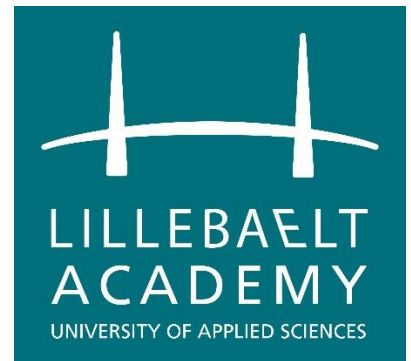


IT Technology

VMware vSphere 6



LILLEBAELT ACADEMY
UNIVERSITY OF APPLIED SCIENCE

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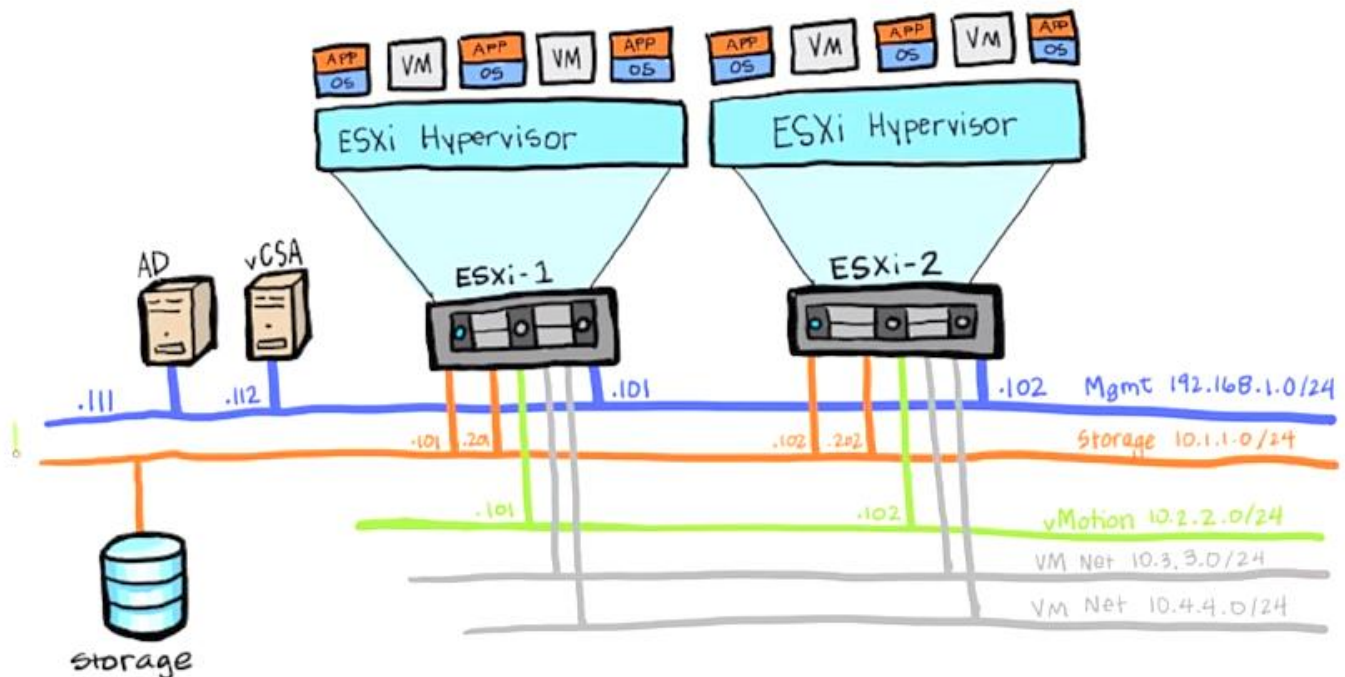
2 Introduction

This document shows how you can setup a vSphere environment in VMware 12.

2.1 Requirements:

- VCSA (v.6.5)
- Two ESXi (v.6.0)
- Windows Server 2012 (used as DNS Server)
- 16GB of RAM
- 100GB of hard drive
- VMware 12

2.2 Networking Topology for this project



3 Setting up VMware before deployment

Virtual Network Editor

Name	Type	External Connection	Host Connection	DHCP	Subnet Address
VMnet0	NAT	NAT	Connected	-	192.168.1.0
VMnet1	Host-only	-	Connected	-	10.1.1.0
VMnet2	Host-only	-	Connected	-	10.2.2.0
VMnet3	Host-only	-	Connected	-	10.3.3.0
VMnet4	Host-only	-	Connected	-	10.4.4.0

Add Network... Remove Network

VMnet Information

☐ Bridged (connect VMs directly to the external network)

Bridged to: Automatic Settings...

☒ NAT (shared host's IP address with VMs) NAT Settings...

☐ Host-only (connect VMs internally in a private network)

☒ Connect a host virtual adapter to this network

Host virtual adapter name: VMware Network Adapter VMnet0

☐ Use local DHCP service to distribute IP address to VMs DHCP Settings...

Subnet IP: Subnet mask:

Restore Defaults OK Cancel Apply Help

Click “NAT Settings...”

NAT Settings

Network: vmnet0

Subnet IP: 192.168.1.0

Subnet mask: 255.255.255.0

Gateway IP:

Port Forwarding

Host Port	Type	Virtual Machine IP Address	Description
-----------	------	----------------------------	-------------

Add... Remove Properties

Advanced

☒ Allow active FTP

☒ Allow any Organizationally Unique Identifier

UDP timeout (in seconds):

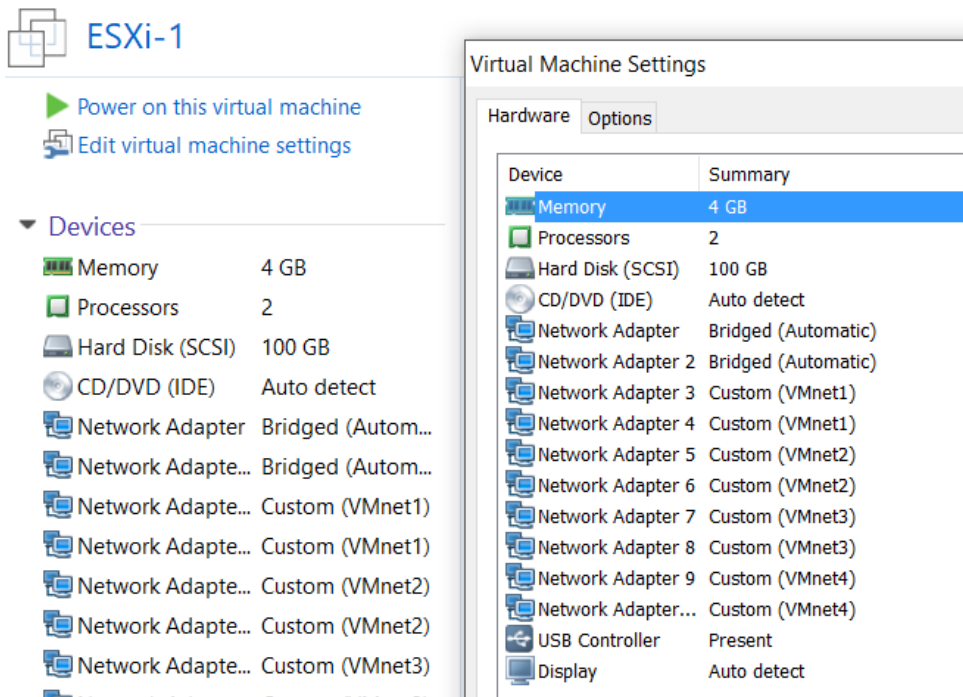
Config port:

☐ Enable IPv6

IPv6 prefix:

DNS Settings... NetBIOS Settings...

OK Cancel Help



Make a clone of ESXi-1 and call it ESXi-2

Power up both ESXi's and setup static IPs.

ESXi-1:

IPv4 Configuration

This host can obtain network settings automatically if your network includes a DHCP server. If it does not, the following settings must be specified:

☐ Disable IPv4 configuration for management network

☐ Use dynamic IPv4 address and network configuration

☒ Set static IPv4 address and network configuration:

IPv4 Address

Subnet Mask

Default Gateway

[192.168.1.101]

[255.255.255.0]

[192.168.1.2]

<Up/Down> Select

<Space> Mark Selected

<Enter> OK

<Esc> Cancel

DNS Configuration

This host can only obtain DNS settings automatically if it also obtains its IP configuration automatically.

☐ Obtain DNS server addresses and a hostname automatically

☒ Use the following DNS server addresses and hostname:

Primary DNS Server

Alternate DNS Server

Hostname

[192.168.1.111]

[8.8.8.8]

[ESXi-1]

<Up/Down> Select

<Space> Mark Selected

<Enter> OK

<Esc> Cancel

ESXi-2:

IPv4 Configuration

This host can obtain network settings automatically if your network includes a DHCP server. If it does not, the following settings must be specified:

☐ Disable IPv4 configuration for management network

☐ Use dynamic IPv4 address and network configuration

☒ Set static IPv4 address and network configuration:

IPv4 Address

[192.168.1.102]

Subnet Mask

[255.255.255.0]

Default Gateway

[192.168.1.2]

<Up/Down> Select

<Space> Mark Selected

<Enter> OK

<Esc> Cancel

DNS Configuration

This host can only obtain DNS settings automatically if it also obtains its IP configuration automatically.

☐ Obtain DNS server addresses and a hostname automatically

☒ Use the following DNS server addresses and hostname:

Primary DNS Server

[192.168.1.111]

Alternate DNS Server

[8.8.8.8]

Hostname

[ESXi-2]

<Up/Down> Select

<Space> Mark Selected

<Enter> OK

<Esc> Cancel

Disable IPv6 for both and save your changes.

4 Setting up DNS Server (Windows Server 2012)

4.1 HOST Network configuration

Before setting up the DNS Server, it is important that you assign a DNS Server to your host network. Find the network that you are running on and enter the following:

Right click your network:

Control Panel > All Control Panel Items > Network and Sharing Center

View your basic network information and set up connections

View your active networks

ngs

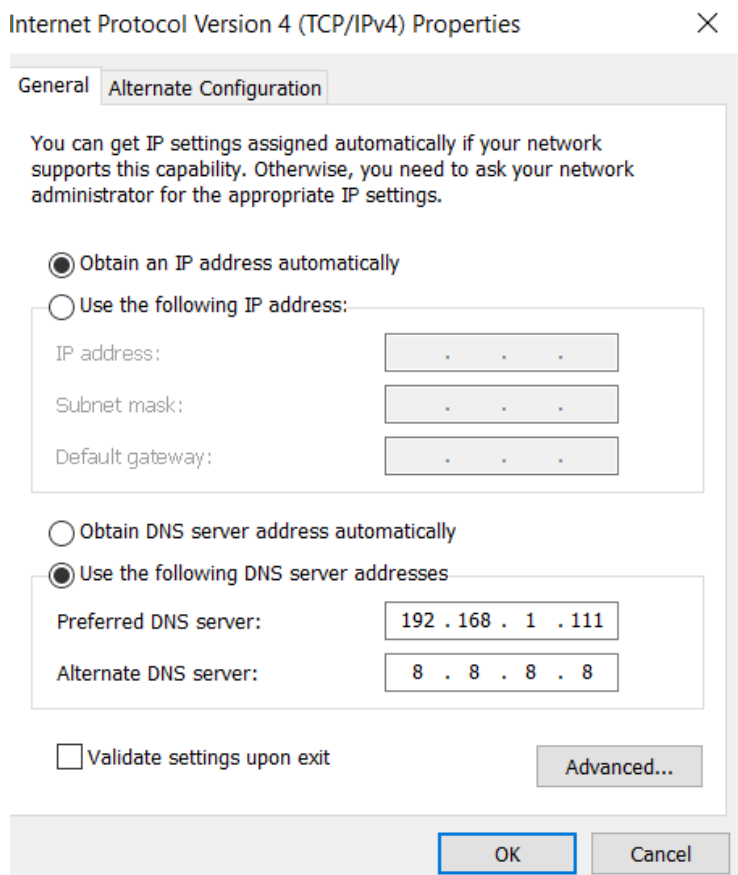
aring

Private network

Access type: Internet

HomeGroup: Ready to create

Connections: Ethernet 2

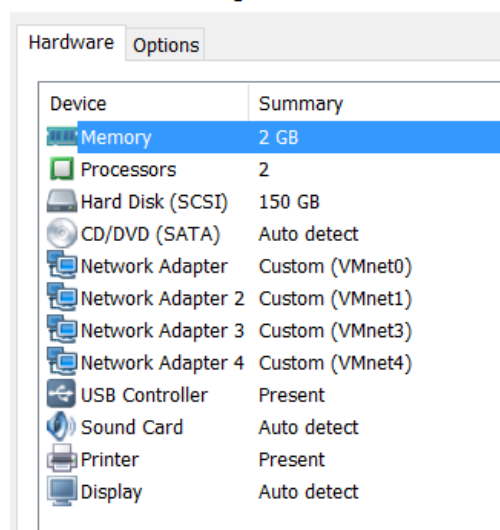


The 192.168.1.111 is the address that we are going to use for the DNS Server.

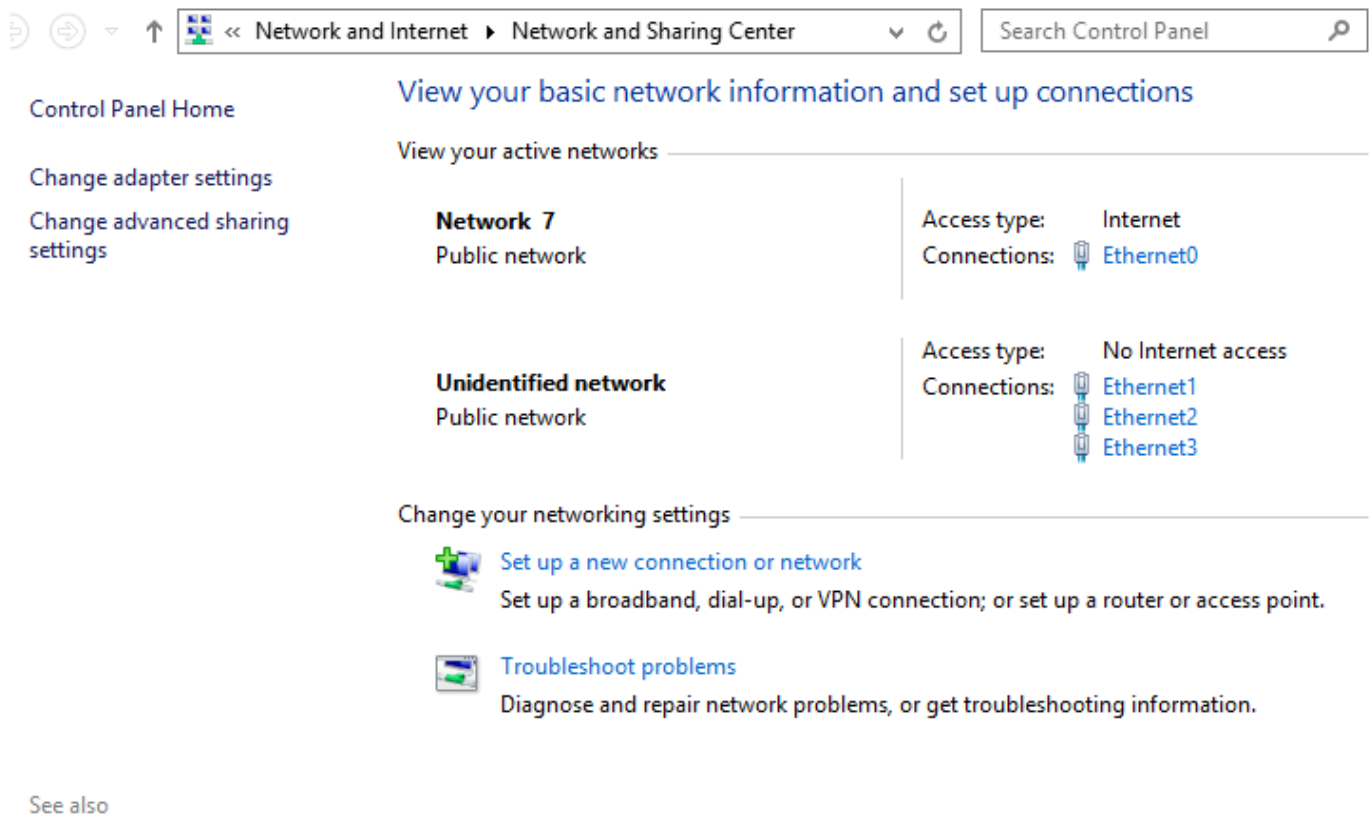
4.2 Network adapter configuration

Install your Windows Server 2012 with the following and run it

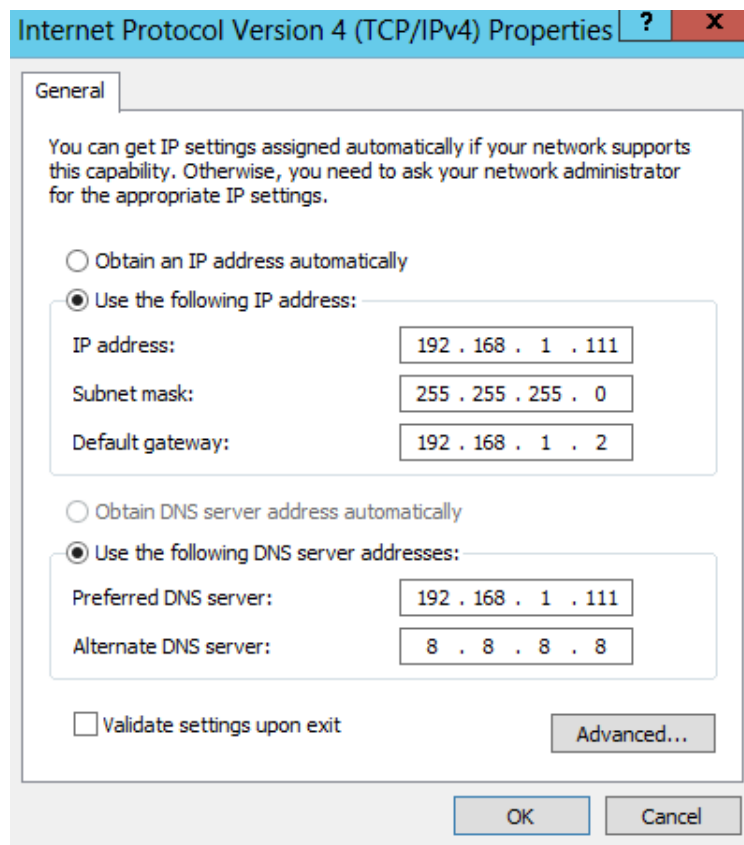
Virtual Machine Settings



Inside the server, go to adapter settings:



Click Ethernet0 > Properties > IPv4 > Properties, to configure static IP:



Ethernet1:

Internet Protocol Version 4 (TCP/IPv4) Properties ? x

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 10 . 1 . 1 . 111

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: 192 . 168 . 1 . 111

Alternate DNS server: 8 . 8 . 8 . 8

☐ Validate settings upon exit

Advanced...

OK Cancel

Ethernet2:

Internet Protocol Version 4 (TCP/IPv4) Properties ? x

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 10 . 3 . 3 . 111

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: 192 . 168 . 1 . 111

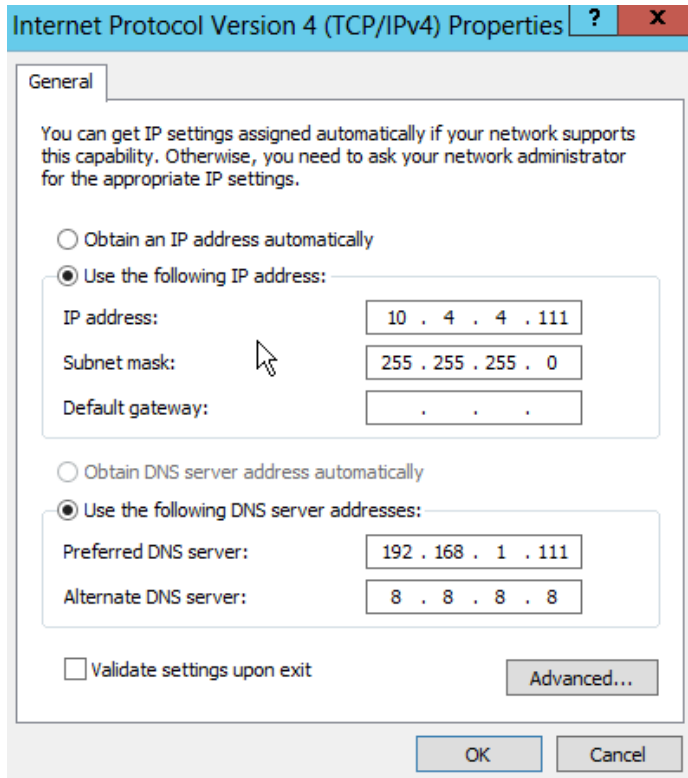
Alternate DNS server: 8 . 8 . 8 . 8

☐ Validate settings upon exit

Advanced...

OK Cancel

Ethernet3:



When you have saved your changes, disable IPv6 by unticking it in Properties. Do this for all the adapters.

4.3 Configuring DNS Server (Forward & Reverse Lookup Zones)

Before setting up DNS Server. Make sure that you can ping ESXi-1 and ESXi-2.

Ping google:

```
PS C:\Users\Administrator> ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=154ms TTL=128
Reply from 8.8.8.8: bytes=32 time=130ms TTL=128
Reply from 8.8.8.8: bytes=32 time=43ms TTL=128
```

Ping ESXi-1 and ESXi-2:

```
PS C:\Users\Administrator> ping 192.168.1.101

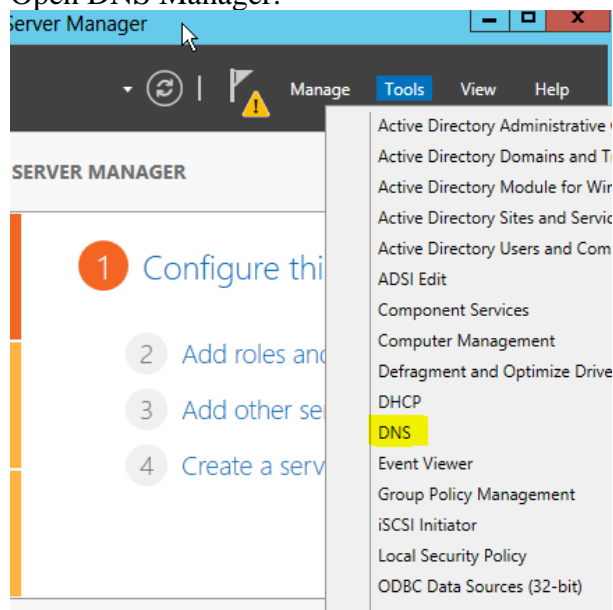
Pinging 192.168.1.101 with 32 bytes of data:
Reply from 192.168.1.101: bytes=32 time<1ms TTL=64
Reply from 192.168.1.101: bytes=32 time<1ms TTL=64
```

```
PS C:\Users\Administrator> ping 192.168.1.102

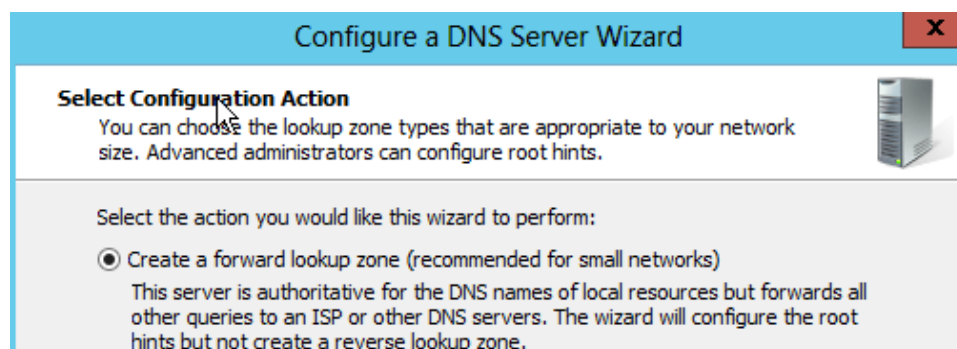
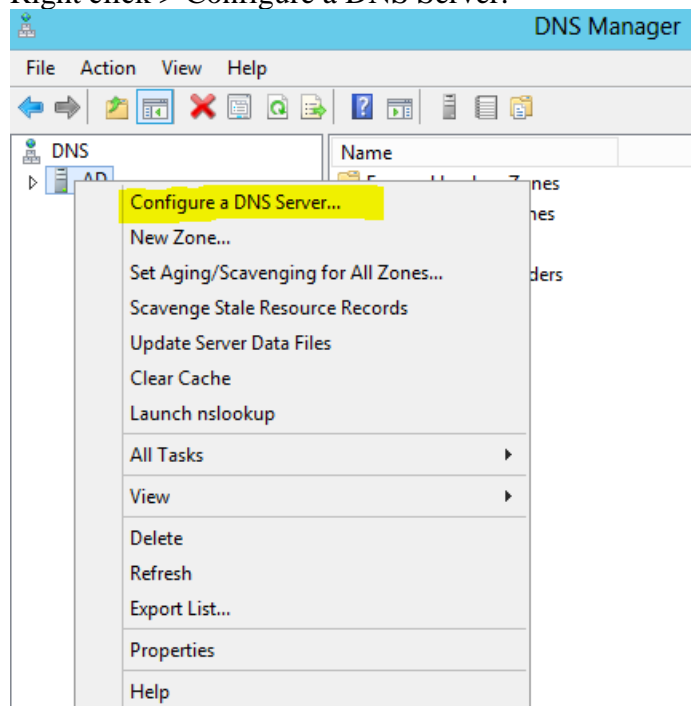
Pinging 192.168.1.102 with 32 bytes of data:
Reply from 192.168.1.102: bytes=32 time<1ms TTL=64
Reply from 192.168.1.102: bytes=32 time<1ms TTL=64
```

Assuming you already have DNS, roles and feature installed into the Server Manager on your Windows Server 2012. Open DNS Manager.

Open DNS Manager:



Right click > Configure a DNS Server:



Which DNS server maintains your primary forward lookup zone?

- ☒ This server maintains the zone
The wizard will help you create a primary forward lookup zone.
- ☐ An ISP maintains the zone, and a read-only secondary copy resides on this server
The wizard will help you create a secondary forward lookup zone.

New Zone Wizard

Zone Name

What is the name of the new zone?



The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:

nuglab.local

Do you want to create a new zone file or use an existing file that you have copied from another DNS server?


- ☒ Create a new file with this file name:

nuglab.local.dns

- ☐ Use this existing file:

To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.

Select the type of dynamic updates you want to allow:

- ☐ Allow only secure dynamic updates (recommended for Active Directory)
This option is available only for Active Directory-integrated zones.
- ☐ Allow both nonsecure and secure dynamic updates
Dynamic updates of resource records are accepted from any client.
 This option is a significant security vulnerability because updates can be accepted from untrusted sources.
- ☒ Do not allow dynamic updates
Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

Should this DNS server forward queries?

☒ Yes, it should forward queries to DNS servers with the following IP addresses:

IP Address	Server FQDN	Validated
<Click here to add an IP Address or DNS Name>		
8.8.8.8	google-public-dns...	OK

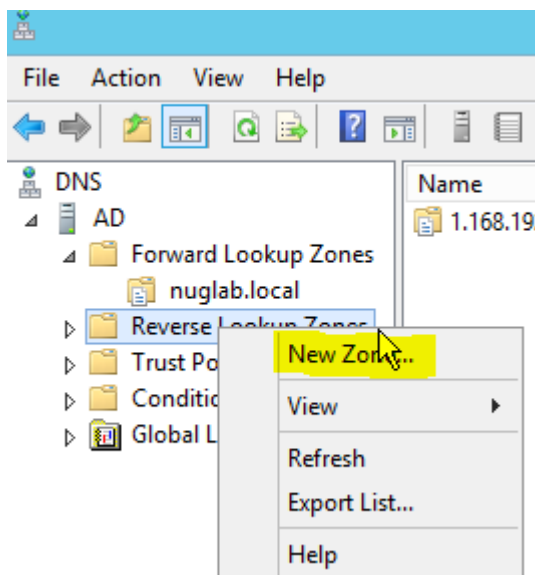
☐ No, it should not forward queries

If this server is not configured to use forwarders, it can still resolve names using root name servers.

Click Next and Finish.
You should now have a Forward Lookup Zone.

Next is to add a Reverse Lookup Zone.

Right click Reverse Lookup Zones:



Zone Type

The DNS server supports various types of zones and storage.

Select the type of zone you want to create:

☒ Primary zone

Creates a copy of a zone that can be updated directly on this server.

Reverse Lookup Zone Name

A reverse lookup zone translates IP addresses into I

Choose whether you want to create a reverse lookup zone for IPv4 or IPv6 addresses.

- ☒ IPv4 Reverse Lookup Zone
- ☐ IPv6 Reverse Lookup Zone

To identify the reverse lookup zone, type the network ID or the name of the zone.

- ☒ Network ID:

The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

- ☐ Reverse lookup zone name:

Do you want to create a new zone file or use an existing file that you have copied from another DNS server?

- ☒ Create a new file with this file name:

- ☐ Use this existing file:

To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.

Don't make any changes. Just click Next.

Dynamic updates enable DNS client computers to register and dynamically update resource records with a DNS server whenever changes occur.

Select the type of dynamic updates you want to allow:

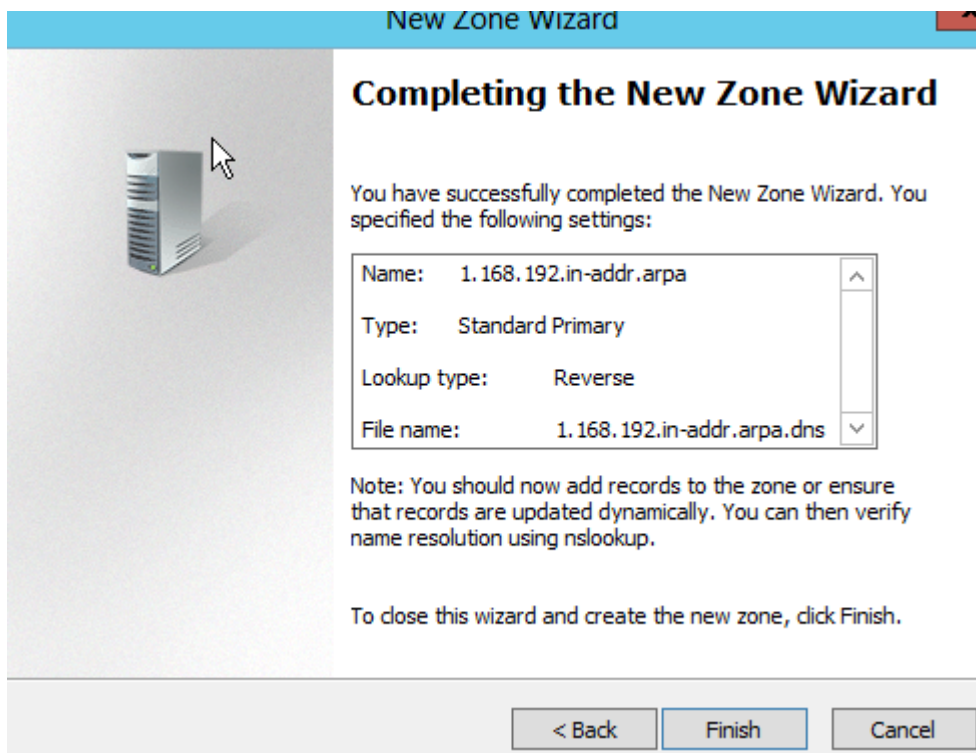
- ☐ Allow only secure dynamic updates (recommended for Active Directory)
- This option is available only for Active Directory-integrated zones.

- ☐ Allow both nonsecure and secure dynamic updates
- Dynamic updates of resource records are accepted from any client.



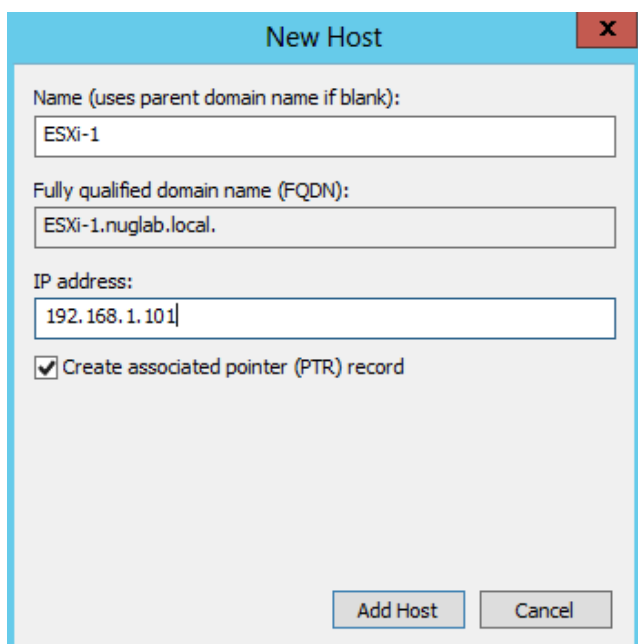
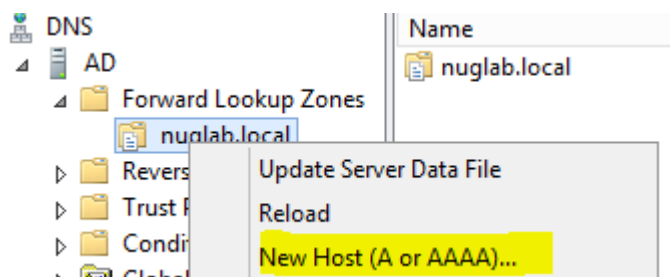
This option is a significant security vulnerability because updates can be accepted from untrusted sources.

- ☒ Do not allow dynamic updates
- Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

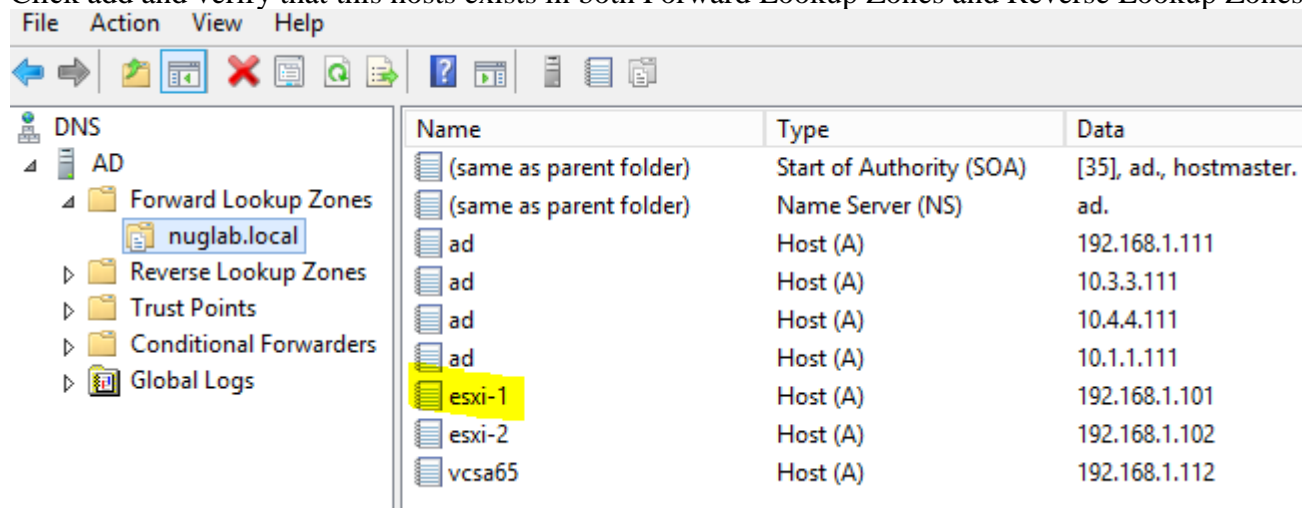


Click Finish.

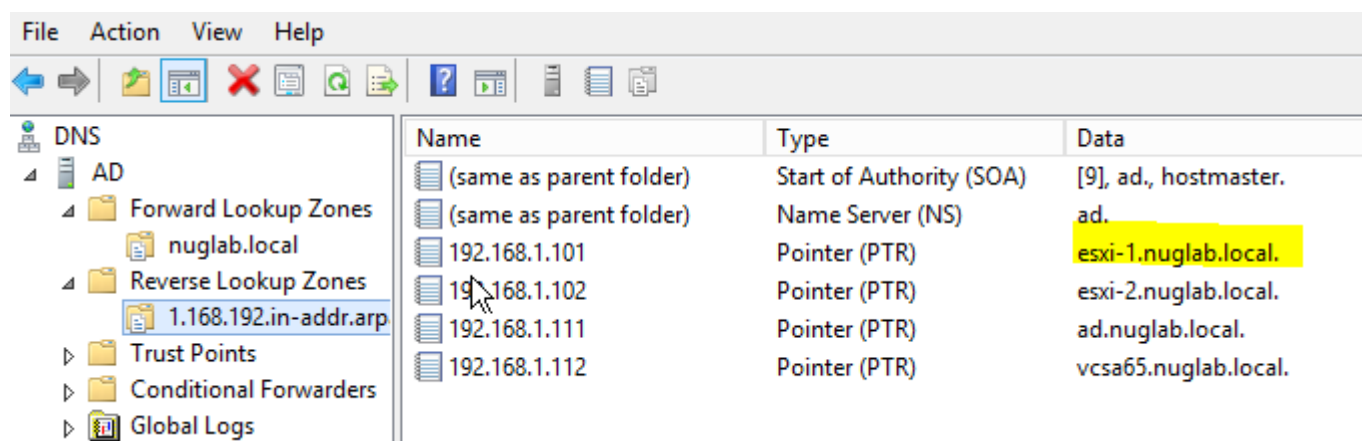
4.4 Adding hosts in Forward Lookup Zones & Reverse Lookup Zones



Click add and verify that this hosts exists in both Forward Lookup Zones and Reverse Lookup Zones.



Name	Type	Data
(same as parent folder)	Start of Authority (SOA)	[35], ad., hostmaster.
(same as parent folder)	Name Server (NS)	ad.
ad	Host (A)	192.168.1.111
ad	Host (A)	10.3.3.111
ad	Host (A)	10.4.4.111
ad	Host (A)	10.1.1.111
esxi-1	Host (A)	192.168.1.101
esxi-2	Host (A)	192.168.1.102
vcsa65	Host (A)	192.168.1.112



Name	Type	Data
(same as parent folder)	Start of Authority (SOA)	[9], ad., hostmaster.
(same as parent folder)	Name Server (NS)	ad.
192.168.1.101	Pointer (PTR)	esxi-1.nuglab.local.
192.168.1.102	Pointer (PTR)	esxi-2.nuglab.local.
192.168.1.111	Pointer (PTR)	ad.nuglab.local.
192.168.1.112	Pointer (PTR)	vcsa65.nuglab.local.

Verify that DNS is now up and running.

To verify simply open a terminal either on your Host laptop or your Windows Server:

Forward Lookup:

```
C:\Users\DSK9>nslookup 192.168.1.101
Server:  ad.nuglab.local
Address:  192.168.1.111

Name:     esxi-1.nuglab.local
Address:  192.168.1.101
```

```
C:\Users\DSK9>nslookup 192.168.1.102
Server:  ad.nuglab.local
Address:  192.168.1.111

Name:     esxi-2.nuglab.local
Address:  192.168.1.102
```


Reverse Lookup:

```
C:\Users\DSK9>nslookup esxi-1.nuglab.local
Server:  ad.nuglab.local
Address: 192.168.1.111

Name:    esxi-1.nuglab.local
Address: 192.168.1.101
```

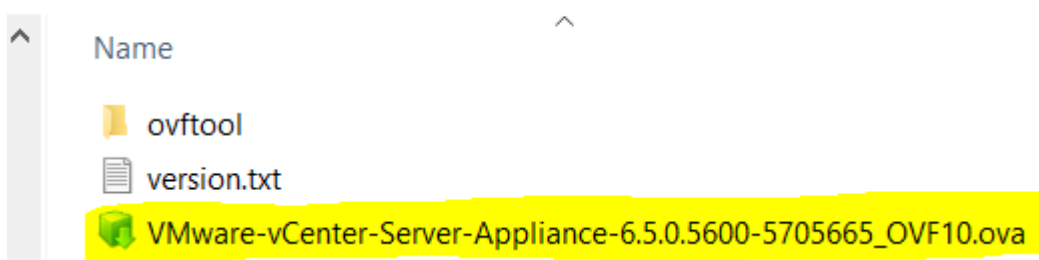
```
C:\Users\DSK9>nslookup esxi-2.nuglab.local
Server:  ad.nuglab.local
Address: 192.168.1.111

Name:    esxi-2.nuglab.local
Address: 192.168.1.102
```

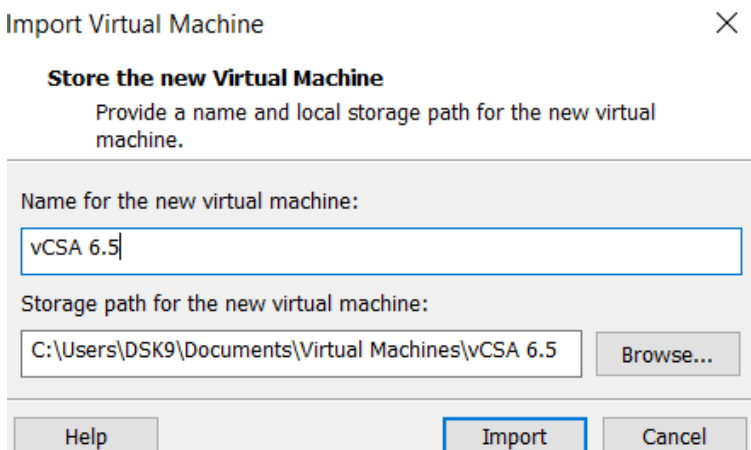
5 Installing & Configuring vCenter Server Appliance 6.5 in VMware 2012

Open the ISO file and go to the folder containing the OVA file:

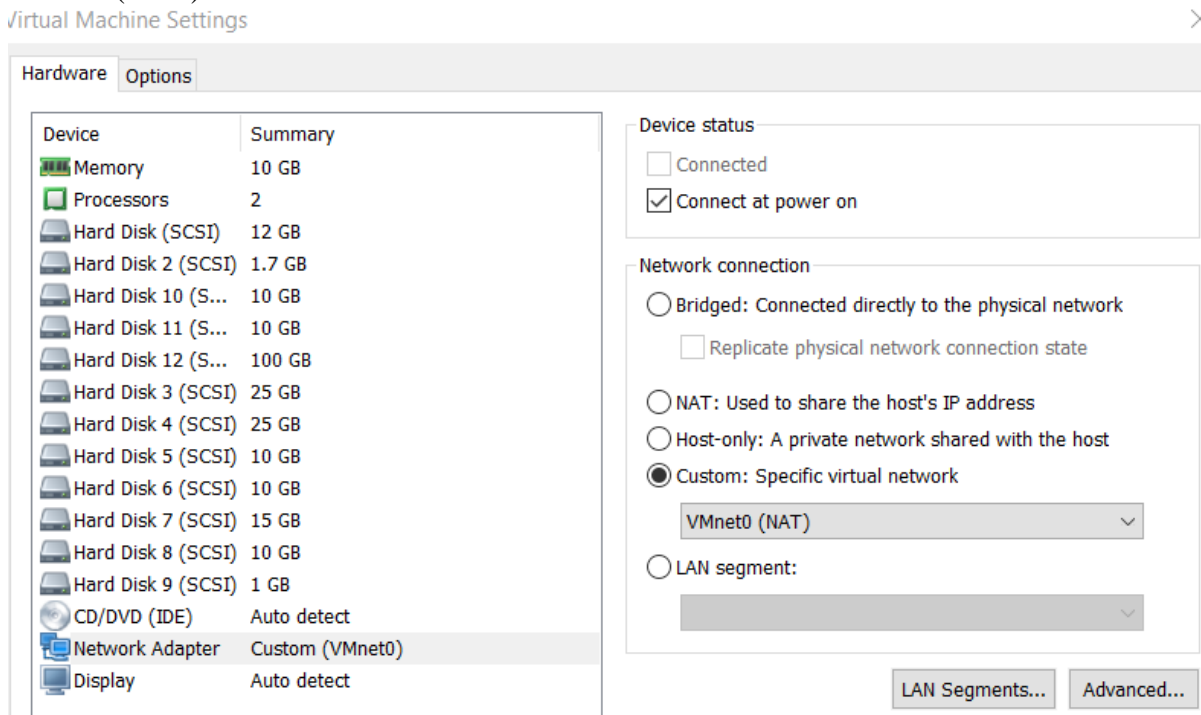
mypc > DVD Drive (D:) CDRROM > vcsa



Double click it and import it to your VMware.



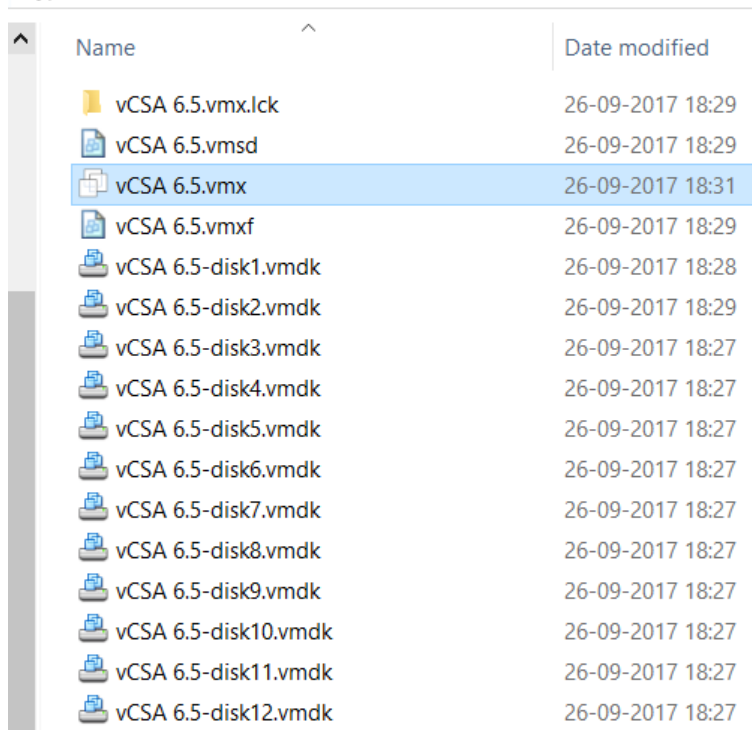
When the vCSA 6.5 is imported. Right click it, go to Settings and change the network adapter to VMnet0(NAT):



Before running vCSA, we need to edit a file to get this machine up and running with the correct static IP addresses.

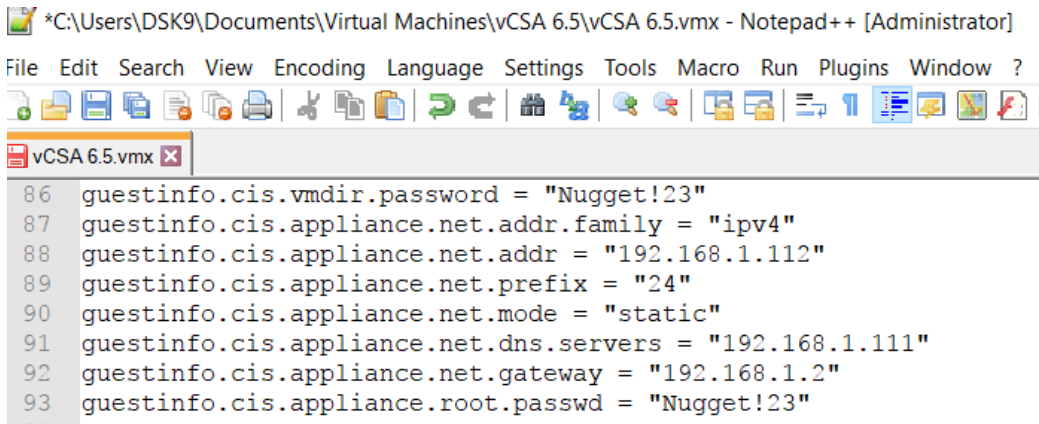
Open the folder containing all your virtual machines:

mypc > Documents > Virtual Machines > vCSA 6.5



Select "vCSA 6.5.vmx" and edit it with Notepad and add the following lines at the bottom of the file:

```
guestinfo.cis.vmdir.password = "Nugget!23"  
guestinfo.cis.appliance.net.addr.family = "ipv4"  
guestinfo.cis.appliance.net.addr = "192.168.1.112"  
guestinfo.cis.appliance.net.prefix = "24"  
guestinfo.cis.appliance.net.mode = "static"  
guestinfo.cis.appliance.net.dns.servers = "192.168.1.111"  
guestinfo.cis.appliance.net.gateway = "192.168.1.2"  
guestinfo.cis.appliance.root.passwd = "Nugget!23"
```



Save the file and close it. Go back to VMware and run the machine.

Its important to know that running multiple virtual machines take up much of your memory your computer. Always be aware of the machines running and the memory assigned to them...

When vCSA is running, it might ask for a root login.

```
Welcome to Photon 1.0 (x86_64) - Kernel 4.4.8 (tty1)  
photon-machine login: root  
Password:
```

Just leave it and it will go away after a couple of minutes. If not, the username is root and the password is password

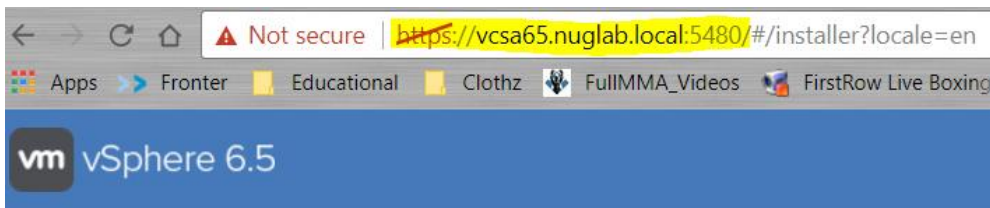
IF you cannot login from the terminal, you can easily change the password by clicking the following link:
[Reset password for root login](#)

After the installation is complete, wait approximately 15 minutes for the machine to run the background scripts and load up the correct static IP addresses:


```
VMware vCenter Server Appliance 6.5.0.5600
Type:
2 x Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz
1.9 GiB Memory
```

```
Please visit the following URL to configure this appliance:
https://vcsa65.nuglab.local:5480
https://192.168.1.112/ (STATIC)
```


Enter the URL in your web browser:





Getting Started - vCenter Server Appliance with an Embedded Platform Controller (PSC)

 vCenter Server 6.5 has been successfully installed. However, additional steps must be completed for use. Click one of the links below to continue setup.

 **Set up vCenter Server Appliance**
Configure this Appliance as a new vCenter Server.

 **Upgrade a vCenter Server Appliance**
Transfer the configuration, historical, and identity data from a vCenter Server Appliance.

 **Migrate from a vCenter Server Instance on Windows**
Transfer the configuration, historical, and identity data from a vCenter Server instance on Windows.

 **Restore from backup**
Transfer the configuration, historical, and identity data from a vCenter Server Appliance backup.

Login to vCSA:

Log in to vCenter Server Appliance

User name: root

Password:

Log in

Cancel

Password is: **Nugget!23**

Introduction

vCenter Server Appliance installation overview

Stage 1



Deploy new vCenter Server Appliance

Stage 2



Set up vCenter Server Appliance

Click Next

Appliance configuration

Network configuration	<input type="text" value="Assign static IP address"/>
IP version	<input type="text" value="IPv4"/>
System name	<input type="text" value="vcsa65.nuglab.local"/> ⓘ
IP address	<input type="text" value="192.168.1.112"/>
Subnet mask or prefix length	<input type="text" value="255.255.255.0"/>
Default gateway	<input type="text" value="192.168.1.2"/>
DNS servers	<input type="text" value="192.168.1.111"/> <input type="text" value="8.8.8.8"/>
Time synchronization mode	<input type="text" value="Synchronize time with the ESXi host"/>
SSH access	<input type="text" value="Disabled"/>

ⓘ For vCenter Server High Availability (HA), enable SSH access.

Back

Next

Finish

Cancel

Make sure everything is correct and hit Next

SSO configuration

SSO domain name	<input type="text" value="vsphere.local"/> ⓘ
SSO user name	<input type="text" value="administrator"/>
SSO password	<input type="password" value="....."/> ⓘ
Confirm password	<input type="password" value="....."/>
Site name	<input type="text" value="Site-1"/> ⓘ

ⓘ In vCenter 6.5, joining a vCenter with embedded PSC to an external PSC is not supported. For more information on recommended vCenter and PSC topologies, refer to the vCenter Server documentation.

Password is: **Nugget!23**

Configure CEIP

Join the VMware Customer Experience Improvement Program

VMware's Customer Experience Improvement Program ("CEIP") provides VMware with information that enables VMware to improve its products and services, to fix problems, and to advise you on how best to deploy and use our products. As part of the CEIP, VMware collects technical information about your organization's use of VMware products and services on a regular basis in association with your organization's VMware license key(s). This information does not personally identify any individual.

Additional information regarding the data collected through CEIP and the purposes for which it is used by VMware is set forth in the Trust & Assurance Center at <http://www.vmware.com/trustvmware/ceip.html>.

If you prefer not to participate in VMware's CEIP for this product, you should uncheck the box below. You may join or leave VMware's CEIP for this product at any time.

☒ Join the VMware's Customer Experience Improvement Program (CEIP)

Back

Next

Finish

Cancel

Ready to complete

Review your settings before finishing the wizard.

Network configuration	Assign static IP address
IP version	IPv4
Host name	vcsa65.nuglab.local
IP Address	192.168.1.112
Subnet mask	255.255.255.0
Gateway	192.168.1.2
DNS servers	192.168.1.111 , 8.8.8.8
Appliance Details	
Time synchronization mode	Synchronize time with the ESXi host
SSH access	Disabled
SSO Details	
Domain name (new)	vsphere.local
Site name (new)	Site-1
User name	administrator
Customer Experience Improvement Program	
CEIP setting	Opted in

Back

Next

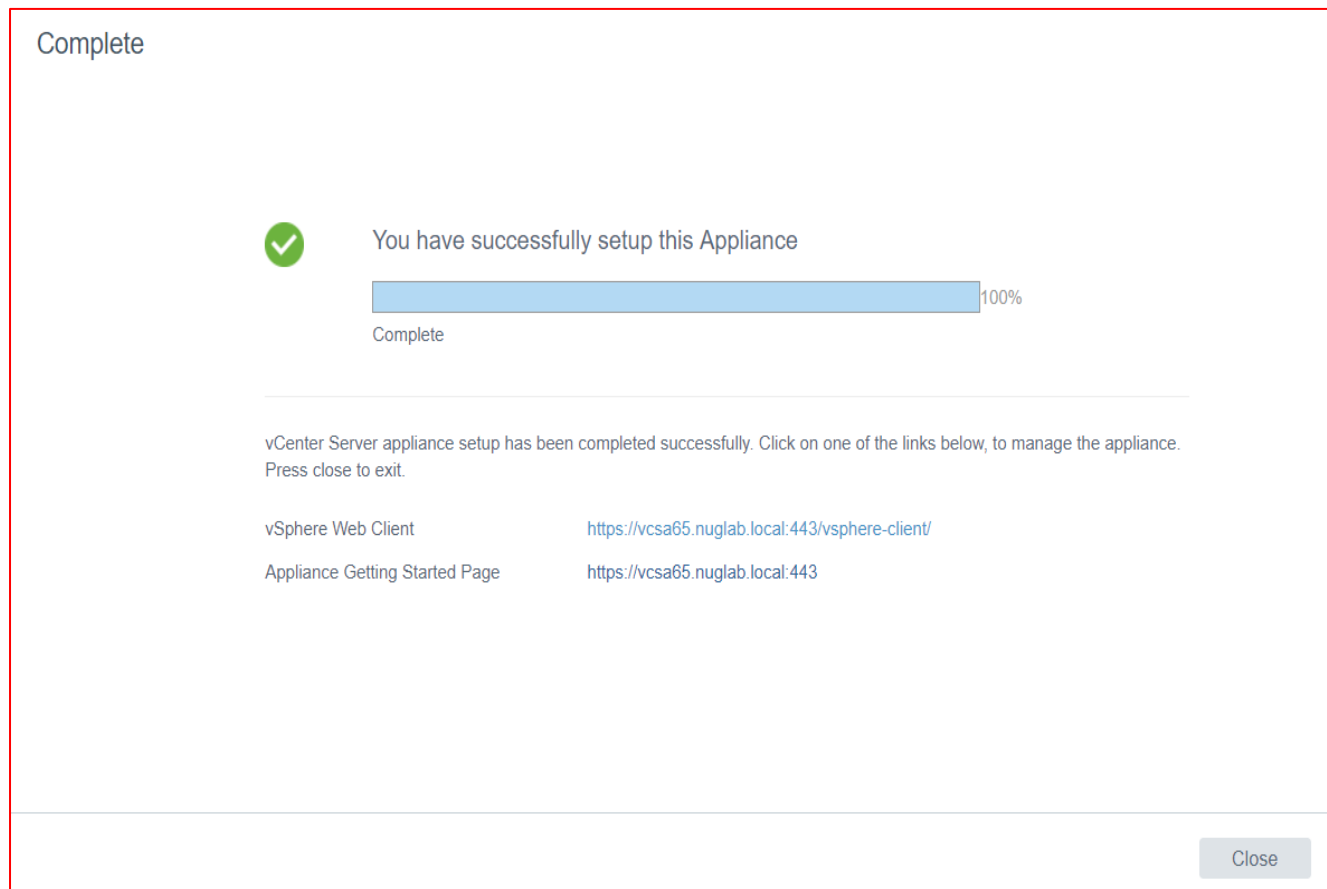
Finish

Cancel

Make sure everything is correct

The installation of vCSA will fail if your DNS Server is not up and running! Make sure your host can ping the DNS Server (Windows Server 2012), and make sure that DNS lookup zones are functioning correctly.

If for some other reasons the installation fails, change the Host name to the IP address of the machine (192.168.1.112)



6 vSphere Web Client

To login into the vCSA, use the vSphere Web Client URL.

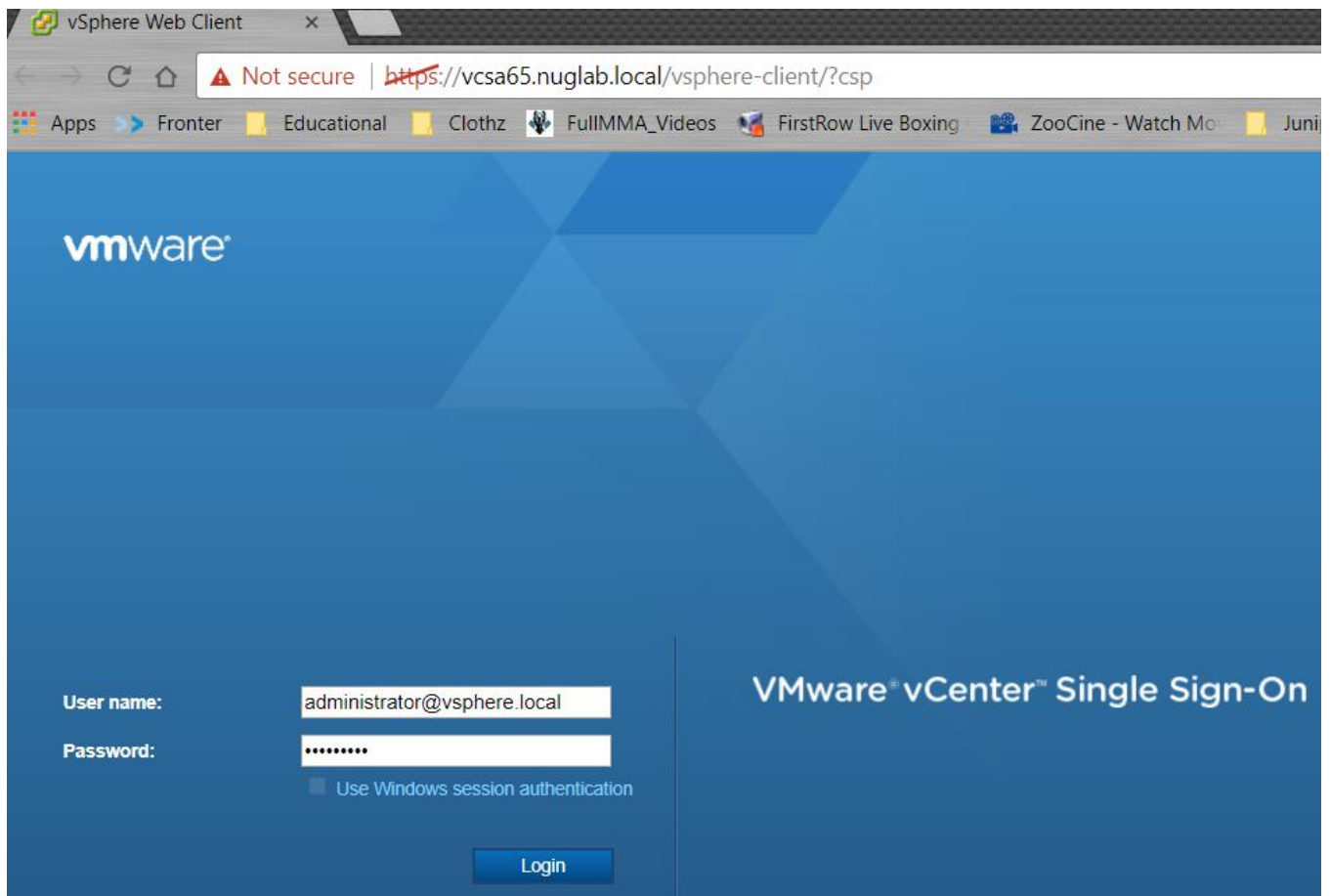
vCenter Server appliance setup has been completed successfully. Click on one of the links below, to manage the appliance. Press close to exit.

vSphere Web Client

<https://vcsa65.nuglab.local:443/vsphere-client/>

Appliance Getting Started Page

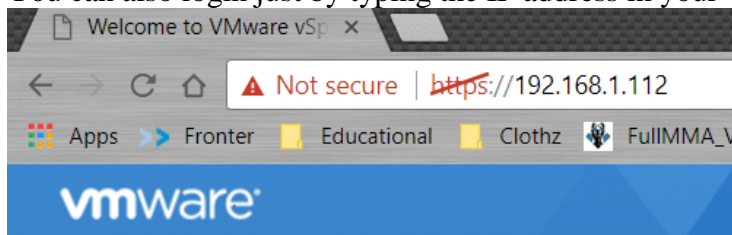
<https://vcsa65.nuglab.local:443>



Username: **administrator@vsphere.local**

Password: **Nugget!23**

You can also login just by typing the IP address in your webbrowser:



Getting Started

To access vSphere, log in to:

vSphere Web Client (Flash)

vSphere Client (HTML5) - partial functionality

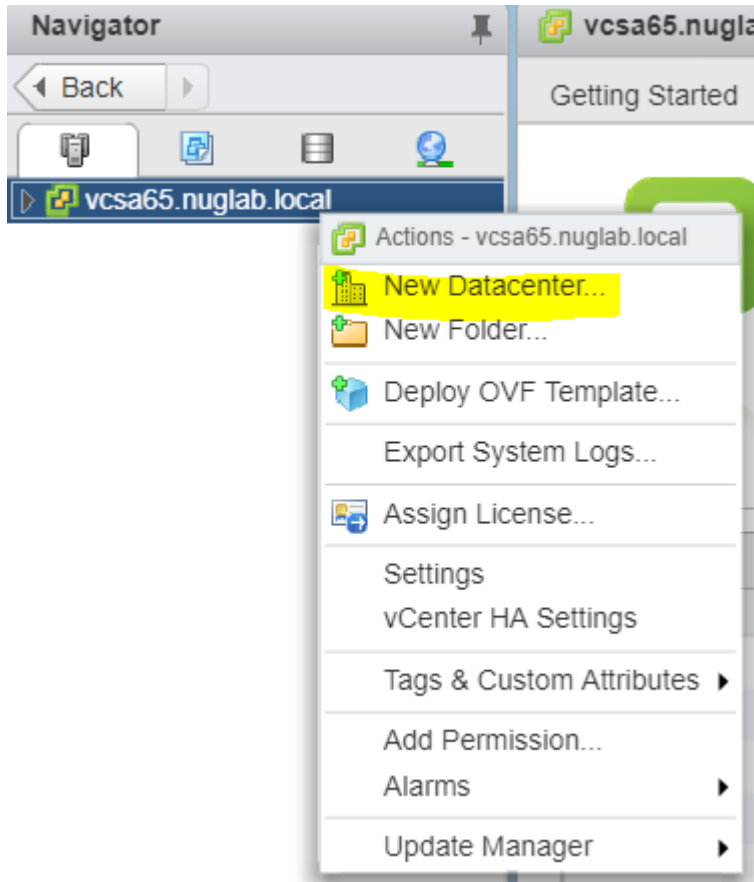
For help, see:

[vSphere Documentation](#)

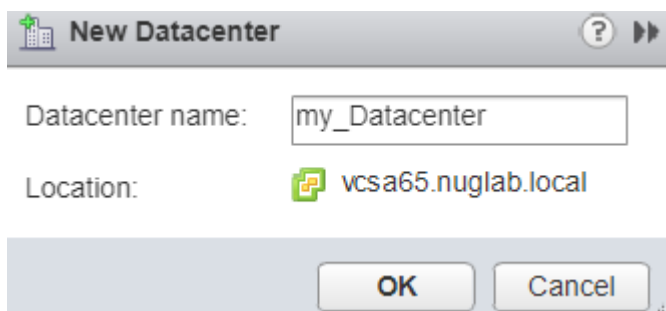
[Supported Functionality in vSphere Client \(HTML5\)](#)

7 Exporting ESXi-1 and ESXi-2 into vCSA

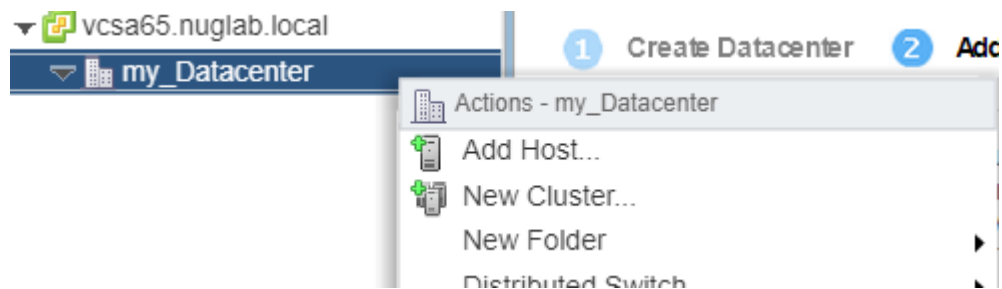
Create a datacenter:



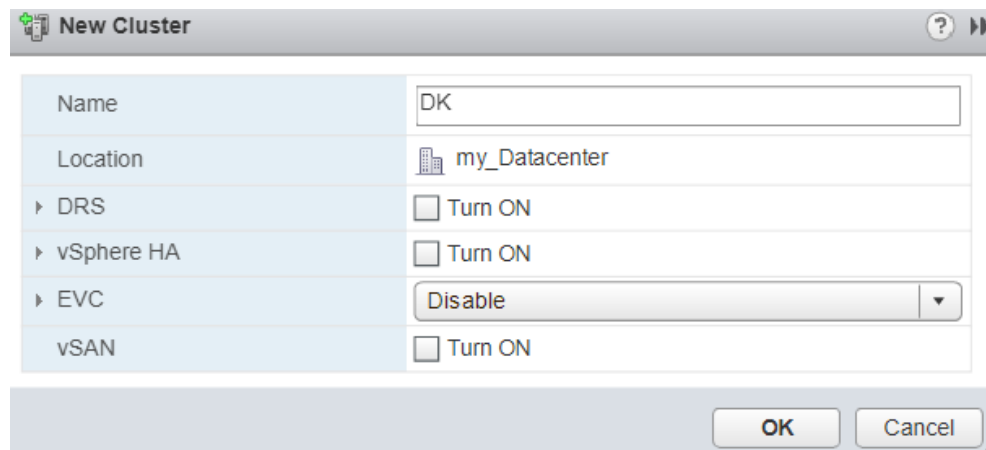
Call it something and hit OK.



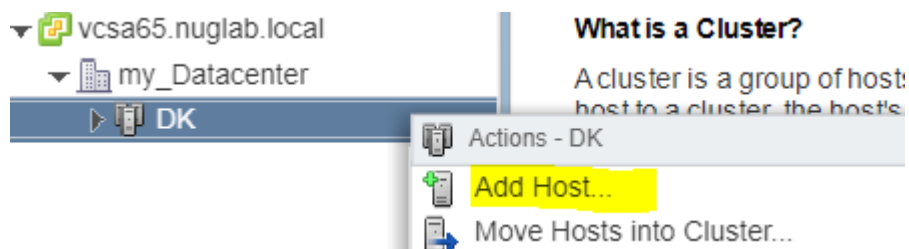
Create a new Cluster:



Call it something and hit OK.



Add a Host:



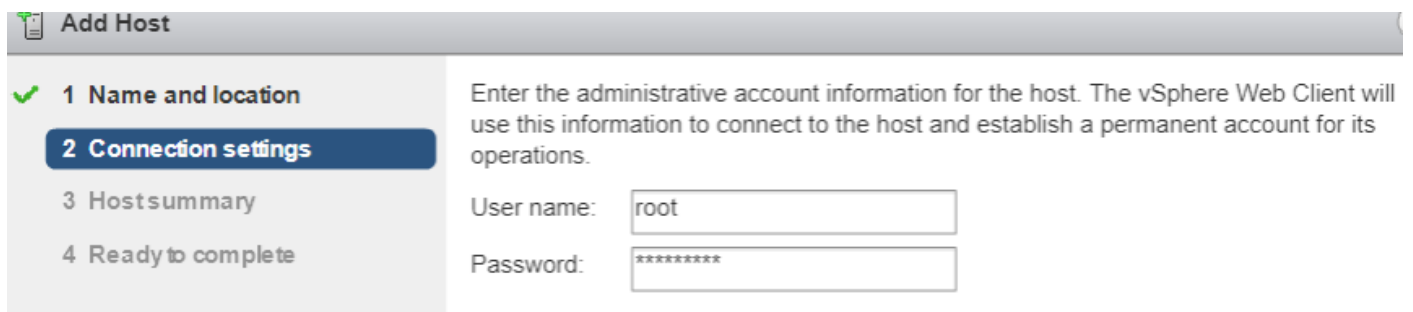
Enter the IP or Host name/DNS URL for ESXi-1

Make sure your ESXi's are running!



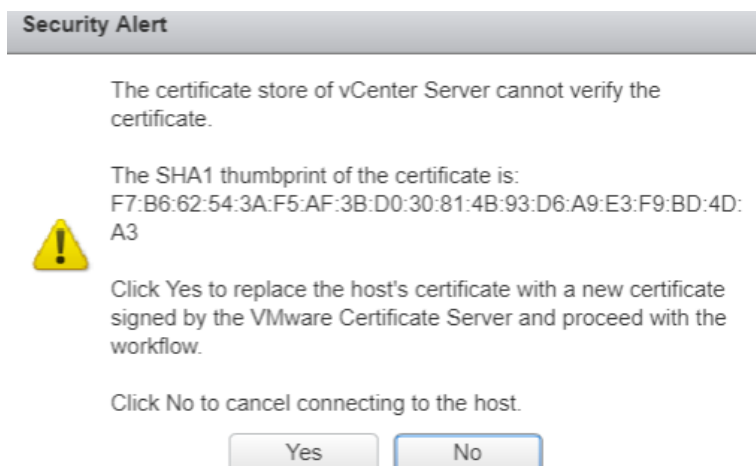
The screenshot shows the 'Add Host' wizard in the vSphere Web Client. The left sidebar contains four steps: 1 Name and location (selected with a green checkmark), 2 Connection settings, 3 Host summary, and 4 Ready to complete. The main area displays the following fields: 'Host name or IP address' with the value 'esxi-1.nuglab.local', 'Location' with a dropdown menu showing 'DK', and 'Type' with a dropdown menu showing 'ESXi' and an information icon.

click Next



The screenshot shows the 'Add Host' wizard in the vSphere Web Client, Step 2: Connection settings. The left sidebar shows the same four steps, with Step 2 now selected. The main area displays the following fields: 'User name' with the value 'root' and 'Password' with a masked value '*****'.

Enter your ESXi-1 login and click Next



The screenshot shows a 'Security Alert' dialog box. It contains a yellow warning icon and the following text: 'The certificate store of vCenter Server cannot verify the certificate.' followed by 'The SHA1 thumbprint of the certificate is: F7:B6:62:54:3A:F5:AF:3B:D0:30:81:4B:93:D6:A9:E3:F9:BD:4D:A3'. Below this, it says 'Click Yes to replace the host's certificate with a new certificate signed by the VMware Certificate Server and proceed with the workflow.' and 'Click No to cancel connecting to the host.' At the bottom are two buttons: 'Yes' and 'No'.

Assuming the SHA1 thumbprint is the same as your ESXi-1(see in ESXi-1 support information), click Yes.

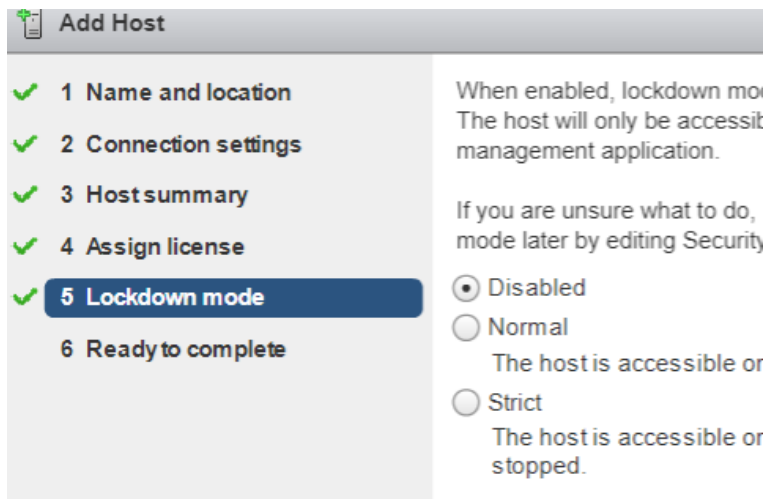
The system will now load up your ESXi-1. (Xu-02 to 0-5, are virtual machines installed on this specific ESXi, used for this document)

Name	esxi-1.nuglab.local
Vendor	VMware, Inc.
Model	VMware Virtual Platform
Version	VMware ESXi 6.0.0 build-3620759
Virtual Machines	Xu-02 Xu-03 Xu-04 Xu-05

Click Next

[illegible]

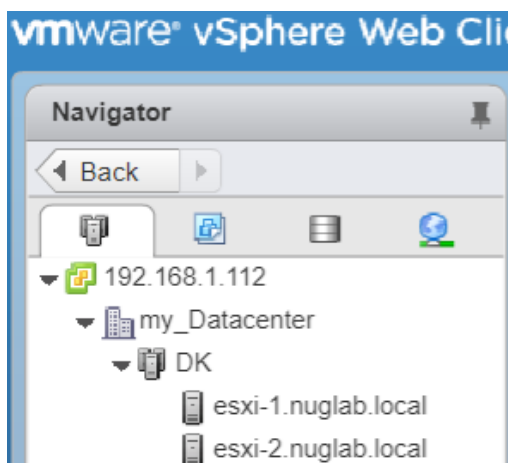
Click Next



Click Next and Finish.

Do the same with ESXi-2.

You should end up with this:



You can now create folders inside the host and inside the folders you can create the virtual machines.
Goodluck & Have fun

End of this document