

ITOps Board

User Guide

Release 2.9.2

Document Date: April 20, 2020

NOTICE

All rights reserved. No parts of this work may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems—without the written permission of the publisher.

Products that are referred to in this document may be either trademarks and/or registered trademarks of the respective owners. The publisher and the author make no claim to these trademarks.

While every precaution has been taken in the preparation of this document, the publisher and the author assume no responsibility for errors or omissions, or for damages resulting from the use of information contained in this document or from the use of programs and source code that may accompany it. In no event shall the publisher and the author be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly by this document.

© Copyright 2020, Martello Technologies Corporation. All rights reserved

User Guide
Release 2.9.2 - April 20, 2020

Contents

CHAPTER 1

Introduction	6
Document Purpose and Intended Audience	6
Revision History	6

CHAPTER 2

About ITOps Board	7
-------------------------	---

CHAPTER 3

About the Interface	8
Home	8
Computers	8
Computers Component Page	10
Alerts	10
Incidents	11
Groups and Services	12
Groups and Services Component Page	13
Components	14
Component Page	14
Search Bar	15
Saved Searches	15
Boards	16
Services Overview	16
Settings	16
Integrations	16
Roles	17
Agents	17
General Settings	17
Licensing	17
Storage	18

CHAPTER 4

Configuring Integrations	19
Add an Integration	19
Test an Integration	20
Download a Remote Agent	20

CHAPTER 5

Organizing Monitored Data	21
Perform a Search	22
Search Operators	22
Create a Board	23
Create Sub-Boards	24
Create a Synced Board	24
Create a Business Service	25
Configure SLO for a Business Service	26
Pin Objects to a Board or Business Service	27
Configure Rules	28
Configure Exclusions	29

CHAPTER 6

Configuring Views	30
Select the Data View	30
View Data in NOC Mode	31
Configure the Layout	31

CHAPTER 7

Managing Health and Performance Data	32
Change the State of a Board or Service	33
Place a Board or Business Service in Maintenance Mode	33
Share a Board or Business Service	35
Locate Critical Issues	35
Configure Automatic Notifications	36
View SLA Performance Data	37
Filter Boards	38
Search for Boards	38
Use the Board Explorer	38
Use the Groups and Services Explorer	39
Use the Components Explorer	40

CHAPTER 8

Managing Incidents and Reporting	42
--	----

Resolve an Alert	42
Configure SLA Reporting	42
CHAPTER 9	
Managing Users	44
Create a Role	45
Assign Users to Roles	45
Add Integrations to a Role	45
Add Boards or Business Services to a Role	45
Scope User Access	46
Add an Email Address for a User	46
Create a Consent Message	47
Configure Access to Saved Searches	47
CHAPTER 10	
Managing Licensing	48
Add a License Key	48
View License Information	48
CHAPTER 11	
Managing Storage	49
Configure Storage Options	49
View Storage	49



Introduction

Document Purpose and Intended Audience

This document provides information about how to use ITOps Board to analyze and manage data from multiple PRTG servers.

This guide is intended for use by administrators and operators.

Revision History

Document Date	Description
April 20, 2020	ITOps Board User Guide Release 2.9.2



About ITOps Board

ITOps Board is a powerful IT analytics solution that consolidates the information from multiple PRTG servers into a single system. It pulls alerts and health state information from your PRTG installations and unifies them in groups, known as boards. Consolidating the information from various systems allows you to quickly see the overall health status of a system.



About the Interface

The ITOps Board main menu allows you to manage boards, services, and administrative settings.

The following sections describe each of the menu options and the functionality they provide:

- ["Home" on page 8](#)
- ["Boards" on page 16](#)
- ["Services Overview" on page 16](#)
- ["Settings" on page 16](#)

Home

The Home page provides access to the following tabs, which allow you to view and search health information, as well as the raw properties that ITOps Board collects from the source systems.

- ["Computers" on page 8](#)
- ["Alerts" on page 10](#)
- ["Incidents" on page 11](#)
- ["Groups and Services" on page 12](#)
- ["Components" on page 14](#)
- ["Saved Searches" on page 15](#)

In addition, the Home page provides a Search bar that allows you to search the details or raw properties of each object, alert, and incident.

Computers

The Computers tab provides information about the properties of the computers that are monitored by your systems. ITOps Board and PRTG use different terminology. For consistency, ITOps Board normalizes the monitored objects into data types. On the Computers tab, the data types are:

- Computer







- Virtual machine

You can filter the computers and virtual machines using the following options:

- **Types**—Filter based on the type of object: computers or virtual machines.
- **Integration Types**— Filter based on the type of integration. Only PRTG Network Monitor appears in the list.
- **Integrations**—Filter based on the names of the integrations that you have configured.
- **State**—Filter based on the health status of the object.

When you select a single computer or virtual machine, the properties panel displays. You can use the Ctrl and Shift keys to select multiple objects on this tab if you want to perform the same action for multiple objects. For example, you can pin multiple objects to a board or service.

The following functions are available when you select a computer or virtual machine:

Button	Function	Description
	Raw properties	Use the toggle to view raw properties from the original monitoring system.
	More Details	This button opens a page with all the details about the selected computer, including relationships with other objects, alerts, and incidents. See the section below for more information.
	Source	This button opens a new browser tab and navigates to the selected object in the console of the integrated source system.
	Action	This button provides access to the following options:
	Pin	This button pins the object to a new or existing board.
	Service	This button pins the object to a service.



Note: PRTG identifies objects as devices, which may be computers. ITOps Board shows objects that may be considered computers on this tab; however, if a computer does not display on this tab, it may be due to the way that PRTG has identified it. If you are unable to find a computer on this tab, you can find it in the Components tab, which contains all objects.

Computers Component Page

When you click the More Details button, the Component page displays. It contains the following tabs:

- **Properties**—View the raw properties from the original monitoring system.
- **Alerts**—View alerts related to the selected computer or virtual machine.
- **Incidents**—View incidents related to the selected computer or virtual machine.
- **Boards**—View boards that the computer or virtual machine is a member of.
- **Services**—View services that the computer or virtual machine is a member of.

Alerts



The Alerts tab displays all of the alerts from the different monitoring systems. The most recent alerts are shown at the top of the tab by default, but you can change the sort order.








You can filter alerts using the following options:

- **Integration Types**—Filter based on the type of integration. Only PRTG Network Monitor appears in the list.
- **Integrations**—Filter based on the names of the integrations that you have configured.
- **Severity**—Filter based on the severity of the alert.
- **Active**—Show active alerts only.
- **Time**—Filter based on the length of time since the alert was raised or updated.

You can use the Ctrl and Shift keys to select multiple alerts on this tab. When you select a single alert, the properties panel displays.

The following functions are available when you select an alert:

Button	Function	Description
	Details	Use the toggle to display messages related to the Alert.
	Editable Fields	This toggle displays for SCOM integrations. Use it to view editable fields in SCOM.

Button	Function	Description
	Raw Properties	Use the toggle to view details from the original monitoring system.
	Related Components	This button opens a new page that lists details about components in ITOps Board that are related to this alert.
	Source	This button opens a new browser tab and navigates to the selected object in the console of the integrated source system.
	Alert Count and Actions	This button shows the number of alerts selected, and provides access to the following options:
	Resolve	Resolve the alert.
	Link an Incident	Link the alert to an existing incident.
	Create an Incident	Link the alert to a new incident.

Incidents






The Incidents tab displays incidents that ITOps Board has captured from your integrated systems.

You can filter incidents using the following options:

- **Integration Types**—Filter based on the type of integration. Only PRTG Network Monitor appears in the list.
- **Integrations**—Filter based on the names of the integrations that you have configured.
- **Active**—Show active incidents only.
- **Created by ITOps Board**—Show only those incidents created by ITOps Board.
- **Time**—Filter based on the length of time since the alert was raised or updated.

You can use the Ctrl and Shift keys to select multiple incidents on this tab. When you select a single incident, the properties panel displays.

The following functions are available when you select an incident:

Button	Function	Description
	Details	Use the toggle to view details about the incident, such as a description of the problem and who the incident is assigned to for resolution.
	Raw Properties	Use the toggle to view additional details collected from the source system.
	More Details	Use the button to view the incident page with raw properties and related alerts.
	Related Components	This button opens a new page that lists details about components in ITOps Board that are related to this incident.
	Source	This button opens a new browser tab and navigates to the selected object in the console of the integrated source system.

Groups and Services


The Groups & Services tab displays all groups and services from your monitoring systems. This tab allows you to view the group health as well as the health of the objects within the group.







You can filter groups and services using the following options:

- **Types**—Filter based on the type of object: groups or services.
- **Integration Types**— Filter based on the type of integration. Only PRTG Network Monitor appears in the list.
- **Integrations**—Filter based on the names of the integrations that you have configured.
- **State**—Filter based on the health status of the object.

You can use the Ctrl and Shift keys to select multiple objects on this tab. When you select a single group or service, the properties panel displays.

The following functions are available when you select an object:

Button	Function	Description
	Raw properties	Use the toggle to view raw properties from the original monitoring system.

Button	Function	Description
	More Details	This button opens the Component page, which provides details about the object, as well as several additional tabs. See the section below for more information.
	Action	This button provides access to the following options:
	Import a Live Maps Service	Import a Live Maps service from Microsoft System Center Operations Manager (SCOM).
	Create a Synced Board	A synched board displays the members of the group as they are configured in the source system. When members are added or removed in the source system, those changes are reflected on the board in ITOps Board. The health state of the board is the same as the health state of the original group in the source system.
	Pin	This button pins the object to a new or existing board.
	Service	This button pins the object to a service.

Groups and Services Component Page

When you click the More Details button, the Component page displays. It contains the following tabs:

- **Properties**—View the raw properties from the original monitoring system.
- **Members**—View members of the group or service. You can click the name of the member to view more information about that object.
- **Explorer**—View a topology diagram that shows components and relationships. You can use the diagram to explore the group or service to see the hierarchy of objects. For more information about using the Explorer, see ["Use the Groups and Services Explorer" on page 39](#).
- **Alerts**—View alerts related to the selected group or service.
- **Incidents**—View incidents related to the selected group or service.
- **Boards**—View boards that the group or service is a member of.
- **Services**—View services that the group or service is a member of.

Components






The Components tab displays all monitored components.

You can filter the components using the following options:

- **Types**—Filter based on the type of object. Each monitoring system uses its own terminology. For consistency, ITOps Board normalizes the monitored components into types, such as computers, websites, databases, and more. You can filter the components on this tab based on any of the available types.
- **Integration Types**—Filter based on the type of integration. Only PRTG Network Monitor appears in the list.
- **Integrations**—Filter based on the names of the integrations that you have configured.
- **State**—Filter based on the health status of the component.

You can use the Ctrl and Shift keys to select multiple components on this tab. When you select a single component, the properties panel displays.

The following functions are available when you select a component:

Button	Function	Description
	Raw properties	Use the toggle to view raw properties from the original monitoring system.
	More Details	This button opens a page with all the details about the component, including relationships with other objects, alerts, and incidents. See the section below for more information.
	Action	This button provides access to the following options:
	Pin	This button pins the object to a new or existing board.
	Service	This button pins the object to a service.

Component Page

When you click the More Details button, the Component page displays. It contains the following tabs:

- **Properties**—View the raw properties from the original monitoring system.
- **Alerts**—View alerts related to the selected component.
- **Explorer**—View a topology diagram that shows components and relationships. You can use the diagram to explore the group or service to see the hierarchy of

objects. For more information about using the Explorer, see ["Use the Components Explorer" on page 40](#).

- **Incidents**—View incidents related to the selected component.
- **Boards**—View boards that the component is a member of.
- **Services**—View services that the component is a member of.

Search Bar

The Search bar allows you to search the details or raw properties of each object, alert, and incident in Elasticsearch. When you use the Search bar, it returns results for each of the tabs on the page. As long as the search term remains in the Search bar, the tabs continue to display information based on that search term. ITOps Board highlights areas that match the search in yellow. If a search result is returned but not highlighted, that typically indicates that the searched item was found in the details or raw properties.

Unless you use a wild card, the search looks for the exact words that you enter. For example, searching SQL will not return SQLSVR01. For information about using search strings, see ["Search Operators" on page 22](#)

On the right side of the Search bar, there are three options:

- **Save**—Save a search.
- **Load**—Load a saved search.
- **X**—Clear the search.

Saved Searches

The Saved Searches tab allows you to customize searches and save your preferences. You can set filters for the search and select the tab where you want the results to display.

The Saved Searches tab includes several pre-defined searches:

- Contains 'SQL'
- Critical Alerts in Last 24h
- Critical Computers
- Critical Databases
- Critical Websites
- Exceptions and Errors
- Incidents Created in Last 24h

The saved search displays the number of objects, alerts, incidents or components that match your search criteria. You can click the information on the saved search to go directly to the data tab for that item.

Boards

Boards are a way to group objects from one or more monitoring systems. You can also create boards nested within boards. This allows you to model your IT environment in the way that best fits your needs. For example, you can create boards for locations, applications, or business units, and then divide these boards into sub-boards.

Services Overview

Use this page to add and monitor critical business services, such as your company's email, a licensing system, or a software build process. The page displays information about how the service impacts the following aspects of your business:

- End-User
- Application
- Infrastructure
- Supplier Services (other services that impact the current service)

For each business service that you configure, you can set service level objectives (SLO). The Services Overview page displays the percentage of availability over the period of time that you define in the SLO settings for the business service. An icon at the end of each row provides access to the following menu items:

- Details—View configuration details for the business service.
- Supplier Services—View or select supplier services that relate to the selected business service.
- Configure SLO Settings—Set the SLA goal, and the time period and business hours to use in SLA calculations.
- Remove—Delete the business service.

Settings

The Settings option on the main menu is available to ITOps Board administrators only.

The Settings page contains the following tabs:

- ["Integrations" on page 16](#)
- ["Roles" on page 17](#)
- ["Agents" on page 17](#)
- ["General Settings" on page 17](#)
- ["Licensing" on page 17](#)
- ["Storage" on page 18](#)

Integrations

ITOps Board can connect to multiple PRTG servers. You can connect to one or more of these systems on the Integrations tab. You can find PRTG servers in the data systems category.

Roles

Roles are used to control the access that a user has to boards, integrations, and business services. Users added to the Administrators role are considered ITOps Board administrators and have automatic access to all data, as well as application settings. The user who installed ITOps Board is added to the administrator's role by default.

You can add any user or group from Active Directory to a ITOps Board role.

Agents

There is always one active agent, which is called the local agent. For complex implementations of ITOps Board, you may require multiple remote agents to overcome network boundaries. For example, if you want to use a monitoring system installed on-premises and ITOps Board is running in Amazon Web Services, you can use the remote agent to communicate with ITOps Board in the cloud without any open inbound ports on-premises.

Use the Agents tab to download additional agents.

General Settings

Use this tab to configure the following options:

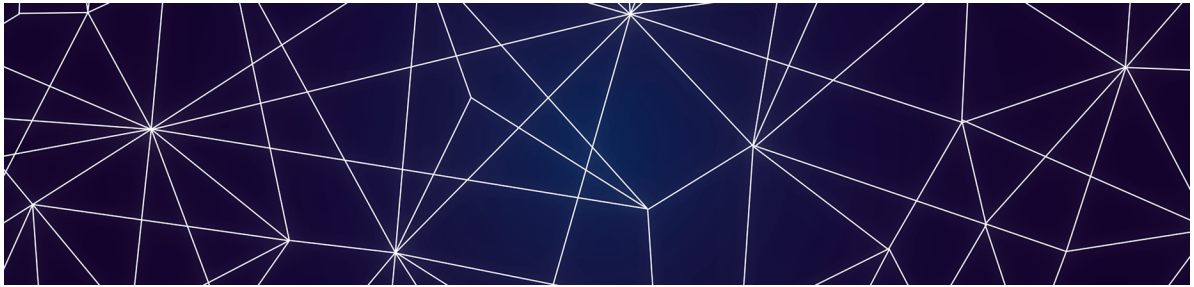
- **Scope Components By Boards and Services**—When a user accesses a board or service, the board or service may contain components from an integration that the user does not have permission to access. Administrators can configure whether users can view details about all components on a board, regardless of the source, or administrators can choose to limit the user to viewing data from specific integrations.
- **Saved Searches Visibility**—Administrators can control who can see and use saved searches. Use the toggle on this page to choose one of the following options:
 - Admin only
 - Everyone
- **Downtime**—Administrators can define which states are considered as downtime for the board SLA calculations.
- **Consent Messages**—Administrators can create messages that display in a banner at the bottom of the page. Users must accept the message to remove the banner. Administrators can multiple messages and can configure them to display for specific user roles.

Licensing

Use this tab to view and update licenses.

Storage

Use this tab to control the number of days that ITOps Board retains data from its integrated source systems.



Configuring Integrations

Use the information in this section to complete the following tasks:

Task	Description
"Add an Integration" on page 19	Integrate your monitoring systems with ITOps Board.
"Test an Integration" on page 20	Ensure that monitoring systems are communicating successfully with ITOps Board.
"Download a Remote Agent" on page 20	Optional. ITOps Board has a default remote agent; however, complex integrations may require additional remote agents.

Add an Integration

You must be a ITOps Board administrator to perform this procedure. The user permissions in the source system are also important, because those permissions determine the access that ITOps Board has to the source system. If the user in the source system does not have sufficient permissions, some data may not be visible in ITOps Board and some functionality—such as the ability to close an alert—may not work.

Before you Begin

Ensure that you have information about how to access the monitoring system. For a complete list of the information needed, see the *ITOps Board Installation Guide*.

1. From the main menu, select **Settings**.
The Integrations tab displays the currently installed integrations.
2. Click the **Add** button at the bottom of the page.
3. Select a monitoring system from the dialog box.
4. Enter the information required for the monitoring system.
5. Enter the following information:
 - **Discovery Interval**—The interval for collecting components and relationships. The default value is 3600 seconds.

- **Operation Interval**—The interval for collecting alerts, incidents, and component health states. The default value is 120 seconds.

6. Click **Save**.

Test an Integration

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.
The Integrations tab displays the currently installed integrations.
2. Select an integration and click the **Test Integration** button.
A banner displays at the top of the screen to indicate the status.

Download a Remote Agent

A remote agent is needed when it is not possible to connect to the source system from the ITOps Board web server due to network boundaries. For example, you may need a remote agent because of firewall restrictions or because you authenticate users against a remote Active Directory.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.
2. Click the **Agents** tab.
3. Click the **Download Agent** button.
A dialog box displays.
4. Click **Save** to download the AgentInstaller.zip file.
5. Unzip the file on the Windows server where you want to install the remote agent and execute the command file.
The command file installs the remote agent using the correct ITOps Board web server settings and registers with ITOps Board automatically.



Organizing Monitored Data

Use the information in this section to complete the following tasks:

Task	Description
"Perform a Search" on page 22	Search for objects, alerts, or incidents, and save your searches.
"Create a Board" on page 23	Create boards when you want to group data from one or more monitoring systems.
"Create Sub-Boards" on page 24	Optional. Create sub-boards when you want to add child boards to a parent board.
"Create a Synced Board" on page 24	Optional. Create a board that is synced with the source system. The members of the board and the health state are determined by the source system and are not configurable in ITops Board.
"Create a Business Service" on page 25	Optional. Create business services when you want to monitor critical services, such as email or order entry, according to the following categories: end user, application, infrastructure, or supplier services.
"Configure SLO for a Business Service" on page 26	Optional. For each business service that you configure, you can set service level objectives (SLO). You can set the SLA goal, as well as the time period and business hours to use in SLA calculations. If you do not want to set SLOs for each business service, you can use the default settings provided by ITops Board.
"Pin Objects to a Board or Business Service" on page 27	Add components to an existing board or business service.

Task	Description
"Configure Rules" on page 28	Optional. Use rules to dynamically add objects to a board or business service.
"Configure Exclusions" on page 29	Optional. Use exclusions in conjunction with rules to refine the scope of objects that are dynamically added to a board or business service.

Perform a Search

The Search bar allows you to search the details or raw properties of each component, alert, and incident. When you enter a search term, ITOps Board returns results on all tabs, not only on the currently selected tab. If you have any filters enabled on the tabs, the search results are filtered as well. As long as the search term remains in the Search bar, the tabs continue to display information based on that search term.

ITOps Board highlights areas that match the search in yellow. If a search result is returned but no data is highlighted in the main window, that typically indicates that the searched item was found in the details or raw properties. You can view the raw data by selecting the component and clicking the **More Details** button.

Before you Begin

- Click **X** to clear any existing searches.
 - Review ["Search Operators" on page 22](#)
1. From the main menu, select **Home**.
 2. Choose one of the following options:
 - Enter a search term in the **Search** bar and press **Enter** to begin the search.
 - Click **Load** and select a **Saved Search** from the list.
 3. If you entered a search term:
 - Click **Save** if you use this search term frequently.
 - Click **X** to clear the search.

Search Operators

You can use any of the following terms to include or exclude results from your search:

- AND
- NOT
- OR
- TO

ITOps Board performs a text search. Some characters are reserved. You cannot search for the following characters unless they are in quotes as part of a search:

+ - = && | | > < ! () { } [] ^ " ~ * ? : \ /

Searches are not case-sensitive, unless you are searching on field name. For example, you may want to search on alerts where the Priority field is set to High. In the case of field names, you must use the proper case and formatting to target a field. You can verify the proper name and case of a field by hovering your mouse over the field name. If the field name has a space in it, such as "IP Address," you must enter an escape character (\) in the search to represent the space.

Because the field names are related to the source system, you need to specify the integration type in your search. The format is:

```
source.<integration>. <field name>: <search term>
```

Create a Board

Boards are a way of organizing groups of objects from one or more monitoring systems. Use the following procedures to create a new board.

There are two ways to create boards. Choose one of the following options:

- ["Create a New Board" on page 23](#) and then search for objects and pin them at a later time.
- Search for an object and ["Create a Board from Search Results" on page 24](#).



Tip:

When you create a board, ITOps Board creates a URL for it. The URL is based on how you are connected to ITOps Board at the time that you create the board. For example, if you connect to ITOps Board through localhost, the URL is based on the localhost address. We recommend that when you create a new board, you access ITOps Board in the same way that all users access typically the application. This practice ensures that the URL of the board is accessible to other users when it is shared. For example, if you configure automatic notifications, the board URL is included in the message sent to recipients.

Create a New Board

1. From the main menu, select **Boards**.
2. Click the **Add** icon at the bottom right corner.
3. Enter a name for the board.
4. Choose the way that you want the health status reported for the board:
 - Worst-case
 - Best-case
 - Percentage-based
If you chose percentage-based, enter a percentage.

5. Click **Create**.

Create a Board from Search Results


1. Click the main menu and select **Home**.
2. Select a saved search or search for an object and select it on the related tab.
3. Click the **Action** button and then click the **Pin** button.
4. In the dialog box, click **Create a Board**.
5. Enter a name for the board.
6. Choose the way that you want the health status reported for the board:
 - Worst-case
 - Best-case
 - Percentage-based
If you chose percentage-based, enter a percentage.
7. Click **Create**.

Create Sub-Boards

1. From the main menu, select **Boards**.
2. Find the board that you want to assign as sub-board and click the icon in the top corner.
3. Click **Actions** and select **Pin**.
4. Select a board from the list. If needed, use the **Filter** field to search for a board.

Create a Synced Board

Create a board that is synced with the source system. The members of the board and the health state are determined by the source system and are not configurable in ITOps Board. If members are added or deleted in the source system, or if the health state changes in the source system, the board in ITOps Board automatically updates.

1. Click the main menu and select **Home**.
2. Select a saved search or search for an object and select it on the **Groups & Services** tab.
3. Click the **Action** button and then click the button to create a synced board. A dialog box prompts you to confirm that you want to create a board from the selected group.
4. Click **OK**.
5. Optional. To view the source system, click .



Tip: To create multiple synced boards at once, use the Ctrl or Shift keys when you select groups or services. ITOps Board creates one synced board for each group or service that you selected.

Create a Business Service

Business services are a way of organizing data about critical business services from one or more monitoring systems. Business services allow you to view information about critical business services, such as email or order entry, according to the following categories: end user, application, infrastructure, or supplier services.

Use the following procedures to create a new business service.

There are two ways to create business services. Choose one of the following options:

- ["Create a New Business Service" on page 25](#) and then search for objects and pin them at a later time.
- Search for an object and ["Create a Business Service from Search Results" on page 26](#).



Tip:

When you create a business service, ITOps Board creates a URL for it. The URL is based on how you are connected to ITOps Board at the time that you create the business service. For example, if you connect to ITOps Board through localhost, the URL is based on the localhost address. We recommend that when you create a new business service, you access ITOps Board in the same way that all users access typically the application. This practice ensures that the URL of the business service is accessible to other users when it is shared. For example, if you configure automatic notifications, the business service URL is included in the message sent to recipients.

Create a New Business Service

1. From the main menu, select **Services Overview**.
2. Click the **Add** button.
3. Enter a name and description for the business service.
4. Choose the perspective that you want to use to calculate the health status for the business service:
 - End user
 - Application

- Infrastructure

The health status is reported based on a worst-state basis for the perspective.

5. Click **Create**.

Create a Business Service from Search Results

1. Click the main menu and select **Home**.
2. Select a saved search or search for an object and select it on the related tab.
3. Click the **Action** button and then click the **Pin to Service** button.
4. In the dialog box, select the **Create a Service** tab.
5. Select a perspective for the object: End User, Application, or Infrastructure.
6. Enter a name and description for the business service.
7. Choose the perspective that you want to use to calculate the health status for the business service:
 - End user
 - Application
 - Infrastructure

The health status is reported based on a worst-state basis for the perspective.
8. Click **Create**.



Tip: You can edit the name, description, and health roll-up setting for a business service from the **Services Overview** page. Click the icon at the end of the entry for the business service and select **Details**.

Configure SLO for a Business Service

Set service level objectives (SLO) for each business service that you configure. This procedure explains how to set the SLA goal, as well as the time period and business hours to use in SLA calculations. To configure the health states that you want to include in downtime calculations, see ["Configure SLA Reporting" on page 42](#).

If you do not want to set the SLO for each business service, you can use the default settings provided by ITOps Board. The default settings are as followings:

- The SLA goal is 99%.
- The week begins on the first day of the week configured for your server, which varies according to your location. For example, in some countries, the first day of the week is Monday, while in other countries it is Sunday.
- The time zone is based on the local time of the web server.
- The time period for the calculation is one month.
- Business hours are days are disabled; available is calculated over a 24-hour period, 7 days a week.

If you edit the SLO settings after you initially configure them, or change the components included in the business service, the SLA calculations are updated for the time period since the change was made. Calculations are not made retroactively.

1. From the main menu, select **Services Overview**.
2. Select a business service.
The business service opens.
3. Click the **Action** button and then click the **Configure SLO Settings** button.
4. Enter the following information in the dialog box:
 - **Set an SLA Goal**—Enter the percentage of availability that the service requires. You can enter a percentage with up to three decimal places.
 - **Set a time period**—Select whether you want the SLA calculated over a day, a week, or a month.
 - **Set a time zone**—Select the time zone to use for calculations.
 - **Toggle**—Use the toggle to control whether any downtime that occurs in a 24-hour period impacts your SLA calculations, or whether only downtime that occurs during business hours is used in your SLA calculations. If you choose to use business hours only, define the hours and days.
5. Click **Save**.



Tip: You can also set the service level objectives without opening the business service. From the **Services Overview** page, click the icon at the end of the entry for the business service and select **Configure SLO Settings**.

Pin Objects to a Board or Business Service

Use this procedure to add objects to an existing board or business service.

1. Click the main menu and select **Home**.
2. Search for an object. When the results display, select one of the following tabs: **Computers**, **Groups & Services**, or **Components**.
3. Select an object in the list. If needed, filter the list using the options on the left side of the page.
4. Click the **Action** button and choose one of the following options:
 - To pin the object to a board, click the **Pin** button and select a board from the list.
 - To pin the object to a business service, click the **Service** button and select a business service from the list. Choose a perspective and click **Pin It**.



Tip: You can add a supplier service to a business service without



performing a search. Choose one of the following options:

- From the main menu, select **Services Overview**. Click the icon at the end of the entry for the business service and select **Supplier Services**. In the dialog box, select the supplier services that relate to the selected business service.
- From the **Services Overview** page, open the business service and click the **Action** button. Click **Edit Supplier Services** and select the supplier services that relate to the selected business service.

Configure Rules

Use this procedure to dynamically add objects to a board or business service using rules. You can use any saved search as a rule.

There are two ways to create a rule. Choose one of the following options:

- ["Create a New Rule" on page 28](#)
- ["Create a Rule from an Existing Saved Search" on page 29](#)

Create a New Rule

1. From the main menu, select **Home**.
2. Enter a search term in the **Search bar** and press Enter to begin the search.
3. Filter the search results if necessary.
4. Click **Save** and enter the following information in the dialog box:
 - Name your search.
 - Select the target tab for the object: Computers, Groups & Services, or Components.
5. Click **Save & Add Rule**.
6. Choose one of the following options:
 - To apply this rule to a board, select **Add Rule to Board** and select a board from the list.
 - To apply this rule to a business service, select **Add Rule to Service** and select a service from the list, then choose a perspective.
7. Click **Pin It**.

A status message indicates that the rule has been added. Click the link to navigate to the board or service.

Create a Rule from an Existing Saved Search

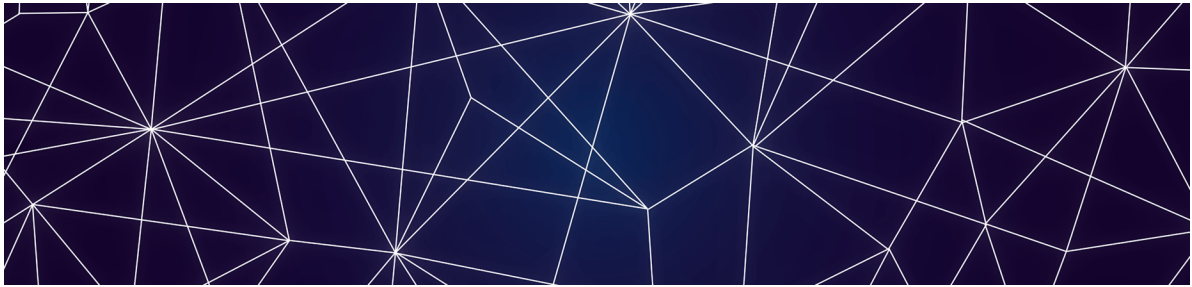
1. From the main menu, select **Home**.
2. Select the **Saved Searches** tab and select a saved search.
3. Click the icon in the top corner of the search and select one of the following options:
 - Click **Add Rule to Service** and select a service from the list. Choose a perspective and click **Pin It**.
 - Click **Add Rule to Board** and select a board from the list.

A status message indicates that the rule has been added. Click the link to navigate to the board or service.

Configure Exclusions

You can configure exclusions after you add a rule to a board or business service. Exclusions are a way of refining rules.

1. Review the board or the perspective in a business service where you added a rule. If the search results included an object that you do not want, click the icon in the upper corner of the object and click **Remove**.
2. Click **OK** to confirm the removal.
The object is moved to the Exclusions tab.
3. Optional. If you want to reinstate the object, click the **Exclusions** tab.
4. Click the **Action** button and click **Remove Exclusion**.
5. Click **OK** to confirm the change.



Configuring Views

Use the information in this section to complete the following tasks:

Task	Description
"Select the Data View" on page 30	Select how you want to view boards.
"View Data in NOC Mode" on page 31	Display boards or business services in a NOC view, where the status colour fills the entire board.
"Configure the Layout" on page 31	Change the order of the columns on pages that display data in tabular format.

Select the Data View

You can configure how you want the boards to display information.

1. From the main menu, select **Boards**.
2. From the drop-down list on the upper right side of the page, select one of the following options:
 - **Pie chart**—Displays the health status of individual objects within the board, shown in pie chart form.
 - **Heat map**—In non-NOC mode, displays tiles of colour that indicate the health status of individual objects within the board, as well as the overall health status of the board. In NOC mode, the background colour indicates the health status of the board as a whole.
 - **Alerts**—Displays the total number of alerts for all the objects, plus the Mean Time To Resolution (MTTR).
 - **Incidents**—Displays the total number of incidents related to the components plus the MTTR.
 - **Uptime**—Displays the uptime percentage of the board, calculated over the last 7 days.

View Data in NOC Mode

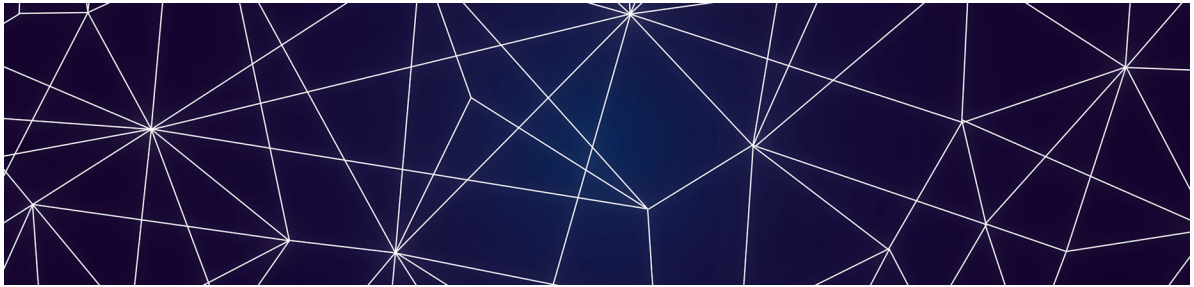
By default, each board or business service shows the health roll-up of the board, as well as the health of the underlying objects. Use this procedure when you prefer a NOC view, where the status colour fills the entire board.

1. From the main menu, select one of the following options:
 - **Boards**
 - **Services Overview**
2. Use the toggle on the upper right side of the page to select one of the following options:
 - **NOC mode**—The colour that indicates the overall health status displays as the background of the board or business service.
 - **Non-NOC mode**—Non-NOC mode shows the overall health status of the board, as well as the health state of the individual components pinned to the board. This view displays up to 100 individual objects. If the board has more than 100 objects pinned to it, ITOps Board displays 100 tiles that represent the health states as a percentage. For example, if 30% of the objects are in a critical state, the view shows 30 tiles as critical.

Configure the Layout

Use this procedure to change the order of the columns on pages where the data is displayed in table form. Examples include:

- The Services Overview page.
 - Tabs such as Computers, Alerts, Incidents, Groups & Services, and Components, or Rules and Exclusions.
1. Select the page or tab for which you want to configure display options.
 2. Click the Sort icon.
 3. Click the arrows to change the order of the columns.
 4. Click **Save**.



Managing Health and Performance Data

Use the information in this section to complete the following tasks:

Task	Description
"Change the State of a Board or Service" on page 33	Manually change the state of a board.
"Place a Board or Business Service in Maintenance Mode" on page 33	Place a board or business service in maintenance mode when you want to temporarily suppress state changes, notifications and incident automation steps.
"Share a Board or Business Service" on page 35	Give a specified group of users access to a board or business service.
"Locate Critical Issues" on page 35	Find critical issues on boards or groups and services.
"Configure Automatic Notifications" on page 36	Configure a notification that is triggered when a board or business service is shared, when its state changes, or when there is a new alert or new incident.
"View SLA Performance Data" on page 37	View SLA performance data for a business service.
"Filter Boards" on page 38	Filter the view to easily find boards on the Boards page.
"Search for Boards" on page 38	Enter search criteria to quickly find boards.
"Use the Board Explorer" on page 38	View a topology diagram that allows you to view components and explore related components.

Task	Description
"Use the Groups and Services Explorer" on page 39	View a topology diagram that allows you to view groups and services and their related components.
"Use the Components Explorer" on page 40	View a topology diagram that allows you to view components and their relationships.

Change the State of a Board or Service

You can manually change the state of a board.

1. From the main menu, select one of the following options:
 - **Boards**
 - **Services Overview**
2. Select a board or a business service.
3. Click the **Action** button and then click the **Manual State** button. A dialog box displays.
4. Select a state from the drop-down list and click **Update**.



Tip: You can also change the state of a board without opening the board. From the **Boards** page, click the icon in the top corner of the board and select **Edit > Manual State**. Select a state from the drop-down list and click **Update**.

Place a Board or Business Service in Maintenance Mode

Place a board or business service in maintenance mode when you want to temporarily suppress state changes, notifications and incident automation steps.

Choose one of the following options:

- ["Place a Board or Business Service in Maintenance Mode Immediately" on page 33](#)
- ["Schedule Maintenance Mode for a Board or Business Service" on page 34](#)

Place a Board or Business Service in Maintenance Mode Immediately

1. From the main menu, select one of the following options:
 - **Boards**
 - **Services Overview**
2. Select a board or a business service.
3. Click the **Action** button and then click the **Start Maintenance Now** button.

A banner indicates that the board was placed in maintenance mode.



Tip: You can also place a board in maintenance mode without opening the board. From the **Boards** page, click the icon in the top corner of the board that you want to place in maintenance mode and select **Maintenance Mode > Start Maintenance Now**.

Schedule Maintenance Mode for a Board or Business Service

1. From the main menu, select one of the following options:
 - **Boards**
 - **Services Overview**
2. Select a board or a business service.
3. Click the **Action** button and then click the **Schedule Maintenance Mode** button. A dialog box displays.
4. To schedule a maintenance period, enter the following information:

Field	Description
	Choose one of the following:
Recurrence Interval	<ul style="list-style-type: none">• Once• Daily• Weekly• Monthly
Duration	
Start Time	Enter a start time
	Choose one of the following options:
End Time	<ul style="list-style-type: none">• Set a duration (in minutes) for the maintenance period.• Enter a specific time for the maintenance period to end.
Schedule Start and Expiration	
Timezone	Select a timezone from the drop-down list.
Effective Date	Select a start date for the maintenance period.
Expiry Date	Select an end date for the maintenance period. For Daily, Weekly, or Monthly schedules only.

5. Click **Save**.



Tip: You can disable a scheduled maintenance period by using the toggle at the top of the Maintenance Mode dialog box.

Share a Board or Business Service

Use this procedure when you want to give a specified group of users access to a board or a business service.

1. From the main menu, select one of the following options:
 - **Boards**
 - **Services Overview**
2. Select a board or a business service.
3. Click the **Action** button and then click the **Share** icon.
A dialog box displays a list of roles.
4. Select a role (a group of users) to share the board with.
5. Click **Share**.



Tip: You can also share a board without opening the board. From the **Boards** page, click the icon in the top corner of the board select **Actions > Share..** Select a role from the list and click **Share**.

Locate Critical Issues

You can use the Explorer to locate critical issues in your network.

1. Choose one of the following options:
 - From the main menu, select **Boards**. Open a board and click the **Explorer** tab.
 - From the main menu, select **Home**. Click **Groups & Services** and select a group or service. Click the **More Details** icon and then select the **Explorer** tab.
 - From the main menu, select **Home**. Click **Components** and select an object. Click the **More Details** icon and then select the **Explorer** tab.
2. Click the **Action** button and click the **Critical Issue Locator** icon.
The diagram expands, if needed, to show critical issues. Click on the item to display detailed information.

Configure Automatic Notifications

You can configure a notification that is triggered when a board or business service is shared, when its state changes, or when there is a new alert or new incident.

You can send notifications to email recipients or to a PowerShell script. The option to send notifications to a PowerShell script gives you the flexibility to configure a range of actions in response to the notification. For example, you can send notifications to a PowerShell script that generates an SMS message. If you choose to send notifications to a PowerShell script, ITOps Board sends the following data:

- [String] \$notificationtrigger
- [String] \$destinationemails
- [String] \$destinationphone
- [String] \$destinationaccount
- [String] \$userrole
- [Int32] \$userroleid
- [String] \$affecteditemkey
- [String] \$affecteditemname
- [String] \$affecteditemtype
- [String] \$message
- [String] \$title
- [String] \$severity
- [DateTime] \$timestamp
- [String] \$details
- [String] \$url

Before you Begin

- You must have added an integration for email notifications or for PowerShell to use this feature.
- If you are configuring a notification to trigger a PowerShell script, ensure that you copy the script to the **ITOps Board > PSScripts** folder.

1. From the main menu, select one of the following options:
 - **Boards**
 - **Services Overview**
2. Select a board or a business service.
3. Click the **Action** button and then click the **Notification Settings** button. A dialog box displays.
4. Select an option from the **Trigger** drop-down list.
5. Select an option from the **Action** drop-down list:
 - Email Notification
 - PowerShell script—Select a PowerShell script from the drop-down menu.

6. Click **+** to add the notification.
7. Select the **Recipient List** tab.
The option to Notify All Recipients is enabled by default.
8. To send notifications to specific recipients, click the slider to disable the default and select recipients from the list.
If you want to send notifications by email and no address is configured for the selected user, see ["Add an Email Address for a User" on page 46](#).
9. Click **Save**.



Tip: You can also configure automatic notifications for a board without opening the board. From the **Boards** page, click the icon in the top corner of the board and select **Edit > Notifications**. Configure the options as described in the procedure above.

View SLA Performance Data

View SLA performance data for a business service. If you edited the SLO settings after you initially configure them, or changed the components in the business service, ensure that you reload the page to see updated data.

1. From the main menu, select **Services Overview**.
2. Select a business service and click the **SLA** tab.
The SLA tab displays the following information:
 - A graph that shows the availability of the service over the period of time specified in the SLO settings.
 - A summary of the current SLA status, including:
 - The availability as a percentage of the SLA goal.
 - The SLA goal.
 - The amount downtime that has occurred in the specified time period.
 - The allowed amount of downtime in the specified time period.
 - The amount of time remaining before the SLA goal is breached.
 - A list of the components that have impacted the SLA during the period shown in the graph.



Tip: You can also view the SLA report in Kibana. For information about how to import the SLA report into Kibana, see the following Martello Knowledge Base article:

<https://support.martellotech.com/knowledgeBase/9870461>

Related Topics

- To specify how downtime is calculated, see ["Configure SLA Reporting" on page 42](#).
- To configure service level objectives, see ["Configure SLO for a Business Service" on page 26](#).

Filter Boards

Use this procedure to easily find boards on the Boards page.

1. From the main menu, select **Boards**.
2. Click the arrow on the left side of the screen to display the **Filter** panel.
3. Select the filtering options:
 - **Exclude Child Boards**—When you select the option to exclude child boards, ITOps Board displays top-level boards only. Boards that roll up their health state to a higher-level board are not shown.
 - **Board States**—Filter the list based on the state of the board. Select one or more states.
4. Click **Filter**.








Search for Boards

Use this procedure to quickly search for a board.

1. From the main menu, select **Boards**.
2. Click the **Search** button.
3. Enter the search term.
4. Sort and filter the results by selecting any of the following options:
 - **Sort By**—List the search results according to the board state or the board name.
 - **Board States**—Filter the results based on the state of the board. Select one or more states.
 - **Health Rollup Types**—Filter the results based on the type of health rollup configured for the board. Select one or more rollup types.
 - **Incident Automation**—Filter the results based on whether incident automation is enabled for the board.

Use the Board Explorer








1. From the main menu, select **Boards**.
2. Open a board and click the **Explorer** tab.
3. Perform any of the following tasks:

Button	Function/Task	Description
—	Change the layout	Drag nodes/items to change how they are displayed.
—	View object information	Hover over the item to see its name. Click on the item/object to open a details pane.
	Action	This button provides access to the following options:
	Save	Save all changes that you made to the layout of the topology diagram.
	Get All Nodes	Expand nested boards and display the nodes in a tree diagram.
	Center	Center the diagram on the page.
	Revert Network	Revert the diagram to its default display.
	Critical Issue Locator	Show critical issues. The diagram expands, if needed, to show the location of critical issues.
	Refresh Explorer Data	Refresh the data shown in the diagram.

Use the Groups and Services Explorer

1. From the main menu, select **Home**.
2. Select the **Groups & Services** tab.
3. Select a group or service and click the **More Details** icon.
A new page displays.
4. Click the **Explorer** tab.
5. Perform any of the following tasks:








Button	Function/Task	Description
—	Change the layout	Drag nodes/items to change how they are displayed.

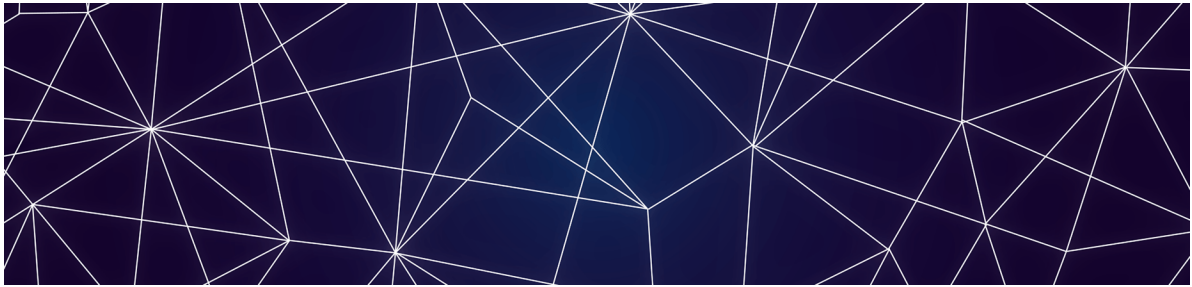
Button	Function/Task	Description
—	View object information	Hover over the item to see its name. Click on the item/object to open a details pane.
	Action	This button provides access to the following options:
	Save	Save all changes that you made to the layout of the topology diagram.
	Get All Nodes	Expand nested groups and display the nodes in a tree diagram.
	Center	Center the diagram on the page.
	Revert Network	Revert the diagram to its default display.
	Critical Issue Locator	Show critical issues. The diagram expands, if needed, to show the location of critical issues.
	Refresh Explorer Data	Refresh the data shown in the diagram.

Use the Components Explorer

1. From the main menu, select **Home**.
2. Select the **Components** tab.
3. Select a group or service and click the **More Details** icon. A new page displays.
4. Click the **Explorer** tab.
5. Perform any of the following tasks:

Button	Function/Task	Description
—	Change the layout	Drag nodes/items to change how they are displayed.

Button	Function/Task	Description
—	View object information	Hover over the item to see its name. Click on the item/object to open a details pane.
	Action	This button provides access to the following options:
	Save	Save all changes that you made to the layout of the topology diagram.
	Get All Nodes	Expand nested groups and display the nodes in a tree diagram.
	Center	Center the diagram on the page.
	Revert Network	Revert the diagram to its default display.
	Critical Issue Locator	Show critical issues. The diagram expands, if needed, to show the location of critical issues.
	Refresh Explorer Data	Refresh the data shown in the diagram.



Managing Incidents and Reporting

Use the information in this section to complete the following tasks:

Task	Description
"Resolve an Alert" on page 42	When an alert on a board or business service has been resolved, you can close the incident in your ITSM system from within ITOps Board.
"Configure SLA Reporting" on page 42	Configure the health states that you want to include in downtime calculations.

Resolve an Alert

Use this procedure when an alert on a board or business service has been resolved and you want to close the incident from within ITOps Board.

1. From the main menu, perform one of the following steps:
 - Select **Home** and click the **Alerts** tab.
 - Select **Boards**. Open a board and select the **Alerts** tab.
 - Select **Services Overview**. Open a business service and select the **Alerts** tab.
2. From the **Alerts** tab, select an alert.
A window opens to show the alert details.
3. Click the **Action** icon and click the **Resolve** button.
A message displays to confirm that the alert is resolved.

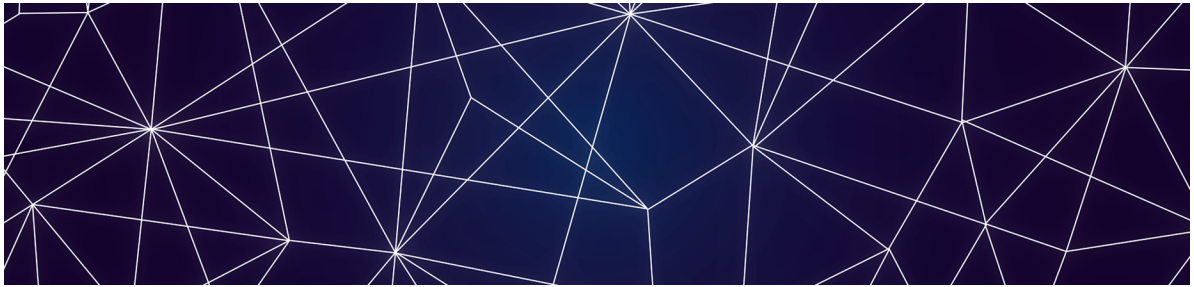
Configure SLA Reporting

Use this procedure to configure the health states that you want to include in downtime calculations. You must be an administrator to perform this procedure.

1. From the main menu, select **Settings > General Settings**.
2. In the **Downtime** section, select the states that you want to include in downtime reporting.

Related Topics

- To configure service level objectives, see ["Configure SLO for a Business Service" on page 26](#).
- To see SLA performance, see ["View SLA Performance Data" on page 37](#).



Managing Users

Use the information in this section to complete the following tasks:

Task	Description
"Create a Role" on page 45	Create roles for the different types of users in your organization.
"Assign Users to Roles" on page 45	Assign users to a specific role.
"Add Integrations to a Role" on page 45	Manage the integrations that can be viewed by users in different roles.
"Add Boards or Business Services to a Role" on page 45	Manage how users in different roles can access boards and business services.
"Scope User Access" on page 46	When a user accesses a board or service, the board or service may contain components from an integration that the user does not have permission to access. Configure whether the user can view all information on a board, regardless of the source, or limit the user to viewing data from specified integrations.
"Add an Email Address for a User" on page 46	Add an email address for a user that can be used for notifications.
"Create a Consent Message" on page 47	Create a custom message that displays in a banner at the bottom of the page. Users must accept the message to remove the banner.
"Configure Access to Saved Searches" on page 47	Control who can see and use saved searches.

Create a Role

Use this procedure to create roles for the different types of users in your organization. You can use roles to manage access to data and functionality in ITOps Board.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.
2. Click the **Roles** tab.
3. Click the **Add** button.
4. Enter a name for the role and click **Create**.

Assign Users to Roles

Use this procedure to assign users to a specific role.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.
2. Click the **Roles** tab.
3. Select a role from the list.
4. Click the **Add** button.
5. Enter the name of the user you want to add and click **Search**.
A list displays.
6. Select the user and click **Add**.

Add Integrations to a Role

Use this procedure to manage the integrations that can be viewed by users in different roles.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.
2. Click the **Roles** tab and select a role.
A new page displays.
3. Click a role and select **Integrations**.
4. Click the **Add** button.
5. Select an integration from the list and click **Add**.
6. Optional. If you want users in this role to have read-only access to the integration, select the **Read-only** box.

Add Boards or Business Services to a Role

Use this procedure to allow users in a specified role to access boards and business services.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.

2. Click the **Roles** tab and select a role.
A new page displays.
3. Select one of the following options:
 - Boards
 - Business Services
4. Click the **Add** button
5. Select one or more boards or business services from the list and click **Add**.
6. Optional. If you want users in this role to have read-only access to the board or business service, select the **Read-only** box.

Scope User Access

Configure whether the user can view details about all components on a board, regardless of the source, or limit the user to viewing data from specified integrations.

1. From the main menu, select **Settings > General Settings**.
2. In the **Scope Components By Boards and Services** section, select one of the following options:
 - **Scope by source**—Users are restricted to viewing components from integrations they have access to.
 - **Scope by boards and services**—Users can view details about all components on a board or service, even if the component is from an integration that they do not have access to. Detailed information includes properties, related alerts, and incidents.

Related Topics

- To manage the integrations that users can access, see ["Add Integrations to a Role" on page 45](#).
- To manage the boards and business services that users can access, see ["Add Boards or Business Services to a Role" on page 45](#).

Add an Email Address for a User

Use this procedure to add an email address that can be used to send notifications to a user.

1. From the main menu, select **Settings**.
2. Click the **Roles** tab.
3. Select a role to see a list of users.
4. Click the **Edit** button next to the user name and enter an email address.
5. Click the check mark to save the change.

Create a Consent Message

Use this procedure to add a message that displays in a banner at the bottom of the page. You can customize the message according to user roles. Users must accept the message to remove the banner.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings > General Settings**.
2. In the **Consent Messages** section, click the **Add** button.
3. Configure the following settings:
 - **Title**—Enter a descriptive title for the message.
 - **Roles**—Use the list to select the types of users who will see the message.
 - **Message**—Enter the text of your message.
 - **Disable background**—Select this option to require the user to accept the message before using the interface.
 - **Show every session**—Select this option to show the message every time the user accesses ITOps Board.
4. Click **Save**.

Configure Access to Saved Searches

Use this procedure to control who can see and use saved searches.

You must be an administrator to perform this procedure.

1. From the main menu, select **Settings > General Settings**.
2. In the **Saved Searches Visibility** section, select one of the following options:
 - Admin only
 - Everyone



Managing Licensing

Use the information in this section to complete the following tasks:

Task	Description
"Add a License Key" on page 48	Activate a license.
"View License Information" on page 48	View information about your license, such as the expiry date.

Add a License Key

After you purchase a license, the support team sends you an email with the license key attached in a text file. Use this procedure to activate the license.

1. From the main menu, select **Settings**.
2. Click the **Licensing** tab.
3. Click the **Add License** button.
4. Paste your license key in the dialog box and click **Activate**.

View License Information

Use this procedure to view information about your license, such as:

- The type of license you have.
 - The number of integrations supported for that license.
 - The number of integrations currently configured.
 - The expiry date.
1. From the main menu, select **Settings**.
 2. Click the **Licensing** tab.
 3. Click on a license to view details.



Managing Storage

Use the information in this section to complete the following tasks:

Task	Description
"Configure Storage Options" on page 49	Configure the length of time that data is stored in ITOps Board.
"View Storage" on page 49	See the amount of storage spaced used by each integration.

Configure Storage Options

Use this procedure to configure the length of time that data is stored in ITOps Board.

1. From the main menu, select **Settings**.
2. Click the **Storage** tab.
3. Under **Storage Retention**, enter the number of days that you want to retain data.
4. Click **Save**.

View Storage

Use this procedure to see the amount of storage spaced used by each integration.

1. From the main menu, select **Settings**.
2. Click the **Storage** tab.
3. Review the list of integrations to see the amount of data stored for each one.
The total storage used is shown at the bottom of the list.

