

ENRICHMENT EXERCISE

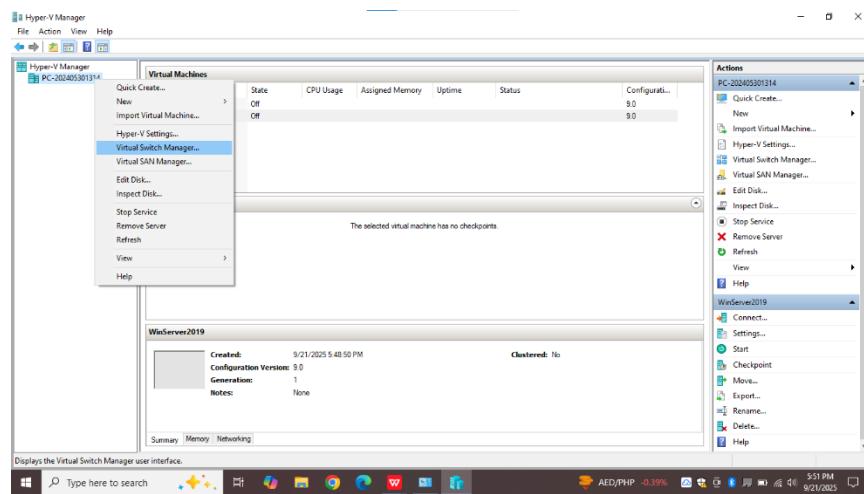
BSinfotech 4B

Members:

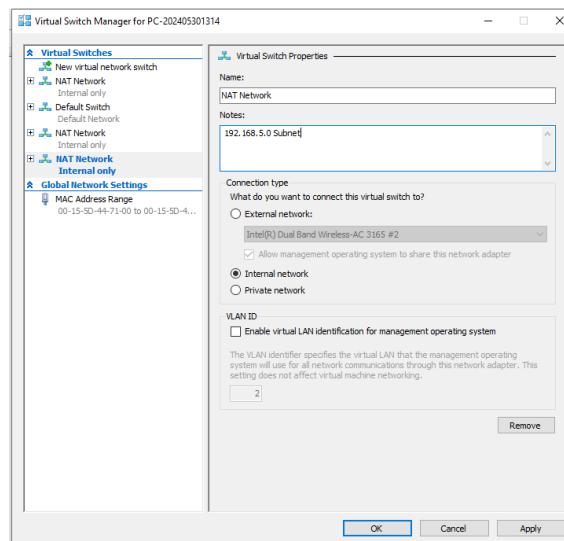
Ardin T. Baltar
Mary Rose L. Rodriguez
Juan Paolo L. Tolentino
Aubrey V. Aragon

CREATING THE VIRTUAL SWITCH

1. We opened Hyper-V on our PC/Laptop. Once the console loaded, we right-clicked on our Hyper-V host name and selected “Virtual Switch Manager.” Inside the Virtual Switch Manager, we created a new internal virtual switch. In the window that appeared, we chose “Internal” and clicked “Create Virtual Switch.” This produced a switch that we could use to network our new VMs together.



2. After creating the switch, we renamed it and added some notes. We included the subnet we planned to use for that internal network so we would have it handy for NAT configuration later. In our case we decided on the 192.168.5.0/24 subnet and entered that into the notes for reference. We then clicked OK to save the new internal switch.



3. With PowerShell open, we ran the command to list our network interfaces and identified the virtual switch we had just created by the name we had chosen (for example “NAT Network”). We looked up its ifIndex so that we could use it in the next step. If needed, we filtered the list by name to quickly find the adapter.

```

Administrator: Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Administrator> Get-NetAdapter
Name           InterfaceDescription          ifIndex Status      MacAddress      LinkSpeed
----           -----                   ...
vEthernet (NAT Network) 3 Hyper-V Virtual Ethernet Adapter #4   67 Up       00-15-5D-44-71-07  10 Gbps
vEthernet (NAT Network) 2 Hyper-V Virtual Ethernet Adapter #3   61 Up       00-15-5D-44-71-03  10 Gbps
Bluetooth Network Conn... Bluetooth Device (Personal Area Netw...
vEthernet (Default Swi... Hyper-V Virtual Ethernet Adapter    49 Up       00-15-5D-A2-0F-73  10 Gbps
vEthernet (NAT Network) Hyper-V Virtual Ethernet Adapter #2   17 Up       00-15-5D-44-71-01  10 Gbps
Ethernet          Intel(R) Ethernet Connection I219-V        12 Disconnected EC-21-E5-1C-DD-2F  0 bps
Wi-Fi            Intel(R) Dual Band Wireless-AC 3165 #2        7 Up       F8-34-41-11-43-6A  325 Mbps

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Ethernet          Intel(R) Ethernet Connection I219-V        12 Disconnected EC-21-E5-1C-DD-2F  0 bps
Wi-Fi            Intel(R) Dual Band Wireless-AC 3165 #2        7 Up       F8-34-41-11-43-6A  433.3 Mbps

PS C:\Users\Administrator>

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Wi-Fi            Intel(R) Dual Band Wireless-AC 3165 #2        7 Up       F8-34-41-11-43-6A  433.3 Mbps

PS C:\Users\Administrator> Get-NetAdapter | Where {$_._Name -match "NAT Network"}
Name           InterfaceDescription          ifIndex Status      MacAddress      LinkSpeed
----           -----                   ...
vEthernet (NAT Network) 3 Hyper-V Virtual Ethernet Adapter #4   67 Up       00-15-5D-44-71-07  10 Gbps
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PS C:\Users\Administrator>

```

4. Next, we set up a gateway for our virtual switch using the subnet we had put in the notes. Since our subnet was 192.168.5.0/24, all hosts on the network would have IP addresses starting with 192.168.5.x. We designated .1 as our gateway and used prefix length /24. We executed:

```
New-NetIPAddress -IPAddress 192.168.5.1 -PrefixLength 24 -InterfaceIndex 67
```

```

PS C:\Users\Administrator> New-NetIPAddress -IPAddress 192.168.5.1 -PrefixLength 24 -InterfaceIndex 55

IPAddress          : 192.168.5.1
InterfaceIndex     : 55
InterfaceAlias     : vEthernet (NAT Network)
AddressFamily      : IPv4
Type              : Unicast
PrefixLength      : 24
PrefixOrigin      : Manual
SuffixOrigin      : Manual
InterfaceType     : Virtual
ValidLifetime     : Infinite ((TimeSpan):.MaxValue)
PreferredLifetime : Infinite ((TimeSpan):.MaxValue)
InterfaceMetric   : False
PolicyStore       : ActiveStore
PolicyStore       : ActiveStore

IPAddress          : 192.168.5.1
InterfaceIndex     : 55
InterfaceAlias     : vEthernet (NAT Network)
AddressFamily      : IPv4
Type              : Unicast
PrefixLength      : 24
PrefixOrigin      : Manual
SuffixOrigin      : Manual
InterfaceType     : Virtual
ValidLifetime     : Infinite ((TimeSpan):.MaxValue)
PreferredLifetime : Infinite ((TimeSpan):.MaxValue)
InterfaceMetric   : False
PolicyStore       : PersistentStore
PolicyStore       : PersistentStore

PS C:\Users\Administrator>

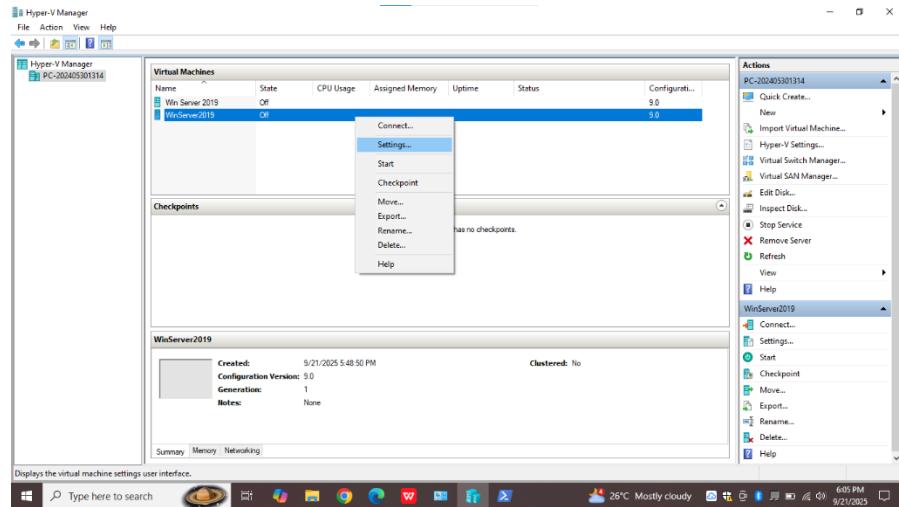
```

- After the gateway was created, we established the NAT between the gateway and our network with another simple command. We verified the output matched our expectations. Finally, when configuring our guest VMs on this new NAT Network, we kept these settings in mind so that we could correctly set their TCP/IPv4 configurations.

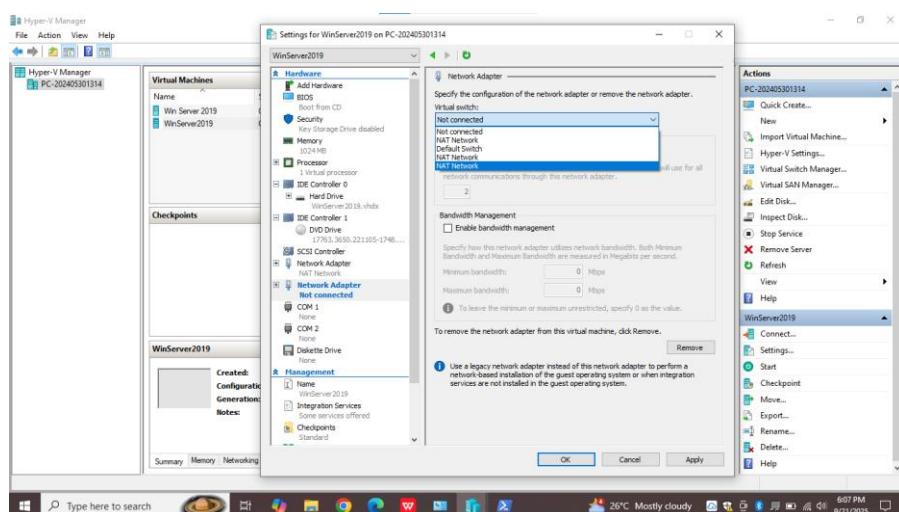
```
PS C:\Users\Administrator> New-NetNat -Name NATNetwork -InternalIPInterfaceAddressPrefix 192.168.5.0/24
Name : NATNetwork
ExternalIPInterfaceAddressPrefix : 192.168.5.0/24
InternalIPInterfaceAddressPrefix : 192.168.5.0/24
Enabled : True
TcpEstablishedConnectionTimeout : 1800
TcpTransientConnectionTimeout : 120
UdpFilteringBehavior : AddressDependentFiltering
UdpIdleSessionTimeout : 120
UdpNoRoundRefresh : False
Start : Local
Active : True
```

ADDING THE WINDOWS SERVER 2019 TO VIRTUAL SWITCH

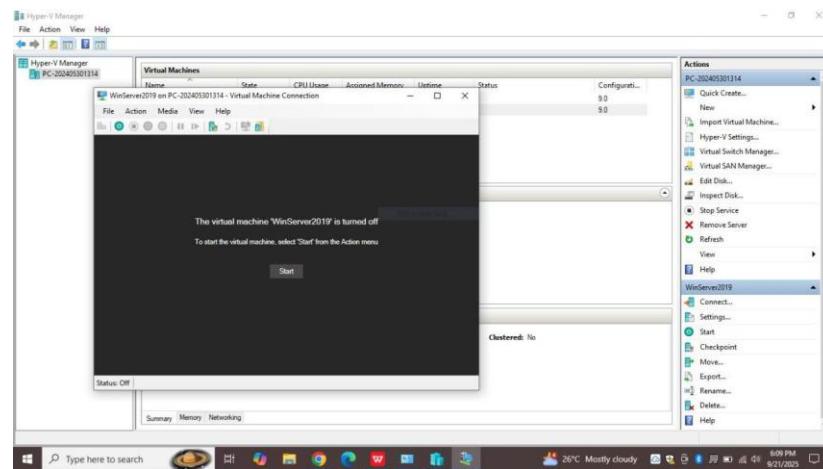
- We went to the Home screen of Hyper-V. We right-clicked our server and clicked Settings.



- Inside the settings window, we opened Network Adapter > Virtual Switch and selected the switch we had created in the previous activity (NAT Network). We applied any additional changes we wanted and then clicked OK. When everything was ready, we right-clicked the VM and selected Start.

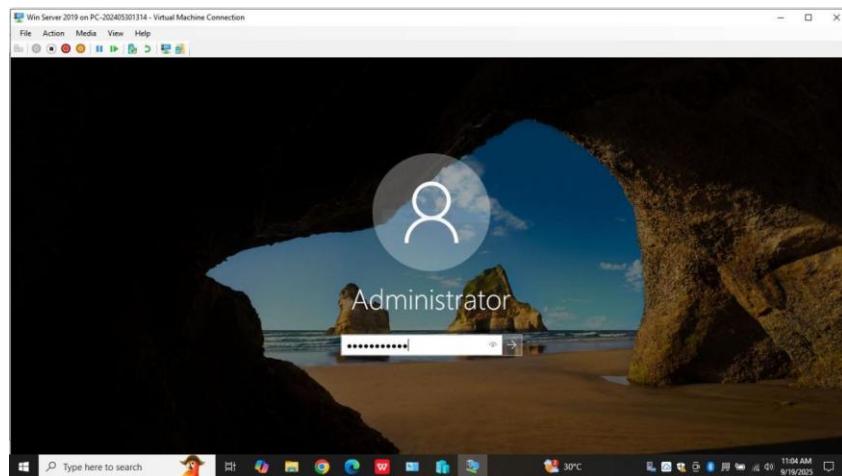


- At that point, the VM was up and ready for the guest operating system installation.

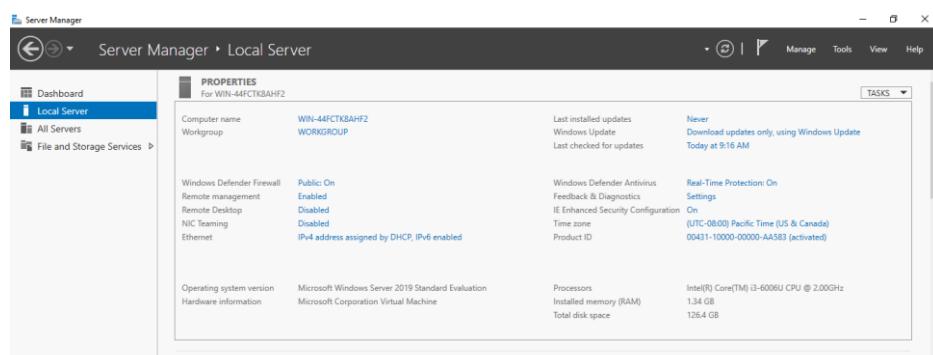


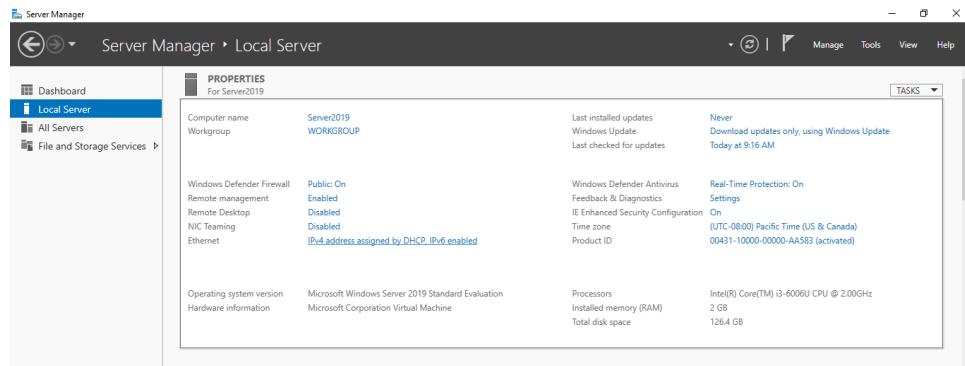
WINDOWS SERVER 2019 INITIAL CONFIGURATION

- We started our Windows Server 2019 VM and logged in with the administrator account.

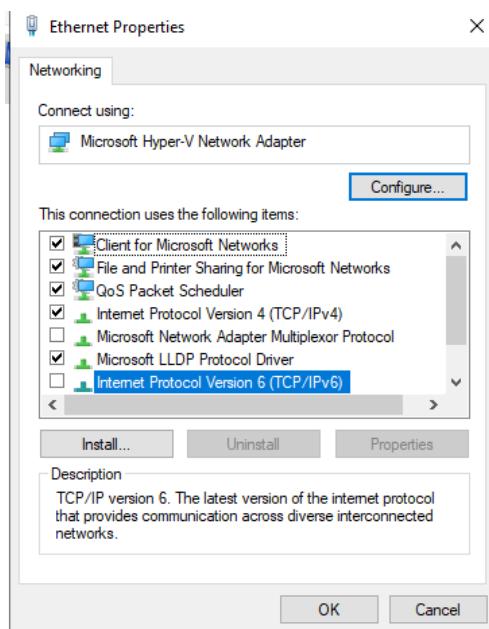


- Once we were on the desktop, Server Manager opened automatically. From there we completed two key actions: we changed the server name and configured the IP settings. In Server Manager, we went to the Local Server tab. We clicked the blue text links to adjust the Computer Name and the Ethernet network configuration. We selected the IPv4 option as shown in the example.





- Inside the network settings, we disabled Internet Protocol Version 6 since it would not be used. We then selected Version 4, clicked Properties, and manually configured a static IP address.

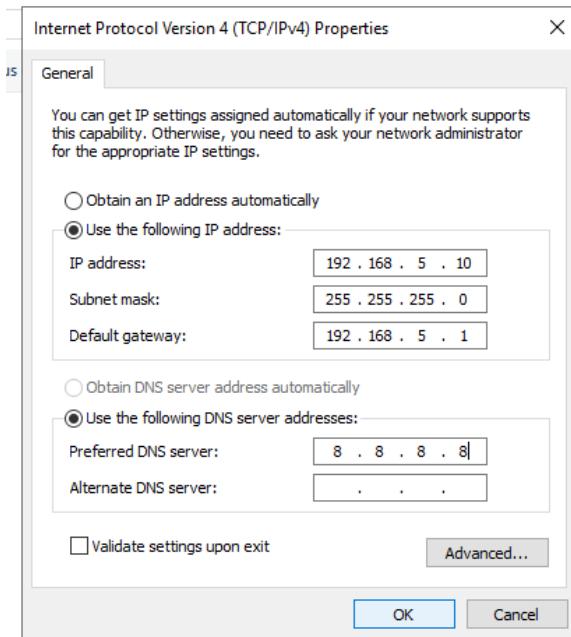


- Because we had no DHCP server, we assigned a static IP address using the NAT Network details we had set up earlier:

Network ID: 192.168.5.0

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.5.1



5. For the IP address we chose 192.168.5.10. We entered the subnet mask and default gateway above, and since we had no DNS server yet, we used Google's DNS server 8.8.8.8. We left the "Alternative DNS server" field blank. We clicked OK to close the window and again clicked OK to close the Ethernet Properties window.
6. We tested our network configuration by opening CMD, running ipconfig to verify the IP address, and then running ping google.com to confirm that we received a response.

```

Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.6332]
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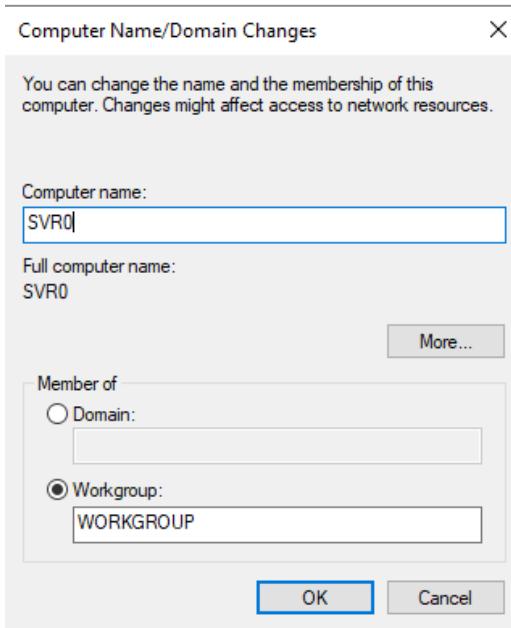
C:\Users\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :
  Ethernet adapter vEthernet (Default Switch):
    Connection-specific DNS Suffix . . . . . : fe80::f875:bb05:5635:64f1%4
    IPv4 Address . . . . . : 172.27.192.1
    Subnet Mask . . . . . : 255.255.248.0
    Default Gateway . . . . . :
  Ethernet adapter vEthernet (NAT Network):
    Connection-specific DNS Suffix . . . . . : fe80::aed9:c82e:76f3:9754%17
    IPv4 Address . . . . . : 192.168.5.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
  Ethernet adapter vEthernet (NAT Network) 2:
    Connection-specific DNS Suffix . . . . . : fe80::e31e:c94e:d028:770b%61
    Link-local IPv6 Address . . . . . : fe80::e31e:c94e:d028:770b%61
    Autoconfiguration IPv4 Address . . . . . : 169.254.54.243
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . :
  Wireless LAN adapter Local Area Connection* 1:
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . . . . :
  Wireless LAN adapter Local Area Connection* 2:

```

7. Next, we renamed the computer. Back in Server Manager, we clicked the blue text near Computer Name, which opened the System Properties. We clicked Change, typed the new computer name, and clicked OK. Since we hadn't created a domain or workgroup yet, we only changed the computer name. The VM prompted us to restart, and we accepted.



8. Finally, we ran Windows Update. We clicked the blue text near "Last installed updates," hit Check for updates, and allowed Windows to download and install available updates. At this point we had successfully installed Windows Server and built our IT lab. From here, we were ready to begin installing and configuring Server Roles such as Active Directory Domain Services, DNS, DHCP, WSUS, and others.

