Monitoring Pure Storage

Pure Storage PowerPack version 103

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Chapter 1

Introduction

Overview

This manual describes how to monitor Pure Storage FlashArrays in SL1 using the *Pure Storage* PowerPack.

The following sections provide an overview of Pure Storage FlashArrays and the *Pure Storage* PowerPack:

This chapter covers the following topics:

What is Pure Storage? 3

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What is Pure Storage?

Pure Storage is a Flash-based storage solution provider. Its FlashArray solution provides multi-level cell, high-performance Flash memory for applications such as server virtualization, desktop virtualization, database systems, and cloud computing.

What Does the Pure Storage PowerPack Monitor?

The *Pure Storage* PowerPack includes:

- Dynamic Applications to discover and collect configuration and performance data for Pure Storage FlashArrays and component devices
- Device Classes for each of the Pure Storage devices monitored
- Event Policies and corresponding alerts that are triggered when Pure Storage devices meet certain status criteria
- A sample Credential for discovering Pure Storage devices
- Dashboards that display information about Pure Storage devices

Installing the Pure Storage PowerPack

Before completing the steps in this manual , you must import and install the latest version of the *Pure Storage* PowerPack.

TIP: By default, installing a new version of a PowerPack overwrites all content from a previous version of that PowerPack that has already been installed on the target system. You can use the ***Enable Selective PowerPack Field Protection*** setting in the **Behavior Settings** page (System > Settings > Behavior) to prevent new PowerPacks from overwriting local changes for some commonly customized fields. (For more information, see the ***System Administration*** manual.)

To download and install the PowerPack:

1. Search for and download the PowerPack from the **PowerPacks** page (Product Downloads > PowerPacks & SyncPacks) at the ScienceLogic Support Site.
2. In SL1, go to the **PowerPacks** page (System > Manage > PowerPacks).
3. Click the **[Actions]** button and choose *Import PowerPack*. The **Import PowerPack** dialog box appears.
4. Click **[Browse]** and navigate to the PowerPack file from step 1.
5. Select the PowerPack file and click **[Import]**. The **PowerPack Installer** modal displays a list of the PowerPack contents.
6. Click **[Install]**. The PowerPack is added to the **PowerPacks** page.

NOTE: If you exit the **PowerPack Installer** modal without installing the imported PowerPack, the imported PowerPack will not appear in the **PowerPacks** page. However, the imported PowerPack will appear in the **Imported PowerPacks** modal. This page appears when you click the **[Actions]** menu and select *Install PowerPack*.

Chapter 2

Configuration and Discovery

Overview

The following sections describe how to configure and discover Pure Storage FlashArrays and their component devices for monitoring by SL1 using the *Pure Storage* PowerPack:

This chapter covers the following topics:

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Testing TCP Port Connectivity 6
Configuring a Pure Storage Credential 6
Discovering Pure Storage Components 8
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Generating a Pure Storage API Token

The *Pure Storage* PowerPack uses the Pure Storage REST API for collecting configuration and performance data. The Pure API uses port 443; therefore, you must have access to that port. You must also use an API Token, which you can create on the Pure FlashArray and then copy into the ***Basic/Snippet credential*** you create that enables SL1 to discover and monitor the FlashArray.

There are two ways to create the API Token:

- Generate the API token through the Purity user interface (System > Users > Create API Token)
- Generate the API token through the Purity command line interface (`pureadmin create --api-token`)

You can also view existing API tokens in the Purity user interface by navigating to System > Users > API Tokens, clicking the gear icon next to the username, and then selecting *Show API Token*.

After the API Token has been generated, copy and save it for use in the credential.

Testing TCP Port Connectivity

The Pure Storage REST API service runs on TCP port 443 from the primary IP address assigned to the Pure FlashArray. This IP address should be the same one used to access the Purity user interface. To enable SL1 to communicate with the Pure API, your ScienceLogic Data Collector or All-In-One Appliance must have access to TCP port 443.

To test TCP port connectivity, log in to the command line interface of your Data Collector or All-In-One Appliance as the root user and type the following command:

```
nmap -p 443 10.1.1.10

```

If TCP port 443 is open, the following message displays:

```
Starting Nmap 5.51 ( http://nmap.org ) at 2015-10-01 18:42 UTC

Nmap scan report for purestorage-001.mydomain.net (204.110.219.37)

Host is up (0.027s latency).

PORT    STATE SERVICE

443/tcp open  https

Nmap done: 1 IP address (1 host up) scanned in 0.36 seconds

```

If the port does not appear, or it appears with the state of "filtered", check your firewall settings. If there is a firewall between the ScienceLogic Data Collector or All-In-One Appliance and the Pure Storage REST API, ensure that it can communicate over TCP port 443.

Configuring a Pure Storage Credential

To configure SL1 to monitor Pure Storage, you must first create a Basic/Snippet credential that allows the Dynamic Applications in the *Pure Storage* PowerPack to connect with the Pure Storage FlashArray. An example Basic/Snippet credential that you can edit for your own use is included in the *Pure Storage* PowerPack.

To create a Basic/Snippet credential to access Docker hosts and swarms:

1. Go to the **Credentials** page (Manage > Credentials).
2. Locate the example **Pure Storage Example** credential, click its **[Actions]** icon (⋯) and select ***Duplicate***. A copy of the credential, called **Pure Storage Example copy** appears.
3. Click the **[Actions]** icon (⋯) for the **Pure Storage Example copy** credential and select ***Edit***. The **Edit Credential** page appears:

4. Supply values in the following fields:
    - ***Name***. Type a new name for the Pure Storage credential.
    - ***All Organizations***. Toggle on (blue) to align the credential to all organizations, or toggle off (gray) and then select one or more specific organizations from the ***What organization manages this service?*** drop-down field to align the credential with those specific organizations.
    - ***Port***. Type "443".
    - ***Timeout(ms)***. Type a value greater than or equal to "5000".
    - ***Username***. Type your Pure Storage username.
    - ***Password***. Type or paste the Pure Storage API token.
4. Click **[Save & Close]**.

Configuring a Pure Storage Credential in the SL1 Classic User Interface

To configure SL1 to monitor Pure Storage, you must first create a Basic/Snippet credential that allows the Dynamic Applications in the *Pure Storage* PowerPack to connect with the Pure Storage FlashArray. An example Basic/Snippet credential that you can edit for your own use is included in the *Pure Storage* PowerPack.

To create a Basic/Snippet credential to access Docker hosts and swarms:

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Locate the example **Pure Storage Example** credential, and then click its wrench icon ( ). The **Edit Basic/Snippet Credential** modal page appears.

3. Complete the following fields:
    - ***Credential Name***. Type a new name for the Pure Storage credential.
    - ***Port***. Type "443".
    - ***Timeout(ms)***. Type a value greater than or equal to "5000".
    - ***Username***. Type your Pure Storage username.
    - ***Password***. Type or paste the Pure Storage API token.
4. Click the **[Save As]** button.
5. When the confirmation message appears, click **[OK]**.

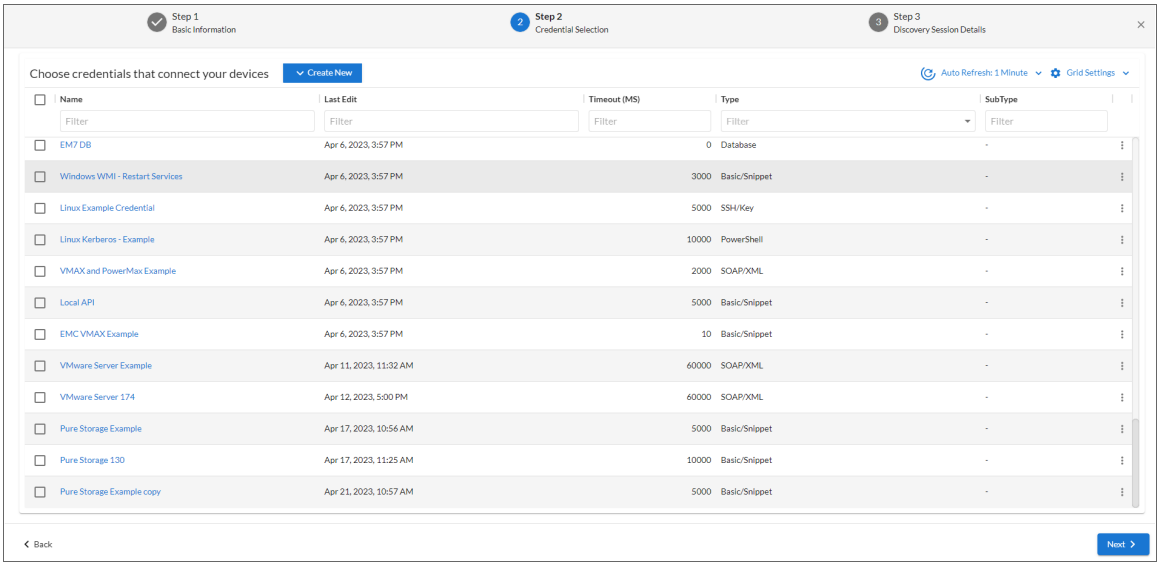
Discovering Pure Storage Components

To discover and model your Pure Storage FlashArray and component devices for monitoring, you must run a discovery session. Several minutes after the discovery session has completed, the Dynamic Applications in the *Pure Storage* PowerPack will automatically align to the FlashArray root device. These Dynamic Applications will discover, model, and monitor the remaining Pure Storage components.

To discover Pure Storage components:

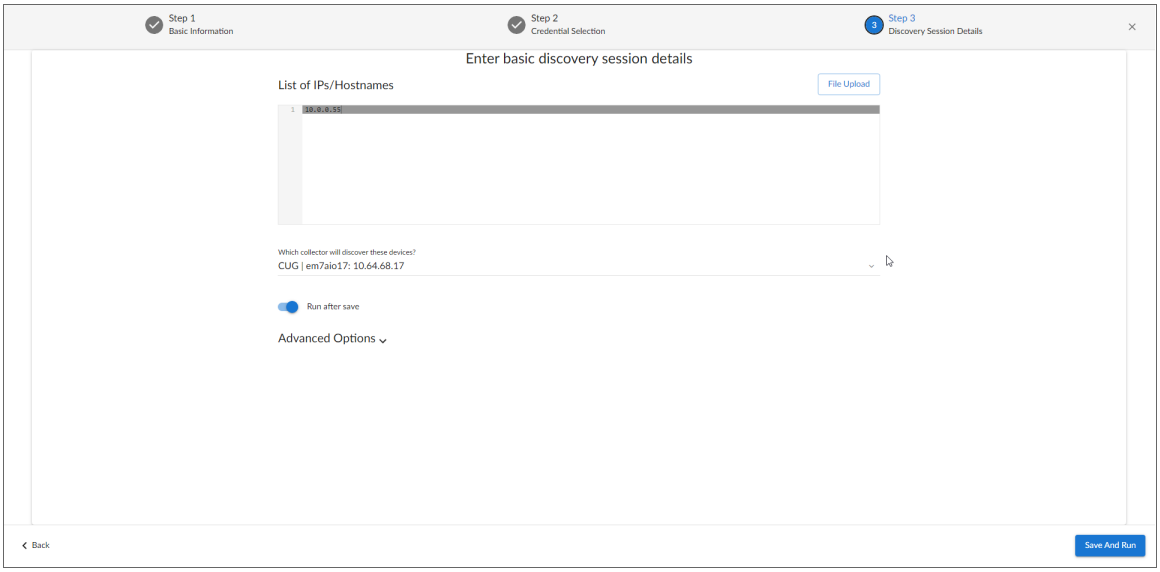
1. On the **Devices** page ( ) or the **Discovery Sessions** page (Devices > Discovery Sessions), click the **[Add Devices]** button. The **Select** page appears:
2. Click the **[Unguided Network Discovery]** button. Additional information about the requirements for discovery appears in the **General Information** pane to the right.
3. Click **[Select]**. The **Add Devices** page appears:
4. Complete the following fields:
    - ***Name***. Type a unique name for this discovery session. This name is displayed in the list of discovery sessions on the **[Discovery Sessions]** tab.
    - ***Description***. Optional. Type a short description of the discovery session. You can use the text in this description to search for the discovery session on the **[Discovery Sessions]** tab.
    - ***Select the organization to add discovered devices to***. Select the name of the organization to which you want to add the discovered devices.

5. Click **[Next]**. The **Credentials** page of the **Add Devices** wizard appears:



6. On the **Credentials** page, locate and select the *Basic/Snippet credential* you created.

7. Click **[Next]**. The **Discovery Session Details** page of the **Add Devices** wizard appears:



8. Complete the following fields:

   - ***List of IPs/Hostnames***. Type the IP address for the Pure Storage FlashArray that you want to discover.

- ***Which collector will discover these devices?***. Select an existing collector to monitor the discovered devices. Required.
- ***Run after save***. Select this option to run this discovery session as soon as you click **[Save and Close]**.

  In the **Advanced options** section, click the down arrow icon ( ) to complete the following fields:

  - ***Initial Scan Level***. Select *5. Deep discovery*.
  - ***Discover Non-SNMP***. Toggle on (blue).
  - ***Model Devices***. Toggle on (blue).

9. Click **[Save and Close]** to save the discovery session. The **Discovery Sessions** page (Devices > Discovery Sessions) displays the new discovery session.
10. If you selected the **Run after save** option on this page, the discovery session runs, and the **Discovery Logs** page displays any relevant log messages. If the discovery session locates and adds any devices, the **Discovery Logs** page includes a link to the **Device Investigator** page for the discovered device.

Discovering Pure Storage Components in the SL1 Classic User Interface

To discover and model your Pure Storage FlashArray and component devices for monitoring, you must run a discovery session. Several minutes after the discovery session has completed, the Dynamic Applications in the *Pure Storage* PowerPack will automatically align to the FlashArray root device. These Dynamic Applications will discover, model, and monitor the remaining Pure Storage components.

To discover Pure Storage components:

1. Go to the **Discovery Control Panel** page (System > Manage > Classic Discovery), and then click the **[Create]** button. The **Discovery Session Editor** page appears.
2. In the **Discovery Session Editor** page, complete the following fields:

   - ***Name***. Type a name for your discovery session.
   - ***IP Address/Hostname Discovery List***. Type the IP address for the Pure Storage FlashArray that you want to discover.
   - ***Other Credentials***. Select the ***Basic/Snippet credential*** you created for Docker.
   - ***Initial Scan Level***. Select *5. Deep discovery*.
   - ***Detection Method & Port***. Select *TCP 443 - https*.
   - ***Discover Non-SNMP***. Select this checkbox.
   - ***Model Devices***. Select this checkbox.

3. Optionally, you can enter values in the other fields on this page. For more information about the other fields on this page, see the ***Discovery & Credentials*** manual.
4. Click the **[Save]** button to save the discovery session, and then close the **Discovery Session Editor** window.

5. The discovery session you created displays at the top of the **Discovery Control Panel** page. Click its lightning-bolt icon ( ) to run the discovery session.
6. The **Discovery Session** window appears. When a root device is discovered, click its device icon ( ) to view the **Device Properties** page for that device.

Manually Aligning Dynamic Applications

To verify that SL1 has automatically aligned the correct Dynamic Applications during discovery:

1. Go to the **Devices**page (Devices > Device Manager).
2. Locate your Pure Storeage FlashArray virtual and click its name.
3. In the **Device Investigator**, click the **[Collections]** tab.
4. The following Dynamic Applications should appear in the list of aligned Dynamic Applications:

    - Pure Storage: Array Capacity Stats
    - Pure Storage: Array Discovery
    - Pure Storage: Array Stats
    - Pure Storage: Controller Config
    - Pure Storage: Drive Config
    - Pure Storage: Hardware Config
    - Pure Storage: Hosts & Groups Config
    - Pure Storage: Message Log Config
    - Pure Storage: Protection Groups Config
    - Pure Storage: Temperature Stats
    - Pure Storage: Volume Discovery

If the Dynamic Applications have not been automatically aligned, you can align them manually. To do so, perform the following steps:

1. Click the **[Edit]** button at the top of the page, then click the **[Align Dynamic App]** button.
2. In the **Align Dynamic Application** modal, click ***Choose Dynamic Application***.
3. Locate the Dynamic Application you want to manually align and click **[Select]**.
4. In the **Align Dynamic Application** modal, de-select the ***Use Device SNMP Credential*** box. Click the ***Choose Credential*** option that appears.
5. Select the *Basic/Snippet credential* you created for Pure Storage and click **[Select]**.
6. Click **[Align Dynamic App]** to align the Dynamic Application with the Pure Storage device.
7. Repeat steps 1-6 as needed to align any additional Dynamic Applications.

Manually Aligning Dynamic Applications in the SL1 Classic User Interface

To verify that SL1 has automatically aligned the correct Dynamic Applications during discovery:

1. From the **Device Properties** page (Registry > Devices > wrench icon ( )) for the Pure Storage FlashArray, click the **[Collections]** tab. The **Dynamic Application Collections** page appears.
2. The following Dynamic Applications should appear in the list of aligned Dynamic Applications:

    - Pure Storage: Array Capacity Stats
    - Pure Storage: Array Discovery
    - Pure Storage: Array Stats
    - Pure Storage: Controller Config
    - Pure Storage: Drive Config
    - Pure Storage: Hardware Config
    - Pure Storage: Hosts & Groups Config
    - Pure Storage: Message Log Config
    - Pure Storage: Protection Groups Config
    - Pure Storage: Temperature Stats
    - Pure Storage: Volume Discovery

NOTE: It can take several minutes after discovery for Dynamic Applications to display on the **Dynamic Application Collections** page. If the listed Dynamic Applications do not display on this page, try clicking the **[Reset]** button.

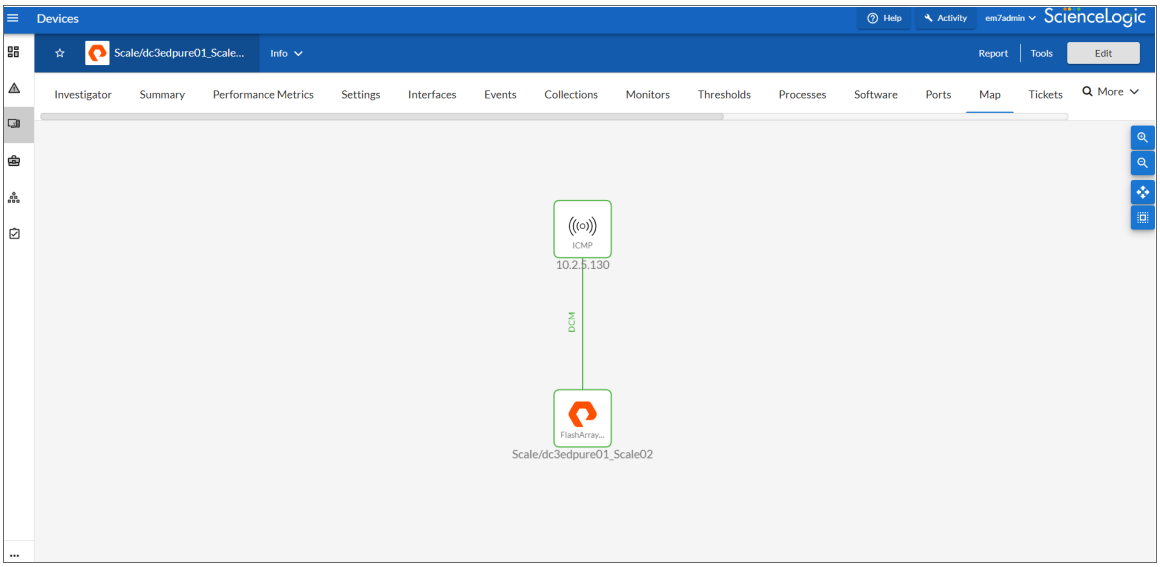
If the Dynamic Applications have not been automatically aligned, you can align them manually. To do so, perform the following steps:

1. Go to the **Device Properties** page (Registry > Devices > wrench icon( )) for the Pure Storage FlashArray and click the **[Collections]** tab. The **Dynamic Application Collections** page appears.
2. On the **Dynamic Application Collections** page, click the **[Action]** button and then select *Add Dynamic Application* from the menu. The **Dynamic Application Alignment** page appears.
3. In the ***Dynamic Applications*** field, select a Dynamic Application to align.
4. In the ***Credentials*** field, select the *Basic/Snippet credential* you created for Pure Storage.
5. Click the **[Save]** button.
6. Repeat steps 2-5 as needed to align any additional Dynamic Applications.

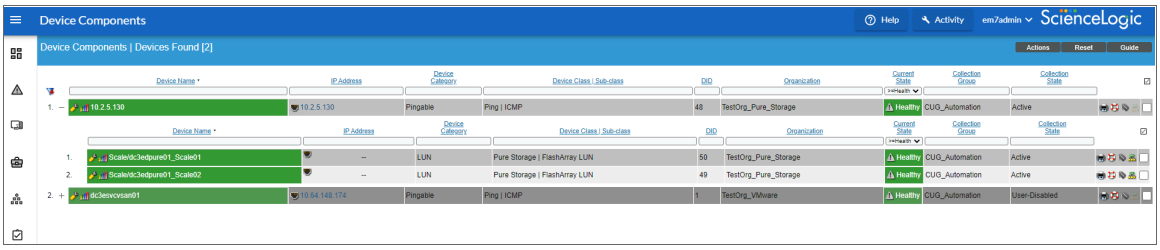
Viewing Pure Storage Component Devices

In addition to the **Devices** page, you can view the Pure Storage FlashArray and all of its component devices in the following places in the user interface:

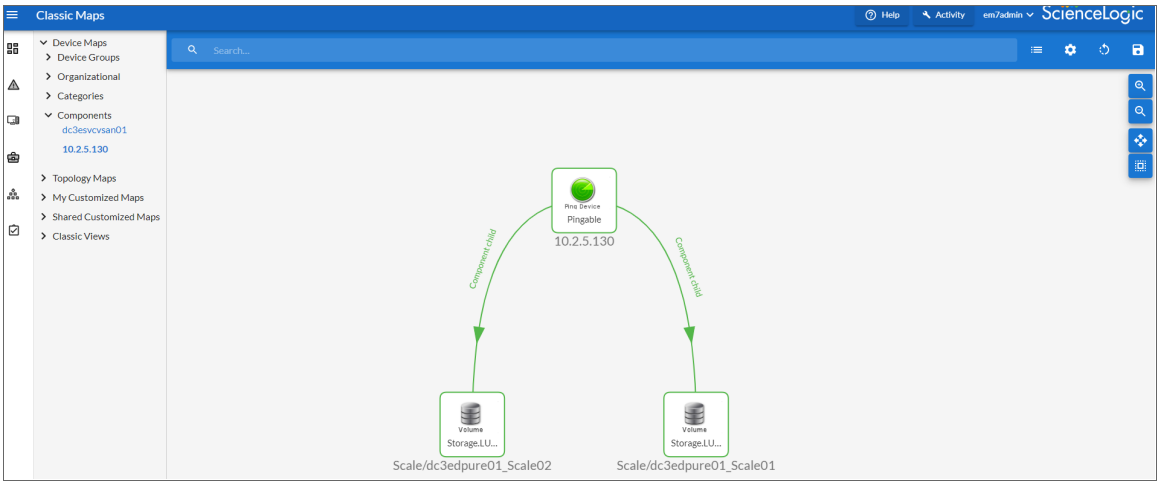
- The **Device Investigator** Map page (click **Map** in the **Device Investigator** page) displays a map of a particular device and all of the devices with which it has parent-child relationships. Double-clicking any of the listed devices reloads the page to make the selected device the primary device.



- The **Device Components** page (Devices > Device Components) displays a list of all root devices and component devices discovered by SL1. The **Device Components** page displays all root devices and component devices in an indented view, so you can easily view the hierarchy and relationships between child devices, parent devices, and root devices. To view the component devices associated with a Pure Storage FlashArray, find the device and click its plus icon (+).



- The **Component Map** page (Classic Maps > Device Maps > Components) allows you to view devices by root node and view the relationships between root nodes, parent components, and child components in a map. This makes it easy to visualize and manage root nodes and their components. SL1 automatically updates the **Component Map** as new component devices are discovered. The platform also updates each map with the latest status and event information. To view the map for a Pure Storage FlashArray, go to the **Component Map** page and select the map from the list in the left NavBar. To learn more about the **Component Map** page, see the ***Maps*** manual.



Viewing Pure Storage Component Devices in the SL1 Classic User Interface

In addition to the **Device Manager** page (Registry > Devices > Device Manager), you can view the Pure Storage FlashArray and all of its component devices in the following places in the user interface:

- The **Device View** modal page (Registry > Devices > Device Manager > graph icon > Topology) displays a map of a particular device and all of the devices with which it has parent-child relationships. Double-clicking any of the devices listed reloads the page to make the selected device the primary device:

- The **Device Components** page (Registry > Devices > Device Components) displays a list of all root devices and component devices discovered by SL1 in an indented view, so you can easily view the hierarchy and relationships between child devices, parent devices, and root devices. To view the component devices associated with Pure Storage, find the Pure Storage FlashArray device and click its plus icon (+):

- The **Component Map** page (Classic Maps > Device Maps > Components) allows you to view devices by root node and view the relationships between root nodes, parent components, and child components in a map. This makes it easy to visualize and manage root nodes and their components. SL1 automatically updates the **Device Component Map** as new component devices are discovered. The platform also updates each map with the latest status and event information. To view the map for Pure Storage, go to the **Device Component Map** page (Views > Device Maps > Components) and select the map from the list in the left NavBar. To learn more about the **Device Component Map** page, see the ***Views*** manual.

Chapter 3

Dashboards

Overview

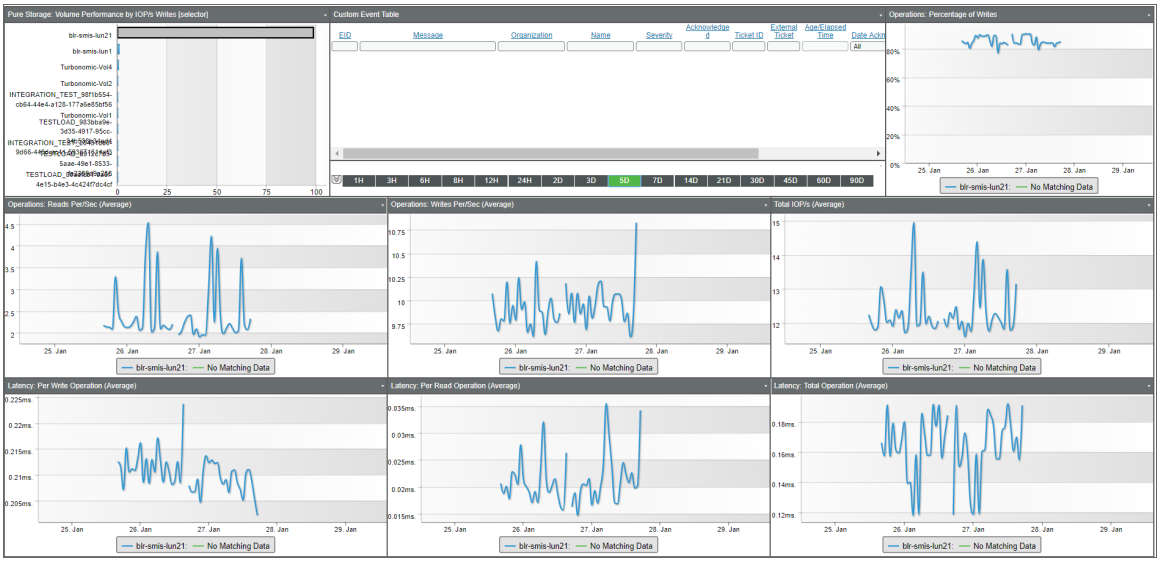
The following sections describe the dashboards that are included in the *Pure Storage* PowerPack:

This chapter covers the following topics:

Pure Volume: Performance *16*
Device Dashboards *16*

Pure Volume: Performance

The *Pure Storage* PowerPack includes one built-in dashboard for viewing an overview of Pure Storage volume performance metrics.



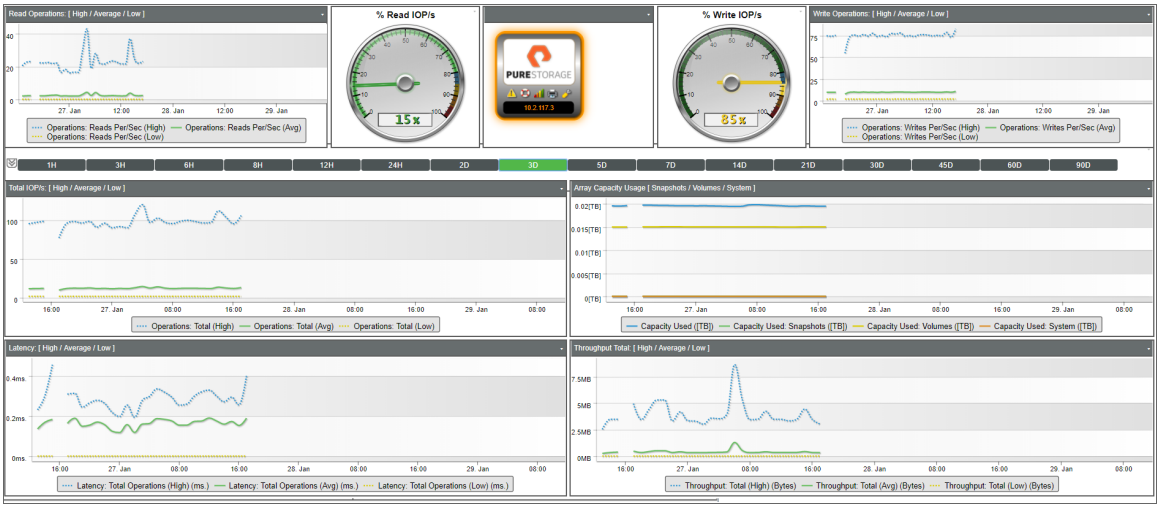
The "Pure Volume: Performance" dashboard displays the following information:

- A list of volumes with their write input/output operations per second over a specified period of time. This widget acts as the dashboard selector; when you click the bar for one of the listed volumes, the other widgets in the dashboard are updated to reflect metrics specific to that volume.
- A list of events over a specified period of time
- Write operations over a specified period of time, expressed as a percentage
- Read operations per second over a specified period of time
- Write operations per second over a specified period of time
- Total input/output operations per second over a specified period of time
- Write latency over a specified period of time
- Read latency over a specified period of time
- Total latency over a specified period of time

Device Dashboards

The *Pure Storage* PowerPack includes device dashboards that provide summary information for Pure Storage component devices. Each of the device dashboards in the *Pure Storage* PowerPack is set as the default device dashboard for the equivalent device class.

Pure Storage: Array Performance & Usage



The "Pure Storage: Array Performance & Usage" device dashboard displays the following information:

- Read operations per second over a specified period of time
- Read input/output operations per second over a specified period of time, expressed as a percentage
- Write input/output operations per second over a specified period of time, expressed as a percentage
- Write operations per second over a specified period of time
- Total input/output operations per second over a specified period of time
- Array capacity usage over a specified period of time
- Latency over a specified period of time
- Throughput over a specified period of time

Pure Storage: Volume Performance & Usage

The "Pure Storage: Volume Performance & Usage" device dashboard displays the following information:

- Read operations per second over a specified period of time
- Write operations per second over a specified period of time
- Latency over a specified period of time
- Total input/output operations per second over a specified period of time
- Throughput over a specified period of time
- Volume usage over a specified period of time

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