

Implementing Windows Server 2019 Hyper-V

LAB SETUP



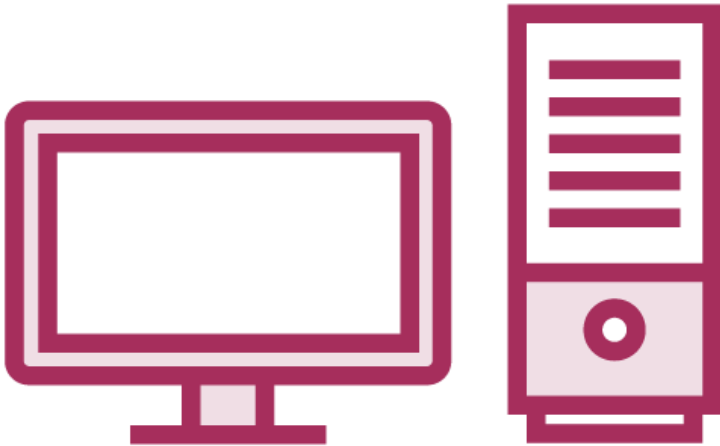
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Why Should I Take This Course?



Your organization uses Windows Server 2019 Hyper-V (or will soon)

You work in IT (or will soon!) and are involved with virtualization

You work in a Microsoft environment and are interested in cloud computing

You want to prepare for Microsoft Server certifications





If you've taken the Pluralsight course on Hyper-V in Windows Server 2016, the content here covers similar ground.
So, what's different?

We use some new tools in this course, all content has been verified with Server 2019, and the demos here use Server 2019.



Modules in This Course

Lab Setup

**Install and
Configure Hyper-V**

**Configure Virtual
Machines**

**Configure VM
Storage**

**Configure Virtual
Networks**



Topics in This Module



Lab setup: first steps

Virtual machine setup



“All knowledge of reality starts from experience and ends in it.”

Albert Einstein, “Ideas and Opinions”



Lab Setup: First Steps





Setting up a test lab:

Obtain evaluation software

Set up a Hyper-V host

Build your virtual machines

Build your virtual switch

Obtain an Eval of Server 2019



Recommended version:

- Datacenter edition
- Server “with Desktop Experience” for your VM host and the “DC” VM
- Server Core for the “HyperV1” VM

180-day eval from Microsoft:

- Google “Microsoft Evaluation Center” plus the name of your language for the localized download site. For example:
- “Microsoft evaluation center French” > www.microsoft.com/fr-fr/evalcenter



https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2019

Most Visited

Windows Server Evaluations

⊖

Windows Server 2019

Evaluations | 180 days

⬇

In addition to your trial experience of Windows Server 2019, you can download a new feature on demand for Server Core, the App Compatibility FOD. This FOD contains additional features from the Desktop Experience to improve the compatibility of Server Core for apps and tools used for troubleshooting and debugging. Windows features on demand can be added to images prior to deployment or to actively running computers, using the DISM command. [Learn more about the Server Core App Compatibility FOD.](#) Download this [FOD](#). To learn more about FODs in general, and the DISM command, please visit [DISM Capabilities Package Servicing](#).

⊖

Start your evaluation

Please select your evaluation file type:

☒ Azure

☐ ISO

☐ VHD

Continue

⊕

Description

⊕

Preinstall Information

⊕

Explore

⊕

Try

⊕

Learn

⊕

Buy

Alternative: Hyper-V Server 2019



Free (not eval product) and contains:

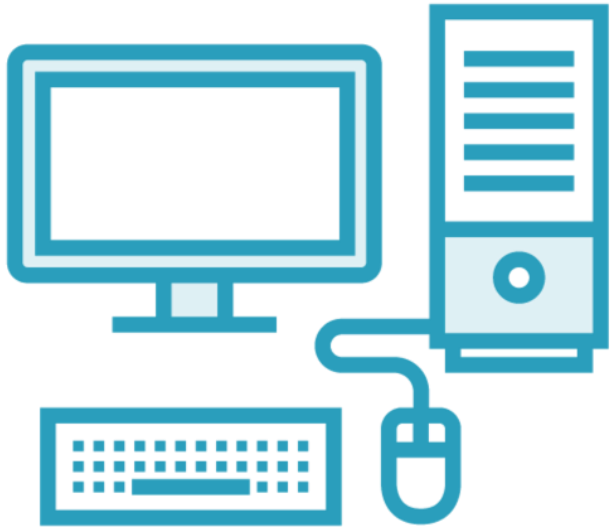
- Windows hypervisor
- Windows Server driver model
- Virtualization components

Only available as ISO

Obtain at same URL as noted previously

You'll still need an eval or licensed product to run atop Hyper-V Server 2019

Obtain an Eval of Windows 10



Optional but useful for management workstation

Recommended version:

- Enterprise edition
- Either LTSC or semi-annual release

90-day eval from Microsoft:

- Same “Evaluation Center” URL as above

Set up a VM Host



Host system recommendations:

- Windows Server 2019
- Hyper-V server role
- HAV, SLAT, DEP, UEFI, TPM
- 16+ GB RAM
- 75+ GB storage (SSD is best)

Other platforms should work

- VMware, VirtualBox, etc.

Internet connectivity for downloads

- VLAN support in switch is a bonus





Consider a NUC!

- Next Unit of Computing

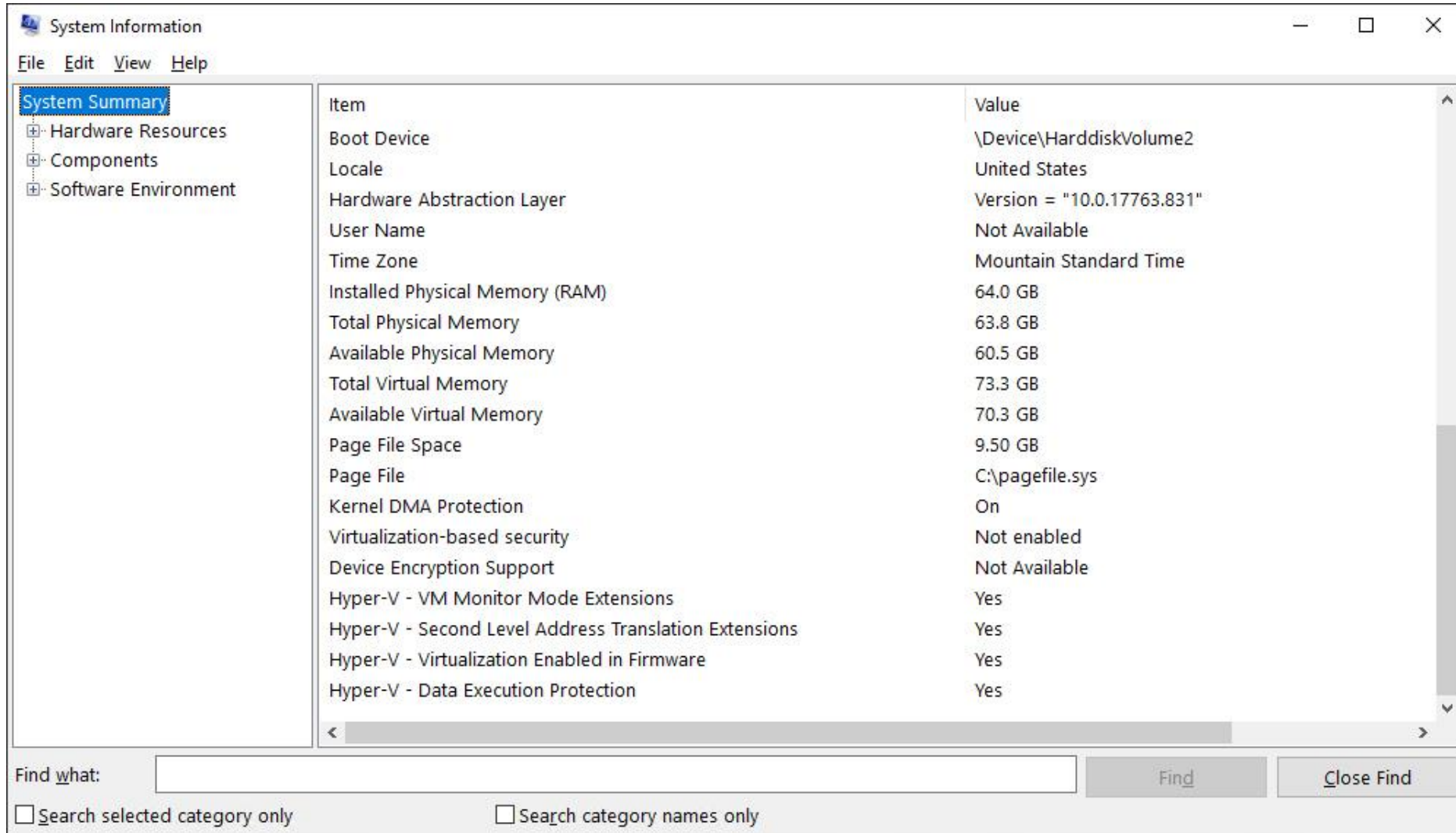
Extremely small form factor:
4" x 4" x 2.5"

Low power, low noise

Pre-assembled or in kit form

NVMe SSD excellent for running VMs

Checking MSINFO32 for Hyper-V Compatibility

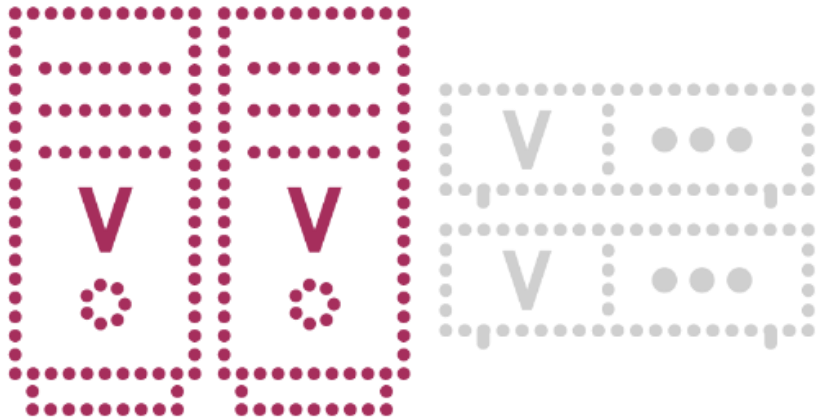


The screenshot shows the Windows System Information window. The left sidebar has a tree view with 'System Summary' selected. The main area displays a table of system information. The 'Item' column lists various system details, and the 'Value' column shows their corresponding values. At the bottom, there is a search bar labeled 'Find what:' and two checkboxes: 'Search selected category only' and 'Search category names only'. The 'Find' and 'Close Find' buttons are also visible.

| Item | Value |
|---|----------------------------|
| Boot Device | \Device\HarddiskVolume2 |
| Locale | United States |
| Hardware Abstraction Layer | Version = "10.0.17763.831" |
| User Name | Not Available |
| Time Zone | Mountain Standard Time |
| Installed Physical Memory (RAM) | 64.0 GB |
| Total Physical Memory | 63.8 GB |
| Available Physical Memory | 60.5 GB |
| Total Virtual Memory | 73.3 GB |
| Available Virtual Memory | 70.3 GB |
| Page File Space | 9.50 GB |
| Page File | C:\pagefile.sys |
| Kernel DMA Protection | On |
| Virtualization-based security | Not enabled |
| Device Encryption Support | Not Available |
| Hyper-V - VM Monitor Mode Extensions | Yes |
| Hyper-V - Second Level Address Translation Extensions | Yes |
| Hyper-V - Virtualization Enabled in Firmware | Yes |
| Hyper-V - Data Execution Protection | Yes |



Build Your VMs (Overview)



Use Hyper-V Manager on Host computer

Choose dynamically expanding hard drive, VHDX, on SSD if possible

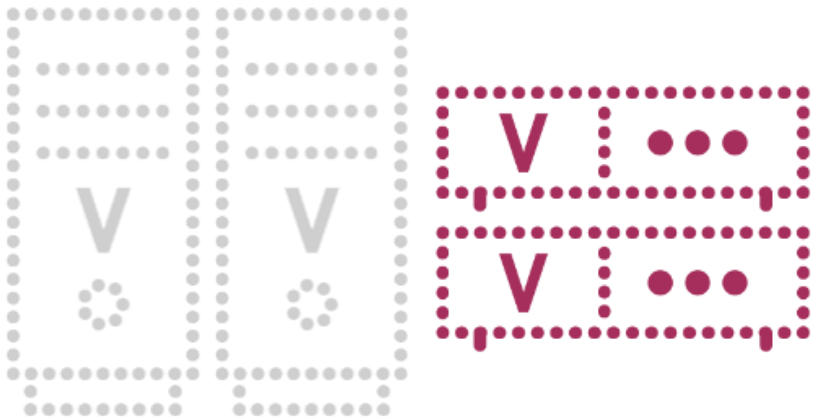
Configure guests for multiprocessor support if available

1 GB RAM minimum per guest,
2 GB preferable

Windows Server 2019 (2X) and Windows 10 (1X) – see next clip for details



Build Your Virtual Switches (Overview)



Use Hyper-V Manager on host computer

Company Private

- Private network type

Company External

- External network type
(has connectivity to host and Internet)





If you have multiple network adapters, you can “team” them prior to creating your virtual switches.

Details appear in our module titled
“Configure Virtual Networks.”





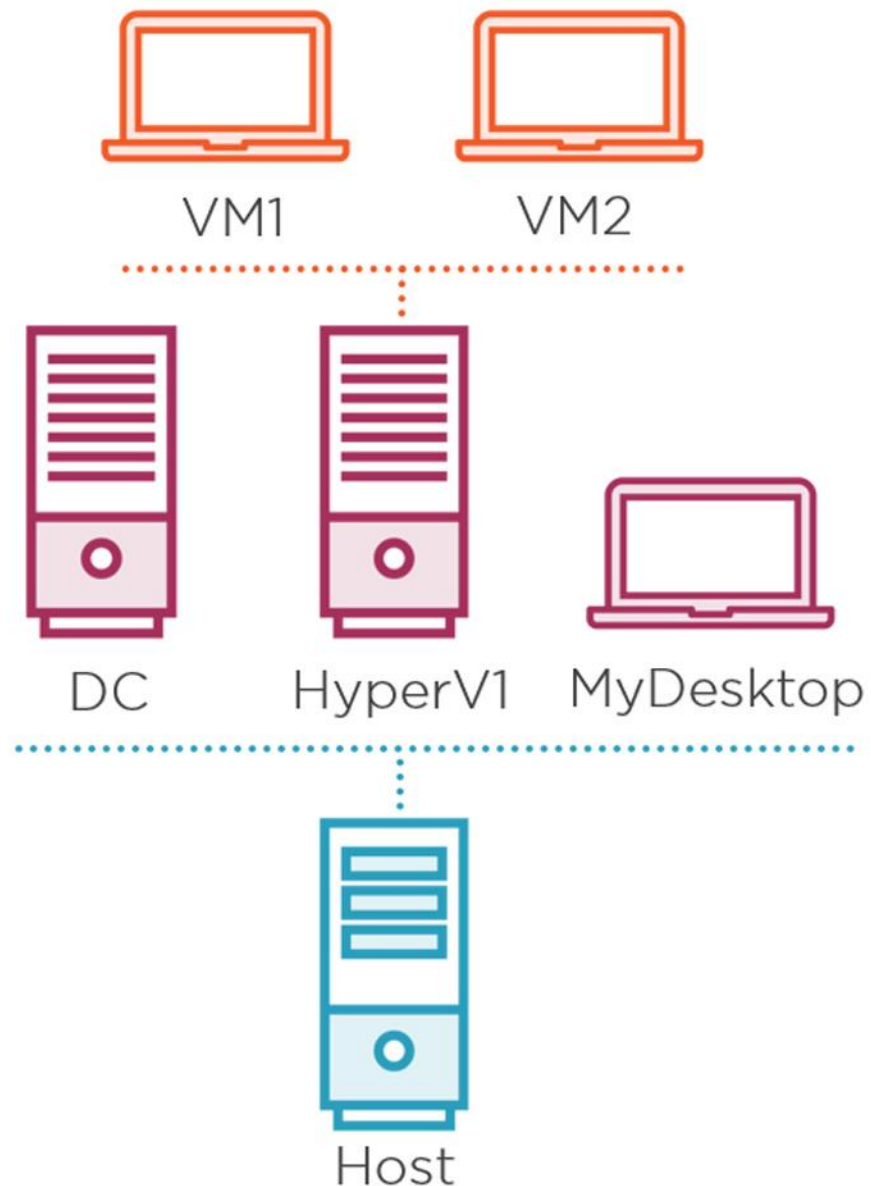
Do it all in the cloud!

This module describes using a physical machine as your VM host, but everything can be built in the Azure environment too, now that Azure supports nested virtualization.



Virtual Machine Setup





Host

- Server 2019 with Hyper-V Role
- **OR** Hyper-V Server 2019

DC (Server 2019)

- Domain controller, file server, DNS

MyDesktop (Windows 10)

- Management workstation

HyperV1 (Server Core 2019)

- Hyper-V host

VM1, VM2

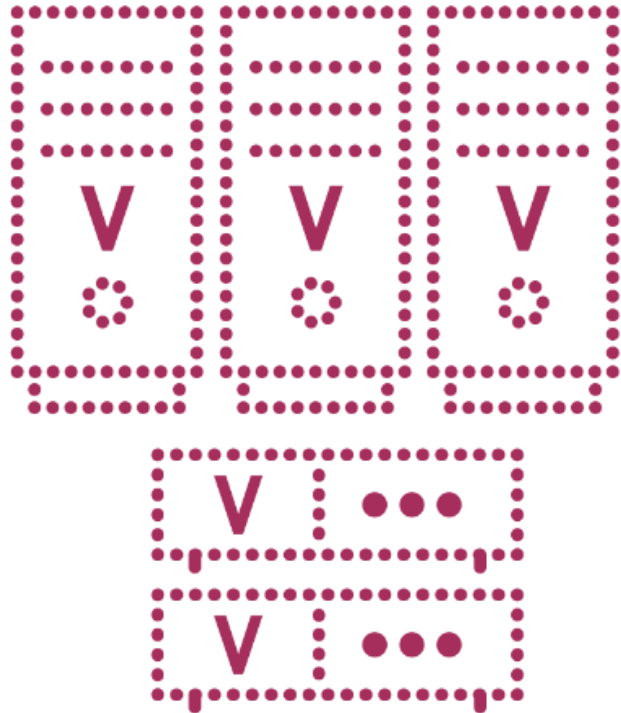
- Build during the course; OS can vary

This section presents the setup that
I used for this course.

You can, of course, set things up
differently if you like!



Virtual Switch Assignments



DC, MyDesktop, and HyperV1:

- Company Private (normal operation)
- Company External (for activating, downloading)
- (only one vNIC will be active at a time on each VM)



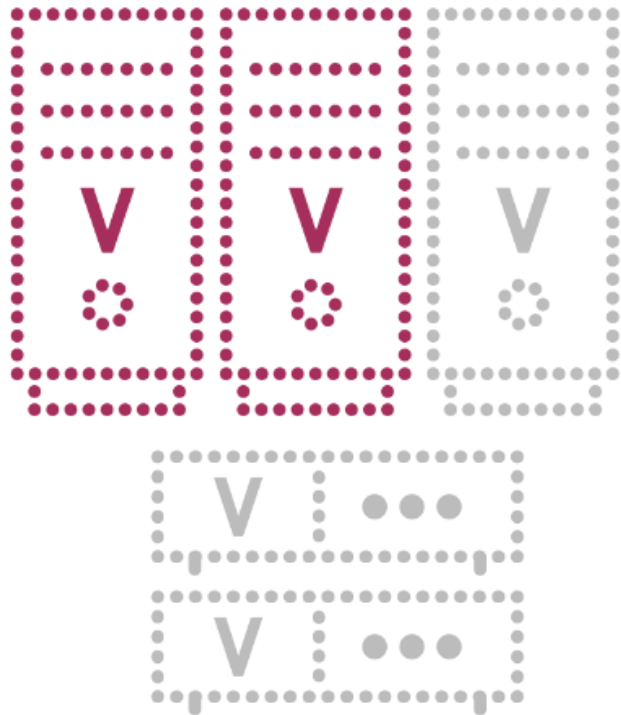


If you want, you could avoid switching NICs by building a NAT router on another VM...

...but in this course, we rarely need Internet connectivity, so using two NICs is probably easier.



Installing Server 2019 into VMs



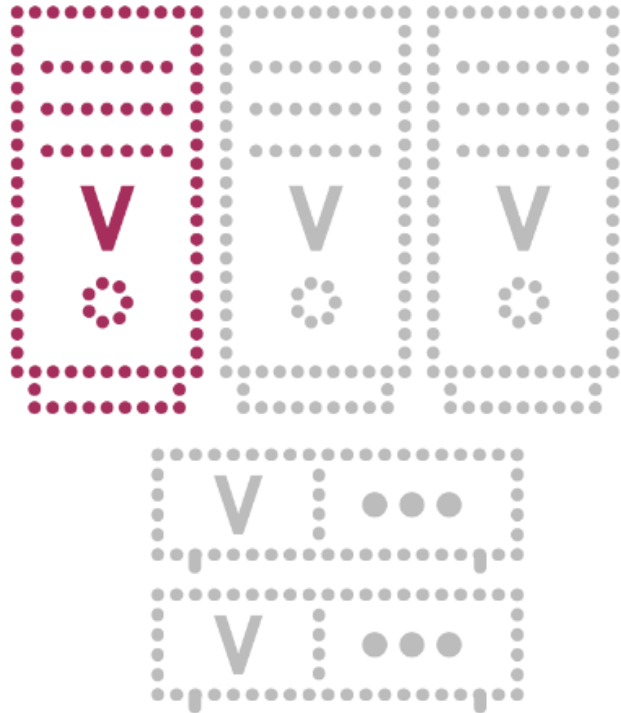
Using an eval version?

- Download the VHD and save time!

Using a licensed version?

- Install the ISO in a share on your “Host”
- Set constrained delegation if needed (see “Configure Virtual Machines” module for details)
- Mount the ISO as a virtual DVD with Hyper-V Manager
- Set the boot order so DVD is first

DC Setup Notes (1)



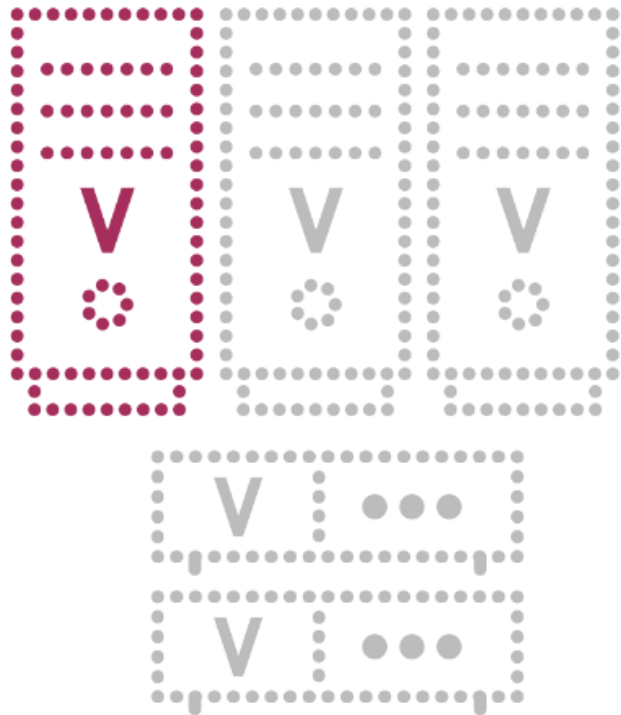
Install Server 2019 (preferably with Desktop Experience)

Via Server Manager:

- Name computer
- Set date, time, time zone
- Use external NIC to activate Windows
- Enable remote desktop
- IP 192.168.3.10/24, gateway 192.168.3.2, DNS 127.0.0.1



DC Setup Notes (2)



Install & configure ADDS role

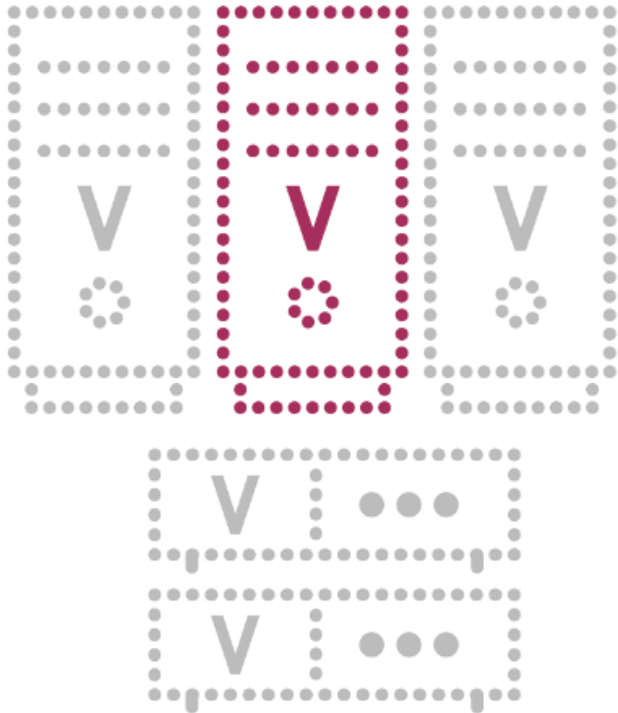
- e.g. with Server Manager
- New forest, new tree, new domain (company.pri)
- Include DNS, global catalog

Install File and Storage Services...

...and create one or two file shares

Install DHCP (optional)

HyperV1 Setup Notes (1)

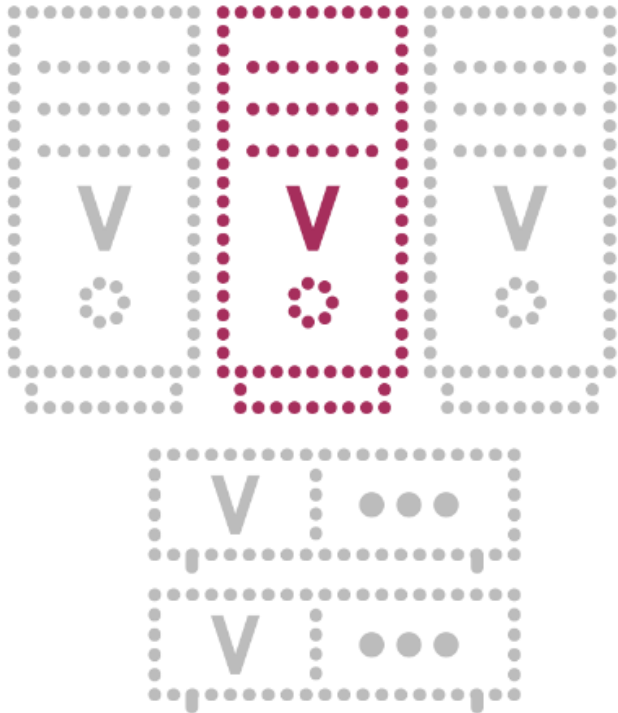


Install Server Core and use sconfig to:

- Name the computer
- Set date, time, time zone
- Use external NIC to activate Windows
- Set internal NIC to 192.168.3.200/24, gateway 192.168.3.2, DNS 192.168.3.10
- Join domain (company.pri)
- Enable remote desktop

Install Hyper-V role (See “Install and Configure Hyper-V” module for details)

HyperV1 Setup Notes (2)



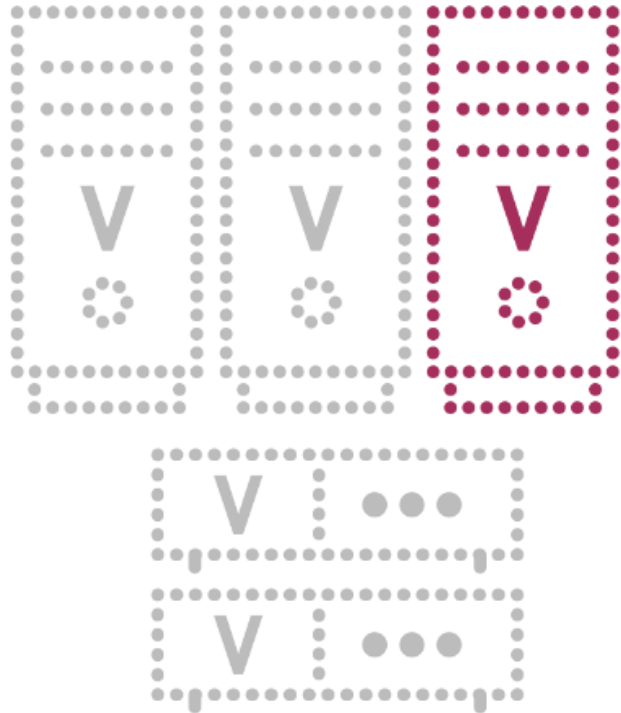
Enable nested virtualization from host

- Necessary for HyperV1 to be a virtualization host
- Shut down HyperV1
- From host OS:

```
Set-VMProcessor -VMName HyperV1  
-ExposeVirtualizationExtensions $true
```



MyDesktop Setup Notes (1)



Via Control Panel or Settings:

- Name computer
- Set date, time, time zone

Network (configure 2 NICs):

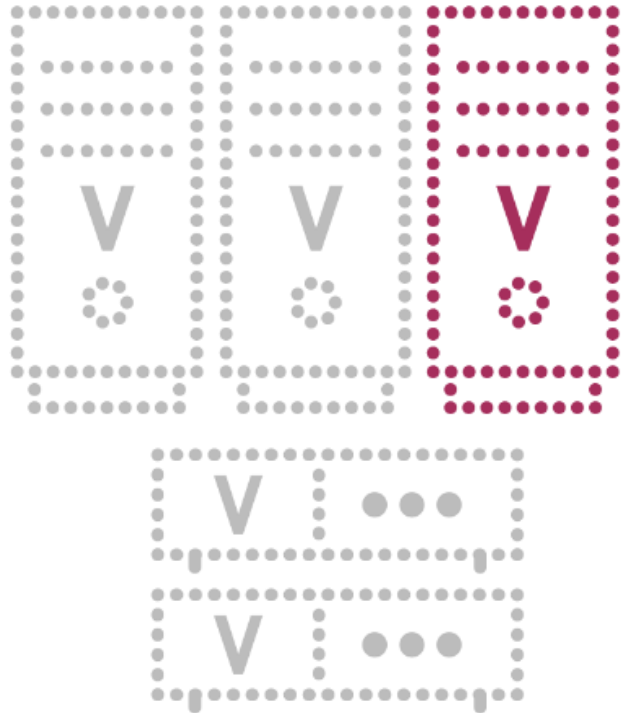
- Company Private: IP 192.168.3.100/24, gateway 192.168.3.2, DNS 192.168.3.10
- Company External: DHCP from your router

Use external NIC to activate Windows

Use private NIC to join company.pri



MyDesktop Setup Notes (2)



Turn on Hyper-V Management Tools

- Control Panel > Programs and Features > Turn Windows features on or off

Using external NIC:

Download Windows Admin Center

- <https://www.microsoft.com/<lang>/cloud-platform/windows-admin-center>

Update PowerShell help

- At PS prompt, type update-help





Not sure how to
accomplish some
of these steps?

No worries, we cover most of
them in the course itself. Watch
the next couple of modules, then
come back here and perform the
steps.



Good work! Up next:

Install and Configure Hyper-V

