

# Myricom nVoy Series Packet Recorder

# User Guide

Version 1.0



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# 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	<i>Quick Start Guide</i> 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 <u>not</u> 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	<i>Licenses Menu</i> 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 <i>not</i> supported in this nVov Packet Recorder release.
	<u> </u>



# 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.

<b>CSPi</b>	Dashboard	System <del>-</del>	Applications -	Licenses <del>•</del>	Admin <del>-</del>
System /	Users				
System Us	sers Web U	Jsers Auth	i Logs		
	Users	● root ● n2disk			
		Add User	Delete User	Change Pw	

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.

CSP1 <sup>shboard</sup>	System <del>-</del>	Applications <del>-</del>	Licenses <del>-</del>	Admin <del> -</del>
Configuration / Users /	Change Pw			
Login	root			
Password			٩	
Password (retype)			۹	
(	Change P	w		

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.

CSP <sup>ashboard</sup>	System <del>-</del>	Applications -	Licenses <del>-</del>	Admin <del>-</del>	
Admin / Logout					
	Do you w	rant to Logout from	nVoy Packet Re	corder?	
	Yes, Lo	ogout			

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.

	There is a problem with this website's security certificate.			
	The security certificate presented by this website was issued for a different website's address. The security certificate presented by this website was not issued by a trusted certificate authority.			
	Security certificate problems may indicate an attempt to fool you or intercept any data you send to the server.			
	We recommend that you close this webpage and do not continue to this website.			
	Vick here to close this webpage.			
	Solution to this website (not recommended).			

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).

	System -	Applications -	Licenses <del>-</del>	Admin -	
Admin / Shut Down					
	Are you s	ure you want to Sł	nut Down this n	/oy Packet Re	corder?
	Yes, St	nut Down			

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.

CSP <sup>Dashboard</sup>	System - Applications -	r Licenses <del>v</del> Admin <del>v</del>	
CSPI- Linux kernel - Linux kernel - Linux kernel - LSI Logic LSI Logic LSI Logic CSP, Inc	<b>NVOY-If</b> 4.4.0-64-generic x86_6 con(R) CPU E5-2667 v- / Symbios Logic MegaF oration Ethernet Contro 10G-PCIE3-8E-2S Netw	A (2) 3.20GHz (PU 0 0 1 2 3 4) (PU 0 8 9 10 11) (PU 0 8 9 10) (PU 0 8 9 1	Box 2.5
Network Inter myri0 myri1	em1 em2 i em2	em3 em4	
Cores		Memory	Storage
System IRQ User WO Wait		0.2% 1.3% cached used TOTAL 64317.1 MB 97.9% free	16.1% used 9.3 GB System (storage

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.

User I/O Wait

System /storage



# 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).

CS Dashboard S	ystem + Applications +	Licenses <del>•</del> Admin •			
Linux kernel 4.4 Linux kernel 4.4 Linux kernel 4.4 Linutel(R) Xeo Linutel(R) Xeo Linutel(R) Xeo Linutel(R) Xeo Linux kernel 4.4 Linux kernel 4.4 Li	4.0-59-generic x86_64 n(R) CPU E5-2667 v4 @ Symbios Logic MegaRAI ation Ethernet Controller evice 4264	-record	<b>er</b> 4 5 6 7 1 42 43 44 45		1
Network Inter myri0 myri1 ICO O ICO O IXI IXI IXI IXI	faces em1 em2 wwww construction em2 construction construc	em3 em4	2		
Cores		Memory 21.5% cached 64317.2 MB	73.8% free	Storage	3
System IRG User VO Wait		1		System /storage	

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.

Network Interfaces					
	real-time traffic graph				
myri0 myri1	em1	em2	em3	em4	
	~~~W				
RX TX RX TX	RX TX	RX TX	RX TX	RX TX	
Capture ports	Etherr	net ports			

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.

CSP Dashboard	System -	s▼ Licenses▼ Admin▼
nbo	General Users Network PF_RING	2.3
🚺 Linux kerner	Cloudsbark	@ 2.40GHz CPU 0 0 1 2 3
🔯 🚠 Intel Corr 💽 🚠 Intel Corr	Manage Configuration	bit Ethernet Controller bit Ethernet Controller

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 <u>not</u> supported in this nVoy Packet Recorder release.

	System  Applications  Licenses  Admin
System / General	
Host Name	nVoy Packet Recorder
Timezone	America/New_York ~
NTP Server	List of servers for remote time synchronization. Leave this field empty for no time synchronization. Time is synchronized at boot, every day, or whenever you restart the ntpdate service.
NTP	Enabled Disabled Activate ntp instead of ntpdate service.
SSH	Enabled Disabled Disa
	Save changes Reset

Figure 15: General tab.



#### At a glance

#### **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

	System <del>▼</del>	Applications -	Licenses <del>•</del>	Admin <del>-</del>
System / Users				
System Users Web U	sers Auth L	_ogs		
Users	● root			
	⊖ n2disk			
	Add Llser	Delete Liser	Change Pwd	
	Aud Oser	Delete Oser	Change Pwd	

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

	System <del>•</del>	Applications -	Licenses <b>-</b>	Admin <del>-</del>
System / Users				
System Users Web Us	sers Auth	Logs		
Users	) nbox (Adr	ninistrator)		
	Add User	Delete User	Change Pwd	

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).

	System <del>•</del>	Applications -	Licenses <del>•</del>	Admin <del>•</del>
Configuration / Users /	Add User			
Login				
Password				
Password (retype)				
	Add User			

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).

C	SP Dashboard	System <del>•</del>	Applications -	Licenses <b>-</b>	Admin <del>-</del>
	Configuration / Users /	Delete User			
	Are you sure you want to	delete user <b>ro</b>	oot?		
		Delete Us	er		

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).

	System <b>▼</b>	Applications -	Licenses <del>•</del>	Admin <del>•</del>
Configuration / Users /	Change Pw			
Login	root			
Password				
Password (retype)				
	Change P	w		

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.

	System - Applications - Licenses - Admin -
System / Network	
Please reboot your n	y whenever you change these settings.
Management em1	em2 em3 em4 myri0 myri1 +
Warning! There is no co	onfiguration for this device yet.
Management Interface	eth0
DHCP Client	Enabled Disabled
	If you enable DHCP support the above address fields are not used.
IP Address	Address Netmask
Default Gateway	Address
Interface Alias (eth0:1)	Address Netmask
	This field allows you to specify a secondary IP address on the eth0 interface.
IP Forwarding	Enabled Disabled
	Enable this facility if you want to use your nBox 2.5 as a network router.
Primary DNS	Address
Secondary DNS	Address
Domain Name	
Domain Name	
Input Traffic Policy	
	Use just only the managment interface in order to receive input traffic. Note: if you check this field you will not be able to manage the nbox from another interface.
Exporting Interface	Set this flag in order to use this interface as an exporting interface.
	Save changes Reset Delete

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

Figure 22: Network window


#### At a glance

#### **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.



#### At a glance

#### 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)

Dashboard System+ Applications+ Licenses+ Admin+	
System / PF_RING	
Please reboot your nVoy whenever you change these settings.	
General ZC Aliases	
You don't have interfaces aliases configured.	
Configured Aliases	
Add Aliases	
Alias Name	
Interfaces	ported
Interface name (comma-separated list) e.g: eth1,eth2	Not Support
Enable Allases Enable Disable	1.
Enable/Disable the aliases interface.	
Save changes Reset	

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)



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 multiplepage size capabilities of Hugepages to optimize packet processing performance (Figure 26).

	System <del>-</del>	Applications -	Licenses <del>-</del>	Admin <del>-</del>
System / Hugepages				
Page Size	2048	KE	byte	
Node 0 Pages	- System does	s not have availabl	e pages on nod	le 0 now.
			Not SI	upported
Node 1 Pages	- System does	s not have availabl	e pages on nod	le 1 now.
	Save char	nges Reset		

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 <u>not</u> 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).

CSP board System -	Applications -	Licenses -	Admin -
System / Manage Configuration			
Backup Restore Assistance			
This pag	e allows you to dov	vnload a backu	p copy of your box configuration.
Backu	p Configuration		

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).

	System <del>-</del>	Applications -	Licenses <del>-</del>	Admin <del>-</del>	
System / Manage Config	guration				
Backup Restore A	ssistance				
Warning: restoring from Please reboot your nVo	another con y after you	figuration you wi restored the config	II lose the curr guration.	ent one.	
Restor	e Browse This page	No file selecte	d. tore a nVoy con	figuration.	
	Restor	e Configuration			

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).

[	CSP	Dashboard	System -	Applications -	Licenses <del>•</del>	Admin <del>-</del>		
(	System /	Manage Co	nfiguration					
	Backup	Restore	Assistance					
		System / Manage Configuration         Backup       Restore         Assistance         Status       This page allows you to download a dump of your box configuration and current status. In fact, shall you experience problems, when you contact the technical support you need to provide copy of this information.         Download Configuration						
			Down	load Configuration	I			

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 <u>support@cspi.com</u>



# 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.

	System <i></i> ≁	Applications -	Licenses <del>-</del>	Admin <del>-</del>		
System / Factory Reset						
Factory Reset	This page allows you to reset to factory defaults the system. Please unplug all the network cables except the management interface to let the system auto-detect the desired management port. Please <b>backup licenses and configuration</b> if needed before. The system will <b>automatically reboot</b> during the reset process.					
	Reset	to Factory Defaults				

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.

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 <u>not</u> 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 <u>not</u> supported in this nVoy Packet Recorder release.
Utility (3)	Traffic Generator utility (pfsend) (not supported)
	Remove Historical Data utility
	Activity Scheduler

The following table lists all available applications:

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.



### 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.

	System •	Applications	•	Licenses*	Admin <del>-</del>			
Apps / n2disk / Extra	ict							
Extract Pa	ckets	5						
Instances	myri0 myri1							
	Instances of	n2disk from wł	hich	extract packets	Б.			
Task Priority	Low N	ormal High						
	Specify the p	priority of task.						
From	2017-02-07			10:38:00	Ø			
То	2017-02-07		<b>111</b>	10:38:00	O			
Filter							*	
	BPF-Like filte	er for selecting	pac	ckets (same forr	mat used by the p	opular topdun	np tool).	
Max File Size	16 MBytes	64 MByte	s	256 MBytes	512 MBytes	1 GBytes	2 GBytes	None
	Specify the r	maximum size	of e	ach dumped file	1.			
Max File Packets	1K 10H	K 100K	1M	5M 10M	/ None			
	Specify the r	maximum <mark>nu</mark> ml	ber	of packets for e	ach dumped file.			
File Tag								
	You can add	a specific tag	strir	ng to each dump	ped filename. The	format of the	filename is "[ta	ag] <file number="">".</file>
Output Dir	/storage/n2	disk/myri0/						
	Specify where the output file will be stored. If the path does not exist, it will be created.							
	O LUNCT							
	Submit Ta	sk						

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



#### 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.

<u>CSPi</u>	System - Applicati	ons∙ Licenses∙ Admin∙				
Apps / n2disk / Dump	o (myri0)					
storage/n	2disk/my	ri0				
Filter files by Crea	ition Time					
From 2017-02-07	10:59	O To 2017-02-07	iii 10:59 O	By Name Date Search		
File Name			Creation Time	Size		
iii 1				997.37 GB	*	Ê
10				997.56 GB	*	Ê
2				997.38 GB	*	Ê
2017				9945.13 GB	*	Ê
<b>a</b> 3				993.33 GB	*	Ê
<b>a</b> 4				993.30 GB	*	<b></b>
<b>m</b> 5				993.32 GB	*	1
6				993.33 GB	*	Û
<b>i</b> 7				994.88 GB	*	1
8				993.32 GB	*	1
9				993.32 GB	*	Û
<						>
	Replay to network		oad nOpen with ntopng			

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.

hboard System • Applications • Licenses • Admin •						
Apps / n2disk / Dump (myri0)						
/storage/n2disk/myri0/ <u>10</u>						
Eilter files by Creation Time						1
From 2017-02-07	12:04 O By N	ame Date Sea	rch			
File Name	Creation Time	Size				
1.pcap	Tue Feb 7 09:28:15 2017	2.00 GB	<b>_</b>	۵	n 🗈	
10.pcap	Tue Feb 7 09:28:46 2017	2.00 GB	<b></b>	۵	n 🗈	
100.pcap	Tue Feb 7 09:34:04 2017	2.00 GB	✓ ≛	۵	n 🗈	7
і 101.рсар	Tue Feb 7 09:34:08 2017	2.00 GB	*	۵	n 🗈	
102.рсар	Tue Feb 7 09:34:11 2017	2.00 GB	<b>_</b>	۵	n 🗈	
103.pcap	Tue Feb 7 09:34:15 2017	2.00 GB	*	۵	n 🗈	
104.pcap	Tue Feb 7 09:34:18 2017	2.00 GB	<b></b>	۵	n 🗈	
105.pcap		.00 GB	*	۵	n 🗈	
<sup>106.pcap</sup> Upload to		.00 GB	<b></b>	۵	n 🗈	
i <sup>107.pcap</sup> CloudShark	Tue (not active)	.00 GB	*	۵	n 🗈	
i 108.pcap	Tue Feb 7 09:34:32 2017	2.00 GB	<b></b>	۵	n 🗈	Ξ,
i 109.pcap Download	Tue Feb 7 09:34:36 2017	2.00 GB	*	۵	n 🗈	
i 11.pcap file	Tue Feb 7 09:28:50 2017	2.00 GB	<b>*</b>	۵	n 🥖	<b>y</b> -
110.pcap	Tue Eak 7 00-24-20 0047	2.00 GB Dele	ete 🛛 🔺	•	1	
🖬 111.pcap	<b>n</b>	2.00 GB	1		n 🗈	
<	•••				>	
	oad nOpen with ntopng					

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 <u>not</u> 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.

	System • Applications • Licenses • Admin •
n2disk / myri0 / Logs	
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
n2disk-myri0@0.log	Lines to display 5 V

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

Applications	▪ Licenses▼ Admin▼	
Apps / n2disk		
Status em1 em2 em3 em4 myri0	myri1	
Only n2disk configured instances will be shown below.		
myri0 on Off Fites Files Cono (9950.83 GB) al Network Stats al Memory Stats E Logs Config	Opening n2disk-myri0.conf         You have chosen to open:         n2disk-myri0.conf         which is: Text Document (185 bytes)         from: data:         What should Firefox do with this file?            • Open with Notepad (default)         • Save File         • Do this automatically for files like this from now on.	Cancel

Figure 42: Downloading a copy of the pcap configuration file to a local PC.



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 <u>not</u> 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.

CSP ashboard System -	Applications - Licenses - Admin -
Apps / disk2n	ntopng (not installed) nProbe (not installed)
Status +	n2disk 1 disk2n
Only disk2n configured instances will be	cluster
	Utility

Figure 43: Displaying the current status of any active disk2n configured instance.



### 6.2.1 Creating a disk2n instance

Configuration d	lisk2n		х	
Name:	Instance Name			
Configuration:	Default Clone			
Clone from:		~		
		Close	Save changes	

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.

board	System - Appl	cations -	Licenses -	Admin <del>-</del>
ops / disk2n				
atus prod1				
larning! Invalid or missing	license			
eneral				
Egress interface	em1 em2 em3 em4 myri0 myri1 myri2 myri3		~	
	Network interface	s where disk2	n is active.	
Timeline Path				
	Specify the path	of the time-arr	anged director	ory for peaps.
From	2017-02-08	韴	23:10:00	0
То	2017-02-08	=	23:10:00	0
10	Specify the time i	nterval for pac	kets.	
One Shot				
	Send selected tra	ffic once.		
Buffer Size	128 MBytes	256 MBytes	512 MByt	ytes 1 GBytes 2 GBytes 3 GBytes 4 GBytes
	The size of the in important to have	ternal buffer s quite large bu	hared betweer	en the thread that read chunk of packets from the storage and the thread that send packets to the wire. It is a of disk fluctuations and system activities.
rocessor Affinity				
acket Reforging				
dvanced				
		Save cha	nges	

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 <u>not</u> 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).

	System • Applications • Licenses • Admin •
Apps / pfsend	
Traffic Ge	nerator
Output Interface	myri0 🗸
	Select the Network interface where the traffic will be replayed.
Source	Synthetic Pcap File Not Supp
Doop File	
Pcap File	
Loop Control	Infinite Loop Send Pcap Once
Speed	Wire-Speed GBits/s Original
	You can specify: wire-speed (as fast as possible), a specific bit rate, original pcap capture speed.
Processor Affinity	CPU 0: 0 1 2 3 4 5 6 7
	CPU 1: 8 9 10 11 12 13 14 15
	Bind to a specific processor/core.
Accurate	Enabled Disabled
	Enable/Disable more accurate packet timing (this leads to higher CPU utilization!).
	Start

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).

	System <del>-</del>	Applications -	Licenses <del>•</del>	Admin <del>-</del>
Apps / Utility / Remove	e Historical Da	ata		
	Are you s	sure you want to re	move the histor	ical applications data?
	Yes			

Figure 48: Remove historical data window.



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.

Apps / Utili	Apps / Utility / Activity Scheduler								
Activity Scheduler									
▼ Filter ▼	Create New	task							
All Task									
To Do On Done Onl	ly y	Task Creation Date 🔻	Duration 🖕	Application Scheduler	Action				
Processe	d Only	Tue Apr 29 12:45:17 2014	0 second	n2disk Extract Packets					
Done	Normal	Mon Apr 28 17:53:38 2014	56 seconds	n2disk Extract Packets	<b>*</b> / <b>*</b>				
🗢 Done	Normal	Mon Apr 28 17:30:15 2014	0 second	n2disk Extract Packets	<b>7</b> = 7 m				
🗢 Done	Normal	Mon Apr 28 17:28:41 2014	0 second	n2disk Extract Packets	<b>\$ !</b> / <b>i</b>				
📀 Done	Normal	Mon Apr 28 17:23:43 2014	0 second	n2disk Extract Packets					
🗢 Done	Normal	Mon Apr 28 17:18:28 2014	0 second	n2disk Extract Packets	☞ Ⅲ / 曲				
📀 Done	Normal	Tue Apr 22 11:15:25 2014	Ohannia	n2disk/Extract Show conf	iguration				
Showing 1 to 7	of 7 entries		Show log		← Previous 1 Next →				
∰ Delete	all task	Snow pcap		ション	Remove task				
				· W					

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).







# 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.

	System • Applications • Licenses • Admin •
Licenses / Wizard	
This page allows you to from CSPi yo	generate licenses for the current <b>nVoy</b> and it is designed mostly for OEMs who need to create licenses in one click If you bought some licenses u can automatically setup them here.
System ID	8C91130AB207AB27
Email	
Order Id	
n2disk	
	Dump Speed:
disk2n	
	Generate Licenses

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.

	System - Applications - Licenses - Admin -
Licenses / Configuration	n
nVoy n2disk o	disk2n Myricom
Valid license found.	
Version	2.7.170206
System ID	8C91130AB207AB27
Dump Speed	10G 🗸
License	FCD70116596245264E781633A37C835414873674899660CE27
	Delete License

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).

CSP <sup>iboard</sup>	System+	Applications <del>-</del>	Licenses+	Admin <del>-</del>	
Licenses / Maintenance	e				
Application	Тур	e License		Maintenance	e Status
n2disk	Ma	intenance will expli	re in 365 days		
disk2n	No	valid license foun	1		

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.

hboard System Applications Licenses	Admin -
Admin / Services	Services Storage
Please note that stopping services can cause the system to behave incorwith the above services.	Update cnow what you are doing before playing
networking (10) On Off O	Reboot Shutdown
	Logout

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).

ntop Dashboard	System <del>-</del>	Applications -	Licenses <del>-</del>	Admin≁			Demo will expir
Admin / Storage							
Partition and Format Disk	s						
Partition a	nd F	ormat l	Disks				
Disk	/dev/sda			×.			
Size	26815.500	GE	Byte				
Filesystem	XFS			~			
Disk Type	HDD			~			
Partition Table	Partition	Size			Filesystem	Scheduler	Mountpoint
	sda1	2681	5.498 GB		xfs	Standard	/storage
	Initialize D	Disk					

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.

(	SP <sup>shboard</sup>	System -	Applications -	Licenses •	Admin -	)
٢	Admin / Update					
	Please reboot your nVo	y whenever	r you update the sy	rstem.		
	Update	<ul> <li>This page</li> <li>Warning:</li> <li>start then</li> </ul>	e allows you to upd After updating son n manually.	ate the system ne active servic	es may have l	been stopped. After rebooting they will be started if "automatic startup" is set, otherwise please
		Update				

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 <b>automatic startup</b> is set prior to rebooting. You can manually start the services after rebooting if <b>automatic</b> <b>startup</b> 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).

	System <del>-</del>	Applications -	Licenses <del>•</del>	Admin <del>-</del>	
Admin / Reboot					
	Are you s	ure you want to Re	eboot this nVoy	Packet Recor	der?
	Yes, Re	eboot			

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).

	System <del>-</del>	Applications -	Licenses •	Admin <del>•</del>	
Admin / Shut Down					
	Are you s	ure you want to Sh	nut Down this nV	oy Packet Re	corder?
	Yes, Sh	nut Down			

Figure 59: Shutting down the nVoy Packet Recorder window.



## At a glance

#### **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.

	System <del>-</del>	Applications -	Licenses <del>•</del>	Admin <del>-</del>	
Admin / Logout					
	Do you w	ant to Logout from	nVoy Packet Re	corder?	
	Yes, Lo	ogout			

Figure 60: Logging off the Web user interface.

At a glance		

## 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.

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

- General
- Processor Affinity
- Timestamp
- Filters
- Storage Data Layout
- Index and Timeline
- Advanced

	System - Applications -	Licenses▼ Admin▼
Apps / n2disk		
Status em1 em2	em3 em4 myri0	myri1
Valid n2disk license found.		
General		
Processor Affinity		
Timestamp		
Filters		
Storage Data Layout		
Index and Timeline		
Advanced		
	Save changes Close	ne from em1 V Factory Reset

Figure 61: n2disk application tab.



## 9.1 General tab

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

CSP poard	System + Applications + Licenses + Admin +
Apps / n2disk	
Status em1 em2	em3 em4 myri0 myri1
Valid n2disk license found	
General	
Automatic Startup	Enabled Disabled Enable/Disable n2disk on interface myri0 at startup.
Interfaces	0 1
Alias Interface Name	Use this field if you want to set an alias interface name for the badge in n2disk status.
Snapshot Length	1518         Bytes           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 into the files.
	IMPORTANT: Make sure that the 'Snap. Length' is greater than or equal to the interface MTU size.
Buffer Size	256 MBytes 512 MBytes 1 GBytes 2 GBytes 4 GBytes 6 GBytes 8 GBytes 16 GBytes
	It is the size of internal buffer shared between the thread that capture packets and the thread that write chunk of packets to the storage. It is important to have quite large buffer because of network peaks and system activities.
Processor Affinity	
Timestamp	
Filters	
Storage Data Layout	
Index and Timeline	
Advanced	
l	Save changes Clone from err V Factory Reset

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.



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.



## 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).

Status em1 em2	em3 e	m4	myri0	) m	nyri1							
Valid n2disk license found.												
General												
Processor Affinity												
B 1 7 1	CPU 0:	0	1	2	3	4	5	6	7			
Reader Inread	CPU 1:	8	9	10	11	1:	2	13	14	15	None	
	Bind Re	ader T	hread	to a sp	pecific	proce	sso	r/core.				
Consumer Threads (MT	CPU 0:	0	1	2	3	4	5	6	7			
Support)	CPU 1:	8	9	10	11	1:	2	13	14	15		
	Enable a	additio	nal rea	ader th	reads	and b	ind t	hem to	o speci	fic proc	essors/c	ores.
	CPU 0:	0	1	2	3	4	5	6	7			
Writer Thread	CPU 1:	8	9	10	11	13	2	13	14	15	None	
	Bind Wr	iter Th	read t	o a spi	ecific p	roces	sor/	core.				
Indexer/Compression	CPU 0:	0	1	2	3	4	5	6	7			
Thread	CPU 1:	8	9	10	11	13	2	13	14	15		
	Enable I	ndexe	r/Com	pressi	on thre	ads a	ind b	ind the	em to s	specific	process	ors/cores.
	CPU 0:	0	1	2	3	4	5	6	7			
Time Pulse Thread	CPU 1:	8	9	10	11	1:	2	13	14	15	Any	Disable
	En abla i			41		tu al ta						

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:



## 9.3 Timestamp

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

CSP shboard	System <del>-</del>	Applications -	Licenses <del>-</del>	Admin <del>-</del>
Apps / n2disk				
Status em1 em2	em3 er	m4 myri0 m	ıyri1	
Valid n2disk license found	l.			
General				
Processor Affinity				
Timestamp				
Nanoseconds	s ⊠ Use the p	cap nanoseconds	file format.	
Filters				

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).

CSP nboard	System - Applications - Licenses - Admin -
Apps / n2disk	
Status em1 em	em3 em4 myri0 myri1
Valid n2disk license for	ıd.
General	
Processor Affinity	
Timestamp	
Filters	
BPF F	er
Storage Data Layout	

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.



## 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.

	System • Applications • Licenses • Admin •
Processor Affinity	
Timestamp	
Filters	
Storage Data Layout	
Dump Path	/storage/n2disk/myri0/ Specify the path of the directory where the files will be stored.
Max File Size	16 MBytes         64 MBytes         256 MBytes         512 MBytes         1 GBytes         2 GBytes         3 GBytes         4 GBytes         None
	Specify the maximum size of each dumped file.
Max File Duration	1 Sec 10 Sec 1 Min 10 Min 30 Min 1 Hour None
	Specify the maximum duration of each dumped file.
Max File Packets	1K 10K 100K 1M 5M 10M None
	Specify the maximum number of packets for each dumped file.
Max Files per Dir	500
	Specify the maximum number of files per directory. It is not a good idea to have more than 1K files per directory.
Max Directories	10
	Specify the maximum number of nested directory.
Sampling Rate	
	Packet sample rate (e.g. 100 means 1:100 sampling). Put an empty value for no sample.
Archiving	
	Rename file (to .old) instead of overwrite if already present. <b>NOTE</b> : this will <u>double</u> disk space.
File Tag	
	You can add a specific tag string to each dumped filename. The format of the filename is "[tag] <file number="">".</file>
Pcap Compression	
	Enable Pcap compression.
Index and Timeline	

Figure 66: Storage data layout window.



#### At a glance

## 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).

CSP <sup>iboard</sup>	System * Applications * Licenses * Admin *
Apps / n2disk	
Status em1 em2	em3 em4 myri0 myri1
Valid n2disk license found.	
General	
Processor Affinity	
Timestamp	
Filters	
Storage Data Layout	
Index and Timeline	
Index	Enabled Disabled
	Enable/Disable pcap indexing.
Timeline	Enabled Disabled
Timeline Path	/storage/n2disk/myri0/
	Specify the path of the time-arranged directory for produced pcaps and indexes.
Disable Compression	Disable Index Compression.
Extended index	
	Adds additional informations to the packet digest (i.e. the packet timestamp). Please make sure you really need this option before enabling it.
Activate GTP-U	Activated compute index on tunnel content.
Advanced	
l	Save changes Clone from em1 < Factory Reset

Figure 67: Index and timeline window.



#### At a glance

#### 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.



## 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).

board System • Applications • Licenses • Admin •	
Apps / n2disk	
Status em1 em2 em3 em4 myri0 myri1	
Valid n2disk license found.	
General	
Processor Affinity	
Timestamp	
Filters	
Storage Data Layout	
Index and Timeline	
Advanced	
Chunk Size 128 KBytes 512 KBytes 1 MBytes 2 MBytes 4 MBytes	
Set the size of the chunk written to disk.	
Hugepages	
Enable hugepages support. Note that prior to enable this option you must have configure	d and mounted the huge pages filesystem.
Poll Duration 1 uSec	
Poll timeout (default 10 usecs).	
Active wait	
Use active wait instead of poli (this leads to higher CPU utilization!).	
Save changes Clone from em1 V Factory Reset	

Figure 68: Advanced window.



## **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:



# **10** Configuring the disk2n Interface (not supported)

**NOTE:** The disk2n utility is <u>*not*</u> 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).

CSP	System * Applications	<ul> <li>Licenses</li> </ul>	Admin •
Apps / disk2n			
Status prod1 +			
Member I to old as mission			
warning: invalid or missing	) license		
General			
Egress interface	em1 em2 em3 om4 myri0 myri1 myri2 myri3 Network interfaces where	a disk2n is active.	
Timeline Path			
	Specify the path of the tir	me-arranged directory	ry for pcaps.
From	2017-02-08	23:10:00	O
То	2017-02-08	23:10:00	٥
	Specify the time interval	for packets.	
One Shot	Send selected traffic onc	θ.	
Buffer Size	128 MBytes 256 M	Bytes 512 MByte	tes 1 GBytes 2 GBytes 3 GBytes 4 GBytes
	The size of the internal b important to have quite la	uffer shared between arge buffer because o	In the thread that read chunk of packets from the storage and the thread that send packets to the wire. It is of disk fluctuations and system activities.
Processor Affinity			
Packet Reforging			
Advanced			
	Sa	ve changes	

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.



## **10.2 Processor Affinity**

<b>WARNING:</b> Changing the processor affinity default settings may lead dropped packets.	d to
--------------------------------------------------------------------------------------------	------

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

_			_												
		System <del>-</del>	Ap	plicat	ions •	L	iceı	nse	s▼	Ad	min <del>•</del>				
	Apps / disk2n														
	Status prod1 +														
	Warning! Invalid or missing	license													
	General														
	Processor Affinity														
		CPU 0:	0	1	2	3	4	Ļ	5	6	7				
	Reader Thread	CPU 1:	8	9	10	11		1:	2	13	14	15	None		
		Bind Rea	der T	hread	to a si	pecific	; pr	006	esso	r/core.					
	Sender Thread	CPU 0:	0	1	2	3	4	ŀ	5	6	7		None		
	Gender miead	CPU 1:	8	9	10	11		1	2	13	14	15			
		Bind Sen	der Tl	hread	to a sp	pecific	; pr	oce	esso	r/core.					
	Time Pulse Thread	CPU 0:	0	1	2	3	4	•	5	6	7		Disable		
		CPU 1:	8	9	10	11		1:	2	13	14	15			
		Enable a	time	pulse	thread	and I	oind	d it	to a	specifi	c proc	essor/c	ore.		
	Packet Reforging														
	Advanced														
					Save	chan	nes								
					Cave	enan	ges								
1															

Figure 70: Processor affinity window.



#### At a glance

## **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:



## **10.3 Packet Reforging**

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

	System - Applications -	Licenses <del>•</del>	Admin <del>-</del>	
Apps / disk2n				
Status prod1 +				
Warning! Invalid or missing	license			
General				
Processor Affinity				
Packet Reforging				
Source MAC	MAC Address			
Destination MAC	MAC Address			
Source IP	IP Address			
Destination IP	IP Address			
Source Port	Port			
Destination Port	Port			
Advanced				
	Save	changes		

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.



## **10.4 Advanced**

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

shboard System Applications Licenses Admin
Apps / disk2n
Status prod1 +
Warning! Invalid or missing license
General
Processor Affinity
Packet Reforging
Advanced
Chunk Size 128 KBytes 512 KBytes 1 MBytes 2 MBytes 4 MBytes
Set the size of the chunk read from disk.
Hugepages Enable hugepages support. Note that prior ported with option you must have configured and mounted the huge pages filesystem.
Active Wait
Use active wait instead of usleep (this leads to higher CPU utilization!). Precise Timing High time accuracy (lower throughput, forces active wait and leads to higher CPU utilization!).
Save changes

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.



# 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: 10° to 35° C (32° to 95° F)

Non-operating Temperature: -40° to 60° C (-40° to 140° 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.

