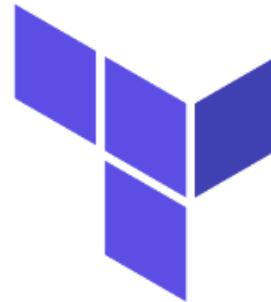


Create a CentOS 7 Terraform template for VMware vSphere

13 June 2019

[Terraform](#) is an automation tool created by [HashiCorp](#). It focuses on deploying cloud infrastructure in an automatic fashion. It supports a lot of cloud providers like [AWS](#), [DigitalOcean](#), [Google Cloud Platform](#), [OpenStack](#), [VMware vSphere](#), and more. [Terraform](#) is developed in [GoLang](#), which makes the installation really easy to perform, and allows for a lot of operating systems to be supported.



In this lab, we will see how to create a CentOS 7 Terraform template for VMware vSphere.

Creating a VMware vSphere virtual machine

1- Create a new virtual machine.

vSphere - Compute-01 - Summary - Mozilla Firefox

vSphere Client | Menu | Search in all environments | Administrator@VSPHERE.LOCAL | Actions

Compute-01 | ACTIONS

Summary | Monitor | Configure | Permissions | Hosts | VMs | Datastores | Networks | Updates

Total Processors: 8
Total vMotion Migrations: 566

CPU: Free: 27.3 GHz
Used: 696 MHz Capacity: 28 GHz

Memory: Free: 19.58 GB
Used: 4.42 GB Capacity: 24 GB

Storage: Free: 1.44 TB
Used: 573.3 GB Capacity: 2 TB

Actions - Compute-01

- Add Hosts...
- New Virtual Machine...
- New Resource Pool...
- Deploy OVF Template...
- New vApp...

Storage

Host Profiles

Edit Default VM Compatibility...

Assign License...

Settings

Move To...

Rename...

Tags & Custom Attributes

Add Permission...

Alarms

Delete

Update Manager

vSAN

Recent Tasks

New Datastore...
Rescan Storage...

Related Objects

Datacenter inkubate-lab

Cluster Consumers

Custom Attributes

Attribute	Value

vSphere DRS

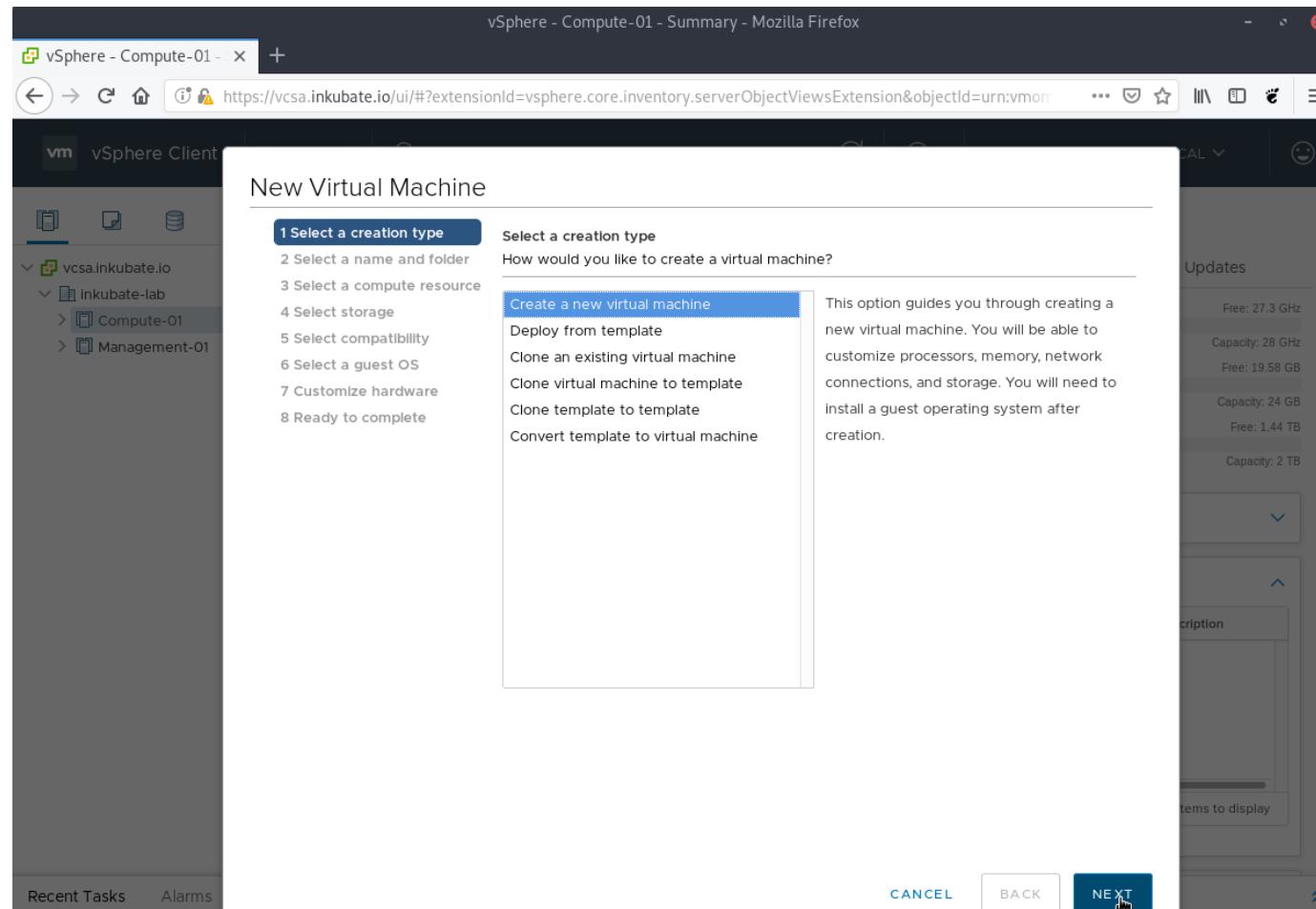
Tags

Assigned Tag	Category	Description

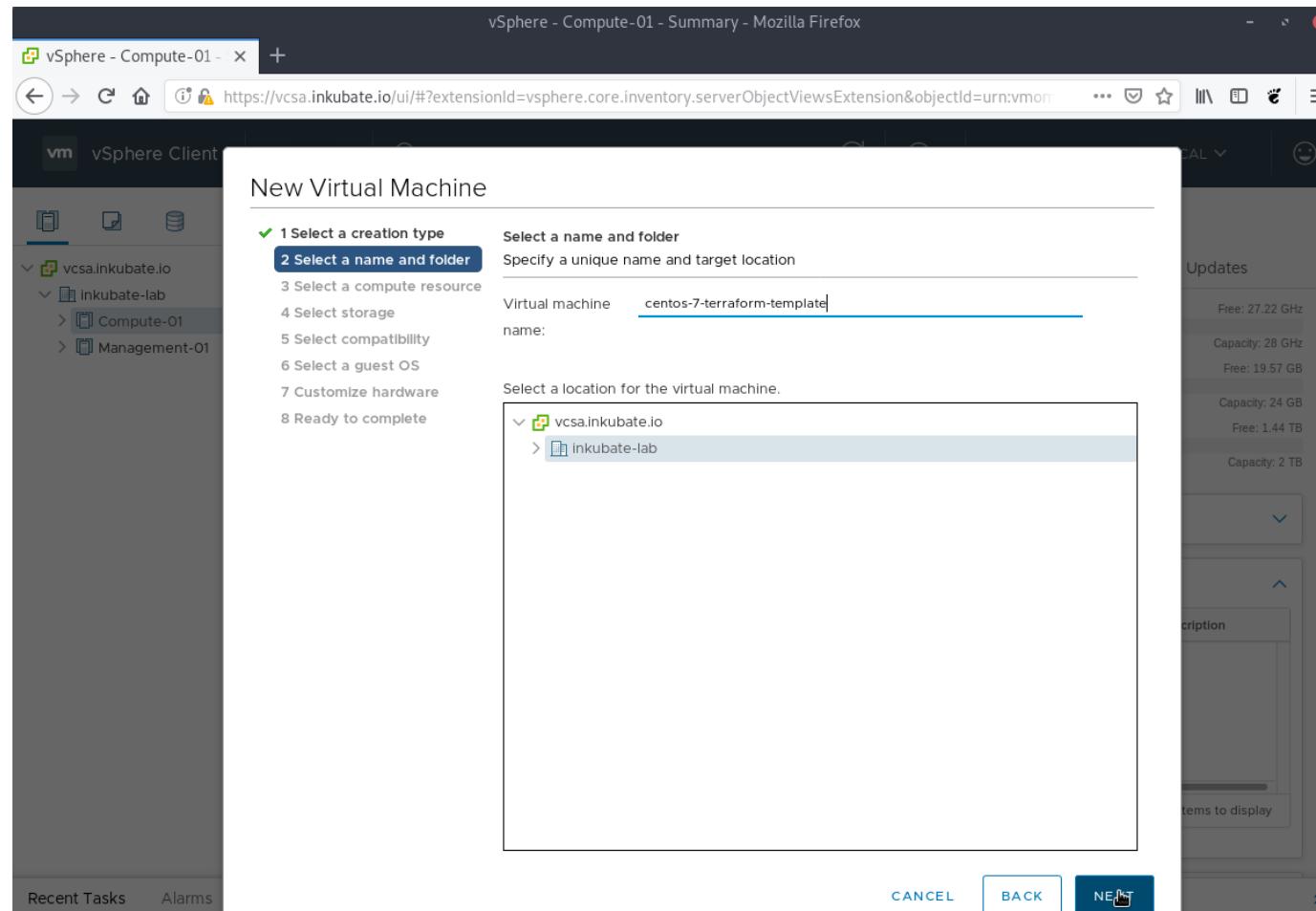
No items to display

Assign... Remove...

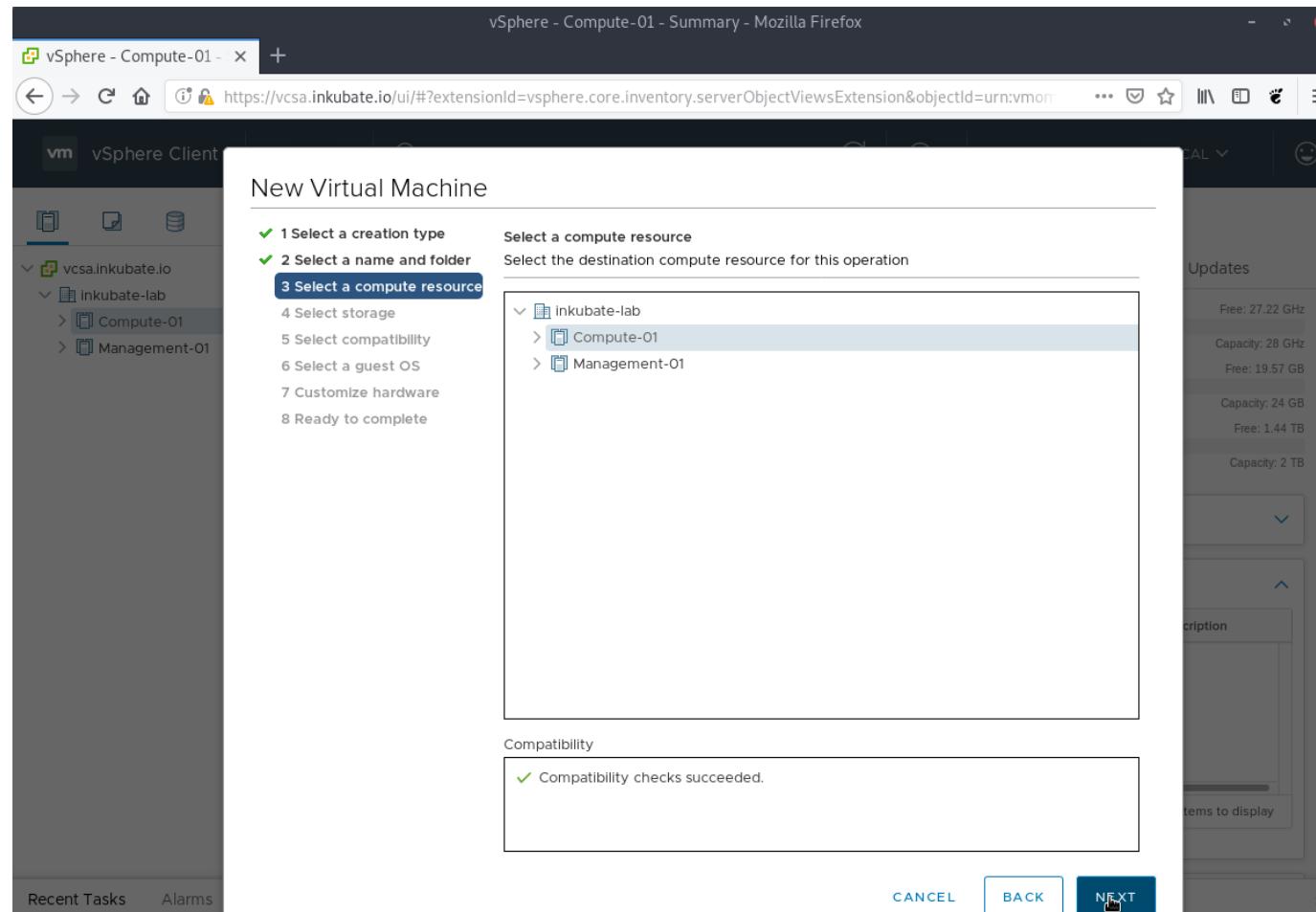
The screenshot displays the vSphere Client interface for a host named 'Compute-01'. The left sidebar contains a tree view of the vSphere environment, with 'vcsa.inkubate' expanded to show 'inkubate-lab'. The main pane shows the 'Compute-01' host details, including its configuration (8 processors), performance metrics (vMotion migrations: 566), and resource utilization (CPU: 27.3 GHz free, 696 MHz used; Memory: 19.58 GB free, 4.42 GB used; Storage: 1.44 TB free, 573.3 GB used). The 'Actions' menu on the left provides options for adding hosts, creating new virtual machines, and managing resources. The 'Tags' section on the right allows for assigning tags to the host.



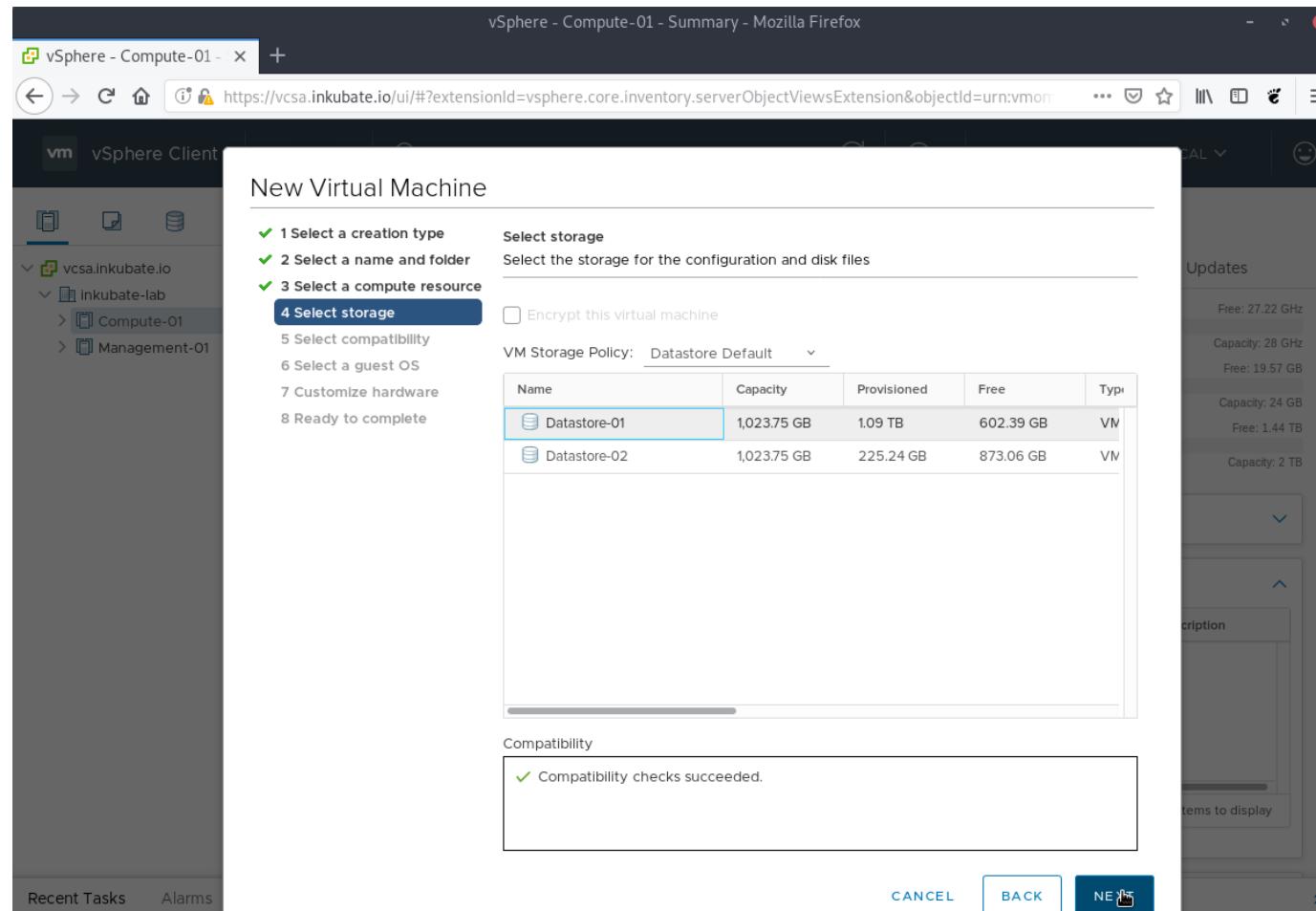
2- Choose a name for your virtual machine template.



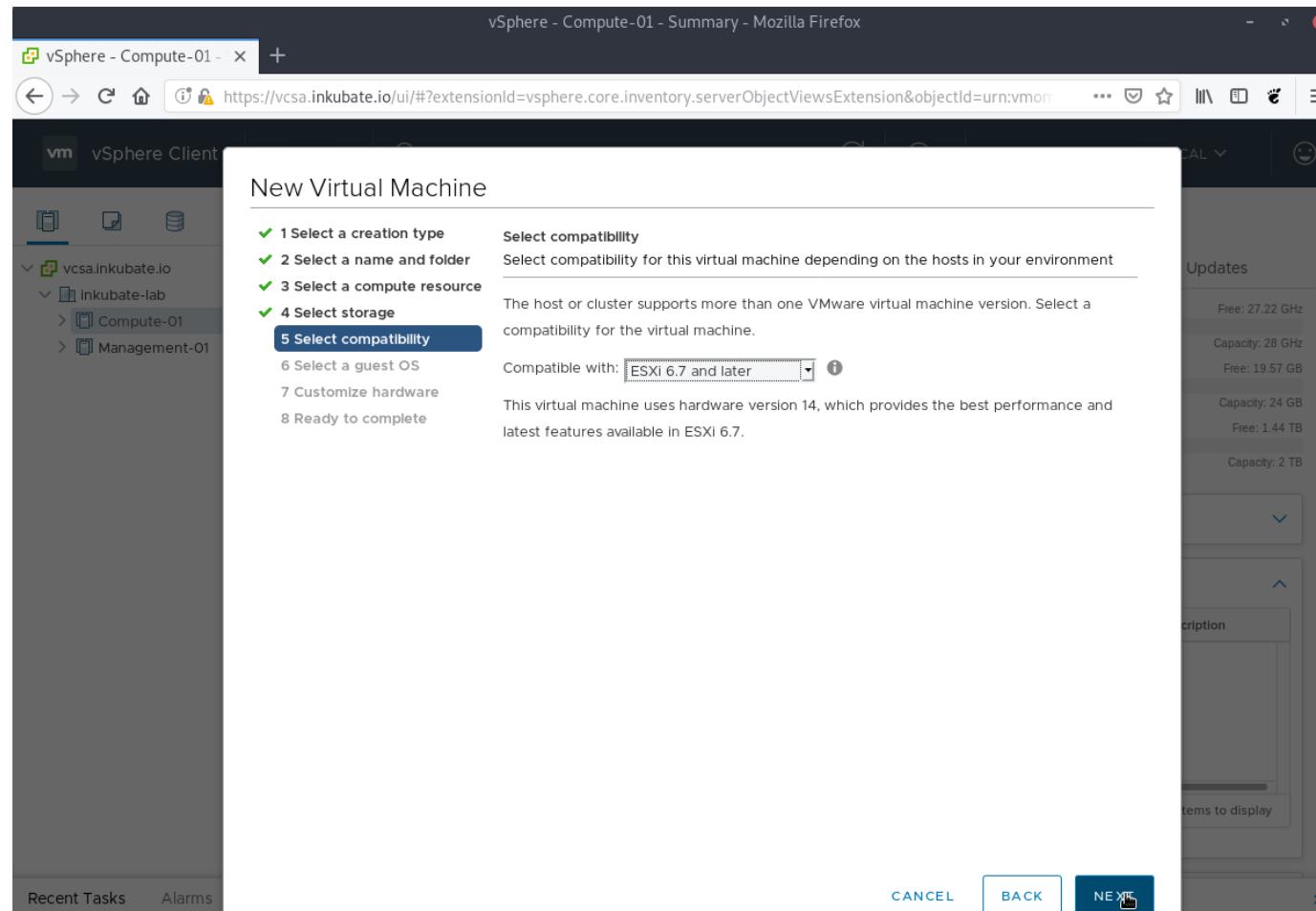
3- Select a temporary compute resource for the virtual machine.



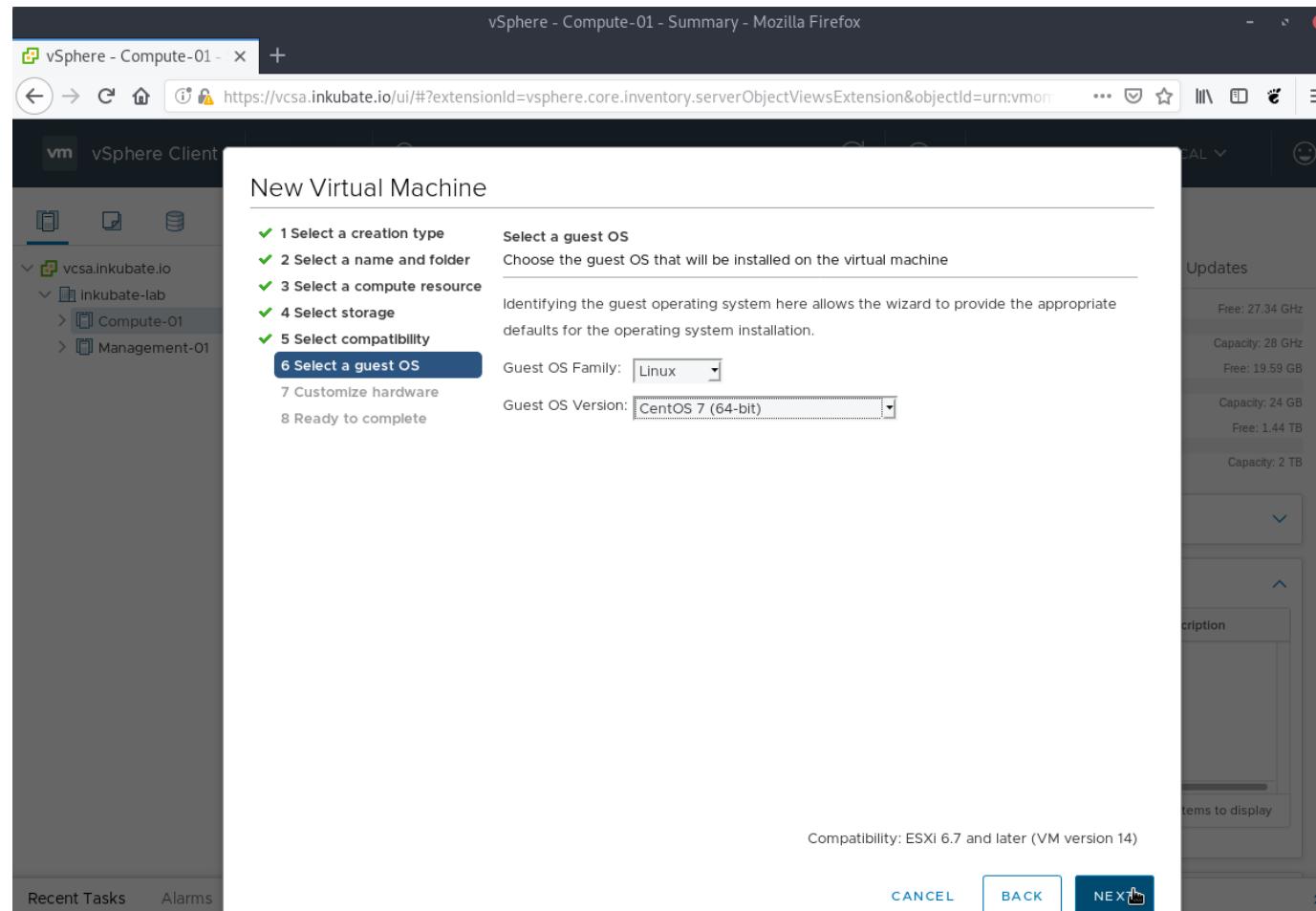
4- Select a datastore for the virtual machine.



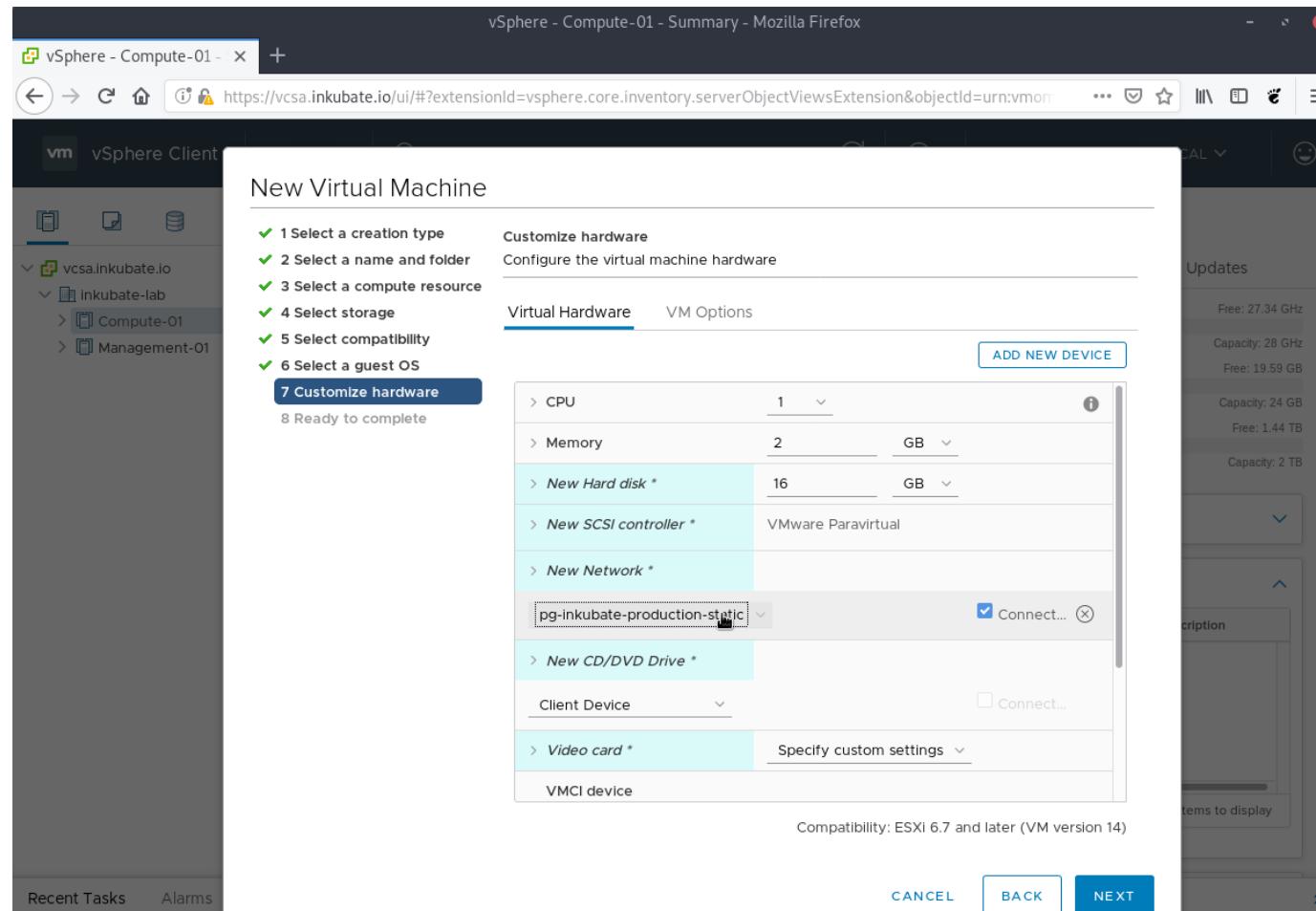
5- Select the vSphere compatibility for the virtual machine.



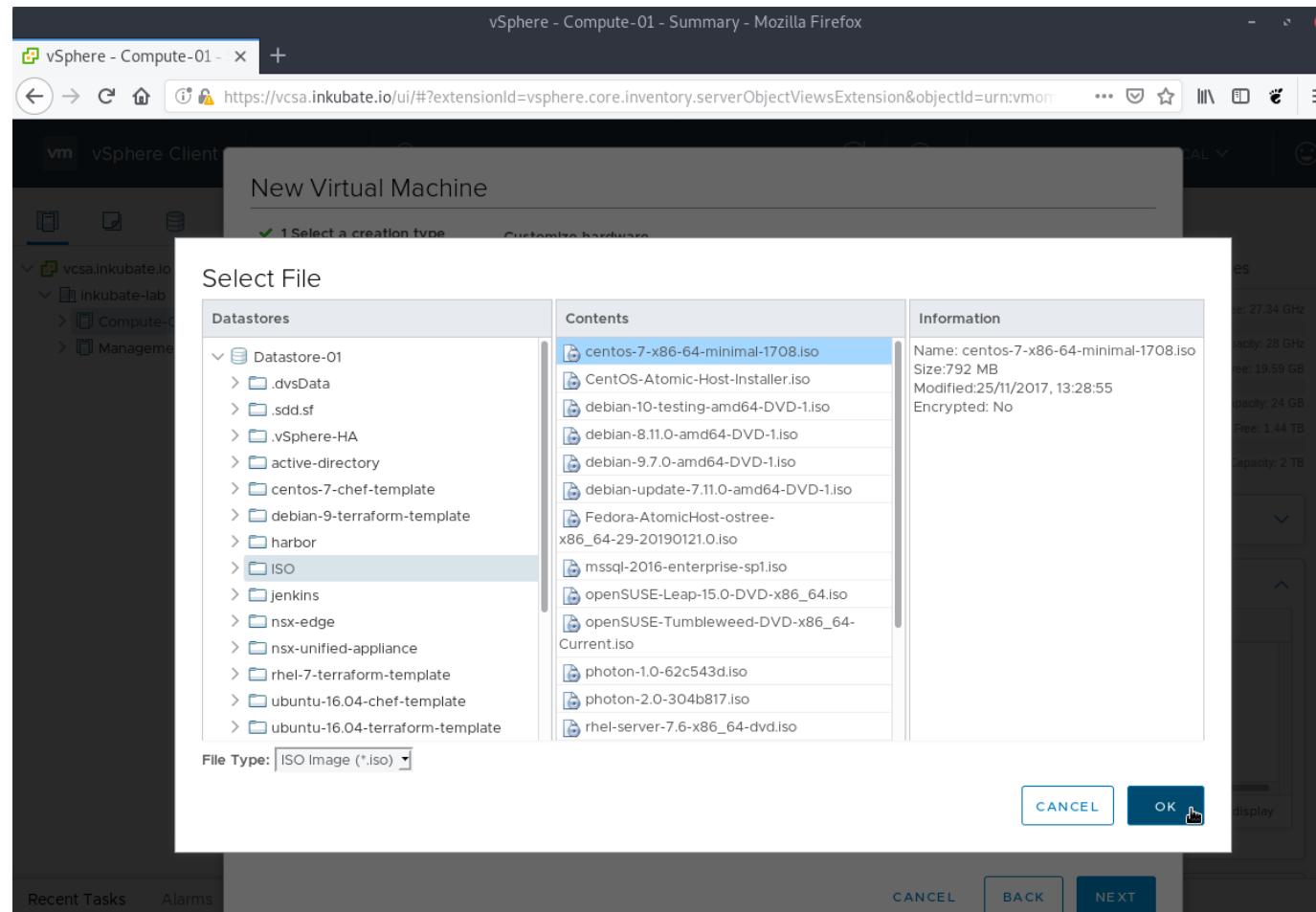
6- Select "CentOS 7 (64-bit)" as guest OS for the virtual machine.



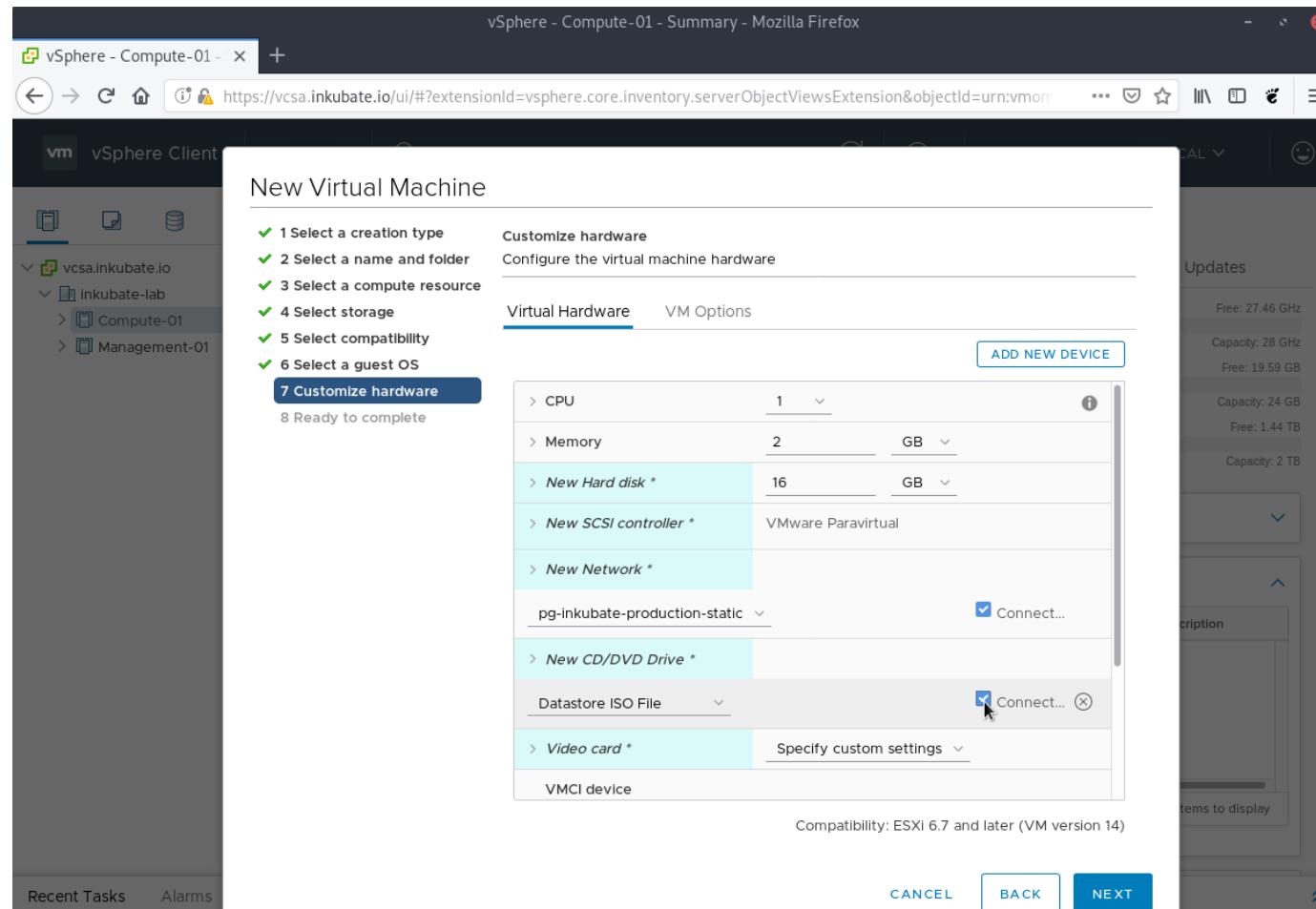
7- Choose a temporary network for the virtual machine.



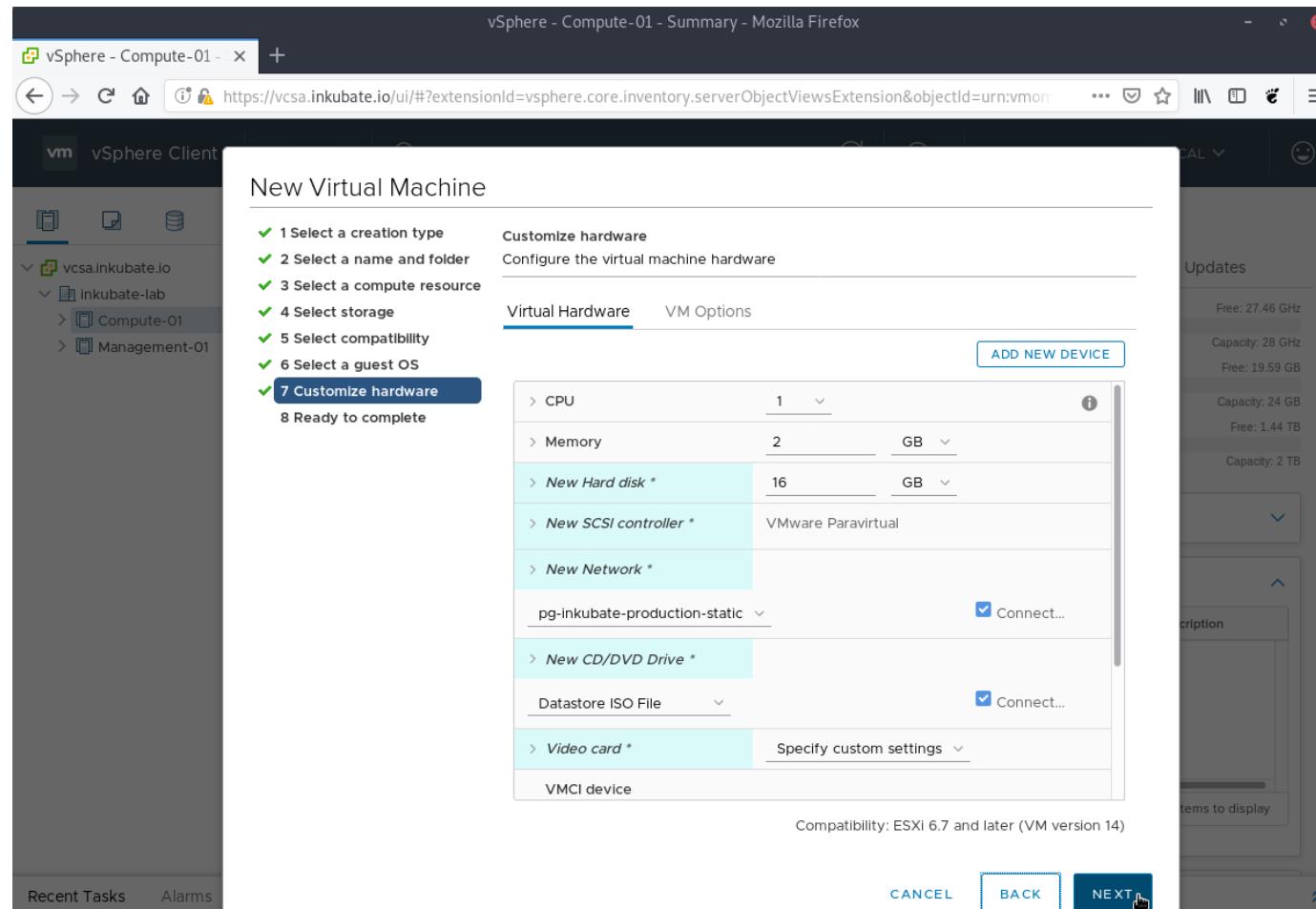
8- Add the CentOS 7 ISO to the CD/DVD drive of the virtual machine.



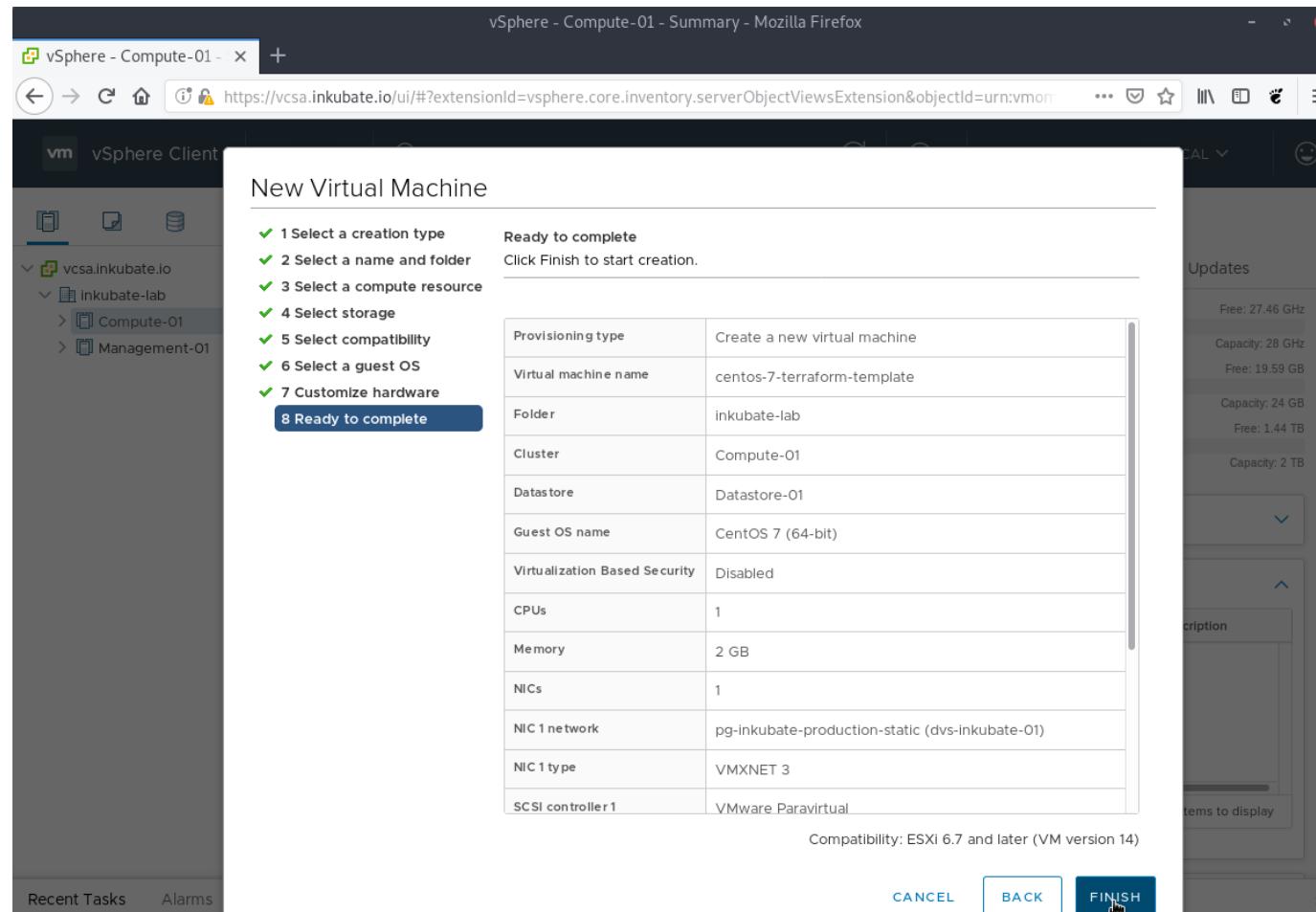
9- Connect the CD/DVD drive at boot.



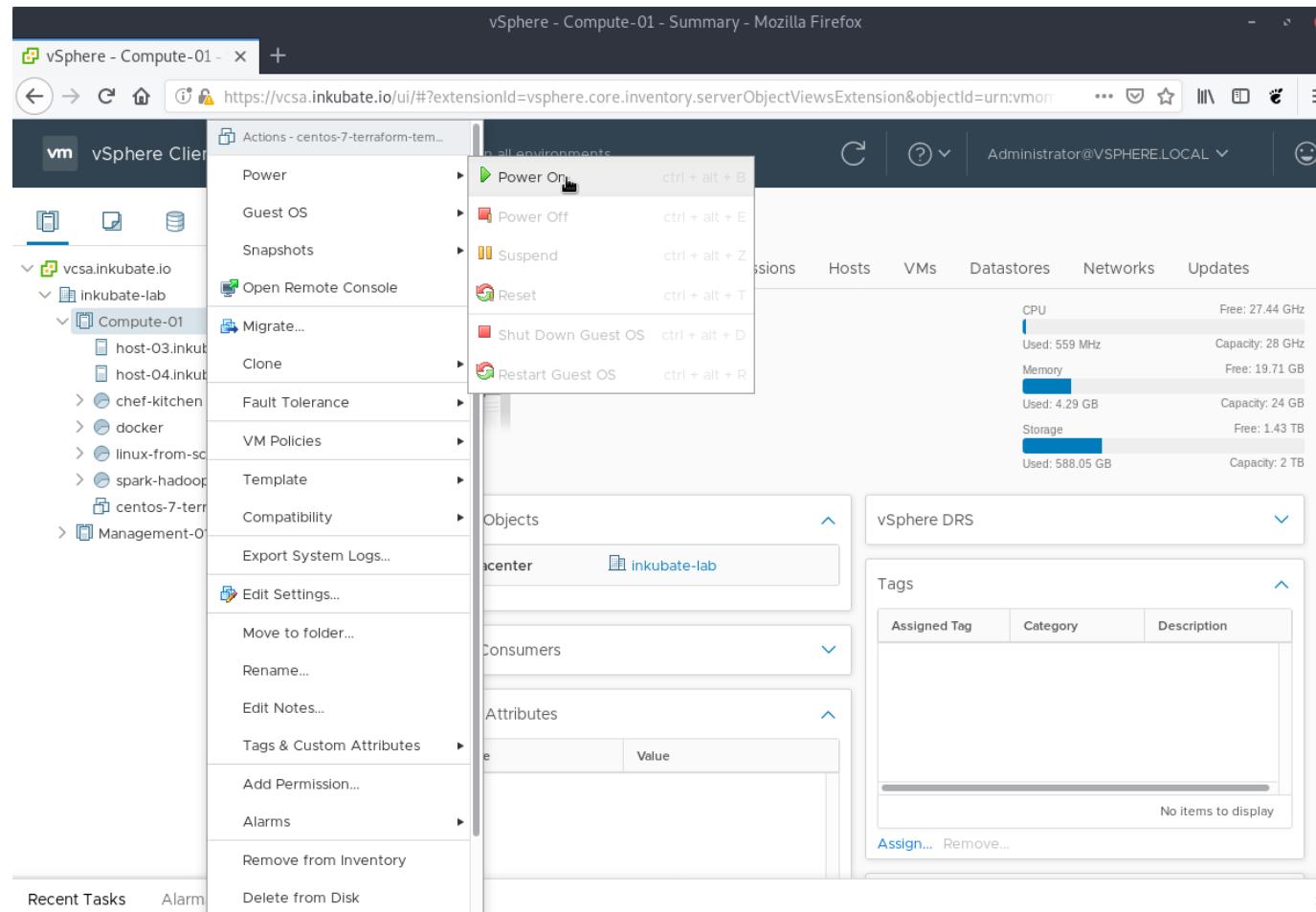
10- Finish the hardware customization of the virtual machine.



11- Validate the creation of the virtual machine.



12- Power on the virtual machine.



13- Launch the vSphere web console.

vSphere - centos-7-terraform-template - Summary - Mozilla Firefox

vSphere Client | Menu | Search in all environments | Administrator@VSPHERE.LOCAL | Actions

centos-7-terraform-template | Summary | Monitor | Configure | Permissions | Datastores | Networks | Updates

Guest OS: CentOS 7 (64-bit)
Compatibility: ESXi 6.7 and later (VM version 14)
VMware Tools: Not running, not installed
[More info](#)

DNS Name:
IP Addresses:
Host: host-04.inkubate.io

CPU USAGE: 0 Hz
MEMORY USAGE: 0 B
STORAGE USAGE: 18.11 GB

Powered On | Launch Web Console | Launch Remote Console | [Install VMware Tools...](#)

VM Hardware | Notes | Custom Attributes | VM Storage Policies

VM Hardware:

> CPU	1 CPU(s)
> Memory	2 GB, 0 GB memory active
> Hard disk 1	16 GB
> Network adapter	1
pg-inkubate-production-static (connected)	
> CD/DVD drive 1	Connected

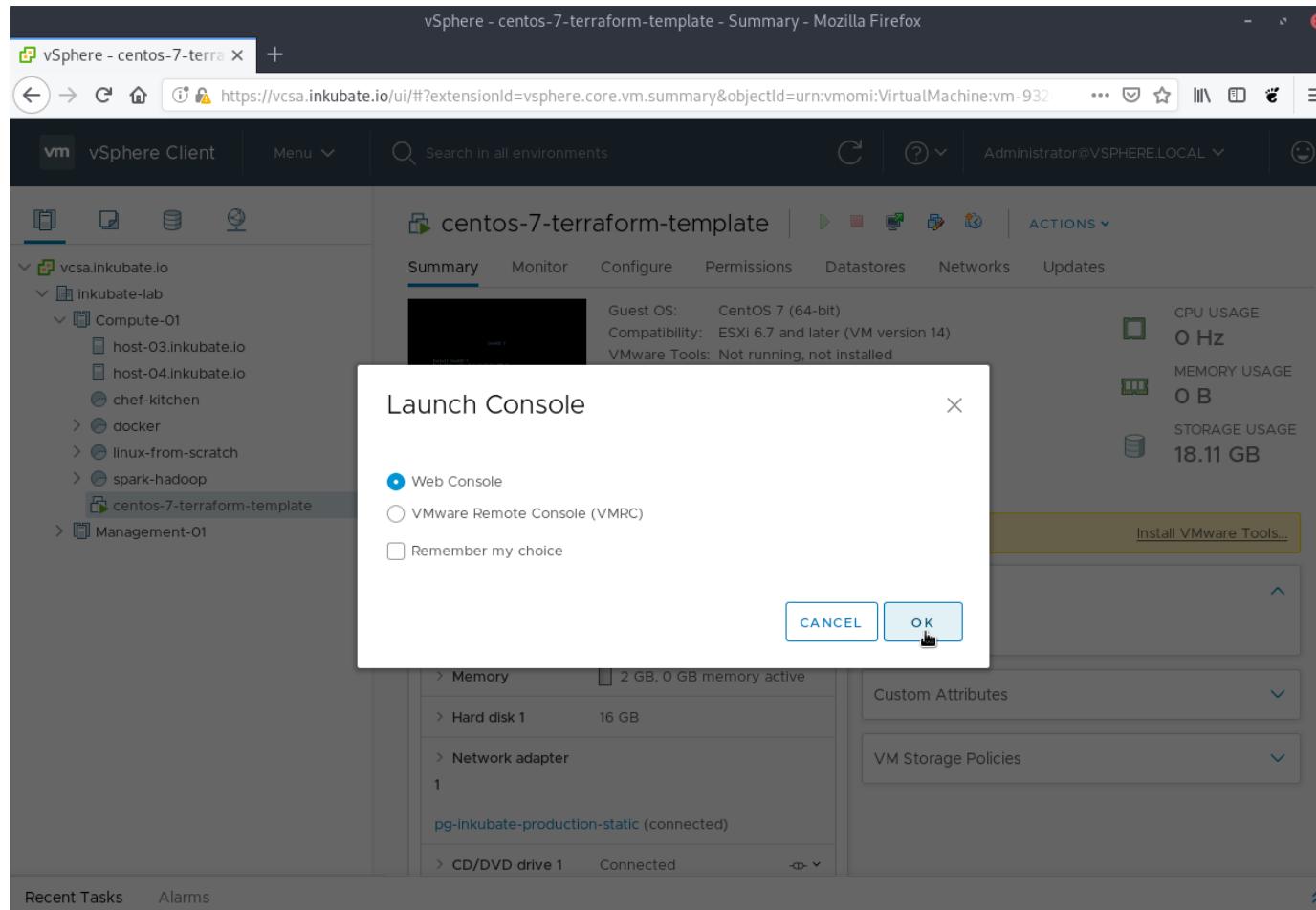
Notes:

[Edit Notes...](#)

Custom Attributes | VM Storage Policies

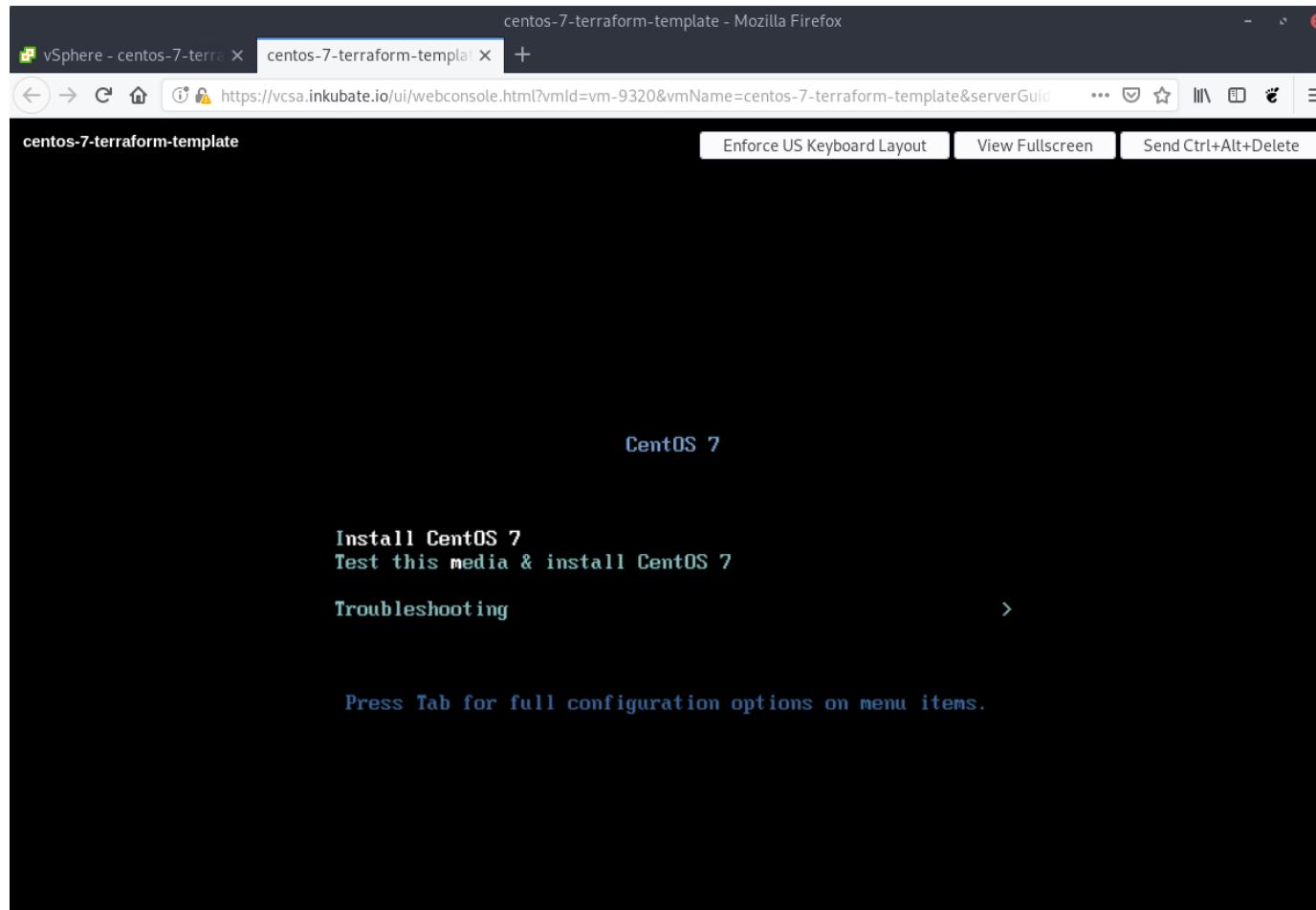
VM Hardware Notes Custom Attributes VM Storage Policies

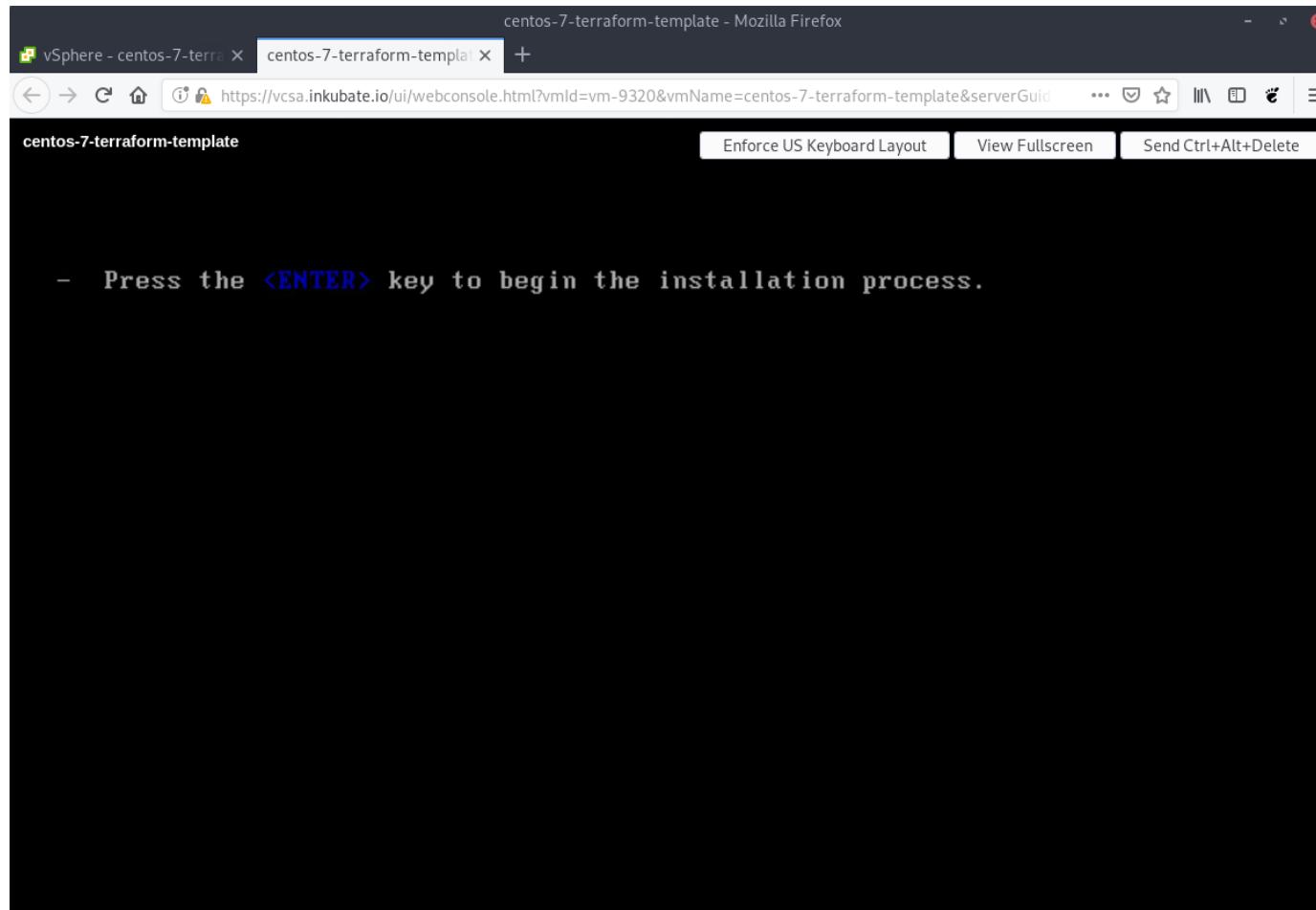
https://vcsa.inkubate.io/ui/



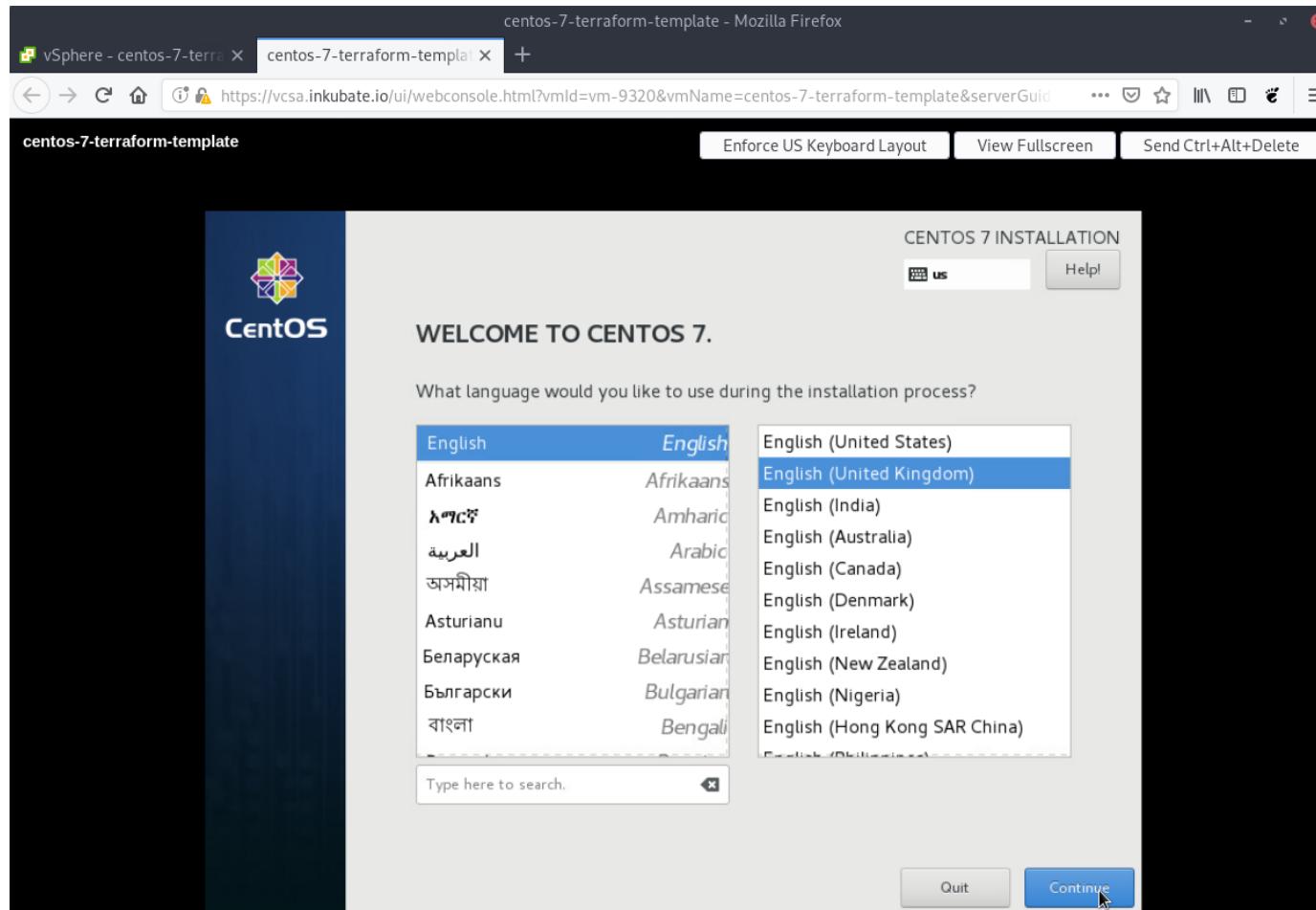
Installing CentOS 7

1- Launch the CentOS installer.

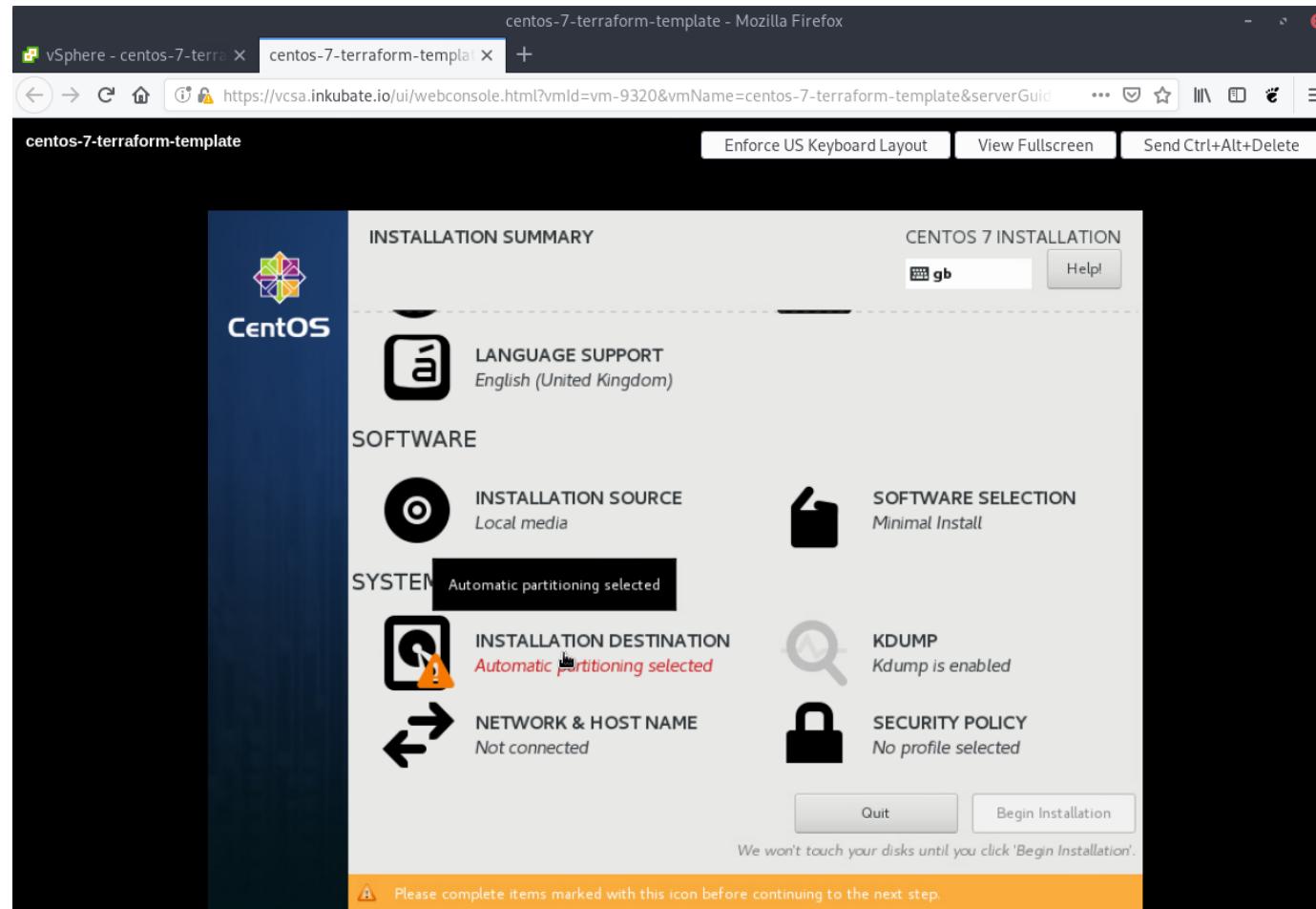


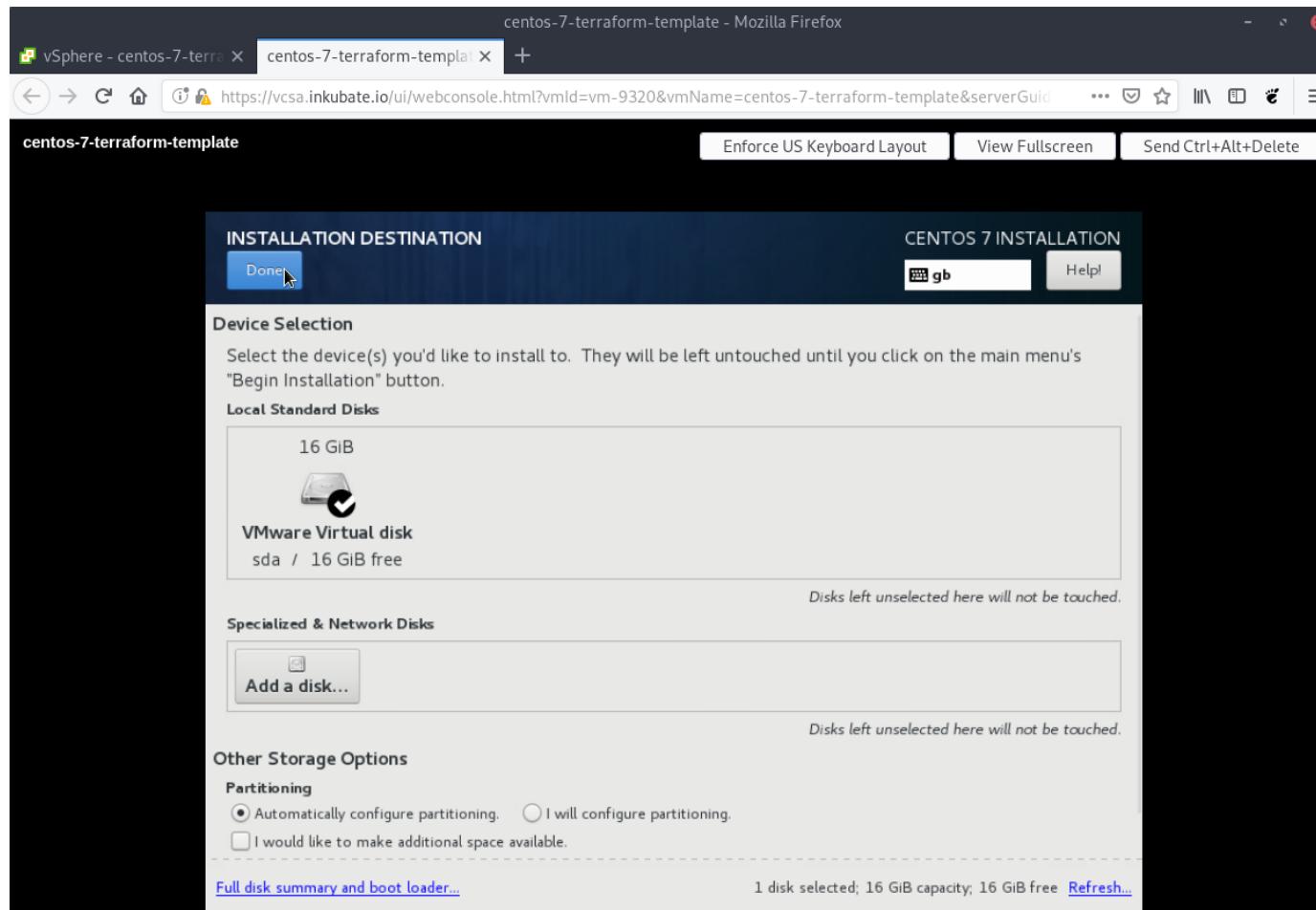


2- Select the language of the installer.

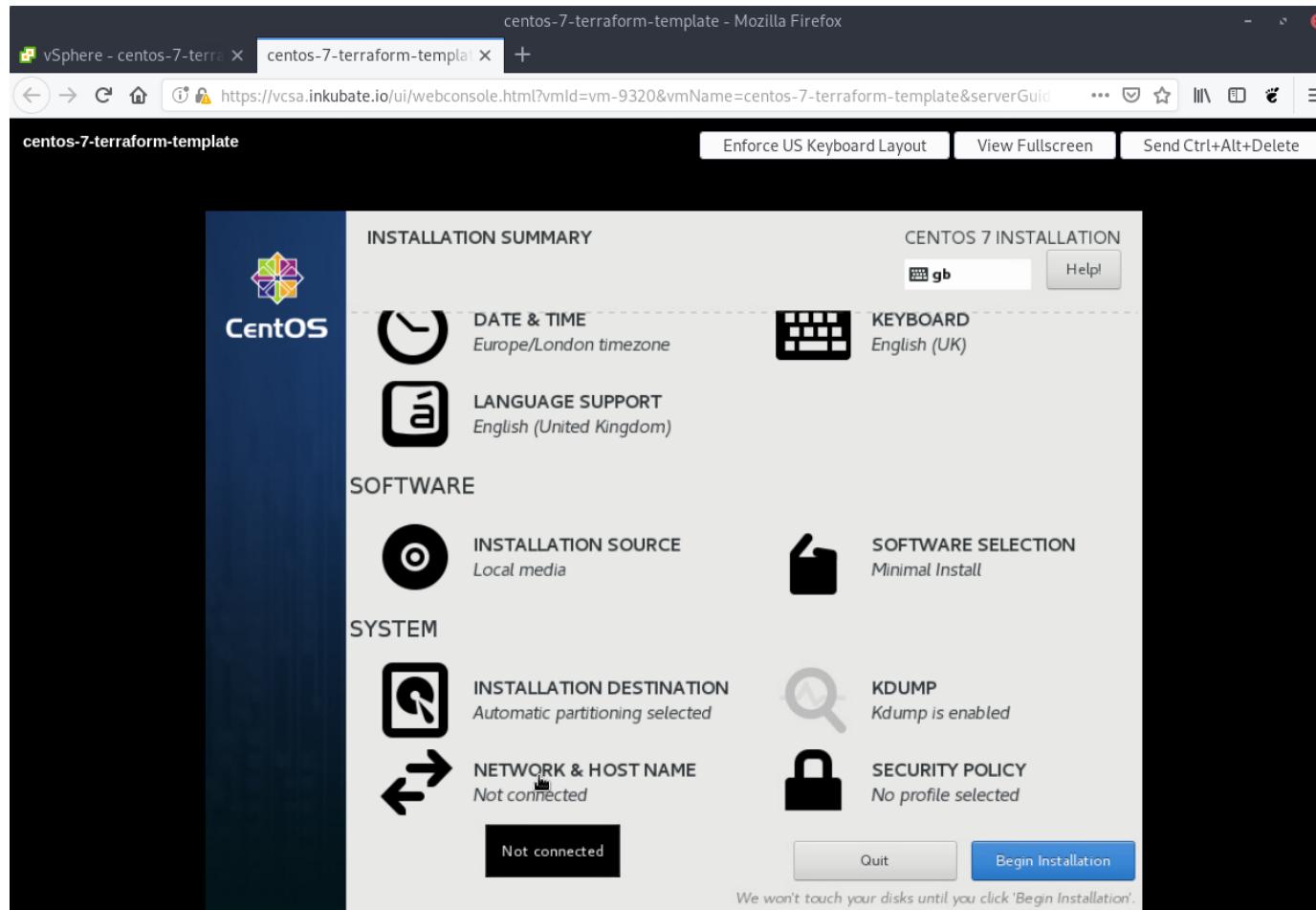


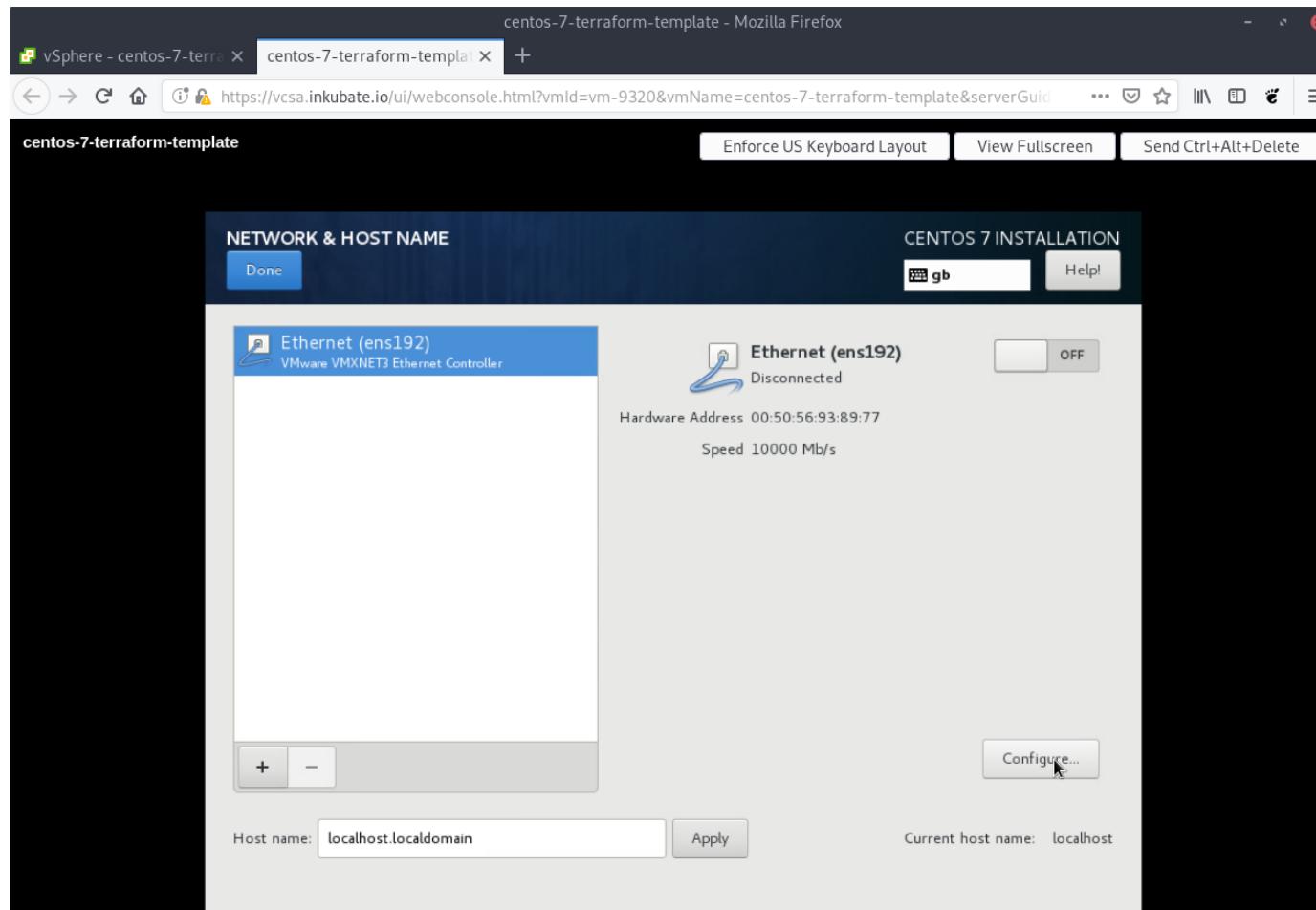
3- Select the installation disk.

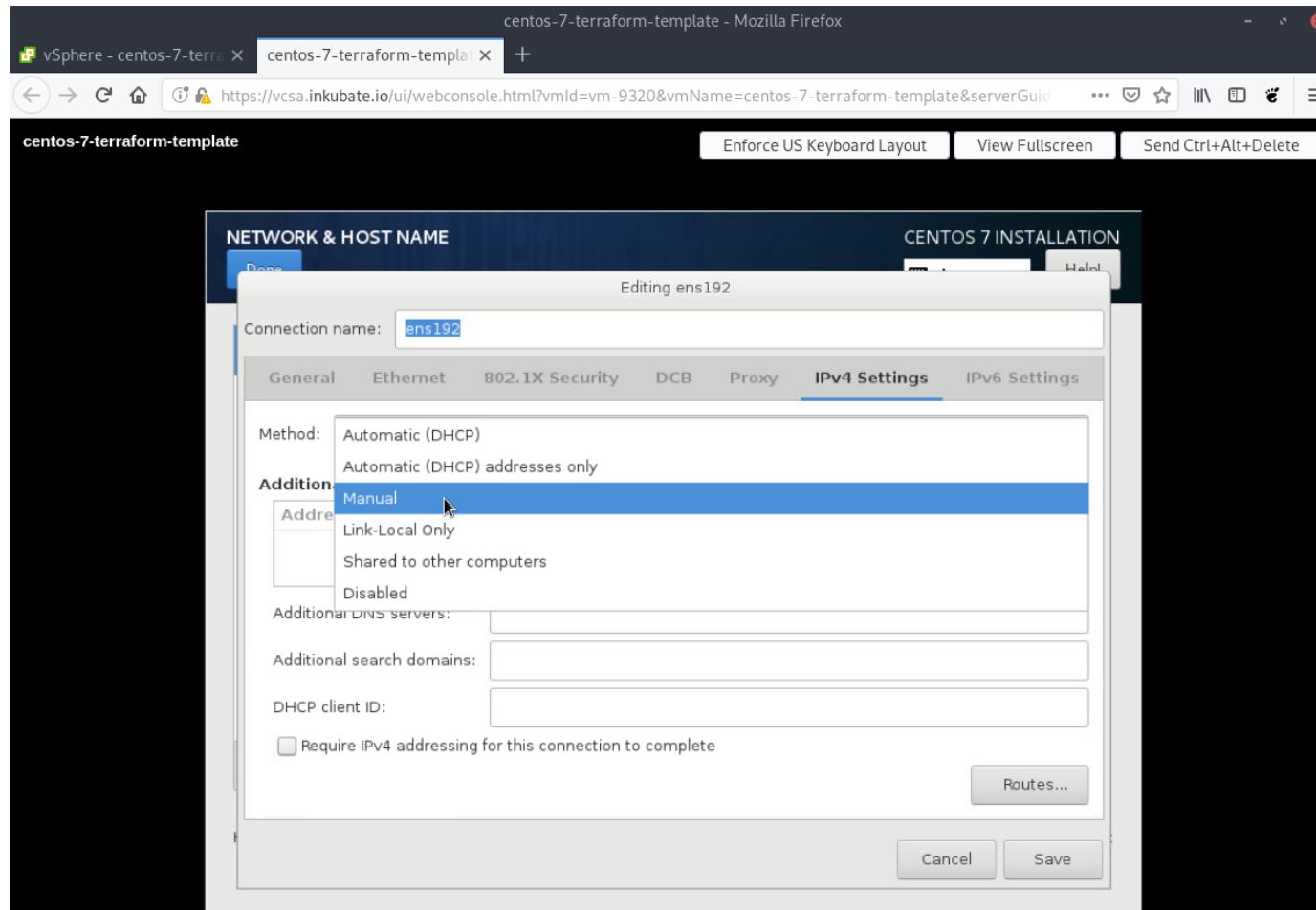


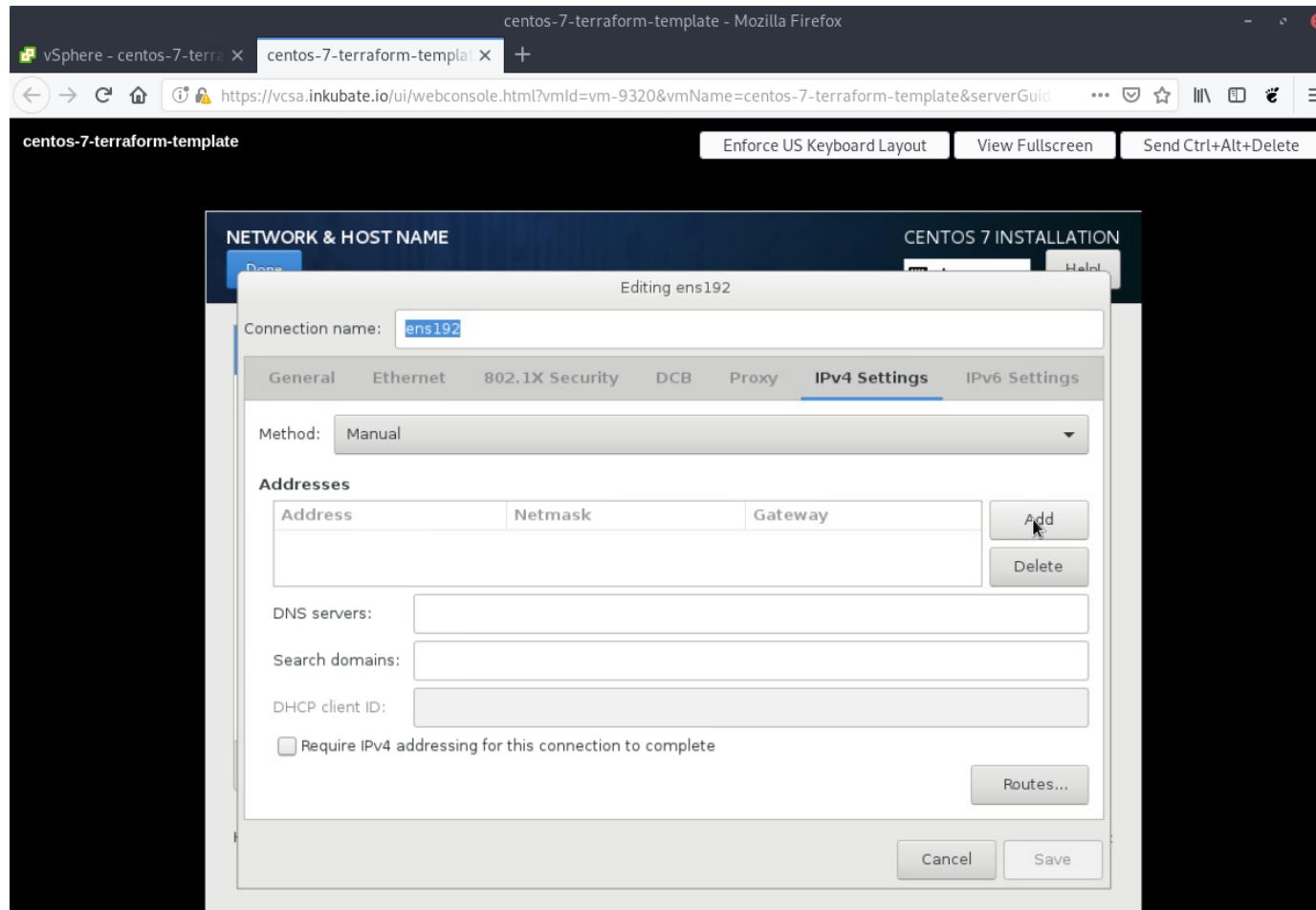


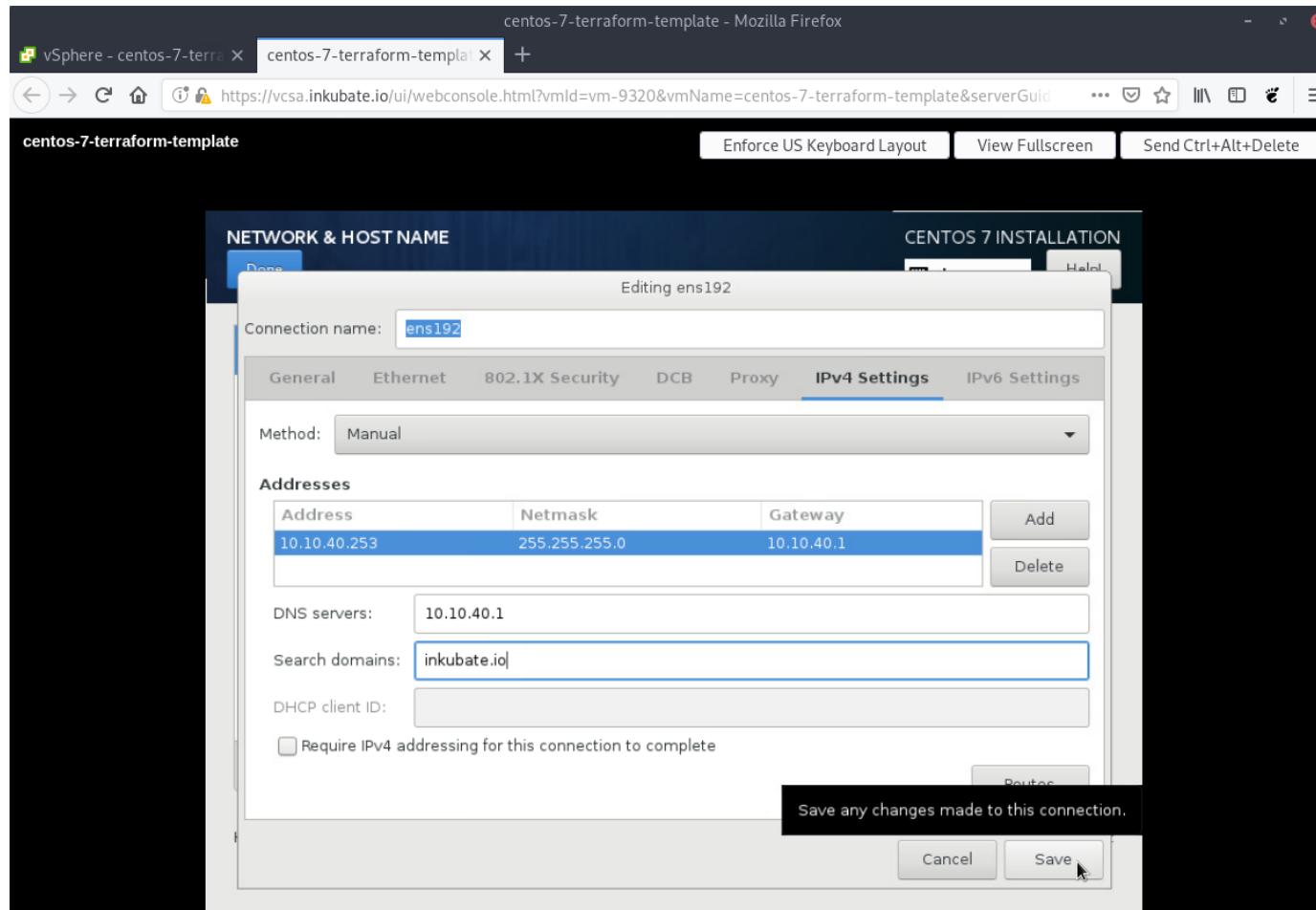
4- Configure the network card of the virtual machine with a temporary configuration.

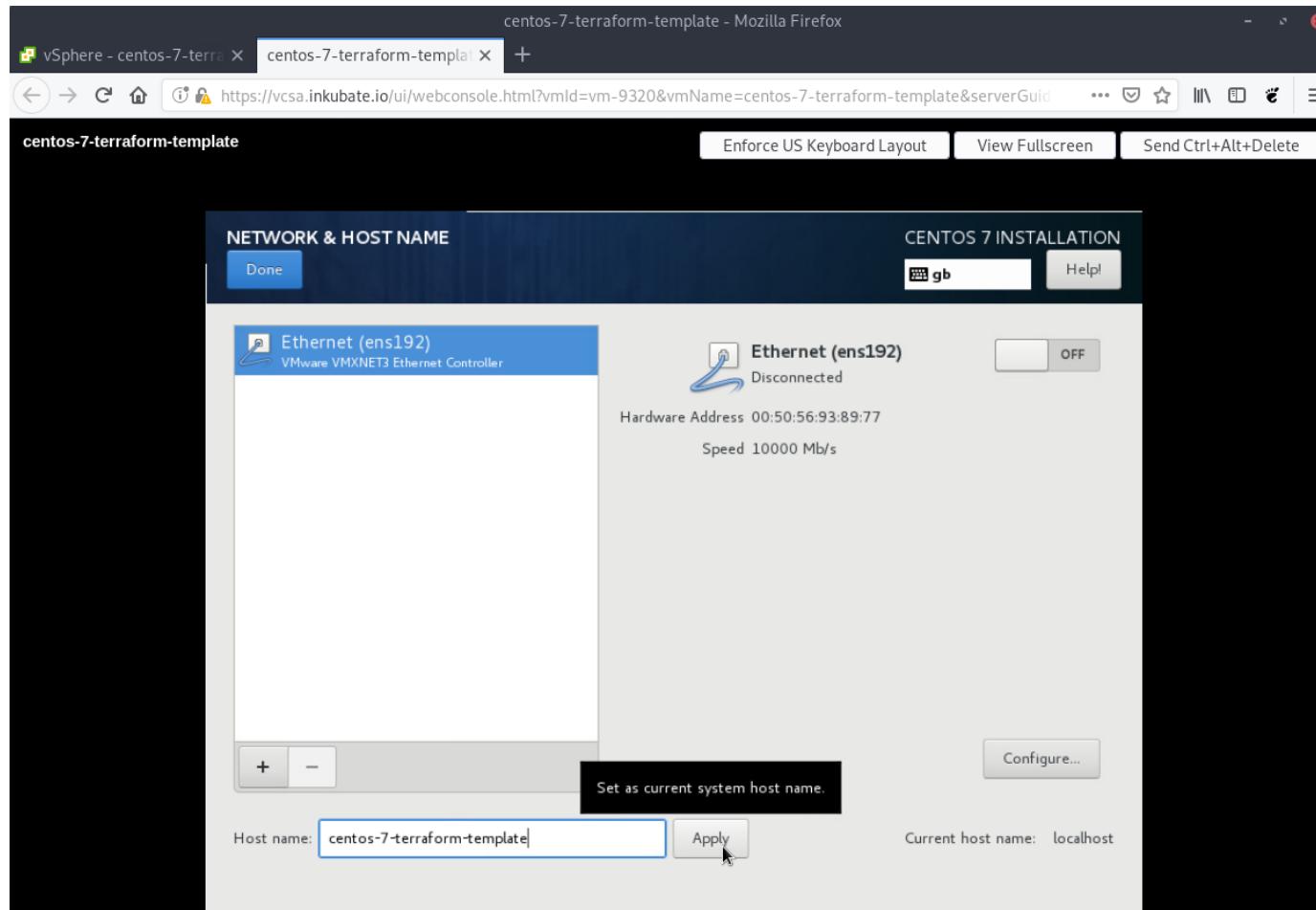


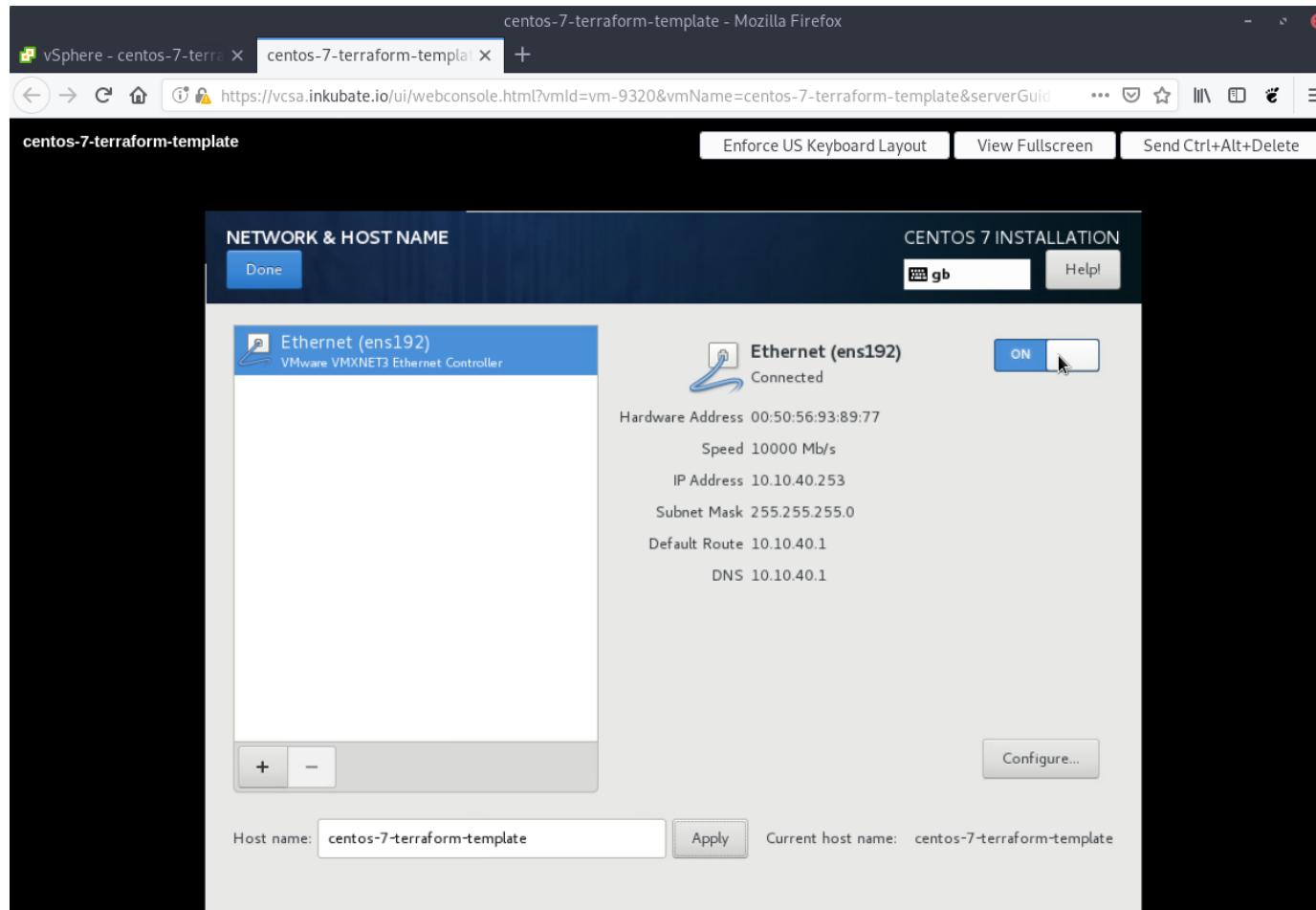


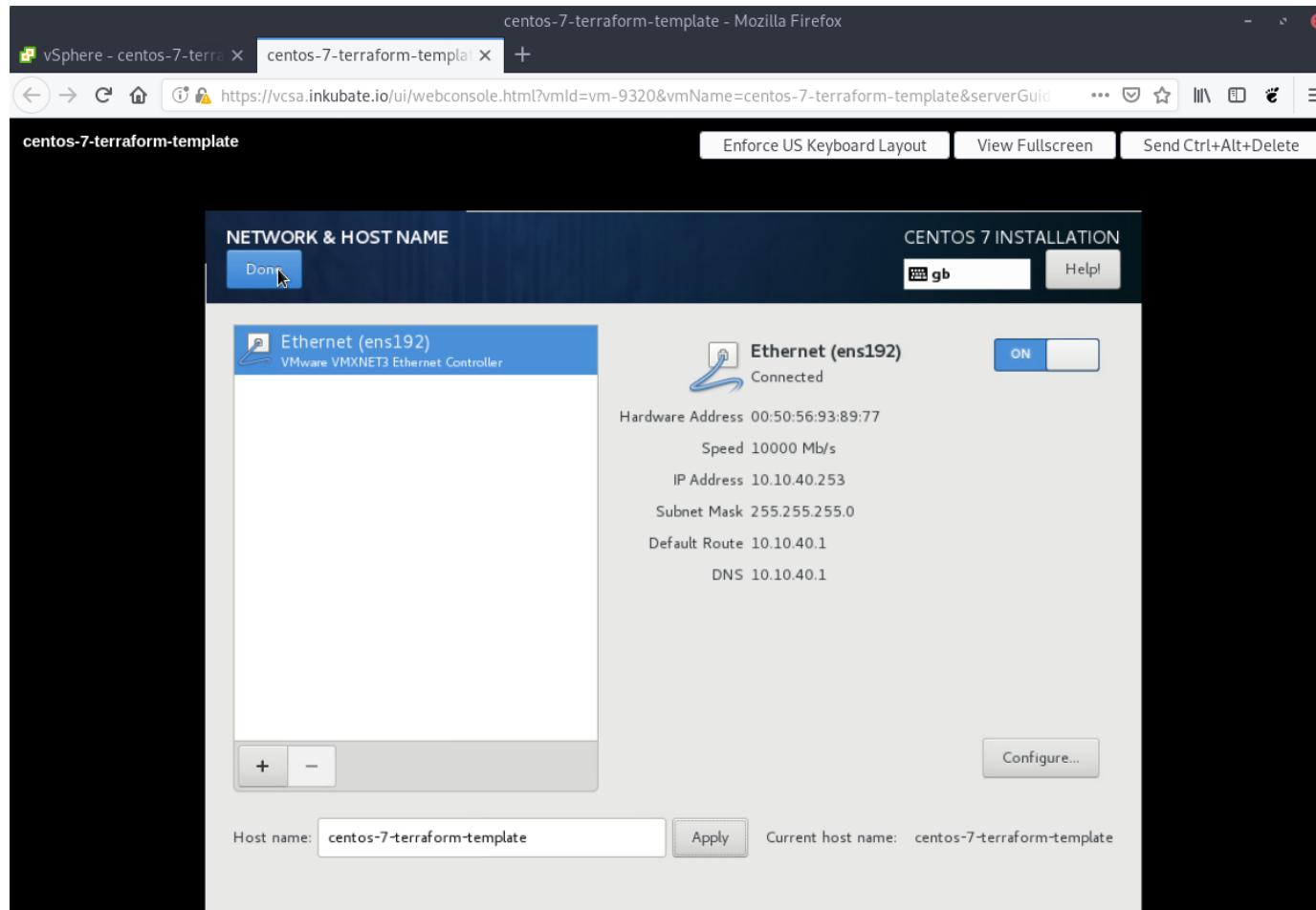




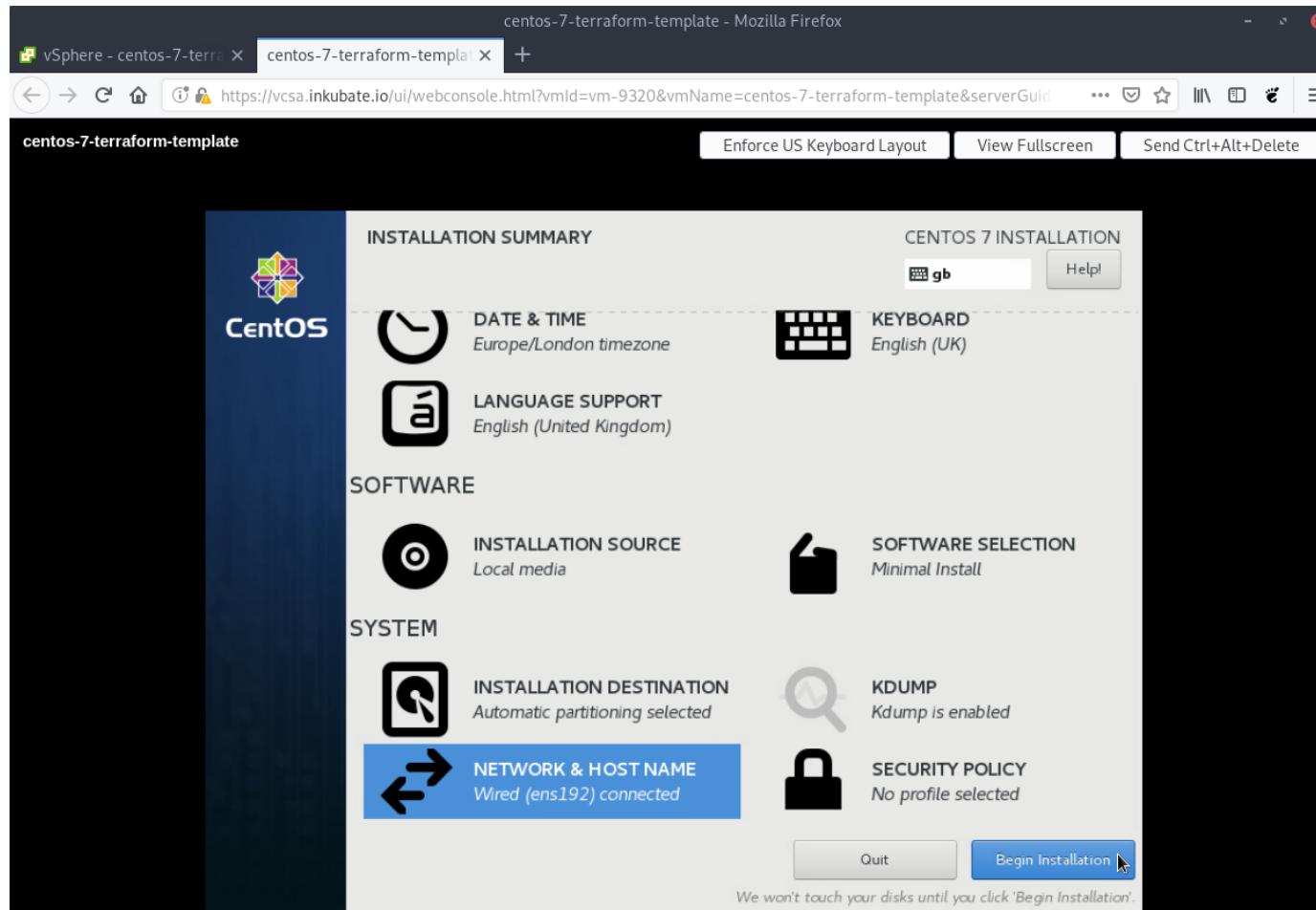




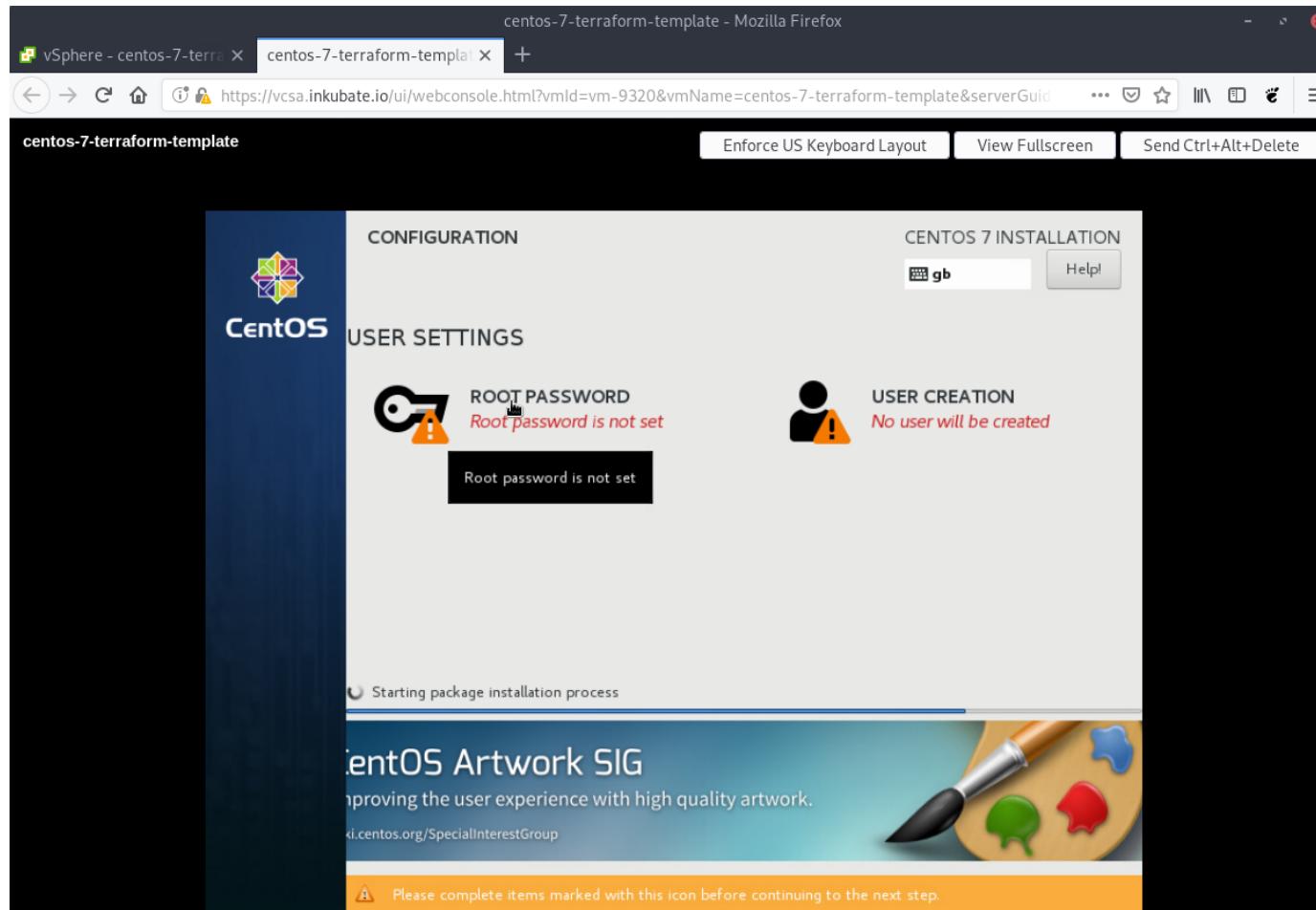


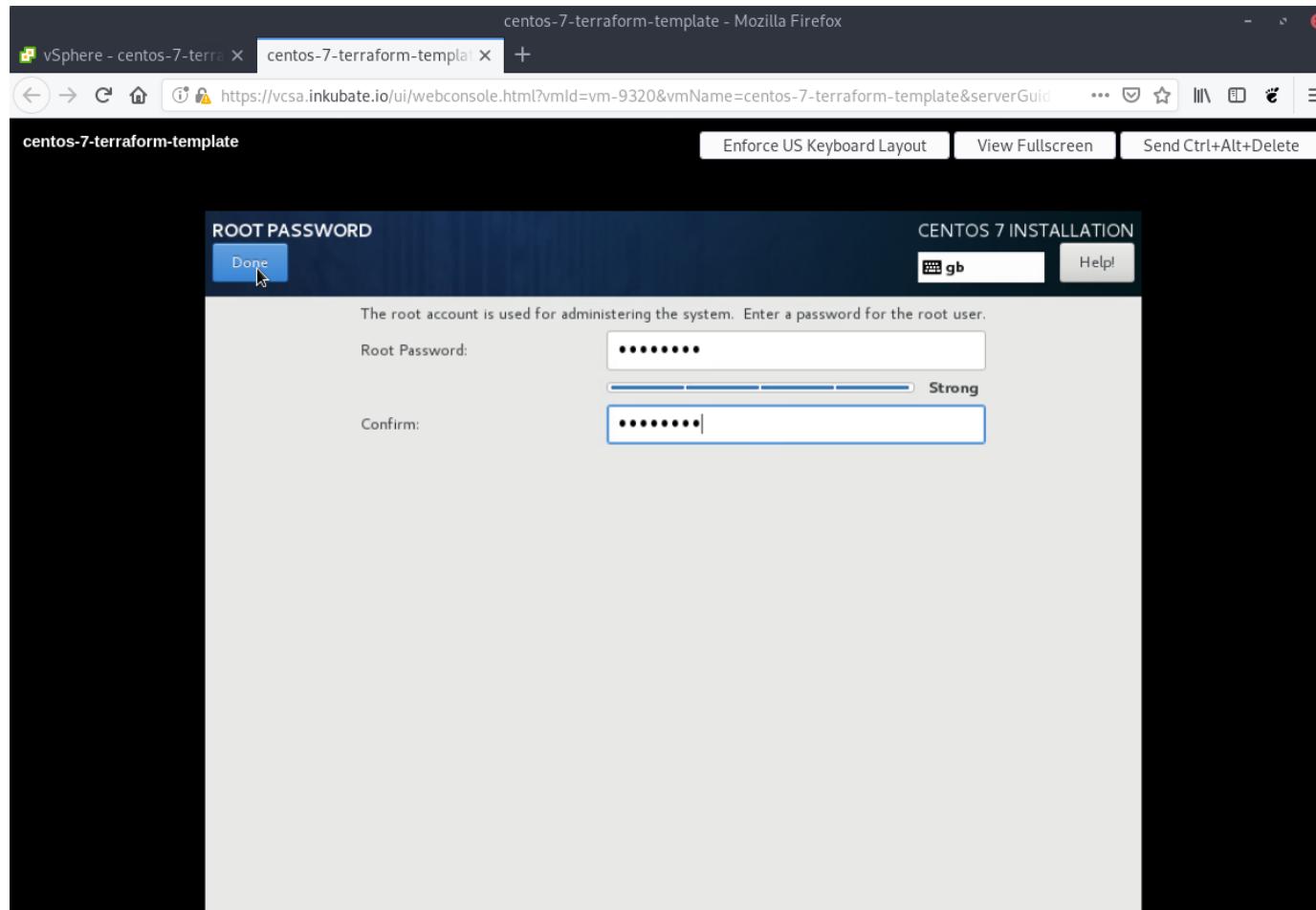


5- Start the installation.

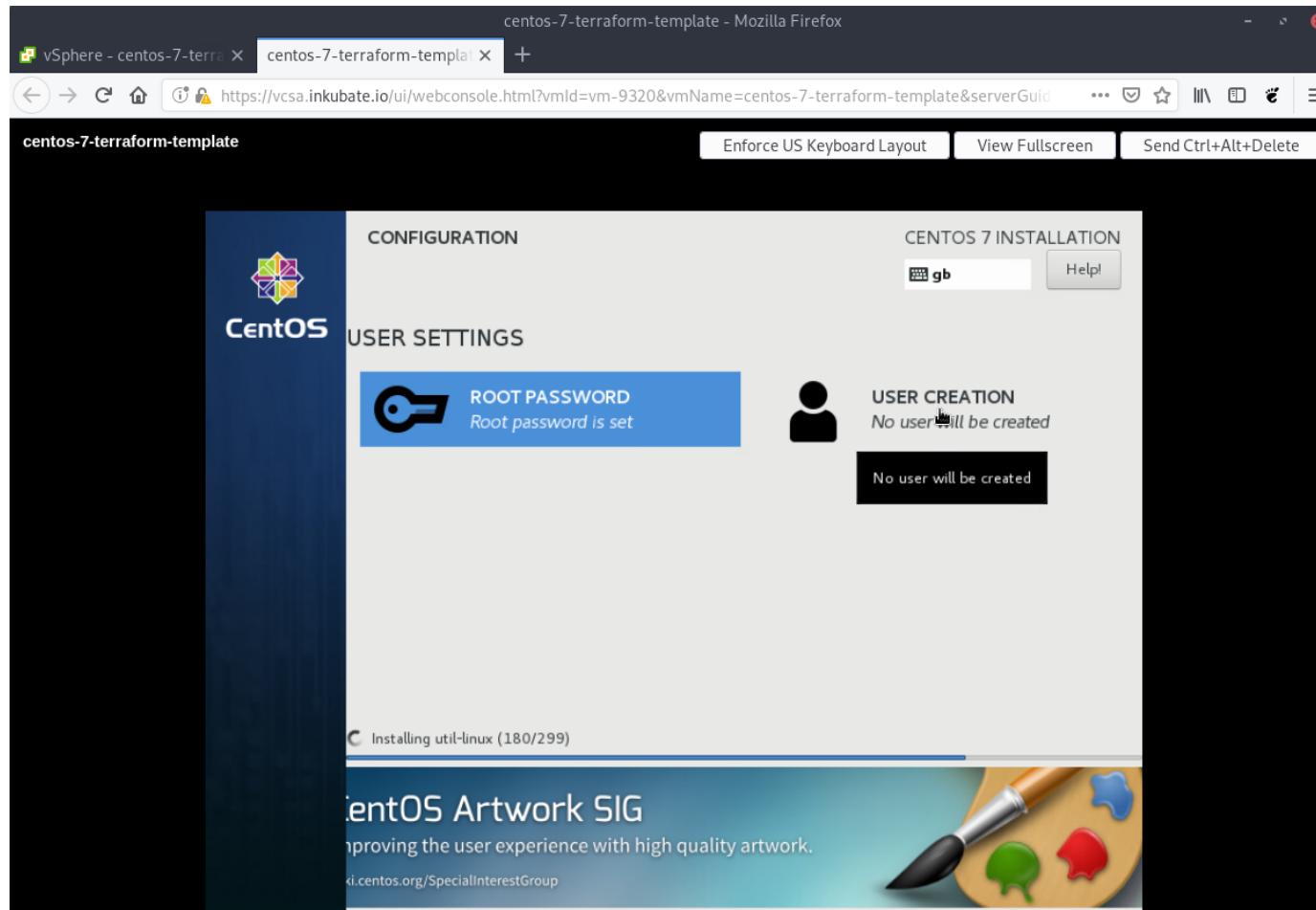


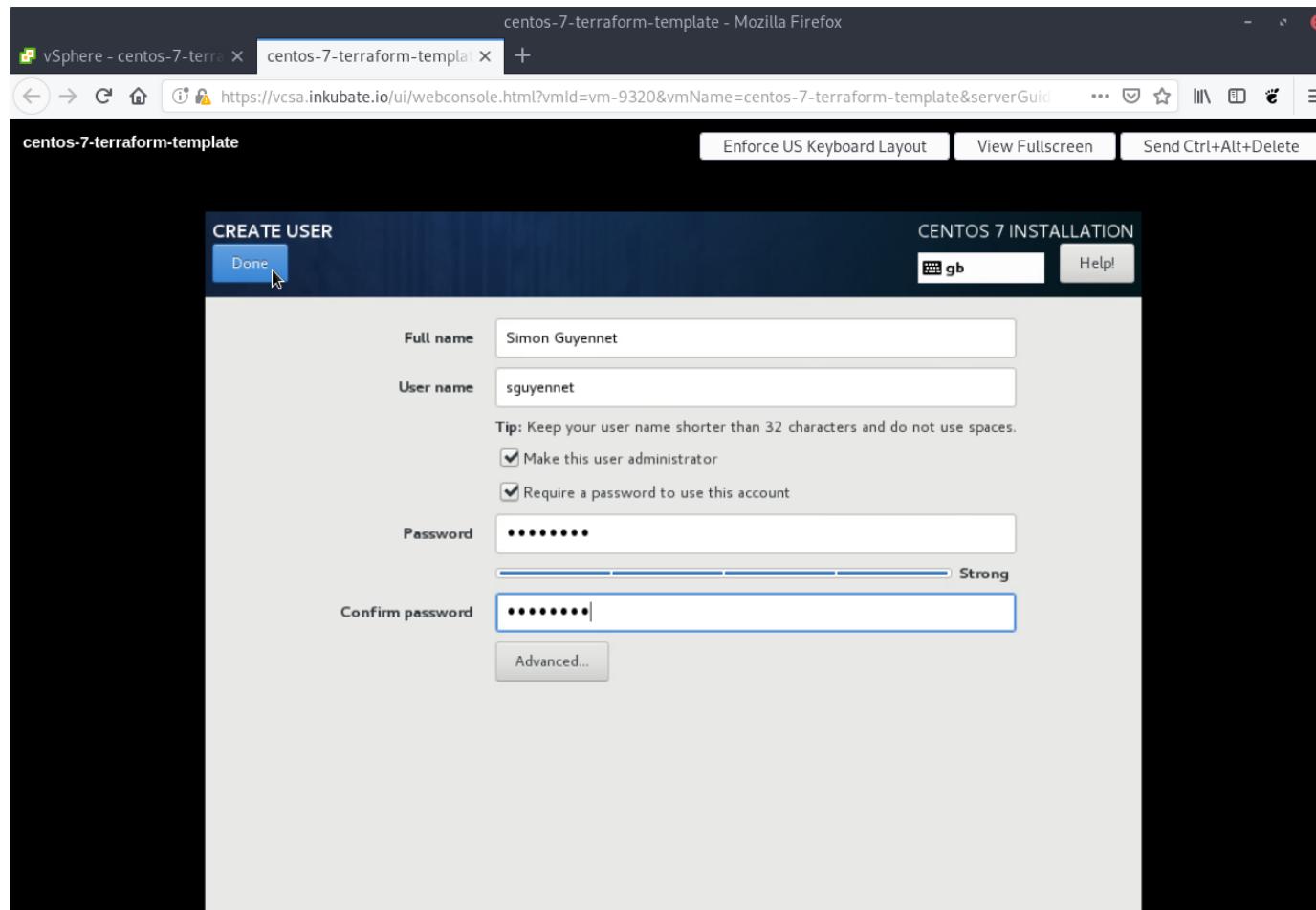
6- Configure the root password.



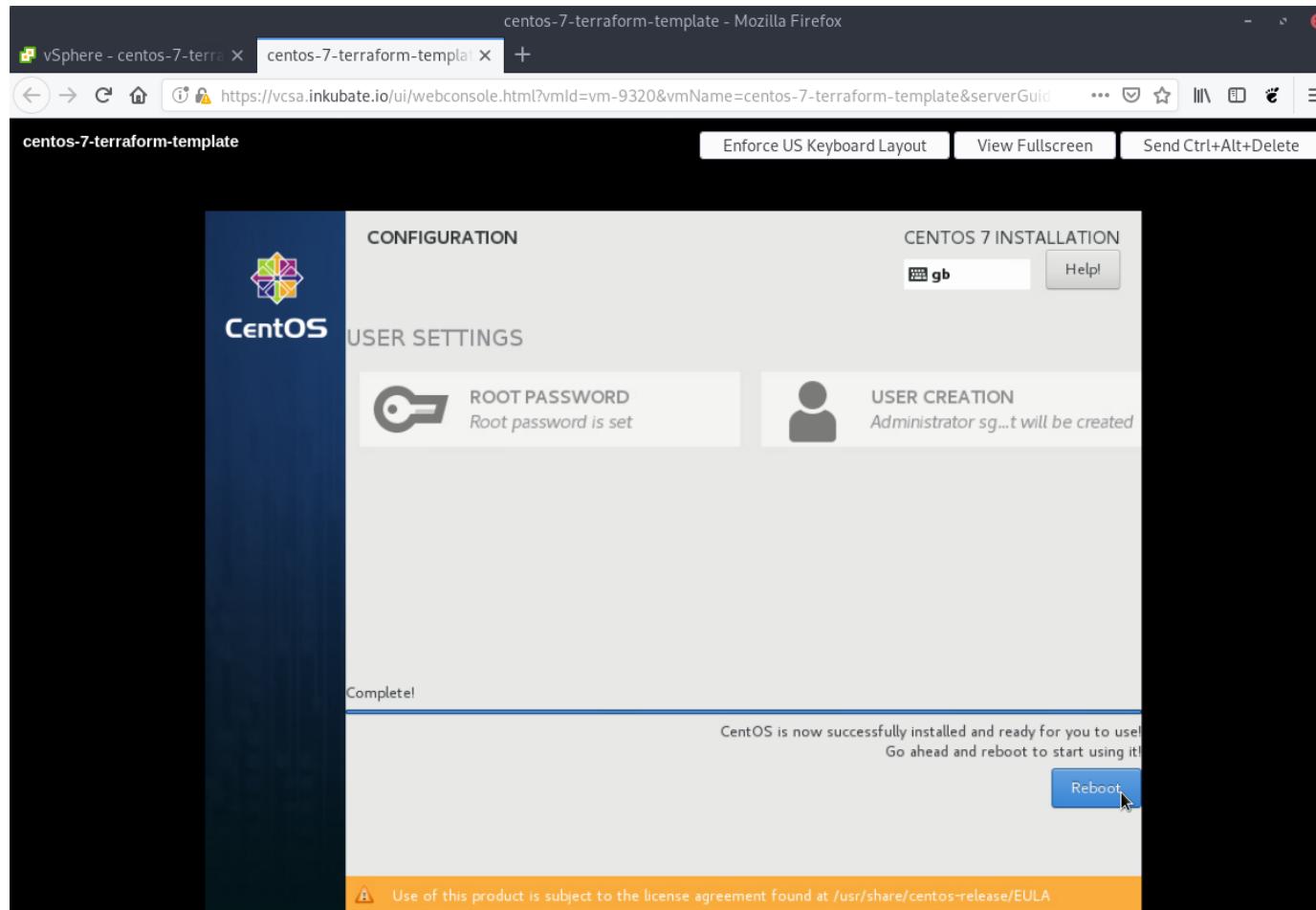


7- Configure an administrator user.





8- Reboot the virtual machine.



9- SSH to the new CentOS virtual machine.

```
$ ssh sguyennet@10.10.40.253
```

10- Upgrade the CentOS packages.

```
$ sudo yum upgrade
```

11- Install Perl.

```
$ sudo yum install perl
```

12- Install open-vm-tools

```
$ sudo yum install open-vm-tools
```

13- Reboot the virtual machine.

```
$ sudo reboot
```

Cleaning the virtual machine configuration

1- SSH to the new CentOS virtual machine.

```
$ ssh sguyennet@10.10.40.253
```

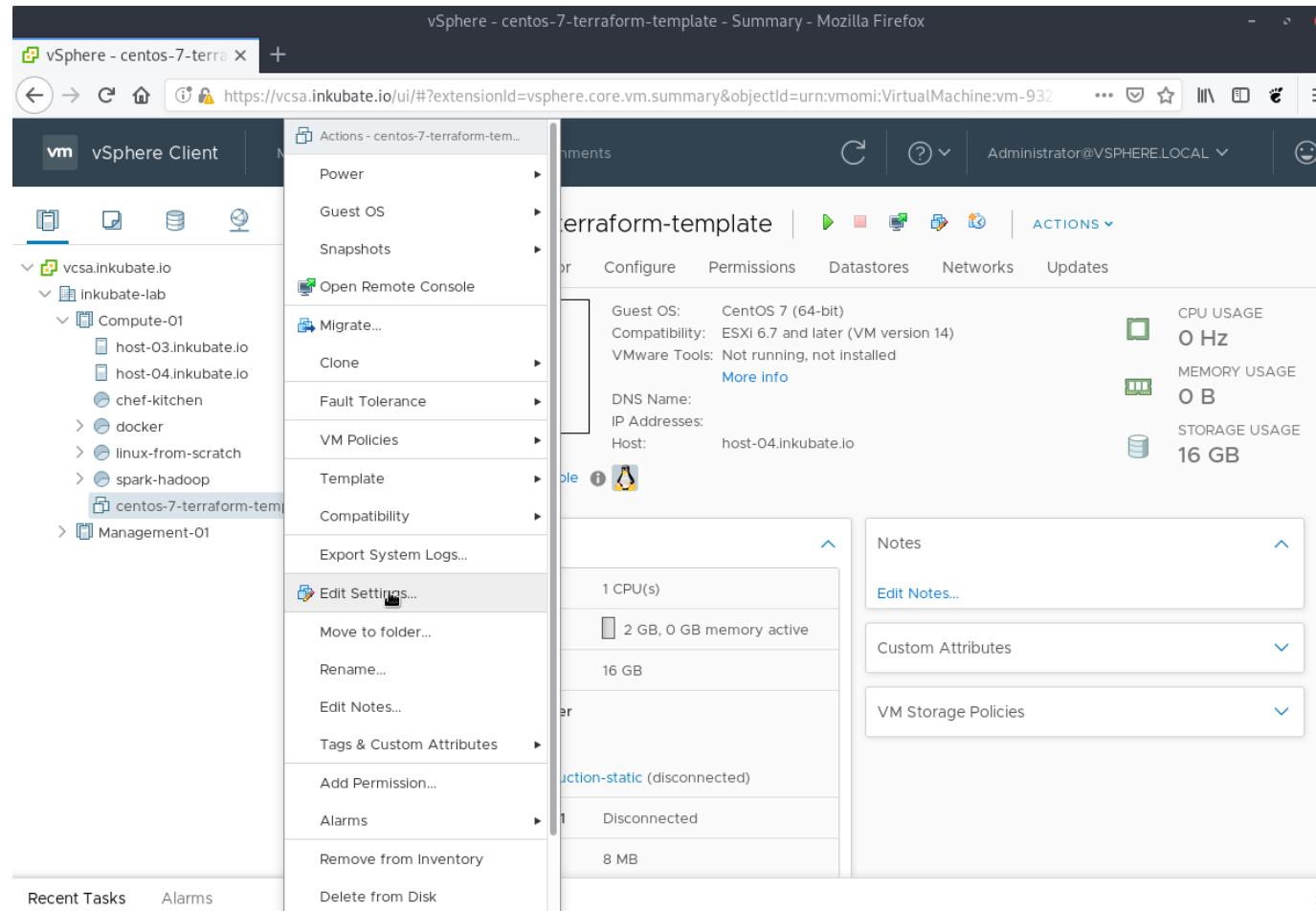
2- Remove the temporary network configuration.

```
$ sudo rm /etc/sysconfig/network-scripts/ifcfg-ens192
```

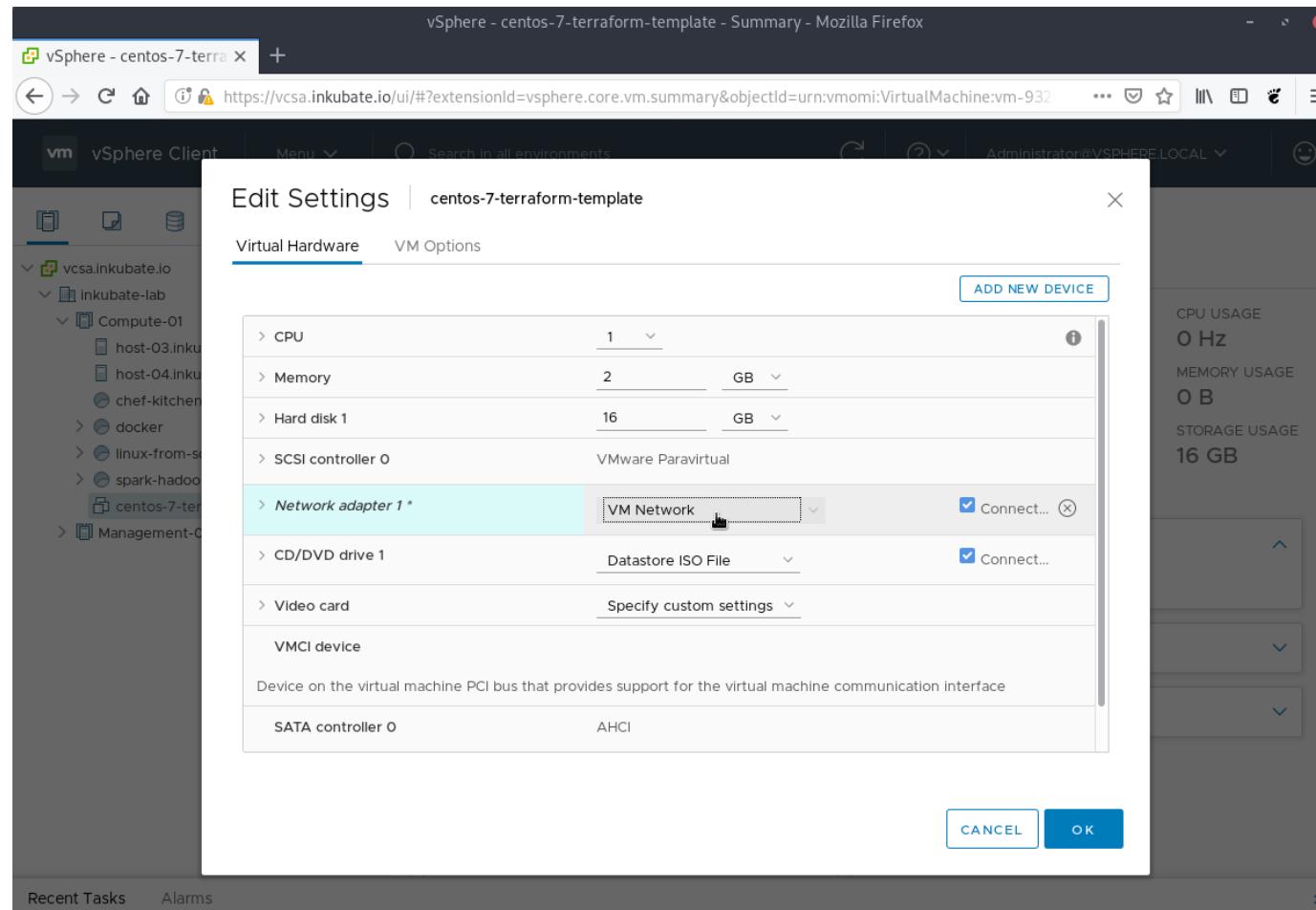
3- Power off the CentOS virtual machine.

```
$ sudo shutdown now
```

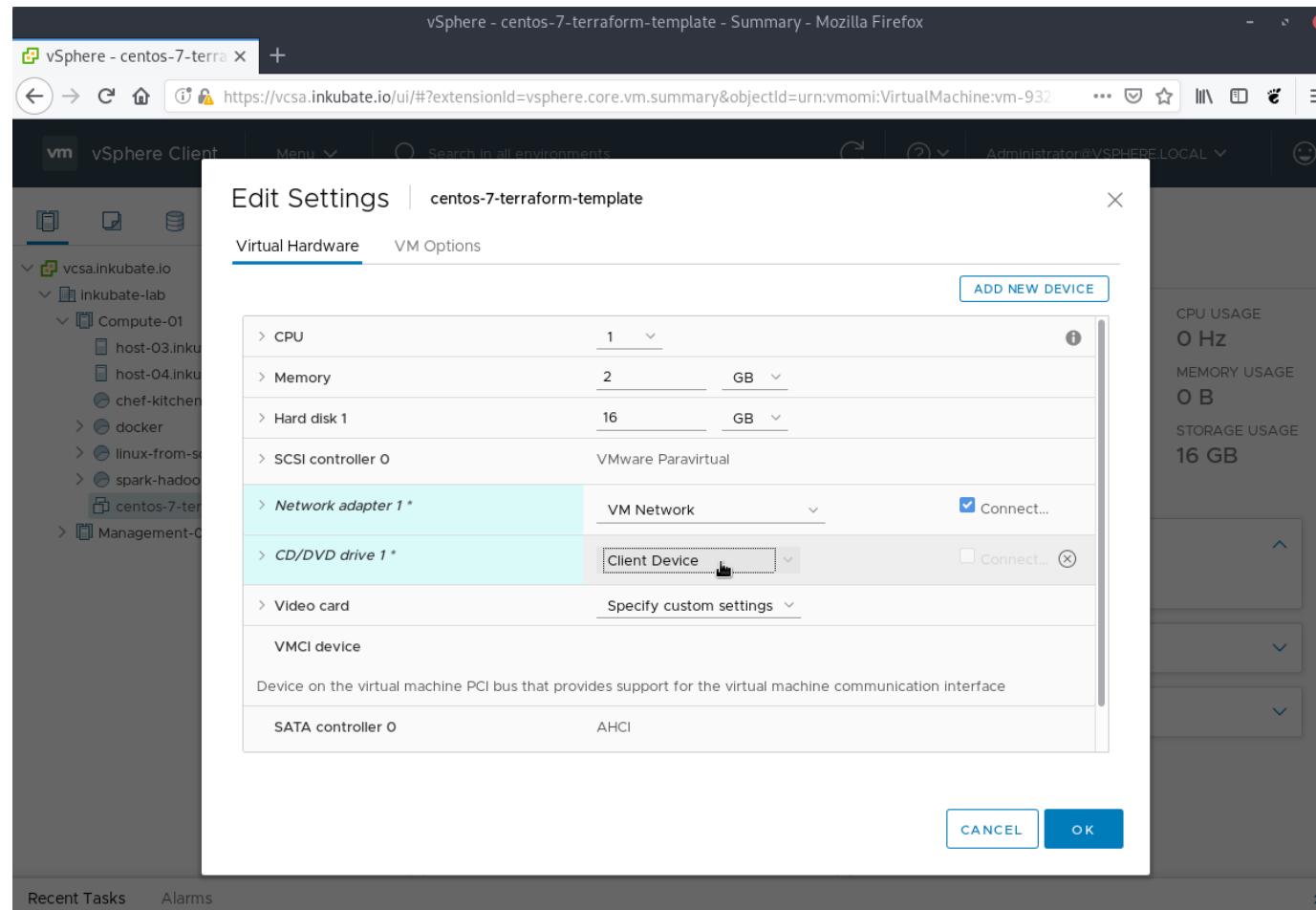
4- Edit the settings of the virtual machine.



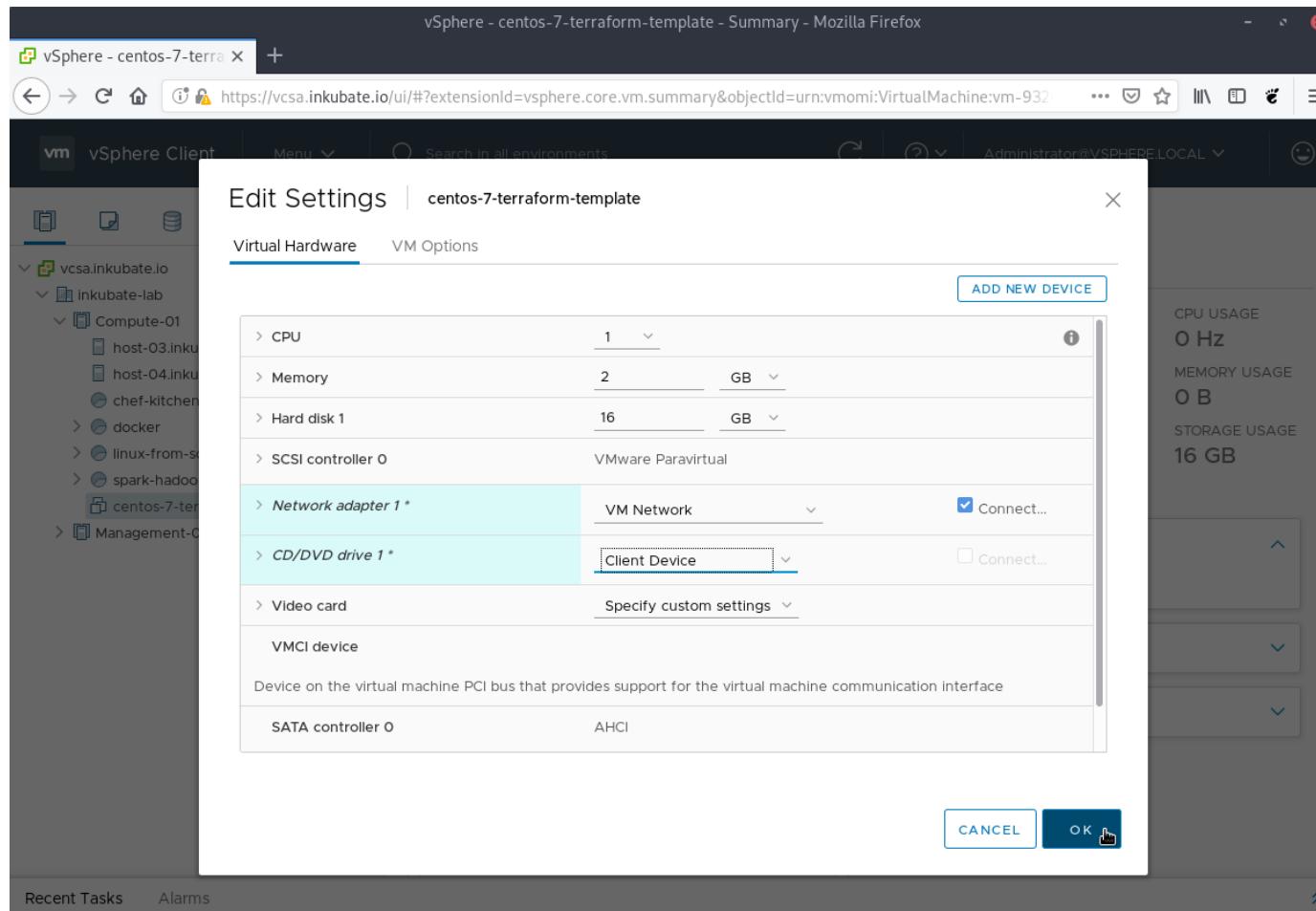
5- Set back the network card to "VM Network".



6- Set back the CD/DVD drive to "Client Device".



7- Validate the changes.



Creating the VMware vSphere template

- 1- Convert the virtual machine to a vSphere template.

vSphere - centos-7-terraform-template - Summary - Mozilla Firefox

vSphere Client

Actions - centos-7-terraform-tem...

Power

Guest OS

Snapshots

Open Remote Console

Migrate...

Clone

Fault Tolerance

VM Policies

Template

Compatibility

Export System Logs...

Edit Settings...

Move to folder...

Rename...

Edit Notes...

Tags & Custom Attributes

Add Permission...

Alarms

Remove from Inventory

Delete from Disk

vSphere - centos-7-terraform-template - Summary - Mozilla Firefox

https://vcsa.inkubate.io/ui/#?extensionId=vsphere.core.vm.summary&objectId=urn:vmomi:VirtualMachine:vm-932

All environments

Administrator@VSPHERE.LOCAL

centos-7-terraform-template

Monitor Configure Permissions Datastores Networks Updates

Powered Off

Guest OS: CentOS 7 (64-bit)
Compatibility: ESXi 6.7 and later (VM version 14)
VMware Tools: Not running, not installed
[More info](#)

DNS Name:
IP Addresses:
Host: host-04.inkubate.io

CPU USAGE: 0 Hz
MEMORY USAGE: 0 B
STORAGE USAGE: 16 GB

Console

Convert to Template

Export OVF Template

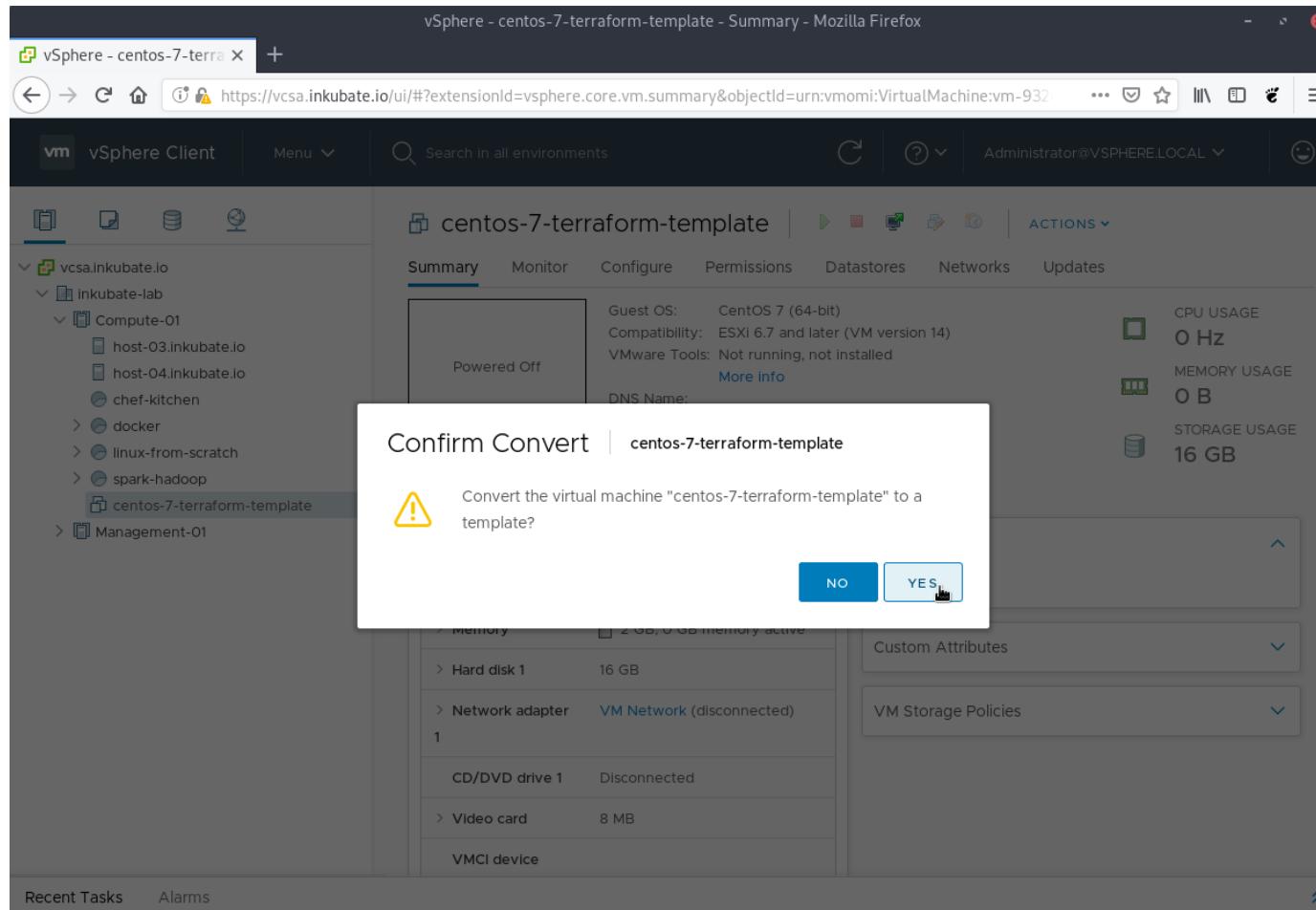
Notes

Edit Notes...

Custom Attributes

VM Storage Policies

The screenshot shows the vSphere Client interface within a Mozilla Firefox browser window. The main title bar reads 'vSphere - centos-7-terraform-template - Summary - Mozilla Firefox'. The address bar shows the URL 'https://vcsa.inkubate.io/ui/#?extensionId=vsphere.core.vm.summary&objectId=urn:vmomi:VirtualMachine:vm-932'. The left sidebar lists various hosts and clusters under 'vSphere Client' and 'vcsa.inkubate.io'. The central pane displays the summary for the 'centos-7-terraform-template' VM, which is currently powered off. Key details shown include the Guest OS (CentOS 7), Compatibility (ESXi 6.7 and later), and VMware Tools status (Not running, not installed). Resource usage statistics are provided for CPU, Memory, and Storage. A context menu is open over the VM, specifically the 'Actions' menu, which includes options like 'Convert to Template' and 'Export OVF Template'.



Testing the VMware vSphere template

Installing Terraform

This is an example on how to install Terraform on your Linux desktop. Terraform is also available for Mac OSX and Windows.

- 1- Download Terraform.

```
$ wget https://releases.hashicorp.com/terraform/0.11.14/terraform_0.11.14_linux
```

2- Unzip the archive.

```
$ unzip -e terraform_0.11.14_linux_amd64.zip
```

3- Copy the binary to your path.

```
$ sudo cp terraform /usr/bin
```

Launching a new virtual machine based on the template

1- Clone the Terraform script repository.

```
$ git clone https://github.com/sguyennet/terraform-vsphere-standalone.git
```

2- Initialise Terraform.

```
$ cd terraform-vsphere-standalone
```

```
$ terraform init
```

3- Configure the deployment (modify accordingly).

```
$ vim terraform.tfvars
=====
# VMware vSphere configuration
=====
# vCenter IP or FQDN #
vsphere_vcenter = "vcsa.inkubate.io"
# vSphere username used to deploy the infrastructure #
```

```
vsphere_user = "administrator@vsphere.local"
# Skip the verification of the vCenter SSL certificate (true/false) #
vsphere_unverified_ssl = "true"
# vSphere datacenter name where the infrastructure will be deployed #
vsphere_datacenter = "inkubate-lab"
# vSphere cluster name where the infrastructure will be deployed #
vsphere_cluster = "Compute-01"

#####
# Virtual machine parameters
#####

# The name of the virtual machine #
vm_name = "centos-standalone"
# The datastore name used to store the files of the virtual machine #
vm_datastore = "Datastore-02"
# The vSphere network name used by the virtual machine #
vm_network = "pg-inkubate-production-static"
# The netmask used to configure the network card of the virtual machine
vm_netmask = "24"
# The network gateway used by the virtual machine #
vm_gateway = "10.10.40.1"
# The DNS server used by the virtual machine #
vm_dns = "10.10.40.1"
# The domain name used by the virtual machine #
vm_domain = "inkubate.io"
# The vSphere template the virtual machine is based on #
vm_template = "centos-7-terraform-template"
# Use linked clone (true/false)
```

```
vm_linked_clone = "false"  
# The number of vCPU allocated to the virtual machine #  
vm_cpu = "1"  
# The amount of RAM allocated to the virtual machine #  
vm_ram = "1024"  
# The IP address of the virtual machine #  
vm_ip = "10.10.40.254"
```

4- Deploy the virtual machine.

```
$ terraform apply
```

5- Test to access the virtual machine.

```
$ ssh sguyennet@10.10.40.254
```

6- Destroy the virtual machine.

```
$ terraform destroy
```

Congratulations! You can now use this CentOS 7 template to deploy vSphere virtual machines with Terraform.

Tags: [Cloud](#), [Automation](#), [Terraform](#), [vSphere](#), [VMware](#), [CentOS](#)

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