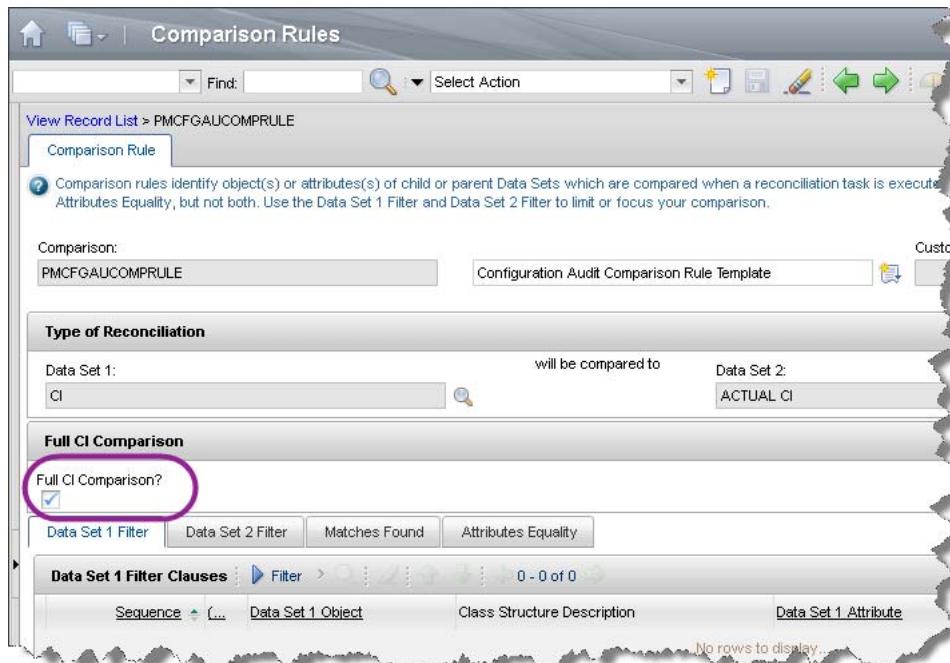
In addition to the one-to-one attribute value comparison, you can define special rules based on filtering. If, for example, the value of the SITE attribute in the Data Set 1 record equals PMSCRTP, then compare the value of the SITE attribute to the CPUSPEED attribute of the related Data Set 2 record. The possibilities are endless.

To see how the default comparison rule used for configuration audit is defined, complete these steps:

- i. From the Reconciliation Tasks dialog click on the Detail Menu tool (») next to the PMCFGAUCOMP RULE in the Comparison Rules section (at the bottom of the application) and select **Go To Comparison Rules**.



- ii. In the Comparison Rules application notice that the Full Comparison check box is checked. This implies that all the CI attributes (found in Data Set 1) will be compared to the corresponding attributes in the actual CI records (from Data Set 2).



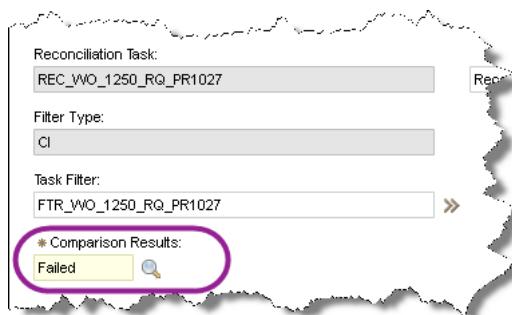
This Comparison Rule is by far the easiest to define, and the most powerful, since it will compare all the attributes found in the Data Set 1 records to those found in Data Set 2, but that's exactly what you want from an audit perspective.

- iii. Now that you understand how the audit comparison is performed, use the **Return** link to navigate back to the Reconciliation Task.



You have finally reviewed all the settings for the configuration audit reconciliation task that will identify discrepancies between the attributes of the target CIs of the configuration audit work order and the related Actual CIs. You have also verified that the linkage between CIs and Actual CIs will be based on the ACTCINUM attribute, and the comparison is performed for all attributes that are associated with the CI.

- d. Finally, take a look at the value for the Comparison Results field.



This field is used to control the type of results that are reported by the comparison. Typically, for audit purposes, you are only interested in the failed comparisons, where there are discrepancies between the value of an attribute for a CI in Data Set 1 and the value for corresponding attribute in the linked CI in Data Set 2. However, if you want to see a LOT of data, you can specify either Successful, or All.

For the purpose of these exercises, change the value of the Comparison Results property to **All** by using the Select Value icon (🔍) next to the field.

Save your changes by clicking the Save icon (💾) in the toolbar.

- e. Use the **Return** link to navigate back to the Plans of your configuration audit work order.



Now that you understand how the reconciliation task that is responsible for producing the audit report works, you are ready to set up a cron task to schedule the execution of the reconciliation task.

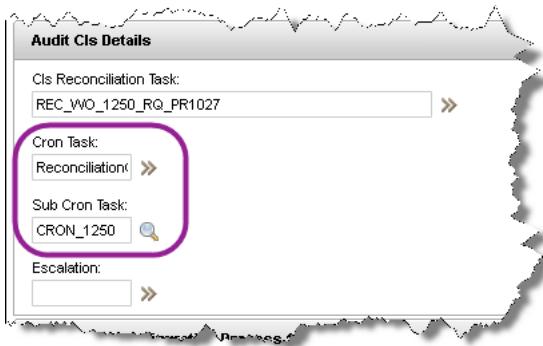


Important: At this point you would normally define a schedule for the reconciliation task, and activate it. However, in order for you to understand what goes on under the covers when you do this, in the following you define and active the cron sub task that ultimately is responsible for executing the reconciliation task.

4 Configuration audit process

Exercise 5. Audit process execution

3. In the Audit CI Details section in the Plans tab of the AUDITCI work order you see that the work order contains a reference to a Cron Task named ReconciliationCronTask, as well as a reference to a Sub Cron Task, named after your work order. In combination, these two parameters control the execution of the reconciliation task you have just defined.

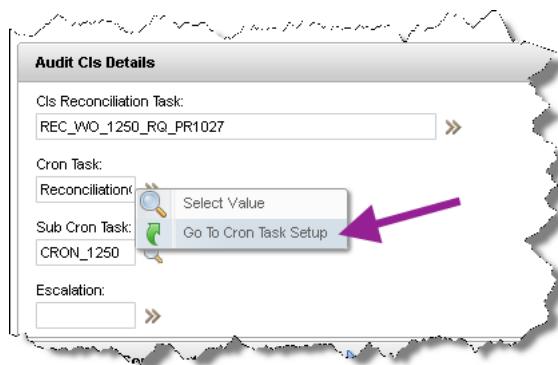


The Cron Task parameter, identifies the cron task that is repeatedly invoked in the background by IBM SmartCloud Control Desk. The cron task named ReconciliationCronTask is a system defined cron task that is used to invoke all reconciliation tasks on a scheduled basis. You should not change this value.

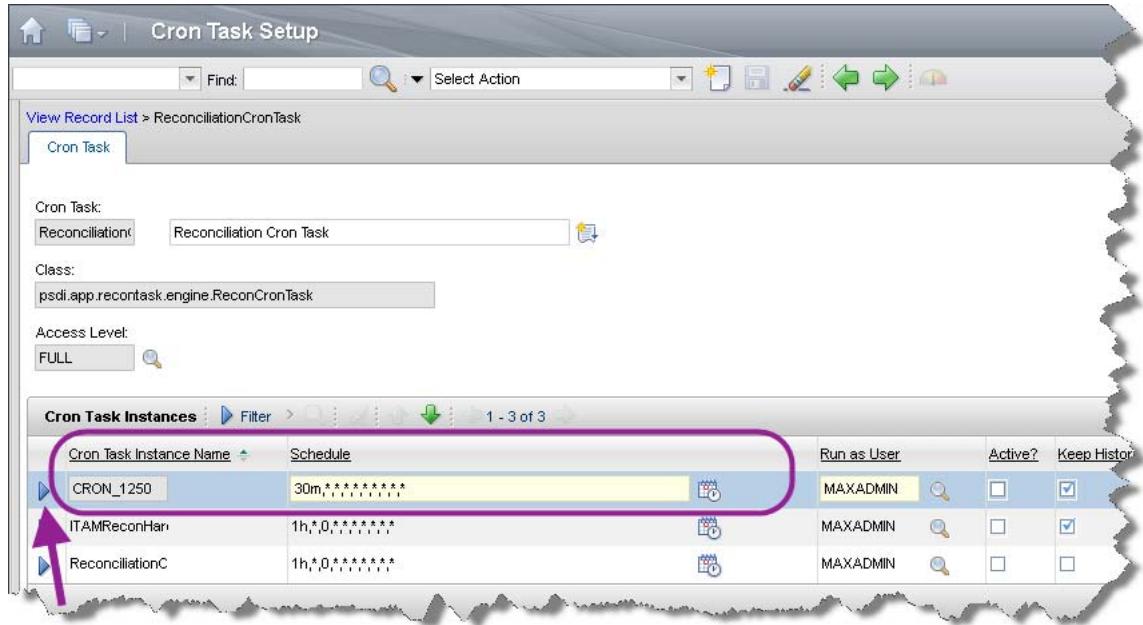
The Sub Cron Task related to your work order, named CRON_1255 in this example, contains the scheduling parameters that will apply to the execution of the particular reconciliation task that is associated with this configuration audit work order. By default, this task is not activated, so unless you intervene, the reconciliation task will never be executed.

Follow the steps outlined below to review schedule and activate the cron task.

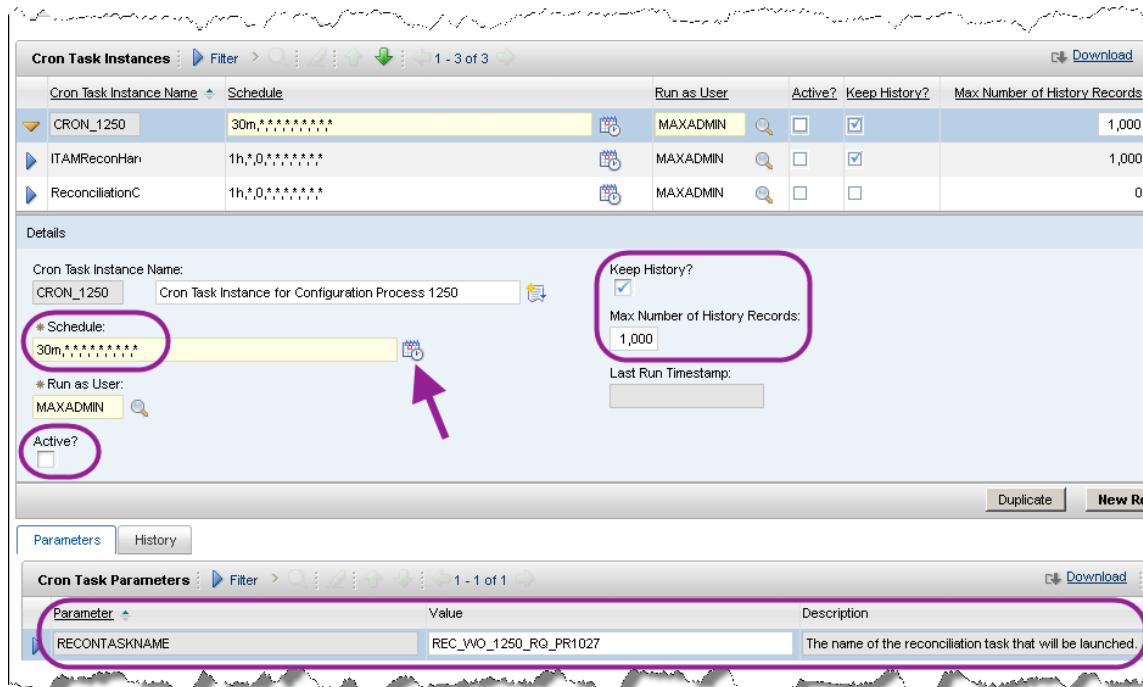
- a. From the **Plans** tab of the Configuration Process dialog, locate the **Cron Task** field in the Audit CIs Details section, and use the Detail Menu tool (**>>**) next to the **Cron Task** field to select **Go To Cron Task Setup**.



- b. In the Cron Task Setup application, identify the task that related to your configuration audit work order, the one named CRON_<WO_NUM> (CRON_1250 in the example below), and click the View Details icon (▶) to reveal all the details.



- c. In the details for the specific cron task, you should notice that by default it is scheduled to run every 30 minutes, 1000 history records about the invocation will be kept in the database, but the cron task has not yet been marked as Active.



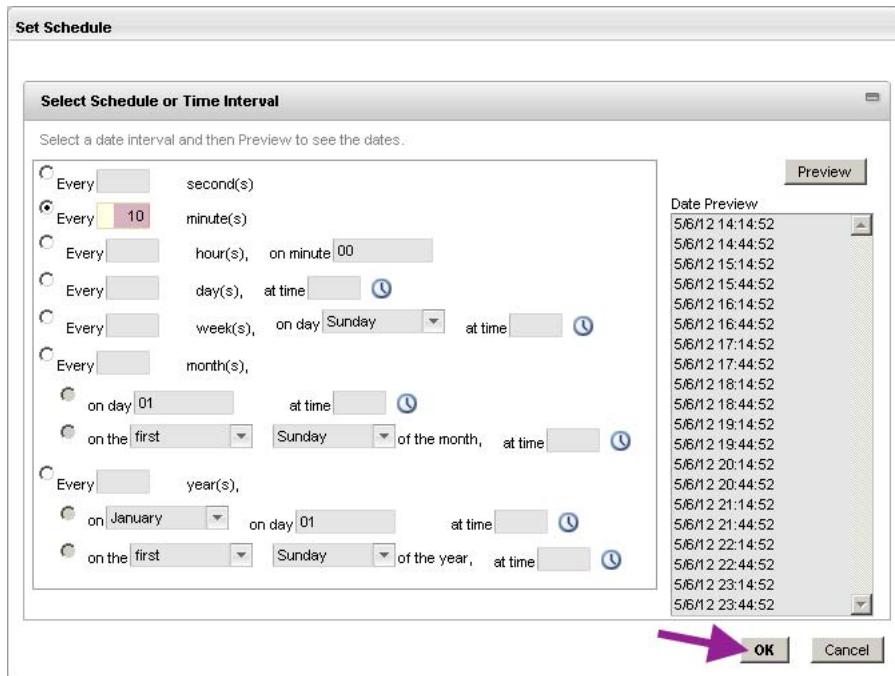
Also pay attention to the Cron Task Parameters section at the bottom of the console. Here you see that a parameter named RECNTASKNAME is associated with the cron task, and the value of this parameter is set to the name of the CIs Reconciliation Task associated with the current AUDITCI work order.

4 Configuration audit process

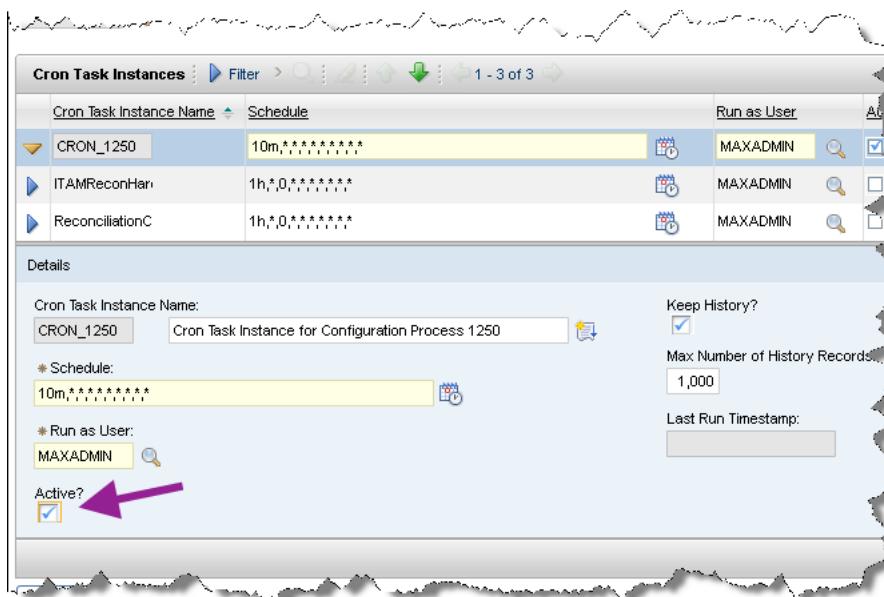
Exercise 5. Audit process execution

- d. For this exercise you most likely do not want to wait 30 minutes for the task to execute, so use the Set Schedule tool (CALENDAR) next to the Schedule field to ensure that the task is executed every 10 minutes.

To modify the schedule, change the value of the second line (the one that has the related radio-button selected) to 10, and click **OK** to return to the Cron Task Setup.



- e. Now, to activate the cron task, make sure that the Activate check box is **selected**.

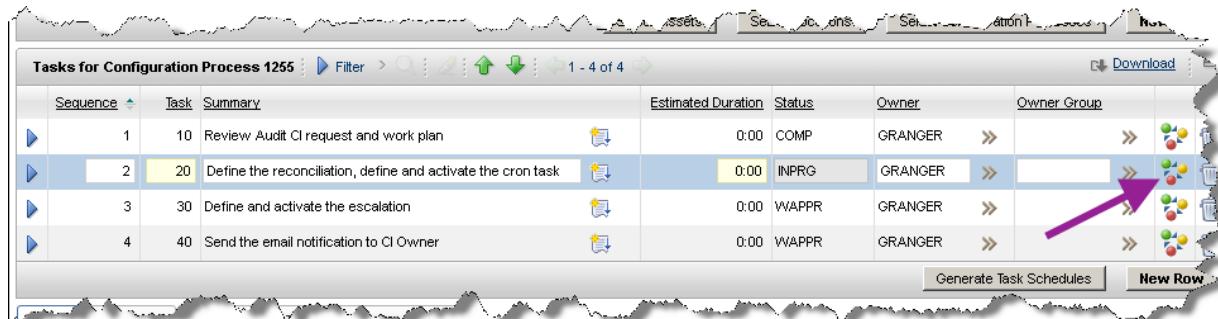


- f. Finally, click the Save icon (DISK) in the toolbar to save your activated, 10 minute schedule and then use the **Return** link to navigate back to the configuration audit work order.



4. You have now completed all the steps involved with the Define the reconciliation, define and activate the cron task work order task. At this point your reconciliation task is executed every 10 minutes.

To mark your work completed, use the Change Status icon () at the far right of the line representing the task (#20) to change the status to COMPLETED.



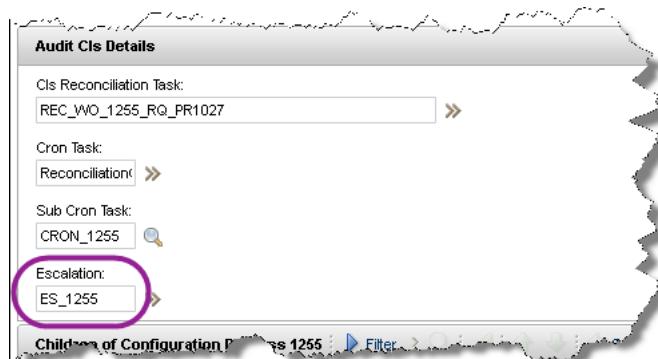
Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
1	10	Review Audit CI request and work plan	0:00	COMP	GRANGER	>>
2	20	Define the reconciliation, define and activate the cron task	0:00	INPRG	GRANGER	>>
3	30	Define and activate the escalation	0:00	WAPPR	GRANGER	>>
4	40	Send the email notification to CI Owner	0:00	WAPPR	GRANGER	>>

The definition and scheduling of the CI audit reconciliation task is done. At this point it is being executed every 10 minutes. As a result, the attributes and relationships of the CIs that are related to the specified change, will be compared to the actual configuration items every 10 minutes. This may not reflect a normal production setup, but 10 minutes works well for these exercises. After a short while, you will be able to see your first set of results in the CI Link Results and CI Reconciliation Results applications.

So far you have not created any definitions that will help you react to, or alert you about failing audits. That's exactly what you will do in the next task in the work order.

Define and activate the escalation

If you look closely at the **Plans** tab of the configuration audit work order, you will notice that after completing the task defining and activating reconciliation and cron tasks, a value has been populated into the **Escalation** field.



Audit CIs Details

CIs Reconciliation Task:
REC_WO_1255_RQ_PR1027 >>

Cron Task:
Reconciliation >>

Sub Cron Task:
CRON_1255 <input type="button" value="Search" />

Escalation:
ES_1255 >>

This escalation is used to analyze the output from the reconciliation task and verify if any comparisons have failed or any resources are missing. If this is the case, a new audit process, AUDITCI2, is created and assigned to the configuration auditor team, in order for an auditor to resolve the issues. This neat feature allows you to set up standard audit reporting that runs for

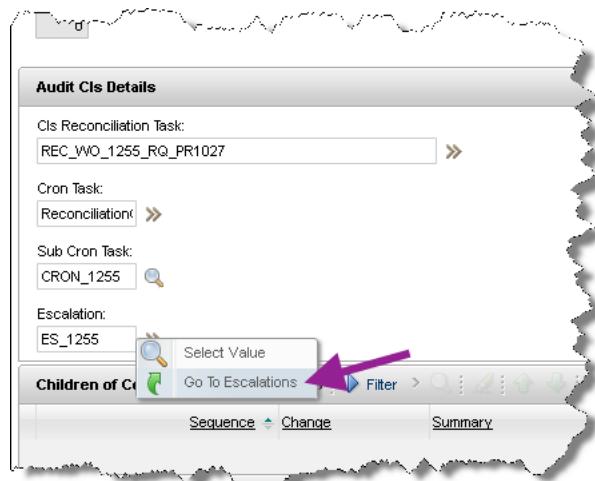
example every weekend, and only if AUDITCI2 processes are awaiting Monday morning, the configuration auditors will know that something needs to be looked at.



Note: It is important to remember that both the reconciliation task and the escalation are repetitive tasks, so unless you deactivate them, the audit will run continuously, and whenever comparisons fail, AUDITCI2 tasks will be issued.

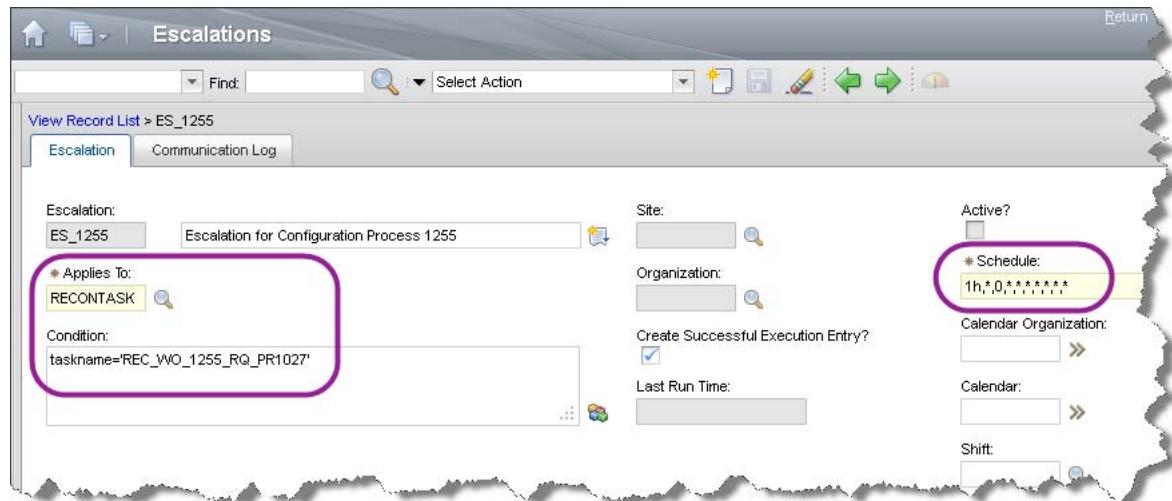
By default, the escalation is not activated. This means, that even though the cron task executes and discrepancies are found, no AUDITCI2 tasks are being issued. Naturally, you would want this to take place, so follow the steps outlined below to review and activate the escalation.

1. From the **Plans** tab of the **Configuration Processes** dialog, locate the **Escalation** field in the **Audit CIs Details** section, and use the Detail Menu tool (») next to the field to select **Go To Escalations**.



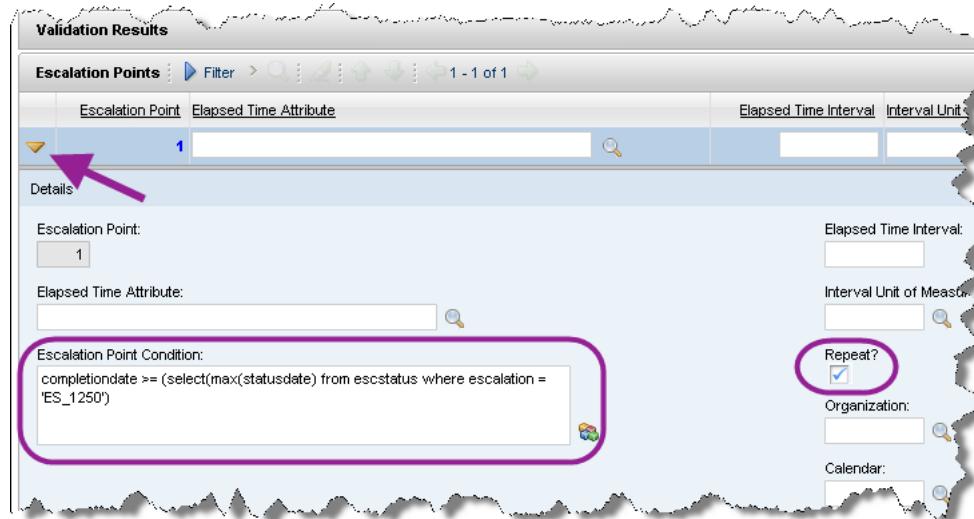
2. Now take a few minutes to review the escalation.

- The first thing you should notice is that this escalation is defined to evaluate reconciliation tasks (see the **Applies To** field), and in particular the reconciliation task that was defined for your configuration audit work order as specified in the **Condition** field.



To the right you will see, that the escalation, by default, evaluate the reconciliation task every hour.

- Now, focus on the Escalation Points section and expand the Escalation Point named 1 by clicking on the View Details icon (▶) next to it.



In the **Escalation Point Condition** field you see that the escalation action only will be invoked if the completion date for the reconciliation tasks is greater than last time the escalation was invoked. Also pay attention to the **Repeat?** field, which, when checked, ensures that the action associated with the escalation is invoked repeatedly, every time the escalation condition validates to true.

4 Configuration audit process

Exercise 5. Audit process execution

- c. Finally, at the bottom of the Escalations application you see the action that will be invoked if the Escalation Point Condition validates to *true*.

The screenshot shows the 'Actions' tab of the Escalations application. A single row is selected in a table. The 'Action' column contains 'PMCFGREMED' and the 'Description' column contains 'Action to be kicked off by escalation monitoring audit reconciliation tasks'. The entire row is highlighted with a purple oval.

For this escalation the system action to perform is named PMCFGREMEDIATION, and if you use the links to the action, you can see that is implemented as a Java class.

3. Now that you have a better understanding of the inner workings of the escalation, you should scroll back to the top of the Escalations application, and use the Set Schedule tool (next to the Schedule field, to force the invocation of the escalation every 5 minutes.

The screenshot shows the Escalations application with an escalation record selected. A modal dialog titled 'Select Schedule or Time Interval' is open, showing various frequency options. An arrow points from the 'Validata' button on the left to the 'Every 5 minute(s)' option. Another arrow points from the 'Schedule' field on the right to the 'Preview' section of the modal, which shows a list of dates and times starting from 5/6/12 23:00:58.

Since the reconciliation task runs every 10 minutes, every other invocation of the escalation will result in a failed Escalation Point Condition, and therefore the escalation action will not be invoked.

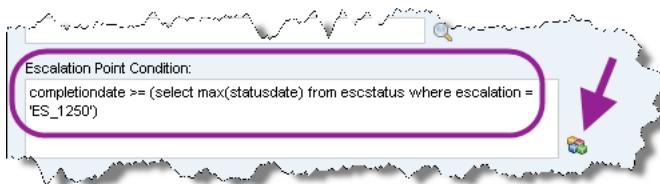
In a real-life implementation, the frequencies with which both the reconciliation task and the escalation is invoked should naturally be adjusted to reflect expected execution times and the needs of the organization.

4. Now open the escalation point named 1 again, and inspect the Escalation Point Condition once more.

In relation to your current reconciliation and escalation schedules, the impact of comparing the completion date of the reconciliation task to the timestamp of the last run of the escalation is,

that the escalation will trigger whenever the reconciliation task has been executed. This may not necessarily be what you are looking for.

When ever the reconciliation task runs, it places the reconciliation results in the RECONCIRESULT table. In this table, identical records are not replaced, so if nothing has changed in the CMDB, you will not see more reconciliation results. The only effect of executing the reconciliation task is, that a CHANGEDATE field for each record is updated. Since the Escalation Point Condition tests the completion date of the reconciliation task, without considering the content, the escalation will trigger every time the escalation has executed, and the action will create a new AUDIT2 configuration audit task. After a short while you will end up with several AUDIT2 tasks, for the same set of reconciliation results.



To avoid this situation, you should modify the Evaluation Point Condition, so it validates the DATECREATED of the reconciliation result records instead of the completion time of the task. Enter a new Escalation Point Condition similar to the following, where you replace the EscalationID and the ReconciliationTaskName with the current values in your environment:

```
( (select max(datecreated) from reconciresult where
recontaskid=recontask.recontaskid and recontask.taskname =
'<ReconciliationTaskName>') >= (select max(statusdate) from escstatus where
escalation = '<EscalationName>') )
```

or

```
( (select changedate from escalation where escalation = '<EscalationName>') >
(select max(changedate) from reconciresult where
recontaskid=recontask.recontaskid and recontask.taskname =
'<ReconciliationTaskName>') )
```

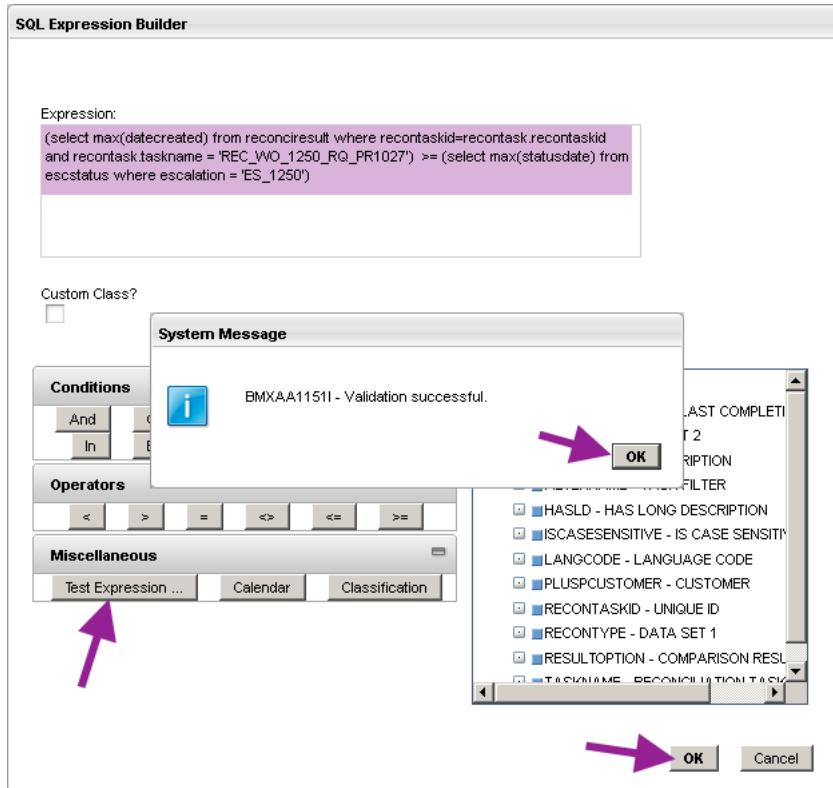
For your convenience, this SQL statement can be copied and pasted from E:\LabFiles\CCMDB\config\escalationRule.sql.

Remember to replace <ReconciliationTaskName> and <EscalationName> with your current values. The value to use for <EscalationName> is the current escalation name, and the value to use for <ReconciliationTaskName> is referenced in the **Condition** field of the escalation.

4 Configuration audit process

Exercise 5. Audit process execution

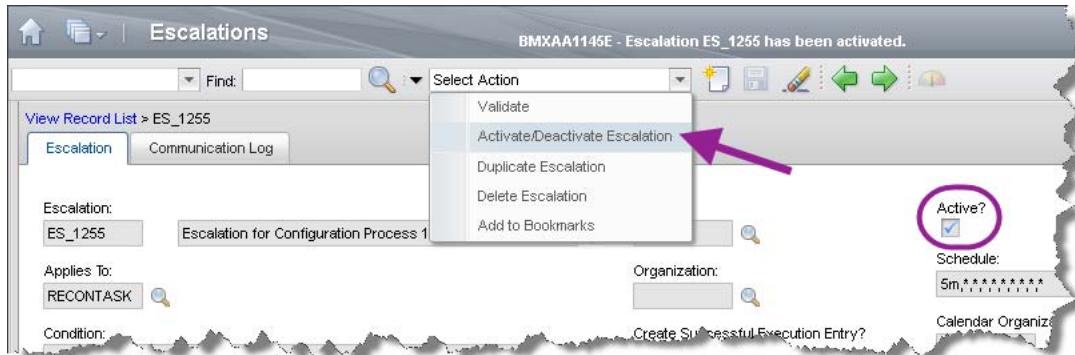
Remember, that you can edit and test the condition in the SQL Expression Builder tool (by clicking the SQL Expression Builder icon (SQL) next to the escalation point condition, and use the Test Expression ... option to validate the expression.



When you are ready, click **OK** to return to dismiss the SQL Expression Builder window.

5. Save the escalation using the Save icon (Save) in the toolbar.
6. The last step you need to complete to ensure that the escalation is working is to activate it.

From the **Select Action** drop-down menu, select **Activate/Deactivate Escalation**, and verify that the **Active?** check box is selected.



7. You have now successfully created and scheduled the escalation that is responsible for launching AUDITCI2 tasks in case the reconciliation task identifies discrepancies during the audit.

Use the **Return** link to navigate back to the configuration audit work order, so you can mark your task complete.



8. When you return to the Plans section of the Configuration Processes application, you can complete the Define and activate the escalation task. To mark the task completed, use the Change Status icon (多样性图标) at the far right of the line representing the task (30) to change the status to COMPLETED, as you did for the two previous tasks of the work order.

You have now completed all the steps involved with the Define and activate the escalation task of the work order. At this point your escalation kicks-in every 5 minutes to evaluate the results of last run of the reconciliation task.

Send the email notification

The last task of the configuration audit work order is defined to remind the auditor to send an e-mail to the audit requester when the audit has been completed. When this task completes, the entire configuration audit work order will complete too, and the related audit request will be marked Resolved.

In a real-world scenario, the auditor would normally not complete this task until the results of the audit reconciliation process have been analyzed and any discrepancies resolved using the AUDITCI2 work order that may be generated automatically. However, for this exercise, you should complete the configuration audit work order now, to get it out of the way.

Use the Change Status icon (多样性图标) at the far right of the line representing the task (40) to change the status to Completed.

You have now completed the setup of the audit.

Verifying reconciliation task and escalation execution

It has been a while since you configured the reconciliation task, and with a 10 minute invocation frequency, by now it should have been executed at least once. To verify if it has completed, you

4 Configuration audit process

Exercise 5. Audit process execution

need to look at the reconciliation task. You can load the reconciliation task that is related to the configuration audit process in several ways. This time, follow these steps:

1. Verify execution of the reconciliation task.

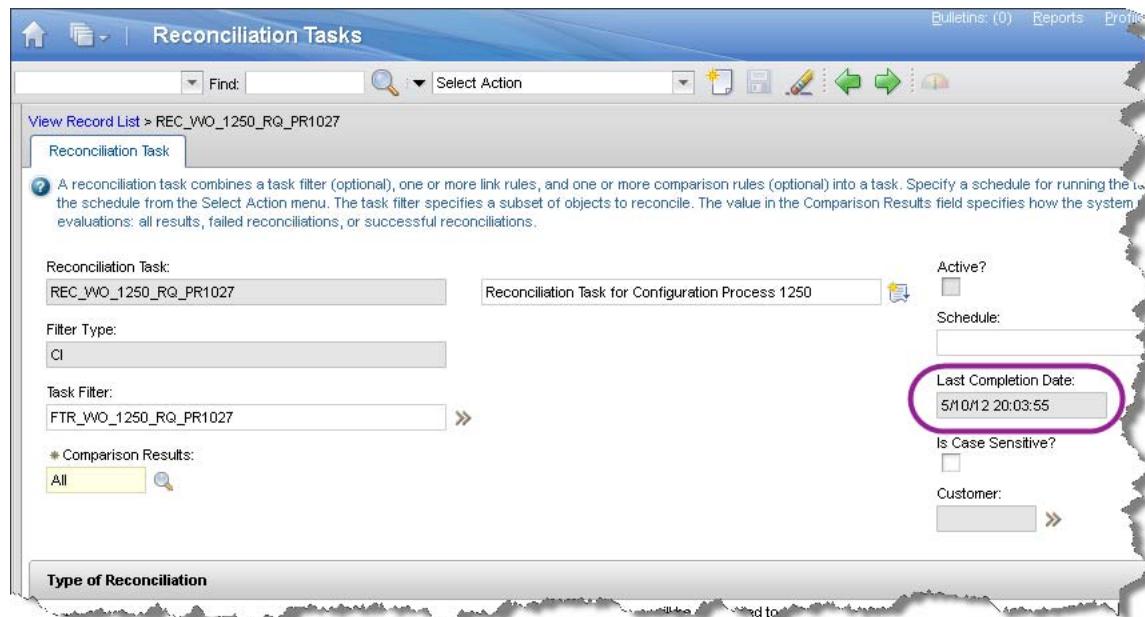
- a. From Granger's start Configuration Auditor start center, use the Reconciliation Tasks link in the Related Applications.



- b. When the Reconciliation Tasks application loads, press Enter to list all the available tasks, and load the one that is related to your configuration audit process. Look for a reconciliation task that contains your process and request numbers. In this example the name of the reconciliation task is REC_WO_1250_RQ_PR1027. Open the task in the Reconciliation Tasks application.

Reconciliation Task	Description	Task Filter
CCILinkAssetsAndClis	Default recon task that links assets to Cls.	
ITAMHardwareReconTask	ITAM Hardware Reconciliation Task	
REC_WO_1250_RQ_PR1027	Reconciliation Task for Configuration Process 1250	FTR_WO_1250_RQ_PR1027

- Locate the **Last Completion Date** field, and notice the value.

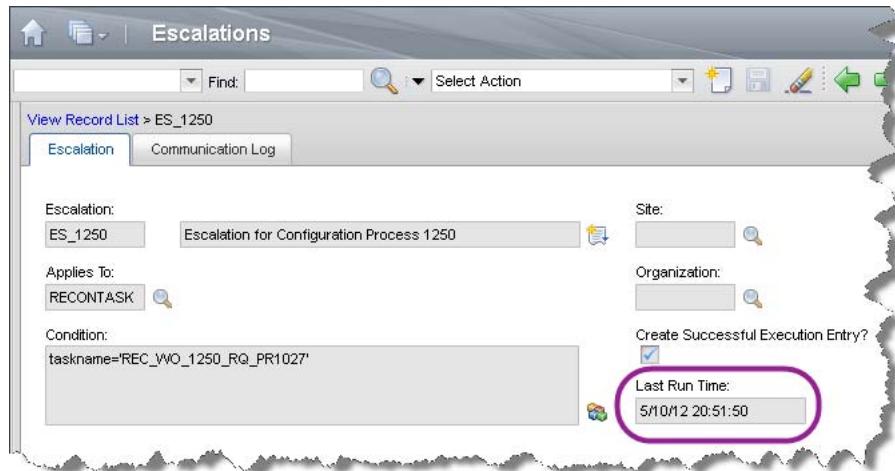


If a value is reported in the **Last Completion Date** field, you have verified that the reconciliation has been executed at least once. If there is no value in the field, you have to wait a few more minutes, refresh the content of the Reconciliation Application, and hopefully you will see a date. In this is not the case, don't hesitate to contact your instructor.

Make a note of the value in the **Last Completed Date** field so you can compare it to the similar information for the escalation.

- To verify if the escalation has executed, complete these steps:
 - Return to the Configuration Auditor start center, and launch the configuration audit process from the Configuration Audit Processes section.
 - When the Configuration Audit Processes application launches, navigate to the **Plans** tab, and locate the **Escalation** field in the Audit CIs Details section, and use the Detail Menu tool (**>>**) next to it to select **Go To Escalations**.

- c. Locate the **Last Run Time** field, and compare the value to the **Last Completion Date** for the reconciliation task.



If the **Last Run Time** of the escalation is later than the reconciliation task **Last Completion Date**, you can feel assured, that the escalation has validated your reconciliation results, and if any failures were identified, an AUDIT2 process has been created and assigned to the configuration auditor.

If the value of the **Last Run Time** is empty, or earlier than the **Last Completion Date**, you need to wait a bit, or contact your instructor.

When you have ensured that both the reconciliation task and the escalation have executed, and that the escalation has completed after the reconciliation task, you are ready to start looking at the results.

Understanding reconciliation

While you are waiting for the reconciliation task to complete, you may spend a few minutes looking into the inner workings of the reconciliation task, to better interpret results.

When the reconciliation task executes, it follows the logic outlined below:

1. First, the reconciliation task uses the task filter to identify the authorized CIs to be processed.
2. For each authorized CI the linked actual CI is identified in accordance with the link rule. The default link rule uses the Actual CI Number attribute to find the corresponding actual CI. If an actual CI is not found, a record is written to the CI Reconciliation Results table.

If an actual CI is found for an authorized CI, the comparison rule is invoked to compare the attributes of the two resources. For the audit process, the default comparison rule compares all the attributes in the authorized CI to the attributes in the actual CI.

3. Next, the relationships of the authorized CI are inspected.

For each relationship, the authorized source CI and authorized target CI of the relationship are identified.

Then, the corresponding actual CIs for both the source and the target CIs of the relationship are identified using the link rule. If no CI can be identified for either of the CIs, the relationship is ignored, and you will not receive any messages indicating an inconsistency.

If actual CIs for both CIs in the authorized relationship exist, the reconciliation task verifies that a similar relationship exists for the actual CIs. In addition, attributes will be compared for CIs that have not yet been processed.

Now that you have a better understanding of what the reconciliation task does, you are prepared to analyze the results.

Exercise 6. Looking at CI reconciliation results

To investigate the results of your configuration audit, you can either use the configuration audit work order as the anchor point, or use the links that are provided in the Configuration Auditor start center.

Now go back to Granger's Configuration Auditor start center by clicking on the Home icon () in the header of the IBM SmartCloud Control Desk console, and check the status of the Process Tasks

4 Configuration audit process

Exercise 6. Looking at CI reconciliation results

assigned to Granger, the status of the Configuration Audit Processes, and the status of the Configuration Process Requests. Verify that all are in the expected state.

The screenshot shows the 'Welcome, Granger Configuration Auditor' start center. Key sections include:

- Configuration Auditor:** Shows a 'Quick Insert' panel with 'New Process Request' and a 'Related Applications' panel listing 'Activities and Tasks', 'CI Link Results', 'CI Reconciliation Results', 'Comparison Rules', 'Link Rules', and 'Reconciliation Tasks'.
- Bulletin Board:** Displays a table for messages, showing no entries.
- Inbox / Assignments:** Displays a table for assignments, showing no entries.
- Configuration Process Requests:** Shows a table with one row:

Process Request	Description	Class Structure	Reported By	Reported Date	Site	Process State	Status Date
PR1027	Audit OS Installation on EXERCISE VM 01	AUDITREQ	LUCY	5/10/12 18:42:45	PMSCRTP	ACCEPTED	5/10/12 19:45:23
EXER_CO_00	Set OPERATING and update memory	UPDATEDREQ	STEVE	5/10/12 17:36:36	PMSCRTP	COMPLETED	5/10/12 22:50:30
- Configuration Audit Processes:** Shows a table with one row:

Job Plan	Work Order	Description	Owner	Status	Status Date
AUDITCI	1250	Audit OS Installation on EXERCISE VM 01		COMP	5/10/12 19:45:23
- Configuration Audit 2 Processes:** Shows a table with one row:

Job Plan	Work Order	Parent Work Order	Description	Owner	Status	Status Date
AUDITCI2	1255		Configuration Process Audit CIs Phase 2 Job Plan		INPROG	5/10/12 19:06:50
- My Configuration Process Tasks:** Shows a table with four rows of tasks:

Activity	Task	Summary	Owner	Status	Status Date
1251	10	Review Audit CI request and work plan	GRANGER	COMP	5/10/12 18:50:22
1252	20	Define the reconciliation, define and activate the cron task	GRANGER	COMP	5/10/12 18:53:34
1253	30	Define and activate the escalation	GRANGER	COMP	5/10/12 19:44:55
1254	40	Send the email notification to CI Owner	GRANGER	COMP	5/10/12 19:45:23

You will hopefully see that the status of all the tasks, in the My Configuration Process Tasks section, and the processes, in the Configuration Audit Processes section is COMPLETED. Also notice that the status of the original audit request, in the Configuration Process Requests section still is ACCEPTED.

In the start center, you also see an entry in the Configuration Audit 2 Processes section so at this point, you can already tell, that the reconciliation task has executed, and that discrepancies or failures were found. If the audit had passed without problems, the status of the Process Request would have been RESOLVED, and there would be no AUDITCI2 process.

If you recall what you did in the previous exercises, you may remember that you deliberately updated the COMPUTERSYSTEM_MEMORYSIZE attribute for the EXERCISE VM 01 computer system CI and thereby introduced differences between the actual and the authorized CIs.

Did you perform a new Tivoli Application Dependency Discovery Manager scan and import the data via Tivoli Integration Composer?

Are you absolutely sure that the audit completed and succeeded?

To easily access the reconciliation results, the Related Applications section in the start center contains links to both the CI Link Results, and CI Reconciliation Results applications.

CI Link Results

This contains the results of the linkage between CI and Actual CI records. Remember you referenced a link rule to specify how actual CI records would be linked to the authorized CI records identified in the Task Filter?

CI Reconciliation Results

Contains a list of the results of the comparison. Based on your settings, you will see either comparison results for all attributes (this may yield a lot of data for all the successful comparisons), and relationship, or just the failed comparisons, which indicate discrepancies and audit failures.

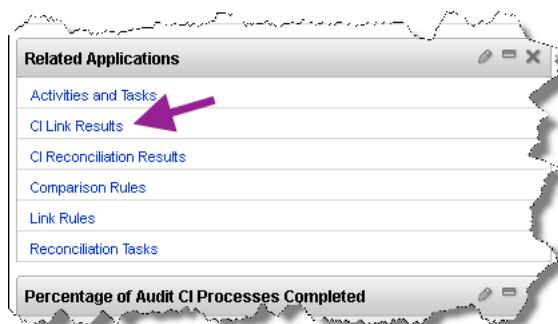
First, check the Link results to see how your CIs were linked.

CI link results

When you defined the reconciliation task, you specified a task filter that includes the two authorized CIs in the EXER_SC_00 change, the EXERCISE VM 01: LINUX operating system CI, and the EXERCISE VM 01 computer system CI. In addition, you used a link rule that specified that the corresponding actual CIs should be identified using the ACTUALCINUM field.

To see how your CIs were linked, complete these steps:

1. Open the CI Link Results application from the Related Applications section in the configuration auditor start center.



4 Configuration audit process

Exercise 6. Looking at CI reconciliation results

- When the CI Link Results application opens, press Enter to load all the link results into the application.

The screenshot shows the 'CI Link Results' application interface. At the top, there are navigation links for 'Home', 'Find', 'Select Action', 'Advanced Search', 'Save Query', and 'Bookmarks'. Below the header is a toolbar with various icons. A message bar indicates '1 - 1 of 1'. The main area displays a table with four columns: 'Site', 'Rule Name', 'Link Date', and 'CI'. A purple arrow points to the 'Rule Name' column, highlighting 'PMCFGGAULINKRULE'. Another purple circle highlights the 'CI' column, which contains 'EXERCISE VM 01'. A third purple circle highlights the 'Actual Configuration Item Name' column, which contains 'EXERVM01.TIVOLI.EDU'.

You notice that you only have a single link, and that it was based on the PMCFGGAULINKRULE. Didn't you expect two; one for each of the CIs in the change?



Note: If you do not see any link results, you may have forgotten to set the value for the Comparison Results parameter of the reconciliation task to ALL, or you have not specified both the EXERCISE VM 01 and the EXCISE VM 01:LINUX CIs as targets of the change, or the reconciliation task has not executed yet. If you are sure that all of these conditions are true, you need to revisit the reconciliation task definition to identify the problem.

- You can already see, that the link represents the EXERCISE VM 01 configuration item. Click the link to see the details.

The screenshot shows the 'View Record List > 15' screen for 'CI Link Result'. It displays detailed information for the link. A purple circle highlights the 'Rule Name' field, which contains 'PMCFGGAULINKRULE'. Another purple circle highlights the 'Link Date' field, which contains '5/10/12 21:23:52'. Below this, there are two sections: 'Authorized CI Information' and 'Actual Information'. Both sections are enclosed in purple circles. The 'Authorized CI Information' section shows 'CI: EXERCISE VM 01' and 'Configuration Item Name: EXERCISE VM 01'. The 'Actual Information' section shows 'Actual Configuration Item Number: EXERVM01.TIVOLI.EDU-150763' and 'Actual Configuration Item Name: EXERVM01.TIVOLI.EDU'. There is also a 'Description' field.

In the details you see that the reconciliation task managed to link the EXERCISE VM 01 computer system CI to its actual sibling. That's basically all you see, but it provides verification that the CIs were linked.

4. To go back to Granger's start center, click the Home icon () in the header of the IBM SmartCloud Control Desk console.

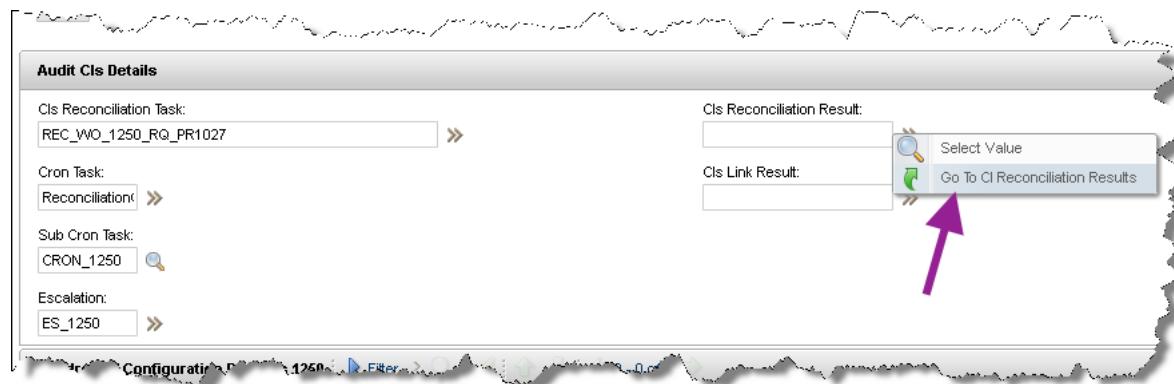
So what happened to the EXERCISE VM 01: LINUX operating system CI. Obviously it was not linked, so somehow the reconciliation task could not find an actual CI using the default link rule. This link rule uses the ACTCINUM field to match authorized and actual CIs, and for some reason using this field yielded no match for the new operating system CI.

To investigate this, you have to look at the CI Reconciliation Results.

CI reconciliation results

To figure out what has happened during the audit of the EXERCISE VM 01: LINUX configuration item, try following these steps:

1. From the Configuration Audit Processes section, open the AUDITCI process (1250 in this example). When the Configuration Audit Processes application loads, navigate immediately to the Plans tab.
2. Look at the Audit CIs Details section, and notice that it contains links to both the CI Link Results and CI Reconciliation Results information. At this point, no information is provided, but you can link it in if you want to.



To open the CI Reconciliation Results, use the Detail Menu tool () , and select **Go To CI Reconciliation Results**.

4 Configuration audit process

Exercise 6. Looking at CI reconciliation results

3. To see the results related to the EXERCISE VM 01: LINUX configuration, complete these steps:
 - a. Enter your process number (1250 in this example) as the value for the **Reconciliation Task** filter field, and **LINUX** as the value for the **Configuration Item Name** filter field. Then press Enter to populate the list of results.

The screenshot shows the 'CI Reconciliation Results' interface. At the top, there are filters for 'Reconciliation Task' (set to 'REC_WO_1250_RQ_PR1027') and 'Configuration Item Name' (set to 'LINUX'). A single result row is displayed, with the 'Message' column containing the text 'This CI has no matching ACTUAL CI. EXERCISE VM 01: LINUX'. The entire message text is highlighted with a red oval.

Notice the message for the only result related to the operating system CI:

This CI has no matching ACTUAL CI

The meaning of this message is obvious, so again you have to ask yourself if you performed all the necessary actions to ensure that the reconciliation task could find the actual CI using the default link rule.

Well, in this exercise you created the authorized CI manually, and did not provide a value for the ACTCINUM attribute. Because the link rule uses the ACTCINUM fields for comparison, you also need to link the actual and authorized CIs. You can do this manually, by promoting the actual CI, or by linking the authorized CI to an actual CI using naming rules.

- b. If you open the result you can see all the details related to this result: tasks, work orders rules and so on. However you have already deduced what the problem is, and how to resolve it.
- c. To return to the list of reconciliation results, use the **View Record List** link immediately above the CI Reconciliation Result tab.

The screenshot shows the 'CI Reconciliation Results' interface. A purple arrow points to the 'View Record List > 1' link, which is located above the main result table. The 'Reconciliation Task' field is set to 'REC_WO_1250_RQ_PR1027'.

4. Back in the list of reconciliation results, you may want to see all the results that were generated. When you defined the reconciliation task, you specifically requested that all comparison data, successful as well as unsuccessful comparisons should be reported, so perhaps there are some interesting details.

To see all the results for your reconciliation task, clear the information in the **Configuration Item Name** field, and press Enter.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name
REC_WO_1250_RQ_PR1027	RELATION.CONTAINS	Relationships comparison between CI and ACTUAL CI has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	ACTCINUM	This CI has no matching ACTUAL CI.	EXERCISE VM 01: LINUX
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_VIRTUAL	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_VMID	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_ARCHITECTURE	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_CPUSPEED	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_CPUTYPE	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_FQDN	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MANAGEDSYSTEMNAME	Attribute comparison has failed.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MANUFACTURER	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MEMORYSIZE	Attribute comparison has failed.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MODEL	Attribute comparison has succeeded.	EXERCISE VM 01

You notice that more than 70 results have been created, the majority of which indicate successful comparison of attributes or relationships. On the first page, you may also notice the message indicating the missing ACTUAL CI, as well as two messages indicating attribute comparison failure. These three messages all indicate audit failure, and will trigger the creation of the AUDITCI2 process.

If you scroll down, you will see messages for the IPINTERFACE, L2INTERFACE, and FILESYSTEM resources that are related to the top-level EXERCISE VM 01 computer system.

Take a few minutes to investigate the results.

5. To return to the Configuration auditor start center, click the Home icon () in the header of the IBM SmartCloud Control Desk console.

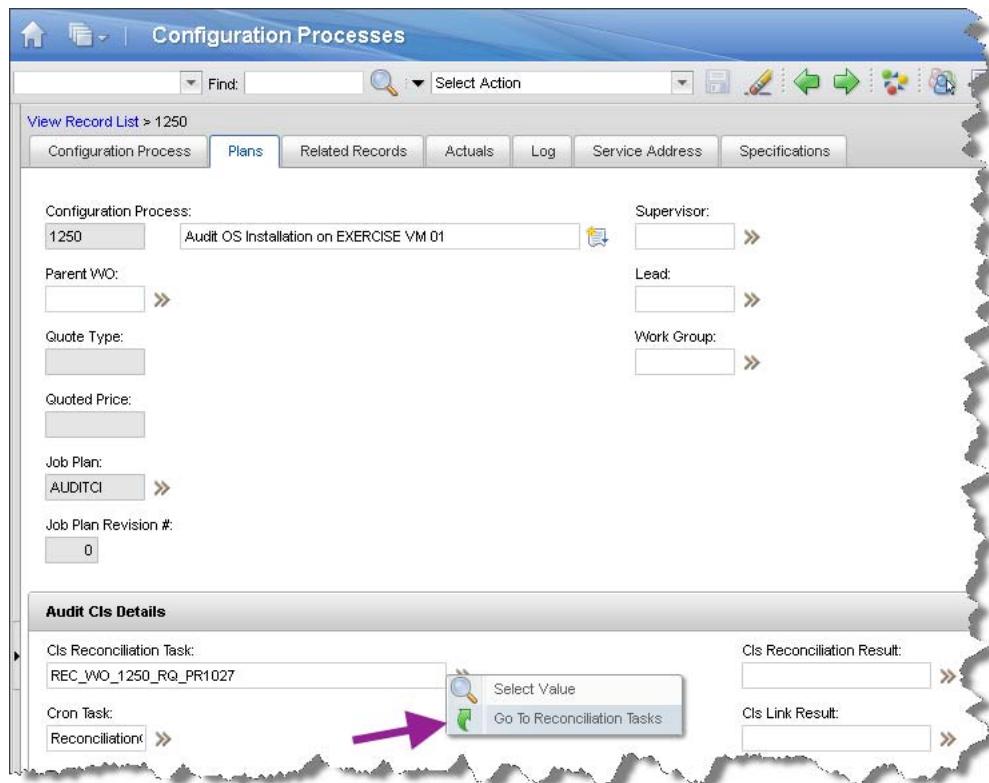
By now, you have checked the CI Link Results, and briefly looked at the CI reconciliation results. Normally you would do this while working with the AUDITCI2 process, but here you cheated a little bit so you could familiarize yourself with the two results applications.

Clean up the CI reconciliation results

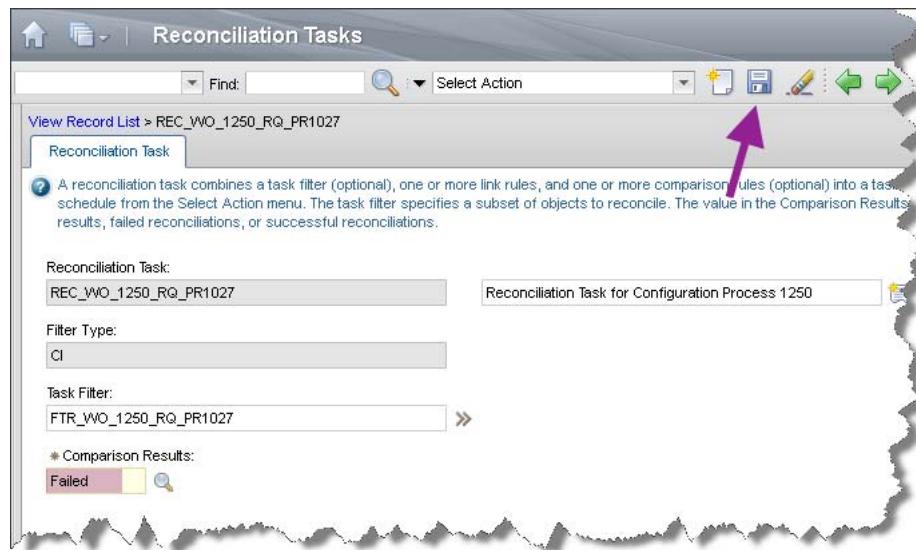
As you have experienced, the reconciliation task can generate a large amount of information. Most of this, the successful attribute and relationship comparison results, provide little or no value. To avoid filling up the CMDB with this information, you should modify the reconciliation task so that it only reports failures, and remove all the successful result records. You need to modify the reconciliation tasks first, because, as you may recall, it is invoked every 10 minutes, and if you do not change the reporting first, the successful records may be recreated.

Complete these steps to remove all the successful reconciliation results, and prevent that they are re-created:

1. Prevent success reconciliation records from being created.
 - a. Open the AUDITCI configuration task from the Configuration Audit Processes section of the Configuration Auditor start center.
 - b. When the Configuration Processes application opens, navigate to the **Plans** tab, and use the Detail Menu tool (») next to the CIs Reconciliation Task filed in the Audit CIs Details section to select **Go To Reconciliation Tasks**.

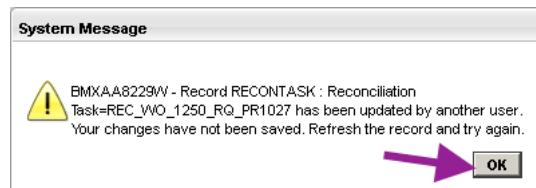


- In the Reconciliation Tasks application, change the value of the **Comparison Results** field to Failed. This prevents the generation of all the successful comparison result records.



When you are ready, save your updates by clicking the Save icon (H) in the toolbar.

If you see a message indicating that the reconciliation task has been updated by another user, don't despair.



The message indicates, that the reconciliation task is executing. Simply click **OK** the dismiss the message, wait a few minutes, and try saving the reconciliation task again.

- Then use the **Return** link to return to the audit configuration process.



What you have achieved now is, that for all future executions of the reconciliation task, results will only be reported for failed comparisons. This makes a whole lot more sense than reporting all results since only the failed comparisons need attention.

4 Configuration audit process

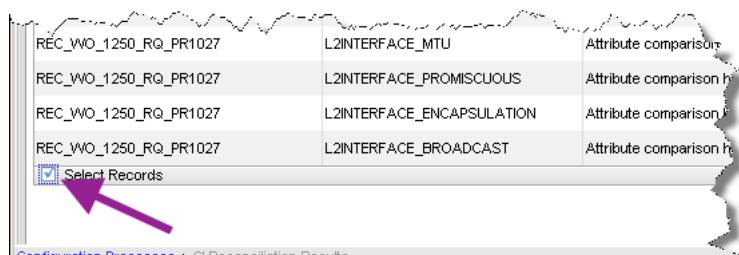
Exercise 6. Looking at CI reconciliation results

2. To remove the existing successful result records, complete these steps:
 - a. Launch the CIs Reconciliation Results application by selecting **Go To CIs Reconciliation Results** from the Details Menu tool (») next to the **CIs Reconciliation Results** field in the Audit CIs Details section in the Plans tab of the Configuration Processes application.
 - b. To list all the result records that indicate successful comparison, enter your AUDIC CI process number (1250 in this example) as the value for the **Reconciliation** filter field a value of **succeeded** in the **Message** filter value, and press Enter.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item
1250		succeeded	
REC_WO_1250_RQ_PR1027	RELATION.BINDSTO	Relationships comparison between CI and ACTUAL CI has succeeded.	127.0.0.1
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_VIRTUAL	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_VMID	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_ARCHITECTURE	Attribute comparison has succeeded.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_CPLUSPEED	Attribute comparison has succeeded.	EXERCISE VM 01

Notice that only three fewer result records are shown compared to when you looked at all the records. Consequently, three records indicate failures.

- c. To delete all the records that indicate successful comparison, complete these steps:
 - i. Scroll to the bottom of the console, and check the Select Records option in the lower left corner.

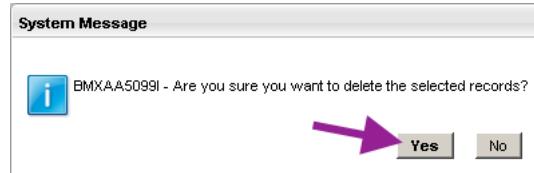


- ii. Now, scroll to the top of the console, and check the check box to the left of the Reconciliation Task column header to select all the identified records. When you have checked the option, you see check marks in front of all the result records.

The screenshot shows the 'CI Reconciliation Results' interface. A context menu is open over three selected rows. The menu items are: Create, Update CI Attribute Values, Mark Result(s) Resolved, Delete Result(s), and Run Reports. Arrows point from the menu items to their respective descriptions below. The selected rows are highlighted with purple checkmarks in the 'Reconciliation Task' column.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name
<input checked="" type="checkbox"/> REC_WO_1250_RQ_PR1027	RELATION.BINDSTO	Attribute comparison has succeeded.	
<input checked="" type="checkbox"/> REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_VIRTUAL	Attribute comparison has succeeded.	
<input checked="" type="checkbox"/> REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_VMID	Attribute comparison has succeeded.	

- iii. To delete all the selected result records, choose **Delete Result(s)** from the Select Action drop-down menu.



When the confirmation window appears, click **Yes** to confirm your intentions.

- d. After the records have been deleted, notice that the list of reconciliation result records is empty. To see which records are left, click the Clear Filter Fields icon (to reset query, and press Enter to see all the remaining records.

The screenshot shows the 'CI Reconciliation Results' interface after some records have been deleted. A single row is circled in red. The row details a reconciliation task for 'REC_WO_1250_RQ_PR1027' where the attribute 'ACTCINUM' failed to find a matching actual CI, resulting in the message 'This CI has no matching ACTUAL CI.' The configuration item name is listed as 'EXERCISE VM 01: LINUX'.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name
REC_WO_1250_RQ_PR1027	ACTCINUM	This CI has no matching ACTUAL CI.	EXERCISE VM 01: LINUX
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MANAGEDSYSTEMNAME	Attribute comparison has failed.	EXERCISE VM 01
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MEMORYSIZE	Attribute comparison has failed.	EXERCISE VM 01

When the list is recreated, you see only the three records that indicate reconciliation failure. One for the missing actual CI, and two indicating failed attribute comparisons.

3. To return to the start center, click the icon (in the header of the IBM SmartCloud Control Desk console.

You are done, you have cleaned out all the successful result records that do not provide a lot of value (except for verifying that the reconciliation works), so you can focus on the real issues.

Exercise 7. Working with AUDITCI2 processes

When you return to the start center you should see one new process in the Configuration Audit 2 Processes section. If you did not modify the escalation point condition, you may even see more than one.

Job Plan	Work Order	Description	Owner	Status	Status Date
AUDITCI	1250	Audit OS Installation on EXERCISE VM 01		COMP	5/10/12 19:45:23
AUDITCI2	1255	Configuration Process Audit Cls Phase 2 Job Plan		INPRG	5/10/12 19:06:51

The purpose of the Configuration Audit 2 processes, which has been created by the escalation, is to provide a traceable process through which the configuration auditor can resolve the discrepancies discovered by the AUDITCI processes.

Whenever the escalation discovers discrepancies, an AUDITCI2 process is created.

Executing the AUDITCI2 process

To complete the AUDITCI2 configuration process, follow these steps:

- From the Configuration Audit 2 Processes section in the Configuration Auditors start center, launch the process by clicking the AUDITCI2 link.
- When the Configuration Processes application launches, open the Plans tab.

Looking at the plan for the AUDITCI2 work order, you see that it is made up of three tasks:

- Review CI links and reconciliation results

- Remedy the variances
- Send email notification to the CI owner

Even though the process is *In Progress*, all of the tasks are still in *Waiting Approval* status.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
2	10	Review CI Link and Reconciliation Results	0:00	WAPPR		
3	20	Remediate the variances	0:00	WAPPR		
4	30	Send email notification to CI Owner	0:00	WAPPR		

For each of the tasks, review the ownership of the task (leave them blank for this exercise) and use the related Change Status icon (a colorful gear icon) to change the status to *Approved*.

Reviewing CIs link and reconciliation results

The audit reconciliation identified discrepancies, and reported records with *failed* attribute comparison, otherwise you would not have seen any AUDITCI2 tasks in your start center. You have already performed the initial analysis when you looked at the results, however you skipped a few details when you inspected the reconciliation results earlier.

To review the results of the reconciliation task, do the following.

1. From the **Plans** tab, use the Change Status icon (a colorful gear icon) next to the first task (10), Review CI Link and Reconciliation Results, and change the status to *In Progress*.

Change Status

Task: 10 Review CI Link and Reconciliation Results

Status: WAPPR Waiting on Approval

* New Status: In Progress

* Status Date: 5/11/12 00:38:43

Memo:

OK **Cancel**

4 Configuration audit process

Exercise 7. Working with AUDITCI2 processes

2. In the Audit CIs Details section, locate the **CIs Reconciliation Results** field, and use the Detail Menu tool (») to **Go To CI Reconciliation Results**.



As you saw earlier, at this point these fields have not been populated.

3. You have already inspected the information in the CI Link Results dialog, and discovered that the reconciliation task could not find an actual CI that matched the EXERCISE VM 01: LINUX operating system CI. However, you also saw a few other messages.

To inspect these messages in further detail, enter the process number for your AUDIT configuration process (1250 in this example) as the value for the **Reconciliation Task** filter field, and value of `fail` for the **Message** filter field, and press Enter to populate the results table.

The screenshot shows the 'CI Reconciliation Results' table. It has columns for Reconciliation Task, CI Attribute / Relation, Message, Configuration Item Name, and Created Date. Two rows are highlighted with a purple oval: one for 'REC_WO_1250_RQ_PR1027' comparing 'COMPUTERSYSTEM_MANAGEDSYSTEMNAME' and another for 'REC_WO_1250_RQ_PR1027' comparing 'COMPUTERSYSTEM_MEMORYSIZE'. Both rows show a 'fail' message and 'EXERCISE VM 01' as the Configuration Item Name.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name	Created Date
1250	»	fail		
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MANAGEDSYSTEMNAME	Attribute comparison has failed. EXERCISE VM 01	EXERCISE VM 01	5/10/12 19:03:56
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MEMORYSIZE	Attribute comparison has failed.	EXERCISE VM 01	5/10/12 19:03:56

Notice the two result records that appear. They both point out, that the comparison between an attribute value in the EXERCISE VM 01 authorized CI does not match the corresponding attribute in the linked actual CI. You can even see that the two attributes in question are the `COMPUTERSYSTEM_MANAGEDSYSTEMNAME` and the `COMPUTERSYSTEM_MEMORYSIZE` attributes. Do you recall that some time ago, you, as Lou, updated the memory size to 8GB? It looks as if the implementation of the change was not applied correctly!

4. To see the details of the result record open the record representing the results for the comparison of the COMPUTERSYSTEM_MEMORYSIZE attribute.
 - a. When the details are revealed, take a look at the Reconciliation Result Details section.

CI Object:	CI	Actual CI Object:	ACTCI
CI Attribute:	COMPUTERSYSTEM_MEMORYSIZE	Actual CI Attribute:	COMPUTERSYSTEM_MEMORYSIZE
CI Value:	8.0000000000	Actual CI Value:	4,294,967,296.0000000000
CI Unit of Measure:		Actual CI Unit of Measure:	
Top Level Site:		Actual Configuration Item Number:	EXERVM01.TIVOLI.EDU~150763
Configuration Item Number:	EXERCISE VM 01 >	Actual Configuration Item Name:	EXERVM01.TIVOLI.EDU
Configuration Item Name:	EXERCISE VM 01	Manually added system	

As you can see in the two value fields, there are indeed different.

Notice that you can also see the changes that are related to the current CI, and in the changes, you can see who authorized the updates.

- b. If you scroll down until you locate the Authorized CI Attribute History section, you see how the COMPUTERSYSTEM_MEMORYSIZE attribute has been modified since it was initially created.

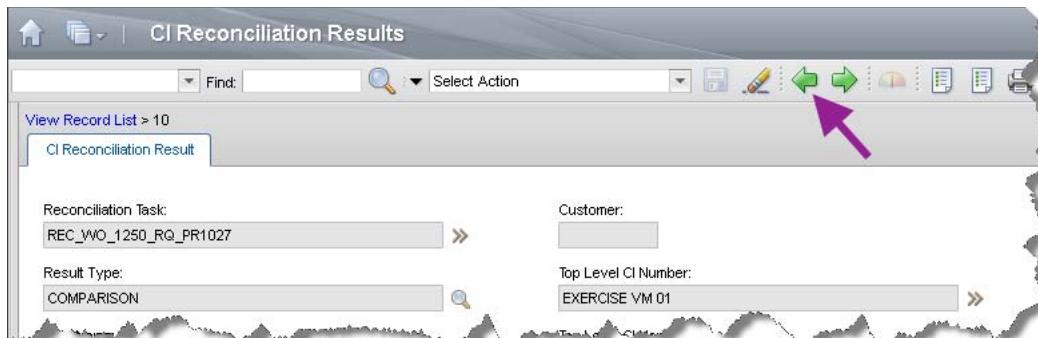
Configuration Item Name	Attribute	Alphanumeric Value	Numeric Value	Unit of Measure	Changed By	Changed Date
EXERCISE VM 01	COMPUTERSYSTEM_MEMORYSIZE				MAXADMIN	4/23/12 17:24:52
EXERCISE VM 01	COMPUTERSYSTEM_MEMORYSIZE		4,294,967,296.0000010000		LOU	4/30/12 17:49:21
EXERCISE VM 01	COMPUTERSYSTEM_MEMORYSIZE		8.0000000000		LOU	5/4/12 22:30:28
EXERCISE VM 01	COMPUTERSYSTEM_MEMORYSIZE		4,294,967,296.0000010000		LOU	5/4/12 22:40:41
EXERCISE VM 01	COMPUTERSYSTEM_MEMORYSIZE		8.0000000000		LOU	5/4/12 22:43:35

Notice that Lou was the last person to change it some time ago. (The attribute history you see may be slightly different from the one shown above).

4 Configuration audit process

Exercise 7. Working with AUDITCI2 processes

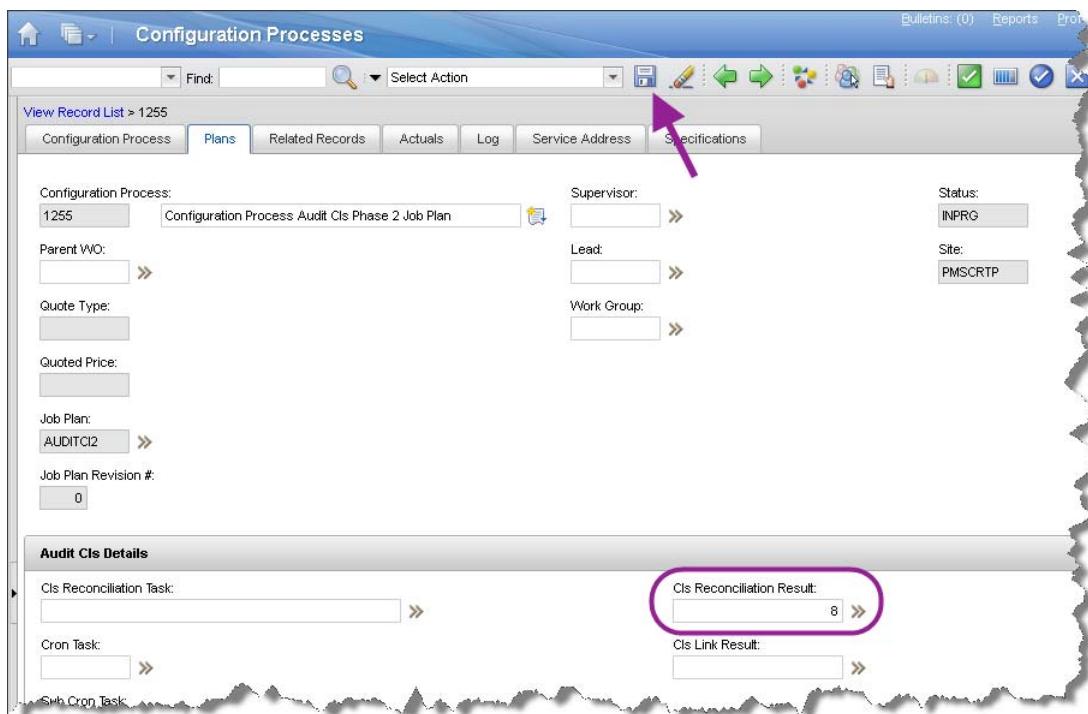
- To see the similar details of the other audit failure result, click the Previous Record icon (in the header and inspect the details.



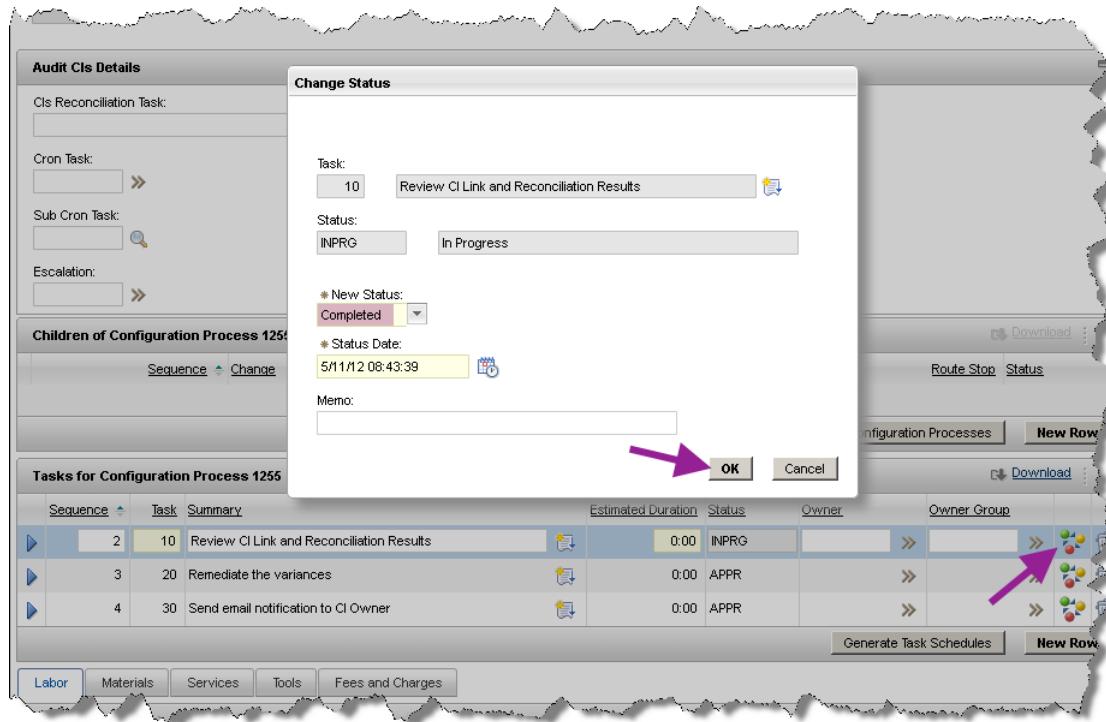
- To save the link to the CI Reconciliation Result with your AUDITCI2 work order, use the **Return With Value** link in the header, and notice how the link is saved in the CI Reconciliation Results field in the AUDITCI2 process.



- When you return to the AUDITCI2 process, click the Save icon (at the top of the console to save the reference to the reconciliation result with the work order.



- The review is done, so you should indicate this by completing the task. Scroll down to the Tasks for Configuration Process and use the Change Status icon () to update the status of the Review CI Link and Reconciliation Results task(10) to COMPLETED.



At this point you have identified exactly which links and attributes failed the audit, and you can start working on resolving the issues.

Remediate the variances

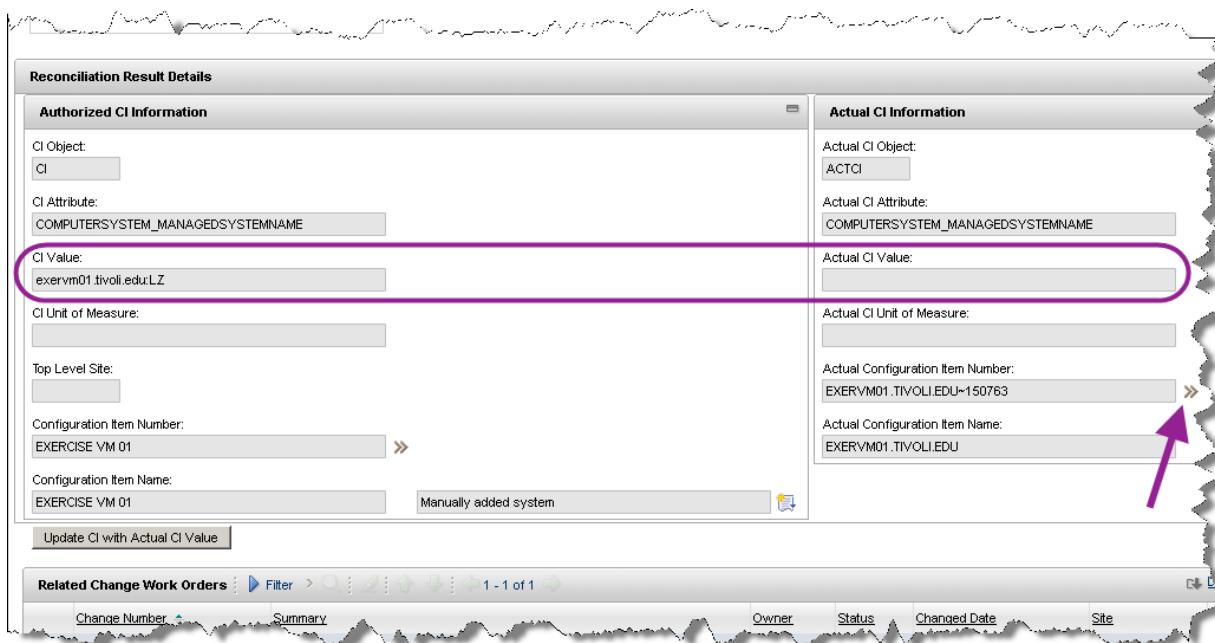
At last you are ready to remediate the discrepancies related to the change that installed an operating system on the EXERCISE VM 01 system.

To make the appropriate updates to the database to resolve the variances identified by the reconciliation task, do the following:

1. Notice, that when you completed the previous task, the status of the Remediate the variances task (20) changed to In Progress.
2. Now, open the result record that you identified previously using the Detail Menu tool (») next to the *CIs Reconciliation Results* and select **Go To CI Reconciliation Results**.



3. When the CI Reconciliation Results details open, you will see the information you already saw when you verified that the reconciliation task was working as expected. And you already know that the value for the COMPUTERSYSTEM_MANAGEDSYSTEMNAME attribute has a value in the authorized CI but no value in the actual configuration item.

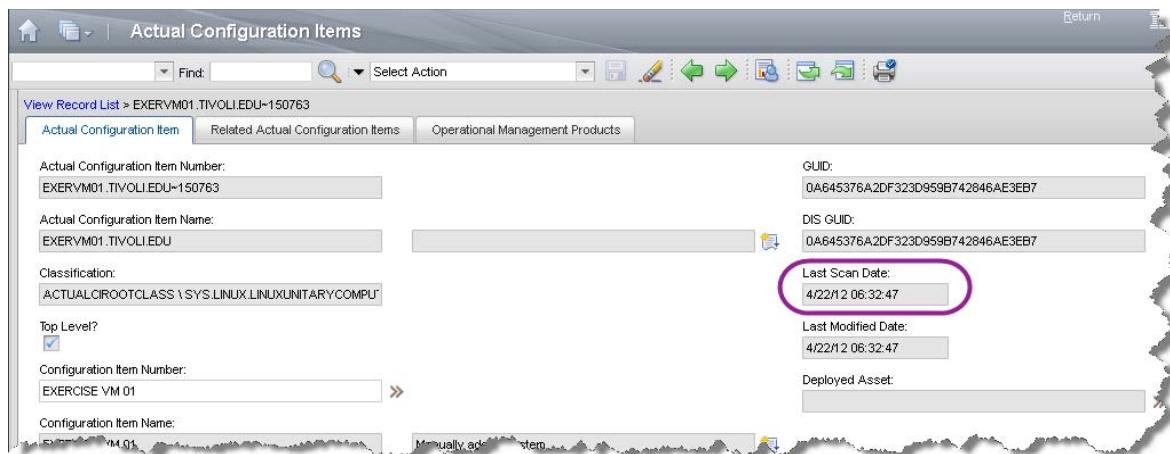


4. To analyze the data consider the following:

- First you need to know if you can trust the data.

In order to ensure that you are comparing apples to apples, you must ensure that the last scan date of the actual CI is later than the completion date for the change. Actually, the last scan date should be later than the completion date for the last implementation task in the change, but the completion date for the change will suffice in this example.

To find the last scan date for the actual CI, use the **Go To Actual Configuration Items** option of the Detail Menu tool (») next to the Actual Configuration Item Number in the Reconciliation Result Details section. When the Actual Configuration Items application opens, look at the information in the Last Scan Date.



In this example, the Last Scan Date is May 22, 2012.

Use the Return link to go back to the reconciliation result record.

- Now that you know when the actual CI data was collected, you must relate that date to the information in the Authorized CI Attribute History section.

Change Number	Summary	Owner	Status	Changed Date	Site	Progress
EXER_SC_00	Install operating system on EXERCISE VM 01	COMP	5/11/12 01:00:02		PMSCRTP	

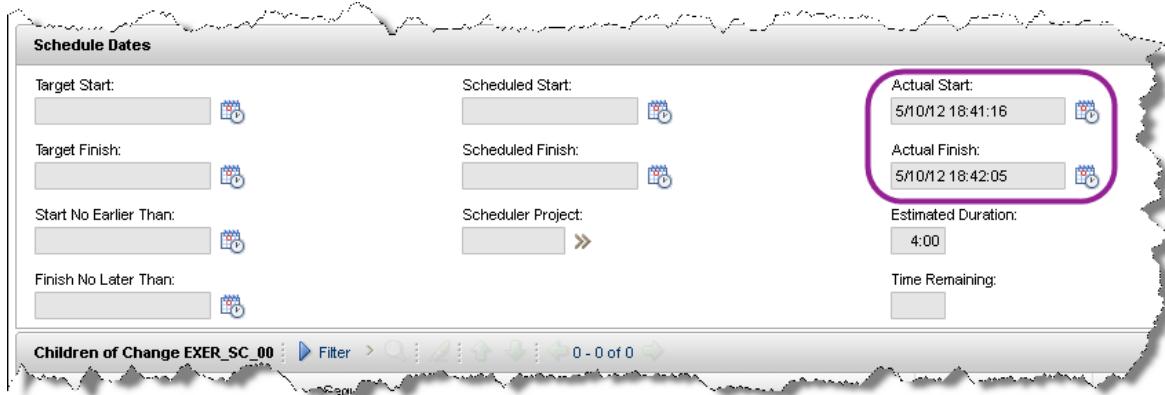
Configuration Item Name	Attribute	Alphanumeric Value	Numeric Value	Unit of Measure	Changed By	Changed Date
EXERCISE VM 01	COMPUTERSYSTEM_MANAGEDSYSTEMNAME				MAXADMIN	4/23/12 17:23:23
EXERCISE VM 01	COMPUTERSYSTEM_MANAGEDSYSTEMNAME	exervm01.tivoli.edu:LZ			LOU	4/30/12 17:54:19

You can see that the value of the attribute was changed by LOU after the last scan (April 30, 2012). From this you can deduce that the actual data you are comparing to the authorized CI are not current, and you should wait until the system has been scanned and the actual CI information has been updated.

Now, assume for a while, that the last scan date was later than the last update of the attribute, so you actually are working with the correct data. In this case you might assume that attribute was updated as part of the processing of an authorized change for which the

proper RCF and change history, including approvals, has been recorded. However, before you can be sure, you have to know if the CIs have been the target of any changes, and when those changes started and completed.

- To find the start date for the change, you have to expand the change details by clicking the View Details icon (▶) next to the change, and use the **Go To Changes** option from the Detail Menu tool (») next to the **Change Number** field. When the change opens, navigate to the **Schedule** tab, and notice the actual information in the Schedule Dates section, so you can compare these dates to the attribute history and determine if the attribute was updated *before or during* the life of the change.



In this example you see that the change started several days (May 12, 2012) after the last update to the attribute (April 30, 2012). Because there is only one change, you can now deduce that the update Lou applied was *unauthorized*, because it was not performed inside the time frame of an active change.

Use the **Return** link to go back to the reconciliation results.

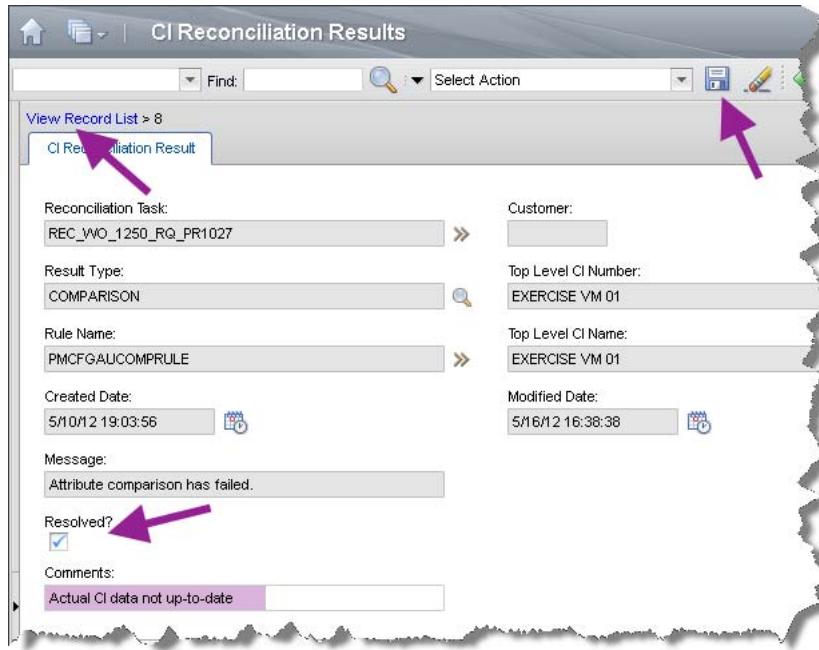
- Now, still assuming that the actual CI information is current, you have reached a conclusion that the actual CI should take preference, and overwrite Lou's updates, since they were not authorized. However before you, as the configuration auditor, update anything, you get both Lou and the owner of the CI on the phone, and reach consensus on what the value of the COMPUTERSYSTEM_MANAGEDSYSTEMNAME attribute should be.

If you agree that the new value should be different from the current value on the actual CI, you need to submit a Configuration Update request so it can be properly documented why the attribute value is changed.

On the other hand, if you agree that the current value of the attribute in the actual CI is the correct value to be used in the authorized CI, you can immediately use the Update CI with Actual CI Value facility to perform the update. For multiple updates, you could consider using the Synchronize Authorized CI function from the Configuration Items application or the Create Authorized Configuration Item function from the Actual CI application to (re)promote the actual CI.

In the current example, you decide not to update the value of the authorized CI attribute. To record that fact that you have investigated the discrepancy and reached the conclusion you

reached, select the **Resolved?** check box, and add a comment stating: Actual CI data not up-to-date.



Click the Save icon () at the top of the console when you are ready.

You have now resolved the first failed reconciliation result. Next you will process the two remaining ones.

5. To view all the reconciliation results, click the View Records link immediately above the **CI Reconciliation Result** tab. When the list of results open, reset the list by clicking the Clear Filter Fields icon (), and then click the Reload to update the list from the database icon ().

4 Configuration audit process

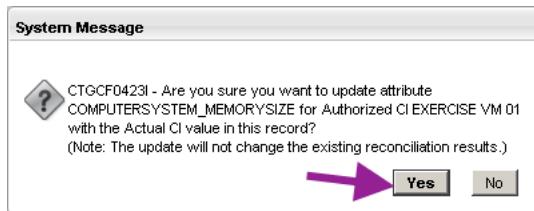
Exercise 7. Working with AUDITCI2 processes

Open the reconciliation result for the COMPUTERSYSTEM_MEMORYSIZE attribute, and take a look at the Reconciliation Result Details section.

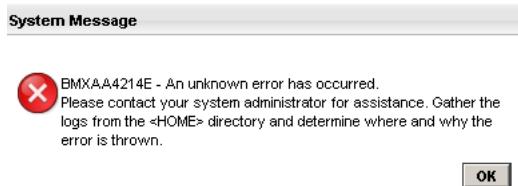
The screenshot shows the 'Reconciliation Result Details' window. On the left, under 'Authorized CI Information', the 'CI Value' field is set to '8.0000000000'. On the right, under 'Actual CI Information', the 'Actual CI Value' field is set to '4,294,967,296.0000000000'. A purple arrow points to the 'Update CI with Actual CI Value' button at the bottom left of the window.

Remember that Lou, when working with the configuration update request, set the value of the memory size attribute to 8. Once again assuming that the actual CI data are accurate and current, apparently someone never allocated more memory to the virtual system.

To update the authorized value for the attribute from the actual value, click **Update CI with Actual CI Value**. When the confirmation message appears, click **Yes** to confirm that you intend to update the CI.



Note: In some instances it has been observed that you do not get the expected results. If you see a message similar to the following, use the CI synchronization feature to update the attributes, or simply ignore the update, and report the result as resolved.



6. To remediate the last discrepancy, the one where the message states **This CI has no matching ACTUAL CI**, complete these steps:
 - a. To see the list of the remaining, unresolved reconciliation results, click the **View Record List** link, reset the list by clicking the Clear Filter Fields icon (), enter a value of **N** for the Resolved? filter field, and press Enter. The list of reconciliation results will contain only a single record.

The screenshot shows a table titled "CI Reconciliation Results". The columns are: Reconciliation Task, CI Attribute / Relation, Message, Configuration Item Name, Created Date, and Resolved?. A single row is selected, highlighted in blue. The "CI Attribute / Relation" column contains "ACTCINUM". The "Message" column contains "This CI has no matching ACTUAL CI. EXERCISE VM 01: LINUX". The "Resolved?" column shows "N". There are two pink arrows: one pointing to the "CI Attribute / Relation" column, and another pointing to the "ACTCINUM" value in that column.

Open the only reconciliation result record in the list.

You have already visited this linkage problem, so you can immediately resolve it.

- b. To resolve this issue, you must link the authorized CI to a matching actual CI using naming rules from the Configuration Items application. The link rule of the reconciliation task only identifies existing links, and does not use naming rules to identify new ones.

To link the CI to the matching actual CI, use the Detail Menu tool (next to the Configuration Item Number field in the Reconciliation Result Details section, and select **Go To Configuration Items**.

The screenshot shows the "Reconciliation Result Details" page. It has several input fields: CI Object (CI), CI Attribute (ACTCINUM), CI Value, CI Unit of Measure, Top Level Site, Configuration Item Number (EXERCISE VM 01: LINUX), and Configuration Item Name (EXERCISE VM 01: LINUX). Below these fields is a button labeled "Go To Configuration Items" with a green icon. A pink arrow points to this button.

4 Configuration audit process

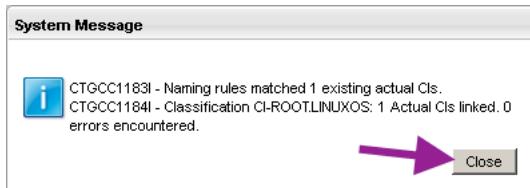
Exercise 7. Working with AUDITCI2 processes

- c. In the Configuration Items application, choose **Select Action > Link to Actual CI**.



When you see the Link to Actual CI window, click **OK** to accept the default values.

After a short while, you see the results of the naming rule-based linkage. The naming rules should have matched exactly 1 actual CI. It happens to be the one you manually imported in order to simulate discovery and load.



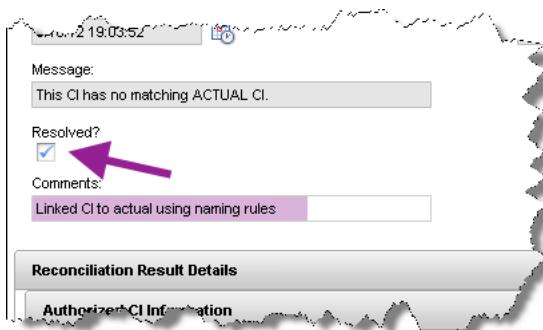
Click **Close** to dismiss the System Message window.

- d. To return to the reconciliation results, use the **Return** link in the upper-right part of the IBM SmartCloud Control Desk console.



- e. All that is left for you to do is to mark the reconciliation result as resolved.

Select the **Resolved?** check box for the reconciliation result, and provide a comment stating the action you took. For example: Linked CI to actual using naming rules.



Click **Save** when you are done.

7. At long last you have processed all the failed reconciliation results. Return to the AUCIT2 configuration process by clicking the **Return** link in the header.

- Back in the AUDITCI2 process, scroll down to the Tasks for Configuration Process and use the Change Status icon () to update the status of the Remediate the variances task (20) to COMPLETED.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group	
2	10	Review CI Link and Reconciliation Results	0:00	COMP	>>		
3	20	Remediate the variances	0:00	COMP	>>		
4	30	Send email notification to CI Owner	0:00	INPRG	>>		

At last you have resolved all the discrepancies by making informed decisions on what action to take. All you need to do now is to inform the stakeholders.

Send email notifications to the CI owner

For this exercise you can bypass this task, and immediately set the status of task #30 to COMPLETED.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group	
2	10	Review CI Link and Reconciliation Results	0:00	COMP	>>		
3	20	Remediate the variances	0:00	COMP	>>		
4	30	Send email notification to CI Owner	0:00	COMP	>>		

Notice that when you complete the last task in the configuration process, the status of the entire process changes to COMPLETED. You have finalized the audit of the change that implemented the EXERCISE VM 01: LINUX operating system CI.

At this point you should return to the start center to close the audit request. Click the Home icon () in the header of the IBM SmartCloud Control Desk console, to go back to Granger's start center.

Finalizing the audit

When you return to your start center, depending on your timings, you may notice a new AUDITCI2 work order related to the original Audit CI work order. Didn't you just complete the audit, and mark all the failing results as resolved?

Also notice, that this new AUDITCI2 process was created before the original AUDITCI2 completed.

Job Plan	Work Order	Parent Work Order	Description	Owner	Status	Status Date
AUDITCI2	1255		Configuration Process Audit CIs Phase 2 Job Plan		COMP	5/17/12 04:48:44
AUDITCI2	1259		Configuration Process Audit CIs Phase 2 Job Plan		INPRG	5/17/12 04:05:23

Set Graph Options

My Configuration Process Tasks	
Filter	Search
Set Graph Options	

Well, you did, but as part of your efforts to resolve the discrepancies, you created a new link between an authorized CI and an actual CI. Since you only linked the two, and did not perform any synchronization or promotion, you did not ensure the consistency of the values of the attributes in the newly linked CI. In addition, your reconciliation task is still scheduled to run every 10 minutes, and the escalation is also still active. Since you see an AUDIT2 configuration process, you know that there still exist un-resolved reconciliation results, so changes are, that the reconciliation task has found discrepancies between the newly linked CIs.

To verify this theory, complete these steps:

1. Use the **CI Reconciliation Results** link in the Related Application section in the start center to see if any new failing results have been created.

Welcome, Granger Configuration Auditor

Configuration Auditor All Users

Quick Insert

New Process Request

Related Applications

- Activities and Tasks
- CI Link Results**
- CI Reconciliation Results** (highlighted with a purple arrow)
- Comparison Rules
- Link Rules
- Reconciliation Tasks

Percentage of Audit CI Processes Completed

When the CI Reconciliation Results application opens, press Enter to populate the list of results.

- Notice number of records, and the information in the **Created Date** and **Resolved?** fields.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name	Created Date	Resolved?
REC_WO_1250_RQ_PR1027	ACTCINUM	This CI has no matching ACTUAL CI.	EXERCISE VM 01: LINUX	5/10/12 19:03:52	<input checked="" type="checkbox"/>
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MANAGEDSYSTEMNAME	Attribute comparison has failed.	EXERCISE VM 01	5/10/12 19:03:56	<input checked="" type="checkbox"/>
REC_WO_1250_RQ_PR1027	COMPUTERSYSTEM_MEMORYSIZE	Attribute comparison has failed.	EXERCISE VM 01	5/10/12 19:03:56	<input checked="" type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSMODE	Attribute comparison has failed.	EXERCISE VM 01: LINUX	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_FQDN	Attribute comparison has failed.	EXERCISE VM 01: LINUX	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_KERNELVERSION	Attribute comparison has failed.	EXERCISE VM 01: LINUX	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSCONFIDENCE	Attribute comparison has failed.	EXERCISE VM 01: LINUX	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSNAME	Attribute comparison has failed.	EXERCISE VM 01: LINUX	5/17/12 04:04:37	<input type="checkbox"/>

You see that a number of new result records have been added. They are all related to the OPERATINGSYSTEM attributes in the EXERCISE VM 01: LINUX configuration item. Since this CI is the one that was recently linked to an actual CI, your theory seems to be correct.

Open any of new result record to resolve all of them.

- In the Reconciliation Result Details you see that the values of the authorized and actual attributes are different. This is the common situation for all the new reconciliation results, so the easiest way for you to resolve all of them is to perform a synchronization for the CI.

To access the CI, so you can synchronize it with its actual sibling, complete these steps:

- Choose **Go To Configuration Items** from the Detail Menu tool (») next to the **Configuration Item Number** field in the Reconciliation Result Details section.

Reconciliation Result Details

Authorized CI Information

CI Object: CI

CI Attribute: OPERATINGSYSTEM_FQDN

CI Value:

CI Unit of Measure:

Top Level Site:

Configuration Item Number: EXERCISE VM 01: LINUX

Configuration Item Name: EXERCISE VM 01: LINUX

CentOS 5.5 SMP 64-bit

Go To Configuration Items

Update CI with Actual CI Value

4 Configuration audit process

Exercise 7. Working with AUDITCI2 processes

- b. When the Configuration Items application opens, open the **CI Details** tab, and locate the Specifications section.

Attribute	Authorized Value	Discovered Variance	Unit of Measure	Match
OPERATINGSYSTEM_FQDN		exervm01.tivoli.edu		GLOBAL
OPERATINGSYSTEM_KERNELVERSION		2.6.18-274.17.1.el5		GLOBAL
OPERATINGSYSTEM_NAME	Linux			GLOBAL
OPERATINGSYSTEM_OSCONFIDENCE		100.0		GLOBAL
OPERATINGSYSTEM_OSMODE	SMP	No discovered value		GLOBAL
OPERATINGSYSTEM_OSNAME		Linux		GLOBAL
OPERATINGSYSTEM_OSVERSION	CentOS 5.5			GLOBAL

Notice the number of attributes that have different actual and authorized values. It should be 5, similar to the number of new reconciliation results that were created.

- c. To synchronize the CIs, click **Select Action > Synchronize Authorized CI**.

The screenshot shows the Configuration Items application interface. In the center, a dialog box titled "Synchronize Authorized CI" is displayed. The dialog contains fields for "Configuration Item Name" (EXERCISE VM 01: LINUX) and "Actual Configuration Item Name" (EXERVM01.TIVOLI.EDU). Below these are sections for "Synchronization options" and "Existing Configuration Items". The "Existing Configuration Items" section includes checkboxes for "Copy Attributes?" (checked) and "Overwrite Existing Attributes?" (checked). A purple circle highlights the "Overwrite Existing Attributes?" checkbox. Another purple arrow points to the "OK" button at the bottom right of the dialog. The background shows the main Configuration Items screen with a list of attributes under the "Specifications" tab.

When the Synchronize Authorized CI window appears, ensure that both the Copy Attributes? and the Overwrite Existing Attributes? options are checked. Then click **OK** to perform the synchronization.

- When the synchronization has completed, you will see that all the discrepancies have been resolved. Click **Return** to go back to the reconciliation results.

So by synchronizing the CI, you have resolved all the attribute discrepancies in a single operation.

- To mark all the unresolved results as resolved, in a single action, complete these steps:
 - To see all your reconciliation results, click the **View Record List** link immediately above the CI Reconciliation Result tab.
 - To filter the list to all the unresolved results, supply a value of **N** in the Resolved? filter field and press Enter.

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name	Created Date	Resolved?
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSMODE	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_FQDN	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_KERNELVERSION	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSCONFIDENCE	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSNAME	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>

When the new filter has been applied, check the Select Records option at the bottom left of the list, so you can perform an action on multiple records.

- Now, select all the records in the list by selecting the check box to the left of the Reconciliation Task column header, and use **Select Action > Mark Result(s) Resolved** option to mark all 5 records resolved.

Select Records
Message

Reconciliation Task
CI Attribute / Relation
Message
Configuration Item Name
Created Date
Resolved?

Reconciliation Task	CI Attribute / Relation	Message	Configuration Item Name	Created Date	Resolved?
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSMODE	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_FQDN	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_KERNELVERSION	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSCONFIDENCE	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>
REC_WO_1250_RQ_PR1027	OPERATINGSYSTEM_OSNAME	Attribute comparison has failed.	EXERVM01.TIVOLI.EDU	5/17/12 04:04:37	<input type="checkbox"/>

When prompted to confirm the action, click **OK**.

4 Configuration audit process

Exercise 7. Working with AUDITCI2 processes

- d. When the action completes, you notice that no more records are listed in the Reconciliation Results application. Your active filter includes only un-resolved records, and since you have marked all records resolved, the list is empty.

You have now performed all the tasks that are listed in the new AUDITCI2 configuration process, so you can close it without paying attention to the individual tasks.

5. To close the AUDITCI2 process which is still In Progress, perform these tasks:
 - a. Go back to the start center, and open the process from the Configuration Audit 2 Processes section using the link to the process (1259 in this example).
 - b. When the process has been loaded, navigate to the Plans tab.
 - c. Use the change Status icon () at the end of each line in the Tasks for Configuration Process ... section to change the status of the Review CI Link and Reconciliation Results task (10) to IN PROGRESS. Then change the status of all the tasks, one-by-one, to COMPLETED.

When the last task completes, the status of the whole process changes to COMPLETEDSD.

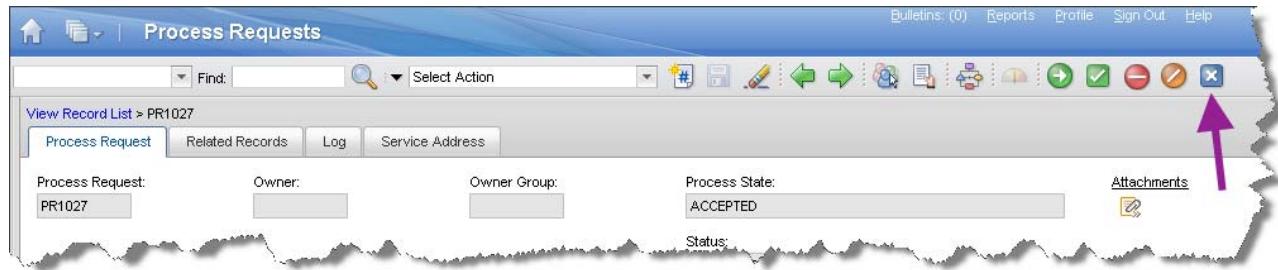
6. You are done. Return to the start center, and verify that the status of all the configuration processes is COMPLETED, and that no new AUDITCI2 processes have been created.

At last, the audit is complete, however, if you notice the status of the initial request, you see that it is still in the ACCEPTED state. You would expect that the status would automatically be changed to COMPLETED when all related configuration processes have completed, however this is not the case.

The screenshot shows the 'Welcome, Granger Configuration Auditor' dashboard. On the left, there's a sidebar with 'Configuration Auditor' and 'All Users' tabs. Below them are sections for 'Quick Insert' (New Process Request), 'Related Applications' (Activities and Tasks, CI Link Results, CI Reconciliation Results, Comparison Rules, Link Rules, Reconciliation Tasks), and 'Percentage of Audit CI Processes Completed'. The 'Percentage of Audit CI Processes Completed' section includes a gauge chart showing 70% completion. The main area contains several tables:

- Bulletin Board:** Shows a table with columns: Subject, Message, Post Date, Expiration Date, and Viewed. It notes "There are currently no bulletin board messages to view."
- Inbox / Assignments:** Shows a table with columns: Description, Due Date, Priority, Start Date, and Route. It notes "No Assignments found for Granger Configuration Auditor."
- Configuration Process Requests:** Shows a table with columns: Process Request, Description, Class Structure, Reported By, Reported Date, Site, Process State, and Status Date. It lists two entries: PR1027 (Audit OS Installation on EXERCISE VM 01, AUDITREQ, LUCY STEVE, 5/10/12 18:42:45, PMSCRTP, ACCEPTED, 5/10/12 19:45:45) and EXER CU_00 (Set OPERATING and update memory, UPDATEREQ, 5/3/12 17:38:38, PMSCRTP, COMPLETED, 5/4/12 22:50:00).
- Configuration Audit Processes:** Shows a table with columns: Job Plan, Work Order, Description, Owner, Status, and Status Date. It lists one entry: AUDITCI 1250 (Audit OS Installation on EXERCISE VM 01, 1250, 5/10/12 19:45:23, COMP).
- Configuration Audit 2 Processes:** Shows a table with columns: Job Plan, Work Order, Parent Work Order, Description, Owner, Status, and Status Date. It lists two entries: AUDITCI2 1255 (Configuration Process Audit CIs Phase 2 Job Plan, 1255, 5/17/12 04:48:44, COMP) and AUDITCI2 1259 (Configuration Process Audit CIs Phase 2 Job Plan, 1259, 5/17/12 09:45:35, COMP).

To indicate to Lucy, the original audit requester, that the audit has completed, open the request (PR1027 in this example), and use the Close icon (in the header) to change the process state to COMPLETED.



Important: One point to remember once you have completed the audit is, that the reconciliation task and the escalation are not de-activated automatically. Both will continue to execute according to the defined schedule. This may cause extra load on your system, so if this audit is a one-off, you should de-activate the reconciliation task and the escalation. However, if you wish to perform the audit on a periodic basis, you should keep the reconciliation task and escalation active, but reconsider adjusting the schedule so it meets your requirements.

This completes the configuration audit exercises, and you should grant yourself a well deserved break.

Promoting a business application

As you have seen, it is the responsibility of the configuration management team to place actual CIs under management by promoting the actual CIs to authorized configuration items. As an alternative, you can also synchronize existing authorized CIs with their corresponding actual siblings, using naming rules to perform the linkage between the authorized and actual CIs. In this case, naming rules are used to identify the actual CI that matches the CI by comparing specific attributes, and promote the matching actual CIs under the covers.

It is important that you understand, that promotion can only be performed on actual CIs that are associated with a promotion scope. The promotion scope is defined using Deployer's Workbench, and is used to specify a hierarchy of CI types to promote as descendant CIs when the parent CI is promoted. The promotion scope contains references to the associated actual CI classifications to include, as well as relationship definitions to be used to find the CIs to clone. The relationships must provide a top-down path to the descendant CIs to be included. The authorized relationships that are created as part of the promotion process are used to define the dependencies between the authorized CIs. Promotion scopes are typically customized to meet your specific needs, but are normally only created for high-level object types such as Business Services, Applications, Computer Systems, and IP Networks all of which are top-level resources. When these resources are promoted, the relationships defined in the promotion scope are used as a template, and if they exist in the actual CI space, the relationships and their related target resources will be cloned to the actual CIs. Then, this process is repeated for all the newly promoted resources for which a promotion scope has been defined. As mentioned, you typically associate promotion scopes with top-level resource types, however, you can also define promotion scopes for non top-level resource, and thereby enable the configuration management team to promote these lower-level resources. It all depends on the needs and requirements of your environment.

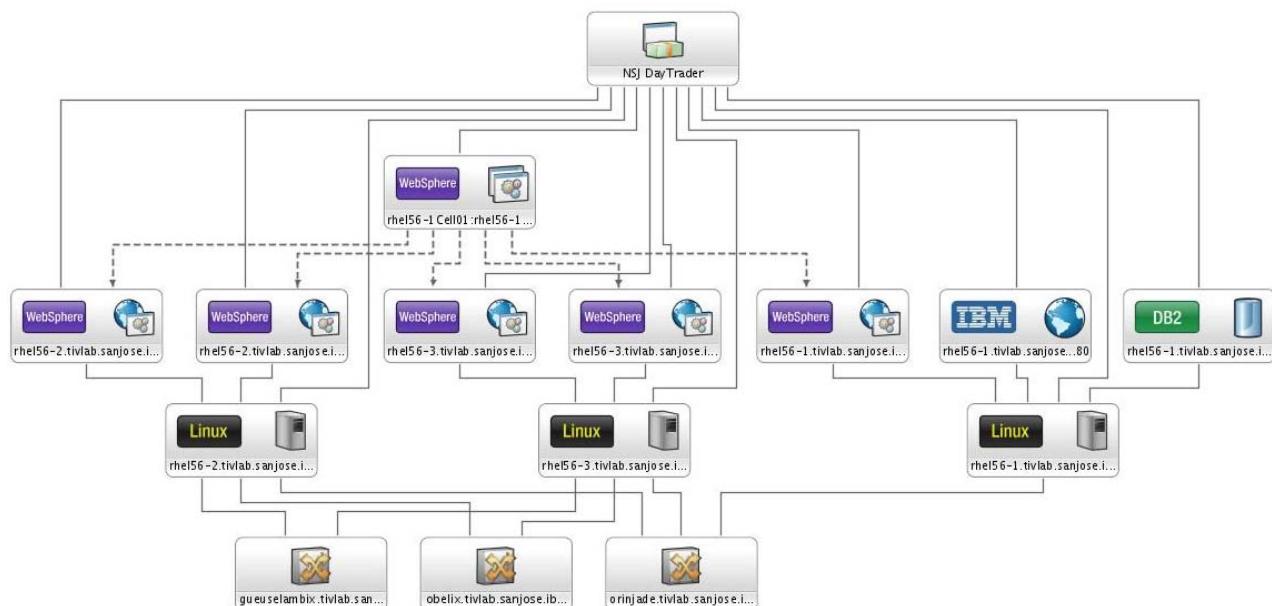
Promotion scopes are also used when you synchronize an authorized CI. If a promotion scope is associated with the classification of the CI, you will be prompted to decide if you wish to include, and optionally create descendant resources, as part of the synchronization process.

To promote all the resources that belong to an application of a business system, you typically have to perform three promotions. One for the logical resources that make up the application or business system, one for the physical platforms that host the application resources, and one for the network resources that enable the resources to communicate. Over time these resources change, so promotion, or synchronization, is something you perform repeatedly. Some organizations have decided to promote all top level actual CIs on a regular basis, while others rely on CI audits and reconciliation tasks to identify actual CIs that need to be promoted. Ultimately it is you own processes and practices that determine how you will design your promotion policy.

Introducing the NSJ DayTrader application

In the following exercise you promote an application in order to start managing the resources that are used to facilitate the application. In the exercise environment, the application resources have been discovered by TADDM, and the application has been defined. Based on this information, the actual CIs have been loaded into IBM SmartCloud Control Desk through IBM Tivoli Integration Composer, so the exercise environment contains more than 100,000 actual CIs that are ready to be promoted.

In the remainder of these exercises, you will work with resources related to the NSJ DayTrader application. If you had access to TADDM, you would be able to see the Physical Topology View. This view shows you where the main resources are installed and how they are interconnected. The physical topology is shown in the following diagram.



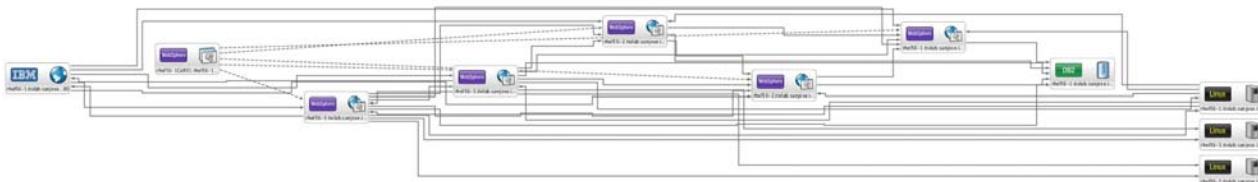
Notice that the application uses one Apache Server, five WebSphere servers, and a single DB2 instance. These resources are hosted on three computer systems, which communicate through three switches. You also see that the five WebSphere servers are grouped into a cluster, which indicates, that the WebSphere configurations of all five should be identical. Naturally there are more logical components such as databases, WebSphere nodes and node agents, application modules, virtual hosts, and a myriad of configuration parameters that control the configuration of each of the resources, but these are hidden in this view.

At the bottom you see that the three computer systems communicate via three switches. The right-most router, named orinjade, is the only switch that all three computer systems are connected to.



Note: You should note that TADDM does not show all the resources that are involved in the provisioning of an application. In many cases, TADDM hides complexities and combines information in order to increase readability. All of these complexities are shown when you look at the topology in the Detailed topology view in IBM SmartCloud Control Desk. For example, in the Physical Topology View above, you see that the Computer System and Operating System have been combined into a single object.

TADDM also provides a Software Topology View. In this you can see how TADDM has discovered live communications, and logical connections between the application server resources. This view shows that the apache server (to the far left) communicates with all five WebSphere Servers, and in turn all of these communicate with the DB2 Instance. In addition, if you look closely, you see that the WebSphere servers communicate with the computer systems. These, discovered, dependencies represent the communication between the WebSphere Servers, their related node agents and the deployment manager.



You also see that the WebSphere cluster has been included in the logical view. The dotted lines between the cluster and the five WebSphere Servers represent the management relationships that exist between the cluster and the servers. The logical view has also been simplified in order to decrease the complexity. Resources like DB2Systems, WebSphere Cells and so on are not shown, since they do not participate directly in the application provisioning, even though they are required, in order to host/implement the operational resources.

The two views you have seen provide a simplification of the reality. If all the resources that have been discovered by TADDM were shown in the views they would be so busy that they would be unusable. These views are intended to show the high-level physical and logical relationships to help you understand which high-level resources are involved in application provisioning and how they are interconnected, in order to help you identify resources and understand relationships.

Exercise 8. Promoting the NSJ DayTrader application

To promote the NSJ DayTrader application components, which have been loaded into IBM SmartCloud Control Desk as actual CI, complete these simple steps:

1. Sign in to the IBM SmartCloud Control Desk console as the configuration librarian Lou (password object00), and navigate to **Go To > IT Infrastructure > Actual Configuration Items**.
2. To promote the NSJ DayTrader application, complete these steps:
 - a. Locate the NSJ DayTrader application by providing the following filter values:

Name	NSJ
Classification	application
Top Level?	Y

and press Enter to populate the list.

The screenshot shows a software interface titled 'Actual Configuration Items'. At the top, there's a toolbar with various icons like home, file, search, and select action. Below the toolbar is a navigation bar with links for advanced search, save query, and bookmarks. The main area is a grid table with columns labeled 'Name', 'Classification', 'Top Level?', and 'Authorized'. There are two rows in the table. The first row has 'NSJ' in the Name column, 'application' in Classification, and 'Y' in Top Level?. The second row has 'NSJ DAYTRADER' in the Name column, 'APP.APPLICATION' in Classification, and a checked checkbox in Top Level?. A purple arrow points to the 'NSJ DAYTRADER' link in the second row.

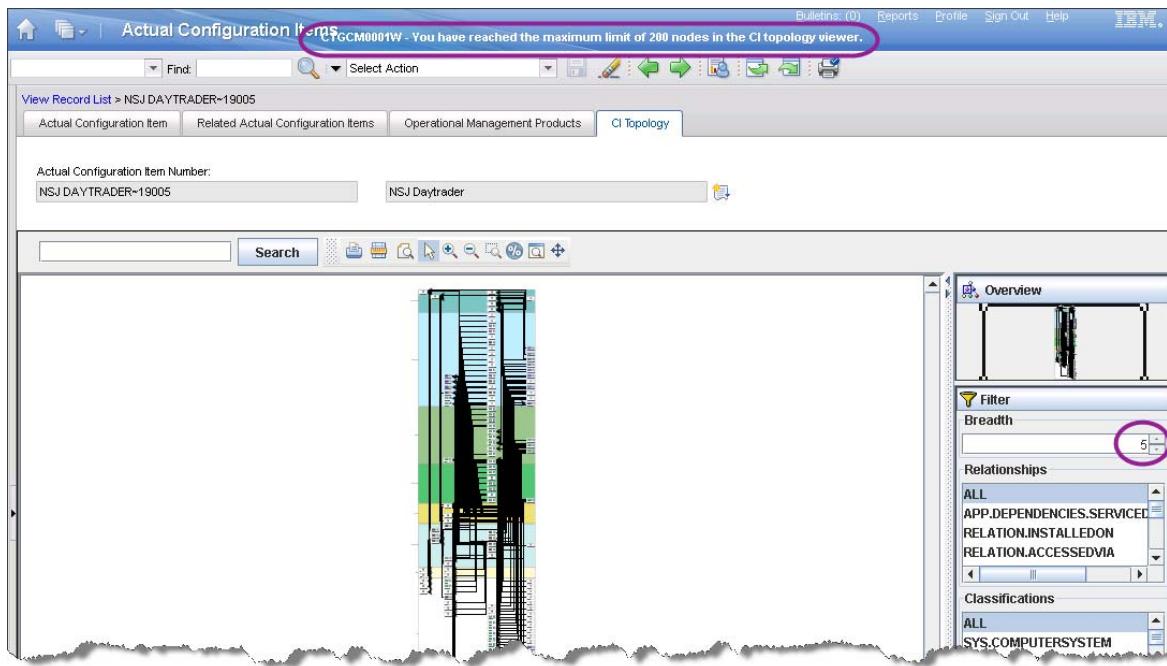
Name	Classification	Top Level?	Authorized
NSJ	application	Y	
NSJ DAYTRADER	APP.APPLICATION	<input checked="" type="checkbox"/>	

- b. To open the NSJ DayTrader application click the link named NSJ DAYTRADER.

4 Configuration audit process

Exercise 8. Promoting the NSJ DayTrader application

- c. Before you start the promotion, take a quick look at the CI Topology. Navigate to the **CI Topology** tab, and wait a minute or two for the system to render the view.

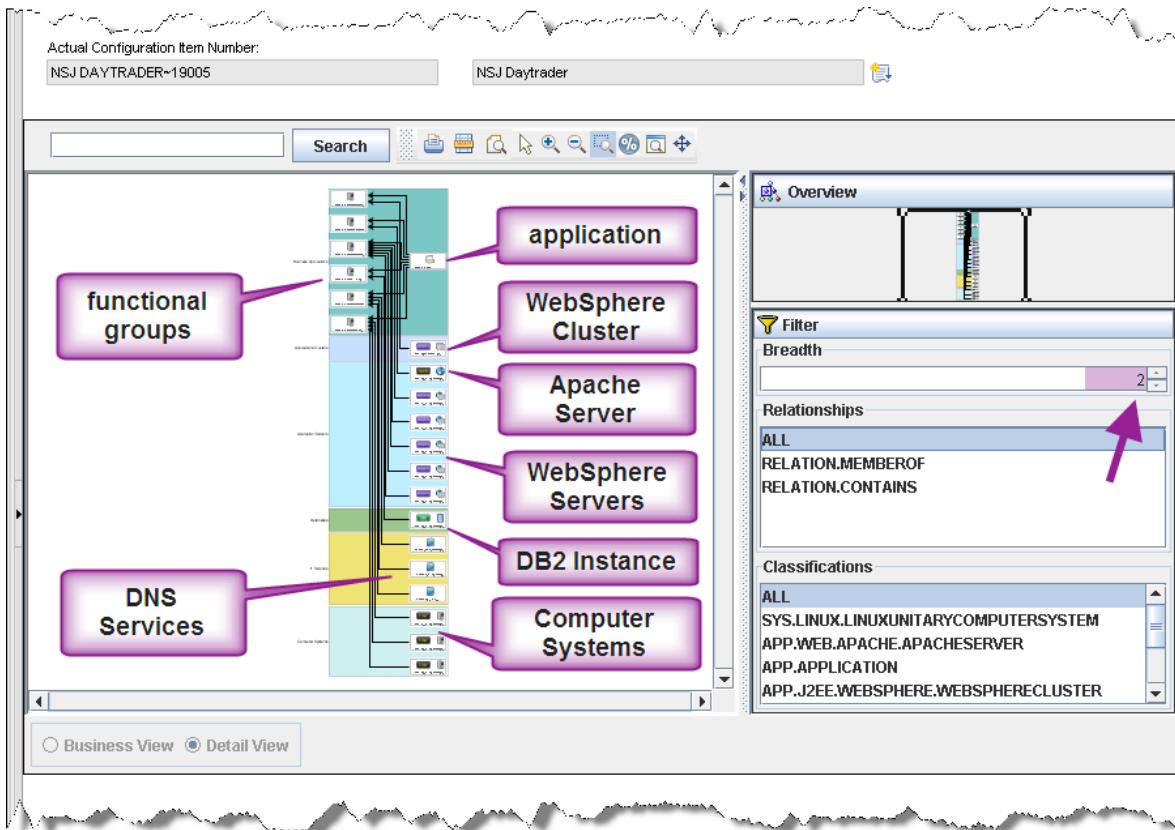


If you pay close attention, you may notice the message that briefly appears in the header. It states that *You have reached the maximum limit of 200 nodes in the CI topology*. This is an indication, that you do not see all the resources that are included in the topology. This message appears in part because you are looking at the Detail View of the actual CI topology, for which there is no filtering. In addition, the default breadth for the view is 5, which will include resources that can be found by following four levels of relationships from the selected resource. All of this generates a large amount of data, and to ensure performance of the GUI, and avoid overloading the server, the limit of 200 resources has been introduced.



Note: You can adjust both the initial breadth and the number of resources in the topology by changing the values for the pmgui.citopology.init, and pmgui.citopology.maxnodes system properties.

To see an overview of the application resources, try setting the breadth to 2, and review the new topology.



What you see in the topology is the resources that are identified by following two levels of relationships from the NSJ DayTrader application. The first level is the functional groups, each of which contain specific resource types as members. In the lower swim lanes you see the specific resource types, and you can see that the application uses five WebSphere Servers, one DB2 database, and three DNS Services. All of this is hosted on three computer systems. Does it match the TADDM software topology?

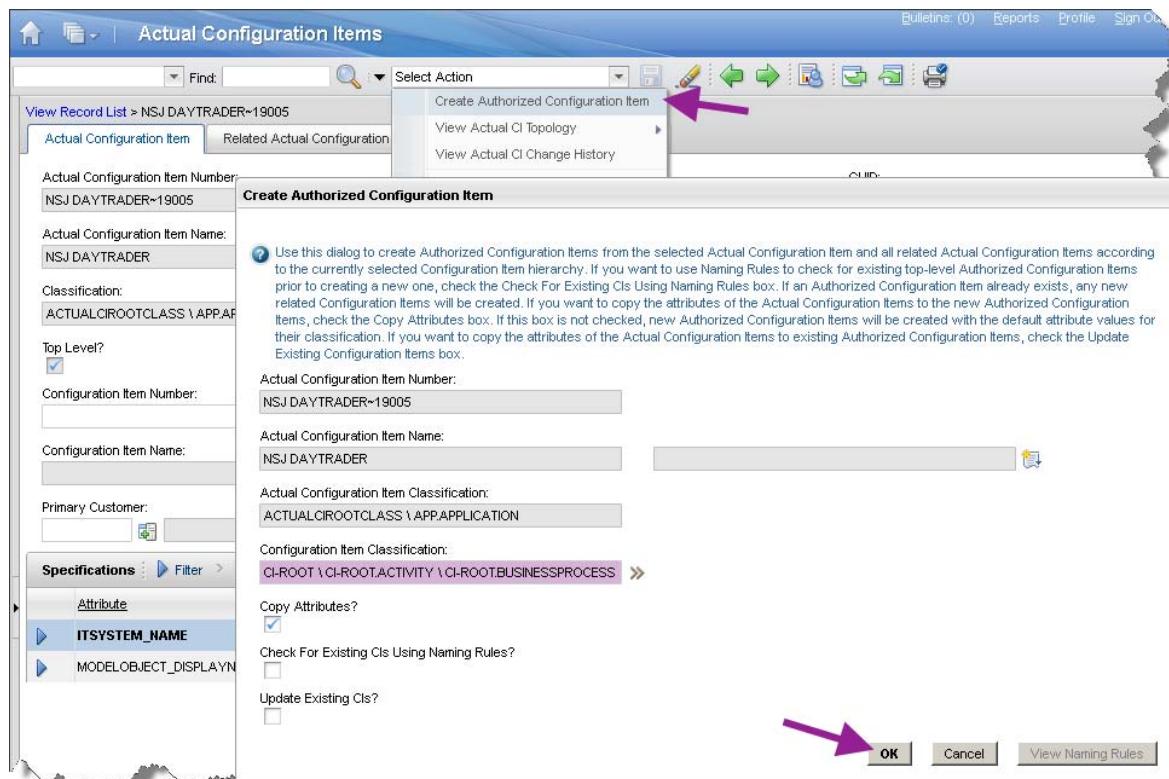
- d. To promote the current actual CI and its related resources, use the **Select Action > Create Authorized Configuration Item** option. This will create, or update, the authorized CIs related to the application.

When the Create Authorized Configuration Item window appears, ensure that you select the Configuration Item Classification named `CI-ROOT\CI-ROOT.ACTIVITY`

4 Configuration audit process

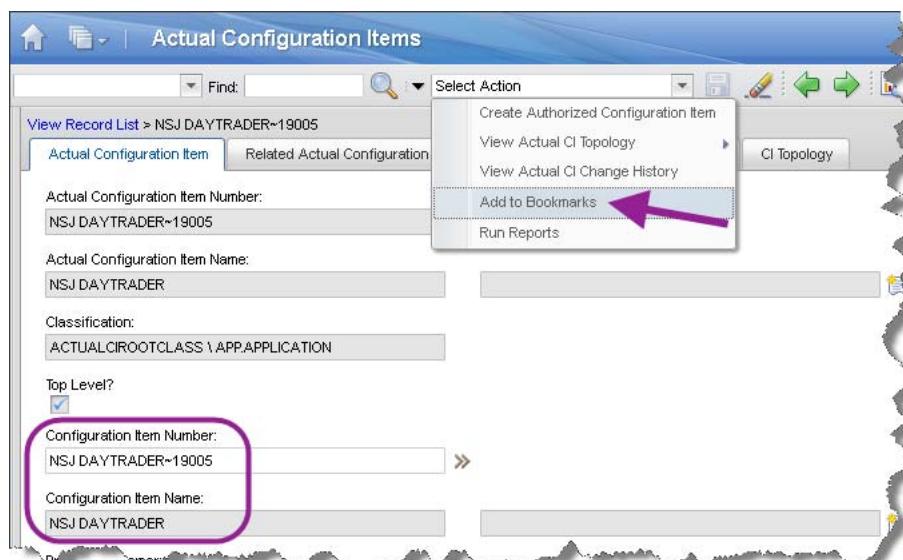
Exercise 8. Promoting the NSJ DayTrader application

\CI - ROOT . BUSINESSPROCESS\CI - ROOT . BUSINESSSERVICE\CI - ROOT . BUSINESSAPPLICATION, and click **OK** to initiate the promotion.



- When the promotion completes open the **Actual Configuration Item** tab, and verify that the **Configuration Item** field has been populated.

To create a bookmark you can use later on to quickly load the application CI, use **Select Action > Add to Bookmarks**.



During promotion you actual CI hierarchies (CIs, attributes, and relationships) are copied to the authorized CIs. In this process, the promotion scope and the actual relationships are

used to determine which actual CI to promote using a top-down approach. It is important to understand, that, the relationships are followed top-down, and since relationships are unidirectional, you may reach a point at which you cannot find descendants. This means, that if, for example, you promote an application, its related functional groups, application servers, and computer systems are promoted. Resources that are bottom-up descendants of any included resource, such as operating systems and software servers that are related through an INSTALLEDON or similar target-is-parent relationship, are not promoted unless the relationship in the promotion scope is marked *target-is-parent*. You must take this into consideration when defining your promotion scopes.

The promotion scopes used in the exercise environment have been designed to include the logical layer, and hosting platforms of the application hierarchy when an application is promoted. This implies, that the application, functional groups, application servers, operating systems and computer systems that can be located by following the relationships between the resources from top to bottom are promoted. Because the exercise environment also includes a promotion scope for the ComputerSystem object type, IPInterfaces, IPAddresses, FQDN, and L2Interfaces, will also be promoted, for the ComputerSystems that host application server resources. However, as a result of your promotion, you will not necessarily have promoted all the resources that take part in provisioning the NSJ DayTrader application, and that is intended.

Remember, the authorized CIs are supposed to represent only the resources you want to manage. If you do not intend to be able to apply configuration management to deep configuration parameters such as the Db2InstanceConfigValues, they should not be included in the promotion scope.

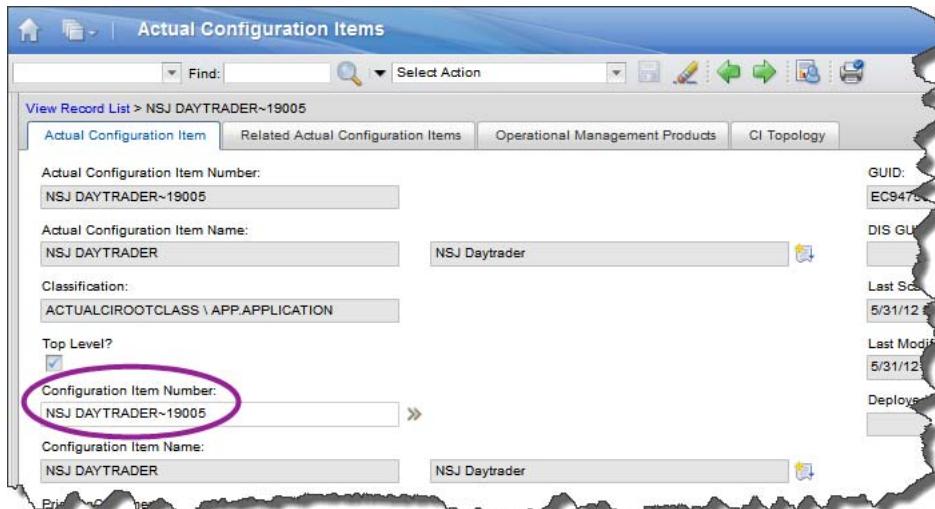
On the other hand, if you want to be able to identify changes to for example the configuration of your WebSphere servers in the production environment, you should include them in the promotion scope, so you can compare the desired state to the actual state.

Along with the main resources, configuration details for all the components are promoted. The resources, that are created as descendants of the top-level CI-ROOT.APPLICATION configuration item, are determined by the promotion scope, so the behavior may be different in your own environment.

4 Configuration audit process

Exercise 8. Promoting the NSJ DayTrader application

- f. When the promotion completes, you will see that the **Authorized Configuration Item** field has been populated for the NSJ DayTrader application.



If you look at some of the other actual CIs that were promoted, you will see that they have also been linked to authorized configuration items.

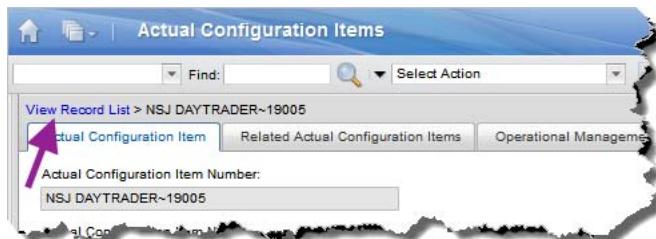


Hint: If you clear the filter in the Actual Configuration Items application, and set the value of the Authorized Configuration Item filter field to `!=`, you will generate a list of all the actual configuration items that are linked with an authorized CI.

If you do this now, you will see that the promotion of the NSJ DayTrader application resulted in the promotion of roughly 800 individual configuration items.

3. To promote some of the network equipment that the NSJ DAYTADER application and its supporting resources are connected to, you should promote the IP network named 9.43.72.128/25. Complete these steps:

- a. Click the **View Record List** link immediately above the Actual Configuration Item tab, to return to the list of actual CIs.



- b. Clear the filter fields and provide the following filtering values. Press Enter when you are ready:

Name	9.43.72
Classification	network

The screenshot shows a software interface titled "Actual Configuration Items". At the top, there are search and filter options. Below is a table with columns "Name" and "Classification". The first row shows "9.43.72" and "network". The second row is highlighted in blue and shows "9.43.72.128/25" and "NET.IPV4NETWORK". The third row shows "9.43.72.0/27" and "NET.IPV4NETWORK". At the bottom of the list, there is a row labeled "Select Records" with a checkbox. A purple arrow points to this checkbox.

- c. When the network is listed, notice that it is not a top-level resource. When you promote this network and its descendants, you experience that as long as a promotion scope is associated with a resource classification, those resources can be promoted, independently of the top-level property.

Check the Select Records check box at the bottom, to be able to perform multi-record operations. When the check boxes appear in front of each of the resources, check the check box in front of the header row to select all the records for processing:

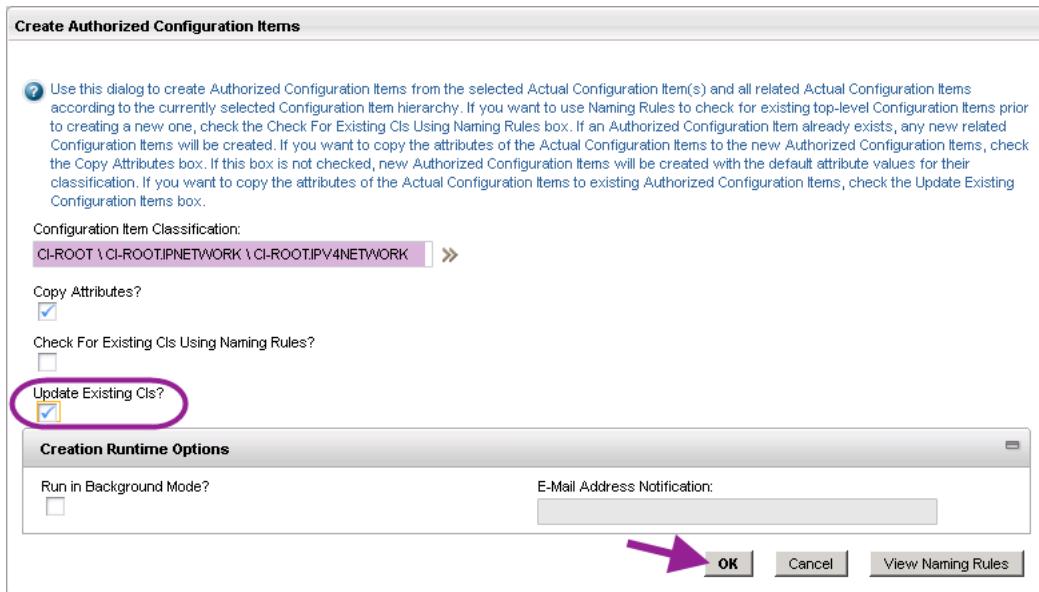
The screenshot shows the same software interface as before, but now with several checkboxes checked in the list. A purple circle highlights the "Select Records" checkbox. A purple arrow points to a dropdown menu labeled "Select Action" which contains the option "Create Authorized Configuration Items".

- d. To promote the selected networks, use **Select Action > Create Authorized Configuration Item.**

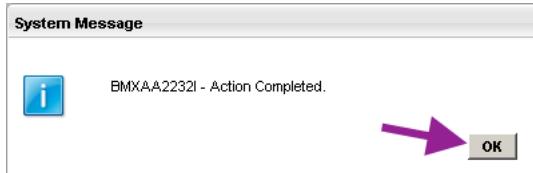
4 Configuration audit process

Exercise 8. Promoting the NSJ DayTrader application

When the Create Authorized Configuration Item window appears, select the classification CI - ROOT\CI - ROOT . IPNETWORK\CI - ROOT . IPV4NETWORK. Also ensure that you check the Update Existing CIs check box. Then, click **OK**.



When you see the confirmation message indicating that the promotion completed successfully, click **OK** to dismiss the window.



You have now promoted the NSJ DayTrader application, the hosting hardware resources, and the network resources it uses. You are ready to see the results of your efforts.

4. Before you can see the business topology of the NSJ DAYTRADER configuration item, you may have to wait a short while. The business topology is built by a background task that, in the exercise environment, executes every 15 minutes, and until this has processed the newly promoted CIs, you cannot see topology in the Business View.

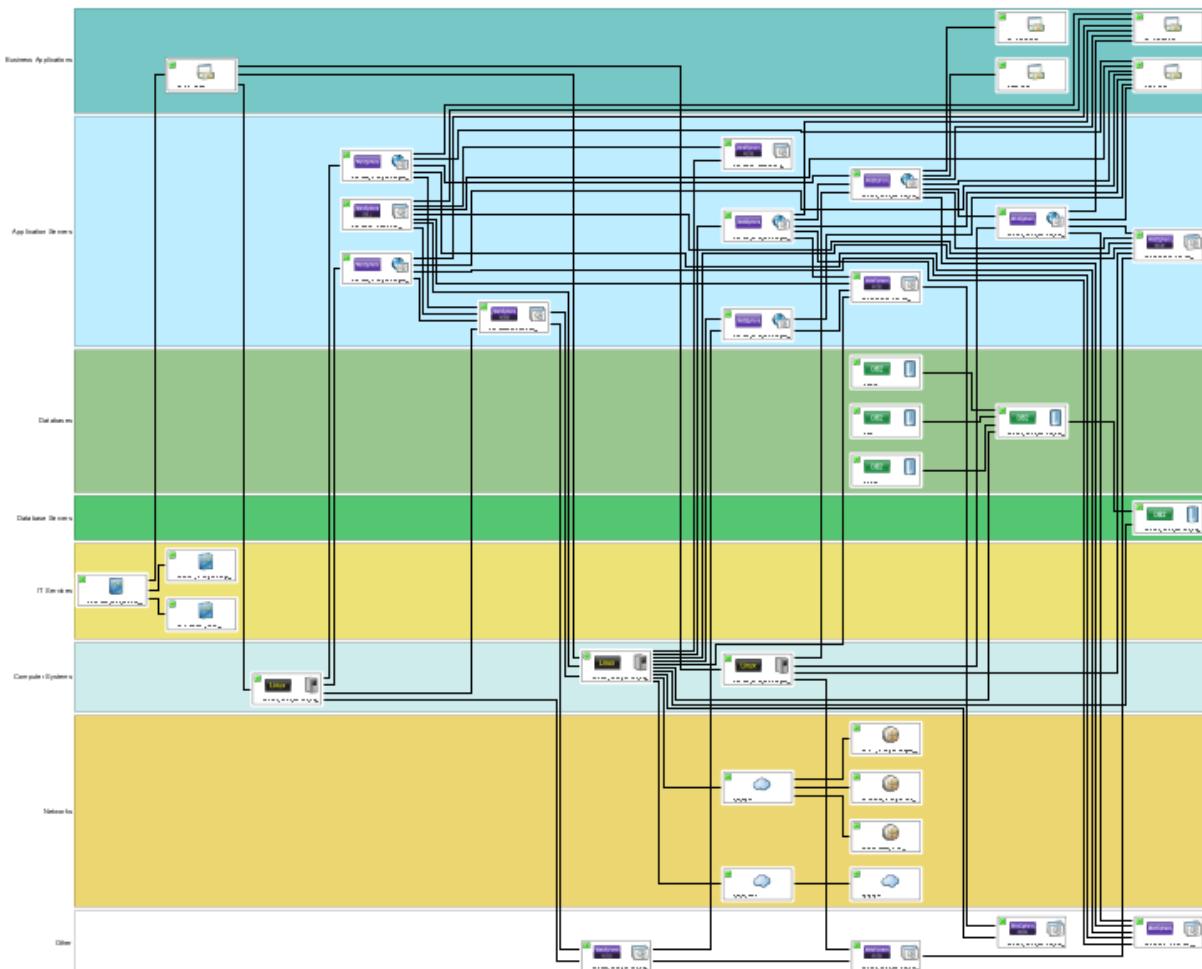
To force the execution of the TopologyCacheCron task, you can load it into the System Administration > Platform Configuration > Cron Task Setup application, select the active instance of the task, and click **Select Action > Reload Request**.

To open the NSJ DAYTRADER actual CI, load the All Bookmarks query, and click the only link you see.



To navigate to the authorized CI that represents the application, use the Detail Menu tool (») next to the Configuration Item field, to **Go To Configuration Items** and open the CI Topology tab when the Configuration Item application has loaded.

You see a topology similar to this:



The Business View provides an overview of the main components in the application. This view hides all the technical details that logically are required to implement, configure, or connect resources. Details such as operating systems, L2 Interfaces, and configuration attributes are

not shown. If you wish to see all the details, use the Detail View, but remember that for performance reasons, the view is limited to only show the first 200 resources in the topology. Depending on the resource for which you choose to see the topology, and the breadth setting, you may see different parts of the topology.

Like the Detail View, the Business View uses so called swim lanes to group similar resources. Each swimlane contains resources from one or more classification groups which in turn contains specific resource types. As an example, look at the Business Applications swimlane (at the top) and notice that you see both Business Application and WebSphereJ2EEApplication CIs in this swimlane. Resources that are not represented in the swim lanes are all located in the swimlane named *Other*.

Also notice that each resource has indicators associated with them. In the current view you see a green square with a circular symbol (green circle with a green dot) on each of the CIs. This indicates that the state of the CIs is Operational.



Note: Remember, when the topology is rendered, IBM Smart Cloud Control Desk sets the breath setting to include a number of layers starting from the selected resource. Each layer represents the next level resources that are related to any resource in the previous layer. This implies, that the topology is not limited to resources that are related to the selected resource, but it includes any descendants that can somehow be related to the selected resource through the relationship hierarchy.

Even though you only promoted the Business Application and the network CIs, you see three CIs in the Computer Systems swimlane. The reason for this is, that in the exercise environment, the promotion scopes have been defined in such a way, that computer systems are promoted as children of the application servers, and the descendants of the Computer System (Operating System, L2Interface, IPInterface etc.) are promoted with the Computer System itself. This way, the application, and computer system layers can be combined with the network layer through the L2- and IP-Interface definitions, which are included in both the application and network promotion scopes.

Take some time to experiment with the various features of the topology view, for example searching for resources, filtering in only selected resource types, or viewing CI details.

You are done. You have now promoted an entire business application and the network infrastructure it uses. This means that you are ready to start managing the configurations and start performing change management on the infrastructure components.

Working with collections

The support for collections in IBM SmartCloud Control Desk provides a convenient way to group together configuration items that are otherwise not related. Collections can be used in many contexts instead of individual CIs in order to represent multiple CIs, for example when performing move/swapping operations, selecting targets for a change, or to restrict/grant data access.

Collections can also be used to restrict access to resources for certain users. If a security group has been associated with specific collection, users in the group can only see resources that are members of the specified collection.

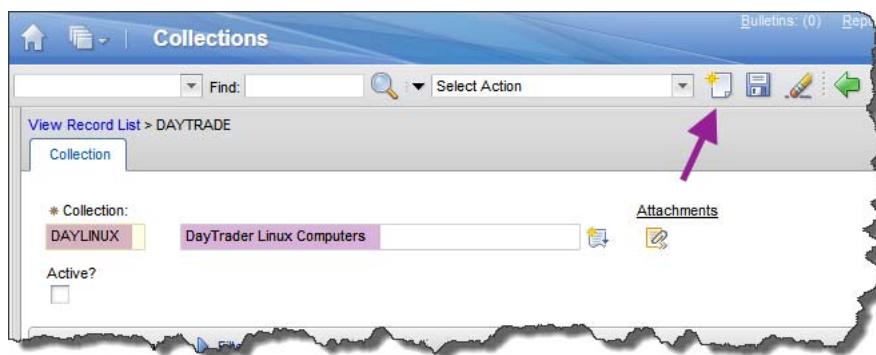
Remember, that Collections can only contain configuration items. IBM SmartCloud Control Desk does not allow you to manipulate the actual CIs in any way, so for that reason only authorized CIs can be included in a collection.

Exercise 9. Creating a collection

To create a collection that includes the three computer systems you promoted in the previous exercise, complete these steps.

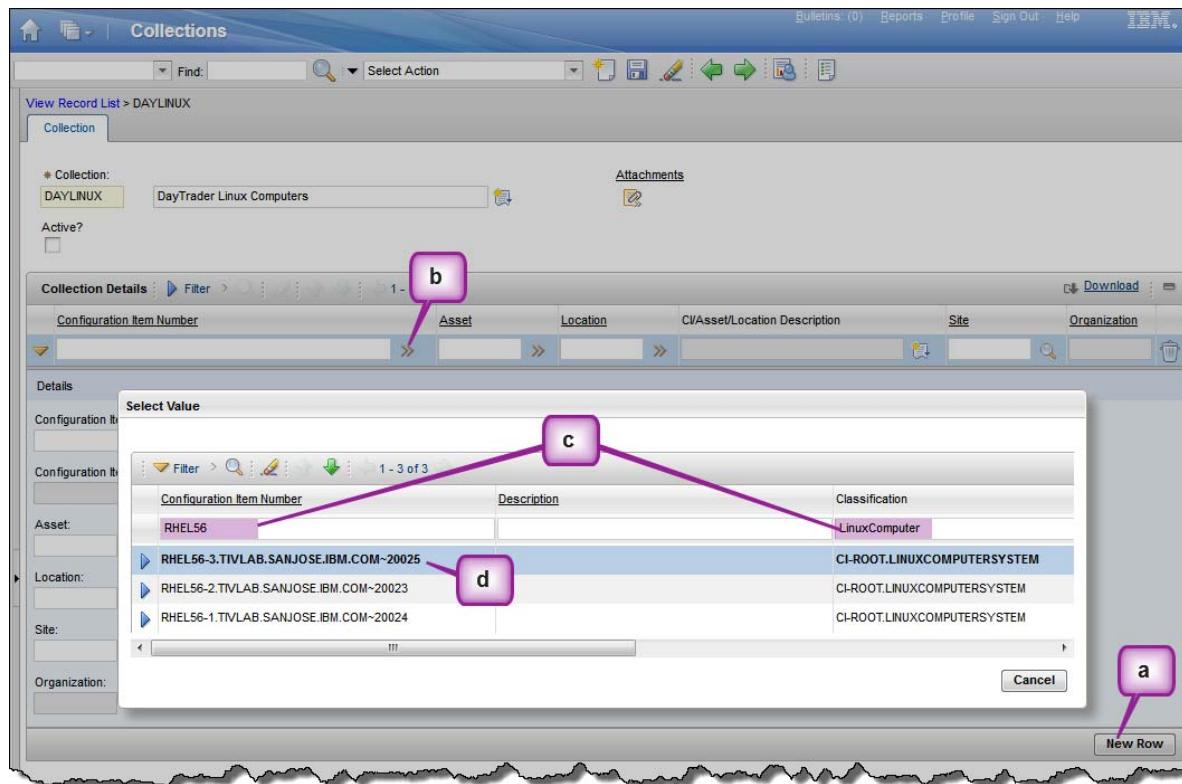
1. First, ensure that you are logged in to the IBM SmartCloud Control Desk as the super administrator user `maxadmin`, using a password of `object00`.
2. When `maxadmin`'s start center is loaded, open the Collections application by navigating to **Go To > IT Infrastructure > Collections**.
3. Create a new collection by clicking the New Collection icon () in the toolbar, and provide the following details:

Collection	DAYLINUX
Description	DayTrader Linux Computers

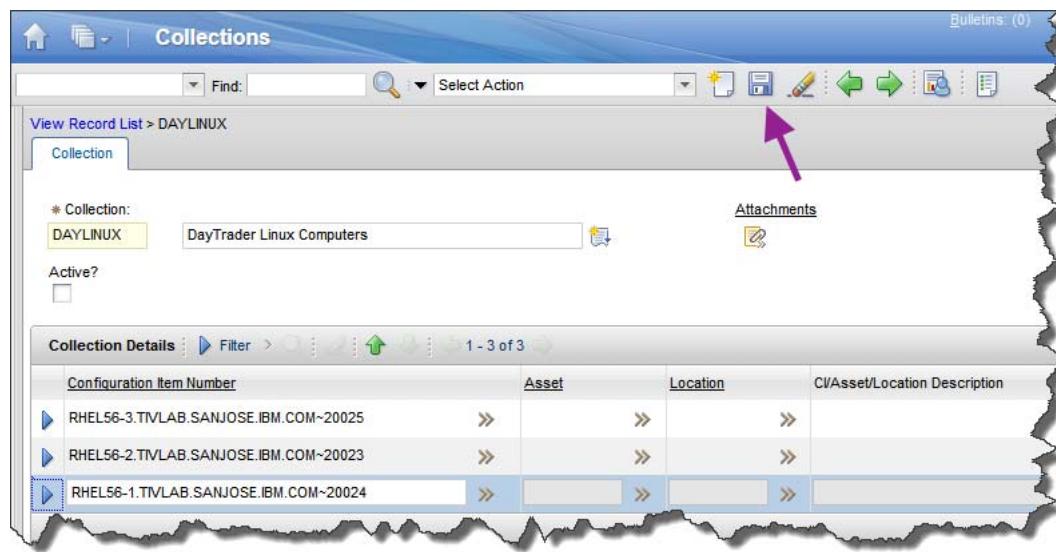


4 Configuration audit process
Exercise 9. Creating a collection

4. To add members to the collection, repeat this procedure for each of the three LinuxComputerSystem CIs whose name starts with RHEL56.
 - a. Click **New Row**.
 - b. In the Collection Details section, click the Detail Menu icon (») next to the Configuration Item field, and choose **Select Value**.
 - c. In the Select Value window, apply RHEL56 as the filter value for the Configuration Item Number field, and LinuxComputer as the value for the Classification filter field. Then press Enter to activate the filter.
 - d. To select the CI that will become a member of the collection, simply click the desired row.



- When all three members have been added, click the Save icon (in the toolbar to save the collection.



You have now created a very simple collection. In a production environment where the volumes are higher, and the environment is dynamic, you should consider automating the addition of members to the collections using for example escalations and associated actions. This way you can test on specific attribute values to control which members become members of your collections.

Configuration audit summary

In these exercises you practiced how to set up reconciliation tasks and perform CI audits to identify authorized and unauthorized modifications to the configurations. In addition, you experienced how you can promote an entire business application in a single operation, and how to work with the topology viewer to visualize component relationships.

What you did not experience, because of the time limitations, was how to define your authorized CI classification hierarchy, and the all-important promotion scopes. Classification hierarchies and promotion scopes are essential for determining what you can manage, and the level of details in the auditing process. In addition, you did not have a chance to look at how actual CIs are loaded into the IBM SmartCloud Control Desk CMDB from TADDM, and how you configure and control this process.



5 Change management with IBM SmartCloud Control Desk V7.5

The change management functions in IBM SmartCloud Control Desk help you to plan, assess, authorize, schedule, control, verify, track and document the application of changes to your environment. To help you use the same methodology for similar types of changes, IBM SmartCloud Control Desk provides standardized response plans and workflows, that can be used as templates and guides the change owner through a set of activities required to process a change. The workflows supplied with IBM SmartCloud Control Desk provide standardized processing, in accordance with ITIL best practices, and allows for automation of trivial tasks.

The purpose of applying a standardized process for change management is to ensure (or improve) the availability and performance of the mission critical systems and applications by applying data and controls that improve the planning and minimize application of unauthorized changes. In IBM SmartCloud Control Desk, this is achieved by utilizing the information in the CMDB and enforcing the use of the change management process to track and authorize change requests and implementation plans.

By leveraging the configuration and dependency information in the CMDB which has been provided by the configuration management team, while planning change implementation, you can avoid unintended outages or degradation during change implementation, which otherwise would have been unknown or overseen. IBM SmartCloud Control Desk provides a framework of data, collaboration tools, and processes which will help an organization better control what and when changes are applied to the IT infrastructure.

By applying standard processes, enabling systems administrators and application owners to document and formally request approval for changes, you capture and document the dynamics of the infrastructure, and provide the basic historical data that will show which type of changes have the highest impact on the IT infrastructure.

Change processing overview

Before you begin the change processing, understanding of the way IBM SmartCloud Control Desk processes changes is helpful.

IBM SmartCloud Control Desk wraps the standard change processing in a process request, and the structure is strongly aligned to ITIL. For changes, this is known as a Request For Change (RFC). The purpose of the process request is to allow for the recording of the request from a user that does not necessarily know all the technical details that are required to create the change record itself.

- When an authorized user, who has been assigned the change management requester role, submits a Request For Change (RFC), it is approved by the change manager, and assigned to a change owner who assesses the request and either accepts or rejects it.
- When the RFC has been accepted, the change is created. A change typically consists of one or more tasks, each of which are executed by one or more persons holding specific roles or skills (crafts) required to complete the task. It is possible to group multiple related tasks into activities so ownership and status can be assigned to all tasks in a single operation. Tasks and activities are defined in job plans that serve as reusable templates for the tasks that are related to a specific type of change. Job plans may be included in response plans, which can be applied automatically when a change is created. In addition to the job plan, response plans include additional template information for example, priority, severity, and other properties related to the change.
- Most of the tasks that are related to change processing are of administrative nature, for example: specify, assess, schedule, authorize, and review. To keep track of these tasks, a classification that is associated with the tasks is used to identify the type of the task. For example, you can specify that the task is an approval task or a milestone. In addition, because most often the intent of a change is to implement some sort of modification to the infrastructure, you can use the IBM SmartCloud Control Desk task classifications to specify that a task is an implementation task. Implementation tasks are given special consideration in IBM SmartCloud Control Desk in that they can be the targets of Impact Analysis, which would be a natural part of any technical change assessment. Implementation tasks are also scheduled through the change implementation schedule to identify any scheduling conflicts between related CIs.
- In many job plans, the detail specification, authorization, and scheduling of the changes that are needed to implement the requested modifications, are part of the tasks that are performed as part of the change. So, when using standard job plans (or response plans that include job plans) it is very common that the change is immediately approved and started when the basic information (target, times, time estimates, for example) has been provided. When the activities and tasks are performed, you can always change the scheduling of subsequent tasks until they have been authorized.

- Depending on the type, impact, urgency, and risk of the change, additional activities may be needed to complete the processing of the change. You can create response plans that take all of these factors into account, and apply standard templates that match your organizations policies. The main activities you need to consider to perform as part of the change processing is impact analysis, both technical and business-related, authorization, scheduling, and review.
- Analysis of both business and technical impact leverages the information in the CMDB to identify resources that will be impacted during change implementation. Therefore, impact analysis relies heavily on the job performed by the configuration management team. During scheduling, change windows and blackout periods for all impacted resources are taken into account so the change implementation can be planned to take place at approved times, or approval for implementing a change outside the pre-approved periods can be requested. If needed, authorization to implement the change can be requested from several levels of approvers. In this process, the change approvers review the change specifications, plans, risks, analysis, and schedule, and sign-off on the plan.
- When all the required activities needed to specify the change have been completed, the change implementer takes over, and performs the actual implementation based on the change schedule.
- When the change has been implemented, best practices encourages that the CI information is updated to reflect the changes that were applied. If the implementation has been performed according to specifications, this update helps to minimize the number of false-positives during the CI audit process that can be used to identify unauthorized changes to the infrastructure. The audit can also be an integral part of a change so it must be completed before the change is closed
- On completion of all the change activities, the change is closed, and at this time, the related RFC is closed as well. Escalations can, among other, be used to send notifications as required by the organization.

Based on this change processing overview, you understand that the IBM SmartCloud Control Desk change management functions very flexible, and can be tailored to meet the requirements of your organization. IBM SmartCloud Control Desk provides several workflows that provide best practice processing for simple, normal, and emergency changes. In addition, wizard-style workflows are provided to assist the change owner in change creation, and other workflows are used in the background to automate tasks.

During IBM SmartCloud Control Desk implementation these standard best practice workflows can be adopted as-is, or you can create your own, tailored workflows, that implement the practices and policies of your organization.

Change management in action

Many of the changes to the IT infrastructure can be processed automatically, as pre-approved standard changes. Often, the requests for this type of changes are generated from self-service solutions, in which end-users, developers and testers can request new resources or the decommissioning of existing ones. Requests may also origin from your business service management solution or the cloud management system as a response to the identification of bottlenecks or the over provisioning of a particular resource. In this case, resource adjustment requests based on the current demand may be generated automatically.

Changes that do not origin from automated tools or customer front-ends are typically requested through a Request For Change (RFC) or simply a change request. Many organizations require formal RFCs for changes that involve resources that are actively supporting production workloads. These resources are typically in a protected lifecycle state, and as such changes to them MUST also be approved.

Process requests

Process requests, or Requests for Changes (RFC), are used to request changes to the infrastructure. As already discussed, these are not necessarily required, but they provide the means to record and document the needs for changes, and provide statistics to help you determine the areas or locations where you can improve quality, training, documentation, or your processes.

Process requests can be created automatically based on service requests, such as password reset. Under the covers, the RFC is automatically accepted, and the proper workflows and actions are invoked to automate the processing.

Change types

Changes are often classified as standard, normal or emergency change types to meet different processing requirements. The intended use of the different change types is:

Standard	Used for low impact, low risk, pre-approved changes that implement proven changes in a well known configurations. The standard change type can be used to for example update or reset passwords, install standard components, apply fixes, or decommission non-production resources. Standard changes are not typically scheduled. They can be implemented at any time, because they have no impact on the production environment.
Normal	Used for more complex changes which may require impact analysis and approval. Typically, normal changes are created to update production resources, or to transition resources in and out of protected lifecycle stages. Normal changes will typically be scheduled for implementation in accordance with the change window calendars and blackout periods.
Emergency	Compatible to the normal change type, but because of urgency, this change type may not necessarily be subject to full analysis and approval, and can be implemented within a blackout period or outside a change window.

When you create a change, the type is the key property that determines how IBM SmartCloud Control Desk calculates risk, and assigns the response plan. In addition to the type, IBM SmartCloud Control Desk uses change properties such as category, urgency, impact, priority, and probability of failure when calculating risk and impact when assigning the correct response plan.

Express versus Advanced change processing

When creating normal and emergency changes, you should consider placing the change under workflow control. This implies that you initiate a workflow that control the processing of the change, and assigns tasks to the correct persons or groups as the change processing progresses.

IBM SmartCloud Control Desk provides two sets of workflows. One for express change processing, and one for advanced change processing. Express processing is intended for organizations who prefer less automation in favor of a streamlined hands-on approach. The express processing is supported by a simplified Change application, and is implemented by the following two workflows:

PMCHGFIXD1	This workflow operates like a wizard, guiding you through a series of steps sequentially to the completion of the process. It ensures that all steps are completed in a certain order.
PMCHGFLEX1	Instead of going through all of the steps sequentially, this workflow completes only the steps for the current phase of the process, updates the status, and exits. The user then clicks the workflow icon again to start the next step in the process. This workflow is more flexible than PMCHGFIXD1; for example, you can go back and change the status to an earlier phase in the process and redo that earlier phase.

The advanced processing is supported only by a single workflow. The name of this is PMCHGMAIN1.



Note: The default workflow that is set in a pristine installation of IBM SmartCloud Control Desk is PMCHGFIXD1. This means that the default change processing is express using a wizard-style process to guide users to define and process changes. To customize your environment to set the default workflow to use, provide the name of your desired default workflow as the value for the system property named pmchg.process.workflow.

Besides the three workflows that have been named already, you might encounter other workflows such as PMCHGPROC1, PMCHGPRFL. These implement the ITIL V2 change process, and are still provided for organizations that prefer use them. If you look at all the workflows related to WOCHANGE objects, you will find additional workflows. These implement subprocesses and are called from the main workflows already mentioned.

In the following exercises you will work both with the express and the advanced change processes.

Response plans

Often, the implementation activities and tasks, as well as the processing requirements are very similar from one change to another. IBM SmartCloud Control Desk allows you to set up templates, so called response plans, that can be used to pre-populate the change with default information once the change has been properly classified. The defaults that are applied can include job plans, owner information, location information and so on. You can even invoke specific actions as part of the response plan, for example to invoke your own workflows that provide additional processing.

By classifying the change you register the change as an instance of a specific class of change, and are given access to attributes that can be used to control processing of that specific class of changes. In addition, the classification is also a key attribute that is used by IBM SmartCloud Control Desk to select the specific response plan that applies to the change. The workflows that control the processing of the change are responsible for applying the response plan automatically, but naturally you can also do this manually. However, it is important to understand, that as a user, you cannot select a specific response plan. The response plan is selected automatically based on a set of conditions that test specific values of key change properties such as classification, type, risk, impact, urgency, priority and so on. Notice that risk, priority and impact are calculated by the workflow prior to selecting the response plan.

Job plans

One of the key components of a change is the job plan. A job plan defines the specific activities and tasks that must be completed in order to implement a change. The job plan also specifies the sequence in which the activities and tasks must be performed, and any conditions that must be met before the task can be initiated. Tasks can be automated by the assignment of automated actions or workflows. Each task is assigned an owner, or an owner group, to specify who is responsible for performing the task.

A job plan contains all the tasks necessary to plan, schedule, implement, and validate a change. This includes all the preparation tasks performed by the change owner and change assessors, as well as the implementation tasks performed by the change implementors. Implementation tasks are special in that they define the actual work that needs to be performed to implement the change, and are associated with target CIs that represent the components that are being worked on for the duration of the task. In addition, the nature of the outage of the target CI is also specified in the implementation task. The outage information is used to determine the nature of the service disruption the business will experience during the execution of the implementation task.

To support scheduling and planning, tasks and activities are often associated with an expected duration, as well as the anticipated work that is required to complete the task. Tasks and activities may also be assigned start and end dates so the change owner can determine when the actual work is performed. It is not necessary to provide start and end times for all tasks. During change preparation IBM SmartCloud Control Desk will calculate the start and end times for the entire change based on the estimated durations. IBM SmartCloud Control Desk also include a scheduler function that can be used to schedule the change. The Scheduler automatically takes change windows and blackout periods for the target CIs and all impacted CIs into account when scheduling implementation tasks. The availability of implementation resources (the owner or owner group) based on calendar information and assigned work, can also be included in the scheduling process.

The job plan can be created automatically by the response plan, or by the change owner. In both cases, an existing job plan is used as a template, and cloned into the change. It is the responsibility of the change owner to review the job plan, and revise it so that it includes all the tasks necessary to complete the change processing, and provide the relevant target, owner, and scheduling information. If the template job plan that is used does not contain all the necessary activities and tasks, or contain excess tasks, the change owner can add or remove tasks as needed to accommodate the requirements of the change. In rare situations, the change owner can also manually create the entire job plan from scratch.

Change management roles and responsibilities

As preparation for the following exercises, you should review the information in the tables below to gain an overview of the roles and responsibilities that applies to the exercise environment, and which users assume which roles.

The responsibilities for the various phases of the change management processing have been assigned to users and persons belonging to the groups (Security and Person groups) outlined in the following table::

Role	Security Group	Responsibilities
Change Administrators	PMCHGADM	Owns the change process definition for the business
Change Analysts	PMCHGANA	Responsible for performing technical assessments
Change Approvers	PMCHGAPP	Responsible for approving changes
Change Implementers	PMCHGIMP	Responsible for implementing the changes
Change Owners	PMCHGOWN	Owns the change and is responsible for timely change processing from acceptance to completion.
Change Advisory Board	PMCHGCAB	Approves changes at level 2
Business Executives	PMCHGBUS	Approves changes at level 1
IT Management Board	PMCHGITM	Approves changes at level 3
All IT Managers	PMCHGMA	Manages IT processes or resources
Business Analysts	PMCHGBAN	Responsible for performing business assessments

In the exercise environment, the users listed below have been associated with the groups (roles) shown in order to assign them different responsibilities pertaining to configuration management.

Security Group	Person Group	Role	User	Password
PMCHANGEADMIN	PMCHGADM	Change Administrators		
PMCHANGEANALYST	PMCHGANA	Change Analysts	NANCY	object00
PMCHANGEAPPROVER	PMCHGAPP	Change Approvers	FRED	object00
PMCHANGEIMPL	PMCHGIMP	Change Implementers	SCHROEDER	object00
PMCHANGEMGR	PMCHGADM	Change Managers	FRANKLIN	object00
PMCHANGEOWNER	PMCHGOWN	Change Owners	LUCY	object00

You should now have the basic understanding of the processes and responsibilities used in the exercise environment, and should be ready to set up your CI Lifecycles in order to prepare for the creation of CIs based on the Actual CIs in your environment.

Express processing of an emergency change

In [“Create a standard change”](#) on page 73 you created and processed a standard change, so you should not be a total stranger to the Changes application. In this exercise you will experience how the express wizard workflow can help you through the creation and implementation of an emergency change.

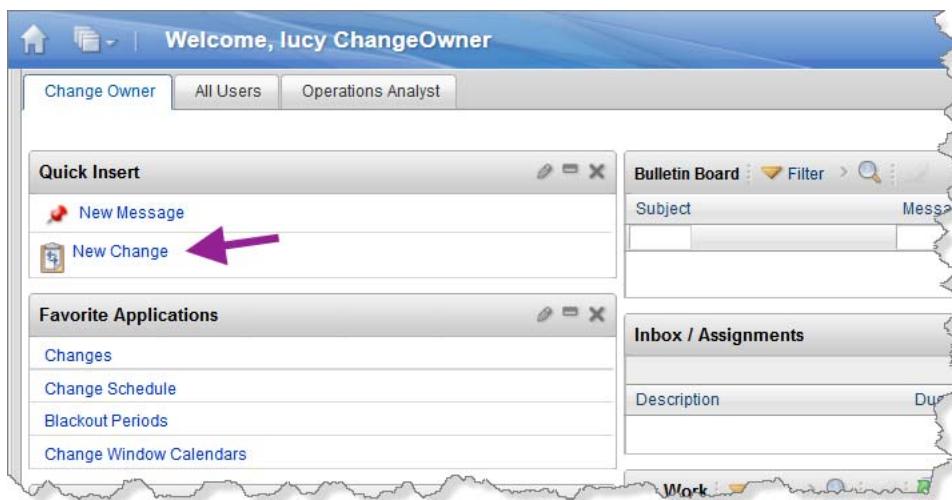
Your service desk has received several calls regarding outage of the NSJ DayTrader application, and your system administrators have discovered that the network team changed the address of a router without proper impact analysis. Consequently, the IP routing information in the three Linux systems that host the WebSphere Application servers must be changed. This issue must be fixed in a rush.

To document the fact that the configuration of the production equipment will be changed, and to obtain the proper authorization, you create an emergency change, and drive it through the express process to minimize the time needed to complete it. To solve this issue as soon as possible you disregard that there is no RFC, and decide to create one when the crisis is over.

Exercise 1. Creating an emergency change

To create and process an emergency change for the IP Gateway issue, complete these steps:

1. If you are logged on to the IBM SmartCloud Control Desk console, sign out, and log back in as the change owner `lucy` using a password of `object00`.
2. When the Change Owner start center appears, notice that it has been configured to include the most commonly used tasks in the Quick Insert and Favorite Application sections. Use the New Change link in the Quick Insert section to initiate a new change.



3. To categorize the new change properly, provide the following information:

Change	EXER_EC_01
Summary	Update routing information
Details	route add -net 18.1.1.1/24 gw 51.2.3.4 dev eth0
Change Type	Emergency
Impact	4 (Low)
Urgency	1 (Critical)
Failure Probability	3 (Low)
Change Category	Minor
Reason for Change	Failure of the NSJ DayTrader application
Effect of Not Implementing	Lost revenue
Classification	PMCHG

The screenshot shows the 'Changes' screen in IBM SmartCloud Control Desk. At the top, there's a 'Progress Map' showing a sequence of states: ACC_CAT, ASSESS, SCHED, AUTH, IMPL, INPRG, COMP, REVIEW, and CLOSE. Below the map, the 'Change' tab is selected, showing details for 'EXER_EC_01'. The 'Change Details' section includes fields for Summary (Update routing information), Details (route add -net 18.1.1.1/24 gw 51.2.3.4 dev eth0), Impact (4), Urgency (1), Priority (1), Failure Probability (3), Change Category (Minor), Reason for Change (Failure of the NSJ DayTrader application), Effect of Not Implementing (Lost revenue), and Classification (PMCHG). Other tabs like Assessments, Impacts, Authorization, Schedule, Related Records, Actuals, Log, and Service Address are also visible.

Notice that the Progress map at the top include all the possible process states, that apply to a normal change. When the change has been fully categorized, and saved, the Progress Map will only show the stages that are relevant to the current change.

Exercise 1. Creating an emergency change

The reason for providing the specific details is for you to experience how IBM SmartCloud Control Desk recalculates some of them based on the others. The meaning of the various properties is:

Change Type	Determines the processing needs. To speed up the process, emergency changes do not undergo the same meticulous assessment, scheduling, and authorization as normal changes.
Change Category	Denotes the complexity of the change implementation. In this case, updating a configuration file is considered a minor operation.
Urgency	Your estimate of the current necessity for the change. The urgency is based on how long the implementation can afford to be delayed. In this example, the implementation is considered very urgent.
Priority	The priority of a change indicates whether it must be implemented before other changes. Priority is derived from impact and urgency and is calculated.
Failure Probability	Reflects the likelihood that the change will not be successful. Changes that are performed only occasionally might have a higher failure probability, because they cannot be predicted with accuracy. A high probability of failure might also indicate that the change involves extremely mission critical resources whose outages are not well understood. For this change, the probability of failure is considered low.
Impact	Initially, your estimate of the overall impact of the change, based on the degree to which the change will impact your business. When the change is categorized, the workflow re-calculates impact, and overwrites your initial specification if the calculated impact value is lower (more intense) than the one that you supplied. For this change, you specify low (4), and rely on the system to assign a value.
Risk	Derived from the overall impact and the probability of failure for the change. A high-risk change is one that is not performed often, involves many business-critical CIs, or has a high probability of failure. High-risk changes have the potential to cause disruptive outages across the data center and must be managed with care.

When you, in one of the following steps, invoke the workflow that controls the processing, you will see how Priority and Impact are recalculated.

4. Click the Save icon () to save your change.
5. Next, focus on the Primary Target section. This is where you specify which configuration items to change. As you see, you can only specify a single CI as the primary target, and for this change you need to update three servers.

The change processing in IBM SmartCloud Control Desk is designed, in accordance with ITIL, to support only one primary target for each change, and by default, the primary target CI

becomes the target of the implementations tasks in the job plan. If you want to include plan and process modifications to multiple resources as part of your change you must add the targets to the implementation tasks manually.

So, for this change, you must add all three servers to one or more implementation tasks in order for them to be considered when you perform impact analysis and scheduling. However, for documentation purposes, you also add them as additional targets.

To add additional targets, simply leave the Primary Target section empty, and complete these steps to populate the Additional Targets section from the collection you created earlier:

- e. At the bottom of the Additional Targets section, click **Select**, and choose **From Collections**.

- f. Because there is only one collection in your environment, it will automatically be selected, and you see the members. To select all of them, mark the select all check box at the far left of the filter bar, and verify that all three members are selected.

Asset	Description	Location	Configuration Item Number
<input checked="" type="checkbox"/>			RHEL56-3.TIVLAB.SANJOSE.IBM.COM~20025
<input checked="" type="checkbox"/>			RHEL56-2.TIVLAB.SANJOSE.IBM.COM~20023
<input checked="" type="checkbox"/>			RHEL56-1.TIVLAB.SANJOSE.IBM.COM~20024

To register the selected CIs as additional targets, click **OK**.

- g. When you return to the Change application, notice that all three LINUXCOMPUTERSYSTEM CIs have been added to the change as additional targets.

Asset	Configuration Item Name	Configuration Item Number
2077	RHEL56-1.TIVLAB.SANJOSE.IBM.COM	RHEL56-1.TIVLAB.SANJOSE.IBM.CI
2078	RHEL56-2.TIVLAB.SANJOSE.IBM.COM	RHEL56-2.TIVLAB.SANJOSE.IBM.CC
2079	RHEL56-3.TIVLAB.SANJOSE.IBM.COM	RHEL56-3.TIVLAB.SANJOSE.IBM.CC

Save your updates by clicking the Save icon (💾) in the toolbar.

You have successfully added all three targets. When they are associated with implementation tasks, they will all be considered in the impact analysis and scheduling of the change.

At this point, you have provided information about the change and its targets. This categorization information helps IBM SmartCloud Control Desk to control and prioritize the change as the workflow takes you through the various steps of the process. Next you specify which tasks to perform to implement the change.

Exercise 2. Specifying implementation plans and targets

An important part of the change is the information about which activities and tasks to perform in order to implement the change. Typically you will provide this information by applying a response plan to the change. By applying a response plan, you copy standard information into the change, and will, in most cases, only have to worry about the specific targets and timings. Part of the standard information is the job plan, which contains the standard activities and tasks as they apply to the specific category that has been assigned to change you are working with. Actually, the change classification, type, impact, priority and a few more pieces of information are used to identify the response plant to use.

When you use the using the advanced change processing workflow, the response plan is automatically applied by the workflow.

Once the tasks for the change have been created, you can assign/verify the targets of each of the implementation tasks. Implementation tasks are tasks in which work is performed on the IT resources, and for that reason they may suffer an outage or degraded performance. This step is

extremely important since only implementation tasks are considered during impact analysis and scheduling of the change.

To apply a response plan and assign targets to the implementation tasks, complete these steps:

1. Still as Lucy, the change owner, navigate to the Schedule tab and notice that both the Response Plan and Job Plan fields are empty.

The screenshot shows the 'Changes' application interface. At the top, there's a navigation bar with links for 'Bulletins (0)', 'Reports', 'Profile', 'Sign Out', and other system icons. Below the navigation bar, the title 'View Record List > EXER_EC_01' is displayed. The main content area has several tabs: 'Change', 'Assessments', 'Impacts', 'Authorization', 'Schedule', 'Related Records', 'Actuals', 'Log', and 'Service Address'. The 'Schedule' tab is currently selected. On the left side, there's a 'Progress Map' showing a sequence of states: ACC_CAT, ASSESS, SCHED, AUTH, IMPL, INPRG, COMP, REVIEW, and CLOSE. To the right of the map is a section titled 'Current Workflow Assignments' which states 'There are no workflow assignments.' Below the map, there are various input fields for the change record, including 'Change' (set to 'EXER_EC_01'), 'Status' (set to 'WAPPR'), 'Owner' and 'Owner Group' fields, and sections for 'Supervisor', 'Lead', 'Work Group', 'Verification Plan', 'Remediation Plan', 'Job Plan', and 'Response Plan'. The 'Job Plan' and 'Response Plan' sections are specifically highlighted with a purple rounded rectangle. At the bottom left, there's a checkbox for 'Fully Automated?'.

Scroll down until you see the section named *Tasks for Change EXER_EC_01*. Verify that no tasks have been assigned to the change.

The screenshot shows a table titled 'Tasks for Change EXER_EC_01'. At the top, there are buttons for 'Select Assets' and 'Select Locations'. Below the title, there's a note: ' Optionally create tasks in this table to define the implementation plan'. The table has a header row with columns: 'Sequence', 'Task', 'Summary', 'Estimated Duration', 'Status', and 'Owner'. The main body of the table is empty and displays the message '...No rows to display...'.

You have now verified that at the moment, there are not implementation tasks, and therefore nothing to be done to implement this change. You'd better fix that.

2. To apply a response plan, use the **Select Action > Apply Response Plan**.

When the response plan has been applied, notice that both the Job Plan and the Response Plan fields have been populated.

3. Scroll back down to the *Tasks for Change EXER_EC_01* section, and notice that a single task has been added. Now, expand the task by clicking the View Details icon (▶), and verify that it indeed is an Implementation task.

Sequence	Task	Summary	Estimated Duration	Status
10	10	Implement the Change	4:00	WAPPR

Task Information

Task: Implement the Change
Sequence: 10
Status: WAPPR
Classification:
Classification Description:

Under Flow Control?
Flow Action:
Flow Action Assist?
Assisted Workflow:
Launch Entry Name:

Implementation Task?

Scroll further down, until you find the *Task Targets* section at the bottom of the Tasks for Change EXER_EC_01 section. Has any targets been assigned?

Configuration Item Name	Configuration Item Number	Business Impact	Asset	Location	Outage
...No rows to display...					

Schedule Conflicts

Since you did not specify any primary target for the change, no CIs have been assigned as the target of the implementation task.

4. To assign the three **LINUXCOMPUTERSYSTEMS** you added as additional targets to this task, click **Select > From Collections**, and select all the members of the collection. The process is similar to what you did in Step f on page 179.

When you have added the three target CIs, the Task Targets section should look like this:



Configuration Item Name	Configuration Item Number	Business Impact	Asset	Location	Outage
RHEL56-1.TIVLAB.SANJOSE.IBM.COM	RHEL56-1.TIVLAB.SANJOSE.IBM.COM~20024	2078			Offline
RHEL56-2.TIVLAB.SANJOSE.IBM.COM	RHEL56-2.TIVLAB.SANJOSE.IBM.COM~20023				Offline
RHEL56-3.TIVLAB.SANJOSE.IBM.COM	RHEL56-3.TIVLAB.SANJOSE.IBM.COM~20025				Offline

Notice the outage fields. This specifies the operational state of the targets during the execution of the implementation task. In this case, the three systems are Offline, which is true, but you could also have chosen None, or Degraded. In this example, where the IP route needs to be reconfigured, you could argue that technically the systems are online and available, but from an application point of view, they appear as if they are offline.

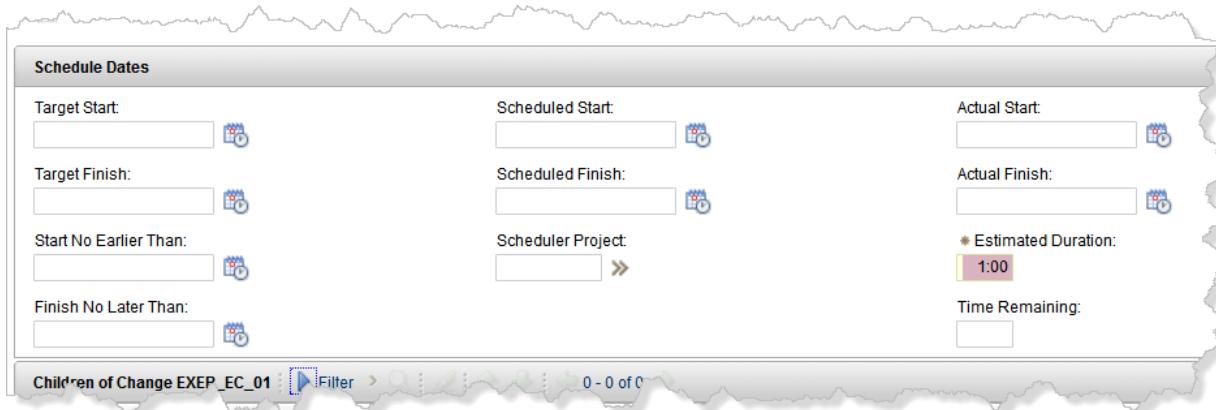
- Before you complete the specification of the change, you should focus on timings.

Collapse the Tasks for Change EXER_EC_01 section, and set the value of the Estimated Duration to 1 hour.



Tasks for Change EXER_EC_01			Filter >	1 - 1 of 1
Optionally create tasks in this table to define the implementation plan			Estimated Duration	Status
Sequence	Task	Summary		
10	10	Implement the Change	1:00	WAPPR

Scroll up until you find the *Schedule Dates* section. This is where you specify target start and completion dates, but since this is an emergency change, we will skip this step. However, you should update the total estimated time for the entire change. Set the value of the Estimated Duration field to 1 hour as well.



Schedule Dates		
Target Start:	Scheduled Start:	Actual Start:
<input type="text"/>	<input type="text"/>	<input type="text"/>
Target Finish:	Scheduled Finish:	Actual Finish:
<input type="text"/>	<input type="text"/>	<input type="text"/>
Start No Earlier Than:	Scheduler Project:	* Estimated Duration:
<input type="text"/>	<input type="text"/>	<input type="text"/> 1:00
Finish No Later Than:		Time Remaining:
<input type="text"/>		<input type="text"/>
Children of Change EXEP_EC_01 Filter > 0 - 0 of 0		

- You save your work, click the Save icon (floppy disk) in the toolbar.

You have now provided the necessary task and target details to implement the change. You could have added more details, for example instructions obtained from the SME on how to perform the updates, but for this exercise you will skip this.

At this point you have specified categorizing information that helps IBM SmartCloud Control Desk and your colleagues to process this change as a high priority, emergency change, as well as which CIs to change. In addition, you provided an estimate of the duration so everyone knows when to expect the application to be back online, relative to actual scheduling of the change.

Exercise 3. Determining authorization requirements

Before you start the change processing, you must determine the requirements for authorizations. For changes to the production environment, like the one you are working with, you need to get the approval from your management to perform the modifications. When you have obtained approval to implement a change, the change is often referred to as an *authorized change*.

Given that this is an emergency change you may not want to follow the normal approval process.

To specify the requirements for authorization for the EXER_EC_01 change, complete these steps:

1. Open the Authorization tab and focus on the Approvers for Change EXER_EC_01 section.
Notice that by default you require authorization from three authorities: The Change Advisory Board, the IT Management Board, and the Business Executive Board.

Description	Approver	Approver Group	Approval level
CAB		PMCHGCAB	3
IT Management Board		PMCHGITM	2
Business Executive Board		PMCHGBUS	1

The approval levels you see are interpreted from high to low - meaning that the Business Executive Board in the example above has the last word. In its default implementation, IBM SmartCloud Control Desk requires approvals from all the listed authorization bodies, however you can easily tailor the system to authorize the change if you receive approval from any one of the approvers.

- To remove the approval requirements you deem unnecessary for this change, simply click the delete icon (at the end of the line you wish to delete. For his example, delete the Business Executive Board, and the IT Management Board authorization bodies.

Description	Approver	Approver Group	Approval level
CAB			3
IT Management Board			2
Business Executive Board			1

You are done. When the change is processed, only the Change Advisory Board will be required to authorize the change.

It's now time to pass control to the workflow that controls the change processing, so it can calculate impact and risk, initiate the change processing, and guide you and your team members through the change process by assigning work that needs to be performed as the prerequisites are completed.

Exercise 4. Activate the express workflow

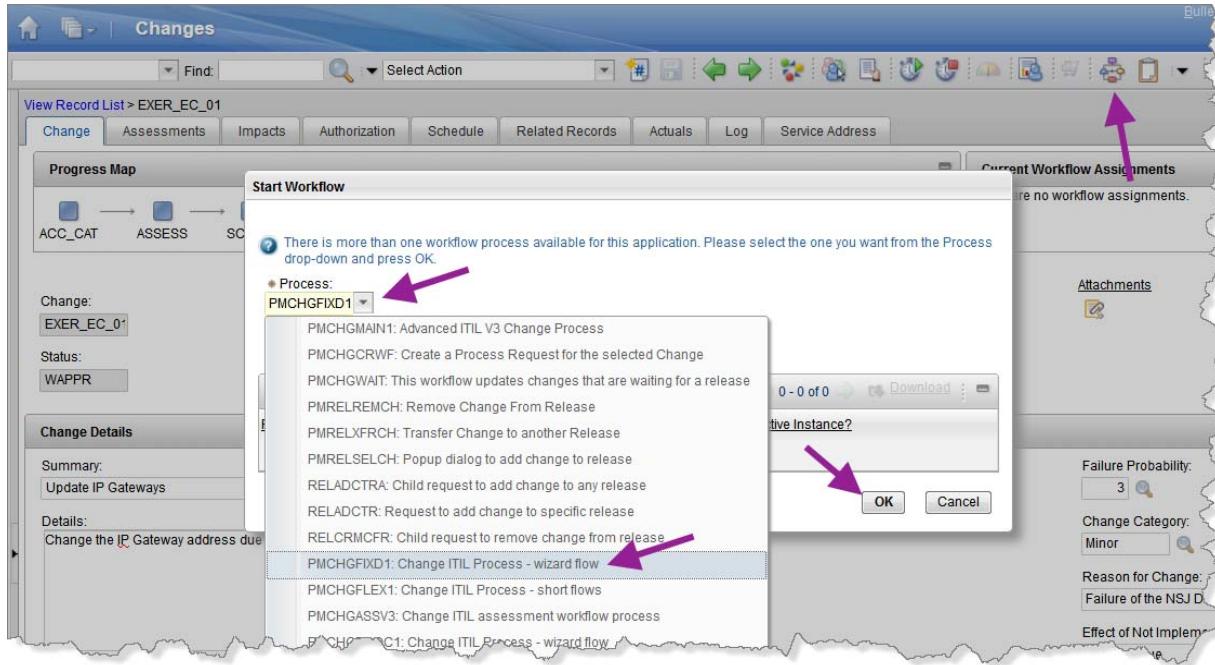
To help you drive the change through the express process, you must route the change to a workflow. IBM SmartCloud Control Desk provides several workflows to choose from, and you will most likely modify the system-provided workflows to meet your specific requirements.

For this exercise you will use the express wizard workflow, PMCHGFIXD1, which will take you through the process steps in sequence. Because this is an emergency change, some of the steps

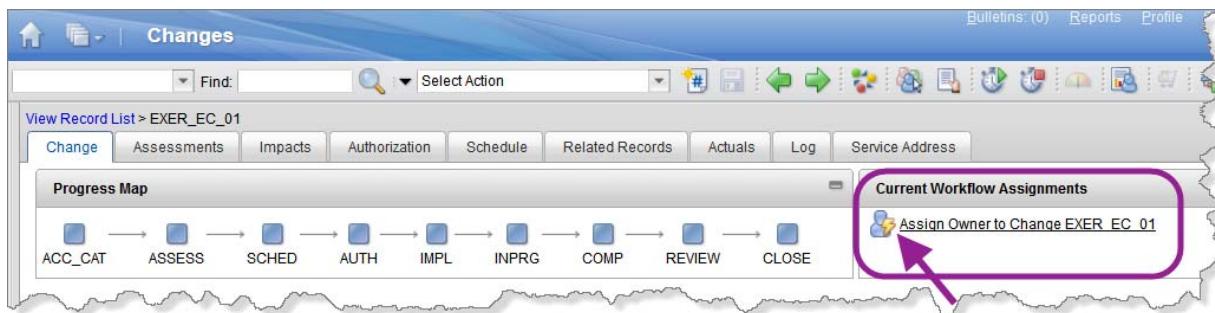
Exercise 4. Activate the express workflow

will be touched only briefly or totally skipped. In a later exercise you will be given the opportunity to focus on the details that are skipped here.

- To start the workflow that controls the change processing, click the Route Workflow icon ( in the toolbar. When The Start Workflow window appears, select the PMCFGIXD1 workflow from the Process drop-down menu, and click **OK**.

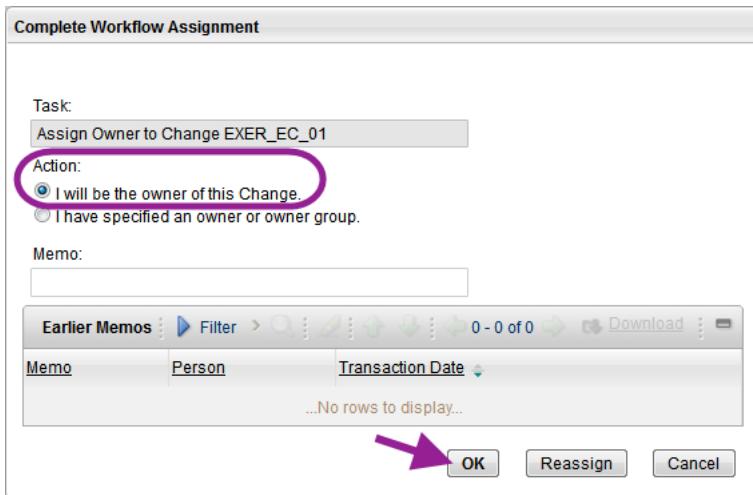


- When the workflow starts, notice that an assignment has appeared in the Current Workflow Assignments section. Obviously, something needs to be done manually, and since the icon next to the assignment is fully colored () you know that the assignment is for the current user.



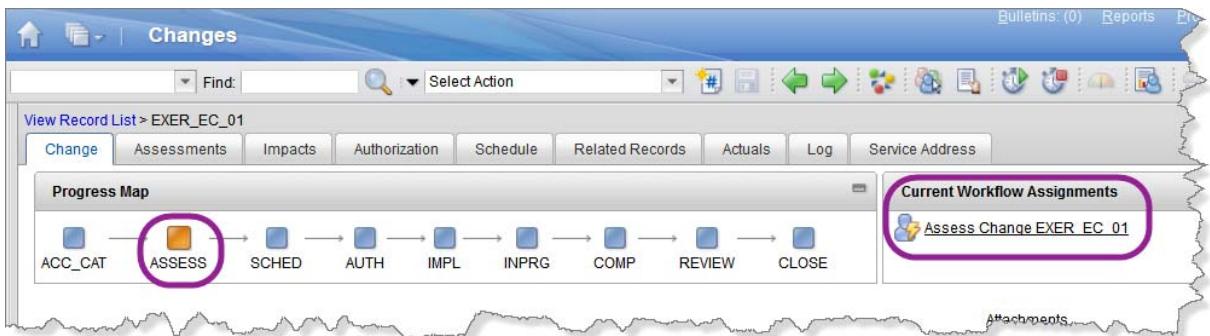
If you look closely, you can see that the assignment title indicates that you need to assign an owner to the change.

- To assign an owner, click the assignment link, and when the Complete Workshop Assignment window appears, click **OK** to accept the default action: “I will be the owner of this change”.



By accepting ownership, you (Lucy) are responsible for the processing of this change from its current state to completion.

After an owner has been assigned to the change, notice that the status of the change is modified to Access, and that a new assignment for Lucy has appeared.



The new assignment asks you to assess the change. This implies that you, or someone you assign the task to, must verify the implementation plan, and assess the technical and business impact of the change.

By now, the emergency change processing has started.

Exercise 5. Assessing a change

In the assessment of the change, you normally assess the technical and business impacts of the change. The business assessment ensures that a business savvy subject matter experts validates that the expected business advantages of implementing the change outweigh the disadvantages of implementing the change considering the impact to the business. In this context, disadvantages

should be interpreted as the combined business cost, monetary as well as immaterial, of implementing the change. Topics like, implementation costs, lost revenue due to outage, risk of failure, loss of goodwill etc. are included in this assessment.

The technical assessment ensures that the proposed technical implementation is valid, and that there are no unexpected risks and impacts of implementing the change.

For this emergency change in which the implementation is very straightforward Lucy determines that there is no need to perform neither business nor technical assessments.

To reflect the decision to bypass assessments in the change, complete these steps:

1. Open the Assessments tab, and notice that no risk is associated with the change. Also notice, in the bottom of the window, that no assessments have been planned for this change. That implies either that no assessments are required, or that the response plan did not include best practice assessment requirements for this type of change.
2. Because you, Lucy, provided all the details for the technical implementation, you can be confident that they will work, so for this change you do not perform any special technical assessments. But you want to see how the outage of the three servers will impact the other resources in the IT infrastructure. To see these impacts, complete these steps:
 - a. Choose **Select Action > Impacts > Calculate Implementation Task Impacts**.

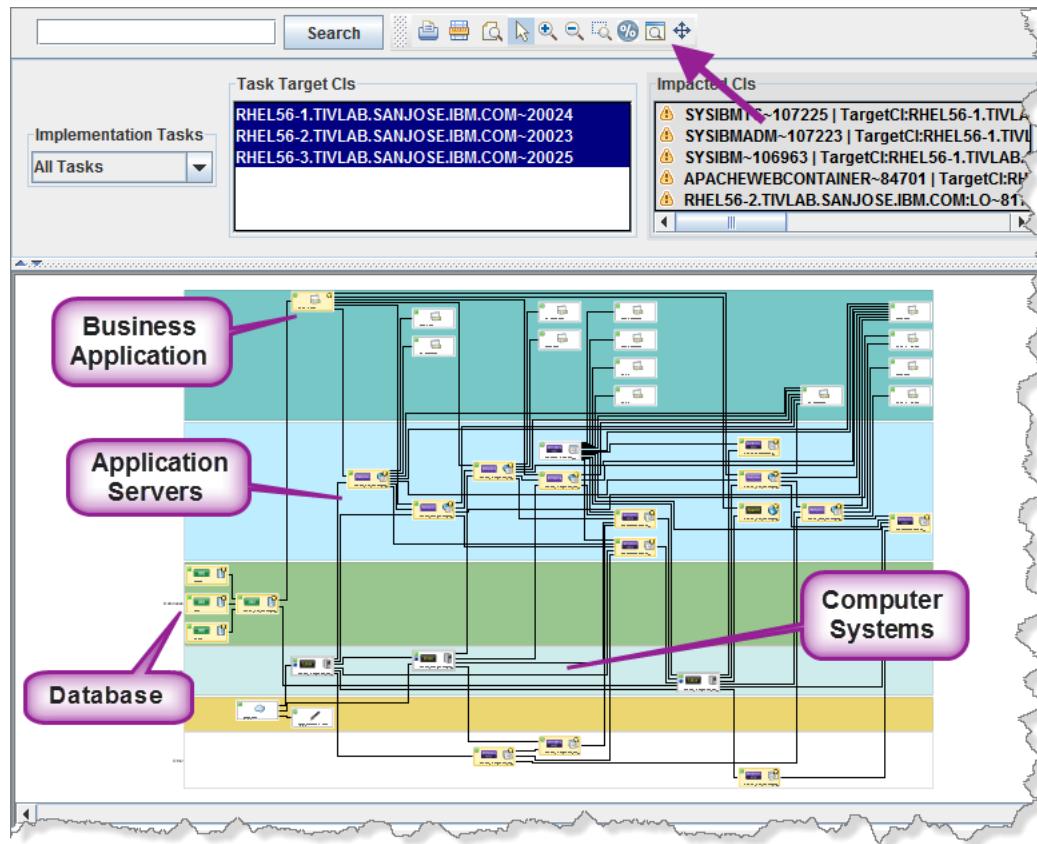
After a short while you see a confirmation message indicating the number of impacts that were detected.



Click **OK** to dismiss the message window

- b. In the Summary that is shown in the Impacts tab, you can see both the targets and their planned outages, and a list of all the impacted CIs. If you look at the names of the impacted CIs, you may get an idea of what will happen if you offline all three servers.

Scroll to the bottom of the Impacts tab, and take a look.



Click the Fit to View icon () to see the entire view.

Notice how all the impacted CIs are highlighted with a light tan background and the impacted symbol (⚠), and how the CIs that are targets of an implementation task are marked with the change symbol (🔧).

Take a few minutes to digest all this information.

The summary of the impact analysis is, that if the three servers are brought offline, all the application servers, and database servers hosted on these systems will go offline as well. This will bring the NSJ DayTrader business system to a halt, and no users will be able to use that business system for the duration of the implementation task.

For the emergency change that is basically all right. As a matter of fact, since the computer systems are already not-available, because of the incorrect router configuration, this situation has already materialized, and the purpose of the change is to remediate it.

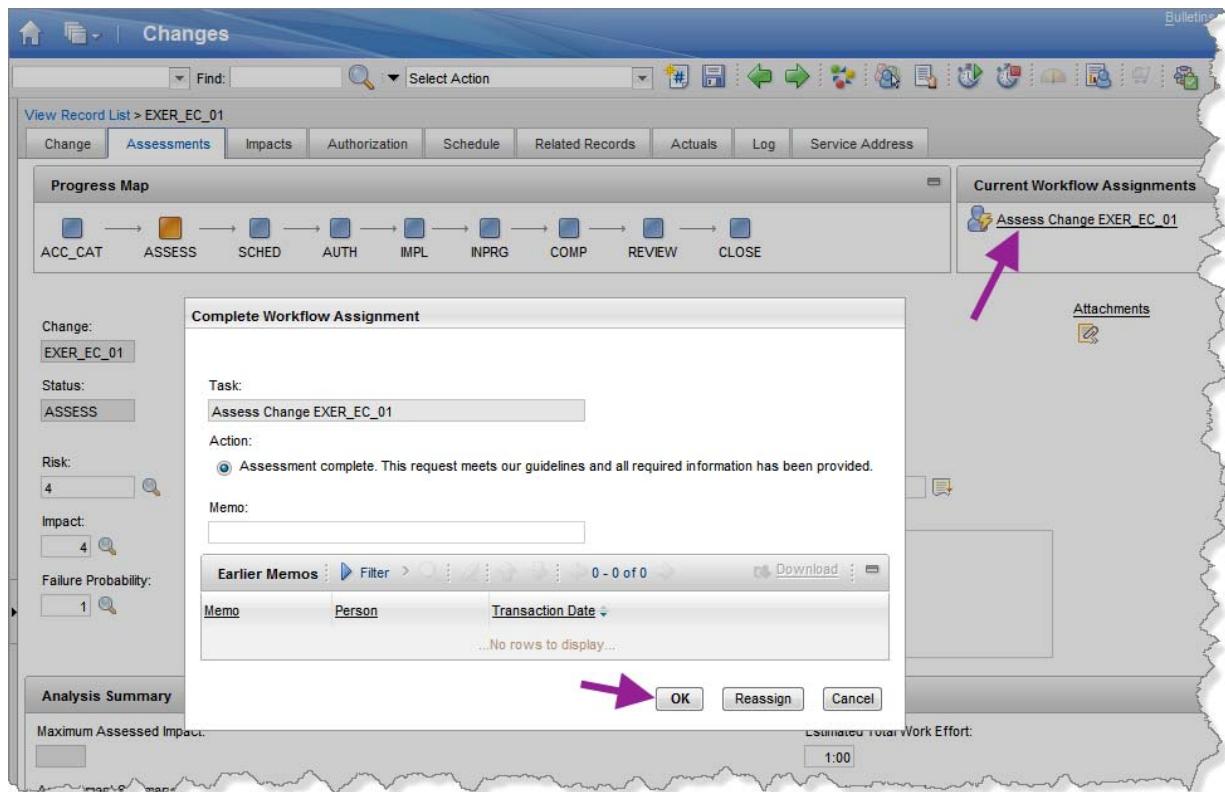
3. Now that you have verified that the change will have no unexpected impacts, you can go back to the Assessments tab, and add your comments. In the Assessments tab, provide the following information:

Risk	4
Assessment Summary	No impacts to online systems
Estimated Total Work Effort	1:00

The screenshot shows the 'Assessments' tab for a change named 'EXER_EC_01'. The 'Change' field is set to 'EXER_EC_01'. The 'Status' is 'ASSESS'. The 'Risk' is '4', 'Impact' is '4', and 'Failure Probability' is '1'. The 'Owner' is 'LUCY' and the 'Owner Group' is listed as a placeholder. The 'Summary' is 'Update routing information' and the 'Details' show the command 'route add -net 18.1.1.1/24 gw 51.2.3.4 dev eth0'. In the 'Analysis Summary' section, the 'Maximum Assessed Impact' is shown as a grey bar, 'Estimated Total Work Effort' is '1:00', and 'Estimated Total Cost' is '0.00'. The 'Assessment Summary' is 'No impacts to online systems'. The 'Technical Assessments' section shows '0 - 0 of 0' results.

When you are done, the Save icon () in the toolbar.

- To mark the assignment as completed, click the assignment link named **Assess Change EXER_EC_01**.



When the Complete Workflow Assignment window appears, accept the defaults and click **OK**.

You have completed the assessment, and verified that out of all the impacts of the change, none raises cause for alarm.

Did you notice that a new assignment, Schedule Change EXER_EC_01, appeared and that the status of the change now is Schedule?

Exercise 6. Scheduling the emergency change

During the scheduling phase, you produce a schedule by which all of the tasks of a change can be completed in the right order, by the right people, and with a minimum of disruption to the IT infrastructure. You create a schedule using the graphical tools provided by the Scheduler application.

Most emergency changes must be implemented as soon as possible. For that reason, all you need to do is to provide a Target Start of the current time, or something very close.

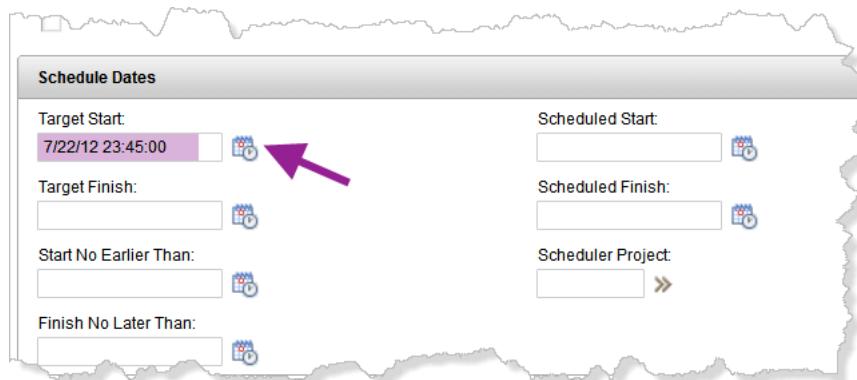
For normal changes, the scheduling process, as you will experience in a later exercise, takes into account the availability of all the impacted resources, when trying to find a time slot in which to

Exercise 6. Scheduling the emergency change

implement the change. The search for a proper installation time, involves analyzing the change window calenders for all the targets and all the impacted resources for each implementation task. Once a window of opportunity has been identified, IBM SmartCloud Control Desk checks if any other changes are planned for that period of time. In addition, the system-wide blackout periods are consulted to avoid planning change implementation for a time when no resources can be updated, and finally, when candidate time slots are identified, the master scheduler plan is updated.

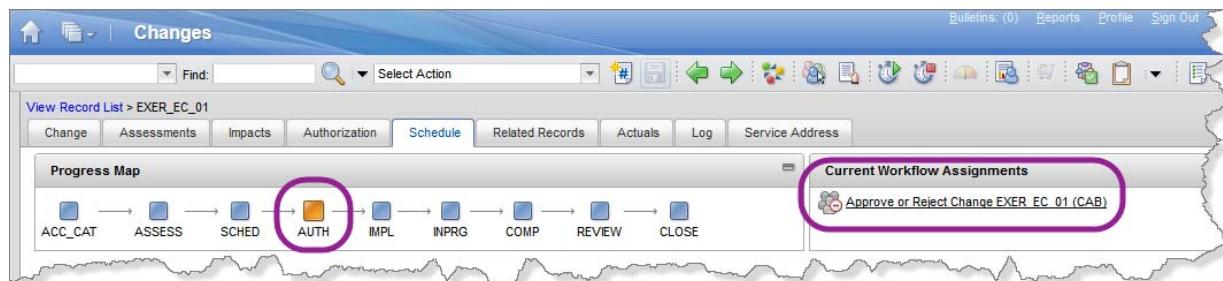
To complete the scheduling, do the following:

1. Open the Schedule tab, and use the Select Date and Time tool (next to the Target Start field in the Schedule Dates section to set the target start.



Specify the current date and time, and click **OK**.

2. To complete the scheduling assignment, click the **Schedule Change EXER_EC_01** assignment in the Current Workflow Assignment section, and click **OK** to accept the defaults when the Complete Workflow Assignment window appears.



Notice that the status of the change now changes to Authorize, and a new assignment has been created. This time the assignment icon (indicates that the assignment is for someone other than Lucy.

3. As you probably have guessed already, the authorization assignment is assigned to the members of the only authorization body you specified earlier: The Change Advisory Board.

To see who they are, you can click the assignment.

The screenshot shows the 'Changes' module in IBM SmartCloud Control Desk. A 'Workflow Assignments' dialog is open, displaying three assignments for the 'Approve or Reject Change EXER_EC_01 (CAB)' task. The assignments are listed in a table:

Assigned Person Code	Name	Description	Priority	Time Limit	Start Date	Due Date
FRED	User Manager	Approve or Reject Change EXER_EC_01 (CAB)	0:00	7/22/12 01:03:06	7/22/12 01:03:06	
MAXADMIN	maxadmin	Approve or Reject Change EXER_EC_01 (CAB)	0:00	7/22/12 01:03:06	7/22/12 01:03:06	
SDADMIN	Administrator	Approve or Reject Change EXER_EC_01 (CAB)	0:00	7/22/12 01:03:06	7/22/12 01:03:06	

As you can see, there are three members of the CAB.

4. To allow another user to sign in so the change can be authorized, click the **SignOut** link at the upper right of the window to log out Lucy.



At this point, Lucy must wait until at least one member of the CAB has approved the change.

Exercise 7. Authorizing an emergency change

The authorization of a change is performed in order for management and stakeholders to be able to approve or reject the proposed plan. In support of the approval, the approvers can look at all the information that related to the change, in order to make an informed decision. Usually, approval is only required for normal and emergency changes.

The default workflow performs a structured series of steps to ensure that your change is authorized to proceed. You can tailor the system to have approval assignments sent to approvers based on their authorization level, or you can send these assignments to all approvers, regardless of authorization levels. In addition, IBM SmartCloud Control Desk can be configured to require

Exercise 7. Authorizing an emergency change

approval from all or any members of an authorization body, and can also be configured to require approval from all levels of approval or just from the level that matches the risk level of the change.

Complete these steps to approve this emergency change.

1. Sign in as Fred using object00 as the password.
2. Open the User Manager start center, and focus on the Inbox/Assignments section.
3. Locate the assignment named *Approve or Reject Change EXER_EC_01 (CAB)* and click the Route icon (✉).

Description	DUEDATE	Route
Manager Approval from BOB for 'Firewall Change Requests'	2/19/12 12:52:43	
Manager Approval from BOB for 'Request PC'	8/10/11 13:31:41	
Manager Approval for New Asset Request	5/11/12 20:28:32	
Approve or Reject Change EXER_EC_01 (CAB)	2/24/13 16:28:16	

4. When the Complete Workflow Assignment window appears, accept the default value of I Approve the change, by clicking **OK**.

Memo	Person	Transaction Date
...No rows to display...		

Task: **Approve or Reject Change EXER_EC_01 (CAB)**

Action:

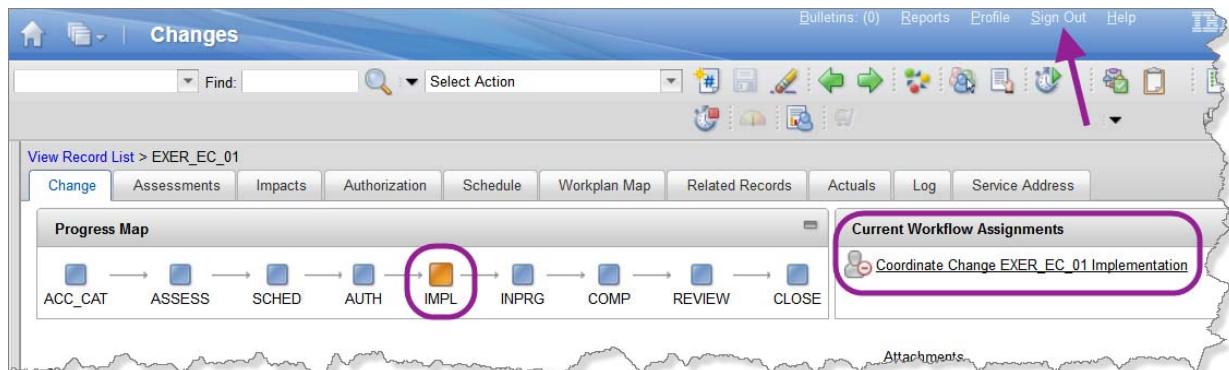
I Authorize the Change.
 I Reject the Change.

Memo:

Earlier Memos Filter Download 0 - 0 of 0

OK Reassign Cancel

- Notice how the status of the change is immediately changed to Implementation and another assignment is created.



If you open the new assignment, you will see that the task of implementing the change has been assigned to SCHROEDER, the change implementer.

- Your work as the approver is done. Click the **SignOut** link so you can log in as SCHROEDER and process the assignment.

The change has been approved, and now it is up to SCHROEDER to update the routing tables on the three servers.

Exercise 8. Implementing the emergency change

The start of the implementation phase depends on whether the change has a scheduled start date. If it does not have a scheduled start date, the workflow sets the change status to IN PROGRESS after the authorization phase completes, and starts sending the implementation task assignments. If there is a scheduled start date, and it is in the future, the workflow waits. When the scheduled start date arrives, an escalation sets the status to IN PROGRESS, and the implementation begins. These process steps ensure that implementation tasks are not performed until the Change is scheduled for implementation.

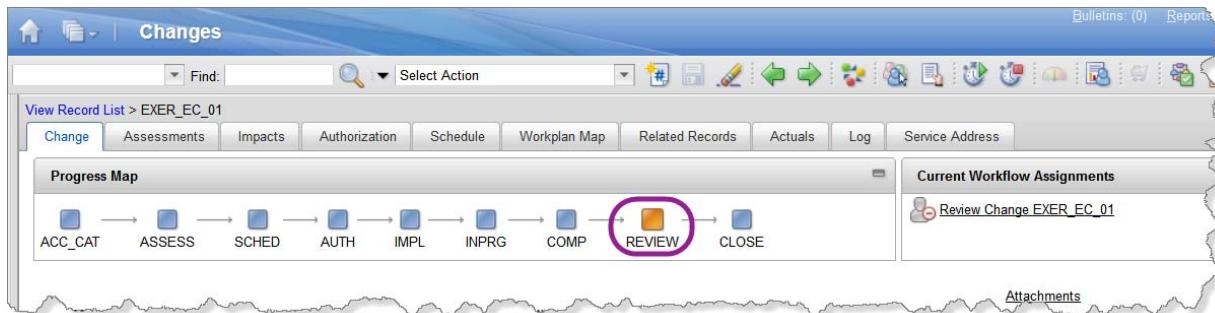
During the implementation of the change, the responsibility to progress the change lies with the members of the change implementers group. The change implementer inspects the documentation provided in the change, and carries out the work. When a task has been completed, the change implementer reports the status back into IBM SmartCloud Control Desk, and the system will schedule additional tasks or update the status of the change appropriately.

If the implementation tasks change special attribute values for a CI, and this is documented as part of the change, IBM SmartCloud Control Desk will update the attribute values accordingly when the

task completes. For this emergency change, you are not manipulating attributes that are kept in the authorized management hierarchy, so you will not experience this behavior in this exercise.

To report that the routing tables on the three servers have been updated, complete these steps:

1. Log in as SCHROEDER using a password of object00.
2. Open the Change Approval, analysis, and implementation start center, and click the Route icon (✉) for the only assignment for Schroeder.
3. When the Confirm Workflow Assignment window appears, click **OK** to accept the details, and complete the assignment.



When the implementation task completes, notice that the status of the change jumped directly from IMPLEMENTATION to REVIEW. This happened because the job plan included only a single implementation task. When the first implementation task starts, the status changes to IN PROGRESS, and when the last implementation task completes, the status changes to COMPLETE. In addition, the express processing workflows skip the normal tasks related with the COMPLETE phase of the change processing, so the next state is REVIEW.

You probably also noticed that a new assignment was created. It is now up to the change owner, Lucy, to review the change, and close it.

4. Use the **SignOut** link to log off so you can log back in as Lucy.

Naturally, the implementation of changes can be a lot more complicated than the current example. It is up to the change owner to decide the logical flow of the change implementation and map it to a job plan. In addition, thorough documentation and references to standard policies and procedures can be associated with the change so all the relevant information for change implementation is available from the change record.

Exercise 9. Reviewing and closing the emergency change

The change owner and others who review the change must consider a number of factors as they evaluate the completed change. Following are some of the factors:

- The Change has had the desired effect and met its objectives.
- Stakeholders are content with the results; if they are not, they can identify the shortcomings.
- The Change has led to no undesirable side-effects to functionality, service levels, security, costs, and so on.

After the review is completed, the change owner indicates whether the result of the change is satisfactory. In addition, the change owner creates a new row in the Log tab to add review comments before closing the change. If the result is satisfactory, the change is closed. If the result is not satisfactory, the change owner is prompted to initiate the creation of a process request, a change work order, or an incident so that outstanding issues can be resolved.

To review the emergency change, complete these steps:

1. Log in to the IBM SmartCloud Control Desk console as Lucy, using a password of object00.
2. Focus on the Inbox/Assignments section of the Change Owner start center, and notice that an assignment is available, and open it by clicking on the Review Change EXER_EM_01 link.

The screenshot shows the 'Inbox / Assignments' section of the IBM SmartCloud Control Desk. At the top, it says 'There are currently no bulletin board messages to view.' Below that, it displays the next assignment due at 7/22/12 11:43:56. The assignment details are shown in a table:

Description	Due Date	Priority	Start Date	Route
Review Change EXER_EM_01	7/22/12 11:43:56		7/22/12 11:43:56	

Below the table, there are buttons for 'Work Log', 'Filter', and a magnifying glass icon. To the right, there's a 'Refresher' button and a status bar showing '1 - 1'.

3. When the Workflow Help window appears, click **OK** to dismiss it.
4. To verify that the NSJ DayTrader is working as expected, Lucy calls the operations center to learn if the status of the application is 'all green', and double checks by asking the application owner if the application can be accessed.

Both inquiries yielded positive answers, so Lucy is convinced that the change had the desired, and expected, effect.

To log this series of events, do the following:

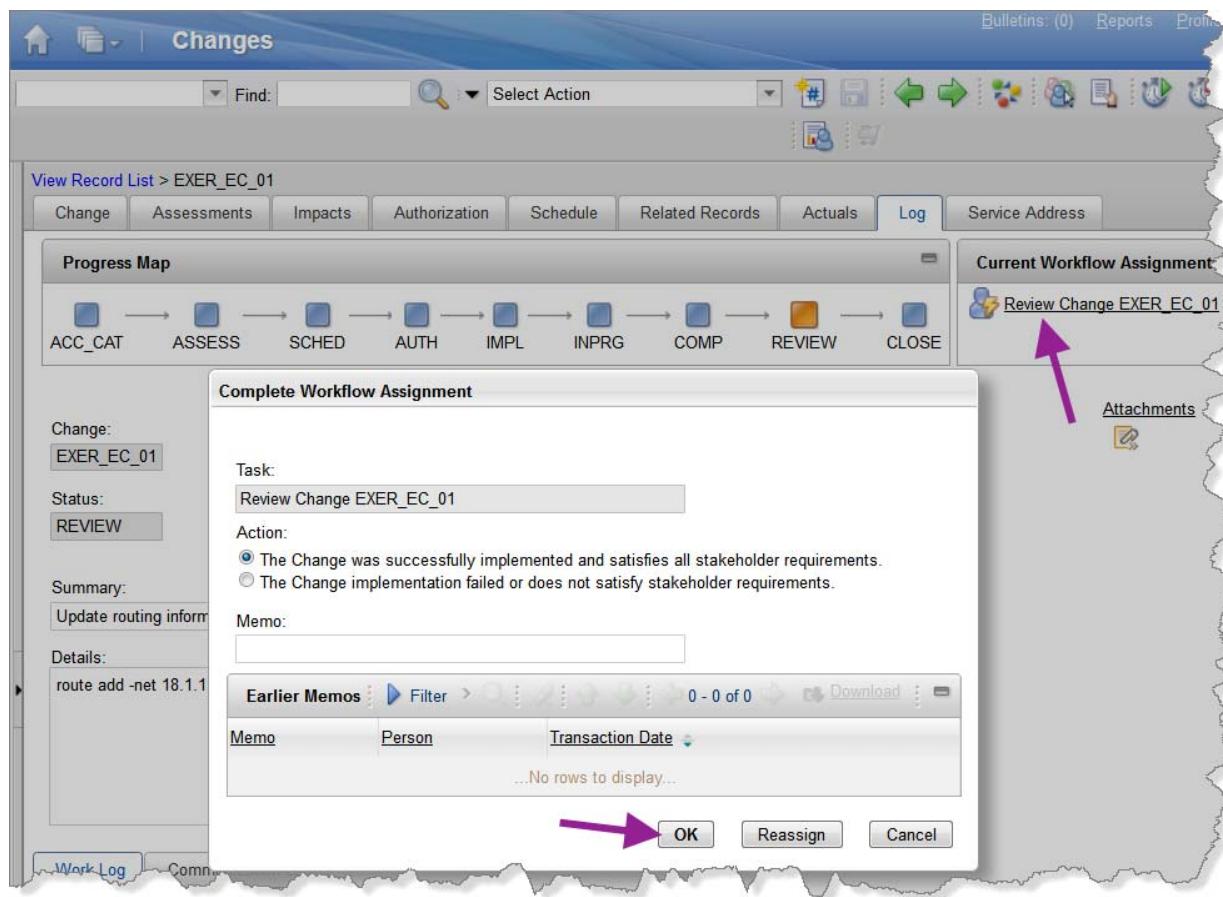
- a. Open the Log tab, and click **New Row** in the Work Log sub-tab.

The screenshot shows the 'Work Log' sub-tab within the 'Log' tab. It has two tabs: 'Work Log' (which is selected) and 'Communication Log'. Below the tabs, there are buttons for 'Work Logs', 'Filter', and a download icon. The main area shows a table with columns: Record, Class, Created By, Date, Type, Summary, and Viewable?. A message '...No rows to display...' is centered below the table. In the bottom right corner, there is a button labeled 'New Row' with a purple arrow pointing to it.

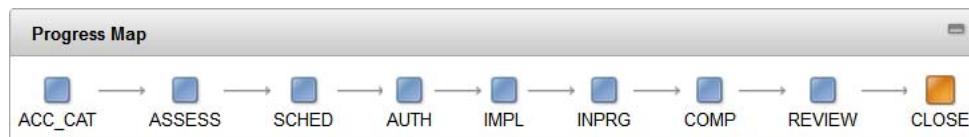
- b. Provide the following information in the Summary field:

Confirmed operation of NSJ DayTrader with operations and application owner

- c. Click the Save icon (floppy disk) in the toolbar to save your new log entry.
5. Now, complete the assignment by clicking the only assignment in the Current Workflow Assignments section, and press **OK** in the Complete Workflow Assignment window to accept the defaults.



6. Upon successful review, you see that the change is closed.



The processing of the emergency change was successfully completed, and all the stakeholders are satisfied.

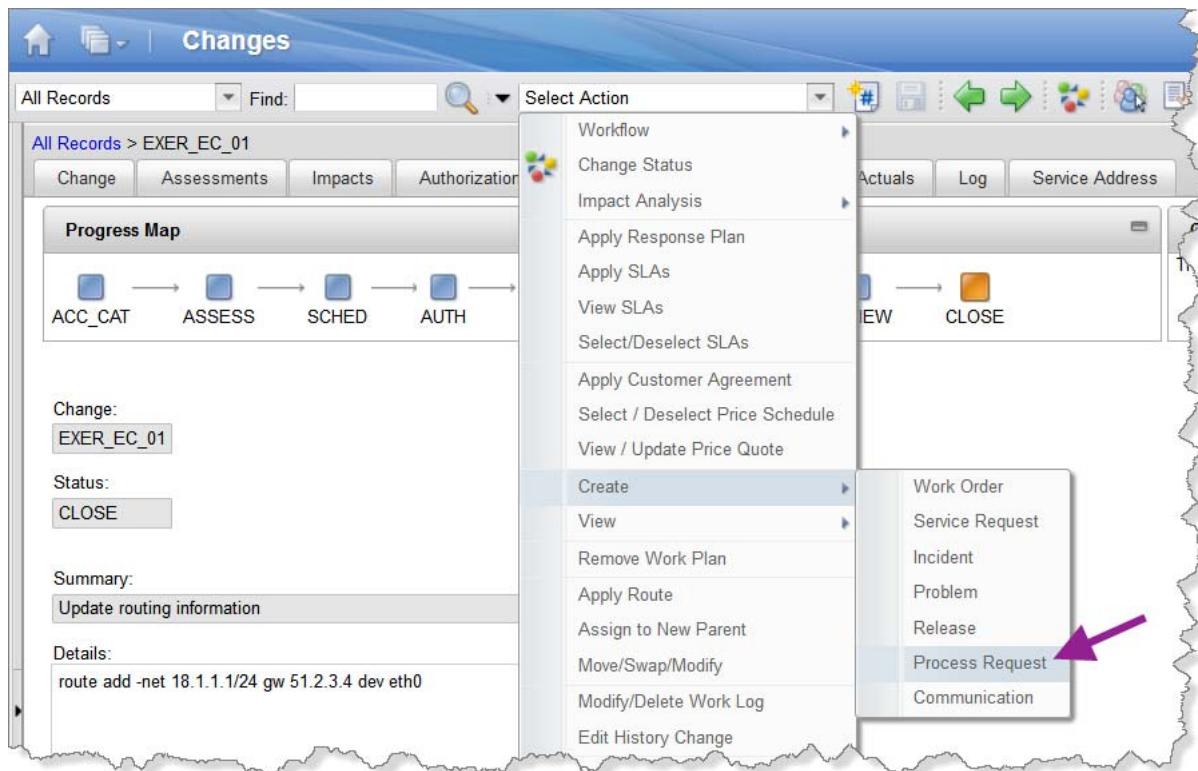
Before Lucy can go back to her normal duties, a change request must be created retrospectively to document the justification for the emergency change.

Exercise 10. Adding a change request after change implementation

Because of the huge financial impact of the outage of the NSJ DayTrader application, every minute counted, and there was no time for Lucy to ask for, or create a change request prior to start working on the change. For documentation purposes Lucy decides to attach a change request to the completed change, so the entire change history is available in the IBM SmartCloud Control Desk environment.

To create a change request and associate it with the change, complete these steps:

1. Open the Related Records tab, and verify that no tickets are related to the change.
2. Create a Process Request by choosing **Select Action > Create > Process Request**.



3. When the Process Requests application opens, provide the following values in the Process Request Details section:

Description	NSJ DayTrader outage
Details	The NSJ DayTrader application cannot be accessed.
Process Manager Type	Change
Configuration Item	NSJ DayTrader~19005 (use the Detail Menu tool (») next to the field to select the BUSINESSAPPLICATION CI named NSJ DAYTRADER)
Urgency	1
Priority	1

And set the classification in the Process Classification Details section:

Classification	PMCHG
----------------	-------

The screenshot shows the 'Process Requests' application interface. The 'Process Request Details' section contains fields for Description, Details, Process Manager Type, Asset, Location, Configuration Item, Response Plan, Customer, Customer Charge Account, and Customer Cost Center. The 'Request Classification Details' section contains fields for Classification and Class Description. Arrows point to the Configuration Item field and the Classification field, both of which have been updated.

Save your updates by clicking the Save icon (F) in the toolbar.

4. To set the status of the Process Request to CLOSED, because you have already processed the request, click the Close icon () in the toolbar.



When the ISMCLOSE workflow has completed (you can see a message to that effect in the header), return to the change by using the **Return** link in the header.

5. When you are returned to the Changes application, notice that the process request is now listed as a related ticket.

You have now completed the change processing, including providing additional information about the reason for the creation and processing of the change.

Summary

In this quick example of the express processing of an emergency change, you went through most of the phases of a normal change. You skipped many details, especially in the assessment, and scheduling phases, because of the urgency of the change.

End-to-end change management processing

To experience all the features of change processing from end to end, the following exercises take you through the creation of a Request For Change (RFC), which is the basis for the change. When the RFC has been approved, you assume different roles, change owner, change analyst, change approver, for example, in order to process the change as it progresses. The progress consists of different stages in which the change is detailed, assessed, scheduled, approved, implemented, verified, and closed.

Exercise 11. Submitting a change process request

Douglas B Anderson is a DBA a developer associated with the NSJ DayTrader business system. He want to add a new database to the environment to support new features he has implemented. Douglas knows that the DB2 instances are configured to host only the actual number of active databases so in preparation for the addition of a new database, Douglas needs to request that the value of the NUMDB instance configuration parameter for the instance is increased by 1.

Doug has not been assigned any authorizations to use the IBM SmartCloud Control Desk system; so he sends a note to the service delivery manager, Steve, with the following content:

Hey Steve,

Can you please put in a change request to increase the NUMDB configuration parameter for the db2inst1 DB2 instance supporting the NSJ DayTrader business application by 1 in order to accommodate the implementation of the new trade database on that instance.

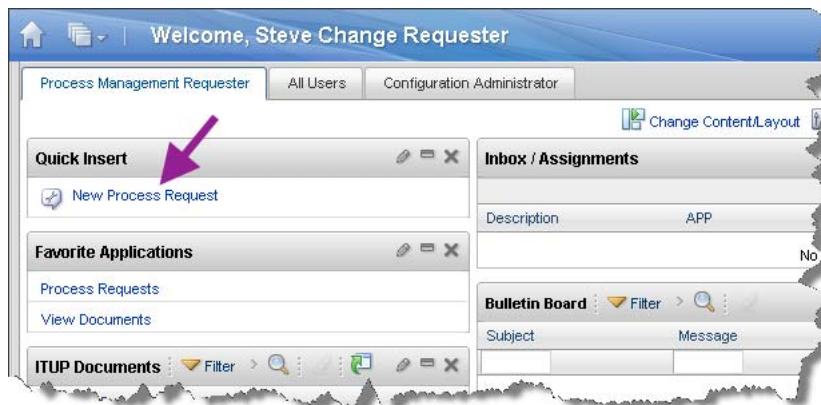
If possible, I'd like to have the change implemented no later than next Saturday.

Thanks in advance DBA

As a process management requester in the change management process, Steve submits requests to the IT organization. These requests might come in the form of an incident, a service request, a request for change, a request for information, or some other type of request.

Assume that you are Steve, and follow these steps to create a Request For Change of the DB2 instance configuration that is under change control in the change management system:

1. Log on to the IBM SmartCloud Control Desk console using the user ID and password credentials of Steve/object00, and navigate to the Process Management Requester start center.
2. To create the process request, click the **New Process Request** link in the Quick Insert portlet.



3. Provide the details of the request using the following instructions:
 - a. Set the value of the Request Number to something you can remember, for example EXER_RFC_1.
 - b. In the Process Request Details section enter a description in the Description field; for example:

Increase the number of active databases for the NSJ DayTrader application
 - c. Provide additional details regarding the change in the Details field, for example:

To support the addition of a database to the NSJ DayTrader application, we need the NUMDB db2 instance configuration parameter increased by 1.
 - d. In the Process Manager Type field, use the Select Value tool (🔍) to find and use the Change process manager.
 - e. Accept the default value for the Site field.
 - f. Select a Requested Completion Date of next Saturday at 10:00 pm (as requested by Douglas) using the Select date and time tool (🕒).
 - g. Set the Priority to Medium (3) using the Select Value tool (🔍).
 - h. Use the Detail Menu tool (▶) to set the classification of the request to:

PMSCCMDB: DB Install and Config.

Note: Remember to click the small blue square (■) to select a classification.

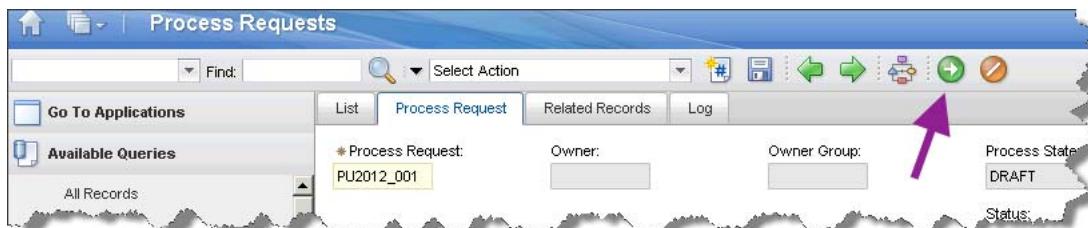
- Click the **Save** icon (□) to store your request.

The screenshot shows the 'Process Request' screen in IBM SmartCloud Control Desk. The process request is identified by the ID PU2012_001. The status is NEW and the process state is DRAFT. The 'User Information' section includes fields for Owner and Owner Group. The 'Process Request Details' section contains a description and details about increasing active databases. The 'Request Classification Details' section shows a classification of PMSCCMDB and a class description of Software. Callouts point to various fields:

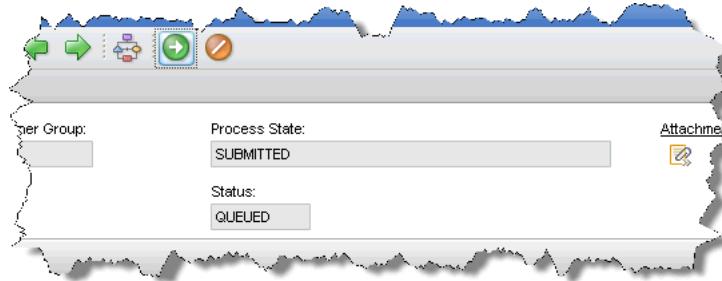
- a**: Points to the 'Process Request' ID field (PU2012_001).
- b**: Points to the 'Description' field, which contains the text: 'Increase the number of active databases for the Inventory Management application.'
- c**: Points to the 'Details' text area, which contains the note: 'To support the addition of a database in the Inventory Management application, we need the NUMBD db2 instance configuration parameter increased by 1.'
- d**: Points to the 'Process Manager Type' field, which is set to 'Change'.
- e**: Points to the 'Site' field, which is set to 'PMSCRTTP'.
- f**: Points to the 'Impact' field.
- g**: Points to the 'Priority' field, which is set to '3'.
- h**: Points to the 'Classification' field, which is set to 'PMSCCMDB'.

Note: It is possible to select the CI on which to perform the change. For this example you will not, because Steve does not know which specific DB2 instance needs to be modified.

- Verify your data, and click the **Submit** button (✚) to send your request for processing.



5. Look at upper right of the Process Request window to determine the status of the request. It should be SUBMITTED and QUEUED:



6. The request has been submitted, so you (as Steve) can log off. Click **SignOut** in the upper right corner of the IBM SmartCloud Control Desk console.



Steve has now completed the creation of the change request. Next, you see the request from the change managers point of view.

Exercise 12. Reviewing the change request

According to ITIL, the change manager is responsible for the acceptance of RFCs and the categorization of the changes that are created based on RFCs. When the RFC has been accepted, the change manager assigns ownership of the change to a change owner who is responsible for the processing of the change.

The change owner follows the change from beginning to end, bringing in analysts, subject matter experts, and approvers as needed to complete the change. The change owner is responsible for ensuring that analysts and experts bring the change to a close. In this process, the responsibility of the change manager is to supervise the change owner.

In relation to change requests, the primary responsibilities of the change manager include the following tasks:

- Acceptance, prioritization, and categorization of change requests.
- Rejects outright any change request that is completely out of scope or out of policy for change management.
- Identifies change requests that have not been acted on in a timely manner and takes appropriate action.
- Ensures that changes are communicated in a timely and adequate manner.
- Closes change requests.

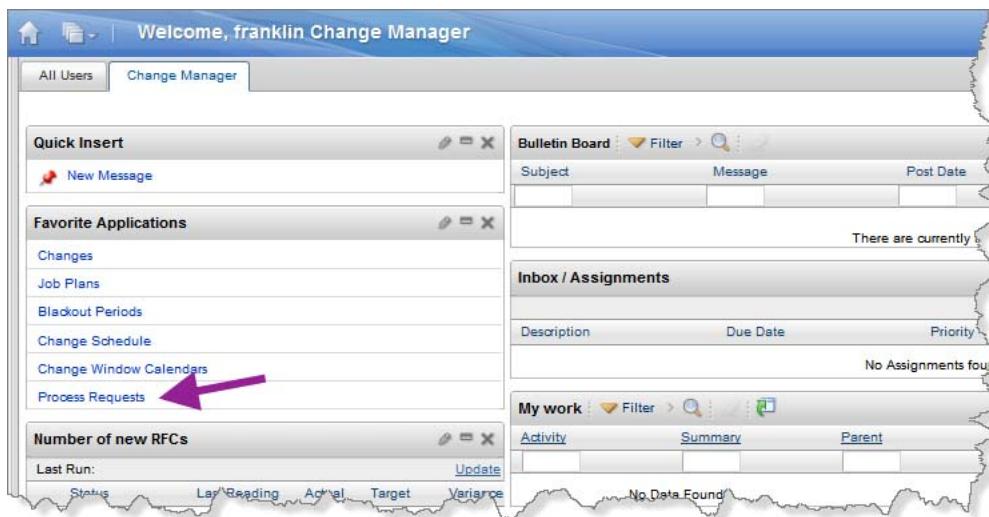
Perform the following steps to validate and categorize the request.

1. Log in to the IBM SmartCloud Control Desk console as the change manager Franklin using a password of object00.

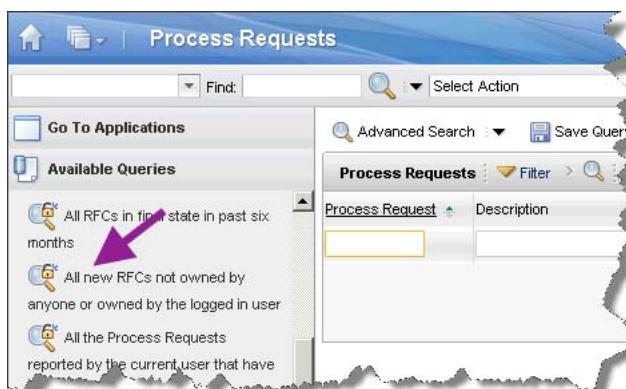
2. Open the Change Manager start center.

Notice that in the system provided start center for the change manager there is no portlet that specifically shows RFCs that have not yet been accepted. A user with administrative authorization can modify the start center to include such a portlet, but for now, you can ignore that.

3. Click the **Process Requests** link in the Favorite Applications portlet to launch the Process Requests application so you can take a closer look at the outstanding requests.



4. To find the RFCs that have been submitted, but not yet accepted, execute the standard query named *All new RFCs not owned by anyone or owned by the logged in user*. You can find this query in the navigation frame, in the Available Queries section. To launch the query, click the name.



When the list of requests is generated, see if you can recognize the request ID.

The screenshot shows a software interface titled 'Process Requests'. At the top, there are buttons for 'Advanced Search', 'Save Query', and 'Bookmarks'. Below this is a toolbar with icons for 'Process Request', 'Description', 'Customer', and 'Process Manager Type'. A status bar at the bottom indicates '1 - 1 of 1'. The main area displays a single row in a table:

Process Request	Description	Customer	Process Manager Type
EXER_RFC_1	Increase the number of active databases for the NSJ DayTrader application		Change

There should be only one unless you have repeated the previous exercise.

5. Open the RFC that was submitted by Steve (EXER_RFC_1).
6. Review the request and consider the following questions:
 - Is it missing any data?
 - Does it have a Priority? Is the priority correct?
 - Does it have a Request Completion Date?
 - Has the request been cataloged correctly?
 - Does it reference the correct Target CI and attributes?

As the change manager you decide that the information provided by Steve is adequate to process the change. So you decide that it can be accepted, and enter the change queue for processing.

Accepting the RFC

As the change manager, Franklin, you are ready to accept the change.

During the acceptance, you can assign the change to a change owner. As a matter of fact, when you are using workflows to control the change, this information is mandatory. For this particular change, you decide to assign it to any team member that has been assigned the role of change owner.

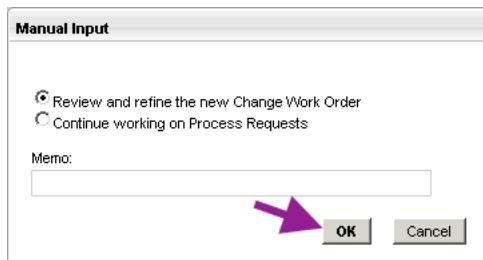
In addition, you also decide to process this change using the advanced processing (under the control of the PMCHGMAIN1 workflow). Using a workflow ensures that the corporate policies are automatically applied, and relieves you of a lot of manual input. In addition, once under workflow control, the status of the change is automatically updated as the change is processed, and the tasks related to the change are automatically routed to the correct groups that are responsible for the particular steps in the change processing.

To accept the change request using the workflow processing, complete these steps:

1. Click Accept in the toolbar () to accept the request. This acceptance routes the request to the ISMACCEPT workflow, which creates a change work order using the information from the

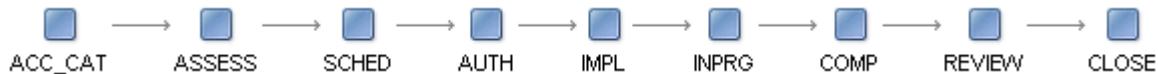
request. The change work order is referred to as the change, and serves as the anchor for all the process steps related to the change processing.

- Review the change work order and add additional information that was not represented in the request. To assign the change to any member of the PMCHGOWN group, which represents all change owners, select **Review and refine the new change work order** in the Manual Input window, and click **OK**.



The Changes application is automatically launched. In this application you can review and specify the details of the change work order.

Change Work Orders specify the details of the change including the what, where, why, how, who and when details. Depending on the type of the information that has been specified one of nine stages are assigned to the change. These stages can be seen at the Progress Map that is shown at the top of all windows in the Changes application.



The nature of each of the stages is described in the following list:

- Accept and Categorize:**

In this stage, the change is accepted and categorized. The primary purpose is to validate the input provided in the RFC, and decide whether to accept or reject it. If it is accepted, the change must be categorized and a type must be assigned.

- Assess:**

The initial assessment is performed to verify the accuracy of the information in the change, such as the target CIs, assessment, and authorization requirements, as well as the job plan and scheduling. In this stage impact analysis and initial scheduling can also be performed.

The change is also assessed to determine the consequences of implementing the change. This assessment can be performed at both of the following levels:

- At a technical level to assess the risks of the implementation itself
- At the business level to document business aspects of the implementation

- Schedule:**

After assessment, ownership of the individual tasks can be assigned, and the change can be scheduled. This scheduling includes all of the implementation tasks in the change work order,

taking into account the change windows associated with the impacted CIs, as well as the schedules of the people that are assigned to implement the changes.

- **Authorize:**

Depending on the nature of the change, different levels of approval might be needed, and in this stage, it is ensured that the individual approvers review the change and provide approval or rejection.

- **Implement:**

The implementation stage is basically a placeholder that indicates that the change is ready for implementation, but the scheduled start time has not yet been reached

- **In Progress:**

During the In Progress stage, the implementation tasks are performed, and the changes are applied to the target Configuration Items. As tasks complete, subtasks are initiated as specified in the tasks that are associated with the change.

- **Complete:**

In the Complete stage, the change is marked complete, and the attributes for the target CIs are updated to reflect the changes that were applied. At this point, a Configuration Audit Request can be submitted in order to request that the configuration auditor verifies that there are no discrepancies between the actual and authorized CIs.

- **Review:**

The entire change is reviewed to verify that the change was applied according to plan. If this is the case, the change is automatically closed.

- **Close:**

A closed change finalizes the process and ensures no further work against a change record.

Now, you can complete the activities and the tasks they contain in sequence to plan and implement the change.

Exercise 13. Approving the change processing

In the Changes application, you see that all the relevant information from the RFC has been copied to the change work order. You see the Progress Map that helps you to quickly see the stage of the change. At this point, you are preparing the change work order, and it has not yet been approved, so you do not see a progress of the change.

Notice, that the initial status of the change is WAPPR, which means that it is waiting to be approved. This status implies that the change needs to be approved for processing, not that it has been accepted and authorized for implementation.

1. Familiarize yourself with the information that is presented to you in the Changes application.
2. In the Change Type field you see that a default value of NORMAL has been set by the workflow that created the change. This value is used in a short while to pre-set a number of default values, such as job plan, necessary assessment, and approvers by applying a response plan to the change. The value of the change type field determines, among other, which response plans is applied.

Two of the other properties that are considered when the response plan is selected is risk, and priority. These are either

- copied from the change request
- provided by the person who categorizes the change,
- calculated by the advanced change processing workflow, based on the values provided for Impact, Urgency, and Failure Probability.

You see that default values have already been assigned for these three properties as well as the priority.

The system has assigned values for the Impact, Urgency, and Failure Probability properties based on the priority and requested completion date in the request.

For this change, ensure that the following values for the three properties that are used to calculate priority and risk, and add a little more additional information while you are at it:

Impact	4 (Low)
Urgency	4 (Low)
Failure probability	3 (Low)
Reason for change	Need to support more databases
Effect of Not Implementing	Application updates cannot be deployed

To approve the change and initiate the processing, you, the change manager, initiate the workflow that controls the progress of the change. Using IBM SmartCloud Control Desk, you can choose from several change process workflows depending on your specific requirements. For this exercise, you use the workflow that ensures that all the change phases are visited. Usually, that workflow is used only for complex or emergency changes, but it is used here so that you can experience as many aspects of change processing as possible.

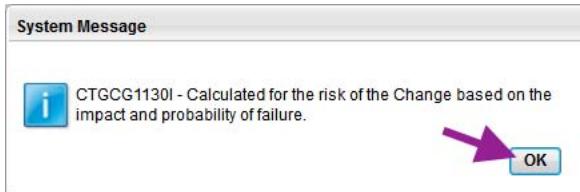
- Click the Save icon (in the toolbar.
- To start the advanced change processing for this change, using the PMCHGMAIN1 workflow, click the Advanced Change Process icon ()

The screenshot shows the 'Changes' screen with the following details:

- Progress Map:** Shows a sequence of states: ACC_CAT → ASSESS → SCHED → AUTH → IMPL → INPRG → COMP → REVIEW → CLOSE.
- Current Workflow Assignments:** States "There are no workflow assignments."
- Change Information:**
 - Change: 1273
 - Status: ACC_CAT
 - Owner: [Empty field]
 - Owner Group: [Empty field]
- Attachments:** A link labeled "Attachments" with a magnifying glass icon.

Exercise 13. Approving the change processing

When the PMCHGMAIN1 workflow starts, it automatically calculates the impact and risk for the change, if you had not already provided a value for these fields. If you see any messages that indicate that these calculations were performed, click **OK** to dismiss the messages.

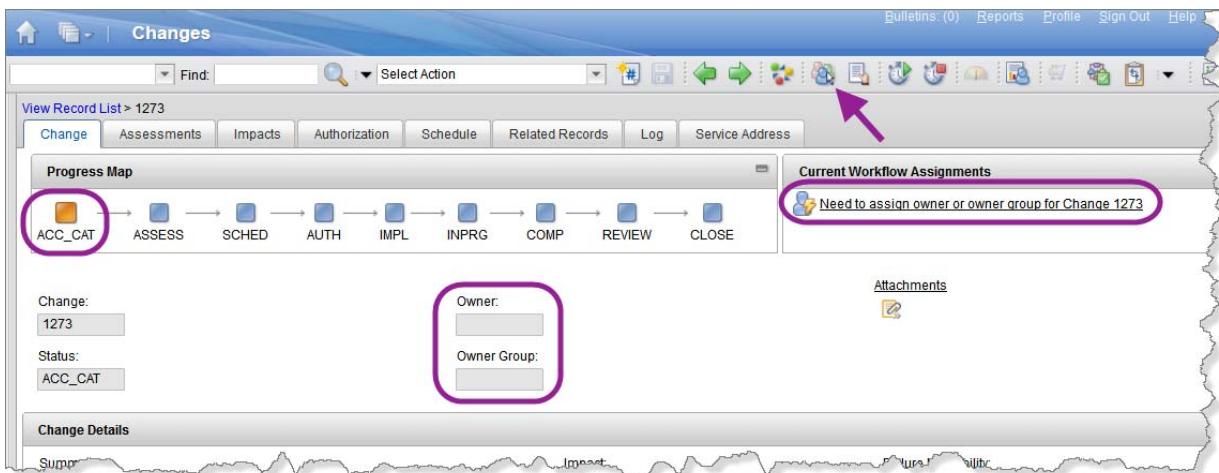


The workflow, also applies the response plan that is related to the change type. This response plan provides defaults for the job schedule, assessments, and required approvals.

Notice that the state of the change has been updated. By invoking the workflow, you, the change manager, approved the processing of the change, and the change has entered the Assessment and Categorization phase.

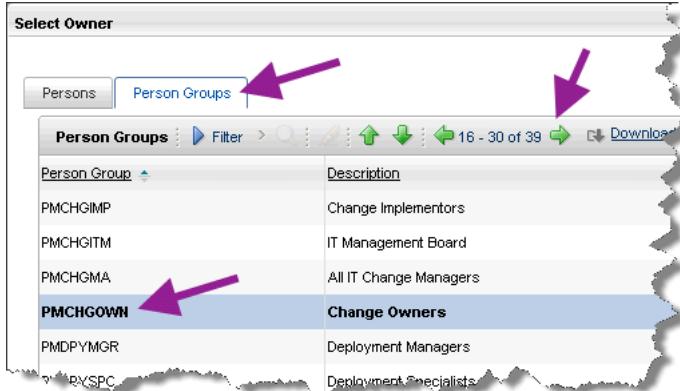
In the Current Workflow Assignments portlet, you are reminded that you need to assign an owner or owner group to the change.

The value of both the Owner and Owner Group fields in the change are empty. To specify an owner, click the **Select Owner** icon (a person icon) from either the toolbar or the Common Actions portlet in the navigation frame.



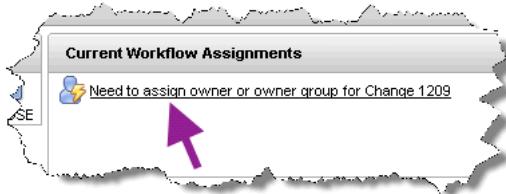
When the Select Owner window opens, notice that you can assign either specific persons, or a group. By assigning ownership to a group, any member of the group can work with the change.

To assign PMCHGOWN as the owner group of this change, open the Person Groups tab, scroll down using the Next Page icon (), and find the group named PMCHGOWN. When you click the group name, it is populated into the Owner Group field of the change.

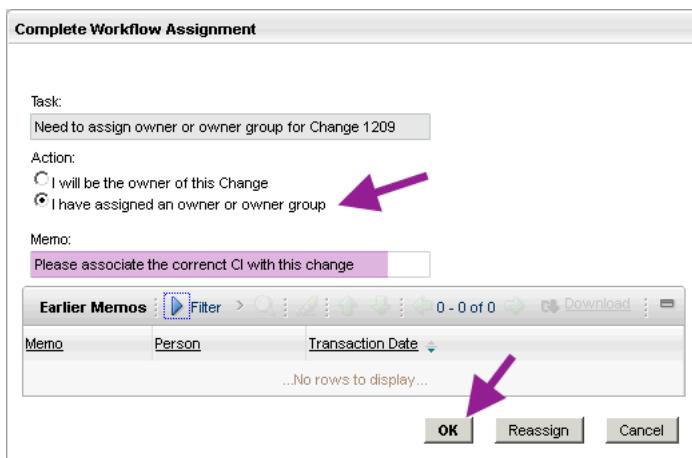


When you are returned to the Changes application, you see that the Owner Group field has been populated with the group you selected.

5. To complete your work as the change manager, and assign the change to a member of group of change owners, click your assignment to indicate that it has been completed.



6. In the Complete Workflow Assignment window, choose *I have assigned an owner or an owner group*, add a memo to log a message that the owner should assign the CI, and click **OK**.



When you have completed your assignment, the status of the change has been set to ASSESS and a new assignment has been added. Notice that the icon representing the assignment is grayed out to indicate that you are not authorized to work on this assignment.

7. Click the assignment link named **Perform preliminary assessment of change...** to see the details:

Assigned Person/Code	Name	Description	Priority	Time Limit	Start Date	End Date
LUCY	Lucy	Perform preliminary assessment of Change 1209	0:00	1/30/12 12:29:09		
SDADMIN	Service Desk Administrator	Perform preliminary assessment of Change 1209	0:00	1/30/12 12:29:09		

Because you assigned ownership of the change to the PMCHGOWN group, you see that the next task of the change processing has been assigned all the members of the group. In the exercise environment, this implies that only LUCY or SDADMIN are authorized to perform the preliminary assessment.

8. Your job as the change manager is done. Click the **SignOut** link in the upper right corner of the IBM SmartCloud Control Desk console to log off so you can log back in as another user.

You have verified the information in the RFC, accepted it, and created a new change work order that is linked to the RFC. In addition, you assigned PMCHGOWN as the owner group of the change.

Exercise 14. Specifying the change work order

Remember, according to ITIL, the change owner is responsible for the processing of a change. This implies, that the change owner follows the change from beginning to end, bringing in analysts, subject matter experts, approvers, and implementers as needed to complete the change. The change owner is responsible for ensuring that analysts and experts bring the change to a close.

As the change owner, it is Lucy's responsibility to ensure that the information is correct, and that a set of relevant activities and tasks are associated with the change. These activities and tasks specify in detail the administrative and technical work that must be performed to securely update the database instance configuration with minimal disruption to the environment.

Default values for most of these settings have already been added by the response plan. It is the change owner's responsibility to review the information that has been added to the change and perform any updates that apply to the specific change.

As Lucy, you must now perform the following actions to make sure that the change work order has been specified in adequate detail to obtain preliminary approval.

- Review the change specification

- Review the change schedule
- Review the change assessment requirements
- Review the change authorization requirements

To start working with the change as the change owner, complete these steps:

1. Log in to the IBM SmartCloud Control Desk console, using a user ID of `Lucy` and a password of `object00`.
2. From the change owner workspace, notice that the assignment for the change is listed in the **Inbox/Assignments** portlet.

The screenshot shows the 'Welcome, Lucy Change Owner' dashboard. The 'Inbox / Assignments' portlet is highlighted with a purple border. It displays a single assignment row:

Description	Due Date	Priority	Start Date	Route
Perform preliminary assessment of Change 1273	7/22/12 23:46:06		7/22/12 23:46:06	

3. To open the assignment, simply click the relevant link, and the change is opened in the **Changes** application.
4. As a service to new users, an informational message is displayed to help the user to complete the task. Click **OK** to dismiss the window.

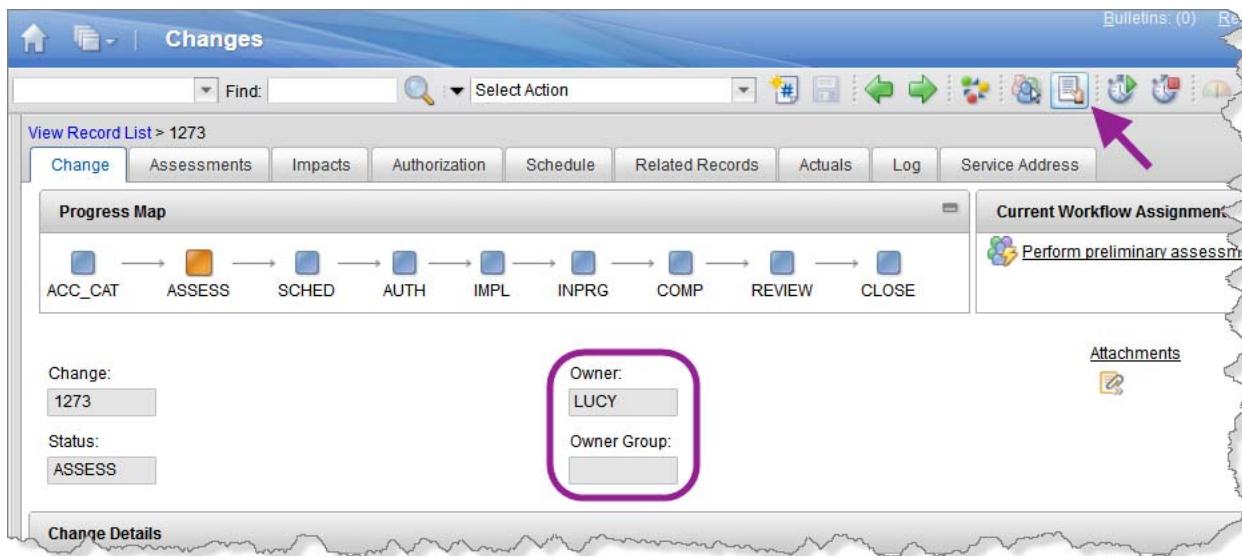
When the **Changes** application loads, notice that the icon representing the assignment is now colored, so you, Lucy, have the proper authorizations to perform the task.

You are now ready to start the preliminary assessment of the change.

Taking ownership

To signal to the rest of the group that Lucy assumes responsibility for this change, Lucy now takes ownership of the change.

Click the Take Ownership icon (✉) in the toolbar or the Common Actions section of the navigation bar, and notice how the ownership has been transferred from the PMCHGOWN group to Lucy, the change owner.



Now, Lucy is ready to start working on the change specification to document what needs to take place to accommodate Steve's request.

Reviewing the change specification

The change owner has to provide the correct change category, and associate the appropriate target CI with the change. These tasks are handled from the Change tab of the Changes application.

To categorize the change, and assign the target CI perform the following steps:

1. Provide the correct change category.

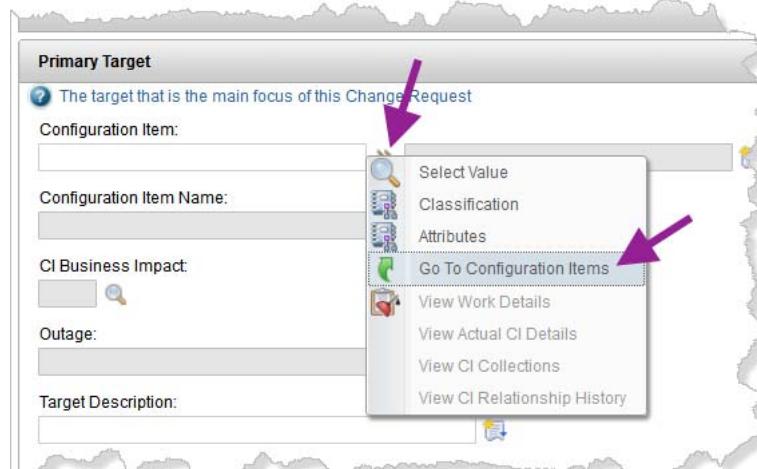
The change category specifies how the change should be processed, and might include options such as Major, Minor, Significant, or any other value that is helpful to your organization. The change type is used along with the change category to determine how the change is processed.

Categorize this change work order as **Minor** by using the Select Value tool (🔍) next to the Change Category field.

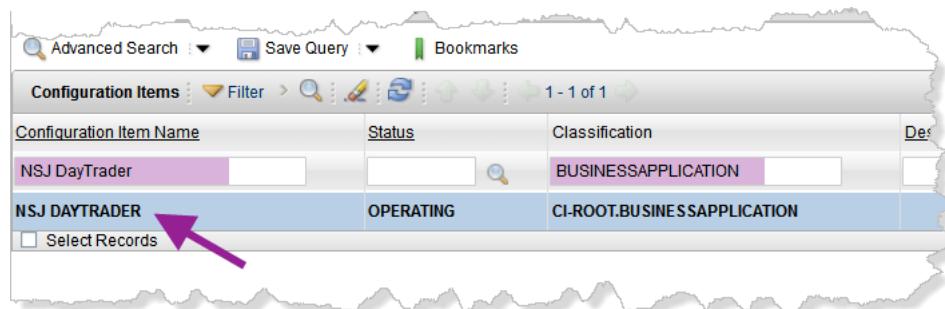
2. The information in the change request helps Lucy determine that the CI that must be changed is the NUMDB DB2 Instance Configuration Value that is related to the db2inst1 instance that supports the NSJ DayTrader application.

To assign the CI, complete the following steps:

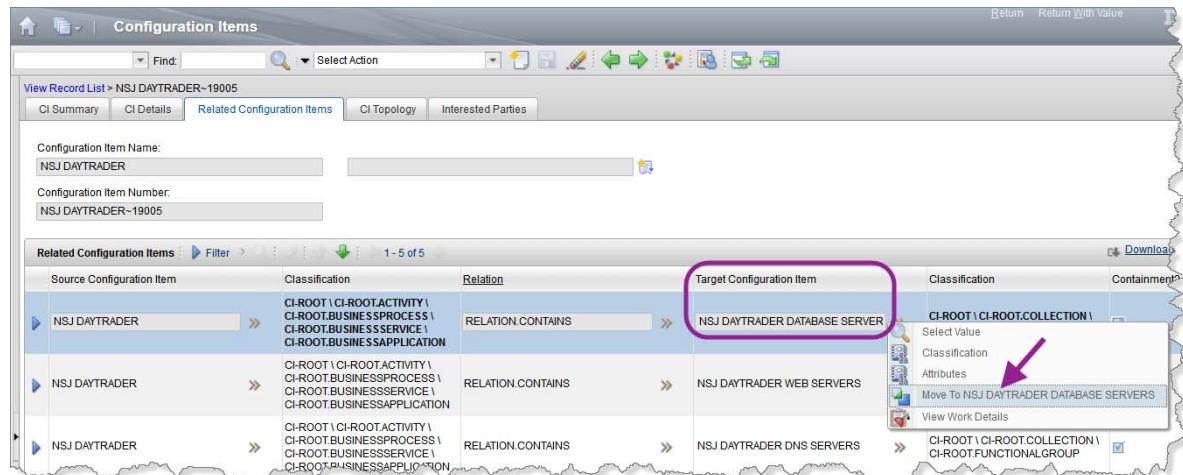
- From the Primary Target section of the change, use the Detail Menu tool (next to the Configuration Item field and choose **Go To Configuration Items**.



- From the Configuration Items application, enter the filter values of **NSJ DayTrader** for the Configuration Item Name field, **BUSINESSAPPLICATION** for the Classification field, and then press Enter to activate the filter.



- Click the CI representing the NSJ DayTrader instance to open it so you can see the CIs that are related to the application.
- Open the Related Configuration Items tab and see if you have any DB2 Instances or database-related functional groups that are related to the application.



You see a Target CI named NSJ DAYTRADER DATABASE SERVERS. The classification of this CI should be FUNCTIONALGROUP. Functional group CIs are used in the CDM (and the management hierarchies in IBM SmartCloud Control Desk) to represent similar resources that are members of business applications.

- Use the Detail Menu tool (») next to the NSJ DAYTRADER DATABASE SERVERS target CI, to **Move to ...** to drill down and see if any children are related to this CI.

You automatically launch into the Related Records tab of the NSJ DAYTRADER DATABASE SERVERS functional group configuration item. Here you can see that this CI is contained by the application. You also see that the functional group has a DB2INSTANCE member.

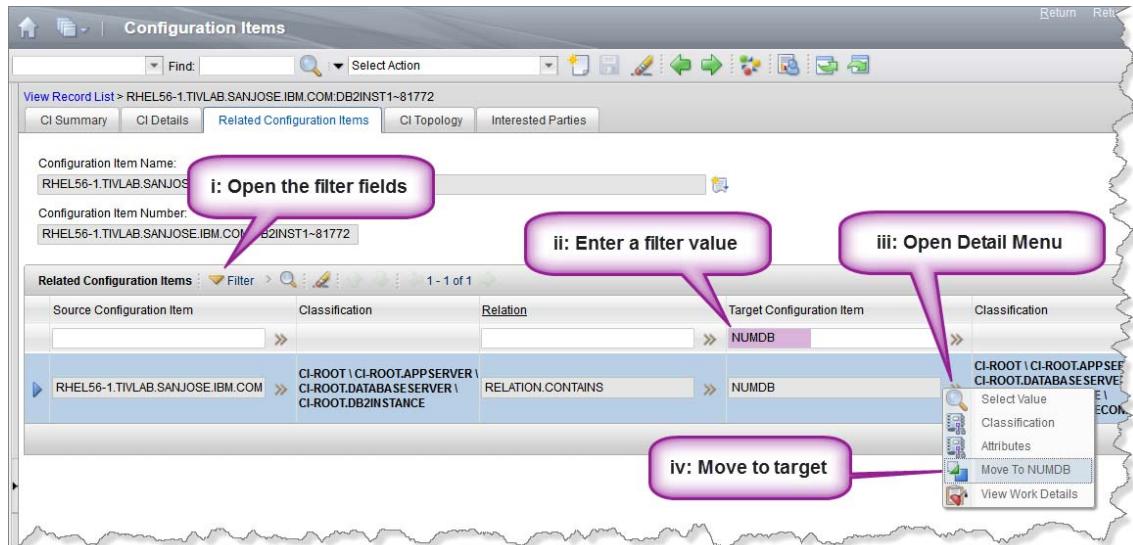
Related Configuration Items		
Source Configuration Item	Classification	Relation
NSJ DAYTRADER	CI-ROOT \ CI-ROOT.ACTIVITY \ CI-ROOT.BUSINESSPROCESS \ CI-ROOT.BUSINESSSERVICE \ CI-ROOT.BUSINESSAPPLICATION	RELATION.CONTAINS
RHEL56-1.TIVLAB.SANJOSE.IBM.COM	CI-ROOT \ CI-ROOT.APPSERVER \ CI-ROOT.DATABASESERVER \ Select Value Classification Attributes	RELATION.MEMBEROF

- To access the DB2 instance in order to identify the NUMBD attribute that you want to update, use the Detail Menu tool (») next to the RHEL56-1.TIVLAB.SANJOSE.IBM.COM:DB2INST1 CI, which is a MEMBEROF the NSJ DAYTRADER DATABASE SERVERS functional group, and select **Move to**
- The details of the DB2INSTANCE resource are shown. Notice that it is related to more than 100 CIs, most of which are classified as DB2MODULE or DB2INSTANCECONFIGVALUE resources.

To locate the DB2INSTANCECONFIGVALUE that is supposed to be the target of this change, complete these steps from the Related Records tab:

- Activate the filter by clicking the Open Filter icon (») in the heading of the Related Configuration Items list.
- When the filter fields appear, enter **NUMDB** in the Target Configuration Item Name field, and press Enter. The CI you are looking for will be revealed.
- Open the Detail Menu tool (») next to the NUMDB target configuration item.

- iv. To navigate to this CI, choose **Move to NUMDB**.



When you see that the Configuration Item Name field in the Related Resources tab changes to NUMDB, you have identified the CI that is the target of the change.

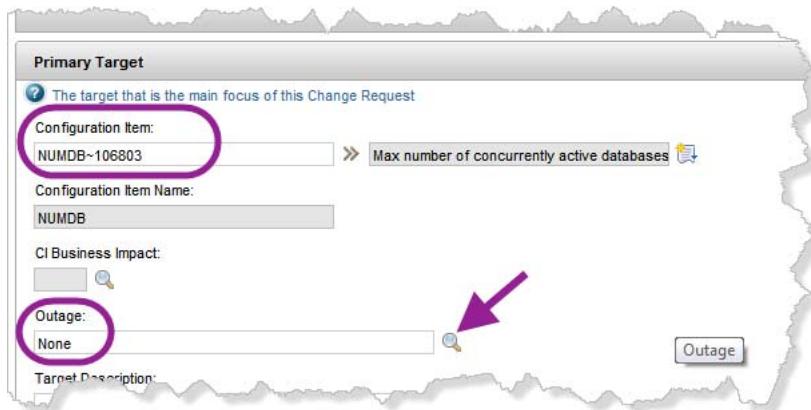
- h. Open the CI Details tab, and notice in the Specifications section that both the authorized and discovered values of the DB2CONFIGURATIONVALUE_VALUE attribute are 8.

Attribute	Authorized Value	Discovered Value
DB2INSTANCECONFIGVALUE_NAME	NUMDB	NUMDB
MODELOBJECT_DISPLAYNAME	NUMDB	NUMDB
DB2INSTANCECONFIGVALUE_VALUE	8	8

- i. To return the NUMDB CI to the change, click **Return With Value** at the upper right of the console.



Back at the change, you see that the CI you selected has been populated into the Primary Targets section of the change. Notice that the Configuration Item Number in this example is NUMDB~106803. (The numeric suffix might be different in the exercise environment.)



3. To record the availability of the target CI during implementation of the change, you use the Outage field in the Primary Target section. Ensure that the value for this field is set to None. Use the Select Value tool (🔍) next to the Outage field.

When the Primary configuration item has been assigned, you can specify exactly which attributes of the CI need to be changed. There are many reasons to specify the new attribute values for your change because that information provides the following benefits:

- Instructions to the change implementer on which new configuration values to apply
- The base information that is used to complete the following tasks:
 - Perform post-implementation validation
 - Update the database (through a CI Update Request linked to your change) when the change has been implemented
 - Perform a CI audit to ensure that the implementation was performed according to specifications.

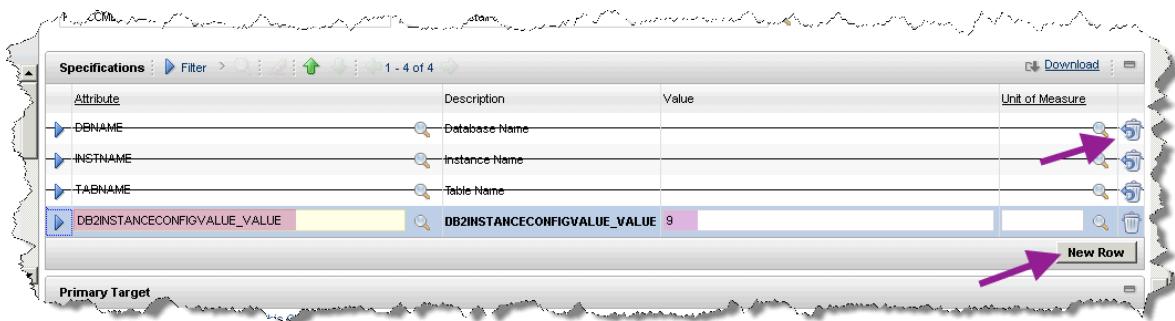
The specification itself is a simple list of values that should be assigned to specific attributes related to the target CIs after the implementation of the change. These attribute values represent the values that are discovered and associated with the actual CI when a TADDM discovery is run after the change implementation.

For the current exercise, only a single attribute value must be applied:

`DB2INSTANCECONFIGVALUE_VALUE`, which you have examined in the previous step. The current alphanumeric value of this attribute is 8, and because you must add support for one more database, the new value (stored in the Specifications section) should be 9.

4. To add the change specification, complete these steps:
 - a. In the Change tab, focus on the Specification section.
 - b. To remove the existing specifications that have been added as a result of using the PMSCCMDB classification for the change, click the Delete icon (at the end of each of the existing specifications.
 - c. To add a new specification, click **New Row** and provide the following values in the specification details, as shown here:

Attribute	DB2INSTANCECONFIGVALUE_VALUE
Alphanumeric Value	9



The value of 9 is set because the current value of the attribute is 8, and you were requested to increase it by 1.

- d. Click the **Save** icon (to save the change.

The change specification is complete. Now, you see, the Primary CI, the change specifications, and a category of *Minor* in the Change section.

When you have identified what needs to be changed, and how it must be processed, you are ready to specify how this change should be assessed from both technical and business standpoints to determine how the change might affect both your technical and business environments.

Reviewing the change schedule

During the preliminary preparation of the change, you should specify a job schedule that applies to the specific change. Since the response plan was generic, the job plan assigned by default contains only a single, generic, task: Implement the change. To specify a job plan that is more relevant to the current change, you can add additional job steps to make a plan that better meets your requirements.



Note: In a real implementation, you would have created job schedule templates that better suit your particular needs, and optionally embedded these in your customized response plans.

Exercise 14. Specifying the change work order

In the following steps, you add two tasks: one for checking prerequisites, and one to validate the change implementation. To do so, complete these steps:

1. Navigate to the Schedule tab to see the plan. The interesting information is found in the Tasks for Change ... section.

The screenshot shows a table titled 'Tasks for Change 1155'. The table has columns: Sequence, Task, Summary, Estimated Duration, Status, Owner, and Owner Group. There is one row with the following values: Sequence 10, Task 'Implement the Change', Summary 'Implement the Change', Estimated Duration 4:00, Status WAPPR, Owner blank, and Owner Group PMCHGIMP.

The default plan contains only one task, which by default is assigned to the Change Implementers group (PMCHGIMP).

2. Click the **View Details** icon (▶) to the left of the task to see the details. Notice that the Implementation Task field is selected. This selection indicates that work on the CIs associated with the task is performed for the duration of the task, and for the duration of the task the resources might suffer an outage.

The screenshot shows the 'Task Information' dialog for the task 'Implement the Change'. The 'Implementation Task?' checkbox is checked and highlighted with a purple oval. Other fields include Task (10), Sequence (10), Status (WAPPR), and various flow control options like Under Flow Control? (checked), Flow Action, Flow Action Assist?, Assisted Workflow, and Launch Entry Name.

This information is critical to the scheduling process since only Implementation Tasks are taken into account when you schedule the task for execution within the change window of the CI, and, depending on the outage definition and the relationships, optionally also within the change windows of the impacted CIs.



Note: Tasks that are tagged as an Implementation Task are the ones that actually modify the target CI. These tasks are the only ones that are scheduled for execution within change windows that apply to the target CI. This is an important point to remember when assigning CIs changes and tasks.

3. Make sure that a CI is referenced in the Work Reference section of the task.

To add the DB2INSTANCECONFIGVALUE CI as the target of the task, complete these steps:

- a. Use the Detail Menu tool (») next to the Configuration Item field, and choose **Select Value** from the context menu.
- b. When the Select Value window opens, enter **NUMDB** in the search field for Configuration Item Number and press Enter.
- c. When the results of your search are shown, choose the only CI named **NUMDB**.

Configuration Item Number	Description	Classification
NUMDB		
NUMDB~106803	Max number of concurrently active databases	CI-ROOT.DB2INSTANCECONFIGVALUE

When you return to the change work order schedule, notice that the CI fields in the Work Reference section of the task have been populated.

Work Reference Information

Reference WO:
1211 ➤

Configuration Item:
NUMDB~24422 ➤ Max number of concurrently active databases

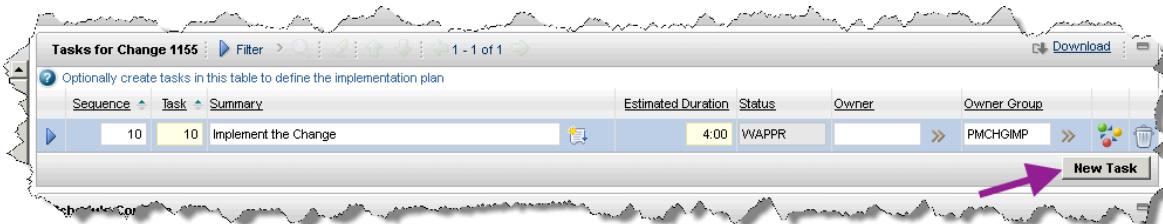
Configuration Item Name:
NUMDB

CI Business Impact:

Outage:
Offline

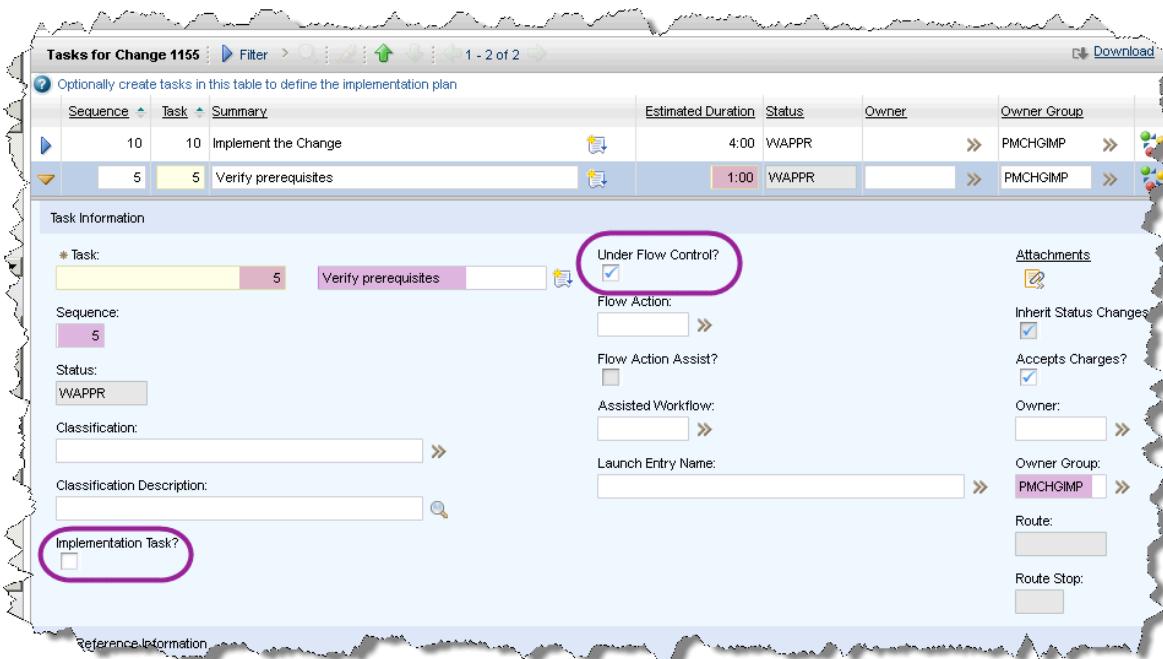
4. In addition, ensure that the value for the Outage field is set to **None**.

5. Complete the following steps to add a new task that is used to verify the prerequisites. Also, make sure that this task is executed before the implementation task.
- Click the **New Task** button to the far right at the bottom of the Tasks for Change ... section.



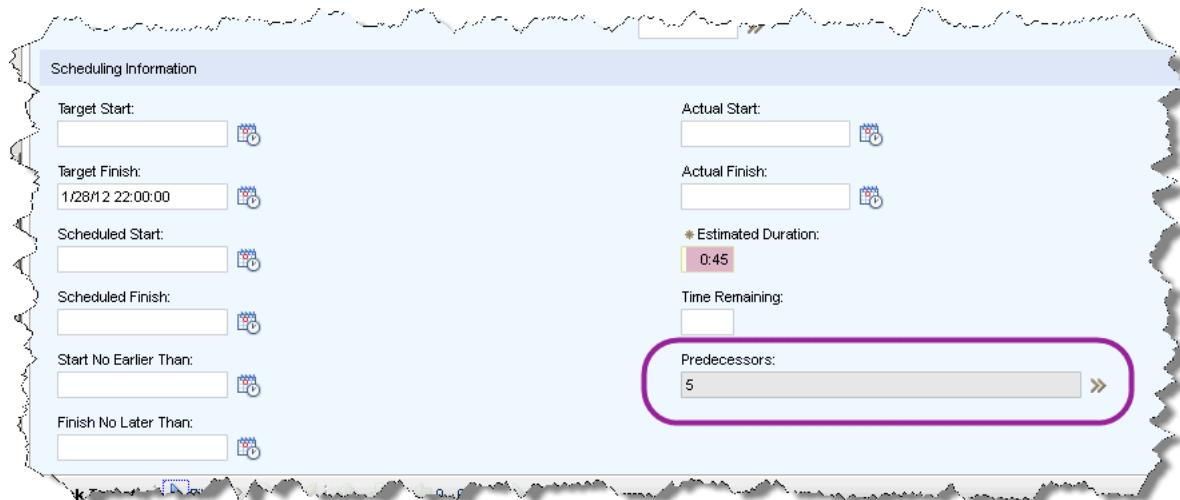
- When the Task Information section expands, supply the following information:

Task ID	5
Sequence	5
Description	Verify prerequisites
Under Flow Control	checked
Owner Group	PMCHGIMP
Implementation Task	unchecked
Estimated Duration	1:00



6. Look at the Implement change task that was copied from the job plan. Scroll down until you see the subsection named Scheduling Information.
Four hours to update a database configuration parameter seems a bit much, so you should update the Estimated Duration to 45 minutes (0:45). Make sure that you update the

Predecessors field to contain the task number (5) of the Verify prerequisites task that you have just added. Use the Detail Menu tool (next to the Predecessors field to set the value.



- To add the third task to the job plan, which executes after the implementation ask, repeat the previous step, this time providing these parameters:

Task ID	15
Sequence	15
Description	Validate change implementation
Under Flow Control	checked
Owner Group	PMCHGIMP
Implementation Task	unchecked
Estimated Duration	1:00
Predecessors	10

When you are done, your job plan looks similar to this example:

Tasks for Change 1155					
Sequence	Task	Summary	Estimated Duration	Status	Owner
5	5	Verify prerequisites	1:00	WAPPR	PMCHGIMP
10	10	Implement the Change	0:45	WAPPR	PMCHGIMP
15	15	Validate Change Implementation	1:00	WAPPR	PMCHGIMP

Note that not all tasks in the plan are implementation tasks. Actually, the only implementation task is the one copied from the job plan, the one named Implement the change.

Notice the status of the tasks. They should all be waiting approval (WAPPR).

8. Make sure that you update the Estimated Duration field in the Schedule Dates section in order to reflect the changes. Use a value of three hours and 15 minutes (3 : 15). This setting allows for slack between the three individual tasks.

The screenshot shows the 'Schedule Dates' configuration screen. It contains several input fields with associated icons:

- Target Start:** An input field with a calendar icon.
- Scheduled Start:** An input field with a calendar icon.
- Actual Start:** An input field with a calendar icon.
- Target Finish:** An input field containing the value "1/26/12 22:00:00" with a calendar icon.
- Scheduled Finish:** An input field with a calendar icon.
- Actual Finish:** An input field with a calendar icon.
- Start No Earlier Than:** An input field with a calendar icon.
- Scheduler Project:** An input field with a double arrow icon.
- * Estimated Duration:** A highlighted input field containing "3:15".
- Finish No Later Than:** An input field with a calendar icon.
- Time Remaining:** An input field.

9. Click the **Save** icon (floppy disk) to make sure that the modifications you made to the change are not lost by accident.

You have now updated the change to include a plan for the implementation. Next, the change owner, Lucy, must specify the assessment requirements for the change so that the approvers are provided the necessary information from the subject matter experts to make an informed decision on whether or not to allow the change to be implemented.

Previewing impacted CIs

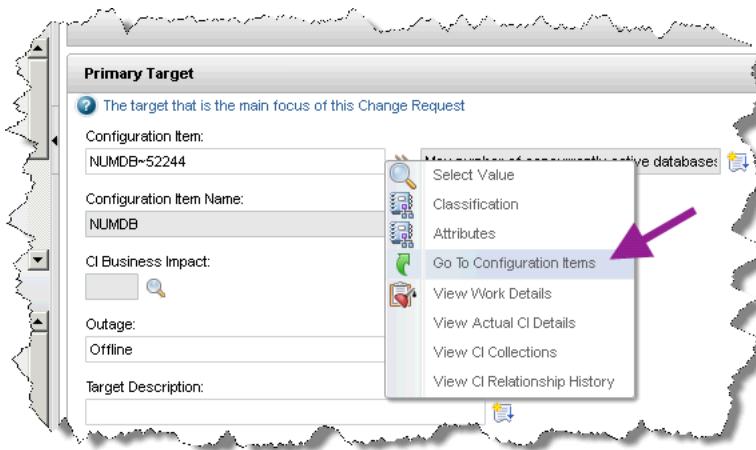
before determining the assessment requirements for the change, Lucy want an overview of the CIs that are impacted. From the request Lucy can deduce that the NSJ DayTrader business application may be affected, but it would be nice to know if any other applications will be impacted by the change implementation.

The Preview Impacted CIs option, can be used to see which CIs are affected by the change to the target CI of the change (NUMDB).

Viewing the topology

Before you start defining assessment requirements for the change, consider visiting the CI topology for the db2inst1 database instance. Because of all the configuration values related to the instance, it is more convenient for you to look at the instance itself.

1. Make a note of the real CI identifier for the NUMDB CI that is the target of the change. In this example, it would be *NUMDB~106803*. You will need this identifier in a later step.
2. To see the topology, use the **Detail Menu** tool (») next to the **Configuration Item** field in the **Primary Targets** tab and select **Go To Configuration Items**.



3. In the Configuration Item application, open the CI Topology section. Notice, that you see only the NUMDB CI, and that the status is OPERATIONAL (green circle) and is associated with one or more pending changes (blue wrench).



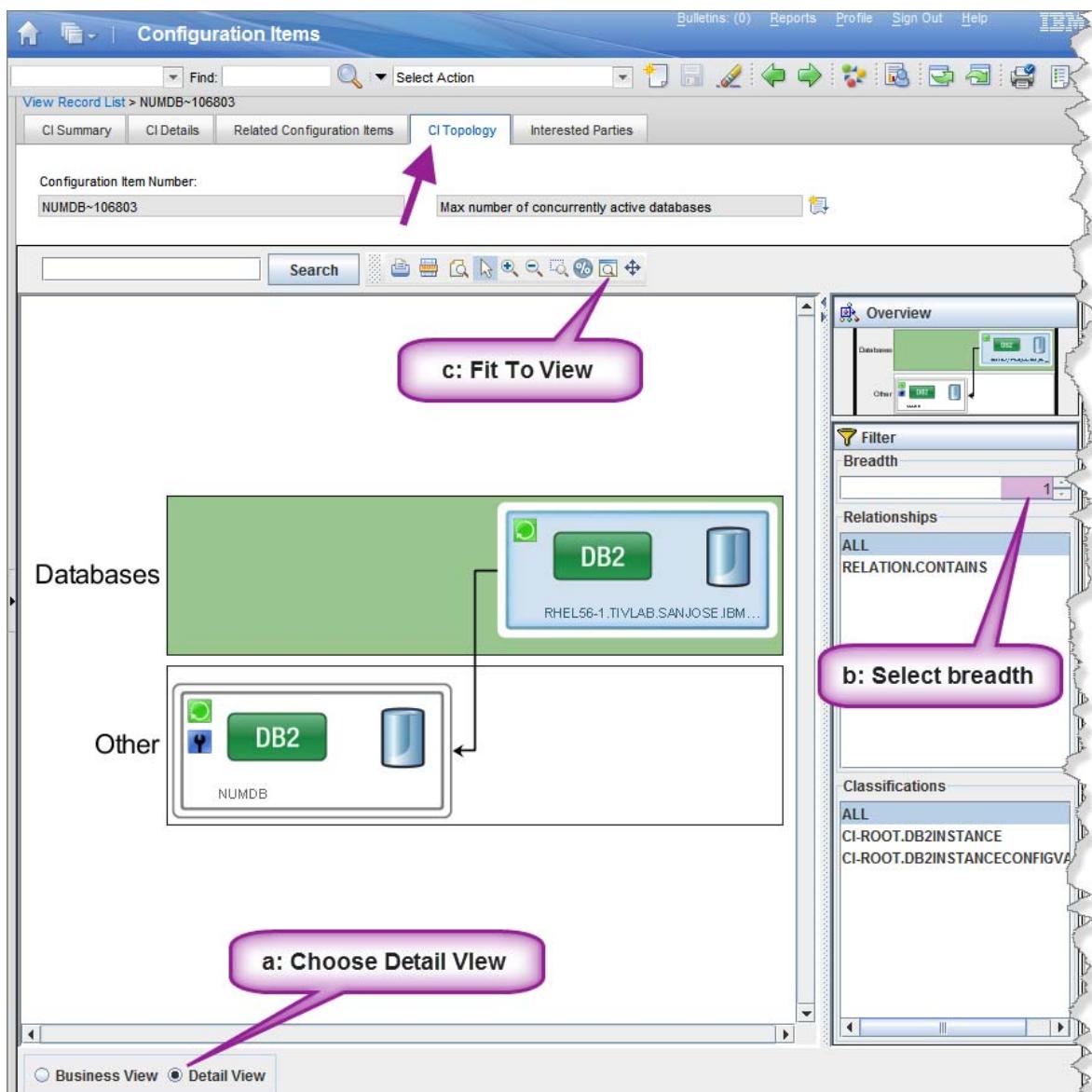
By default the Business View is launched. This view is designed to show only CIs for which their classification has been specifically associated with the Business View. The DB2INSTANCECONFIGVALUE classification is not one such classification, which is why the relationships to higher-level resources are ignored. To see the full topology for this type of resource, you must use the Details View.

4. To customize the view, so you see the context in which the CI exists, and use the view to find the database instance that is configured by the NUMDB configuration value, complete these steps:

- Select **Detail View** at the lower right of the topology pane.

Be patient. The rendering of the Detail View takes a while. You might notice that for a brief period a message is displayed in the header of the console. This message indicates that you have reached the limit of 200 nodes in the topology map. This limitation has been implemented for performance reasons, and might cause some resources to not be available in the map.

- To limit the scope of the topology, set the Breadth of the topology to a value of 1.
- Reset the zoom level by using the Fit To View tool (🔍).



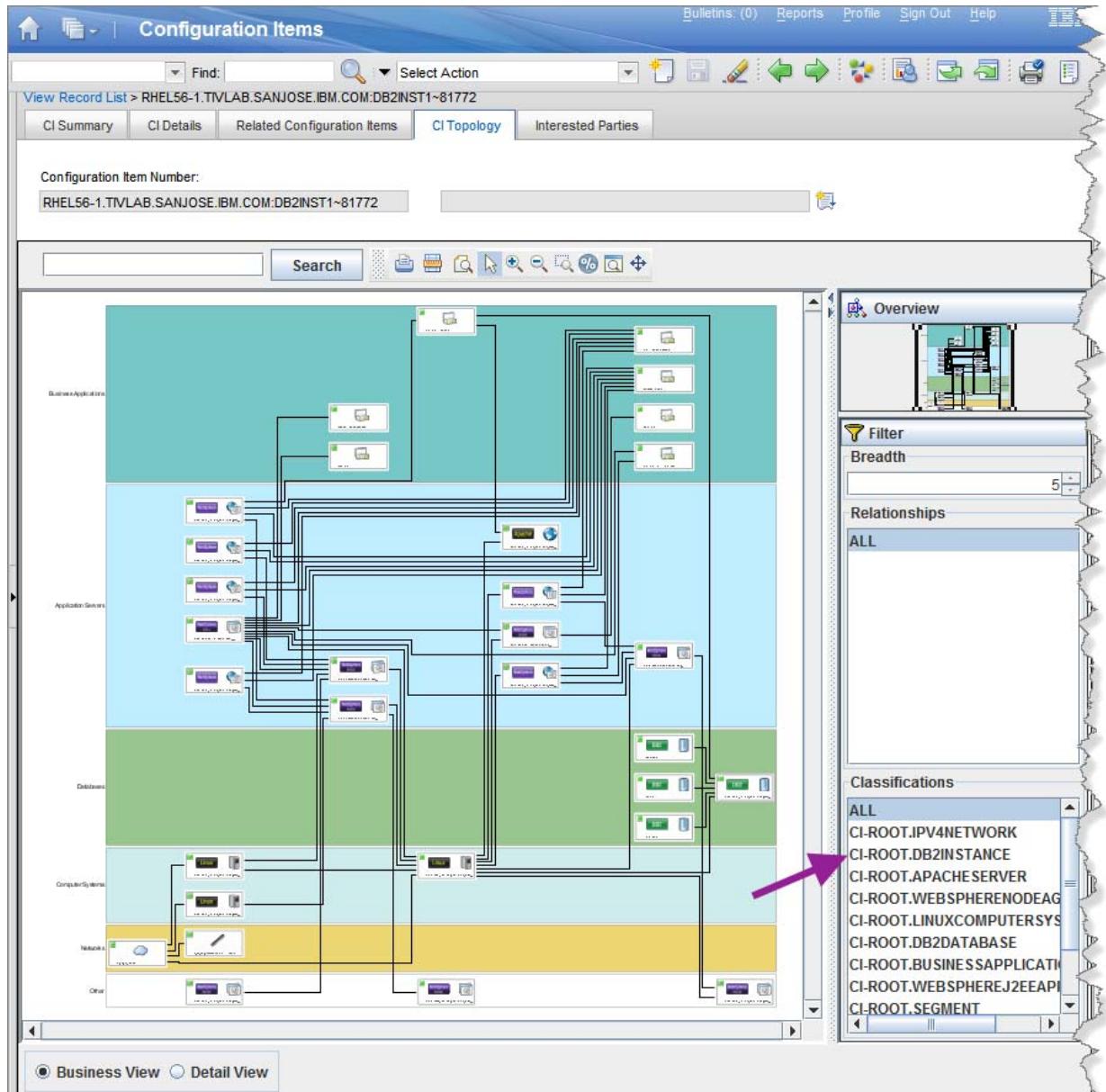
In the Relationships and Classifications sections to the right, you can see that the only relationship represented in the topology map is the RELATION.CONTAINS. You can use

these controls to limit the information that is shown in the map. Also, notice the **Search** field that you can use to find specific resources by name.

You might also want to see which resources depend on the DB2 instance.

- Right-click on the RHEL56-1.TIVLAB.SANJOSE.IBM.COM DB2INSTANCE node, and choose **Move to CI**.

Now, the Business View of the DB2 instance is shown, and you see how the topology map shows all the relationships, all the way to the NSJ DAYTRADER application.



Notice how the various types of resources are grouped into *swim lanes* to provide an easy identification of the resource types. In the swimlane named Databases, you see both the database instance and the databases it hosts. The upper swimlane named Applications represent the business services, business applications, and the J2EE applications.

You may also have noticed that the topology views are not limited to the immediate parents and siblings of the currently selected configuration item, but shows all resources that can be located by following the relationships a number of steps. The Breadth setting controls the number of steps.

6. Try selecting the resource type CI-ROOT.BUSINESSAPPLICATION from the Classifications menu to the right. Notice how only resources of the selected type are shown.
You are now ready to return to the impact preview.
7. Click **Return** from the console header to go back to the change.



By now you should have a little understanding of the application topology, which helps you define the impact analysis requirements for the application. In this tiny exercise environment, you can predict the impacts of the change by looking at the CI topologies. However, in a production environment it might not be equally simple. Using IBM SmartCloud Control Desk to calculate, analyze, and visualize the impacts helps improve the quality of your work and your productivity.

Initial impact preview

Now that you have got a general idea about the topology of the NSJ DayTrader application, the DB2 instance and the relationships between them, you might want to preview the impacts that IBM SmartCloud Control Desk can calculate.

To investigate and understand the impacts, perform the following steps:

1. Navigate to the Impacts tab of the Changes application.
2. Look at the Impacted by Change ... section. You hopefully see a list of impacted CIs. These impacts have been calculated behind your back by the workflow.

Configuration Item Number	Configuration Item Name	Business Impact	Outage	Task
NUMDB-106803	NUMDB	None		1274

Configuration Item	Configuration Item Name	Business Impact	Outage	Task
...No rows to display...				

If no impacts are reported, click **Calculate Impacts**. The system notifies you about the results of the calculation.

- Click **OK** to dismiss the message window that appears.



At this point, no impacts are calculated. You specifically set the outage for the implementation task target CI to *None*, and since the availability of the CI does not change while the change is implemented, nothing will be impacted.

- Focus on the bottom half of the Summary section. Here you see the Business View for the target CI, including indicators showing you, in the Impacted CIs group, that no CIs are impacted.

The screenshot shows the Business View interface for the target CI 'NUMDB~402009'. The 'Task Target CIs' panel shows the target CI. The 'Impacted CIs' panel is highlighted with a purple rounded rectangle. The main view shows the CI 'NUMDB' with a green operational marker, a wrench icon indicating pending changes, and a blue cylinder icon. The 'Overview' panel on the right shows the CI is part of 'Other' and associated with 'DB2'. The 'Filter' panel shows 'Breadth' set to 5. The 'Relationships' and 'Classifications' panels are also visible.

Because the CI classification `CI.DB2INSTANCECONFIGVALUE` has not been configured to be shown in the business view, all you see is the target CI of the implementation tasks. Notice, that the status of the CI is OPERATIONAL (the green marker) and is associated with one or more pending changes (the wrench icon).

You have just completed previewing the impact of the change.

Notice that the status of the change still is ASSESS, meaning that there are still one or more assessment tasks to be completed.

Reviewing assessment requirements

Even though there are no outages or impacts associated with the change, Lucy reasons that because the DB2 instance configuration will be changed, other systems using the same DB2 instance might be impacted anyway. Because of this, Lucy decides that the change should be thoroughly assessed.both from a business and a technical aspect.

Default assessment requirements to be performed for a change are defined in the response plan that was assigned to this change work order. Reviewing and verifying these requirements is the responsibility of the change owner.

To specify which assessments are needed for this change, the change owner (Lucy) completes the following steps:

1. Navigate to the Assessments tab, and see which assessments were added automatically through the assignment of the response plan. The information of interest is found in the Technical Assessments and Business Assessments sections at the bottom:

Technical Assessments						
Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
OS						PMCHGANA
Application						PMCHGANA
Server						PMCHGANA
Security						PMCHGANA
Storage						PMCHGANA
Capacity						PMCHGANA
Network						PMCHGANA

Business Assessments						
Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
SOX						PMCHGANA
Financial						PMCHGANA
Operational						PMCHGANA

These assessments represent the default Technical and Business assessments. For a change that is related to the configuration of a database instance configuration value that relates to capacity, you might not need all of them. Notice, how the assessment tasks by default are assigned to the PMCHGANA group, which represents the change analysts in the organization.

2. To remove the assessments you deem unnecessary, click the **Delete** icon (trash bin) to the far right of each row to delete the individual assessments.

For this change, remove the Application technical assessment as well as the Financial, and SOX business assessments.

Before you save your changes, your Assessment window should look similar to the following screen capture:

Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
OS						PMCHGANA
Application						PMCHGANA
Server						PMCHGANA
Security						PMCHGANA
Storage						PMCHGANA
Capacity						PMCHGANA
Network						PMCHGANA

Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
SOX						PMCHGANA
Financial						PMCHGANA
Operational						PMCHGANA

- Do not forget to save your changes when you are done.

Next, look at the approvals for the change.

Reviewing approval requirements

Similar to assessment requirements, the change owner also specifies approval requirements for the change.

In the Authorizations tab of the Changes application, you can specify which approvers are associated with the change and the approval level that is required to allow the change to be implemented. When the change reaches the Authorize status, the IBM SmartCloud Control Desk automatically sends approval requests to the specified approvers.

When you specify approvers, you naturally take into account the anticipated complexity and business impact of the change. The more complex the change is, and the greater impact it has to the business, the higher level of approval is typically required.

To review the required approvers for the current change, perform the following steps:

1. Navigate to the Authorization tab to see which approvers have been defined for the change.

Description	Approver	Approver Group	Approval level
CAB		PMCHGCAB	3
IT Management Board		PMCHGITM	2
Business Executive Board		PMCHGBUS	1

Notice that three levels of approvers have been defined. The lower the Approval level, the more significant the approval is.

For this exercise, use the default approval requirements, which specify approval from a minimum a single group member at the highest level, so there are no modifications necessary.

Note: By default, the workflows that control the approval process have been designed to seek only approval from the more significant approvers (the lowest level) assigned by the change owner. When the approval level is set, the workflow seeks approvals for only that specific level. However, you can easily change this behavior to request approvals from each approver at each level starting from the least significant level (the highest number).

When you are satisfied with the approval requirements, you have completed the preliminary assessment of the change, so you are ready to move it into its next phase.

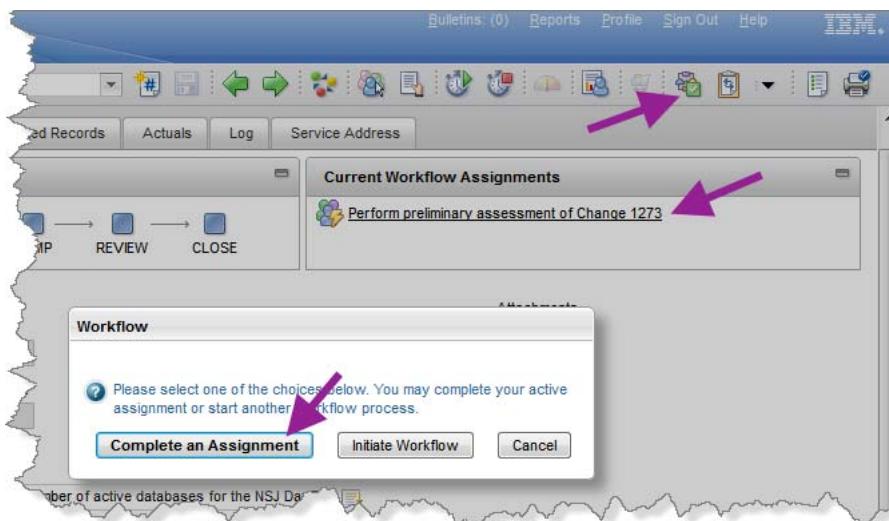
At this point, you have completed the following tasks:

- Reviewed, assessed, and verified the RFC information
- Created a change based on the RFC

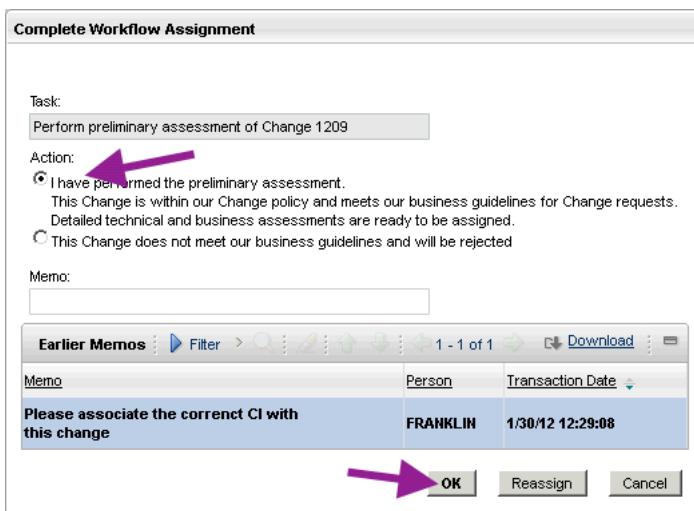
- Categorized and prioritized the change
- Assigned a Primary Target CI specifying what needs to be changed
- Reviewed modified assessments, approvals, and the schedule for the change

To complete your assignment, complete these steps:

2. From the Change tab of the current change, click the link in the Current Workflow Assignment section, or click the **Route Workflow** icon () in the toolbar to signal to the workflow that you have completed your assignment, and that the change processing can progress to the next step.

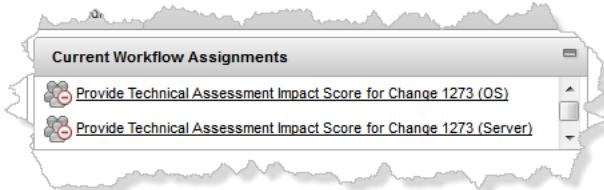


3. If you click the Route Workflow icon () , you are prompted if you want to complete your current assignment, or initiate a new workflow. Choose **Complete an Assignment**.
4. In the Complete Workflow Assignment window that opens, select the *I have completed ...* option to indicate that you indeed have performed the tasks that are related to the current assignment. Then, click **OK** to complete your assignment.



Exercise 14. Specifying the change work order

As the result of your action, the status of the change still remains ASSESS, but new assignments have been added. These assignments are for the change analysts who need to perform the assessments you specified.



These represent the assessments tasks you requested. From the icons that are attached (✉) you can see that the assignments are for other users than Lucy. If you click the assignments, you can see the details. They reveal that the assignments are for the members of the PMCHGANA group.

- Just to verify that you have no more assignments that are related to this Change, click the **Home** button (🏠) at the far left of the title bar, and verify that the Inbox/Assignments portlet is empty.



So, for now, Lucy has done her (significant) part, and have to wait for the analysts to complete their assignments.

- Before you can log in as an analyst, click the **SignOut** link at the upper right of the window to log out Lucy.



You have now completed the change specification phase.

At this point, you have provided all the information that is needed to take the change processing through its individual phases and complete the implementation in time. All that you need is the cooperation of your peers so they complete their assignment in a timely fashion.

Exercise 15. Providing change assessments

The technical assessments are intended to provide the technical risk analysis as well as recommendations to modifications to the change schedule in order to minimize outages and other unwanted effects that are related to the change implementation. Depending on policies and tradition, some organizations also use the technical assessment to validate back-out plans for the change.

Change owners are not expected to be subject matter experts on the various technologies and business aspects as they relate to the IT infrastructure. The technical assessment is supposed to be supplied by one or more change analysts, who are supposed to be subject matter experts in the area that relates to the targets CIs of the change.

In the exercise environment, only a single change analyst, Nancy, is defined, so she is the only person in the exercise environment who is authorized to perform the assessments. Notice, that all assessment tasks, both technical and business related, are available to Nancy. To provide the technical assessment for the change, complete these steps.

1. Log in to the IBM SmartCloud Control Desk Console as Nancy (password: object00) and look at the assignments.

The screenshot shows the IBM SmartCloud Control Desk Console interface. The top navigation bar includes 'Welcome, Nancy Incident Analyst', 'Change Approval, analysis and implementation', 'All Users', 'Incident Analyst', 'Operations Specialist', 'Bulletins: (0)', 'Reports', 'Profile', 'Sign Out', and 'Help'. On the left, there's a 'Quick Insert' panel with a 'New Change' button and a 'Favorite Applications' panel listing 'Activities and Tasks', 'Changes', 'Blackout Periods', 'Change Schedule', and 'Change Window Calendars'. The main content area is titled 'Inbox / Assignments' and shows a table of assignments. One assignment is highlighted with a red oval and an arrow: 'Provide Technical Assessment Impact Score for Change 1273 (OS)'. The table columns are 'Description', 'Due Date', 'Priority', 'Start Date', and 'Route'. All assignments listed have a due date of 7/23/12 15:51:27.

Description	Due Date	Priority	Start Date	Route
Provide Technical Assessment Impact Score for Change 1273 (OS)	7/23/12 15:51:27		7/23/12 15:51:27	
Provide Technical Assessment Impact Score for Change 1273 (Server)	7/23/12 15:51:27		7/23/12 15:51:27	
Provide Technical Assessment Impact Score for Change 1273 (Security)	7/23/12 15:51:27		7/23/12 15:51:27	
Provide Technical Assessment Impact Score for Change 1273 (Storage)	7/23/12 15:51:27		7/23/12 15:51:27	
Provide Technical Assessment Impact Score for Change 1273 (Capacity)	7/23/12 15:51:27		7/23/12 15:51:27	
Provide Technical Assessment Impact Score for Change 1273 (Network)	7/23/12 15:51:27		7/23/12 15:51:27	

Start the OS technical assessment by opening the *Provide Technical Assessment Impact Score for Change ... (OS)* assignment link.

If the Workflow Help window opens, dismiss it by clicking **OK**.

2. To provide the requested technical assessment, navigate to the Assessments tab.

Exercise 15. Providing change assessments

You see two sections in which assessments can be added; one for technical assessments and one for business assessments. Each section already contains entries for the assessment types identified by the change owner as required for the change.

The screenshot shows the 'Analysis Summary' section at the top with fields for Maximum Assessed Impact, Estimated Total Work Effort, and Estimated Total Cost. Below it are two tables: 'Technical Assessments' and 'Business Assessments'. The 'Technical Assessments' table has columns for Assessment Type (OS, Server, Security, Storage, Capacity, Network), Impact, Results, Implementation Notes, Owner, and Owner Group (all listed as PMCHGANA). The 'Business Assessments' table has columns for Assessment Type (Operational), Impact, Results, Cost, Effort, Owner, and Owner Group (PMCHGANA). Both tables include a 'New Row' button at the bottom right.

Assessment Type	Impact	Results	Implementation Notes	Owner	Owner Group
OS					PMCHGANA
Server					PMCHGANA
Security					PMCHGANA
Storage					PMCHGANA
Capacity					PMCHGANA
Network					PMCHGANA

Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
Operational						PMCHGANA

Notice that you see only the assessment types that have been identified by the change owner during the preparation of the change.

Each assessment record type can be associated with a number of attributes such as Results, Impact (risk), Cost, Effort (estimated duration), and Implementation Notes. The Implementation Notes serves as the vehicle to communicate suggestions to introduce additional implementation tasks to the change schedule, since the analyst should not manipulate the schedule directly.

3. The first thing the change analyst does is to review the assessment requirements, and realizing that the change is a simple update to a DB2 instance configuration, the change analyst decides to delete the following technical assessments:
 - Security
 - Storage
 - Capacity
 - Network

To delete these assessments, click the Delete icon (trash bin) to the far right on each line representing an assignment to be deleted.

Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
OS						PMCHGANA
Server						PMCHGANA
Security						PMCHGANA
Storage						PMCHGANA
Capacity						PMCHGANA
Network						PMCHGANA

- Click the Save icon (floppy disk) when you have marked all four assessment categories for deletion.
- To provide the technical assessment for the two remaining assessment categories, click the View Details icon (eye) to the left of each assessment, and supply information similar to what you see in the following table. For the successful progression of these exercises, at a minimum, you should provide the Server assessment.

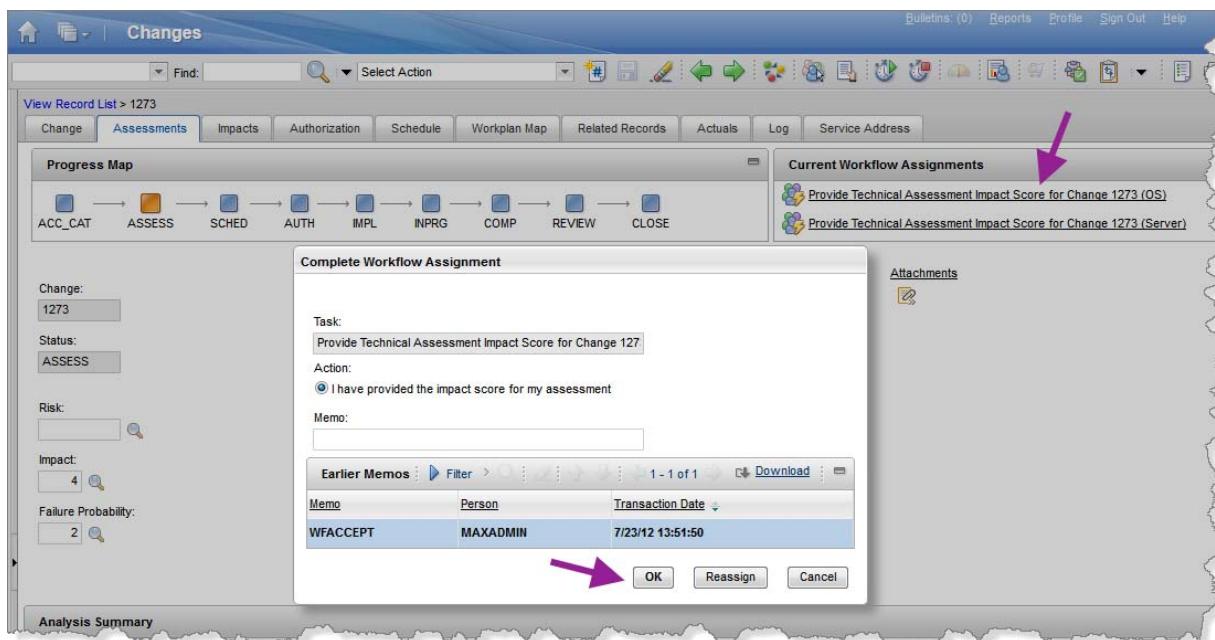
Assessment Type	Results	Implementation Notes	Cost	Effort	Impact
OS	Memory, swapping, and cpu capacity seems OK				4 (Low)
Server	The DB2 Instance needs to be restarted to activate configuration changes	Restart the DB2 instance		0:30	3 (Medium)

When you are done, the Technical Assessment section looks similar to the following:

Assessment Type	Impact	Results	Implementation Notes	Owner	Owner Group
OS		4	Memory, swapping, and cpu capacity set		PMCHGANA
Server		3	The DB2 Instance needs to be restarted	Restart the DB2 instance	PMCHGANA

Click the **Save** icon (floppy disk) when you are ready.

- The technical OS assessment has been completed. To signal that you are done, click the relevant assignment link in the Current Workflow Assignments portlet.



When prompted, choose *I have completed my assessment*, and click OK.

- In a similar fashion, complete the remaining technical assessment assignments, Server, Security, Storage, Capacity, and Network.

When you complete the last technical assessment assignment, notice how the Current Workflow Assignments portlet is refreshed, and you see a business assessment assignment. The workflow governing the process has discovered that the technical assignments have been completed, and automatically starts the business assessment process. Since Nancy is the only member of the group to which the responsibility for the business assessment is assigned, you can immediately start working on this new assignment.

- Navigate back to the start center by clicking the Home button (at the far left of the title bar).

You have completed the technical assessment. Now it is time to perform the business assessment.

Performing business assessments

In the start center, you also see the new assignment for Nancy: Provide Business Assessment Impact Score for Change ... (Operational).

Normally technical personnel do not perform business assessments, but in this case, where Nancy is the only member of the change analysts group she is the correct business assessor.

The business assessment process is similar to the technical assessment, so for this exercise, you immediately mark the assignment as completed. You can do this directly from the start center by

clicking the Route icon (✉) at the far right of the assignment. However, if you do so, you are not offered the possibility to provide details.

Perform these steps to complete the business assessment assignment.

1. Open the assignment link in the Inbox.
2. In the Changes application, navigate to the Assessments tab, and set the following values for the attributes of the *Operational* Business Assessment:

Impact	3 (Medium)
Results	If scheduled for daytime, we may lose a few orders
Cost	10.000

When you are done, the Business Assessment section looks similar to what you see in the following screen capture:

The screenshot shows a table titled "Assessments for the Change." It has columns for "Assessment Type" (with a dropdown menu showing "Operational"), "Impact" (set to 3), "Results" (containing the text "If scheduled for daytime, we may lose a few orders"), "Cost" (set to 10,000.00), "Effort" (empty), and "Owner" (empty). The table has a header row with column names and a data row containing the assessment details.

3. Click the **Save** icon (💾) to save the assessment.
4. To mark the assignment completed, click the Route Workflow icon (✉) in the toolbar, and confirm your action by selecting **Complete an Assignment** when the Workflow window opens.

When you see the Complete Workflow Assignment window, choose **I have completed my assessment**, and click **OK**.

Notice what has happened in the Current Workflow Assignments portlet.

5. Log out from IBM SmartCloud Control Desk so that you can log in again as another user.

You have completed all the required assessments, and it is time for the change owner to resume work on the change.

Exercise 16. Creating implementation tasks

You might have noticed that the change analyst added information in the *Implementation Note* and *Effort* attributes of the Server technical assessment category. These fields are used to notify the change owner that in the opinion of the analyst, additional implementation tasks should be added to the plan. In this example, the change analyst has recommended that the DB2 instance is restarted after updating the configuration value to activate the new configuration.

Because of this, triggered by the content in the Implementation Note field, IBM SmartCloud Control Desk has created an assignment for the change owner to add this extra implementation task to the change schedule. This is the next assignment for the change owner, which you start working on now.

To perform this assignment, complete the following steps.

1. If you have not done so already, open your browser, and log in to the IBM SmartCloud Control Desk Console at <http://localhost/maximo> as the change owner **Lucy** using a password of **object00**.
2. From the change owner start center, open the *Create Implementation tasks for Change ... and assign targets* assignment from the Inbox/Assignments portlet in order to open the change. Then, navigate to the **Assessments** tab.

Review the assessments and provide an assessment summary: Change should be scheduled for off-line time.

Change: 1273 **Owner:** LUCY

Status: ASSESS **Owner Group:**

Risk: [empty] **Summary:** Increase the number of active databases for the NSJ DayTra [edit]

Impact: 4 **Details:** To support the addition of a database to the NSJ DayTrader application, we need the NUMDB db2 instance configuration parameter increased by 1.

Failure Probability: 2

Analysis Summary

- Maximum Assessed Impact: 3
- Estimated Total Work Effort: 0:30
- Estimated Total Cost: 10,000.00

Assessment Summary: Change should be scheduled for off-line time

3. Review the Implementation Notes, and identify potential new implementation tasks.

In the current example, take the technical Server assessment into account and create a new implementation task that is based on the associated implementation note.

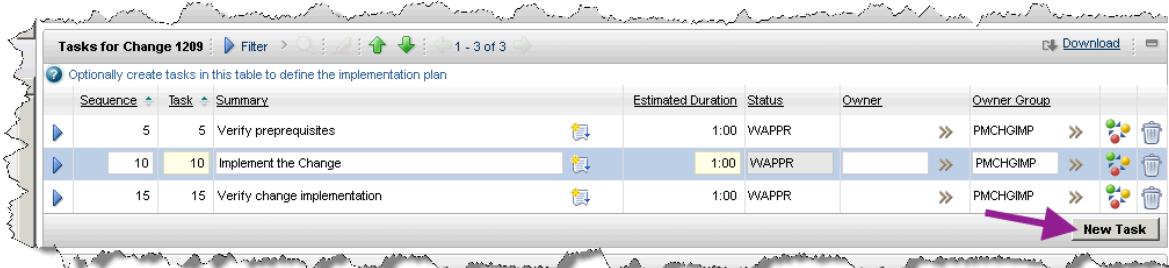
Make a note of the Implementation Note content and the Effort associated with the Server assessment.

Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
OS	4	Memory swapping and cpu capacity seems Ok				PMCHGA
Server	3	The DB2 Instance needs to be restarted to ac		0:30		PMCHGA

Assessment Type	Impact	Results	Cost	Effort	Owner	Owner Group
Operational	3	If scheduled for daytime, we may loose a fe	10,000.00			PMCHGA

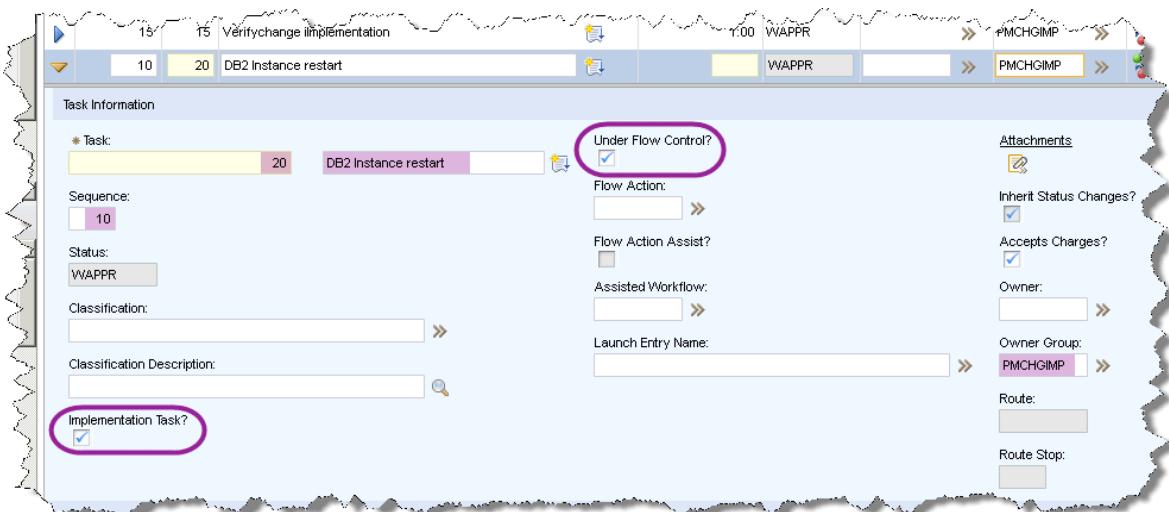
4. To create the new implementation task, open the **Schedule** tab and complete these steps:

- a. Click **New Task** in the Tasks for change ... section of the window.



- b. In the Task Information section for the new task, provide the following information:

Task	20
Sequence	10
Name	DB2 instance restart
Implementation Task	checked
Under Flow Control	checked
Owner	<blank>
Owner Group	PMCHGIMP



Notice that using the same sequence number (10) as the one associated with the *Implement the change* task, in combination with a task number of 20 forces the implementation of the new task to occur after the *Implement change* task and before the *Verify Implementation* task.

- c. In the Work Reference Information subsection, change the value of the **Configuration Item** field to the ID of the DB2INSTANCE CI named RHEL56-1.TIVLAB.SANJOSE.IBM.COM:db2inst1. (In the current example, the ID is *RHEL56-1.TIVLAB.SANJOSE.IBM.COM:db2inst1~81772*). If you do not remember the configuration item ID by heart, you can use options from the **Detail Menu** tool (») next to the **Configuration Item** field to find the correct CI.

- d. Also, make sure that you set the value of the Outage field to Offline.

The screenshot shows the 'Work Reference Information' section of a form. It includes fields for 'Reference WO' (1277), 'Configuration Item' (RHEL56-1.TIVLAB.SANJOSE.IBM.COM), 'Configuration Item Name' (RHEL56-1.TIVLAB.SANJOSE.IBM.COM:DB2INST1), 'CI Business Impact' (a dropdown menu), and 'Outage' (Offline). The 'Outage' field has a search icon next to it.

- e. The only two fields you have to be concerned about in the Scheduling Information subsection is the **Estimated Duration** and **Predecessor**.

For the Estimated Duration field, enter a value of 30 minutes (0 : 30), and set the predecessor to 10 (the task named Implement the change). Remember you can use the Detail Menu tool (») next to the Predecessors field to select the value for the field.

The screenshot shows the 'Scheduling Information' section of a form. It includes fields for Target Start, Target Finish, Scheduled Start, Scheduled Finish, Start No Earlier Than, Finish No Later Than, Actual Start, Actual Finish, *Estimated Duration (0:30), Time Remaining, and Predecessors (10). The 'Predecessors' field is circled in purple.

- f. Before you save the change, make sure that you update task #15, adding the new task (#20) as a predecessor for task #15. When you are done, both task #10 and task #20 should be predecessors for task #15.
- g. Click the **Save** icon (floppy disk) to store the new task with the change.

Your tasks for the change at this point contain four tasks:

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
5	5	Verify prerequisites	1:00	WAPPR		PMCHGIMP
10	10	Implement the Change	0:45	WAPPR		PMCHGIMP
15	15	Verify change implementation	1:00	WAPPR		PMCHGIMP
20	20	DB2 instance restart	0:30	WAPPR		PMCHGIMP

Do not worry by the sequence in which the tasks are displayed. Even though task #20 appears before task#10 in the list, it is executed after task #10.

This completes the creation of additional implementation tasks.

Exercise 17. Analyzing the impact of the change

Normally, you use the facilities in the Impacts tab of the Changes application to work with change impacts. However, at this point there is no need for you to navigate to the Impacts tab to see how the new task influences the infrastructure. When you close your current assignment, the PMCHGMAIN1 workflow automatically performs impact analysis for the new implementation tasks and alerts you about the results.

So, to complete the assignment, follow these steps:

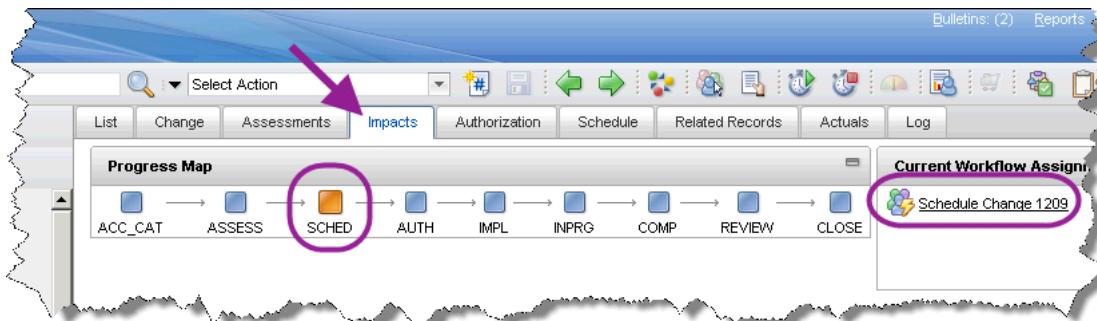
1. Click the **Create implementation tasks for Change ... and assign targets** assignment in the Current Workflow Assignments portlet.
2. When prompted, select **All implementation tasks are created**, and click **OK**.

After a short while, you see the result of the impact calculation for the new task. You see that 41 new impacts are identified because you added an extra implementation task that introduced outages in your environment.



Click **OK** to continue.

3. You also receive messages about the recalculation of the impact and risk for the change. Click **OK** to dismiss them.
4. When the calculation is done, notice that the status of the change has now been set to **SCHEDULE**. Now you can navigate to the Impacts tab to see the results of the calculation.



Exercise 17. Analyzing the impact of the change

5. In the Targeted by Change ... section of the Summary sub tab on the Impacts tab you see the target CIs for each task, along with the outage and business impact.

Configuration Item Number	Configuration Item Name	Business Impact	Outage	Task
NUMDB~106803	NUMDB	None	1274	
RHEL56-1.TIVLAB.SANJOSE.IBM.COM:DB2INST1~81772	RHEL56-1.TIVLAB.SANJOSE.IBM.COM:DB2INST1	Offline	1277	

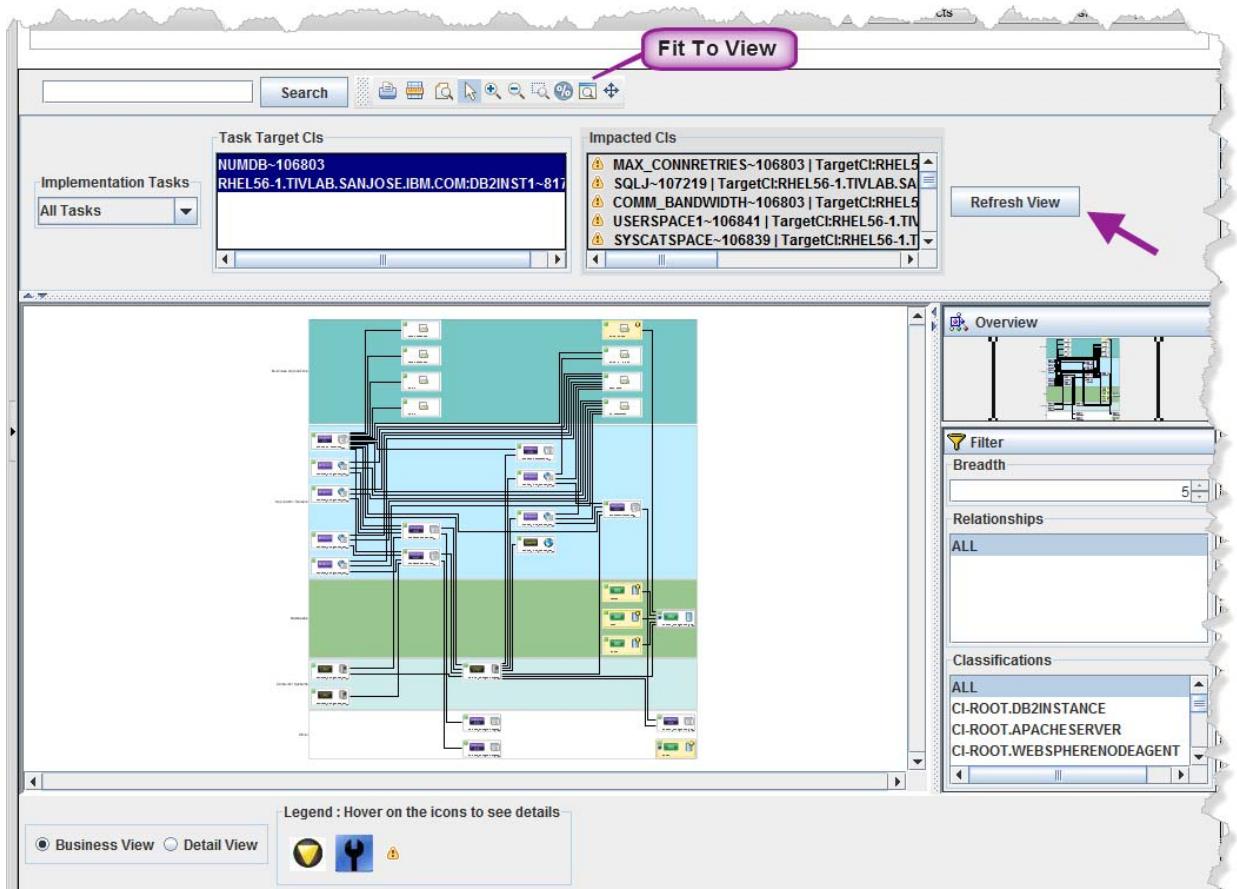
Right underneath this section, you can see all the calculated impacts. These were all calculated based on the relationships that are recorded in the IBM SmartCloud Control Desk database.

Configuration Item	Configuration Item Name	Business Impact	Outage	Task
/HOME/DB2INST1/DB2INST1/NODE0000/TRADE/T0000003/C0000000.LRG-402112	/HOME/DB2INST1/DB2INST1/NODE0000/TRADE/T0000003/C0000000.LRG		Offline	1277
SYSTOOLSPACE~171238	SYSTOOLSPACE		Offline	1277
/HOME/DB2INST1/DB2INST1/NODE0000/TRADE/T0000000/C0000000.CAT-402109	/HOME/DB2INST1/DB2INST1/NODE0000/TRADE/T0000000/C0000000.CAT		Offline	1277
SYSCATSPACE~171235	SYSCATSPACE		Offline	1277
/HOME/DB2INST1/DB2INST1/NODE0000/TRADE/T0000002/C0000000.LRG-402111	/HOME/DB2INST1/DB2INST1/NODE0000/TRADE/T0000002/C0000000.LRG		Offline	1277

Notice how all the calculated impacts are related to the same task, and that the outage is Offline.

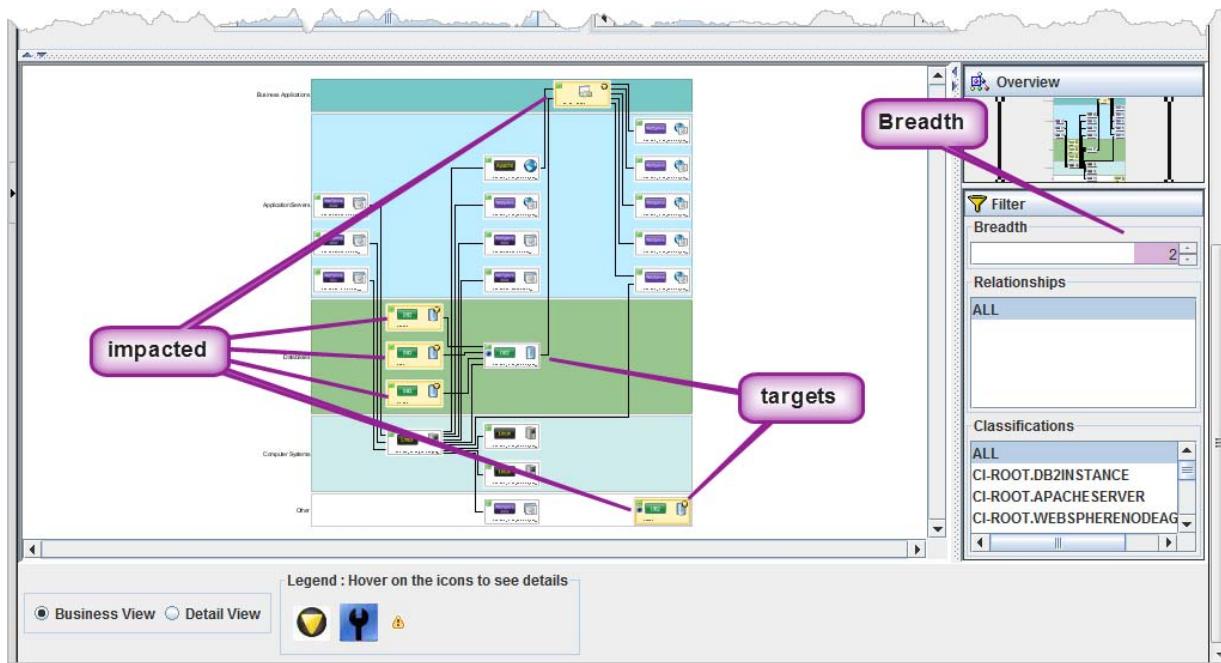
Scroll to the bottom of the page to see how the impacts are represented in the topology maps. The impact analysis shows you exactly which CIs are impacted by the change. This time, you see the related resources in the Business View because the change includes implementation tasks that operate on targets for which the classification is enabled to be shown in the Business View. In addition, the ones that are impacted by the change, are tagged with the Impacted CI icon (⚠️). Also, the CIs that are targets of any implementation task are shown, and marked by with the Scheduled Tasks icon (🕒).

To see the entire map, click the Fit To View tool (Fit To View) in the header section of the topology view.



Notice how you can select each task and/or each target CI at the top of the topology view. This allows you to see exactly which impacts are related to which task. Try viewing different combinations of tasks and target CIs, and remember to click **Refresh View** to rebuild the topology, and the Fit To View tool (Fit To View) to center the view.

6. To limit the resources you see, set the breadth of the view to 2.

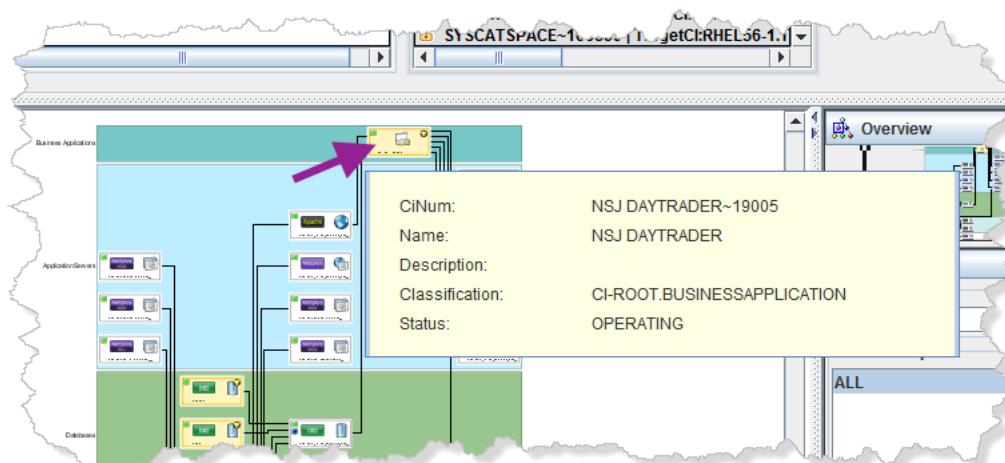


The resource at the bottom left represents the NUMDB

DB2INSTANCECONFIGURATIONVALUE CI. Notice, that because it is the target of an implementation task, it is included in the topology. However, because it is not enabled for showing in the Business View, you do not see the relationship to the DB2INSTANCE.

The impacted CIs are shaded in yellow, and target CIs are tagged with the Scheduled Tasks icon (⌚). The NUMDB DB2INSTANCECONFIGURATIONVALUE CI is both a target of a task, and impacted by the outage to the DB2INSTANCE CI because the DB2INSTANCECONFIGVALUE is a MEMBEROF the DB2INSTANCE.

7. Try hovering the mouse over the only shaded resource in the top swimlane. This swimlane represents business applications, and when hovering the mouse over a resource, you briefly see the CI details.



Notice that the only business application that is impacted is NSJ DayTrader.

8. Familiarize yourself with the impact analysis topology. When you are ready, click the Home button () at the far left of the title bar to go back to Lucy's start center.

You have analyzed the new impacts that were calculated as a result of your addition of an additional task. You should now be ready to schedule the change in order to provide a realistic time frame for the approvers.

Exercise 18. Scheduling the change

When the assessment is done, you can schedule the change in order to figure out when you can possibly implement the change to meet the requirements of the requestor while observing the availability policies set out in the Change Window Calendars defined for your configuration items and general BlackOut Periods.

In IBM SmartCloud Control Desk you can associate CIs with Change Window Calendars that define the time slots in which the CI is allowed not to be operational. When changes are scheduled, the Change Window Calendars for all impacted CIs are taken into account, so for that reason you usually only create and maintain Change Window Calendars for the highest level resources such as business applications and business services.

In addition to Change Window Calendars, IBM SmartCloud Control Desk can take general blackout periods into account when scheduling changes. Blackout periods are time slots in which the configuration of the entire IT infrastructure is protected. You can use two types of blackout periods:

LOCKDOWN	Indicates that no change should be scheduled during the specified time period.
RESTRICTED	Indicates that scheduled changes are restricted during this period, and that caution should be applied in scheduling a change.

If you attempt to schedule a changes during a RESTRICTED blackout period you must obtain proper approval. No changes can be scheduled for implementation in LOCKDOWN blackout periods.

The highlights of the schedule phase are described in the following list:

- During the scheduling phase, you can run the automated scheduler to schedule all of the implementation tasks in the change. If a valid scheduling solution is not found for all of the tasks, you can search for scheduling solutions for individual tasks.
- A change owner typically schedules implementation tasks, but you can assign any user to this phase.
- The scheduler takes blackout periods, change windows, and other criteria into account when it looks for a scheduling solution. Therefore, before you accept the assignment to schedule the implementation tasks, check the following conditions:

- Blackout periods and associated CIs are defined.
- Change Windows are defined, along with CIs that can be taken out of service during the change windows.
- You have identified target and impacted CIs for each of the implementation tasks that are to be scheduled.
- You have identified any predecessor tasks for each implementation task that is to be scheduled. If a job plan was applied to the change, this information is attached to the tasks that are in the job plan; if you have created tasks in addition to those in the job plan, ensure that predecessor tasks are specified. Some tasks do not have predecessor tasks.
- Each task to be scheduled has an estimated duration. If a job plan was applied to the change, this information is attached to the tasks that are in the job plan; if you have created tasks in addition to those in the job plan, ensure that you set estimated durations. If you do not set a task duration, the scheduler assumes that the duration of the task is one minute. If you are not sure how long a task takes to complete, specify your best guess.
- (Optional) An owner is assigned to each task to be scheduled, and owner work shifts are defined.

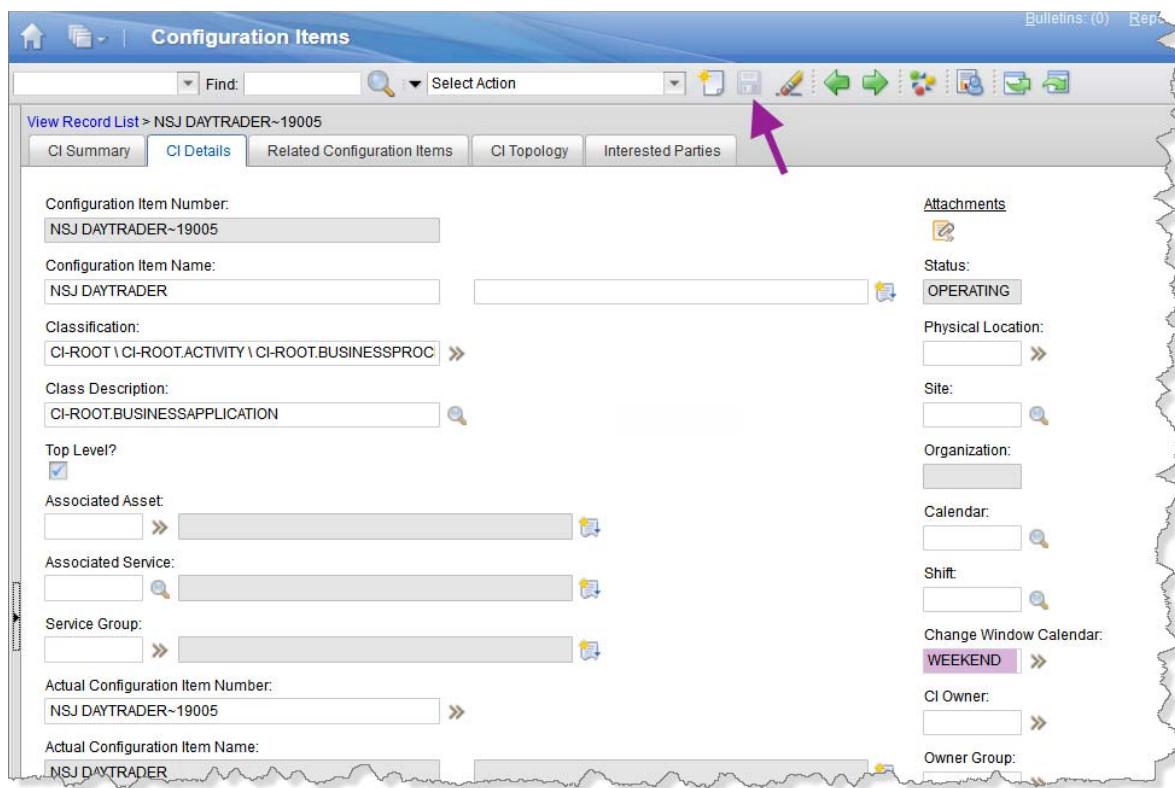
Assigning Change Window Calendars

Before you start the scheduling process, you must assign Change Window Calendars to a couple of CIs in the exercise environment. The following two Change Window Calendars have been prepared and must be associated with selected CIs.

DATABASE	The restrictions enforced by this change window allow you to schedule implementation tasks on the associated CIs only every other day at 2:00 a.m. The duration of the tasks cannot exceed two hours and 45 minutes (2:45).
WEEKEND	Allows you to execute implementation tasks on the associated CIs only during the weekend; from midnight Saturday morning to midnight Sunday evening.

In the exercise environment, you associate the NSJ DAYTRADER business application CI with the WEEKEND Change Window Calendar, and the DB2INST1 DB2 instance CI hosted on the RHEL56-1 system with the DATABASE calendar, by completing these steps:

1. Click the **Go To** icon (☰) and navigate to **IT Infrastructure > Configuration Items**.
2. To associate the business application with the WEEKEND Change Window Calendar, perform these actions:
 - a. Use the filtering facilities to locate the CI named NSJ DAYTRADER with a classification of CI-ROOT.BUSINESSAPPLICATION, and open it.
 - b. Navigate to the CI Details tab, and use the Detail Menu tool (») next to the Change Window Calendar field to select the value of WEEKEND.



- c. Click the **Save** icon (💾) to store your updates.
3. Complete these steps to associate the TRADEDB DB2DATABASE instance hosted on the RHEL56-1.TIVLAB.SANJOSE.IBM.COM:DB2INST1 DB2 instance with the DATABASE calendar:
 - a. Use the filtering facilities to locate the CI named TRADEDB with a classification of CI-ROOT.DB2DATABASE and open it.
 - b. Navigate to the CI Details tab, and use the Detail Menu tool (») next to the Change Window Calendar field to select the value of DATABASE.
 - c. Click the **Save** icon (💾)

When you interpret the results of your scheduling in a short while, keep the Change Window Calendar definitions and associations in mind, and combine them with your knowledge about impact relationships and outages in the exercise environment.

Scheduling the implementation tasks

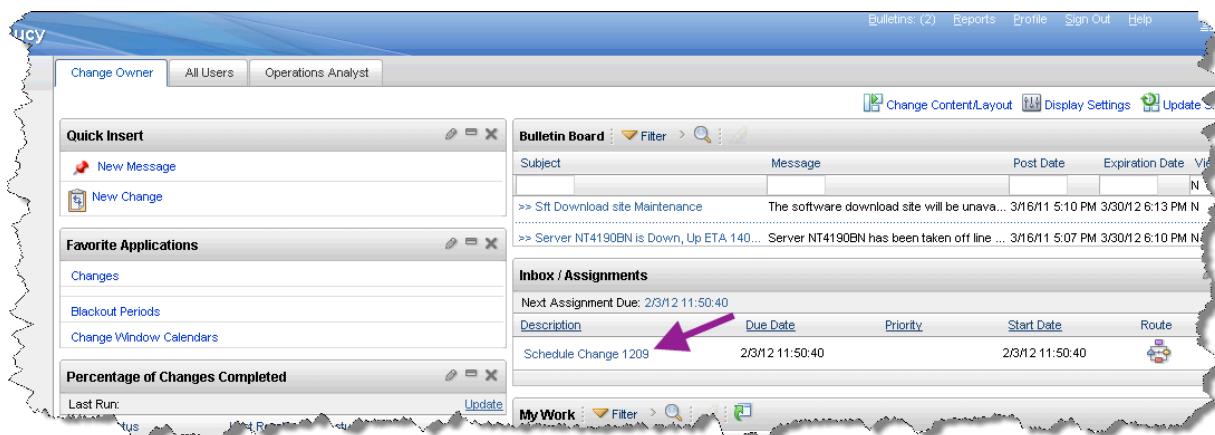
Scheduling of changes is focused around the implementation tasks. During the execution of implementation tasks the target and impacted CIs may be subject to outages, so in many situations it is critical to schedule the execution of implementation tasks during periods where the service disruption has a minimal impact to the business. Scheduled start and end for the change, task dependencies, Change Window Calendars for the target and impacted CIs, Blackout Periods, other planned changes, and implementation resource schedules are the most important constraints that must be taken into account when a change is scheduled.

In the Schedule Dates section of the Schedule tab in the Changes application, you can specify scheduled start and end dates for the entire change. These dates are optional. If you do not specify any values, the system will start the change processing when the change has been authorized.

You also find schedule dates for each of the tasks in the change. If you use these fields you can manually apply scheduling constraints, such as *Start time*, *End time*, or *Finish no later than*. These constraints are normally applied only to select, key tasks such as the implementation tasks. When you have applied your constraints, you can use the Update Conflicts function to identify violations against other constraints such as Change Window Calendars, Blackout periods, or other active changes. However, this manual way of scheduling is complemented by a more advanced, graphical Scheduler, which visualizes the schedule and constraints in a Gantt Chart. In addition, the Scheduler can also take implementation resource constraints into consideration, so the preferred way to schedule changes is by using the Scheduler.

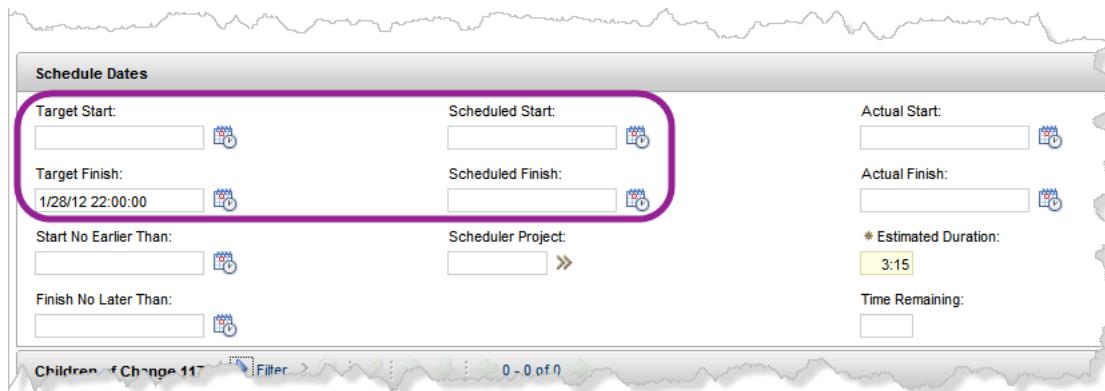
To schedule the change that you are working on, complete the following steps:

1. Navigate to Lucy's Change Owner start center, and open the Schedule Change assignment in the Inbox/Assignments portlet.



As usual, the Changes application is launched.

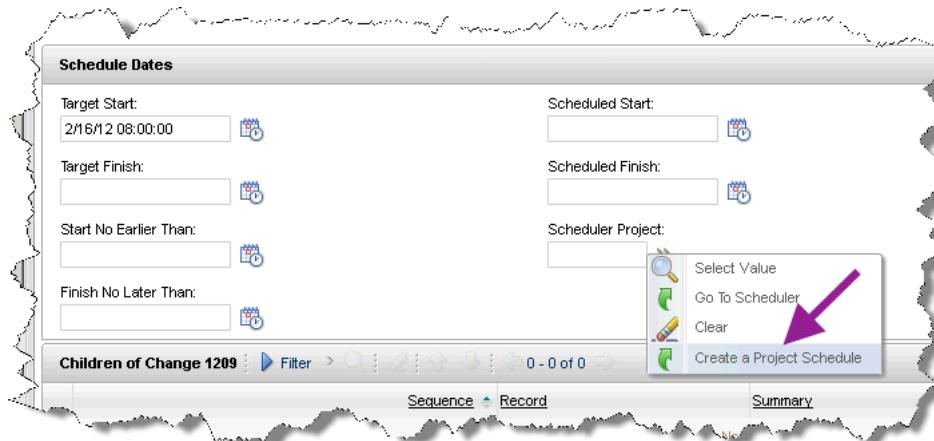
2. Navigate to the **Schedule** tab, and focus on the Schedule Dates section immediately below the base information for the change.



The Target dates represent your wishes for the start and completion dates of the change without consideration to any constraints that may effect the schedule. The Scheduled dates can be either applied manually to set specific start and completion dates for the entire change. In the scheduling process Scheduled dates take preference over Target dates. If neither Scheduled nor Target Start dates are supplied for the change, the PMCHGMAIN1 workflow sets the status of the change to In Progress immediately after all necessary approvals have been obtained.

To schedule the change, you have to create a Scheduler Project, link this to the change, and perform the scheduling, as outlined in the following steps: When the scheduler project is created, the task duration and dependencies are linked into the scheduler project, and any task level scheduling information is applied to each task. The change scheduling information is, somewhat unexpectedly, copied to the first task in the job plan. However, this behavior does not really make a difference, because you will use the scheduler functions to optimize the scheduling of the change.

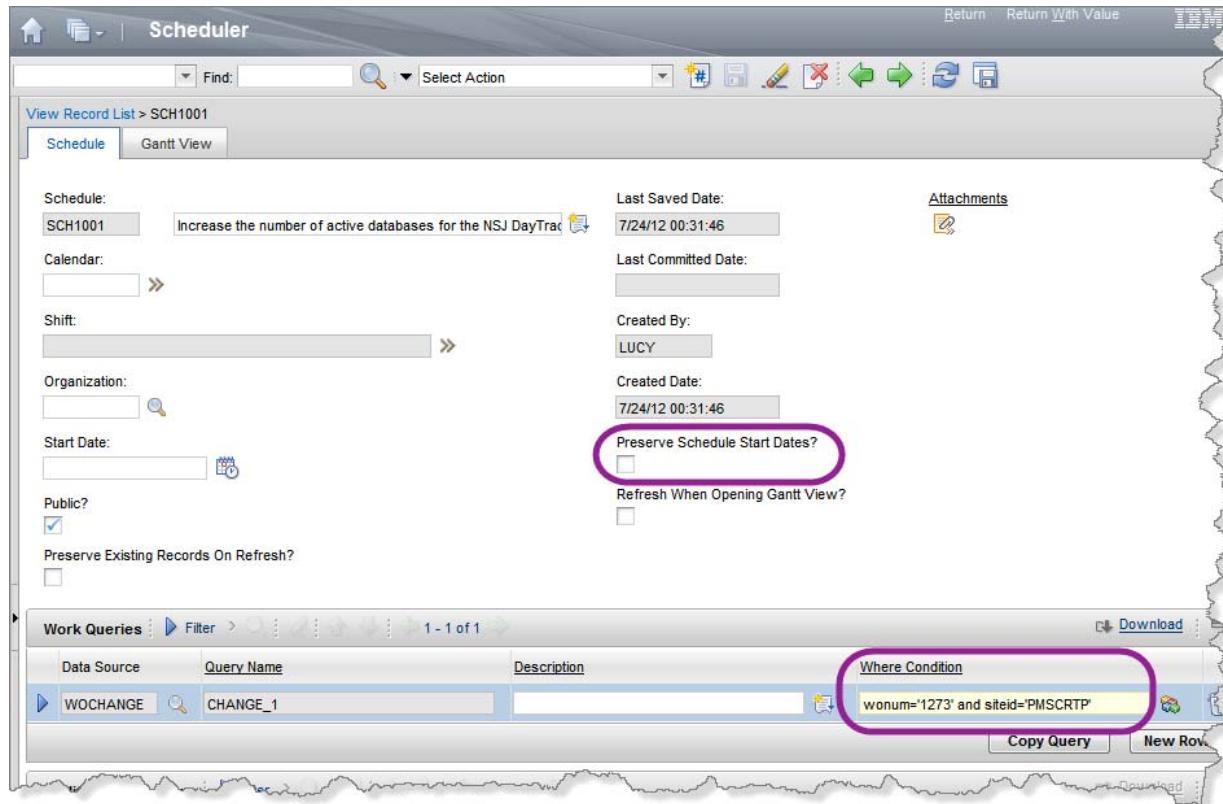
3. To create and link the scheduler project in a single operation, ensure that the Include Tasks in Schedule option is selected. Use the Detail Menu tool (next to the Scheduler Project field for the change, and select **Create a Project Schedule**.



Exercise 18. Scheduling the change

A new scheduler project is created, and automatically includes the query that identifies the tasks that are part of the current change work order. In addition, the Scheduler application is launched in context of the newly created project.

In the Scheduler application, notice in the Work Queries section how the query has been created to select Change Work Orders (WOCHANGE) that are related to the work order number of the current change, and the current site.

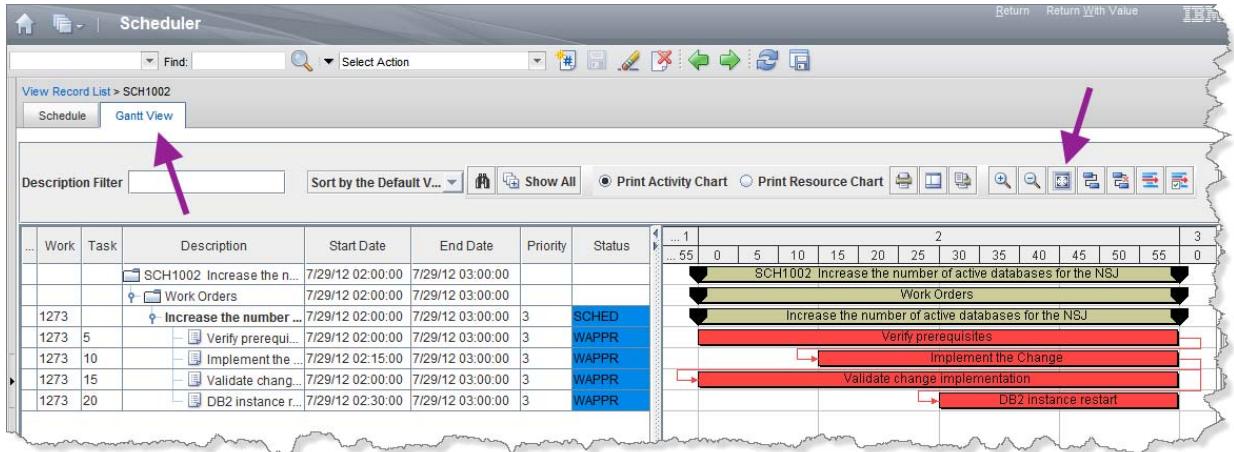


- To allow the scheduler to reschedule the start date of your change, make sure that you clear the option for Preserve Schedule Start Dates. If you fail to do so, the first task in the job is automatically rescheduled when a schedule has been confirmed.

You can also take a look at the Refresh When Opening Gantt View option. When it is selected, the schedule is automatically rescheduled when you navigate to the Gantt View.

- Click the **Save** icon () to save your modifications.

- To see the actual schedule, navigate to the Gantt View tab. You might have to resize the panes of the Scheduler pane to see all the data. As a start, click the Zoom To Fit icon (in the menu bar to render the Gantt chart readable.



In the Gantt View, you see that no scheduling has been attempted since all the tasks are overlapping, even though you meticulously defined predecessors for your tasks.

The Gantt View has four panes.

- In the upper right you see the job plan.
- To the right of the job plan pane you see the Gantt Chart that visualizes the schedule relative to time. Notice that the task dependencies are visualized by the tiny lines connecting the tasks.

If you select a task, a link is provided so you can easily navigate to the specification of the task.

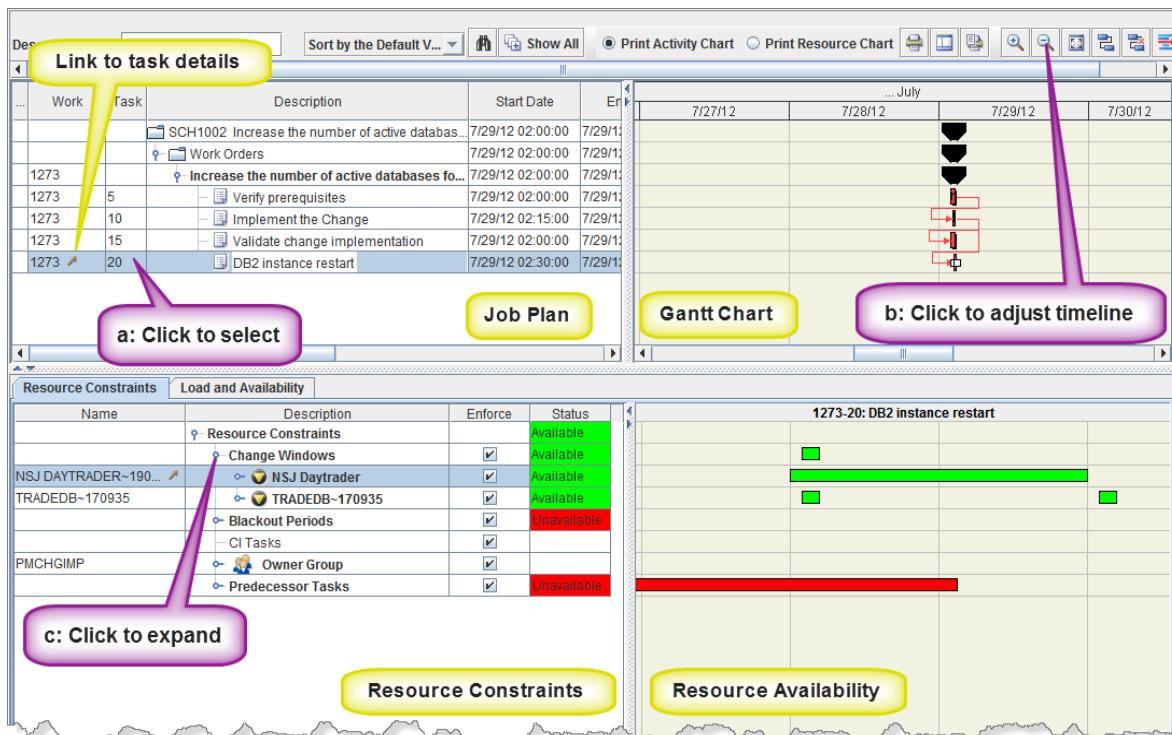
- At the lower left, you find the controls that govern the scheduling. Here you can see the Resource Constraints (Change Windows, Blackout Periods, CI availability, Resource availability, predecessor tasks) that apply to the task you have selected from the job plan.
- At the bottom right, you see the status of the constraints for the selected time interval. If a constraint is not satisfied, the status is highlighted in red.

To visualize most of the extensive information you can see in the scheduler, complete these steps:

- Selecting the task named **1273-20**, and notice how a link icon appears. Also, notice how the information in the Resource Constraints pane changes.
- Click the Zoom Out icon in the header () until the see timeline headings in the Gantt Chart shows the name of the months. Notice how you start seeing details in the Resource Availability pane immediately beneath the Gantt Chart.
- In the Resource Constraints pane, click the Expand icon () in front of the Change Windows branch. You see the two resources for which you assigned change windows, and their availability is shown in the Resource Availability pane.

Exercise 18. Scheduling the change

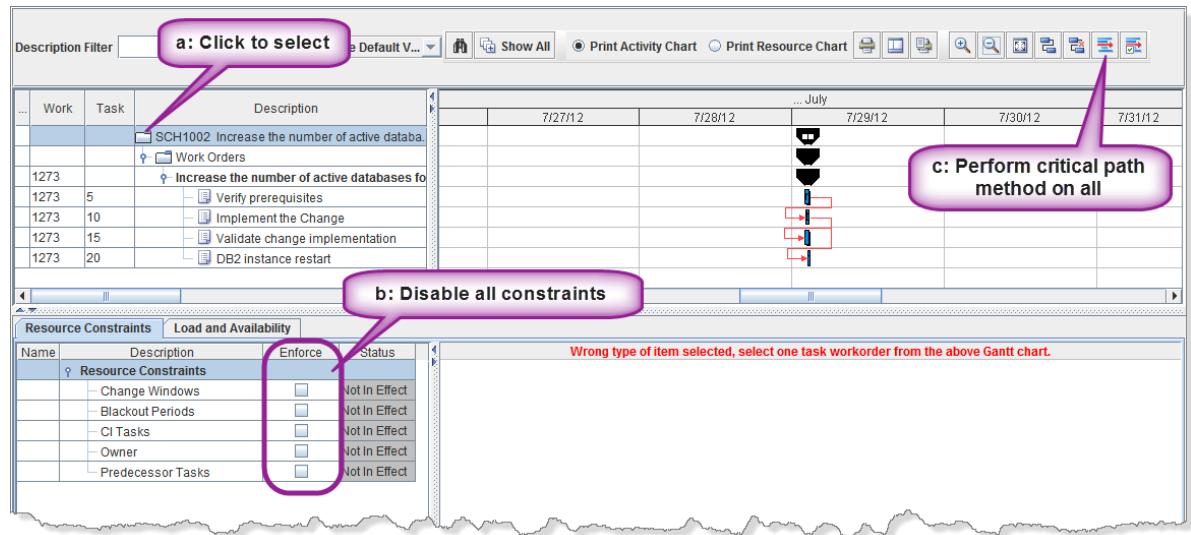
Notice how the individual resource constraints are displayed (Change Windows, and Predecessor Tasks in this case) and the availability is shown relative to time on the view to the right.



The availability of the various resources that are impacted by the change, as well as the task dependencies, are included in the Gantt Chart. This is reflected in the Status field in the Resource Constraints pane. Remember you only see these details because the task is an implementation task that impacts configuration items.

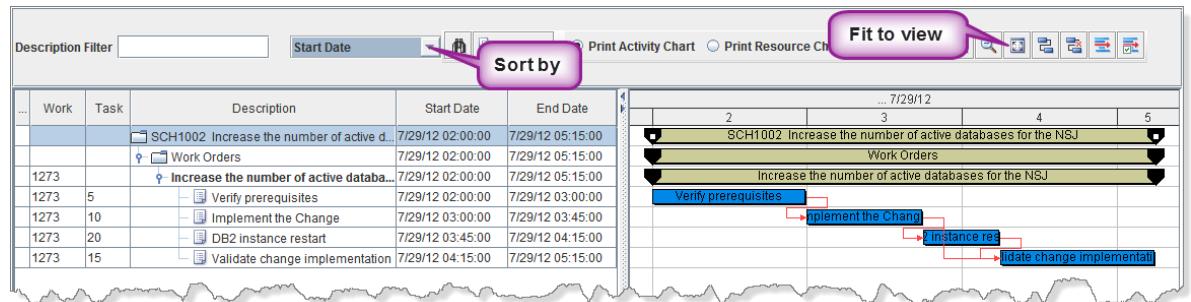
7. To create your first attempt on scheduling the change, complete these steps:
 - a. From the Job Plan pane, to reset all your selections, select the top line which represents the entire job plan for the change.
 - b. To schedule the change without considering any of the constraints that might apply (just to get an idea of the total run time in the ideal situation), disable all the constraints by clearing all the boxes in the **Enforce** column in the Resource Constraints pane.

- c. To create the schedule, click the **Perform Critical Path method on All** icon (➡) almost to the far right in the Gantt View toolbar.



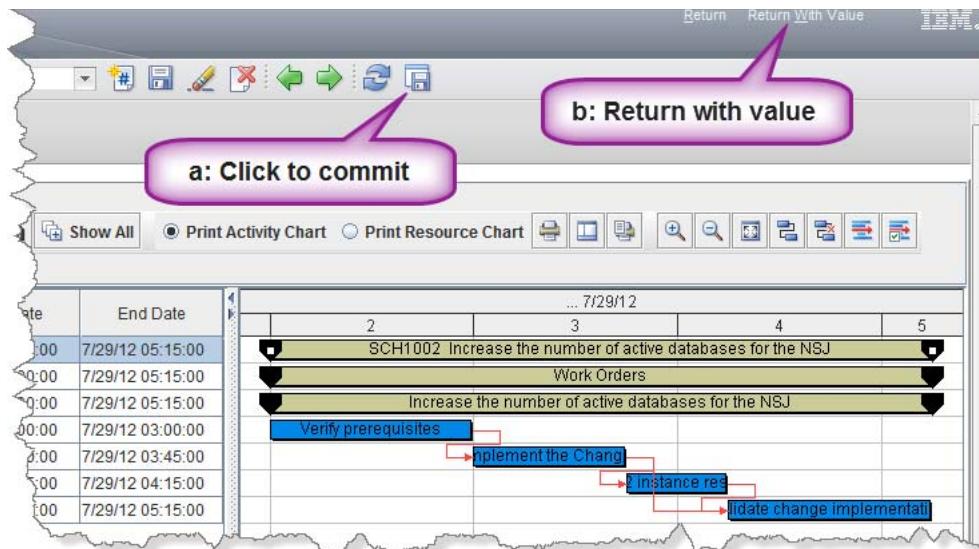
The new schedule is now built, and as a result you see that the tasks in the Gantt chart are rearranged and appear in sequence. If you use the option to sort the task list according to **Start Date**, and the **Fit to View** option, it is easier for you to confirm.

Notice that the **Start Date** and **End Date** fields in the Job Plan pane have been updated to reflect the current schedule.



Exercise 18. Scheduling the change

8. Even though you know that constraints do apply to the change, and you most likely have to redo the schedule, confirm the current schedule and see how it is represented in the context of the change. Complete the following steps:
 - a. Confirm the schedule, by clicking the **Commit Changes** icon () at the toolbar of the Scheduler window. Notice that confirming a schedule for the first time, takes a little while.
 - b. To return to the change window and record the linkage between this schedule and the change, click the **Return with value** link at the upper right of the Scheduler window.



When you return to the change window, notice that the Scheduler Project field has been populated, along with the Scheduled Start and Scheduled Finish fields.

Schedule Dates	
Target Start:	<input type="text" value="7/25/12 08:00:00"/>
Target Finish:	<input type="text" value="7/29/12 03:00:00"/>
Start No Earlier Than:	<input type="text"/>
Finish No Later Than:	<input type="text"/>
Children of Change 1273 Filter > 0 - 0 of 0	

The Schedule information has now been populated into the change, and if you inspect each of the tasks, they have all have been assigned scheduled start and end dates.

9. You have a schedule, but something happened to the constraints. You deliberately turned off the constraint enforcement when you created the schedule. Chances are that the current schedule has conflicts with either change windows, Blackout Periods, people availability, or other jobs related to the same CIs.

To investigate this situation, focus on the Schedule Conflicts section of the **Schedule** tab. You might have to scroll down to find it. Perform the following steps:

- a. Click the **Update Conflicts** button to compare the current schedule to the known constraints that apply to this change. Any conflicts are shown in the type-specific tabs on in the Schedule Conflicts section.

The screenshot shows the 'Schedule Conflicts' interface. At the top, there are tabs: 'Summary' (which is selected), 'Change Window', 'CI', and 'Blackout Period'. Below the tabs, a header row displays 'Tasks With Conflicts', 'Filter', and download options. A table follows, with columns: Task, Summary, Scheduled Start, Scheduled Finish, Status, and Date Detected. One row is visible, showing Task 1277, Summary 'DB2 instance restart', Scheduled Start '7/29/12 03:45:00', Scheduled Finish '7/29/12 04:15:00', Status 'WAPPR', and Date Detected '7/23/12 22:09:32'. A red circle highlights the 'Date Detected' column. A purple arrow points from the text above to the 'Update Conflicts' button at the bottom right of the table area.

Notice in the **Summary** tab that a single task has currently been scheduled to be executed in time slots that introduce some type of conflict.

Remember that only *implementation tasks* are validated. These tasks are the only tasks that actually introduce changes or updates to the CIs. In the example that is used for these exercises, the first and last tasks, Verify Prerequisites and Validate Implementation, neither change nor update the database instance. So these are not validated against any component availability constraints.

- b. Click one each of the constraint-type specific tabs, and see if you can identify the root cause of the conflicts.

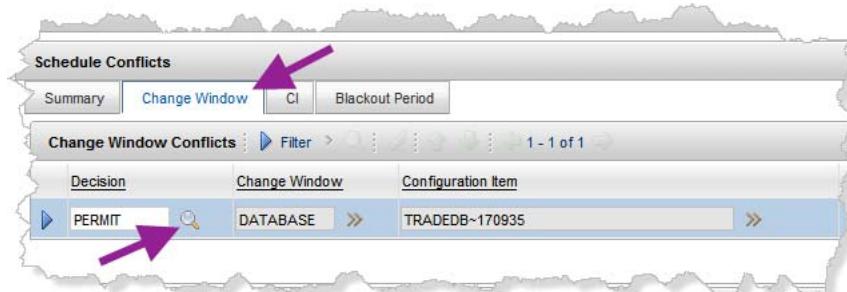
Did you see that change windows is the cause of the conflicts?

As described earlier, the exercise environment has been set up with change windows preventing changes to business applications on weekdays and allowing planned outages to databases (for example, to perform backups) only every other night between 2:00 A.M. and 4:45 a.m. These change windows might be the cause of the conflicts you observe.

In this context, it is important to understand, that the scheduling conflict analysis incorporates both the existing change and other changes that might have been scheduled in advance. The scheduling process looks only on resource availability and constraints for the specific change. In addition, Scheduling Conflicts analyses both the validity of the individual change schedule, and the overall change schedule for the entire IT environment.

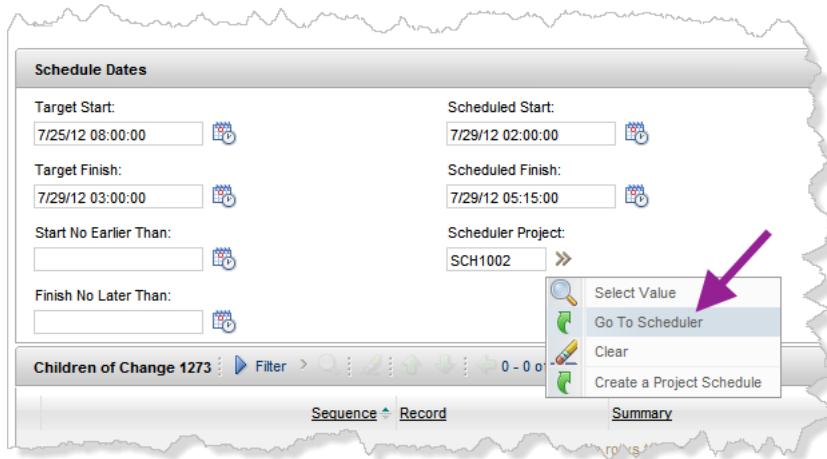
- c. Currently, your *DB2 instance restart* implementation task is scheduled outside of the change windows. However, in this exercise, you, choose to permit that the task *DB2 instance restart* can be executed at any time.

Click the **Select Value** icon (🔍) next to the **Decision** field for the conflict that is related to the *DB2 instance restart* task, and set a value of **PERMIT**.



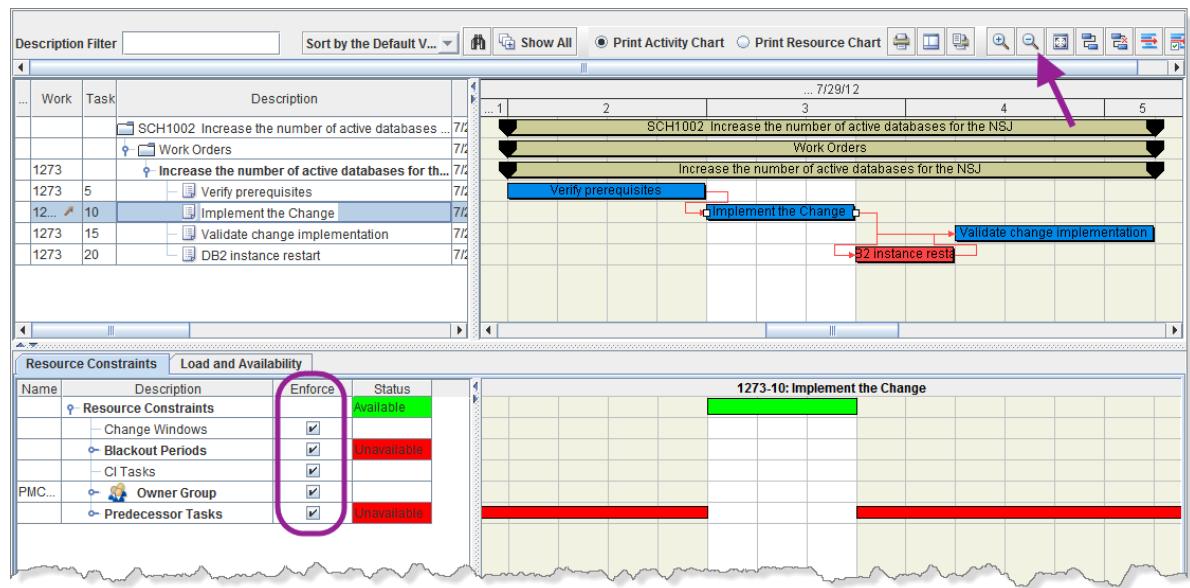
You have now registered the fact that you are allowing this scheduling conflict.

10. At this point, calculate a new plan, taking the new permissions into consideration. To do so, complete the following steps:
 - a. Launch the Scheduler again by selecting **Go To Scheduler** from the **Detail Menu** tool (➡) next to the **Scheduler Project** field.



- b. When the Scheduler application opens, navigate to the **Gantt View** tab.

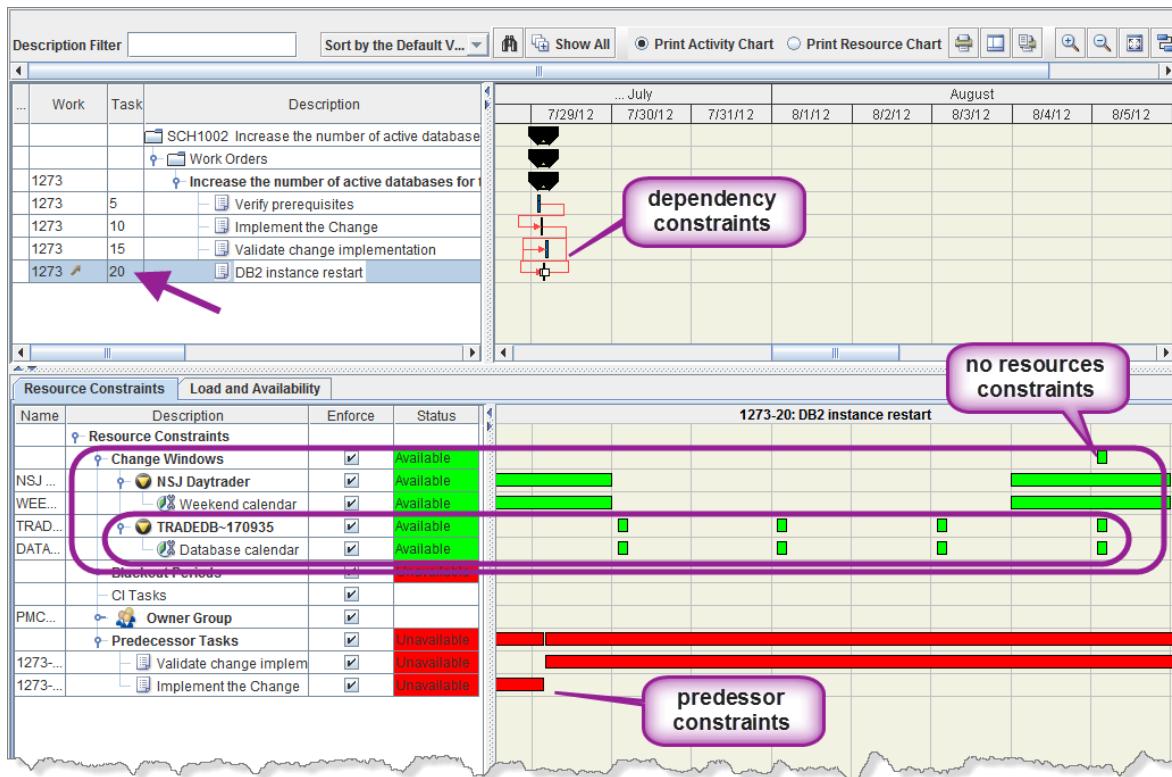
- c. Before rescheduling, make sure that you have enabled all the enforcements in the Resource Constraint pane.



Notice how the status of the tasks changes as you enforce the various resource constraint types. The Scheduler basically performs the same function as the Update Conflicts you used from the Changes application, but without taking other changes into account. In addition, the scheduler provides a visual indication of when the constraint might be true. To see the available change windows, you might have to expand the timeframe by clicking the **Zoom Out** icon () repeatedly to see a couple of weeks in the chart.

- d. The current Gantt Chart shows that a single task (marked with red) is in conflict with constraints.

To analyze what prevents the scheduling, start by clicking **DB2 instance restart** in the Job Plan pane, and notice what happens in the Resource Constraints pane.



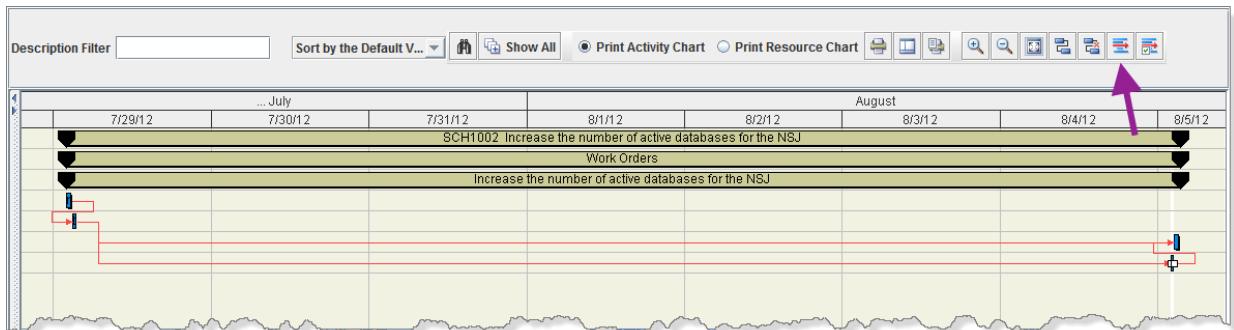
In the Resource Constraints pane, you see that the impacted CIs are revealed, and if you expand them, the change windows that is associated with each one are displayed. In the previous example, you can see that the CI named TRADEDB~170935 is not available to the currently selected task #20 until a few days after the current schedule (indicated by the green bar in the time view). On the other hand, you can see, that the NSJ DAYTRADER resource, will not be available at the time TRADEDB becomes available.

You might notice that the status field for the CIs indicates AVAILABLE. This tells you that you are able to overcome the change window constraint at some point in the future. Because both resources are needed, the task can be scheduled only for a time where both change windows are available, as you see to the far right of the chart.

You see that the change window labeled *DATABASE* allows for changes to be applied to the TRADEDB CI a few times every other day. Combining this with the restrictions set by the *WEEKEND* change window used for the NSJ DAYTRADER CI you can see when, as indicated by the green bar in the Change Windows line, no change window restrictions exist. At these times, you can schedule the change.

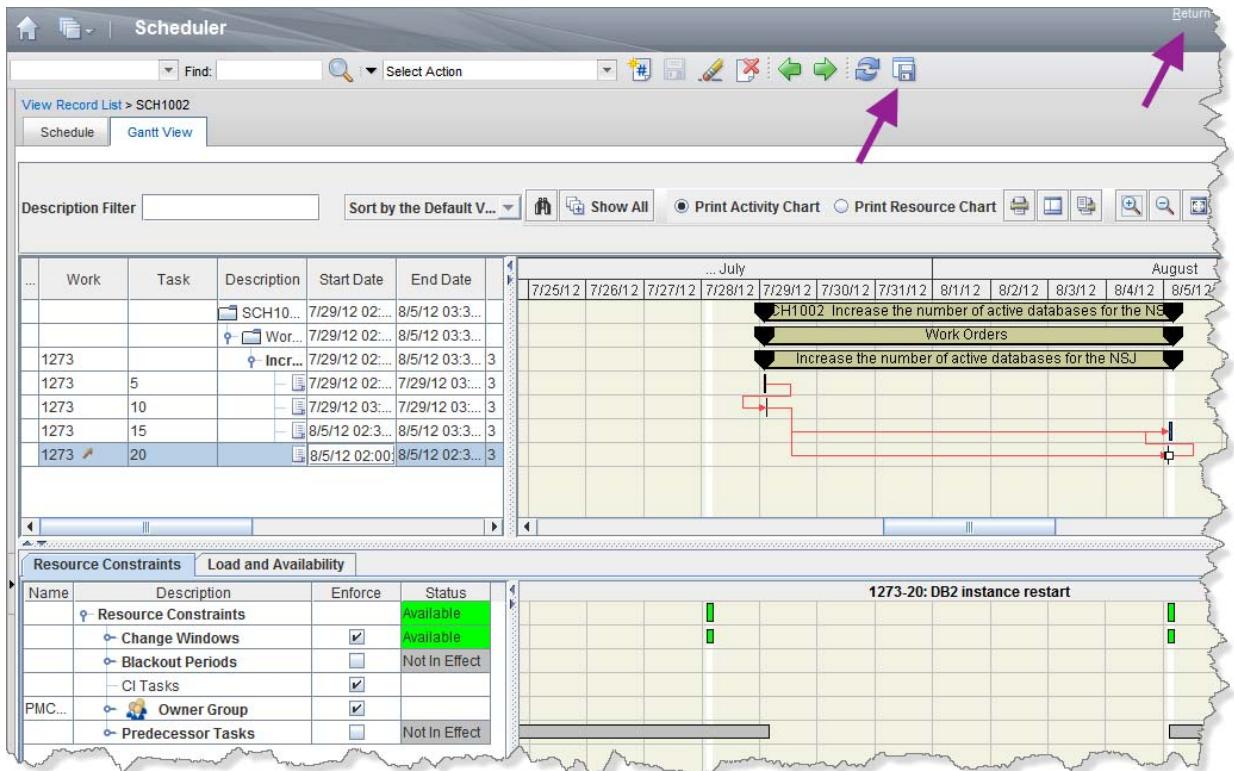
The Scheduler provides many more facilities in support of scheduling your changes, but because that is not the focus of this exercise, allow the system to automatically schedule the change, taking all constraints into consideration.

11. To automatically schedule all tasks, click the **Perform Critical Path method on All** icon (➡) in the toolbar of the Gantt View.



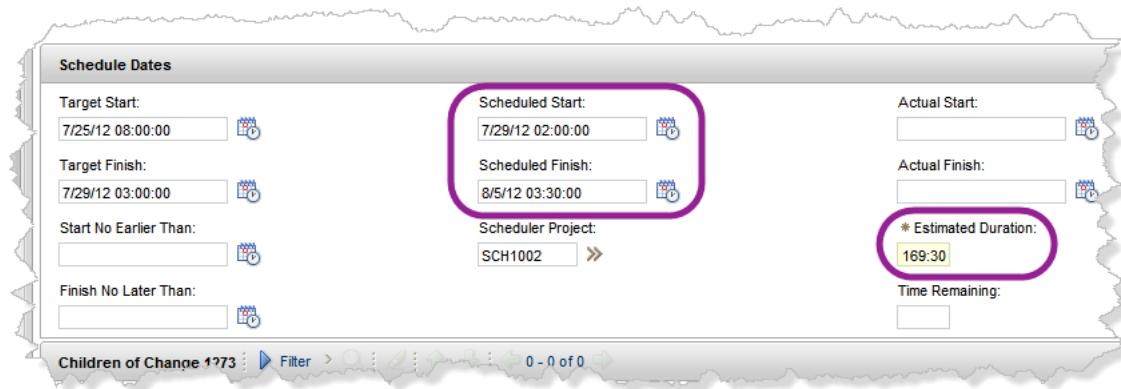
As a result of the rescheduling, with all resource constraints enabled, the critical implementation tasks (the one with impacts) are now scheduled within the available change windows, and the dependent validation task has been scheduled to take place after the last implementation task. Also notice that the initial verification of prerequisites and the first implementation tasks are scheduled to take place as soon as possible after the target start date.

12. To save and commit your schedule, click the **Commit Changes** icon (💾) at the toolbar of the Scheduler window. When you are ready, click the **Return** link at the upper right of the window to return to the Changes application.

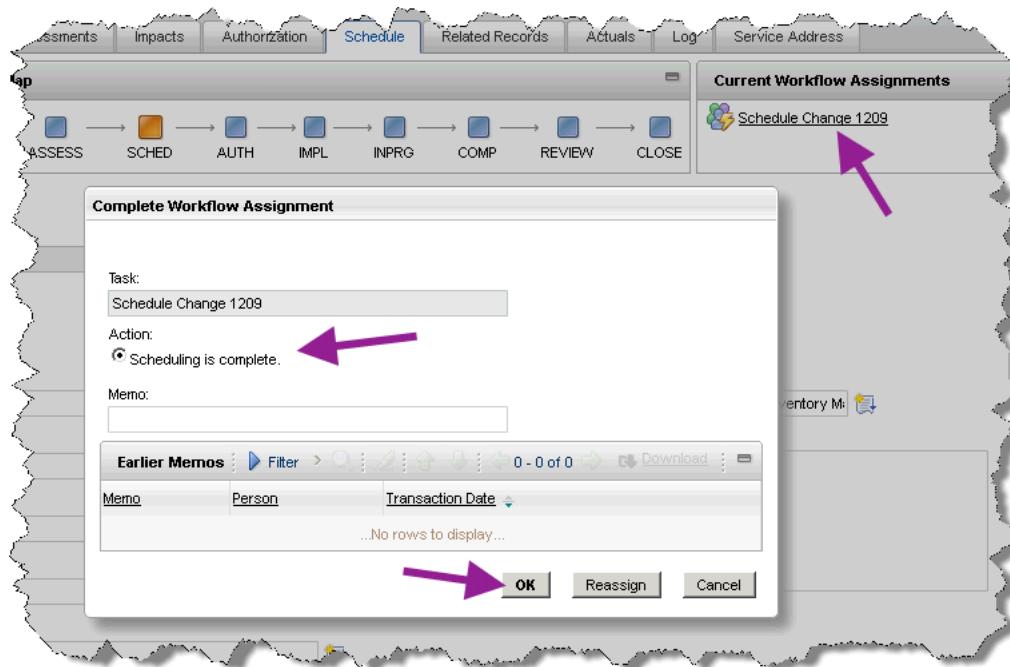


Exercise 18. Scheduling the change

When you are returned to the Changes application, notice how the **Scheduled Start**, **Scheduled Finish**, and **Duration** fields have been updated in accordance with the schedule you created.



13. You are satisfied with the schedule. Complete your assignment by clicking the **Schedule Change ...** assignment in the Current Workflow Assignments portlet, select the **Scheduling is complete** option, and click **OK**.



As a result, the status of the change now changes to AUTH; an indication that it is ready to be authorized by obtaining the necessary approvals.

14. To see who is authorized to approve the change, click the new **L3 - Approve or Reject Change ... (CAB)** link in the Current Workflow Assignments portlet, and notice that in the exercise

environment, FRED, MAXADMIN, and SDADMIN are all authorized to approve the change.

The screenshot shows a window titled "View Workflow Assignments". A message at the top says: "You selected an assignment that you do not own. Details for the selected assignment are shown below. If you have been granted the authority, you can reassign an assignment by clicking on the Reassign Assignment icon in the desired row." Below this is a table titled "Workflow Assignments" with columns: Assigned Person Code, Name, Description, Priority, Time Limit, Start Date, Due Date, and several icons. The table contains three rows:

Assigned Person Code	Name	Description	Priority	Time Limit	Start Date	Due Date	Actions
FRED	L3 - Approve or Reject Change 1209 (CAB)		0:00	2/11/12 00:30:48	2/11/12 00:30:48		
MAXADMIN	L3 - Approve or Reject Change 1209 (CAB)		0:00	2/11/12 00:30:48	2/11/12 00:30:48		
SDADMIN	L3 - Approve or Reject Change 1209 (CAB)		0:00	2/11/12 00:30:48	2/11/12 00:30:48		

A purple arrow points to the "Close" button at the bottom right of the window.

15. Click **Close** to dismiss the window.

16. Click **Sign Off** in order to let Fred log in.

This completes the scheduling exercise.

Next, you work with change authorization, which involves obtaining and providing approvals.

Exercise 19. Change authorization

The change authorization phase gives the stakeholders an opportunity to review the change and either approve or disapprove its continuation. During authorization, the workflow sends approval assignments to the approvers or approver groups that have these assignments.

You can have approval assignments sent to approvers based on their authorization level, or you can send these assignments to all approvers, regardless of authorization levels. The workflow performs a structured series of steps to ensure that your change is authorized to proceed.

You can preauthorize a change before this phase is set to begin by assigning the *standard* category to the change. When the workflow encounters a pre-authorized change, it skips this phase and moves on to the next step of the change process.

The phase basically consists of the following subprocesses:

- Determine the required authorization level
- Change approval
- Verify approvals

In a previous exercise, you already defined the approval requirements; so you can go straight to the approval process.

Approving a change

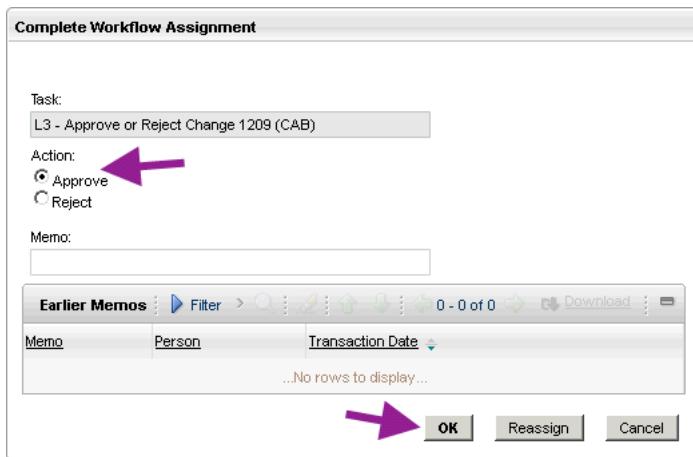
The change that you have been working on needs approval from the Change Advisory Board (CAB), and in the exercise environment, one of the members of the board is Fred. So you have to assume Fred's identity to proceed.

1. Log in to the IBM SmartCloud Control Desk Console (<http://localhost/maximo>) as **Fred** (password `object00`).
2. Start the L3 – Approve or Reject the Change ... (CAB) assignment from the Inbox/Assignments portlet of Fred's User Manager workspace by clicking the assignment link.

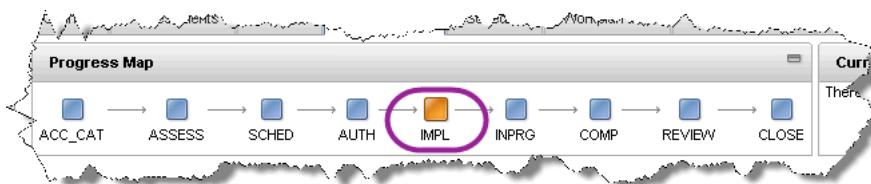


- You are now taken to the Changes application, where the approver can look at all the plans, impacts, assessments, as well as the schedule before making a decision. When a decision has been reached, the approver uses the active link in the Current Workflow Assignments portlet to add document the decision in the change. When the link is clicked, a window prompting the user to approve or reject the change, is opened.

Select **Approve**, and click **OK**.



Because The CAB is the only required approver, the status of the change now changes. If a Scheduled Start date has been assigned, as in this case, the new status of the change becomes Implementation (IMPL), which indicates that the change is waiting to be started. If no Scheduled Start has been assigned to the change, the new status is In Progress (INPRG).



- You are done. You can now return to the start center to verify that the assignment has been closed, and then sign out, to let another user log in.

You have completed the approval of the change.

Verifying approvals

As the change owner, you want to keep track of the approvals in order to ensure timely processing of the change. To keep track of the approval process, complete the following steps:

- Log in to the IBM SmartCloud Control Desk Console as the change owner, Lucy, using a password of object00.

Notice, that there are no outstanding assignments of Lucy for your change.

2. To open the change you have been working with so far, complete these steps:

- Click the **Go To** icon () and navigate to **Change > Changes** and to open the Changes application.



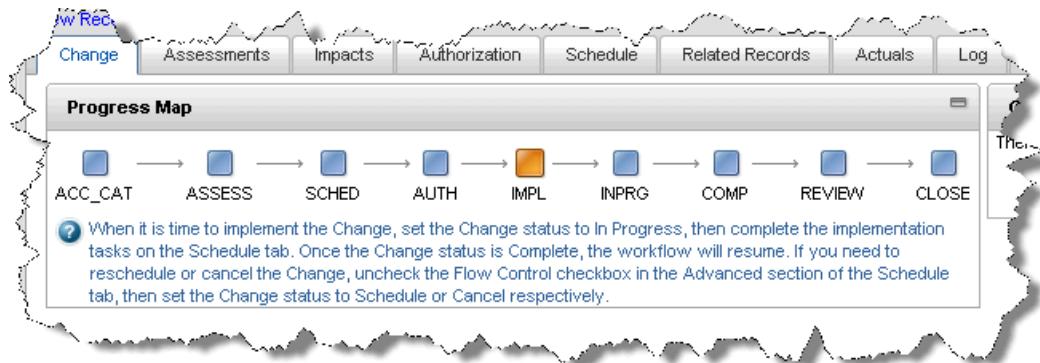
- To find all the changes that are owned by Lucy, the change owner, click **Advanced Search** to be able to specify search criteria that are not available in the standard list. Use the Detail Menu tool (») next to the Owner field in the User Information section to set the value of the field to =LUCY. Click **Find** when you are ready.

Plan Details		User Information	
Job Plan:	»	Reported By:	»
Job Plan Revision #:	»	On Behalf Of:	»
Plan Craft:	»	Whom is this change for:	»
Plan Materials:	»	Supervisor:	»
Plan Services:	»	Lead:	»
Plan Tools:	»	Owner:	=LUCY »
Response Plan:	»	Owner Group:	»
Dates			
<input type="button" value="Find"/> <input type="button" value="Restore Appl"/>			

Because Lucy is the owner of only one change, this change is opened immediately. In this example, it is the change named 1273 you have been working with through these exercises.

Notice that the change status.has changed to Implementation (IMPL) or In Progress (INPRG). This is a first indicator that you have obtained all the required approvals.

If the status is IMPL, you also see an informational message that indicates that the change is ready for processing, but that the scheduled start time has not yet been reached. The message also provides instructions on how to modify the status of the change if you need to.



3. Navigate to the Authorization tab, and look at the value of the Authorization Decision field. It should state *Approved*.

Changes

All my active Changes > 1273

Change: 1273 Owner: LUCY

Status: IMPL Owner Group:

Authorization Decision: Approved

Decision Reason:

Change Authority Level: 3

Summary: Increase the number of active databases for

Details: To support the addition of a database to the NS application, we need the NUMDB db2 instance parameter increased by 1.

4. Navigate to the Approval Log section at the bottom of the window.

Approval Logs

Summary	Decision	Person	Transaction Date	Task	Memo
Other approvers for Approval Level 3	WFASSIGNCOMP	FRED	7/23/12 23:26:36	1273	
Other approvers for Approval Level 3	ACCEPT	FRED	7/23/12 23:26:36	1273	

You see that Fred accepted the change, and immediately after that, the workflow decided that all approvals had been obtained, and automatically changed the Approval Status to Accept. You

also see the useful button **Show Outstanding Approvals** that can come in handy when you have to remind the approvers about what they need to do.

You have completed all the tasks that are related to approval of a change.

At this point you ready to start the change implementation; or, if you like, you can wait until you reach the scheduled start time.

Exercise 20. Implementing the change

The actual implementation of a change naturally varies with the complexity of the change. In this example, the implementation is simple, only three DB2 commands. In addition to the implementation of the specific modifications that are specified in a change, a production-strength implementation plan at a minimum, includes these tasks:

- Prerequisite verification
- Testing the back-out plan
- Implementation of change specific modifications.
- Update of the authorized CI information to reflect the implemented changes. Optionally, this can be performed through submission of a CI Update request.
- Change verification, optionally through a CI Audit request.

In the change you have prepared, you have deliberately ignored the back-out planning, because it is similar to an implementation plan. The only difference is, that the work that is performed is focused on creating, verifying, and applying backups.

You also notice that you have not created any tasks in the change work order to update the CI information. As a matter of fact, updates are performed as an integral part of the implementation tasks. When an implementation task is complete, it is the responsibility of the change implementer to use the Move/Swap/Modify tool to record the modifications that have been applied

Starting the change

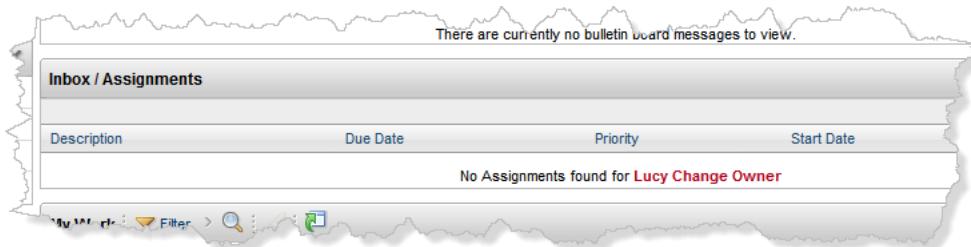
In the previous exercises, you created a change that is scheduled to start at 8am tomorrow. As previously described, an escalation is responsible for identifying tasks that need to be started, and performing the actual activation. This escalation runs, by default, every five minutes.

As long as the change is in the IMPL status, nothing is assigned to the change implementers, so unless you do something to speed things up, the change implementation will not start until 8am tomorrow. To start the task, you have two options: either change the status manually, or change the start time, and see how the escalation automatically starts the change.

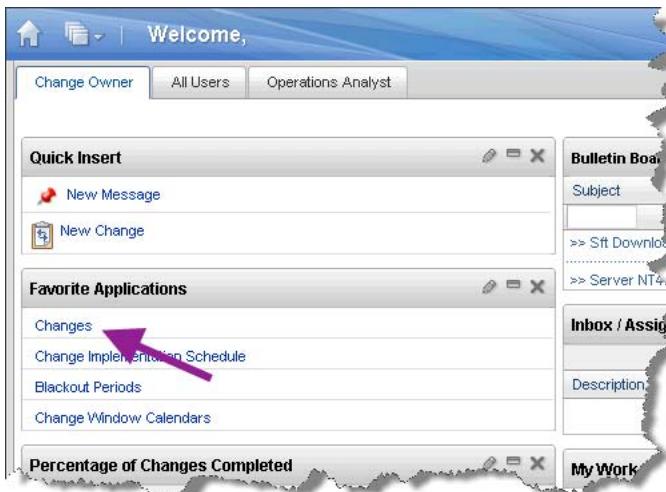
Complete the following steps to change the scheduled start of the change, and let the escalation activate your change:

1. If you are not logged in to the IBM SmartCloud Control Desk console as the change owner, do so now, using the credentials Lucy/object00. If you are already logged in as Lucy, click the **Home** button (at the far left of the title bar to navigate to Lucy's start center.

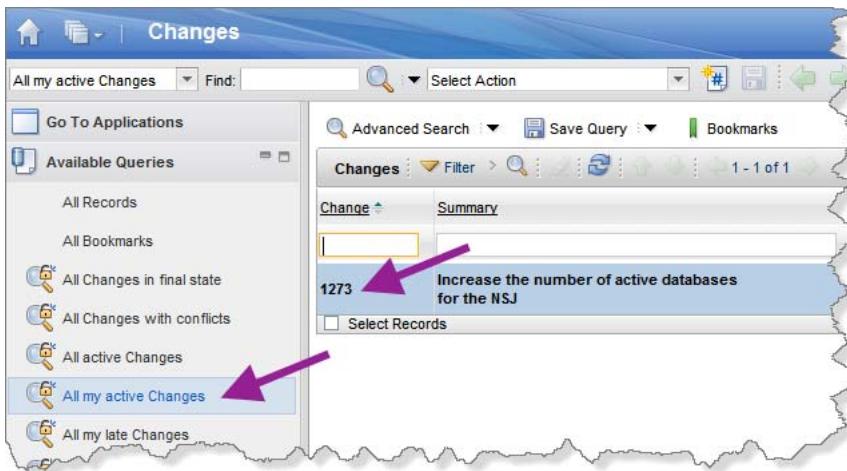
Notice, in the Inbox/Assignments portlet, that there are not assignments for Lucy.



2. To navigate to the Changes application, click the **Changes** link in the Favorite Applications portlet of the change owner start center.



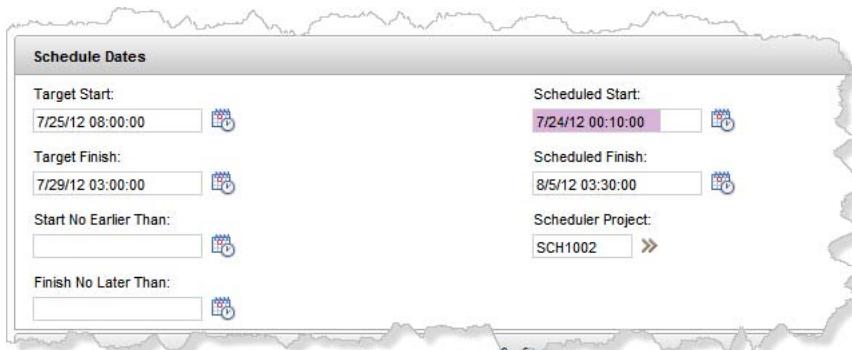
3. To find the changes that are currently owned by Lucy, run the query named **All my active Changes** from the Available Queries section of the navigation bar.



4. When the list is shown, open the only change that is owned by Lucy. 1273 in the example.

- To start the change immediately, you can use the Change Status icon (info) to set the status of the change to In Progress (INPR). As an alternative, and to verify that IBM SmartCloud Control Desk automatically starts the change when the scheduled start date is reached, you can simply change the scheduled start date.

In the Changes application, navigate to the Schedule tab, and provide a value for the Scheduled Start field to the current time. You can either use the Date and Time tool (info) next to the Scheduled Start field, or simply enter the time in the format MM/DD/YY tt:mm:ss. Enter a value for the time to the current time plus 5 minutes.

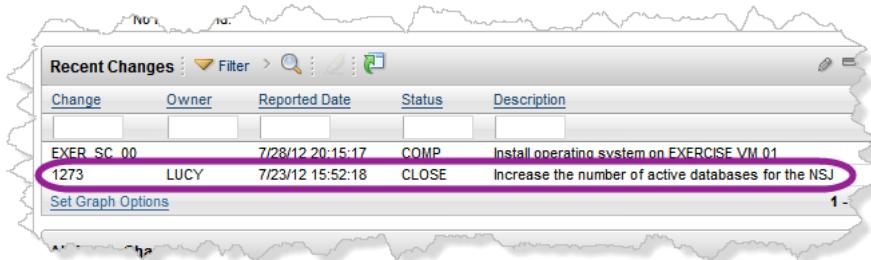


Make sure that you change the date. In a previous exercise, you deliberately set the Scheduled Start to 8 AM tomorrow, and it may have been changed during your scheduling.

- Click the **Save** icon (info) to save your modifications.

After a short while, at the most five minutes after the scheduled start date, the PMCHGSTARTCHG escalation activates the change. As a result, you see that the status of the change is set to In Progress (INPRG) and work has been assigned to the change implementer.

- In order to see the updated status, you must refresh the information for the change. You can easily do this by entering the change number in the **Find** field in the toolbar and pressing Enter. As an alternative, you can navigate to Lucy's start center and look at the information in the Recent Changes section.



- To refresh the view, simply click the **Home** button (info) at the far left of the title bar.
- For now, sign out as Lucy so that you can log in as a new user.

You are now ready to perform the implementation tasks. While you are waiting for the change to be started, continue with the next exercise. By the time you log back in to the IBM SmartCloud Control Desk console, the change status should be IN PROGRESS.

Exercise 21. Change implementation

In IBM SmartCloud Control Desk, change tasks and assignments are treated a bit differently.

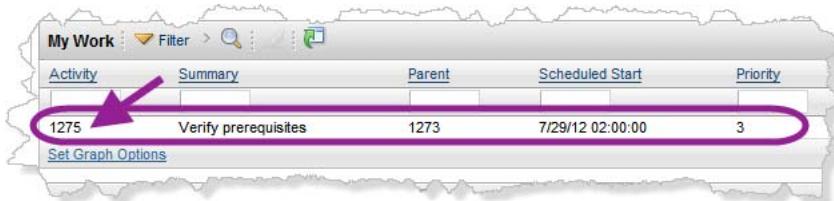
Assignments are communicated through the Inbox, while tasks assigned to a user show up in the My Work portlet in the start center. In the previous, you have been working with assignments, and found them in the Inbox, but work assignment for the change implementer are communicated through the My Work portlet.

To implement the change, log in as a member of the PMCHGIMP group, to which the change has been assigned, and execute the tasks of the change one-by-one. In the exercise environment, the user Schroeder is a member of the group, but in a production environment, you most likely have multiple groups representing different skill-sets.

In this exercise, you do not perform any updates to the exercise systems. All you do is to report the modifications you normally would have applied, and update the status of the implementation tasks to mark them completed.

To implement the change, perform the following steps:

1. If a user is already active in your browser session with the IBM SmartCloud Control Desk Console (<http://localhost/maximo>), sign out the user, and log in using the user ID Schroeder and password object00.
2. Take a close look at the My Work portlet in Schroeder's Change Approval, analysis and implementation start center, and see which assignments are waiting for Schroeder to take action.

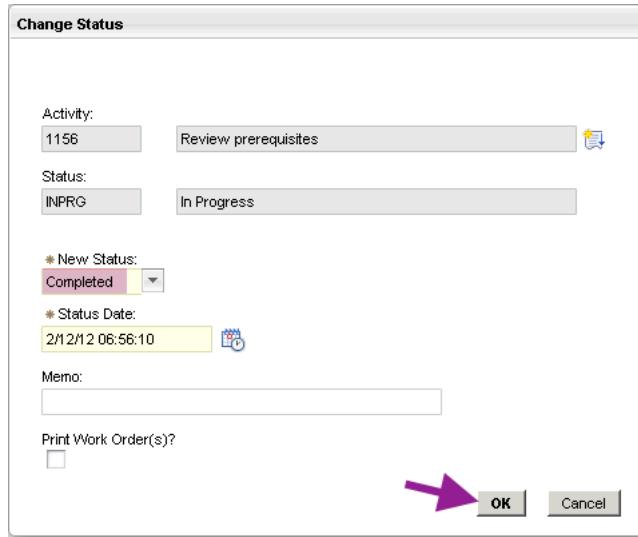


If the escalation has started the change, the first task of the change has been assigned to Schroeder.

3. To work with this task, simply click the activity link to open it in the Activities and Tasks application.

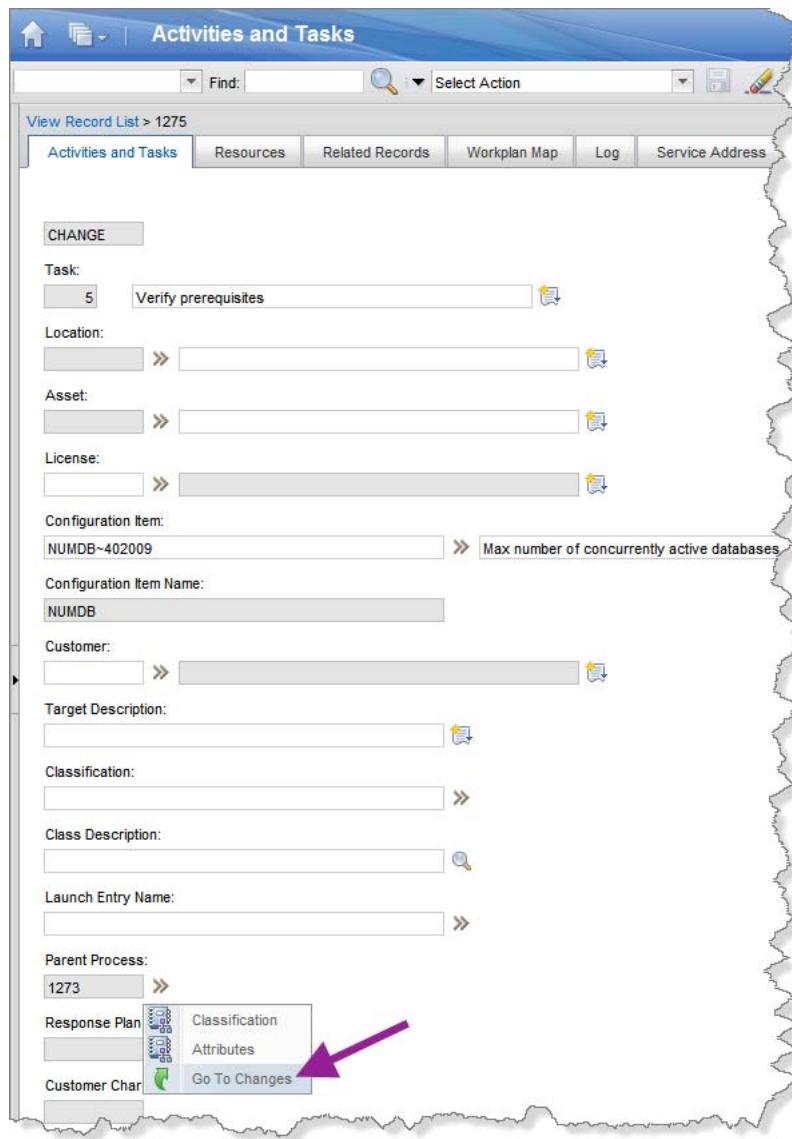
From the Activities and Tasks application, Schroeder can now see the task description, expected duration, and all the relevant instructions that are required to perform the task.

To complete the first task, Review Prerequisites, use the Change Status tool ( from the toolbar, and set a new status of Completed by providing the information in the Change Status window.



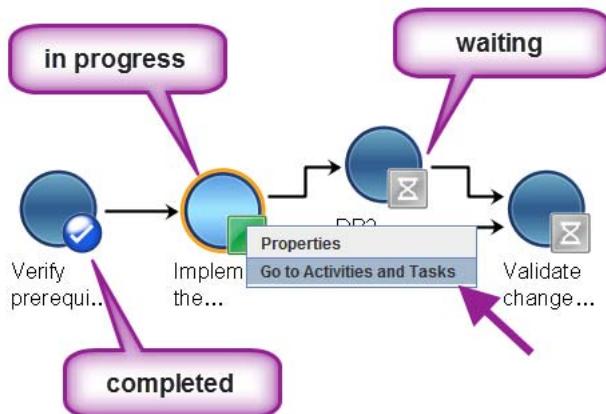
4. Click **OK** to complete the status update.
5. From the Activities and Tasks application you can see only the information that is related to the individual tasks, not the entire job plan. It might be easier to work with the task in the context of

the change, so use the Detail Menu tool (») next to the field named Parent Process, and select **Go To Changes** from the context menu to navigate to the change.



6. In the Changes application, you can use the information in the familiar Schedule tab to see the details related to the activities and tasks for the change. However, if you open the Workplan

Map tab, you can see a graphical representation of the plan, with indication of the status of each task.



Notice, that for each of the tasks, you can see the status, and you can link directly to Activities and Tasks application from an individual task.

7. To complete the Implement the Change task, perform the following steps:
 - a. Right-click on the task that is In Progress, and select **Go to Activities and Tasks**.
 - b. In the Activities and Tasks application you should read the instructions carefully and execute and document your actions. For this exercise, you should be fully aware of what has to be done.
To perform the update to the DB2 instance configuration, access the RHEL56-1 system hosting the database instance and use the appropriate DB2 tools to update the NUMDB configuration value. In the exercise environment, you do not have access to this system, so you have to assume that it was done.
 - c. To report that you performed the task, click the Change Status tool (from the toolbar to change the status of the task to *Completed*.
 - d. Click the Return link to go back to the Changes application.
 - e. Navigate to the **Schedule** tab of the Changes application, scroll down, and focus on the information in the Tasks for Change ... section. Notice that here you also see the status of the individual tasks, and for each task you have a link to the **Change Status** tool.



Note: If you do not see the expected status for the tasks, enter the change number in the Find field, and press Enter to refresh the information in the console.

- f. Click the Change Status tool (⊕) next to the task named *DB2 instance restart* to change the status of the task to *Completed*.

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
5	5	Verify prerequisites	1:00	COMP		PMCHGIMP
10	10	Implement the Change	0:45	COMP		PMCHGIMP
10	20	DB2 instance restart	0:30	INPRG		PMCHGIMP
15	15	Validate change implementation	1:00	WAPPR		PMCHGIMP

- g. From the Change Status window, select *Completed* as the new status, and click **OK** to save your changes and return to the schedule.

Notice how the status of the last task changes to In Progress.

8. For the last task, Validate Change implementation, perform the following steps to make sure that the updates you performed are reflected in the attributes of the NUMBDB DB2INSTANCECONFIGVALUE CI that is the target of the change. In a real-life implementation, you would submit a CI Update request, and let the configuration team take care of performing the updates. However, in this exercise you take a short-cut, and perform the same activities as the change librarian would, to update the CI information to match the changes that has just been implemented.
- Expand the task by using the **Show Details** icon (⊕) at the front of to the task (#15).
 - Look at the Work Reference Information section and select **Go To Activities and Tasks** from the **Detail Menu** tool (») next to the **Reference WO** field.

Task Information

* Task: Validate change implementation [Edit](#)

Sequence:

Status:

Classification: [View](#)

Classification Description: [Search](#)

Implementation Task?

Work Reference Information

Reference WO: [»](#) [Go To Activities and Tasks](#)

Configuration Item: [»](#) Max number of concurrently active da [Edit](#)

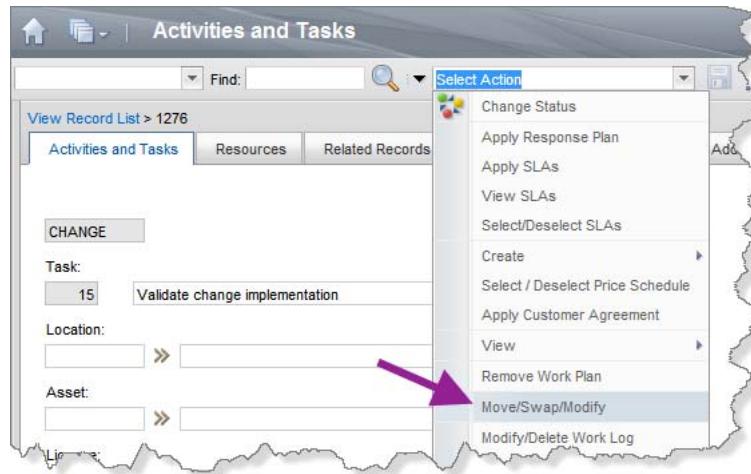
Configuration Item Name: [Search](#)

Location: [Edit](#)

Asset: [Edit](#)

Service Group: [Edit](#)

- c. When the Activities and Tasks application opens, choose **Move/Swap/Modify** from the **Select Action** drop-down menu to record your changes.



- d. In the Move/Swap/Modify window, complete the following steps:
- Open the **Modify** tab to indicate your intended action.
 - Open the Configuration Items tab to indicate your intended type of target.
 - Check the DB2INSTANCECONFIGVALUE_VALUE attribute.
 - Click Modify Attribute.**
 - Provide a new value of **9** in the **New Value** field.
 - Click Save As Plan** to signal to IBM SmartCloud Control Desk that the modifications should be applied to the database when the change is closed.



Note: If you want to have the updates to the CI configuration performed immediately, you can use the **Execute Now** option instead of **Save As Plan**.

Attribute	Description	Section	Data Type	Alphanumeric Value	Numeric Value	Unit of Measure
DB2INSTANCECONFIGVALUE_NAME	DB2INSTANCECONFIGVALUE_NAME	ALN	NUMDB			
MODELOBJECT_DISPLAYNAME	MODELOBJECT_DISPLAYNAME	ALN	NUMDB			
DB2INSTANCECONFIGVALUE_VALUE	DB2INSTANCECONFIGVALUE_VALUE	ALN		8	9	

You have now instructed IBM SmartCloud Control Desk to automatically update the CI information in the database when the change completes.

- Click the **Return** link in the menu bar to go back to the Changes application.



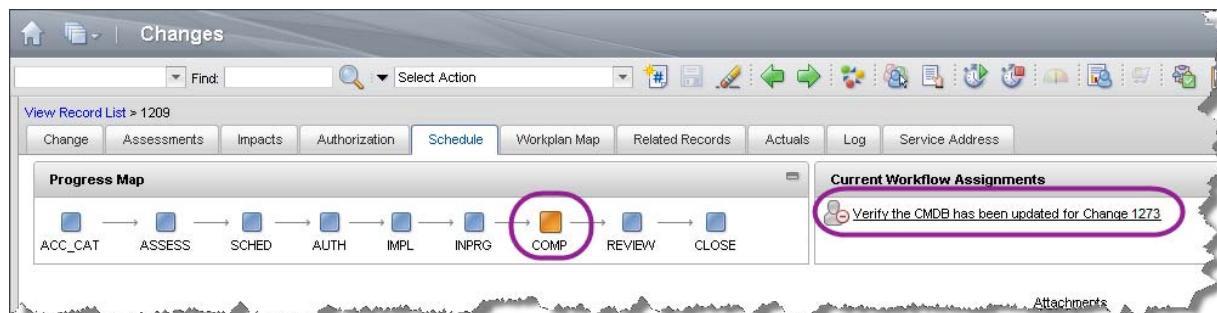
- Use the Change Status tool (info icon) next to the task named Verify Change implementation to mark the status of the task Completed.

After you have completed all four tasks (simulating that you have implemented, and verified the change), the implementation is complete. The new status is reflected in the status for the change.

You will also see a message the change completes, that indicates that the PMCFGMAIN1 workflow has changed the status of the related process request, the one submitted by Steve, has been changes to Resolved. Click **Close** to dismiss this message.



Everything seems to be all-right, however, you have not yet ensured that the CI information in the database is updated. According to ITIL, this is the responsibility of the change owner. Notice that a new workflow assignment has been created, and that the icon for the new workflow assignment is grayed out indicating that the assignment is not for you.



- To check if there is more work to do for Schroeder, click the **Home** button (**↑**) at the far left of the title bar, and verify that both the My Work, and Inbox/Assignment portlets are empty. When they are, Schroeder, the change implementer, can log off.
- To log out, click the **SignOut** link in the header of the IBM SmartCloud Control Desk console.

You have completed the change implementation.

Exercise 22. Completing the change

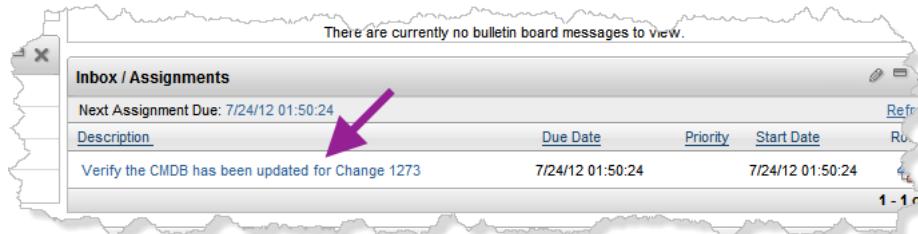
After the change has been implemented, it is the responsibility of the change owner to make sure that all the changes that were implemented are recorded in the CMDB.

Updating CI information in the CMDB is the responsibility of the configuration management process. If you find discrepancies between the change specifications and the CI attribute information in the database, you, as the change owner, have to submit a CI Update request for the current change in order for the Configuration Librarian to perform the updates to the database.

Verifying CMDB updates

To verify that the attributes of the CI have been updated to reflect the implemented changes, complete the following steps.

1. Log in to the IBM SmartCloud Control Desk console as the change owner, **Lucy**, using a password of **object00**.
2. Look at the assignments for the change owner, and open the one named *Verify the CMDB has been updated for Change ...* in order to open the change.



3. To check if the CMDB has been updated, complete the following steps:

- Focus on the Specifications section, and make a note of the attributes that should be updated along with the new value.

In this example, the value of the DB2INSTANCECONFIGVALUE_VALUE should now be 9.

Attribute	Description	Value
DBNAME	Database Name	
INSTNAME	Instance Name	
TABNAME	Table Name	
DB2INSTANCECONFIGVALUE_VALUE	DB2INSTANCECONFIGVALUE_VALUE	9

Primary Target

The target that is the main focus of this Change Request

Configuration Item: **NUMDB~402009** ➤ Max number of concurrently active databases

Configuration Item Name: **NUMDB**

CI Business Impact:

Outage: **None**

Target Description:

Asset: ➤

Location: ➤

Asset/Location Priority:

- To see the current values in the CMDB, select **Go To Configuration Items** from the Detail Menu tool (➤) next to the Configuration Item field in the Primary Targets section.
- In the Configuration Item application, select **View Attribute Value History** from the Select Action drop-down menu.

Configuration Items

View Record List > NUMDB~402009

CI Summary CI Details Related Configuration Items

Configuration Item Name: **NUMDB**

Classification: **CI-ROOT \ CI-ROOT.APPSERVER \ CI-ROOT.DATABASESERV**

Select Action

- View Naming Rules
- Synchronize Authorized CI
- Change Status
- View Actual CI Details
- View Work Details
- View CI Relationship History
- View Attribute Value History**
- View Actual CI Topology
- View Actual CI Change History

- d. In the View Attribute Value History window that opens, you see that Schroeder changed the value of the DB2INSTANCECONFIGVALUE_VALUE attribute to 9 just a few minutes ago.

Attribute	Description	Alphanumeric Value	Numeric Value	Unit of Measure	Changed By	Changed Date
DB2INSTANCECONFIGVALUE_VALUE	DB2INSTANCECONFIGVALUE_VALUE		9		SCHROEDER	7/24/12 01:50:23

This is proof that the CMDB was indeed updated as part of the change implementation.

- e. Click **OK** to dismiss the window.
f. Navigate to the **CI Details** tab in the Configuration Items application, and look at the Specifications section. Do you see anything suspicious?

Attribute	Authorized Value	Discovered Variance	Unit of Measure	Match
DB2INSTANCECONFIGVALUE_NAME	NUMDB			GLOBAL
MODELOBJECT_DISPLAYNAME	NUMDB			GLOBAL
DB2INSTANCECONFIGVALUE_VALUE	9	8		GLOBAL

Notice, that the value for the attribute for the related Actual CI still is 8. This means either that the change was not implemented correctly, or that the updated attribute values for the Actual CI have not yet been imported into the CMDB. Either way, management of this discrepancy is the responsibility of the configuration team. Lucy can decide to ignore it, or submit a CI Audit request to ask the configuration auditor to look into the matter. However, Lucy knows that Actual CI data is only collected every night, so she feels confident that the information will be updated in the morning.

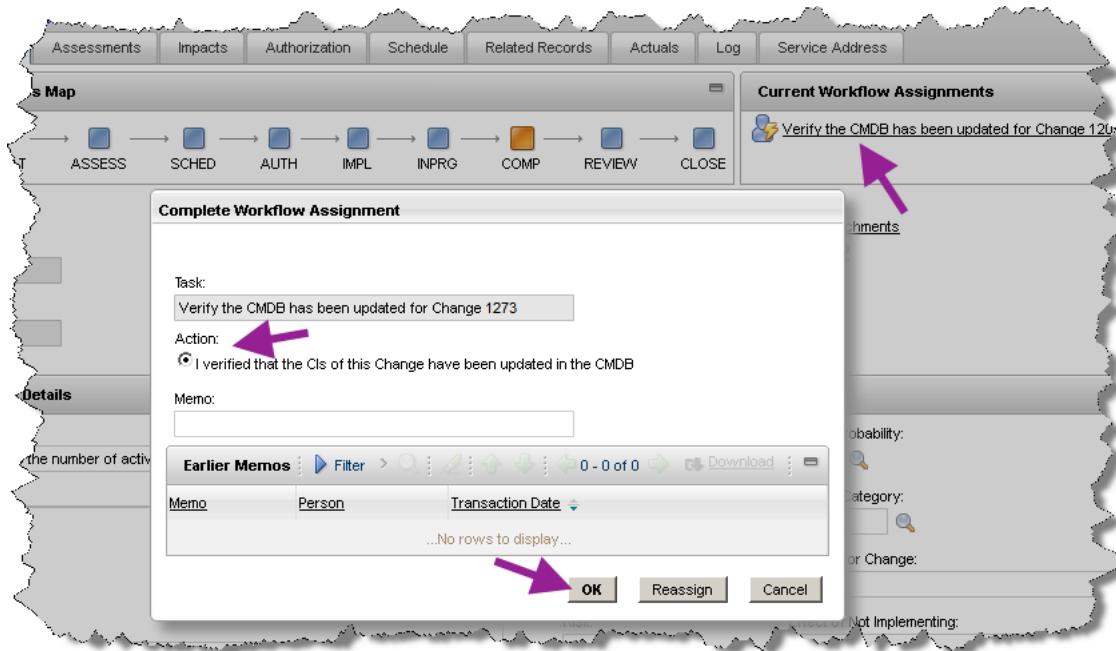
- g. To go back to the change record, click the **Return** link in the menu bar.



As it turned out, you can conclude that implemented changes are reflected in the CMDB, and there is no need to submit a CI Update Request.

4. Now you can complete your assignment.

Click the **Verify the CMDB has been updated for Change ...** link in the Current Workflow Assignments portlet. In the Complete Workflow Assignment window that opens, select the *I verified that the Cls of this Change have been updated in the CMDB* option and click **OK**.



Notice, that the status of the change will change to REVIEW.

You have successfully completed the change. All that is left before you can close it is a review and communication to the stakeholders to inform them about your achievements.

Exercise 23. Reviewing the change

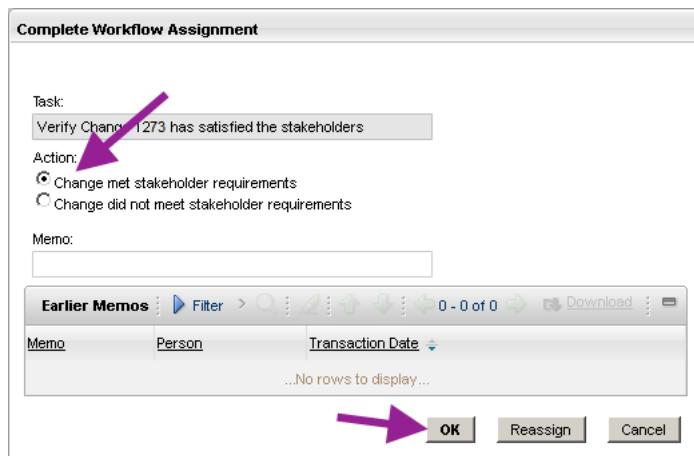
The purpose of the final review is to give the change owner, or perhaps the change manager, or change administrator if your policies dictate this, a chance to probe the stakeholders for their satisfaction. This review is of the whole change and is meant to provide feedback to the stakeholders, and to extract timing information, lessons learned, and related information that can be used to improve the change management process.

In this exercise, there is no need to do all of that. In this situation, you close the assignment immediately. Perform the following steps:

1. From Lucy's change owner start center, click the **Route** icon (✉) to complete the awaiting assignment, Verify Change ..., has satisfied the stakeholders.

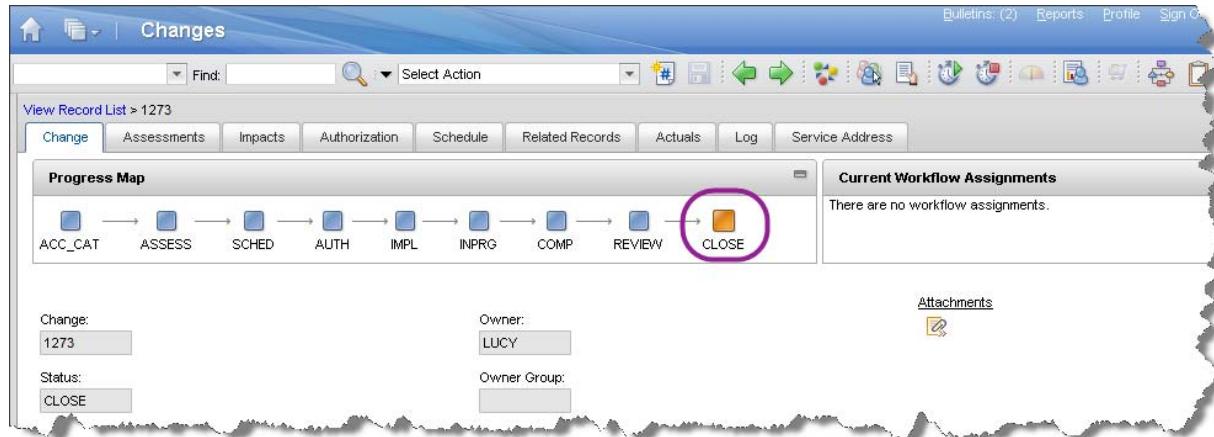


2. When prompted, choose *Changes met Stakeholder requirements*, and click **OK** to complete the assignment.



Exercise 23. Reviewing the change

Notice that the status of the change changes to CLOSE and there are no outstanding assignments. You are done.



You have just completed the processing of an normal change including assessments, scheduling, authorization and implementation using IBM SmartCloud Control Desk change management. You can now **SignOut**.

In the last exercise, you log in as Steve to review the status of the original RFC.

Exercise 24. The change requester reviews the request

Now that the change has been processed, the change request that started the whole chain of events has been automatically completed. Had you set up an escalation to alert the requester on completion of the request, Steve would have received an email with information of the status.

Assume that Steve did receive an email, and in response to that email, Steve logs in to see the status of the original request.

1. Log in as Steve (password object00), open the Process Management Requester start center and see if you can find the original process request (EXER_RFC_1) in any of the portlets in the start center.

It is not there. Not even in the My Active Process Requests portlet. The reason might be, that the request is neither in the draft, active, or rejected state.

2. To see the status of your request, click the **Process Requests** link in the Favorite Applications portlet, and when the application opens, press Enter to populate the list.

- Take a look at the Process Requests that are listed, and notice that the state of the original request (*EXER_RFC_1* in this example) is CLOSED, and that the status of the related process is COMPLETED.

Process Request	Description	Customer	Process Manager Type	Priority	Process State	Status
EXER CU_00	Set OPERATING and update memory		Configuration		COMPLETED	RESOLVED
EXER RFC_1	Increase the number of active databases for the NSJ		Change	3	COMPLETED	CLOSED
PR1002	Audit OS Installation on EXERCISE VM 01		Configuration		ACCEPTED	RESOLVED

You can open the request and check out the information in the Related Records tab. There you find the reference to the change that was used to implement your request.

This completes the quick review of the advanced, change process. You can add many more steps of impact analysis, approvals, and updates, but at least by now you should be familiar with the basics concepts such as requests, changes, response plans, job plans, approvals, assignments, tasks, schedules, and work orders, and you should have a better understanding of how different responsibilities are handled by different users.

The process flow that you have been working with can easily be tailored to support your particular needs. IBM SmartCloud Control Desk provides other change process workflows that bypass some of the processing, such as assessments, or approvals, which you can use for standard, pre-approved changes, or modify to meet your needs.

Change management summary

By completing the change management exercises, you have experienced, how the powerful change management features in IBM SmartCloud Control Desk 7.5 enables you to take control of your change processing, ensure that the changes you implement are fully assessed, authorized, their impacts are well known, and they are scheduled for a time where the impact to the business.

You tried working with both emergency and normal changes, and went through all the appropriate processing phases. You learned, that response plans can be used to provide a template for most of the definitions in the change, and the importance of the implementation tasks and their associated target CIs. You also experienced how the risk, and importance are calculated, and how change analysts can encourage the change owner to modify the job plan by providing Implementation Notes. During the assessment, you saw how the Impact Analysis uses the relationship information to identify the resources that will be impacted by an outage to the target CIs, and during the scheduling of the change, you realized that the change windows and blackout periods of the impacted CIs are taken into account when scheduling the implementation tasks.



6 Release management with IBM SmartCloud Control Desk 7.5

Release management can in many ways be regarded as an add-on to change management that provides facilities to orchestrate the implementation of multiple changes as a single unit. You can think of release management as a wrapper around multiple changes and/or multiple target Cls. This capability is used for complex changes where, for example, the scope of the change is unknown, or the changes must be implemented in a specific sequence. Application of fix packs, mass deployment of virus checking signatures, and deployment of an entire application stack across multiple systems, are just a few examples of infrastructure modifications where the release management capabilities are used.

Another example of work that is supported by the release management capabilities in IBM SmartCloud Control Desk is the management and control of periodic maintenance releases to, for example, specific business applications, specific operating platforms, or other logical grouping s that may apply to your organization.

IBM SmartCloud Control Desk release management is used to define, manage, control and coordinate the implementation of modifications to your infrastructure that involves multiple, diverse resources such as hardware and software assets, application server instances, and/or business services and business applications.

The main reason for implementing multiple changes into a release is that you can treat the release as a unit when scheduling, tracking progress, and obtaining approval. This makes the management process much smoother than having to manage, and synchronize, multiple changes individually. However, the individual changes that are members of a release should go through the normal change processing for categorization, assessment, and approval before being added to a release. It is still the responsibility of the change team to properly assess and approve each change that becomes a member of a release. On the other hand, when a change is added to a release, the release team becomes responsible for the planning, scheduling, and coordination of the change implementation.

Often you see, that the availability of the change implementers is not included in the change scheduling. Naturally it can be considered, but typically, the change scheduling focuses on scheduling the change, so it can be implemented at the time where it has minimum impact to the business. Change windows and blackout periods are used to identify the best time, considering both the Cls that are the targets of the change, and the ones that are impacted by the change.

On the other hand, release management very often takes the availability of the implementers into account, so tasks are only scheduled for a time when a sufficient number of people with a specific role, are available. By assigning task ownership, you help get an overview of the work load for each group and/or person. Naturally, CI availability is also considered in the release scheduling process.

Release management is divided into two distinct phases:

- Specify, plan, schedule, and approve the release
- Implement the outcome of the previous phase

Depending on the nature of the release, the detailed work performed in each phase will vary.

A set of general milestones characterizes each major activity of the ITIL-aligned release process. For specific releases, you might emphasize certain steps, while de-emphasizing or even skipping others. For example, if a release does not involve software distribution, the Distribute and Install activity might not apply. Nonetheless, it is important to understand the purpose of each activity.

The following summarizes the major release activities.

Plan	After a new release is created, you determine which changes will go into the release. Multiple changes can be added to a release. When you add a change to a release, the source and target configuration items (CIs) for the change are also associated with the release. A basic task list is defined; you can apply a job plan that contains activities and tasks that meet the requirements of the release. Certain activities might be empty at this stage; for example, detailed rollout tasks are defined during the Plan Rollout activity. The overall structure of the release plan is the final goal of this stage.
Design, Build	The installation scripts and packages to be deployed are designed and created during this activity. The software is not created, but it is packaged for deployment. Installation scripts and mechanisms, communication and education plans, and backout procedures are also developed.
Test, Accept	During this activity, the release package is tested to ensure that is free of errors, and the release is reviewed to determine whether it can be accepted for deployment. Copies of the package are added to the definitive media library.
Plan Rollout	Detailed plans, including release dates and deliverables, are created for rolling out the release to each site. For each site, delivery is scheduled for any new assets that are part of the release, and the release deployment is also scheduled. If training is needed, it is scheduled, as are any communications that are needed.
Communicate, Prepare	During this activity, you ensure that all stakeholders, end users, and support personnel are aware of the changes that will occur when

the release is deployed. To ensure that a site is ready for a release, you might schedule site-specific testing, system shutdowns, reminders about the release, and so on.

Distribute, Install

As the Distribution and Installation activity gets underway, you check with configuration management to determine the status of CIs that are involved in the release, and ensure that the target CIs are ready for the release. Finally, the release is distributed to all of the target CIs.

Release management processes and roles

In the following you familiarize yourself with the release management processes, their main activities and tasks, as well as the division of roles and responsibilities among the release management team.

Exercise 1. Release management roles and responsibilities

As preparation for the following exercises, you should review the information in the tables below to gain an overview of the roles and responsibilities that applies to the exercise environment, and which users assume which roles.

The responsibilities for the execution of the various phases of the release processing have been assigned to users and persons belonging to the groups (Security and Person groups) outlined in the following tables:

Role	Security Group	Responsibilities
Release Administrator	PMRELEASEADMIN	Responsible for administering the release process, and the base definitions such as classifications, response plans and so on.
Release Deployer	PMRELEASEDEPLOYER	Performs software deployments that are defined for a release.
Release Deployment Specialist	PMRELEASEDEPLOYMENT TSPECIALIST	Performs software deployments that are defined for a release
Release Manager	PMRELEASEMGR	Manages and assesses the effectiveness of the overall process, making changes as needed to ensure efficiency.

Role	Security Group	Responsibilities
Release Owner	PMRELEASEOWNER	Creates releases and manages the tasks and activities within each assigned release.
Release Specialist	PMRELEASESPECIALIST	Responsible for performing the actual work that is required by release tasks and activities.

In the exercise environment, the users listed below have been associated with the groups (roles) shown in order to assign them different responsibilities pertaining to release management.

Security Group	Person Group	Role	User	Password
PMRELEASEADMIN	PMRELADM	Release Administrators	Pete	object00
PMRELEASEDEPLOYER	PMRELDEP	Release Deployers	Diane	object00
PMRELEASEMA	PMRELMA	All IT Release Managers	Silvia	object00
PMRELEASEMGR	PMRELMGR	Release Managers	Silvia	object00
PMRELEASEOWNER	PMRELOWN	Release Owners	Henry	object00
PMRELEASESPECIALIST	PMRELSPC	Release Specialists	Thomas	object00

Working with software releases

Often you will use releases to manage mass deployment of software. Typically, these releases are initiated based on newly identified security threads, or requirements for functional updates (fix packs) to core components such as BIOS, operating systems, or application server platforms. Using releases to handle this type of changes ensures that you have tested and verified the deployment in order to avoid issues, and minimize the impact when the release is implemented. Furthermore, similar to changes, mass update releases generally must be reviewed and authorized. This authorization provides an extra assurance that the necessary tests, and verifications have been completed with satisfactory results, and that proper documentation, or updates to existing operational procedures, is provided.

In addition to the functions needed to control the planning, design, testing and deployment of software-related releases, IBM SmartCloud Control Desk provides functionality to manage one or more Definitive Media Libraries. ITIL defines the definitive media library (DML) as:

One or more locations in which the definitive and approved versions of all software configuration items are securely stored. The DML may also contain associated CIs such as licenses and documentation. The DML is a single logical storage area even if there are multiple locations. All software in the DML is under the control of change and release management and is recorded in the configuration management system. Only software from the DML is acceptable for use in a release.

Installation media are registered as individual software CIs in the DML. These must be treated as production CIs, and be under strict change control. This implies, that restricting access to, and backing up the DML are key activities in ensuring that you only use tested, and authorized installation media.

Once you have defined your installation media in the DML, you can associate the software CIs with a change as the source CI. This allows you to track the usage of the individual media. Collecting this information may prove very useful for reporting as well as debugging in case you start noticing similar issues on multiple systems.

In the following exercises, the scenario outlined below is used to demonstrate the core functionality of the IBM SmartCloud Control Desk release management capabilities:

- Steve, a process requester, has learned that the default keys in WebSphere V6 are soon to expire. A fix pack has been made available and this needs to be installed on all the WebSphere Application Server instances in the environment. To have all the WebSphere resources updated, Steve submits a change request.
- When Lucy, the change owner, receives the request, she realizes that the change may involve many software deployments, so creates a change for the request, and uses the change to create a release. Before she creates the release, Lucy identifies the target CIs that need to be

updated, creates a source CI representing the software image for the WebSphere fix pack, calculates the impact of the change, and assigns a job plan that waits for the release to complete.

- Henry, the release owner, accepts the release, applies an appropriate job plan, and takes, with the help of the release specialists and deployers, the release through all the required activities to plan, build, test, approve, and deploy the updates.

However, before you can start this scenario, you must create a definitive media library to host the WebSphere fix pack and the installation scripts that will be developed as part of the release.

Exercise 2. Preparing for software distribution

The software deployment feature of release management is designed to only work with software images that are stored in the definitive media library.

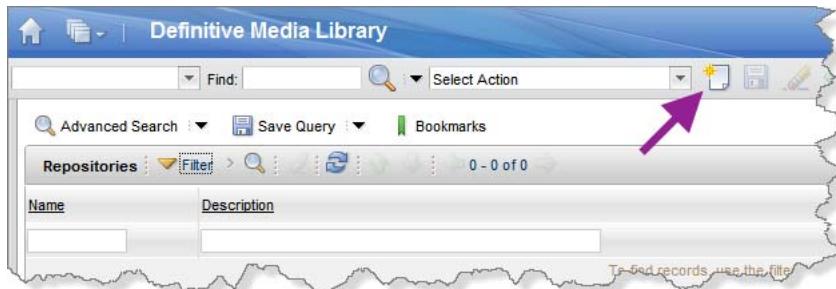
Creating a definitive media library

As previously mentioned, the definitive media library should be surrounded by strict security, and access control. For this reason, in the exercise environment, only the built-in Release Administrators and Release Managers roles are authorized to create definitive media libraries, and register software in these.

To configure the exercise environment to contain a definitive media library in which you can register software media, complete these steps:

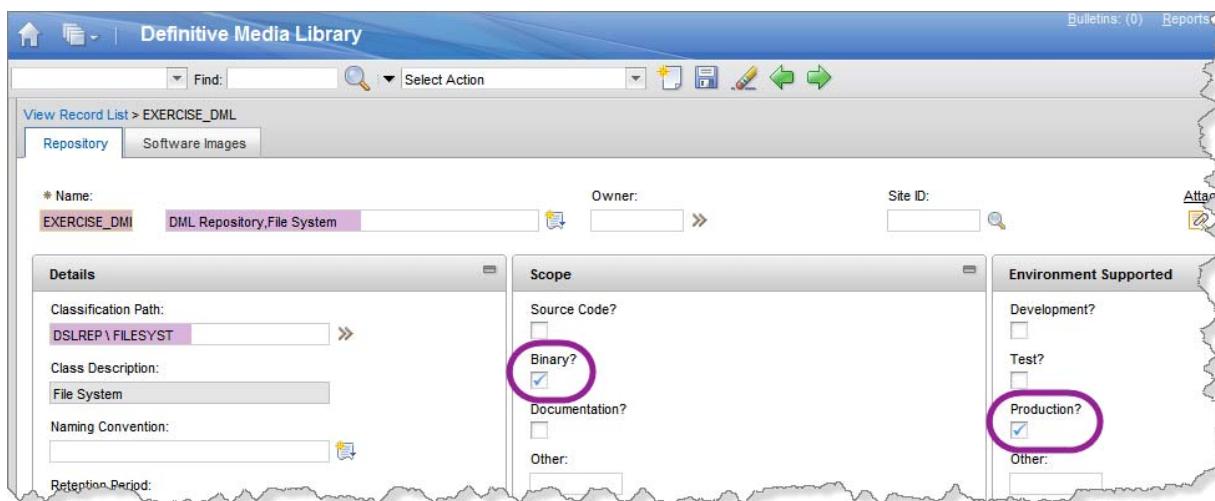
1. Log in to the IBM SmartCloud Control Desk environment as the super administrator, maxadmin, using a password of object00.
2. Navigate to the definitive media library application by clicking the Go To icon () in the Console header and navigate to **Release > Definitive Media Library**.

3. When the Definitive Media Library application opens, press Enter to see all the existing libraries. Ensure that the list is empty, and therefore no Definitive Media Libraries have been created.



4. To create a definitive media library named EXERCISE_DML, click the Create DML icon (in the toolbar, and provide the following information:

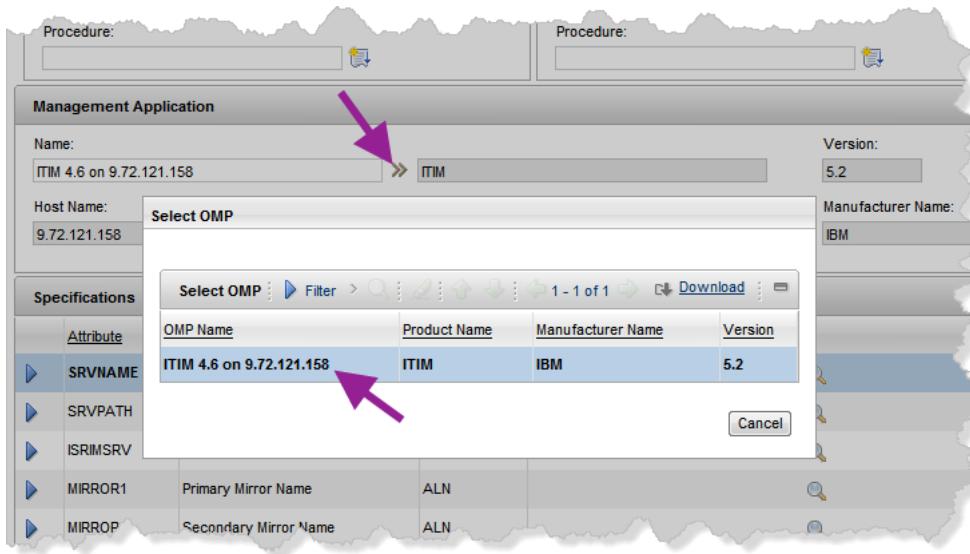
Name	EXERCISE_DML
Description	Definitive Media Library for exercises
Classification Path	DSLREP\FILESYS (use the Detail Menu tool () next to the Classification field to set the value)
Binary	Checked
Production	Checked



Notice that there are many additional options that can be used to specify properties for auditing, capacity, and backup/restore just to name a few. In the Specifications section at the bottom, you also see the attributes that are used to specify the exact location of the library. For this exercise you can ignore those.

5. To link the definitive media library to the operational management product that owns the resources in the DML, click the Detail Menu tool () next to the Name field in the Management

Application section. When the Select OMP window appears, select the only OMP in the environment.



When you are ready, click the Save icon (💾) in the toolbar to save your DML definition.



Note: In a real-life scenario, the OMP linked to a DML would be a software distribution tool such as Tivoli Provisioning Manager (TPM). However, such an OMP is not present in the exercise environment, so you need to simulate the TPM OMP using the existing IBM Tivoli Identity Manager OMP definition.

At this point you have prepared the environment to keep track of software images that are authorized to be used in your production environment. However, at this point the library is empty.

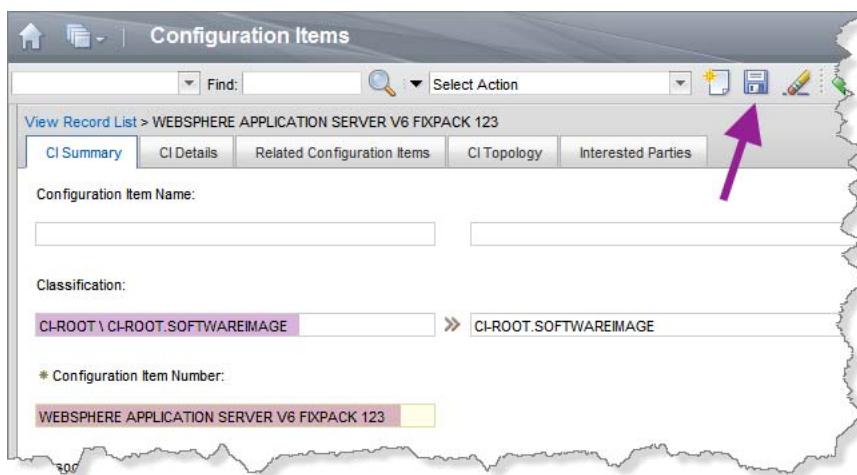
Create a Software Image CI

Dealing with software deployments, CIs serve as the source for a software deployment. These CIs are a SOFTWAREIMAGE configuration items that identify the software images in the definitive media library that must be used for software deployment.

To create a SOFTWARE image CI for the WebSphere V6 FixPack 123 binaries and installation code, complete these steps:

1. Navigate to the Configuration Items application by clicking the Go To icon (grid) in the Console header and navigate to **IT Infrastructure > Configuration Items**.
2. When the Configuration Items application launches, click the New CI icon (plus) in the toolbar and provide these values in the CI Summary tab:

Classification	CI - ROOT \ CI - ROOT.SOFTWAREIMAGE
Configuration Item Number	WEBSPHERE APPLICATION SERVER V6 FIXPACK 123



There might be more details to provide later on, but for now this will work.

Click the Save icon (disk) in the toolbar to save the new SOFTWAREIMAGE CI.

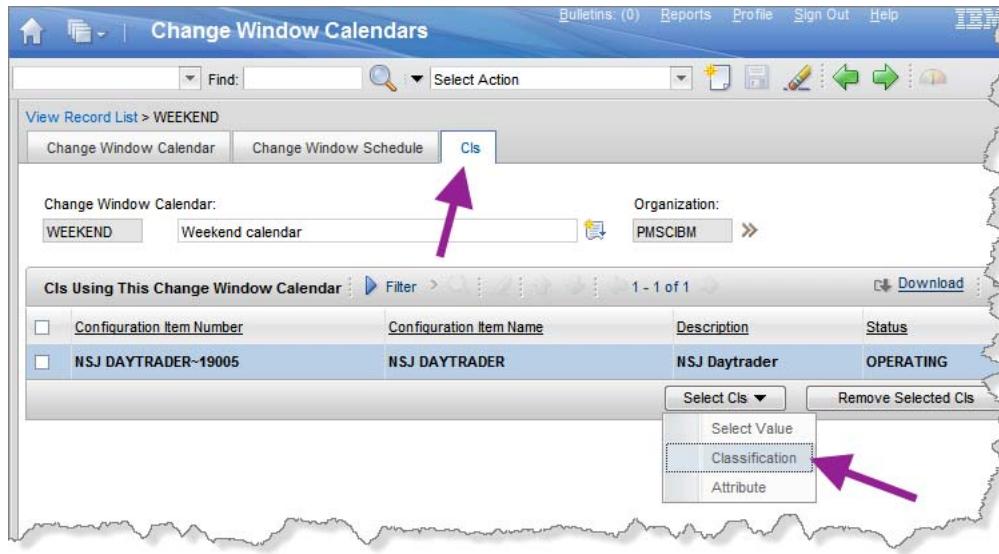
Assign change windows to WebSphere server CIs

The release scheduling process does not use the impact analysis module to calculate impacted CIs the same way the Change Management module does. This means, that when scheduling releases, only the change windows and blackout periods that apply to the target CIs of a release are taken into account when scheduling the release.

To be able to demonstrate this in these exercises, you must associate the Change Window Calendar with the CIs that will become targets of the release. To do this, complete these steps:

1. Open the Change Window Calendars application as the super administrator, maxadmin, by clicking the Go To icon (grid) in the Console header and select **Changes > Change Window Calendars**.
2. When the Change Window Calendars application launches, press Enter to populate the list, open the Change Window Calendar named WEEKEND, and navigate to the CIs tab.

- To add CIs, choose **Select CIs > Classification** from the CIs Using This Change Window Calendar section.



- When the Classification Search window appears, navigate down the CI-ROOT classification hierarchy until you find the classification named CI-ROOT.WEBSPHERESERVER:CI-ROOT.WEBSPHERESERVER, by following this path:

```

CI - ROOT
  CI - ROOT . APPSERVER
    CI - ROOT . J2EE SERVER
  
```

Select the classification, so you see that the attributes section as well as the CIs section are populated.

Attribute	Description
APP SERVER_EXECUTABLENAME	APP SERVER_EXECUTABLENAME
APP SERVER_KEYNAME	APP SERVER_KEYNAME
APP SERVER_MANAGEDSYSTEMNAME	APP SERVER_MANAGEDSYSTEM
APP SERVER_NAME	APP SERVER_NAME
APP SERVER_PRODUCTNAME	APP SERVER_PRODUCTNAME

If you do not see exactly 10 instances, check that you selected the correct classification path.

5. To select the first five server instances, check the *select all* check box in the heading line inside the CIs section
6. To select the five remaining instances, click the Next Page (icon in CIs section header, and check the select all check box, so you see that all the CIs in the list have been selected. Then, and click **OK** to assign all the selected CIs to the change window calendar.
7. When the Classification Search window disappears, you see that all ten CIs have been added to the change window calendar. From the names, you can almost determine which types of server instances you selected, but as a matter of fact, you have selected WebSphere servers, node agents, as well as deployment manager instances.

You have now ensured, that the tasks that affect the availability of the CIs, soon to become targets of a release, can only be scheduled in accordance with the specifications in the WEEKEND calendar.

8. You are done, for now. Click the **SignOut** link in the upper right corner of the IBM SmartCloud Control Desk console to log off so another user can log in.



You are now ready to start the specific release management exercises.

Exercise 3. Submit a request for the application of a WebSphere fix pack

To create the initial request for the deployment of WebSphere v6 FixPack 123, which will update the encryption keys used to secure the internal keys used by the WebSphere components to authenticate with one another, you must complete these steps:

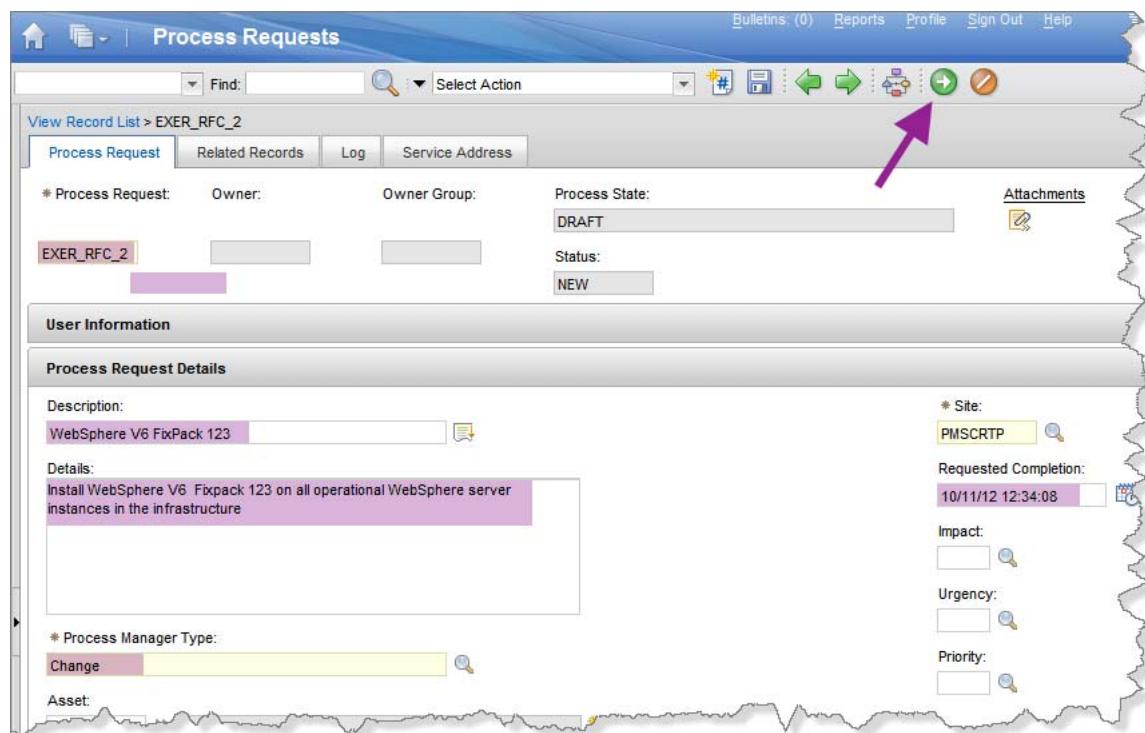
1. Log into the IBM SmartCloud Control Desk console as the process management requester Steve, using a password of `object00`.
2. When the Process Management Requester start center appears, use the **New Process Request** link in the Favorite Applications portlet to launch the Process Requests application.

3. To submit the request, do the following:

- a. Provide the details of the request, supply the following information:

Process Request	EXER_RFC_2
Description	WebSphere V6 FixPack 123
Details	Install WebSphere V6 Fixpack 123 on all operational WebSphere server instances in the infrastructure
Requested Completion	<two months into the future>
Process Manager Type	Change
Classification	PMCHG \ PMCHGSFW \ PMCHG_MWINSTALL

and click the Submit icon (⊕) when you are ready.



The screenshot shows the 'Process Requests' screen in IBM SmartCloud Control Desk. The process request 'EXER_RFC_2' is selected. The 'Process Request Details' section contains the following information:

- Description:** WebSphere V6 FixPack 123
- Details:** Install WebSphere V6 Fixpack 123 on all operational WebSphere server instances in the infrastructure
- Process Manager Type:** Change
- Process State:** DRAFT
- Status:** NEW
- Site:** PMSCRTP
- Requested Completion:** 10/11/12 12:34:08
- Impact:** (empty)
- Urgency:** (empty)
- Priority:** (empty)

The toolbar at the top right includes icons for Find, Select Action, and various process steps. A purple arrow points to the 'Submit' icon (a green circle with a white plus sign).

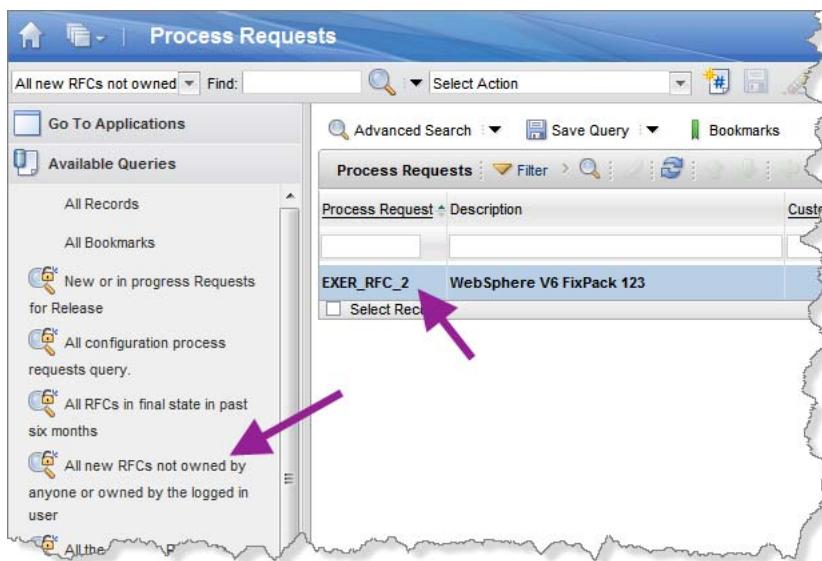
- b. Verify that the process state of the request changes to SUBMITTED.
 4. Use the **SignOut** link to log off, so another user can log in.

Now, you have to rely on the change team to process your request.

Exercise 4. Accept the change request

The change manager, Franklin, receives an email indicating that a new change request has been submitted. When he realizes that the request involves mass deployment of a software update to multiple servers he decides to accept it and assign the request to Lucy. Complete these steps to replicate what Franklin did:

1. Log into the IBM SmartCloud Control Desk console as the process management requester Franklin, using a password of object00.
2. To open the outstanding process requests, click **Process Requests** in the Favorite Applications portlet in the Change Manager start center, and when the Process Requests application has been launched, load the query named *All new RFCs not owned by anyone, or owned by the logged in user*.



The query reveals only a single request; the one that was just submitted by Steve.

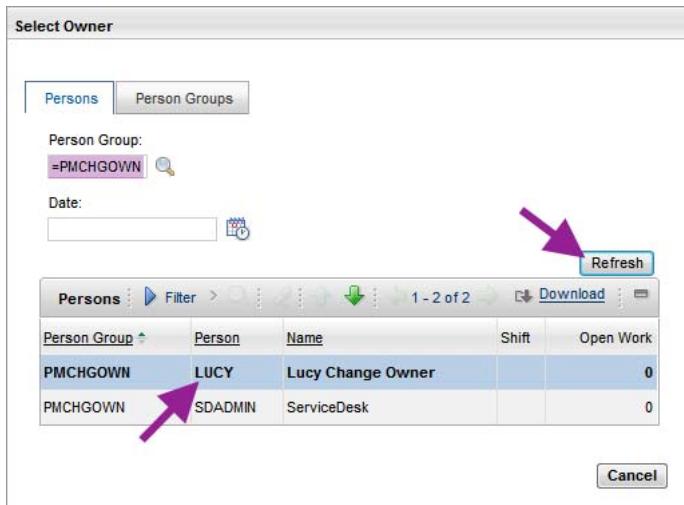
Click the **EXER_RFC_2** request to open it.

3. To immediately accept the request, click the Accept icon () in the toolbar.

When the Manual Input prompt appears, accept the default option to Review and refine the new Change Work Order by pressing **OK**.

4. In the change, ensure that the Change Type is **Standard**.

5. To assign Lucy as the owner, click the Select Owner icon (🔍) in the toolbar. When the Select Owner window appears, enter =PMCHGOWN in the Person Group field, and click Refresh.



The list of users is now limited to two entries. Select **Lucy** to as the new owner of the change.

6. When you assigned the new user, the change was automatically saved. You can now sign off, so lucy can use your browser. Click the **SignOut** link in the header.



You have now accepted Steve's request and assigned Lucy as the change owner, Lucy is now responsible for the further processing of the change.

Exercise 5. Processing the change

It is time to the change owner, Lucy, to go to work. When looking over the change, and the related request, she realizes that change is meant to deploy a software update to multiple target CIs. Based on that knowledge, Lucy decides to do the following before requesting the creation of a release based on the change:

- Assign all the relevant configuration items as target CIs. This helps the release team, since the target CIs are transferred to the release.
- Assign a job plan that only waits for the release to complete before completing the change
- Create a software image CI to represent the fix pack installation image, and assign it as the source CI in the change.

To prepare for these activities, follow these steps to open the change:

1. Sign on to the IBM SmartCloud Control Desk console as the change owner, Lucy, using a password of object00.
2. When the Change Owner start center appears, use the **Changes** link in the Favorite Applications portlet to launch the Changes application.
3. In the Changes application, launch the *All my active Changes* query to list all Lucy's changes.

The screenshot shows the 'Changes' application interface. On the left, there's a sidebar with a 'Available Queries' section containing links like 'All Records', 'All Bookmarks', and 'All my active Changes'. A purple arrow points to the 'All my active Changes' link. The main area displays a table with one row, showing a change with ID '1278' and summary 'WebSphere V6 FixPack 123'. Another purple arrow points to the change ID '1278'.

There will only be a single change in the list. Click the link (#1278 in this example) to open the change.

Assign targets to the change

To assign all the WebSphere Application Server server instances in the CI-ROOT hierarchy to the change, complete these steps:

1. First, navigate to the Change tab, and locate the Additional Targets section
2. To select targets click **Select > CIs > Classification** to be able to select multiple CIs from a list.

The screenshot shows a 'Select > CIs > Classification' dialog. On the right, there's a sidebar with options: 'Assets', 'Locations', 'Cls' (which is selected), 'From Routes', 'From Collections', and 'From WO Hierarchies and Relationships'. Two purple arrows point to the 'Select Value' button and the 'Select' button at the bottom right of the dialog.

- When the Classification Search window appears, navigate down the CI-ROOT classification hierarchy until you find the classification named CI-ROOT.WEBSPHERESERVER:CI-ROOT.WEBSPHERESERVER, by following this path:

```
CI - ROOT
  CI - ROOT . APPSERVER
    CI - ROOT . J2EE SERVER
```

Select the classification, so you see that the attributes section as well as the CIs section are populated.

The screenshot shows the 'Classification Search' window. On the left, a tree view of classification hierarchy is shown, with a purple arrow pointing to the 'CI-ROOT.WEBSPHERESERVER' node. The main area has two tabs: 'Attributes' and 'CIs'. The 'Attributes' tab displays a table with columns 'Attribute' and 'Description', listing attributes like APPSERVER_EXECUTABLENAME, APPSERVER_KEYNAME, APPSERVER_MANAGEDSYSTEMNAME, APPSERVER_NAME, and APPSERVER_PRODUCTNAME. The 'CIs' tab displays a list of Configuration Item Names, with the first five selected (indicated by a checked checkbox) and circled in red. A purple arrow points to the 'Next Page' button (green right arrow) at the top of the CIs list, which is also circled in red. The list includes entries such as RHEL56-3.TIVLAB.SANJOSE.IBM.COM:RHEL56-3 NODE01:TRADESERVERS, RHEL56-2.TIVLAB.SANJOSE.IBM.COM:RHEL56-2 NODE01:TRADESERVER3, and RHEL56-2.TIVLAB.SANJOSE.IBM.COM:RHEL56-2 NODE01:TRADESERVER2.

If you do not see exactly 10 instances, check that you selected the correct classification path.

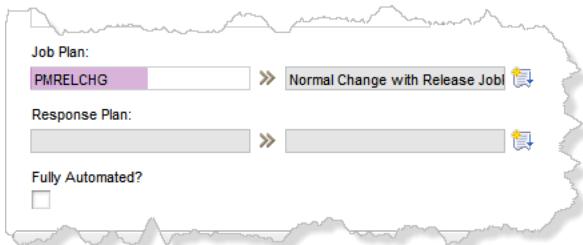
- To select the first five server instances, check the *select all* check box in the heading line inside the CIs section
- To select the five remaining instances, click the Next Page (→) icon in CIs section header, and check the select all check box so you see that all the CIs in the list have been selected. Then, and click **OK** to assign all the selected CIs to the change.
- When the Classification Search window disappears, you see that all ten CIs have been added to the change. From the names, you can almost determine which types of server instances you selected, but as a matter of fact, you have selected WebSphere servers, node agents, as well as deployment manager instances.
- When you have added the ten CIs as targets to the change, click the Save icon (floppy disk) in the toolbar to store the change.

You are done. All the targets have been added to the change.

Assign the release-aware job plan to the change

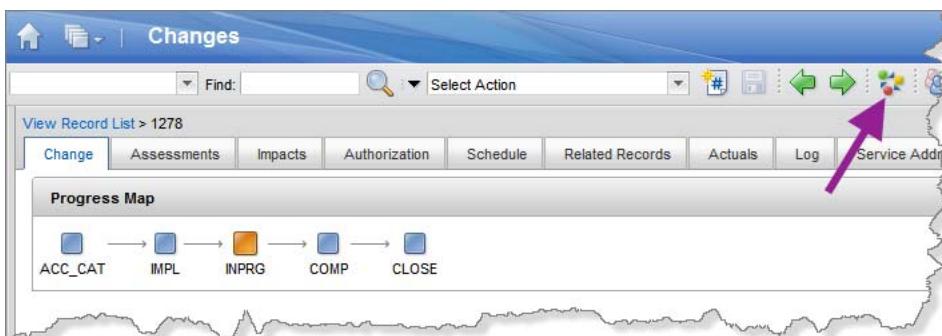
To apply the job plan that does nothing except waiting for the associated release to complete, do the following:

1. Open the Schedule tab, and use the **Select Value** option in the Detail Menu tool (») next to the Job Plan field to assign the job plan named PMRELCHG to the change.



2. Click the Save icon (💾) in the toolbar to save the latest modifications to the change.
3. You have supplied all the information you can, so you can start the change processing.

Use the Change Status icon (↻) in the toolbar to change the status of the change to InProgress.



This status indicates that the change is ready to be assessed, but before you get to that step, the release needs to be created and specified so you can determine exactly what needs to be done.

At this point you have specified the targets of the change, and instructed it to complete once the related release completes. At this point the release is not yet created, and therefore not linked to the change. The details of the CI, such as location, authorization status are yet to be determined.

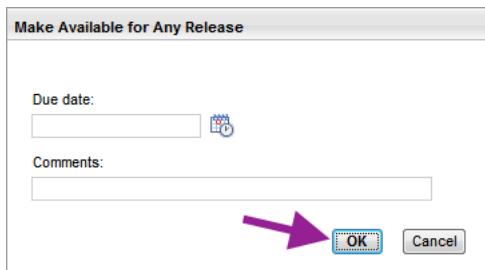
Make the change available for releases

To transfer responsibility of the further processing to the release team, the change owner creates a release, based on the current change. During this process, the change will be linked to the release, and the release will be aware of all the CIs that have been specified.

To create a new release directly, you can use the Select Action > Create > Release option. However, for this exercise you decide to make the change available to any release. This way, the release owner can import the link into any release that the release owner selects, and you allow the release team to decide how they want to organize their releases.

To make the change available to any release, do the following:

1. Choose **Select Action > Release Requests > Make available for any Release**.
2. When the Make Available for any release window appears, leave the Due date field empty, and click **OK**.



The change has now been made available so it can be linked in to any release.

Create a release request

To ensure that the new change is brought to the attention of the release team, Lucy decides to create a process request, so the release team is notified about the requirement to deploy the WebSphere fix pack.

To create a release request complete these steps:

1. Use the **Select Action > Create > Process Request** option to create a new request.
2. When the Process Request application loads, provide the following details:

Description	Deploy WebSphere V6 FixPack 123
Details	Install WebSphere V6 Fixpack 123 on all WebSphere instances in the infrastructure
Process Manager Type	Release
Classification	PMREL \ PMRELSFW \ RMMWINSTALL

3. Before you submit the release request, navigate to the Related Records tab, and notice that the change is related to the request. This has happened because you created the request while editing the change.
4. To submit the request, click the Submit icon (green circle with a plus sign) when you are ready.

5. Your job as change owner is done, for now. Click the **SignOut** link in the upper right corner of the IBM SmartCloud Control Desk console to log off so another user can log in from your browser.



In this exercise you have created the basics for the release. By adding the source and target CI information to the change, you have already performed some of the work related to the release. By applying the PMRELCFG job plan to your change, you have ensured that there is no overlap between the change and the release, and from a processing point of view, you have basically embedded the release in the change.

Exercise 6. Creating and specifying a release for software deployment

The specification is one of the most critical activities when managing releases. During specification you make decisions that are critical for how the release processing will take place, and which aspects of the change to include.

The most important decision you make is to decide which job plan to assign to the change. Release management does not use workflows to progress the release, as for example change processing does, so all of the job plans are used to manage the process. Activities and tasks in the job plan are assigned to help you serialize and perform specific steps of the release processing.

Job plans

IBM SmartCloud Control Desk offers seven release-related standard job plans. You can regard these as best practice job plans that you can tailor during the specification of the release to meet the exact requirements of the release.

Each of the system provided release-specific job plans include one or more predefined activities, which in turn contains the individual tasks. The seven release-specific job plans are:

PMRELEASE	The PMRELEASE job plan can be used to plan and structure specific release work plans. This job plan implements the standard release process in a typical IT environment. It contains all of the activities and tasks that are typically used for release processes.
PMRELEDB	The PMRELEDB job plan can be used to install a database.
PMRELMW	The PMRELMW job plan can be used to install middleware.

PMRELSB	The PMRELSB job plan can be used to build a server.
PMRELBLDTE	The built-in PMRELBLDTE job plan can be used to build and test a release package that you do not want to deploy at this time. Activities in this job plan ensure that the release is adequately planned, designed and built, tested and verified, and reviewed and closed. The release is ready for deployment when you determine deployment is needed.
PMRELDPY	The PMRELDPY job plan can be used to plan, prepare, and deploy a release package.
PMRELSEDPY	The PMRELSEDPY job plan can be used to plan, design and build, and test and verify a new release package, and to distribute and install the release to the IT infrastructure.



Note: Despite the fact that job plans are provided, IBM SmartCloud Control Desk does not provide any built-in response plans. If you wish to enforce standard policies through automated response plan selection, you can create your own response plans.

Each job plan includes one or more tasks, or activities, which in turn includes the specific tasks that need to be performed during each activity. When specifying the release, it is the responsibility of the release manager or release owner to select the proper job plan, and take a critical look at each of the activities to determine if the specified tasks are relevant for the current release.

The most comprehensive job plans are the PMRELEASE and PMRELSEDPY job plans. The PMRELEASE job plan implements the ITIL V3 release process, which is designed to be applicable to almost any kind of change, from the simplest software deployment to the establishment of and migration to a totally new datacenter. The PMRELEASE job plan contains these activities:

- Release Plan Activity
- Design and Build Release
- Test and Accept Release
- Plan Release Rollout
- Communicate, Prepare, and Train for Release
- Distribute and Install Release

You see a number of activities that are not necessarily directly related to modifying the IT environment. Remember a release is defined as:

A collection of hardware, software, documentation, Processes or other Components required to implement one or more approved Changes to IT Services. The contents of each Release are managed, Tested, and Deployed as a single entity.

To manage all the activities of a release as they apply to the design, building, testing, documentation, approval, training, deployment, and verification of a release. The PMRELEASE and PMRELSEDPY job plan both include every possible activity for you to manage a complex release, but the other job plans are more specific to particular types of releases.

During implementation of IBM SmartCloud Control Desk a number of job plans that apply to your particular policies and requirements would be developed.

Tasks

During the processing of a release, tasks are assigned to users that are associated with specific roles. As part of the task definition, automated actions may be executed in order to provide some level of automation in the tool. Note that the automation is associated with the tasks, so it is required that the tasks are initiated and completed to ensure that the automation is applied.

Some tasks are classified, others are not. IBM SmartCloud Control Desk uses the task classification to identify specific milestones, approvals, or software deployment tasks, so they can be highlighted in the console. Some tasks, for example the ones used to deploy software packages, are associated with assisted workflows. These are used to help the person that performs the task to navigate or complete the job at hand.

Accepting a release request

For this exercise, assume the identity of the release manager, Silvia, and accept the release request in order to create the release in the CMDB. Once the release has been created, you assign ownership to the release owner Henry.

To accept the release, complete these steps:

1. Log in to the IBM SmartCloud Control Desk console as the release manager, **Silvia**, using a password of **object00**.



2. When the Release Manager start center loads, notice the information in the Active Requests for Release portlet.

A screenshot of the "Active Requests for Release" portlet. The portlet has a header with "Active Requests for Release" and various filter and search options. The main area is a table with columns: Request ID, Description, Status, Classification, and Requester. Two rows are visible, both circled in purple with a pink arrow pointing to the second row. The first row is for request PR1006 with description "Add Change To Release, 1278" and status "QUEUED". The second row is for request PR1007 with description "Deploy WebSphere V6 FixPack 123" and status "QUEUED".

Request ID	Description	Status	Classification	Requester
PR1006	Add Change To Release, 1278	QUEUED	ADDCHGREL	LUCY
PR1007	Deploy WebSphere V6 FixPack 123	QUEUED	PMREL_RMMWINSTALL	LUCY

The Active Requests for Release portlet contains the request for deploying WebSphere V6 FixPack 123 that the change owner recently submitted, as well as the request to add a change (1278 in this example) to any release.

To open the request to Deploy WebSphere V6 FixPack 123, click the link.

3. When the Process Requests application opens, you see all the details provided by the requester. Navigate to the Related Records tab. Here you see any related changes, and can use the links to find more details.

The screenshot shows the 'Process Requests' application interface. At the top, there's a toolbar with various icons. Below it, a header bar displays 'View Record List > PR1005'. Underneath, there are tabs for 'Process Request', 'Related Records' (which is selected), 'Log', and 'Service Address'. The main content area shows a process request for 'PR1005' with a description 'Deploy WebSphere V6 FixPack 123', a site 'PMSC RTP', and a process state 'SUBMITTED'. Below this, a status box shows 'Status: QUEUED'. The 'Related Records' section has two tabs: 'Related Tickets' (0 - 0 of 0) and 'Related Work Orders' (1 - 1 of 1). The 'Related Work Orders' table has columns: Work Order, Description, Class, Status, and Relationship. It contains one row with a work order key '1278', description 'WebSphere V6 FixPack 123', class 'CHANGE', status 'IMPL', and relationship 'ORIGINATOR'. A purple circle highlights the 'ORIGINATOR' value in the Relationship column. A purple arrow points to the green checkmark icon in the toolbar.

Notice, in the Relationship field related to the change, that you can see that the change is the originator of the release. This information is used to close the change when the release completes.

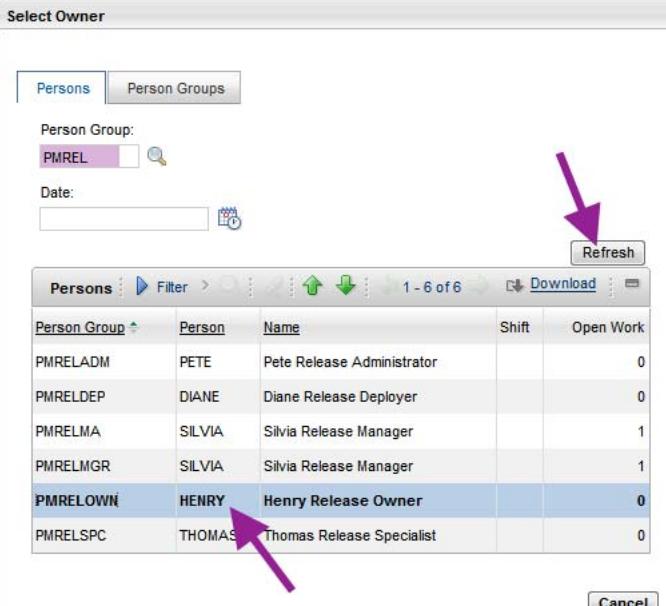
To accept the release request, click the Accept icon (✓) in the toolbar.

4. At this point, the release has been created, but no user is assigned. To assign the Henry as the owner of the release, complete these steps.
 - a. From the Related Records tab, refresh the information in the console by entering the release number (PR1005 in this example) in the Find field, and click the Find icon (🔍).
Notice, that now you see the release in the Related Work Order section.

The screenshot shows the 'Process Requests' application interface. In the top navigation bar, there is a 'Find' field containing 'PR1005' with a magnifying glass icon to its right. Below the navigation bar, there are tabs: 'Process Request' (selected), 'Related Records', 'Log', and 'Service Address'. The main content area displays a 'Process Request' record for 'PR1005' with the description 'Deploy WebSphere V6 FixPack 123' and site 'PMSCRTP'. To the right, status information is shown: 'Process State: ACCEPTED' and 'Status: INPROG'. Below this, the 'Related Tickets' section shows '0 - 0 of 0' rows. The 'Related Work Orders' section is highlighted with a purple oval and contains two entries: '1278' with description 'WebSphere V6 FixPack 123' and 'Class: CHANGE', and '1280' with description 'Deploy WebSphere V6 FixPack 123' and 'Class: RELEASE'. A purple arrow points from the 'Find' field in the top bar to the '1280' entry in the 'Related Work Orders' list. Another purple arrow points from the 'Go To Releases' link at the bottom of the 'Related Work Orders' section to the '1280' entry.

- b. To navigate to the release, use the Detail Menu tool (➡) next to the release to choose **Go To Releases**.

- c. When the release is opened, assign the Henry Release Owner as the owner for the release by clicking the Select Owner icon () in the toolbar. In the Select Owner window that appears, supply a value of `PMREL` in the Person Group field, and click **Refresh**.



Person Group	Person	Name	Shift	Open Work
PMRELAADM	PETE	Pete Release Administrator		0
PMRELDEP	DIANE	Diane Release Deployer		0
PMRELMA	SILVIA	Silvia Release Manager	1	
PMRELMGR	SILVIA	Silvia Release Manager	1	
PMRELOWN	HENRY	Henry Release Owner		0
PMRELSPC	THOMAS	Thomas Release Specialist		0

To select the Henry Release Owner, simply click the link in the Person column.

Your job as the release manager is done. The release has been created, and assigned to a release owner for further specification and approval.

5. To free up the browser, use the **SignOut** link, so another user can sign in.



You have just accepted the release request, and thereby created a release that you assigned to a release owner. Now it is time for the release owner to specify the details of the release by assigning and customizing an appropriate job plan, before the release can be approved.

Approval and specification of the release

The specification of the release is where you assign a job plan. This is done before the release is approved. Selecting the correct job plan, and modifying it to your particular needs determines how the entire release is processed. You can add tasks and activities to the release after the initial job plan assignment, which is a common occurrence when working with releases in real life.

The nature of releases is such, that at the outset, you are uncertain about the content and scope of the release. The release is basically a project in which you define what needs to be done, and then you do it. This is very different from the way changes are processed. During change processing, you have a set number of ways to process the change, and based on certain attributes, a specific, structured path (or workflow) is followed, taking the change through a set of predetermined states.

The uncertainty, or need for flexibility, is what makes releases harder to specify in comparison to changes. The specification and processing of the release have to provide enough flexibility to support the dynamic nature of releases, as well as the diversity of resources that can be included in a release.

However, software deployment releases also follow a pretty straightforward structure. The release needs to contain activities to define or complete the following

- the deployment model (how), and scope (what needs to be installed and where)
- building, testing, verification, approval, and registration of the installation package
- roll-out plan including communications and training,
- implementation
- verification.

For most software deployments this model can be adapted, even though it can become complex. Imagine creating a release for deploying a new application system, for which you need to orchestrate the deployment of brand new OS configurations, middleware components, and application modules, and provide integration between all the components.

Often you will see, that Operational Management Products, such as Tivoli Provisioning Manager (TPM), are leveraged to perform the actual deployment. IBM SmartCloud Control Desk provides an integration module to TPM, so you can use the configuration item information in the CMDB, to provide information directly to TPM. This way, TPM becomes responsible for the actual implementation of the deployment, while it is still controlled through your release management process. All your release deployment tasks need to do is to gather the required information from the CMDB, parse it to TPM, and inspect the results once the TPM tasks have completed.

For this exercise, you take a manual approach to the deployment. You configure the release to use a standard middleware installation job plan, and remove unnecessary steps. Once you have the job plan as complete as possible, you approve the release, and then you can start processing the release, activity by activity.

Release approval

To approve the release, and complete these steps:

1. Log in to the IBM SmartCloud Control Desk console as the release owner, Henry, using a password of object00.

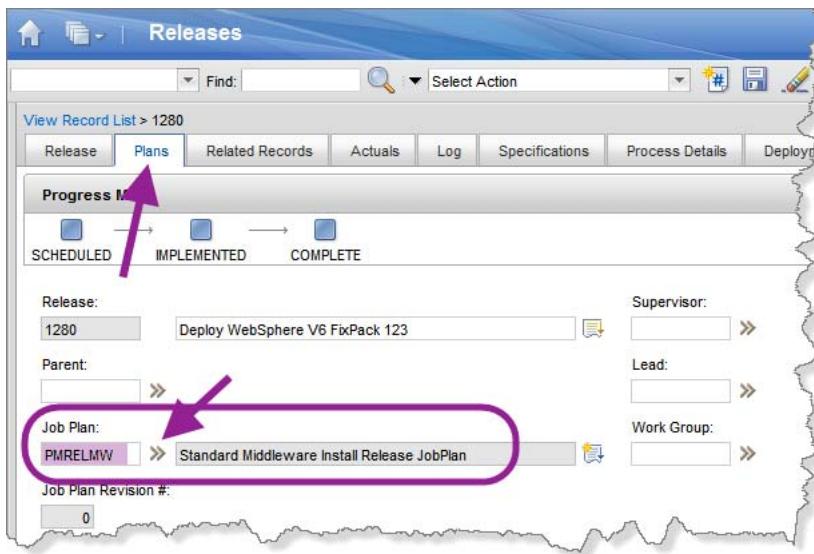


2. Because the release has not yet been approved, it does not show up in any of the portlets in the Release Owners start center. To locate the release, do the following:
 - a. Use the **Releases** link in the Favorite Applications portlet to open the Releases application.
 - b. Launch the query named *All releases that are waiting for approval*.

A screenshot of the 'Releases' application interface. On the left, a sidebar lists various queries: 'All releases that are wait...', 'Available Queries', 'All Releases in Final state that were late', 'All Releases in Final State', 'All releases that are waiting for approval' (which has a purple arrow pointing to it), 'Successful Releases that were late', and 'Successful Releases'. The main area shows a table titled 'Releases' with one row highlighted by a purple oval. The table columns are 'Release', 'Summary', 'Customer', and 'Status'. The highlighted row contains the values '1280', 'Deploy WebSphere V6 FixPack 123', 'Customer', and 'WAPPR'. A 'Select Records' link is visible at the bottom of the table row.

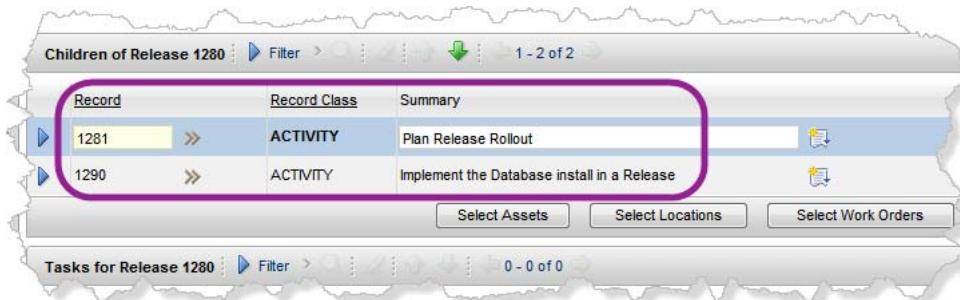
Notice that the query reveals only one release. The one that was recently accepted by the release manager. Open the release by clicking the link.

- To assign a job plan to the release open the Plans tab and locate the Job Plans field. Use the **Select Value** option of the Detail Menu tool (») to assign the job plan named PMRELMW.



Notice how the Progress map changes from the default change progress map to the release progress map that highlights the main activities of the assigned job plan.

- To see the plan that was applied, focus on the Children of Release... section. Here you see that only two main activities were added to the release.



Notice how the activities reflect just a subset of the main activities of the ITIL release management process: Plan, Design, Build, Test, Communicate, Deploy, Review and Close.

In the Children of Release ... section you only see the high-level activities. Each of them contains multiple tasks that must be performed to process the activity. You can see the details for each activity if you select Go to Activities and Tasks from the Detail Menu tool (»). However, you can also take a look at the Process Details tab.

- If you have inspected the details of each activity you will have noticed that the current job plan does not include any activities or tasks to build, test, verify, document, approve, or register the installation package. Luckily, this job plans to build and test releases are available in other job plans, so you can easily add them to this release, by completing these steps:
 - To add an activity for building the release, simply click **New Activity** at the bottom of the Children of Release ... section, and in the Child Information that appears provide a value for

the Job Plan of PMRELBUILD. Collapse the Child Information section when you are done, and make a mental note of the record number that was assigned to the new activity.

To find the correct job plan ensure that the value of the WO Class field is set to **Activity**, and click **Refresh**.

The screenshot shows a 'Select Value' dialog box with the following interface:

- Show Job Plans for the Work Order's Asset and Location Only?**: An unchecked checkbox.
- Show Job Plans with No Classes Defined?**: A checked checkbox.
- WO Class:**: A dropdown menu set to **Activity**.
- Refresh**: A button with a purple arrow pointing to it.

Below the dialog is a table listing job plans:

Job Plan	Description	Template Type	Organization	Site
PMREL				
PMRELBUILD	Design and Build Release	ACTIVITY		
PMRELD	Implement the Database Install in a	ACTIVITY		

- To add an activity for testing the release, click **New Activity** at the bottom of the Children of Release ... section again, and in the Child Information that appears provide a value for the Job Plan of PMRELTEST.

To ensure that the testing of the release occurs after the building, you must make the build activity the predecessor of the test activity. Scroll down until you see the Predecessors field, and use the Detail Menu tool (next to the Predecessors field to assign the record number of the build task as the predecessor for this activity.

- Finally, to make sure that the testing is completed before you start planning, ensure that the testing activity is assigned as the predecessor of the planning task.
- When you are done, the Children of Release ... section should look similar to this:

The screenshot shows a table titled 'Children of Release 1280' with the following data:

Record	Record Class	Summary
1306	ACTIVITY	Design and Build Release
1310	ACTIVITY	Test and Accept Release
1281	ACTIVITY	Plan Release Rollout
1290	ACTIVITY	Implement the Database install in a Release

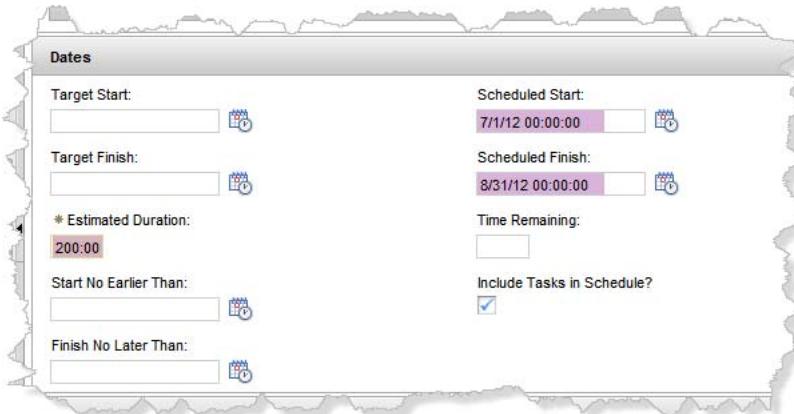
Notice that the activities are shown in the sequence determined by the predecessor settings, so if your sequence is not similar to the one shown, you need to ensure that the predecessor settings are correct.

- You may also, but is not required to, schedule the release. Scheduling the release involves setting realistic Scheduled Start, and Scheduled End date for the most important tasks that was imported from the job plan, and for the entire release. In this exercise you will not spend time on

scheduling the individual tasks, but to schedule the entire release, you should complete these steps:

- Navigate to the Release tab, and locate the Dates section near the bottom.
- Apply the values shown below for the related fields:

Scheduled Start Date	<the first day of the current month>
Scheduled End Date	<the last day of the next month>
Estimated Duration	200 (hours)



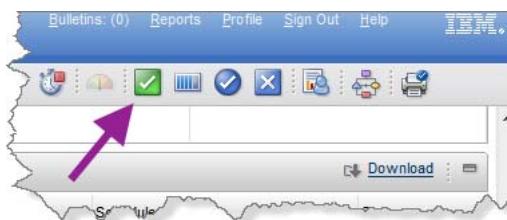
- Click the Save icon (floppy disk) in the toolbar to save the latest updates to the release.

Finally, you are ready to accept the release in its current state.

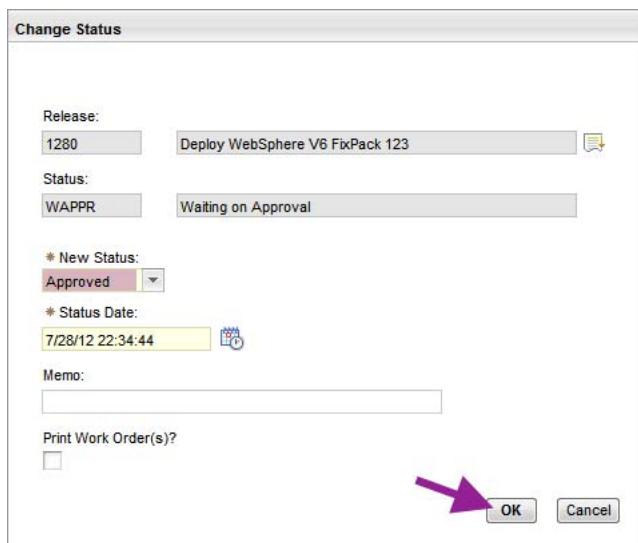


Note: The scheduling mechanism for releases does not use the Scheduler application like the Change application does. If you wish to use the Scheduler application for your release, you can create your own scheduler project, by specifying the release number in the scheduler project definition. This will include all the activities and tasks that are included in the release in the scheduler project. Note that, by default, the release owner is not authorized to use the Scheduler application.

- In order to start the processing, all you need to do is to accept the release. Click the Approve Release icon (checkmark) in the toolbar.



When the Change Status windows appears, ensure that the new status is set to Approved, and click **OK** to confirm the approval.



You have successfully approved the release. This implies that the release now is marked as ready to be processed,

8. To see the immediate effects of the approval, use the Home icon (in the title bar to return to the Release Owner start center, and notice how the release now appears in multiple portlets, three to be exact.

The screenshot shows the IBM SmartCloud Control Desk interface with four active portlets:

- Master Release Calendar:** Displays a single row of data: 'Deploy WebSphere V6 FixPack 123' by 'HENRY' with scheduled dates from '7/1/12 00:00:00' to '8/31/12 00:00:00'.
- My Active Requests for Release:** Displays a table with columns: Request ID, Description, Status, Classification, Requester, and Due Date. It shows 'No Data Found.'
- My Active Releases:** Displays a table with columns: Release, Summary, Priority, Progress, Scheduled Start, and Scheduled Finish. It shows a single row: '1280 Deploy WebSphere V6 FixPack 123' with dates '7/1/12 00:00:00' and '8/31/12 00:00:00'. This portlet is circled in red.
- My Late Releases:** Displays a table with columns: Release, Summary, Priority, Progress, Scheduled Start, and Scheduled Finish. It shows a single row: '1280 Deploy WebSphere V6 FixPack 123' with dates '7/1/12 00:00:00' and '8/31/12 00:00:00'. This portlet is also circled in red.

Not surprisingly, the release appears in the release owners My Active Releases portlet, but because you applied scheduling dates, it also appears in the Master Release Schedule portlet. The scheduling is also responsible for the appearance of the release in the My Late Requests portlet because the scheduled start date is before the current time.

Before you go into all the details, you should understand the applied job plan, so you can relate each activity and task to the task at hand.

Release specification

To understand, and optionally modify, the details about the activities that have been created for your release when the job plan was added, complete these steps:

1. Open the release by using the link in any of the portlets in the start center, navigate to the Plans tab, locate the Children of Task ... section
2. To review the first activity of the release, complete these steps:
 - a. Use the **Go To Activities and Task** option from the Detail Menu tool (») next to the first activity in the list, the one named *Design and Build Release*, to see the details of the activity.

Record	Record Class	Summary
1306	ACTIVITY	Design and Build Release
1310	ACTIVITY	Test and Accept Release
1281	ACTIVITY	Plan Release Rollout
1290	ACTIVITY	Implement the Database install in a Release

- b. When the Activities and Tasks application opens, navigate to the Plans tab, and focus on the Tasks for Activity ... section.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
10	10	Design Release	2:00			WAPPR		PMRELOWN
20	20	Build Release	4:00			WAPPR		PMRELOWN
30	30	Update Release Progress	0:01			WAPPR		PMRELOWN

This activity only contains three tasks, and basically only the first two, design and build, are significant.

For each task, you can see the description of the task if you click the Long Description icon (📘) next to the task Summary. The following table lists the descriptions for each task:

Task #	Task Name	Description
10	Design Release	Design the installation scripts and packages that will be deployed. This does not involve creating software to be deployed, but packaging the software so it can be deployed and creating any necessary installation scripts and mechanisms. Design backout procedures if the deployment is not successful.
20	Build Release	Create the Release packages and installation scripts needed. In addition, create communication and education plans needed for deployment, and create backout procedures.
30	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.

After you have understood the purpose of each task, it seems fair to say that the tasks cover your intentions, so there is no need to add or remove tasks.



Note: Most of the tasks are fully documented in the IBM Tivoli Unified Process documentation, which has been loaded into the IBM SmartCloud Control Desk environment on the exercise system. To access this documentation, you can navigate to **Go To > Administration > View Documents**, and search a document named ITUP.

- c. Notice that all three tasks are assigned to the release owner, Henry. They should be assigned to the release specialist role, so enter a value of PMRELSPC in each of the Owner Group fields, or use the **Select Value** option of the Detail Menu tool (») next to each field to perform the update.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
10	10	Design Release	2:00			WAPPR		PMRELSPC
20	20	Build Release	4:00			WAPPR		PMRELSPC
30	30	Update Release Progress	0:01			WAPPR		PMRELSPC

- d. Click the Save icon (💾) in the toolbar to save the latest updates to the activity.

- e. If you look at the details of the last task, Update Release Progress, you should notice that it is classified as PMREL \ PMRELTSK \ PMRELCPR and that it is associated with a Flow Action named PMRELPROGTOBLTGRP. The flow action is responsible for updating the progress of the release when the entire activity completes, and the classification is used to mark this task a milestone in the release processing.

Sequence	Task	Summary	Estimated Duration	Route	Route
10	10	Design Release	2:00		
20	20	Build Release	4:00		
30	30	Update Release Progress	0:01		

Task Information

* Task: 30 Update Release Progress

Under Flow Control?

Flow Action: PMRELPROGTOBLTGRP

Sequence: 30

Status: WAPPR

Classification: PMREL \ PMRELTSK \ PMRELCPR

Classification Description: Change Progress task

Flow Action Assist?

Assisted Workflow: >>

Launch Entry Name:

You have now completed the review of the first activity. You could have focused on additional details such as time estimates, and schedules, but to understand the principles behind release management, these are not significant.

- f. Use the **Return** link in the header to navigate back to the Plans tab of the release.



3. Now look at the second task you added: *Test and Accept Release*, and perform these steps to review this task:
 - a. Use the **Go To Activities and Task** option from the Detail Menu tool (») next to the second activity in the list, the one named *Test and Verify Release*, to see the details of the activity.
 - b. When the Activities and Tasks application opens, navigate to the Plans tab, and focus on the Tasks for Activity ... section.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
10	10	Software Distribution	8:00			WAPPR	HENRY	>>
20	20	Determine if Release is Accepted	1:00			WAPPR	HENRY	>>
30	30	Import Software into DML	4:00			WAPPR	HENRY	>>
40	40	Update Release Progress	0:01			WAPPR	HENRY	>>

This activity only contains four tasks, and the last one is only used to progress the release.

For each task, you can see the description of the task if you click the Long Description icon (DOC) next to the task Summary. The following table lists the descriptions for each task:

Task #	Task Name	Description
10	Software Distribution	Test the deployment of the release package. note errors that occur. use a controlled test environment to test all release packages.
20	Determine if Release is Accepted	Ensure that the appropriate approvals have been obtained for the release, before updating the DML.
30	Import Software into DML	Put golden copies of the release package in the definitive media library and use the definitive hardware store for hardware needed to deploy the release.
40	Update Release Progress	Close the activity, update status of the release and progress the release to the next activity.

If you look at the details of each task, you will notice that some tasks have a special classification, and are associated with an Assisted Workflow. The following table summarizes these details:

Task #	Task Name	Classification	Assisted Workflow	Impl. Task?
10	Software Distribution	PMREL \ PMRELT SK \ SWDIST	PMRELSWDST	yes
20	Determine if Release is Accepted	PMAPPR	<none>	
30	Import Software into DML	PMREL \ PMRELT SK \ RELIMPSW	RELDEFSW	
40	Update Release Progress	PMREL \ PMRELT SK \ PMRELCPR	<none>	

As mentioned earlier, the classification is used to identify tasks with a special importance. In this case you see a task (40) similar to the milestone task that was present in the previous activity. In addition you see a Software Distribution task (10) and an Import Software into DML task (30) which both have assisted workflows. Like the milestone task the classifications are used to apply special processing, and the assisted workflows can be used by the task owner to perform the task. Finally you see that the Software Distribution task (10) also is marked as an Implementation Task, indicating that when this particular task is scheduled, change calendar windows and blackout periods that apply to the target CIs of the task, are taken into account.

- As was the case in the previous task, you need to update the task owner. In this case, the Release Deployer group is responsible for the first task (10), so provide a value of PMRELDEP in the Owner Group field for this task. The Release Owner group is responsible for the second task (20), so the value of the owner group should be PMRELOWN. The Release Specialist group is responsible for the remaining tasks so provide a value of PMRELSPC in each of the Owner Group fields in the last two tasks.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
10	10	Software Distribution	8:00			WAPPR		PMRELDEP
20	20	Determine if Release is Accepted	1:00			WAPPR		PMRELOWN
30	30	Import Software into DML	4:00			WAPPR		PMRELSPC
40	40	Update Release Progress	0:01			WAPPR		PMRELSPC

- Click the Save icon (💾) in the toolbar to save the latest updates to the activity.
 - You have completed the review of the second activity. Use the **Return** link in the header to navigate back to the Plans tab of the release.
- It is time to review the third activity: *Plan Release Rollout*. Complete these steps:
 - Use the **Go To Activities and Task** option from the Detail Menu tool (↗) next to the third activity in the list, the one named *Plan Release Rollout*, to see the details of the activity.
 - When the Activities and Tasks application opens, navigate to the Plans tab, and focus on the Tasks for Activity ... section. In its initial state it only shows the first six of eight tasks.

If you could see all the eight tasks in the Plan Release Rollout activity, you would see a list of tasks similar to this:

- 10 Develop Site Roll-out Plans
- 20 Schedule Asset Delivery
- 30 Schedule Release Implementation
- 40 Coordinate with Communication and Training
- 50 Identify new CIs Involved in a Release
- 60 Approve Rollout Plan
- 70 Approve Impacted CI List
- 80 Update Release Progress

You can already, at first glance, see that for the current release, where no assets or new CIs are used, that tasks number 20, and 50 can be removed. They simply do not apply to this release.

For each task, you can see the description of the task if you click the Long Description icon (doc) next to the task Summary. The following table lists the descriptions for each task:

Task #	Task Name	Description
10	Develop Site Roll-out Plans	Create the plans for rolling out the Release to each site to which the Release will be rolled out. Plans should include Release dates and deliverables. Refer to related RFCs, problems, and known errors that are addressed in the Release.
20	Schedule Asset Delivery	If new assets are deployed as part of this Release, schedule their delivery. These should be received at a central internal location prior to delivery to the site.
30	Schedule Release Implementation	Schedule the deployment of the Release to the site.
40	Coordinate with Communication and Training	Determine when training related to this Release will be provided to the affected sites. Schedule the delivery of communications concerning the Release to the site.
50	Identify new CIs Involved in a Release	If new configuration items are to be deployed as part of the Release, send that information to configuration management for inclusion in the CMDB.
60	Approve Rollout Plan	Approve the rollout plan

Task #	Task Name	Description
70	Approve Impacted CI List	Approve the target CIs
80	Update Release Progress	Close the activity, update status of the release and progress the release to the next activity.

If you read the descriptions, you can see that each task is designed to ensure that you process a unique set of considerations.

- c. If you take the time to go through the details of each task you will see that tasks number 60 and 70 (the two approval tasks) both are classified as PMAPPR tasks, and are associated with a flow action named PMRELAPPR. This means, that the PMRELAPPR action will be executed behind the scenes when the tasks complete. The action initiates a workflow which is used to assign tasks for the approvers, and escalate the approval in case the approver rejects the schedule. For this escalation, the release management roles are used.
- d. Now review the task owners. Currently, Henry, the release owner, is the owner of all the tasks, and it is a fundamental principle, that no-one should approve their own work. Therefore you need to assign different owners for the two approval tasks. In this exercise, assume that the release administrator must approve the schedules and plans.
 To assign the Pete Release Administrator as the owner of the two approval tasks, provide a value of PETE in the owner field of tasks 60, and 70.
- e. You have decided, that you do not need task 20, and task 50. To remove the two tasks that do not apply to this release, use the Mark Row for Delete tool (at the end of the lines representing tasks 20 and 50.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
10	10	Develop Site Roll-out Plans	4:00			WAPPR	HENRY	
20	20	Schedule Asset Delivery	2:00			WAPPR	HENRY	
30	30	Schedule Release Implementation	2:00			WAPPR	HENRY	
40	40	Coordinate with Communication and Train	1:00			WAPPR	HENRY	
50	50	Identify new CIs involved in a Release	1:00			WAPPR	HENRY	
60	60	Approve Rollout Plan	1:00			WAPPR	PETE	

- f. In addition, because you remove task 50, you removed the predecessor for task 70. To reestablish the flow of the activity, you must set the predecessor of task 70 to task 10.

- g. To assign ownership of the tasks, you ned to ensure that the release owner is not assigned the task of approving the work her or she has performed. You should assign the ownership of the approval tasks to a release manager or someone else. In this exercise, you assign the approval task to the release administrator.

To set the appropriate approval task ownership, set the value of the Owner field to Pete for tasks 60 and 70.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
10	10	Develop Site Roll-out Plans	4:00			INPRG		
30	30	Schedule Release Implementation	2:00			WAPPR	PMCHGOWN	PMRELOWN
40	40	Coordinate with Communication and Train	1:00			WAPPR		PMRELOWN
60	60	Approve Rollout Plan	1:00			WAPPR	PETE	PMRELOWN
70	70	Approve Impacted CI List	1:00			WAPPR	PETE	PMRELOWN
80	80	Update Release Progress	0:01			WAPPR		PMRELOWN

- h. Click the Save icon (💾) in the toolbar to save the latest updates to the activity.

You have completed the review of the second activity. Use the **Return** link in the header to navigate back to the Plans tab of the release.

5. Complete these steps to review the last activity: *Implement the Database install in a Release*.
- Before you start looking at the details of the fourth and last activity, notice the name. *Implement the Database install in a Release* does not really describe what you intend to achieve in this release, so you should rename the activity to something more meaningful. Update the Summary field for the activity to *Implement WebSphere V6 FixPack 123 in a Release*.

Record	Record Class	Summary
1306	ACTIVITY	Design and Build Release
1310	ACTIVITY	Test and Accept Release
1281	ACTIVITY	Plan Release Rollout
1290	ACTIVITY	Implement WebSphere V6 FixPack 123 in a Release

Click the Save icon (💾) in the toolbar to save your update.

- Use the **Go To Activities and Task** option from the Detail Menu tool (») next to the last activity in the list, the one named *Implement WebSphere V6 FixPack 123 in a Release*, to see the details of the activity.
- When the Activities and Tasks application opens, navigate to the Plans tab, and focus on the Tasks for Activity ... section. In its initial state it only shows the first six of fifteen tasks.

If you could see all fifteen tasks, you would see a list of tasks similar to this:

- | | |
|-----|--|
| 10 | Obtain Status of CIs in a Release |
| 20 | Verify CI Targets for a Release |
| 30 | Validate Database Requirements are met |
| 40 | Software Distribution |
| 50 | Validate MQ Requirements are met |
| 60 | Software Distribution |
| 70 | Validate WAS Requirements are met |
| 80 | Software Distribution |
| 90 | Configure Monitoring System |
| 100 | Verify Platform Security Compliance |
| 110 | Test Backups |
| 120 | Update Inventory System and SR Information |
| 130 | Update Release Progress |
| 140 | Update CI Status |
| 150 | Update Release Progress |

You immediately notice that the default job plan for this activity includes three sets of similar tasks for validation and distribution. For this release, tasks 30 through 60 can be removed since no database or messaging systems are involved.

In addition, you do not intend to configure monitoring so task 90 can also be removed.

To delete the tasks use the Mark Row for Delete tool ( at the end of each line, to delete tasks 30, 40, 50, 60, and 90.

Click the Save icon () in the toolbar to save your modifications.

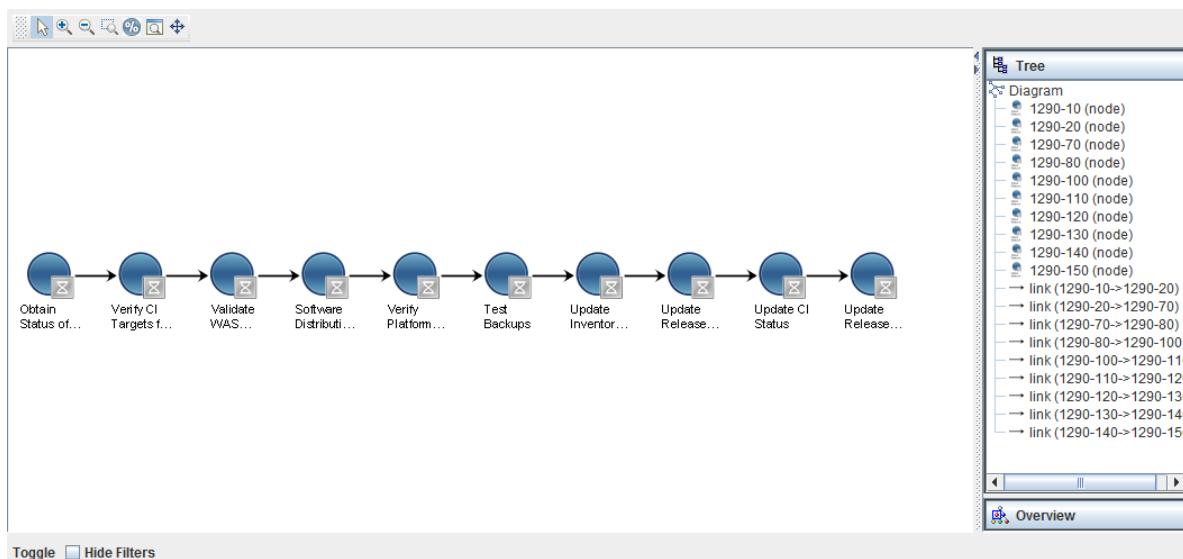
- d. By deleting tasks you have broken the chain of dependencies for the tasks in the activity. To re-create a proper set of predecessors for the involved tasks, set the value for the Predecessors field according to the information below:

<u>Task #</u>	<u>Predecessor</u>
---------------	--------------------

70	20
----	----

100	80
-----	----

To verify that all the tasks will be executed in the expected sequence, open the Workplan Map tab, and verify that the workplan looks similar to this:



If you see the expected results, click the Save icon (floppy disk) in the toolbar to save your job structure.

Then, return to the Plans tab.

- e. To understand the purpose of the remaining ten tasks, you can use the Long Description icon (book) next to the task Summary for each task, or look at the information in the following table:

Task #	Task Name	Description
10	Obtain Status of CIs in a Release	Ensure that the required CIs exist, and are operational.
20	Verify CI Targets for a Release	For CIs that are not OPERATIONAL, ensure that they are moved into the correct status.

Task #	Task Name	Description
70	Validate WAS Requirements are met	<p>The Server Build System Administrator will work with the WAS Administrator to ensure that the disk, memory, network and backup requirements are met prior to installing or updating the WebSphere Server.</p> <p>Checklist Items:</p> <ul style="list-style-type: none"> - Validate memory requirements - Create Required MQ administration IDs - Create any required MQ client IDs - Validate Disk Space requirements - Create required filesystems directories or virtual disks with proper ACLs - Validate OS level Requirements - Validate SAN allocation requirements - Validate TSM backup requirements - Validate Network Connectivity - Validate that required Firewall ports are open
80	Software Distribution	<p>Checklist Items:</p> <ul style="list-style-type: none"> - Install and Configure WAS Application - Test WAS connectivity
100	Verify Platform Security Compliance	Run security scans to ensure compliance.
110	Test Backups	After the standard applications and utilities have been installed on the server, the System Administrator attaches the (TSM) option file to the server and forces a backup of the server image.
120	Update Inventory System and SR Information	Perform inventory scan, append comments to service request, and make updates to the SR as necessary.
130	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.
140	Update CI Status	Update the status of the CIs if necessary.
150	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.

As you can see, many of the tasks are generic, and applies to almost any type of modification to a production system.

You may expect that many of these tasks are milestone, approval, software distribution, or implementation tasks. If you look at the details of each task, can compile the information below:

Task #	Task Name	Classification	Assisted Workflow	Impl. Task?
10	Obtain Status of CIs in a Release			
20	Verify CI Targets for a Release			
70	Validate WAS Requirements are met			
80	Software Distribution	PMREL \ PMRELT SK \ SWDIST	PMRELSWDS T	yes
100	Verify Platform Security Compliance			
110	Test Backups			
120	Update Inventory System and SR Information			
130	Update Release Progress	PMREL \ PMRELT SK \ PMRELCPR	<none>	
140	Update CI Status			
150	Update Release Progress	PMREL \ PMRELT SK \ PMRELCPR	<none>	

As mentioned earlier, the classification is used to identify tasks with special characteristics, and the assisted workflows can be used by the task owner to perform the task.

- f. Notice, that for all the tasks, the expected owner group is assigned. Most of the tasks are owned by the Release Deployers group, PMRELDEP.
- g. You are done, The final activity has been reviewed. Click Return to navigate back to the Plans tab of the Releases application.

Finally, you have completed the review of all 23 tasks in the four main activities of the release. Wonder if there was an easier way to do this?

- If you open the Process Details tab, you will see how the classifications you spend so much time to identify, are used to provide an overview of the most important tasks in the release.

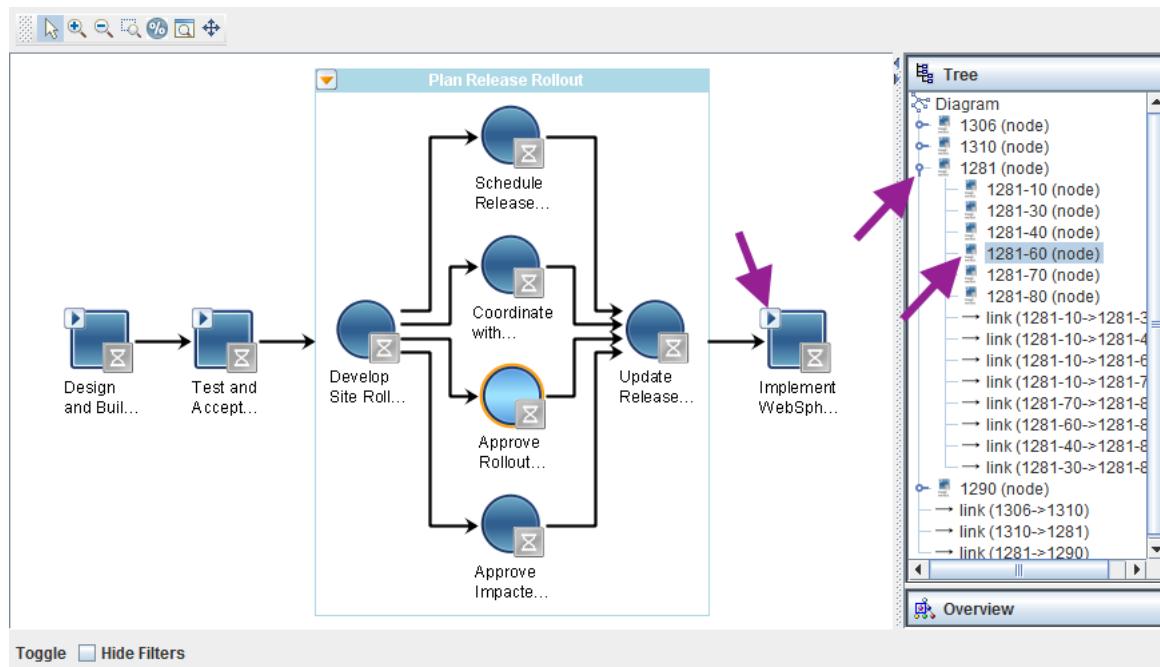
The screenshot shows the 'Process Details' section of the IBM SmartCloud Control Desk interface. It displays four grouped tables:

- Approval tasks:** Shows three tasks: 'Approve Rollout Plan' (Task 1287), 'Approve Impacted CI List' (Task 1288), and 'Determine if Release is Accepted' (Task 1312).
- Milestones:** Shows five tasks all labeled 'Update Release Progress': Task 1289, 1303, 1305, 1309, and 1314.
- Implementation tasks:** Shows four tasks: 'Software Distribution' (Task 1298), 'Design and Build Release' (Task 1306), 'Test and Accept Release' (Task 1310), and 'Software Distribution' (Task 1311).
- Software distribution tasks:** Shows two tasks: 'Software Distribution' (Task 1298) and 'Software Distribution' (Task 1311).

Notice how this view provides a different view of the release process. In this view, you see that the tasks are grouped into four main groups. These groups represent the most important tasks in the job plan, and show Authorization, Milestone, Implementation, and Software distribution tasks. The grouping is based on the classification that is associated with the individual tasks in the job plan.

If you scroll to the bottom of the Process Detail section you see the Workplan Map. This map provides a graphical representation of the process with indication of state and status for each task activity and all its related tasks. Initially you only see the main activities (the ones you saw

in the Children of Release ... section in the Plans tab), but if you click the explode (▶) icon on any one of them, you can see all the tasks as well.



Notice how you can use the Tools section to navigate directly to any task, if you expand (▶) the related activity.

If you explode all of the activities, you will see more than 20 tasks related to this release.

This completes the specification of the content of the release.

Adding targets to the release

If you look at the Release tab, and focus on the Release Content section you see, that no targets have been assigned to the release, yet. This is perfectly all right. The nature of release is such, that part of the processing of the release to clarify and determine *what* to implement, and *where*, so for most releases you will not be able to specify neither source CIs or target CIs until you build your roll-out plans.

However, in this exercise, you will be proactive, and try to determine the target CIs early on. By associating the target CIs with the release, you get a reference point that can be leveraged in the work that lies ahead.

To figure out which targets to add, the release owner needs to consult the original request to review the information. Perhaps there are some clues on where the WebSphere FixPack needs to be installed. Complete the following steps to analyze the related records, and define targets for the change.

1. If you open the Related Records tab for the release, you see a reference to the request is associated with the release. Open this release request, using the **Go To Process Requests**

option from the Detail Menu tool (») next to the Related Record Key field, and open the Related Records tab. You might see that a change is the originator of the request.

The screenshot shows the 'Process Requests' application interface. At the top, there's a toolbar with various icons. Below it, a navigation bar with tabs: 'View Record List > PR1005', 'Process Request' (selected), 'Related Records', 'Log', and 'Service Address'. Under 'Process Request', details are shown: 'Process Request: PR1005', 'Description: Deploy WebSphere V6 FixPack 123', 'Site: PMSCRTP', 'Process State: ACCEPTED', and 'Status: INPROG'. The 'Related Records' tab is selected, showing a table titled 'Related Work Orders'. The table has columns: 'Work Order', 'Description', 'Class', 'Status', and 'Relationship'. There are two rows: one for '1278' with 'WebSphere V6 FixPack 123' as the description, 'CHANGE' as the class, 'WAPPR' as the status, and 'ORIGINATOR' as the relationship; and another for '1280' with 'Deploy WebSphere V6 FixPack 123' as the description, 'RELEASE' as the class, 'INPRG' as the status, and 'FOLLOWUP' as the relationship. A red arrow points to the 'Work Order' column for the first row, and a red circle highlights the 'Relationship' column for the same row.

Note the change number (1278 in this example). The change owner might have been doing some of your work while processing the change, and if that is the case, you can simply link the change to the release.

2. Open the change, to verify if the targets have been added to the change. Use the **Go To Changes** option of the Detail Menu tool (next to the Work Order field for the change, and look at the Primary Target and Additional Targets sections of the change.

The screenshot shows the 'Changes' screen in IBM SmartCloud Control Desk. The 'Primary Target' section contains fields for Configuration Item, Asset, Location, CI Business Impact, Outage, and Target Description. The 'Additional Targets' section lists four target records with columns for Asset, Configuration Item Name, Configuration Item Number, and Target Description. The 'Source CIs' section lists one source record with columns for CI number, Configuration Item Name, and Classification.

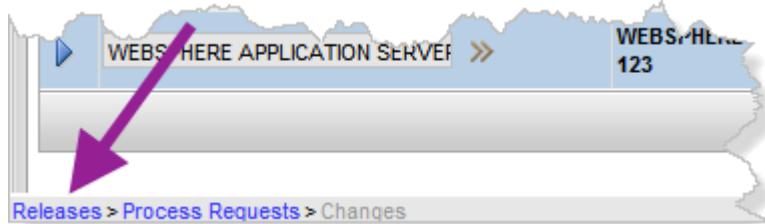
Asset	Configuration Item Name	Configuration Item Number	Target Description
RHEL56-3.TIVLAB.SANJOSE.IBM.COM:RHEL56-3 NODE01:NODEAGENT	RHEL56-3.TIVLAB.SANJOSE.IBM.CI		
RHEL56-2.TIVLAB.SANJOSE.IBM.COM:RHEL56-2 NODE01:NODEAGENT	RHEL56-2.TIVLAB.SANJOSE.IBM.CC		
RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1 NODE01:NODEAGENT	RHEL56-1.TIVLAB.SANJOSE.IBM.CC		
RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1 CELLMANAGER01:DMGR	RHEL56-1.TIVLAB.SANJOSE.IBM.CC		

CI number	Configuration Item Name	Classification
WEBSPHERE APPLICATION SERVER 123	WEBSPHERE APPLICATION SERVER V6 FIXPACK	CI-ROOT \ CI-ROOT.SOFTWAREIMAGE

It seems s if you are in luck. Both Additional Targets and a source CI are specified in the change. All you need to do now, is to link in the change. If the change owner has already enabled linkage from any release, you can do it yourself, otherwise, you need to contact the change owner to request that the change be authorized to be linked to your release.

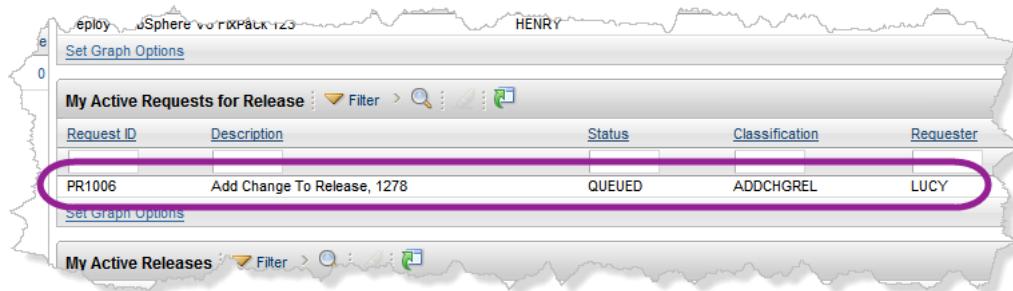
Navigate to the Related Records tab of the change, and notice that there is a request named Add Change To Release It definitely looks as if the change owner already has allowed the change to be linked to releases.

- Now, to return to the Releases application you could use the Return link in the header multiple times until you are back. However, you can also use the navigation links that are shown, in a very tiny font, at the bottom of the console.



If you click the **Releases** link, you will be taken directly to the Releases application.

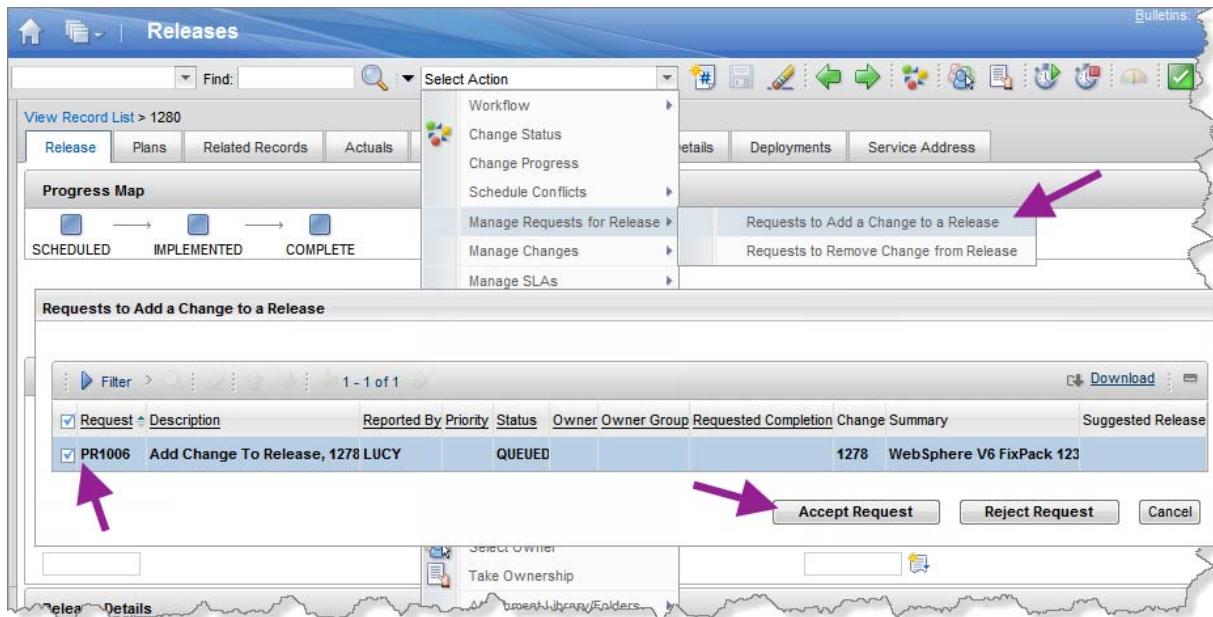
- Before you add the change to the release, use the Home icon (in the title bar to return to the start center, and see if there is any interesting information in the My Active Requests for Release portlet.



If you had paid attention to this portlet at an earlier point in time, you might have saved yourself some time. As you would expect, you can launch the request directly from the portlet to process the change. However, for this exercise you should use the facilities available from the Releases application.

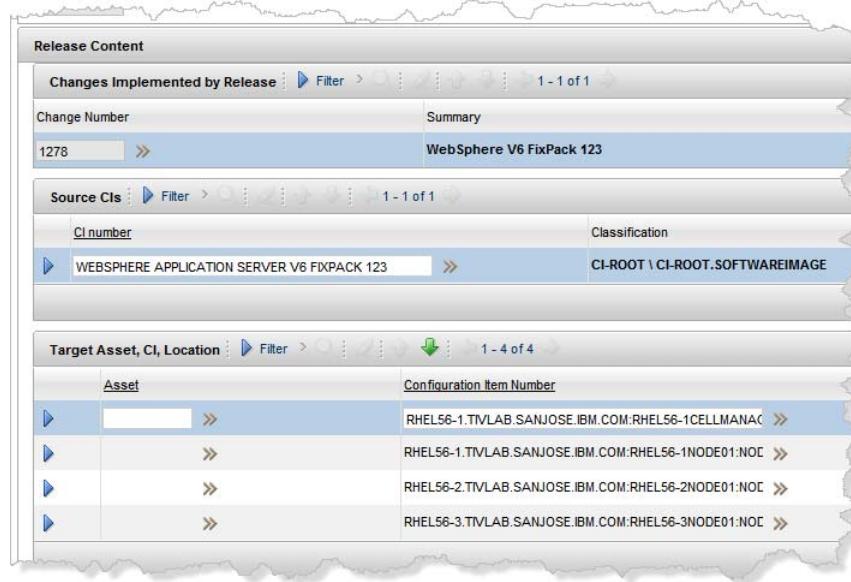
- Open the release use the link you see in the My Active Releases portlet.

To link in the change, and all its related CIs, you use **Select Action > Manage Requests for Release > Requests to Add a Change to a Release**.



When the Requests to Add a Change to a Release window appears, select the only request you see, and click **Accept Request**.

6. To see what happened, locate the Release Content in the Release tab, and see how the change, and its target CIs are now imbedded in the release.



You have now successfully linked the change to the release, and if you look in the Related Records tab, you can see that the change is the ORIGINATOR of the release.

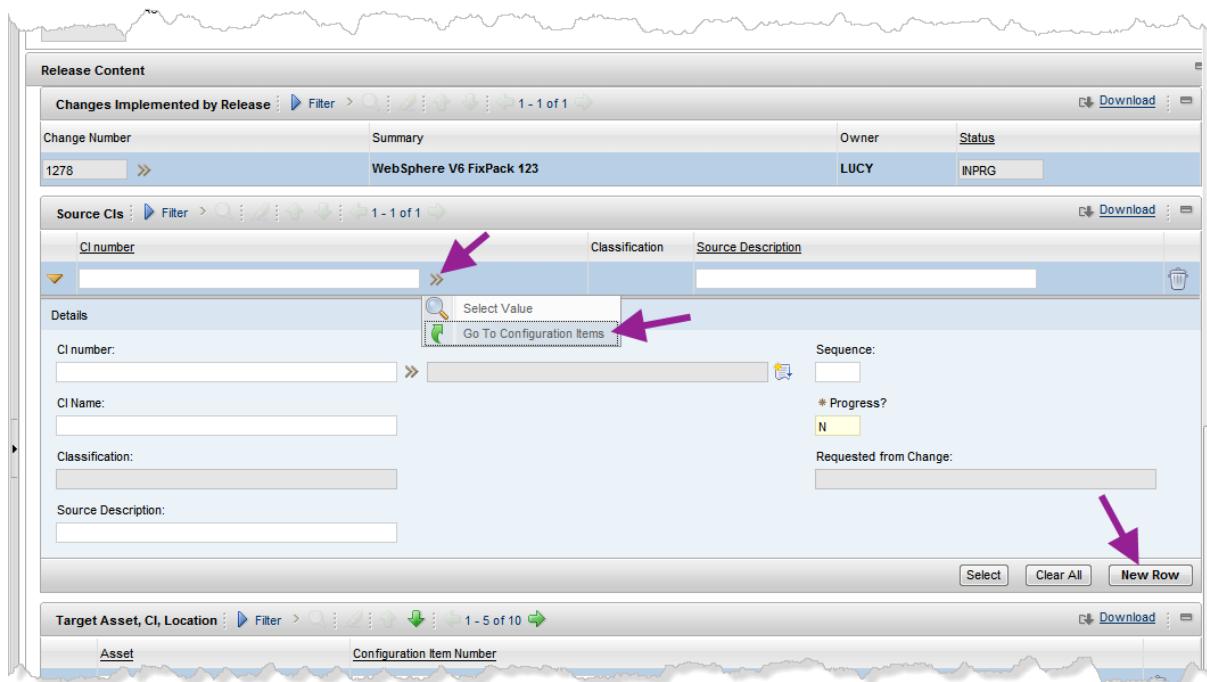
So you have targets, but since this is a software distribution release, you should also consider registering one or more source CIs with the release.

Adding a source CI

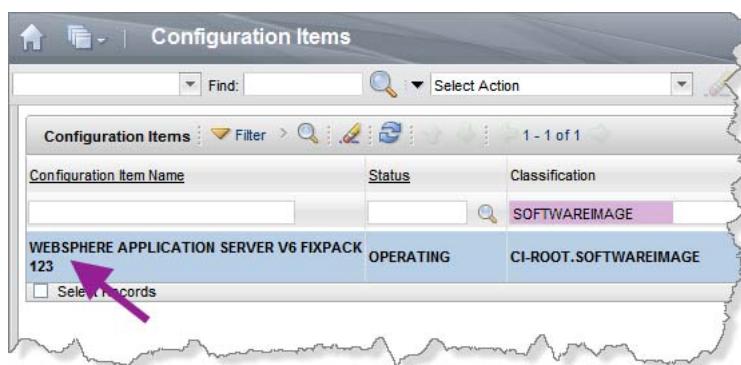
As the release owner, you want to help the rest of the release team that contributes to the processing of the release. From the description of the release you can tell, that a software image that represents the WebSphere V6 FixPack 123 is needed to perform software distributions, so you want to be nice and make this image available to the release. This way, your colleagues can immediately access it, and you ensure that the release can only be implemented when this software image is in a consistent state, and not while it is being updated, or changed.

To add the software image as a source CI, complete these steps:

- Focus on the Source CI section immediately above the Target Asset, CI, Location section, and click **New Row**. When the details for the new row appear, use the **Go To Configuration Items** option of the Detail Menu tool () next to the CI Number field to launch the Configuration Items application.

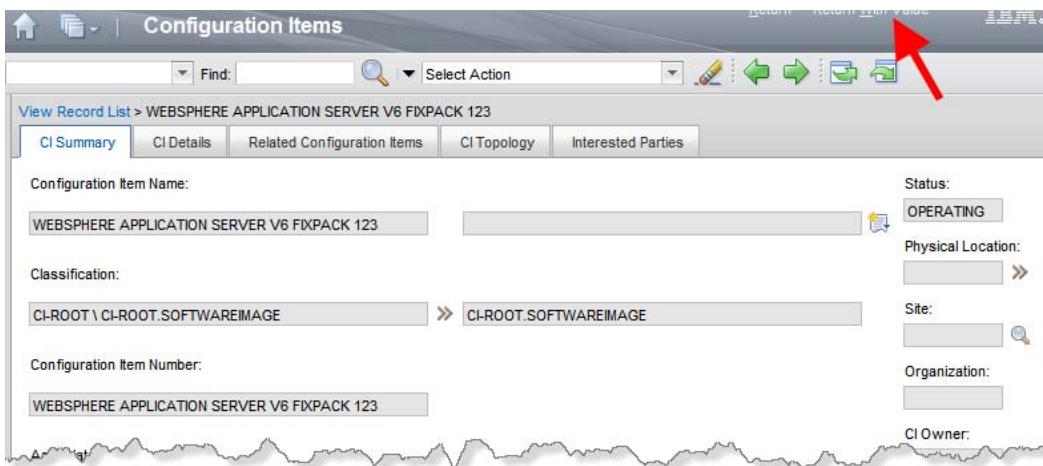


- When the Configuration Items application launches, provide a value of SOFTWAREIMAGE in the Classification filter field, and press Enter to see all the software images in your environment.

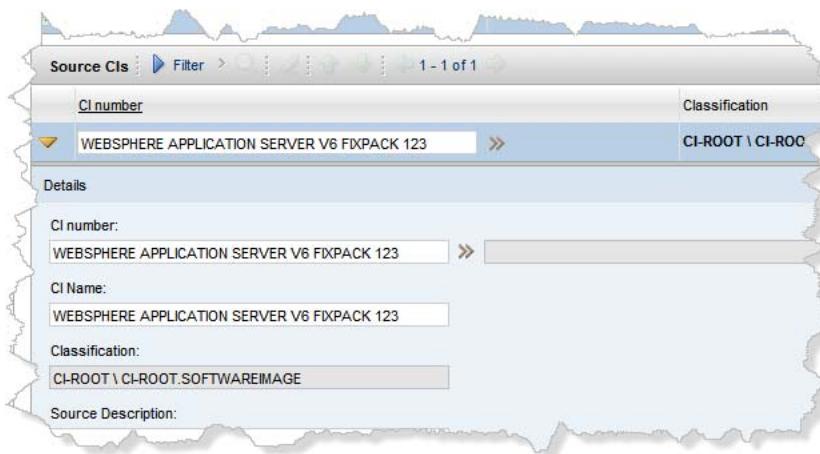


Select the only CI you see.

3. When you see the details of the WEBSPHERE APPLICATION SERVER V6 FIXPACK 123 configuration item, click **Return With Value** to populate the source CI of the release with value of the selected CI.



4. When you return to the Release application, notice how the source CI details have been populated:



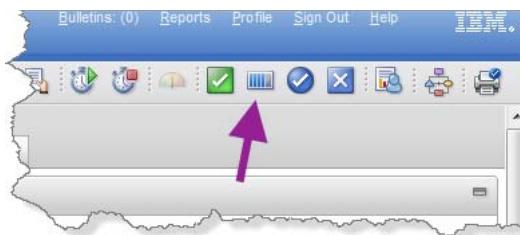
To store your modifications to the release, click the Save icon () in the toolbar.

This completes the review and specification of the release. You have a job plan that will support the building, testing, authorization, and deployment of WebSphere V6 FixPack 123.

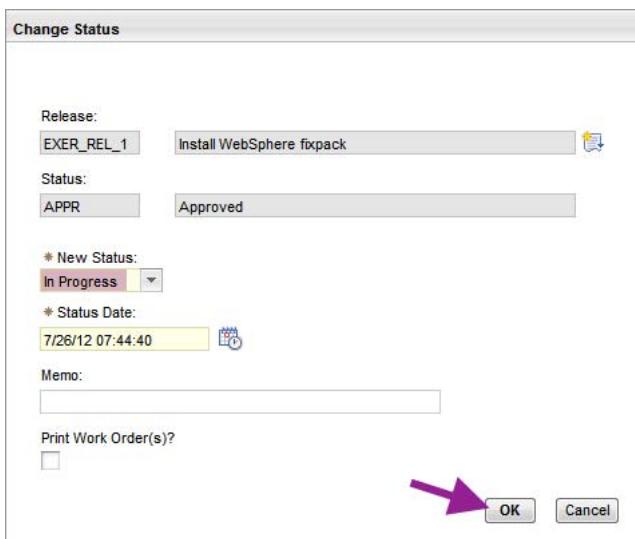
Initiate the release

Before you start processing the release, you should initiate the release, and thereby approve the first activity, so it, and the first task it contains, will start processing. To do this, complete these steps:

1. Click the Initiate Release icon () in the toolbar.



2. When you see the Change Status window, ensure that the new status is In Progress, and click **OK**.



Change Status

Release: EXER_REL_1 Status: Approved

* New Status: In Progress

* Status Date: 7/26/12 07:44:40

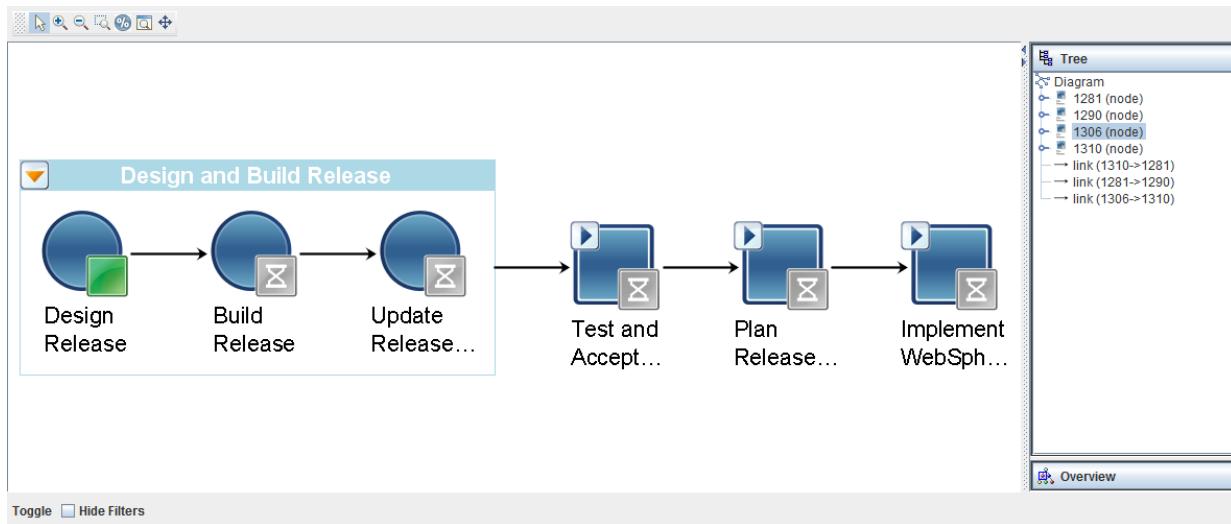
Memo:

Print Work Order(s)?

OK Cancel

You are finally ready to start processing the release.

3. If you take a look at the Workplan Map at the bottom of the Process Details section. Here you see, that the first activity has been started, and that the status of the first task, Design Release, has been changed to In Progress.



You may recall, that the owner of the Design Release task is the Release Owners group.

You have now created a release based on a template job plan. All that is left is to complete each of the 20+ tasks one by one, and you're done :).

Exercise 7. Design and Build Release

In the first activity, you design and build the release. The primary contributor is the release specialist, who is responsible for obtaining the necessary installation media, and for designing and building the scripts and procedures necessary to deploy the release. The following table lists the tasks for this activity:

Task #	Task Name	Description
10	Design Release	Design the installation scripts and packages that will be deployed. This does not involve creating software to be deployed, but packaging the software so it can be deployed and creating any necessary installation scripts and mechanisms. Design backout procedures if the deployment is not successful.
20	Build Release	Create the Release packages and installation scripts needed. In addition, create communication and education plans needed for deployment, and create backout procedures.
30	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.

For this exercise, which is not designed for you to understand WebSphere FixPack installation scripts and backout procedures, you can limit the efforts related to the whole activity to make a mental note about the file system location where the release specialist saved the WebSphere fix pack installation media and custom installation and backout scripts. Actually, for this exercise, you can use any value, but in a real-life scenario, the installation code must be placed in a shared location so it can be used later on for testing and ultimate to be stored in the definitive media library.

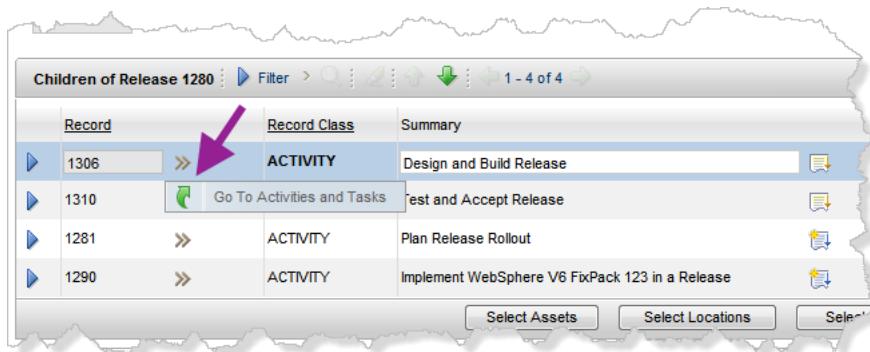
To ensure that the source CI, the one that represents the software image, has the correct configuration information, the release specialist should consider using the Move/Swap/Modify facility to apply details about the location and name of the image. If the release specialist is not authorized to use the Move/Swap/Modify tool, a CI Update request can be submitted instead. However, for this exercise you will skip this step.

Complete the activity

In a real-life scenario, the release specialist would perform the Design and Build tasks in this activity. However, for this exercise you will simulate that the work has been completed, simply by changing the status as the release owner. To do this, you need to set the status of all the tasks to COMPLETED.

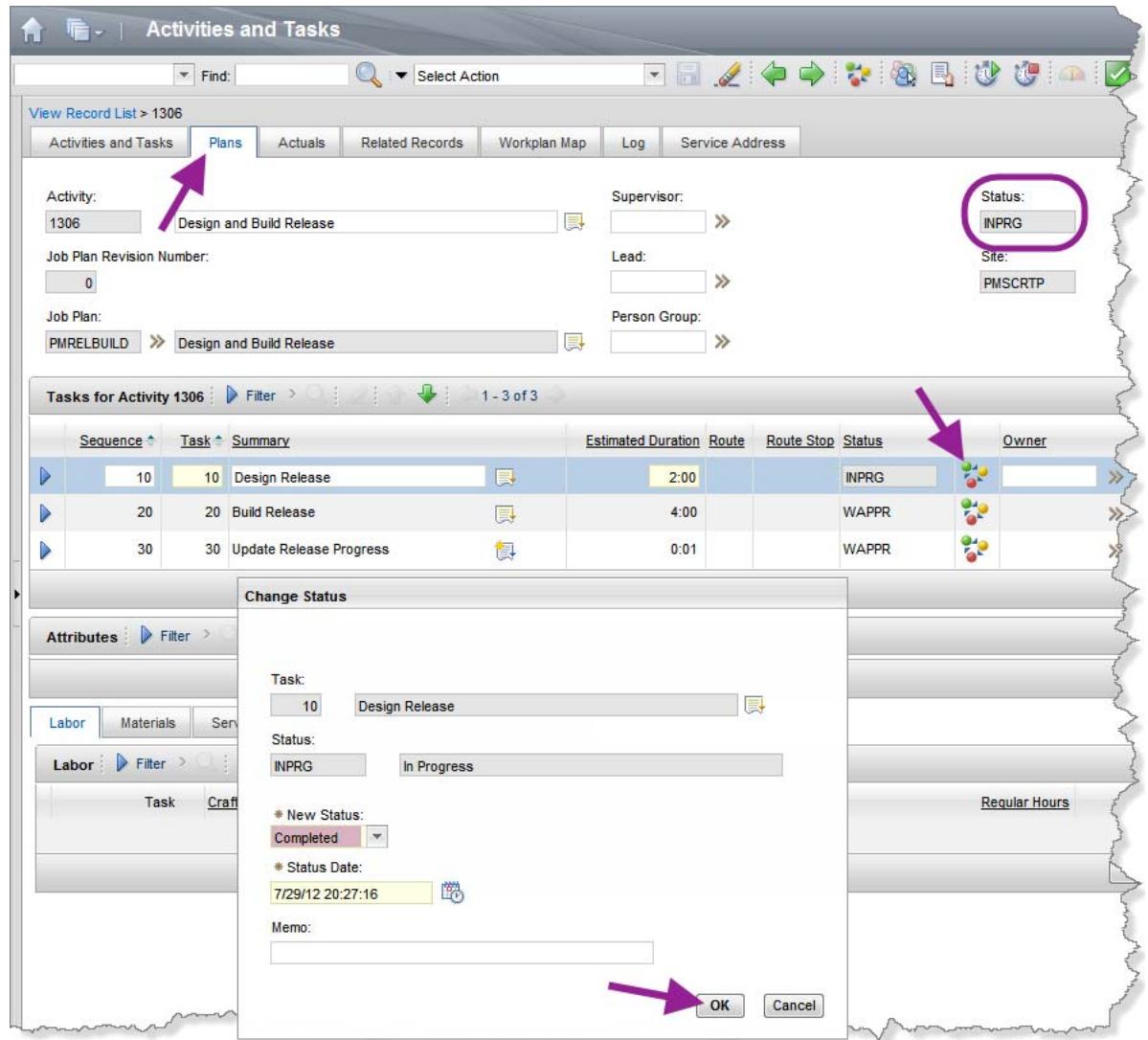
To complete the activity, do the following.

1. Navigate to the Plans tab of the release, and find the current activity, Design and Build Release, in the Children of Release ... section. Use the Detail Menu tool (») next to the activity to **Go To Activities and Tasks**.



2. When the Activities and Tasks application has launched, open the Plans tab.

3. Now, to mark the tasks as complete, Complete the following steps for each task.
 - a. Use the Change Status icon () at the end of each line in the Tasks for Activity ... section to change the status of tasks to COMPLETED.



- b. When the Change Status window appears, choose a status of Completed, and click **OK**.
4. Repeat the previous step for the next task until you see that the status for the whole activity changes to COMPLETED. Notice, that when you complete the second to last task, the last task, Update Release Progress, is automatically closed, and the entire activity is completed.
5. When you are done, click the Return link in the header to return to the Releases application.



6. To refresh the information about the release, enter the release number (1280 in this example) in the Find field, and click the Find icon (🔍). Notice that the status of the activity has been updated, and so has the progress of the release.

The screenshot shows the 'Releases' screen in IBM SmartCloud Control Desk. At the top, there is a search bar with 'Find: 1280' and a magnifying glass icon. Below the search bar is a toolbar with various icons. The main area displays 'View Record List > 1280' with tabs for Release, Plans, Related Records, Actuals, Log, Specifications, Process Details, Deployments, and Service Address. Under the Release tab, there is a 'Progress Map' showing a sequence of three boxes: SCHEDULED, IMPLEMENTED, and COMPLETE. Below the map, detailed information for Release 1280 is shown, including Release Number (1280), Supervisor (INPRG), Status (INPRG), Progress (BUILT), Parent (Job Plan: PMRELMW, Work Group: Standard Middleware Install Release JobPlan), Lead (Work Group: Standard Middleware Install Release JobPlan), and Site (PMSCRTP). A purple arrow points to the magnifying glass icon in the toolbar. In the bottom right corner of the main area, there is a circular button labeled 'Status' with a downward arrow. Below the main area, there is a section titled 'Children of Release 1280' with a table showing four activities:

Record	Record Class	Summary	Status
1306	ACTIVITY	Design and Build Release	COMP
1310	ACTIVITY	Test and Accept Release	INPRG
1281	ACTIVITY	Plan Release Rollout	WAPPR
1290	ACTIVITY	Implement WebSphere V6 FixPack 123 in a Release	WAPPR

A purple circle highlights the 'Status' button in the bottom right of the main area, and another purple circle highlights the status 'COMP' for the first activity in the table.

The progress of the release is now BUILT.

You have completed the processing of the first activity of the release processing. Only three more to go.

Exercise 8. Test and Accept Release

For the second activity, Test and Accept Release, the release deployer tests and verifies that all the hard work put in by the release specialist. This activity is intended to provide assurance that the installation of the updates runs smoothly and without problems. Once it has been verified that software package works as expected, it is registered with the definitive media library.

These are the main tasks:

Task #	Task Name	Description
10	Software Distribution	Test the deployment of the Release package. Note errors that occur. Use a controlled test environment to test all Release packages.
20	Determine if Release is Accepted	Ensure that the appropriate approvals have been obtained for the release, before updating the DML.
30	Import Software into DML	Put golden copies of the release package in the definitive media library and use the definitive hardware store for hardware needed to deploy the release.
40	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.

As usual, the last task, Update Release Progress, is only important to progress the release process, so for now, you can ignore it.

The three main tasks are pretty important. The first task, Software Distribution, is intended to verify that the software package created by the release specialist is valid, and can install without a glitch,. Once this has been confirmed, the release deployer must verify that the release has been accepted, in order to determine if the last task should be executed. If the release has been accepted, the release deployer registers the software package in the definitive media library, so it is captured.

Software Distribution for test and verification

To properly test the software package, the release deployer must perform the exact same actions as will be used when the release is implemented. If Operational Management Products for software distribution, such as Tivoli Provisioning Manager, are leveraged, the release deployer must create all the proper definitions in the OMP in order to perform a realistic test. Naturally, it is assumed, that a representative test environment is available. If this is not the case, the release plan should be changed to include the implementation of a test environment that can be used to thoroughly test the release.

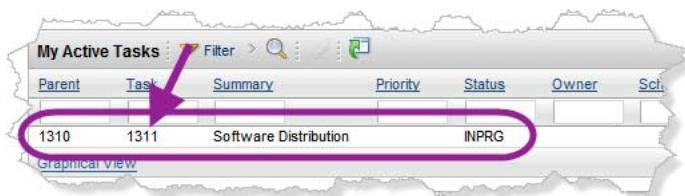
To create a unique instance for each installation that is sent to the OMP, the release deployer must create a deployment for each combination of software package and a target system. For example, if three software packages need to be installed on five systems, fifteen deployments must be created. For the testing in this exercise environment, only one deployment is needed.

In a deployment, the release deployer specifies the OMP to use, the necessary parameters to interact with the OMP, the source and target CIs, and optional configuration parameters that are required by the installation procedure. Under the covers, deployments are used to schedule the release since each deployment is an individual implementation task that needs to be analyzed for impact, and scheduled within the change window calendars and blackout periods that apply to the target CIs. You can think of deployments as fully automated change implementation tasks, with specific capabilities to interact with a software distribution OMP.

Assuming that all the prerequisites are in place, it is time for the release deployer to get started. To mimic the implementation activity, the release deployer must create, and implement a deployment. In this process, the release deployer uses the software package developed by the release specialist, including the documentation. Once the software package is fully verified, and the rollback procedures have been tested, the test is considered successful. It goes without saying, that the release deployer naturally has to document the results.

To test and verify the software package, complete these steps:

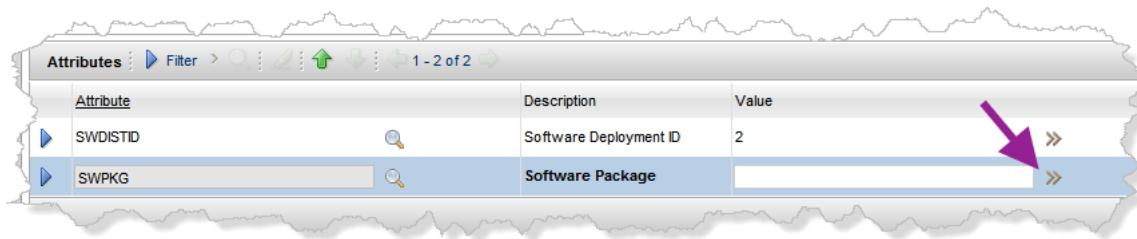
1. Sign in to the IBM SmartCloud Control Desk console as Diane, the release deployer, using a password of objecct00.
2. When the Release Deployers start center opens, focus on the My Active Tasks portlet.



Notice that a task is waiting for your attention. It just might be the software distribution task for testing the software image. To launch the task, click the link in the portlet.

- When the Activities and Tasks application opens, and the task has been loaded, notice how the task is classified, that it is an implementation task, and that an assisted workflow is available. You can even see a push button labeled *Start Assisted Workflow*.

Scroll to the bottom of the Activities and Tasks tab, locate the Attributes section. Here you see that both the distribution ID (SWDISTID) the reference to the software package to be used (SWPKG) are empty. The distribution id will be assigned by the system. However, if supply a value for the software package attribute, so can be used as the default value for all the deployments you create as part of this task, so it might be a good idea to provide a value.



In order to specify the software package to be used for the deployments, click the Detail Menu tool (») next to the Value field for the SWPKG attribute.

When the Select Value window appears, you notice that it contains a list of all the SOFTWAREIMAGE CIs in your environment that have a lifecycle status of OPERATING.

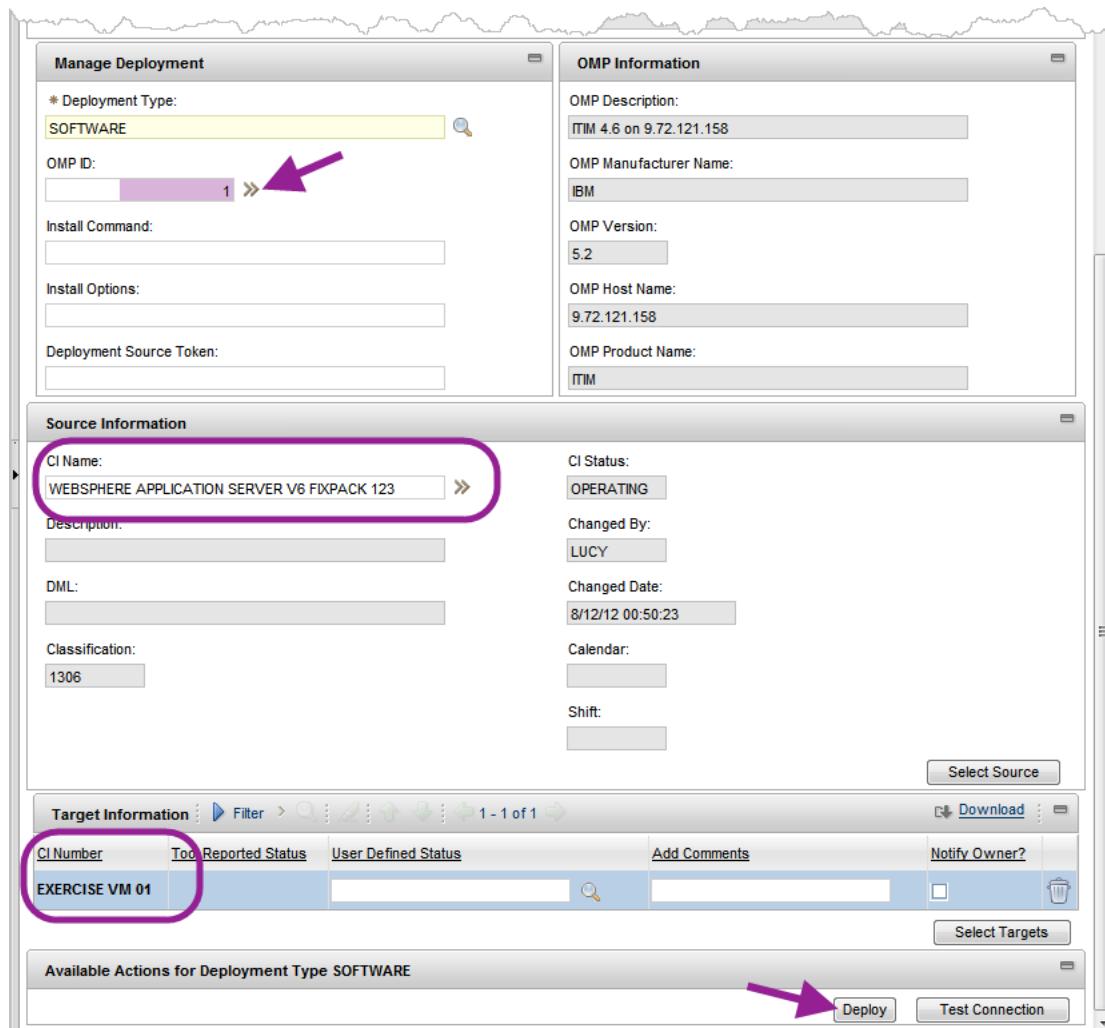


To specify a value for the SWPKG attribute select the only record from the Select Value window, and click the Save icon (💾) in the toolbar to save the modifications to the task.

- Now, scroll back to the top, and focus on the Configuration Item field. In this, you define a single target to be used for the software distribution. To define the target CI that you will deploy the software package to in order to perform the test, click the Detail Menu tool (») next to the Configuration Item field, and select the CI named *EXERCISE VM 01*.
- You are ready to start the definition of the deployment that is needed to test the software package. Click **Start Assisted Workflow**. Under the covers, the workflow launches the Deployments application and parses selected properties of the task to the application.

Exercise 8. Test and Accept Release

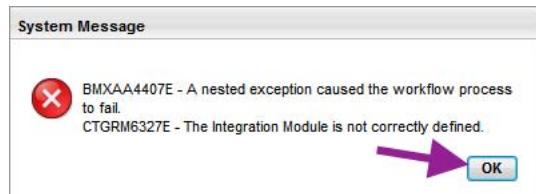
When the Deployments application starts, notice, at the bottom of the Deployment tab, how your source and target CI information was transferred to the deployment.



To perform a deployment, an OMP must be defined. Use the Detail Menu tool (next to the OMP ID field, and select the only available Operational Management Product with an ID of 1.

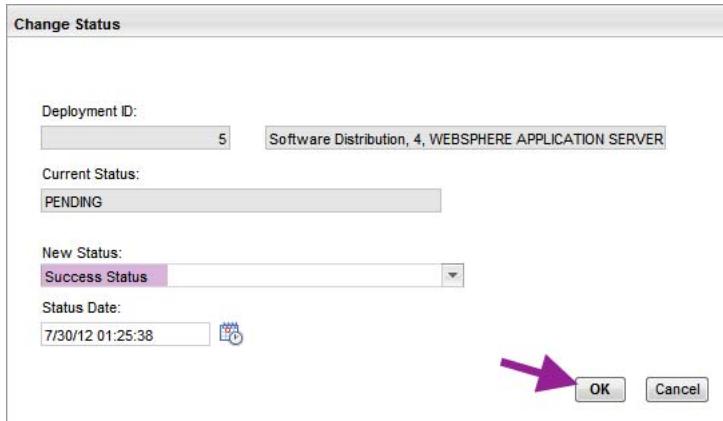
To test the deployment of the WEBSPHERE V6 FIXPACK 123 software package to the EXERCISE VM 01 system, simply click **Deploy** at the bottom of the console.

After a short while, you will see an error message. The OMP is not available in the exercise environment, so the deployment cannot be completed.



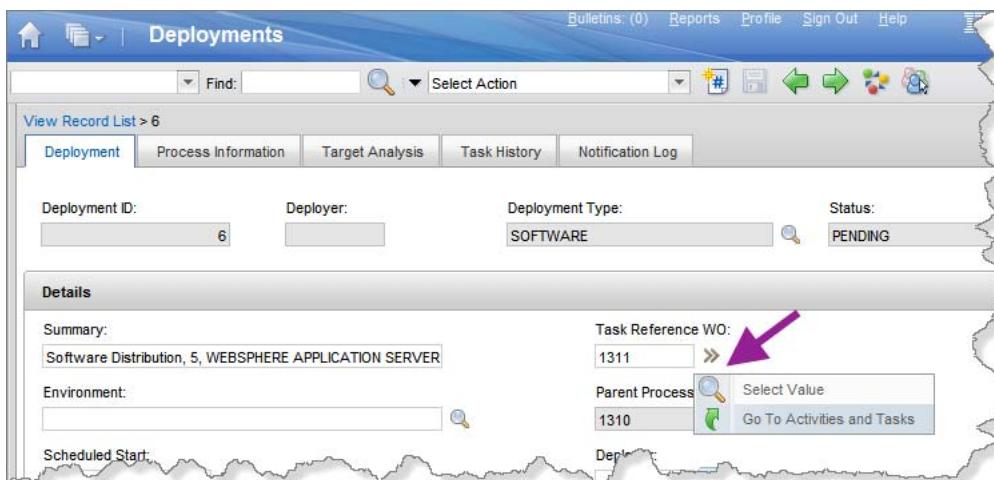
- Even though the OMP is not available, and ignoring the fact that the software package actually does not exist in the exercise environment, you should set the status of the deployment to SUCCESS.

Click the Change Status icon (⊕) in the toolbar, and when the Change Status window appears, choose a value of Success Status for the New Status field. Click **OK** to update the status of the deployment.



Remember to click the Save icon (💾) in the toolbar to save the new status.

- Now, assume that the test and verification went well, and that the software package is properly documented. You can now complete the Software Distribution task by performing these steps:
Use Go To Activities and Tasks option of the Detail Menu tool (») next to the Task Reference WO field to navigate back to the Software Distribution task.



Notice how the name of the task has been modified, and now includes the deployment id and the name of the source CI. To complete the task, click the Change Status icon (⊕) in the toolbar, and when the Change Status window appears, choose a value of Completed for the New Status field before you click **OK**.

- If there are no more active tasks waiting for the release deployer, you are done. To log off, use the Home icon (🏠) in the title bar to return to the start center, and click the **SignOut** link, so another user can sign in.



You have just completed the first task in the Test and Verify Release, by ensuring that the software package can be installed, and rolled back, successfully. In addition, you verified that the documentation was accurate and appropriate.

Next you need to verify that the current release has been accepted.

Determine if Release is Accepted

For the progression of these exercises, which is already in the IN PROGRESS state, all you need to do is to mark the task completed. Because the task is assigned to the release specialists group you have to log on as a user which has been assigned this role.

Complete these steps to complete the task:

1. Log in to the IBM SmartCloud Control Desk console as the release specialist, Henry, using a password of object00.
2. When the Release Owners start center launches, open the release you are working with from the My Active Releases portlet.
3. Looking at your WebSphere FixPack release, open the Process Details tab, and focus your attention on the section named *Approval tasks*.

Task	Description	Scheduled Start	Scheduled Finish	Status
1287	Approve Rollout Plan			WAPPR
1288	Approve Impacted CI List			WAPPR
1312	Determine if Release is Accepted			INPRG

Notice the approval task that is IN PROGRESS.

To open it, use **Go To Activities and Tasks** of the Detail Menu tool (») next to the Task field.

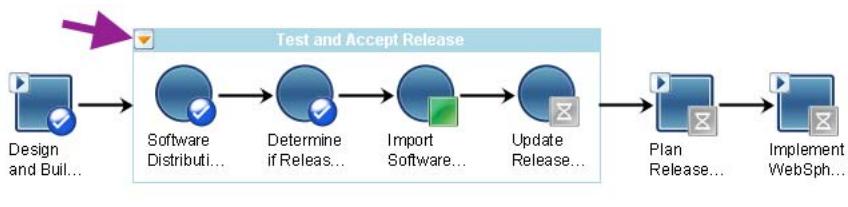
4. To complete the task, simply use click the Complete Activity icon (✓) in the toolbar. When you see the Change Status window click **OK** to accept the default values, and dismiss the window.
5. Use the **Return** link to navigate back to the release.



You have now completed the Determine if Release is Accepted task.

6. To refresh the information in the console, enter the release number (1280 in this example) in the Find field in the header, and press Enter.

Scroll to the bottom of the Process Details tab, expand the active Test and Accept Release process in the Workplan Map, and verify that the next task that must be performed is the Import Software into DML task. The status of the task should be IN PROGRESS.



7. To log off, use the Home icon () in the title bar to return to the start center, and click the **SignOut** link, so another user can sign in.



You are ready to perform the last task of the Test and Accept Release activity.

Import Software into DML

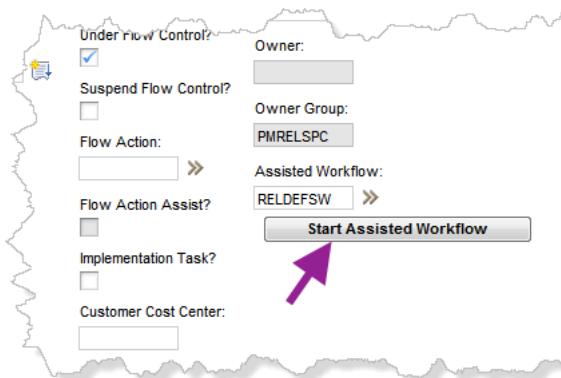
The purpose of this task is to capture the tested and verified software package, and load into the Definitive media Library.

The release specialist is also responsible for this task, so there is no need to log in as another user.

1. Log in to the IBM SmartCloud Control Desk console as the release specialist, Thomas, using a password of object00.
2. Notice that a task named *Import Software into DML* is awaiting in the My Active Tasks portlet. To launch the task, click the link.
3. When the Activities and Tasks application loads, notice that there is an assisted workflow named RELDEFSW associated with this task.
4. Before you invoke the workflow, ensure that you have provided a value for the DSLNAME attribute in the Attributes section at the bottom of the console. Use the **Select Value** option in the Detail Menu tool (next to the Value field for the attribute to list valid values. Select the only one you see, which will be EXERCISE_DML.

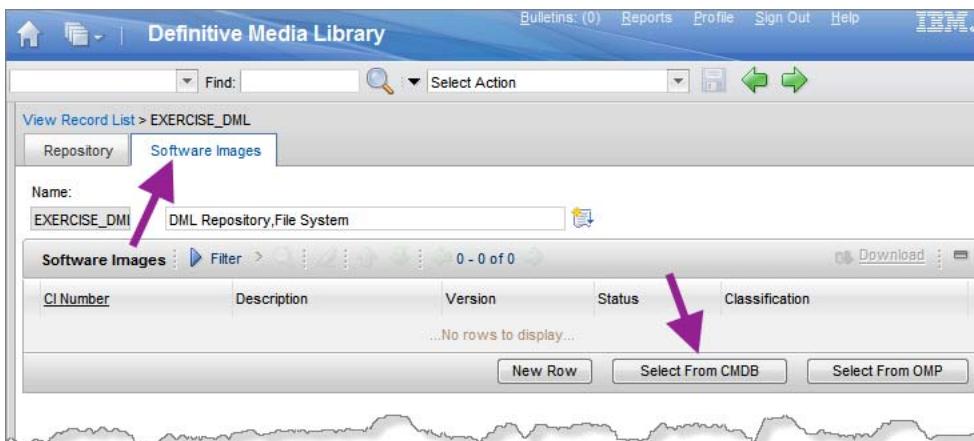
When the value of the DSLNAME attribute has been updated, click the Save icon (in the toolbar.

5. Scroll back to the top of the console, and find the Assisted Workflow field. To start it, click **Start Assisted Workflow** ad see where it takes you.



You are now taken directly to the Definitive Media Library application.

6. To add a new software package, open the Software Images tab, and click **Select From CMDB**.

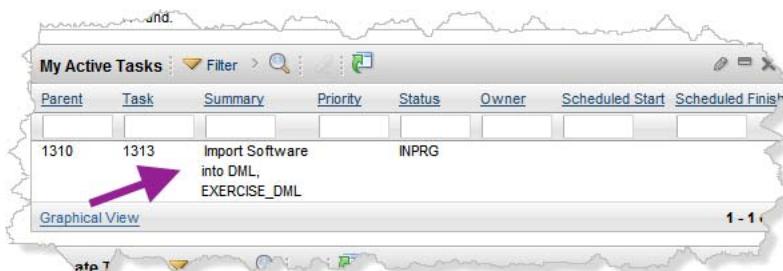


You use the CMDB option because the source CI associated with the release is already known as a SOFTWAREIMAGE configuration item.

When the Select Software Images window appears, select the only image in the system, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123 and click **OK**.

Click the Save icon (💾) when you are ready.

7. To return to the task, so you can update the status, use the Home icon (🏠) in the title bar to return to the start center, and then open the Import Software into DML task from the My Active Tasks portlet.



8. When the task is loaded in the Activities and Tasks application, complete the task by clicking the Complete Activity icon (checkmark) in the toolbar. When you see the Change Status window click **OK** to accept the default values, and dismiss the window.
9. Finally use the **SignOut** link to log off the release specialist.



Congratulations, you have completed the Test and Accept Release activity. By now, the progress of the release has been set to ACCEPTED, and you are ready to plan the implementation of the release.

Exercise 9. Plan Release Rollout



Note: The following sections contain a brief discussion of the purpose and details of the planning of the release rollout.. If you do not want to browse through it at this point in time, feel free to proceed directly to "[Develop Site Roll-out Plan](#)" on page 359.

In this activity, the deployment plan details are generated. They specifically focus on what will be performed during deployment of the release. So far you have only focused on the planning and specification of the release, now it is time to define what actually is going to take place. In general, this activity includes:

- Assignment of individuals to specific activities
- Detailed sequence of events
- Specifications of requirements (number, type) for assets to be ordered and delivered as part of each deployment event
- Identification of the CIs installed, changed, and removed
- Multi-site plans
- Restoration plans
- Plans for communicating the deployment to stakeholders
- Generating release notes for users

When you create the tasks in a planned rollout, each task is an implementation task.

Implementation tasks affect CIs, and planned rollouts by definition affect CIs. All current and upcoming implementation tasks that are scheduled in your data center are displayed in the Change Implementation Schedule. The Change Implementation Schedule calendar can be used to identify potential conflicts and the dates that are most appropriate for scheduling an implementation task.

For each software distribution rollout task that you create, you specify a software image CI reference so it can be used as the source for the deployment. Not only does this capture CI data for auditing purposes, but it also captures the data necessary for performing the task. A separate deployment ID is subsequently created for each of the rollout tasks in the plan.

For this particular exercise, you need only one implementation task, since you only need to deeply a single software package to four target CIs that are all in the same site. You can achieve this by specifying one software package and all four targets to the same implementation task. Furthermore, you are in luck. The job plan you chose already has the implementation plan defined. All you have to do is to assign CIs.

Had the situation been different, for example in the case of deploying an entire business application which involves multiple different software packages to multiple targets in an odd mix, you would have to create implementation tasks for each unique combination of software package and target CIs. All of these tasks would be defined during the execution of the *Develop Roll-out Plans* task, and the new tasks would naturally become a part of the *Implement WebSphere V6 FixPack 123 in a Release* activity.

Naturally deployment plan details will vary depending upon the type of deployment. IBM SmartCloud Control Desk supports three deployment types Hardware, Software, and Other. These three types can be used to deploy almost anything, using these methods:

- Rollouts involving site preparation, siting and installation of physical machinery, and other activities requiring on-site availability of deployment personnel.
- Software distribution, both pushed and pulled.
- Education and training events in support of technology introduction
- Transfer of responsibility between providers (with or without any alteration in service content or quality)

As you may recall, the tasks involved in planning the rollout of the release you are currently working with are the following.

- 10Develop Site Roll-out Plans
- 30Schedule Release Implementation
- 40Coordinate with Communication and Training
- 60Approve Rollout Plan
- 70Approve Impacted CI List
- 80Update Release Progress

In case you forgot, the descriptions for each of tasks you need to address in this activity, is:

Task #	Task Name	Description
10	Develop Site Roll-out Plans	Create the plans for rolling out the Release to each site to which the Release will be rolled out. Plans should include Release dates and deliverables. Refer to related RFCs, problems, and known errors that are addressed in the Release.
30	Schedule Release Implementation	Schedule the deployment of the Release to the site.
40	Coordinate with Communication and Training	Determine when training related to this Release will be provided to the affected sites. Schedule the delivery of communications concerning the Release to the site.
60	Approve Rollout Plan	Approve the rollout plan
70	Approve Impacted CI List	Approve Impacted CI List
80	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.

As was the case in previous activities, there is no need for you to worry about the Update Release Progress task.

In the current scenario, the tasks you will focus on are the Develop Site Roll-out Plans task (task 10), Schedule Release Implementation (task 20), and the Approve Rollout Plan (task 60). During the plan development in task 10, you provide high-level scheduling information for the implementation tasks, but in the Schedule Implementation Tasks task, you leverage the change management impact analysis and scheduling to create a realistic implementation plan. The Communication and education (task 40) task is not performed using IBM SmartCloud Control Desk features, besides updating the task information, since the two approval tasks are almost identical, there is no need to process both of them in detail.

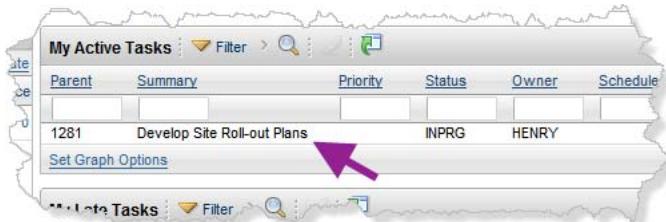
Develop Site Roll-out Plan

Before you dive into defining the roll-out plan head-first, you should hold your breadth, and consider what you are about to do. The ten targets you are about to update actually represent one WebSphere domain manager instance, three node agent instances, and six server instances. If memory serves you correctly, you remember that you need to update the deployment manager prior to updating the node agents, and node agents must be updated prior to servers.

In order to ensure that these dependencies are reflected in your plan, you must modify the existing implementation task, by applying a reference to the software package, and adding the deployment manager CI as the target. Then you create a similar task and add the node agent CIs as the targets. Finally you add a third implementation task, and associate it with the six WebSphere server instances. In addition, you add the original implementation task as the predecessor for the first new task, to ensure that the deployment manager is updated before any of the node agents. In a similar fashion, you make the first new tasks the predecessor of the last task you added, so the node agents are updated before the server instances. To ensure that the last implementation task completes before the activity can complete, you must make all three implementation predecessors of the task that originally followed the only implementation task.

To plan and schedule the rollout of your release, complete these steps:

1. Sign in to the IBM SmartCloud Control Desk console as **Henry**, the release owner, using a password of **objecct00**.
2. When the Release Owners start center opens, focus on the My Active Tasks portlet.



The release owner has one outstanding task waiting: Develop Site Roll-out Plans.

3. You recall that in this task, it is the responsibility of the release owner to ensure that the implementation activity in the release contains the necessary implementation tasks to implement the change. These implementation tasks may vary in nature, for example, installation of new racks, upgrading of the cooling capacity, creation of virtual systems, updating networking information, deployment of different software packages on different targets, mass rollout of a security update to multiple sites and so on.

In this exercise you are only dealing with a single, simple software update that needs to be deployed, and the job plan already contains an implementation task. However, if you recall, the implementation task is classified as a Software Distribution task, and is associated with an assisted workflow. This workflow is meant to be used by the release deployer to define, and optionally launch the individual deployments. You actually used this feature in ["Software Distribution for test and verification"](#) on page 350.

For the release implementation, you do not want to rely on a release deployer to be available when the change windows for the target CIs allow you to install new software. You would rather want the release deployer to prepare the deployments in advance, and perform the installation automatically at a convenient time, decided by the implementation schedule. In addition, you want to be able to ensure that the deployment manager WebSphere instances are updated prior to the node agents, and that the node agents are updated before the server instances.

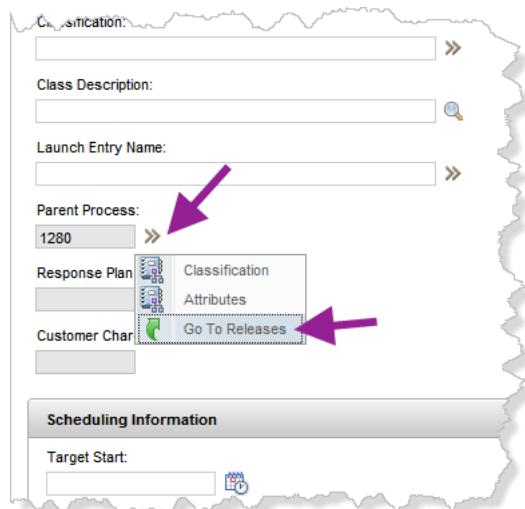
To accomplish this, you must:

- Redefine the current implementation task, so it is not marked as an implementation task. This task will now be used by the release deployer, as part of the implementation, to create the deployments needed for the installation.
- Create three new implementation tasks (one for each type of update), specify the appropriate software package and target CIs, and supply an automation action that invokes the related deployments automatically.
- Ensure that the relationships between the tasks forces the correct installation sequence.

You could also take a critical look on the pre-defined implementation tasks to decide whether you need them or not, however you will not focus on that in these exercises.

To finalize your implementation plan, complete these steps:

- a. Open the Develop Site Roll-out Plans assignment from the My Active Tasks portlet.
- b. When the task launches, navigate to the release by locating the Parent Process field in the Activities and Tasks tab, and choose the **Go To Releases** option the Detail Menu tool (») next to the Parent field.



- c. When the Releases application is launched, open the Process Details tab, and look at the Implementation Tasks section. Open the only task that has not been completed, the one named Software Distribution, by selecting **Go To Activities and Tasks** from the Detail Menu tool (») next to the Task field.

Task	Description	Scheduled Start	Scheduled Finish	Status
1298	Software Distribution			WAPPR
1306	Go To Activities and Tasks			COMP
1310	» Test and Accept Release			COMP
1311	» Software Distribution, 1, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			COMP

Task	Description	Scheduled Start	Scheduled Finish	Status

You have finally reached the implementation task.

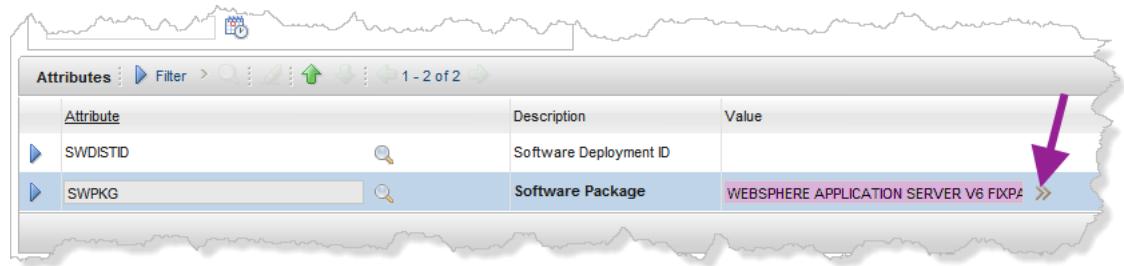
- d. To modify the implementation task, complete these steps:
- First, ensure that the task is not marked as an implementation task. This means, that it can be scheduled at any time the release deployer is available, and does not require a change window for the target CIs.

Uncheck the Implementation task? option.

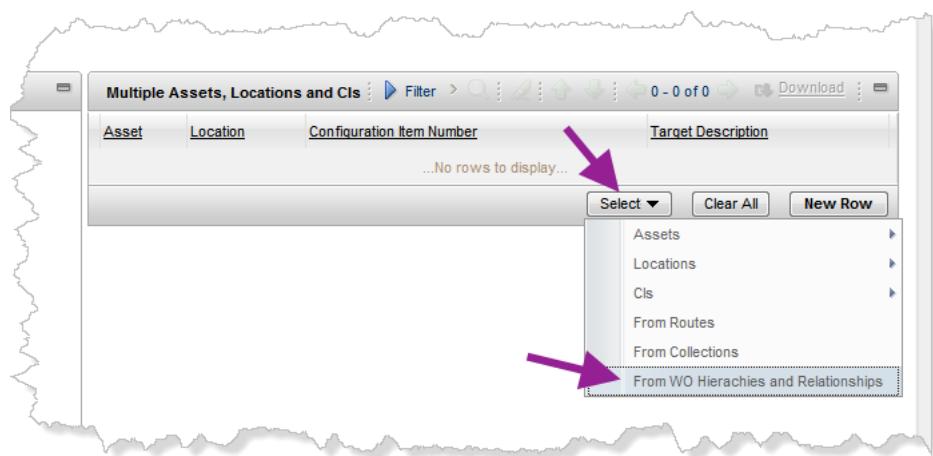
The screenshot shows the 'Activities and Tasks' screen for Task 1298. The 'Implementation Task?' checkbox is highlighted with a red circle. Other fields visible include Task (80), Activity Type, Priority, Reported By (LUCY), SLA Applied, Under Flow Control (checked), Suspend Flow Control, Flow Action, Flow Action Assist?, and Customer Cost Center.

- Now you need to add the information about the software package to use for this software distribution task. Scroll to the bottom locate the Attributes section, and use the

Detail Menu tool (») next to the value field for the SWPKG attribute to select the software image named WEBSPHERE APPLICATION SERVER V6 FIXPACK 123.
 (You basically have to follow steps already outlined in Step 3 on page 351.)



- To define the target CIs, which are all the targets that were added to the release when you linked the original change to the release, simply locate the section named Multiple Assets, Locations and CIs, and click **Select > From WO Hierarchies and Relationships.**



Exercise 9. Plan Release Rollout

When the Select From Hierarchies and Relationships window appears, notice that the release has already been selected, and the target CIs that it references are shown.

Record	Class	Description	Status	Site	Organization	Is Task?
1280	RELEASE	Deploy WebSphere V6 FixPack 123	INPRG	PMSC RTP	PMSC IBM	<input type="checkbox"/>
1290	ACTIVITY	Implement WebSphere V6 FixPack 123 in a Release	WAPPR	PMSC RTP	PMSC IBM	<input type="checkbox"/>

Asset	Location	Configuration Item Name	Target Description	Site
<input checked="" type="checkbox"/>		RHEL56-3.TIVLAB.SANJOSE.IBM.COM:RHEL56-3 NODE01:TRADESERVER5		
<input checked="" type="checkbox"/>		RHEL56-2.TIVLAB.SANJOSE.IBM.COM:RHEL56-2 NODE01:TRADESERVER3		

Asset	Location	Configuration Item Name	Target Description	Site
<input checked="" type="checkbox"/>		RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1 NODE01:NODEAGENT		
<input checked="" type="checkbox"/>		RHEL56-3.TIVLAB.SANJOSE.IBM.COM:RHEL56-3 NODE01:NODEAGENT		
<input checked="" type="checkbox"/>		RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1 CELLMANAGER01:DMGR		

OK **Cancel**

You must create deployments for all the targets, so check the check box next to the Asset heading field, and click **OK**.

- ii. You are done re-specifying the existing implementation task. Click the Save icon () in the toolbar to save your updates.
- iii. To navigate back to the Develop Site Roll-out Plans task, click **Return**.

This will take you back to the release. Verify that the name of the implementation task has changed (the name of the software package has been appended).

Task	Description	Scheduled Start	Scheduled Finish	Status
1298	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	8/12/12 20:56:08	8/26/12 01:56:08	WAPPR
1306	Design and Build Release			COMP
1310	Test and Accept Release			COMP
1311	Software Distribution, 1, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			COMP

Now you can focus on creating the additional implementation tasks.

- e. To create a new implementation task complete these steps:
 - i. Navigate to the Plans tab, and locate the Children of Release ... section. To open the implementation activity, use the **Go To Activities and Tasks** option from the Detail

Menu tool (») next to the Record field of the activity with a Summary of *Implement WebSphere V6 FixPack 123 in a Release*.

Record	Record Class	Summary
1310	ACTIVITY	Test and Accept Release
1306	ACTIVITY	Design and Build Release
1281	ACTIVITY	Plan Release Rollout
1290	ACTIVITY	Implement WebSphere V6 FixPack 123 in a Release

- ii. When the Activities and Tasks application launches, open the Plans tab, locate the Tasks for Activity ..., and click **New Row** in order to create a new task.

Sequence	Task	Summary	Estimated Duration	Route	Route Stop	Status	Owner	Owner Group
1	10	Obtain Status of Cls in a Release	1:00			WAPPR		PMRELDEP
2	20	Verify CI Targets for a Release	1:00			WAPPR		PMRELDEP
7	70	Validate WAS Requirements are met	1:00			WAPPR		PMRELDEP
8	80	Software Distribution, WEBSHPEARE APPL	4:00			WAPPR		PMRELDEP
10	100	Verify Platform Security Compliance	1:00			WAPPR		PMRELDEP
11	110	Test Backups	8:00			WAPPR		PMRELDEP

- iii. To see the new task, click the Next Page icon (→) in the Tasks for Activity ... header, and locate the new task (the one with no description; most likely task number 160) at the

bottom of the list. To access the details, click the Show Details icon (▶) in front of the line that represents the task

Sequence	Task	Summary	Estimated Duration	Route	Route Step
12	120	Update Inventory System and SR Inform	2:00		
13	130	Update Release Progress	0:01		
14	140	Update CI Status	1:00		
15	150	Update Release Progress	0:01		
	160		1:00		

When the task details are shown, complete these steps to specify the task:

Locate Task Information section, and provide the following details:

Classification	PMREL \ PMRELT SK \ SWDIST
Flow Action	PMRELDISTSOFT
Assisted Workflow	PMRELSWDST
Implementation Task?	<checked>
Owner Group	PMRELDEP

Task Information

* Task: 160 Software Distribution

Sequence: 160

Status: WAPPR

Classification: PMREL \ PMRELT SK \ SWDIST

Flow Action: PMRELDISTSOFT

Assisted Workflow: PMRELSWDST

Implementation Task?

Owner Group: PMRELDEP

Scroll down until you see the Scheduling Information section, and provide values for these fields:

Estimated duration 8 (hours)

Predecessors 80

(Use the Detail Menu tool (») next to the

Predecessors field to select the task number of the original implementation task)

The screenshot shows the 'Scheduling Information' panel with the following fields:

- Target Start: [Input Field] [Calendar Icon]
- Target Finish: [Input Field] [Calendar Icon]
- Scheduled Start: [Input Field] [Calendar Icon]
- Scheduled Finish: [Input Field] [Calendar Icon]
- Start No Earlier Than: [Input Field] [Calendar Icon]
- Finish No Later Than: [Input Field] [Calendar Icon]
- Actual Start: [Input Field] [Calendar Icon]
- Actual Finish: [Input Field] [Calendar Icon]
- * Estimated Duration: [Input Field] 8:00
- Time Remaining: [Input Field]
- Predecessors: [Input Field] 80 [Horizontal Bar] [Arrow Icon]

A purple arrow points to the 'Predecessors' field.

- f. Create two more tasks similar to the one you just created. Repeat Step e on page 364 twice.

When you are done, you will have three new implementation tasks, most likely task numbers 160, 170, and 180.

Exercise 9. Plan Release Rollout

- g. To verify that the three new implementation tasks were successfully created, use the **Return** link to go back to the release, open the Process Details tab, and refresh the content of the release, by entering the release number (1280 in this example) in the Find field, and click the Find icon (🔍).

Task	Description	Scheduled Start	Scheduled Finish	Status
1306	Design and Build Release			COMP
1310	Test and Accept Release			COMP
1311	Software Distribution, 1, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			COMP
1315	Software Distribution			WAPPR
1316	Software Distribution			WAPPR

Task	Description	Scheduled Start	Scheduled Finish	Status
1298	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			WAPPR
1311	Software Distribution, 1, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			COMP
1315	Software Distribution			WAPPR
1316	Software Distribution			WAPPR
1317	Software Distribution			WAPPR

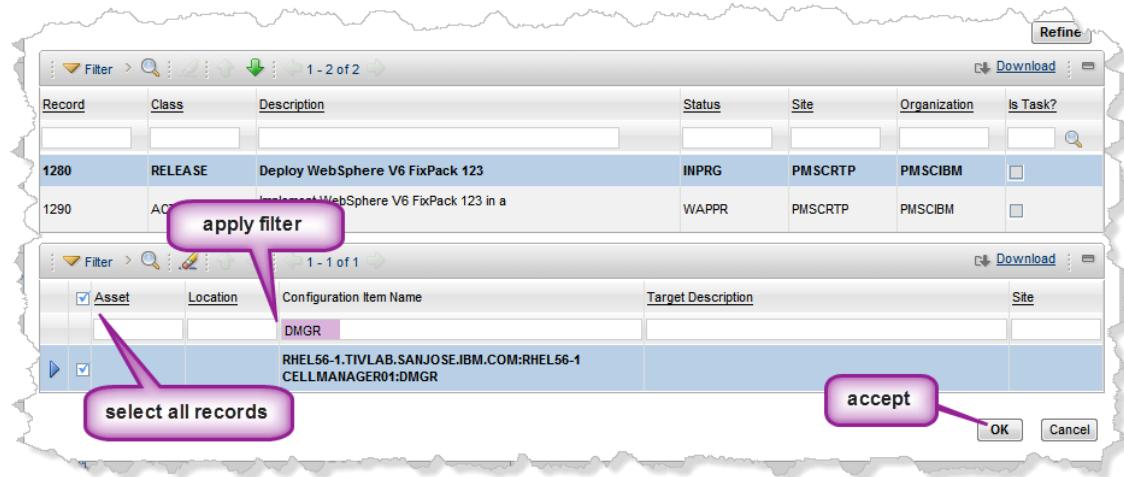
Now, focus on the Implementation tasks section, and verify that you see the three new tasks in both the Implementation tasks and in the Software distribution tasks sections.

You may have to look at the second page of the Implementation Tasks section to see the last task you added.

- h. To assign the correct software package and the deployment manager target Cls (use a filter value of DMGR) to the first new software distribution task (1315 in this example), complete these steps:
- Use the **Go To Tasks and Activities** option from the Detail Menu tool (➡) next to the Task field of the Software Distribution task with a name *Software Distribution* and the lowest task number.
 - When you see the details for the task, locate the Multiple Assets, Locations and Cls, and click **Select > From WO Hierarchies and Relationships**.

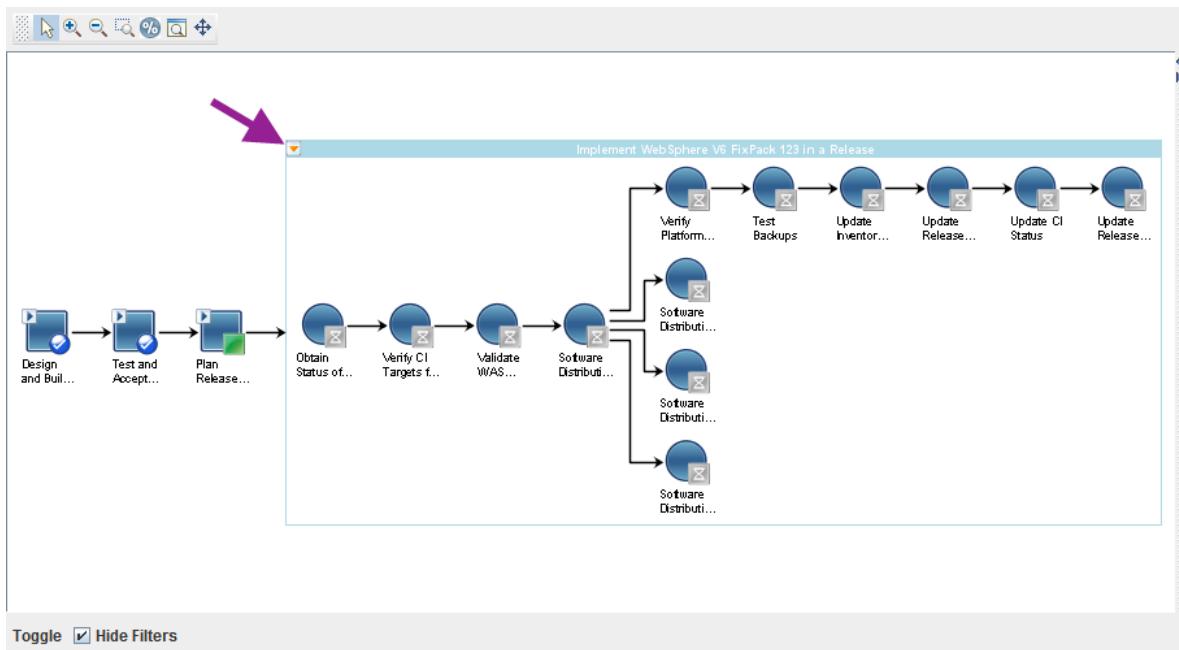
When the Select From Hierarchies and Relationships window appears, you must select only the deployment agent instance(s). Supply the appropriate filter value in the Configuration Item Name filter field, and press Enter.

To select all the CIs that were included by the filter, check the check box next to the Asset column heading, and then click **OK**.



- iii. When you return to the task definition, scroll to the bottom, and use Detail Menu tool (») next to the value field for the SWPKG attribute to ensure that the value is set to WEBS SPHERE APPLICATION SERVER V6 FIXPACK 123.
- iv. To save your recent updates, click the Save icon (F) in the toolbar, and then use the **Return** link to navigate back to the release.
- v. When you return to the Releases application, refresh the information by providing the release number (1280) in the Find field and click the Find icon (🔍), and verify that the title of the task you just modified has been updated. The name of the software package has been appended to the name.
- i. To add targets to the second task you added (1316 in this example), repeat the previous step using a filter value of NODEAGENT in order to include all three node agent instances as targets.
- j. To add targets to the last task you added (1317 in this example), repeat Step h on page 368 using a filter value of SERVER in order to include the remaining 6 server instances as targets.
- k. Before you have completed the modifications to the roll-out plan, you must ensure that the tasks are properly related to one another.

Scroll down until you see the workplan map, and expand the last activity. The map should now look like this:

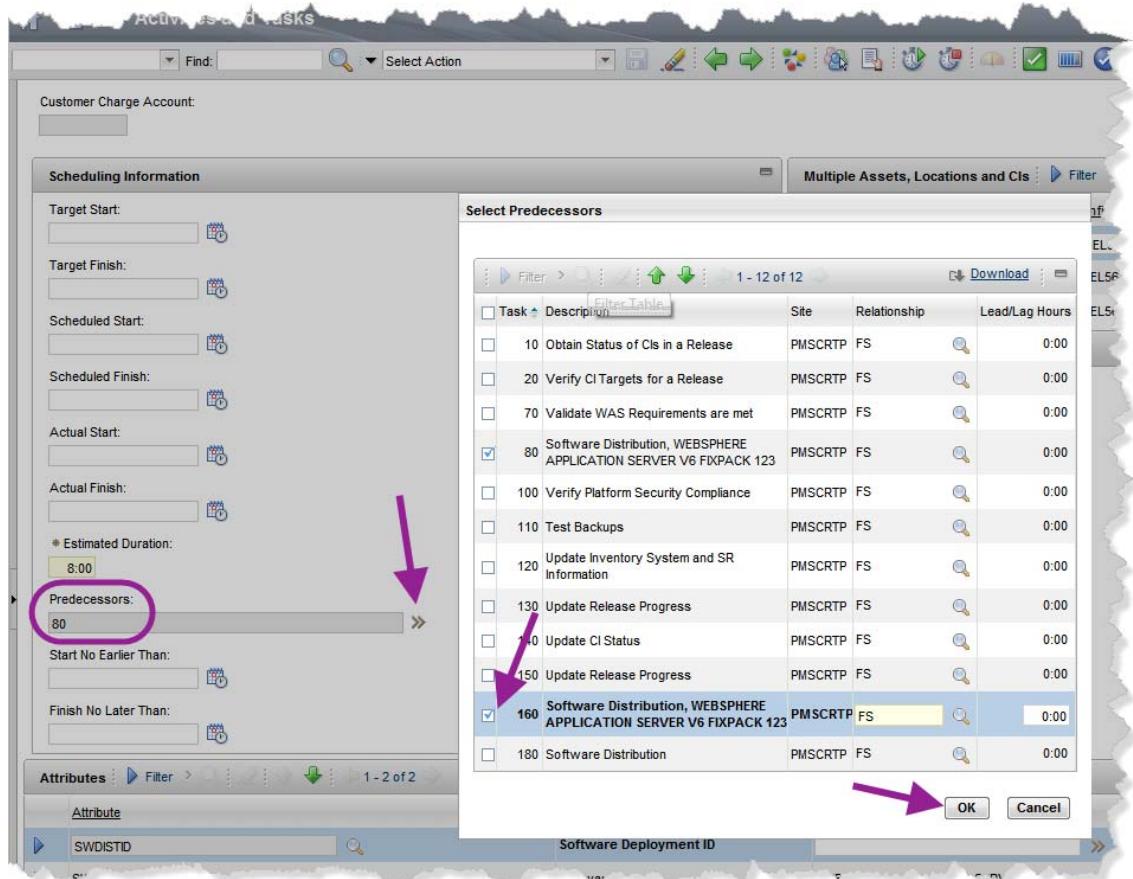


Obviously, the dependencies need to be fixed.

To ensure that the second new software distribution task you created (170) is preceded the first one you added (160) complete these steps:

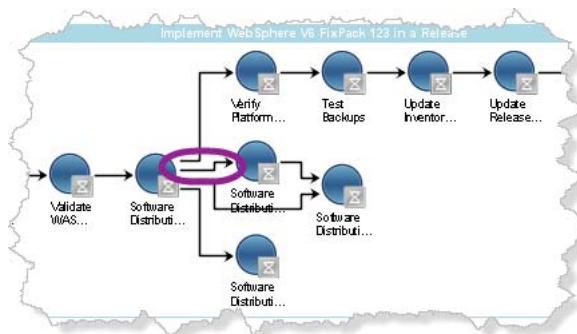
- i. From the workplan map, select the relevant task (1290-170 in this example) in the Tree pane, and notice how it is highlighted in the map.
- ii. Right-click the highlighted task in the map, and choose **Go To Activities and Tasks** from the context menu.

- In the Activities and Tasks application, locate the Scheduling Information section, and use the Detail Menu tool (») next to the Predecessors field, to add the preceding implementation task (160 in this case) to the list of predecessors for the current task.



Click **OK** to confirm the new set of predecessors.

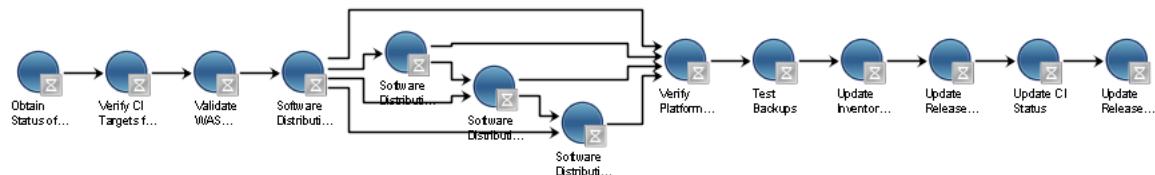
- To save your recent updates, click the Save icon (💾) in the toolbar, and then use the **Return** link to navigate back to the release.
- When you return to the Releases application, refresh the information by providing the release number (1280) in the Find field and click the Find icon (🔍). Then verify that the workplan map has been updated and shows the dependency you just added.



- To ensure that the last implementation task you created (1290-180) is preceded by the second (170), repeat the previous step, using the tasks numbers specified in this sentence.

- m. Finally, you must ensure that the *Verify Platform Security Compliance* task (1290-100) is preceded by all four software distribution tasks in the implementation plan (80, 160, 170, and 180). Repeat Step k on page 369 to define the new predecessors for task 1290-100.

When all the relationships have been defined, your workplan map should look similar to this:

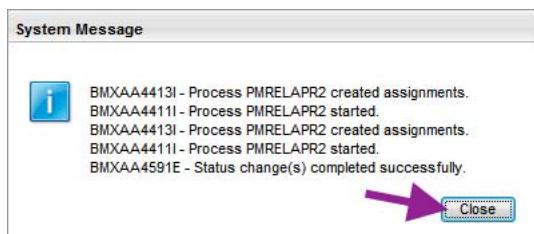


You are done, at this point you are satisfied with the roll-out plan, so you can complete the Develop Site Roll-out Plans task. To navigate to the task, simply press **Return** again.

4. In the Activities and Tasks application, complete the task by clicking the Complete Activity icon (✓) in the toolbar.

When you see the Change Status window click **OK** to accept the default values, and dismiss the window.

You will see, that when you complete the task, the PMRELAPR2 process is started, and it creates new assignments. This is a result of the flow actions related to the first approval task. This task invokes a workflow that calculates the approval needs, and assigns approvers.



Click **Close** to dismiss the message.

5. To return to the start center, click the Home icon (⌂) in the title bar.

You have now scheduled the implementation tasks, and identified the software package that will be deployed, as well as the targets that will receive the package when the implementation tasks are executed.

So you managed to create a roll-out plan. The plan you created now consists of three implementation tasks, all of which distribute the WebSphere V6 FixPack 123 software package. The first task deploys the updates to the domain manager, the second task deploys the software package to three node agents, and the last task updates six WebSphere servers. Because the deployment manager must be updated before the node agents, and the node agents before the servers, predecessor dependencies have been defined to control the implementation sequence.

But when will the WebSphere instances be updated?

It is time to create an implementation schedule.

Schedule the implementation

Ultimately, the release modifies components in your infrastructure, so it implements changes. As for all other changes it must be processed according to the policies set forth by your organization, so you must create an implementation schedule that takes into account the change windows and blackout periods associated with the targets of the release.

At this point in time, the roll-out plan has been fully specified. It identifies all the implementation tasks and their targets, and you have classified the tasks correctly. So, the only step between you and the approved release plan is to create the implementation schedule, so it can be approved, and implemented.

If you recall, you used a job plan for the change that included only a single task, which only waits for a release to complete, before it completes the change. So far, the change itself does not include any implementation tasks, so there isn't really a lot to process. However, you can reference the release from the change, thereby bringing in all the tasks you have already performed, as well as the pending implementation tasks. By doing this, the details of the release plan become visible to the change, and you can process the change as any other change, including scheduling the change taking change windows, blackout periods, and impacts into account.

Scheduling the release is performed using the Scheduler application. This provides a Gantt Chart view of your release project, that gives you graphical capabilities to manipulate activity and task dates, duration, and relationships. In addition, it visualizes availability of both CIs and people that are assigned to perform specific tasks, and shows group utilization, so you can adjust the plan to meet the available resources.

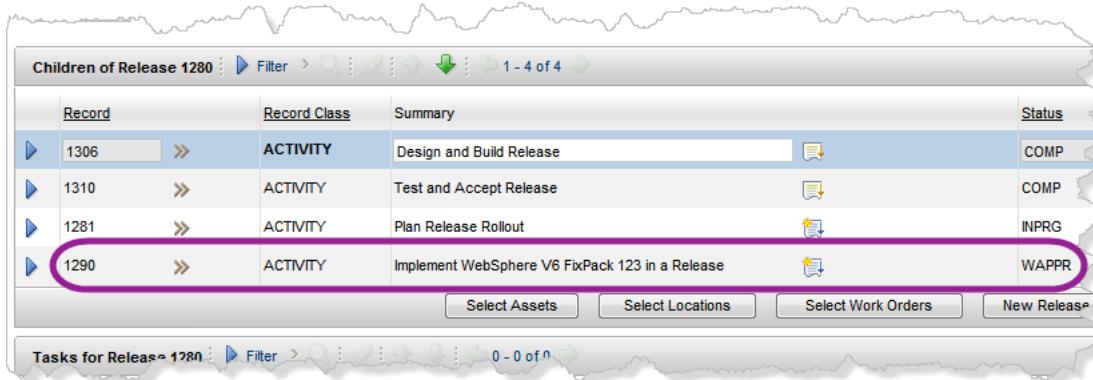
Scheduling projects are maintained through the Scheduler application. When defining a project, you specify one or more queries, that are used to specify the tasks that are included in the schedule. Typically, you would use only one query, which identifies all the activities you wish to schedule.

This flexibility allows you to include the same tasks in several Scheduler projects, or create multiple scheduler projects for a release. You could have created one scheduler project to help you plan and manage the develop, build, test, and plan activities of the release, and another scheduling project for the implementation activity.

Since you are creating a schedule for the roll-out plan, in this exercise you will create a scheduler project specifically for the *Implement WebSphere V6 FixPack 123 in a Release* activity.

To create an implementation schedule, follow this simple procedure:

1. First, you need to find the work order number of the implementation activity you are about the schedule.
 - a. Open the Deploy WebSphere V6 FixPack 123 release from the My Active Releases portlet in the Release Owners start center, and navigate to the Plans tab.
 - b. In the Children of Change ... locate the activity named *Implement WebSphere V6 FixPack 123 in a Release*. The activity you are looking for, is the only one with a status of Waiting Approval (WAPPR).

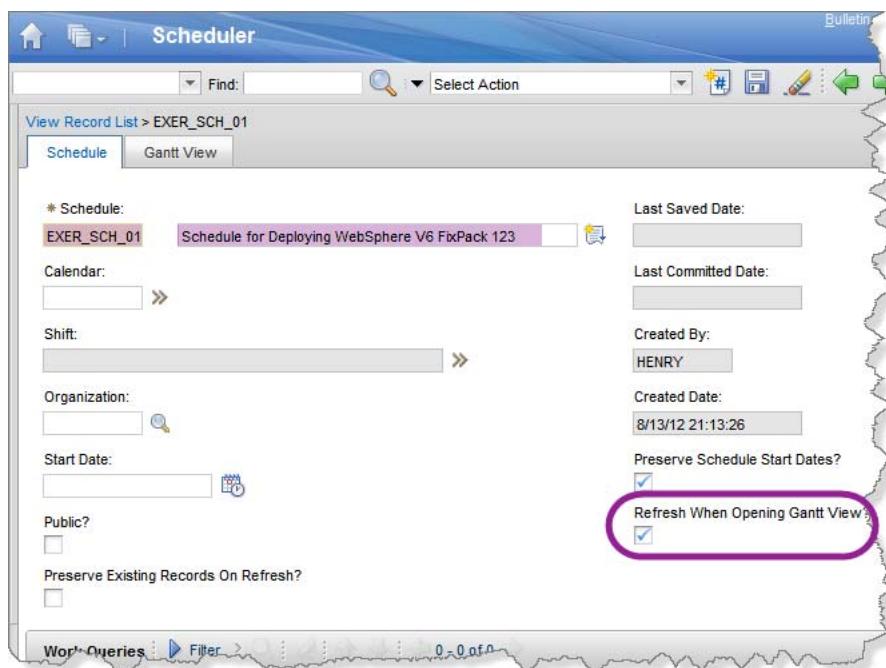


Record	Record Class	Summary	Status
1306	ACTIVITY	Design and Build Release	COMP
1310	ACTIVITY	Test and Accept Release	COMP
1281	ACTIVITY	Plan Release Rollout	INPRG
1290	ACTIVITY	Implement WebSphere V6 FixPack 123 in a Release	WAPPR

- c. Make a note of the Record number for the implementation activity, 1290 in this example, you will need the number in a short while.

2. Next, create a scheduler project that includes the relevant implementation tasks, by complete the following steps:
 - a. To open the Scheduler application click the Go To icon (grid) in the Console header and navigate to **Planning and Scheduling > Scheduler**.
 - b. When the application opens, create a new Scheduler Project by clicking New Schedule icon (grid) in the toolbar, and provide the following information:

Schedule	EXER_1280
Description	Schedule for Deploying WebSphere V6 FixPack 123
Refresh When Opening Gantt View	Checked



- c. To specify which tasks to include, you must associate one or more queries with the schedule. To create a new query, click **New Row** in the Work Queries section, and provide these attributes:

Data Source	WOACTIVITY
Query Name	Implementation Activity For Release 1280
Where Condition	wonum = '<rec#>' and siteid='PMSCRTP' (substitute <rec#> with the record number of the implementation activity you just recorded)
Description	Implement WebSphere V6 FixPack 123 in a Release

Work Queries			
Filter > 1 - 1 of 1 Download			
Data Source	Query Name	Description	Where Condition
WOACTIVITY	Implementation Activity For Release 1280	Implement WebSphere V6 FixPack 123 in a Re	wonum = '1290' and siteid='PMSCRTP'

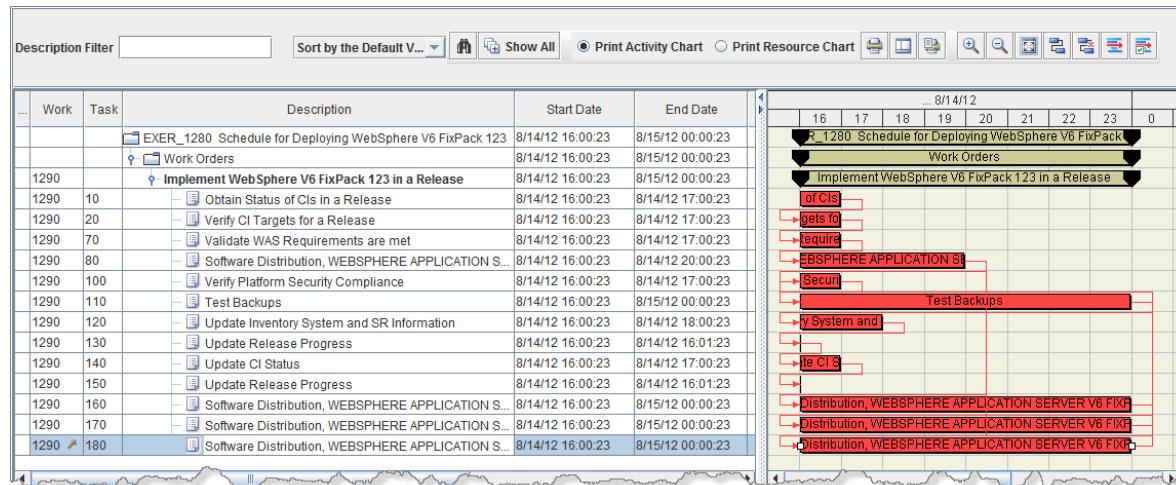
Details

* Data Source: WOACTIVITY
* Query Name: Implementation Activity For Release 1280
* Where Condition: wonum = '1290' and siteid='PMSCRTP'
Description: Implement WebSphere V6 FixPack 123 in a Release

Copy Query New Row

- d. To save the schedule project click the Save icon (S) in the toolbar.

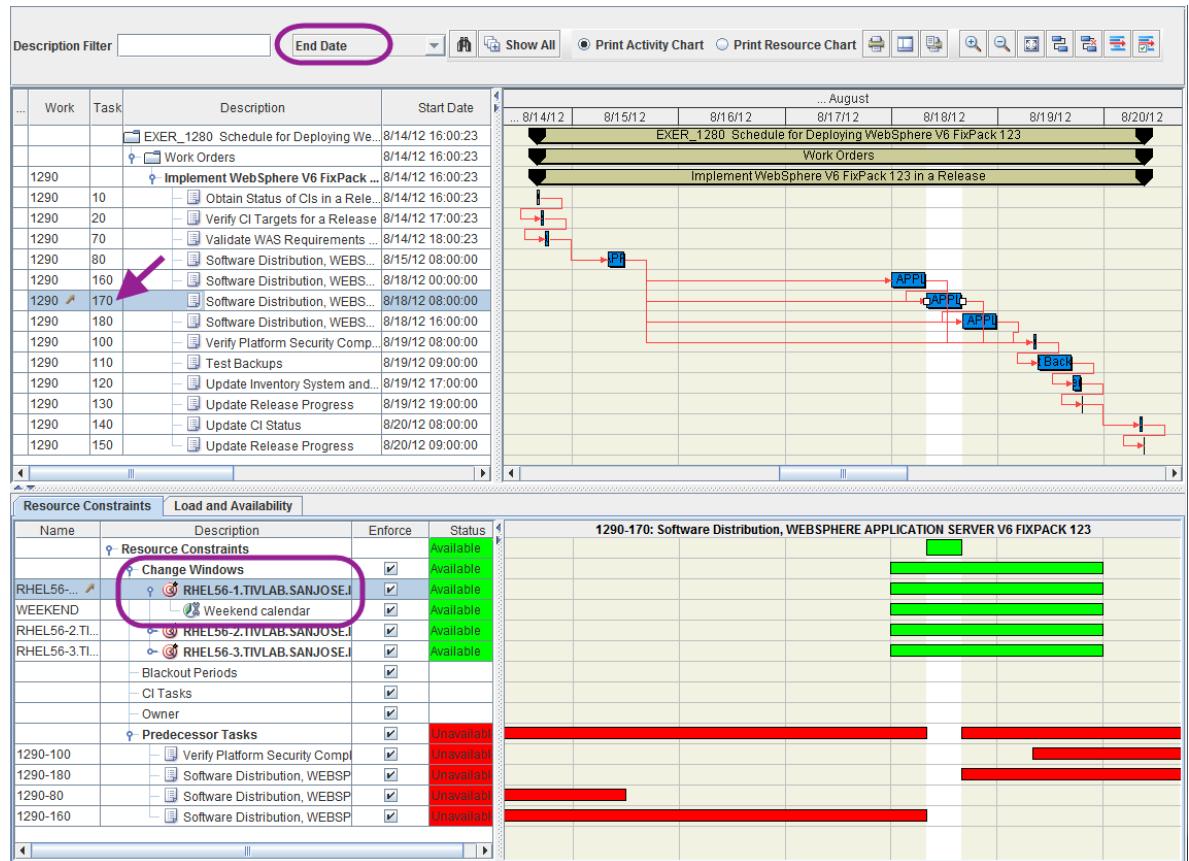
3. You can now verify that the expected tasks are included in the schedule, and actually create a schedule for your release implementation activity.
- a. To verify that the expected tasks open the Gantt View tab, and verify that all the tasks that are included are the ones you expected.



To see the task details you may have to resize some of the panes or columns.

Notice how the start date is the same for all the tasks, and that the dependencies you so carefully created in the implementation plan does not seem to be respected.

- To schedule the whole activity, click the Perform Critical Path Method on All Rows icon (🕒) in the toolbar of the Gantt View. When the schedule has been recalculated, choose End Date in the Sort-By drop-down menu, and then select your second software distribution task (task 170 in this example) which deploys WebSphere V6 FixPack 123 to the WebSphere node agent instances.



You see how the project has been rescheduled based on dependences, as well as the task dependencies, and availability of resources. Also, notice how the scheduling is limited by both the change window for the three node agents, and not by the availability of the release deployer, since these implementation tasks are automated.

You have now successfully scheduled the implementation activity of the release.

It looks as if the schedule you have produced can be implemented well in advance of the target end date originally requested by Steve.

4. To see how the scheduling has affected your release, navigate back to the start center, and use the link in the My Active Releases portlet to open the release. Then, look at the information in the Process Details tab:

Milestones	Description	Scheduled Start	Scheduled Finish
1289	Update Release Progress		
1303	Update Release Progress	8/20/12 18:00:00	8/20/12 18:01:00
1305	Update Release Progress	8/20/12 19:01:00	8/20/12 19:02:00
1309	Update Release Progress		
1314	Update Release Progress		

Implementation tasks	Description	Scheduled Start	Scheduled Finish	Status
1298	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	8/18/12 08:00:00	8/18/12 12:00:00	WAPPR
1306	Design and Build Release			COMP
1310	Test and Accept Release			COMP
1311	Software Distribution, 1, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			COMP
1315	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	8/18/12 12:00:00	8/18/12 20:00:00	WAPPR

Software distribution tasks	Description	Scheduled Start	Scheduled Finish	Status
1298	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	8/18/12 08:00:00	8/18/12 12:00:00	WAPPR
1311	Software Distribution, 1, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123			COMP
1315	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	8/18/12 12:00:00	8/18/12 20:00:00	WAPPR
1316	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	8/19/12 08:00:00	8/19/12 16:00:00	WAPPR

You see how scheduled dates have been assigned to all the tasks, implementation, and verification tasks alike, that has not yet started or completed.

5. To mark the Schedule Implementation Plan task that was assigned to Henry as complete, click the Home icon () to return to the start center, and reload the task from the My Active Tasks portlet. When the Activities and Tasks application loads, use the Complete Activity icon () in the toolbar to set the status to COMPLETE, and confirm your intent.
6. Before you continue to look at the My Active Tasks in the release owners start center once more. There is another assignment for you, one that expects you to communicate the plans to stakeholders and site administrators. For this exercise, assume that you have already informed them, and complete the task.
7. When there are no more outstanding tasks for the release owner in the My Active Tasks portlet, you have completed this step.

8. To log off so another user can use your browser, click the **SignOut** link.



You have now scheduled the release, so all you need before the plan can be implemented, is to obtain approval from the release team.

Approve Rollout Plan

You may recall, that during the initial specification of the release, you specifically added Pete Release Administrator as the owner of the two approval tasks. Pete needs to approve both the roll-out plan, and the target CI allocation.

Just for you to experience how the escalation process works, you will no, as Pete, approve the roll-out plan, and reject the target CI allocation. During this process you experience how other users are notified, based on the PMRELAPPR action and its related workflow.

To approve the roll-out plan, complete these steps:

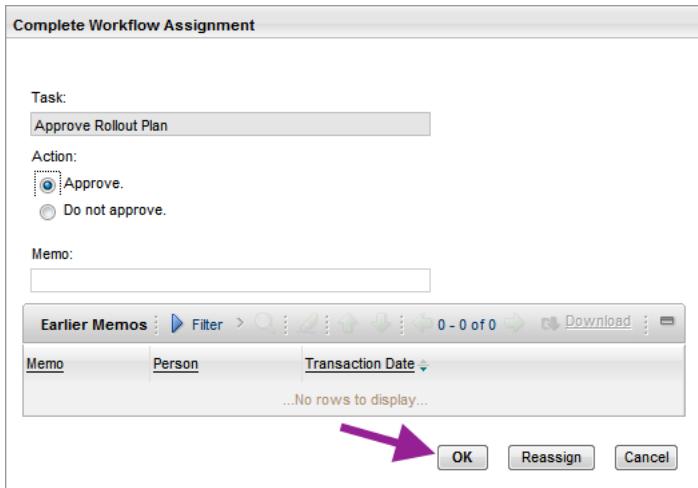
1. Log in to the IBM SmartCloud Control Desk console as the release administrator, **Pete**, using a password of `object00`.
2. Notice that two assignments are waiting. They appear in the **Inbox/Assignments** portlet, and not as you are used to, in the **My Active Tasks** portlet.

A screenshot of the 'Inbox / Assignments' portlet. The portlet header shows 'Next Assignment Due: 8/9/12 23:09:14'. Below the header is a table with columns: Description, Due Date, Priority, Start Date, and Route. Two assignments are listed:

Description	Due Date	Priority	Start Date	Route
Approve Rollout Plan	8/9/12 23:09:13		8/9/12 23:09:13	
Approve Impacted CI List	8/9/12 23:09:14		8/9/12 23:09:14	

The reason for this is, that these assignments were specifically created by a workflow, and are not based on the normal task status and ownership information which is used to populate the **My Active Tasks** portlet.

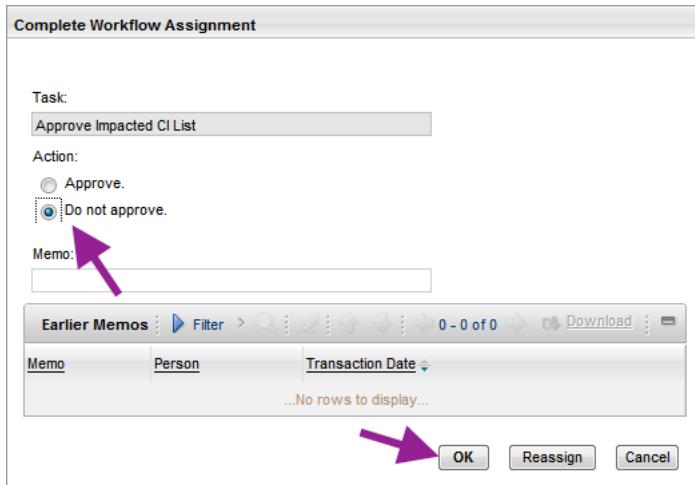
To immediately approve the roll-out plan, click the Route Workflow () icon in the line that represents the assignment named Approve Rollout Plan.



When the Complete Workflow Assignment window appears, accept the defaults, and click **OK** to complete the assignment, and the underlying task.

When you are done, click the Home icon () to return to the start center, and confirm that the assignment has disappeared.

3. Now, let the fun begin, and see if you can get the target CI allocation approved.
 - a. As Pete Release Owner, reject the target CI allocation, click the Route Workflow () icon in the line that represents the assignment named Approve Target CI List. When the Complete Workflow Assignment appears, check the *Do not approve* option, and click **OK**.

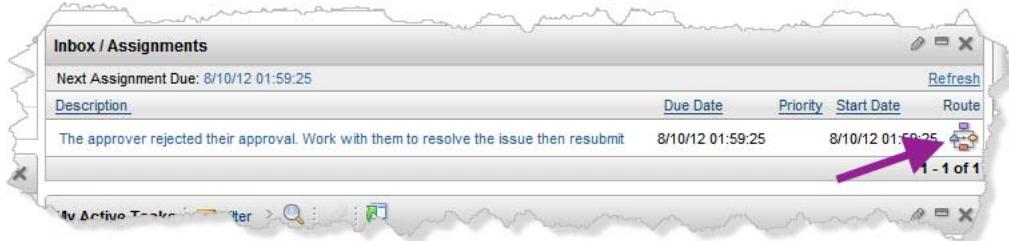


When the window is dismissed, click the Home icon () to return to the start center, and confirm that there are no more assignments for the release administrator.

Use the **SignOff** link to let another user log in.

- b. Now, log in to the IBM SmartCloud Control Desk console as the release owner, Henry, using a password of object00. The reason that you deliberately log in as the release owner is, that the workflow assigns the resolution task to the release owner if the first level of approval is rejected.

Notice the assignments for the release owner.



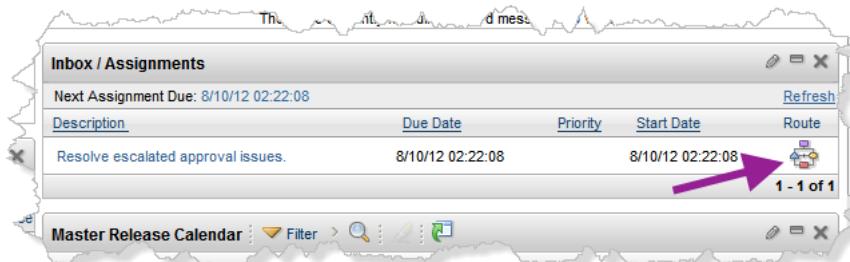
The assignment suggests that you should work with the approver to resolve any issues. Assuming you make the necessary modifications and resubmit the approval request, the process you have just seen will repeat. The approver will receive an approval assignment, which can be accepted or rejected. However, if you cannot agree with the approver, you can escalate the issue. If you do this, the request will end up as an assignment for the release manager.

To escalate the approval request, If you resubmit the request click the Route Workflow (icon for the assignment. When you see the Complete Workflow Assignment window, choose the *Issue cannot be resolved - escalate for resolution* option and click **OK**.

When the window is dismissed, click the Home icon (to return to the start center, and confirm that there are no more assignments for the release owner.

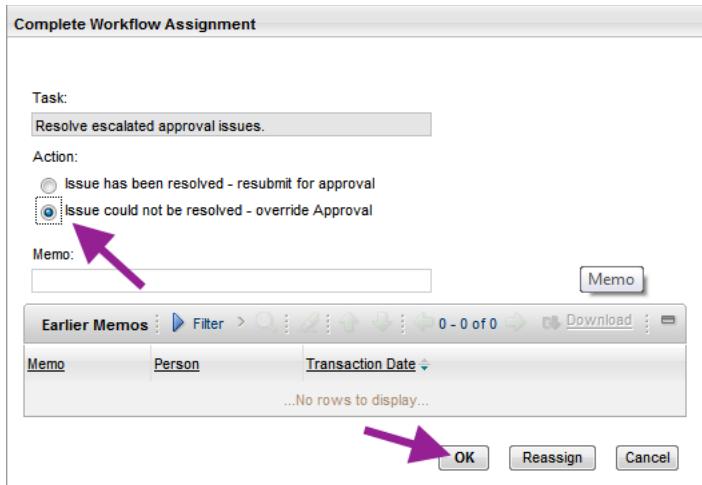
Use the **SignOff** link to let another user log in.

- c. Now, log in to the IBM SmartCloud Control Desk console as the release administrator, Silvia, using a password of object00, and notice the assignments.



Hopefully you are not surprised to see an assignment for the release manager to resolve the conflict between the release owner and the approver.

To resolve the issue, click the Route Workflow () icon for the assignment.



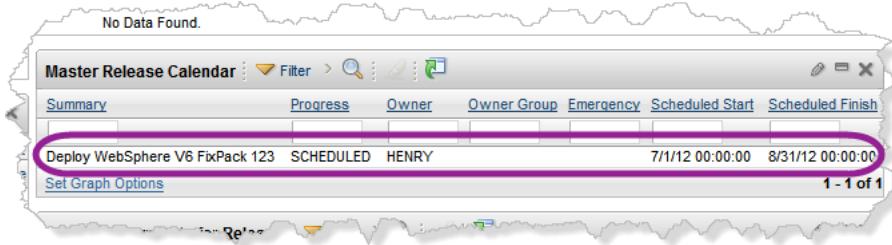
The release manager decides to stop the quarrel between the release owner and the approver, by selecting the *Issue could not be resolved - override Approval* option, and clicking **OK**.

When the Complete Workflow Assignment window disappears, notice that by now, the status of the Approve Impacted CI List task has been set to COMPLETED.

The manager has trumped, and can now **SignOut**, so the release manager can complete the preparation of the release.

At last both approvals have been obtained, and the release manager is ready to check if more works needs to be done before the release can be implemented.

4. Log in to the IBM SmartCloud Control Desk console as the release owner, Henry, using a password of object00, and notice the information in the Release Owners start center.



First of all, notice that there are no assignments, and no active tasks for the release owner.

Next, look at the Master Release Schedule portlet. There you see that entire release has been moved to the SCHEDULED status. This implies, that when the last approval was obtained, the Plan Release Rollout activity was closed, and the release was moved to the next activity: Implement WebSphere V6 FixPack 123 in a Release.

The release owner can finally take a break. The implementation of the release is the responsibility of the Release Deployers group.

To allow someone else to use your browser, click **SignOut** - and take a rest.

Exercise 10. Implement WebSphere V6 FixPack 123 in a Release

You have almost reached your goal to upgrade the WebSphere platform code on the four selected systems in your environment. The only activity that is left for you to perform the actual implementation.

As you have seen for the other activities, the implementation activity also contains multiple tasks, some of which are more relevant to these exercises than others. In case you do not recall all the activities, that were copied to your release when you applied the job plan, they are listed below:

Task #	Task Name	Description
10	Obtain Status of CIs in a Release	Ensure that the required CIs exist, and are operational.
20	Verify CI Targets for a Release	For CIs that are not OPERATIONAL, ensure that they are moved into the correct status.
70	Validate WAS Requirements are met	Check prerequisites, including creating valid backups for the remediation, so the original system can be restored in case the update fails.
80	Software Distribution	Prepare deployments
160	Software Distribution	Distribute to WebSphere deployment managers
170	Software Distribution	Distribute to WebSphere node agents
180	Software Distribution	Distribute to WebSphere servers
100	Verify Platform Security Compliance	Run security scans to ensure compliance
110	Test Backups	After the standard applications and utilities have been installed on the server, the System Administrator attaches the (TSM) option file to the server and forces a backup of the server image.
120	Update Inventory System and SR Information	Perform inventory scan, append comments to service request, and make updates to the SR as necessary.
130	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.
140	Update CI Status	Update the status of the CIs if necessary.
150	Update Release Progress	Close the activity, update status of the Release and progress the release to the next activity.

As you probably have already figured out, the magic happens in the four Software Distribution tasks, 80, 160, 170, and 180. However, prior to distributing the software, the release deployer must obtain the status of the source and target Cls (10) and ensure that they are all in an operational state (20). Once they are operational, the release deployer can perform any required steps to prepare for the deployment (70). This task can include steps like obtaining the right credentials, stop components that rely on the target CI, or backing up the existing configuration. Naturally the steps you perform vary depending on the specific requirements of the release, and will have been identified and planned for during the roll-out planning. For this exercise, there are no specific requirements to fulfil or prerequisites to obtain.

In task 80, the release deployer creates *deployments* for each unique combination of source and target Cls. To support this project, the release deployer must create three deployments, each of which contains a different set of targets. The source and target Cls are already defined for the implementation tasks, so the release deployer can leverage the assisted workflow in the implementation tasks to easily create the deployments. Eventually, these will be installed automatically when tasks 160, 170, and 180 are started.

When defining the deployment, you can provide the information necessary to have the actual implementation performed by an Operational Management Product (OMP) such as Tivoli Provisioning Manager. Notice that OMPs can be leveraged for other tasks, such as Tivoli Storage Manager for backup/restore operations, Tivoli Access Manager for providing access to resources, Tivoli Identity Manager for managing credentials, or Tivoli Endpoint Manager for mass deployments. In the current exercise you only simulate using an OMP by referencing the only OMP available in the exercise environment. The ITIM OMP represents IBM Tivoli Identity Manager, which is not capable of distributing software, so you will not see any software deployed as the result of all your hard work.

So, for these exercises all that is left is for the release deployer to complete all the tasks in the *Implement WebSphere V6 FixPack 123 in a Release* activity. To finalize the processing of your release, complete these steps:

1. Log in to the IBM SmartCloud Control Desk console as the release deployer, Diane, using a password of object00.
2. From the Release Deployers start center, notice the tasks for which Diane is responsible in the My Active Tasks.



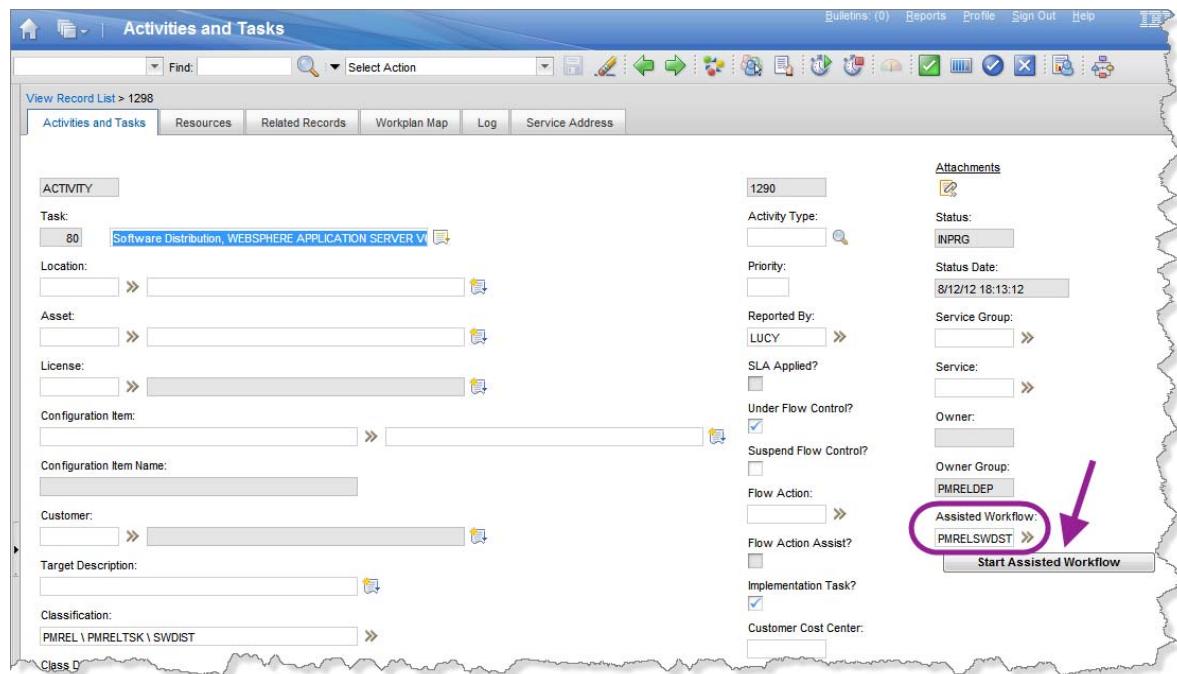
3. To process, and complete the task complete these steps:
 - a. Click the link in the My Active Tasks portlet to open the task.
 - b. Read the description and/or any instructions so you understand the purpose and scope of the task.
 - c. Assume that you have completed the work in this specific task, and click the Complete icon (✓) in the toolbar to set the status to COMPLETE.



When the Change Status window appears, accept the defaults and click **OK**.

- d. To return to the start center, click the Home icon (⌂).
4. When you return to the start center, you see that a new task (20), Verify CI Targets for a Release, awaits. In the exercise environment you can also complete this task immediately, so repeat the previous step for move on.
5. Next, task 70, Validate WAS Requirements are met, must be processed. Complete it immediately by performing the steps outlined in Step 3 on page 386.

6. Finally, the Software Distribution task is ready to be processed. This is the one in which you create the deployments that are used in the automated processes 160.170, and 180. To create these deployments, complete these steps:
 - a. Open task 80, *Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123*, using the link in the My Active Tasks portlet.
 - b. When the Activities and Tasks application launches, notice that the task is associated with an assisted workflow. This workflow was assigned when the task was classified, and is meant as a help for the release deployer to complete the task.



To launch the workflow, click **Start Assisted Workflow**.

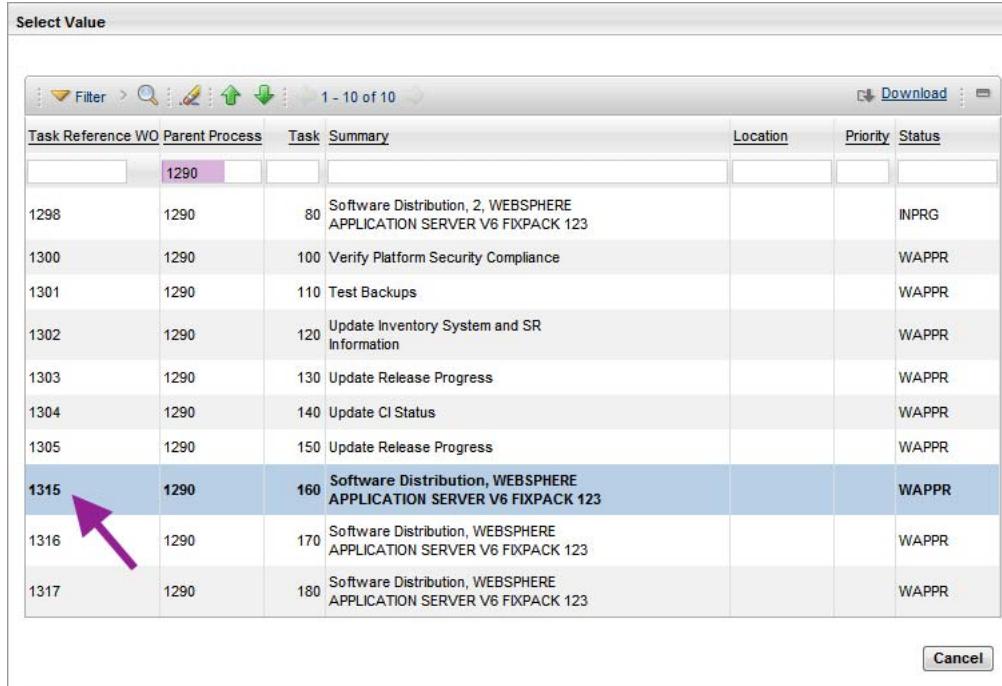
- c. The assisted workflow takes the release owner directly to the Deployment application, transferring information from the task that is needed to create a new deployment.

The screenshot shows the 'Deployments' screen in IBM SmartCloud Control Desk. At the top, there are tabs for 'Deployment', 'Process Information', 'Target Analysis', 'Task History', and 'Notification Log'. Below the tabs, the 'Deployment' tab is active. The main area is divided into 'Source Information' and 'Target Information' sections. The 'Source Information' section contains fields for CI Name (WEBSHPEARE APPLICATION SERVER V6 FIXPACK 123), Description, DML (DML Repository, File System), Classification (1306), CI Status (OPERATING), Changed By (LUCY), and Changed Date (8/12/12 00:50:23). The 'Target Information' section shows one target entry: CI Number (RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1), Tool Reported Status, User Defined Status, Add Comments, Notify Owner?, and a Select Targets button. Both sections are highlighted with magenta circles.

Notice, near the bottom of the window, that both the Source and Target Information sections have been populated, and because the source CI is registered with the DML, you also see the DML information.

- d. To create the deployment for the implementation task that will update the deployment manager, complete these steps:
 - i. Notice the Task Reference WO in the Details section. This field provides a link between the implementation task and the deployment, so in order to create a deployment for another task, you need to update it.

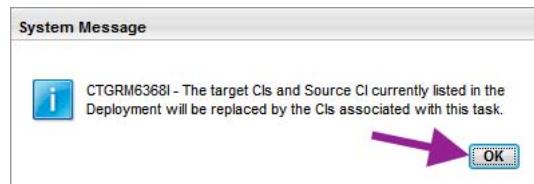
Use the **Select Value** option from the Detail Menu tool (») next to the Task Reference WO field, and select the work order that references task 160 of activity 1290 (supply a value of 1290 for the Parent Process filter field):



Select Value					
		Filter	Task	Summary	
Task Reference WO	Parent Process				
1298	1290	80	Software Distribution, 2, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123		INPRG
1300	1290	100	Verify Platform Security Compliance		WAPPR
1301	1290	110	Test Backups		WAPPR
1302	1290	120	Update Inventory System and SR Information		WAPPR
1303	1290	130	Update Release Progress		WAPPR
1304	1290	140	Update CI Status		WAPPR
1305	1290	150	Update Release Progress		WAPPR
1315	1290	160	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123		WAPPR
1316	1290	170	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123		WAPPR
1317	1290	180	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123		WAPPR

You see that you can easily identify the individual tasks of your activity, and their related WO numbers.

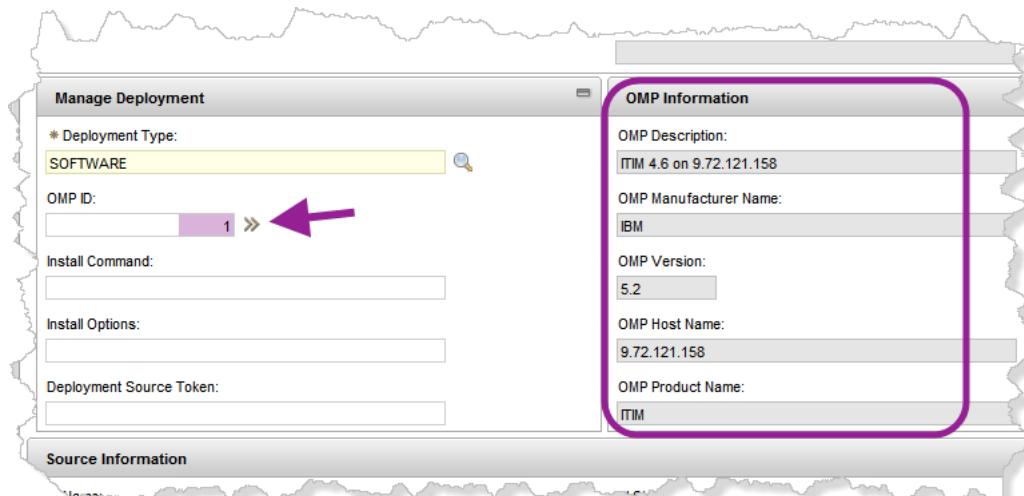
Notice that when you select a different task, the source and target CIs for that task is, very conveniently, copied to the deployment.



Click **OK** to dismiss the System Message window.

- ii. Next look at the Manage Deployment section, and notice that no OMP ID has been selected, and the parameters used to control the software distribution are all empty. To select an OMP ID, enter a value of 1, or use the Detail Menu tool (») next to the OMP ID field to select the only OMP in the system, which happens to have the ID 1.

Once you have selected the OMP ID, you will see that the information in the OMP Information section is populated.

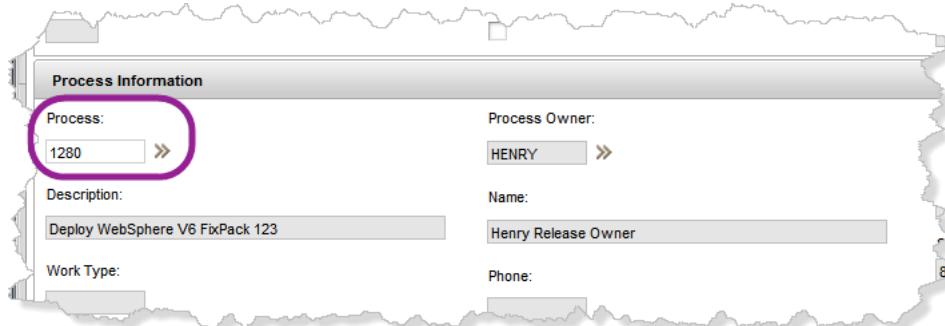


Remember that the OMP you are using does not really support software distribution, and by the way, there are no systems in the exercise environment to which you can install software, so leave the Install Command and Install Options fields empty.

- iii. If you scroll to the bottom of the Deployments application, verify that you are using the correct source CI, and notice that a number of targets have been marked for deletion.

To save the deployment as it is, click the Save icon (in the toolbar.

If you want, take a look at the information in the other tabs of the Deployments application. This is basically only reference information, but if you notice the Process field in the Process Information tab, you see the release number. This reference is used to link deployments, so you can see that status of all deployments related to a specific release.



- e. You have now specified the deployment for the first implementation task. When the task is started, the flow action will use the information you have just provided, and use that to send the installation request to the OMP.

To return to the start center, click the Home icon ().

7. To create the deployments for the second implementation task (#170) repeat the previous step using task 170 as the reference when you select the correct value for the Task Reference WO field.
8. Repeat Step 6 on page 387 using your third implementation task (#180) as the reference, to create the third and final deployment you need for installing the WebSphere V6 FixPack 123 on all the server instances.

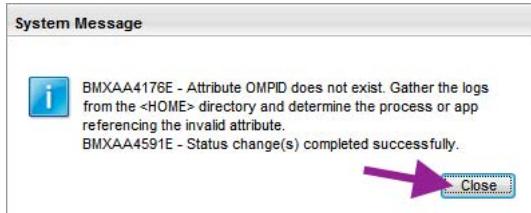
When you have created all three deployments, open the currently active task once more so you can mark it as completed. However before you complete the task, you should remove the value in the SWDISTID attribute. This is set by the assisted workflow, and since you will not initiate any deployments using this task, the reference should be removed.

Simply delete any data in the value field for the SWDISTID attribute in the Attributes section near the bottom of the window, and then click the Save icon () in the toolbar.



Now you can complete the task. Use the Complete Activity icon () in the toolbar to set the status to COMPLETE, and return to the start center when you are done.

9. Now, at this point the automated distribution tasks 160, 170, and 180 will kick in. Unfortunately, because you are using an OMP that is not capable of performing software distributions, you will receive an error message, and the task will halt.



To simulate successful implementation complete these steps:

- a. Click **Close** to dismiss the System Message window.
- b. Navigate to the start center by clicking the Home icon ()
- c. Open the only task you see in the My Active Tasks portlet.
- d. Locate the Attributes section of the Activities and Tasks application, and use the **Go To Deployments** option of the Detail Menu tool () next to the value field of the attribute named SWDISTID, to navigate to the deployment record so you can set the status.

- e. In the Deployments application, scroll to the bottom and find the Target Information section. For each target, use the Select Value tool (🔍) next to the User Defined Status field to set a value of Success.

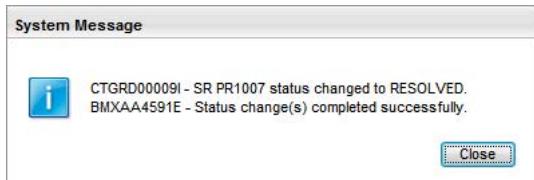
The screenshot shows a table with one row. The columns are 'CI Number', 'Tool Reported Status', and 'User Defined Status'. The 'CI Number' column contains 'RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1 CELLMANAGER01:DMGR~125813'. The 'Tool Reported Status' column is empty. The 'User Defined Status' column has a blue background and contains the word 'Success'. To the right of the 'User Defined Status' column is a small magnifying glass icon. The table has a light gray border and is set against a background of a wavy line graph.

- f. To change the status of the entire deployment, use the Change Status icon (✳️) in the toolbar, and when the Change Status window appears, choose a value of Success Status for the New Status field before you click **OK**.
- g. To store the new status information, click the Save icon (💾) in the toolbar
- h. Click the **Return** link in the header to go back to the Activities and Tasks application.
- i. Complete the task by clicking the Complete Activity icon (✅) in the toolbar and return to the start center when you are done.
10. When the first automate distribution task completes, the next one is automatically started, in accordance with your job plan. Again you see an error message indicating that there is something wrong with the OMPID.
To complete this task, repeat the actions in previous step for the current task.
11. When the last automated deployment task is invoked, complete it by following the steps outlined in Step 9 on page 391.
12. Now, all that is left is to complete the verification, and test tasks. First notice that the Verify Platform Security Compliances task has been assigned to the release deployer, complete the task, and go back to the start center.
13. Next you need to focus on the Test backups task. You have not performed a backup yet, but you would assume that after you have updated the platform, your standard procedure would prescribe that you must back up and test the restoration of the modified system. Once it has been validated that the backup can be restored, you can authorize and register the backup to be used for disaster recovery. The Tivoli Storage Manager OMP is the tool that could help you automate all of this - except the verification of the restored copy.

Assume for this exercise, that you have verified that the restore worked, and complete the task.

14. At this point you are done, so you must update the inventory systems, and make any necessary updates to the Service Registry. For this release there are no Service Registry updates, but you in production you should consider initiating a TADDM scan of the system so the configuration is uploaded to the actual CI side of your CMDB, and you can ensure that the configuration in the authorized CIs match the actual configuration.

15. Assume that you have submitted a TADDM scan request, and complete the task.
16. Finally, you are asked to update the CI status. This is not relevant for the current change, so complete your last task - and thereby the release.
17. When the release completes, you see a message indicating that the original release request has been resolved.



Click **Close** to dismiss the message.

18. Your work as the release deployer is done. Use the **SignOut** link, to allow Henry Release Owner to log back in, so the implementation results can be reviewed.

Finally your hard work has paid off. The release has been completed, and it is time to review the information that has been captured about the implementation activity, and the records that are related to the release, directly or indirectly.

Exercise 11. Review the release implementation

The purpose of the following activities is to verify that the release implementation was carried out successfully, and achieved the expected outcome. These activities could have been included as the finale step of the release, so it would be the responsibility of the release owner to perform these checks.

If you recall, the release implemented WebSphere updates on ten systems. It was requested by the Lucy Change Owner, and is linked to a change, which was originally requested by Steve. So besides focusing on exclusively on the release, Henry Release Owner should also check the status of these related records.

To check the release implementation, complete these steps:

1. Log in to the IBM SmartCloud Control Desk console as the release owner, **Henry**, using a password of `object00`.
2. When the Release Owners start center opens, notice that no releases are shown in either of the portlets.

To find the release that has just been completed, launch the Releases application by clicking the **Releases** link in the Favorite Applications section:

Exercise 11. Review the release implementation

3. When the Releases application opens, activate the query named *All Releases in Final State*, and verify that the *Deploy WebSphere V6 FixPack 123* release (#1280) is listed.

Release	Summary	Customer	Status	Progress
1280	Deploy WebSphere V6 FixPack 123		COMP	COMPLETE

You can already see, in the Status and Progress fields, that the release has completed.

Open the release by clicking the link in the Release column.

4. When you see the release details, notice that the progress map shows the expected status.

The Progress Map shows the following sequence of states: SCHEDULED → IMPLEMENTED → COMPLETE.

5. Open the Related Records tab to see the status of any requests and/or changes that are related to this release.

Work Order	Description	Class	Status	Relationship
1278	WebSphere V6 FixPack 123	CHANGE	COMP	ORIGINATOR

Related Record Key	Description	Class	Status	Relationship
PR1007	Deploy WebSphere V6 FixPack 123	SR	RESOLVED	ORIGINATOR
PR1006	Add Change To Release, 1278, 1280	SR	RESOLVED	FOLLOWUP

In the Related Work Orders section you see the change that was added to the release (based on the request at the bottom that shows a FOLLOWUP relationship). If you look closely, you see that the status of the change is COMPLETED. So how did that happen, as far as you know, no one has deliberately updated the status of the change as part of the release processing?

Well, you may recall that Lucy Change Owner, before submitting the request to make the change a member of a release, modified the classification of the implementation task in the change to PMCHG \ PMCHGTSK \ PMCHGWFR. Tasks with this classification are automatically completed (by an escalation) when the release, for which the change is an ORIGINATOR, completes. So, because of this classification was applied to the implementation task, the only task in the change was automatically completed, and as a result the whole standard change is completed as well.

In the Related Tickets section, you see that the service request that is the ORIGINATOR of the release has completed too. This was the release request submitted by Lucy Change Owner when it was decided that a release would be better suited to roll out the WebSphere V6 FixPack 123 to all the WebSphere instances in the infrastructure. Because the change has successfully completed, the request is marked as RESOLVED.

6. Next, open the Deployments tab, so you can see the results of the individual deployments.

At a first glance, you see that all three deployments were successful. (Don't tell Henry that Diane manually set the deployment status during these exercises :).

Unique ID	Description	Distribution Status	Task
2 >>	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	SUCCESS	1315
3 >>	Software Distribution, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	SUCCESS	1316
4 >>	Software Distribution, 3, WEBSPHERE APPLICATION SERVER V6 FIXPACK 123	SUCCESS	1317

If you open any deployment, by choosing the **Go To Deployments** option from the Detail Menu tool (») next to the deployment number field, you can see the details for each target that was included in the deployment in the Target Analysis tab.

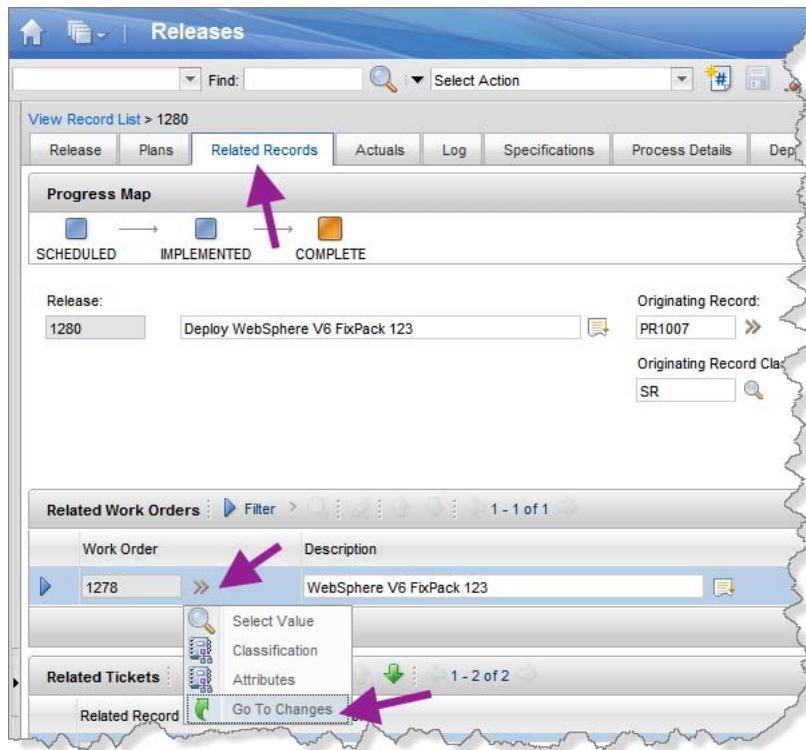
Target CI	Tool Reported Status	User Defined Status	Add Comments
RHEL56-3.TIVLAB.SANJOSE.IBM.COM:RHEL56-NODE01:TRADESERVER5-133846	Success		
RHEL56-2.TIVLAB.SANJOSE.IBM.COM:RHEL56-2-NODE01:TRADESERVER3-105411	Success		
RHEL56-2.TIVLAB.SANJOSE.IBM.COM:RHEL56-2-NODE01:TRADESERVER2-105448	Success		
RHEL56-3.TIVLAB.SANJOSE.IBM.COM:RHEL56-3-NODE01:TRADESERVER4-133845	Success		
RHEL56-1.TIVLAB.SANJOSE.IBM.COM:RHEL56-1-NODE01:TRADESERVER1~120241	Success		

By looking at the Tool Reported Status and the User Defined Status fields in the Targets section, you can tell, that the status of all the deployments were set to Success by the release deployer.

Use the **Return** link in the header to navigate back to the Releases application.

7. You have completed the review of the release, however before you sign off, you should check that the original RFC that triggered all this work, has been resolved, as the result of the completion of the change.

- a. To navigate to the change, open the Related Records tab, and use the **Go To Changes** option from the Detail Menu tool (next to the Work Order field in the Related Work Orders section.



- b. When the Changes application is launched, open the Related Records tab, and notice the status of the only ORIGINATOR request in the Related Tickets section.

Related Work Orders						Download
Work Order	Description	Class	Status	Relationship		
1280	Deploy WebSphere V6 FixPack 123	RELEASE	COMP	FOLLOWUP		
Select Work Orders New Row						
Related Tickets						
Related Record Key	Description	Class	Status	Relationship		
EXER_RFC_2	WebSphere V6 FixPack 123	SR	RESOLVED	ORIGINATOR		
PR1006	Add Change To Release, 1278, 1280	SR	RESOLVED	FOLLOWUP		
PR1007	Deploy WebSphere V6 FixPack 123	SR	RESOLVED	FOLLOWUP		
Select Ticket New Row						

You see that the status of the request named EXER_RFC_1 is RESOLVED. This tells you that Steve, the requester, has received notification that his request has been fulfilled.

8. At this point you have complete the release review, and are, hopefully, satisfied with the outcome.

You are done, the release has now been fully defined, designed, developed, tested, planned, scheduled, implemented, and reviewed. You are ready to move on to the next release.

Software release summary

During these exercises you experienced how IBM SmartCloud Control Desk release management features help you manage complex changes with built-in dependencies. The scenario focused on performing a mass roll-out of WebSphere updates to a number of servers in your infrastructure, and interact with Operational Management Products such as Tivoli Provisioning Manager to perform the deployments.

You experienced how the roll-out can be requested from a change, and how the information captured for the change, is available to the release. You also experienced how the definitive media library is used to control your approved installation code (SoftwareImage CIs), and other media, such as documentation. (DataFile CIs). You also worked with the scheduler to find time slots for the implementation tasks at which outages to the target CI is tolerated by your organization. Finally, you saw how you can use the class classification to assign special processing and/or capabilities to special tasks, both in the release and in related changes, and you experienced how to link a change to a release, and use the classification to automatically close the change once the release completed.

During the execution of these exercises you progressed the release through the phases that apply to a release the involved design and development of specific deployment scripts and processes, documentation, or operational procedures. For other releases, the nature of the work that must be completed may be different, and in that case you would apply another, more appropriate, job plan, and progress the release through the phases that applies to that.



7 IBM SmartCloud Control Desk 7.5 summary

There are no student exercises for this chapter.

More about Cloud & Smarter Infrastructure

You can find the latest information about IBM Cloud & Smarter Infrastructure education offerings online at the following location:

www.ibm.com/software/tivoli/education/

Also, if you have any questions about education offerings, send an email to the appropriate alias for your region:

- Americas: tivamedu@us.ibm.com
- Asia Pacific: tivtrainingap@au1.ibm.com
- EMEA: tived@uk.ibm.com

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You can get even more out of Cloud & Smarter Infrastructure software by participating in one of the 91 independently run Cloud & Smarter Infrastructure user groups around the world. Learn about online and in-person user group opportunities near you at www.tivoli-ug.org.

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