# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Notice</td>
<td>3</td>
</tr>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Specifications</td>
<td>5</td>
</tr>
<tr>
<td>Physical Installation</td>
<td>6</td>
</tr>
<tr>
<td>Hardware Overview</td>
<td>7</td>
</tr>
<tr>
<td>System Interface</td>
<td>9</td>
</tr>
<tr>
<td>Network Connections</td>
<td>14</td>
</tr>
<tr>
<td>Submitting a Service Request</td>
<td>20</td>
</tr>
<tr>
<td>Appendix A</td>
<td>21</td>
</tr>
<tr>
<td>About Pluribus Networks</td>
<td>28</td>
</tr>
</tbody>
</table>
Legal Notice

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR PLURIBUS NETWORKS REPRESENTATIVE FOR A COPY.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE ARE PROVIDED "AS IS" WITH ALL FAULTS. PLURIBUS NETWORKS DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL PLURIBUS NETWORKS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA, ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF PLURIBUS NETWORKS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

©2020 Pluribus Networks, Inc. All rights reserved. Pluribus Networks, the Pluribus Networks logo, nvOS, Netvisor®, vManage, vRender, PluribusCare, FreedomCare, Pluribus Cloud, and iTOR are registered trademarks or trademarks of Pluribus Networks, Inc., in the United States and other countries. All other trademarks, service marks, registered marks, registered service marks are the property of their respective owners. Pluribus Networks assumes no responsibility for any inaccuracies in this document. Pluribus Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.
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 Standard Appliance is a pre-integrated 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 100 Million records
- Capable of collecting up to 1,000 connection records/seconds

The Pluribus UNUM Standard Appliance with Insight Analytics is suitable for small to medium deployments.
## Specifications

### UNUM Appliance Specfications

<table>
<thead>
<tr>
<th>UNUM Appliance</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Hardware</td>
</tr>
<tr>
<td></td>
<td>- Single server, 1 Rack Unit</td>
</tr>
<tr>
<td></td>
<td>- 4 CPU cores (8 vCPU), 128 GB Ram, 480 GB SSD,</td>
</tr>
<tr>
<td></td>
<td>- Dual 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>
<tr>
<td>Insight Analytics:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ingest up to 1,000 connections/second</td>
</tr>
<tr>
<td></td>
<td>- Retains up to 100 Million connections</td>
</tr>
</tbody>
</table>

*UNUM Standard Appliance Specifications*
Physical Installation

Please refer to “Server Installation” section in the Users Manual (MNL-1793). Follow the “Manuals” link at the following location:

https://www.supermicro.com/products/system/1u/1028/sys-1028r-mctc.cfm

Please review and follow all Warnings! outlined in the above documentation.
Hardware Overview

The 1RU Pluribus UNUM Standard Appliance consists of:

**Processors**
One Intel® Xeon® E5-26x series processor.

**Memory**
Four 32GB ECC RDIMM (Registered DIMM) memory modules: Total 128G Ram.

**Serial ATA**
An on-chip Serial ATA controller and a 480GB SSD.

**I/O Ports**
The rear I/O ports include one VGA port, two USB 3.0 ports, two 1 Gb LAN ports, two 10 Gb LAN ports and a dedicated IPMI LAN port.

**System Power**
Includes redundant 600W hot-plug high-efficiency power supplies.

An amber light will be illuminated on the power supply when the power is off.

An illuminated green light indicates that the power supply is operating.

**Cooling System**
The chassis includes four 4-cm counter-rotating, PWM (Pulse Width Modulated) fans located in the middle of the chassis.

**Mounting Rails**
The Pluribus UNUM Standard Appliance includes a set of quick-release rails, and can be placed in a rack for secure storage and use.

To setup your rack, follow the step-by-step instructions included in the SMCI manual.
Hardware Overview (cont'd)

Control Panel

The control panel provides important system monitoring and control information.

LEDs indicate power on, network activity and hard disk drive activity. Also present are a main power button and a system reset button.
System Interface

System Overview

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.

Control Panel LEDs

Control Panel Button

There are three buttons located on the front of the chassis: a UID button, a reset button and a power on/off button.

UID

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations.

The LED will remain on until the button is pushed a second time.

Another UID button on the rear of the chassis serves the same function.

This button has an LED built into it, which will illuminate when either the front or rear UID button is pushed.
System Interface (cont'd)

**Power**

This is the main power button, which is used to apply or turn off the main system power.

Turning off system power with this button removes the main power but keeps standby power supplied to the system.

**Reset**

Use the reset button to reboot the system.

**Control Panel LEDs**

The control panel located on the front of the chassis has five LEDs.

These LEDs provide you with critical information related to different parts of the system.

This section explains what each LED indicates when illuminated and any corrective action you may need to take.

**NIC2**

Indicates network activity on LAN2 when flashing.
System Interface (cont'd)

**NIC1**

Indicates network activity on LAN1 when flashing.

**HDD**

Indicates SATA and/or peripheral drive activity when flashing.

**Power**

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.
System Interface (cont'd)

Information LED

This LED will be solid blue when the UID function has been activated.

When this LED flashes red, it indicates a fan failure.

When red continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm.

Check the routing of the cables and make sure all fans are present and operating normally.

You should also check to make sure that the chassis covers are installed.

This LED will remain flashing or on as long as the indicated condition exists.

<table>
<thead>
<tr>
<th>State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast Blinking Red (1x/sec)</td>
<td>Fan Fail</td>
</tr>
<tr>
<td>Solid Red</td>
<td>CPU Overheat</td>
</tr>
<tr>
<td>Slow Blinking Red (1x/4 sec)</td>
<td>Power Fail</td>
</tr>
<tr>
<td>Solid Blue</td>
<td>Local UID Button Depressed</td>
</tr>
<tr>
<td>Blinking Blue</td>
<td>IPMI-Activated UID</td>
</tr>
</tbody>
</table>

Universal Information LED States
System Interface (cont'd)

Drive Carrier LEDs

The chassis includes externally accessible SATA drives. Each drive carrier displays two status LEDs on the front of the carrier.

<table>
<thead>
<tr>
<th>LED Color</th>
<th>State</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity LED</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>Solid On</td>
<td>SATA drive installed</td>
</tr>
<tr>
<td>Green</td>
<td>Blinking</td>
<td>I/O activity</td>
</tr>
<tr>
<td><strong>Status LED</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>Solid On</td>
<td>Failed drive for SATA with RSTe support</td>
</tr>
<tr>
<td>Red</td>
<td>Blinking at 1 Hz</td>
<td>Rebuild drive for SATA with RSTe support</td>
</tr>
<tr>
<td>Red</td>
<td>Blinking with two blinks and one stop at 1 Hz</td>
<td>Hot spare for SATA with RSTe support</td>
</tr>
<tr>
<td>Red</td>
<td>On for five seconds, then off</td>
<td>Power on for SATA with RSTe support</td>
</tr>
<tr>
<td>Red</td>
<td>Blinking at 4 Hz</td>
<td>Identify drive for SATA with RSTe support</td>
</tr>
</tbody>
</table>

*Universal Information LED States*
Network Connections

After installation of the Pluribus UNUM Standard Appliance, network activity must be setup as follows:

1. Connect the Management Network to Eth0 (1G or 10G).

2. Note, Eth1 connection is not required, it comes pre-configured with the following IP (Note this is used for internal communication):
   a) 172.16.250.152/24

3. Connect VGA console and IPMI as desired. IPMI default configuration is DHCP.

4. USB connections are not advised.

5. Plug in redundant power connections with the provided cables ONLY and power up.

6. Upon boot up, the Appliance Host OS and Pluribus UNUM SW will use DHCP to obtain an IP. The Host IP can be found via a console connection.
7. It is highly recommended that the default root password of your Server be changed from @<serial_number_of_your_device>. Please see the password information located on the sticker affixed to the device.

To change the root password, you can do the following:

Log onto as root using the ESXi web client (or vSphere client if you have access)
Network Connections (cont'd)

Select “Change Password”:

VMware Change Password Dashboard

Enter New Password:

VMware Change Password
8. The Pluribus UNUM Standard Appliance, comes with the Pluribus UNUM software pre-installed. As noted will use DHCP to obtain an IP by default.

9. You can find the IP of your Pluribus UNUM SW via the ESXi web client (or vSphere client if you have access), log in with the your newly set root password:

In the above example, you will see the IP from your DHCP server, in this case it’s “10.x.x.x”, but the actual IP will depend on your DHCP configurations.
Network Connections (cont'd)

10. If desired to set a static IP see Appendix A.

11. Once you obtain or set the IP of your Pluribus UNUM, use a Chrome browser to connect to that IP for the best experience.
Network Connections (cont’d)

12. Please refer to the PluribusNUM Installation & User's Guide for SW configuration and current Release Notes for configuration and operating instructions:

   a) These documents can be found at: http://www.pluribusnetworks.com/get-started/unum

   ![Pluribus Networks Cloud Login Screen](image)

   **NOTE:** All content of the above documentation is applicable to both the Pluribus UNUM Standalone VM as well as the Pluribus UNUM Standard Appliance unless otherwise noted.

There is no need to download the OVA software as it comes pre-installed on the Standard Appliance.

The software upgrade procedure is the same for both the Standalone VM/Appliance and the High Capacity Appliance.

If supported between two compatible versions, upgrade software can also be obtained from: http://www.pluribusnetworks.com/get-started/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:

- **Eth0**: used for management, GUI (user interaction) and data collection via Netvisor REST. This interface uses DHCP by default.
- **Eth1**: used for internal system communication as single UNUM VM instances **REQUIRE** an IP address setting for **Eth1** before normal operations begin.

  **Eth1** is set to IP address **172.16.250.152/24** by default.

  **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.

- **Eth2**: <Optional> used to connect a Seed Switch or Fabric on a separate network other than the web interface.
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**.

![UNUM - Configure Docker0 & VCFnet Bridge IP](image)

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

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

Enter the sudo password.

UNUM updates the docker0 IP address, stopping and restarting services.
Appendix A (cont'd)

UNUM: Configure UNUM IP Menu

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

(0-3): 2

Enter desired docker0 IP/mask [: 192.17.241.1/24

[sudo] password for vcf:
Updating docker interface ip
2020-01-20 13:53:15 Stopping UNUM 5.2.0~SNAPSHOT ...
2020-01-20 13:53:16 Stopping vcf-elastic ...
2020-01-20 13:53:19 Stopping vcf-collector ...
2020-01-20 13:53:21 Stopping vcf-mgr ...
2020-01-20 13:53:52 Starting skedler ...
2020-01-20 13:53:54 Stopping vcf-center ...
2020-01-20 13:53:58 Stopping vcf-dhcp ...
2020-01-20 13:53:59 Services have been successfully stopped.
2020-01-20 13:53:59 Starting UNUM 5.2.0~SNAPSHOT ...
2020-01-20 13:53:59 Starting vcf-elastic ...
2020-01-20 13:54:00 Starting vcf-collector ...
2020-01-20 13:54:01 Starting vcf-mgr ...
2020-01-20 13:54:02 Starting skedler ...
2020-01-20 13:54:03 Starting vcf-center ...
2020-01-20 13:54:04 Starting vcf-dhcp ...
2020-01-20 13:54:05 Services have been successfully started.
Press any key to continue ...

UNUM - Configure Docker0 IP

Press any key to continue.

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

UNUM - New Docker0 IP Address

Note: The docker0 IP address has to be a specific host IP address and mask.
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.
Appendix A (cont'd)

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

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

Enter desired vcf net subnet/mask []: 192.18.251.1/24
2023-01-20 14:08:20 Stopping UNUM 5.2.0-SNAPSHOT ...
2023-01-20 14:08:22 Stopping vcf-elastic ...
2023-01-20 14:08:55 Stopping vcf-collector ...
2023-01-20 14:09:06 Stopping vcf-ngr ...
2023-01-20 14:09:08 Stopping skedler ...
2023-01-20 14:09:10 Stopping vcf-center ...
2023-01-20 14:09:15 Stopping vcf-dhcp ...
2023-01-20 14:09:16 Services have been successfully stopped.
2023-01-20 14:09:16 Starting UNUM 5.2.0-SNAPSHOT ...
2023-01-20 14:09:16 Starting vcf-elastic ...
2023-01-20 14:09:17 Starting vcf-collector ...
2023-01-20 14:09:18 Starting vcf-ngr ...
2023-01-20 14:09:19 Starting skedler ...
2023-01-20 14:09:20 Starting vcf-center ...
2023-01-20 14:09:21 Starting vcf-dhcp ...
2023-01-20 14:09:22 Services have been successfully started.
Press any key to continue ...
```

Press any key to continue.

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

```
$vcf@unum:~$ ifconfig
br-fe5fcf4df2a Link encap:Ethernet    HWaddr 02:42:72:4f: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

Follow us on Twitter @pluribusnet or on LinkedIn at https://www.linkedin.com/company/pluribus-networks/

Corporate Headquarters
Pluribus Networks, Inc.
5201 Great America Parkway, Suite 422
Santa Clara, CA 95054
1-855-438-8638 / +1-650-289-4717

India Office
Pluribus Networks India Private Limited
Indiqube Brigade Square, 4th Floor
21, Cambridge Road
Bangalore 560008

Document Version - June 2020