



# Monitoring using Cloud Insights

## NetApp Solutions

NetApp  
May 01, 2024

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# Monitoring using Cloud Insights

## Monitoring using Cloud Insights for VMs in Red Hat OpenShift Virtualization

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This section of the reference document provides details for integrating NetApp Cloud Insights with a Red Hat OpenShift Cluster to monitor OpenShift Virtualization VMs.

NetApp Cloud Insights is a cloud infrastructure monitoring tool that gives you visibility into your complete infrastructure. With Cloud Insights, you can monitor, troubleshoot, and optimize all your resources including your public clouds and your private data centers. For more information about NetApp Cloud Insights, refer to the [Cloud Insights documentation](#).

To start using Cloud Insights, you must sign up on the NetApp BlueXP portal. For details, refer to the [Cloud Insights Onboarding](#)

Cloud Insights has several features that enable you to quickly and easily find data, troubleshoot issues, and provide insights into your environment. You can find data easily with powerful queries, you can visualize data in dashboards, and send email alerts for data thresholds you set. Refer to the [video tutorials](#) to help you understand these features.

For Cloud Insights to start collecting data you need the following

### Data Collectors

There are 3 types of Data Collectors:

- \* Infrastructure (storage devices, network switches, compute infrastructure)
- \* Operating Systems (such as VMware or Windows)
- \* Services (such as Kafka)

Data Collectors discover information from the data sources, such as ONTAP storage device (infrastructure data collector). The information gathered is used for analysis, validation, monitoring, and troubleshooting.

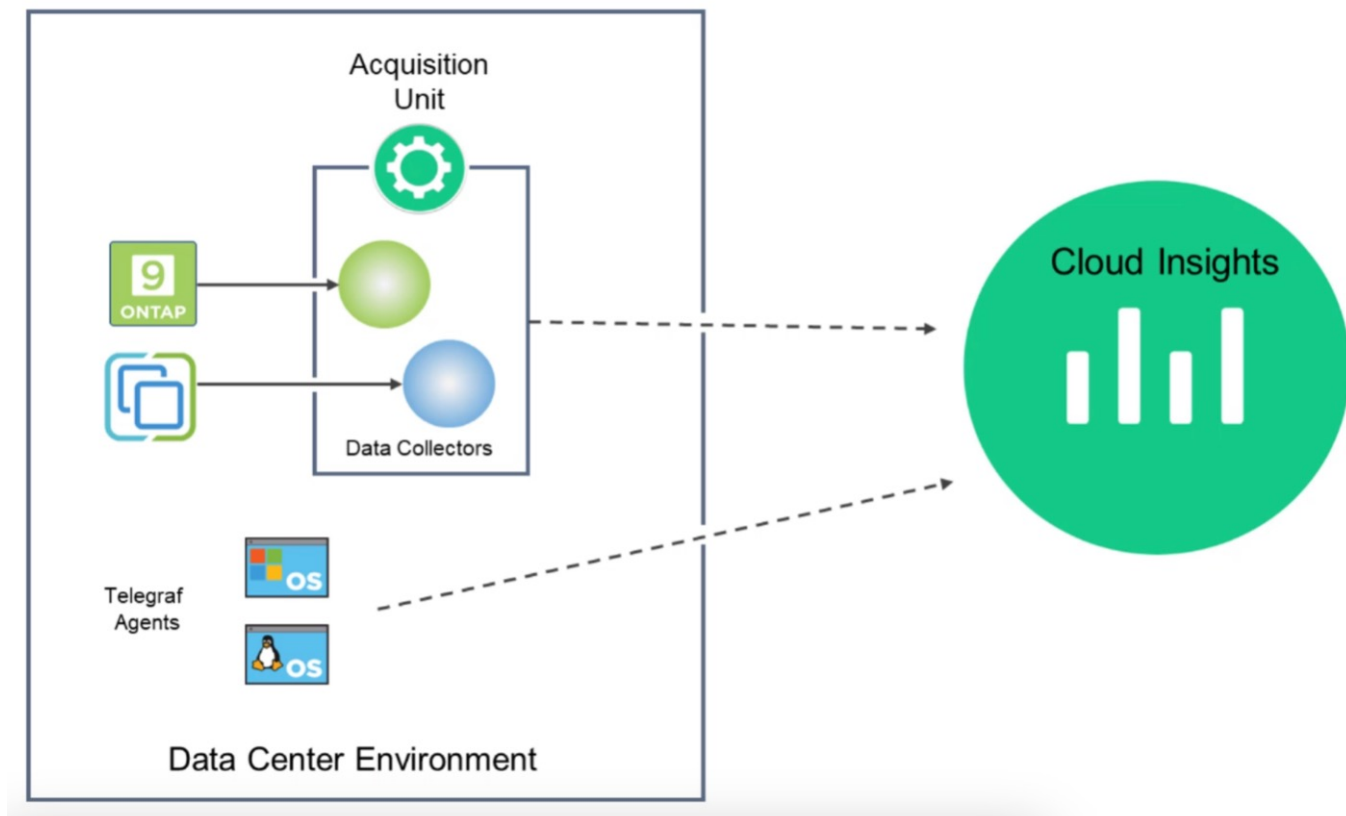
### Acquisition Unit

If you are using an infrastructure Data Collector, you also need an Acquisition Unit to inject data into Cloud Insights. An Acquisition Unit is a computer dedicated to hosting data collectors, typically a Virtual Machine. This computer is typically located in the same data center/VPC as the monitored items.

### Telegraf Agents

Cloud Insights also supports Telegraf as its agent for collection of integration data. Telegraf is a plugin-driven server agent that can be used to collect and report metrics, events, and logs.

Cloud Insights Architecture



## Integration with Cloud Insights for VMs in Red Hat OpenShift Virtualization

To start collecting data for VMs in OpenShift Virtualization you will need to install:

1. A Kubernetes monitoring operator and data collector to collect Kubernetes data  
For complete instructions, refer to the [documentation](#).
2. An acquisition unit to collect data from ONTAP storage that provides persistent storage for the VM disks  
For complete instructions, refer to the [documentation](#).
3. A data collector for ONTAP  
For complete instructions, refer to the [documentation](#)

Additionally, if you are using StorageGrid for VM backups, you need a data collector for the StorageGRID as well.

## Sample Monitoring capabilities for VMs in Red Hat OpenShift Virtualization

### Monitoring based on events and creating Alerts

Here is a sample where the namespace that contains a VM in OpenShift Virtualization is monitored based on events. In this example, a monitor is created based on **logs.kubernetes.event** for the specified namespace in the cluster.

Observability

Explore

Alerts

Collectors

Log Queries

Enrich

Reporting

Kubernetes

Workload Security

ONTAP Essentials

Admin

NetApp PCS Sandbox / Observability / Alerts / Manage Monitors / Monitor virtual-machines-demo-ns

Edit log monitor

Filter/Advanced Query and Group by in section 1 must not be empty. If alert resolution is based on log entry, section 3 filter/advanced query also must not be empty.

Select the log to monitor

Log Source

logs.kubernetes.event

Filter By

kubernetes\_cluster

ocp-cluster4

involvedobject.namespace

virtual-machines-demo

Advanced Query

Group By

reason

27 items found

timestamp	type	source	message
04/19/2024 10:31:18 AM	logs.kubernetes.event	kubernetes_cluster:ocp-cluster4;namespace:cloudi nsights- monitoring;pod_name:net app-ci-event-exporter- 7f7c8d84c4-sk7t9;	VirtualMachineInstance started.
04/19/2024 10:31:18 AM	logs.kubernetes.event	kubernetes_cluster:ocp-cluster4;namespace:cloudi nsights- monitoring;pod_name:net app-ci-event-exporter- 7f7c8d84c4-sk7t9;	VirtualMachineInstance defined.

Define alert behavior

Create an alert at severity

Warning

when the conditions above occur

1

time

## Edit log monitor

### 1 Select the log to monitor

Log Source logs.kubernetes.event ▼

7 items found

Last

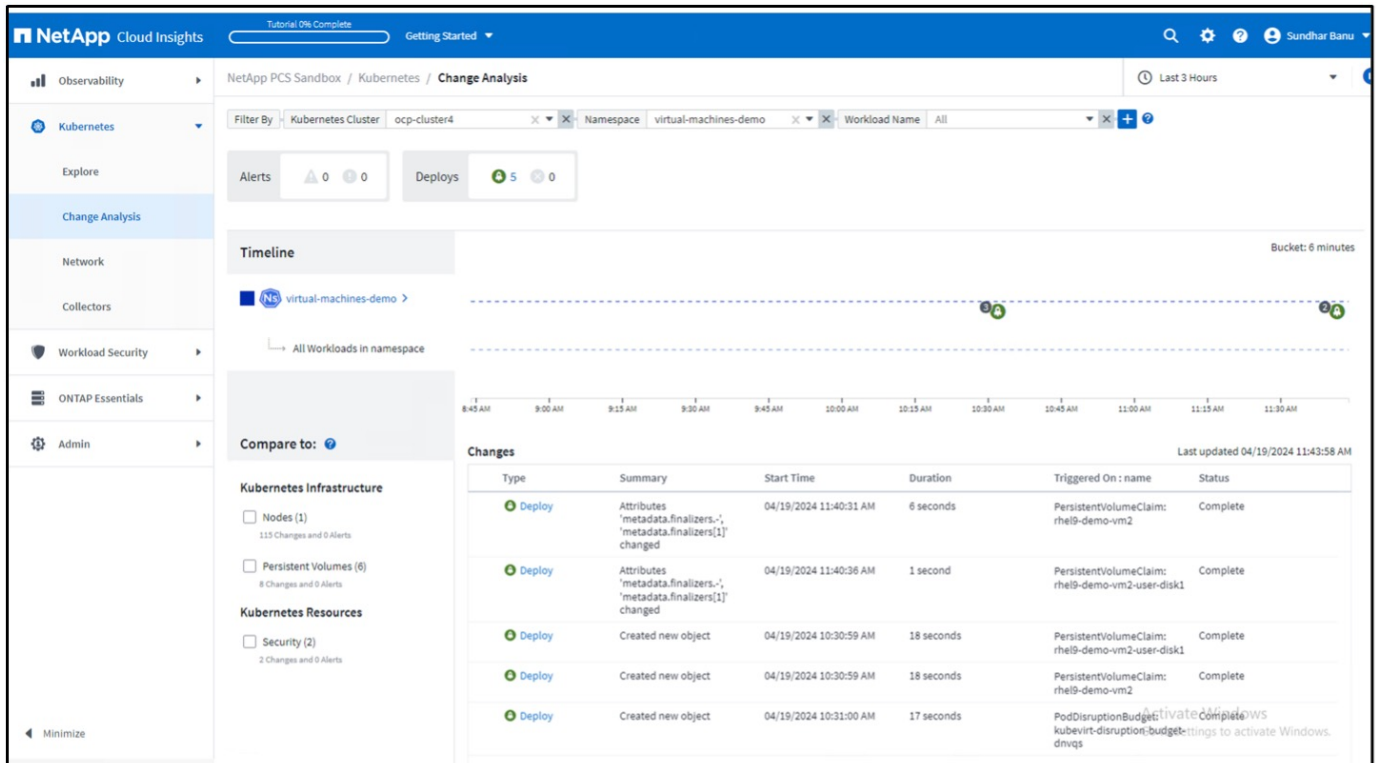
timestamp ↓	type	source	message
04/19/2024 10:31:18 AM	logs.kubernetes.event	kubernetes_cluster:ocp-cluster4;namespace:cloudi nsights-monitoring;pod_name:net app-ci-event-exporter- 7f7c8d84c4-sk7t9;	VirtualMachineInstance started.
04/19/2024 10:31:18 AM	logs.kubernetes.event	kubernetes_cluster:ocp-cluster4;namespace:cloudi nsights-monitoring;pod_name:net app-ci-event-exporter- 7f7c8d84c4-sk7t9;	VirtualMachineInstance defined.
04/19/2024 10:31:18 AM	logs.kubernetes.event	kubernetes_cluster:ocp-cluster4;namespace:cloudi nsights-monitoring;pod_name:net app-ci-event-exporter- 7f7c8d84c4-sk7t9;	VirtualMachineInstance started.

## 2 Define alert behavior

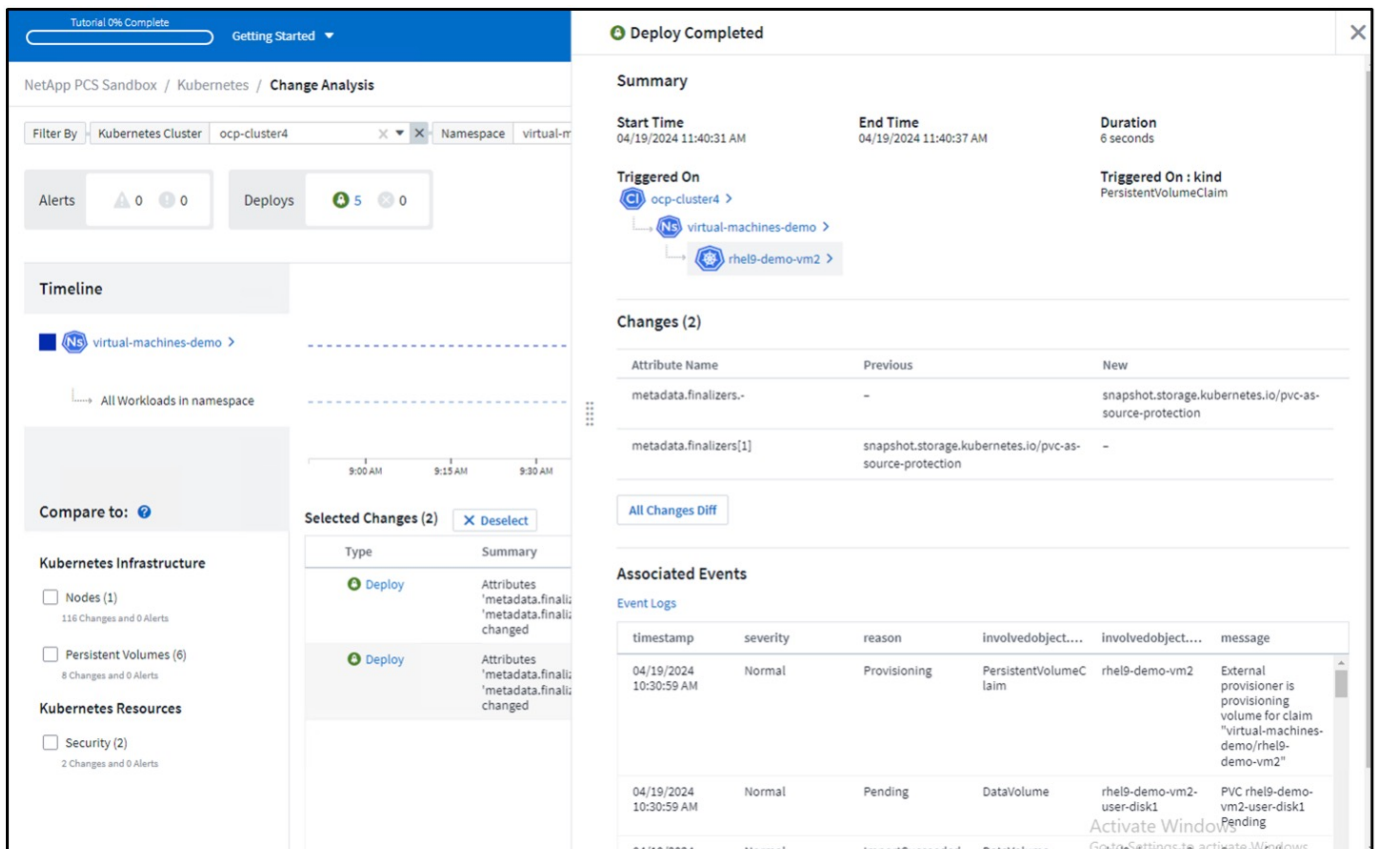
Create an alert at severity	Warning ▼	when the conditions above occur	1	time
-----------------------------	-----------	---------------------------------	---	------

This query provides all the events for the virtual machine in the namespace. (There is only one virtual machine in the namespace). An advanced query can also be constructed to filter based on the event where the reason is “failed” or “FailedMount” These events are typically created when there is an issue in creating a PV or mounting the PV to a pod indicating issues in the dynamic provisioner for creating persistent volumes for the VM.

## Change Analytics



In the above example, Change Analysis is configured on the OpenShift cluster for the namespace that contains an OpenShift Virtualization VM. The dashboard shows changes against the timeline. You can drill down to see what changed and the click on All Changes Diff to see the diff of the manifests. From the manifest, you can see that a new backup of the persistent disks was created.



All Changes Diff

Previous

New

Expand 45 lines ...

46

kind: DataVolume

47

name: rhel9-demo-vm2

48

uid: dcf93b7a-71bc-409b-ad12-4916d05e0980

49

- resourceVersion: "8569671"

50

uid: 953a4188-5932-46ac-85d7-9734acc78278

51

spec:

52

accessModes:

Expand 15 lines ...

46

kind: DataVolume

47

name: rhel9-demo-vm2

48

uid: dcf93b7a-71bc-409b-ad12-4916d05e0980

49

+ resourceVersion: "8619670"

50

uid: 953a4188-5932-46ac-85d7-9734acc78278

51

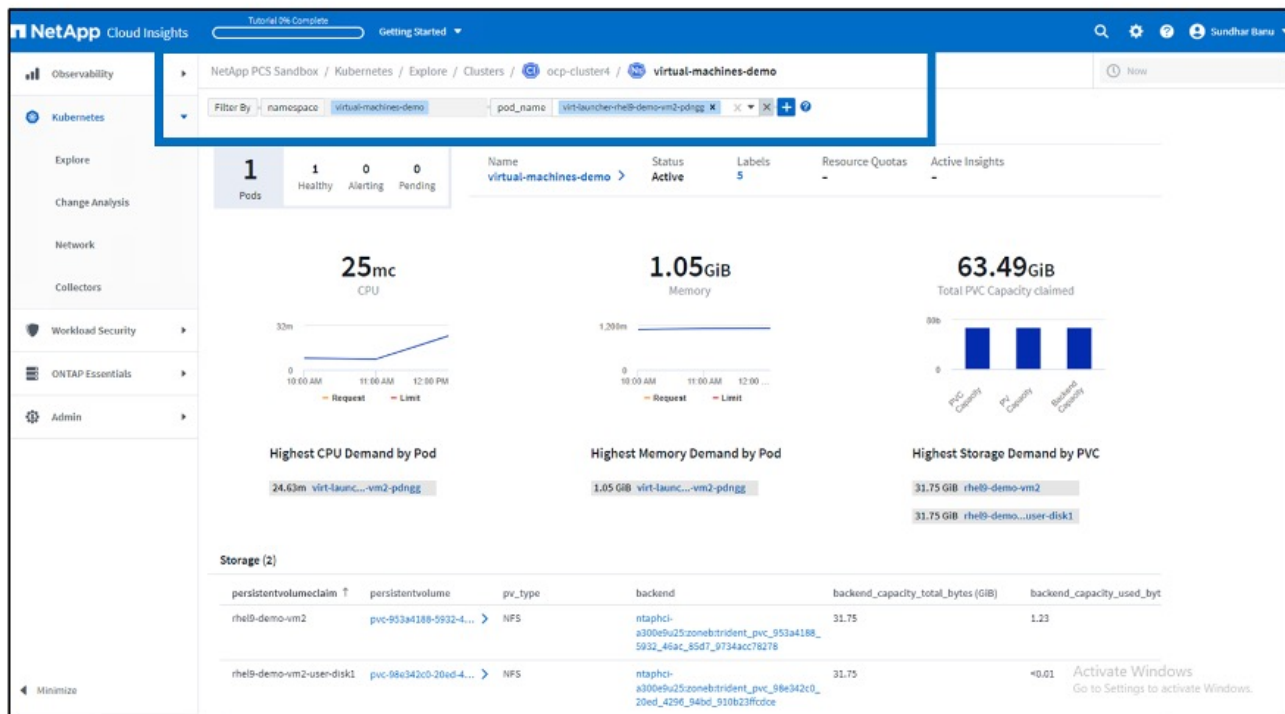
spec:

52

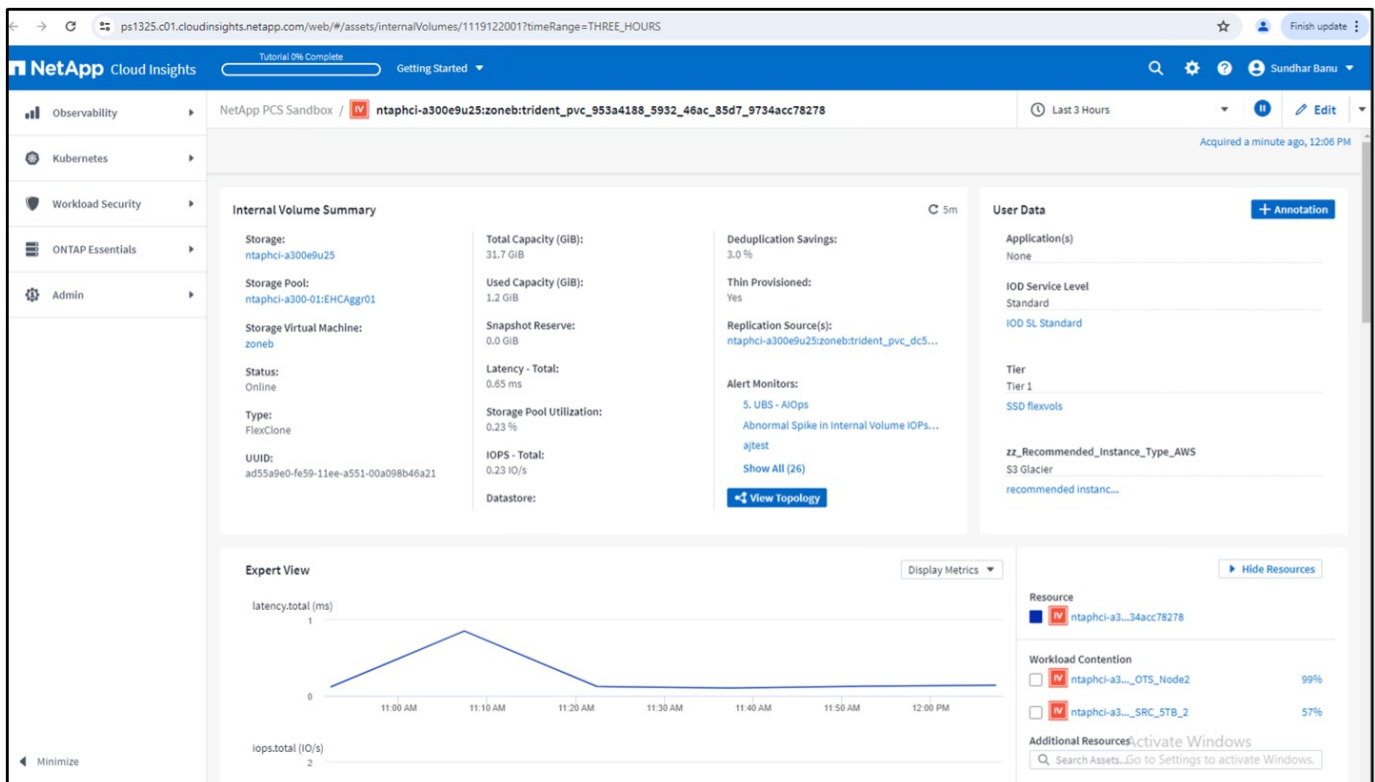
accessModes:

## Backend Storage Mapping

With Cloud Insights, you can easily see the backend storage of the VM disks and several statistics about the PVCs.



You can click on the links under the backend column, which will pull data directly from the backend ONTAP storage.



Another way to look at all the pod to storage mapping is creating an All Metrics query From Observability menu under Explore.

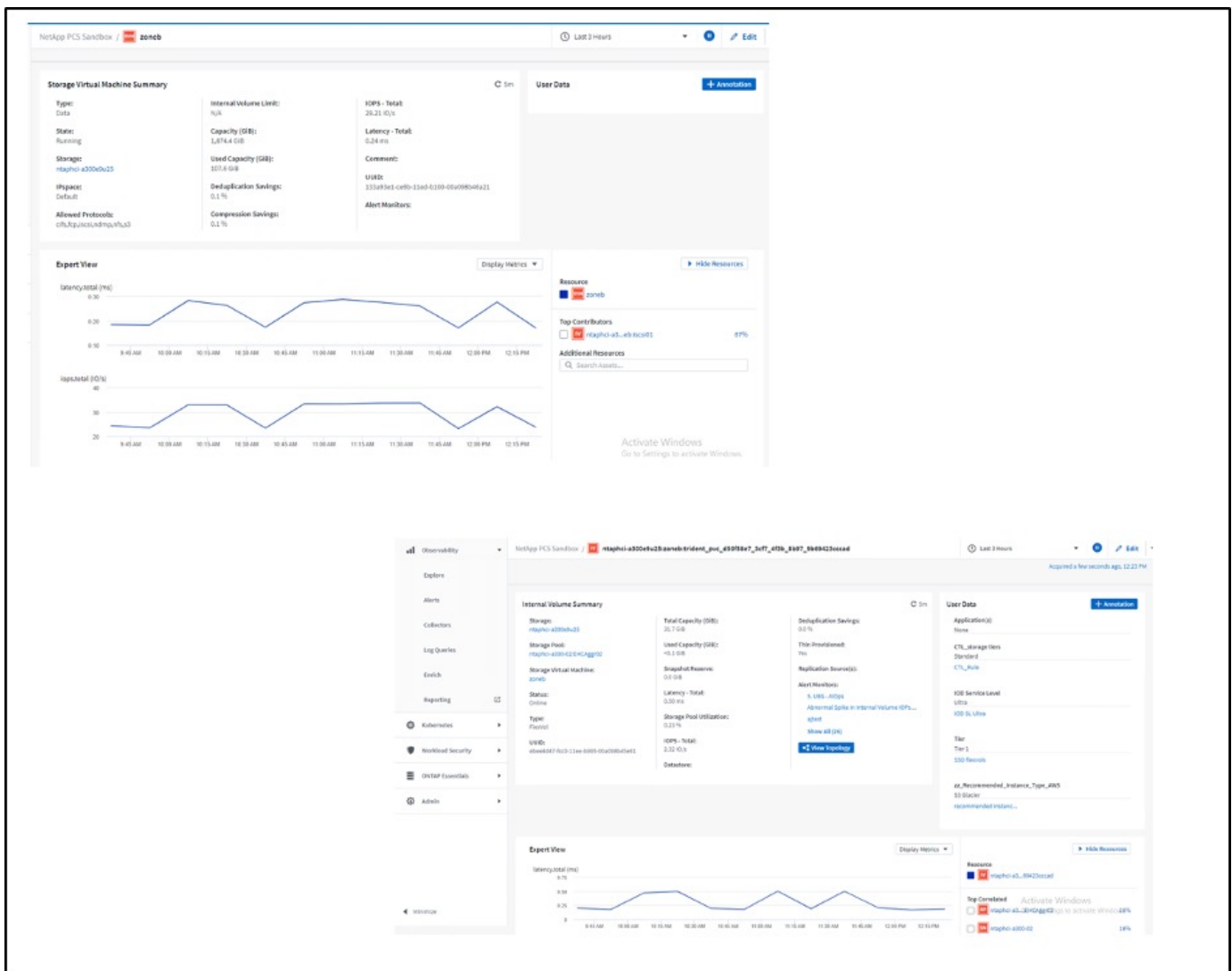
The screenshot shows the 'All Metric Queries' page in NetApp Cloud Insights. A query for 'persistent disks' is selected, and a table of results is displayed. The table includes columns for Object, Metrics & Attributes, and various storage-related fields.

Object	Metrics & Attributes
kubernetes.pod_to_storage	persisten..., workload..., namespace, storagevirt..., InternalVol..., volume.na..., qtree.name, timeToFull..., backen
importer-prime-47b8351-2678-4295-b9db-64...	pvc-d4ccec0-24b, openshift-virtualization-os-image, zoneb, ntaphci-a300e9u25, 3d72704c-6108-11e-000, 0.16
importer-prime-8f792a30-02bb-4e86-a8a8-d6...	pvc-d50f58e7-3cf7, openshift-virtualization-os-image, zoneb, ntaphci-a300e9u25, 3d72704c-6108-11e-000, 0.16
virt-launcher-rhel9-demo-vm2-pdngg	pvc-98e342c0-20e, virtual-machines-demo, zoneb, ntaphci-a300e9u25, 3d72704c-6108-11e-000, 0.00
virt-launcher-rhel9-demo-vm2-pdngg	pvc-953a4188-993, virtual-machines-demo, zoneb, ntaphci-a300e9u25, 3d72704c-6108-11e-000, 3.88
virt-launcher-rhel9-demo-vm2-mzj	pvc-f4d1ad3c-314, virtual-machines, zoneb, ntaphci-a300e9u25, 3d72704c-6108-11e-000, 3.88
virt-launcher-rhel9-demo-vm2-mzj	pvc-ad805a7b-4a1, virtual-machines, zoneb, ntaphci-a300e9u25, 3d72704c-6108-11e-000, 0.00

Clicking on any of the links will give you the corresponding details from ONTP storage. For example, clicking on an SVM name in the storageVirtualMachine column will pull details about the SVM from ONTAP. Clicking on an internal volume name will pull details about the volume in ONTAP.



	storageVirtualMachin...	internalVolume.name	volume.na..
zation-os-image	zoneb		ntaphci-a300e9u25:zoneb:trident_p
zation-os-image	zoneb		ntaphci-a300e9u25:zoneb:trident_p
demo	zoneb		ntaphci-a300e9u25:zoneb:trident_p
demo	zoneb		ntaphci-a300e9u25:zoneb:trident_p
	zoneb		ntaphci-a300e9u25:zoneb:trident_p
	zoneb		ntaphci-a300e9u25:zoneb:trident_p



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