Prism - Features and Usage

[PDF generated June 03 2025. For all recent updates please see the Nutanix Bible releases notes located at https:// nutanixbible.com/release_notes.html. Disclaimer: Downloaded PDFs may not always contain the latest information.]

In the following sections we'll cover some of the typical Prism uses as well as some common troubleshooting scenarios.

Nutanix Software Upgrade

Performing a Nutanix software upgrade is a very simple and non-disruptive process.

To begin, start by logging into Prism and clicking on the gear icon on the top right (settings) or by pressing 'S' and selecting 'Upgrade Software':

	Q 👬 🌣 -
Cluster Details	Licensing
Create Container	Filesystem Whitelists
Expand Cluster	Image Configuration
Upgrade Software	Prism Central Registration

Prism - Settings - Upgrade Software

This will launch the 'Upgrade Software' dialog box and will show your current software version and if there are any upgrade versions available. It is also possible to manually upload a NOS binary file.

You can then download the upgrade version from the cloud or upload the version manually:

Upgrade Software	
NOS · Hypervisor · Firmware · NCC	
CURRENT VERSION	4.5
AVAILABLE COMPATIBLE VERSIONS	
No available versions for upgrade.	
UPLOAD UPGRADE SOFTWARE BINARY	
NOS METADATA FILE	
C:\Users\steve\Downloads\nutanix_installer_package-re Brows	e 🔶
NOS BINARY FILE	
C:\Users\steve\Downloads\nutanix_installer_package-re Brows	e 🔶
Upload	Now
Enable Automatic Download	Close

Upgrade Software - Main

Upload software from the CVM	
In certain cases you may want to download the software and upload from the CVM itself. For example, this can be used to download builds locally to the CVM.	
First SSH into a CVM and find the Prism leader:	
curl localhost:2019/prism/leader	
SSH to the Prism leader and download the software bundle and metadata JSON	
Run the following command to "upload" the software to Prism:	
ncli software upload file-path=PATH_TO_SOFTWARE meta-file-path=PATH_TO_METADATA_JSON software-type=SOFTWARE_TYPE	
The following shows an example for Prism Central:	
ncli software upload file-path=/home/nutanix/tmp/leader-prism_central.tar meta-file-path=/home/nutanix/tmp/leader-prism_central-meta	tadata

It will then upload the upgrade software onto the Nutanix CVMs:

AVAILABLE COMPATIBLE VERSIONS

4.5	uploading	

UPLOAD UPGRADE SOFTWARE BINARY



Upgrade Software - Upload

After the software is loaded click on 'Upgrade' to start the upgrade process:

AVAILABLE COMPATIBLE VERSIONS

4.5	\rightarrow	Upgrade

Upgrade Software - Upgrade Validation

You'll then be prompted with a confirmation box:

Do you want to upgrade to 4.5?



Upgrade Software - Confirm Upgrade

The upgrade will start with pre-upgrade checks then start upgrading the software in a rolling manner:

Upgrading Cluster	34%
4 host(s) are being upgraded	close
Upgrading CVM 10.2.100.18 (Host ID: 7)	34%
Upgrading CVM 10.2.100.17 (Host ID: 6)	34%
Upgrading CVM 10.2.100.16 (Host ID: 5)	34%
Upgrading CVM 10.2.100.15 (Host ID: 4)	34%

Upgrade Software - Execution

Once the upgrade is complete you'll see an updated status and have access to all of the new features:





Note

Your Prism session will briefly disconnect during the upgrade when the current Prism Leader is upgraded. All VMs and services running remain unaffected.

Hypervisor Upgrade

Similar to Nutanix software upgrades, hypervisor upgrades can be fully automated in a rolling manner via Prism.

To begin follow the similar steps above to launch the 'Upgrade Software' dialogue box and select 'Hypervisor'.

You can then download the hypervisor upgrade version from the cloud or upload the version manually:

Upgrade Software	? X
NOS • Hypervisor • Firmware • NCC	
CURRENT VERSION Nutanix 20	0150513
AVAILABLE COMPATIBLE VERSIONS	
No available versions for upgrade.	
UPLOAD UPGRADE SOFTWARE BINARY	
HYPERVISOR METADATA FILE	
C:\Users\steve\Downloads\host-bundle-el6.nutanix.2015 Brows	e 🛻
HYPERVISOR BINARY FILE	
C:\Users\steve\Downloads\host-bundle-el6.nutanix.2015 Brows	e 🗲
Upload	Now
	Close

Upgrade Hypervisor - Main

It will then load the upgrade software onto the Hypervisors. After the software is loaded click on 'Upgrade' to start the upgrade process:



Upgrade Hypervisor - Upgrade Validation

You'll then be prompted with a confirmation box:

Do you want to upgrade to el6.nutanix.20150616?



The system will then go through host pre-upgrade checks and upload the hypervisor upgrade to the cluster:

CURRENT VERSION	Nutanix 20150513
Host PreUpgrade	4%
Checking all components for upgrade. Please wait.	close
Starting hypervisor preupgrade checks	14%
Uploading hypervisor bundle to cluster	0%
Completed hypervisor preupgrade checks for the cluste	r 0%

Upgrade Hypervisor - Pre-upgrade Checks

Once the pre-upgrade checks are complete the rolling hypervisor upgrade will then proceed:

CURRENT VERSION	Nutanix 20150513
Upgrading Hypervisor	22%
7 host(s) are being upgraded	close
Host Upgrade (Host ID: 9)	14%
Host Upgrade (Host ID: 8)	14%
Host Upgrade (Host ID: 7)	71%
Host Upgrade (Host ID: 14)	14%

Upgrade Hypervisor - Execution

Similar to the rolling nature of the Nutanix software upgrades, each host will be upgraded in a rolling manner with zero impact to running VMs. VMs will be live-migrated off the current host, the host will be upgraded, and then rebooted. This process will iterate through each host until all hosts in the cluster are upgraded.

Pro tip

You can also get cluster wide upgrade status from any Nutanix CVM by running 'host_upgrade --status'. The detailed per host status is logged to ~/data/logs/ host_upgrade.out on each CVM.

Once the upgrade is complete you'll see an updated status and have access to all of the new features:



Upgrade Hypervisor - Complete

Cluster Expansion (add node)

auto_chuster Settings v 🤤 🗄 🐥 🔍 💿 🐵 v	N	Q ? ~ 🏟 sp 🚨
Settings		
Setup ^		
Connect to Citrix Cloud	Expand Cluster ?	
Prism Central Registration	1 Salart Host 2 Assinn Back 3 Confinue Host	
Pulse		
Rack Configuration	Newly discovered nodes are displayed below. Select the ones you would like to add	
	and configure their network addresses. New nodes must be connected to the network on the same subnet as the cluster (1015 228.0/255.255.254.0)	
	Remember to add licenses for all new nodes.	
enoral Instan Datalla		
laster Details	NX-3060-G5 (Serial Number: 18FM6F100206)	
onngure CVM		
onvert Cluster	00	
xpand Cluster	5	
hage Configuration		
kensing	NX-3060-G5 (Serial Number: 18FM6F100217)	
fe Cycle Management		
mote Support		
equest Reboot		
Ipgrade Software		
	Cancel Next	
twork		
TTP Proxy		
ame Servers		
Network Configuration		

Cluster Expansion

The ability to dynamically scale the Nutanix cluster is core to its functionality. To scale a Nutanix cluster, rack/stack/cable the nodes and power them on. Once the nodes are powered up they will be discoverable by the current cluster using mDNS.

The figure shows an example 7 node cluster with 1 node which has been discovered:

Hardware Summary	
7 2 HOSTS BLOCKS	NX3050 MODEL
7 Hosts	
7 MONITORED	1 <u>DISCOVERED</u>
42 Disks	
28	14
HDD	SSD

Add Node - Discovery

Multiple nodes can be discovered and added to the cluster concurrently.

Once the nodes have been discovered you can begin the expansion by clicking 'Expand Cluster' on the upper right hand corner of the 'Hardware' page:



Hardware Page - Expand Cluster

You can also begin the cluster expansion process from any page by clicking on the gear icon:

	Q ? ~ 🛱 ~
Cluster Details	Licensing
Create Container	Filesystem Whitelists
Expand Cluster	Image Configuration
Upgrade Software	Prism Central Registration
	Pulse
Authentication	Manage VM High Availability
SSL Certificate	Name Servers
Role Mapping	Network Configuration
User Management	NTP Servers
	Remote Support
Alert Email Configuration	SMTP Server
Alert Policies	SNMP
	Welcome Banner
Cluster Lockdown	UI Settings
HTTP Proxy	

Gear Menu - Expand Cluster

This launches the expand cluster menu where you can select the node(s) to add and specify IP addresses for the components:

Expand Cluster	?	×
1. Host Selection · 2. Host Configuration		
NX3050 (Serial Number: 13SM35210020)		^
☑ B [103.340.156] ○		
HOST NAME ONLY REQUIRED FOR HYPER-V		;
Host B NTNX-BEAST-6		
 CONTROLLER VM IP SUBNET: 10.3.140.151 / 255.255.252.0 		
Host B 10 _ 3 _ 140 _ 156		
✓ HYPERVISOR IP SUBNET: 10.3.140.101 / 255.255.252.0		
Host B 10 _ 3 _ 140 _ 106		
 IPMLIP SUBNET: 10.3.140.59 / 255.255.240.0 		
Host B 10 . 3 . 140 . 72		~
Cancel	Ne	xt

Expand Cluster - Host Selection

After the hosts have been selected you'll be prompted to upload a hypervisor image which will be used to image the nodes being added. For AHV or cases where the image already exists in the Foundation installer store, no upload is necessary.

Expand Cluster	? X
1. Host Selection · 2. Host Configuration	
HYPERVISOR(5) NEEDED 1 hypervisor is detected. Please upload correct ISO imag before expanding with selected hosts.	es respectively
Hypervisor : AHV REQUIRE	D BY 1 HOST(S)
Uploading: host-bundle	×
Hypervisor ISO Whitelist UPDAT	ED: JUST NOW
Back Cancel Validate E	xpand Cluster

Expand Cluster - Host Configuration

After the upload is completed you can click on 'Expand Cluster' to begin the imaging and expansion process:

Expand Cluster		? X
1. Host Selection	2. Host Configuratio	n
HYPERVISOR(S) NEEDE 1 hypervisor is detected before expanding with	ED I. Please upload correct I selected hosts.	SO images respectively
Hypervisor : AHV	nutanix.20150616.tar.g	REQUIRED BY 1 HOST(S) Z Change File
Hypervisor ISO Wh	itelist	UPDATED: JUST NOW
👱 whitelist.json		Update
Back	Cancel Validate	Expand Cluster

Expand Cluster - Execution

The job will then be submitted and the corresponding task item will appear:



Expand Cluster - Execution

Detailed tasks status can be viewed by expanding the task(s):

• •	
ExpandCluster 17%	
Expand cluster operation initialized 100% done	٥
Pre expand-cluster tests started 5%	©
▲ Internal preparation 0% queued	
Trigger imaging of nodes 0% queued	
♣ Per node tasks 0% queued	
▲ Expand-cluster complete 0% queued	

Expand Cluster - Execution

After the imaging and add node process has been completed you'll see the updated cluster size and resources:

Hardware Summary	
8 2 HOSTS BLOCKS	NX3050 MODEL
8 Hosts	
8 MONITORED	DISCOVERED
48 Disks	
32	16

Expand Cluster - Execution

I/O Metrics

Identification of bottlenecks is a critical piece of the performance troubleshooting process. In order to aid in this process, Nutanix has introduced a new 'I/O Metrics' section to the VM page.

Latency is dependent on multitude of variables (queue depth, I/O size, system conditions, network speed, etc.). This page aims to offer insight on the I/O size, latency, source, and patterns.

To use the new section, go to the 'VM' page and select a desired VM from the table. Here we can see high level usage metrics:

 VM NAME 	HOST	IP ADDRESSES	CORES	MEMORY CAPACITY	STORAGE	CPU USAGE	CONTROLLER READ IOPS	CONTROLLER WRITE IOPS	CONTROLLER IO BANDWIDTH	CONTROLLER AVG IO LATENCY	BACKU	FLASH MODE
loadgen1	NTNX-BEAST-5	10.3.14	8	8 GiB	136.92 GIB / 4.14 TiB	28.45%	24799	10603	283.25 MBps	1.33 ms	Yes	No

VM Page - Details

The 'I/O Metrics' tab can be found in the section below the table:

Manage G	iuest Tools 🛛 🛃 Lau	nch Console Power	Off Actions Take Sn	apshot Migrate	Pause Clone	🖋 Update 🛛 🗙 Delete
VM Performance	Virtual Disks	VM NICs	VM Snapshots	VM Tasks	I/O Metrics	Console

VM Page - I/O Metrics Tab

Upon selecting the 'I/O Metrics' tab a detailed view will be shown. We will break this page down and how to use it in this section.

The first view is the 'Avg I/O Latency' section that shows average R/W latency for the past three hours. By default the latest reported values are shown with the corresponding detailed metrics below for that point in time.

You can also mouse over the plot to see the historical latency values and click on a time of the plot to view the detailed metrics below.

Avg I/O Latency	10:11:00 AMency Wite Latency
Mmmm	Write Latency 0.03ms Read Latency 0.16ms
· · · · · · · · · · · · · · · · · · ·	
7:20:00 AM 7:36:40 AM 7:53:20 AM 8:10:00 AM 8:26:40 AM 8:43:20 AM 9:00:00 AM 9:16:40 AM 9:	33:20 AM 9:50:00 AM 10:06 <mark>10:11:00an</mark>

I/O Metrics - Latency Plot

This can be useful when a sudden spike is seen. If you see a spike and want to investigate further, click on the spike and evaluate the details below.



I/O Metrics - Latency Plot

If latency is all good, no need to dig any further.

The next section shows a histogram of I/O sizes for read and write I/Os:



I/O Metrics - I/O Size histogram

Here we can see our read I/Os range from 4K to 32K in size:





I/O Metrics - Read I/O Size histogram

Here we can see our write I/Os range from 16K to 64K with some up to 512K in size:



I/O Metrics - Write I/O Size histogram





I/O Metrics - Latency histogram

Looking at the read latency histogram we can see the majority of read I/Os are sub-ms (<1ms) with some up to 2-5ms.



Read Latency (ms)

I/O Metrics - Read Latency histogram

Taking a look below at the 'Read Source' we can see most I/Os are being served from the SSD tier:



I/O Metrics - Read Source SSD

As data is read it will be pulled in to the Unified Cache realtime (Check the 'I/O Path and Cache' section to learn more). Here we can see the data has been pulled into the cache and is now being served from DRAM:



I/O Metrics - Read Source DRAM

We can now see basically all of our read I/Os are seeing sub-ms (<1ms) latency:



Read Latency (ms)

I/O Metrics - Read Latency histogram

Here we can see the majority of our write I/O are seeing <1-2ms latency:



Write Latency (ms)

I/O Metrics - Write Latency histogram

Pro tip

If you see a spike in read latency and the I/O sizes aren't large, check where the read I/Os are being served from. Any initial read from HDD will see higher latency than the DRAM cache; however, once it is in the cache all subsequent reads will hit DRAM and see an improvement in latency.

The last section shows the I/O patterns and how much is random vs. sequential:



I/O Metrics - RW Random vs. Sequential

Typically I/O patterns will vary by application or workload (e.g. VDI is mainly random, whereas Hadoop would primarily be sequential). Other workloads will be a mix of both. For example, a database might be random on inserts or some queries, however sequential during ETL.