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Milestone 3 Nested Virtualization and Templates

💡This we will be workinging with virtual templates in the form of an OVA file that we imports as well as templates the we create ourselves. A Template is a FULL copy of a virtual machine that can stand alone. It can be customized to receive pre configured parameters

This is a 2 Part Lab:

- **Part 1 is nesting ESXi Hosts as VMs on our existing ESXi physical host (superX)**
- **Part 2 is creating and using Templates for Ubuntu 22.04 and Rocky 8**
- **The 2 Parts are not really related!**

Part 1: Nested Virtualization

Step 1: DNS Entries on **ad350**

Create DNS and PTR records for the following systems

- nested1 :10.0.17.20
- nested2 :10.0.17.30
- nested3:10.0.17.40

`Deliverable 1. Provide a screenshot showing the A records for nested 1-3 similar to the one below.`

```
PS C:\Users\hermione-adm> Get-DnsServerResourceRecord -ZoneName hermione.local -RRType A

HostName                  RecordType Type       Timestamp            TimeToLive      RecordData
--------                  ---------- ----       ---------            ----------      ----------
@                         A          1          1/23/2022 1:00:00 PM 00:10:00        10.0.17.4
ad350-hermione            A          1          0                    01:00:00        10.0.17.4
DomainDnsZones            A          1          1/23/2022 1:00:00 PM 00:10:00        10.0.17.4
ForestDnsZones            A          1          1/23/2022 1:00:00 PM 00:10:00        10.0.17.4
mgmt1                     A          1          0                    01:00:00        10.0.17.100
nested1                   A          1          0                    01:00:00        10.0.17.20
nested2                   A          1          0                    01:00:00        10.0.17.30
nested3                   A          1          0                    01:00:00        10.0.17.40
pf                        A          1          0                    01:00:00        10.0.17.2
super1                    A          1          0                    01:00:00        192.168.3.11
vcenter                   A          1          0                    01:00:00        10.0.17.3
```

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Step 2: ESXi Auto-Start

Using the ESXi console (not vcenter), make sure that pf, mgmt1, ad and vcenter autostart in that order.

- Under “actions” for the VMs - Enable Autostart in the order listed
- Then, go to Host-Manage-System-Autostart
    - Edit Settings - Enable Autostart on Host
    - Verify order is correct

Note: one would presume you could do this in vcenter, however the current version would not support it when tested, you may have better luck.

Step 3: 3 ESXi Virtual Appliances

> 💡ESXi can be installed as a Virtual Machine, this non-intuitive method is called Nested Virtualization. We are doing this only to demonstrate what managing multiple hypervisors would look like. In production, please use real hardware.

You can install the ESXi appliance using a OVA template file.

In vcenter, this can be done by pointing to an OVA file via URL

You can choose the VMWare url from here (this will take a very long time).
(NOTE: Newer OVA’s at:
https://williamlam.com/nested-virtualization/nested-esxi-virtual-appliance)

Or you can use a URL to the class web servers:

- Odd # supers use: http://192.168.7.241/ovas/Nested_ESXi7_Template.ova
- Even # supers use: http://192.168.7.240/ovas/Nested_ESXi7_Template.ova
- **Note**: you can import an Open Virtual Appliance (ova) file from a url in vcenter which is an improvement over esxi.

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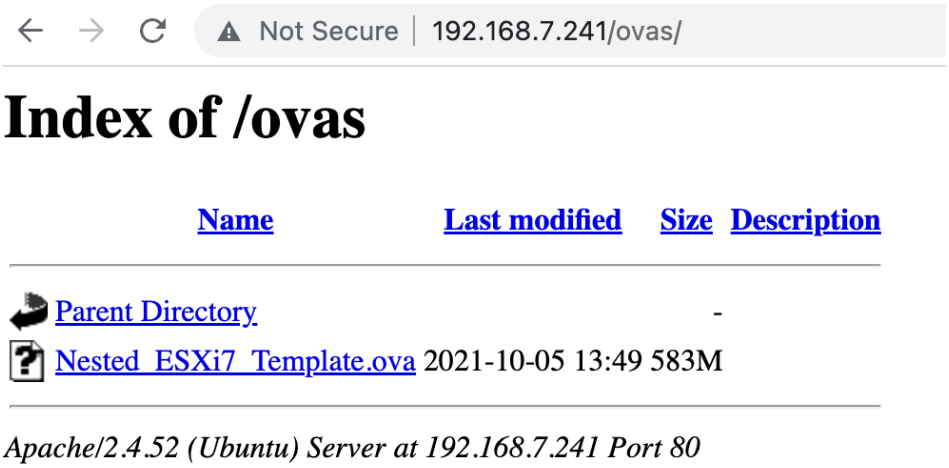
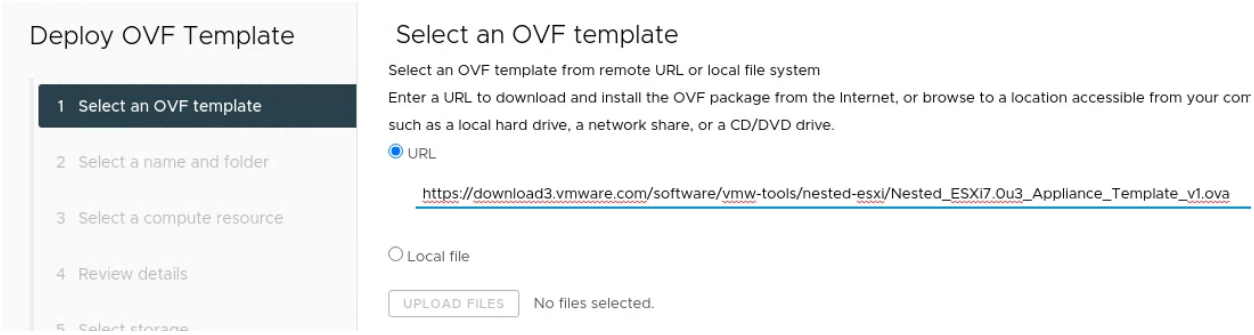


From vcenter - Deploy OVF Template (This will create a new VM from the Template)

- **Use URL from above**
- **Make sure to change the Virtual Machine Name to nested1**



When selecting Storage -Make sure the esxi VM is **thinly provisioned** and is tied to your 350-Internal Network. (**Need to change from defaults)**

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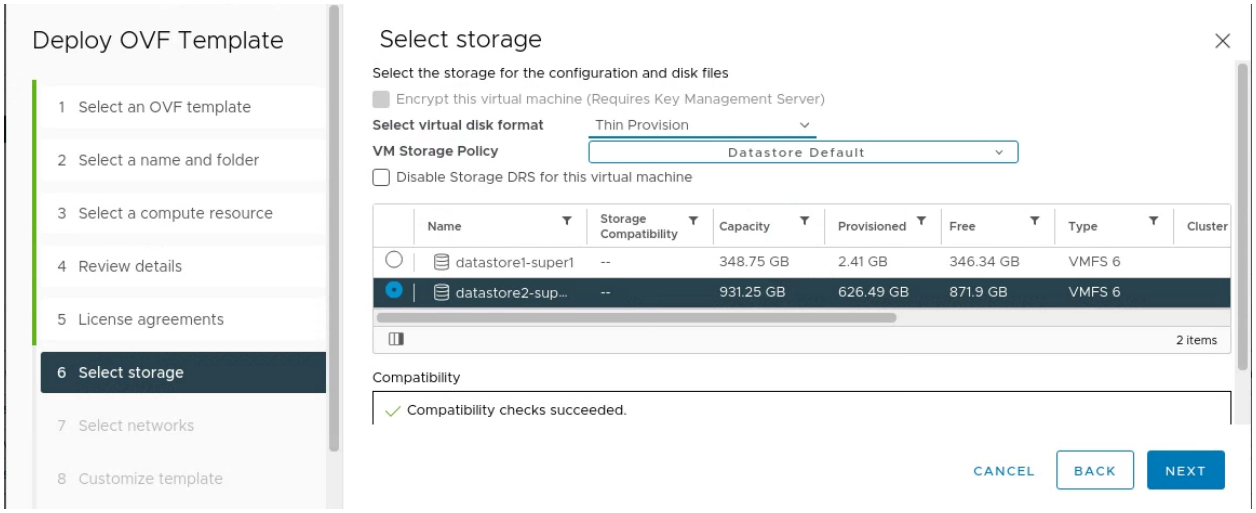

Configure Network Settings - NOTE: Set esxi Root password for nested1 - or you can use SSH keys if you have that set up

💡Note, this errored out the first time attempted, sometimes these errors are due to web certs, open esxi on superX and bypass any web cert complaints.

Do this 2 more times, replacing ip's to match nested2 and 3.

In order to make nested virtual networking work, you will need to hunt down and tweak the vSwitch settings for 350-Internal as shown below. (**From ESXi Host Site - Networking-350-Internal- Edit Settings- Security**

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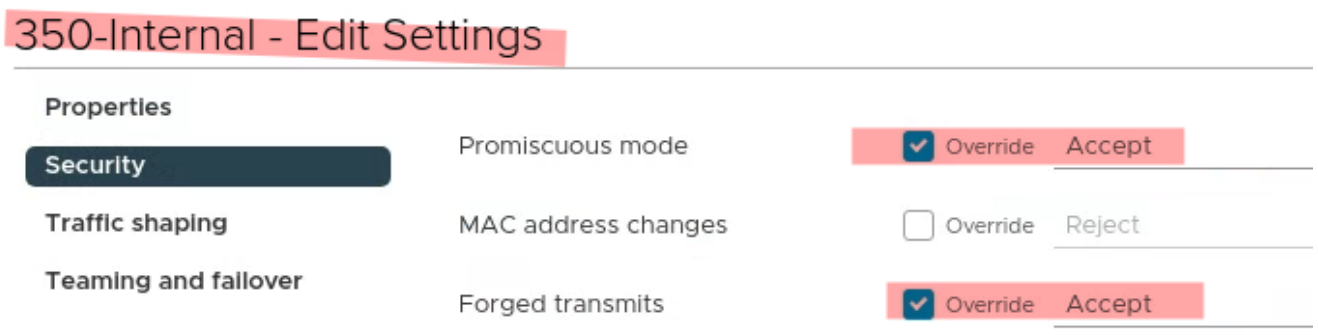
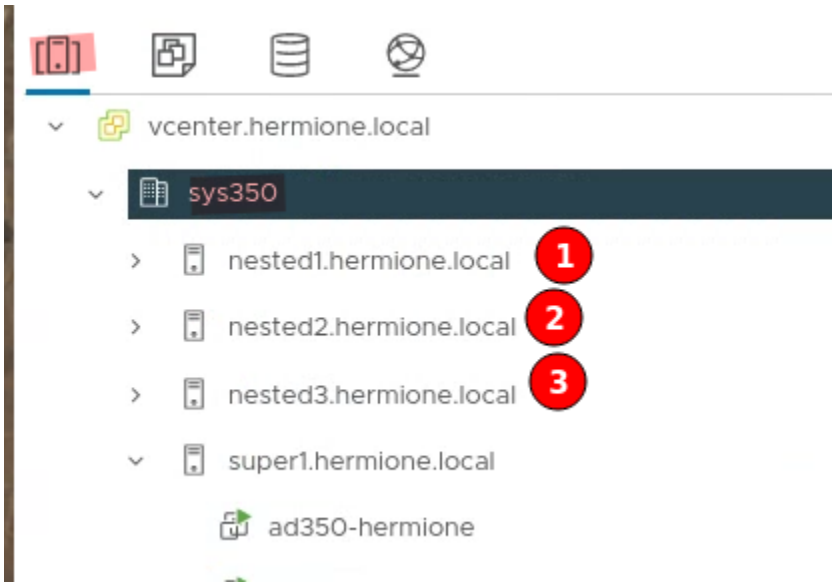


Adding nested1,2,3 to your sys350 datacenter

Add and license these three nested hypervisors. Your current license should cover all of them
`Deliverable 2.  Provide a screenshot that shows your 4 hypervisors (the nested ones are virtual)`



Part 2: Templates (convert VM to Template- then Clone)

Step 1: Configure DHCP on your 350-Internal Network

- Configure DHCP in AD

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- **OR**
- Configure DHCP in pfSense

Step 2: Create an Ubuntu VM

Create an ubuntu 22.04 VM in **vcenter** (**not** using the nested esxi VMs for this)

Isos at:

- Odd supers: 192.168.7.241/isos
- Even super: 192.168.7.240/isos

Index of /isos

Name	Last modified	Size	Description
Parent Directory		-	
Rocky-8.6-x86_64-minimal.iso	2023-09-14 12:38	2.1G	
SERVER_19_x64_FA23.iso	2023-09-07 12:24	5.3G	
VMware-VCSA-all-8.0.0-20519528.iso	2023-09-07 12:27	7.9G	
ubuntu-22.04-live-server-amd64.iso	2023-09-14 12:31	1.4G	

Apache/2.4.52 (Ubuntu) Server at 192.168.7.241 Port 80

- Remember: can wget isos directly into datastore by SSH'ing to your esxi host
- 350-Internal
- Stick with defaults - except:
    - Customize Hardware
        - Expand Hard Disk and select - Thin Provision
        - CD- point to ubuntu iso on Datastore
- VM Should get a DHCP IP Address
- Add a deployer user and password
- (Install can take awhile)
- install open-vm-tools
- install perl if it's not already installed
- Powerdown
- Remove the CD, point it to client device
- Take a snapshot called Base

Step 3: Conversion of VM to a template

Figure out how to convert your new powered off VM into a template (fairly intuitive in vcenter).

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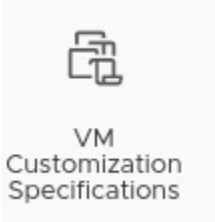
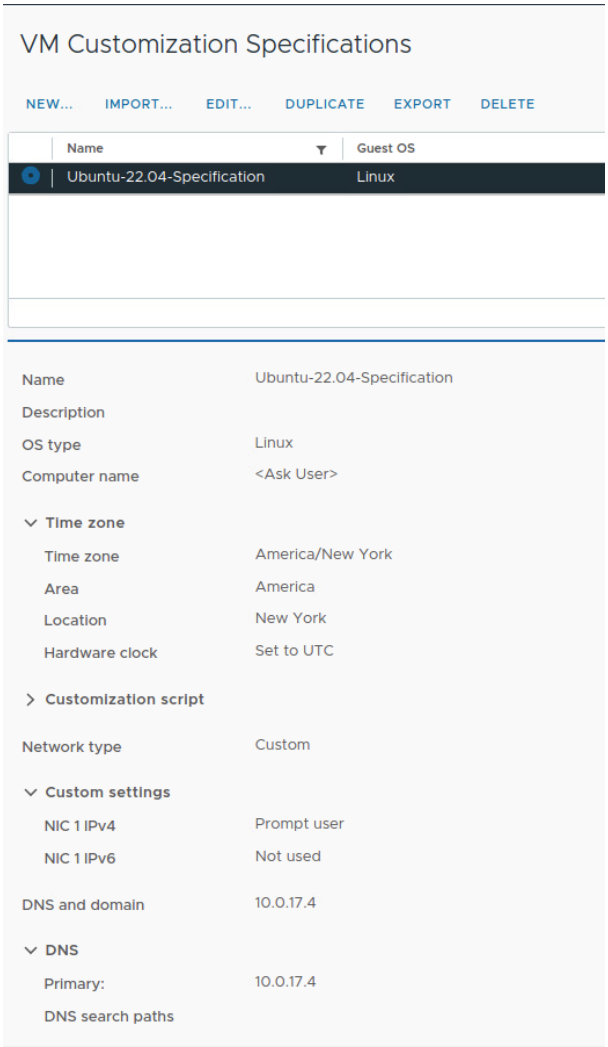
You should notice that a new file .vmtx has been added to the datastore and that you can no longer power the VM on - nor manage its associated snapshots.

Hunt down the VM Customization Specifications Shortcut in vcenter- and create an ubuntu specification - called Ubuntu-22.04 Specification





Step 4: Create New VM from Template:

Create a VM called Ubuntu-01-*name* using your Ubuntu 22.04 template

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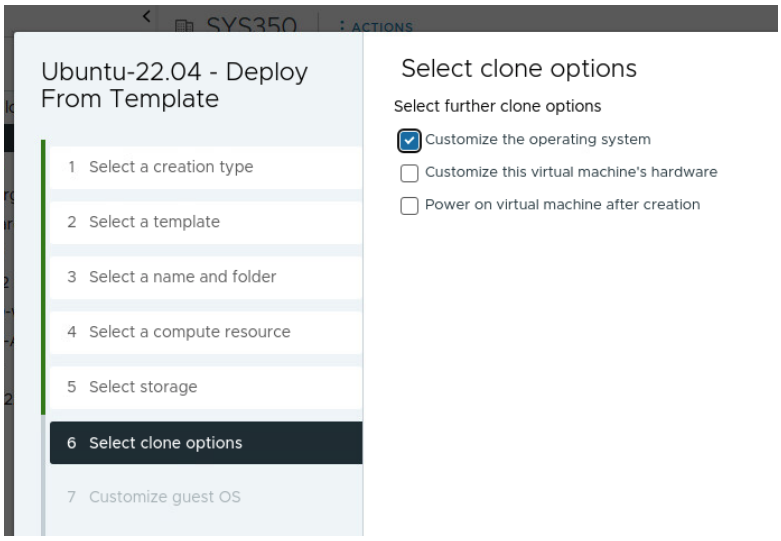
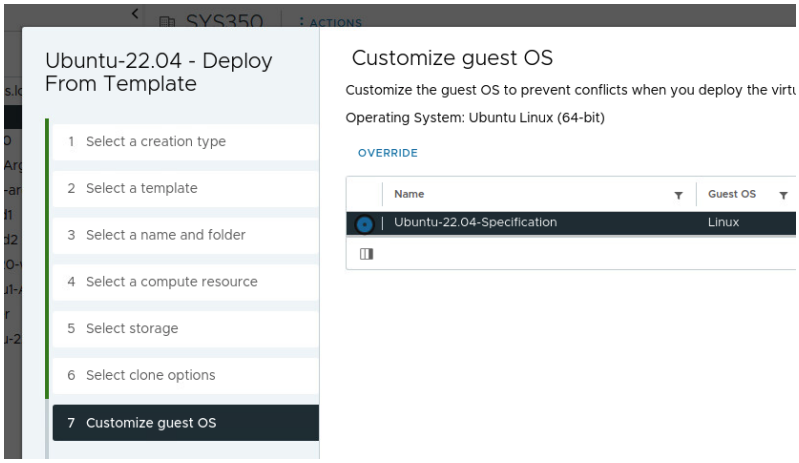
When deploying, select “Customize the Operating System” and it will allow you to pick your Ubuntu 22.04 Specifications.





Deliverable 3. Find the Cloning Task in the vCenter Task Console and provide a screenshot of the successful deployment similar to the one below.

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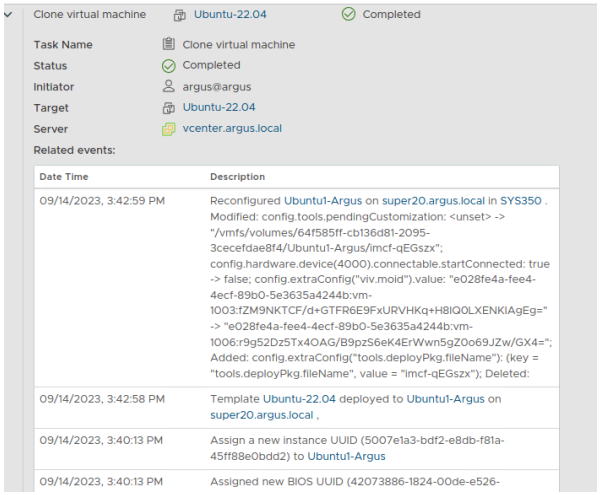

Step 5: Create a Rocky VM -> Template -> Cloned VM

- Create a Rocky8 VM from ISO
- Create user “deployer” during installation (User Settings on Install Summary Screen)
- Install open-vm-tools and perl
- **NOTE: You need to reboot once to ensure that open-vm-tools will start**
- Poweroff, disconnect CD/ISO - and convert to Template
- Create “Rocky8-Specification” in custom specifications that allows user to:
    - Set hostname when cloning
    - Set IP address when cloning
- Deploy a VM called Rock-01-*name* as a Clone of the Rocky 8 Template using the Rock8-Specification

```
Deliverable 4.  Create another VM and Custom specification for Rocky 8.
Deploy the template with a custom IP address.  Provide a screenshot of both the cloning task as seen in Deliverable 3.  As well as a screenshot of the VMs powered on IP address that should match the one entered during New VM Creation.
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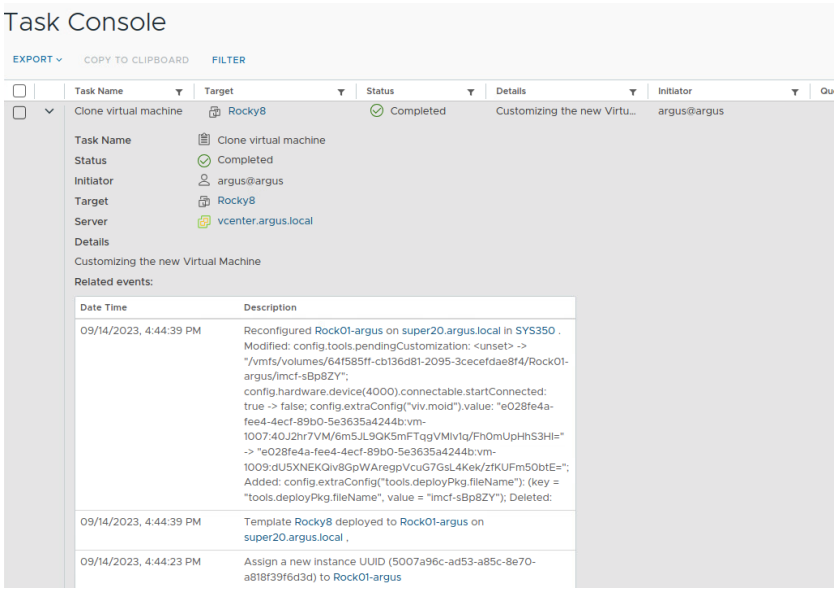

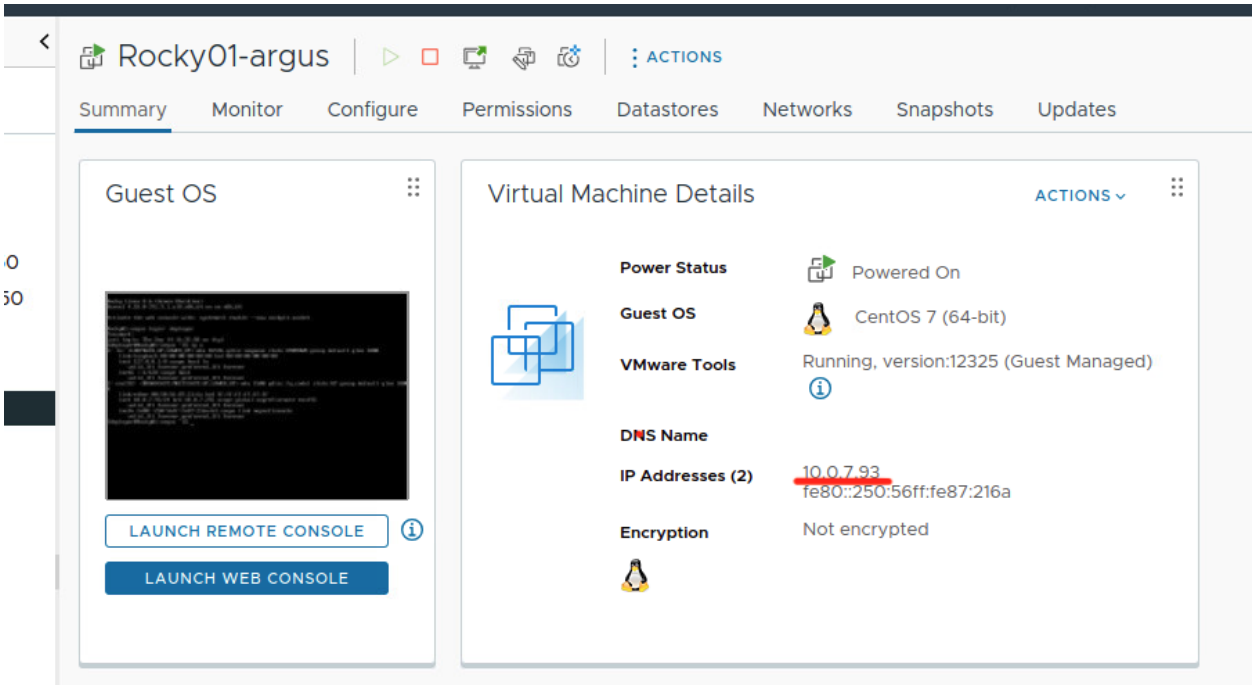

Deliverable 5. Make sure you capture what was done technically to meet the requirements of this milestone. This includes how to make nested versions of ESXi, The requirements for Solid DNS entries and the Technical steps required to create templates and their associated specifications. Make sure to capture and comment on the areas that gave you trouble. Provide links to the documentation you created in the course of this milestone.

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Resources

- Milestone 3 - Overview Video