2017

Create your VMware laboratory for vRealize Suite test

LUKASZ TWOREK

For my second half

without you

I would not find the power

to conquer the world

Table of contents

Introduction

This document could help you to build your own laboratory or provide you basic technical knowledge for some of VMware technology. How to simple install and configure few tool for learning and fun. At the end of this guide you will have prepared full laboratory based on VMware technology to provide cloud solutions and other tools from vRealize Suite and NSX.

NTP

Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks. In operation since before 1985, NTP is one of the oldest Internet protocols in current use. NTP was designed by David L. Mills of the University of Delaware.

NTP is intended to synchronize all participating computers to within a few milliseconds of Coordinated Universal Time (UTC). It uses the intersection algorithm, a modified version of Marzullo's algorithm, to select accurate time servers and is designed to mitigate the effects of variable network latency. NTP can usually maintain time to within tens of milliseconds over the public Internet, and can achieve better than one millisecond accuracy in local area networks under ideal conditions. Asymmetric routes and network congestion can cause errors of 100 ms or more.

The protocol is usually described in terms of a client-server model, but can as easily be used in peer-to-peer relationships where both peers consider the other to be a potential time source. Implementations send and receive timestamps using the User Datagram Protocol (UDP) on port number 123. They can also use broadcasting or multicasting, where clients passively listen to time updates after an initial round-trip calibrating exchange. NTP supplies a warning of any impending leap second adjustment, but no information about local time zones or daylight saving time is transmitted. (wikipedia)

In Our Lab we will be using NTP server on CentOS server

Prerequisites

Username: root
Password: P@ssw0rd

Build

Firstly we need to deploy Virtual Machine which will be used to provide Time Servers for all servers in our LAB environment.

Our VM has

OS	CentOs 6.7 minimal	
RAM	2GB	
CPU	1vCPU	
HDD	16GB thin	
Network	1 NIC	10.10.10.140

We need to install our Linux system in default configuration. Before we will continue we need to create clone of that VM for another solution. Before cloning we need install VMware Tools.

VMware Tools

Mount VMware tools in your CD-ROM
Login to your CentOS

Create two folder one in tmp and second in mnt directory

mkdir /tmp/tools

mkdir /mnt/cdrom

Mount your CD-ROM to mnt directory and copy tools to tmp.

mount /dev/cdrom /mnt/cdrom/

cp /mnt/cdrom/VMwareTools-10.0.6-3560309.tar.gz /tmp/tools/

unpack *tar xvf /tmp/tools/VMwareTools-10.0.6-3560309.tar.gz*

and install tools in default configuration

./vmware-install.pl --default

NTP Configuration

After VMware Tools installed and clone VM we will start to configure NTP

Install ntp via yum

yum install ntp

Configure file /etc/ntp.conf and add your Time Servers

```
# Hosts on local network are less restricted.
restrict 10.10.10.0 mask 255.255.255.0 nomodify notrap

# Use public servers from the pool.ntp.org project.
# Please consider joining the pool (http://www.pool.ntp.org/join.html).
server 0.pl.pool.ntp.org iburst
server 1.pl.pool.ntp.org iburst
server 2.pl.pool.ntp.org iburst
server 3.pl.pool.ntp.org iburst
```

Restart NTP and turn off iptables (never do this in prod environment)

After Configuration create a Snapshot to save clear VM that you can back after something will be broken.

Active Directory

Active Directory (**AD**) is a directory service that Microsoft developed for Windows domain networks. It is included in most Windows Server operating systems as a set of processes and services.Initially, Active Directory was only in charge of centralized domain management. Starting with Windows Server 2008, however, Active Directory became an umbrella title for a broad range of directory-based identity-related services.

A server running Active Directory Domain Services (AD DS) is called a domain controller. It authenticates and authorizes all users and computers in a Windows domain type network—assigning and enforcing security policies for all computers and installing or updating software. For example, when a user logs into a computer that is part of a Windows domain, Active Directory checks the submitted password and determines whether the user is a system administrator or normal user.Also, it allows management and storage of information, provides authentication and authorization mechanisms, and establishes a framework to deploy other related services: Certificate Services, Federated Services, Lightweight Directory Services and Rights Management Services (Wikipedia)

Prerequisites

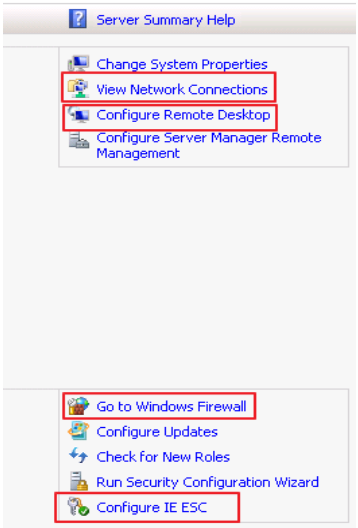
Username: Administrator@vcap.domain.local
Password: P@ssw0rd

Build

Our VM has

OS	Windows Server 2008R2	
RAM	4GB	
CPU	1vCPU	
HDD	40GB thin	
Network	1 NIC	10.10.10.141

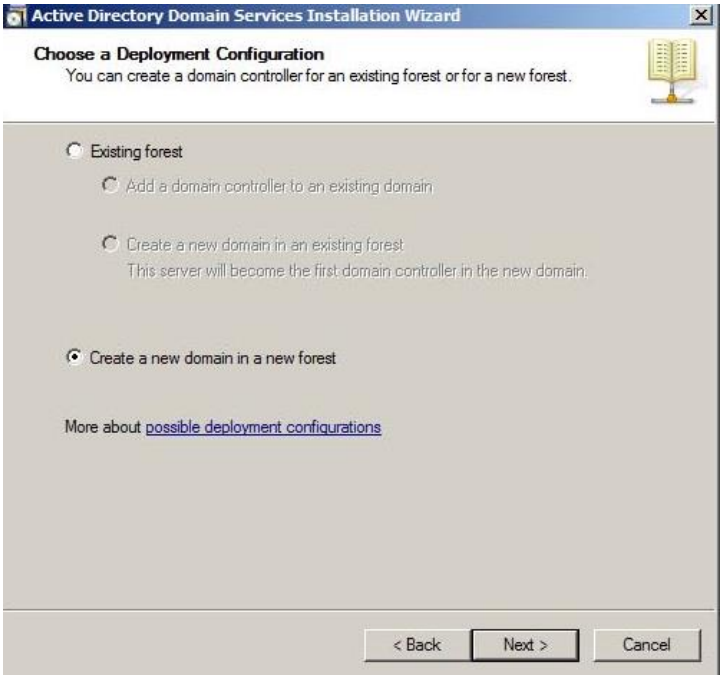
On this VM we need to install Windows Server 2008R2. After installation, we need to turn off firewall (only in lab). Set static IP and turn off IE ESC. Allow access via Remote Desktop and clone this VM for template



Install Active Directory

Click on menu start and run *dcpromo* tool for creating forest and domain. Run it in advanced mode.

On the next information screen press NEXT and after that you will have page with creating new domain in new forest.



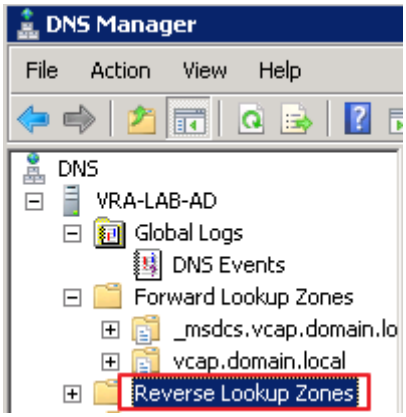
Specify the FQDN for domain. In our LAB we will use ***vcap.domain.local***

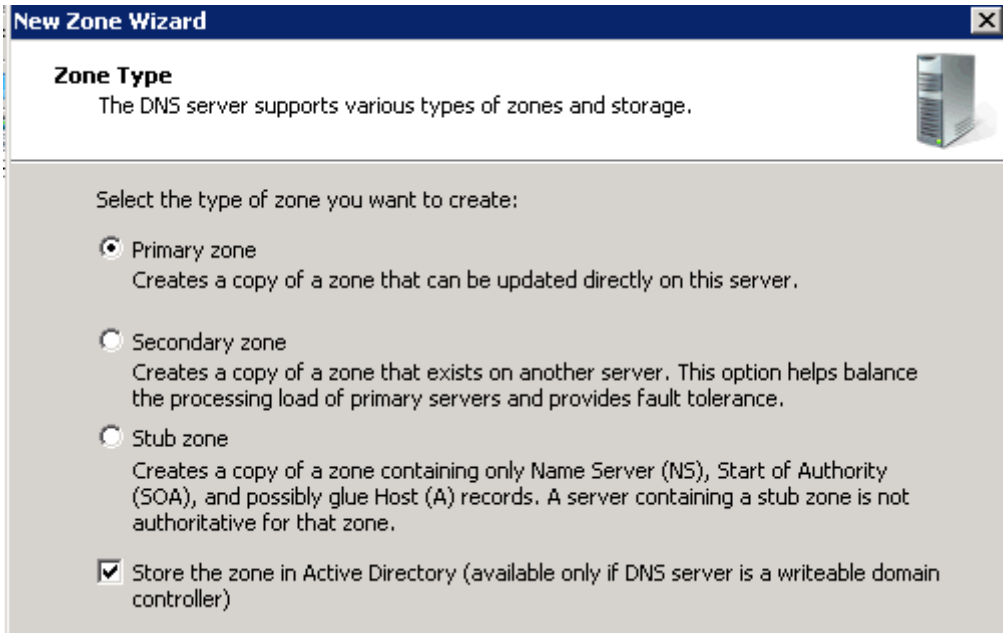
On the rest screen leave default values. Only on page with password setting you need to set your own password. In this LAB we will using ***P@ssw0rd.***

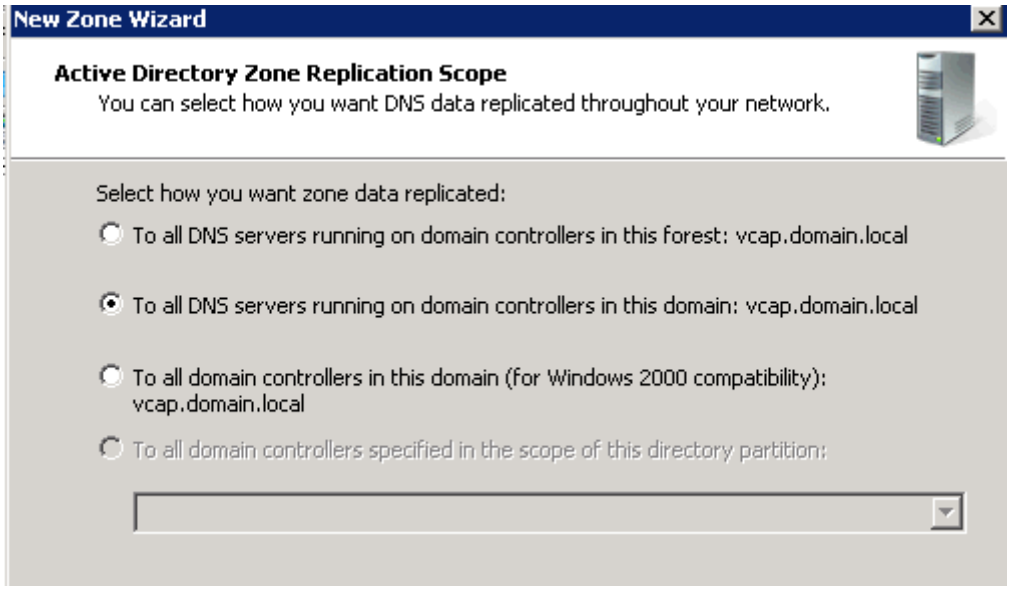
Reboot your VM and now you can log-in via your Domain Admin.

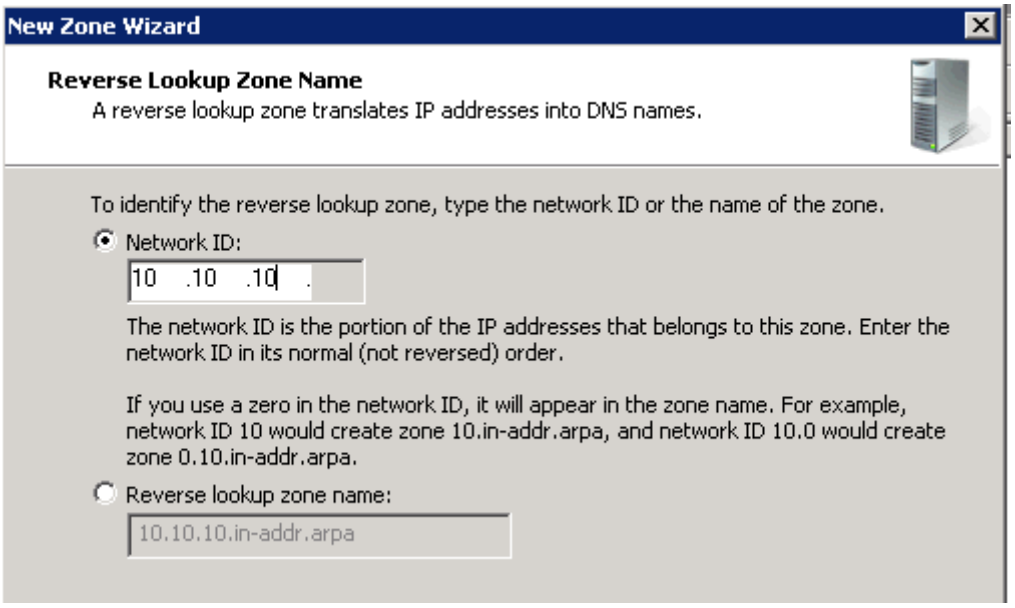
Configure DNS

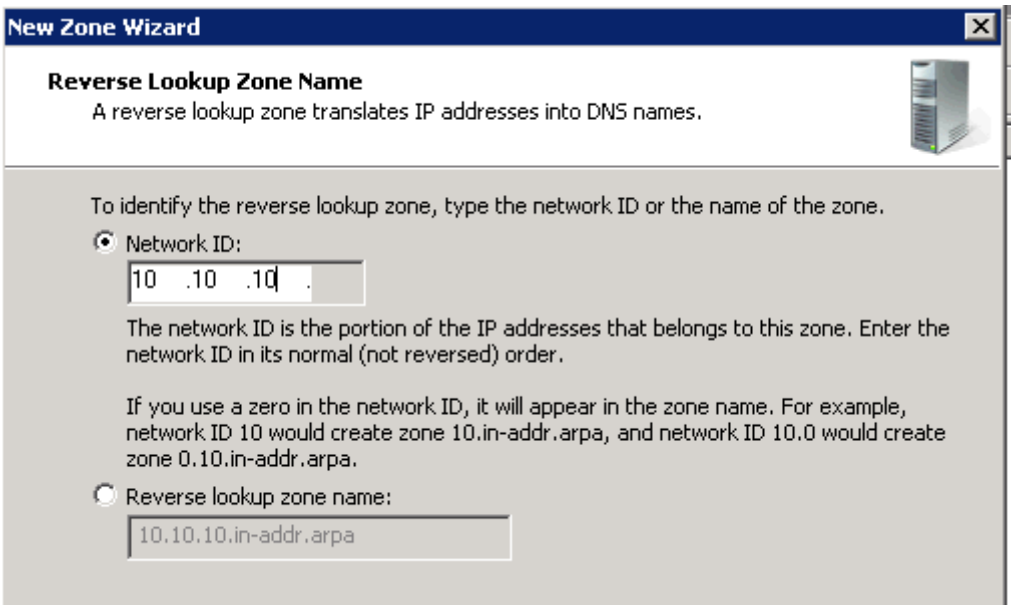
On Active directory Server create reverse lookup zone for your domain which is needed for the rest configuration.






New Zone Wizard
Active Directory Zone Replication Scope
You can select how you want DNS data replicated throughout your network.
Select how you want zone data replicated:
To all DNS servers running on domain controllers in this forest: vcap.domain.local
To all DNS servers running on domain controllers in this domain: vcap.domain.local
To all domain controllers in this domain (for Windows 2000 compatibility): vcap.domain.local
To all domain controllers specified in the scope of this directory partition:


New Zone Wizard
Reverse Lookup Zone Name
A reverse lookup zone translates IP addresses into DNS names.
To identify the reverse lookup zone, type the network ID or the name of the zone.
Network ID:
10 .10 .10 .
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:
10.10.10.in-addr.arpa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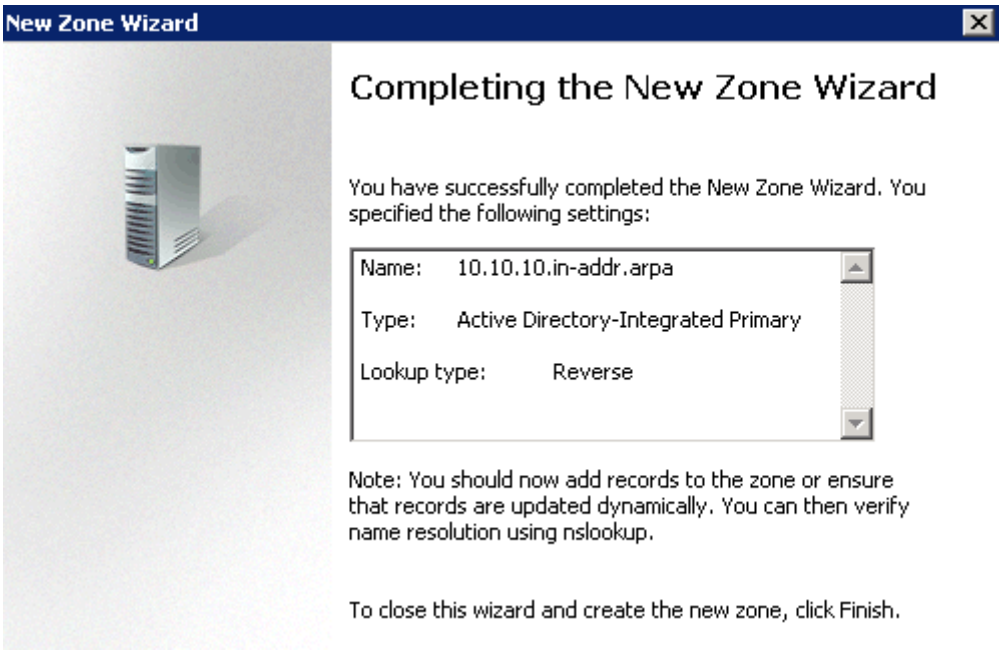


After domain configuration you can create another VM with windows server for SQL.

Microsoft SQL

Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications—which may run either on the same computer or on another computer across a network (including the Internet). (wikipedia)

Prerequisites

Username: Administrator@vcap.domain.local
Password: P@ssw0rd

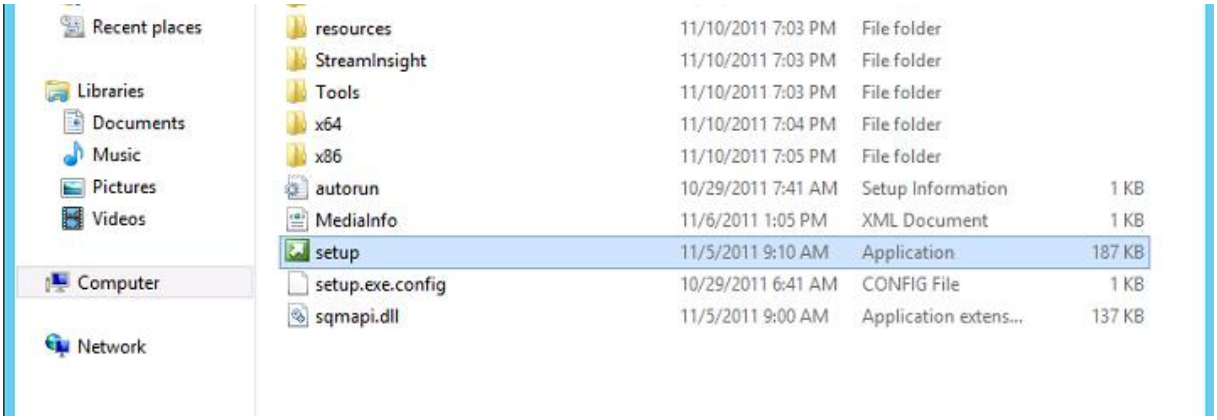
Build

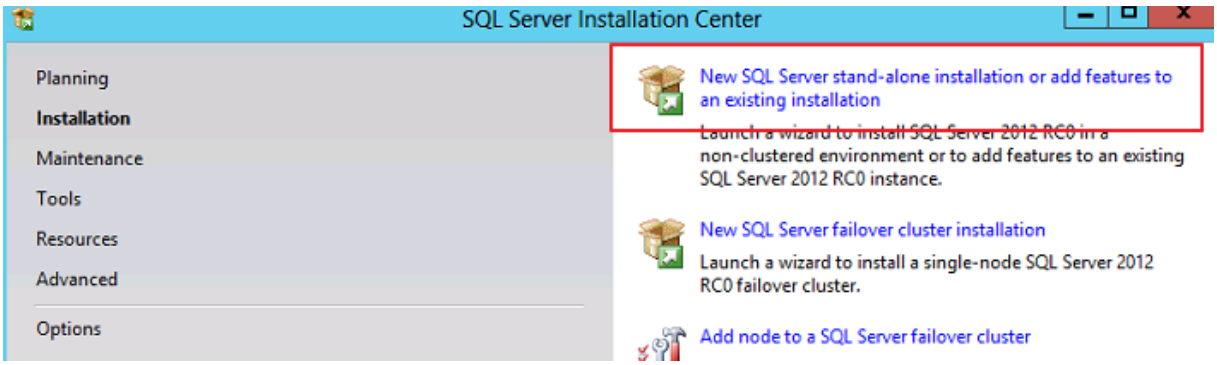
Our VM has

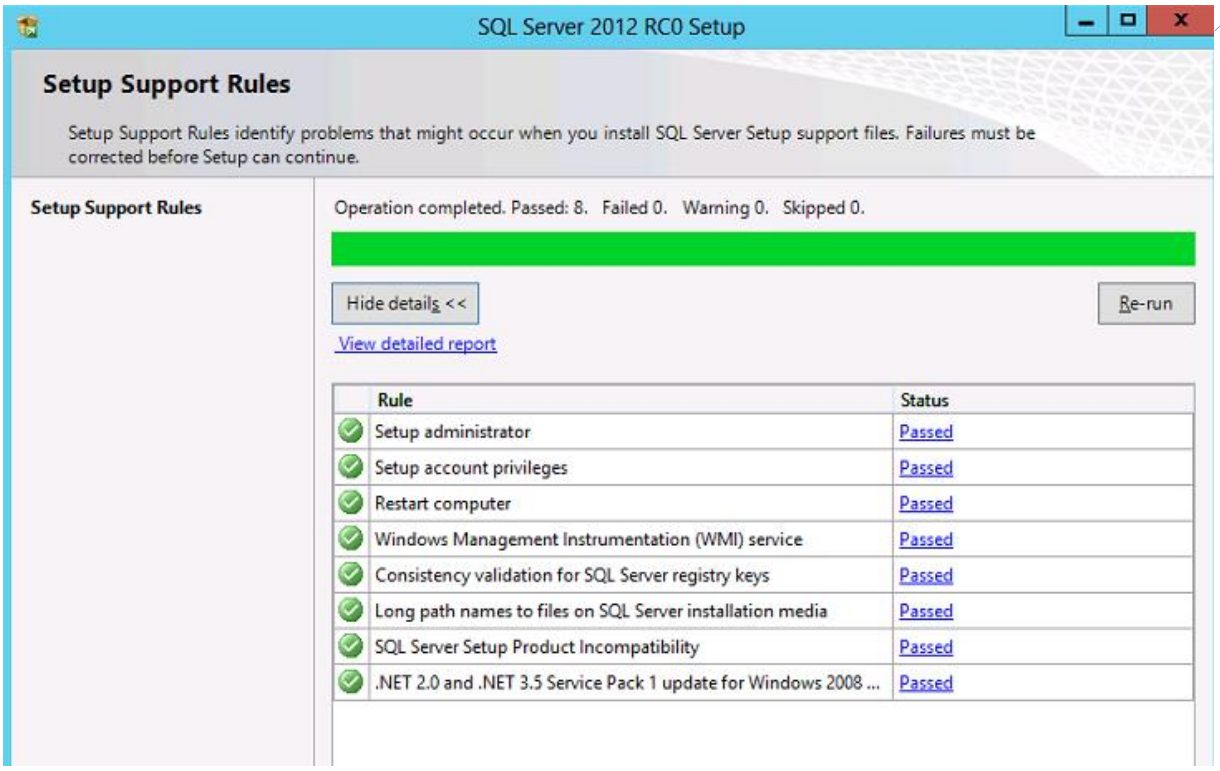
OS	Windows Server 2008R2	
RAM	4GB	
CPU	1vCPU	
HDD	40GB thin	
Network	1 NIC	10.10.10.151

The SQL Server is clone of our previous Windows Server 2008R2 which we create before install Active Directory.

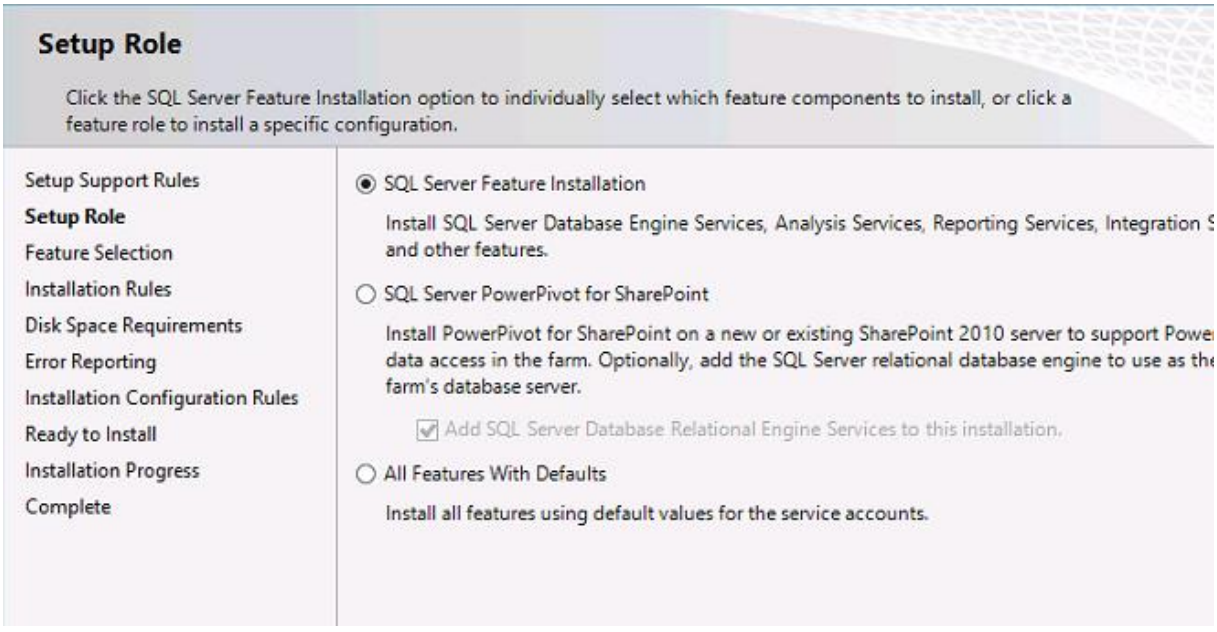
For our LAB environment we will be using Microsoft SQL Server 2012.



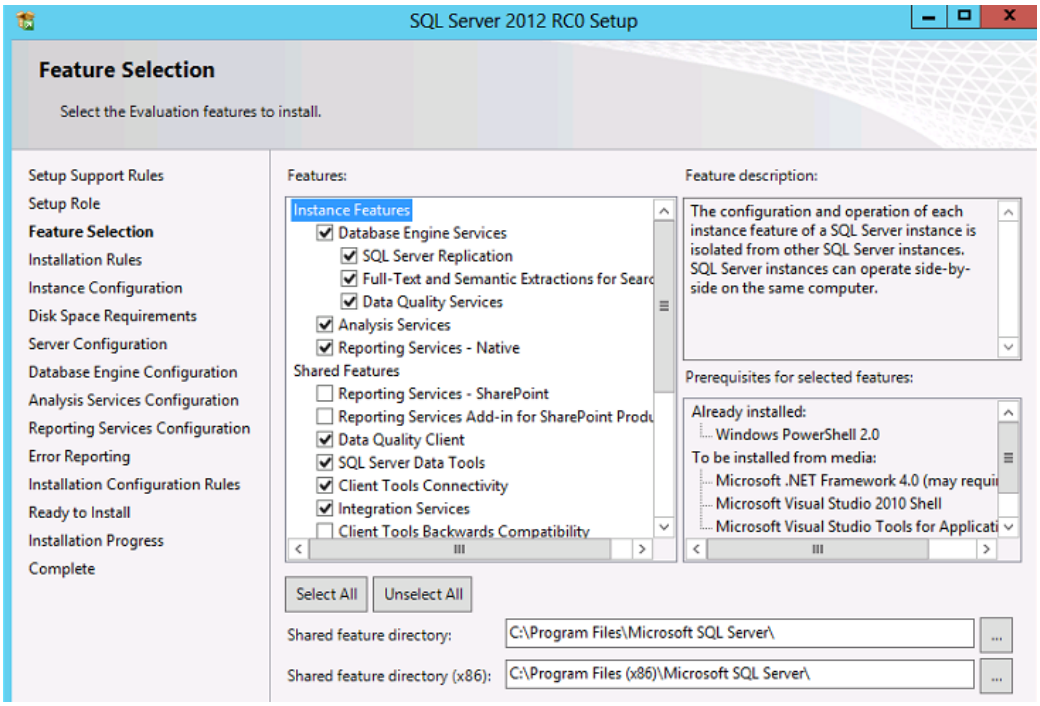




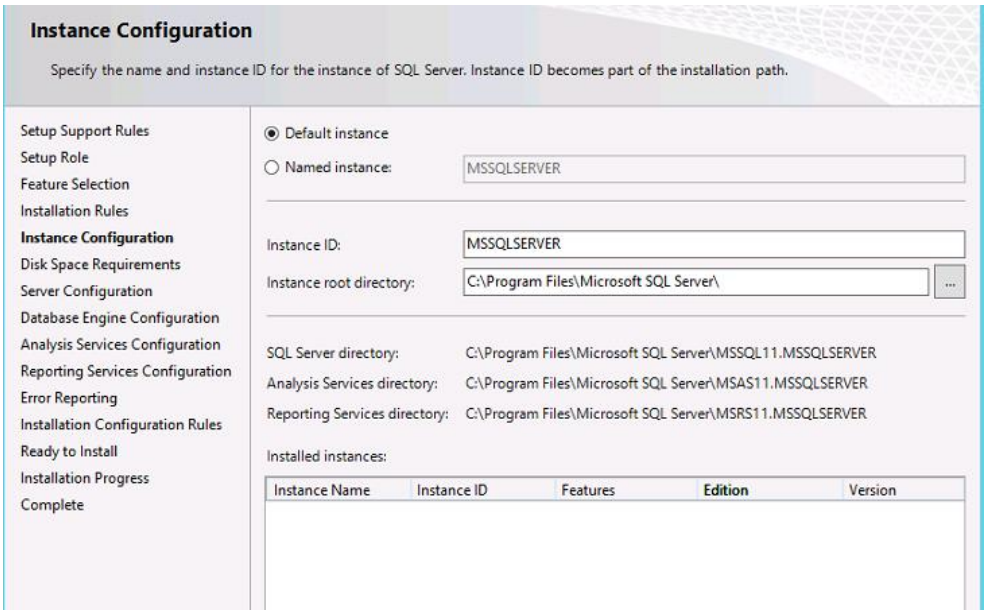
After some prereq



On the Feature Selection page, please select the features you would like to install. For Lab purpose we need Database Engine service and Management Studio.

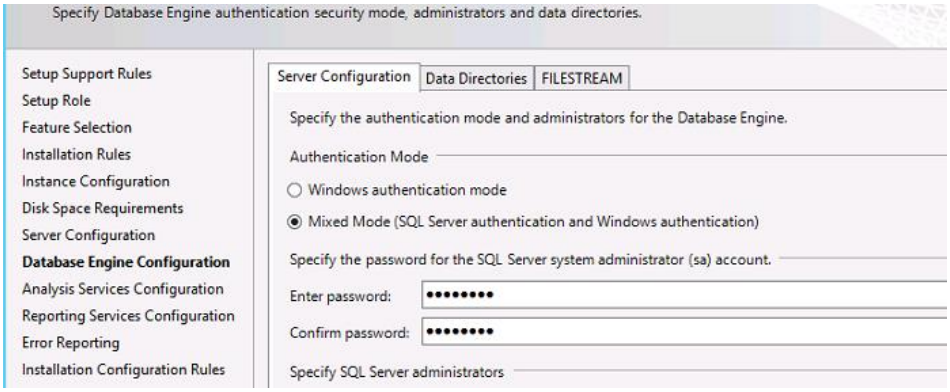


On the Instance Configuration page, select a default or named instance for your installation, and select the directory where you want to install the features you have chosen

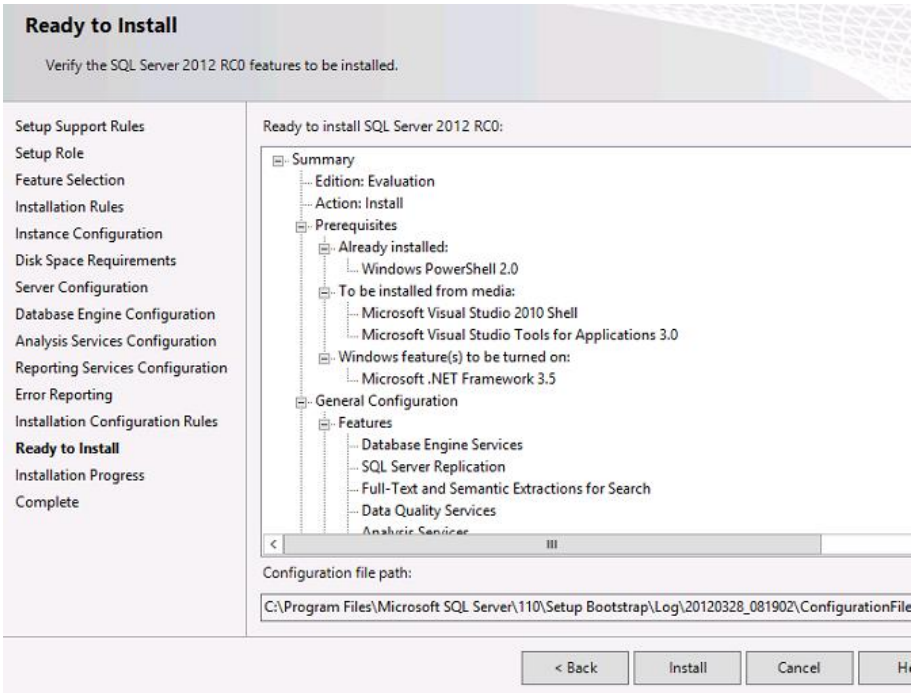


On the Database Engine Configuration page, choose the authentication mode to use for your SQL Server installation.

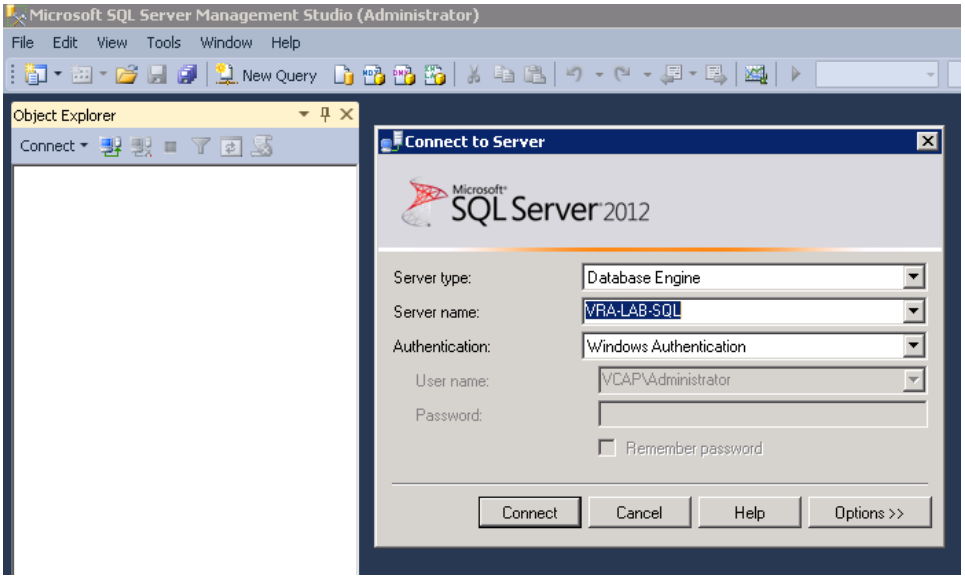
Enter and confirm the password for the (sa) login when you choose Mixed Mode Authentication. Add current user for SQL Server administrators which should be domain admin.



For the rest screen leave default values, and on confirmation screen press install



After couple of minutes we will have your SQL Server Installed and can confirm that via Management Studio



ESXi

Another element in our lab will be the infrastructure of ESXi servers. VMware ESXi (formerly ESX) is an enterprise-class, type-1 hypervisor developed by VMware for deploying and serving virtual computers. As a type-1 hypervisor, ESXi is not a software application that one installs in an operating system (OS); instead, it includes and integrates vital OS components, such as a kernel.

The name ESX originated as an abbreviation of Elastic Sky X. (wikipedia)

Prerequisites

Username: root
Password: P@ssw0rd

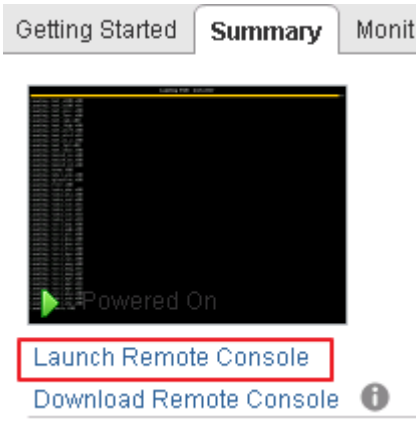
Build

We need in our purpose 4-6 ESXi. In this lab we will install 4

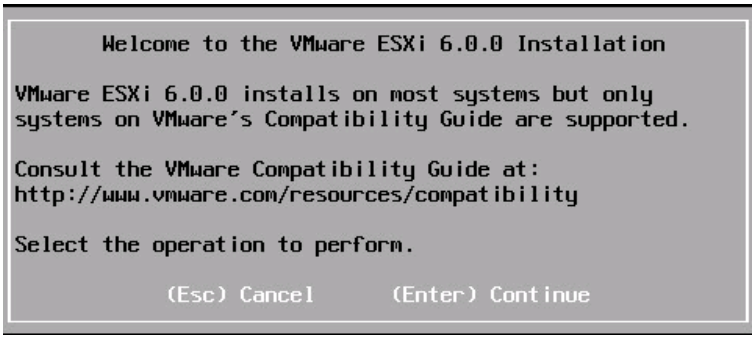
OS	ESXi 6.5	
RAM	16GB	
CPU	2vCPU	
HDD	10GB,40GB,100GB,100GB thin	
Network	8 NIC	10.10.10.144 10.10.10.145 10.10.10.146 10.10.10.147

In this lab all ESXi hosts are virtual. I'v created 4 VM and made simple install of ESXi OS.

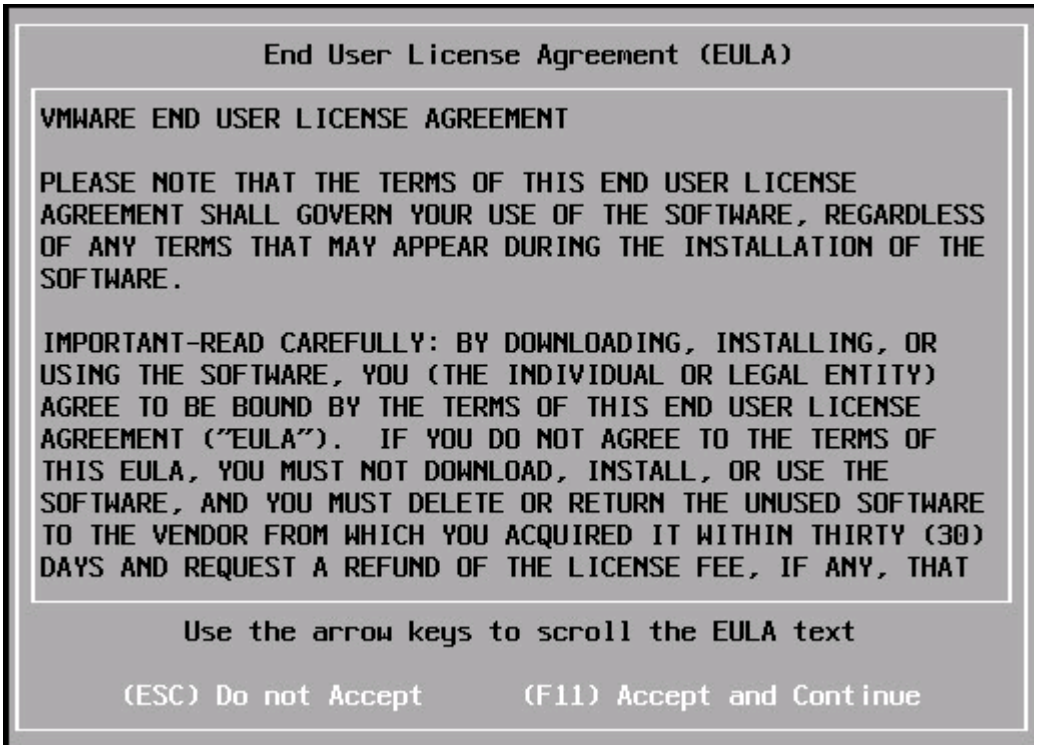
Launch Remote Console



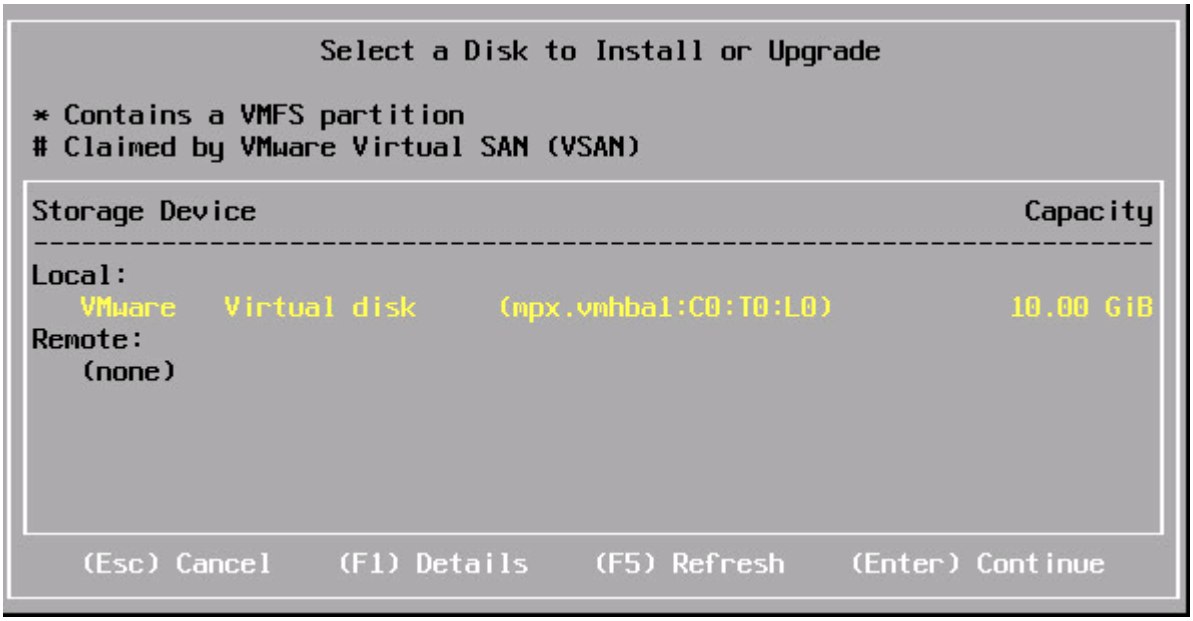
On Welcome Screen press **Enter**



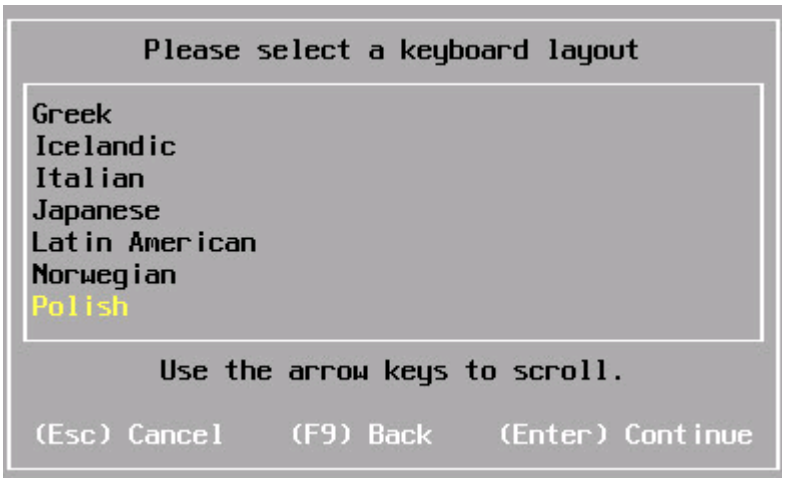
Accept the license by pressing **F11**



Choose local hard disk by pressing **Enter**

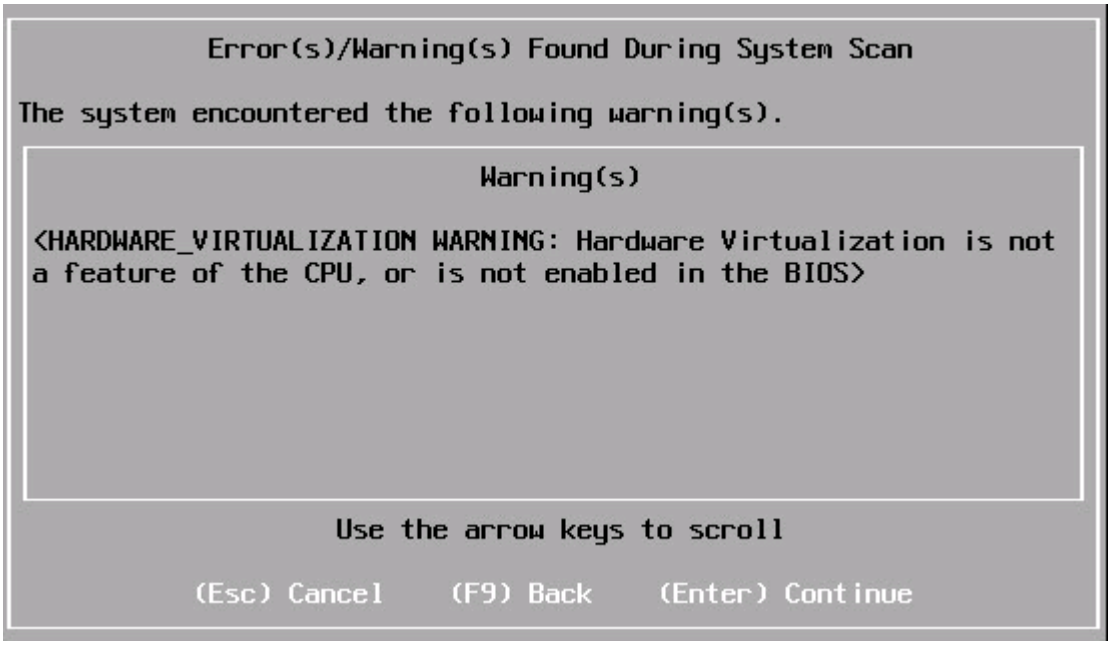


Change Keybord Layout

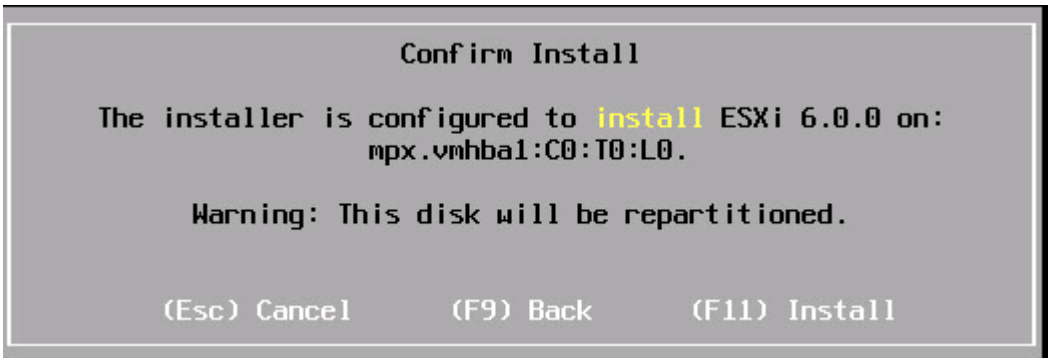


Set passwod (P@ssw0rd)

Check errors and warning and press **Enter**



Press **F11** to install ESXi on local disk



Press Enter to Reboot your Host

vCenter

Another element in our lab will be the infrastructure of ESXi servers. VMware vCenter Server provides a centralized platform for managing your VMware vSphere environments, so you can automate and deliver a virtual infrastructure with confidence. (vmware.com)

Prerequisites

Username: root
Password: P@ssw0rd

Username: Administrator@vsphere.local
Password: P@ssw0rd

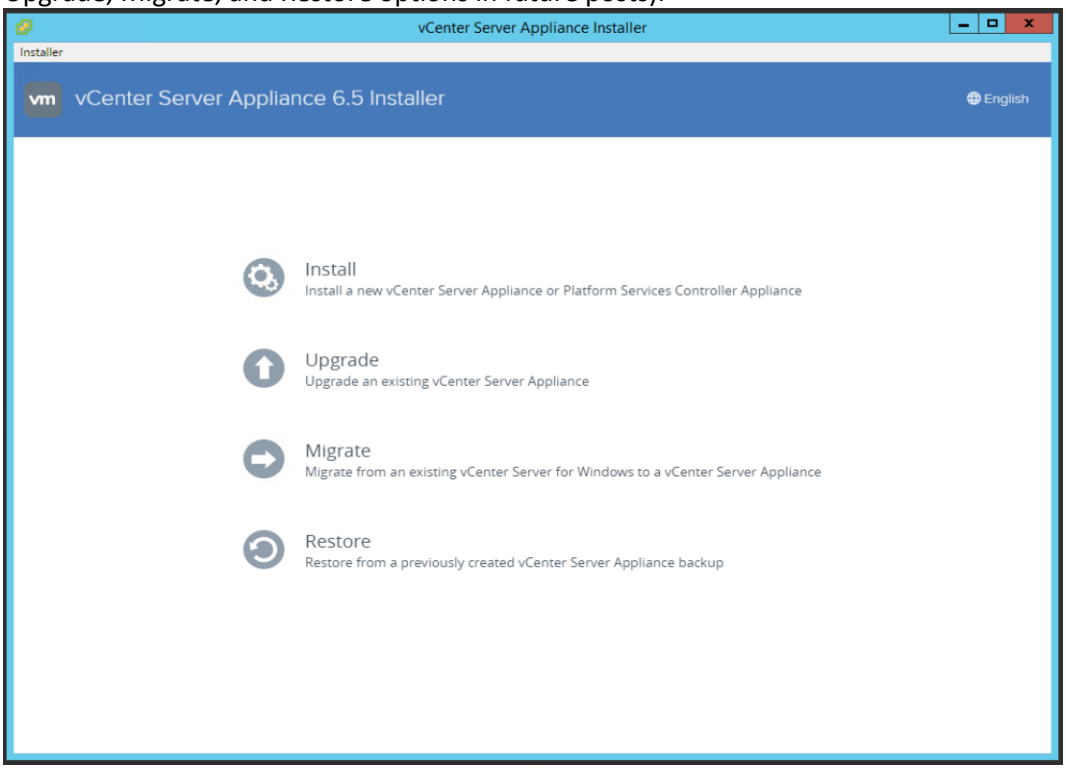
Build

We will be using vCenter appliance

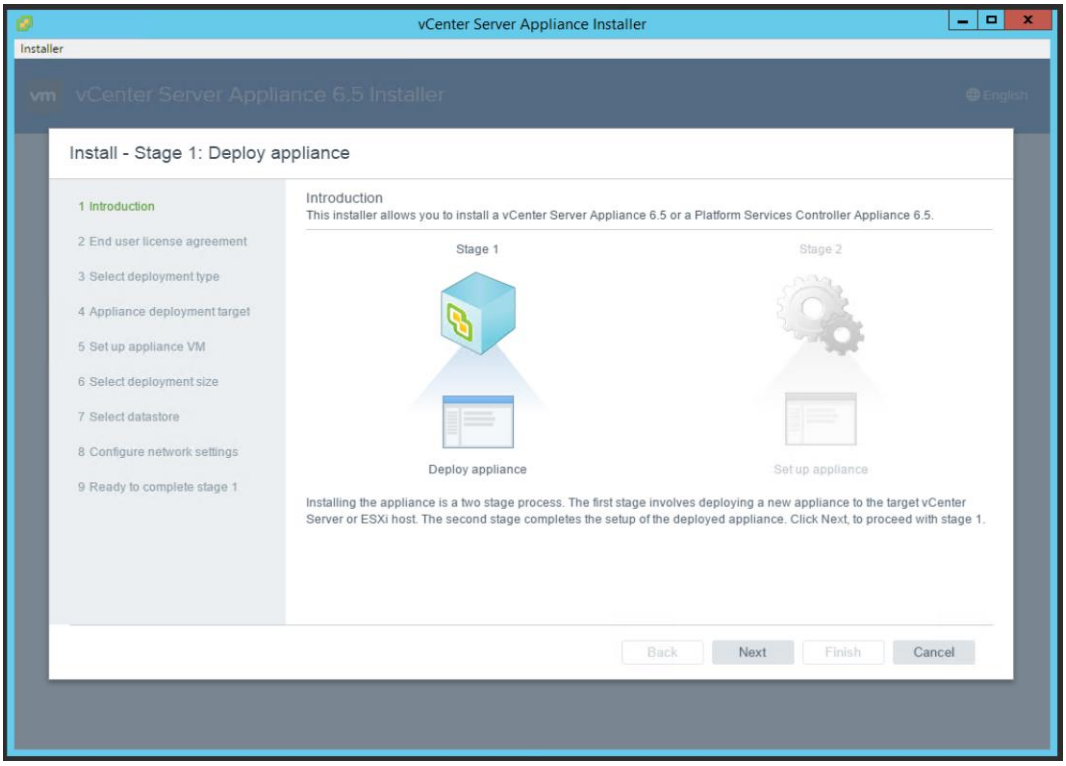
OS	vCenter Appliance 6.5	
RAM	10GB	
CPU	2vCPU	
HDD		
Network	1 NIC	10.10.10.142

Deployment

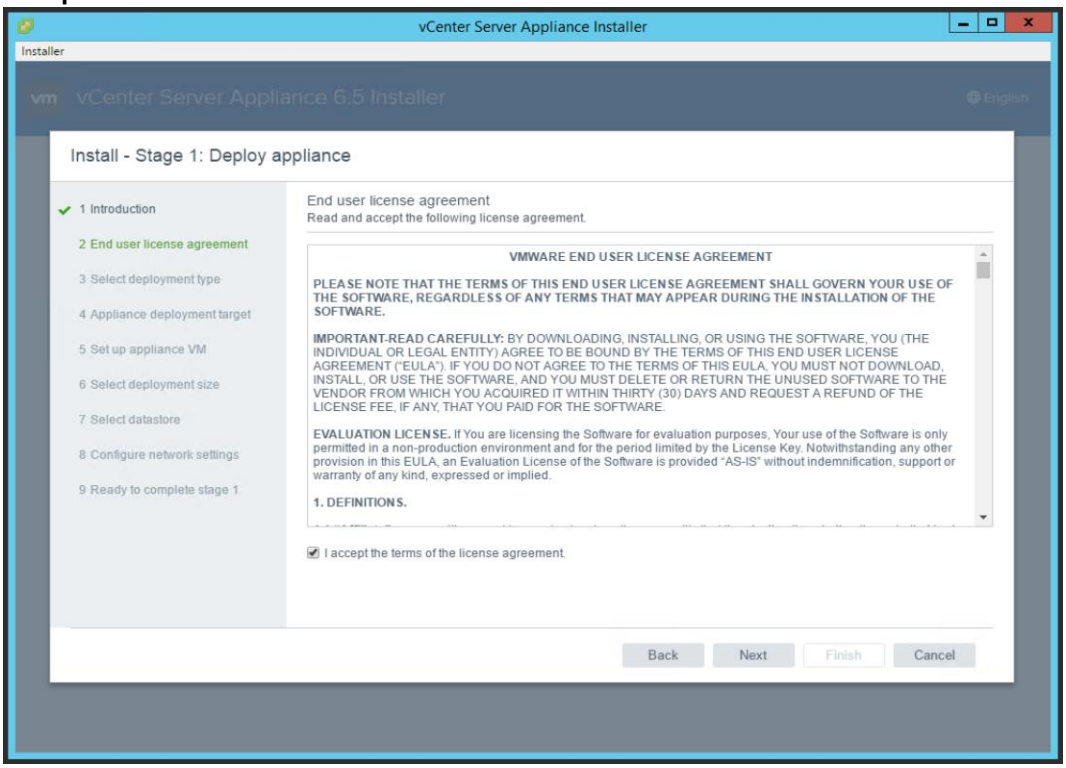
Log on to a domain-joined server, mount the VCSA installation media, and click **Install** (more on the Upgrade, Migrate, and Restore options in future posts).



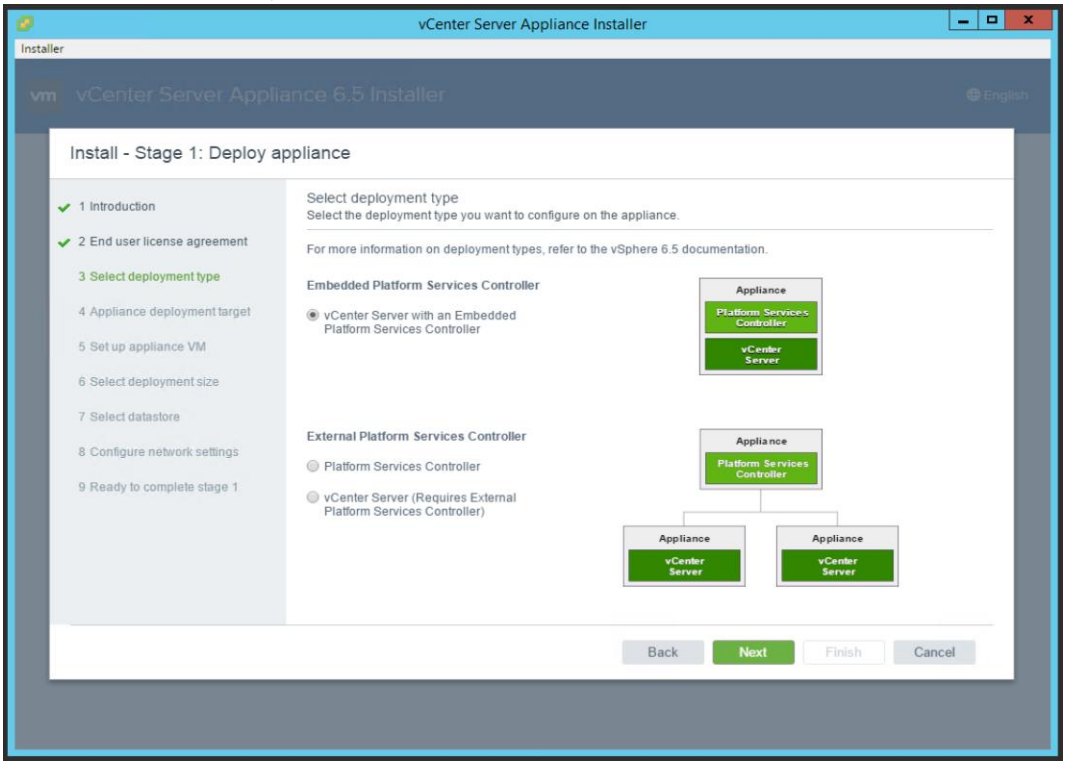
Click **Next** at the Introduction screen.



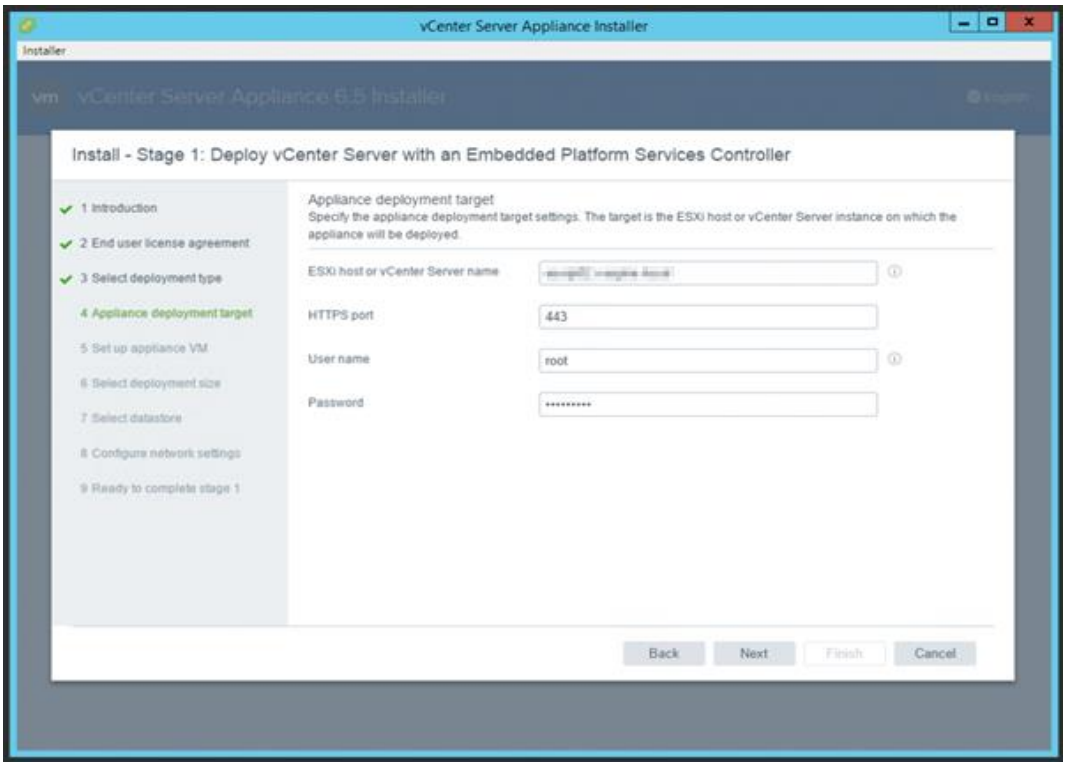
Accept the EULA and click **Next**.



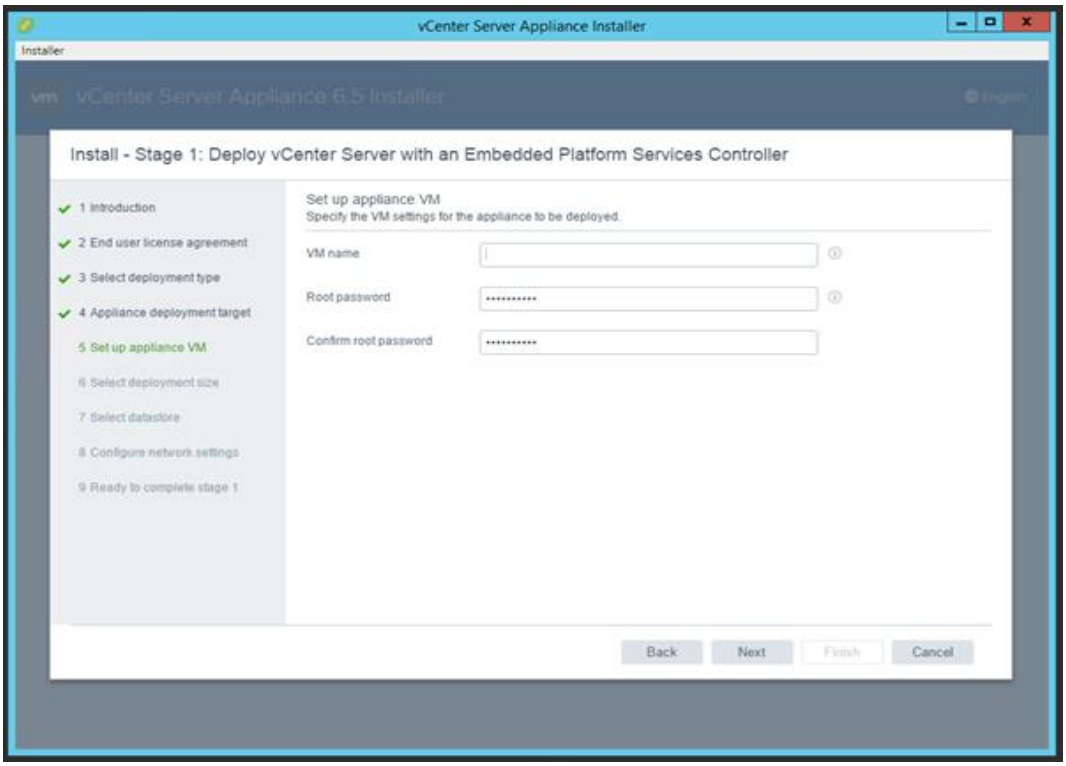
For this installation, we will be deploying the **vCenter Server with an Embedded Platform Services Controller**. Once done, click **Next**.



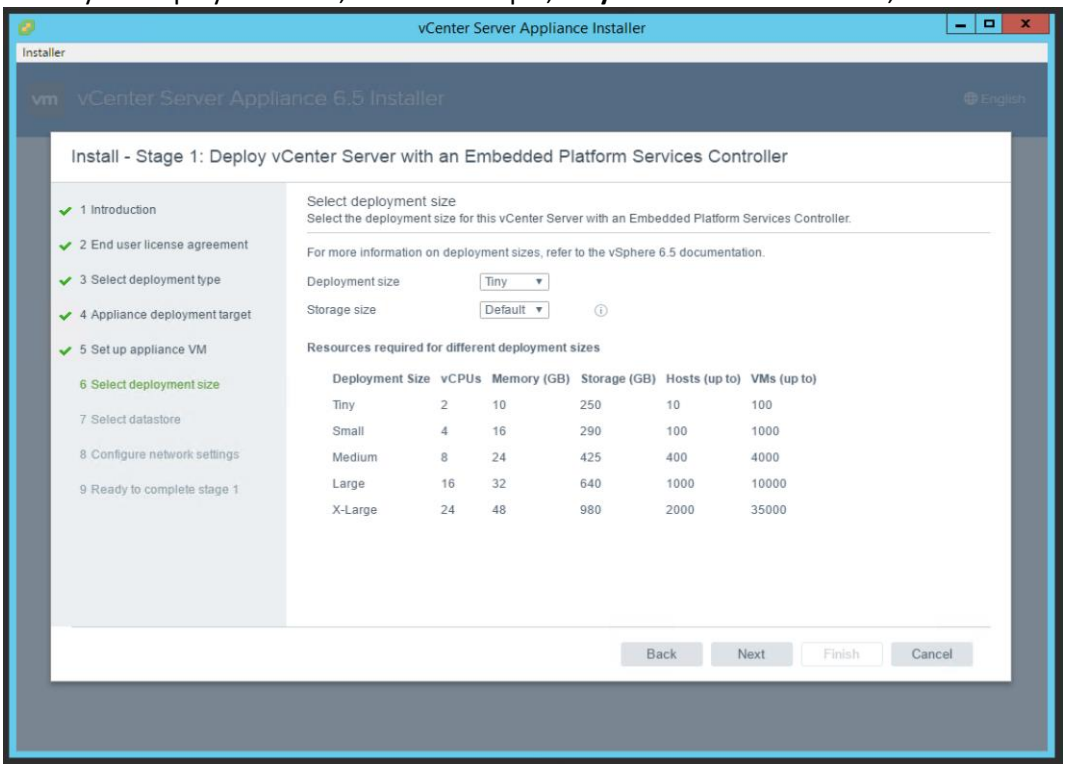
Configure the **Appliance Deployment Target** by entering the target ESXi host, HTTPS port, and user credentials, and click **Next**.



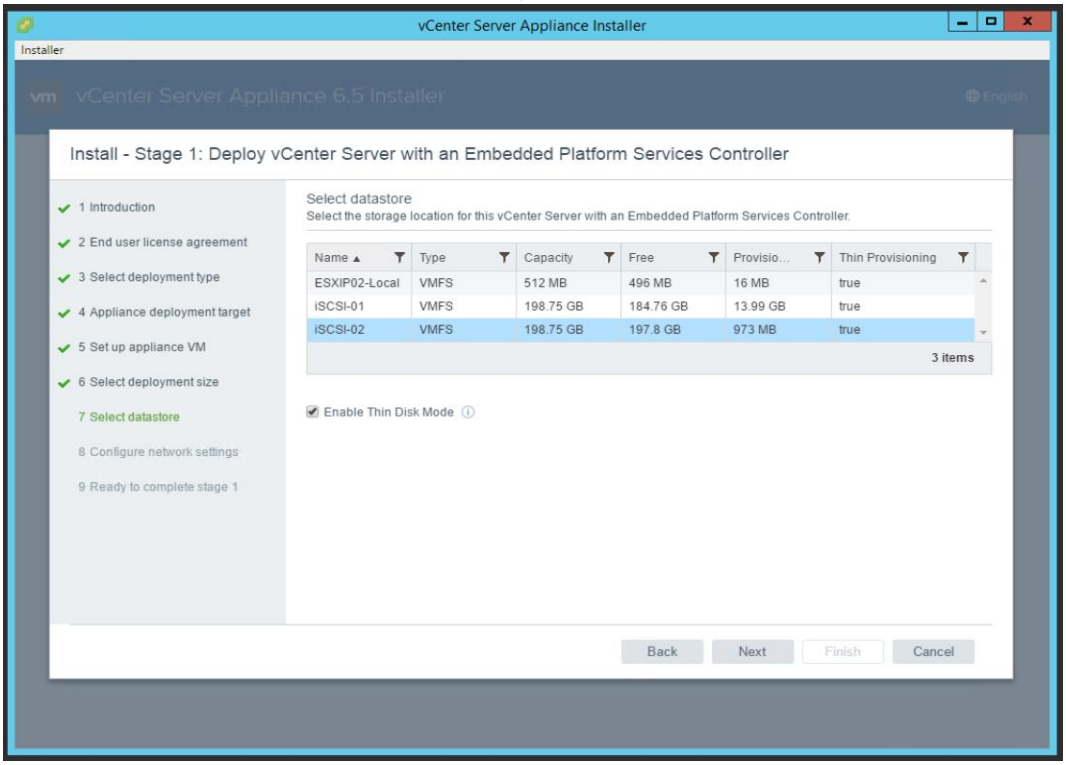
Configure up the **appliance virtual machine** by specifying a VM name, and Root credentials. Our name will be **vCenter-01**



Select your deployment size; for this example, **Tiny** will suffice. Once done, click Next**.**



Select a suitable datastore for the new VM, and click **Next**.



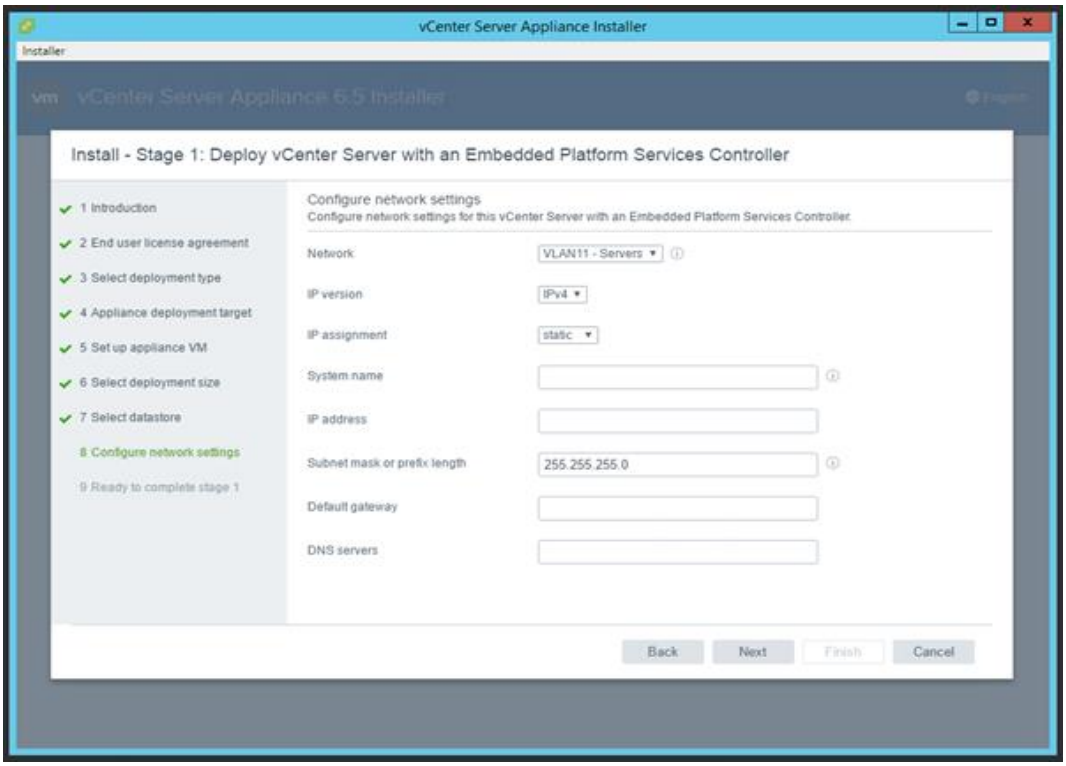
Configure the **network settings** accordingly, and click **Next**.

IP Address 10.10.10.142/24

GW: 10.10.10.1

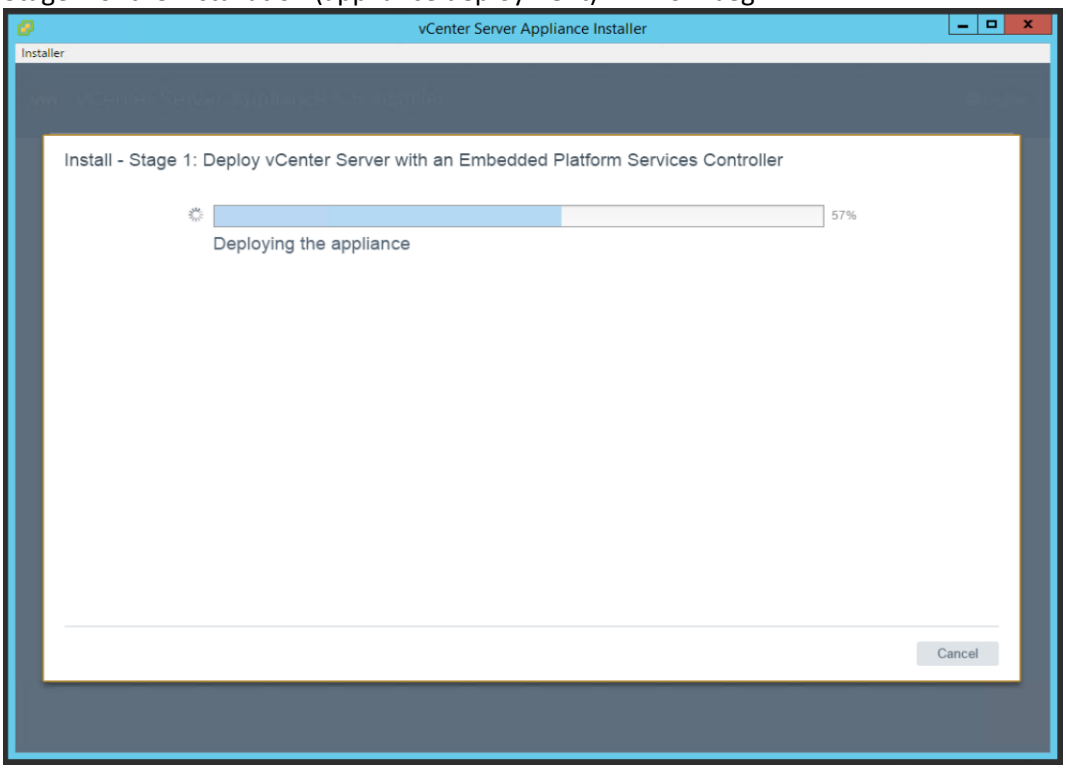
DNS: 10.10.10.141

System Name: vCenter-01.vcap.domain.local

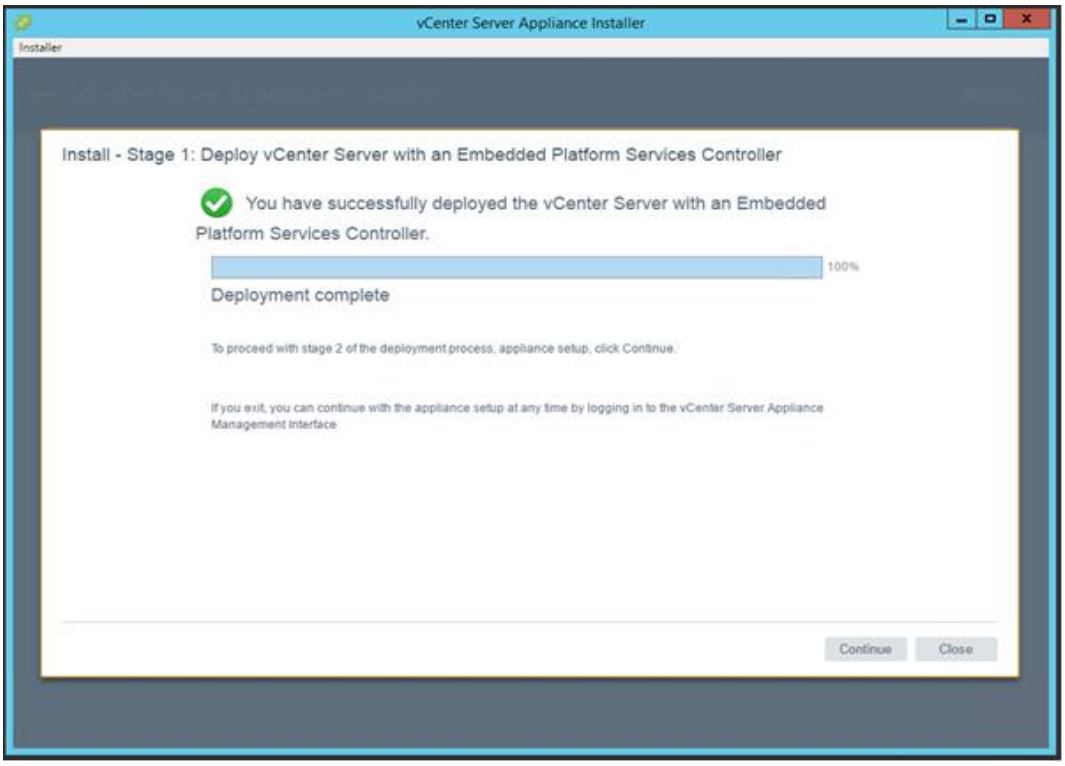


Confirm the configuration and click **Finish**.

Stage 1 of the installation (appliance deployment) will now begin.

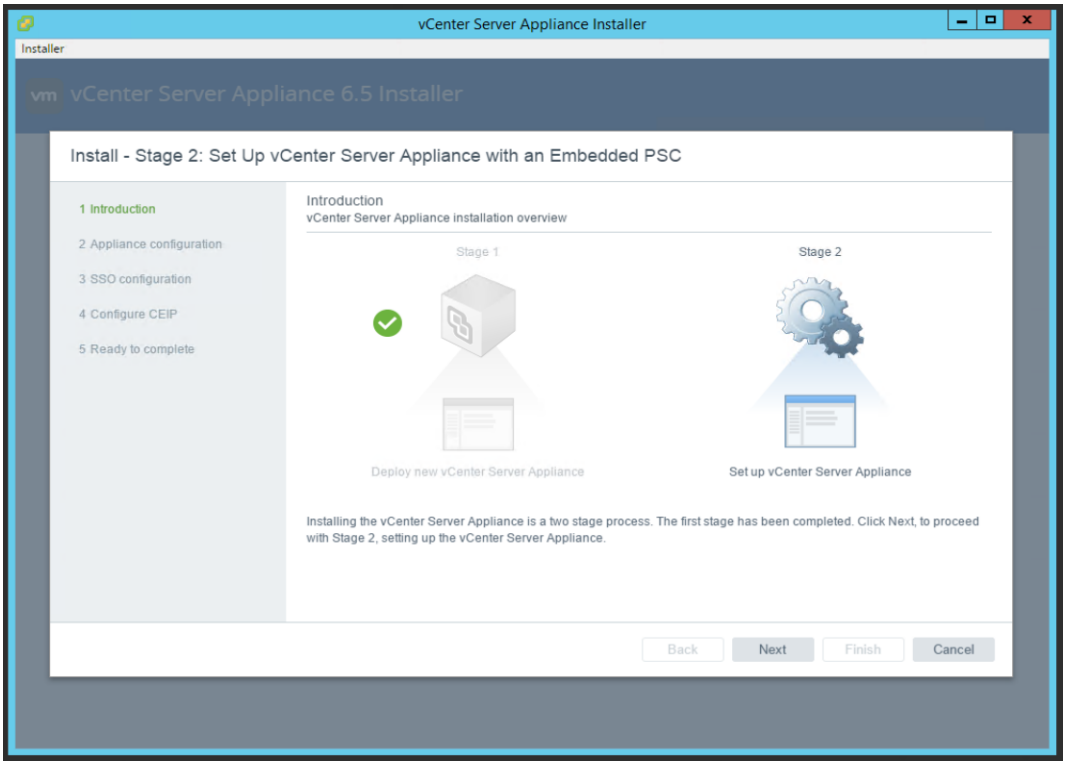


Once installation is complete, click **Continue** to configure the appliance.

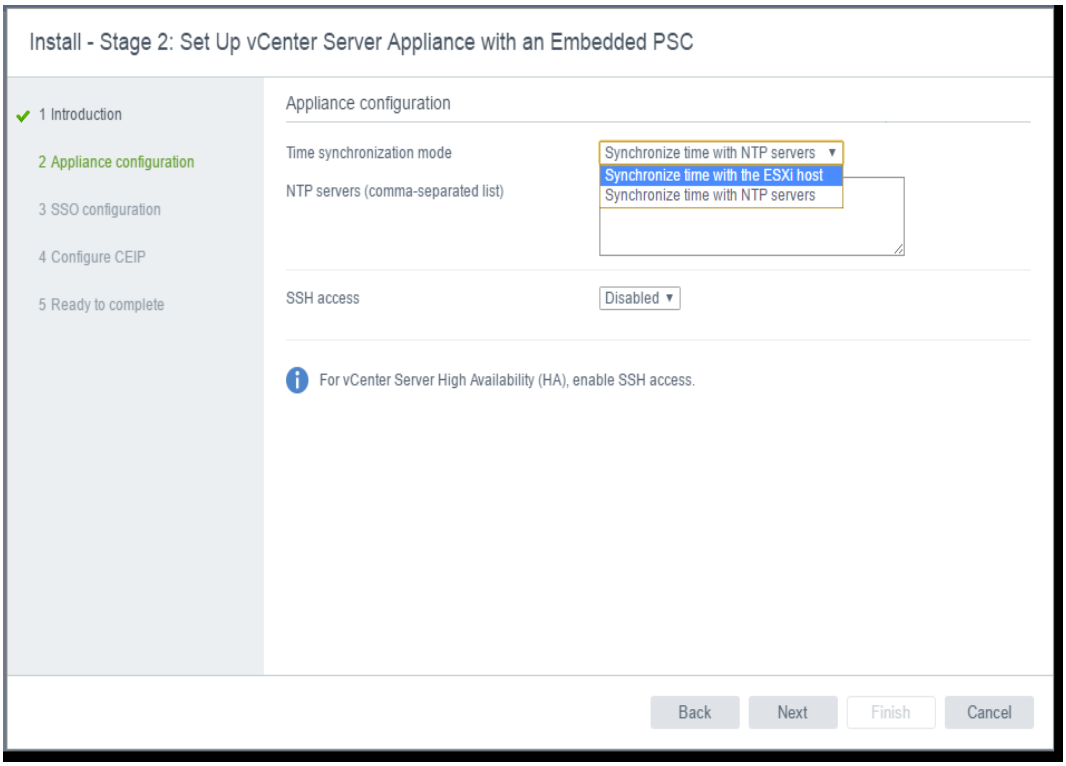


Configuration

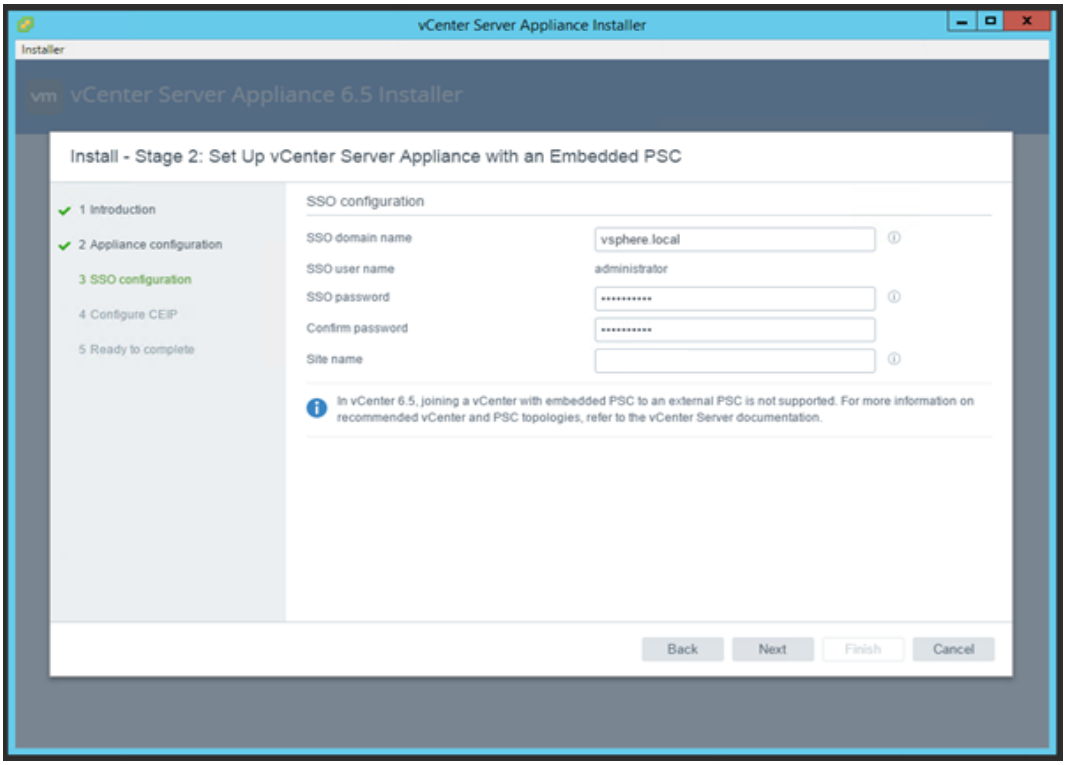
Click **Next** at the **Introduction** screen.



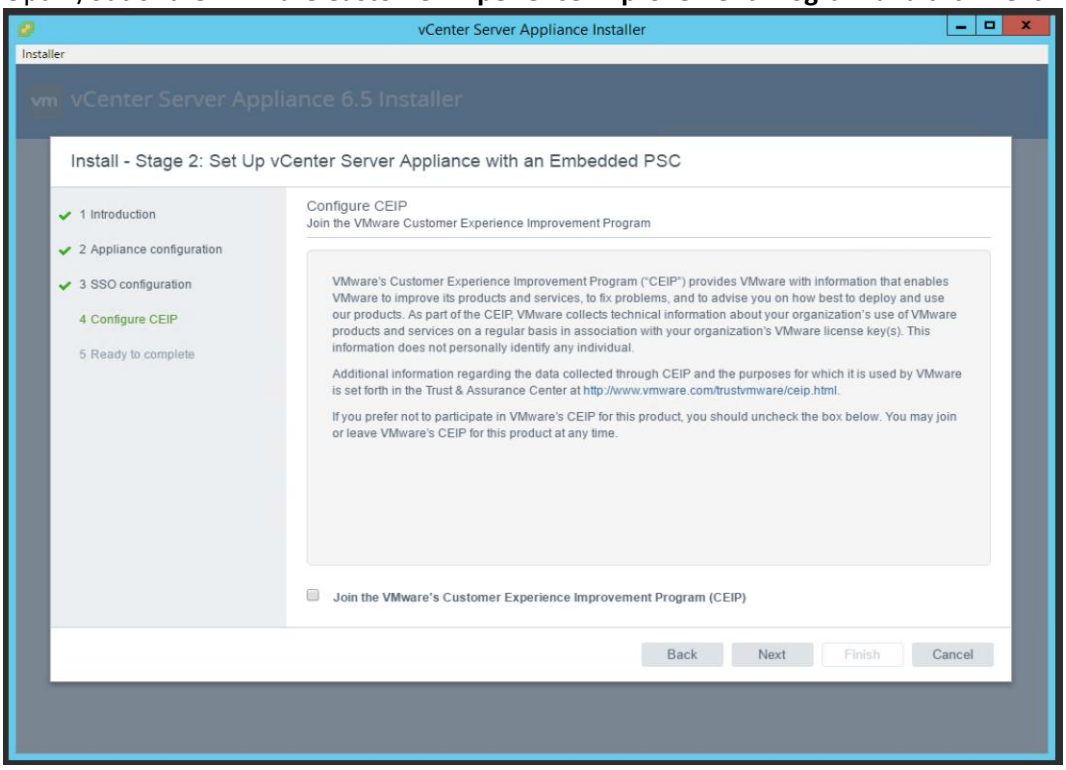
Configure **NTP** settings for our NTP server and click **Next**.



Complete the **vCenter SSO configuration**, and click N**ext**.

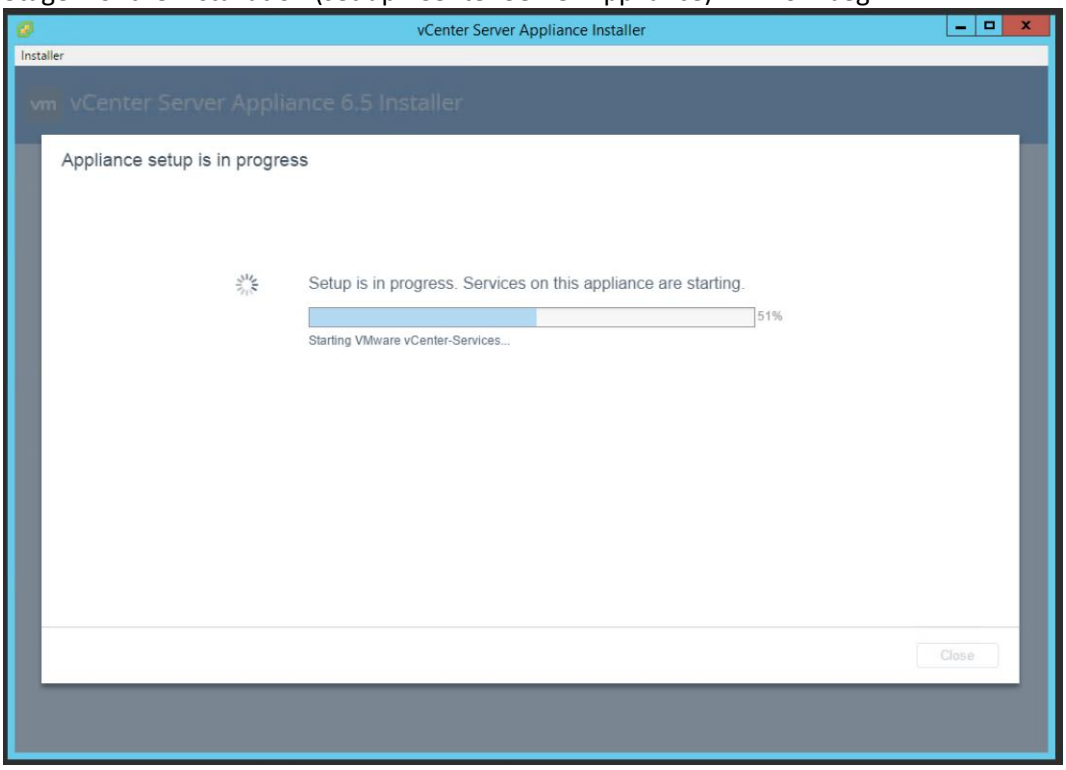


Opt in/out of the **VMware Customer Experience Improvement Program** and click **Next**.

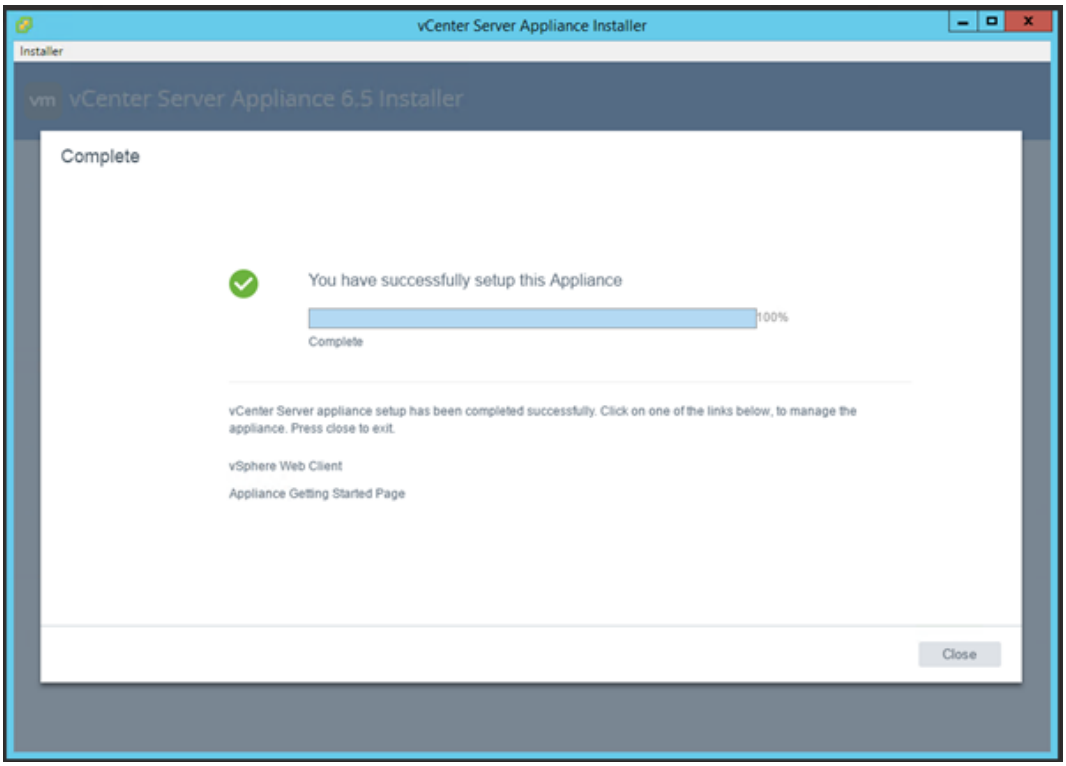


Review the **Summary** and click **Finish**.

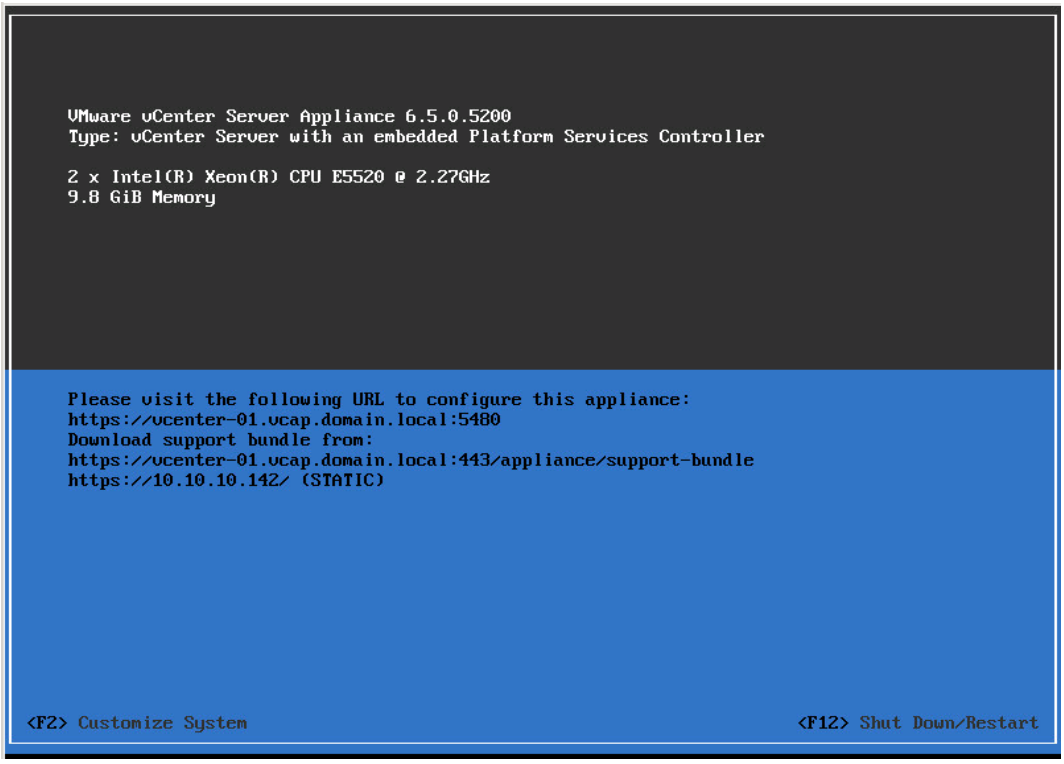
Stage 2 of the installation (set up vCenter Server Appliance) will now begin.



Once complete, you will be presented with your FQDN for your new vCenter Server.



Looking at the console of the vCSA, and we are presented with a very familiar grey and blue (instead of grey and yellow) interface. Appliance URLs are visible here, as well as basic management/configuration tasks.



The new vCenter Server Appliance can now be accessed via the default URLs and, depending on your choice of interface (either the new vSphere Client or older vSphere Web Client), there are now two URLs to remember.

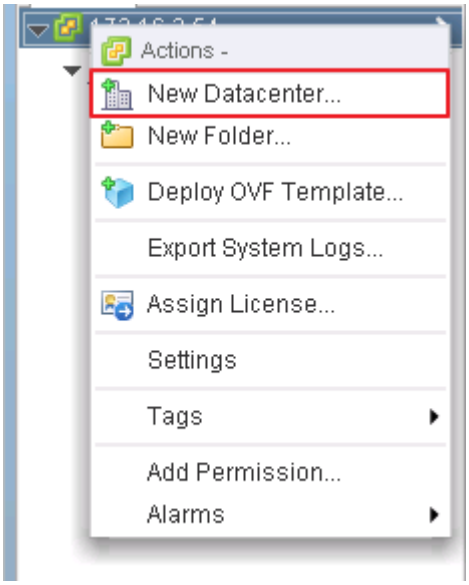
- **vSphere Web Client –** http://<vcenter_fqdn>/vsphere-client)
- **vSphere Client –** http://<vcenter_fqdn>/ui.

vCenter Configuration

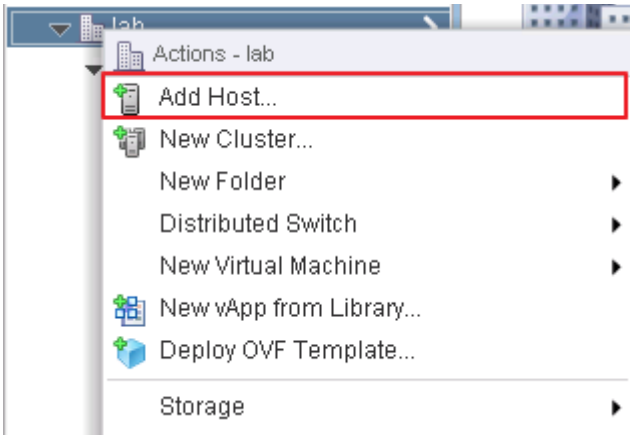
After we deploy our vCenter Appliance we can configure datacenter, clusters and hosts with storage and networking.

Add ESXi

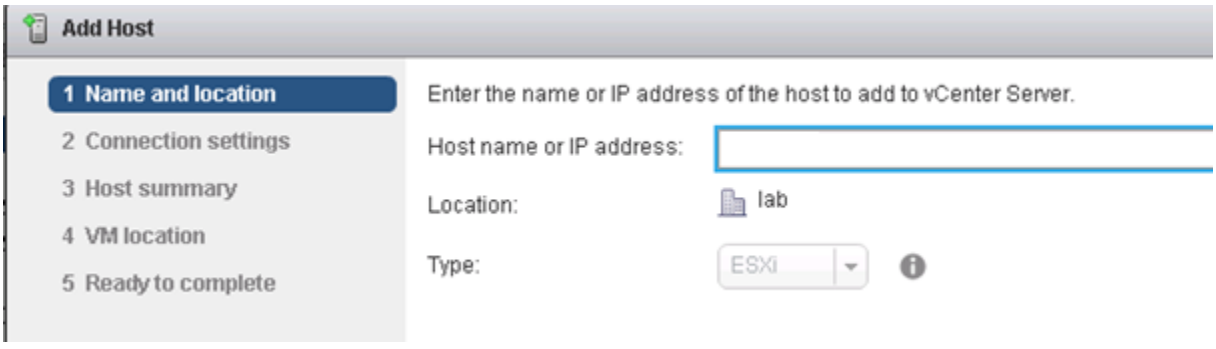
Create new Datacenter by clicking a right mouse button and



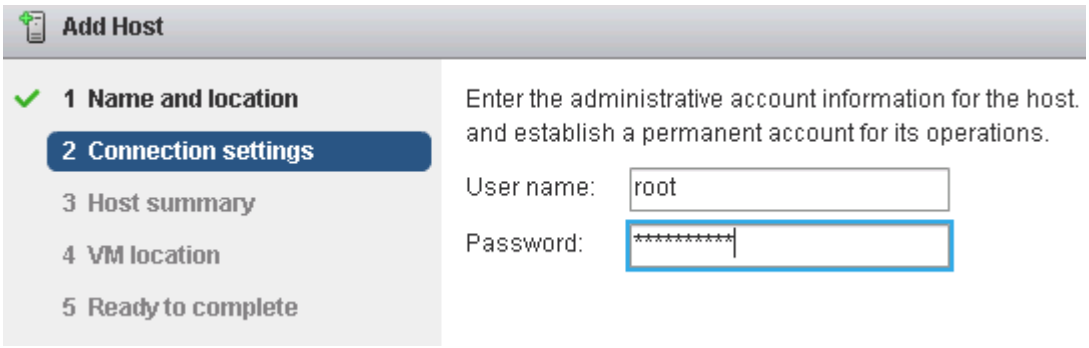
Add a Host by clicking a right mouse button on Datacenter



Enter IP address from first Host

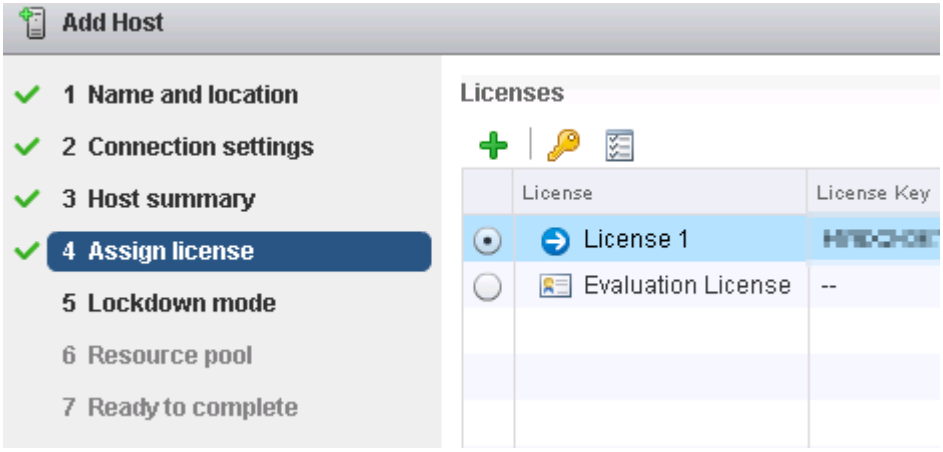


Provide credentials

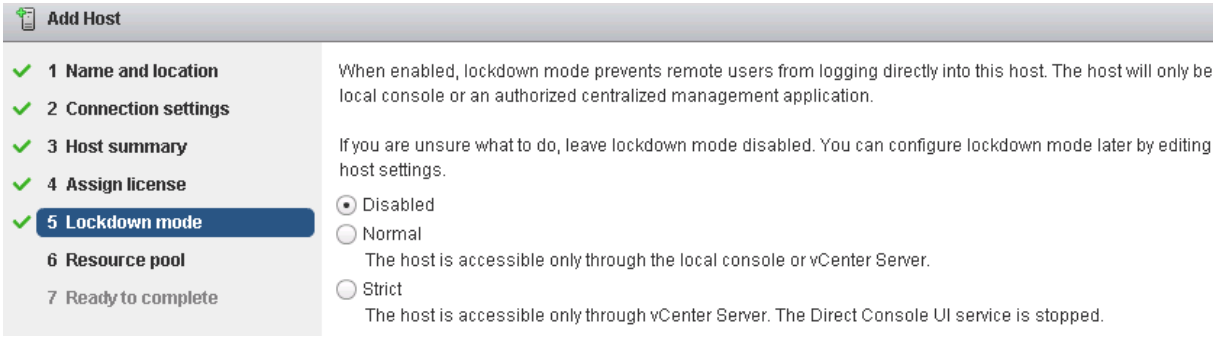


Accept the SHA key. Compare with your DATA collected in **LAB-02**

Chose the license



Leave disabled lockdown mode



Repeat step from 2-7 to add second ESXi Host

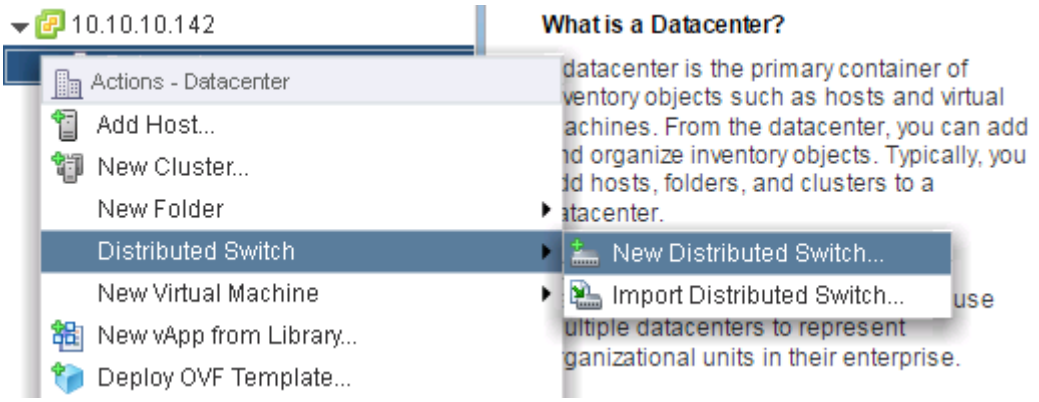
Configure Network

VMware vSphere Distributed Switch (VDS) provides a centralized interface from which you can configure, monitor and administer virtual machine access switching for the entire data center. The VDS provides:

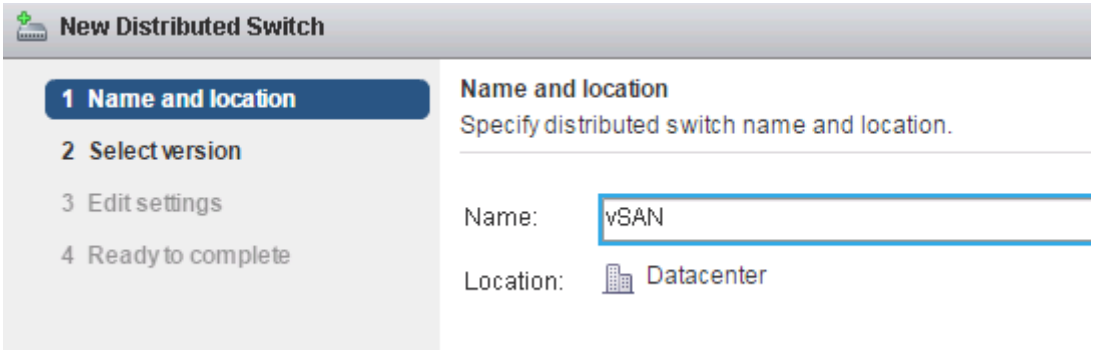
Simplified virtual machine network configuration

Enhanced network monitoring and troubleshooting capabilities

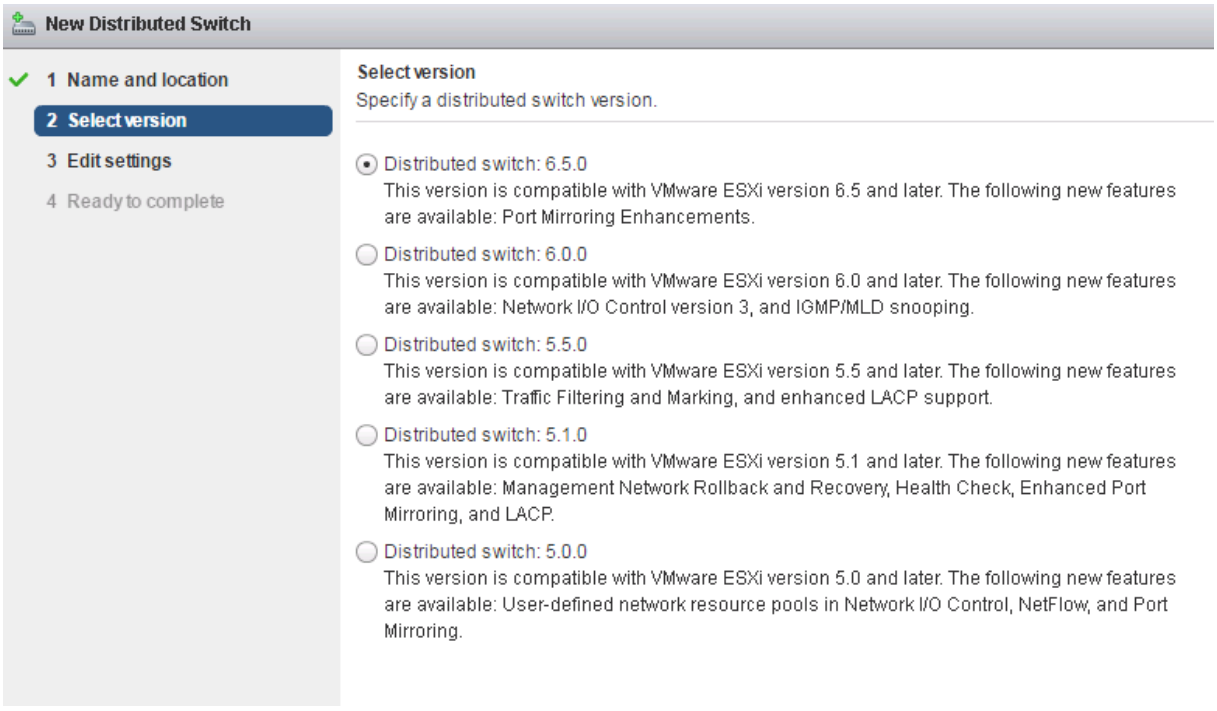
Support for advanced VMware vSphere networking features (vmware.com)



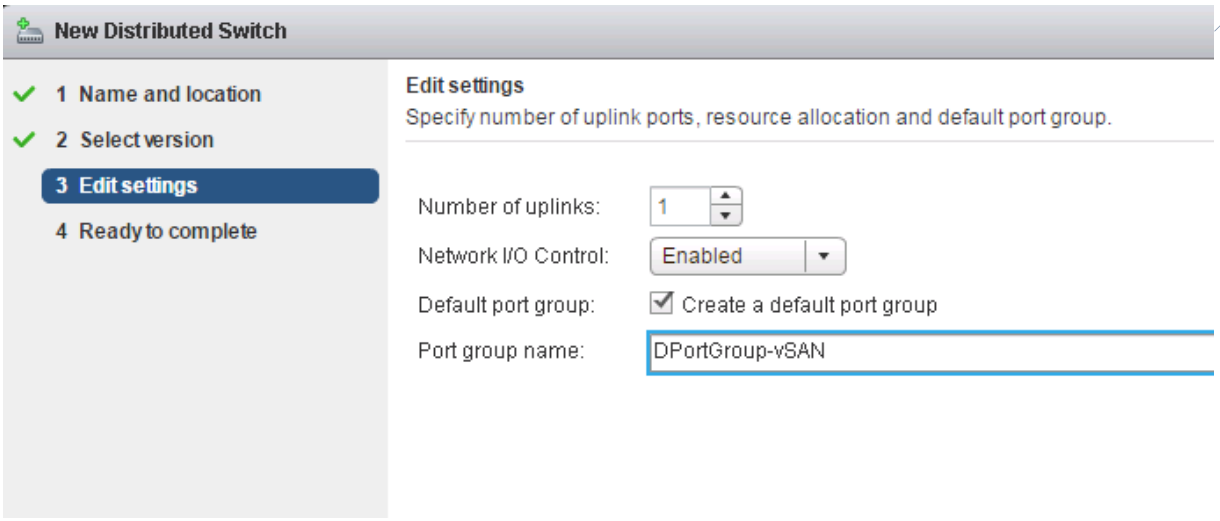
Provide name for this distributed switch

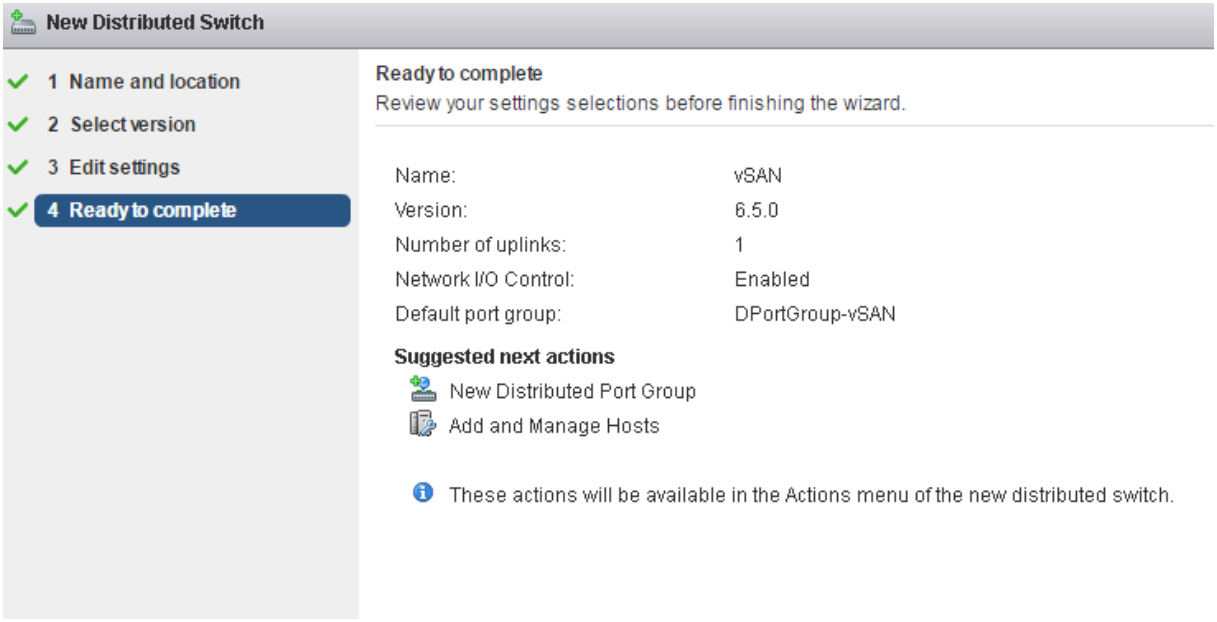


Choose version

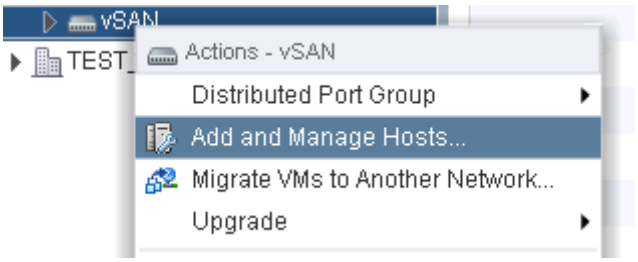


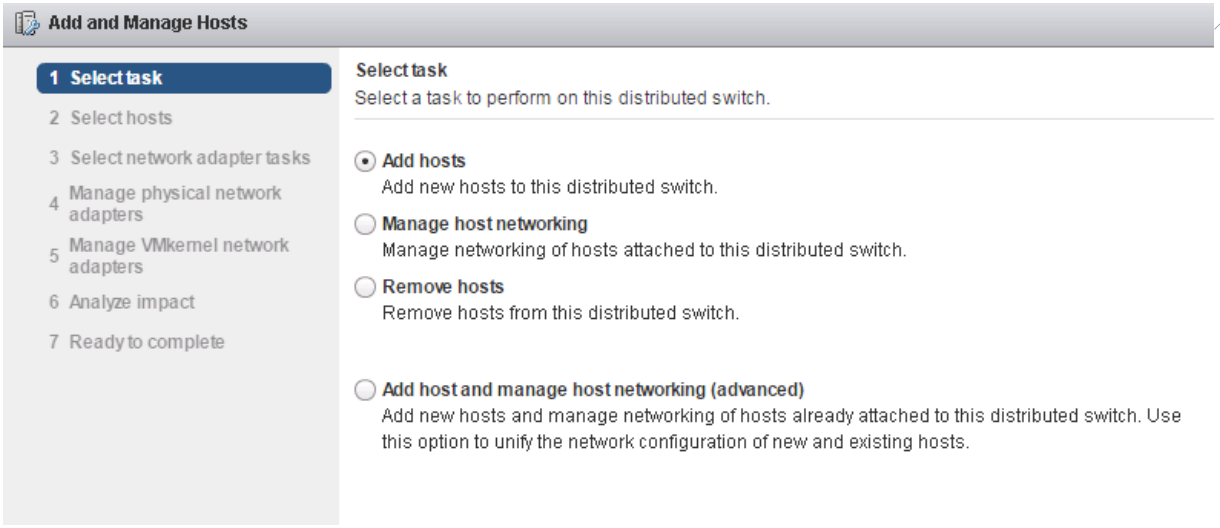
Select number of uplinks (physical interface per host)

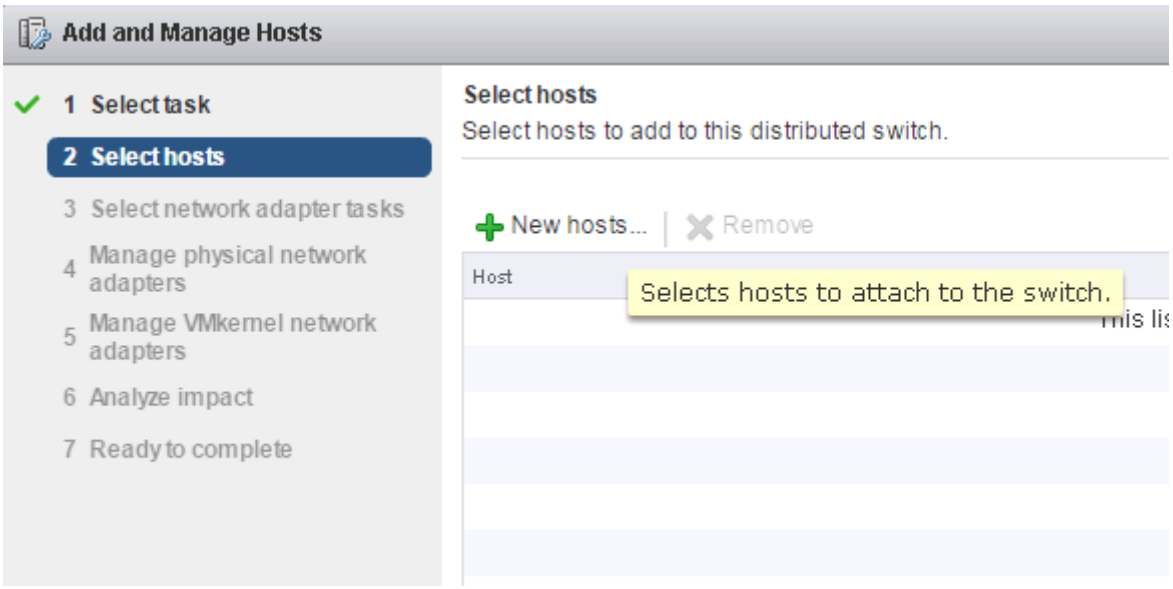




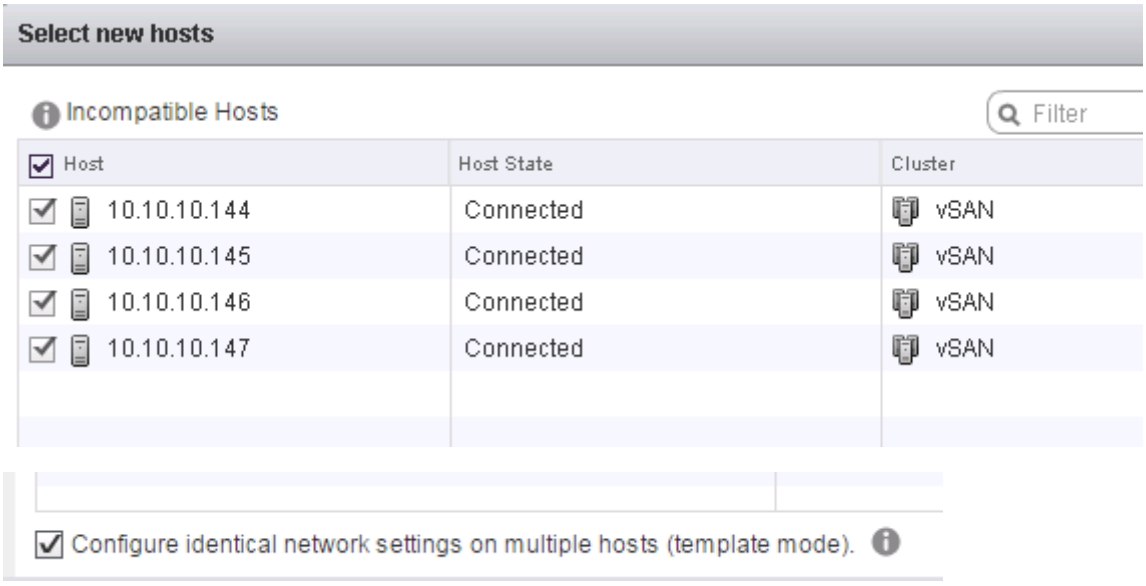
Add hosts to the newly created switch.

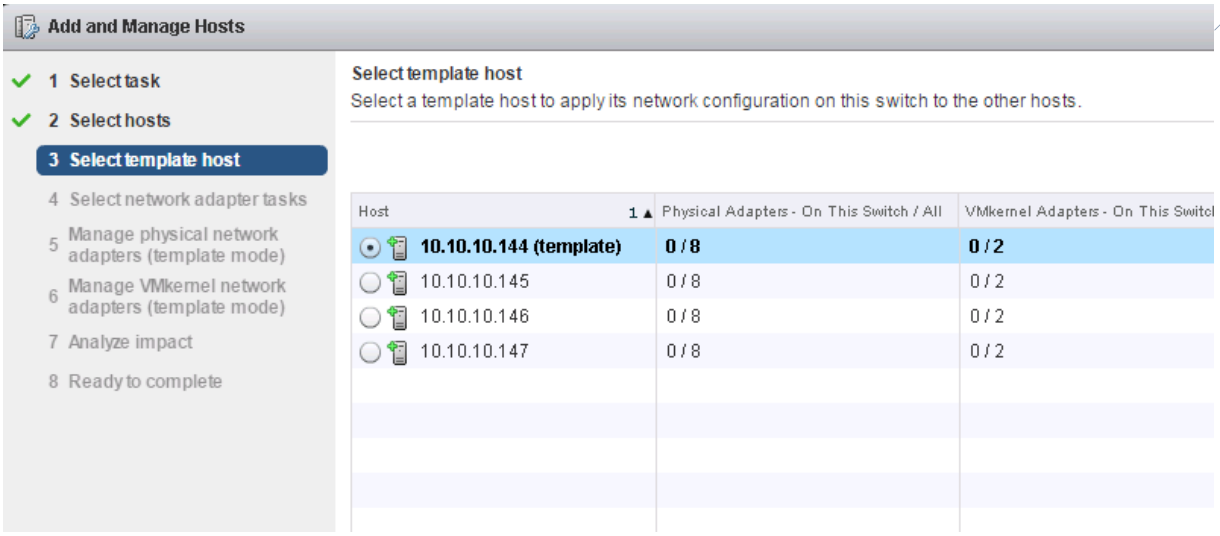


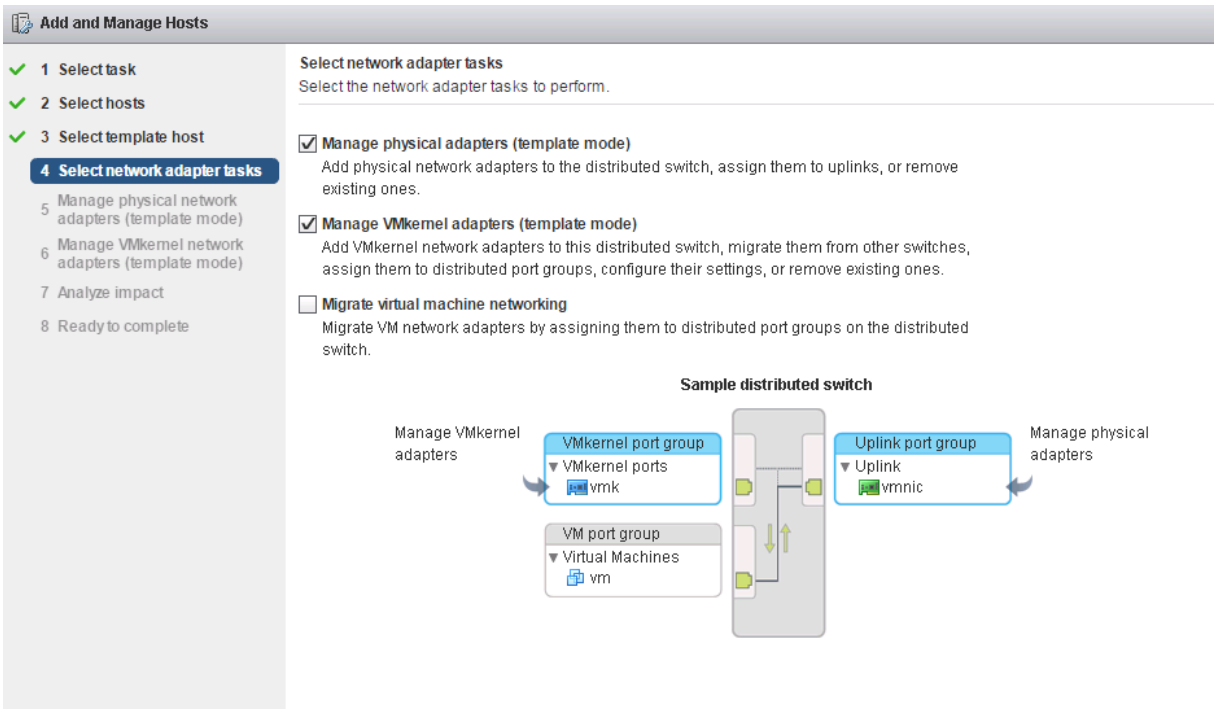




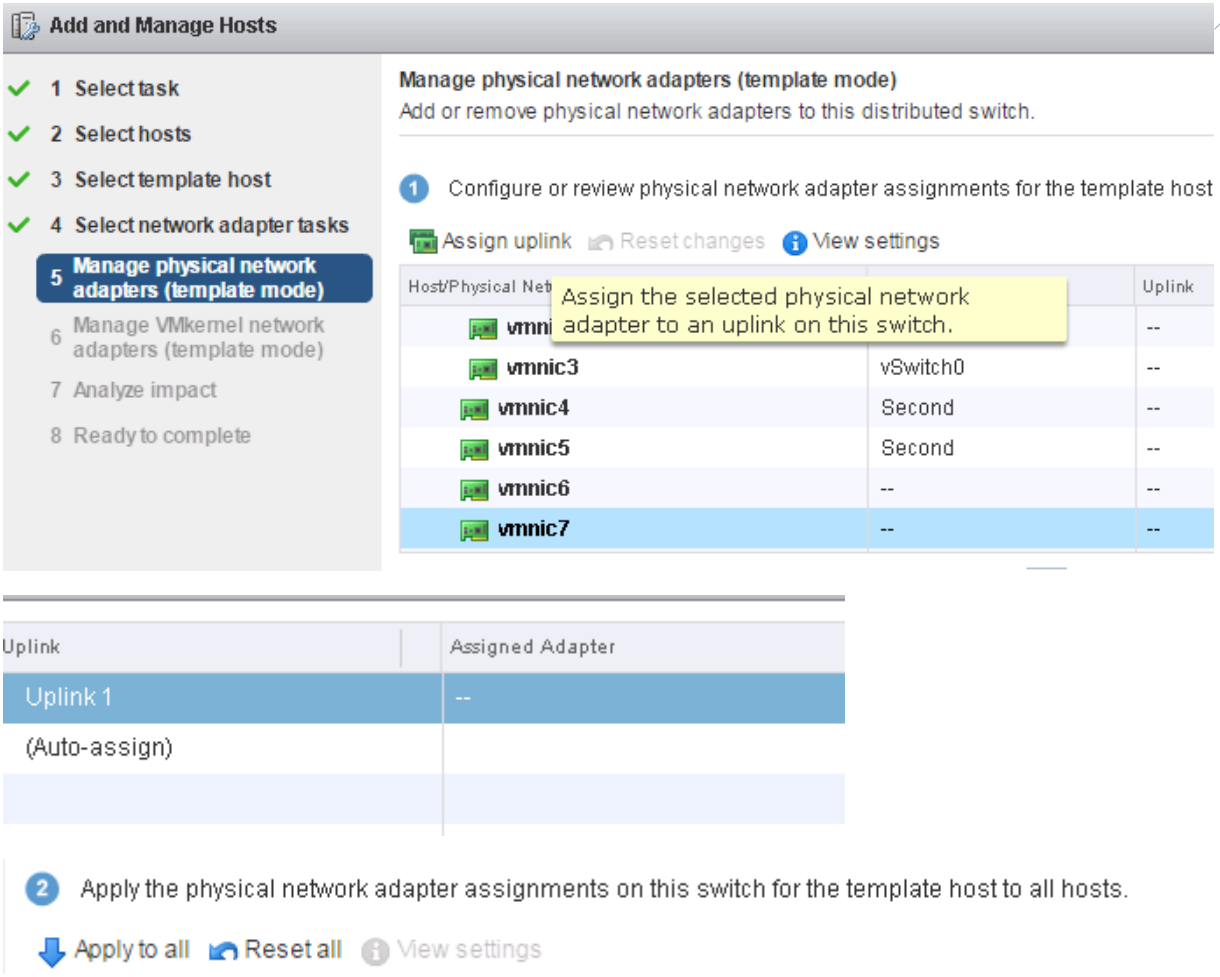
We can do this for all servers at one time

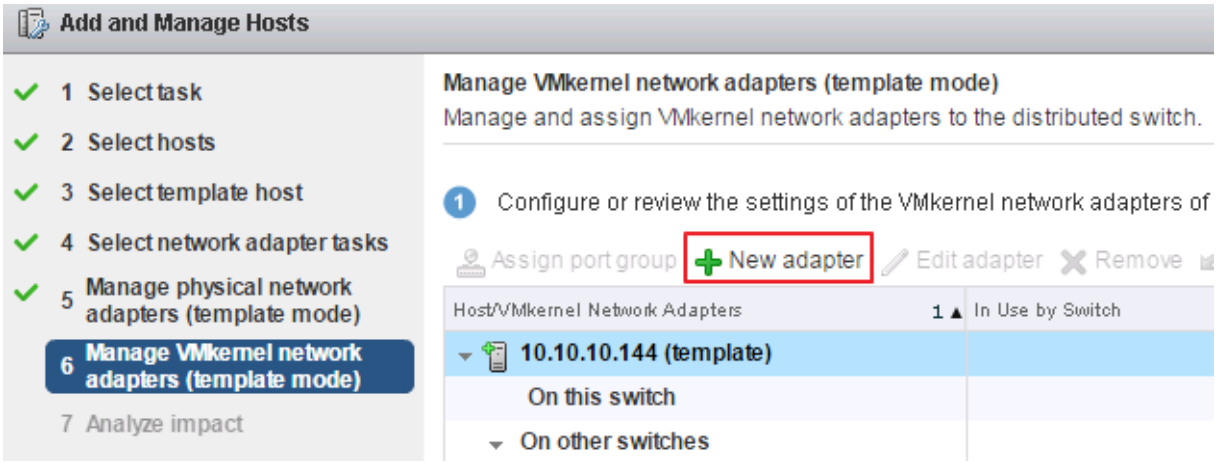


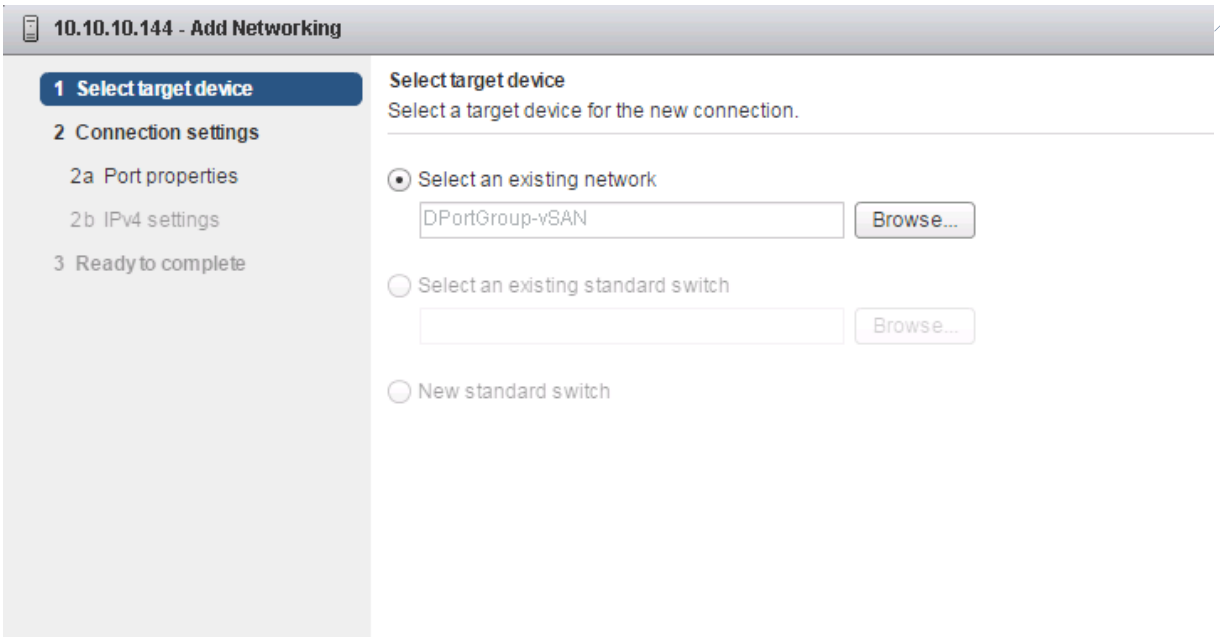




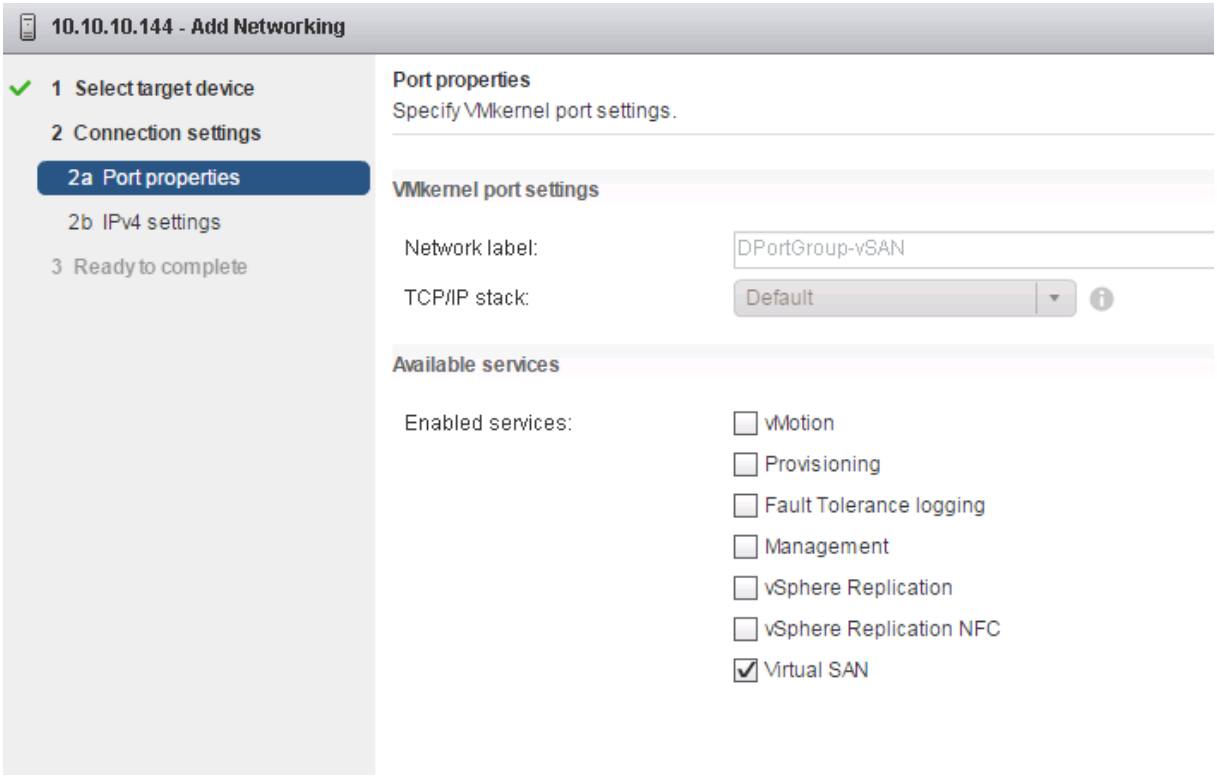
Choose your proper vmnic in our LAB this will be vmnic7

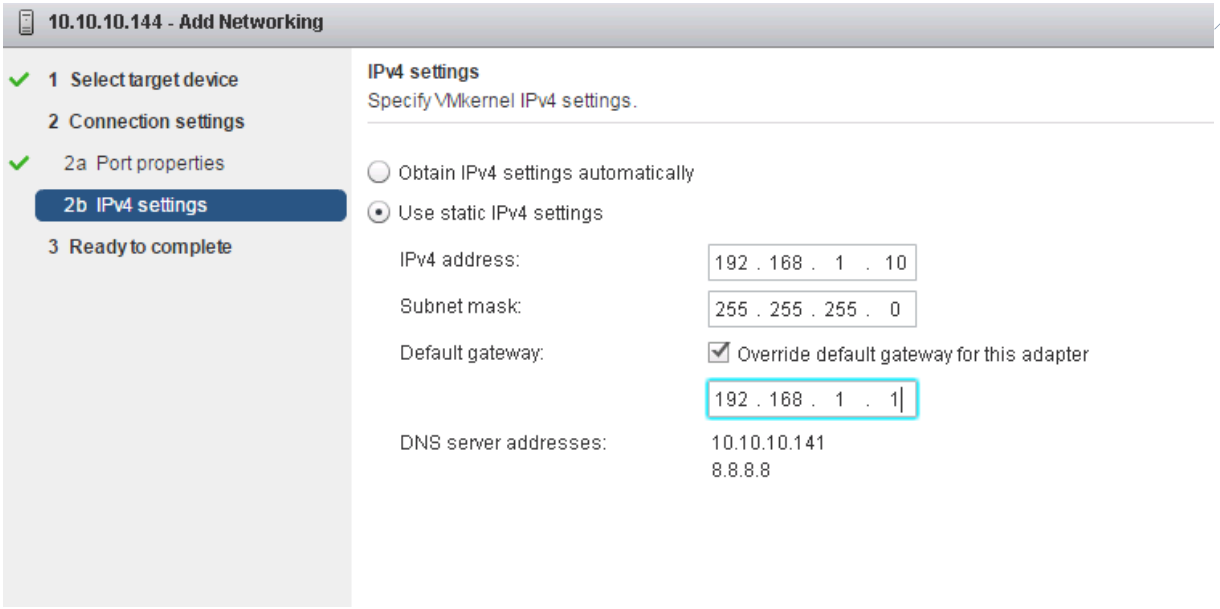

Add and Manage Hosts
1 Select task
2 Select hosts
3 Select template host
4 Select network adapter tasks
5 Manage physical network adapters (template mode)
6 Manage VMkernel network adapters (template mode)
7 Analyze impact
8 Ready to complete
Manage physical network adapters (template mode)
Add or remove physical network adapters to this distributed switch.
1 Configure or review physical network adapter assignments for the template host
Assign uplink
Reset changes
View settings
Host/Physical Net
Uplink
Assign the selected physical network adapter to an uplink on this switch.
vmnic3
vSwitch0
vmnic4
Second
vmnic5
Second
vmnic6
vmnic7
Uplink
Assigned Adapter
Uplink 1
(Auto-assign)
2 Apply the physical network adapter assignments on this switch for the template host to all hosts.
Apply to all
Reset all
View settings

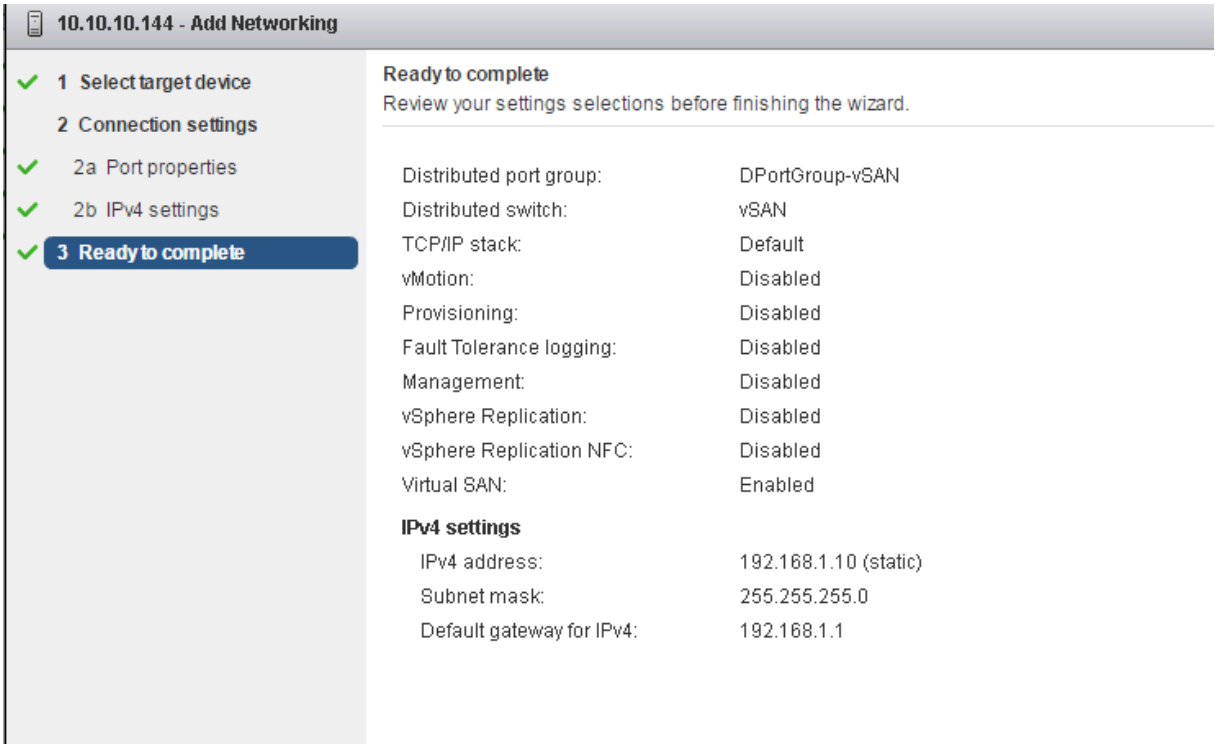

Add and Manage Hosts
1 Select task
2 Select hosts
3 Select template host
4 Select network adapter tasks
5 Manage physical network adapters (template mode)
6 Manage VMkernel network adapters (template mode)
7 Analyze impact
Manage VMkernel network adapters (template mode)
Manage and assign VMkernel network adapters to the distributed switch.
1 Configure or review the settings of the VMkernel network adapters of
Assign port group
New adapter
Edit adapter
Remove
Host/VMkernel Network Adapters
In Use by Switch
10.10.10.144 (template)
On this switch
On other switches



You need to mark vSAN as this will be used for our vSAN cluster




10.10.10.144 - Add Networking
1 Select target device
2 Connection settings
2a Port properties
2b IPv4 settings
3 Ready to complete
IPv4 settings
Specify VMkernel IPv4 settings.
Obtain IPv4 settings automatically
Use static IPv4 settings
IPv4 address: 192 . 168 . 1 . 10
Subnet mask: 255 . 255 . 255 . 0
Default gateway: Override default gateway for this adapter
192 . 168 . 1 . 1
DNS server addresses: 10.10.10.141
8.8.8.8


10.10.10.144 - Add Networking
1 Select target device
2 Connection settings
2a Port properties
2b IPv4 settings
3 Ready to complete
Ready to complete
Review your settings selections before finishing the wizard.
Distributed port group: DPortGroup-vSAN
Distributed switch: vSAN
TCP/IP stack: Default
vMotion: Disabled
Provisioning: Disabled
Fault Tolerance logging: Disabled
Management: Disabled
vSphere Replication: Disabled
vSphere Replication NFC: Disabled
Virtual SAN: Enabled
IPv4 settings
IPv4 address: 192.168.1.10 (static)
Subnet mask: 255.255.255.0
Default gateway for IPv4: 192.168.1.1

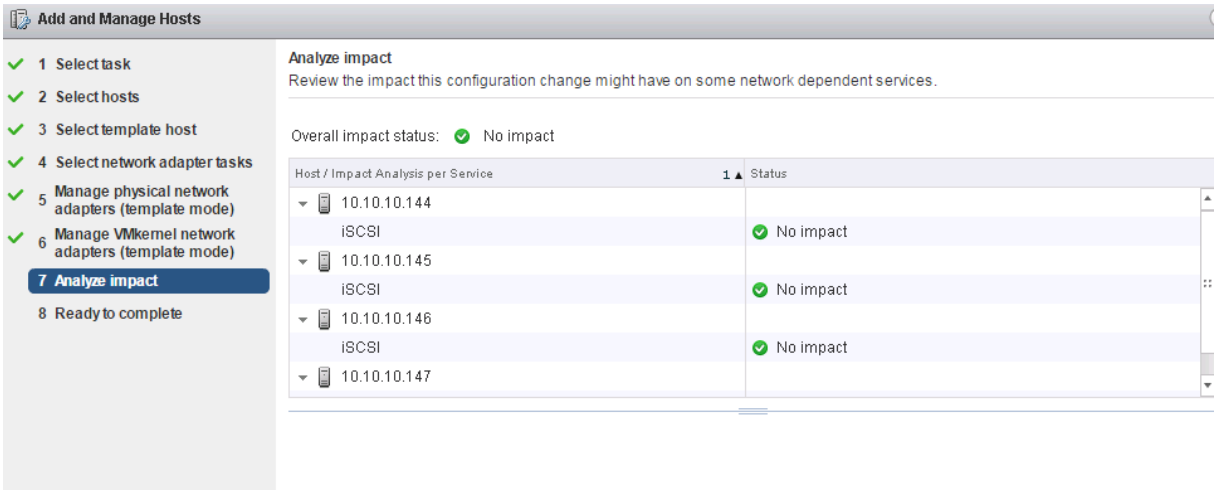
10.10.10.144 - Apply VMkernel network adapter configuration to other hosts

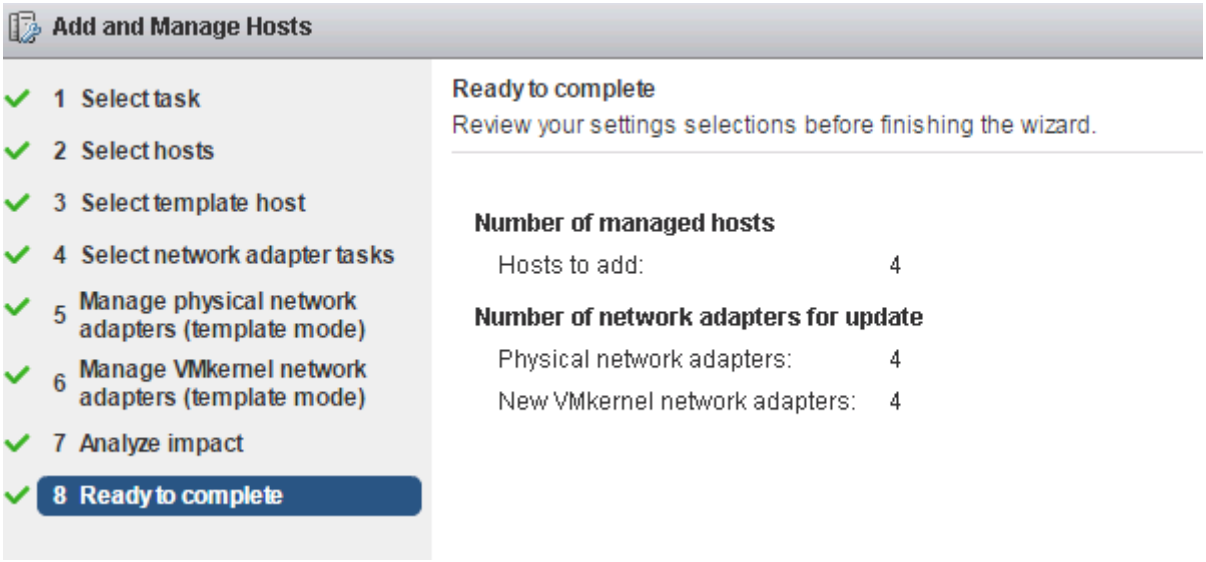
The other hosts will receive the VMkernel network adapter configuration of the host on this switch.

The following VMkernel network adapters on the template host use static IP addresses. In the IP settings for each adapter, enter as many IP addresses as the number of hosts on which the template settings will be applied.

vmk1 (new)

Port group:	DPortGroup-vSAN
Services:	Virtual SAN
IPv4 settings of the template adapter:	192.168.1.10 / 255.255.255.0
IPv4 addresses (3 required):	192.168.1.11,192.168.1.12,192.168.1.13

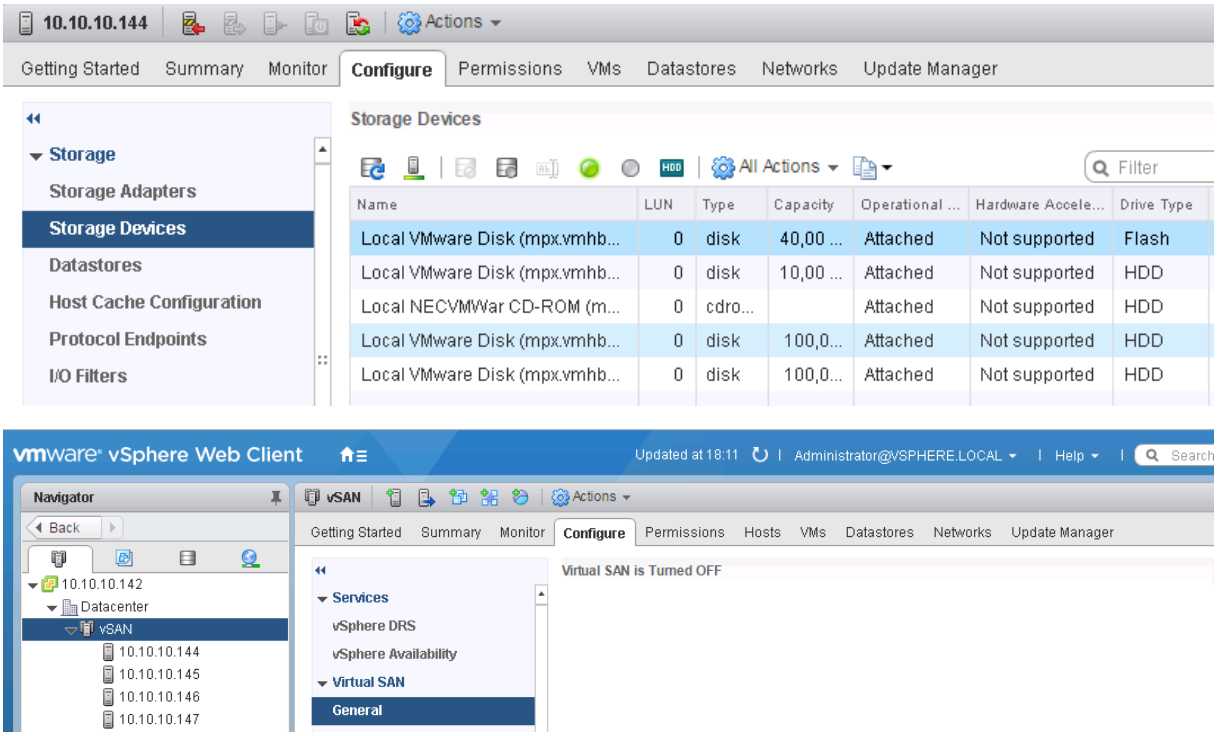


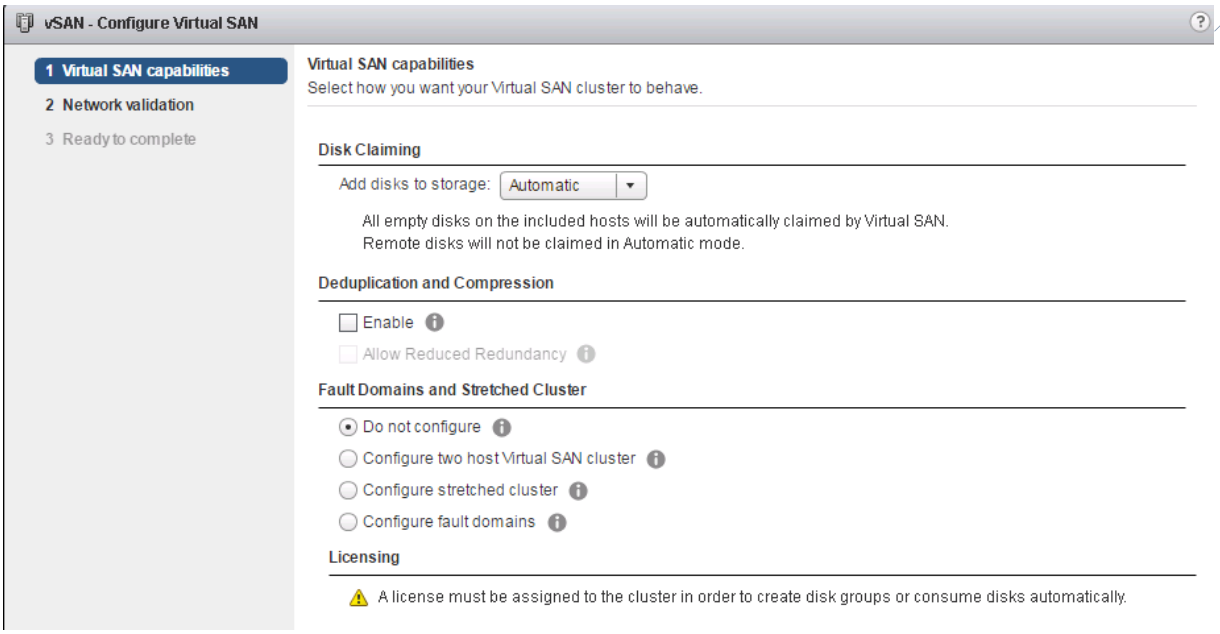


vSAN

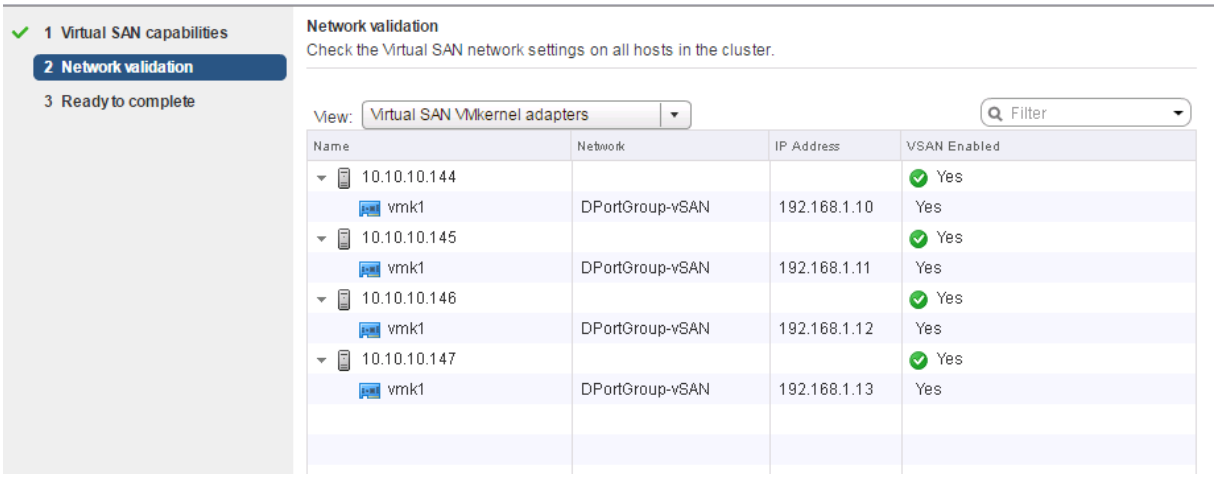
vSAN is radically simple, enterprise-class software-defined storage powering VMware hyper-converged infrastructure. Accelerate infrastructure modernization with VMware vSAN™ to make IT a strategic, cost-effective advantage for your company. By powering the leading Hyper-Converged Infrastructure (HCI) solutions, vSAN helps customers evolve their data center without risk, control IT costs and scale to tomorrow's business needs. vSAN, native to the market-leading hypervisor, delivers flash-optimized, secure storage for all of your critical vSphere workloads. vSAN is built on industry-standard x86 servers and components that help lower TCO by up to 50% versus traditional storage. It delivers the agility to easily scale IT and offers the industry's first native HCI encryption.New enhanced stretched clusters and intelligent, 1-click operations further lower costs for affordable site protection (50% less than leading traditional solutions) and simple day-to-day management. Seamless integration with VMware vSphere® and the entire VMware stack makes it the simplest storage platform for virtual machines— whether running business-critical databases, virtual desktops or next-generation applications. (vmware.com)

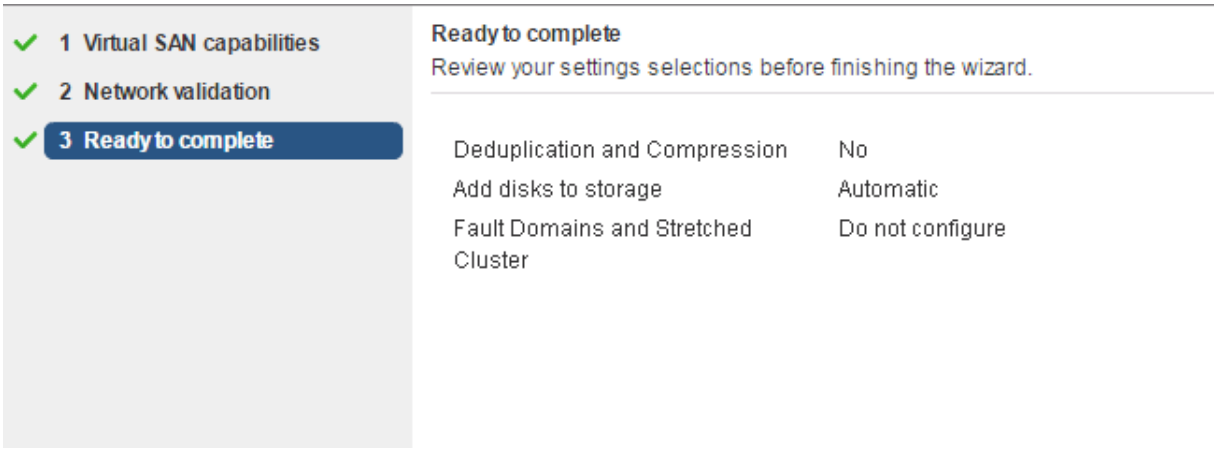
On lab we can mark our disk as flash, so we don't need to buy SSD drives for cache.





Choose previously created switch





On-disk Format Version

Disk format version	All 12 disks on version 3.0

Disk Groups

Disk Groups | Disks

Filter

Disk Group	Disks in Use	State	Virtual
10.10.10.144	3 of 3	Connected	Health
Disk group (0000000000766d686261303a313a30)	3	Mounted	Health
10.10.10.145	3 of 3	Connected	Health
Disk group (0000000000766d686261303a313a30)	3	Mounted	Health
10.10.10.146	3 of 3	Connected	Health
Disk group (0000000000766d686261303a313a30)	3	Mounted	Health
10.10.10.147	3 of 3	Connected	Health

8 items Export Copy

10.10.10.144: Disks

All Actions Show: In use (3)

Name	Drive Type	Disk Tier	Capacity	Virt
Local VMware Disk (mpx.vmhba0:C0:T1:L0)	Flash	Cache	40,00 GB	H
Local VMware Disk (mpx.vmhba0:C0:T3:L0)	HDD	Capacity	100,00 GB	H
Local VMware Disk (mpx.vmhba0:C0:T2:L0)	HDD	Capacity	100,00 GB	H

Health Service

Edit settings ...

Health service status	Enabled
Health service version	6.5.0.0
Health check interval	60 minutes

HCL Database

Update from file... Get latest version online

Last updated	Today

Support Assistant

Upload Support Bundles to Service Request...

Last upload time	--

Performance Service is Turned ON

Turn off Edit storage policy ...

Stats object health	Healthy
Stats object UUID	60ee1159-77e9-4d0e-0973-0050568c1c28
Stats object storage policy	Virtual SAN Default Storage Policy
Compliance status	Compliant

vsanDatastore	Normal	vsan		791,94 GB

vRealize Operation Manager

Now we will add two tools from vRealize Suite before we will be adding NSX and we finally get vRealize Automation

VMware vRealize™ Operations Manager delivers intelligent operations management with application-to-storage visibility across physical, virtual, and cloud infrastructures. Using policy-based automation, operations teams automate key processes and improve IT efficiency.(vmware.com)

Prerequisites

Username: admin
Password: P@ssw0rd

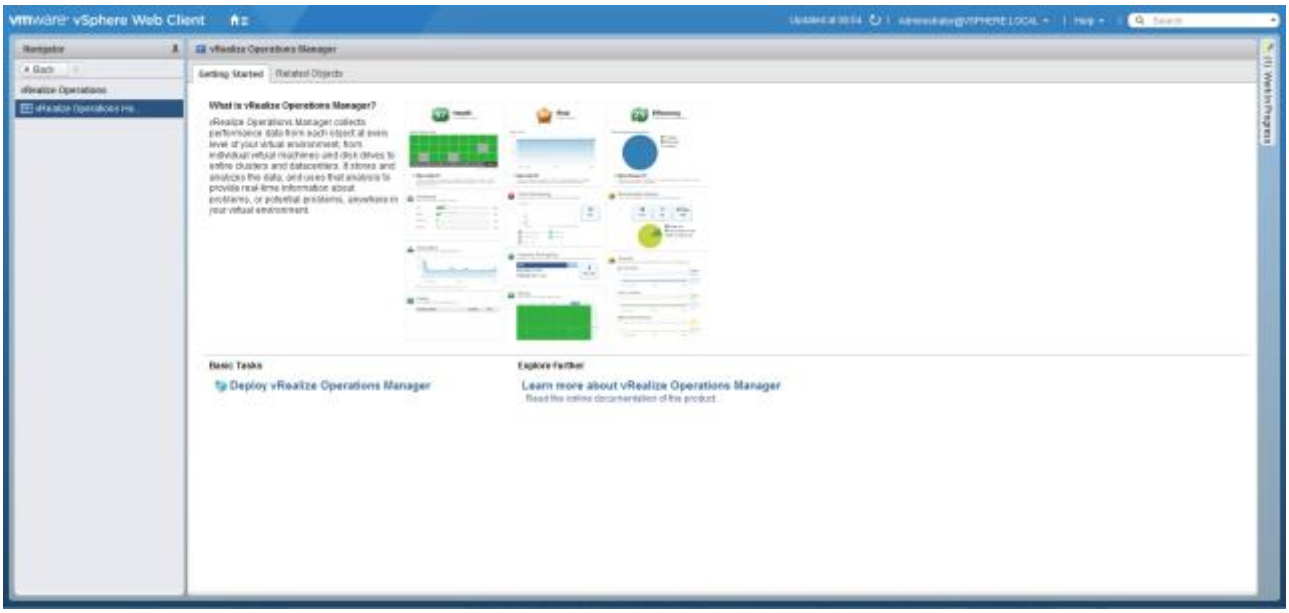
Username: Administrator@vsphere.local
Password: P@ssw0rd

Build

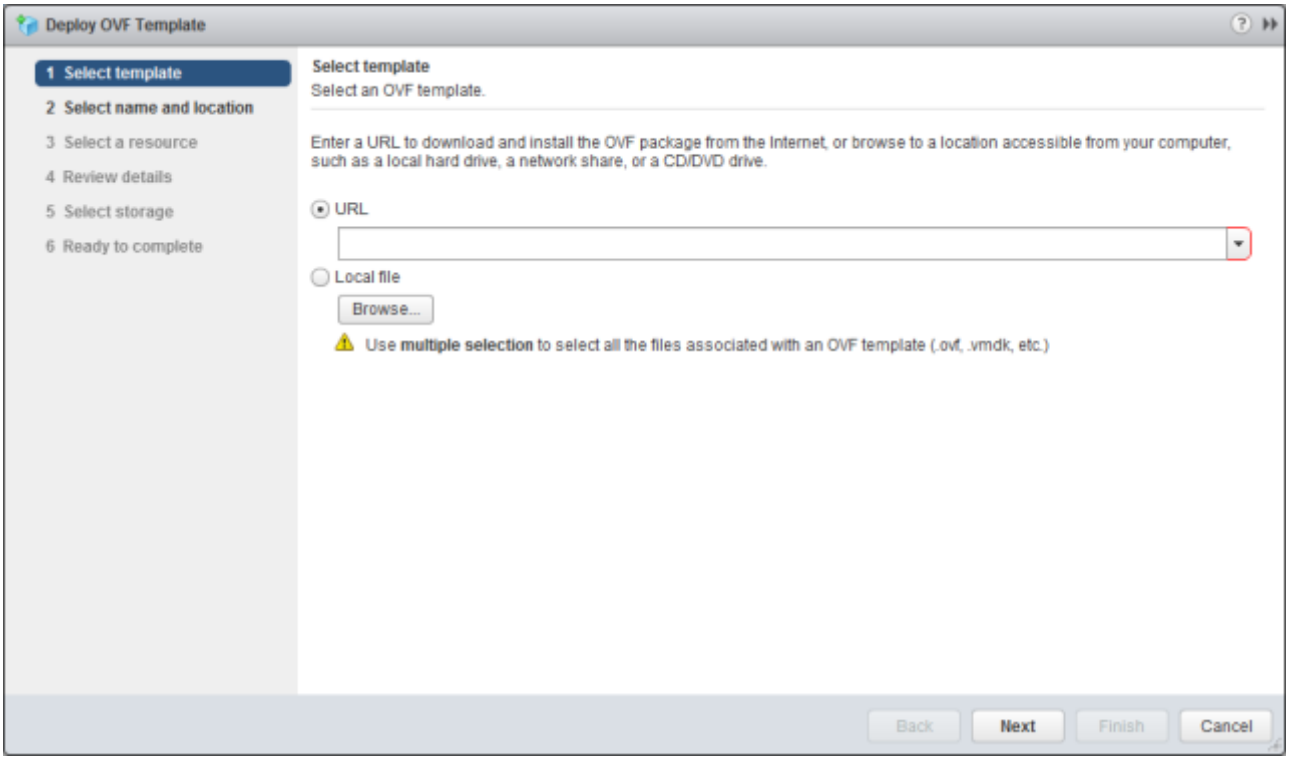
OS	vRealize Operation Manager Appliance	
RAM	8GB	
CPU	2vCPU	
HDD		
Network	1 NIC	10.10.10.152

Deploy OVA

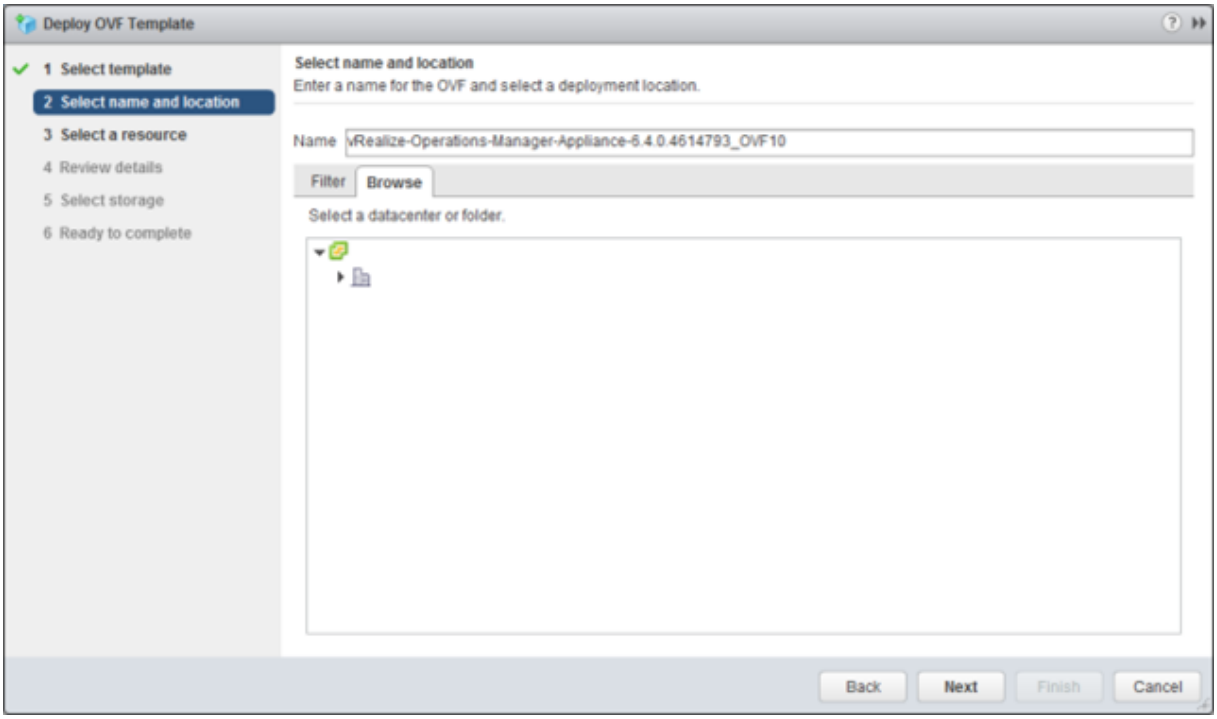
Navigate to the vSphere web client home page, click **vRealize Operations Manager** and select **Deploy vRealize Operations Manager**.



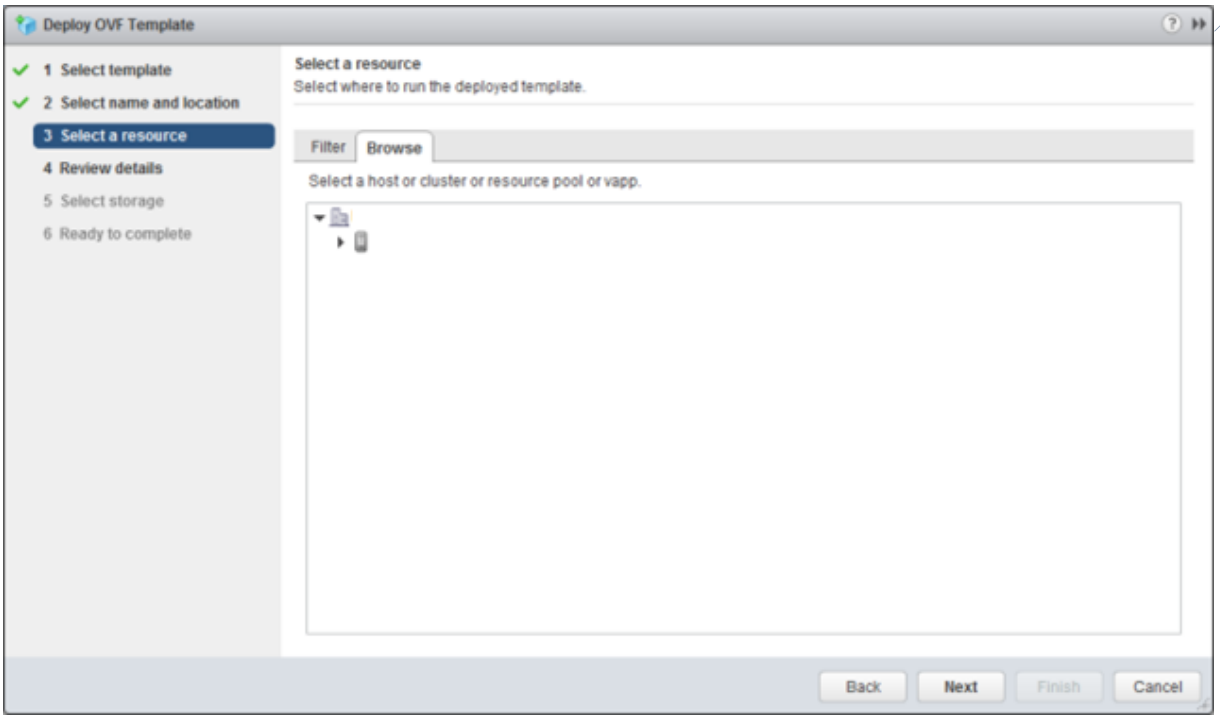
The OVF template wizard will open. Browse to the location of the OVA file downloaded earlier and click Next.



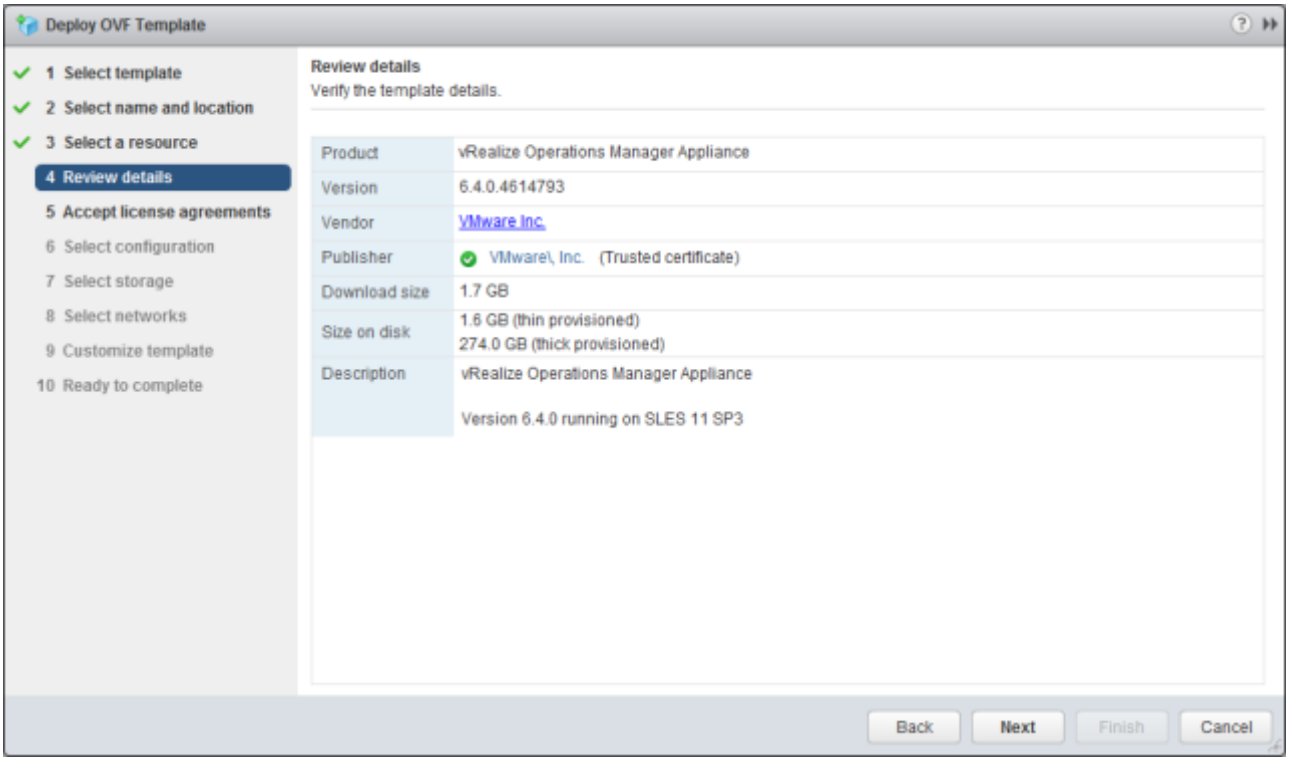
Enter a name for the virtual appliance, and select a location. Click **Next**.



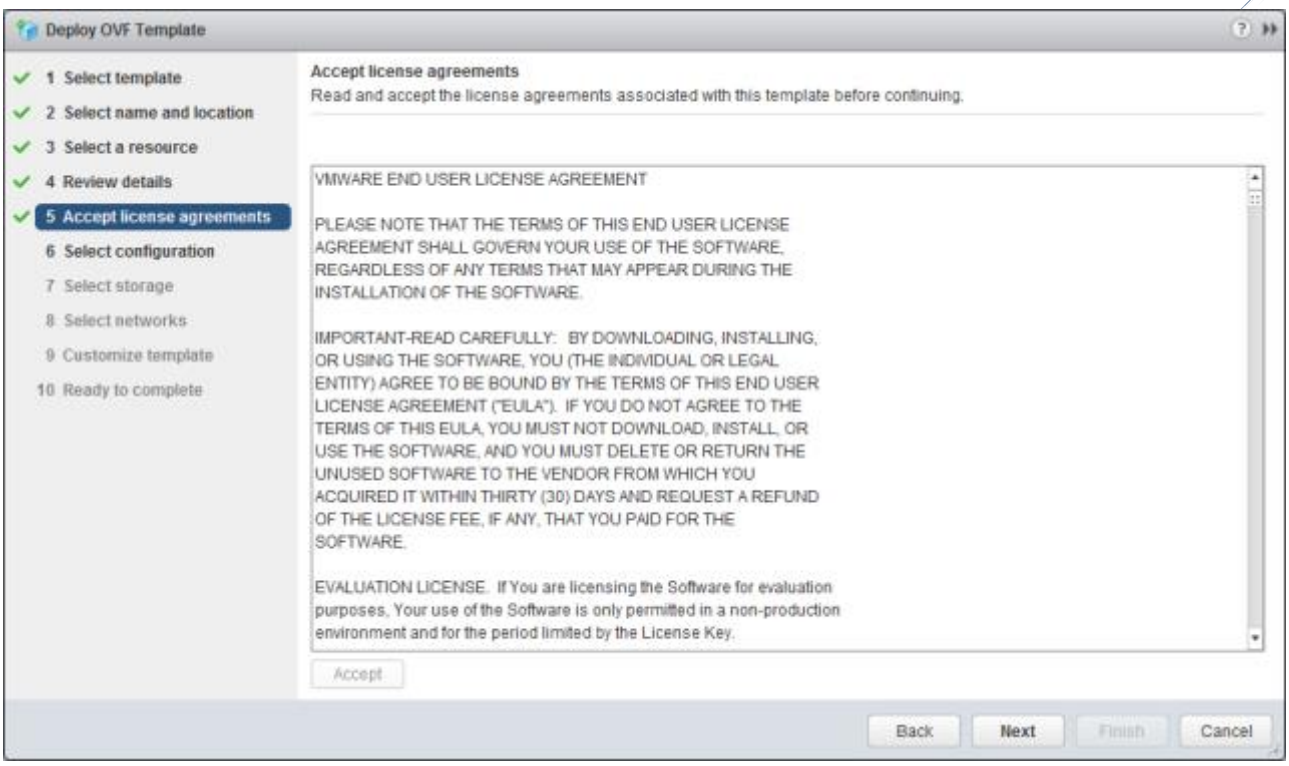
Select the host or cluster compute resources for the virtual appliance and click **Next**.



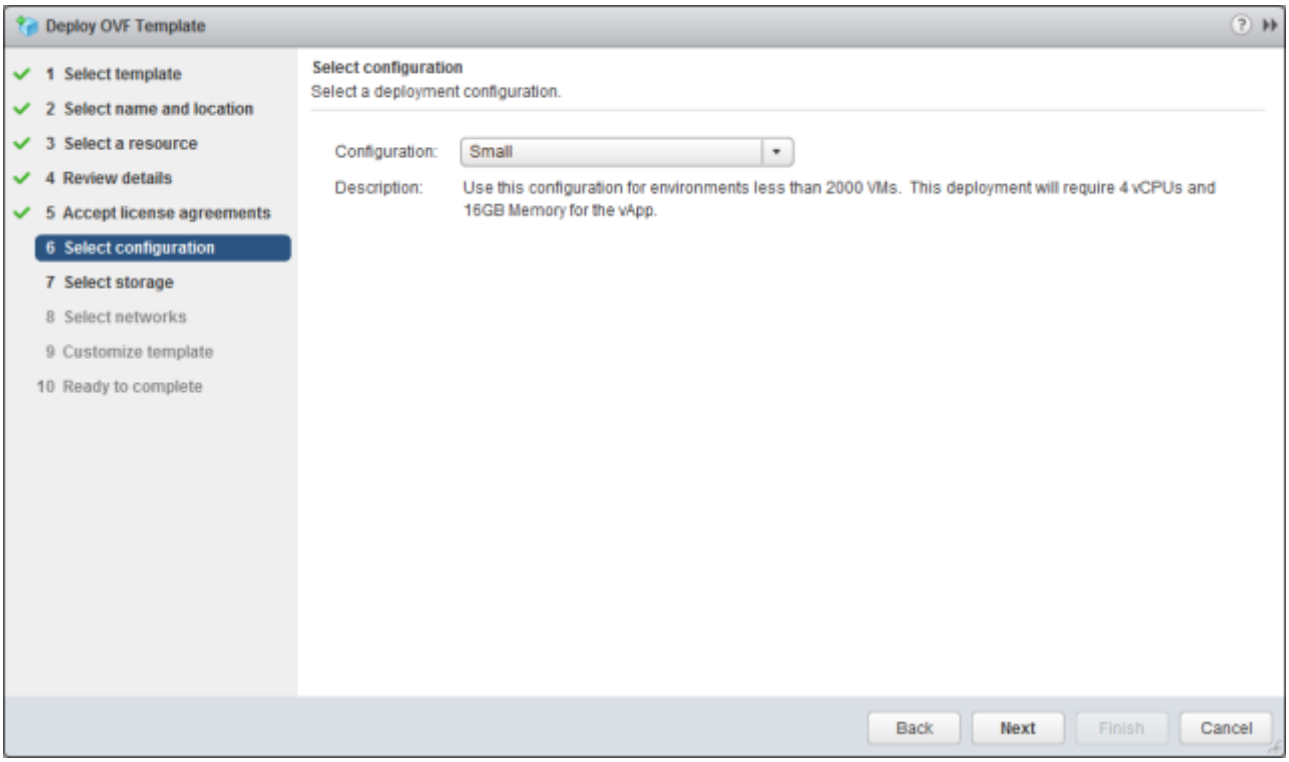
Review the details of the OVA, click **Next**.



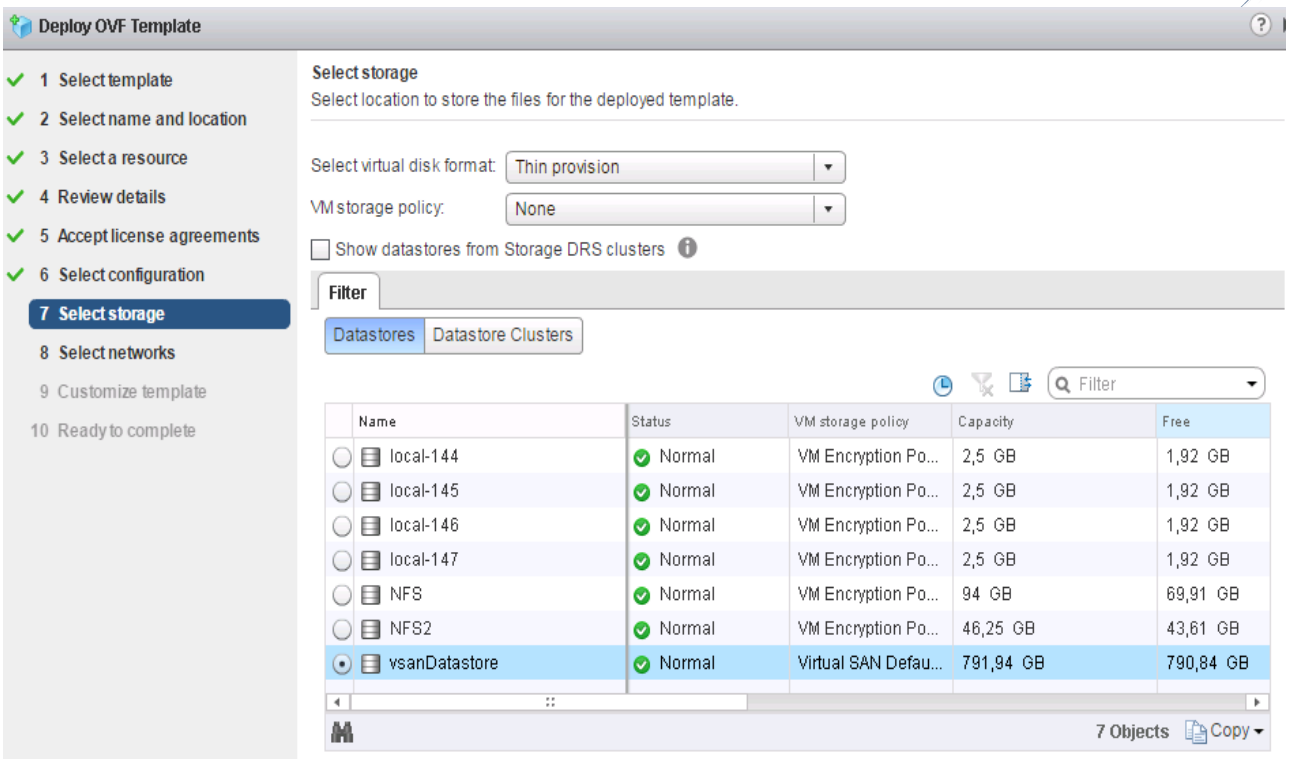
Accept the EULA and click **Next**.



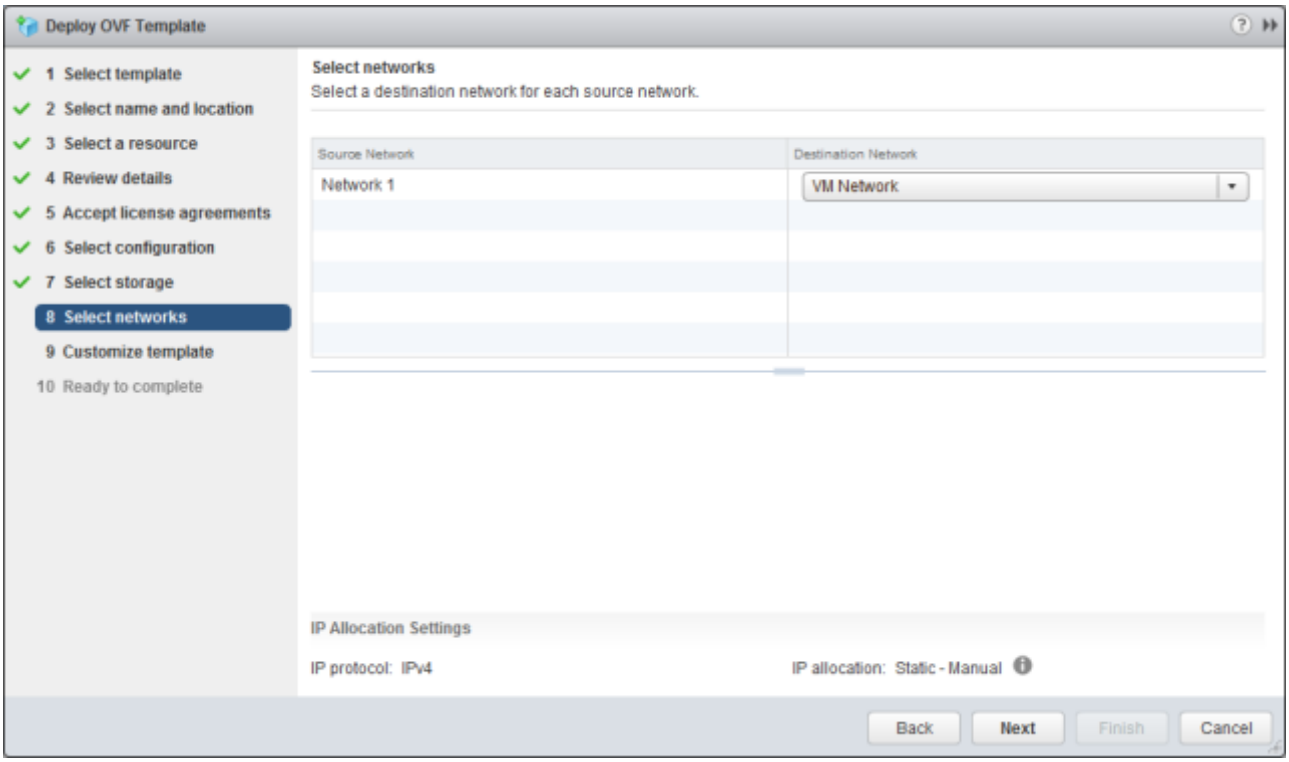
Select the configuration size based on the considerations listed above, then click **Next**.



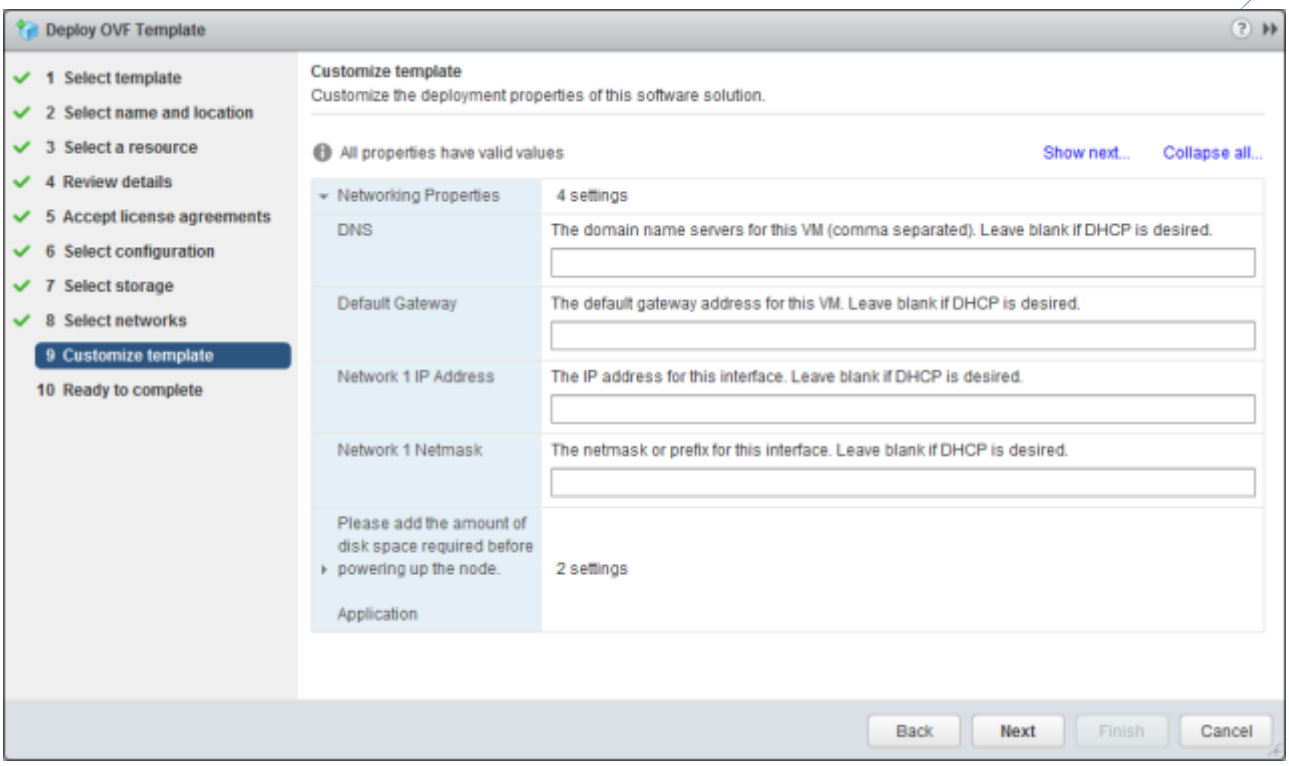
Select the storage for the virtual appliance, click **Next**.



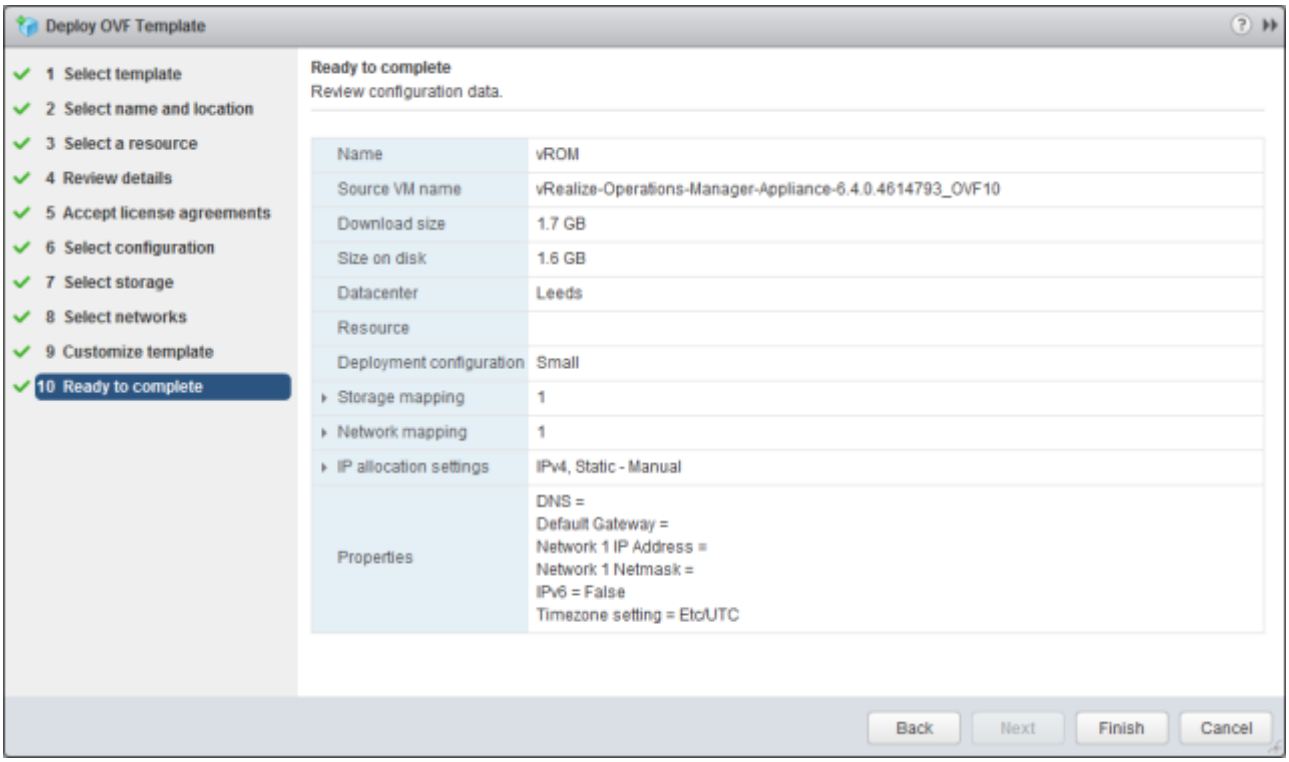
Select the network for the virtual appliance, click **Next**.



Configure the virtual appliance network settings, click **Next**.

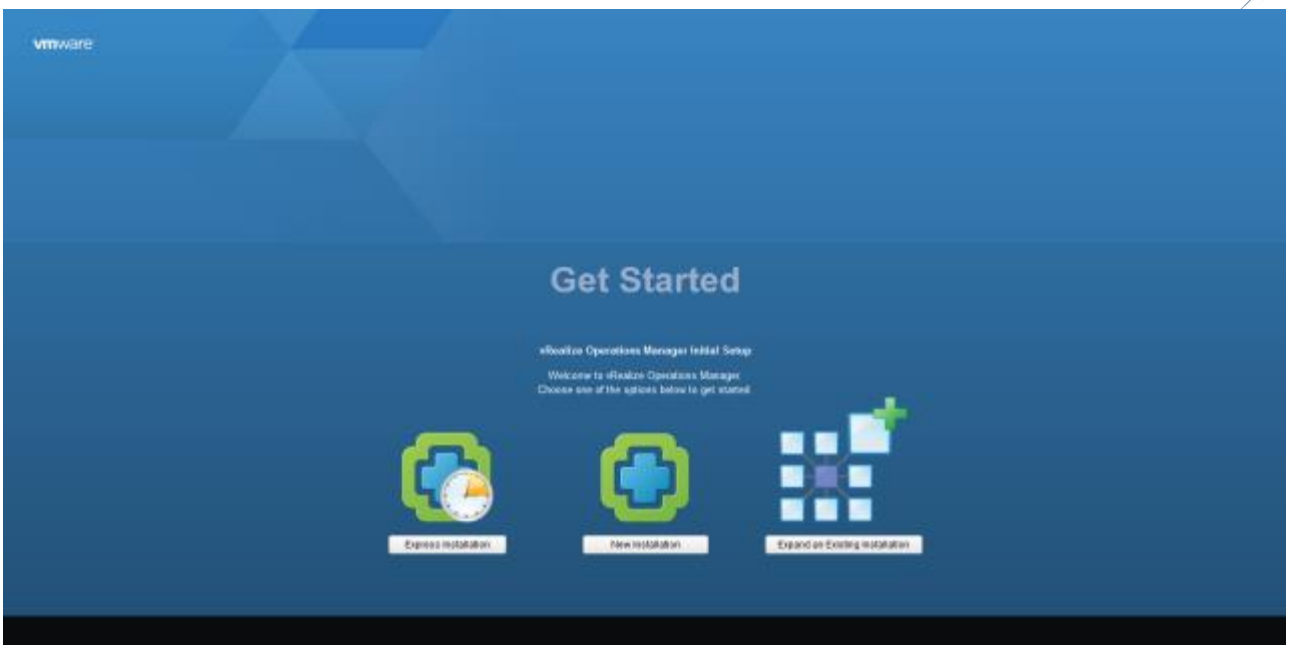


Click **Finish** on the final screen to begin deploying the virtual appliance.

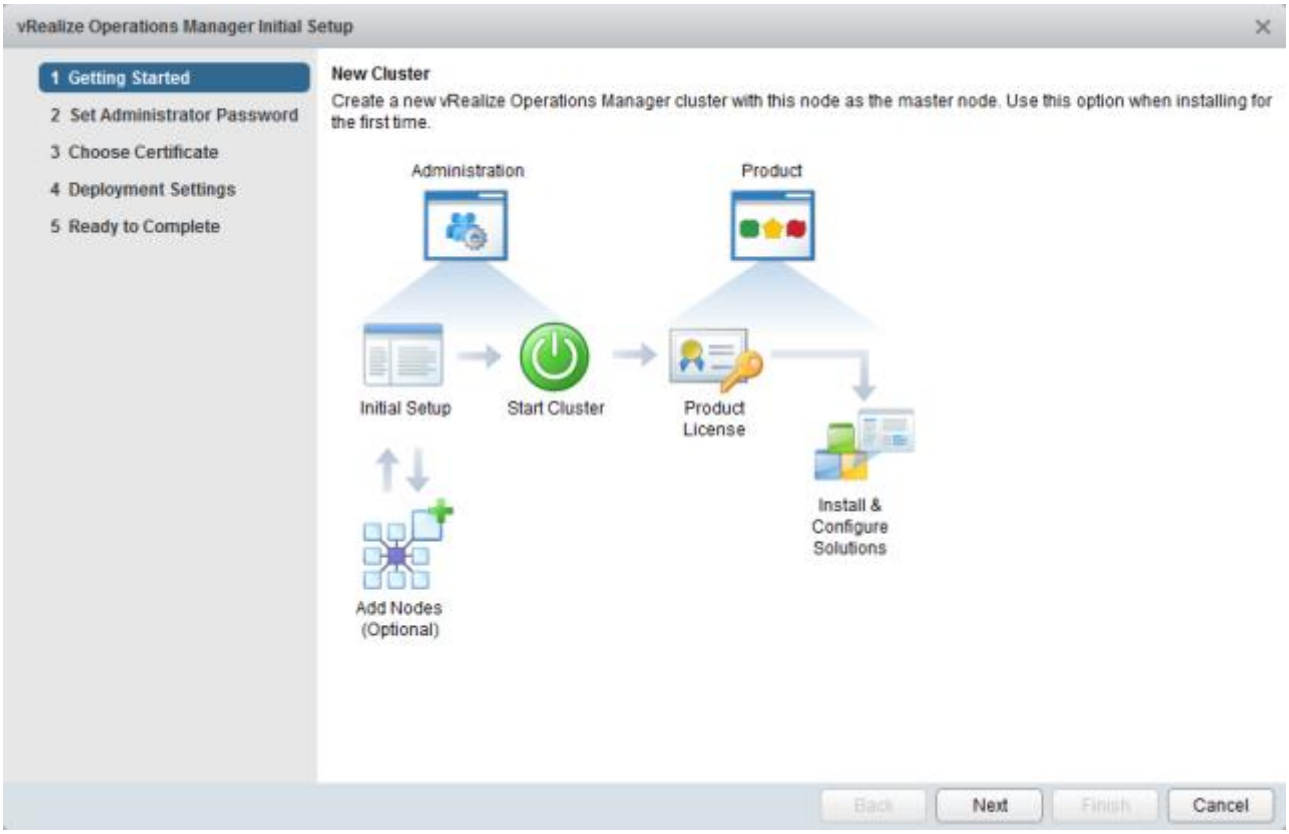


Setup

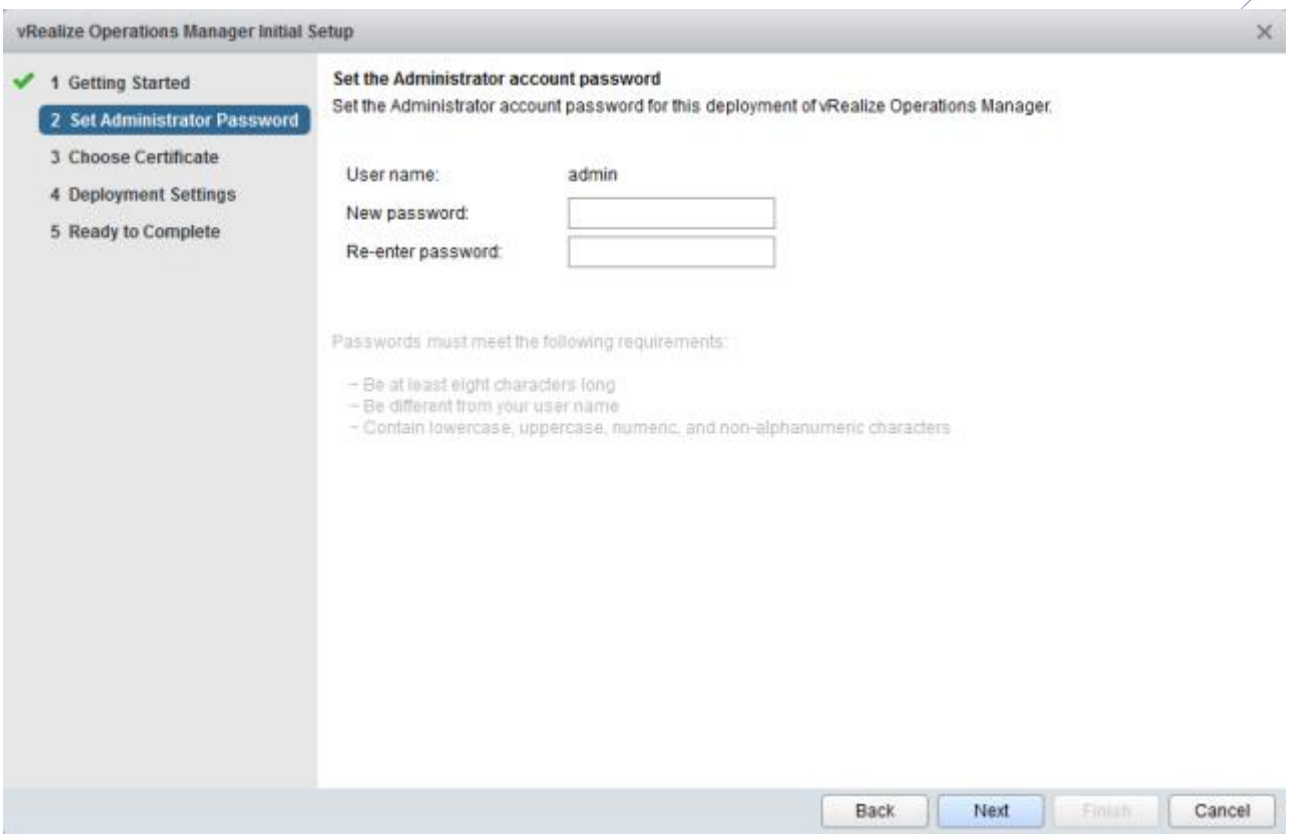
Once the virtual appliance has been deployed and is powered on, open a web browser to the FQDN or IP address configured during deployment. Select **New Installation**.



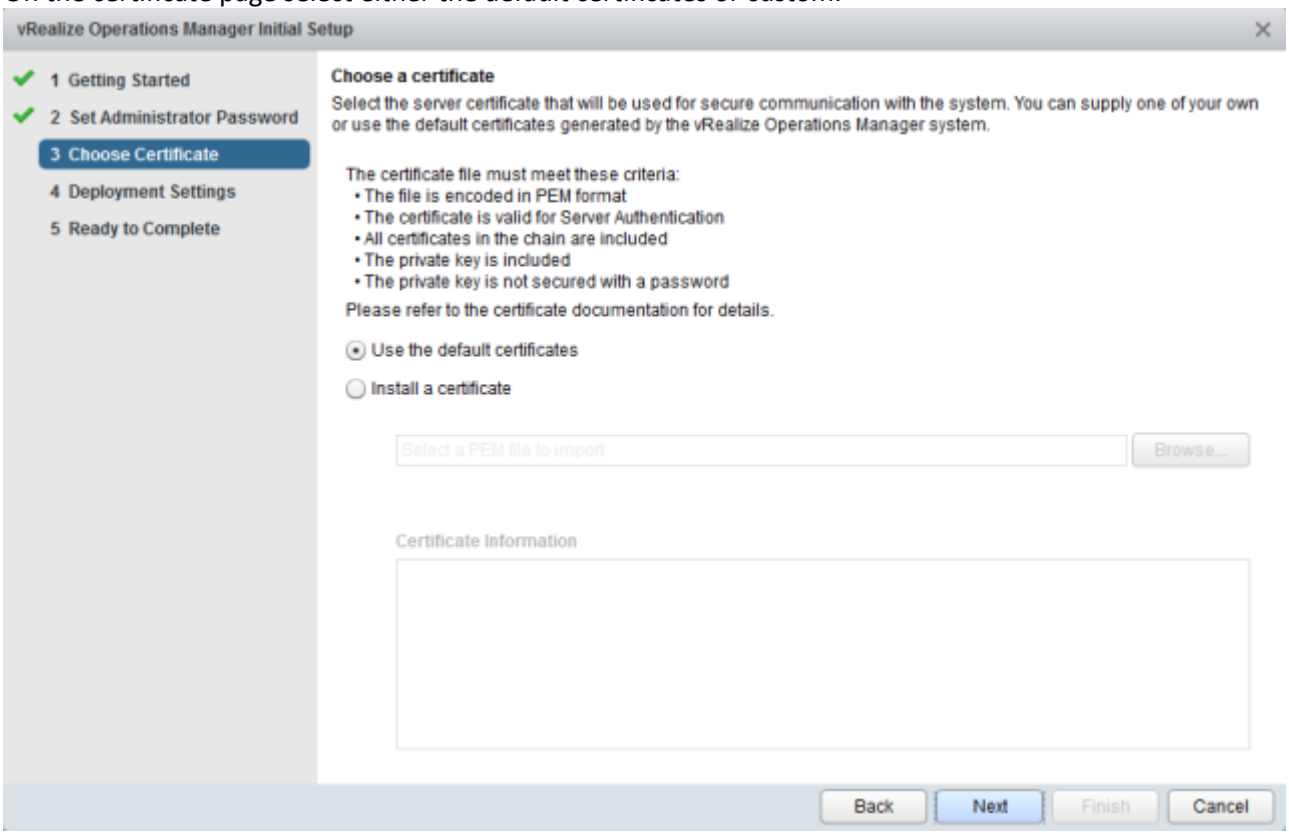
Click **Next** to begin the setup wizard.



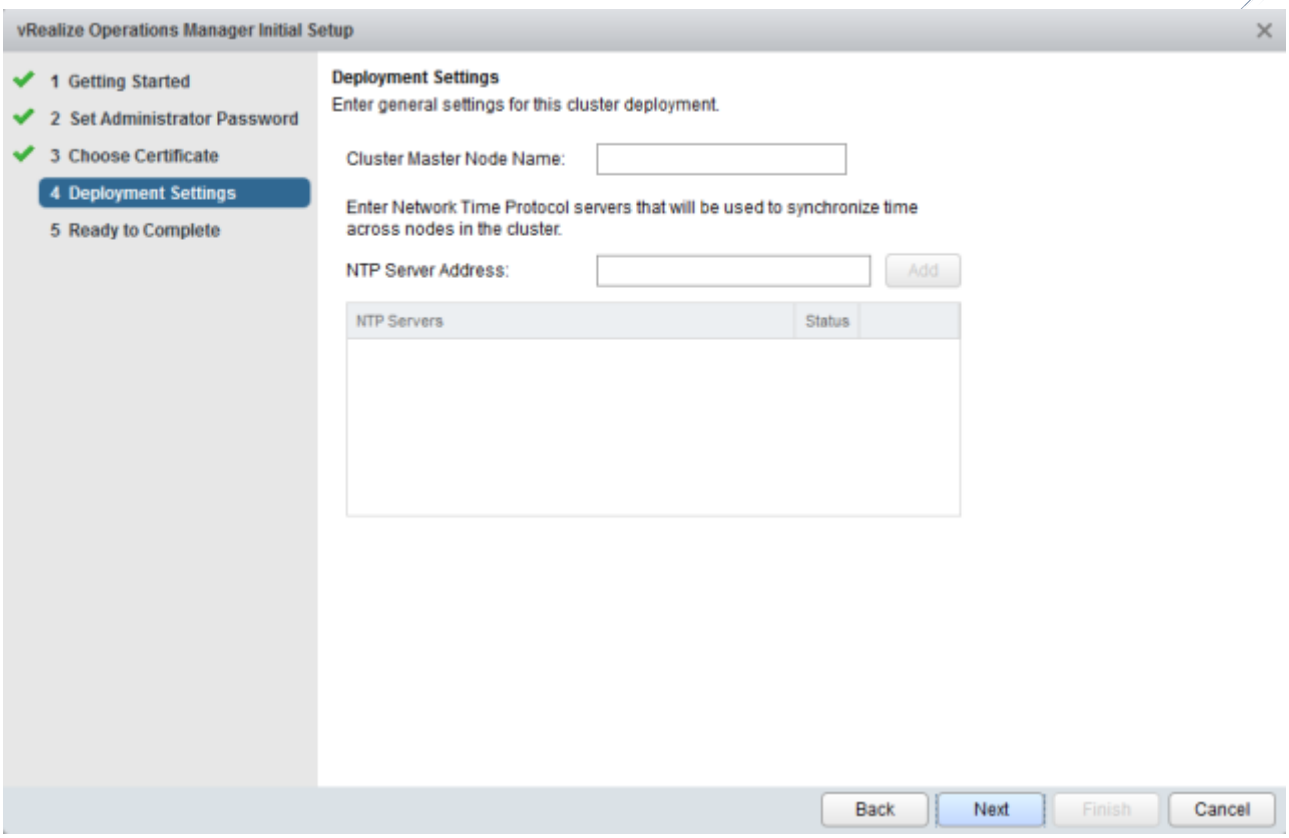
Configure a password for the admin account and click **Next**.



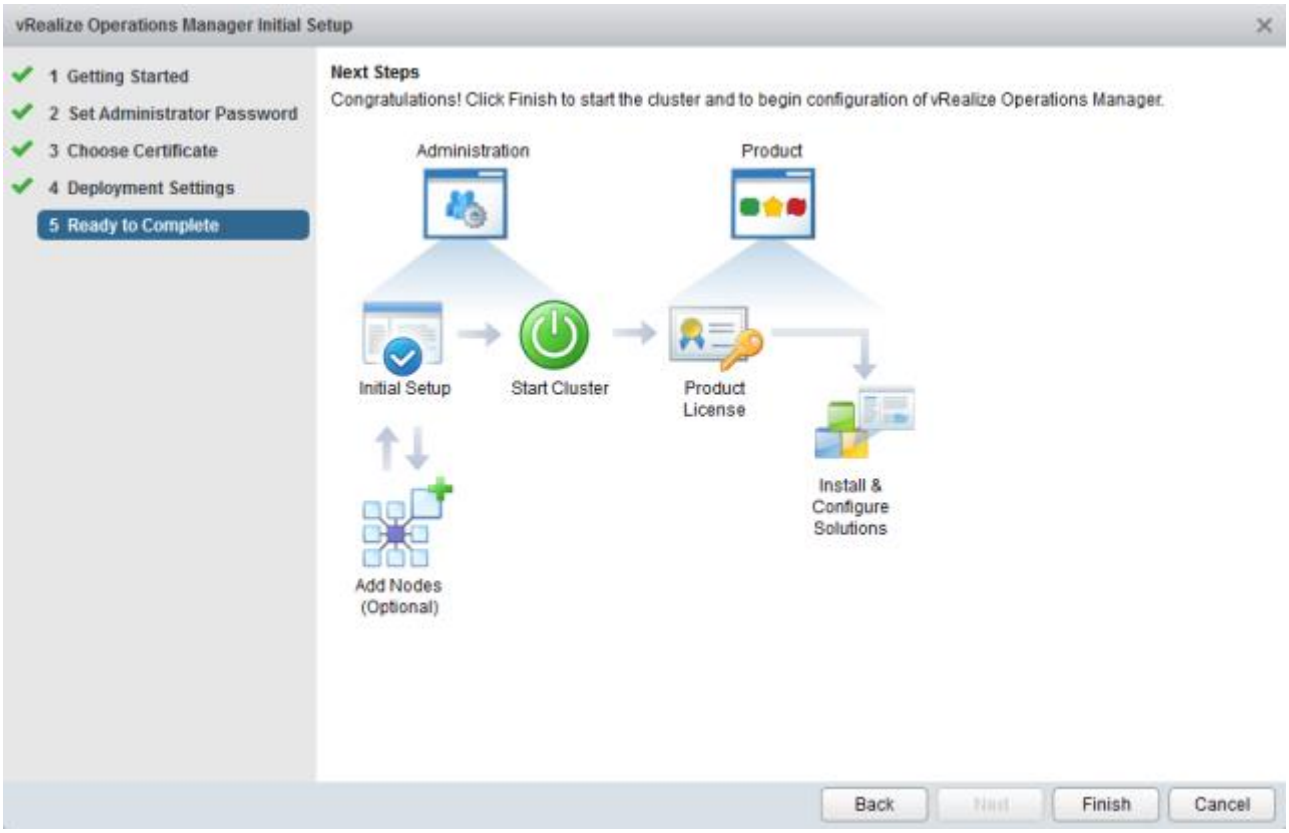
On the certificate page select either the default certificates or custom.



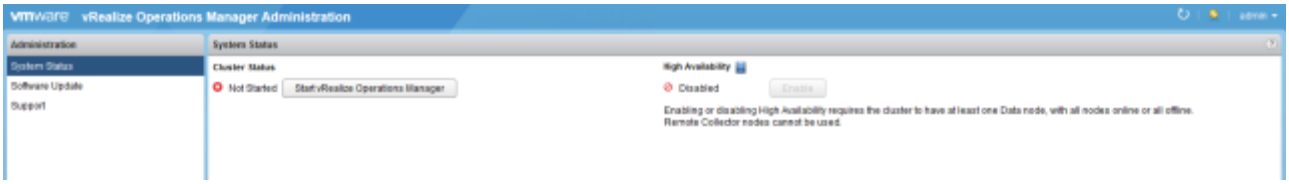
Enter the host name for the master node and an NTP server, click **Next**.



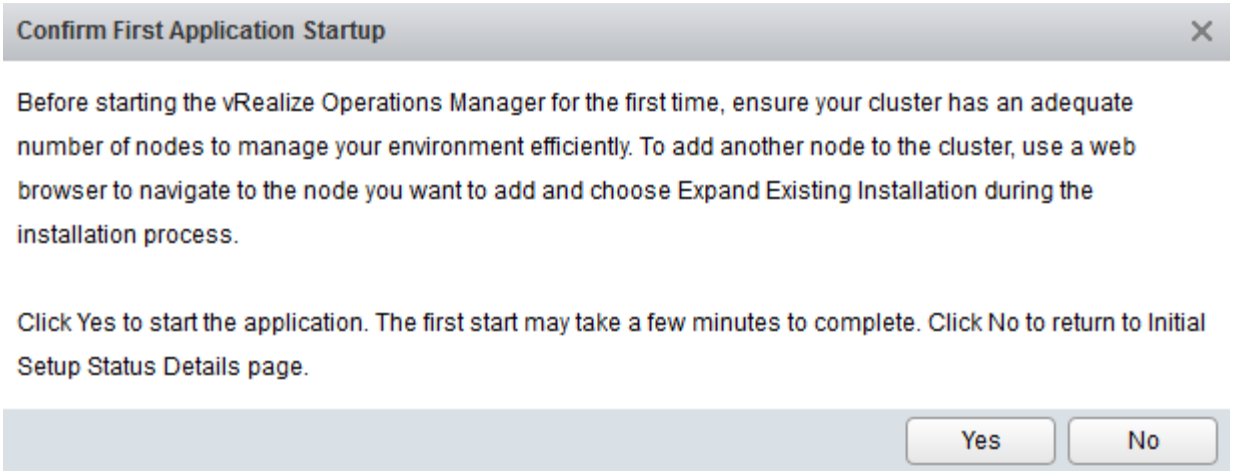
Click **Finish**.



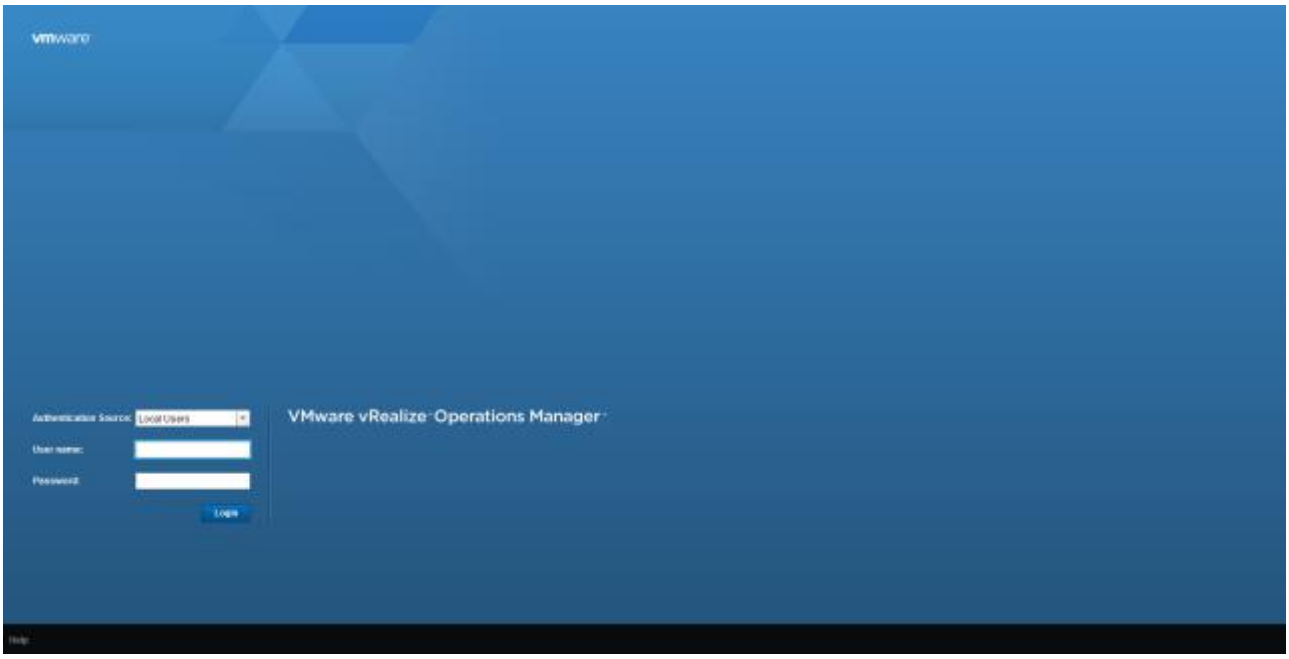
Since we are deploying a single node cluster we will now click **Start vRealize Operations Manager**. Depending on the size of the cluster it may take 10-30 minutes to fully start up.



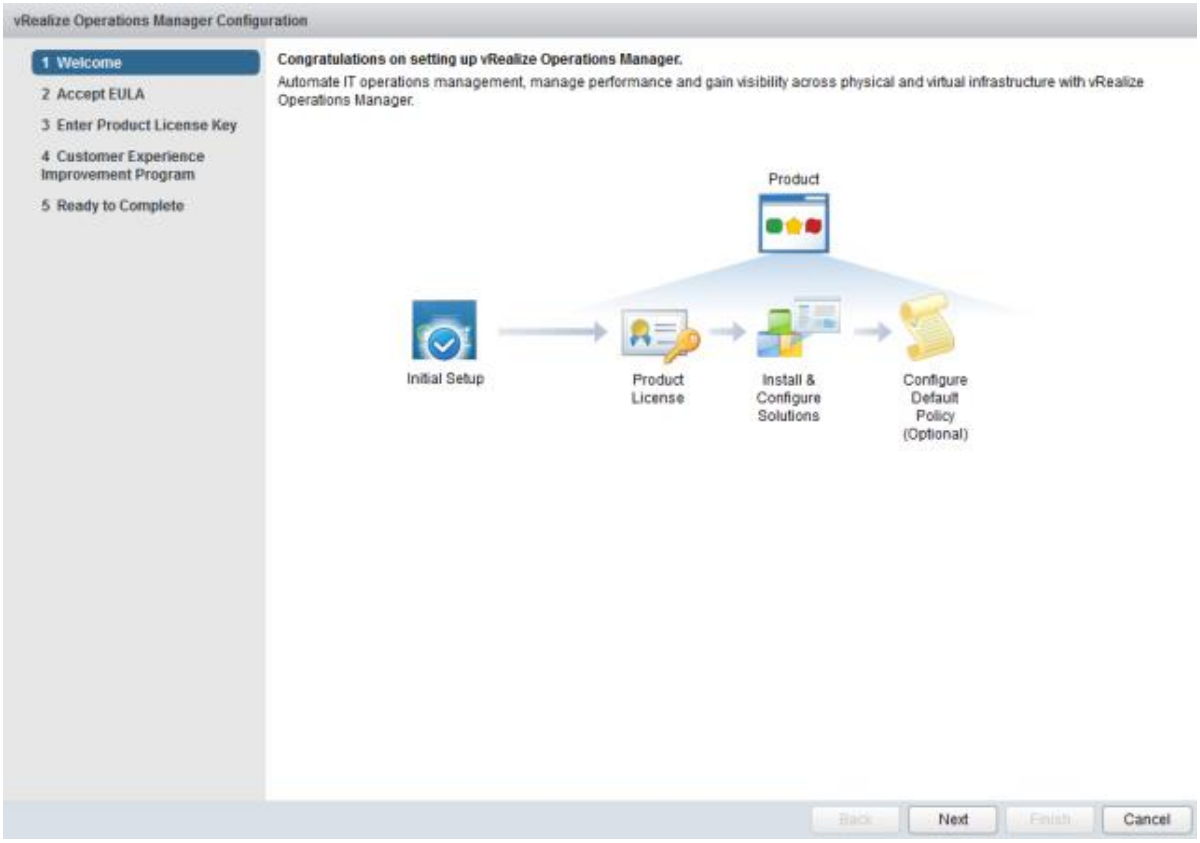
Confirm that the cluster has adequate nodes for the environment and click **Yes** to start up the application.



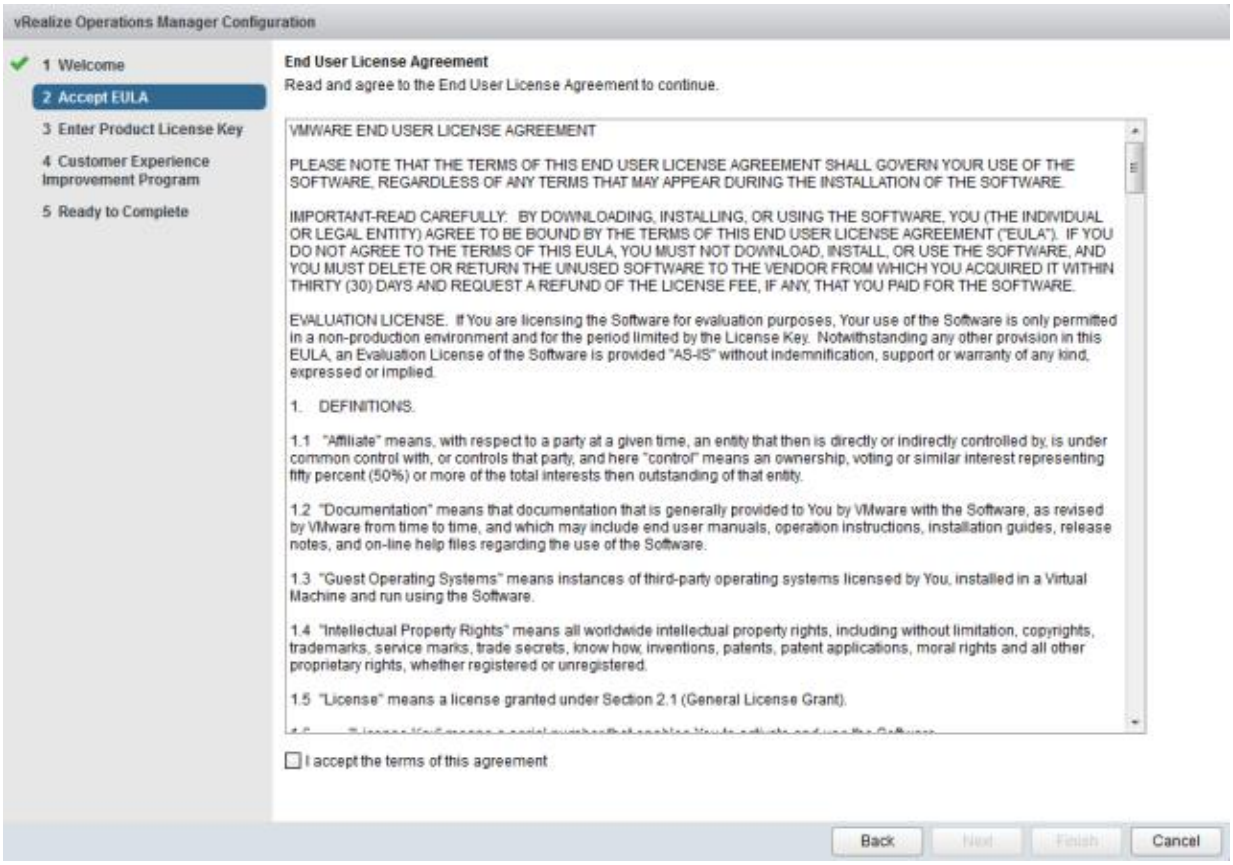
After the cluster has started you will be diverted to the user interface. Log in with the admin details configured earlier.



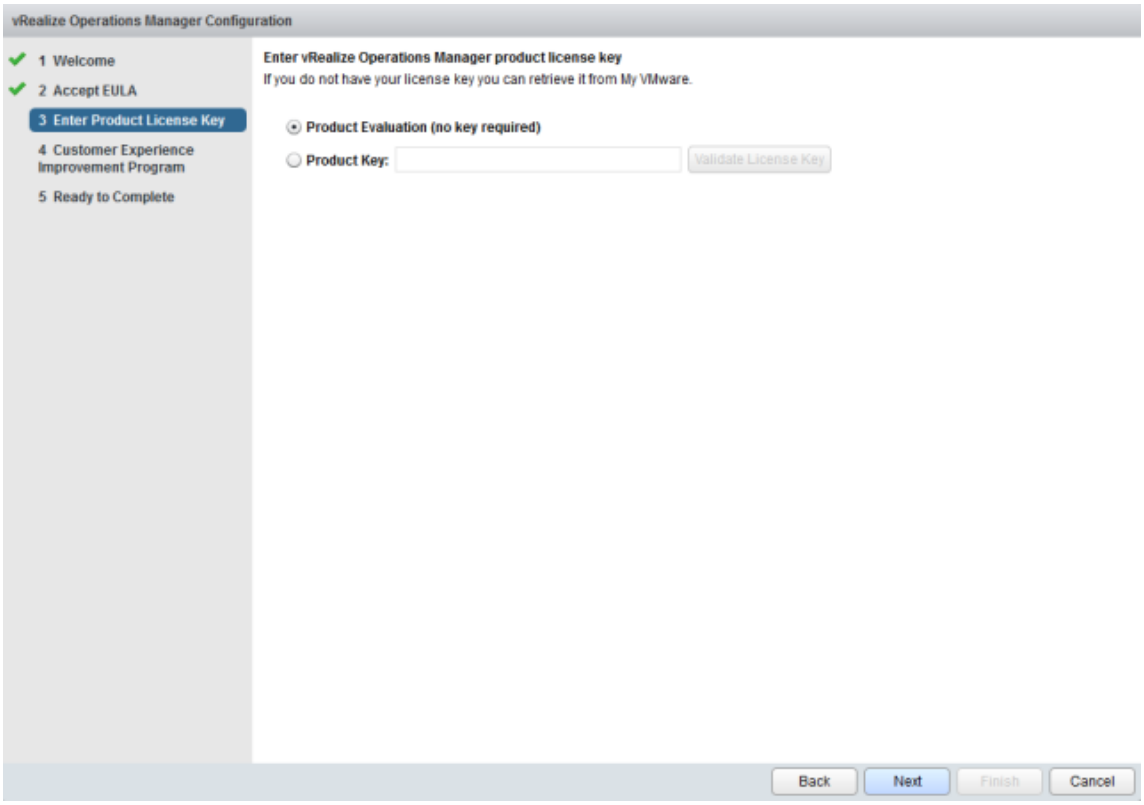
The configuration wizard will automatically start, click **Next**.



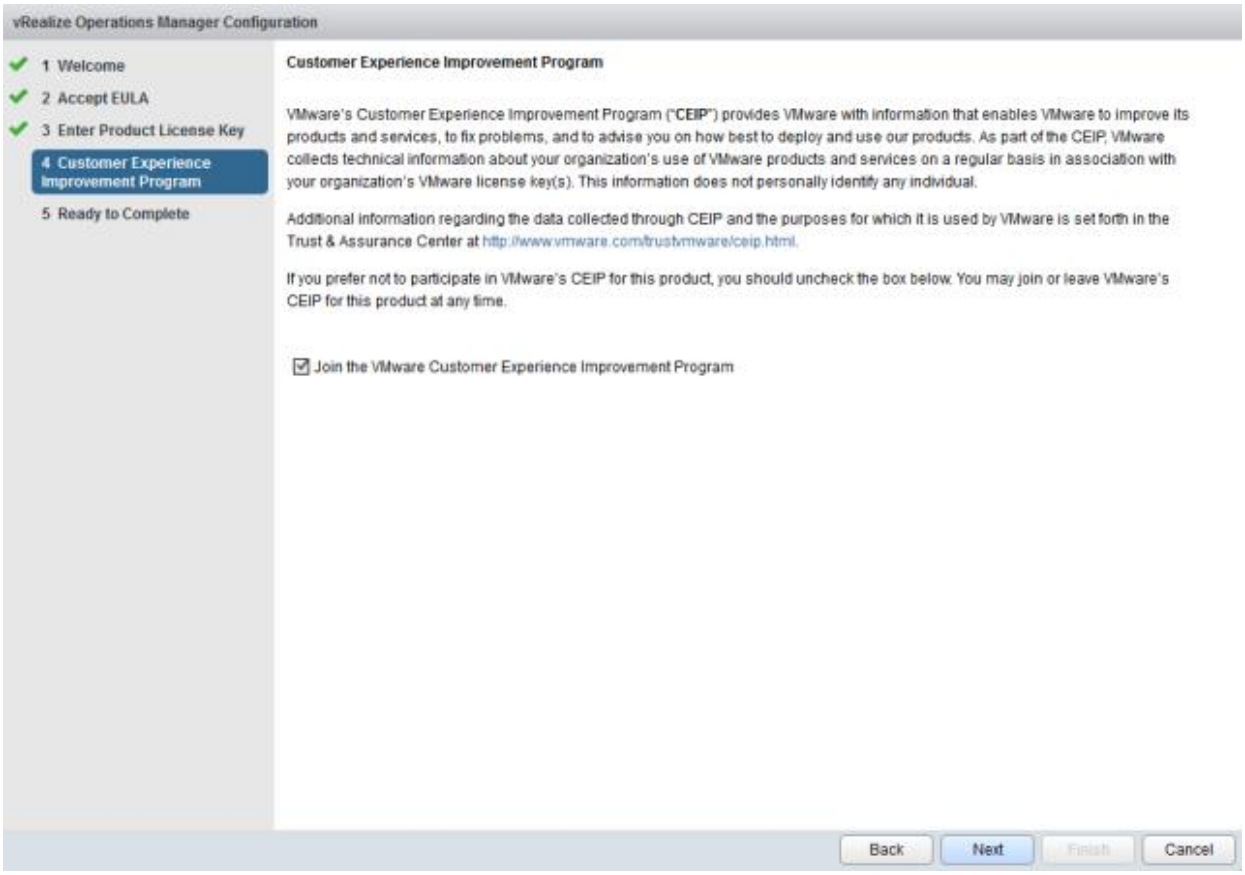
Accept the EULA and click **Next**.



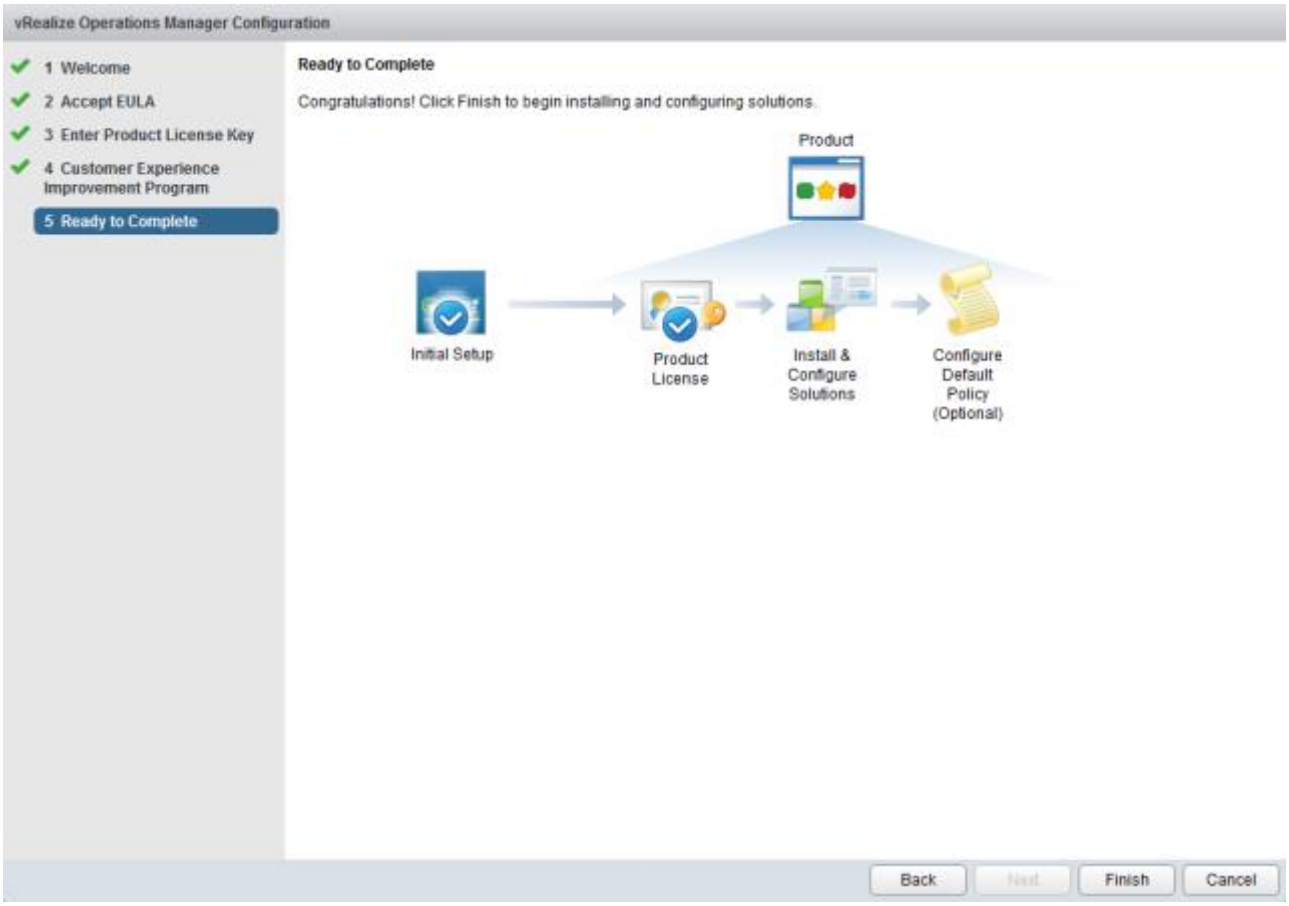
Enter the license key or use the 60 day product evaluation. Click **Next**.



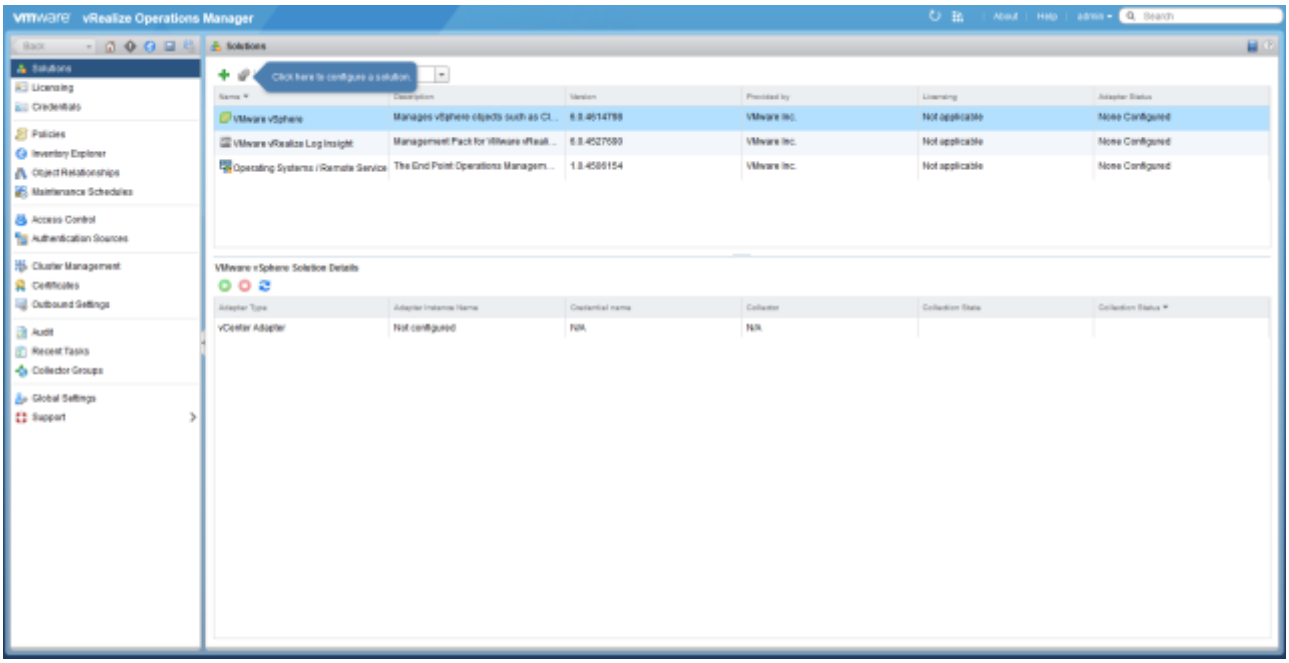
Select whether or not to join the VMware Customer Experience Improvement Program and click **Next**.



Click **Finish**.



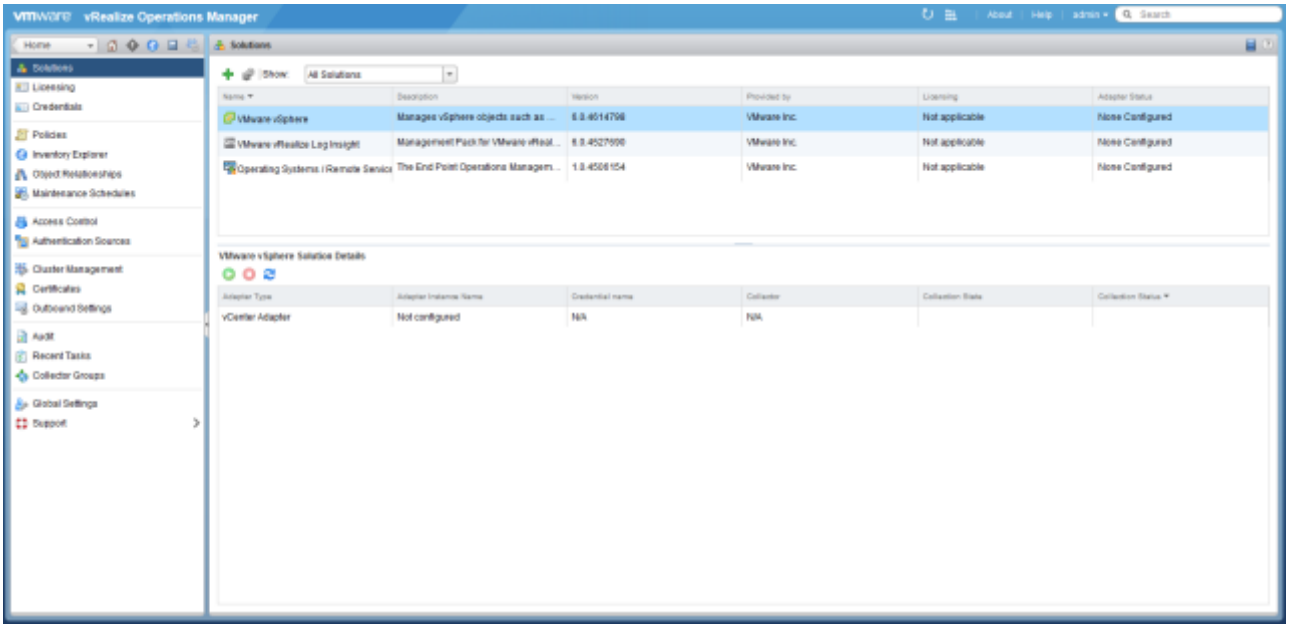
The vRealize Operations Manager dashboard will be loaded. The installation process is now complete. The admin console can be accessed by browsing to https://10.10.10.152/ui/ where is the IP address of FQDN of your vRealize Operations Manager appliance or server.



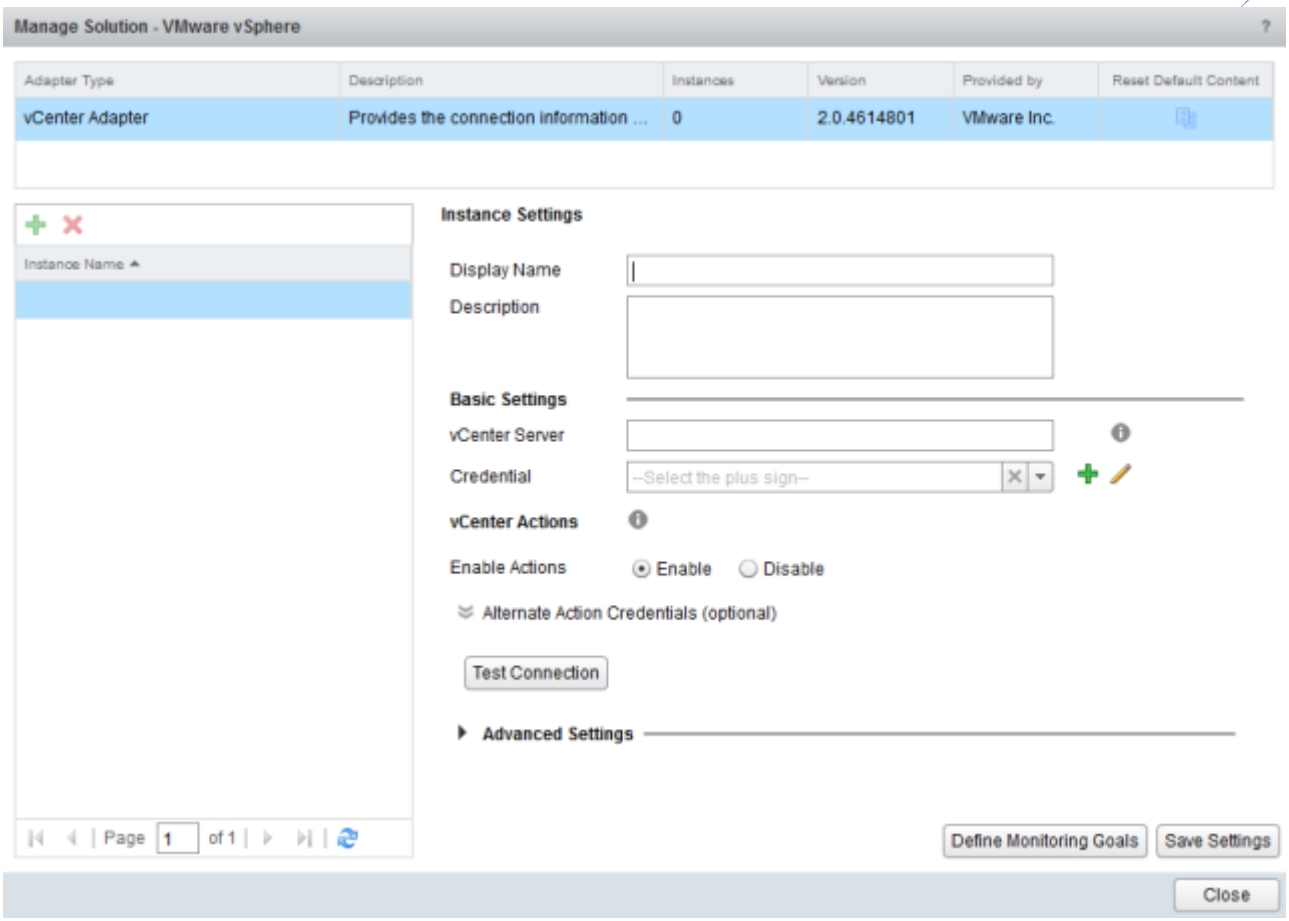
Post Installation

After first setup we need to secure the console by creating a root account. Browse to the vROps appliance in vSphere and open the console. Press **ALT + F1** and log in as **root**. You will be prompted to create a root password. All other work in this post is carried out using the vRealize Operations web interface.

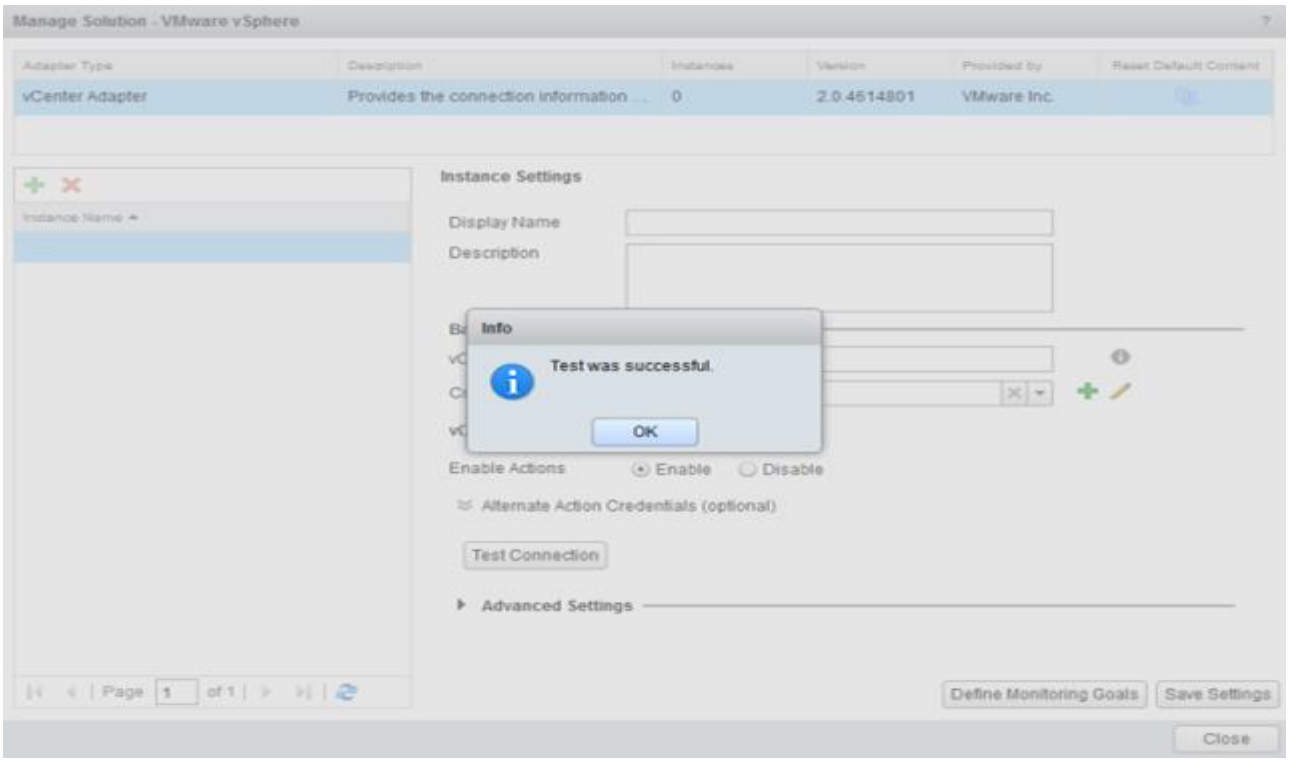
The next step is to configure the vCenter Adapter to collect and analyse data. Select **Administration** from the left hand navigation pane. From the **Solutions** menu select **VMware vSphere** and click the **Configure** icon.



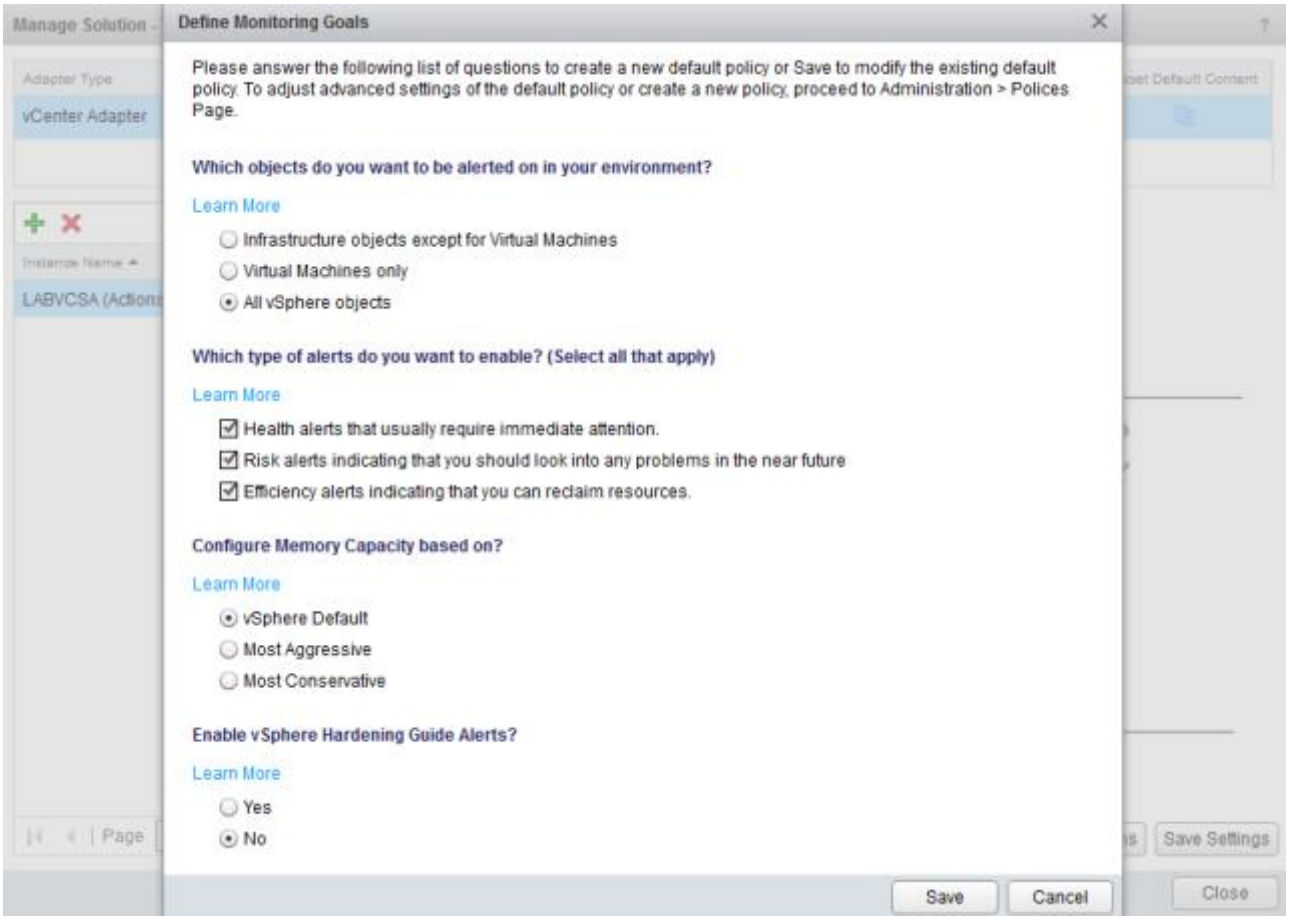
Enter the vCenter Server details and credentials with administrator access.



Click **Test Connection** to validate connectivity to the vCenter Server.

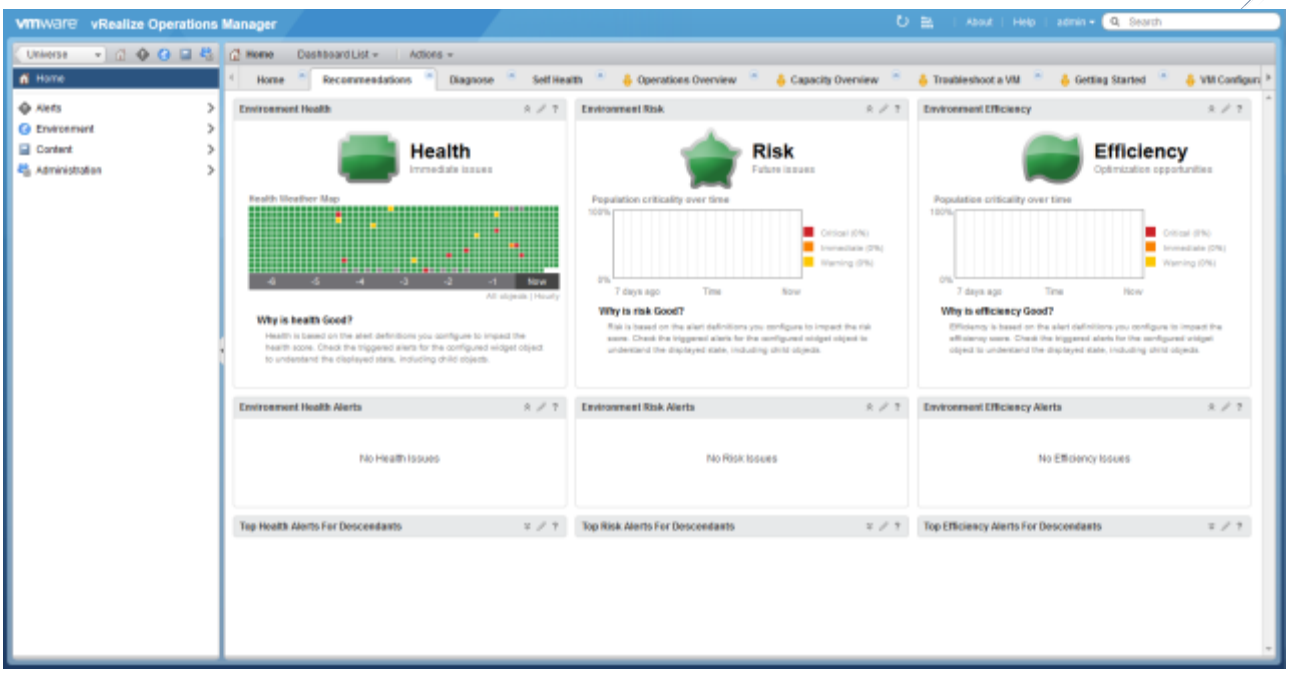


Expand **Advanced Settings** and review the default settings, these can be changed if required. Click **Define Monitoring Goals** and review the default policy, again this can be changed to suit your environment.



When you're ready click **Save Settings** and **Close**. The vCenter adapter will now begin collecting data. Collection cycles begin every 5 minutes, depending on the size of your environment the initial collection may take more than one cycle.

Once data has been collected from the vCenter Server go back to the **Home** page and browse the different tabs and dashboards.


vmware vRealize Operations Manager
Home
Dashboard List
Actions
Recommendations
Diagnose
Self Health
Operations Overview
Capacity Overview
Troubleshoot a VM
Getting Started
Alerts
Environment
Content
Administration
Environment Health
Health
Immediate issues
Why is health Good?
Environment Risk
Risk
Future issues
Population criticality over time
Why is risk Good?
Environment Efficiency
Efficiency
Optimization opportunities
Population criticality over time
Why is efficiency Good?
Environment Health Alerts
No Health Issues
Environment Risk Alerts
No Risk Issues
Environment Efficiency Alerts
No Efficiency Issues
Top Health Alerts For Descendants
Top Risk Alerts For Descendants
Top Efficiency Alerts For Descendants

vRealize LogInsight

vRealize Log Insight delivers heterogeneous and highly scalable log management with intuitive, actionable dashboards, sophisticated analytics and broad third-party extensibility. It provides deep operational visibility and faster troubleshooting across physical, virtual and cloud environments. (vmware)

Prerequisites

Username: admin
Password: P@ssw0rd

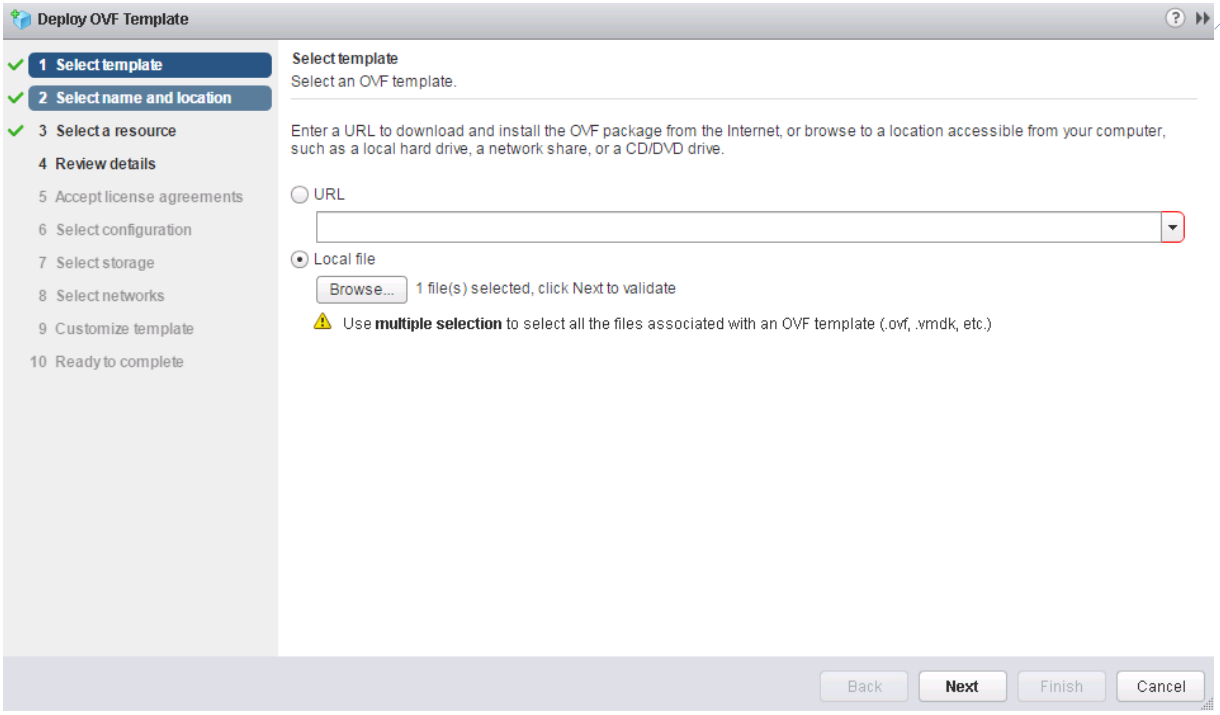
Username: Administrator@vsphere.local
Password: P@ssw0rd

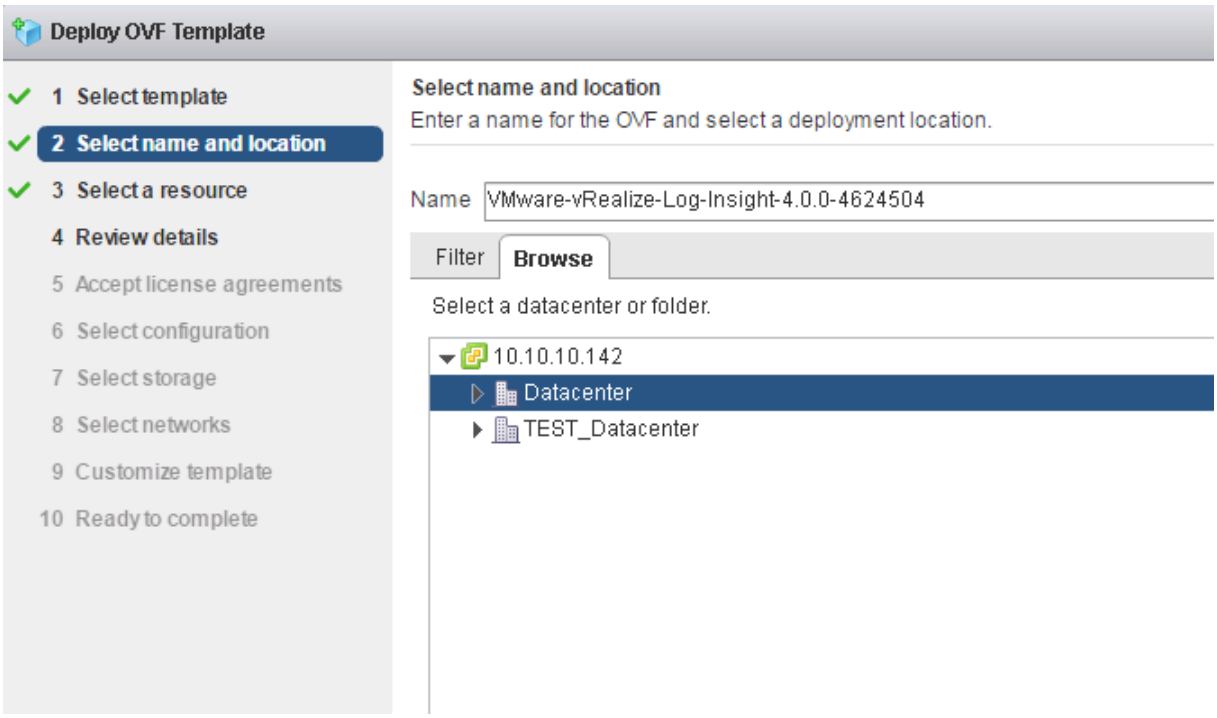
Build

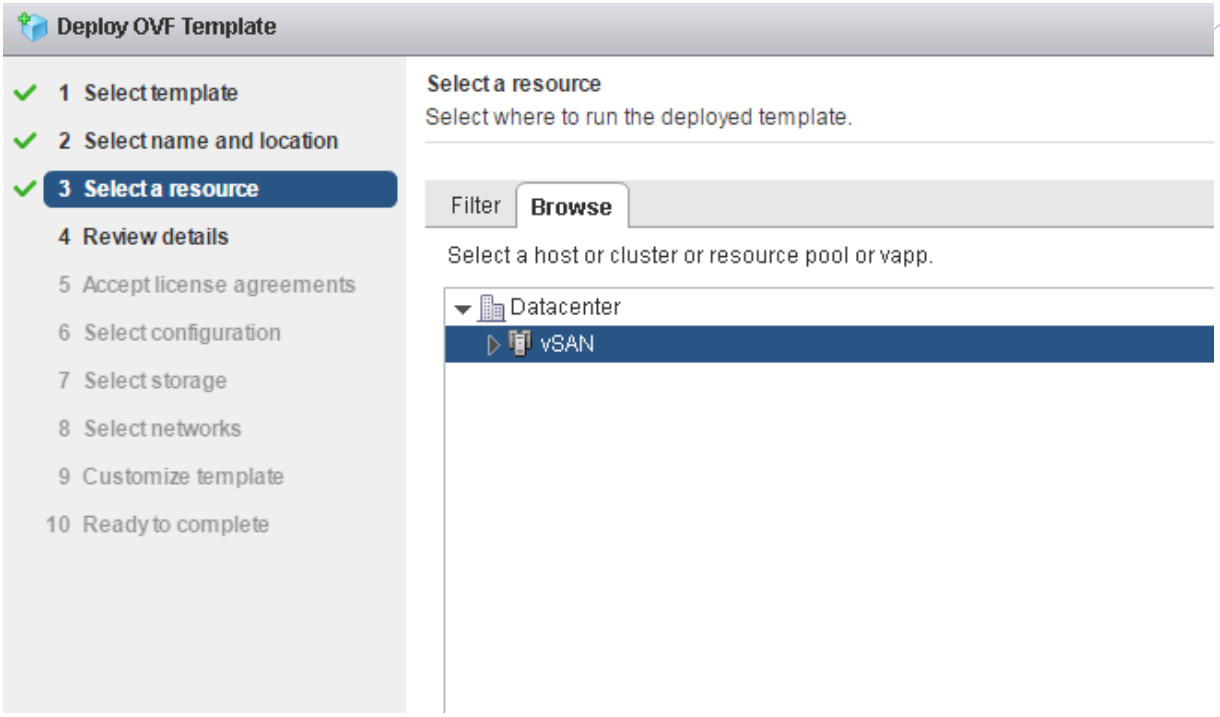
OS	vRealize Operation Manager Appliance	
RAM	4GB	
CPU	2vCPU	
HDD		
Network	1 NIC	10.10.10.165

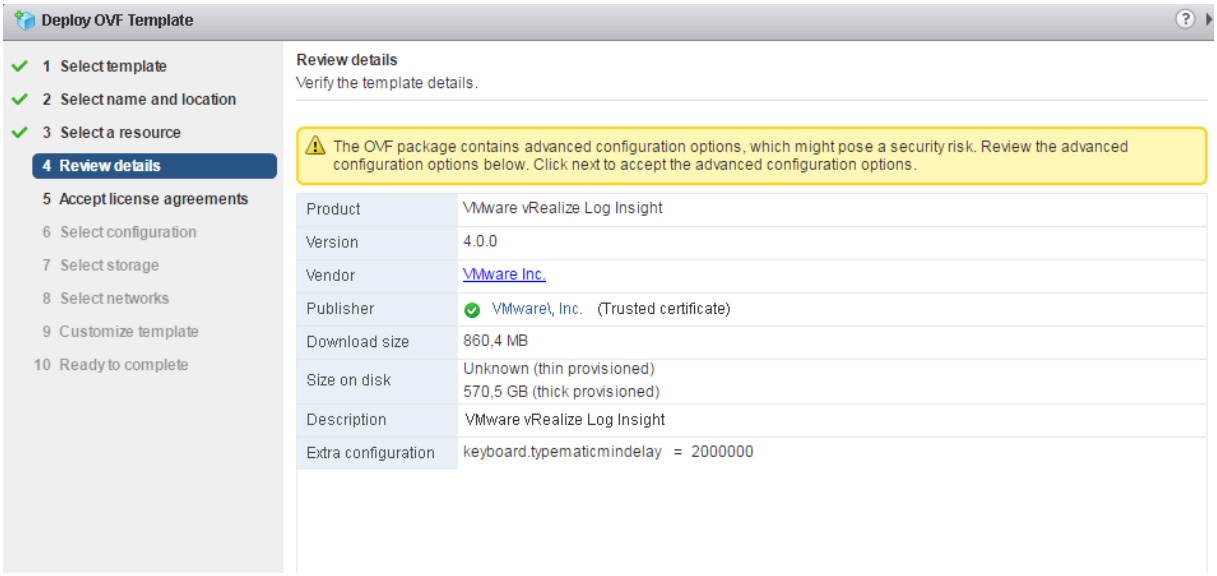
Deployment

Download the VMware vRealize Log Insight 4.0 virtual appliance here. Log into the vSphere web client and right click the host or cluster where the appliance will be deployed, select **Deploy OVF Template**. Browse to the location of the downloaded OVA file and click **Next**. Review the template details and click **Next**.

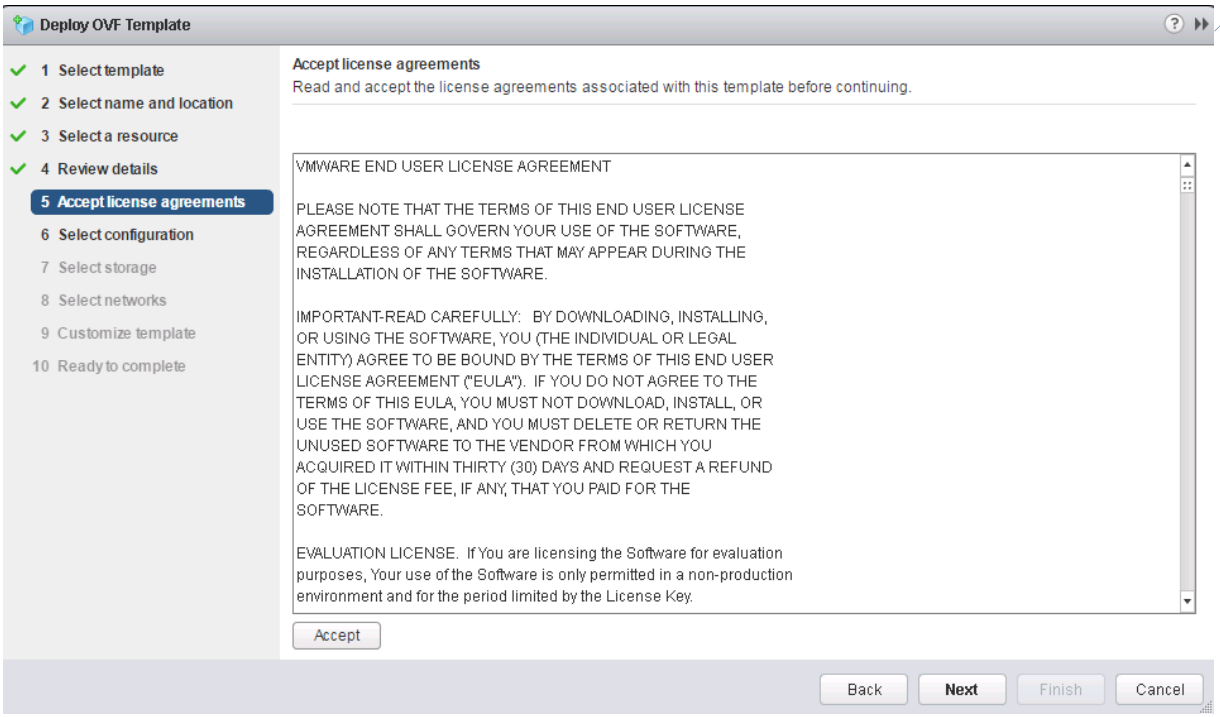

Deploy OVF Template
1 Select template
2 Select name and location
3 Select a resource
4 Review details
5 Accept license agreements
6 Select configuration
7 Select storage
8 Select networks
9 Customize template
10 Ready to complete
Select template
Select an OVF template.
Enter a URL to download and install the OVF package from the Internet, or browse to a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.
URL
Local file
Browse...
1 file(s) selected, click Next to validate
Use multiple selection to select all the files associated with an OVF template (.ovf, .vmdk, etc.)
Back
Next
Finish
Cancel


Deploy OVF Template
1 Select template
2 Select name and location
3 Select a resource
4 Review details
5 Accept license agreements
6 Select configuration
7 Select storage
8 Select networks
9 Customize template
10 Ready to complete
Select name and location
Enter a name for the OVF and select a deployment location.
Name
VMware-vRealize-Log-Insight-4.0.0-4624504
Filter
Browse
Select a datacenter or folder.
10.10.10.142
Datacenter
TEST_Datacenter

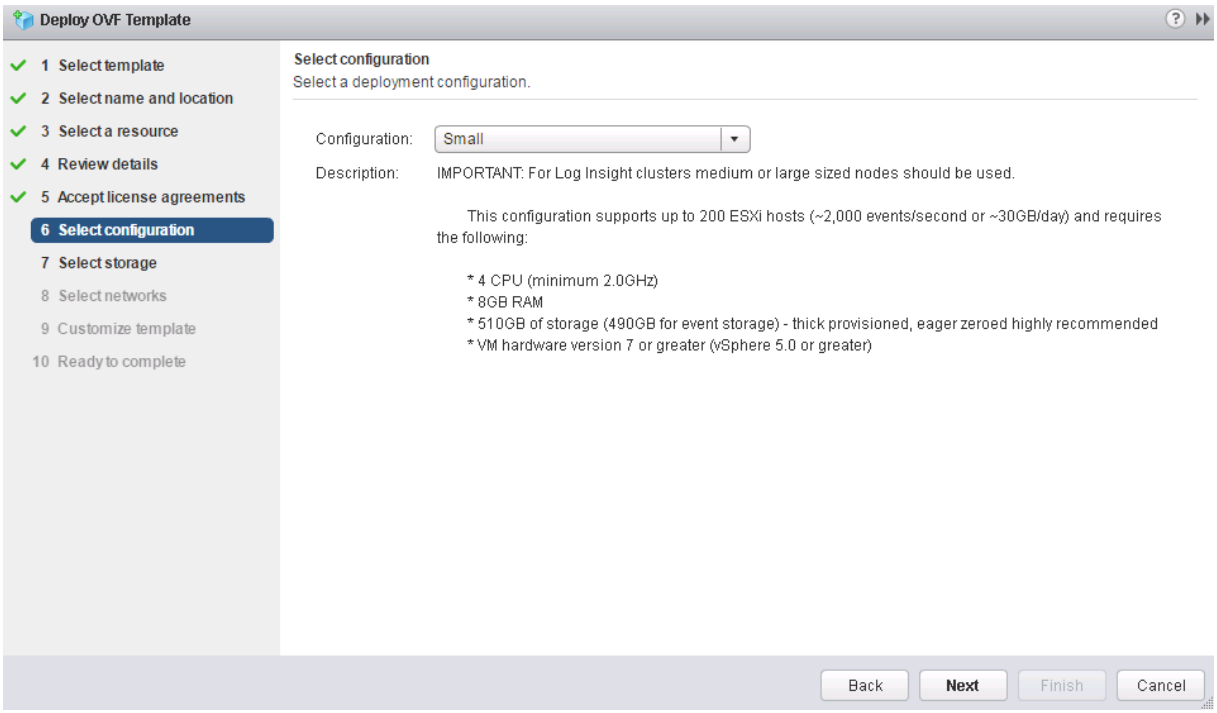




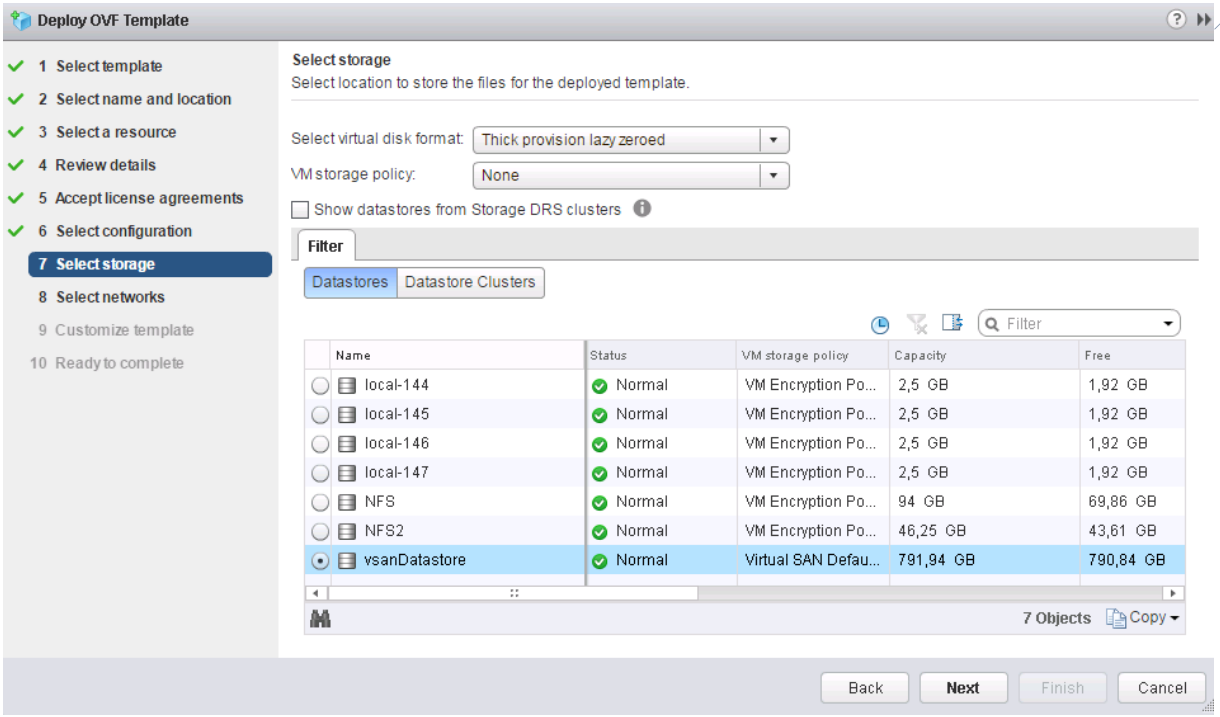
Accept the license agreement and click **Next**.

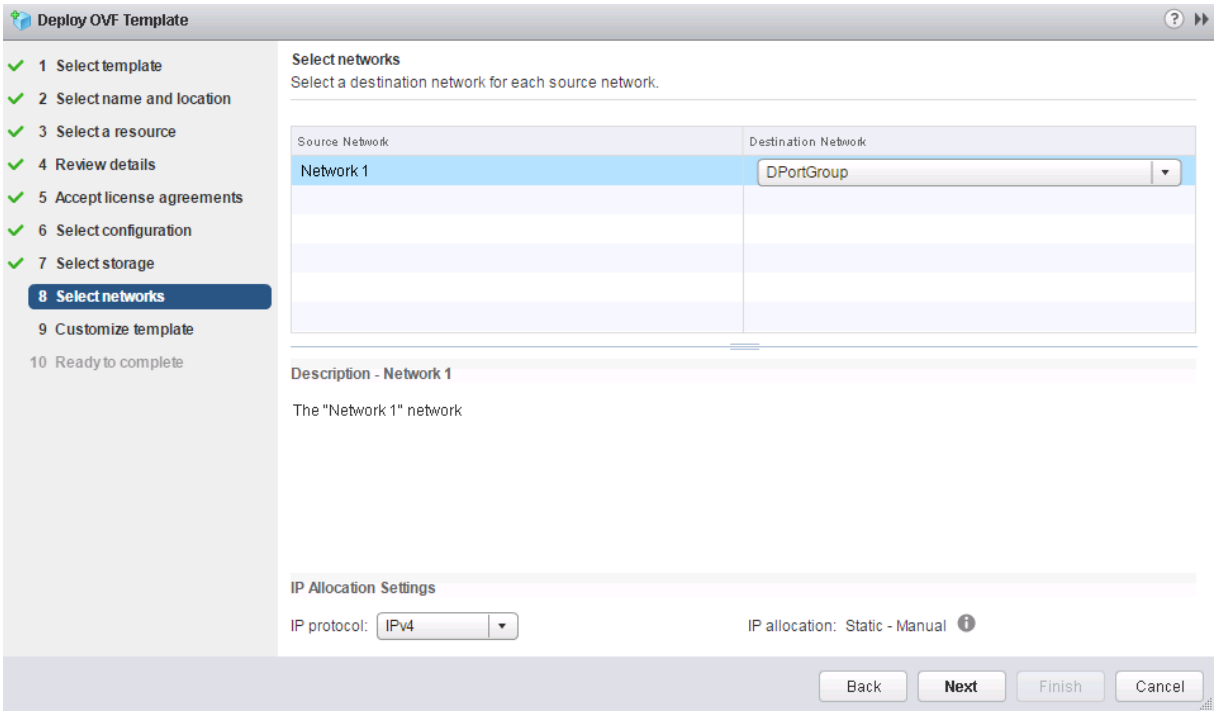


Select the appropriate deployment configuration and click **Next**. See above for sizing assistance.

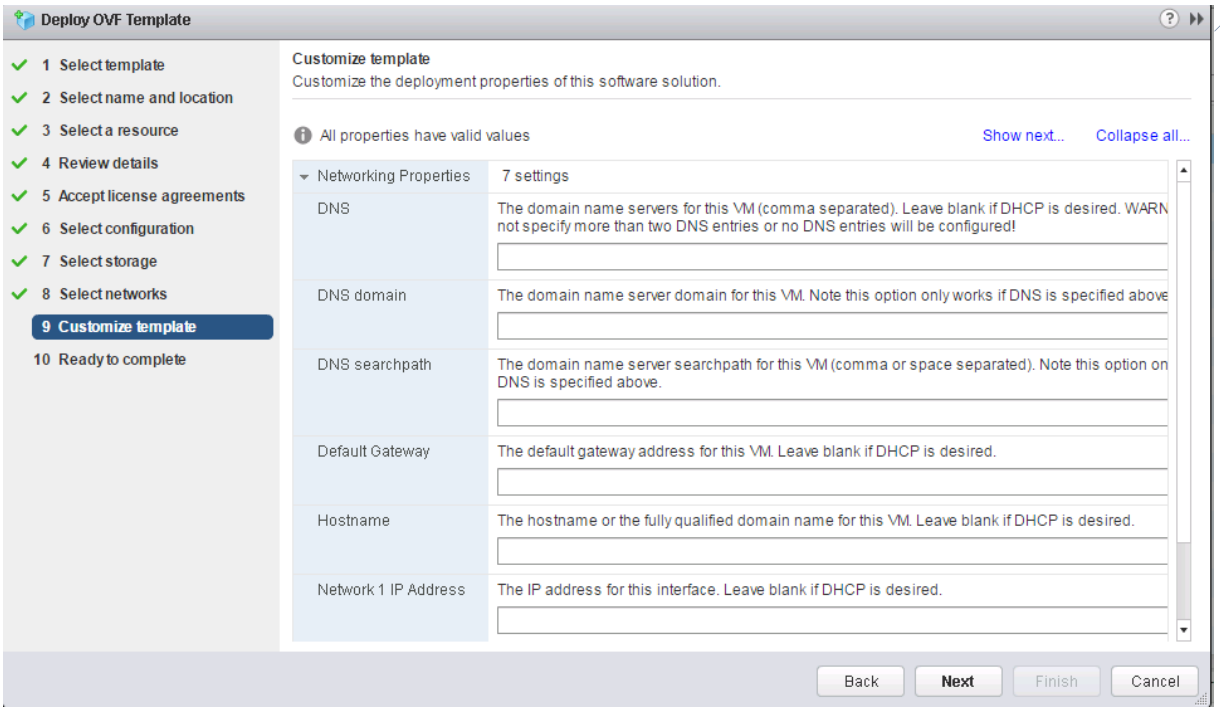


Select the datastore to use and click **Next**. Select the network to use and click **Next**.

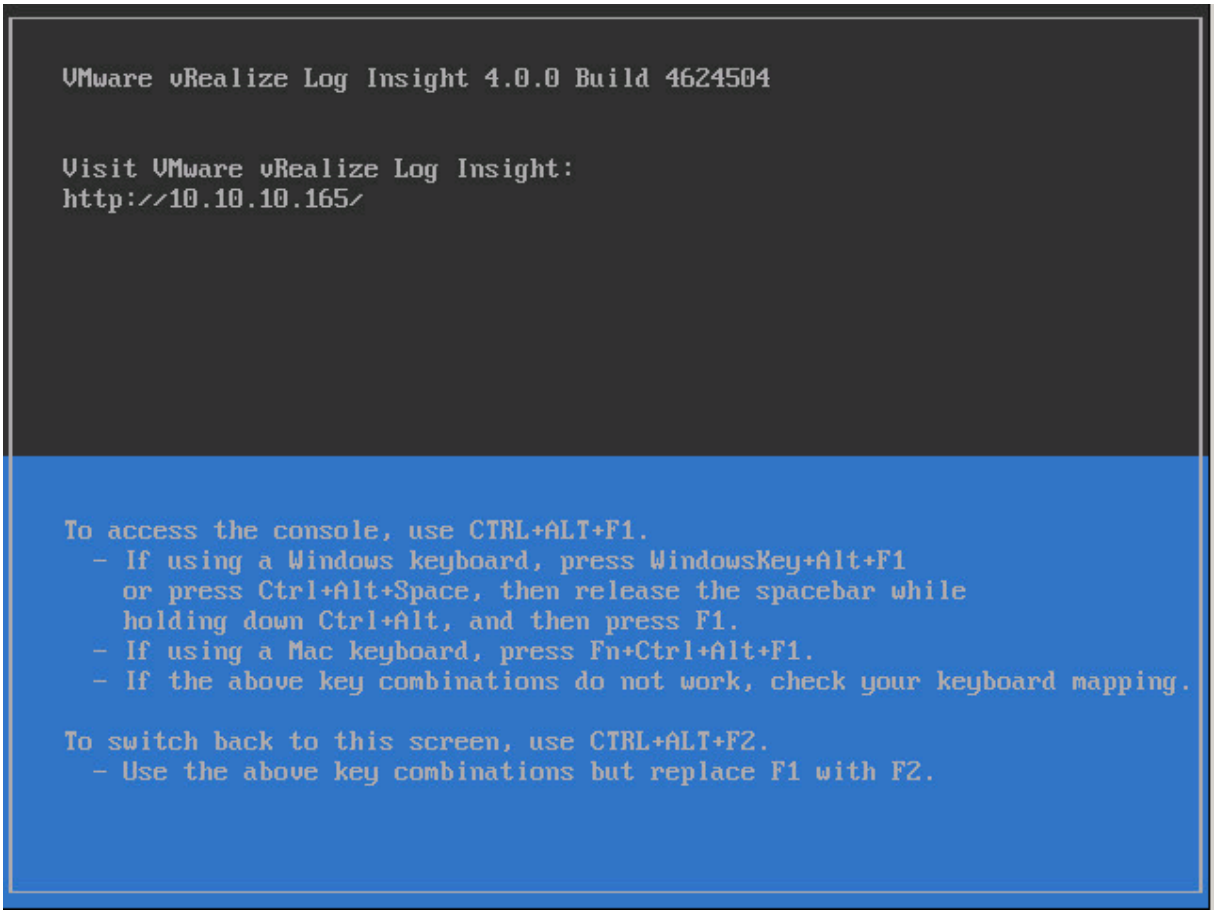




Enter the network settings for the virtual appliance. Expand **Other properties** and configure a root password. Once complete click **Next**. When adding DNS servers do not specify more than 2 DNS entries.

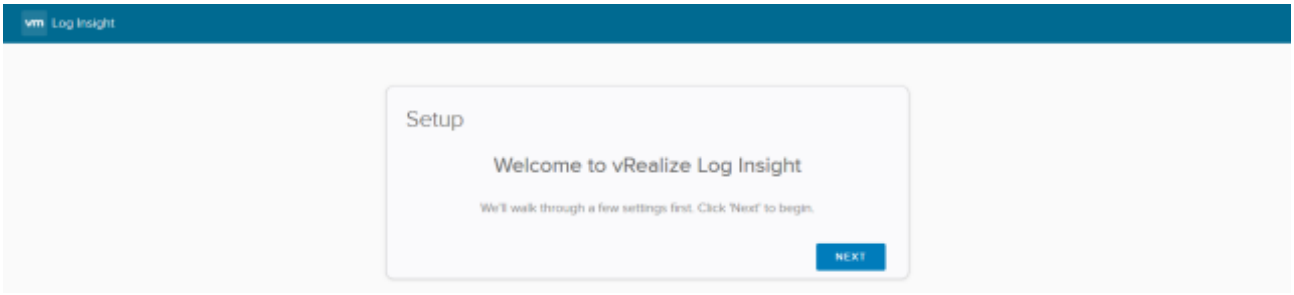


Review the summary page, tick **Power on after deployment**, and click **Finish**. The appliance console has a similar look and feel to ESXi. If you ever need to use the command line login with the root account. The password should be set during the OVA deployment, if you missed it then the root password is blank.

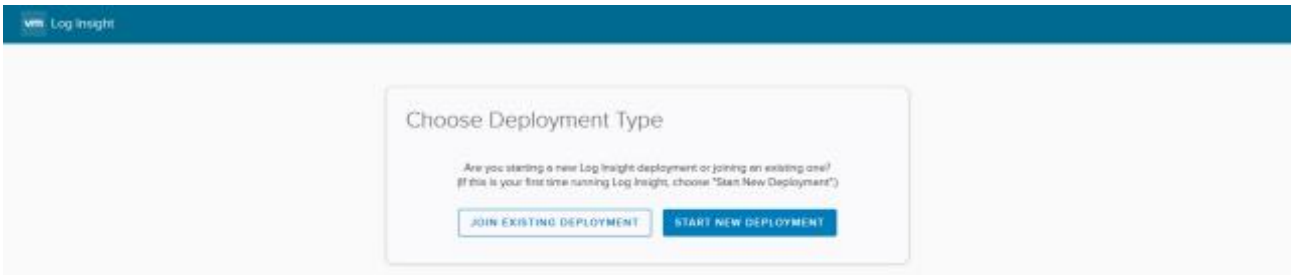


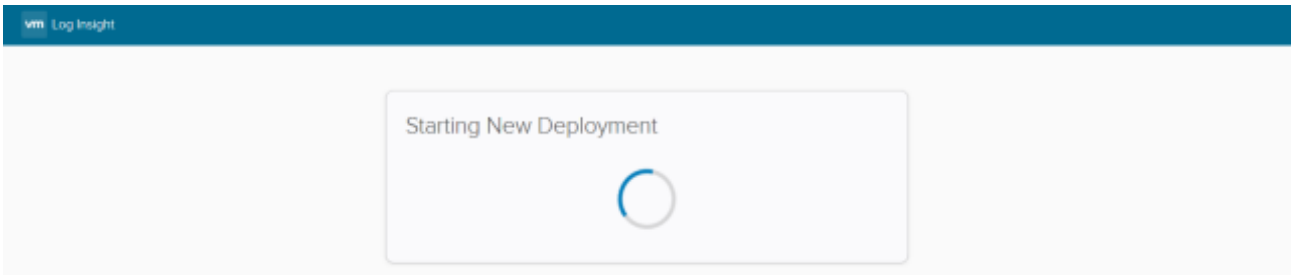
Configuration

Open a web browser and connect to the IP address or FQDN of the newly deployed appliance. The setup wizard will autostart, click **Next**.

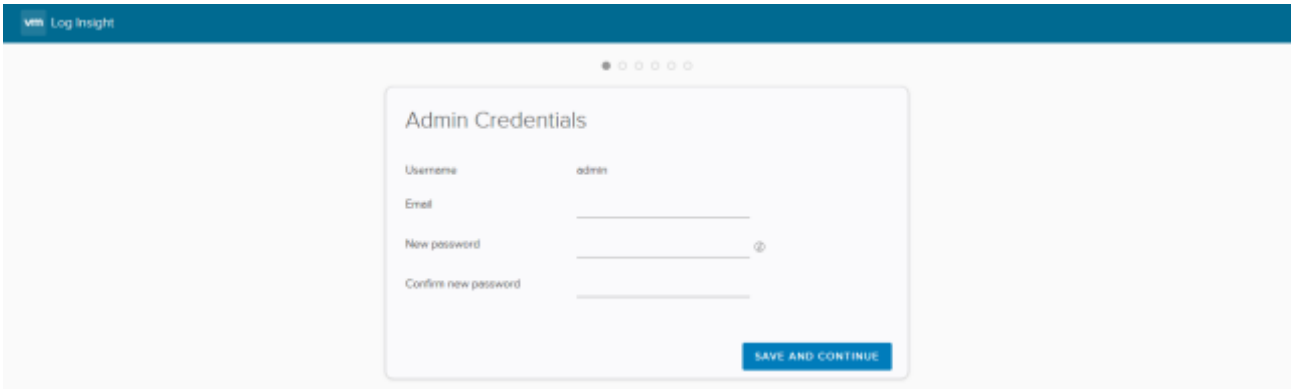


Click **Start New Deployment**.

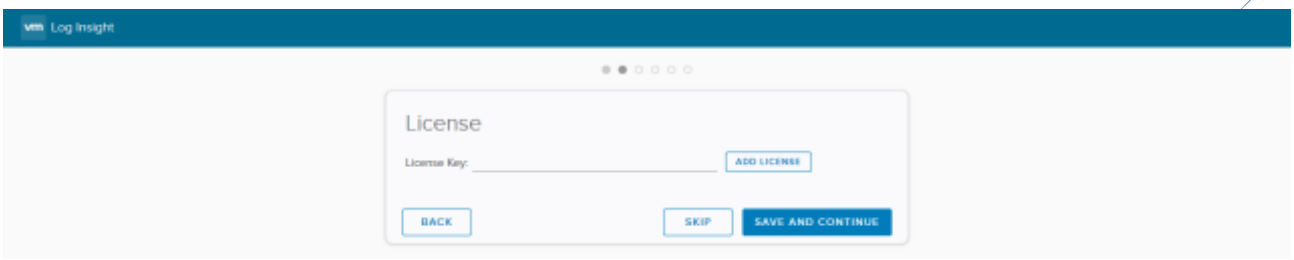




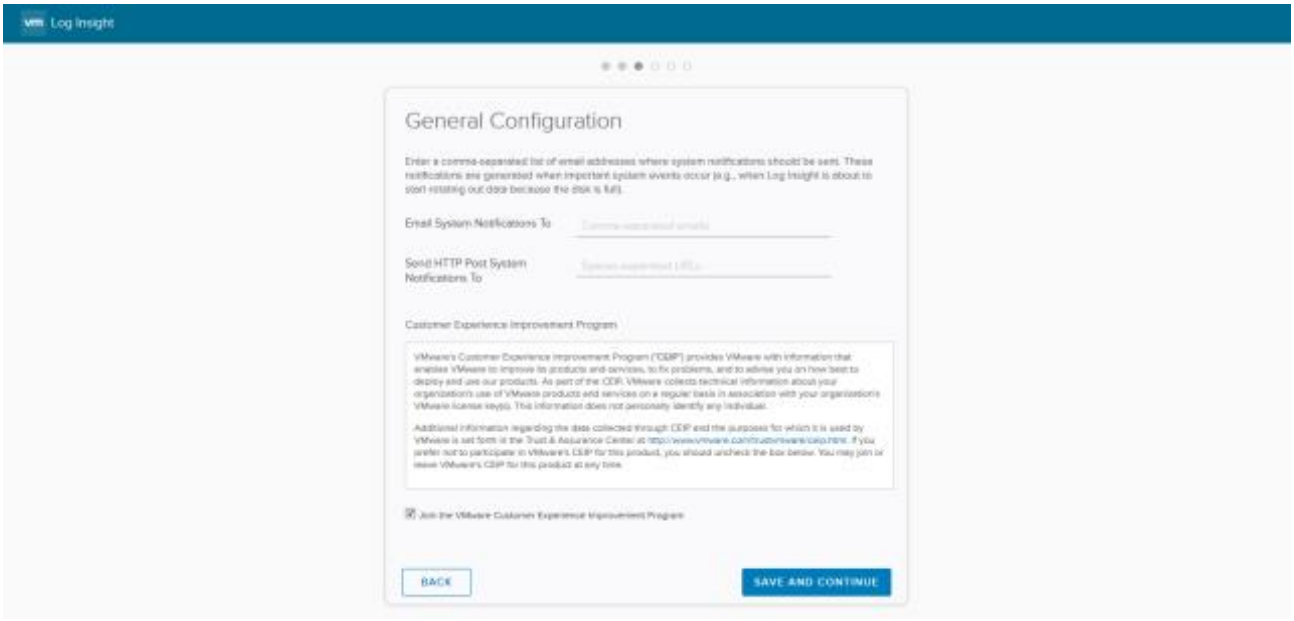
Enter an email address and new password for the admin user, click **Next**.



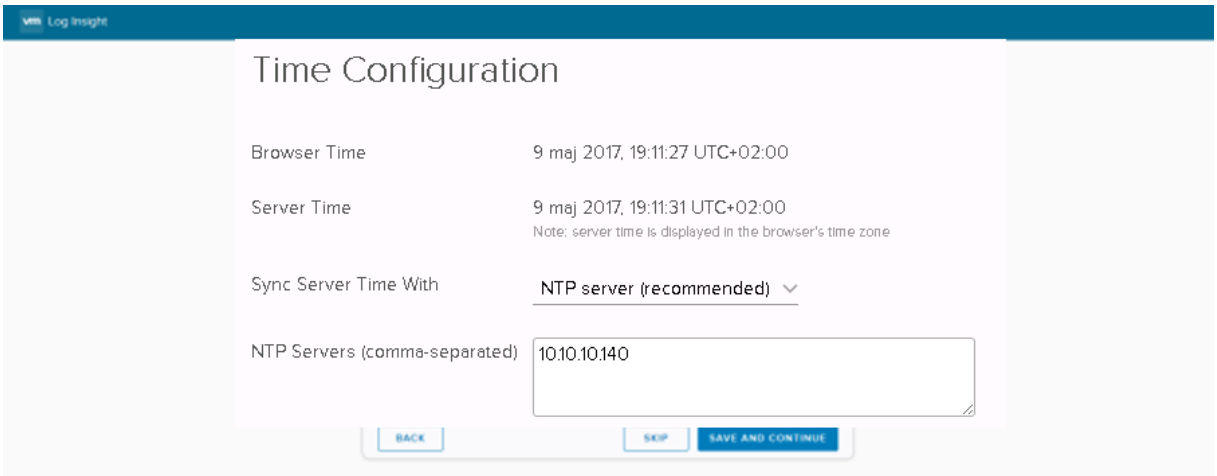
Enter a license key and click **Save and Continue**.



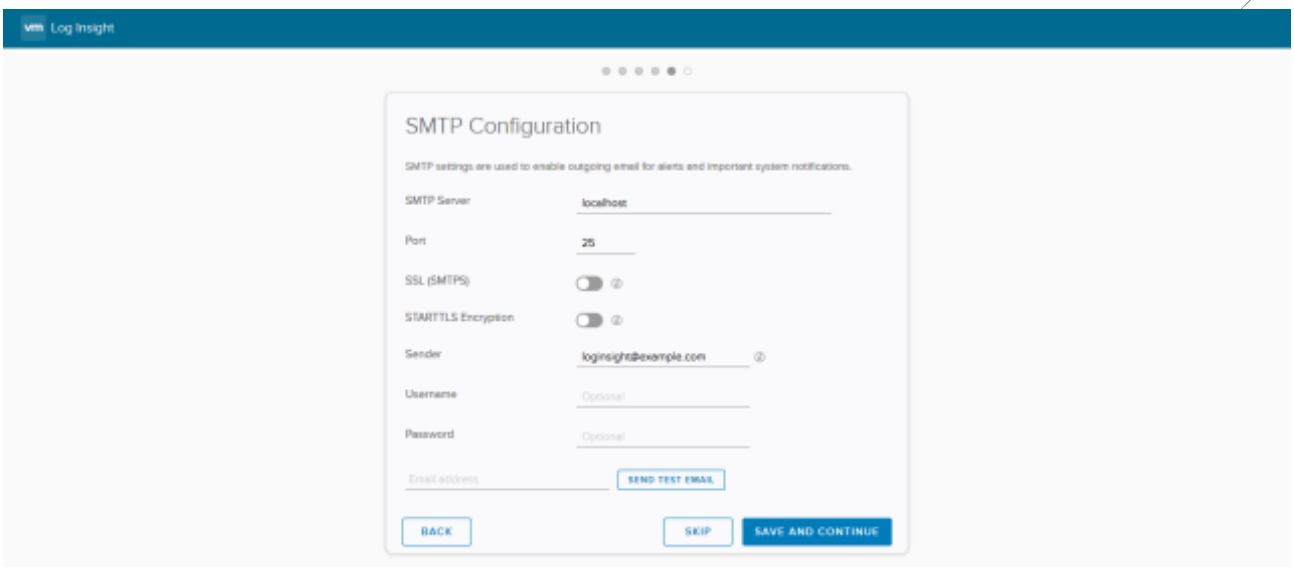
Configure system notification settings and click **Save and Continue**.



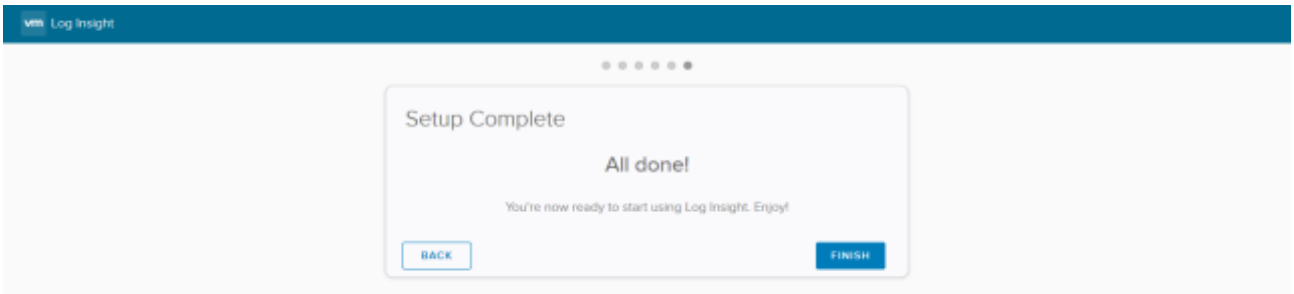
Enter the NTP server(s) to use and click **Test**. If the test succeeds click **Save and Continue**.



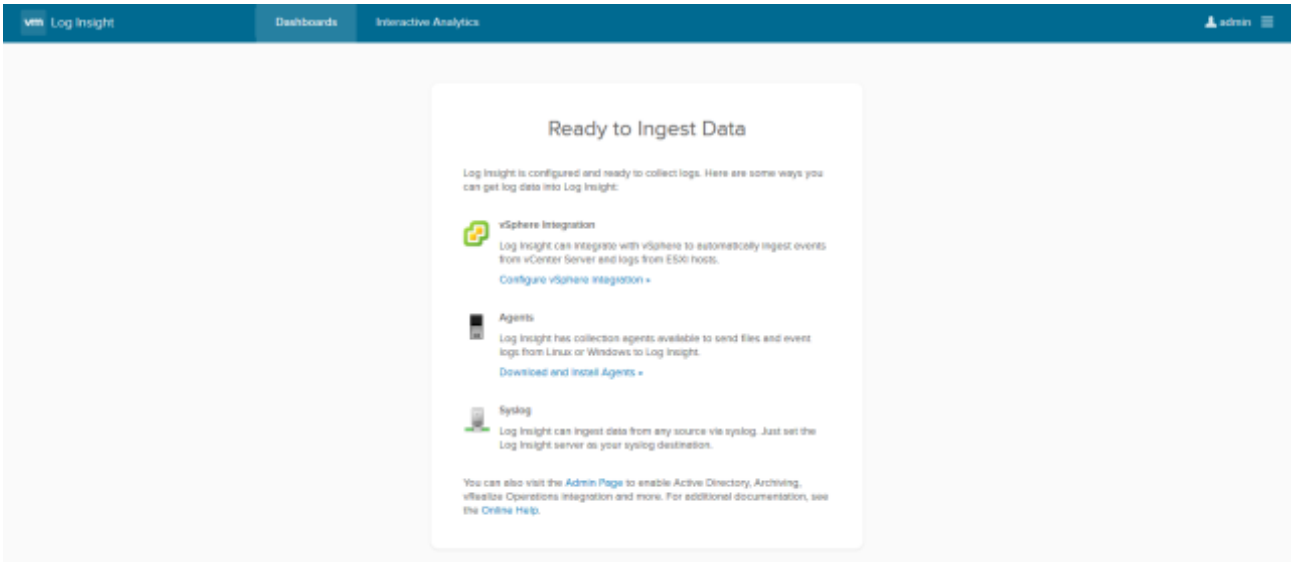
Configure the SMTP server to use and click **Save and Continue**.



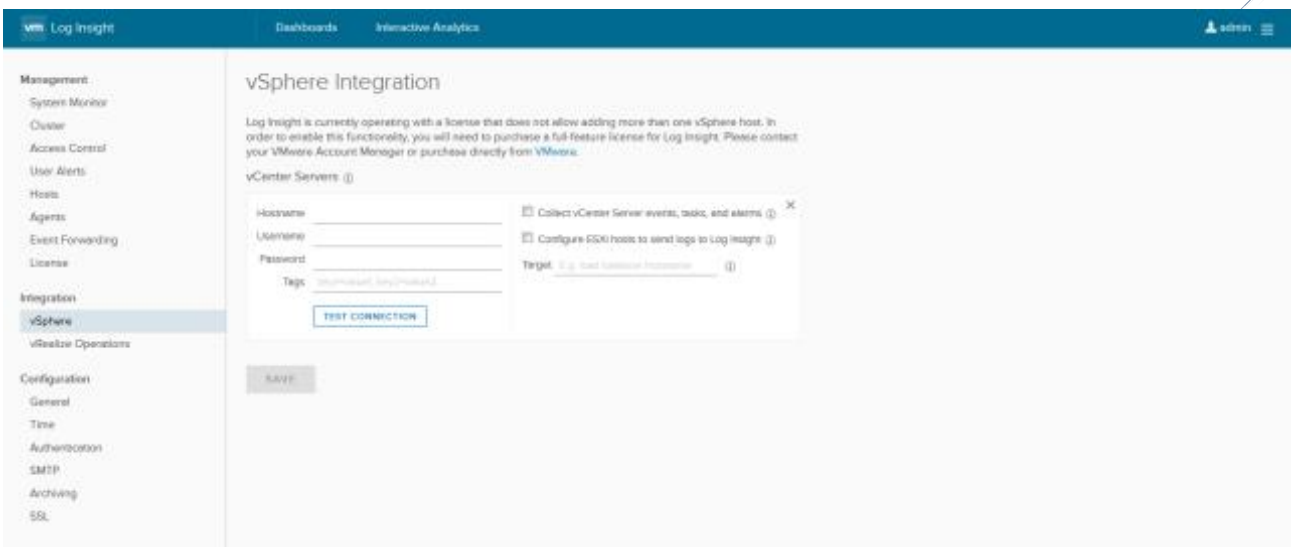
On the setup complete page click **Finish**.

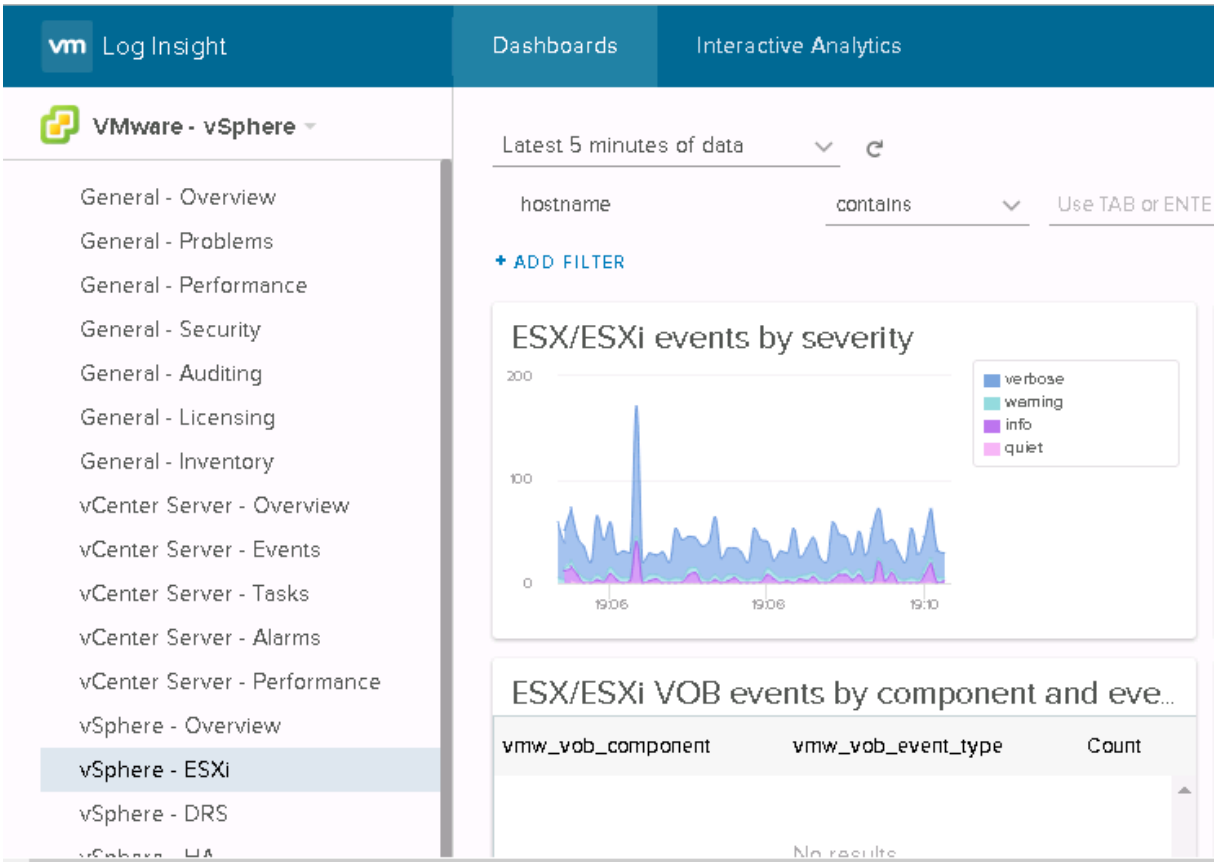


The vRealize Log Insight appliance is now deployed and can begin collecting data. In this example we will be configuring vSphere Integration to automatically collect logs and events from vCenter Server and ESXi hosts. Click **Configure vSphere Integration**.



Enter the connection details of the vCenter Server. To configure only specific hosts to send logs to Log Insight click **Advanced optiosns**. Test the connection and when you're ready click **Save**.


Log Insight
Dashboards
Interactive Analytics
admin
Management
System Monitor
Cluster
Access Control
User Alerts
Hosts
Agents
Event Forwarding
License
Integration
vSphere
vRealize Operations
Configuration
General
Time
Authentication
SMTP
Archiving
SSL
vSphere Integration
Log Insight is currently operating with a license that does not allow adding more than one vSphere host. In order to enable this functionality, you will need to purchase a full-feature license for Log Insight. Please contact your VMware Account Manager or purchase directly from VMware.
vCenter Servers
Hostname
Username
Password
Tags
TEST CONNECTION
Collect vCenter Server events, tasks, and alarms
Configure ESXi hosts to send logs to Log Insight
Target
SAVE


Log Insight
Dashboards
Interactive Analytics
VMware - vSphere
General - Overview
General - Problems
General - Performance
General - Security
General - Auditing
General - Licensing
General - Inventory
vCenter Server - Overview
vCenter Server - Events
vCenter Server - Tasks
vCenter Server - Alarms
vCenter Server - Performance
vSphere - Overview
vSphere - ESXi
vSphere - DRS
Latest 5 minutes of data
hostname
contains
Use TAB or ENTE
+ ADD FILTER
ESX/ESXi events by severity
200
100
0
19:06
19:08
19:10
verbose
warning
info
quiet
ESX/ESXi VOB events by component and eve...
vmw_vob_component
vmw_vob_event_type
Count
No results

NSX

NSX enables the creation of entire networks in software and embeds them in the hypervisor layer, abstracted from the underlying physical hardware. All network components can be provisioned in minutes, without the need to modify the application. (vmware.com)

Prerequisites

Username: admin
Password: P@ssw0rd

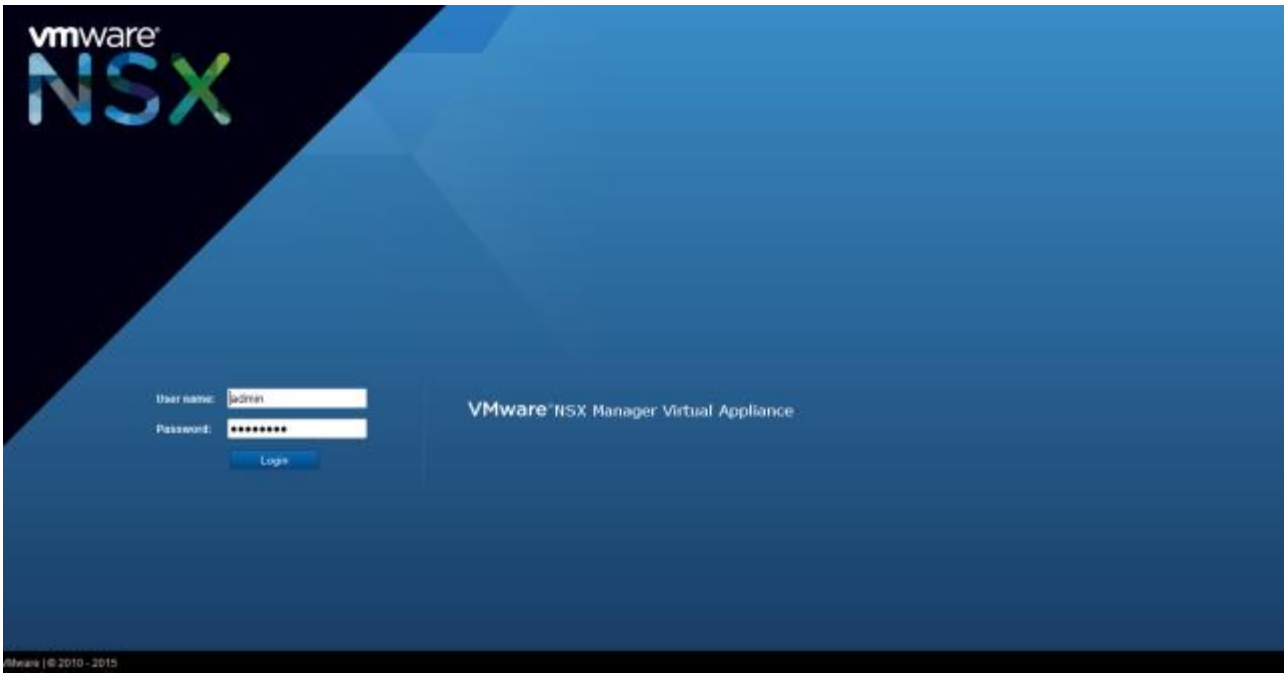
Build

OS	NSX Manager	
RAM	4GB	
CPU	2vCPU	
HDD	60GB	
Network	1 NIC	10.10.10.150

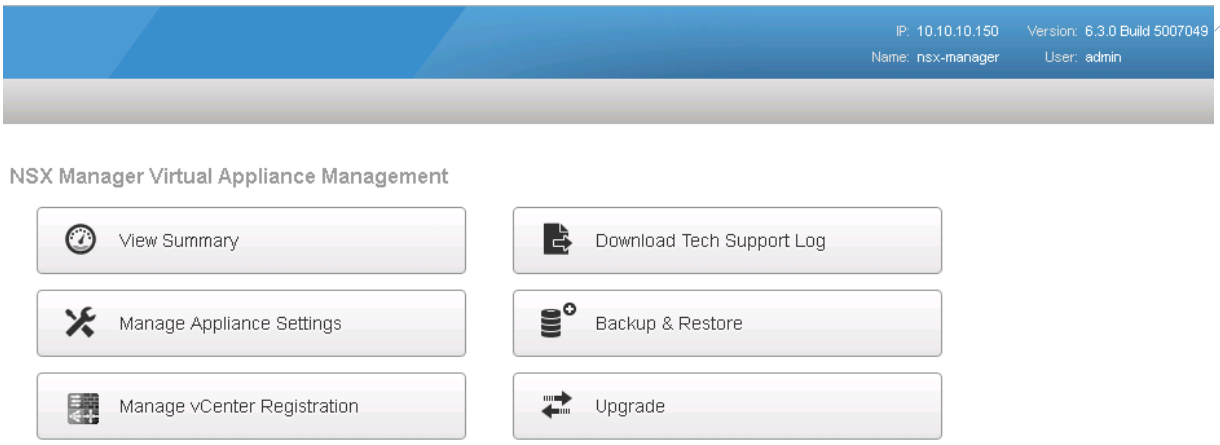
Installing NSX Manager

NSX Manager is deployed and registered with vCenter Server on a 1:1 mapping. Upon registration a plug-in is injected into the vSphere web client to enable deployment and management of logical networks and services.

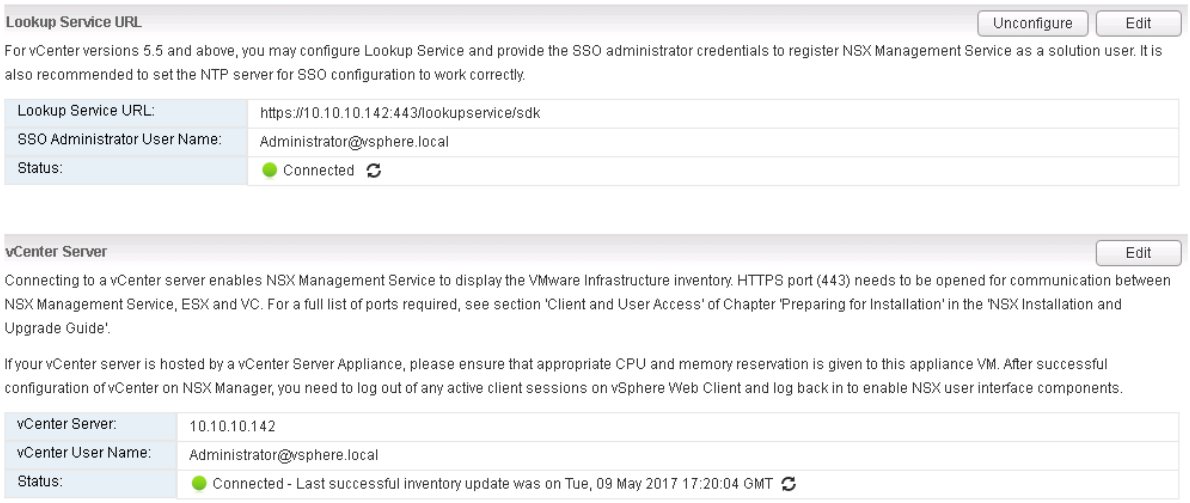
Deploy the OVA file to the vCenter, in the customisation options configure the appliance network settings. Once the NSX Manager appliance is deployed and powered on open a web browser to the configured IP address. Log in with the **admin** account, if you didn't change the password during deployment the default password is **default**.



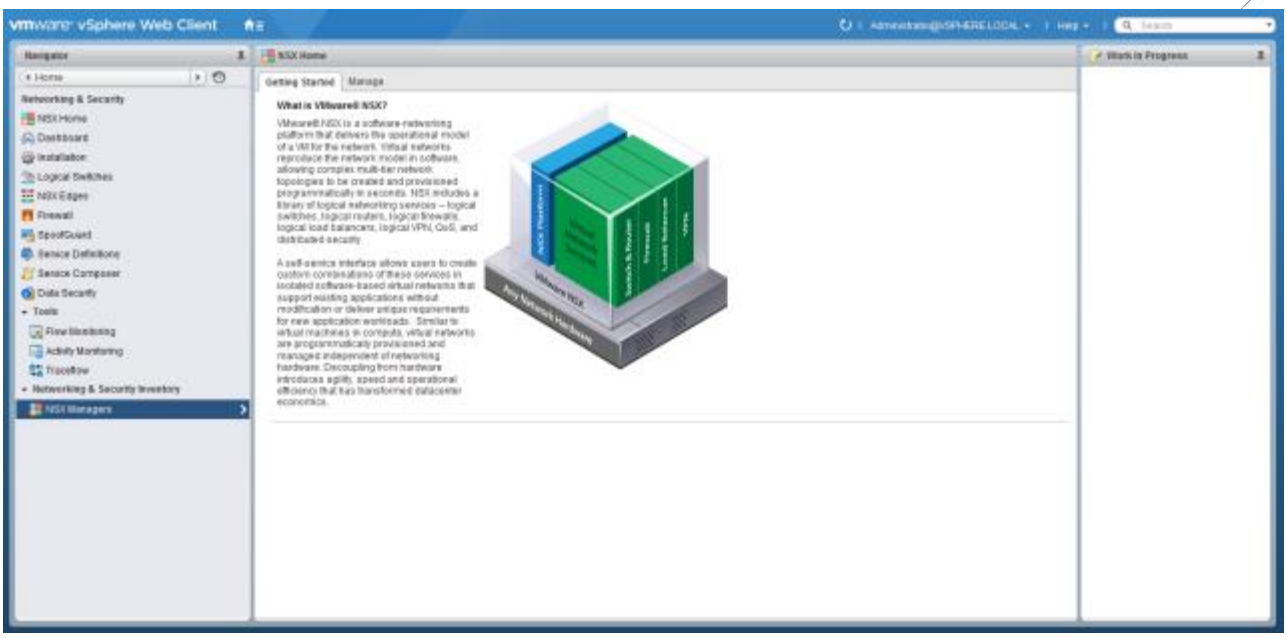
Click **Manage vCenter Registration**,



under **vCenter Server** click **Edit**. Enter the name of the vCenter server to register NSX Manager and the relevant credentials, click **Ok**. Configure the vCenter settings under **Lookup Service URL** by clicking **Edit**, enter the vCenter host name and SSO details, click **Ok**.



After configuring NSX Manager restart the VMware vSphere Web Client on the vCenter Server the NSX Manager was registered with. You may also need to restart your browser. Log in to the vSphere web client and browse to **Networking & Security**, click **NSX Managers** and verify the newly deployed NSX Manager is present.



To configure additional permissions select the NSX Manager and click **Manage**, **Users**. Here you can add, edit, and remove users and permissions. Each role provides a description of the level of access, for more information on NSX permissions click here. To add Active Directory permissions to NSX Manager select the **Domains** tab, and click the green plus symbol to add the LDAP details.

To apply a license key to NSX Manager select the **Administration** option from the home page of the vSphere web client, click **Licenses**, **Assets**, **Solutions**. Highlight **NSX for vSphere** and click the **All Actions** drop down menu, select **Assign License**. Add a new license key or assign an existing license key and click **Ok**.

NSX Controllers

NSX controller is an advanced distributed state management system that controls virtual networks and overlay transport tunnels.

NSX controller is the central control point for all logical switches within a network and maintains information of all virtual machines, hosts, logical switches, and VXLANs. The controller supports two new logical switch control plane modes, Unicast and Hybrid. These modes decouple NSX from the physical network. VXLANs no longer require the physical network to support multicast in order to handle the Broadcast, Unknown unicast, and Multicast (BUM) traffic within a logical switch. The unicast mode replicates all the BUM traffic locally on the host and requires no physical network configuration. In the hybrid mode, some of the BUM traffic replication is offloaded to the first hop physical switch to achieve better performance. (vmware.com)

Prerequisites

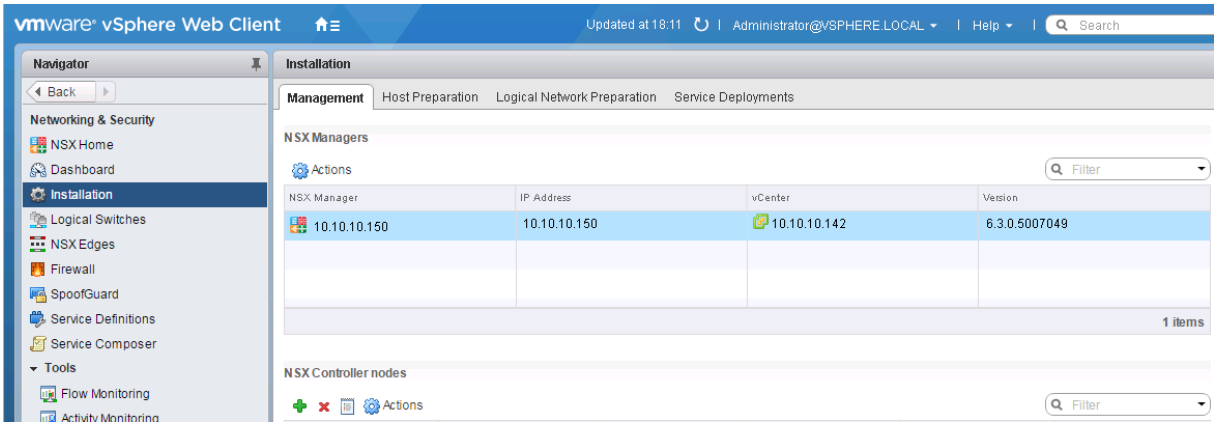
Username: admin
Password: $DwHp5T#3D~=

Build

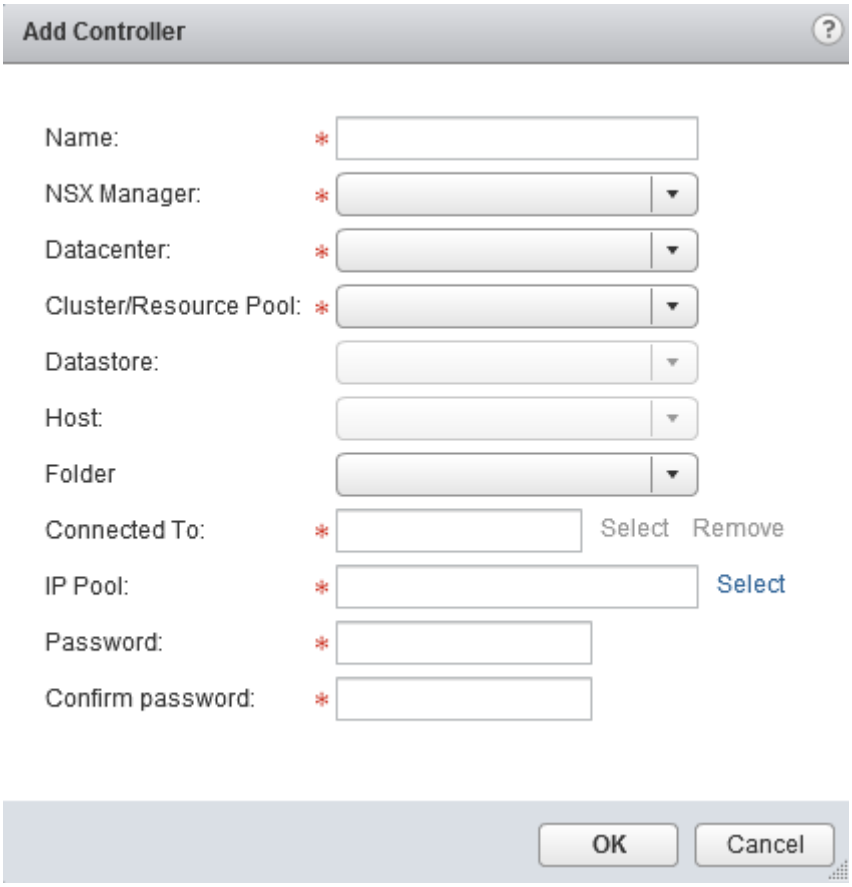
OS	NSX Controlers	x3
RAM	4GB	

CPU	2vCPU	
HDD	20GB	
Network	1 NIC	10.10.10.137 10.10.10.138 10.10.10.139

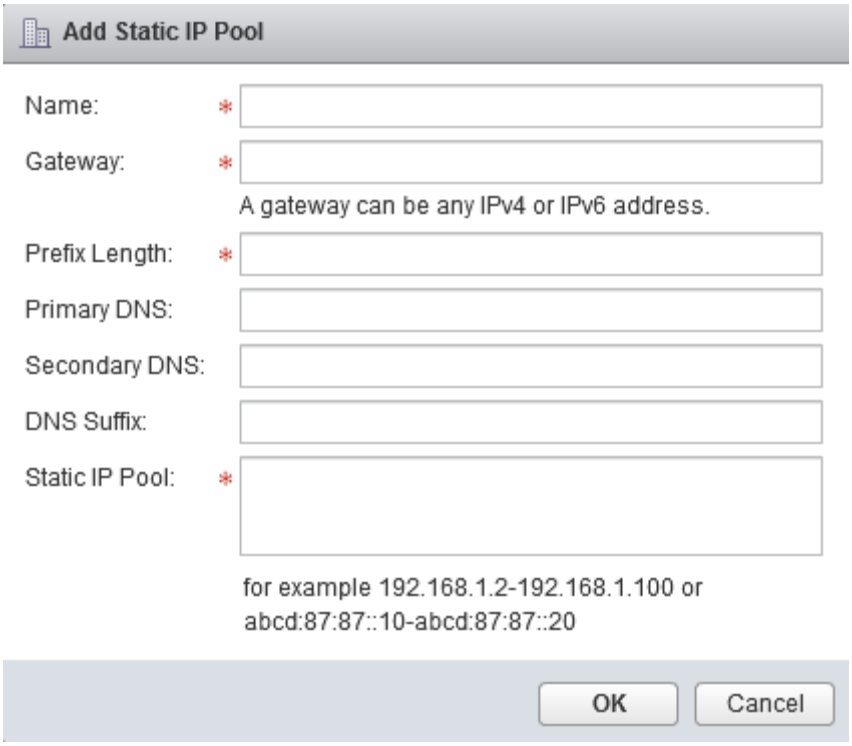
Log into the vSphere web client and select Networking & Security. From the left hand navigator pane click **Installation**. In the NSX Controllers section click the green plus symbol to add a controller.



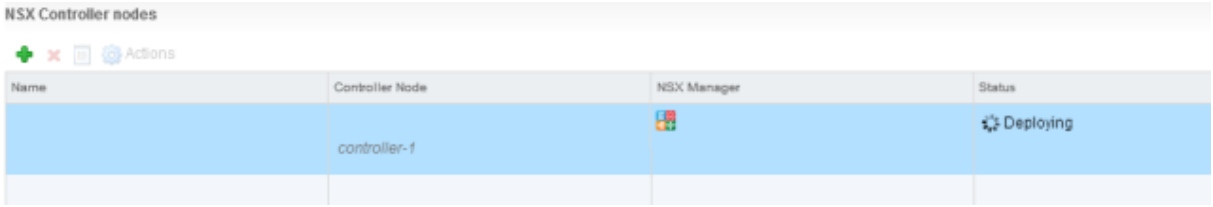
Populate the fields in the Add Controller wizard. For the IP Pool click **Select**; each NSX Controller uses an IP address from the IP Pool. Create a new pool click **New IP Pool**.



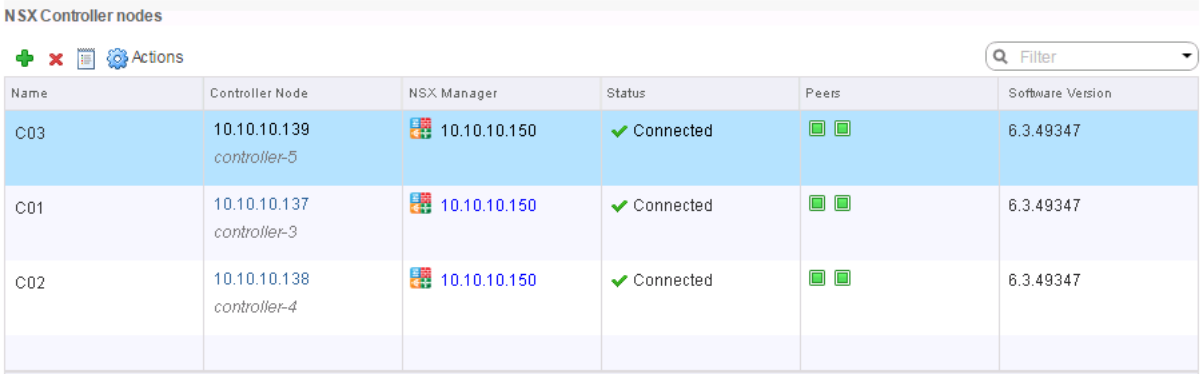
To create a new IP Pool fill in the details in the Add Static IP Pool wizard. The IP Pool used can be shared with other services (i.e. doesn't have to be dedicated to NSX Controllers) as long as there are enough free IP addresses in the pool for all 3 controllers.



When you have configured the IP Pool click **Ok** on the Add Controller wizard. The first controller will now be deployed.

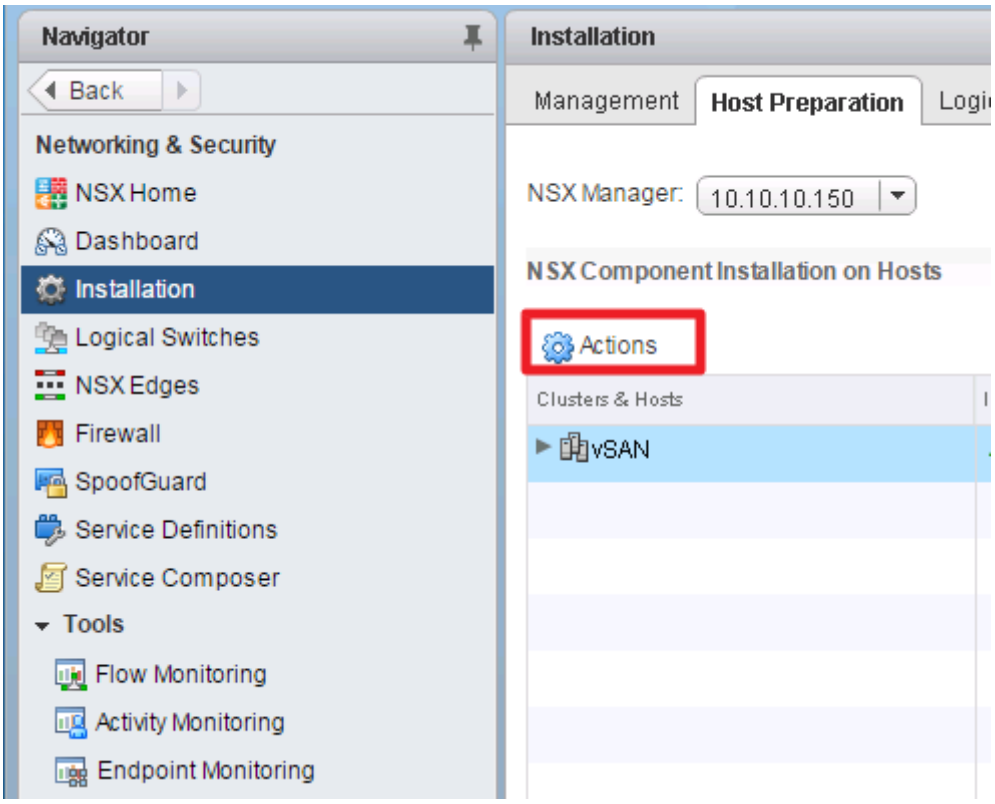


When the deployment has completed repeat the process a further two times, using the same IP Pool. You may notice the password field is absent when deploying the second and third controllers; subsequent NSX controllers are configured with the same root password as the first deployed controller.

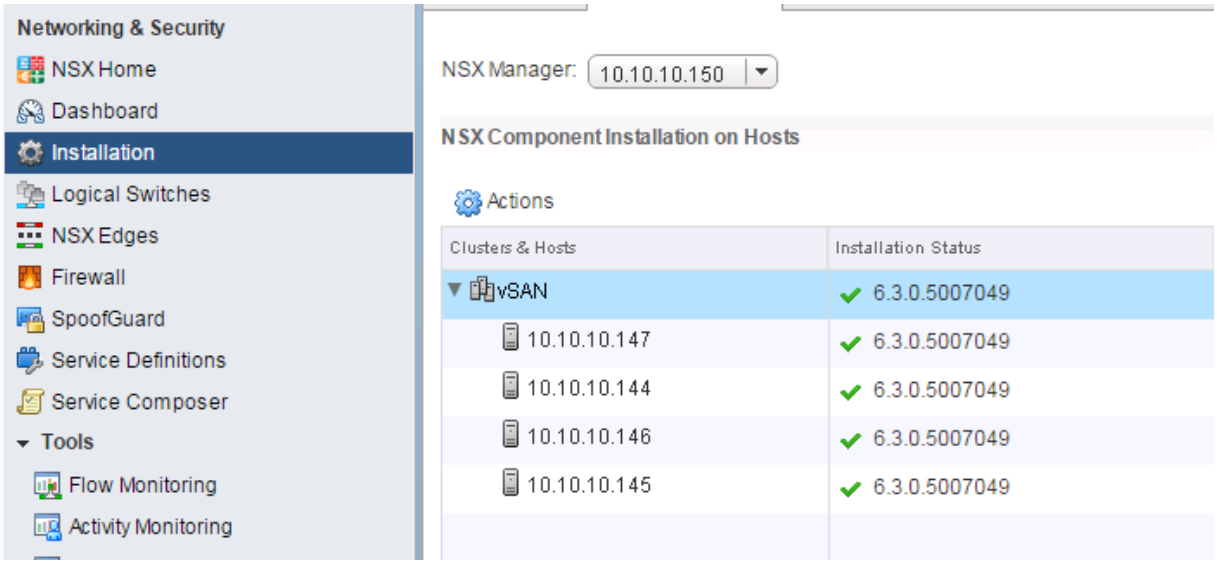


Host Preparation

Log into the vSphere web client and select **Networking & Security**. From the left hand navigator pane click **Installation**. Select the **Host Preparation** tab. Highlight the cluster you want to prepare for NSX and click **Actions**, from the drop down menu click **Install**.



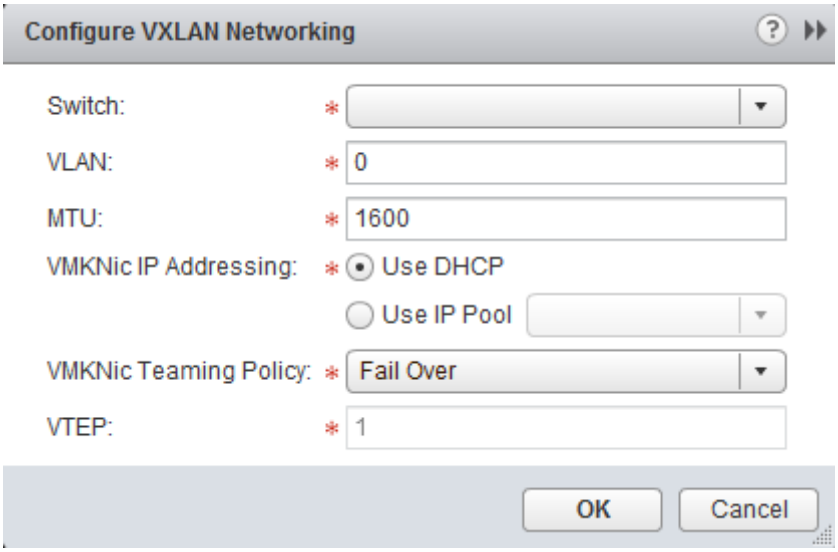
Click **Yes** to confirm the install, the NSX kernel modules will now be pushed out to the hosts in the selected cluster. The installation status will change to Installing, and then a green tick with the version number.



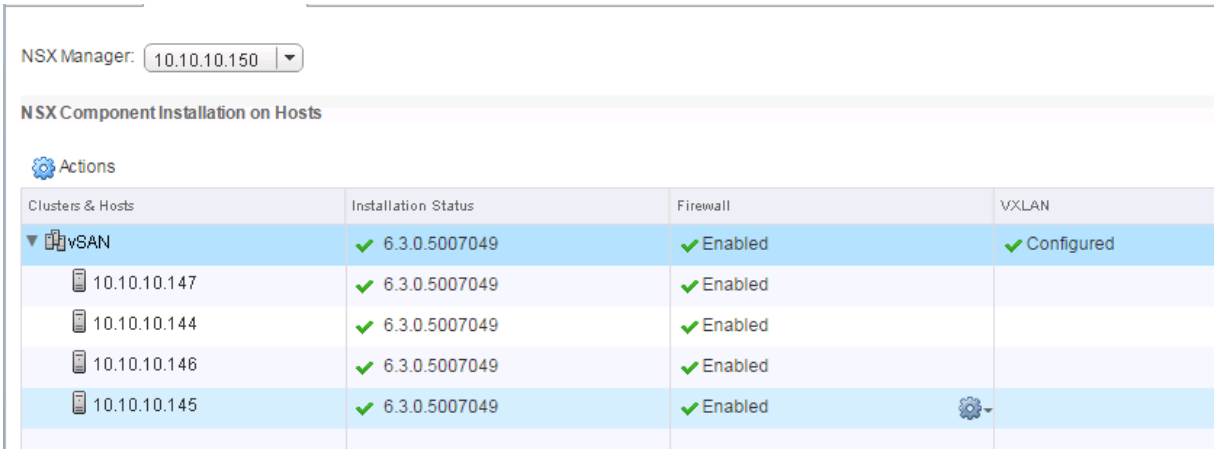
VTEP Interfaces

VXLAN-Pool	10.10.10.156-10.10.10.160

Stay within the Host Preparation tab, in the VXLAN for each cluster click **Not Configured**. Select the distributed switch and VLAN to use for the VTEP interfaces. Ensure the MTU size of the VTEP configuration and underlying network is at least 1600. Select the IP addressing option (you can create a new IP Pool in the **Use IP Pool** drop down menu). Specify the VMkernel NIC teaming policy and click **Ok**.

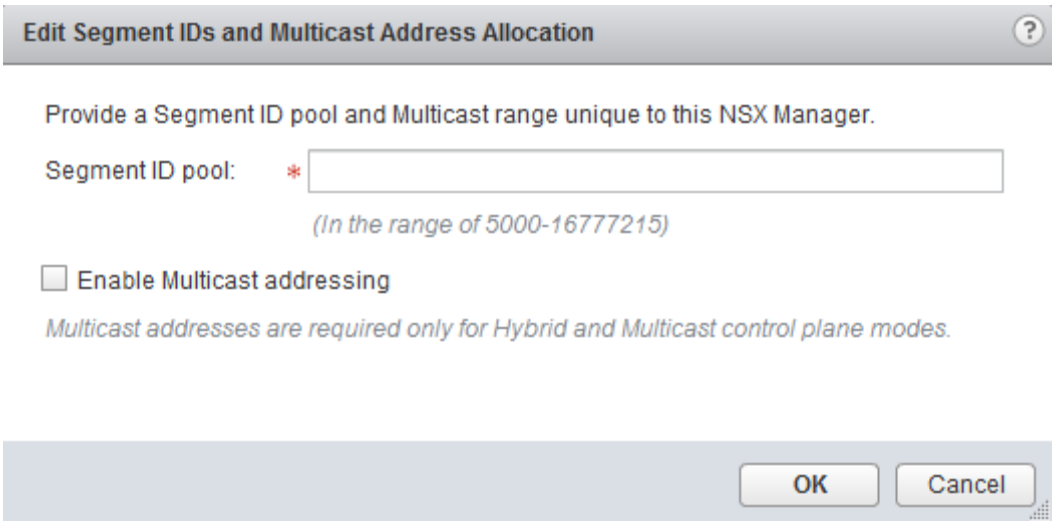


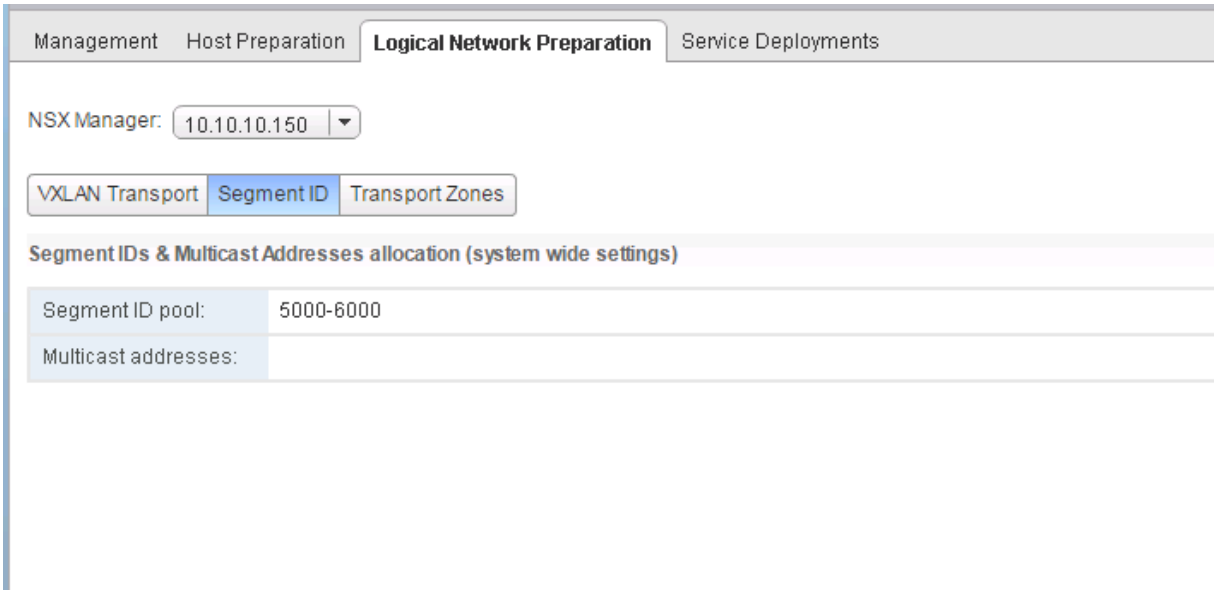
The VMkernel interfaces will now be configured on the specified distributed switch, once complete the VXLAN configuration of the cluster will show configured and a green tick.



VXLAN Network Identifiers

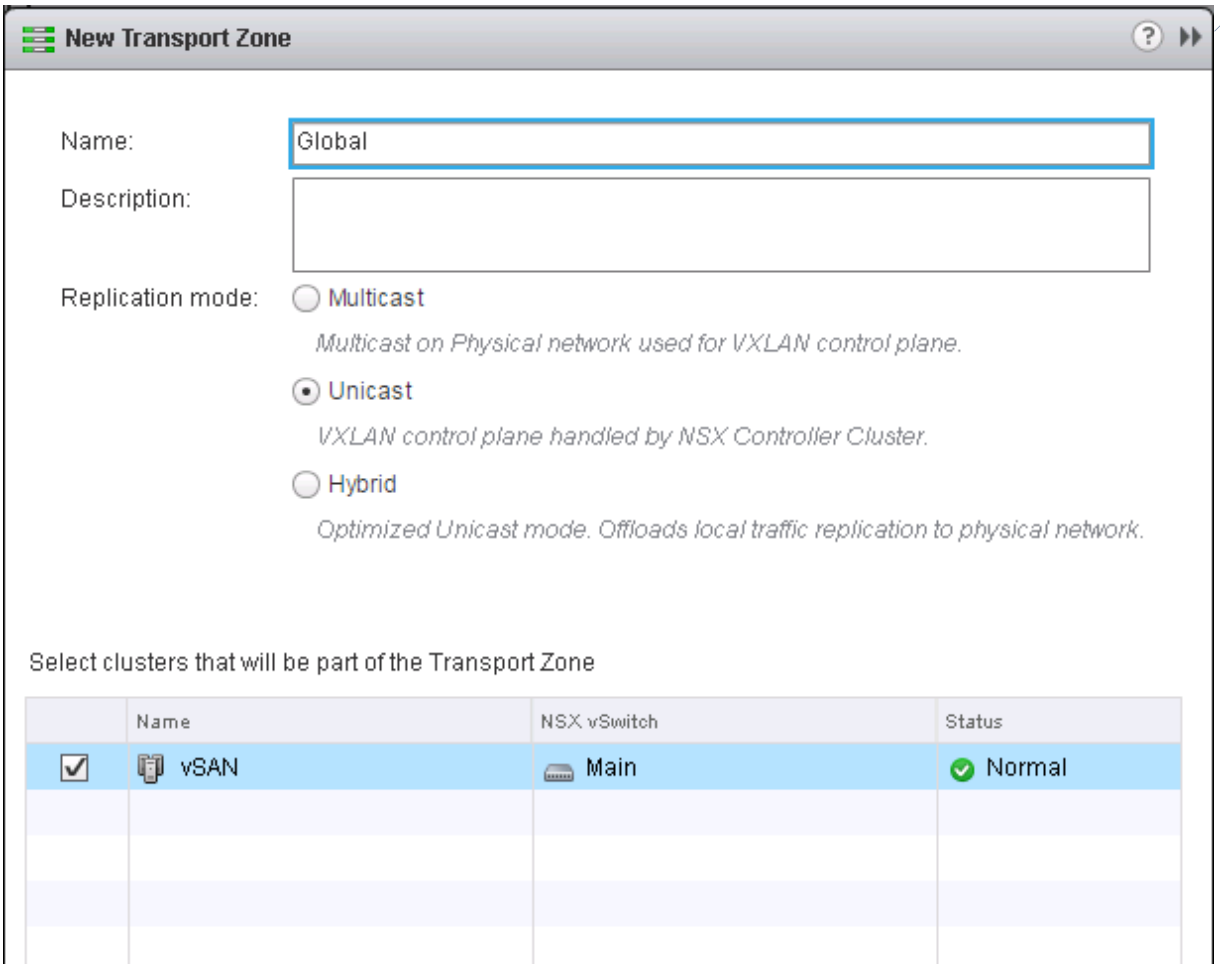
Switch to the **Logical Network Preparation** tab and click **Segment ID**. Click **Edit** to create the Segment ID Pool. Enter the range for the pool 5000-6000, and click **Ok**





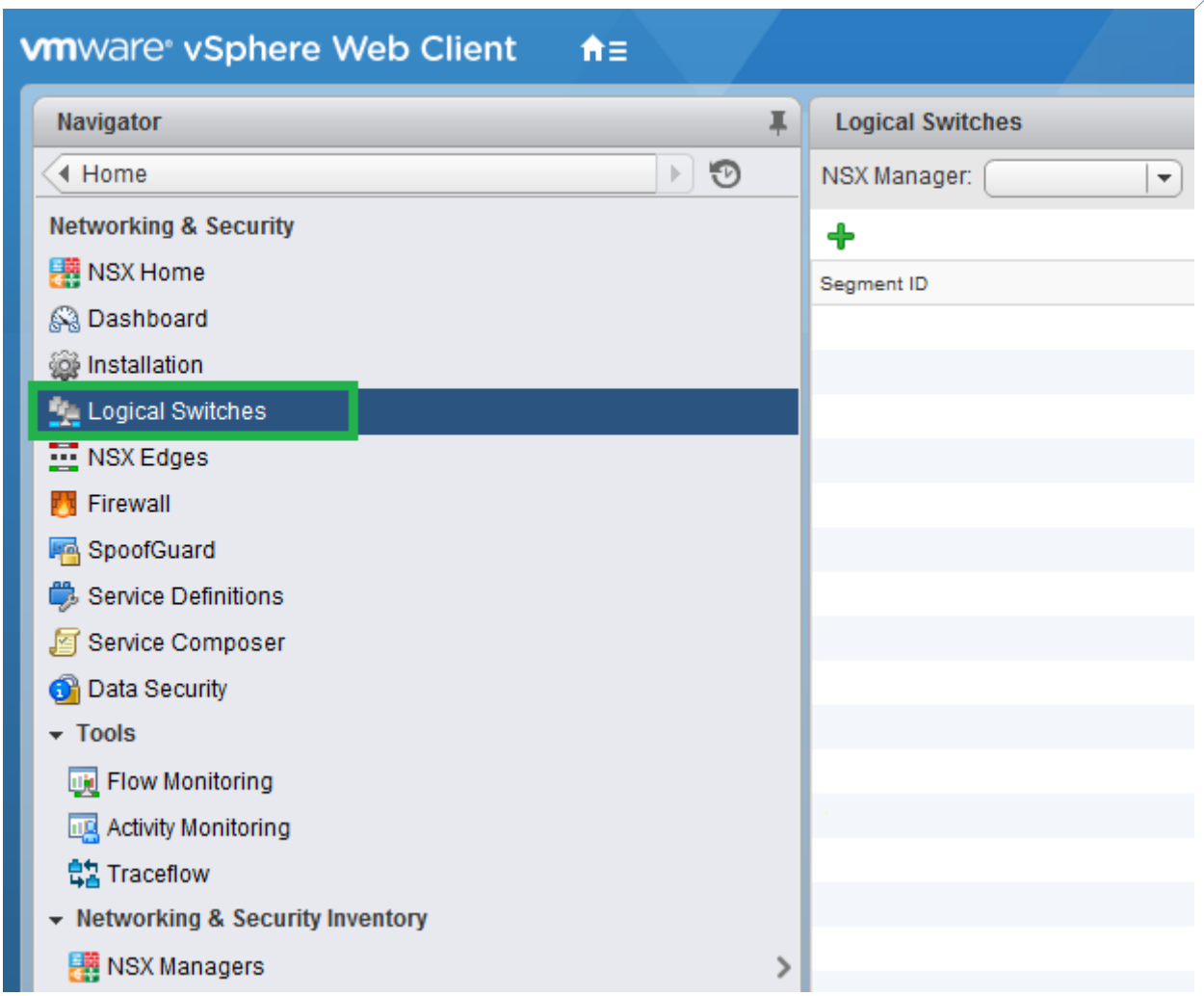
Transport Zone

Still under the **Logical Network Preparation** tab, select **Transport Zones**. Click the green plus symbol to add a new zone. In this example we will be using **Unicast** mode, allowing the NSX Controllers to look after the control plane. There are further network and IP requirements if you want to use multicast or hybrid modes. Add the clusters you want your VXLAN networks to span to the transport zone, click **Ok**.

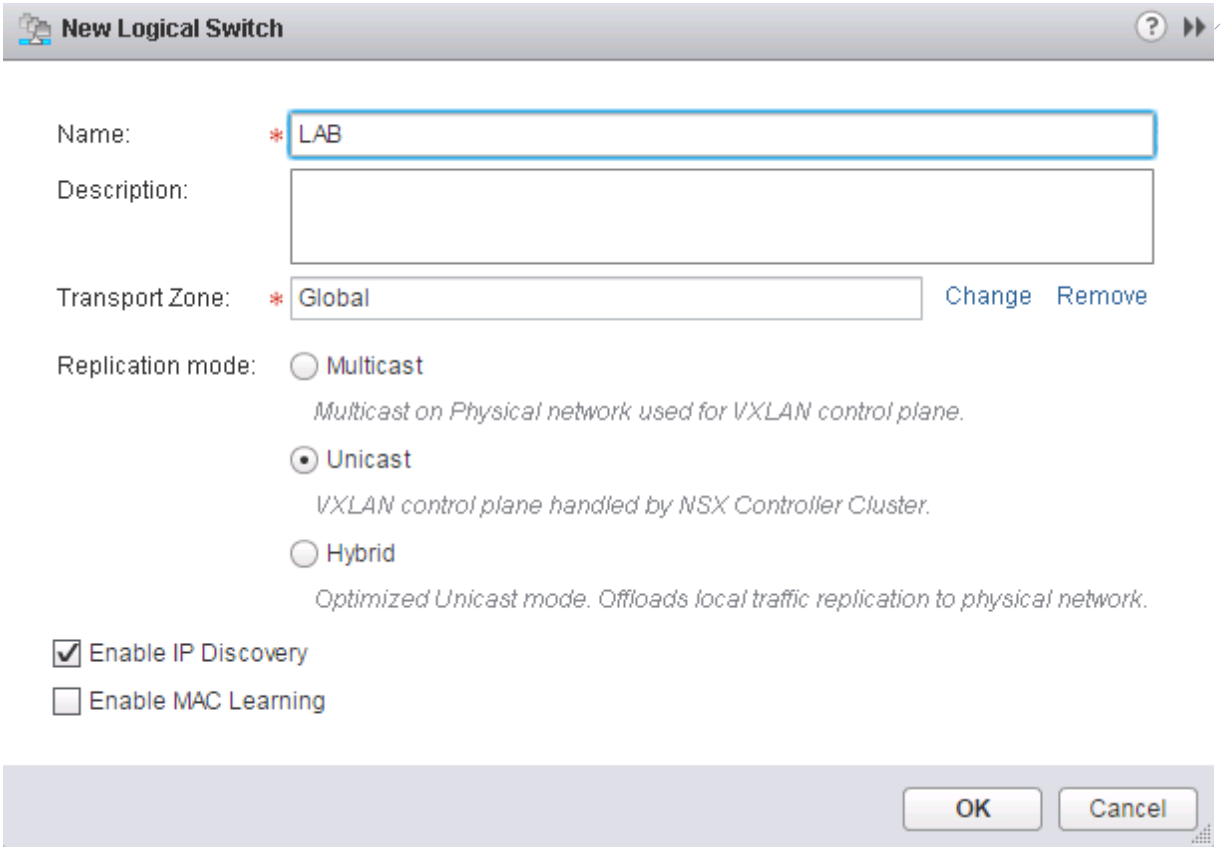


Logical Switches

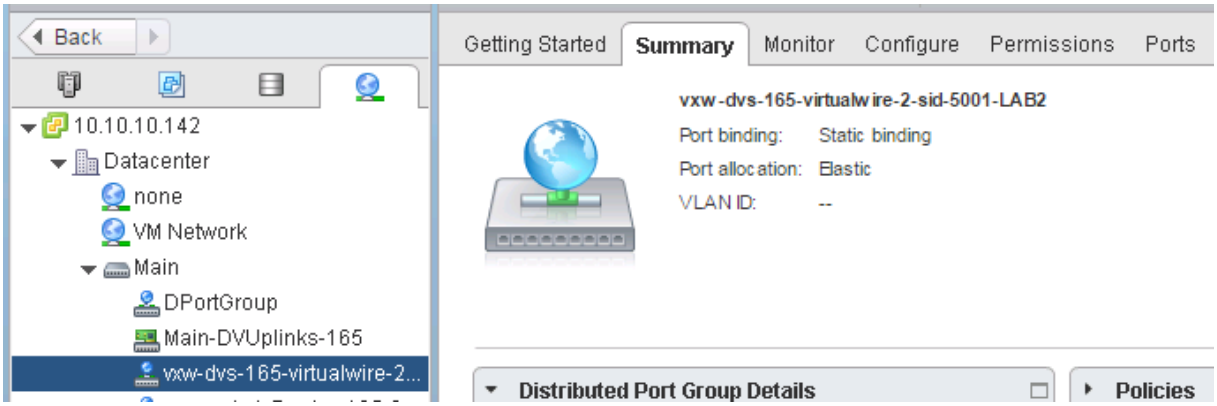
From the left hand navigation pane locate **Logical Switches**.

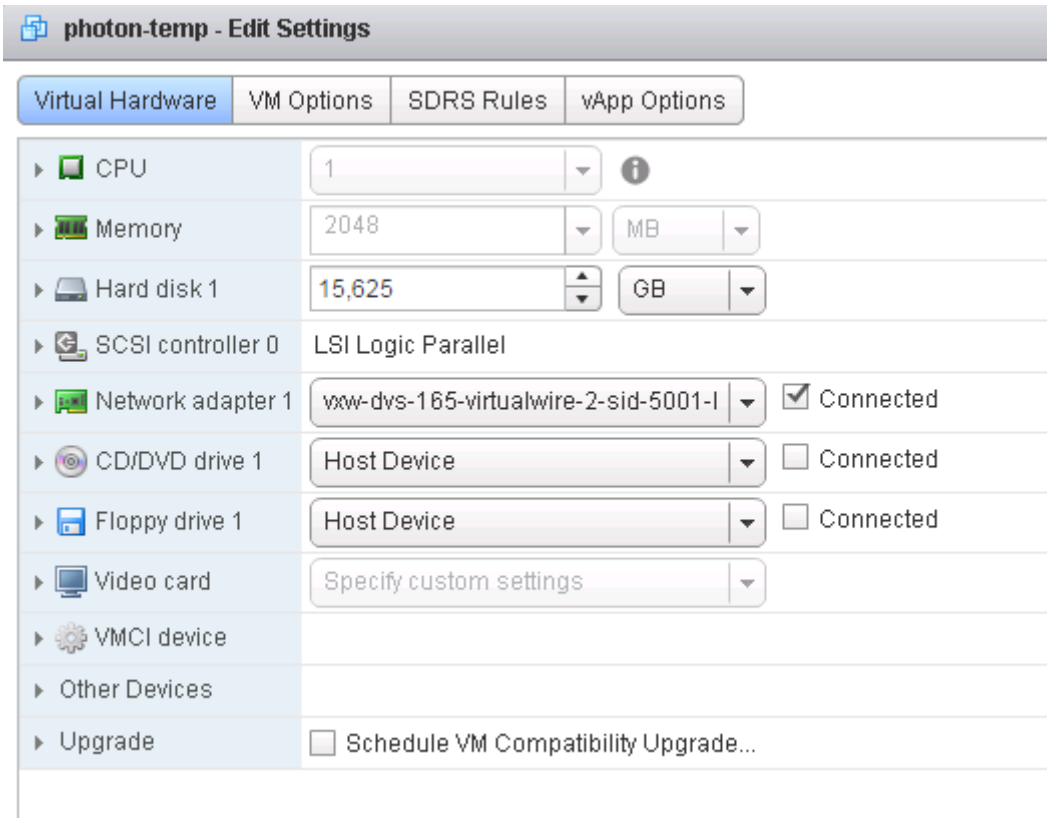


Click the green plus symbol to add a new logical switch. Enter a name and description, the Transport Zone we created earlier will automatically be selected, tick **Unicast** mode and click **Ok**. **Enable IP Discovery** is enabled by default, this option minimises ARP traffic flooding within the logical switch.



Now the logical switch is created we will see the new port group listed under the relevant distributed switch. Port groups created as NSX logical switches start with **vxw-dvs–virtualwire-**. Virtual machines can be added to a logical switch using the Add Virtual Machine icon, or by selecting the port group in the traditional Edit Settings option direct on the VM.





Virtual machines added to a logical switch at this stage only have connectivity with each other. To create VXLAN subnets, route traffic between different logical switches, and route traffic outside of VXLAN subnets; we need an Edge Services Gateway or Distributed Logical Router

Edge Services Gateway

NSX Edge provides network edge security and gateway services to isolate a virtualized network. You can install an NSX Edge either as a logical (distributed) router or as a services gateway.

The NSX Edge logical (distributed) router provides East-West distributed routing with tenant IP address space and data path isolation. Virtual machines or workloads that reside on the same host on different subnets can communicate with one another without having to traverse a traditional routing interface.

The NSX Edge gateway connects isolated, stub networks to shared (uplink) networks by providing common gateway services such as DHCP, VPN, NAT, dynamic routing, and Load Balancing. Common deployments of NSX Edge include in the DMZ, VPN Extranets, and multi-tenant Cloud environments where the NSX Edge creates virtual boundaries for each tenant. (vmware.com)

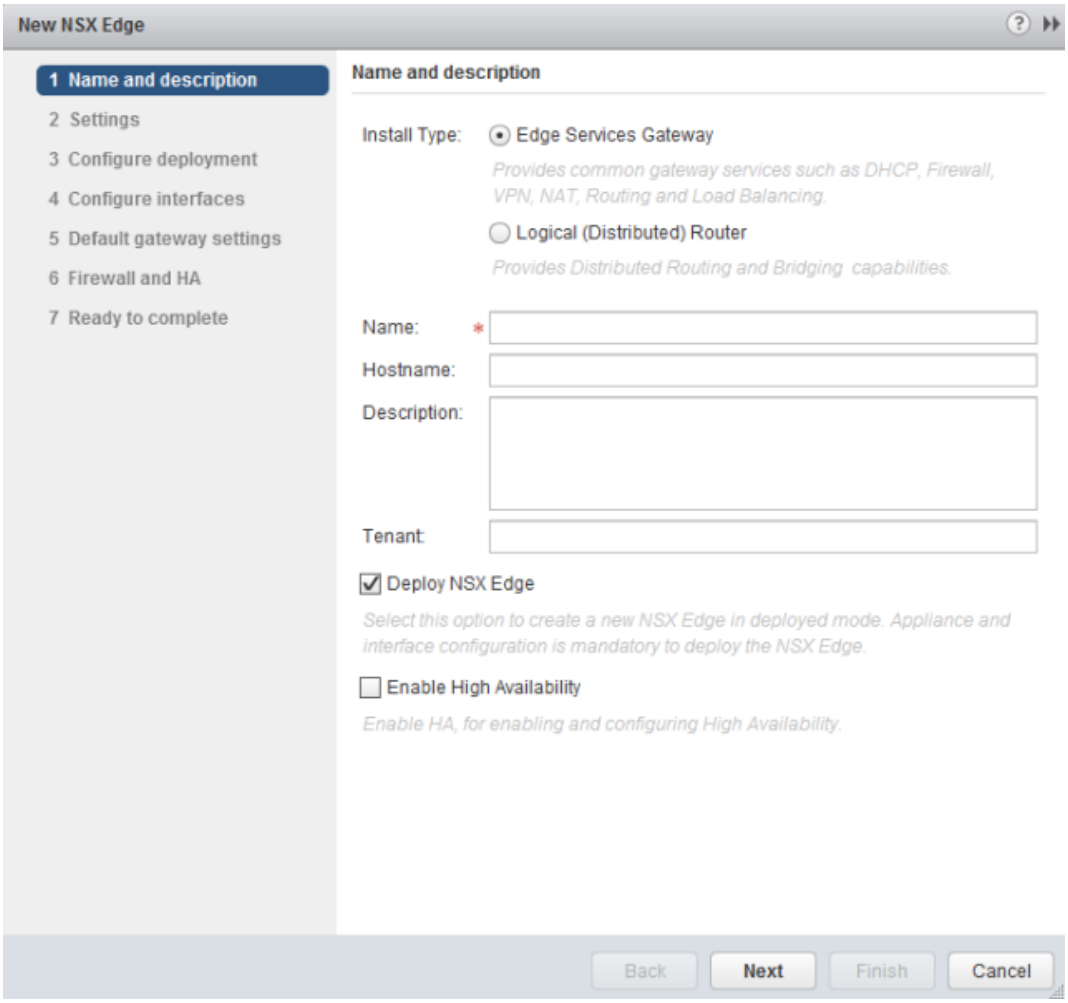
Prerequisites

Username: admin
Password: $DwHp5T#3D~=

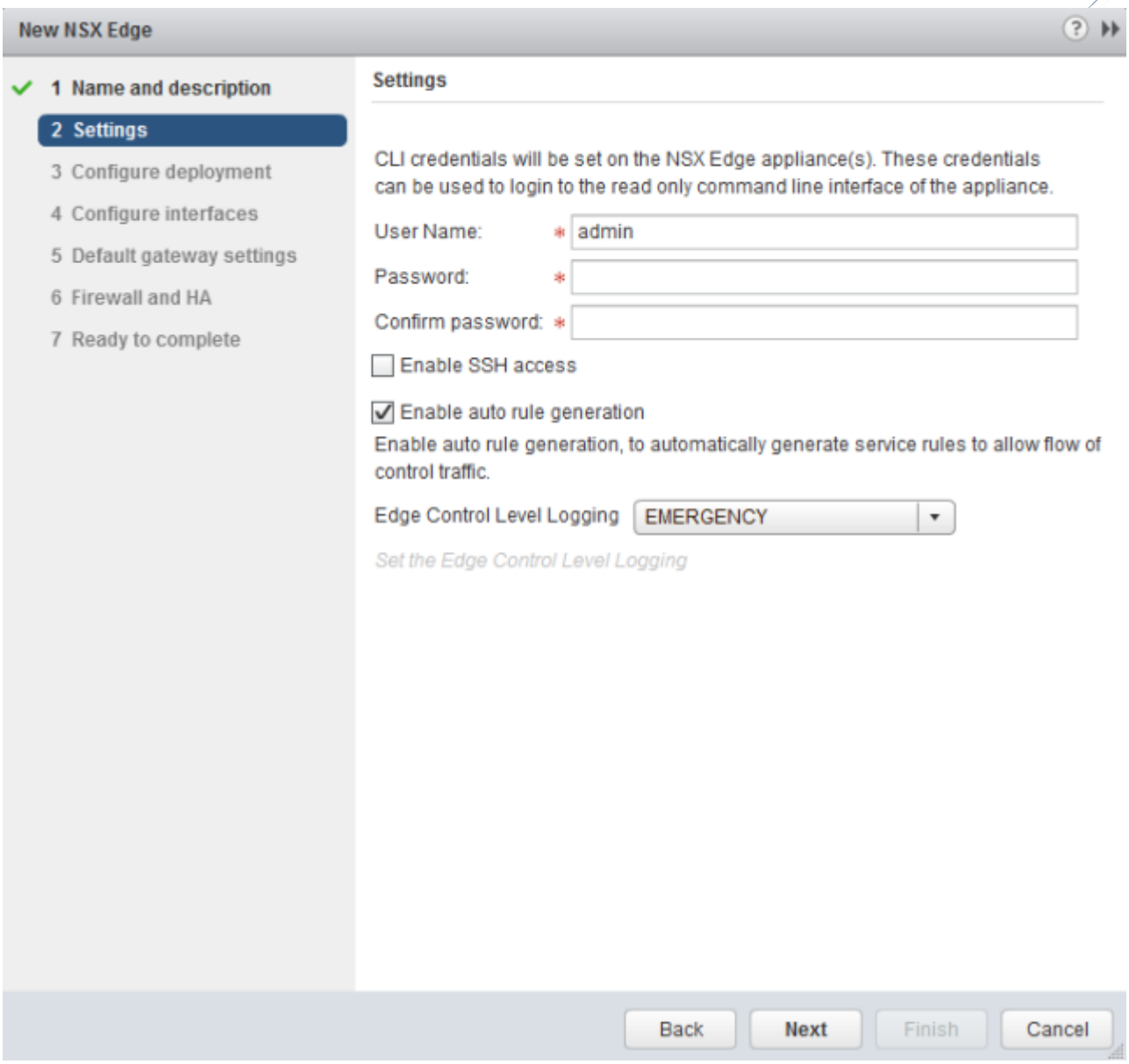
Build

OS	NSX Manager	
RAM	512 MB	
CPU	1vCPU	
HDD	500MB	
Network	9 NIC	OUTSIDE - 10.10.10.161 INSIDE - 10.10.20.1

From the left hand navigation pane select **NSX Edges**, click the green plus symbol to create a new Edge. Select **Edge Services Gateway**. Assign a name that will be displayed in the vSphere inventory and click **Next**.

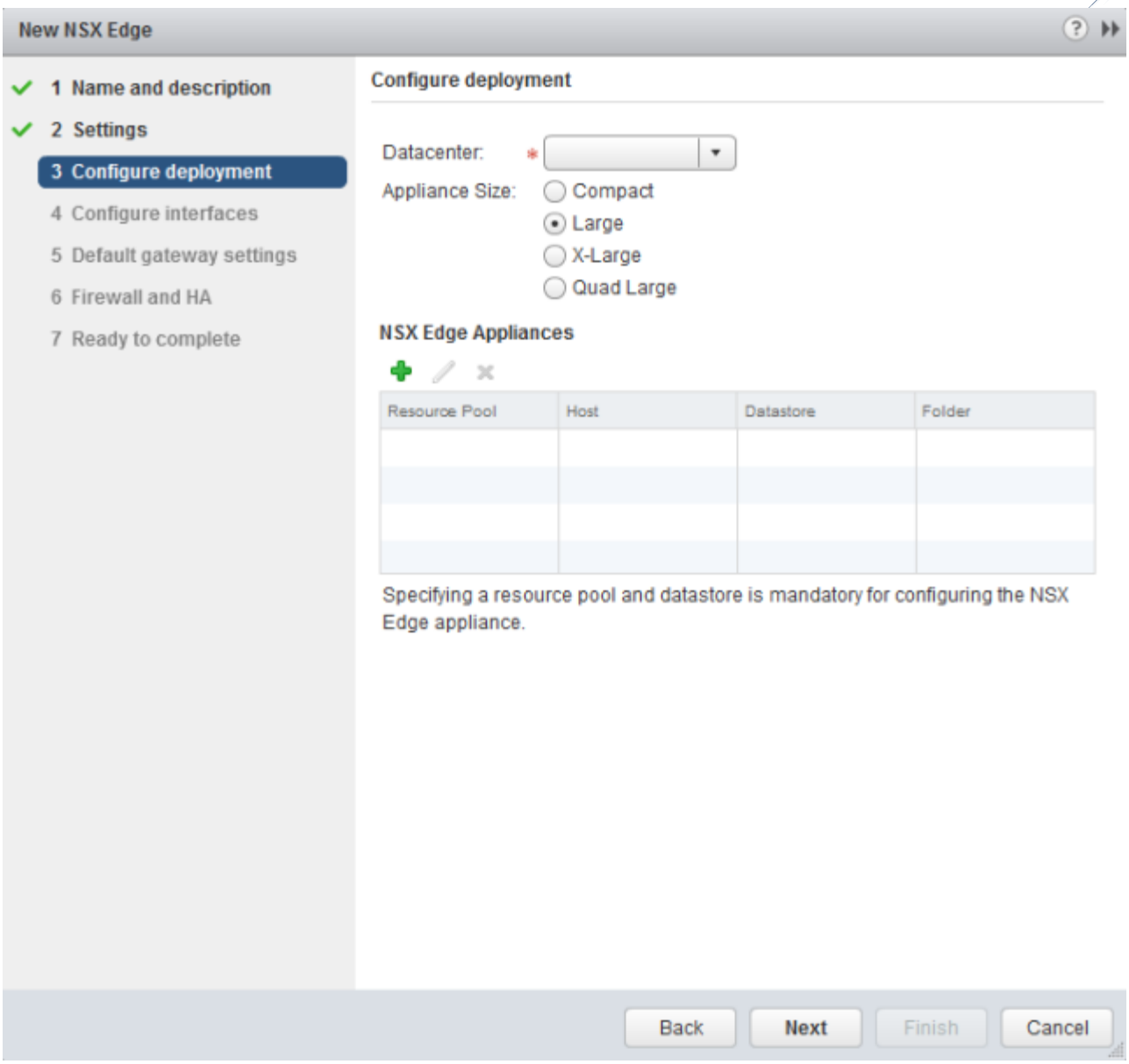


Configure the admin password (needs to be 12 characters plus the usual requirements) and logging level. You may want to enable SSH for troubleshooting purposes, this can also be enabled at a later date if required. Click **Next**.

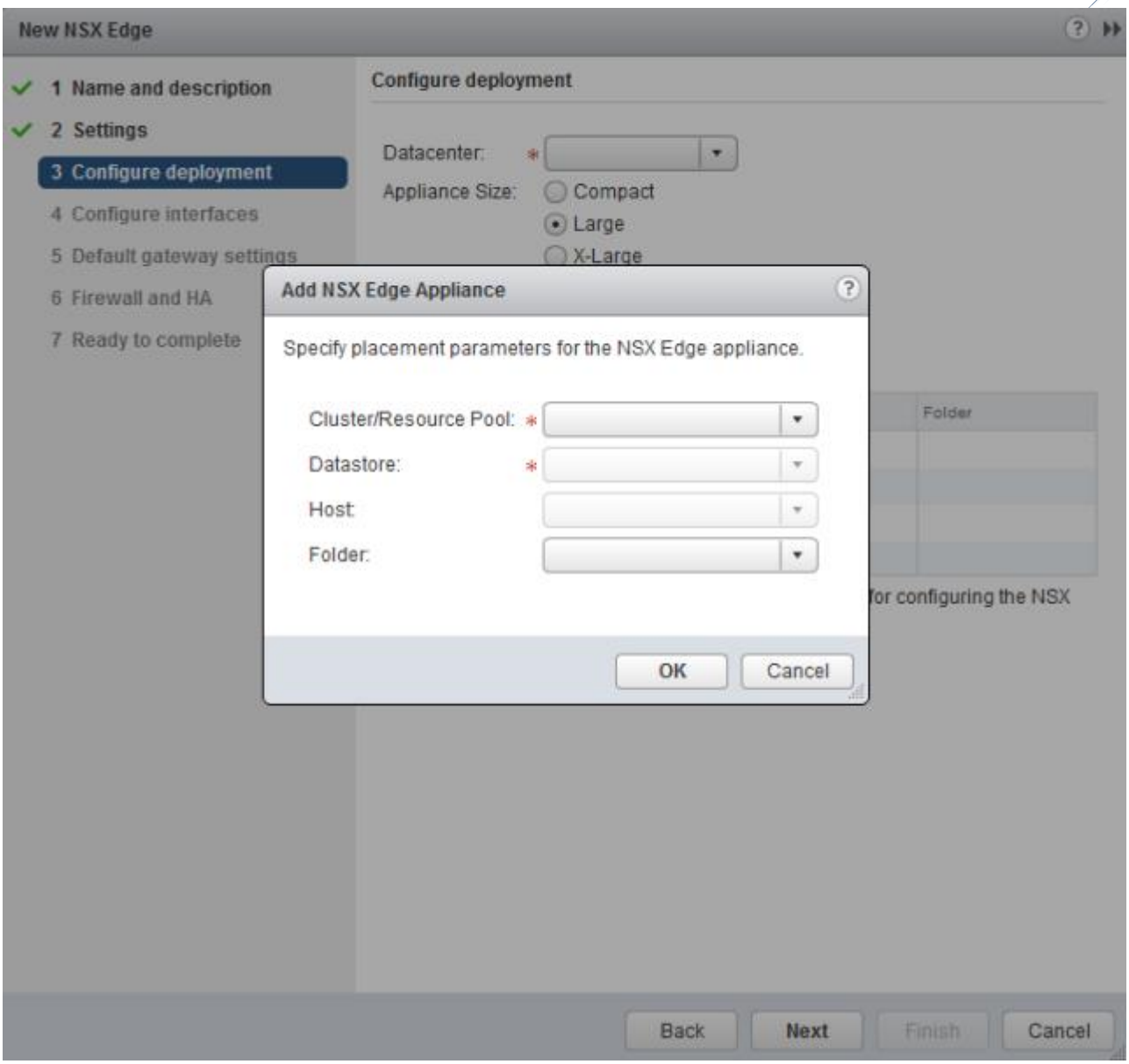


Select the datacentre and appliance size

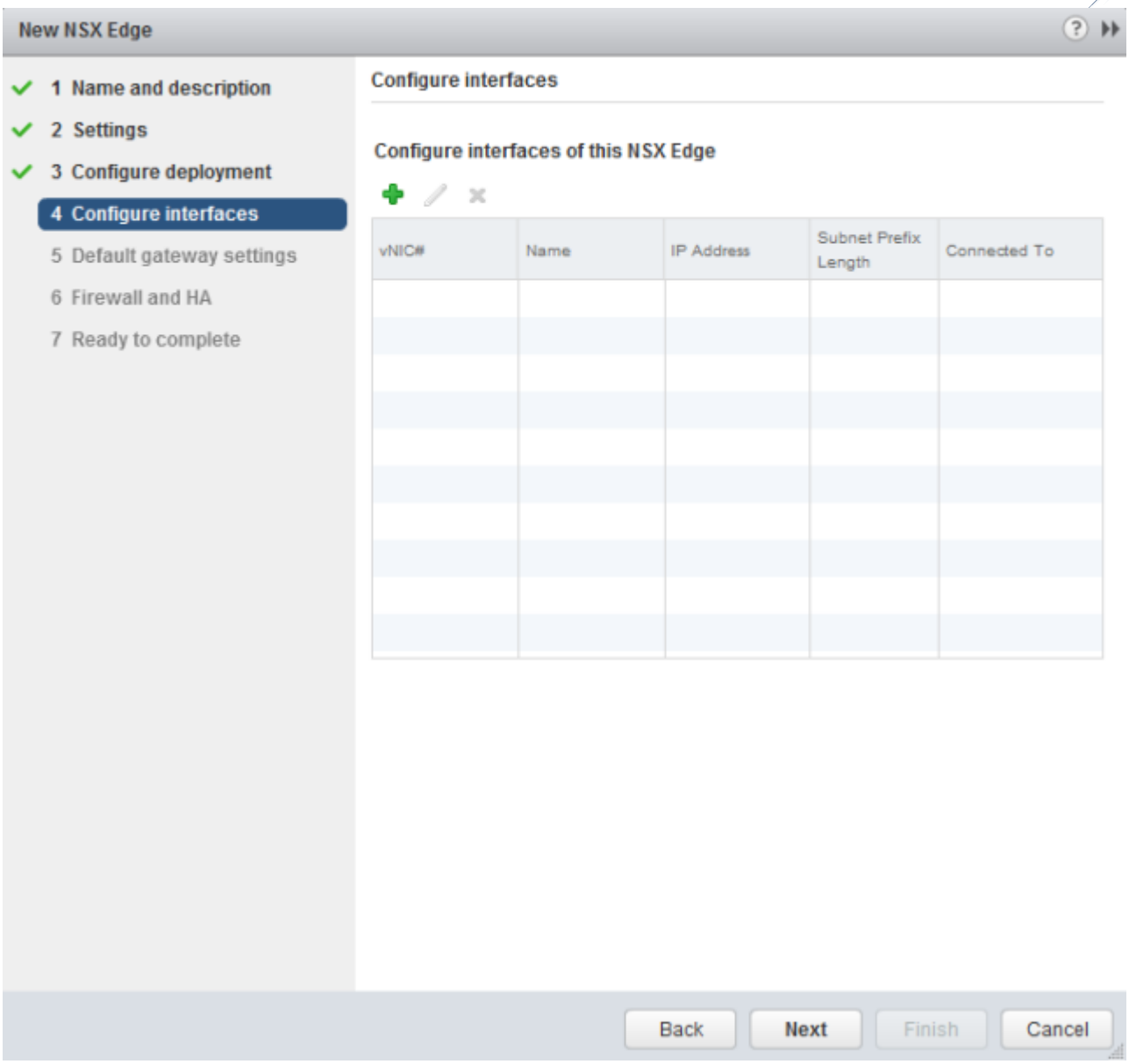
Click the green plus symbol to add an Edge appliance.



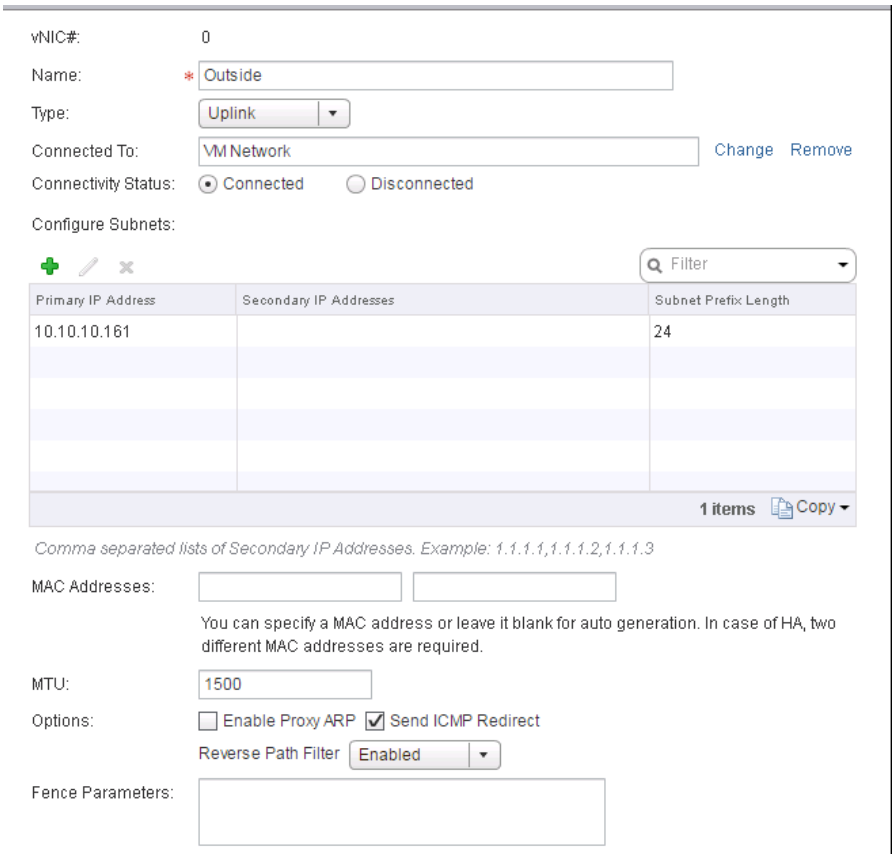
Configure the vSphere placement parameters and click **Ok**. When you have finished adding the Edge appliances click **Next**.

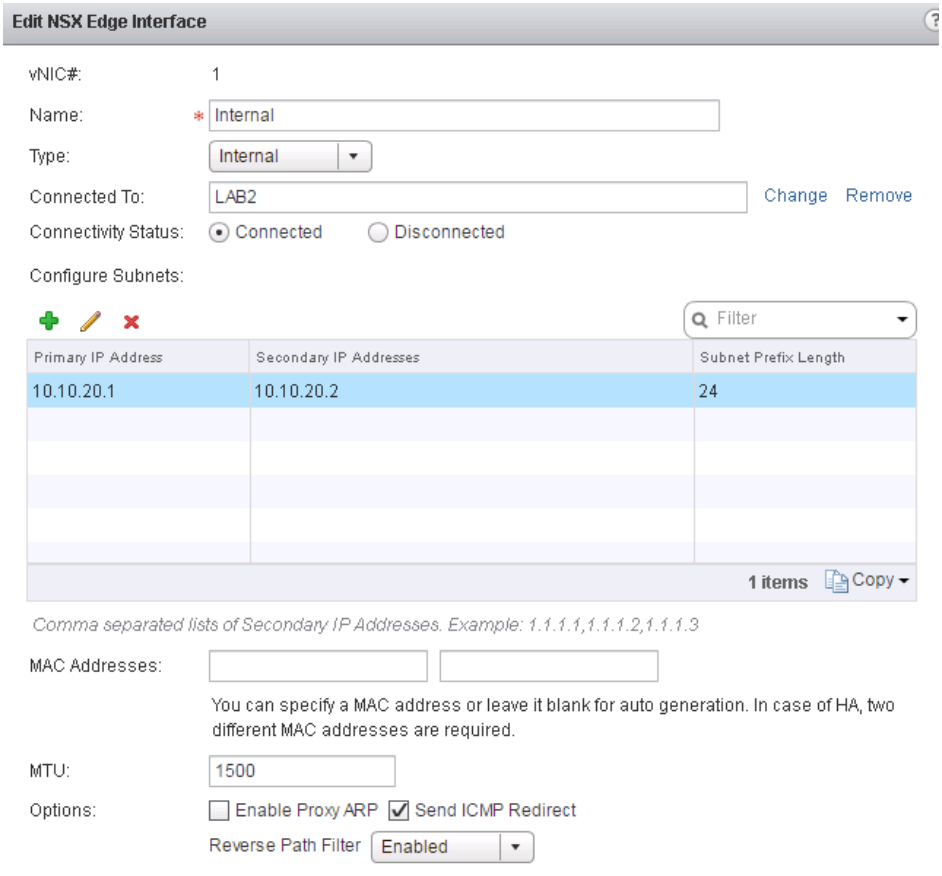


We must now add the Edge interfaces, click the green plus symbol.

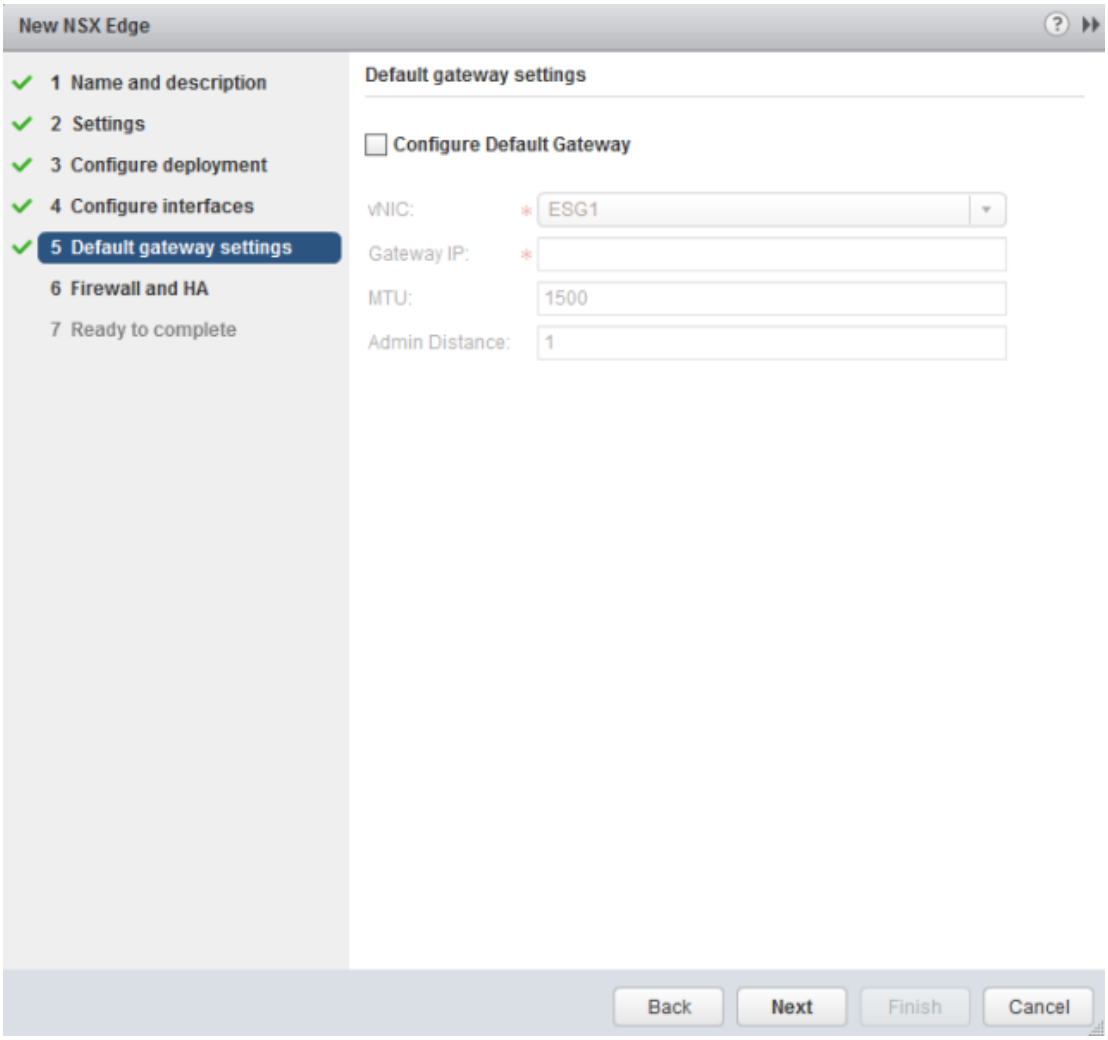

New NSX Edge
1 Name and description
2 Settings
3 Configure deployment
4 Configure interfaces
5 Default gateway settings
6 Firewall and HA
7 Ready to complete
Configure interfaces
Configure interfaces of this NSX Edge
vNIC#
Name
IP Address
Subnet Prefix Length
Connected To
Back
Next
Finish
Cancel

Configure the NSX Edge interfaces:

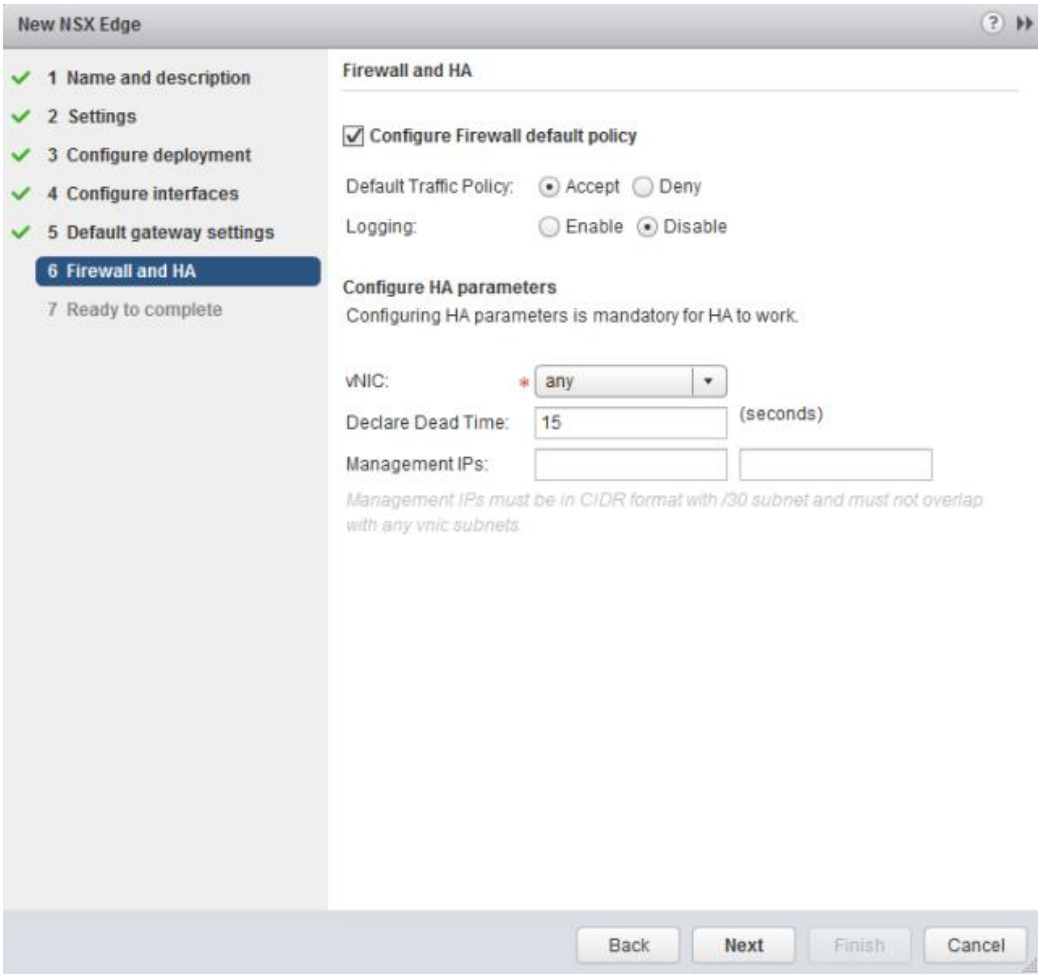




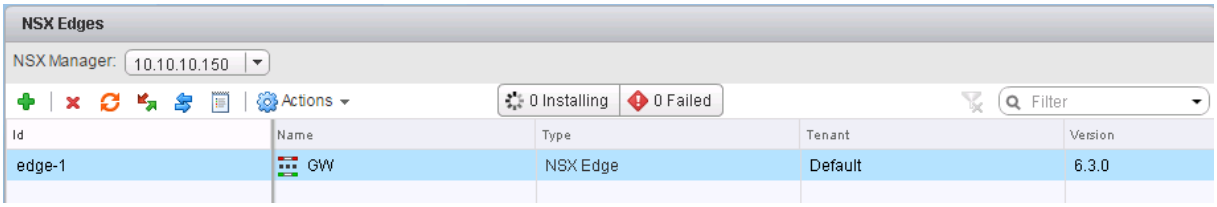
When the required interfaces have been added click **Next**. Depending on your routing configuration you may need to add a default gateway, click **Next**.



Tick **Configure Firewall default policy** and set the default traffic policy to **Accept**, enable logging if required

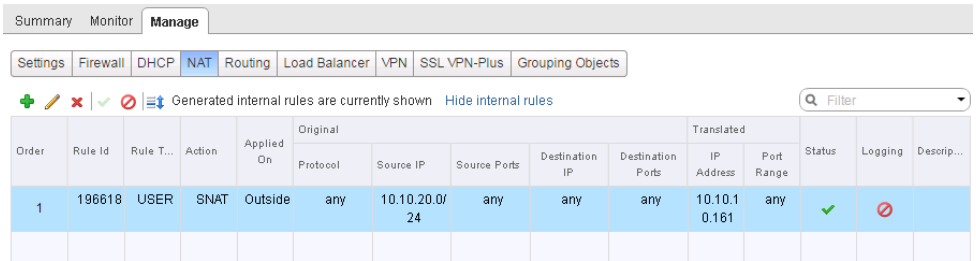


On the summary page click **Finish** to finalize the installation. The ESG will now be deployed, the details are listed on the NSX Edges page.



Once an Edge is deployed you can add or change the existing configuration, such as interfaces, by double clicking the Edge. For our LAB purpose we need to configure NAT rules to have Internet access

Create Source NAT rule for VM assigned to Logical Switch



IaaS

Prerequisites

Username: Administrator@vcap.domain.local
Password: P@ssw0rd

Build

Our VM has

OS	Windows Server 2008R2	
RAM	4GB	
CPU	1vCPU	
HDD	40GB thin	
Network	1 NIC	10.10.10.153

The IaaS Server is clone of our Windows Server 2008R2 which we create before install Active Directory.

Host preparation for IaaS is very simple we need to run good prepared script for this created by **Brian Graf**

Script

```
#==============================================
# Generated On: 12/4/2014 9:46 AM
# Generated By: Brian Graf
# Technical Marketing Engineer - Automation
# Organization: VMware
# Twitter: @vTagion
# vRA 6.2 Pre-Req Automation Script v1
#==============================================
#----------------------------------------------
#==================USAGE=======================
# For Windows Server 2008 & 2012
# This script has been created to aid in
# Configuring the settings for the vRA 6.2
# Pre-Req Checker. This script will set all
# Pre-Req's except for enabling TCP/IP in
# MS SQL, chich needs to be performed manually
# And the services will need to be restarted.
#----------------------------------------------
#===============REQUIREMENTS==================
# For this script to run successfully be sure:
#   *To run PowerShell as administrator
#   *To have admin rights on the server
#----------------------------------------------

#=============EDITOR'S NOTE===================
# In order for this script to work on servers that
# have proxied or restricted access to the Internet,
# it is necessary to configure a local source repository
# or else the features and roles requiring .NET 3.5 will fail.
# To do so, configure the variable called $InstallSource
# below making sure to set the path appropriately. In
# this example, the source is provided by mounting the
# installation CD as drive D.
```

```
#   - Chip Zoller, Senior Virtualization Engineer, Worldpay US

# ----------------------------------------
#   USER CONFIGURATION - EDIT AS NEEDED
# ----------------------------------------

# Set IIS default locations to be used with IIS role
$InetPubRoot = "C:\Inetpub"
$InetPubLog = "C:\Inetpub\Log"
$InetPubWWWRoot = "C:\Inetpub\WWWRoot"

# ------------- Dot Net 4.5.2 -------------
# Specify what the installer will do if .NET is not 4.5.2
# 1 - use a local .NET installer, 2 - Auto-Download from the internet and
proceed , 3 - Exit the script
$menuoption = ""
$dotnetlocalpath = ""

# ------------- Server 2012 ---------------
# Specify what the installer will do for installing framework components
# 1 - use a local 2012 iso sources folder, 2 - Auto-Download from Microsoft
servers internet and proceed , 3 - Exit the script
$frameworkmenuoption = ""
# Set install source location if unable to directly connect to the Internet
# Example of Mounted 2012 ISO source path (ex D:\sources\sxs)
$InstallSource = ""
# This applies ONLY to 2012

# ------------- NT Rights -----------------
#Specify how you would like to obtain and run NTRights.exe
# 1 - use a local NTRights.exe file , 2 - Auto-Download from the internet
and proceed , 3 - Exit the script
$NTRightsmenuoption = ""
#Example C:\Temp\NTRights.exe
$NTRightsInstallSource = ""
#Account to use for Batch Logon and Secondary Logon Services (if left blank
will default to local administrators group)
# Example Corp\vcacservice or Eng\Smithj
$domainAdminAcct = ""

# -------------- Java 1.7 ----------------
# Specify what the installer will do if Java is not 1.7
# 1 - use a local Java installer, 2 - Auto-Download from the internet and
proceed , 3 - Exit the script
$javamenuoption = ""
$javalocalpath = ""

# ----------------------------------------
#       END OF USER CONFIGURATION
# ----------------------------------------

# ----Do not modify beyond this point-----
$ErrorActionPreference="SilentlyContinue"
$ErrorActionPreference="Continue"

# ----------------------------------------
#       CHECK POWERSHELL SESSION
# ----------------------------------------
$Elevated = New-Object Security.Principal.WindowsPrincipal(
[Security.Principal.WindowsIdentity]::GetCurrent() )
& {
```

```
    if ($Elevated.IsInRole(
[Security.Principal.WindowsBuiltInRole]::Administrator ))
    {

        write-host "PowerShell is running as an administrator." -
ForegroundColor Green
    } Else {
        throw "Powershell must be run as an adminstrator."
    }

    if( [IntPtr]::size * 8 -eq 64 )
    {
        Write-Host "You are running 64-bit PowerShell" -ForegroundColor
Green

    }
    else
    {
        Write-Host "You are running 32-bit PowerShell" -ForegroundColor Red
        Throw "Please run using 64-bit PowerShell as administrator"
    }
}
# ----------------------------------------
#       END OF POWERSHELL CHECK
# ----------------------------------------


# ----------------------------------------
#       CHECK FOR .NET FRAMEWORK
# ----------------------------------------

# .NET FRAMEWORK 4.5.2 is required for vRA 6.2 to run properly
    # Check to see if .Net 4.5.2 is present
    $DNVersion = Get-ChildItem 'HKLM:\SOFTWARE\Microsoft\NET Framework
Setup\NDP' -Recurse | Get-ItemProperty -name Version -EA 0 | Where-Object {
$_.PSChildName -match '^(?!S)\p{L}'} | Sort-Object version -Descending |
Select-Object -ExpandProperty Version -First 1
    $DNVersions = $DNVersion.Split(".")
    $DNVersionMajor = $DNVersions[0]
    $DNVersionMinor = $DNVersions[1]
    $DNVersionBuild = $DNVersions[2]


    # If .Net is older than 4.5, stop installer until .Net is upgraded
    # .NET Framework 4.5.2 Build is 4.5.51209
    if ($DNVersionMajor -eq 4 -and $DNVersionMinor -eq 5 -and
$DNVersionBuild -ge 51209 ){ Write-Host ".NET version on this server is
$DNVersion "  -ForegroundColor Green
    }else{
        Write-Host "vRA 6.2 requires .Net framework version 4.5.2 to
continue" -ForegroundColor Red
        if ($menuoption -eq ""){
        do{
            Write-Host "
    (1) - I have the .Net 4.5.2 installer and want to install it from a
local folder
    (2) - I have internet access and want to download and install it
automatically
    (3) - Exit this script" -ForegroundColor Yellow
            $menuoption = read-Host -Prompt "Choose a number to proceed:  "
```

```
        } Until ($menuoption -eq "1" -or $menuoption -eq "2" -or
$menuoption -eq "3")}
            Switch ($menuoption){
            "1" {
                if (($dotnetlocalpath -eq "") -or (Test-Path -Path
"$dotnetlocalpath" -ErrorAction SilentlyContinue -eq $false)){
                    do {
                        $dotnetlocalpath = Read-Host -Prompt "Unable to
locate file. Where is the .NET 4.5.2 installer located locally? (example
c:\temp\dotnetinstaller.exe)"
                    } while ((Test-path -Path $dotnetlocalpath -ErrorAction
SilentlyContinue) -eq $false)}
                    Write-Host "Attempting to Install .NET 4.5.2. Please be
patient." -ForegroundColor Green
                    Write-Verbose ""
                    $InstallDotNet = Start-Process $dotnetlocalpath -
ArgumentList "/q /norestart" -Wait -PassThru
                    Write-Host "Dot Net Installation finished. Proceeding
with Server configuration." -ForegroundColor Green

                    }
            "2" {
                if (!(test-path -Path "c:\Temp")){
                    Write-Host "Creating folder C:\Temp" -ForegroundColor
Green
                    New-Item -ItemType Directory -Force -Path "C:\Temp"
                }
                Write-Host "Preparing to Download .NET 4.5.2" -
ForegroundColor Green
                Write-Host "Attempting to Download .NET 4.5.2. Please be
patient." -ForegroundColor Green
                    $download = New-Object Net.WebClient
                    $url =
"http://download.microsoft.com/download/E/2/1/E21644B5-2DF2-47C2-91BD-
63C560427900/NDP452-KB2901907-x86-x64-AllOS-ENU.exe"
                    $file = ("C:\Temp\DotNet452.exe")
                    $download.Downloadfile($url,$file)
                if (!(Test-Path -Path "C:\Temp\DotNet452.exe")) {Write-Host
"Uh Oh. For some reason we were unable to download the .NET Installer
correctly" -ForegroundColor Yellow
                Throw "Please check your internet connection and rerun this
script" } else {Write-Host "File downloaded successfully... Proceeding" -
ForegroundColor Green}
                Write-Host "Attempting to Install .NET 4.5.2. Please be
patient." -ForegroundColor Green
                Write-Verbose ""
                $InstallDotNet = Start-Process $file -ArgumentList "/q
/norestart" -Wait -PassThru
                Write-Host "Dot Net Installation finished. Proceeding with
Server configuration." -ForegroundColor Green

            }
            "3" { Exit }
            }
#       }
    }

# -------------------------------------
#       END OF .NET FRAMEWORK CHECK
# -------------------------------------
```

```
# ---------------------------------------
#      Check Operating System Version
# ---------------------------------------

# Grab the OS Name
$os = (get-WMiObject -class Win32_OperatingSystem).caption

# Overwrite $OS variable with smaller string
switch -wildcard ($os) {
"*2008*" {
    Write-Host "OS = $os" -ForegroundColor Green
    $os = "2008"
}
"*2012*" {
    Write-Host "OS = $os" -ForegroundColor Green
    $os = "2012"
}
Default {Write-Host "The current operating system, $os, is not supported at
this time" }
}

# ---------------------------------------
#       END OF OS VERSION CHECK
# ---------------------------------------


# Begin installations

# ---------------------------------------
#     BEGIN ROLE AND FEATURE INSTALL
# ---------------------------------------


# Loading feature installation modules
Write-Host "Importing Server Manager " -ForegroundColor Yellow
Import-Module ServerManager

Write-Host "Installing IIS roles " -ForegroundColor Yellow
if ($os -eq "2008") {
# Installing roles specified in vCAC 6 Pre-req checker
Add-WindowsFeature -Name Web-Webserver,Web-Http-Redirect,Web-Asp-Net,Web-
Windows-Auth,Web-Mgmt-Console,Web-Mgmt-Compat, web-metabase
}

if ($os -eq "2012"){

if ($frameworkmenuoption -eq ""){
        do{
            Write-Host "
    (1) - I have the Server 2012 ISO mounted and want to install the
framework files from a local folder
    (2) - I have internet access and want to download it from Microsoft and
install it automatically
    (3) - Exit this script" -ForegroundColor Yellow
            $frameworkmenuoption = read-Host -Prompt "Choose a number to
proceed:  "
        } Until ($frameworkmenuoption -eq "1" -or $frameworkmenuoption -eq
"2" -or $frameworkmenuoption -eq "3")}
            Switch ($frameworkmenuoption){
            "1" {
```

```
                if (($InstallSource -eq "") -or (Test-Path -Path
"$InstallSource" -ErrorAction SilentlyContinue -eq $false)) {
                    do {
                        $InstallSource = Read-Host -Prompt "Unable to
locate folder. Please specify the source folder for required files (ex
D:\sources\sxs\)"
                    } while ((Test-path -Path $InstallSource -ErrorAction
SilentlyContinue) -eq $false)}
                    Write-Host "Attempting to Install .NET Framework.
Please be patient." -ForegroundColor Green
                    Add-WindowsFeature -Name Web-Webserver,Web-Http-
Redirect,Web-Asp-Net,Web-Windows-Auth,Web-Mgmt-Console,Web-Mgmt-Compat,
web-metabase -Source $InstallSource

                    }
            "2" {
                Write-Host "Preparing to Download Framework Components" -
ForegroundColor Green
                Write-Host "Attempting to Download Framework Components.
Please be patient. (~200MB)" -ForegroundColor Green
                if (Test-Connection google.com -Count 3 -ErrorAction
SilentlyContinue) {Write-Host "Internet Connection Succeeded." -
ForegroundColor Green}
                    Add-WindowsFeature -Name Web-Webserver,Web-Http-
Redirect,Web-Asp-Net,Web-Windows-Auth,Web-Mgmt-Console,Web-Mgmt-Compat,
web-metabase
                Write-Host "Framework finished. Proceeding with Server
configuration." -ForegroundColor Green

            }
            "3" { Exit }
            }
#       }
}

Write-Host "IIS role installation complete, adding features... "  -
ForegroundColor Green

# --------------------------------------
#      Install Correct Framework
# --------------------------------------
# Run the correct command based off the OS result
switch ($os) {
"2008" {
    # Adding 2008 features specified in vCAC 6 Pre-req checker
    Write-Host "Adding Windows features " -ForegroundColor Yellow
    Add-WindowsFeature -Name AS-Net-framework, NET-Win-CFAC, NET-HTTP-
Activation, NET-Non-HTTP-Activ
    Write-Host "Features installation complete, loading IIS module "  -
ForegroundColor Green
}
"2012" {

    # Adding 2012 features specified in vCAC 6 Pre-req checker
    Write-Host "Adding Windows features " -ForegroundColor Yellow
    Install-WindowsFeature -name NET-Framework-Core,net-wcf-http-
activation45
    Add-windowsfeature -name was, was-config-apis, was-Net-Environment,NET-
Non-HTTP-Activ
    Write-Host "Features installation complete, loading IIS module "  -
ForegroundColor Green}
```

```
Default {Write-Host "The Operating System does not appear to be compatible
with this script"
Throw "This is for Windows Server 2008 and 2012"
}
}
# ---------------------------------------
#       END OF Framework Installation
# ---------------------------------------


# Loading IIS web admin module
if (Get-Module -ListAvailable WebAdministration){
    Write-host "Importing Web Admin module " -Foregroundcolor Yellow
    Import-Module WebAdministration
}
else {

    throw "Webadministration is not installed on this system"
}

# Build the IIS folder structure
Write-Host "Setting up folder structure"  -ForegroundColor Yellow
New-Item -Path $InetPubRoot -type directory -Force -ErrorAction
SilentlyContinue
New-Item -Path $InetPubLog -type directory -Force -ErrorAction
SilentlyContinue
New-Item -Path $InetPubWWWRoot -type directory -Force -ErrorAction
SilentlyContinue

# Set the directory access for 'Builtin\IIS_IUSRS' and 'NT
SERVICE\TrustedInstaller'
$Command = "icacls $InetPubWWWRoot /grant BUILTIN\IIS_IUSRS:(OI)(CI)(RX)
BUILTIN\Users:(OI)(CI)(RX)"
cmd.exe /c $Command
$Command = "icacls $InetPubLog /grant ""NT
SERVICE\TrustedInstaller"":(OI)(CI)(F)"
cmd.exe /c $Command

# Setting the default website location used in vCAC
Set-ItemProperty 'IIS:\Sites\Default Web Site' -name physicalPath -value
$InetPubWWWRoot

# Setting authentication values for IIS
# Anonymous Authentication needs to be disabled
# Windows Authentication needs to be enabled
Write-Host "Setting authentication values for IIS" -ForegroundColor Yellow
Set-WebConfigurationProperty -Location 'Default Web Site' -Filter
/system.webServer/security/authentication/AnonymousAuthentication  -Name
Enabled -Value $true
Set-WebConfigurationProperty -Location 'Default Web Site' -Filter
/system.webServer/security/authentication/AnonymousAuthentication  -Name
Enabled -Value $false

Set-WebConfigurationProperty -Location 'Default Web Site' -Filter
/system.webServer/security/authentication/windowsAuthentication  -Name
Enabled -Value $false
Set-WebConfigurationProperty -Location 'Default Web Site' -Filter
/system.webServer/security/authentication/windowsAuthentication  -Name
Enabled -Value $true
```

```
# Sometimes the pre-req checker cannot distinguish the values of the
Windows authentication without
# The providers being removed and added back in.
# Removing and re-adding Windows authentication providers

Write-Host "Removing & Re-Adding Windows authentication providers" -
ForegroundColor Yellow
# Authentication Providers code by Jonathan Medd
http://www.jonathanmedd.net
Get-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name providers.Collection | Select-Object -
ExpandProperty Value | ForEach-Object {Remove-WebConfigurationProperty -
Filter system.webServer/security/authentication/WindowsAuthentication -
Location 'Default Web Site' -Name providers.Collection -AtElement
@{value=$_}}
Add-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name providers.Collection -AtIndex 0 -Value "Negotiate"
Add-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name providers.Collection -AtIndex 1 -Value "NTLM"

# Extended protection needs to be enabled and disabled for vCAC to
recognize the value
# Enable and disable the Extended Protection
Write-Host "Enabling and disabling Extended Protection" -ForegroundColor
Yellow
Set-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name extendedProtection.tokenChecking -Value 'Allow'
Set-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name extendedProtection.tokenChecking -Value 'None'

# The same must happen with Kernel-Mode. This will disable then re-enable
the value
# Resetting KERNEL MODE
Write-Host "Resetting Kernel Mode" -ForegroundColor Yellow
Set-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name useKernelMode -Value $false
Set-WebConfigurationProperty -Filter
system.webServer/security/authentication/WindowsAuthentication -Location
'Default Web Site' -Name useKernelMode -Value $true

# IIS must be restarted for the changes to take effect
# Resetting IIS
Write-Host "Resetting IIS" -ForegroundColor Yellow
$Command = "IISRESET"
Invoke-Expression -Command $Command
Write-Host "IIS Reset Complete..."  -ForegroundColor Green


# ----------------------------------------
#      END OF ROLE & FEATURE INSTALL
# ----------------------------------------

# ----------------------------------------
#      FIREWALL & SECURITY SETTINGS
# ----------------------------------------
```

```
# MSDTC is used for Coordinating Transactions spanning several resource
managers (databases, message queues, etc)
# The following settings will allow vCAC to function properly on the
network.
# Setting the MSDTC components
Write-Host "Setting MSDTC components in the registry. Please restart your
system after installation completes" -ForegroundColor Yellow
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
LuTransactions -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcAccess -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcAccessInbound -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcAccessOutbound -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcClients -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcAccessTransactions -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcAccessAdmin -Value 1
Set-ItemProperty -Path HKLM:\Software\Microsoft\MSDTC\Security -Name
NetworkDtcAccessClients -Value 1

# The Distributed Transaction Coordinator needs to have access through the
firewall
# The following line of code is all that we will use. (If the firewall is
enabled it
# Will utilize the rule, if the firewall is disabled, this can be ignored
# Creating firewall rule for DTC

#netsh advfirewall firewall set rule group="Distributed Transaction
Coordinator" new enable=Yes | Out-Null
netsh advfirewall firewall set rule group="Distributed Transaction
Coordinator" new enable=Yes

# ----------------------------------------
#    END FIREWALL & SECURITY SETTINGS
# ----------------------------------------

# ----------------------------------------
#        LOGON SERVICE SETTINGS
# ----------------------------------------

# Enabling Secondary Logon service
# If the 'Secondary Logon' service is not running, this will set the
service to
# Automatic and start the service
Write-Host "Enabling Secondary Logon Service" -ForegroundColor Yellow

    if ((Get-Service seclogon).Status -ne 'Running'){
        Set-Service Seclogon -StartupType Automatic
        Start-Service seclogon
        Write-Host "Secondary Logon Service Enabled..."  -ForegroundColor
Yellow
    }

if ($NTRightsmenuoption -eq ""){
        do{
            Write-Host "
```

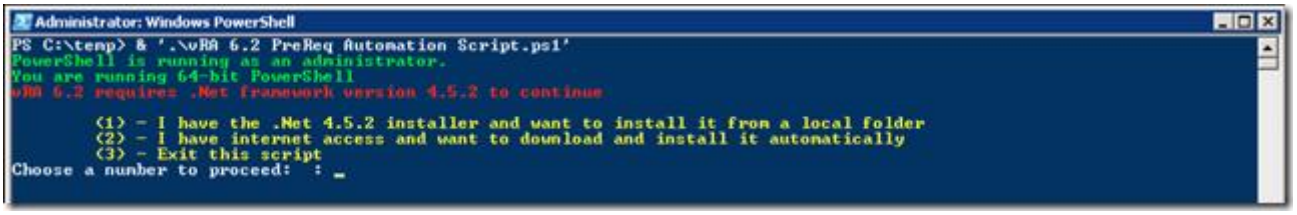
```
    (1) - I have the NTRights.exe and want to run the file from a local
folder
    (2) - I have internet access and want to download it from the internet
automatically
    (3) - Exit this script" -ForegroundColor Yellow
            $NTRightsmenuoption = read-Host -Prompt "Choose a number to
proceed:  "
        } Until ($NTRightsmenuoption -eq "1" -or $NTRightsmenuoption -eq
"2" -or $NTRightsmenuoption -eq "3")}
            Switch ($NTRightsmenuoption){
            "1" {
            if (($NTRightsInstallSource -eq "") -or (Test-Path -Path
"$NTRightsInstallSource" -ErrorAction SilentlyContinue -eq $false)) {
                    do {
                        $NTRightsInstallSource = Read-Host -Prompt "Unable
to locate file. Please specify the location of ntrights.exe(ex
c:\temp\ntrights.exe)"
                    } while ((Test-path -Path $NTRightsInstallSource -
ErrorAction SilentlyContinue) -eq $false)}
                    Write-Host "Attempting to run NTRights.exe." -
ForegroundColor Yellow
                    if ($domainAdminAcct -eq "") {$domainAdminAcct = read-
Host -Prompt "What is the domain admin account for vCAC-IAAS? (ex.
Corp\Services)  " }
                    Write-Host "Account specified for Batch Logon and
Secondary Service Logon is $domainAdminAcct" -ForegroundColor Yellow
                    }
            "2" {
                Write-Host "Preparing to Download NTrights.exe" -
ForegroundColor Green
                Write-Host "Attempting to Download NTrights.exe." -
ForegroundColor Green
                if (!(test-path -Path "c:\Temp")){
                    Write-Host "Creating folder C:\Temp" -ForegroundColor
Green
                    New-Item -ItemType Directory -Force -Path "C:\Temp"
                }
                if (Test-Connection google.com -Count 3 -ErrorAction
SilentlyContinue) {Write-Host "Internet Connection Succeeded." -
ForegroundColor Green}
                    $downloadNTRights = New-Object Net.WebClient
                    $NTRightsurl =
"http://download.microsoft.com/download/8/e/c/8ec3a7d8-05b4-440a-a71e-
ca3ee25fe057/rktools.exe"
                    $NTRightsfile = ("C:\Temp\rktools.exe")

$downloadNTRights.Downloadfile($NTRightsurl,$NTRightsfile)
                if (!(Test-Path -Path "C:\Temp\rktools.exe")) {Write-Host
"Uh Oh. For some reason we were unable to download rktools.exe correctly" -
ForegroundColor Yellow
                Throw "Please check your internet connection and rerun this
script" } else {Write-Host "File downloaded successfully... Proceeding" -
ForegroundColor Green}
                c:\Temp\rktools.exe /C /T:c:\temp
                Start-Sleep -Seconds 5
                if (!(Test-Path -Path "C:\Temp\rktools.msi")) {Write-Host
"Uh Oh. For some reason rktools.msi didn't unpack correctly" -
ForegroundColor Yellow
                Throw "There appears to be an issue with the rktools.exe,
you may need to extract the rktools and place ntrights.exe in the c:\temp
```

```
folder manually and rerun this script" } else {Write-Host "rktools.msi
unpacked successfully" -ForegroundColor Green}
                msiexec /i c:\Temp\rktools.msi /Qb
                Write-Host "Waiting for ntrights.exe to appear in
C:\Program Files (x86)\Windows Resource Kits\Tools\"
                do {Start-Sleep -Seconds 5} until (Test-Path -path
"C:\Program Files (x86)\Windows Resource Kits\Tools\ntrights.exe" -
ErrorAction SilentlyContinue)
                Copy-Item "C:\Program Files (x86)\Windows Resource
Kits\Tools\ntrights.exe" c:\temp\ntrights.exe -force
                Start-Sleep -Seconds 2
                if ($domainAdminAcct -eq "") {$domainAdminAcct = read-Host
-Prompt "What is the domain admin account for vCAC-IAAS? (ex.
Corp\Services)  " }
                Write-Host "Account specified for Batch Logon and Secondary
Service Logon is $domainAdminAcct" -ForegroundColor Yellow
                $NTRightsInstallSource = "C:\Temp\NTRights.exe"

            }
            "3" { Exit }
            }



    Write-Host "Setting Batch Logon Rights" -ForegroundColor Yellow
    #iex "c:\Temp\NTRights.exe +r SeBatchLogonRight -u $domainAdminAcct"
    iex "$NTRightsInstallSource +r SeBatchLogonRight -u $domainAdminAcct"
    Write-Host "Setting Secondary Logon Rights" -ForegroundColor Yellow
    #iex "c:\Temp\NTRights.exe +r SeServiceLogonRight -u $domainAdminAcct"
    iex "$NTRightsInstallSource +r SeServiceLogonRight -u $domainAdminAcct"

# ----------------------------------------
#      END LOGON SERVICE SETTINGS
# ----------------------------------------

# All Windows settings are now set for vCAC to install correctly
# After SQL Server is installed, make sure to enable TCP/IP and
# Restart the SQL services

# ----------------------------------------
#        JAVA INSTALL & CONFIG
# ----------------------------------------
Write-Host "Java Section " -ForegroundColor Yellow
if (dir "HKLM:\SOFTWARE\JavaSoft\Java Runtime Environment" -ErrorAction
SilentlyContinue){
$JavaVersion = dir "HKLM:\SOFTWARE\JavaSoft\Java Runtime Environment"  |
select -expa pschildname -Last 1
$JavaVersions = $JavaVersion.Split(".")
$JavaVersionMajor = $JavaVersions[0]
$JavaVersionMinor = $JavaVersions[1]
$JavaVersionBuild = $JavaVersions[2]
} else {$javaversionmajor = 0}
# If .Net is older than 4.5, stop installer until .Net is upgraded
    if ($JavaVersionMajor -eq 1 -and $JavaVersionMinor -ge 7 ){ Write-Host
"Java version on this server is $JavaVersion "   -ForegroundColor Green
    }else{
        Write-Host "vRA 6.2 requires Java JRE 1.7 64-bit or higher" -
ForegroundColor Red
        if ($javamenuoption -eq ""){
        do{
            Write-Host "
```

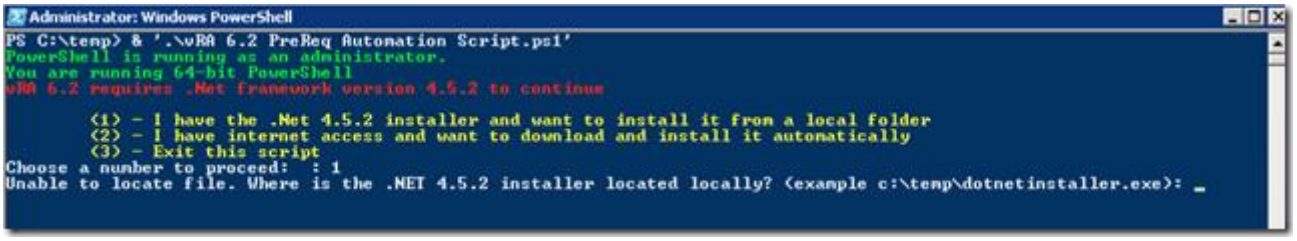
```
    (1) - I have the Java JRE 1.7 or higher and want to install it from a
local folder
    (2) - I have internet access and want to download and install it
automatically
    (3) - Exit this script" -ForegroundColor Yellow
            $javamenuoption = read-Host -Prompt "Choose a number to
proceed:  "
        } Until ($javamenuoption -eq "1" -or $javamenuoption -eq "2" -or
$javamenuoption -eq "3")}
            Switch ($javamenuoption){
            "1" {
                if (($javalocalpath -eq "") -or (Test-Path -Path
"$javalocalpath" -ErrorAction SilentlyContinue -eq $false)) {
                    do {
                        $javalocalpath = Read-Host -Prompt "Unable to
locate file. Where is the Java installer located locally? (example
c:\temp\jre71.exe)"
                    } while ((Test-path -Path $javalocalpath -ErrorAction
SilentlyContinue) -eq $false)}
                Write-Host "Attempting to Install Java. Please be patient."
-ForegroundColor Green
                Write-Verbose ""
                $InstallJava = Start-Process $javalocalpath -ArgumentList
"/s" -Wait -PassThru
                Write-Host "Java installation finished. Proceeding with
script." -ForegroundColor Green
                }
            "2" {
                if (!(test-path -Path "c:\Temp")){
                    Write-Host "Creating folder C:\Temp" -ForegroundColor
Green
                    New-Item -ItemType Directory -Force -Path "C:\Temp"
                }
                Write-Host "Preparing to Download Java JRE 1.7" -
ForegroundColor Green
                Write-Host "Attempting to Download Java. Please be
patient." -ForegroundColor Green
                    $downloadjava = New-Object Net.WebClient
                    $javaurl =
"http://javadl.sun.com/webapps/download/AutoDL?BundleId=95125"
                    $javafile = ("C:\Temp\javajre17.exe")
                    $downloadjava.Downloadfile($javaurl,$javafile)
                if (!(Test-Path -Path "C:\Temp\javajre17.exe")) {Write-Host
"Uh Oh. For some reason we were unable to download the Java installer
correctly" -ForegroundColor Yellow
                Throw "Please check your internet connection and rerun this
script" } else {Write-Host "File downloaded successfully... Proceeding" -
ForegroundColor Green}
                Write-Host "Attempting to Install Java. Please be patient."
-ForegroundColor Green
                Write-Verbose ""
                $InstallJava = Start-Process $javafile -ArgumentList "/s" -
Wait -PassThru
                Write-Host "Java installation finished. Proceeding with
script." -ForegroundColor Green

            }
            "3" { Exit }
            }
#       }
    }
```

```
    Write-Host "Setting Java_HOME variable to C:\Program Files\Java\jre7" -
ForegroundColor Green
    setx /M JAVA_HOME "C:\Program Files\Java\jre7"
    Write-Host "Java_HOME variable set." -ForegroundColor Green

# ----------------------------------------
#      END JAVA INSTALL & CONFIG
# ----------------------------------------


Write-Host ""
Write-Host "Pre-Req settings have been completed." -foregroundcolor Green
Write-Host "Please run the prerequisite checker and verify. Proceed with
SQL pre-reqs" -ForegroundColor Green

# ----------------------------------------
#             END OF SCRIPT
# ----------------------------------------
```

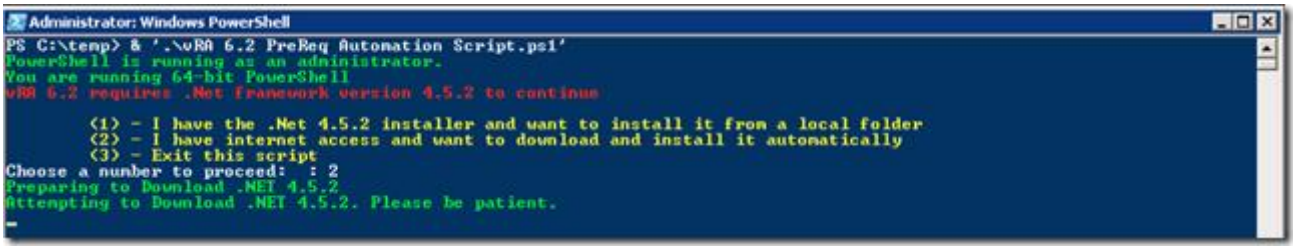
How to use the script



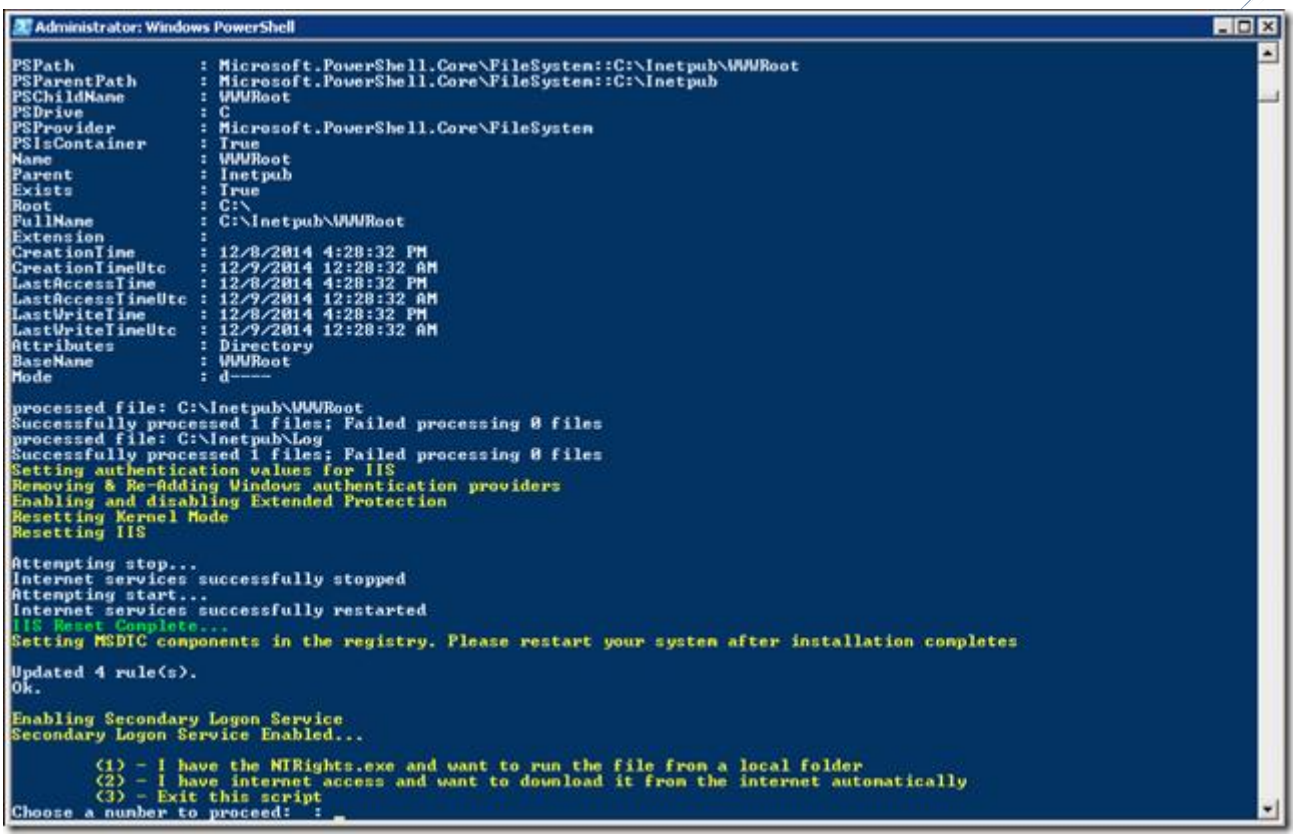
This menu shows up if the user has not pre-set the script variables before running the script. This is just fine, but you will receive prompts throughout the duration of the script.



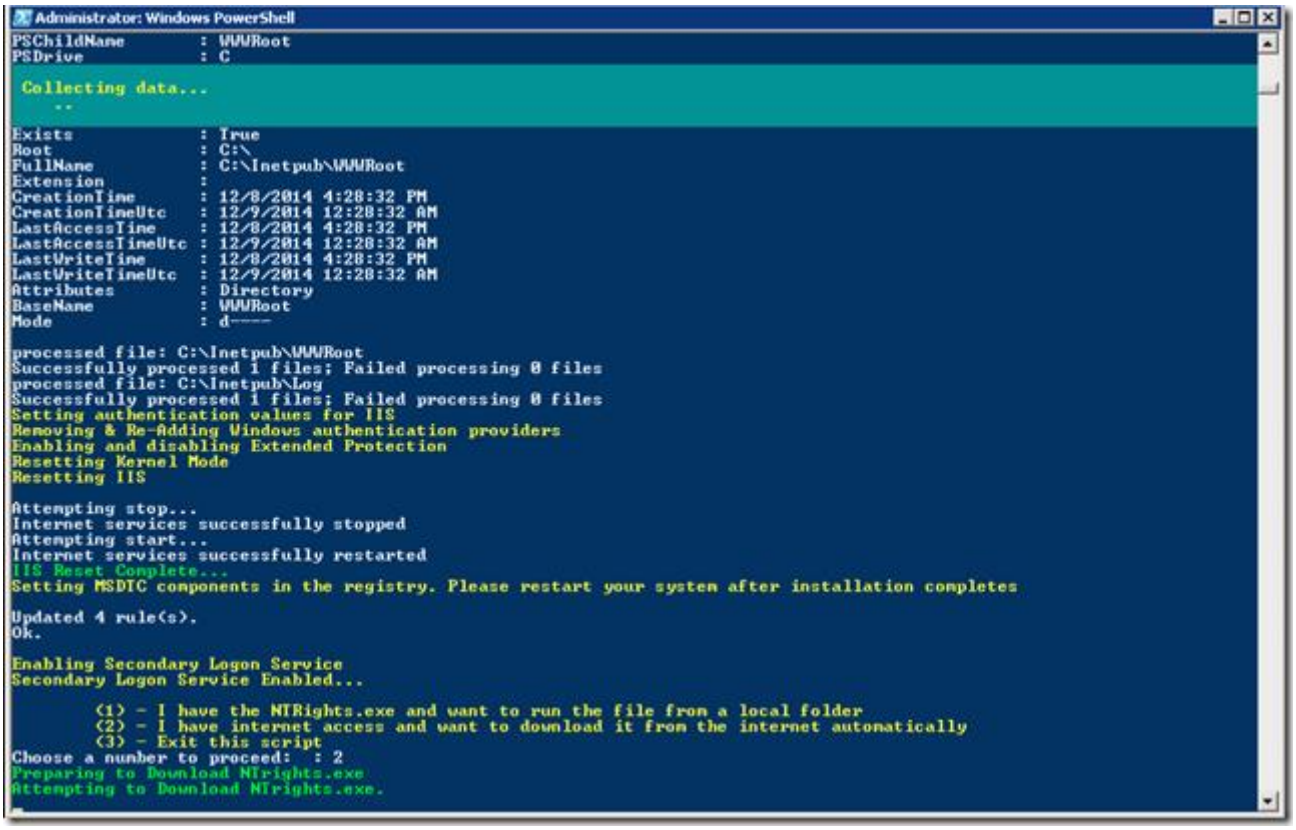
Selecting 2 will download and install .NET



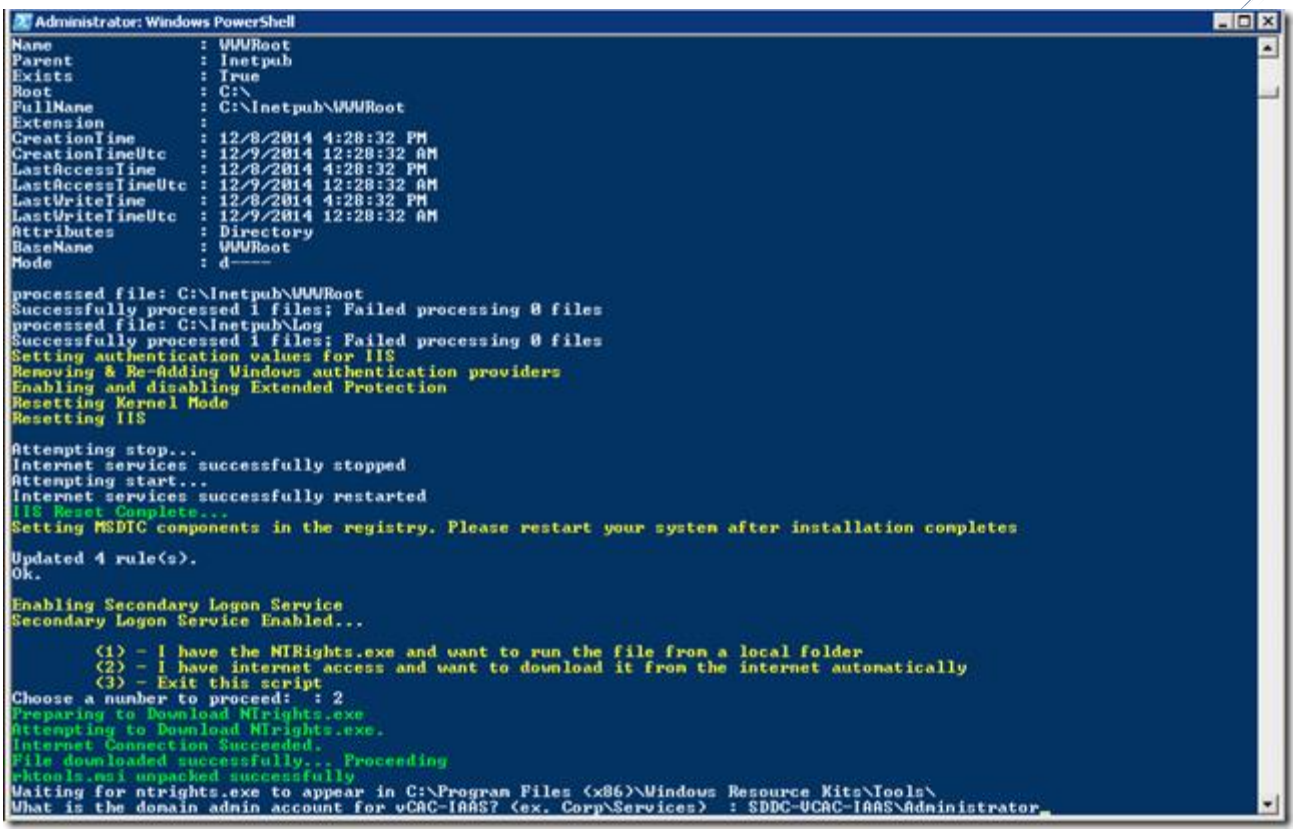
To set the Secondary Logon Service and Batch Logon requirements, the NTRights.exe file must be used to do this in an automated fashion. This file is only found in the Windows 2003 Resource Kit.



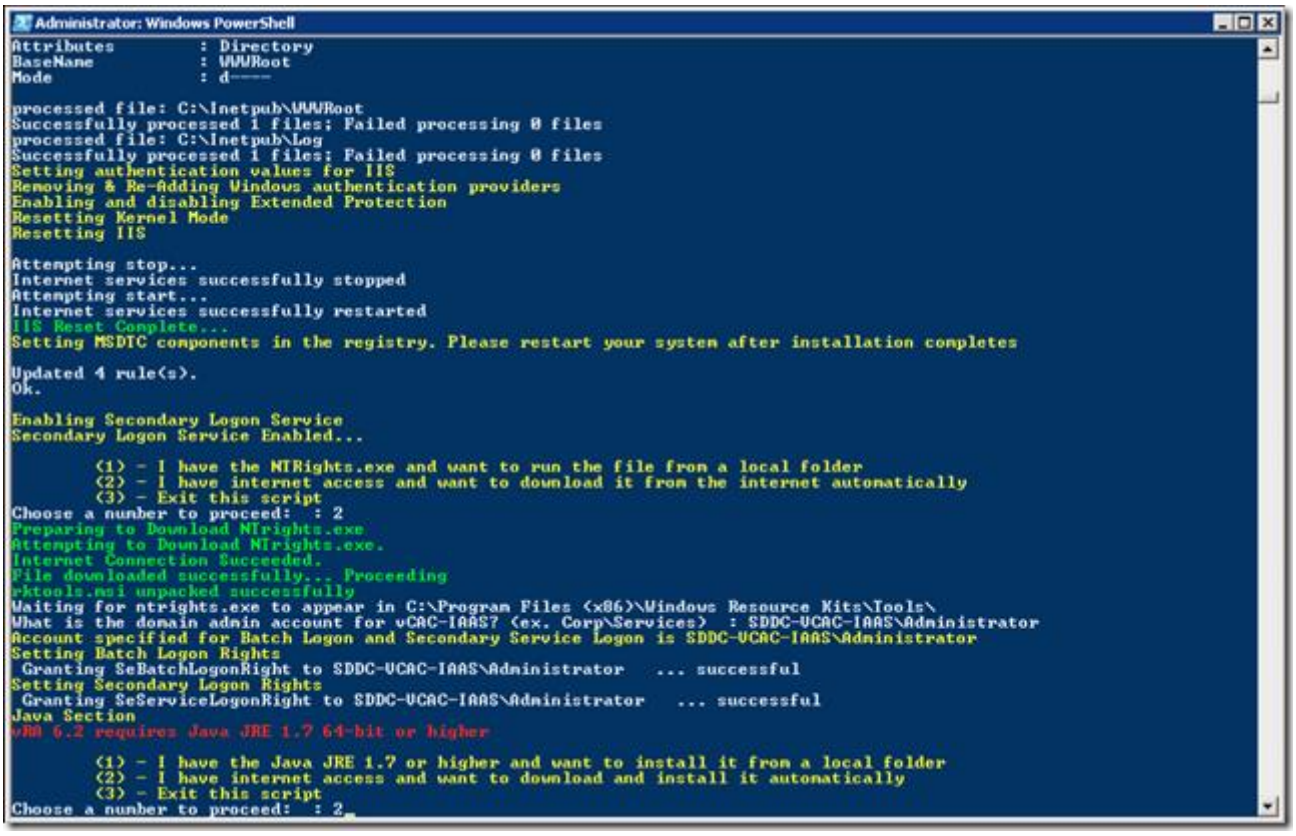
Choosing Menu item (2) will download the resource kit (~11MB), unzip, and use ntrights.exe.



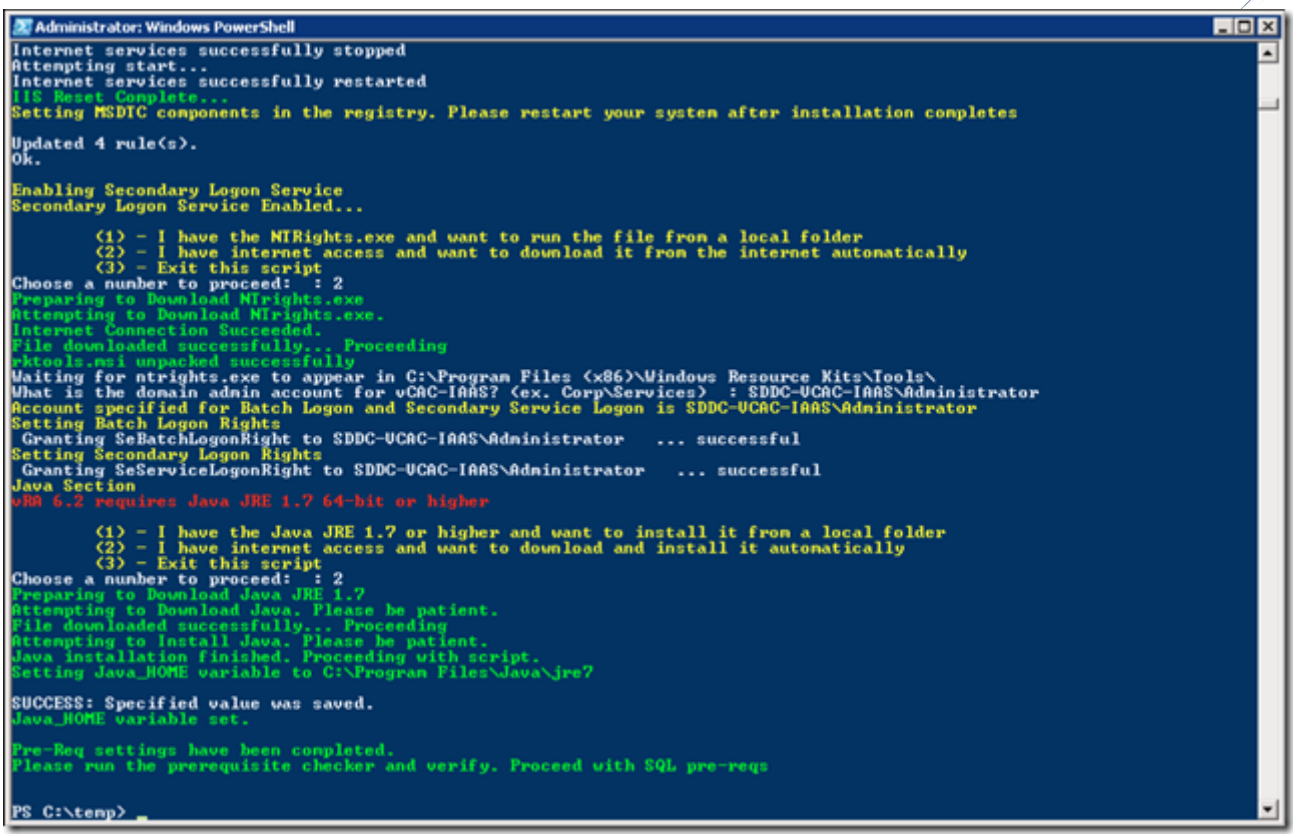
Once the file has been downloaded and extracted, the script will ask for the user account to add to these services. Make sure to follow the example of using host\user_account



Java is then installed. Follow the menu items and continue



Once Java has been installed, it will also set the Java_HOME variable automatically.



The Pre-Reqs are now complete.

Same task we need to do on our SQL Server.

vRealiza Automation

vRealize Automation enables IT Automation through the creation and management of personalized infrastructure, application and custom IT services (XaaS). This IT Automation lets you deploy IT services rapidly across a multi-vendor, multi-cloud infrastructure. (vmware.com)

Prerequisites

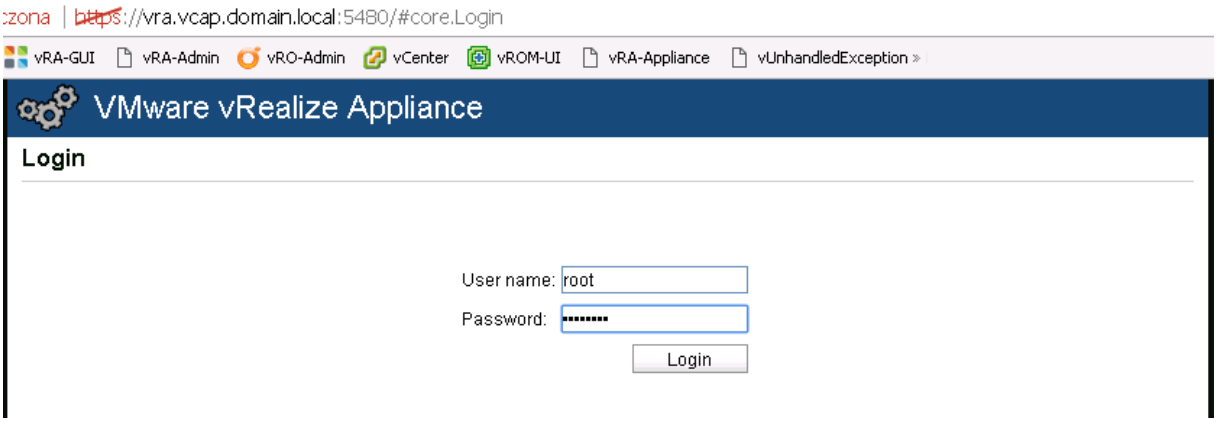
Username: root
Password: P@ssw0rd

Build

OS	vCenter Appliance 6.5	
RAM	18GB	
CPU	2vCPU	
HDD		
Network	1 NIC	10.10.10.154

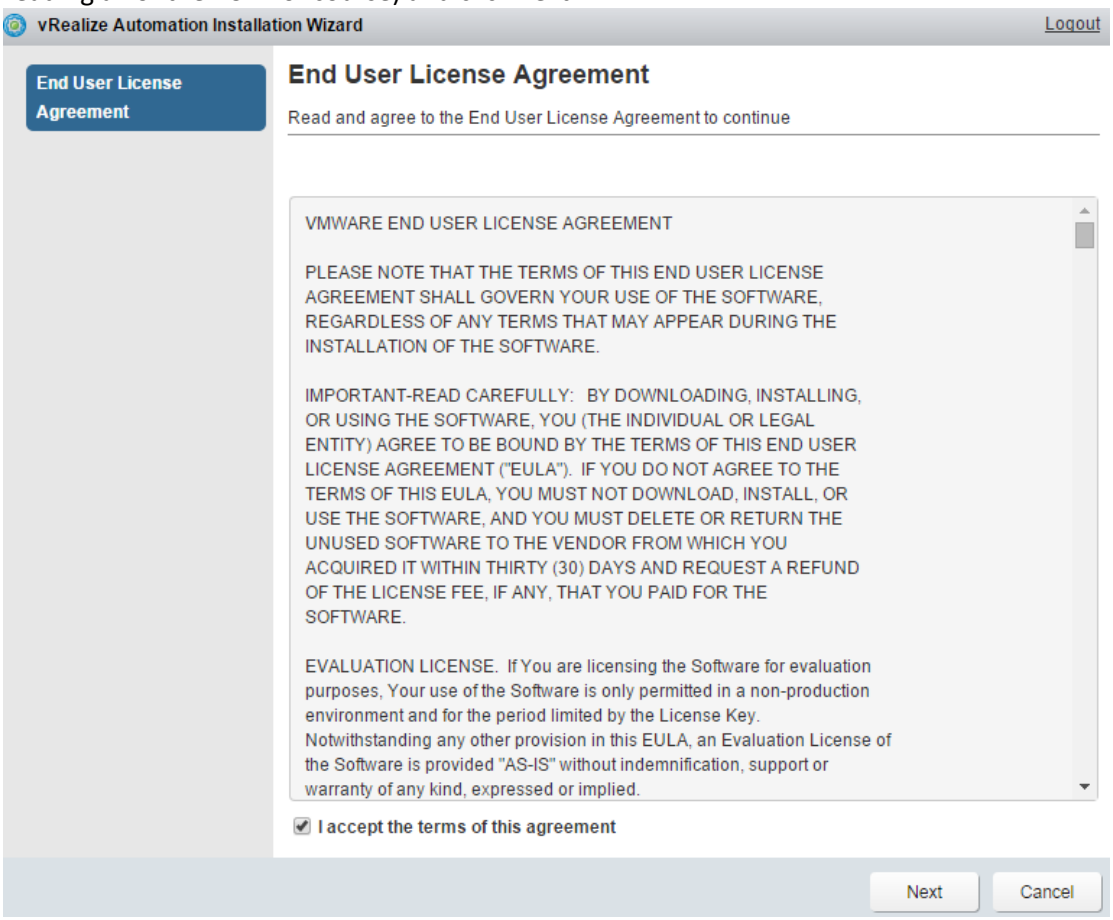
Deploy

deploy the vRA7 OVA, login to the appliance with the root login and password supplied during your OVA deployment.

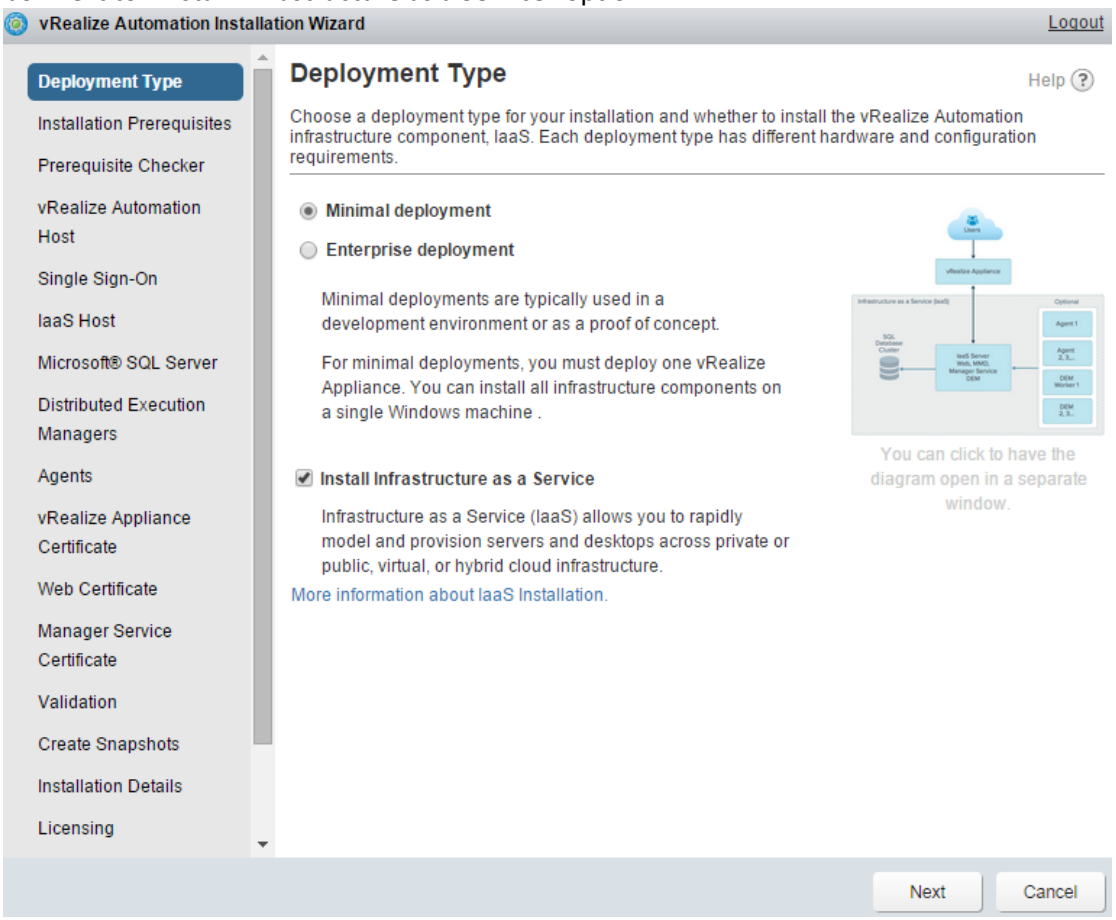


Unlink past versions of vRA, we now have a lovely wizard that pops up and of course asks us to acknowledge that we will adhere to the End User License Agreement. Click the check mark (after

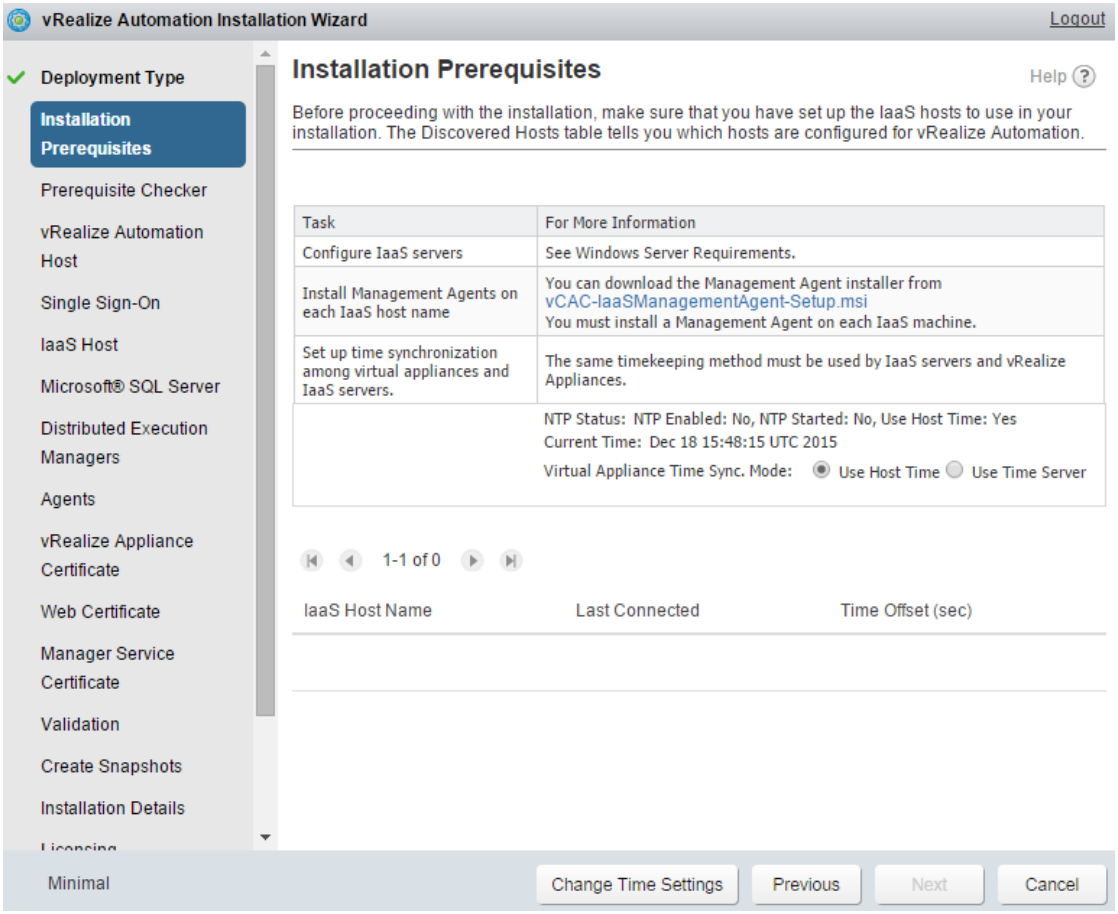
reading all of the EULA of course) and click next.



We get a deployment wizard For this lab click the minimal deployment option and select the check box next to “Install Infrastructure as a Service” option.

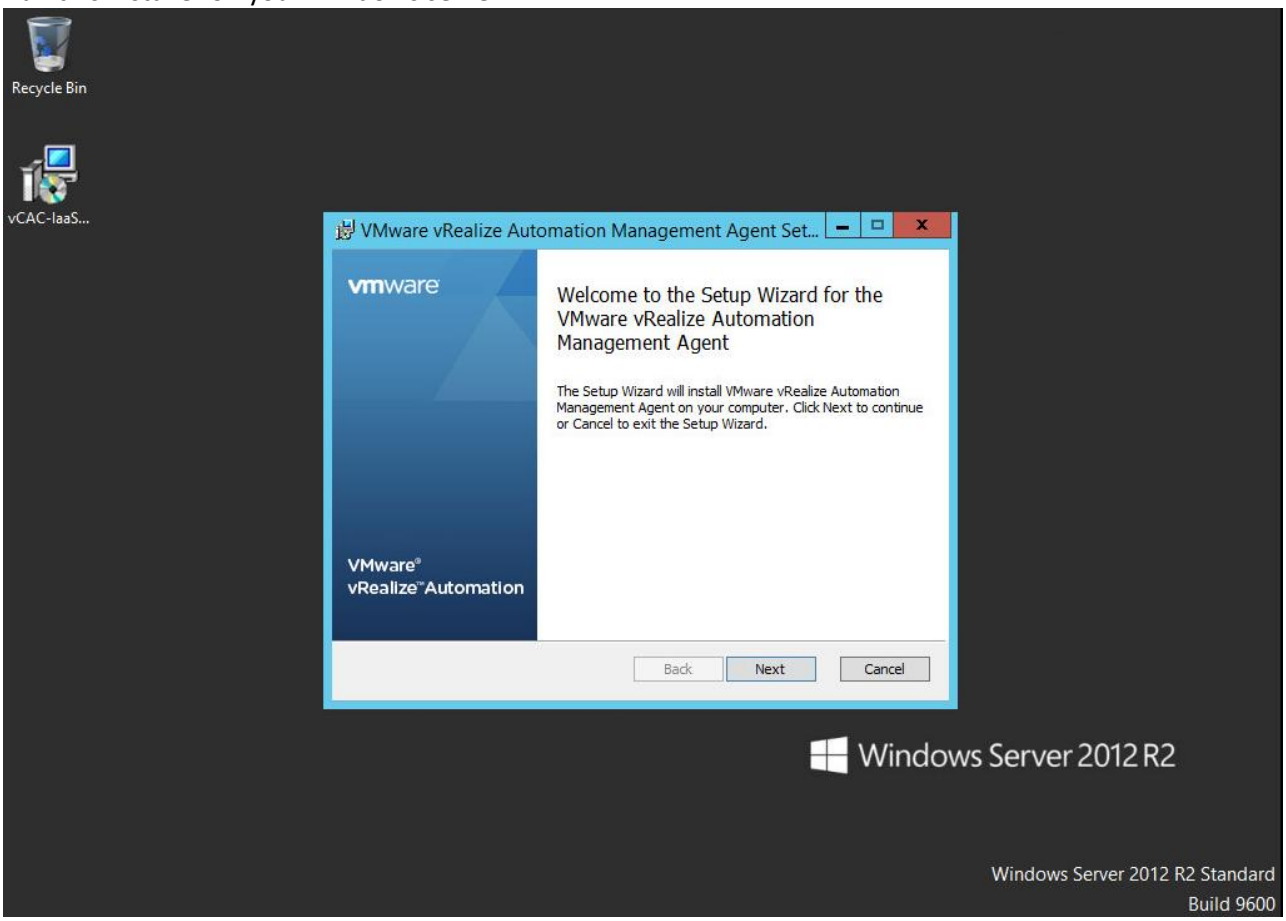


Since we selected the IaaS option in the last screen, we'll see there are some things we need to do on

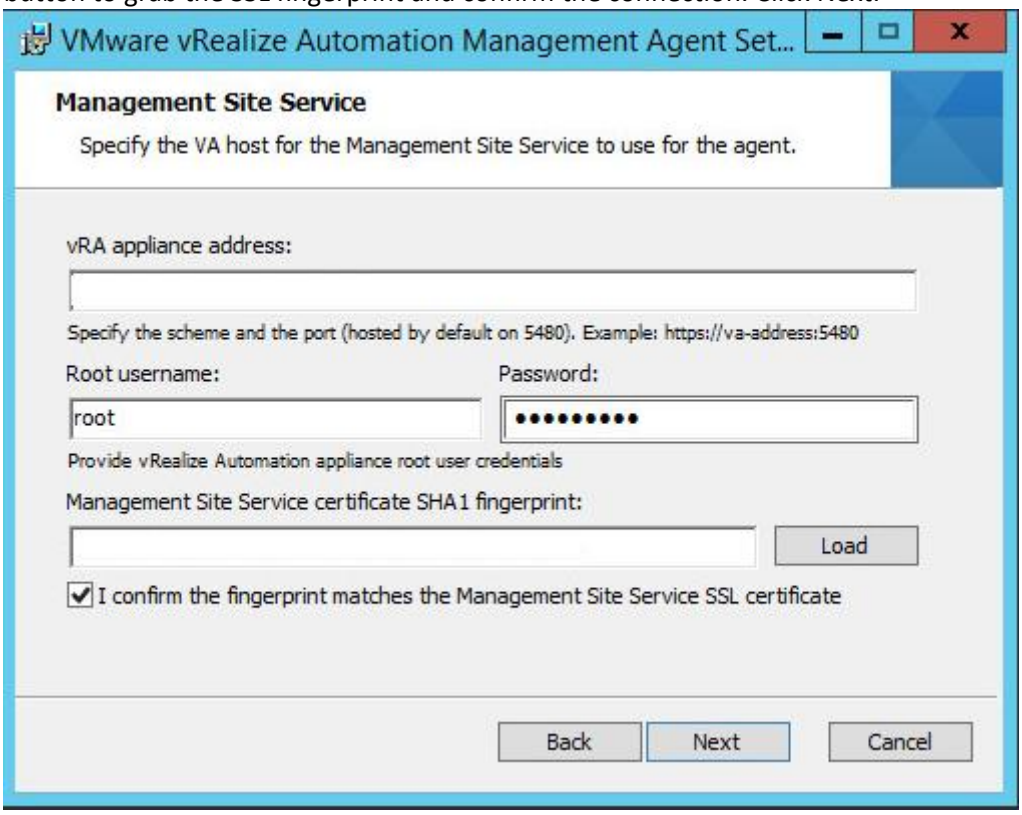


our IaaS servers. This is the Windows server we've stood up in addition to the vRA virtual appliance. You'll notice there is a link on this page will will let you download an MSI file.

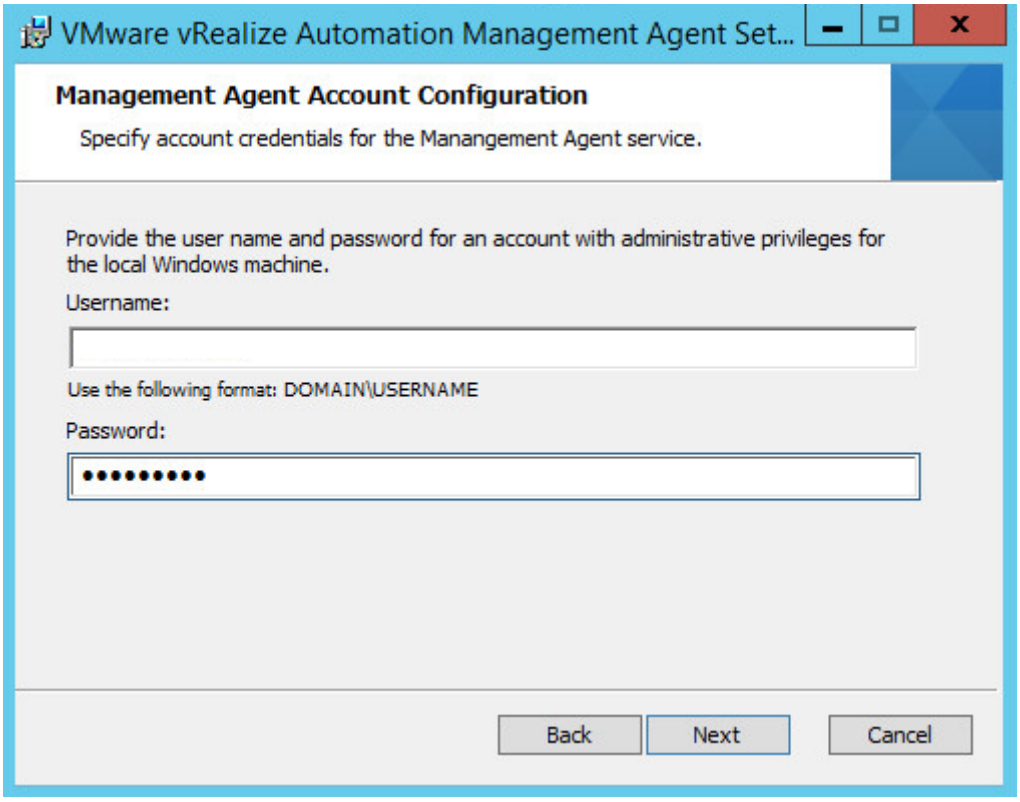
Run this installer on your Windows server



This installer will ask for the address and login information for your vRA appliance. Click the “Load” button to grab the SSL fingerprint and confirm the connection. Click Next.

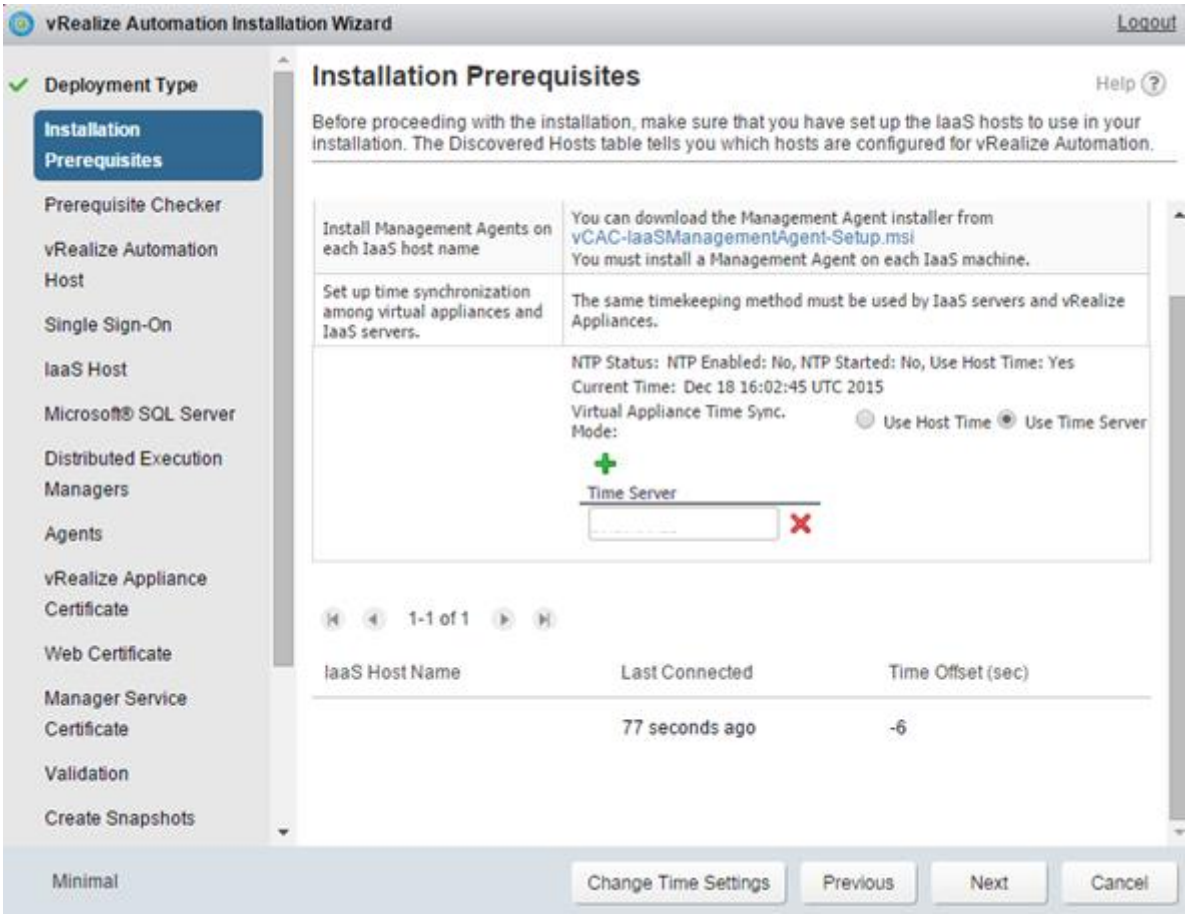


The next screen will ask you for account information that has administrative rights on your IaaS Server. This account will be used to install services and additional pre-requisite software.



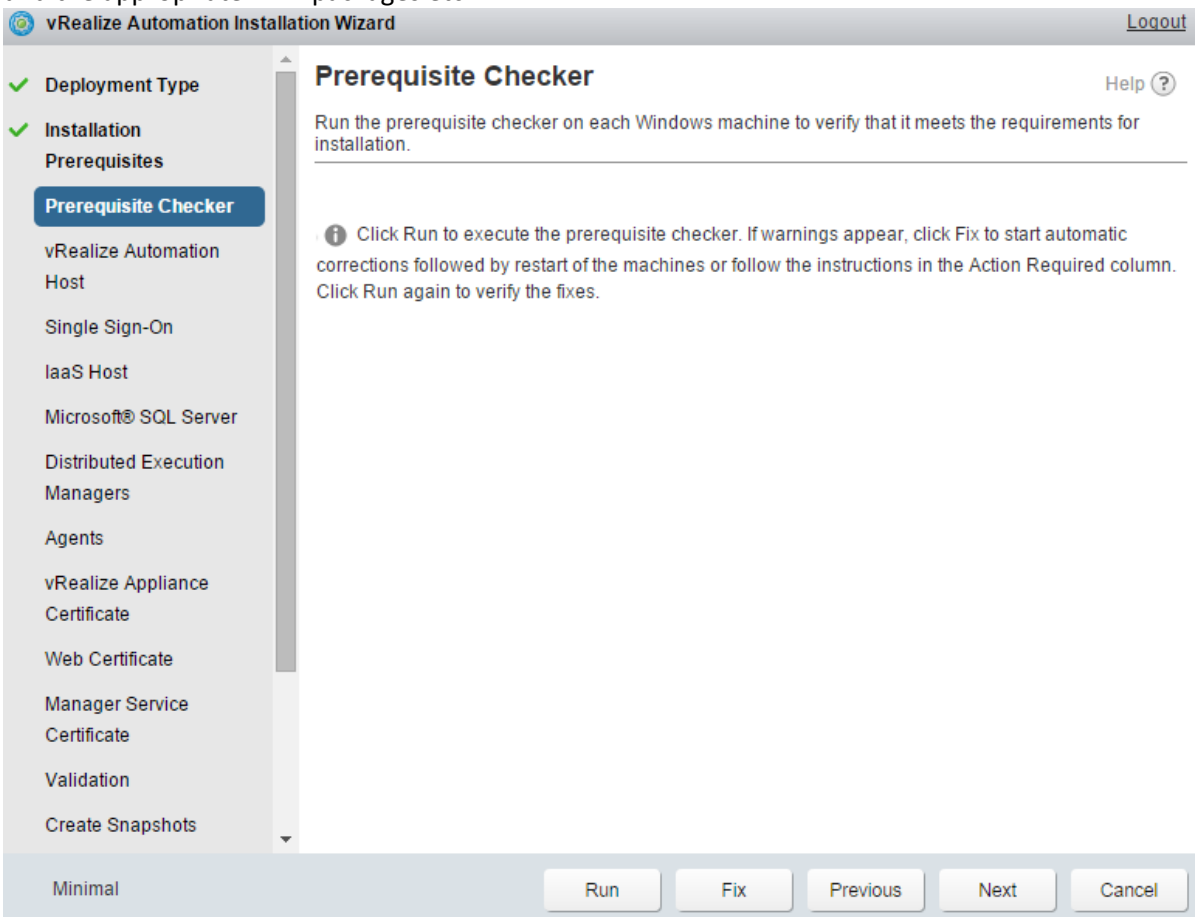
Once the installer finishes, go back to your wizard. Notice that at the bottom of the screen you were on, there is now an IaaS Server listed. Set your NTP settings (THIS IS VERY IMPORTANT !) and click

next.

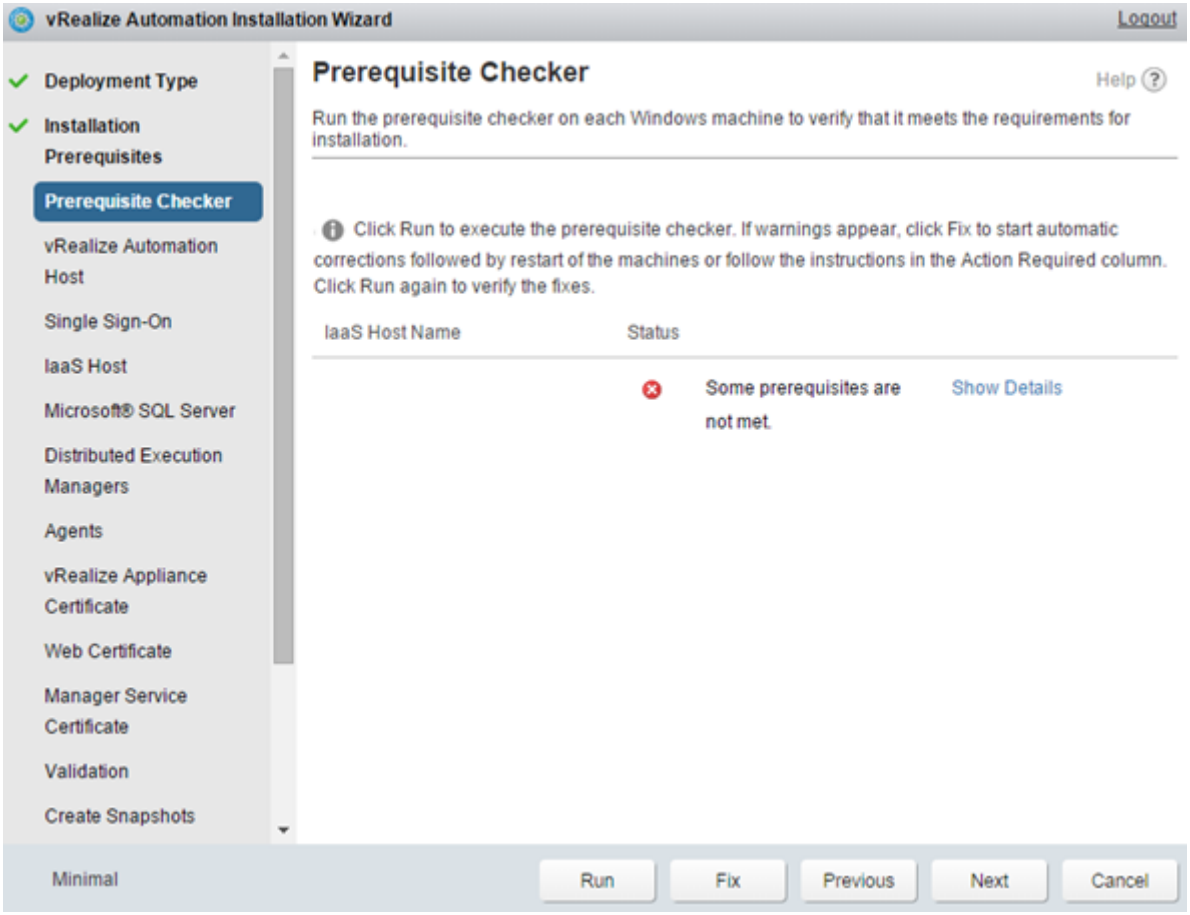


Now we we are met with a prerequisite check screen. Click “Run” to test to make sure you have all the prerequisites met. This step checks to see if you have things like IIS installed on the IaaS Server,

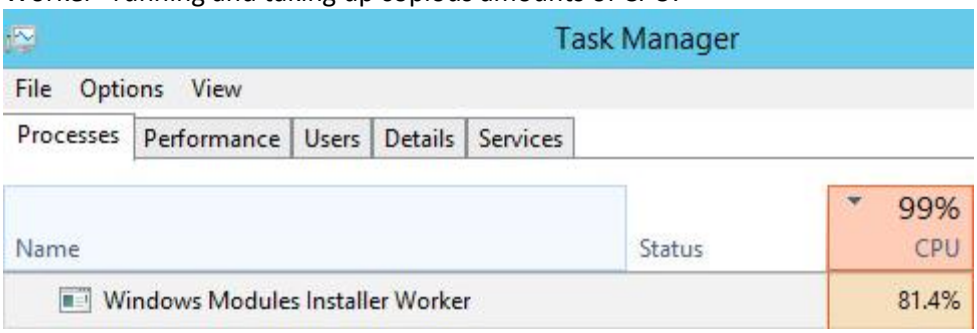
and the appropriate .NET packages etc.



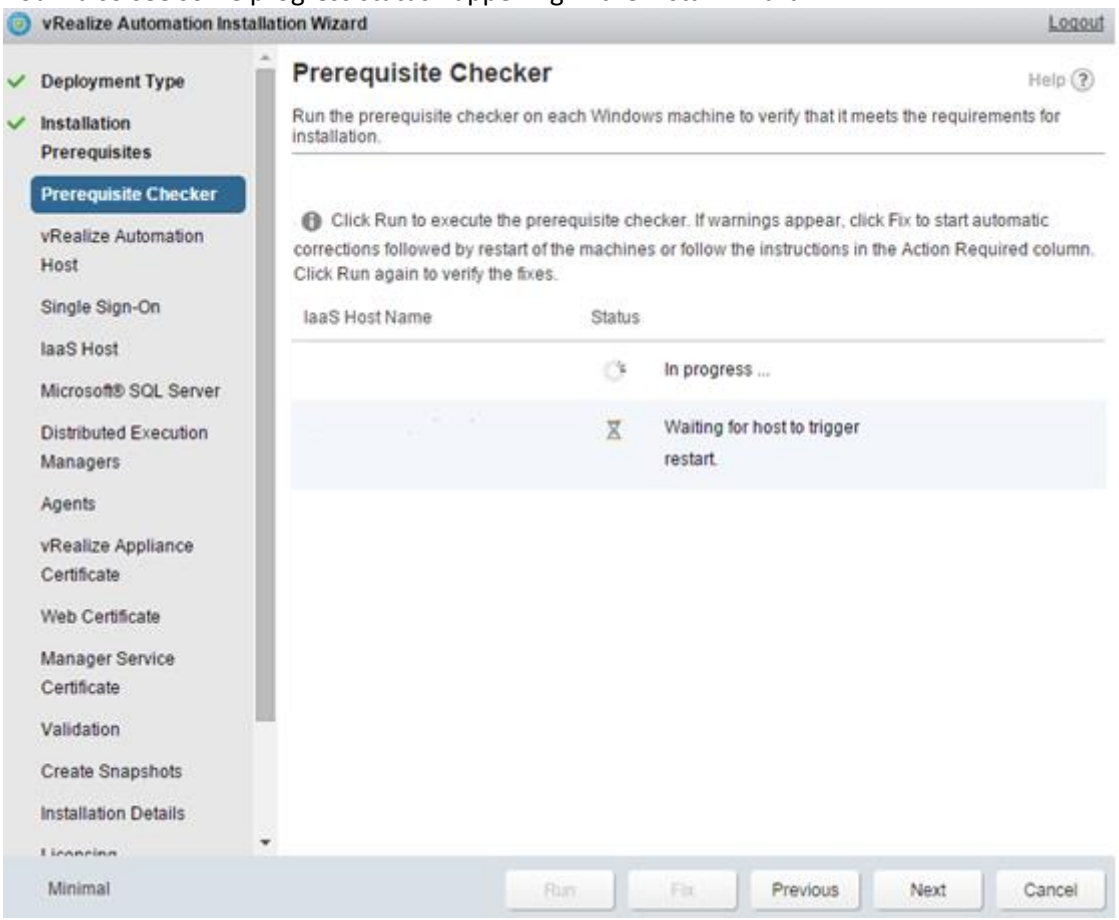
Once the check is complete you can view the details and click the “fix” button to have the installer automatically take care of them for you.



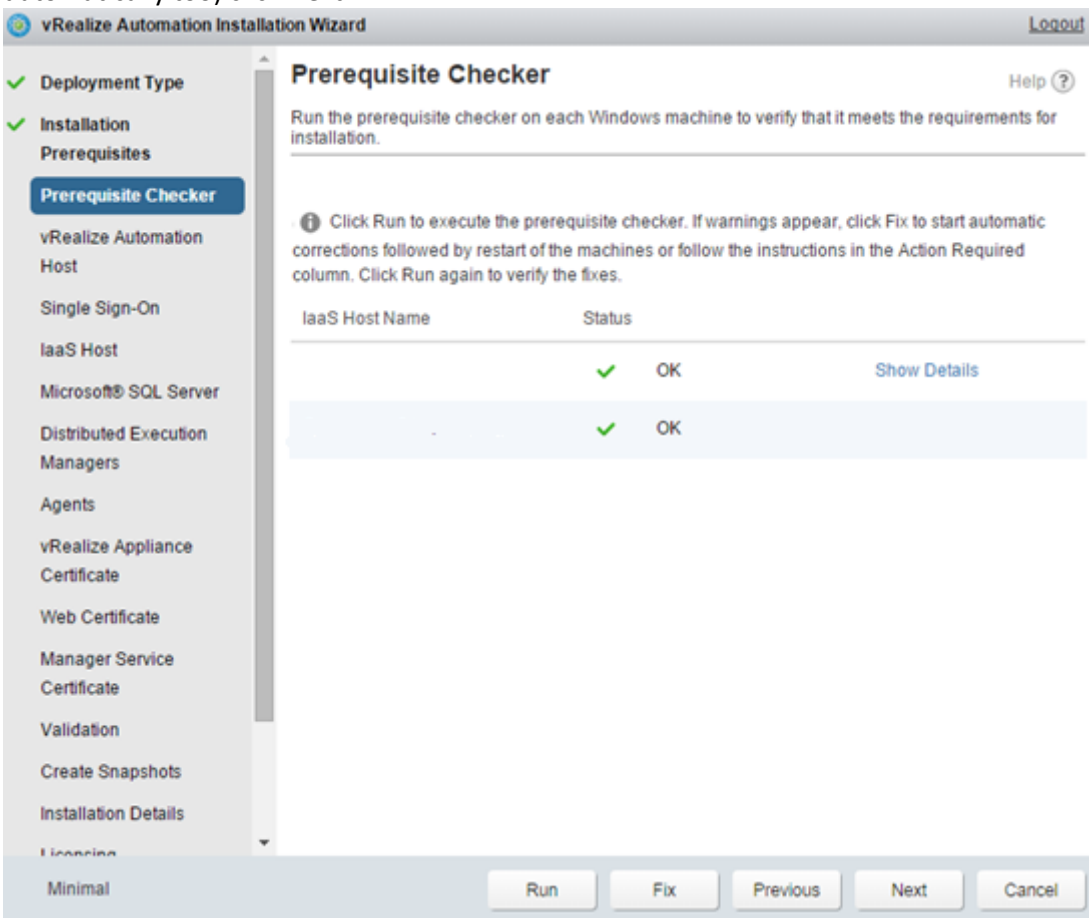
The fix step could take some time. If you aren't sure that anything is really happening or not, go over to your IaaS Server and check task manager. You'll probably find a "Windows Modules Installer Worker" running and taking up copious amounts of CPU.



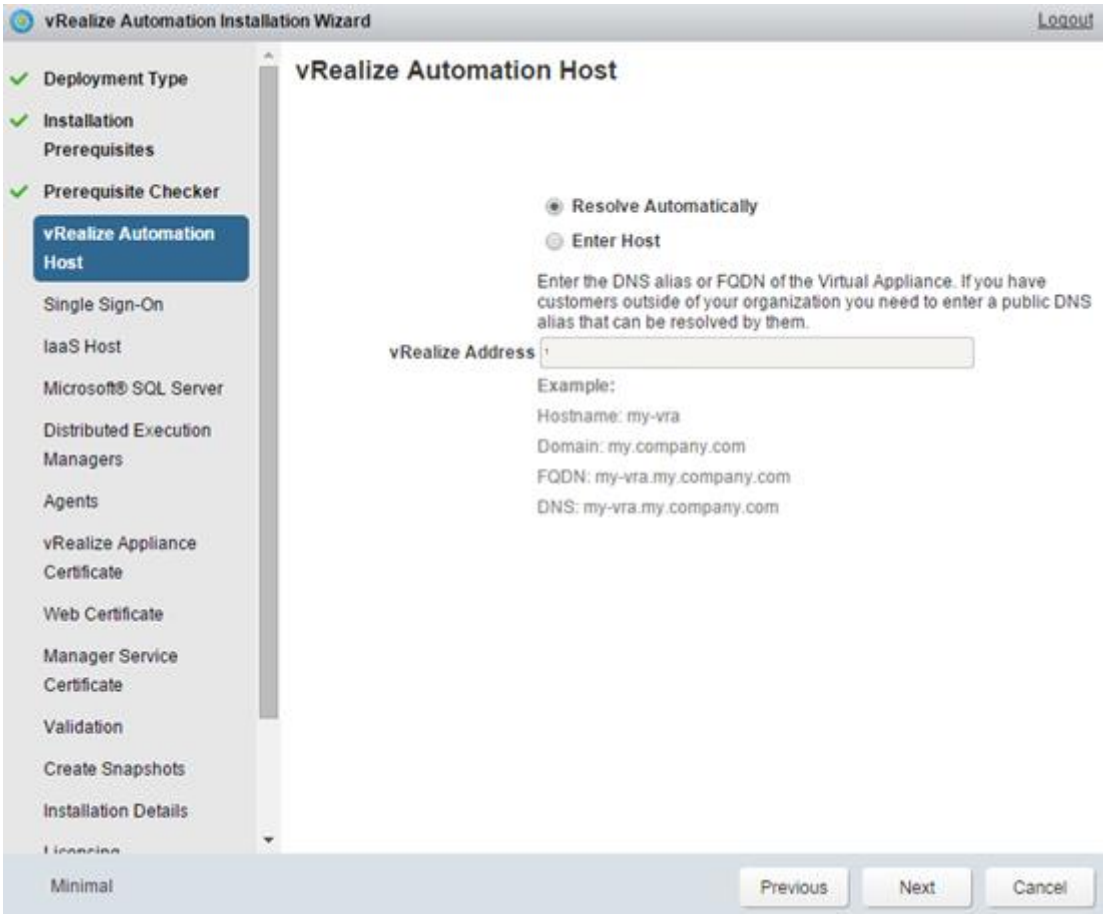
You'll also see some progress status happening in the install wizard.



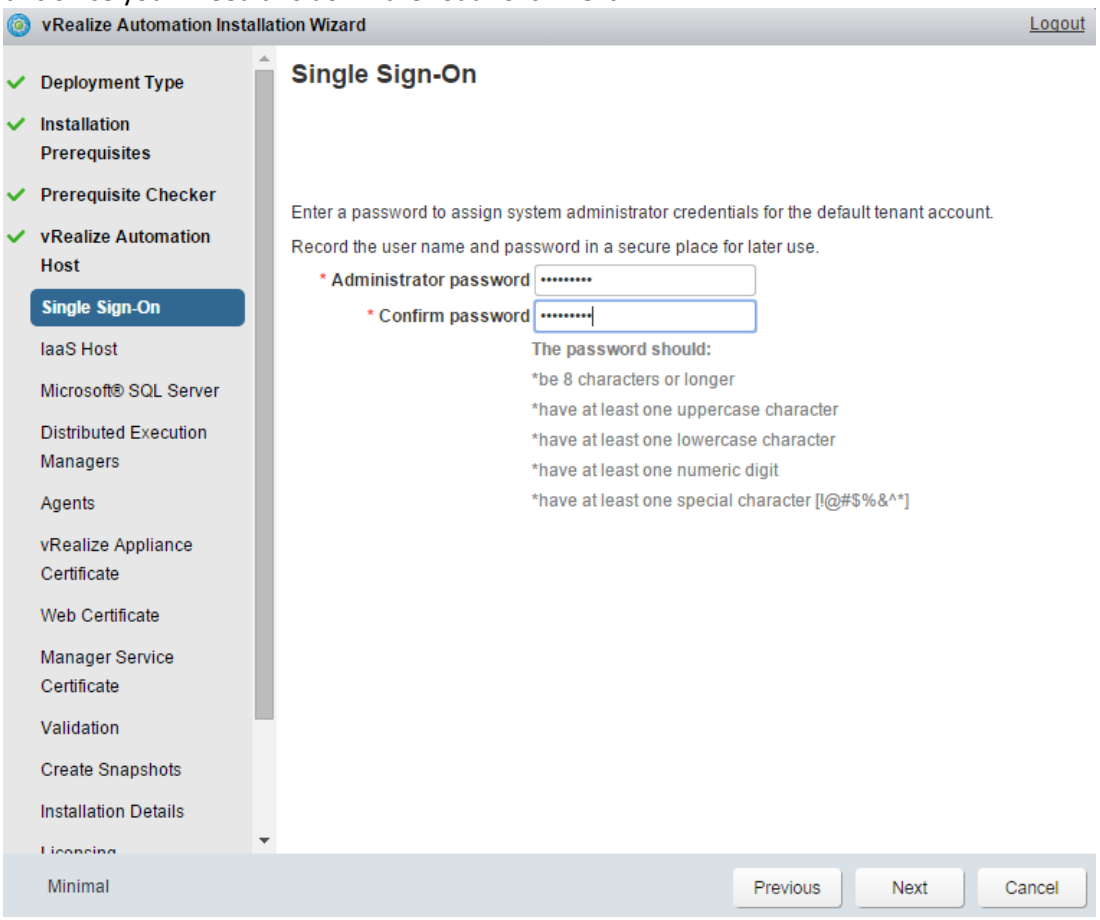
Once the prerequisites have been installed and the server is rebooted (the reboot happens automatically too) click Next.



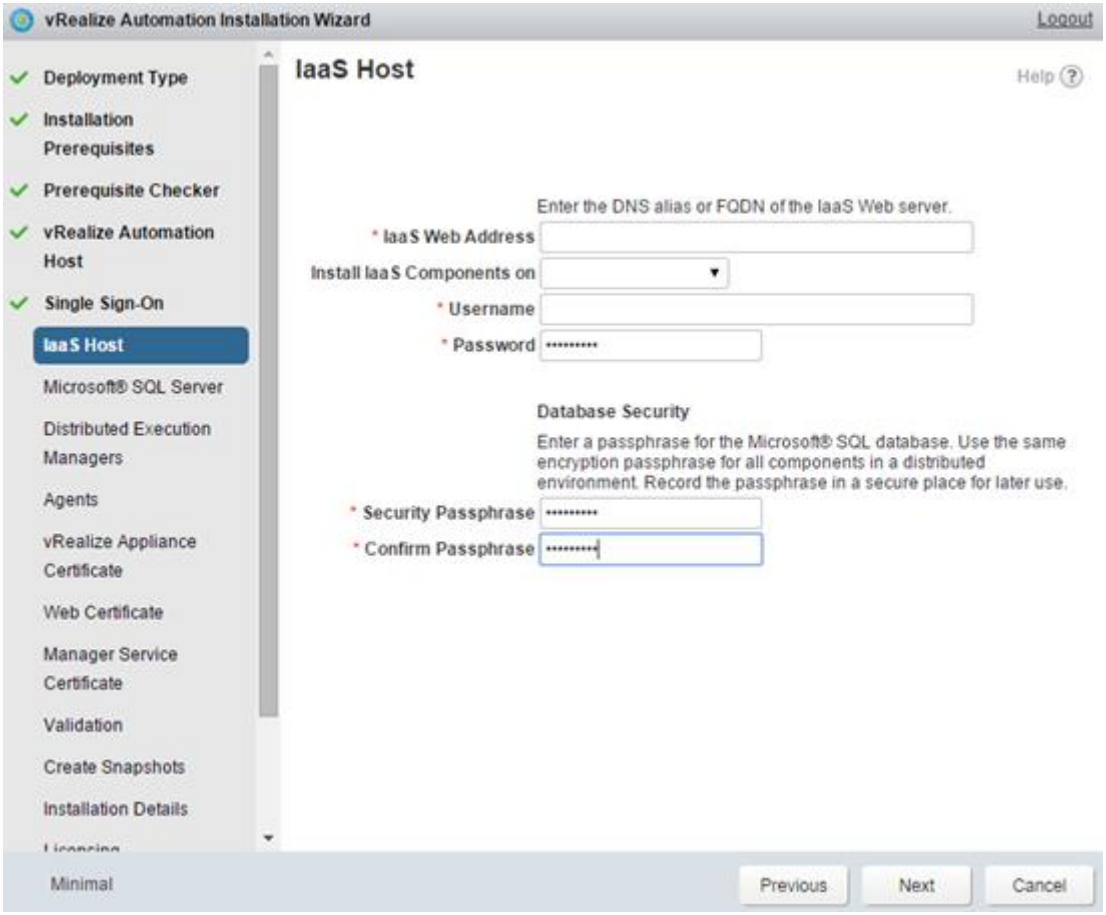
Next we're asked for the vRA host name. You could change the name here but we've chosen to grab hostname from



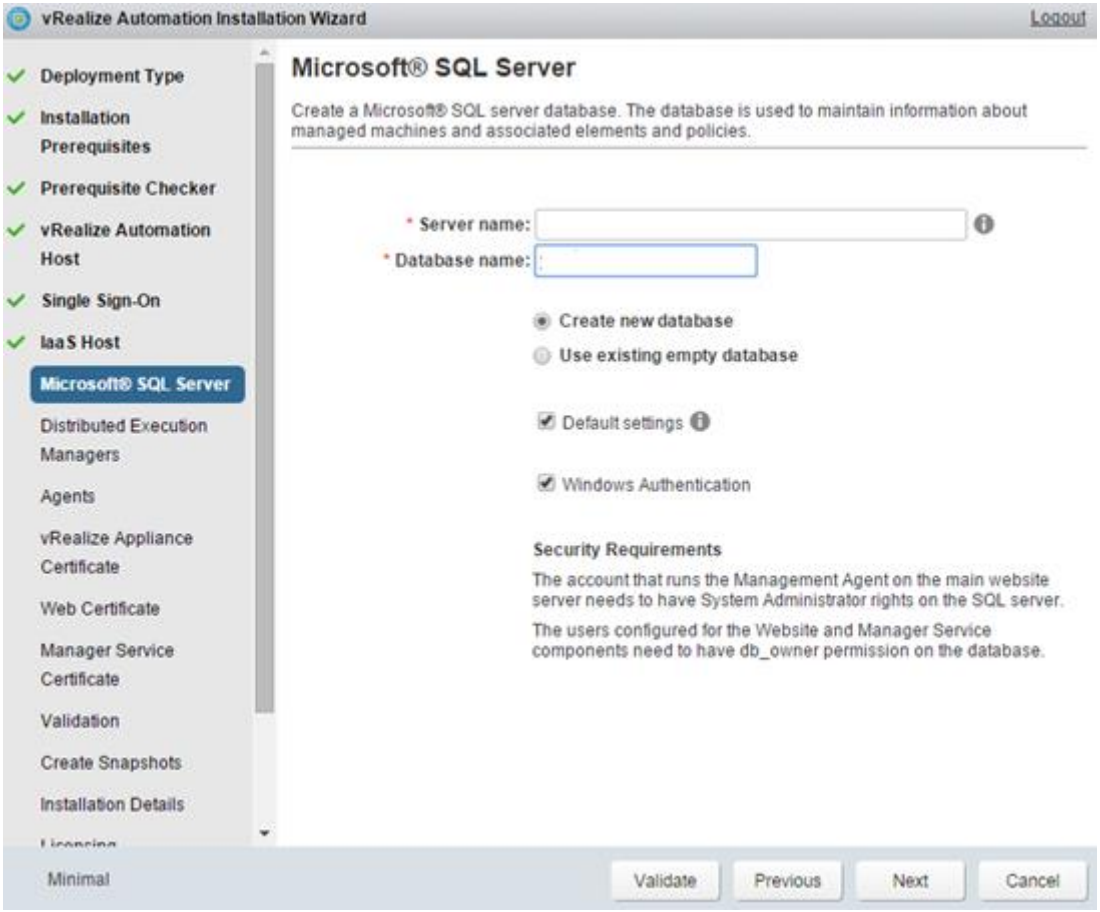
Enter a very strong password for your default tenant administrator account. Be sure to keep track of this since you'll need this down the road. Click Next.



just input the name of our Windows IaaS Host here. Select the IaaS host from the dropdown in order to install components on it and enter a login that has administrative credentials on the box. Also, enter a security passphrase for the SQL database to use for encryption. Click Next.

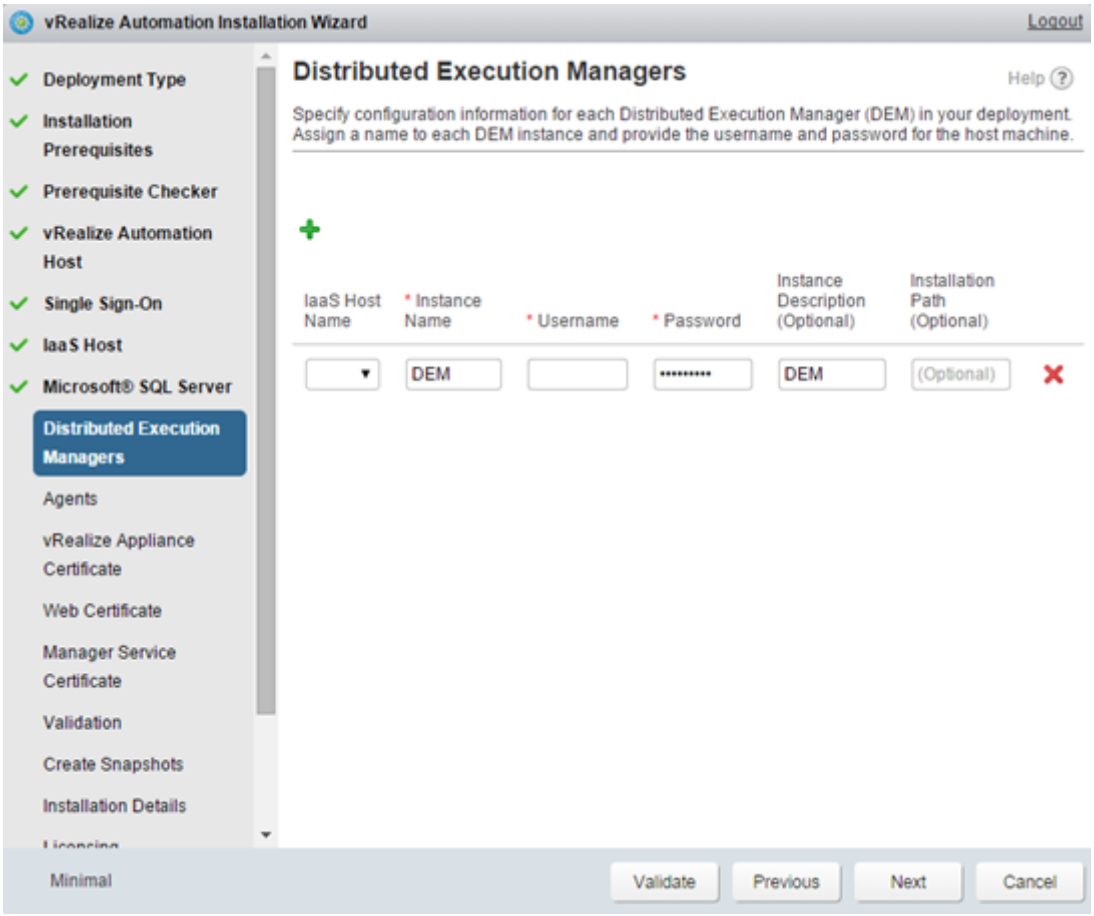


Next enter the name of your SQL server and a name for the new database that will be created.



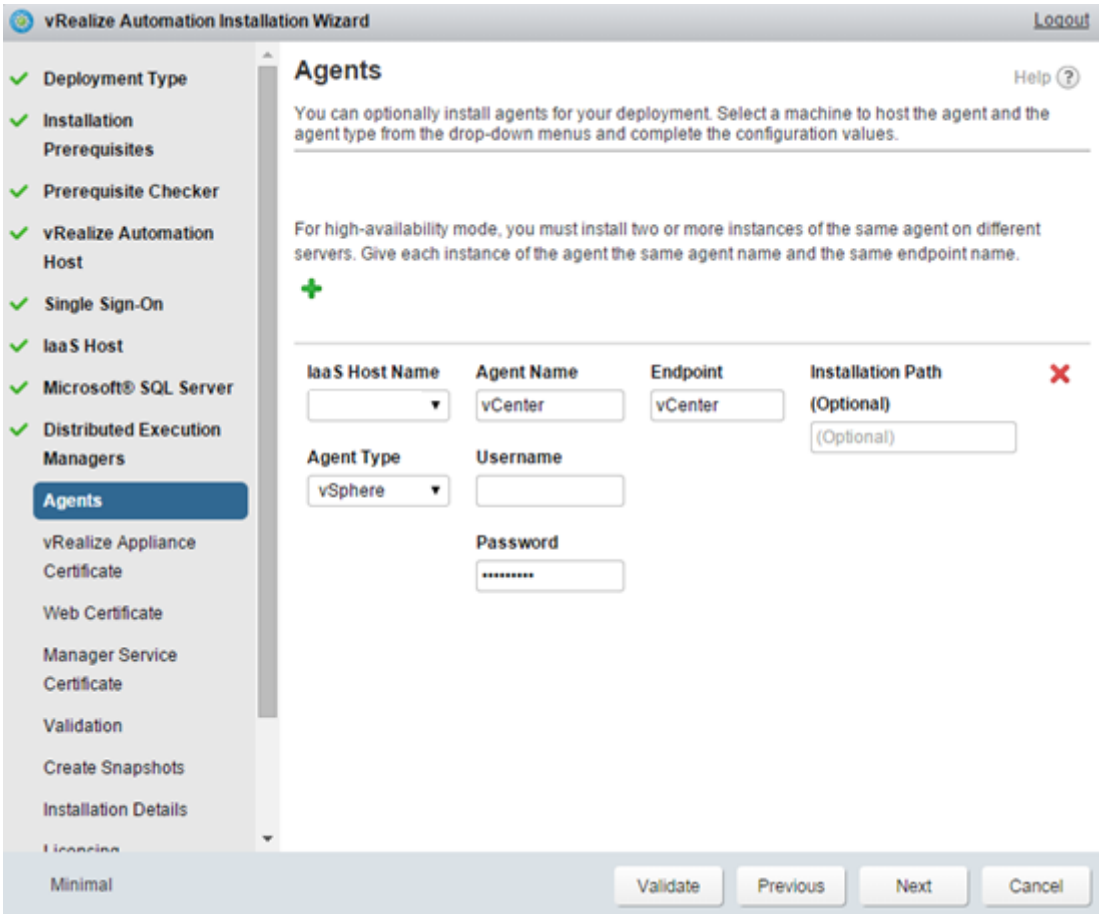
Select the name of an IaaS Host in which to install the DEM Workers. This should be simple since it's there's only one IaaS box in the simple environment of ours. Add login credentials to install the DEM

service. Click Next.



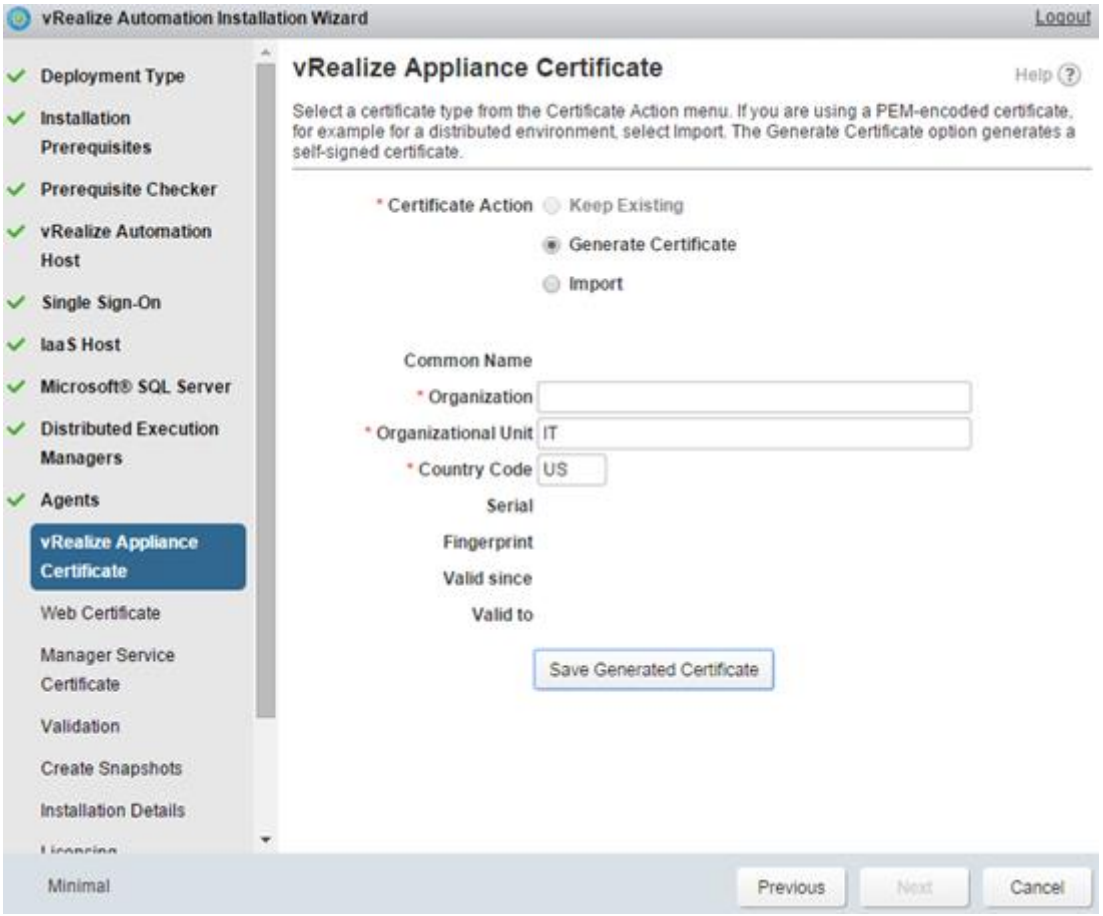
We'll perform the same operation with our DEM Agents except we need to specify an Endpoint here as well. I've named my Endpoint vCenter. The agent type is vSphere and I've provided login

information. Click Next.

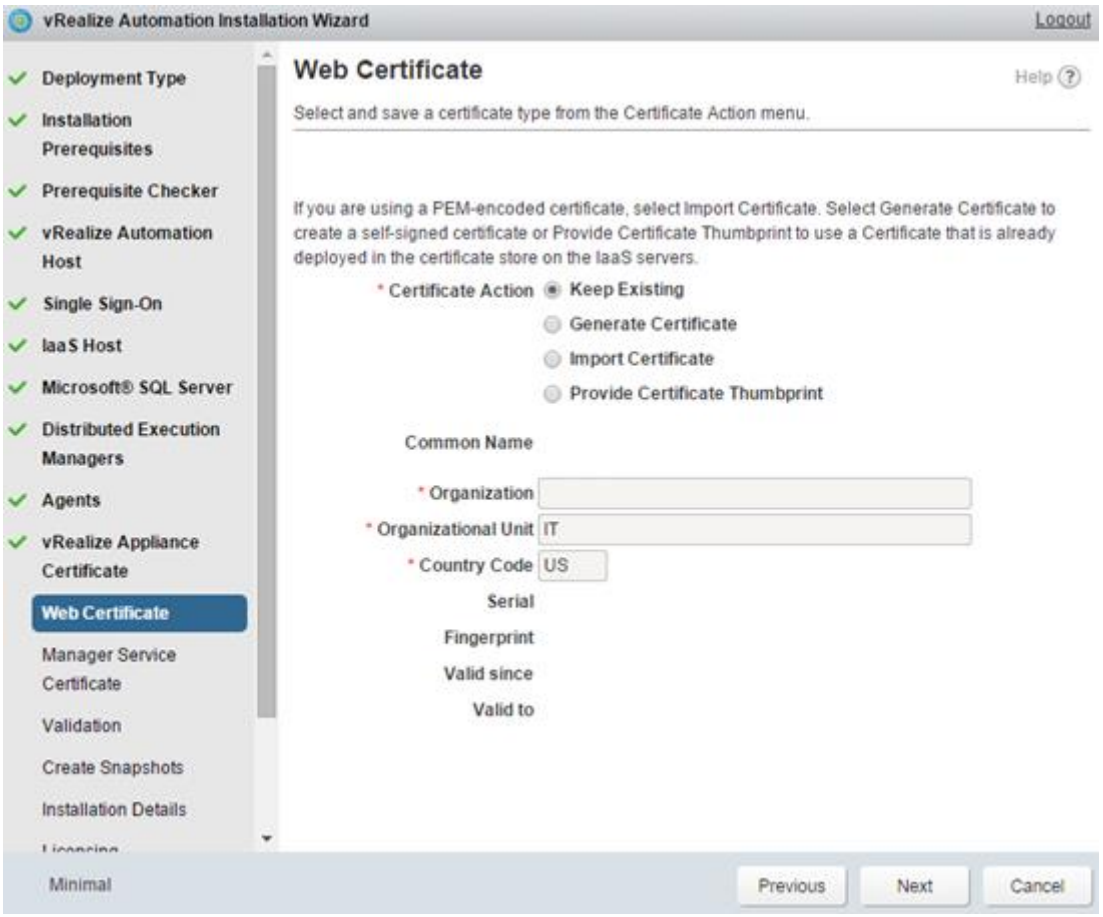


Now we can import certificates that we created with our own certificate authority or we can generate self signed certs. The first cert we need to generate is the vRA appliance and web portal.

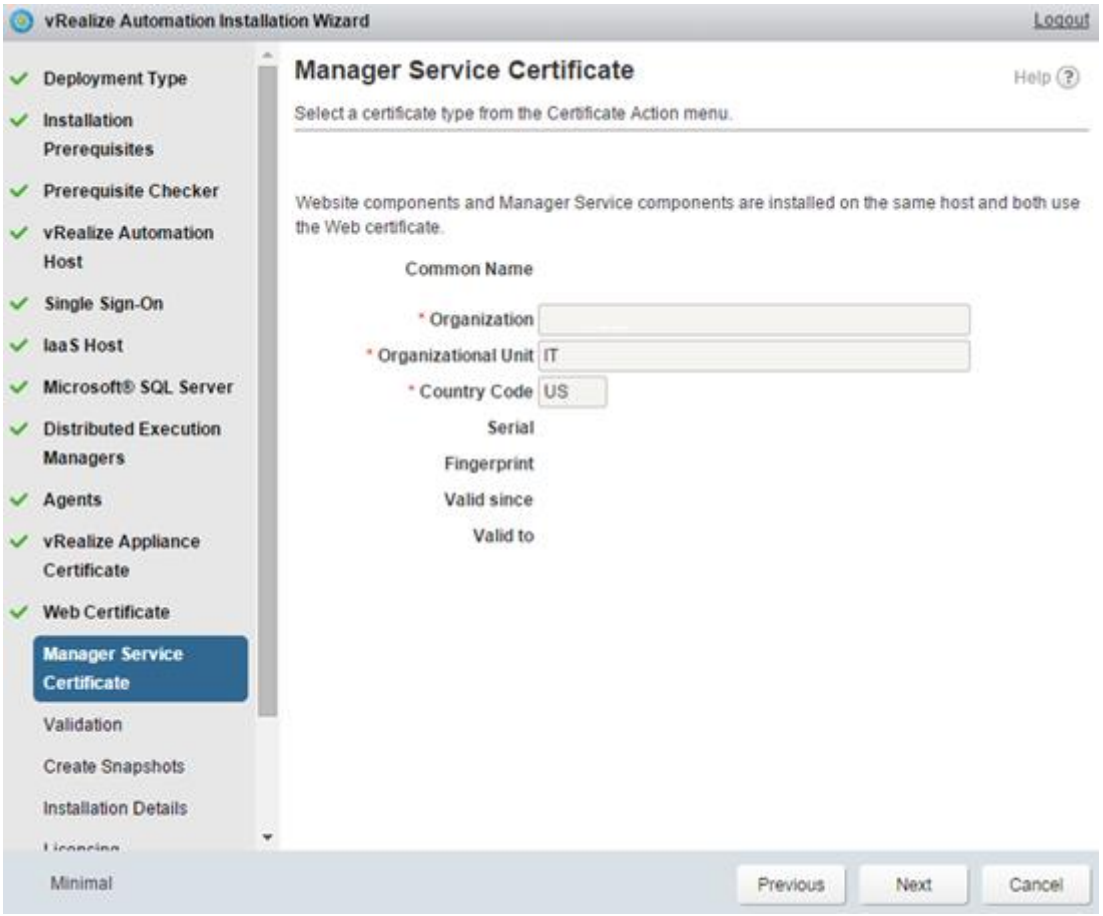
Enter the certificate information and click Next.



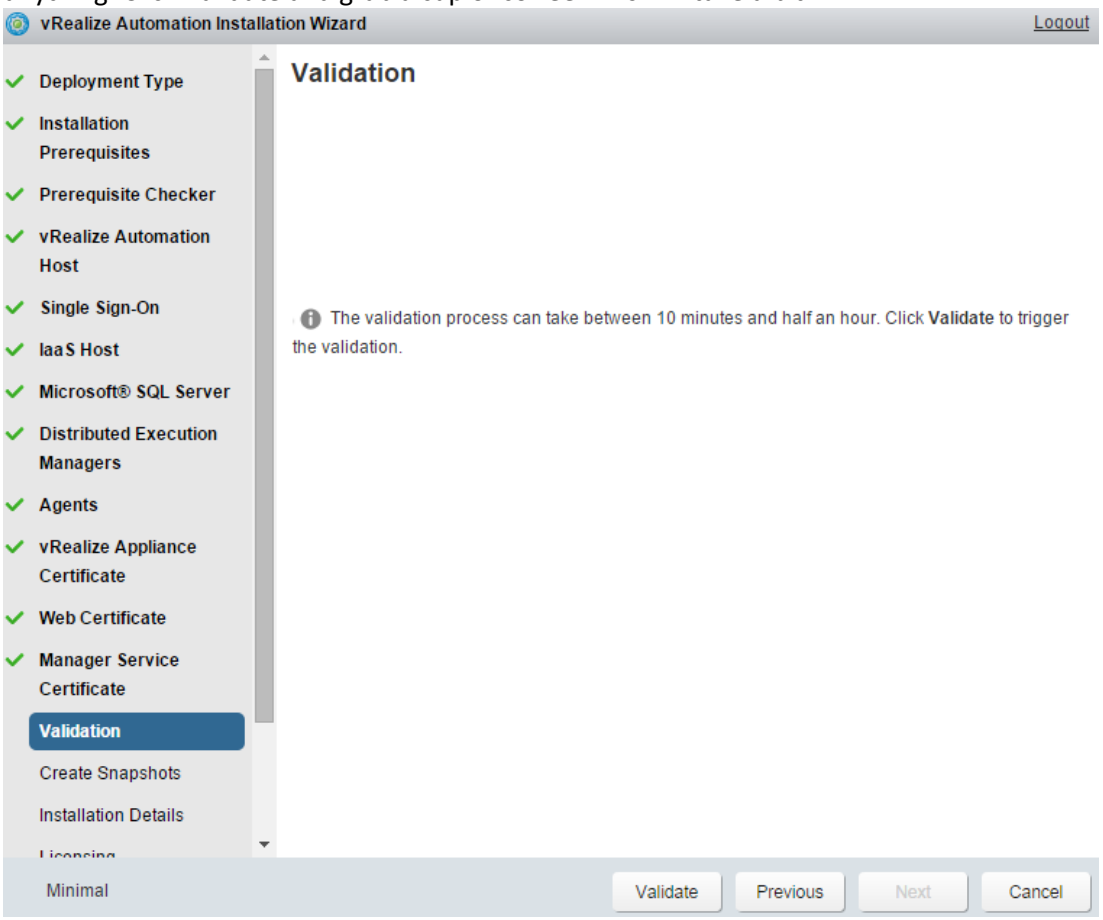
Now we need to enter the web certificate information for the IaaS Server. Enter the certificate information and click Next.


vRealize Automation Installation Wizard
Logout
Deployment Type
Installation Prerequisites
Prerequisite Checker
vRealize Automation Host
Single Sign-On
IaaS Host
Microsoft® SQL Server
Distributed Execution Managers
Agents
vRealize Appliance Certificate
Web Certificate
Manager Service Certificate
Validation
Create Snapshots
Installation Details
Licensing
Web Certificate
Help
Select and save a certificate type from the Certificate Action menu.
If you are using a PEM-encoded certificate, select Import Certificate. Select Generate Certificate to create a self-signed certificate or Provide Certificate Thumbprint to use a Certificate that is already deployed in the certificate store on the IaaS servers.
* Certificate Action
Keep Existing
Generate Certificate
Import Certificate
Provide Certificate Thumbprint
Common Name
* Organization
* Organizational Unit
IT
* Country Code
US
Serial
Fingerprint
Valid since
Valid to
Minimal
Previous
Next
Cancel

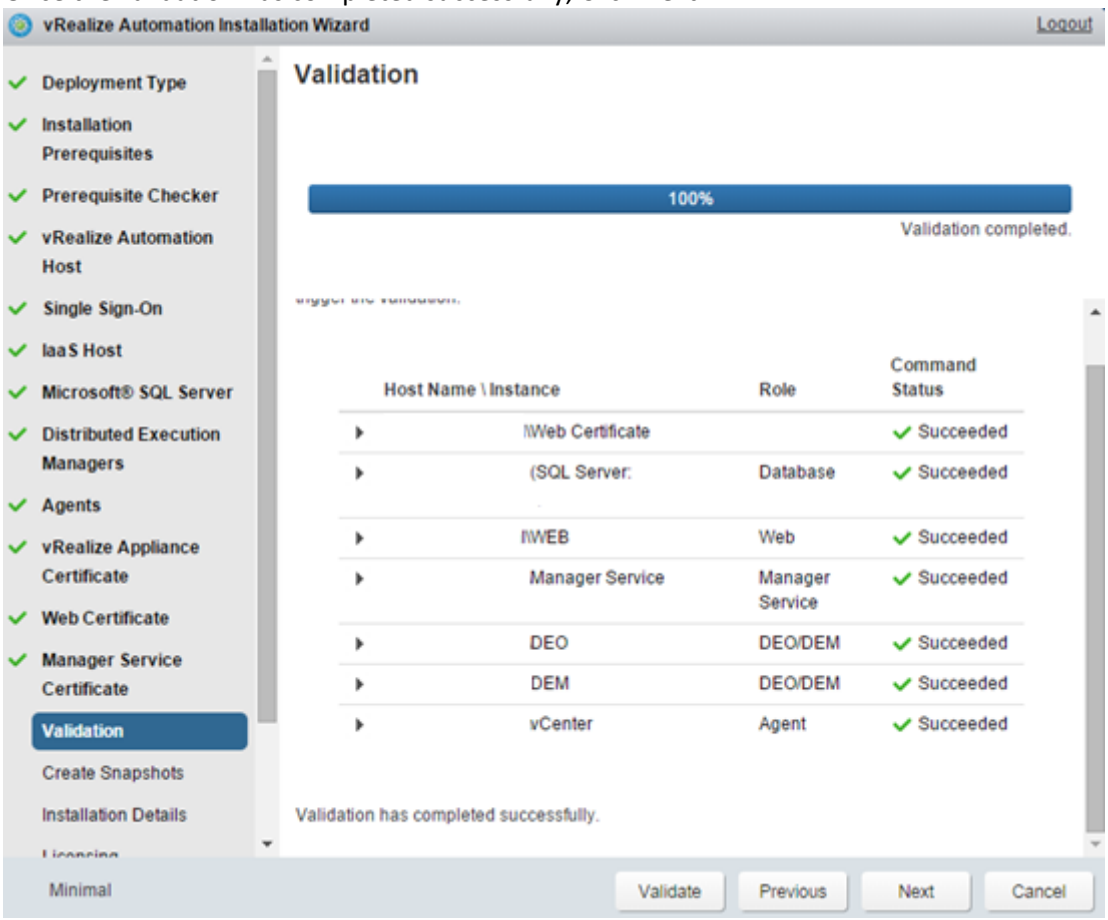
The last certificate we need to provide is the manager service certificate. Enter the certificate information and click Next.



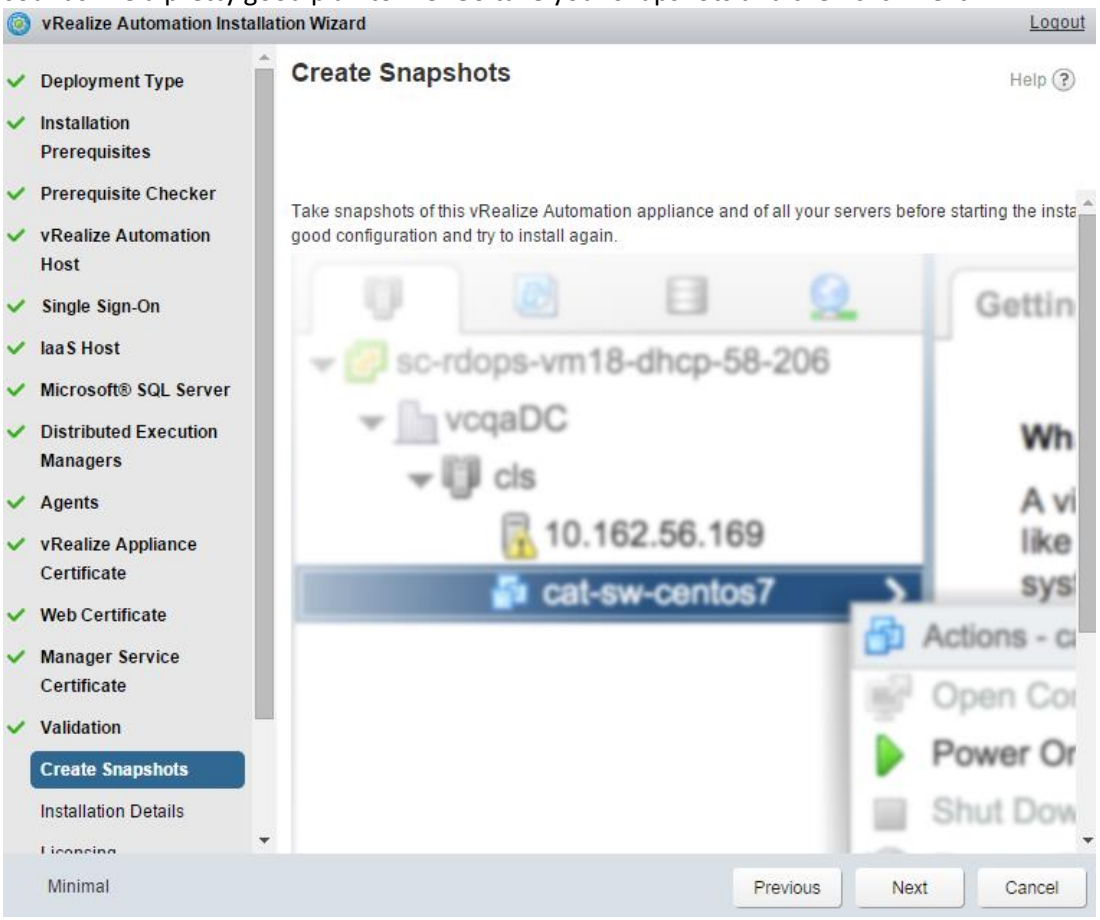
Now we're ready to validate all of our settings. Lucky for us, the wizard will do that before installing anything. Click Validate and grab a cup of coffee. This will take a bit.



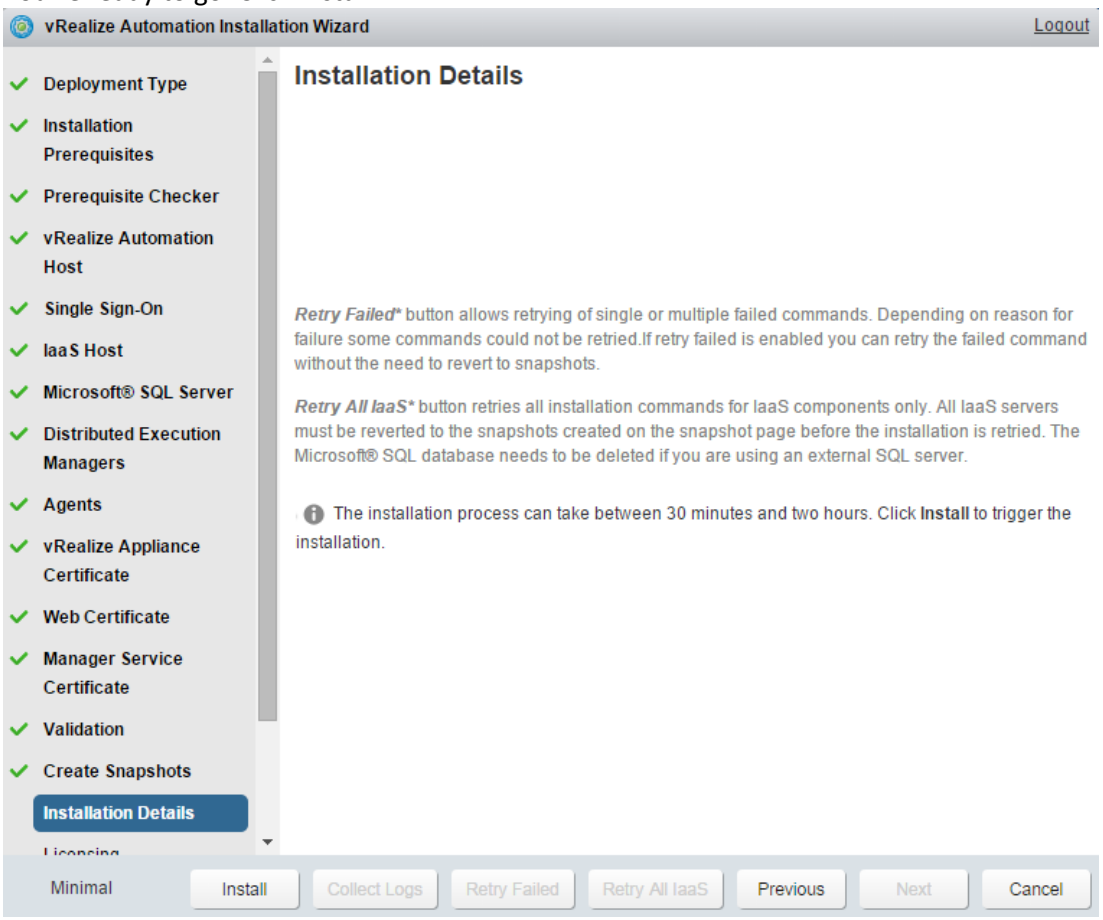
Once the validation has completed successfully, Click Next.



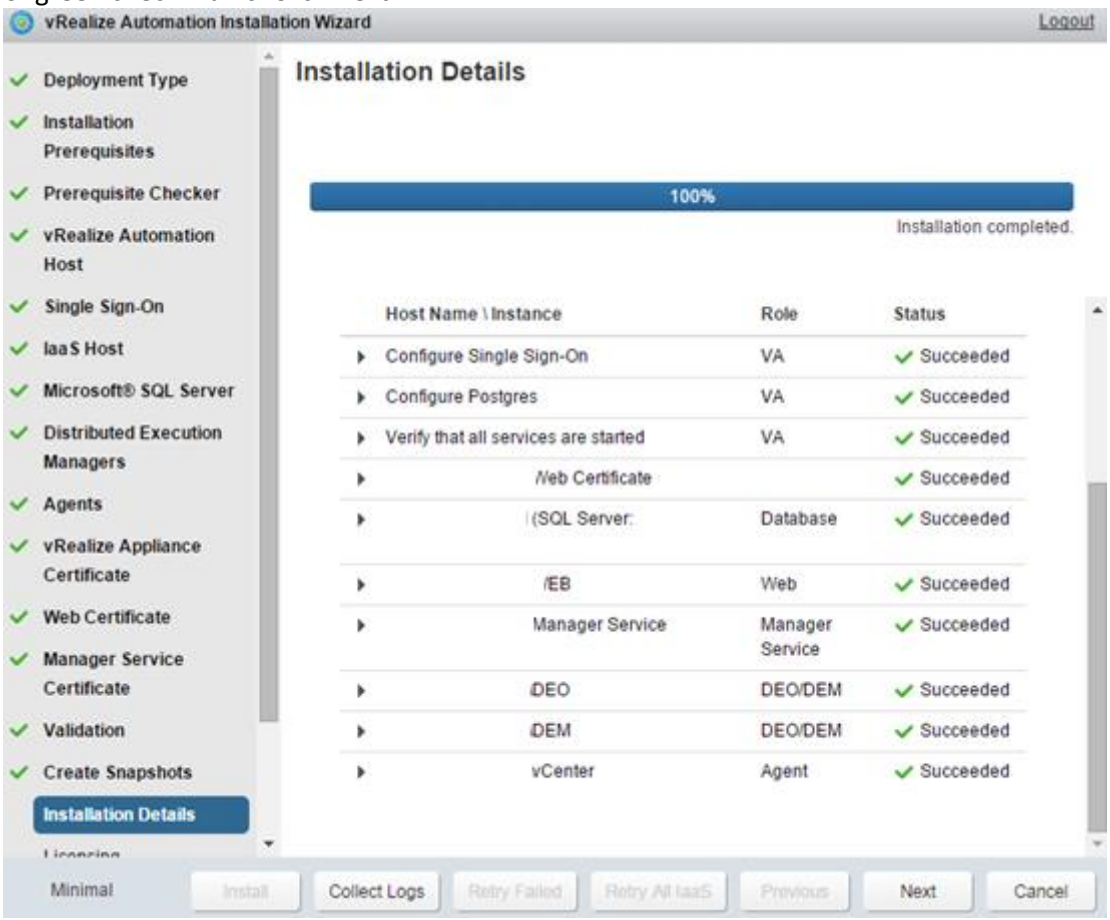
A nice reminder will be presented to you here to take a couple of snapshots before continuing. This sounds like a pretty good plan to me. Go take your snapshots and then click Next.



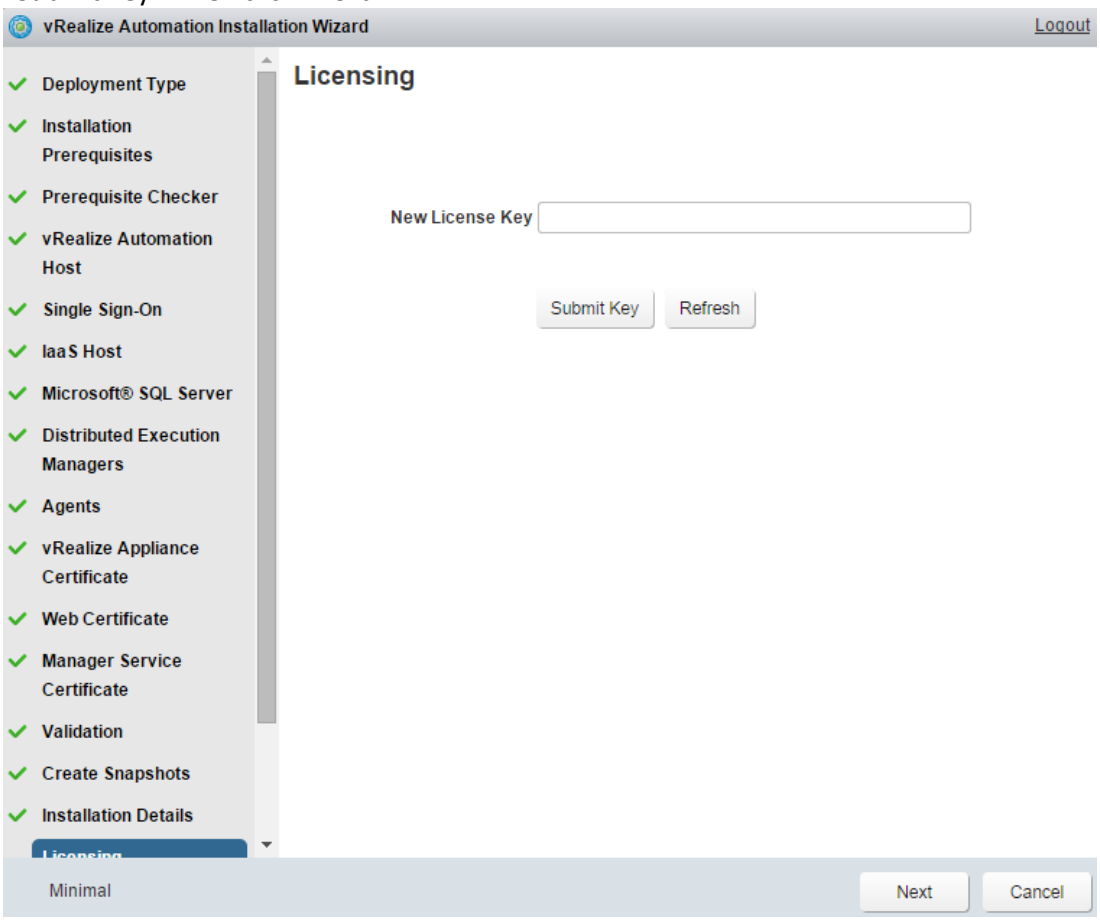
You’re ready to go. Click Install.



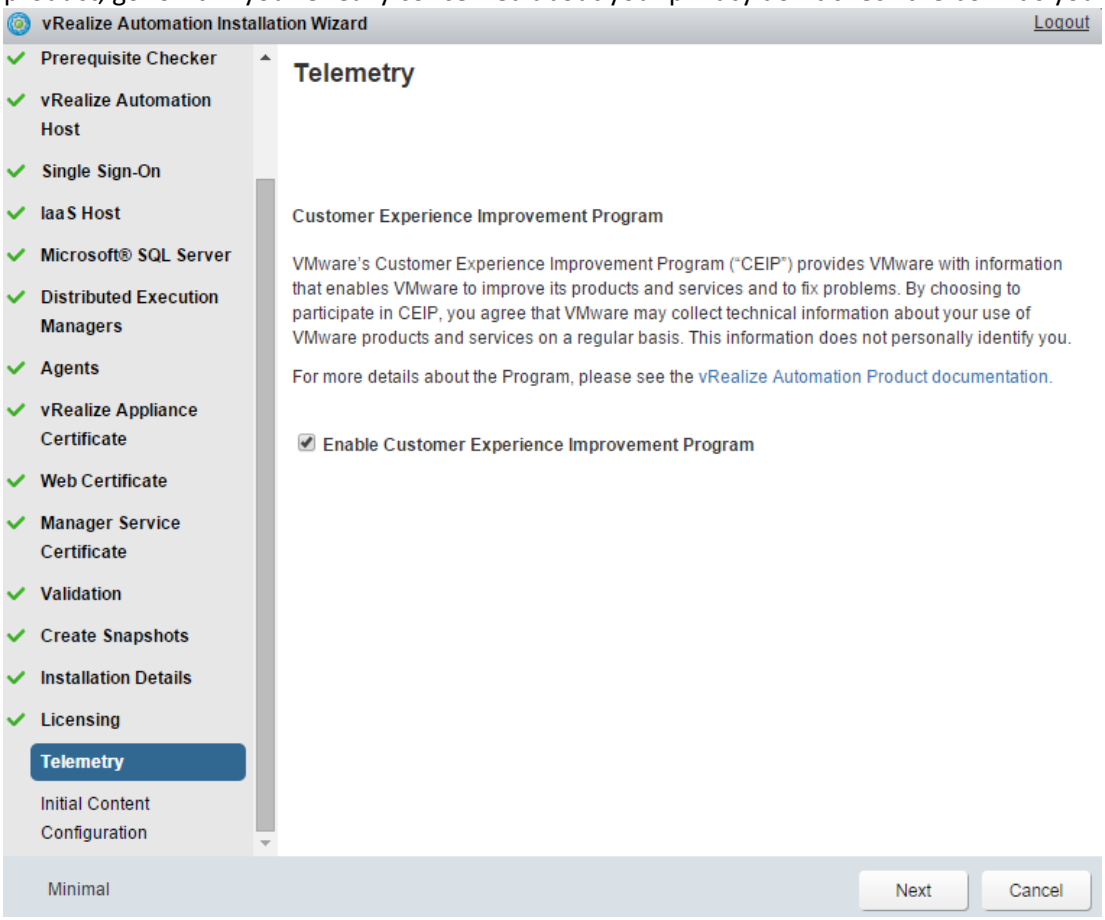
Hopefully, the install process will go flawlessly, and at the end you'll have a nice screen with a bunch of green check marks. Click Next.



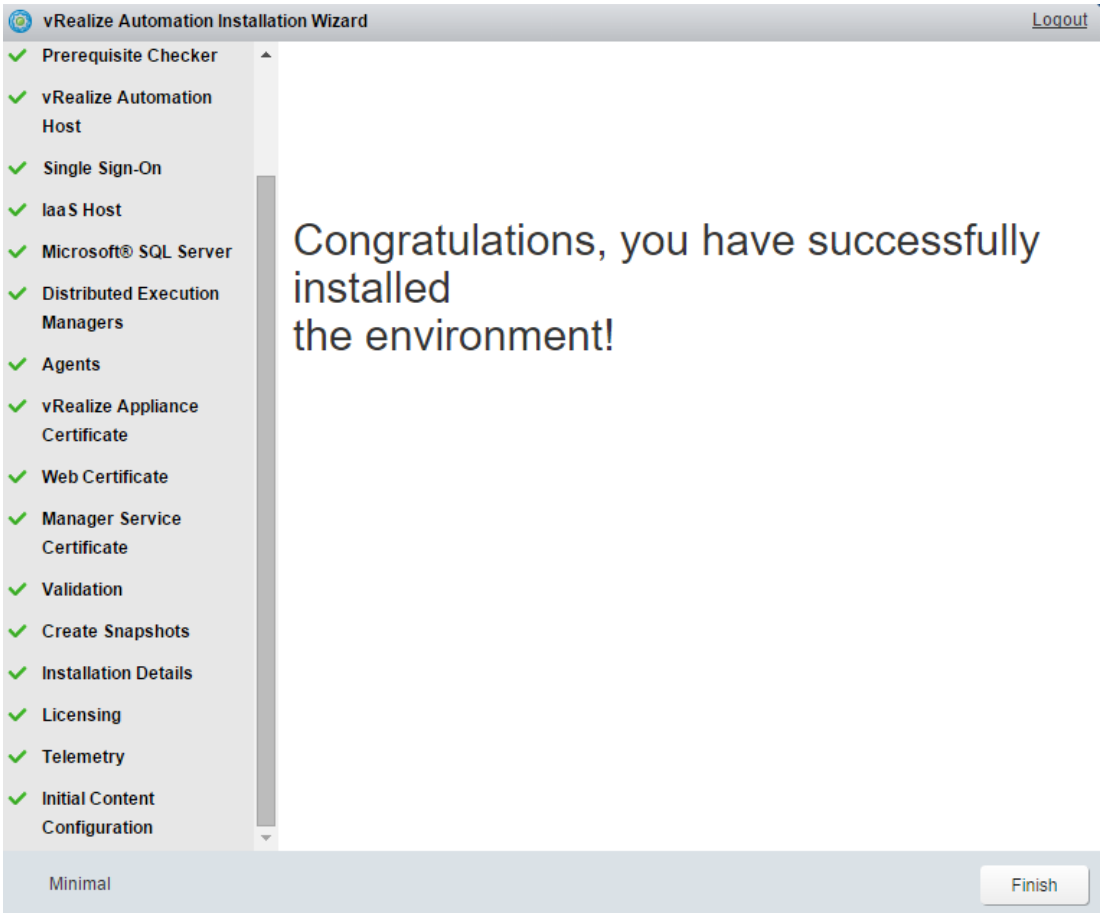
AHHHHHHH! The license. Nothing is free is it. Go grab your license key and enter it in the box. Click “Submit Key”. Then click “Next”.



It’s up to you here. If you want to submit telemetry data back to VMware so they can better the product, go for it. If you’re really concerned about your privacy don’t check the box. It’s your call.

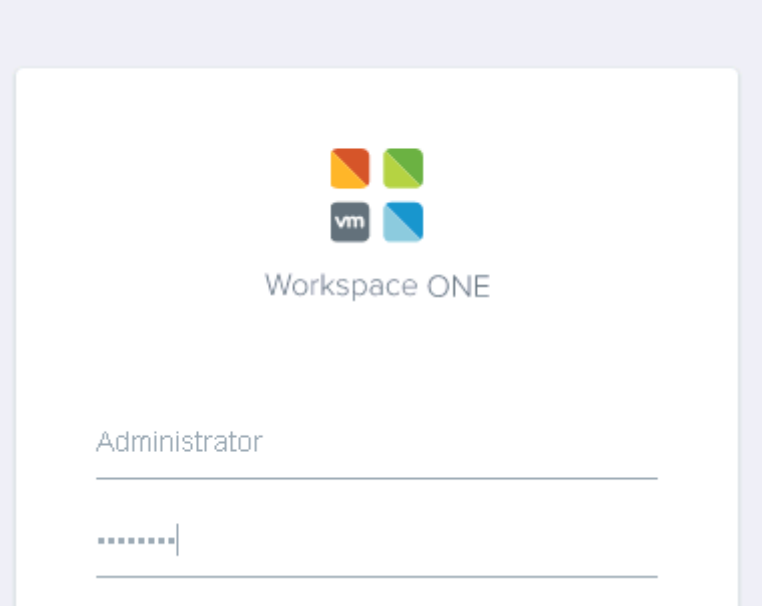


vRealize Automation is now installed.

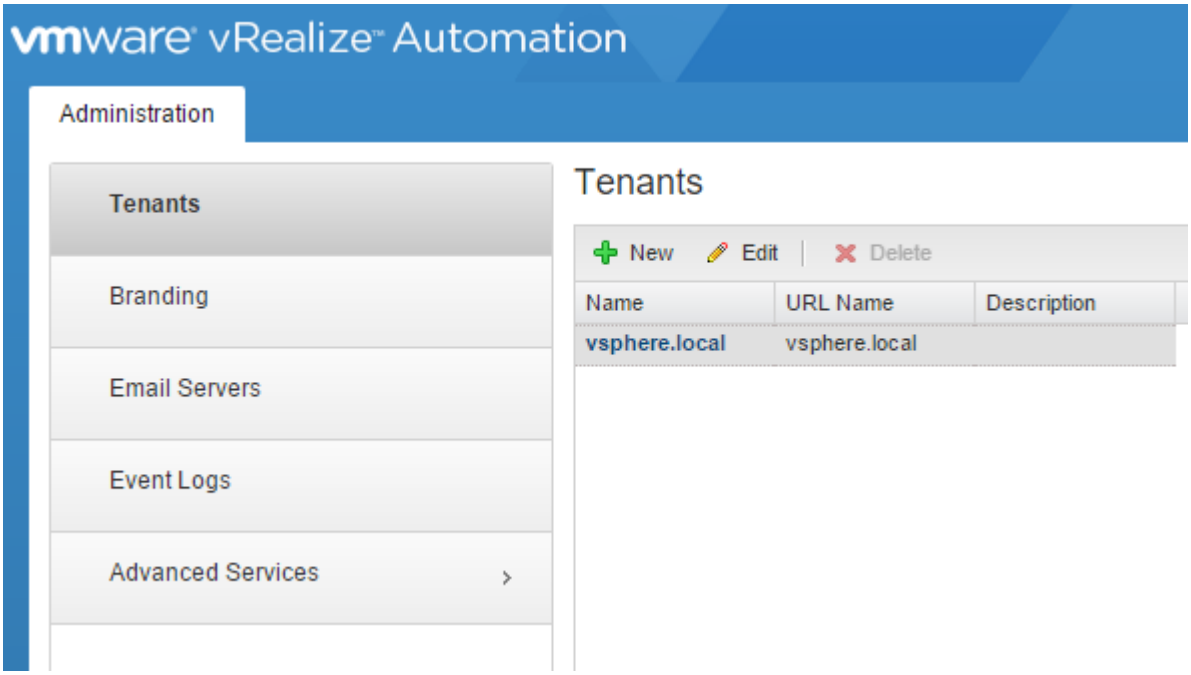


Local Account

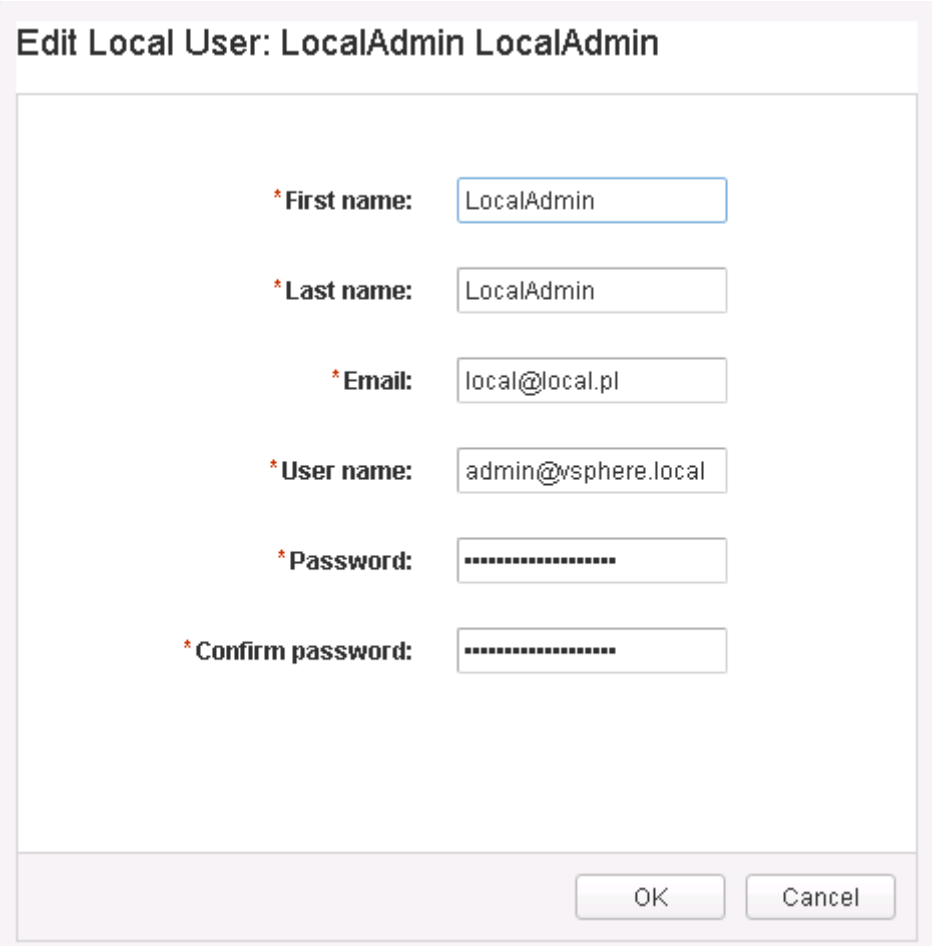
We've got vRA installed and thats a good start. Our next step is to login to the portal and start doing some configuration. Go to https://vra-appliance-name-orIP and enter the administrator login that you specified during your install.



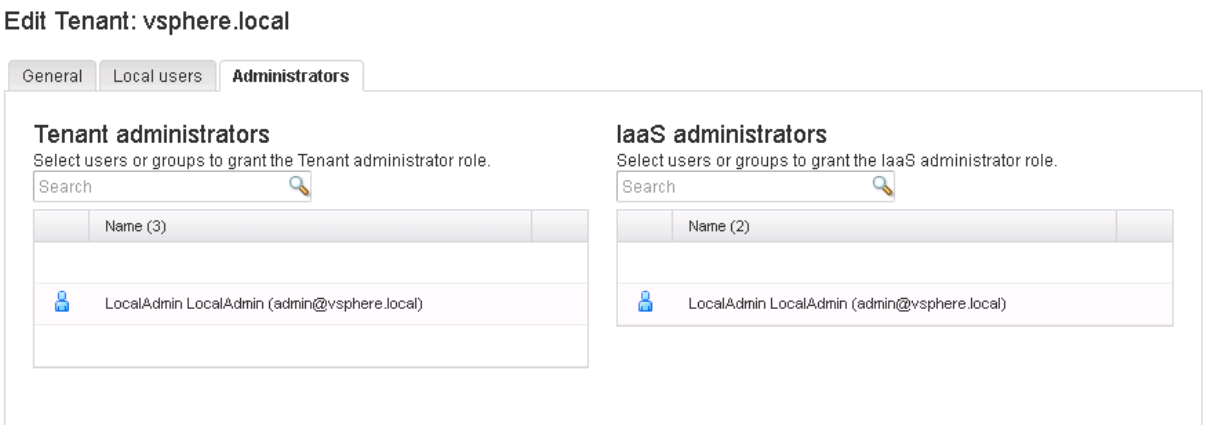
To start, Lets add some local users to our vSphere.local tenant. Click on the vsphere.local tenant.



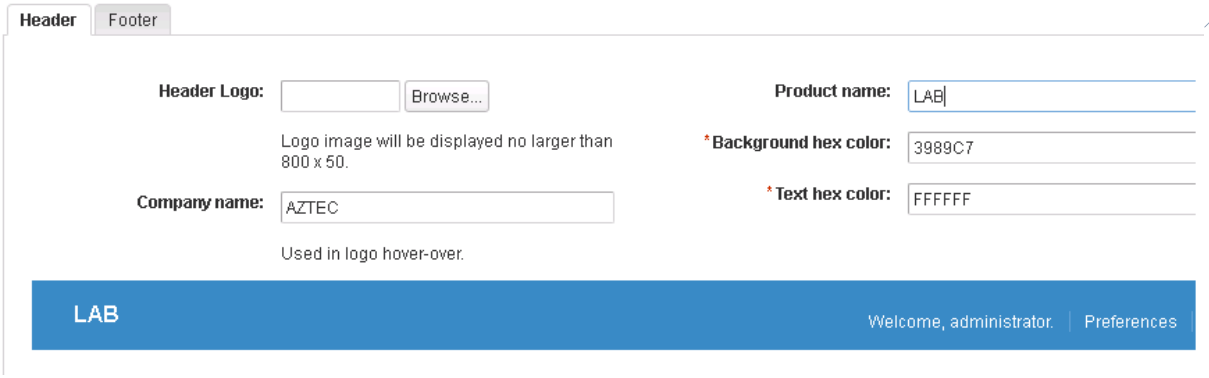
Click on the "Local users" tab and then click the "New" button to add a local account. I've created a Local Admin account that will be a local account only used to manage the default tenant configurations.



Click the Administrators Tab and add the account you just created to the Tenant Admins and IaaS Admins groups. Click Finish.



Click on the Branding Tab. If you want to change any of the look and feel of your cloud management portal, uncheck the “Use default” check box and upload headers, change colors to fit your needs.

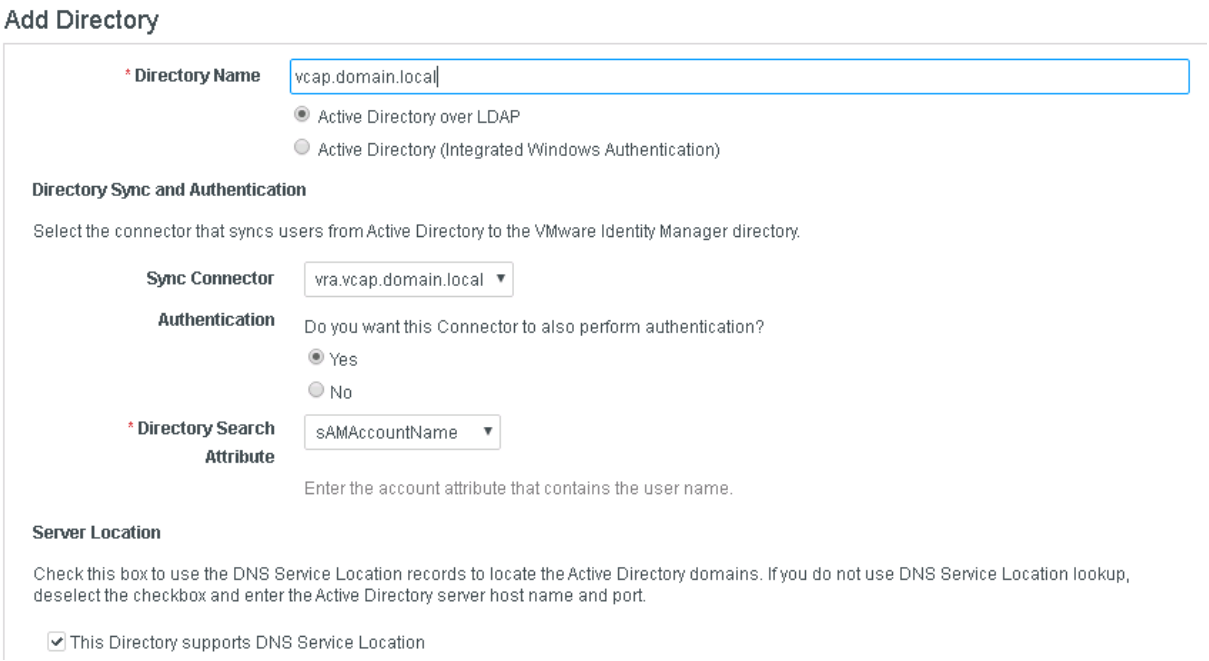


Log out of the portal and log back in as the new tenant administrator account.

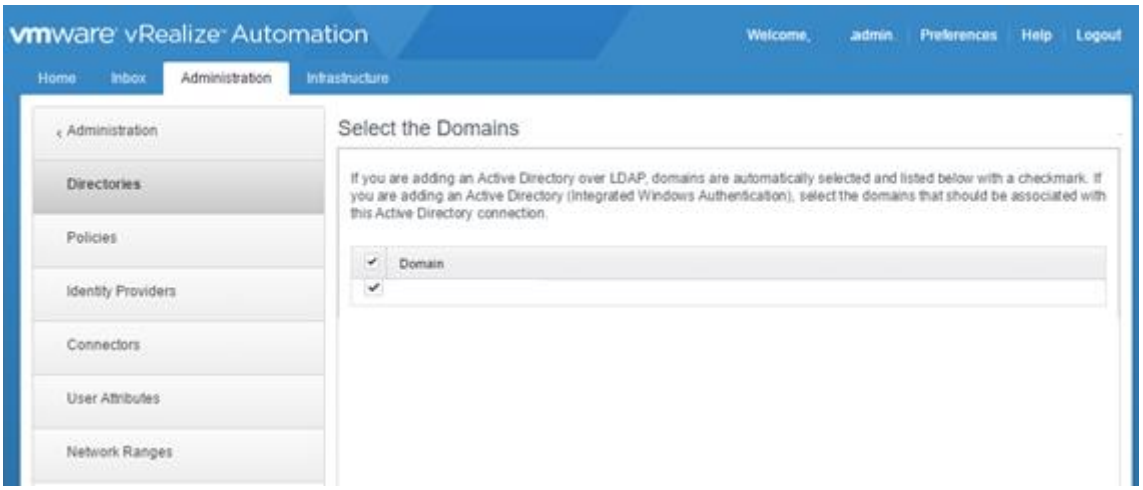
Active Directory Authentication

In order to setup Active Directory Integrated Authentication, we must login to our default tenant again but this time as our "Tenant Administrator" instead of the system administrator account that is created during initial setup.

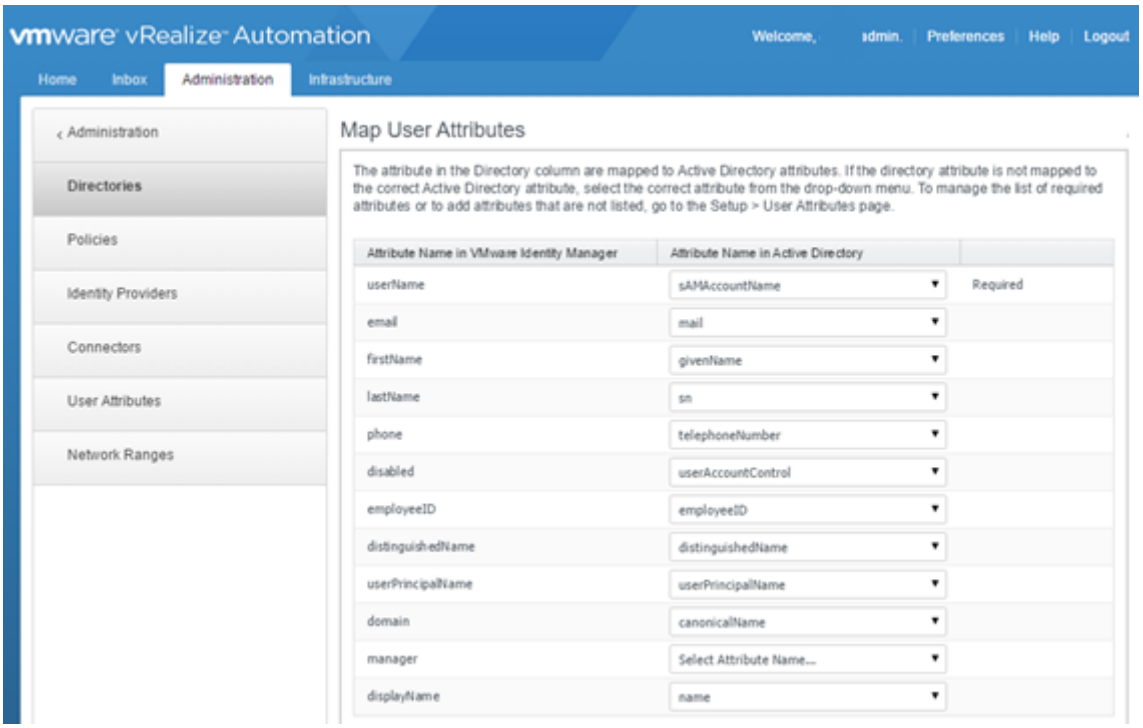
Once you're logged in, click the Administration tab –> Directories Management –> Directories and then click the "Add Directory" button. Give the directory a descriptive name like the name of the ad domain for example. Then select the type of directory. I've chosen the "Active Directory (Integrated Windows Authentication)" option. This will add the vRA appliance to the AD Domain and use the computer account for authentication.



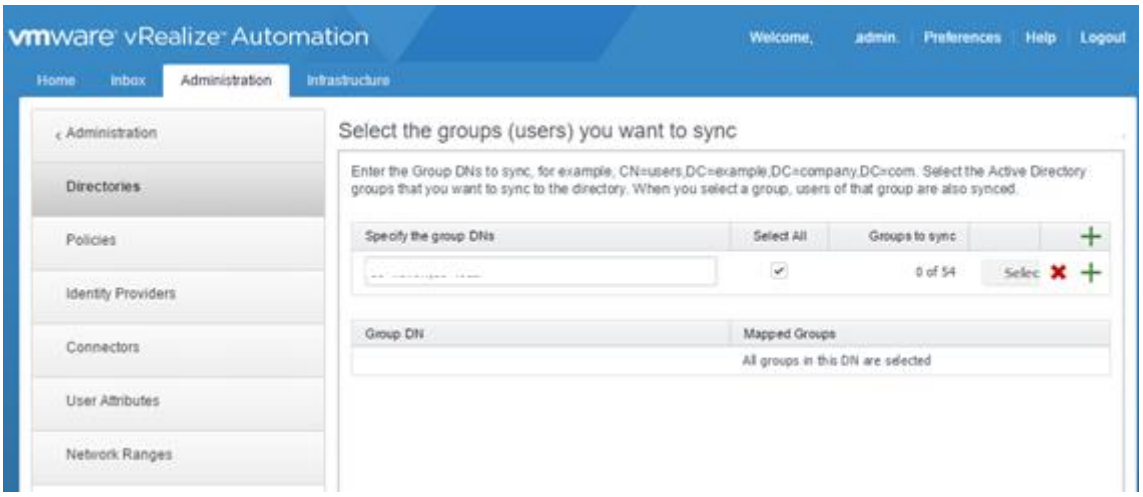
Now, select the domain you just added. Click Next.



Now we can map vIDM properties to your active directory properties. The properties I used are shown in the screenshot below. I tweaked the default values a tad bit, but for the most part, all of the properties were already mapped correctly to start with.

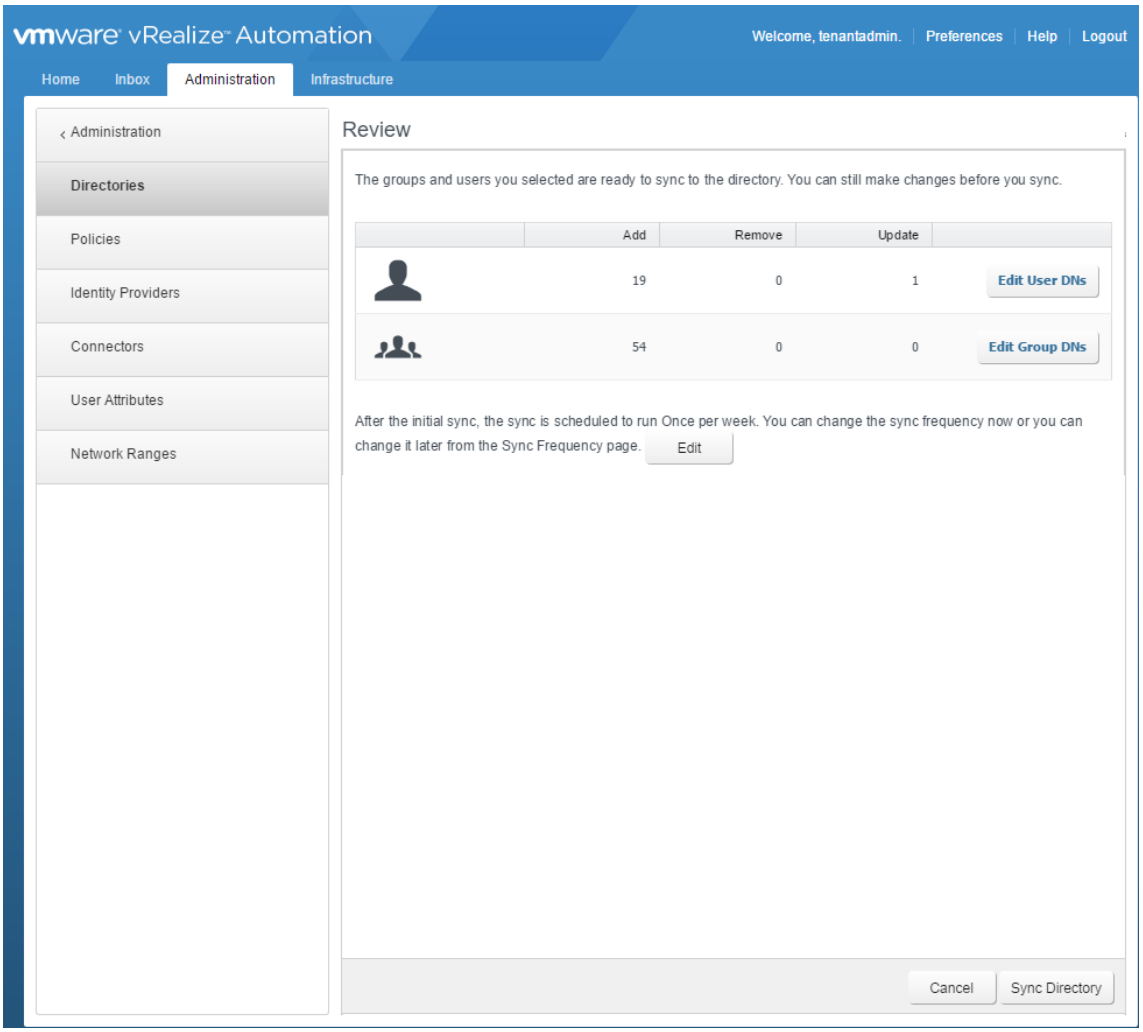


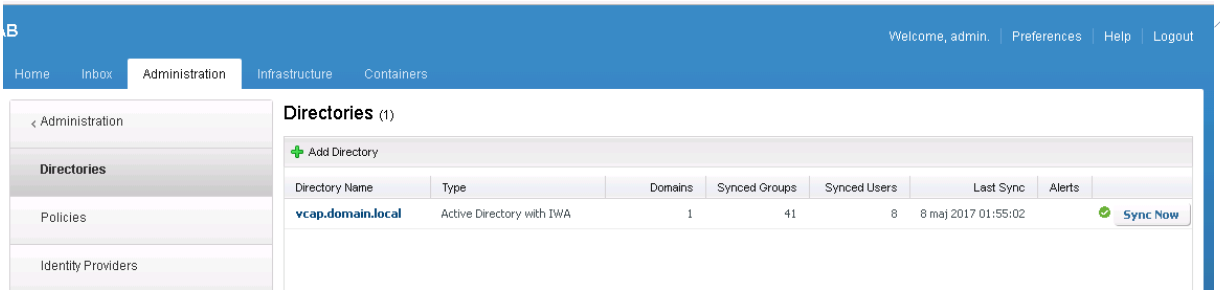
Now we enter a Distinguished Name to search for groups to sync with. I chose the root DN for my domain, and selected all of the groups. Click Next.



repeat the process with user accounts. Click Next.

The next screen shows you details about the user and groups that will be synced. You can edit your settings or click “Sync Directory” to complete the setup.



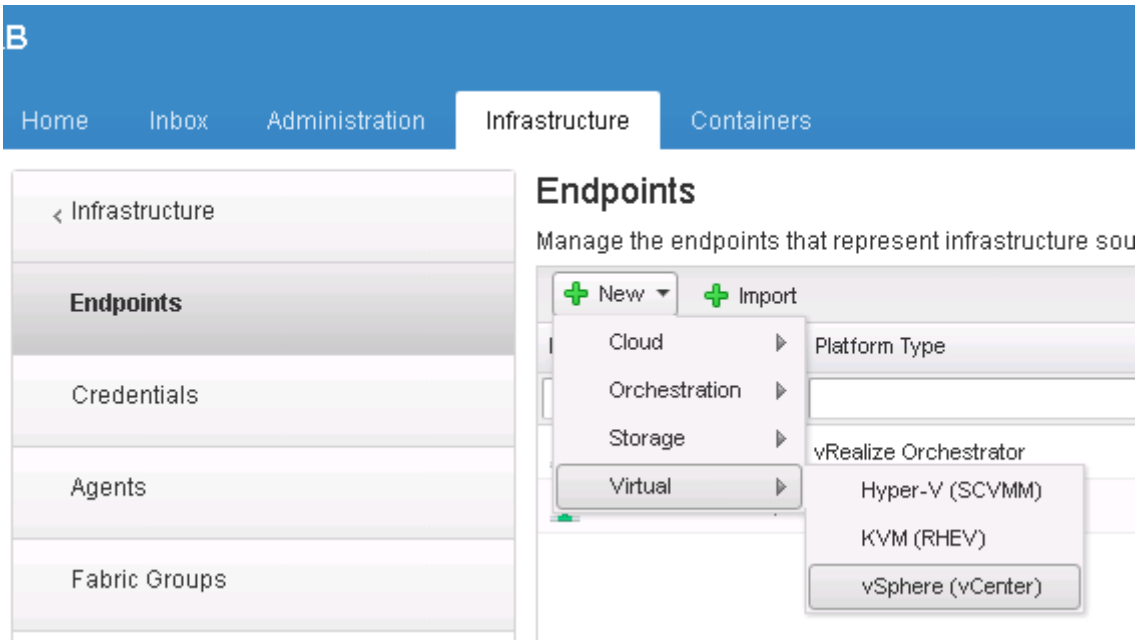


Endpoints

Now that we've setup our new tenant, lets login as an infrastructure admin and start assigning some resources that we can use. To do this we need to start by adding an endpoint

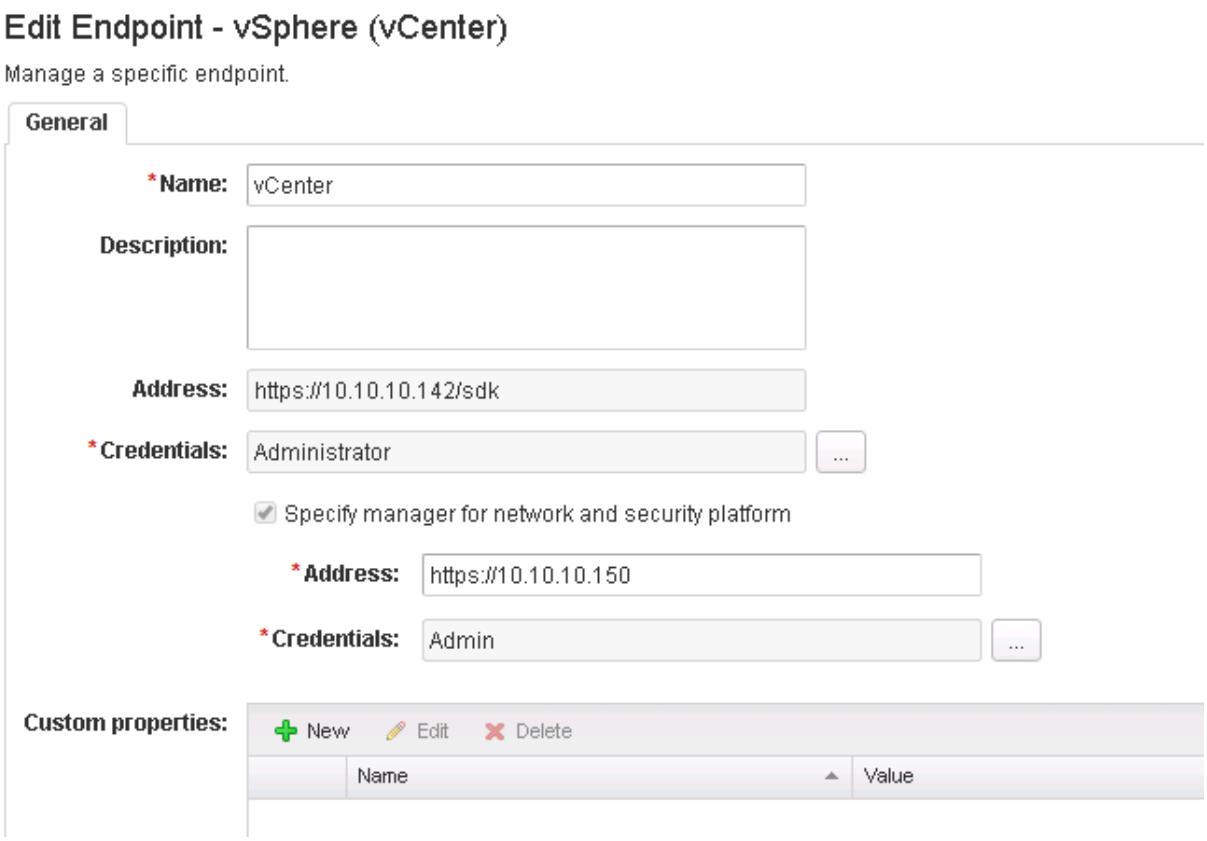
In this lab we'll add a vSphere endpoint. Go to the Infrastructure Tab –> Credentials and then click the "New" button to add a login. Give it a name and description that will help you remember what the credentials are used for

Now that we've got some credentials to use, go to Infrastructure Tab –> Endpoints and then click the "New" button again. Here I'm selecting Virtual –> vSphere (vCenter) because thats the type of endpoint I'm connecting to. Your mileage may vary.



Fill out the name which should match the agents that were created during the installation. If you kept all of the defaults during the install, the first vCenter agent is named “vCenter” spelled exactly like this with the capital “C”. Give it a description and then enter the address. The address for a vCenter should be https://vcenterFQDN/sdk. Now click the ellipsis next to credentials and select the username/password combination that we created earlier.

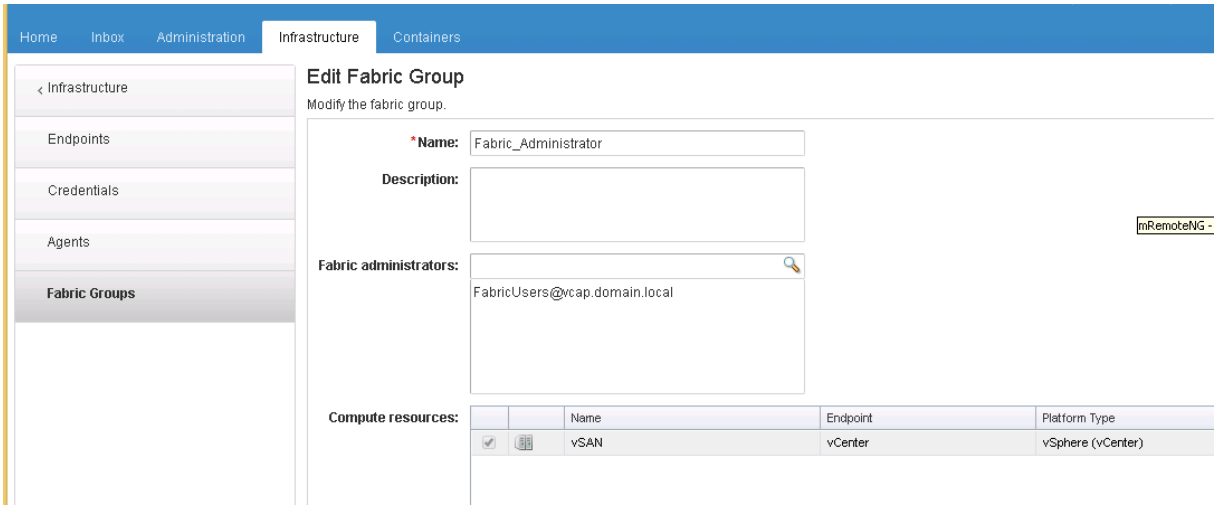
We are using NSX so also we will add NSX



Fabric Group

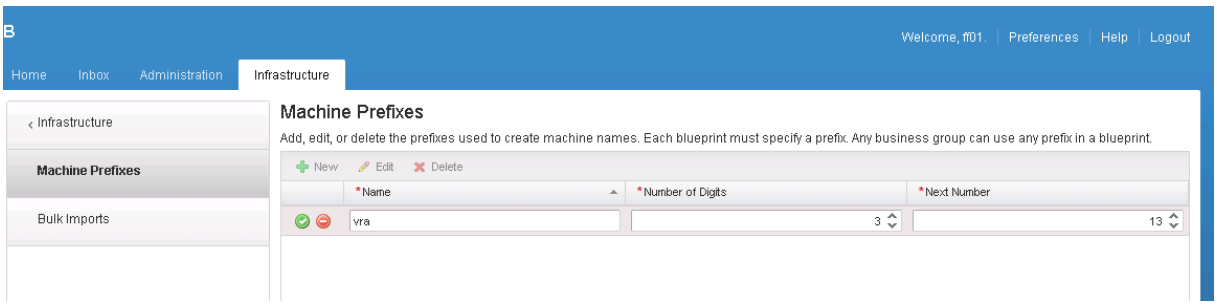
Now we must create a fabric group We will be using group created in our Active directory for Fabric Groups

To add a Fabric Group, login to your vRealize Automation tenant as a IaaS Administrator account which we setup in a previous post. Now go to the Infrastructure Tab –> Endpoints –> Fabric Groups. Click the “New Fabric Group” button to create a new group.



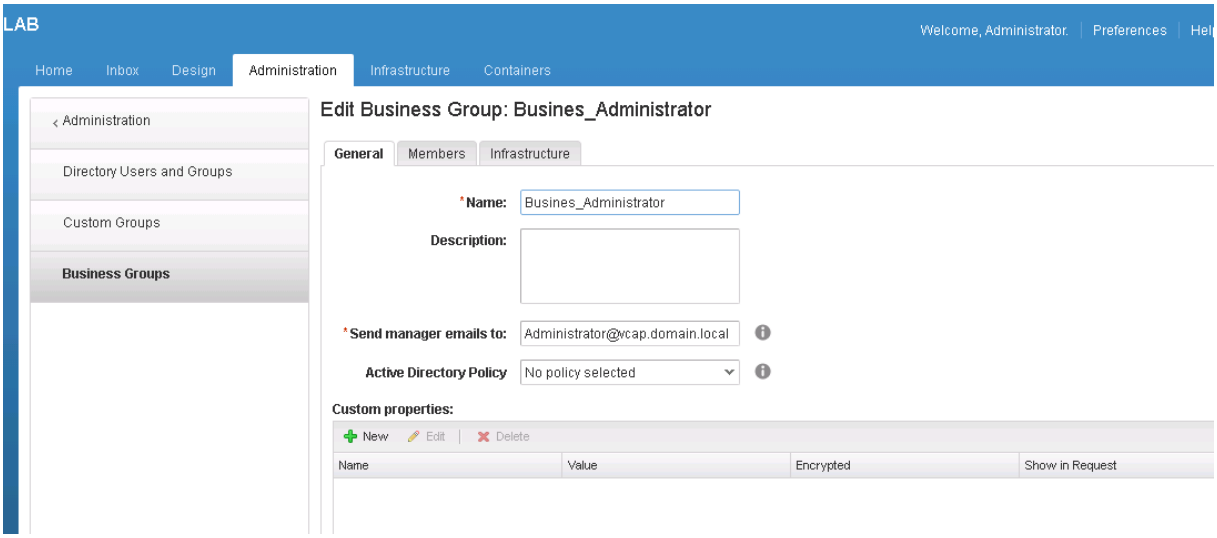
Business Group

We want to make sure that our machines don’t have the same names so we’ll need a scheme to set them up in some sort of pool like we do with IP addresses. To setup a machine prefix go to Infrastructure –> Administration –> Machine Prefixes on your Fabric account . Click the “New” button with the plus sign on it to add a new prefix. Enter a string to be used in the name that will always be added to a new machine name. Next add a number of digits to append to the end of that string, and lastly enter a number for the next machine to start with.

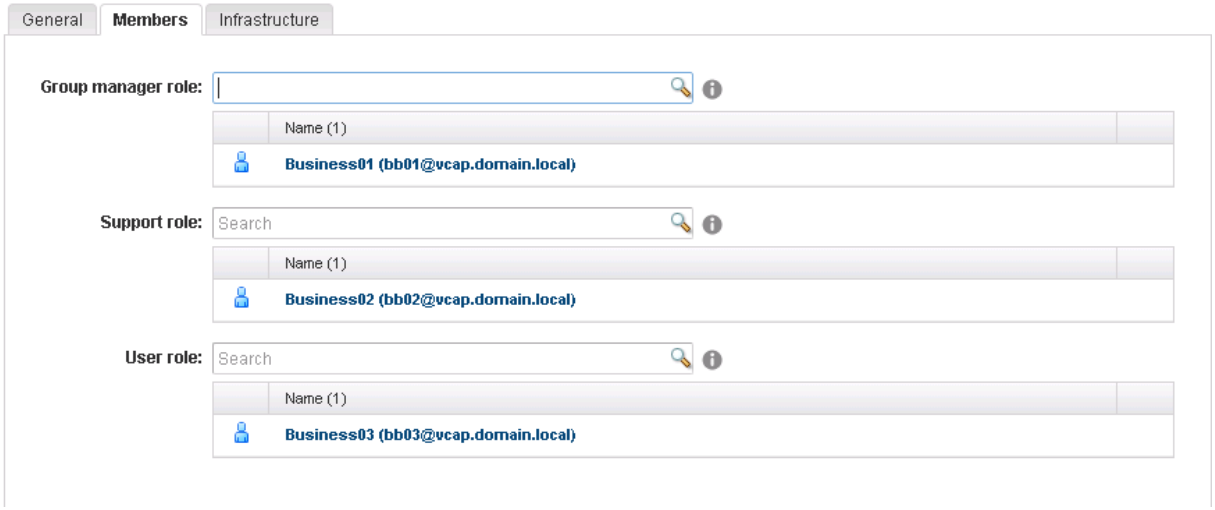


Now that we created the machine prefix, we can add our business group. Go back to Administrator account and Go to Administration –> Users and Groups –> Business Groups. Click the “New” button

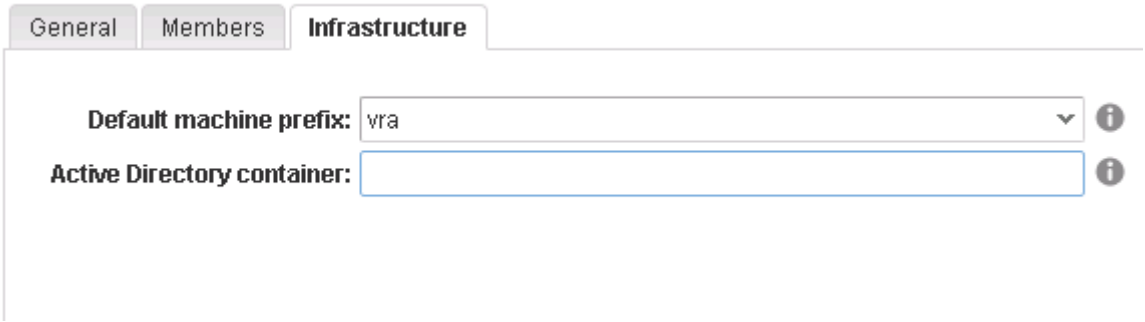
again to add a new group. When the first screen opens, Give the group a name, description and an email address in which to send business group activities. Click “Next”.

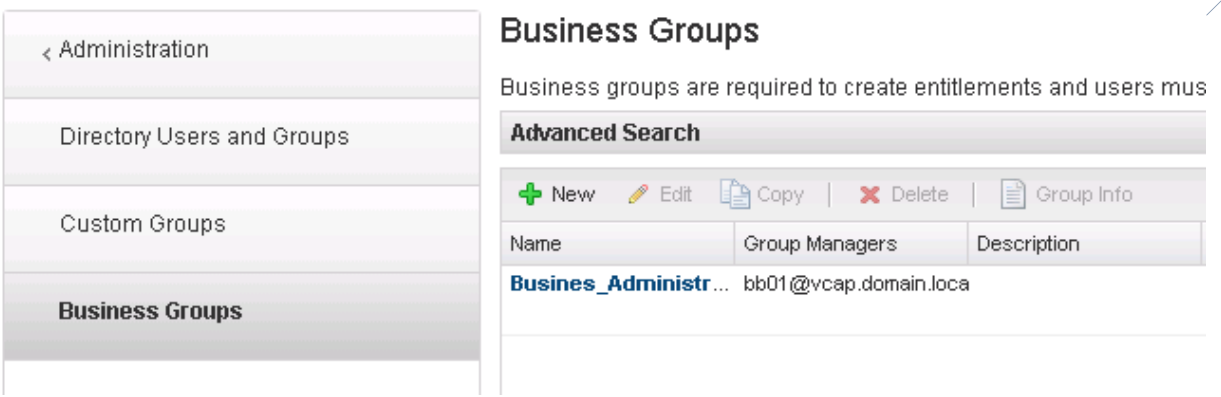


Next, we’re presented with a screen to add users to three different roles. The group manager role will entitle the users to blueprints and will manage approval policies. The support role will be users that can provision resources on behalf of the users, and the users role will be a list of users who can request catalog items. Click “Next”.



On the Infrastructure screen, select a machine prefix from the drop down.

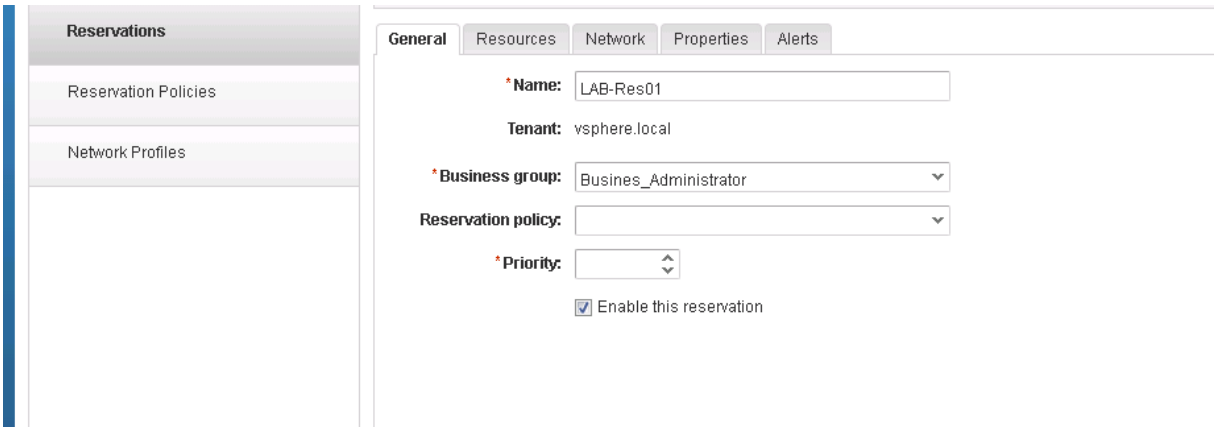




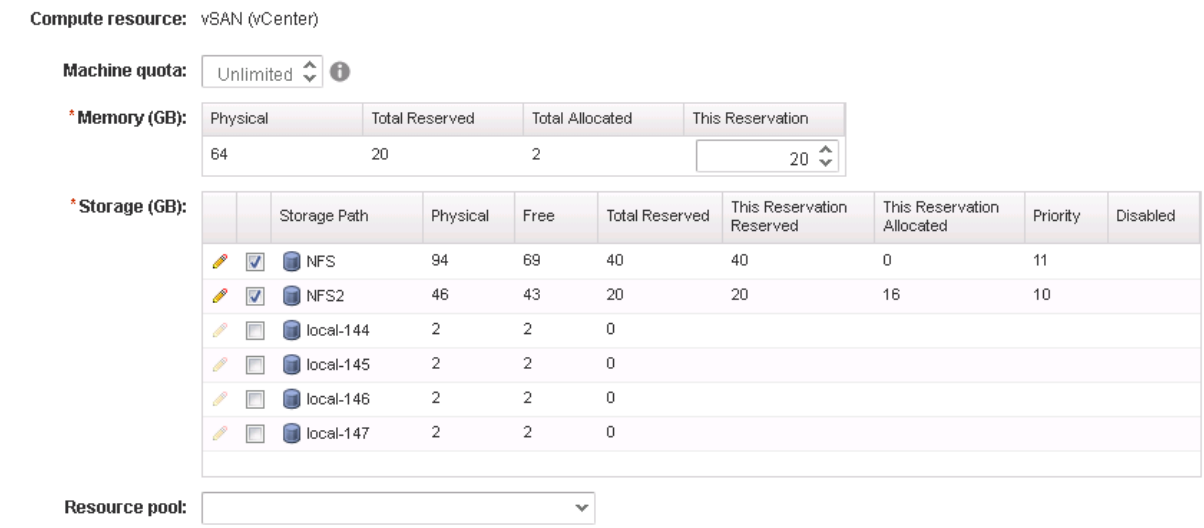
Reservation

Login via Fabric User. To add a reservation go to Infrastructure –> Reservations. Click the “New” button to add a reservation and then select the type of reservation to be added.

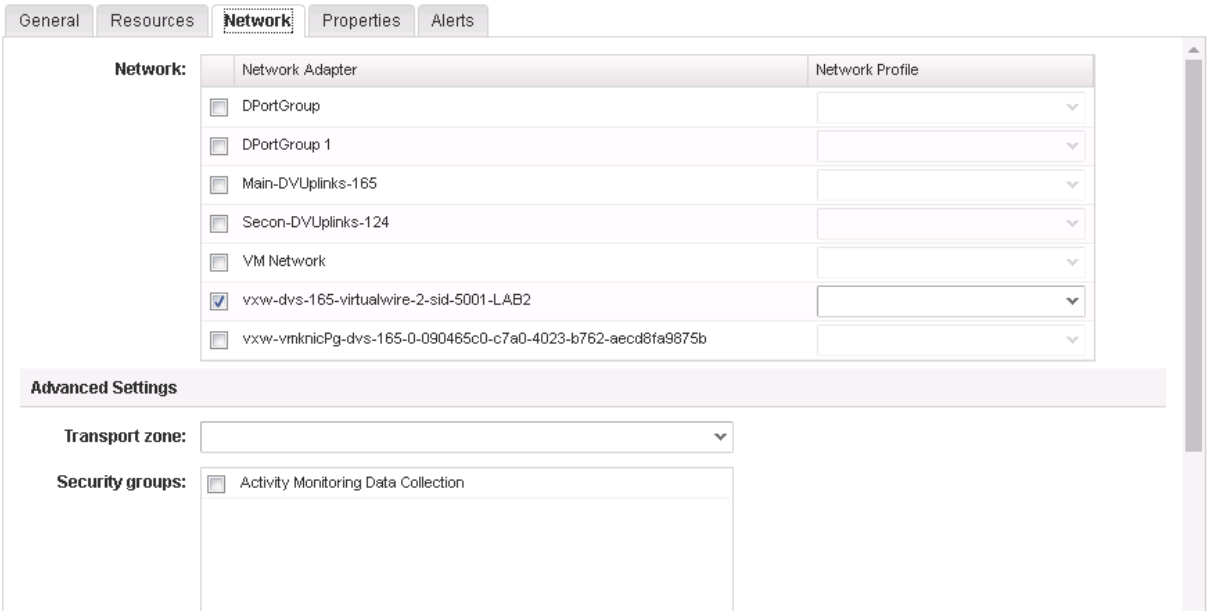
Enter a Name for the reservation and the tenant (which should already be selected). Next, in the dropdown select your business group that will have access to the reservation. Leave reservation policy empty for now but enter a priority. If a business group has access to more than one reservation, the priority is used to determine which to use up first. Lastly, select “Enable this reservation”. Click “Next”.



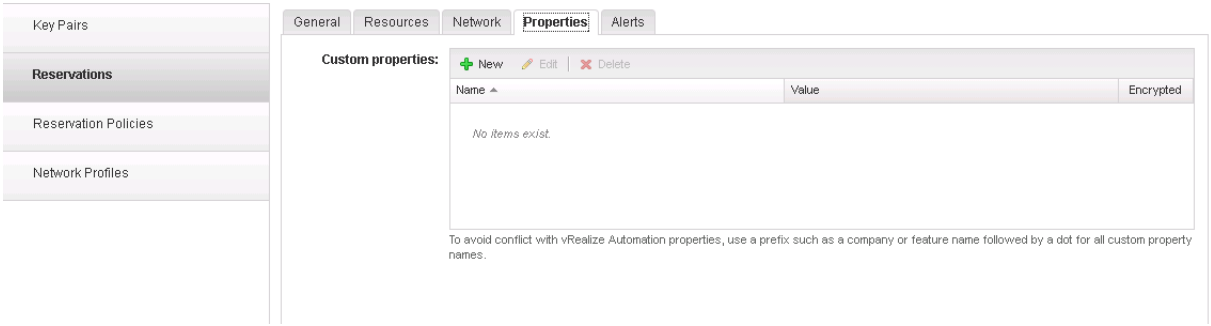
On the resources tab, select the compute resource and then we need to add some quotas. Quotas limit how large the reservation will be, so we can limit it by a number of machines, the amount of memory or how much storage is being used. Be sure to enter a memory amount and at least one datastore to be used for deploying cloud resources. Click “Next”.



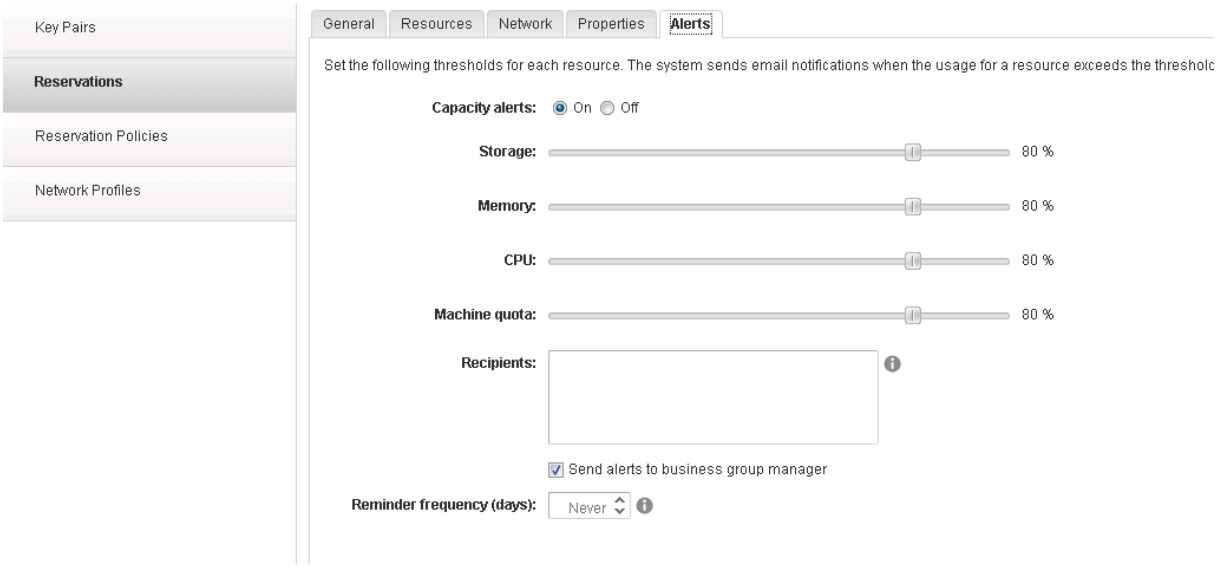
On the network tab, select the networks that can be used to deploy resources and for now leave the "Network Profile" blank.The bottom section is used with NSX

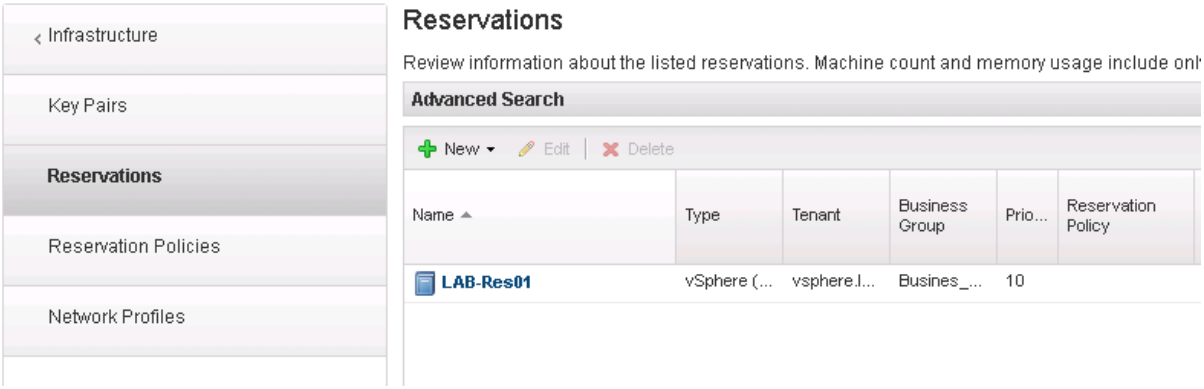


On the properties tab, you can add custom properties that will be associated with all catalog items deployed through this reservation. For now we'll leave this empty. Click "Next".



Lastly, the alerts page we can set the thresholds on when to alert our administrators about resource usage.

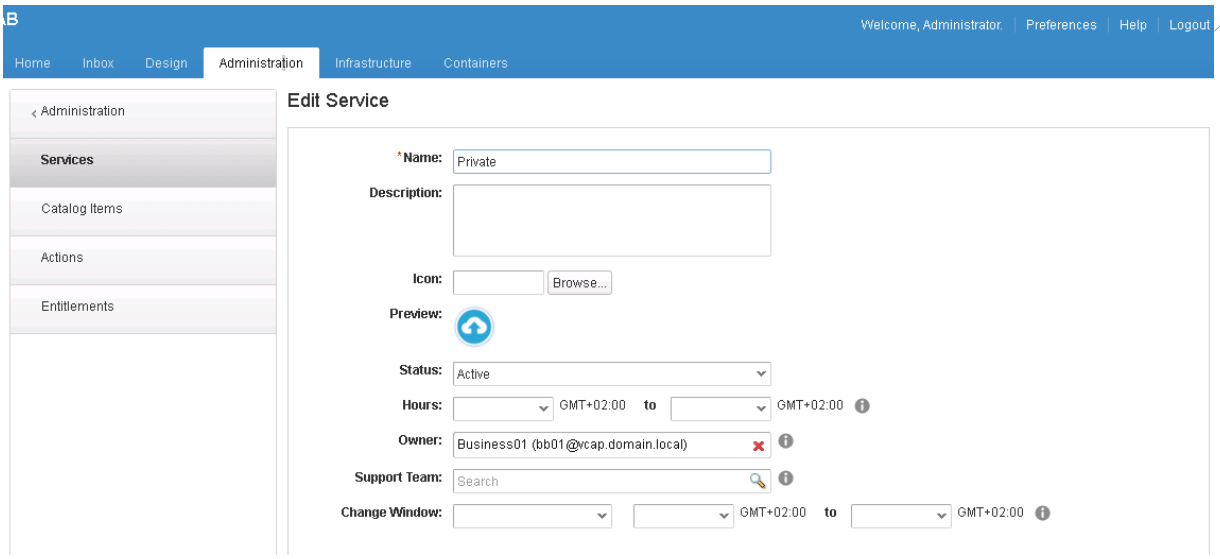




Services

All blueprints must be part of a service for it to be provisioned. To create a service go to Administration tab –> Catalog Management –> Services. Click the “New” button to add a new service.

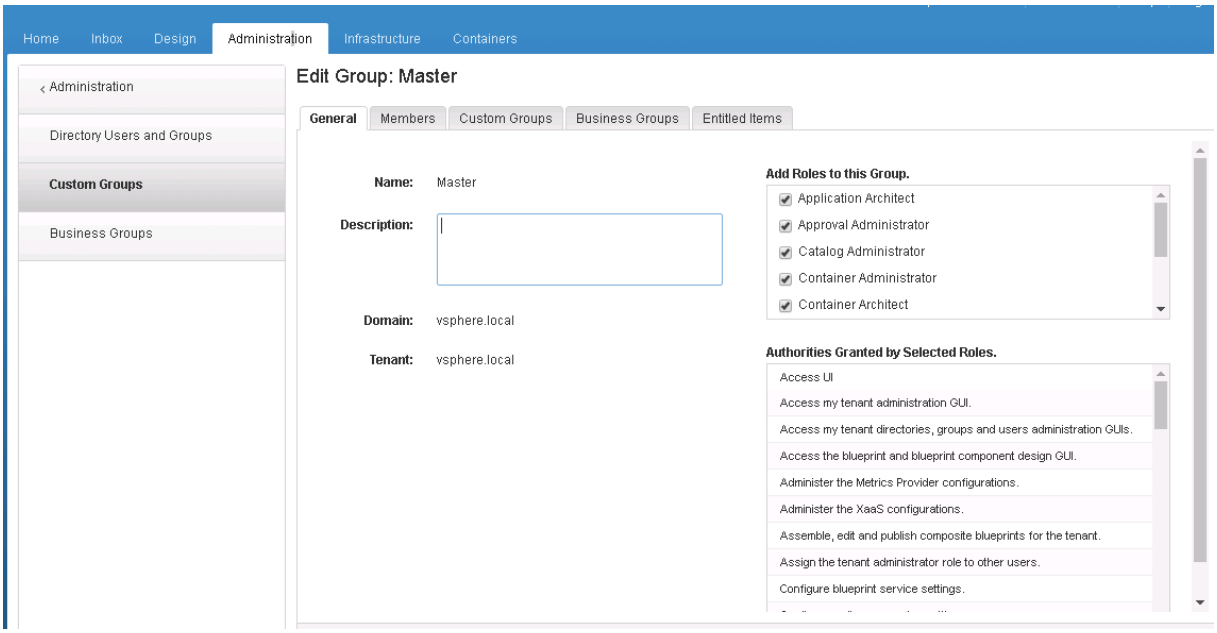
Give the service a name and description. Then click the browse button to add an icon for your service. Change the status to Active and then give it an owner. You can also set which hours the service is available to your users and the default change window for the service if you’d like. Again, I’m in a small lab so I’m not messing with this much. Click “OK”.



Custom Group

To create a custom group, login as a tenant administrator and go to the Administration Tab –> Users and Groups –> Custom Groups. From there click the “New” button to add a new custom group.

Once the “New Group” screen appears give it a name and description. On the right hand side, select the built in roles that you’d like to assign to this group. In our case, this is a lab and we are assigning all roles to the group and assuming that this group managed EVERYTHING in our vRA infrastructure



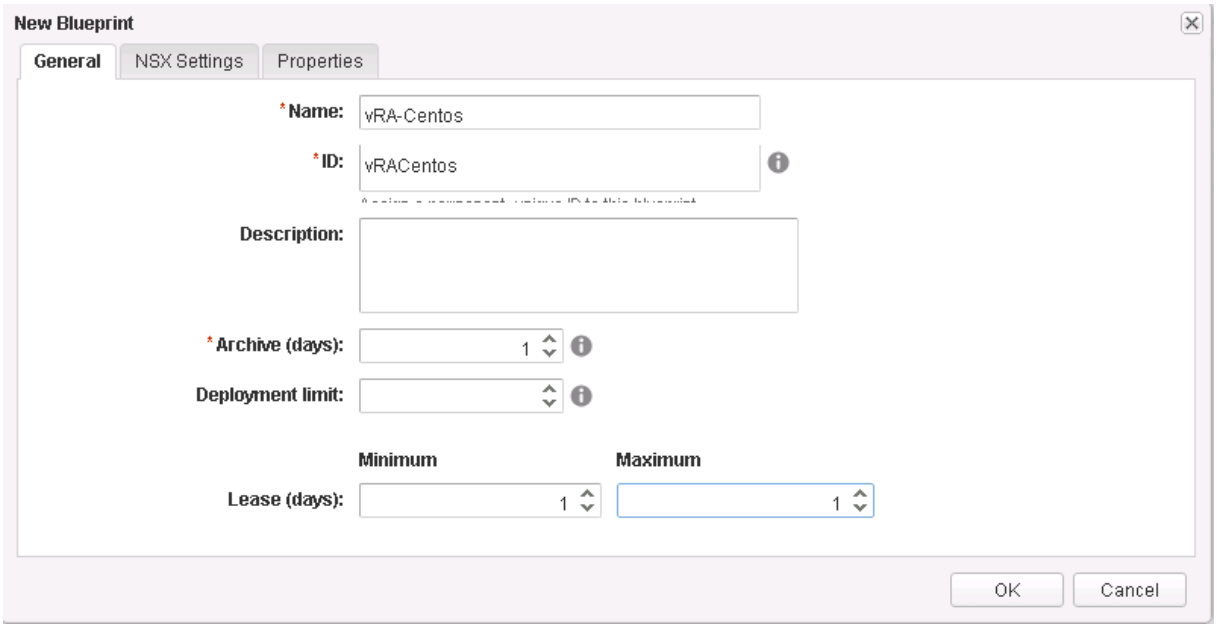
Blueprint

We've finally gotten most of the setup done so that we can publish our vSphere templates in vRA.

To create a blueprint in vRealize Automation 7 go to the "Design" tab.

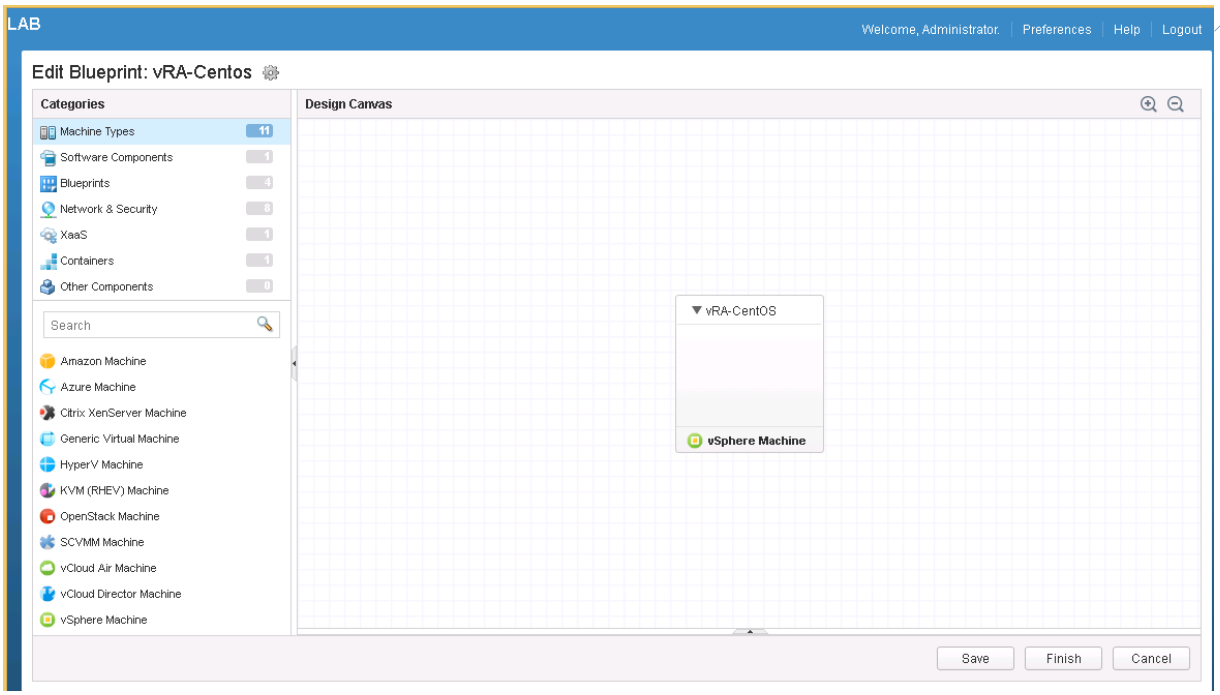
Click the "New" button to add a new blueprint.

Give the new blueprint a name and a Unique ID.

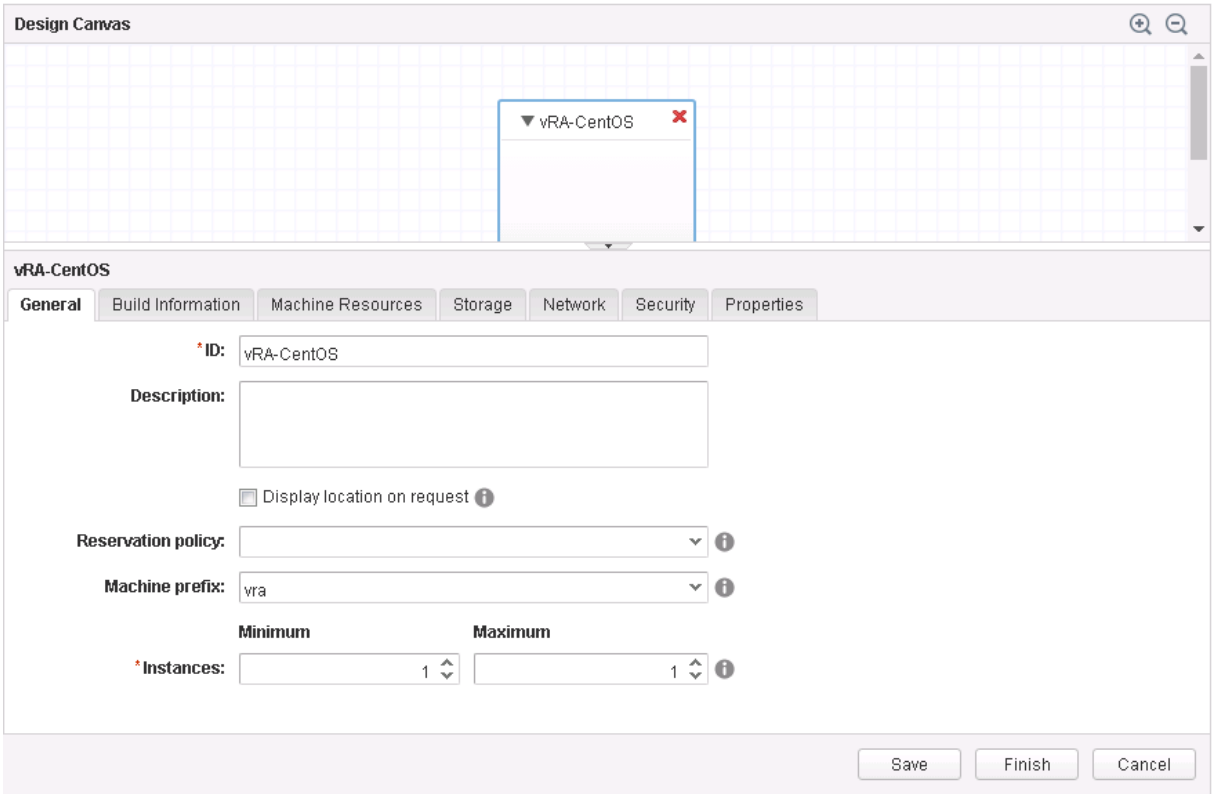


Click OK.

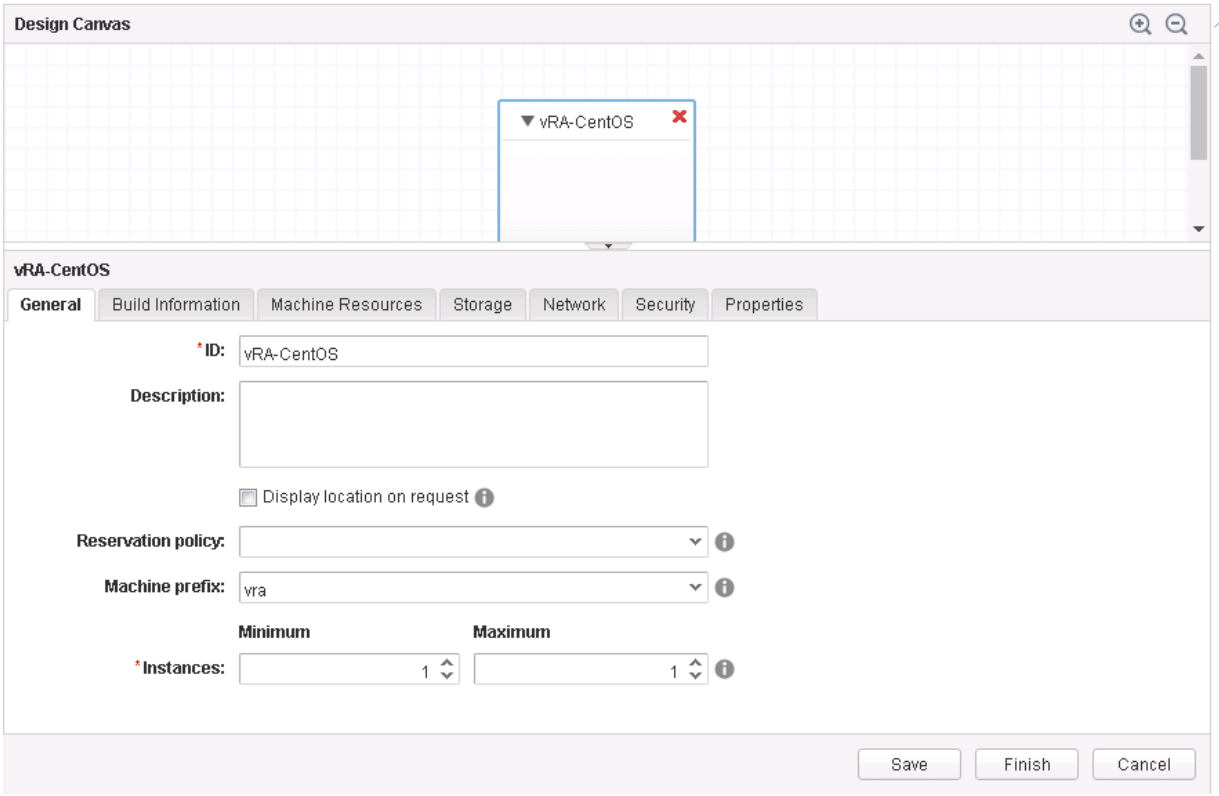
Now we've given our blueprint some basic characteristics. The next step is to put all of our "stuff" into the blueprint. For our very basic example, we are going to drag the "vSphere Machine" object onto our design canvas. This adds a vCenter template into our blueprint.



Once we've added our components into the blueprint, we need to give each of them some characteristics. To start, we're going to give the component an ID and description.



On the Build Information tab, we are going to make sure the blueprint type is "Server" and we are going to change the Action to "Clone". Click the ellipsis and select one of our vSphere templates. This template is VM with installed CentOS on our VMware environment. This is default install. And lastly on this tab enter a customization spec exactly how it is named in vSphere, including case sensitivity.



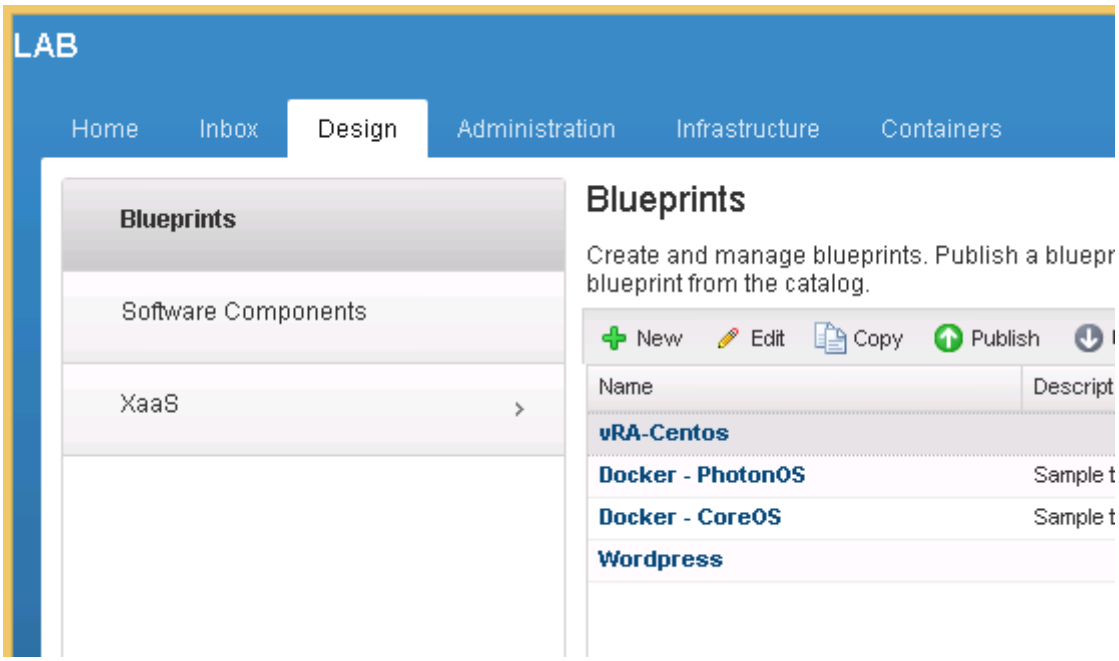
The next tab is the “Machine Resources” tab. Leave default values.

The storage tab will let us customize the sizes of our disks. We have left our disk sizes the same as vSphere template

The network tab, left blank

The security tab is to be used specifically with NSX. So leave it blank for now.

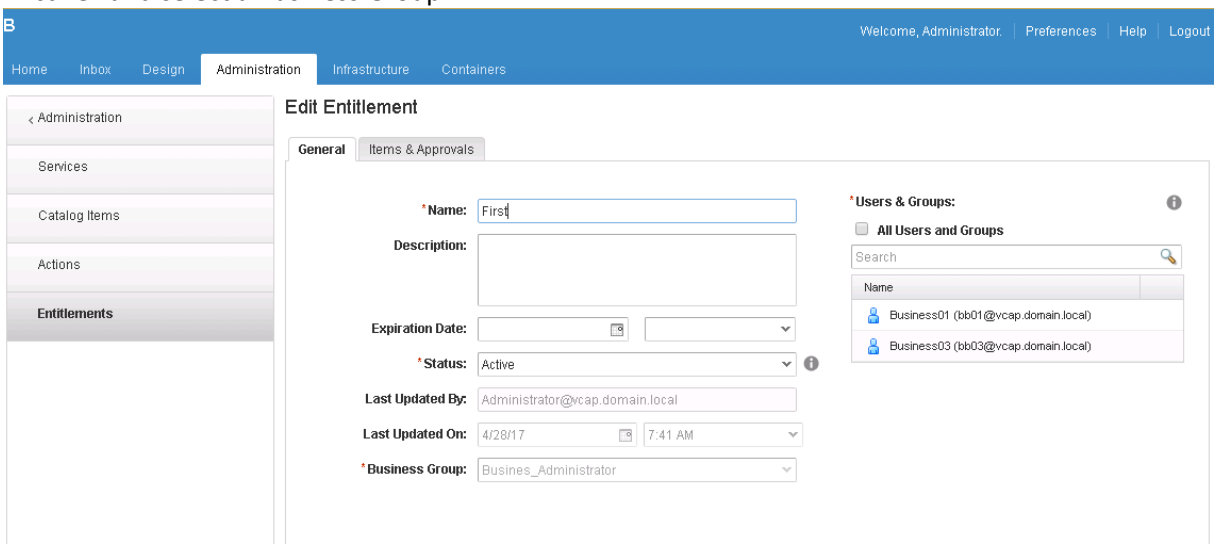
Click “Finish”. When we’re done, we must publish this blueprint to be accessible by groups Click the blueprint in the grid and then select the “Publish” button.



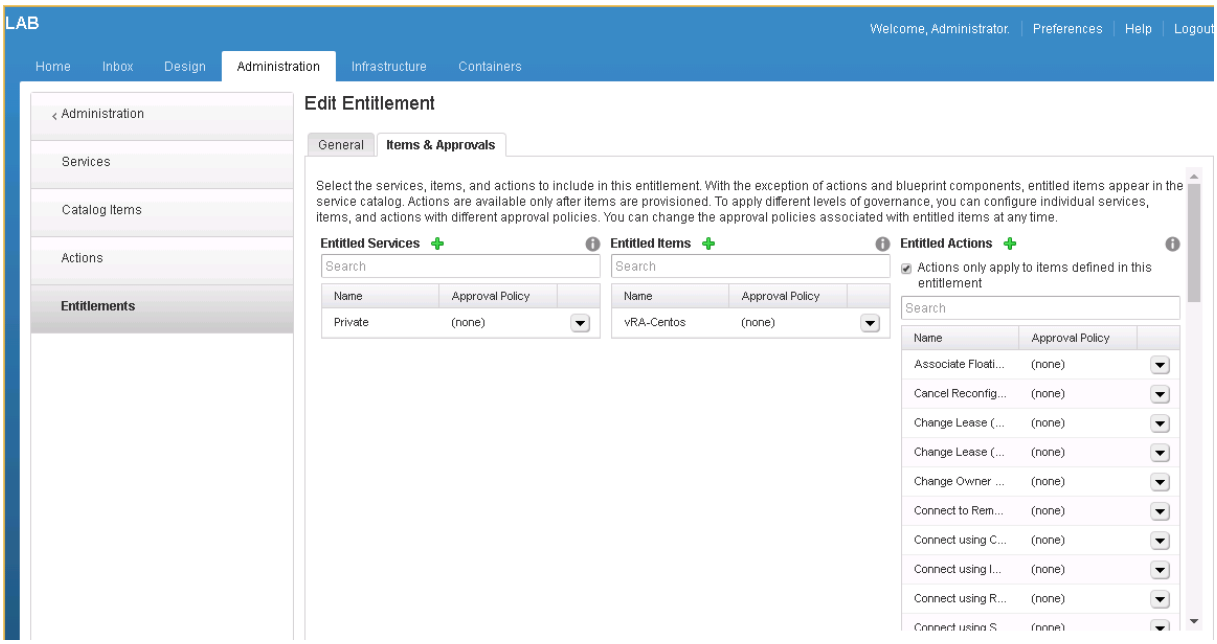
Entitlements

To create a new entitlement go to Administration tab –> Catalog Management –> Entitlements. Click the “New” button to add a new entitlement.

Under the General tab, enter a name for the entitlement and a description. Change the status to “Active” and select a Business Group.



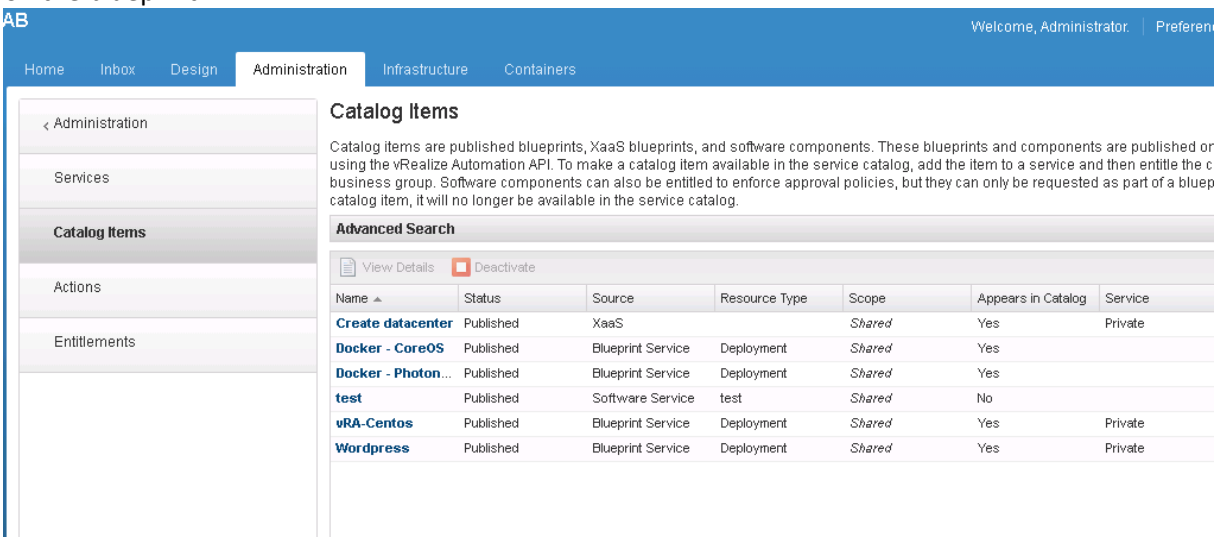
Next, under the “Items & Approvals” tab, we get to pick which things this user(s) will have access to. We do not need to fill out all of these types, but we can if we choose to do so.



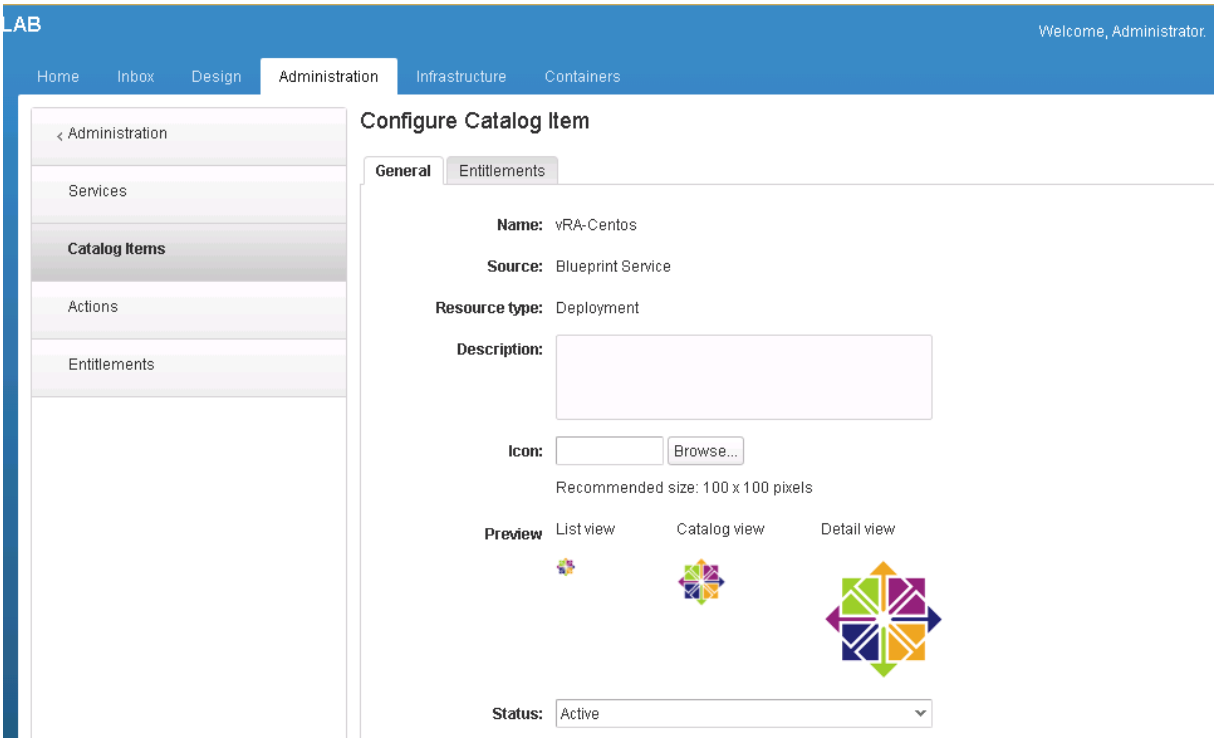
Catalog Item

Log in as a tenant administrator and go to the Administration Tab –> Catalog Management –> Catalog Items. From here, we’ll need to look for the blueprint that we’ve previously published. Click

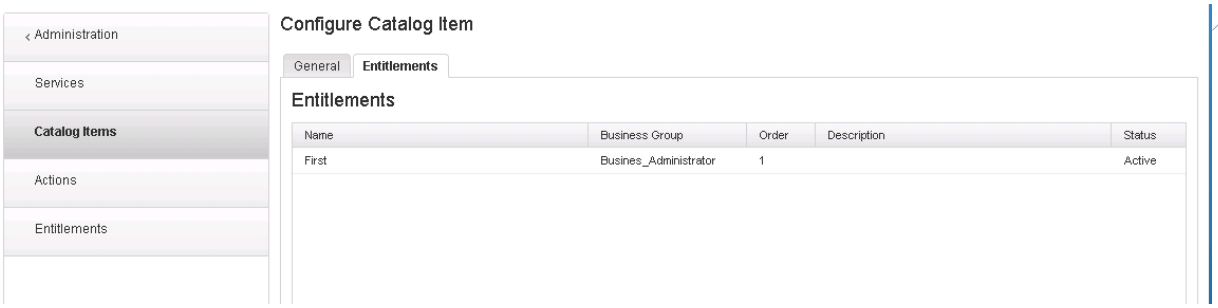
on the blueprint.



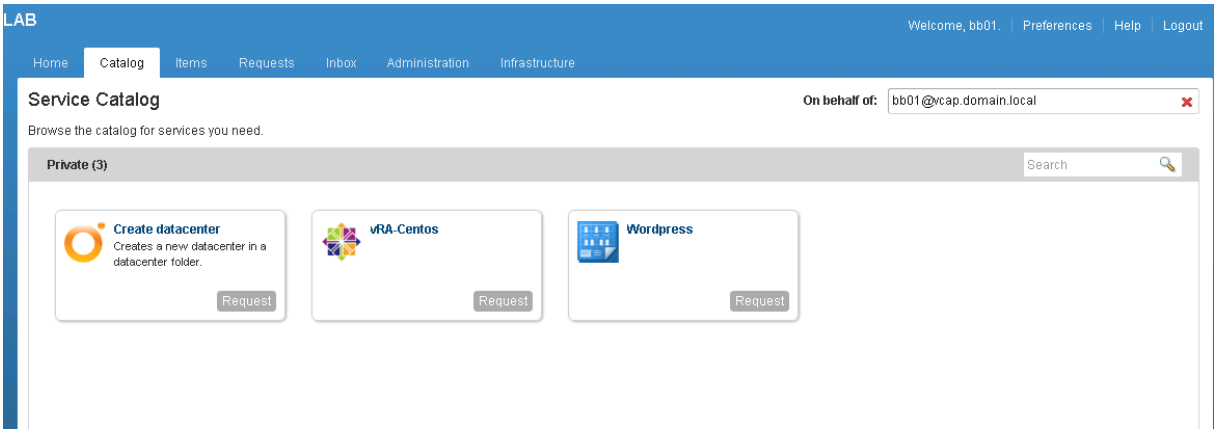
The configure catalog item screen will appear. Here, we can assign this catalog item an icon. Next, change the status to Active so that it will show up in the catalog, and lastly, select which service this catalog item should be listed under



If we click the entitlements tab, we'll see who has been entitled to the item. Click Finish.



When we go to the service catalog, we should see some nicely laid out items, with icons and logged in has the correct entitlements.



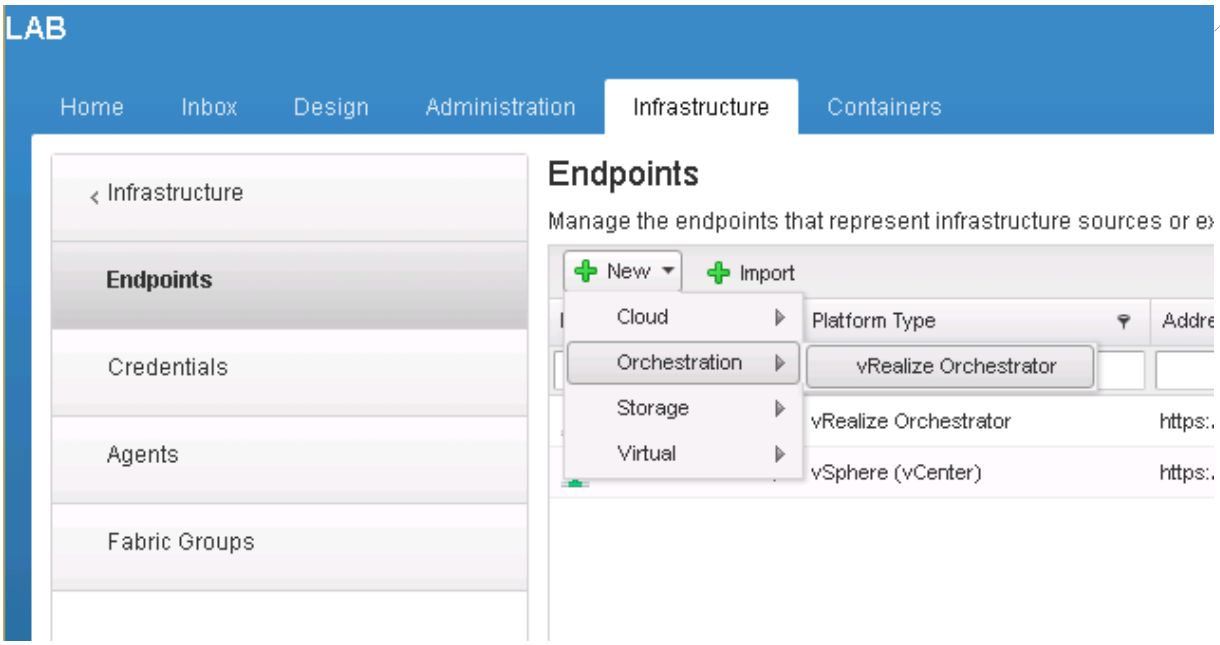
XaaS

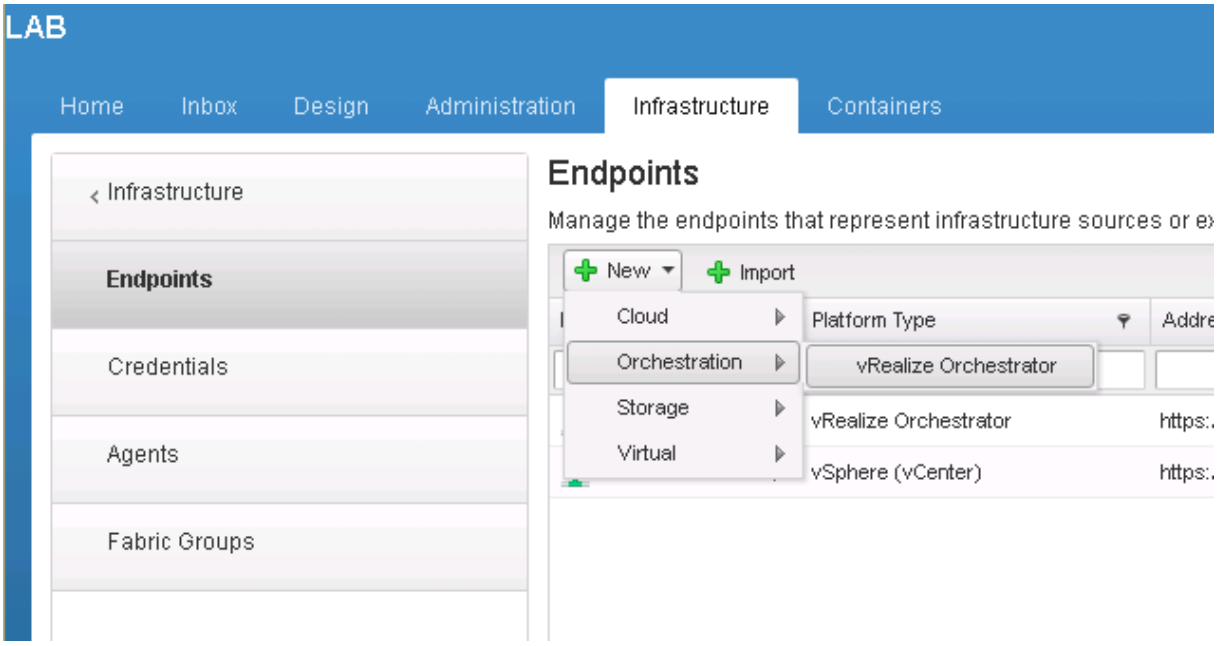
XaaS Blueprint

Before you begin, make sure that the user who will be adding these new service blueprints is an XaaS Architect.

Also before creating this we need to create orchestrator endpoint

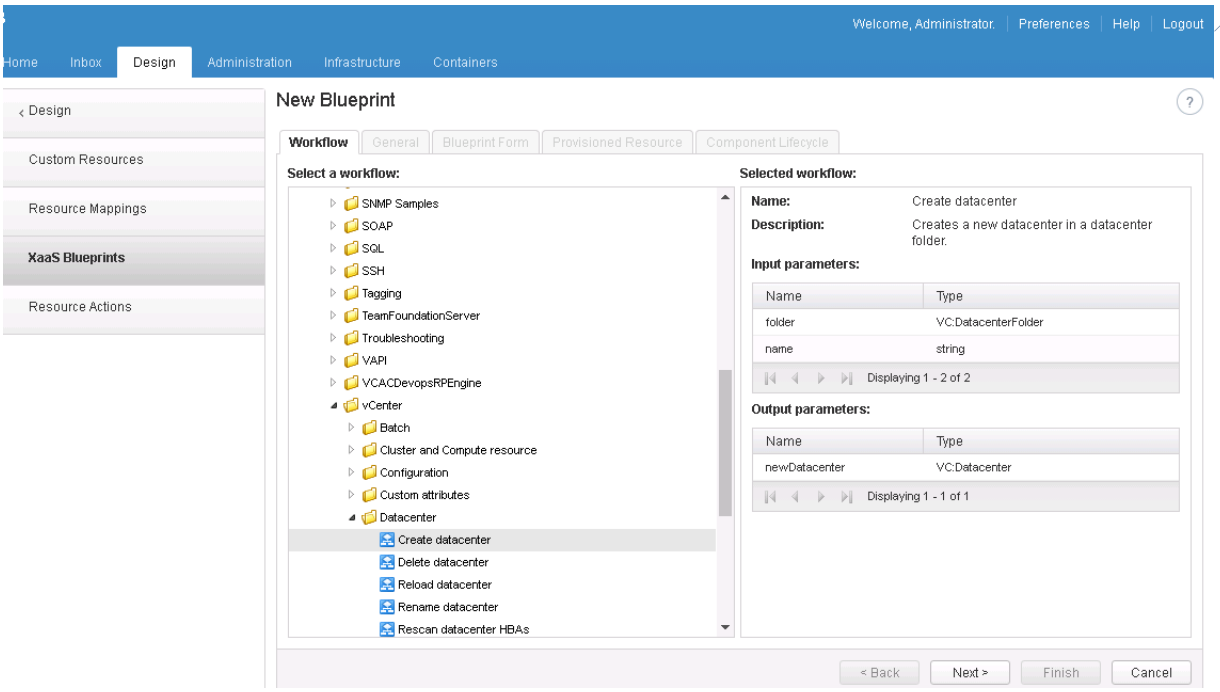
Go to Endpoints and Create new Orchestration -> vrealize Orchestrator Endpoint



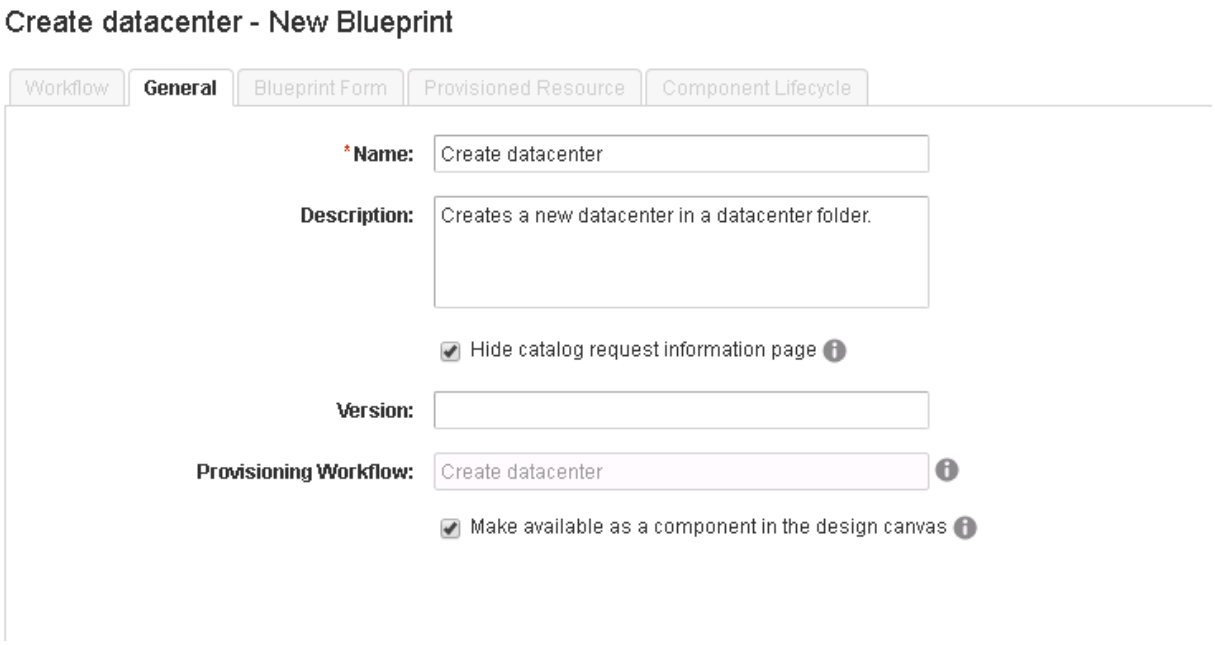


To create an XaaS Blueprint, go to the Design Tab –> XaaS –> XaaS Blueprints. Click the “New” button to add a new blueprint.

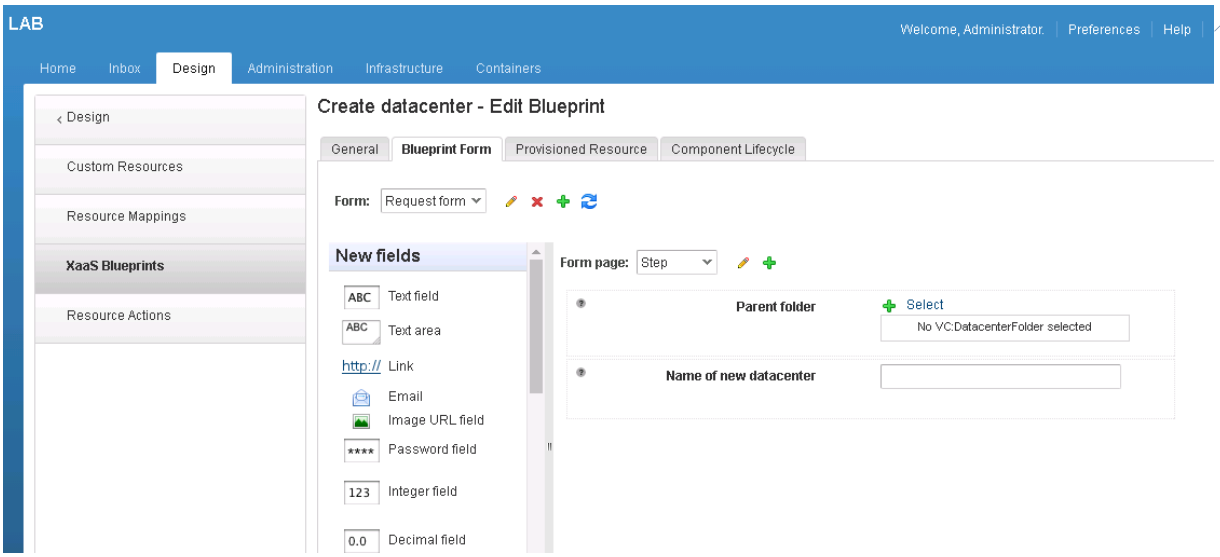
Select the vRO blueprint that should be added to the service catalog.



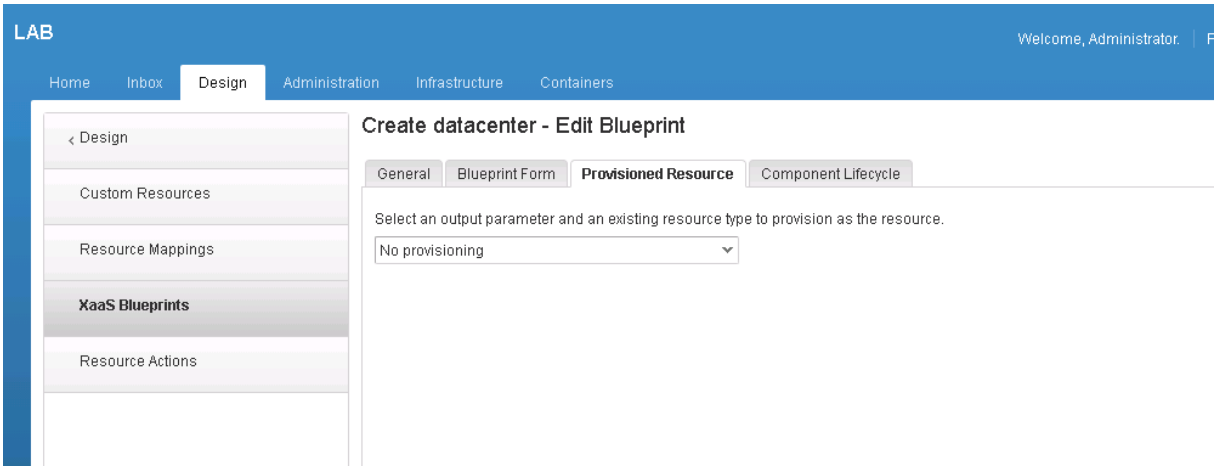
Give the blueprint a name and description. Click Next.



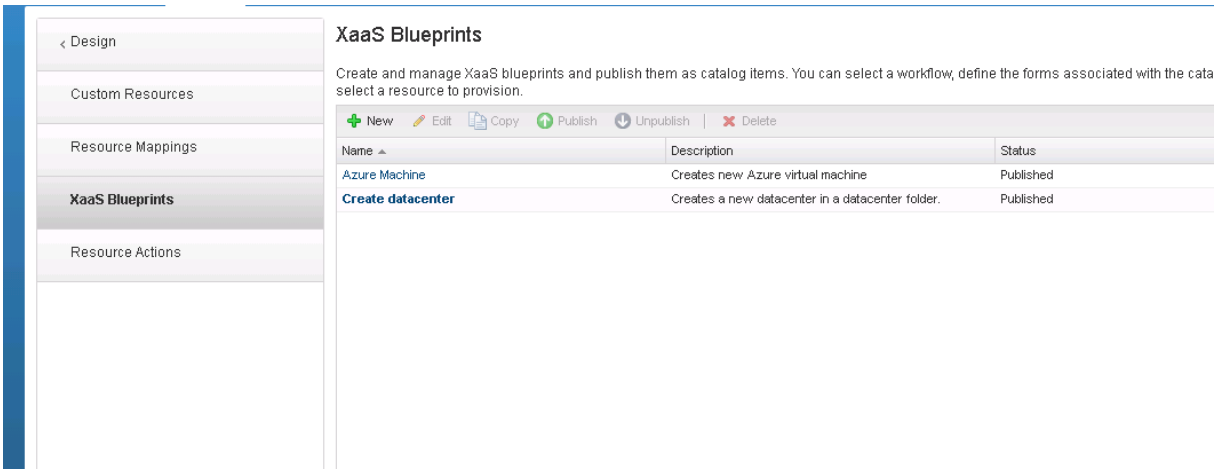
The inputs from the vRO blueprint should be added to the main form. It is possible to customize how the form will look when published to end users.

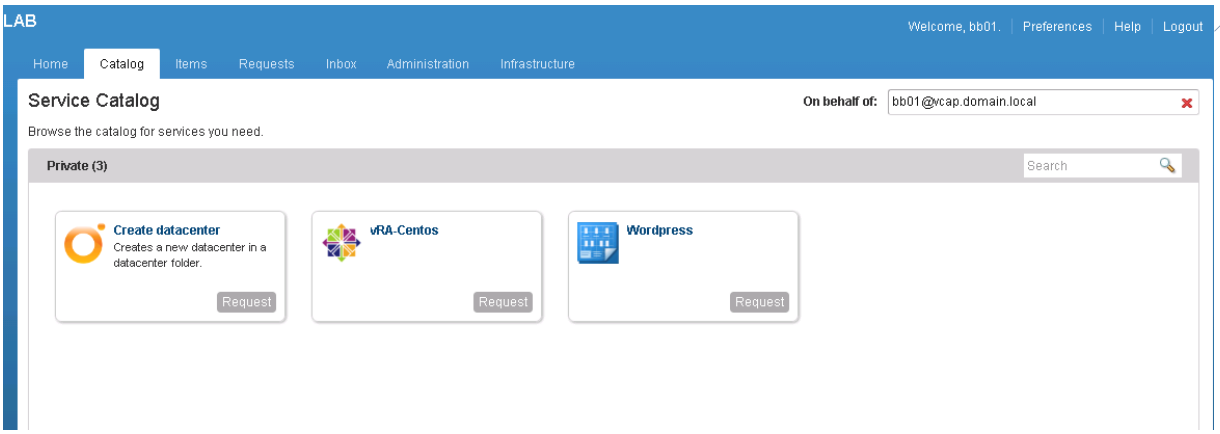


On the provisioned resource tab, leave the field at “No provisioning”.



When we’re done, we will see our XaaS blueprint in the list. Now we only need to publish it and add to catalog like previously




LAB
Welcome, bb01.
Preferences
Help
Logout
Home
Catalog
Items
Requests
Inbox
Administration
Infrastructure
Service Catalog
On behalf of:
bb01@vcap.domain.local
Browse the catalog for services you need.
Private (3)
Search
Create datacenter
Creates a new datacenter in a datacenter folder.
Request
vRA-Centos
Request
Wordpress
Request

Containers

Before we can start with container we need to prepare our container host. For this solution we will use specially prepare OS from VMware called PhotonOS.

PhotonOS

Photon OS™ is a minimal Linux container host, optimized to run on VMware platforms. With the 1.0 release, we have greatly expanded the library of packages that are in our repository, making Photon OS™ more broadly applicable to a range of use-cases. We invite partners, customers and interested community members to collaborate on both running containerized applications in a virtualized environment and the potential of an operating system tightly coupled to underlying virtual infrastructure.

Optimized for vSphere - Leveraging more than a decade of experience validating guest operating systems, Photon OS is thoroughly validated on vSphere; and, because VMware is focused on the vSphere platform, we're able to highly tune the Photon OS kernel for VMware product and provider platforms.

Container support - Compatible with container runtimes, like Docker, and container scheduling frameworks, like Kubernetes.

Efficient lifecycle management - Contains a new, open-source, yum-compatible package manager - tdnf - that makes the system as small as possible, but preserves robust yum package management capabilities. (vmware)

Prerequisites

Username: root
Password: KHykh30Fr

Build

Our VM has

OS	PhotonOS	
RAM	2GB	
CPU	1vCPU	
HDD	16GB thin	
Network	1 NIC	10.10.10.164

After PhotoOS is installed we only need to do some few steps to prepare this for container.

Login to PhotonOS and stop docker

systemctl stop docker

edit default docker configuration

vi /etc/default/docker

add this line

DOCKER_OPTS="-H tcp://0.0.0.0:2375 -H unix:///var/run/docker.sock"

Add firewall rules to accept docker connection

iptables -A INPUT -p tcp --dport 2375 -j ACCEPT

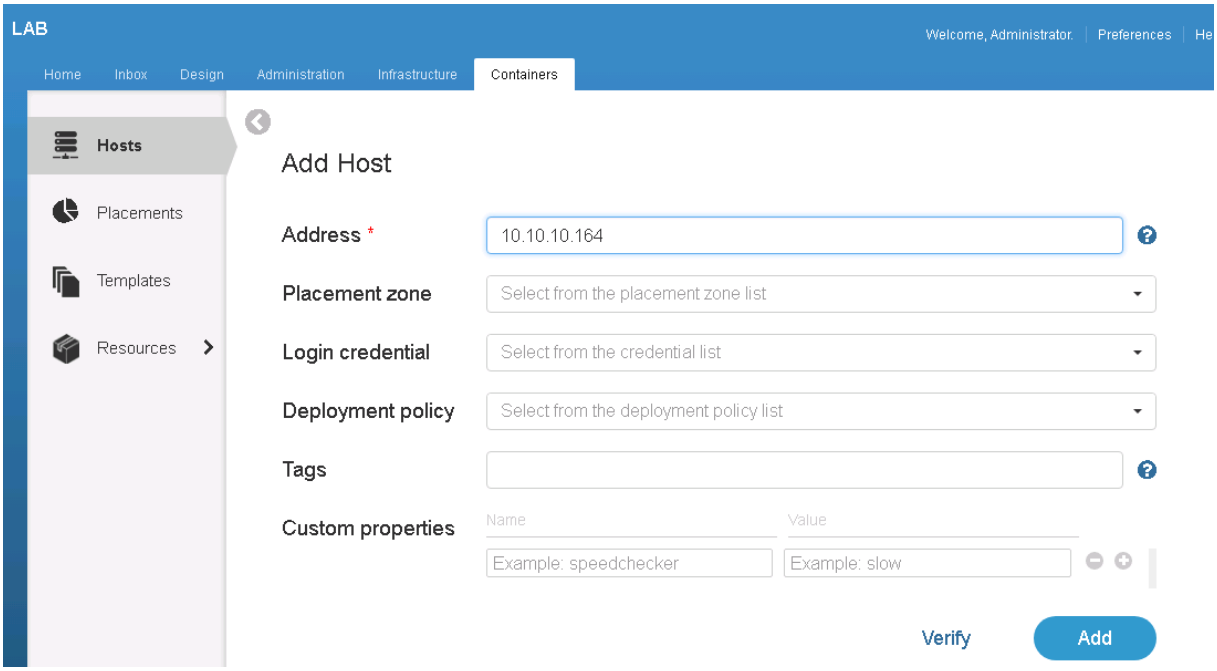
and start back docker

systemctl start docker

After those few steps we have our host for docker prepared and we can add this container on our vRA.

Container in vRA

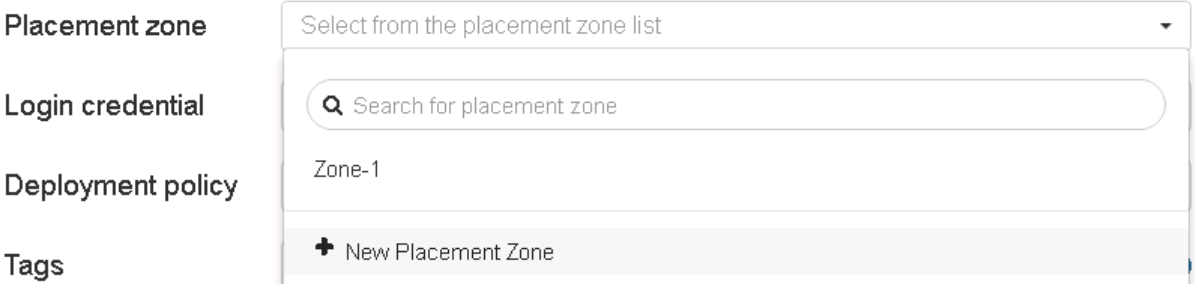
Go to "Containers" tab and add new host



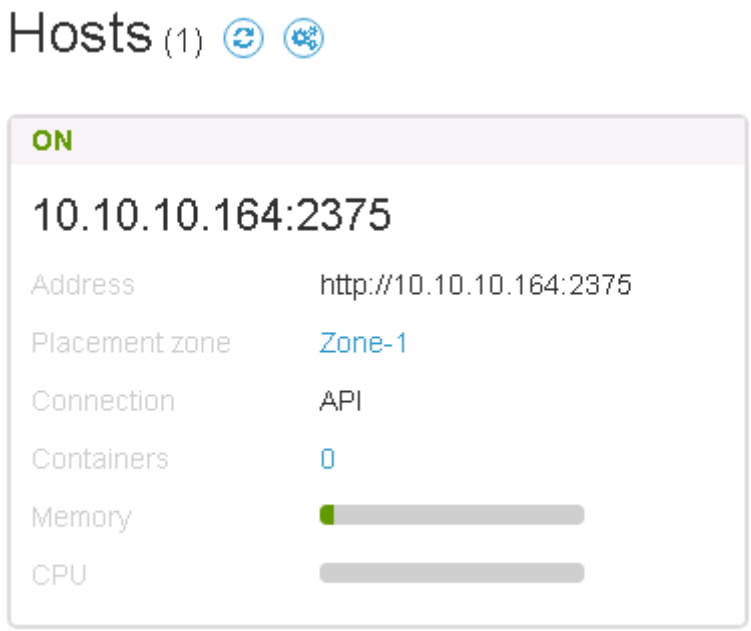
Placements

Placements are used in much the same way a reservation is used with deploying virtual machines through vRA.

On Placement menu click new zone Give it a name, and either select the default placement zone or create your own.

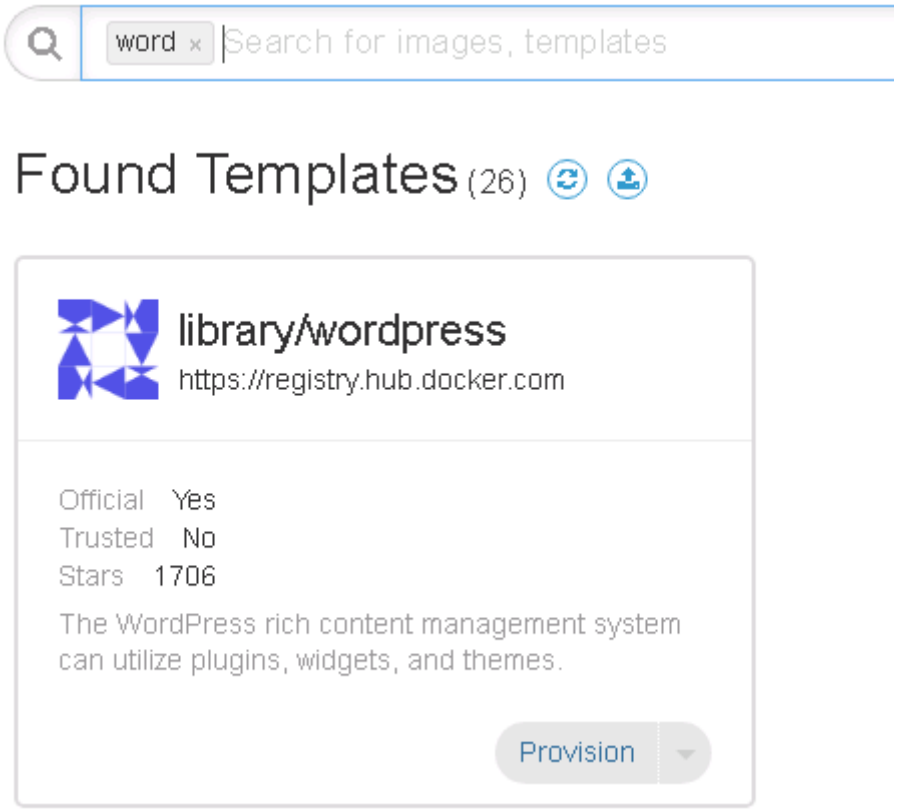


After success verification we will have host in our hosts list

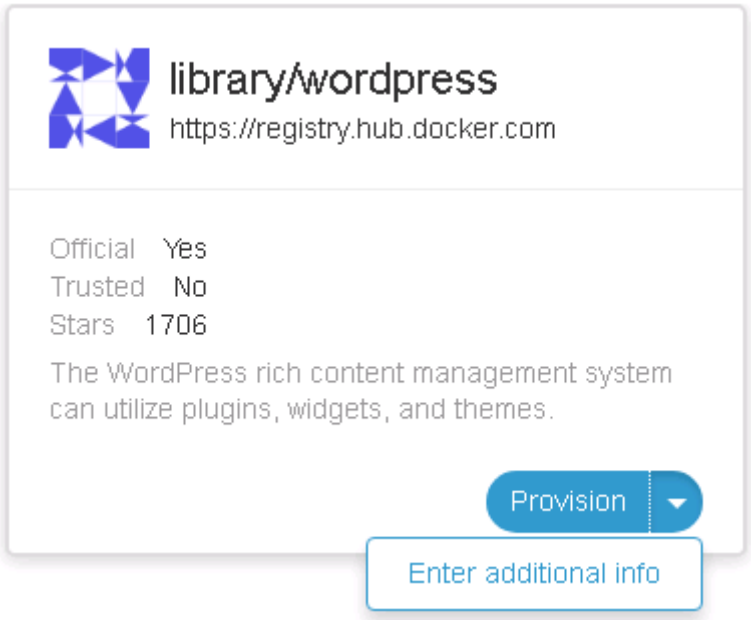


Templates

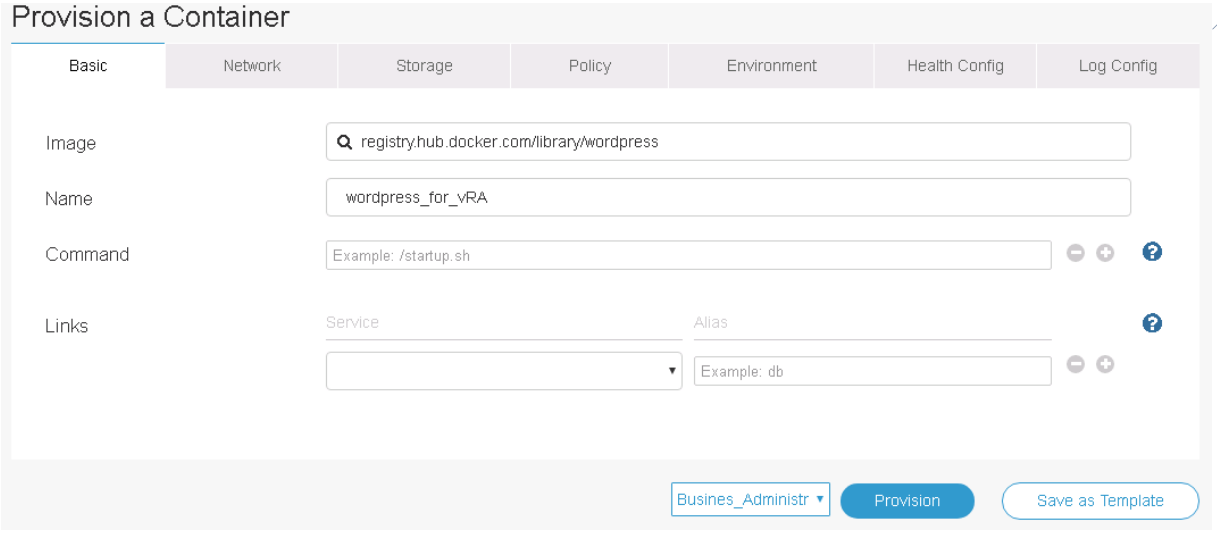
Now that you've got the container hosts and placement zones all figured out we can use one of the default templates to deploy as a test. I will create worpress instance



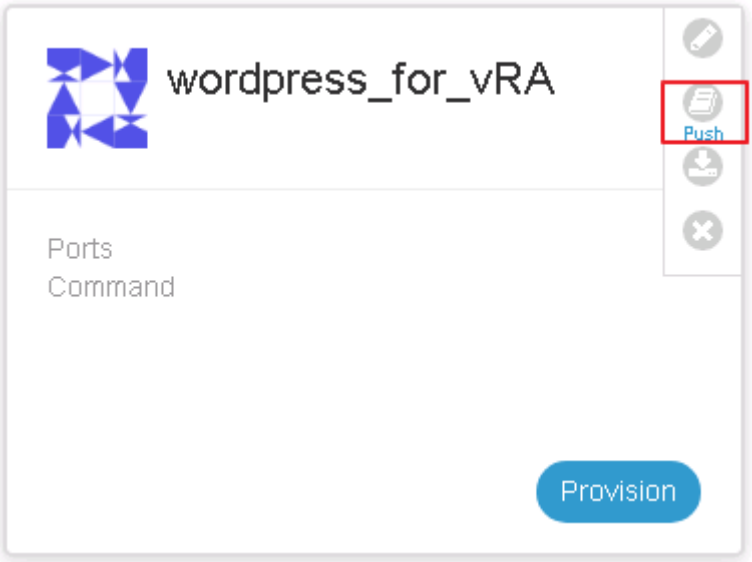
After you click the “Provision” button on the template you want to deploy, a new box will appear for you to select the business group that’s requesting it. In my case I only belong to a single business group so I’ve got one option. Click the “Provision” button again to start the process.



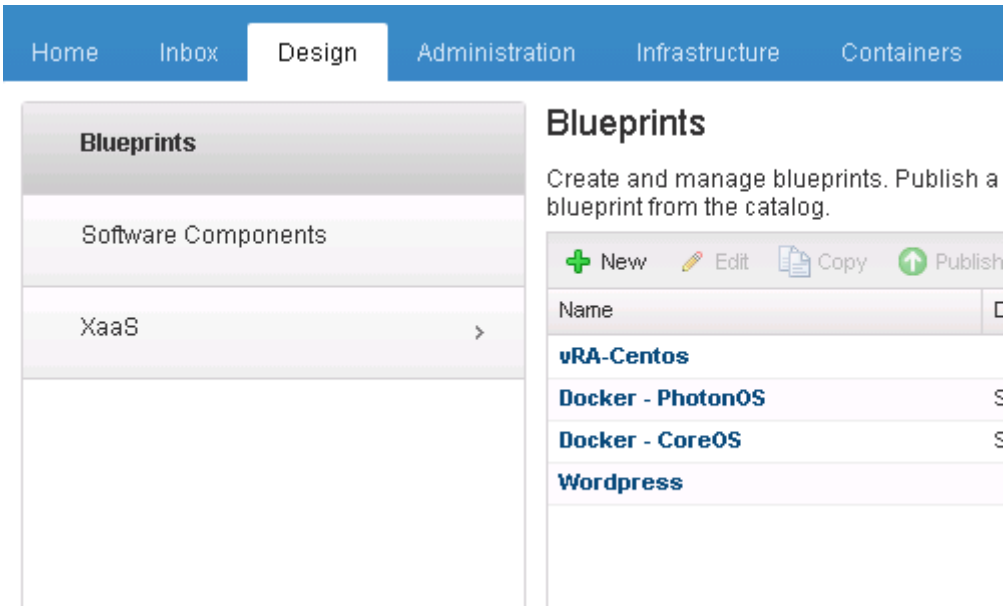
Go to additional info and save this as template



When you save this as template you can find this again and push this to your blueprints

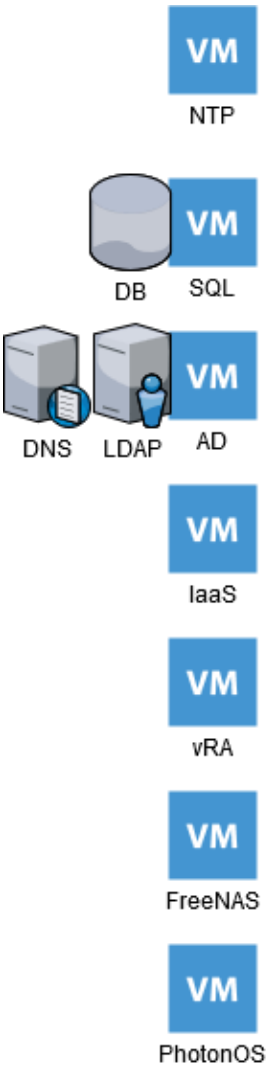


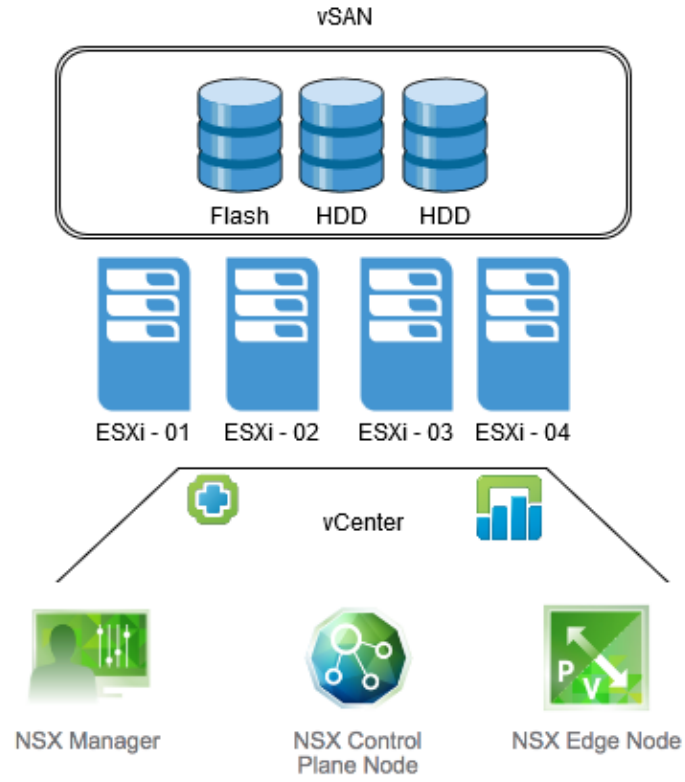
And on your blueprint you can find your wordpress instance which can be added to catalog


Home
Inbox
Design
Administration
Infrastructure
Containers
Blueprints
Software Components
XaaS
Blueprints
Create and manage blueprints. Publish a blueprint from the catalog.
New
Edit
Copy
Publish
Name
vRA-Centos
Docker - PhotonOS
Docker - CoreOS
Wordpress

DESIGN

NTP	10.10.10.140
AD	10.10.10.141
vCenter	10.10.10.142
ESXi-01	10.10.10.144
ESXi-02	10.10.10.145
ESXi-03	10.10.10.146
ESXi-04	10.10.10.147
NSX-Manager	10.10.10.150
SQL	10.10.10.151
Operation Manager	10.10.10.152
IaaS	10.10.10.153
vRA	10.10.10.154
FreeNAS	10.10.10.155
NSX-Controllers	10.10.10.137-10.10.10.139
VXLAN-Pool	10.10.10.156-10.10.10.160
EDGE	10.10.10.161 (10.10.20.1)
vRealize Log Insight	10.10.10.165
Photon for Docker	10.10.10.164


VM
NTP
VM
DB
SQL
VM
DNS
LDAP
AD
VM
IaaS
VM
vRA
VM
FreeNAS
VM
PhotonOS


vSAN
Flash
HDD
HDD
ESXi - 01
ESXi - 02
ESXi - 03
ESXi - 04
vCenter
NSX Manager
NSX Control Plane Node
NSX Edge Node

SUMMARY

We have created a complete vRealize Suite environment that can be used for learning, to presenting client technology, or deepening knowledge with VMware Cloud. Anyone who wants to create their own environment can base on the above instructions, or use only parts of it to configure individual elements to get to know only some technologies like NSX, vRealize Operation Manager or vRalize Log Insight.