



Analyzing your infrastructure

OnCommand Insight

NetApp
October 24, 2024

Table of Contents

Analyzing your infrastructure	1
About this task	1
Observe an object's behavior over time	1
Compare objects with the top 10 latency total to the average latency for all like objects	2
Compare one object's latency total to the latency total of the top 10 objects	3
Compare metrics-A against metrics-B to show categories and anomalies	4
Use an expression to identify alternate metrics	5

Analyzing your infrastructure

The procedures in this topic are ones that you might use to perform an analysis of parts of the infrastructure in your environment. The steps, views, and data you gather in this exercise use virtual computing objects as an example. Analysis of other assets in your environment will follow similar steps using relevant counters for each specific asset. The intent of this exercise is to familiarize you with the variety of options Insight offers to monitor and understand the characteristics of the assets in your data center.

About this task

Some of the actions you can take to analyze the state of your infrastructure might include the following:

- Observe an object's behavior over time
- Compare an object's metrics against the metrics of the top 10 like objects
- Compare numbers for objects
- Compare the top 10 objects against the average
- Compare metrics A vs. B for many objects to show categories and anomalies
- Compare a range of objects against other objects
- Use an expression to display metrics not available in the web UI

You can create all of these views of objects in your infrastructure in a dashboard using widgets for each analysis you perform. The dashboards can be saved to provide quick access to current data on your infrastructure.

Observe an object's behavior over time

You can observe the behavior of a single object to determine if the object is operating within expected operational levels.

Steps

1. Use a query to identify the VM that will be the subject of analysis: **Query > + New query > Virtual machine > "name"**

Leaving the name field blank returns all VMs. Select the VM that you want to use in this exercise. You can select it by scrolling through the list of VMs.

2. Create a new dashboard for the information you want to collect. From the toolbar, click **Dashboards > +New Dashboard**.

3. In the new Dashboard, select **Variable > Text**.

- a. Add the VM name from your query as the `$var1` value.
 - b. Click the check box.

The variable is used to easily swap between different sets of objects you want to analyze. In other steps of your analysis, you may reuse this variable for additional analysis against the single VM initially chosen.

Variables become more useful when identifying multiple objects.

4. Add a line chart widget to the new dashboard: **Widget > Line chart**.

- a. Change the default asset type to virtual machine: Click **Virtual machine > Latency-Total**.
- b. Click **Filter by > Name > \$var1**.
- c. Change the time period on the dashboard: **Override dashboard time > On > 7 days**.

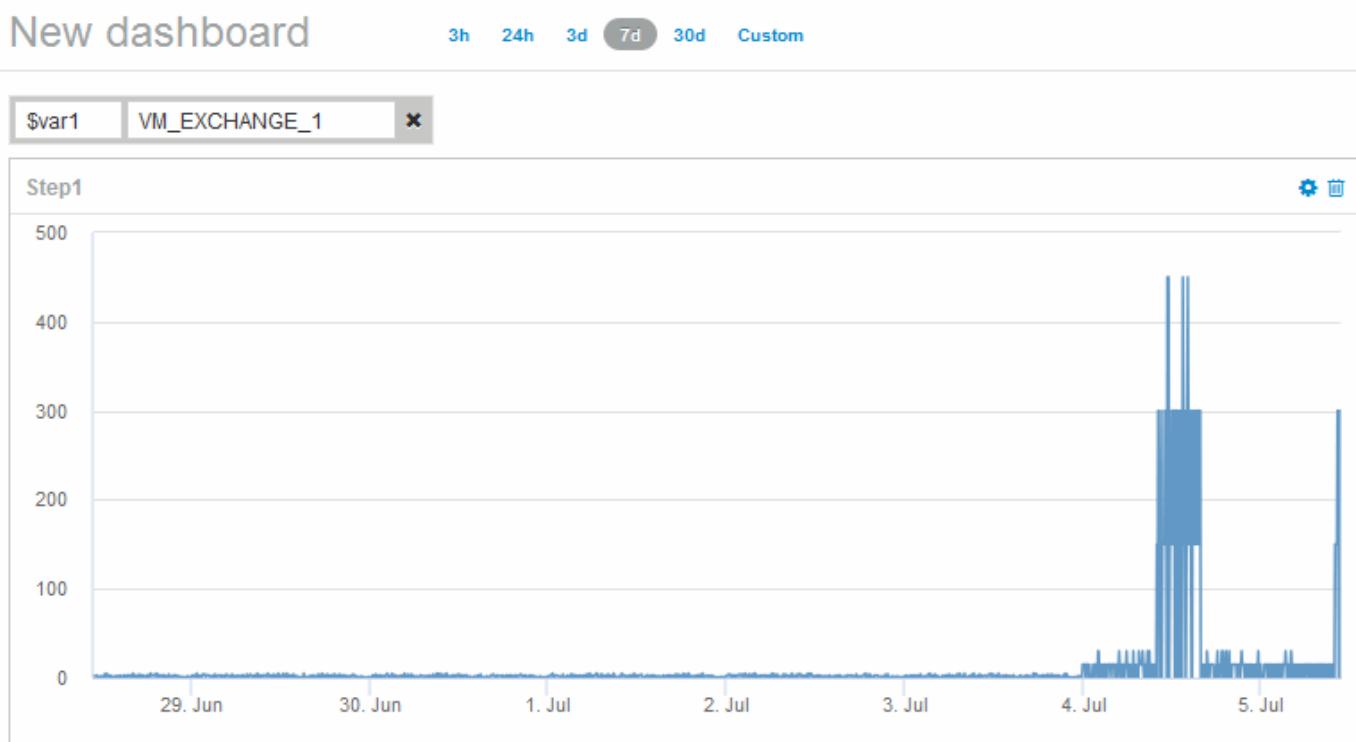
You can change the duration of the display using any of the preset selections or by specifying a custom time range.

+ The dashboard displays the VM's **IOPS-Total** for the period of time you specify.

5. Assign a name to the widget and save the widget.

Results

Your widget should contain data similar to the following:



The VM shows a period of abnormally high latency for a short period of time in the 7 days that are displayed.

Compare objects with the top 10 latency total to the average latency for all like objects

You might want to compare the VMs with the top 10 latency total to the average latency total to identify any that are extremely out of the average range. This information could help in decisions to balance workloads on VMs.

Steps

1. Add a widget with a stacked area chart to the new dashboard: **Widget > Stacked Area Chart**

a. Change the default device to Virtual machine: Click **Storage > Virtual machine > Latency total**

The widget displays the Latency Total, for all VMs, for 24 hours in a stacked area chart.

b. Create a second display in this widget that shows Latency Total averaged for all VMs: **Widget > Line chart**

c. Change the default device to Virtual machine: Click **Virtual machine > Latency-total**

The widget displays the Latency Total for the default 24 hour period of time using a line chart.

d. Click **X** on the **Roll up** bar and select **Show > Top > 10**

The system displays the Top 10 VMs based on Latency Total.

2. To compare the average Latency Total for all VMs to the Top 10 IOPS total use the following steps:

a. Click **+Add**

b. Change the default device to Virtual machine: Click **Storage > Virtual machine > IOPS total**

c. Click **X** on the **Roll up** bar and select **Show > Top > 10**

The system displays the 10 objects with high latency and shows the average latency in a line chart.

+ image:../media/analytics-top10-avg.gif[]

+ The average latency is 1.6 ms, while in the top ten, the are VMs experiencing latency of over 200 ms.

Compare one object's latency total to the latency total of the top 10 objects

The following steps compare a single VM's Latency Total to the VMs reporting the Top 10 Latency Total in the entire virtual infrastructure.

Steps

1. Add a widget with a line chart to the new dashboard: **Widget > Line Chart**

a. Change the default device to Virtual machine: Click **Storage > Virtual machine > Latency-total**

The widget displays the total Latency, for all VMs, for the default 24 hours in an area chart.

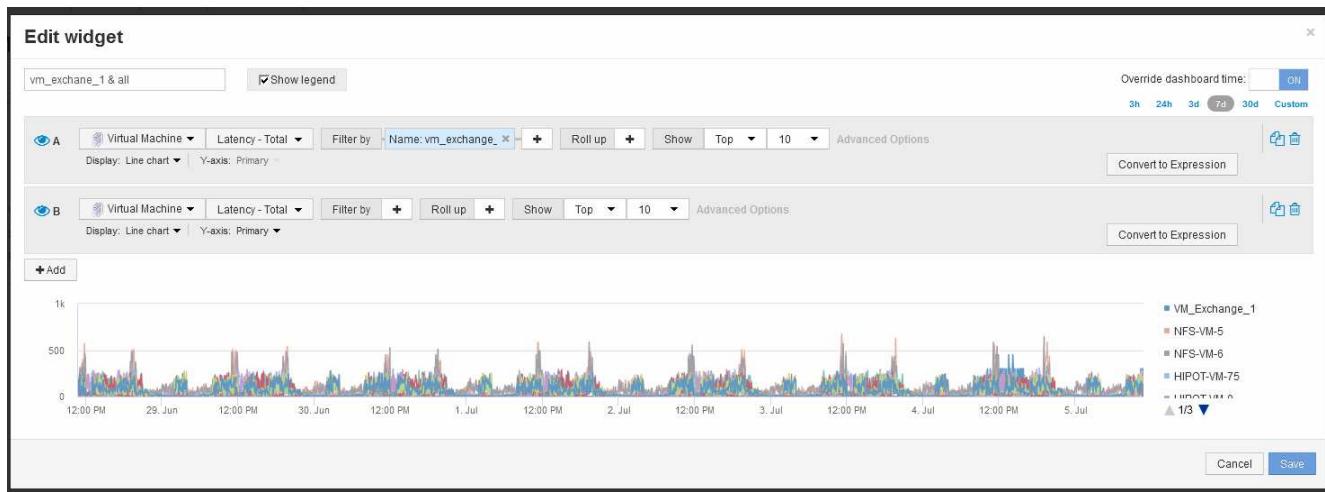
b. Create a second display in this widget that shows Latency Total averaged for all VMs: **Widget > Line chart**

c. Change the default device to Virtual machine: Click **Storage > Virtual machine > Latency-Total**

The widget displays the Latency total for the default 24 hour period of time using a line chart.

d. Click **X** on the **Roll up** bar and select **Show > Top > 10**

The system displays the Top 10 VMs based on Latency - Total.



2. Add the VM that you want to compare to the Top 10:
 - a. Click **+Add**
 - b. Change the default device to Virtual machine: Click **Storage > Virtual machine > Latency total**
 - c. Click **Filter by > Name > \$var1**
3. Click **Show legend**

Results

A legend identifies each of the VMs under analysis. You can easily identify VM_Exchange_1 and determine if it is experiencing latency similar to the top ten VMs in the environment.

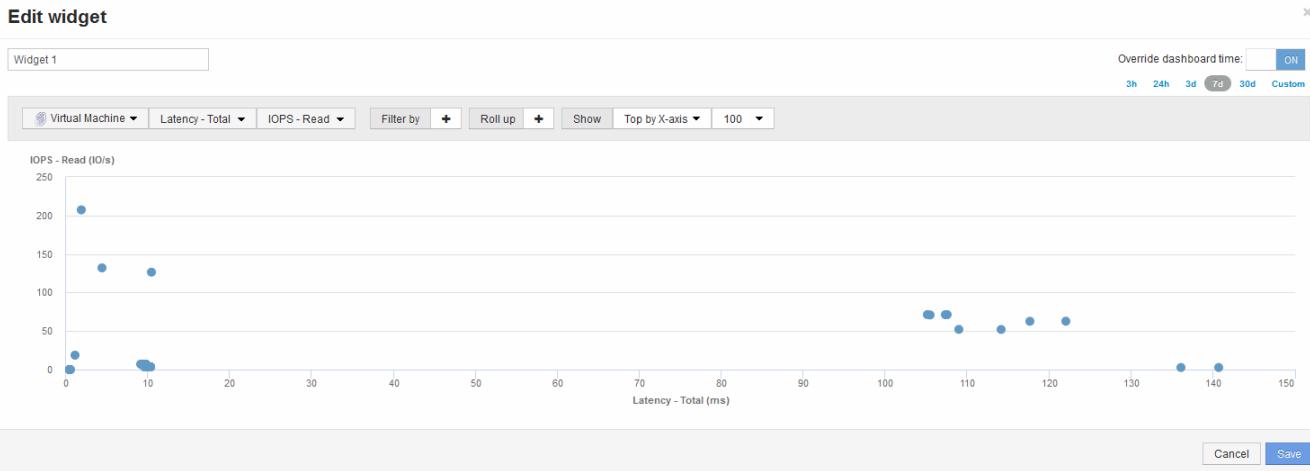
Compare metrics-A against metrics-B to show categories and anomalies

You can use a scatter plot to show two sets of data for each object. For example, you can specify IOPS Read and Latency Total to be displayed for each object. Using this chart you can identify the object you consider troublesome based on both the IOPS and the Latency combined.

Steps

1. Add a widget with a scatter plot chart to the new dashboard: **Widget > Scatter Plot Chart**
2. Change the default device to Virtual machine: Click **Storage > Virtual machine > Latency total > IOPS Read**

The system displays a scatter plot similar to the following:



Use an expression to identify alternate metrics

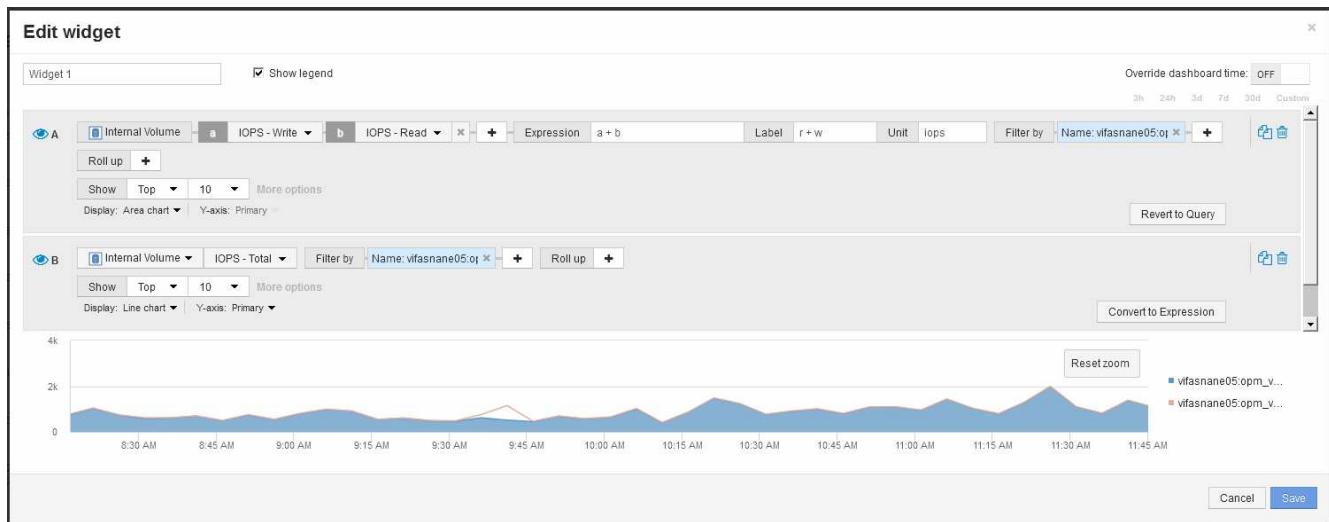
You can use expressions to view metrics not provided by the web UI, such as the IOPS that are system overhead generated.

About this task

You might want use an expression to show total IOPS generated by non-read or non-write operations, such as overhead operations for an internal volume.

Steps

1. Add a widget to the dashboard. Choose **Area chart**.
2. Change the default device to Internal volume: Click **Storage > Internal volume > IOPS Write**
3. Click the **Convert to Expression** button.
4. The **IOPS - Write** metric is now in the alphabetic variable field “**a**”.
5. In the “**b**” variable field, click **Select** and choose **IOPS - Read**.
6. In the **Expression** field, type **a + b**. In the **Display** section, choose **Area chart** for the expression.
7. In the **Filter by** field, enter the name of the internal volume you are analyzing.
8. The **Label** field identifies the expression. Change the label to something meaningful like “**R + W IOPS**”.
9. Click **+Add** to add a line for total IOPS to the widget.
10. Change the default device to Internal volume: Click **Storage > Internal volume > IOPS Total**
11. In the **Filter by** field, enter the name of the internal volume you are analyzing.



The chart displays the total IOPS as a line, with the chart showing the combination of read and write IOPS in blue. The gap between 9:30 and 9:45 shows non-read and non-write IO (overhead) operations.

Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—with prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.