KeyNexus Hyper-V
Deployment Guide

v1.0

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Copyright Notice

Table of Contents

Introduction

A Key Management Service provides you with the means to create, apply and manage encryption keys from a single location.

Rather than using multiple encryption solutions to manage your keys, a Unified Key Manager (UKM) such as KeyNexus can manage all the keys used by your organization on all platforms and environments, resulting in reduced implementation times, resource allocation and usage, and providing better protection of your sensitive data.

This document provides information relating the various aspects of the KeyNexus installation, activation and configuration process using the Microsoft Hyper-V virtualization platform. Hyper-V allows you to run multiple operating systems as virtual machines on Microsoft Windows.

Section 1 Provides information and instruction relating to the deployment of the KeyNexus VM on the Microsoft Hyper-V platform.

Section 2 Provides information and instruction relating to the node initialization, cluster configuration and activation of the KeyNexus UKM.

The KeyNexus Hyper-V Deployment Guide v1.0 supports KeyNexus version 1.11.

Note: This document assumes you already have Hyper-V installed and configured. If you have not installed and configured Hyper-V, visit https://docs.microsoft.com/en-us/virtualization/index for more information.

System Requirements

This section is divided into two parts, requirements for Hyper-V and requirements for KeyNexus.

Hyper-V Requirements

OS Requirements

- Windows Server 2008 or later
- Pro, Enterprise and Education versions of Windows 7 or later

Hardware Requirements

- 64-bit Processor with Second Level Address Translation (SLAT)
- Minimum of 4 GB memory

Software Requirements

- Processor virtualization extensions (Intel-VT and AMD-V). If the extensions have not been enabled, a change to the CPU settings in your bios is required. Consult your system documentation for information regarding enabling virtualization.

KeyNexus Requirements

Hardware Requirements

Hardware	Requirement
Processor	Recommended: Intel quad core or higher
Memory	Minimum: 6 GB RAM Recommended: 16 GB of RAM
Storage	Minimum: 20 GB HDD Recommended: 40 GB HDD

Software Requirements

When deploying KeyNexus on Hyper-V, it is provided in a Virtual Hard Disk (vhd) format. As long as your system software meets the necessary requirements to run your virtual machine platform and meets the Hyper-V and KeyNexus hardware requirements, the KeyNexus VM will perform as described.

Supported Browsers

KeyNexus has been tested and is supported on the following browsers:

- Google Chrome Version 62.0.3202.94 (64-bit)
- Safari Version 11.0.1 (12604.3.5.1.1)
- Microsoft Edge Version 41.16299.15.0 (EdgeHTML 16.16299)
- Firefox Version 54.0.1 (64-bit)
- Microsoft Internet Explorer 11 Version 11.64.16299.0

Note: If you are using a browser version different from the ones shown here, your experience might be different.

Port Configuration

Before you begin initialization and configuring KeyNexus, it is important to confirm the ports that KeyNexus requires are open. If these ports are not open, you cannot access the KeyNexus client, or successfully make modifications to a KeyNexus cluster.

KeyNexus Ports

In order to access the KeyNexus Subscription Activator and the KeyNexus client, there are several ports that must be open. Make sure these ports are open in your firewall using the protocol indicated.

- port 8443 (TCP)
- port 1443 (TCP)
- port 443 (TCP)
- port 5696 (TCP)

Internode Communication

When configuring KeyNexus to operate as a cluster, there are ports that must be open in order for the nodes that make up the cluster to communicate with one another. Make sure these ports are open in your firewall using the protocol indicated.

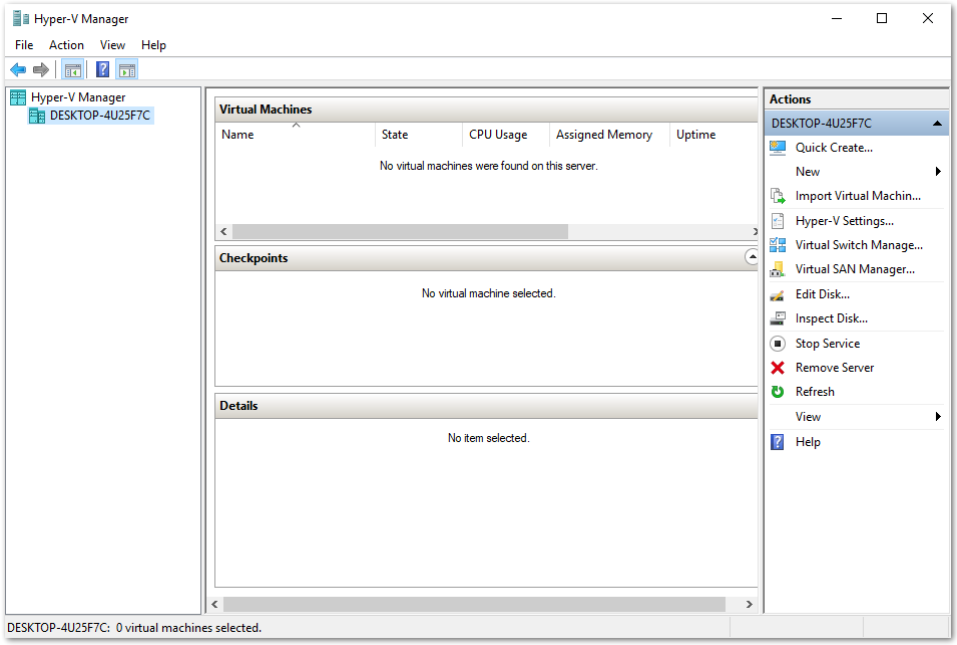
- port 8443 (TCP)
- port 2377 (TCP)
- port 7946 (TCP and UDP)
- port 4789 (UDP)
- port 50 (TCP)

Section 1: KeyNexus VM Deployment in Microsoft Hyper-V

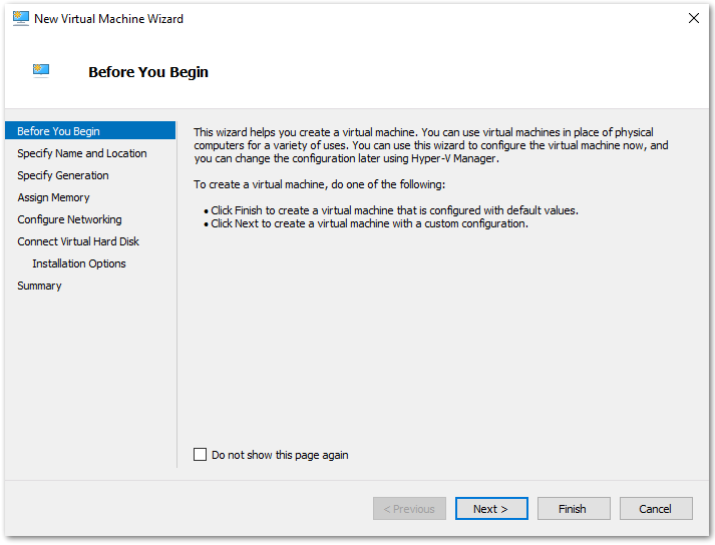
The primary method of deploying KeyNexus is as a Virtual Machine (VM). This section describes the import and configuration of the KeyNexus file into Microsoft Hyper-V.

1. Open the Hyper-V Manager. If Hyper-V has been successfully installed, you should be able to perform a search for Hyper-V manager.

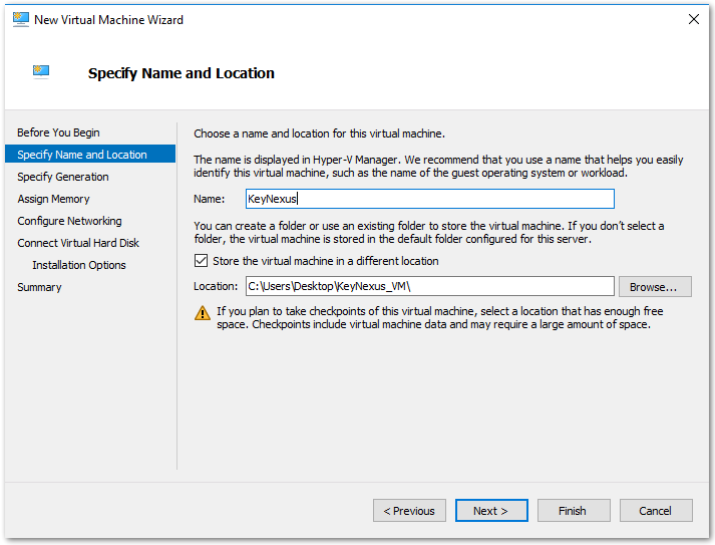
   When successful, the Hyper-V Manager screen appears.



2. In the **Actions** pane, click **New** > **Virtual Machine**. This starts the New Virtual Machine Wizard.

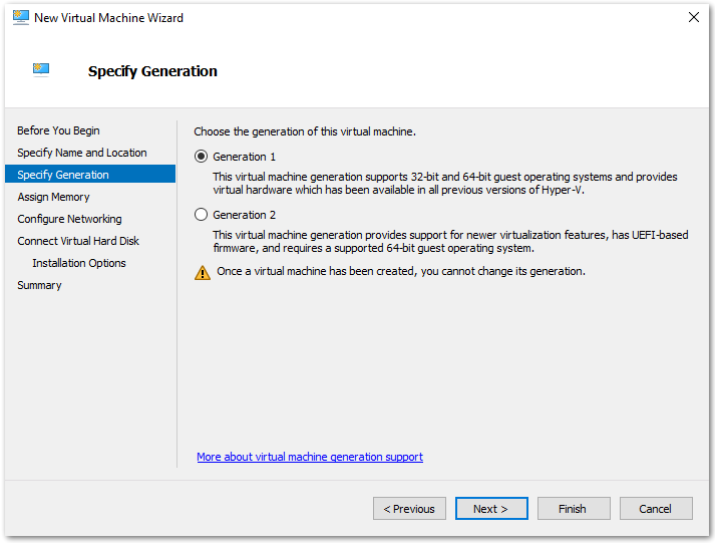


3. Review the information on the Before You Begin page and click **Next** to advance to the Specify Name and Location page.



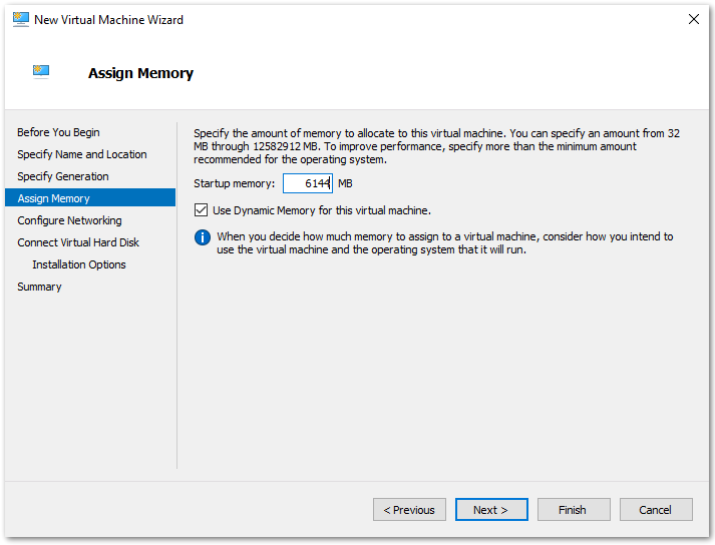
4. Enter a name for the virtual machine in the **Name** field. Enter the path for where the virtual machine will be stored in the **Location** field or click **Browse** and navigate to the folder location and click **Open**.

5. Click **Next** to advance to the Specify Generation page.



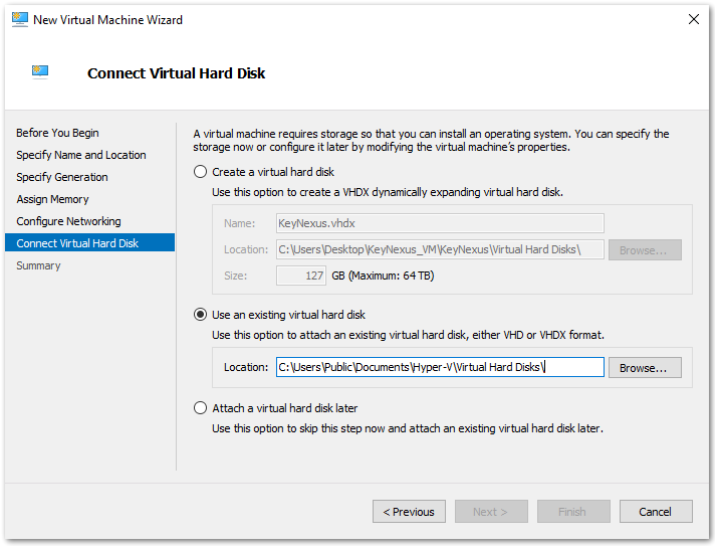
6. Select **Generation 1** from the Specify Generation options. If you are using a .vhd file, selecting the **Generation 2** option does not allow you to complete the virtual machine setup.

7. Click **Next** to advance to the Assign Memory page.

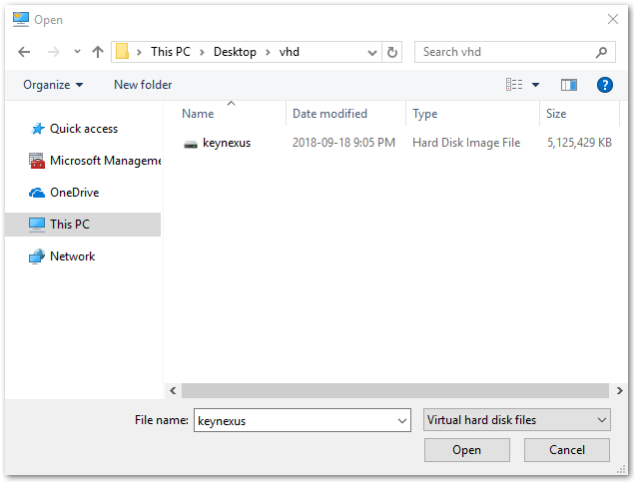


8. Set the Startup memory at a minimum of 6144 MB. Check **Use Dynamic Memory for this virtual machine**. Click **Next** to advance to the Configure Networking page.

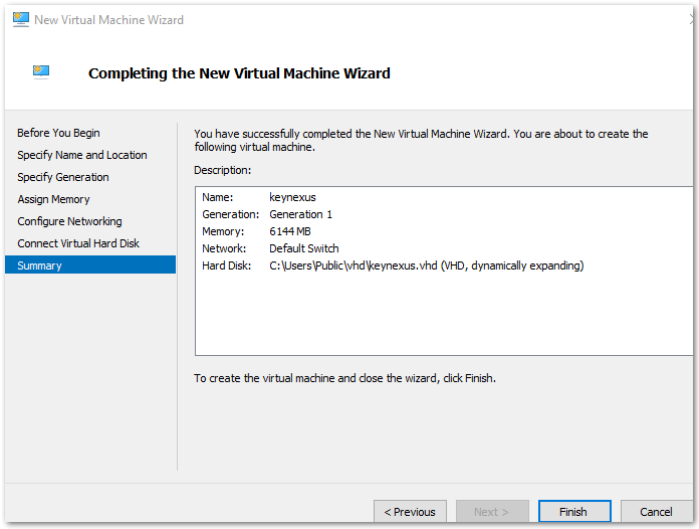
9. Select **Default Switch** from the **Connection dropdown** list. Click **Next** to advance to the Connect Virtual Hard Disk page.



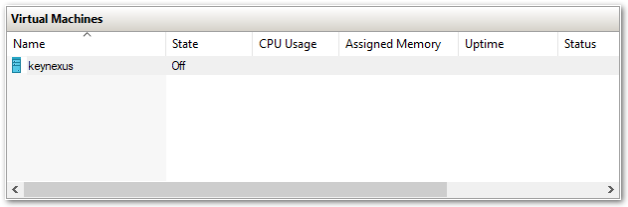
10. Select **Use an existing virtual hard disk**. Enter the path for the .vhd file in the **Location** field or click **Browse** and navigate to the .vhd file location. Select the file and click **Open**. Click **Next**.



11. On the Completing the new virtual machine wizard, review the items in the description field. If a change is required, click **Previous** to move back through the screens until you reach the item you want to change. Make the change and click **Next** until you return to the Completing the New Virtual Machine Wizard page. Click **Finish** to create your virtual machine.



When the virtual machine is created, it appears in the Virtual Machines list.



12. Right click the VM and select **Start**.

13. When the state changes to **Running**, right click the virtual machine again and select **Connect**. The Virtual Machine Console appears, displaying the IP Address of the KeyNexus VM. Enter this IP address in your browser to access the KeyNexus Subscription Activator page.

Section 2 KeyNexus Initialization and Activation

This section provides information regarding the initialization and activation of the KeyNexus UKM.

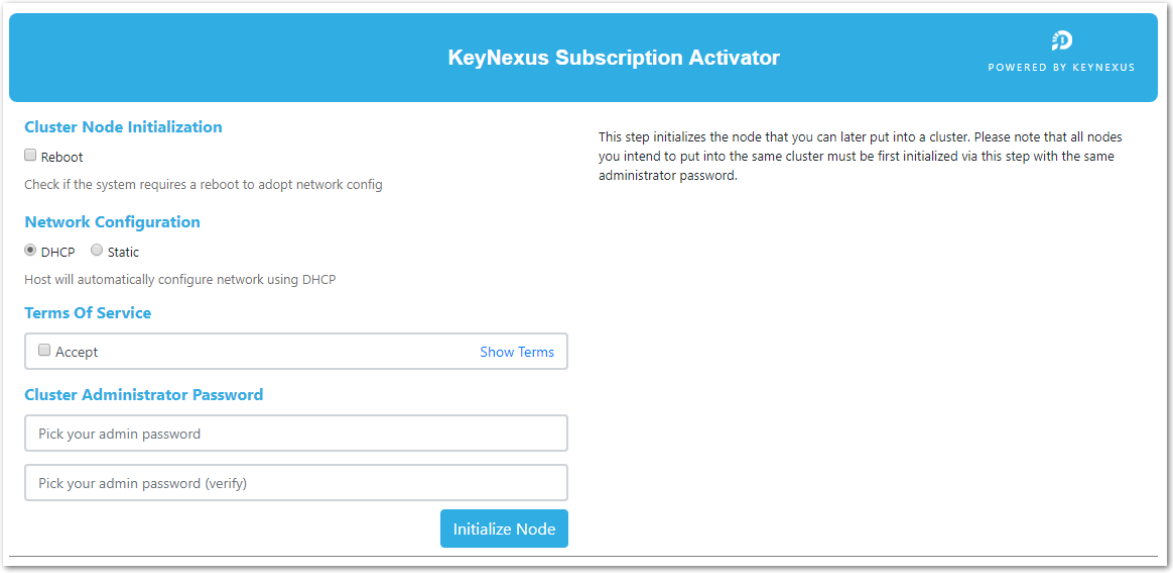
Cluster Node Initialization

To successfully configure your KeyNexus cluster, the nodes that make up that cluster must first be initialized. Perform this operation on each node before adding it to your cluster.

To access the KeyNexus Subscription Activator, open your browser and provide the URL containing the IP address (for example `https://<KeyNexus_IP>:8443` where `<KeyNexus_IP>` is the IP address of the KeyNexus node), or the fully qualified domain name. Make sure to add port 8443 to the end of the URL.

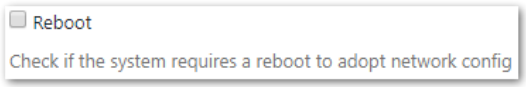
Note: When applicable, accept the self-signed certificate when navigating to the Initialize Network Node, Cluster Configuration, or Account Login pages.

If you are initializing a network node for the first time, the KeyNexus Subscription Activator page appears.



Initialize a Node

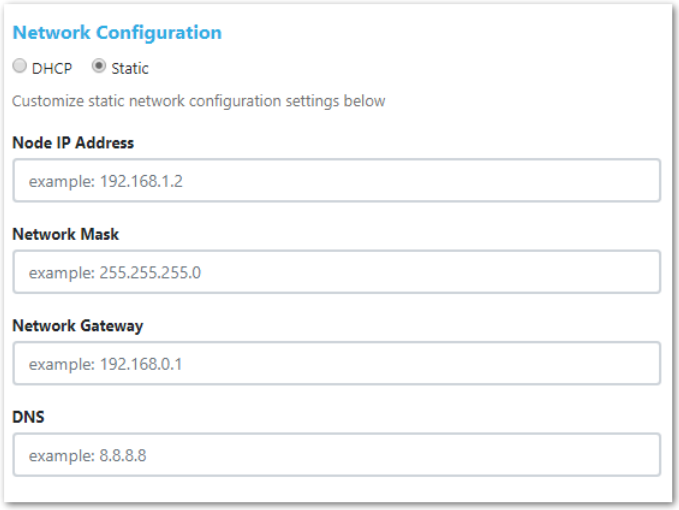
1. Select **Reboot** if your system requires a reboot in order for the network config to take effect.



2. Select **DHCP** or **Static** from the **Network Config** options.

   Select **DHCP** to configure the network automatically using DHCP.

   Select **Static** to manually configure the host and enter your valid network information (IP Address, Network Mask, Network Gateway and DNS) in their respective fields.



   There are several considerations when deciding between using DHCP or Static IP:

   - When using DHCP, if the same IP address cannot always be provided to the same node, DHCP should only be used for short term test clusters.
   - If you need to use DHCP in a production environment, ensure that the same IP is provided to the same node using external tools such as pinned entries in the DHCP server. This helps to ensure that the same IP is provided to the same node.
   - Static IP can be used in a production environment to help ensure the same IP is provided to the same node.

   Note: If you select **Static**, change the IP address of the machine and choose the **Reboot** option, the **Cluster Configuration** on the Initialize Network Node success page does not advance you to the Cluster Nodes page. The IP in the address tab of the browser is no longer associated with that node. You must connect to the activator again with one of the new IPs to finish the configuration once the reboot is complete.

3. Click **Show Terms** to review the Terms of Service and click **Accept** to accept them. Terms of service must be accepted to continue.

4. Enter a **Cluster Admin Password**. Passwords must be 8-256 characters long. You must provide this password when clustering nodes. All nodes in a cluster must share the same password.

5. Click **Initialize Node**. If any configuration step has been missed or entered incorrectly, that area is highlighted in red when you attempt to initialize the node. The information in highlighted area must be entered correctly to continue.

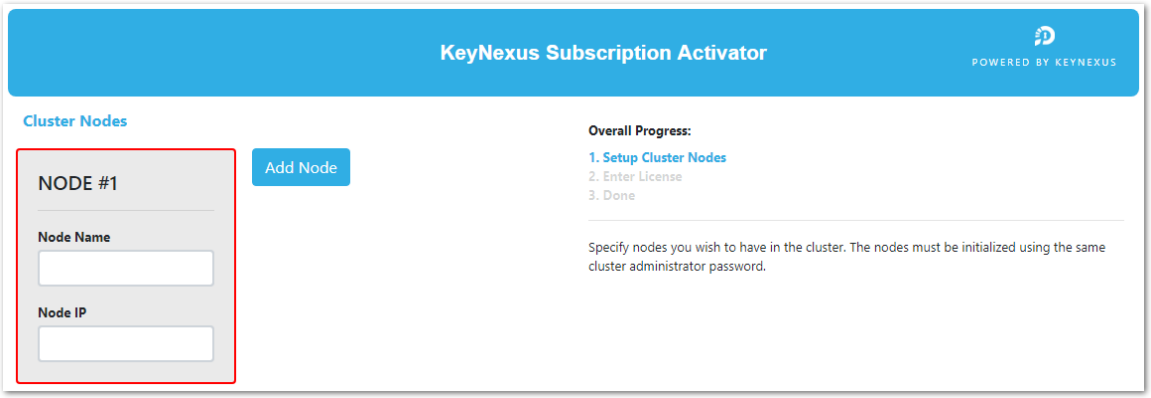
   When the node has been initialized, a message indicating the node has been successfully initialized is displayed.

6. Click **Cluster Configuration** to continue.

Perform this operation for each additional node that will be part of the cluster. An uninitialized node cannot be part of a cluster.

Cluster Nodes

Use the Cluster Nodes page to enter the name and IP address of each node in your cluster.



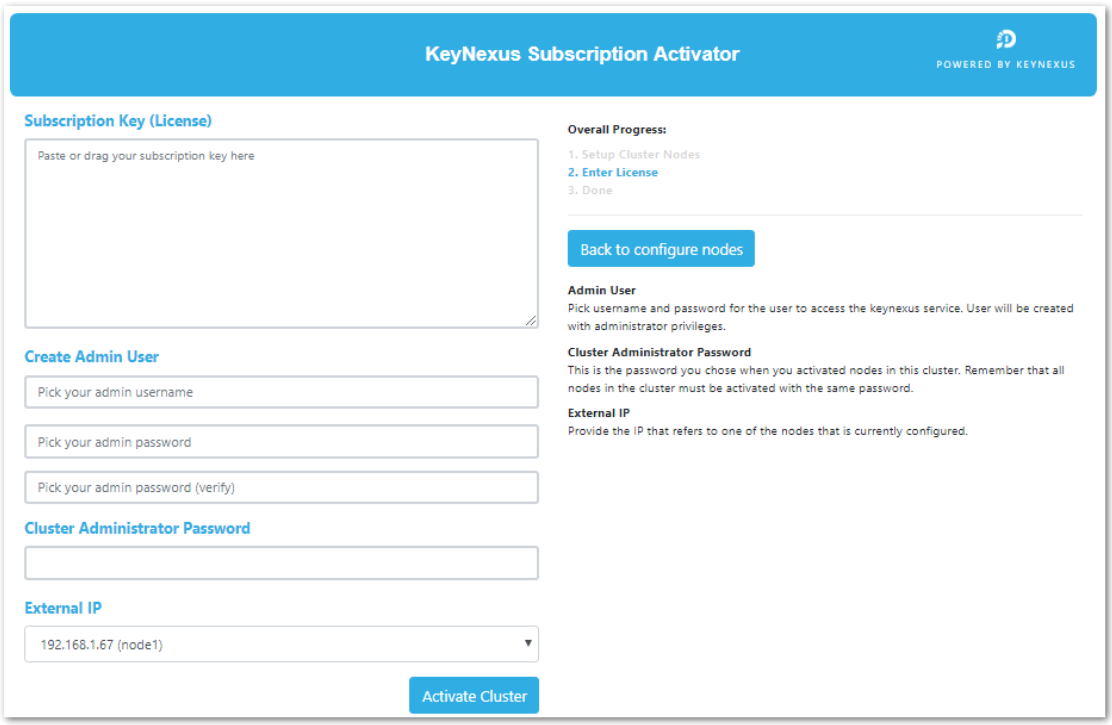
1. Enter the name and IP address of your first node in the NODE #1 box.

2. Click **Add Node** to open an additional node box. Enter the name and IP address of the second node. Repeat for each node you are adding to your cluster. When a valid node name and IP address are entered, the border around the Node box turns green.

3. To remove a node, click the **x** in the top right corner of the node box. You cannot remove NODE #1.

Once you have configured all the nodes in your cluster, click **Continue to Specify License**. This button appears when at least one node contains a valid name and IP address.

Use the License page to enter your subscription key, create a first admin username and password, re-enter your cluster configuration password, and set the external IP address for the node currently being configured.



Activate your KeyNexus Subscription

1. Provide your subscription key in the **Subscription Key** field. There are several ways you can enter your key. You can enter your key manually, you can cut and paste the key from a text file, or you can import the subscription key by dragging and dropping a text file containing the subscription key into the **Subscription Key** field.

2. Once a valid subscription key is entered in the **Subscription Key** field, information regarding the Business ID, the company associated with this subscription key, and the subscription key expiry date are displayed.

3. Create an admin user by entering a name in the **Pick your admin username** field.

4. Enter a password in the **Pick your admin password** field and verify it in the **Pick your admin Password (Verify)** field. The password must contain a minimum of 10 characters. KeyNexus uses a password strength meter to indicate the strength of the password and provides tips for creating stronger passwords.

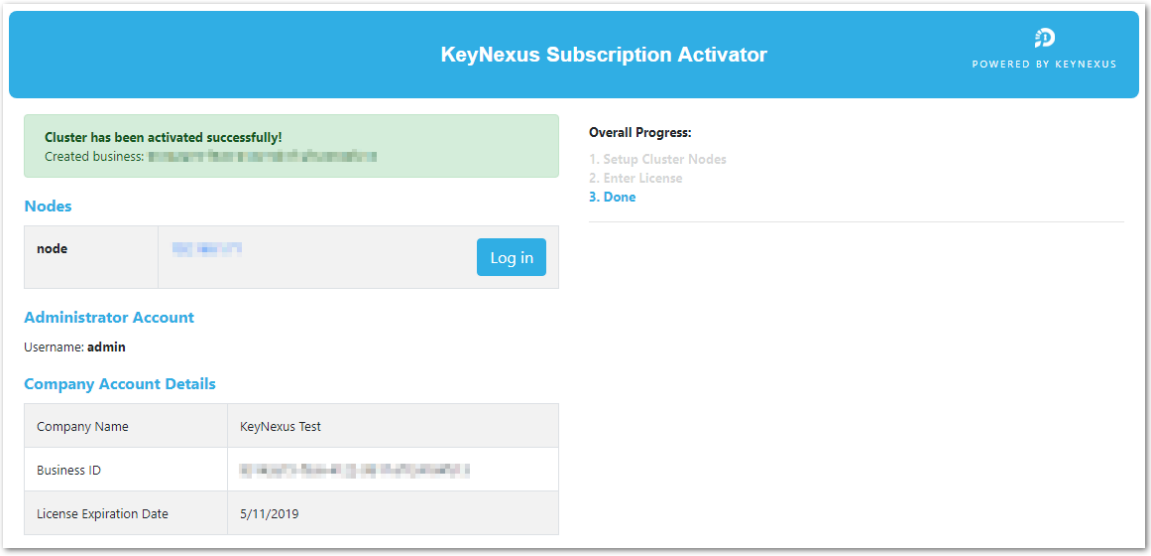
   Note: The tips provided by the password strength meter are informational. As long as your password meets the minimum length requirement, KeyNexus accepts the password.

5. Enter the Cluster Configuration Password you created during the node initialization.

6. Select the External IP address from the dropdown list. This list is made up of the nodes entered on the Cluster Nodes page.

7. Click **Activate Cluster** when all fields have been completed. It can take some time for this action to complete.

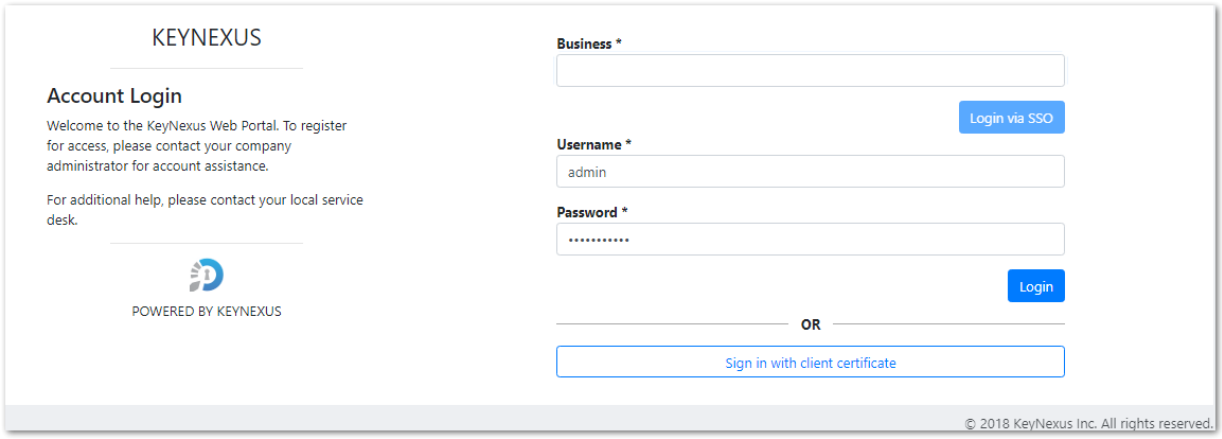
Successful activation of the KeyNexus cluster brings you to a summary page that contains information regarding your Business ID, the nodes in your cluster, the Administrator account and company account details.



Click the Portal URL link or the **Log In** button to go to the KeyNexus login page, where the Business ID and Username fields are prepopulated.

Account Login page

Once you have received your Business ID, provide the URL containing the IP address (for example `https://<KeyNexus_IP>/login` or the fully qualified domain name into your browser's address bar. Make sure to add `/login` to the end of the URL. You can log in with your regular login credentials (Business ID, Username and Password), using Single Sign-On (SSO), or with a Client Certificate.

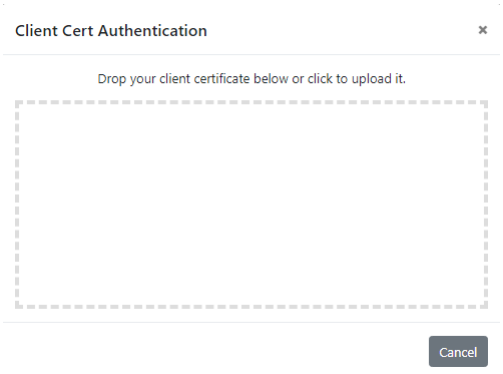


1. Enter the Business Number provided on the Subscription Activation page in the **Business** field.

2. Click the **Login via SSO** button if you have Single Sign On (SSO) configured for this account, otherwise enter a **Username** and **Password** in the applicable fields. Refer to the Administration section for information regarding configuring the KeyNexus portal for Single Sign-On.

3. Click **Login**.

4. Alternatively, click **Sign in with client certificate**. If you have previously generated a client certificate, you can use it to sign in to the KeyNexus portal as the user associated with the client certificate. Drag and drop the certificate file into the dialog, or click in the dialog, locate the certificate and click **Open**. If you have not generated a client certificate, refer to the Users section for instructions regarding the creation of a user with an associated client certificate.



A successful login advances you to the **Dashboard Page**.

For information regarding the configuration of the KeyNexus Web Portal, refer to the *KeyNexus Web Portal User Guide*.

KeyNexus Hyper-V Deployment Guide

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