



nSSV Single Node Installation Guide

Single Node Deployment (CLI)

Contents

1	Overview	2
2	Install nSSV and Perform Initialization	2
2.1	Hardware Requirements	2
2.2	Recommended Configurations for Server Hardware	2
2.3	Prepare Installation Packages	3
2.4	Create Bootable USB Drive	4
2.5	Installation	4
2.6	Review Installation Configuration	4
2.7	Select Installation Mode	5
2.8	Configure Disk Partitions	5
2.9	Configure Network Interfaces	5
3	Post-Installation Network Configuration	6
3.1	Login and Initial Setup	6
3.2	Post-Installation Network Configuration	6
3.3	Network Configuration Commands	7
3.4	Removing Incorrect Configurations	7
4	Install nSSV Management Service	8
5	Access nSSV Web Interface	8
5.1	Platform Login	8
6	Initial nSSV Configuration via Web Interface	9
6.1	First Login Setup	9
6.2	Create Data Center	9
6.3	Create Cluster	9
6.4	Add Host to Cluster	10
6.5	Configure Data Storage	11
6.6	Configure Image Storage	12
6.7	Configure Network Resources	13
7	Creating Virtual Machines	14
8	Conclusion	14

1 Overview

This tutorial describes how to install nSSV in single management node deployment.

The guide provides:

- Step-by-step installation procedures for single-node environments
- Essential hardware and network configuration requirements
- Basic post-installation setup through both CLI and web interface
- Quick-start guidance for initial virtualization operations

This approach ensures that users can deploy a functional nSSV environment efficiently while maintaining focus on the core components necessary for single-node operation.

2 Install nSSV and Perform Initialization

2.1 Hardware Requirements

- Server: Any manufacturer, obtain the configuration through the server's official website;
- CPU: Intel/AMD, ARM, at least 1 physical CPU (8 Threads);
- RAM: 16GB recommended;
- Network Card: Management NIC-1Gb, IPMI-1Gb, service NIC-10Gb/25Gb, or above;
- RAID: The system disk must be RAID1, support RAID 1 and JBOD mixed modes;
- HBA: FC HBA, not recommended using Emulex;
- HDD: SAS/SATA, recommended using 600GB/16TB, commonly using 4T or above;
- SSD: No special requirements;
- GPU: All graphics cards can be passthrough, needs motherboard support IOMMU. vGPU support AMD/NVIDIA, NVIDIA requires its license;
- Other Cards: Support all PCI/E card passthrough;

2.2 Recommended Configurations for Server Hardware

Whether for minimum environment deployment or production environment deployment, it is recommended that hardware devices such as servers be configured according to the recommended configurations in the table below:

Device	Component	Configuration Requirements
Server	CPU	x86 Environment: 64-bit x86 architecture, supporting Intel VT or AMD-V hardware virtualization features (for example, Intel's VMX or AMD/Hygon's SVM). ARM Environment: 64-bit ARM architecture, supporting hardware virtualization features.
	Memory	DDR4 or higher recommended.
	Motherboard	Standard server motherboard.
	RAID Card	Supports SAS/SATA RAID 0/1/10 and supports passthrough mode.
	Hard Disk	HDD or SSD based on needs.
	Network Port	• 1x 1GbE management port • 1x 10GbE business port.
Network Switch	—	• 1GbE switch (10GbE recommended), RJ45 • Several category 5 cables.

Table 1: System Configuration Requirements

When preparing your server hardware, make sure to configure the following:

- Enable CPU virtualization support in the server BIOS.
- Plan your network in advance: It is recommended that you consistently name all physical host NICs and use NICs with the same name to carry the same type of communication traffic. For example, management traffic should all use the em1 NICs.
- Complete the necessary configurations on your network switch in advance:
 - If you need to use a VLAN network environment, configure the corresponding VLAN network communication on the switch in advance.
 - nSSV will actively allocate IP addresses to your virtual machines, so reserve a range of IP addresses that do not conflict with your system, and avoid conflicts with existing DHCP services in your network environment.

2.3 Prepare Installation Packages

nSSV ISO is built on Helix, a self-made virtualization kernel software that operates between the infrastructure layer and the upper-layer operating systems. It integrates essential components like hardware drivers, macro kernels, and virtual agents, shielding the differences among heterogeneous hardware. This releases operating systems from hardware driver dependencies, ensuring proper access to the heterogeneous hardware on the under layer. By doing so, Helix enhances hardware compatibility, high reliability, high availability, scalability, and performance of your virtual environment.

You can install nSSV without connecting to the public network or configuring a yum source, allowing for a completely offline installation.

To install nSSV, make sure to prepare the necessary ISO package in advance.

2.4 Create Bootable USB Drive

To begin the installation, you need to create a bootable USB drive with the nSSV ISO image:

- Download the nSSV ISO image from the official repository
- Use a tool like Rufus to write the ISO to a USB drive
- Ensure the USB drive has at least 8GB of capacity
- Insert the bootable USB drive into the target server
- Configure the server BIOS/UEFI to boot from the USB device

The system will boot from the USB drive and start the nSSV installation process.

2.5 Installation

Enter the ISO boot interface and choose the default option to start the operating system installation. You can select based on your actual situation, but we recommend using the graphical user interface (GUI) for installation. If the server does not have a VGA port and only supports serial connections, you can use either VNC or text mode installation methods.

2.6 Review Installation Configuration

Review the installation configuration summary.

This page displays the system installation configuration. You can modify the configuration as needed.

Remember to insert your custom root password, it will be used for settings later.

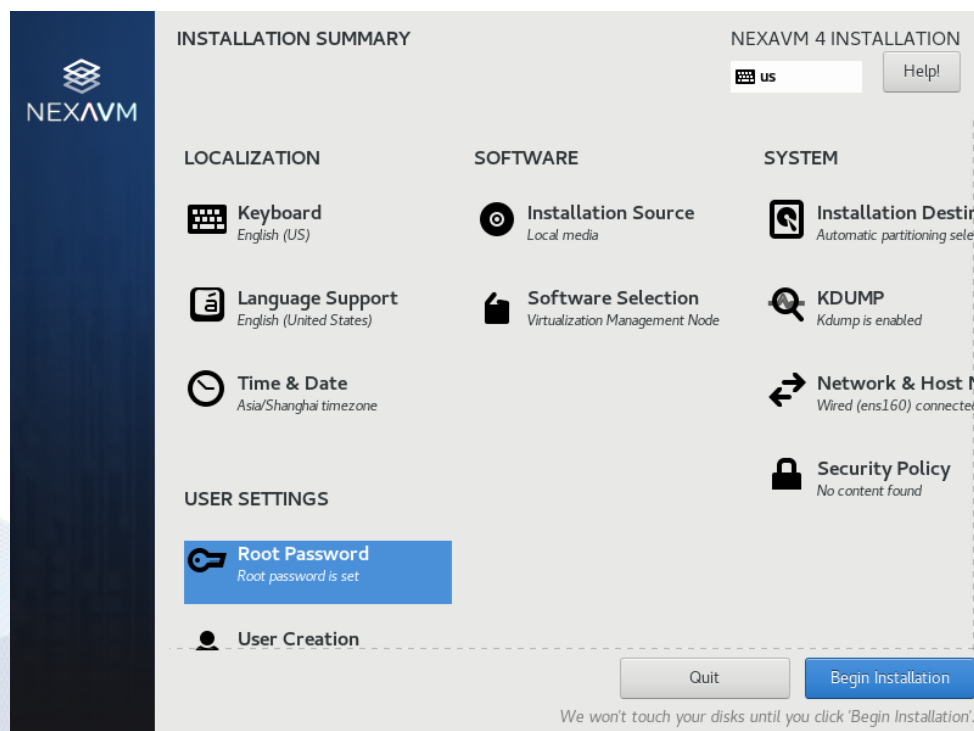


Figure 1: Installation Summary Page

2.7 Select Installation Mode

On the *Installation Summary* page, click *Software Selection*.

On the *Software Selection* page, choose the installation mode:

- *nSSV Management Node*

After selecting the installation mode, click *Done*.

2.8 Configure Disk Partitions

On the *Installation Summary* page, click *Installation Destination* to enter the *Installation Destination* page.

For *Device Selection*, we recommend that you only configure the system disk. After the system is installed, you can configure other disks.

If the selected disk does not have enough available space, click *Reclaim Space* and *Delete All*.

For *Storage Configuration*, we recommend selecting *Automatic* to automatically configure the disk partitions.

If you need to manually configure disk partitions, refer to the following guidelines based on the BIOS boot mode:

UEFI Mode:

- */boot*: This directory stores the core files needed for Linux boot. We recommend allocating 1GB of space.
- */boot/efi*: This directory stores the UEFI boot files. We recommend allocating 500MB.
- */*: This is the root directory for the Linux system. We recommend allocating all remaining space.

Legacy Mode:

- */boot*: This directory stores the core files needed for Linux boot. We recommend allocating 1GB of space.
- */*: This is the root directory for the Linux system. We recommend allocating all remaining space.
- The above values represent the recommended partition sizes for nSSV (total disk capacity should be greater than 300GB).
- In Legacy mode, if the system disk capacity exceeds 2TB, you need to configure a BIOS boot partition to support GPT partitioning. UEFI mode does not have this limitation and supports GPT partitioning.

Review the configuration and click *Done*.

2.9 Configure Network Interfaces

On the *Installation Summary* page, click *Network & Host Name* to configure the network interfaces.

- Select the network interface cards (NICs) you want to use
- For each NIC you wish to configure, follow these steps:
 1. Click on the NIC from the list in the left panel
 2. Click the **Configure** button in the bottom-right corner
 3. In the configuration window, select **IPv4 Settings** from the menu
 4. From the **Method** dropdown menu, select **Disabled**
 5. Select **IPv6 Settings** from the menu
 6. From the **Method** dropdown menu, select **Disabled**
 7. Click **Save** to apply the configuration
- Repeat this process for each NIC you want to configure
- After configuring all NICs, click **Done** to return to the main installation screen

This configuration ensures that the network interfaces are properly set up before proceeding with the installation.

Begin The Installation Process

Once all required configurations have been completed, click **Begin Installation** in the bottom-right corner of the Installation Summary page.

Wait for the first part of the installation to complete. When the screen turns black and the server begins to reboot, **remove the USB drive** to prevent the system from booting from it again.

The system will now complete the installation and reboot. After the reboot, we will continue with the backend configuration manually through the command line interface.

3 Post-Installation Network Configuration

3.1 Login and Initial Setup

After the system reboots, log in using the credentials created during the installation process.

3.2 Post-Installation Network Configuration

General Rules

- Replace interface names (e.g., eth0, eth1, eth2, eth3) with the real ones from your system.
- For trunk mode, replace VLAN IDs (100, 200) with your actual VLAN IDs.
- Use the provided IPs, masks, and gateways only as examples.
- Typically, only the management network requires a gateway.

3.3 Network Configuration Commands

The following procedure describes how to configure a bond interface. These steps (create bond → attach NICs → optional VLAN → bridge and IP configuration) must be repeated for each bond that the system requires. At a minimum, one bond should be created for **management**. Additional bonds may be configured as needed.

Create a virtual link aggregation interface in active-backup mode:

```
zs-bond-ab -c [BOND_NAME]
```

Attach a physical NIC to the bond interface:

```
zs-nic-to-bond -a [BOND_NAME] [NIC_NAME]
```

Create a network bridge and configure its IP address:

```
zs-network-setting -b [BOND_NAME] [IP_ADDRESS] [NETMASK] [GATEWAY]
```

(Optional) If required create a VLAN interface, add it to the selected bond, and configure the network:

```
zs-vlan -c [BOND_NAME] [VLAN_ID]
```

```
zs-network-setting -b [BOND_NAME].[VLAN_ID] [NETMASK] [GATEWAY]
```

Verify the current network configuration:

```
zs-show-network
```

3.4 Removing Incorrect Configurations

If a bond or bridge was configured incorrectly:

```
# Stop the created bridge
ip link set [BRIDGE_NAME] down
```

```
# Delete the bridge
brctl delbr [BRIDGE_NAME]
```



```
# Delete the bridge configuration file
rm -f /etc/sysconfig/network-scripts/ifcfg-[BRIDGE_NAME]
```

Delete VLAN configuration:

```
zs-vlan -d [BOND_NAME] [VLAN_ID]
```

Delete bond:

```
zs-bond-ab -d [BOND_NAME]
```

Check that bonds are active and IPs are correctly assigned. Then continue with the remaining nSSV configuration steps.

4 Install nSSV Management Service

After configuring the network, run the following command to manually install the nSSV management service:

```
bash /opt/zstack-installer.bin
```

5 Access nSSV Web Interface

Once the services related to nSSV have started successfully, you can access nSSV using your browser:

- When logging in for the first time, use the default username: `admin`, and the default initial password: `password`.
- For the best user experience, it is recommended to use Chrome version 67 or above, with a minimum resolution of 1280*900 px.
- If the page does not load properly, ensure that both the management service and the UI service are running correctly.

5.1 Platform Login

nSSV supports the following protocols to access the UI management interface:

- **HTTPS Protocol:** The virtualization platform defaults to redirecting to the HTTPS address on port 443. Simply enter the management node IP address in your browser to access the UI management interface, for example: `https://management_node_ip`

nSSV supports the following login methods:

- **Account Login:** You need to enter your username and password.
- **Single Sign-On Login:** You need to enter your login attribute name and password.

6 Initial nSSV Configuration via Web Interface

6.1 First Login Setup

After successfully logging into the nSSV web interface, you may either follow the initial setup wizard or skip it and proceed with manual configuration as described below.

Click on **Inventory** in the left-side menu.

6.2 Create Data Center

1. Click the **Root Node** (the IP of the in use node)
2. Click the **Actions** button and select **New Data Center**
3. Fill in the required fields
4. Click **OK** to create the data center

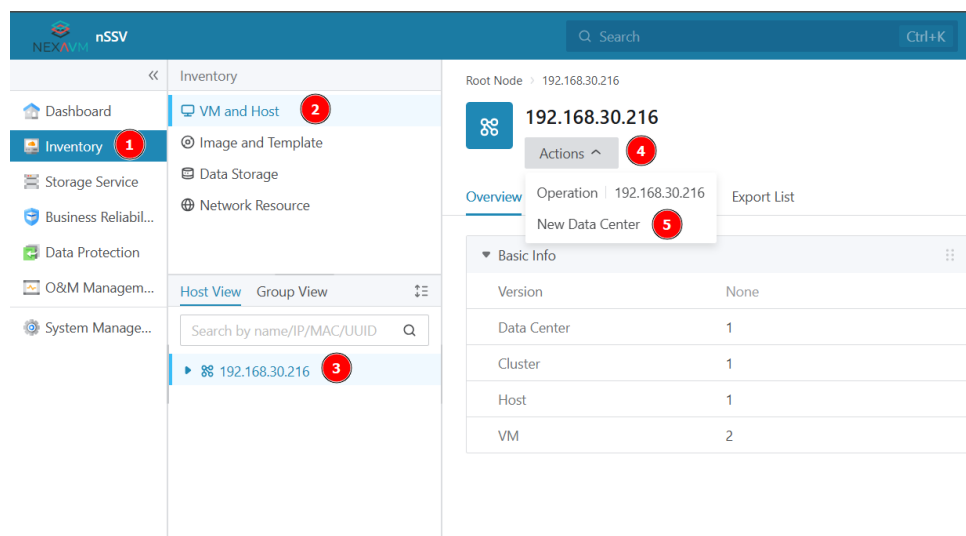


Figure 2: New Data Center Flow

6.3 Create Cluster

1. Click on the newly created **Data Center** in the left menu
2. Click the **Actions** button and select **New Cluster**
3. Fill in the required fields
4. Click **OK** to create the cluster

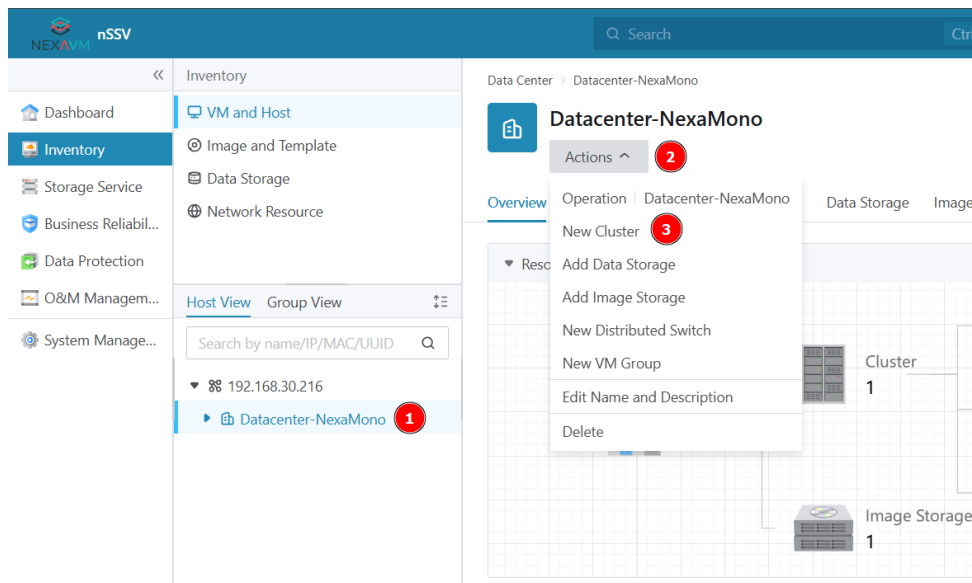


Figure 3: New Data Center Flow

6.4 Add Host to Cluster

1. Click on the newly created **Cluster** in the left menu
2. Click the **Actions** button and select **Add Host**
3. Fill in the host information:
 - **Addition Method:** Select **Single**
 - **Host IP:** Enter the management IP address configured earlier
 - **SSH Port:** Enter the SSH port (default: 22)
 - **Username:** Enter the root username
 - **Password:** Enter the root password created during installation
4. Click **OK** to add the host to the cluster

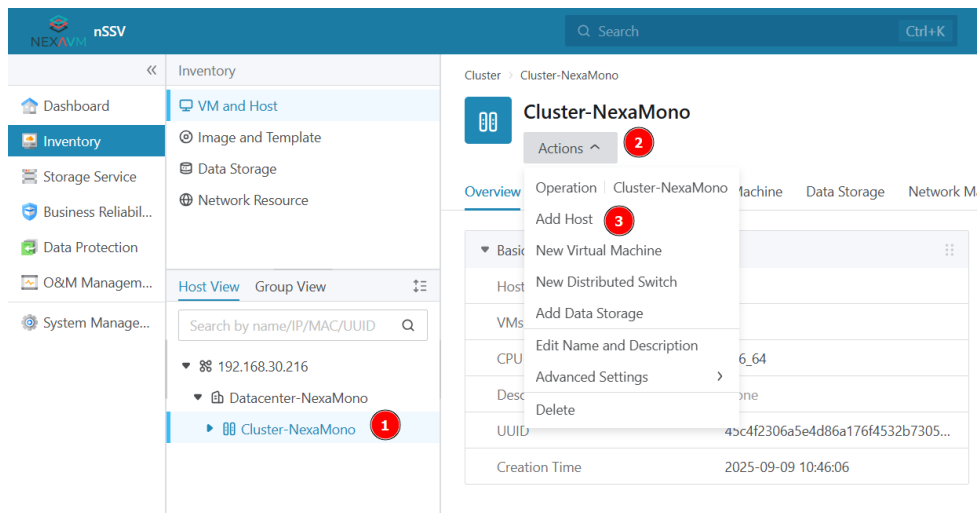


Figure 4: New Data Center Flow

6.5 Configure Data Storage

1. Navigate to **Data Storage**
2. Select your **Data Center** from the left menu
3. Click **Actions** and select **Add Data Storage**
4. Configure storage settings:
 - **Type:** For single node installation, select **Local Storage**
 - Select the appropriate disk from available storage devices
 - Configure remaining parameters as needed
5. Click **OK** to create the data storage

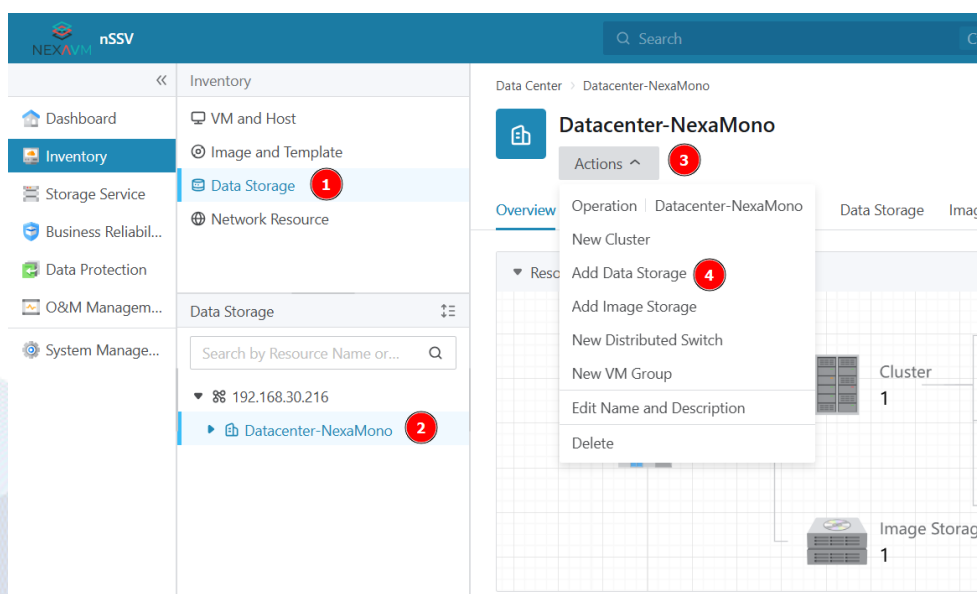


Figure 5: New Data Center Flow

6.6 Configure Image Storage

1. Navigate to **Image and Template**
2. Select your **Data Center** from the left menu
3. Click **Actions** and select **Add Image Storage**
4. Select **Stand Alone Image Storage**
5. Configure the image storage parameters
6. Click **OK** to create the image storage
7. Select the created image storage and click **Add Image** to upload OS images

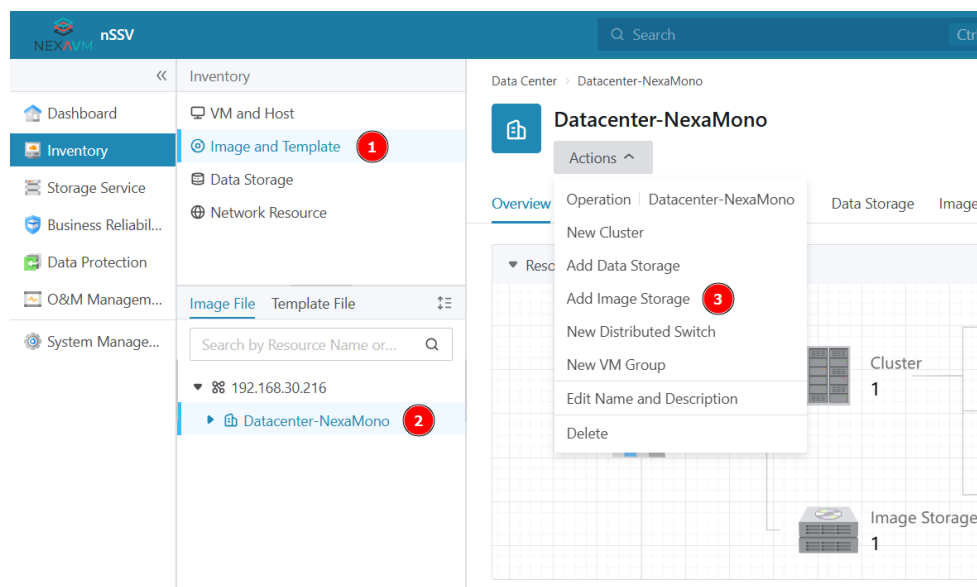


Figure 6: New Data Center Flow

Add OS Image to Image Storage

1. Select the created **Image Storage** from the left menu
2. Click the **Add Image** button
3. Configure the image settings
4. Click **OK** to start the image upload process
5. Wait for the image to be successfully added to the image storage

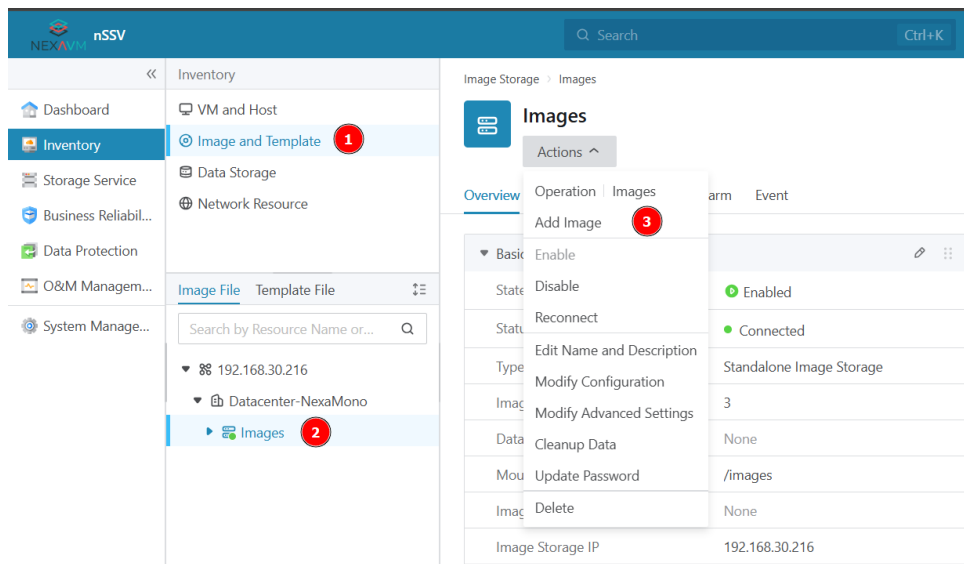


Figure 7: New Data Center Flow

6.7 Configure Network Resources

1. Navigate to **Network Resources**
2. Select your **Data Center** from the left menu
3. Click **Actions** and select **Add New Distributed Switch**
4. Configure network settings as required
5. Click **OK** to create the distributed switch

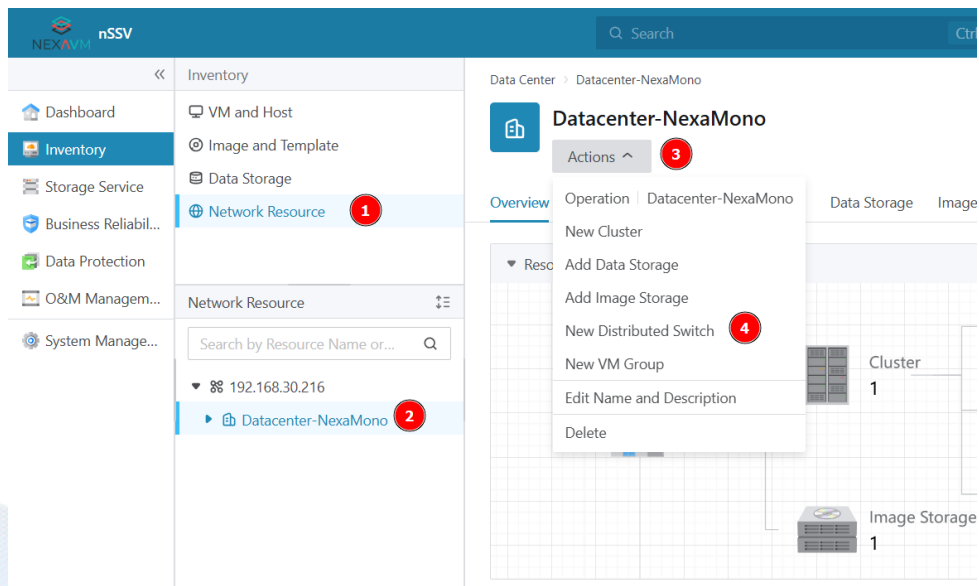


Figure 8: New Data Center Flow

7 Creating Virtual Machines

Now that the basic infrastructure is configured, you can create virtual machines:

1. Navigate to **VM and Host**
2. Select the desired **Host** from the left menu
3. Right-click on the host or click the **Actions** button
4. Select **New Virtual Machine**
5. Configure the virtual machine settings:
 - **Basic Information:** Name, description, and operating system type
 - **Compute Resources:** CPU cores, memory allocation
 - **Storage:** Select data storage and disk size
 - **Networking:** Attach appropriate network interfaces
 - **OS Configuration:** Select installation media from image storage
6. Review the configuration and click **OK** to create the virtual machine

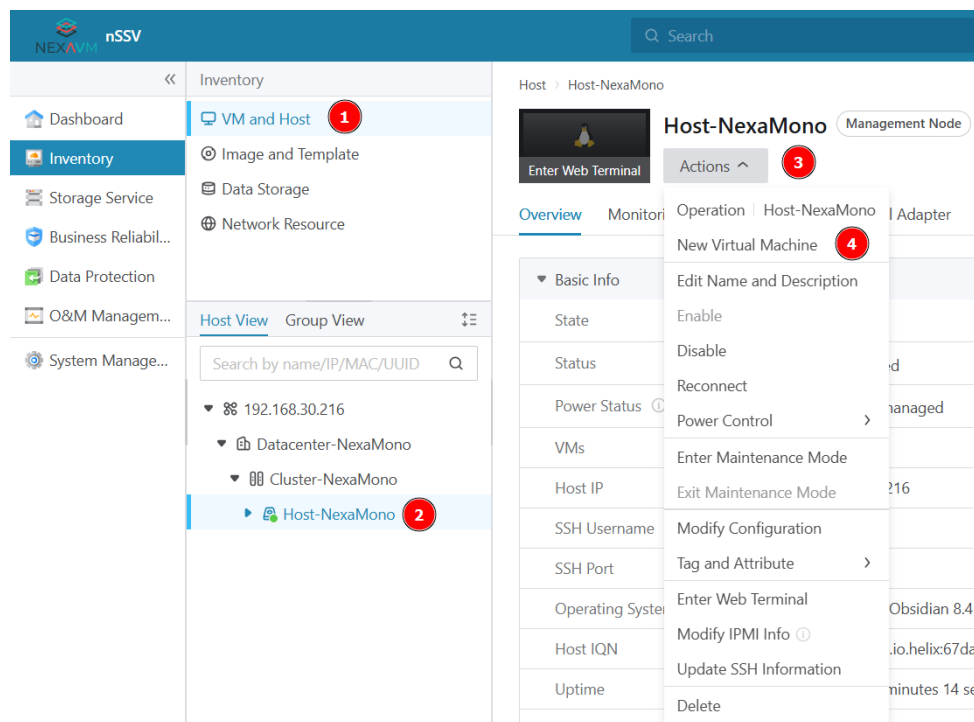


Figure 9: New Data Center Flow

8 Conclusion

The nSSV single node installation is now complete. The platform is ready for virtual machine deployment and management. You can:

- Create additional virtual machines as needed

- Configure advanced networking features
- Set up backup and recovery procedures
- Monitor system performance through the dashboard
- Manage storage resources and allocate to VMs