Hyper-V
Deployment Guide
Eli-v6.4.84

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1 Minimum Hardware Requirements for Nodes in Hyper-V

1.1 Bridgeworks Hyper-V 100 Series Node

- 2 logical processors
- 2GB of RAM
- 1GB of storage space

1.2 Bridgeworks Hyper-V 200 Series Node

- 3 logical processors
- 4GB of RAM
- 1GB of storage space

1.3 Bridgeworks Hyper-V 400 Series Node

- 4 logical processors
- 16GB of RAM
- 1GB of storage space

1.4 Hyper-V Host

Hyper-V platforms *Windows Server 2012 R2*, *Windows Server 2016* and *Windows Server 2019* are currently supported.

More information about installing Hyper-V on Windows 2016 and Windows 2019 located at https://docs.microsoft.com/en-us/windows-server/virtualization/hyper-v/get-started/install-the-hyper-v-role-on-windows-server and information for Windows 2012 R2 located at https://technet.microsoft.com/en-us/library/jj647783(v=ws.11).aspx.

Warning: When deploying a Virtual Machine on a *Windows Server 2019* it is imperative that the Virtual Machine's configuration version is 9.0. For information about how to upgrade the Virtual Machine's configuration using the Hyper-V Manager see Section 2.3.1: Upgrading Using Hyper-V Manager or, if using PowerShell, see Section 3.3.1: Upgrading Using PowerShell.

1.5 Supported Features

For SR-IOV passthrough the following cards are recommended:

- Intel 10GbE X520
- Intel 10GbE X540
- Intel 10GbE X550

2 Deploying a Bridgeworks Hyper-V Node with Hyper-V Manager

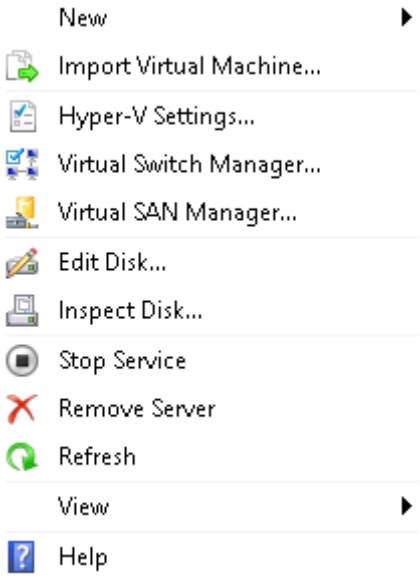
2.1 Introduction

This section details how to deploy a Bridgeworks Node into a Hyper-V environment using the Hyper-V Manager with Windows Server 2012 R2, Windows Server 2016 and Windows Server 2019.

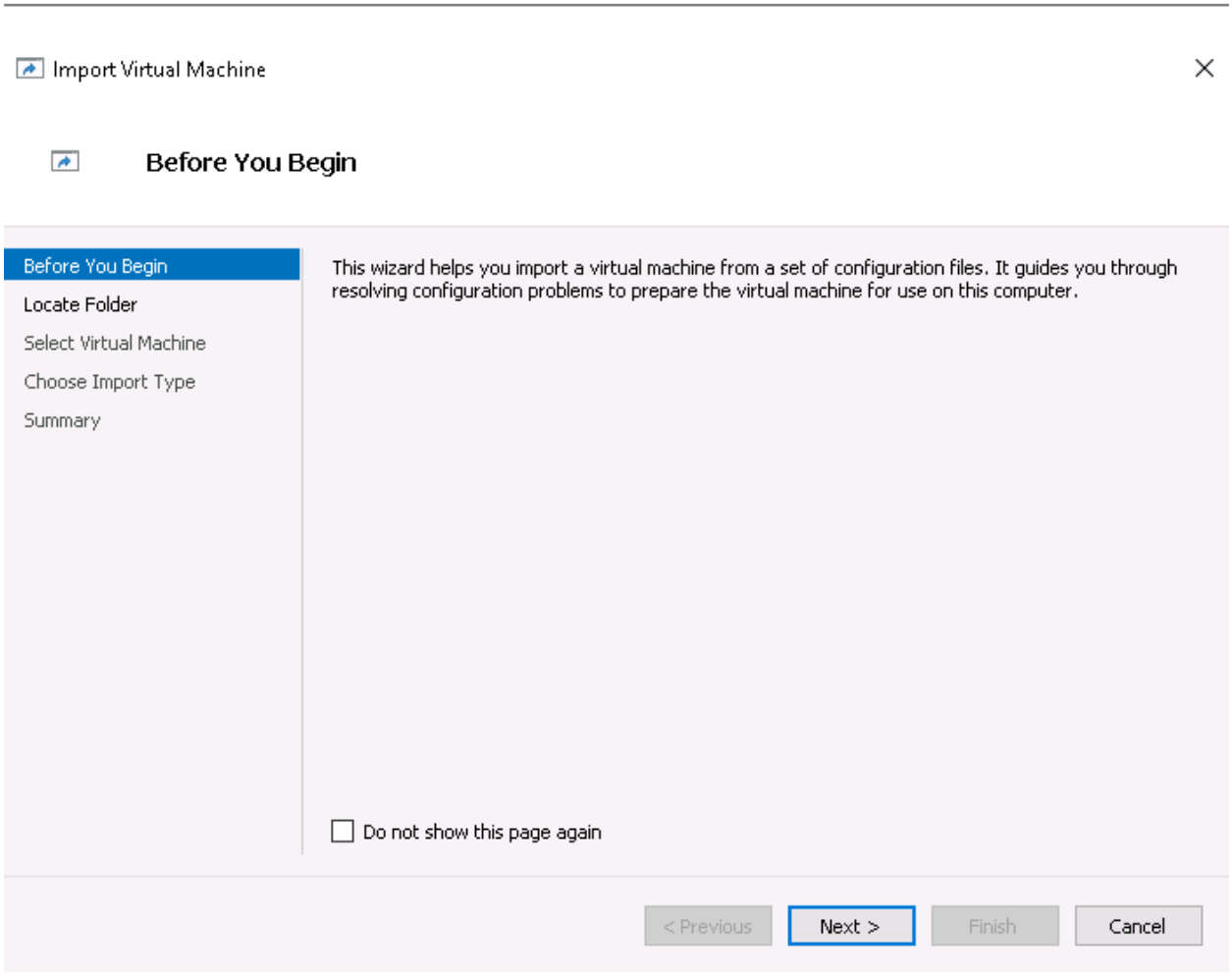
Skip this step if you wish to deploy a Node using PowerShell.

2.2 Deploying the Virtual Machine

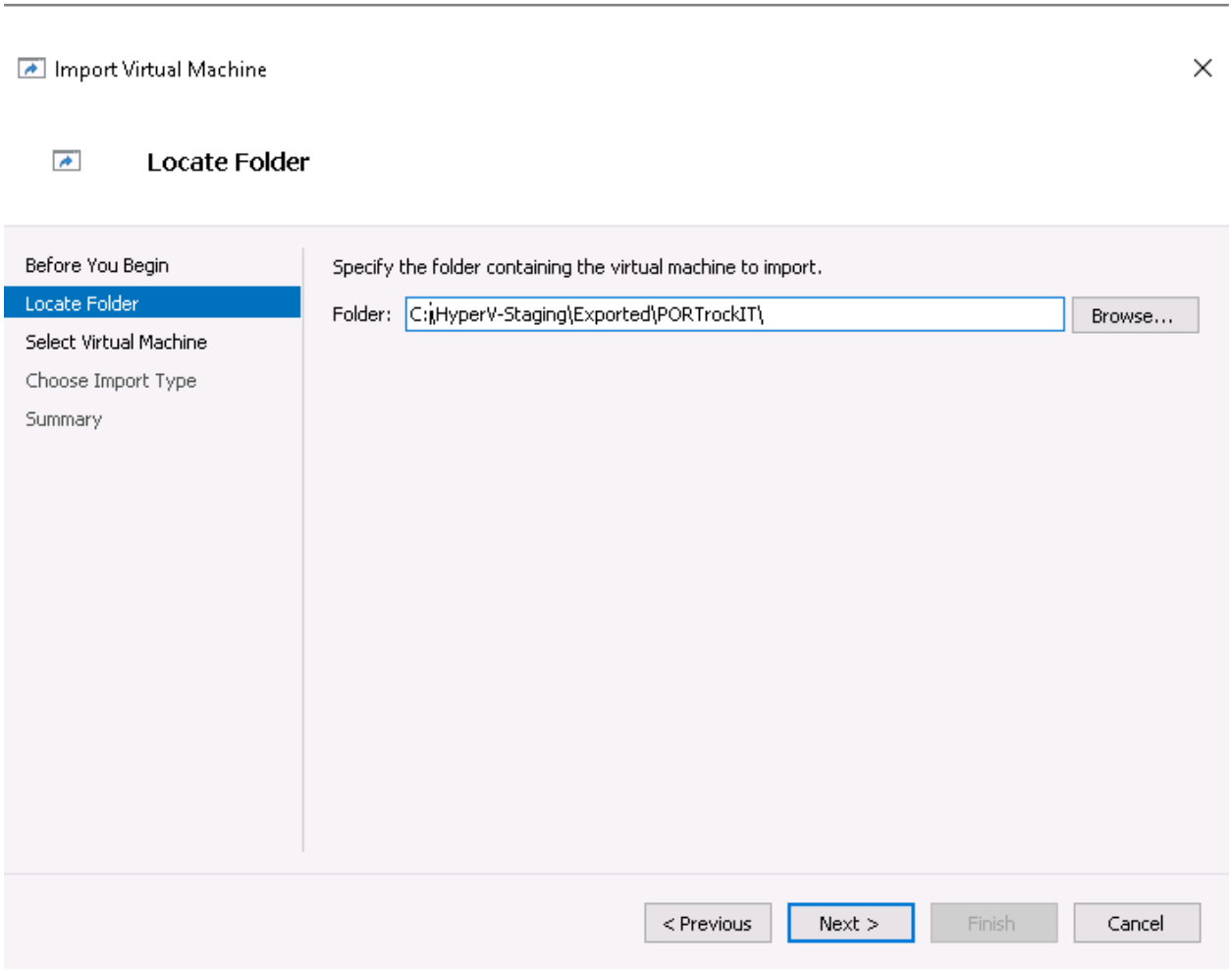
Bridgeworks provide virtual machine images in a zipped folder. To begin, unzip the folder.



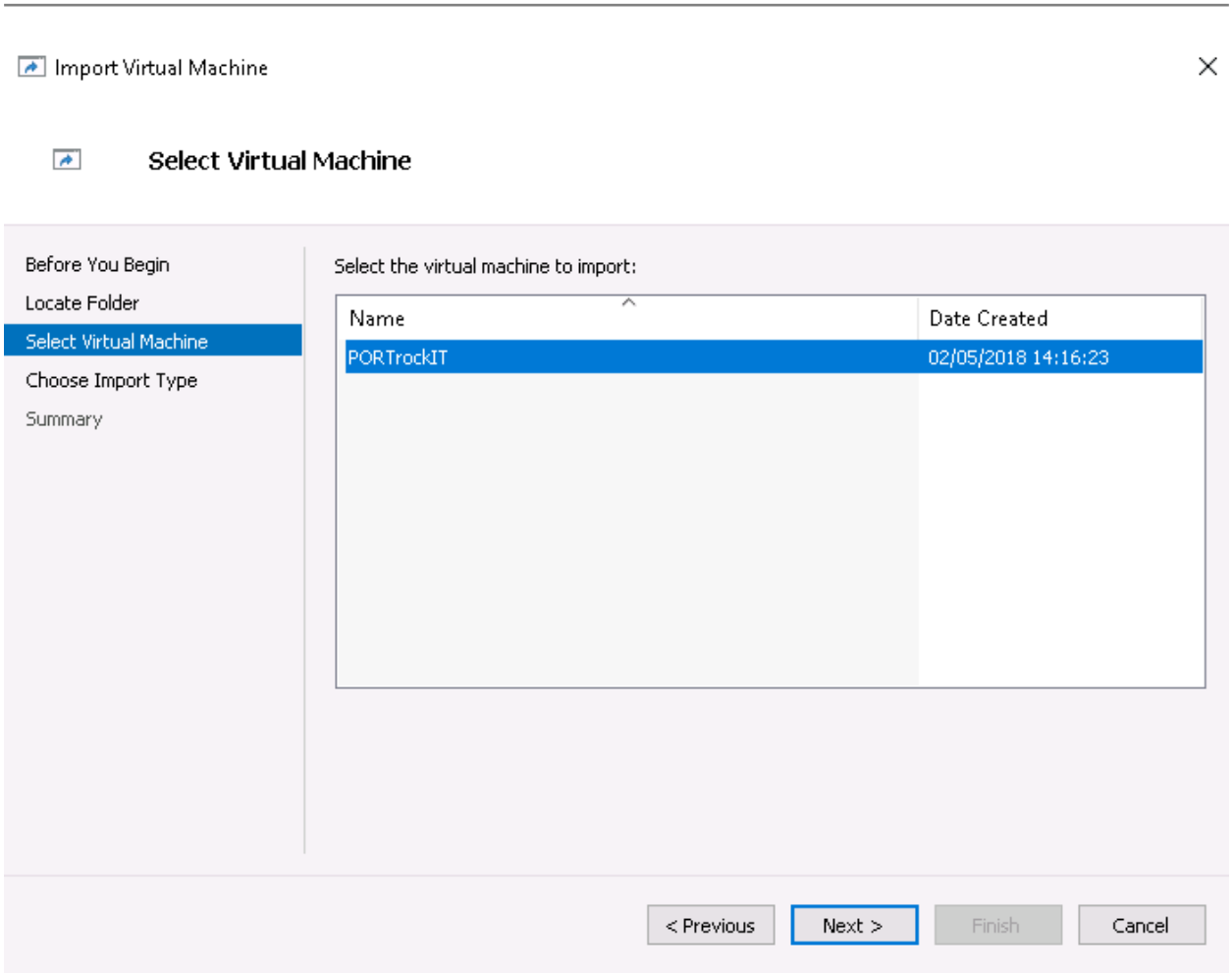
After logging in to the Hyper-V Manager, select *Import Virtual Machine* from the top right hand menu.



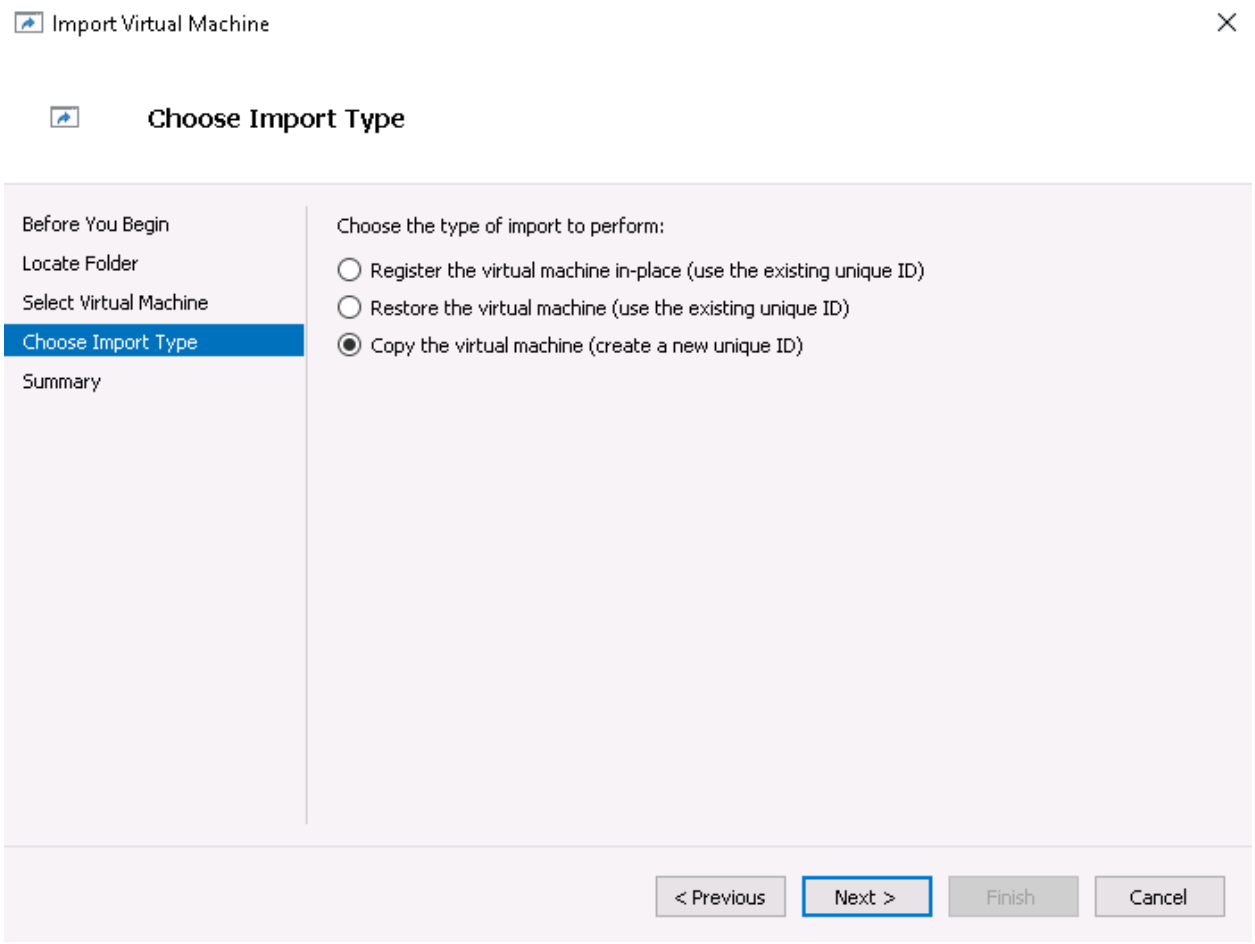
The Import Virtual Machine Wizard will load. Click *Next* to progress through the available import options.



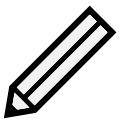
Click on the *Browse* button to select the location of the Virtual Image folder.

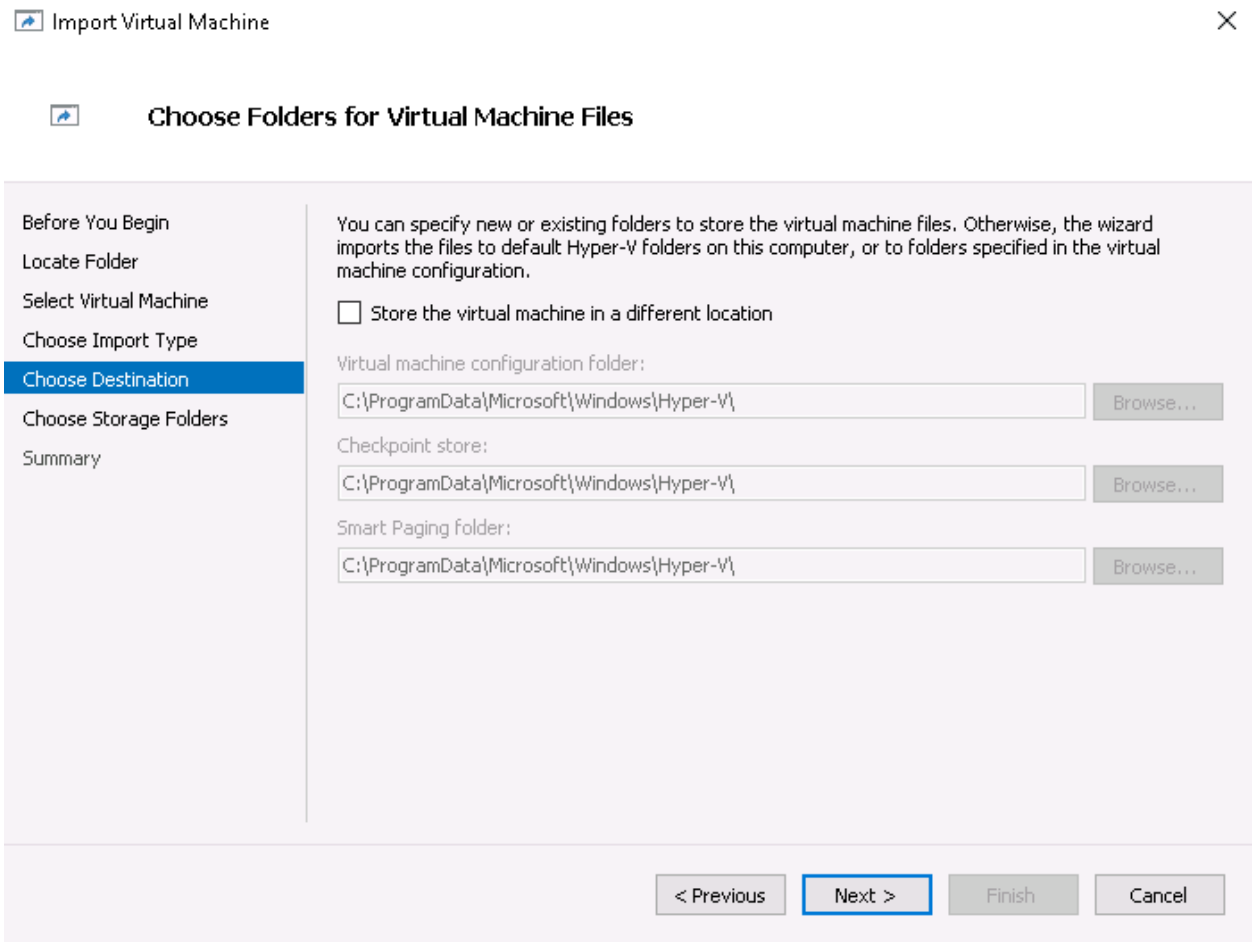


Select the Virtual Machine that you want to import from the list displayed.

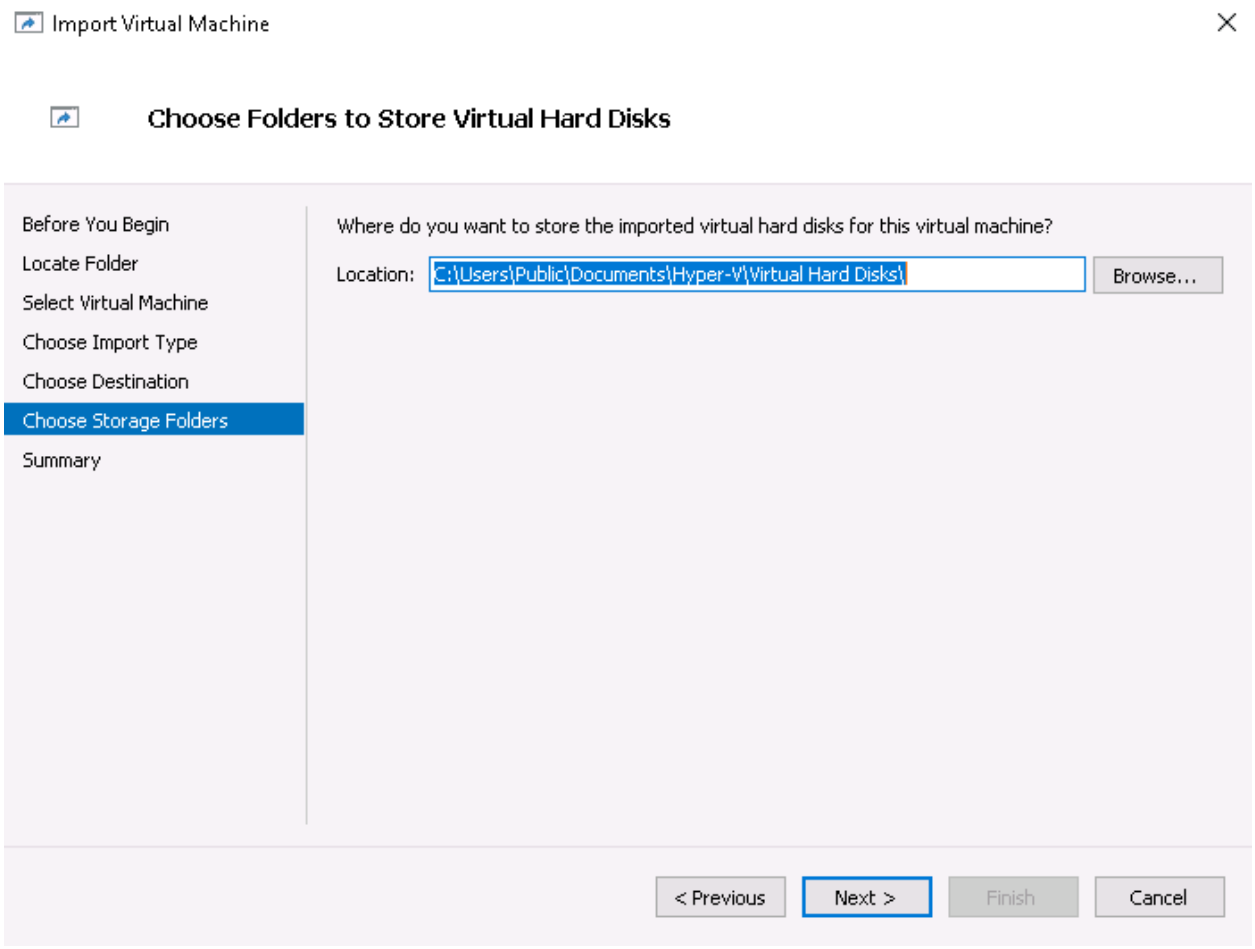


Select the type of import to perform. Copying the Virtual Machine creates a new unique ID for the new Virtual Machine, allowing multiple imports to the same host.

	Note: It is critical to create a PORTrockIT node with a unique ID to ensure Node to Node connectivity can be established.



The Wizard will automatically choose default Hyper-V folders for the virtual machine. These can be changed to different locations if preferred.



The Wizard will automatically choose default Hyper-V folders for the hard disk storage. This can be changed to a different location if required.

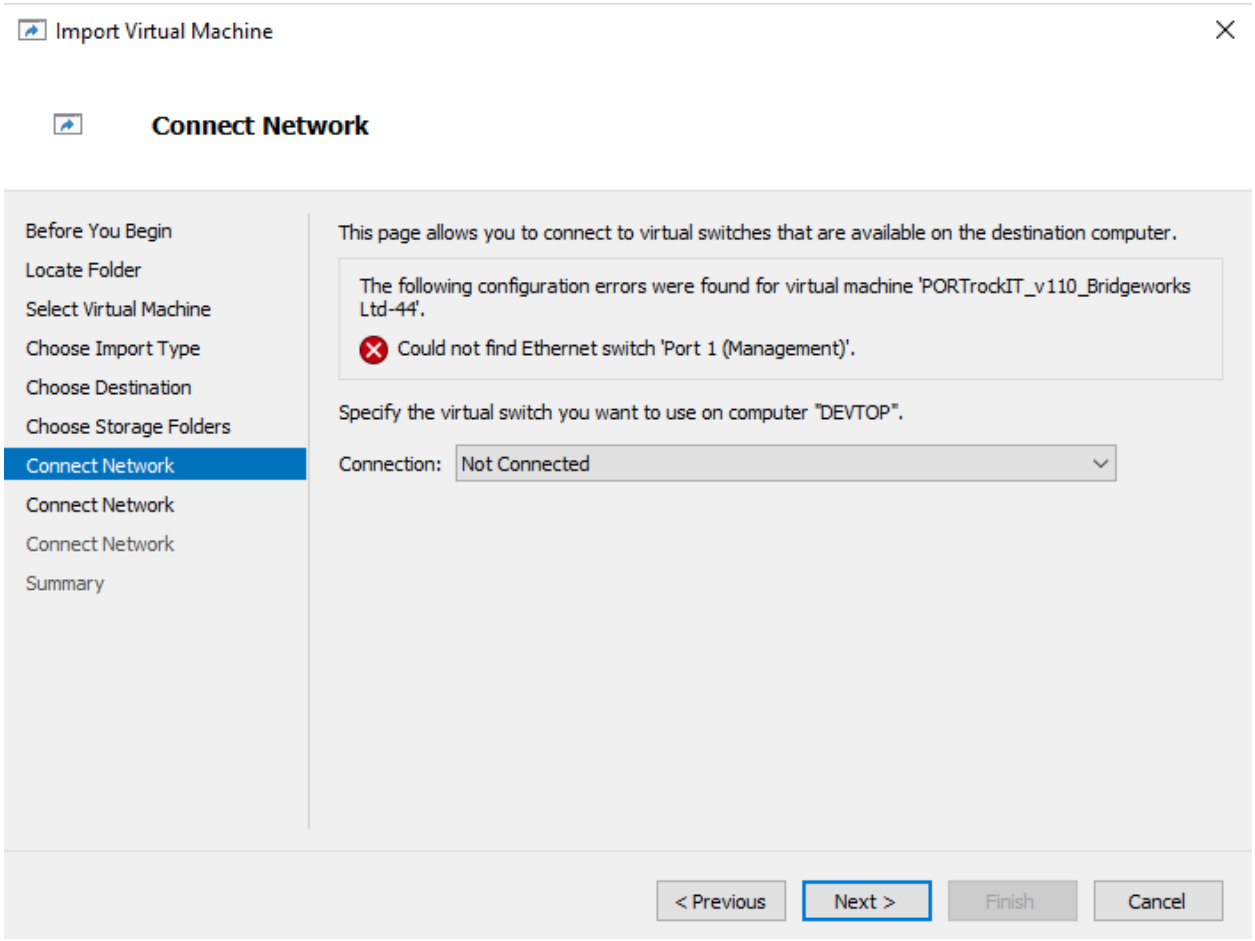
The summary page will confirm choices made for deployment. Click the *Finish* button to finalise.

2.2.1 Connecting to Virtual Switches

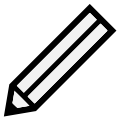
Three network ports need to be configured and connected to relevant virtual switches:

- Port 1 (Management): Used to access the web interface for managing your Node.
- Port 2 (WAN): Used to connect to your other Bridgeworks Node across a WAN link.
- Port 3 (LAN): Used to connect to the device to which you want to apply the acceleration.

To connect to a virtual switch, choose a switch from the drop down menu displayed.



Congratulations, you have finished deploying your Bridgeworks Node.

	Note: It is advisable to create a checkpoint of your node when it is in a good working state. To create a checkpoint click on the *checkpoint* button in the right hand menu.

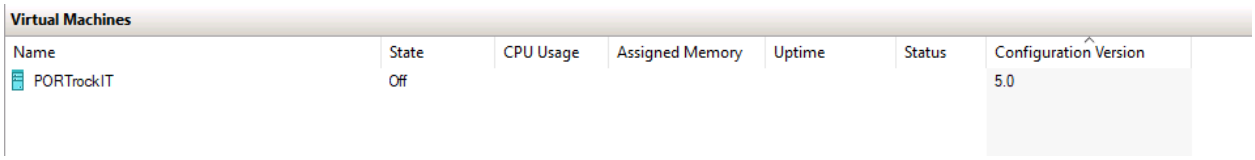
2.3 Upgrading Configuration Versions on Windows Server 2019

To ensure that your Virtual Machine has full functionality when using *Windows Server 2019* the Virtual Machine needs to have a configuration version of 9.0.

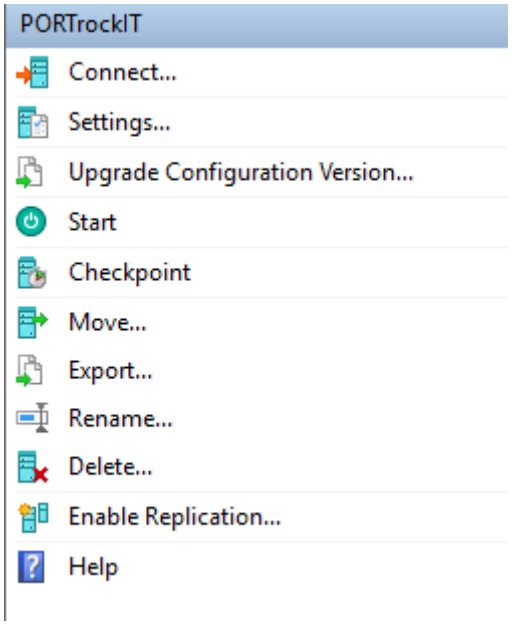
	Warning: If the configuration version is lower than 9.0 you will need to upgrade your configuration.

2.3.1 Upgrading Using Hyper-V Manager

The configuration version of your Virtual Machine can be seen in the Hyper-V manager.



To upgrade your Virtual Machine's configuration version, click on the virtual machine you wish to update and in the bottom right hand menu click *Upgrade Configuration Version*.



A dialogue box confirming that you wish to upgrade the configuration version will appear. Click the *Upgrade* button. The Virtual Machine will now be using configuration version 9.0.

2.4 Troubleshooting

2.4.1 Renaming the Virtual Hard Disk

If an import has a problem deploying because the virtual hard disk already exists, deleting the virtual hard disk solves this issue.

Alternatively choose a different storage location for the virtual hard disk.

3 Deploying a Bridgeworks Hyper-V Node with PowerShell

3.1 Introduction

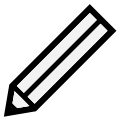
This section details how to deploy a Bridgeworks Node into a Hyper-V environment using PowerShell with Windows Server 2012 R2, Windows Server 2016 and Windows Server 2019.

If you have already deployed your Node using the Hyper-V Manager, skip this step.

3.2 Deploying the Virtual Machine

Bridgeworks provide virtual machine images in a zipped folder. To begin, unzip the folder.

After loading PowerShell, use the Import-VM cmdlet to import a virtual machine as a copy with a new ID. Importing as a copy will allow multiple imports to the same host.



Note: It is critical to create a PORTrockIT node with a unique ID to ensure Node to Node connectivity can be established.

Below are examples of paths to the virtual machine. Be aware that the UUID be unique for each virtual machine.

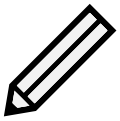
On *Windows Server 2016 and Windows Server 2019* run the cmdlet:

```
Import-VM -Path 'C:\BridgeworksExports\2B91FEB3-F1E0-4FFF-B8BE-29CED892A95A.vmcx'
-Copy -GenerateNewId
```

On *Windows Server 2012 R2, Windows Server 2016 or Windows Server 2019* run the cmdlet:

```
Import-VM -Path 'C:\BridgeworksExports\2B91FEB3-F1E0-4FFF-B8BE-29CED892A95A.xml'
-Copy -GenerateNewId
```

Using the path to your Virtual Machine to import folder.



Note: Windows Server 2016 and Windows Server 2019 can import vmcx and xml virtual machines but Windows Server 2012 R2 can only import xml virtual machines.

You can see what virtual machines are deployed using the *Get-VM* cmdlet.

3.2.1 Connecting to Virtual Switches

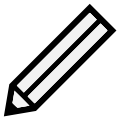
Three network ports need to be configured and connected to relevant virtual switches:

- Port 1 (Management): Used to access the web interface for managing your Node.
- Port 2 (WAN): Used to connect to your other Bridgeworks Node across a WAN link.
- Port 3 (LAN): Used to connect to the device to which you want to apply the acceleration.

To connect to a virtual switch use the cmdlet:

```
Get-VM "VM name" | Get-VMNetworkAdapter | Connect-VMNetworkAdapter -SwitchName
"SwitchName"
```

Congratulations, you have finished deploying your Bridgeworks Node.



Note: It is advisable to create a checkpoint of your node when it is in a good working state. To create a checkpoint click on the *checkpoint* button in the right hand menu.

3.3 Upgrading Configuration Versions on Windows Server 2019

To ensure that your Virtual Machine has full functionality when using *Windows Server 2019* the Virtual Machine needs to have a configuration version of 9.0.

Warning: If the configuration version is lower than 9.0 you will need to upgrade your configuration.

3.3.1 Upgrading Using PowerShell

The configuration version of your Virtual Machine can be seen using the cmdlet:

```
Get-VM "VM name" | Format-Table Version
```

To upgrade your Virtual Machine's configuration version use the cmdlet:

```
Update-VMVersion "VM name"
```

You will be asked to confirm that you want to upgrade your Virtual Machine. Type *Y* and press *Enter*. The Virtual Machine will now be using configuration version 9.0.

3.4 Troubleshooting

3.4.1 Renaming the Virtual Hard Disk

If an import has a problem deploying because the virtual hard disk already exists, deleting the virtual hard disk solves this issue.

Alternatively choose a different storage location for the virtual hard disk.

To change the location use the Import-VM cmdlet above, and add to the end of it:

```
-VhdDestinationPath '<new storage location path>'
```

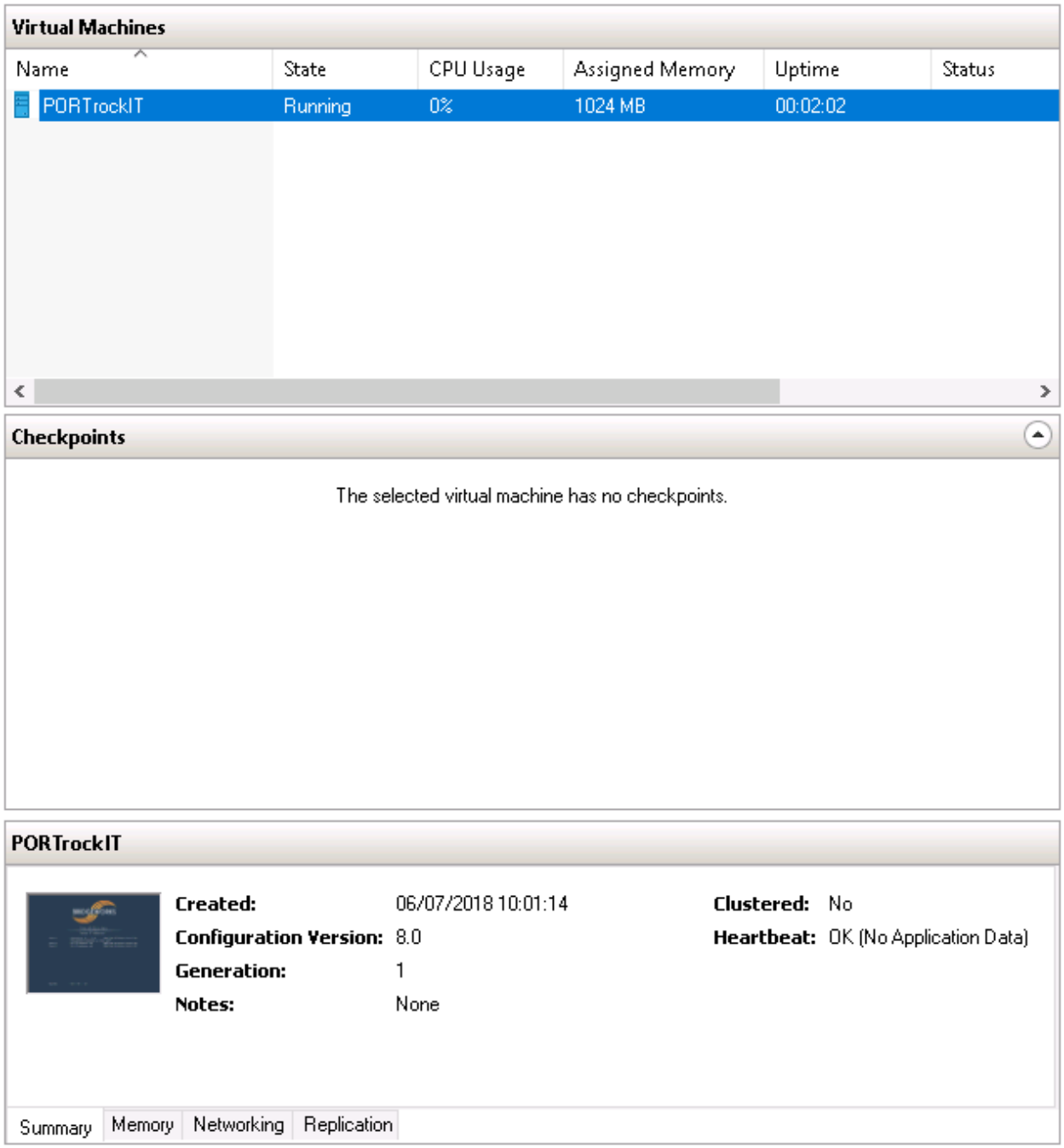
4 Accessing Information about a Virtual Machine

4.1 Direct Access

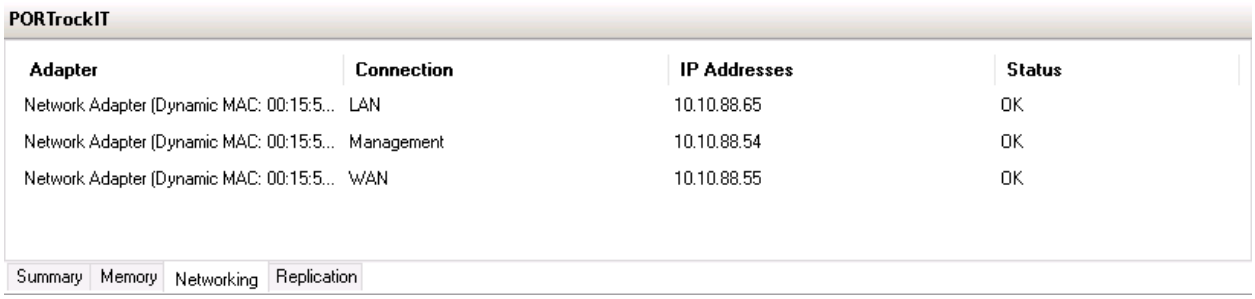
Hyper-V provides abilities to directly access details about a virtual machine’s network interfaces and IP addresses.

4.1.1 Hyper-V Manager

To find information regarding a virtual machine using the Hyper-V Manager, click on the virtual machine you wish to find details about.



The tabs at the bottom of the page will let you find out information about the virtual machine. The *Networking* tab shows details such as the IP addresses of the network interfaces and the virtual switches to which they are connected.



4.1.2 PowerShell

To retrieve information about a virtual machine using PowerShell, run the cmdlet:

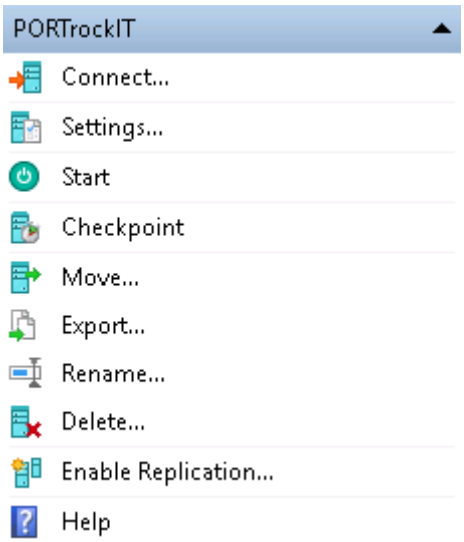
```
Get-VM -VMName '<Name of Virtual Machine>' | Select -ExpandProperty
NetworkAdapters | Select Name, MacAddress, SwitchName, IPAddresses
```

4.2 Virtual Machine Connection

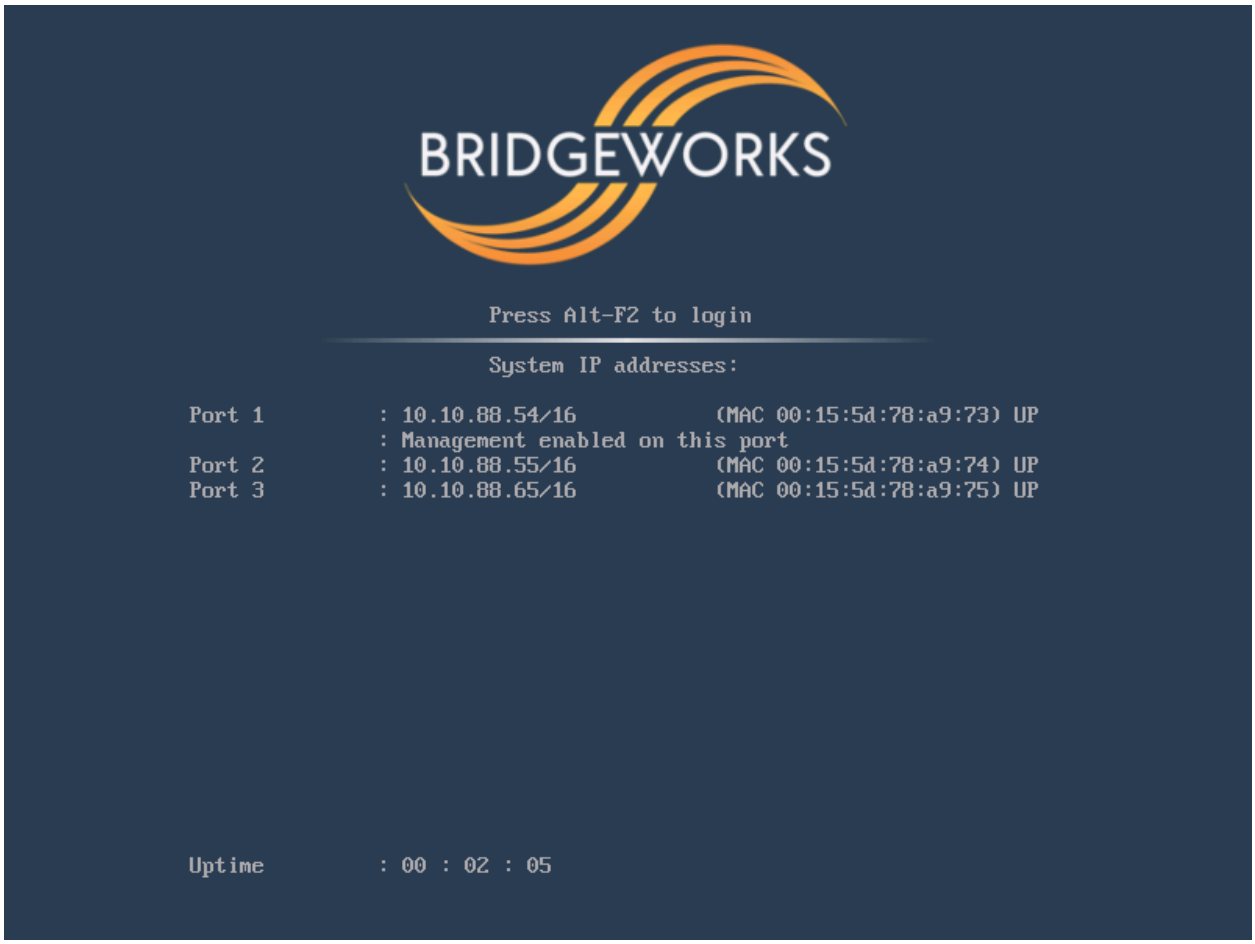
Hyper-V provides the ability to connect to a virtual machine which also allows you to view useful information about the network interfaces that are available.

4.2.1 Hyper-V Manager

To connect to a virtual machine using Hyper-V Manager, select the virtual machine you wish to connect to and in the bottom right hand menu click *Connect*.



This will display the PORTrockIT console in a new window. Then click *Start* to turn on the virtual machine.



4.2.2 PowerShell

To start your virtual machine using PowerShell run the cmdlet:

```
Start-VM -Name <Name of Virtual Machine>
```

Launch the Virtual Machine Connection tool by running the following executable in PowerShell:

```
VMconnect.exe <Hyper-V host, e.g. localhost> <Name of Virtual Machine>
```

The PORTrockIT console will then be displayed in a new window.