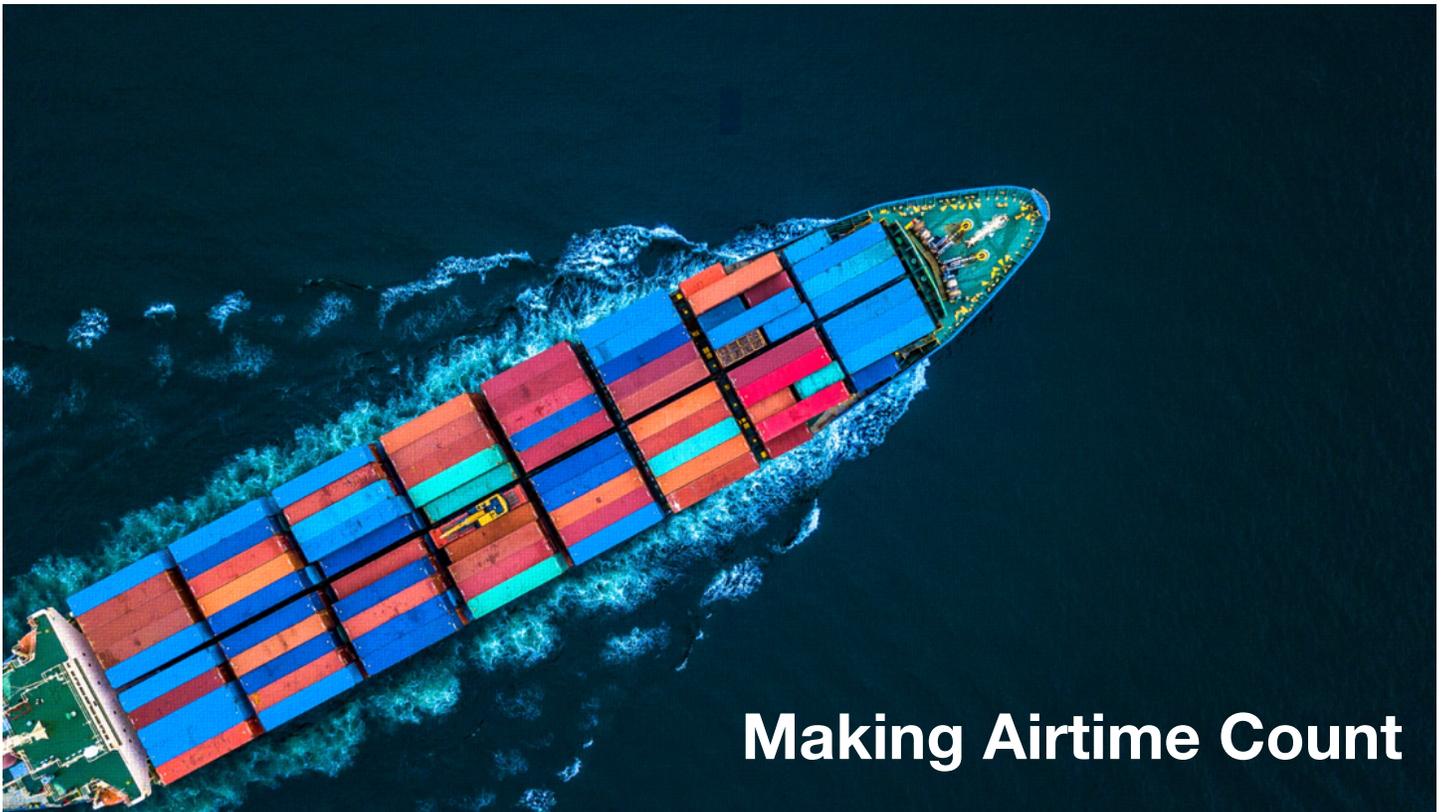


# RedPort™

**GMN**  
Global Marine  
**NETWORKS**



**Making Airtime Count**

**Optimizer Network Service Device (NSD)**

**Advanced Guide for Installers, Network Administrators, and Users**

**RedPort Router:  
wXa-584 (Optimizer NSD)**



## Revision History

Date	Version	Point of Contact
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## 1. About this Guide

This guide is intended for Installers, Network Administrators, and Users of the RedPort Optimizer Network Service Device (NSD). This guide will provide the following detailed information:

- NSD installation and use.
- NSD and related equipment physical setup.
- NSD Console and Menu navigation and use.
- NSD Provisioning to the Inmarsat network.

For detailed information on the use of the RedPort Optimizer Enterprise (RedPort VM) and the User Interface (UI) go to [redportglobal.com/support/documentation-manuals](http://redportglobal.com/support/documentation-manuals).

## 2. Introduction to NSD

Global Marine Networks (GMN), the leaders in advancing satellite data speeds and services, helps Fixed and Mobile Satellite Services providers and their customers by offering the industry's fastest, most reliable and easy-to-use email, web, VoIP and other hardware and software services to maritime, oil and gas, first responder and business continuity users. The company's products include XGate high-speed satellite email, weather and oceanographic data software, and vessel tracking systems.

Ship to shore network management solutions are sold by GMN under the RedPort Global brand name at [redportglobal.com](http://redportglobal.com) and as white-label solutions for the world's premier satellite data service providers.

The wXa-584 NSD series router is a 12 port NSD appliance. The NSD was designed for use with the Inmarsat Fleet Xpress (FX) program which utilizes:

- Global Xpress (GX) Ka-band - primary communications.
- Fleet Broadband (FB) L-band - backup communications.

Use of the RedPort Optimizer NSD minimizes devices (and their associated costs) and maximizes the Inmarsat Communications Infrastructure when coupled with the RedPort Optimizer Enterprise Virtual Machine within the NSD.

### 2.1. Key Features and Services

The RedPort NSD is a platform that combines the Cisco 5921 (Inmarsat SoftNSD) and the RedPort Optimizer Enterprise (OE) into a single appliance, as described in full below. This creates several benefits for Inmarsat and its DP/VARs and SPs (Distributed Partners/Value Added Resellers and Service Providers) who also sell GMN's RedPort services:

- Standardizes the NSD implementation across multiple partners.
- Reduces the number of multiple development and certification processes Inmarsat needs to engage in with various partners.
- Increases reliability through to simpler physical connections and proven compatibility.
- Maximizes electronics rack space with only one device for both NSD and value added services.
- Simplifies installation.
- Reduces costs compared to buying a hard NSD, and a separate hardware appliance.
- Hosted applications allow VAR-specific solutions to be provided alongside the NSD.

### 2.2. Hosted Applications

The RedPort NSD is delivered with a number of hosted VM appliances. These include at a minimum:

- Cisco 5921 VM.
- RedPort VM - RedPort Optimizer Enterprise.
- RedPort Optimizer Enterprise with CrewCommWifi service (**Future Optional Capability/Service**).



Hosted Applications included in white-labeled versions of the NSD may include as few as 0 applications, and as many as the partner needs/desires.

### 2.2.1. RedPort Optimizer Enterprise (RedPort VM)

**NOTE:** For more in-depth guidance on the functionality and use of the RedPort Optimizer Enterprise, visit [redportglobal.com/support/documentation-manuals](http://redportglobal.com/support/documentation-manuals).

Optimizer Enterprise satellite data routers are enterprise-grade appliances for an all-in-one solution suitable for even the most complex vessel networks, or as the central hub for crew welfare, business operations, and VoIP services.

Optimizer Enterprise routers provide the following capabilities:

- Firewall/Router
- Network Security
- RedPort Email
- Web Compression
- Shared Web Caching
- Onboard Captive Portal (PIN-code service)
- Shore-side Captive Portal
- Logging
- Multi-WAN for Failover and Load-Balancing.
- Out of Band Management
- GPS Vessel Tracking
- IP-based compatibility with Satellite, GSM, Long-range WiFi and more.

## 3. Things to Know Before Getting Started

### 3.1. NSD Internal Hardware

When designing the hardware platform to run Inmarsat's soft NSD version 1.5 and 2.0, many factors were taken into consideration. Some of these design factors include:

- Single board embedded solutions to reducing the number of components.
- Reduced interconnected boards and components. Low-power CPUs that run cool, thus reducing power requirements and allowing for longevity in harsh environments.
- Reduced number of cables which with their connectors that can result in premature failure.
- ½ depth 1U rack unit (RU) designed for ease and flexibility of installation.
- Connectors on the front panel of the unit for ease of access.
- Robust military grade power supplies with very large Mean Time Between Failure (MTBF).
- 100% solid state hardware with no moving parts (except for fans).
- If required, redundant fans in enclosures.

The RedPort NSD 1.0 has the following base system specifications:

- Intel Embedded CPU 35W 2.5 GHz Hyper-Threading with 8 cores.
- 16 GB RAM upgradable to 32 GB.
- 512 GB SSD upgradable to 1 TB.
- 12 Ethernet ports.
- 16 Ethernet ports (Optional).

The RedPort NSD 1.0 is available in hardware multiple configurations including:

- With 12 Ethernet port version.
- With 16 Ethernet port version.
- With 4 port Foreign Exchange Service (FXS) version.
- Without FXS port version.

Optional 4 port FXS analog telephone jacks are available allowing connectivity to legacy analog PBXs and standard POTS phones.

**Figure 1** depicts the component layout including:

- Power supply.
- Motherboard with 512 GB SD and 24 GB RAM.
- 4 analog FXS telephone ports.
- 16 Ethernet ports.

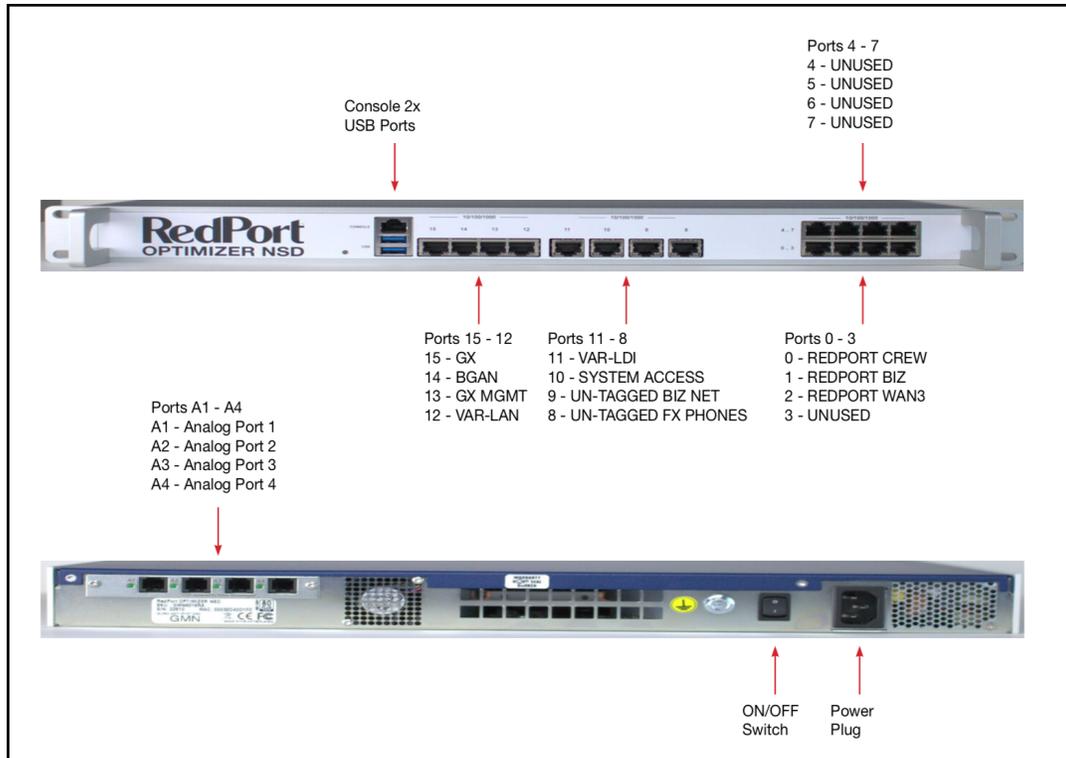


**Figure 1 - NSD Hardware Component Layout.**

## 3.2. NSD Baseline Configuration

The NSD Baseline Configuration within this document represents ONE way the NSD can be configured and utilized. The RedPort NSD can be configured in many communication architectures to satisfy customer needs and complete mission objectives. For the purposes of this document the Baseline Configuration is presented to showcase what is expected to be the most common Communications Architecture that will be used by customers. The NSD will be shipped in the Baseline Configuration.





**Figure 3 - NSD Port Details.**

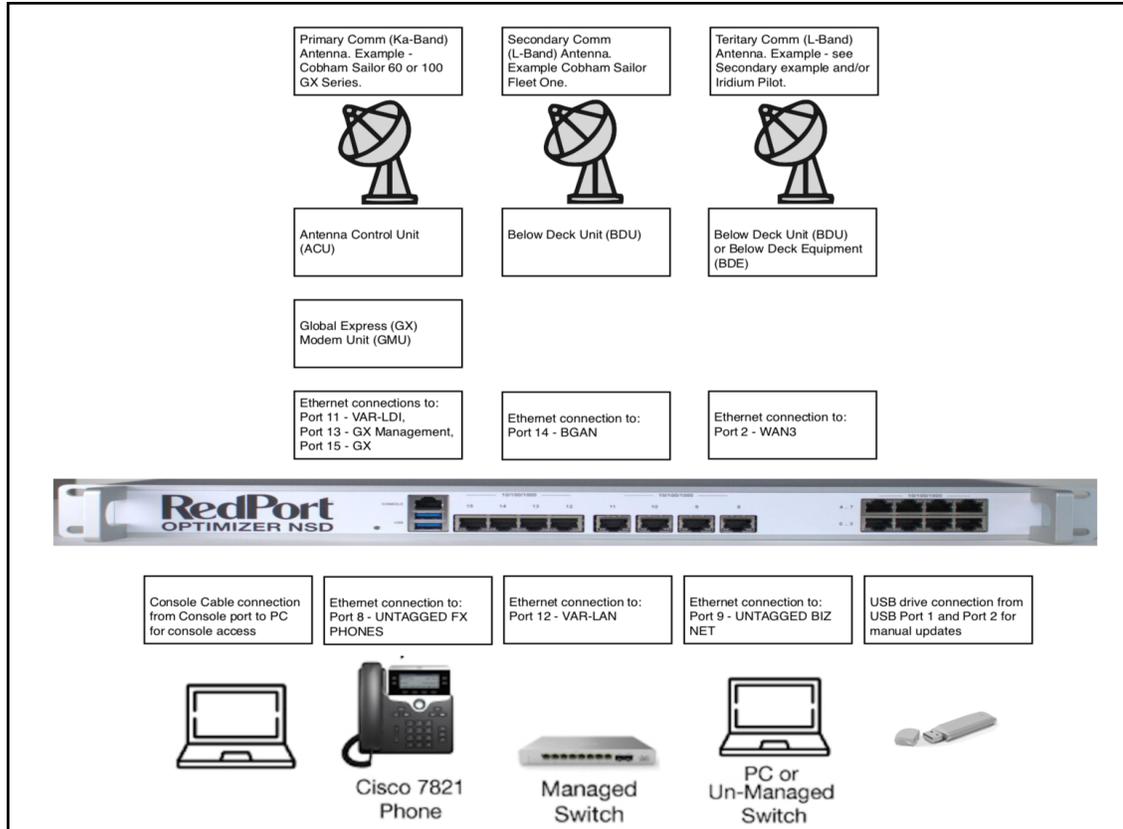
### 3.2.3. NSD Communications Path

The NSD Communications Path within a Baseline Configuration is represented in [Figure 4](#) and provides details for:

- Primary Communications: needed to provide operational communications.
- Secondary Communications: optional, but recommended to provide alternate means for communications should the primary means fail, to meet operational needs.
- Tertiary Communications: optional, but recommended to provide another alternate means of communications in the event there is an issue with the Primary Comm as well as to provide Out-of-band Management (OBM).

The NSD Communications Path within a Baseline Configuration is represented above and provides details of the Communications equipment needed to:

- Control Antenna as needed for motorized equipment.
- Condition data stream for transmission from and reception into the RedPort NSD.
- Cabling connections to the NSD from communications equipment.
- Cabling connections to the NSD from user defined hardware such as Cisco phone, Managed or Un-Managed switches, and PCs.



**Figure 4 - NSD Conceptual Communications Path.**

## 4. NSD Hardware Installation

### 4.1. Required Items

Included:

- RedPort Optimizer NSD.
- RedPort Optimizer NSD power cable.
- RedPort Optimizer NSD console cable.

Not included:

- Primary Comm - (GX) terminal and cabling.
- Computer or Laptop - For NSD Console access.
- Secondary Comm - (BGAN) terminal and cabling.
- Tertiary Comm - (BGAN or Pilot) terminal and cabling.
- Managed or Un-Managed Switches.
- End user communication devices (Phones).
- Ethernet Cabling.
- Power conditioning (hardware safety) and/or power conversion equipment.

### 4.2. Hardware Installation Process

For Baseline NSD Hardware Installation:

1. Configure Communications Antenna as well as Above and Below Deck Equipment per Manufacture's Documentation.

2. Remove RedPort NSD, NSD power cord, and NSD console cable from shipping container.
3. Install RedPort NSD in desired rack location.
4. Connect Hardware to NSD as outlined in ([see Chap 3.2.3 - NSD Communications Path](#)).
5. Connect NSD power cord to Uninterruptible Power Supply (UPS) and Surge protection configuration to protect equipment and meet user needs.

NSD Hardware Installation Process is now complete.

## 5. NSD Console Use

The NSD console allows the installer and end user to perform basic maintenance operations such as rebooting specific virtual machines or cleanly rebooting the entire box. In addition to this basic functionality more advanced features are offered to the installer, administrator, and maintainer.

### 5.1. Console Connection

**NOTE: Drivers may need to be installed for Windows to recognize hardware.**

1. To Use the NSD Console (after [Chap 4 - NSD Hardware Installation](#)):
  - Plug the supplied console cable (Ethernet end) into the NSD “Console” port.
  - Plug the supplied console cable (USB end) into laptop/computer.
2. Use your favorite program that can establish a serial connection. Some examples include putty, cu, kermit, and screen. When using screen on a Mac run the following command from terminal where XXXXXXXX is device specific:  
**screen /dev/cu.usbserial-AL036MXD XXXXXXXX**

The following screen will be displayed:

```
#####  
1. Reboot NSD                2. Reboot c5921 VM  
3. Reboot RedPort VM        4. Reboot All VMs  
5. Start LDI                 6. USB firmware update  
7. Halt System              8. Halt c5921 VM  
9. Halt RedPort VM          10. c5921 VM Console  
11. RedPort VM Console      12. Backup VM Image  
13. Restore VM Backup       14. Provision NSD  
#####  
Enter an option: █
```

The Console Menu Options are described in [Chap 5.2 - Console Menu Options](#).

NSD Console Connection is now complete.

## 5.2. Console Menu Options

1. Reboot NSD - Reboots the entire system. It attempts to cleanly shutdown all virtual machines before the reboot takes place. This is the recommended way of rebooting the appliance. If the virtual machine fails to halt it is killed by the system shutdown when the KVM process exits.

```
Enter an option: shutting down all virtual machines
halting inmarsat-utm vm
Domain inmarsat-utm is being shutdown

successfully halted inmarsat-utm
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921
halting redport vm
Domain redport is being shutdown

successfully halted redport
Rebooting...
Connection to remote.redportglobal.com closed by remote host.
Connection to remote.redportglobal.com closed.
```

2. Reboot c5921 VM - Reboots the Inmarsat Guest VM running the Cisco 5921 via virsh shutdown command followed by a virsh start command. This command halts if there is a failure of the shutdown process.

```
Enter an option: 2
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921
starting c5921 vm
Domain c5921 started

successfully started c5921

#####
1. Reboot NSD                2. Reboot c5921 VM
```

3. Reboot RedPort Virtual Machine (RedPort VM) - Reboots the RedPort VM via virsh shutdown followed by virsh start. This commands halts if there is an error during shutdown with a console error.

```
Enter an option: 3
halting redport vm
Domain redport is being shutdown

failed to halt redport cleanly
starting redport vm
vm redport is already running
successfully started redport

#####
1. Reboot NSD                2. Reboot c5921 VM
```

4. Reboot All VMs - Reboots all currently running virtual machines via the virsh shutdown command. If a machine fails to shutdown the console notes and it continues to shutdown the remaining running VMs.

```
[Enter an option: 4
shutting down all virtual machines
halting inmarsat-utm vm
Domain inmarsat-utm is being shutdown

successfully halted inmarsat-utm
halting redport vm
Domain redport is being shutdown

successfully halted redport
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921
starting all virtual machines
starting c5921 vm
Domain c5921 started

successfully started c5921
starting inmarsat-utm vm
Domain inmarsat-utm started

successfully started inmarsat-utm
starting redport vm
Domain redport started

successfully started redport

#####
1. Reboot NSD                2. Reboot c5921 VM
```

5. Start LDI - Starts LDI functionality. (See [Chap 9 - GX LDI \(Last Ditch Internet\)](#) for description and implementation details).

```
Enter an option: 5
Checking for terminal type, this may take a couple minutes
Found Cobham GX TERMINAL
Getting IP address
IP address = 10.0.0.2
SSH host is remote.redportglobal.com and Port is 53557

#####
1. Reboot NSD                2. Reboot c5921 VM
```

6. USB Firmware Update - Executes an update via a USB memory stick. This requires an encrypted and digitally signed firmware file.

**\*\*Currently Not Enabled, will add new screen shots and guidance when enabled\*\***

7. Halt System – Shuts down the NSD. It attempts to cleanly halt all running virtual machines and then shuts down the host OS. If a guest machine fails to shutdown then the guest OS is shutdown when the system shutdown process exits KVM. This is the recommended way of shutting down the appliance.

**NOTE: Halt System will leave the NSD in a state where a Power Off Reset (Unplug and Replug in the NSD) is required for access. Physical access to the NSD is required to return the NSD to a usable state.**

```
Enter an option: 7
shutting down all virtual machines
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921
halting inmarsat-utm vm
Domain inmarsat-utm is being shutdown

successfully halted inmarsat-utm
halting redport vm
Domain redport is being shutdown

successfully halted redport
Connection to remote.redportglobal.com closed by remote host.
Connection to remote.redportglobal.com closed.
admins-iMac-1126:~ aaron$ █
```

**NOTE: To restart all VMs use Option 4 Reboot All VMs.**

8. Halt c5921 VM - Halts the Inmarst Guest VM running the Cisco 5921 via virsh shutdown. This command halts if there is a failure of shutdown process.

```
Enter an option: 8
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921

#####
1. Reboot NSD                2. Reboot c5921 VM
```

**NOTE: To restart c5921 VM use Option 2 Reboot c5921 VM.**

9. Halt RedPort VM - Halts the RedPort VM via virsh shutdown command. This commands halts with a console error if there is an error during shutdown.

```
Enter an option: 9
halting redport vm
Domain redport is being shutdown

successfully halted redport

#####
1. Reboot NSD                2. Reboot c5921 VM
```

**NOTE: To restart RedPort VM use Option 3 Reboot RedPort VM.**

10. c5921 VM Console - Halts the NSD Daemon process and establishes a console session to the Inmarst Guest VM running the Cisco 5921. Exit from this session using Control-].

```
Enter an option: 10
Connected to domain c5921
Escape character is ^]

Login incorrect

CentOS release 6.6 (Final)
Kernel 2.6.32-504.el6.i686 on an i686

c5921-vm login: █
```

Additional login/passwords will be made available from VAR for access.

11. RedPort VM Console - Halts the NSD Daemon process and establishes a console session to the Inmarsat Guest VM running the Cisco 5921. Exit from this session using Control-]. This takes you to the console menu of the RedPort VM.

```
Enter an option: 11
Connected to domain redport
Escape character is ^]
```

Click enter and the following Console will be displayed:

```
~~~~~
Optimizer Enterprise Console
~~~~~
1. Reboot
2. Halt
3. Factory Reset
4. Login shell
5. Exit
Enter an option: █
```

12. Backup VM Image - Creates a backup of the current running image of any guest VM. This halts, stores a copy, and then starts the halted VM.

The User is prompted to select which VM to backup. In the example below the c5921 was selected for backup. The User is prompted to enter a filename for the backup.

```
Enter an option: 12
\n Select VM to backup
1.  c5921
2.  inmarsat-utm
3.  redport
Select Option:1
taking snapshot of qcow image c5921
Enter Snapshot Name:AD_Test_c5921_backup
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921
Domain snapshot AD_Test_c5921_backup created
starting c5921 vm
Domain c5921 started

successfully started c5921

#####
1.  Reboot NSD                2.  Reboot c5921 VM
```

13. Restore VM Image - Restores a previously backed up VM image.

The User is prompted to select which VM image to restore. In the example below the c5921 was selected. A listing of available images for the VM selected is presented. The image selected was the one created in option 12, when a Backup VM Image was created. The VM is halted, then shutdown before restoring to the image selected. The VM is then restarted.

```
Enter an option: 13
\n Select VM to backup
1. c5921
2. inmarsat-utm
3. redport
Select Option:1
Name                Creation Time        State
-----
AD_Test_c5921_backup 2018-08-01 14:37:50 +0000 shutoff
cheddar              2018-07-31 14:08:33 +0000 shutoff
cookie               2018-07-31 14:50:16 +0000 shutoff
good-provisioning    2018-07-21 19:13:23 +0000 shutoff

Enter Snapshot Name You Wish to Restore:AD_Test_c5921_backup
halting c5921 vm
Domain c5921 is being shutdown

successfully halted c5921
reverting c5921 VM to AD_Test_c5921_backup

starting c5921 vm
Domain c5921 started

successfully started c5921

#####
1. Reboot NSD                2. Reboot c5921 VM
```

14. Provision NSD - Executes the provisioning wizard. More details on the provisioning process are provided in the provisioning section. (See **Chap 5.3 - NSD Provisioning** for description and implementation details).

```
Enter an option: 14

Enter CNS ID:sdfpsaioeru

Enter CCE Instance(1,2,3):2

Auto-Provision the NSD(Yes,No):Yes

#####
% Auto-Provisioning of this site requires access to a %
% username and password for the Cisco Virtual Machine. %
% If you do not have this information then please exit %
% and contact your service provider or configure the %
% terminal manually. %
#####

Enter the Username:█
```

### 5.3. NSD Provisioning

Provisioning is the procedure(s) for staging, installing, and commissioning a customer’s hardware, software, and services to the provider’s network. Provisioning a RedPort NSD is the process of staging, installing, and commissioning a customer’s: NSD; associated SATCOM equipment (example GX and BGAN); VMs (and optional VMs); and other equipment to the Inmarsat network.

There are three separate and distinct paths (processes) for provisioning an NSD device. The preferred method is to use the Web-UI of the RedPort guest with auto provisioning enabled. This is the preferred method because of its simplicity to the end user. You can also auto-provision the terminal using the console-menu provisioning wizard or manually by gaining access to the c5921 console (option <10>) and running the VARPAR script.

## 5.3.1. Pre-Provisioning

Prior to provisioning, you will need the MAC address of the GX-Voice interface printed on the label and displayed in the UI of the RedPort guest machine in order to use the RedPort PBX with the GX voice service. In the provisioning portal the device must be provisioned with type 7821.

### Support During Provisioning

1. VAR - First line of Support.
2. RedPort - Second line of Support.

## 5.3.2. Provisioning Process

When using the Auto-Provisioning feature with a Cisco c5921 a username and password must be obtained by the VAR. The following information is obtained automatically:

- The corporate SVN VLAN tag(s).
- The GX-Voice SVN VLAN tag.
- The corporate loopback address.
- The voice loopback address.

The user has the option to set these manually by:

- The legacy procedure of running the VARP script via the console is still available by connecting to c5921 console via option <10> in **Chap 5.2. Console Menu Options**.
- Or utilizing the RedPort VM (**see Chap 11.1 Connecting RedPort VM to Inmarsat VM Manually**).

There are three separate and distinct processes (paths) for Provisioning an NSD device.

- Path 1. Recommended Provisioning path through Web UI. Recommended for instances when the NSD is to be utilized with the RedPort VM configuration.
- Path 2. Provisioning through the Console. Alternate path. Can be used when the NSD is to be used without the RedPort VM.
- Path 3. Provisioning manually. Tertiary path which is the process from previous generation NSD devices. Can be used when the NSD is to be used without the RedPort VM. Ports 8, 9, and 12 will not be useable.

### 5.3.2.1. Provisioning NSD device - Path 1 (Web UI) \*Recommended\*

1. To Provision an NSD through path 1 (after hardware installation), navigate to the Optimizer Enterprise UI through the BIZ port by going to 192.168.11.1 in a browser, the following screen will appear:

Optimizer | wXa-524 v2.17 | Load: 0.50 0.55 0.43

### Authorization Required

Please enter your username and password.

Username

Password

[Reset](#) [Login](#)

2. Login with the following credentials:  
username = superadmin  
password= webxaccess

The following screen will appear:

The screenshot displays the RedPort web interface. At the top, there is a navigation bar with tabs for Home, NSD, Services, Status, System, VPN, Network, Users, Statistics, and Logout. Below this is a sub-navigation bar with tabs for Tasks, Traffic Routing, and MWAN Overview. The main content area is divided into several sections:

- Welcome**: A simple greeting section.
- Crew Internet Services**: Includes Captive Portal URLs (Login, Status, Logout) and four action buttons: Generate pincodes, Create users, Generate pincode usage reports (CDRs), and View/Manage pincodes.
- Email Access**: Includes email access settings and parameters (WEB, POP, SMTP) and a single action button: Go to webmail.
- Email Management**: Includes four action buttons: Create and manage crew email accounts, Retrieve, delete, or drop large emails (BigMail) quarantined on the server, Perform common email tasks, and View email logs.
- System Status**: Includes four action buttons: System status overview, Realtime bandwidth usage over satellite link, Historic bandwidth usage over satellite link, and System message log.
- Local WiFi setup**: Includes SSID and Security settings and two action buttons: WiFi setup and Change hotspot name and/or add security and set password.
- Remote Support**: Includes remote access urls (http, ssh) and two action buttons: Disable Remote Support and Terminate remote support.
- System**: Includes two action buttons: Router password and Reboot router.

3. Navigate to the <NSD> tab, and then to the <NSD Provisioning> tab, the following will be displayed:

The screenshot shows the 'NSD Provisioning' configuration page. The navigation menu includes Home, NSD, Services, Status, System, VPN, Network, Users, Statistics, and Logout. The 'NSD Provisioning' sub-menu is active, showing 'Tools' and 'provisioning' options. The 'provisioning' section contains the following fields:

Current Provisioning Status	Bootstrap Mode, Previously Provisioned
CNS ID	gA6Q0tmuARfWZBq
CCE Instance	cce-global3
Auto Provision	<input checked="" type="checkbox"/>
Cisco 5921 Username	operator
Cisco 5921 Password	pRshddYIA
WAN SVN	SVN3899_CORP <small>SVN associated with the WAN interface</small>
WAN2 SVN	SVN3899_CORP <small>SVN associated with the WAN2 interface</small>
Voice SVN	SVN3966_VOICE <small>SVN associated with the GXVOICE interface</small>

At the bottom of the page, there are buttons for 'Reset', 'Save', and 'Save & Apply'.

4. Enter your CNS ID and select your CCE instance.
5. If auto provisioning then check the Auto-Provisioning box and input the username and password.
6. If not Auto-Provisioning the system then fills in the Corporate SVN VLAN tag, and the GX-Voice service VLAN tag.
7. Optionally, provide the Voice Loopback and Corporate SVN Loopback IP addresses.

**NOTE: The Voice Loopback IP address will need to be obtained by using the following console CMD:**

```
sh ip int br | i Di
```

8. Click <Save & Apply>.
9. Navigate to the <NSD> tab, and then to the <Tools> tab.

The screenshot shows the 'Tools' page under the 'NSD' tab. The navigation menu is the same as in the previous screenshot. The 'Tools' section is titled 'Tools for Administering the NSD.' and contains the following actions:

Restart the Cisco VM	<input type="button" value="Restart c5921"/>
Restart the NSD	<input type="button" value="Restart NSD"/>
Restart the NSD Daemon	<input type="button" value="Restart Daemon"/>
Provision the Cisco VM	<input type="button" value="Provision C5921"/>

10. Click <Provision C5921>, the following will occur:
  - a. Runs VARPAR script.
  - b. Automatically obtains SVN information if login successful.
  - c. Obtains corporate voice loopbacks.

- d. Attaches WAN and WAN2 to one corporate SVN.
- e. If enabled, attaches GX Voice to Voice SVN, convfigures and restarts asterisk.

**NOTE: Installer will be required to enter PBX DID in asterisk.**

- f. Populates system informaation such as SiteID, SVN, etc.
- g. Sets Host VLANS for voice and corporate.

11. Navigate to the <NSD> tab and then the <Status> tab to check the status of the staging site to monitor the state of provisioning.

Look for:

- Provisioning Status - Provisioned.
- Site Id - Populated with a Valid Set.
- c5921 Interfaces - Valid paramaters dependent upon your specific configuration.

The screenshot displays the NSD Status page with the following sections:

- System:**
  - Provisioning Status: Provisioned
  - Site Id: n240000661430000
  - Redport Hardware Id: NSD00032D3EBF4E
  - Hostname: redport-NSD
  - Model: Intel(R) Core(TM) i7-7700T CPU @ 2.90GHz
  - Kernel Version: Linux 3.10.0-693.21.1.el7.x86\_64 x86\_64
  - Local Time: Mon 13 Aug 2018 08:35:36 PM UTC
  - Uptime: up 11 minutes
  - Load Average: 0.18 0.27 0.22
- Memory:**
  - Total Available: 18144152 kB / 24494780 kB (74%)
  - Free: 17002236 kB / 24494780 kB (69%)
  - Buffered: 22228 kB / 17002236 kB (0%)
- Swap:**
  - Total Available: 16777212 kB / 16777212 kB (100%)
  - Free: 16777212 kB / 16777212 kB (100%)
- c5921 Network Status:**

Interface	IP-Address	OK?	Method	Status	Protocol
Dialer1	unassigned	YES	IPCP	administrately-down	down
Dialer10	unassigned	YES	IPCP	administrately-down	down
Dialer101	unassigned	YES	TFTP	administrately-down	down
Dialer102	unassigned	YES	TFTP	administrately-down	down
Dialer15	unassigned	YES	TFTP	administrately-down	down

Dialer16	unassigned	YES	TFTP	administrately-down	down
Dialer19	unassigned	YES	TFTP	administrately-down	down
Ethernet0/0	unassigned	YES	NVRAM	up	up
Ethernet0/0.3896	161.30.223.82	YES	TFTP	up	up
Ethernet0/0.3899	161.30.223.86	YES	TFTP	up	up
Ethernet0/0.3910	161.30.223.26	YES	NVRAM	administrately-down	down
Ethernet0/0.3924	161.30.223.38	YES	TFTP	up	up
Ethernet0/0.3927	161.30.223.6	YES	TFTP	up	up
Ethernet0/0.3959	161.30.223.18	YES	TFTP	up	up
Ethernet0/0.3966	161.30.223.10	YES	TFTP	up	up
Ethernet0/0.5	161.30.223.22	YES	TFTP	up	up
Ethernet0/1	192.168.0.126	YES	NVRAM	up	up
Ethernet0/2	unassigned	YES	NVRAM	up	up
Ethernet0/2.156	192.168.240.1	YES	TFTP	up	up
Ethernet0/2.2896	10.96.7.201	YES	TFTP	up	up
Ethernet0/2.2896	10.96.7.201	YES	TFTP	up	up
Ethernet0/2.2899	10.99.7.201	YES	TFTP	up	up
Ethernet0/2.3924	10.65.0.65	YES	TFTP	up	up
Ethernet0/3	192.168.1.10	YES	TFTP	up	up
Ethernet1/0	10.76.3.74	YES	TFTP	up	up
Ethernet1/1	10.108.3.73	YES	TFTP	down	down
Ethernet1/2	161.30.223.253	YES	TFTP	down	down
Ethernet1/3	unassigned	YES	NVRAM	administrately-down	down
Loopback0	10.71.1.96	YES	TFTP	up	up
Loopback1	10.99.0.106	YES	TFTP	up	up
Loopback3896	10.96.7.250	YES	TFTP	up	up
Loopback3899	10.99.7.250	YES	TFTP	up	up
Loopback3959	10.103.0.106	YES	TFTP	up	up
NVI0	10.71.1.96	YES	unset	up	up
Tunnel1	unassigned	YES	unset	up	down
Tunnel2	unassigned	YES	unset	up	down
Virtual-Access1	unassigned	YES	unset	up	up
Virtual-Access2	unassigned	YES	unset	down	down
Virtual-Access3	unassigned	YES	unset	down	down

Powered by RedPort (Copyright © Global Marine Networks, LLC 2015 - All Rights Reserved)

Provisioning NSD device - Path 1 (Web UI) \*Recommended\* is now complete.

### 5.3.2.2. Provisioning NSD device - Path 2 (Console)

1. To Provision an NSD through path 2 (after hardware installation), connect to the NSD console (**see Chap 5.1. - Console Connection**).
2. Navigate to the NSD Console Menu (**see Chap 5.1. - Console Connection**), the following will be displayed:

```
#####  
1. Reboot NSD                2. Reboot c5921 VM  
3. Reboot RedPort VM        4. Reboot All VMs  
5. Start LDI                 6. USB firmware update  
7. Halt System               8. Halt c5921 VM  
9. Halt RedPort VM           10. c5921 VM Console  
11. RedPort VM Console       12. Backup VM Image  
13. Restore VM Backup        14. Provision NSD  
#####  
Enter an option: █
```

3. Select option <14> “Provision NSD”.
4. Enter Your CNS ID when requested.
5. Select your CCE Instance by entering 1,2, or 3.
6. You will then be asked if you want to auto provision your terminal.
  - Enter Yes to auto provision the terminal (requires a username for the Cisco c5921 that has access to the sh vrf command used to obtain VLAN information).
  - Enter No to manually provide VLAN tags for Business Port and GX Voice Port in.

```
Enter an option: 14  
Enter CNS ID:sdfpsaioeru  
Enter CCE Instance(1,2,3):2  
Auto-Provision the NSD(Yes,No):Yes  
  
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  
% Auto-Provisioning of this site requires access to a %  
% username and password for the Cisco Virtual Machine. %  
% If you do not have this information then please exit %  
% and contact your service provider or configure the %  
% terminal manually. %  
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%  
Enter the Username: █
```

7. If Auto-Provisioning is set to Yes:
  - Enter username when prompted.
  - Enter password when prompted.
  - The terminal will now attempt to provision itself and configure the trunked ports on the VM as configured by default

```
[Auto-Provision the NSD(Yes,No):No  
  
[Enter the Biz-Net Port VLAN Tag:2899  
  
[Enter the GX-Voice VLAN Tag:156
```

8. If Auto-Provisioning is set to No:
  - Provide VLAN tag for the BIZ-NET port when prompted.
  - Provide VLAN tag for the GX-Voice port when prompted.

Provisioning NSD device - Path 2 is now complete.

### 5.3.2.3. Provisioning NSD device - Path 3 (Manual)

Provisioning the NSD device through path 3 is exactly the same as the current provisioning process used on legacy Inmarsat NSD products. Limited functionality is provided through provisioning via path 3, the OE guest VM, BIZ-NET, and GX-Voice ports can be manually configured after provisioning.

1. To provision NSD through path 3 (after hardware installation), connect to the NSD console ([see Chap 5.1. - Console Connection](#)).
2. Navigate to the NSD Console Menu ([see Chap 5.1. - Console Connection](#)), the following will be displayed:

```
#####  
1. Reboot NSD                2. Reboot c5921 VM  
3. Reboot RedPort VM        4. Reboot All VMs  
5. Start LDI                 6. USB firmware update  
7. Halt System               8. Halt c5921 VM  
9. Halt RedPort VM          10. c5921 VM Console  
11. RedPort VM Console       12. Backup VM Image  
13. Restore VM Backup        14. Provision NSD  
  
#####  
  
Enter an option: █
```

3. Select option <10> “c5921 VM Console”.

```
[Enter an option: 10
Connected to domain c5921
Escape character is ^]

Login incorrect

CentOS release 6.6 (Final)
Kernel 2.6.32-504.el6.i686 on an i686

c5921-vm login: █
```

4. Press enter the appropriate credentials when prompted:
  - c5921-vm login: var
  - Password: 1SATS0ftn5d5921
  
  - Password: 1nmarsat-N\$D
  - NSD-bootstrap>en
  
  - Password: NSD-In5t@11
5. Execute the VARPAR script.
  - event manager run VARPAR <NSD ID> <CCE Instance>

Provisioning NSD device - Path 3 is now complete.

## 6. NSD Daily Check-in

The NSD host machine accomplishes a check-in once daily at a random time (to mitigate Server load) and reports system diagnostics to a RedPort server. The interface connectivity priority determines the order in which communication paths are selected:

Interface Connectivity Priority:

1. vcorplan0 Corporate Data, requires knowledge of the corporate VLAN or a c5921 username and password (provided during provisioning).
2. vldi0, untagged, non-Cobham GX LDI.
3. vldi3925, tagged 3925 for Cobham based GX LDI..
4. BGAN LDI when made available

During check-in, the NSD:

1. Sends Metric Data to a RedPort sever:
  - bee.gmn-usa.com:34332 (primary).
  - ladybug.gmn-usa.com:34332 (secondary)
2. Determines if any updates are available. If updates are available, the NSD automatically installs updates ([see Chap 7 - Automatic Updates \(Over the Air\)](#)).
3. Logs Check-in and Update status. These statuses will be treated as “Events” and sent during the next NSD Daily Check-in.

NSD Daily Check-in section is now complete.

## 7. Automatic Updates (Over the Air)

During NSD device daily Check-in (see **Chap 6 - NSD Daily Check-in**) the GMN server will notify the NSD device if there is an update available. If there is an update required, the update will be automatically accomplished. The status of an update (success or failure) will be logged as an Event.

## 8. Manual Updates (Via USB) (currently not enabled)

In addition to Over Air Updates (see **Chap 7 - Automatic Updates (Over the Air)**), manual updates to the NSD device can be accomplished. Manual updates will be accomplished via a USB (Universal Serial Device).

1. To activate LDI, connect to the NSD console (see **Chap 5.1. - Console Connection**).
2. Navigate to the NSD Console Menu (see **Chap 5.1. - Console Connection**), the following will be displayed:

```
#####  
1. Reboot NSD                2. Reboot c5921 VM  
3. Reboot RedPort VM        4. Reboot All VMs  
5. Start LDI                 6. USB firmware update  
7. Halt System              8. Halt c5921 VM  
9. Halt RedPort VM          10. c5921 VM Console  
11. RedPort VM Console      12. Backup VM Image  
13. Restore VM Backup       14. Provision NSD  
#####  
Enter an option: █
```

3. Select option <6> “USB firmware update”.

\*\*\*Future SCREENSHOTS OF OPTION 6 details.\*\*\*

Manual Updates (Via USB) actions are now complete.

## 9. GX LDI (Last Ditch Internet)

**NOTE: BGAN LDI is currently unavailable for use.**

LDI is the last resort option for accessing the NSD. LDI can only be initiated from the console, as this is a support feature that is used in cases of extreme failure where normal channels used for accessing the device are unavailable. This feature uses the same reverse SSH server to proxy traffic onto the public internet where it can be accessed. This implementation of LDI supports all GX terminals including those manufactured by Cobham.

1. To activate LDI, connect to the NSD console (see **Chap 5.1. - Console Connection**).
2. Navigate to the NSD Console Menu (see **Chap 5.1. - Console Connection**), the following will be displayed:

```
#####  
1. Reboot NSD                2. Reboot c5921 VM  
3. Reboot RedPort VM        4. Reboot All VMs  
5. Start LDI                 6. USB firmware update  
7. Halt System               8. Halt c5921 VM  
9. Halt RedPort VM          10. c5921 VM Console  
11. RedPort VM Console       12. Backup VM Image  
13. Restore VM Backup        14. Provision NSD  
#####  
Enter an option: █
```

3. Select option <5> “Start LDI”.

The system will search for a GX terminal.

If a “Cobham” manufactured terminal is found the system will return “Found Cobham GX TERMINAL” and the terminal IP address, SSH URL, and port details.

Otherwise it will return “Found GX TERMINAL” and the terminal IP address, SSH URL, and port details.

```
Enter an option: 5  
Checking for terminal type, this may take a couple minutes  
Found Cobham GX TERMINAL  
Getting IP address  
IP address = 10.0.0.2  
SSH host is remote.redportglobal.com and Port is 53557  
#####  
1. Reboot NSD                2. Reboot c5921 VM
```

GX LDI procedures are now complete.

## 10. Technical Support Access to the NSD

The RedPort VM (located within the NSD) has the ability to dynamically and persistently configure remote access tunnels for HTTP and SSH access to the guest machine. This capability allows remote access to the NSD for technical support personnel to assist NSD installers and end users.

It is easy to configure the remote access to the terminal from the web-UI of the guest router.

1. To access the NSD over SSH with parameters gathered from LDI (see **Chap 9 - GX LDI (Last Ditch Internet)**) or from the RedPort VM (OE) UI (see images below).

2. To **ENABLE** the Redport VM (OE) navigate to the Optimizer Enterprise UI through the BIZ port by going to 192.168.11.1 in a browser, the following screen will appear:

Optimizer | wXa-524 v2.17 | Load: 0.50 0.55 0.43

## Authorization Required

Please enter your username and password.

Username

Password

### 3. Login with the following credentials:

- username = superadmin
- password = webxaccess

The following screen will appear:

Optimizer | wXa-524 v2.17 | Load: 0.52 0.55 0.43 Changes: 0

Home NSD Services Status System VPN Network Users Statistics Logout

Tasks Traffic Routing MIWAN Overview

### Welcome

#### Crew Internet Services

Captive Portal URLs:

- Login - <http://10.1.5.1/login.php>
- Status - <http://10.1.5.1/status.php>
- Logout - <http://logout> or <http://10.1.5.1/logout.php>

#### Email Access

### 4. Navigate to the <Services> tab, and then to the <Remote Access> tab, the following will be displayed:

Optimizer | wXa-524 v2.17 | Load: 0.14 0.08 0.02 Changes: 0

Home NSD **Services** Status System VPN Network Users Statistics Logout

Crew Internet Access Web Compression and Filtering RedPort Email **Remote Access** SMS GPS Tracking Dynamic DNS GPS/NMEA Repeater Voice PBX SNMP Network Shares

### Remote Access

#### Options

Remote access urls:

- <http://remote.redportglobal.com:53636>
- <ssh://remote.redportglobal.com:53635>

Enable Remote Access  Open up a tunnel to remote.redportglobal.com allowing remote access to the router and keep it running.

Access Port

**NOTE: Do not set your NSD OE remote Access Port to the presented port. The NSD OE will present you a port. Do not attempt to login to the example remote login, it is just presented for your knowledge.**

### 5. To allow technical support **ACCESS** to the console remotely provide by LDI procedure or UI access. From the example above:

- <http://remote.redportglobal.com:53636>
- <ssh://remote.redportglobal.com:53635>

Technical Support Access to the NSD actions are now complete.

## 11. Troubleshooting

### 11.1. Connecting RedPort VM to Inmarsat VM manually.

#### 11.1.1. Network configuration

The RedPort NSD has three virtual interfaces connected to the Inmarsat Virtual appliance.

By default:

- eth0 is associated with the WAN interface.
- eth1 is associated with the WAN2 interface.
- eth3 is associated with the GXVOICE interface.

By design the Redport NSD detects when traffic is being routed through the GX system versus the backup FBB.

WAN traffic is associated with the GX device.

WAN2 traffic is associated with Fleet Broadband/BGAN outbound traffic.

1. To modify Network Configuration Settings, log into the the RedPort NSD OE by going to 192.168.11.1 after connecting to the LAN port.

Optimizer | wXa-524 v2.17 | Load: 0.11 0.05 0.01

Authorization Required

Please enter your username and password.

Username

Password

2. Login with the following credentials:

- username = superadmin
- password = webxaccess

The following screen will appear:

Optimizer | wXa-524 v2.17 | Load: 0.52 0.55 0.43 Changes: 0

Home NSD Services Status System VPN Network Users Statistics Logout

Tasks Traffic Routing MWAN Overview

Welcome

Crew Internet Services

Captive Portal URLs:

- Login - <http://10.1.5.1/login.php>
- Status - <http://10.1.5.1/status.php>
- Logout - <http://logout> or <http://10.1.5.1/logout.php>

3. Navigate to the <Network> tab, then to the <Interfaces> tab.

The screenshot shows the RedPort web interface with the 'Network' tab selected. The 'Interfaces' sub-tab is active, displaying a table of network interfaces. The table has three main columns: 'Network', 'Status', and 'Actions'. The 'WAN' interface is highlighted in red. Below the table, there is a section for 'Global network options' with a text input field for 'IPv6 ULA-Prefix' containing the value 'fd49:4e9d:af71::48'. At the bottom, there are 'Reset', 'Save', and 'Save & Apply' buttons.

Network	Status	Actions
<b>NSDINTERNAL</b> eth2	<b>Uptime:</b> 5d 22h 4m 6s <b>MAC-Address:</b> 52:54:00:64:DF:EC <b>RX:</b> 53.49 MB (86809 Pkts.) <b>TX:</b> 10.60 MB (161357 Pkts.) <b>IPv4:</b> 10.0.3.25/24	Connect Stop Edit Delete
<b>CAP</b> tun0	<b>MAC-Address:</b> 00:00:00:00:00:00 <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.) <b>IPv4:</b> 10.1.5.1/24	Connect Stop Edit Delete
<b>BIZ</b> eth5	<b>Uptime:</b> 5d 22h 4m 6s <b>MAC-Address:</b> 00:03:2D:3C:A4:2D <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.) <b>IPv4:</b> 192.168.11.1/24	Connect Stop Edit Delete
<b>LAN</b> br-lan	<b>Uptime:</b> 5d 22h 4m 6s <b>MAC-Address:</b> 00:03:2D:3C:A4:2C <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.) <b>IPv4:</b> 192.168.10.1/24	Connect Stop Edit Delete
<b>PPP</b> ppp0	<b>MAC-Address:</b> <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.)	Connect Stop Edit Delete
<b>PPTP</b> pptp	<b>MAC-Address:</b> <b>RX:</b> 0.00 B (0 Pkts.) <b>TX:</b> 0.00 B (0 Pkts.)	Connect Stop Edit Delete
<b>GXVOICE</b> eth3.156	<b>Uptime:</b> 1h 42m 13s <b>MAC-Address:</b> 00:03:2D:3E:BF:56 <b>RX:</b> 6.45 KB (85 Pkts.) <b>TX:</b> 22.58 MB (66208 Pkts.) <b>IPv4:</b> 192.168.240.2/24	Connect Stop Edit Delete
<b>WAN</b> eth0.2899	<b>Uptime:</b> 1h 42m 12s <b>MAC-Address:</b> 00:03:2D:3E:BF:57 <b>RX:</b> 32.42 MB (263472 Pkts.) <b>TX:</b> 38.79 MB (325402 Pkts.) <b>IPv4:</b> 10.99.7.202/29	Connect Stop Edit Delete
<b>WAN2</b> eth1.2899	<b>Uptime:</b> 1h 42m 12s <b>MAC-Address:</b> 00:03:2D:3E:BF:58 <b>RX:</b> 35.55 MB (342738 Pkts.) <b>TX:</b> 37.64 MB (277228 Pkts.) <b>IPv4:</b> 10.99.7.203/29	Connect Stop Edit Delete
<b>WAN3</b> eth6	<b>Uptime:</b> 4d 21h 57m 51s <b>MAC-Address:</b> 00:03:2D:3C:A4:2E <b>RX:</b> 32.33 MB (437083 Pkts.) <b>TX:</b> 30.34 MB (345907 Pkts.) <b>IPv4:</b> 192.168.231.4/24	Connect Stop Edit Delete

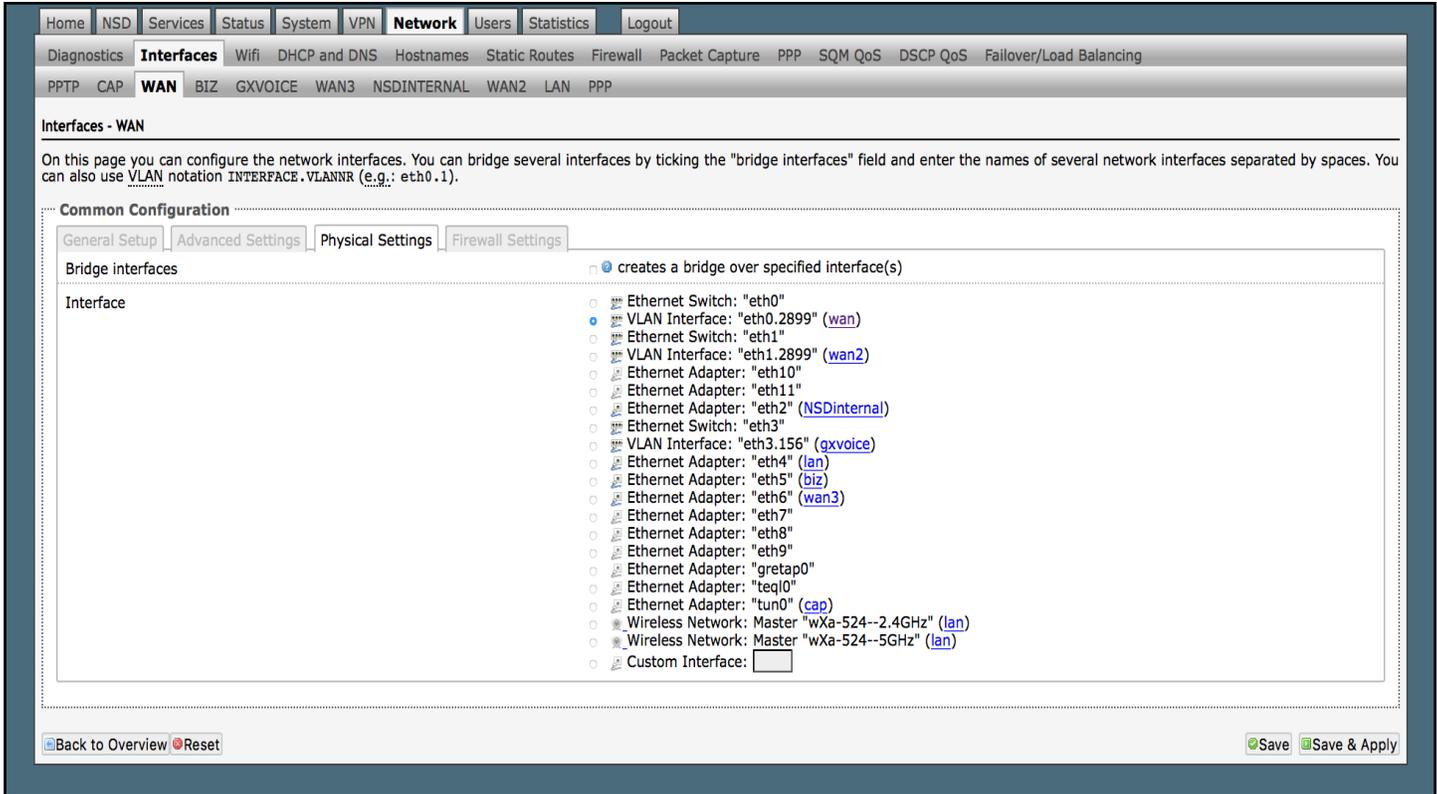
Global network options

IPv6 ULA-Prefix:

Reset Save Save & Apply

4. Click <Edit> under “Actions” for the WAN.

5. Navigate to the <Physical Settings> tab.



6. Click custom interface. Enter eth0.XXXX where XXXX is the vlan of the SVN being used for that interface.
7. Click <Save & Apply>
8. Repeat the process for WAN2 using the eth1 interface.
9. Repeat the process for the GXVOICE interface using the eth3 interface.

Modification of Network Settings is Complete. Accomplish Voice configuration actions as needed.

## 11.1.2. Voice configuration

If the NSD is provisioned to use the RedPort VM PBX for voice service then it must be configured even with automatic provisioning enabled. To complete this process you need the DID bound to the RedPort NSD MAC address, the GX Voice service VLAN, and the IP address of the Loopback interface.

1. To accomplish Voice Configuration, log into the c5921 virtual machine console and run the 'sh ip int br | i Loopback1' command to extract the voice loopback ip address.

```
n240000661430000>
n240000661430000>sh ip int br | i Loopback1
Loopback1          10.99.0.106      YES TFTP    up          up
n240000661430000>
n240000661430000>
```

2. Obtain the DID associated with the GXVOICE mac address used during provisioning.
3. Log into the RedPort NSD by going to 192.168.11.1 after connecting to the BIZ port.

Optimizer | wXa-524 v2.17 | Load: 0.11 0.05 0.01

**Authorization Required**

Please enter your username and password.

Username	<input type="text"/>
Password	<input type="password"/>

4. Login with the following credentials:

- username = superadmin
- password = webxaccess

The following screen will appear:

Optimizer | wXa-524 v2.17 | Load: 0.52 0.55 0.43 Changes: 0

Home | NSD | **Services** | Status | System | VPN | Network | Users | Statistics | Logout

Tasks | Traffic Routing | MWAN Overview

**Welcome**

**Crew Internet Services**

Captive Portal URLs:

- Login - <http://10.1.5.1/login.php>
- Status - <http://10.1.5.1/status.php>
- Logout - <http://logout> or <http://10.1.5.1/logout.php>

**Email Access**

Email access settings and parameters:

- WEB - <http://127.0.0.1/webmail>
- POP - 127.0.0.1:110
- SMTP - 127.0.0.1:25 with no connection or authentication security.

5. Navigate to the <Services> tab, then to <Voice PBX> tab.

Home | NSD | **Services** | Status | System | VPN | Network | Users | Statistics | Logout

Crew Internet Access | Web Compression and Filtering | RedPort Email | Remote Access | SMS | GPS Tracking | Dynamic DNS | GPS/NMEA Repeater | **Voice PBX** | SNMP | Network Shares

Settings | Extensions | Voicemail | CDR | Logs | Sat SIP Trunk | RedPort VoIP

**PBX Services**

Enable PBX	<input checked="" type="checkbox"/> Enable/Disable PBX VOIP service.
Listen port	<input type="text" value="5060"/> <input checked="" type="checkbox"/> Port used by the PBX to listen for SIP traffic. Leave blank for default port 5060.
Listen interfaces	<input type="text" value="ALL - 0.0.0.0"/> <input checked="" type="checkbox"/> Bind proxy to the following interfaces.
Analog phone audio gain/volume. Increasing positive values means higher volume.	<input type="text" value="-10.0"/> <input checked="" type="checkbox"/> Receive audio gain. Higher positive values correspond to louder volume.
Auto attendand (IVR)	<input type="checkbox"/> Enable IVR to prompt for extension number and route call appropriately.
Enable voicemail	<input type="checkbox"/> Enable voicemail and directory dialing. Also create a default system voicemail box at extensions 0.

6. Click <Enable PBX>, to Enable the PBX.
7. Click <Save and Apply>.
8. Navigate to the <Services> tab, then to the <Voice PBX> tab, and then to the <Sat SIP Trunk> tab.

Home NSD **Services** Status System VPN Network Users Statistics Logout

Crew Internet Access Web Compression and Filtering RedPort Email Remote Access SMS GPS Tracking Dynamic DNS GPS/NMEA Repeater **Voice PBX** SNMP Network Shares

Settings Extensions Voicemail CDR Logs **Sat SIP Trunk** RedPort VoIP

Sailor FBB and iSavi VOIP Configuration

Attention Sailor users. Refer to the IP Handset configuration section in the Sailor FBB users guide.

**Note:** IP Handset compatibility under "Settings->IP Handsets->Server settings" on the Sailor FBB needs to be set to "version 1.8 or newer".

Enable	<input checked="" type="checkbox"/>
Force Terminal Selection	<input checked="" type="radio"/> Do not auto-detect satellite terminal
Satellite Terminal	NSD
IP Address of Terminal	10.99.0.106 <input type="checkbox"/> Leave blank for system default.
SIP Extension	870771310400 <input checked="" type="radio"/> Value must be 501 through 504.
SIP Password	Unneeded

9. Click <Enable>.
10. Click <Force Terminal Selection>.
11. Click <NSD> from the Satellite Terminal dropdown menu.
12. Enter the DID provisioned with the GXVOICE mac address.
13. Click <Save and Apply>.

Modification of Voice Settings is Complete.

## 12. RedPort Global Contact information

For any questions, concerns, or recommendations, please contact us:

### RedPort Company Information

For product orders, support or returns, please contact:

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USA: 877.379.8723

Email: [info@redportglobal.com](mailto:info@redportglobal.com)

Sales: [sales@redportglobal.com](mailto:sales@redportglobal.com)

Web: [redportglobal.com](http://redportglobal.com)

### RedPort Corporate Address

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