

Book of Basics - Foundation (Imaging)

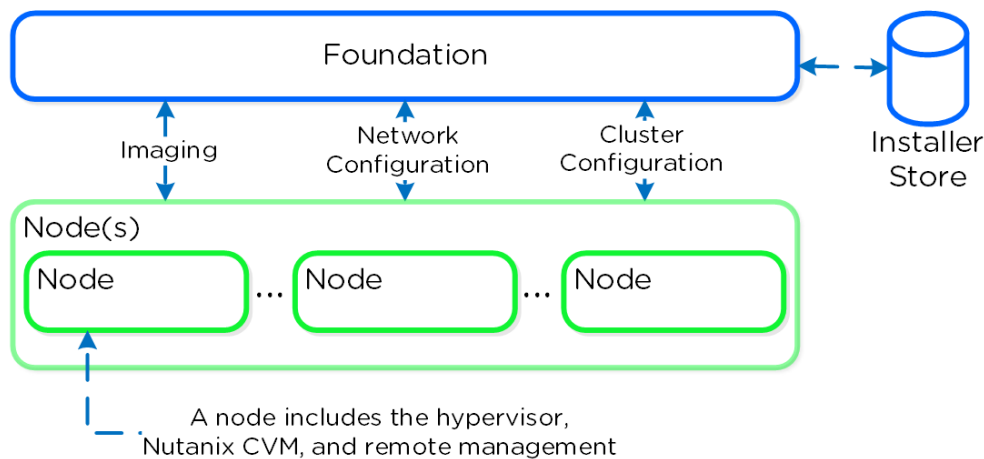
[PDF generated December 27 2023. For all recent updates please see the Nutanix Bible releases notes located at https://nutanixbible.com/release_notes.html. Disclaimer: Downloaded PDFs may not always contain the latest information.]

Foundation Imaging Architecture

Foundation is a Nutanix provided tool leveraged for bootstrapping, imaging and deployment of Nutanix clusters. The imaging process will install the desired version of the AOS software as well as the hypervisor of choice.

By default Nutanix nodes ship with AHV pre-installed, to leverage a different hypervisor type you must use foundation to re-image the nodes with the desired hypervisor. NOTE: Some OEMs will ship directly from the factory with the desired hypervisor.

The figure shows a high level view of the Foundation architecture:

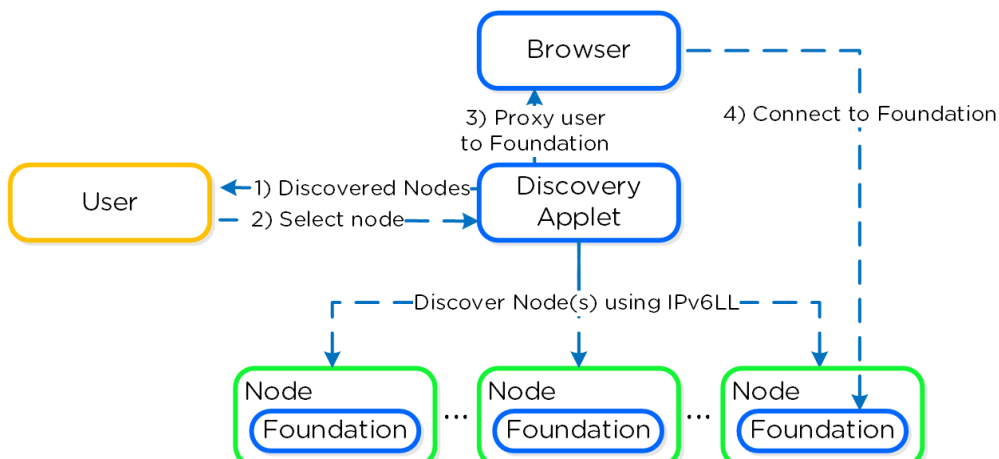


Foundation - Architecture

As of 4.5, Foundation is built in to the CVMs to simplify configuration. The installer store is a directory for storing uploaded images, these can be used for the initial imaging as well as cluster expansion when imaging is required.

The Foundation Discovery Applet (which can be found [HERE](#)) is responsible for discovering nodes and allowing the user to select a node to connect to. Once the user has selected a node to connect to, the applet will proxy localhost:9442 IPv4 to the CVM's IPv6 link-local address on port 8000.

The figure shows a high level view of the applet architecture:



Foundation - Applet Architecture

NOTE: the discovery applet is merely a means of discovery and proxy to the Foundation service which runs on the nodes. All of the imaging and configuration is handled by the Foundation service, not the applet.

Pro tip

If you're on a different network (L2) than your target Nutanix nodes (e.g. over the WAN) you can connect directly to the Foundation service on the CVM if it has an IPv4 address assigned (instead of using the discovery applet).

To directly connect browse to <CVM_IP>:8000/gui/index.html

Inputs

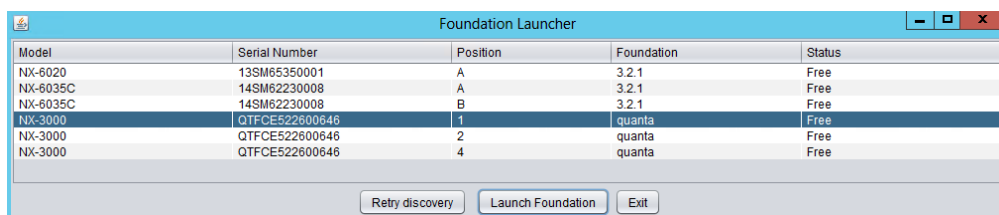
The Foundation tool has the following configuration inputs (below). A typical deployment requires 3 IP addresses per node (hypervisor, CVM, remote management (e.g. IPMI, iDRAC, etc.)). In addition to the per node addresses, it is recommended to set a Cluster and Data Services IP addresses.

- Cluster
 - Name
 - IP
 - *NTP*
 - DNS*
- CVM
 - IP per CVM
 - Netmask
 - Gateway
 - Memory
- Hypervisor
 - IP per hypervisor host
 - Netmask
 - Gateway
 - DNS*
 - Hostname prefix
- IPMI*
 - IP per node
 - Netmask
 - Gateway

NOTE: Items marked with '*' are optional but highly advisable

System Imaging and Deployment

The first step is to connect to the Foundation UI which can be done via the discovery applet (if on same L2, node IPs unnecessary):



| Model | Serial Number | Position | Foundation | Status |
|----------|----------------|----------|------------|--------|
| NX-6020 | 13SM65350001 | A | 3.2.1 | Free |
| NX-6035C | 14SM62230008 | A | 3.2.1 | Free |
| NX-6035C | 14SM62230008 | B | 3.2.1 | Free |
| NX-3000 | QTFCE522600646 | 1 | quanta | Free |
| NX-3000 | QTFCE522600646 | 2 | quanta | Free |
| NX-3000 | QTFCE522600646 | 4 | quanta | Free |

Foundation - Discovery Applet

If you can't find the desired node, make sure you're on the same L2 network.

After connecting into the selected node's Foundation instance the main Foundation UI will appear:

1. Discover Nodes2. Define Cluster3. Setup Node4. Select Images5. Create Cluster

Discover Blocks and nodes.

Discovered 3 new nodes. You have selected 3 nodes. Your Redundancy Factor is set to (2).

Missing nodes? [Rerun discovery](#).

Select All · Deselect All · Change RF (2)

Show only new nodes

QTFCE522600646

☐

1

VLAN 0

☐

2

VLAN 0

☐

4

VLAN 0

Next

Foundation - Discovery Page

This will show all of the discovered nodes and their chassis. Select the desired nodes to form the cluster and click 'Next'

1. Discover Nodes2. Define Cluster3. Setup Node4. Select Images5. Create Cluster

Discover Blocks and nodes.

Discovered 3 new nodes. You have selected 3 nodes. Your Redundancy Factor is set to (2).

Missing nodes? [Rerun discovery](#).

Select All · Deselect All · Change RF (2)

Show only new nodes

QTFCE522600646

☒

1

VLAN 0

☒

2

VLAN 0

☒

4

VLAN 0

Next

Foundation - Node Selection

The next page prompts for the cluster and network inputs:

1. Discover Nodes2. Define Cluster3. Setup Node4. Select Images5. Create Cluster

New Cluster Setup

Set up general information to create and connect your cluster to the network.

Cluster Information

Set up cluster level information like cluster name and IP address.

NAME

TM3

IP ADDRESS (OPTIONAL)

10.2.100.10

ENABLE IPMI☒

NTP SERVER ADDRESS (OPTIONAL)

207.196.240.30

DNS SERVER IP (OPTIONAL)

10.11.100

Network Information

This is some basic information about your Hypervisor, CVM, IPMI IPs.

CVM

NETMASK:

255.255.255.0

Hypervisor

NETMASK:

255.255.255.0

IPMI (Optional)

NETMASK:

255.255.255.0

Prev

Next

Foundation - Cluster Information

1. Discover Nodes
2. Define Cluster
3. Setup Node
4. Select Images
5. Create Cluster

⚙️

New Cluster Setup

Set up general information to create and connect your cluster to the network.

network information
This is some basic information about your Hypervisor, CVM, IPMI IPs.

| | | |
|--|--|---|
| CVM NETMASK: <input type="text" value="255.255.255.0"/> GATEWAY: <input type="text" value="10.2.100.1"/> MEMORY: <input type="text" value="32 GB"/> | Hypervisor NETMASK: <input type="text" value="255.255.255.0"/> GATEWAY: <input type="text" value="10.2.100.1"/> DNS SERVER IP: <input type="text" value="10.11.100"/> | IPMI (Optional) NETMASK: <input type="text" value="255.255.255.0"/> GATEWAY: <input type="text" value="10.2.100.1"/> |
|--|--|---|

Post Imaging Tests
This enables a series of tests to ensure that the cluster has been correctly configured and everything is running smoothly.

☒ ENABLE TESTING

◀ Prev

Next ▶

Foundation - Network Information

Once the details have been input, click 'Next'

Next we'll input the node details and IP addresses:

1. Discover Nodes
2. Define Cluster
3. Setup Node
4. Select Images
5. Create Cluster

⚙️

Node Setup

Set up the IP addresses of your nodes.

Clear IPs and Hostnames

Hostnames and IP Range
Specify the IP Range for the Nodes.

| | | |
|--|--|---|
| Hypervisor Hostname ENTER HOSTNAME <input type="text" value="TM3"/> | CVM IP FROM / TO <input type="text" value="10.2.100.15"/> <input type="text" value="10.2.100.17"/> | Hypervisor IP FROM / TO <input type="text" value="10.2.100.11"/> <input type="text" value="10.2.100.13"/> |
|--|--|---|

IPMI IP (Optional)
FROM / TO

Manual Input
Manually fill in the IP Range for the Nodes.

◀ Prev

Validate Network ▶

Foundation - Node Setup

You can manually override the hostname and IP addresses if necessary:

1. Discover Nodes
2. Define Cluster
3. Setup Node
4. Select Images
5. Create Cluster

⚙️

Node Setup

Set up the IP addresses of your nodes.

Clear IPs and Hostnames

Manual Input
Manually fill in the IP Range for the Nodes.

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| | | |
|--------------------------------------|--|--|
| HYPERVISOR HOSTNAME | CVM IP | HYPERVISOR IP |
| 1 <input type="text" value="TM3-1"/> | <input type="text" value="10.2.100.15"/> | <input type="text" value="10.2.100.11"/> |
| 2 <input type="text" value="TM3-2"/> | <input type="text" value="10.2.100.16"/> | <input type="text" value="10.2.100.12"/> |
| 4 <input type="text" value="TM3-4"/> | <input type="text" value="10.2.100.18"/> | <input type="text" value="10.2.100.14"/> |

IPMI IP (OPTIONAL)

◀ Prev

Validate Network ▶

Foundation - Hostname and IP

Click 'Validate Network' to validate network configuration and proceed. This will check for IP address conflicts and ensure connectivity.

Node Setup
Set up the IP addresses of your nodes.

Clear IPs and Hostnames

Hostnames and IP Range
Specify the IP Range for the Nodes.

Hypervisor Hostname
ENTER HOSTNAME
TM3

CVM IP
FROM / TO
10.2.100.15
10.2.100.17

Hypervisor IP
FROM / TO
10.2.100.11
10.2.100.13

IPMI IP (Optional)
FROM / TO
10.4.41.89
10.4.41.91

Validating...
Checking for IP conflicts and testing CVM-CVM and CVM-Host connectivity.
Progress 63%

Manual Input
Manually fill in the IP Range for the Nodes.

◀ Prev

Validating... ▶

Foundation - Network Validation

Once network validation has completed successfully we'll now proceed to selecting the desired images.

To upgrade AOS to a newer version than currently on the CVM, download it from the portal and upload the Tarball. Once we have the desired AOS image, we'll select the hypervisor.

For AHV, the image is built-in to the AOS image. For others you must upload the desired hypervisor image. NOTE: make sure the AOS and hypervisor versions are on the compatibility matrix ([LINK](#)).

Once we have the desired images, click 'Create':

Image Uploads
You can select Acropolis and Hypervisor ISO images for your nodes.

Acropolis
Installed Version
4.7
Uploaded
nutanix_installer_package-
release-danube-4.7.01-
stable.tar.gz
Upload Tarball

Hypervisor
AHV ESX HYPER-V CPS
Available hypervisors
host-bundle-el6.nuta
nix.20150921tar.gz
host-bundle-el6.nuta
nix.20160217.2.tar.gz
kvm_host_bundle_2
01606016.tar.gz
Upload VM Image

SKU
Choose Hyper-V SKU
Free
Standard
Datacenter
Standard with GUI
Datacenter with GUI

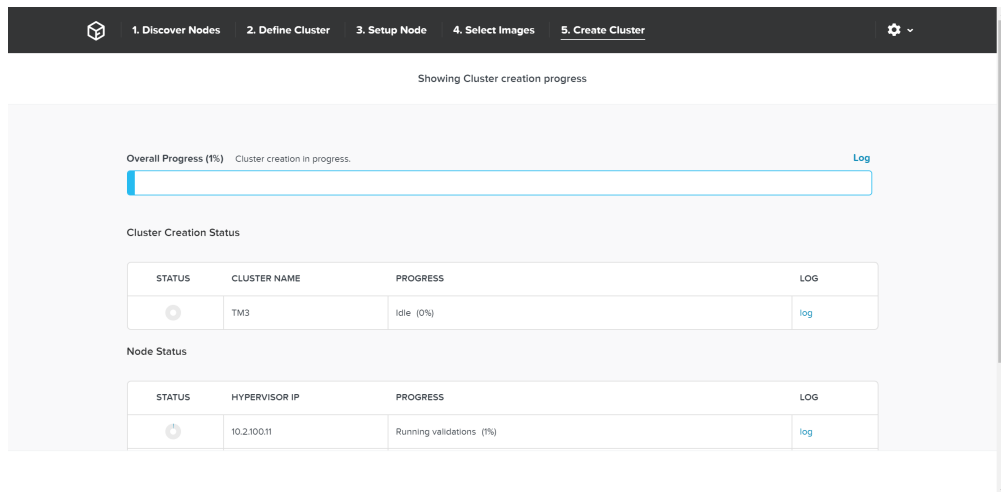
◀ Prev

Skip Create ▶

Foundation - Select Images

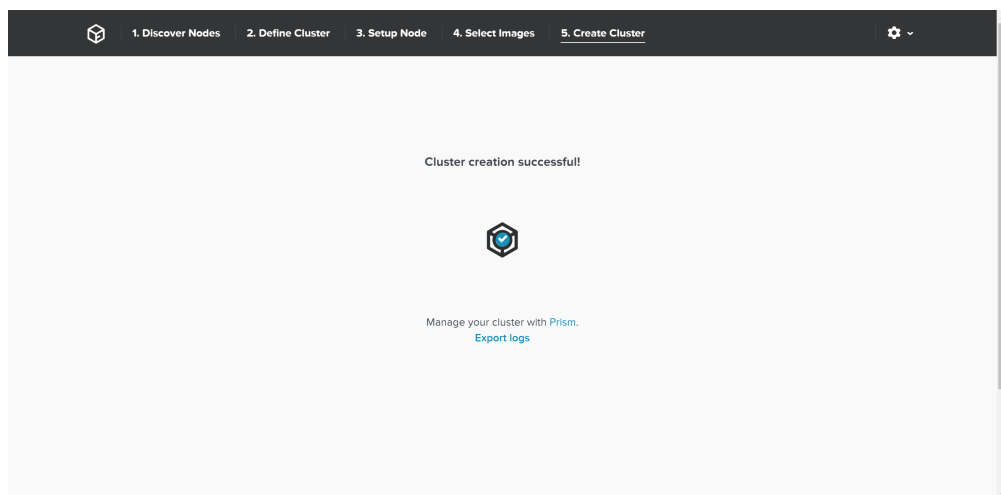
If imaging is not necessary you can also click 'Skip' to skip the imaging process. This will not re-image the hypervisor or Nutanix cluster, but just configure the cluster (e.g. IP addresses, etc.).

Foundation will then proceed with the imaging (if necessary) and cluster creation process.



Foundation - Cluster Creation Process

Once the creation is successful you'll get a completion screen:



Foundation - Cluster Creation Complete

At this point you can now log into any CVM or the Cluster IP and start using the Nutanix platform!