

**Interactive Session Recorder**  
Installation Guide  
Release 5.2

November 2017

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# Preface

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## About This Guide

The Interactive Session Recorder Installation Guide provides information including:

- Overview of the Interactive Session Recorder (ISR)
- Hardware/Software Requirements/Recommendations
- ISR Software Installation Procedures
- Post-install and Verification Procedures
- Making the First Call
- Remote Archival Web Service and FACE Installation Procedures
- Additional Advanced Topics (Appendices)

### Related Documentation

The following table describes the documentation set for this release.

Document Name	Document Description
ISR Release Notes	Contains information about new ISR features, fixes, and known issues.
ISR Installation Guide	Provides an overview of the ISR, hardware/software requirements and recommendations, storage considerations, pre-installation information, installation procedures, post-install verification procedures, making the first call, and additional advanced topics about the ISR.
ISR User Guide	Contains information about using the ISR Dashboard for all levels of users. Provides information about viewing, playing, deleting recordings, running reports, and managing user profiles.
ISR Administrator Guide	Contains information about using the ISR Dashboard for the Administrator level user (Super User, Account Administrator, Tenant Administrator). Provides information about creating and managing accounts, routes, and users. Also provides information about configuring the ISR, running reports, viewing active calls, and securing the ISR deployment.
ISR API Reference Guide	Contains information about ISR FACE, VoiceXML Commands, legacy application programming interfaces (APIs), Recording File Types/Formats Supported, Return Codes, sendIPCRCommand.jsp Subdialog, Advanced Options, and Troubleshooting.

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Document Name	Document Description
ISR Monitoring Guide	Contains information about installing and configuring the ISR Monitor, the Monitor database schema, and the Monitor MIB.
ISR Remote Archival Web Services Reference Guide	Contains information about the Remote Archival Web Service, its methods, WSDL definitions, DataType definitions, sample responses, and importing its certificates into the client keystore.
ISR Security Guide	Contains information about security considerations and best practices from a network and application security perspective for the ISR product.

## Revision History

Date	Description
September 2016	<ul style="list-style-type: none"> <li>Initial release of ISR 5.2 software.</li> </ul>
December 2016	<ul style="list-style-type: none"> <li>Adds the "Upgrading the ISR" chapter.</li> <li>Updates the list of hardware requirements.</li> <li>Removes "CIS Networking" from the CIS Troubleshooting chapter.</li> <li>Updates the following sections for technical accuracy: <ul style="list-style-type: none"> <li>Installation Prerequisites</li> <li>Installing the ISR Index</li> <li>Installing the ISR Dashboard</li> <li>Configuring FACE Reduced Security</li> <li>Virtual Machine Default Resource Configurations</li> <li>Creating an Oracle Linux Virtual Machine</li> <li>Editing the vmgConfig.xml File</li> <li>Index Virtual Machine</li> <li>Configuring Circular Replication</li> <li>Configuring Database Failover</li> </ul> </li> </ul>
February 2017	<ul style="list-style-type: none"> <li>Adds the g.722 and g.722.2 transmission codecs to the list of supported codecs.</li> </ul>
March 2017	<ul style="list-style-type: none"> <li>Updates upgrade procedures for each ISR component for technical accuracy.</li> </ul>
November 2017	<ul style="list-style-type: none"> <li>Updates "Installation Prerequisites" for technical accuracy.</li> </ul>



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## Overview

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

## About the ISR

---

Driven by a profusion of government and industry regulations, enterprises are required to record and store an increasing quantity of telephony sessions in order to maintain compliance. Conventional call recording solutions, designed for capturing contact center agent exchanges for training or quality assurance purposes, are not well suited to compliance recording applications. They are difficult to integrate with business applications, offer limited scalability, and can be costly to deploy.

The Oracle Communications Interactive Session Recorder (ISR) is specifically designed to eliminate enterprise compliance recording cost and complexity. The solution features an open, standards-based architecture that dramatically simplifies the capture and storage of real-time IP communications sessions throughout the enterprise. Ideal for a wide range of compliance applications, ISR leverages a modular design for superior scalability and economics, offers an extensive API set for ultimate extensibility and flexibility, and includes integrated support for screen recording using an industry leading user monitoring solution.

## Supported Session Director Platforms

The following Session Director (SD) products are certified for use with the ISR software:

- SIPREC-enabled SRCs such as the Oracle Communications Session Border Controller
- Broadworks Application Server with SIPREC interface configuration R21



## Hardware/Software Requirements

This section provides the hardware and software pre-requisites for installing the ISR. It provides the recommended certified hardware you can use in your network, as well as a list of the supported codecs.

### Hardware

ISR is distributed as an application running on Oracle Linux 7.2 and higher, which abstracts the ISR application from the physical hardware. As such, ISR can be deployed on any hardware platforms that support Oracle Linux 7.2 or higher. For a comprehensive list of the hardware platforms currently certified, see the [Oracle Linux and Oracle VM Hardware Certification List \(HCL\)](#).

ISR Internal testing is predominantly done on Oracle Server X5-2 and Oracle Server X6-2 systems with the following resource configurations:

Hardware Description	Quantity
Intel® Xeon® E5-2630 v3 8-core 2.4 GHz processor	2
One 16 GB DDR4-2133 DIMM	8
One 1.2 TB 10000 rpm 2.5-inch SAS-3 HDD with marlin bracket in RAID 10 configuration using 12Gb SAS RAID HBA	4

 **Note:** RAID must be configured BEFORE performing the ISR component installation.

Each of the ISR components must be installed on their own server/VM instance.

### Virtual Machine Default Resource Configurations

The ISR virtual hosts have changes to the following default VM configurations:

RSS:

VM Version	8
CPU	4 vCPU
Memory	16384 MB

## Hardware/Software Requirements

Disk Provisioning Type	Thin
Disk Provisioning Provisioned Size	256 GB
Network Adapter 1	Admin
Network Adapter 2	Local (169.254.1.x)
Network Adapter 3	Voice
Network Adapter 4	Data

Index:

VM Version	8
CPU	4 vCPU
Memory	8192 MB
Disk Provisioning Type	Thin
Disk Provisioning Provisioned Size	256 GB
Network Adapter 1	Admin
Network Adapter 2	Local (169.254.1.x)
Network Adapter 3	Data

Dashboard:

VM Version	8
CPU	1 vCPU
Memory	2048 MB
Hard Disk 1 Provisioning Type	Thin
Hard Disk 1 Provisioned Size	12 GB
Hard Disk 2 Provisioning Type	Thin
Network Adapter 1	Admin
Network Adapter 2	Local (169.254.1.x)
Network Adapter 3	Data

FACE:

VM Version	8
CPU	1 vCPU
Memory	2048 MB
Hard Disk 1 Provisioning Type	Thin
Hard Disk 1 Provisioned Size	12 GB
Hard Disk 2 Provisioning Type	Thin
Network Adapter 1	Admin
Network Adapter 2	Local (169.254.1.x)

Network Adapter 3

Data

## Software

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

### Installation Prerequisites


To install the ISR components, you must:

1. Have installed Oracle Linux version 7.2 or higher
2. Have access to the ISR rpms:
  - `isr-Index-<release#>.x86_64.rpm`
  - `isr-Dashboard-<release#>.x86_64.rpm`
  - `isr-rss-<release#>.x86_64.rpm`
  - `isr-Face-<release#>.x86_64.rpm` (optional)
3. Have access to the Ruby 2.4 rpm ( `ruby-2.4.0-1.el7.centos.x86_64.rpm` )
4. Configure a Linux user named `isradm` to allow you to automatically gain access to config and log files. Once you have configured the `isradm` Linux user, you must add the user to the "sudoers" group.
5. Verify you are connected to the Internet.
6. Oracle Linux 7 has the yum package management utility configured by default with access to the "public-yum.oracle.com" repositories in the file located at `/etc/yum.repos.d/public-yum-ol7.repo`. If, for some reason, this file needs to be created, see the Appendix, "Oracle Public Yum Repository Configuration File" in the *Oracle Communications Interactive Session Recorder Installation Guide*, which contains the specific repository entries.
7. Configure interfaces; ISR expects network configuration to include 4 interfaces, connecting to separate Administration, Local, Data, and Voice networks. Refer to the Oracle Communications Interactive Session Recorder Security Guide for more information on networking and trusted boundaries.

For more information on configuring networking in Oracle Linux 7, see the *man nmtui* guide and <http://www.unixarena.com/2015/04/rhel-7-network-management-nmcli-or-nmtui.html>.


8. Ensure the `proxy` parameter in the `/etc/yum.conf` file is set to:

```
proxy=http://<your_proxy_host>
```

-  **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords and interfaces you created during the Oracle Linux installation. Ensure you have that information before you begin the installation process.

### ISR Dashboard Requirements

- Web browser recommendations for ISR Dashboard:
  - Chrome Version 60.0.3112.113
  - Firefox ESR 52.3.0
  - Internet Explorer 11.0.9600.18762CO

-  **Note:** Browser playback support for recording codecs changes frequently. Refer to the *Oracle Communications Interactive Session Recorder Release Notes* and *Oracle Communications Interactive Session Recorder Maintenance Release Guide* for current details.

### Supported Codecs

The ISR supports the following transmission codecs:

- g.711 mulaw

## Hardware/Software Requirements

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- g.711 alaw
- g.729
- g.722 and g.722.2 (excluding g.722.1)
- H.264

These transmission codecs can be mapped to the following recording formats:

- RAW ulaw
- RAW alaw
- RAW PCM
- WAVE PCM (8-bit 8k Hz) mono
- WAVE PCM (8-bit 8k Hz) stereo
- WAVE PCM (8-bit 8k Hz)
- WAVE PCM (16-bit 8k Hz) mono
- WAVE PCM (16-bit 8k Hz) stereo
- WAVE PCM (16-bit 8k Hz)
- WAVE PCM (16-bit 1k Hz) mono
- WAVE PCM (16-bit 16k Hz) stereo
- WAVE PCM (16-bit 16k Hz)
- WAVE ulaw (8-bit 8k Hz) mono
- WAVE ulaw (8-bit 8k Hz) stereo
- WAVE ulaw (8-bit 8k Hz)
- WAVE alaw (8-bit 8k Hz) mono
- WAVE alaw (8-bit 8k Hz) stereo
- WAVE alaw (8-bit 8k Hz)
- WAVE ADPCM (4-bit 8k Hz) mono
- WAVE ADPCM (4-bit 8k Hz) stereo
- WAVE ADPCM (4-bit 8k Hz)
- MP4

## Sample Implementation Diagrams

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The following are sampleISR/SBC implementation diagrams.

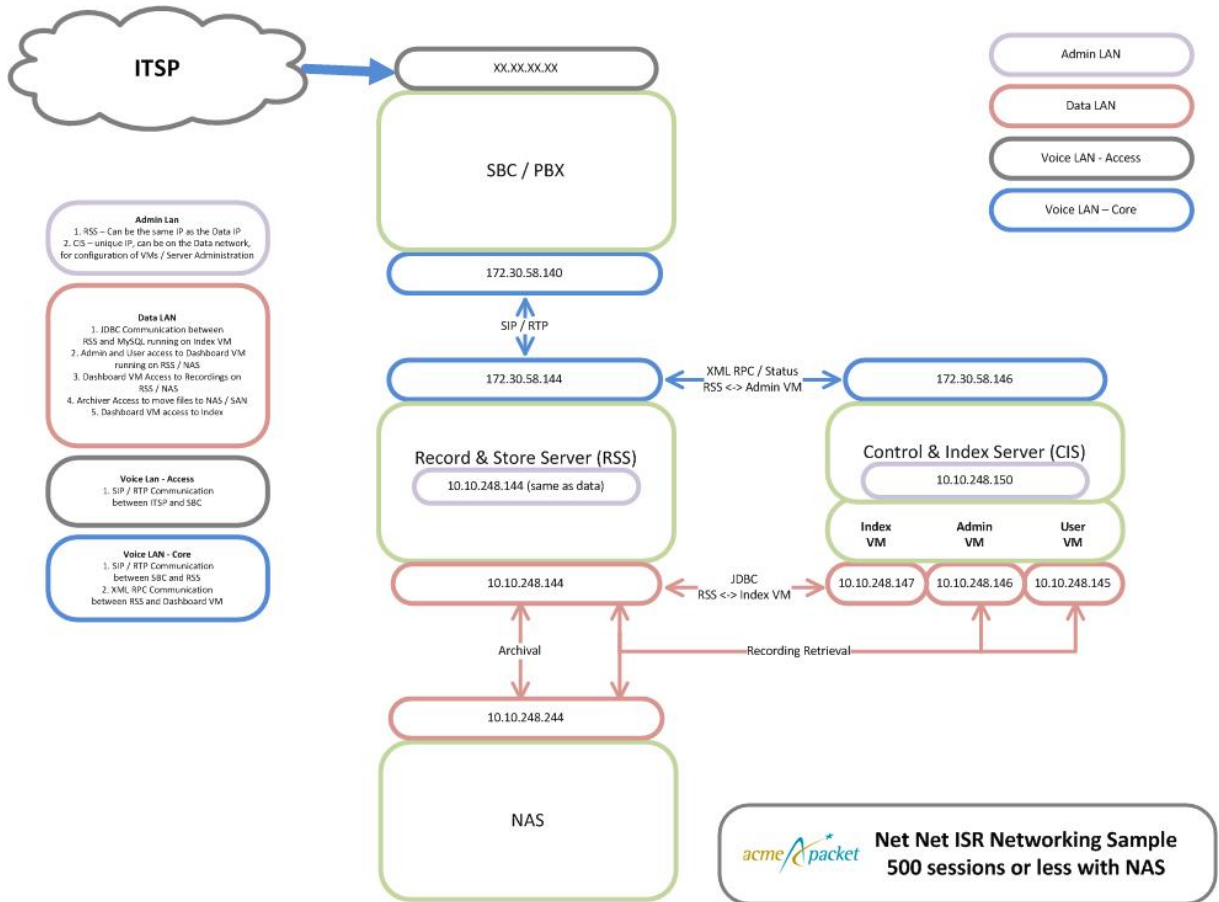
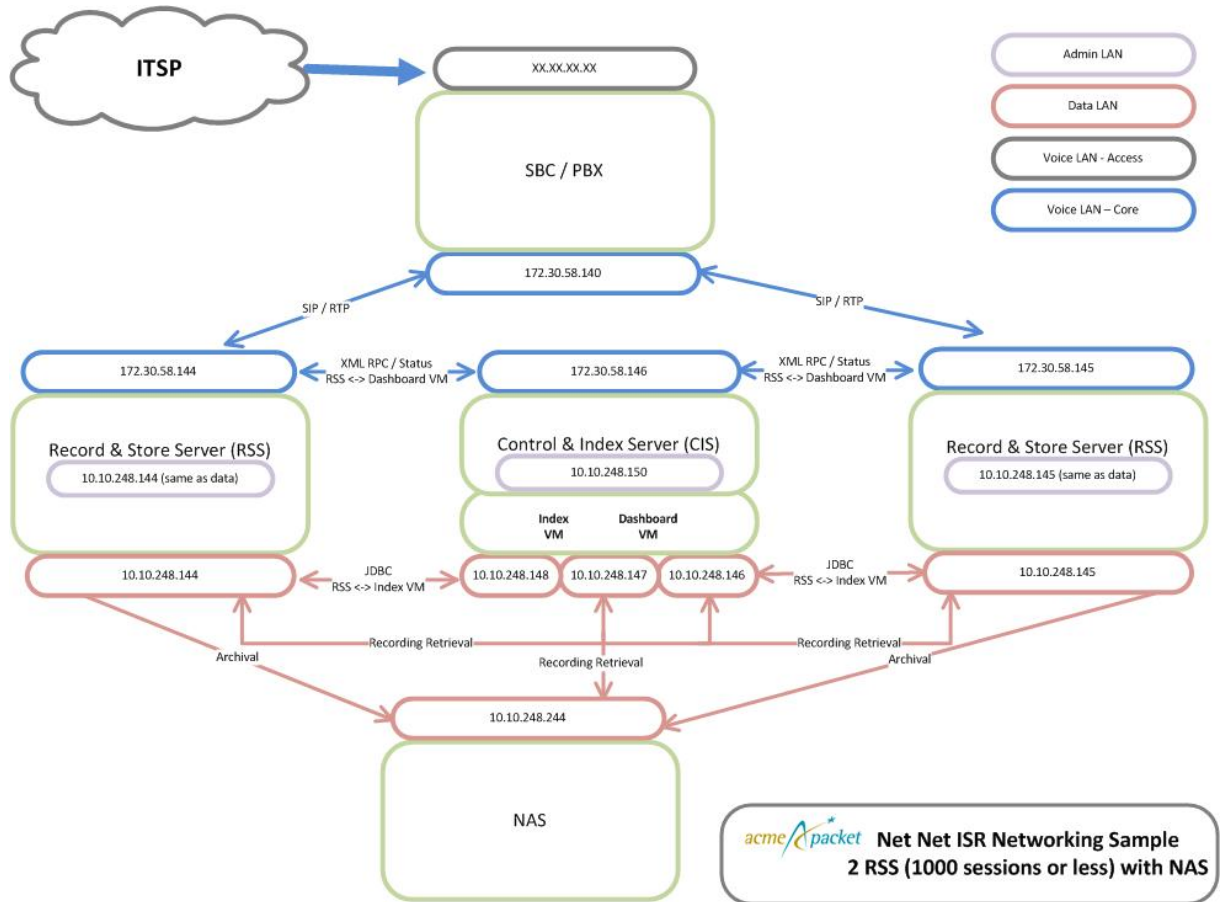


Figure 1: Single Site-Single Server ISR/SBC Implementation

# Hardware/Software Requirements



**Figure 2: Single Site-2RSS ISR/SBC Implementation**



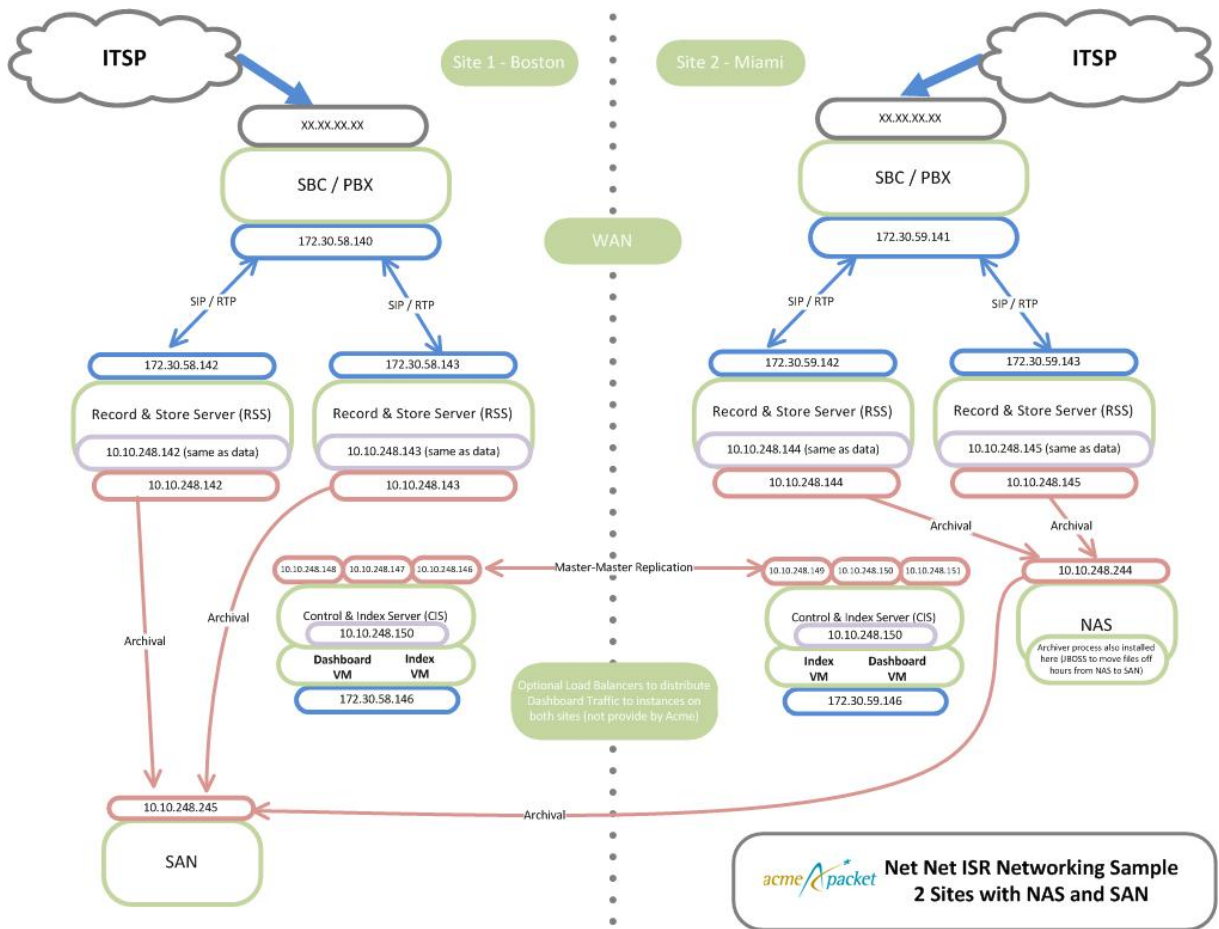


Figure 3: Dual Site Redundant ISR/SBC Implementation




---

## Installing the ISR Software

This chapter provides the information and procedures you need to install the ISR and its components.

The ISR runs on Oracle Linux 7 and uses yum to install and update RPM files.

 **Note:** While the ISR operates under Oracle Linux, it has not been currently tested to verify operation in other Linux environments.

You must have Oracle Linux Release 7.2 or higher installed on your hardware prior to installing the ISR.

You must install the ISR components in the following order:

- Index
- RSS
- Dashboard
- FACE (optional)

---

## Installation Prerequisites

To install the ISR components, you must:

1. Have installed Oracle Linux version 7.2 or higher
2. Have access to the ISR rpms:
  - `isr-Index-<release#>.x86_64.rpm`
  - `isr-Dashboard-<release#>.x86_64.rpm`
  - `isr-rss-<release#>.x86_64.rpm`
  - `isr-Face-<release#>.x86_64.rpm` (optional)
3. Have access to the Ruby 2.4 rpm ( `ruby-2.4.0-1.el7.centos.x86_64.rpm` )
4. Configure a Linux user named **isradm** to allow you to automatically gain access to config and log files. Once you have configured the **isradm** Linux user, you must add the user to the "sudoers" group.
5. Verify you are connected to the Internet.
6. Oracle Linux 7 has the yum package management utility configured by default with access to the "public-yum.oracle.com" repositories in the file located at `/etc/yum.repos.d/public-yum-ol7.repo`. If, for some reason, this file needs to be created, see the Appendix, "Oracle Public Yum Repository Configuration File" in the *Oracle Communications Interactive Session Recorder Installation Guide*, which contains the specific repository entries.

## Installing the ISR Software


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7. Configure interfaces; ISR expects network configuration to include 4 interfaces, connecting to separate Administration, Local, Data, and Voice networks. Refer to the Oracle Communications Interactive Session Recorder Security Guide for more information on networking and trusted boundaries.

For more information on configuring networking in Oracle Linux 7, see the *man nmtui* guide and <http://www.unixarena.com/2015/04/rhel-7-network-management-nmcli-or-nmtui.html>.

8. Ensure the **proxy** parameter in the `/etc/yum.conf` file is set to:

```
proxy=http://<your_proxy_host>
```

-  **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords and interfaces you created during the Oracle Linux installation. Ensure you have that information before you begin the installation process.

## ISR Software

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The following components are installed during the ISR installation process:

- RSS
- Dashboard
- Index
- FACE (optional)

## Installing the ISR Components

---


This section describes how to install the ISR components, including the Index, Dashboard, and RSS.

-  **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords, and interfaces you created during the Oracle Linux installation.

## Installing the ISR Index

This section describes how to install the ISR Index.

The ISR requires installations of both MySQL Server and the MySQL client application, which are included in the Index RPM. The ISR has been tested using MySQL Enterprise Commercial (Advanced) Edition Version 5.7.11. For more information, see Oracle's MySQL Products page to learn more about the MySQL platform.

-  **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords, and interfaces you created during the Oracle Linux installation, including:
- OS root passwords of all ISR component hosts
  - MySQL root password in the case of an existing MySQL deployment (otherwise the temporary password is replaced during initial configuration)
  - An understanding of how to map your four network interfaces to ISR's 'Admin', 'Local', 'VoIP', and 'Data'.


To install the ISR Index:

1. Log into the Oracle Linux CLI using an SSH client.

 **Note:** The Oracle Linux CLI is case-sensitive.

2. Verify that the Index is connected to the Internet and that `yum.conf` is properly configured with the proxy.
3. Enter the following command into the CLI:

```
sudo yum install isr-Index
```

 **Note:** Most ISR installation environments do not have access to a repository with the RPM required to install the `isr-Index` RPM itself. The best way to manage this issue is to (secure) copy the following file onto the Index host:

- `isr-Index-<release#>.x86_64.rpm`

Once the file is properly copied, connect to the Index host with an SSH client and in the directory (for example, `/tmp`) containing the file, execute the following two commands:

```
# sudo yum localinstall /tmp/isr-Index-<release#>.x86_64.rpm
```

4. Verify the installation when prompted.

```
Is this ok [y/d/N] :y
```

Oracle Linux downloads the Index installation packages.

5. Enter the following command into the CLI once Oracle Linux indicates the installation packages have finished downloading.

```
sudo /opt/isr/configIsr.sh
```

6. Follow the script's instructions closely.

- In order to install MySQL successfully, you must update the MySQL password provided to you during the MySQL installation. When prompted by the script with, "If you have not changed the MySQL root user password, you will not be able to continue. Would you like to change it now?", answer **yes** and follow the instructions closely if the temporary MySQL root password has not been updated, otherwise answer **no**.

 **Note:** MySQL User Passwords must be:

- At least 8 characters long
- Contain at least 1 uppercase and 1 lower case letter
- Contain at least 1 number
- Contain at least 1 special character
- Map the physical network interfaces to ISR networks. Hit **<Enter>** when prompted.

```
System Interfaces Found:
ens32 ens33-1 ens34 ens36
```

```
Enter Admin interface [ens32] <Enter>
Enter Local Interface [ens33-1] <Enter>
Enter VoIP Interface [ens34] <Enter>
Enter Data Interface [ens36] <Enter>
```

- Modify the configuration as needed by selecting **m** when prompted by the script.

```
Please select from the following menu:
```

```
-----
s) Show the current configuration
m) Modify the current configuration
i) Modify network interface mapping
z) Show firewall settings for Index.
q) Quit
```

```
Choice: m
```

- With the **m** option, you are prompted to set the host name, add a remote MySQL user with a default name **isr\_admin**, and an opportunity to change network configurations and mappings.


The ISR Index is installed.

## Installing the ISR RSS

This section describes how to install the ISR RSS.

## Installing the ISR Software

---

-  **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords, and interfaces you created during the Oracle Linux installation.


To install the ISR RSS:

1. Log into the Oracle Linux CLI using an SSH client.

 **Note:** The Oracle Linux CLI is case-sensitive.

2. Enter the following command into the CLI:

```
sudo yum install isr-rss
```

 **Note:** Most ISR installation environments do not have access to a repository with the RPMs required to install the isr-rss package and the isr-rss RPM itself. The simplest way to manage this issue is to (secure) copy the following file onto the Index host:

- isr-rss-<release#>.x86\_64.rpm

Once the file is properly copied, connect to the Index host with an SSH client and in the directory (for example, /tmp) containing the file, execute the following two commands:

```
# sudo yum localinstall /tmp/isr-rss-<release#>.x86_64.rpm
```

3. Verify the installation when prompted.

```
Is this ok [y/d/N]:
```

Oracle Linux downloads the RSS installation packages.

4. Enter the following command into the CLI once Oracle Linux indicates the installation packages have finished downloading.

```
sudo /opt/isr/configIsr.sh
```

5. You are prompted with the following important prompt:

```
Now Generating RSS key and certificate files. If you have not already configured the RSS data network IP address, please skip this key generation, and re-run configIsr.sh after completing that task. Hit <Enter> when ready.
```

The RSS secure API requires the Data IP set properly when generating the secure key. If the Data network is not configured during the initial run of the configIsr.sh script, the configIsr.sh script must be run one more time.


6. The RSS MySQL users must be granted access to the Index database and only can once network connectivity is established. If networking is not properly configured before the MySQL user step, the following error and instructions are displayed:

```
Networking connection to MySQL index not available, please configure networking and run the configuration option 'm' again.
```

Once you've chosen **m** to modify the configuration, accept the prompt to add the Dashboard MySQL user and follow the steps carefully to grant privileges.

## Installing the ISR Dashboard

This section describes how to install the ISR Dashboard.

-  **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords, and interfaces you created during the Oracle Linux installation.

To install the ISR Dashboard:

1. Log into the Oracle Linux CLI using an SSH client.


 **Note:** The Oracle Linux CLI is case-sensitive.

2. Install Ruby by copying the Ruby RPM, `ruby-2.4.0-1.el7.centos.x86_64.rpm`, to your working directory (for example `/tmp`) and executing the `yum localinstall` command. For example:

```
# sudo yum localinstall /tmp/ruby-2.4.0-1.el7.centos.x86_64.rpm
```

3. Enter the following command into the CLI:

```
sudo yum install isr-Dashboard
```

 **Note:** Most ISR installation environments do not have access to a repository with the RPMs required to install the ISR Dashboard. The simplest way to manage this issue is to (secure) copy the following file onto the Dashboard host:

- `isr-Dashboard-<release#>.x86_64.rpm`

Once the files are properly copied, connect to the Index host with an SSH client and in the directory (for example, `/tmp`) containing the files, execute the following command:

```
# sudo yum localinstall /tmp/isr-Dashboard-<release#>.x86_64.rpm
```

4. Verify the installation when prompted.

```
Is this ok [y/d/N]:
```


Oracle Linux downloads the Dashboard installation packages.

5. Enter the following command into the CLI once Oracle Linux indicates the installation packages have finished downloading.

```
sudo /opt/isr/configIsr.sh
```

6. Follow the script's instructions closely.

- Create a certificate key password when prompted.

 **Note:** This password does not have to follow any rigid requirements.

- When prompted for Database IP addresses, you may press `<Enter>` to accept the default values, unless you are not using the default Index IP address of the Local network. In that case, enter the appropriate values.
- Map the physical network interfaces to ISR networks. Hit `<Enter>` when prompted.

```
System Interfaces Found:
ens32 ens33 ens34 ens36
```

```
Enter Admin interface [ens32] <Enter>
Enter Local Interface [ens33] <Enter>
Enter VoIP Interface [ens34] <Enter>
Enter Data Interface [ens36] <Enter>
```

 **Note:** The following warning may appear during Dashboard gem configuration:

```
Do not run Bundler as root...
```

You may ignore this warning.

- Select `m` when prompted to set the hostname and finish the configuration.

```
Please select from the following menu:
```

```
-----
s) Show the current configuration
m) Modify the current configuration
i) Modify network interface mapping
z) Show firewall settings for Index.
q) Quit
```

```
Choice: m
```

## Installing the ISR Software

---

- The Dashboard MySQL user must be granted access to the Index database and only can once the network connectivity is established. If networking is not properly configured before the MySQL user step, the following error and instruction are displayed:

```
Missing IP Parameter to get_ip_for_iface().
```

```
-----  
Networking connection to MySQL index not available, please configure  
networking and run the configuration option 'm' again.
```


Once you've configured networking on the Dashboard host and chosen **m** to modify the configuration, accept the prompt to add the Dashboard MySQL user and follow the steps carefully to grant privileges.

The ISR Dashboard is installed.

### Configuring Recording Capacity

Configuring recording capacity has not changed from previous releases and is performed via the `configRss.sh` script.

Once you have completed the initial `configIsr.sh` script steps, select the **m** option to finish configuring your RSS. Follow the script's instructions closely, ensuring you set the RSS licensed capacity to the proper number of sessions at the **Enter Licensed RSS Capacity (Number of Sessions): [2]** prompt.

-  **Note:** The **Enter Licensed RSS Capacity (Number of Sessions): [2]** value is the number of concurrent sessions allowed for this RSS host. This number must comply with your Oracle contract. For more information regarding your ISR software contract, contact your Oracle representative.



---

## Post-Install Verification and Configuration

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

---

### Verifying Connectivity Between the RSS and the Index

When installation of the RSS and Index 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
- Logging into the dashboard

#### Testing Connectivity

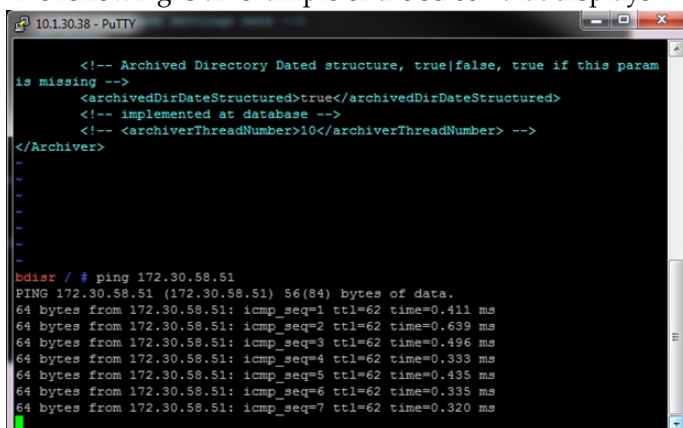
Use the following procedure to test connectivity between the RSS and Index VM.

To test connectivity:

1. Log in to the RSS host using an SSH client.
2. Enter **ping index\_host\_ip** and press Enter.

```
hostname# ping <your_index_host_ip>
```

The following is an example of the screen that displays.



```
10.1.30.38 - PuTTY
<!-- Archived Directory Dated structure, true|false, true if this param
is missing -->
<archivedDirDateStructured>true</archivedDirDateStructured>
<!-- implemented at database -->
<!-- <archiverThreadNumber>10</archiverThreadNumber> -->
</Archiver>
...
bdier / # ping 172.30.58.51
PING 172.30.58.51 (172.30.58.51) 56(84) bytes of data:
64 bytes from 172.30.58.51: icmp_seq=1 ttl=62 time=0.411 ms
64 bytes from 172.30.58.51: icmp_seq=2 ttl=62 time=0.639 ms
64 bytes from 172.30.58.51: icmp_seq=3 ttl=62 time=0.496 ms
64 bytes from 172.30.58.51: icmp_seq=4 ttl=62 time=0.333 ms
64 bytes from 172.30.58.51: icmp_seq=5 ttl=62 time=0.435 ms
64 bytes from 172.30.58.51: icmp_seq=6 ttl=62 time=0.335 ms
64 bytes from 172.30.58.51: icmp_seq=7 ttl=62 time=0.320 ms
```

## Post-Install Verification and Configuration

You can complete the connectivity verification by logging into the dashboard using the procedures in, "Logging Into ISR Dashboard".

### Logging Into ISR Dashboard

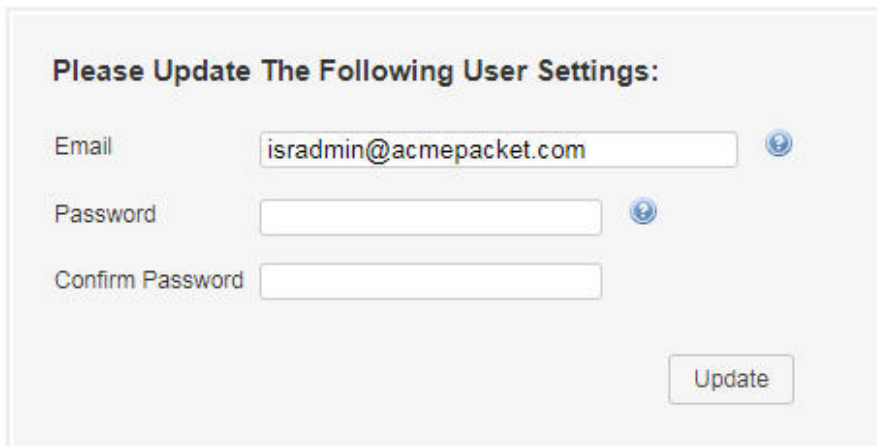
Use the following procedures to verify the administrator dashboard is working properly.

To log into the Dashboard:

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

```
https://172.54.66.7
```


The initial Login page displays.



The screenshot shows a form titled "Please Update The Following User Settings:". It contains three input fields: "Email" with the value "isradmin@acmepacket.com", "Password", and "Confirm Password". Each field has a blue circular icon with a question mark to its right. An "Update" button is located at the bottom right of the form.

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

**User name:** isradmin@acmepacket.com **Password:** admin123.



 **Note:** You are required to change the default email and password upon initial login and then the password again every 90 days.













4. After logging in, the following page displays.



### Navigation Icons

The 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.
	Delete - Removes the item from the list.

Icon	Description
	Details - Shows additional information about the item.
	Back - Navigates to the previous screen.
	Forward - Navigates to the next screen.
	Play - Plays the file.
	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.)
	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.
	Help - Displays information about online Technical Support.
	Logoff - Exits from the ISR Dashboard.

For more information about using the features and functions of the ISR dashboard, see the Interactive Session Recorder Administrator Guide or the 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 ISR for Recording a Call to configure the RSS and route.

## Configuring the ISR for Recording a Call

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

- Add a new site for the RSS server
- Add a new RSS to the site
- 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**.
2. Click **Sites**.
3. Click **Create**.
4. In the **Name** field, enter a name for the Site and click **Create**. The new site displays on the Sites page.


## Post-Install Verification and Configuration

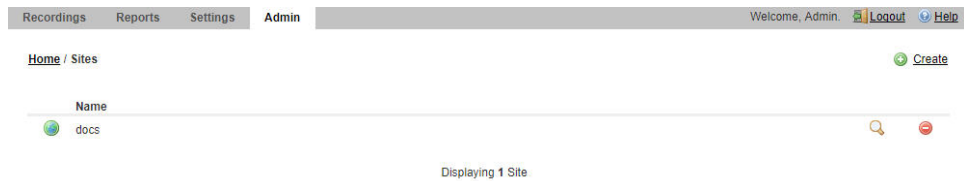
For more information about creating Sites, see the *Oracle Communications Interactive Session Recorder Administrator Guide*.

### Add the RSS to a Site

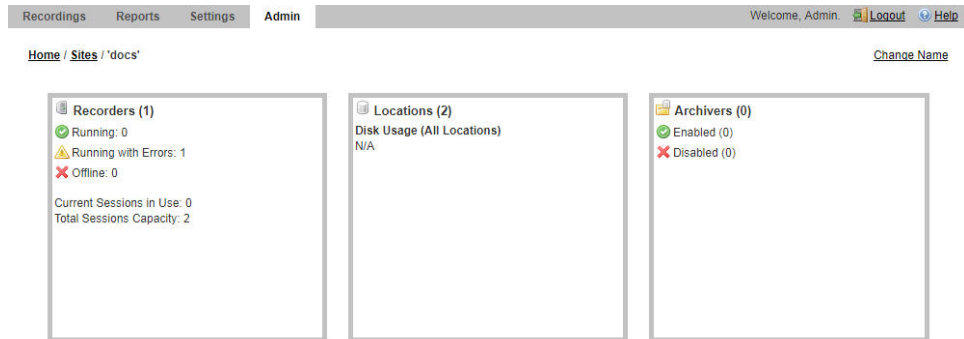
To enable connectivity between the RSS and the CIS, you must add the new RSS to a site. Use the following procedure to add the new RSS.

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.

2. Click the RSS block. The following page displays.

Name	VoIP IP	Status	Uptime	Current Sessions in Use	Sessions Capacity
rss197	10.10.248.197		4 days	0	2

Displaying 1 Recorder

The RSS page displays the following about each RSS.

Column	Description
Name	Name of the RSS.
VoIP IP	IP Address of the VoIP interface of the RSS.
Status	Current status of the RSS . Status can be: Enabled (active) Disabled (inactive) Active with errors
Uptime	Time elapsed since the last RSS process restart.
Current Sessions in Use	Total number of ports currently being used on the RSS.
Sessions Capacity	Total number of licensed ports on the RSS.

- Click **Create**. The following dialog box displays.

**Create**
✕

Name

VoIP IP

Admin IP

Data IP

Sessions Capacity

\*A new location will be created for this new RSS with default path configurations (/opt/isri/Recordings).

- In the **Name** field, enter a name for the RSS you are adding.
- In the **VoIP IP** field, enter the IP address (in dotted decimal format) on which the RSS is listening for SIP traffic.
- In the **Admin IP** field, enter the IP address at which to connect to the RSS host over the Administrator network.
- In the **Data IP** field, enter the IP address at which ISR components communicate with the RSS host over the Data network.

## Post-Install Verification and Configuration

---

8. In the **Sessions Capacity** field, enter the value of the number of concurrent sessions allowed for this RSS host.



**Note:** This number must comply with your Oracle contract.

9. Click **Create**.

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

---

## Setting up a Test Call


This chapter provides information and procedures for configuring the first route to use for placing a test call to the 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

Route configuration is important to the flexibility of your 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 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.

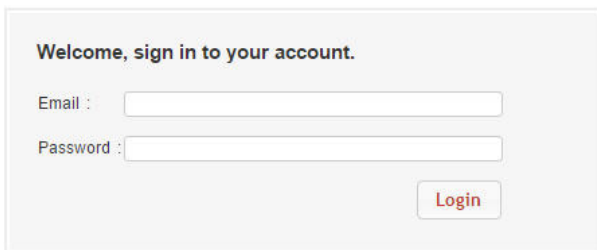
 **Note:** Use the new Route you configure in this section for call verification purposes only.

To configure a route:

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

`https://172.54.66.7`

The Login page displays.



>Welcome, sign in to your account.

Email :

Password :

Login

3. Enter your email and password, respectively, in the "Email" and Password fields.

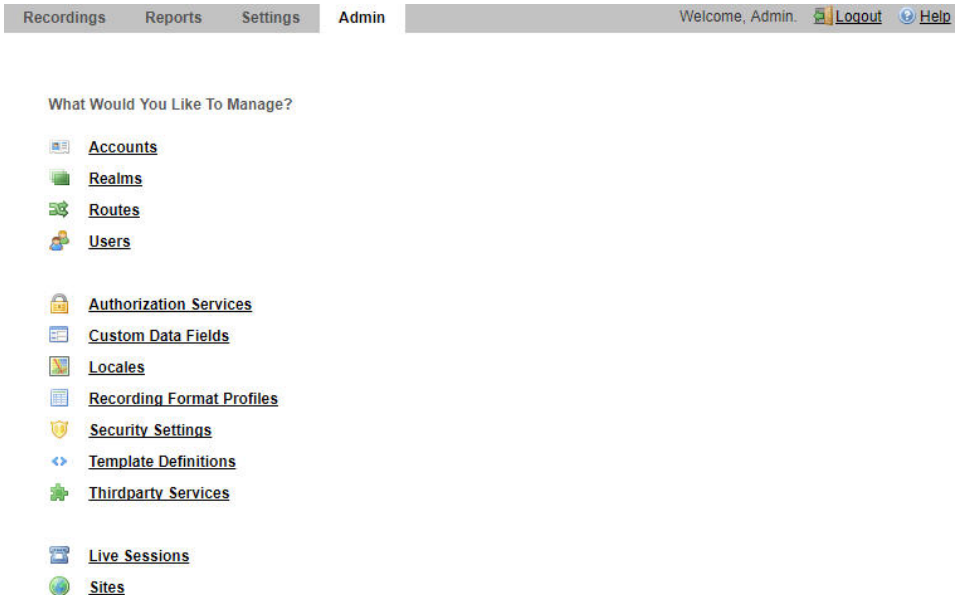
**Note:** Upon initial login, you are required to change the email and password login credentials, and then you must update the password again every 90 days.

## Setting up a Test Call

The following page displays.




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




- Click the **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 - To, ANI - From, or Both - To/From)
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. 



Column	Description
	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.

## 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 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 example installs the PhonerLite SIP Softphone application.

### Installing the Softphone

Use the following procedure to install the Softphone.

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](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.

### Configuring the Softphone

Use the following procedure to configure the Softphone.

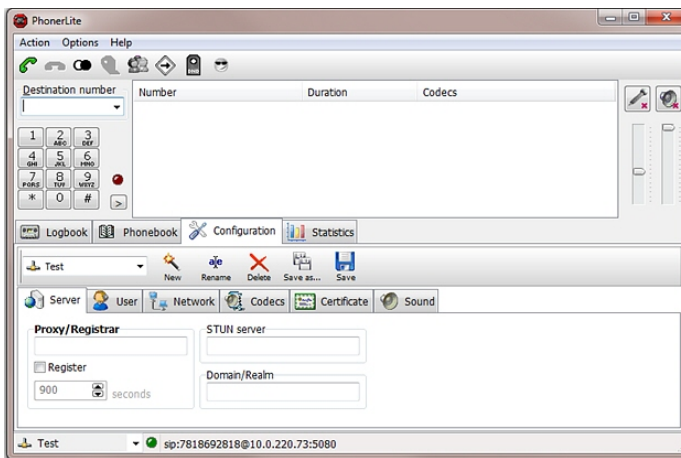
To configure the softphone:

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

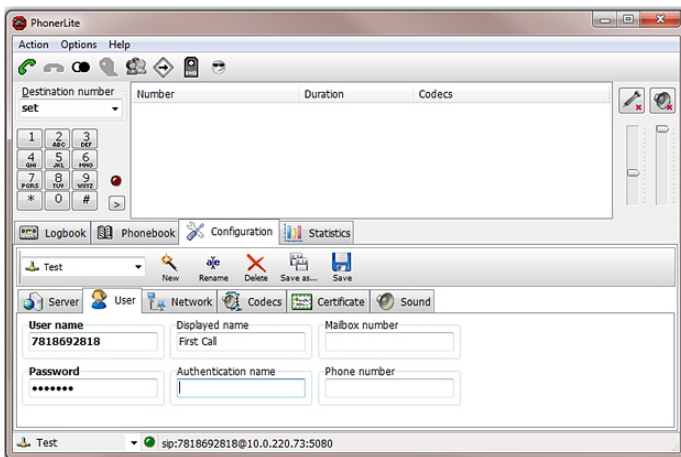


2. In the PhonerLite window, click the Configuration tab.
3. Click the Server tab.

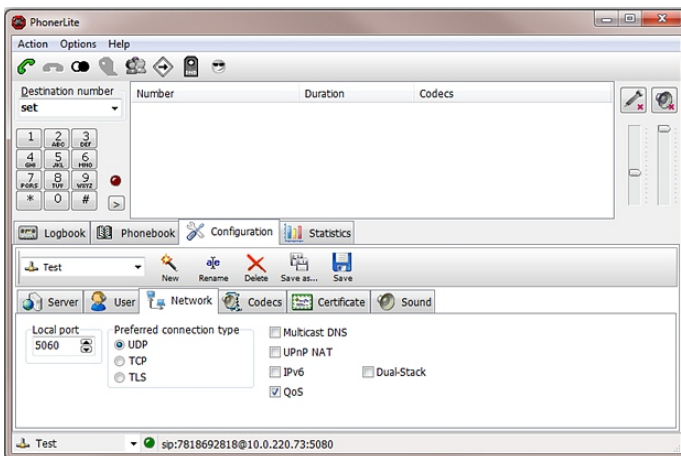
## Setting up a Test Call



4. Verify that the Register box is disabled (unchecked).
5. Click the User tab.

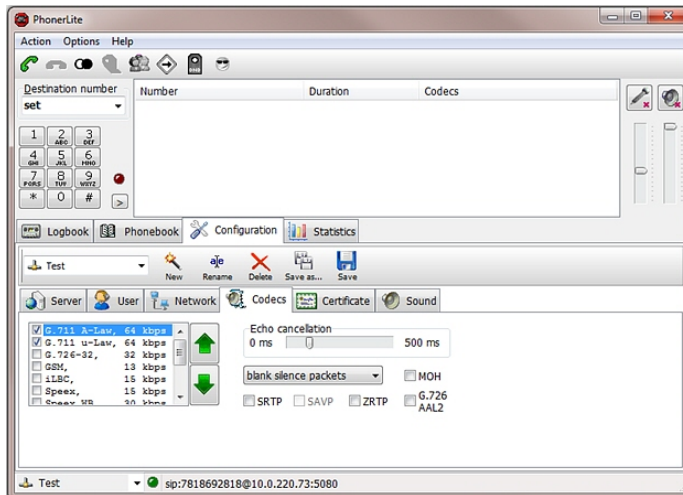


6. In the User name box, enter your user name. Your user name is your outgoing caller ID (SIP URI).
7. In the Displayed name box, enter a name to display to the recipient of a call. Valid values are alpha-numerical characters.
8. Click on the Network tab.



9. In the Local Port box, enter the value for an open port on your computer. Default SIP port is 5060. This port value should be available if you have no other SIP devices running on your computer.
10. In the Preferred connection type field, click **UDP** to enable it. The RSS requires the UDP transport protocol. All other network parameters can remain at default values.

- Click the Codecs tab.



- In the codec list, select "G.711 A-Law, 64 kbps" and/or G.711 u-Law, 64 kbps. At least one of these codecs must be selected.
- In the drop-down box, select blank silence packets.
- Click the <Save> icon. Do not close this Softphone application as you will be using it to make your first call. Go to Making the First Call to make the first test call to the RSS.

## Making the First Call

After installing the Softphone Client, you can use it to place your first call to the RSS.

### Before You Begin

Before you make your first call to the RSS, open the `/opt/isr/logs/recorder/recorder.log` file to observe the cache refresh and see your test call display in the log as it happens.

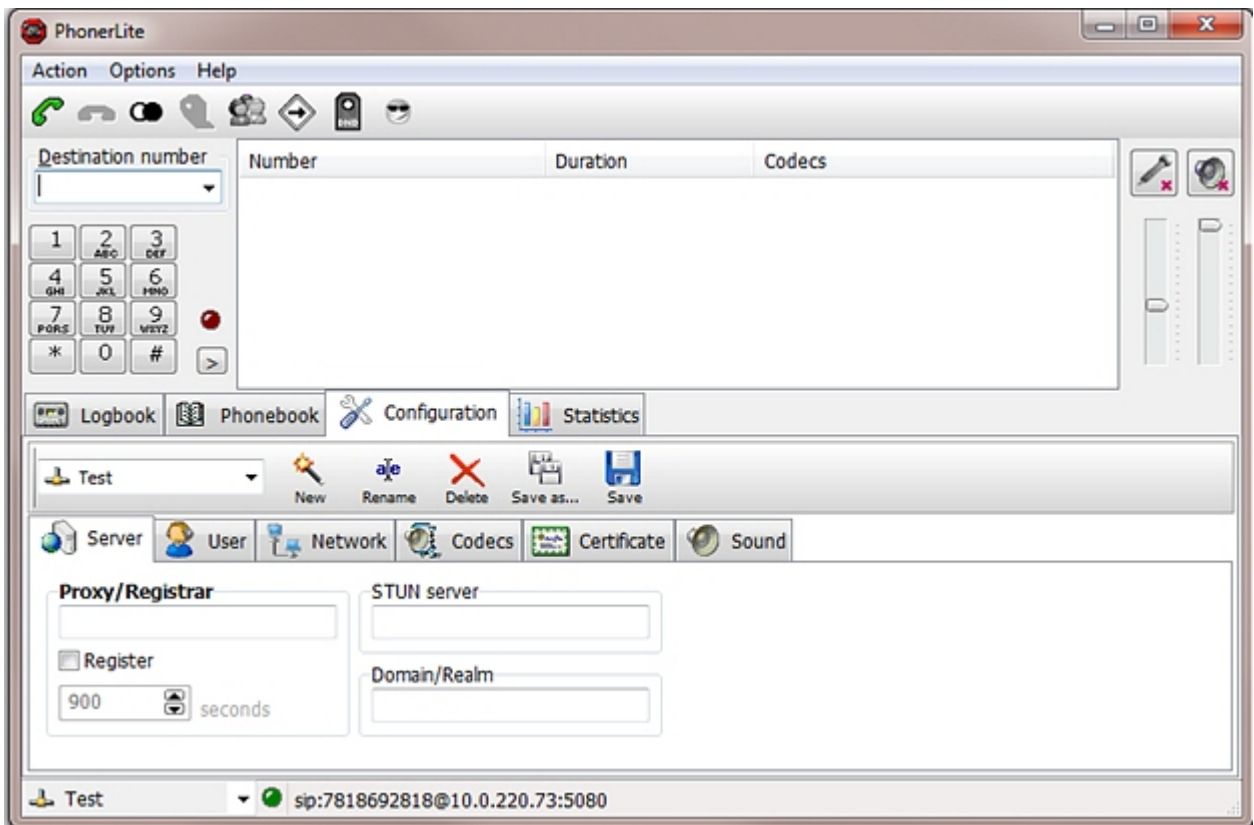
To open the ISR.log file:

- Enter `tail -f /opt/isr/logs/recorder/recorder.log` and press Enter.

```
<hostname> # tail -f /opt/isr/logs/recorder/recorder.log
```

- 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`.

## Setting up a Test Call




3. Click the  icon in the Main Menu or Press Enter.

The output in the `/opt/isr/logs/recorder/recorder.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-F0DEF154AD05@10.1.30.38 08/30/2011
07:31:54[ INFO]callManager: [Channel 1] Dequeueing SipCall, callId:
800D645C-5CD2-E011-9026-F0DEF154AD05@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_CONFERENCE accountName: System
08/30/2011 07:31:54[ INFO] RouteMap: [Channel 1] getRouteInfo returned with
vDNIS: test, isRecordable: 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.
```

4. When the RSS answers the call, leave a voice recording.
5. Click  to hang up the phone.
6. 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.

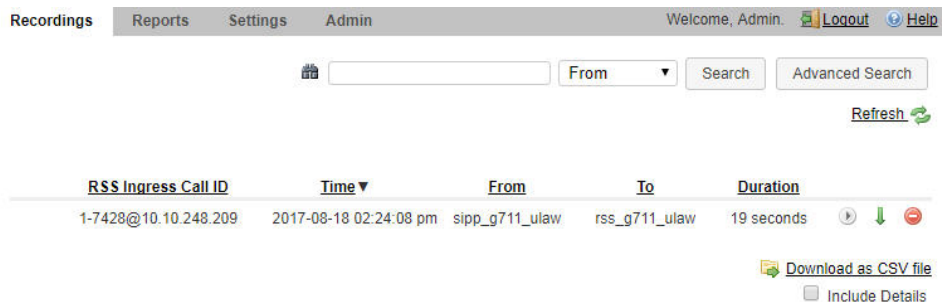
## Verifying Call Recording/Playback Using the Dashboard

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 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 ISR Dashboard Requirements.

To verify the call recording/playback:

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



Recordings   Reports   Settings   Admin   Welcome, Admin.   Logout   Help

From   Search   Advanced Search

Refresh

RSS Ingress Call ID	Time	From	To	Duration
1-7428@10.10.248.209	2017-08-18 02:24:08 pm	sipp_g711_ulaw	rss_g711_ulaw	19 seconds

Download as CSV file

Include Details

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 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 /opt/isr/logs/dashboard/production.log.



---

## Deploying and Configuring the Remote Archival Web Service

### Deploying the ISR Remote Archival Web Service


---

The ISR Remote Archival Web Service (RAWS) is deployed the same way as the other ISR components. For more information, see Installing the ISR Index in the *Oracle Communications Interactive Session Recorder Installation Guide*.

### Installing the Remote Archival Web Service

---

This section describes how to install the ISR Remote Archival Web Service (RAWS).

 **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords, and interfaces you created during the Oracle Linux installation.


To install the ISR RAWS:

1. Log into the Oracle Linux CLI using an SSH client.

 **Note:** The Oracle Linux CLI is case-sensitive.

2. Enter the following command into the CLI:

```
sudo yum install isr-RemoteArchival
```

 **Note:** Most ISR installation environments do not have access to a repository with the RPM required to install the `isr-RemoteArchival` RPM itself. The simplest way to manage this issue is to (secure) copy the following files onto the Index host:

- `isr-RemoteArchival-5.2-0.x86_64.rpm`

Once the files are properly copied, connect to the Index host with an SSH client and in the directory (for example, `/tmp`) containing the files, execute the following two commands:

```
# sudo yum localinstall /tmp/isr-RemoteArchival-5.2-0.x86_64.rpm
```

3. Verify the installation when prompted.

```
Is this ok [y/d/N]:
```


Oracle Linux downloads the RAWS installation packages.

## Deploying and Configuring the Remote Archival Web Service

---


4. Enter the following command into the CLI once Oracle Linux indicates the installation packages have finished downloading.

```
sudo /opt/isr/configIsr.sh
```

 **Note:** Once you begin editing the configIsr.sh script, you cannot perform a **<Ctrl> C** to exit the file.

5. Follow the script's instructions closely.

- Create a certificate key password when prompted.

 **Note:** This password does not have to follow any rigid requirements.

- When prompted for Database IP addresses, you may press **<Enter>** to accept the default values, unless you are not using the default Index IP address of the Local network. In that case, enter the appropriate values.
- Map the physical network interfaces to ISR networks. Hit **<Enter>** when prompted.

```
System Interfaces Found:
ens32 ens33-1 ens34 ens36
```

```
Enter Admin interface [ens32] <Enter>
Enter Local Interface [ens33-1] <Enter>
Enter VoIP Interface [ens34] <Enter>
Enter Data Interface [ens36] <Enter>
```

- Select **m** when prompted to set the hostname and finish the configuration.

```
Please select from the following menu:
-----
```

```
s) Show the current configuration
m) Modify the current configuration
i) Modify network interface mapping
z) Show firewall settings for Remote Archival.
q) Quit
```

```
Choice: m
```

- The RAWs MySQL user must be granted access to the Index database and only can once the network connectivity is established. If networking is not properly configured before the MySQL user step, the following error and instruction are displayed:

```
Networking connection to MySQL index not available, please configure
networking and run the configuration option 'm' again. Hit <Enter> when
ready.
```

Once you've chosen **m** to modify the configuration, accept the prompt to add the Remote Archival/ RAWs MySQL user and follow the steps carefully to grant privileges.

The ISR Remote Archiver is installed.



---

## Deploying and Configuring ISR FACE


---

### Deploying ISR FACE

The ISR FACE is deployed the same way as the other ISR components. The ISR FACE is commonly deployed on an Oracle Linux 7 VM and has the same prerequisites as the other ISR components.

### Installing ISR FACE

By default, FACE is configured to handle HTTP requests over SSL, but you must perform the following steps to complete the initial configuration.

 **Note:** During the installation process, you will be asked to provide and/or verify the users, passwords, and interfaces you created during the Oracle Linux installation.


To install the ISR FACE:

1. Log into the Oracle Linux CLI using an SSH client.

 **Note:** The Oracle Linux CLI is case-sensitive.

2. Enter the following command into the CLI:

```
sudo yum install isr-Face
```

 **Note:** Most ISR installation environments do not have access to a repository with the RPM required to install the isr-Face RPM itself. The simplest way to manage this issue is to (secure) copy the following file onto the Index host:

- isr-Face-<release#>.x86\_64.rpm

Once the file is properly copied, connect to the Index host with an SSH client and in the directory (for example, /tmp) containing the file, execute the following command:

```
# sudo yum localinstall /tmp/isr-Face-<release#>.x86_64.rpm
```

3. Verify the installation when prompted.

```
Is this ok [y/d/N]:
```

Oracle Linux downloads the FACE installation packages.

4. Enter the following command into the CLI once Oracle Linux indicates the installation packages have finished downloading.

```
sudo /opt/isr/configIsr.sh
```

## Deploying and Configuring ISR FACE

---

5. Follow the script's instructions closely.

- Create a certificate key password when prompted.



**Note:** This password does not have to follow any rigid requirements.

- When prompted for Database IP addresses, you may press **<Enter>** to accept the default values, unless you are not using the default Index IP address of the Local network. In that case, enter the appropriate values.
- Select **m** when prompted to set the hostname and finish the configuration.

```
Please select from the following menu:
```

```
-----  
s) Show the current configuration  
m) Modify the current configuration  
i) Modify network interface mapping  
z) Show firewall settings for Index.  
q) Quit
```

```
Choice: m
```

The ISR FACE is installed.

## Configuring FACE Reduced Security

The ISR's FACE functionality may be run with reduced security. You can use the configCis.sh script to loosen security settings on the FACE host.

To disable HTTPS in FACE, run the configCis.sh script and select HTTP for FACE.

```
[root@face ~]# configCis.sh
```

```
-----  
Please select from the following menu:
```

```
-----  
s) Show the current configuration  
m) Modify the current configuration  
i) Add/modify a second network interface  
f) Set face default configuration in DB  
q) Quit
```

```
Choice: f
```

```
WARNING, this action will reset the FACE to its default configuration.  
** All customization of FACE or EEN configured will be lost.
```

```
Continue? (yes|no) [yes] yes  
You have been warned.
```

```
Enter Face Host IP: [] 1.2.3.4  
Protocol to use for FACE connections? (http|https) [https] http
```

```
FACE connection protocol set to http  
Enter ObserveIT Server IP: [] 2.3.4.5  
Protocol to use for ObserveIT Server connections? (http|https) [https]  
ObserveIT connection protocol set to https  
Attempting to restore backup SQL  
Backing up FACE Config (to /opt/isr/faceSetupTemplate.sql.bak).  
Updating FACE IP in SQL Script.  
Updating FACE HTTP/S in SQL Script.  
Updating ObserveIT IP in SQL Script.
```


---

## Upgrading the ISR

The ISR includes a "yum-style" approach to upgrading all ISR applications on each ISR component host. The upgrade feature is limited to upgrades within the 5.2Mx and later release sets, and an upgrade process from release 5.1 or earlier is not currently available. Contact your Oracle account representative with any questions.

You must upgrade the ISR components in the following order:

- Index
- RSS
- Dashboard
- FACE (if present)


 **Note:** The order in which you must upgrade ISR components has changed from 5.x releases.

---

## Upgrade Prerequisites

To upgrade the ISR components, you must complete the following prerequisites:

- The ISR component hosts are properly running on the Oracle Linux 7.2 OS
- Access to the following upgrade tar files from the ISR component hosts:
  - isr-Index-<release#>-upgrade.tgz
  - isr-Dashboard-<release#>-upgrade.tgz
  - isr-rss-<release#>-upgrade.tgz
  - isr-Face-<release#>-upgrade.tgz
- Have access to the Ruby 2.4 rpm ( ruby-2.4.0-1.el7.centos.x86\_64.rpm )
- For the duration of the maintenance window, all call traffic is stopped on all sites and outside client access to the Dashboard and API services, is prohibited.

 **Note:** The following instructions assume the recommended "isradm" Linux user has sudo permissions.

WARNING: The upgrade process for each component includes a critical backup step that copies important host configuration, ISR application configuration, ISR application platform configuration, ISR application data, encrypted keys, keystores, and log files to a temporary directory before consolidating these copies into a compressed set of files for a potential rollback situation. This backup step requires additional disk space to successfully write the files, and a warning prompt is displayed to detail concerns and recommend

## Upgrading the ISR

---

an option to mount an additional drive if disk space may be an issue. Oracle strongly recommends you consider these details and the recommended option carefully before continuing with the upgrade. For more information about mounting remote storage, see [Chapter 22, Shared File System Administration](#) from the Oracle Linux Administrators Guide Release 7.

## Upgrading the ISR Index

---

This section describes the ISR Index upgrade process.

1. Log into the Index host using the recommended "isradm" user.
2. Copy the Index upgrade file "isr-Index-<release#>-upgrade.tgz into the /opt/isr/releases directory.
3. Switch to the root directory by executing the `cd /` command.
4. Delete prior ISR RPM packages to avoid confusion with the current version by executing the following command:

```
$ sudo rm /opt/isr/releases/isr-*.rpm
```

5. Unpack the upgrade file from the root directory by executing the following command:

```
sudo tar xzf /opt/isr/releases/isr-Index-<release #>-upgrade.tgz -C /
```

6. Run the upgrade script by executing the following command:

```
sudo /opt/isr/releases/upgradeIsr.sh
```

7. Follow the script's prompts and instructions closely.

8. Verify the updated build upon completion by executing the following command.

```
yum info isr-Index
```

If the upgrade is successful, the following information displays:

```
Repo      : installed
Summary   : <release#> <build_date>          Index for ISR
```

## Upgrading the ISR RSS

---

This section describes the ISR RSS upgrade process.

1. Log into the RSS host using the recommended "isradm" user.
2. Copy the RSS upgrade file "isr-rss-<release#>-upgrade.tgz into the /opt/isr/releases directory.
3. Switch to the root directory by executing the `cd /` command.
4. Unpack the upgrade file from the root directory by executing the following command:

```
sudo tar xzf /opt/isr/releases/isr-rss-<release #>-upgrade.tgz -C /
```

5. Run the upgrade script by executing the following command:

```
sudo /opt/isr/releases/upgradeIsr.sh
```

6. Delete prior ISR RPM packages to avoid confusion with the current version by executing the following command:

```
$ sudo rm /opt/isr/releases/isr-*.rpm
```

7. Follow the script's prompts and instructions closely.

8. Verify the updated build upon completion by executing the following command.

```
yum info isr-rss
```

If the upgrade is successful, the following information displays.

```
Repo      : installed
Summary   : 6.0 20161234-567890          RSS for ISR
```

- Run the configuration script by executing the following command:

```
sudo /opt/isr/configIsr.sh
```

- Follow any configuration script's prompts and instructions closely to ensure all component configurations are verified and select the **q** option to finish.

## Upgrading the ISR Dashboard

This section describes the ISR Dashboard upgrade process.

- Log into the Dashboard host using the recommended "isradm" user.
- Copy the Dashboard upgrade file "isr-Dashboard-<release#>-upgrade.tgz into the /opt/isr/releases directory.
- Copy the Ruby 2.4 RPM to the /opt/isr/releases directory. The Ruby 2.4 RPM package is easily obtained from GitHub here: <https://github.com/feedforce/ruby-rpm/releases/tag/2.4.0> with the file name "ruby-2.4.0-1.el7.centos.x86\_64.rpm".
- Switch to the root directory by executing the **cd /** command.
- Delete prior ISR RPM packages to avoid confusion with the current version by executing the following command:

```
$ sudo rm /opt/isr/releases/isr-*.rpm
```

- Unpack the upgrade file from the root directory by executing the following command:

```
sudo tar xzf /opt/isr/releases/isr-Dashboard-<release #>-upgrade.tgz -C /
```

- Run the upgrade script by executing the following command:

```
sudo /opt/isr/releases/upgradeIsr.sh
```

- Follow the script's prompts and instructions closely.
- Verify the updated build upon completion by executing the following command.

```
yum info isr-Dashboard
```


If the upgrade is successful, the following information displays:

```
Repo          : installed
Summary       : <release#> <build_date>          Dashboard for ISR
```

- Run the configuration script with the following command:

```
sudo /opt/isr/configIsr.sh
```

- Follow the configuration script's prompts and instructions closely to import public keys from all RSS hosts.

 **Note:** For the Recorder and Converter processes to update their configurations and record successfully after upgrade, you must log into the Dashboard, access the **Admin > Sites > Recorders** page, and edit each Recorder, updating their network IPs, Sessions Capacity, Primary and Failover Locations, and confirm the remaining configuration settings. The Primary Location may already be set. Typically, the Failover Location is configured to the Destination Location set for the Archival process for this Recorder.

## Upgrading the ISR FACE

This section describes the ISR FACE upgrade process.

- Log into the FACE host using the recommended "isradm" user.
- Copy the FACE upgrade file "isr-Face-<release#>-upgrade.tgz into the /opt/isr/releases directory.
- Switch to the root directory by executing the **cd /** command.

## Upgrading the ISR

---

4. Delete prior ISR RPM packages to avoid confusion with the current version by executing the following command:

```
$ sudo rm /opt/isr/releases/isr-*.rpm
```

5. Unpack the upgrade file from the root directory by executing the following command:

```
sudo tar xzf /opt/isr/releases/isr-Face-<release #>-upgrade.tgz -C /
```

6. Run the upgrade script by executing the following command:

```
sudo /opt/isr/releases/upgradeIsr.sh
```

7. Follow the script's prompts and instructions closely.

8. Verify the updated build upon completion by executing the following command.

```
yum info isr-Face
```

If the upgrade is successful, the following information displays:

```
Repo          : installed
Summary       : <release#> <build_date>          Face for ISR
```

9. Run the configuration script with the following command:

```
sudo /opt/isr/configIsr.sh
```

10. Follow the configuration script's prompts and instructions closely to import public keys from all RSS hosts.

---

## Installing a Virtual Machine

This section describes the process of installing a VM.

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## Configuring a 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 traditionally run on the Hypervisor platform:

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

### Virtual Machine Default Resource Configurations

The ISR supports one platform, the VMWare vSphere Hypervisor. Any Hypervisor that Supports Oracle Linux 7.2 and higher are permitted.

 **Note:** A table on the VMWare Knowledge Base recommends certain VM virtual hardware versions (“VM Version” above) with Hypervisor (ESXi) platform versions. Although no misbehavior associated with the ISR hosts has been confirmed as related to hardware version incompatibilities, the latest virtual hardware version, vmx-10, has been successfully tested with the recommended Hypervisor version, VMware ESXi 5.5 Update 2. The following instructions from VMWare’s Knowledge Base explain upgrading the virtual hardware version of a VM:

1. Power on the VM to be upgraded.
2. Install VMware Tools using vSphere client by right-clicking on the VM, selecting the **Guest** menu, and the **Install/Upgrade VMWare Tools** option.
3. In vSphere client, right-click the entry for the VM and select **Upgrade Virtual Hardware**.
4. In vSphere Client’s General Summary of the VM confirm the **VM Version** value is **vmx-10**.
5. Power on the VM.

### 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.

## Installing a Virtual Machine

---

To install vSphere Hypervisor:

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

<https://my.vmware.com/web/vmware/evalcenter?p=free-esxi5&lp=default>

2. Download the ESXi 5.5 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 5.5 update 1 <filename>.ISO image to a CD.
4. Boot the server from the ESXi 5.5 update 1 CD you just created.
5. At the prompt, press Enter to proceed with the installation.
6. Press <F11> to accept the ESXi 5.5 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 5.5 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 step before you can use it. Use the following procedure to configure vSphere Hypervisor.

To deploy your Oracle Linux 7 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.



**Warning:** 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 additional virtual network

To install the vSphere Client:

## Installing a Virtual Machine

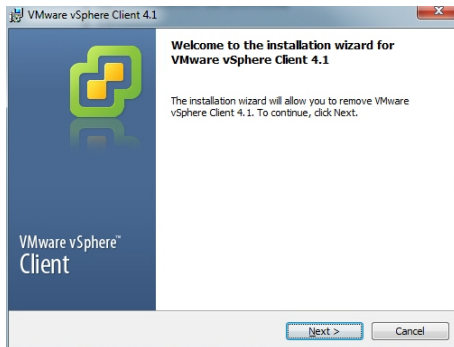
---

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,

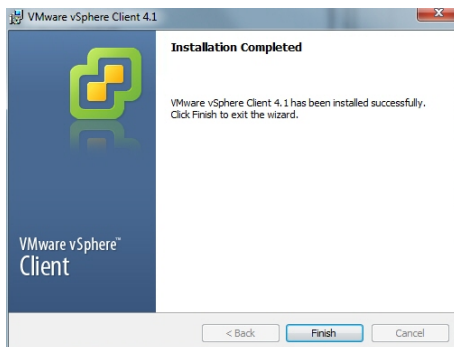
<http://172.30.58.164>

A warning displays followed by a prompt allowing you to accept or reject the certificate.

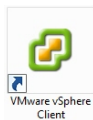
2. Press Enter to accept the certificate.
3. Click **Download vSphere Client**.
4. Navigate to the location on your PC where you downloaded the vSphere Client. The vSphere Client file name is VMware-viclient-all-5.5.0-1281650.exe.
5. Double-click the file to begin the installation. The file proceeds to extract the application files and continues the installation process. The following screen displays.



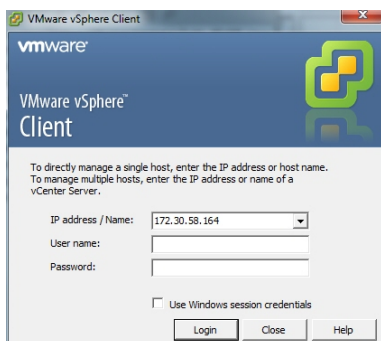
6. Click **Next**. Select I agree to the terms in the license agreement and click **Next**. Continue the installation by following all remaining instructions for installing the vSphere Client. When the installation is complete, the following screen displays.



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).

## Getting the vSphere Hypervisor License

To get the VMware vSphere Hypervisor License:

1. Enter the following URL:

<https://www.vmware.com/account/login.do>

2. 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.

3. Open your email message from VMware and click the Activate Now button.

The VMware 's Enter Your Password screen displays.

4. In the Password text box, enter the password you specified when registering with VMware and click Continue.

## Installing a Virtual Machine

The "Account Activated" screen displays with the following message:

Success! Your account has been activated.

5. Copy and paste the following link into your browser:

<https://my.vmware.com/web/vmware/evalcenter?p=free-esxi5&lp=default&lp=1&ie=UTF-8&q=vmware%20vsphere%20hypervisor%20esxi%204.1%20license>

6. 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.

7. 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.

8. Open your email message from VMware and click **Access Now.**

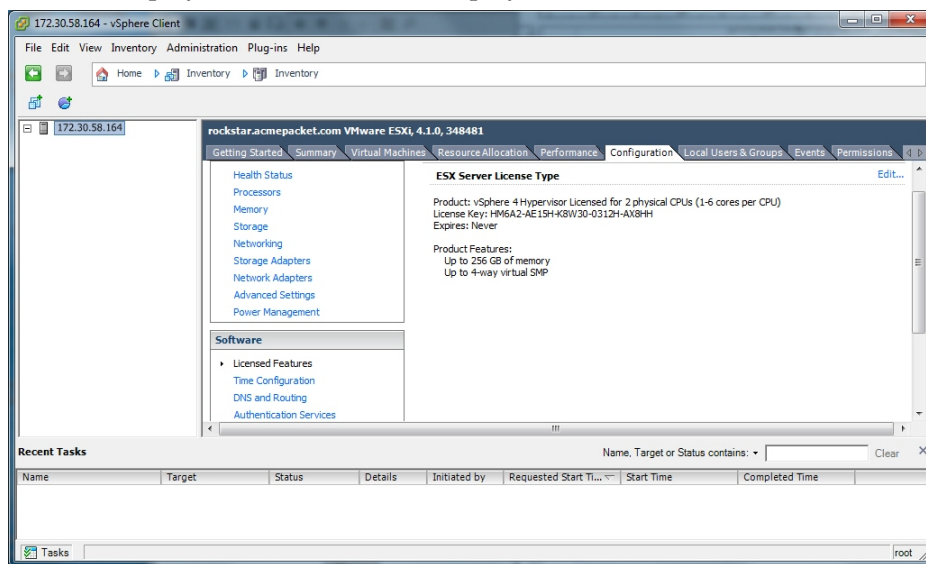
A VMware vSphere Hypervisor license string displays.

9. Copy the VMware vSphere Hypervisor license key string.

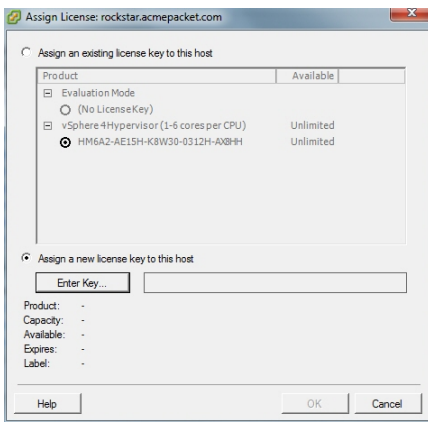
## Applying the VMware vSphere Hypervisor License

To apply the VMware vSphere Hypervisor license:

1. 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.



2. Click the **Configuration** tab.
3. In the left column, under the Software category, click **Licensed Features.**
4. In the upper right corner of the window, click **Edit.** The following window displays.



5. 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.
6. In the **New License Key** text box, paste the license key string you copied from Step 24. Or enter the license key string manually.

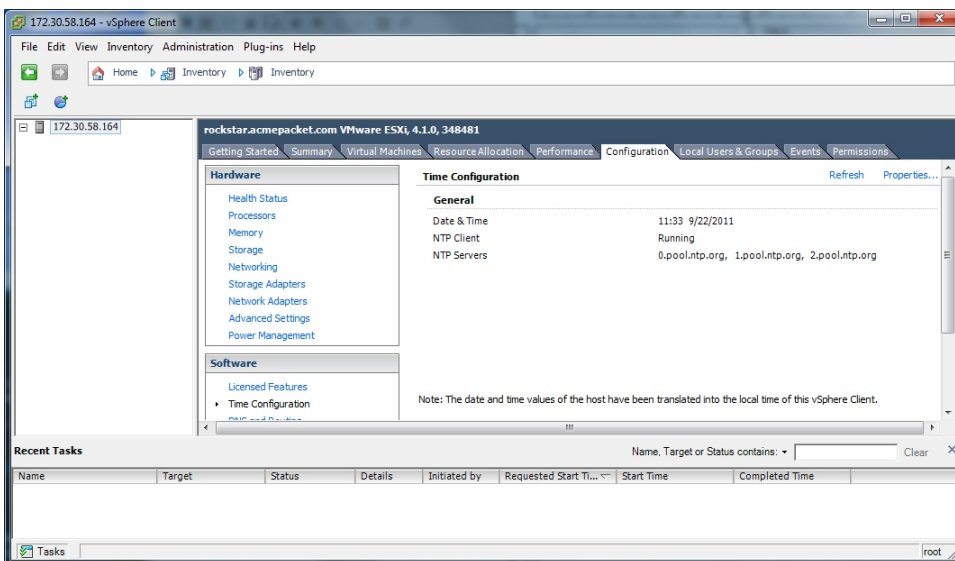
## Configuring your vSphere ESXi Host

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

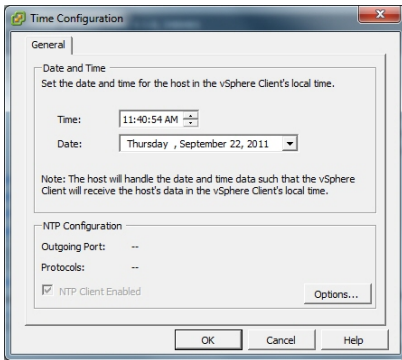
To assign a network time server:

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

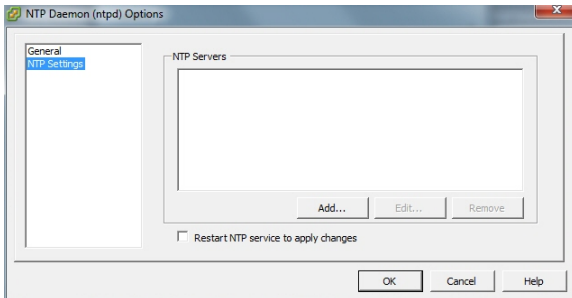


3. In the left column, under the Software category, click on **Time Configuration**.
4. In the upper right corner of the window, click on **Properties**. The following window displays.

## Installing a Virtual Machine

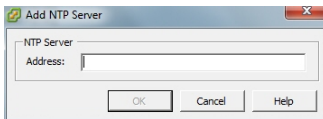


5. Click on **Options**. The following window displays.



6. In the left column, click on **NTP Settings**.

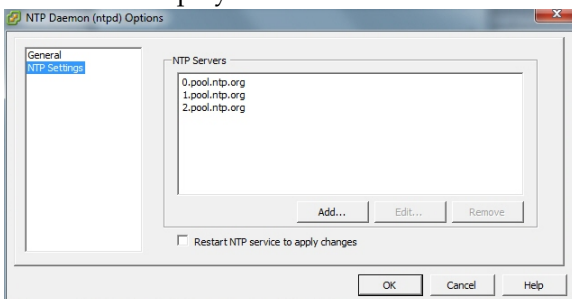
7. Click **Add**. The following window displays.



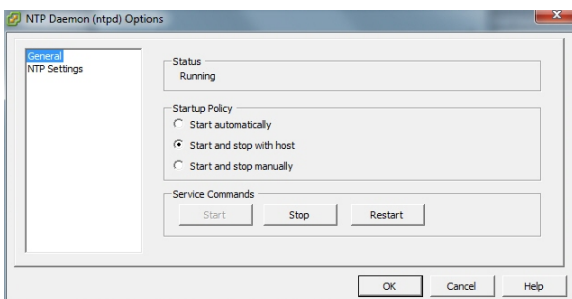
8. Add each of the following in the **Address** text box, clicking **OK** after each entry:

- 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 ISR component hosts are assigned the same timezone, except the Index host, which must be set to UTC.

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

## Configuring Additional Networks

This section describes how to configure a local network, a VoIP network, and a Data Network.

### Configuring the Local Network

The ISR applications have network default configurations to simplify initial deployment, particularly for VM environments. These configurations expect a private, internal network known as "Local" that offers the IP address range of 169.254.1.x.

The default application Local IPs are set to the following:

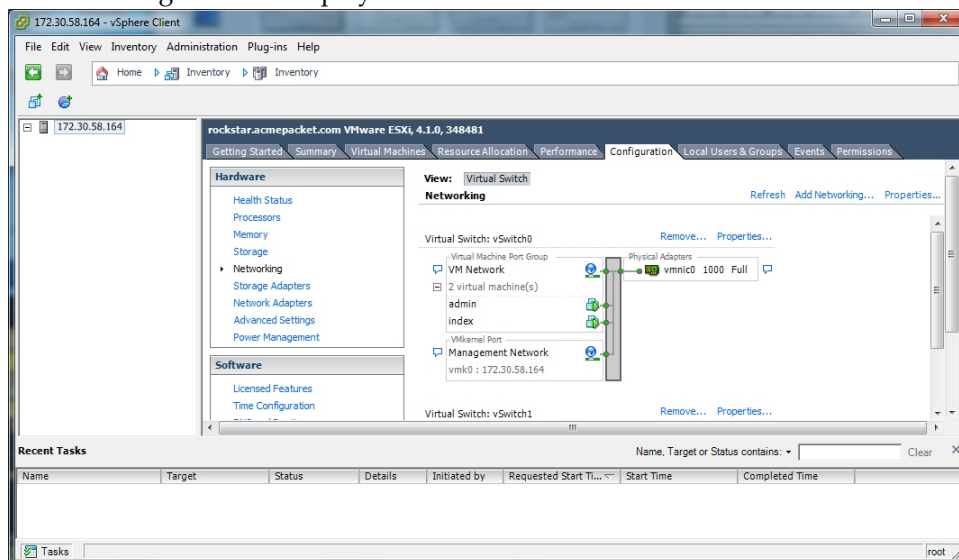
Component	Default Local IP
Dashboard	169.254.1.20
Index	169.254.1.50
RSS	169.254.1.xyz (where xyz=RSS's Administration network host address)
FACE	169.254.1.40

This section describes adding the Local network.

To create and configure your local network:

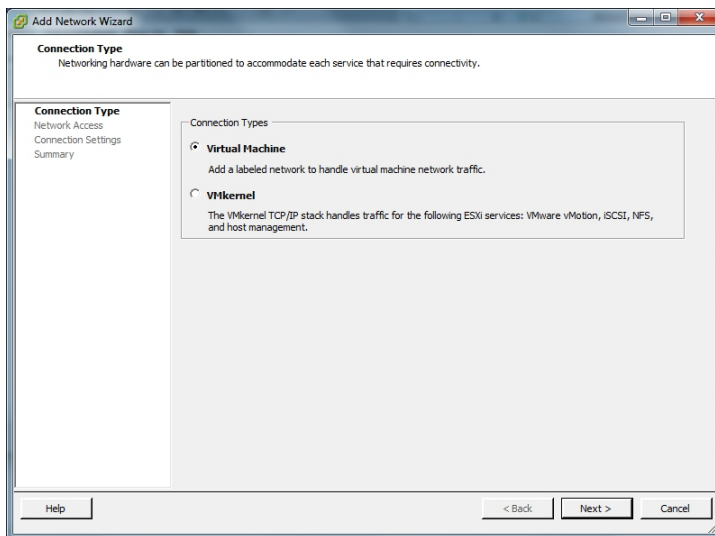
1. Open your vSphere Client and enter your username and password to login.

The following window displays.

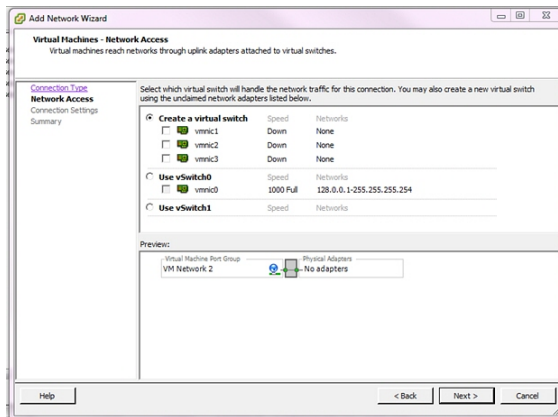


2. Click on the **Configuration** tab.
3. In the left column, under the Hardware category, click on **Networking**.
4. In the upper right corner of the window, click on **Add Networking**. The following window displays.

## Installing a Virtual Machine

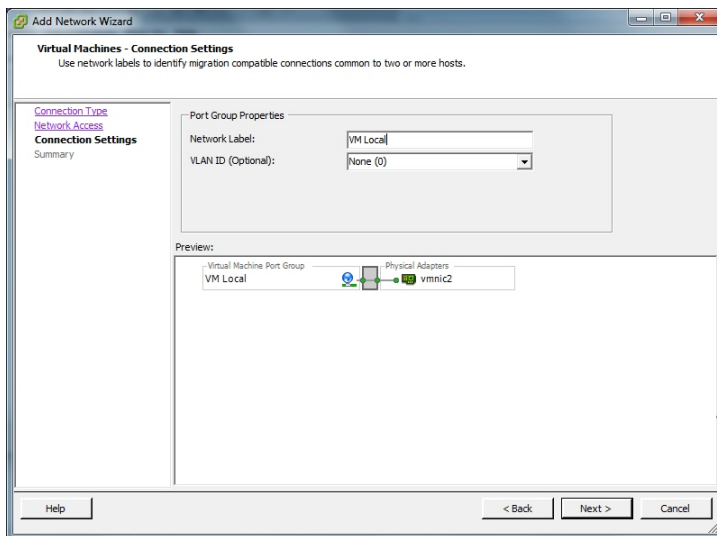


5. Click on the radio button for **Virtual Machine** and click **Next**. The following window displays.



6. The **Create a virtual switch** radio button is enabled by default. Make sure you leave this enabled. In the case of a pure-VM solution, the virtual network you are creating is not affiliated with any of the physical network interfaces on your ESXi host. However, a bare-metal RSS installation requires a physical interface between the CIS server and RSS server(s). For more information, see "Configuring a Bare-Metal RSS Installation".
7. Uncheck (disable) the vmnic1 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.

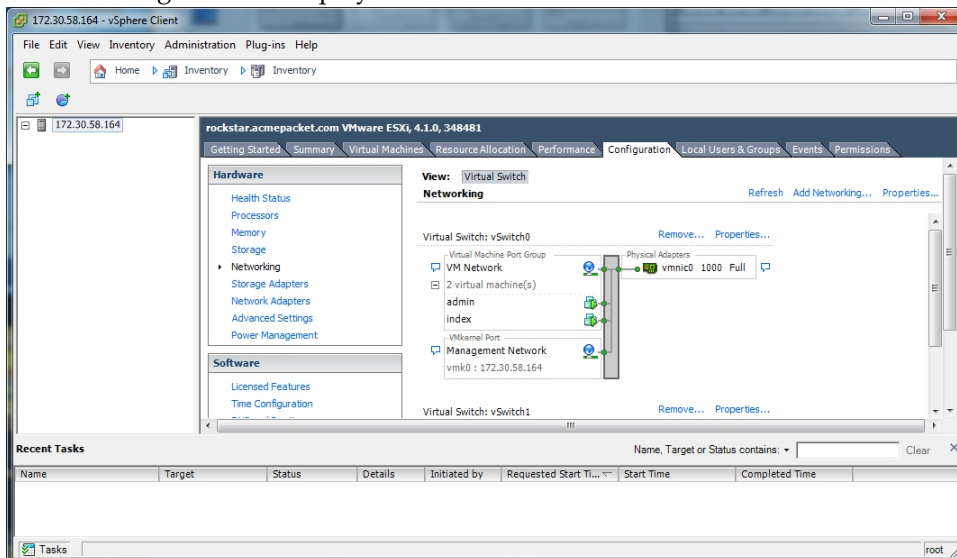
## Configuring the VoIP Network

This section describes adding the VoIP network.

To create and configure your VoIP network:

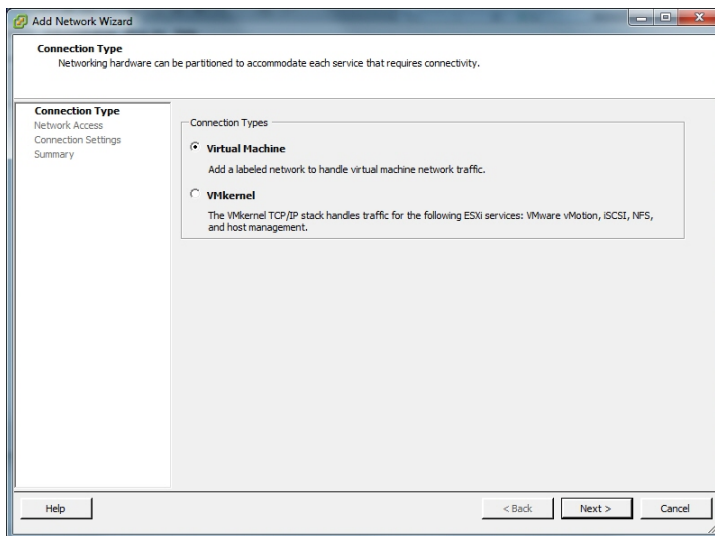
1. Open your vSphere Client and enter your username and password to login.

The following window displays.

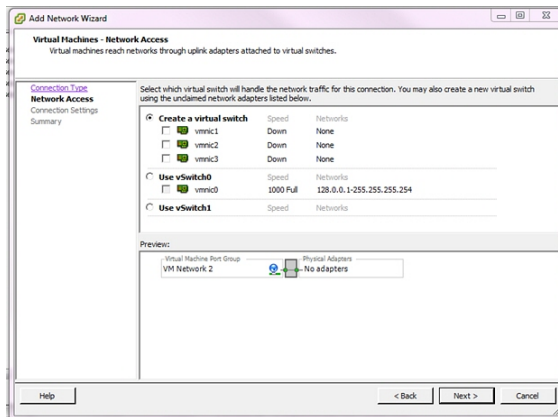


2. Click on the **Configuration** tab.
3. In the left column, under the Hardware category, click on **Networking**.
4. In the upper right corner of the window, click on **Add Networking**. The following window displays.

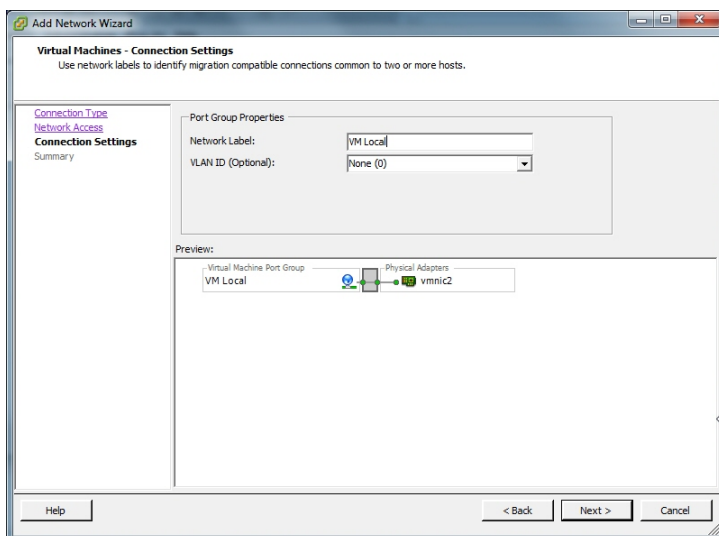
## Installing a Virtual Machine



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. In the case of a pure-VM solution, the virtual network you are creating is not affiliated with any of the physical network interfaces on your ESXi host. However, a bare-metal RSS installation requires a physical interface between the CIS server and RSS server(s). For more information, see "Configuring a Bare-Metal RSS Installation".
7. Uncheck (disable) the vmnic1 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 VoIP network is now created.

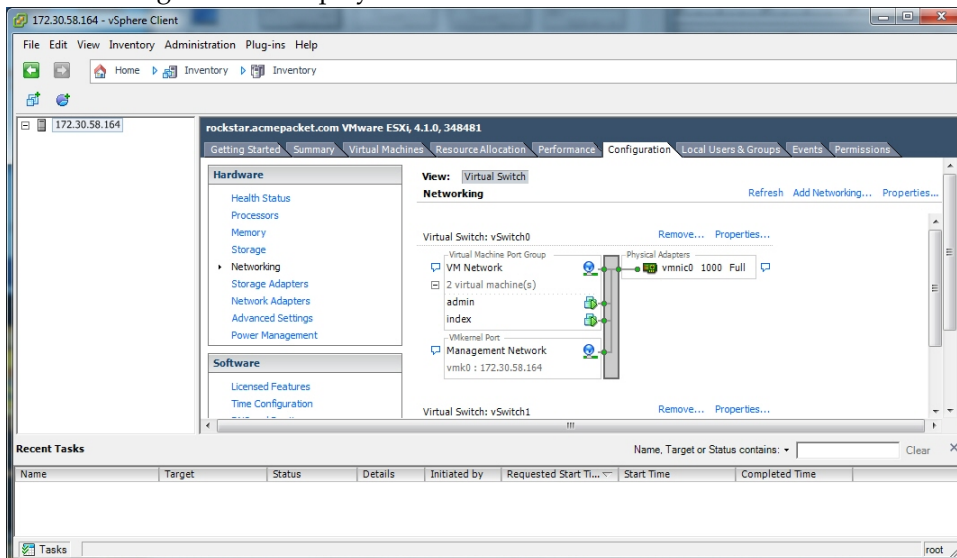
## Configuring the Data Network

This section describes adding the Data network.

To create and configure your Data network:

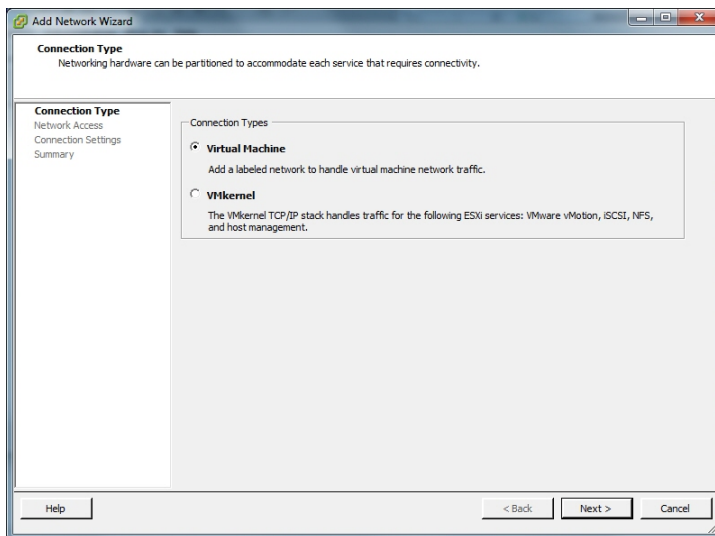
1. Open your vSphere Client and enter your username and password to login.

The following window displays.

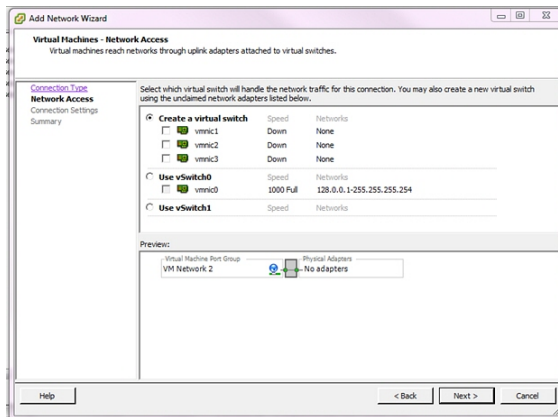


2. Click on the **Configuration** tab.
3. In the left column, under the Hardware category, click on **Networking**.
4. In the upper right corner of the window, click on **Add Networking**. The following window displays.

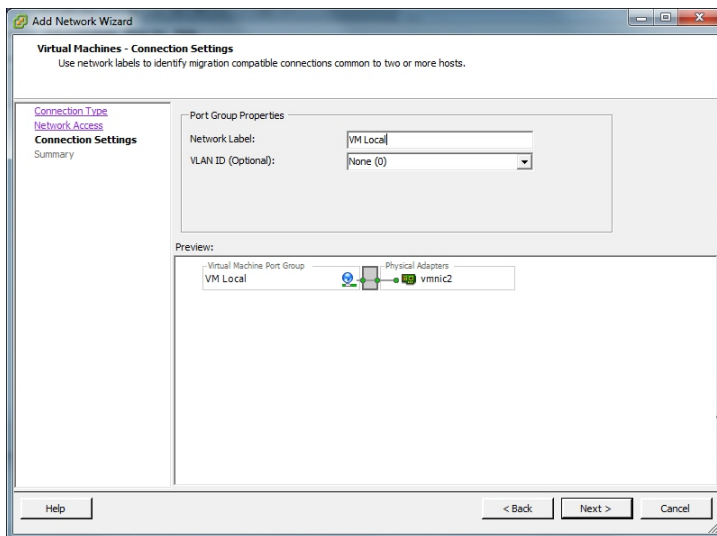
## Installing a Virtual Machine



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. In the case of a pure-VM solution, the virtual network you are creating is not affiliated with any of the physical network interfaces on your ESXi host. However, a bare-metal RSS installation requires a physical interface between the CIS server and RSS server(s). For more information, see "Configuring a Bare-Metal RSS Installation".
7. Uncheck (disable) the vmnic1 adapter.
8. Click **Next**. The following window displays.



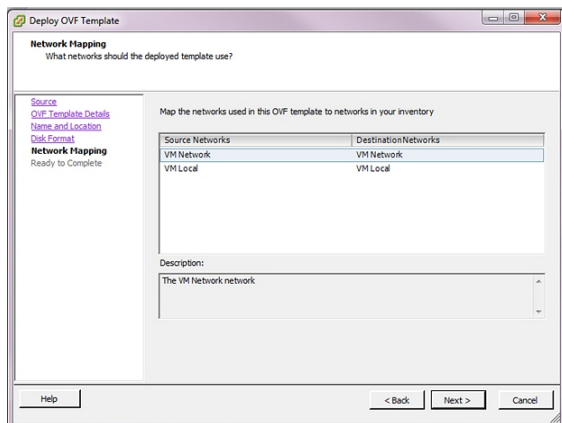
9. In the Port Group Properties section, enter a network label for this virtual switch in the **Network Label** text box. For example, VM Local.
10. The VLAN ID value is set as None(0). Do not change the default value in this field.
11. Click **Next**. Click **Finish**.

The Data network is now created.

## Network Mapping

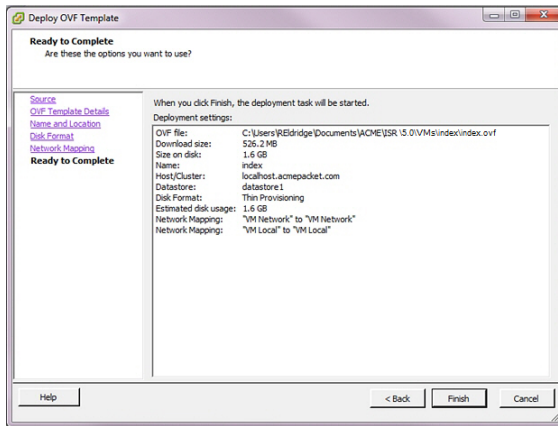
The ISR OVF's are defined with two network interfaces:

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

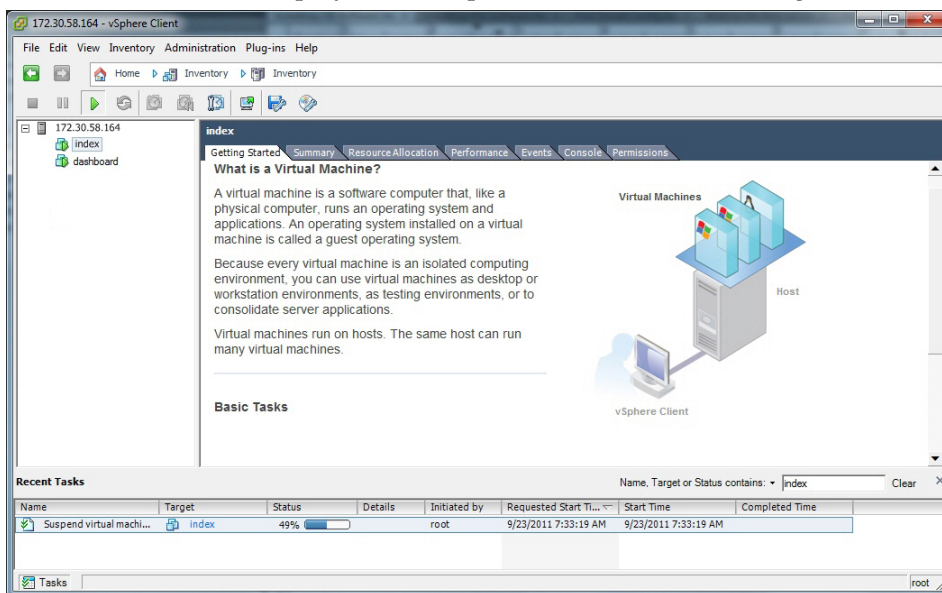


1. Map the Source Network column to the Destination Network column if only one physical interface is configured on your ESXi host.
2. Map VM Local to the network you created in Configuring the Local Network.
3. Click **Next**. The following window displays.

## Installing a Virtual Machine

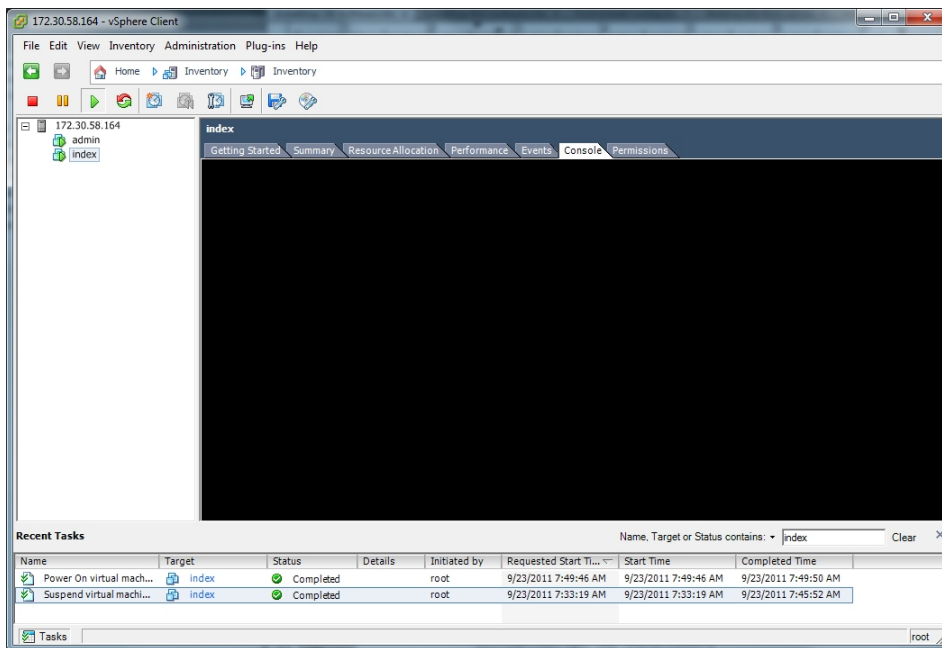


4. Review all selections in the Ready to Complete window and click **Finish**.
5. Click **OK** to close the Deploy OVF Template window. The following window displays.



6. In the left column, click on the Virtual Machine called for the component you are mapping.
7. Press the **Start/Play** icon to power ON the VM.

Configure the VM network address using the procedures in "Configuring the VM Network Addresses".



Repeat this entire process for all 3 required components.





---

## Creating an Oracle Linux Virtual Machine

This section describes creating an Oracle Linux Virtual Machine (VM).

To create an Oracle Linux VM:

1. Download the "Oracle Linux 7.x for x86 64 bit ISO image" from <http://edelivery.oracle.com/linux>.
  1. Sign in.
  2. Enter **Oracle Linux** in the search field.
  3. From **Select Platform** choose **x86 64 bit** and click **Select**.
  4. Click **Continue**.
  5. Click **Continue** again if the correct version is displayed.
  6. Follow the instructions to complete the download.
2. Open the vSphere Client and create a new VM.
  1. Set **Configuration** to **Typical**.
  2. Enter the **Name and Location**.
  3. Set **Storage** to the appropriate datastore.
  4. Set **Guest Operating System** to **Linux** with **Version Oracle Linux 4/5/6/7 (64-bit)**.
  5. Set **Networks**, with the number of NICs set to **4**. Also set the following networks (all with **Adapter** set to **VMXNET3** and **Connect at Power On** selected):
    - 1: "VM Network"
    - 2: "VM Local"
    - 3: "VM Voip"
    - 4: "VM Data"
  6. Set **Create a Disk** as **Thin Provisioned** at either the Virtual Disk Size or a different size.
  7. On the "Ready to Complete" screen, select **Edit the virtual machine setting before completion** to adjust resources such as Memory and CPUs.
  8. If necessary, select the "Options" tab's **Boot Options** menu item to force entry into the BIOS setup screen.
3. Select **File > New > 'Virtual Machine...'**
  1. Follow the Typical instructions.
  2. Choose **Oracle Linux 4/5/6/7 (64-bit)** for **Guest Operating System**.
  3. Connect the 4 NICs.
  4. Select **Thin Provision** for the datastore.
  5. Click **Finish**.

## Creating an Oracle Linux Virtual Machine

4. Right-click the new VM and select **Edit Settings...**
  1. Select the **Options** tab.
  2. Select **Boot Options** from the left panel.
  3. Check the box under **Force BIOS Setup** in the right panel.
  4. Click **OK**.
5. Start the VM.
6. 'Open Console' to the VM, and you see the BIOS screen.
  1. Select the **Boot** table using the arrow keys.
  2. Move the cursor over the **CD-ROM Drive** and hit the '+' key to move it above the **Hard Drive**.
  3. Do not exit BIOS yet.
7. Within the vSphere Client, ensure the VM is selected and click the CD icon in the toolbar.
  1. Select **CD/DVD drive 1**.
  2. Select **Connect to ISO image on local disk...**
  3. Select the Oracle 7 ISO image downloaded in step 1.
8. In the console, **Save & Exit** from BIOS.  
Installation begins. Follow the instructions provided.



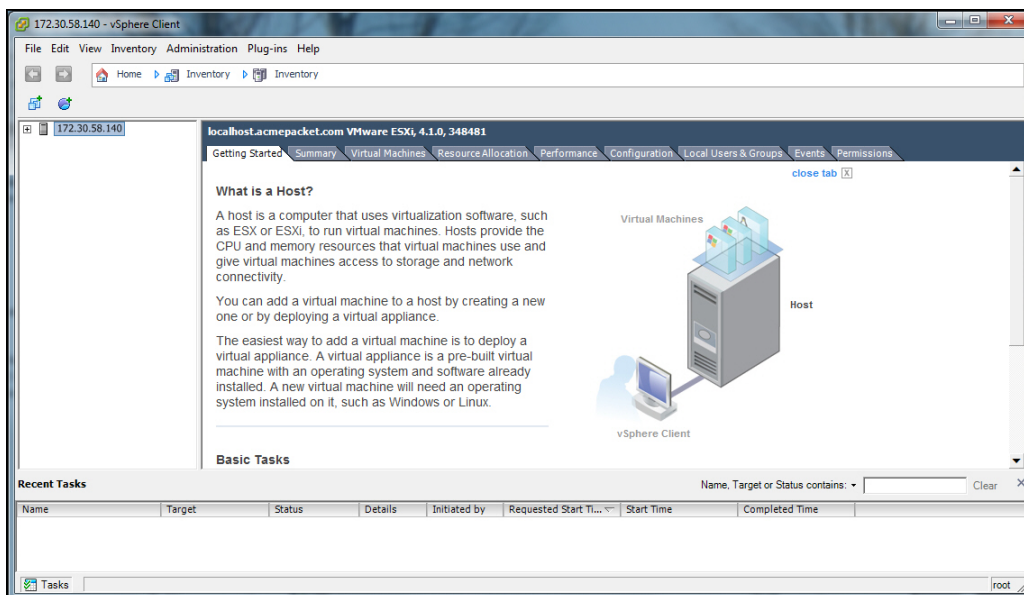
**Note:** During the installation, the default configuration of partitions allocates almost the entire disk to the `"/home"` directory. ISR software is installed by default on the path `/opt/isr`, requiring more space on the root `("/")` directory, or more specifically the `"/opt"` directory. If the Oracle Linux 7 installer defaults are accepted, the ISR components can very easily run out of disk space and not function properly.

## Deploying the Oracle Linux Virtual Machine

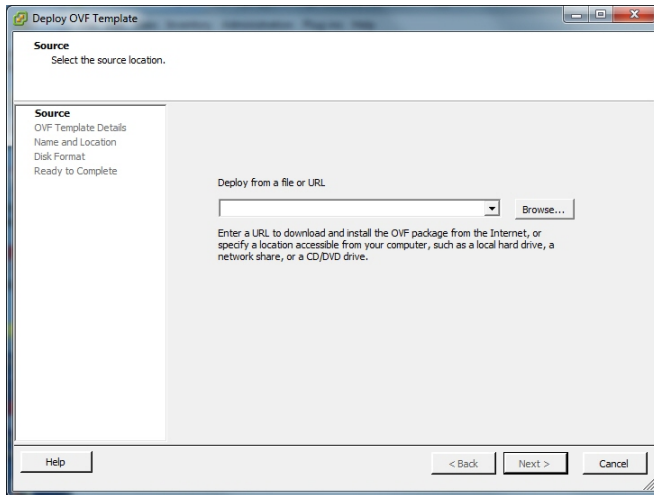
Once you configure your ESXi host and local network, you use the vSphere Client to deploy your Oracle Linux VMs into that network.

To deploy the Oracle Linux VM:

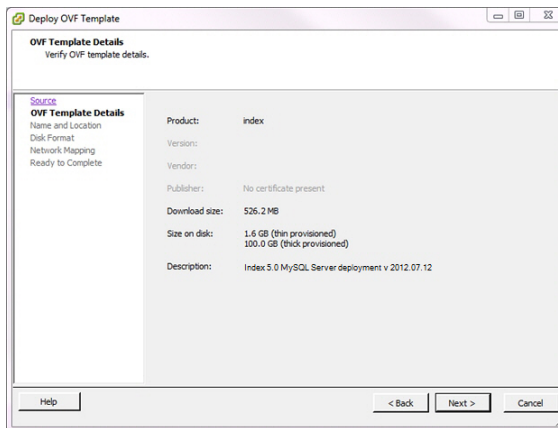
1. Open the vSphere Client application to the Home page.



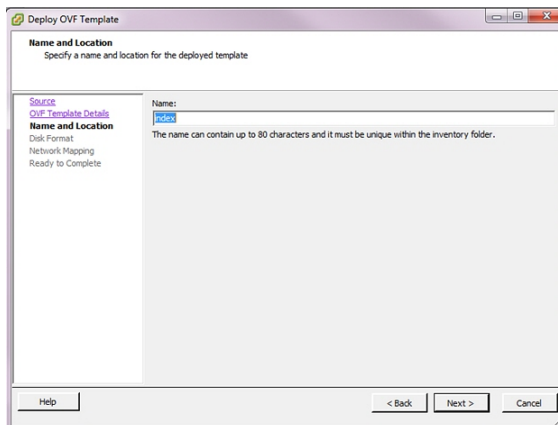
2. From the Main Menu, select **File->Deploy OVF Template...** The following window displays.




3. Click **Browse** and navigate to the directory where you have unzipped the VM.
4. Select the file for the component you are deploying and click **Open**. The following window displays.



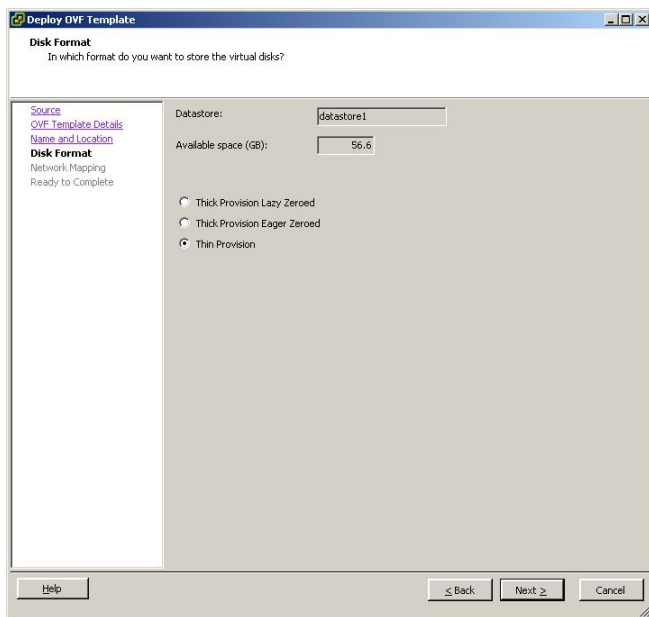
5. Click **Next** in the Deploy OVF Template window. The Name and Location window displays. This field is automatically populated with the name and location of the VM you selected in Step 4.




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

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

## Creating an Oracle Linux Virtual Machine



 **Note:** If using CIS certified hardware, ensure 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 provision** 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 created in "Configuring the Local Network".
10. Click **Next**.
11. Review all selections in the Ready to Complete window and click **Finish**.
12. Click **OK** to close the Deploy OVF Template window.
13. In the left column, click on the VM you are deploying.
14. Press the **Start/Play** icon to power on the VM.
15. To complete the VM installation, configure the network address of the VM using the procedure in "Configuring the VM Network Addresses".

---

## Installing Oracle Linux 7 On a Bare-Metal Server

Prior to installing the ISR components, you must have Oracle Linux installed on your hardware. You can either install Oracle Linux via a USB stick or a DVD. This guide documents installing Oracle Linux via a USB.

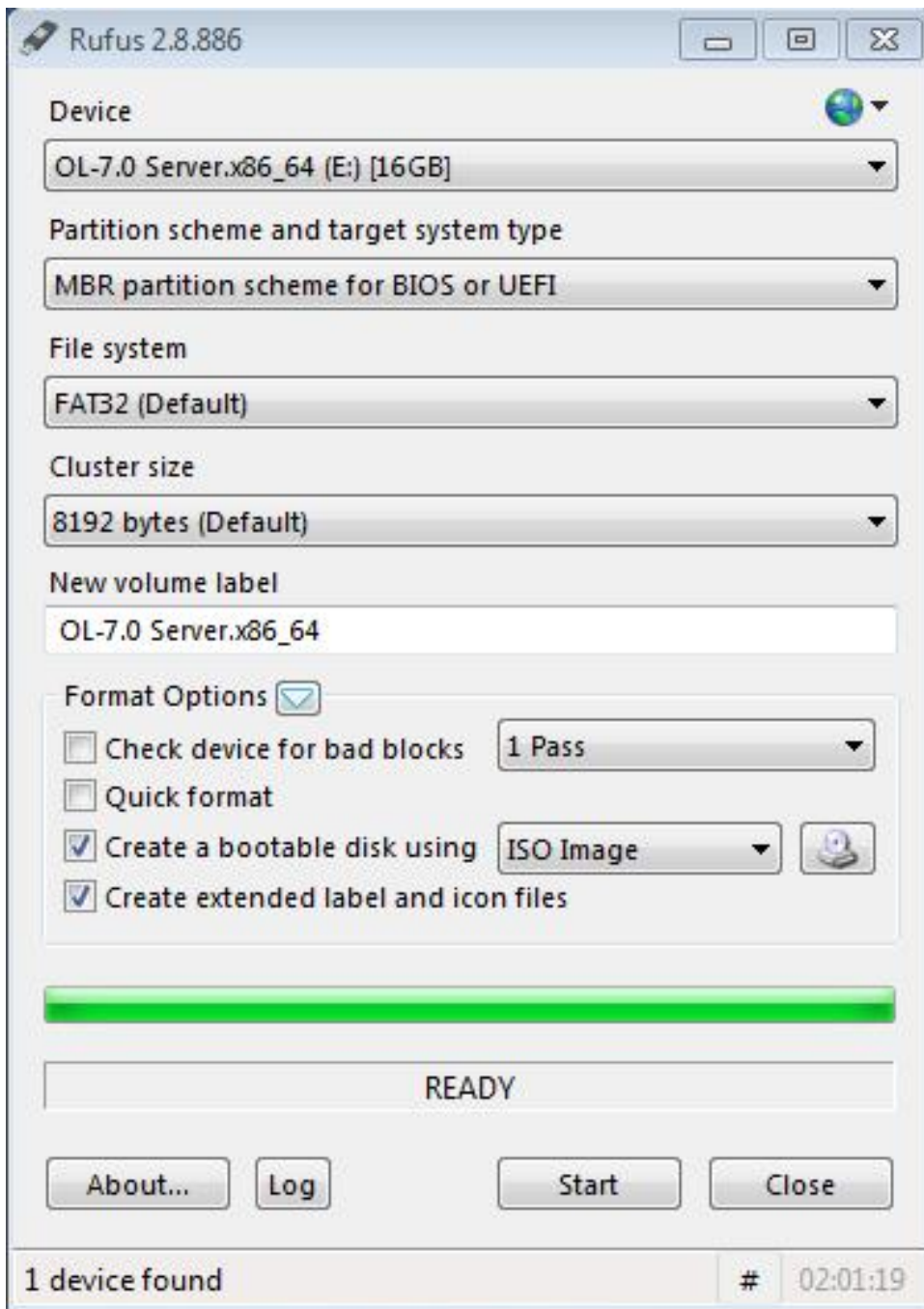
 **Note:** When you install Oracle Linux via a USB stick, you must have a 16 GB or bigger USB drive.

For a much more comprehensive and thorough description of installing Oracle Linux 7, see [https://docs.oracle.com/cd/E52668\\_01/E54695/E54695.pdf](https://docs.oracle.com/cd/E52668_01/E54695/E54695.pdf).

 **Note:** Traditionally CIS hosts are installed as Virtual Machines (VMs) on VMware. For more information on installing VMware, see APPENDIX.

To install Oracle Linux via a USB stick:

1. Download “Oracle Linux 7.X for x86 64 bit ISO image” from <http://edelivery.oracle.com/linux>.
  1. Sign in.
  2. Enter **Oracle Linux** in the search field.
  3. Select **x86 64 bit** from **Select Platform** and click **Select**.
  4. Click **Continue**.
  5. Click **Continue** if the correct version is displayed.
  6. Follow the instructions provided to complete the download.
2. Create a bootable USB stick that contains the full Oracle Linux 7 ISO image. The following example uses Rufus 2.8 software to create the bootable USB stick.



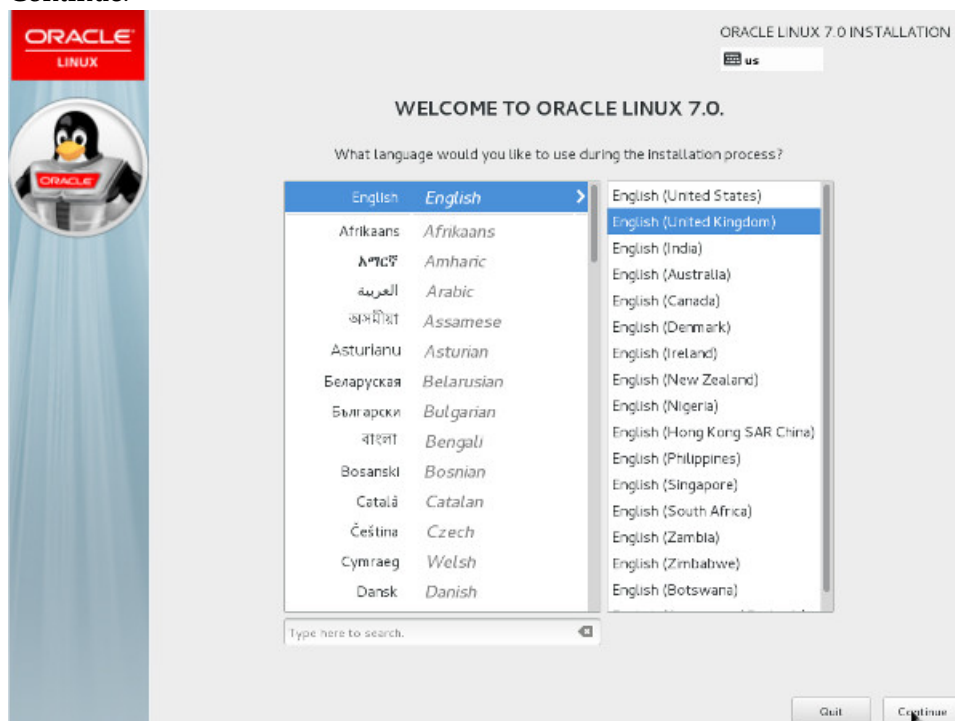
 **Note:** You can also install Oracle Linux via a DVD by downloading “Oracle Linux 7.1 for x86 64 bit ISO image” from <http://edelivery.oracle.com/linux> and burning the \*.iso image onto a DVD.

3. Insert your bootable Oracle Linux 7 USB drive onto your hardware.
4. Boot the system from the boot image by selecting **Boot from usb** from the boot menu options.


The system locates the boot image file and the boot menu appears.



5. Select **Install Oracle Linux 7.2**, hit **<Enter>**, and follow the Oracle Linux Installer instructions.
6. Select the appropriate language and select **Set keyboard to default layout for selected language**. Click **Continue**.



The Installation Summary screen appears.

-  **Note:** During the installation, the default configuration of partitions allocates almost the entire disk to the `/home` directory. ISR software is installed by default on the path `/opt/isr`, requiring more space on the root (`/`) directory or, more specifically, the `/opt` directory. If the Oracle

## Installing Oracle Linux 7 On a Bare-Metal Server

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Linux 7 installer defaults are accepted, the ISR components can very easily run out of disk space and not function properly.



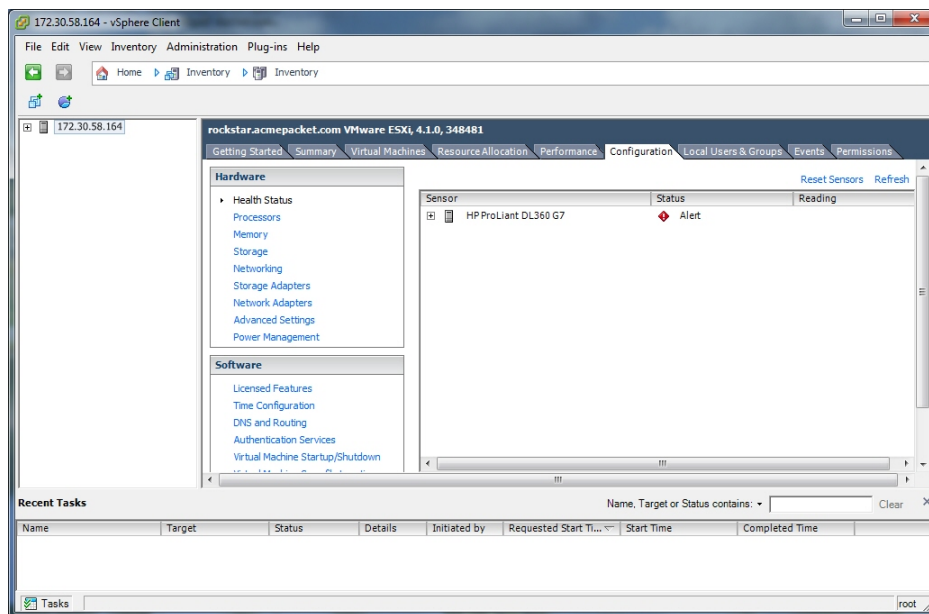
## Configuring Automatic Start of the VMs

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.

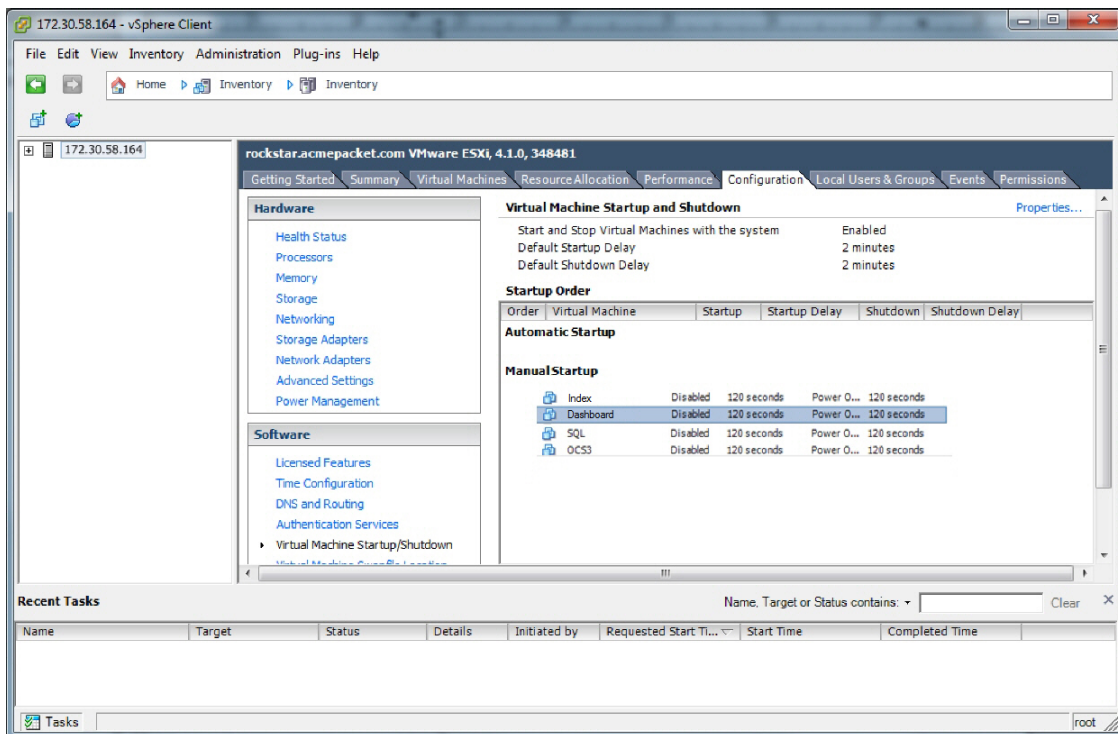
To configure the VMs to start automatically:

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

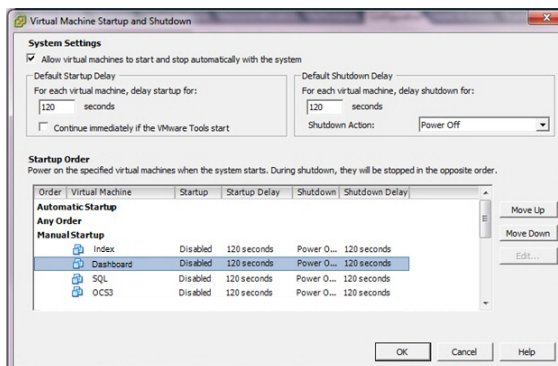



3. In the left column, under the Software category, click on **Virtual Machine Startup/Shutdown**. The following screen displays.

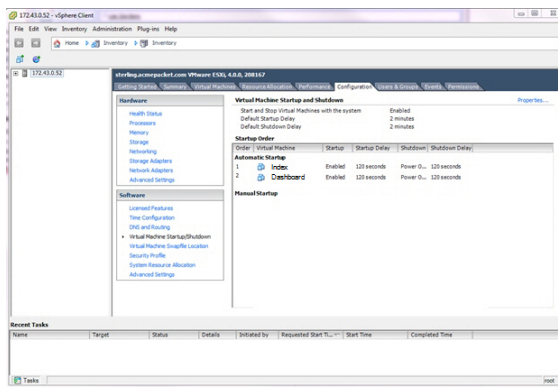
## Configuring Automatic Start of the VMs



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



5. 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.
6. 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.
7. Select the **Dashboard** entry and then click **<Move Up>** to place the Dashboard VM just below the Index entry in the Automatic Startup group.
8. Click **OK**. The window should display as follows.



You must continue the ISR installation process by installing the Record and Store Server (RSS). For RSS installation procedures, see [Installing the RSS Software](#).



---

## Configuring the Timezone on an ISR

The timezone of each ISR has a default setting of `America/New_York`, also known as the Eastern Time Zone. To change the timezone on the ISR, the administrator must set all hosts to the timezone of choice and the RSS hosts must be set to the same timezone as all ISRs (for RSS timezone configuration see the section *Configuring the Timezone* in Chapter 4, *Installing the RSS Software*).

 **Note:** It is important that your ISR component hosts are assigned the same timezone, except the Index host, which must be set to UTC.

To configure the timezone of an ISR:

1. Connect to the ISR with an SSH client.
2. Execute the `rm -f /etc/localtime` command to remove the previous timezone setting.
3. Execute the following command to link the updated timezone.

```
ln -s /usr/share/zoneinfo/<region>/<timezone> /etc/localtime
```

**Note:** When you enter the `/usr/share/zoneinfo/<region>` and `/usr/share/zoneinfo/<region>/<timezone>` commands the CLI provides options for both the `<region>` and `<timezone>` arguments.



---

## Mounting a Second RSS Drive for Recordings

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

1. Using an SSH application (like Putty), SSH to the RSS server as root using the default password **sips**.
2. Press Enter at both the "username" and "password" prompts.  
The "Access granted since there are no configured users" prompt displays followed by the ISR> prompt.
3. Format and mount the drive from the ISR> prompt (OS-E shell):

```
ISR> format data1 ext4
```

These changes take affect upon restart.

4. Restart the RSS for the changes to take effect.

```
ISR> restart warm
Are you sure (y or n)? y
ISR is restarting
ISR>
```

---

## Mounting an Existing Pre-Formatted Second RSS Drive

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

1. Using an SSH application (like Putty), SSH to the RSS server as root using the default password **sips**.
2. Press Enter at both the "username" and "password" prompts.  
The "Access granted since there are no configured users" prompt displays followed by the ISR> prompt.
3. Format and mount the drive from the ISR> prompt (OS-E shell):

```
ISR> add-device data1 ext4
```

These changes take affect upon restart.


4. Restart the RSS for the changes to take effect.

```
ISR> restart warm
Are you sure (y or n)? y
ISR is restarting
ISR>
```

### 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. Edit the `/opt/isr/rss/vmgConfig.xml` file.

The initial location for all recordings is Line 6 of the XML file.

```
<Location>/opt/isr/Recordings</Location>
```

2. 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>
```

3. Save the changes to the file.
4. Enter **systemctl restart recorderd** for the RSS to use this new configuration.
5. Confirm the `/opt/isr/logs/recorder/recorder.log` file has the new configuration written towards the bottom of the file.

```
10/04/2011 06:01:23[NOTICE] mixMaster: Recordings Directory = /ArchivedRecordings
```



---


## CIS Troubleshooting

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

---

### Log Collection Scripts

Each ISR component deployment contains a log collection script. To collect logs for a service request, run the 'collectLogs.sh' script and attach the resulting TGZ file to the request.

 **Note:** By default, the TGZ file can be found in the directory from where the script was executed.

---

### 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 Oracle Linux Server release 7.2.

**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?**

## CIS Troubleshooting

---

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

---

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

A. The MySQL Server version is 14.14 Distrib 5.7.11, for Linux (x86\_64).


**Q. 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 'Isr\_admin' along with the password (for example, `mysql -u isr_admin -p ipcr_db -h <Index_host_ip>`).

**Q. How do I view the logs in MySQL Server?**

A. MySQL Server's log file can be found in the directory `/var/lib/mysql.log`. The main log file is named `<host_name>.err`. 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 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 ISR Dashboard?**


A. Perform the following:

1. Open your Internet Web browser.
2. Enter the IP address of the 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.

 **Note:** When logging into the ISR Dashboard for the first time, you are required to enter new email and password credentials, and then again every 90 days.

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

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

**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:

4. Access the Dashboard VM shell.
5. Enter **less /var/www/dashboard/current/log/production.log**.
6. Enter **G** to scroll to the bottom of the log.
7. 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)
```

8. Enter **q** to exit.
9. Enter **ping 169.254.1.50**.
10. 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.




## 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
<NumberOfChannels>500</NumberOfChannels>	1 - 500	The number of sessions that should be started on this device. This parameter is restricted by the license file.
<Recording>		
<FullCallRecording>disabled</FullCallRecording> <Location>/opt/isr/Recordings</Location>	enabled, disabled  accessible directory	enabled = ISR will not use recording rules, index recordings. It will record all traffic received and put files named <FileNameFormat> in <Location>.  disabled = ISR uses other sources to ascertain how sessions should be recorded. This is the standard behavior.  The location where recordings made on this RSS will be written. This is normally the RSS itself.
<AlternativeLocation>/opt/isr/ArchivedRecordings</AlternativeLocation>	accessible directory	An alternate location where recordings will be written. If <Location> is changed to a remote storage device, <AlternativeLocation> would allow you to specify a fallback location in the event <Location> is not accessible. When <Location> is on the RSS, <AlternativeLocation> is not needed.
<ThirdLocation/>	accessible directory	A third alternate location where recordings are written. If <Location> is changed to a remote storage device, <ThirdLocation> would allow you to specify a fallback

## vmgConfig.xml Parameters

XML Parameters	Supported Values	Description
		location in the event <Location> and <AlternativeLocation> are not accessible. When <Location> is on the RSS, <ThirdLocation> is not needed.
<FileNameFormat>%DNIS%-%CALLID%.wav</FileNameFormat>	text	Any combination of letters and numbers, - (dash) and _ (underscore) along with system variables %DNIS%, %ANI%, %CALLID%, %DATE% that will be used as the default naming convention for files.
<Format>	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.   <b>Note:</b> with this enabled , calls can not be played back through the Acme provided dashboards.
<RIFFHeader>enabled</RIFFHeader> <Encoding>linear</Encoding> <BitRate>8</BitRate> <NumberOfChannels>1</NumberOfChannels> <SeparateFilePerChannel/> </Format> <BeepOnRecord> <BeepFile>beep.wav</BeepFile> <BeepIntervalSeconds>10</BeepIntervalSeconds> <BeepOnRecordState>disabled</BeepOnRecordState> <BeepDirection>ToCaller</BeepDirection> </BeepOnRecord> </Recording>	enabled, disabled linear, ulaw, alaw, adpcm 8,16 1, 2 true, false name of an 8bit 8KHz ulaw file numbers enabled, disabled ToCaller, ToCalledParty, ToBoth	Insert RIFF Header on WAV recordings 1 = mono 2 = stereo 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. 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. Time, in seconds, between each beep, when enabled in the dashboard. This flag is obsolete. Beep enabled/disabled in AdminDashboard on route by route, account by account basis. Specify who should hear the intermittent beep tone.
<Sip>	valid SIP URI	Port RSS is listening for SIP Traffic.

XML Parameters	Supported Values	Description
<pre> &lt;SipPort&gt;5060&lt;/SipPort&gt; &lt;FromFormat&gt;%ANI%@@%IP%:%PORT %;channel=%CHANNEL%; call-id= %CALLID%&lt;/FromFormat&gt; &lt;ToFormat&gt;%DNIS%@@%IP%:%PORT %&lt;/ToFormat&gt; &lt;RejectionSubstitutionCode&gt;-1&lt;/ RejectionSubstitutionCode&gt; &lt;RegistrarAddress/&gt; &lt;RegistrarUserName/&gt; &lt;RegistrarExpires&gt;0&lt;/ RegistrarExpires&gt; &lt;AuthenticationUserId/&gt; &lt;AuthenticationPassword/&gt; &lt;AuthenticationRealm/&gt; &lt;InviteTimeout&gt;75&lt;/InviteTimeout&gt; &lt;TransferInviteTimeout&gt;75&lt;/ TransferInviteTimeout&gt; &lt;SipProxyAddress/&gt; &lt;ForwardHoldRequest&gt;disabled&lt;/ ForwardHoldRequest&gt; &lt;Supported&gt; &lt;Headers/&gt; &lt;ComfortNoise/&gt; &lt;/Supported&gt; &lt;AuthorizedIncomingGateways&gt; &lt;Host/&gt; &lt;/AuthorizedIncomingGateways&gt; &lt;/Sip&gt; </pre>	<p>valid SIP URI</p> <p>Any valid SIP response</p> <p>IP/FQDN of Registrar</p> <p>text</p> <p>numeric</p> <p>text</p> <p>text</p> <p>text</p> <p>1 - 180</p> <p>1 - 180</p> <p>enabled, disabled</p> <p>SIP Header</p>	<p>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.</p> <p>Format of TO header to be used on INVITES FROM the RSS back to the Outbound Session Agent.</p> <p>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.</p> <p>IF RSS must register as endpoint, what address should it register with.</p> <p>Registrar User Name</p> <p>Registrar Expiration. Default is no expiration.</p> <p>User ID for Challenge Authentication</p> <p>Password for Challenge Authentication</p> <p>Realm for Challenge Authentication</p> <p>Timer, in seconds, for how long RSS will wait for 18x message on an INVITE</p> <p>Timer, in seconds, for how long RSS will wait for 18x message on an REFER</p> <p>Header name that should be taken from incoming INVITE and added to outgoing INVITE</p> <p>With no values, RSS accepts all incoming INVITEs and evaluates for recording. To restrict devices, enumerate.</p>
<pre> &lt;XmlRpc&gt; &lt;ServerPort&gt;8888&lt;/ServerPort&gt; &lt;AllowedHosts&gt; &lt;Host/&gt; &lt;/AllowedHosts&gt; &lt;QueryAgent&gt; &lt;Enabled&gt;&gt;true&lt;/Enabled&gt; &lt;Host&gt;localhost&lt;/Host&gt; </pre>	<p>true, false</p> <p>IP/FQDN</p> <p>port</p> <p>enabled, disabled</p> <p>enabled, disabled</p> <p>time, seconds</p>	<p>Port where XML RPC server is listening. This should not be changed.</p> <p>Hosts that should be allowed to issue API commands</p> <p>If true, RSS will connect to CIS to get recording rules. If false, RSS expects that either &lt;FullCallRecording&gt; is enabled OR &lt;SkipVoiceBrowserMode&gt; is disabled. DO NOT EDIT UNLESS DIRECTED.</p>

## vmgConfig.xml Parameters

XML Parameters	Supported Values	Description
<pre> &lt;Port&gt;8887&lt;/Port&gt; &lt;SkipVoiceBrowserMode&gt;enabled&lt;/SkipVoiceBrowserMode&gt; &lt;LocalRouteMapCache&gt;enabled&lt;/LocalRouteMapCache&gt; &lt;LocalRouteMapCacheUpdateInterval&gt;300&lt;/LocalRouteMapCacheUpdateInterval&gt; &lt;/QueryAgent&gt; &lt;/XmlRpc&gt; </pre>		<p>IP Address of XMLRPC Query Agent. Is installed on each RSS host. DO NOT EDIT UNLESS DIRECTED.</p> <p>Port for XMLRPC Query Agent. DO NOT EDIT UNLESS DIRECTED.</p> <p>If disabled, RSS will issue INVITE to address specified in &lt;IVRGateway&gt; for recording rules. This is the RSS 1.4 implementation and is here for backwards compatibility. DO NOT EDIT UNLESS DIRECTED.</p> <p>If disabled, RSS will need to communicate with CIS on every call, which could impact performance. DO NOT EDIT UNLESS DIRECTED.</p> <p>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.</p>
<pre> &lt;TransferDropOutMode&gt;disabled&lt;/TransferDropOutMode&gt; &lt;Rtp&gt; &lt;ListenPortStart&gt;22000&lt;/ListenPortStart&gt; &lt;SendPortStart&gt;32000&lt;/SendPortStart&gt; &lt;MinimumPacketSize&gt;1&lt;/MinimumPacketSize&gt; &lt;MaximumPacketSize&gt;160&lt;/MaximumPacketSize&gt; &lt;RtpInCheckPacketSource/&gt; &lt;TransferMuteAudio/&gt; &lt;MissingMediaDetection&gt; &lt;SessionEstablishment&gt; &lt;WarnAfterSeconds&gt;10&lt;/WarnAfterSeconds&gt; &lt;TerminateSessionAfterSeconds&gt;300&lt;/TerminateSessionAfterSeconds&gt; &lt;/SessionEstablishment&gt; &lt;/SessionInProgress&gt; </pre>	<p>disabled, enabled</p> <p>1 - 66535</p> <p>1 - 66535</p>	<p>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.</p>



XML Parameters	Supported Values	Description
<pre>&lt;WarnAfterSeconds&gt;10&lt;/WarnAfterSeconds&gt; &lt;TerminateSessionAfterSeconds&gt;300&lt;/TerminateSessionAfterSeconds&gt; &lt;/SessionInProgress&gt; &lt;/MissingMediaDetection&gt; &lt;/Rtp&gt;</pre>		
<pre>&lt;IvrGateways&gt; &lt;Host/&gt; &lt;/IvrGateways&gt;</pre>		Fallback Session Agent IP address in the event RSS can't build initial Session Agent Cache from CIS
<pre>&lt;VMGIpAddress&gt;&lt;/VMGIpAddress&gt; &lt;LocalCallDetailRecord&gt;disabled&lt;/LocalCallDetailRecord&gt; &lt;EarlyMediaAllow&gt;true&lt;/EarlyMediaAllow&gt;</pre>	IPv4 Address enabled, disabled true, false	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. Should Early Media (RTP received before 200OK) be forwarded or dropped
<pre>&lt;Cache&gt; &lt;NumberOfCacheEntries&gt;256&lt;/NumberOfCacheEntries&gt; &lt;LocalRepository&gt;/cxc_common/ISR/Cache/&lt;/LocalRepository&gt; &lt;RemoteRepositoryURL&gt;http://loudeye.com/muzak/get_some.php&lt;/RemoteRepositoryURL&gt; &lt;/Cache&gt;</pre>	1 - 256 directory	Number of files RSS should hold in its cache before the oldest file is removed and replaced with a newer request. Directory where Cached files should be stored. Not currently supported.
<pre>&lt;FailOver&gt; &lt;Mode/&gt; &lt;GatewayToInvite/&gt; &lt;MessageFile/&gt; &lt;MessageFile/&gt; &lt;/FailOver&gt;</pre>		LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED. LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED. LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED. LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.
<pre>&lt;PortCapacity&gt; &lt;NumberOfPortCapacityLines&gt;0&lt;/NumberOfPortCapacityLines&gt; &lt;MessageFile/&gt; &lt;Loop/&gt; &lt;/PortCapacity&gt;</pre>		LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED. LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED. LEGACY SUPPORT ONLY. DO NOT EDIT UNLESS DIRECTED.

## vmgConfig.xml Parameters



XML Parameters	Supported Values	Description
<pre>&lt;Sip&gt; &lt;IsrUcidHeaderField&gt; X-ISR-UCID &lt;/ IsrUcidHeaderField&gt; &lt;/Sip&gt;</pre>		Configures the X-ISR-UCID header field in SIP INVITE messages.
<pre>&lt;Siprec&gt; &lt;SiprecEnabled/&gt; &lt;/Siprec&gt;</pre>	true, false	Enables or disables SIPREC support. The default is false.
<pre>&lt;WebService&gt; &lt;ServerPort/&gt; &lt;SSLCertificateKeyFile/&gt; &lt;/WebService&gt;</pre>	<pre>&lt;ServerPort/&gt; - port # (default 9998) &lt;SSLCertificate KeyFile/&gt; - certificate file location (default /opt/isr /cert.pem)</pre>	These parameters enable the RSS REST Webservice to listen on a specific port and enable HTTPS with the specified certificate file name and path. <pre>&lt;WebService&gt; &lt;serverPort&gt;9998&lt;/ServerPort&gt; &lt;SSLCertificateKeyFile&gt;/opt/isr/ cert.pem&lt;/SSLCertificateKeyFile&gt; &lt;/WebService&gt;</pre>

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## Selective Call Recording/SIPREC

The SIPREC protocol is the protocol used to interact between a Session Recording Client (SRC) (the role performed by ESD) and a Session Recording Server (SRS) (a 3rd party call recorder or the 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:** SIPREC isolates the 3rd party recorders from the communication session. The 3rd party recorders can determine whether or not recording is desired.
-  **Note:** 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.

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## License/Hardware Requirements

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

SIPREC is currently supported on all Enterprise Acme Packet platforms.

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## How it Works

The SIPREC feature supports active recording, where the ESD acting as the SRC, purposefully streams media to the 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 ESD acting as the SRC, is the source for the recorded media. The 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.

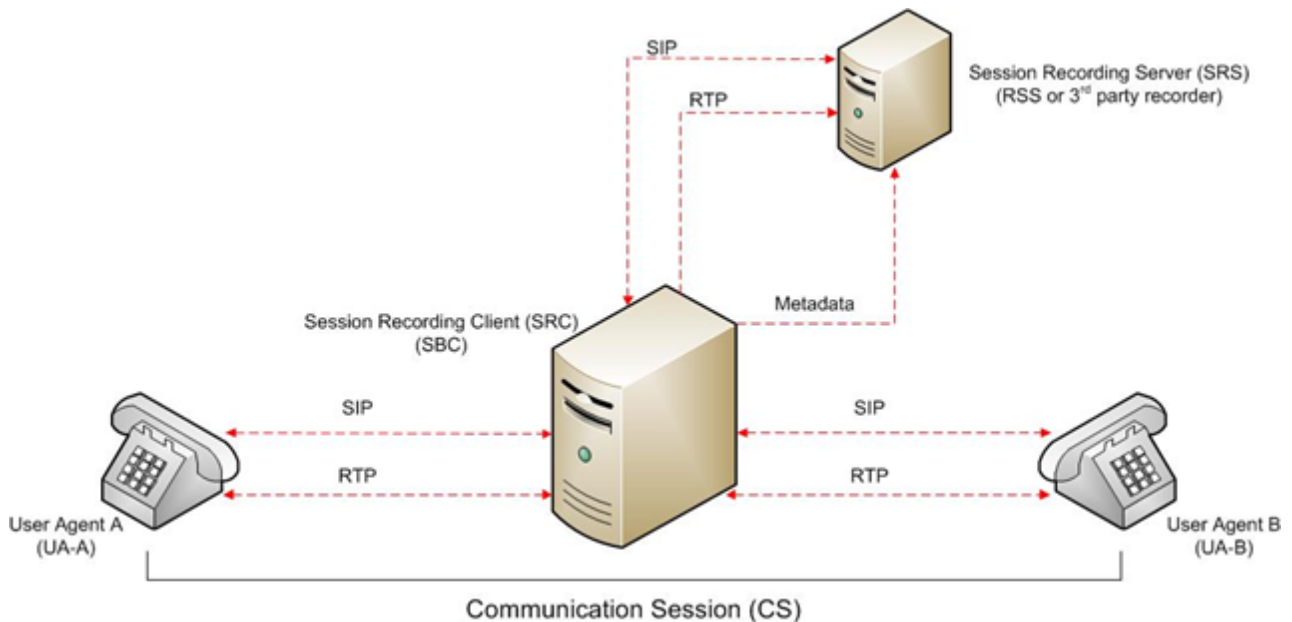
During the establishment of a SIP Session, the ESD determines if SIPREC is configured for recording the call. If so, it then duplicates the media prior to initiating the session with the SRS. (Media replication is set up prior to the recording session). The SRS may choose to record, not record, or cancel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

## Selective Call Recording/SIPREC

session, and then communicates via SIP signaling to the ESD. If the call is not to be recorded, the SRS signals termination of the recording session.

The 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 ESD. The SRS is responsible for maintaining call history, etc. The 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](#)).

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 ESD) and an SRS.



## Configuring SIPREC

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

### Session Recording Server (SRS)

The ISR's RSS acts as the SRS in the network. A **session-recording-server** attribute under the **session-router** object in the ESD ACLI 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 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.

The ESD supports large UDP packets, and ISR currently only supports SRS realms provisioned with a UDP port.

## Session Recording Group

The ESD uses the **session-recording-group** attribute under the **session-router** object in the ACLI to set high availability (HA) for 3rd party call recorders. Using this object, you can define a collection of one or more SRSs. The 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 ESD load balancing in session recording groups, see [Load Balancing](#)). When multiple SRSs are in a session recording group, the 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 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 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 ESD supports recording server load balancing across members of a session recording group using the following strategies:

**[Round-robin]:** The 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 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 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 or timeout) causes the ESD to attempt the next possible SRS. When **simultaneous-recording-servers** is greater than 1, the 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 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 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

## Selective Call Recording/SIPREC

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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 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 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 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 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 ESD replicates media to both destinations. However, if the same set of SRSs has the exact same identifier, the ESD sends media to one and not both SRSs.

## Selective Recording

SIPREC defines a number of use cases for which the 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 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.

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

## High Availability (HA) Support

An ESD using SIPREC supports HA in the network. The ESD replicates all metadata states between the active and standby 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 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 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 ESD has the session recording license enabled on the 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. If selected, this option behaves the same as the **selective** option.

```
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 alpha-numeric 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 (ESD) uses when sending recordings to the session reporting server. Valid values are:

- **Round-robin** (default) - The 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 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 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 or timeout) causes the ESD to attempt the next possible SRS. When `simultaneous-recording-servers` is greater than 1, the 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 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 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 ( 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 ( 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-grou Attribute. If specifying a session-recording-group, you must precede the group name with SRG:.

## Selective Call Recording/SIPREC

---

5. **session-recording-required** — Enter whether or not you want a call to be accepted by the 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 ( 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 Ste 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 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 (ESD). Valid values are alpha-numeric characters. Default is no value specified.

```
ACMEPACKET(sip-interface) # se ss on-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-grou Attribute (for HA only).

5. **session-recording-required** — Enter whether or not you want a call to be accepted by the 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 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 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 ESD to the present time). The following example shows the use of this command.

1. Log into the 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
13:49:44-81645
```

Recording Agent	Status	-- Period --		----- Lifetime -----		
		Active	High	Total	Total	PerMax
Rec Sessions	0	1	1	1	1	1
Comm Groups	0	0	0	0	0	0
Comm Sessions	0	1	1	1	1	1
Media Streams	0	2	2	2	2	2
Participants	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 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 ESD to the present time) on both the primary and redundant ESD. The following example shows the use of this command.

1. Log into the ESD as a User or Superuser.

```
ACMEPACKET> enable
ACMEPACKET(enable)#
```

2. Type **show rec redundancy** and press Enter to display the session recording server statistics for ESDs in HA mode. The following output is an example of the show rec redundancy command.

```
ACMEPACKET(enable)# show rec redundancy
13:49:44-81645
Recording Agent Status    -- Period --    ----- Lifetime -----
                        Active      High  Total  Total  PerMax  High
Rec Sessions            0          1    1    1     1     1
Comm Groups             0          0    0    0     0     0
Comm Sessions           0          1    1    1     1     1
Media Streams           0          2    2    2     2     2
Participants            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.


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Object	Description
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 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.

## Codec Negotiation Support For All Packet Times


The ISR supports codec negotiation for all additional packet times (ptime) within codecs supported by the RSS, specifically including but not limited to 30ms, G.711, and ulaw/alaw.

## 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:

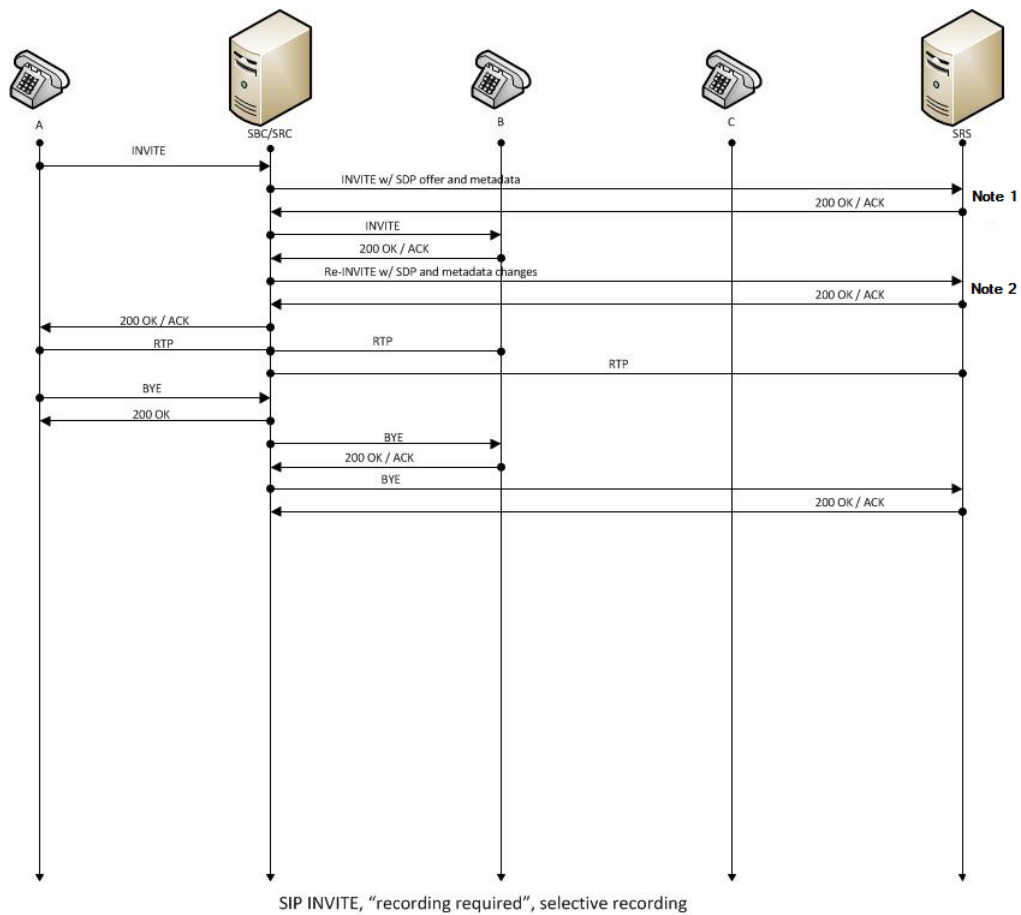
- Normal Call (recording required)
- Normal Call (recording not required)
- Early Media Call (recording not required)
- REFER Pass-Through Call (REFER handled by User Agent)
- REFER Call (REFER handled by ESD)
- SRS Indicates Busy in Call (recording not required)

 **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	
q UA-A sends INVITE to ESD.	a RTP stream initiated between ESD and UA-B.
w ESD forwards INVITE with SDP and metadata to SRS.	s RTP stream initiated between ESD and SRS.
e SRS responds with OK to ESD.	d UA-A sends BYE to ESD.
r ESD sends INVITE to UA-B.	f ESD responds with OK to UA-A.
t UA-B responds with OK to ESD.	g ESD sends BYE to ESD.
y ESD sends re-INVITE with SDP and metadata changes to SRS.	h ESD responds with OK to UA-A.
u SRS responds with OK to ESD.	j ESD sends BYE to UA-B.
i ESD forwards OK response to UA-A.	k UA-B responds with OK to ESD.
o RTP stream initiated between UA-A and ESD.	l ESD sends BYE to SRS.
	; SRS responds with OK to 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
```

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```
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:uuid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
    <start-time>2011-06-27T17:03:57</start-time>
  </session>
  <participant id="urn:uuid:10ac9063-76b7-40bb-4587-08ba290d7327"
session="urn:uuid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
    <aor>sip:sipp@168.192.24.40</aor>
    <name>sipp </name>
    <send>urn:uuid:07868c77-ef8e-4d6f-6dd5-a02ff53a1329</send>
    <start-time>2011-06-27T17:03:57</start-time>
  </participant>
  <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>
  </participant>
  <stream id="urn:uuid:4a72aled-abb2-4d7c-5f4d-6d4c36e2d4ec"
session="urn:uuid:79b2fcd8-5c7f-455c-783f-db334e5d57d0">
    <mode>separate</mode>
    <start-time>2011-06-27T17:03:57</start-time>
    <label>1</label>
  </stream>
</recording>

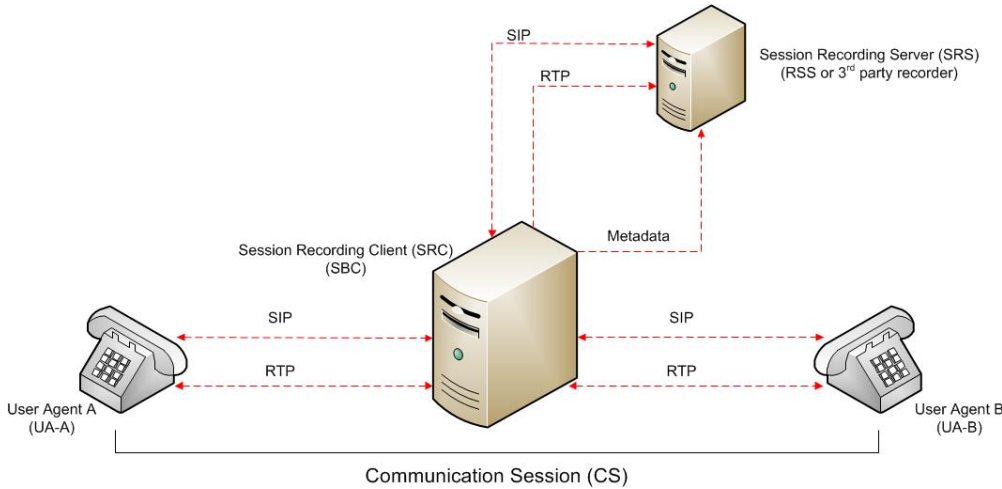
--[Note 2]-----
Content-Type: application/sdp
v=0
o=- 171 213 IN IP4 10.0.0.2
s=-
c=IN IP4 10.0.0.1
t=0 0
m=audio 6000 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=label:1
m=audio 6002 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=label:2
Content-Type: application/rs-metadata+xml
Content-Disposition: recording-session
<?xml 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:4a72aled-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>
  <label>2</label>
</stream>
</recording>
```

**Normal Call (recording not required)**

The following illustration shows a normal call using selective recording with recording optional.

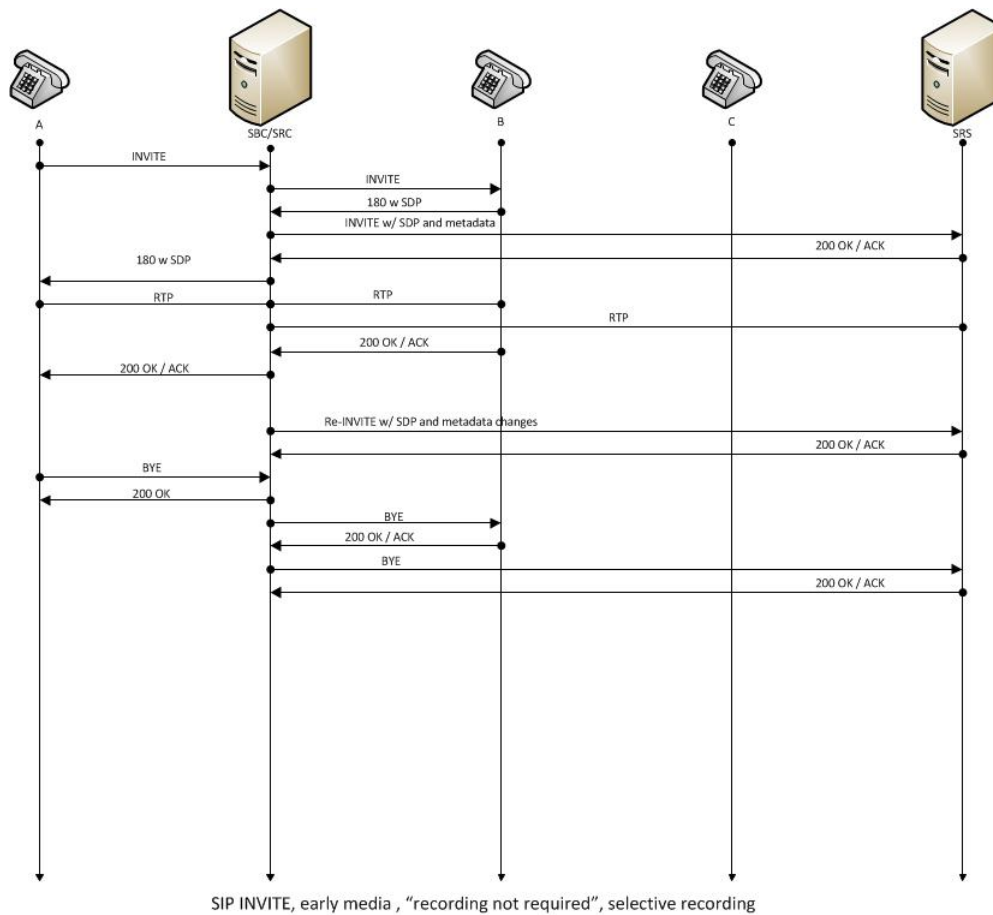


Call Flow Description	
q UA-A sends INVITE to ESD.	i RTP stream initiated between ESD and SRS.
w ESD forwards INVITE to UA-B.	o UA-A sends BYE to ESD.
e UA-B responds with OK to ESD.	a ESD responds with OK to UA-A.
r ESD forwards OK response to UA-A.	s ESD sends BYE to UA-B.
t ESD sends INVITE with SDP and metadata to SRS.	d UA-B responds with OK to ESD.
y SRS responds with OK to ESD.	f ESD sends BYE to SRS.
u RTP stream initiated between UA-A, ESD, and UA-B.	g SRS responds with OK to ESD.

**Early Media Call (recording not required)**

The following illustration shows an early media call using selective recording with recording optional.

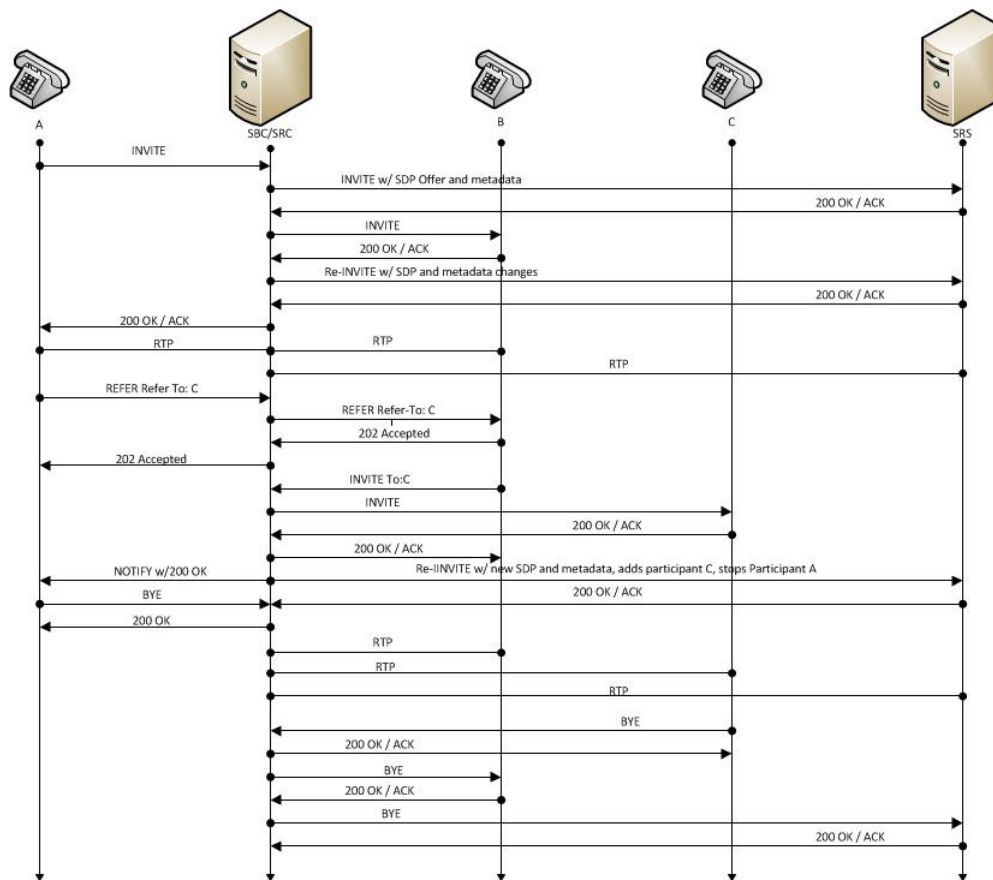
## Selective Call Recording/SIPREC



Call Flow Description	
q UA-A sends INVITE to ESD.	a UA-B responds with OK to ESD.
w ESD forwards INVITE to UA-B.	s ESD forwards OK to UA-A.
e UA-B sends 180 and SDP to ESD.	d ESD sends re-INVITE with SDP and metadata changes to SRS.
r ESD sends INVITE with SDP and metadata to SRS.	f SRS responds with OK to ESD.
t SRS responds with OK to ESD.	g UA-A sends BYE to ESD.
y ESD sends 180 with SDP to UA-A.	h ESD responds with OK to UA-A.
u RTP stream initiated between ESD and UA-A.	j ESD sends BYE to UA-B.
i RTP stream initiated between ESD and UA-B.	k UA-B responds with OK to ESD.
o RTP stream initiated between ESD and SRS.	l ESD sends BYE to SRS.
	; SRS responds with OK to 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.



SIP REFER, UA handles REFER, "recording required", selective recording

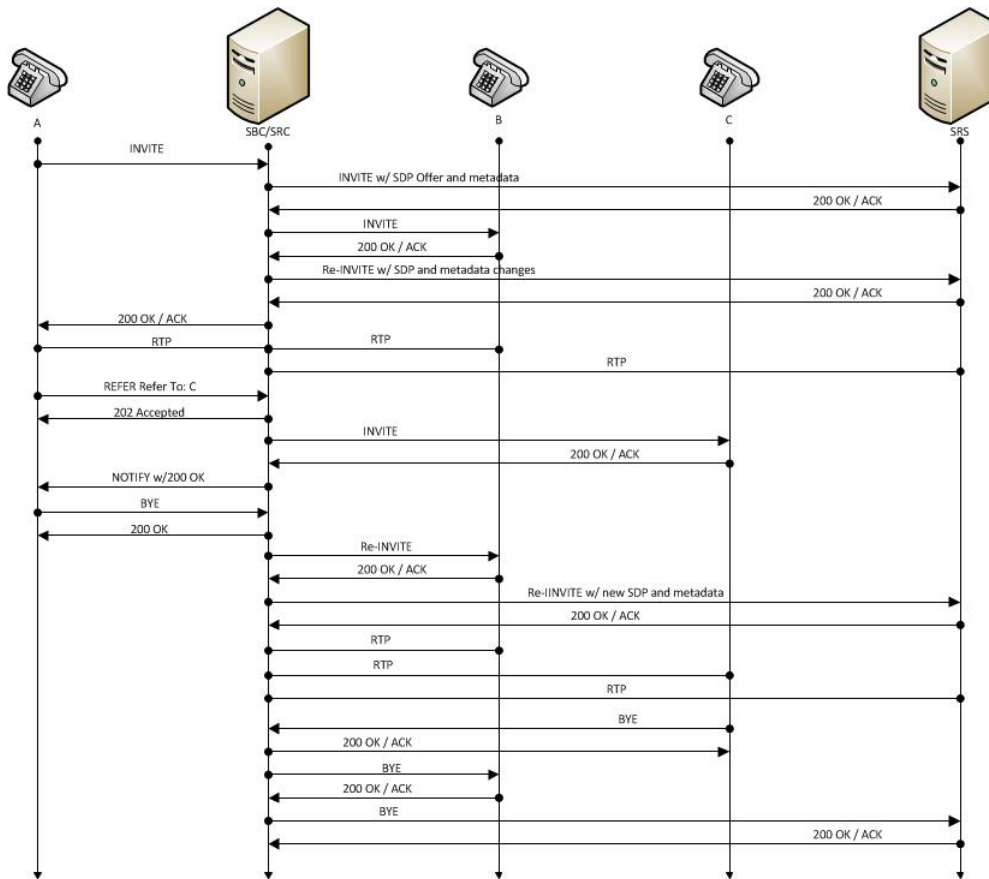
Call Flow Description	
1. UA-A sends INVITE to ESD.	18. UA-C responds with OK to ESD.
2. ESD forwards INVITE with SDP Offer and metadata to SRS.	19. ESD forwards OK response to UA-B.
3. SRS responds with OK to ESD.	20. ESD sends NOTIFY with OK response to UA-A.
4. ESD sends INVITE to UA-B.	21. ESD sends re-INVITE to SRS with new SDP and metadata, adds participant C, stops participant A .
5. UA-B responds with OK to ESD.	22. SRS responds with OK to ESD.
6. ESD sends re-INVITE with SDP and metadata changes to SRS.	23. UA-A sends BYE to ESD.
7. SRS responds with OK to ESD.	24. ESD responds with OK to UA-A.
8. ESD forwards OK response to UA-A.	25. ESD responds with OK to UA-A.
9. RTP stream initiated between UA-A and ESD.	26. RTP stream initiated between ESD and UA-B.
10. RTP stream initiated between ESD and UA-B.	27. RTP stream initiated between ESD and UA-C.
11. RTP stream initiated between ESD and SRS.	28. RTP stream initiated between ESD and SRS.
12. UA-A sends REFER-TO: C to ESD.	29. UA-C sends BYE to ESD.
13. ESD forwards REFER-TO: C to UA-B.	30. ESD responds with OK to UA-C.
14. UA-B responds with 202 ACCEPTED to ESD.	31. ESD sends BYE to UA-B.

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Call Flow Description	
15. ESD forwards 202 ACCEPTED to UA-A.	32. UA-B responds with OK to ESD.
16. UA-B sends INVITE TO: C to ESD.	33. ESD sends BYE to SRS
17. ESD sends INVITE to UA-C.	34. SRS responds with OK to ESD.

### REFER Call (REFER handled by ESD)

The following illustration shows a call using selective recording and the Session Border Controller (ESD) handling the REFER on the call. Recording is required in this call flow.



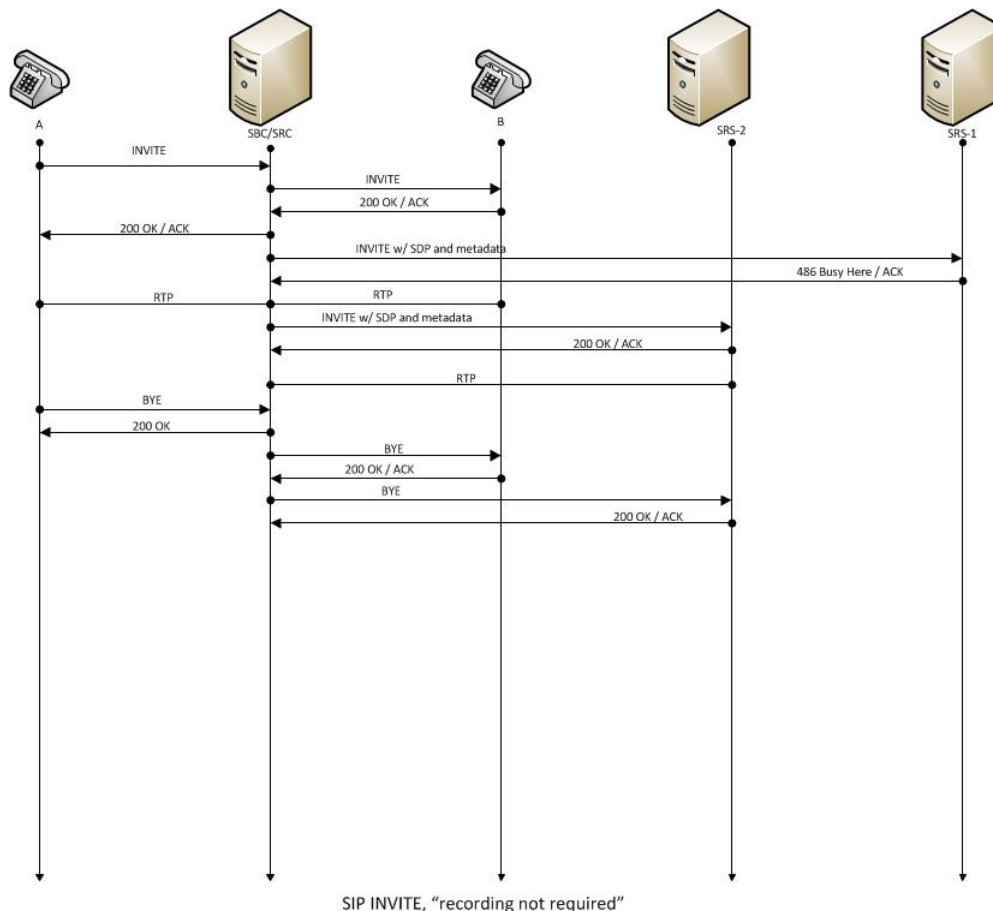
SIP REFER, SBC absorbs REFER, "recording required", selective recording

Call Flow Description	
1. UA-A sends INVITE to ESD.	16. ESD sends NOTIFY with OK response to UA-A.
2. ESD forwards INVITE with SDP Offer and metadata to SRS.	17. UA-A sends BYE to ESD.
3. SRS responds with OK to ESD.	18. ESD responds with OK to UA-A.
4. ESD sends INVITE to UA-B.	19. ESD sends re-INVITE to UA-B.
5. UA-B responds with OK to ESD.	20. UA-B responds with OK to ESD.
6. ESD sends re-INVITE with SDP and metadata changes to SRS.	21. ESD sends re-INVITE to SRS with new SDP and metadata.
7. SRS responds with OK to ESD.	22. SRS responds with OK to ESD.

Call Flow Description	
8. ESD forwards OK response to UA-A.	23. RTP stream initiated between ESD and UA-B.
9. RTP stream initiated between UA-A and ESD.	24. RTP stream initiated between ESD and UA-C.
10. RTP stream initiated between ESD and UA-B.	25. RTP stream initiated between ESD and SRS.
11. RTP stream initiated between ESD and SRS.	26. UA-C sends BYE to ESD.
12. UA-A sends REFER-TO: C to ESD.	27. ESD responds with OK to UA-C.
13. ESD responds with 202 ACCEPTED to UA-A.	28. ESD sends BYE to UA-B.
14. ESD sends INVITE to UA-C.	29. UA-B responds with OK to ESD.
15. UA-C responds with OK to ESD.	30. ESD sends BYE to SRS.
	31. SRS responds with OK to 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	
1. UA-A sends INVITE to ESD.	9. ESD sends INVITE to SRS2 with SDP and metadata.
2. ESD forwards INVITE to UA-B.	10. SRS2 responds with OK to ESD.
3. UA-B responds with OK to ESD.	11. RTP stream initiated between ESD and SRS2.

## Selective Call Recording/SIPREC

Call Flow Description	
4. ESD forwards OK response to UA-A.	12. UA-A sends BYE to ESD.
5. ESD sends INVITE to SRS1 with SDP and metadata.	13. ESD responds with OK to UA-A.
6. SRS1 responds to ESD with 436 BUSY HERE.	14. ESD sends BYE to UA-B.
7. RTP stream initiated between UA-A and ESD.	15. UA-B responds with OK to ESD.
8. RTP stream initiated between ESD and UA-B.	16. ESD sends BYE to SRS2.
	17. SRS2 responds with OK to ESD.

---

## Configuring an NFS Share For Archival

This chapter provides information about configuring a Network File System (NFS) share for archival.

To configure archival to an NFS share:

1. Once the NFS filesystem is properly being exported by the server, use the following command: object.

```
mount -t nfs -o ro,nosuid <nfs_host_name>:<nfs_mount_path> /opt/isr/ArchivedRecordings" e.g. mount -t nfs -o ro,nosuid host01.mydoc.com:/usr/local/apps /opt/isr/ArchivedRecordings
```



**Note:** You may need to install the `nfs-utils` package for mounting an NFS file system. For more information, refer to [https://docs.oracle.com/cd/E52668\\_01/E54669/html/ol7-cfgclnt-nfs.html](https://docs.oracle.com/cd/E52668_01/E54669/html/ol7-cfgclnt-nfs.html).

2. Link the new mounted path to the default Archived Recordings Location.

```
ln -s /mnt/<nfsservername> /opt/isr/ArchivedRecordings
```

3. From the RSS Linux shell, verify that users in the group "isr" have write permissions on the NFS share.

- Verify the current user is in the "isr" group (in the following example the user's name is "isradm").

```
#groups isradm
isradm: isradm wheel isr wireshark
```

- Add a file on the share.

```
touch /opt/isr/ArchivedRecordings/foo.txt
```

- Verify that the file exists

```
ls -l/opt/isr/ArchivedRecordings/foo.txt
```

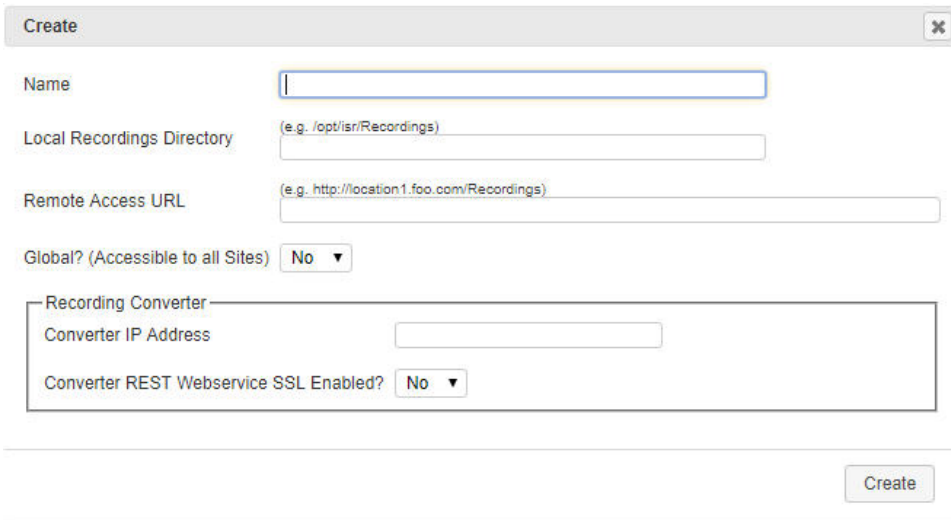
4. From the RSS Linux shell, using the `systemctl restart tomcatd` command, restart Tomcat. Since the Archived Location was not available as a resource to the application server responsible for serving recordings previously, this is necessary.

5. From the ISR Dashboard, add the new Archival Location.

- Click the **Admin** tab.
- Click the **Manage Sites** link.
- Click on the displayed Site.
- Click on the **Locations** icon.
- Click the **Create** link.

## Configuring an NFS Share For Archival

---

- 

The screenshot shows a 'Create' form with the following fields and options:

  - Name:** A text input field.
  - Local Recordings Directory:** A text input field with a placeholder example: `(e.g. /opt/isr/Recordings)`.
  - Remote Access URL:** A text input field with a placeholder example: `(e.g. http://location1.foo.com/Recordings)`.
  - Global? (Accessible to all Sites):** A dropdown menu currently set to 'No'.
  - Recording Converter:** A section containing:
    - Converter IP Address:** A text input field.
    - Converter REST Webservice SSL Enabled?:** A dropdown menu currently set to 'No'.

A 'Create' button is located at the bottom right of the form.

- **name**—Enter a specific name for the Location.
  - **Recordings Directory**—Set the recordings directory path to `/opt/isr/ArchivedRecordings`.
  - **URL**—Set the URL serving recordings in the directory (this is likely to be `http://<RSS IP>/ArchivedRecording`).
  - **IP Address**—Specify the RSS IP address for conversion to play recordings using certain codecs.
  - Click **Create**.
6. From the ISR Dashboard, configure Archival to the Location.
- Click the **Admin** tab.
  - Click the **Manage Sites** link.
  - Click on the displayed Site.
  - Click on the **Archivers** icon.
  - Click the **Create** link.



• **Create** ✕

IP Address

Source

Destination

Number of Threads

Move Attempts

Mode  Primary  Failover

Status  Enabled  Disabled

Able to Delete Recordings  Yes  No

Store in Date Directory  Yes  No

Store in Account Directory  Yes  No

Purge Index of Missing Recordings  Yes  No

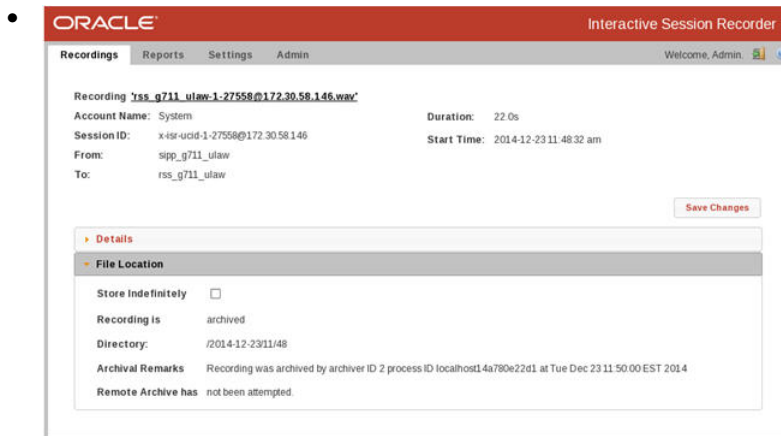
▶ *Conversion Configurations*

- **IP Address**—Enter the RSS IP address.
- **Source Location**—Set to <RSS name> (<RSS IP>) **Primary**.
- **Destination Location**—Set to the name you gave the Location.
- Click **Create**.

For more information on advanced settings while configuring a new Archiver, see *Managing Archivers* in the Oracle Communications Interactive Session Recorder Administrator Guide.

7. From the ISR Dashboard, verify that Archival is configured properly.
  - Click on the **Recordings** tab.
  - Click on a recording to display the details.
  - Click the **File Location** tab and verify that the recording was archived in the **Archival Remarks** field.

## Configuring an NFS Share For Archival



**Note:** By default, the Archival process runs every two minutes and you must wait for it to run at its scheduled time.

## Troubleshooting

Issue:

If the **showmount** command fails:

```
$ showmount 10.138.217.89
clnt_create: RPC: Port mapper failure - Unable to receive: errno 113 (No route to host)
```

Solution:

This is likely due to a firewalld configuration problem. Verify your configuration.

Issue:

You cannot write to share.

```
$ touch tmpshare/foo.txt
touch: cannot touch `tmpshare/foo.txt': Permission denied
```


Solution:

Update the permissions by changing the mode/ownership of the share on the NFS server using the **chmod** and/or **chown** commands.

---

## Configuring Circular Replication

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

-  **Note:** The below instructions are for configuring MySQL replication with two clean installations of the ISR Index. Any configuration or historical data causes this process to fail, while likely corrupting the data. Consult your Oracle account representative for instructions on configuring replication with an Index containing historical and configuration data.

---

### Configuration Instructions

To configure circular replication:

1. Create a replication user on each MySQL instance.

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';
```

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.
  - a) Log into the Index Virtual Machine (VM) of the PRIMARY host and shut down the MySQL service by entering the following:


```
systemctl stop mysql
```

- b) 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
```

## Configuring Circular Replication

```
#Set the master for replication reporting (optional)
report-host= <secondary host IP address>
```

 **Note:** If copying and pasting directly from this document, ensure there are no erroneous carriage returns impacting the configuration "my.cnf" file formatting. This could prevent MySQL Server from starting properly.

- c) Make sure the following lines are in the mysqld section:

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


3. Enable binary logging on the SECONDARY host.

- a) 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 :

```
systemctl stop mysql
```

- b) 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>
```

 **Note:** If copying and pasting directly from this document, ensure there are no erroneous carriage returns impacting the configuration "my.cnf" file formatting. This could prevent MySQL Server from starting properly.

- c) Make sure the following lines are in the mysqld section:

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

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

```
systemctl start mysql
```



**Warning:** Ensure there are no connections to the 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:

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

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

```
mysql> START SLAVE;
```

- 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

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

- Free the read lock by entering the following:

```
mysql> UNLOCK TABLES;
```

- 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
```

## Configuring Database Failover

To edit the configuration on the ISR API and Archival deployments to include database failover:

- Using a secure shell (SSH) client, log into the RSS host/s using a user name and password.
- To add the secondary database IP address to the API configuration, edit the following file.

```
/var/lib/tomcat/webapps/IsrApi/WEB-INF/web.xml
```

- Using the arrow keys to navigate the file and edit the following line with the relevant IP addresses:

```
<context-param>  
  <param-name>connectionString</param-name>  
  <param-value>jdbc:mysql://169.254.1.50,<secondary_host_IP>/ipcr_db</  
param-value>  
  <description>MsSQLX connection URI</description>  
</context-param>
```

- Save your changes to the file.
- Restart the application server by performing the following:

```
systemctl restart tomcat
```

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



---

## Oracle Public Yum Repository Configuration File

The repositories specified in the `/etc/yum.repos.d/public-yum-ol7.repo` file, usually found by default in Oracle Linux 7, must be accessible during ISR software installations. The repository entries are the following:

```
[ol7_latest]
name=Oracle Linux $releasever Latest ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/latest/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=1
```

```
[ol7_u0_base]
name=Oracle Linux $releasever GA installation media copy ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/0/base/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_u1_base]
name=Oracle Linux $releasever Update 1 installation media copy ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/1/base/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_u2_base]
name=Oracle Linux $releasever Update 2 installation media copy ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/2/base/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_UEKR3]
name=Latest Unbreakable Enterprise Kernel Release 3 for Oracle Linux
$releasever ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/UEKR3/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=1
```

```
[ol7_optional_latest]
name=Oracle Linux $releasever Optional Latest ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/optional/latest/
$basearch/
```

## Oracle Public Yum Repository Configuration File

---

```
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_addons]
name=Oracle Linux $releasever Add ons ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/addons/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_UEKR3_OFED20]
name=OFED supporting tool packages for Unbreakable Enterprise Kernel on
Oracle Linux 7 ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/
UEKR3_OFED20/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
priority=20
```

```
[ol7_MySQL56]
name=MySQL 5.6 for Oracle Linux 7 ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/MySQL56/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_MySQL55]
name=MySQL 5.5 for Oracle Linux 7 ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/MySQL55/$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```

```
[ol7_spacewalk22_client]
name=Spacewalk Client 2.2 for Oracle Linux 7 ($basearch)
baseurl=http://public-yum.oracle.com/repo/OracleLinux/OL7/spacewalk22/client/
$basearch/
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle
gpgcheck=1
enabled=0
```