

# OPNFV MONTREAL LAB INFO/ACCESS WORKBOOK

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## LAB SECTION

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## ▶ EXAMPLES / TOOLS Section:

- ▶ [FUEL GUI Port Forward](#)
- ▶ [VIC Client Port Forward](#)
- ▶ [Manually Create Ubi OStack Environment](#)

# TABLE OF COTENTS

- ▶ This document will outline the following information:
  - ▶ Overall description of the Lab layout and setup
  - ▶ LLD (One-Pager) of each Blade/Lab
  - ▶ List of Tools and applications you will need
  - ▶ At the bottom are example slides of common activities you will do connecting and working in the lab (port forward, deploy, etc)

# OVERVIEW

- ▶ The Montreal Lab is a HP C6000 Chassis (16Blade) enclosure with 2 Mezzanine cards (4 NICs per Blade). There are two V670's backing the enclosure
- ▶ Nested Environments occupy a complete blade and run either:
  - ▶ Ubuntu 14.10, Centos 7 or ESXi 5.5 as base hypervisor and contain:
    - ▶ Fuel VM
    - ▶ Compute and Control VM
    - ▶ Virtual Router VM (quagga or vyatta)
      - ▶ *Since we run the vSwitch in Promiscuous mode and not bound to a NIC, we use the VR to ensure Network L2 Barrier. As well, if a User wants to make a Tenant or Compute/Control interface Public – the facility is there at will*

# PREAMBLE / INFO

- ▶ You will need the following setup in order to access the lab:
  - ▶ 1<sup>st</sup> – Provide SSH key to Jonas, Daniel, Erik R or other Sudoer to get an account created on the SSH GW.
  - ▶ Once you have your account, you access the SSH GW via the IP provided in the mails sent and from there you can ssh to either your FUEL Node or your Router, etc
  - ▶ Port Forwarding is much better than using Firefox on the SSH GW
  - ▶ You should also be ready to install / use
    - ▶ 1 virtual machine with Ubuntu (for virsh, libvirt-mgr etc if you want local based access)
    - ▶ Vmware VIC – 5.5 update 1 (get it from vmware.com)
    - ▶ Firefox (it works better for ILO frames than Chrome or IE)
    - ▶ Xming, Exceed or some other Xdisplay tool

# ACCESS INFORMATION

- ▶ Some common users/passwords you will typically use:
  - ▶ FUEL GUI – admin/admin
  - ▶ FUEL (and COMPUTE/CONTROL) SSH – root/r00tme
  - ▶ vSphere ESXI – root/systemabc
  - ▶ Ubuntu Base OS (Libvirt Env) root/systemabc
  - ▶ Vyatta Routers – vyatta/vyatta

# PASSWORD QUICK REFERENCE



## ▶ **BLADE 9 Layout Information**

ILO IP – 10.118.32.208 (reachable via OA @ 10.118.32.197)

### ▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ **Logical Connections:**

BL9\_OSTACK\_NET – Bound to VMNIC4 (PRIVATE L2VLAN ON PHYSICAL-SWITCH)

Carries Admin(PXE), Public (Vlan 109), Storage (vlan 809), Mgmt (vlan 909)

BL9\_ENV1\_NET – Bound to NO NIC (Internal to this blade only)

Carries Private (Tenant) – VLAN 1000-1030

### ▶ **Routable Addresses:**

ESXi VIC – 10.118.34.195 - root/systemabc

Virtual Router – 10.118.34.196 – vyatta/vyatta

Blade9-FUEL – 10.118.34.211 – admin/admin

### ▶ **Network Assignments:**

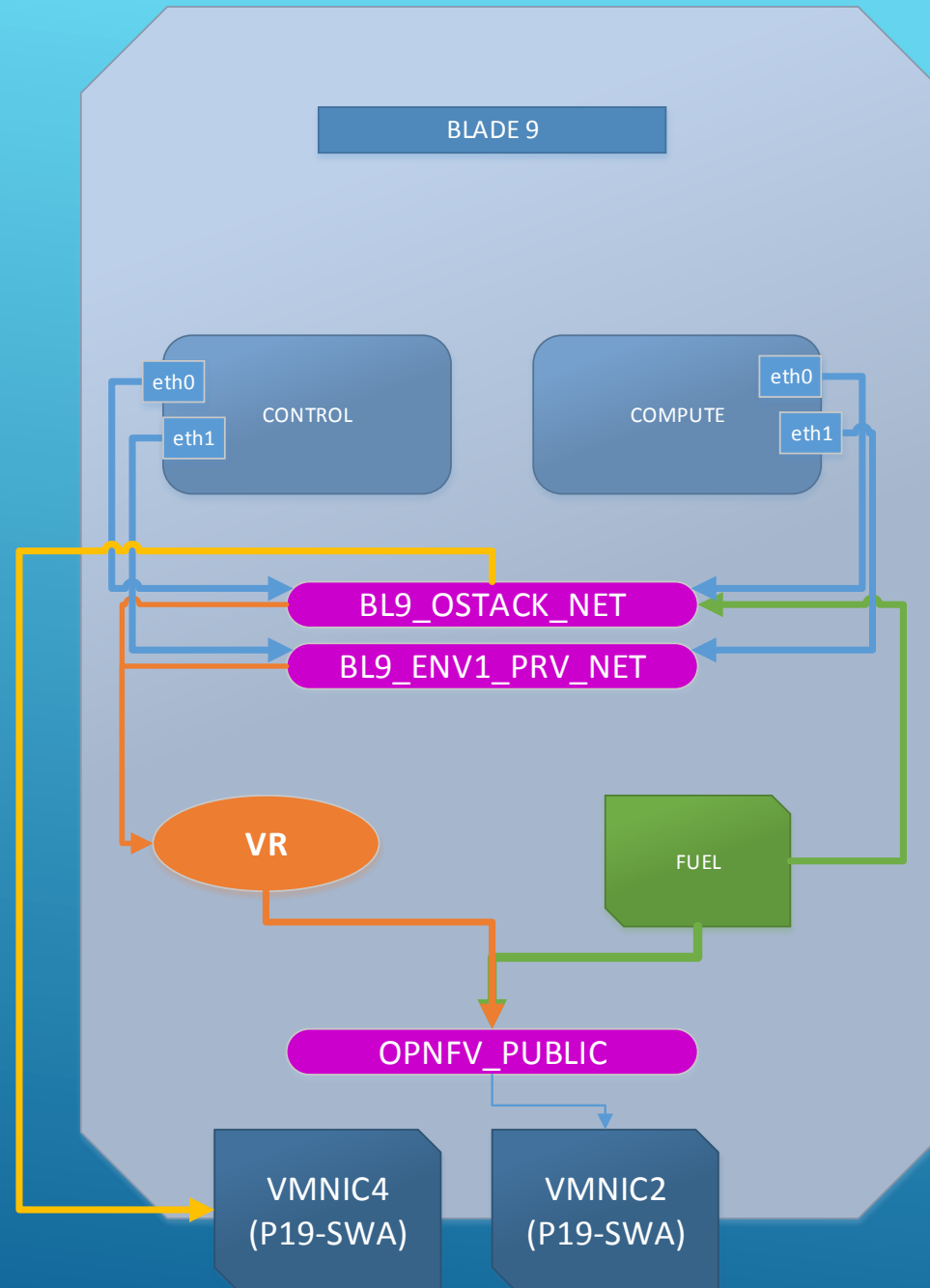
Public – 172.16.9.0/24

Management – 192.168.0.0/24

Storage – 192.168.1.0/24

# BLD9 IP / VLAN INFORMATION

# BL9 LOGICAL CONNECT DIAGRAM





▶ **BLADE 10 Layout Information (JENKINS-BUILD-SERVER)**

ILO IP – 10.118.32.208 (reachable via OA @ 10.118.32.197)

▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

▶ **Logical Connections:**

BL9\_OSTACK\_NET – Bound to VMNIC4 (PRIVATE L2VLAN ON PHYSICAL-SWITCH)

Carries Admin(PXE), Public (Vlan 109), Storage (vlan 809), Mgmt (vlan 909)

BL9\_ENV1\_NET – Bound to NO NIC (Internal to this blade only)

Carries Private (Tenant) – VLAN 1000-1030

▶ **Routable Addresses:**

ESXi VIC - 10.118.34.195 - root/systemabc

Virtual Router – 10.118.34.196 – vyatta/vyatta

Blade9-FUEL – 10.118.34.211 – admin/admin

▶ **Network Assignments:**

Public – 172.16.9.0/24

Management – 192.168.0.0/24

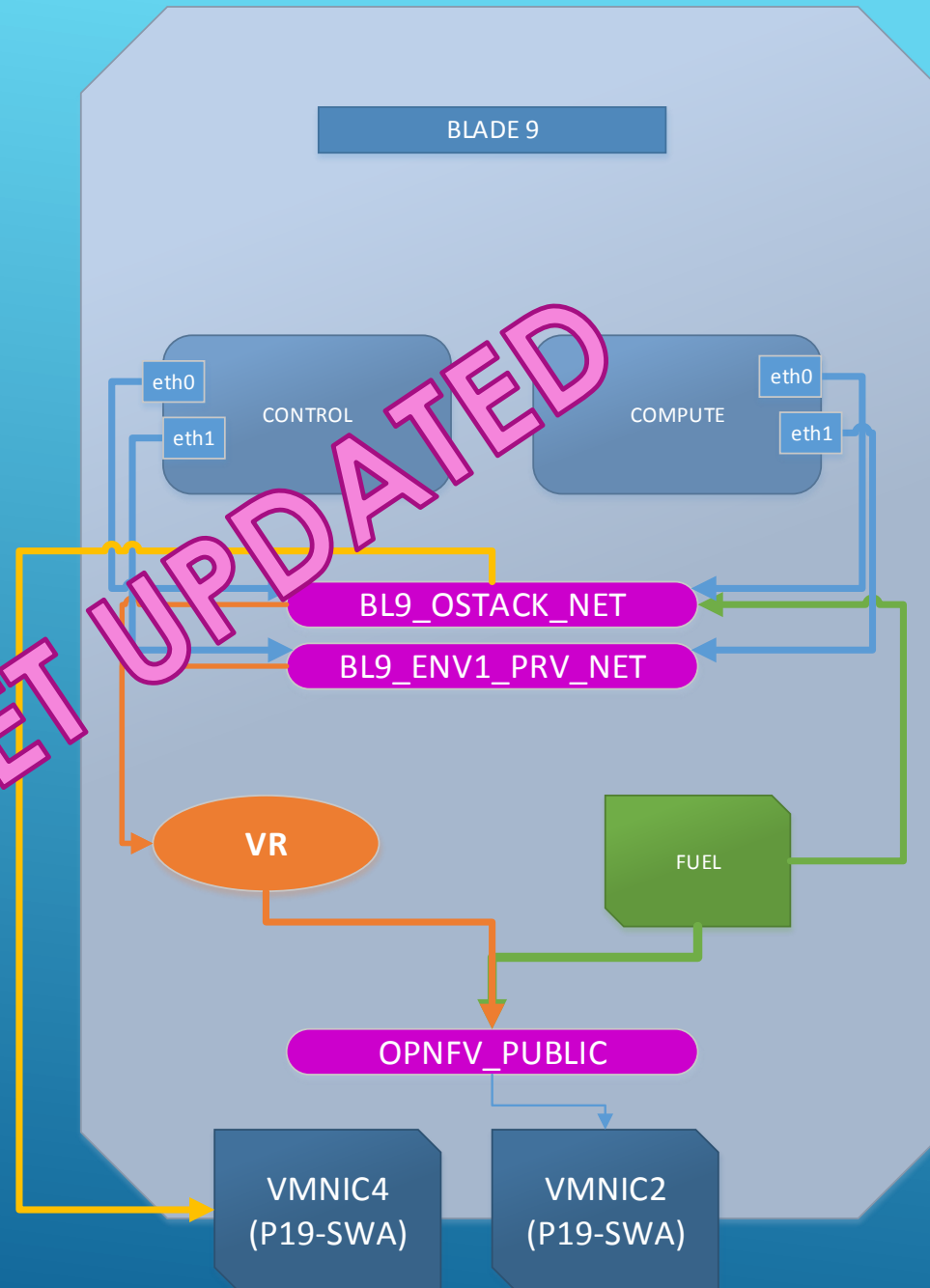
Storage – 192.168.1.0/24

NOT YET UPDATED

BLD10 IP / VLAN INFORMATION

# BL10 LOGICAL CONNECT DIAGRAM

NOT YET UPDATED



## ▶ **BLADE 11 Layout Information**

ILO IP – 10.118.32.209 (reachable via OA @ 10.118.32.197 only)

### ▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ **Logical Connections:**

BL11\_OSTACK\_NET – Bound to VMNIC4 (PRIVATE L2VLAN ON PHYSICAL-SWITCH)

Carries Admin(PXE), Public (Vlan 111), Storage (vlan 811), Mgmt (vlan 911)

BL11\_ENV1\_NET – Bound to NO NIC (Internal to this blade only)

Carries Private (Tenant) – VLAN 1031-1060

### ▶ **Routable Addresses:**

ESXi VIC – 10.118.34.199 - root/systemabc

Virtual Router – 10.118.34.200 – vyatta/vyatta

Blade9-FUEL – 10.118.34.212 – admin/admin

### ▶ **Network Assignments:**

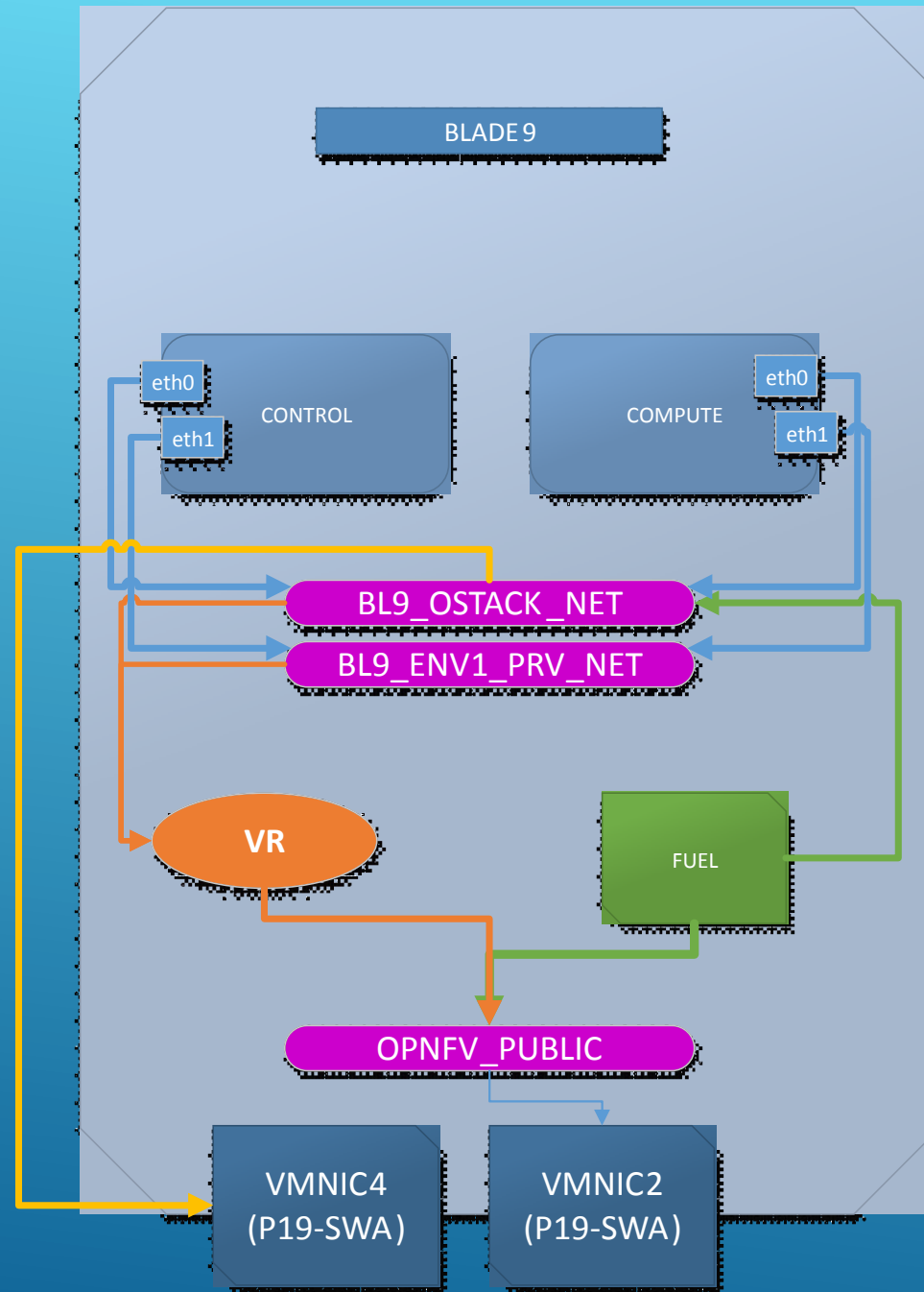
Public – 172.16.11.0/24

Management – 192.168.0.0/24

Storage – 192.168.1.0/24

# BLD11 IP / VLAN INFORMATION

# BL11 LOGICAL CONNECT DIAGRAM



## ▶ **BLADE 12 Layout Information**

ILO IP – 10.118.32.210 (reachable via OA @ 10.118.32.197)

### ▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ **Logical Connections:**

BL12\_OSTACK\_NET – Bound to VMNIC4 (PRIVATE L2VLAN ON PHYSICAL-SWITCH)

Carries Admin(PXE), Public (Vlan 109), Storage (vlan 809), Mgmt (vlan 909)

BL12\_ENV1\_NET – Bound to NO NIC (Internal to this blade only)

Carries Private (Tenant) – VLAN 1000-1030

### ▶ **Routable Addresses:**

ESXi VIC – 10.118.34.201 - root/systemabc

Virtual Router – 10.118.34.202 – vyatta/vyatta

Blade12-FUEL – 10.118.34.213 – admin/admin

### ▶ **Network Assignments:**

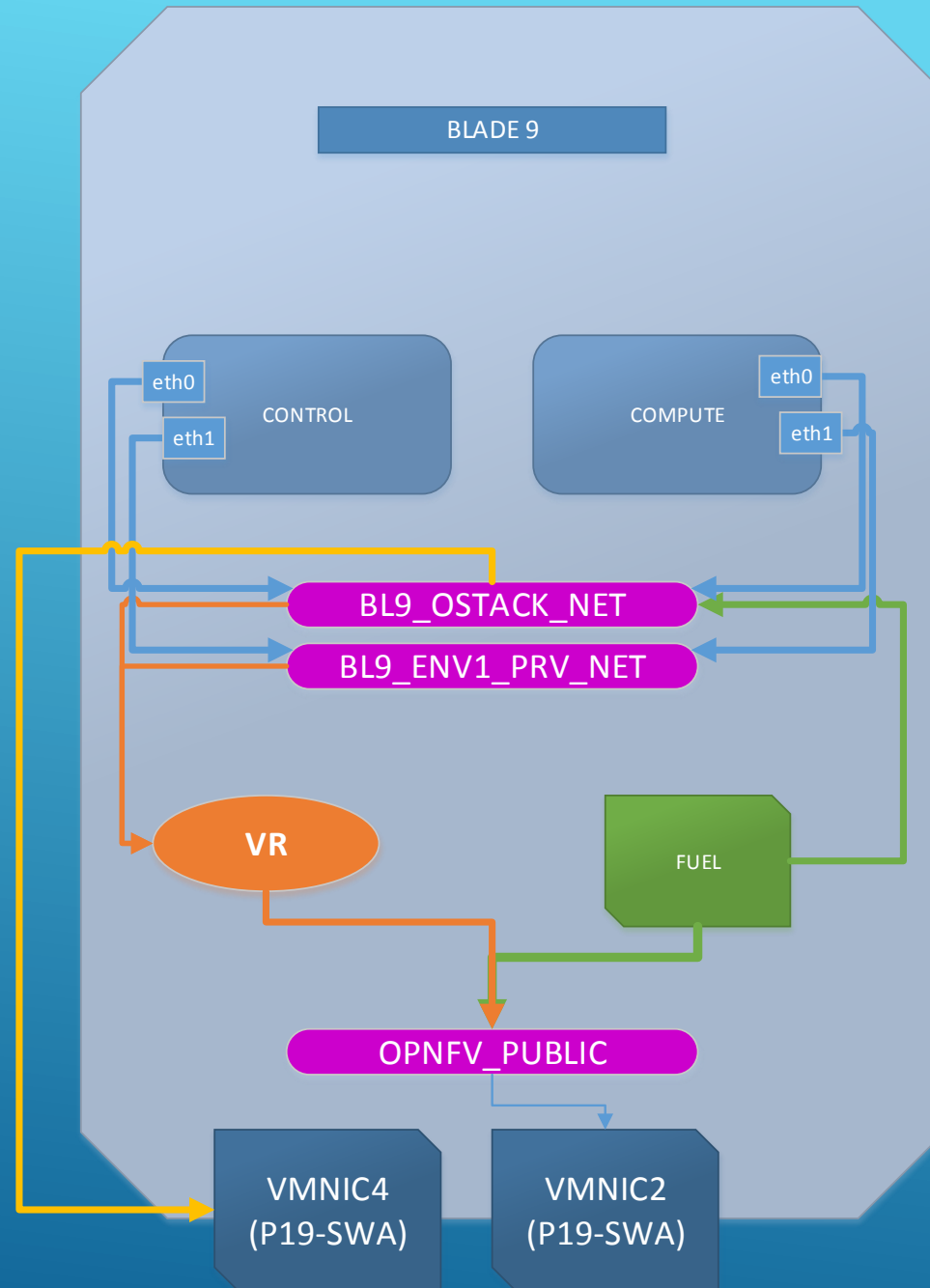
Public – 172.16.12.0/24

Management – 192.168.0.0/24

Storage – 192.168.1.0/24

# BLD12 IP / VLAN INFORMATION

# BL12 LOGICAL CONNECT DIAGRAM



## ▶ BLADE 13 Layout Information

ILO IP – 10.118.32.210 (reachable via OA @ 10.118.32.197)

### ▶ Physical Connections:

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ Logical Connections:

STEFAN BERG TO PROVIDE INPUT

#### Routable Addresses:

Ubuntu Base OS - 10.118.34.203 - user/systemabc

Blade13-FUEL – 10.118.34.213 – admin/admin

### ▶ Network Assignments:

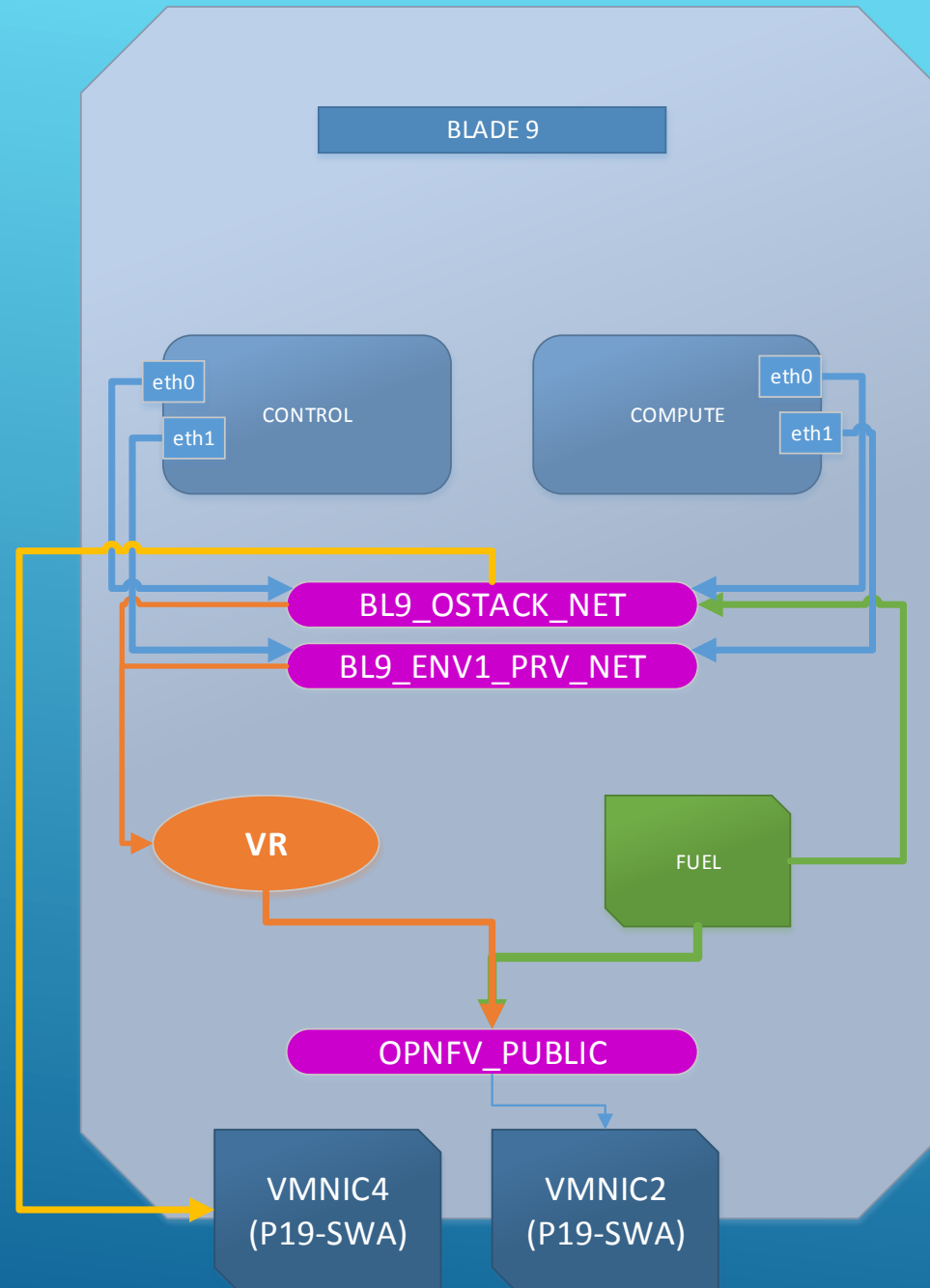
Public – 172.16.13.0/24

Management – 192.168.0.0/24

Storage – 192.168.1.0/24

# BLD13 IP / VLAN INFORMATION

# BL13 LOGICAL CONNECT DIAGRAM





## ▶ **BLADE 13 Layout Information**

ILO IP – 10.118.32.212 (reachable via OA @ 10.118.32.197)

### ▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ **Logical Connections:**

BL9\_OSTACK\_NET – Bound to VMNIC4 (PRIVATE L2VLAN ON PHYSICAL-SWITCH)

Carries Admin(PXE), Public (Vlan 109), Storage (vlan 809), Mgmt (vlan 909)

BL9\_ENV1\_NET – Bound to NO NIC (Internal to this blade only)

Carries Private (Tenant) – VLAN 1000-1030

### ▶ **Routable Addresses:**

Ubuntu Base OS – 10.118.34.205 – root/systemabc

Blade14-FUEL – 10.118.34.214 – admin/admin

### ▶ **Network Assignments:**

Public – 172.16.14.0/24

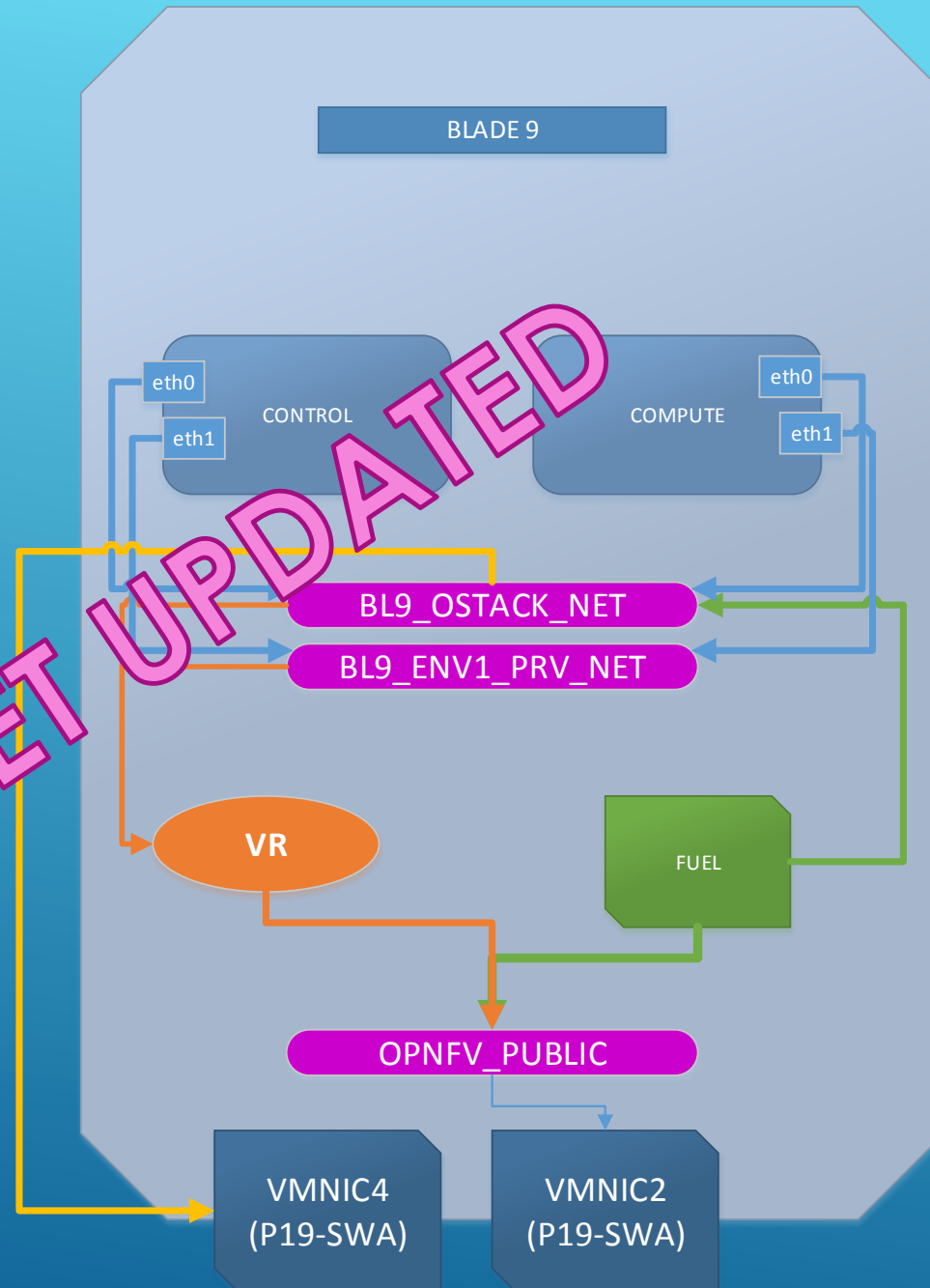
Management – 192.168.0.0/24

Storage – 192.168.1.0/24

# BLD14 IP / VLAN INFORMATION

# BL14 LOGICAL CONNECT DIAGRAM

NOT YET UPDATED



## ▶ **BLADE 15 Layout Information**

ILO IP – 10.118.32.213 (reachable via OA @ 10.118.32.197)

### ▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ **Logical Connections:**

STEFAN BERG TO PROVIDE INPUT

### ▶ **Routable Addresses:**

Ubuntu Base OS - 10.118.34.207 - root/systemabc

Blade9-FUEL – 10.118.34.214 – admin/admin

### ▶ **Network Assignments:**

Public – 172.16.13.0/24

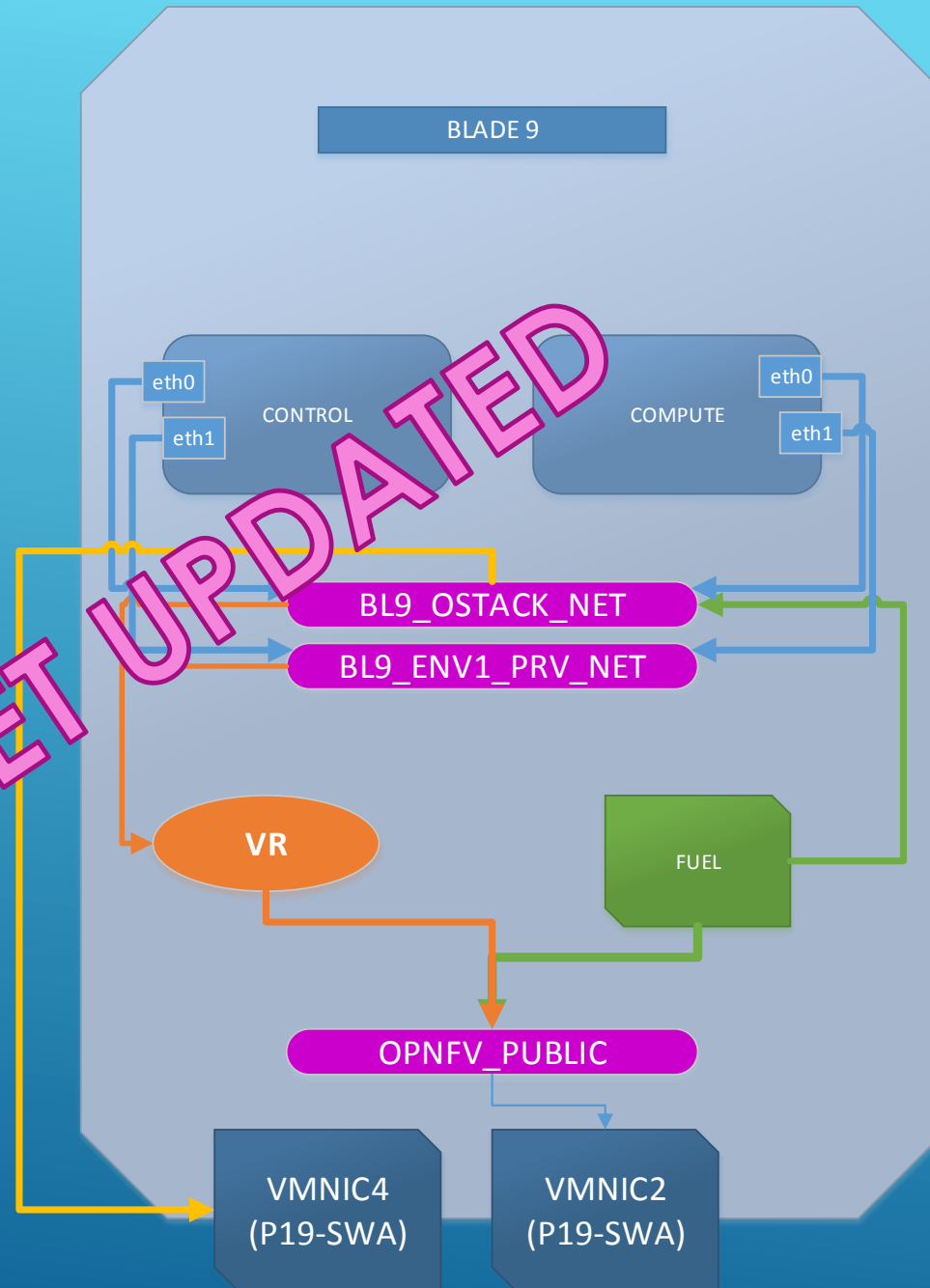
Management – 192.168.0.0/24

Storage – 192.168.1.0/24

# BLD15 IP / VLAN INFORMATION

# BL15 LOGICAL CONNECT DIAGRAM

NOT YET UPDATED



## ▶ **BLADE 16 Layout Information - WEB SERVER / INTERNET REPO**

ILO IP – 10.118.32.213 (reachable via OA @ 10.118.32.197)

### ▶ **Physical Connections:**

VMNIC2 (Bay3) -> Port 19SWA, VMNIC (Bay4) -> Port SWB

\*note: FT/HA/Bonding Not Enabled

### ▶ **Logical Connections:**

BL9\_OSTACK\_NET – Bound to VMNIC4 (PRIVATE L2VLAN ON PHYSICAL-SWITCH)

Carries Admin(PXE), Public (Vlan 109), Storage (vlan 809), Mgmt (vlan 909)

BL9\_ENV1\_NET – Bound to NO NIC (Internal to this blade only)

Carries Private (Tenant) – VLAN 1000-1030

### ▶ **Routable Addresses:**

Ubuntu Base OS - 10.118.34.207 - root/systemabc

Virtual Router – 10.118.34.208 – vyatta/vyatta

Blade9-FUEL – 10.118.34.214 – admin/admin

### ▶ **Network Assignments:**

Public – 172.16.13.0/24

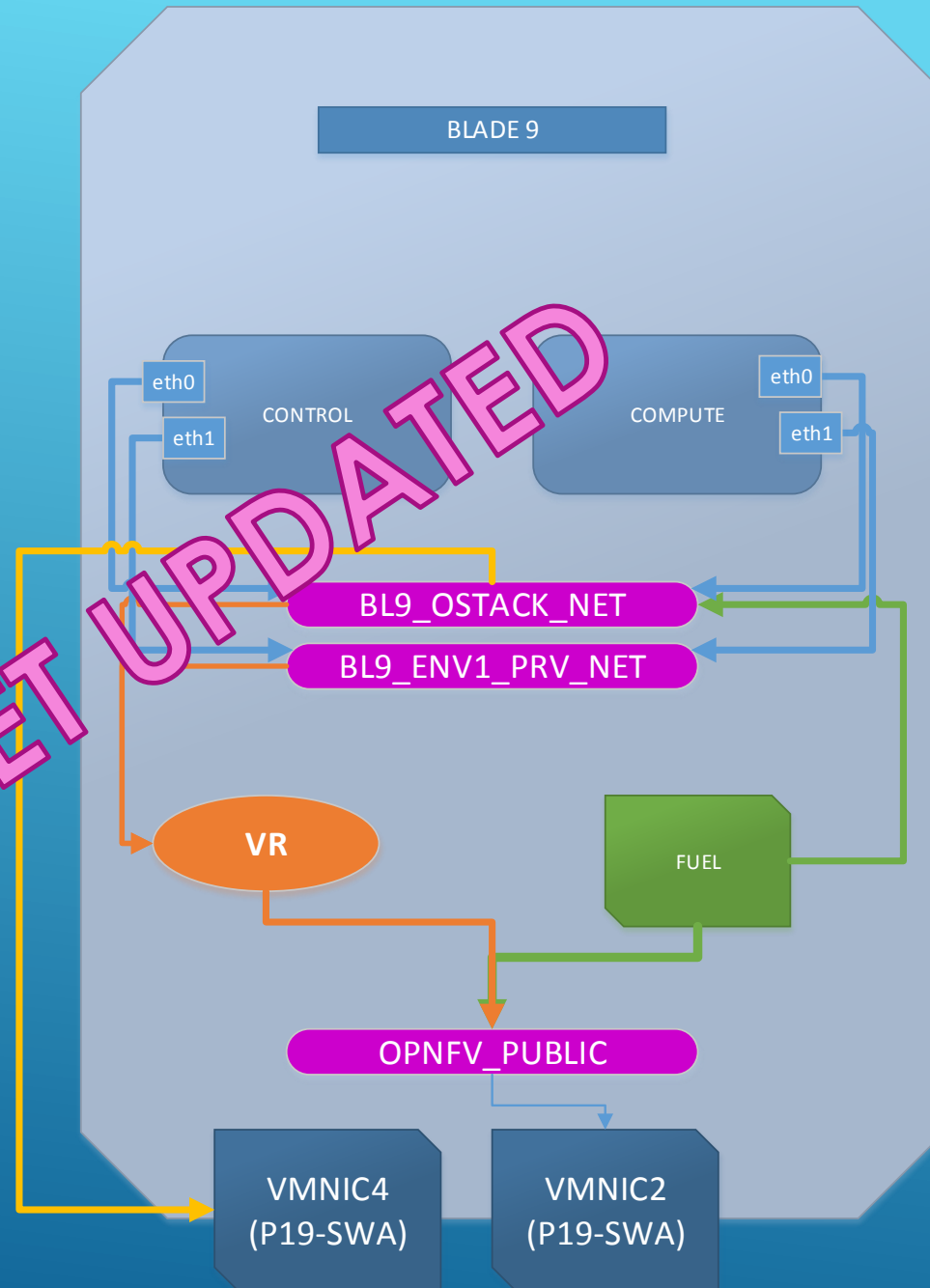
Management – 192.168.0.0/24

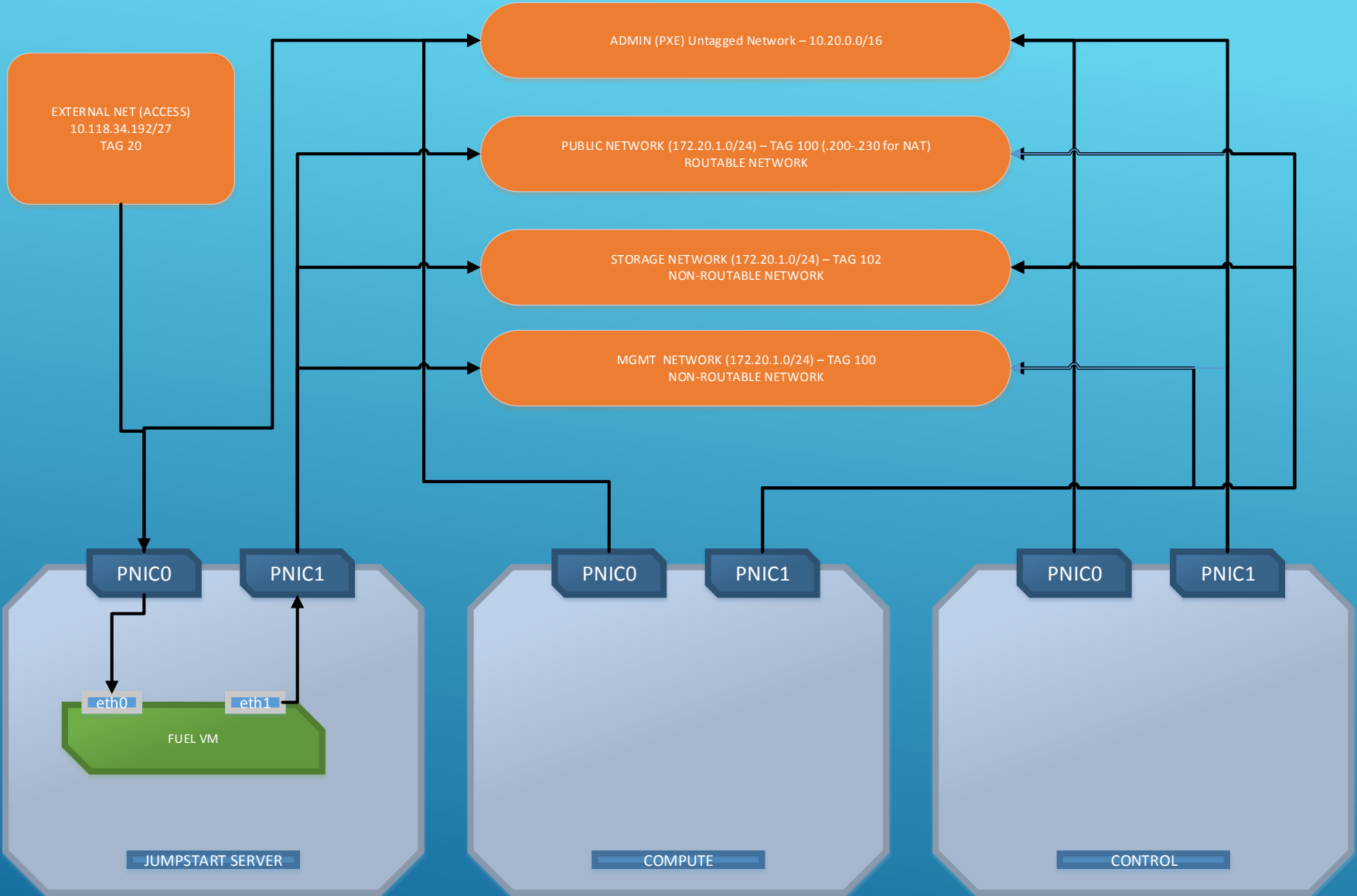
Storage – 192.168.1.0/24

# BLD16 IP / VLAN INFORMATION

# BL16 LOGICAL CONNECT DIAGRAM

NOT YET UPDATED





## IP (ACCESS) INFORMATION:

FUEL EXT – 10.118.34.217  
 BM\_NTP\_EXT – 10.118.34.219  
 BM\_NTP\_PUB – 172.20.1.253  
 PUBLIC GW – 172.20.1.1

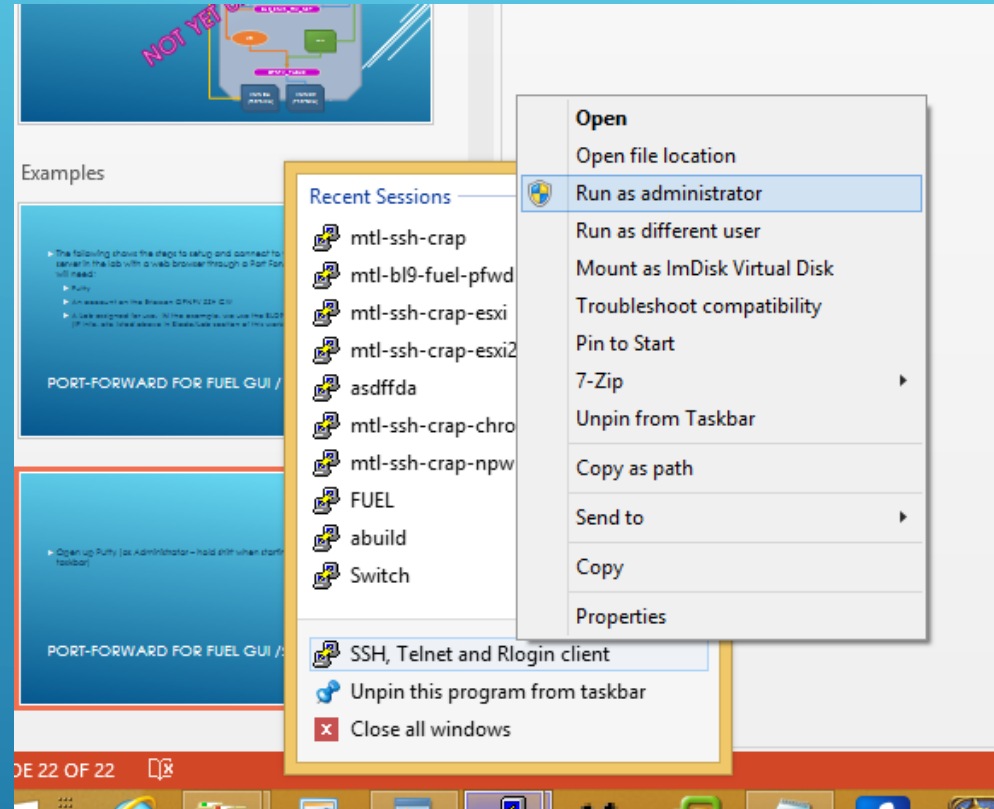
BAREMETAL LAB DETAILED SETUP  
 \*NOTE ONLY 1 COMPUTE/CONTROL SHOW

- ▶ The following shows the steps to setup and connect to your FUEL server in the lab with a web browser through a Port Forward. You will need:
  - ▶ Putty
  - ▶ An account on the Ericsson OPNFV SSH GW
  - ▶ A Lab assigned for use. IN the example, we use the BLD9-FUEL server (IP info, etc listed above in Blade/Lab section of this workbook)

## PORT-FORWARD FOR FUEL GUI /1

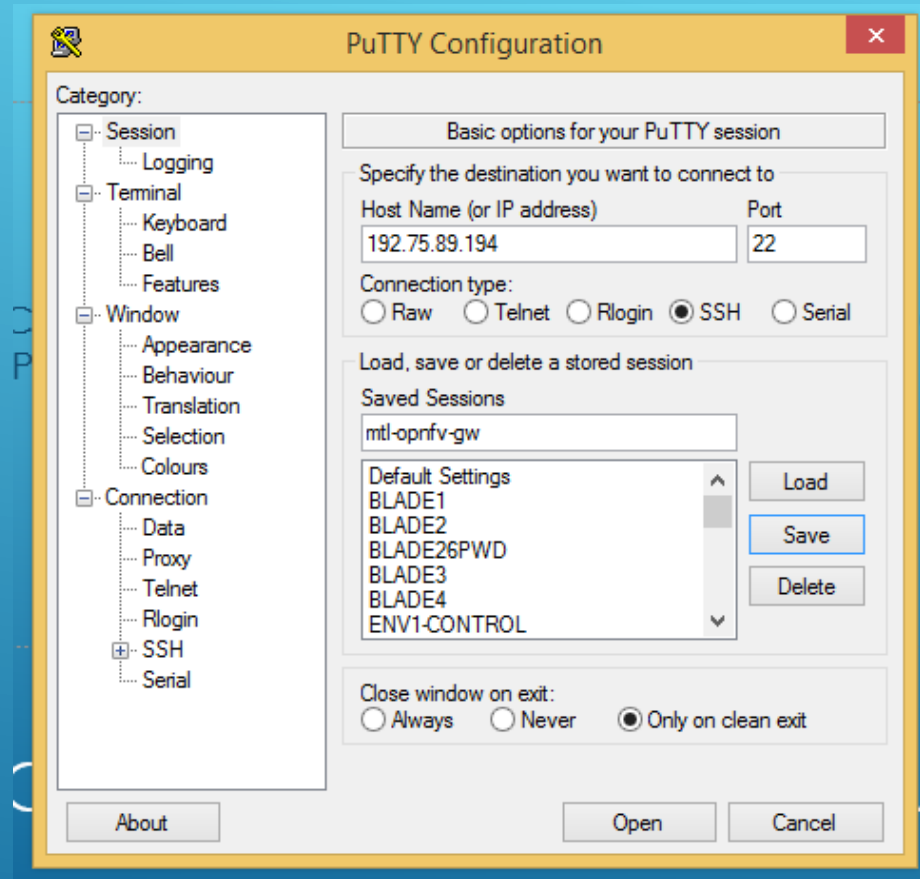


- ▶ Open up Putty (as Administrator – hold shift when starting it from taskbar)



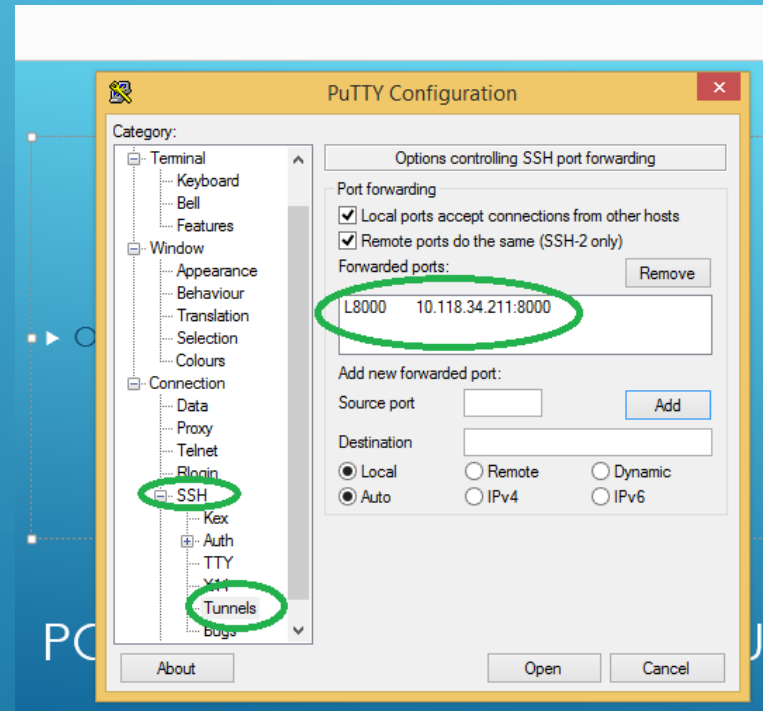
# PORT-FORWARD FOR FUEL GUI /2

- ▶ Configure Main Putty Screen as shown below (/// OPNFV SSH GW IP)



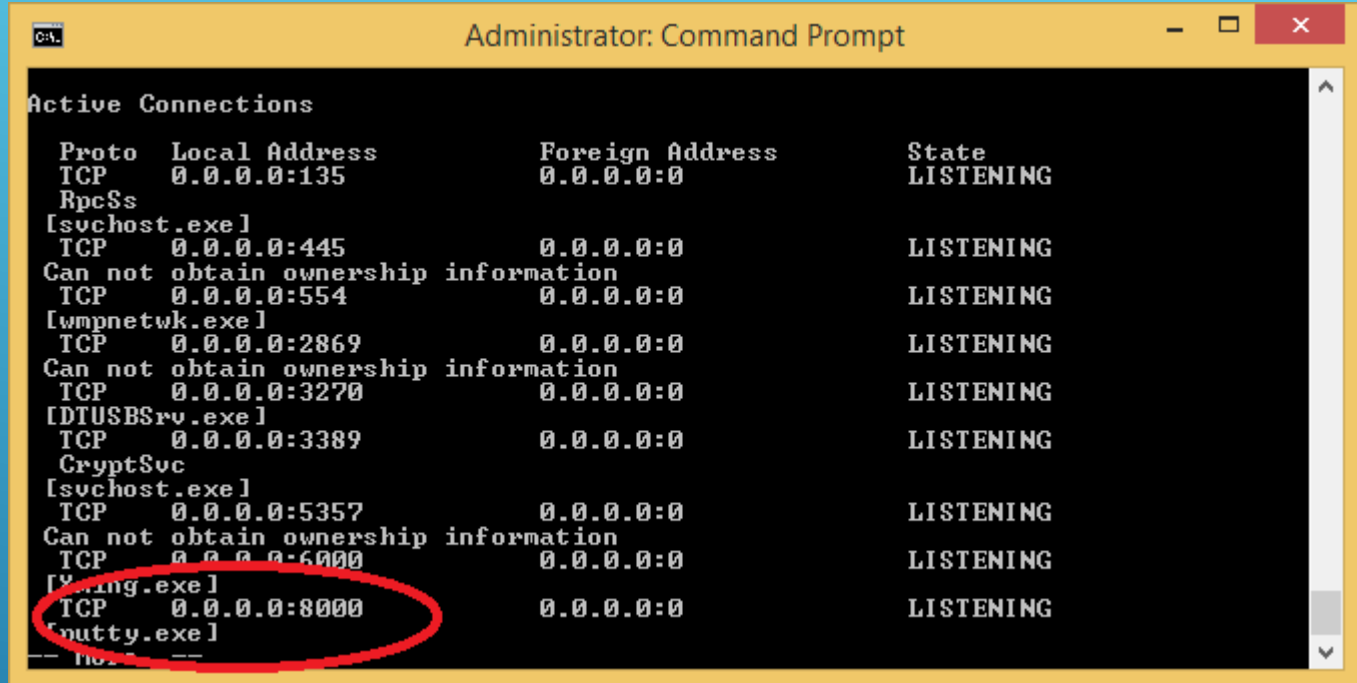
PORT-FORWARD FOR FUEL GUI /3

- ▶ On Left Side – Click SSH→Tunnels and configure you Port Forwarding thus (note: if you are going to a different Fuel – make sure you use the appropriate IP herein). Then click Open and Login



# PORT-FORWARD FOR FUEL GUI /4

- ▶ Open CMD on windows and observe that the port is forwarded through (netstat -amb | more)



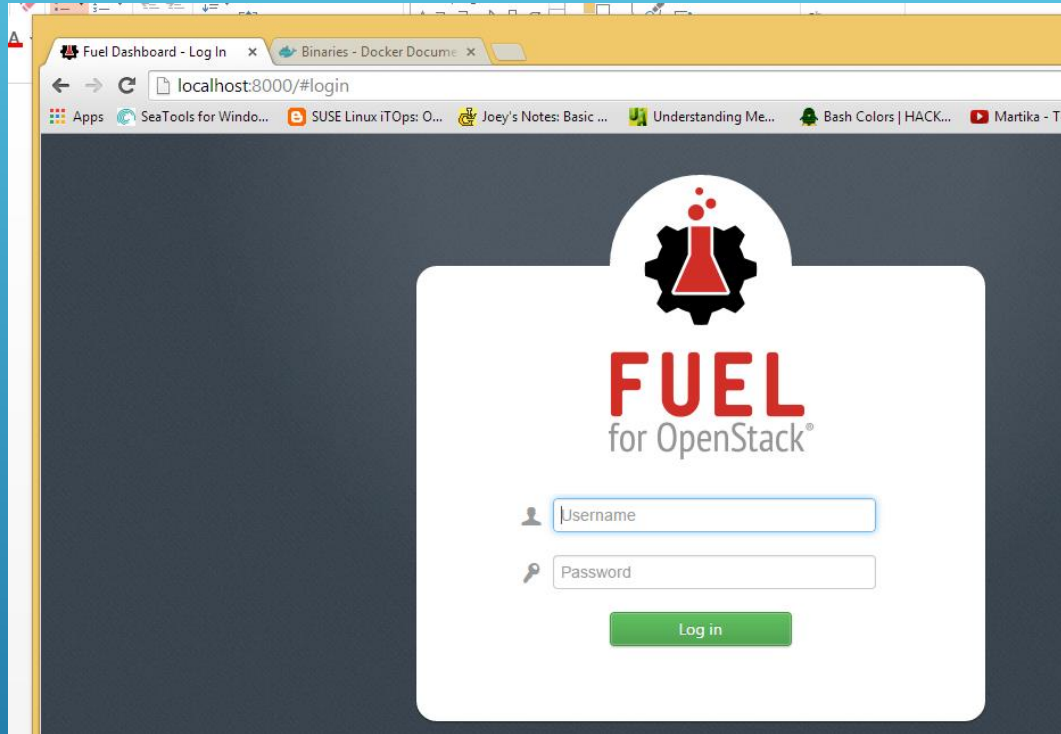
```
Administrator: Command Prompt

Active Connections

Proto Local Address           Foreign Address         State
TCP   0.0.0.0:135              0.0.0.0:0               LISTENING
RpcSs
[svchost.exe]
TCP   0.0.0.0:445              0.0.0.0:0               LISTENING
Can not obtain ownership information
TCP   0.0.0.0:554              0.0.0.0:0               LISTENING
[wmprnetwk.exe]
TCP   0.0.0.0:2869             0.0.0.0:0               LISTENING
Can not obtain ownership information
TCP   0.0.0.0:3270             0.0.0.0:0               LISTENING
[DTUSBSrv.exe]
TCP   0.0.0.0:3389             0.0.0.0:0               LISTENING
CryptSvc
[svchost.exe]
TCP   0.0.0.0:5357             0.0.0.0:0               LISTENING
Can not obtain ownership information
TCP   0.0.0.0:6000             0.0.0.0:0               LISTENING
[Listening.exe]
TCP   0.0.0.0:8000             0.0.0.0:0               LISTENING
[cmd.exe]
[notepad.exe]
```

# PORT-FORWARD FOR FUEL GUI /5

- ▶ Open a browser and go to <http://localhost:8000> and you will see your FUEL open up – Login is “admin/admin”

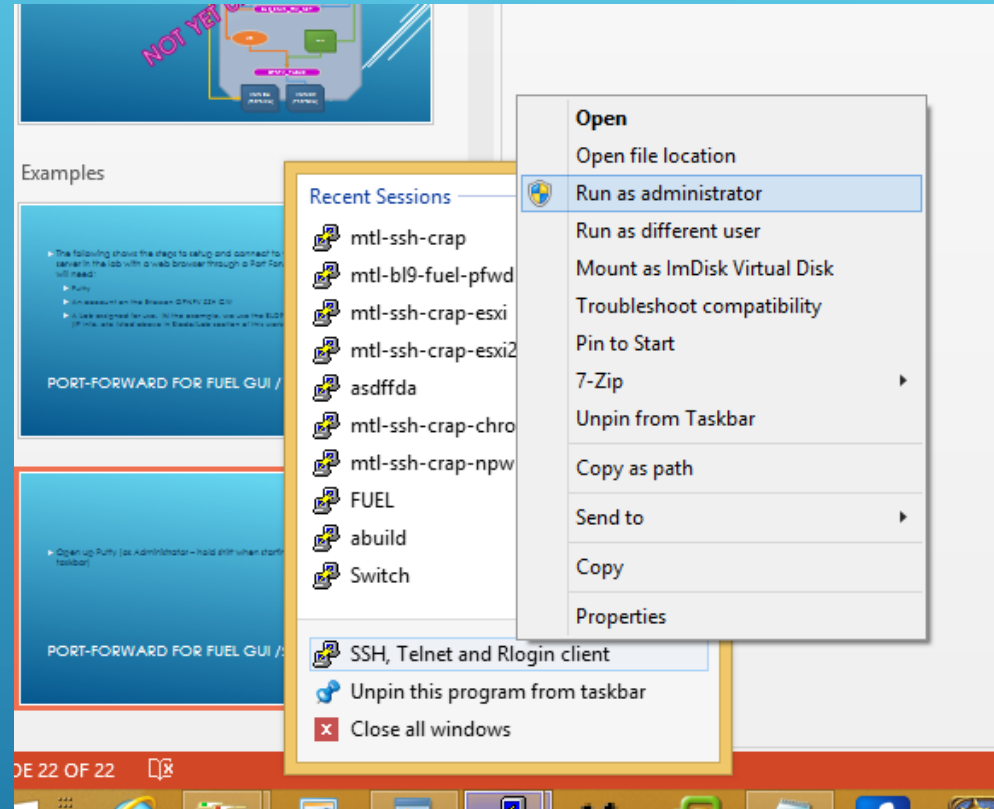


# PORT-FORWARD FOR FUEL GUI /6

- ▶ The following slides outline how to connect to the VIC (ESXi) vSphere via the Ericsson OPNFV SSH GW so you can power on / off and use the console of your FUEL, VR, COMPUTE and CONTROL Nodes.
- ▶ For this task you will need the following (These steps are done on Windows 8 Environment):
  - ▶ VIC Client installed 5.5 is required
  - ▶ Putty (or other SSH Port forwarding) Tool
  - ▶ A Blade/Lab Environment to connect to (BI9,11,12 & 13)

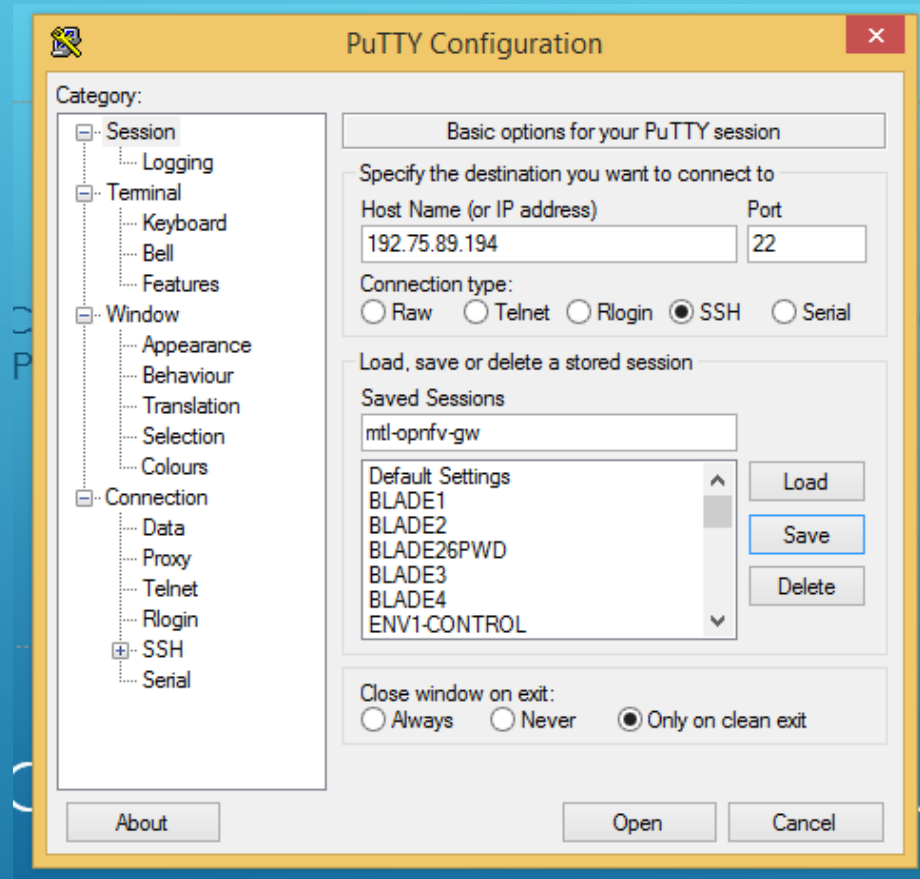
## PORT FORWARDING – VIC SETUP/1

- ▶ Open up Putty (as Administrator – hold shift when starting it from taskbar)



## PORT FORWARDING – VIC SETUP/2

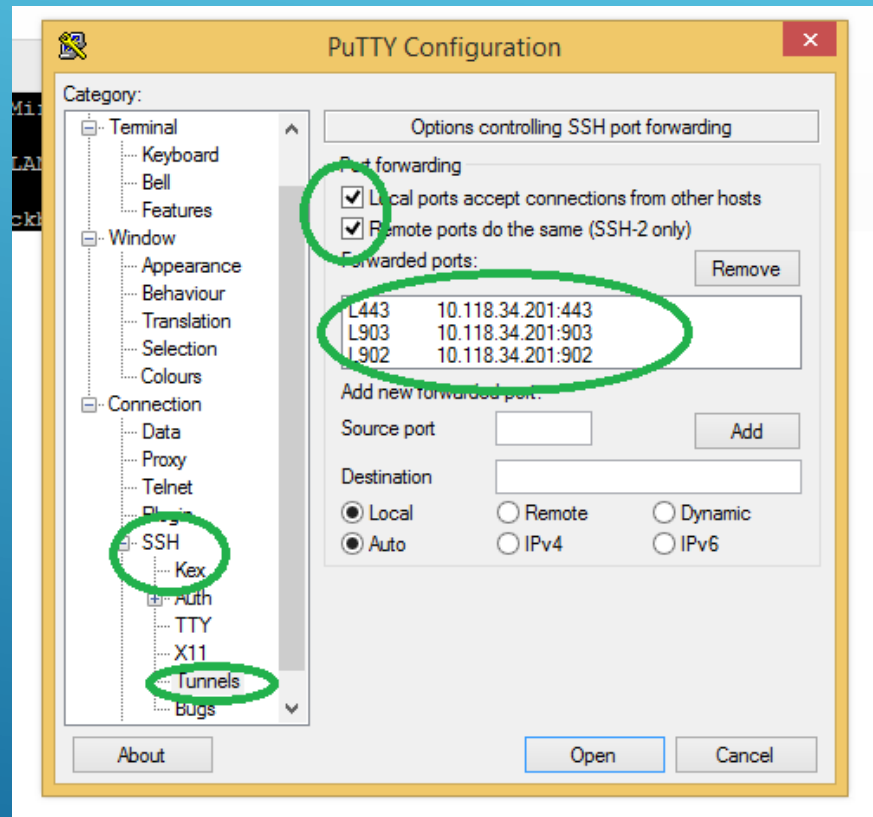
- ▶ Configure Main Putty Screen as shown below (/// OPNFV SSH GW IP)



PORT FORWARDING – VIC SETUP /3

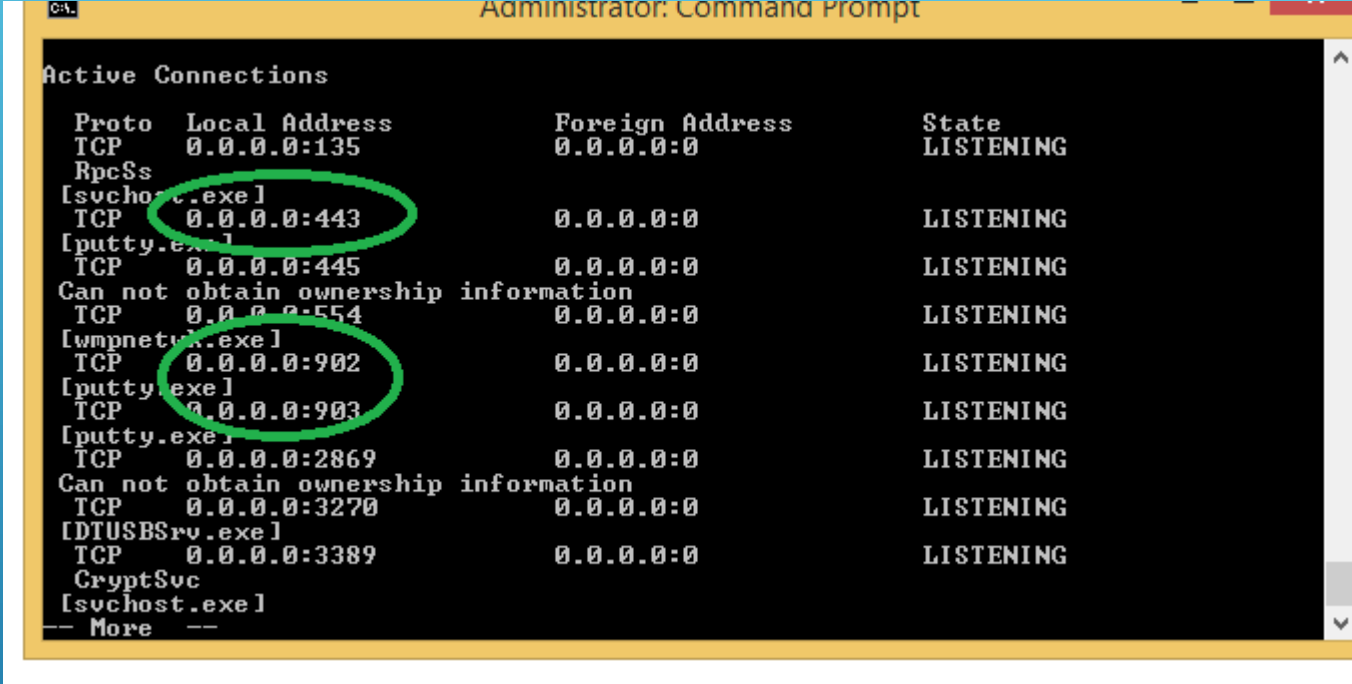


- ▶ On Left Side – Click SSH→Tunnels and configure you Port Forwarding thus (note: if you are going to a different vSphere– make sure you use the appropriate IP herein). Then click Open and Login



# PORT FORWARDING – VIC SETUP /4

- ▶ Open CMD on windows and observe that the port is forwarded through (netstat -amb | more)



```
Administrator: Command Prompt
Active Connections
Proto Local Address           Foreign Address         State
TCP   0.0.0.0:135              0.0.0.0:0               LISTENING
RpcSs
[svchost.exe]
TCP   0.0.0.0:443              0.0.0.0:0               LISTENING
[putty.exe]
TCP   0.0.0.0:445              0.0.0.0:0               LISTENING
Can not obtain ownership information
TCP   0.0.0.0:554              0.0.0.0:0               LISTENING
[mpnetui.exe]
TCP   0.0.0.0:902              0.0.0.0:0               LISTENING
[putty.exe]
TCP   0.0.0.0:903              0.0.0.0:0               LISTENING
[putty.exe]
TCP   0.0.0.0:2869             0.0.0.0:0               LISTENING
Can not obtain ownership information
TCP   0.0.0.0:3270             0.0.0.0:0               LISTENING
[DTUSBSrv.exe]
TCP   0.0.0.0:3389             0.0.0.0:0               LISTENING
CryptSvc
[svchost.exe]
-- More --
```

## PORT FORWARDING – VIC SETUP /5

- ▶ Open up VIC and in the HOST: put “localhost” and the root/systemabc and click Connect (**note: If you get a message about certificate – check –install and select Ignore and select yes if it complains about new cert**).

vSphere 5.5.

The vSphere Client is still used for the vSphere Update Manager (VUM) and Host Client, along with a few solutions (e.g. Site Recovery Manager).

To directly manage a single host, enter the IP address or host name.  
To manage multiple hosts, enter the IP address or name of a vCenter Server.

IP address / Name: localhost

User name: root

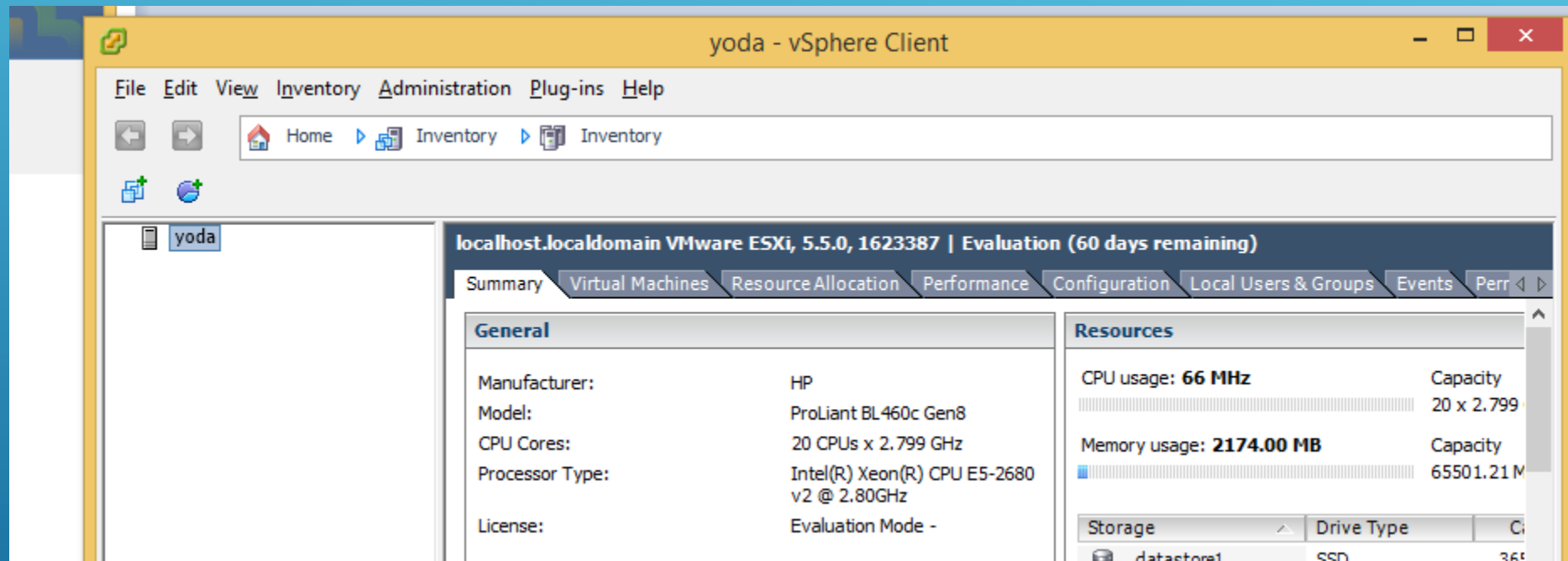
Password: \*\*\*\*\*

Use Windows session credentials

Login Close Help

# PORT FORWARDING – VIC SETUP /6

- ▶ Observe your vSphere Console is opened. Console will work through port 902 so it must be available. You aren't able (without a lot of work) to change this setting inside vSphere. From here you can create you Fuel, VR and other VM's

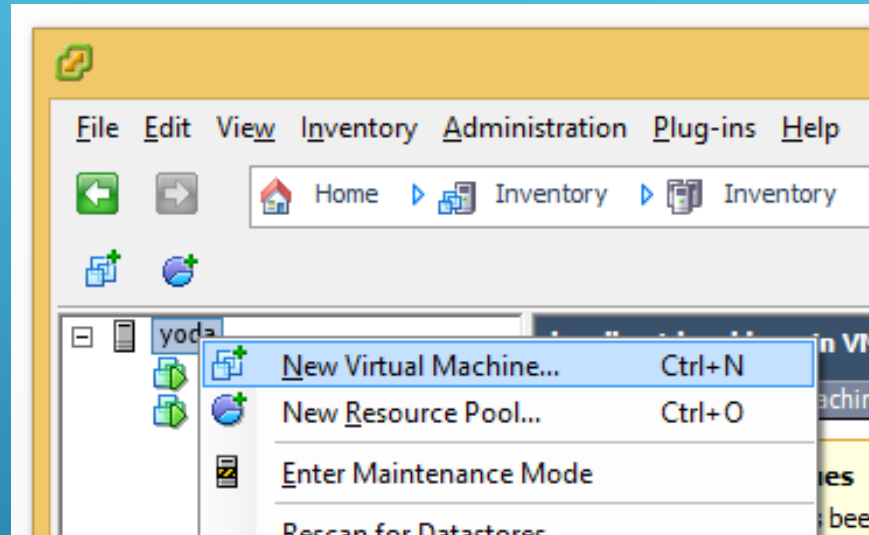


## PORT FORWARDING – VIC SETUP /7

- ▶ The following slides outline the steps you do to manually create and configure your compute and control blades. Showing how to set them up for Nested Operation – note\* without `vhv` parameter in your `.vmx` file, your Openstack will fail to work.
- ▶ Things you will need to execute this activity
  - ▶ A Blade/Lab using ESXi for Nested OPNFV operation
  - ▶ A VI Client
  - ▶ A Port Forward Tunnel setup to your VIC (see previous section)

# CREATE ESXI COMPUTE/CONTROL VM/1

- ▶ Starting from the Login Screen, Click and Create a New VM



CREATE ESXI COMPUTE/CONTROL VM/2

▶ Step through the screens with the Following Answers:

▶ Custom VM

- |               |                   |                                       |
|---------------|-------------------|---------------------------------------|
| ▶ VM Name:    | BLXX-ENVX-COMPUTE | BLXX-ENVX-CONTROL                     |
| ▶ Datastore:  | DS1               | DS2 (or opposite to 1 <sup>st</sup> ) |
| ▶ VM Version: | 8                 | 8                                     |
| ▶ Guest OS:   | Ubuntu 64-bit     | Ubuntu 64-bit                         |
| ▶ vCPUs:      | 16 (or optional)  | 8 (or optional)                       |
| ▶ RAM:        | 24GB              | 12GB                                  |
| ▶ NICS:       | ETH0 – OSTACK_NET | ETH0-OSTACK_NET                       |
| ▶ NICS:       | ETH1 – ENVX_NET   | ETH1-ENVX_NET                         |
| ▶ DISK:       | 200GB (Optional)  | 300GB(optional)                       |

# CREATE ESXI COMPUTE/CONTROL VM/3

- ▶ **POWER ON and POWER OFF your VMs (or files wont be created on the HOST)**
- ▶ SSH to the ESXi HOST and Modify the VM's .vmx files and set "vhv.enable = "TRUE"" in the files for the COMPUTE/CONTROL nodes.
- ▶ PATH to VM is  
node:/vmfs/volumes/datastoreX/BL11-ENVX-COMPUTE/BL11-ENVX-COMPUTE.vmx

```
The ESXi Shell can be disabled by an administrative user. See the  
vSphere Security documentation for more information.  
~ # cd /vmfs/volumes/DS-1/BL11-  
BL11-ENV1-COMPUTE/ BL11-FUEL/ BL11-VR/  
~ # cd /vmfs/volumes/DS-1/BL11-  
BL11-ENV1-COMPUTE/ BL11-FUEL/ BL11-VR/  
~ # cd /vmfs/volumes/DS-1/BL11-ENV1-COMPUTE/  
/vmfs/volumes/552d7143-c65ab4d0-7b64-38eaa717d838/BL11-ENV1-COMPUTE # vi BL11-ENV1-COMPUTE.vmx
```

```
The ESXi Shell can be disabled by an administrative user. See the  
vSphere Security documentation for more information.  
~ # cd /vmfs/volumes/DS-1/BL11-ENV1-COMPUTE/  
BL11-ENV1-COMPUTE.vmx  
~ # vi BL11-ENV1-COMPUTE.vmx  
evcCompatibilityMode = "FALSE"  
vmotion.checkpointFBSize = "4194304"  
cleanShutdown = "TRUE"  
softPowerOff = "FALSE"  
vhv.enable = "TRUE"  
~ # cd /vmfs/volumes/DS-1/BL11-ENV1-COMPUTE/  
BL11-ENV1-COMPUTE.vmx [Modified] 87/87 100%
```

# CREATE ESXI COMPUTE/CONTROL VM/4



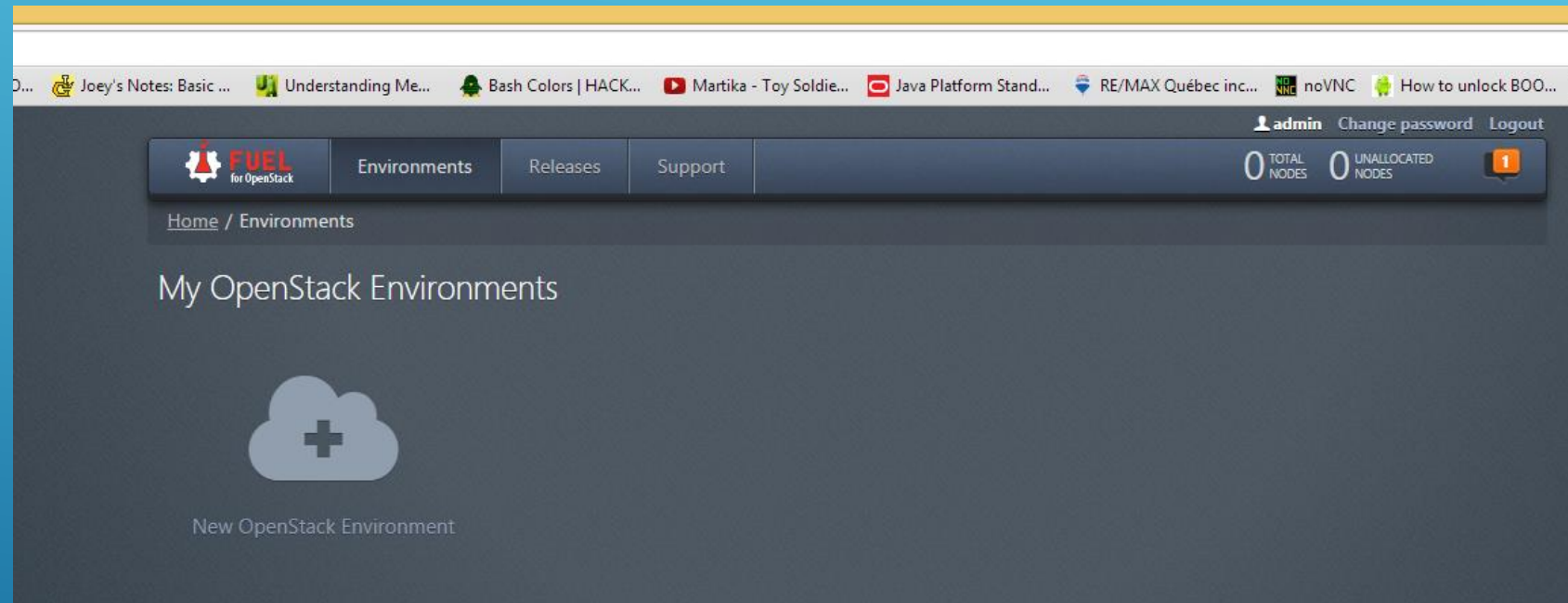
- ▶ Power On your VM's and the Fuel server (if you have it configured – see the appropriate section) will provide a DHCP IP and install the bootstrap automatically
- ▶ You can test that your have nested setup working by running the “kvm-ok” from any distro running in the VM with KVM installed on it.

## CREATE ESXI COMPUTE/CONTROL VM/4

- ▶ The following slides will outline the steps to create a Nested Environment within Fuel (on a Nested ESXi Environment)
- ▶ For this activity you will need the following:
  - ▶ VI Client connected to your vSphere Host
  - ▶ An Installed Fuel VM (see previous sections)
  - ▶ Created Compute/Control VM (see previous sections)
  - ▶ FUEL Port Forward setup (see previous section)

# CREATE ENVIRONMENT IN FUEL (UBI)/1

- ▶ Login to your Fuel Server via the Web GUI ([http:<host>:8000](http://<host>:8000)) – admin/admin, and check the “Statistics Box off” and you should arrive a screen as outlined below



# CREATE ENVIRONMENT IN FUEL (UBI)/2

- ▶ Click on Create New Environment and Name your new environment (for example BL11-ENV-1) and select Juno Ubuntu release and select “Accept”

Create a new OpenStack environment

**Name and Release**

✓ Deployment Mode

Compute

Networking Setup

Storage Backends

Additional Services

Finish

**Name**

**OpenStack Release**

This option will install the OpenStack Juno packages using Ubuntu as a base operating system. With high availability features built in, you are getting a robust, enterprise-grade OpenStack deployment.

CREATE ENVIRONMENT IN FUEL (UBI)/3

- ▶ Select Multi-Node (**NOT HA**) and click Next

Create a new OpenStack environment

✓ Name and Release

**Deployment Mode**

Multi-node with HA

Multi-node

In this configuration the OpenStack controller is deployed separately from the compute and cinder nodes. This mode assumes the presence of 1 controller node and 1 or more compute/cinder nodes. You can add more nodes to scale your cloud later.

Compute

Networking Setup

Storage Backends

Additional Services

Finish

Cancel

← Prev

Next →

CREATE ENVIRONMENT IN FUEL (UBI)/4

- ▶ Select “KVM” and click Next

Create a new OpenStack environment

✓ Name and Release

✓ Deployment Mode

**Compute**

Networking Setup

Storage Backends

Additional Services

Finish

**KVM**  
Choose this type of hypervisor if you run OpenStack on hardware

**QEMU**  
Choose this type of hypervisor if you run OpenStack on virtual hosts

**vCenter**  
Choose this option if you have a vCenter environment with ESXi servers to be used as hypervisors

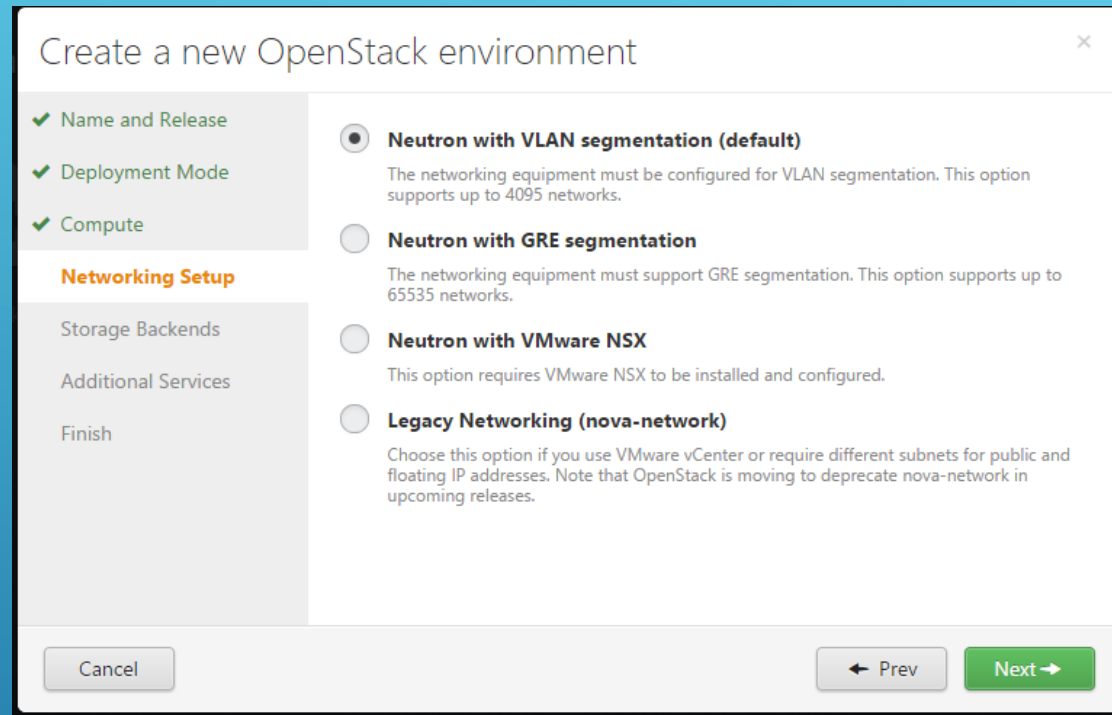
Cancel

← Prev

Next →

CREATE ENVIRONMENT IN FUEL (UBI)/5

## ▶ Select VLAN Segmentation



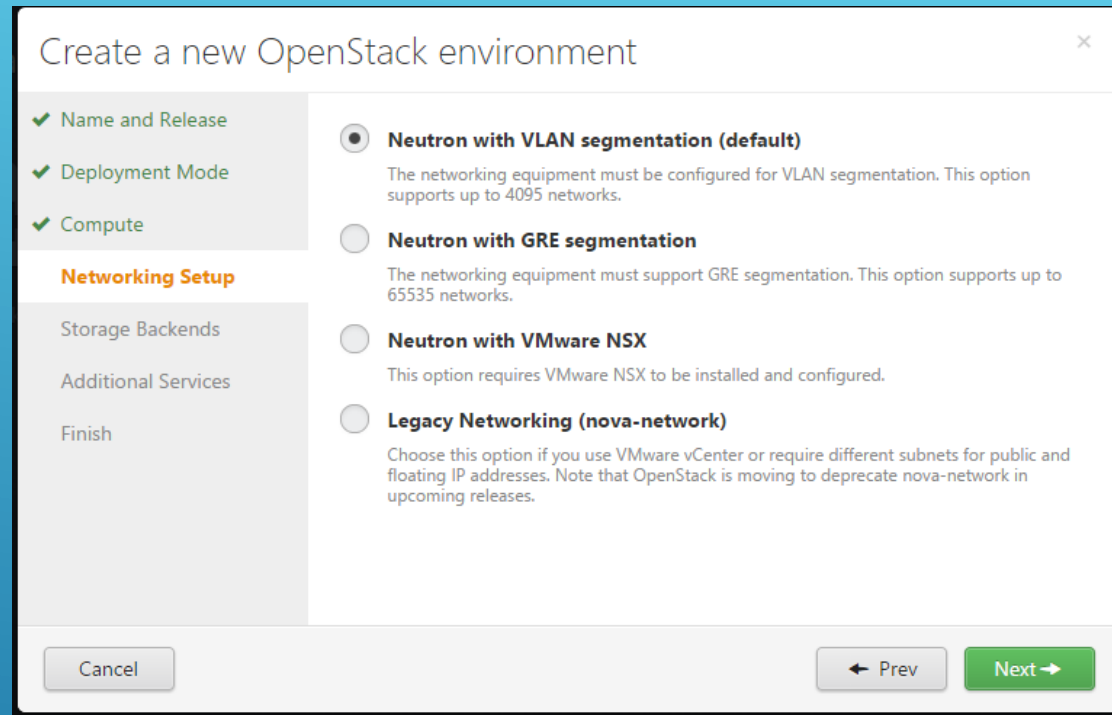
The screenshot shows a wizard window titled "Create a new OpenStack environment" with a close button (X) in the top right corner. On the left side, there is a vertical list of steps: "Name and Release" (checked), "Deployment Mode" (checked), "Compute" (checked), "Networking Setup" (highlighted in orange), "Storage Backends", "Additional Services", and "Finish". The main area displays four radio button options for networking:

- Neutron with VLAN segmentation (default)**  
The networking equipment must be configured for VLAN segmentation. This option supports up to 4095 networks.
- Neutron with GRE segmentation**  
The networking equipment must support GRE segmentation. This option supports up to 65535 networks.
- Neutron with VMware NSX**  
This option requires VMware NSX to be installed and configured.
- Legacy Networking (nova-network)**  
Choose this option if you use VMware vCenter or require different subnets for public and floating IP addresses. Note that OpenStack is moving to deprecate nova-network in upcoming releases.

At the bottom of the window, there are three buttons: "Cancel", "← Prev", and "Next →". The "Next" button is highlighted in green.

CREATE ENVIRONMENT IN FUEL (UBI)/6

## ▶ Select VLAN Segmentation



The screenshot shows a dialog box titled "Create a new OpenStack environment" with a close button (X) in the top right corner. On the left side, there is a vertical list of steps: "Name and Release" (checked), "Deployment Mode" (checked), "Compute" (checked), "Networking Setup" (highlighted in orange), "Storage Backends", "Additional Services", and "Finish". The main area of the dialog displays four radio button options for networking:

- Neutron with VLAN segmentation (default)**  
The networking equipment must be configured for VLAN segmentation. This option supports up to 4095 networks.
- Neutron with GRE segmentation**  
The networking equipment must support GRE segmentation. This option supports up to 65535 networks.
- Neutron with VMware NSX**  
This option requires VMware NSX to be installed and configured.
- Legacy Networking (nova-network)**  
Choose this option if you use VMware vCenter or require different subnets for public and floating IP addresses. Note that OpenStack is moving to deprecate nova-network in upcoming releases.

At the bottom of the dialog, there are three buttons: "Cancel", "← Prev", and "Next →". The "Next →" button is highlighted in green.

CREATE ENVIRONMENT IN FUEL (UBI)/7



- ▶ Select Cinder and Glance Options (up to your desires)

The screenshot shows a wizard window titled "Create a new OpenStack environment". On the left, a sidebar lists steps: "Name and Release", "Deployment Mode", "Compute", "Networking Setup", "Storage Backends", "Additional Services", and "Finish". The "Storage Backends" section is active. It contains two columns of options:

- Cinder:** Three radio button options: "Default" (selected), "Ceph", and "VMWare vCenter/ESXi". Below these is a text block: "By default, Cinder block storage uses LVM volumes shared over iSCSI. Ceph backend requires two or more Ceph-OSD nodes and the KVM hypervisor."
- Glance:** Three radio button options: "Default" (selected), "Ceph", and "VMWare vCenter/ESXi". Below these is a text block: "By default, Glance image service uses Swift object storage in HA deployment mode, and local storage on the Controller node in simple multi-node mode. Ceph backend requires two or more Ceph-OSD nodes."

At the bottom of the window are three buttons: "Cancel", "← Prev", and "Next →".

CREATE ENVIRONMENT IN FUEL (UBI)/7

- ▶ Select any additional Openstack Options that you want

Create a new OpenStack environment

- ✓ Name and Release
- ✓ Deployment Mode
- ✓ Compute
- ✓ Networking Setup
- ✓ Storage Backends
- Additional Services**
- ✓ Finish

**Install Sahara**  
Sahara enables on demand provisioning of Hadoop clusters to be deployed on OpenStack utilizing a variety of vendor distributions.

**Install Murano**  
Murano is an application catalog, which allows application developers and cloud administrators to publish various cloud-ready applications in a browsable categorized catalog, which may be used by the cloud users (including the inexperienced ones) to pick-up the needed applications and services and composes the reliable environments out of them in a "push-the-button" manner.

**Install Ceilometer (OpenStack Telemetry)**  
Ceilometer provides metering and monitoring of an OpenStack cloud.

Cancel      ← Prev      Next →

CREATE ENVIRONMENT IN FUEL (UBI)/8

- ▶ Select Finish and Create, afterwards you should arrive back at a screen that looks similar

The screenshot displays the FUEL for OpenStack web interface. At the top, there is a navigation bar with the FUEL logo, menu items for Environments, Releases, and Support, and user information for 'admin' with options to change password or logout. On the right, it shows '0 TOTAL NODES' and '0 UNALLOCATED NODES' with a notification icon. Below the navigation bar, the breadcrumb path is 'Home / Environments / BL11-ENV-1'. The main heading is 'BL11-ENV-1 (0 nodes)'. Below this, it specifies 'OpenStack Release: Juno on Ubuntu 12.04.4 (2014.2.2-6.0.1)', 'Deployment Mode: Multi-node', and 'Status: New'. A row of icons provides access to 'Nodes', 'Networks', 'Settings', 'Logs', 'Health Check', and 'Actions', along with a 'Deploy Changes' button. Below these are 'Group By' (set to 'Roles') and 'Filter By' (set to 'Node name/mac') dropdowns. To the right are buttons for 'Configure Disks', 'Configure Interfaces', and a prominent green '+ Add Nodes' button. A yellow callout box at the bottom states: 'To add nodes to the environment, select the Add Nodes option, choose the nodes you want to allocate and assign roles to each.'

CREATE ENVIRONMENT IN FUEL (UBI)/9

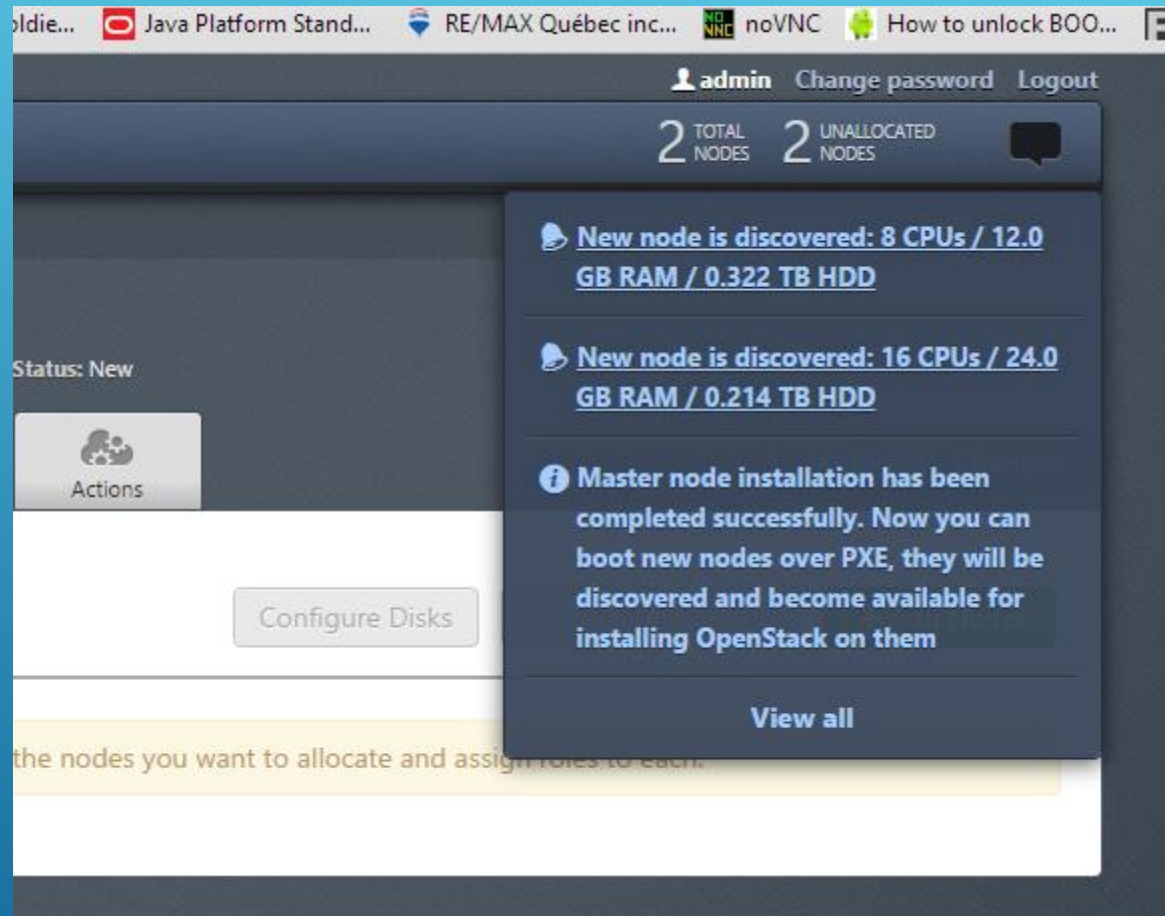
- ▶ Power on your VM's via the VI Client and while they are booting, Click on the Network Tab in the GUI and edit the information according to the Lab Layout (provided in the Blade/Lab Section of this document). Click Save at the bottom once you have made your changes

The screenshot shows a web-based interface for configuring network settings. At the top, there is a navigation bar with icons for Nodes, Networks, Settings, Logs, Health Check, and Actions, along with a 'Deploy Changes' button. The main content area is titled 'Network Settings' and includes the subtitle 'Neutron with VLAN segmentation'. There are two main sections: 'Public' and 'Management'. The 'Public' section has fields for 'IP Range' (Start: 172.16.11.2, End: 172.16.11.126), 'CIDR' (172.16.11.0/24), 'Use VLAN tagging' (checked, with a dropdown set to 111), and 'Gateway' (172.16.11.1). The 'Management' section has a 'CIDR' field set to 192.168.0.0/24.

| Section    | Field            | Value                                   |
|------------|------------------|---|
| Public     | IP Range Start   | 172.16.11.2                             |
|            | IP Range End     | 172.16.11.126                           |
|            | CIDR             | 172.16.11.0/24                          |
|            | Use VLAN tagging | <input checked="" type="checkbox"/> 111 |
| Management | Gateway          | 172.16.11.1                             |
|            | CIDR             | 192.168.0.0/24                          |

CREATE ENVIRONMENT IN FUEL (UBI)/10

- ▶ Once you see that your Compute/Control nodes have been found and picked up by Fuel, Click on the “Add Nodes” Button



CREATE ENVIRONMENT IN FUEL (UBI)/11

► Select the Appropriate Roles for the Control/Compute nodes

The screenshot displays the 'Assign Roles' section of the OpenStack Fuel interface. It lists several roles with checkboxes and descriptive text:

- Controller**  
The controller initiates orchestration activities and provides an external API. Other components like Glance (image storage), Keystone (identity management), Horizon (OpenStack dashboard) and Nova-Scheduler are installed on the controller as well.
- Compute** ▲  
A compute node creates, manages and terminates virtual machine instances.
- Storage - Cinder**  
Cinder provides scheduling of block storage resources, typically delivered over iSCSI, VMWare vCenter, and other compatible backend storage systems. Block storage can be used for database storage, expandable file systems, or providing a server with access to raw block level devices.
- Storage - Ceph OSD**  
Ceph storage can be configured to provide storage for block volumes (Cinder), images (Glance) and ephemeral instance storage (Nova). It can also provide object storage through the S3 and Swift API (See settings to enable each).
- Telemetry - MongoDB**  
A feature-complete and recommended database for storage of metering data from OpenStack Telemetry (Ceilometer).
- Zabbix Server** ▲  
Zabbix monitoring system server.

At the bottom right of the role list, there is a 'Select All' checkbox which is currently unchecked.

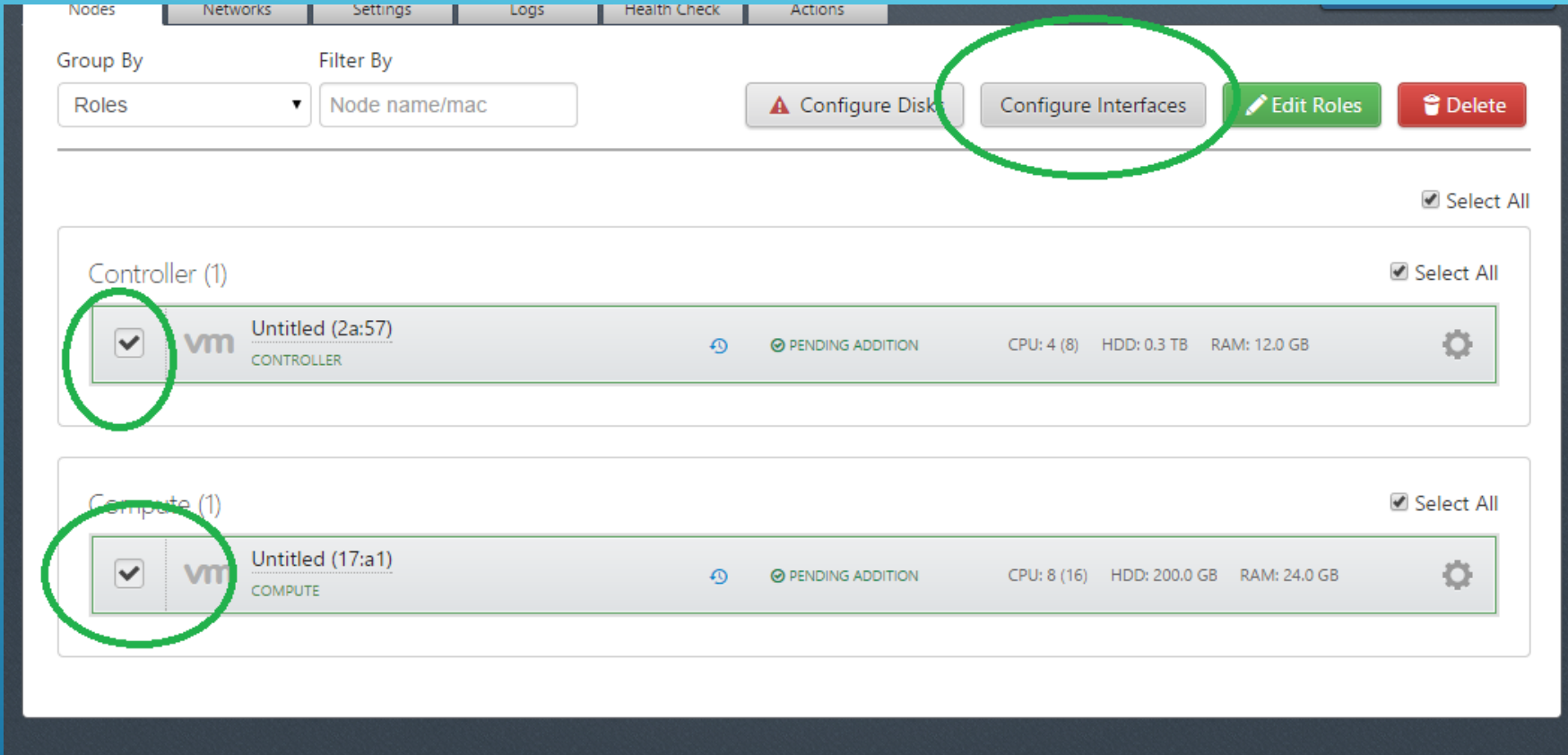
Below the role list, the node's hardware specifications are shown: HDD: 0.3 TB RAM: 12.0 GB (1). To the right of these specifications is another 'Select All' checkbox, which is checked.

The bottom of the screenshot shows a table with one row representing the node:

|                                     |    |                                |            |            |             |              |    |
|-------------------------------------|----|--------------------------------|------------|------------|-------------|--------------|----|
| <input checked="" type="checkbox"/> | vm | Untitled (2a:57)<br>CONTROLLER | DISCOVERED | CPU: 4 (8) | HDD: 0.3 TB | RAM: 12.0 GB | ⚙️ |
|-------------------------------------|----|--------------------------------|------------|------------|-------------|--------------|----|

CREATE ENVIRONMENT IN FUEL (UBI)/12

- ▶ Select the Two Nodes and Click on Configure Interfaces



CREATE ENVIRONMENT IN FUEL (UBI)/13

- ▶ Configure the Adapters thus

The screenshot shows a web-based network configuration interface. At the top, there is a navigation bar with tabs for 'Nodes', 'Networks', 'Settings', 'Logs', 'Health Check', and 'Actions'. The main heading is 'Configure interfaces on 2 nodes'. Below this, there are two interface configuration cards. The first card is for 'eth0' with MAC address '00:0c:29:0e:17:a1' and Speed 'N/A'. It has four configuration buttons: 'Admin (PXE)', 'Public' (VLAN ID: 111), 'Storage' (VLAN ID: 911), and 'Management' (VLAN ID: 811). The second card is for 'eth1' with MAC address '00:0c:29:0e:17:ab' and Speed 'N/A'. It has one configuration button: 'Private' (VLAN IDs: 1031-1060). At the bottom of the interface, there are buttons for 'Back To Node List', 'Load Defaults', 'Cancel Changes', and 'Apply'.

CREATE ENVIRONMENT IN FUEL (UBI)/14



- ▶ Login to Fuel Node and run the pre-deploy script for this environment

```
Last login: Wed Apr 15 00:24:18 2015
[root@fuel-bl11 ~]# /opt/opnfv/pre-deploy.sh 1
Getting deployment info...
Default deployment info was downloaded to /var/lib/opnfv/deployment_1
Getting provisioning info...
Default provisioning info was downloaded to /var/lib/opnfv/provisioning_1

Pre-deployment configuration

IPs for the DNS servers to go into /etc/resolv.conf. You will be
prompted for one IP at the time. Press return on an empty line
to complete your input. If no DNS server is specified, the IP of
the Fuel master will be used instead.

IP for CIC name servers:10.118.32.193
```

CREATE ENVIRONMENT IN FUEL (UBI)/15

- ▶ Refresh your FUEL Gui and observe that the message states we have changed something outside the GUI (that's a good thing). Click Deploy Changes and your Environment will install

The screenshot displays the FUEL GUI interface. At the top, there is a navigation bar with the FUEL logo and menu items: Environments, Releases, and Support. On the right side of the navigation bar, the user is logged in as 'admin' with options for 'Change password' and 'Logout'. Below the navigation bar, the current environment is identified as 'BL11-ENV-1' with '2 TOTAL NODES' and '0 UNALLOCATED NODES'. A breadcrumb trail shows 'Home / Environments / BL11-ENV-1'. The main content area shows the environment name 'BL11-ENV-1 (2 nodes)' and details: 'OpenStack Release: Juno on Ubuntu 12.04.4 (2014.2.2-6.0.1)', 'Deployment Mode: Multi-node', and 'Status: New'. A warning message states: 'Some deployment parameters for this environment have been modified from Fuel CLI. Changes from Fuel CLI take precedence over any settings made from your browser. Proceed with caution.' Below the warning, there is a row of icons for 'Nodes', 'Networks', 'Settings', 'Logs', 'Health Check', and 'Actions'. A prominent blue 'Deploy Changes' button is located on the right. Below this row, there are filters for 'Group By' (set to 'Roles') and 'Filter By' (set to 'Node name/mac'). There are also buttons for 'Configure Disks', 'Configure Interfaces', and '+ Add Nodes'. At the bottom right, there is a 'Select All' checkbox.

CREATE ENVIRONMENT IN FUEL (UBI)/16

► Observe the Deployment Screen

The screenshot displays the Fuel deployment interface. At the top, a navigation bar includes icons for Nodes, Networks, Settings, Logs, Health Check, and Actions. A progress indicator in the top right corner shows a green bar at 0% and a red close button. Below the navigation bar, there are filter options: 'Group By' set to 'Roles' and 'Filter By' set to 'Node name/mac'. Action buttons for 'Configure Disks', 'Configure Interfaces', and '+ Add Nodes' are visible. The main content area shows two node groups: 'Controller (1)' and 'Compute (1)'. Each group contains a single node entry with a checkbox, a 'vm' icon, a name, a role, and a progress bar. The Controller node is 'Untitled (2a:57) CONTROLLER' with a progress bar labeled 'INSTALLING UBUNTU' and specifications 'CPU: 4 (8) HDD: 0.3 TB RAM: 12.0 GB'. The Compute node is 'Untitled (17:a1) COMPUTE' with a progress bar labeled 'INSTALLING UBUNTU' and specifications 'CPU: 8 (16) HDD: 200.0 GB RAM: 24.0 GB'. Both progress bars are circled in green. A 'Select All' checkbox is present for each group.

CREATE ENVIRONMENT IN FUEL (UBI)/17