



Net-Net[®] Interactive Session Recorder Administrator Guide

Release Version 5.0

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About this Guide

Overview

The *Net-Net Interactive Session Recorder Installation Guide* provides information about:

- Overview of the Net-Net Interactive Session Recorder (NN-ISR) release features
- Hardware/Software Requirements/Recommendations
- Storage Considerations
- Control and Index Server (CIS) Installation
- Record and Store Server (RSS) Installation
- Post-install and Verification Procedures
- Making the First Call
- Additional Advanced Topics (Appendices)

NN-ISR Releases

The following Acme Packet Net-Net Session Director (SD) products are certified for use with the NN-ISR software:

- C-Series (Net-Net 3000/4000) SDs
- E-Series (Net-Net 2600) SDs
- Net-Net Application Session Controller (ASC)

Note: For more information on the Net-Net C-Series, E-Series, and ASC hardware, see Acme Packet's applicable hardware documentation.

Who is Acme Packet?

Acme Packet (NASDAQ: APKT), the leader in session delivery network solutions, enables the trusted, first-class delivery of next-generation voice, data and unified communications services and applications across IP networks. Our Net-Net product family fulfills demanding security, service assurance and regulatory requirements in service provider, enterprise, and contact center networks. Based in Bedford, Massachusetts, Acme Packet designs and manufactures its products in the USA. For more information, visit www.acmepacket.com.

Related Documentation

The following table lists related documents.

Document Name	Document Description
Net-Net Interactive Session Recorder Release Note	Contains information about new NN-ISR features and fixed issues in the current release of the NN-ISR.
Net-Net Interactive Session Recorder User's Guide	Contains information about using the NN-ISR Dashboard for all levels of users. Provides information about viewing, playing, deleting recordings, running reports, managing user profiles (Super User, Account Administrator, and Tenant Administrator only).
Net-Net Interactive Session Recorder Administrator Guide	Contains information about using the NN-ISR Dashboard for the Administrator level user (Super User, Account Administrator, and Tenant Administrator). Provides information about creating and managing accounts, routes, and users. Also provides information about configuring the NN-ISR, running reports, and viewing active calls.
Net-Net Interactive Session Recorder API Reference Guide	Contains information about Methods for Recording, VoiceXML Commands, representational state transfer (REST) application programming interface (API), Recording File Types/Formats Supported, Return Codes, sendIPCRCommand.jsp Subdialog, Advanced Options, Troubleshooting.

Revision History

This section contains the revision history for this document.

Date	Revision Number	Description
December 14, 2012	Revision 1.00	<ul style="list-style-type: none"> Initial release of the NN-ISR 5.0M1 software.
February 1, 2013	Revision 1.01	<ul style="list-style-type: none"> Updated the preconfigured subnet used by the Dashboard and Index VMs. Added troubleshooting steps for the Dashboard VM interface.
April 30, 2013	Revision 1.02	<ul style="list-style-type: none"> Adds RSS installer USB requirements.
July 29, 2013	Revision 1.03	<ul style="list-style-type: none"> Updates the CIS Index Replication instructions.

Technical Assistance

If you need technical assistance with Acme Packet products, you can obtain it on-line by going to support.acmepacket.com. With your customer identification number and password, you can access Acme Packet's on-line resources 24 hours a day. If you do not have the information required to access the site, send an email to tac@acmepacket.com requesting a login.

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- From the United States, Canada, and Mexico call: 1 866 226 3758
- From all other locations, call: +1 781 756 6920

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Introduction

This section provides an overview of the NN-ISR. It also includes the Release 5.0 features of the NN-ISR suite of software you can install on the NN-ISR.

About the NN-ISR

Acme Packet introduces the NN-ISR to the Interactive Voice Response (IVR) and Telecom industries. Awarded 2008 Communications Solutions Product of the Year Award, the NN-ISR allows any telephony or IVR environment to handle full-duplex call recording (both pre- and post-transfer).

The NN-ISR reliably records any phone call in carrier, enterprise, or contact center. Supporting enterprise & multi-tenant architectures, the NN-ISR provides ad-hoc (partial call) recording allowing any call to be recorded at any point and for any duration. Call recording can be initiated automatically by SIP URI or conditionally by any authorized VoiceXML or web application. In addition, call data such as time of call, SIP URI, account number, etc. are stored in a recording database for clients to search and review. Once recording starts, recordings can continue after being transferred to an agent or employee thereby providing continuity for recordings & call data across IVR, office, and call center telephony deployments.

Using the NN-ISR, VoiceXML and representational state transfer (REST) application programming interface (API) developers have the ability to record every call, a percentage of calls, specific VoiceXML dialogs as well as transfers to agent conversations. With simple VoiceXML and REST API code, the VoiceXML application controls recording for any call, at any point and for a specific period of time. In addition, every recording may be indexed by key VoiceXML values or identifiers (account#, unique call identifier, SIP URI, time of call, etc.).

The NN-ISR can scale from one call to thousands of concurrent calls and is a simple add-on to any SIP telephony network. An affordable software-based solution, the IP Call Recorder runs on standard Intel-based servers in VoIP and standard telephony environments.

Features

The following are features of the NN-ISR 5.0 product.

Recording Features

- Software only solution
- Simple SIP network integration
- Whole or percentage based call recording
- Selective or Ad hoc call recording
- Record & Save
- Easy VoiceXML integration for IVR
- Announcement & Opt-out
- Media format support: WAV (16-bit, 8 bit), ulaw, alaw, Adaptive Differential Pulse-Code Modulation (ADPCM)
- Recording in mono or stereo (caller & callee on separate channels)
- Dashboard Graphical User Interface (GUI)
- Auto-archival

Technical Features

- Telephony Support
 - Session Initiation Protocol (SIP) (RFC 3261, 2327, 3264, Diversion Headers)
 - Real-Time Transport Protocol (RTP) (1889, 1890, 2883) - G.711 ulaw/alaw
 - Session Initiation Protocol Recording (SIPREC)
- IP Call Recorder Indexing via MySQL (5.x)
- Systems Management & Monitoring
 - NN-ISR Web UI
 - Secure Login (HTTP/HTTPS)
 - View & Search Recordings
 - Configure recordings
 - Configure users
 - NN-ISR Channel Status
 - NN-ISR Indexing
 - System Error Log Viewer
 - Third-Party Authorization
 - SNMPv1 (RFC 1157) and SNMPv2c (RFC 1901) via Voice Application Monitor
- Storage
 - Integration with EMC CX3 Series SAN or other Microsoft® iSCSI Initiator compatible storage devices.
- Codec Support
 - NN-ISR supports G.729, G.711 mu-law, G.711 a-law, and G.722 variants (excluding G.722.2) conversions in release F2 (license required to enable; see NN-ISR RMC License for more information).

- Application - Centric call recording solution
 - Flexible Web service methods (REST) for Web 2.0 integration
 - Simple sub-dialogs for integration with VoiceXML
 - Initiate and label recordings with any identifier available to the application (ex. SIP URI, etc.)

The NN-ISR installs on the VoIP network. It passes-through or conferences in SIP-based phone calls. The NN-ISR may behave as a back-to-back User Agent (B2BUA), User Agent (UA), or SRS depending on the configuration, network architecture, and call type.

The NN-ISR also features support for the IETF-standard Session Recording Protocol (SIPREC). The solution integrates seamlessly with other SIPREC-capable products, including Acme Packet Net-Net session border controllers (SBC) and products from other leading IP telephony and UC vendors.

For more information about pass-through and conference modes, see the *Net-Net Interactive Session Recorder Administrator Guide*.

Note:

2 Hardware/Software Requirements

Introduction

This section provides the hardware and software pre-requisites for installing the NN-ISR. It provides the recommended certified hardware you can use in your network, as well as sample implementation diagrams.

Hardware

This section describes the hardware Acme Packet has certified for load/capacity. Other hardware platforms may be compatible, but have not been certified for load.

CIS & RSS Certified Hardware

The third-party servers in this section have been certified for use with Acme Packet's NN-ISR software which is composed of two modular elements:

- **Control and Index Server (CIS)** - The CIS maintains metadata and indices; and provides browser-based administration.
- **Recording and Storage Server (RSS)** - The RSS, under the control of the CIS, records sessions and manages the storage and archival processes. It selects, starts, and stops recordings using Web services APIs.

Note: The specified processor choices and disk sizes of these third-party server recommendations represent the minimal options. Redundant environments require additional servers.

For CIS Server

The following third-party server is certified for use with the NN-ISR and the CIS software.

- **HP DL360 G7 Server**
Features of this server include:
 - Suitable for NN-ISR applications up to 5000 sessions
 - Form factor: 8 SFF (Small Form Factor) drive bays total
 - Dual Six-Core Intel Xeon® processors, 24 GB RAM
 - Two AC power supplies

Configuration Recommendation

The recommended configuration for the HP DL360 G7 Server is:

Hardware	Qty
HP ProLiant® DL360 G7 Server	1
HP DL360 G7 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W)	2
HP 4GB memory (1 x 4GB @ 1333MHz)	6
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise (RAID 1)	2
HP 300 GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise (RAID 6 or 1+0)	4
HP Smart Array P410i/1G FBWC Controller – Low profile PCIe	1
HP NC375T PCI Express Quad Port Gigabit Server Adapter	1
HP 750W CS HE Power Supplies	2
HP 1.83m 10A C13-UL US Power Cords (North American variant; acquire applicable power cord for your region)	2

For RSS Server

The following third-party server is certified for use with the NN-ISR and the RSS software.

Note: The RSS certified drive specs call for a second drive to be used for recordings. For a procedure to mount a second drive, see Appendix B, Mounting a Second RSS Drive for Recordings.

- **HP DL360 G7 Server**

Features of this server include:

- Suitable for NN-ISR applications up to 500 sessions
- Form factor: 8 SFF (Small Form Factor) drive bays total
- Dual Quad-Core Intel® Xeon® processors, 8 GB RAM

Note: You must use a 4G USB flash drive for the RSS to install properly.

Configuration Recommendation

The recommended configuration for the HP DL360 G7 Server is:

Hardware	Qty
HP ProLiant® DL360 G7 Server	1
Quad-Core Intel® Xeon® Processor E5620 (2.40GHz/4-core/12MB/80W)	2
HP 4GB memory (2 slots x 4GB @ DDR3-1333MHz)	2
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise (RAID 1)	2
HP 300 GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise (RAID 1)	2
HP Smart Array P410i/1G FBWC Controller – Low profile PCIe	1
HP NC375T PCI Express Quad Port Gigabit Server Adapter	1

Hardware	Qty
HP 750W Common Slot Gold Hot Plug Power Supply Kit (AC)	2
HP 1.83m 10A C13-UL US Power Cords (North American variant; acquire applicable power cord for your region)	2

RAID Configuration

Redundant Arrays of Inexpensive Disks (RAID) is a combination of multiple small, inexpensive disk drives into an array of disk drives which yields performance exceeding that of a single drive. This array of drives appears to the computer as a single logical storage unit or drive.

There are 6 levels of RAID (RAID 0 through RAID 5). The CIS and RSS certified hardware servers support RAID 1 and RAID 5. RAID Level 1 provides redundancy by writing all data to two or more drives. RAID Level 5 distributes parity among the drives.

The following table identifies the RAID supported on each CIS and RSS certified server.

Hardware	RAID Supported
<i>CIS</i>	
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise	RAID 1
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise	RAID 5 or RAID 10
<i>RSS</i>	
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise	RAID 1
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise	RAID 1

Note: The 72GB servers in the table above include the RAID 1 configuration. For the 300GB servers, you must install RAID before performing the CIS and RSS installation.

IMPORTANT: If you are going to install a 300GB CIS and/or RSS server, use the procedure in Appendix C, Installing RAID on the CIS and RSS Servers, to install RAID before attempting the CIS and RSS installation process.

Software

This section provides a list of the software that installs during the NN-ISR installation process.

NN-ISR Software

The following components are installed during the NN-ISR installation process:

- **CIS** - Installs the following components:
 - VMware Enterprise vSphere™ Hypervisor (ESXi)
 - VMware vSphere™ Client
 - 2 Virtual Machines running Fedora 14
 - NN-ISR Dashboard
 - NN-ISR Index
- **RSS**
 - NN-ISR core software
 - APIs
 - Archiver Service
 - RMC Converter

For more information about installing the CIS and RSS software, see *Installing the CIS Software* and *Installing the RSS Software*.

NN-ISR Dashboard Requirements

The following list recommends third-party applications you can use with the NN-ISR Dashboard.

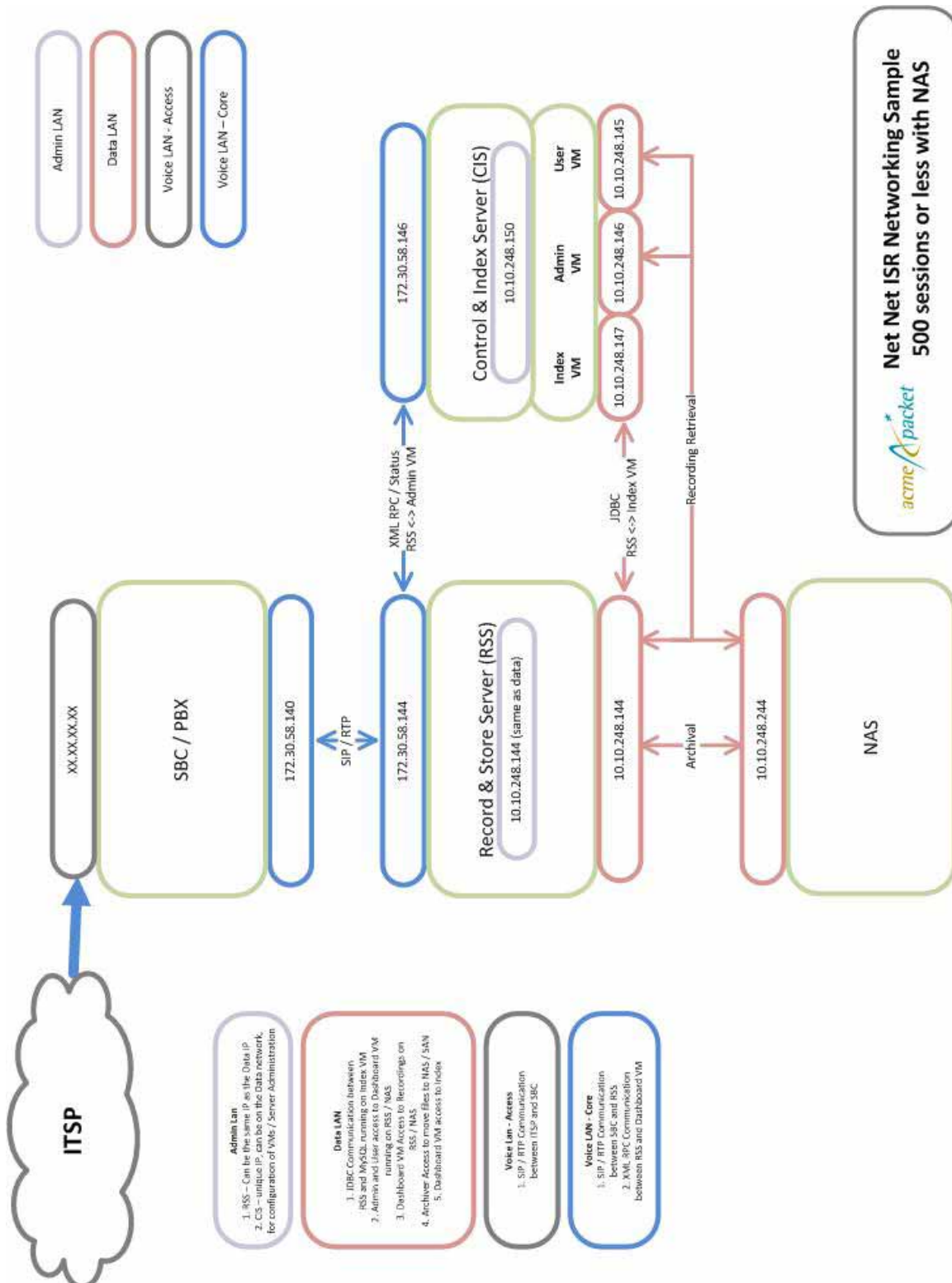
The recommended third-party applications are:

- Web browser recommendations for NN-ISR Dashboard:
 - Microsoft® Internet Explorer 9 (IE9) with full regression specifically on IE Version 9.0.8112.16421 and with Quicktime® 7.7.1 Player Plug-in (<http://www.apple.com/quicktime/>) or Windows Media Player 10/11
 - Mozilla Firefox® 8.0 with Quicktime® 7.7.1 Player Plug-in or Windows Media Player 10/11
 - Google Chrome™ 16.0.912.63 with Quicktime® 7.7.1 Player Plug-in
 - Other browsers (please contact Acme Packet Customer Service before using other browsers)
- SIP softphone recommendations for testing:
 - X-lite by CounterPath Corporation - (<http://www.counterpath.net/x-lite.html>)
 - PhonerLite by Heiko Sommerfeldt - (http://www.phonerlite.de/index_en.htm)

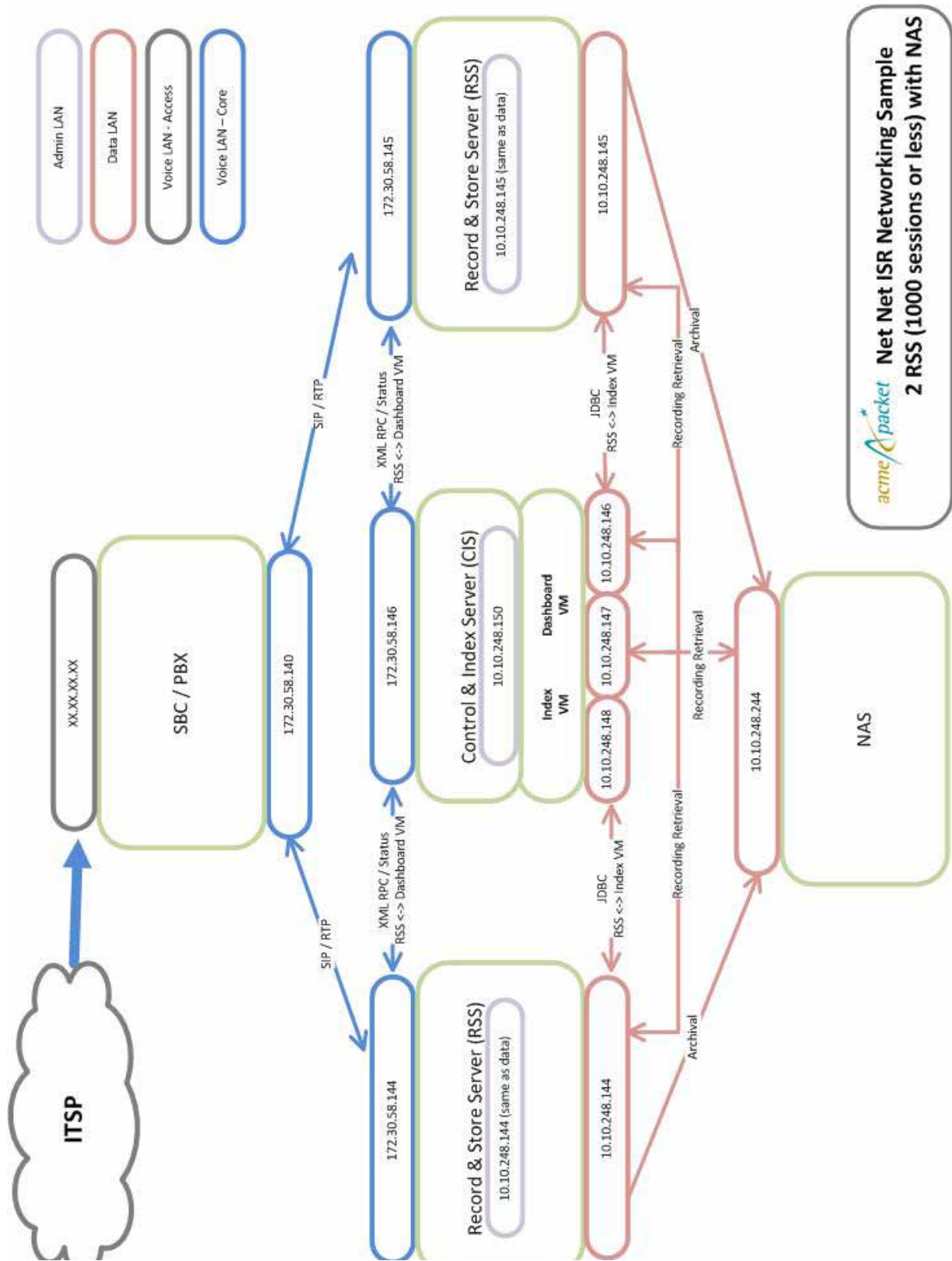
Sample Implementation Diagrams

The following are sample NN-ISR/SBC implementation diagrams.

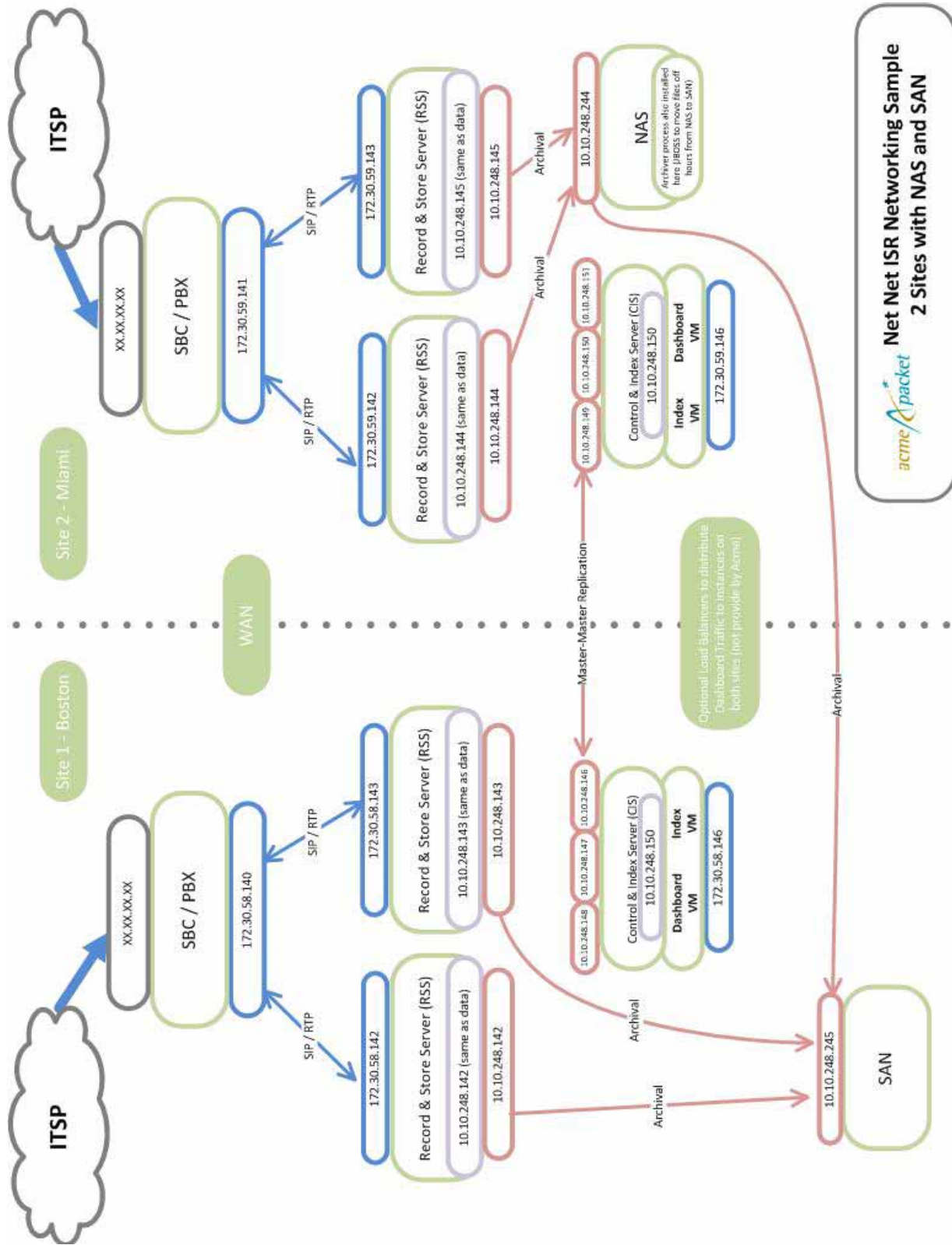
Single Site-Single Server NN-ISR/SBC Implementation



Single Site-2RSS NN-ISR/SBC Implementation



Dual Site Redundant NN-ISR/SBC Implementation



Introduction

This section provides information and procedures for installing the CIS software for the NN-ISR. Performing the procedures in this section installs the following CIS components:

- VMware Enterprise vSphere Hypervisor ESXi
- VMware vSphere Client
- NN-ISR Index
- NN-ISR Dashboard

What is CIS?

The CIS is a component of the NN-ISR that is responsible for storing and accessing recordings and recording policy in an NN-ISR deployment. It is comprised of two virtual machines running in a vSphere Hypervisor environment.

- Index—MySQL database that stores the RSS and recording policy configurations, as well as information (metadata) about the recordings created by RSS servers.
- Dashboard—Web portal for configuring RSS servers and recording policy, as well as for searching for and retrieving/playing back recordings created by RSS servers.

Before You Begin

Before installing the CIS software, you must perform the following:

- Confirm Virtual Machine (VM) host network and power
- Obtain a VMware ESXi 4.1 update 1 install disk or .iso file (current file "4.0_U1_Apr_2011_ESXi_HD-USB-SDImageInstlr_Z7550_00096.iso")
- Obtain VMs for the NN-ISR Dashboard and the NN-ISR Index, and unzips the following files on a Windows host that manages the VMs with vSphere Client:
 - NN-ISR Index Version <version#>Build <build#>.zip
 - NN-ISR Dashboard Version <version#> Build <build#>.zip

Use the remaining procedures in this chapter to install the CIS software. It is important that you install the CSI components in the order they are presented (vSphere Hypervisor first then vSphere Client).

After the components are installed, you must configure the virtual machines to start up automatically.

Note: The 72GB servers in the table above include the RAID 1 configuration. For the 300GB servers, you must install RAID before performing the CIS and RSS installation.

VMware Enterprise vSphere Hypervisor (ESXi)

What is vSphere Hypervisor?

The vSphere Hypervisor (formerly known as ESXi), is the free edition of vSphere offering the bare-metal architecture for best possible performance. It installs during boot-time of the Hypervisor host.

The following components run on the Hypervisor platform that constitute the NN-ISR's CIS platform:

- **Index** - MySQL Server stores the recording and management data
- **Dashboard** - Single NN-ISR Dashboard for both the Administrator and User

Installing vSphere Hypervisor

Use the following procedure to install vSphere Hypervisor. Before beginning this installation, be sure you have performed the tasks in the section Before You Begin.

To install vSphere Hypervisor:

1. Open a web browser and enter the following URL to navigate to the VMware download page:

<https://www.vmware.com/tryvmware/index.php?p=free-esxi&lp=1>

2. Download the ESXi 4.1 update 1 file to your server.

Note: You may need to login into the VMware download page with a user name and password before downloading the file. If not already registered, please register and then login to download the applicable file.

3. Burn the ESXi 4.1 update 1 “<filename>.ISO” image to a CD.
4. Boot the server from the ESXi 4.1 update 1 CD you just created.
5. At the prompt, press <Enter> to proceed with the installation.
6. Press <F11> to accept the ESXi 4.1 license.
7. At the “Select a Disk” menu, press <Enter> to confirm the remote storage device and continue.
8. Press <F11> to install the ESXi 4.1 update 1.
9. When the installation is complete, remove the CD and press <Enter> to reboot the server.
10. Configure the vSphere Hypervisor using the procedures in Configuring vSphere Hypervisor.

Configuring vSphere Hypervisor

After installing the vSphere Hypervisor, you must perform two basic configuration steps you can use it. Use the following procedure to configure vSphere Hypervisor.

To deploy your CIS Virtual Machines:

1. After installing vSphere Hypervisor and rebooting the server, press <F2> **Customize System**.

2. At the login prompt, enter the following:

User name: **root**
Password: <leave blank>

3. Select **Configure Password** and follow the instructions to assign a password to assign for logging into vSphere Hypervisor.

The password rules as stated on the VMWare knowledge base are as follows:

"A valid password requires a mix of upper and lower case letters, digits, and other characters. You can use a 7-character long password with characters from at least 3 of these 4 classes, or a 6-character long password containing characters from all the classes. An upper case letter that begins the password and a digit that ends it do not count towards the number of character classes used. It is recommended that the password does not contain the username."

IMPORTANT: This password is required to login to your Hypervisor instance (this console) as well as for accessing through the vSphere client.

Keep this password secure.

4. Press <Enter> when complete to enter the System Customization Menu.
5. Select **Configure Management Network** and press <Enter>.
6. Select **Network Adapters** and confirm at least one network interface card (NIC) has status showing "*Connected*". Press <Enter>.

Note: Make a note of this NIC; you will need this information later.

7. Select **IP Configuration** and press <Enter>.
8. Press <space bar> to select **Set Static IP Address and Network Configuration**.
9. Enter the IP address of your ESXi Host and press <Enter>. For example:
IP Address: **172. 40. 34. 56**
10. Enter the subnet mask and press <Enter>. For example:
Subnet Mask: **255. 255. 255. 0**
11. Enter the default gateway and press <Enter>. For example:
Default Gateway: **172. 40. 34. 1**
12. Press <Esc> to exit the IP Configuration Menu.
13. Select **DNS Configuration**.
14. In the "**DNS Server**" field, specify the domain name system (DNS) server addresses if required.

Note: Internet access is required to download the vSphere Client in the next section.

15. In the "**Hostname**" field, specify the Hostname for the server to use.
16. Press <Esc> to exit the DNS Configuration Menu.

17. Press <Esc> to exit the Management Network Menu.
18. At the “Save Changes” prompt, press **Y** to apply the changes and restart the management network.
19. Select **Test Management Network**.
20. Attempt to ping your server in the network.

Note: The ping you send out may include any DNS server configured in your network.

If the first attempt fails, try pinging again. The test should show a response from your server indicating that your server was setup correctly for network management in your network.

Note: If your hostname cannot be resolved by your DNS servers, or you didn't configure any DNS servers, the “resolving hostname” test will fail. This does not adversely affect the CIS performance.

21. Press <Esc> to exit the Test Management Network Menu.
22. Press <Esc> to log out.

Once the ESXi host is on the network, perform all configuration management through the vSphere client.

VMware vSphere Client

What is vSphere Client?

The vSphere Client is an application that enables management of a vSphere installation. The vSphere Client provides an administrator with access to the key functions of vSphere without the need to access a vSphere server directly.

Installing vSphere Client

After installing the vSphere Hypervisor onto your server, you can then install the vSphere Client onto your Microsoft Windows® machine. Installing the vSphere Client, includes:

- Downloading the vSphere Client from VMware
- Assigning a License to VMware vSphere Hypervisor
- Assigning the network time servers
- Adding a second virtual network

To install the vSphere Client:

1. Open your web browser. Enter the IP address of the ESXi host which you configured in the procedure, Configuring vSphere Hypervisor. (<http://<ESXi host ip address>>) and press <Enter>. This accesses the web page to download the vSphere Client to your WINDOWS machine. For example, **http: //172. 30. 58. 164**
A warning displays followed by a prompt allowing you to accept or reject the certificate.
2. Press <Enter> to accept the certificate.

3. Click **Download vSphere Client**.
4. Navigate to the location on your PC where you downloaded the vSphere Client. The vSphere Client file name is *VMware-viclient-all-4.1.0-345043.exe*.
5. Double-click the file to begin the installation. The file proceeds to extract the application files and continues the installation process. The following screen displays.



6. Click **Next**. Select *I agree to the terms in the license agreement* and click **Next**. Continue the installation by following all remaining instructions for installing the vSphere Client. When the installation is complete, the following screen displays.



7. Click **Finish** to complete the installation.

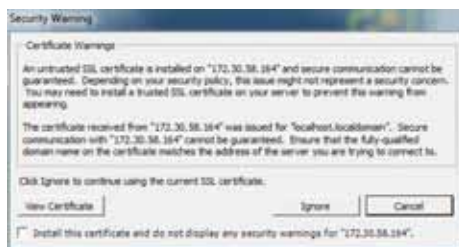
The VMware vSphere Client icon appears on your PC desktop.



8. Double-click the VMware vSphere Client icon. The following screen displays.



9. In the **IP address / Name** text box, enter the IP address or the domain name of the ESXi host. For example:
 IP address / Name: **172.30.58.164**
10. In the **User name** text box, enter the user name assigned to you by the system administrator of the ESXi host. For example:
 User name: **root**
11. In the **Password** text box, enter the password assigned to you by the system administrator of the ESXi host. For example:
 Password: **Jre453i**
12. Click **Login**. The following Security Warning displays:



13. Place a check mark in the box that indicates:
Install this certificate and do not display any security warnings for <ip_address>.
 The IP address is the address of the ESXi host.
14. Press **Ignore**. The VMware Evaluation Notice alert displays.
15. Click "Assign license to the ESXi host."

Note: vSphere 4 Hypervisor is licensed for 2 physical CPUs (free, never expires).

To get the VMware vSphere Hypervisor License:

16. Enter the following URL:
<https://www.vmware.com/account/login.do>
 17. Register for a VMware account by clicking **<Register>**.
 or
 If already registered, enter your email address or VMware customer number, and password, and click **Sign In**.
- VMware sends the following message to the email address you specified during registration:
- Thank you for creating a VMware account. To complete the registration process, please click the button below.*
18. Open your email message from VMware and click the **Activate Now** button. The VMware 's Enter Your Password screen displays.
 19. In the **Password** text box, enter the password you specified when registering with VMware and click **Continue**. The "Account Activated" screen displays with the following message:

Success! Your account has been activated.

20. It is recommended that you copy and paste the following link into your browser:

<https://www.vmware.com/tryvmware/p/activate.php?p=free-esxi&lp=1&ie=UTF-8&q=vmware+vsphere+hypervisor+esxi+4.1+license>

21. In the box, **On how many physical servers do you plan to install VMware vSphere Hypervisor?**, enter the number of servers on which you are installing the VMware vSphere Hypervisor. Valid values are 1 - 999.
22. Place a check mark in the box, **I agree to the terms and conditions outlined in the VMware vSphere Hypervisor End User License Agreement.** and click **<Register>**.

VMware sends you an email message for accessing your VMware ESXi License.

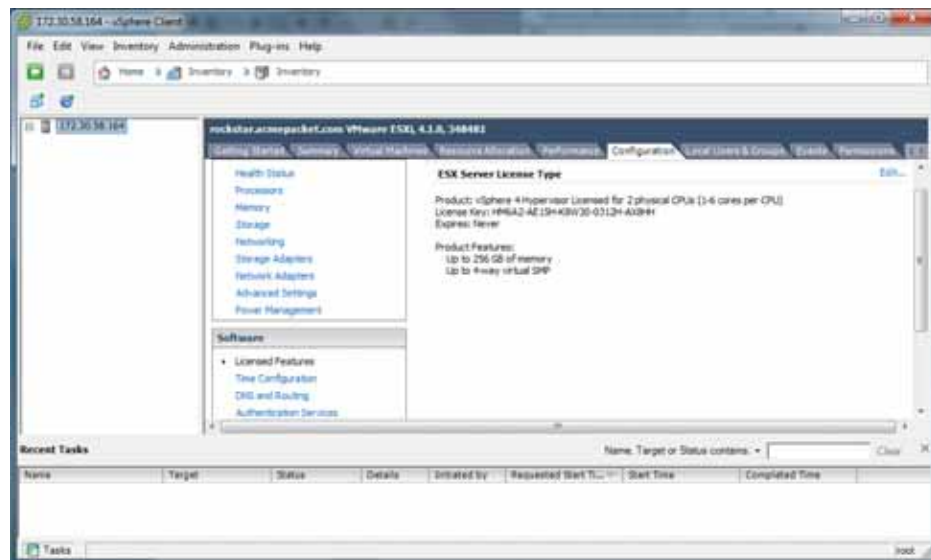
23. Open your email message from VMware and click the **<Access Now>** button.

A VMware vSphere Hypervisor license string displays.

24. Copy the VMware vSphere Hypervisor license key string.
or
Record the license key string to be used later for Step 31.

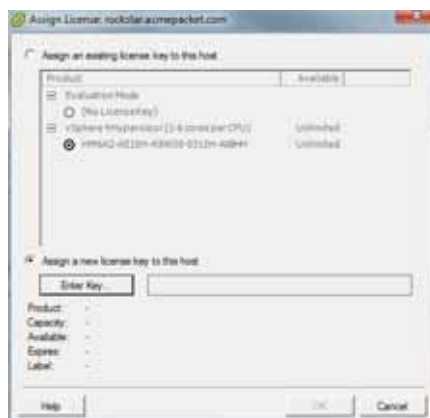
To apply the VMware vSphere Hypervisor license:

25. Click **<OK>** to close the VMware Evaluation Notice window that displayed in Step 14. The following window displays. The ESXi Host IP displays in the left column.



26. Click the **Configuration** tab.
27. In the left column, under the Software category, click **Licensed Features**.

28. In the upper right corner of the window, click **Edit**. The following window displays.



29. Click the radio button **Assign a new license to this host**, and click **Enter Key**. A pop-up displays allowing you to enter the license key string.
30. In the **New License Key** text box, paste the license key string you copied from Step 24.
or
Enter the license key string manually.
31. Click **OK** to accept the license key, and click **<OK>** to close the editing window.

Your vSphere Client software is installed. You must now configure your ESXi Host using the procedures in *Configuring your vSphere ESXi Host*.

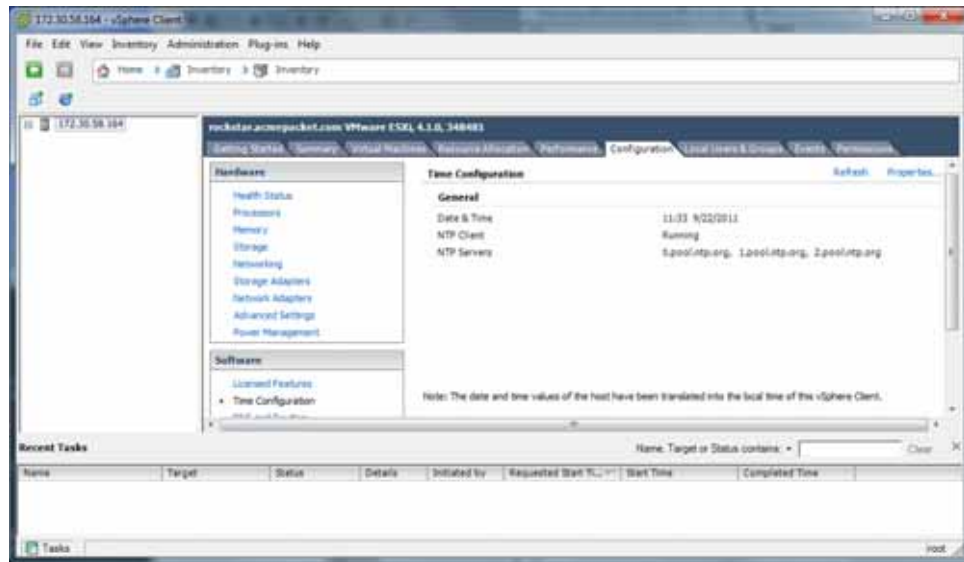
Configuring your vSphere ESXi Host

After installing your vSphere Client, you must configure the vSphere ESXi host's network time server. Use the procedures in this section to configure the network time server of your ESXi host.

Assigning Network Time Server

To assign a network time server:

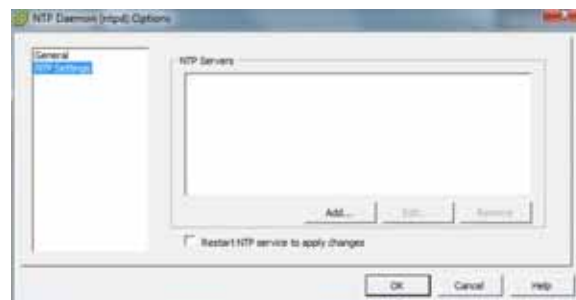
1. Open the vSphere Client and enter your username and password to login.
2. In the vSphere Client window, click the **Configuration** tab.



3. In the left column, under the Software category, click on **Time Configuration**.
4. In the upper right corner of the window, click on **Properties**. The following window displays.



5. Click on **Options**. The following window displays.



6. In the left column, click on **NTP Settings**.
7. Click **Add**. The following window displays.



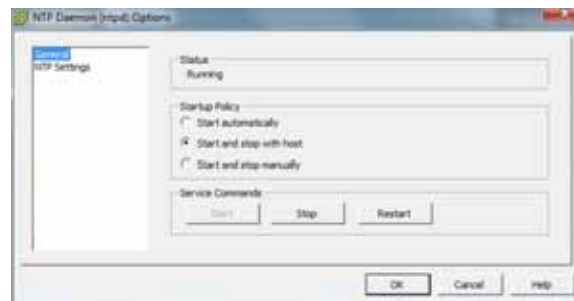
8. Add each of the following in the **Address** text box, clicking **OK** after each entry:

0.pool.ntp.org
 1.pool.ntp.org
 2.pool.ntp.org

The entries display in the NTP Servers box.



9. In the left column, click on **General**. The following window displays.



10. Click **Restart**.

Note: It is important that your CIS and RSS servers are assigned the same timezone.

You must now configure your local network using the procedures in Configuring the Local Network.

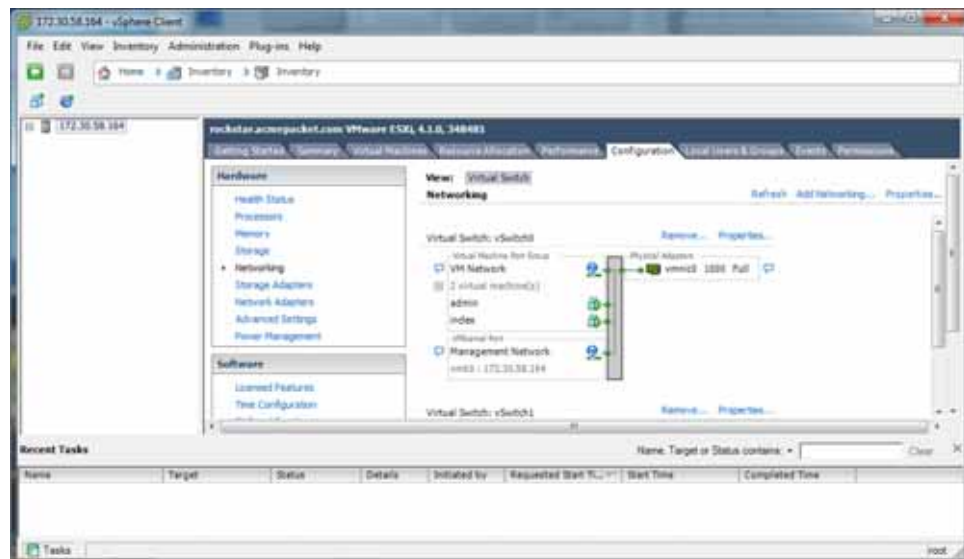
Configuring the Local Network

The Index and Dashboard virtual machines are part of the CIS installation. They communicate with each other over a private, internal network. This network is preconfigured to use the 169.254.1.x subnet. This section provides procedures for adding this local virtual network.

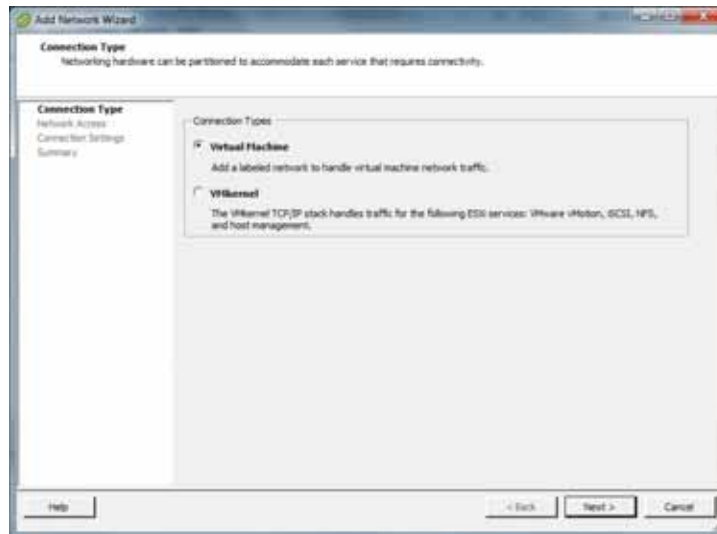
Note: If the 169.254.1.x network IP address range is already used in your environment, contact Acme Packet Support for assistance in modifying the CIS virtual machines.

To create and configure your local network:

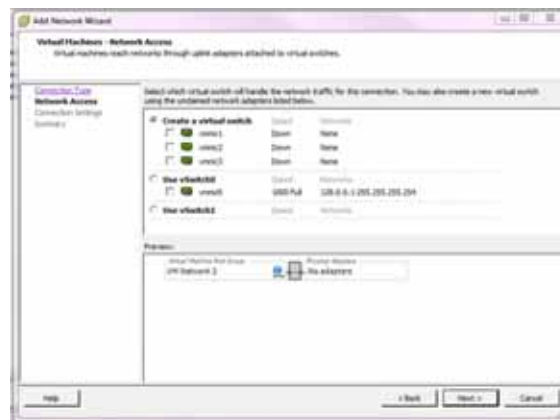
1. Open your vSphere Client and enter your username and password to login. The following window displays.



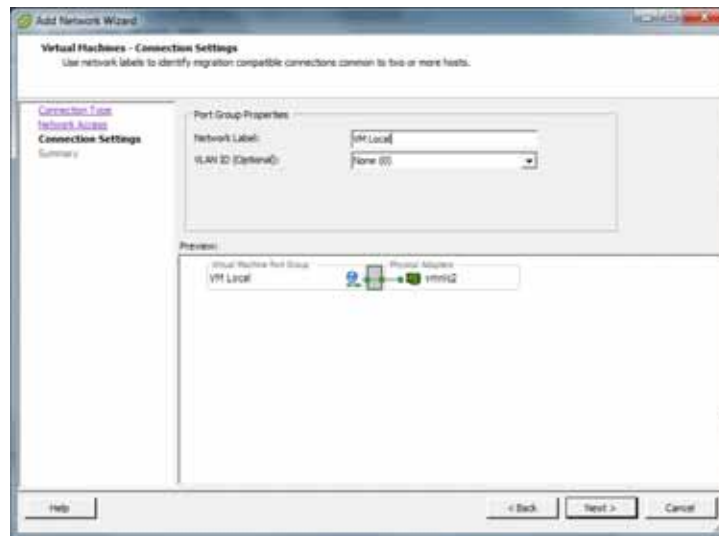
2. Click on the **Configuration** tab.
3. In the left column, under the Hardware category, click on **Networking**.
4. In the upper right corner of the window, click on **Add Networking**. The following window displays.



5. Click on the radio button for **Virtual Machine** and click **Next**. The following window displays.



6. The **Create a virtual switch** radio button is enabled by default. Make sure you leave this enabled. The virtual network you are creating is not affiliated with any of the physical network interfaces on your ESXi host.
7. Uncheck (disable) the “vnic1” adapter.
8. Click **Next**. The following window displays.



9. In the Port Group Properties section, enter a network label for this virtual switch in the **Network Label** text box. For example, VM Local.
10. The VLAN ID value is set as None(0). Do not change the default value in this field.
11. Click **Next**.

Click **Finish**.

The local virtual switch is now created.

If you have additional storage arrays uninstalled in your ESXi host, use the following section Adding Addition Storage Array to CIS to add them to the storage pool.

If you do not have additional drives, you must continue the NN-ISR installation process by installing the following virtual machines:

- Index (For more information, see NN-ISR Index.)
- Dashboard (For more information, see NN-ISR Dashboard.)

Adding Additional Storage Array to CIS

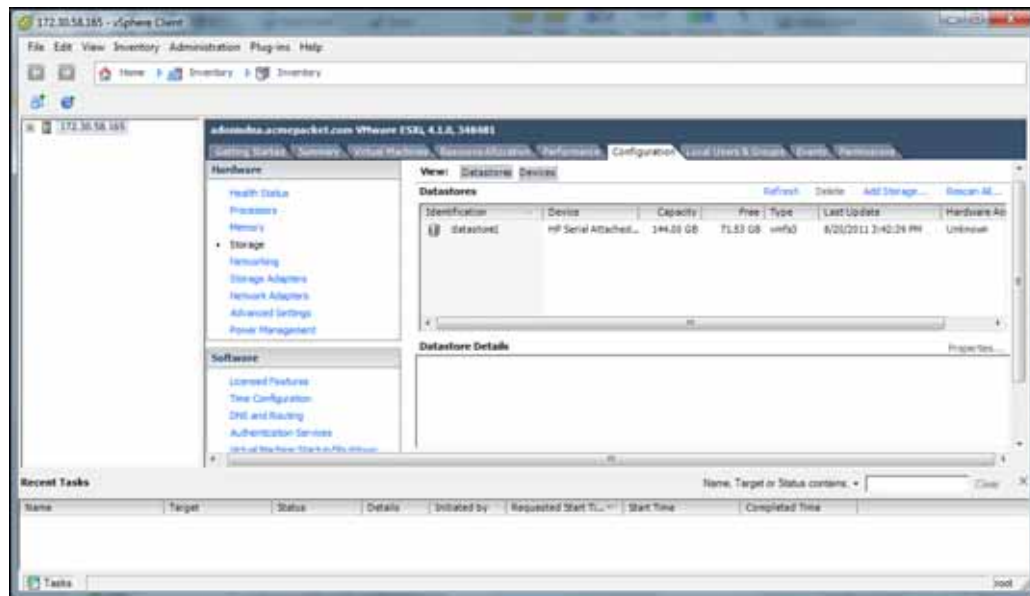
The certified hardware specifications for the CIS include four drives in a RAID configuration (see CIS and RSS Certified Hardware). The CIS uses these drives for database (Index) storage. This datastore must be added into the ESXi storage pool.

Use the procedures in this section to add the additional drive to the ESXi storage pool.

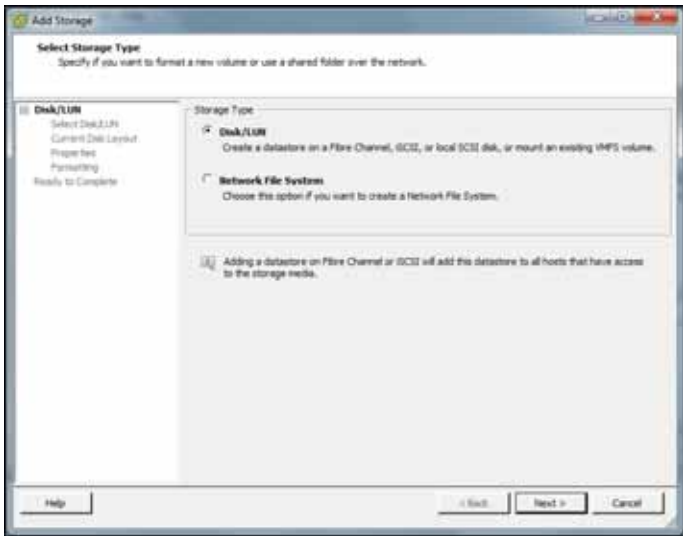
Adding the Datastore to the ESXi Storage Pool

Use the following procedure to add the datastore to the ESXi storage pool.

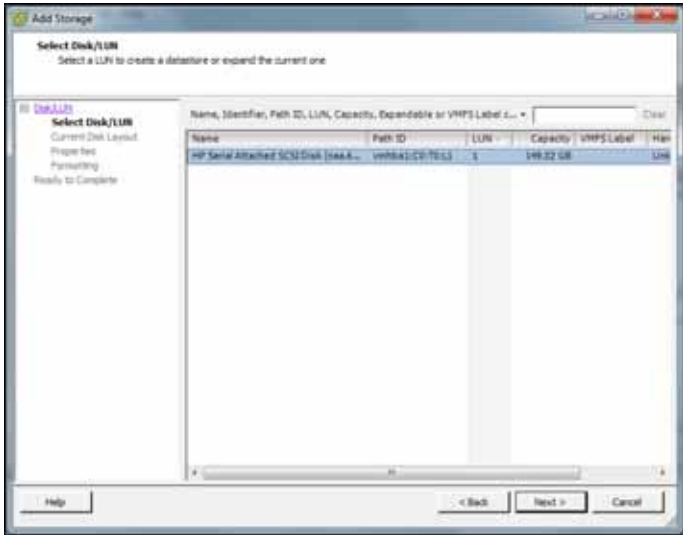
1. Open your vSphere Client and enter your username and password to login. The following window displays.



2. Click on the **Configuration** tab.
3. In the left column, under the “Hardware” category, click on **Storage**.
4. In the upper right corner of the window, click **Add Storage...** The following window displays.



5. Select **Disk/LUN** to create a datastore on the disk and click **Next**.

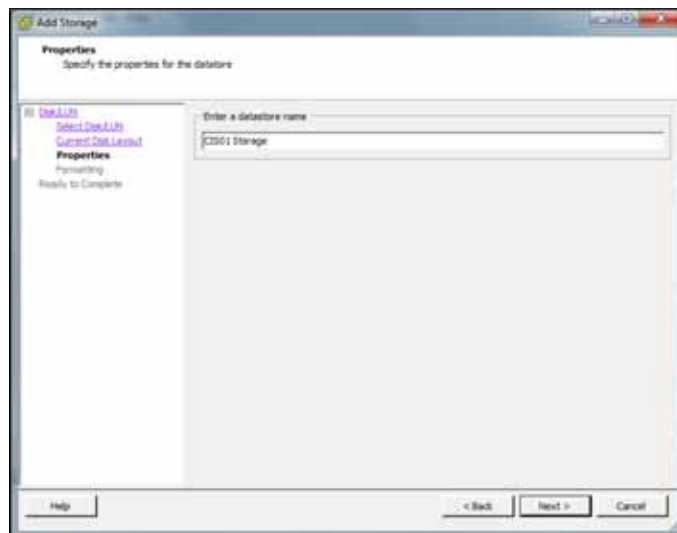


6. Select the drive and click **Next**.

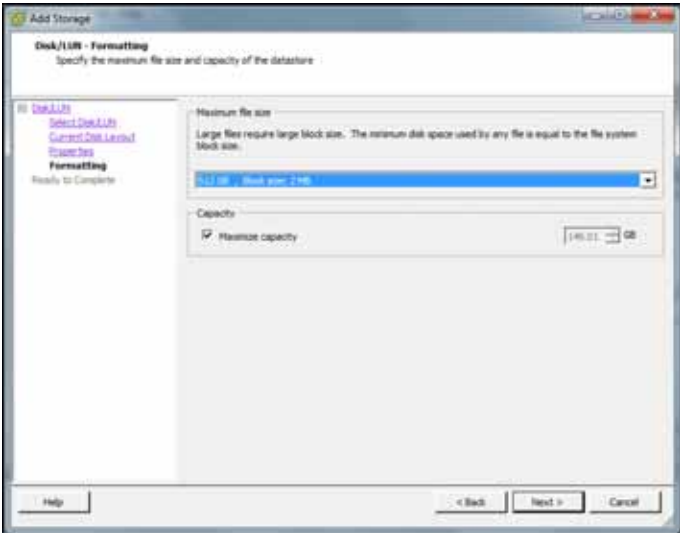


This window displays the storage device and the current disk layout.

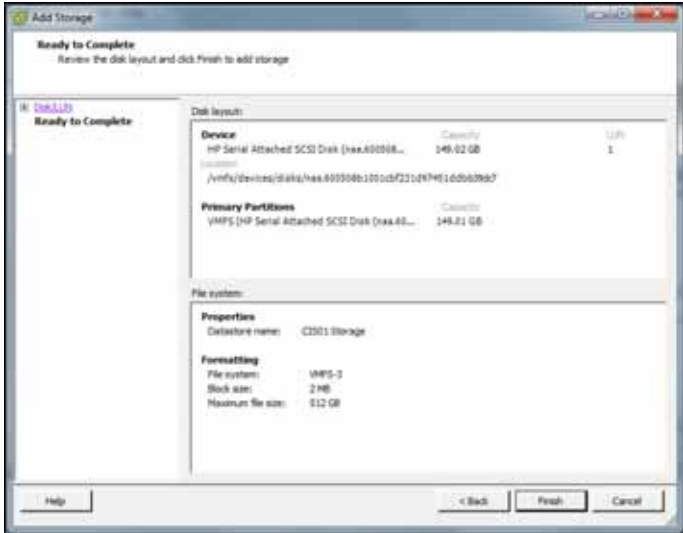
7. Click **Next** to add this device to the datastore.



8. In the **Enter a datastore name** field, specify a name for the storage area you are creating, and then click **Next**. For example, “CIS01 Storage”.



- 9. In the **Maximum file size** field, select **512 GB, Block size: 2MB**.
- 10. In the **Capacity** field, place a check mark in the **Maximize capacity** field, and click **Next**.

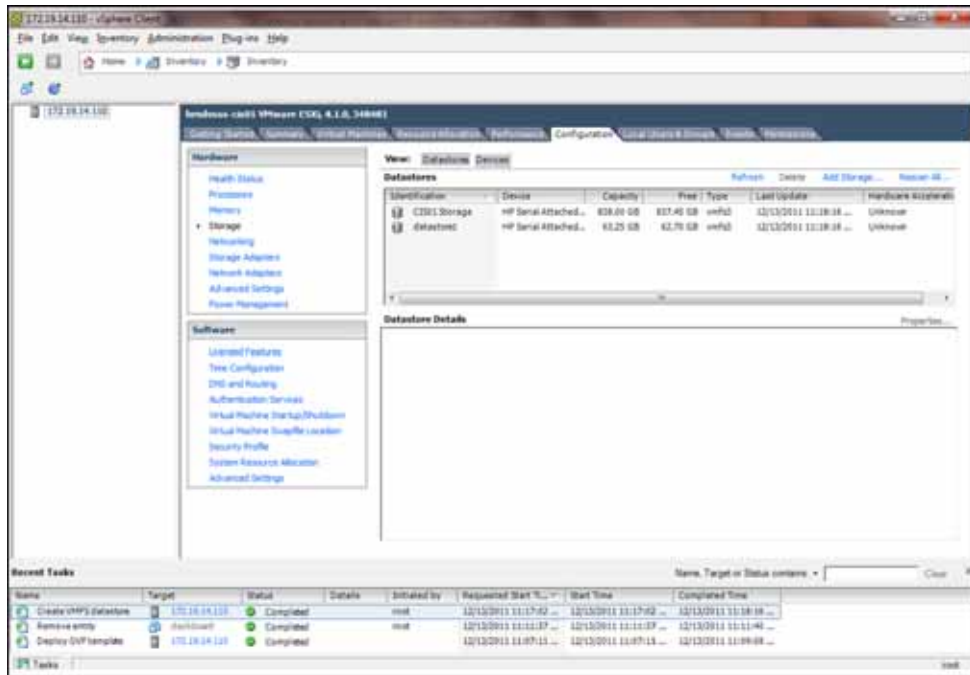


- 11. Review all information in the Ready to Complete window and click **Finish**.

A progress screen displays at the bottom of the window as the datastore is being added.

Name	Target	Status	Details	Initiated by	Requested Start Time	Start Time	Completed Time
Create VMFS datastore	172.25.194.110	In Progress		root	12/13/2011 11:17:02 ...	12/13/2011 11:17:02 ...	
Remove entity	localhost	Completed		root	12/13/2011 11:11:57 ...	12/13/2011 11:11:57 ...	12/13/2011 11:11:48 ...
Deploy OVF template	172.25.194.110	Completed			12/13/2011 11:07:11 ...	12/13/2011 11:07:11 ...	12/13/2011 11:09:08 ...

When adding the datastore process is complete, the datastore displays in the main storage window. For example, "CIS01 Storage" displays in the main window below.



If using CIS certified hardware, you can now install all Virtual Machines (VMs) to this datastore device. The device provides a larger datastore for the VMs.

Installing the NN-ISR Index

The NN-ISR Index is the component that stores the recording and management data for the NN-ISR RSS and NN-ISR Dashboard. This component uses the MySQL Server database application to store and retrieve data to/from the other NN-ISR components.

You can deploy the NN-ISR Index virtual machine (Index VM) using the procedures in this section.

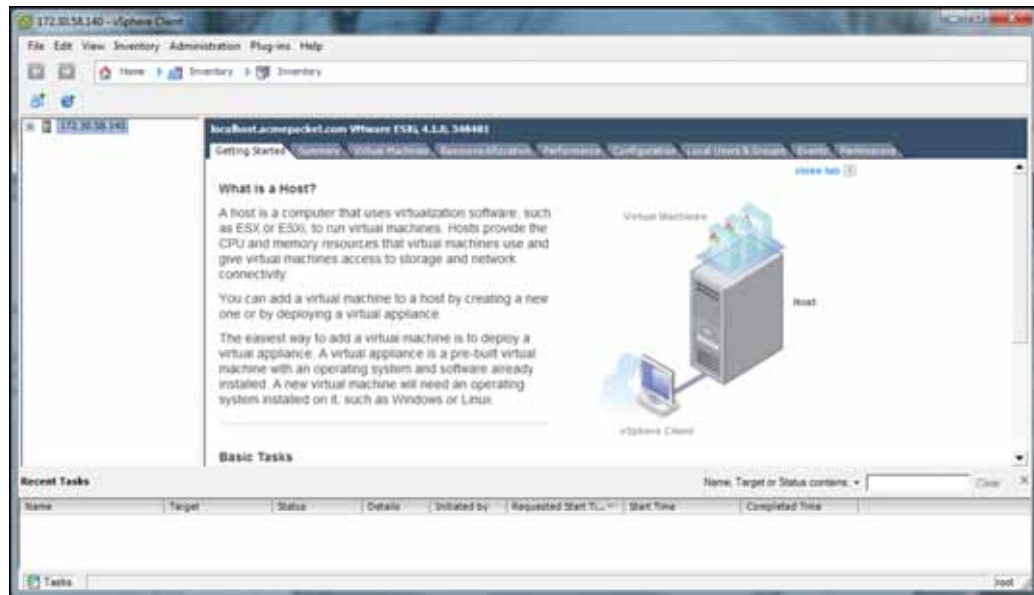
IMPORTANT: If you are using CIS certified hardware, install the “Index VM” onto the datastore you created in the section, Adding the Datastore to the ESXi Storage Pool.

Deploying the Index VM

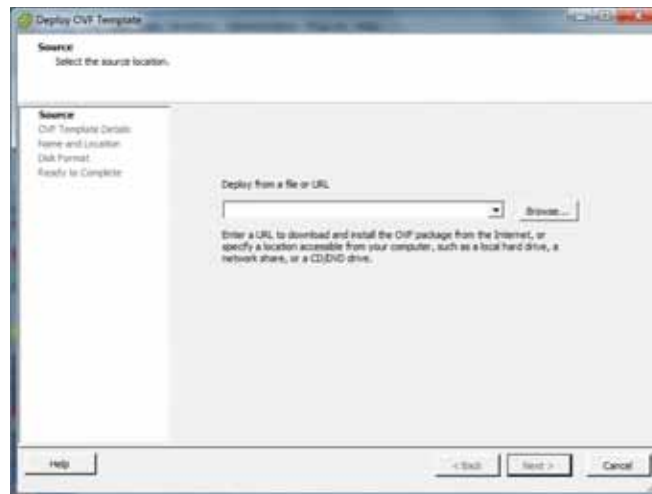
Once you configure your ESXi host and local network, you use the vSphere Client to deploy your virtual machines into that network. Use the following procedure to deploy the Index VM.

To deploy the index VM:

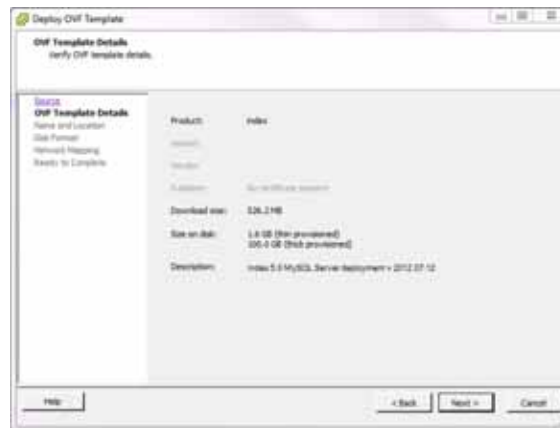
1. Open the vSphere Client application to the Home page.



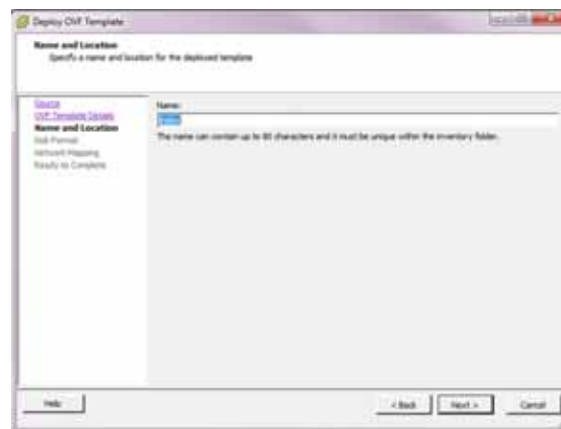
- From the Main Menu, select **File->Deploy OVF Template...** The following window displays.



- Click **Browse** and navigate to the directory where you have unzipped the Index VM.
- Select the **index** file and click **Open**. The following window displays.

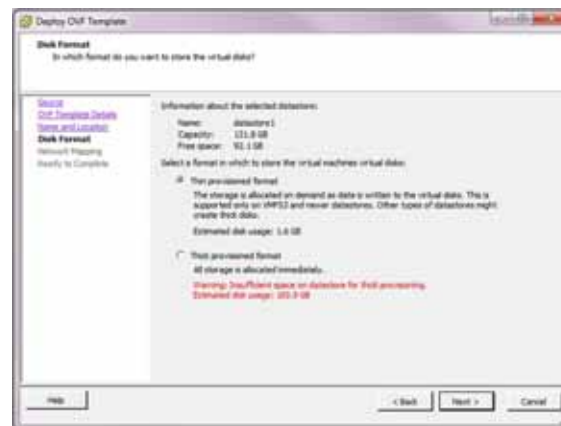


5. Click **Next** in the Deploy OVF Template window. The Name and Location window displays. This field is automatically populated with the name and location of the virtual machine you selected in Step 4.



Note: You are able to change this name if desired.

6. Click **Next**. The Disk Format window displays.



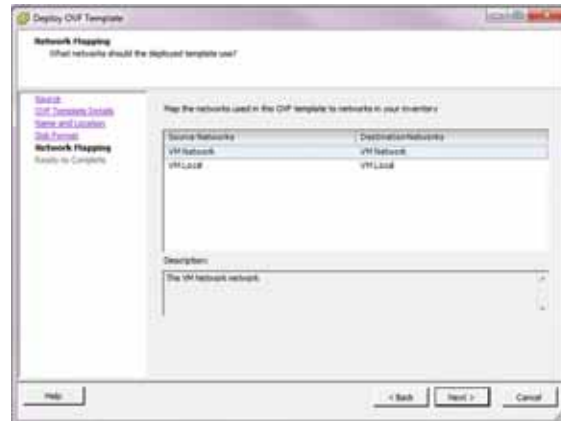
Note: If using CIS certified hardware, make sure the datastore name is the datastore you created in the section, Adding the Datastore to the ESXi Storage Pool. This datastore is larger to accommodate database growth.

7. Select **Thin provisioned format** and click **Next**. The Network Mapping window displays.

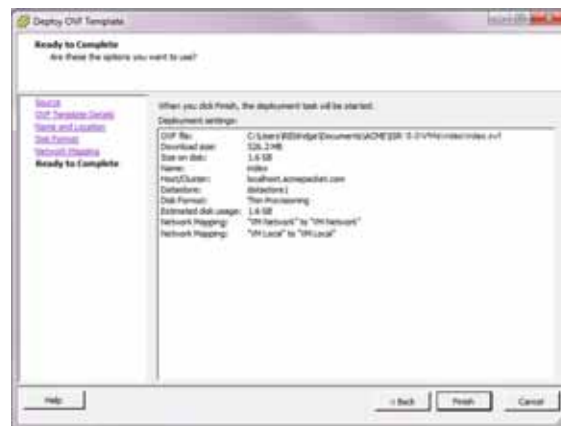
Network Mapping

The NN-ISR OVF's are defined with two network interfaces:

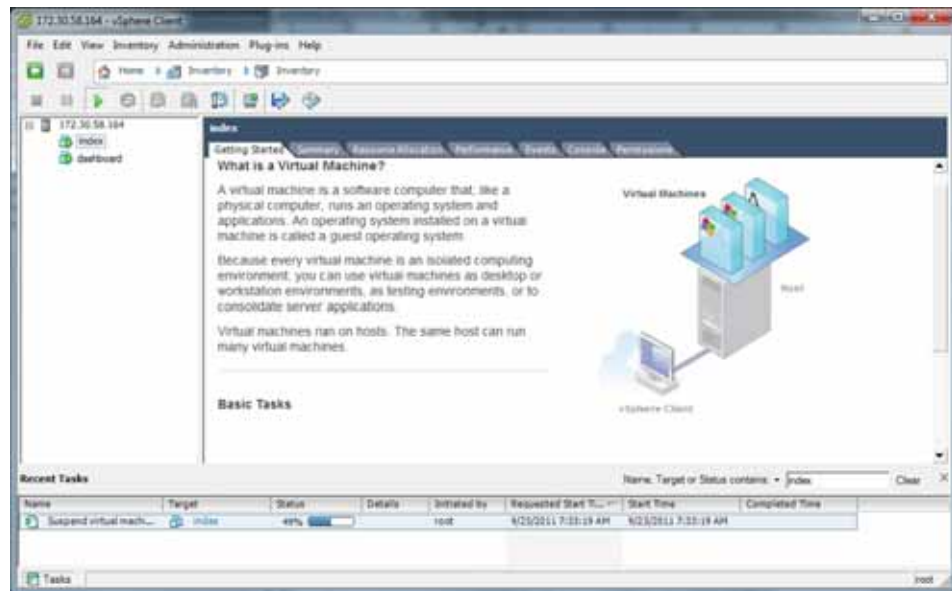
- VM Network—Physical interface for management
- VM Local—Virtual interface for intra-VM communication



8. Map the Source Network column to the Destination Network column if only one physical interface is configured on your ESXi host.
9. Map VM Local to the network you created in Configuring the Local Network.
10. Click **Next**. The following window displays.



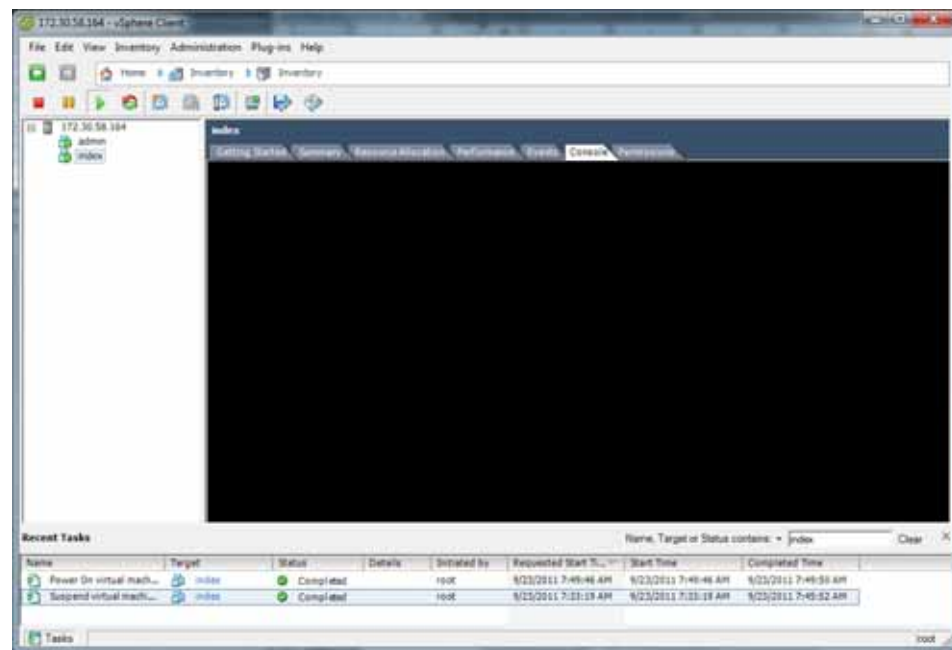
11. Review all selections in the Ready to Complete window and click **Finish**.
12. Click **OK** to close the Deploy OVF Template window. The following window displays.



13. In the left column, click on the Virtual Machine called "index".

14. Press the **Start/Play** icon to power ON the index virtual machine.

Configure the Index virtual machine network address using the procedures in Configuring the VM Network Addresses.



NN-ISR Dashboard

The NN-ISR Dashboard is a graphical user interface (GUI) you can use to manage and monitor audio recordings in your network. You can login to the Dashboard as an Administrator or User. The Dashboard allows you to:

- Add/edit/delete/view accounts
- Add/edit/delete/view routes (manage recording policies)
- Add/edit/delete realms
- View/search recordings
- Configure, manage, and monitor recording servers, archivers, and RSS configurations for each site
- Assign a user level to accounts (Super User, Account Administrator, Tenant Administrator, Tenant User)
- Run billing, usage, and system reports
- View active calls and call recordings
- Customize the personal NN-ISR Dashboard start page

Note: Specific functions listed above are dependant on your login status (Adminsitrator or User) and your assigned access level (Superuser, Account Administrator, Tenant Administrator, Tenant User).

For more information and procedures for using the NN-ISR Dashboard, see the *Net-Net Interactive Session Recorder Administrator Guide* or the *Net-Net Interactive Session Recorder User Guide*.

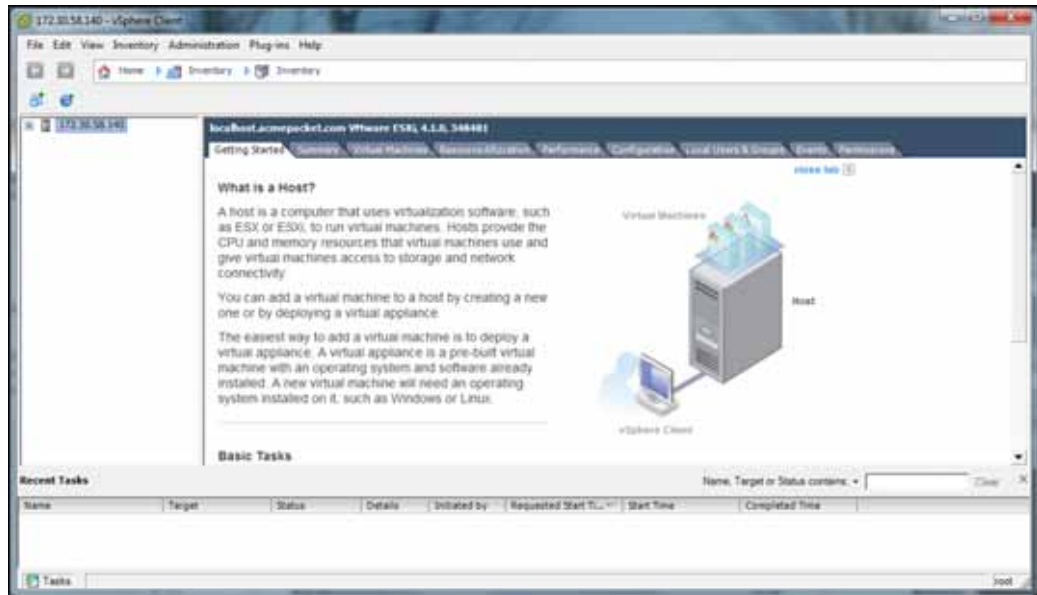
Deploying the Dashboard VM

The NN-ISR Dashboard VM is the component that provides an administrator and user access to the NN-ISR via a graphical user interface (GUI).

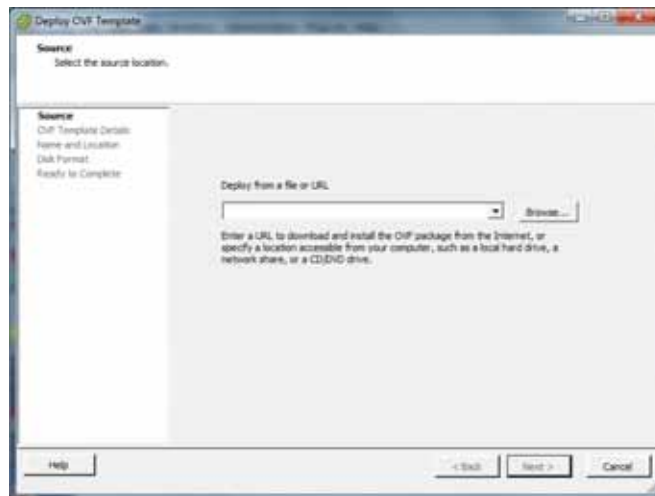
Once you configure your ESXi host and local network, you use the vSphere Client to deploy your virtual machines into that network. Use the following procedure to deploy the Dashboard VM.

To deploy the Dashboard VM:

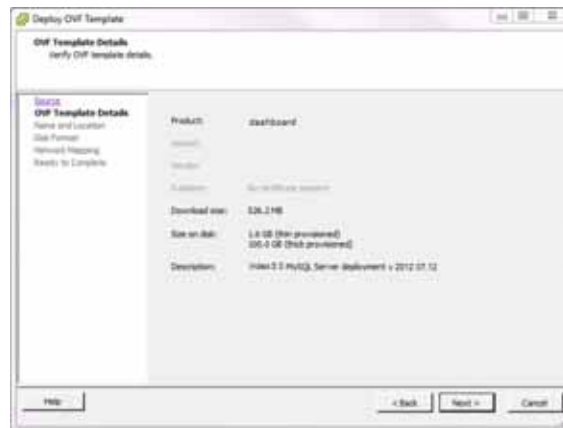
1. Open the vSphere Client application to the Home page.



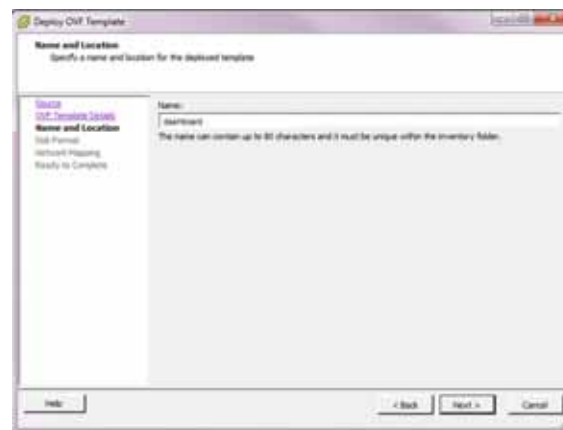
- From the Main Menu, select **File->Deploy OVF Template...** The following window displays.



- Click **Browse** and navigate to the directory where you have unzipped your dashboard VM.
- Select the dashboard file and click **Open**. The following window displays.

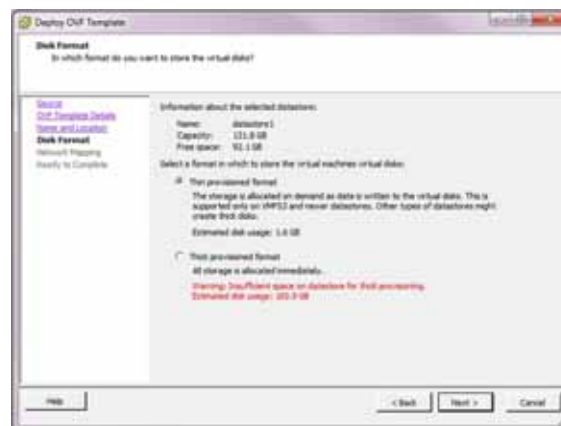


- Click **Next** in the Deploy OVF Template window. The Name and Location window displays. This field is automatically populated with the name and location of the virtual machine you selected in Step 4.

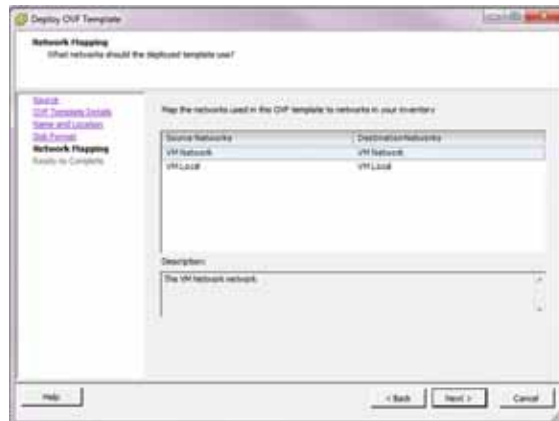


Note: You are able to change this name if desired.

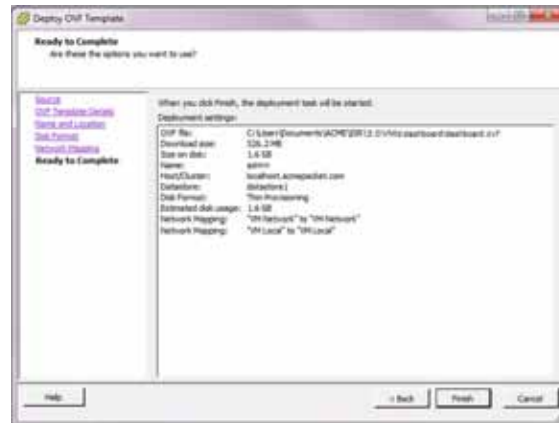
- Click **Next**. The Disk Format window displays.



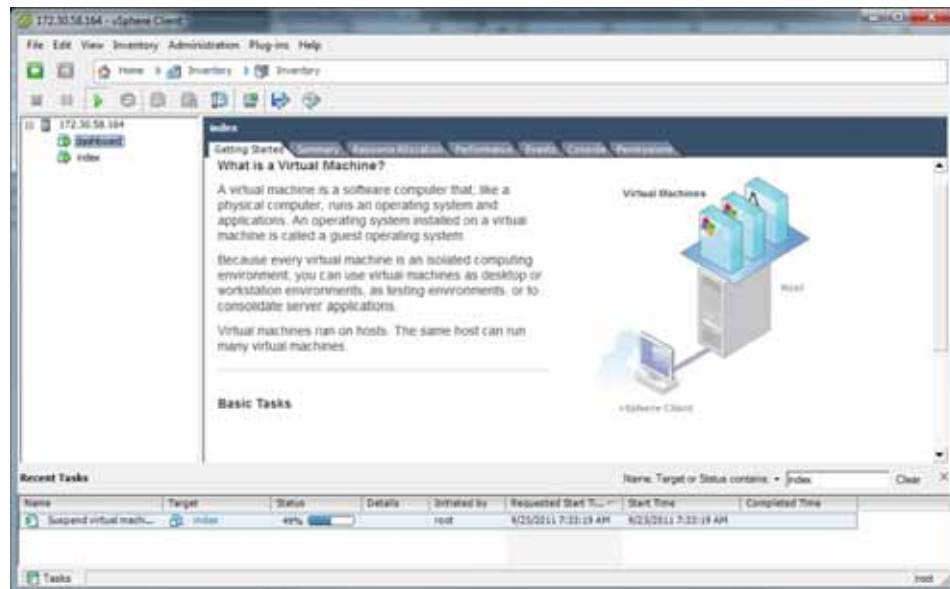
7. Select **Thin provisioned format** and click **Next**. The Network Mapping window displays.



8. Map the Source Network column to the Destination Network column if only one physical interface is configured on your ESXi host.
9. Map VM Local to the network you crated in Configuring the Local Network.
10. Click **Next**. The following window displays.



11. Review all selections in the Ready to Complete window and click **Finish**.
12. Click **OK** to close the Deploy OVF Template window. The following window displays.

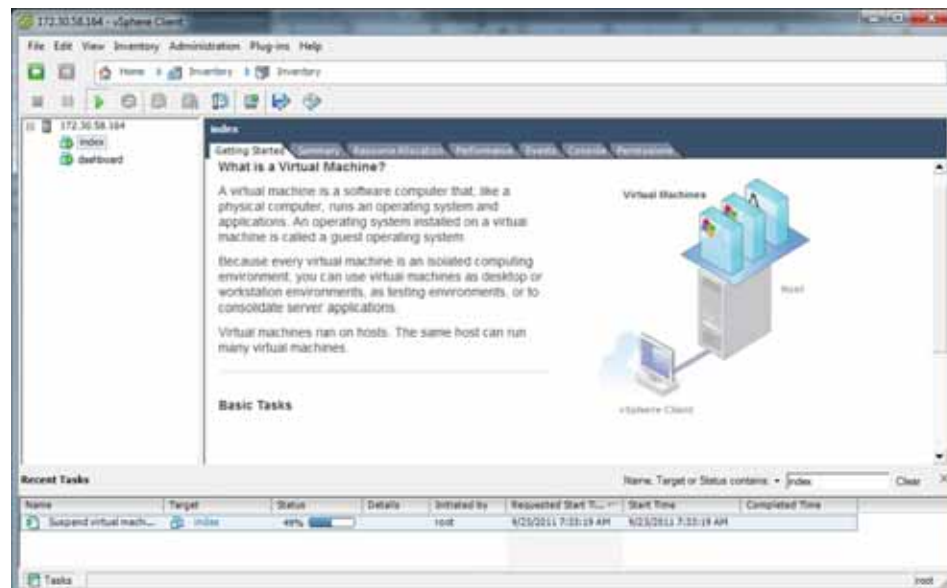


13. In the left column, click on the Virtual Machine called **dashboard**.
 14. Press the **Start/Play** icon to power ON the dashboardVM.
 15. To complete the Dashboard VM installation, configure the network address of the Dashboard VM using the procedure in Configuring the VM Network Addresses.
- When this step is complete, the Dashboard VM is installed and on the network.

Configuring the VM Network Addresses

Once you deploy a VM (Index, Dashboard), you must configure the network address of that virtual machine. Use the procedures in this section to configure the network address of each VM.

1. Open the vSphere Client application to the Home page.



2. Select a virtual machine in the left column for which you want to configure a network address, and then click on the **Console** tab.
3. Click in the main panel of this window. The following screen displays.
4. Press **Enter**.

Note: You must press **Enter** to refresh the screen after placing the cursor in the console window.

5. Your mouse is confined to the console panel. Press <Alt> + <Ctrl> to release it.

The following screen displays with the applicable VM prompt.



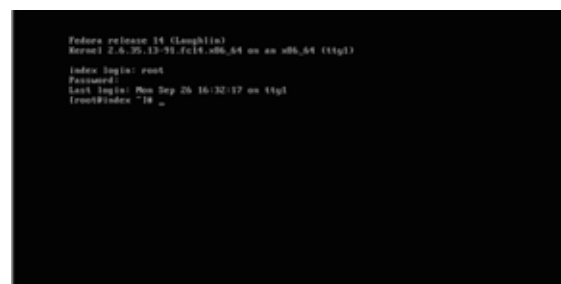
6. Log in to the VM with the following and press Enter:

```

<VM> Logi n: root
Password: 64^5377
    
```

Note: The root and password logins are the same on both VMs.

The following screen displays.



7. To set the IP address of the VM, enter the following at the prompt and press <Enter>:
vi /etc/sysconfi g/network-scri pts/1 fcfg-eth0
8. Press <i> to enter insert mode.
9. Using the arrow keys to navigate the file, edit the following lines:
 - IPADDR=<your index IP address>
or
IPADDR=<your dashboard IP address>
 - PREFIX=<subnet offset>
 - GATEWAY=default gateway
 - DNS1=DNS1
 - DNS2=DNS2

Note: If you do not have a DNS configured in your network, insert a “#” before the line. For example,

```
#DNS1=DNS1  
#DNS2=DNS2
```

10. Press <Esc>, then type **:wq**, and press Enter.
This saves your changes and displays the Index prompt.
11. To start the network services, enter the following and press Enter.
service network start
12. To enable network services to automatically start on reboot, enter the following and press Enter:
chkconfig network on
Configuring the network address of the VM is complete.
13. Repeat this process for the dashboard VM.

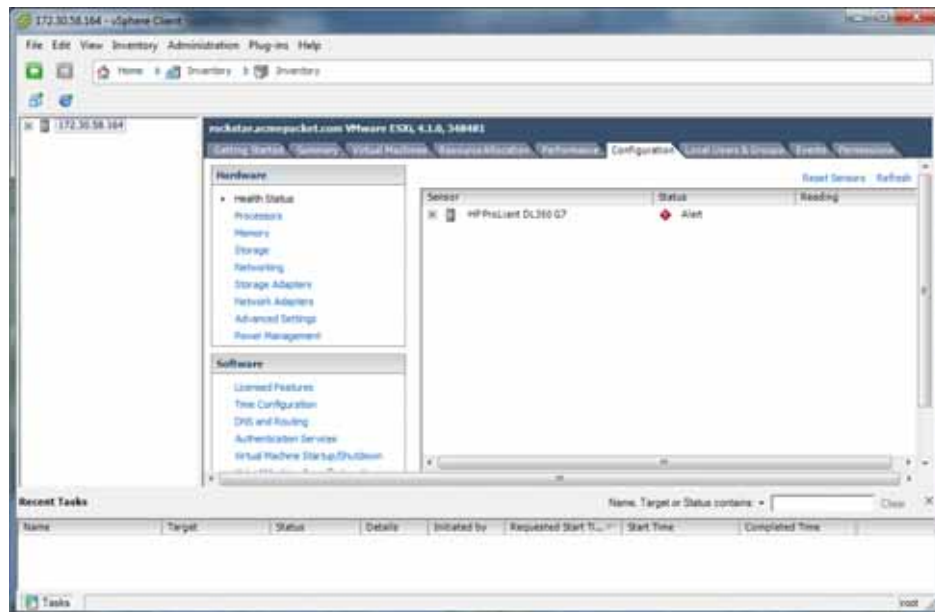
Configure Automatic Start of the VMs

When all CIS components are installed, you must configure the virtual machines to start automatically.

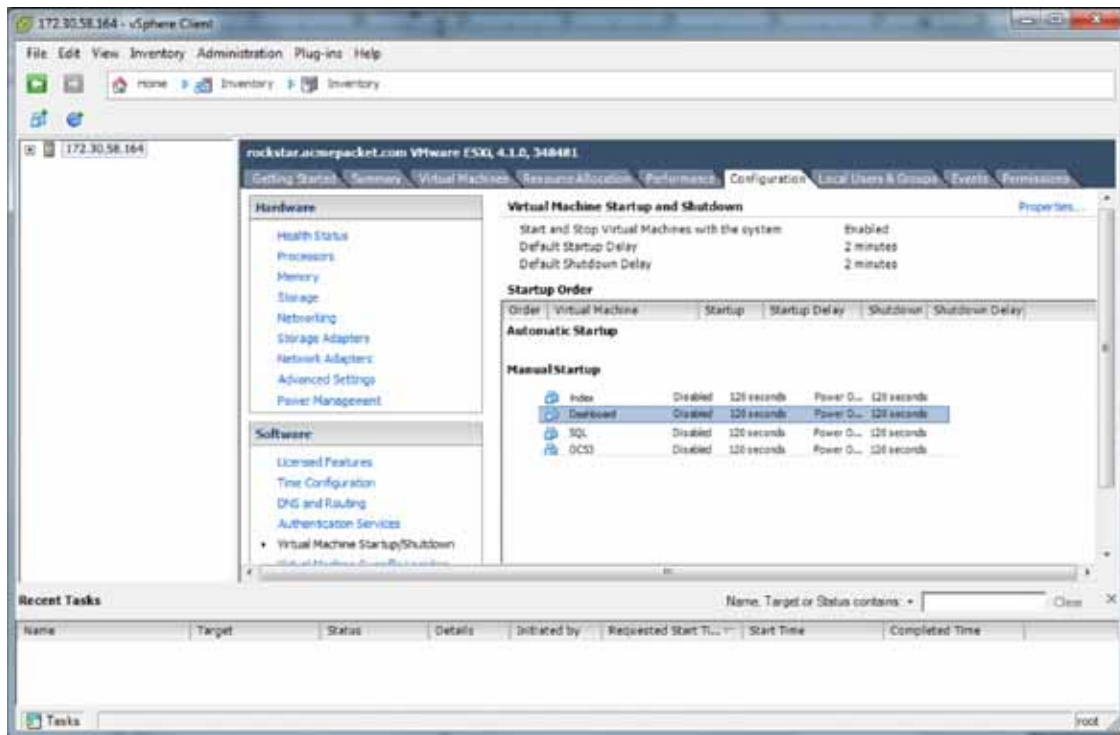
Use the following procedure to configure the virtual machines to start automatically.

To configure the VMs to start automatically:

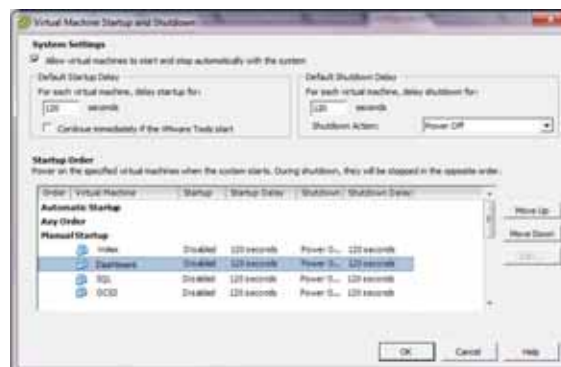
1. Open the vSphere Client application to the Home page.
2. Click on the **Configuration** tab.



3. In the left column, under the Software category, click on **Virtual Machine Startup/Shutdown**. The following screen displays.



- In the upper right corner of the window, click **Properties**. The following window displays:



- In System Settings section, enable the **Allow virtual machines to start and stop automatically with the system** by placing a check mark in the box.
- In the Startup Order section, select the **Index** entry and then click **<Move Up>** to include the index virtual machine in the Automatic Startup group.

Note: When moving the entry up in the window, continue to click **<Move Up>** until the entry is in the appropriate category.

- Select the **Dashboard** entry and then click **<Move Up>** to place the Dashboard VM just below the Index entry in the Automatic Startup group.
- Click **OK**. The window should display as follows.

Introduction

This section provides information and procedures for installing the RSS software for the NN-ISR.

What is RSS?

The RSS is a component of the NN-ISR under the control of the CIS, that records sessions and manages the call recording storage and archival processes. It selects, starts, and stops recordings using Web services APIs.

In the NN-ISR installation process, you install the RSS component after installing the CIS component.

Note: If you are going to install a 300GB CIS and/or RSS server, use the procedure in Appendix C, Installing RAID on the CIS and RSS Servers, to install RAID before attempting the CIS and RSS installation process.

Installing RSS

Use the procedures in this section to perform the following:

- Load RSS software
- Configure RSS Networking

Loading RSS Software

Use this procedure to load the software to your RSS server.

To load the software:

1. Insert USB flash drive containing the NN-ISR installer package into the USB port on your RSS server.

Note: You must use a 4G USB flash drive for the RSS to install properly.

2. Reboot the server.
3. During the BIOS load, select the option “Boot from the USB”.

Note: On an HP DL-360 system, press <F11>, and select Option 3. On some HP DL-360 systems, you may be required to press <F1> during the boot process, depending on the BIOS settings of the individual machines.

The RSS software proceeds to install. The RSS server reboots automatically.

Note: There is no interaction with the user during the install. The install deletes all data on the drive without prompting.

Warning: DO NOT REMOVE THE USB THUMB.

Proceed to Configuring RSS Networking to continue the installation and configuration.

Configuring RSS Networking

For RSS to operate properly, you must configure the RSS using the procedures in this section.

Before You Begin

The installation of the RSS requires you to access and use specific files/directory locations on your RSS server.

File/Directory	Description
/etc/hosts	Host information for RSS
/cxc/isrl.elf	RSS binary executable file
/cxc/vmgConfig.xml	RSS configuration file Note: See Appendix F, vmgConfig.xml Parameters for parameter descriptions.
/cxc/vmgLog.properties	RSS log file
/cxc/CDRLog.properties	Call Detail Record (CDR) log file
/cxc/converterl.elf	Media Converter (RMC) executable file
/cxc/converterLog.properties	Media Converter (RMC) log file
/cxc/converterConfig.xml	Media Converter (RMC) configuration file
/var/run/isr.pid	RSS process ID file used by the monitor/manager to identify NN-ISR processes and their states
/cxc_common/ISR/ISRLogs/ISR.log	NN-ISR log file
/cxc_common/ISR/ISRLogs/ISRService.log	NN-ISR Service Start/Stop service log file
/cxc_common/ISR/Recordings	Base of NN-ISR recordings storage
/cxc_common/ISR/CDR	Base of NN-ISR CDR log storage
/usr/local/jboss-4.0.2/server/default/log/server.log	JBOSS Application Server Log file
/cxc_common/ISR/ApiLog/IsrApi.log	RSS REST: VXML API log file
/cxc_common/ISR/Archiver/ArchivalService.log	NN-ISR Archiver Service log file

Configure Primary Network Interface

To configure primary network interface:

1. After installing the NN-ISR, your system reboots and performs an RSA key generation.

Note: It is safe to ignore the message “Unable to determine the product from Unknown”.

2. When booting is complete (after RSA key generation), press <Enter> to display the login prompt.
3. At the **Login as** prompt, enter **root** and press <Enter>.
Login as: **root**

The password prompt displays.

4. At the **Password** prompt, enter **sips** and press <Enter>.
root@<hostname>'s password> **si ps**

The following prompt and message display.

```
Net-Net ISR
Copyright (c) 2004-2012 Acme Packet Inc.
Username:
```

5. No username is required so press <Enter>.
Username: (leave blank)

The password prompt displays.

6. No password is required so press <Enter>.
Password: (leave blank)

The following message displays followed by the NN-ISR hostname prompt.
“Access granted since there are no configured users.”

```
NN-ISR>
```

7. Enter **show ethernet** and press <Enter> to list the available Ethernet devices.
NN-ISR> **show ethernet**

If an empty device list displays, you must re-install the network interface controller (NIC) software. Perform Step 6 and 7. If the list contains ethernet devices, skip Step 8 and 9 and go to Step 10.

```

NN-ISR> exit
NN-ISR> show ethernet
name link          speed duplex autoneg
-----
NN-ISR>

```

8. Enter **install nic** and press <Enter>.


```
NN-ISR> install nic
```
9. Enter **show ethernet** and press <Enter> to list the available Ethernet devices.


```
NN-ISR> show ethernet
```

A list of Ethernet devices available on the NN-ISR display.

```
bdier / # exit
exit
NN-ISR>show ethernet

name link      speed duplex autoneg
----
eth0 up        1Gb   full   enabled
eth1 down                enabled
NN-ISR>
```

10. Enter **config setup** and press <Enter>.


```
NN-ISR> config setup
```

The Set box\hostname” prompt displays.

11. Enter the hostname of your RSS and press <Enter>. For example, “RSS01”.


```
Set box\hostname: RSS01
```

The “Config box\interface” prompt displays.

Note: Configure the ethernet adapter as the same one displayed when the **show ethernet** command was executed. This is usually eth0.

12. Enter **eth0** as the Ethernet port you want to configure and press <Enter>.


```
Config box\interface: eth0
```

The “Set box\interface eth0\ip a\ip-address” prompt displays.

13. Enter the IP address of the NN-ISR followed by the local-link designation and press <Enter>. For example, 172.45.3.4/16.


```
Set box\interface eth0\ip a\ip-address: 172.45.3.4/16
```

Note: You must supply the local-link designation with the IP address (i.e., /16). Other local-link designation formats from RFC 5735 are supported, if required.

The “Set box\interface eth0\ip a\ ssh” prompt displays.

14. Enter **Y** to allow Secure Shell access to the NN-ISR and press <Enter>.


```
Set box\interface eth0\ip a\ssh [y|n]: y
```

The “Set box\interface eth0\ip a\ web” prompt displays.

15. Enter **Y** to allow Web access to the NN-ISR and press <Enter>.


```
Set box\interface eth0\ip a\web [y|n]: y
```

The “Set box\interface eth0\ip a\ routing\route” prompt displays.

16. Specify **admin** or any other LAN designation and press <Enter>.

```
Set box\interface eth0\ip a\routing\route: admin
```

Note: The name specified here has no impact on functionality. It is a descriptor only.

The “Set box\interface eth0\ip a\ gateway” prompt displays.

17. Enter the IP address for the network default gateway and press <Enter>. For example, 172.45.0.1.

```
Set box\interface eth0\ip a\gateway: 172. 45. 0. 1
```

The “Set box\cli\ prompt” prompt displays.

18. Enter the command line interface (CLI) prompt that you want to display when using the CLI (or enter the hostname) , and press <Enter>. For example, RSS01.

```
Set box\cli \prompt: RSS01
```

The “Commit these changes” prompt displays.

19. Enter **Y** and press <Enter>.

```
Commi t these changes [y|n]: y
```

The “Update the config and continue” prompt displays.

20. Enter **Y** and press <Enter>.

```
Update the confi g and conti nue [y|n]: y
```

The “NN-ISR>” prompt displays.

21. Remove the USB flash drive from the USB port on your RSS server.

Note: This USB flash drive can now be used as a backup rescue drive for the RSS. The network configuration you just performed is saved to your RSS server as well as to the flash drive.

22. After the NN-ISR has restarted, at the “login as” prompt, enter **root** and press <Enter>.

```
logi n as: root
```

The password prompt displays.

23. At the “Password” prompt, enter “**sips**” and press <Enter>.

```
root@<hostname>' s password> si ps
```

The following prompt and message display.

```
Net-Net OS-E
```

```
Copyri ght (c) 2004-2012 Acme Packet Inc.
```

```
Username:
```

24. No username is required so press <Enter>.

```
Username: (l eave bl ank)
```

The password prompt displays.

25. No password is required so press <Enter>.

```
Password: (l eave bl ank)
```

The following message displays followed by the NN-ISR hostname prompt.
“Access granted since there are no configured users.”

```
NN-ISR>
```

Configure a Media network interface card (NIC) for the RSS server using the procedures in Configuring Media NIC.

Configuring Media NIC

After configuring the primary network interface on the RSS server, proceed with the following steps to configure your media network interface card (NIC).

To configure the media NIC:

After completing Step 26 in the previous procedure, the NN-ISR prompt displays.

26. Enter **config box** and press <Enter>.

```
NN-ISR> config box
```

The “Config box” prompt displays.

27. Enter **config interface eth1** to configure the Ethernet 1 port on the NN-ISR, and press <Enter>.

```
Config box> config interface eth1
```

The “Config interface eth1” prompt displays.

28. Enter **config ip media** to configure the Media NIC on the NN-ISR, and press <Enter>.

```
Config interface eth1> config ip media
```

The “Config ip media” prompt displays.

29. Enter **set ip-address static <<IP address>/<link designation>>** to set the static IP address and link designation on the NN-ISR, and press <Enter>.

```
Config ip media> set ip-address static <10.10.248.15/24>
```

The “Config ip media” prompt displays.

30. Enter **show** to show the current configuration of Ethernet 1 on the NN-ISR, and press <Enter>.

```
Config ip media> show
```

The following displays to the screen:

```
Box
  Interface eth1
    Ip media
    ...
  Admin enabled
    Ip-address static <10.10.248.15>/24
    ...
Config ip media>
```

31. Enter **exit** and press <Enter>.

```
Config ip media> exit
```

A prompt displays asking if you want to commit your changes.

32. Enter **Y** and press <Enter>.

```
Do you want to commit your changes before you exit [y|n]> y
```

A prompt displays asking if you want to update the startup configuration.

33. Enter **Y** and press <Enter>.

```
Do you want to update the startup configuration [y|n]> y
```

The “NN-ISR>” prompt displays.

Finalize NN-ISR Configuration

After configuring the media NIC on the RSS server, proceed with the following steps to finalize your NN-ISR configuration.

To finalize the NN-ISR configuration:

After completing Step 34 in the previous procedure, the NN-ISR prompt displays.

34. Enter **show processes** to verify the NN-ISR is up and running.

```
NN-I SR> show processes
```

The **show processes** command displays statistics for all active processes. The following is an example of this command's output.

process	i d	condi ti on	run-level	starts	uptime	fds
moni tor	6217	runni ng	7	1	0 days 19: 01: 06	17
manager	6410	runni ng	7	1	0 days 19: 01: 06	39
web	6678	runni ng	7	3	0 days 18: 55: 39	156
WS	0	i dl e	i ni t	0	0 days 00: 00: 00	0
SSH	6676	runni ng	none	2	0 days 18: 55: 39	4
ISR	6443	runni ng	none	5	0 days 18: 55: 41	12
RMC	4721	runni ng	none	1	4 days 23: 26: 08	5

The following table identifies each column in this display.

Column	Description
Process	Current active process on the NN-ISR.
ID	Temporary ID assigned to the current process. Note: The process ID changes each time you initiate the "restart process isr" command.
Condition	Current status of the process.
Run-Level	State of the process after reboot. NN-ISR should be set to "none" because it is managed by manager process above.
Starts	Number of times the process has started since the server was booted. Uptime changes on every restart.
Uptime	Current amount of time that the process has been up and running. Note: The "Uptime" is a timer so the "0" indicates the process has restarted. Any number higher than zero (0) indicates how long the process has been up and running since the last restart.
FDS	File descriptors

35. Next, configure the *IsrApi.war* file using the procedures in Configure IsrApi.war File.

Configure IsrApi.war File

36. At the NN-ISR prompt, enter **shell** to start a shell session.

```
NN-I SR> shel l
```

```

10.130.38 - PuTTY
login as: root
root@10.1.30.38's password:
Net-Net OS-E
Copyright (c) 2004-2010 Acme Packet Inc.
username:
password:
Access granted since there are no configured users
NN-ISR>
NN-ISR>show ethernet

name link      speed duplex autoneg
---- ----      -
eth0 up        1Gb  full  enabled
eth1 down      1Gb  full  enabled
NN-ISR>shell
bdier app_slot_1 #

```

37. Open the *ISRApi.war* file, by entering the following at the prompt and press <Enter>:
`<hostname> # vi /usr/local/Jboss-4.0.2/server/default/deploy/ISRApi.war/WEB-INF/web.xml`
38. Enter **i** to initiate the insert mode.
39. Edit the DB host string to point to the IP address of the Index VM:
 - 39a. On line 13 of the web.xml file, replace the following:
 Default:
`jdbc:mysql://localhost/ipcr-db`
 with
`jdbc:mysql://172.16.30.22/ipcr-db`
 where 172.16.30.22 is the IP address configured in the procedure Deploying the Index VM.
40. Press <Esc>, then type **:wq**, and press <Enter> to save the changes and close the file.
41. Enter **exit** to end the shell. The “NN-ISR>” prompt displays.
42. Next, configure the *ArchiverConfig.xml* file using the procedures in Configure the ArchiverConfig.xml File.

Configure the ArchiverConfig.xml File

43. At the NN-ISR prompt, enter **shell** to start a shell session.
 NN-ISR> **shell**


```

10.1.30.38 - PuTTY
login as: root
root@10.1.30.38's password:

Net-Met OS-E
Copyright (c) 2004-2018 Acme Packet, Inc.

Username:
password:

Access granted since there are no configured users

NN-ISR>
NN-ISR>show ethernet

name  link      speed duplex autoneg
-----
eth0  up        1Gb   full  enabled
eth1  down          full  enabled

NN-ISR>shell
root@10.1.30.38:~#

```

44. Open the *ArchiverConfig.xml* file by entering the following at the prompt, and press <Enter>:
 <hostname> # vi /usr/local/jboss-4.0.2/bin/ArchiverConfig.xml
45. Enter **i** to initiate the insert mode.

```

Archiver>
<!-- Database settings here -->
<database>
  <type>MySQL</type>
  <driver>com.mysql.jdbc.Driver</driver>
  <url>jdbc:mysql://localhost/ipcr_db</url>
  <username>ipcr_archiver</username>
  <password>n3wf0und</password>
</database>

<!-- Archived Directory Dated structure, true|false, true if this param
is missing -->
<archivedDirDateStructured>true</archivedDirDateStructured>
<!-- implemented at database -->
<!-- <archiverThreadNumber>10</archiverThreadNumber> -->
</Archiver>
i

```

46. Edit the DB host string to point to the IP address of the Index VM:
 - 46a. On line 13 of the web.xml file, replace the following:

Default:
jdbc:mysql://localhost/ipcr-db

with

jdbc:mysql://172.16.30.22/ipcr-db

where 172.16.30.22 is the IP address configured in the procedure Deploying the Index VM.
47. Press <Esc>, then type “:wq”, and press <Enter> to save the changes and close the file.
48. Enter **exit** to end the shell. The “NN-ISR>” prompt displays.
49. Next, configure the timezone on the RSS to be the same as the timezone on the CIS using the procedures in Configuring the Timezone.

Note: You can adjust the ArchiverCron Schedule by editing the *IPCRArchiver.sar* file. For more information, see Appendix D, CIS FAQs and Additional Information.

Configuring the Timezone

After finalizing the NN-ISR configuration, you must configure the timezone on the RSS to be the same as the timezone on the CIS. Use the following procedure to configure the timezone.

To configure the timezone:

50. At the NN-ISR> prompt, enter **config box** and press <Enter>.

```
NN-ISR> config box
```

The “config box” prompt displays.

51. Enter **set timezone ?** and press <Enter>.

```
config box> set timezone ?
```

Adding the **?** at the end of the command, displays a list of timezone locations for you to review.

Timezone	ACLI Value
Alaska	Alaska
Aleution	Aleution
Arizona	Arizona
Central	Central
Indiana	Indiana
Eastern	Eastern
Hawaii	Hawaii
Starke	Starke
Michigan	Michigan
Mountain	Mountain
Pacific	Pacific
Samoa	Samoa
GMT	GMT
GMT-plus-1	GMT+1
GMT-plus-2	GMT+2
GMT-plus-3	GMT+3
GMT-plus-4	GMT+4
GMT-plus-5	GMT+5
GMT-plus-6	GMT+6
GMT-plus-7	GMT+7
GMT-plus-8	GMT+8
GMT-plus-9	GMT+9
GMT-plus-10	GMT+10
GMT-plus-11	GMT+11

Timezone	ACLI Value
GMT-plus-12	GMT+12
GMT-minus-1	GMT-1
GMT-minus-2	GMT-2
GMT-minus-3	GMT-3
GMT-minus-4	GMT-4
GMT-minus-5	GMT-5
GMT-minus-6	GMT-6
GMT-minus-7	GMT-7
GMT-minus-8	GMT-8
GMT-minus-9	GMT-9
GMT-minus-10	GMT-10
GMT-minus-11	GMT-11
GMT-minus-12	GMT-12

52. Determine which timezone the NN-ISR is located in and enter the ACLI value from the table above, and then press <Enter>.

```
confi g box> set timezone Eastern
```

The “config box” prompt displays.

To verify the setting for the timezone, enter **show** and press <Enter>.

```
confi g box> show
```

The following is an example of the output for the show command.

```
box
admin enabled
hostname NN_ISR
timezone Eastern
name
description Acme Packet Net-Net ISR
contact
location
interface eth0
cli
confi g box>
```

53. Enter **commit** and press <Enter>.

```
confi g box> commi t
```

The “config” prompt displays.

54. Enter **exit** and press <Enter>.

```
confi g> exi t
```

The “Do you want to update the startup configuration?” prompt displays.

55. Enter **Y** and press <Enter>.

```
Do you want to update the startup configuration (y or n)? y
NN-ISR>
```

The “NN-ISR>” prompt displays.

The timezone is now configured.

Configure the Network Time Protocol (NTP) services for the RSS server using the procedures in Configuring NTP Services.

Configuring NTP Services

After configuring the timezone, you must configure the NTP services. Use the following procedure to configure the NTP services.

To configure the NTP services:

56. At the NN-ISR> prompt, enter **config box** and press <Enter>.
 NN-ISR> **config box ntp-client**

The “config cluster” prompt displays.

57. Enter **set server <NTP server IP address>**, which is your NTP server, and press <Enter>.
 config ntp-client> **set server 150.214.94.5**

The “config ntp-client” prompt displays.

To add multiple NTP servers, run **set server** for each server you are adding.

58. Enter **show** to verify that the server was set to the correct IP address, and press <Enter>.
 config ntp-client> **show**

The following is an example of the show command output.

```
box
ntp-client
admin enabled
server[1] 150.214.94.5
poll-interval 10 minutes
```

59. Enter **commit** to save the NTP configuration, and press <Enter>.
 config ntp-client> **commit**

The “config” prompt displays.

60. Enter **exit** to exit the configuration container, and press <Enter>.
 config> **exit**

The following prompt displays:

Do you want to update the startup configuration (y or n)?

61. Enter **y** to update the startup configuration with the NTP services you specified, and press <Enter>.
 Do you want to update the startup configuration (y or n)? **y**

The “NN-ISR>” prompt displays. The installation of the RSS is complete.

Applying RSS License

This section provides the information and procedures for applying an RSS license.

The RSS is licensed for two sessions by default. For additional capacity, you must acquire and apply a license file. This file is generated by Acme Packet and provided, via email, when the order is filled. If you do not have your license file or you have questions on the session capacity, please contact your Acme Packet sales representative or installation engineer.

The license file must be named *VoIPMediaGateway.lic*, and the name **IS** case sensitive. If you are licensing multiple RSS servers, the license files may be named with the server MAC address when provided. You must rename these license files to *VoIPMediaGateway.lic* for the files to correctly apply to the RSS.

To apply the RSS license:

This procedure assumes the use of the Open Source Secure FTP (SFTP) Client application called FileZilla, but you can use any FTP client that supports SFTP.

1. Open an FTP client.
2. In the **Host** field, enter the RSS management IP address. For example,
Host: **172.30.58.16**
3. In the **Port** field, enter **22**. For example,
Port: **22**
4. In the **Username** and **Password** fields, enter **root** and **sips**, respectively. For example,
Username: **root**
Password: **slps**

The license file is stored in the */exc* directory of the RSS. When you connect via FTP (or SSH) you are in the */exc* directory.

5. Copy the license file from your local machine to the RSS using the FTP application.
6. Using an SSH Client, login to the NN-ISR by entering **root** at the “Login as” prompt, and press <Enter>.
Logi n as: **root**

The password prompt displays.

7. At the “Password” prompt, enter **sips** and press <Enter>.
root@<hostname>'s password> **slps**

The following prompt and message display.

```
Net-Net OS-E
Copyright (c) 2004-2012 Acme Packet Inc.
Username:
```

8. No username is required so press <Enter>.
Username: (l eave bl ank)

The password prompt displays.

9. No password is required so press <Enter>.
Password: (l eave bl ank)

The following message displays followed by the NN-ISR hostname prompt.
“Access granted since there are no configured users.”

NN-ISR>

10. At the “<Hostname>#” prompt, enter **restart process isr** and press <Enter>.


```
<NN-ISR> # restart process isr
```

Note: The “restart process isr” restarts the NN-ISR and allows the RSS to read the new license information immediately.

Warning: The “restart process isr” command terminates all calls in progress and should not be used on a production system with live calls.

Verify RSS License Applied

You can use either of two methods to verify that the RSS license was applied to the NN-ISR:

- Viewing through the NN-ISR Dashboard (at the path *Admin->Manage Sites-><edit a Site>*).
- Viewing in the NN-ISR log file (at the path */cxc_common/ISR/ISRLogs/ISR.log*)

Using the NN-ISR Log File

To verify the RSS license is applied:

11. While still logged in after applying the license, enter **shell** from the prompt to get into the Linux shell.
12. Enter **cd /cxc_common/ISR/ISRLogs** and press <Enter>.

The “cxc_common/ISR/ISRLogs” prompt displays.

Enter “**cat ISR.log**” and press <Enter>.

```
/cxc_common/ISR/ISRLogs> cat ISR.log
```

The following is an example of the ISR.log contents.

```
12/14/2011 23:21:32[NOTICE] mi xMaster: Starting 50 Media Channels...
12/14/2011 23:21:32[ INFO] mi xMaster: Initializing Channel 1/50
```

The “*Starting 50 Media Channels*” in the above example indicates there are 50 sessions licensed on the RSS. If the number of sessions is correct, this indicates the RSS license was installed successfully.

Proceed to Post-Install Verification and Configuration to verify connectivity between the CIS and RSS and all components, and to make your first call.

Applying Converter License

The NN-ISR platform handles sessions containing G.729 media and the recording and playback of these sessions using a media converter (RMC). This RMC is automatically installed when performing the CIS/RSS installations. However, in order for you to use RMC on the NN-ISR, you must purchase the RMC license. Contact your Acme Packet sales representative for more information about obtaining the RMC license.

The NN-ISR RMC is a converter that converts incoming G.729 recordings from Real-Time Transport Protocol (RTP) packet data (“.rpdd” formatted files) to Pulse Code Modulation (PCM) wave files (“.wav” formatted files), for playback by the NN-ISR Dashboard. It allows the NN-ISR to accept calls from a G.729 codec. In order for you to use RMC on the NN-ISR, you must purchase the RMC license. Contact your Acme Packet sales representative for more information about obtaining the RMC license. For more information about the RMC converter, see Appendix E, NN-ISR RMC.

This section provides information for applying the RMC converter license to the NN-ISR.

To apply the converter license:

Note: This procedure assumes you have just configured the *converterConfig.xml* file using the procedure in Configure *converterConfig.xml* File and the NN-ISR> prompt displays.

1. At the NN-ISR prompt, enter a shell session by entering “**shell**” and press <Enter>.


```
NN-ISR> shell
```

The hostname prompt displays.

```
<hostname> #
```

2. Enter “**ifconfig**”, and press <Enter>.


```
<hostname> # ifconfig
```

The following is an example of the “ifconfig” output:

```
eth0      Link encap: Ethernet  HWaddr 3C: 4A: 92: F5: 9B: C4
          inet
addr: 172.30.58.141  Bcast: 172.30.255.255  Mask: 255.255.0.0
          UP BROADCAST RUNNING MULTICAST  MTU: 1500  Metric: 1
          RX packets: 184074 errors: 0 dropped: 0 overruns: 0 frame: 0
          TX packets: 34402 errors: 0 dropped: 0 overruns: 0 carrier: 0
          collisions: 0 txqueuelen: 1000
          RX bytes: 20765532 (19.8 Mb)  TX bytes: 3099950 (2.9 Mb)
          Interrupt: 30 Memory: f4000000-f4012800
```

3. Make a note of the “**HWaddr**” in the “ifconfig” command output. This is the MAC address of the NN-ISR.
4. Contact your Acme Packet sales representative to acquire an RMC converter license. You must provide the following information when requesting a license:
 - System name
 - Number of ports
 - Production or Development license
 - License expiration (Development licenses only)
 - Product name (converter with G.729 for standard NN-ISR RSS hosts)

After receiving the license key, transfer the key to the RSS host’s filesystem using either of the following methods:

Using a UNIX Shell Session

1. At the hostname prompt in a shell session, enter the following and press <Enter>:

```
<hostname> # scp converter.lic root@<hostname>: /cxc/
```

The password prompt displays.

2. Enter your password and press <Enter>.

```
Password # *****
```

The license key file proceeds to copy to the RSS host's filesystem.
3. Enter **“restart process rmc”** and press <Enter>.

```
<hostname> # restart process rmc
```

Note: The “restart process rmc” restarts the RMC converter and allows the RSS to read the converter license information immediately.

Warning: The “restart process rmc” command terminates all conversions currently in progress.

4. Verify that the converter license file was installed by viewing the NN-ISR log files.

Using a USB Flash Drive

1. Copy the license key to the USB flash drive.
2. Insert the USB flash drive into a USB port on the RSS host system.
3. Go to your shell session you opened in Steps 1-6.
4. Locate the USB flash drive on your system by entering the following and press <Enter>:

```
<hostname> # dmesg | tail -15
```

The following displays:

```
Device scan complete.  
Sda: sda1 sda2
```

Sda1 should be the applicable USB device (first device scanned by your system and found).

5. Mount the USB device to the local filesystem by entering the following (assumes sda1 is the USB device), and press <Enter>:

```
<hostname> # mount -t vfat /dev/sda1 /mnt/usb
```
6. Enter the following and press <Enter>:

```
<hostname> # ls /mnt/usb
```

This displays a list that shows the “*converter.lic*” file.

7. Copy the license file to the RSS host's filesystem:

```
<hostname> # cp /mnt/usb/converter.lic /cxc/
```
8. Enter **“restart process rmc”** and press <Enter>.

```
<hostname> # restart process rmc
```

Note: The “restart process rmc” restarts the RMC converter and allows the RSS to read the converter license information immediately.

Warning: The “restart process rmc” command terminates all conversions currently in progress.

9. Verify that the converter license file was installed by viewing the NN-ISR log files.
10. If you copied the converter license file using the USB flash drive, unmount/eject the drive by entering the following, and press <Enter>:
`<hostname> # umount /mnt/usb`

Physically remove the USB flash drive from the USB port on your system.

Introduction

This section provides information and procedures for post-install verification and configuration. It includes verifying connectivity between the CIS and RSS and testing the call recording functionality of the NN-ISR. It also includes required NN-ISR configuration that must be performed before making the first call.

Verifying Connectivity Between the RSS and the Index VM

When installation of the RSS and Index VM are complete, you can test the connectivity between these components to verify they are working properly. Procedures in this section include:

- Testing connectivity between the RSS and Index VM
- Logging into the dashboard

Testing Connectivity

Use the following procedure to test connectivity between the RSS and Index VM.

To test connectivity:

1. After rebooting the NN-ISR, press <Enter> to display the login prompt.
2. At the “Login as” prompt, enter “**root**” and press <Enter>.
Logi n as: **root**

The password prompt displays.

3. At the “Password” prompt, enter “**sips**” and press <Enter>.
root@<hostname>' s password> **si ps**

The following prompt and message display.

```
Net-Net OS-E  
Copyright (c) 2004-2012 Acme Packet Inc.  
Username:
```

4. No username is required so press <Enter>.
Username: (l eave bl ank)

The password prompt displays.

5. No password is required so press <Enter>.
Password: (l eave bl ank)

The following message displays followed by the NN-ISR hostname prompt.
“*Access granted since there are no configured users.*”

```
NN-ISR>
```

- At the NN-ISR prompt, enter “**shell**” to open a shell session, and press <Enter>.

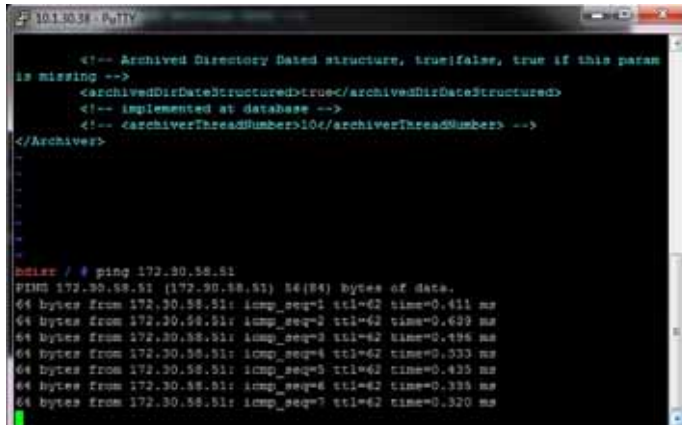
```
NN-ISR> shell
```

The “<hostname> #” prompt displays.

- Enter **ping index_vm_ip** and press <Enter>.

```
hostname # ping index_vm_ip
```

The following is an example of the screen that displays.



You can complete the connectivity verification by logging into the dashboard using the procedures in LogginInto NN-ISR Dashboard.

Logging Into NN-ISR Dashboard

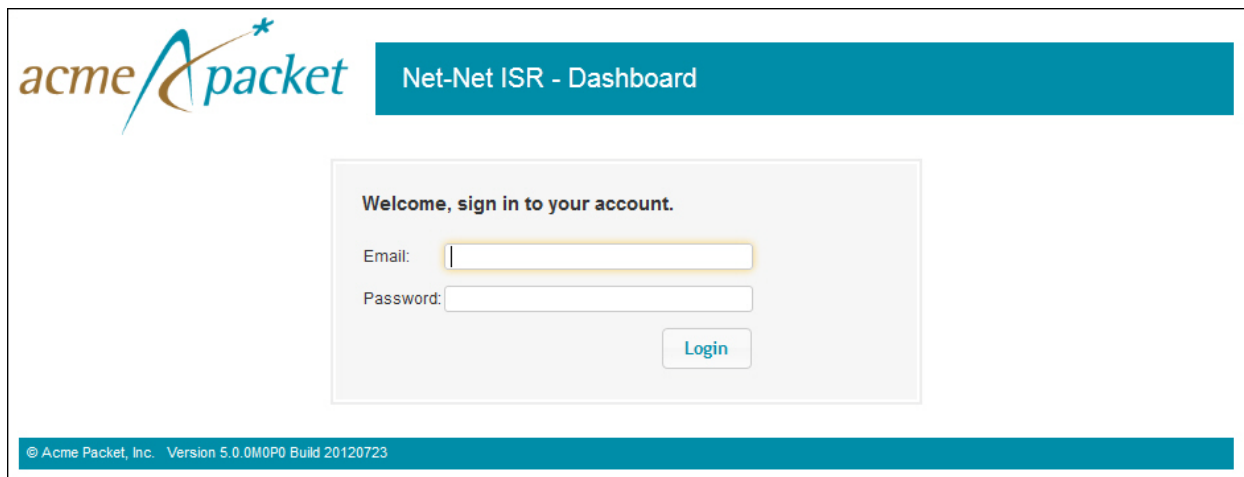
Use the following procedures to verify the adminstrator dashboard is working properly.

To log into the Dashboard:

- Open your Internet Web browser.
- Enter the IP address of the NN-ISR dashboard. For example:

```
ht tp://172.54.66.7
```

The Login page displays.



- Enter your email and password, respectively, in the “**Email**” and “**Password**” fields.

The default user name and password are:

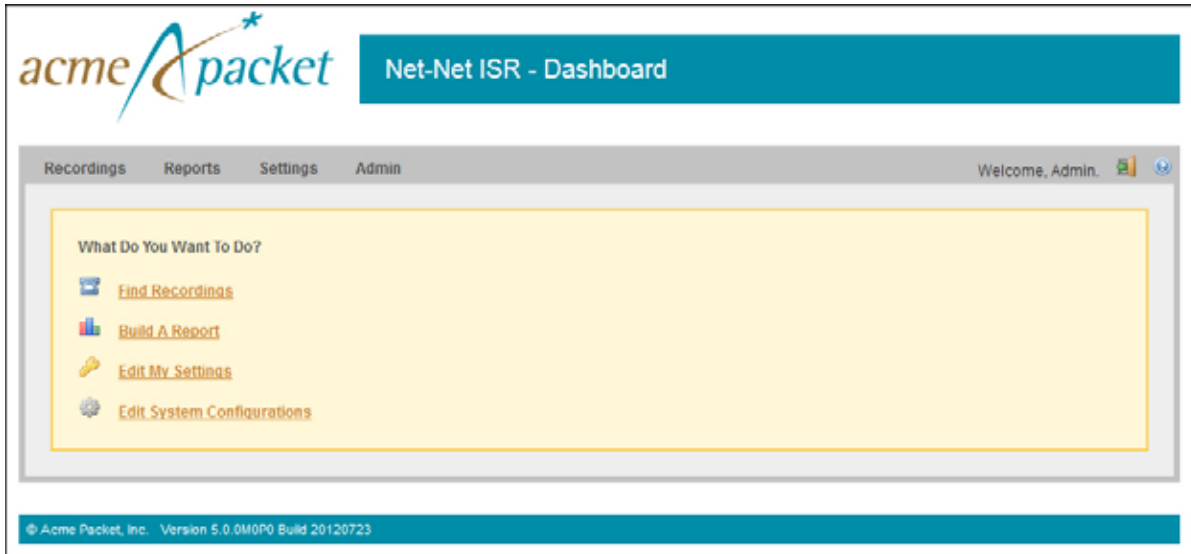
User name: isradmin@acmepacket.com

Password: admin123

The system prompts you to change your password on initial login and then again every 45 days.









4. Respond to the prompts as applicable to change your password.








After changing your password, the following page displays.



Navigation Icons

The NN-ISR Dashboard provides specific navigation tools you can use to perform functions when required. The following table identifies these tools.

Icon	Description
	Add - Adds an item to the list (for example, +Add New).
	Delete - Removes the item from the list.
	Details - Shows additional information about the item.
	Back - Navigates to the previous screen.
	Forward - Navigates to the next screen.
	Play - Plays the specific ".wav" file recording stored in the NN-ISR database.
	Download - Downloads the selected recording to your PC or local server.
	User Audit Trail - Display the selected user's audit trail (Action performed, time, IP address, etc.)

Icon	Description
	RSS Details - Displays and allows you to edit RSS details and advanced configuration information about a Site.
	Enabled - Status that indicates the element is enabled or active.
	Disabled - Status that indicates the element is disabled or inactive.
	Error - Status that indicates an error occurred on the element.
	Session Agent Events - Displays the events associated with a Session Agent.
	Help - Displays information about online Technical Support.
	Logoff - Exits from the NN-ISR Dashboard.

For more information about using the features and functions of the NN-ISR dashboard, see the *Net-Net Interactive Session Recorder Administrator Guide* or the *Net-Net Interactive Session Recorder User Guide*.

Before you can make the first call, you must configure the RSS and the route to use to receive the call. Use the procedures in *Configuring the NN-ISR for Recording a Call* to configure the RSS and route.

Configuring the NN-ISR for Recording a Call

You can place a call to verify that the NN-ISR call recording functionality is working properly. Before you can place a call, you must configure the following on the NN-ISR:

- Add a new site for the RSS server
- Add a new RSS to the site
- Add a Session Agent (phone or device to receive the call from the NN-ISR)
- Add a Route

Add Site for RSS Server

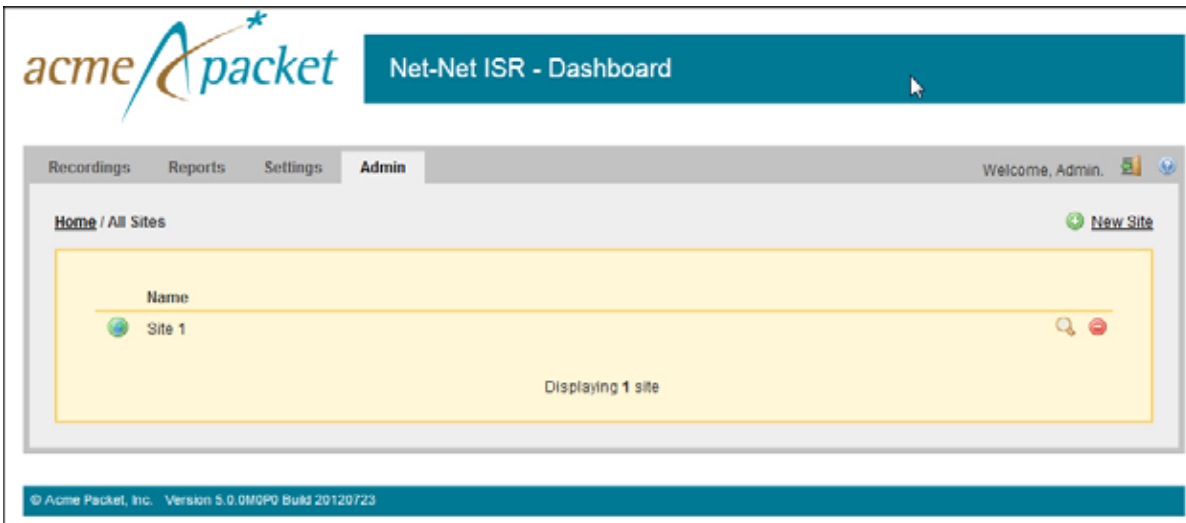
To verify that the RSS and the dashboard are communicating, you must add a new site for the RSS server. Use the following procedure to add a new site.

To add a site:

1. From the Main Menu, click **Admin**.
The following page displays.

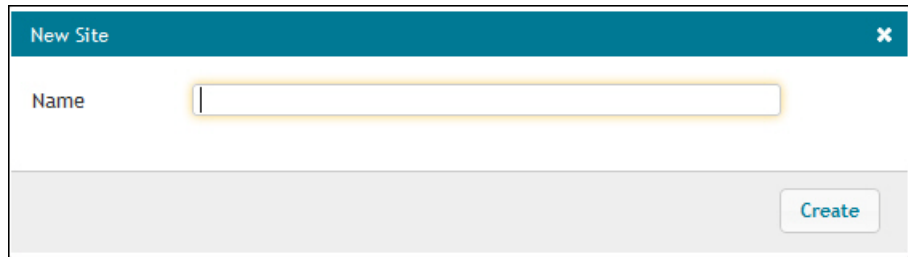


2. Click **Manage Sites**.
The following page displays.



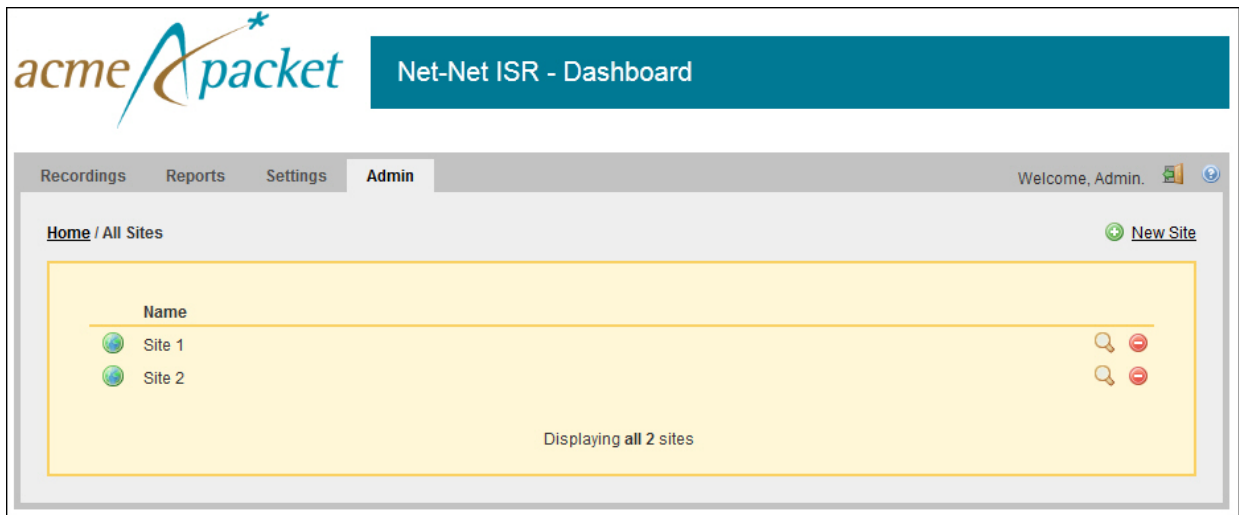
3. Click **New Site**.

The following dialog box displays.



4. In the **Name** field, enter a name for the Site and click **Create**. Valid values are alphanumeric characters.

The new site displays on the Sites page.




For additional information about Sites, see the *Net-Net Interactive Session Recorder Administrator Guide*.

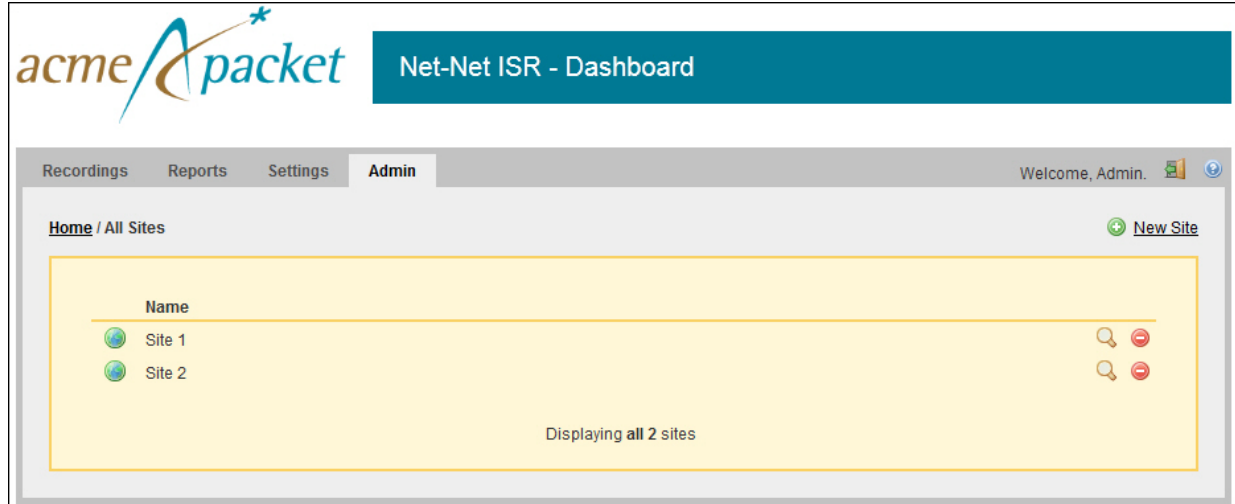
Note: Each RSS should be contained in its own site, regardless of physical location.

Add the RSS to a Site

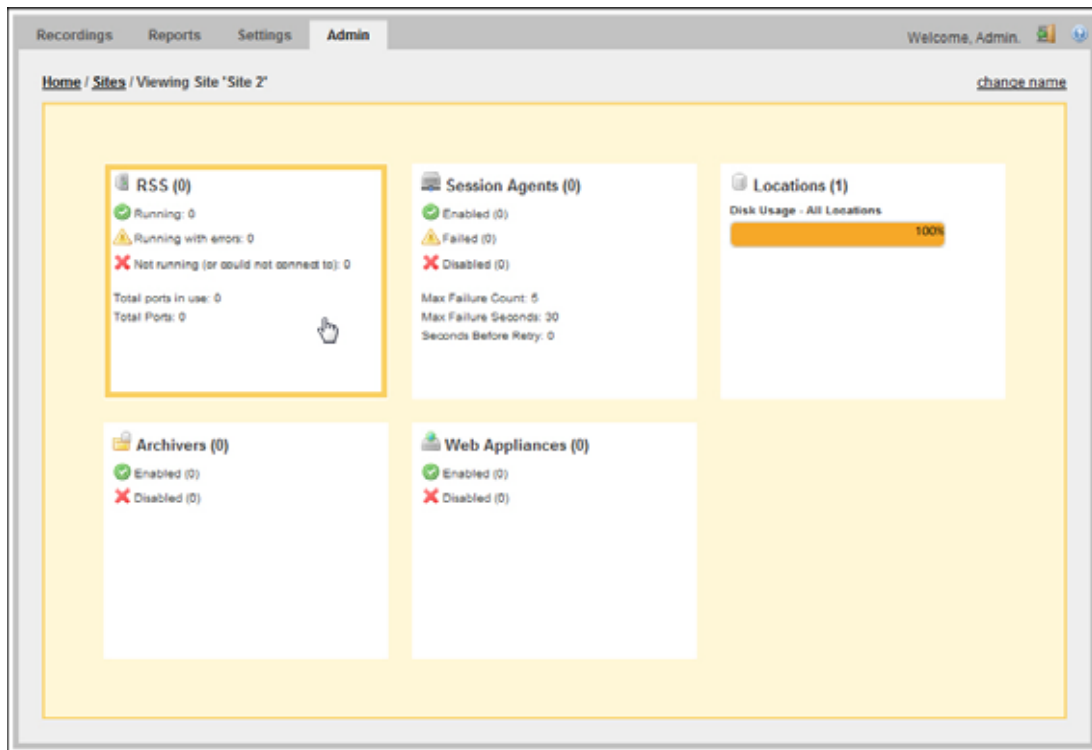
To enable connectivity between the RSS and the CIS, you must add the new RSS to a site. Use the following procedure to add the new RSS.

To add the new RSS to the site:

1. On the “All Sites” page, select a site for which you want to add the RSS, and click .



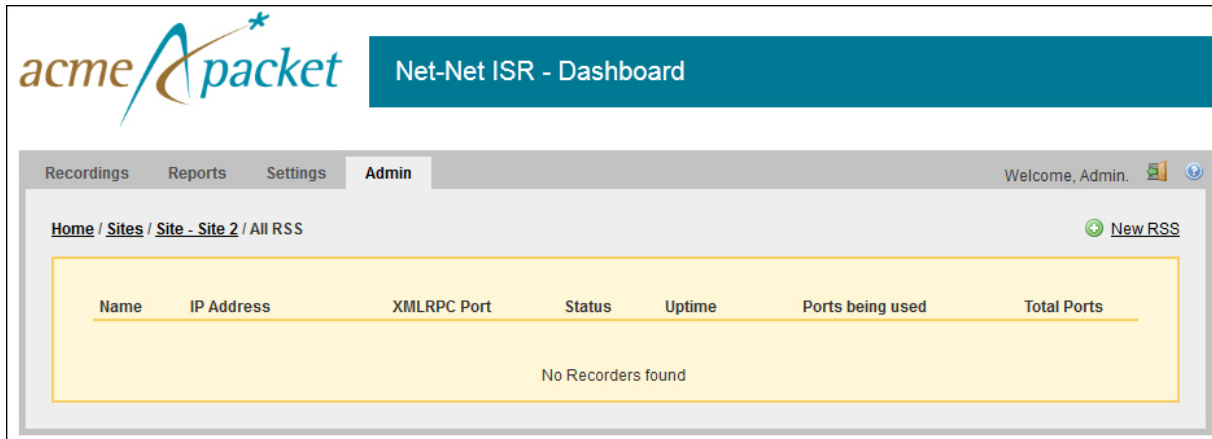
The following page displays.






The RSS block displays the following:

Field	Description
Running	Displays the number of RSSs currently enabled (active.)
Running with errors	Displays the number of RSSs currently active with errors.
Not running (or could not connect to)	Displays the number of RSSs currently disabled (inactive).
Total ports in use	Displays the total number of RSS ports currently in use.
Total ports	Displays the total number of licensed ports.

- Click the RSS block. The following page displays.



The RSS page displays the following about each RSS.

Column	Description
Name	Name of the RSS.
IP Address	IP Address of the RSS in dotted decimal format.
XMLRPC Port	Port number of the XML-RPC service. This service accepts and queues remote call and recording commands.
Status	Current status of the RSS . Status can be: <ul style="list-style-type: none"> - Enabled (active)   Disabled (inactive)  Active with errors
Uptime	Time elapsed since the last RSS process restart.
Ports being used	Total number of ports currently being used on the RSS.
Total Ports	Total number of licensed ports on the RSS.

3. Click **New RSS**. The following dialog box displays.

4. In the **Name** field, enter a name for the RSS you are adding. Valid values are alphanumeric characters.
5. In the **IP Address** field, enter the IP address (in dotted decimal format) on which the RSS is listening for SIP traffic.
6. In the **XMLRPC Port** field, enter the Port number of the XMLRPC service. This service accepts and queues remote call and recording commands. Default is **8888**.

Note: This value should not be changed unless directed by Acme Packet Technical Support. Contact Technical Support for more information.

7. Click **Create** to add the RSS. The RSS window displays with the RSS assigned to the site.

For additional information about RSS, see the *Net-Net Interactive Session Recorder Administrator Guide*.

Add a Session Agent

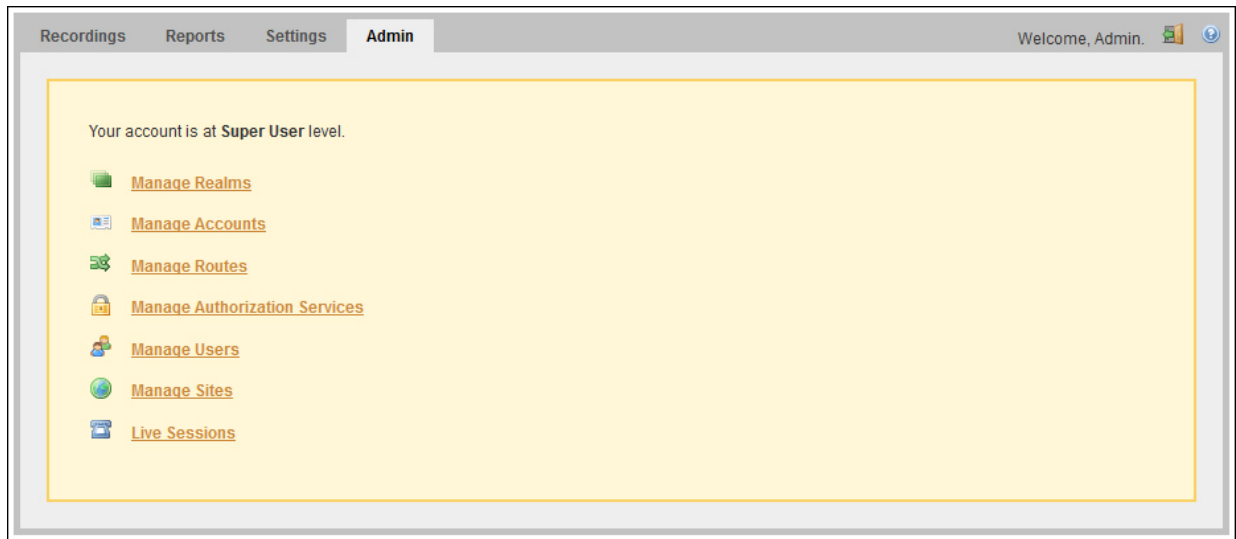
The Session Agent is the NN-ISR's next-hop IP on all Pass-Thru Routes. The NN-ISR delivers calls to the Session Agent after recording is started. The Session Agent can be an Acme Packet Session Border Controller (SBC), SIP PBX, or other SIP compatible device.

To test call recording in Pass-thru Mode, you must add a Session Agent. Use the following procedure to add a Session Agent.

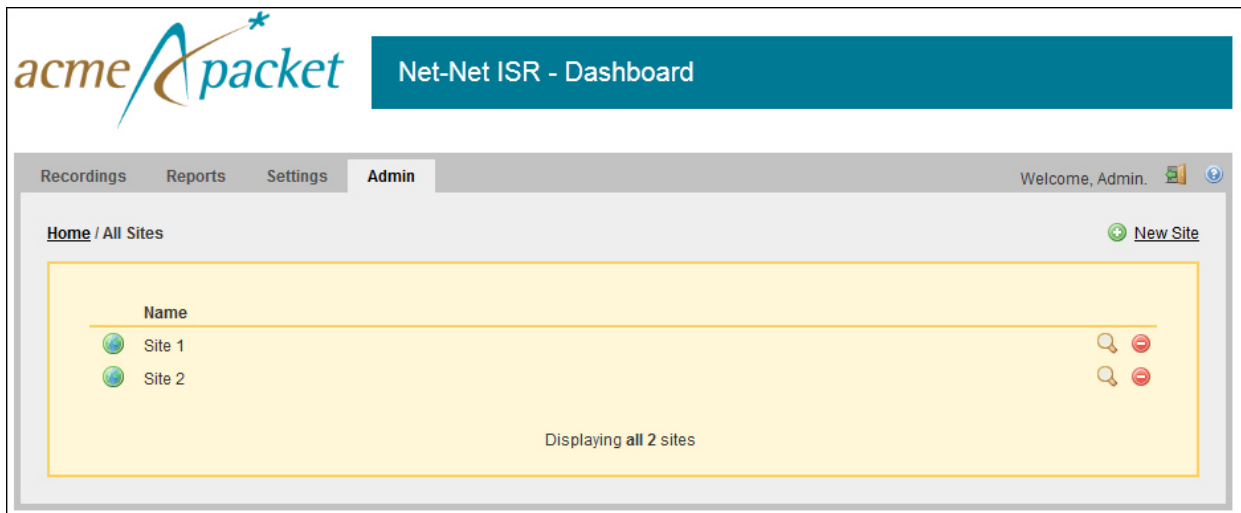
Note: If you intend to use SIPREC or Conference Mode Recording, configuring a Session Agent is not required.

To add a Session Agent:

1. From the Main Menu, click **Admin**. The following page displays.



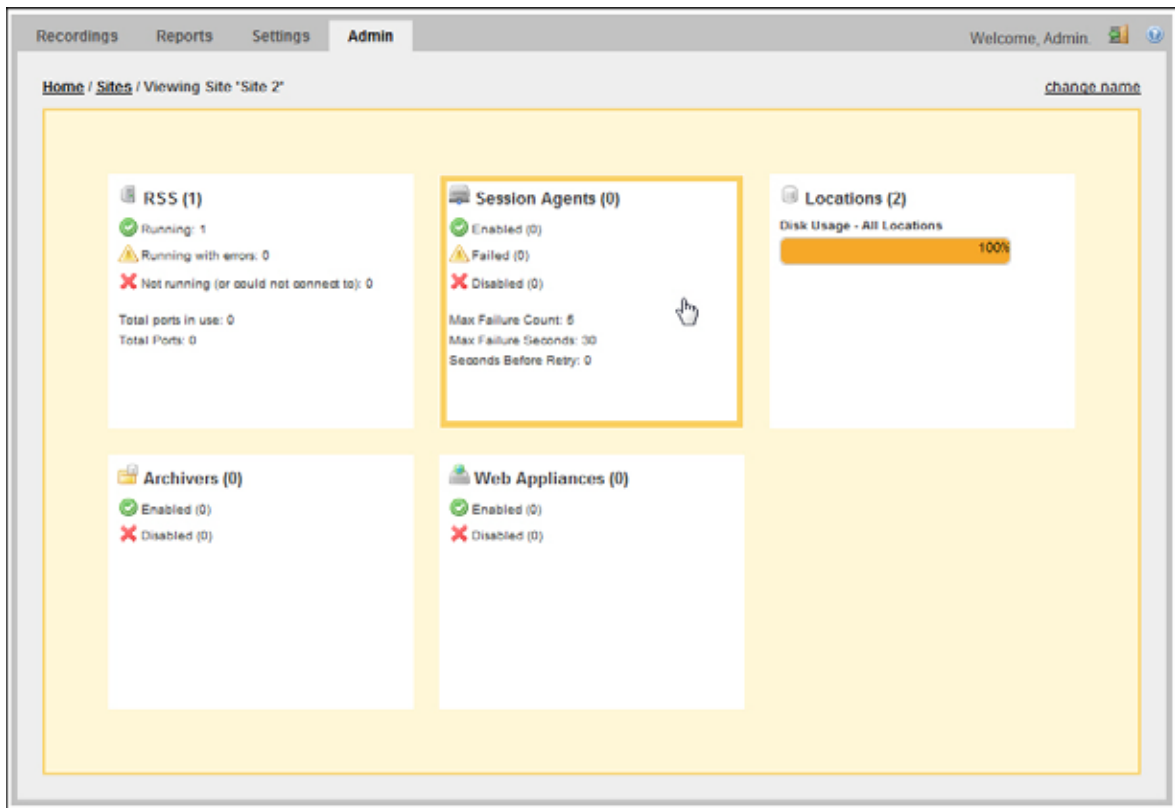
2. Click **Manage Sites**. The following page displays.






Select a site for which you want to add the Session Agent, and

click  .

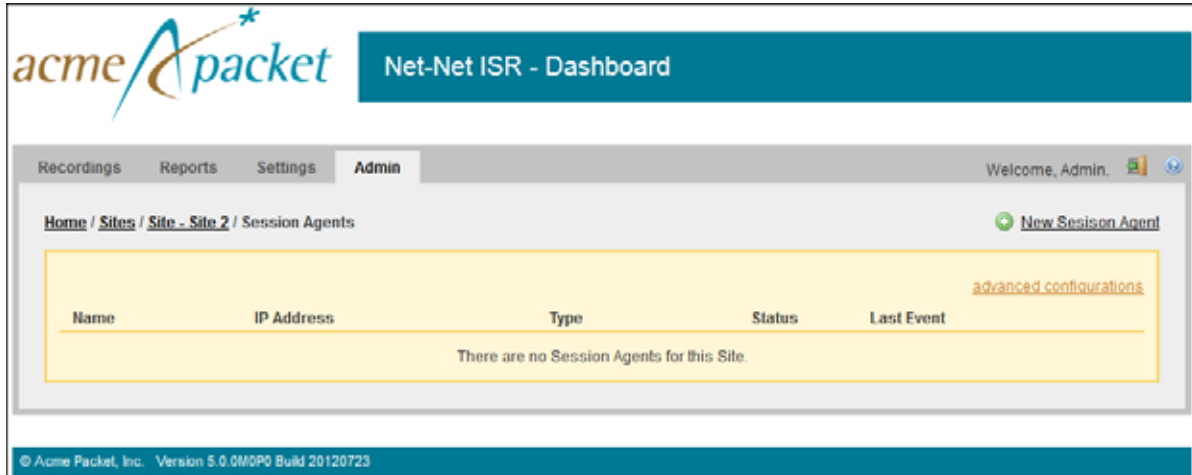
The following page displays.






The Session Agents block displays the following:

Field	Description
 Enabled	Displays the number of Session Agents currently enabled (active).
 Failed	Displays the number of Session Agents that are currently in the failed state.
 Disabled	Displays the number of Session Agenets currently disabled (inactive).
Max Failure Count	Number of attempts the RSS makes to connect a call to a Session Agent(or pool of session agents) before the call is rejected. Valid values are 0 through 100. Default is 5
Max Failure Seconds	Total number, in seconds, for which the Session Agent waits for a response before it considers the attempt unsuccessful and moves onto the next Session Agent. Valid values are 0 through 86400 seconds (24 hours). Default is 30 seconds.
Seconds Before Retry	Number of seconds a Session Agent is taken out of service in the event of a failure. Valid values are 0 through 86400 seconds (24 hours). Default is 300 seconds (5 minutes).
	Note: If you have only one Session Agent configured, set this value to 0 to prevent your Session Agent from being taken out of service.

- Click the Session Agent block. The following page displays.



The Session Agent page displays the following about each Session Agent.

Column	Description
Name	Name of the Session Agent.
IP Address	IP Address of the Session Agent in dotted decimal format.
Type	Specifies whether the Session Agent is acting as a Primary or Secondary (failover) device.
Status	Current status of the Session Agent. Status can be: <ul style="list-style-type: none"> - Enabled (active)   Disabled (inactive)  Active with errors
Last Event	Specifies the last event that occurred on the Session Agent.

- Click **New Session Agent**. The following dialog box displays.

The 'New Session Agent' dialog box has a title bar with a close button. It contains three main sections: a 'Name' text input field, an 'IP Address' text input field, and a 'Type' section with two radio buttons labeled 'Primary' and 'Failover'. At the bottom right, there is a 'Create' button.

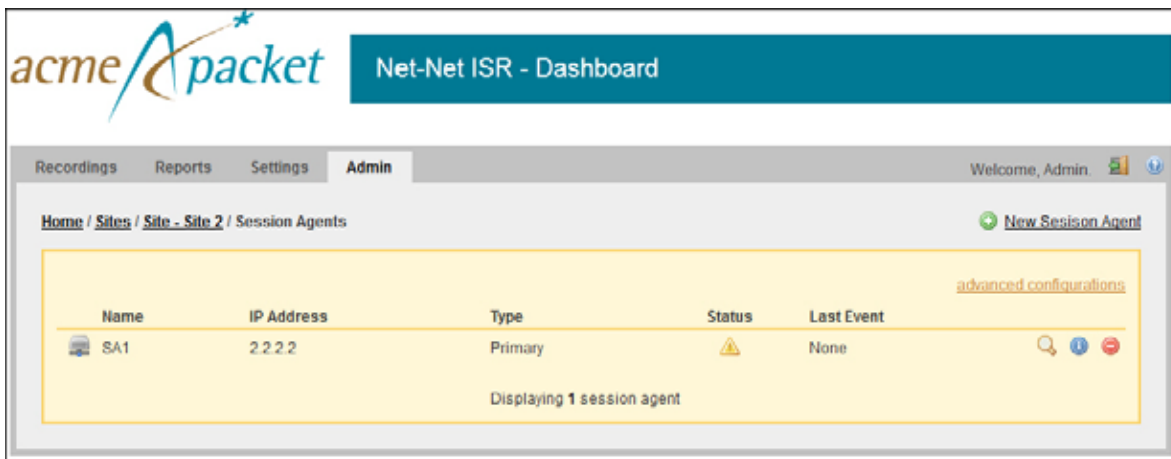
- In the **Name** field, enter a name for the Session Agent you are adding. Valid values are alpha-numeric characters. For example, SA1.

Note: This is the name associated with the receiving phone or device you are going to use to test a call.

- In the **IP Address** field, enter the IP address (in dotted decimal format), for the Session Agent you are adding. For example, 2.2.2.2.

Note: This is the IP address associated with the receiving phone or device you are going to use to test a call.

- In the **Type** field, select **Primary** as the Session Agent type for the Session Agent you are adding.
- Click **Create**. The following page displays.



For additional information about Session Agents, see the *Net-Net Interactive Session Recorder Administrator Guide*.

Before making your first call, you must configure a Route on the NN-ISR for the calls to use. To set up a route, see Chapter 6, Configuring a Route (Conference Mode Recording).

Introduction

This chapter provides information and procedures for configuring the first route to use for placing a test call to the NN-ISR. It also includes information for setting up a Softphone for making the first call procedures for verifying that the recording was made and that the Dashboard works properly.

Configuring a Route (Conference Mode Recording)

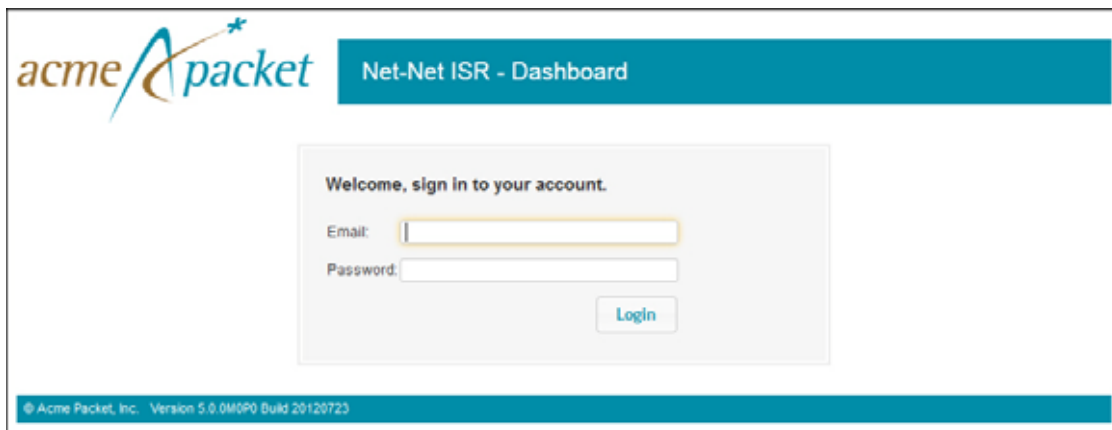
Route configuration is important to the flexibility of your NN-ISR installation. A route defines the parameters to evaluate and invoke recording, as well as the recording rules to apply for all calls received by the NN-ISR. Users are given access to recordings based on routes.

Use the following test procedure to make your first recording. This procedure uses a wildcard route that applies the same recording rules to every call received. Please note that this is not the recommended configuration to deploy in a production system, as it eliminates the ability to assign users access to specific recordings.

Note: Use the new Route you configure in this section for call verification purposes only.

To configure a route:

1. Open your Internet Web browser.
2. Enter the IP address of the NN-ISR. For example:
ht tp: //172. 54. 66. 7
The Login page displays.

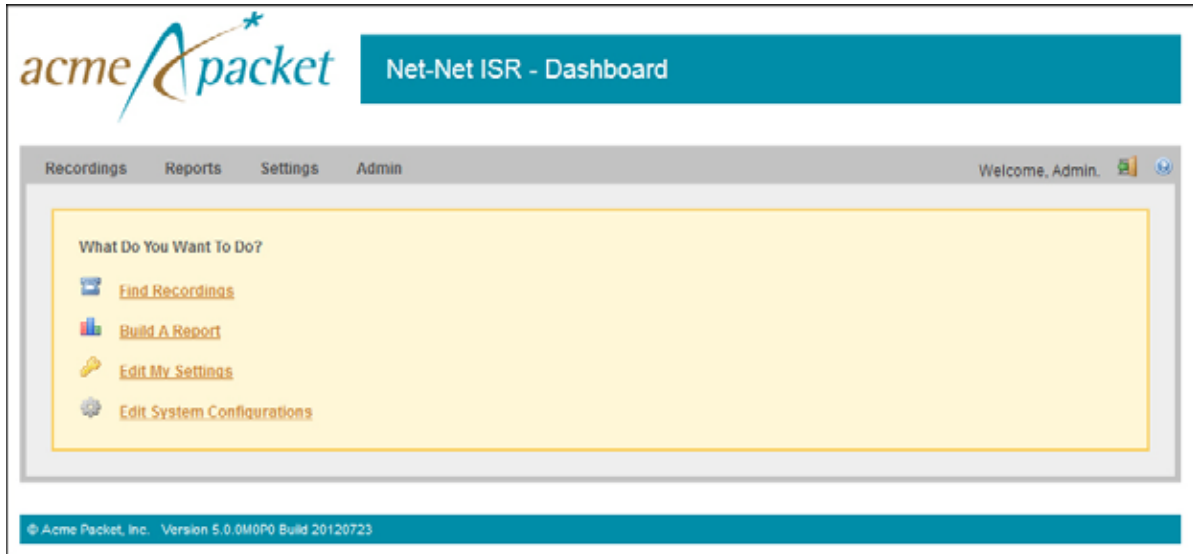


3. Enter your email and password, respectively, in the “**Email**” and “**Password**” fields.
The default user name and password are:

User name: isradmin@acmepacket.com

Password: admin123

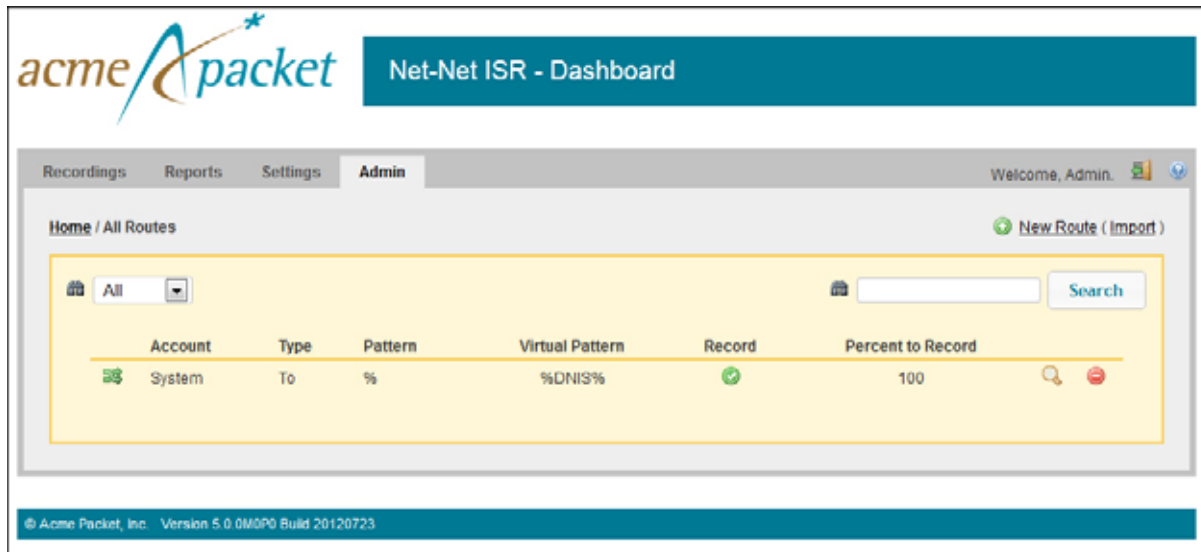
The following page displays.





4. From the Main Menu, click **Admin**.
The following page displays.



5. Click the **Manage Routes** . The following page displays.



The Route page displays the following about each Route.

Column	Description
Account	Name of the Account assigned to the current route.
Type	Type of route associated with this account (DNIS - From, ANI - To, or Both - From/To)
Pattern	Pattern that is matched in the incoming INVITE.
Virtual Pattern	The user portion of the destination where the calls matching the route pattern are forwarded once recording rules have been evaluated.
Record	Specifies whether or not recording is enabled on this account/route. <ul style="list-style-type: none">  Recording is enabled  Recording is disabled
Percent to Record	Indicates the percentage of calls currently being recorded on this account/route.

This route can also be used to test SIPREC traffic without any changes. The RSS evaluates all SIPREC invites against all configured routes, regardless of Route Type. This allows legacy installations to migrate to SIPREC while continuing to support existing PassThru/Conference routing.

Setting Up a Softphone

In order to make calls to the RSS, you must have phone hardware or a softphone. If you have phone hardware with a configured route to the NN-ISR, you can skip the procedure in this section and go directly to the procedure *Verifying Call Recording/Playback Using the Dashboard* to verify connectivity to the RSS.

A softphone is software that allows you to talk using VoIP without having a physical phone set. It acts as an interface allowing you to dial numbers and carry out other phone functions using your computer screen and your mouse, keyboard or keypad.

If you would like to make a call to the RSS using a softphone, use the procedures in this section to install a SIP Softphone onto your computer. You can use any SIP Softphone application that supports G.711a/u. The following procedure installs the “PhonerLite” SIP Softphone application.

For this test, the RSS and CIS components use the following IP addresses. You can enter your own IP addresses in the table below for reference.

Component	Example IP Address	Your IP Address
RSS	10.1.30.38	
CIS - ESXi Host	10.1.30.39	
CIS - Index VM	10.1.30.40	
CIS - Admin VM	10.1.30.41	
CIS - User VM	10.1.30.42	

Installing and Configuring the Softphone

Use the following procedure to install and configure the Softphone you can use to make the first call to the RSS.

To install the softphone:

Note: You must install the Softphone onto a computer with network access to the RSS server and the computer must have audio input/output (microphone/speakers).

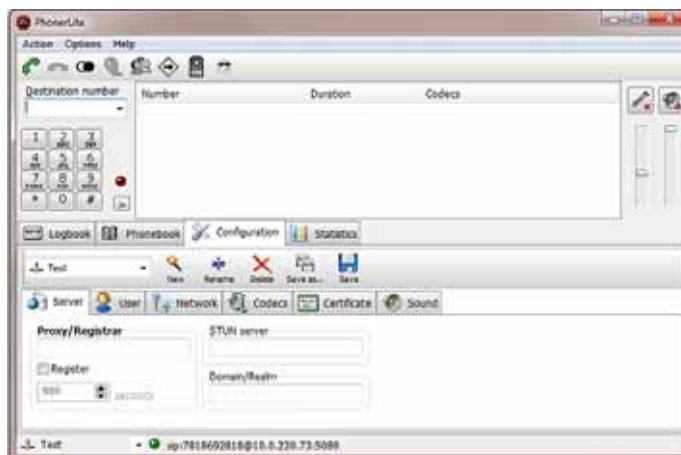
1. Open a Web browser and enter the following URL in the URL field to access the download page for the “PhonerLite” application:
http://www.phonerlite.de/download_en.htm
2. Click on the “*PhonerLiteSetup.exe*” file in the download box to download the application to your PC.
3. Double-click the application and follow the instructions to install PhonerLite to your PC.

To configure the softphone:

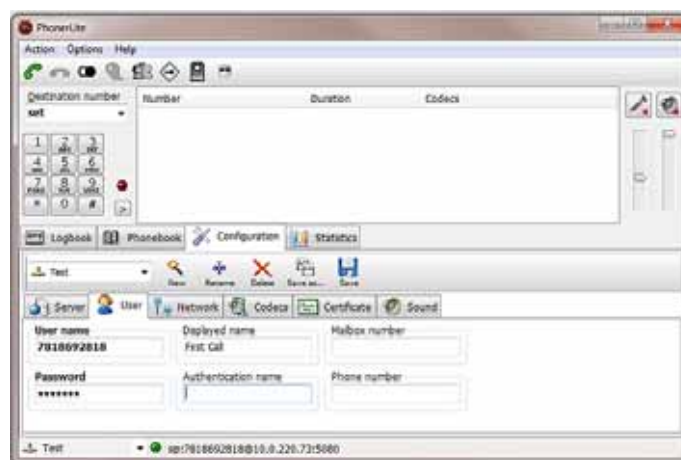
4. When PhonerLite is installed, double-click the PhonerLite icon on your desktop to open the application.



5. In the PhonerLite window, click the “**Configuration**” tab.
6. Click the “**Server**” tab.



7. Verify that the “**Register**” box is disabled (unchecked).
8. Click the “**User**” tab.



9. In the “**User name**” box, enter your user name. Your user name is your outgoing caller ID (SIP URI).
10. In the “**Displayed name**” box, enter a name to display to the recipient of a call. Valid values are alpha-numerical characters.
11. Click on the “**Network**” tab.

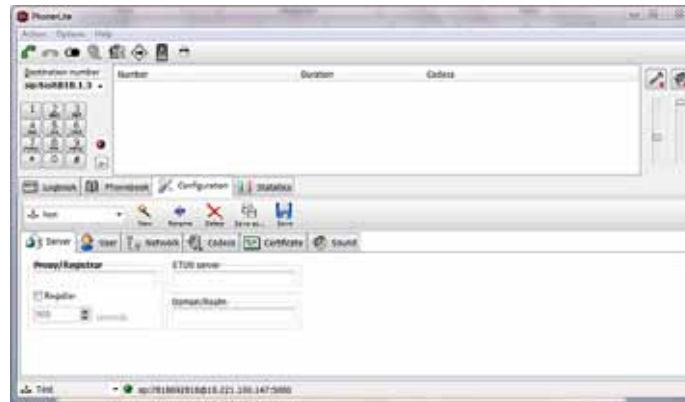
Before You Begin

Before you make your first call to the RSS, open the “*ISR.log*” file to observe the cache refresh and see your test call display in the log as it happens.

To open the *ISR.log* file:

1. Open a shell interface on the RSS by entering “**shell**” at the NN-ISR> prompt.
NN-ISR> **shell**
2. Enter “**tail -f /cxc_common/ISR/ISRLogs/ISR.log**” and press <Enter>.
<hostname> # **tail -f /cxc_common/ISR/ISRLogs/ISR.log**
3. In your Softphone client (PhonerLite), enter a test phone number in the “**Destination Number**” field. The destination number must be a full SIP URI of the format sip:<User>@<your_rss_ip>. The following window uses an example destination number of “sip:test@10.1.30.38”.

Destina-




4. Click the  icon in the Main Menu.
or
Press <Enter>.

The output in the *ISR.log* displayed in your RSS tail should look similar to the following:

```

08/30/2011 07:31:54[ INFO] sipProxy: (SIP INVITE received - new call!!! [cid = 1, did = 2])
08/30/2011 07:31:54[ INFO] sipProxy: [Channel 1] Looking up call w/ ANI: 7818692818 DNIS: test
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] Enqueueing SipCall, callId: 800D645C-5CD2-E011-
9026-FODEF154AD05@10.1.30.38
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] Dequeueing SipCall, callId: 800D645C-5CD2-E011-
9026-FODEF154AD05@10.221.100.147, queueSize: 1
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] Looking up call w/ ANI: 7818692818 DNIS: test
08/30/2011 07:31:54[ INFO] RouteMap: Call route with ANI: 7818692818 DNIS: test returned
CALL_TYPE_CONFERECE accountName: System
08/30/2011 07:31:54[ INFO] RouteMap: [Channel 1] getRouteInfo returned with vDNIS: test, isRecord-
able: true
08/30/2011 07:31:54[ INFO]xmlRpcQueryAgent: XmlRpcQueryAgent::execute: method addDirectVmgEntry
(_connectionState 0).
08/30/2011 07:31:54[ INFO]xmlRpcQueryAgent: XmlRpcQueryAgent::execute: method addDirectVmgEntry
completed.
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] addDirectVmgEntry return with ACK.
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] addDirectVmgEntry is successful with ANI:
7818692818 DNIS: test channelId 1
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] routeId 1 adjusted limit is 24, adjusted burst
ports is 6, acct limit is 100, acct burst port is -1.
08/30/2011 07:31:54[ INFO]callManager: [Channel 1] Current route (1) usage: 1, account (1) usage: 1.
08/30/2011 07:31:54[ INFO] sipProxy: [Channel 1] Call State Transition: Idle -> Called
08/30/2011 07:31:54[ INFO] sipProxy: [Channel 1] Got rtp port 22000 for Caller->Mixer RTP Stream.
08/30/2011 07:31:54[ INFO] sipProxy: [Channel 1] Got RTP Port 22002 for 3Party->Mixer RTP Stream.

```

5. When the RSS answers the call, leave a voice recording.
6. Click  to hang up the phone.
7. Verify that no errors appear in the *ISR.log* file on your RSS tail output.

Go to [Verifying Call Recording/Playback Using the Dashboard](#) to verify the call recording was successful.

Verifying Call Recording/Playback Using the Dashboard

After making a call with your phone equipment or softphone, you can verify that the call recording was successful by playing back the call using the NN-ISR Dashboard. Use this procedure to verify that the RSS has stored your recording.

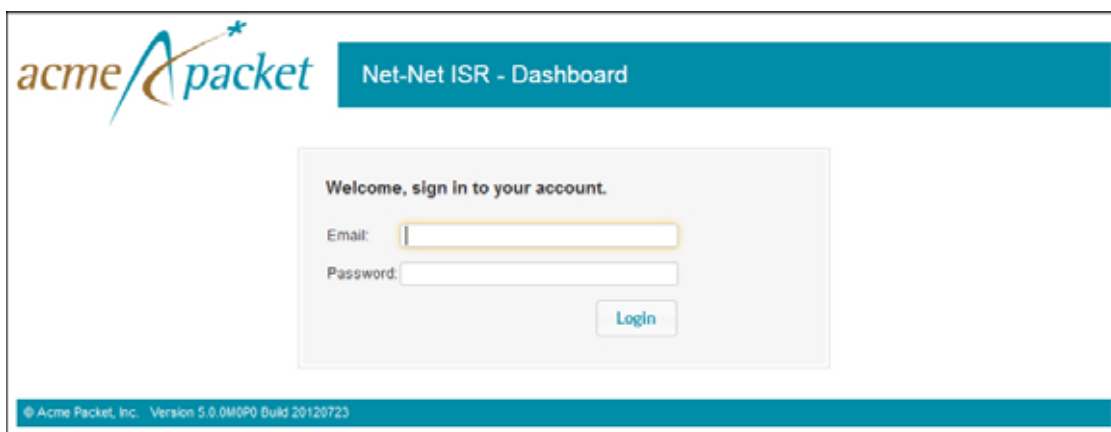
Note: Before playing recordings, make sure you have a media application that plays audio files with a “.wav” format and that your speaker/microphone is turned ON. For more information about the software requirements and recommendations for playing recordings, see NN-ISR Dashboard Requirements.

To verify the call recording/playback:

1. Open your Internet Web browser.
2. Enter the IP address of the NN-ISR. For example:

http://172.54.66.7

The Login page displays.



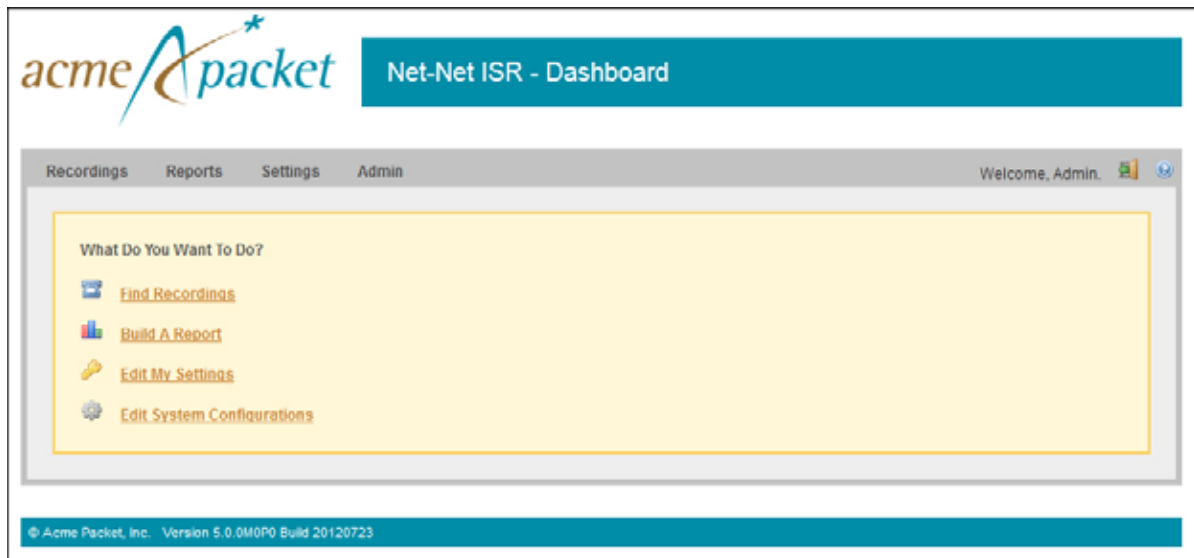
3. Enter your email and password, respectively, in the “**Email**” and “**Password**” fields.

The default user name and password are:

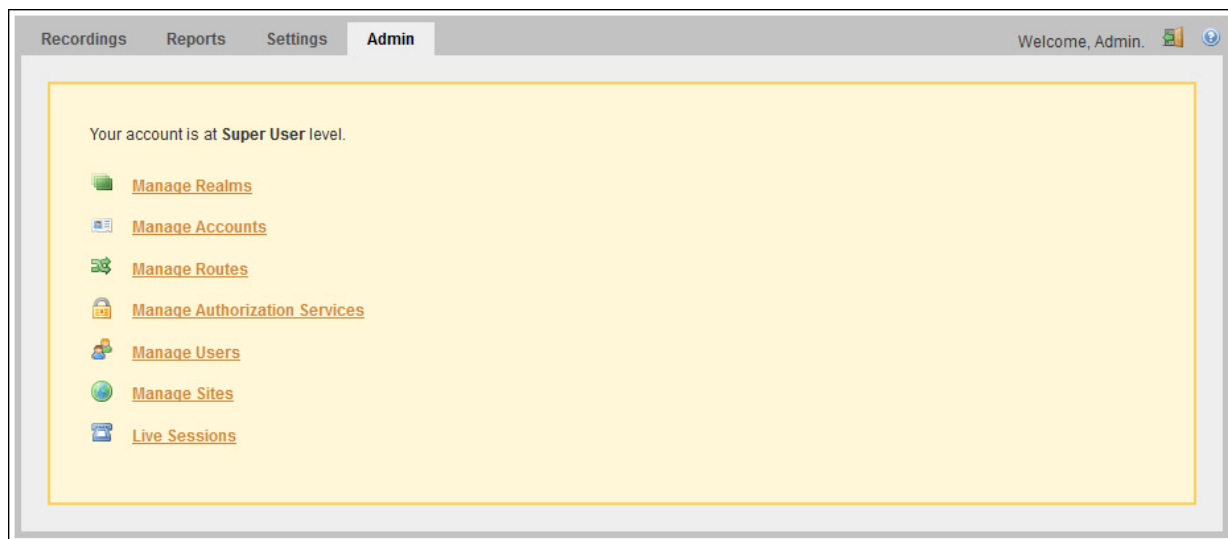
User name: isradmin@acmepacket.com

Password: admin123

The following page displays.



4. From the Main Menu, click **Recordings**.
The following page displays.



The following page displays.

The screenshot shows the Acme Packet Net-Net ISR Dashboard. The top navigation bar includes 'Recordings', 'Reports', 'Settings', and 'Admin'. The main content area displays a table of recordings with the following data:

RSS Ingress Call ID	Time	From	To	Duration	Actions
1-7443@172.30.58.239	2012-08-02 05:00:04 pm	sippTraditional	traditional	10.0s	Play, Stop, Search, Delete
1-5930@172.30.58.239	2012-07-30 02:52:35 pm	sippTraditional	traditional	10.0s	Play, Stop, Search, Delete
3-5896@172.30.58.239	2012-07-30 02:31:25 pm	45003007	62099	10.0s	Play, Stop, Search, Delete
2-5096@172.30.58.239	2012-07-30 02:31:15 pm	45003007	62099	10.0s	Play, Stop, Search, Delete
1-5896@172.30.58.239	2012-07-30 02:31:05 pm	45003007	62099	10.0s	Play, Stop, Search, Delete

At the bottom of the table area, there is a 'Download as CSV file' link and an 'Include Details' checkbox.

This page displays the test recording you just made on the first call to the RSS.

Select the recording and click the Play icon. Your media application opens and plays the file for you to listen. If you can hear the recording, the call recording process was successful.

If required, you can also view the details of the recording by clicking the Details icon on the recordings page. This displays details about the recording and allows you to select the Play icon at the top of the page to play the recording from the details page.

If the recording does not appear in the dashboard, review your NN-ISR log for errors.

If the recording appears in the dashboard but does not play, ensure your media application is installed. Dashboard logging can be found on the dashboard VM in `/var/www/user_dash.production.log`.

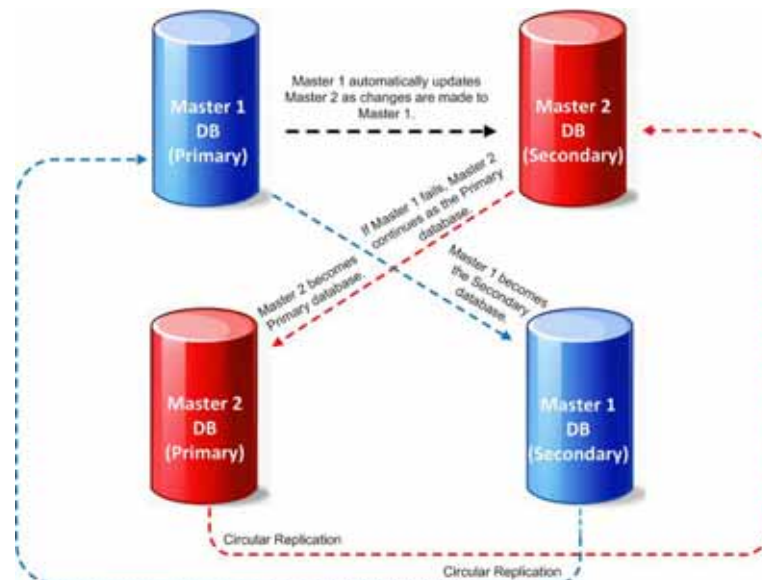
The CIS uses the MySQL relational database management system (RDBMS) which runs as a server providing multi-user access to a number of databases. Users store and retrieve structured collections of data with the MySQL database.

MySQL Master-Master Replication is the process of creating a redundant pair of MySQL databases that are synchronized for the purpose of achieving high-availability (HA). The primary database (Master 1) automatically updates the secondary database (Master 2) each time the primary database (Master 1) changes. If the Master 1 fails, Master 2 takes over without the loss of data and continues as the primary master database. In this case, Master 1 then becomes the secondary database, and when it recovers and runs again, the primary database (Master 2) synchronizes with the secondary database (Master 1) so that the data is the same in both databases.

The process continues when required - if the current primary database fails, the current secondary database becomes the primary, and the previous primary becomes the secondary (Circular Replication in the illustration below). This allows a Master database to consistently be available without any interruption in the storage and retrieval of data in an HA state.

Note: Deployment of MySQL Master-Master Replication is recommended for larger installations

The following illustration shows the MySQL Master-Master Replication process when one database fails and the other takes over.



CIS Index Replication

The CIS software installation that you performed in Chapter 3, Installing the CIS Software installs and configures the database for the CIS virtual machine. For replication you need at least two index installations. You must setup circular replication manually for the CIS Index. Use the following procedure to setup circular replication.

Note: To configure replication you need the MySQL username and password. The username is **root** and the password is **n3wf0und**.

Configuring Circular Replication

To configure circular replication:

1. Create a replication user on each MySQL instance.
 - 1a. Using the MySQL command line client or a GUI tool such as MySQL Workbench, enter the following on the PRIMARY index:


```
GRANT REPLICATION SLAVE ON *.* TO 'repl'@'<secondary index IP address>' IDENTIFIED BY 'n3wf0und';
```
 - 1b. Using the MySQL client again, enter the following on the SECONDARY index:


```
GRANT REPLICATION SLAVE ON *.* TO 'repl'@'<primary index IP address>' IDENTIFIED BY 'n3wf0und';
```
2. Enable binary logging on the PRIMARY host.
 - 2a. Log into the Index Virtual Machine (VM) of the PRIMARY host and shut down the MySQL service by entering the following:


```
service mysqld stop
```
 - 2b. Make a back-up instance of the file `/etc/my.cnf` (for example, `/tmp/my.cnf`), and then edit `/etc/my.cnf` by entering the following in the `[mysqld]` section:


```
log-bin=Primary1-mysql-bin
server-id=1

#Replication increments to avoid primary key auto-increment collisions for 2 hosts
auto_increment_increment=2
auto_increment_offset=1

#Set the db/tables to replicate
replicate-do-db=ipcr_db
replicate-ignore-table=ipcr_db.log
replicate-ignore-table=ipcr_db.heartbeats

#Set the master for replication reporting (optional)
report-host= <secondary host IP address>
```
 - 2c. #Make sure the following lines are in the `mysqld` section:


```
binlog-format=row
slave-skip-errors=1032
sync_binlog=1
```

3. Enable binary logging on the SECONDARY host.
 - 3a. Using a secure shell client (SSH), log into the Index VM of the SECONDARY host. Then shut down the MySQL service by entering the following :

```
service mysqld stop
```

- 3b. Make a back-up instance of the file `/etc/my.cnf` (for example, `/tmp/my.cnf`), and then edit `/etc/my.cnf` by entering the following in the **[mysqld]** section:

```
log-bin=Secondary2-mysql-bin
server-id=2
```

```
#Replication increments to avoid primary key auto-increment
collisions for 2 hosts
```

```
auto_increment_increment=2
auto_increment_offset=2
```

```
#Set the db/tables to replicate
replicate-do-db=ipcr_db
replicate-ignore-table=ipcr_db.log
replicate-ignore-table=ipcr_db.heartbeats
```

```
#Set the master for replication reporting (optional)
```

```
report-host= <primary host IP address>
```

- 3c. #Make sure the following lines are in the `mysqld` section:

```
binlog-format=row
slave-skip-errors=1032
sync_binlog=1
```

4. Start the MySQL instance on both the PRIMARY and SECONDARY hosts by entering the following:

```
service mysqld start
```

Warning: Ensure there are no connections to the NN-ISR Record and Store Server (RSS), and that the Dashboard on both primary and secondary hosts is disabled.

5. Using the MySQL client, check the Master status on the PRIMARY host by entering the following:

```
mysql> FLUSH TABLES WITH READ LOCK;
mysql> SHOW MASTER STATUS;
```

The following is an example of the output from the above commands.

File	Position	Binlog_Do_DB	Binlog_Ignore_DB
Primary1-mysql-bin.000002	98	test	manual, MySQL

6. Make a note of the filename and position values from the output table.

7. Free the read lock by entering the following:

```
mysql> UNLOCK TABLES;
```

8. Using the MySQL client, on the SECONDARY host, edit the MySQL replication Slave configuration using the file and position values from the output in Step 5, and enter the following using the CHANGE MASTER command:

```
mysql> RESET SLAVE;
mysql> CHANGE MASTER TO MASTER_HOST='<primary host IP
address>',
mysql> MASTER_USER='repl',
mysql> MASTER_PASSWORD='n3wf0und',
mysql> MASTER_LOG_FILE='Primary1-mysql-bin.000002',
mysql> MASTER_LOG_POS=98;
```

9. Start the Slaves & ensure there are no errors in the "MySQL logs" by entering the following:

```
mysql> START SLAVE;
```

10. Check the Master status on the SECONDARY host by entering the following:

```
mysql> FLUSH TABLES WITH READ LOCK;
mysql> SHOW MASTER STATUS;
```

The following is an example of the output from the above commands.

File	Position	Binlog_Do_DB	Binlog_Ignore_DB
Secondary2-mysql-bin.000002	98	test	manual, mySQL

11. Make a note of the filename and position values from the output table.

12. Free the read lock by entering the following:

```
mysql> UNLOCK TABLES;
```

13. Using the MySQL client, on the PRIMARY host, edit the MySQL replication Slave configuration using the filename and position values from the output in Step 10 (from the SECONDARY host), and enter the following using the CHANGE MASTER command:

```
RESET SLAVE;
CHANGE MASTER TO MASTER_HOST='<secondary host IP address>',
MASTER_USER='repl',
MASTER_PASSWORD='n3wf0und',
MASTER_LOG_FILE='Secondary2-mysql-bin.000002',
MASTER_LOG_POS=98;
START SLAVE;
```

The following commands, run on each host, display the current replication status. To improve the formatting, append the command with \G.

```
mysql>SHOW MASTER STATUS \G
mysql>SHOW SLAVE STATUS \G
```

To edit the configuration on the NN-ISR API deployment to include database failover:

- 13a. Using a secure shell (SSH) client, log into the RSS host/s using a user name "root" and password "sips".

- 13b. Edit the API configuration file by performing the following:

Type "vi /usr/local/jboss 4.0.2/server/default/deploy/VmgVxmlApi.war/WEB-INF/web.xml" and press <Enter>.

Press <i> to enter insert mode.

Using the arrow keys to navigate the file, edit the following line as:

```
<param-value>jdbc:mysql://<primary host IP address>,  
<secondary host IP address>/ipcr_db</param-value>
```

Press <Esc>, enter “:wq”, and press <Enter>.

This saves your changes.

- 13c. Edit the Archiver configuration file by performing the following:

Type "**vi /usr/local/jboss 4.0.2/bin/ArchiverConfig.xml**" and press <Enter>.

Press <i> to enter insert mode.

Using the arrow keys to navigate the file, edit the following line as:

```
<param-value>jdbc:mysql://<primary host IP address>,  
<secondary host IP address>/ipcr_db</param-value>
```

Press <Esc>, enter “:wq”, and press <Enter>.

This saves your changes.

- 13d. Restart the application server by performing the following:

Type "**/etc/init.d/jboss stop**" and press <Enter>.

Type "**/etc/init.d/jboss start**" and press <Enter>.

14. If required, verify successful failover between the PRIMARY and SECONDARY servers.

B

Mounting a Second RSS Drive for Recordings

The RSS certified hardware specs call for a second drive to be used to store recordings as needed. This can be used for initial storage or short term archival. The following is a procedure for mounting the second drive.

Note: Before performing these procedures, the **RSS installation must be complete**. For procedures to install the RSS see, Chapter 4, Installing the RSS Software.

To mount a second drive on the RSS for recording storage:

1. Using an SSH application (like Putty), SSH to the RSS server.
2. At the “Login” prompt, enter your login user ID and press <Enter>.
Logi n> **root**

The password prompt displays.

3. Enter your password and press <Enter>. The default password is **sips**.
Password> *****

The “username” prompt displays.

4. Press <Enter> at both the “username” and “password” prompts.

The “Access granted since there are no configured users” prompt displays followed by the “NN-ISR>” prompt.

5. Enter **shell** and press <Enter>.
Access granted since there are no configured users.

NN-ISR> **shell**

The shell prompt displays.

The remaining steps show examples of the shell prompt and output displays for each command entered.

6. Enter **fdisk -l** to display a list of currently installed drives on your NN-ISR server, and press <Enter>.
fdisk -l

The following output displays.

```

172.30.58.111 - PuTTY
Device Boot      Start          End      Blocks   Id  System
/dev/sdb1        1             8924    71681998+  c6  DRDOS/sec (FAT-16)
ordinance app_slot_1 # fdisk -l

Disk /dev/sda: 73.4 GB, 73407820800 bytes
255 heads, 63 sectors/track, 8924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x62dd99d8

   Device Boot      Start          End      Blocks   Id  System
   /dev/sda1        1             262      2097120    82  Linux swap / Solaris
Partition 1 does not end on cylinder boundary.
   /dev/sda2        262          7098    54910108+   83  Linux
   /dev/sda3        7098         8011     7340032    83  Linux
   /dev/sda4        8011         8925     7340032    83  Linux

Disk /dev/sdb: 73.4 GB, 73407820800 bytes
255 heads, 63 sectors/track, 8924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x62dd99d8

   Device Boot      Start          End      Blocks   Id  System
   /dev/sdb1        1             8924    71681998+  c6  DRDOS/sec (FAT-16)
ordinance app_slot_1 # █

```

Depending on the server manufacturer, your primary partition may be sd2, cciss, or other. In the example above, sda is the primary disk and sdb is the unformatted second disk (array) you mount.

7. You can verify that “sda” is your primary partition by entering **df** and pressing <Enter> to display the usage information about the disk.
df

The following output displays.

```

172.30.58.111 - PuTTY
ordinance app_slot_1 # df
Filesystem      1K-blocks      Used Available Use% Mounted on
/dev/sda3       7339804    1911176   5428628  27% /
udev            5119448         716   5118732   1% /dev
/dev/sda2       54908400    33352   54875048   1% /cxc_common
rootfs          1048576         0    1048576   0% /mnt/ramdisk
ordinance app_slot_1 # █

```

The “/cxc_common” is your NN-ISR installation, which is installed on “/dev/sda2”. The “/dev/sda” is the primary drive, so “/dev/sdb” is the drive you can use to mount to obtain additional storage.

8. Enter **fdisk /dev/sdb** and press <Enter> to format the second drive at /dev/sdb.
fdisk /dev/sdb

The following output displays.

```

172.30.58.111 - PuTTY
ordinance app_slot_1 # fdisk /dev/sdb

The number of cylinders for this disk is set to 8924.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): █

```

9. Enter **m** and press <Enter> to display a list of available commands.
command (m for help): m

The following output displays.

```

172.30.58.111 - PuTTY
ordinance app_slot_1 # fdisk /dev/sdb
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)

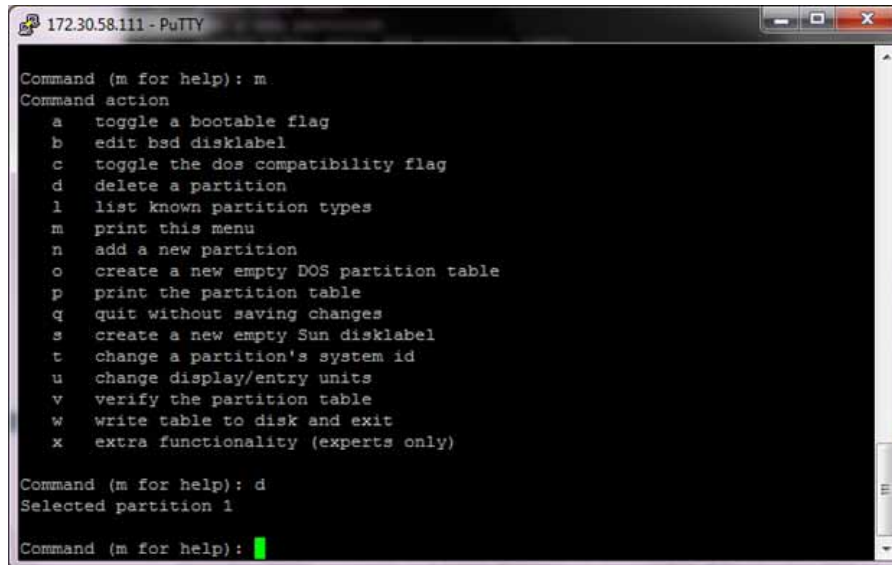
Command (m for help): m
Command action
 a  toggle a bootable flag
 b  edit bsd disklabel
 c  toggle the dos compatibility flag
 d  delete a partition
 l  list known partition types
 m  print this menu
 n  add a new partition
 o  create a new empty DOS partition table
 p  print the partition table
 q  quit without saving changes
 s  create a new empty Sun disklabel
 t  change a partition's system id
 u  change display/entry units
 v  verify the partition table
 w  write table to disk and exit
 x  extra functionality (experts only)

Command (m for help): █

```

10. Enter **d** and press <Enter> to delete a partition.
command (m for help): **d**

The following output displays.



```

172.30.58.111 - PuTTY
Command (m for help): m
Command action
a  toggle a bootable flag
b  edit bsd disklabel
c  toggle the dos compatibility flag
d  delete a partition
l  list known partition types
m  print this menu
n  add a new partition
o  create a new empty DOS partition table
p  print the partition table
q  quit without saving changes
s  create a new empty Sun disklabel
t  change a partition's system id
u  change display/entry units
v  verify the partition table
w  write table to disk and exit
x  extra functionality (experts only)

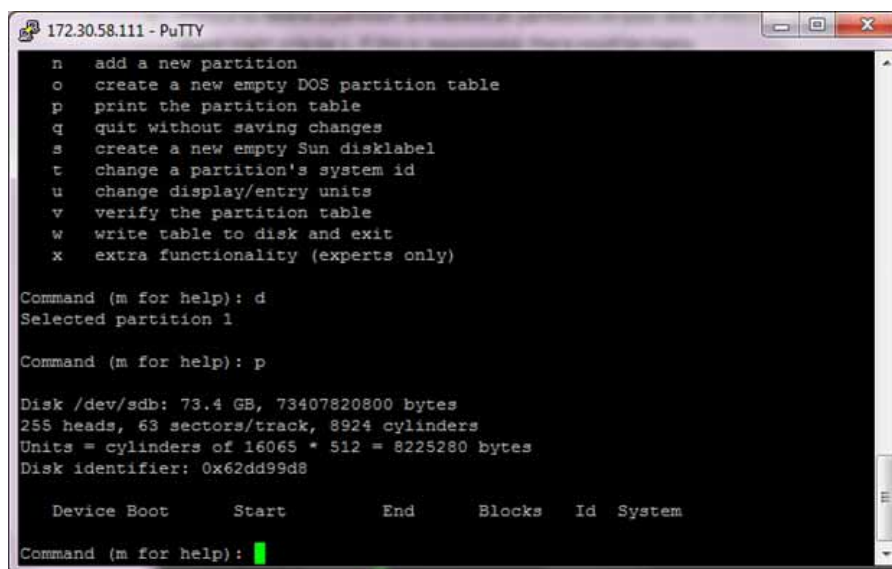
Command (m for help): d
Selected partition 1
Command (m for help): █

```

Note: If this disk is new, there may only be one partition to delete. If this is a repurposed disk, there may be multiple partitions to delete.

11. If there are multiple partitions on this disk, repeat Step 12 until you have deleted all remaining partitions.
12. Enter **p** to print the list of partitions to verify you have deleted all partitions on this disk.
command (m for help): **p**

The following output displays.



```

172.30.58.111 - PuTTY

n  add a new partition
o  create a new empty DOS partition table
p  print the partition table
q  quit without saving changes
s  create a new empty Sun disklabel
t  change a partition's system id
u  change display/entry units
v  verify the partition table
w  write table to disk and exit
x  extra functionality (experts only)

Command (m for help): d
Selected partition 1

Command (m for help): p

Disk /dev/sdb: 73.4 GB, 73407820800 bytes
255 heads, 63 sectors/track, 8924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x62dd99d8

   Device Boot      Start         End      Blocks   Id  System
Command (m for help): █

```

13. If all partitions have been deleted on this disk, enter **n** and press <Enter> to add a new partition.

command (m for help): **n**

The following output displays.

```

172.30.58.111 - PuTTY
s  create a new empty Sun disklabel
t  change a partition's system id
u  change display/entry units
v  verify the partition table
w  write table to disk and exit
x  extra functionality (experts only)

Command (m for help): d
Selected partition 1

Command (m for help): p

Disk /dev/sdb: 73.4 GB, 73407820800 bytes
255 heads, 63 sectors/track, 8924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x62dd99d8

   Device Boot      Start         End      Blocks   Id  System

Command (m for help): n
Command action
  e  extended
  p  primary partition (1-4)

```

14. Enter **p** and press <Enter> to assign this disk as the primary partition.

command (m for help): **p**

The following output displays.

```

172.30.58.111 - PuTTY

t  change a partition's system id
u  change display/entry units
v  verify the partition table
w  write table to disk and exit
x  extra functionality (experts only)

Command (m for help): d
Selected partition 1

Command (m for help): p

Disk /dev/sdb: 73.4 GB, 73407820800 bytes
255 heads, 63 sectors/track, 8924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x62dd99d8

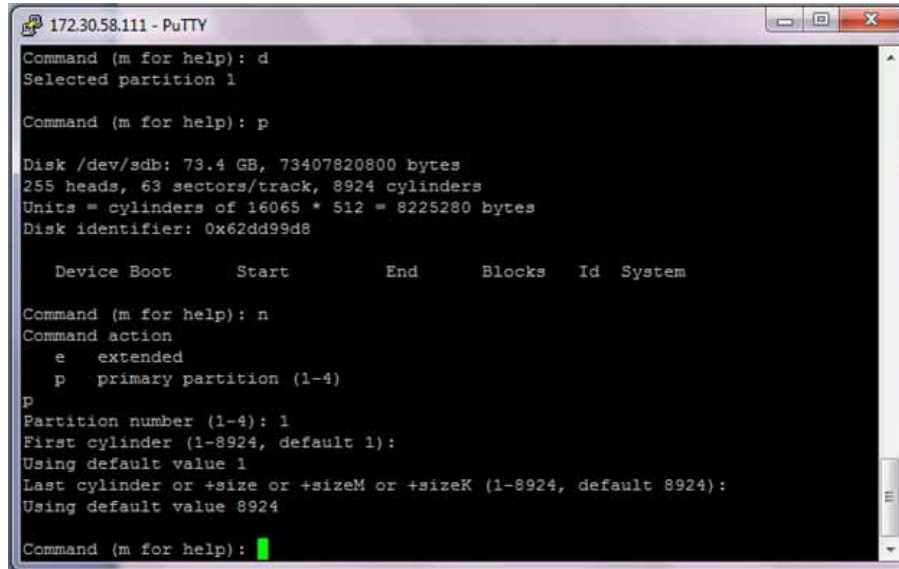
   Device Boot      Start         End      Blocks   Id  System

Command (m for help): n
Command action
  e  extended
  p  primary partition (1-4)
p
Partition number (1-4): █

```

15. Enter **1** and press <Enter> to assign the first partition as the NN-ISR storage disk.
command (m for help): 1

The following output displays.



```

172.30.58.111 - PuTTY
Command (m for help): d
Selected partition 1

Command (m for help): p

Disk /dev/sdb: 73.4 GB, 73407820800 bytes
255 heads, 63 sectors/track, 8924 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x62dd99d8

   Device Boot      Start         End      Blocks   Id  System
Command (m for help): n
Command action
  e   extended
  p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-8924, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-8924, default 8924):
Using default value 8924
Command (m for help): █

```

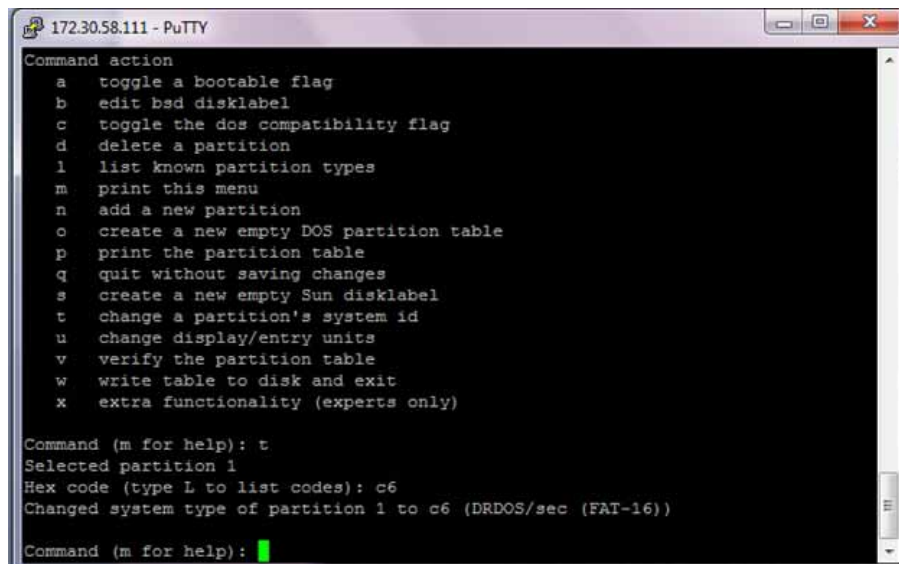
Keep all the defaults assigned to the first partition.

16. Enter **t** and press <Enter> to change the partition type.

Note: Acme Packet recommends using 25 as the partition type, however you can use whichever type you want. You can list the codecs by pressing **L**.

When the “Hex code” parameter displays, enter **83**.

command (m for help): **t**
Selected partition 1
Hex code (type L to list codes): **83**
Changed system type of partition 1 to 83 Linux (DRDOS/sec (FAT-16))
The following output displays.



```

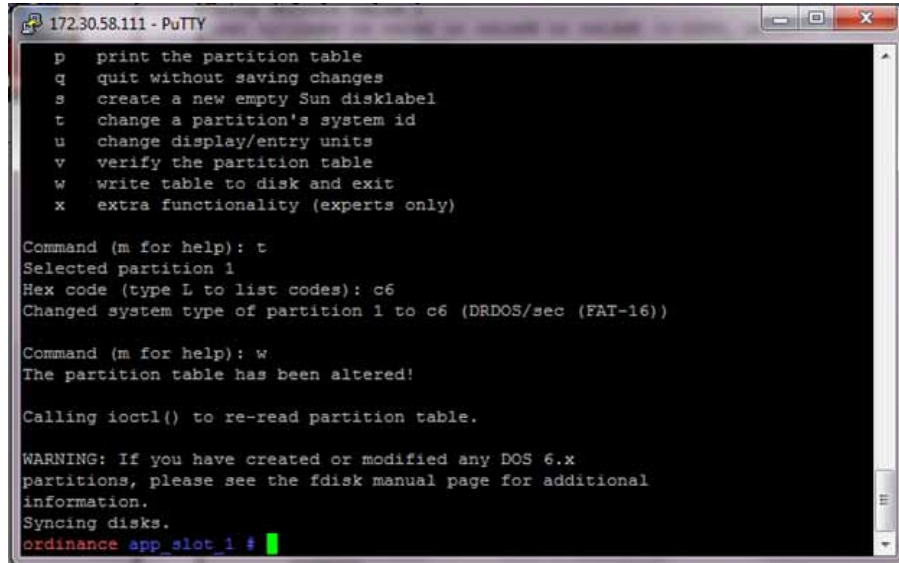
172.30.58.111 - PuTTY
Command action
  a   toggle a bootable flag
  b   edit bsd disklabel
  c   toggle the dos compatibility flag
  d   delete a partition
  l   list known partition types
  m   print this menu
  n   add a new partition
  o   create a new empty DOS partition table
  p   print the partition table
  q   quit without saving changes
  s   create a new empty Sun disklabel
  t   change a partition's system id
  u   change display/entry units
  v   verify the partition table
  w   write table to disk and exit
  x   extra functionality (experts only)

Command (m for help): t
Selected partition 1
Hex code (type L to list codes): c6
Changed system type of partition 1 to c6 (DRDOS/sec (FAT-16))
Command (m for help): █

```


17. Enter **w** and press <Enter> to write the new partition table to disk.
command (m for help): **w**

The following output displays.



```

172.30.58.111 - PuTTY
p  print the partition table
q  quit without saving changes
s  create a new empty Sun disklabel
t  change a partition's system id
u  change display/entry units
v  verify the partition table
w  write table to disk and exit
x  extra functionality (experts only)

Command (m for help): t
Selected partition 1
Hex code (type L to list codes): c6
Changed system type of partition 1 to c6 (DRDOS/sec (FAT-16))

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional
information.
Syncing disks.
ordinance app_slot_1 # █

```

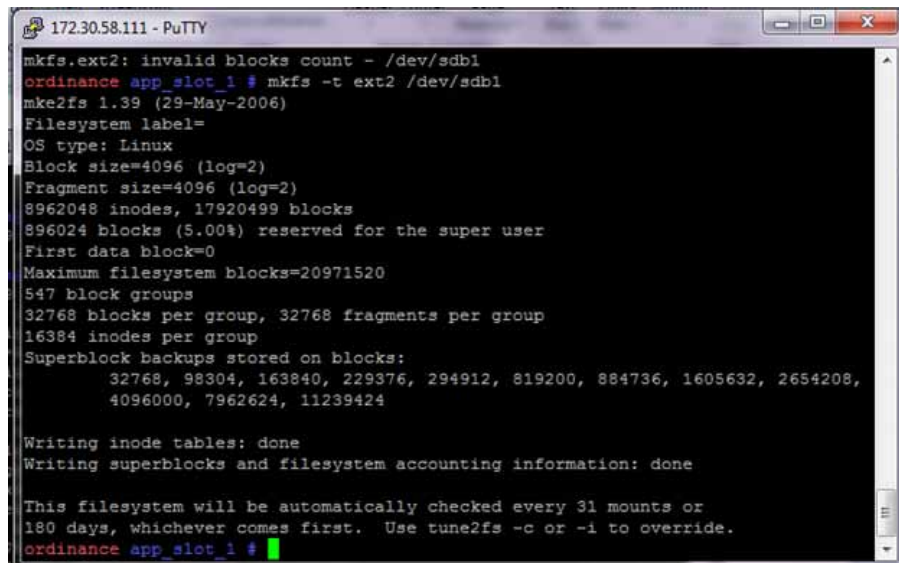
When the partition table is written, the utility exits and you are returned to the Linux shell.

Formatting the File System

This section describes how to format the file system.

18. Enter **mkfs -t ext3 /dev/sdb1** and press <Enter> to format the new file system.
mkfs -t ex3 /dev/sdb1

The shell prompt displays.



```

172.30.58.111 - PuTTY
mkfs.ext2: invalid blocks count - /dev/sdb1
ordinance app_slot_1 # mkfs -t ext2 /dev/sdb1
mke2fs 1.39 (29-May-2006)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
8962048 inodes, 17920499 blocks
896024 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=20971520
547 block groups
32768 blocks per group, 32768 fragments per group
16384 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624, 11239424

Writing inode tables: done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 31 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
ordinance app_slot_1 # █

```

19. Create a mount point for the new drive by entering **mkdir /<directory name>** and pressing <Enter>. The following example uses “ArchivedRecordings” as the directory name, however, you can choose any name.

```
mkdi r /Archi vedRecordi ngs
```

The shell prompt displays.

20. Enter **mount -t ext2 /dev/sdb1 /<directory name>** to mount your new partition to the specified directory.

```
mount -t ext2 /dev/sdb1 /Archi vedRecordi ngs/
```

The shell prompt displays.

21. Enter **vi /etc/fstab** and press **Enter** to edit the file system table (which is stored in text format).

22. Press **<Shift> G** to bring the prompt to the bottom of the file.

You are going to add a new line to the bottom of the file for the new mount point you created in the above steps.

Each line in the fstab file is a white space delimited series of six fields:

- filesystem—the filesystem location you created in step 18
- mount point—the directory (mount point) you created in step 19
- fs-type—the type of filesystem you created in step 18
- options—other filesystem options
- dump—not used
- fsck-order—not used

23. Position the cursor on the line above #End /etc/fstab and press **i** to enter insert mode. You are going to add a new line with the details of the mount point you created in steps 18-20.

24. Enter the following:

```
/dev/sdb1 <tab> /Archi vedRecordi ngs <tab> ext2 <tab> defaul ts
<tab> 0 <tab> 0
```

```
# File: /etc/fstab
# Summary: System file-system initialization table.
#
# filesystem mount-point fs-type options dump fsck-ord
er
/dev/sda3 / reiserfs defaults,noatime,data=writebac
k 1 1
/dev/sda2 /cxc_common reiserfs defaults,noatime,data=writebac
k 1 2
#<DATA-DEV> /cxc_common/data1 reiserfs defaults,noatime,data=writeback
1 2
#<DATA-DEV> /cxc_common/data2 reiserfs defaults,noatime,data=writeback
1 2
#<DATA-DEV> /cxc_common/data3 reiserfs defaults,noatime,data=writeback
1 2
/dev/sda1 swap swap pri=1 0 0
rootfs /mnt/ramdisk tmpfs defaults,size=1G,nr_inodes=5k,mo
de=777 0 0
/dev/sdb1 /ArchivedRecordings ext defaults 0 0
# End /etc/fstab
~
17,0-1 Bot
```

Here's the new line we created

25. Make your mount point permanent by entering **vi /etc/fstab** and pressing **<Enter>**. You can also edit the filesystem utilization table by entering **vi /etc/fstab** and pressing enter.

```
/etc/fstab
```

Warning: You must make the new drive a permanent mount. If you don't perform this procedural step, the mount is removed when the server is rebooted and you are not able to write and archive files to the disk.

26. Press <Shift> **G** to move to the bottom of the file.
27. Enter **i** to enter insert mode.

```

#
# File: /etc/fstab
# Summary: System file-system initialization table.
#
# filesystem      mount-point      fs-type          options          dump    fsck-ord
er
/dev/sda3        /                reiserfs        defaults,noatime,data=writeback
k 1 1
/dev/sda2        /cxc_common      reiserfs        defaults,noatime,data=writeback
k 1 2
#<DATA-DEV>     /cxc_common/data1 reiserfs        defaults,noatime,data=writeback
1 2
#<DATA-DEV>     /cxc_common/data2 reiserfs        defaults,noatime,data=writeback
1 2
#<DATA-DEV>     /cxc_common/data3 reiserfs        defaults,noatime,data=writeback
1 2
/dev/sda1        swap            swap            pri=1            0        0
rootfs          /mnt/ramdisk    tmpfs          defaults,size=1G,nr_inodes=5k,mo
de=777 0 0
#/dev/sdb1      /mnt/vm         ext2           defaults         1        1
/dev/sdb1       /ArchivedRecordings ext2           defaults         1        2
End /etc/fstab
19,1 Bot

```

28. You have completed the mounting of a separate drive on the RSS to store recordings.

Note: If you want to make this new drive you just mounted the primary location for which the RSS writes recordings, you must edit the *vmgConfig.xml* file. However, if you intend to use this drive for archiving, consult the Archiver Tabl section in the *Net-Net Interactive Session Recorder Administrator Guide* and do not complete the following step.

Editing the vmgConfig.xml File

After completing the procedures in Mounting a Second RSS Drive for Recordings, you can make the new drive the primary location for which the RSS writes recordings. To do this, you must edit the *vmgConfig.xml* file. Use the following procedure to edit the *vmgConfig.xml* file.

Note: For *vmgConfig.xml* parameter descriptions, see Appendix F, *vmgConfig.xml* Parameters.

To edit the vmgConfig.xml file:

1. Enter **shell** and press <Enter>.


```
NN-I SR> shel l
```

The shell prompt displays. The remaining steps show examples of the shell prompt and output displays for each command entered.

2. Enter **vi vmgConfig.xml** and press <Enter> to open the XML file.
 <hostname> # **vi vmgConfig.xml**

The file opens and displays the contents of the file in the window.

3. Enter **i** and press <Enter> to enter the editing mode.
 <hostname> # **i**

Line 6 in the XML file is the initial location for all recordings.
 <Location>/cxc_common/ISR/Recordings</Location>

4. Edit Line 6 to read <Location>/<Directory Name>/<Location>, replacing Directory Name with the mount point created in the process step. For example,
 <hostname> # **<Location>/ArchivedRecordings</Location>**
5. Press <Esc>, then type “:wq”, and press <Enter>.

The shell prompt displays.

6. Enter **exit** to exit the shell.

The “NN-ISR>” prompt displays.

Enter **restart processor** for the RSS to use this new configuration.
 NN-ISR> **restart processor ISR**

The NN-ISR restarts.

7. After the NN-ISR is up and running, perform Steps 1 through 4 to open a shell on the NN-ISR.
8. Enter **less /cxc_common/ISR/ISRLogs/ISR.log** and press <Enter> to open the *ISR.log* file.
 <hostname> # **less /cxc_common/ISR/ISRLogs/ISR.log**

The contents of the *ISR.log* file display.

9. Press the <space bar> to move the file forward. The currently configured recording location displays. For example:
 10/04/2011 06:01:23[NOTICE] mi xMaster: Recordings Directory = /ArchivedRecordings

C

Configuring RAID on the CIS and RSS Servers

Redundant Arrays of Inexpensive Disks (RAID) is a combination of multiple small, inexpensive disk drives into an array of disk drives which yields performance exceeding that of a single drive. This array of drives appears to the computer as a single logical storage unit or drive.

There are 6 levels of RAID (RAID 0 through RAID 5). The CIS and RSS certified hardware servers support RAID 1 and RAID 5. RAID Level 1 provides redundancy by writing all data to two or more drives. RAID Level 5 distributes parity among the drives.

The 72GB CIS and RSS servers include the RAID 1 configuration. For the 300GB CIS and RSS servers, you must configure RAID before performing the CIS and RSS installation. Use the procedures in this Appendix to configure RAID on the CIS and RSS servers.

Configuring RAID

Use the following procedure to configure RAID on the CIS and/or RSS server.

To configure RAID:

1. Power up and boot the server.

After the “HP ProLiant” splash screen, the following message displays:
“Press any key for ROM Message Options”.

2. Press any key so you can see the remaining boot options.

The startup messages and configuration options for the various hardware components display. The first option presented is the Hewlett Packard Integrated Lights Out (HP ILO) service. If you want to use this service, you can find more information about configuring HP ILO on the [HP website](#).

The RAID controller starts up and the following prompt displays:
Slot HP Smart Array P41i Controller # Logical Drives:

The number of logical drives should be “2”. However, on first bootup of the server, it is typically “1”.

Note: If there are “2” logical drive sets, you are finished with this procedure. If there is “1” logical drive, continue to Step 3.

3. Press <F8> to enter the **Option ROM Configuration for Arrays Menu**. The following menu displays:

```

Create Logical Drive
View Logical Drive
Delete Logical Drive
Select Boot Volume
Manage License Keys
Cache Settings
    
```

4. Select **“View Logical Drive”**. The following information displays:
Logical Drive #1 Raid 1+0, 73.37 GB
5. Press <Esc> to return to the Main Menu.
6. Select **“Create Logical Drive”**. The output information shows the drives that are not currently part of an existing logical drive. The default RAID configuration for each server is as follows:

Server	Number of Drives	Drive Size Each	Default RAID Configuration
CIS	4	600GB	RAID 5
RSS	2	300GB	RAID 1 and 0

7. Press <Enter> to create the volume on the server. The volume size is approximately 300GB with the remaining 300GB used for the mirrored volume.
8. Select **“View Logical Drive”** from the Options Menu to view the logical drive you created.
9. Select <Exit> to exit the Options Menu and continue the bootup process.

Note: On the CIS, the 900GB partition is used to deploy the Virtual Machines, specifically the database. On the RSS, the 300GB partition is used to store Recordings.

This Appendix provides FAQs and additional information regarding the CIS components for your reference.

vSphere Hypervisor

Q. How do I manage the virtual machine (VM) host?

A. You use the VMware vSphere client to monitor and configure the VM host. To install the vSphere client, see Chapter 3, Installing the CIS Software.

Q. What operating system do the virtual machines use?

A. All VMs use the Fedora 14 (x86_64) Linux operating system.

Q. How do I monitor and manage the virtual machines?

A. You use the VMware vSphere client to monitor and configure the VMs. To install the vSphere client, see Chapter 3, Installing the CIS Software.

Q. What user and password is used to login on the guest OS?

A. All VMs have a "gansett" user with password "n3wf0und".

Q. What is the root password on the guest OS?

A. The root password for the guest OS is "64^5377".

A. Do I need to configure the database URL for the dashboards?

A. No. There is a local VM network (named VM Local) that includes the database VM (named "index") with IP address 192.168.1.50, and Dashboard VM (named "dashboard") on 192.168.1.25. These settings and the "VM Local" virtual network remain static.

A. How do I download files from a virtual host?

A. SSH file transfers with an SFTP client such as Filezilla using the root user and password gains access to any file on the system.

Index Virtual Machine

A. What version of MySQL Server is installed with the CIS?

A. The MySQL Server version is 14.14 Distrib 5.5.12, for Linux (x86_64).

A. How do I connect directly to the CIS database in MySQL Server?

A. If the index VM was configured with a static IP on the VM Network, you can connect to the 'ipcr_db' database from a MySQL client with user 'ipcr_admin' and password 'n3wf0und'.

Root access to MySQL server is possible only from mysql's command line client in the index VM connecting as 'root' with password 'n3wf0und'.

A. How do I view the logs in MySQL Server?

A. MySQL Server's log file can be found in the directory */var/log/mysqld.log*. The error log can be found in the directory */var/lib/mysql/index.err*.

If configured to do so, slow query logs can be found in the directory */var/lib/mysql/index-slow.log*.

Note: All NN-ISR-related errors are found in the respective component logs.

Q. How do I log slow queries in MySQL Server?

A. To start logging slow queries without restarting mysql server, execute the following:

1. At MySQL command prompt, enter **set global slow_query_log=1**.
2. Enter **set global long_query_time=1** (or whatever you want for query seconds).
3. To verify the settings for these commands, use the following show variables:

```
%slow%  
%length%
```

By default, the slow query logs are stored in the directory */var/lib/mysql/index-slow.log*.

Q. How do I find the data files in MySQL Server?

A. Data files for the 'ipcr_db' database are found in the directory */var/lib/mysql/ipcr_db/*.

Dashboard Virtual Machine

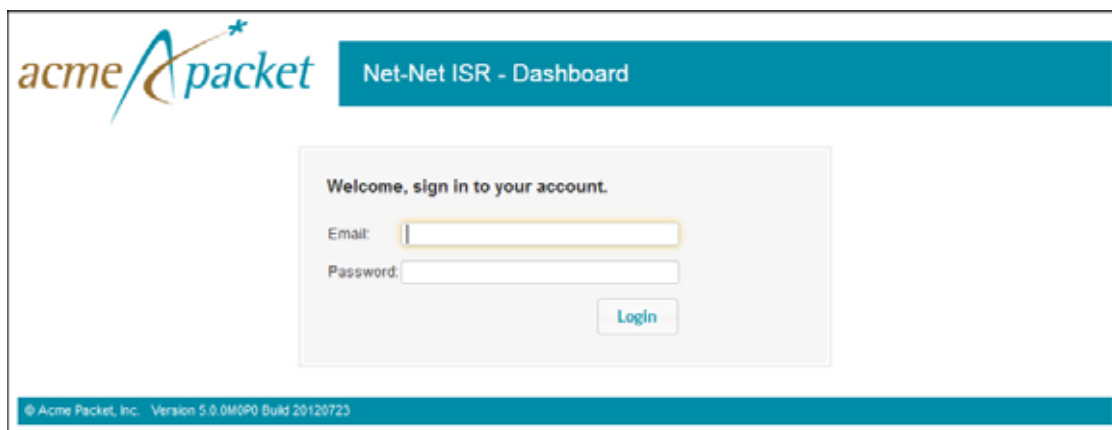
Q. How do I log in to the NN-ISR Dashboard?

A. Perform the following:

1. Open your Internet Web browser.
2. Enter the IP address of the NN-ISR. For example:

http://172.54.66.7

The Login page displays.



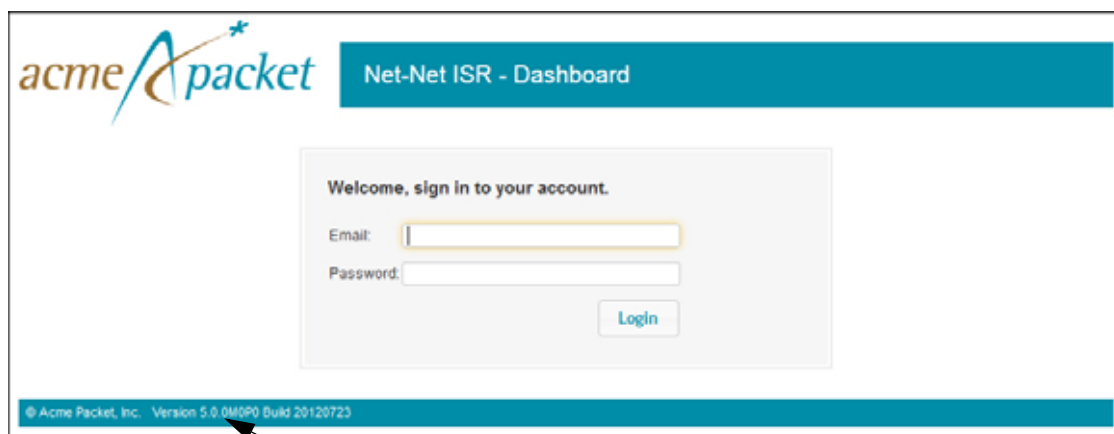
3. Enter your email and password, respectively, in the “**Email**” and “**Password**” fields. The default user name and password are:

User name: isradmin@acmepacket.com

Password: admin123

Q. How do I find the version of the NN-ISR Dashboard?

A. The NN-ISR Dashboard version number is shown on the bottom border of all pages in the graphical user interface (GUI).



Version Number of NN-ISR Dashboard

Q. How do I troubleshoot problems with the web interface on the Dashboard VM?

A. A common error during Dashboard deployment leaves the Dashboard unable to connect to the Index VM database. If browsing to the Dashboard IP results in the display of a “500 Internal Server Error” message (for example, in Chrome “HTTP Error 500 (Internal Server Error): An unexpected condition was encountered while the server was attempting to fulfill the request.”), the error should be described in the Dashboard application log.

To access the application log:

1. Access the Dashboard VM shell.
2. Enter **less /var/www/dashboard/log/production.log**.
3. Enter **G** to scroll to the bottom of the log.
4. Scroll up the file looking for the following lines:

```
Status: 500 Internal Server Error
Can't connect to MySQL server on '169.254.1.50' (113)
```

5. Enter **q** to exit.
6. Enter **ping 169.254.1.50**.
7. If the following appears:

```
PING 169.254.1.50 (169.254.1.50) 56(84) bytes of data
From 169.254.1.50 icmp_seq=2 Destination Host Unreachable.
```

<Ctrl> C to discontinue the ping and check the network service status and connections on the Index host's eth1 interface.

CIS Networking

Q. How do I add a separate network, for example a separate network for voice traffic?

A. Using the vSphere client, perform the following:

1. Log in to the vSphere client application.
2. Click on the **Configuration** tab for the ESXi host.
3. Click on **Hardware->Networking**.
4. Click **Add Networking...** in the top right corner
5. In the **Add Network Wizard**, complete the following steps:
 - Verify the **Virtual Machine** radio button is selected and hit <Next>.
 - Verify the **Create a Virtual Switch** radio button is selected.
 - Click the check-box of the appropriate NIC and click <Next>.

The appropriate NIC has a "**Speed**" column value that is not "Down", for example, "1000 Full". In addition, the NIC has a "**Network**" column value that contains the range of IPs expected on that network.

- Edit the "**Network Label**"; for example, "VM Voice", and click <Next>.
 - Review and click <Finish>.
6. Right-click on the VM where the network is being added.
 7. Click "**Edit Settings...**" and complete the following:

- In the properties window, click <Add>.
 - Select "**Ethernet Adapter**" and press <Next>.
 - Select the proper "**Network Connection**" from the pull-down menu; for example, "VM Voice".
 - Review and click <Finish>.
8. Select the VM for adding the network, and execute the following:
- Click on the "**Console**" tab and click in the main panel. Your mouse is confined to the console panel.
 - Press <Alt>+<Ctrl> to release.
 - Log into the VM with the root password **root/64^5377**.
 - Copy the first network config as a template for the third interface:
- ```
cp /etc/sysconfig/network-scripts/ifcfg-eth0 /etc/sysconfig/network-scripts/ifcfg-eth2
```
9. Set the IP of the VM by editing the file *ifcfg-eth2* as follows:
- Enter **vi /etc/sysconfig/network-scripts/ifcfg-eth2** and press <Enter>.
  - Press <i> to enter insert mode.
  - Change DEVICE="eth2".
  - Change IPADDR=<your Index IP> (on VM voice network).
  - Change GATEWAY=<network gateway>.
  - Change DNS1=<network DNS>.
  - Change DNS2=<network secondary DNS>.
  - Change NAME="System eth2".
  - Press <Esc>, then type ":wq", and press <Enter>.
10. Delete the UDev rules for the network interfaces as follows:
- Type "**rm -f /etc/udev/rules.d/70-persistent-net.rules**".
11. Restart the host for the interface to automatically be added as follows:
- Type "**shutdown -r now**".

**Note:** Executing this command reboots the system, so it is important to do this with no live traffic.

12. Log in to the VM again and ping an appropriate IP address to verify the new interface.

**Q. How do I add a second Ethernet adapter on the same network, (also known as NIC teaming)?**

A. Perform the following:

1. Verify the cable connection and green light on the physical interface.
2. Using the vSphere client, execute the following:
  - Click on the Host IP or name on the list in the left panel.
  - Click on the "**Configuration**" tab in the main panel.
  - Click the **Hardware->Networking**.

- Find the "**Virtual Switch**", for example, "vSwitch0", containing the labeled network to which the new network adapter will be added, and click the "**Properties**" link next to that "Virtual Switch".
- In the vSwitch Properties window, click the "**Network Adapters**" tab.
- With the proper adapter highlighted, click <Add>.
- In the "**Add Adapter Wizard**" click the check-box of the appropriate NIC and click <Next>.

The appropriate NIC has a "**Speed**" column value that is not "Down", for example, "1000 Full". In addition, the NIC has a "**Network**" column value that contains the range of IPs expected on that network.

- Verify both adapters are in the "**Active Adapters**" group and click <Next>.
- Review the list and click <Finish>.

The second "**Physical Adapter**" icon displays next to the labeled network indicating that the second Ethernet adapter is now on the same network.

# E vmgConfig.xml Parameters

This Appendix provides the parameters, the supported values, and the description of each parameter in the vmgConfig.xml file. Refer to this appendix as required when editing the vmgConfig.xml file.

| XML Parameters                                                                                                                                       | Supported Values     | Description                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>&lt;NumberOfChannels&gt;500&lt;/NumberOfChannels&gt;</code>                                                                                    | 1 - 500              | The number of sessions that should be started on this device. This parameter is restricted by the license file.                                                                                                                                                                                                                                                                                                                    |
| <code>&lt;Recording&gt;</code>                                                                                                                       |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>&lt;FullCallRecording&gt;disabled&lt;/FullCallRecording&gt;</code><br><code>&lt;Location&gt;/cxc_common/ISR/Recordings&lt;/Location&gt;</code> | enabled, disabled    | <b>enabled</b> = NN-ISR will not use recording rules, index recordings. It will record all traffic received and put files named <code>&lt;FileNameFormat&gt;</code> in <code>&lt;Location&gt;</code> .<br><b>disabled</b> = NN-ISR uses other sources to ascertain how sessions should be recorded. This is the standard behavior.                                                                                                 |
|                                                                                                                                                      | accessible directory | The location where recordings made on this RSS will be written. This is normally the RSS itself.                                                                                                                                                                                                                                                                                                                                   |
| <code>&lt;AlternativeLocation&gt;/cxc_common/ISR/ArchivedRecordings&lt;/AlternativeLocation&gt;</code>                                               | accessible directory | An alternate location where recordings will be written. If <code>&lt;Location&gt;</code> is changed to a remote storage device, <code>&lt;AlternativeLocation&gt;</code> would allow you to specify a fallback location in the event <code>&lt;Location&gt;</code> is not accessible. When <code>&lt;Location&gt;</code> is on the RSS, <code>&lt;AlternativeLocation&gt;</code> is not needed.                                    |
| <code>&lt;ThirdLocation/&gt;</code>                                                                                                                  | accessible directory | A third alternate location where recordings are written. If <code>&lt;Location&gt;</code> is changed to a remote storage device, <code>&lt;ThirdLocation&gt;</code> would allow you to specify a fallback location in the event <code>&lt;Location&gt;</code> and <code>&lt;AlternativeLocation&gt;</code> are not accessible. When <code>&lt;Location&gt;</code> is on the RSS, <code>&lt;ThirdLocation&gt;</code> is not needed. |
| <code>&lt;FileNameFormat&gt;%DNIS%-%CALLID%.wav&lt;/FileNameFormat&gt;</code>                                                                        | text                 | Any combination of letters and numbers, - (dash) and _ (underscore) along with system variables <code>%DNIS%</code> , <code>%ANI%</code> , <code>%CALLID%</code> , <code>%DATE%</code> that will be used as the default naming convention for files.                                                                                                                                                                               |

| XML Parameters                                  | Supported Values                | Description                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>&lt;Format&gt;</b>                           |                                 |                                                                                                                                                                                                                                                                                                                                                                        |
| <RIFFHeader>enabled</RIFFHeader>                | enabled, disabled               | Insert RIFF Header on WAV recordings                                                                                                                                                                                                                                                                                                                                   |
| <Encoding>linear</Encoding>                     | linear, ulaw, alaw, adpcm       |                                                                                                                                                                                                                                                                                                                                                                        |
| <BitRate>8</BitRate>                            | 8,16                            |                                                                                                                                                                                                                                                                                                                                                                        |
| <NumberOfChannels>1</NumberOfChannels>          | 1, 2                            | 1 = mono<br>2 = stereo                                                                                                                                                                                                                                                                                                                                                 |
| <SeparateFilePerChannel/>                       | true, false                     | By default, with no parameter, this is disabled. Set to true, <SeparateFilePerChannel>true</SeparateFilePerChannel>, if you want your stereo recording to be in 2 separate files, caller in one file, called party in the other. Used in broadcast implementations. IMPORTANT -- with this enabled, calls can not be played back through the Acme provided dashboards. |
| <b>&lt;/Format&gt;</b>                          |                                 |                                                                                                                                                                                                                                                                                                                                                                        |
| <b>&lt;BeepOnRecord&gt;</b>                     |                                 |                                                                                                                                                                                                                                                                                                                                                                        |
| <BeepFile>beep.wav</BeepFile>                   | name of an 8bit 8KHz ulaw file  | File that should be played when beep tone is enabled. This file needs to be placed in the <LocalRepository> directory specified in the Cache section of this file.                                                                                                                                                                                                     |
| <BeepIntervalSeconds>10</BeepIntervalSeconds>   | numbers                         | Time, in seconds, between each beep, when enabled in the dashboard.                                                                                                                                                                                                                                                                                                    |
| <BeepOnRecordState>disabled</BeepOnRecordState> | enabled, disabled               | This flag is obsolete. Beep enabled/disabled in AdminDashboard on route by route, account by account basis.                                                                                                                                                                                                                                                            |
| <BeepDirection>ToCaller</BeepDirection>         | ToCaller, ToCalledParty, ToBoth | Specify who should hear the intermittent beep tone.                                                                                                                                                                                                                                                                                                                    |
| <b>&lt;/BeepOnRecord&gt;</b>                    |                                 |                                                                                                                                                                                                                                                                                                                                                                        |
| <b>&lt;/Recording&gt;</b>                       |                                 |                                                                                                                                                                                                                                                                                                                                                                        |

| XML Parameters                                                                    | Supported Values       | Description                                                                                                                                                                     |
|-----------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>&lt;Sip&gt;</b>                                                                |                        |                                                                                                                                                                                 |
| <SipPort>5060</SipPort>                                                           |                        | Port RSS is listening for SIP Traffic.                                                                                                                                          |
| <FromFormat>%ANI%@%IP%:%PORT%;channel=%CHANNEL%;<br>call-id=%CALLID%</FromFormat> | valid SIP URI          | Format of FROM header to be used on INVITES FROM the RSS back to the Outbound Session Agent. channel and callid are useful for API implemetnations. They should not be removed. |
| <ToFormat>%DNIS%@%IP%:%PORT%</ToFormat>                                           | valid SIP URI          | Format of TO header to be used on INVITES FROM the RSS back to the Outbound Session Agent.                                                                                      |
| <RejectionSubstitutionCode>-1</RejectionSubstitutionCode>                         | Any valid SIP response | Error Message to be sent back in the event the RSS is unable to accept a call. Overrides all Error responses. -1 indicates no override, use standard rejection message.         |
| <RegistrarAddress/>                                                               | IP/FQDN of Registrar   | IF RSS must register as endpoint, what address should it register with.                                                                                                         |
| <RegistrarUserName/>                                                              | text                   | Registrar User Name                                                                                                                                                             |
| <RegistrarExpires>0</RegistrarExpires>                                            | numeric                | Registrar Expiration. Default is no expiration.                                                                                                                                 |
| <AuthenticationUserId/>                                                           | text                   | User ID for Challenge Authentication                                                                                                                                            |
| <AuthenticationPassword/>                                                         | text                   | Password for Challenge Authentication                                                                                                                                           |
| <AuthenticationRealm/>                                                            | text                   | Realm for Challenge Authentication                                                                                                                                              |
| <InviteTimeout>75</InviteTimeout>                                                 | 1 - 180                | Timer, in seconds, for how long RSS will wait for 18x message on an INVITE                                                                                                      |
| <TransferInviteTimeout>75</TransferInviteTimeout>                                 | 1 - 180                | Timer, in seconds, for how long RSS will wait for 18x message on an REFER                                                                                                       |
| <SipProxyAddress/>                                                                |                        |                                                                                                                                                                                 |
| <ForwardHoldRequest>disabled</ForwardHoldRequest>                                 | enabled, disabled      |                                                                                                                                                                                 |
| <b>&lt;Supported&gt;</b>                                                          |                        |                                                                                                                                                                                 |
| <Headers/>                                                                        | SIP Header             | Header name that should be taken from incoming INVITE and added to outgoing INVITE                                                                                              |
| <ComfortNoise/>                                                                   |                        |                                                                                                                                                                                 |
| <b>&lt;/Supported&gt;</b>                                                         |                        |                                                                                                                                                                                 |
| <b>&lt;AuthorizedIncomingGateways&gt;</b>                                         |                        |                                                                                                                                                                                 |
| <Host/>                                                                           |                        |                                                                                                                                                                                 |
| <b>&lt;/AuthorizedIncomingGateways&gt;</b>                                        |                        |                                                                                                                                                                                 |
| <b>&lt;/Sip&gt;</b>                                                               |                        | With no values, RSS accepts all incoming INVITEs and evaluates for recording. To restrict devices, enumerate.                                                                   |

| XML Parameters                                                           | Supported Values  | Description                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>&lt;XmlRpc&gt;</b>                                                    |                   |                                                                                                                                                                                                                                                                        |
| <ServerPort>8888</ServerPort>                                            |                   | Port where XML RPC server is listening. This should not be changed.                                                                                                                                                                                                    |
| <b>&lt;AllowedHosts&gt;</b>                                              |                   |                                                                                                                                                                                                                                                                        |
| <Host/>                                                                  |                   | Hosts that should be allowed to issue API commands                                                                                                                                                                                                                     |
| </AllowedHosts>                                                          |                   |                                                                                                                                                                                                                                                                        |
| <b>&lt;QueryAgent&gt;</b>                                                |                   |                                                                                                                                                                                                                                                                        |
| <Enabled>>true</Enabled>                                                 | true, false       | If true, RSS will connect to CIS to get recording rules. If false, RSS expects that either <FullCallRecording> is enabled OR <SkipVoiceBrowserMode> is disabled. DO NOT EDIT UNLESS DIRECTED.                                                                          |
| <Host>localhost</Host>                                                   | IP/FQDN           | IP Address of XMLRPC Query Agent. Is installed on each RSS host. DO NOT EDIT UNLESS DIRECTED.                                                                                                                                                                          |
| <Port>8887</Port>                                                        | port              | Port for XMLRPC Query Agent. DO NOT EDIT UNLESS DIRECTED.                                                                                                                                                                                                              |
| <SkipVoiceBrowserMode>enabled</SkipVoiceBrowserMode>                     | enabled, disabled | If disabled, RSS will issue INVITE to address specified in <IVRGateway> for recording rules. This is the RSS 1.4 implementation and is here for backwards compatibility. DO NOT EDIT UNLESS DIRECTED.                                                                  |
| <LocalRouteMapCache>enabled</LocalRouteMapCache>                         | enabled, disabled | If disabled, RSS will need to communicate with CIS on every call, which could impact performance. DO NOT EDIT UNLESS DIRECTED.                                                                                                                                         |
| <LocalRouteMapCacheUpdateInterval>300</LocalRouteMapCacheUpdateInterval> | time, seconds     | Interval, in seconds, that RSS should attempt to refresh the route map cache and read in changes in the CIS. 5 minutes is the default. This is the maximum amount of time that will elapse before a change in the AdminDashboard will be applied to incoming sessions. |
| </QueryAgent>                                                            |                   |                                                                                                                                                                                                                                                                        |
| <b>&lt;/XmlRpc&gt;</b>                                                   |                   |                                                                                                                                                                                                                                                                        |



| XML Parameters                                                   | Supported Values  | Description                                                                                                                                                                                      |
|------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <TransferDropOutMode>disabled</TransferDropOutMode>              | disabled, enabled | Should the RSS drop out of the call when a request to transfer is received? If disabled, RSS will continue to record. If enabled, RSS will remove itself from the call path on transfer request. |
| <b>&lt;Rtp&gt;</b>                                               |                   |                                                                                                                                                                                                  |
| <ListenPortStart>22000</ListenPortStart>                         | 1 - 66535         |                                                                                                                                                                                                  |
| <SendPortStart>32000</SendPortStart>                             | 1 - 66535         |                                                                                                                                                                                                  |
| <MinimumPacketSize>1</MinimumPacketSize>                         |                   |                                                                                                                                                                                                  |
| <MaximumPacketSize>160</MaximumPacketSize>                       |                   |                                                                                                                                                                                                  |
| <RtpInCheckPacketSource/>                                        |                   |                                                                                                                                                                                                  |
| <TransferMuteAudio/>                                             |                   |                                                                                                                                                                                                  |
| <MissingMediaDetection>                                          |                   |                                                                                                                                                                                                  |
| <SessionEstablishment>                                           |                   |                                                                                                                                                                                                  |
| <WarnAfterSeconds>10</WarnAfterSeconds>                          |                   |                                                                                                                                                                                                  |
| <TerminateSessionAfterSeconds>300</TerminateSessionAfterSeconds> |                   |                                                                                                                                                                                                  |
| </SessionEstablishment                                           |                   |                                                                                                                                                                                                  |
| </SessionInProgress                                              |                   |                                                                                                                                                                                                  |
| <WarnAfterSeconds>10</WarnAfterSeconds>                          |                   |                                                                                                                                                                                                  |
| <TerminateSessionAfterSeconds>300</TerminateSessionAfterSeconds> |                   |                                                                                                                                                                                                  |
| </SessionInProgress                                              |                   |                                                                                                                                                                                                  |
| </MissingMediaDetection>                                         |                   |                                                                                                                                                                                                  |
| <b>&lt;/Rtp&gt;</b>                                              |                   |                                                                                                                                                                                                  |

| XML Parameters                                                                                                                                                                                                                                             | Supported Values         | Description                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>&lt;IvrGateways&gt;</b><br><Host/><br><b>&lt;/IvrGateways&gt;</b>                                                                                                                                                                                       |                          | Fallback Session Agent IP address in the event RSS can't build initial Session Agent Cache from CIS                                                                                                                          |
| <VMGIpAddress></VMGIpAddress>                                                                                                                                                                                                                              | IPv4 Address             | Must be specified when there are multiple network interfaces configured on an RSS server. Tells the RSS which address it should use for all egress traffic.                                                                  |
| <LocalCallDetailRecord>disabled</LocalCallDetailRecord>                                                                                                                                                                                                    | enabled, disabled        |                                                                                                                                                                                                                              |
| <EarlyMediaAllow>true</EarlyMediaAllow>                                                                                                                                                                                                                    | true, false              | Should Early Media (RTP received before 2000K) be forwarded or dropped                                                                                                                                                       |
| <b>&lt;Cache&gt;</b><br><NumberOfCacheEntries>256</NumberOfCacheEntries><br><br><LocalRepository>/cxc_common/ISR/Cache/</LocalRepository><br><br><RemoteRepositoryURL>http://loudeye.com/muzak/get_some.php</RemoteRepositoryURL><br><b>&lt;/Cache&gt;</b> | 1 - 256<br><br>directory | Number of files RSS should hold in its cache before the oldest file is removed and replaced with a newer request.<br><br>Directory where Cached files should be stored.<br><br>Not currently supported.                      |
| <b>&lt;FailOver&gt;</b><br><Mode/><br><br><GatewayToInvite/><br><br><MessageFile/><br><br><MessageFile/><br><b>&lt;/FailOver&gt;</b>                                                                                                                       |                          | LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.<br><br>LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.<br><br>LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.<br><br>LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED. |
| <b>&lt;PortCapacity&gt;</b><br><NumberOfPortCapacityLines>0</NumberOfPortCapacityLines><br><br><MessageFile/><br><br><Loop/><br><b>&lt;/PortCapacity&gt;</b>                                                                                               |                          | LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.<br><br>LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.<br><br>LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.                                                          |

---

| XML Parameters                                                                                     | Supported Values | Description                                                    |
|----------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------|
| <b>&lt;Sip&gt;</b><br><IsrUcidHeaderField> X-ISR-UCID </IsrUcidHeaderField><br><b>&lt;/Sip&gt;</b> |                  | Configures the X-ISR-UCID header field in SIP INVITE messages. |
| <b>&lt;Siprec&gt;</b><br><SiprecEnabled/><br><b>&lt;/Siprec&gt;</b>                                | true, false      | Enables or disables SIPREC support. The default is false.      |

---



# F Selective Call Recording/SIPREC

## What is SIPREC?

---

The SIPREC protocol is the protocol used to interact between a Session Recording Client (SRC) (the role performed by Net-Net ESD) and a Session Recording Server (SRS) (a 3rd party call recorder or the NN-ISR's Record and Store Server (RSS)). It controls the recording of media transmitted in the context of a communications session (CS) between multiple user agents.

SIPREC provides a selective-based call recording solution that increases media and signaling performance on 3rd party call recording servers, more robust failovers, and the ability to selectively record.

**Note:**

1. SIPREC isolates the 3rd party recorders from the communication session. The 3rd party recorders can determine whether or not recording is desired.
2. The SRC starts a recording session for every call within a configured realm. All call filtering, if desired, must be accomplished by the SRS. The SRS performs the filtering and selection of which sessions it should record.

## License/Hardware Requirements

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SIPREC requires the purchase of a Session Recording license. Contact your Acme Packet Representative for more information.

SIPREC is currently supported on the following platforms running Acme Packet Release E-C(xz)6.4.0F1:

- Net-Net 3820
- Net-Net 4500
- Net-Net Enterprise Session Director-Server Edition (ESD-SE)
- Net-Net Enterprise Session Director-Virtual Machine Edition (ESD-VME)

## How it Works

---

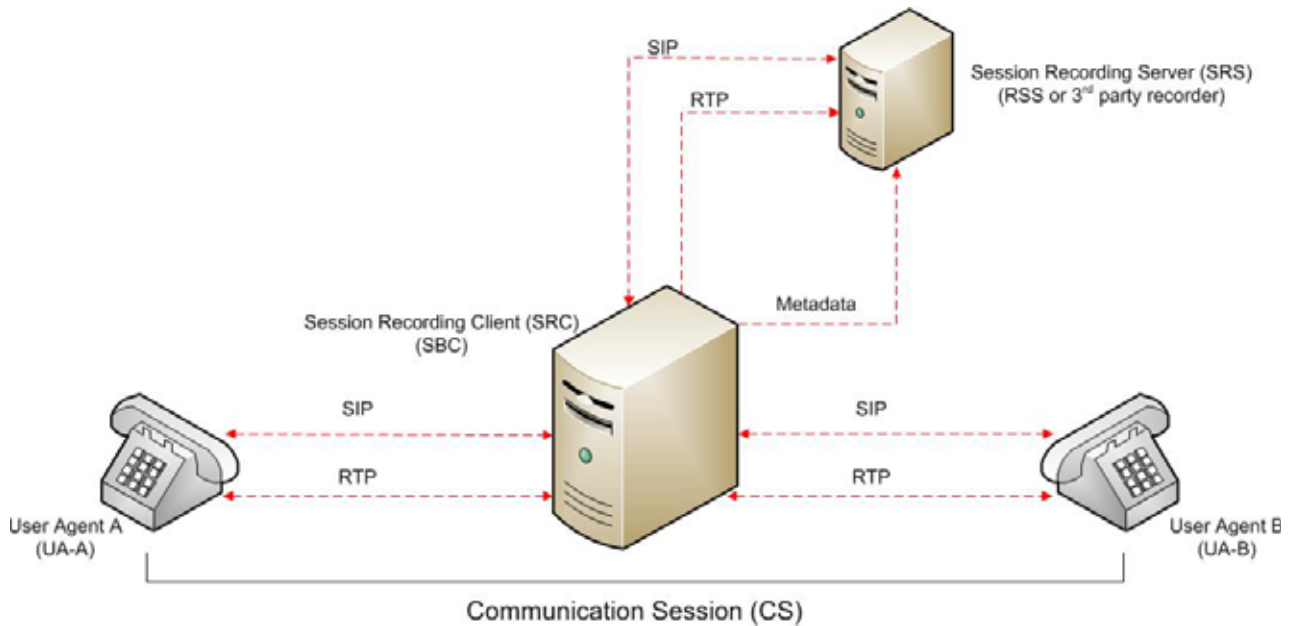
The SIPREC feature supports active recording, where the Net-Net ESD acting as the SRC, purposefully streams media to the NN-ISR's RSS (or 3rd party call recorder) acting as the SRS. The SRC and SRS act as SIP User Agents (UAs). The SRC provides additional information to the SRS to describe the communication sessions, participants and media streams for the recording session to facilitate archival and retrieval of the recorded information.

The Net-Net ESD acting as the SRC, is the source for the recorded media. The Net-Net ESD consumes configuration information describing the ecosystem within which it operates. The interface, realm and session agent configuration objects specify the SIPREC configuration. A SIP UA can elect to allow or disallow any network element from recording its media.

During the establishment of a SIP Session, the Net-Net ESD determines if SIPREC is configured for recording the call. If so, it then duplicates the media prior to initiating the session with the SRS. (Media replication is set up prior to the recording session). The SRS may choose to record, not record, or cancel the recording session, and then communicates via SIP signaling to the Net-Net ESD. If the call is not to be recorded, the SRS signals termination of the recording session.

The Net-Net ESD maintains SIPREC metadata information associated with recording sessions. The recording session metadata describes the current state of the recording session and its communication session(s). It is updated when a change of state in the communication session(s) is observed by the Net-Net ESD. The SRS is responsible for maintaining call history, etc. The Net-Net ESD creates and logs call detail records (CDRs) in the current manner, the 3rd party SRS vendor may collate this information if desired. (For more information about the contents of metadata, see [Metadata Contents \(143\)](#)).

The following illustration shows two endpoints, User Agent A (UA-A) and User Agent B (UA-B). Their session is being recorded by an SRC (the Net-Net ESD) and an SRS.



## Configuring SIPREC

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This section defines the information required to configure SIPREC on the Net-Net ESD. It also provides a sample procedure for configuring SIPREC using the Acme Packet Command Line Interface (CLI).

### Session Recording Server (SRS)

The NN-ISR's RSS acts as the SRS in the network. A **session-recording-server** attribute under the **session-router** object in the Net-Net ESD CLI allows you to enable/disable the SRS. This object is the session recording server that receives replicated media and records signaling. Additional parameters for SRS are configured under the **session-agent**, **realm-config**, and **sip-interface** objects. The rules of precedence for which the Net-Net ESD uses these parameters are:

**session-agent** takes precedence over the **realm-config**, and **realm-config** takes precedence over **sip-interface**.

Each SRS is associated with a **realm-config**. The realm specifies the source interface from which replicated traffic originates. The destination is an IP Port parameter (IP address or hostname with an optional port) that defines the SIP address (request URI) of the actual SRS.

For an additional level of security, Acme Packet recommends the SRS be configured in its own realm so as to apply a set of access control lists (ACLs) and security for the replicated communication.

Although the Net-Net ESD supports large UDP packets, Acme Packet recommends the **sip-interface** associated with the SRS realm, be provisioned with a TCP port.

### Session Recording Group

The Net-Net ESD uses the **session-recording-group** attribute under the **session-router** object in the CLI to set high availability (HA) for 3rd party call recorders. Using this object, you can define a collection of one or more SRSs. The Net-Net ESD utilizes SIP's transport mechanism and keeps track of statistics on each SRS to manage the distribution of traffic and load balancing. (For more information on Net-Net ESD load balancing in session recording groups, see [Load Balancing \(136\)](#)). When multiple SRSs are in a session recording group, the Net-Net ESD uses heuristics to intelligently route the recording dialog to one or more SRSs utilizing the selection strategy.

The **simultaneous-recording-servers** configuration attribute controls the number of simultaneous SIP dialogs that the Net-Net ESD establishes to the SRSs in the session recording group per communication session. For instance, if a session recording group contains 3 SRSs, and **simultaneous-recording-servers** is set to **2**, the recording agent initiates a SIP INVITE to the next two SRSs based on the session recording group strategy. In this way, duplicative recording sessions are instantiated, allowing for recording redundancy in multiple SRSs or within a session recording group.

**Note:** The Net-Net ESD streams media to all SRSs. Each SRS chooses whether or not to ignore the media by returning a "recvonly"(receive only) media line. This permits an SRS to select specific media to record in the recording session, as well as determine whether or not to record the media.

The number of simultaneous recording servers does not dictate the number of recording devices required to be active for a communication session. If two SRSs exist in a session recording group and **simultaneous-recording-servers** is set to **2**, if at least one recording device to any of the servers completes, the recording server is treated as being established.

## Load Balancing

The Net-Net ESD supports recording server load balancing across members of a session recording group using the following strategies:

**[Round-robin]**: The Net-Net ESD remembers the last SRS that was used. Each new recording session selects the next SRS in the session recording group. When **simultaneous-recording-servers** is greater than 1, the next n recording servers are selected from the session recording group.

**[hunt]**: The Net-Net ESD successively attempts to contact SRSs in the session recording group until a successful recording dialog is established with the SRS, starting from the first SRS in the session recording group. The Net-Net ESD attempts to contact each SRS in the session reporting group once. When contact is exhausted, the recording device is considered failed. A SIP failure (response greater than 399, timeout or TCP setup failure) causes the Net-Net ESD to attempt the next possible SRS. When **simultaneous-recording-servers** is greater than 1, the Net-Net ESD attempts to establish n recording devices in a hunting fashion.

**[least busy]**: For some 3rd party recording devices, the number of concurrent recording servers proves to be the most taxing for system resources. The Net-Net ESD tracks the number of recording servers active to a given SRS at any given time. It uses this information to determine which SRS would be the best candidate for the next RS. The SRS with the fewest number of active recording servers receives the next RS. If two or more SRSs in a session recording group currently have the same number of active recording servers, the SRS configured first in the session recording group takes precedence.

**[lowest sustained rate (fewest-setups-per-minute)]**: For some 3rd party recording servers, processing large amounts of sessions in a short amount of time proves to be the most taxing on their system's resources. The Net-Net ESD tracks the number of recording server setups over a sliding window of five minutes. The SRS within the session recording group with the fewest setups per the window of time is selected as the next candidate for receiving the recorded session. If two or more SRSs in a session recording group currently have the same value for setups in the given window of time, then the SRS configured first in the session recording group takes precedence.

## Session Recording Group within Logical Remote Entities

Each logical remote entity (session-agent, realm-config and sip-interface) has a **session-recording-server** attribute. This attribute is a reference to a specific SRS configuration and can be used to specify a session recording group instead. If a session recording group is specified instead of an SRS, the session recording group name must be prefixed with **"SRG:"** followed by the session recording group name. This distinguishes between an SRS being referenced and a session recording group being referenced.

When the Net-Net ESD is configured for legacy SRR features, it is possible to configure a call recording server on both the ingress and egress realms. If configured, the Net-Net ESD uses the egress call recording server to record. However, with SIPREC, this process works differently. With SIPREC, if an SRS or session recording group is configured on both the ingress and egress logical remote entities, both the ingress and egress SRS/session recording groups are used. This means that the Net-Net ESD records the media between participants twice (or more) - once for the ingress recorders and once for the egress recorders.



If both the ingress and egress SRS/session recording group are the same, the Net-Net ESD makes an optimization and only records the media once. Even if the ingress session recording group is the same exact set of SRSs as the egress session recording group (but with a different name), the Net-Net ESD replicates media to both destinations. However, if the same set of SRSs has the exact same identifier, the Net-Net ESD sends media to one and not both SRSs.

## Selective Recording

SIPREC defines a number of use cases for which the Net-Net ESD can record communication sessions. These use cases include the use of selective based recording. A **selective recording** is one in which a unique recording server is created per communication session.

**Note:** The Net-Net ESD does not support persistent recording.

For SRSs using selective recording, recording servers are unique per session recording group. For each selective SRS in a session recording group, during the setup of a new communication session, the recording metadata is the same for each recording device. The SRC initiates a new SIP INVITE to the SRS carrying the metadata for that new recording server. The recording agent terminates the SIP dialog at the time that the recording session ends.

**Note:** The lifetime of a recording session extends beyond the lifetime of the recorded communication. The SRC (Net-Net ESD) re-uses the recording session ID in the metadata instead of creating a new ID for each recording.

## High Availability (HA) Support

An Net-Net ESD using SIPREC supports HA in the network. The Net-Net ESD replicates all metadata states between the active and standby Net-Net ESDs. Any recording dialogs in progress do not survive the failover, but all calls in progress are preserved. Additionally, the recording dialogs are replicated as well to the failed over Net-Net ESD so that in-dialog SIP requests continue to function.

Each recorded communication session replicated to a single SRS counts as two calls instead of one. The Net-Net ESD creates two flows between the two participants and two additional flows to the SRS for each of the parent flows.

## Single SRS

Assuming that each communication session (CS) is recorded to a single SRS with a single recording session, the total session capacity for recorded sessions is 4000.

## SIPREC Configuration Procedure

The following configuration example assumes the Net-Net ESD has the session recording license enabled on the Net-Net ESD. Changes to the call session recording configuration for SIPREC are dynamic. Active calls in progress remain unaffected by the configuration changes. New calls, however, utilize the changes after a **Save** and **Activate** of the configuration.

The following attributes must be configured:

- **session-recording-server**
- **session-recording-group** (for RSS or 3rd party SRS high availability (HA) only)

and at least one of the following attributes:

- **realm-config**
- **session-agent**
- **sip-interface**

### Session-recording-server Attribute

#### To configure the “session-recording-server” attribute:

1. In Superuser mode, type **configure terminal** and press <Enter>.
 

```
ACMEPACKET# configure terminal
```
2. Type **session-router** and press <Enter> to access the session router-related objects.
 

```
ACMEPACKET(configure)# session-router
ACMEPACKET(session-router)#
```
3. Type **session-recording-server** and press <Enter> to access the session recording server-related attributes.
 

```
ACMEPACKET(session-router)# session-recording-server
ACMEPACKET(session-recording-server)#
```
4. **name** — Enter a unique name for the session recording server. This name can be referenced when configuring realm-config, session-agent, and sip-interface. Valid values are alpha-numeric characters. Default is no value specified.
 

```
ACMEPACKET(session-recording-server)# name SRS1
```
5. (optional) **description** — Enter a description for the session recording server. Valid values are alpha-numeric characters. Default is no value specified.
 

```
ACMEPACKET(session-recording-server)# description "<recording server name>"
```
6. **realm** — Enter the realm for which the session recording server belongs. Valid values are alpha-numeric characters. Default is no value specified.
 

```
ACMEPACKET(session-recording-server)# realm <realm name>
```

**Note:** Acme Packet recommends that the session recording server be configured in its own realm.
7. **recording-mode** — Enter the recording mode for the session recording server. Valid values are:
  - **selective** (default) - Unique recording server created per communication session
  - **persistent** - Not supported.

```
ACMEPACKET(session-recording-server)# recording-mode selective
```
8. **destination** — Enter the destination IP address with IP port (port specification is optional) that defines the SIP address (request URI) of the session recording server. Enter values in the format 0.0.0.0:<port number>. Default is no value specified.
 

```
ACMEPACKET(session-recording-server)# destination 172.34.2.3:5060
```
9. **protocol** — Enter the protocol that the session recording server uses to accept incoming packets from the session reporting client on the network. Default is **UDP**.
 

```
ACMEPACKET(session-recording-server)# protocol UDP
```
10. Enter **done** to save the session recording configuration.
 

```
ACMEPACKET(session-recording-server)# done
```
11. Enter **exit** to exit the session-recording-server configuration.
 

```
ACMEPACKET(session-recording-server)# exit
```
12. Enter **exit** to exit the session-router configuration.

```
ACMEPACKET(session-router)# exit
```

13. Enter **exit** to exit the configure mode.

```
ACMEPACKET(configure)# exit
```

14. Enter **save-config** to save the session recording configuration.

```
ACMEPACKET# save-config
```

15. Enter **activate-config** to activate the session recording configuration.

```
ACMEPACKET# activate-config
```

## Session-recording-group Attribute (for HA only)

For environments that required high availability (HA) requirements, configure the **session-recording-group** attribute.

### To configure the “session-recording-group” attribute and enable HA:

1. In Superuser mode, type **configure terminal** and press <Enter>.

```
ACMEPACKET# configure terminal
```

2. Type **session-router** and press <Enter> to access the session router-related objects.

```
ACMEPACKET(configure)# session-router
```

```
ACMEPACKET(session-router)#
```

3. Type **session-recording-group** and press <Enter> to access the session recording group-related attributes.

```
ACMEPACKET(session-router)# session-recording-group
```

```
ACMEPACKET(session-recording-group)#
```

4. **name** — Enter a unique name for the session recording group that is a collection of one or more session recording servers. This name can be referenced when configuring realm-config, session-agent, and sip-interface. Valid values are alphanumeric characters. Default is no value specified.

```
ACMEPACKET(session-recording-group)# name <SRG Group Name>
```

**Note:** The name of the session recording group must be prefixed with “SRG”.

5. (optional) **description** — Enter a description for the session recording group. Valid values are alpha-numeric characters. Default is no value specified.

```
ACMEPACKET(session-recording-group)# description <Recording Group Name>
```

6. **session-recording-servers** — Enter the names of the session recording servers that belong to this session recording group. Valid values are alpha-numeric characters. Default is no value specified.

```
ACMEPACKET(session-recording-group)# session-recording-servers SRS1, SRS2
```

**Note:** You must enter multiple servers as values for the session-recording-servers attribute.

7. **strategy** — Enter the load balancing strategy that the session reporting client (Net-Net ESD) uses when sending recordings to the session reporting server. Valid values are:

- **Round-robin** (default) - The Net-Net ESD remembers the last SRS that was used. Each new recording session selects the next SRS in the session recording group. When simultaneous-recording-servers is greater than 1, the next n recording servers are selected from the session recording group.

- **hunt** - The Net-Net ESD successively attempts to contact SRSs in the session recording group until a successful recording dialog is established with the SRS, starting from the first SRS in the session recording group. The Net-Net ESD attempts to contact each SRS in the session reporting group once. When contact is exhausted, the recording device is considered failed. A SIP failure (response greater than 399, timeout or TCP setup failure) causes the Net-Net ESD to attempt the next possible SRS. When simultaneous-recording-servers is greater than 1, the Net-Net ESD attempts to establish n recording devices in a hunting fashion.
- **least busy** - For some 3rd party recording devices, the number of concurrent recording servers proves to be the most taxing for system resources. The Net-Net ESD tracks the number of recording servers active to a given SRS at any given time. It uses this information to determine which SRS would be the best candidate for the next RS. The SRS with the fewest number of active recording servers receives the next RS. If two or more SRSs in a session recording group currently have the same number of active recording servers, the SRS configured first in the session recording group takes precedence.
- **lowest sustained rate** (fewest-setups-per-minute) - For some 3rd party recording servers, processing large amounts of sessions in a short amount of time proves to be the most taxing on their system's resources. The Net-Net ESD tracks the number of recording server setups over a sliding window of five minutes. The SRS within the session recording group with the fewest setups per the window of time is selected as the next candidate for receiving the recorded session. If two or more SRSs in a session recording group currently have the same value for setups in the given window of time, then the SRS configured first in the session recording group takes precedence.

ACMEPACKET(session-recording-group)# **strategy round-robin**

8. **simultaneous-recording-servers** — Enter the number of simultaneous SIP dialogs that the session reporting client (Net-Net ESD) establishes to the session reporting servers in the session reporting group per communication session. Valid values are **1** to **100**. Default is **0**.

ACMEPACKET(session-recording-group)# **simultaneous-recording-servers 2**

9. Enter **done** to save the session recording group configuration.

ACMEPACKET(session-recording-group)# **done**

10. Enter **exit** to exit the session recording group configuration.

ACMEPACKET(session-recording-group)# **exit**

11. Enter **exit** to exit the session-router configuration.

ACMEPACKET(session-router)# **exit**

12. Enter **exit** to exit the configure mode.

ACMEPACKET(configure)# **exit**

13. Enter **save-config** to save the session recording group configuration.

ACMEPACKET# **save-config**

14. Enter **activate-config** to activate the session recording group configuration.

ACMEPACKET# **activate-config**

## Realm-config Attribute      To configure the “realm-config” attribute and enable session recording:

1. In Superuser mode, type **configure terminal** and press <Enter>.

ACMEPACKET# **configure terminal**

2. Type **media-manager** and press <Enter> to access the media manager-related objects.

ACMEPACKET(configure)# **media-manager**

ACMEPACKET(media-manager)#

3. Type **realm-config** and press <Enter> to access the realm-config-related attributes.

```
ACMEPACKET(media-manager)# realm-config
ACMEPACKET(realm-config)#
```

4. **session-recording-server** — Enter the name of the session-recording server or the session-recording-group in the realm associated with the session reporting client (Net-Net ESD). Valid values are alpha-numeric characters. Default is no value specified.

```
ACMEPACKET(realm-config)# session-recording-server <srs-name>
```

or

```
ACMEPACKET(realm-config)# session-recording-server SRG: <group-name>
```

**Note:** The value for this attribute is the name you specified in Step 4 of the Session-recording-server Attribute or Step 4 of the Session-recording-group Attribute. If specifying a session-recording-group, you must precede the group name with “**SRG:**”.

5. **session-recording-required** — Enter whether or not you want a call to be accepted by the Net-Net ESD if recording is not available. Valid values are:

- **Enabled** - Restricts call sessions from being initiated when a recording server is not available.
- **Disabled** (default)- Allows call sessions to initiate even if the recording server is not available.

```
ACMEPACKET(realm-config)# session-recording-required disabled
```

**Note:** Acme Packet recommends that the “session-recording-required” parameter remain disabled.

6. Enter **done** to save the realm configuration.

```
ACMEPACKET(realm-config)# done
```

7. Enter **exit** to exit the realm configuration.

```
ACMEPACKET(realm-config)# exit
```

8. Enter **exit** to exit the media manager configuration.

```
ACMEPACKET(media-manager)# exit
```

9. Enter **exit** to exit the configure mode.

```
ACMEPACKET(configure)# exit
```

10. Enter **save-config** to save the realm configuration.

```
ACMEPACKET# save-config
```

11. Enter **activate-config** to activate the realm configuration.

```
ACMEPACKET# activate-config
```

## Session-agent Attribute

### To configure the “session-agent” attribute and enable session recording:

1. In Superuser mode, type **configure terminal** and press <Enter>.

```
ACMEPACKET# configure terminal
```

2. Type **session-router** and press <Enter> to access the session router-related objects.

```
ACMEPACKET(configure)# session-router
```

```
ACMEPACKET(session-router)#
```

3. Type **session-agent** and press <Enter> to access the session agent-related attributes.

```
ACMEPACKET(session-router)# session-agent
```

```
ACMEPACKET(session-agent)#
```

4. **session-recording-server** — Enter the name of the session-recording server or the session-recording-group to apply to the session recording client (Net-Net ESD). Valid values are alpha-numeric characters. Default is no value specified.

```
ACMEPACKET(session-agent)# session-recording-server <srs-name>
```

or

```
ACMEPACKET(session-agent)# session-recording-server SRG: <group-name>
```

**Note:** The value for this attribute is the name you specified in Step 4 of the Session-recording-server Attribute or Step 4 of the Session-recording-group Attribute (for HA only). If specifying a session-recording-group, you must precede the group name with “SRG:”.

5. **session-recording-required** — Enter whether or not you want a call to be accepted by the Net-Net ESD if recording is not available. Valid values are:

- **Enabled** - Restricts call sessions from being initiated when a recording server is not available.
- **Disabled** (default)- Allows call sessions to initiate even if the recording server is not available.

```
ACMEPACKET(session-agent)# session-recording-required disabled
```

**Note:** Acme Packet recommends that the “session-recording-required” parameter remain disabled.

6. Enter **exit** to exit the session agent configuration.

```
ACMEPACKET(session-agent)# exit
```

7. Enter **exit** to exit the session router configuration.

```
ACMEPACKET(session-router)# exit
```

8. Enter **exit** to exit the configure mode.

```
ACMEPACKET(configure)# exit
```

9. Enter **save-config** to save the session agent configuration.

```
ACMEPACKET# save-config
```

10. Enter **activate-config** to activate the session agent configuration.

```
ACMEPACKET# activate-config
```

## Sip-interface Attribute

### To configure the “sip-interface” attribute and enable session recording:

1. In Superuser mode, type **configure terminal** and press <Enter>.

```
ACMEPACKET# configure terminal
```

2. Type **session-router** and press <Enter> to access the session router-related objects.

```
ACMEPACKET(configure)# session-router
```

```
ACMEPACKET(session-router)#
```

3. Type **sip-interface** and press <Enter> to access the SIP interface-related attributes.

```
ACMEPACKET(session-router)# sip-interface
```

```
ACMEPACKET(sip-interface)#
```

4. **session-recording-server** — Enter the name of the session-recording server or the session-recording-group to apply to the SIP interface on the session recording client

(Net-Net ESD). Valid values are alpha-numeric characters. Default is no value specified.

```
ACMEPACKET(sip-interface)# session-recording-server SRG: <session recording server name or session-recording group name>
```

**Note:** The value for this attribute is the name you specified in Step 4 of the Session-recording-server Attribute or Step 4 of the Session-recording-group Attribute (for HA only).

5. **session-recording-required** — Enter whether or not you want a call to be accepted by the Net-Net ESD if recording is not available. Valid values are:
  - **Enabled** - Restricts call sessions from being initiated when a recording server is not available.
  - **Disabled** (default)- Allows call sessions to initiate even if the recording server is not available.

```
ACMEPACKET(sip-interface)# session-recording-required disabled
```

**Note:** Acme Packet recommends that the “session-recording-required” parameter remain disabled.

6. Enter **exit** to exit the SIP interface configuration.  
ACMEPACKET(sip-interface)# **exit**
7. Enter **exit** to exit the session router configuration.  
ACMEPACKET(session-router)# **exit**
8. Enter **exit** to exit the configure mode.  
ACMEPACKET(configure)# **exit**
9. Enter **save-config** to save the SIP interface configuration.  
ACMEPACKET# **save-config**
10. Enter **activate-config** to activate the SIP interface configuration.  
ACMEPACKET# **activate-config**

## Metadata Contents

The recording metadata contains a set of related elements which define the recording session. A recording session may contain zero or more communication sessions and/or communication session groups. A communication session represents a call instance; a communication session group represents a related group of communication sessions. A recording session is composed of a sequence of complex element types. Not all element types are required to describe a recording session initiated from the Net-Net ESD. The recording session XML schema defines the following element types:

- **dataMode** - partial or complete metadata description (required)
- **group** - a collection of related communication sessions
- **session** - a single communication session of two or more participants (required)
- **participant** - a SIP endpoint representation (required)
- **stream** - a media stream
- **extensiondata** - application specific data outside of the SIPREC scope.

The recording agent generates dataMode, session, participant, and stream elements. Extension data is attached to other elements within the metadata through the use of the parent attribute. The recording metadata is defined as a sequence of element types; therefore all associations between elements are represented as references to element identifiers.

The state of the metadata within a recording session reflects the state of the communication session(s) which is being recorded. SIPREC implements stop-times and reason codes when communication sessions end within a recording session. Once a communication session, participant, or media stream has been marked as 'stopped' and accepted by the SRS, the metadata item is removed from the current metadata state. In addition, media lines within the SDP or the recording session may be re-used/re-labeled for reuse if new communication sessions and media streams are created within the recording session.

The XML schema for the recording metadata is defined in the IETF draft RFC “*draft-ram-siprec-metadata-format-02 [7]*”.

The ACLI command to show recorded metadata is “**show rec**”. For more information on this command see the section, Show rec.

## Show Commands for Recording Sessions

The Net-Net ESD allows you to utilize the following **show** commands via the ACLI to display statistical information about recording sessions:

- **show rec**
- **show rec redundancy**

### Show rec

The **show rec** command displays the count of all metadata objects in sessions managed by the recording agent. These statistics include metadata monitored over an active period of time and over a lifetime period (where “lifetime” totals reflect from the last reboot of the Net-Net ESD to the present time). The following example shows the use of this command.

1. Log into the Net-Net ESD as a User or Superuser.

```
ACMEPACKET> enable
ACMEPACKET(enable)#
```

2. Type **show rec** and press <Enter> to display the recording metadata statistics. The following output is an example of the “show rec ” command.

```
ACMEPACKET(enable)# show rec
```

#### “Show rec” output

```
13: 49: 44-81645
```

| Recording Agent | Status | Active | High | Total | Period | Total | PerMax | Lifetime | High |
|-----------------|--------|--------|------|-------|--------|-------|--------|----------|------|
| Rec Sessi ons   |        | 0      | 1    | 1     |        | 1     | 1      |          | 1    |
| Comm Groups     |        | 0      | 0    | 0     |        | 0     | 0      |          | 0    |
| Comm Sessi ons  |        | 0      | 1    | 1     |        | 1     | 1      |          | 1    |
| Medi a Streams  |        | 0      | 2    | 2     |        | 2     | 2      |          | 2    |
| Parti ci pants  |        | 0      | 2    | 2     |        | 2     | 2      |          | 2    |



The following table describes the metadata objects in the “show rec ” command output.

| Object        | Description                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------|
| Rec Sessions  | Number of recording sessions during an active period of time and over a lifetime period.                            |
| Comm Groups   | Number of active communication session recording groups during an active period of time and over a lifetime period. |
| Comm Sessions | Number of active communication sessions during an active period of time and over a lifetime period.                 |
| Media Streams | Number of active media streams during an active period of time and over a lifetime period.                          |
| Participants  | Total number of participants in session recordings during an active period of time and over a lifetime period.      |

## Show rec redundancy

The **show rec redundancy** command displays information for session recording server statistics when the Net-Net ESD is configured for HA. These statistics include metadata monitored over an active period of time and over a lifetime period (where “lifetime” totals reflect from the last reboot of the Net-Net ESD to the present time) on both the primary and redundant Net-Net ESD. The following example shows the use of this command.

1. Log into the Net-Net ESD as a User or Superuser.

```
ACMEPACKET> enabl e
ACMEPACKET(enabl e)#
```

2. Type **show rec redundancy** and press <Enter> to display the session recording server statistics for Net-Net ESDs in HA mode. The following output is an example of the “show rec redundancy” command.

```
ACMEPACKET(enabl e)# show rec redundancy
```

### Show rec redundancy output

#### Primary System

13: 49: 44-81645

```
Recording Agent Status -- Peri od -- ----- Li fetime ----

 Acti ve Hi gh Total Total PerMax Hi gh
Rec Sessi ons 0 1 1 1 1 1
Comm Groups 0 0 0 0 0 0
Comm Sessi ons 0 1 1 1 1 1
Medi a Streams 0 2 2 2 2 2
Parti ci pants 0 2 2 2 2 2
```

#### Redundant System

13: 49: 44-81646

```
Recording Agent Status -- Peri od -- ----- Li fetime ----

 Acti ve Hi gh Total Total PerMax Hi gh
```

|                |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|
| Rec Sessi ons  | 0 | 1 | 1 | 1 | 1 | 1 |
| Comm Groups    | 0 | 0 | 0 | 0 | 0 | 0 |
| Comm Sessi ons | 0 | 1 | 1 | 1 | 1 | 1 |
| Medi a Streams | 0 | 2 | 2 | 2 | 2 | 2 |
| Parti ci pants | 0 | 2 | 2 | 2 | 2 | 2 |

The following table describes the session recording server statistics in the **show rec redundancy** command output.

| Object        | Description                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------|
| Rec Sessions  | Number of recording sessions during an active period of time and over a lifetime period.                            |
| Comm Groups   | Number of active communication session recording groups during an active period of time and over a lifetime period. |
| Comm Sessions | Number of active communication sessions during an active period of time and over a lifetime period.                 |
| Media Streams | Number of active media streams during an active period of time and over a lifetime period.                          |
| Participants  | Total number of participants in session recordings during an active period of time and over a lifetime period.      |

## Codec Negotiation

In a SIPREC environment, it is assumed that the recording ecosystem provides transcoding media servers for which media calls can be redirected to, relieving the issue of codec matching from the recording servers. However, if transcoding media servers are not provided, the responsibility for transcoding falls on the recording server or the recording client in a SIPREC environment. The Net-Net ESD/SRC is required to impose some policy decisions on the codec negotiation between the three, or more, end-points. Specifically, the codec negotiation between the two participants and the recording server is subject to additional policy actions.

The SDP answer from the SRS may not agree with the media flows established in the communication session between UA-A and UA-B. If UA-A and UA-B agree to use G729, yet the SRS's answer indicates no support for G729, the SRS is then unable to interpret the media streams. The SDP offer forwarded to the called party (in this case UA-B) limits the codec choices to those supported by the SRS.

**Note:** The recording agent forwards the original codec offer to the SRS prior to sending the invite to the UA-B. The SRS responds with the SDP answer, indicating the codec list most desirable to the SRS. The codec list in the answer is then forwarded to UA-B. This allows three parties in a conference call to participate in the negotiation of the codecs among the supported formats only.

## SIPREC Call Flows

This section provides examples of call flow scenarios that can occur in a SIPREC environment. SIP recording call flow examples include:

### For Selective Recording:

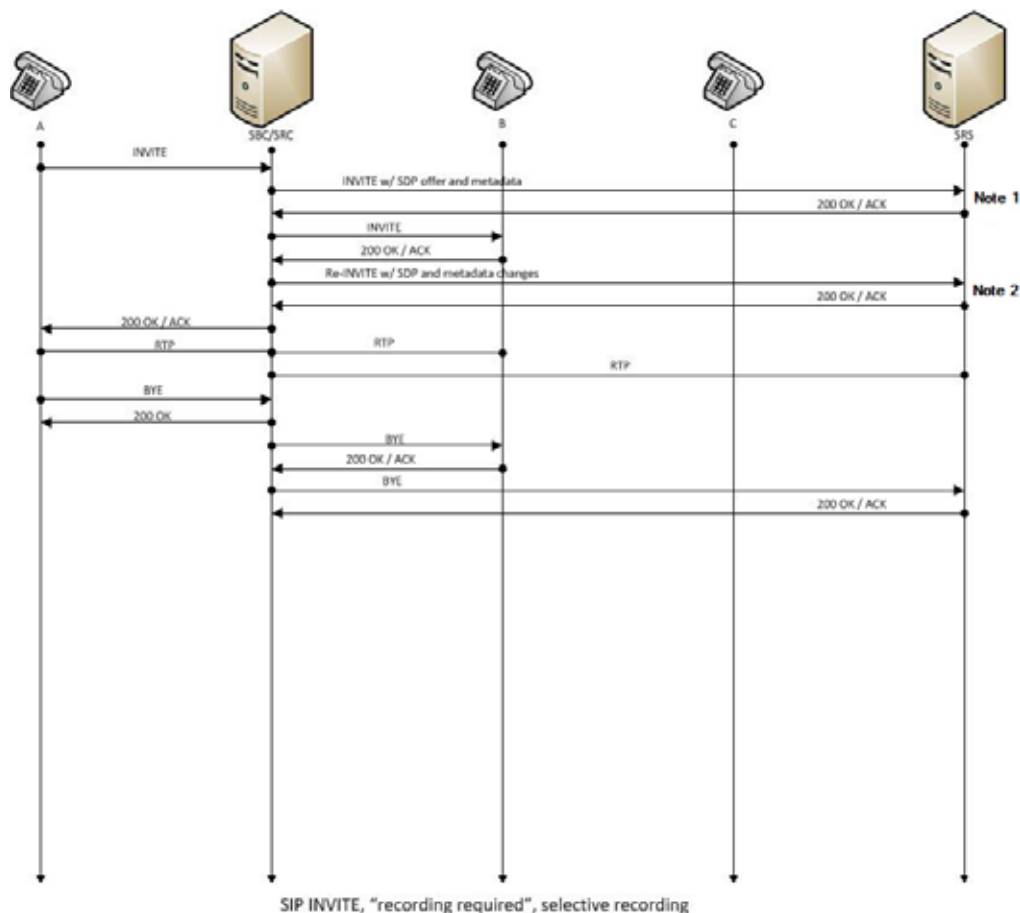
- Normal Call (recording required)
- Normal Call (recording not required)
- Early Media Call (recording not required)
- REFER Pass-Through Call (REFER handled by User Agent)
- REFER Call (REFER handled by Net-Net ESD)
- SRS Indicates Busy in Call (recording not required)

**Note:** REFER is a SIP method indicating that the recipient (identified by the Request-URI) should contact a third party using the contact information provided in the request.

## Selective Recording

### Normal Call (recording required)

The following illustration shows a normal call using selective recording with recording required. For SDP and Metadata information in Notes 1 and 2, see Sample SDP and Metadata.



## I

**Call Flow Description**

|                                                                            |                                                             |
|----------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Q</b> UA-A sends INVITE to Net-Net ESD.                                 | <b>a</b> RTP stream initiated between Net-Net ESD and UA-B. |
| <b>W</b> Net-Net ESD forwards INVITE with SDP and metadata to SRS.         | <b>S</b> RTP stream initiated between Net-Net ESD and SRS.  |
| <b>e</b> SRS responds with OK to Net-Net ESD.                              | <b>d</b> UA-A sends BYE to Net-Net ESD.                     |
| <b>r</b> Net-Net ESD sends INVITE to UA-B.                                 | <b>f</b> Net-Net ESD responds with OK to UA-A.              |
| <b>t</b> UA-B responds with OK to Net-Net ESD.                             | <b>g</b> Net-Net ESD sends BYE to Net-Net ESD.              |
| <b>y</b> Net-Net ESD sends re-INVITE with SDP and metadata changes to SRS. | <b>h</b> Net-Net ESD responds with OK to UA-A.              |
| <b>u</b> SRS responds with OK to Net-Net ESD.                              | <b>j</b> Net-Net ESD sends BYE to UA-B.                     |
| <b>i</b> Net-Net ESD forwards OK response to UA-A.                         | <b>k</b> UA-B responds with OK to Net-Net ESD.              |
| <b>O</b> RTP stream initiated between UA-A and Net-Net ESD.                | <b>l</b> Net-Net ESD sends BYE to SRS.                      |
|                                                                            | <b>;</b> SRS responds with OK to Net-Net ESD.               |

**Sample SDP and Metadata**

The following sample SDP and Metadata pertain to Notes 1 and 2 in the previous Call Flow diagram.

--[Note 1]-----

```
Content-Type: application/sdp
v=0
o=- 171 213 IN IP4 10.0.0.2
S=-
c=IN IP4 10.0.0.1
t=0 0
m=audio 6000 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=label:1
```

```
Content-Type: application/rs-metadata+xml
Content-Disposition: recording-session
<?xml version='1.0' encoding='UTF-8'?>
<recording xmlns='urn:ietf:params:xml:ns:recording' >
 <dataMode>complete</dataMode>
 <session id="urn:uiid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <start-time>2011-06-27T17:03:57</start-time>
 </session>
 <participant id="urn:uiid:10ac9063-76b7-40bb-4587-08ba290d7327" session="urn:uiid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <aor>sip:si pp@168.192.24.40</aor>
 <name>si pp </name>
 <send>urn:uiid:07868c77-ef8e-4d6f-6dd5-a02ff53a1329</send>
 <start-time>2011-06-27T17:03:57</start-time>
 </participant>
 <participant id="urn:uiid:797c45f5-e765-4b12-52b0-d9be31138529" session="urn:uiid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <aor>sip:service@168.192.24.60</aor>
 <name>sut </name>
 </participant>
 <stream id="urn:uiid:4a72a1ed-abb2-4d7c-5f4d-6d4c36e2d4ec" session="urn:uiid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <mode>separate</mode>
 <start-time>2011-06-27T17:03:57</start-time>
 </stream>
</label>1</label>
</recording>
```

--[Note 2]-----

```
Content-Type: application/sdp
v=0
o=- 171 213 IN IP4 10.0.0.2
S=-
c=IN IP4 10.0.0.1
```

```

t=0 0
m=audio 6000 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=label:1
m=audio 6002 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=label:2

```

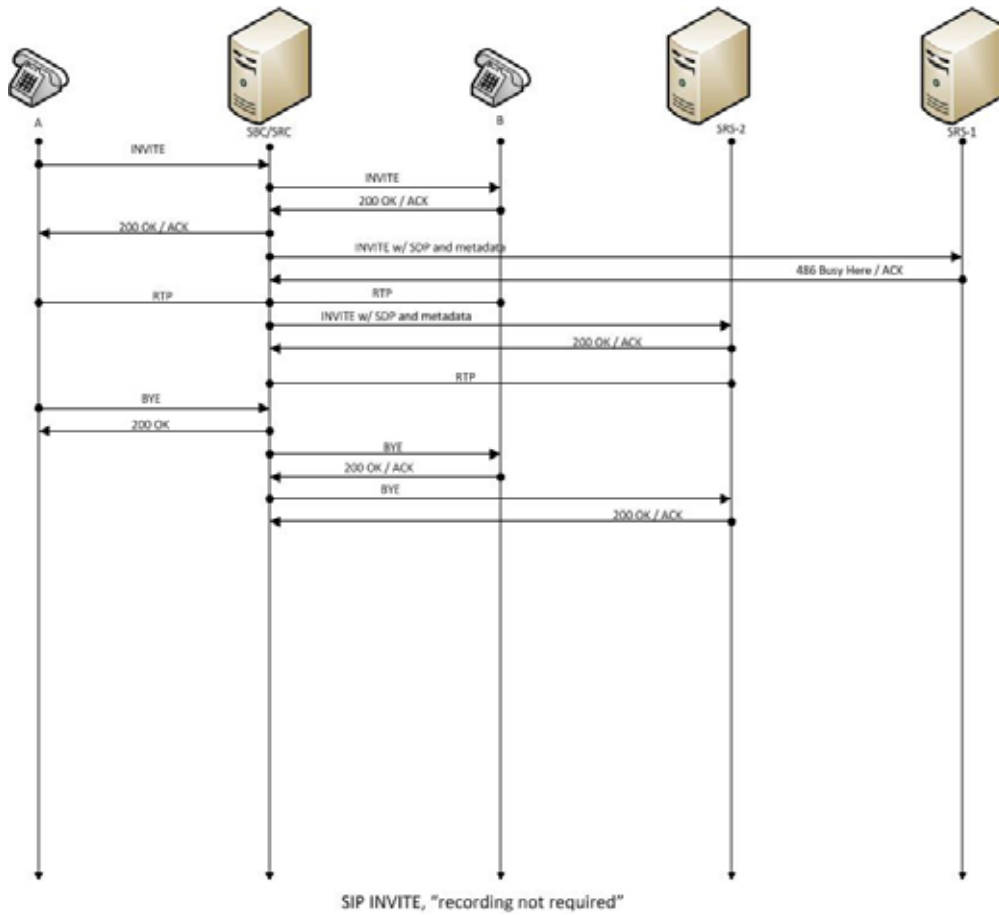
```

Content-Type: application/rs-metadata+xml
Content-Disposition: recording-session
<?xml version='1.0' encoding='UTF-8'?>
<recording xmlns='urn:ietf:params:xml:ns:recording' >
 <dataMode>partial </dataMode>
 <session id="urn:uuid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <start-time>2011-06-27T17:03:57</start-time>
 </session>
 <participant id="urn:uuid:797c45f5-e765-4b12-52b0-d9be31138529" session="urn:uuid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <aor>sip:service@168.192.24.60</aor>
 <name>sut </name>
 <send>urn:uuid:4a72a1ed-abb2-4d7c-5f4d-6d4c36e2d4ec</send>
 <start-time>2011-06-27T17:03:58</start-time>
 </participant>
 <stream id="urn:uuid:07868c77-ef8e-4d6f-6dd5-a02ff53a1329" session="urn:uuid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
 <mode>separate</mode>
 <start-time>2011-06-27T17:03:58</start-time>
 </stream>
</label>2</label>
</recording>

```

**Normal Call (recording not required)**

The following illustration shows a normal call using selective recording with recording optional.

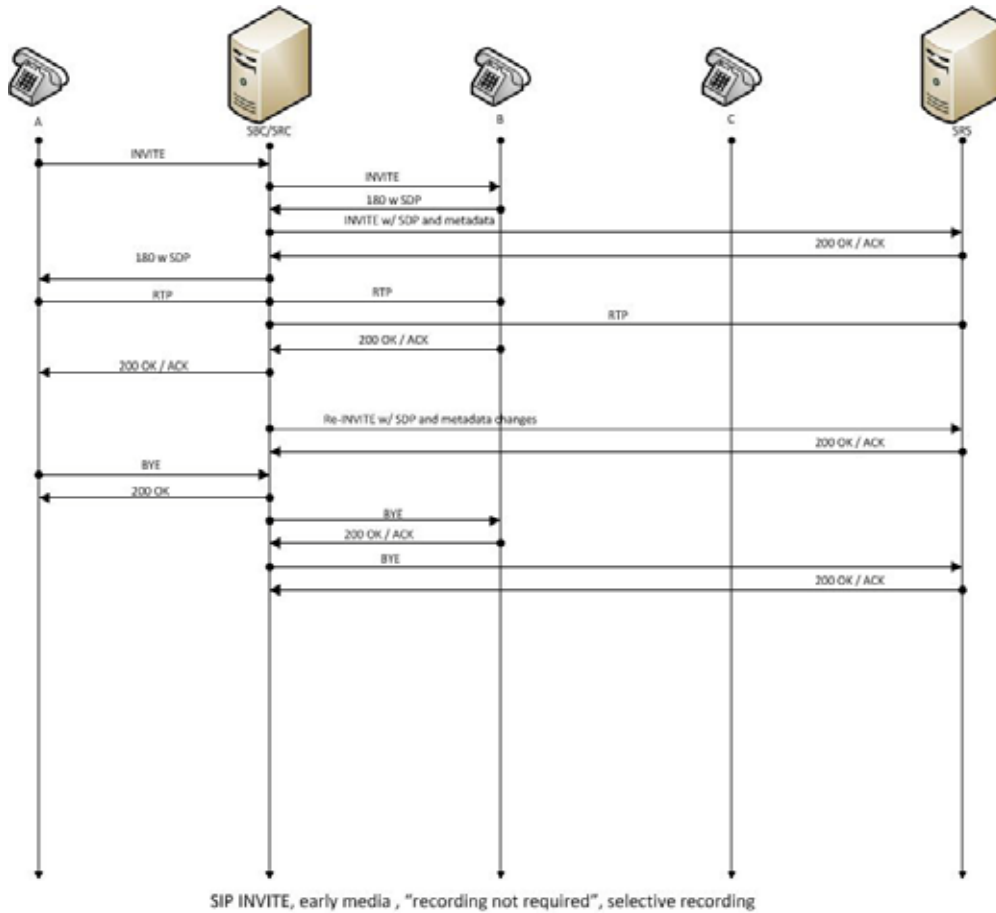


**Call Flow Description**

- Q UA-A sends INVITE to Net-Net ESD.
- W Net-Net ESD forwards INVITE to UA-B.
- e UA-B responds with OK to Net-Net ESD.
- I Net-Net ESD forwards OK response to UA-A.
- t Net-Net ESD sends INVITE with SDP and metadata to SRS.
- y SRS responds with OK to Net-Net ESD.
- U RTP stream initiated between UA-A, Net-Net ESD, and UA-B.
- i RTP stream initiated between Net-Net ESD and SRS.
- O UA-A sends BYE to Net-Net ESD.
- a Net-Net ESD responds with OK to UA-A.
- S Net-Net ESD sends BYE to UA-B.
- d UA-B responds with OK to Net-Net ESD.
- f Net-Net ESD sends BYE to SRS.
- g SRS responds with OK to Net-Net ESD.

**Early Media Call  
(recording not  
required)**

The following illustration shows an early media call using selective recording with recording optional.

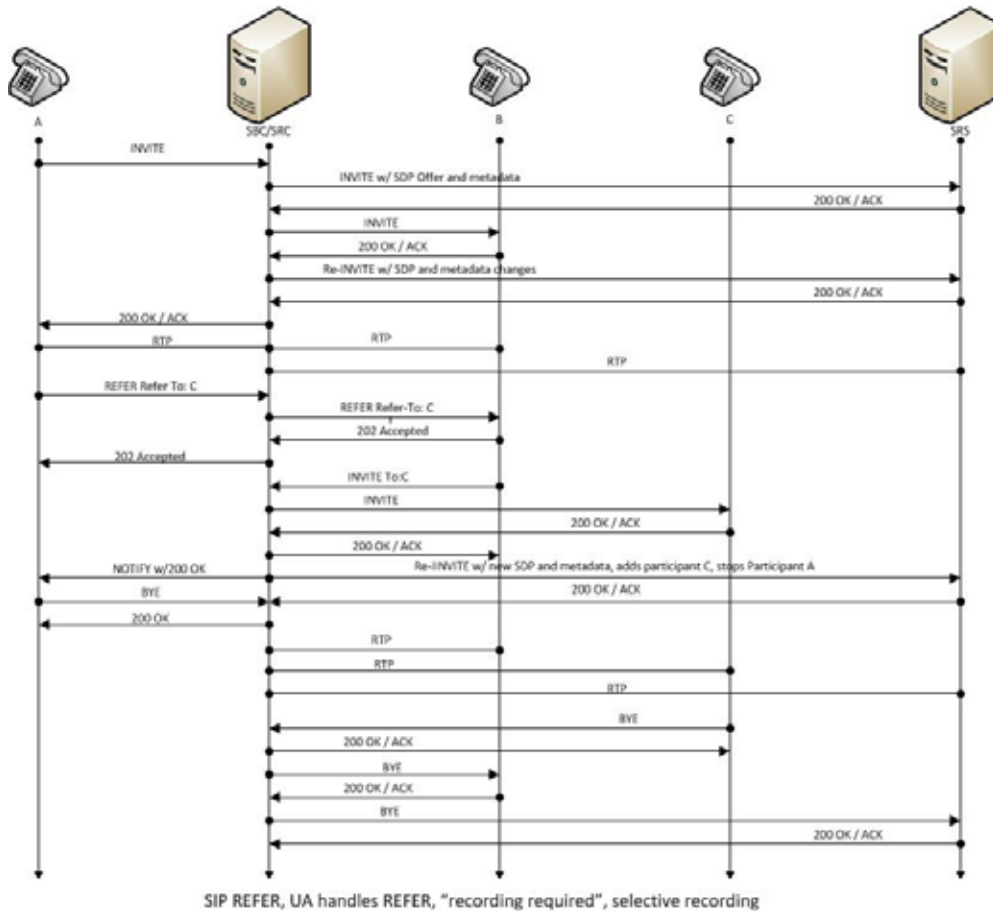


**Call Flow Description**

- Q UA-A sends INVITE to Net-Net ESD.
- W Net-Net ESD forwards INVITE to UA-B.
- e UA-B sends 180 and SDP to Net-Net ESD.
- I Net-Net ESD sends INVITE with SDP and metadata to SRS.
- t SRS responds with OK to Net-Net ESD.
- y Net-Net ESD sends 180 with SDP to UA-A.
- U RTP stream initiated between Net-Net ESD and UA-A.
- i RTP stream initiated between Net-Net ESD and UA-B.
- O RTP stream initiated between Net-Net ESD and SRS.
- a UA-B responds with OK to Net-Net ESD.
- S Net-Net ESD forwards OK to UA-A.
- d Net-Net ESD sends re-INVITE with SDP and metadata changes to SRS.
- f SRS responds with OK to Net-Net ESD.
- g UA-A sends BYE to Net-Net ESD.
- h Net-Net ESD responds with OK to UA-A.
- j Net-Net ESD sends BYE to UA-B.
- k UA-B responds with OK to Net-Net ESD.
- l Net-Net ESD sends BYE to SRS.
- ; SRS responds with OK to Net-Net ESD.

**REFER Pass-Through Call (REFER handled by User Agent)**

The following illustration shows a REFER pass-through call using selective recording and the User Agent (UA) handling the REFER on the call. Recording is required in this call flow.



**Call Flow Description**

- |                                                                     |                                                                                                           |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Q UA-A sends INVITE to Net-Net ESD.                                 | I UA-C responds with OK to Net-Net ESD.                                                                   |
| W Net-Net ESD forwards INVITE with SDP Offer and metadata to SRS.   | ; Net-Net ESD forwards OK response to UA-B.                                                               |
| e SRS responds with OK to Net-Net ESD.                              | 20 Net-Net ESD sends NOTIFY with OK response to UA-A.                                                     |
| I Net-Net ESD sends INVITE to UA-B.                                 | 21 Net-Net ESD sends re-INVITE to SRS with new SDP and metadata, adds participant C, stops participant A. |
| t UA-B responds with OK to Net-Net ESD.                             | 22 SRS responds with OK to Net-Net ESD.                                                                   |
| y Net-Net ESD sends re-INVITE with SDP and metadata changes to SRS. | 23 UA-A sends BYE to Net-Net ESD.                                                                         |
| U SRS responds with OK to Net-Net ESD.                              | 24 Net-Net ESD responds with OK to UA-A.                                                                  |
| i Net-Net ESD forwards OK response to UA-A.                         | 25 Net-Net ESD responds with OK to UA-A.                                                                  |

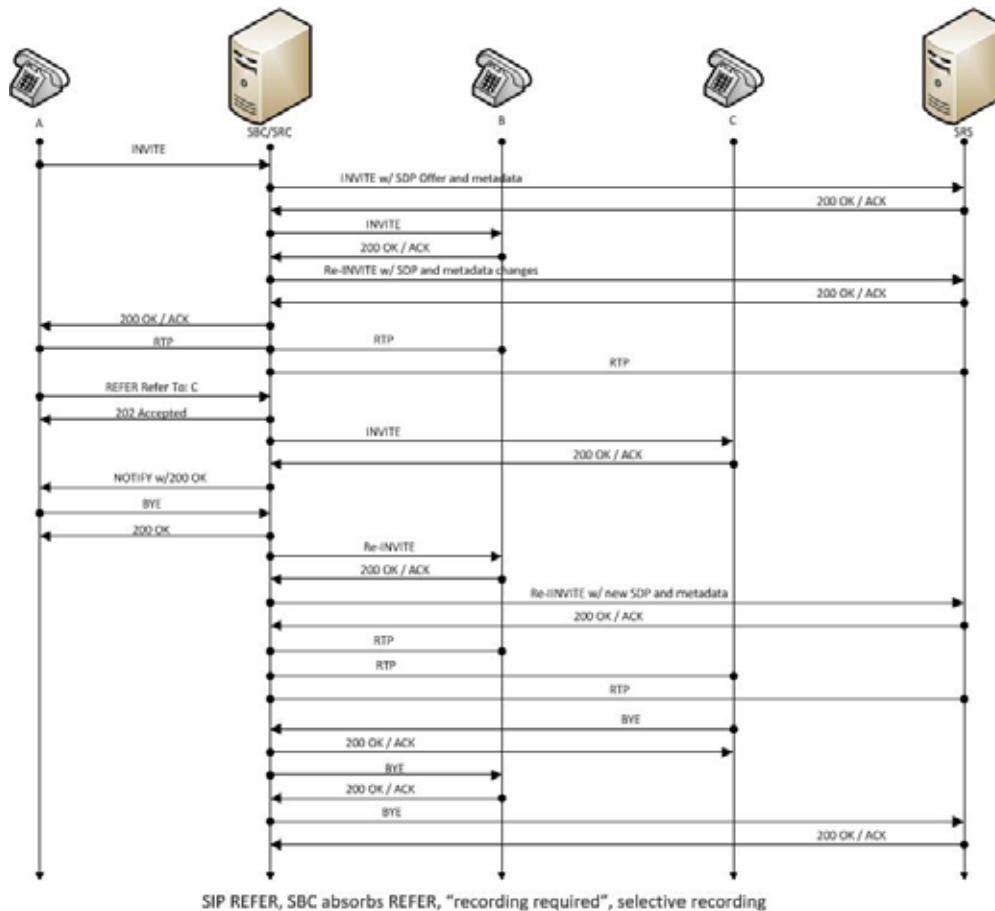


**Call Flow Description**

- O RTP stream initiated between UA-A and Net-Net ESD.
- a RTP stream initiated between Net-Net ESD and UA-B.
- S RTP stream initiated between Net-Net ESD and SRS.
- d UA-A sends REFER-TO: C to Net-Net ESD.
- f Net-Net ESD forwards REFER-TO: C to UA-B.
- g UA-B responds with 202 ACCEPTED to Net-Net ESD.
- h Net-Net ESD forwards 202 ACCEPTED to UA-A.
- j UA-B sends INVITE TO: C to Net-Net ESD.
- k Net-Net ESD sends INVITE to UA-C.
- 26 RTP stream initiated between Net-Net ESD and UA-B.
- 27 RTP stream initiated between Net-Net ESD and UA-C.
- 28 RTP stream initiated between Net-Net ESD and SRS.
- 29 UA-C sends BYE to Net-Net ESD.
- 30 Net-Net ESD responds with OK to UA-C.
- 31 Net-Net ESD sends BYE to UA-B.
- 32 UA-B responds with OK to Net-Net ESD.
- 33 Net-Net ESD sends BYE to SRS
- 34 SRS responds with OK to Net-Net ESD.

**REFER Call (REFER handled by Net-Net ESD)**

The following illustration shows a call using selective recording and the Session Border Controller (Net-Net ESD) handling the REFER on the call. Recording is required in this call flow.



---

**Call Flow Description**

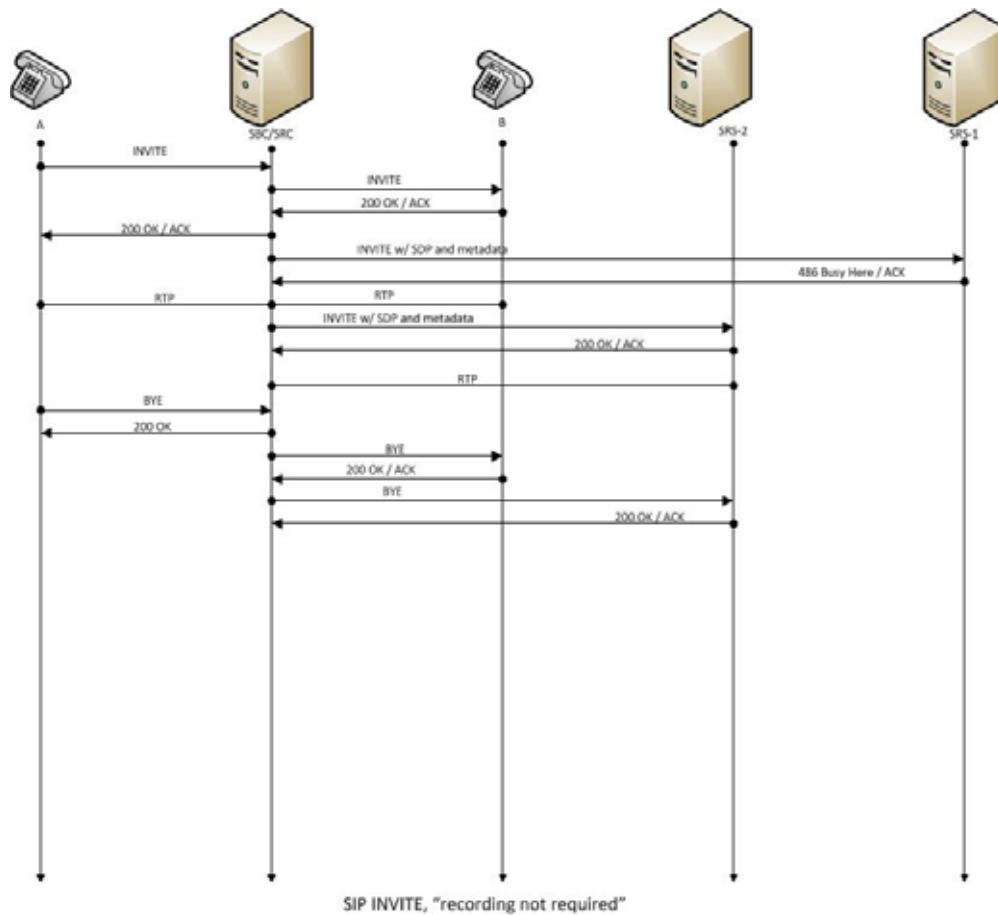

---

<b>q</b> UA-A sends INVITE to Net-Net ESD.	<b>j</b> Net-Net ESD sends NOTIFY with OK response to UA-A.
<b>W</b> Net-Net ESD forwards INVITE with SDP Offer and metadata to SRS.	<b>k</b> UA-A sends BYE to Net-Net ESD.
<b>e</b> SRS responds with OK to Net-Net ESD.	<b>l</b> Net-Net ESD responds with OK to UA-A.
<b>r</b> Net-Net ESD sends INVITE to UA-B.	<b>;</b> Net-Net ESD sends re-INVITE to UA-B.
<b>t</b> UA-B responds with OK to Net-Net ESD.	<b>20</b> UA-B responds with OK to Net-Net ESD.
<b>y</b> Net-Net ESD sends re-INVITE with SDP and metadata changes to SRS.	<b>21</b> Net-Net ESD sends re-INVITE to SRS with new SDP and metadata.
<b>u</b> SRS responds with OK to Net-Net ESD.	<b>22</b> SRS responds with OK to Net-Net ESD.
<b>i</b> Net-Net ESD forwards OK response to UA-A.	<b>23</b> RTP stream initiated between Net-Net ESD and UA-B.
<b>O</b> RTP stream initiated between UA-A and Net-Net ESD.	<b>24</b> RTP stream initiated between Net-Net ESD and UA-C.
<b>a</b> RTP stream initiated between Net-Net ESD and UA-B.	<b>25</b> RTP stream initiated between Net-Net ESD and SRS.
<b>S</b> RTP stream initiated between Net-Net ESD and SRS.	<b>26</b> UA-C sends BYE to Net-Net ESD.
<b>d</b> UA-A sends REFER-TO: C to Net-Net ESD.	<b>27</b> Net-Net ESD responds with OK to UA-C.
<b>f</b> Net-Net ESDNet-Net ESD responds with 202 ACCEPTED to UA-A.	<b>28</b> Net-Net ESD sends BYE to UA-B.
<b>g</b> Net-Net ESD sends INVITE to UA-C.	<b>29</b> UA-B responds with OK to Net-Net ESD.
<b>h</b> UA-C responds with OK to Net-Net ESD.	<b>30</b> Net-Net ESD sends BYE to SRS.
	<b>31</b> SRS responds with OK to Net-Net ESD.

---

## SRS Indicates Busy in Call (recording not required)

The following illustration shows the Session Recording Server (SRS) is BUSY for a call session. Recording is not required in this call flow.



### Call Flow Description

- |                                                                  |                                                                  |
|------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Q</b> UA-A sends INVITE to Net-Net ESD.                       | <b>O</b> Net-Net ESD sends INVITE to SRS2 with SDP and metadata. |
| <b>W</b> Net-Net ESD forwards INVITE to UA-B.                    | <b>a</b> SRS2 responds with OK to Net-Net ESD.                   |
| <b>e</b> UA-B responds with OK to Net-Net ESD.                   | <b>S</b> RTP stream initiated between Net-Net ESD and SRS2.      |
| <b>I</b> Net-Net ESD forwards OK response to UA-A.               | <b>d</b> UA-A sends BYE to Net-Net ESD.                          |
| <b>t</b> Net-Net ESD sends INVITE to SRS1 with SDP and metadata. | <b>f</b> Net-Net ESD responds with OK to UA-A.                   |
| <b>y</b> SRS1 responds to Net-Net ESD with 486 BUSY HERE.        | <b>g</b> Net-Net ESD sends BYE to UA-B.                          |
| <b>U</b> RTP stream initiated between UA-A and Net-Net ESD.      | <b>h</b> UA-B responds with OK to Net-Net ESD.                   |
| <b>i</b> RTP stream initiated between Net-Net ESD and UA-B.      | <b>j</b> Net-Net ESD sends BYE to SRS2.                          |
|                                                                  | <b>k</b> SRS2 responds with OK to Net-Net ESD.                   |

