

HP IT Operations Compliance

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-

User Guide

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Chapter 1: Welcome to ITOC

HP IT Operations Compliance (ITOC) allows IT Operations users to track business service compliance against corporate and regulatory policies, making their environment compliant and therefore secure.

With ITOC, you can:

- Scan compliance of business services against policies in a repeatable and reliable manner (see [Run a Scan Compliance Job](#)).
- Remediate non-compliance (see [Run a Remediation Job](#)).
- Provide an overall view of compliance status across policies and business services (see [Policy Compliance](#) and [Business Service Compliance](#)).
- Track exceptions of resources to requirements in the Statement of Applicability (SoA) (see [Manage Statements of Applicability](#)).
- Track the lifecycle and revisions of policies, business services, controls, and SoAs (see [Workflow and Lifecycle States](#)).



For information about how to install ITOC and set up IT resources, see the [HP IT Operations Compliance Installation, Setup, and Upgrade Guide](#).

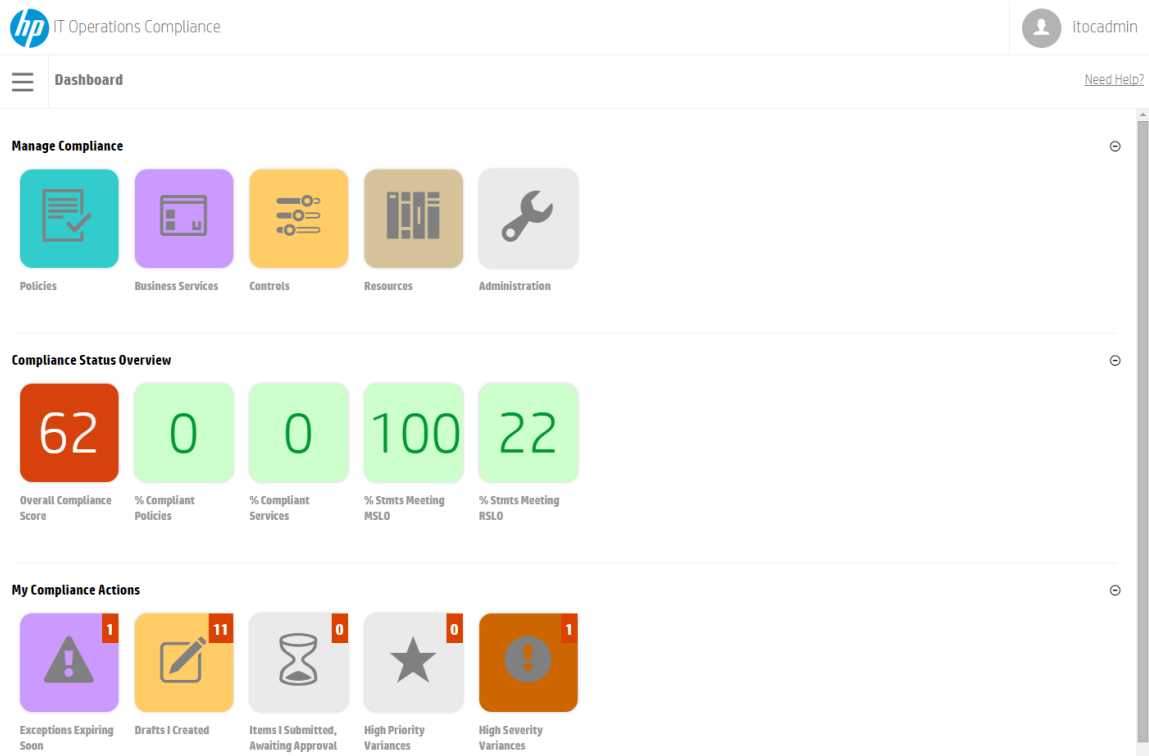
Chapter 2: The Dashboard

The **Dashboard** appears when you log in to ITOC, providing you with a comprehensive overview of ITOC results in your environment. The **Dashboard** layout is designed to help you navigate easily and intuitively within ITOC.

View the ITOC Dashboard

From anywhere in ITOC, you can:

- Click the organization logo  to return to the Dashboard.
- Click the sidebar menu icon  to display a list of navigation links within ITOC.

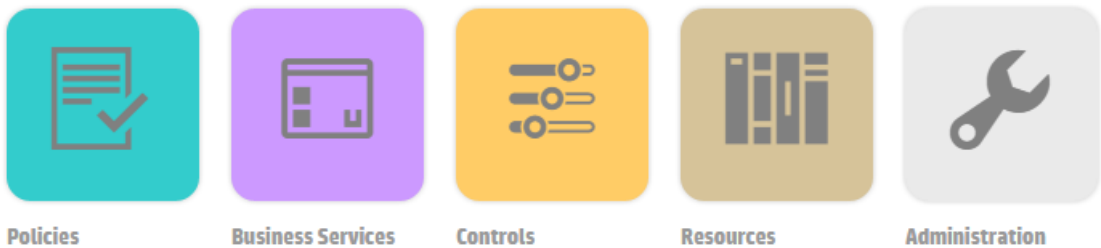


Based on your roles and permissions, you may not see all widgets shown in the illustration above. For more information about roles and permissions, see the [HP IT Operations Compliance Administration Guide](#).

Manage Compliance

Use the widgets in the **Manage Compliance** section to navigate to the main ITOC sections.


Manage Compliance



- Policies
- Business Services
- Controls
- Resources
- Administration

Compliance Status Overview

To view the **Compliance Status Overview** section, the user must be logged in with the **Read All** permission. The widgets provide an overview of the compliance status across the system.

If no compliance data is available, the  icon appears in the widget.



You can hover over a widget to view further details on policies, business services, and SoAs.

Overall Compliance Score

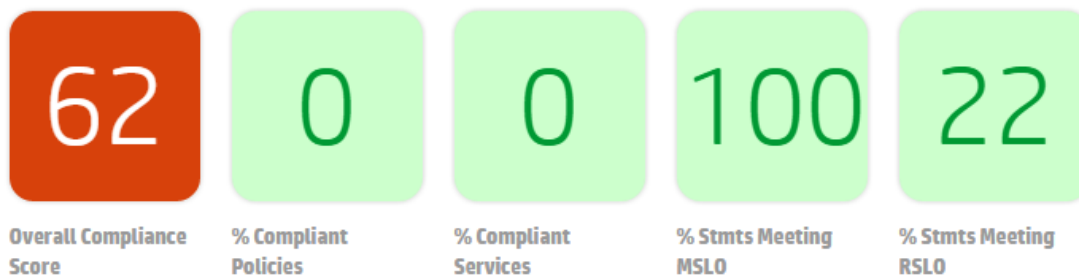
The number on the **Overall Compliance Score** widget represents the overall percentage of compliant rule-resource pairs across all policies and business services in the system.

Compliance is indicated by the widget color:

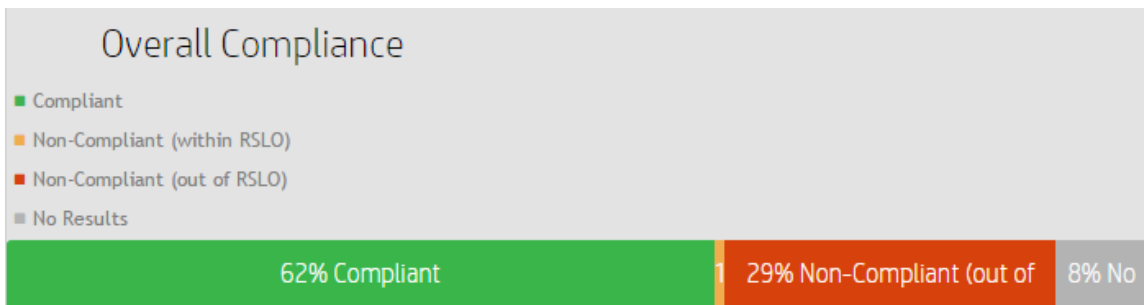
- If the number meets the compliance threshold, the widget is the same green as the compliance bar in the following figure.
- If the number is less than the compliance threshold, the widget is red.
- If no SoAs are in production state or if a scan has not yet been run, the widget is gray.

In the following illustration, the default compliance threshold of 100 is used. Because the overall compliance score is 62, the compliance threshold is not met, and the **Overall Compliance Score** widget is red.

Compliance Status Overview



When the user hovers over the **Overall Compliance Score** widget, a compliance bar is displayed, with colors indicating compliance.



- Green - Percentage of compliant rule-resource pairs. The number is the same as displayed in the widget.

- Orange – Percentage of non-compliant rule-resource pairs that are within remediation service level objective (RSLO).
- Red – Percentage of non-compliant rule-resource pairs that are out of RSLO.
- Gray – Percentage of rule-resource pairs that have not been evaluated or are unknown.

% Compliant Policies

The number on the **% Compliant Policies** widget represents the percentage of policies in the system that are compliant based on the compliance threshold. A single policy is deemed to be compliant if the percentage of rule-resource pairs across all of the business services that need to comply with the policy meets the compliance threshold.

When you hover over the widget, the policies by compliance rating chart displays. The chart color indicates compliance:

- Green – Percentage of compliant policies. The number is the same as displayed in the widget.
- Red – Percentage of non-compliant policies.
- Gray – Percentage of policies with unknown compliance status.

% Compliant Services

The number on the **% Compliant Services** widget represents the percentage of business services in the system that are compliant based on the compliance threshold. A single business service is considered compliant if the percentage of rule-resource pairs across all of the policies with which it must comply meets the compliance threshold.

When you hover over the widget, the business services by compliance rating chart displays. The chart color indicates compliance:

- Green – Percentage of compliant business services. The number is the same as displayed in the widget.
- Red – Percentage of non-compliant business services.
- Gray – Percentage of business services with unknown compliance status.

% Stmts Meeting MSLO

The number on the **% Stmts Meeting MSLO** widget represents the percentage of SoAs in the system that are meeting measurement SLO. If any one rule-resource pair is not meeting MSLO, then the entire SoA is not meeting MSLO.

When you hover over the widget, the percentage of SoAs meeting MSLO pie chart displays. The chart color indicates compliance:

- Green – Percentage of SoAs meeting MSLO. The number is the same as displayed in the widget.
- Red – Percentage of SoAs not meeting MSLO.

% Stmts Meeting RSLO

The number on the **% Stmts Meeting RSLO** widget represents the percentage of SoAs in the system that are meeting remediation SLO. If any one rule-resource pair is not meeting RSLO, then the entire SoA is not meeting RSLO. Only the rule-resource pairs that were previously scanned and evaluated as not compliant are considered.

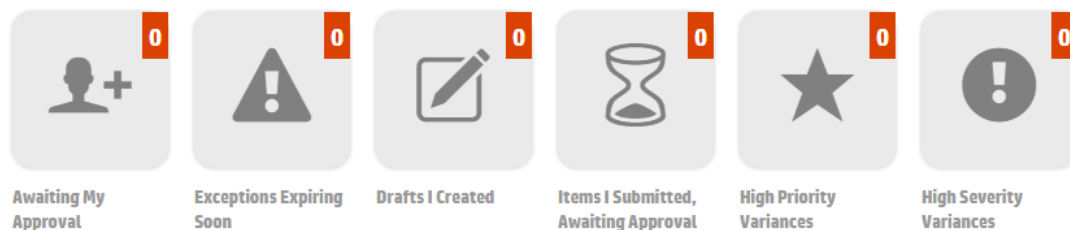
When you hover over the widget, the percentage of SoAs meeting RSLO pie chart displays. The chart color indicates compliance:

- Green – Percentage of SoAs meeting RSLO. The number is the same as displayed in the widget.
- Red – Percentage of SoAs not meeting RSLO.

My Compliance Actions

The widgets in the **My Compliance Actions** section help users identify actions they need to perform and items that need their attention. The view is personalized based on the user's permissions.

My Compliance Actions



If the number displayed in the top right corner of a **My Compliance Actions** widget is 0, the widget is gray and is not clickable.

For more information about user permissions, see "Permissions" in the **HP IT Operations Compliance Administration Guide**.

Awaiting My Approval

Use the **Awaiting My Approval** widget to go directly to an object revision that has been submitted for your approval, and approve the object revision. For information on approving object revisions, see

Workflow and Lifecycle States.

To see the **Awaiting My Approval** widget, you must be logged in with one of the following approver permissions:

- **Approve Policies**
- **Approve Business Services**
- **Approve Statements of Applicability**
- **Read and Approve Controls**

The number in the top right of the widget is the number of revisions across revisioned objects that have been submitted, and the user is the named Approver.

If the number is greater than 0, click the widget to navigate to the **Awaiting My Approval** page. Objects are grouped by type - as you scroll down the page, you see the **Policies**, **Business Services**, **Controls**, and **Statements of Applicability** awaiting approval. The following example shows the **Policies** and **Business Services** awaiting your approval.

Dashboard

Items Requiring My Approval

Items Requiring My Approval

ID	Name	Revision	Submitted By
Policies			
POL0017	person service test policy	1 (Submitted)	PersonService Test on 2/10/15 3:55 PM
Business Services			
SVC00017	person service test service	1 (Submitted)	PersonService Test on 2/10/15 3:55 PM

- **ID** - Object ID.
- **Name** - Object name.
- **Revision** - Object revision number and lifecycle state.
- **Submitted By** - Name of the submitter; date and time submitted.

Exceptions Expiring Soon

Use the **Exceptions Expiring Soon** widget to go directly to an SoA ID link, where you can create a new revision to extend the exception expiration date or delete the exception. To see the **Exceptions Expiring Soon** widget, the user must be logged in with the **Read All** permission.

The number in the top right of the widget is the number of exceptions across all non-Obsolete SoAs that are expiring within 30 days or have already expired.

If the number is greater than 0, click the widget to navigate to the **Exceptions Expiring Soon** page, which lists exceptions grouped by SoAs. Select an SoA to view further details.

<

- **STMT_0000001 Revision 2 (Production)** - The SoA ID, revision, and lifecycle state.
- **Reason** - Reason for the exception.
- **Expiration Date** - Date the exception is no longer valid.

For more information, see the [To view SoA exceptions...](#) section.

Drafts I Created

Use the **Drafts I Created** widget to track your work-in-progress revisions.

To see the **Drafts I Created** widget, the user must be logged in with one of the following authoring permissions:

- **Write Policies**
- **Write Business Services**
- **Write Statements of Applicability**
- **Read and Write Controls**

The number in the top right of the widget is the number of revisions in draft state created by the user. These include **New** (Object), **New Draft Revision**, or an object the user imported that is in draft state.

If the number is greater than 0, click the widget to navigate to the **Drafts I Created** page. Objects are grouped by type - as you scroll down the page, you see the revisions of the **Policies**, **Business Services**, **Controls**, and **Statements of Applicability** created by the user. The following example shows the **Policies** and some of the **Controls** the user created.

≡	< Dashboard	Drafts I Created
Drafts I Created		
ID	Name	Revision
Policies		
POL_0001	CIS Red Hat Enterprise Linux 6 Benchmark v1.3.0	1 (Draft)
POL_0003	CIS Oracle 11g Benchmark v1.0.1	1 (Draft)
POL_0004	CIS Oracle 10g Benchmark v2.0.1	1 (Draft)
POL_0005	CIS Red Hat Enterprise Linux 7 Benchmark v1.0.0	1 (Draft)
POL_0006	CIS SUSE Linux Enterprise Server 11 Benchmark v 1.0	1 (Draft)
POL_0007	CIS Ubuntu 12.04 LTS Server Benchmark v1.0.0	1 (Draft)
POL_0002	Payment Card Industry (PCI) Data Security Standard version 3.0.0	2 (Draft)
Controls		
CTRL_000929	Q892843 - Security Update for Office 2003 Multilingual User Interface Pack (KB892843)	1 (Draft)

- **ID** - Object ID.
- **Name** - Object name.
- **Revision** - Object revision number and lifecycle state.

Items I Submitted, Awaiting Approval


Use the **Items I Submitted, Awaiting Approval** widget to see which approvers need to review your business objects and remind them to perform the review.


To see the **Items I Submitted, Awaiting Approval** widget, the user must be logged in with one of the following authoring permissions:



- **Write Policies**
- **Write Business Services**
- **Write Statements of Applicability**
- **Read and Write Controls**

The number in the top right of the widget is the number of revisions that the user submitted for approval and are in Submitted state.

If the number is greater than 0, click the widget to navigate to the **Items I Submitted, Awaiting Approval** page. Objects are grouped by type; as you scroll down the page, you see the revisions of the **Policies, Business Services, Controls, and Statements of Applicability** you submitted.

IT Operations Compliance

itocadmin

Dashboard

Items I Submitted, Awaiting Approval

[Need Help?](#)

Items I Submitted, Awaiting Approval

ID	Name	Revision	Submitted Date
Policies			
POL_0010	p10	1 (Submitted)	6/4/15 11:59 AM
POL_0003	p3	1 (Submitted)	6/4/15 12:00 PM
POL_0006	p6	1 (Submitted)	6/4/15 12:04 PM
POL_0007	p7	1 (Submitted)	6/4/15 12:05 PM
POL_0002	p2	1 (Submitted)	6/4/15 11:59 AM
POL_0001	p1	1 (Submitted)	6/4/15 11:45 AM
POL_0004	p4	1 (Submitted)	6/4/15 12:01 PM
POL_0005	p5	1 (Submitted)	6/4/15 12:02 PM

- **ID** - Object ID.
- **Name** - Object name
- **Revision** - Object revision number and lifecycle state.
- **Submitted Date** - Date and time submitted.

High Priority Variances

Use the **High Priority Variances** widget to identify high-priority variances. To view the **High Priority Variances** widget, the user must be logged in with the **Read All** permission.

Business services have a priority (**Gold**, **Silver**, or **Bronze**). A high-priority variance occurs if a rule-resource pair from a **Gold** business service is found to be non-compliant (see [View Business Services in ITOC](#)).

The number in the top right of the widget is the number of SoAs associated with a **Gold** priority business service that has any non-compliances.

If the number is greater than 0, click the tile to navigate to the **High Priority Variances** list page.

Dashboard

High Priority Variances

Need Help?

High Priority Variances

ID	Compliance Score	Meeting MSLO	Meeting RSLO	Policy Name	Business Service Name
STMT_0000003	<div><div></div>0</div>	<div><div></div>No</div>	<div><div></div>Yes</div>	ROBOT_TEST_Policy mSLO 2 Months rSLO 336 effDate 2015-3-24 1427389094	s1

- **ID** - Link to the SoA with the variances.
- **Compliance Score** - The overall compliance score.

- Whether the SoA is **Meeting MSLO**.
- Whether the SoA is **Meeting RSLO**.
- **Policy Name** - Name of the policy.
- **Business Service Name** - Name of the business service.

To see specific rule-resource pair details, click on the non-compliant links in each widget on the SoA.

High Severity Variances

Use the **High Severity Variances** widget to identify high-severity variances. To view the **High Severity Variances** widget, the user must be logged in with the **Read All** permission.

Policy requirements have a severity (**High**, **Medium**, or **Low**), so any SoA that has non-compliant rule-resource pairs associated with a high-severity requirement are of high severity (see [To modify policy requirements...](#)).

The number in the top right of the widget is the number of SoAs with non-compliance for rule-resource pairs related to a high-severity requirement.

If the number is greater than 0, click the tile to navigate to the **High Severity Variances** list page.

High Severity Variances					
ID	Compliance Score	Meeting MSLO	Meeting RSLO	Policy Name	Business Service Name
STMT_0000003	0	Yes	Yes	ROBOT_TEST_Policy mSLO 2 Months rSLO 336 effDate 2015-3-18 1426877569	Robot Service 61712042


- **ID** - Links to the SoA with the variances.
- **Compliance Score** - The overall compliance score.
- Whether the SoA is **Meeting MSLO**.
- Whether the SoA is **Meeting RSLO**.
- **Policy Name** - Name of the policy.
- **Business Service Name** - Name of the business service.

To see the rule-resource pairs for high-severity requirements, go to each SoA, sort the widgets by severity, and click the non-compliant links for the high-severity widgets.

Sidebar Menu

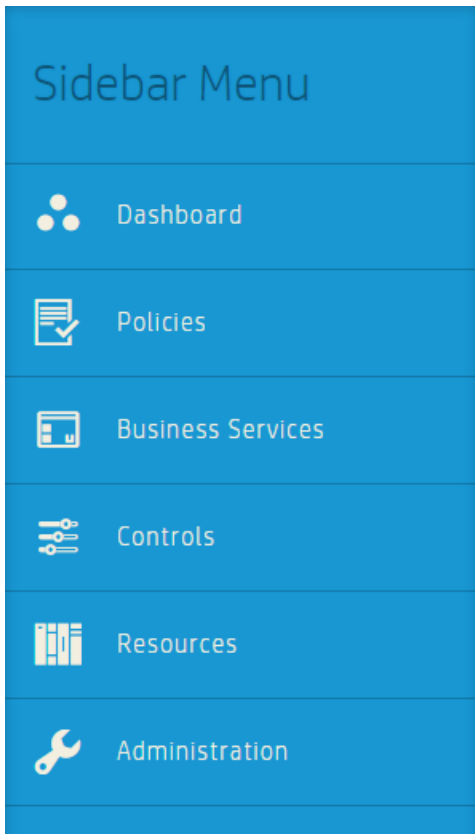
For quick and direct navigation to and from any view in ITOC, use the **Sidebar Menu**. You can show or hide this menu in the views. By default, the **Sidebar Menu** is hidden.

The navigation selections are the same as the widgets in the **Manage Compliance** section of the **Dashboard**.


- To show the **Sidebar Menu**, in the upper left sub-heading, select the  icon.
- To hide the **Sidebar Menu**, make a selection from the sidebar menu. You will be directed to that section, and the **Sidebar Menu** will close.
Or

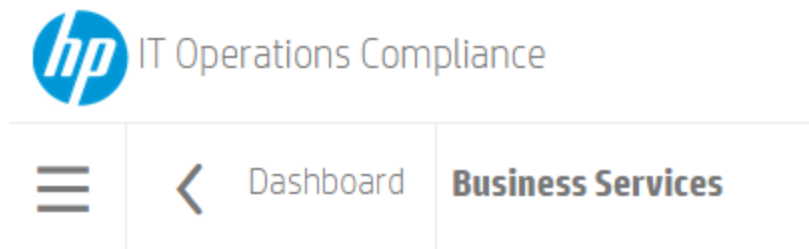
Click anywhere on the application screen to hide the **Sidebar Menu**.

Menu options are displayed based on the user's permissions.



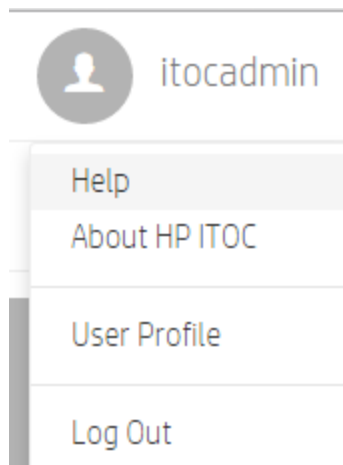
Back Navigation

From any view in ITOC, click the  icon in the sub-heading to return to the page shown next to the icon. The following example shows that you can navigate back to the **Dashboard** from the **Business Services** page.



View User Profile

Use the options in the **View User Profile** menu in the upper right corner of the screen to learn about the ITOC system and user.



Help

Click on **Help** to see ITOC online documentation. As you work in ITOC, you can click on the **Need Help?** text below the **Help** menu to view context-sensitive help.

About HP ITOC

Click **About HP ITOC** to see information about your ITOC system.

HP IT Operations Compliance

Version: 1.1.0

Server Version: 1.1.0 (Build #1238)

UI Version: 1.1.0 (Build #793)

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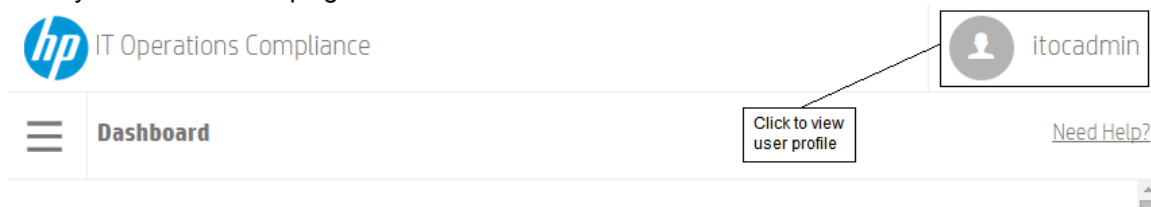
OK

- **Version:** HP ITOC version.
- **Server Version:** The HP ITOC and build versions.
- **UI Version:** The HP ITOC and user interface versions.
- Copyright information for this version of HP ITOC.

User Profile

To view user roles and permissions:

1. Log into ITOC.
2. Click your name in the top right of the **Dashboard**.



3. Select **User Profile** from the menu.

User Profile

Organization:

public

Username:

itocadmin

First Name:

ITOC

Last Name:

Admin

Email:

Roles:

Business Administrators
Business Service Authors
Control Authors
Policy Authors
Resource Administrators
System Administrators

Permissions:

Business Administration
Read All
Read and Write Controls
Read and Write Maintenance Windows
Read and Write Resources
System Administration
Write Business Services
Write Policies

OK

Logout

Click **Logout** to exit ITOC.

Keyboard Navigation

The following hotkeys allow you to use your keyboard to navigate easily within ITOC.

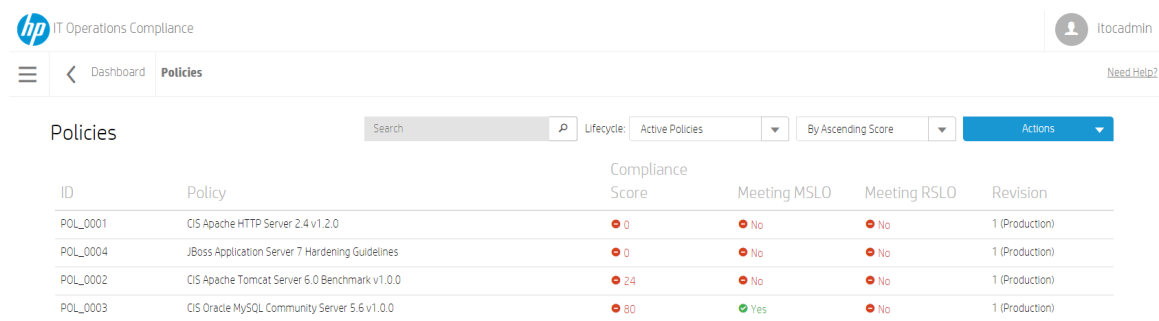
Hotkey	Page
Ctrl+Shift+1	Dashboard
Ctrl+Shift+2	Policies
Ctrl+Shift+3	Business Services
Ctrl+Shift+4	Controls
Ctrl+Shift+5	Resources
Ctrl+Shift+6	Administration

Chapter 2: Policies

A policy is a system representation of a corporate regulatory or government policy, such as PCI, SOX, or FISMA. In ITOC, each policy has a hierarchy of requirements, with each requirement having one or more rules. HP provides policy content that can be downloaded from HP Live Network and imported into ITOC (see the [HP IT Operations Compliance Installation, Setup, and Upgrade Guide](#)).


View Policies in ITOC

The **Policies** page lists all policies in an environment.



ID	Policy	Compliance Score	Meeting MSLO	Meeting RSLO	Revision
POL_0001	CIS Apache HTTP Server 2.4 v1.2.0	0	No	No	1 (Production)
POL_0004	JBoss Application Server 7 Hardening Guidelines	0	No	No	1 (Production)
POL_0002	CIS Apache Tomcat Server 6.0 Benchmark v1.0.0	24	No	No	1 (Production)
POL_0003	CIS Oracle MySQL Community Server 5.6 v1.0.0	80	Yes	No	1 (Production)

- Use the **Search** field to find a specific policy. Type the full or partial name of the policy in the

 **Search** field, and click the icon.

- Use the **Lifecycle** list to filter policies by lifecycle state. Available options are **Active Policies** (default), **Draft Revisions**, **Submitted Revisions**, **Approved Revisions**, **Production Policies**, or **Obsolete Policies**.
For example, if you are logged in as a user in a consumer organization and want create an SoA to test your business service against a public policy, you can view public organization policies (which say "Public" at the end of their names) when you filter by **Production Policies**. For more information about organizations, see the [HP IT Operations Compliance Administration Guide](#).
- Click the second list to sort policies **By Ascending Score** (default), **By Descending Score**, **By Name**, or **By ID**.
- Use **Actions** to create a **New Policy**.

The overall **Policies** view shows:

- **ID** of a policy.
- **Policy** name.

- **Compliance Score** - The overall compliance score for policies in production across all business services. The number displayed is the percentage of compliant rules across all applicable resources in all of the applicable business services. The icon and color indicate whether or not it is compliant based on the compliance threshold.
- Whether the policy is **Meeting MSLO**.
- Whether the policy is **Meeting RSLO**.
- Policy **Revision** number and lifecycle state.
 - The policy revision number used when viewing details about the policy in this row.
 - Results for policies filtered by revisions in draft, submitted, or approved state may show multiple revisions of the same policy.
 - Results for policies filtered for active, production, or obsolete state show only one revision per policy listed.

Select a policy to view further details.

Create a New Policy

Use the following steps to create a new policy. To modify a policy in draft state, see [Manage Policies](#).

1. Navigate to the **Policies** list.

2. From **Actions**, select **New Policy**.

3. The **New Policy** dialog appears:

New Policy

Name:
Required

Description:

Effective Date:
6/5/15 Pick Date

Default Measurement SLO:
Within 1 Month

Default Remediation SLO (in days):
14

Char Count: 0/4000

OK Cancel

Complete the following fields:

- **Name:** (required) - Enter a policy name.
- **Description:** (optional) - Enter a policy description.
- **Effective Date:** - Use the **Pick Date** dropdown calendar to select an effective date. The default is today's date.
- **Default Measurement SLO:** - The measurement SLO is the time frame in which a business service must be measured against a particular policy. Select a default measurement SLO (the system default is **Within 1 Month**). This SLO value is the default used when you create a new SoA with this policy (see [Create a New Statement of Applicability](#)).
- **Default Remediation SLO (in days):** - The remediation SLO is the time frame in which a non-compliant IT resource needs to be remediated against a particular requirement. Enter a default remediation SLO (default is **14** days). This SLO value is the default used when you create a new SoA with this policy. See [Create a New Statement of Applicability](#) for more information.

4. Press **OK** to create revision 1 of a new policy in draft state.

From the **Details** view, you can add, edit, or delete requirements and rules (see [Policy Details](#)).

Use the **Actions** dropdown list to submit the policy to the next workflow state. See [Workflow and Lifecycle States](#) for more information.

Next Step: Create an SoA to tie the policy to a business service. See [Create a New Statement of Applicability](#) for more information.

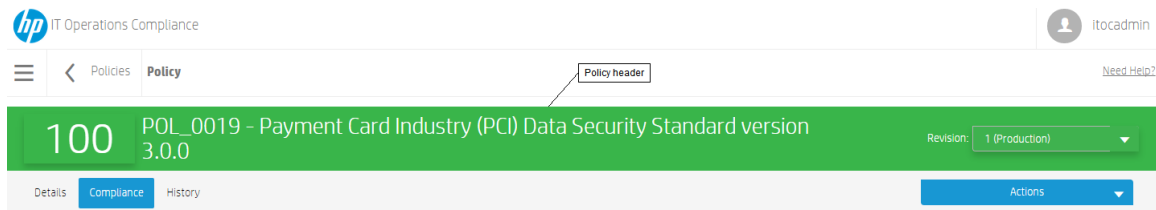
Manage Policies

This section describes how to view, author, and edit policies.

- [Policy Header](#)
- [Policy Details](#)
- [Policy Compliance](#)
- [Policy History](#)

Policy Header

When you select a policy, information about that policy appears in a new view. The Policy Header is the bar that appears directly beneath the ITOC tabs:



- The overall compliance score is the number on the left side of the header, showing that the policy in the example is 100 percent compliant.
The header background color indicates the policy's compliance state:
 - Green - Compliant based on the compliance threshold.
 - Red - Not compliant based on the compliance threshold.
 - Gray - Not calculated or unknown.
- Policy ID - "POL_0019" in the example.
- Policy name - "Payment Card Industry (PCI) Data Security Standard version 3.0.0" in the example.
- **Revision** - Revisions of this policy and the lifecycle for each revision.

Policy Details

Navigate to the **Details** view of a policy in draft state to view information about a specific policy, edit policy properties, and modify policy requirements and rules.

The screenshot shows the HP IT Operations Compliance interface. At the top, there's a header with the HP logo and 'IT Operations Compliance'. A user profile 'itocadmin' is in the top right. Below the header, a navigation bar shows 'Policies' and 'Policy'. A green banner displays '100 POL_0019 - Payment Card Industry (PCI) Data Security Standard version 3.0.0' with a revision dropdown set to '1 (Production)'. Below the banner, tabs for 'Details', 'Compliance', and 'History' are visible, along with an 'Actions' button. The 'Details' tab is active, showing a description of the PCI DSS standard and a list of 12 requirements. The requirements are numbered 1 through 12, with some marked with a green checkmark and others with a blue diamond.

hp IT Operations Compliance

itocadmin

Need Help?

100 POL_0019 - Payment Card Industry (PCI) Data Security Standard version 3.0.0

Revision: 1 (Production)

Details Compliance History Actions

Description: The Payment Card Industry Data Security Standard (PCI DSS) was developed to encourage and enhance cardholder data security and facilitate the broad adoption of consistent data security measures ...

Effective Date: 6/8/15

Default Measurement SLO: Within 1 Month

Default Remediation SLO: Comply within 14 days

Created By: ITOC Admin on 6/8/15 8:15 AM

Modified By: Approver User on 6/8/15 7:05 PM

Requirements

- 1 Install and maintain a firewall configuration to protect card holder data
- 2 Do not use vendor supplied defaults for system passwords and other security parameters
- 3 Protect stored card holder data
- 4 Encrypt transmission of card holder data across open, public networks
- 5 Protect all systems against malware and regularly update anti virus software or programs
- 6 Develop and maintain secure systems and applications
- 7 Restrict access to cardholder data by business need to know
- 8 Identify and authenticate access to system components
- 9 Restrict physical access to cardholder data
- 10 Track and monitor all access to network resources and cardholder data
- 11 Regularly test security systems and processes
- 12 Maintain a policy that addresses information security for all personnel.

To edit policy detail properties...

1. From a policy in Draft state, click **Actions** to select **Edit Properties**.

Edit Properties

Name:

CIS Microsoft Windows Server 2012 v1.0.0

Description:

This policy, CIS Microsoft Windows Server 2012 Benchmark v1.0.0, provides prescriptive guidance for establishing a secure configuration posture for CIS Microsoft Windows Server 2012

Char Count: 181/4000

Effective Date:

12/16/14

Pick Date

Default Measurement SLO:

Within 1 Month

Default Remediation SLO (in days):

14


OK

Cancel

2. The **Edit Properties** dialog appears. Modify the policy as needed.
3. Press **OK**.

To modify policy requirements...

From the **Details** view of the policy in draft state, you can use the **Requirements** table to add or delete requirements and rules.

1. Click the  icon next to Requirements to create a new requirement at the top level.
2. The **New Requirement** dialog appears:

New Requirement

Name:

Required

Description:

Char Count: 0/4000

Severity:

High

OK

Cancel

Complete the following fields:



- **Name** (required) - Enter a requirement name.
- **Description** (optional) - Enter a requirement description.
- **Severity** - Use the dropdown list to select **High**, **Medium**, or **Low**.

3. Press **OK**.



Requirements 1, 2, and 3 in the following figure are examples of top requirements. Highlight the requirement, and use the icons next to the requirement to modify its level, edit its value, add a sub-requirement, and add a rule.



Requirements


▶ 1 Requirement Name


▶ 2 Requirement Name       

▶ 3 Requirement Name


 **Move up** - Move the requirement branch up. In this example, clicking  results in requirement 2 displaying above requirement 1.

 **Move down** - Move the requirement branch down. In this example, clicking  results in requirement 2 displaying below requirement 3.

 **Indent** - Indent this requirement branch, making this requirement branch a sub-requirement of requirement 1.

 **Edit** - Edit this requirement.

 **Add a sub-requirement** - Add a sub-requirement as a child of this requirement.



 **Add a rule** - Add a rule to this requirement.

 **Delete** - Delete this requirement branch and its children, including rules.

To modify policy sub-requirements...






Depending on a sub-requirement's place in the structure, you can **Move up**, **Move down**, **Indent**, and **Outdent** it.

- To be moved up or down, a sub-requirement must have sibling requirements above or below.
- To be indented, a sub-requirement needs a sibling above it.

You can **Outdent**  this sub-requirement to make it one level higher. In this example, clicking  results in the **Sub-requirement Name** displaying between requirement 2 and requirement 3, at the same level:

▶ 1 Requirement Name

▶ 2 Requirement Name

▶ Sub-requirement Name     


⚙ Rule Name

▶ 3 Requirement Name

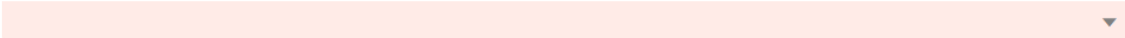
To modify policy rules...

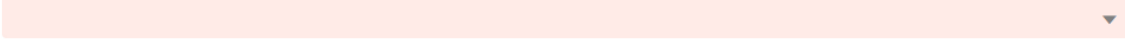
The rule scope limits the controls that can be associated with a rule, based on the control's applicable scope. When a scan is run, the system matches the resource type to the rule scope and performs the compliance check for the applicable matches, which are rule-resource pair matches.


One requirement can have multiple rules. You need to define a rule for each resource type to evaluate compliance with the requirement (for example, one rule that uses the Windows control and another that uses the Linux control). A complex requirement may need multiple rules to evaluate its compliance.

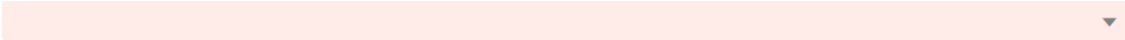
1. To create a new rule, click the  icon.
2. The **New Rule** dialog appears:

New Rule

Type:



Scope:


Control : 



Rule Name:




Complete the following fields:



- **Type** (required) - Set the type of rule (**Evaluation** or **Evaluation and Remediation**).
- **Scope** (required) - Select the resource type to which this rule applies (**Platform** or **Software**).
- **Control** (required) - The list of available controls shows controls with a production revision only, filtered by the **Type** and **Scope** selected. Select a control from the dropdown list or search for a specific control by entering text the Search box and pressing the  icon.
- **Rule Name** - The field defaults to the selected control name. You can customize this field.


3. Press **OK**.

Hover over a rule to edit rule name or parameter values, or to delete the rule.

Requirements

- ▶ 1 Requirement Name
- ▼ 2 Requirement Name
 - ▼ Sub-requirement Name
 -  Rule Name  
- ▶ 3 Requirement Name

-  **Edit** - Edit this rule.
-  **Delete** - Delete this rule.

- 1. To edit a rule, click the  icon.
- 2. The **Edit Rule** dialog appears:

Edit Rule

Type:

evaluation

Scope:

MSSQL Server 2005

Control:

CTRL_000946 - MSSQL DMA control

Rule Name:

SQL Server install platform

Evaluation Input Parameters:

Name	Source	Value
MSSQL Function Name	<div>Custom Value</div>	audit_201_platform
expectedValue	<div>Custom Value</div>	0

OK

Cancel

- 3. Modify the rule as needed, and press **OK**.

Policy Compliance

The Policy **Compliance** view is visible only for the revision of the policy that is in production state. The compliance view is based on the last compliance job for all SoAs that include the policy. This view shows an aggregation of job results for this policy across business services:

HP IT Operations Compliance

itocadmin

Need Help?

Policies Policy

75 POL_0005 - CIS CentOS Linux 7 Benchmark v1.1.0 Revision: 1 (Production)

Details Compliance History Actions

75% Compliant 25% Non-Compliant (out of RSLO)

Statements of Applicability Lifecycle: Active Statements By Ascending Score

ID	Business Service	Compliance Score	Meeting MSLO	Meeting RSLO	Revision	Last Compliance Scan
STMT_0000003	Robot Service 79230749	75	Yes	No	2 (Production)	9/8/15 7:18 AM

The Policy Compliance Bar in this view displays the overall compliance score for the policy across all business services that need to comply with this policy. The example shows:

- **75% Compliant** (green) - 75 percent compliance in MSLO.
- **Non-Compliant (within RSLO)** (orange) - Percent of rules are not in compliance within the remediation SLO.
- **25% Non-Compliant (out of RSLO)** (red) - 25 percent of rules that must comply with this policy are not in compliance and are out of RSLO.
- **Unknown** (gray) - Percent of rules have not been scanned or have failed.

The **Statements of Applicability** table shows SoAs for this policy.

The **Compliance Score** column is sorted by **Ascending Score** and shows which business services are performing poorly against a policy.

The following information is shown in this view:

- **ID** - SoA ID
- **Business Service** - The Business Service that needs to comply with this policy.
- **Compliance Score** - The icon and color indicate whether or not the policy is compliant based on the compliance threshold.
- Whether the SoA is **Meeting MSLO**
- Whether the SoA is **Meeting RSLO**
- **Revision** - SOA revision and lifecycle state.
- **Last Compliance scan** - Date and time on which the last compliance scan was run.

You can filter SoAs by lifecycle state and sort them by compliance score or ID. Results for SoAs filtered by revisions in draft, submitted, or approved state may show multiple revisions of the same SoA. The list can be sorted **By Ascending Score** (default), **By Descending Score**, or **By ID**.

Click on a statement of applicability to view details.

Policy History

The Policy **History** view shows details about each revision's history, including:

- **Action** - What was done (created, submitted, approved, and so on).
- **Notes** - Information provided by the **User** who created or modified the policy (approval notes made by the approver, submit notes made by the submitter, and so on).
- **User** - Who performed the action.
- **Date** - Date and time on which the action was performed.

The screenshot shows the HP IT Operations Compliance interface. At the top, there's a header with the HP logo and 'IT Operations Compliance'. Below it, a navigation bar shows 'Policies' and 'Policy'. The main content area has a green header for 'POL_0019 - Payment Card Industry (PCI) Data Security Standard version 3.0.0' with a 'Revision: 1 (Production)' dropdown. Below this, there are tabs for 'Details', 'Compliance', and 'History' (which is selected). To the right of the tabs is an 'Actions' dropdown. The 'History' section contains a table with the following data:

Action	Notes	User	Date
Auto moved to Production	The revision 1. of Policy [POL_0019] has been moved to Production.	Approver User (approver)	6/8/15 7:05 PM
Approve	I approve.	Approver User (approver)	6/8/15 7:05 PM
Submit	ready for production	Compliance Architect (compliancearchitect)	6/8/15 7:04 PM
Set Approver/s	Approver/s have been set on Policy revision 1.	Compliance Architect (compliancearchitect)	6/8/15 7:04 PM
Add Rule	The rule [RHEL Compatibles:Service Status(zebra)] has been added to the policy.	ITOC Admin (itocadmin)	6/8/15 8:24 AM
Add Rule	The rule [RHEL Compatibles:Service Status(yxfrdl)] has been added to the policy.	ITOC Admin (itocadmin)	6/8/15 8:24 AM
Add Rule	The rule [RHEL Compatibles:Service Status(rpcsvcgssd)] has been added to the policy.	ITOC Admin (itocadmin)	6/8/15 8:24 AM
Add Rule	The rule [RHEL Compatibles:Service Status(yppasswd)] has been added to the policy.	ITOC Admin (itocadmin)	6/8/15 8:24 AM
Add Rule	The rule [RHEL Compatibles:SSH Server Parameter Setting(ignoreRhosts)] has been added	ITOC Admin (itocadmin)	6/8/15 8:24 AM

To view the history of a policy...

You can view the history of a **Policy** in any state.

1. Navigate to the **Policies** tab, and click the policy whose history you want to view.
2. Click **History**.

Create a New Draft Revision

1. Navigate to the **Policies** list, and select a policy.
2. Select a revision of the policy on which you want to base your new draft revision.
3. Click **Actions**, and select **New Draft Revision**. The following message appears:

New Revision

This will create a new revision based on revision 4.

Do you want to continue?



4. Press **OK**.

From the **Details** view, you can edit properties, or add, edit, or delete requirements and rules (see [Policy Details](#)).

Click **Actions** to submit the policy to the next workflow state (see [Workflow and Lifecycle States](#)).

Workflow and Lifecycle States

The policy, business service, control, and SoA business objects are revision-controlled. Regardless of an object's lifecycle state, a user with write permissions can create a new revision based on the source revision of an object. For example, revision 3 of a policy may be in production state, and revisions 1 and 2 of this policy are obsolete. From revision 3, you can create a revision 4, which starts as a copy of revision 3, is in draft state, and can be edited.

Each revision of a policy, business service, control, and SoA follows a workflow, which consists of predefined lifecycle states. Each object can have multiple revisions, and these revisions can be in multiple lifecycle states, although only one revision of an object can be in production state at a time.

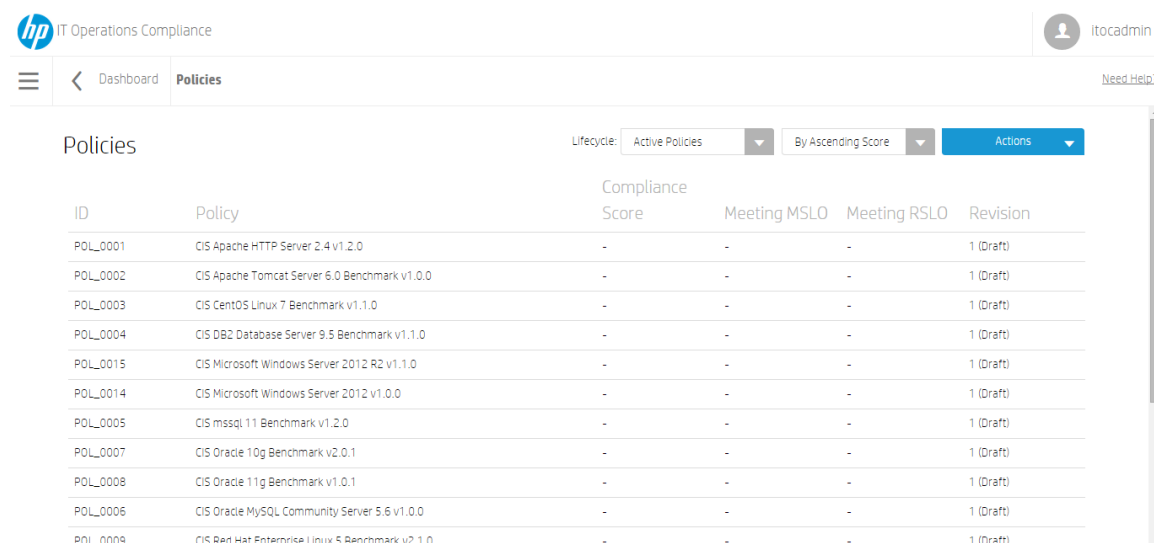
Lifecycle states are as follows:

- **Draft** - Business objects can be edited only in draft state. Once moved out of draft state, they cannot be changed.
- **Submitted** - If a business object requires approval, it must be moved into the submitted state. From there, the object can be reviewed and then approved.

- **Approved** - When a business object is manually or automatically Approved, it moves automatically to Production (for Policies, this occurs on the Effective Date).
- **Production** - The production revision is the one that ITOC uses. Only one revision of an object is in production state at a time, and the current production revision is the one always used in a scan or remediation job. When a new revision is promoted, the revision that was previously in production is moved automatically to obsolete state.
- **Obsolete** - An obsolete revision is no longer in use or out of date. If all revisions of an object are in obsolete state, a user has made the entire object obsolete.

Active Revision

An active revision of an object means the objects is in any state other than **Obsolete**. If there is a **Production** revision of an object, that is the version shown. The following figure shows policies that are currently active.



The screenshot shows the HP IT Operations Compliance interface. At the top, there's a header with the HP logo and 'IT Operations Compliance' on the left, and a user profile 'itocadmin' on the right. Below the header is a navigation bar with a menu icon, a back arrow, 'Dashboard', and 'Policies'. A 'Need Help?' link is on the far right. The main content area is titled 'Policies'. Above the table, there are filters: 'Lifecycle: Active Policies' (a dropdown menu), 'By Ascending Score' (a dropdown menu), and an 'Actions' button. The table has columns: ID, Policy, Compliance Score, Meeting MSLO, Meeting RSLO, and Revision. All policies listed have a 'Compliance Score' of '-' and are in '1 (Draft)' state.

ID	Policy	Compliance Score	Meeting MSLO	Meeting RSLO	Revision
POL_0001	CIS Apache HTTP Server 2.4 v1.2.0	-	-	-	1 (Draft)
POL_0002	CIS Apache Tomcat Server 6.0 Benchmark v1.0.0	-	-	-	1 (Draft)
POL_0003	CIS CentOS Linux 7 Benchmark v1.1.0	-	-	-	1 (Draft)
POL_0004	CIS DB2 Database Server 9.5 Benchmark v1.1.0	-	-	-	1 (Draft)
POL_0015	CIS Microsoft Windows Server 2012 R2 v1.1.0	-	-	-	1 (Draft)
POL_0014	CIS Microsoft Windows Server 2012 v1.0.0	-	-	-	1 (Draft)
POL_0005	CIS mssql 11 Benchmark v1.2.0	-	-	-	1 (Draft)
POL_0007	CIS Oracle 10g Benchmark v2.0.1	-	-	-	1 (Draft)
POL_0008	CIS Oracle 11g Benchmark v1.0.1	-	-	-	1 (Draft)
POL_0006	CIS Oracle MySQL Community Server 5.6 v1.0.0	-	-	-	1 (Draft)
POL_0009	CIS Red Hat Enterprise Linux 5 Benchmark v2.1.0	-	-	-	1 (Draft)

Lifecycle Actions

- **New Object or New Draft Revision** - A new object or new revision of an object starts in draft state. An object can have many revisions in draft state, all with different edits.
- **Submit** - Depending on the workflow, a revision moves to submitted, production, or approved state.
- **Approve** - This action can only be performed by the approver specified by the user when the business object was submitted. It moves a revision from submitted to production or approved, based on the effective date.
- **Comment** - Any user with approve or write permissions can make comments.

- **Reject** - Returns a revision from submitted to draft state. This action can be performed only by the named approver or submitter of the revision.
- **Make Obsolete** - Can only be done when the object is not used in an active revision of an object. Results in the object not being available for use in the future. Not reversible.

Workflows

Use the [Administration](#) tab to change the workflow for a business object. This action requires business administration permission.

About the Approval Required workflow

In the **Approval Required** workflow:

1. The submitter chooses from a list of users with the approver permission for the object type.
2. The approver must approve the object for it to move into production.

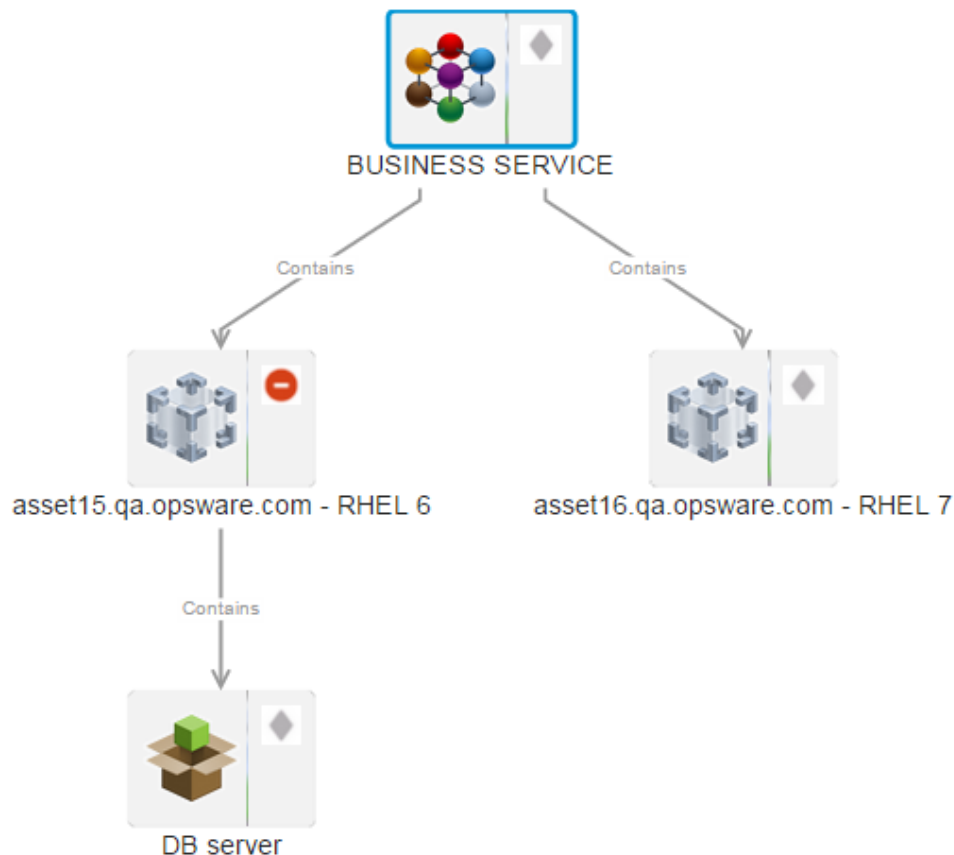
About the Auto-Approval workflow

In the **Auto-Approval** workflow, an object can be moved into production without approval.

If the policy's effective date is in the future, a policy moves into approved state until the effective date.

Chapter 3: Business Services

The business service object in ITOC is a set of IT resources with customer-defined relationships to one another. These relationships can be viewed in a topology, as shown below.

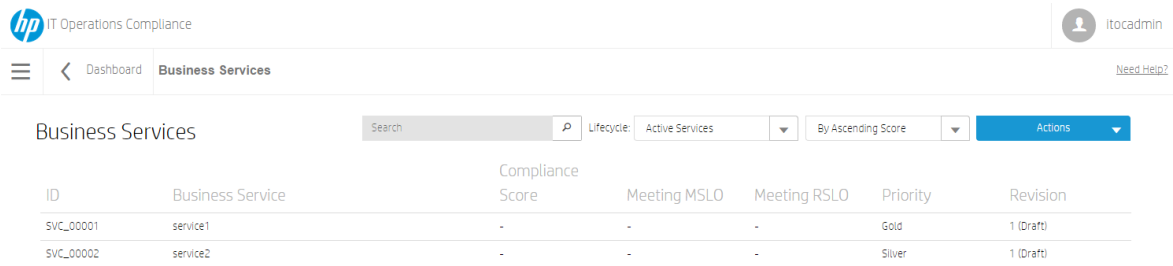


Each business service must comply with one or many policies. These business service-to-policy relationships are defined in the SoA.


In ITOC, business services follow the Auto-Approval workflow (see [About the Auto-Approval workflow](#)).

View Business Services in ITOC

The **Business Services** page lists the business services in your environment.



ID	Business Service	Compliance Score	Meeting MSLO	Meeting RSLO	Priority	Revision
SVC_00001	service1	-	-	-	Gold	1 (Draft)
SVC_00002	service2	-	-	-	Silver	1 (Draft)

- Use the **Search** field to find a specific business service. Type the full or partial name of the business service in the **Search** field, and click the  icon.
- Use the **Lifecycle** list to filter business services by lifecycle state or sort by compliance score, name, or ID. Available options are **Active Services** (default), **Draft Revisions**, **Submitted Revisions**, **Approved Revisions**, **Production Services**, or **Obsolete Services**.
- Click the second list to sort **By Ascending Score** (default), **By Descending Score**, **By Priority**, **By Name**, or **By ID**.
- Click **Actions** to create a **New Business Service** or **Import Business Services**.

The overall **Business Services** view shows:

- **ID** of the business service.
- **Business Service** name.
- **Compliance Score** - The overall compliance score for business services in production across all policies. The number displayed is the percentage of resources within the business service that are compliant with rules within the policies. The icon and color indicate whether or not it is compliant based on the compliance threshold.
- Whether the business service is **Meeting MSLO**.
- Whether the business service is **Meeting RSLO**.
- **Priority** - Priority of the business service (**Gold**, **Silver**, or **Bronze**).
- Business Service **Revision** number and lifecycle state.
 - The business service revision number used when viewing details about the business service in this row.
 - Results for business services filtered by draft, submitted, or approved state may show multiple revisions of the same business service.
 - Results for business services filtered by active, production, or obsolete state show only one revision per business service listed.

Select a business service to view further details.

Create a New Business Service

Create a new business service using the following steps. To modify an existing business service, see [Manage Business Services](#).

1. Navigate to the **Business Services** list.
2. From **Actions**, select **New Business Service**.
3. The **New Business Service** dialog appears. Complete the following fields:
 - **Name** (required) - Enter a name for the business service.
 - **Description** (optional) - Enter a description.
 - **Priority** - Select **Gold**, **Silver**, or **Bronze**.

New Business Service

Name:

Required

Char Count: 0/255

Description:

Char Count: 0/4000

Priority:

Silver

OK

Cancel

4. Press **OK** to create revision 1 of a new business service object in draft state.

From the **Details** view, you can add resources to the business service topology (see [Business Service Details](#)). Use the **Actions** dropdown list to submit the policy to the next workflow state (see [Workflow and Lifecycle States](#)).

Next Step: Create an SoA to tie the business service to a policy (see [Create a New Statement of Applicability](#)).

Import Business Services and Resources

Use the following task to import a business service or resource:

1. Navigate to the **Business Services** or **Resources** list.
2. From the **Actions** list, select **Import Business Services** or **Import Resources**.
3. The **Import Data** screen appears:

hp IT Operations Compliance

Resources Import Services and Resources

Need Help?

Import Data

Select the file containing the data that you want to import. Click the help link for a full description of the required data format.

```
{
  "services": [
    {
      "name": "ServiceAlpha",
      "ref": [ "sourceUri": "https://ucmdo.hp.com", "sourceRef": "ServiceAlpha" ],
      "relationships": [
        {
          "source": [ "sourceRef": "Alpha" ],
          "target": [ "sourceRef": "Beta" ],
          "type": "contains"
        }
      ]
    }
  ]
}
```

Choose File | Import.json

Start Import

4. Press **Choose File** to select the file containing the data you want to import.
5. Press **Start Import**.
6. After several moments, the **Import Results** screen appears:

hp IT Operations Compliance

Resources Import Services and Resources

Need Help?

Import Results

Source Ref	Source URI	ID
Alpha	https://ucmdo.hp.com	4
Beta	https://csa.hp.com	5
Gamma	https://csa2.hp.com	6
Bravo	https://ucmdo.hp.com	7
Charlie	https://ucmdo.hp.com	8

Source Ref	Source URI	Errors
Delta	https://ucmdo.hp.com	111: accessThroughRef (sourceUri: https://ucmdo.hp.com, sourceRef: Psi) is invalid

Source Ref	Source URI	ID
ServiceQ	https://ucmdo.hp.com	2 (revision 1)

- **Created Resources** - Resources that were imported successfully onto your system.
 - **Source Ref** - Name of the imported source.
 - **Source URL** - URL of the imported source.
 - **ID** - Resource ID.
- **Failed Resources** - Resources that failed to import onto your system.
- **Skipped Resources** - Resources that were skipped during this import.
- **Updated Resources** - Resources that were updated in this import.
- **Created Services** - Business services that were imported successfully onto your system.
- **Failed Services** - Business services that failed to import onto your system.
- **Skipped Services** - Business services that were skipped during this import.
- **Updated Services** - Business services that were updated in this import.

See [How to Write JSON Files for Services and Resources Import](#) for more information about configuring files for ITOC import.

Manage Business Services

This section describes how to view, author, and modify business services.

- [Business Service Header](#)
- [Business Service Details](#)
- [Business Service Compliance](#)
- [Business Service History](#)

Business Service Header

When you select a business service, information about that business service appears in a new view. The Business Service Header is the bar that appears directly beneath the ITOC tabs:

The screenshot displays the HP IT Operations Compliance interface. At the top, the HP logo and 'IT Operations Compliance' text are on the left, and a user profile 'itocadmin' is on the right. Below this is a navigation bar with 'Business Services' and 'Business Service' tabs. A callout box points to the 'Business Services header' area. The main header is green and contains the compliance score '100', the service name 'SVC_00001 - demo service', and a revision dropdown set to '2 (Production)'. Below the header is a tabbed interface with 'Details', 'Compliance', and 'History' tabs, and an 'Actions' button. A green progress bar indicates '100% Compliant'. The 'Statements of Applicability' section includes filters for 'Lifecycle' (Active Statements) and 'By Ascending Score'. A table lists compliance statements with columns for ID, Policy, Compliance Score, Meeting MSLO, Meeting RSLO, Revision, and Last Compliance Scan.

ID	Policy	Compliance Score	Meeting MSLO	Meeting RSLO	Revision	Last Compliance Scan
STMT_0000001	Payment Card Industry (PCI) Data Security Standard version 3.0.0	100	Yes	Yes	1 (Production)	6/14/15 4:48 AM

- The overall compliance score is the number on the left side of the header. The business service in the example is 100 percent compliant.
The header background color indicates the business service's compliance state:
 - Green - Compliant based on the compliance threshold.
 - Red - Not compliant based on the compliance threshold.
 - Gray - Not calculated or unknown.
- Business Service ID - "SVC_00001" in the example.
- Business Service Name - "demo service" in the example.
- **Revision** - Revisions of this business service and lifecycle state for each revision.

Business Service Details

Navigate to the **Details** view of a business service in draft state to view information about a specific business service, edit business service properties, and modify the business service topology.

hp

IT Operations Compliance

itocadmin

Business Services

Business Service

Need Help?

SVC_00004 - ITOC 2 RH 6.4 VMs with relationship (0d4884af-3e76-4377-bf38-41f6f11a5002)

Revision: 1 (Production)

DetailsComplianceHistoryActions

Description: CSA service imported to ITOC

Priority: Silver

Created By: CartersCSAIntegrator CartersCSAIntegrator on 7/29/15 8:55 AM

Modified By: CartersCSAIntegrator CartersCSAIntegrator on 7/29/15 8:55 AM

Resource Topology

View Graph

BUSINESS SERVICE

Depends on

ITOC vCenter Server (e8be9569-0d2c-4216-a6ab-6b83b4c5701a)

Depends on

ITOC vCenter Server (8df3d452-9c95-4521-a39a-50b0c311a697)

The default view shows the resource topology as a graph. Use the dropdown list on the right to show the topology as a table.

hp

IT Operations Compliance

itocadmin

Business Services

Business Service

Need Help?

SVC_00004 - ITOC 2 RH 6.4 VMs with relationship (0d4884af-3e76-4377-bf38-41f6f11a5002)

Revision: 1 (Production)

DetailsComplianceHistoryActions

Description: CSA service imported to ITOC

Priority: Silver

Created By: CartersCSAIntegrator CartersCSAIntegrator on 7/29/15 8:55 AM

Modified By: CartersCSAIntegrator CartersCSAIntegrator on 7/29/15 8:55 AM

Resource Topology

View Table

ID	Resource	Type	Compliance Score	Status
RES_000002	BUSINESS SERVICE Depends on ITOC vCenter Server (e8be9569-0d2c-4216-a6ab-6b83b4c5701a)	Business Service	-	Defined
RES_000011	ITOC vCenter Server (e8be9569-0d2c-4216-a6ab-6b83b4c5701a) Depends on ITOC vCenter Server (8df3d452-9c95-4521-a39a-50b0c311a697)	RHEL 6	-	Defined
RES_000012	ITOC vCenter Server (8df3d452-9c95-4521-a39a-50b0c311a697)	RHEL 6	-	Defined

The resource topology tables shows:

- **ID** of the resource.
- **Resource** name.
- **Type** of resource

- **Compliance Score** of the resource.
- **Status** of the resource.

To edit business service detail properties...

1. From a business service in draft state, click **Actions** to select **Edit Properties**.
2. The **Edit Properties** dialog appears. Modify the business service information as needed.
3. Press **OK**.

To modify the business service topology...

Use the icons described in this section to add a resource to the business service topology and specify its relationship within the topology. You can edit a business service in draft state only.

hp IT Operations Compliance

Business Services Business Service

SVC_00006 - ITOC 2 RH 6.4 VMs with relationship (28cdebcf-15b2-4aef-88c8-9c77045bd3cb) Revision: 1 (Draft)

Details History Actions

Description: CSA service imported to ITOC
Priority: Silver
Created By: CartersCSAIntegrator CartersCSAIntegrator on 7/29/15 9:52 AM
Modified By: CartersCSAIntegrator CartersCSAIntegrator on 7/29/15 9:52 AM

Resource Topology + X View Graph

BUSINESS SERVICE

Depends on

ITOC vCenter Server (3e68e794-a...)

Depends on

ITOC vCenter Server (ec7218e9-2...)



- **Add** resource to topology. To add a resource, select a node in the topology to enable the button.



- **Remove** resource from topology. To remove a resource, select a node in the topology to enable the button.



- **Zoom in**



- Zoom out



- Fit screen



- Reset zoom

To add a new resource to the topology:

1. Click the  icon. The **Add to Topology** dialog appears.

Add to Topology

Filter for and then select the resource to be added to the topology. Also specify the relationship with respect to the selected resource 'RHEL 7'.

Choose Resource:

Status is:

Active Resources ▼

Type is:

Platform ▼

Name contains:

Search

Relationship:

Contains ▼

OK Cancel

2. Complete the following information about the resource to be added to the topology:
 - **Status is:** - Use the dropdown list to filter resources by status. Available options are **Active Resources**, **Defined Resources**, **Managed Resources**, and **Install Failed**.
 - **Type is:** - Use the dropdown list to filter resources by type.

- **Name contains:** - To find a specific resource, enter the complete or partial name of the resource you want to use.
3. Press **Search** to find the resource you want to add.
 4. Use the dropdown list to find the existing resource to which you want to add the new resource.
 5. Click **Contains** or **Depends on** to determine the relationship between the newly added resource and the existing resource.
 6. Press **OK**.

To remove a resource from the topology:

1. Click the  icon. The **Remove from Topology** dialog appears:

Remove from Topology

Remove the selected resource or one of its relationships. All orphaned resources will be removed too.

Remove:



The resource 'asset03.qa.opsware.com2'



Resources to be Removed:

- asset03.qa.opsware.com2

OK

Cancel

2. The dialog confirms the resource or resource relationship you want to remove and notifies you of any "orphaned" resources that may also be removed as a result of this action.
3. Press **OK**.

Business Service Compliance

The Business Service Compliance view is visible only for the revision of the business service that is in Production state. This view is based on the last compliance job for all SoAs that include the business service and shows an aggregation of job results for this business service.

The screenshot shows the HP IT Operations Compliance interface. At the top, there's a header with the HP logo and 'IT Operations Compliance'. Below it, a navigation bar shows 'Business Services' and 'Business Service'. A user profile 'itocadmin' is in the top right. The main content area has a red banner with '62 SVC_00001 - Robot Service 79230749' and a 'Revision: 1 (Production)' dropdown. Below the banner is a 'Compliance' tab. A progress bar shows '62% Compliant' (green), '29% Non-Compliant (out of RSLO)' (red), and '9%' (gray). Below the bar is a 'Statements of Applicability' table with columns: ID, Policy, Compliance Score, Meeting MSLO, Meeting RSLO, Revision, and Last Compliance Scan. The table lists several policies with their respective scores and compliance status.

ID	Policy	Compliance Score	Meeting MSLO	Meeting RSLO	Revision	Last Compliance Scan
STMT_0000005	CIS Red Hat Enterprise Linux 6 Benchmark v1.3.0	-	-	-	2 (Production)	
STMT_0000010	CIS Microsoft Windows Server 2012 R2 v1.1.0	5	Yes	Yes	2 (Production)	9/8/15 8:33 AM
STMT_0000009	CIS Microsoft Windows Server 2012 v1.0.0	46	Yes	No	2 (Production)	9/8/15 8:51 AM
STMT_0000006	CIS Red Hat Enterprise Linux 7 Benchmark v1.0.0	56	Yes	No	2 (Production)	9/8/15 8:51 AM
STMT_0000002	arnold.p1	69	Yes	No	3 (Production)	9/8/15 8:52 AM
STMT_0000004	CIS Red Hat Enterprise Linux 5 Benchmark v2.1.0	71	Yes	No	2 (Production)	9/8/15 8:52 AM
STMT_0000003	CIS CentOS Linux 7	75	Yes	No	2 (Production)	9/8/15 8:51 AM

The Business Service Compliance Bar in this view displays the overall compliance score for the business service across all policies for which it must comply. The business service compliance bar in the example shows:

- **62% Compliant** (green) - 62 percent compliance in MSLO.
- **1% Non-Compliant (within RSLO)** (orange) - 1 percent non-compliant within RSLO.
- **29% Non-Compliant (out of RSLO)** (red) - 29 percent not in compliance and out of remediation or measurement SLO.
- **8% Unknown** (gray) - 8 percent unknown or not calculated.

The **Statements of Applicability** table shows SoAs for this business service. The following information is shown in this view:

- **ID** - SoA ID.
- **Policy** - The **Policy** with which this service needs to comply.
- **Compliance Score** - The icon and color indicate whether or not the policy is compliant based on the compliance threshold.
- Whether the SoA is **Meeting Measurement SLO**.
- Whether the SoA is **Meeting Remediation SLO**.

- **Revision** - SoA revision and lifecycle state.
- **Last Compliance Scan** - Date and time on which the last compliance scan was run.

You can filter SoAs by lifecycle state, and sort them by compliance score or ID. Results for SoAs filtered by revisions in draft, submitted, or approved state may show multiple revisions of the same SoA. The list can be sorted **By Ascending Score** (default), **By Descending Score**, or **By ID**.

Click on a statement of applicability to view further details.

Business Service History

The business service **History** view shows details about each revision's history, including:

- **Action** - What was done (created, submitted, and so on).
- **Notes** - Information provided by the user who created or modified the business service.
- **User** - Who performed the action.
- **Date** - Date and time the action was performed.

The screenshot shows the HP IT Operations Compliance interface. At the top, there's a header with the HP logo and 'IT Operations Compliance'. Below that, a navigation bar shows 'Business Services' and 'Business Service'. A green banner displays '100 SVC_00001 - demo service' and 'Revision: 2 (Production)'. Below the banner, there are tabs for 'Details', 'Compliance', and 'History', with 'History' being the active tab. To the right of the tabs is an 'Actions' button. The main content area is titled 'History' and contains a table with four columns: Action, Notes, User, and Date.

Action	Notes	User	Date
Auto moved to Production	The revision 2 of Service [SVC_00001] has been moved to Production.	Service Owner (serviceowner)	6/22/15 2:10 PM
Submit	please approve	Service Owner (serviceowner)	6/22/15 2:10 PM
Update Resource Topology	The resource topology has been updated.	Service Owner (serviceowner)	6/22/15 2:10 PM
New Revision	New revision 2 has been created for the Service SVC_00001.	Service Owner (serviceowner)	6/22/15 2:09 PM

To view the history of a business service...

1. Navigate to the **Business Services** tab, and click the business service whose history you want to view.
2. Click **History**.

Create a New Draft Revision

1. Navigate to the **Business Services** list, and select a business service.
2. Select a revision of the business service on which you want to base your new draft revision.
3. Click **Actions**, and select **New Draft Revision**. The following message appears:

New Revision

This will create a new revision based on revision 4.

Do you want to continue?



4. Press **OK**.

From the **Details** view, you can edit properties and add or remove resources from the business service topology (see [Business Service Details](#)). Use **Actions** to submit the business service to the next workflow state (see [Workflow and Lifecycle States](#)).

Chapter 4: Controls

Controls define what to measure, how to evaluate compliance, and how to remediate non-compliance. A control is a reusable, shared function or test used in a policy to create a rule, and it is associated to policy requirements through rules.

The same control can be used multiple times in the same policy. For example, a generic control that checks the status of a service can be used for multiple requirements within a policy to check whether many different services are enabled or disabled. In another example, one control may work across multiple Red Hat versions, but you may want to use a different value for evaluation for Red Hat 6 than used for Red Hat 7.

The same control also can be used across multiple policies. Different policies have similar requirements, so use the same controls to evaluate those rules. For example, use the same control to test minimum password length across all policies with that requirement.


Multiple controls may exist that perform the same function; for example, you may have two different scripts (one for Windows and one for Linux) that both test minimum password length.


By default, controls follow the Approval Required workflow (see [Workflow and Lifecycle States](#)). When a new revision of an existing control used in a policy rule is promoted into production, the new revision of the control will be used on the next scan of that policy through the SoA.


HP provides policy content that can be downloaded from HP Live Network and imported into ITOC (see the [HP IT Operations Compliance Installation, Setup, and Upgrade Guide](#)), or users can create custom controls with their own scripts (see [Create a New Control](#)).

View Controls in ITOC


The **Controls** page lists all of the controls in your environment.

 IT Operations Compliance

 itocadmin

 < Dashboard **Controls** [Need Help?](#)

Controls

Search 

Lifecycle: Active Controls By ID Actions

ID	Control	Type	Revision	Modified By	Modified Date
CTRL_000946	Vendor-provided cryptographic certificates	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000947	System logs must be rotated daily	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000948	The 'nfs' option must be enabled on all Network File System (NFS) client mounts.	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000949	The system package management tool Audit Package	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000950	The RPM package management tool to verify contents of all files associated with the audit package	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000951	The xorg-x11-server-common (X Windows) package	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000952	String to be search in a unix file	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000953	simultaneous user logins	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM
CTRL_000954	The RPM package management tool to cryptographically verify the authenticity of all software packages	Evaluation	1 (Production)	ITOC Admin	5/26/15 8:40 AM

- Use the **Search** field to find a specific control. Type the full or partial name of the control in the

Search field, and click the  icon.

- Use the **Lifecycle**: lists to filter controls by lifecycle state. Available options are **Active Controls** (default), **Draft Revisions**, **Submitted Revisions**, **Production Controls**, or **Obsolete Controls**. If you are logged in as a user in a consumer organization, you can view public organization policies (which say "Public" at the end of their names) when you filter by **Production Controls**. For more information about organizations, see the **HP IT Operations Compliance Administration Guide**.
- Click the second list to sort controls **By ID** (default) or **By Name**.
- Use **Actions** to create a new control.

The overall **Controls** view shows:

- **ID** of the control.
- **Control** name.
- **Type** of control.
- **Revision** number and lifecycle state.
 - The control revision number used when viewing details about the business service in this row.
 - Results for controls filtered by revisions in draft or submitted state may show multiple versions of the same control.
 - Results for controls filtered by active, production, or obsolete state show only one revision per control listed.
- **Modified By** - Who modified a control.
- **Modified Date** - Date the control was modified.

Select a control to view further details.

Create a New Control

HP provides a library of controls through HP Live Network that can be imported into ITOC, or users can create custom controls. To create a new custom control:

1. Navigate to the **Controls** list.
2. From **Actions**, select **New Control**.

3. The **New Control** dialog appears:

New Control

Name:

Required

Description:

Char Count: 0/4000

Category:

Software Custom Script

Type:

Evaluation

Applicable Scope:

Software
Application Server
J2EE Server
JBoss
JBoss Application Server 7
WebLogic
WebSphere
Database

OK

Cancel

4. Complete the following fields:

- **Name:** (required) - Enter a name.
- **Description:** (optional) - Enter a description.
- **Category:** - Use the dropdown list to select **Software Custom Script** or **Platform Custom Script**.
- **Type:** - Use the dropdown list to set the type of control (**Evaluation** or **Evaluation and Remediation**).
- **Applicable Scope:** - Based on the **Category** selected, you can select from the resource types to which this control will apply. You can use **Ctrl-Click** or **Shift-Click** to make multiple choices.

5. Press **OK** to create revision 1 of a new control in draft state.

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Need Help?

CTRL_000001 - JBoss Application Control

Revision: 1 (Draft)

Details History Actions

Description: Software Custom Script
Category: Evaluation
Type: JBoss Application Server 7
Applicable Scope: ITOC Admin on 6/19/15 3:20 PM
Created By: ITOC Admin on 6/19/15 3:20 PM
Modified By: ITOC Admin on 6/19/15 3:20 PM

Evaluation Script and Parameters: Edit Script Edit Parameters

Order	Name	Datatype	Default Value
-------	------	----------	---------------

Scripts must be defined in order to submit the control. To define evaluation and remediation scripts, click **Edit Script** next to **Evaluation Script and Parameters** or **Remediation Script and Parameters**.

- If needed, click **Edit Parameters** to specify the script parameters.

Click **Actions** to submit the control to the next workflow state (see [Workflow and Lifecycle States](#)).

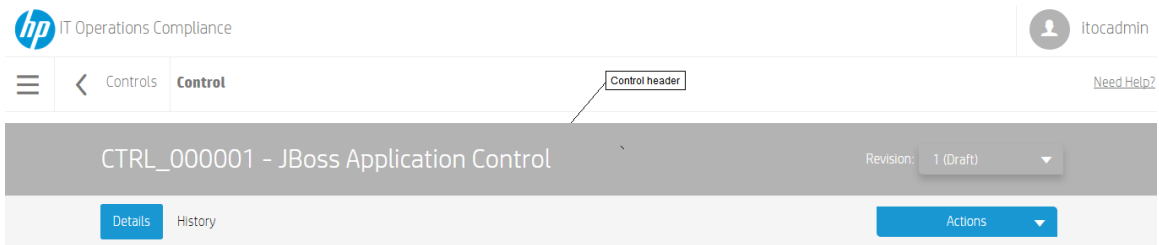
Manage Controls

This section describes how to view, author, and modify controls.

- [Control Header](#)
- [Control Details](#)
- [Control History](#)

Control Header

When you select a control, information about that control appears in a new view. The Control Header is the bar that appears directly beneath the ITOC tabs:

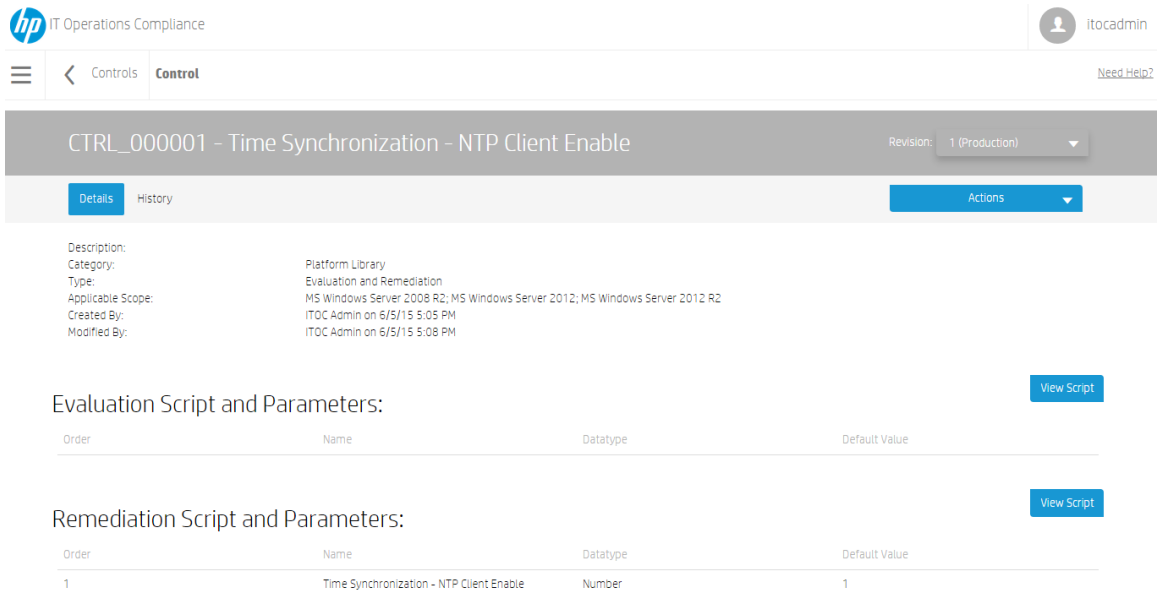


The control header shows:

- Control ID - "CTRL_000001" in the example.
- Control name - "JBoss Application Control" in the example.
- **Revision** - Revisions and lifecycle state of this control.

Control Details

Navigate to the **Details** view of a control in draft state to view information about a specific control, control, edit control properties, and edit evaluation and remediation scripts and parameters.



To edit control detail properties...

1. From a control in draft state, click **Actions** to select **Edit Properties**.

Edit Properties

Name:

JBoss Application Control

Description:

Char Count: 0/4000

Category:

Software Custom Script

Type:

Evaluation

Applicable Scope:

JBoss Application Server 7

Software

- Application Server
 - J2EE Server
 - JBoss
 - JBoss Application Server 7
 - WebLogic
 - Websphere
- Database
 - DB2 Database Server

OK

Cancel

2. Information about this control appears. Modify the control as needed.
3. Press **OK**.

Before you edit, consider the effects of modifying a control that is already in use by a policy. Changing the applicable scope (e.g., by changing the selection of RHEL 6 compatibles to RHEL 6 only) can invalidate a policy rule.

To edit evaluation or remediation scripts...

1. Click the **Edit Script** button to the right of **Evaluation Script and Parameters** or **Remediation Script and Parameters**.

Edit Script

Evaluation Script

Script Type:

Python

Evaluation Script:

OK

Cancel

2. Add or modify content for your script.
3. Press **OK**.

To edit evaluation or remediation parameters...

1. Click the **Edit Parameters** button to the right of **Evaluation Script and Parameters** or **Remediation Script and Parameters**.

Edit Parameters

Order	Name	Datatype	Default Value	
1	Required	String		<div>+ -</div>

OK

Cancel

2. To add a new parameter, click the **+** icon on the right.
 - **Order** - The order is system-generated.
 - **Name** (required) - Enter a name.
 - **Datatype** - Select a **Number**, **String**, or **Date** for the parameter.
 - **Default Value** - Set the default value:
 - **Number** - Enter a number in the **Default Value** field.
 - **Date** - The ITOC system provides today's date, which you can modify.

Before you edit, consider the effects of modifying a control that is already in use by a policy. Changing the datatype or order of parameters (such as inserting a new parameter between two existing parameters or adding a new parameter without a default value) can invalidate a policy rule.

Control History

The Control **History** view shows details about each revision's history, including:

- **Action** - What was done (created, submitted, and so on).
- **Notes** - Information provided by the user who created or modified the control.
- **User** - Who performed the action.
- **Date** - When the action was performed.

To view the history of a control...

1. Navigate to the **Controls** tab, and click the control whose history you want to view.
2. Click **History**.

Create a New Draft Revision

1. Navigate to the **Controls** list to select a control to revise.
2. Select a specific control revision.
3. From **Actions**, select **New Draft Revision**. The following message appears:

New Revision

This will create a new revision based on revision 1.

Do you want to continue?



4. Press **OK**.

From the **Details** view, you can edit properties and add, edit, or delete evaluation and remediation scripts and parameters (see [Control Details](#)). Use **Actions** to submit the control to the next workflow state (see [Workflow and Lifecycle States](#)).

Chapter 5: Resources

Resources are the ITOC representation of an IT resource in the customer's environment. IT resources are associated with business services, and the same IT resource can be used across different business services. Customers can create their own custom controls to measure compliance for other resource types. Users populate their resource library with their own resources from the datacenter whose compliance they want to track.

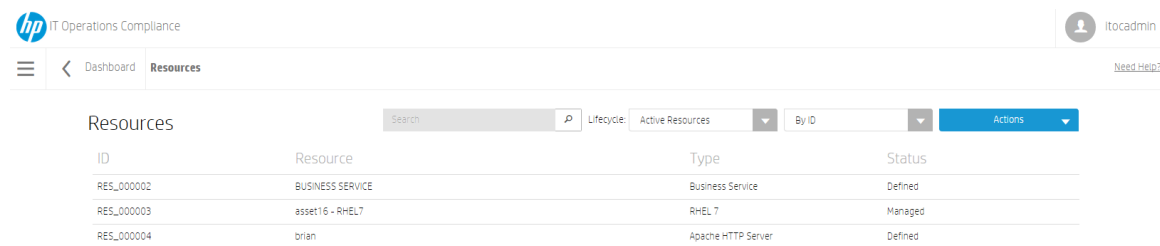
ITOC has the following classes of resources:

- **Business Service** - A collection of IT resources with defined relationships to one another (see [Business Services](#)).
- **Device** - A hardware asset.
- **Group** - A group asset.
- **Platform** - An OS resource.
- **Resource Manager** - An asset through which resources can be accessed.
- **Software** - Includes application server, database, and web server.
- **Unknown** - An unknown resource.

Before configuring any of these resources, ensure that the FQDN used in the minion configuration is resolvable through DNS or by the local `/etc/hosts` file.


View Resources in ITOC

The **Resources** page lists all of IT resources in your environment.



ID	Resource	Type	Status
RES_000002	BUSINESS SERVICE	Business Service	Defined
RES_000003	asset16 - RHEL7	RHEL 7	Managed
RES_000004	brian	Apache HTTP Server	Defined

- Use the **Search** field to find a specific resource. Type the full or partial name of the resource in the

Search field, and click the  icon.

- Use the **Lifecycle** list to filter resources by lifecycle state. Available options are **Active Resources** (default), **Defined Resources**, **Managed Resources**, **Installing Agent**, **Install Failed**, or **Obsolete Resources**.
- Click the second list to sort resources **By ID** (default) or **By Name**.
- Click **Actions** to create a **New Resource**, **Import Resources**, or **Install Agents**.

The overall **Resources** view shows:

- **ID** of the resource.
- **Resource** name.
- **Type** of resource.
- **Status** of the resource (**Defined**, **Managed**, or **Obsolete**). You can click on the status to see further details. For example, the following screenshot shows information about a resource with a **Managed** status:

Agent Installation Results

Status:

Managed

Output:

```
-----  
SSH Test  
-----  
SSH Test is a success!  
  
Successfully copied /opt/hp/itoc/salt/srv/salt/Win64_minion-2014.1.10.exe to /tmp/Win64_minion-2014.1.10.exe on the remote host asset09.qa.opsware.com  
  
-----  
Executing installer
```

Errors:

```
-----  
Executing installer  
-----  
ERROR: Input redirection is not supported, exiting the process immediately.  
ERROR: Input redirection is not supported, exiting the process immediately.
```

OK

Create a Resource

1. Navigate to the **Resources** list.
2. Click **Actions**, and select **New Resource**.
3. The **New Resource** dialog appears.
 - **Name** (required) - Enter a Name for the resource.
 - **Resource Type** - Use the dropdown list to select a resource type.
 - Depending on the resource type you select, different resource attributes are available to specify.
4. Press **OK**.

Import Business Services and Resources

Use the following task to import a business service or resource:

1. Navigate to the **Business Services** or **Resources** list.
2. From the **Actions** list, select **Import Business Services** or **Import Resources**.
3. The **Import Data** screen appears:

hp IT Operations Compliance

Resources > Import Services and Resources

Import Data

Select the file containing the data that you want to import. Click the help link for a full description of the required data format.

```
{
  "services": [
    {
      "name": "ServiceAlpha",
      "ref": [
        {
          "sourceUri": "https://ucomdb.hp.com",
          "sourceRef": "ServiceAlpha",
          "relationships": [
            {
              "source": {
                "sourceRef": "Alpha"
              },
              "target": {
                "sourceRef": "Beta"
              },
              "type": "contains"
            }
          ]
        }
      ]
    }
  ]
}
```

Choose File | import.json

Start Import

4. Press **Choose File** to select the file containing the data you want to import.
5. Press **Start Import**.

6. After several moments, the **Import Results** screen appears:

HP IT Operations Compliance

Resources Import Services and Resources

Need Help?

Import Results

Created Resources (5)

Source Ref	Source URI	ID
Alpha	https://ucmdb.hp.com	4
Beta	https://csa.hp.com	5
Gamma	https://csa2.hp.com	6
Bravo	https://ucmdb.hp.com	7
Charlie	https://ucmdb.hp.com	8

Failed Resources (1)

Source Ref	Source URI	Errors
Delta	https://ucmdb.hp.com	111: accessThroughRef (sourceURI: https://ucmdb.hp.com, sourceRef: Psi) is invalid

Created Services (1)

Source Ref	Source URI	ID
ServiceQ	https://ucmdb.hp.com	2 (revision 1)

- **Created Resources** - Resources that were imported successfully onto your system.
 - **Source Ref** - Name of the imported source.
 - **Source URL** - URL of the imported source.
 - **ID** - Resource ID.
- **Failed Resources** - Resources that failed to import onto your system.
- **Skipped Resources** - Resources that were skipped during this import.
- **Updated Resources** - Resources that were updated in this import.
- **Created Services** - Business services that were imported successfully onto your system.
- **Failed Services** - Business services that failed to import onto your system.
- **Skipped Services** - Business services that were skipped during this import.
- **Updated Services** - Business services that were updated in this import.

See [How to Write JSON Files for Services and Resources Import](#) for more information about configuring files for ITOC import.

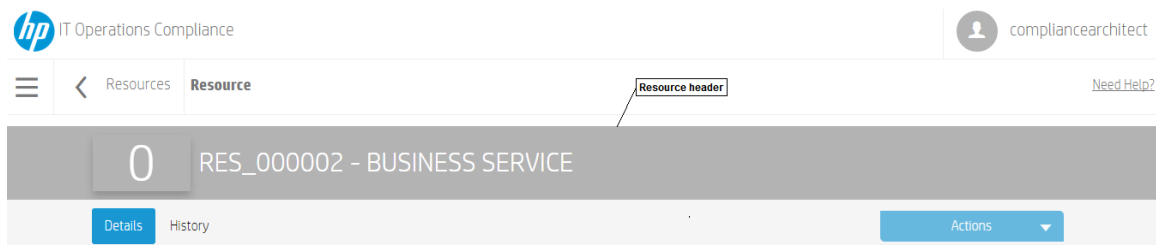
Manage Resources

This section describes how to view, author, and edit resources.

- [Resource Header](#)
- [Resource Details](#)
- [Resource History](#)

Resource Header

When you select a resource, information about that resource appears in a new view. The Resource Header is the bar that appears directly beneath the ITOC tabs:



- The overall compliance score is the number on the left side of the header. The compliance of the resource in the example is not calculated or is unknown.
The header background color indicates the resource's compliance state:
 - Green - Compliant based on the compliance threshold.
 - Red - Not compliant based on the compliance threshold.
 - Gray - Not calculated or unknown.
- Resource ID - "RES_000002" in the example.
- Resource Name - "BUSINESS SERVICE" in the example.

Resource Details

Navigate to the **Details** view of a resource in defined state to view information about a specific resource, edit resource properties, and use the **Make Obsolete** action:

To edit resource detail properties...

1. Navigate to the **Resources** list, and select the resource you want to edit.
2. From **Actions**, select **Edit Properties**. The **Edit Properties** dialog appears, showing information about this resource.

Edit Properties

Name:

asset06.qa.opsware.com Robot 46520294

Server Identifier:

asset06.qa.opsware.com

Choose the Access Through Resource: ☐ Use self

Status is:

Active Resources

Type is:

Platform

Name contains:

Search

RES_000005 - asset06.qa.opsware.com Robot 46520294

OK

Cancel

3. Edit the **Name:** and **Server Identifier:** information as needed.
4. **Choose the Access Through Resource:**
 - **Status is:** You can filter resources by status. Available options are **Managed Resources** (default), **Active Resources**, **Defined Resources**, **Installing Agent**, and **Install Failed**.
 - **Type is:** You can filter resources by type. Available options are determined by the **Status is:** selection, above.
 - **Name contains:** To find a specific resource, enter the complete or partial name of the resource you want to use, and press **Search**.
 - Use the dropdown list to find the existing resource through which to access this resource. For a server, this would usually be self. For a software resource, you would select the server it is installed on.
5. Press **OK**.

To use the Make Obsolete action...

The **Make Obsolete** action can be performed on a resource that is not part of an active business service or is not being used as the Access Resource Through resource. Once you have made a resource obsolete, it will not be available to be used in a business service in the future. This action is not reversible (see [Lifecycle Actions](#)).

1. Navigate to the **Resources** page, and select a resource.
2. From **Actions**, select **Make Obsolete**. The **Make Obsolete** dialog appears:

Make Obsolete

Mark all revisions of this object obsolete.

Notes:

This resource is now obsolete.

Char Count: 30/4000

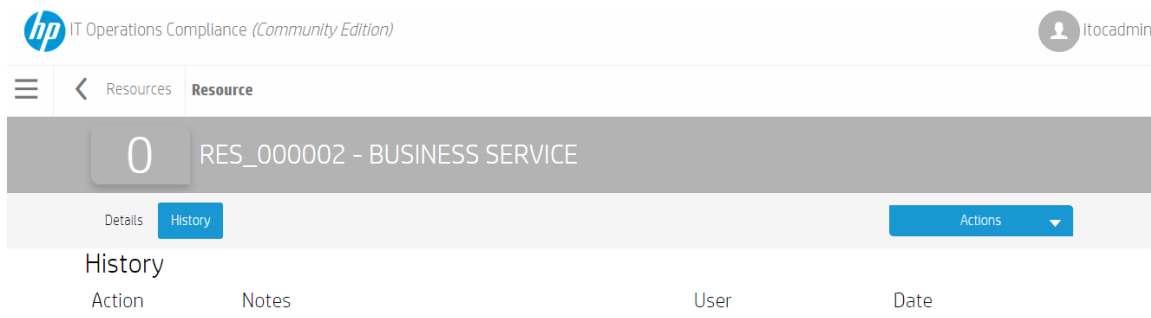


3. **Notes** (required) - Enter information about this resource.
4. Press **OK**.

Resource History

The **Resource History** view shows details about the resource's history, including:

- **Action** - What was done (created, updated, or obsoleted).
- **Notes** - Information provided by the **User** who created or modified the resource.
- **User** - Who performed the action.
- **Date** - When the action was performed.



To view the history of a resource...

1. Navigate to the **Resources** tab, and click the resource whose history you want to view.
2. Click **History**.

Install an Agent on a Resource

This section describes how to install an agent on a resource, prerequisites for installing an agent on certain resources, and post-installation target server configuration.

Prerequisites

- [Prerequisites for an Agent on a Windows Platform](#)
- [Prerequisites for an Agent on a SLES Platform](#)

Prerequisites for an Agent on a Windows Platform

Select an SSH installation for Windows. HP ITOC has been tested with the following two SSH installation options for Windows; however, you can use any other similar solution.

- **COPSSH 64-bit** - <https://www.itefix.net/copssh>
- **BITWISE SSH** - <https://www.bitwise.com/>

All the Windows servers on a system must have either **COPSSH** or **BITWISE SSH** installed. Do not use both. HP ITOC does not support a mix of **COPSSH** and **BITWISE SSH** on servers.

By default, the ITOC `application.properties` file is configured to support **COPSSH** as follows (default configurations are shown in **bold text**):

```
## itoc.rex.salt.minion.windows.temp : salt minion temp dir for windows
## This is an optional property with default value C:/tmp
itoc.rex.salt.minion.windows.temp = C:/tmp
```

```
## itoc.rex.salt.minion.windows.pythonloc : salt minion python location for windows
```

```
## This is an optional property with default value C:/python27  
itoc.rex.salt.minion.windows.pythonloc = C:/python27
```

```
## itoc.rex.salt.minion.windows.sshsaltloc : location for salt installation while  
access from SSH  
## This is an optional property with default value /cygdrive/c/salt  
itoc.rex.salt.minion.windows.sshsaltloc = /cygdrive/c/salt
```

```
## itoc.rex.salt.minion.windows.sshenvtype : what kind of command set windows ssh  
uses (POSIX or Windows)  
## This is an optional property with default value POSIX  
itoc.rex.salt.minion.windows.sshenvtype = POSIX
```

To use **BITWISE** instead of **COPSSH**, the application.properties file must have the following information (shown in bold text):

```
## itoc.rex.salt.minion.windows.temp : salt minion temp dir for windows  
## This is an optional property with default value C:/tmp  
itoc.rex.salt.minion.windows.temp = C:/tmp
```

```
## itoc.rex.salt.minion.windows.pythonloc : salt minion python location for windows  
## This is an optional property with default value C:/python27  
itoc.rex.salt.minion.windows.pythonloc = C:/python27
```

```
## itoc.rex.salt.minion.windows.sshsaltloc : location for salt installation while  
access from SSH  
## This is an optional property with default value /cygdrive/c/salt  
itoc.rex.salt.minion.windows.sshsaltloc = C:/salt
```

```
## itoc.rex.salt.minion.windows.sshenvtype : what kind of command set windows ssh  
uses (POSIX or Windows)  
## This is an optional property with default value POSIX  
itoc.rex.salt.minion.windows.sshenvtype = Windows
```

For both **COPSSH** and **BITWISE**, the user must ensure that:

- The Python 2.7 64-bit library is installed in the directory specified by
itoc.rex.salt.minion.windows.pythonloc.
- itoc.rex.salt.minion.windows.sshsaltloc must be:
 - %SystemDrive%/salt for **BITWISE** use.
 - /cygdrive/%SystemDrive%/salt for **COPSSH** use.
- itoc.rex.salt.minion.windows.temp and itoc.rex.salt.minion.windows.sshsaltloc are pre-created.
 - itoc.rex.salt.minion.windows.temp must have read and write permissions for the Administrator and System users.

- `itoc.rex.salt.minion.windows.sshsaltloc` must have read permissions.
- All directory names specified in the `application.properties` files must use `/` as a separator, not `\`.
- Appropriate Firewall settings should be updated to allow the SSH server to communicate.

HP recommends that the user create a template Windows server with this configuration and clone it for easy configuration.

Prerequisites for an Agent on a SLES Platform

This process allows automated agent installation on an SLES platform and is not required for further ITOC operation and use.

Before you install an agent on a SLES resource, you must configure the following information:

1. Change the following information in the `/etc/ssh/sshd_config` file:
#To disable tunneled clear text passwords, change to no here!

```
#PasswordAuthentication no
```

To:

```
#PasswordAuthentication yes
```

2. Restart the SSH daemon.

Install an Agent

1. Navigate to the **Resources** list.
2. Click **Actions**, and select **Install Agents**. The **Install Agents** dialog appears.

Install Agents
Filter for and then select the resources on which to install the ITOC agent. Provide the credentials for accessing the resources.

Choose Resources:

Status is:
Defined Resources

Type is:
Platform

Name contains:

Search

Force install:
Skip if already installed

Install Location:

SSH Port:

SSH Login:

SSH Password:

OK Cancel

Choose Resources:

- **Status is:** - Use the dropdown list to filter resources by status.
- **Type is:** - Use the dropdown list to filter resources by type.
- **Name contains:** - To find a specific resource, enter the complete or partial name of the resource you want to install.

3. Press **Search**.

4. Use the multi-select list to find the existing resources you want to install an agent on. Other information in this dialog is as follows:
 - **Force Install:** - Select **Skip if already installed** (default) or **Always install**.
 - **Install Location:** - This field is grayed out and not editable by the user. This is the install location.
 - **SSH Port:** - This field is grayed out and not editable by the user. This is the default SSH port.
 - **SSH Login:** (required) - Your username for logging into SSH.
 - **SSH Password:** (required) - Your password for logging into SSH.
5. Press **OK**.

For information about Resource Managers, see the [HP IT Operations Compliance Administration Guide](#).

Chapter 6: Statements of Applicability

A Statement of Applicability links a policy to a business service and defines the SLOs, maintenance windows, and exceptions. Exceptions are defined to exclude a resource from being tested against a requirement (see [SoA Details](#)).

SoAs are created manually from a production business service or policy. By default, SoAs follow the Approval Required workflow (see [Workflow and Lifecycle States](#)). An SoA must be in production state to run compliance scan and remediation jobs.

View Statements of Applicability in ITOC

Navigate to a production revision of a business service or policy, and see the business service or policy **Compliance** view for applicable SoAs. The table shows:

- **ID** of each SoA.
- **Policy** or **Business Service** to which each SoA is tied.
- **Compliance Score** of each SoA. The color and icon indicate the compliance state based on the compliance threshold.
- Whether the SoA is **Meeting Measurement SLO**.
- Whether the SoA is **Meeting Remediation SLO**.
- **Revision** number and lifecycle state.
- **Last Compliance Scan** of this SoA.

Select an SoA to view further details.

Create a New Statement of Applicability

1. To create a new SoA, navigate to the **Compliance** view of a production business service or policy.

2. Open the business service or policy for which you want to create a new SoA:

HP IT Operations Compliance

itocadmin

Need Help?

POL_0001 - p1

Revision: 2 (Production)

Details Compliance History

Actions

100% Unknown

Statements of Applicability

Lifecycle: Active Statements By Ascending Score

ID	Business Service	Compliance Score	Meeting MSLO	Meeting RSLO	Revision	Last Compliance Scan
STMT_0000001	b1	-	-	-	2 (Production)	

3. From **Actions**, select **New Statement of Applicability**, and enter the following information:
- **Policy or Business Service** - The system automatically enters the policy or business service from which you opened the new SoA page.
 - **Business Service or Policy** (required) - Opposite of the value in the first, pre-populated field. Select a **Business Service** or **Policy**.
 - **Measurement SLO** - The measurement SLO is the time frame in which a business service must be measured against a particular policy. Select a value from the dropdown list. The default is set based on the policy's default measurement SLO (see [Create a New Policy](#)).
 - **Remediation SLO (in days)** - The remediation SLO is the time frame in which a non-compliant IT resource needs to be remediated against a particular requirement. Enter the remediation SLO. The default is set based on the policy's default remediation SLO (see [Create a New Policy](#)).
 - **Maintenance Windows** - Select the maintenance windows in which you want to run scan and remediation jobs.
The maintenance windows you select here are the allowable times that the business service is available for scan and/or remediation jobs. When the maintenance window timeslot begins, many SoAs can be slated for the same maintenance window, and the jobs are prioritized by the business service priority and will run in a way that optimizes meeting MSLO.
4. Press **OK**.

For more information about maintenance windows, see the [HP IT Operations Compliance Administration Guide](#).

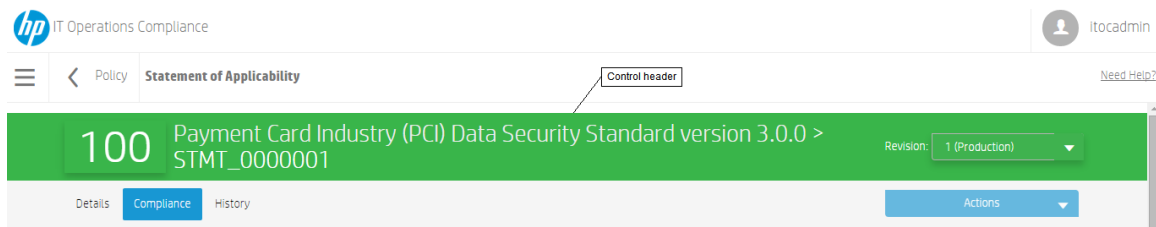
Manage Statements of Applicability

This section describes how to view, author, and edit SoAs.

- [SoA Header](#)
- [SoA Details](#)
- [SoA Compliance](#)
- [SoA History](#)

SoA Header

When you select an SoA, information about it appears in a new view. The SoA Header is the bar that appears directly beneath the ITOC tabs:



- The overall compliance score is the number on the left side of the header. The policy used to create this SoA is 22 percent compliant.
The header background color indicates the SoA's compliance state:
 - Green - Compliant based on the compliance threshold.
 - Red - Not compliant based on the compliance threshold.
 - Gray - Not calculated or unknown.
- Name of the policy or business service from which you navigated to the SoA (in this example, a policy named "Corporate Security Standard Configuration").
- SoA ID - "STMT_0000001" in the example.
- **Revision** - Revisions of this SoA and the lifecycle state.

SoA Details

Navigate to the **Details** view of an SoA to view information about a specific SoA, edit SoA properties, view and create SoA exceptions, and edit or delete SoA exceptions:

hp IT Operations Compliance

itocadmin

Policy Statement of Applicability

Need Help?

100 Payment Card Industry (PCI) Data Security Standard version 3.0.0 > STMT_0000001

Revision: 1 (Production)

Details Compliance History Actions

Policy: POL_0019 - Payment Card Industry (PCI) Data Security Standard version 3.0.0
Business Service: SVC_00001 - demo service
Measurement SLO: Within 1 Month
Remediation SLO: Comply within 14 days
Maintenance Windows: MWF 1-7AM PT (scan only); Weekends 2-6AM PT (scan and remediate)
Created By: Service Owner on 6/8/15 7:08 PM
Modified By: System Admin on 6/14/15 4:48 AM

Exceptions

Name	Reason	Expiration Date	Created By
1.5 Ensure that security policies and operational procedures for managing firewalls are documented, in use, and known to all affected parties			
asset16 - RHEL7	Not applicable for this resource because XYZ.	6/9/16 12:00 AM	Service Owner on 6/8/15 7:09 PM

To edit SoA detail properties...

1. From a revision in draft state, click **Actions** to select **Edit Properties**.
2. The **Edit Properties** dialog appears. Modify the SoA as needed.
3. Press **OK**.

To view SoA exceptions...

An exception is defined in the statement of applicability for a specific resource (within the business service) that is not required to comply with a specific requirement in the policy. SoA exceptions can only be added, edited, and deleted from an SoA in draft state.



To create an exception...

1. From an SoA in draft state, click the **New Exception** button.
2. The **New Exception** dialog appears. Complete the following fields:
 - **Requirement** (required): Select a requirement. Selecting a top-level requirement includes the selection of any sub-requirements below it.
 - **Resource** (required): Select a resource from the business service.
 - **Reason** (required) - Enter the reason the exception was created.
 - **Expiration Date** (required): Use the **Pick Date** dropdown calendar to select an effective date,

which must be a date in the future. The default is today's date.

New Exception

Requirement:

- ▶  User Accounts and Environments
- ▶  Oracle Parameter Settings

Resource:

Reason:

Expiration Date:

1/15/15

[Pick Date](#)

[OK](#)

[Cancel](#)

3. Press **OK**.

To edit an exception...

You can edit the properties of an exception in draft state.

1. Navigate to an exception in an SoA that is in draft state.
2. Click the **Name** link in the exception row to edit the exception.
3. The **Edit Exception** dialog appears. Edit the information as needed.
4. Press **OK**.

To delete an exception...

1. From an SoA in draft state, click the Delete  icon the exception row (see the following figure).

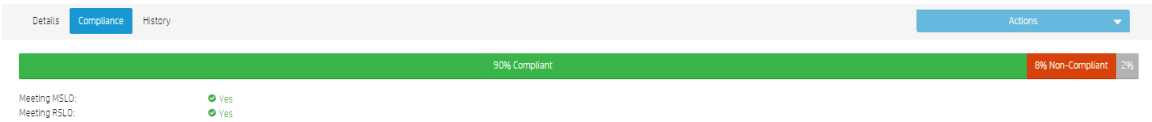
Exceptions +

Name	Reason	Expiration Date	Created By
Jboss7_on_Ubuntu12			
10.2.2 All actions taken by any individual with root or administrative privileges	Known Issue for this JBOSS application. Requires ...	7/31/16 12:00 AM	Service Owner on 6/22/15 2:53 PM ✕

- 2. A confirmation message appears, asking if you want to delete the exception.
- 3. Press **OK**.

SoA Compliance

The following figure shows the SoA **Compliance** bar:



The **SoA Compliance Bar** in this view displays the overall compliance score for the SoA. The example shows:

- **90% Compliant** (green) - 90 percent compliance in MSLO.
- **8% Non-Compliant (within RSLO)** (orange) - 8 percent non-compliance in RSLO.
- **Non-Compliant (out of RSLO)** (red) - Non-compliance out of RSLO.
- **2% Unknown** (gray when greater than 0) - 2 percent not calculated or unknown.
- **Meeting MLSO** - Whether the SoA is meeting MSLO.
- **Meeting RSLO** - Whether the SoA is meeting RSLO.

To view compliance results...

You can view **Compliance Results** from an SoA that you have navigated to through a policy or business service. **Compliance Results** shows a widget for each requirement that has one or more rules directly associated with it. Use the dropdown list to view compliance results **By Requirement** or **By Resource** (by default, results are shown by requirement).

HP IT Operations Compliance

Policy Statement of Applicability

57 CIS SUSE Linux Enterprise Server 11 Benchmark v 1.0 > STMT_0000003

Revision: 1 (Production)

Details Compliance History Actions

Meeting MSLO: Yes
Meeting RSLO: Yes

Compliance Results

By Requirement All Results By Compliance View Table

Name	Severity	Non-Compliant (out of RSLO)	Non-Compliant (within RSLO)	Compliant	Failed	Excepted
7.5.4 Disable TIPC	Medium	0	1	0	0	0
2.1 Create Separate Partition for /tmp	Medium	0	1	0	0	0
2.4 Set noexec option for /tmp Partition	Medium	0	1	0	0	0
2.5 Create Separate Partition for /var	Medium	0	1	0	0	0
2.6 Bind Mount the /var/tmp directory to /tmp	Medium	0	1	0	0	0
2.7 Create Separate Partition for /var/log	Medium	0	1	0	0	0
2.8 Create Separate Partition for /var/log/audit	Medium	0	1	0	0	0


Click the second dropdown list to filter results by **All Results** (default), **With Non-Compliant**, **With Excepted**, or **With Failed**. Click the third dropdown list to sort results **By Compliance** (default), **By Name**, or **By Severity** (if you selected **By Requirement**) or **By Compliance**, **By Name**, or **By Type** (if you selected **By Resource**). Click the fourth dropdown list to see results as **View Tiles** or **View Table**.

The widget color is based on the following:


- **Compliant** - The widget is green if one or more rule-resource pairs are **compliant** and none are **non-compliant (within RSLO)** or **non-compliant (out of RSLO)**.
- **Non-Compliant (within RSLO)** - The widget is orange if a requirement has any rule-resource pairs are **non-compliant (within RSLO)** but no rule-resource pairs that are **non-compliant (out of SLO)**.
- **Non-Compliant (out of RSLO)** - The widget is red if a requirement has any rule-resource pairs are **non-compliant (out of RSLO)**.
- **Unknown** - The widget is gray if there are no rule-resource pairs in any categories.
- Requirement severity (**High**, **Medium**, or **Low**) is displayed on the widget. Users can sort widgets by severity value.
- The numbers on each widget indicates the number of rule-resource pairs.
- You can click on the number link on the widget for more details about test results for these rule-resource pairs. For example, in the previous illustration, you can click on "3 Non-Compliant (out of SLO)" in the "2.8 2.8 Ensure Plugin Directory Has Appropriate Permissions" widget for further results, which are grouped by rule.
Clicking on this rule name shows further details about this rule.

Non-Compliant (out of RSLO) Results


MySQL Community Server 5.6:File Permissions(\$PLUGINDIR) (CTRL_000010)

ID	Resource	Type	Scanned	Job ID
RES_000008	mysql 5.6	MySQL Community Server 5.6	7/7/15 8:43 AM	 17

MySQL Community Server 5.6:File Owning User(\$PLUGINDIR) (CTRL_000008)

ID	Resource	Type	Scanned	Job ID
RES_000008	mysql 5.6	MySQL Community Server 5.6	7/7/15 8:43 AM	 17

MySQL Community Server 5.6:File Owning Group(\$PLUGINDIR) (CTRL_000009)

ID	Resource	Type	Scanned	Job ID
RES_000008	mysql 5.6	MySQL Community Server 5.6	7/7/15 8:43 AM	 17

OK

- **ID** - Resource ID.
- **Resource** - Resource name. Click on the resource name to see resource details.
Resource

53

RES_000004 - asset04.qa.opsware.com Robot
32843792

Resource Type: RHEL 6
Hostname: asset04.qa.opsware.com
Access Resource Through: asset04.qa.opsware.com Robot 32843792_1eab9fa4-40c4-4335-bcb9-295675dc1d5f
Status: Defined
Created By: ITOC Admin on 5/19/15 1:27 PM
Modified By: ITOC Admin on 5/19/15 1:27 PM

OK

- **Type** - Resource type.
- **Scanned** - Date and time this resource was last scanned for compliance.

- **Job ID** - ID of the compliance job. Click on the value in the **Job ID** column for more specific information.

Control Output

Output from the control 'Text Entry in a Directory or File' executed against the resource 'asset13.qa.opsware.com Robot 88656649'.

Return Code:

0

Expected Value:

"^root:[*\\|:]"

Old Value:

New Value:

"root:\$6\$25JEsVAB\$K1UB8I3cfsBA.2kgz1pZl/4KFlbmSwlUTFqB7zETV3q4l80o/h0ENkFcsYwoW4y51e0eA92t12EV/jkbVo.a1:16394.0:99999:7::"

Output:

root:\$6\$25JEsVAB\$K1UB8I3cfsBA.2kgz1pZl/4KFlbmSwlUTFqB7zETV3q4l80o/h0ENkFcsYwoW4y51e0eA92t12EV/jkbVo.a1:16394.0:99999:7::

Result Details:

Checking if Solaris 11 is installed (oval:com.hp.livenet.2:tst:511000)

Found 1 object(s) that match

Actual os_release: 3.2.0-29-generic

Operator: pattern match

Policy os_release: ^5.11\$

Result: False

Test result: Failed

OK

- **Return Code** - Error return code.
- **Expected Value** - Expected information based on the control settings.
- **Old Value** - Value before the job was run.
- **New Value** - Value resulting from the job that was run.
- **Output** - Output from the specified control executed against the specified resource.
- **Result Details** - May contain errors or results from the control.

The widget also may show the number of rule-resource pairs that failed to provide a result (compliant or not compliant) in the most recent scan.

- If there was a previous scan result within MSLO, that result is counted in the numbers shown in the widget.
- If there was no previous result, it remains unknown.

SoA History

The **History** view shows details about each revision's history, including:

- **Action** - What was done (created, submitted, and so on).
- **Notes** - Information provided by the **User** who created or modified the policy or business service.
- **User** - Who performed the action.
- **Date** - When the action was performed.

To view the history of an SoA...

Select the SoA whose history you want to view, and click **History**.

The screenshot shows the HP IT Operations Compliance interface. At the top, there's a header with the HP logo and 'IT Operations Compliance' on the left, and a user profile 'itocadmin' on the right. Below the header, there's a navigation bar with a menu icon, a back arrow, 'Business Service', and 'Statement of Applicability'. A 'Need Help?' link is on the far right. The main content area has a green header bar with '100 demo service > STMT_0000001' on the left and a 'Revision: 1 (Production)' dropdown on the right. Below this, there's a tabbed interface with 'Details', 'Compliance', and 'History' (which is selected). To the right of the tabs is an 'Actions' button with a dropdown arrow. The 'History' view displays a table with the following data:

Action	Notes	User	Date
Remediate Statement	A remediation has been invoked on the Statement.	Job Runner (jobrunner)	6/14/15 4:48 AM
Scan Statement	A scan has been started on the Statement.	Job Runner (jobrunner)	6/14/15 4:46 AM
Scan Statement	A scan has been started on the Statement.	Job Runner (jobrunner)	6/9/15 2:08 PM
Auto moved to Production	The revision 1 of Statement [STMT_0000001] has been moved to Production.	Approver User (approver)	6/8/15 7:10 PM
Approve	approved	Approver User (approver)	6/8/15 7:10 PM
Submit	ready for production	Service Owner (serviceowner)	6/8/15 7:09 PM
Set Approver/s	Approver/s have been set on Statement revision 1.	Service Owner (serviceowner)	6/8/15 7:09 PM
Add Exclusion	An exclusion has been added for the Statement.	Service Owner (serviceowner)	6/8/15 7:09 PM
Create	New Statement STMT_0000001 revision 1 has been created.	Service Owner (serviceowner)	6/8/15 7:08 PM

Create a New Draft Revision

1. From the **Compliance** view of a business service or policy, select an SoA in the SoA table.
2. Select the SoA revision on which you want to base your new draft revision.
3. Click **Actions**, and select **New Draft Revision**. The following message appears:

New Revision

This will create a new revision based on revision 4.

Do you want to continue?



4. Press **OK**.
5. Use **Actions** to submit the SoA to the next workflow state (see [Workflow and Lifecycle States](#)).

Scan and Remediate

ITOC determines which policy rules to run against which IT resources (within the business service) based on the rule scope and resource type. A compliance scan or remediation job runs against the revision of the current production policy and business service associated with the production revision of the SoA.

ITOC uses a resource type hierarchy to determine which rules to test against which IT resources. For example, if a rule's scope is for Windows, it runs only against resources whose type is Windows or below in the resource-type hierarchy (e.g., it runs on Windows 2012, Windows 2012 R2, etc.).

Scanning and remediation occurs automatically through maintenance windows. However, you may need to run scanning and remediation manually, as described in the following section.

Manually Scan and Remediate

This section describes how to run a scan compliance or remediation job manually.

Run a Scan Compliance Job

You must have the **Run Scan Compliance Job** permission to perform this task.

1. From the **Dashboard**, **Policy**, or **Business Service** page, navigate to the production policy or business service you want to scan for compliance.
2. Select an SoA in production state.
3. From **Actions**, select **Scan Compliance** to initiate a scan compliance job.
Your compliance results appear. If any of your IT resources are out of compliance, you can initiate a **Run Remediation** job.

Run a Remediation Job

You must have the **Run Remediation Job** permission to perform this task.

1. From the **Dashboard**, **Policy**, or **Business Service** page, navigate to the production policy or business service you want to remediate.
2. Select an SoA in production state.
3. From **Actions**, select **Run Remediation** to initiate a remediation job.
The job remediates non-compliant resources and updates the compliance results.

Chapter 7: Administration

The **Administration** view shows information about ITOC users, roles, notifications, maintenance windows, resource managers, business configuration, system configuration.

For more information, see the [HP IT Operations Compliance Administration Guide](#).

Appendix A: Terminology

- **Business Service** - A business service is a collection of IT resources with defined relationships to one another that can be viewed in a topology.
- **Business Service Owner** - A user who defines the business service, the statement of applicability, and exceptions.
- **Compliance Architect** - A user who authors the policies using the controls library.
- **Control** - A control is a reusable, shareable function or test that can be used in a policy to create a rule.
- **Dashboard** - The **Dashboard** provides a comprehensive overview of ITOC results in an environment.
- **Exception** - An exception is defined in the statement of applicability for a specific resource (within the business service) that is not required to comply with a specific requirement in the policy.
- **IT Resource** - The ITOC application's representation of an IT resource in the customer's environment.
- **ITOC Administrator** - The seeded **itocadmin** user. The ITOC administrator is responsible for setting up and customizing ITOC. The ITOC administrator creates users and assigns roles to users.
- **Maintenance Window** – A definition of a block of time within which jobs are allowed to run and which types of jobs can run in the window.
- **Measurement SLO (MSLO)** - The timeframe in which a business service needs to be measured against a particular policy. This value is set in the SoA.
- **Platform Engineer** - A user who creates the controls.
- **Policy**- A policy is a system representation of a government or corporate regulatory policy. Policies have a set of requirements and requirements can have one or many rules.
- **Remediation SLO (RSLO)** - The time frame in which a non-compliant IT resource needs to be remediated against a particular requirement.
- **Results** - Results represent a resource's compliance with policy requirements.
- **Requirement** - Requirements are defined in a policy and contain rules. You can set a requirement severity to high, medium, or low.

- **Rule** - A rule is defined in a policy. It ties together a requirement and a control. A rule defines scope, parameters, and other values to evaluate compliance with the requirement.
- **Scope** - Scope allows the system to determine to which IT resources a rule must apply, and a rule defines the scope. A control has applicable scope. The author can use the same control in multiple rules with different scope and parameter values.
- **Service Level Objective (SLO)** - See Measurement SLO or Remediation SLO.
- **Statement of Applicability (SoA)** - The SoA ties a business service to a policy and defines the SLOs, maintenance windows, and exceptions. Scan compliance and remediation jobs are manually run within the maintenance windows.
- **VP of Operations** - A user who is primarily interested in overall compliance status, viewed from the dashboard.

Appendix B: How to Write JSON Files for Services and Resources Import

You can import your own business services and resources into ITOC using a JSON file. This appendix provides information about the syntax and semantics for this JSON file.

Limitations

The import request must be in the JSON format. To export and import resources, services, or relationships from a different data source, such as UCMDB/CSA, you must first create this JSON file with the desired input.

Security

The import of business services and resources requires the following permissions:

- Write Business Services
- Read and Write Resources

Input JSON Format

The following example shows a simple API request body:

```
{
  "canUpdate": true,
  "defaultSourceURI" : "https://ucmdb.hp.com",
  "resources" : [
    {
      "type": "SLES 11",
      "name": "Alpha",
      "ref" : { "sourceRef": "Alpha" },
      "attributes" : [ {"name" : "Hostname", "value" : "Alpha.qa.itoc.com"} ]
    }
  ],
  "services" : [
    {
      "name": "Service1Alpha",
      "ref" : { "sourceRef": "Service1Alpha" },
      "priority" : "Silver",
      "relationships" : [
        {
          "target" : { "sourceRef" : "Alpha" },

```

```
        "type" : "contains"  
      }  
    ]  
  }  
}
```

The request body contains the following four major components:

- **canUpdate** - This field specifies if the preexisting entities (such as resources and services) can be updated during the progressive import. If specified as true and if the reference of a preexisting resource or service matches the reference specified in the request body, that preexisting entity will be updated to reflect the new values specified in the request body. If specified as false, that preexisting entity will NOT be updated, and a skipped message is generated for the import results.
- **defaultSourceURI** - The uniform resource identifier (URI) must be valid and is used to abbreviate the references of the referred entities (for resources and services) in the request body. The resource and service references have two parts: **sourceURI** and **sourceRef**. If the **sourceURI** matches the **defaultSourceURI**, then the **sourceURI** can be omitted from the reference.
- **List of resources** - This list specifies all the resources that are to be imported or updated (if **canUpdate** is true). The resources must be uniquely identified by their references, which consist of a **sourceURI** and a **sourceRef**, as mentioned above. If there is a duplicate reference for a resource found in the database, the preexisting resource is updated if **canUpdate** is true. If **canUpdate** is false, the resource is skipped and reported as such in the response body. If the reference is not found in the database, a new resource is created. If the resource definition contains errors, it is reported as failed in the response body, along with a list of errors specifying what is wrong with the import. If a resource reference is specified multiple times in the resources section, the repeating references will be reported as failed, as they can neither be created nor updated (a maximum of only one update is allowed).
- **List of services** - This list specifies all the services that are to be imported or updated (if **canUpdate** is true). Just like resources, the services too must be uniquely identified by their references, which consist of a **sourceURI** and a **sourceRef**, as mentioned above. If the reference is not found in the database, a new service is created. If the service definition contains errors, it is reported as failed in the response, along with a list of errors specifying what is wrong with the import. If a service reference is specified multiple times in the services section, the repeating references will be reported as failed, as they can neither be created nor updated (a maximum of only one update is allowed).

Results

If you try the sample request (above) in the ITOC UI, you will get following result:

Import Results

Created Resources (1)

Source Ref	Source URI	ID
Alpha	https://ucmdb.hp.com	RES_000053

Created Services (1)

Source Ref	Source URI	ID
Service1Alpha	https://ucmdb.hp.com	SVC_00004 (revision 1)

If you try the same import a second time, the subsequent response changes to:

Import Results

Updated Resources (1)

Source Ref	Source URI	ID
Alpha	https://ucmdb.hp.com	RES_000053

Updated Services (1)

Source Ref	Source URI	ID
Service1Alpha	https://ucmdb.hp.com	SVC_00004 (revision 1)

The message for the subsequent import has changed to “Updated” because the first import created the resources and services, and the subsequent import could only update the definitions for the preexisting resources and services.

If you change the `canUpdate` value to false and retry the import, you will receive the following response:

Import Results

Skipped Resources (1)

Source Ref	Source URI	ID
Alpha	https://ucmdb.hp.com	RES_000053

Skipped Services (1)

Source Ref	Source URI	ID
Service1Alpha	https://ucmdb.hp.com	SVC_00004 (revision 0)

In general, for any import, the Results contains up to three sections (which may be applicable depending on the JSON request):

- **Errors** - This list shows the errors for the defaultSourceURI specification. Errors messages are as follows:

```
{ 1, "defaultSourceURI exceeds 255 characters" },  
{ 2, "Malformed defaultSourceURI" },  
{ 3, "A resource definition does not have a ref specified." },  
{ 4, "A service definition does not have a ref specified." }
```

- **Resources** - Resources are divided into the following categories. If the canUpdate field is false, the updated list will be empty.
 - Created
 - Skipped
 - Updated
 - Failed
- **Services** – Services too are divided into the same categories as Resources. If the canUpdate field is false, the updated list will be empty.
 - Created
 - Skipped
 - Updated
 - Failed

Failed Error Codes

If a service or resource import fails, one of the following messages can specify exactly what may have failed:

For Resources

```
{ 101, "'name' {0} exceeds 255 characters" },
{ 102, "'sourceURI' {0} exceeds 255 characters" },
{ 103, "'sourceURI' {0} is malformed" },
{ 104, "'sourceRef' {0} exceeds 255 characters" },
{ 105, "'type' {0} is invalid" },
{ 106, "attribute 'name' {0} exceeds 255 characters" },
{ 107, "attribute 'name' {0} is not valid for 'type' {1}" },
{ 108, "attribute 'value' {0} exceeds 4000 characters" },
{ 109, "attribute 'name' {0} is already specified" },
{ 110, "Missing mandatory attribute 'name' {0} for 'type' {1}" },
{ 111, "'accessThroughRef' {0} is invalid" },
{ 112, "Duplicate ref {0} in the request body, subsequent definitions are being ignored" },
{ 113, "A cyclic or incomplete chain of 'accessThroughRef' relationship was detected on adding or updating {0} which has an accessRef of {1}" },
{ 114, "An unexpected error was detected on adding or updating {0}, exception is {1}, trace is {2}" },
{ 115, "accessThroughRef 'sourceURI' {0} exceeds 255 characters" },
{ 116, "accessThroughRef 'sourceURI' {0} is malformed" },
{ 117, "accessThroughRef 'sourceRef' {0} exceeds 255 characters" },
{ 118, "The organization for resource {0} does not allow read access to this resource." },
{ 119, "The organization for resource {0} does not allow write access to this resource." },
{ 120, "One of the attributes for resource does not have a name." },
{ 121, "Resource name must be specified" },
{ 122, "'sourceRef' value is missing for the resource" },
{ 123, "'sourceRef' value is missing for the accessRef" },
{ 124, "'name' {0} preexists for a non obsolete resource" },
{ 125, "'name' {0} is defined multiple times for resources in the request body." }
```

For Services

```
{ 201, "'name' {0} exceeds 255 characters" },
{ 202, "'description' {0} exceeds 4000 characters" },
{ 203, "'sourceURI' {0} exceeds 255 characters" },
{ 204, "'sourceURI' {0} is malformed" },
{ 205, "'sourceRef' {0} exceeds 255 characters" },
{ 206, "'rootRef' {0} is invalid" },
{ 207, "Duplicate ref {0} in the request body, subsequent definitions are being ignored" },
{ 208, "'relationship' {0} is already defined" },
{ 209, "'source' {0} unreachable from the 'rootRef' {1}" },
{ 210, "'type' {0} invalid for relationship {1}" },
{ 211, "A cyclic 'relationship' was detected on adding {0}" },
{ 212, "'priority' {0} is invalid" },
{ 213, "relationship 'sourceURI' {0} exceeds 255 characters" },
{ 214, "relationship 'sourceURI' {0} is malformed" },
{ 215, "relationship 'sourceRef' {0} exceeds 255 characters" },
{ 216, "root 'sourceURI' {0} exceeds 255 characters" },
{ 217, "root 'sourceURI' {0} is malformed" },
```

```
{ 218, "root 'sourceRef' {0} exceeds 255 characters" },
{ 219, "'source' {0} is invalid" },
{ 220, "'target' {0} is invalid" },
{ 221, "'target' {0} is same as 'root' {1} in relationship {2}" },
{ 222, "An unexpected error was detected on adding or updating {0}, exception is {1}, trace is {2}" },
{ 223, "'source' and 'target' can not be same in relation {0}" },
{ 224, "'name' {0} preexists for a non obsolete service" },
{ 225, "The organization for service {0} does not allow read access to this service." },
{ 226, "The organization for service {0} does not allow write access to this service." },
{ 227, "The organization for resource {0} does not allow read access to this resource." },
{ 228, "A relationship {0} can not have a null target" },
{ 229, "An unexpected error was detected on processing organization for resource {0}, exception is {1}, trace is {2}" },
{ 230, "Service name must be specified" },
{ 231, "'sourceRef' value is missing for the service relation's constituent ref" },
{ 232, "'sourceRef' value is missing for the rootRef" },
{ 233, "'sourceRef' value is missing for the service" },
{ 234, "'name' {0} is defined multiple times for services in the request body. " }
```

Users can fix the errors and then try reimporting.

JSON Example

The following example will import a list of resources, along with a list of services based on those resources.

```
{
  "canUpdate" : true,
  "defaultSourceURI" : "https://ucmdb.hp.com",

  "resources" : [
    {
      "type": "SLES 11",
      "name": "Alpha",
      "ref" : { "sourceRef": "Alpha" },
      "attributes" : [ { "name" : "Hostname", "value" : "Alpha.qa.itoc.com" } ]
    },
    {
      "type": "RHEL 6",
      "name": "Beta",
      "ref" : { "sourceURI" : "https://csa.hp.com", "sourceRef": "Beta" },
      "attributes" : [ { "name" : "Hostname", "value": "Beta.qa.itoc.com" } ]
    },
    {
      "type": "RHEL 6",
      "name": "Gama",
      "ref" : { "sourceURI" : "https://csa2.hp.com", "sourceRef": "Gama" },
      "attributes" : [ { "name" : "Hostname", "value": "Gama.qa.itoc.com" } ],
      "accessThroughRef" : { "sourceRef": "Alpha" }
    },
    {
      "type": "RHEL 6",
      "name": "Delta",
      "ref" : { "sourceRef": "Delta" },
      "attributes" : [ { "name" : "Hostname", "value": "Delta.qa.itoc.com" } ],
      "accessThroughRef" : { "sourceRef": "Psi" }
    }
  ]
}
```

```
    },
    {
      "type": "RHEL 6",
      "name": "Charlie",
      "ref": { "sourceRef": "Charlie" },
      "attributes": [ { "name": "Hostname", "value": "Charlie.qa.itoc.com" } ],
      "accessThroughRef": { "sourceRef": "Bravo" }
    },
    {
      "type": "RHEL 6",
      "name": "Bravo",
      "ref": { "sourceRef": "Bravo" },
      "attributes": [ { "name": "Hostname", "value": "Bravo.qa.itoc.com" } ],
      "accessThroughRef": { "sourceURI": "https://csa.hp.com", "sourceRef": "Beta" }
    }
  ],
  "services": [
    {
      "name": "ServiceAlpha",
      "ref": { "sourceURI": "https://ucmdb.hp.com", "sourceRef": "ServiceAlpha" },
      "relationships": [
        {
          "source": { "sourceRef": "Alpha" },
          "target": { "sourceRef": "Beta" },
          "type": "contains"
        }
      ]
    },
    {
      "name": "ServiceAlpha",
      "ref": { "sourceURI": "https://ucmdb.hp.com", "sourceRef": "ServiceAlpha" },
      "priority": "Silver",
      "relationships": [
        {
          "source": { "sourceRef": "Alpha" },
          "target": { "sourceURI": "https://csa.hp.com", "sourceRef": "Beta" },
          "type": "contains"
        }
      ]
    },
    {
      "name": "ServiceQ",
      "ref": { "sourceURI": "https://ucmdb.hp.com", "sourceRef": "ServiceQ" },
      "priority": "Silver",
      "relationships": [
        {
          "source": { "sourceRef": "Alpha" },
          "target": { "sourceURI": "https://csa.hp.com", "sourceRef": "Beta" },
          "type": "contains"
        }
      ]
    },
    {
      "name": "ServiceR",
      "ref": { "sourceURI": "https://ucmdb.hp.com", "sourceRef": "ServiceR" },
      "priority": "Silver",
      "relationships": [
        {
```

```

    "source" : { "sourceRef" : "Alpha" },
    "target" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },
    "type" : "contains"
  },
  {
    "source" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },
    "target" : { "sourceURI" : "https://csa2.hp.com", "sourceRef" : "Gama" },
    "type" : "contains"
  },
  {
    "source" : { "sourceURI" : "https://csa2.hp.com", "sourceRef" : "Gama" },
    "target" : { "sourceRef" : "Delta" },
    "type" : "contains"
  }
]
}
]
```

- Because the Alpha resource has already been imported, that resource is updated. The rest of the resources are created or have failed (if there were any errors in their definitions).
- Similarly, services are either created or listed as failed (if there were any errors in their definitions).
- Because none of the listed services were created previously, there is no updated section for the services.

The following example shows results for this test case:

Import Results		
Created Resources (4)		
Source Ref	Source URI	ID
Beta	https://csa.hp.com	RES_000054
Gama	https://csa2.hp.com	RES_000055
Bravo	https://ucmdb.hp.com	RES_000056
Charlie	https://ucmdb.hp.com	RES_000057
Updated Resources (1)		
Source Ref	Source URI	ID
Alpha	https://ucmdb.hp.com	RES_000053
Failed Resources (1)		
Source Ref	Source URI	Errors
Delta	https://ucmdb.hp.com	111: accessThroughRef (sourceURI: https://ucmdb.hp.com, sourceRef: Psi) is invalid
Created Services (1)		
Source Ref	Source URI	ID
ServiceQ	https://ucmdb.hp.com	SVC_00005 (revision 1)
Failed Services (3)		
Source Ref	Source URI	Errors
ServiceAlpha	https://ucmdb.hp.com	207: Duplicate ref (sourceURI: https://ucmdb.hp.com, sourceRef: ServiceAlpha) in the request body, subsequent definitions are being ignored
ServiceAlpha	https://ucmdb.hp.com	212: priority null is invalid 220: target (sourceURI: https://ucmdb.hp.com, sourceRef: Beta) is invalid
ServiceR	https://ucmdb.hp.com	220: target (sourceURI: https://ucmdb.hp.com, sourceRef: Delta) is invalid

JSON Attributes for Resources

The following JSON attributes describe the resources in input JSON:

- **type:** this is the `resourceType` of the resource being imported. See [Specify Attributes for Resources Being Imported](#) for a complete list of resource types and applicable resource attributes that can be specified. Note that resource attribute types are different from the JSON attributes described here.
- **name:** A unique name qualifying the resource. This name is visible in the UI. The name must be unique across all the organizations in which the resource is visible.
- **ref:** A unique URI/string pair to identify the resource globally throughout the ITOC. Unlike `name`, the `ref` must be unique across all organizations irrespective of the service being visible or invisible for a given organization.
- **accessThroughRef:** Some of the resources do not have corresponding applicable hardware. They must rely on some other resource to be accessed through. `accessThroughRef` specifies the `ref` of the resource through which the specified resource is accessed. If this field is not specified, the `accessThrough` resource of a given resource is assumed to be itself.
- **attributes:** A name, value pair listing the applicable attributes of the resource (see [Specify Attributes for Resources Being Imported](#)).

Specify Attributes for Resources Being Imported

This section describes how to specify attribute names for resources.

Each resource has a resource type, and each resource type has a set of predefined attributes. The attribute and its value must be specified while defining the resource in the JSON script. An error occurs if an applicable attribute for a resource type is not specified.

The following list shows attributes for each resource type. This list is organized in hierarchical form. All parent attributes are apply to their children. For example, `Device` has `Vendor` attributes, therefore, all its children also have `Vendor` attributes.

```
{
  "resourcetypes":
  [
    { "name": "Business Service"
    },
    { "name": "Device",
      "attributes": "Vendor",
      "children":
      [
        { "name": "Compute",
          "attributes": "BiosUUID",
          "children":
          [
            { "name": "Server" }
          ]
        },
      ]
    },
    { "name": "Platform"
      "attributes": "Hostname",
```

```
"children":
[
  {"name":"Microsoft (MS) Windows",
   "children":
   [
     {"name":"MS Windows 7"},
     {"name":"MS Windows 8"},
     {"name":"MS Windows 8.1"},
     {"name":"MS Windows Server 2008 R2"},
     {"name":"MS Windows Server 2012"},
     {"name":"MS Windows Server 2012 R2"}
   ]
  },
  {"name":"Unix",
   "children":
   [
     {"name":"Linux",
      "children":
      [
        {"name":"RHEL Compatibles"
         "children":
         [
           {"name":"RHEL 5 Compatibles",
            "children":
            [
              {"name":"CentOS 5"},
              {"name":"OEL 5"},
              {"name":"RHEL 5"}
            ]
           },
           {"name":"RHEL 6 Compatibles",
            "children":
            [
              {"name":"CentOS 6"},
              {"name":"OEL 6"},
              {"name":"RHEL 6"}
            ]
           },
           {"name":"RHEL 7 Compatibles",
            "children":
            [
              {"name":"CentOS 7"},
              {"name":"OEL 7"},
              {"name":"RHEL 7"}
            ]
           }
         ]
        }
      ]
     },
     {"name":"SUSE Compatibles",
      "children":
      [
        {"name":"OpenSUSE",
         "children":
         [
           {"name":"OpenSUSE 12"},
           {"name":"OpenSUSE 13"}
         ]
        },
        {"name":"SUSE Linux Enterprise Server (SLES)",
```

```
        "children":
        [
            {"name": "SLES 10"},
            {"name": "SLES 11"}
        ]
    },
    { "name": "Ubuntu Compatibles",
      "children":
      [
          {"name": "Ubuntu",
            "children":
            [
                {"name": "Ubuntu 12.04 LTS"},
                {"name": "Ubuntu 14.04 LTS"}
            ]
          },
          {"name": "Debian",
            "children":
            [
                {"name": "Debian 7"}
            ]
          }
      ]
    }
  ],
  { "name": "Oracle Solaris",
    "children":
    [
        {"name": "Oracle Solaris 11"},
        {"name": "Oracle Solaris 11.1"}
    ]
  }
]
},
{ "name": "Software",
  "children":
  [
      {"name": "Web Server",
        "children":
        [
            {"name": "Apache HTTP Server",
              "attributes": "APACHE_PREFIX;DOCROOT;HTTPD_ROOT",
              "children":
              [
                  {"name": "Apache HTTP Server 2.4"}
              ]
            },
            {"name": "Apache Tomcat",
              "attributes": "CATALINA_HOME;CATALINA_BASE",
              "children":
              [
                  {"name": "Apache Tomcat 6"}
              ]
            }
          ]
      },
  ]
}
```



```
    {"name": "NGINX"}
  ],
  {"name": "Database",
   "children":
   [
     { "name": "DB2 Database Server",
       "attributes": "dbUser;dbName;dbPassword;DASUser;latestVersion(withFixPack)",
       "children":
       [
         {"name": "DB2 Database Server 8"},
         {"name": "DB2 Database Server 9"},
         {"name": "DB2 Database Server 9.5"},
         {"name": "DB2 Database Server 10.5"}
       ]
     },
     { "name": "MYSQL",
       "attributes": "dbUser;dbPassword;dbName",
       "children":
       [
         {"name": "MySQL Community Server 5.6"}
       ]
     },
     { "name": "MS SQL Server",
       "attributes": "dbUser;dbPassword;instanceName;latestVersion(withServicePack)",
       "children":
       [
         {"name": "MSSQL Server 2005"}
       ]
     },
     { "name": "Oracle",
       "attributes": "instanceName;instanceHome",
       "children":
       [
         {"name": "Oracle 10g"},
         {"name": "Oracle 11g"}
       ]
     },
   ],
  },
  {"name": "Application Server",
   "children":
   [
     {"name": "J2EE Server",
      "children":
      [
        {"name": "JBoss",
         "attributes": "JBoss_HOME",
         "children":
         [
           {"name": "JBoss Application Server 7"}
         ]
        },
        {"name": "WebLogic"},
        {"name": "Websphere"}
      ]
     },
   ]
  }
}
```

```
    ]  
  },  
]  
}
```

JSON Attributes for Services

- **name:** A unique name qualifying the service. This name is visible in the UI. The name must be unique across all the organizations in which the service is visible.
- **ref:** A unique URI/string pair to identify the service globally throughout the ITOC. Unlike **name**, the **ref** must be unique across all organizations irrespective of the service being visible or invisible for a given organization.
- **description:** A brief description of the service.
- **priority:** Can be one of the following three values: Gold, Silver, Bronze.
- **rootRef** and **relationships:** See [Specify Topologies for Services Being Imported](#).

Specify Topologies for Services Being Imported

This section describes how to specify topologies for services.

Every service that has a topology specified for it has a **relationships** field specified for it. This field uses the references specified for the predefined resources to populate the service topology. A **rootRef** can be explicitly specified or, if left unspecified, uses a built-in resource called **BUSINESS SERVICE** as the root.

The relationships create the edges in the topology graph. There are two types of relationships: **contains** and **depends_on**.

In the following example, a service is created with an explicit root specified to be a predefined resource

```
-  
{ "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" }. The relationships then  
specify an edge from this root reference to another resource - { "sourceRef" : "Alpha" }.  
  
{  
  "canUpdate" : true,  
  "defaultSourceURI" : "https://ucmdb.hp.com",  
  
  "services" : [  
    {  
      "name": "ServiceAlpha",  
      "ref" : { "sourceURI" : "https://ucmdb.hp.com", "sourceRef": "ServiceAlpha" },  
      "priority" : "Silver",  
      "rootRef" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },  
      "relationships" : [  
        {  
          "target" : { "sourceRef" : "Alpha" },
```

```
        "type" : "contains"
      }
    ]
  }
}
```

In the following example, `rootRef` is not specified, so the script uses the implicit root. All the three resources specified in the relationships (Alpha, Gama, and Charlie) will connect to this implicit root.

```
{
  "canUpdate" : true,
  "defaultSourceURI" : "https://ucmdb.hp.com",

  "services" : [
    {
      "name": "ServiceAlpha",
      "ref" : { "sourceURI" : "https://ucmdb.hp.com", "sourceRef": "ServiceAlpha" },
      "priority" : "Silver",
      "relationships" : [
        {
          "target" : { "sourceRef" : "Alpha" },
          "type" : "contains"
        },
        {
          "target" : { "sourceURI" : "https://csa2.hp.com", "sourceRef" : "Gama" },
          "type" : "contains"
        },
        {
          "target" : { "sourceRef" : "Charlie" },
          "type" : "contains"
        }
      ]
    }
  ]
}
```

The following example does not specify the root, so the implicit root is used. However, the relationships include the `source` attribute as well as the `target` attribute. The `source` is connected to the implicit root, and the `target` is then connected to the source.

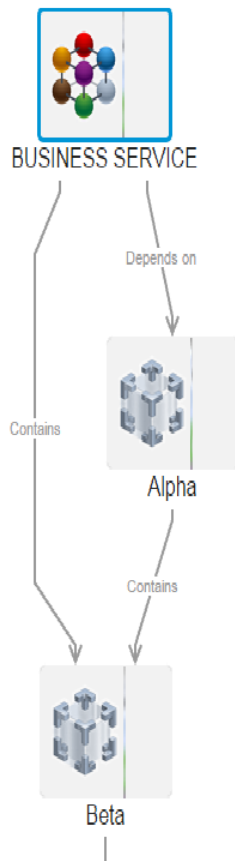
```
{
  "canUpdate" : true,
  "defaultSourceURI" : "https://ucmdb.hp.com",

  "services" : [
    {
      "name": "ServiceQ",
      "ref" : { "sourceURI" : "https://ucmdb.hp.com", "sourceRef": "ServiceQ" },
      "priority" : "Silver",
      "relationships" : [
        {
          "source" : { "sourceRef" : "Alpha" },
          "target" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },
          "type" : "contains"
        }
      ]
    }
  ]
}
```

In the following example, the implicit root resource connects to Alpha, which in turn connected to Beta. Because Beta is also specified as the source in the next relationship, it directly connects to the root.

```
{
  "canUpdate" : true,
  "defaultSourceURI" : "https://ucmdb.hp.com",
  "services" : [
    {
      "name": "ServiceR",
      "ref" : { "sourceURI" : "https://ucmdb.hp.com", "sourceRef": "ServiceR" },
      "priority" : "Silver",
      "relationships" : [
        {
          "source" : { "sourceRef" : "Alpha" },
          "target" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },
          "type" : "contains"
        },
        {
          "source" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },
          "target" : { "sourceURI" : "https://csa2.hp.com", "sourceRef" : "Gama" },
          "type" : "contains"
        },
        {
          "target" : { "sourceURI" : "https://csa.hp.com", "sourceRef" : "Beta" },
          "type" : "contains"
        }
      ]
    }
  ]
}
```

The following figure shows the visual representation of the hierarchy shown above:



Using the relationships (source, target) as well as `rootRef` (implicit or explicit root), it is possible to create arbitrary and complex hierarchies.

Some rules of thumb to remember are:

- Root can be specified implicitly or explicitly.
- If source is not specified in a relationship, `root` is assumed to be the source.
- It is an error to specify cyclic relationships.

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