



# Installing vWLC and KVM with Fedora

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This chapter contains the following topics:

- [Installing Fedora OS, on page 1](#)
- [Updating Fedora OS, on page 2](#)
- [Installing KVM and openswitch with supporting packages, on page 3](#)
- [Network Configuration, on page 3](#)
- [Installing vWLC Using Virtual Machine Manager \(VMM\), on page 5](#)
- [Accessing vWLC's Console, on page 12](#)

## Installing Fedora OS

To install Fedora OS, perform the following steps:

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**Step 1** Install Fedora 21 or later. Click the following link to download Fedora.

<https://getfedora.org/en/server/download/>

**Step 2** After installing Fedora, configure IP address to go to internet.

In this scenario, two dedicated Linux interfaces/ports are used for vWLC.

**Step 3** Find out your interface using **ifconfig**.

**Example**

- 1<sup>st</sup> Interface—for uplink (service-port of WLC); no IP address is required to this interface but should be connected and up.
- 2<sup>nd</sup> Interface—for WLC Management interface; no IP address is required to this interface but should be connected and up.
- 3<sup>rd</sup> or 4<sup>th</sup> Interface—for Linux accessibility; provide IP address to this interface, so that there is a network connectivity to the Linux box.

**Note** By default, KVM uses first interface as service-port for vWLC.

**Step 4** Configure IP address to the 3<sup>rd</sup> or 4<sup>th</sup> interface to access Linux and access internet to get update.

```
vi /etc/sysconfig/network-scripts/ifcfg-enp2s0f3
```

**Note** You will need to change BOOTPROTO from DHCP to static and add IPADDR, NETMASK, BROADCAST, and NETWORK variables. It is recommended to choose the static IP address.

### Example

```
NM_CONTROLLED="yes"
BOOTPROTO=static
DEVICE=eth1
ONBOOT=yes
IPADDR=192.168.8.248
NETMASK=255.255.255.0
BROADCAST=192.168.8.255
NETWORK=192.168.8.0
GATEWAY=192.168.8.1
TYPE=Ethernet
PEERDNS=no
```

**Step 5** Save the file.

OR

```
ifconfig <interface_name> <IP_address>
ifconfig <interface_name> netmask <netmask_address>
ifconfig <interface_name> broadcast <broadcast_address>
```

OR

```
ifconfig <interface_name> <IP_address> netmask <netmask_address> broadcast <broadcast_address>
```

**Note** Configure proxy and DNS information if required. Make sure internet is accessible after configuration.

## Updating Fedora OS

To update Fedora OS after installation, perform the following steps:

**Step 1** Update Fedora OS:

```
yum install update
```

**Step 2** Install GUI:

```
yum install @gnome-desktop -y
```

**Step 3** Install VNC server -- <http://www.namhuy.net/3134/install-vnc-server-on-fedora-20.html>:

```
yum install tigervnc-server -y
```

**Step 4** Install x11:

```
yum groupinstall "X Software Development"
```

# Installing KVM and openvswitch with supporting packages

```
yum install -y @standard @virtualization openvswitch
systemctl enable network.service
systemctl start network.service
systemctl enable openvswitch.service
systemctl start openvswitch.service
```

## Verifying the Installation of KVM

```
lsmod | grep kvm
```

Example output on Intel processor:

```
[root@localhost system]# lsmod | grep kvm
kvm_intel          147785  0
kvm                464964  1 kvm_intel
```

# Network Configuration

## Creating a Bridge and Mapping it to Port (Ethernet Interface)

```
ovs-vsctl add-br ov_10nw
ovs-vsctl add-port ov_10nw enp2s0f0
ovs-vsctl add-br ov_9nw
ovs-vsctl add-port ov_9nw en
```

The bridge name must be the same as created in the XML file.

## Viewing the Bridge Mapping

```
ovs-vsctl show
```

### Example

```
[root@localhost ~]# ovs-vsctl show
099e8b7e-bf00-4071-be62-ec55f9b543cc
    Bridge "ov_9nw"
        Port "ov_9nw"
            Interface "ov_9nw"
                type: internal
        Port "enp2s0f1"
            Interface "enp2s0f1"
    Bridge "ov_10nw"
        Port "ov_10nw"
            Interface "ov_10nw"
                type: internal
        Port "enp2s0f0"
            Interface "enp2s0f0"
    ovs_version: "2.3.1-git3282e51"
```

## Creating XML Files

Create two XML files; one for service-nw (10nw) and the other for management (9nw).

### Example

```
10nw_eth0_ov.xml
9nw_eth1_ov.xml
```

Both XML files contain VLAN information based on the network, or based on what you want to allow.

### Example: To Allow All VLANs

```
<network>
  <name>10-nw</name>
  <forward mode='bridge' />
  <bridge name='ov_10nw' />
  <virtualport type='openvswitch' />
  <portgroup name='vlan-any' default='yes'>
    </portgroup>
</network>
```

The bridge name must be the same as created during "ovs-vsctl" command.

If only specific VLANs need to be allowed, use the following format.

```
<network>
  <name>ov-nw</name>
  <forward mode='bridge' />
  <bridge name='bridge_1' />
  <virtualport type='openvswitch' />
  <portgroup name='all_vlans' default='yes'>
    </portgroup>
  <portgroup name='vlan-152-untagged'>
    <vlan>
      <vlan mode='native-untagged' />
      <tag id='152' />
    </vlan>
  </portgroup>
  <portgroup name='vlan-153'>
    <vlan>
      <tag id='153' />
    </vlan>
  </portgroup>
  <portgroup name='two-vlan'>
    <vlan trunk='yes'>
      <tag id='152' />
      <tag id='153' />
    </vlan>
  </portgroup>
</network>
```

In the above configuration:

- portgroup name='all\_vlans' → allows all VLANs.
- portgroup name='vlan-152-untagged' → allows only untagged VLAN that is 152.
- portgroup name='vlan-153' → allows only 153 VLAN.
- portgroup name='two-vlan' → allows only two VLANs, that is, 152 and 153.

### Allowing CDP Packets to Forward from Open vSwitch

```
ovs-vsctl set bridge ov_9nw other-config:forward-bpdu=true
```

### Viewing the Virtual Network

```
virsh net-list --all
```

### Deleting the Default Network

```
virsh net-undefine default
```

### Creating Virtual Network

```
virsh net-define <xml_file_name>
```

### Viewing the Virtual Network

```
virsh net-list --all
```

### Starting the Virtual Network

```
virsh net-start <network_name_that is in the list>
```

### Example

```
[root@localhost ~]# virsh net-list --all
Name                State      Autostart   Persistent
-----
default             inactive  no          yes

[root@localhost ~]# virsh net-undefine default
Network default has been undefined

[root@localhost ~]# virsh net-define 10nw_eth0_ov.xml
Network 10-nw defined from 10nw_eth0_ov.xml

[root@localhost ~]# virsh net-define 9nw_eth1_ov.xml
Network 9-nw defined from 9nw_eth1_ov.xml

[root@localhost ~]# virsh net-list --all
Name                State      Autostart   Persistent
-----
10-nw               inactive  no          yes
9-nw                inactive  no          yes

[root@localhost ~]# virsh net-start 10-nw
Network 10-nw started

[root@localhost ~]#
[root@localhost ~]# virsh net-start 9-nw
Network 9-nw started

[root@localhost ~]# virsh net-list --all
Name                State      Autostart   Persistent
-----
10-nw               active     no          yes
9-nw                active     no          yes
```

## Installing vWLC Using Virtual Machine Manager (VMM)

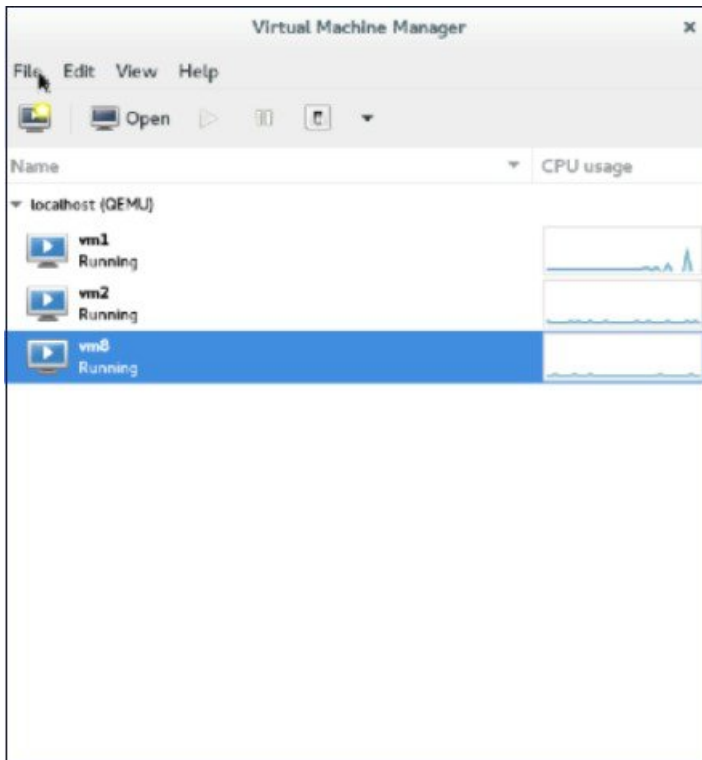
To install vWLC using VMM in Fedora, perform the following steps:



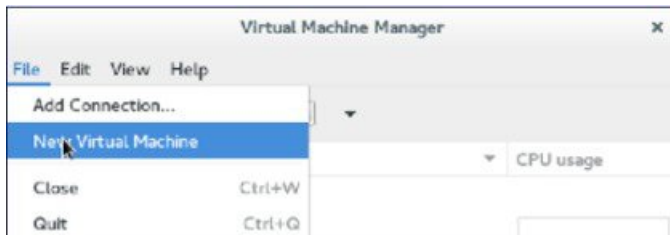
**Note** Console to Fedora. GUI is required for VMM.

**Step 1** Open the terminal (command prompt).

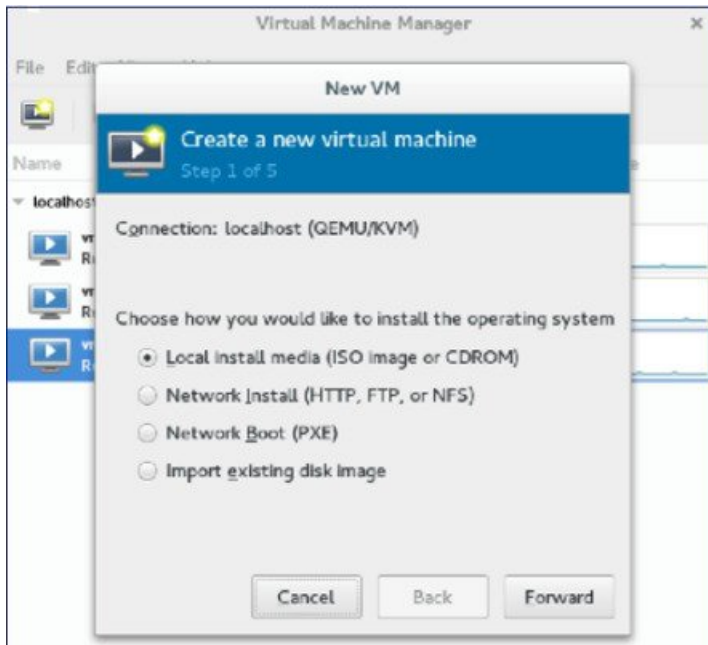
- Step 2** Execute the command **virt-manager**.  
The Virt Manager (VMM) pop-up window appears.



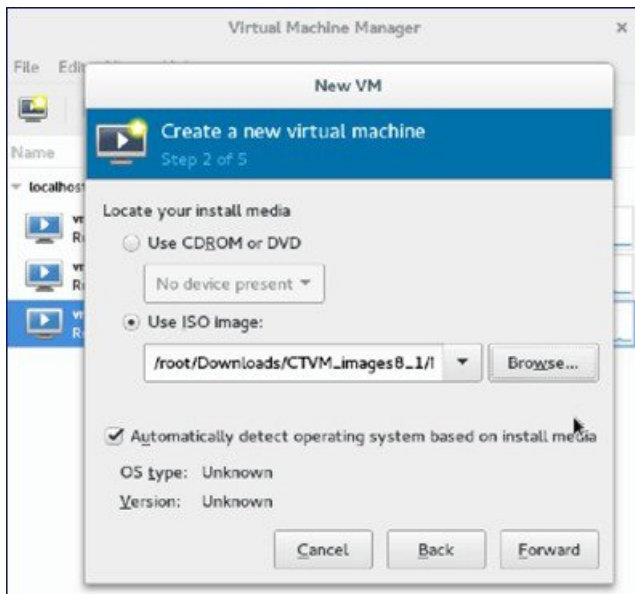
- Step 3** Create a new virtual machine (VM).



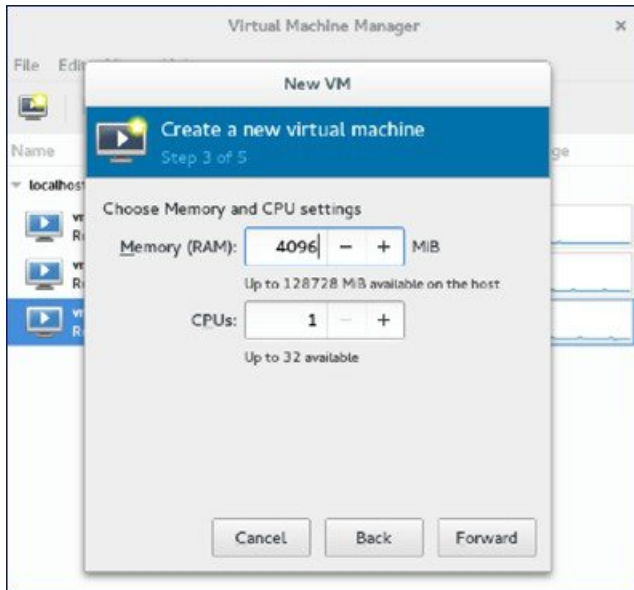
- Step 4** Select the path.



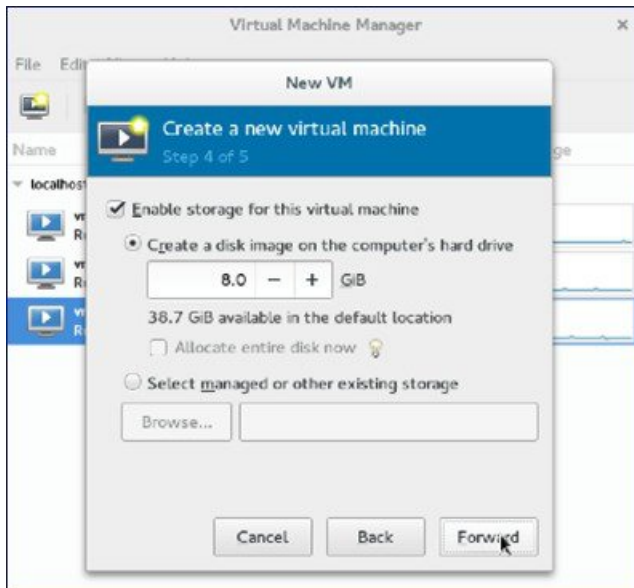
**Step 5** Select the ISO file of vWLC.



**Step 6** Select the memory and CPU.

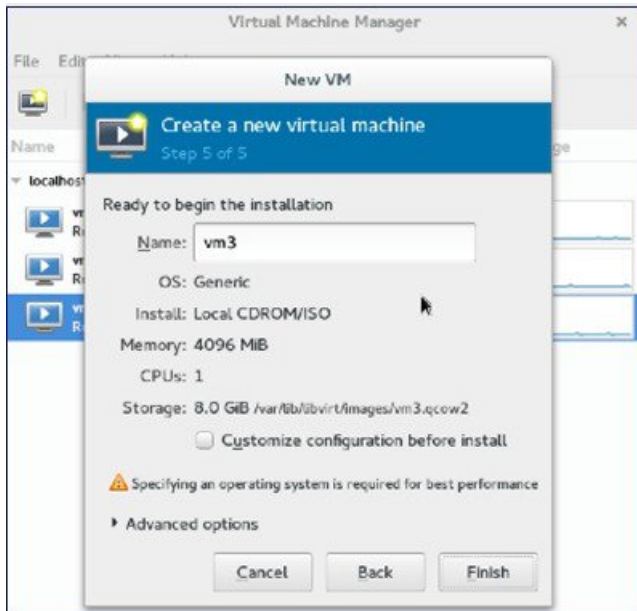


**Step 7** Select the disk space.

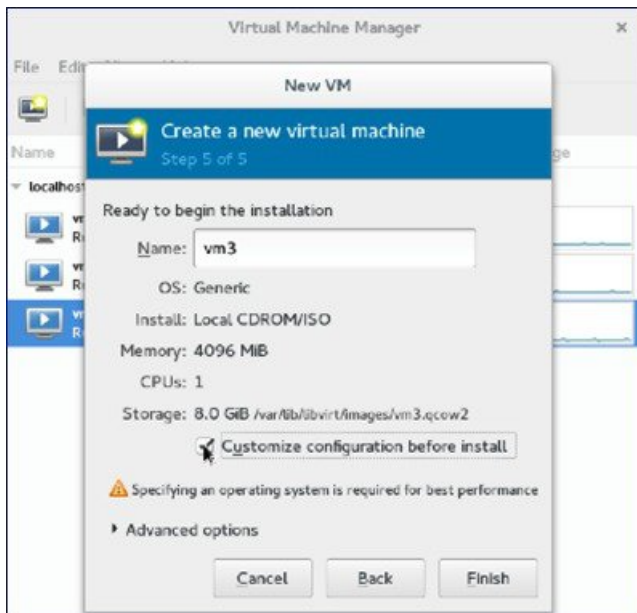


**Step 8** Name the VM.

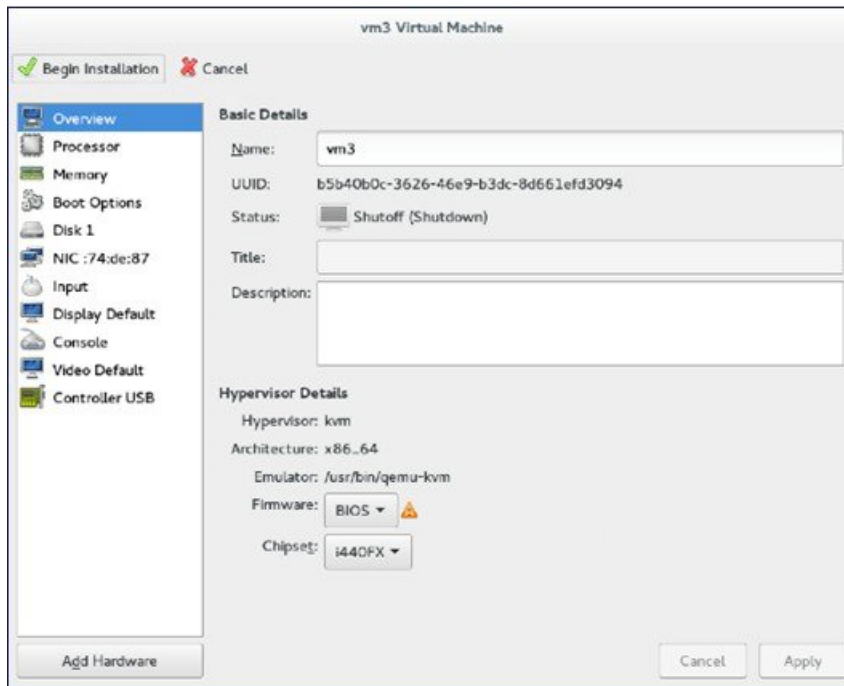




**Step 9** Check the **Customize configuration before install** check box and then click **Finish**. (This helps to configure other options)



**Step 10** Click **Add Hardware**.



The Add New Virtual Hardware window appears.

This window helps you to configure service port, management interface, and serial connection:

a. Click **Network** and do the following:

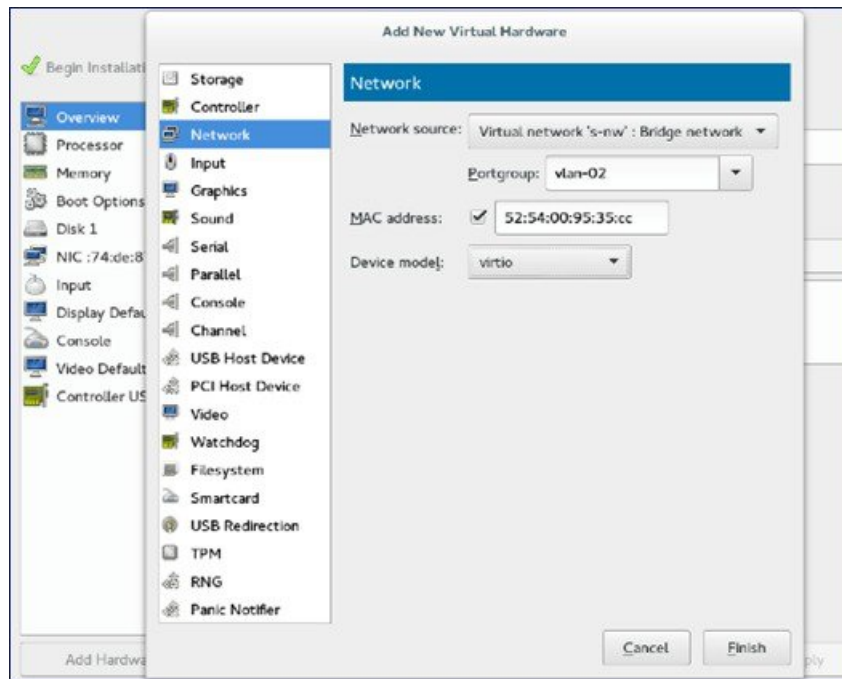
- From the **Network source** drop-down list, choose the virtual network. (It is recommended to select the virtual network of service port of vWLC)
- From the **Portgroup** drop-down list, choose the portgroup configured in xml if there are many.
- From the **Device model** drop-down list, choose **virtio** (only this is supported as of now) and then click **Finish**.

b. Repeat again by selecting **Add Hardware > Network** for virtual network of management interface.

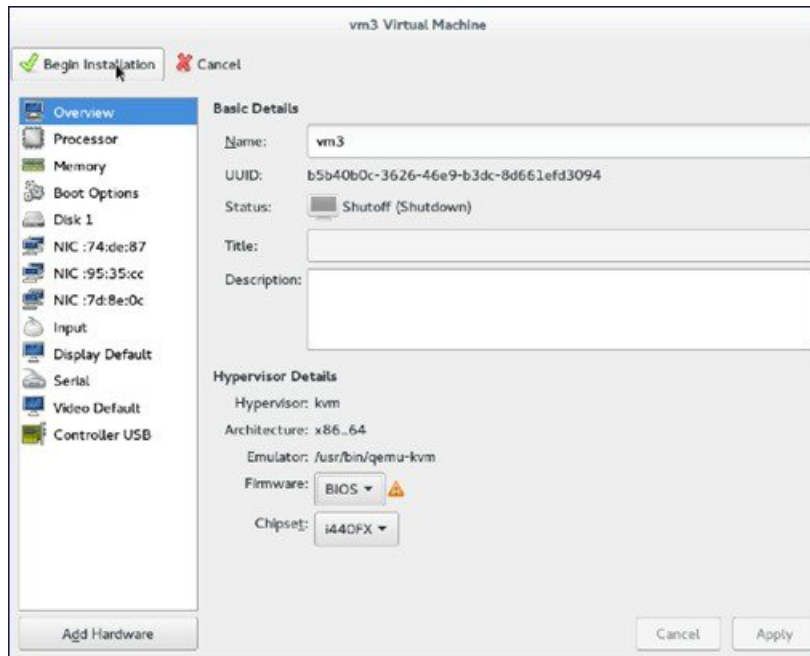
**Note** vWLC supports only two physical ports; one for service port and the other for management/dynamic interface. The management interface is mapped to management/dynamic interface.

c. Click **Add Hardware > Serial** and then click **Finish**.

**Note** Fedora 21 has "Virt-Manager" version 1.1, which has the **portgroup** option. Older version does not have it.



**Step 11** Click **Begin Installation**.



**Step 12** Wait for WLC prompt for initial configuration.

# Accessing vWLC's Console

To access vWLC's console, perform the following steps:

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**Step 1** From the terminal, execute the following command:

```
virsh console <vm_name eg. vm1>
```

**Step 2** Reboot vWLC through virt-manager.

**Note** To find out the vnet mapped to vWLC, execute the following command on vWLC:

```
show interface detail management
```

Match the last six octet with "ifconfig" output.

This is how, you get your targeted "vnet", if there are multiple vWLCs configured.

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