

Foglight™ for OpenStack® 5.7.3
User and Reference Guide



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Legend

- **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.

- ! **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

- i **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

Foglight™ for OpenStack® User and Reference Guide
Updated - Apr 2017
Software Version - 5.7.3

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Using Foglight for OpenStack

This guide provides information on Foglight for OpenStack. Read this guide to acquire an overall understanding of the workings and capabilities of Foglight for OpenStack, and use it as a reference whenever you require specific information about this product.

This topic introduces you to Foglight for OpenStack and provides essential foundational information:

- [Introducing Foglight for OpenStack](#)
- [Navigation basics](#)

Introducing Foglight for OpenStack

Foglight for OpenStack extends Foglight for Virtualization, Enterprise edition capabilities to OpenStack-based clouds reducing the complexity of monitoring and managing OpenStack-based IaaS cloud resources. Using Foglight for OpenStack, you are able to centrally manage the cloud infrastructure and quickly and easily see the situation summary of your OpenStack cloud infrastructure resource objects.

Supported hypervisors

Foglight for OpenStack supports the Group A hypervisors (KVM) according to the OpenStack classification. For more information on the KVM hypervisor, see the [Hypervisor Support Matrix](#).

Foglight for OpenStack elements

Foglight for OpenStack provides monitoring capabilities so that all elements of an OpenStack cloud infrastructure are considered. A typical OpenStack infrastructure contains one or more:

- **Regions** — discrete OpenStack environments with dedicated API endpoints.
- **Availability Zones** — logical groups of compute hosts.
- **Host Aggregates** — a collection of hosts with common features.
- **Hosts** — physical computers within your OpenStack environment.
- **Instances** — virtual machines running on physical compute nodes.
- **Volumes** — detachable block storage devices.

You can view the overall state of all these components on the OpenStack Environment dashboard. For more information on this dashboard, see [Using the OpenStack Environment dashboard](#) on page 13.

Navigation basics

This section describes the basic Foglight for OpenStack navigation techniques necessary for using Foglight for OpenStack:

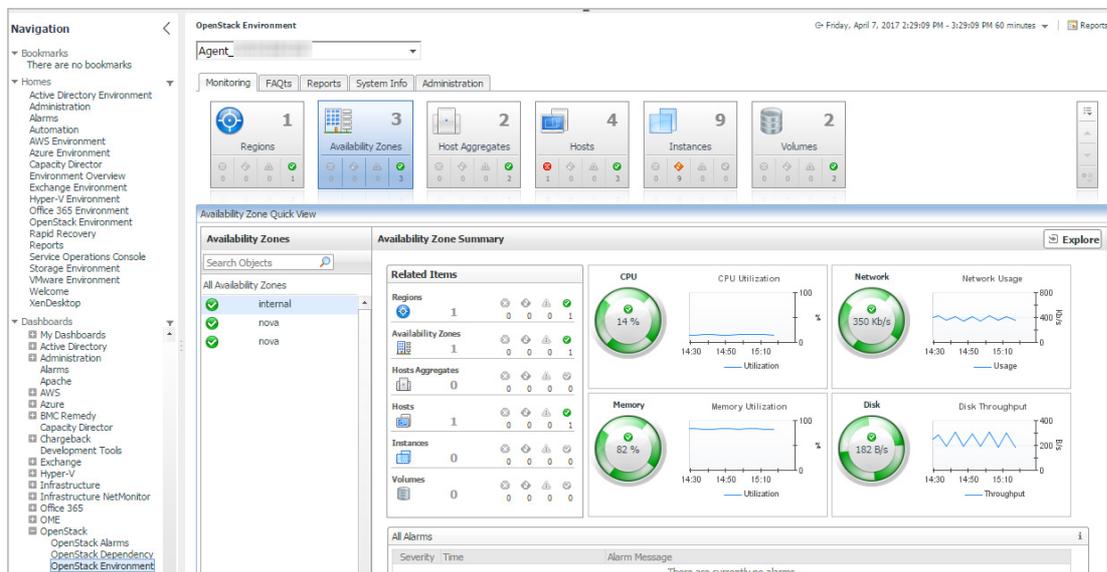
- Foglight browser interface elements
- Breadcrumbs
- Time range
- Sortable lists
- Alarms and status indicators
- Mouse-over actions

Foglight browser interface elements

Depending on your user roles, you may see either the contents of the first bookmark (the Welcome page is the default) listed under Bookmarks, or a home page. For further details about roles, see the *Foglight User Guide*.

Typically, the browser interface is divided into three panels: the navigation panel on the left, the display area in the middle, and the action panel on the right.

Figure 1. Foglight browser interface elements



Navigation panel

The navigation panel operates like a drawer. Its default state is open. To close the navigation panel, click the arrow at the far left of the Foglight for OpenStack browser interface. Click that arrow again to open the navigation panel.

The navigation panel lists all the dashboards that are available to the current user for viewing. You can use the navigation panel to select a dashboard to view in the display area. To access a specific dashboard, open the appropriate module (OpenStack Dependency, for example).

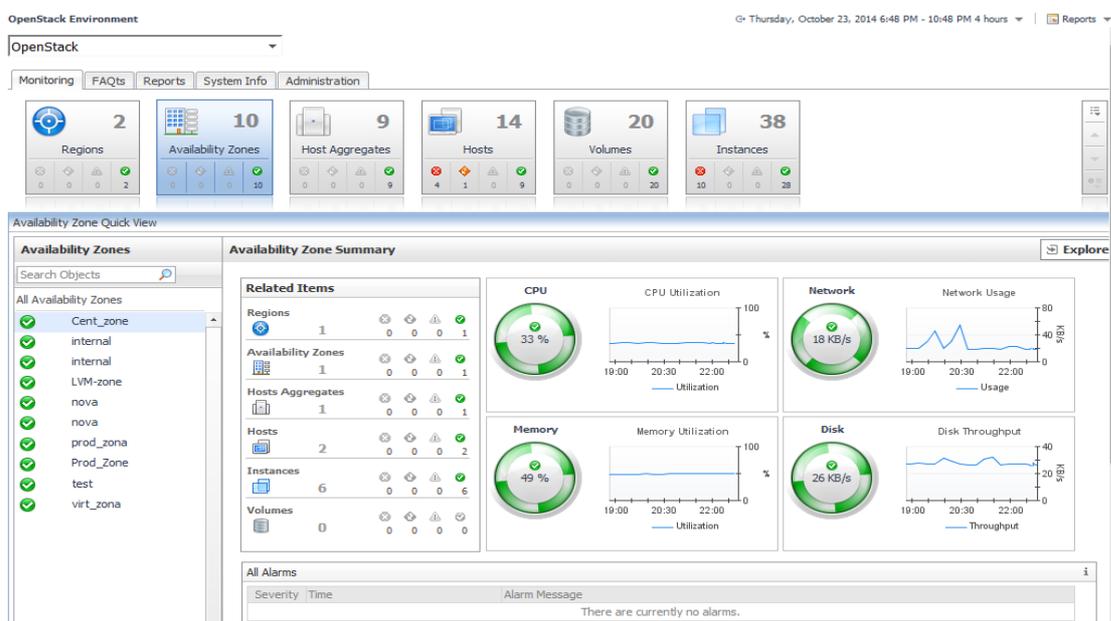
The navigation panel also provides access to the Foglight for OpenStack Administration and Configuration areas.

If you do not see any dashboards in the navigation panel, the user ID with which you signed in may not have been assigned to a group. For details, see the *Foglight User Guide*.

Display area

The display area is used to view current dashboards and reports, as well as to create dashboards and reports. You can increase the size of this area by resizing the navigation panel, or, if the action panel is open, by closing the action panel.

Figure 2. Display area



Action panel

The action panel operates like a drawer. Its default state is closed. To open the action panel, click the arrow at the far right of the Foglight for OpenStack browser interface. Click that arrow again to close the action panel.

The action panel contains the various actions and tasks you can perform with the current dashboard. It also contains views and data that you can add to a dashboard or report you are creating and provides access to the online help files.

Breadcrumbs

If you drill down into various levels across dashboards, a trail of breadcrumbs is left at the top of the current dashboard. This trail provides you with context. It also provides you with the name of the level you are currently viewing and with a simple mechanism for returning to any of its related parent levels.

The following breadcrumb trail was created while drilling down from the OpenStack Environment dashboard into the OpenStack Explorer dashboard. Each item within a breadcrumb trail is a hyperlink to a previously viewed parent level.

Figure 3. Breadcrumbs

OpenStack Environment > OpenStack Explorer

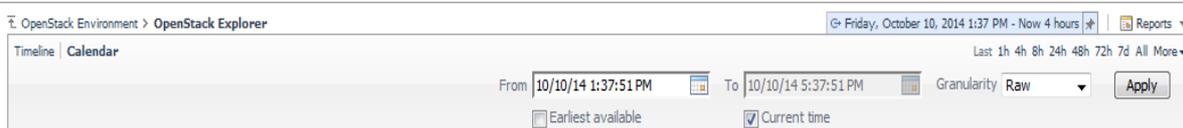
For more information about using Foglight for OpenStack dashboards, see [Interacting with Foglight for OpenStack dashboards](#) on page 12.

Time range

The default behavior of Foglight for OpenStack is to display metrics, alerts, and messages that have occurred within the last four hours. This time range, however, is configurable.

To configure the Time Range, use the Time Range pop-up, which you can access from the upper right corner of the Foglight for OpenStack browser interface.

Figure 4. Time range



Using the Time Range pop-up, you can select from predefined time ranges or you can specify a custom range using calendar precision controls to specify dates and times. When you modify the time range for a dashboard or view, it adjusts the range for all the views contained within and drill-downs accessed from that dashboard or view. It does not adjust the time range for any parent views.

For more information about modifying the time range, see the *Foglight User Guide*.

Sortable lists

In certain Foglight for OpenStack dashboards, some levels of views contain sortable lists. Clicking a column heading once sorts the list in ascending order. Clicking the column heading again re-sorts the list in descending order.

Sorting is handy when you want to have an organized view of virtual machines or host objects sorted by name, status, or some other criterion.

Alarms and status indicators

Foglight for OpenStack uses status indicators to show the alarm status of the objects within the virtual infrastructure. Four status indicators (fatal, critical, warning, and normal) are used throughout the Foglight for OpenStack dashboards. An alarm table, at the top of the OpenStack Explorer views, highlights the key alarms as shown in the following illustration.

Figure 5. Alarms and status indicators

	Fatal	Critical	Warning
Alarms	2	6	24

Spinners

Foglight for OpenStack uses color coded spinners which change color based on overall consumption and deviation from normal values.

Figure 6. Spinners



Mouse-over actions

Many items within the Foglight for OpenStack dashboards display additional information when you hover the cursor over them. For example, when you hover the cursor over a graph you are likely to see a specific value or values that correspond to the position of the cursor. When you hover the cursor over an individual metric, you are likely to see a small descriptive pop-up.

Foglight reports

You can create, run, and manage reports from all Foglight browser pages.

To run a report from a Foglight browser interface:

- 1 Click **Reports**  on the upper-right corner.
- 2 Choose an action from the list that appears.

The report is generated and delivered to the recipients indicated in the report setting. For more information on working with reports, see the *Foglight User Guide*.

Foglight tiles

The upper part of the tile displays the cloud infrastructure and a total count of these entries in the environment.

Figure 7. OpenStack Environment tiles displaying the cloud infrastructure



The lower part of the tile displays the count of entities at each severity level, based on the alarms currently active for those entities.

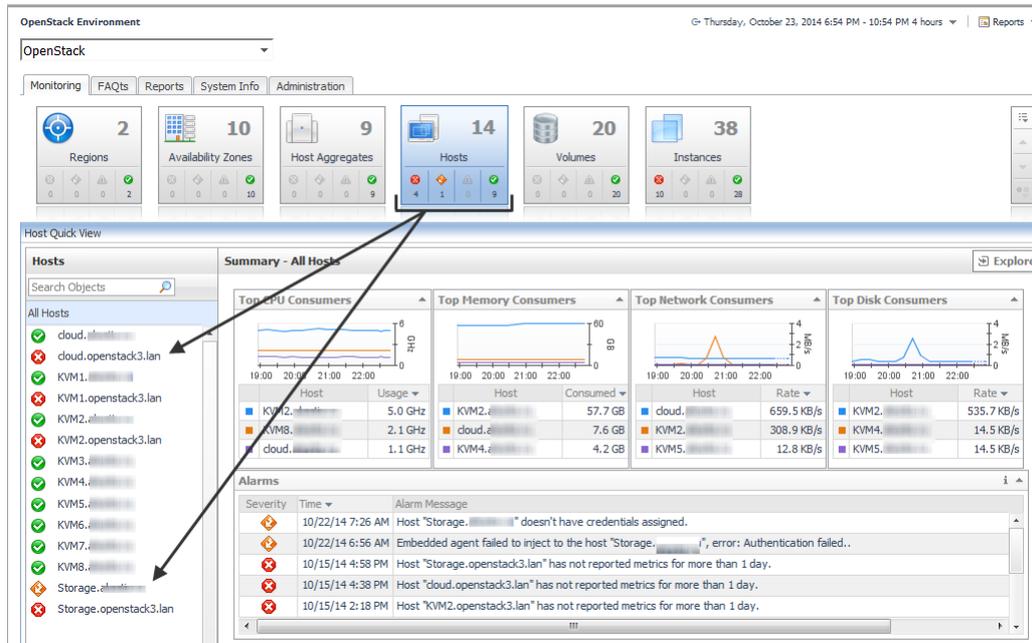
Figure 8. OpenStack Environment tiles: alarms



Clicking the label in the tile, for example, **Availability Zones**, displays summary and alarm information for all components of that type in the Quick View area.

Clicking the alarm count in the lower part of the tile displays summary and alarm information for only the components with that status.

Figure 9. OpenStack Environment: alarms displayed in Quick View



Interacting with Foglight for OpenStack dashboards

After installing Foglight for OpenStack, you can centrally manage your OpenStack cloud infrastructure resource objects. These resource objects include: Regions, Availability Zones, Host Aggregates, Hosts, Instances, and Volumes.

For more information, see these topics:

- [Interacting with Foglight for OpenStack](#)
- [Preparing your OpenStack environment for monitoring](#)
- [Using the OpenStack Environment dashboard](#)
- [Exploring the OpenStack Environment Monitoring tab](#)
- [Using the OpenStack Explorer dashboard](#)

Interacting with Foglight for OpenStack

When you install Foglight for OpenStack, a set of predefined dashboards enables you to view the performance of your OpenStack system at a glance. Use the dashboards to ensure consistent application performance by drilling down on higher-level components such as Regions, Availability Zones, and Host Aggregates to view detailed specifics about each resource, such as CPU Utilization and Network Usage.

Foglight for OpenStack relies on Foglight Agents to collect data from monitored hosts, using a desired collection method. Prior to creating Foglight Agents, it is critical to properly configure the OpenStack environment for monitoring. For more information, see [Preparing your OpenStack environment for monitoring](#) on page 12.

The Administration tab of the OpenStack Environment dashboard lists the available Foglight Agents with their status. You can create agents and modify their properties here. For more information, see [Administration tab](#) on page 15.

In the navigation panel, under **Dashboards**, click **OpenStack Environment** to go to the OpenStack Environment dashboard. For more information about this dashboard and the associated views, see [Using the OpenStack Environment dashboard](#) on page 13.

To see in-depth details about an OpenStack cloud infrastructure resource, use the OpenStack Explorer dashboard. You can drill down for details from using the OpenStack Explorer Topology view in the navigation panel. For more information, see [Using the OpenStack Explorer dashboard](#) on page 31.

Preparing your OpenStack environment for monitoring

Prior to creating Foglight Agents, configure the servers that you want to monitor.

The following requirements must be met before the Foglight Agents can successfully collect data:

- The OpenStack deployment is Liberty, Juno, Havana or Icehouse.
- Endpoints (admin, public, and internal) are available for Keystone (by default, :35357, :5000), Nova (by default, :8774), Glance (by default, :9292), Cinder (by default, :8776), Neutron (by default, :9696).
- The following ports are open on all hosts:
 - HTTPS (443)
 - SSH (22)
- There is network visibility of compute nodes from the Foglight installation location.

Optional (for Instance Agents):

- For Linux[®] instances:
 - Should be 64-bit.
 - Floating IP should be configured for instances to be visible from the host.
 - SSH port (default 22) should be open.
- For Windows[®] instances:
 - Should be 64-bit.
 - Floating IP should be configured for instances to be visible from the host.
 - “Advanced” File and printer sharing should be enabled for administrator shares to be accessible from outside.
 - SMB ports should be open (netbios-ssn 139 and microsoft-ds 445).

Using the OpenStack Environment dashboard

A typical OpenStack environment contains a combination of physical and virtual components. You can view the overall state of all OpenStack objects on the OpenStack Environment dashboard.

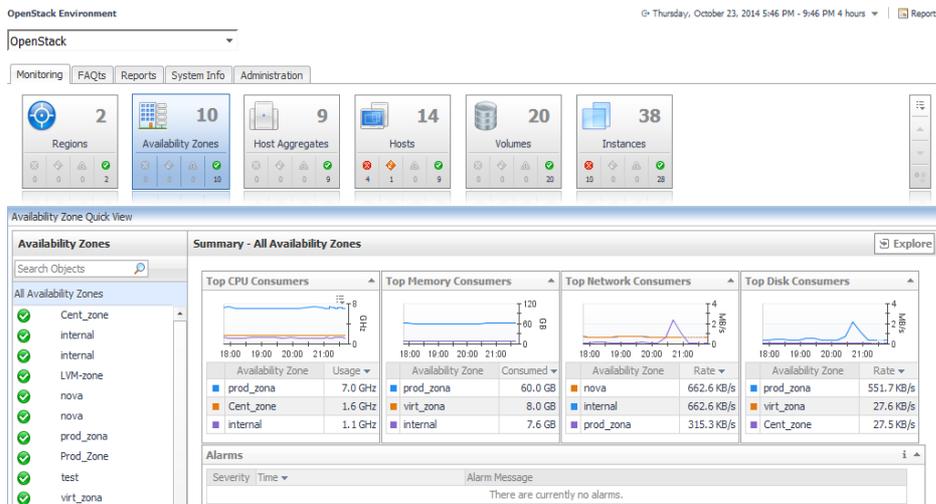
To access the OpenStack Environment dashboard:

- 1 Log in to the Foglight browser interface.
- 2 Ensure that the navigation panel is open.

To open the navigation panel, under **Dashboards**, choose **OpenStack > OpenStack Environment**.

The **Monitoring**, **Reports**, **FAQs**, **Administration**, and **System Info** tabs are available for selection.

Figure 10. OpenStack Environment dashboard



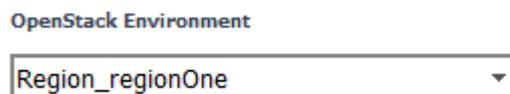
For more information, see these topics:

- [Monitoring tab](#)
- [Reports tab](#)
- [System Info tab](#)
- [Administration tab](#)
- [Exploring the OpenStack Environment Monitoring tab](#)

Navigating between View object instances

Choosing a specific View server instance from the drop-down list in the top-left refreshes the OpenStack Environment dashboard with the information about the selected environment.

Figure 11. View selector



Monitoring tab

Use the Monitoring tab to see the quantity and overall health of your OpenStack cloud infrastructure resource objects using the Foglight tiles. The Monitoring tab contains the Monitoring view with six Foglight tiles and the Quick View.

Click a tile to see a list of infrastructure resource objects in the left frame of the Quick View along with their overall status, and relevant information related to the selected resource object in the summary frame.

For more information about the data appearing on this dashboard, see [Exploring the OpenStack Environment Monitoring tab](#) on page 25.

FAQs tab

The FAQs tab provides predefined questions and answers. For more information, see [FAQs tab](#) on page 42.

Reports tab

The Reports tab contains the following sections: Tasks, Recent Report History, About Reports, and Reports. Foglight for OpenStack includes a collection of predefined report templates. The Tasks section provides you with the functionality to generate, copy, and edit reports. For more information, see [Reports tab](#) on page 50.

System Info tab

The System Info tab displays configuration information for your OpenStack system. For more information, see [System Info tab](#) on page 54.

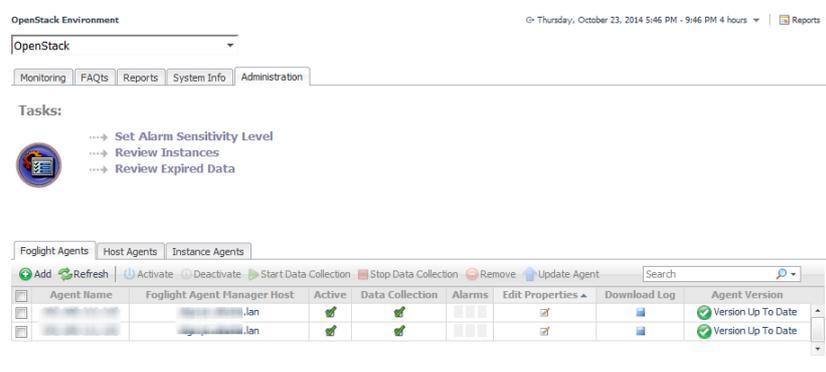
Administration tab

The **Administration** tab contains links to Foglight agent administration tasks that you can use to manage or create agent instances.

This tab consists of the [Administration tab Tasks area](#), [Foglight Agents tab](#), [Host Agents tab](#), and [Instance Agents tab](#). The Tasks area includes three administrative tasks:

- [Set Alarm Sensitivity Level](#)
- [Review Instances](#)
- [Review Expired Data](#)

Figure 12. OpenStack Environment dashboard: Administration tab



Administration tab Tasks area

The Tasks area contains links to administrative tasks:

- **Set Alarm Sensitivity Level** — determines what level of alarms the system stores and displays.
- **Review Instances** — generates a list of existing OpenStack object instances.
- **Review Expired Data** — runs a wizard so you can review and delete hosts and instances.

Set Alarm Sensitivity Level

Sets the level of alarms that the system generates, stores, and displays.

To set the alarm sensitivity level:

- 1 Log in to the Foglight browser interface. On the navigation panel, click **Dashboards > OpenStack Environment**.
- 2 On the OpenStack Environment dashboard that appears in the display area, open the **Administration** tab.
- 3 On the **Administration** tab, click **Set Alarm Sensitivity Level**.
The **Set Alarm Sensitivity Level** dialog box appears.
- 4 In the **Set Alarm Sensitivity Level** dialog box, select the desired sensitivity level: **Essential**, **Normal**, or **Tuning**.
- 5 Click **Save**.
The **Set Alarm Sensitivity Level** dialog box closes.

Review Instances

Review existing OpenStack object instances. The list displays the Object Type and Count.

Review Expired Data

Review and delete OpenStack object instances that are no longer needed.

To review and delete expired data:

- 1 On the OpenStack Environment dashboard, open the **Administration** tab.
- 2 On the **Administration** tab, click **Review Expired Data**.
The **Expired Data Removal Wizard** dialog box appears.
- 3 In the **Expired Data Removal Wizard** dialog box, select the object type that you want to review, and type the number of days during which the object instances were not updated.
- 4 Click **Next**.
The **Expired Data Removal Wizard** dialog box refreshes, showing the object instances that meet the specified requirements.
- 5 Observe the results.
 - If you want to delete all the object instances, click **Next**.
 - If you want to modify your search, click **Previous**, make your changes, and observe your results again. For example, to show fewer instances, click **Previous**, and increase the time period. When satisfied, click **Next**.
 - If you do not want to delete any objects, click **Next**.The **Expired Data Removal Wizard** dialog box refreshes.
- 6 To delete the selected object instances, select the check box.
- 7 Click **Finish**.

Agents view

The **Agents** view has three tabs for embedded agents. Each tab shows a list of existing agent instances and agent management buttons at the top of the table.

Foglight Agents tab

Foglight for OpenStack uses agents to collect information about the monitored hosts.

The **Foglight Agents** view shows a list of all configured Foglight agent instances. The following buttons are available on the table:

- **Add** — starts a workflow for creating agent instances.
- **Refresh** — refreshes the list of agent instances and their states.
- **Activate**—activates one or more selected agent instances. Activating an agent instance starts the agent process on the machine on which the agent is installed.
- **Deactivate** — deactivates one or more selected agent instances. Deactivating an agent stops the agent process on the machine on which the agent is installed.
- **Start Data Collection** — the active Foglight Agent begins to monitor your OpenStack environment and send data about it to the Foglight Management Server.
- **Stop Data Collection** — stops the data collection for one or more selected agent instances.
- **Remove** — deletes the selected agent instance.
- **Update Agent** — upgrades the agent to a new version, after a new cartridge is installed.

i **NOTE:** When a newer Foglight for OpenStack version is installed on your system, the Agent Version column in the Agents table is updated to read *Update Agent*. To apply the new features, update the agents to the latest version. You can upgrade the agents one by one, by selecting from the table and clicking the corresponding *Update Agent* link in the Agent version column. You can upgrade all agents at once by selecting all the listed agents and clicking the **Update Agent** button at the top of the list.

To perform an agent management command, select one or more check boxes in the left-most column and click the appropriate button. For example, to start an agent's data collection, select the check box in the agent row and click **Start Data Collection**.

To edit the properties of an agent:

- 1 Click the **Edit Properties** icon associated with that agent.

The **Edit Properties** dialog box appears.

- 2 Modify the fields, as necessary:

- **User Name** — user name, the agent uses to connect to the monitored OpenStack. This user should have administrative privileges to OpenStack.
- **Password** — user password.
- **Project** — the project on which the user has been granted a role.
- **User domain name** — the domain to which the user is associated.

i **NOTE:** Defaults to 'Default' if not specified.

- **Project domain name** — the domain to which the project is associated.

- 3 Click **Save**.

The new settings are saved for the selected agent.

The **Download Log** button offers a convenient way to get the current log file of the corresponding agent, for review and diagnostics.

Create a Foglight Agent

After installing the Foglight for OpenStack cartridge, you must create a Foglight Agent to communicate with the OpenStack System. Foglight Agents retrieve data about your OpenStack infrastructure resources.

NOTE: Foglight Agents do not retrieve performance data. After creating Foglight Agents, you must configure credentials for the found hosts to retrieve performance data.

To create a Foglight Agent:

- 1 Click the **Add** button on the Foglight Agents tab.

The Create Foglight Agent wizard appears, showing the **Select Agent Host** page.

The screenshot shows a window titled "Create Foglight Agent" with a close button (X) in the top right corner. The left sidebar contains a list of steps: "Select Agent Host" (highlighted with a blue bar and a right-pointing arrow), "Select OpenStack Server", "Enter User Credentials", and "Configure Embedded Agents". The main content area is titled "Select Agent Host" and contains the instruction "Select the Foglight Agent Manager host for new Foglight Agent". Below this is a table with the following data:

Host Name	FglAM Version	OS	Architecture
10.10.10.10.lan	5.8.0	windows	x86_64

At the bottom of the window are four buttons: "Previous", "Next", "Finish", and "Cancel".

A list of available Foglight Agent Manager hosts that can be used to collect data is displayed.

- 2 Select a Foglight Agent Manager host and click **Next**.

The screenshot shows the same "Create Foglight Agent" window, but now the "Select OpenStack Server" step is highlighted in the sidebar. The main content area is titled "Select OpenStack Server" and contains the instruction "Enter the information for the OpenStack server." Below this are three input fields: "Server Name" with the placeholder text "Host name or IP address", "Port" with the value "35357", and "Use HTTPS" with an unchecked checkbox. At the bottom are four buttons: "Previous", "Next", "Finish", and "Cancel".

The Select OpenStack Server page is displayed.

- 3 On the **Select OpenStack Server** page, enter the following, and then click **Next**:
 - **Server Name** — OpenStack (Keystone host) name or IP address.
 - **Port** — through which a remote host communicates with the system running the Identity service.
 - **NOTE:** Pre-populated with the default port for the Identity service (Keystone).
 - **Use HTTPS** — (optional) use secure communications with the OpenStack server.

The screenshot shows a dialog box titled "Create Foglight Agent" with a close button (X) in the top right corner. On the left, a sidebar contains a list of steps: "Select Agent Host" (checked), "Select OpenStack Server" (checked), "Enter User Credentials" (selected and highlighted in blue), and "Configure Embedded Agents" (unchecked). The main area is titled "Enter User Credentials" and contains the instruction "Enter the credentials to access the OpenStack server." Below this are five input fields: "User Name:", "Password:", "Project:", "User domain name:" (with a dropdown menu showing "Default"), and "Project domain name:" (with a dropdown menu showing "Default"). At the bottom right, there are four buttons: "Previous", "Next", "Finish", and "Cancel".

The **Enter User Credentials** page is displayed.

- 4 On the **Enter User Credentials** page, enter the following, and then click **Next**:
 - **User Name** — user name. The user should have administrative privileges to OpenStack.
 - **Password** — user password.
 - **Project** — the project on which the user has been granted a role.
 - **User domain name** — the domain to which the user is associated.

i | **NOTE:** Defaults to 'Default' if not specified.

 - **Project domain name** — the domain to which the project is associated.

i | **NOTE:** Defaults to 'Default' if not specified.

The screenshot shows the same "Create Foglight Agent" dialog box, but now the "Configure Embedded Agents" step is selected and highlighted in blue in the sidebar. The main area is titled "Configure Embedded Agents" and contains the instruction "The agent will collect OpenStack topology data. In addition, to be able to collect the performance data, you can go to Host Agent tab and configure associated Credentials." At the bottom right, there are four buttons: "Previous", "Next", "Finish", and "Cancel".

The **Configure Embedded Agents** page is displayed.

- 5 Carefully read the message on the dialog box and then click **Finish**.
A progress message appears.

The screenshot shows a dialog box titled "Agent Setup" with a close button (X) in the top right corner. The main area contains a blue circular progress indicator and the text "Creating agent in progress".

When the agent is created, a message indicating successful completion appears.

The **Administration** tab refreshes, showing the newly created instance of the Foglight Agent in the list.

The agent is activated and data collection starts.

Host Agents tab

After you have completed setting up the Foglight Agent, you start receiving OpenStack topology data which can be viewed by going to the OpenStack Dependency dashboard and navigating down the topology tree on the **Infrastructure** tab.

The next step is to obtain performance data by setting up host agents.

NOTE: Host Agents collect most but not all the performance data displayed on OpenStack dashboards. Instance Agents are required to retrieve some additional metrics.

The **Host Agents** tab displays a list of all discovered hosts with the statuses for the embedded agents. A set of host management buttons are available:

- **Refresh** — refreshes the list of host agents and their statuses.
- **Credentials** — adds or removes the credentials of one or more host agents.
- **Activate** — installs the host agent.
- **Deactivate** — deletes the host agent.

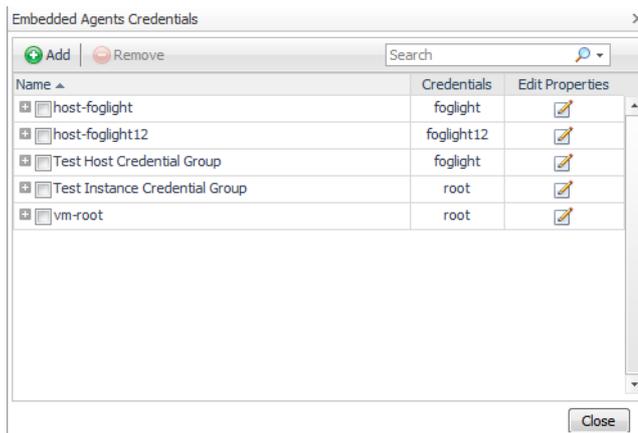
The **Download Log** button offers a convenient way to get the current log file of the corresponding agent, for review and diagnostics.

A host agent begins to return performance data from a host once that agent has been assigned the correct credentials.

To configure the credentials for new hosts:

- 1 Click the **Credentials** button on the **Host Agents** tab.

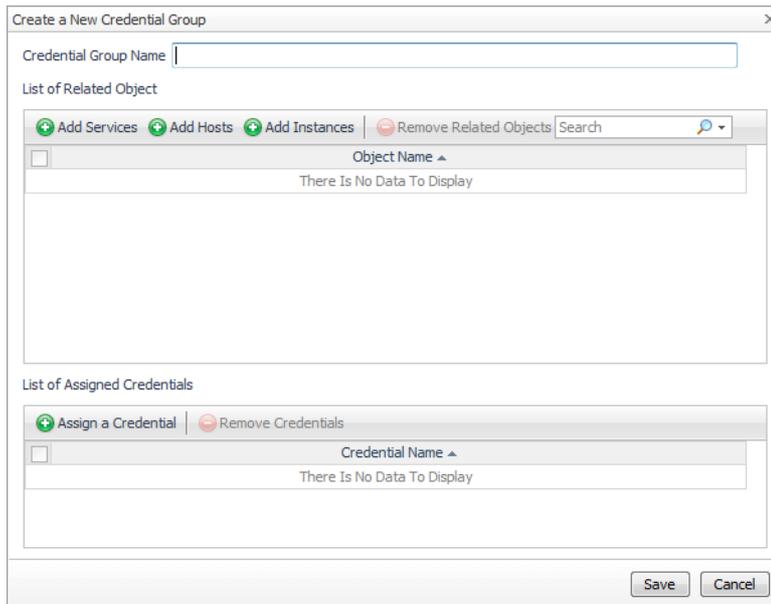
The Embedded Agents Credentials wizard appears.



A list of available host groups is displayed.

- 2 Click **Add**.

The **Create a New Credential Group** wizard appears.



3 Enter a Credential Group Name.

4 Click **Add Hosts**.

A list of all discovered hosts is displayed.

5 Choose one or more hosts and click **Select**.

The **Create a New Credential Group** wizard displays with a refreshed list of related objects.

6 Click **Assign a Credential**.

7 Choose credentials listed in the **Credential Selector** dialog box and click **Select**.

The **Create a New Credential Group** wizard displays with a refreshed list of assigned credentials.

i | **NOTE:** To add more Credentials, go to the Administration dashboard and click **Credentials > Manage Credentials > Add**.

i | **NOTE:** You must provide root credentials for installing the agents into OpenStack compute hosts.

8 Click **Save**.

The new credential group appears in the Embedded Agents Credentials dialog box.

9 Click **Close**.

Instance Agents tab

Configure credentials for new instances

The **Instance Agents** tab shows a list of Instance Agents and a set of management buttons at the top of the list. The following buttons are available:

- **Refresh** — refreshes the list of Instance Agents and their statuses.
- **Credentials** — adds or removes the credentials of one or more Instance Agents.

The workflow to configure credentials for new instances is the same as clicking the **Credentials** button on the Host Agents tab. For more information, see [Host Agents tab](#) on page 20.

Foglight Lockboxes and Credentials

Foglight provides intuitive dashboards with which to manage your lockboxes and credentials. To access these dashboards, on the navigation panel, click **Dashboards > Administration > Credentials**.

Lockboxes

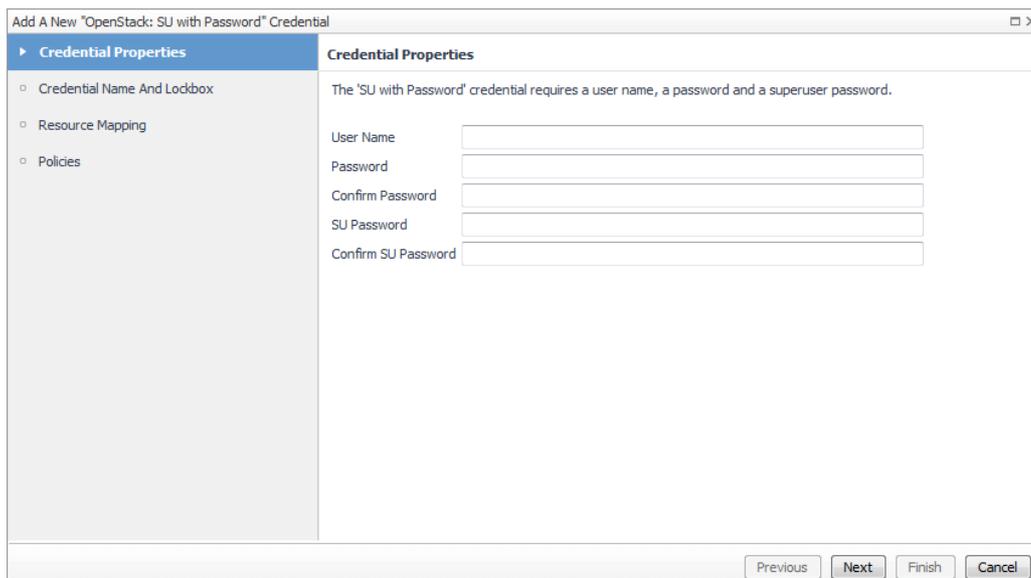
The appropriate lockboxes must be in place before you create credentials. The **Manage Lockboxes** dashboard displays a list of all lockboxes that are defined on the server, in addition to the System lockbox that is included with the Management Server.

Create a credential and release a lockbox

To add an OpenStack specific credential:

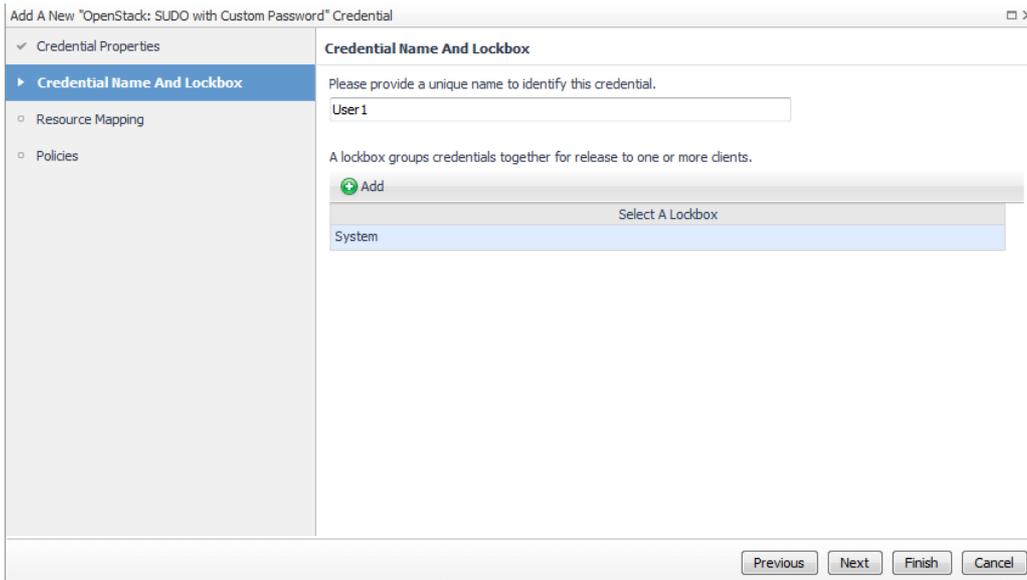
- 1 Click **Manage Credentials** on the Credentials dashboard.
Displayed is a list of all configured credentials.
- 2 Click **Add**.
- 3 Choose one of the following OpenStack specific credentials:
 - OpenStack: SUDO with Custom Password
 - OpenStack: SU with Password

The **Add a New Credential** wizard opens displaying the **Credential Properties** page.



- 4 On the **Credential Properties** page, type the required properties, and click **Next**.
i | NOTE: For the OpenStack: SUDO with Custom Password credential, SUDO password is optional.

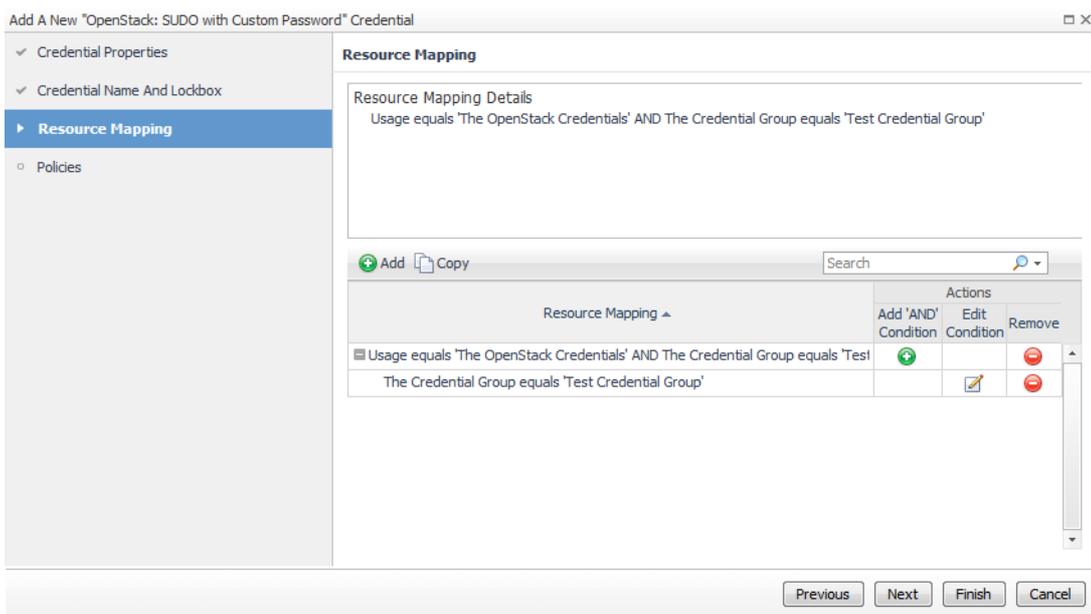
The **Add a New Credential** wizard refreshes displaying the **Credential Name and Lockbox** page.



- 5 On the **Credential Name and Lockbox** page, provide a name to identify the credential, and select a lockbox in which you want to keep the credential. A lockbox can be used to group credentials for access or security. In smaller Foglight installations, using the default **System** lockbox should be sufficient.

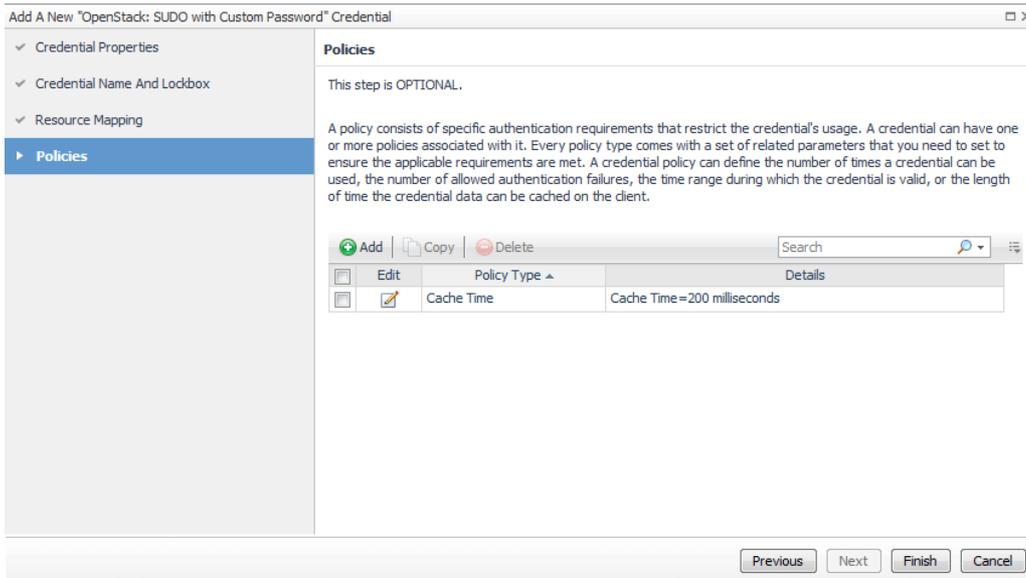
Click **Next**.

The **Add a New Credential** wizard refreshes displaying the **Resource Mapping** page.



- 6 On the **Resource Mapping** page, click **Next**.

The **Add a New Credential** wizard refreshes displaying the **Policies** page.



- 7 Optional-On the **Policies** page, define one or more policies for this credential.

Click **Finish**.

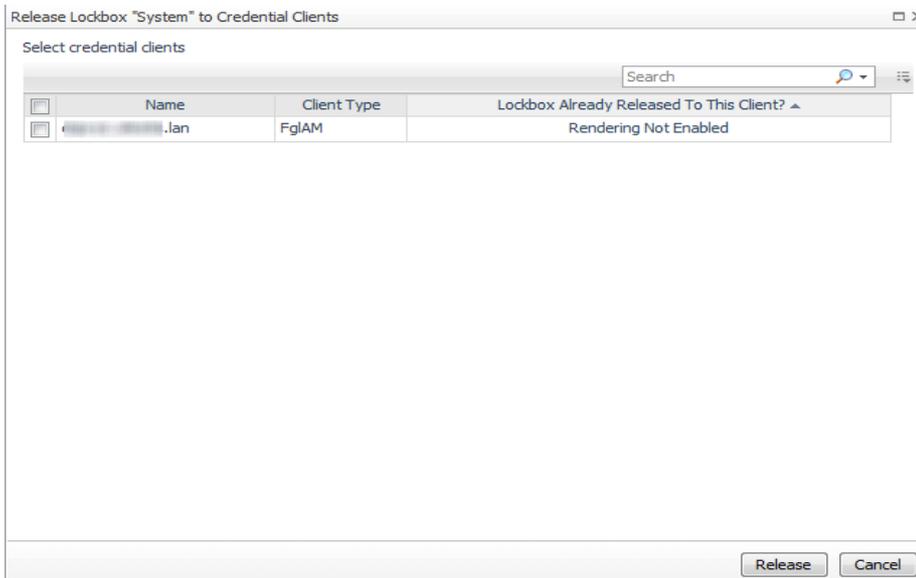
The new Credential appears on the **Manage Credentials** view.

For more information on the Credentials dashboard, see *Foglight Administration and Configuration Guide*.

To release the Lockbox to the Credential Clients

- 1 On the navigation panel, under **Dashboards**, click **Administration > Credentials > Manage Lockboxes**.
- 2 In the row containing the lockbox you want to release to a credential client, click the yellow button  in the Release to Credential Clients column.

The **Release Lockbox to Credential Clients** dialog box appears.



- 3 Select one or more credential clients for lockbox release and click **Release**.

i | **NOTE:** A password dialog box appears if the selected lockbox is password-protected.

The **Release Lockbox to Credentials Clients** dialog box closes, indicating success.

For more information on managing Lockboxes, see the *Foglight Administration Guide*.

Exploring the OpenStack Environment Monitoring tab

The OpenStack Environment **Monitoring** tab contains tiles which represent the various configured resource objects found in the OpenStack infrastructure.

When you click a tile, the Quick View below the tab is refreshed to display the list of infrastructure resource objects along with their status. A summary of the resource utilization of each object or group of objects is shown in the Summary frame.

Default all objects view

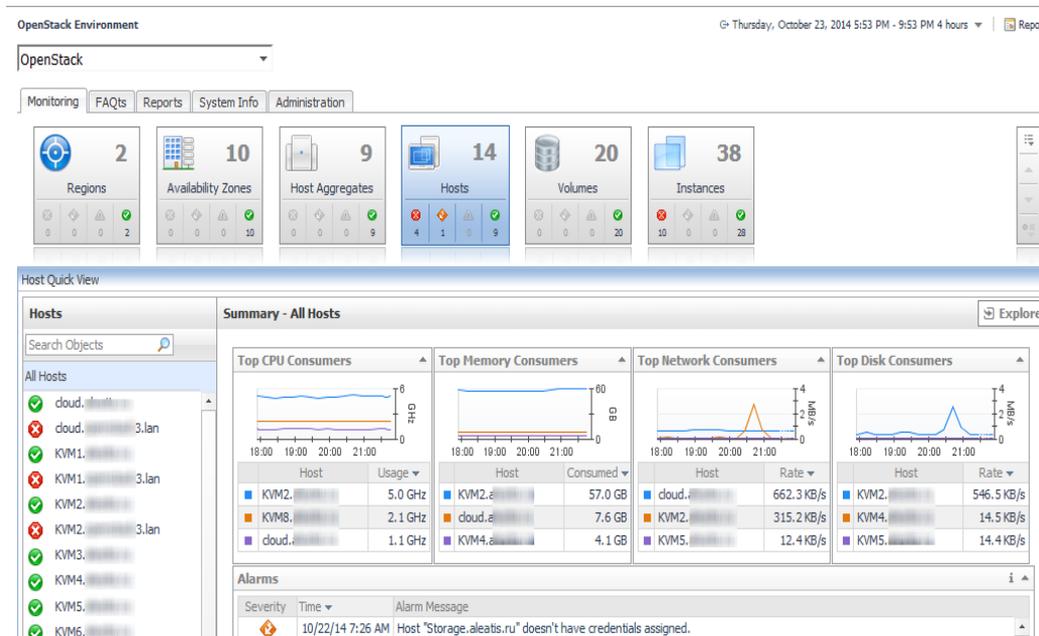
For each resource object type (Regions, Availability Zones, Host Aggregates, Hosts, Volumes, and Instances) the default view when clicking a tile is all objects, such as **All Hosts**. This view can be seen in the object list view in the left frame of the Quick View with top resource consumers in the group in the right frame.

The four embedded views in the right frame display graphs and tables showing the following:

- **Top CPU Consumers** — those members with the highest average CPU utilization.
- **Top Memory Consumers** — those members with the highest memory utilization.
- **Top Network Consumers** — those members consuming most network bandwidth.
- **Top Disk Consumers** — those members with the highest average disk utilization.

An embedded Alarms view displays a list of alarms and when they were raised.

Figure 13. Monitoring tab All Hosts view



Tiles

To customize the tiles section:

- 1 Click the **Tile Customizer**  icon.

A dialog box appears, displaying all the tiles available.

- 2 Select the tile that you want to display by clicking its icon once; click the icon again to toggle the selection.

i | **NOTE:** The currently displayed tile cannot be removed from the list of objects associated with a domain.

- 3 Click **Apply**.

The tiles area is updated to display the selected tiles.

For more information, see these topics:

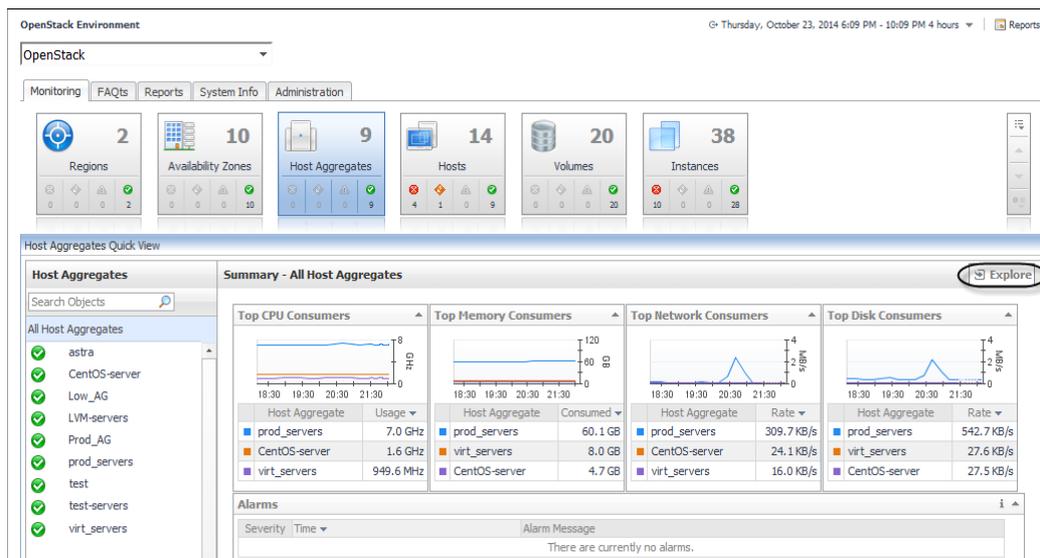
- [Quick View](#)
- [Exploring Regions](#)
- [Exploring Availability Zones](#)
- [Exploring Host Aggregates](#)
- [Exploring Hosts](#)
- [Exploring Instances](#)
- [Exploring Volumes](#)

Quick View

The default view is a summary of all configured objects of the chosen resource type.

After you select a infrastructure resource object in the left frame, the Explore link in the upper-right corner is enabled. Use the link to drill down to the OpenStack Explorer view of the object to see detailed information about the selected object. For more information, see [Using the OpenStack Explorer dashboard](#) on page 31.

Figure 14. Quick View: Explore button



For reference information on the Quick View, see [Quick View](#) on page 49.

Exploring Regions

When you click the **Regions** tile, a list of all configured regions and summary information for all the regions is shown in the Region Quick View. By default, All Regions is selected with charts showing the top CPU, memory, network, and storage consumers in the summary frame. A table of relevant alarms is also shown.

Selecting an individual region in the left frame refreshes the summary frame to display a list of related items along with spinners and graphs that show CPU Utilization, Network Usage, Memory Utilization, and Disk Throughput.

Click the **Explore** link in the upper right of the Quick View to go to the OpenStack Explorer **Summary** tab to see more detailed information about the selected region.

Clicking an object type in the **Related Items** view displays a list of related objects of that type along with their statuses.

Figure 15. Region Quick View



Exploring Availability Zones

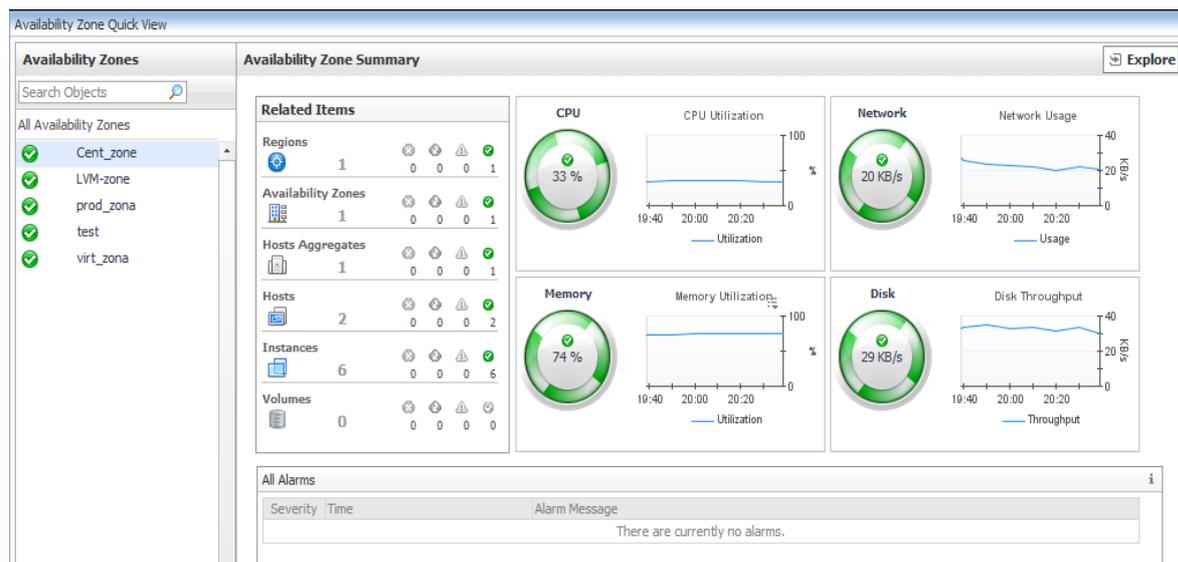
When you click the **Availability Zones** tile, a list of configured Availability Zones is displayed in the left frame. The default selection is All Availability Zones with the **Summary — All Availability Zones** frame displaying: Top CPU Consumers, Top Memory Consumers, Top Network Consumers, and Top Disk Consumers.

Selecting a particular Availability Zone in the left frame brings up an Availability Zone Summary in the main body of the Availability Zone Quick View. Displayed is a list of related items, a list of relevant alarms, and the CPU Utilization, Network Usage, Memory Utilization, and Disk Throughput for the chosen Availability Zone.

Click the **Explore** link on the upper right of the Quick View to view detailed information about the selected Availability Zone.

Clicking an object type in the **Related Items** view displays a list of related objects of that type along with their statuses.

Figure 16. Availability Zone Quick View



Exploring Host Aggregates

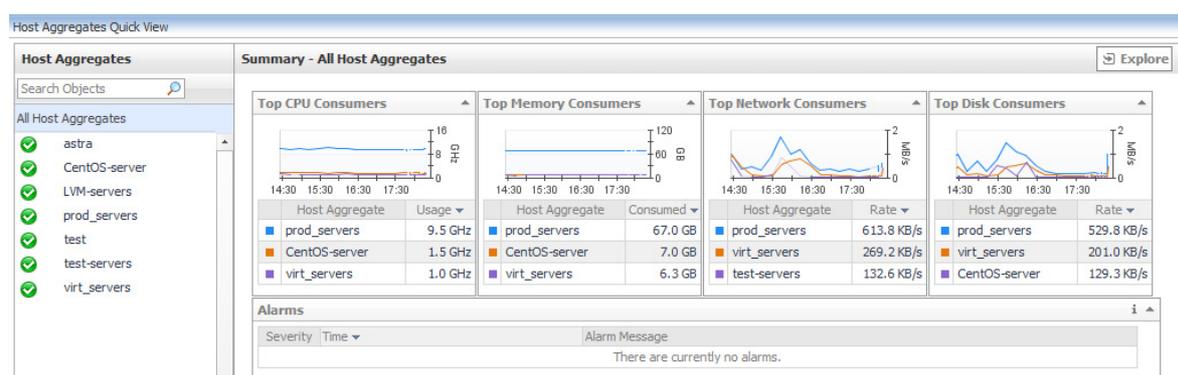
When you click the **Host Aggregates** tile, a list of configured Host Aggregates is displayed, with the default selection being All Host Aggregates. The **Summary — All Host Aggregates** frame shows the trends for each Host Aggregate.

Select a Host Aggregate to see a Host Aggregate summary in the main body of the Quick View. The summary displays a list of related items, a list of relevant alarms, and charts for CPU Utilization, Network Usage, Memory Utilization, and Disk Throughput.

Click the **Explore** link in the upper right of the Quick View to view detailed information about the selected Host Aggregate.

Clicking an object type in the **Related Items** view displays a list of related objects of that type along with their statuses.

Figure 17. Host Aggregates Quick View



Exploring Hosts

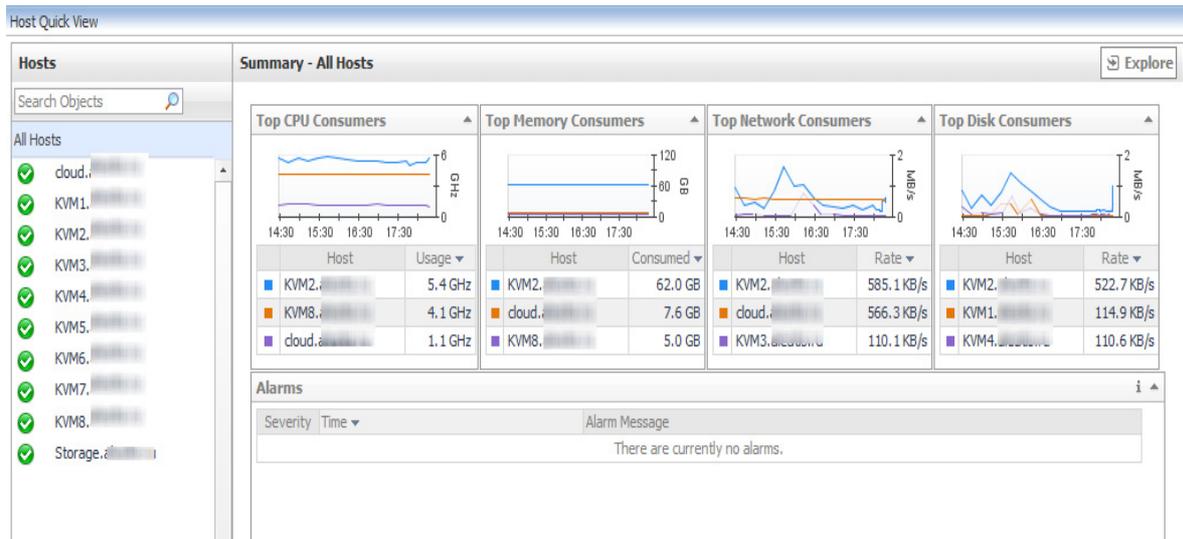
When you click the **Hosts** tab, a list of all configured hosts is displayed with their status. The default selection being All Hosts. The **Summary — All Hosts** frame displays a list of relevant alarms and a summary of the top CPU consumers, top memory consumers, top network consumers, and top disk consumers.

Select a host to see a Host Summary in the main body of the Quick View. The summary displays a list of related items, a list of relevant alarms, and charts for CPU Utilization, Network Usage, Memory Utilization, and Disk Throughput.

Click the **Explore** link in the upper right of the Quick View to view detailed information about the selected Host.

Clicking an object type in the **Related Items** view displays a list of related objects of that type along with their statuses.

Figure 18. Host Quick View



Exploring Instances

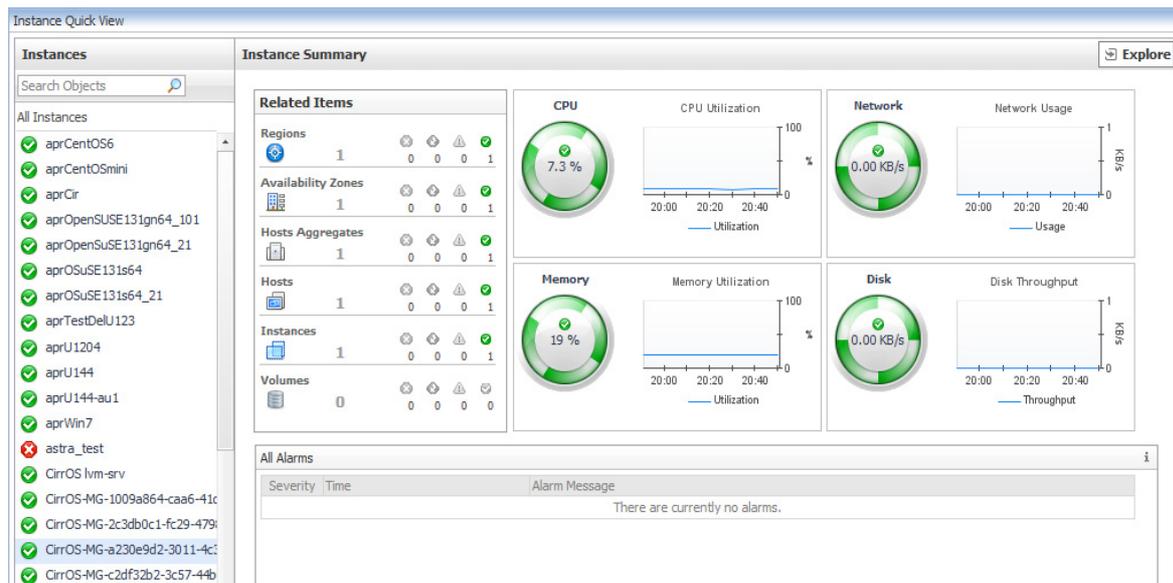
When you click the **Instances** tab, a list of all Instances is displayed, with the default selection being All Instances. The **Summary — All Instances** frame displays a list of relevant alarms and a summary of the top CPU consumers, top memory consumers, top network consumers, and top disk consumers.

Select an Instance to see an Instance summary in the main body of the Quick View. The summary displays a list of related items, a list of relevant alarms, and charts for CPU Utilization, Network Usage, Memory Utilization, and Disk Throughput.

Click the **Explore** in the upper right of the Quick View to view detailed information about the selected Instance.

Clicking an object type in the **Related Items** view displays a list of related objects of that type along with their statuses.

Figure 19. Instance Quick View



Exploring Volumes

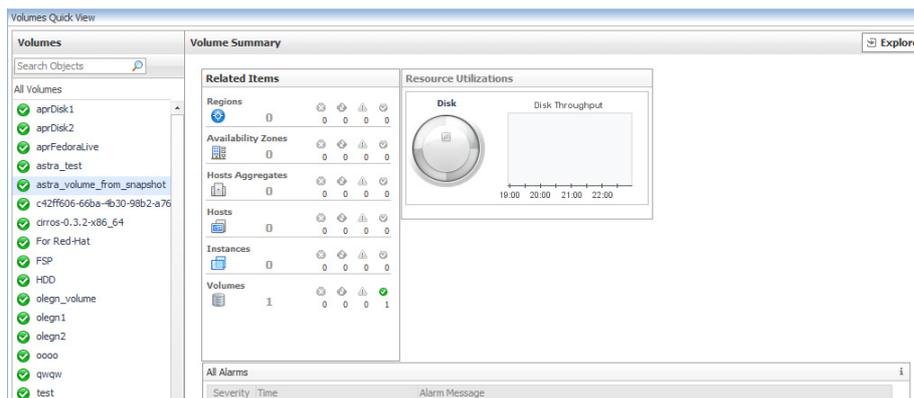
When you click the **Volumes** tab, a list of all volumes is displayed, with the default selection being All Volumes. The **Summary — All Volumes** frame displays a list of relevant alarms and a summary of the top disk consumers.

Select a Volume to see a Volume summary in the main body of the Quick View. The summary displays a list of related items, a list of relevant alarms, and a chart showing Resource Utilizations.

Click the **Explore** link in the upper right of the Quick View to view detailed information about the selected Instance.

Clicking an object type in the **Related Items** view displays a list of related objects of that type along with their statuses.

Figure 20. Volumes Quick View



Using the OpenStack Explorer dashboard

The OpenStack Explorer dashboard allows you to monitor a wide range of elements in your OpenStack infrastructure. It contains several informative views through which you can quickly and easily access detailed information about any of the available components (physical or virtual) within the infrastructure. The hierarchical interface includes drilldown capabilities that display various performance metrics and alarms within the virtual infrastructure.

To access the OpenStack Explorer dashboard:

- 1 Log in to the Foglight browser interface.
- 2 Ensure that the navigation panel is open.
- 3 Click **Dashboards > OpenStack > OpenStack Explorer**.

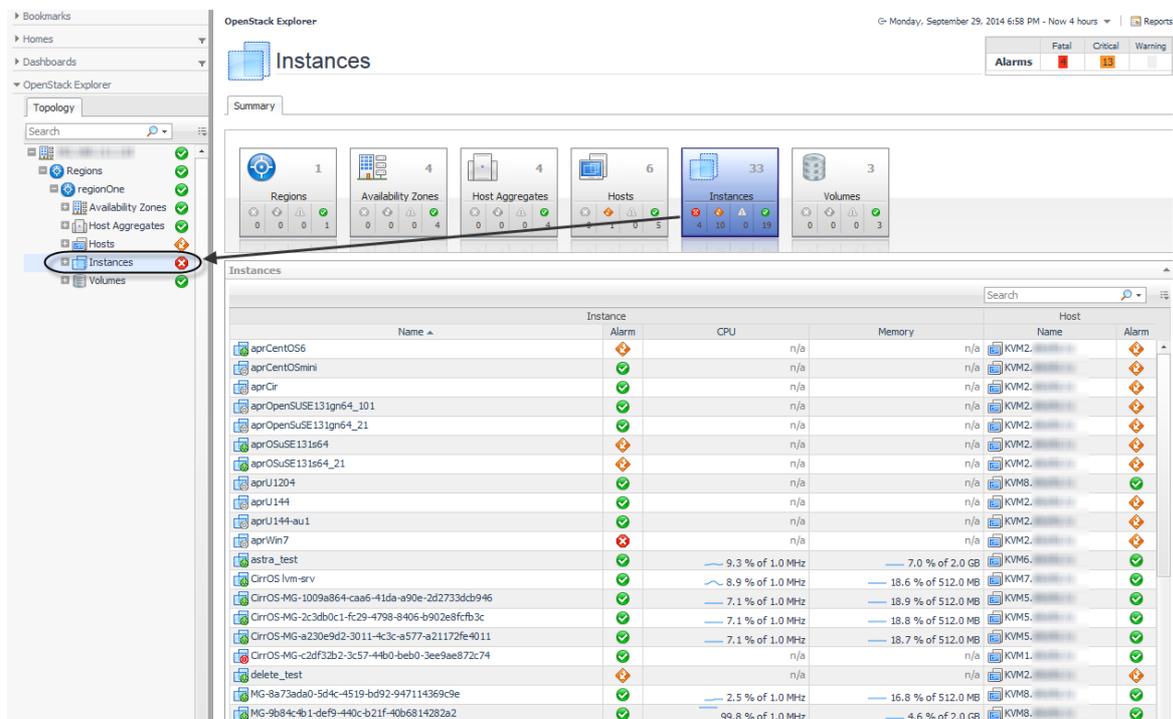
The OpenStack Explorer dashboard contains the following views: The **Topology** tab located in the navigation panel and the **OpenStack Explorer display area**. The tabs available on each view in the display area depends on the resource object or group of resource objects selected on the Topology tab. The **Summary** tab appears on all views.

Topology tab

The OpenStack Explorer topology view is located in the navigation panel below the Dashboards. The navigation tree on the **Topology** tab represents the various OpenStack infrastructure objects: Regions, Availability Zones, Host Aggregates, Hosts, Instances, and Volumes.

For each individual object or group of objects, a status indicator appears, showing the alarm of highest severity that is outstanding for the object or objects.

Figure 21. Topology view



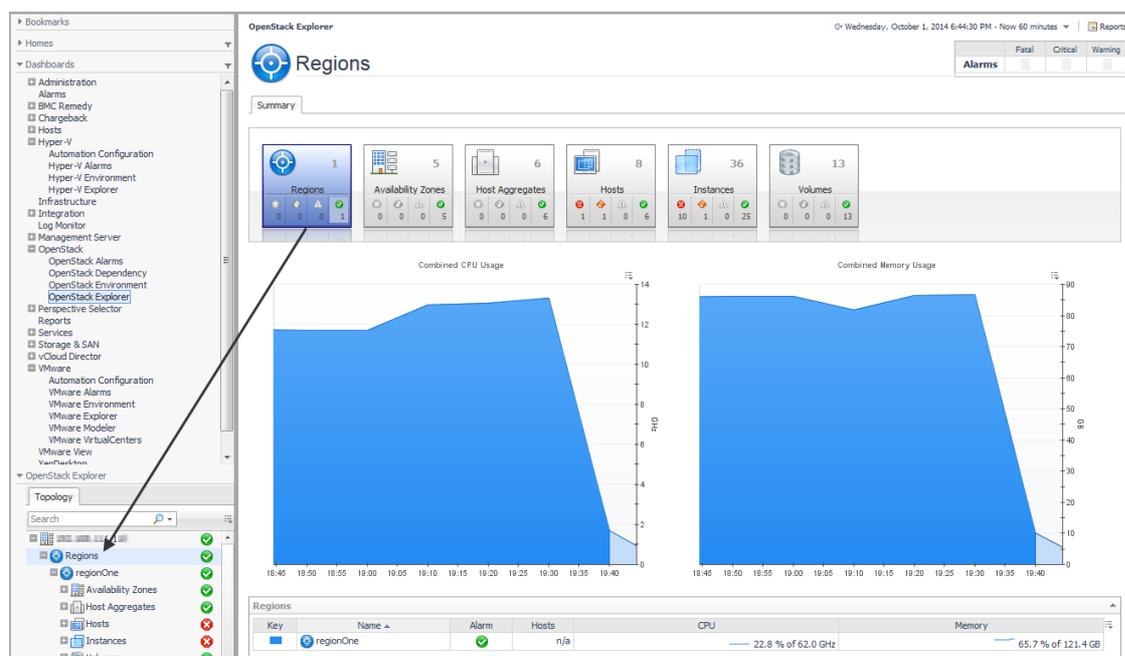
OpenStack Explorer display area

All OpenStack Explorer views contain a **Summary** tab with Foglight tiles that indicate the type of the selected object or objects, and the related alarm counts.

The display area changes in appearance and content, depending on the selected object or group of objects.

For example, if you select Regions from the Topology view, the **Summary** tab displays graphs and a table representative of all the configured regions.

Figure 22. OpenStack Explorer: All Regions view



Drilling down and selecting an individual region from the Topology tree displays a **Summary** tab and a **Performance** tab.

Figure 23. OpenStack Explorer: View showing data for a selected region



For reference information about the tabs and data appearing on the various OpenStack Explorer views, see [OpenStack Explorer Dashboard View](#) on page 46.

OpenStack Explorer reports

There are several predefined report templates included with Foglight for OpenStack. When you choose an object type or particular object instance in the Topology view, the **Reports** button on the top-right of the Foglight browser is populated with predefined reports. Run the reports to record data for analysis and sharing outside of Foglight.

The reports available when clicking the **Reports** button varies by resource object chosen. For a list of available predefined OpenStack report templates, see [Available report templates](#) on page 50.

Using the OpenStack Alarms dashboard

The OpenStack Alarms dashboard shows the alarms that have been triggered but not cleared. This dashboard can be used to isolate a specific alarm.

Figure 24. OpenStack Alarms dashboard



To access the OpenStack Alarms dashboard:

- 1 Log in to the Foglight browser interface.
- 2 Ensure that the navigation panel is open.
To open the navigation panel, click the right-facing arrow on the left.
- 3 On the navigation panel, under **Dashboards**, choose **OpenStack > OpenStack Alarms**.
The OpenStack Alarms dashboard appears in the display area.

Filtering Alarms

The OpenStack Alarms dashboard provides some filtering controls. Use the OpenStack Alarms dashboard to isolate alarms related to a specific bottleneck or issue in your OpenStack environment. The **Search box** appears in the top-right corner of the alarm list.

Type a text string and press ENTER. The list of alarms refreshes, showing only those alarms that match that filter.

For more advanced filtering, click the down-facing arrow, and in the list that appears, click **Advanced Search**. A dwell appears.

Figure 25. Advanced Search



To search on an alarm severity or rule name, or to combine different search criteria, update or add one or more rules in the **Match all the following rules area**.

Figure 26. Filtering rules



To remove a filter, click **Clear**. The list of alarms refreshes, showing all the generated alarms.

Using the OpenStack Dependency dashboard

The OpenStack Dependency dashboard view shows a navigation tree representing a simplified map of your monitored objects and pertinent alarm information. On the right of each object in the Infrastructure and Users views status indicators are displayed. Each status indicator represents the alarm of the highest severity that is generated against the object. For an object type container, the status indicator represents the alarm of highest severity that is outstanding for all objects of that type.

The information appearing in the OpenStack Dependency dashboard is organized into two tabs and a display area in the right frame:

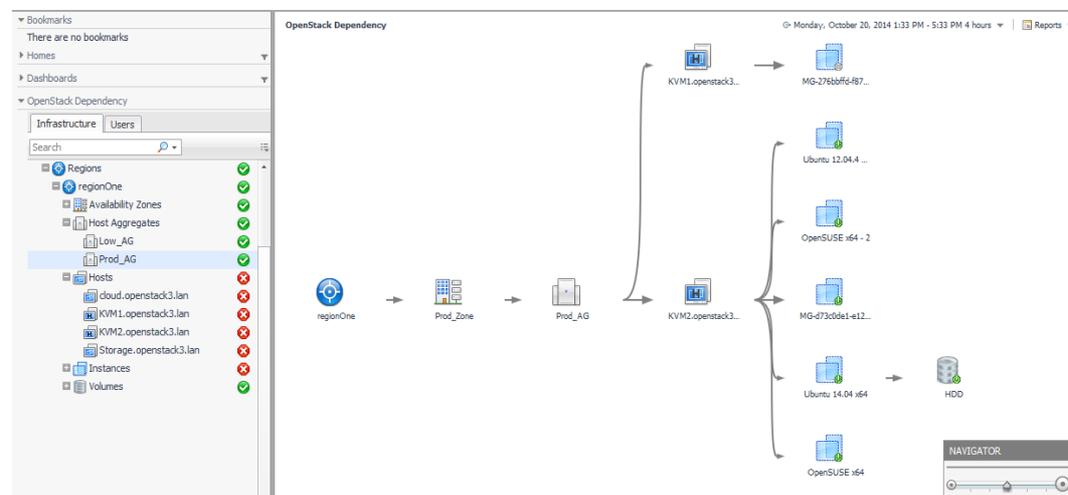
- [Infrastructure tab](#)
- [Users tab](#)
- [OpenStack Dependency map](#)

Infrastructure tab

On this tab, your monitored OpenStack environment appears as the root of the navigation tree, with all its Regions, Availability Zones, Host Aggregates, Hosts, Instances, and Volumes. This structure illustrates the hierarchy of monitored objects in your OpenStack infrastructure.

Use this view to quickly locate a desired object using the logical hierarchy within your Openstack infrastructure, and to explore any related dependencies.

Figure 27. OpenStack Dependency dashboard: Infrastructure tab



The Infrastructure tab allows you to quickly and easily see which hosts are running a hypervisor and which hosts are not. A host icon without the H identifier is not running a hypervisor. The H indicator  in a host icon identifies that host as running a hypervisor.

In the preceding dashboard, *KVM1* and *KVM2* are computer nodes running a hypervisor. *cloud* and *Storage* are controller nodes running scheduling and storage services respectively.

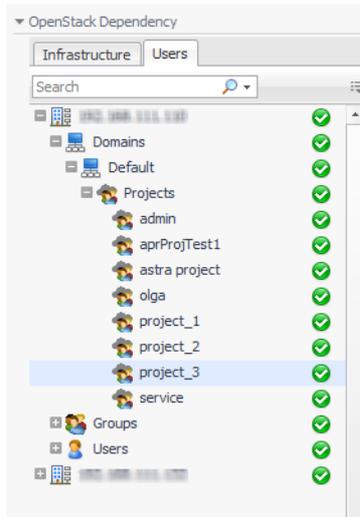
Users tab

The Users tab focuses on the relationships between containers and users. To open this tab, on the navigation panel, under OpenStack Dependency, click **Users**.

Like the [Infrastructure tab](#), this tab also displays the monitored OpenStack environment as the root of the navigation tree, showing Domains, Projects, Groups, and Users.

i | **NOTE:** Users can be associated with multiple projects with a specific role in each project.

Figure 28. Users tab



OpenStack Dependency map

The OpenStack Dependency dashboard displays a dependency map showing the selected object and any dependencies that it may have with other physical and virtual components in your monitored environment.

Click a Region, Availability Zone, or Host Aggregate object to view summary information. Clicking a Host, Instance, or Volume displays configuration information.

Figure 29. Pop-up displaying configuration information

The screenshot displays the OpenStack Dependency dashboard. At the top, it shows the title 'OpenStack Dependency', the date and time 'Thursday, October 23, 2014 5:29 PM - 9:29 PM 4 hours', and a 'Reports' dropdown menu. The main area contains a topological view of resources, including 'regionOne', 'Cent_zone', 'CentOS-server', 'KVM5.lakats.ru', and 'CirrOS-MG-a230e...'. A 'NAVIGATOR' slider is visible on the left side of the topological view. A pop-up window is open, displaying configuration information for the instance 'CirrOS-MG-a230e9d2-3011-4c3c-a577-a21172fe4011'.

CirrOS-MG-a230e9d2-3011-4c3c-a577-a21172fe4011	
Status	ACTIVE
Created	8/4/14 5:21 PM
Updated	8/25/14 10:22 AM
Launched	8/4/14 5:21 PM
Terminated	n/a
Access IP4	n/a
Access IP6	n/a
Metadata	n/a
IP Addresses	[10.0.0.10]
Host	KVM5.lakats.ru
User	admin
Project	admin
Image	CirrOS 0.3.1
Flavor	m1.t0s.1
Embedded Agent	false
VM State	active
Task State	n/a
Power State	1

Zoom in or out using the slider on the NAVIGATOR to reduce or enlarge the topological view. The NAVIGATOR can be dragged and positioned anywhere on the topological view.

Reference

Foglight for OpenStack includes the following views:

- [Action panel](#)
- [Agents view](#)
- [Alarm Analytics tab](#)
- [CPU tab](#)
- [FAQts tab](#)
- [Host](#)
- [Memory tab](#)
- [OpenStack Alarms dashboard view](#)
- [OpenStack Explorer Dashboard View](#)
- [Quick View](#)
- [Reports tab](#)
- [Resource Utilizations view](#)
- [Storage](#)
- [Summary tab](#)
- [Summary and Resource Information view](#)
- [System Info tab](#)
- [Topology tab](#)

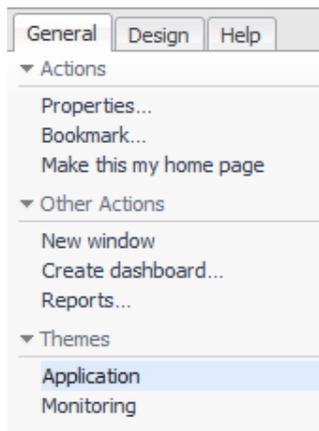
Action panel

The action panel is at the far right of the Foglight browser interface.

Purpose and content

The action panel provides you with easy access to several useful actions and tasks.

Figure 30. Action panel



Agents view

The Agents view is available on the OpenStack Environment dashboard. To find it, open the OpenStack Environment dashboard and click the **Administration** tab.

For more information about this dashboard, see [Using the OpenStack Environment dashboard](#) on page 13.

Purpose and content

The Agents view displays information on the various agent systems that are collecting and sending details to Foglight for OpenStack. This view can be used to verify that agents are properly reporting information at regular intervals to Foglight for OpenStack.

Each agent in the Agents view contains an alarm summary that shows you the number of alarms of each severity that are presently outstanding for the agent.

Alarm Analytics tab

This tab is available in the OpenStack Explorer. To find it, open the OpenStack Explorer and on the [Topology tab](#) that appears on the navigation panel, select a Host, Instance, or Volume. In the OpenStack Explorer, open the **Alarm Analytics** tab.

Purpose and content

The **Alarm Analytics** tab displays resource-related metrics collected about a Host, Instance, or Volume over a selected time period, and also shows any events that occurred during that time frame.

Figure 31. Alarm Analytics tab



Description of embedded views

This view is made up of the following embedded views:

- [Metrics Vs Related Alarms](#)
- [Source Object/Metric](#)
- [Alarms](#)

Metrics Vs Related Alarms

This view shows a chart with the utilization percentage or all values for one or more metric values selected in the Source Object/Metric view.

This view can give you a good idea on how the current resource consumption affects your environment as a whole. For example, a steady increase in memory consumption can trigger memory utilization alarms, which typically indicate that you need to allocate more memory to the affected Server.

Source Object/Metric

This view allows you to select the metrics that appear in the chart view on the right. Possible metric types include: CPU Metrics, Disk Metrics, Memory Metrics, and Network Metrics. For each metric type, you can display the values of a selected metric, or all metric values associated with that type.

For example, selecting Disk Metrics gives you an option of displaying Read Rate, Write Rate, Number Read, Number Write, Read Latency, Write Latency or All in the chart.

Alarms

This view allows you to add alarms as an overlay to the Metrics Vs. Related Events view, and correlate the resource consumption with the stability of your environment.

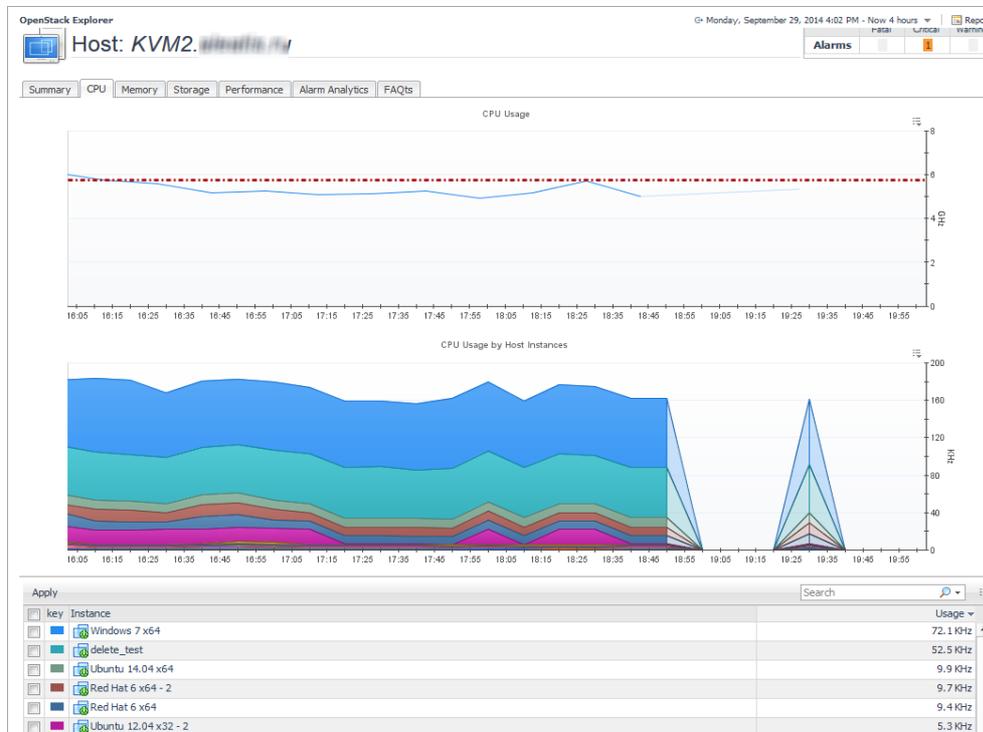
CPU tab

This tab is available in the OpenStack Explorer. To find it, open the OpenStack Explorer and on the [Topology tab](#) that appears on the navigation panel, select a host. In the OpenStack Explorer, open the **CPU** tab.

Purpose and content

The OpenStack Explorer's CPU tab displays the CPU Usage for the selected host and the CPU Usage by Host Instances.

Figure 32. CPU tab



Description of embedded views

This view is made up of the following embedded views:

- [CPU Usage](#)
- [CPU Usage by Host Instances](#)
- [Instances](#)

CPU Usage

This view displays the amount of CPU each host used during a selected time period.

CPU Usage by Host Instances

This view shows the amount of CPU the Host Instances used.

Instances

This view displays a list of all discovered Instances related to the selected host. The default view shows the combined CPU usage by all the instances on the selected host. The graph uses color to represent each instance. If you hover over a color on the graph, a pop-up identifies the instance associated with that color.

To drill down from the default combined view:

- 1 Select one or more check boxes.
- 2 Click the **Apply** button on the embedded view task bar.

Clicking the Instance name in the Instance column takes you to a summary view showing resource utilization and configuration information for that instance.

FAQs tab

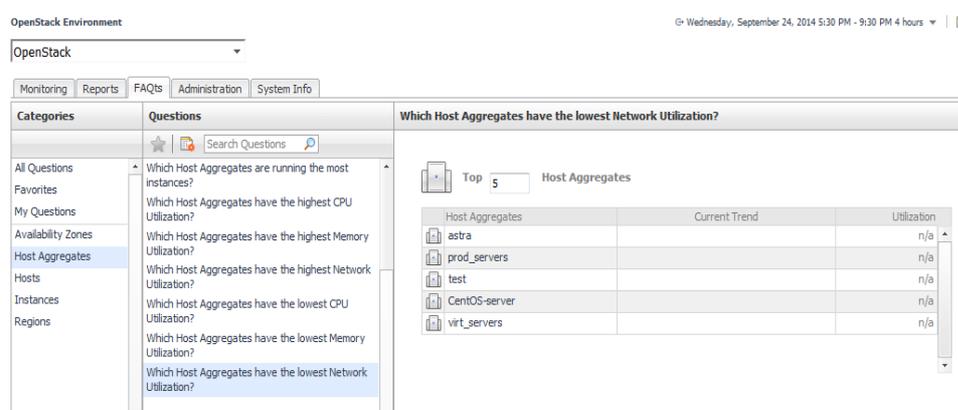
The FAQs tab is provided in the OpenStack Environment view through a navigation tab and is available for some particular object types in OpenStack Explorer.

In OpenStack Explorer, on the [Topology](#) tab, that appears on the navigation panel, select an availability zone or host.

Purpose and content

Through three embedded views (the Categories, Question, and Answer views), the FAQs view enables you to ask questions and provides the answers to those questions.

Figure 33. FAQs view



Description of embedded views

The FAQs view is made up of the following embedded views:

- [Categories](#)
- [Questions](#)
- [Answer](#)

Categories

This view lists the categories for which questions can be answered for you by Foglight for OpenStack.

Click a category in the list to select it.

Questions

This view lists the questions, for the category selected in [Categories](#), that can be answered for you by Foglight for OpenStack.

Click a question in the list to select it.

To mark a question as your favorite:

- Select the question that you want to mark as your favorite in the Questions view, and click **Mark as Favorite** .

i | **NOTE:** To see all your favorites, click **Favorites** in the *Categories* view.

To run a report based on selected questions:

- 1 Click **Create Report** .

The **Create Report** wizard appears.

- 2 Select the check boxes for the questions you want to add to your report and click **Finish**.

The report is displayed in the My Report dashboard.

i | **NOTE:** You can run or schedule a report. For more information, see the “Generating a Report” and “Scheduling a Report” topics in the *Foglight User Guide*.

If the list of questions is long and you want to narrow it down, search for a particular text string using the Search Questions field.

Answer

This view provides an answer to the question selected in the [Questions](#) view. The answer appears in the following form:

Top x *<objects of category>*...

where x is the number of objects of the category you provided in the [Categories](#) view.

Specify x by entering a number. The answer is relative to the subset of the infrastructure you are viewing in the dashboard. For example, the top five datastores are different for each individual cluster in the infrastructure.

When no objects in your environment match the selected question and the selected time range, no data is displayed in the Answers table. Extend the time interval by selecting a different option from the Time Range, or select a different question.

To view detailed information about one of the monitored hosts, click the hosts’s name in the table to drill down to the **Host_Name** dashboard in OpenStack Explorer.

Host

This embedded view is available in the OpenStack Explorer. To find it, open the OpenStack Explorer and from the Topology tree select an individual Region, Availability Zone, or Host Aggregate.

Shown in the Host table is a list of all related hosts.

Purpose

Shows a list of configured hosts related to the selected OpenStack group. Click an individual host name for detailed utilization and configuration information.

To drill down to an instance:

- 1 Click the name of a host in the Name column.

The view refreshes to display the following navigation tabs: Summary, CPU, Memory, Storage, Performance, Alarm Analytics, and FAQs. The embedded views vary by tab.

- 2 Click the name of an instance in the embedded Instances view on the **Summary** tab.

The view refreshes to display a summary of resource utilizations and the configuration information for the chosen instance.

Memory tab

This tab is available in the OpenStack Explorer. To find it, open the OpenStack Explorer and on the [Topology tab](#), that appears on the navigation panel, select a host instance. In the OpenStack Explorer, open the **Memory** tab.

Purpose and content

The OpenStack Explorer's **Memory** tab displays the combined memory consumed for a Host, showing the amount of memory each Instance that is running on that Host uses.

Figure 34. Memory tab



Description of embedded views

This view is made up of the following embedded views:

- [Memory Consumed](#)
- [Consumed Memory by Host Instances](#)
- [Instances](#)

Memory Consumed

This view displays the combined memory that all the Instances running on a Host during a selected time period uses.

Consumed Memory by Host Instances

This view shows the amounts of memory each Instance that is running on the Host during the selected time period consumes. The Consumed Memory by Host Instances graph uses color to represent each instance on the host. If you hover over a color on the graph, a pop-up identifies the instance associated with that color.

Instances

This view displays a list of all discovered Instances related to the selected host. The default view shows the combined CPU usage by all the instances on the selected host.

To drill down for detailed information on an individual instance:

- 1 Select one or more check boxes.
- 2 Click the **Apply** button on the embedded view task bar.

Clicking the Instance name in the Instance column takes you to a summary view showing resource utilization and configuration information for that instance.

OpenStack Alarms dashboard view

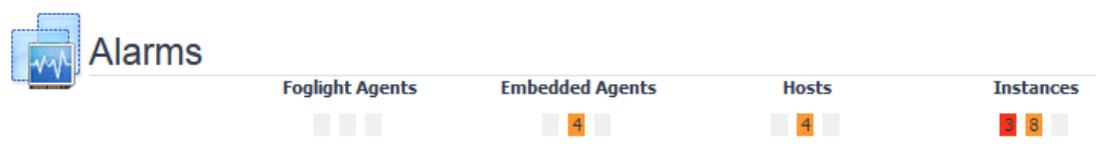
Alarms Overview

Purpose and content

The Alarms Overview groups the OpenStack alarms by object type and severity level. For monitoring alarms, use it as a starting point to quickly identify the sources of problems within the OpenStack infrastructure.

This view appears at the top of the OpenStack Alarms dashboard, preceding the [Alarms List view](#).

Figure 35. Alarms Overview



The alarm counts are the total number of alarms for each alarm type: Normal, Warning, Critical, and Fatal. You can drill down on any alarm count by clicking it. The **Alarms** dialog box appears with a list of all related alarms.

Alarms List view

Purpose and content

The Alarms List view shows all alarms fired in your OpenStack environment. For each alarm entry, the list shows the severity, the time the alarm was fired, the rule name that triggered the alarm, and the alarm message.

The Alarms List view appears on the OpenStack Alarms dashboard, just below the [Alarms Overview](#).

Figure 36. Alarms List view

Severity	Time	Rule Name	Alarm Message
3	10/3/14 12:03 PM	OpenStack Instance Memory Utilization	Memory utilization on instance "Ubuntu 12.04 x32 - 2" has reached 95% of the memory granted to it.
3	10/3/14 12:03 PM	OpenStack Instance Memory Utilization	Memory utilization on instance "Windows 7 x64" has reached 100% of the memory granted to it.
3	10/3/14 12:06 PM	Host Embedded Agent State	Embedded agent failed to inject to the host "KVM6.123456789", error: Authentication failed..

Description of the data displayed

Table 1. Alarms List fields

Data displayed	Description
Object indicator	Indicates which object type the alarm is related to.
Severity	Indicates the alarm severity: Warning, Critical, or Fatal.
Time	The time at which the alarm was generated.
Rule Name	The name of the rule that triggered the alarm.
Alarm Message	An explanation about why the alarm occurred.

Where to go next

Clicking an alarm's **Severity**, **Rule Name**, or **Alarm Message** displays the **Alarm Created** dialog box, showing additional information about the alarm.

Figure 37. Alarms Created dialog box

Alarm Created at 10/3/14 12:03 PM

Host	ubuntu 12.04 x32 - 2	Instance	null (OpenStackMemoryMetrics)
Agent	OpenStackAgent	Origin (By Rule)	OpenStack Instance Memory Utilization
Agent Type	OpenStackAgent	Default Drilldown	n/a

Message and Help

Memory utilization on instance "Ubuntu 12.04 x32 - 2" has reached 95% of the memory granted to it.
This rule detects high memory utilization on an instance

Has Service Level Impact on 2 Services

Service Name	SLC	
OpenStack		✘
Instance_Ubuntu 12.04 x32 - 2		✘

History | All Notes | Remediate

	Created Time	Sev	Dur	Ack'ed Info		Clearing Info		Notes
				Status	By User	Status	By	
⊙	10/3/14 12:03 PM	✘	4.2 d	Not Ack'ed		No		0

Acknowledge | Acknowledge Until Normal | Clear | Find Historic Occurrences | Cancel

Clicking an alarm's object indicator takes you to summary information for that particular resource object.

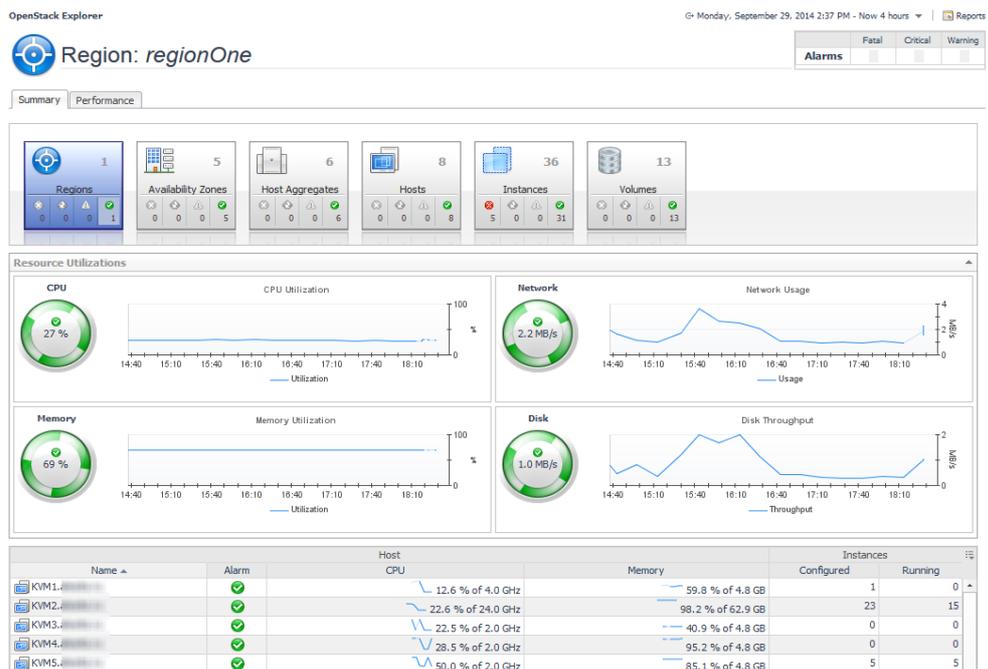
OpenStack Explorer Dashboard View

The OpenStack Explorer dashboard view takes up the entire display panel of the browser interface. For more information about the OpenStack Explorer dashboard, see [Using the OpenStack Explorer dashboard](#) on page 31.

Purpose

The OpenStack Explorer dashboard view is the most content-intensive view in Foglight for OpenStack. It provides access to summary (of alarms and resource utilizations) information for the object being viewed in the OpenStack Explorer dashboard.

Figure 38. OpenStack Explorer dashboard view



Content and embedded views

The metrics and the amount of detail displayed in each view varies depending on the resource object or group of objects you select on the **Topology** tab.

The OpenStack Explorer heading, at the top of the OpenStack Explorer dashboard view, consists of three main components:

- An icon and text that specify the type of selected object or group of objects.
- An alarm summary for the selected object.
- Navigation tabs.

The alarm summary at the right of the view heading shows you the number of alarms at each severity level that are outstanding for the selected object. When you click an alarm count, you get a pop-up that lists the active alarms for the object.

Navigation tabs are located immediately below the selected resource object's name. Click these tabs to see valuable information about the object being viewed.

Foglight tiles display information about the cloud infrastructure and the alarms currently active for the entities in the OpenStack infrastructure. For more information on Foglight tiles, see [Foglight tiles](#) on page 10.

For information the various tabs available in OpenStack Explorer, see the following:

- [Alarm Analytics tab](#)
- [CPU tab](#)
- [FAQs tab](#)
- [Memory tab](#)
- [Performance tab](#)
- [Resource Utilizations view](#)
- [Storage](#)
- [Summary tab](#)
- [Summary and Resource Information view](#)

- [Topology tab](#)

Performance tab

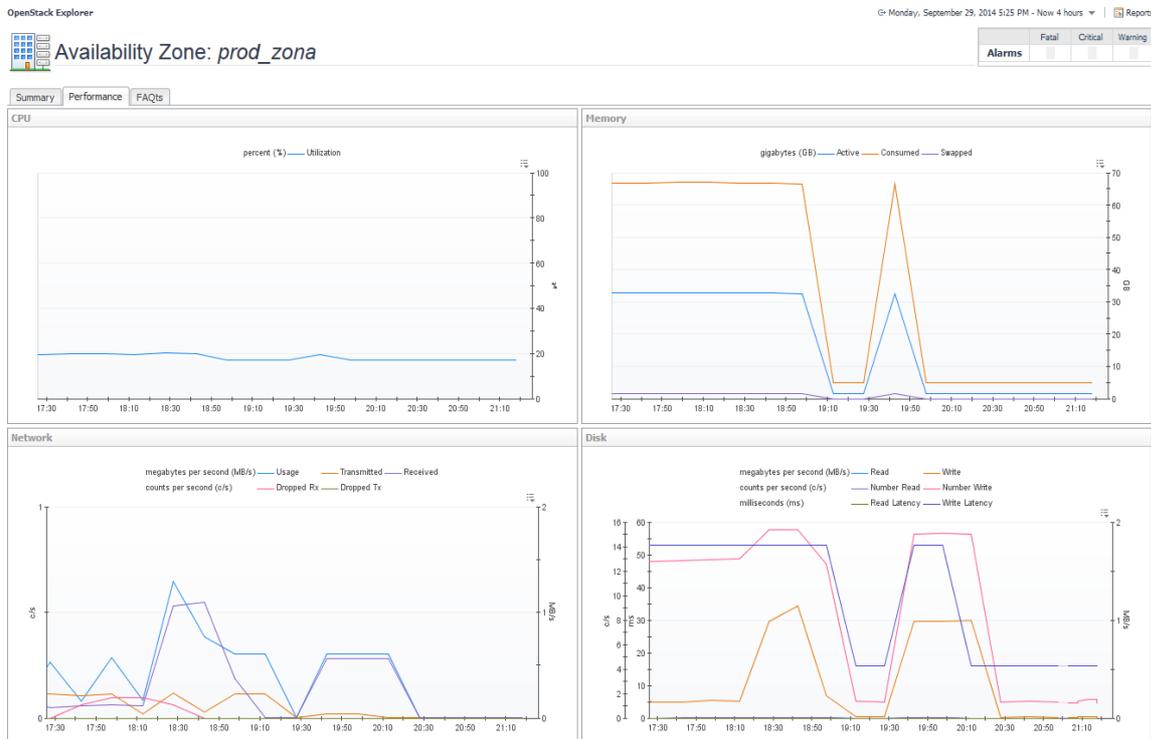
This tab is available when the OpenStack Explorer is open. To find it, on the [Topology tab](#) on the navigation panel, select any configured object of type Region, Availability Zone, Host Aggregate, Host, Instance, or Volume. In the OpenStack Explorer, open the **Performance** tab.

NOTE: The **Performance** tab for Volume contains one embedded view, Volume Usage.

Purpose and content

This tab displays the resource utilization for the selected object or group of objects over a selected time.

Figure 39. Availability Zone: Performance tab



Description of embedded views

This tab is made up of the following embedded views:

- [CPU](#)
- [Memory](#)
- [Network](#)
- [Disk](#)
- [Volume Usage](#)

CPU

This view shows the CPU Utilization summary for the selected component based on the total capacity of CPU % used during a selected time period.

Memory

This view shows the physical memory utilization summary for the selected component. The summary includes the amounts of memory that is swapped to disk, actively used, and consumed, all during a selected time period.

Network

This view shows the network utilization summary for the selected component. The summary includes the average rate of network throughput, the amounts of data sent to and received from the network, and the amount of data dropped, all during a selected time period.

Disk

This view shows the disk utilization summary for the specified host. The summary includes the rates of data that is read from or written to the disk, the number of reads or writes per second, and the read or write latency in milliseconds, during a selected time period.

Volume Usage

This view shows the usage statistics for the selected volume.

NOTE: This view only appears when you are exploring Volume details.

Quick View

The Quick View appears in the middle of the **Monitoring** tab on the OpenStack Environment dashboard. For more information about this dashboard, see [Using the OpenStack Environment dashboard](#) on page 13.

Purpose and content

The Quick View displays a list of objects associated with the selected resource object and summary information about the object or group of objects you select.

Figure 40. OpenStack Environment Monitoring tab: Quick View



The Quick View is made up of the following embedded views:

- **Resource object list view:** displays the list of objects associated with the selected resource.
- **FAQts view:** displays the list of questions relevant to the selected resource.

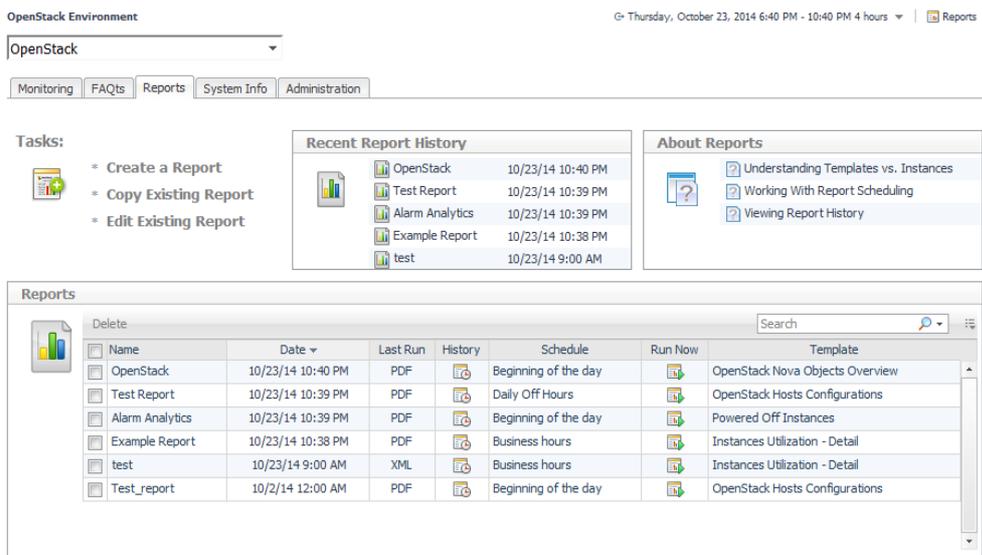
- **Summary view:** displays a summary of relevant information related to the selected resource object or group of objects.
 - **NOTE:** The information displayed on the summary view varies depending on whether you select one resource object or a group of resource objects. The view for a group of resource objects displays graphs and tables showing Top CPU Consumers, Top Memory Consumers, Top Network Consumers, and Top Disk Consumers. The view for one resource object shows a list of related items and CPU Utilization, Memory Utilization, Network Usage, and Disk Throughput.
 - **NOTE:** The default view for All Volumes shows Top Disk Consumers. The summary view for a volume displays a list of related items and a graph showing disk throughput.
- **Alarms view:** displays a list of alarms and when they were raised.

Reports tab

This tab is available in the OpenStack Environment view through a navigation tab. The display provides a convenient and easy-to-use dashboard with which to create reports, keep a track of past reports, reuse reports and edit reports.

Predefined report templates are included with Foglight for OpenStack.

Figure 41. Reports tab



For more information about the Reports dashboard, see the *Foglight User Help*.

Available report templates

The following templates are available with Foglight for OpenStack.

Table 2. Predefined reports

Report Template Name	This template can be used to generate a report that...
Instances Utilization — Detail	Shows the top N and bottom N OpenStack Instances based on: <ul style="list-style-type: none"> • CPU-used Hz • CPU percent ready • Memory consumed • Disk growth rate • Disk transfer rate • Network transfer rate over a user-specified time range The value of N is also user-specified. The report considers only the OpenStack Instances in the service specified.
Instances Utilization — Summary	Shows the top N and bottom N OpenStack Instances based on: <ul style="list-style-type: none"> • CPU-used Hz • CPU percent ready • Memory consumed • Disk growth rate • Disk transfer rate • Network transfer rate over a user-specified time range. The value of N is also user-specified. The report considers only the OpenStack Instances in the service specified.
OpenStack Alarms Overview	Reports on all the open snapshots for each virtual machine in the specified service. Open snapshots have no child snapshots.
OpenStack Host Capacity and Performance — Detail	Summarizes your virtual infrastructure, so that you can be sure that you are in compliance with the Foglight for Virtualization, Enterprise Edition license.
OpenStack Host Capacity and Performance — Summary	Summarizes your virtual infrastructure, so that you can be sure that you are in compliance with the Foglight for Virtualization, Enterprise Edition license.
OpenStack Hosts Configurations	Summarizes your virtual infrastructure, so that you can be sure that you are in compliance with the Foglight for Virtualization, Enterprise Edition license.
OpenStack Keystone Objects Overview	Summarizes your virtual infrastructure, so that you can be sure that you are in compliance with the Foglight for Virtualization, Enterprise Edition license.
Powered off Instances	Lists the powered off virtual instances in the specified service.
Service Alarm Summary by OpenStack Object Type	Contains the alarm (or event) history for the selected Service.
Virtual Infrastructure Alarm Summary	Contains the alarm (or event) history for the selected Service.

Resource Utilizations view

Purpose

The Resource Utilizations view, typically located across the center of the Quick View display area, provides numerical and graphical representations of performance data associated with a chosen resource objects. To find it,

open the OpenStack Explorer and on the [Topology tab](#) select the name of a particular resource from the resource object list in the left frame.

For example, selecting a particular Host Aggregate from the [Topology tab](#) and opening the Performance tab in the display area, displays four graphs in the Resource Utilizations view. The graphs depict CPU, memory, disk, and network resource utilizations for the selected Host Aggregate.

On the **Summary** tab, clicking a graph or a spinner shows a larger view of the graph with descriptive text about each metric appearing in the graph.

Storage

This tab is available in the OpenStack Explorer. To find it, open the OpenStack Explorer and on the [Topology tab](#), that appears on the navigation panel, select a host or an Instance.

The tables displayed vary according to whether you selected a host or an instance.

Figure 42. Storage tab: Host view

Name	Status	Type	Capacity	Free Space	Disk Throughput	URL
dm-0	✓	LOCAL	9.6 GB	47 MB	19.3 B/s	ds:///
sda1	✓	LOCAL	228 MB	162 MB	0.0 KB/s	ds:///boot

Figure 43. Storage tab: Instance view

Name	Status	Connected	Capacity	Disk Throughput	Instance Device	Host Path	Type
virto-disk0	✓	true	20		vda	/var/lib/nova/instances/c6a56c17-9dd0-4f06-a914-d8346906f2f1/disk	Local

Purpose and content

The **Storage** tab displays a list of all mounted datastores on a Host or a list of all virtual disks associated with a particular Instance.

Summary tab

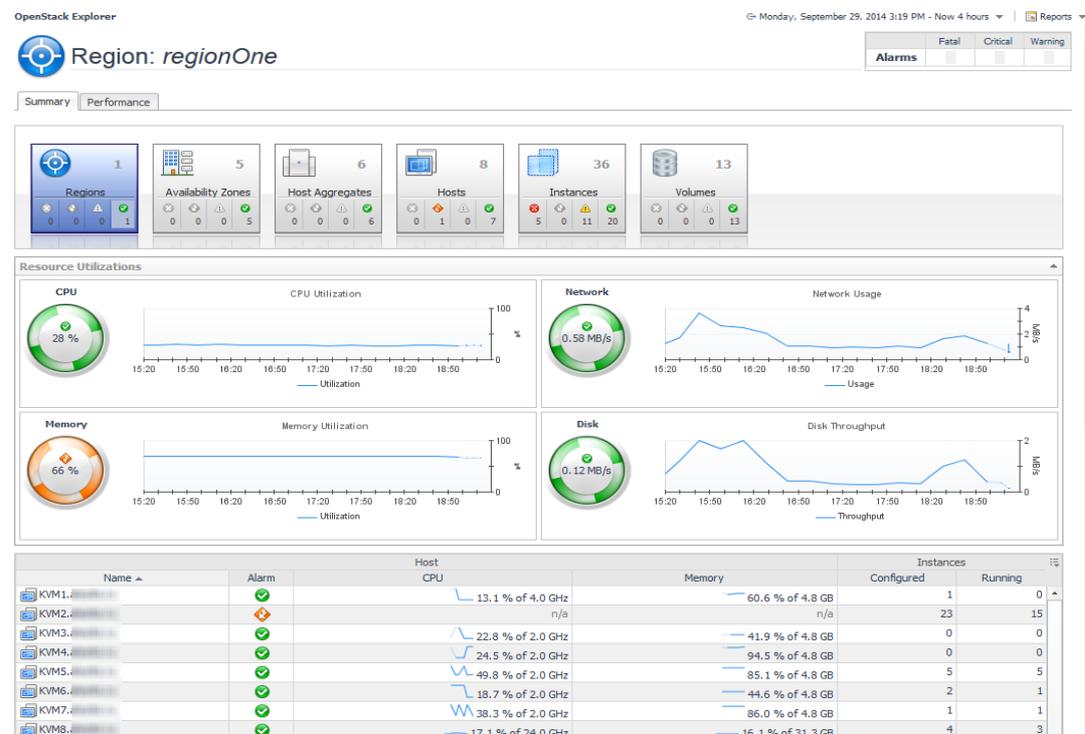
The **Summary** tab is available on OpenStack Explorer and appears on all views regardless of the resource object or group of objects chosen.

For more information about using the OpenStack Explorer dashboard, see [Using the OpenStack Explorer dashboard](#) on page 31.

Purpose and content

The **Summary** tab displays your OpenStack infrastructure resource objects.

Figure 44. OpenStack Explorer Summary tab



Each tile shows how many of the corresponding object types there are and the count of objects of that type in each of the alarm states (normal, warning, critical, fatal).

More detailed information for selected objects is displayed in collapsible views below the Summary tab.

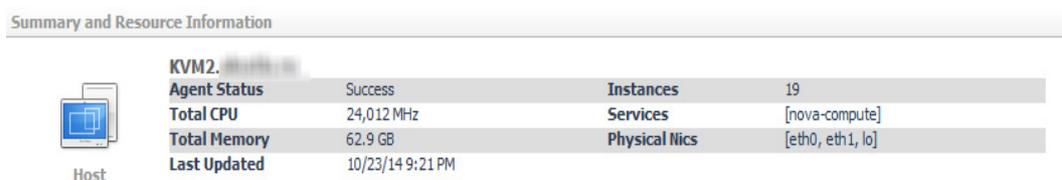
On a tile, click the object type icon, the name, or the count, to view a pop-up that lists all objects of the corresponding type, along with their respective states. Click a column header on the pop-up to change the sort order. Click an object in the pop-up list to view details for that object in the OpenStack Explorer dashboard.

If an alarm state has a count of zero, then you cannot select that alarm state. If you click a normal state icon or count, the OpenStack Explorer page refreshes. No alarms are associated with the normal state.

Summary and Resource Information view

This view is available in the OpenStack Explorer display area. To find it, open the OpenStack Explorer and on the Topology tree on the navigation panel, select an individual Host, Instance, or Volume. In the OpenStack Explorer, open the **Summary** tab.

Figure 45. Summary and Resource Information view



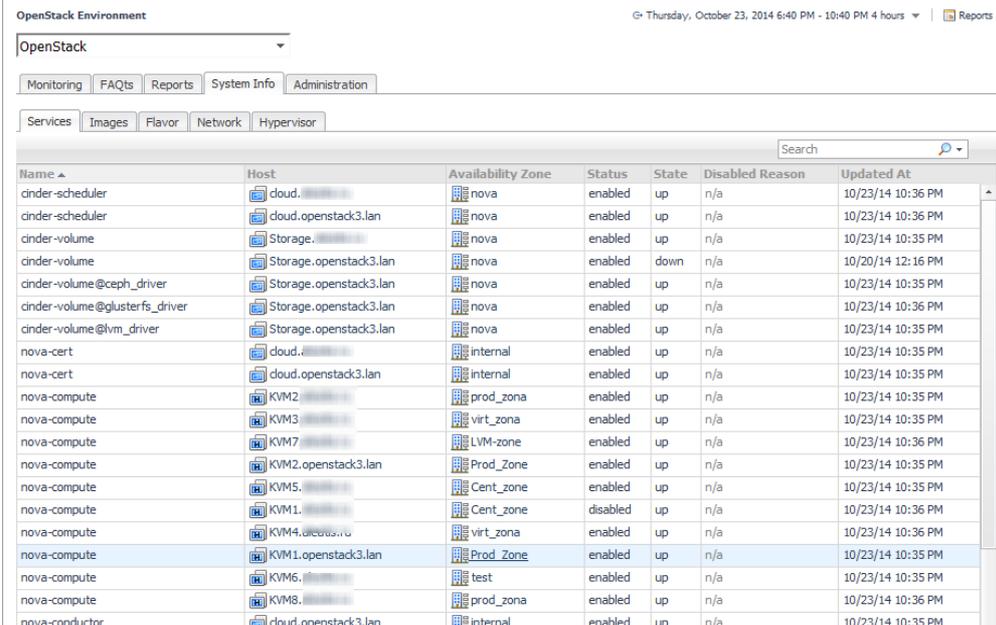
Purpose

The Summary and Resource Information view shows configuration details for the selected Host, Instance, or Volume.

System Info tab

This tab is available on the OpenStack Environment dashboard.

Figure 46. Summary Info tab with sub-tabs



Name	Host	Availability Zone	Status	State	Disabled Reason	Updated At
cinder-scheduler	cloud.openstack3.lan	nova	enabled	up	n/a	10/23/14 10:36 PM
cinder-scheduler	cloud.openstack3.lan	nova	enabled	up	n/a	10/23/14 10:36 PM
cinder-volume	Storage.openstack3.lan	nova	enabled	up	n/a	10/23/14 10:35 PM
cinder-volume	Storage.openstack3.lan	nova	enabled	down	n/a	10/20/14 12:16 PM
cinder-volume@ceph_driver	Storage.openstack3.lan	nova	enabled	up	n/a	10/23/14 10:35 PM
cinder-volume@glusterfs_driver	Storage.openstack3.lan	nova	enabled	up	n/a	10/23/14 10:36 PM
cinder-volume@vm_driver	Storage.openstack3.lan	nova	enabled	up	n/a	10/23/14 10:35 PM
nova-cert	cloud.openstack3.lan	internal	enabled	up	n/a	10/23/14 10:35 PM
nova-cert	cloud.openstack3.lan	internal	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM2.openstack3.lan	prod_zone	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM3.openstack3.lan	virt_zone	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM7.openstack3.lan	LVM_zone	enabled	up	n/a	10/23/14 10:36 PM
nova-compute	KVM2.openstack3.lan	Prod_Zone	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM5.openstack3.lan	Cent_zone	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM1.openstack3.lan	Cent_zone	disabled	up	n/a	10/23/14 10:36 PM
nova-compute	KVM4.openstack3.lan	virt_zone	enabled	up	n/a	10/23/14 10:36 PM
nova-compute	KVM1.openstack3.lan	Prod_Zone	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM6.openstack3.lan	test	enabled	up	n/a	10/23/14 10:35 PM
nova-compute	KVM8.openstack3.lan	prod_zone	enabled	up	n/a	10/23/14 10:36 PM
nova-conductor	cloud.openstack3.lan	internal	enabled	up	n/a	10/23/14 10:35 PM

Purpose and content

Displays summary data for the following OpenStack entities: Services, Images, Flavors, Networks, and Hypervisors.

Description of embedded views

The System Info tab is made up of the following embedded views:

- [Services](#)
- [Images](#)
- [Flavor](#)
- [Network](#)
- [Hypervisor](#)

Services

This view displays a list of OpenStack services running on different hosts.

The table includes the following fields:

- **Name** — the name of a service installed on the OpenStack system.
- **Host** — the node on which the service is installed.

- **Availability Zone** — the location where the node resides.
- **Status** — indicates if the service is enabled.
- **State** — indicates if the service is running.
- **Disabled Reason** — provides a description of why a service is disabled.
- **Updated at** — provides the time the configuration information was last refreshed.

Images

This view displays the total number of image templates available for virtual machine file systems.

The table includes the following fields:

- **Name** — the name of the image.
- **Size** — the size of image data, in gigabytes.
- **Visibility** — indicates if the image is accessible to all members of a project.
- **Min Disk** — the minimum size of the disk needed to boot the image, in gigabytes.
- **Min Ram** — the minimum amount of RAM needed to boot the image, in megabytes.
- **Description** — is a brief description of the image.

You can choose which columns to view by clicking the arrow in the upper right corner of the table and selecting which columns you want to see.

Flavor

This view displays the total number of flavors available identifying them by name. The table shows the amount of RAM, how many virtual CPUs an instance has, and the disk size.

When starting an instance, a set of virtual resources known as a flavor must be selected. Flavors define how many virtual CPUs an instance has, the amount of RAM and disk sizes.

The table includes the following fields:

- **Name** — name of an individual flavor.
- **RAM** — virtual machine memory in megabytes.
- **vCpus** — number of virtual CPUs presented to the instance.
- **Swap** — optional swap space allocation for the instance.
- **rxtxFactor** — optional property that allows created servers to have a different bandwidth cap from that defined in the network.

i | **NOTE:** The default value of 1 is the same as the attached network.1

- **Disk** — Virtual root disk size in gigabytes.
- **Disabled** — Default value is *false*.
- **Public** — whether a flavor is available to all users or private with `True` being the default.
- **Ephemeral** — the size of a secondary ephemeral data disk that exists only for the life of the instance.
- **ExtraSpec** — additional optional restrictions on which compute nodes the flavor can run on.

Network

This view displays the total number of network configurations for the OpenStack system.

The table includes the following fields:

- **Name** — network name.
- **Status** — indicates if the network is operational.

- **Subnets** — subnets associated with the network.
- **PhysicalNetwork** — the name of the physical network.
- **AdminStateUp** — the administrative state of a port.
 - **i** | **NOTE:** `false` indicates that the port is not forwarding packets.
- **Project** — project to which the network is associated.
- **NetworkType** — the default network provider type and the only type of network projects are able to create.
- **External** — indicates if the network is public or private.
- **Shared** — whether any project can access the network resource.
- **SegmentationId** — identifies an isolated segment on the physical network.

Hypervisor

This view displays the total number of hypervisors.

The table consists of the following fields:

- **Hypervisor Type** — the type of hypervisor running on a host.
- **Host** — the host running the hypervisor.
- **Node Name** — name of the hypervisor node.
- **Node Ip** — hypervisor's IP, available for "Icehouse" and higher versions of OpenStack.
- **Hypervisor Version** — the version of the hypervisor running on a host.
- **VCPUs** — the total number of virtual central processing units (VCPUs).
- **RAM** — hypervisor's RAM.
- **Storage** — hypervisor's local storage capacity.

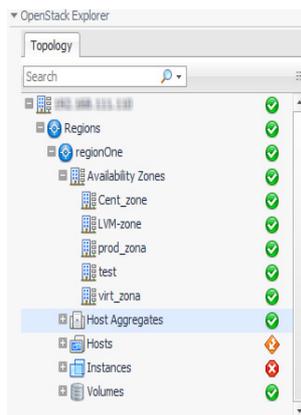
Topology tab

The Topology tab is located in the navigational panel at the left of the Foglight browser interface, under dashboards. For more information about the OpenStack Explorer dashboard, see [Using the OpenStack Explorer dashboard](#) on page 31.

Purpose

The Topology tab provides an organized view of the various OpenStack objects that agents are monitoring. It serves as a navigation tool, and it also presents pertinent alarm information.

Figure 47. Topology tab



When you select an object from the **Topology** tab, all the views in the OpenStack Explorer dashboard are updated with information pertaining to that object.

The topological view is organized into a tree using object type (or topology type) containers for branches.

The top-level objects in the topological view are always the Regions.

Each Region in the Topology view contains those objects in the OpenStack Infrastructure that are related to that particular Region.

Table 3. Topology view object icons

Icon	Object
	Regions
	Availability Zones
	Host Aggregates
	Hosts not running a hypervisor
	Hosts running a hypervisor
	Instances
	Volumes

At the right, the Topology view displays status indicators. For an individual object, the status indicator represents the alarm of highest severity that is outstanding for that object. For an object type container, the status indicator represents the alarm of highest severity that is outstanding for all the objects of that type.

We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation™.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece—you—to the community, to the new Quest.

Contacting Quest

For sales or other inquiries, visit <https://www.quest.com/company/contact-us.aspx> or call +1-949-754-8000.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.
- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
- Chat with support engineers online.
- View services to assist you with your product.