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**Introduction**

**Pluribus Networks' UNUM™** Unified Management, Automation, and Analytics Platform Software is an application portal developed by Pluribus Networks.

UNUM enables the network administrator to extract analytical value from the telemetry data reported by the network switches powered by the Pluribus Networks Netvisor® ONE network operating system.

Once data is collected, UNUM relies upon a modern search engine database infrastructure to store, aggregate, filter, correlate, and visualize vast amounts of data in real-time as well as with a powerful time machine functionality.

The Pluribus UNUM portal provides a collection of feature-rich applications that manages and orchestrates the gathering and presentation of network analytics using various types of collectors and reporting software.

The UNUM applications rely primarily on features of the Netvisor ONE, such as VFLOWs, mirrors, and connections statistics, but can also provide analytics in a non-Pluribus environment.

At a high-level, UNUM supports the following deployment scenarios:

- **Netvisor ONE as a mirror switch;** an out-of-band Pluribus switch is configured as a mirror in either an existing Pluribus-switched network or a non-Pluribus-switched network.
- **Netvisor ONE as an in-band switch;** connection stats are pulled, and VFLOWs configured on the switch.

Collectors gather network analytics and feed data into the UNUM analytics store(s):

- This collector is enhanced to use the vREST API to gather the analytics data from Netvisor.

The **Pluribus UNUM Virtual Edge Platform 4600** is a 1 rack-unit server hosting the UNUM virtual appliance, and it provides the following benefits:

- Turn-key appliance to deploy UNUM Platform and Insight Analytics
- Easy to startup and configure
- Store up to 500 Million records
- Capable of collecting up to 1,000 connection records/seconds

The Pluribus UNUM Virtual Edge Platform 4600 with Insight Analytics is suitable for medium to large deployments.
### Specifications

#### UNUM Appliance

<table>
<thead>
<tr>
<th>UNUM on the DELL VEP4600</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Hardware</strong></td>
</tr>
<tr>
<td></td>
<td>- Single Server chassis, 1 Rack Unit</td>
</tr>
<tr>
<td></td>
<td>- 8 CPU cores (16 vCPU), 128 GB Ram, 960 GB SSD</td>
</tr>
<tr>
<td></td>
<td>- Quad 1G Base-T NIC, dual 10G Base-T NIC</td>
</tr>
<tr>
<td></td>
<td>- IPMI 2.0 + KVM with Dedicated LAN</td>
</tr>
<tr>
<td></td>
<td>- Dual power supply</td>
</tr>
</tbody>
</table>

**Insight Analytics:**

- Ingest up to 1,000 connections/second
- Retains up to 500 Million connections

---

*UNUM Standard Appliance Specifications*

---

*UNUM Dell Virtual Edge Platform 4600*
Physical Installation

Please refer to the “Dell VEP4600 Installation Guide” at the following location:

VEP4600 Installation Guide

Please review and follow all instructions as outlined in the above documentation.

Pre-requisites

The following is a list of components required for successful platform installation:

- VEP4600 platform
- AC country- and regional-specific cables to connect the AC power source to each of the platforms' AC power supplies
- Two-post rail kit mounting brackets for rack installation, included
- Screws for rack installation
- #1 and #2 Phillips screwdrivers, not included
- M2 Philips drive flat head screwdriver, not included
- Ground cable screws (included) for L-bracket—order separately
- M3 ground lug assembly kit screw, depending on your platform
- Copper/fiber cables

Other optional components are:

- UL-certified ground lug assembly kit with bracket
- Extra mounting brackets for the 4-post mount
- Extra power supply unit
- Extra fan module
Hardware Overview

The 1RU Pluribus UNUM Virtual Edge Platform 4600 consists of:

- 8 CPU cores (16 vCPU) - Intel® Xeon® D Skylake Generation processor, with Intel® QuickAssist Technology (Intel® QAT), and Data Plane Development Kit (DPDK)
- Storage - 960GB SSD
- DDR4 ECC 128GB RAM
- Two 10GbE SFP+ ports
- Four 1000Base-T ports
- One MicroUSB-B console port
- Two USB Type-A ports for more file storage
- One board management controller (BMC)
- Two RJ-45, RS-232 serial-console ports
- One 10/100/1000BaseT RJ-45 Ethernet management port for the processor
- One 10/100/1000BaseT RJ-45 Ethernet management port for the BMC
- One or two AC hot-swappable redundant power supplies, depending on the configuration
- Four or five AC normal hot-swappable fan modules, depending on the configuration
- Standard 1U platform
Hardware Overview (cont'd)

Physical Dimensions

The VEP4600 platform have the following physical dimensions:

- 434 x 381 x 43.6 mm (W x D x H)
- 17.1 x 15 x 1.72 inches (W x D x H)
- PSU/fan tray handle: 1.57 inches (40 mm)
System Interface

VEP4600 - System Overview

I/O Panel View

1. Platform status Icons LEDs
2. RS-232 console ports (top) and 10/100/1000 Base-T ports (bottom)
3. SFP+ ports
4. Luggage tag
5. 1000Base-T networking ports
6. Processor power on/off button
7. Micro USB-B port
8. USB Type A ports
9. Optional - VEP4600 Expansion Cards
10. Power Supplies
System Interface (cont'd)

Power Supply (PSU) View

1. PSUs
2. Fans

PSU LEDs

- Solid green—Input is OK.
- Flashing yellow (amber)—There is a fault with the PSU.
- Flashing green blink at 1Hz—Platform is in a standby/CR state.
- Off—PSU is off.
System Interface (cont'd)

Control Panel LEDs

There are several LEDs on the control panel and on the drive carriers to keep you constantly informed of the overall status of the system.

1. Power LED
2. Master LED
3. System LED
4. Locator LED
5. Temperature LED
6. Fan LED
7. SFP+ indicator LED
8. 10/100/1000 BaseT RJ-45 networking link (left) and activity (right) LEDs
9. 10/100/1000 BaseT RJ-45 networking link (left) and activity (right) LEDs for the processor (left) and for the BMC (right)
## System Interface (cont'd)

### LED Behavior

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Status/Health LED</strong></td>
<td>• Off - system off or in standby</td>
</tr>
<tr>
<td></td>
<td>• Solid green—Normal operation</td>
</tr>
<tr>
<td></td>
<td>• Flashing green—Booting</td>
</tr>
<tr>
<td></td>
<td>• Solid yellow (amber)—Critical system error or CPU power off.</td>
</tr>
<tr>
<td></td>
<td>• Flashing yellow—Noncritical system error, fan failure, or power supply failure</td>
</tr>
<tr>
<td><strong>Power LED</strong></td>
<td>• Off - system off or in standby</td>
</tr>
<tr>
<td></td>
<td>• Solid Green—Normal operation</td>
</tr>
<tr>
<td></td>
<td>• Solid yellow—POST is in process</td>
</tr>
<tr>
<td></td>
<td>• Flashing yellow—Power supply failed</td>
</tr>
<tr>
<td><strong>Master LED</strong></td>
<td>• Solid green—platform is in stacking Master or Stand alone mode</td>
</tr>
<tr>
<td></td>
<td>• Off - system is slave of the stack or system in standby</td>
</tr>
<tr>
<td><strong>FAN LED</strong></td>
<td>• Off - system off or in standby</td>
</tr>
<tr>
<td></td>
<td>• Solid green—Normal operation; fan powered and running at the expected RPM</td>
</tr>
<tr>
<td></td>
<td>• Solid yellow—Fan failed</td>
</tr>
<tr>
<td><strong>PSU LED</strong></td>
<td>• Off—No power</td>
</tr>
<tr>
<td></td>
<td>• Solid green—Normal operation or standby mode</td>
</tr>
<tr>
<td></td>
<td>• Solid yellow—Power supply critical event causing a shutdown</td>
</tr>
<tr>
<td></td>
<td>• Flashing yellow—PSU warning event; power continues to operate</td>
</tr>
</tbody>
</table>
## System Interface (cont'd)

<table>
<thead>
<tr>
<th>LOCATOR LED/System Beacon</th>
<th>Status Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off—Locator function disabled</td>
<td>FFllashing blue with 1 sec on and 1 sec off – Locator function enabled</td>
</tr>
<tr>
<td>FFllashing blue with 2 sec on and 1 sec off – system in standby</td>
<td></td>
</tr>
<tr>
<td>Temperature status LED</td>
<td>Status Description</td>
</tr>
<tr>
<td>Off—system off or in standby</td>
<td>Solid green—temperature is normal</td>
</tr>
<tr>
<td>Solid yellow—temperature is at the limit</td>
<td></td>
</tr>
<tr>
<td>Flashing yellow—temperature is over the limit</td>
<td></td>
</tr>
<tr>
<td>RJ-45 Ethernet LED</td>
<td>Status Description</td>
</tr>
<tr>
<td>Off—no link and no activity detected</td>
<td>On—Activity on the port</td>
</tr>
<tr>
<td>Solid yellow—Link operating at a lower speed</td>
<td></td>
</tr>
<tr>
<td>Solid green—Link operating at a maximum speed—1G</td>
<td></td>
</tr>
<tr>
<td>Flashing green—Port activity</td>
<td></td>
</tr>
</tbody>
</table>
System Interface (cont'd)

System Management Ethernet Port LEDs

Link LED
- Off—No link
- Solid green—Link operating at a maximum speed, auto-negotiated/forced or 1G
- Solid yellow—Link operating at a lower speed, auto-negotiated/forced or 10/100M

Activity LED
- Off—No link
- Flashing green—Port activity

SFP+ Port LEDs

Link/Activity LED
- Off—No link
- Solid green—Link operating at maximum speed, 10G
- Solid yellow—Link operating at a lower speed, 1G
- Flashing green—port activity for 10G
- Flashing yellow—port activity for 1G
System Interface (cont'd)

Luggage Tag

1. SVC tag
2. MAC address
3. PPID
4. Express service code
System Interface (cont'd)

Management Ports

RS-232 Console Port Access

1. RS-232: processor console port (left); BMC console port (right)

Caution: Ensure that any equipment attached to the serial port can support the required 115200 baud rate.

Note: Before starting this procedure, ensure that your PC has a 9-pin serial port and that you have installed a terminal emulation program on the PC.

Note: If your PC's serial port cannot accept a female DB-9 connector, use a DB-9 male-to-male adapter.
System Interface (cont'd)

RS-232 Console Port Access (cont'd)

1. Install the provided RJ-45 connector-side of the provided cable into the platform console port.
2. Install the DB-9 female-side of the provided copper cable into your PC’s serial port. Or install the DB-9 cable into other data terminal equipment (DTE) server hardware.
3. Keep the default terminal settings on the console as follows:

   - 115200 baud rate
   - No parity
   - 8 data bits
   - 1 stop bit
   - No flow control

MicroUSB-B Console Port Access

The MicroUSB-B console port is on the PSU side of the VEP4600.

The terminal settings are the same for the serial console port and the RS-232/RJ-45 console port:

   - 115200 baud rate
   - No parity
   - 8 data bits
   - 1 stop bit
   - No flow control

When you connect the microUSB-B port, it becomes the primary connection and, while connected, all messages are sent to the microUSB-B port.

**Note:** Before starting this procedure, be sure that you have a terminal emulation program already installed on your PC. Install the appropriate drivers to support the microUSB-B port. To download Dell EMC drivers, see [https://www.dell.com/support](https://www.dell.com/support). If your computer requires non-Dell EMC drivers, contact Dell EMC Technical Support for assistance.
System Interface (cont'd)

MicroUSB-B Console Port Access (cont'd)

1. Power on the PC.
2. Connect the USB-A end of cable into an available USB port on the PC.
3. Connect the microUSB-B end of cable into the microUSB-B console port on the platform.
4. Power on the platform.
5. Install the necessary USB device drivers.
6. To download Dell EMC drivers, see https://www.dell.com/support. If your computer requires non-Dell EMC drivers, contact Dell EMC Technical Support for assistance.
7. Open your terminal software emulation program to access the platform.
8. Confirm that the terminal settings on your terminal software emulation program are as follows:
   - 115200 baud rate
   - No parity
   - 8 data bits
   - 1 stop bit
   - No flow control
UNUM VEP4600 Configuration

Dell VEP4600 UNUM Configuration

The Dell VEP4600 comes with ESXi pre-installed.

General Configuration Steps

1. Download the requisite OVA files from the Pluribus Network Cloud (PNC) and save them to your local PC. Access the PNC using the Pluribus Customer Portal and select the Downloads tab.

You may download software directly from the Customer Portal. Use your provided support credentials.

If you do not have credentials for the Customer Portal, please Contact Support AND fill out the following:


Note: The Serial Number is equivalent to UNUM’s Machine ID. You may not have a Serial Number if you have not previously installed UNUM. In that event, please indicate "Do Not Have One" in the Serial Number field on the registration form.

Log in to the Customer Portal using the credentials provided.
Upon successfully logging in you are greeted by a welcome screen.

Select **Software Downloads** and follow the login instructions on the screen. Please verify your support credentials again.
### UNUM VEP 4600 Configuration (cont'd)

#### Pluribus Networks Cloud Welcome Screen and Menu

**SOFTWARE**

**OPEN NETVISOR LINUX - 1ST TIME INSTALL**

This image is used for newly purchased or RMA'd products that do not have ONVL installed.

<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
<th>Platform</th>
<th>Checksum</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONVL 3.4 ONIE HF5</td>
<td>3.4.4.19347</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
</tr>
<tr>
<td>ONIE 3.1.1 HF4</td>
<td>3.1.1-13816</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
</tr>
<tr>
<td>ONVL 5.0.0 ONIE GA</td>
<td>5.0.0-14540</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
</tr>
<tr>
<td>ONVL 3.0.0 HF1 ONIE</td>
<td>3.0.0-12817</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
</tr>
</tbody>
</table>

**OPEN NETVISOR LINUX - UPGRADES**

This represents the most current, generally available version of ONVL. In order stay current on any new features, bug fixes and product enhancements, Pluribus recommends you install this version of ONVL.

<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
<th>Platform</th>
<th>Checksum</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONVL 3.0.4 HF5</td>
<td>3.0.4-13347</td>
<td>ONVL</td>
<td>MD5</td>
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<tr>
<td>ONVL 3.1.1 HF4</td>
<td>3.1.1-13816</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
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<tr>
<td>ONVL 5.0.0 GA</td>
<td>5.0.0-14540</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
</tr>
<tr>
<td>ONVL 3.0.0 HF1</td>
<td>3.0.0-12817</td>
<td>ONVL</td>
<td>MD5</td>
<td>Download</td>
</tr>
</tbody>
</table>

**UNUM**

Pluribus UNUM is a Unified Management, Automation and Analytics Platform. It's a web application portal that enables network administrators to configure features and view telemetry data, of the Pluribus Networks Adaptive Cloud Fabric.

<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
<th>Platform</th>
<th>Checksum</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNUM 5.0.0 SA OVA Image</td>
<td>5.0.0-6552</td>
<td>ESXi 6.x</td>
<td>MD5</td>
<td>Download</td>
</tr>
<tr>
<td>UNUM Certs Note: certificates must be upgraded before upgrading UNUM from US 1.1 to US 1.1.1</td>
<td>3.1.1-6209</td>
<td>ESXi 6.x</td>
<td>MD5</td>
<td>Download</td>
</tr>
</tbody>
</table>
UNUM VEP 4600 Configuration (cont'd)

Download UNUM Image

The UNUM image is available from the current downloads page. Select **CURRENT** from the **DOWNLOADS** section of the sidebar menu.

![Pluribus Networks Cloud UNUM Download](image)

**Pluribus Networks Cloud UNUM Download**

Download the software to a local system.

You need to download and have readily available:

- **UNUM Provisioning OVA** - `UNUM-provision-5.2.0-xxxx.xx.ova`
- **UNUM Appliance OVA** - `UNUM-5.2.0-xxxx.xx-st.ova`
- **Virtual Netvisor OVA** - `VNV-5010315465.ova` (example version only).

**Note:** The downloaded vNV version has to match your installed switch OS version.
2. Activate VMware License using the steps illustrated below.

**Note:** A DHCP server must be running for an automatic IP address assignment during ESXi configuration; otherwise, manually assign a static IP addresses for UNUM and vNV. Please refer to the relevant documentation at https://www.pluribusnetworks.com/support/technical-documentation/.

3. Configure ESXi and create a new Virtual Machine (VM) using the configuration examples illustrated below.

4. Connect to the UNUM host via a terminal session using SSH (using the assigned IP address) and run the following script:

   ```sh
   ./unum_provision_sh  (requires DHCP to run)
   ```

5. Deploy a standalone VM.
ESXi Obtain License

From the **ESXi Management Interface**, determine if a license is enabled.

Click the **Licensing** tab to display the current license status.

If a valid license is missing, the following dashboard is displayed.

Obtain a valid license key from the VMware website using the following steps and as illustrated in the following images.

1. Navigate to [https://www.vmware.com/products/vsphere-hypervisor.html](https://www.vmware.com/products/vsphere-hypervisor.html) and select **Download Now**. You may need to create a free account to continue.
2. Register for the download when prompted.
3. After registration you will be redirected to the license and download page.
4. Make a note of your license key (In this example the license is an evaluation version).
5. Select Manually Download to begin the download process.
vSphere Hypervisor

OVERVIEW SPOTLIGHT GETTING STARTED RESOURCES

What is a vSphere Hypervisor?

vSphere Hypervisor is a bare-metal hypervisor that virtualizes servers; allowing you to consolidate your applications while saving time and money managing your IT infrastructure. Our free vSphere Hypervisor is built on the world’s smallest and most robust architecture: VMware vSphere ESXi, which sets the industry standard for reliability, performance, and support.

License Information

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>LICENSE KEYS</th>
</tr>
</thead>
</table>
| VMware vSphere Hypervisor 6 License | [Download License](https://vmware.com)

Download Packages

- VMware vSphere Hypervisor 6.7 Update 3 - Binaries

> VMWare Website - VMware Licenses

- VMware vSphere Hypervisor (ESXi ISO) Image (Includes VMware Tools)
  2019-08-20 | 6.7.0.3 | 314.66 MB | ISO

  Boot your server with this image in order to install or upgrade to ESXi (ESX requires 64-bit capable servers). This ESX ISO image includes VMware Tools.

  MD5SUM: caf95ae04245eb3e9316d6020b6f3b
  SHA1SUM: 4159f833062d1f8d4652c0498e09b6c5b5953b
  SHA256SUM: 9b61c64b95a529b5f02864e094b44405d8976372e7e5b55976237be0

> VMWare Website - VMware Licenses
Enter the key using **Assign License**.
The ESXi dashboard updates with the valid key information.

**ESXi Management Interface - Licensing Tab - New License**
Configure ESXi and Create VM

From the ESXi Management Interface select **Create / Register VM**.
Select **Creation Type** and click deploy a virtual machine from an OVF or OVA file.
Enter a name for the VM and select the provisioning OVA file.

**ESXi Management Interface - VM Name and OVA Installation File**
UNUM VEP 4600 Configuration (cont'd)

Select Storage

![Select Storage Diagram]

ESXi Management Interface - Select Datastore
**Deployment Options**

![Deployment Options](image)

*ESXi Management Interface - Deployment Options*

**Note:** Pluribus Networks recommends using Thin Provisioning
UNUM VEP 4600 Configuration (cont'd)

Ready to Complete

ESXi Management Interface - Ready to Complete
The ESXi Management Interface displays the progress of the VM provisioning status.
UNUM VEP 4600 Configuration (cont'd)

Upon successfully creating the VM, the ESXi management Interface updates.

![ESXi Management Interface - VM Provisioning Complete](image)
Use the **Console** within the ESXi Management Interface to review and record the assigned IP address.

Enter the UNUM login information:

- **username** - vcf
- **password** - changeme

and run the command:

`ifconfig eth0`

The following screen is displayed. Take note of the assigned IP address.
UNUM VEP 4600 Configuration (cont'd)

From a Terminal session enter the following commands:

```bash
ssh vcf@10.110.3.21 (example only) - Enter the IP address you previously recorded from the steps above.

Enter the password: changeme
```

The following screen displays:

![SSH Terminal - VM Login](image-url)
UNUM VEP 4600 Configuration (cont'd)

OVA Files

Create a local directory to hold the OVA files.

![SSH Terminal - UNUM Create OVA File Directory](image1)

SSH Terminal - UNUM Create OVA File Directory

Move the previously downloaded OVA files on your PC to the local OVA directory created above.

![SSH Terminal - UNUM OVA File Directory](image2)

SSH Terminal - UNUM OVA File Directory
UNUM VEP 4600 Configuration (cont'd)

Provision UNUM

To access the requisite installation scripts enter: cd /home/vcf/srv/vcf/bin/tools/cluster at the command prompt.

SSH Terminal - Cluster Directory Scripts

Run the ./unum_provision.sh script.

SSH Terminal - UNUM Provision Script

The following menu displays.

SSH Terminal - Provision Menu
UNUM VEP 4600 Configuration (cont'd)

General Deployment Details and Management Scenarios

UNUM

1. Deploy VM.
2. Eth0 obtains a DHCP IP Address.
3. Login to the VM and set up the Eth1 IP address.
4. Add vnv(s) as a Seed Switch for UNUM. Performed post vNV config/ setup.

vNV

1. Deploy VM.
2. Obtain vmgmt0 IP address for vNV from DHCP.
3. Disconnect the Network adapter 1 on the VM.
4. Accept EULA.
5. If fabric name is specified: join fabric and errors out under the following conditions:
   a) fabric doesn’t exist or is not reachable or is running a different version

Provisioning Details and Steps for Inband Scenario
UNUM VEP 4600 Configuration (cont'd)

Configuration Steps for VEP

ESXi Configuration:

1. Create a **Vswitch** on the **ESXi** host with the following settings:
   a) promiscuous mode enabled
   b) allow forged transmits

2. Portgroup is created (with optional VLAN parameter; defaults to 0 (untagged))

3. Assign a vnic to the vswitch. This vnic is the physical port connected to the switch and needs to be entered correctly by the user for configuration to succeed. Without this is the physical link, the vNV cannot find the fabric to join.

vNV Configuration:

1. vNV's Network Adapter 3 assigned to this port group.

2. vdata0 interface on vNV needs an IP address configured in the same network as the inband IP address of the switch.

3. vNV should have web-enabled on data using: `admin-service-show if mgmt web` (same as the management scenario).
UNUM VEP 4600 Configuration (cont'd)

UNUM Deployment Menu

Select **Option 1, Deploy Standalone VM.**

Enter the requisite information for each configuration prompt. See details below.

In many cases use the default value by hitting **Enter** or **Return**.

---

**SSH Terminal - UNUM Provisioning new VEP Inputs**
UNUM VEP 4600 Configuration (cont'd)

ESXi Inputs

- **Enter ESXi server IP**: 10.110.1.61 (example IP address)
- **Enter ESXi server username [root]**: root
- **Enter ESXi server password**: Enter your ESXi server password

UNUM validates the inputs.

- **Available datastores**: datastore1
- **Enter datastore**: [datastore1]:

UNUM Inputs

- **Enter UNUM VM Name [unum-vm]**: Enter a name for the VM or use the default value.
- **Enter UNUM OVA**: /home/vcf/ova_files/UNUM-5.2.0-7217.11-st.ova (example version only)
- **Enter eth1 IP/ mask for UNUM VM [172.16.250.150/24]**: (default value)

vNV Inputs

- **Enter vNV OVA**: /home/vcf/ova_files/VNV-5010315465.ova (Example version only. The version you use must match the Netvisor ONE OS version running on your switches.)
- **Enter vNV VM Password**: (The selected password must match password used on your switches.)
- **Enter number of vNVs [1]**: 2

**Note**: Switches must exist to create a fabric. Inband management only possible if switches exist.
UNUM VEP 4600 Configuration (cont'd)

Inputs for vNV 1

- Enter VM name for vnv 1 [vnv-vm_1]: Enter name or use default value
- Enter fabric to join on vNV 1 [-]: mgmt-ureg (example only)
- Enter vNV connection mode for vnv-vm_1 - management/inband [management]:

Inputs for vNV 2

- Enter VM name for vnv 2 [vnv-vm_2]: Enter name or use default value
- Enter fabric to join on vNV 1 [-]: inband-ureg (example only)
- Enter vNV connection mode for vnv-vm_1 - management/inband [management]: inband
- Enter vSwitch name for inband_vnv [vnv-switch_2]:
  - Available vmnics: vmnic0 vmnic1 vmnic2 vmnic3 vmnic4 vmnic5 vmnic6 vmnic7 vmnic8
  - Enter up to 2 vmnic(s) connected to inband-ureg separated by comma: vmnic2
- Enter portgroup for vSwitch vnv-switch_2 [VmDataNet]:
- Enter VLAN for port group [0/4095/VLAD-ID]. Note setting VLAN to 0 indicates None; 4095 indicates All (0-4095) [-]:
- Enter inband IP/mask for inband_vnv: 172.18.201.101/24
**UNUM VEP 4600 Configuration (cont'd)**

**Provisioning**

After entering the requisite settings, UNUM begins the provisioning process and reports each configuration step.

![SSH Terminal - UNUM Provisioning]

```plaintext
2020-02-06 11:22:58,800 setupInband INFO Setting up vSwitch vnv-vswitch_2 and portgroup VmDataNet on ESXi 10.110.1.01
2020-02-06 11:23:57,615 setupInband INFO vSwitch vnv-vswitch_2 setup succeeded
2020-02-06 11:23:57,615 vnvProvision INFO Deploying VM unnum-vm
2020-02-06 11:23:57,617 vnvProvision INFO Deploying VM vnv-vm_1
2020-02-06 11:23:57,619 vnvProvision INFO Deploying VM inband_vnv
2020-02-06 11:28:32,081 vnvProvision INFO Deploying VM unnum-vm successful
2020-02-06 11:28:45,570 vnvProvision INFO Deploying VM vnv-vm_1 successful
2020-02-06 11:28:47,873 vnvProvision INFO Deploying VM inband_vnv successful
2020-02-06 11:29:35,541 vnvProvision INFO eth0 IP for unnum-vm on ESXi host 10.110.1.61 is 10.110.3.201
2020-02-06 11:29:47,501 vnvProvision INFO Setting up vNV vnv-vm_1 as management
2020-02-06 11:29:48,806 vnvProvision INFO Setting up vNV inband_vnv as inband
2020-02-06 11:32:22,134 vnvProvision INFO eth0 IP for vnv-vm_1 on ESXi host 10.110.1.61 is 10.110.0.216
2020-02-06 11:32:22,163 vnvProvision INFO eth0 IP for inband_vnv on ESXi host 10.110.1.61 is 10.110.3.40
2020-02-06 11:32:34,083 vnvProvision INFO Accepted EULA on 10.110.0.216
2020-02-06 11:32:34,111 vnvProvision INFO Accepted EULA on 10.110.3.40
2020-02-06 11:32:36,498 vnvProvision INFO Setting up vdata0 IP address on 10.110.3.40 for inband connectivity
2020-02-06 11:32:48,221 vnvProvision INFO Joined fabric mgmt-ureg successfully
2020-02-06 11:33:52,404 vnvProvision INFO Joined fabric inband-ureg successfully
2020-02-06 11:34:39,635 vnvProvision INFO Setting up eth1 IP address on UNNUM
2020-02-06 11:38:18,733 vnvProvision INFO Setting up eth1 IP address on UNNUM complete
2020-02-06 11:40:33,829 addSeedSwitch INFO Ping from UNNUM 10.110.3.201 to 10.110.0.216 successful
2020-02-06 11:40:37,558 addSeedSwitch INFO Successfully added VNV vnv-vm_1 as seed switch
```
Optionally, monitor the provisioning from the ESXi Management Interface.

![ESXi Management Interface - Monitor UNUM Provisioning]
UNUM VEP 4600 Configuration (cont'd)

UNUM logs the provisioning output to the `provision_log` file, which is available for subsequent review.

```
UNUM VEP 4600 Appliance - Getting Started Guide

Note: Once provisioning is complete, we recommend powering down the Provisioning VM.
```
Autostart Settings for VMs.

After deploying the VMs, enable autostart in the event the ESXi host reboots to ensure the UNUM VMs start as well.

From the ESXi Management Interface click Manage and choose Autostart.

Click on Edit Settings and set Enabled to Yes.
UNUM VEP 4600 Configuration (cont'd)

Select the **UNUM VM**, click on **Enable**. Repeat the process for the **vNV VM(s)**.

![Esxi Management Interface Enable Autostart All VMs](image)
vNV Configured Switch

**Login** to the newly configured **seed switch** using the mgmt-ip address: `10.110.0.216` (in this example) to review the configuration.

![SSH Terminal - UNUM Provisioning Show Switch Setup vNV Seed Switch](image)

**Login** to the **UNUM** instance. Refer to the **UNUM 5.2.0 Installation & User Guide** for more information on using UNUM.
UNUM VEP 4600 Configuration (cont'd)

The Topology dashboard displays the newly configured switches and vNV instances.

Note: Refer to the UNUM 5.2.0 Installation & User Guide for more information on using UNUM.
Submitting a Service Request

Pluribus Software Support

For Pluribus software support, you can purchase optional support contracts from your partner, reseller, or Pluribus Networks.

Purchasing a support contract from a local partner is sometimes preferred due to geographical or language requirements.

Please contract your local partner to better understand the available service programs and pricing.

If you purchased a Pluribus FreedomCare maintenance agreement, you can contact Pluribus Networks directly for support requirements.
Appendix A

Appendix

1. **Login** - If desired to set a static IP for Pluribus UNUM, log into the VM via the console with the credentials `vcf/changeme`.

![UNUm Console Login Screen](image)

2. **Run** `./UNUM_setup.sh`:

![Run UNUM_setup.sh Script](image)
Appendix A (cont'd)

3. **Configure UNUM IP**

You may now configure the Host IP by selecting **Option 1**. Follow the on-screen instructions for entering the Host IP address.

**Note:** Before you can configure or edit **UNUM IP Addresses**, you must first stop UNUM using **Option 4**.

---

**UNUM Options Menu**

```
UNUM: Installation Setup

Version: 5.2.0-SNAPSHOT-7172
Template Version: ubuntu-16.04-p5-st
Machine ID: E4C272AF-7852EB26-08FE6F99-C8685EEE

0: Exit
1: Configure UNUM IP
2: Configure date/time
3: Start UNUM
4: Stop UNUM
5: Update UNUM
6: Tech Support
7: Status Check
8: Advanced Settings
9: Configure SNMP community String

(0-9):_
```

**UNUM Configure UNUM IP Menu**

```
UNUM: Configure UNUM IP Menu

0: Main Menu
1: Change interface IP
2: Configure docker0 IP
3: Configure vcfnet network

(0-3):_
```
Note: Please review the following usage information regarding the Ethernet adapters used by UNUM:

<table>
<thead>
<tr>
<th>Ethernet Adapter</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eth0</strong></td>
<td>used for management, GUI (user interaction) and data collection via Netvisor REST. This interface uses DHCP by default.</td>
</tr>
<tr>
<td><strong>Eth1</strong></td>
<td>used for internal system communication is set to IP address 172.16.251.1 by default.</td>
</tr>
</tbody>
</table>

**WARNING!** If you change the IP address of **Eth1** in a cluster configuration, you disrupt normal operations. Please contact **Pluribus Networks Technical Support** if you need or want to change the **Eth1** address in a cluster configuration.

<table>
<thead>
<tr>
<th>Ethernet Adapter</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eth2</strong></td>
<td>&lt;Optional&gt; used to connect a Seed Switch or Fabric on a separate network other than the web interface.</td>
</tr>
</tbody>
</table>
Appendix A (cont'd)

Configure Docker0 IP

UNUM uses a default docker IP address of **172.17.251.1/24** for internal communication.

**Warning:** In the majority of deployments, there is no need to change this address.

However, if you use the default range as the UNUM management network there could be network conflicts within your network. Therefore, you have the ability to modify the docker0 interface IP address using **Option 2 - Configure docker0 IP**.

![Configure UNUM IP Menu](image)

Select **Option 2 - Configure docker0 IP**.

Enter the desired IP address range and mask. (Shown below as example only.)

Enter the sudo password.
Appendix A (cont’d)

UNUM updates the **docker0 IP** address, stopping and restarting services.

![UNUM: Configure UNUM IP Menu]

**Note:** The **docker0 IP** address has to be a specific host IP address and mask.

---

**UNUM - Confi gure Docker0 IP**

Press any key to continue.

If required, view the new **docker0 IP** address using **ifconfig** from a command prompt.

![vcf@unum: ~ — Pluribus Networks UNUM]

**UNUM - New Docker0 IP Address**
Appendix A (cont'd)

Configure VCFnet Network

UNUM uses a default VCFnet IP address of 172.18.251.1/24 for internal communication.

However, if you use the default range as the UNUM management network there could be network conflicts within your network. Therefore, you have the ability to modify the VCFnet interface IP address using Option 3 - Configure vcfnet network.

Select Option 3 - Configure vcfnet Network.

Enter the desired IP address range and mask. (Shown below as example only.)

Enter the sudo password. UNUM updates the vcfnet IP address, stopping and restarting services.

Press any key to continue.
If required, view the new vcfnet IP address using `ifconfig` from a command prompt.

```
vcf@unum:~  ➜  Pluribus Networks UNUM

vcf@unum:~$ ifconfig
br-f815fc4dd2a Link encap:Ethernet  HWaddr 00:42:72:4f:d2:bd
    inet addr:192.18.251.1  Bcast:0.0.0.0  Mask:255.255.255.0
    UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
    RX packets:128530  errors:0  dropped:0  overruns:0  frame:0
    TX packets:119827  errors:0  dropped:0  overruns:0  carrier:0
    collisions:0  txqueuelen:0
    RX bytes:32040870 (32.0 MB)  TX bytes:34109215 (34.1 MB)
```

**Note:** The vcfnet IP address has to be a specific network IP address and mask.

If no further configuration changes are required, use **Option 3** to restart UNUM otherwise proceed to the next step.
About Pluribus Networks

Pluribus Networks delivers an open, controllerless software-defined network fabric for modern data centers, multi-site data centers, and distributed cloud edge environments.

The Linux-based Netvisor® ONE operating system and the Adaptive Cloud Fabric™ have been purpose-built to deliver radically simplified networking and comprehensive visibility along with white box economics by leveraging hardware from our partners Celestica, Dell EMC, and Edgecore, as well as Pluribus Networks’ Freedom™ Series of switches.

The Adaptive Cloud Fabric provides a fully automated underlay and virtualized overlay with comprehensive visibility and brownfield interoperability and optimized to deliver rich and highly secure per-tenant services across data center sites with simple operations having no single point of failure.

Further simplifying network operations is Pluribus UNUM™, an agile, multi-functional web management portal that provides a rich graphical user interface to manage the Adaptive Cloud Fabric. UNUM has two key modules - UNUM Fabric Manager for provisioning and management of the fabric and UNUM Insight Analytics to quickly examine billions of flows traversing the fabric to ensure quality and performance.

Pluribus is deployed in more than 275 customers worldwide, including the 4G and 5G mobile cores of more than 75 Tier 1 service providers delivering mission-critical traffic across the data center for hundreds of millions of connected devices. Pluribus is networking, simplified.

For additional information contact Pluribus Networks at info@pluribusnetworks.com or visit www.pluribusnetworks.com

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