NetApp

Monitor performance of datastores and vVols reports

ONTAP tools for VMware vSphere 9.13

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Overview of ONTAP tools datastore and vVols reports

You can use the ONTAP tools console **Reports** menu to view pre-defined reports for all the datastores managed by a selected ONTAP tools instance in a particular vCenter Server. You can perform operations such as sorting and exporting reports.

Reports display detailed information about datastores and virtual machines, that enables you to review and identify potential issues with datastores and virtual machines in your vCenter Server

You can view, sort, and export reports.

ONTAP tools provide the following pre-defined reports:

- Datastore Report
- Virtual Machine Report
- vVols Datastore Report
- vVols Virtual Machine Report
- Log Integrity Report

Datastore Reports

The datastore reports provide detailed information about traditional datastores and the virtual machines that are created on these datastores.

The traditional dashboard enables you to review and identify potential issues with the datastores and virtual machines in your vCenter Server. You can view, sort, and export reports. The data for the traditional datastores and virtual machines report is provided by the vCenter Server. But due to the introduction of FlexGroup backed datastore support, some metrics such as latency, throughput, and IOPS are obtained from ONTAP.

> ⓘ File monitoring is not supported for FlexGroup datastores configured on direct storage virtual machines (SVMs).

The datastore provides the following pre-defined reports:

- Datastore Report
- Virtual Machine Report

Datastore Report

The Datastore Report menu provides information on the following parameters for datastores:

- Name of the datastore
- Type of datastore: NFS and VMFS
- Volume style

The volume style can either be a FlexVol volume or a FlexGroup volume.

- Free space

- Used space

- Total space

- Percentage of space utilized

- Percentage of space available

- IOPS

  The report displays the IOPS for the datastore.

- Latency

  The report displays the latency information for the datastore.

  You can also verify the time at which the report was generated. The Datastore Report menu enables you to organize the report as per your requirement, and then export the organized report using the **Export to CSV** button. The datastore names in the report are links that navigate to the Monitor tab of the selected datastore, where you can view the datastore performance metrics.

Virtual Machine Report

The Virtual Machine Report menu provides the performance metrics for all the virtual machines that use datastores provisioned by ONTAP tools for a selected vCenter Server. The virtual machine metrics displayed in the Virtual Machine Reports is historical data that is collected every 30 minutes for virtual machines on traditional datastores. The "Last refresh time" and "Next refresh time" are added to the table to provide details on when the data was collected and when will be the next data collection.

- Name of the virtual machine

- Datastore name

- Volume style

  The volume style can be either a FlexVol volume or a FlexGroup volume.

- Source

  The source to gather details for the virtual machine can be either ONTAP or vCenter Server.

- Latency

  The report displays the latency for virtual machines across all datastores associated with the virtual machines.

- IOPS

- Throughput

- Committed capacity

  The report displays the value for the committed capacity for a virtual machine.

- Host

The report displays the host systems on which the virtual machine is available.

- Uptime

  The report displays the time for which the virtual machine is powered on and is available on an ESXi host.

- Power state

  The report displays whether the virtual machine is powered on or powered off.

Each virtual machine name in the report is a link to the Monitor tab of the selected virtual machine. You can sort the virtual machine report as per your requirement and export the report in a .CSV file, and save the report on your local system. The timestamp of the report is also appended to the saved report.

For virtual machines that are backed by FlexGroup volumes, when new virtual machine is powered on, files are registered for monitoring on ONTAP. The historical metrics for Latency, Throughput and IOPS are obtained when VM reports are accessed from ONTAP.

vVols reports

vVols reports display detailed information about VMware Virtual Volumes (vVols) datastores and the virtual machines that are created on these datastores. The vVols dashboard enables you to review and identify potential issues with the vVols datastores and virtual machines in your vCenter Server.

You can view, organize, and export reports. The data for the vVols datastores and virtual machines report is provided by ONTAP.

vVols provides the following pre-canned reports:

- vVols Datastore Report
- vVols VM Report

vVols Datastore Report

The vVols Datastore Report menu provides information about the following parameters for datastores:

- vVols datastore name
- Free space
- Used space
- Total space
- Percentage of space utilized
- Percentage of space available
- IOPS
- Latency Performance metrics are available for NFS based vVols datastores on ONTAP 9.8 and later. You can also verify the time at which the report was generated. The vVols Datastore Report menu enables you to organize the report as per your requirement, and then export the organized report by using the **Export to CSV** button. Each SAN vVols datastore name in the report is a link that navigates to the Monitor tab of the selected SAN vVols datastore, which you can use to view the performance metrics.

vVols Virtual Machine Report

The vVols Virtual Machine Summary Report menu provides the performance metrics for all of the virtual machines that use the SAN vVols datastores that are provisioned by VASA Provider for ONTAP for a selected vCenter Server. The virtual machine metrics displayed in VM reports is historical data that is collected every 10 minutes for virtual machines on vVols datastores. "Last refresh time" and "Next refresh time" are added to the table to provide information on when data was collected and when will be the next data collection.

- Name of the virtual machine
- Committed capacity
- Uptime
- IOPS
- Throughput

  The report displays whether the virtual machine is powered on or powered off.

- Logical space
- Host
- Power state
- Latency

  The report displays the latency for virtual machines across all of the vVols datastores that are associated with the virtual machines.

Each virtual machine name in the report is a link to the Monitor tab of the selected virtual machine. You can organize the virtual machine report according to your requirement, export the report in `.csv` format, and then save the report on your local system. The timestamp of the report is appended to the saved report.

Log Integrity Report

The Log Integrity Report shows the file integrity status. Log integrity is checked at scheduled intervals and the report is displayed in the Log Integrity Report tab. It also provides the status of the different audit files that are being rolled over.

The available log file status are:

- ACTIVE: Indicates the current active file to which the logs are written.
- NORMAL: Indicates that the archive file was not tampered or deleted.
- TAMPERED: Indicates that the file was modified after archival
- ROLLOVER_DELETE: Indicates that the file was deleted as part of log4j retention policy.
- UNEXPECTED_DELETE: Indicates that the file was deleted manually.

The ONTAP tools for VMware vSphere generates Audit logging for following:

- ONTAP tools service

  Audit log location for vscservice: */opt/netapp/vscservice/vsc-audit.log*. You can change the following parameters of the log integrity report in */opt/netapp/vscserver/etc/log4j2.properties* file:

  ◦ Max log size for roll over.
  ◦ Retention policy, the default value of this parameter is 10 files.

- File size, the default value of this parameter is 10MB before the files are archived. You need to restart the services for the new values to come into effect.

- VP service

  Audit log location for VP service: */opt/netapp/vpservice/vp-audit.log* The VP audit logs can be modified in the file */opt/netapp/vpserver/conf/log4j2.properties*. You need to restart the services for the new values to come into effect.

- Maint commands

  Audit log location for maintenance services: */opt/netapp/vscservice/maint-audit.log* Maint log files can be modified in the */opt/netapp/vscserver/etc/maint_logger.properties* file. When you change the default values, restart the server for the new values to come into effect.

The scheduler can be set up to check the audit logs on regular bases. The default value for the scheduler is one day. You can alter the value in */opt/netapp/vscserver/etc/maint_logger.properties* file.

Analyze performance data using the traditional dashboard

You can monitor the traditional datastores and virtual machines using the traditional dashboard of the ONTAP tools. The dashboard data enables you to analyze the datastore usage and to take corrective action to prevent the virtual machines from running into space-related constraints.

What you will need

You should select either the **Enable Storage I/O Control and statistics collection** or **Disable Storage I/O Control but enable statistics collection** option in the Configure Storage I/O Control dialog box. You can enable Storage I/O Control only if you have the Enterprise Plus license from VMware.

vSphere Resource Management

The traditional dashboard displays IOPS, space utilized, latency, and committed capacity metrics that are obtained from your vCenter Server. ONTAP provides aggregate space saving metrics to the traditional dashboard. You can view space saving for a specific aggregate. These performance parameters enable you to identify performance bottlenecks in the virtual environment and to take corrective action to resolve the issues.

> (i) File monitoring is not supported for FlexGroup datastores configured on direct storage virtual machines (SVMs).

The traditional dashboard of the ONTAP tools enables you to view either NFS datastores or VMFS datastores. You can click a datastore to navigate to the datastore details view that is provided by the vCenter Server instance to view and fix any issues with the datastores in your vCenter Server.

Steps

1. From the vSphere Client home page, click **ONTAP tools for VMware vSphere**.

2. Select the required vCenter Server using the **INSTANCE** selector to view the datastores.

3. Click **Overview > Traditional Dashboard**.

   The Datastores portlet provides the following details:

- The number of traditional datastores along with their performance metrics that are managed by ONTAP tools in your vCenter Server instance
- The top five datastores based on resource usage and performance parameters that can be modified, if required You can change the listing of the datastores based on the space utilized, IOPS, or latency and in the order required.

The Virtual Machines portlet provides the following details:

- Number of virtual machines using NetApp datastores in your vCenter Server
- Top five virtual machines based on committed capacity, latency, IOPS, throughput, and uptime

  The IOPS and throughput data in the Virtual Machines portlet is available only for datastores created on FlexGroup backed volumes.

Analyze performance data using the vVols dashboard

You can monitor the performance and view the top five SAN and NAS VMware Virtual Volumes (vVols) datastores in your vCenter Server based on the parameters that you select by using the vVols dashboard of the ONTAP tools.

What you will need

- You should be using ONTAP 9.7 or later for your storage system.

The IOPS data that is provided by ONTAP is rounded off and displayed on the vVols dashboard. There might be a difference between the actual IOPS value that is provided by ONTAP and the IOPS value that is displayed on the vVols dashboard. ONTAP tools provides performance monitoring for NFS based vVols datastores.

- The vVols dashboard data is refreshed periodically, at an interval of 10 minutes.
- If you have added, modified, or deleted a storage system from your vCenter Server instance, then you might not notice any change in the data on the vVols dashboard for some time.
- The Total IOPS value that is displayed in the Overview portlet of the vVols dashboard is not a cumulative value of the Read IOPS value and Write IOPS value.
- NFS based data vVols provisioned on ONTAP 9.8 and above are automatically registered for performance monitoring in the vVols dashboard.

Steps

1. From the vSphere Client home page, click **ONTAP tools**.
2. Select the required vCenter Server using the **INSTANCE** selector to view the datastores.
3. Click **Overview > vVols Dashboard**.

   The Datastores portlet provides the following details:

   - The number of vVols datastores that are managed by VASA Provider in your vCenter Server instance
   - The top five vVols datastores based on resource usage and performance parameters You can change the listing of the datastores based on the space utilized, IOPS, or latency and in the order required.
4. View the details of the virtual machines using the Virtual Machines portlet.

   The Virtual Machines portlet provides the following details:

- Number of virtual machines using ONTAP datastores in your vCenter Server
- Top five virtual machines based on IOPS, latency, throughput, committed capacity, uptime, and logical space You can customize how the top five virtual machines are listed in the vVols dashboard.

vVols dashboard data requirements

You must verify some important requirements of the vVols dashboard to display dynamic details of the VMware Virtual Volumes (vVols) datastores and virtual machines.

The following table presents an overview of what you should verify if the vVols dashboard does not display the performance metrics for the provisioned SAN vVols datastores and virtual machines.

Considerations	Description
Storage system	• You are using ONTAP 9.7 or later. • You are using appropriate credentials for the storage system. • Your storage system is active and accessible. • The virtual machine that you selected must be using at least one vVols datastore, and I/O operations are executing on the disk of the virtual machine.