Collecting Host and VM file system utilization data

OnCommand Insight

NetApp
March 08, 2024

This PDF was generated from https://docs.netapp.com/us-en/oncommand-insight/howto/configure-insight-for-filesystem-collection.html on March 08, 2024. Always check docs.netapp.com for the latest.

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Collecting Host and VM file system utilization data

The Host and VM File Systems data source, combined with the Host Utilization license, enables reporting and chargeback at the file system level for known Hosts and VMs.

OnCommand Insight collects data from storage devices, most of which report their volumes as block devices. This allows Insight to report on utilization at the storage level, but not at the file system level. Storage arrays typically know which blocks have been written to, but not which blocks have been freed.

Client hosts and VMs implement file systems (ntfs, ext*…) on top of these block devices. Most file systems keep a table of contents containing directory and file metadata. When files are deleted, their entries are simply removed from the table of contents. Blocks consumed by those files are now eligible for re-use by the file system, but the storage array doesn't know this. In order for Insight to report on filesystem usage, it must be collected from the client host or VM point of view for accurate chargeback.

Insight allows this level of file system utilization data collection through the **NetApp Host and VM File System** data source, in combination with the **Host Utilization** license. VM's must be annotated with the appropriate **Compute Resource Group** name, and associated storage arrays must be annotated with appropriate **Tier** annotations with proper costs for accurate cost reporting.

The Host Utilization License is resource-based, as opposed to capacity-based as other Insight licenses.

Configure Insight for file system collection

To configure Insight for collection of file system utilization data, you must install the Host Utilization Pack license and configure the NetApp Host and VM File Systems data source.

Before you begin

If you haven't already, install the Host Utilization Pack license. You can check for the license in the **Admin** > **Setup** page, on the **Licenses** tab.

The Host and VM File Systems data source only reports file system utilization and file system metadata for known **Compute Resources** (hosts and VMs) currently being collected or discovered in Insight:

- Virtual Machines are collected by hypervisor data sources such as Hyper-V and VMware.
- Hosts are discovered via device resolution.

The proper Tier annotations must be present on the appropriate storage resources.

The following connected block storage devices are supported:

- NetApp Clustered Data OnTap (cDOT)
- NetApp 7-Mode
- Clariion
- Windows: VMWare virtual disks (VMDKs) for FC, iSCSI

- Linux: VMWare VMDKs (iSCSI and FC not supported)

A **Compute Resource Group** is an annotation that allows grouping of hosts and/or virtual machines that share a common administrative credential.

Steps

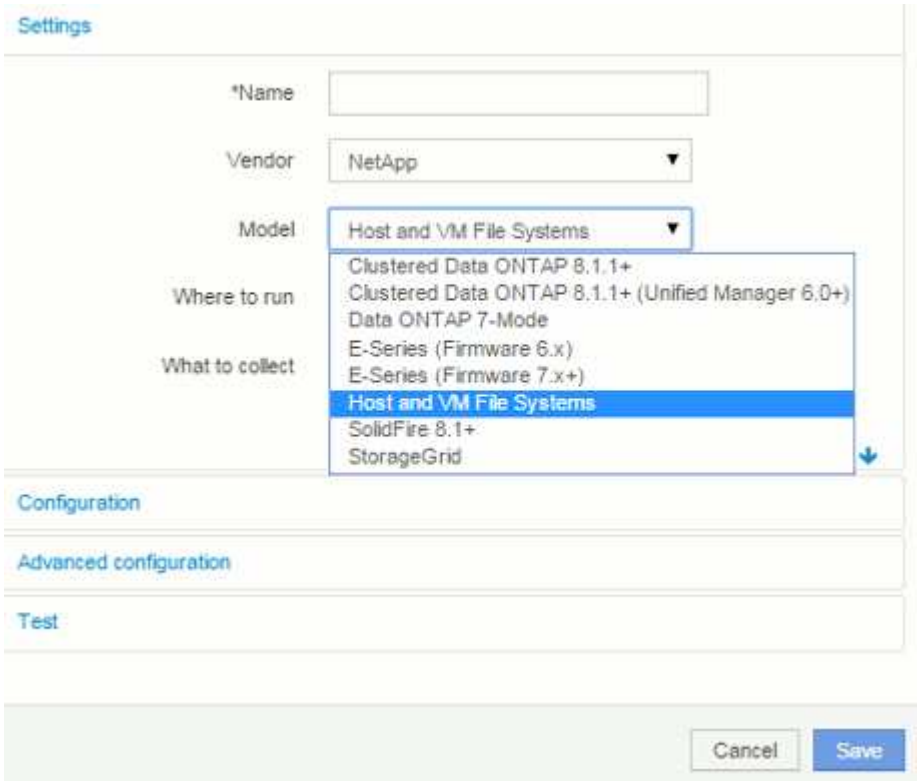
1. First, annotate the hosts and/or virtual machines to be included in your **Compute Resource Group**. Go to **Queries** > **+New query** and search for *Virtual Machine* assets.

   You will need to repeat these steps for *Host* assets.

2. Click on the column selector on the right of the table and select the **Compute Resource Group** column to display it in the query results table.
3. Select the virtual machines you wish to add to the desired compute resource group. You can use a filter to search for specific assets.
4. Click on the **Actions** button and choose **Edit annotation**.
5. Select the *Compute Resource Group* annotation, then choose the desired resource group name in the *Value* field.

   The resource group annotation is added to the selected VMs. The resource group name must match the name you will configure in the Host and VM File Systems data source later.

6. To configure the Host and VM File Systems data source for a compute resource group, click on **Admin** > **Data sources** and **Add** the *NetApp Host and VM File Systems* data source.



7. In the **Configuration** section, enter a **User Name** and **Password** for an operating system user with appropriate rights to retrieve file system data. For Windows operating system users, this must include the domain prefix if your Windows environment uses it.

Note that an Insight Acquisition Unit (AU) installed on Linux can report on Linux compute resources, while an AU installed on Windows can talk to either Linux or Windows compute resources.

8. Enter the name of the **Compute Resource Group** for the assets from which you will want to collect file system utilization data. This name must match the resource group name you used to annotate the assets above.

   If you leave the Compute Resource Group field empty, the data source will collect data for hosts or VMs that have no Compute Resource Group annotation.

9. In the **Advanced Configuration**section, enter the desired polling interval for this data source. The default of 6 hours is usually adequate.
10. It is recommended to **Test** the data source connection before saving it. A successful connection result will also show you how many compute resource targets are contained in the group.
11. Click **Save**. The Host and VM File Systems data source will begin collecting data on its next poll.
12. Once file system data is being collected, you can view it on the host's or VM's asset page, in the File System widget:

13. Repeat these steps for each Compute Resource Group you will have. Each compute resource group must be associated with its own Host and VM File Systems data source.

    Note that file system information will be collected for hosts and VM's that are already being acquired by any traditional VMware or Hyper-V data sources in your environment.

File system chargeback and reporting

Chargeback for file systems is always performed from the storage perspective. Storage arrays associated with virtual machines annotated for a particular compute resource group will be included in chargeback reports for that resource group.

Before you begin

Any virtual machines which you wish to include in file system utilization chargeback must be annotated with the appropriate compute resource group name. Storage arrays associated with those virtual machines must be annotated with the appropriate Tier annotations. ETL to data warehouse must have occurred after these annotations are in place.

Steps

1. Open a browser to your Reporting server, usually `https://<host or IP>:9300/p2pd``http://<host or IP\>:9300/bi (7.3.3 or later)` and log in.

2. Choose the **File System Utilization** package and create a new report.

3. Drag and drop items from your data mart(s) to build your report.

   The example below is a very simple report. You can create complex reports built around your specific business needs.

Name	Type	Allocated Capacity GB	Used Capacity GB	Tier Name	Cost	Storage Name
/	xfs	119.96	9.96	N/A		vifasnane05,vifasnane06
/	xfs	5,492.53	799.63	Tier 1	100	vifasnane
/boot	xfs	0.48	0.17	N/A		vifasnane05,vifasnane06
/boot	xfs	8.72	2.41	Tier 1	100	vifasnane
/dev/dm-1	swap	7.81	0.00	N/A		vifasnane05,vifasnane06
/dev/dm-1	swap	140.61	0.78	Tier 1	100	vifasnane
C:\	NTFS	948.27	331.98	Tier 1	100	vifasnane
PHYSICALDRIVE0: System Reserved	NTFS	1.70	1.41	Tier 1	100	vifasnane

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