Oracle® Communications Interactive Session Recorder

Monitoring Guide

Release 5.1

Formerly Net-Net Interactive Session Recorder

December 2015

ORACLE

Contents

About this Guide

Overview

The *Interactive Session Recorder Monitor Administration Guide* provides information about the Interactive Session Recorder's (ISR's) custom monitoring solution, created specifically to:

- Monitor the uptime of critical recording components
- Review the default tests configured upon installation
- Configure custom tests to monitor other components
- Configure SNMP and email alerts in the event a single test fails

This guide also provides the specific tests configured upon installation and the complete SNMP MIB for use with third-party SNMP monitoring systems.

Audience

This guide is intended for network administrators who have interest in monitoring the uptime and responsiveness of their ISR solution.

Related Documentation

The following table lists related documents.

Document Name	Document Description
Interactive Session Recorder Release Notes	Contains information about new ISR features and fixed issues in each release of the ISR.
Interactive Session Recorder Installation Guide	Provides an overview of the ISR, hardware/software requirements and recommendations, storage considerations, pre-installation information, CIS and RSS installation procedures, post-install verification and configuration procedures, setting up and making a test call, and additional advanced topics about the ISR.
Interactive Session Recorder User's Guide	Contains information about using the ISR Dashboard for all levels of users. Provides information about viewing, playing, deleting recordings, running reports, managing user profiles (Super User, Account Administrator, and Tenant Administrator only).
Interactive Session Recorder Administrator Guide	Contains information about using the ISR Dashboard for the Administrator level user (Super User, Account Administrator, and Tenant Administrator). Provides information about creating and managing accounts, routes, and users. Also provides information about configuring the ISR, running reports, and viewing active calls.
Interactive Session Recorder API Reference Guide	Contains information about Methods for Recording, VoiceXML Commands, representational state transfer (REST) application programming interface (API), Recording File Types/Formats Supported, Return Codes, sendIPCRCommand.jsp Subdialog, Advanced Options, Troubleshooting.
Interactive Session Recorder Remote Archival Web Services Reference Guide	Contains information about the Remote Archival Web Service, its Control methods, WSDL definitions, DataType Definitions, sample responses to requests, and importing the Remote Archival Web Service's certificate into the client keystore.

Revision History

This section contains the revision history for this document.

Date	Revision Number	Description
July 31, 2013	Revision 1.00	• Initial release of the ISR Monitor 5.1 software.
December 17, 2013	Revision 1.01	• Adds information regarding the Email and Password entered upon initial login.
March 7, 2014	Revision 1.02	• Corrects Deploying the Monitor's VM instructions.
May 16, 2014	Revision 1.10	• Replaces NN-ISR with ISR to reflect rebranding. • Corrects various typographical errors. • Updates Configuring ISR SNMP Agents chapter.
August 2014	Revision 1.20	• Updates screenshots to reflect Oracle rebranding.

Date	Revision Number	Description
September 2014	Revision 1.21	• Updates the Securing the ISR chapter.
January 2015	Revision 1.30	• Updates Configuring the ISR Monitor for Remote Archival Monitoring.
February 2015	Revision 1.31	• Updates the ISR Monitor MIB.
December 2015	Revision 1.32	• Adds the Interactive Session Recorder Remote Archival Web Services Reference Guide to the list of Related Documentation.

1 About the ISR Monitor

Introduction

The ISR Monitor tests network-attached application and MySQL database components using a series of synchronous request and result comparisons. Upon recognition of a service failure, the Monitor alerts registered administrators by sending an email and/or SNMP trap.

The ISR Monitor can be configured to conduct the following types of tests:

- HTTP fetch from a web or application server, matching a value configured as "confirmString" within the response for the test
- MySQL database connection
- MySQL database query with alert if result set is empty
- MySQL database query with alert if result set is not empty

If a test fails to connect to the device or does not return the expected result, the Monitor can be configured to send the following notifications:

- SNMP trap with the Object ID and a message specific to that test
- Email alert through the configurable SMTP host with the subject and message detailing instructions configured specifically for that test
- Default email message if no test-specific notifications exist

Additionally, the ISR Monitor offers:

- Configurable alerts on repeat alarms—The administrator can configure whether the monitor sends a notification each time a service fails a test or only upon the first failure. This configuration is only for successive failures of the same service. If a new service fails, a notification is always sent. Even if the **do not resend** parameter is set to true, after the failing test is passed once, a new notification is sent.
- Configurable resend interval—To limit the number of repeat alerts during a string of failures of the same test, the **send after** parameter forces the Monitor to wait a certain number of tests before sending a subsequent alert.
- Configurable delays for start of testing and between tests—Set the test intervals based on criteria important to your operation.
- Unlimited test set size—While the component installs with a base set of tests focused on ISR operation, additional tests can be added as desired, even to monitor non-ISR components.
- Verbose mode for more detailed records of tests and failures

2 Installing the ISR Monitor

Introduction

This chapter provides information about importing and running the ISR Monitor's virtual machine (VM).

Monitor Platform Requirements

The Monitor currently runs exclusively as a VM on the vSphere Hypervisor platform (formerly known as ESXi), the free edition of vSphere's bare-metal virtualization product.

The vSphere Hypervisor is required for operation of the ISR and installation instructions can be found in the *Interactive Session Recorder Installation Guide*.

The Monitor's VM is built with a default configuration that expects 1 virtual CPU (vCPU), 2GB of RAM, and 10GB of disk space available to the Monitor guest OS. These initial configuration settings may be adjusted for specific deployment needs.

Deploying the Monitor's VM

To deploy the Monitor's VM, first import the VM and then assign it an IP address.

To import the VM:

1. Open VMWare vSphere Client.
2. Connect to your vSphere Host by checking **Install this certificate and do not display any security warnings for <*ip_address*>**. Click **Ignore**.
3. Click **File > Deploy OVF Template...**.
4. Browse to the unzipped "ISR Monitor <*version #*> OVF Template.zip" directory, select **monitor.ovf** and click **Next**.
5. Click **Next** at both the summary and VM name and location.
6. Select **Thin provisioned format** and click **Next**.
7. Verify that the "VM Network" and "VM Local" Source and Destination Networks are listed, review the summary, and click **Finish**.
8. Close the OVF deployment window.
9. Click on the VM named **monitor** in the left panel and hit the **start** (play) button.

To assign an IP address to the VM:

1. Click the **Console** tab and place your cursor in the main panel.

   Note: Your mouse is confined to the console pane. Hit **Alt+Ctrl** to release.

2. Log in using username **root** and password **64^5377**.
3. Execute the **configCis.sh** script.
4. Select one of the following:

- s <*Enter*>—Show the current configuration

- q <*Enter*>—Quit the application
- m <*Enter*>—Modifies the current CIS configuration. The following fields appear:
  - Enter host IP: [<*current IP*>]
    - The Eth0 interface IPv4 address of the CIS host
  - Enter prefix: [16]
    - The routing prefix, e.g. 192.168.1.1/16
  - Enter gateway IP: [<*current_gateway_ip*>]
    - The IPv4 address of the network gateway or router.
  - Enter DNS1 IP: [<*current_dns1_ip* or *none*>]
    - The IPv4 address of the first DNS, which may be skipped (set to **none**) and ignored
  - Enter DNS2 IP: [<*current_dns2_ip* or *none*>]
    - The IPv4 address of the second DNS, which may be skipped (set to **none**) and ignored

    Note: To skip to the next field, hit <*Enter*>.

3 Configuring the ISR Monitor

Introduction

This chapter explains how to configure the ISR Monitor, including Monitor access, default and test-specific settings, and ISR and Dashboard settings.

Logging In/Out of the ISR Monitor Dashboard

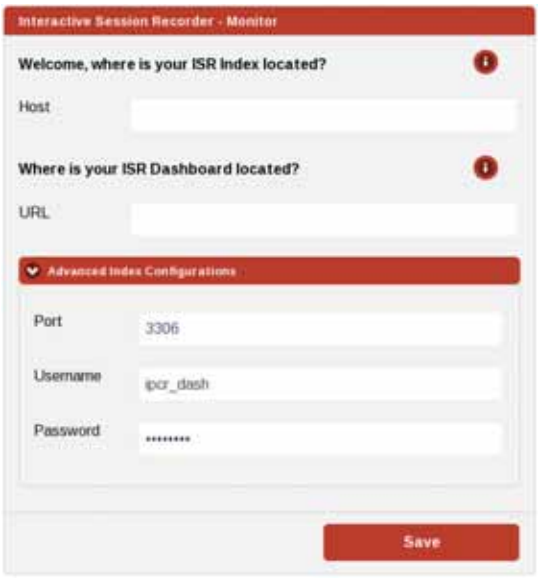
The ISR Monitor Dashboard allows you to access test results, system, and alert configurations, and to import configurations to generate tests for ISR deployments.

Note: You must have Super User privileges to access the ISR Monitor.

The first time you log into the ISR Monitor Dashboard, you must enter and save your Index connection credentials and Dashboard location. These credentials are used to authenticate user login and import data to generate test cases. Once the credentials you entered have been validated, the login screen appears.

You must only enter this information the first time you login to the ISR Monitor. All subsequent login attempts direct you directly to the login page.

The ISR Monitor Dashboard credential page appears.



1. **Host**—Enter the hostname or IP address of the Index that the ISR Monitor connects to.
2. **URL**—Enter the URL of the ISR Dashboard you are monitoring.
3. **Port**—Enter the port number of the Index that the ISR Monitor connects to. The default value is **3306**.
4. **Username**—Enter the Index database username. The default value is **ipcr_dash**.
5. **Password**—Enter the Index database password. The default value is **n3wf0und**.

6. Click **Save**.

   Note: These Index and Dashboard connection credentials can be updated if need be. For more information, see Setting ISR Index and Dashboard Configurations.

To login to the ISR Monitor Dashboard:

Note: Prior to signing into the ISR Monitor Dashboard, you must have signed into the ISR Dashboard with the default Super User account at least once.

1. Open your Internet Web browser.
2. Enter the following URL in the URL field:

   ```
   http://<Monitor IP address>/
   ```

   The Login page appears.

3. **Email**—Enter your ISR Dashboard user email address.
4. **Password**—Enter your ISR user password.
5. Click **Login**.

   The Net-Net ISR Monitor Overview page appears. If there are any ISR component failures, they appear on this page when you log in.

Managing the System

The Manage System tab is where you configure system-wide test and configuration settings. Settings configured here apply to all components tests unless there are test-specific settings configured under the Manage Components tab.

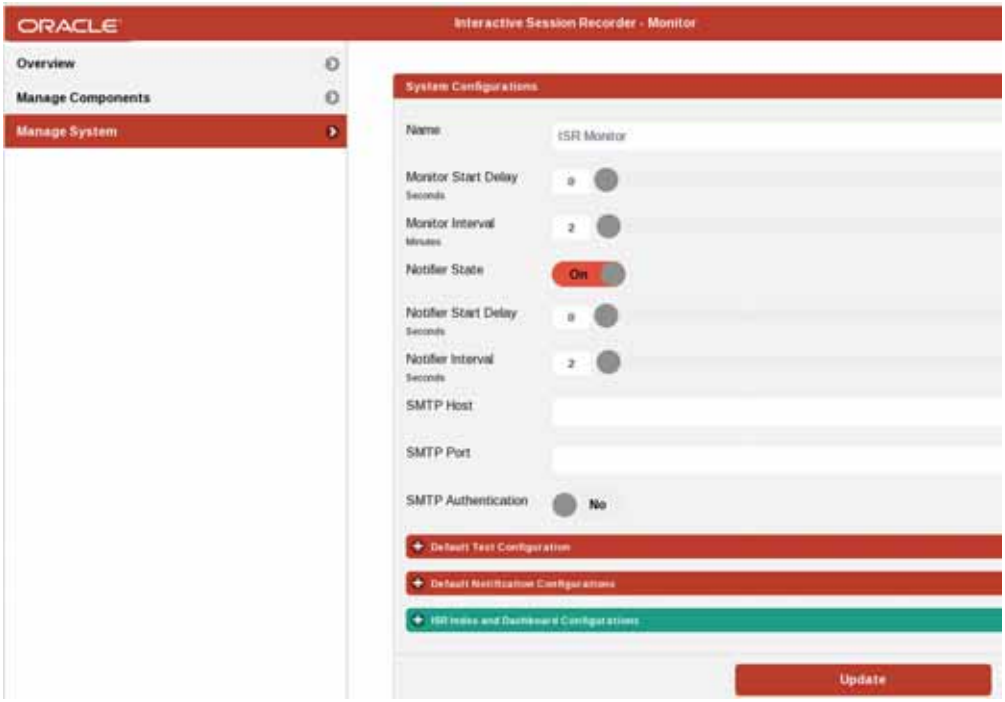
The Manage System tab is divided into four sub-sections.

- System Configurations
- Default Test Configuration
- Default Notification Configurations
- ISR Index and Dashboard Configurations

Setting System Configurations

To configure system configurations settings:

1. Click the **Manage System** tab.

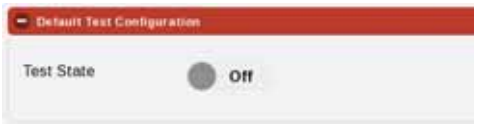


2. **Name**—Enter the name of this ISR Monitor. The default value is **ISR Monitor**.
3. **Monitor Start Delay**—Specify the number of seconds to delay before starting testing at the start of the ISR Monitor service. The minimum value is 0 and the maximum value is 300. The default value is **0**.
4. **Monitor Interval**—Specify the interval, in minutes, that the ISR Monitor performs each test. The minimum value is 0 and the maximum value is 300. The default value is **2** minutes.
5. **Notifier State**—Specify whether the ISR Monitor is enabled to send out notifications. Valid values are **On** and **Off**. The default value is **On**.
6. **Notifier Start Delay**—Specify the number of seconds to wait before sending notifications at the start of the ISR Monitor service. The minimum value is 0 and the maximum value is 300. The default value is **0**.
7. **Notifier Interval**—Specify the interval, in seconds, at which the ISR Monitor sends notifications. The minimum value is 0 and the maximum value is 300. The default value is **2** seconds.
8. **SMTP Host**—Specify the hostname or IP address of the email server. There is no default value.
9. **SMTP Port**—Specify the port number of the email server. There is no default value.
10. **SMTP Authentication**—Enables or disables SMTP authentication. Valid values are **Yes** and **No**. The default value is **No**.
11. **SMTP Username**—When **SMTP Authentication** is set to **Yes**, enter the SMTP username for authentication. There is no default value.
12. **SMTP Password**—When **SMTP Authentication** is set to **Yes**, enter the SMTP password for authentication. There is no default value.
13. Click **Update**.

Setting the Default Test Configuration

To configure the default test configuration setting:

1. Click the **Manage System** tab.
2. Click **Default Test Configuration**.

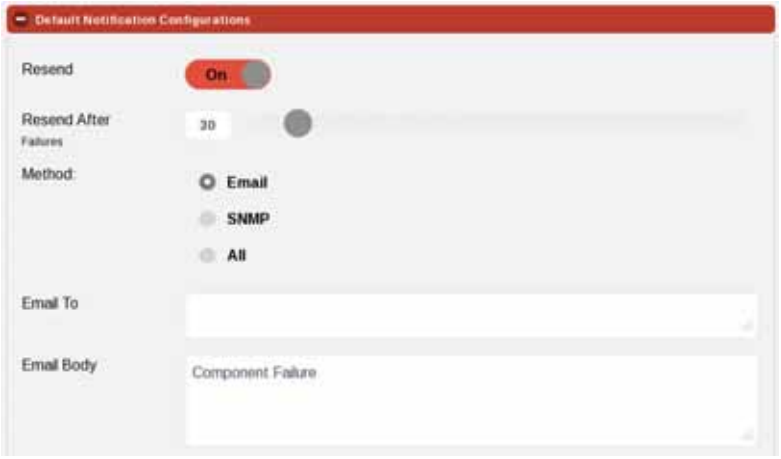


3. **Test State**—Specify whether or not ISR Monitor tests are enabled. Valid values are **On** and **Off**. The default value is **Off**.
4. Click **Update**.

Setting Default Notification Configurations

To configure the default notification configuration settings:

1. Click the **Manage System** tab.
2. Click **Default Notification Configurations**.



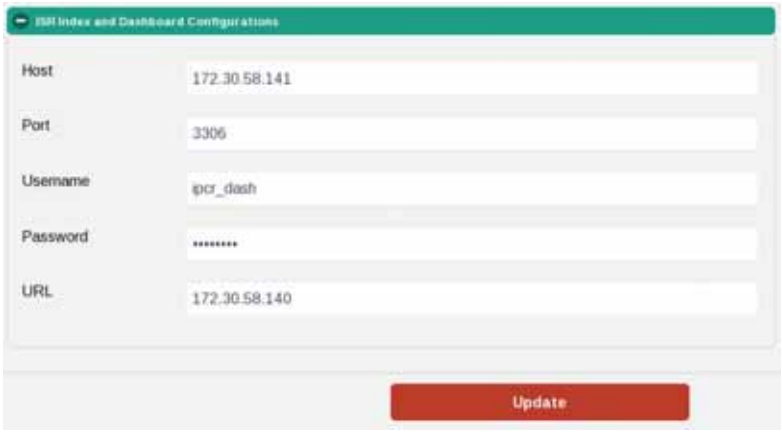
3. **Resend**—Specify whether a notification should be sent for each failure of a test or just after the first in a consecutive string of failures. Valid values are **Yes** and **No**. The default value is **Yes**, meaning notifications will continue to be sent.
4. **Resend After**—Specify the number of consecutive failed tests for the ISR Monitor to wait before it resends a notification. The default value is **30** failures.
5. **Method**—Specify the method to use for notifications when there is a test error. Valid values are **Email**, **SNMP**, or **All**. The default value is **Email**.
6. **Email To**—When the notification method is **Email** or **All**, enter the email address(es) to send the emails to. There is no default setting.
7. **Email Body**—When the notification method is **Email** or **All**, specify the text you want to be included in the email sent when there is a test error. There is no default setting.
8. Click **Update**.

Setting ISR Index and Dashboard Configurations

To configure the ISR Index and Dashboard configuration settings:

1. Click the **Manage System** tab.
2. Click **ISR Index and Dashboard Configurations**.

Note: These are the same index and database credential you enter and save the first time you log into the ISR Monitor.



3. **Host**—Enter the hostname or IP address of the Index that the ISR Monitor connects to.
4. **Port**—Enter the port number of the Index that the ISR Monitor connects to. The default value is **3306**.
5. **Username**—Enter the Index database username. The default value is **ipcr_dash**.
6. **Password**—Enter the Index database password. The default value is **n3wf0und**.
7. **URL**—Enter the URL of the ISR Dashboard you are monitoring.
8. Click **Update**.

Managing Components

The Management Components tab is where you can configure test-specific settings. You can generate new tests, refresh existing tests, view, edit, and remove components being monitored.

Generating Component Tests

To generate or refresh ISR component tests:

1. Click the **Manage Components** tab.
2. Click **Generate ISR Component Tests.**

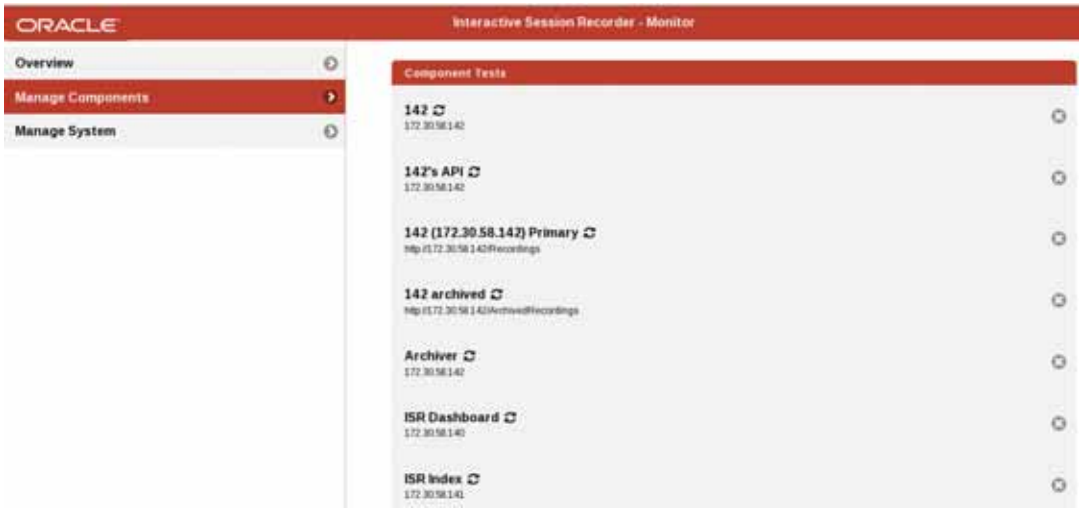
The ISR monitor automatically generates tests with either the system default settings or with test-specific settings you have configured.

Viewing and Editing Monitored Components

To view the components currently being monitored:

1. Click the **Manage Components** tab.
2. Click **View Components Being Monitored**.

All component tests configured on the ISR Monitor appear.



3. Click a specific test to view its configuration details.

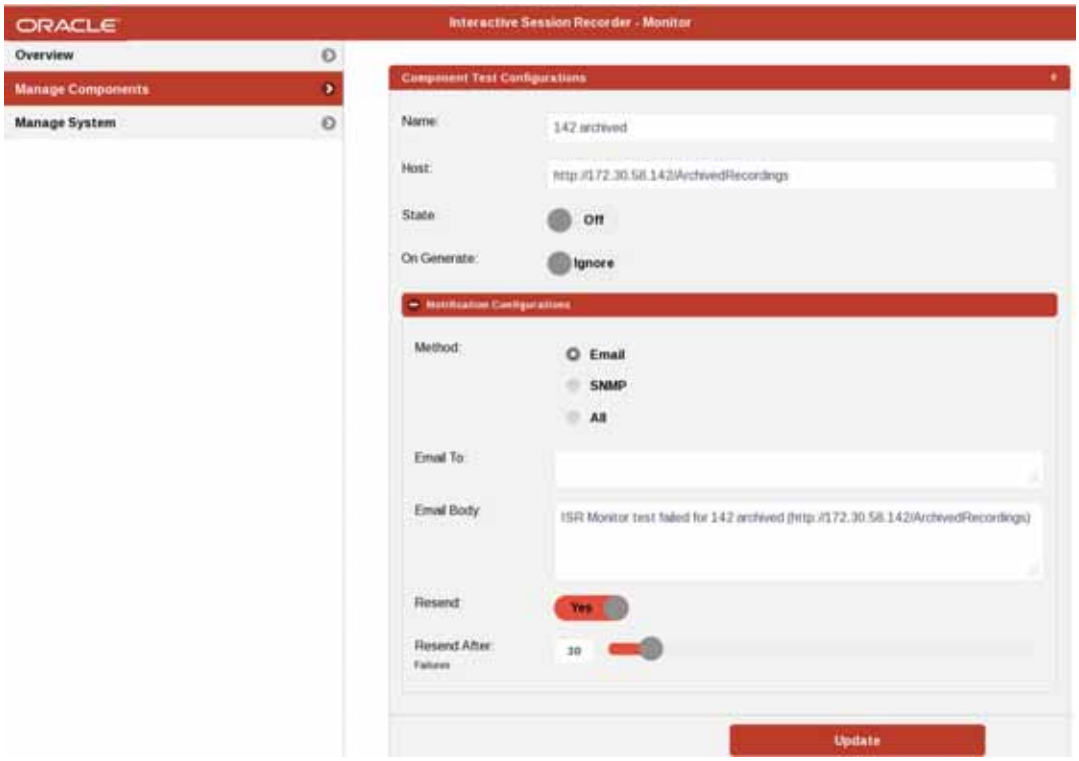
   Note: Click **Notification Configurations** on the Component Test Configurations page to view notification settings for that test.

To edit a component test:

1. Click the **Manage Components** tab.
2. Click **View Components Being Monitored**.

   All component tests configured on the ISR Monitor appear.
3. Click the test you want to edit.

Note: Click **Notification Configurations** to edit notification settings.



4. **Name**—Enter the name of the test.
5. **Host**—Enter the name or IP address of the host being tested. There is no default setting.
6. **State**—Specify whether this test is active. Valid values are **On** and **Off**. The default value is **Off**.
7. **On Generate**—When set to **Update** and Generate Tests is selected, the ISR configuration overwrites changes to the hostname or IP address. Valid values are **Update** and **Ignore**. The default value is **Ignore**.
8. **Method**—Specify the method to use for notifications when there is a test error. Valid values are **Email**, **SNMP**, or **All**. The default value is **Email**.
9. **Email To**—When the notification method is **Email** or **All**, enter the email address(es) to send the emails to. There is no default setting.
10. **Email Body**—When the notification method is **Email** or **All**, specify the text you want to be included in the email sent when there is a test error. There is no default setting.
11. **Resend**—Specify whether a notification should be sent for each failure of a test or just after the first in a consecutive string of failures. Valid values are **Yes** and **No**. The default value is **Yes**, meaning notifications will continue to be sent.
12. **Resend After**—Specify the number of consecutive failed tests for the ISR monitor to wait before it resends a notification. The minimum value is 0 and the maximum value is 300. The default value is **30** failures.
13. Click **Update**.

To delete a component test:

1. Click the **Manage Components** tab.
2. Click **View Components Being Monitored**.

   All component tests configured on the ISR Monitor appear.
3. Click the **X** on the test you want to delete.

   A pop-up appears verifying you want to delete the test.

4. Click **Remove**. The test is deleted.

Configuring the ISR Monitor for Remote Archival Monitoring

Monitoring the Remote Archival Webservice using the ISR Monitor requires two additional tests in the Monitor database.

The following SQL statements update the ISR Monitor with Remote Archival Webservice tests for download errors and for overdue client downloads.

On the Monitor host, use the following command to execute these statements:

```
mysql -u root -p<mysql_root_password> -e "<edited_query>"
```

Ensure that you do not receive any errors in the database server's response.

> **Note:** The SQL queries below require you to edit tagged variables, replacing the bracketed variables like <*ipcr_db_user*>, <*index_host_IP*>, and <*rWebservice_host_IP*> with the appropriate values. The variables that need to be edited are in *italics*. Within each test, use the same value to replace each occurrence of the same variable name.

For ISR versions 5.1M5 and above, the Monitor Dashboard automatically generates the two additional tests when generating ISR component tests. Therefore no further action is required for ISR version 5.1M5 or above.

Note that in 5.1M5 the second test, "Customer Client Service is Remotely Archiving Successfully", is set to alarm when recordings are stale for one day. The customization instructions below are targeted for customers with more urgent Remote Archival monitoring needs and alarm when recordings are stale for one hour.

Webservice is Running Without Failures

To test for any Remote Archival download failures in the system, you must update the database with the two queries below.

To run the queries replace <*edited_query*> in the command above with each of the following:

```
INSERT INTO vam_db.component_tests (service, host, test_type, db_name,
db_user, db_password, db_driver, db_url, db_query,
db_fail_on_empty_result_set, enabled, isr_index_id,
isr_component_type, on_update_overwrite) VALUES ('Remote Archival of
Recordings', '<rWebservice_host_name_or_IP>', 'db', 'ipcr_db',
'<ipcr_db_user>', '<ipcr_db_user_password>', 'com.mysql.jdbc.Driver',
'jdbc:mysql://<index_host_IP>:<index_database_port_eg_3306>/ipcr_db',
'SELECT cdr_id FROM cdr_remote WHERE status=4;', 0, 1, 1,
'remote_archival_failures', 0);
```

```
INSERT INTO vam_db.notifications (method, resend, resend_after,
email_to, email_body, snmp_host, snmp_retries, snmp_timeout,
trap_enterprise_id, trap_object_id, trap_agent_ip, trap_generic_type,
trap_specific_type, trap_message, component_test_id) SELECT
'<both_or_snmp_or_email>', resend, resend_after, email_to, 'ISR Monitor
test Remote Archival of Recordings failed for one or more Recordings
failed to be Remotely Archived successfully', snmp_host, snmp_retries,
snmp_timeout, '1.3.6.1.4.1.28153', '1.9.28', '<rWebservice_host_IP>',
'6', '1', 'ISR Monitor test Remote Archival of Recordings failed for
one or more Recordings failed to be Remotely Archived successfully',
(SELECT id FROM vam_db.component_tests WHERE service='Remote Archival
of Recordings' AND host='<rWebservice_host_name_or_IP>') FROM
vam_db.system_configuration LIMIT 1;
```

Customer Client Service is Remotely Archiving Successfully

To test for overdue Remote Archival client downloads, you must update the database with the two queries below.

To run the queries, replace <*edited_query*> in the command above with each of the following:

```
INSERT INTO vam_db.component_tests (service, host, test_type, db_name,
db_user, db_password, db_driver, db_url, db_query,
db_fail_on_empty_result_set, enabled, isr_index_id,
isr_component_type, on_update_overwrite) VALUES ('Remote Archival
Clients', '<rWebservice_host_name_or_IP>','db', 'ipcr_db',
'<ipcr_db_user>', '<ipcr_db_user_password>', 'com.mysql.jdbc.Driver',
'jdbc:mysql://<index_host_IP>:<index_database_port_eg_3306>/ipcr_db',
'SELECT c.cdr_id FROM cdr_remote c, recordings r WHERE
c.recording_id=r.recording_id AND c.status IN (0,2) AND r.account_code
IN (SELECT DISTINCT account_id FROM remote_archiver_servers) AND
r.start_time <DATE_SUB(NOW(), INTERAL 1 HOUR);', 0, 1, 1,
'remote_archival_inactivity', 0);
```

```
INSERT INTO vam_db.notifications (method, resend, resend_after,
email_to, email_body, snmp_host, snmp_retries, snmp_timeout,
trap_enterprise_id, trap_object_id, trap_agent_ip, trap_generic_type,
trap_specific_type, trap_message, component_test_id) SELECT
'<both_or_snmp_or_email>', resend, resend_after, email_to, 'ISR Monitor
test Remote Archival Clients failed for inactivity.', snmp_host,
snmp_retries, snmp_timeout, '1.3.6.1.4.1.28153', '1.9.28',
'<rWebservice_host_IP>', '6', '1', 'ISR Monitor test Remote Archival
Clients failed for inactivity.', (SELECT id FROM vam_db.component_tests
WHERE service='Remote Archival Clients' AND
host='<rWebservice_host_name_or_IP>') FROM vam_db.system_configuration
LIMIT 1;
```

Note: The Customer Client Service is Remotely Archiving Successfully query is currently set to alarm when client downloads are an hour overdue. This may be changed to minutes or days. For example:

```
INTERVAL <#> MINUTE
INTERVAL <#> DAY
```

For ISR versions 5.1M4 and above, due to the multiple client IPs for a single account feature on the Remote Archiver, the SQL query for the Customer Client Service is Remotely Archiving Successfully test has changed. To update for versions 5.1M4 and above, execute the following command on the Monitor host:

```
mysql -u root -p<mysql_root_password> -e "UPDATE vam_db.component_tests
SET db_query='SELECT c.cdr_id FROM cdr_remote c, recordings r WHERE
c.account_id=r.account_code AND status IN (0,2) AND c.account_id IN
(SELECT DISTINCT account_id FROM ra_clients) AND r.start_time <
DATE_SUB(NOW(), INTERVAL 1 HOUR)' WHERE service='Remote Archival
Clients' AND host='<rWebservice_host_name_or_IP>'"
```

4 Configuring ISR SNMP Agents

Introduction

Beyond the ISR Monitoring application, each host is configured as a managed SNMP device. The ISR host's default SNMP implementation assumes the product is deployed in a managed network where the managers have the task of monitoring ISR hosts by SNMP queries and traps for software and hardware operational status. Each managed ISR host includes a software component called an agent which responds to a query or sends an alarm with information via SNMP to the manager.

Supported SNMP Versions

The ISR supports several versions of SNMP based on component.

The RSS supports:

- SNMP v1
- SNMP v2c

The CIS supports:

- SNMP v1
- SNMP v2c
- SNMP v3

Default CIS SNMP Configuration

The CIS is automatically enabled for SNMP and by default supports SNMPv3. The CIS components, Index, Dashboard, Remote Archiver Webservice, and Monitor Service guest operating systems include the standard net-snmp, net-snmp-libs, and net-snmp-utils packages to provide SNMP agent functionality. The CIS hosts expect secure requests that include a username, password, and user security level ("authNoPriv" by default), following version 3 of the SNMP protocol.

The default configuration is located in the following file:

/etc/snmp/snmpd.conf

It has the following contents on deployment:

```
##############################################################################
##########
# snmpd.conf:
##############################################################################
##########

##### SNMP v3 User #####
createUser isrsnmp MD5 n3wf0und
rouser isrsnmp auth .1.3.6.1.4.1.2021

disk / 500000 (or)
load 20
```

The default SNMP agent configuration for each CIS host consists of a user and password specific to the SNMPv3 protocol. The default username is “isrsnmp” and the default password is “n3wf0und”. These two parameters must be included in any Get requests to the CIS agent.

The “disk” configuration is as follows:

```
disk PATH [MIN=100000]
PATH: mouth path to the disk in question.
MIN: Disks with space below this value will have the Mib’s errorFlag
set. Can be a raw integer value (units of kB) or a percentage followed
by the % symbol. Default value = 100000.
```

The “load” configuration are as follows:

```
Check for unreasonable load average values. Watch the load average
levels on the machine.
load [1MAX=12.0] [5MAX=12.0] [15MAX=12.0]
1MAX: If the 1 minute load average is above this limit at query time,
the errorFlag will be set.
5MAX: Similar, but for 5 min average.
15MAX: Similar, but for 15 min average.
The results are reported in the laTable section of the UCD-SNMP-MIB tree
```

Enabling SNMP Traps on CIS Hosts

To enable the sending of SNMP traps on a CIS host you must manually edit the */etc/snmp/snmpd.conf* file.

The following example shows the recommended additional configuration to turn on the SNMPv2c trap:

```
# trap2sink: A SNMPv2c trap receiver
#   arguments: host [community] [portnum]

trap2sink  <NMS/trapsink IP address> <community_string> <SNMP port,
likely 162>

# Set up the credentials to retrieve monitored values
createUser    _internal MD5 "the first sign of madness"
iquerySecName _internal
rouser        _internal

# Active the standard monitoring entries
defaultMonitors         yes
linkUpDownNotifications yes
```

By activating the **defaultMonitors** parameter, you configure the Event MIB tables to monitor the various UCD-SNMP-MIB tables. This is the equivalent to the “snmpd.conf” configuration:

```
monitor -o prNames -o prErrMessage "process table" prErrorFlag != 0
monitor -o memErrorName -o memSwapErrorMsg "memory" memSwapError != 0
monitor -o extNames -o extOutput "extTable" extResult != 0
monitor -o dskPath -o dskErrorMsg "dskTable" dskErrorFlag != 0
monitor -o laNames -o laErrMessage  "laTable" laErrorFlag != 0
monitor -o fileName -o fileErrorMsg  "fileTable" fileErrorFlag != 0
```

Activating “linkUpDownNotifications” defines two traps, “linkUpTrap” and “LinkDownTrap” as notifications for a network interface being taken up or down.

Extending the CIS SNMP Configuration

The “snmpconf” utility provides some basic SNMP agent configurations. The basic SNMP agent setup command, **snmpconf -r none -g basic_setup**, is a step-by-step guide to set up community and system information.

To extend basic or default SNMP functionality, the *snmpd.conf* file may also be edited manually following the syntax and functions supported by the net-snmp agent. Use the **man snmpd.conf** command on the CIS host for more detail or consult the following URL:

http://www.net-snmp.org/docs/man/snmpd.conf.html

> **Note:** You must restart the "snmpd" service to load a new configuration. To restart the service, execute the **service snmpd restart** command on the CIS host.

CIS Extended SNMP Configuration Example (Network Interfaces)

To extend the monitored variables beyond the default CIS distribution, you must edit the “/etc/snmp/snmpd.conf” file to replace the following line:

```
rouser isrsnmp auth .1.3.6.1.4.1.2021
```

with the following string:

```
rouser isrsnmp auth .1.3.6.1
```

This allows you to monitor variables from two more recommended MIBs, NET-SNMP-MIB and NET-SNMP-AGENT-MIB.

Some basic SNMP agent configurations are easily performed with the included configuration utility, "snmpconf". The basic SNMP agent setup command, **snmpconf -r none -g basic_setup**, is a step-by-step guide to set up community and system information.

To extend basic or default SNMP functionality, the "snmpd.conf" file may also be edited manually following the syntax and functions supported by the net-snmp agent. Use "man snmpd.conf" on the CIS host for more detail or consult the following URL:

http://www.net-snmp.org/docs/man/snmpd.conf.html

> **Note:** The "snmpd" service must be restarted to load a new configuration. To restart the service, execute the **service snmpd restart** command on the CIS host.

Configuring CIS SNMPv2c

The following is a basic example of an SNMP version 2c configuration, replacing the default SNMPv3 configuration.

> **Note:** The configuration is located in the */etc/snmp/snmpd.conf* file.

```
###############################################################################
###########
# snmpd.conf:
###############################################################################
###########

#### SNMP Configuration v2c ####
#### Community string set to 'isrsnmp'####
com2sec isrSnmpUser default isrsnmp
#### security group ####
group isrSnmpGroup v2c isrSnmpUser
#### ISR .extended. view ####
view all included .1.3.6.1.4.1.2021
access isrSnmpGroup "" any noauth exact all none none
```

Verify the configuration by restarting the SNMP agent service and check that the expected OIDs are displayed when you execute the following command:

```
# service restart snmpd
# snmpwalk -v2c -c isrsnmp localhost .1.3.6.1.4.1.2021
```

CIS SNMP Get List

The table below includes CIS SNMP Gets for host resources of CPU, disk, and memory. The first two columns, Name and OID, may be used as the final field in the following SNMPv3 example query:

```
# snmpget -v 3 -u <user> -| authNoPriv -A <password> <agent IP>
<OID/Name>
```

These SNMP requests are defined within the UCD-SNMP-MIB MIB document as .1.3.6.1.4.1.2021 and may be executed from any compatible NMS.

Note: For hardware-specific SNMP variables available for Gets, please refer to the documentation for the VM Hypervisor supporting the CIS.

Name	OID	Description
laLoad.1	.1.3.6.1.4.1.2021.10.1.3.1	CPU Load: 1 minute average
laLoad.2	.1.3.6.1.4.1.2021.10.1.3.2	CPU Load: 5 minute average
laLoad.3	.1.3.6.1.4.1.2021.10.1.3.3	CPU Load: 15 minute average
laErrorFlag.1	.1.3.6.1.4.1.2021.10.1.100.1	CPU Load: set to 1 if CPU load average exceeds threshold, otherwise 0 (1min)
laErrorFlag.2	.1.3.6.1.4.1.2021.10.1.100.2	CPU Load: set to 1 if CPU load average exceeds threshold, otherwise 0 (5 mins)
laErrorFlag.3	.1.3.6.1.4.1.2021.10.1.100.3	CPU Load: set to 1 if CPU load average exceeds threshold, otherwise 0 (15 mins)
laErrMessage.1	.1.3.6.1.4.1.2021.10.1.101.1	CPU Load: message describing error (1 min)
laErrMessage.2	.1.3.6.1.4.1.2021.10.1.101.2	CPU Load: message describing error (5 mins)
laErrMessage.3	.1.3.6.1.4.1.2021.10.1.101.3	CPU Load: message describing error (15 mins)
laConfig.1	.1.3.6.1.4.1.2021.10.1.4.1	CPU Load: threshold setting (1 min=20)
laConfig.2	.1.3.6.1.4.1.2021.10.1.4.2	CPU Load: threshold setting (5 mins=20)
laConfig.3	.1.3.6.1.4.1.2021.10.1.101.3	CPU Load threshold setting (15 mins=20)
ssCpuRawUser.0	.1.3.6.1.4.1.2021.11.50.1	CPU: The number of ticks (1/100s) spent processing user-level code
ssCpuRawSystem.0	.1.3.6.1.4.1.2021.11.52.0	CPU: The number of ticks (1/100s) spent waiting for IO

Name	OID	Description
ssCpuRawWait.0	.1.3.6.1.4.1.2021.11.54.0	CPU: The number of ticks (1/100s) spent waiting for IO Note: This counter is cumulative over all CPUs, so the value is typically multiplied by 4*100 (the standard four processors on a CIS host multiplied by 100 ticks/second).
dskTotal.1	.1.3.6.1.4.1.2021.9.1.6.1	Disk: Total disk size of the "/" partition in kB
dskAvail.1	.1.3.6.1.4.1.2021.9.1.7.1	Disk: Available space on the partition in kB
dskUsed.1	.1.3.6.1.4.1.2021.9.1.8.1	Disk: Used space on the partition in kB
dskPercent.1	.1.3.6.1.4.1.2021.9.1.9.1	Disk: Percentage of used space on the partition
dskErrorFlag.1	.1.3.6.1.4.1.2021.9.1.100.1	Disk: Error flag set to 1 if disk is under configured minimum space; otherwise 0
dskErrorMsg.1	.1.3.6.1.4.1.2021.9.1.101.1	Disk: Descriptive error message
dskMinimum.1	.1.3.6.1.4.1.2021.9.1.4.1	Disk: Threshold setting for minimum (set to 500000 kB)
memTotalReal.0	.1.3.6.1.4.1.2021.4.5.0	Memory: Total RAM in machine
memAvailReal.0	.1.3.6.1.4.1.2021.4.6.0	Memory: Total RAM unused
memTotalFree.0	.1.3.6.1.4.1.2021.4.11.0	Memory: Total memory free (covers RAM and swap)
memTotalSwap.0	.1.3.6.1.4.1.2021.4.3.0	Swap: Total swap space configured for host
memAvailSwap.0	.1.3.6.1.4.1.2021.4.4.0	Swap: Available swap
memMinimumSwap.0	.1.3.6.1.4.1.2021.4.12.0	Swap: memSwapError set to 1 if memAvailSwap falls below this threshold
memSwapError	.1.3.6.1.4.1.2021.4.100	Swap: Error flag set to 1 if memAvailSwap value falls below memMinimumSwap
memSwapErrorMsg	.1.3.6.1.4.1.2021.4.101	Swap: Error message if memAvailSwap value falls below memMinimumSwap
ifIndex	.1.3.6.1.2.1.2.2.1.1	Index ID of every network interface available on the VM.
ifDescr	.1.3.6.1.2.1.2.2.1.2	Description of every network interface available on the VM (for example, eth0)
ifOperStatus	.1.3.6.1.2.1.2.2.1.8	The current state of each interface (up or down)

Name	OID	Description
ifOutOctets	.1.3.6.1.2.1.2.2.1.16	The total number of octets transmitted out of the interface, including framing packets
ifInOctets	.1.3.6.1.2.1.2.2.1.10	The total number of octets received on each interface, including framing characters
ifSpeed	.1.3.6.1.2.1.2.2.1.5	The interface's current bandwidth in bits per second
ifInErrors	.1.3.6.1.2.1.2.2.1.14	The number of inbound packets that contained errors, per interface
ifOutErrors	.1.3.6.1.2.1.2.2.1.20	The number of outbound packets that could not be transmitted because of errors, per interface

CIS SNMP Trap List

The table below includes CIS SNMP Traps for host resources of CPU, disk, memory, and swap space.

Name	Condition	Trap Message Example
memSwapErrorMsg	memSwapError ! =0	CPU Load: 5 minute average
memSwapErrorMsg	memSwapError !0 = >0	(swap error cleared) Memory occupancy alarm cleared
dskErrorMsg	dskErrorFlat ! = 0	(default behavior space < 500MB) /: less than 500000 free (=414622)
dskErrorMsg	dskErrorFlat !0 = >0	(disk error cleared) Disk occupancy alarm cleared
IaErrMessage	IaErrorFlat ! = 0	(default behavior load > 20%) 1 min Load Average too high (=1.26)
IaErrMessage	IaErrorFlat !0 = >0	(load error cleared) CPU Load alarm cleared

CIS SNMP Agent MIBs

The UCD-SNMP-MIB defines the tables to store status and monitor values of the recommended ISR SNMP variables. The traps configured and enabled on a CIS SNMP agent using the recommended configuration are defined with in NET-SNMP-MIB and NET-SNMP-AGENT-MIB. These related MIBs are accessible at the following URLs:

UCD-SNMP-MIB:

http://www.net-snmp.org/docs/mibs/ucdavis.html

and

http://www.net-snmp.org/docs/mibs/UCD-SNMP-MIB.txt

It is also available at the following path on each CIS host:

/usr/share/snmp/mibs/UCD-SNMP-MIB.txt

NET-SNMP-MIB:

http://www.net-snmp.org/docs/mibs/NET-SNMP-MIB.txt

and

http://www.net-snmp.org/docs/mibs/netSnmp.html

It is also available at the following path on each CIS host:

/usr/share/snmp/mibs/NET-SNMP-MIB.txt

NET-SNMP-AGENT-MIB:

http://www.net-snmp.org/docs/mibs/netSnmpAgentMIB.html

and

http://www.net-snmp.org/docs/mibs/NET-SNMP-AGENT-MIB.txt

It is also available at the following path on each CIS host:

/usr/share/snmp/mibs/NET-SNMP-AGENT-MIB.txt

Also, all MIBs included as part of net-snmp are found at the following URL:

http://www.net-snmp.org/docs/mibs/

Configuring RSS SNMP

You must configure the RSS to enable the SNMP agent service on a specific network interface. The RSS supports SNMP v1 and SNMP v2c only, so SNMP Get requests must follow a slightly different version of the protocol than the CIS.

You must use the ISR CLI to configure SNMP on the RSS.

Use the following CLI command sequence to enable the SNMP agent for version 2c on the RSS.

```
>config box
config box> config interface eth0
config interface eth0> config ip a
config ip a> config snmp
config snmp> set admin enabled
config snmp> set port 161
config snmp> set version 2c
config snmp> set community private
config snmp>exit
Do you want to commit your changes before you exit (y or n)? y
Do you want to update the startup configuration (y or n)? y
```

Note: If you set the **community** name to anything other than **isr**, make note of it because you must use this value for management configuration of the Get requests.

Configuring RSS Traps

The RSS configuration must specify a target of the traps for the RSS SNMP platform to alert a monitoring system with an SNMP trap during certain situations.

Use the following CLI command sequence to enable RSS traps:

```
RSS>config box interface eth0 ip a snmp
config snmp>set trap-target <ip> <port>
config snmp>exit
```

```
Do you want to commit your changes before you exit (y or n)? y
Do you want to update the startup configuration (y or n)? y
```

Configuring Specific RSS Traps

To enable alarms for specific parameters, you must configure a named monitor that contains a set of parameters.

The following example enables a monitor named ‘rss1’ with a parameter set for when disk space fills beyond 30%.

```
RSS>config services monitors monitor rss1
Creating ‘monitor rss1’
config monitor rss1>set parameter storage-devices system-1 30
config monitor rss1>commit
config>exit
Do you want to update the startup configuration (y or n)? y
```

Note: This is just an example. For imformation on what parameters can be monitored., execute the **set parameter ?** command via the configuration shell. The most commonly used are **set parameter cpu-usage <*threshold*>**, **set parameter memory-usage <*threshold*>**, **set parameter kernel-memory-usage <*threshold*>**, and **set parameter memory-failures <*threshold*>**.

Configuring RSS Hardware SNMP Monitoring

In addition to the previously mentioned predefined monitors, monitoring for temperature, drive-slot, fan, memory, current, power supply and OEM is available for RSS SNMP via variables logged to the "sensorsTable", or the .1.3.6.1.4.1.21798.1.1.264 subtree.

To enable traps for this set of hardware variables:

1. From the RSS OS-E shell, type **config services event-log** and hit <Enter>.
2. Type **config snmp-trap** and hit <Enter>.
3. Type **set filter sensor notice** and hit <Enter>.
4. Type **exit** and hit <Enter>.
5. Type **y** two times to commit the changes and include them in the startup configuration.

The **set filter sensor** command has the following syntax and options:

```
set filter <logClass> <severity>
emerg   Emergency
alert   Alert
crit    Critical
error   Error
warning Warning
notice  Notice
info    Information
debug   Debug
```

RSS SNMP Get List

The following table includes RSS SNMP gets for hardware resources of CPU and memory. The OID column may be used as the final field in the following example command for SNMPv2c:

 # snmpget -v 2c -c <community_value_provided_in_config> <agent IP> <OID >

These SNMP requests are defined within Oracle's cxc.mib MIB document as SNMPv2-SMI::enterprises.21798 and may be executed from any compatible NMS.

Name	OID	Description
cpuUsageOneSecond	.1.3.6.1.4.1.21798.1.1.55.1	CPU Load: 1 second average
cpuUsageTenSecond	.1.3.6.1.4.1.21798.1.1.55.2	CPU Load: 10 second average
cpuUsageOneMinute	.1.3.6.1.4.1.21798.1.1.55.3	CPU Load: 1 minute average
cpuUsageTenMinute	.1.3.6.1.4.1.21798.1.1.55.4	CPU Load: 10 minute average
cpuUsageOneHour	.1.3.6.1.4.1.21798.1.1.55.5	CPU Load: 1 hour average
cpuUsageSixHour	.1.3.6.1.4.1.21798.1.1.55.6	CPU Load 6 hour average
cpuUsageTwelveHour	.1.3.6.1.4.1.21798.1.1.55.7	CPU Load: 12 hours average
cpuUsageOneDay	.1.3.6.1.4.1.21798.1.1.55.8	CPU Load: 1 day average
availableMemoryTotalAvailable	.1.3.6.1.4.1.21798.1.1.489.1.2.2	Total available memory
availaIbeMemorySysHeapTotal	.1.3.6.1.4.1.21798.1.1.489.1.3.2	Total memory in system heap
availableMemorySysHeapBusy	.1.3.6.1.4.1.21798.1.1..489.1.4.2	Total busy memory in system heap
availableMemorySysHeapAvailable	.1.3.6.1.4.1.2021.10.1.4.3	Total available memory in system heap
ifIndex	.1.3.6.1.2.1.2.2.1.1	Index ID of every network interface available on the RSS
ifDescr	.1.3.6.1.2.1.2.2.1.2	Description of each network interface available on the RSS (for example, eth0)
ifOperStatus	.1.3.6.1.2.1.2.2.1.8	The current state of each interface (up or down)
ifOutOctets	.1.3.6.1.2.1.2.2.1.16	The total number of octets transmitted out of the interface, including framing packets
ifInOctets	.1.3.6.1.2.1.2.2.1.10	The total number of octets received on each interface, including framing characters
ifSpeed	.1.3.6.1.2.1.2.2.1.5	An estimate of the interface's current bandwidth in bits per second
sensorsTable	.1.3.6.1.4.1.21798.1.1.264	Hardware heath statistics such as fan, power supply and temperate. See "Configuring RSS Hardware SNMP Monitoring" for more information
mountsEntry	.1.3.6.1.4.1.21798.1.1.188.1	Mount point information and free disk space (mountsPercentFree .7)

RSS SNMP Trap List

The following table contains a full list of recommended monitors to use when configuring specific RSS Traps.

Name	Set Parameter Syntax	Trap Message Example
cpu-usage	cpu-usage <*threshold*>	Abnormal CPU Usage above <*threshold*>%
memory-usage	memory-usage <threshold>	Abnormal Memory Usage above <*threshold*>%
kernel-memory-usage	kernel-memory-usage <*threshold*>	Abnormal Kernal Memory Usage above <*threshold*>%
memory-failures	memory-failures <*threshold*>	There are Memory Failures in the System
storage-devices	storage-devices <*device*> <*threshold*>	Storage devide is above <*threshold*>% of capacity

Note: To choose which system partition is active and should be monitored, access the OS-E shell and execute the **show chassis config** command. Note the value after "boot-partition:". Additional partitions mounted in the OS-E shell become known as OS-E devices "data-1" and "data-2". For more information, at the "config monitor storage>" prompt execute the **set parameter storage-devices ?** command.

A Monitor Database Schema

Component_Failures

Field Name	Field Type	Nullable	Supported Values	Default	Description
id	bigint(20) unsigned	NOT NULL AUTO_INCREMENT			
failed_at	datetime	NOT NULL		0000-00-00 00:00:00	
cleared	tinyint(1)	NOT NULL		0	
component_test_id	int(11)	DEFAULT NULL			

Component Tests

Field Name	Field Type	Nullable	Supported Values	Default	Description
id	int(10) unsigned	NOT NULL AUTO_INCREMENT			
service	varchar(255)	NOT NULL			
host	varchar(50)	NOT NULL			
test_type	varchar(10)	NOT NULL		system	
system_url	varchar(255)	DEFAULT NULL			
system_confirm_string	varchar(255)	DEFAULT NULL			
db_name	varchar(50)	DEFAULT NULL			
db_user	varchar(30)	DEFAULT NULL			
db_password	varchar(30)	DEFAULT NULL			
db_driver	varchar(80)	DEFAULT NULL			
db_url	varchar(255)	DEFAULT NULL			
db_query	text				
db_fail_on_empty_result_set	tinyint(1)	DEFULT NULL			
enabled	tinyint(1)	NOT NULL		0	
isr_index_id	int(10) unsigned	DEFAULT NULL			

Field Name	Field Type	Nullable	Supported Values	Default	Description
isr_component_type	varchar(255)	DEFAULT NULL			
on_update_overwrite	tinyint(1)	NOT NULL		0	

Dash_Config

Field Name	Field Type	Nullable	Supported Values	Default	Description
config_id	tinyint(3) unsigned	NOT NULL AUTO_INCREMENT			
header_footer_color	varchar(255)	DEFAULT NULL			
logo_url	varchar(255)	DEFAULT NULL			
isr_index_host	varchar(255)	DEFAULT NULL			
isr_index_port	int(11)	DEFAULT NULL			
isr_index_username	varchar(255)	DEFAULT NULL			
isr_index_password	varchar(255)	DEFAULT NULL			
isr_dashboard_url	varchar(255)	DEFAULT NULL			

Notifications

Field Name	Field Type	Nullable	Supported Values	Default	Description
id	int(11)	NOT NULL AUTO_INCREMENT			
method	varchar(255) COLLATE utf8_unicode_ci	DEFAULT NULL			
resend	tinyint(1) unsigned	DEFAULT NULL			
resend_after	tinyint(1) unsigned	DEFAULT NULL			
email_to	text COLLATE utf8_unicode_ci				
email_body	text COLLATE utf8_unicode_ci	DEFAULT NULL			
snmp_host	varchar(255) COLLATE utf8_unicode_ci	DEFAULT NULL			
snmp_retries	int(10) unsigned	DEFAULT NULL			
snmp_timeout	int(10) unsigned	DEFAULT NULL			
trap_enterprise_id	varchar(255) COLLATE utf8_unicode_ci	DEFAULT NULL		1.3.6.1.4.1.28153	

Field Name	Field Type	Nullable	Supported Values	Default	Description
trap_object_id	varchar(255) COLLATE utf8_unicode_ci	DEFAULT NULL			
trap_agent_ip	varchar(255) COLLATE utf8_unicode_ci	DEFAULT NULL			
trap_generic_type	int(10) unsigned			6	
trap_specific_type	int(10) unsigned			1	
trap_message	test COLLAGE utf8_unicode_ci			1	
component_test_id	int(10) unsigned	DEFAULT NULL			

Notify

Field Name	Field Type	Nullable	Supported Values	Default	Description
id	bigint(20) unsigned	NOT NULL AUTO_INCREMENT			
send_type	varchar(20)	NOT NULL			
email_to	varchar(255)	DEFAULT NULL			
email_subject	varchar(255)	DEFAULT NULL			
email_body	text				
snmp_host	varchar(255)	DEFAULT NULL			
snmp_retries	int(10) unsigned	DEFAULT NULL			
snmp_timeout	int(10) unsigned	DEFAULT NULL			
trap_enterprise_id	varchar(30)	DEFAULT NULL			
trap_object_id	varchar(30)	DEFAULT NULL			
trap_agent_ip	varchar(30)	DEFAULT NULL			
trap_generic_type	int(10) unsigned	DEFAULT NULL			
trap_specific_type	int(10) unsigned	DEFAULT NULL			
trap_message	text				
send	tinyint(1) unsigned	NOT NULL		1	
added_time	datetime	DEFAULT NULL			
sent_time	datetime	DEFAULT NULL			
message	varchar(50)	DEFAULT NULL			
status	int(10) unsigned	NOT NULL DEFAULT			
send_failure_count	int(10) unsigned	NOT NULL DEFAULT			

Scheduler

Field Name	Field Type	Nullable	Supported Values	Default	Description
start_time	datetime	NOT NULL		0000-00-00 00:00:00	

System Configuration

Field Name	Field Type	Nullable	Supported Values	Default	Description
id	tinyint(3) unsigned	NOT NULL AUTO_INCREMENT			
application_name	varchar(100)	NOT NULL			
test_begin_delay	int(10) unsigned	NOT NULL		0	
test_interval	int(10) unsigned	NOT NULL		5	
send_begin_delay	int(10) unsigned	NOT NULL		15	
send_interval	int(10) unsigned	NOT NULL		30	
resend	tinyint(1) unsigned	NOT NULL		1	
resend_after	int(10) unsigned	NOT NULL		0	
do_not_send	tinyint(1) unsigned	NOT NULL		0	
default_instructions	text				
notification_method	varchar(10)	NOT NULL		email	
smtp_user	varchar(255)	DEFAULT NULL			
smtp_password	varchar(255)	DEFAULT NULL			
smtp_host	varchar(255)	DEFAULT NULL			
smtp_port	int(10) unsigned	DEFAULT NULL			
smtp_use_authentication	tinyint(1) unsigned	DEFAULT NULL			
email_body	text				
email_to	text				
snmp_host	text				
snmp_retries	int(10) unsigned	DEFAULT NULL			
snmp_timeout	int(10) unsigned	DEFAULT NULL			
enabled	tinyint(1)	NOT NULL		0	

Test_Time

Field Name	Field Type	Nullable	Supported Values	Default	Description
system_id	tinyint(3) unsigned	NOT NULL			
last_test_occurence	datetime	NOT NULL		0000-00-00 00:00:00	

B ISR Monitor MIB

```
ACMEISR-MIB DEFINITIONS ::= BEGIN
        --IMPORTS
               --enterprises FROM SNMPv2-SMI;
          --  MODULE-IDENTITY, OBJECT-TYPE, TRAP-TYPE, enterprises
        --FROM RFC-1215;

      IMPORTS
        enterprises    FROM RFC1155-SMI
        OBJECT-TYPE    FROM RFC-1212
        DisplayString  FROM RFC1213-MIB
        TRAP-TYPE      FROM RFC-1215;
--            ACMEISR
--                       FROM ACMEISR-MIB;
-- Changes:
-- Version 1.7 (5.1M0P0 6/10/13):
--      -Defined MIB OBJECTS for Locations, Media Converters,
--          Remote Archival Clients, and Extension Data Importers.
-- Version 1.6 (5.0M1P0 1/3/13):
--      - acmeIsr Object ID now acmePacketIsr
-- Version 1.5 (5.0M1P0 12/13/12):
--      -Traps object IDs changed:
--      acmeIsrTextEvent 8 -> 2
--      acmeIsrApplicationServerEvent 2 -> 3
--      acmeIsrApplicationServerTextEvent 9 -> 4
--      acmeIsrDBTextEvent 11 -> 8
--      acmeIsrDBEvent 4 -> 9
--      acmeIsrIVRServiceEvent 3 -> 11
--      -organized for readability
-- Version 1.4 (5.0M1P0 11/5/12):
--      -nfIPCR replaced with acmeIsr
--      -Newfound IPCR and Newfound replaced with Acme Packet ISR
--      -NewfoundComm replaced with AcmeISR
-- Version 1.3 (2.2M1P2 8/31/12):
--      -Defined MIB OBJECTs for Remote Archival.
-- Version 1.2:
--      -Defined MIB OBJECTs for Dashboards, Appliances and
Archivers.
-- Version 1.1:
```

```
--      -Defined MIB OBJECTs for IPCR SIP channel component.
--      -Defined TRAP-TYPE for MIB OBJECTs in Octet String type.
-- Version 1.0:
--      -Initial MIB draft.
--      -Defined MIB OBJECTs for IPCR components, including IPCR
service, IPCR Application Service,
--              IVR service, Database service, SAN, NAS.
--     -Defined Integer and Octet String MIB OBJECT TYPE for each
component.
--      -Defined TRAP-TYPEs for each Integer MIB OBJECT.
--
        acmePacketIsr OBJECT IDENTIFIER ::= {enterprises 28153}
        acmeIsr OBJECT IDENTIFIER ::= {acmePacketIsr 1}
        acmeIsrTrapVariables OBJECT IDENTIFIER ::= {acmeIsr 9}
--
-- GET: Global Stats Counters
--
        version OBJECT-TYPE
                SYNTAX INTEGER
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Version number of the Acme Packet ISR mib."
                ::= {acmeIsr 1}
--
-- TRAP: Acme Packet ISR Traps
--
        acmeIsrEvent TRAP-TYPE
                ENTERPRISE acmeIsrState
                VARIABLES  {acmeIsrState}
                DESCRIPTION "Acme Packet ISR state event."
        ::= 1

     acmeIsrTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrStateText
                VARIABLES  {acmeIsrStateText}
                DESCRIPTION "Acme Packet ISR state text event."
        ::= 2

        acmeIsrApplicationServerEvent TRAP-TYPE
                ENTERPRISE acmeIsrApplicationServerState
                VARIABLES  {acmeIsrApplicationServerState}
                DESCRIPTION "Acme Packet ISR application server
state event."
        ::= 3

        acmeIsrApplicationServerTextEvent TRAP-TYPE
```

```
                ENTERPRISE acmeIsrApplicationServerStateText
                VARIABLES  {acmeIsrApplicationServerStateText}
                DESCRIPTION "Acme Packet ISR application server
state text event."
        ::= 4

        acmeIsrSANEvent TRAP-TYPE
                ENTERPRISE acmeIsrSANState
                VARIABLES  {acmeIsrSANState}
               DESCRIPTION "Acme Packet ISR Storage Area Network
state event."
        ::= 5

        acmeIsrNASEvent TRAP-TYPE
                ENTERPRISE acmeIsrNASState
                VARIABLES  {acmeIsrNASState}
              DESCRIPTION "Acme Packet ISR Network Area Storage
device state event."
        ::= 6

        acmeIsrSIPEvent TRAP-TYPE
                ENTERPRISE acmeIsrSIPState
                VARIABLES  {acmeIsrSIPState}
              DESCRIPTION "Acme Packet ISR SIP UAS state event."
        ::= 7

        acmeIsrDBTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrDBStateText
                VARIABLES  {acmeIsrDBStateText}
                DESCRIPTION "Acme Packet ISR database state text
event."
        ::= 8

        acmeIsrDBEvent TRAP-TYPE
                ENTERPRISE acmeIsrDBState
                VARIABLES  {acmeIsrDBState}
             DESCRIPTION "Acme Packet ISR database state event."
        ::= 9

        acmeIsrIVRServiceTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrIVRServiceStateText
                VARIABLES  {acmeIsrIVRServiceStateText}
            DESCRIPTION "Acme Packet ISR IVR service state text
event."
        ::= 10

        acmeIsrIVRServiceEvent TRAP-TYPE
                ENTERPRISE acmeIsrIVRServiceState
```

```
                VARIABLES  {acmeIsrIVRServiceState}
            DESCRIPTION "Acme Packet ISR IVR service state event."
        ::= 11

        acmeIsrSANTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrSANStateText
                VARIABLES  {acmeIsrSANStateText}
               DESCRIPTION "Acme Packet ISR Storage Area Network
state text event."
        ::= 12

        acmeIsrNASTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrNASStateText
                VARIABLES  {acmeIsrNASStateText}
              DESCRIPTION "Acme Packet ISR Network Area Storage
device state text event."
        ::= 13

        acmeIsrSIPTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrSIPStateText
                VARIABLES  {acmeIsrSIPStateText}
            DESCRIPTION "Acme Packet ISR SIP UAS state text event."
        ::= 14

        acmeIsrArchiverEvent TRAP-TYPE
                ENTERPRISE acmeIsrArchiverState
                VARIABLES  {acmeIsrArchiverState}
             DESCRIPTION "Acme Packet ISR Archiver service state
event."
        ::= 15

        acmeIsrArchiverTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrArchiverStateText
                VARIABLES  {acmeIsrArchiverStateText}
               DESCRIPTION "Acme Packet ISR SIP Archiver service
state text event."
        ::= 16

        acmeIsrApplianceEvent TRAP-TYPE
                ENTERPRISE acmeIsrApplianceState
                VARIABLES  {acmeIsrApplianceState}
              DESCRIPTION "Acme Packet ISR Appliance service state
event."
        ::= 17

        acmeIsrApplianceTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrApplianceStateText
                VARIABLES  {acmeIsrApplianceStateText}
```

```
                DESCRIPTION "Acme Packet ISR Appliance service state
text event."
        ::= 18

        acmeIsrAdminDashboardEvent TRAP-TYPE
                ENTERPRISE acmeIsrAdminDashboardState
                VARIABLES {acmeIsrAdminDashboardState}
               DESCRIPTION "Acme Packet ISR Admin Dashboard state
event."
        ::= 19

        acmeIsrAdminDashboardTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrAdminDashboardStateText
                VARIABLES {acmeIsrAdminDashboardStateText}
              DESCRIPTION "Acme Packet ISR Admin Dashboard state
text event."
        ::= 20

        acmeIsrUserDashboardEvent TRAP-TYPE
                ENTERPRISE acmeIsrUserDashboardState
                VARIABLES {acmeIsrUserDashboardState}
               DESCRIPTION "Acme Packet ISR User Dashboard state
event."
        ::= 21

        acmeIsrUserDashboardTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrUserDashboardStateText
                VARIABLES {acmeIsrUserDashboardStateText}
              DESCRIPTION "Acme Packet ISR User Dashboard state
text event."
        ::= 22

        acmeIsrRemoteArchivalWebserviceEvent TRAP-TYPE
                ENTERPRISE acmeIsrRemoteArchivalWebserviceState
                VARIABLES {acmeIsrRemoteArchivalWebserviceState}
                DESCRIPTION "Acme Packet ISR Remote Archival
Webservice state event."
        ::= 23

        acmeIsrRemoteArchivalWebserviceTextEvent TRAP-TYPE
              ENTERPRISE acmeIsrRemoteArchivalWebserviceStateText
             VARIABLES {acmeIsrRemoteArchivalWebserviceStateText}
                DESCRIPTION "Acme Packet ISR Remote Archival
Webservice state text event."
        ::= 24

        acmeIsrRemoteArchivalClientEvent TRAP-TYPE
                ENTERPRISE acmeIsrRemoteArchivalClientState
                VARIABLES {acmeIsrRemoteArchivalClientState}
```

```
                DESCRIPTION "Acme Packet ISR Remote Archival Client
state event."
        ::= 25

        acmeIsrRemoteArchivalClientTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrRemoteArchivalClientStateText
                VARIABLES {acmeIsrRemoteArchivalClientStateText}
               DESCRIPTION "Acme Packet ISR Remote Archival Client
state text event."
        ::= 26

        acmeIsrLocationEvent TRAP-TYPE
                ENTERPRISE acmeIsrLocationState
                VARIABLES {acmeIsrLocationState}
               DESCRIPTION "Acme Packet ISR Location state event."
        ::= 27

        acmeIsrLocationTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrLocationStateText
                VARIABLES {acmeIsrLocationStateText}
                DESCRIPTION "Acme Packet ISR Location state text
event."
        ::= 28

        acmeIsrMediaConverterEvent TRAP-TYPE
                ENTERPRISE acmeIsrMediaConverterState
                VARIABLES {acmeIsrMediaConverterState}
               DESCRIPTION "Acme Packet ISR Media Converter state
event."
        ::= 29

        acmeIsrMediaConverterTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrMediaConverterStateText
                VARIABLES {acmeIsrMediaConverterStateText}
              DESCRIPTION "Acme Packet ISR Media Converter state
text event."
        ::= 30

        acmeIsrExtensionDataImporterEvent TRAP-TYPE
                ENTERPRISE acmeIsrExtensionDataImporterState
                VARIABLES {acmeIsrExtensionDataImporterState}
             DESCRIPTION "Acme Packet ISR Extension Data Importer
state event."
        ::= 31

        acmeIsrExtensionDataImporterTextEvent TRAP-TYPE
                ENTERPRISE acmeIsrExtensionDataImporterStateText
                VARIABLES {acmeIsrExtensionDataImporterStateText}
```

```
            DESCRIPTION "Acme Packet ISR Extension Data Importer
state text event."
        ::= 32


--
-- OBJECT: Acme Packet ISR object types
--


        acmeIsrState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR."
                ::= {acmeIsrTrapVariables 1}


        acmeIsrStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR in String type."
                ::= {acmeIsrTrapVariables 2}


        acmeIsrApplicationServerState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's application server."
                ::= {acmeIsrTrapVariables 3}


        acmeIsrApplicationServerStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's application server in String type."
                ::= {acmeIsrTrapVariables 4}


        acmeIsrIVRServiceState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
```

```
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's IVR service."
                ::= {acmeIsrTrapVariables 5}

        acmeIsrIVRServiceStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's IVR service in String type."
                ::= {acmeIsrTrapVariables 6}

        acmeIsrDBState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's database."
                ::= {acmeIsrTrapVariables 7}

        acmeIsrDBStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's database in String type."
                ::= {acmeIsrTrapVariables 8}

        acmeIsrSANState  OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's Storage Area Network."
                ::= {acmeIsrTrapVariables 9}

        acmeIsrSANStateText  OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's Storage Area Network in String type."
```

```
                ::= {acmeIsrTrapVariables 10}

        acmeIsrNASState  OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's Network Area Storage device."
                ::= {acmeIsrTrapVariables 11}

        acmeIsrNASStateText  OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's Network Area Storage device in String type."
                ::= {acmeIsrTrapVariables 12}

        acmeIsrSIPState  OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's SIP UAS."
                ::= {acmeIsrTrapVariables 13}

        acmeIsrSIPStateText  OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of operation for Acme
Packet ISR's SIP User Agent Server in String type."
                ::= {acmeIsrTrapVariables 14}

        acmeIsrArchiverState  OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's Archiver service."
                ::= {acmeIsrTrapVariables 15}

        acmeIsrArchiverStateText  OBJECT-TYPE
```

```
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of operation for Acme
Packet ISR's Archiver service in String type."
                ::= {acmeIsrTrapVariables 16}

        acmeIsrApplianceState  OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's Appliance service."
                ::= {acmeIsrTrapVariables 17}

        acmeIsrApplianceStateText  OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of operation for Acme
Packet ISR's Appliance service in String type."
                ::= {acmeIsrTrapVariables 18}

        acmeIsrAdminDashboardState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of the operational state
of Acme Packet ISR's Admin Dashboard."
        ::= {acmeIsrTrapVariables 19}

        acmeIsrAdminDashboardStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of operation for Acme
Packet ISR's Admin Dashboard in String type."
        ::= {acmeIsrTrapVariables 20}

        acmeIsrUserDashboardState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
```

```
                DESCRIPTION
                "Indication of the state of the operational state
of Acme Packet ISR's User Dashboard."
        ::= {acmeIsrTrapVariables 21}

        acmeIsrUserDashboardStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of operation for Acme
Packet ISR's User Dashboard in String type."
        ::= {acmeIsrTrapVariables 22}

        acmeIsrRemoteArchivalWebserviceState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the operational state of Acme Packet
ISR Remote Archival Webservice."
        ::= {acmeIsrTrapVariables 23}

        acmeIsrRemoteArchivalWebserviceStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the state of operation for Acme
Packet ISR Remote Archival Webservice in String type."
        ::= {acmeIsrTrapVariables 24}

        acmeIsrRemoteArchivalClientState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Remote Archival Client."
        ::= {acmeIsrTrapVariables 25}

        acmeIsrRemoteArchivalClientStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
               "Indication of the state of operation for an Acme
Packet ISR Remote Archival Client in String type."
```

```
        ::= {acmeIsrTrapVariables 26}

        acmeIsrLocationState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Location."
        ::= {acmeIsrTrapVariables 27}

        acmeIsrLocationStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Location in String type."
        ::= {acmeIsrTrapVariables 28}

        acmeIsrMediaConverterState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Media Converter."
        ::= {acmeIsrTrapVariables 29}

        acmeIsrMediaConverterStateText OBJECT-TYPE
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Media Converter in String type."
        ::= {acmeIsrTrapVariables 30}

        acmeIsrExtensionDataImporterState OBJECT-TYPE
                SYNTAX INTEGER {up(1),down(0)}
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Extension Data Importer."
        ::= {acmeIsrTrapVariables 31}

        acmeIsrExtensionDataImporterStateText OBJECT-TYPE
```

```
                SYNTAX OCTET STRING (SIZE (0..255))
                MAX-ACCESS read-only
                STATUS current
                DESCRIPTION
                "Indication of the operational state of an Acme
Packet ISR Extension Data Importer in String type."
        ::= {acmeIsrTrapVariables 32}

END
```