CSPi

◉ Pinpoint. ◎ Playback. ⑧ Protect.

Myricom nVoy Series

Packet Recorder

User Guide

Version 1.0

March 24, 2017

Table of Contents

1 Introduction – Myricom nVoy Series Packet Recorder

This chapter provides an introduction to the Myricom nVoy Series Packet Recorder and its major user interfaces in the following sections:

- Myricom nVoy Series Packet Recorder - Overview
- Features and Benefits
- Web User Interface
- Chapter Summaries

1.1 Myricom nVoy Series Packet Recorder - Overview

The Myricom nVoy Series Packet Recorder enables security operations engineers to build next-generation network security or visibility solutions by droplessly recording and indexing at 10G. Users can take advantage of these recordings to address issues such as compliance, forensics, and real-time threat mitigation.

Compliance

Some businesses demand an accurate, time-stamped record of specific packets. The nVoy Packet Recorder effectively filters out the traffic that you don't need and permanently records and timestamps those packets that you do need.

Forensics

In routine day-to-day network operations, intrusion detection system (IDS) software raises alerts that a Security Operations Center must investigate. The nVoy Packet Recorder continuously records packets, allowing security engineers to fetch the specific packet flow records that triggered the IDS alert.

Performance

nVoy Packet Recorder essential performance criteria include:

- The ability to filter, merge, and record packets without drops. The nVoy Packet Recorder captures packets at 10G speeds without drops and with extremely accurate nanosecond timestamp capability.

- The ability to locate and identify an area of interest quickly and effectively. Searching through large amounts of stored data for a pattern, session, or even IP addresses can present a significant challenge. The nVoy Packet Recorder creates on-the-fly index trees to retrieve packets in parallel while recording at line rate.

- Searching on a timeline basis or with an accelerated packet filter in BPF notation. Extracted packets are formatted as pcap files for further analysis, with the Myricom nVoy Series Packet Broker, as shown in Figure 1. An API is also available to access the indexes, allowing advanced users to develop their own search and extraction tools.
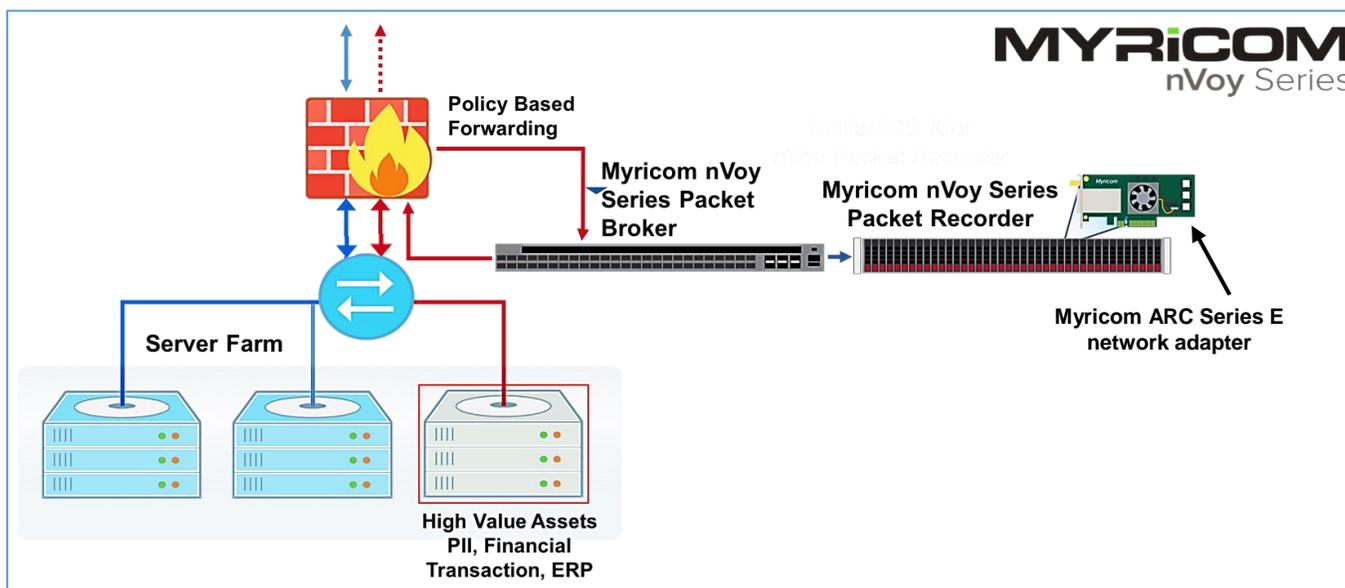
Figure 1: Network traffic recording and indexing scenario featuring the nVoy Packet Recorder teaming with the nVoy Packet Broker.

Real-time compression

Real-time pcap compression can be enabled upon packet capture to reduce the effective written data (and CPU use) and extend the capture window within the same device.

Web Interface

A powerful and easy-to-use, web-based interface is provided for capture and recording configuration, system management, and packet retrieval. Optionally, pcap file analysis can be performed directly via the web interface, enabling users to display a captured pcap or the results of a search directly in a web browser.

Throughout this document we are going to describe the main components of the nVoy Packet Recorder Web user interface.

1.2   Features and Benefits

The nVoy Packet Recorder offers the following key features:

- Two capture ports, each supporting 10G
- 10 Gbit/s packet recording to disk, in pcap file format, with zero packet loss
- On-the-fly indexing and compression/decompression
- Web configuration and management
- Packet indexes accessed through a command line or an API
- Optional pcap re-injection into the network
- 24 x 1.2 TB of storage standard in 2U with options for much more
- Optional pcap analysis available using the web interface

1.3   Chapter Summaries

The nVoy Packet Recorder user guide contains the following chapter summaries:

Chapter	Description
Chapter 1	*Introduction – Myricom nVoy Series Packet Recorder* Provides an overview of the nVoy Packet Recorder, including features and benefits.
Chapter 2	*Quick Start Guide* Provides the user with envoy Packet Recorder setup instructions, including cabling, startup and logon procedures, and network adapter connectivity checks.
Chapter 3	*Web User Interface* Describes the functional details of the Web user interface, the recommended method to interact with the nVoy Packet Recorder.
Chapter 4	*Dashboard Menu* Describes the features of the Dashboard tab. The Dashboard tab is the nVoy Packet Recorder's central information hub.
Chapter 5	*System Menu* Describes the host, user, network, PF_RING, Hugepages, and system management and configuration tasks. Hugepages is _not_ supported in this nVoy Packet Recorder release.
Chapter 6	*Applications Menu* Describes how to manage and customize a variety of licensed nVoy Packet Recorder applications, including n2disk.
Chapter 7	*Licenses Menu* Describes how to automatically renew, configure, and maintain nVoy Packet Recorder software licenses.
Chapter 8	*Admin Menu* The Admin menu enables users to manage nVoy Packet Recorder and software application administrative tasks.
Chapter 9	*Configuring the n2disk Interface* Describes how to configure the n2disk interface, including processor affinity, timestamp, filters, storage data layout and indexing.
Chapter 10	*Configuring the disk2n Interface* Describes how to configure the disk2n interface, including processor affinity and reforging. disk2n is _not_ supported in this nVoy Packet Recorder release.

2   Quick Start Guide

The Quick Start guide provides general information on the following topics:

- Cabling
- Web User Interface
- Logging ON/OFF
- Powering ON/OFF
- Checking ARC Series E Network Adapter Connectivity

2.1   Cabling

This section describes how to connect the nVoy Packet Recorder to the interfaces, as shown in Figure 4.

2.1.1   Prerequisites

1. Personal computer, with Ethernet connectivity to the nVoy Packet Recorder
2. Ethernet cable (Cat 5 or better)
3. Power cord
4. SFP+ cable/transceivers
5. ARC Series E-Class network adapter (installed and configured)
6. 110V 50-60Hz power outlet with 4 Amps capacity, OR

    220V 50-60Hz power outlet with 2 Amps capacity
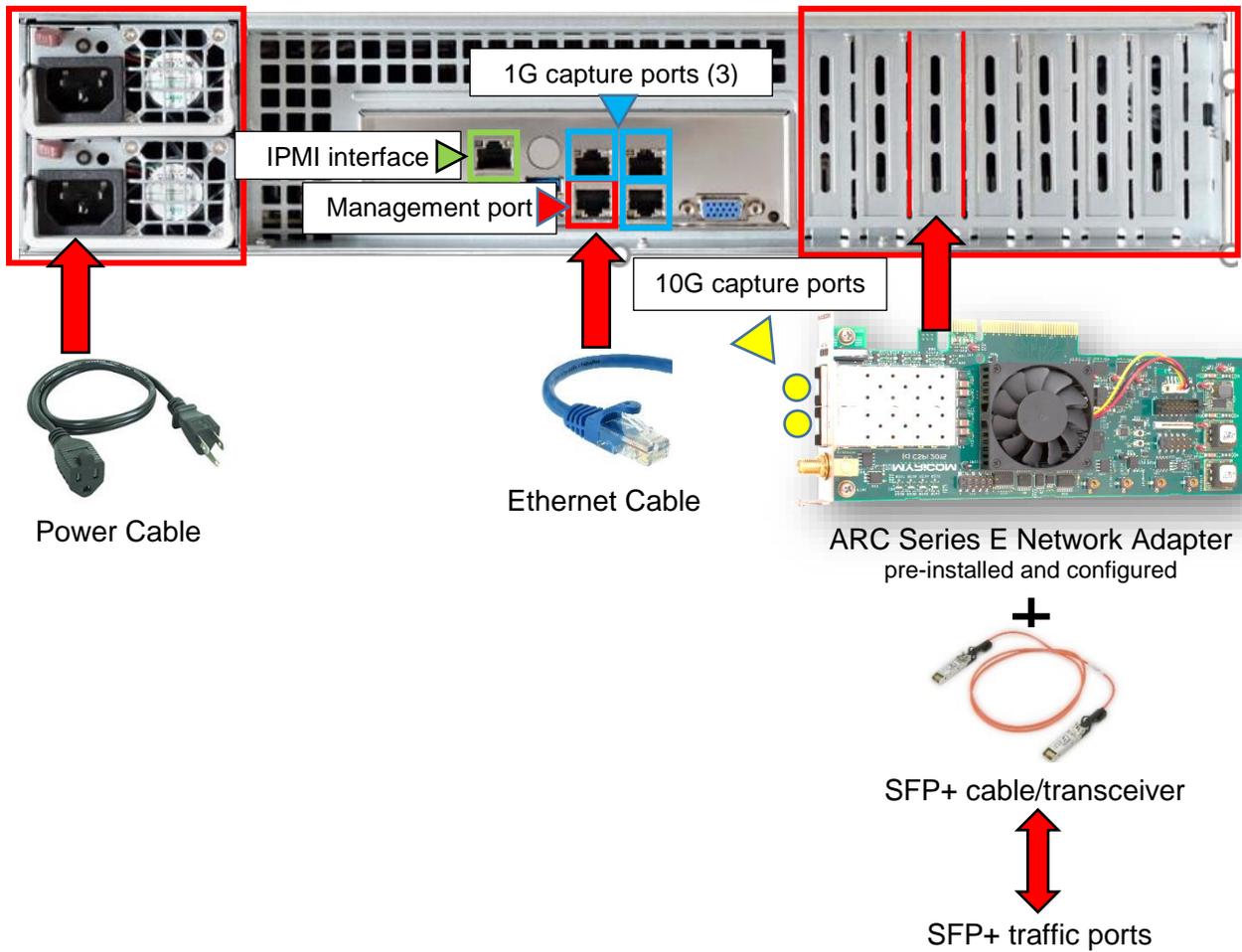
Figure 4: Cabling requirements - rear panel of nVoy Packet Recorder.

2.1.2 IPMI interface

The IPMI interface allows you to access the nVoy Packet Recorder in case of a network disruption on the management port. Refer to the server guide inside the carton for further details.

Connect the management interface to your network and the traffic monitor to the monitoring interface. Depending on your nVoy Packet Recorder configuration, there may be additional monitoring ports that you can configure from the Web user interface.

Factory Reset

To reset the nVoy Packet Recorder to the pre-configured default, navigate to the System tab and select **Factory Reset**. Note that at the first reboot, disconnect all cables from the network interfaces beside the eth0 cable to enable the nVoy Packet Recorder to detect the eth0 management interface.

For more information on resetting to factory specs, go to section 5.8 *Factory Reset tab*

2.1.3 Cabling procedure

1. Connect the Ethernet cable from the nVoy Packet Recorder management port to a switch or PC.

2. For 10G traffic ports, run SFP+ copper cables or fiber optical modules (with proper cables) from one or more nVoy Packet Recorder traffic ports to switch ports or other SFP+ traffic ports.

3. Connect the nVoy Packet Recorder to a power outlet.

2.2 Web User Interface

The nVoy Packet Recorder has a web-based management user interface designed to configure and run the CSPi series of packet recording software such as n2disk.

NOTE:	For the purposes of this user guide, we will be describing the nVoy packet recording Web user interface as it relates to the **n2disk software package**.

2.2.1 Default login information

The nVoy Packet Recorder is shipped with a default IP address to establish TCP/IP connectivity, as described below.

Default IP address	https://192.168.160.10
Default Console username	root
Default Console password	nbox
Default web username	nbox
Default web password	nbox

Table 2: Default login information.

NOTE:	Upon receipt of the nVoy Packet Recorder, we recommend that you immediately change the default root password. For more information, go to Section 2.2.2 *Changing the default root password.*

2.2.2 Changing the default root password

To change the default root password, follow these steps:

1. Click **System** > **Users** tab.

   The System Users window appears, as shown in Figure 4a.
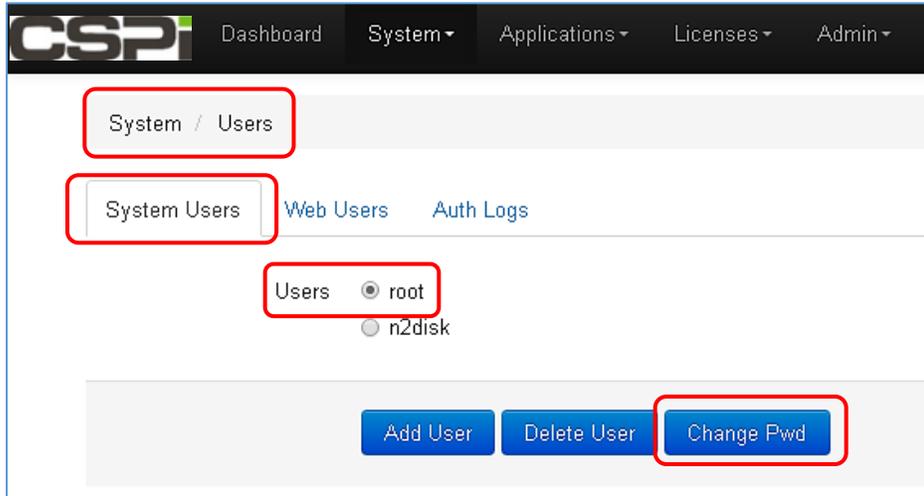
Figure 4a: System Users window.

2. Check the **Users root** radio button and click **Change Pwd**.

   The root login Change Pw window appears, a shown in Figure 4b.
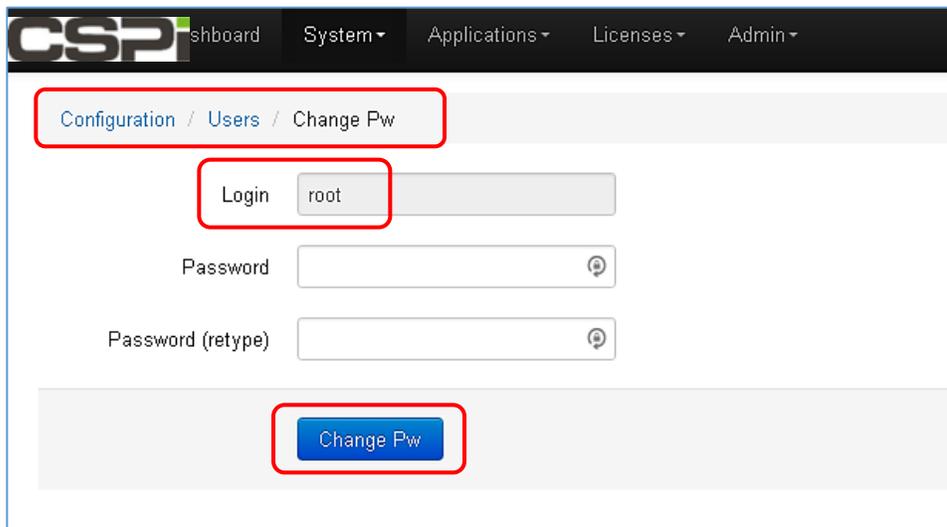
Figure 4b: Change Pw window (root login)

3. Enter the new password twice and click **Change Pw**.

   The default root password has been changed.

2.2.3 Log On procedure

1. Enter the default IP address.

   The Log In window appears, as shown in Figure 5.

Figure 5: Default login information.

2. Click **Log In**

   The Authentication Required prompt appears, requesting a username and password, as shown in Figure 6.

Figure 6: Authentication Required window.

3. Enter the default user name and password.

4. Click **OK**

   The nVoy Packet Recorder Web user interface appears. The homepage defaults to the Dashboard. You can now manage the nVoy Packet Recorder through the Web user interface.

NOTE:	If you received a security certificate warning when logging on, go to section 2.2.5 *SSL Certificate Warning.*

NOTE:	If you are logging on to the Web user interface for the fist time, we recommend that you immediately change the default root password. For more information, go to Section 2.2.2 *Changing the default root password.*

2.2.4 Log Off procedure

The **Admin > Logout** tab enables user to log off the nVoy Packet Recorder Web user interface, as shown in Figure 7.
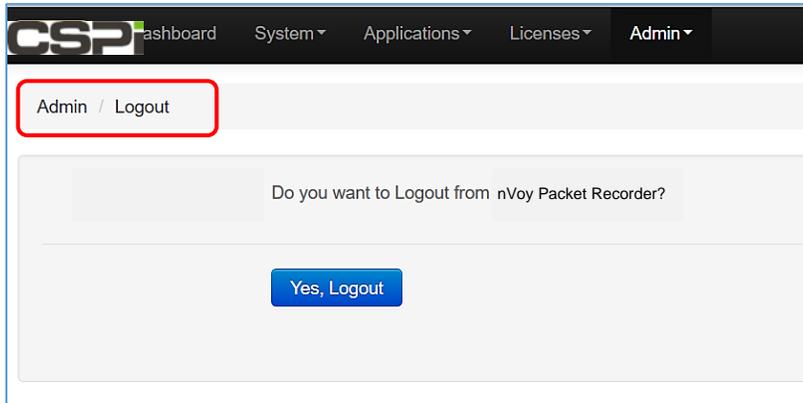
Figure 7: Logging off the nVoy Packet Recorder Web user interface.

Click **Yes, Logout** to log off the nVoy Packet Recorder Web user interface.

2.2.5 SSL Certificate Warning

When connecting to the nVoy Packet Recorder Web user interface, you may receive a security certificate warning according to web browser type.

Internet Explorer browser

In the event of a security certificate warning, click **Continue to this website (not recommended)**, as shown in Figure 7a.
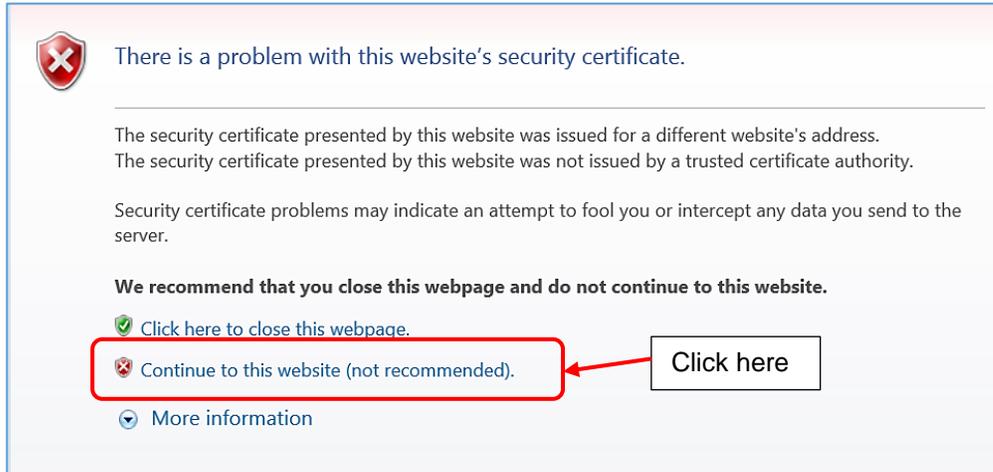
Figure 7a: Internet Explorer browser security certificate warning.

Google Chrome browser

In the event of a security certificate warning, click **Advanced** and then **Proceed to cspi-nvoy-recorder (unsafe)**, as shown in Figure 7b.
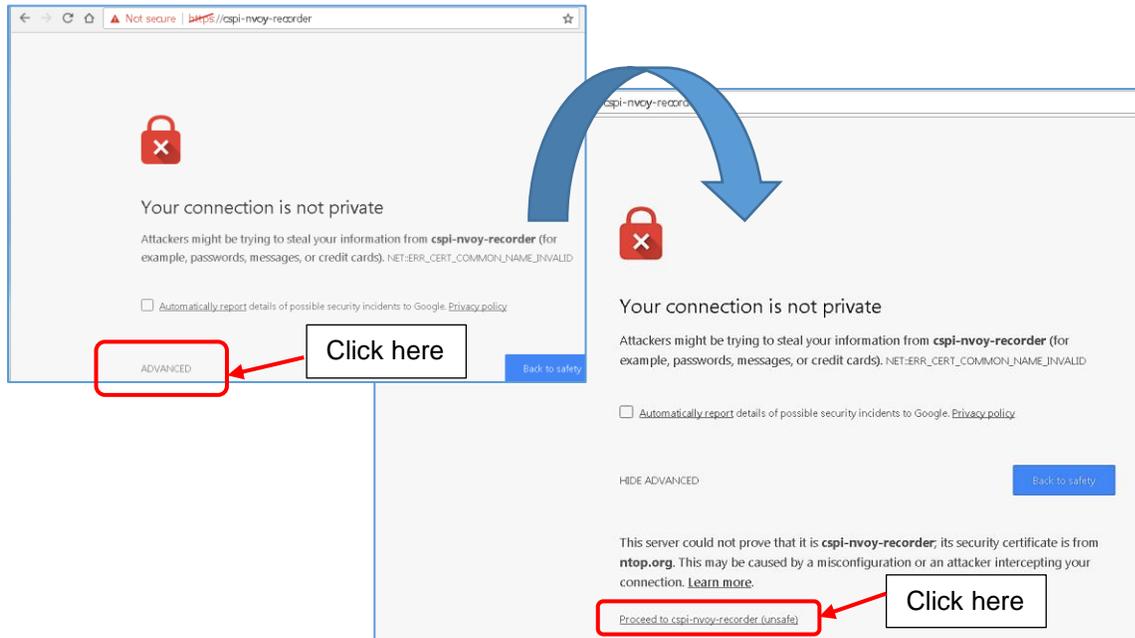
Figure 7b: Google Chrome browser security certificate warning.

2.3 Powering ON/OFF

This section describes how to power ON and OFF the nVoy Packet Recorder.

2.3.1 Power ON sequence

Before you power on the nVoy Packet Recorder:

1. Unplug the Ethernet cable to your network first to prevent IP address conflicts.

2. Connect the appliance power cords to the power supply.

   It takes about five minutes for the appliance to be ready for use.

3. Connect the Ethernet cable directly to a PC or laptop.

NOTE:	We recommend connecting the appliance to a desktop or a laptop to change the IP address from the Web GUI.

2.3.2 Power OFF sequence

The **Admin > Shutdown** tab enables user to shut down the nVoy Packet Recorder system (Figure 8).
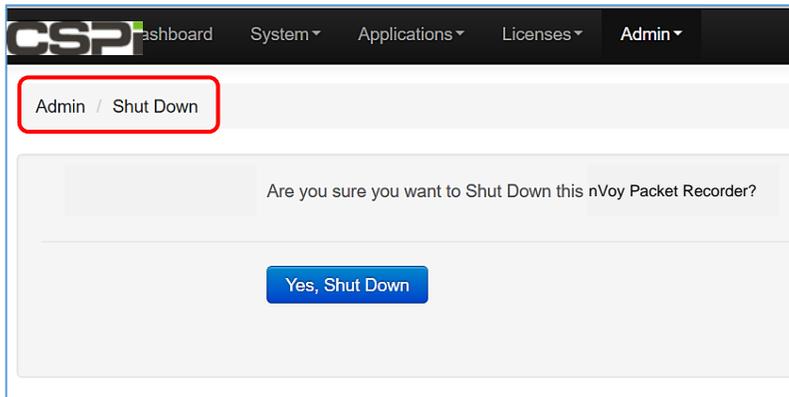
Figure 8: Shutting down the nVoy Packet Recorder system.

Click **Yes, Shut Down** to shut down the nVoy Packet Recorder system.

2.4 Checking ARC Series E Network Adapter Connectivity

To ensure ARC Series E network adapter installation is complete, we recommend running the adapter as a basic Ethernet adapter, as follows:

1. Attach an SFP+ cable/transceiver from each adapter port to your local 10G switch device.

2. Verify the link LEDs on the ARC Series E network adapter.

3. Verify that the **myri0** and **myri1** network interface indicator LEDs are green on the Dashboard display.

3 Web User Interface

Once you have configured the nVoy Packet Recorder IP and the device is accessible through the network, you can now access the device through the Web User Interface (Figure 9). The Web user interface is the recommended method to interact with the nVoy Packet Recorder.
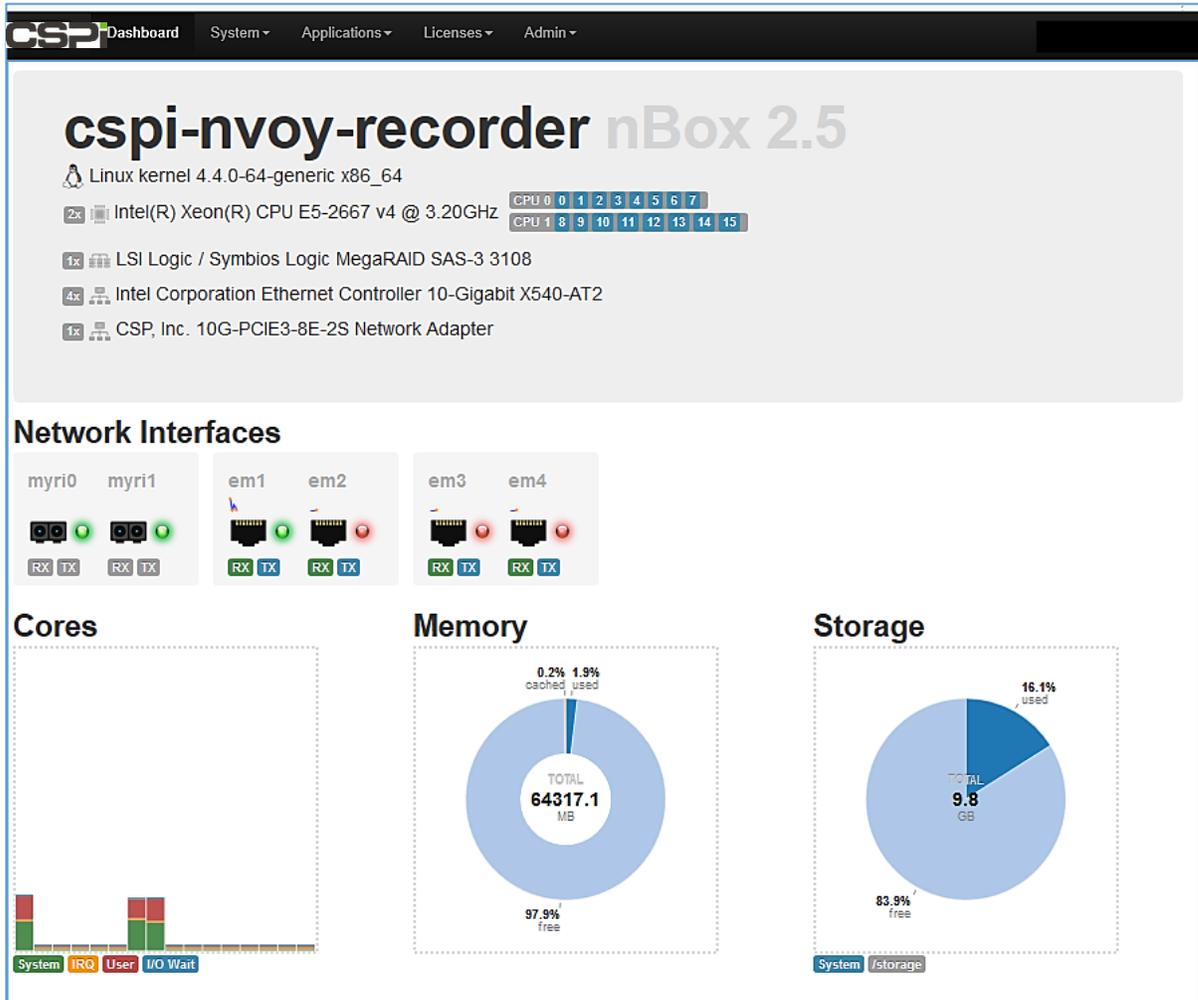
Figure 9: nVoy Packet Recorder Web user interface homepage (Dashboard).

3.1 Web User Interface Features

The Web user interface allows the user to perform and manage the following tasks:

Dashboard

High-level view of the nVoy Packet Recorder, including processor, memory, disk storage utilization, and state of the capture interfaces.

System

Host, user, network, PF_RING, Hugepages, and system management and configuration tasks.

Applications

nVoy application/utilities customization and management tasks.

Licensing

Application licensing configuration and maintenance tasks.

Admin

System services, storage, updates, and shutdown/reboot management tasks.

3.2   Web User Interface Homepage

Familiarize yourself with the layout of the nVoy Web user interface homepage. Figure 10 displays a typical Web user interface layout and its five essential tabs.

Menus

- Dashboard menu
- System menu
- Applications menu
- Licenses menu
- Admin menu

Figure 10: Web user interface with highlighted tabs.

4 Dashboard Menu

The Dashboard menu is the nVoy Packet Recorder's central information hub. With a simple point and click, or mouse-over, users get a high-level view of the nVoy Packet Recorder, including CPU, memory, disk storage utilization, and state of the capture interfaces – all without switching to different menus (Figure 11).
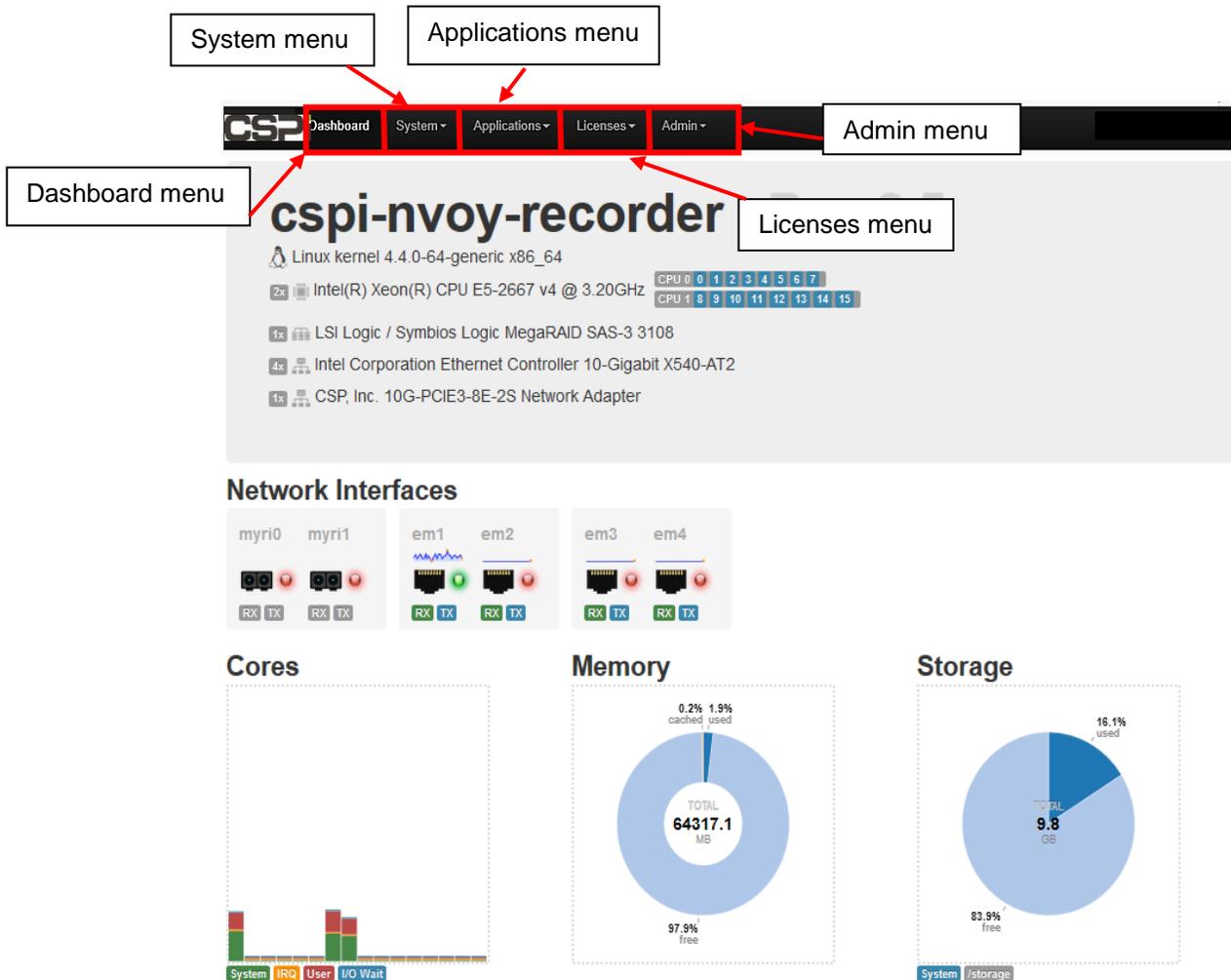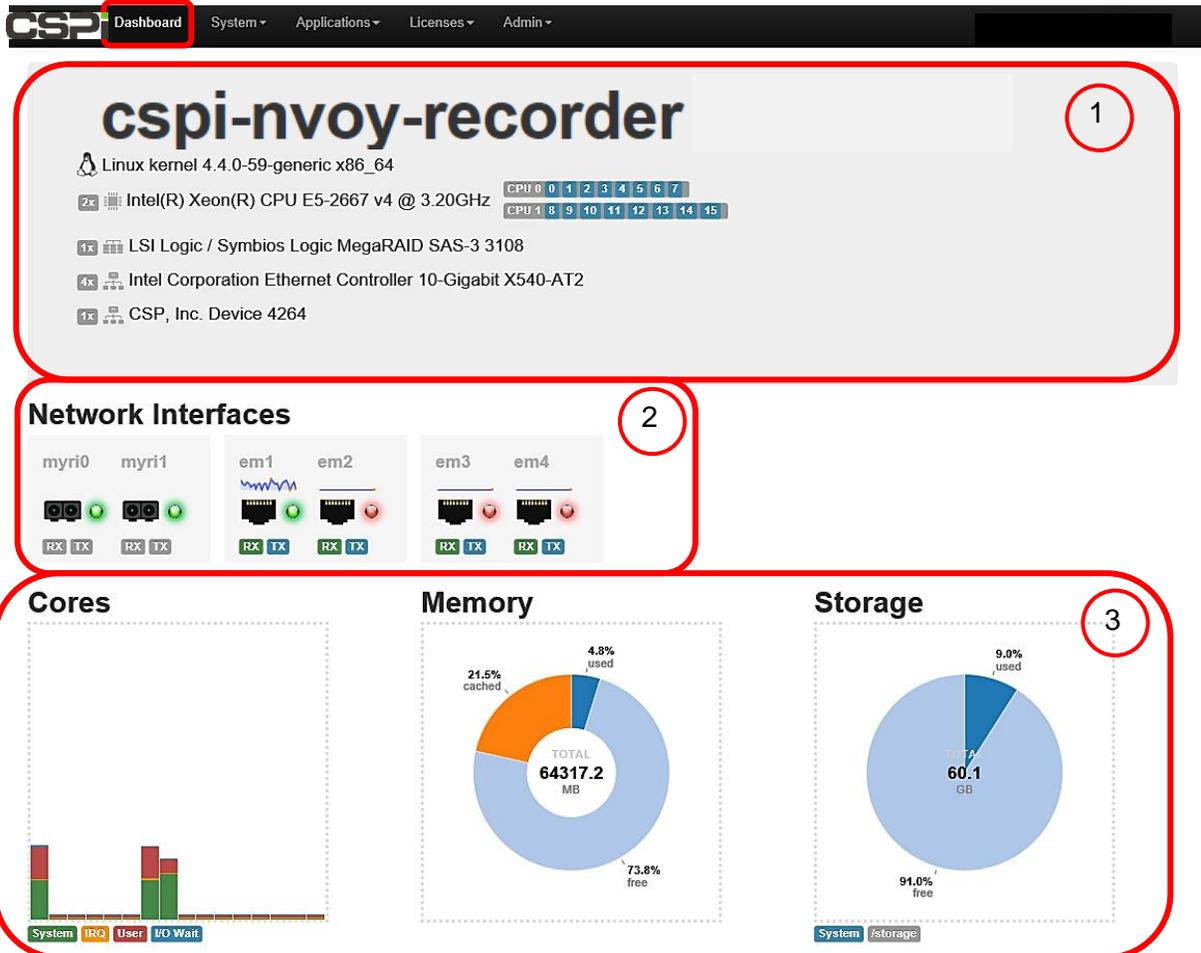

Figure 11: Dashboard tab view.

4.1   System and device information

The system and device information panel displays the following:

- Operating system
- CPU and RAID drives
- Ethernet Controller
- Network adapter device

4.2   Network Interfaces

The Network Interfaces displays connectivity and traffic information for the capture ports and Ethernet ports, as shown in Figure 12. Hover your pointer over the interfaces to display their respective tool tips.
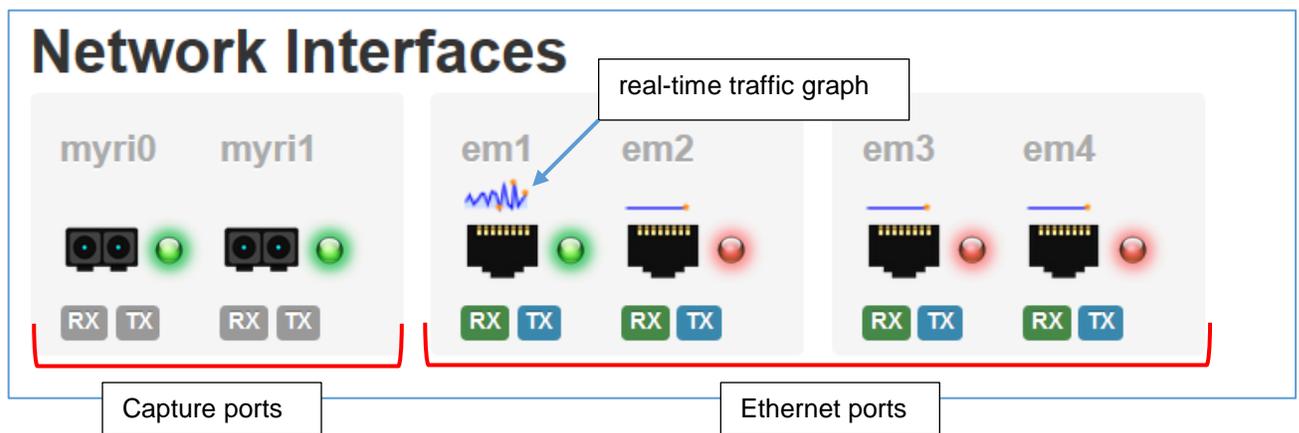
Figure 12: Network interface tool tips.

The interfaces labeled **myri0** and **myri1** are the capture ports. When a cable is connected and there is a link, the LEDs turn green. Even when there is a valid link the RX and TX blocks remain gray. The capture ports do not display the real-time traffic line graph.

The interfaces labeled **em1** to **em4** are the standard Ethernet ports. When a cable is connected and there is a link, the LEDs turn green and the RX/TX blocks turn green and blue, respectively. The standard Ethernet ports display the real-time traffic line graph in blue.

4.3   Cores, Memory, and Storage

The third panel displays CPU core performance, available memory, and systems storage in real-time, as shown in Figure 13.

Cores

Displays CPU performance and utilization by system, IRQ, User, and I/O wait. The Cores panel displays the real-time CPU and I/O utilization for each core. Each core has its own column, from Core 0 to 15. Core utilization increases significantly when a capture is in progress.

Memory

Total memory displays the real-time memory utilization for the machine (as a percentage of total MB). The chart indicates the total amount of memory (64GB) as well as the amount cached, used and free.

Storage

The Storage panel displays the real-time disk space utilization.

1. Clicking the **System** link displays the total, free, and used space on the internal boot drive.

2. Clicking the **/storage** link displays the total, free, and used space on the RAID drive.
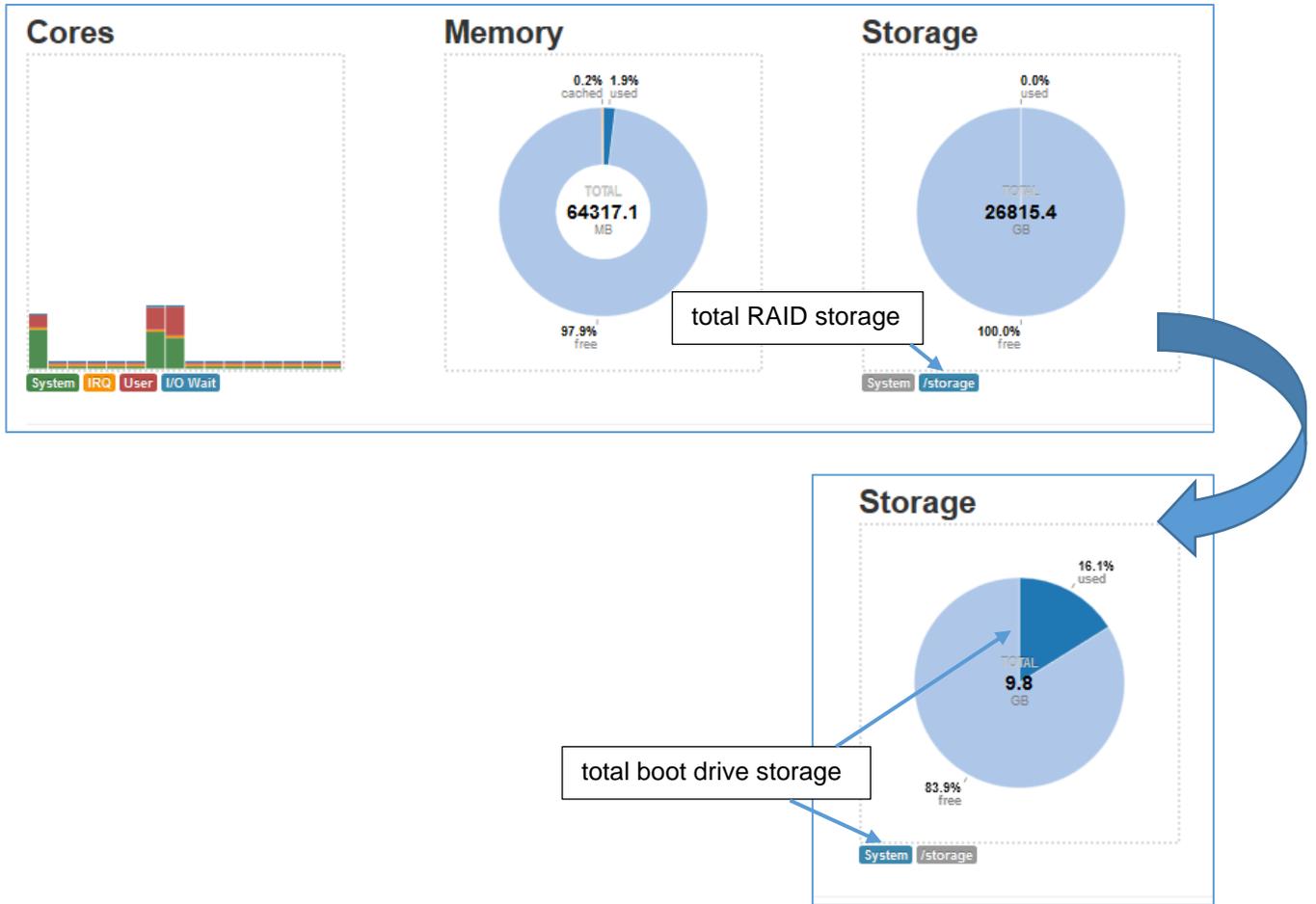
Figure 13: Core, Memory, and Storage panel description.

5 System Menu

The System menu displays the host, user, network, PF_RING, Hugepages, and system management and configuration tasks, as shown in Figure 14.
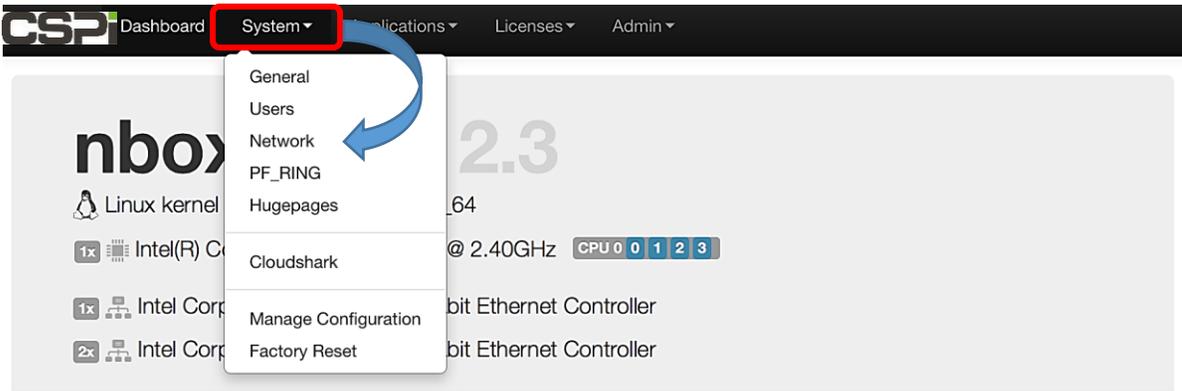
Figure14: System menu.

5.1 General tab

The General tab displays the nVoy Packet Recorder hostname, system time zone, and the NTP and SSH Enable/Disable services, as shown in Figure 15.

NOTE:	SSH is _not_ supported in this nVoy Packet Recorder release.
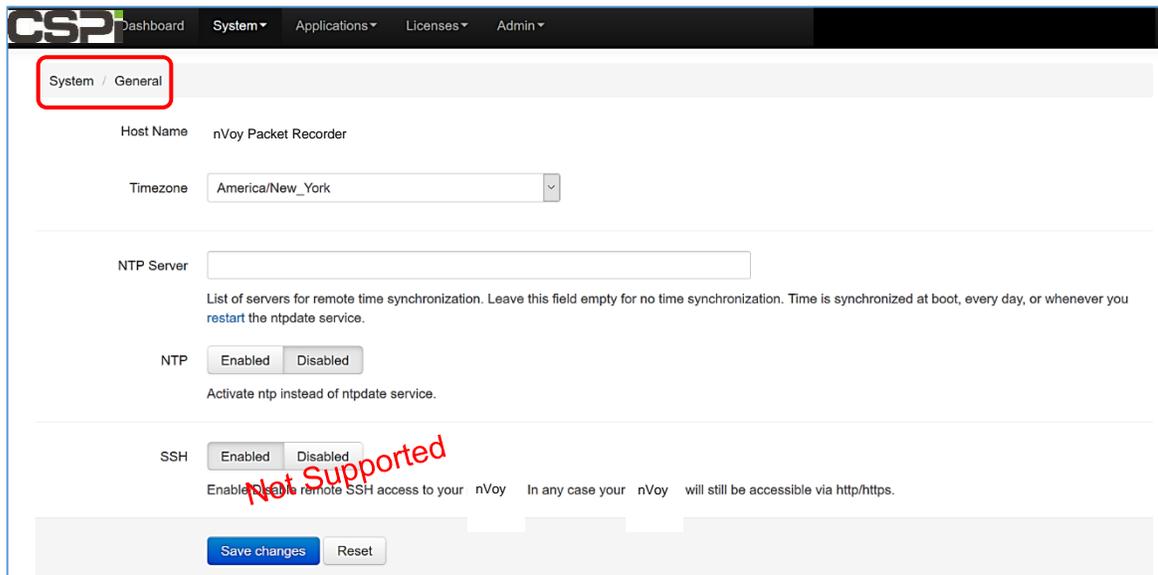
Figure 15: General tab.

NTP Server

Provides a server list for remote time synchronization. Leave this field empty for no time synchronization. Time is synchronized upon start-up, every day, or whenever you restart the ntpdate service.

NTP

Click **Enabled**. You enable NTP instead of the ntpdate service.

Click **Disabled**. You disable NTP and ntpdate service resumes.

SSH (not supported)

You can enable or disable remote SSH access to your nVoy Packet Recorder. In any event, your nVoy Packet Recorder is still available via http/https.

Save your changes by clicking **Save Changes**. A message appears confirming that your settings have been saved.

5.2 Users tab

The Users tab enables Administrator access and management of system and web user accounts, as shown in Figure 9. Administrator tasks include adding, deleting and changing user accounts and passwords. The System Users window appears by default.

The Users tab contains the following:

- System Users (Figure 16)
- Web Users (Figure 17)
- Auth Logs Figure 18)

5.2.1 System Users
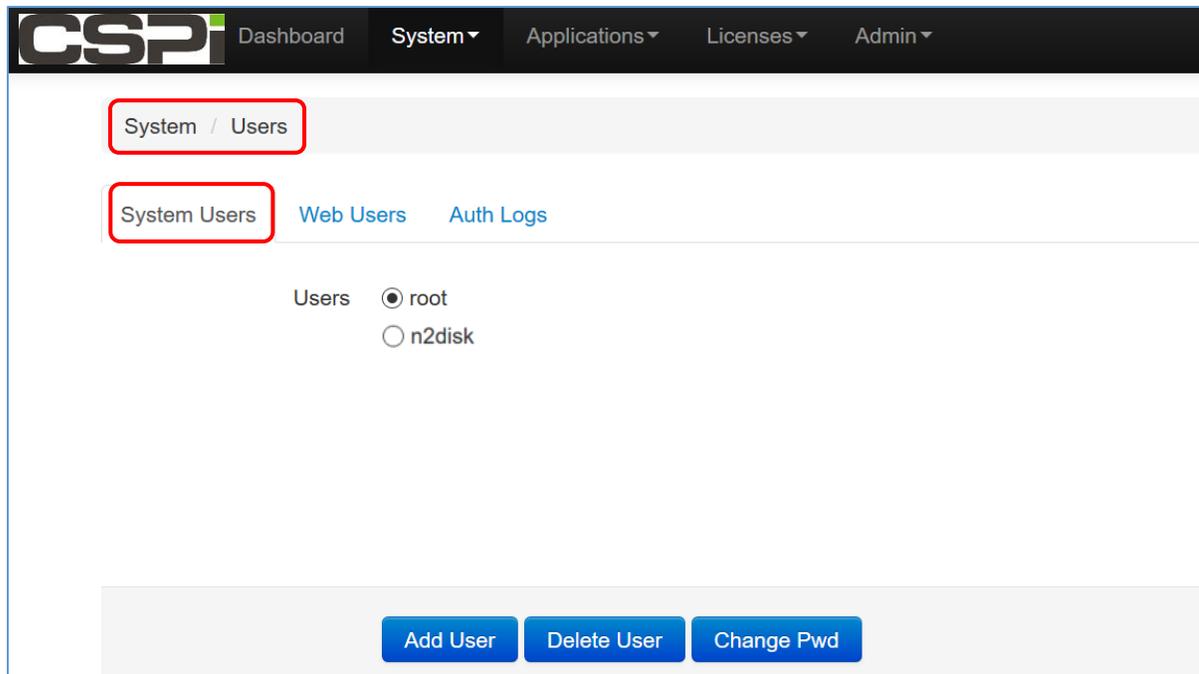
Figure 16: System Users window.

At a glance

Adding a system user

To add a system user, click **Add User** and go to *Adding a User* in this chapter.

Deleting a system user

To delete a system user, select the user to delete, click **Delete User**, and go to *Deleting a User* in this chapter.

Changing a user password

To change a system user password, select the user account, click **Change Pwd**, and go to *Changing a User Password* in this chapter.

5.2.2 Web Users

Figure 17: Web Users window.

At a glance

Adding a Web user

To add a Web user, click **Add User** and go to *Adding a User* in this chapter.

Deleting a Web user

To delete a Web user, select the user account, click **Delete User**, and go to *Deleting a User* in this chapter.

Changing a user password

To change a Web user password, select the user account, click **Change Pwd**, and go *Changing a User Password* in this chapter.

5.2.3 Auth Logs

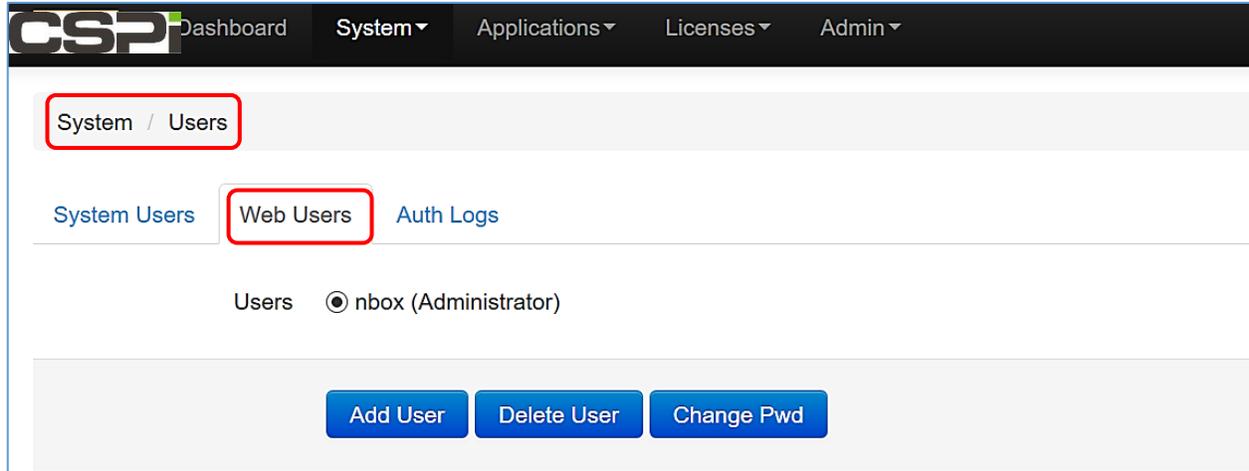The Auth Logs window displays authorized user logins by Interface type, User, Date, Time, and Host, as shown in Figure 11.

	User	Date	Time	Host
WEB	nbox	01/Feb/2017	14:13:21	192.41.172.57
WEB	nbox	01/Feb/2017	14:13:20	10.3.100.214
WEB	-	01/Feb/2017	14:12:26	10.3.100.214
WEB	-	01/Feb/2017	14:09:05	192.41.172.57
SSH	nbox	01/Feb/2017	12:59:14	10.6.10.6
WEB	nbox	01/Feb/2017	11:34:00	10.3.100.74
WEB	-	01/Feb/2017	11:29:12	10.3.100.74
WEB				
WEB	nbox	01/Feb/2017	08:32:01	192.41.172.160
WEB	-	31/Jan/2017	19:36:29	192.41.172.160
WEB	log	31/Jan/2017	17:13:02	10.3.100.214
SSH	nbox	31/Jan/2017	15:12:25	192.41.172.211

Figure 18: Auth Logs window.

Adding a User Account

To add a user account to the nVoy Packet Recorder, enter a user **Login** name and a **Password**. Click **Add User** to add the user account to the system (Figure 19).

Figure 19: Adding a user account.

Deleting a User Account

To delete a user account from the nVoy Packet Recorder, click **Delete User** to delete the user account from the system (Figure 20).
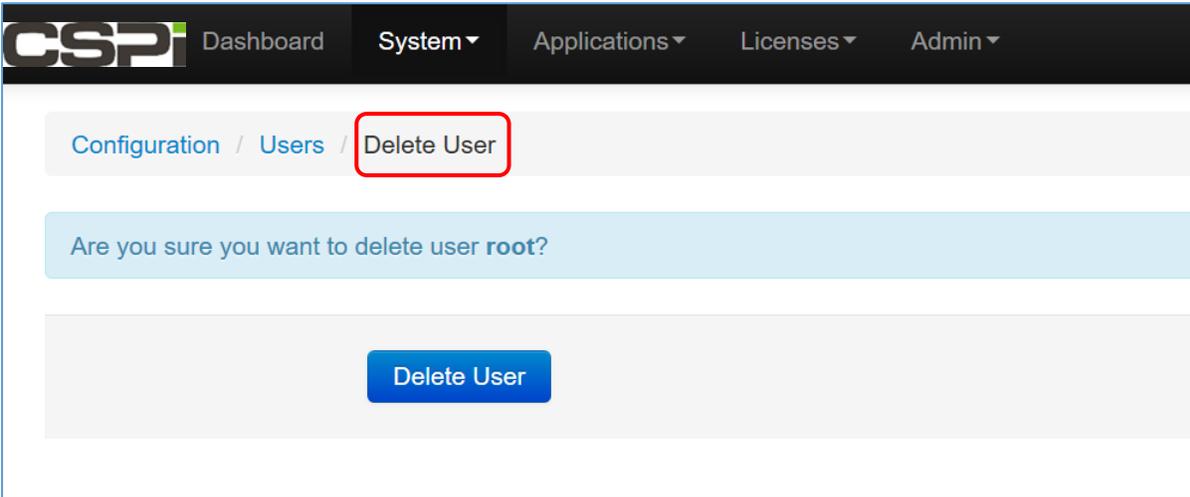
Figure 20: Deleting a user account.

Changing a User Password

To change a user password from the nVoy Packet Recorder, enter the new password twice and click **Change Pwd** to change the user's password (Figure 21).
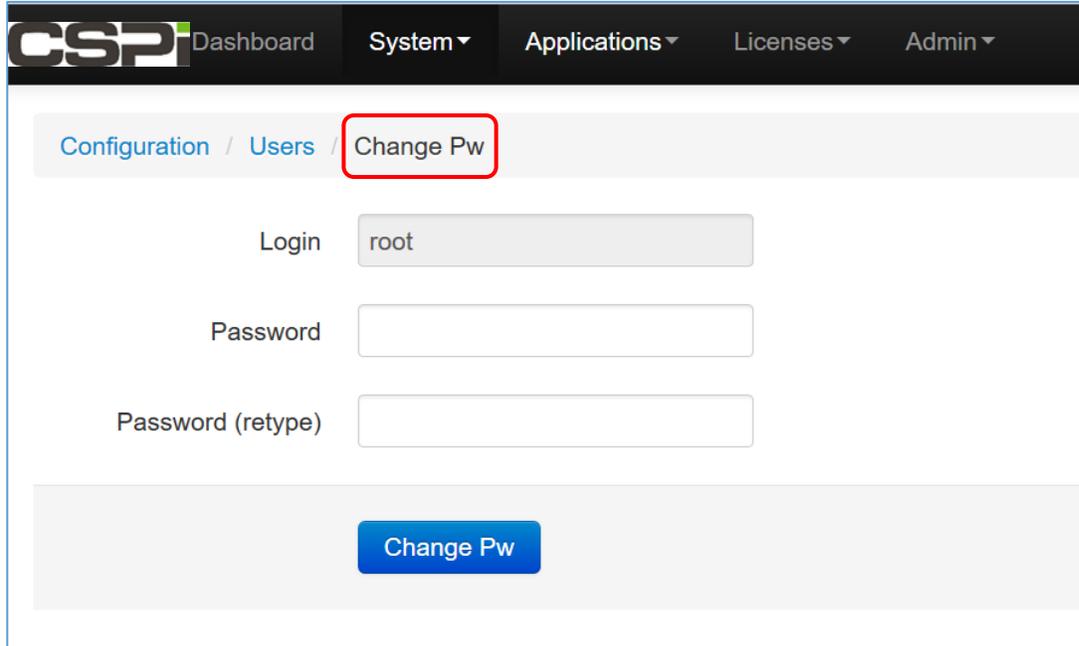
Figure 21: Changing a user password.

5.3 Network tab

The Network tab enables the user to perform all the required network management and interface administration tasks on the nVoy Packet Recorder by easily switching between the management and available network interface tabs, as shown in Figure 22.

The default Management tab offers users the choice of assigning a management IP address via DHCP or static IP address. Users can also add a secondary address (interface alias) to the primary network interface. By default, network routing through the available interfaces is disabled.

The user can assign any interface to a management role at any time.

Figure 22: Network window

Management Interface

The management interface name.

DHCP Client

Click **Enabled**. The address field cannot be accessed.

Click **Disabled**. The address field can be accessed and defaults to:

- IP Address
- Default Gateway
- Interface Alias (eth0:1). This field allows you to specify a secondary IP address on the eth0 interface.

IP Address

Primary IP address and its mask

Interface Alias (`<management_interface>`)

You can specify a secondary IP address on the interface.

IP Forwarding

Click **Enabled**. Sets the nVoy Packet Recorder as a network router.

Click **Disabled**. Does not set the nVoy Packet Recorder as a network router.

Primary/Secondary DNS

The user can specify a custom DNS server

Domain Name

DNS server corresponding name.

Input Traffic Policy

Check the field to receive input traffic.

Uncheck the field to discontinue receiving input traffic.

NOTE:	If you check the Input Traffic Policy field, you will not be able to manage the nVoy Packet Recorder from another interface.

Exporting Interface

Check the field to export data files from the interface.

Uncheck the field to disable data file exports from the interface.

Saving your changes

Click **Save Changes** to save your new network configuration, followed by a system reboot.

Click **Reset** to return to your previous network configuration, followed by a system reboot.

Click **Delete** to delete the interface from the nVoy Packet Recorder, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

5.4 PF_RING tab

The PF_RING tab enables the user to configure the packet capture framework, including kernel module driver, as shown in Figure 16. PF_RING is an alternative network socket that dramatically improves packet capture speed and efficiency, thereby preserving CP utilization.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

5.4.1 General

The General PF_RING configuration tab enables the user to enable or disable PF_RING packet capture acceleration (figure 23). Enabling PF_RING acceleration sets automatic startup and kernel module loading upon system boot, according to the number of assigned ring slots (buffer size) for packet capture, using **myri_snf** drivers.
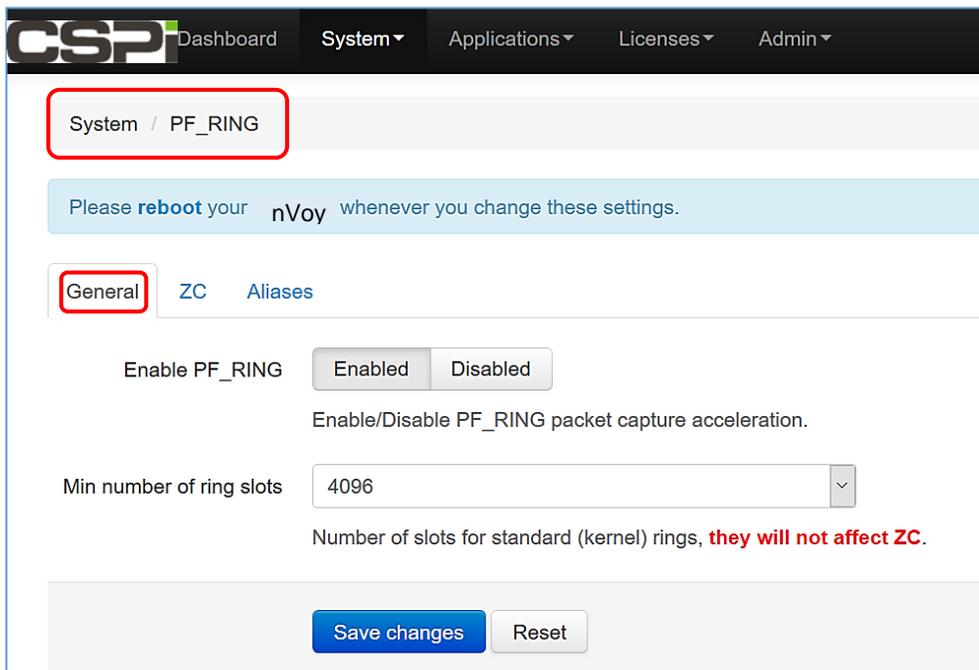
Figure 23: PF_RING window.

Enable PF_RING

Click **Enabled**. You enable PF_RING packet capture acceleration.

Click **Disabled**. You disable PF_RING packet capture acceleration.

Min number of ring slots

Select the minimum number of slots for standard (kernel) rings from the pull-down combo box. Note that this step will not affect the ZC driver.

5.4.2 Zero-Copy (ZC) Driver (not supported)

NOTE:	The CSPI Myricom ARC Series E network adapter software package does not support Zero-Copy drivers, as shown in Figure 24.
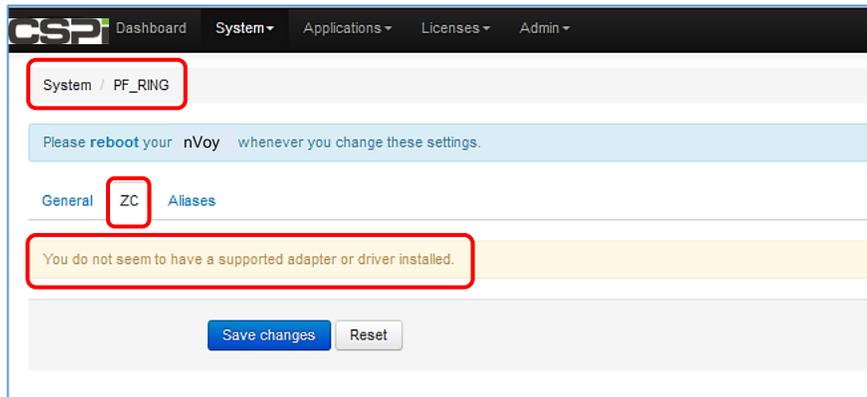
Figure 24: Zero copy driver window.:

5.4.3 Aliases (not supported)
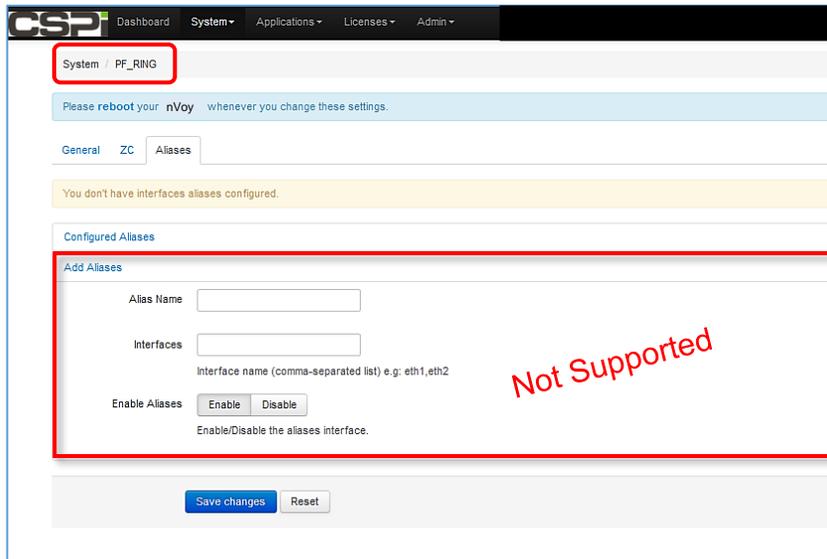
Figure 25: Aliases window.

Saving your changes

Click **Save Changes** to save your new network configuration, followed by a system reboot.

Click **Reset** to return to your previous network configuration, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

5.5   Hugepages tab (not supported)

NOTE:	Hugepages is _not_ supported in this nVoy Packet Recorder release.

Hugepages is a mechanism that allows the Linux kernel to utilize the multiple page size capabilities of modern hardware architectures. Linux uses pages as the basic unit of memory, where physical memory is partitioned and accessed using the basic page unit. The default page size is 4096 Bytes in the x86 architecture. T

Accordingly, the nVoy Packet Recorder exploits this opportunity by using the multiple-page size capabilities of Hugepages to optimize packet processing performance (Figure 26).
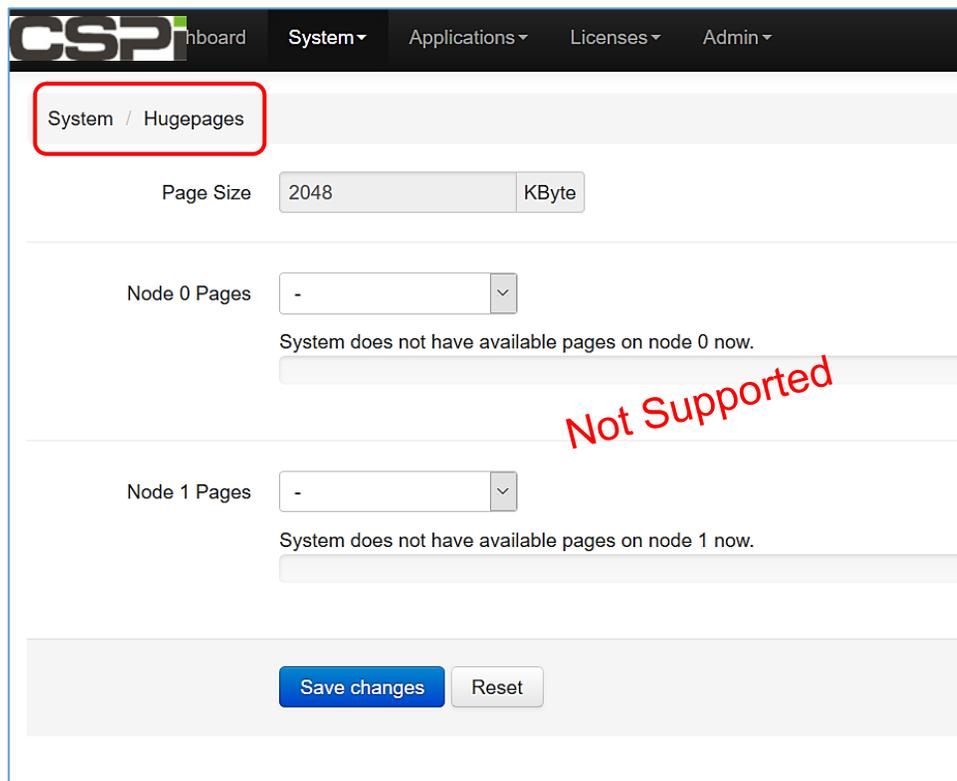
Figure 26: Hugepages window.

At a glance

Page Size
Sets the page size in Kbytes. In this example the page size is set at 2048 Kbytes. This field cannot be modified.

Node 0 and 1 Pages
Sets the number of pages on Nodes 0 and 1.

Saving your changes

Click **Save Changes** to save your new network configuration, followed by a system reboot.

Click **Reset** to return to your previous network configuration, followed by a system reboot.

5.6 CloudShark tab (not supported)

NOTE:	The CloudShark packet capture utility is _not_ supported in this nVoy Packet Recorder release.

5.7 Manage Configuration tab

The Manage Configuration tab (Figure 29) is useful for:

- Backing up the system configuration.
- Restoring a previously stored system configuration.
- Creating a system snapshot for technical support purposes.

5.7.1 Backup

The **System > Manage Configuration > Backup** operation creates a configuration file backup (Figure 29).
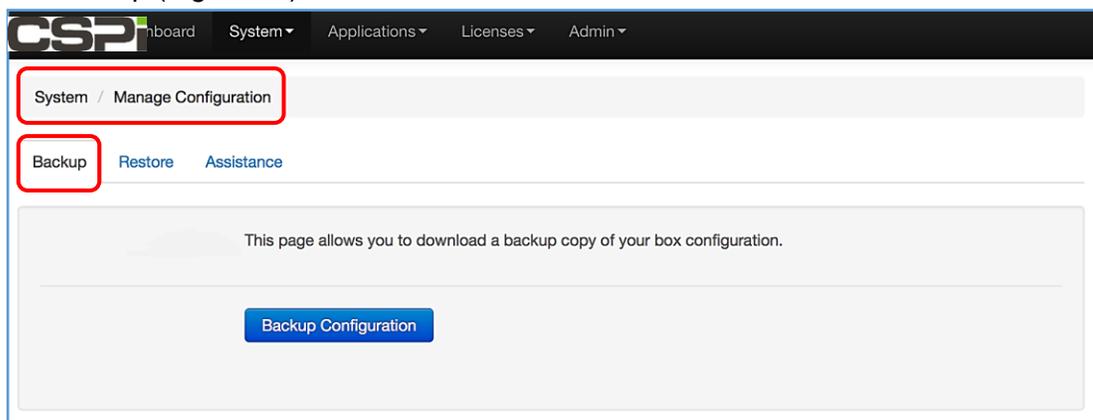
Figure 29: Manage Configuration window.

Click **Backup Configuration** and follow the instructions to download a backup copy of your nVoy Packet Recorder configuration files to your local PC.

5.7.2 Restore

The **System > Manage Configuration > Restore** operation restores a backup copy of the configuration file to the nVoy Packet Recorder (Figure 30).
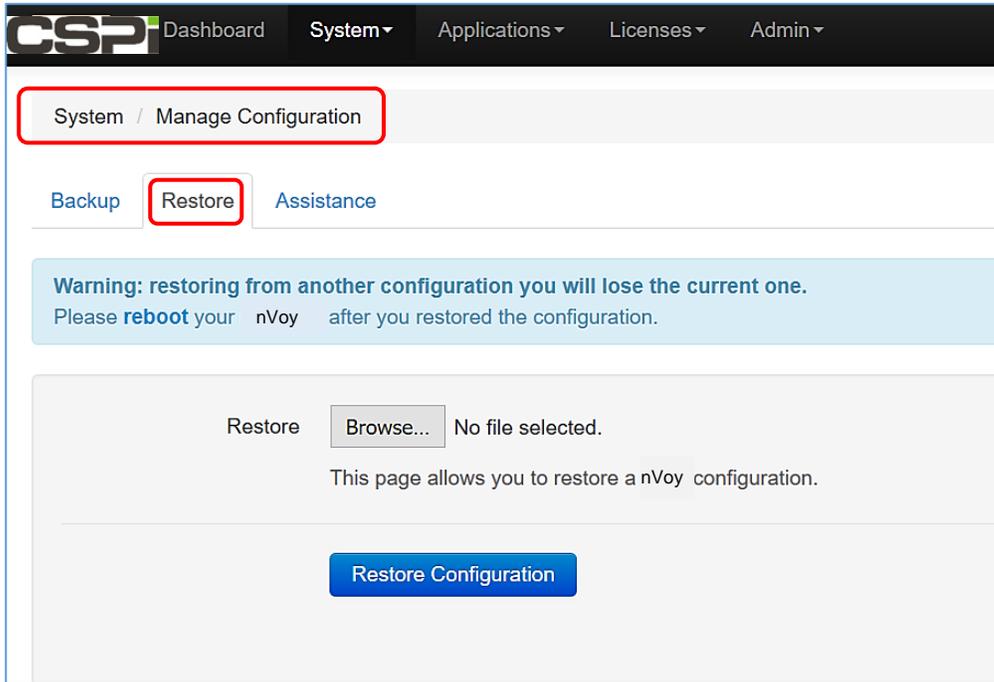
Figure 30: Restoring a backup copy of the configuration file.

At a glance

Click **Browse** and follow the instructions to select the backup file.

Click **Restore Configuration** to restore the backup copy of your nVoy Packet Recorder configuration files from your local PC to the recorder.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

5.7.3 Assistance

The **System > Manage Configuration > Assistance** operation downloads the configuration file to your PC (Figure 31).
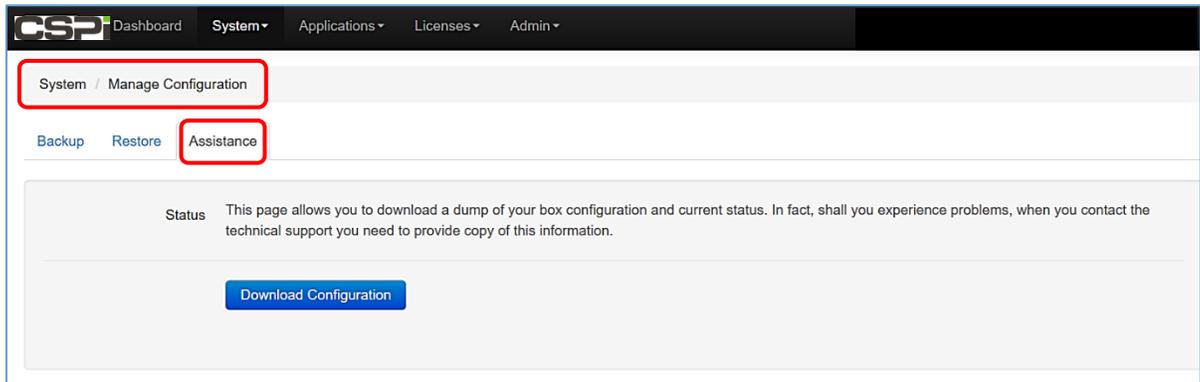
Figure 31: Downloading a configuration dump file to technical support.

At a glance

Click **Download Configuration** to download a snapshot of the nVoy Packet Recorder configuration to a local PC. Send the file to **CSPi Technical Support** at support@cspi.com

5.8 Factory Reset tab

The **System > Factory > Reset** tab allows you to reset the nVoy Packet Recorder system to factory defaults, as shown in Figure 32. The system will automatically reboot during the reset process.

NOTE:	A factory reset deletes network interface configuration settings. We recommend you backup your configurations before you perform a factory reset. Go to Section 5.7.1 *Backup*, for more information.
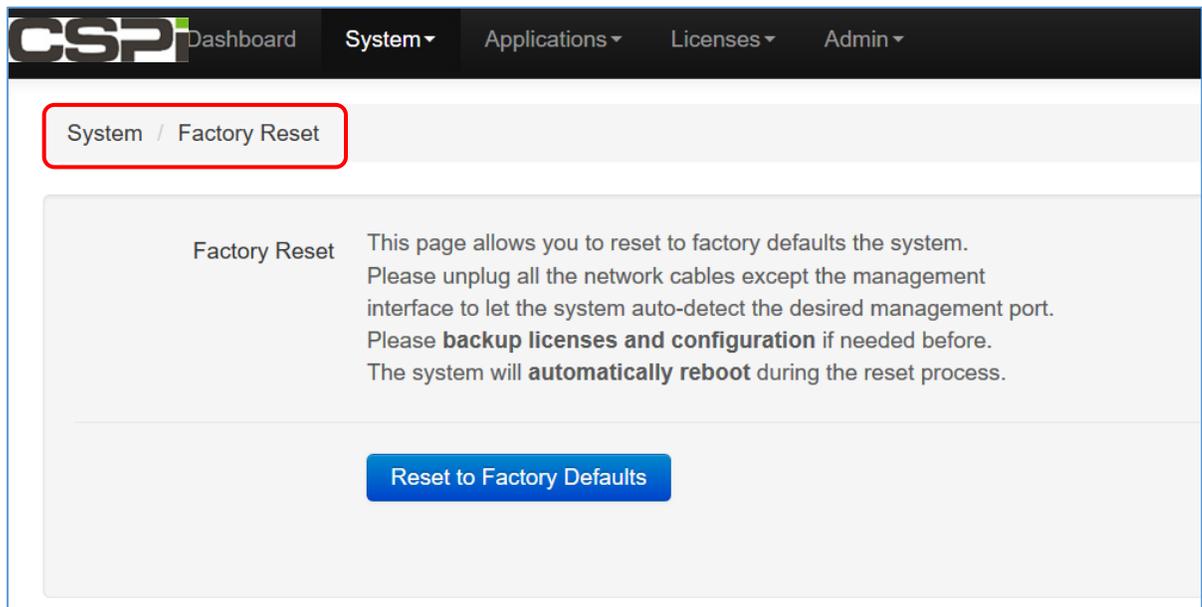
Figure 32: Resetting to system to factory default.

6 Applications Menu

The Application menu allows the user to monitor, manage and customize a variety of licensed nVoy Packet Recorder applications.

In this version of the nVoy Packet Recorder, the user leverages the **n2disk** network traffic recorder application to capture full-sized network packets from a live network interface, and write them to file with no packet loss. Any network traffic previously captured by n2disk can then be played back by running the **disk2n** traffic replay application.

The following table lists all available applications:

Applications	Description
n2disk	n2disk captures and writes to file full-sized network packets at a multi-Gigabit rate from a live network interface without packet loss.
disk2n *Not Supported*	disk2n replays network traffic previously captured with n2disk on live networks while conforming to the original inter-packet time. The application is _not_ supported in this nVoy Packet Recorder release.
Cluster *Not Supported*	Load-balances traffic across application instances, AND/OR sends traffic to multiple application instances. The application is _not_ supported in this nVoy Packet Recorder release.
Utility (3)	Traffic Generator utility (**pfsend**) (not supported)
	Remove Historical Data utility
	Activity Scheduler

Table 3: Available nVoy Packet Recorder applications.

6.1 n2disk application

The **Applications > n2disk** tab displays the current status of any active n2disk configured instance, as shown in Figure 33. In this example, **myri0** and **myri1** are two configured instances.
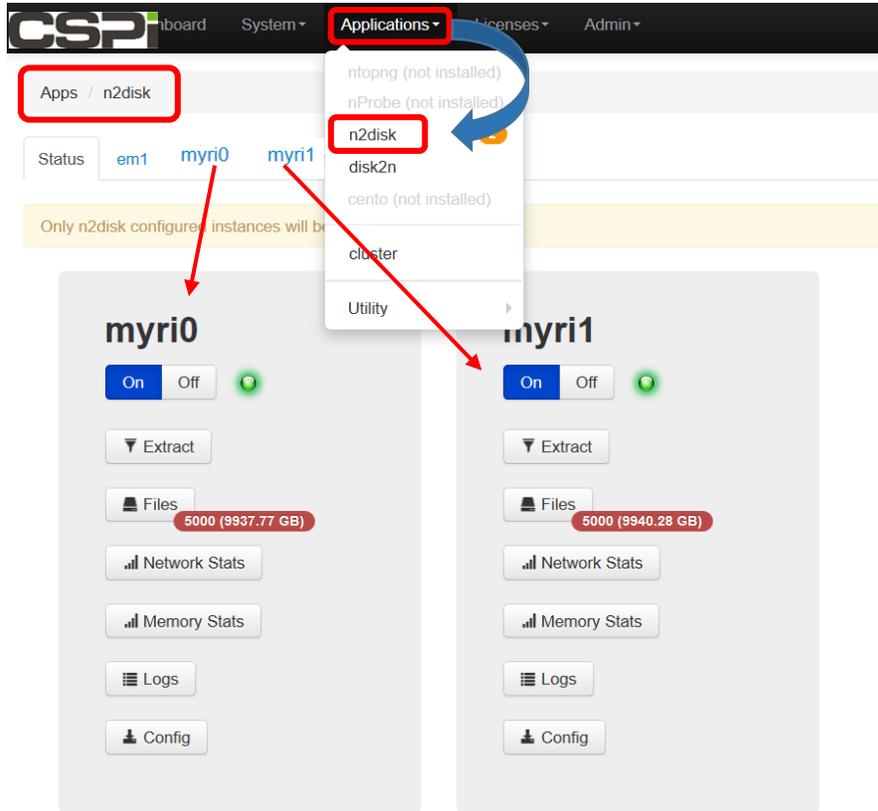
Figure 33: Displaying the current status of a n2disk configured instance.

At a glance

6.1.1 Enable/Disable

Click **ON** to enable an n2disk configured instance. Initiates a packet capture recording.

Click **OFF** to disable an n2disk configured instance.

6.1.2 Extract

Click **Extract** to create a filtered packet from a specific time interval.

The Extract Packets window appears, as shown in Figure 34.

Figure 34: Creating a filtered packet from a specific time interval

At a glance

Instances
Select the instance from which to extract packets.

Task Priority
Specify the task priority – Low, Normal, High.

Extract time interval
Specify the packet extract date and time interval.

Filter

Specify the BPF filter requirements from the Index Filter Wizard

Max File Size

Specify the maximum size of each dumped file.

Max File Packets

Specify the maximum number of packets for each dumped file.

File Tag

You can add a specific tag string to each dumped filename. The format of the filename is "`[tag]<file number>`".

Output Dir

Specify where the output file is to be stored. An output file will be created if the path does not exist.

Submit Task

Click **Submit Task** to save the specified extract dump file to the output file.

6.1.3 Files

The **Files** function enables users to move, download, delete, and filter pcap directories and files from the output file directory, as shown in Figure 35.

The Dump (myri0) window appears. In this example, the **myri0** instance output file directory is `/storage/n2disk/myri0.`

Note that the "Replay to Network" and "Open with ntopng" operations are not active in this version.
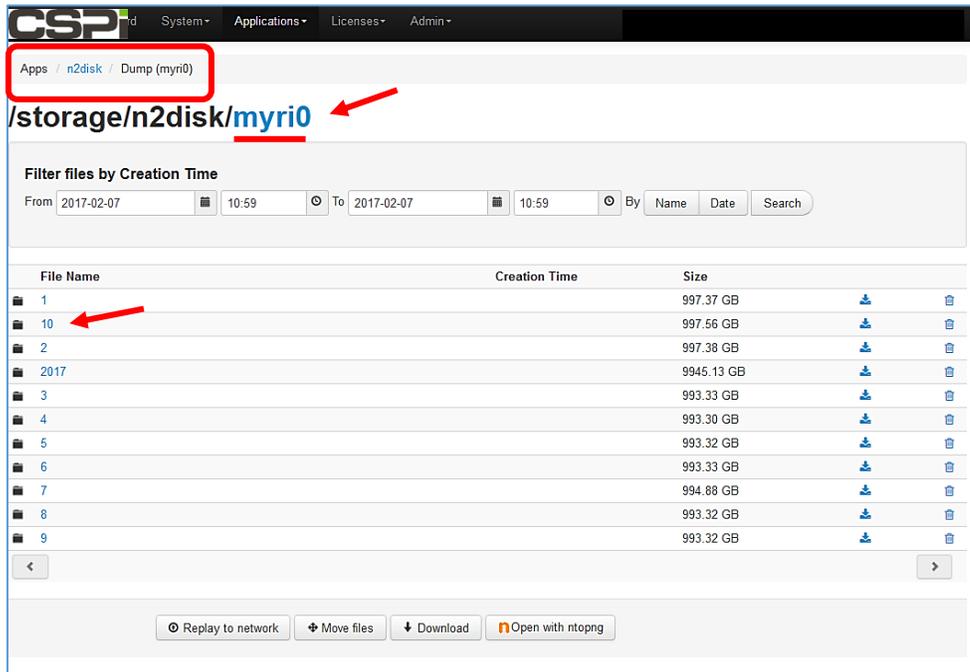
Figure 35: Managing pcap directories and files from the output file directory.

Selecting a pcap file

Select a pcap file from the Dump file directory window. In this example, directory "**10**" was selected from Figure 35. The Dump file directory window refreshes, as shown in Figure 36.

Check a pcap file entry. In this example, pcap file "**100.pcap**" was selected.
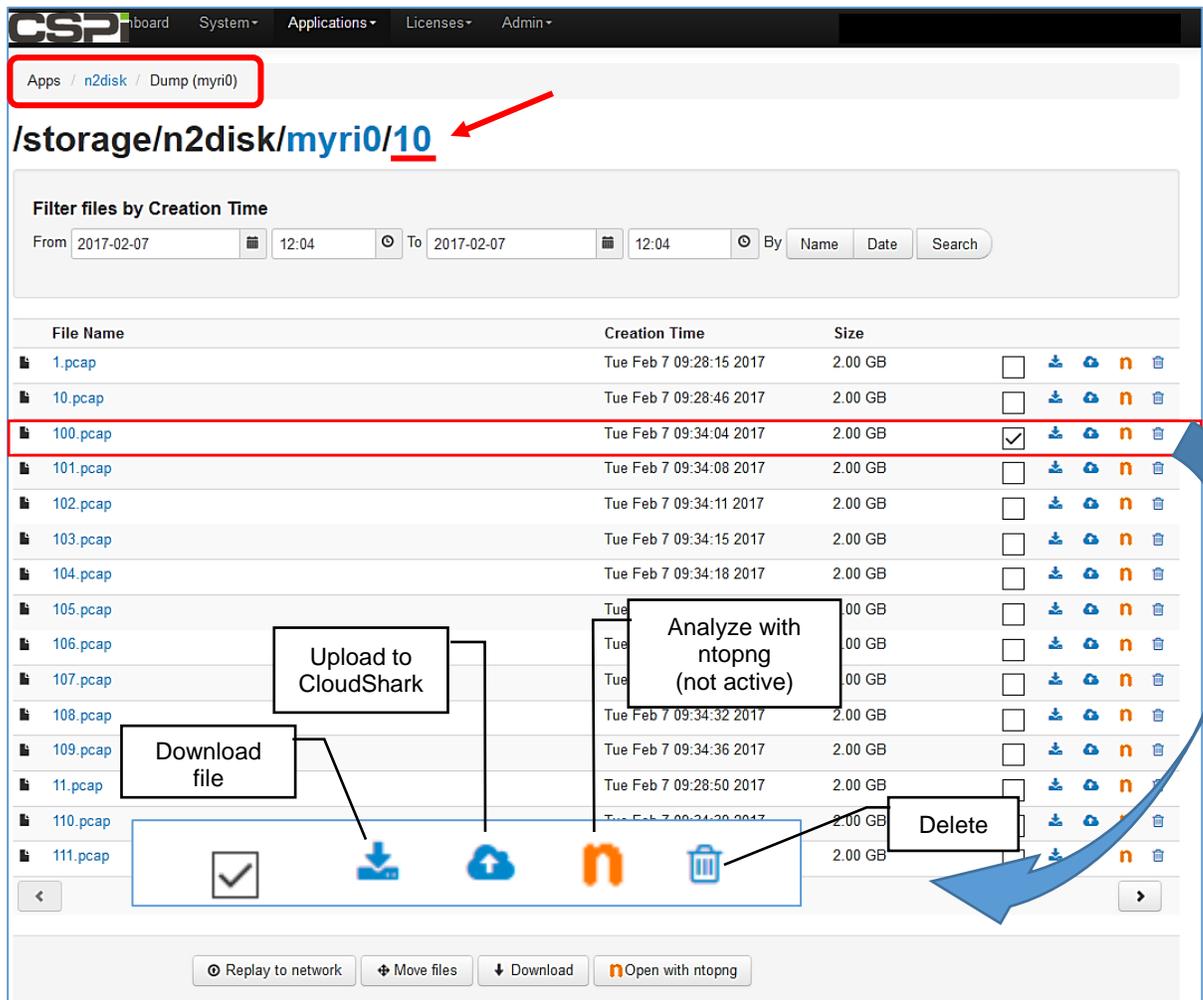
Figure 36: Selecting a pcap file entry.

Downloading a pcap file

Click the checkbox beside the pcap file you wish to download.

Click the **Download** icon and follow the instructions to download a copy of the pcap file to your local PC.

Uploading a pcap file to CloudShark

NOTE:	The CloudShark packet capture utility is *not* supported in this nVoy Packet Recorder release.

Analyzing a pcap file with ntopng

This feature is not active in the current version of the nVoy Packet Recorder.

Deleting a pcap file

Click the **Delete** icon to delete a pcap file from the filesystem. A prompt appears to confirm the file deletion. Click **Yes** to confirm.

The pcap file is deleted from the filesystem.

Moving a pcap file

Click **Move Files** to move a pcap file from one directory to another.

A prompt appears. Specify the destination directory where the files will be moved. If the directory does not exist, it will be created. Click **Move** to confirm.

The pcap file moves from one directory to another.

6.1.4 Network Stats

Live Feed

The Network Stats function displays real-time pcap file statistics by capture packet rate (kpps) and capture throughput (Mbps) in Linear, Power, or Log format (Figure 37.)
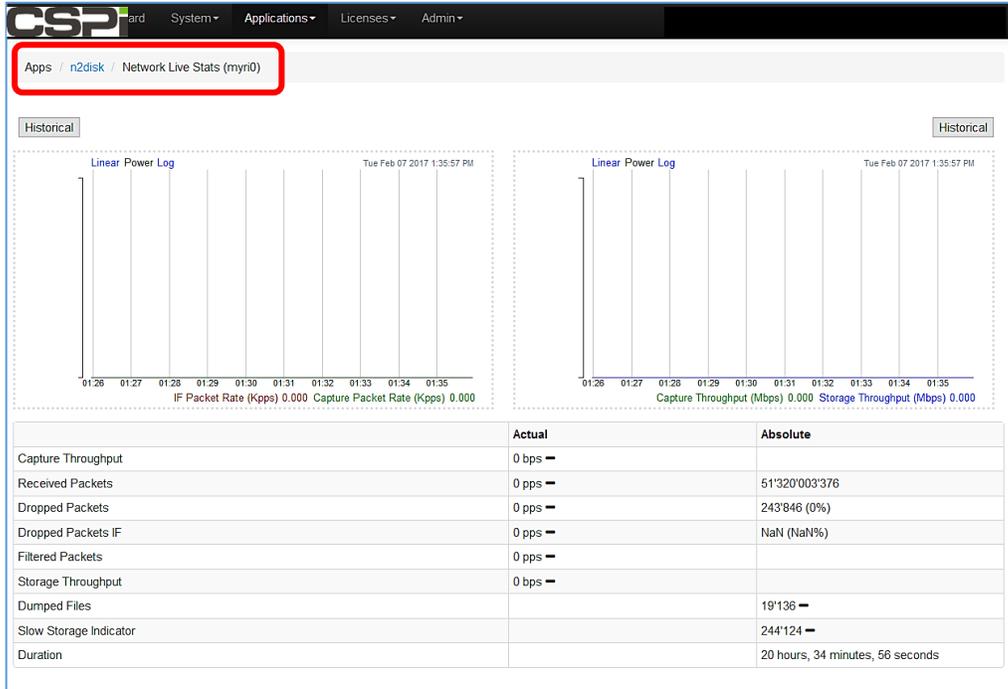
Figure 37: Displaying real-time pcap file statistics.

Historical Trend

Click **Historical** to display historical pcap file statistics by capture throughput (Mbps) in Linear, Power, or Log format (Figure 38.) In this example, pcap statistics are recorded at six-hour intervals.
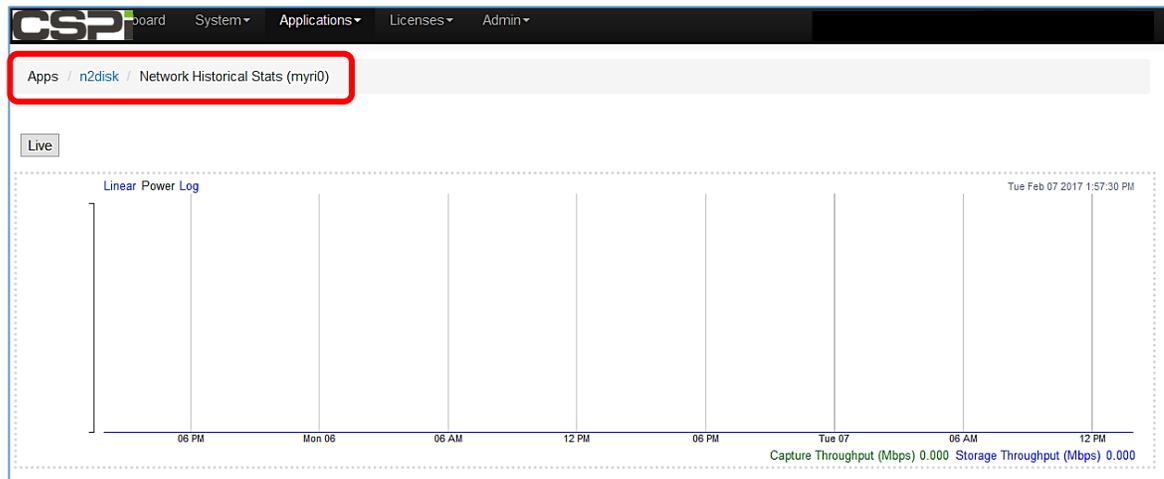
Figure 38: Displaying historical pcap file statistics by capture throughput.

6.1.5 Memory Stats

Live Feed

The Memory Stats function displays real-time pcap file statistics by virtual memory (Mbytes) and physical memory (Mbytes) in Linear, Power, or Log format (Figure 39). In this example, pcap memory statistics are recorded at one-minute intervals.
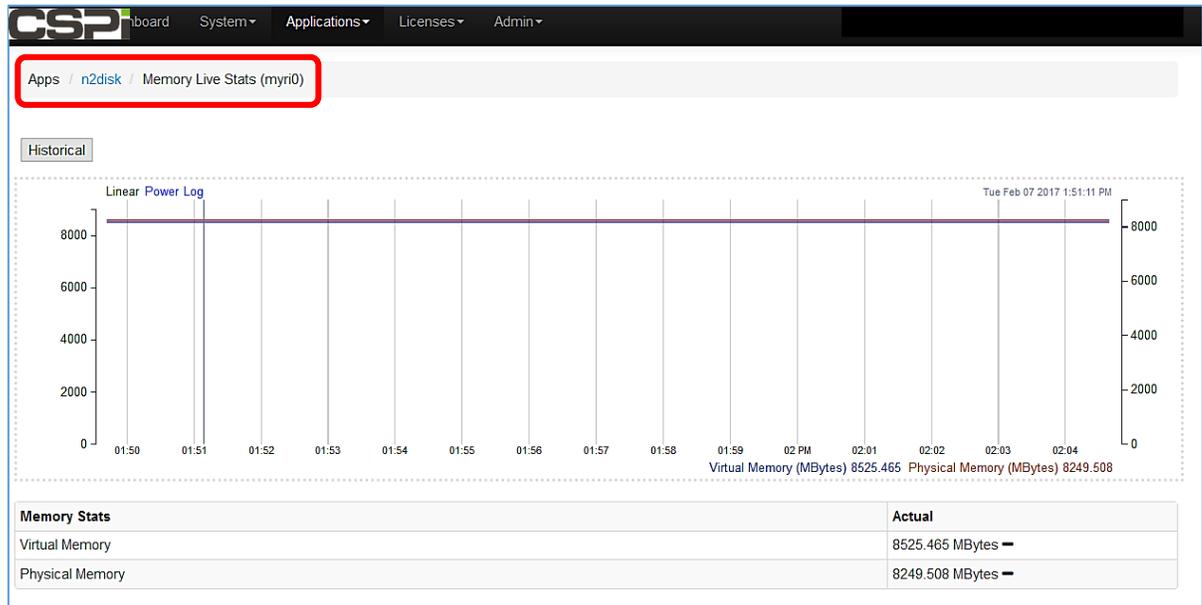
Figure 39: Displaying real-time pcap file statistics by virtual and physical memory.

Historical Trend

Click **Historical** to display historical pcap file memory statistics by virtual memory (Mbytes) and physical memory (Mbytes) in Linear, Power, or Log format (Figure 40). In this example, pcap memory statistics are recorded at six-hour intervals.
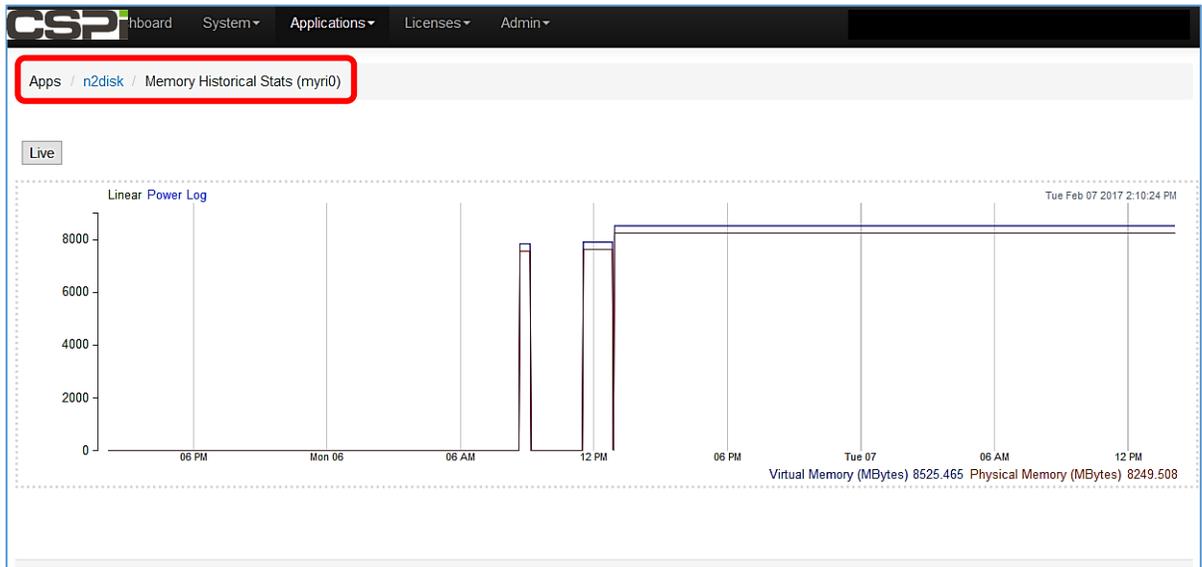
Figure 40: Displaying historical pcap file memory statistics by virtual and physical memory

6.1.6 Logs

The Logs function displays pcap file event logs over time. The user can set how many lines to display from the **Lines to display** drop-down combo box, as shown in Figure 41.

Date	Message
06/Feb/2017 17:00:57	Using time pulse nsec timestamps
06/Feb/2017 17:00:57	Using PF_RING v.6.5.0
06/Feb/2017 17:00:57	Dumping traffic statistics on /proc/net/pf_ring/stats/25495-none.26
06/Feb/2017 17:00:57	Started PF_RING packet reader thread for device myri:0
06/Feb/2017 17:00:57	Time pulse thread started
06/Feb/2017 17:00:58	WARNING: Core 1 is on node 0 whereas other threads are on node 1, this might result in poor application performance!
06/Feb/2017 17:00:58	WARNING: Core 3 is on node 0 whereas other threads are on node 1, this might result in poor application performance!
06/Feb/2017 17:00:58	WARNING: Core 4 is on node 0 whereas other threads are on node 1, this might result in poor application performance!
06/Feb/2017 17:00:58	[reader] Packet capture started
06/Feb/2017 17:00:58	n2disk10g changed user to n2disk

Figure 41: Displaying pcap file event logs over time.

6.1.7 Config

The Config function enables the user to download a copy of the n2disk configuration file to their local PC (`n2disk-<filename>.conf`). In this example (Figure 42), the **myri0** pcap configuration file would be `n2disk-myri0.conf`
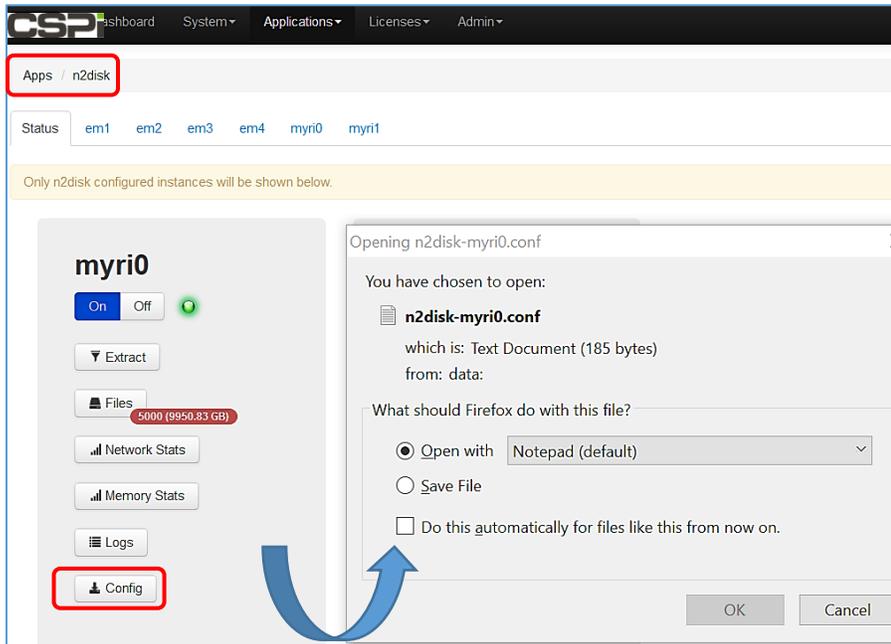
Figure 42: Downloading a copy of the pcap configuration file to a local PC.

At a glance

Click **Config** and follow the instructions to download the file to your PC. Click **OK**.

6.2 disk2n application (not supported)

NOTE:	The disk2n utility is _not_ supported in this release. It is listed in the applications menu but it does not have an associated license installed.

Introduction

The **disk2n** application is designed to replay multiple pcap files of any size with limited memory usage. You specify a pcap file playlist or a timeline, produced by n2disk with a time interval, and instruct disk2n to continue from the first packet to the last.

The application uses a memory buffer of arbitrary size to cache the next packets to replay, achieving great transmit performances with limited memory usage.

The **Applications > disk2n** tab displays the current status of any active disk2n configured instance, as shown in Figure 43.
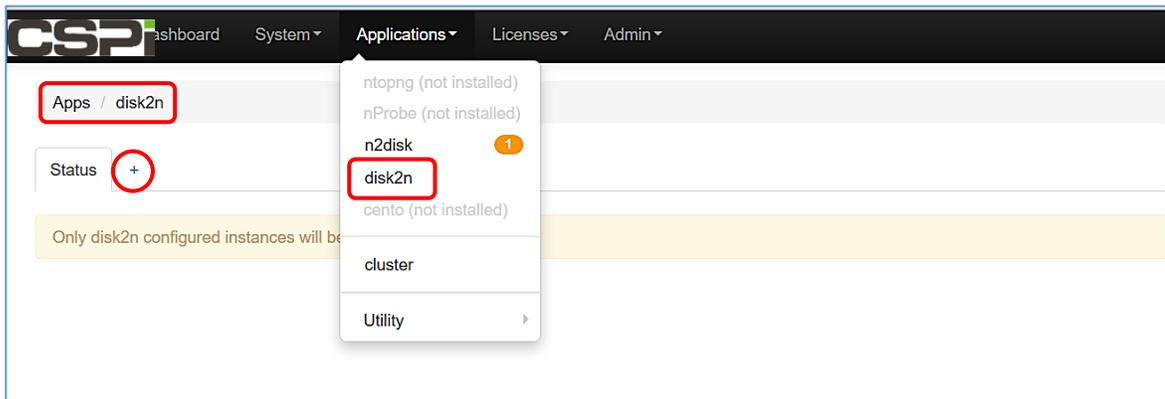
Figure 43: Displaying the current status of any active disk2n configured instance.

6.2.1 Creating a disk2n instance
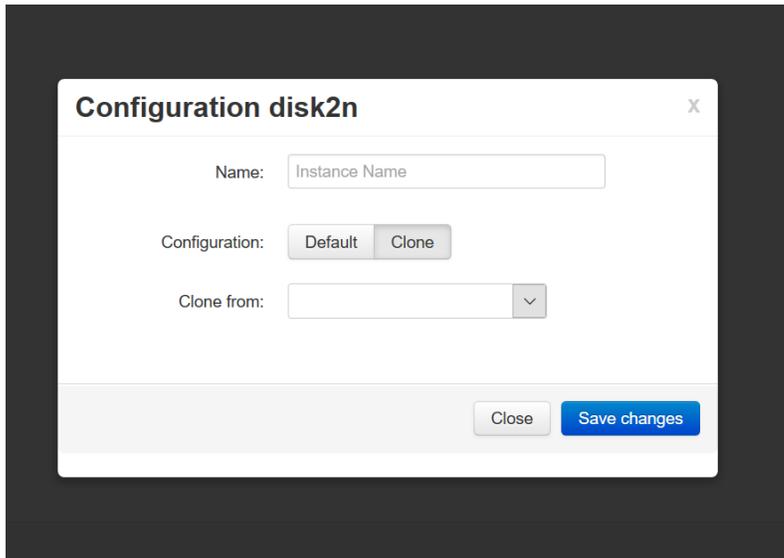
Figure 44: The Configuration disk2n window.

At a glance

Click the "**+**" tab in Figure 43 to create a new disk2n instance. The Configuration disk2n window appears as shown in Figure 44.

Name
Enter the name of the disk2n instance.

Configuration
Click **Default** to enter the default disk2n configuration.

Click **Clone** to clone from an existing disk2n configuration.

Clone From
Click **Save changes** to save the new disk2n configuration.

The new disk2n configuration panel appears, as shown in Figure 45.
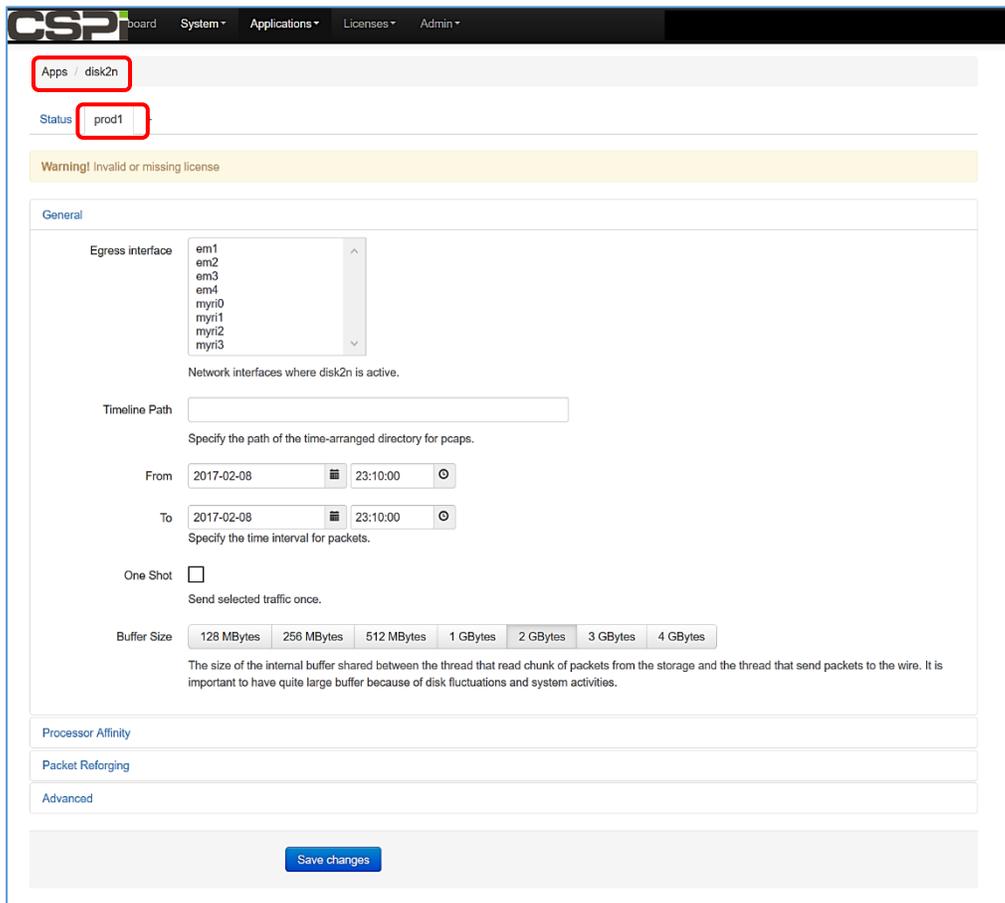
Figure 45: New disk2n configuration panel.

> To configure the disk2n instance, go to *Chapter 10: Configuring the disk2n instance*

6.3 Cluster (not supported)

The "classic" PF_RING is synonymous with the concept of cluster, which serves to balance ingress packets coming from one or more ingress interfaces.

NOTE:	The Cluster utility is *not* supported in this nVoy Packet Recorder release.

6.4   Utility

The **Applications > Utilty** tab contains the following utilities (Figure 46):

- Traffic Generator (pfsend) (Figure 47).

- Remove Historical Data (Figure 48).

- Activity Scheduler (Figure 49).
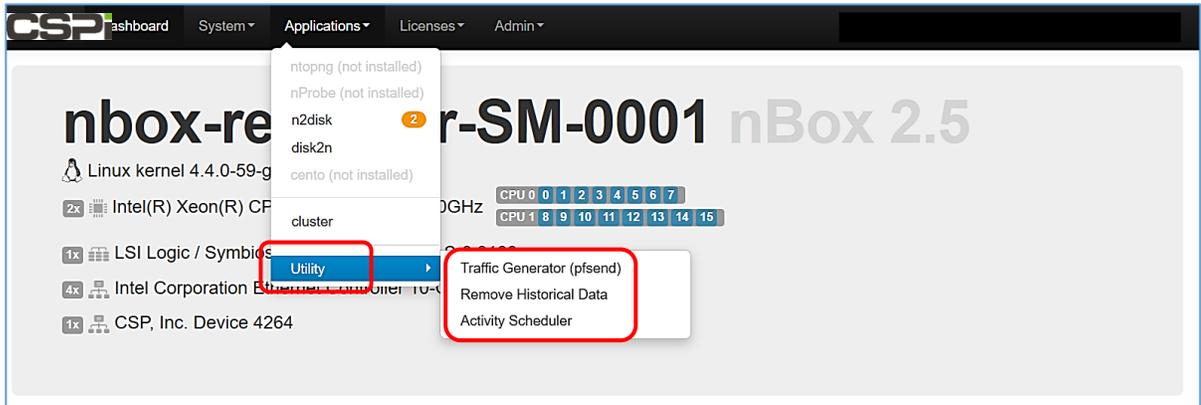
Figure 46: Utility window.

6.4.1 Traffic Generator (pfsend) - (not supported)

In essence, a traffic generator sends dummy packets, often with a unique packet identifier, making it possible to keep track of the packet delivery in the network.

Similarly, the nVoy Packet Recorder traffic generator utility, based on **pfsend**, injects packets into the network from an interface. The **Applications > Apps > Utility > pfsend** utility can either forge synthetic packets or send small pcap files. You can specify wire-speed (as fast as possible at Gbit/s), at a specific bit rate, or at the original pcap-capture speed (Figure 47).

Figure 47: nVoy Packet Recorder traffic generator utility.

At a glance

Output Interface

Select the network interface that will replay the traffic.

Source

Select a **Synthetic** packet or a **Pcap File**. (Specify a **Pcap File** and **Loop Control** type when selecting **Pcap File**).

Speed

Specify wire-speed (as fast as possible), a specific bit rate, or the original pcap capture speed.

Processor Affinity

Select a specific processor/core to bind to.
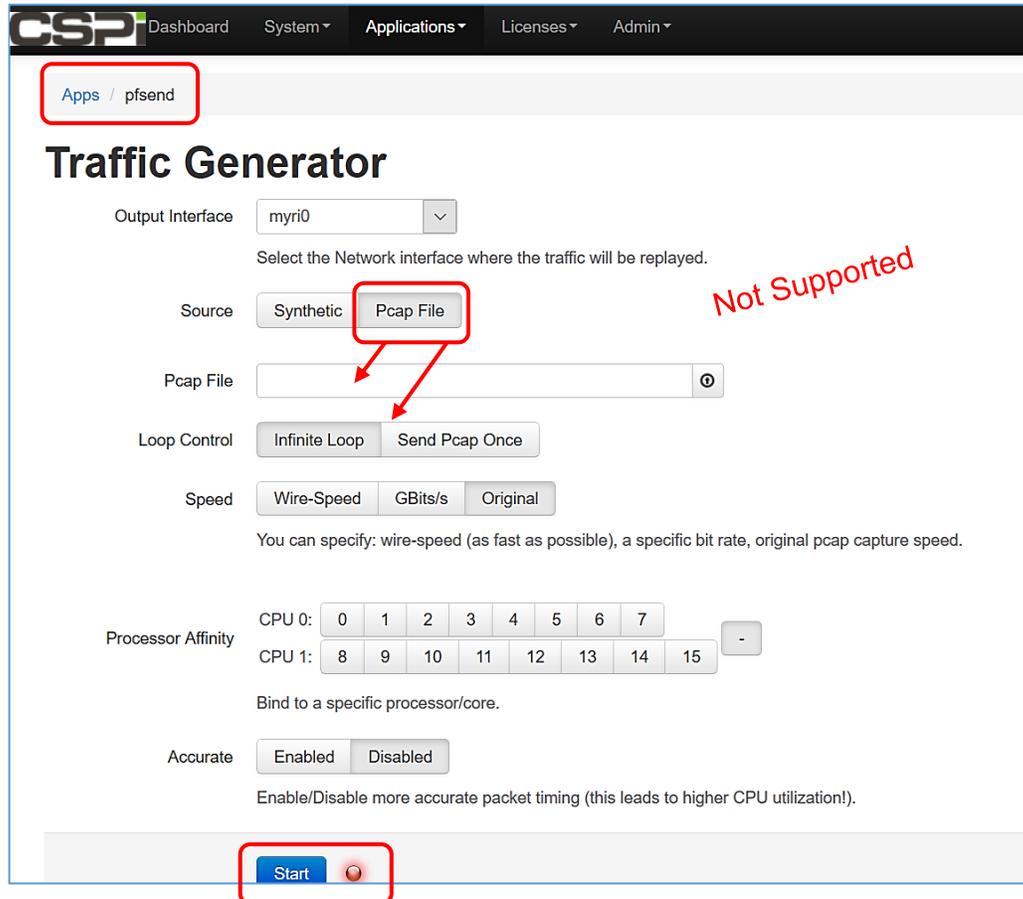
Accurate (Packet timing)

Click **Enabled** for more accurate packet timing (leads to higher CPU utilization!).

Click **Disabled** to disable accurate packet timing.

Generating traffic

Click **Start** at the bottom of the screen. The LED turns from RED to GREEN, indicating that the traffic generator utility is functioning.

6.4.2 Remove Historical Data

The **Applications > Apps > Utility > Remove Historical Data** utility allows you to delete old flow data to free up database memory (Figure 48).
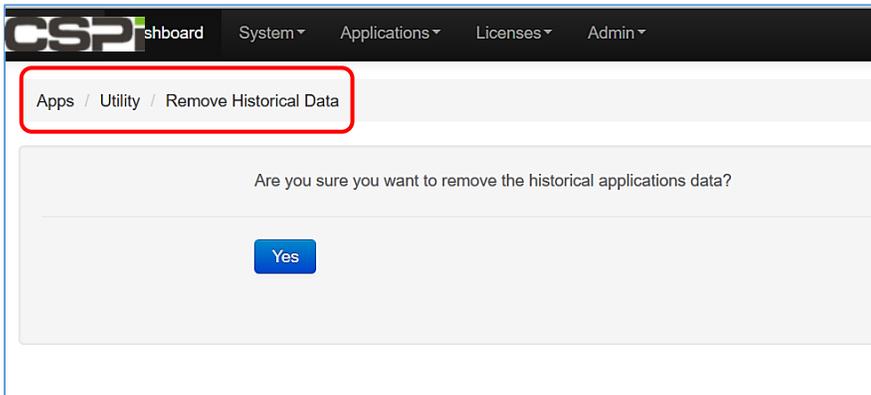
Figure 48: Remove historical data window.

At a glance

Click **Yes** to remove all historical applications data.

6.4.3 Activity Scheduler

The **Applications > Apps > Utility > Activity Scheduler** utility schedules tasks such as traffic extractions from n2disk storage (Figure 49).

In this section, the user can see all the scheduled tasks, retrieve the task log and the extracted pcap files, configure the task, or delete a task and its corresponding files.
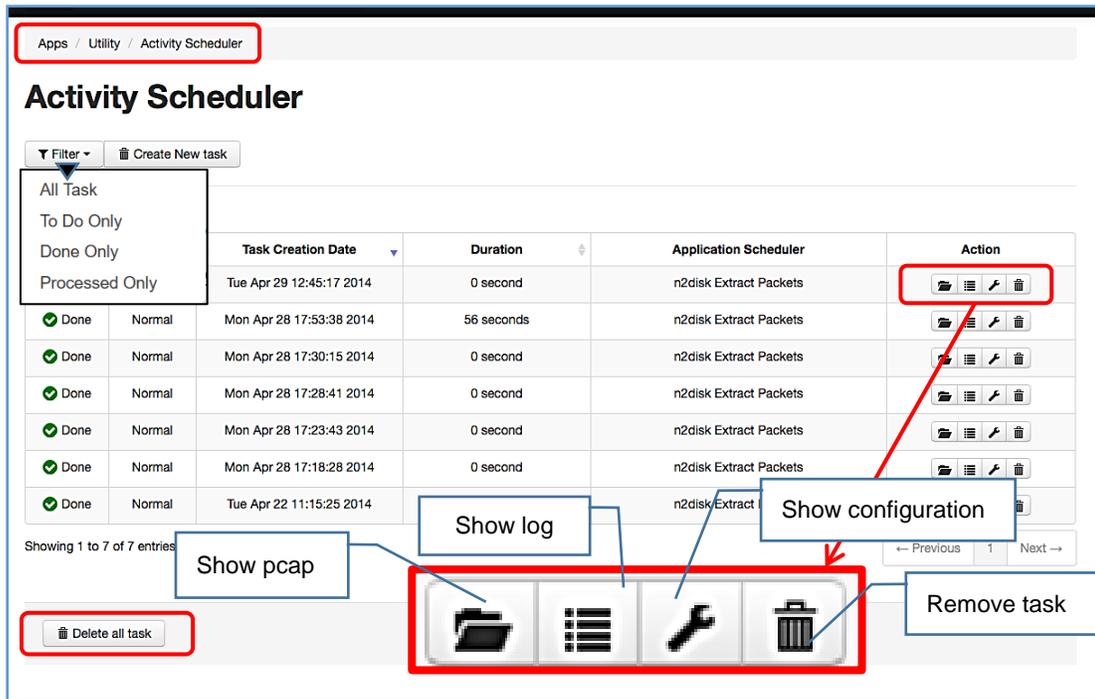
Figure 49: Activity Scheduler utility.

At a glance

Filtering

Select **All Task** to view all tasks.

Select **To Do Only** to view all tasks pending.

Select **Done Only** to view all completed tasks.

Select **Processed Only** to view all processed tasks.

Creating a new task

Click **Create New Task**. The Extract Packets window appears.

Follow the instructions to create a filtered packet from a specific time interval described in section 6.1.2 *Extract*.

Retrieving the activity log

Click the **Show pcap** icon to access the task logs.

Retrieving the extracted pcap files

Click the **Show log** icon to retrieve extracted pcap files.

Configuring the task

Click the **Show configuration** icon to configure a particular task.

Deleting a task

Click the **Remove task** icon to delete a task.

7 Licenses Menu

The nVoy Packet Recorder is available with all software installed and on a perpetual software license. The perpetual license allows the customer to use the licensed software indefinitely. For the first year, the perpetual license also entitles the customer to download all updates to the software and to receive technical support. Beyond that one-year period, the user must renew the license to take advantage of software updates and technical support (Figure 50).

The Licenses Menu contains three sections:

- **Wizard tool** for automatically renewing a license (Figure 51).

- **Configuration tab** where the user has to manually insert licenses for all the needed applications (Figure 52).

- **Maintenance tab** where software maintenance expiration status is reported (Figure 53).
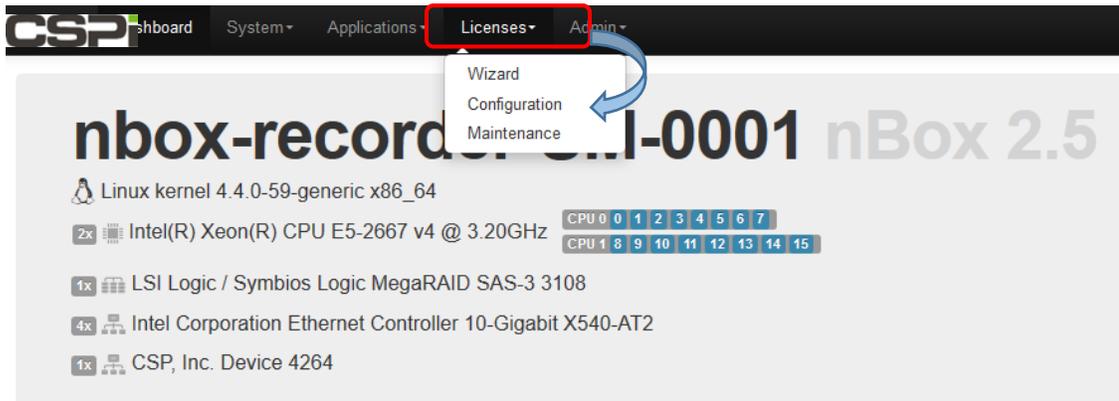
Figure 50: Licenses menu.

7.1 Wizard Tool

The Wizard tool enables customers to quickly process license renewals with an order ID and its corresponding email address, as shown in Figure 51.

Figure 51: Licenses wizard.

At a glance

System ID
The nVoy Packet Recorder system ID. This field cannot be modified.

Email
Enter the customer email address.

Order ID
Enter the order ID.

n2disk
Check the box to renew the n2disk license.

Dump Speed
Check the appropriate dump speed.

> n2disk is licensed based on speed. This way the user can reduce costs acquiring only a license for the required capture speed.

Generate license
Click **Generate Licenses**. The wizard automatically generates a license.

7.2   Configuration tab

The Configuration tab displays the nVoy Packet Recorder and pertinent application license information, as shown in Figure 52.
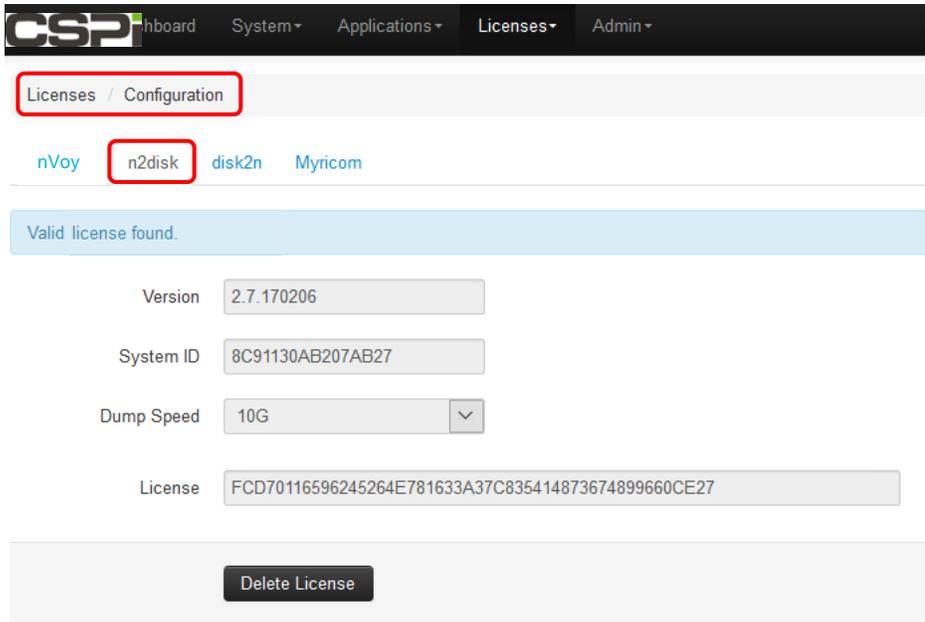
Figure 52: Application configuration window.

At a glance

Version
Software (n2disk) version number. This field cannot be modified.

System ID
The nVoy Packet Recorder system ID. This field cannot be modified.

Dump Speed
Software (n2disk) dump speed. This field cannot be modified.

License
Software license. This field cannot be modified.

Delete License
Click **Delete License** to delete the software license from the system.

7.3 Maintenance tab

The Maintenance tab displays the status of all software maintenance plans, indicating the number of days remaining before the plan expires (Figure 53).
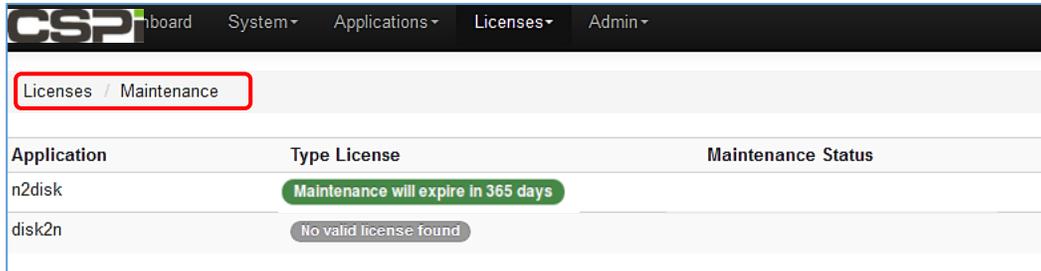
Figure 53: Displaying software maintenance status.

8 Admin Menu

The Admin menu enables users to manage nVoy Packet Recorder and application administrative tasks, as shown in Figure 54.

The administrative tasks include the following:

- Services: Networking, SNMPD, PF_RING, and so on.

- Storage: Partitioning and formatting disks.

- Update: nVoy Packet Recorder system updates.

- Reboot: Rebooting the nVoy Packet Recorder.

- Shutdown: Shutting down the nVoy Packet Recorder.

- Logout: Logging off from the system.

Figure 54: nVoy Packet Recorder and application Admin window.

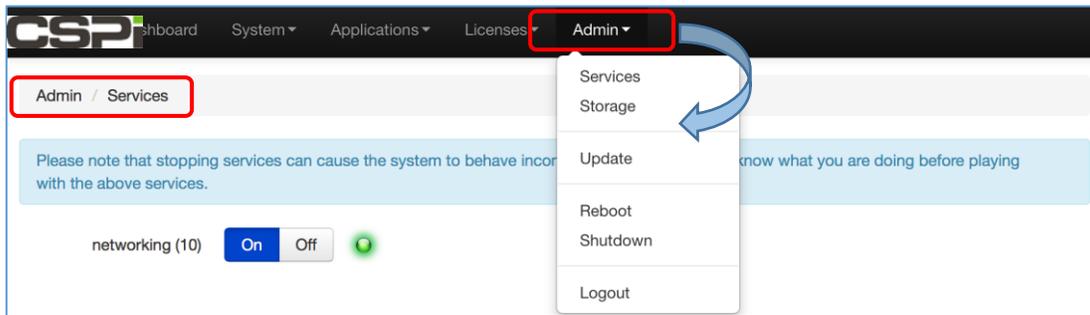# 8.1 Services tab

The **Admin > Services** tab enables users to start, stop, or restart selected nVoy Packet Recorder services by simply toggling the **On/Off** button (Figure 55).
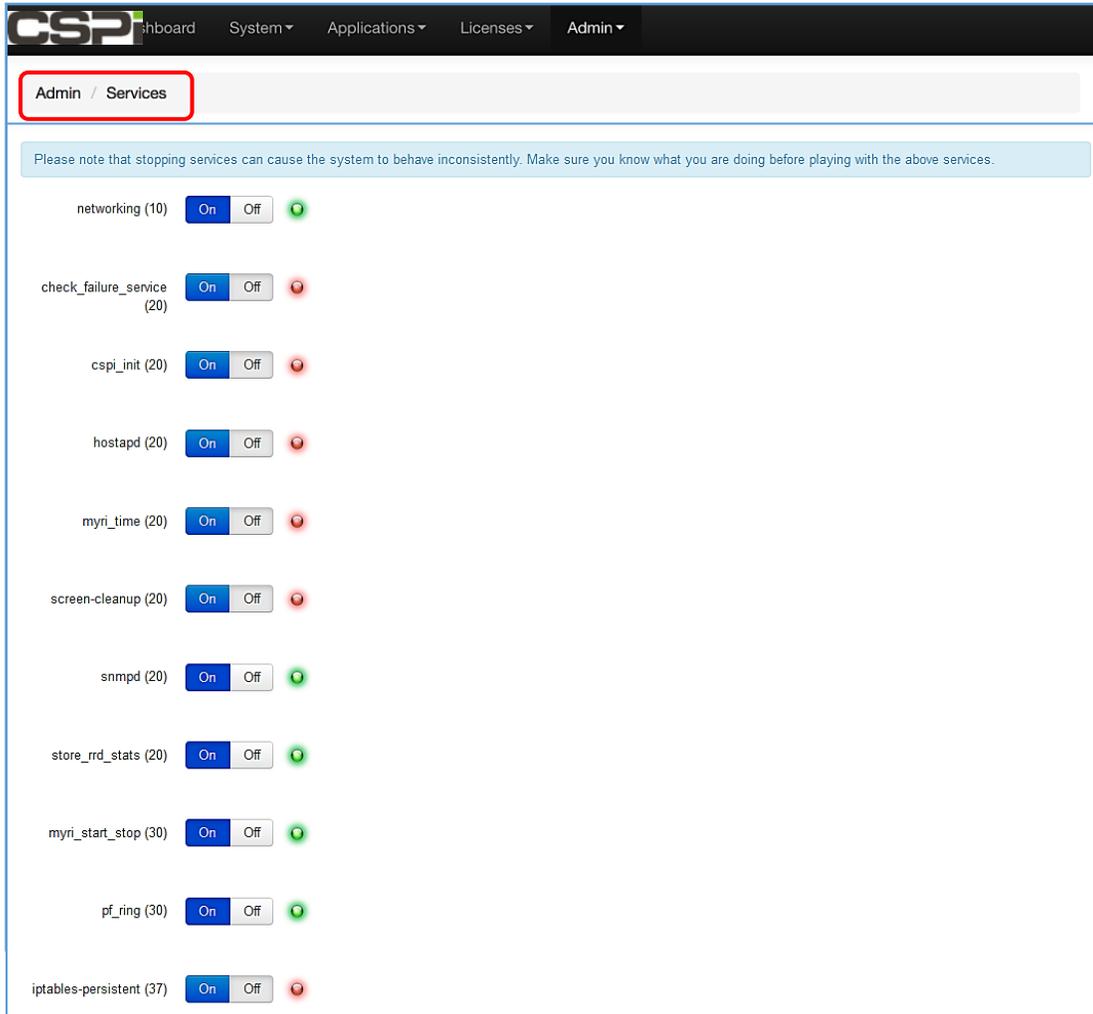
Figure 55: Services window.

8.2   Storage tab

The **Admin > Storage** tab establishes how the nVoy Packet Recorder partitions and formats disks to write files sequentially to the filesystem (Figure 56).
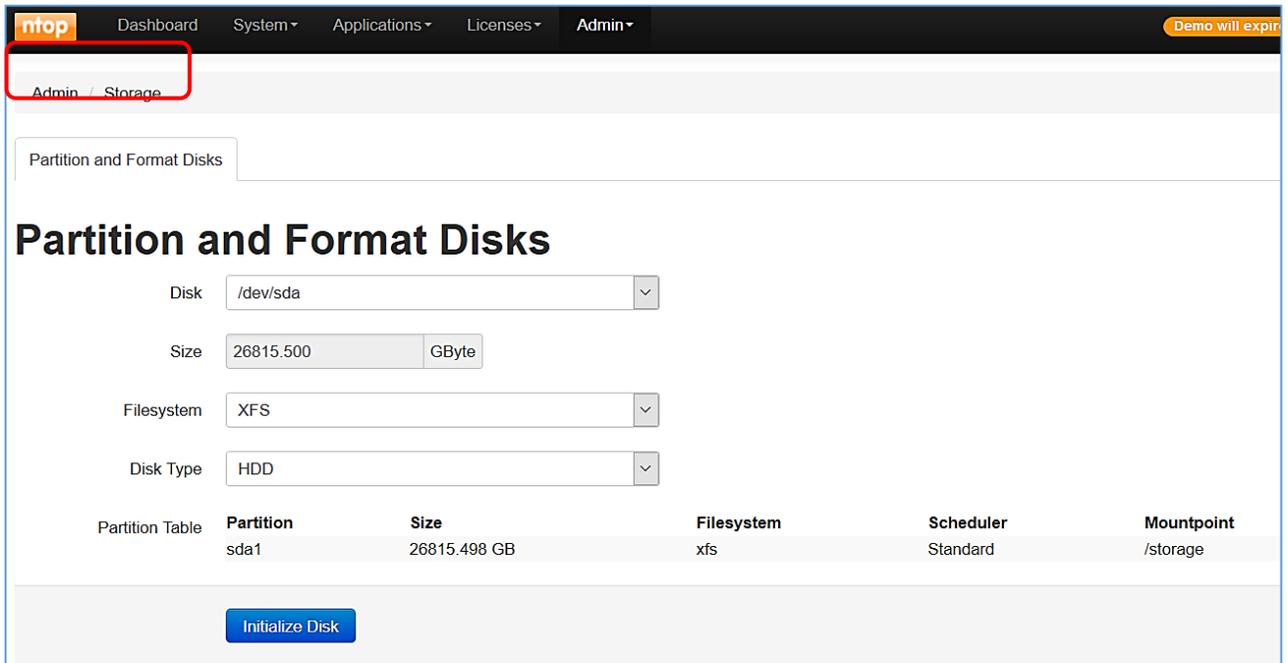
Figure 56: Disk partitioning and formatting window.

At a glance

Disk

Select **dev/sda** as the first hard drive (primary master).

Size

The size of the filesystem in GBytes. This field cannot be changed.

Filesystem

Select the XFS filesystem. The Ext4 filesystem has not been thoroughly tested in this release.

Disk Type

Select HDD. SSD has not been installed in this release.

Partition Table

Basic partition information of the operating system's hard disk drive (HDD) into primary partitions.

8.3 Update tab

The **Admin > Update** tab allows the user to update the nVoy Packet Recorder operating system, as shown in Figure 57.
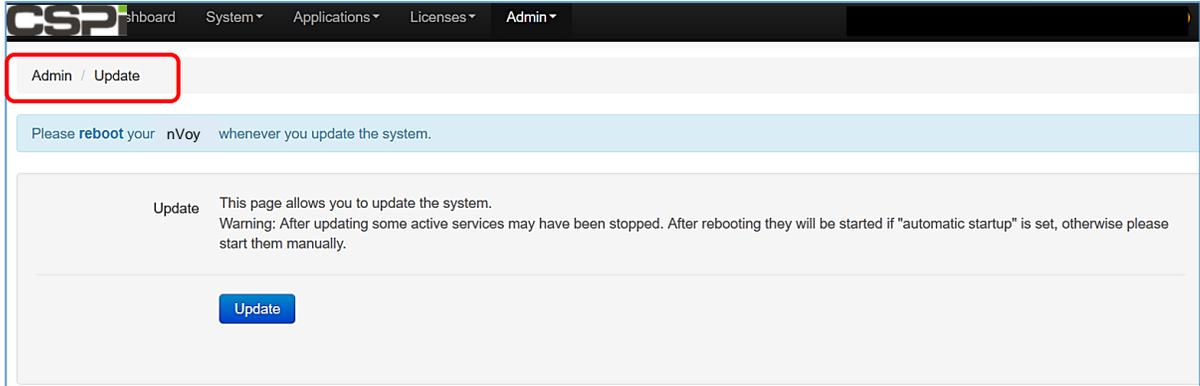
Figure 57: Update operating system window.

At a glance

Update
Click **Update** to update the system, followed by a reboot.

WARNING:	Some active services may have been stopped after updating. To reset these services automatically after rebooting, ensure that **automatic startup** is set prior to rebooting. You can manually start the services after rebooting if **automatic startup** is not set.

8.4 Reboot tab

The **Admin > Reboot** tab enables user to reboot the nVoy Packet Recorder system following a system update or changes to the interface settings (Figure 58).
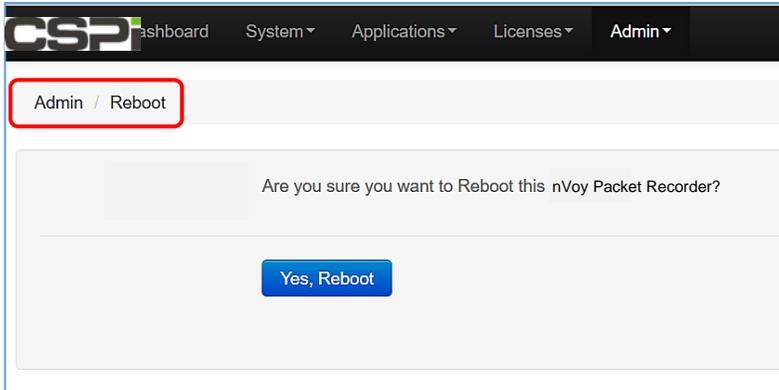
Figure 58: Rebooting nVoy Packet Recorder system window.

At a glance

Reboot

Click **Reboot** to reboot the nVoy Packet Recorder system.

8.5 Shutdown tab

The **Admin > Shutdown** tab enables user to shut down the nVoy Packet Recorder system (Figure 59).
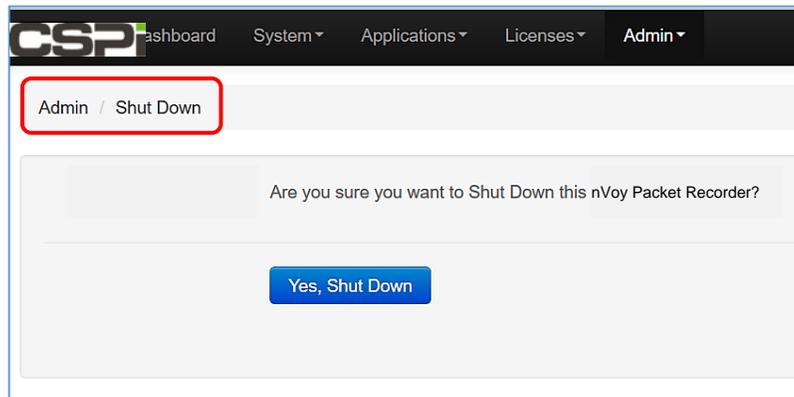
Figure 59: Shutting down the nVoy Packet Recorder window.

Shut Down

Click **Yes, Shut Down** to shut down the nVoy Packet Recorder system.

8.6 Logout tab

The **Admin > Logout** tab enables user to log off the nVoy Packet Recorder Web user interface, as shown in Figure 60.
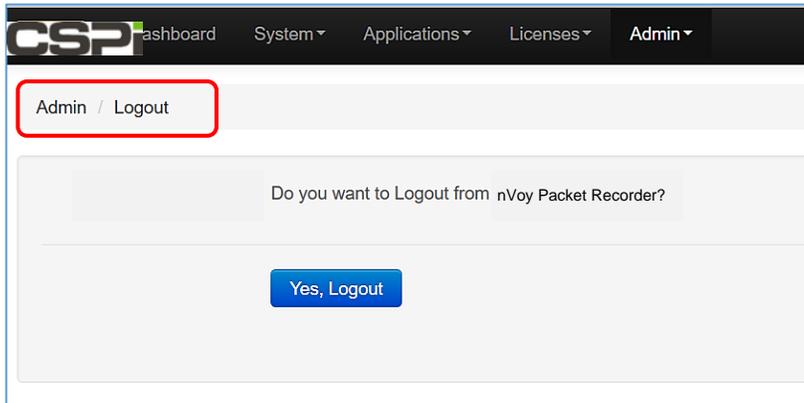
Figure 60: Logging off the Web user interface.

Logout

Click **Yes, Logout** to log off the nVoy Packet Recorder Web user interface.

9 Configuring the n2disk Interface

CSPi makes every effort to configure the n2disk application with nVoy Packet Recorder appliance for maximum performance and therefore requires very little in the way of rigorous user configuration, performance testing, and tuning.

To that end, we recommend that you contact CSPi Technical Support before changing or modifying any of the default n2disk application configuration settings.

NOTE:	In this chapter we refer to **myri0** and **myri1** as the n2disk network interfaces.

This chapter describes the following configuration tabs (Figure 61).

- General
- Processor Affinity
- Timestamp
- Filters
- Storage Data Layout
- Index and Timeline
- Advanced
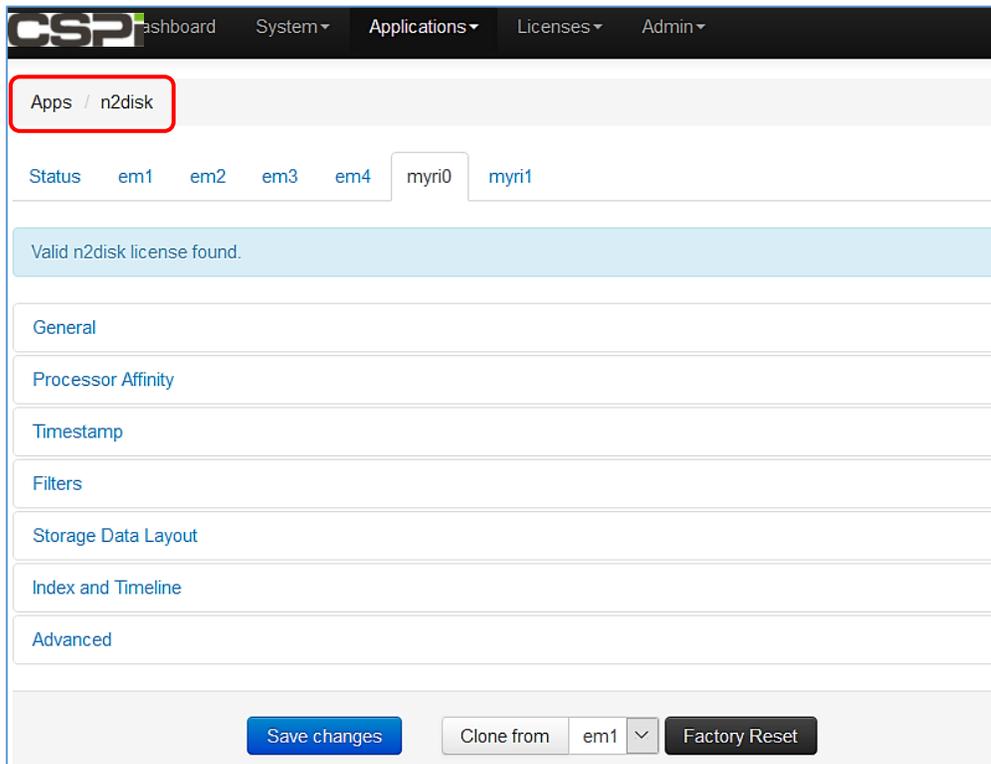
Figure 61: n2disk application tab.

The **Applications > Apps > n2disk > General** tab displays n2disk interface instance, name, snapshot length, buffer size, and license status (Figure 62).

Figure 62: n2disk general configuration window.

At a glance

Automatic Startup

Click **Disabled**. You disable the **myri0** interface at startup (Default).

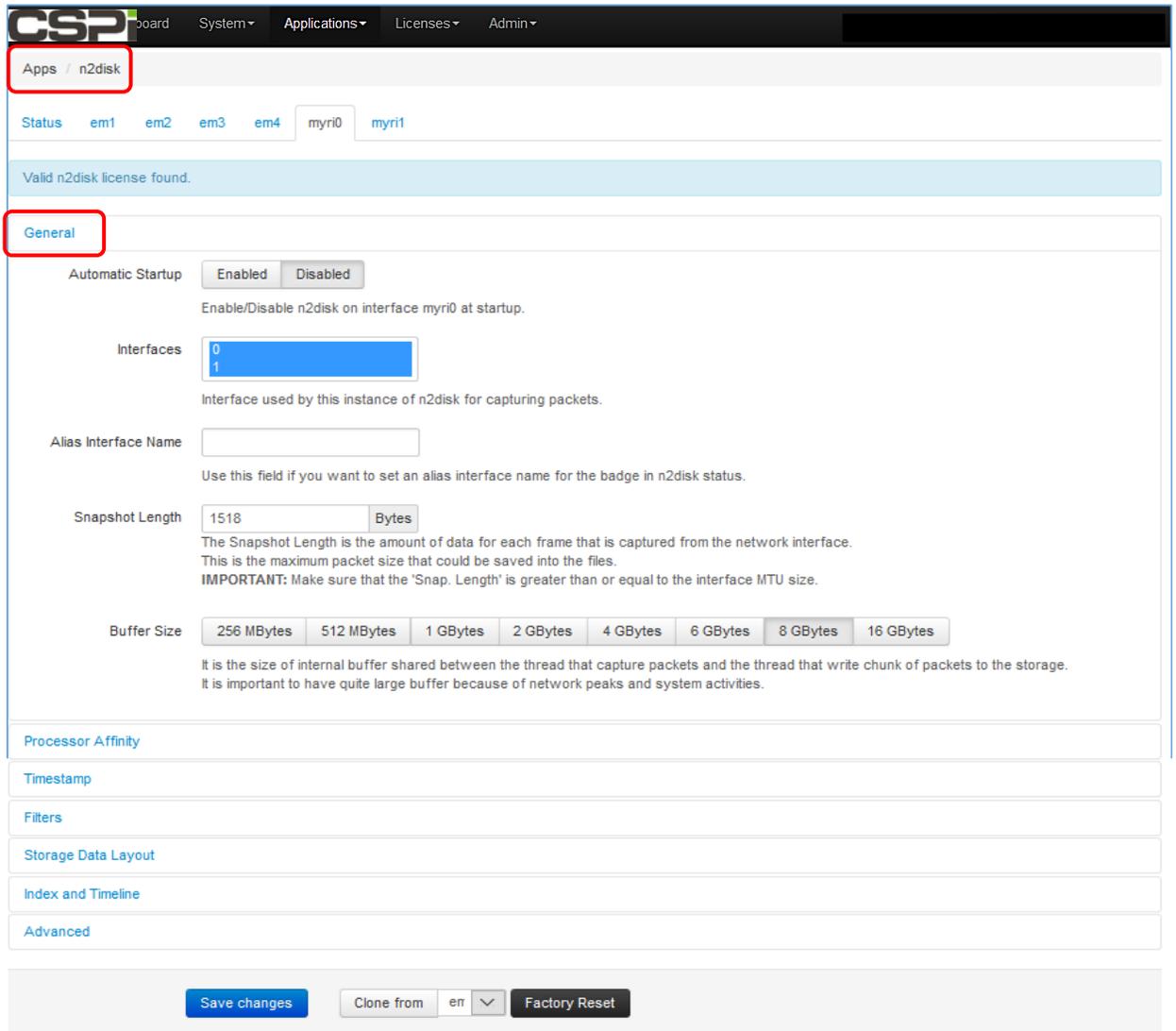Click **Enabled**. You enable the **myri0** interface at startup.

Interfaces

Specify an interface used by this instance of n2disk for capturing packets. In this example, **0** and **1** are selected for **myri0** and **myri1** interfaces respectively.

Alias Interface Name

Specify an alias interface name. Using an alias to identify interfaces as they appear in the output for operational commands allows for more meaningful naming conventions and easier identification.

Snapshot Length

The snapshot length is the amount of data for each frame that is captured from the network interface. This is the maximum packet size that could be saved to the files. The default snapshot length is 1518 bytes.

NOTE:	Make sure that the snapshot length is greater than or equal to the interface MTU size.

Buffer Size

The internal buffer size shared between the thread that captures packets and the thread that writes chunk of packets to storage. Maintain a large buffer size to account for network peaks and system activities. The default buffer size is 8 GBytes.

Saving, Cloning, and Resetting

Click **Save Changes** to save the changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

9.2 Processor Affinity

WARNING:	Changing the processor affinity default settings may lead to dropped packets.

The **Applications > Apps > n2disk > Processor Affinity** tab displays the various threads types that bind to specific processors/cores (Figure 63).
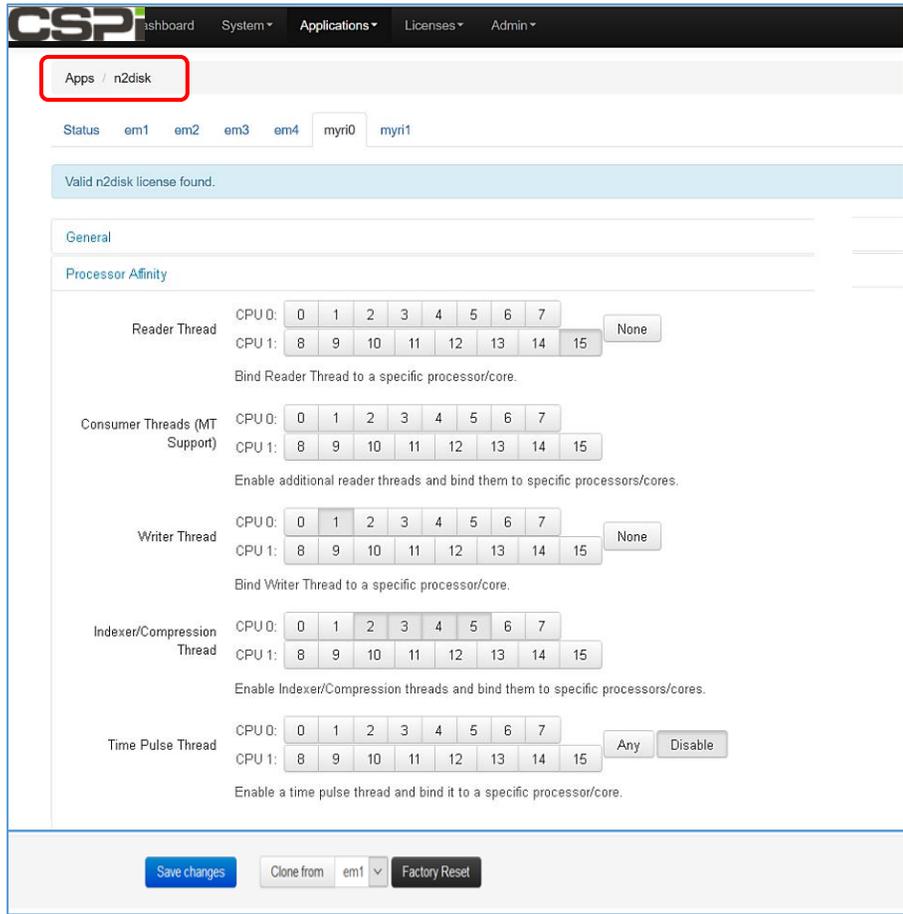

Figure 63: Processor affinity window.

At a glance

Reader Thread
Binds the reader thread to a specific processor/core. The default reader threads bound to CPU 1 is **15**.

Consumer Threads (MT Support)
Enables additional reader threads to bind to specific processors/cores.

Writer Thread

Binds writer threads to a specific processor/core. The default writer threads bound to CPU 0 is **1**.

Indexer/Compression Thread

Enables indexer/compression threads to bind to specific processors/cores. The default indexer/compression threads bound to CPU 0 is **2**, **3, 4**, and **5**.

Time Pulse Thread

Enables a time pulse thread to bind to a specific processor/core. Default is **Disable**.

NOTE:	Enabling the Time Pulse Thread may lead to dropped packets. Set the time pulse thread to **Disable** as a precaution.

Saving, Cloning, and Resetting

Click **Save Changes** to save the changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

9.3 Timestamp

The **Applications > Apps > n2disk > Timestamp** tab allows you to select pcap timestamps in nanosecond or microsecond formats (Figure 64).
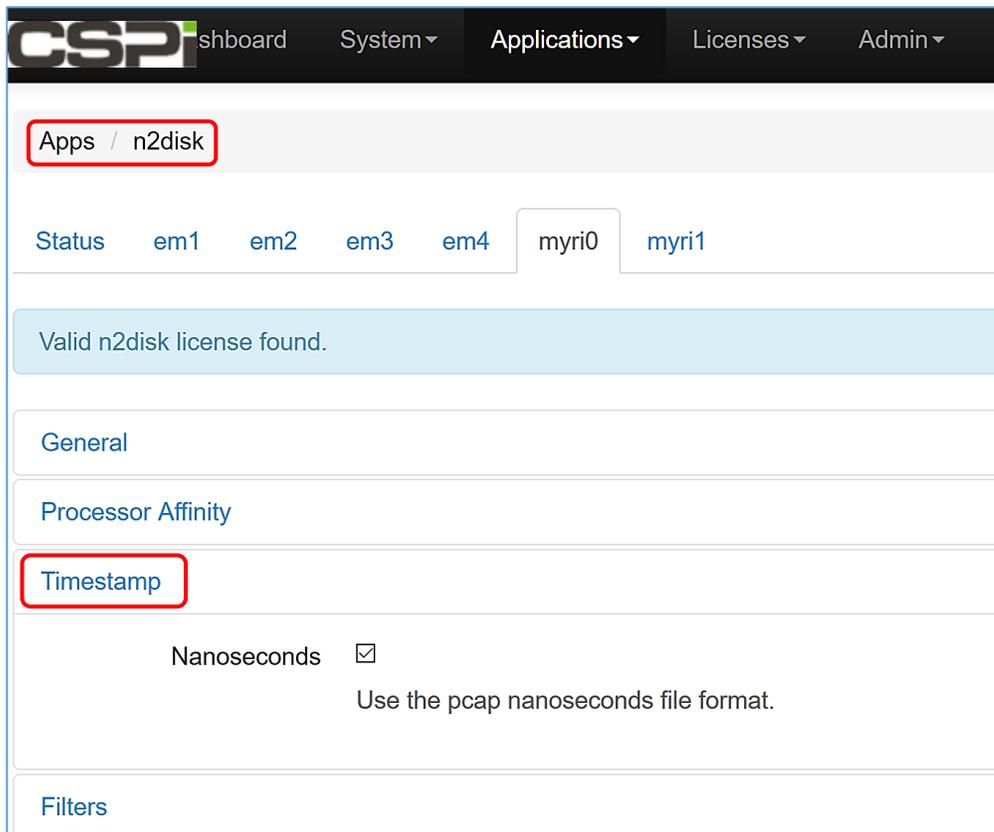
Figure 64: Timestamp window.

At a glance

Nanoseconds

Check the **Nanoseconds** box to record pcap files in nanoseconds (Default).

Uncheck the **Nanoseconds** box to record pcap files in microseconds.

Saving, Cloning, and Resetting

Click **Save Changes** to commit all changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

9.4 Filters

The **Applications > Apps > n2disk > Filters** tab allows you to filter traffic by specifying a BPF filter format (Figure 65).
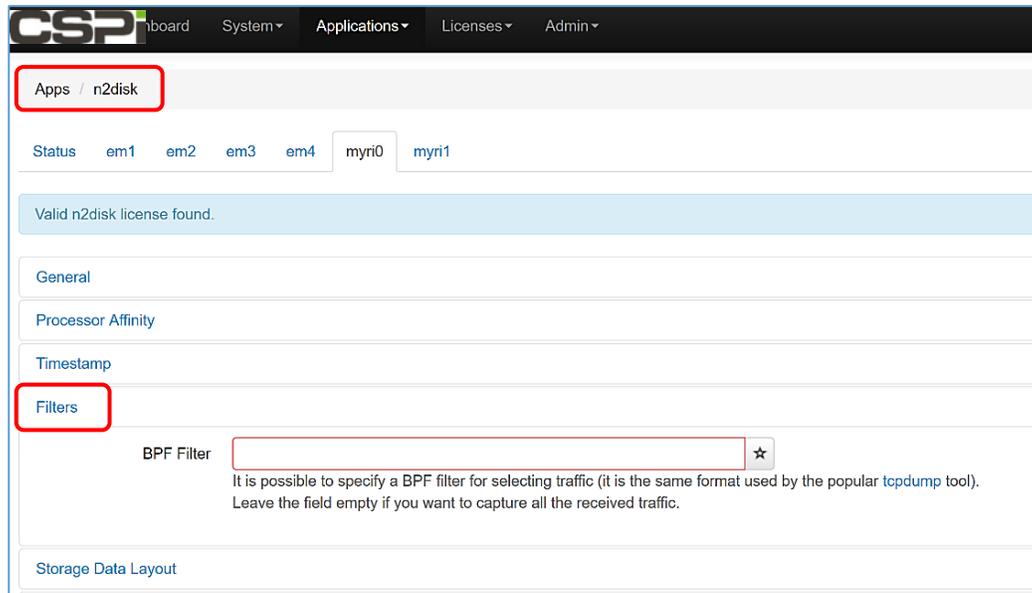
Figure 65: Filters window.

At a glance

BPF Filter

Specify a BPF filter from the Index Filter Wizard for selecting traffic. Leaving the field empty allows you to capture all the received traffic.

Saving, Cloning, and Resetting

Click **Save Changes** to commit all changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

9.5   Storage Data Layout

The **Applications > Apps > n2disk > Storage Data Layout** tab allows you to configure how files are stored on RAID (Figure 66).

By default, the system records up to 10 Terabytes (10 Directories x 500 Files x 2GB pcap files) before over-writing the oldest data. RAID disk space is also shared by any packets that are extracted to **/storage/n2disk/myri0**.

WARNING:	Use caution when selecting the various layout parameters. If the total number and size of files exceeds available disk space, packet capture operations will cease when the disk is full. You can delete unneeded or older pcap files to free up disk space.

Figure 66: Storage data layout window.

Dump Path

Specify the directory path where the files are stored. In this example, the **myri0** interface pcap files are stored in the **/storage/n2disk/myri0/** directory.

Max File Size

Specify the maximum size of each dumped file. The default file size is 2 GBytes.

Max File Duration

Specify the maximum duration of each dumped file. The default maximum duration is 1 hour.

Max File Packets

Specify the maximum number of packets for each dumped file.

Max Files per Dir

Specify the maximum number of files per directory. Assign no more than 1000 files per directory. The default maximum number is 500 files.

Max Directories

Specify the maximum number of nested directories. The default maximum is 10 directories.

Sampling Rate

Specify a packet sampling rate. For example, entering "100" refers to a 1:100 sampling rate. Leave empty for no sampling.

Archiving

You can rename files with the `.old` extension for archiving purposes instead of overwriting them. Left unchecked by default. Checking this setting will double disk space.

File Tag

You can add a specific tag string to each dumped filename. The filename format is "**[tag]<file number>**".

Pcap Compression

Uncheck the **pcap Compression** box to disable pcap file compression (Default).

Check the **pcap Compression** box to compress pcap files. Compression frees up disk space.

Saving, Cloning, and Resetting

Click **Save Changes** to commit all changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

9.6 Index and Timeline

The **Applications > Apps > n2disk > Index and Timeline** tab allows you to enable or disable various index and timeline parameters (Figure 67).
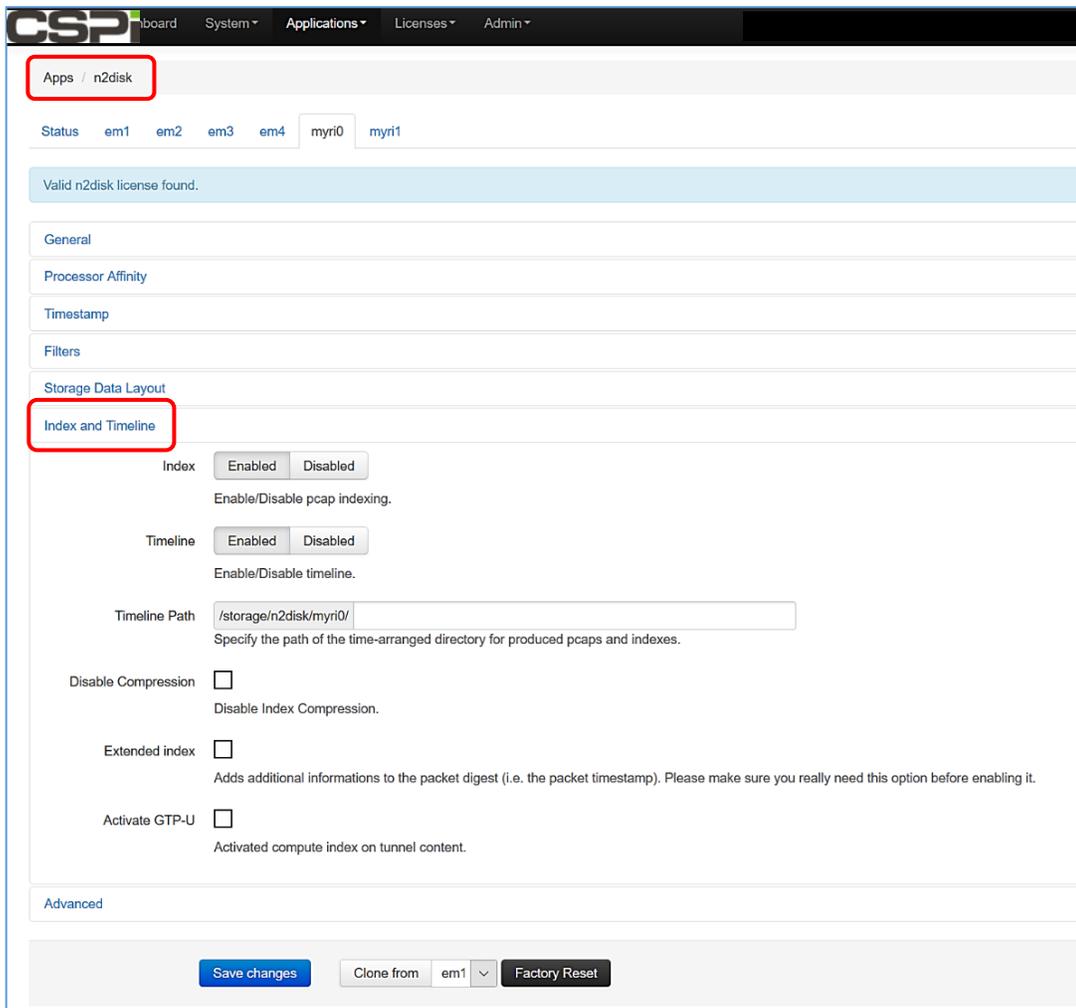

Figure 67: Index and timeline window.

Index

Click **Enable** to enable pcap indexing. Indexing enables extremely fast extraction of packets from a compressed pcap file (Default).

Click **Disable** to disable pcap indexing.

Timeline

Click **Enable** to enable pcap timeline (Default).

Click **Disable** to disable pcap timeline.

Timeline Path

Specify the directory path of the time-arranged directory for produced pcaps and indices. In this example, the **myri0** time-arranged pcap files and indices are stored in the **/storage/n2disk/myri0/** directory.

Disable Compression

Uncheck the **Disable Compression** box to enable index compression (Default).

Check the **Disable Compression** box to disable index compression.

Extended index

Check the **Extended Index** box to enable the extended index option. Extended Index adds additional information to the packet digest, such as packet timestamps. Make sure you really need this option before enabling it.

Uncheck the **Extended Index** box to disable the option (Default).

Activate GTP-U

Check the **Activate GTP-U** box to carry user data within the GPRS core network.

Uncheck the **Activate GTP-U** box to disable the option (Default).

Saving, Cloning, and Resetting

Click **Save Changes** to commit all changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

9.7 Advanced

WARNING:	Changing the advanced default settings may lead to dropped packets.

The **Applications > Apps > n2disk > Advanced** tab allows to define chunk size, poll duration, Hugepages, and active wait parameters (Figure 68).
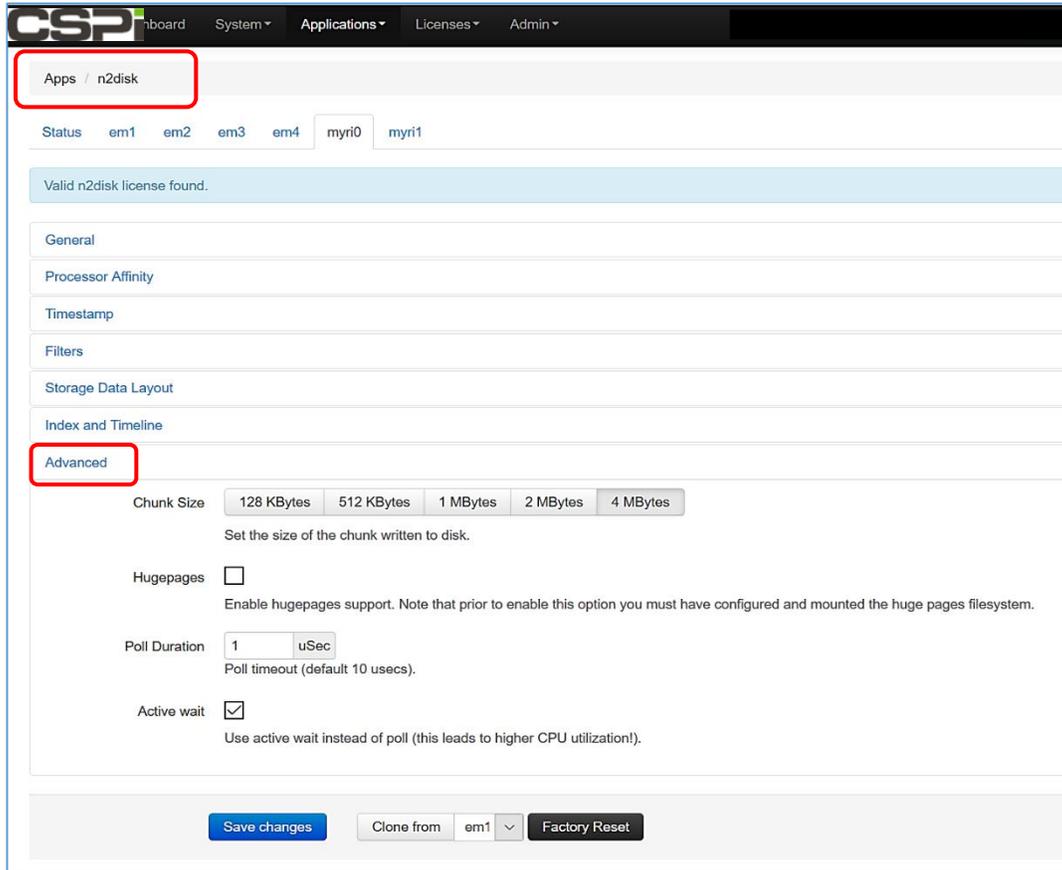

Figure 68: Advanced window.

At a glance

Chunk Size
Sets the chunk size written to disk. The default chunk size is 4 Mbytes.

Hugepages (not supported)
Check the **Hugepages** box to enable Hugepages support. You must configure and mount the Hugepages filesystem prior to enabling the option. Left unchecked by default.

Poll Duration

Select the appropriate poll duration setting from the **μSec** pull-down combo box.

The default poll timeout is 1 μsecs.

Active Wait

Check **Active Wait** instead of the polling option to reduce CPU utilization (Default).

Saving, Cloning, and Resetting

Click **Save Changes** to commit all changes made to the network interface, followed by a system reboot.

Click **Clone from** to create a duplicate of an original network interface.

Click **Factory Reset** to return the system to original factory specifications, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

10 Configuring the disk2n Interface (not supported)

NOTE:	The disk2n utility is _not_ supported in this release. It is listed in the applications menu but it does not have an associated license installed.

NOTE:	In this chapter we refer to **prod1** as the n2disk network interface.

This chapter describes the following configuration tabs:

- General
- Processor Affinity
- Packet Reforging
- Advanced

10.1 General tab

The **Applications > Apps > disk2n > General** tab allows you to tweak disk2n parameters such as egress interfaces, timeline path, source traffic time interval, buffer size, and CPU affinity (Figure 69).
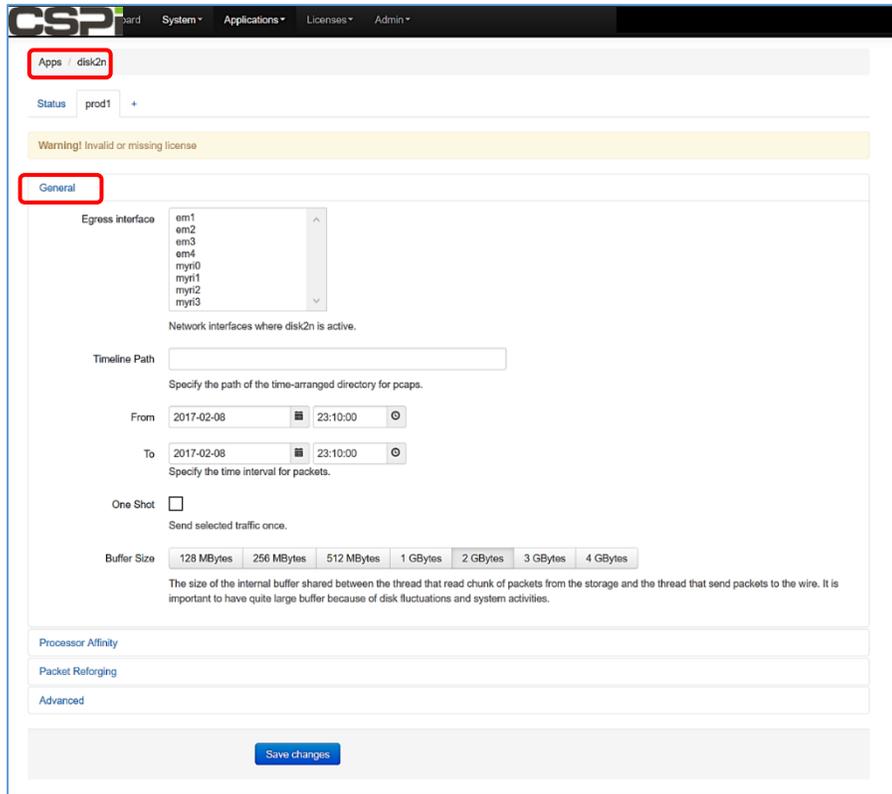
Figure 69: General configuration window - disk2n.

At a glance

Egress interface
Select an active n2disk interfaces from the drop-down menu.

Timeline Path
Specify the pcap timeline path directory and the time interval. In this example the directory is **/storage/disk2n/prod1**

One Shot
Send selected traffic once.

Buffer Size
The internal buffer size shared between the thread that reads stored packets and the thread that send packets to the wire. Maintain a large buffer size to account for network peaks and system activities

Saving Changes

Click **Save Changes** to commit all changes made to the disk2n interface, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

10.2 Processor Affinity

WARNING:	Changing the processor affinity default settings may lead to dropped packets.

The **Applications > Apps > disk2n > Processor Affinity** tab displays the various threads types that bind to specific processors/cores (Figure 70).
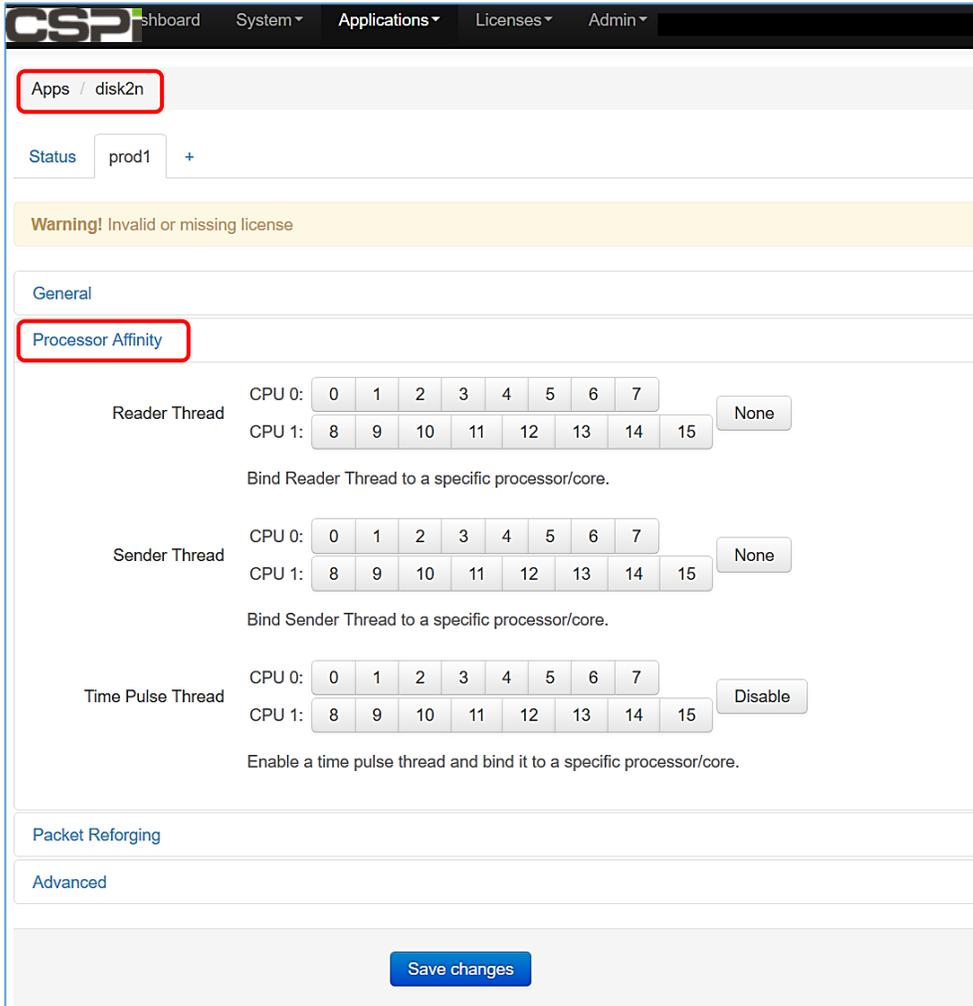

Figure 70: Processor affinity window.

Reader Thread

Binds the Reader Thread to a specific processor/core.

Sender Thread

Binds the Sender Thread to a specific processor/core.

Time Pulse Thread

Enables a Time Pulse Thread and binds it to a specific processor/core. Default is **Disable**.

WARNING:	Enabling the Time Pulse Thread may lead to dropped packets. Set the time pulse thread to Disable as a precaution.

Saving Changes

Click **Save Changes** to commit all changes made to the disk2n interface, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

10.3 Packet Reforging

The **Applications > Apps > disk2n > Packet Reforging** tab allows you to reforge source/destination MAC/IP/Port on the fly, to recomputethe destination MAC in the event of network-assisted multicast, and to recalculate checksums (Figure 71).

Figure 71: Packet reforging window.

At a glance

Source MAC
Specify the source MAC address.

Destination MAC
Specify the destination MAC address.

Source IP
Specify the source IP address.

Destination IP

Specify the destination IP address.

Source Port

Specify the source port.

Destination Port

Specify the destination port.

Saving Changes

Click **Save Changes** to commit all changes made to the disk2n interface, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

10.4 Advanced

WARNING:	Changing the advanced default settings may lead to dropped packets.

The **Applications > Apps > disk2n > Advanced** tab defines chunk size, Hugepages, active wait, and precise timing parameters (Figure 72).
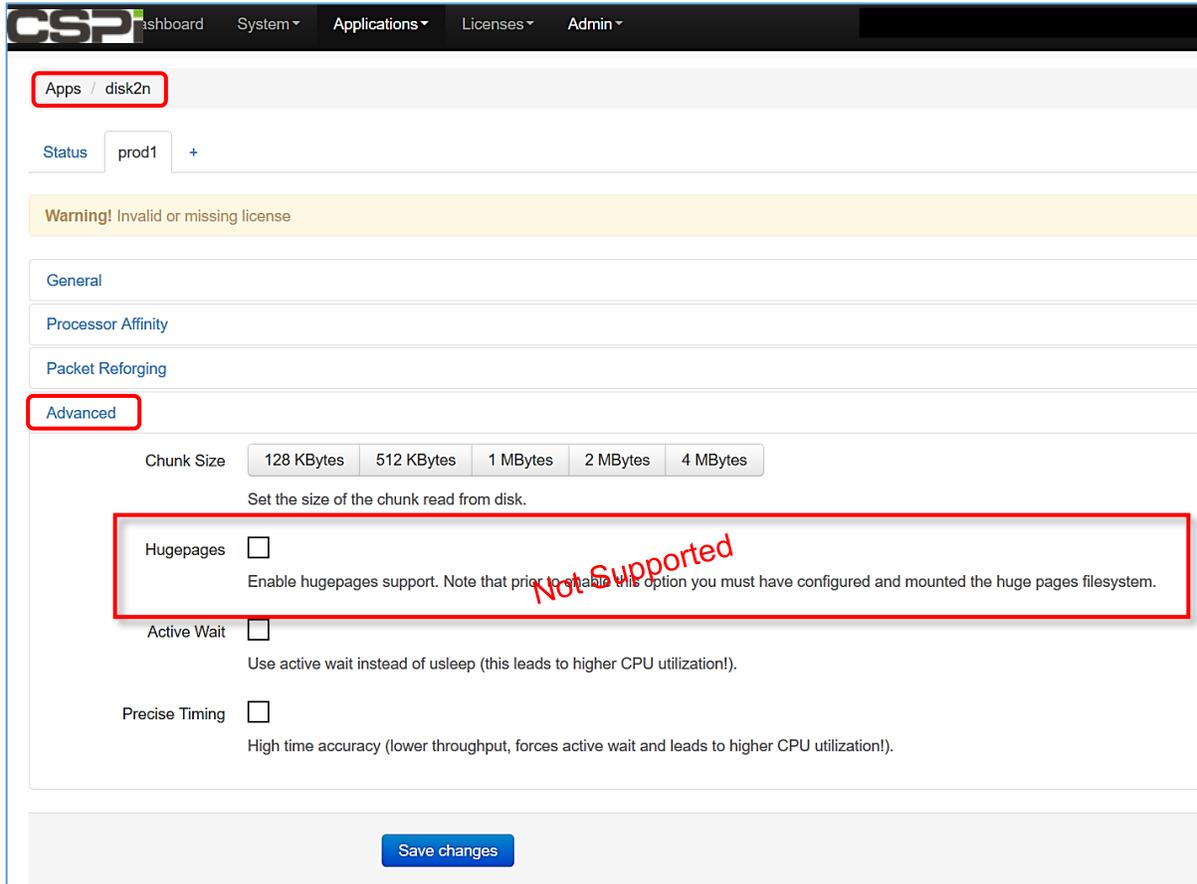

Figure 72: Advanced window.

At a glance

Chunk Size
Sets the chunk size read from disk

Hugepages (not supported)
Check the **Hugepages** box to enable Hugepages support. You must configure and mount the Hugepages filesystem prior to enabling the option.

Active Wait
Check **Active Wait** to reduce CPU utilization.

Precise Timing

Check for higher timing accuracy. Note that checking this option leads to lower throughput, forces Active Wait and leads to higher CPU utilization.

Saving Changes

Click **Save Changes** to commit all changes made to the disk2n interface, followed by a system reboot.

NOTE:	Reboot the nVoy Packet Recorder whenever you make any changes to the interface settings.

Appendix 1:

nVoy Packet Recorder System Specifications

Processors
Single or dual Intel® Xeon E5-2600 (v3/v4) Series processors

Chipset
Intel C612 chipset

BIOS
16 Mb AMI® SPI Flash ROM

Memory Capacity
24 x DIMM sockets supporting up to 3 TB of Load Reduced (LRDIMM) or

1.5 TB of Registered (RDIMM) ECC DDR4-2400/2133/1866/1600 memory.

Drive Bays
24 x hot-swap drive bays to house SAS or SATA drives

Expansion Slots
- 3 x PCI-Express 3.0 x8 slots
- 2 x PCI-Express 3.0 x16 slots
- 1 x PCI- Express 2.0 x4 in x8 slot (CPU2 Slot4) on the server board

Server Board
X10DRi-T4+ (Extended ATX form factor)

Dimensions: 13.68 x 13.05 in (347.5 x 331.5 mm)

Chassis
SC216BE1C-R920LPB, 2U rackmount

Dimensions: (WxHxD) 17.2 x 3.5 x 24.8 in. (437 x 89 x 630 mm)

Weight
Net: 35 lbs. (15.9 kg.)

Gross: 57 lbs. (25.9 kg.)

System Cooling
3 x 8-cm system fans. One air shroud.

System Input Requirements
AC Input Voltage: 100 - 240V AC auto-range

Rated Input Current: 11 - 4.5A max

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 920W (Part# PWS-920P-SQ) (hot-plug, redundant)

Rated Output Voltages: +12V (75A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (32º to 95º F)

Non-operating Temperature: -40º to 60º C (-40º to 140º F)

Operating Relative Humidity: 8% to 95% (non-condensing)

Non-operating Relative Humidity: 5% to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. Perchlorate Material-special handling may apply. See
www.dtsc.ca.gov/hazardouswaste/perchlorate"

Appendix 2:

nVoy Packet Recorder Supported 10G Transceivers

The following 10G transceivers have been tested and are supported to run with the nVoy Packet Recorder.

Supported 10G transceiver modules

CSPi Model Number:	Description:	Release
10G-SFP-SR	Optical-Fiber SFP+ transceiver for 10GBase-SR (850nm wavelength).	nVoy Packet Recorder Release Version 1.0
10G-SFP-LR	Optical-Fiber SFP+ transceiver for 10GBase-LR (1310nm wavelength)	nVoy Packet Recorder Release Version 1.0
10G-XFP-SR	Optical-Fiber XFP transceiver for 10GBase-SR (850nm wavelength)	nVoy Packet Recorder Release Version 1.0
10G-XFP-LR	Optical-Fiber XFP transceiver for 10GBase-LR (1310nm wavelength)	nVoy Packet Recorder Release Version 1.0

Table 1: Supported 10G transceiver modules.