

NetApp Cloud Insights for FlexPod FlexPod

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Table of Contents

App Cloud Insights for FlexPod
R-4868: NetApp Cloud Insights for FlexPod
se cases
rchitecture
esign considerations
eploy Cloud Insights for FlexPod
se cases
ideos and demos
dditional information

NetApp Cloud Insights for FlexPod

TR-4868: NetApp Cloud Insights for FlexPod

Alan Cowles, NetApp

In partnership with:

cisco

The solution detailed in this technical report is the configuration of the NetApp Cloud Insights service to monitor the NetApp AFF A800 storage system running NetApp ONTAP, which is deployed as a part of a FlexPod Datacenter solution.

Customer value

The solution detailed here provides value to customers who are interested in a fully-featured monitoring solution for their hybrid cloud environments, where ONTAP is deployed as the primary storage system. This includes FlexPod environments that use NetApp AFF and FAS storage systems.

Use cases

This solution applies to the following use cases:

- Organizations that want to monitor various resources and utilization in their ONTAP storage system deployed as part of a FlexPod solution.
- Organizations that want to troubleshoot issues and shorten resolution time for incidents that occur in their FlexPod solution with their AFF or FAS systems.
- Organizations interested in cost optimization projections, including customized dashboards to provide detailed information about wasted resources, and where cost savings can be realized in their FlexPod environment, including ONTAP.

Target audience

The target audience for the solution includes the following groups:

- IT executives and those concerned with cost optimization and business continuity.
- Solutions architects with an interest in data center or hybrid cloud design and management.
- Technical support engineers responsible for troubleshooting and incident resolution.

You can configure Cloud Insights to provide several useful types of data that you can use to assist with planning, troubleshooting, maintenance, and ensuring business continuity. By monitoring the FlexPod Datacenter solution with Cloud Insights and presenting the aggregated data in easily digestible customized dashboards; it is not only possible to predict when resources in a deployment might need to be scaled to meet demands, but also to identify specific applications or storage volumes that are causing problems within the system. This helps to ensure that the infrastructure being monitored is predictable and performs according to expectations, allowing an organization to deliver on defined SLA's and to scale infrastructure as needed,

eliminating waste and additional costs.

Architecture

In this section, we review the architecture of a FlexPod Datacenter converged infrastructure, including a NetApp AFF A800 system that is monitored by Cloud Insights.

Solution technology

A FlexPod Datacenter solution consists of the following minimum components to provide a highly available, easily scalable, validated, and supported converged infrastructure environment.

- Two NetApp ONTAP storage nodes (one HA pair)
- Two Cisco Nexus data center network switches
- Two Cisco MDS fabric switches (optional for FC deployments)
- Two Cisco UCS fabric interconnects
- · One Cisco UCS blade chassis with two Cisco UCS B-series blade servers

Or

• Two Cisco UCS C-Series rackmount servers

For Cloud Insights to collect data, an organization must deploy an Acquisition Unit as a virtual or physical machine either within their FlexPod Datacenter environment, or in a location where it can contact the components from which it is collecting data. You can install the Acquisition Unit software on a system running several supported Windows or Linux operating systems. The following table lists solution components for this software.

Operating system	Version
Microsoft Windows	10
Microsoft Windows Server	2012, 2012 R2, 2016, 2019
Red Hat Enterprise Linux	7.2 – 7.6
CentOS	7.2 – 7.6
Oracle Enterprise Linux	7.5
Debian	9
Ubuntu	18.04 LTS

Architectural diagram

The following figure shows the solution architecture.



Hardware requirements

The following table lists the hardware components that are required to implement the solution. The hardware components that are used in any particular implementation of the solution might vary based on customer requirements.

Hardware	Quantity
Cisco Nexus 9336C-FX2	2
Cisco UCS 6454 Fabric Interconnect	2
Cisco UCS 5108 Blade Chassis	1
Cisco UCS 2408 Fabric Extenders	2
Cisco UCS B200 M5 Blades	2
NetApp AFF A800	2

Software requirements

The following table lists the software components that are required to implement the solution. The software components that are used in any particular implementation of the solution might vary based on customer requirements.

Software	Version
Cisco Nexus Firmware	9.3(5)
Cisco UCS Version	4.1(2a)
NetApp ONTAP Version	9.7
NetApp Cloud Insights Version	September 2020, Basic
Red Hat Enterprise Linux	7.6
VMware vSphere	6.7U3

Use case details

This solution applies to the following use cases:

- Analyzing the environment with data provided to NetApp Active IQ digital advisor for assessment of storage system risks and recommendations for storage optimization.
- Troubleshooting problems in the ONTAP storage system deployed in a FlexPod Datacenter solution by examining system statistics in real-time.
- Generating customized dashboards to easily monitor specific points of interest for ONTAP storage systems deployed in a FlexPod Datacenter converged infrastructure.

Design considerations

The FlexPod Datacenter solution is a converged infrastructure designed by Cisco and NetApp to provide a dynamic, highly available, and scalable data center environment for the running of enterprise workloads. Compute and networking resources in the solution are provided by Cisco UCS and Nexus products, and the storage resources are provided by the ONTAP storage system. The solution design is enhanced on a regular basis, when updated hardware models or software and firmware versions become available. These details, along with best practices for solution design and deployment, are captured in Cisco Validated Design (CVD) or NetApp Verified Architecture (NVA) documents and published regularly.

The latest CVD document detailing the FlexPod Datacenter solution design is available here.

Deploy Cloud Insights for FlexPod

To deploy the solution, you must complete the following tasks:

- 1. Sign up for the Cloud Insights service
- 2. Create a VMware virtual machine (VM) to configure as an Acquisition Unit
- 3. Install the Red Hat Enterprise Linux (RHEL) host
- 4. Create an Acquisition Unit instance in the Cloud Insights Portal and install the software
- 5. Add the monitored storage system from the FlexPod Datacenter to Cloud Insights.

Sign up for the NetApp Cloud Insights service

To sign up for the NetApp Cloud Insights Service, complete the following steps:

- 1. Go to https://cloud.netapp.com/cloud-insights
- 2. Click the button in the center of the screen to start the 14-day free trial, or the link in the upper right corner to sign up or log in with an existing NetApp Cloud Central account.

Create a VMware virtual machine to configure as an acquisition unit

To create a VMware VM to configure as an acquisition unit, complete the following steps:

- 1. Launch a web browser and log in to VMware vSphere and select the cluster you want to host a VM.
- 2. Right-click that cluster and select Create A Virtual Machine from the menu.

1 Add Hosts
拾 New Virtual Machine
💝 New Resource Pool
🗊 Deploy OVF Template
🚼 New vApp
Storage 🕨
Host Profiles
Edit Default VM Compatibility
¶→ Assign License
Settings

- 3. In the New Virtual Machine wizard, click Next.
- 4. Specify the name of the VM and select the data center that you want to install it to, then click Next.
- 5. On the following page, select the cluster, nodes, or resource group you would like to install the VM to, then click Next.
- 6. Select the shared datastore that hosts your VMs and click Next.
- 7. Confirm the compatibility mode for the VM is set to ESXi 6.7 or later and click Next.
- 8. Select Guest OS Family Linux, Guest OS Version: Red Hat Enterprise Linux 7 (64-bit).

Select a guest OS

Choose the guest OS that will be installed on the virtual machine

Identifying the guest operating system here allows the wizard to provide the appropriate defaults for the operating system installation.

Guest OS Family: Linux

Guest OS Version: Red Hat Enterprise Linux 7 (64-bit) 🗸

v

Compatibility: ESXi 6.7 and later (VM version 14)



- 9. The next page allows for the customization of hardware resources on the VM. The Cloud Insights Acquisition Unit requires the following resources. After the resources are selected, click Next:
 - a. Two CPUs
 - b. 8GB of RAM
 - c. 100GB of hard disk space
 - d. A network that can reach resources in the FlexPod Datacenter and the Cloud Insights server through an SSL connection on port 443.
 - e. An ISO image of the chosen Linux distribution (Red Hat Enterprise Linux) to boot from.

Customize hardware

Configure the virtual machine hardware

		ADD NEW DEVIC	CE
> CPU *	2 ~	0	^
> Memory *	8 *	GB v	
> New Hard disk *	100 G	в ~	
> New SCSI controller *	VMware Paravirtual		
> New Network *	VM_Network ~	Connect	-
> New CD/DVD Drive *	Datastore ISO File	Connect	
> Video card *	Specify custom sett	ings v	-
VMCI device	Device on the virtual i	machine PCI bus that	
	provides support for t	the virtual machine	100

Compatibility: ESXi 6.7 and later (VM version 14)



10. To create the VM, on the Ready to Complete page, review the settings and click Finish.

Install Red Hat Enterprise Linux

To install Red Hat Enterprise Linux, complete the following steps:

1. Power on the VM, click the window to launch the virtual console, and then select the option to Install Red Hat Enterprise Linux 7.6.





2. Select the preferred language and click Continue.

The next page is Installation Summary. The default settings should be acceptable for most of these options.

- 3. You must customize the storage layout by performing the following options:
 - a. To customize the partitioning for the server, click Installation Destination.
 - b. Confirm that the VMware Virtual Disk of 100GiB is selected with a black check mark and select the I Will Configure Partitioning radio button.

Device Selection

Select the device(s) you'd like to install to. They will be left untouched until you click on the main menu's "Begin Installation" button.

Local Standard Disks	
100 GiB	
C	
VMware Virtual disk	
sda / 100 GiB free	
	Disks left unselected here will not be touched.
Specialized & Network Disks	
Add a disk	
	Disks left unselected here will not be touched.
Other Storage Options	
Partitioning	
O Automatically configure partitioning. I will configure partitioning	
I would like to make additional space available.	
Full disk summary and boot loader	1 disk selected; 100 GiB capacity; 100 GiB free Refresh

c. Click Done.

A new menu displays enabling you to customize the partition table. Dedicate 25 GB each to /opt/netapp and /var/log/netapp. You can automatically allocate the rest of the storage to the system.

IANUAL PARTITIONING			RISE LINUX 7.6 INSTALLATIO
New Red Hat Enterprise Li Installation DATA	nux 7.6	rhel-opt_netapp Mount Point:	Device(s):
/opt/netapp rhel-opt_netapp	25 GiB >	/opt/netapp	VMware Virtual disk (sda)
/var/log/netapp rhel-var_log_netapp	25 GiB	Desired Capacity: 25 GiB	Modify
SYSTEM /boot sda1 / rhel-root swap rhel-swap	1024 MiB 40 GiB 8064 MiB	Device Type: LVM Encrypt File System: xfs Reformat	Volume Group rhel (4096 KiB free) 🕶 Modify
		Label:	Name:
+ - C			opt_netapp
AVAILABLE SPACE 1140.97 MiB 100 GiB			
1 storage device selected			Reset A

- d. To return to Installation Summary, click Done.
- 4. Click Network and Host Name.
 - a. Enter a host name for the server.
 - b. Turn on the network adapter by clicking the slider button. If Dynamic Host Configuration Protocol (DHCP) is configured on your network, you will receive an IP address. If it is not, click Configure, and manually assign an address.

NETWORK & HOST NAME	RED HAT ENTERPRISE LINUX 7.6 INSTALLATION
Ethernet (ens192) VMware VMXNET3 Ethernet Controller	Ethernet (ens192) Connected Mardware Address 00:50:56:AD:13:69 Speed 10000 Mb/s IP Address 10.63.172.12 Subnet Mask 255.255.255.0 Default Route 10.63.172.1 DNS 10.61.184.251 10.61.184.252
+ – Host name: Netapp-AU	Configure Apply Current host name: localhost

- c. . Click Done to return to Installation Summary.
- 5. On the Installation Summary page, click Begin Installation.
- 6. On the Installation Progress page, you can set the root password or create a local user account. When the installation finishes, click Reboot to restart the server.

ঙ redhat.	CONFIGUR	ATION	RED HAT ENTI	ERPRISE LINUX 7.6 INSTALLATION Help!	1
	USER SET	TINGS			
	C	ROOT PASSWORD Root password is set		USER CREATION User netapp will be created	
1/n					
	Complete!				
		Red Hat Ente	erprise Linux is now su	uccessfully installed and ready for you to Go ahead and reboot to start usin	use Ig it
				Reboo	ť

7. After the system has rebooted, log in to your server and register it with Red Hat Subscription Manager.



8. Attach an available subscription for Red Hat Enterprise Linux.



Create an acquisition unit instance in the Cloud Insights portal and install the software

To create an acquisition unit instance in the Cloud Insights portal and install the software, complete the

following steps:

1. From the home page of Cloud Insights, hover over the Admin entry in the main menu to the left and select Data Collectors from the menu.



2. In the top center of the Data Collectors page, click the link for Acquisition Units.



3. To create a new Acquisition Unit, click the button on the right.



4. Select the operating system that you want to use to host your Acquisition Unit and follow the steps to copy the installation script from the web page.

In this example, it is a Linux server, which provides a snippet and a token to paste into the CLI on our host. The web page waits for the Acquisition Unit to connect.

Install Acquisition Unit

Cloud Insights collects device data via one or more Acquisition Units installed on local servers. Each Acquisition Unit can host multiple Data Collectors, which send device metrics to Cloud Insights for analysis.

What Operating System or Platform Are You Using?				
Linux Versions Supported () Production Best Practices ()				
	Need Help?			
rs for this Acquisition Unit only.				
DhbGciOiJIUzMANCJ9.eyJhdWxvZ2luVXJsIjoiaHR0cHM6Ly9hdWxvZ2luLmMwMS FwcC5jb20iLCJvbmV0aW1lVG9rZW5JZCI6IjdKYzIIZWNjLWU5MjctNDQ4YS05NmV VbGVzIjpbImFjcXVpc2l0aW9uX3NpZ25lciJdLCJzZXJ2ZXJVcmwiOiJodHRwczov MC1hNmVmLTQxMzAyMzQwYjVhZi5jMDEuY2xvdWRpbnNpZ2h0cy5uZXRhcHAuY29tI joxNjAyMDk5MjA2LCJsb2dpbiI6ImFjcXVpc2l0aW9uLjAzOTI0MDIyLTg2Y2QtND hhMiIsImlhdCI6MTYwMjAxMjc0NiwidXVpZCI6IjAzOTI0MDIyLTg2Y2QtND	•			
run the installer. asted the snippet into the bash shell.				
	Are You Using? Linux Versions Supported () Production Best Practices () rs for this Acquisition Unit only. CJhbGc101JUZM4NCJ9.eyJhdWxvZ2luVXJsIjoiaHR0cHM6Ly9hdWxvZ2luLmMvMSS GFwcC5jb20iLCJvbmV0aW1lVG9rZW5JZCI6IjdKYZI1ZWNjLWU5MjctNDQ4YS05NmV DvbGVzIjpbImFjcXVpc2l0aW9uX3NpZ25lciJdLCJzZXJ2ZXJVcmwi0iJodHRwczov cMC1hNmVmLTQxMzAyMzQwYjvhZi5jMDEuv2xvdWRpbnNpZ2h0cy5uZXRhcHauv29tI cjoxNjAyMDk5MjA2LCJsb2dpbiI6ImFjcXVpc2l0aW9uLjAzOTI0MDIyLTg2YzQtNDJmMc1 orun the installer. wasted the snippet into the bash shell.			

5. Paste the snippet into the CLI of the Red Hat Enterprise Linux machine that was provisioned and click Enter.

[root@Netapp-AU ~]# token=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzM4NCJ9.eyJhdWxvZ2luVXJsIjoiaHR0cHM6Ly9hdWxvZ2luLmMwMS5jbG91ZGluc 2lnaHRzLm5ldGFwcC5jb20iLCJvbmV0aW1lVG9rZW5JZCI6IjQ5ZTY0MGM5LTY5MTItNDQ4Yi04YmI4LTIwNGY2OTQ2YzY1YSIsInJvbGVzIjpbImFjcXVpc 2l0aW9uX3NpZ25lciJdLCJzZXJZZXJVcmwiOiJodHRwczovLzhkNDE5NWE2LWViYjgtNGFkMC1hNmVmLTQxMzAyMzQwYjVhZi5jMDEuY2xvdWRpbnNpZ2h0c y5uZXRhcHAuY29tIiwiaXNzIjoib2NpIiwiZXhwIjoxNjAyMTgyNzg2LCJsb2dpbiI6ImFjcXVpc2l0aW9uLjc4MTliZGI3LTk50WQtNGNiYS05YmU1LTMwZ TcxZjk00DRiZCIsImlhdCI6MTYwMjA5NjMyNiwidXVpZCI6Ijc4MTliZGI3LTk50WQtNGNiYS05YmU1LTMwZTcxZjk00DRiZCIsInRlbmFudCI6IjhkNDE5N WE2LWViYjgtNGFkMC1hNmVmLTQxMzAyMzQwYjVhZiIsInRlbmFudFN1YmRvbWFpbiI6InBzMTMyNSJ9.RvWLR3wH1_k6fI0Ci0_h-Wok2STfFPDj7VksmXqw -GZ-JqSIe8SZE4Sv3DuWrWM6 domainUrl=https://8d4195a6-ebb8-4ad0-a6ef-41302340b5af.c01.cloudinsights.netapp.com/rest/v1/au version=1.253.0 bootstrap=cloudinsights-au-install-bootstrap.sh && curl \$proxy_auth_scheme -H "Authorization: Bearer \$to ken" -o \$bootstrap \$domainUrl/installerBootstrap && sudo chmod 755 \$bootstrap && sudo /bin/bash -c "TOKEN=\$token HTTPS_P ROXY=\$https_proxy PROXY_AUTH_SCHEME=\$proxy_auth_scheme AU_VERSION=\$version INSTALLER_NAME=cloudinsights-linux-au-install er-\$version INSTALLER_URL=\$domainUrl/installers/linux/\$version ./\$bootstrap"

The installation program downloads a compressed package and begins the installation. When the installation is complete, you receive a message stating that the Acquisition Unit has been registered with NetApp Cloud Insights.

Welcome to CloudInsights (R) Acquisition Unit
<pre>NetApp (R) Installation: /opt/netapp/cloudinsights Logs: /opt/netapp/cloudinsights/logs -> /var/log/netapp/cloudinsights</pre>
To control the CloudInsights service: sudo cloudinsights-service.shhelp To uninstall: sudo cloudinsights-uninstall.shhelp
<pre>1/8 Acquisition Unit Starting 2/8 Connecting to Cloud Insights 3/8 Sending Certificate-Signing Request 4/8 Logging in to Cloud Insights 5/8 Updating Security Settings 6/8 Downloading Data Collection Modules 7/8 Registering to Cloud Insights 8/8 Acquisition Unit Ready</pre>
Acquisition Unit has been installed successfully. [root@Netapp-AU ~]#

Add the monitored storage system from the FlexPod Datacenter to Cloud Insights

To add the ONTAP storage system from a FlexPod deployment, complete the following steps:

1. Return to the Acquisition Units page on Cloud Insights portal and find the listed newly registered unit. To display a summary of the unit, click the unit.

NetApp PCS Sa / Admin / Acquisition Units / NetApp-AU							
Summary							
Name NetApp-AU	IP 10.1.156.115	Status OK	Last Reported 9 minutes ago	Note	4		

2. To start a wizard to add the storage system, on the Summary page, click the button for creating a data collector. The first page displays all the systems from which data can be collected. Use the search bar to search for ONTAP.

Choose a Data Collecto	r to Monitor			
√ Ontap				\otimes
NetApp	NetApp	NetApp	NetApp	
Cloud Volumes ONTAP	Data ONTAP 7-Mode	ONTAP Data Management Software	ONTAP Select	

3. Select ONTAP Data Management Software.

A page displays that enables you to name your deployment and select the Acquisition Unit that you want to use. You can provide the connectivity information and credentials for the ONTAP system and test the connection to confirm.

Select a Data Collector			Configure Data Collector
NetApp ONTAP Data Management Software	Configure Collecto	or	
Add credentials and required	settings		Need Help?
 Configuration: Successfully pine Configuration: Successfully exercise 	ged 192.168.156.50. cuted test command on device.		
Name 🕕		Acquisition Unit	
FlexPod Datacenter		NetApp-AU	▼
NetApp Management IP Address		User Name	
192.168.156.50		admin	
Password			
Complete Setup Test Connection	n		

4. Click Complete Setup.

The portal returns to the Data Collectors page and the Data Collector begins its first poll to collect data from the ONTAP storage system in the FlexPod Datacenter.

FlexPod Datacenter	All stand-by	NetApp ONTAP Data Management Software	NetApp-AU	192.168.156.50	♥Polling	:

Use cases

With Cloud Insights set up and configured to monitor your FlexPod Datacenter solution,

we can explore some of the tasks that you can perform on the dashboard to assess and monitor your environment. In this section, we highlight five primary use cases for Cloud Insights:

- Active IQ integration
- · Exploring real-time dashboards
- Creating custom dashboards
- Advanced troubleshooting
- Storage optimization

Active IQ integration

Cloud Insights is fully integrated into the Active IQ storage monitoring platform. An ONTAP system, deployed as a part of a FlexPod Datacenter solution, is automatically configured to send information back to NetApp through the AutoSupport function, which is built into each system. These reports are generated on a scheduled basis, or dynamically whenever a fault is detected in the system. The data communicated through AutoSupport is aggregated and displayed in easily accessible dashboards under the Active IQ menu in Cloud Insights.

Access Active IQ information through the Cloud Insights dashboard

To access the Active IQ information through the Cloud Insights dashboard, complete the following steps:

1. Click the Data Collector option under the Admin menu on the left.



2. Filter for the specific Data Collector in your environment. In this example, we filter by the term FlexPod.

NetAp	etApp PCS Sa / Admin / Data Collectors							
			Data Collectors \rm 🛛 8	Acquisition Units 🛛 8				
Data	Collectors (1)				+ Data Collector Bulk Act	ions 🔻 🍸 F	lexPod	\otimes
	Name	Status	Туре	Acquisition Unit	IP	Impact \downarrow	Last Acquired	
	FlexPod Datacenter	All successful	NetApp ONTAP Data Management Software	NetApp-AU	192.168.156.50		10 minutes ago	:

3. Click the Data Collector to get a summary of the environment and devices that are being monitored by that collector.

NetApp PCS Sa / Admin / Data Collectors / Installed / FlexPod Datacenter							
Summary							
Name FlexPod Datacenter Acquisition Unit NetApp-AU	Type NetApp ONTAP Data Management Software	Types of Data Collected Inventory, Performance Inventory Recent Status Success	Performance Recent Status Success	Note	4		
Event Timeline (Last 3 W	leeks)						
Inventory					mmm	[[[]]	
Performance							
	3 Weeks Ago		2 Weeks Ago		1 Week Ago		
Inventory 10/15/2020 1:51:42 P	M - 10/19/2020 11:42:15 AM						
Devices Reported by This	s Collector (1)				🍸 Filter		
Device 1		Name		IP			
Storage		<u>aa14-a800</u>	[⁴]	192.168.156.50		4	
Show Recent Changes							

Under the device list near the bottom, click on the name of the ONTAP storage system being monitored. This displays a dashboard of information collected about the system, including the following details:

- Model
- Family
- ONTAP Version
- · Raw Capacity
- Average IOPS
- Average Latency
- Average Throughput

App PCS Sa / 🚺 a	a14-a800			Last 3 Hours	• 🕕 🖉 E
					Acquired 13 minutes ago, 12:51 P
torage Summary			2 5m	User Data	+ Annotation
Model: AFF-A800 Vendor: NetApp Family: AFF Serial Number: 1-80-000011	IP: 192.168.156.50 Microcode Version: 9.7.0P1 clustered Data ONTAP Raw Capacity: 43,594.6 GB Latency - Total: 0.05 ms	IOPS - Total: 4,972.70 IO/s Throughput - Total: 7.98 MB/s Management: HTTPS://192.168.156.50:443 FC Fabrics Connected: 0	Performance Policies: Risks: ④ 35 risks detected by ⓒ Active IQ ☑	Note Testing annotations Testing rules	
Expert View Latency - Total (ms) 0.1		`	Display Metrics Monday 10/19/2020 10.36:38 AM	Resource	Hide Resources
			aa14-a800: 0.04 ms	Top Correlated	79%
0	0:30 AM 11:00 AM	11:30 AM 12:00 PM	12:30 PM 1:00 PM		2007

Also, on this page under the Performance Policies section, you can find a link to NetApp Active IQ.



4. To open a new browser tab and take you to the risk mitigation page, which shows which nodes are affected, how critical the risks are, and what the appropriate action is that needs to be taken to correct the identified issues, click the link for Active IQ.

≡	A	ctive IQ	Active IQ Digit	al Advisor Dis	covery D	ashboard A	sset Insights •••	۹	Set a default view
	Home >	Cisco Systems	Inc. > CISCO SY	STEMS - RTP - BU The Risk A	ILDING 9 Acknow	> aa14-a800 ledgment fea	ature has been migrated to Active I	Q Digital Advisor. Click here to view and ackno	owledge risks.
~	Health	Security Vul	nerability Pr	oactive Remediati	on B	est Practices	Performance System Health Stor	age Virtual Machine Health Health Trending	
•	🗸 Hig	h 🔽 Mediu	im 🔽 Low						
≫	Ack	Node 🕈	Serial No 💠	Impact Level 🗢	Public 🗧	Category 🖨	Risk 🗢	Details 🗢	Corrective Action
*		aa14-a800-2	941834000459	High	No	ONTAP	A network interface (LIF) using a port on a X111 6A, X1146A or X91146A NIC might not fail over t o an alternate port.	A previously operational port on a X1116A, X1146A or X91146A NI C that encounters a fatal error with no preceding "link down" eve nt will still report the link status as "up", instead of reporting link s tatus as "down".	Bug ID: 1322372
								Potential Impact: Any network interface (LIF) using the port does not fail over to an alternate port in the event of failure.	
ŧ	-	aa14-a800-2	941834000459	High	Yes	FAS Hardware	On AFF A800 systems an erroneous 'Critical Hig h' sensor reading can result in a system shutdo wn.	This AFF-A800 system is running BMC firmware 10.3 which is susc eptible to bug 1279964. Potential Impact: System disruption caused by an erroneous 'Criti cal High' sensor reading.	Bug ID: 1279964
	-	aa14-a800-2	941834000459	High	Yes	ONTAP	AFF systems running an unfixed version of ONT AP with data compaction enabled and host ser vices over FCP, iSCSI or NVMe can experience a disruption in service due to BUG 1273955.	This system is running ONTAP 9.7P1 and is utilizing FCP, iSCSI or NVMe protocols and has compaction enabled and therefore is exp osed to BUG 127355. Potential Impact: The system may experience performance degra dation and possible panic.	Bug ID: 1273955
	-	aa14-a800-2	941834000459	High	Yes	ONTAP	ONTAP 9.7 running on an All-Flash FAS (AFF) sy stem having SAN workload might cause a contr oller disruption.	ONTAP 9.7 running on an All-Flash FAS (AFF) system having SAN w orkload with inline compression combined with cross-volume inli ne deduplication might cause a storage controller disruption. Potential Impact: The system may experience a disruption.	KB ID: SU426
		aa14-a800-1	941834000183	High	No	ONTAP	A network interface (LIF) using a port on a X111 6A. X1146A or X91146A NIC might not fail over t	A previously operational port on a X1116A, X1146A or X91146A NI C that encounters a fatal error with no preceding "link down" eve nt will still report the link status as "up", instead of reporting link s tatus as "down".	Bug ID: 1322372
	1 - 17	of 17 results					⊮ ∢ 1	▶ H	

Explore real-time dashboards

Cloud Insights can display real-time dashboards of the information that has been polled from the ONTAP storage system deployed in a FlexPod Datacenter solution. The Cloud Insights Acquisition Unit collects data in regular intervals and populates the default storage system dashboard with the information collected.

Access real-time graphs through the Cloud Insights dashboard

From the storage system dashboard, you can see the last time that the Data Collector updated the information. An example of this is shown in the figure below.

	Acqui	red 3 minutes ago, 1:21 PM
Details		×
Data Collector	Status	Last Acquired
FlexPod Datacenter	All successful	3 minutes ago, 1:21 PM

By default, the storage system dashboard displays several interactive graphs that show system-wide metrics from the storage system being polled, or from each individual node, including: Latency, IOPS, and Throughput, in the Expert View section. Examples of these default graphs are shown in the figure below.



By default, the graphs show information from the last three hours, but you can set this to a number of differing values or a custom value from the dropdown list near the top right of the storage system dashboard. This is shown in the figure below.



Create custom dashboards

In addition to making use of the default dashboards that display system-wide information, you can use Cloud Insights to create fully customized dashboards that enable you to focus on resource use for specific storage volumes in the FlexPod Datacenter solution, and thus the applications deployed in the converged infrastructure that depend on those volumes to run effectively. Doing so can help you to create a better visualization of specific applications and the resources they consume in the data center environment.

Create a customized dashboard to assess storage resources

To create a customized dashboard to assess storage resources, complete the following steps:

1. To create a customized dashboard, hover over Dashboards on the Cloud Insights main menu and click + New Dashboard in the dropdown list.

	Cloud Insi	ghts
MONIT	OR & OPTIMIZE	NetApp PCS Sa / Admin / Da
Â	HOME	Summary
0	DASHBOARDS	Show All Dashboards (1835)
Ø,	QUERIES	+ New Dashboard
	ALERTS	Kubernetes Explorer

The New Dashboard window opens.

2. Name the dashboard and select the type of widget used to display the data. You can select from a number of graph types or even notes or table types to present the collected data.

NetApp PCS Sa / Dashboard	s / New Dashboard			Last 7 Days	- 0	Add Variable 🔹	Add Widget 🔻	🖺 Save
	Choose Widget Type:							×
	Line Chart	Spline Chart	Area Chart	Stacked Area Chart	H H Box Plot	Scatter Plot		
	123 Single Value	Solid Gauge	Bullet Gauge	Bar Chart	III Column Chart	Pie Chart		
	Note	Table	Violations Table					

3. Choose customized variables from the Add Variable menu.

This enables the data presented to be focused to display more specific or specialized factors.

NetApp PCS Sa / Dashboards / New Dashboard	U Last 7 Days	✓ ● Add Variable · · · · · · · · · · · · · · · · · · ·	•
		Search]
Add widgets to	o customize this view	Boolean Date	
		aa to be decom	
		Admin	
		Aggregate Service Level	•

- 4. To create a custom dashboard, select the widget type you would like to use, for example, a pie chart to display storage utilization by volume:
 - a. Select the Pie Chart widget from the Add Widget dropdown list.
 - b. Name the widget with a descriptive identifier, such as Capacity Used.
 - c. Select the object you want to display. For example, you can search by the key term volume and select volume.performance.capacity.used.
 - d. To filter by storage systems, use the filter and type in the name of the storage system in the FlexPod Datacenter solution.
 - e. Customize the information to be displayed. By default, this selection shows ONTAP data volumes and lists the top 10.
 - f. To save the customized dashboard, click the Save.



After saving the custom widget, the browser returns to the New Dashboard page where it displays the newly created widget and allows for interactive action to be taken, such as modifying the data polling period.



Advanced troubleshooting

Cloud Insights enables advanced troubleshooting methods to be applied to any storage environment in a FlexPod Datacenter converged infrastructure. Using components of each of the features mentioned above: Active IQ integration, default dashboards with real-time statistics, and customized dashboards, issues that might arise are detected early and solved rapidly. Using the list of risks in Active IQ, a customer can find reported configuration errors that could lead to issue or discover bugs that have been reported and patched versions of code that can remedy them. Observing the real-time dashboards on the Cloud Insights home page can help to discover patterns in system performance that could be an early indicator of a problem on the rise and help to resolve it expediently. Lastly, being able to create customized dashboards enables customers to focus on the most important assets in their infrastructure and monitor those directly to ensure that they can meet their business continuity objectives.

Storage optimization

In addition to troubleshooting, it is possible to use the data collected by Cloud Insights to optimize the ONTAP storage system deployed in a FlexPod Datacenter converged infrastructure solution. If a volume shows a high latency, perhaps because several VMs with high performance demands are sharing the same datastore, that information is displayed on the Cloud Insights dashboard. With this information, a storage administrator can choose to migrate one or more VMs either to other volumes, migrate storage volumes between tiers of aggregates, or between nodes in the ONTAP storage system, resulting in a performance optimized environment. The information gleaned from the Active IQ integration with Cloud Insights can highlight configuration issues that lead to poorer than expected performance, and provide the recommended corrective action that if implemented, can remediate any issues, and ensure an optimally tuned storage system.

Videos and demos

You can see a video demonstration of using NetApp Cloud Insights to assess the resources in an on-premises environment here.

You can see a video demonstration of using NetApp Cloud Insights to monitor infrastructure and set alert thresholds for infrastructure here.

You can see a video demonstration of using NetApp Cloud Insights to asses individual applications in the environment here.

Additional information

To learn more about the information that is described in this document, review the

following websites:

Cisco Product Documentation

https://www.cisco.com/c/en/us/support/index.html

FlexPod Datacenter

https://www.flexpod.com

NetApp Cloud Insights

https://cloud.netapp.com/cloud-insights

NetApp Product Documentation

https://docs.netapp.com

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