Network Connectivity Monitor Service Assurance Manager Notification Adapters User's Guide

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Contents

Preface

The purpose of this guide is to provide information about how you can use Cisco Network Connectivity Center (CNCC) Network Connectivity Monitor (NCM) Notification Adapters to manage the flow of data between your NCM Global Manager (or Domain Manager) and other applications or locations on the network.

Intended Audience

This guide is intended to be read by any user who needs to run or configure the following Notification Adapters:

- E-Mail Adapter
- Log File Adapter
- Script Adapter
- SNMP Adapter
- CNCC Adapter for TIBCO Rendezvous

Prerequisites

This document assumes the adapters have already been installed. NCM Notification Adapters are considered part of the NCM software platform and are therefore installed automatically as part of all CNCC server applications.

Document Organization

This guide consists of the following sections:

1. INTRODUCTION	Describes the purpose of each adapter.
2. RUNNING THE NOTIFICATION ADAPTERS	Provides general information about the adapters including how to start and stop them.
3. E-MAIL ADAPTER	Describes how to configure the E-Mail Adapter.
4. LOG FILE ADAPTER	Describes how to configure the Log File Adapter.
5. SNMP TRAP ADAPTER	Describes how to configure the SNMP Trap Adapter.
6. SCRIPT ADAPTER	Describes how to configure the Script Adapter.
7. CNCC ADAPTER FOR TIBCO RENDEZVOUS	Describes how to configure the TIBCO Rendezvous Adapter.
8. NOTIFICATION ADAPTER FRAMEWORK	Describes the framework ASL scripts that control the operation of an adapter.
9. NOTIFICATION ATTRIBUTES	Describes the notification attributes for the NCM applications and the CNCC NCM Service Assurance Manager.
A. CUSTOMIZING THE E-MAIL ADAPTER	Provides an example of how to edit the ASL scripts to customize the E-Mail Adapter.
B. EXAMPLE E-MAIL CONFIGURATION FILES	Provides an example E-Mail configuration file.
C. EXAMPLE ASL FILES	Provides example ASL files.
D. TROUBLESHOOTING ADAPTERS	Lists common adapter issues and explains how to resolve those issues.

Table 1: **Document Organization**

Documentation Conventions

Several conventions may be used in this document as shown in Table 2.

CONVENTION	EXPLANATION
`sample code`	Indicates code fragments and examples in Courier font
keyword	Indicates commands, keywords, literals, and operators in bold
`%`	Indicates C shell prompt
`#`	Indicates C shell superuser prompt
<parameter>	Indicates a user-supplied value or a list of non-terminal items in angle brackets
[option]	Indicates optional terms in brackets
/InCharge	Indicates directory path names in italics
yourDomain	Indicates a user-specific or user-supplied value in bold, italics
File > Open	Indicates a menu path in italics

Table 2: **Documentation Conventions**

Directory path names are shown with forward slashes (/). Users of the Windows operating systems should substitute back slashes (\) for forward slashes.

Also, if there are figures illustrating consoles in this document, they represent the consoles as they appear in Windows. Under UNIX, the consoles appear with slight differences. For example, in views that display items in a tree hierarchy such as the Topology Browser, a plus sign displays for Windows and an open circle displays for UNIX.

Finally, unless otherwise specified, the term CNCC Manager is used to refer to NCM programs such as Domain Managers, Global Managers, and adapters.

NCM Installation Directory

In this document, the term ***BASEDIR*** represents the location where NCM software is installed.

- For UNIX, this location is: */opt/InCharge<n>/<productsuite>*.
- For Windows, this location is: *C:\InCharge<n>\<productsuite>*.

The <*n*> represents the software platform version number. The <*productsuite*> represents the product suite that the product is part of.

Table 3 defines the <*productsuite*> directory for each product.

PRODUCT SUITE	INCLUDES THESE PRODUCTS	DIRECTORY
CNCC NCM IP Management Suite	• IP Availability Manager • IP Performance Manager • IP Discovery Manager • CNCC NCM Adapter for HP OpenView NNM • CNCC NCM Adapter for IBM/Tivoli NetView • CNCC NCM Adapter for CiscoWorks LMS and ITEM	/IP
CNCC NCM Service Assurance Management Suite	• Service Assurance Manager • Global Console • Business Dashboard • Business Impact Manager • Report Manager • SAM Failover System • Notification Adapters • Adapter Platform • SQL Data Interface Adapter • SNMP Trap Adapter • Syslog Adapter • XML Adapter • Adapter for Remedy • Adapter for TIBCO Rendezvous • Adapter for Concord eHealth • Adapter for InfoVista • Adapter for NetIQ AppManager	/SAM
InCharge Application Management Suite	• Application Services Manager • Beacon for WebSphere • Application Connectivity Monitor	/APP
InCharge Security Infrastructure Management Suite	• Security Infrastructure Manager • Firewall Performance Manager • InCharge Adapter for Check Point/Nokia • InCharge Adapter for Cisco Security	/SIM
InCharge Software Development Kit	• Software Development Kit	/SDK

Table 3: **Product Suite Directory for NCM Products**

For example, on UNIX operating systems, CNCC NCM IP Availability Manager is, by default, installed to */opt/InCharge6/IP/smarts*. This location is referred to as ***BASEDIR****/smarts*.

Optionally, you can specify the root of ***BASEDIR*** to be something other than */opt/InCharge6* (on UNIX) or *C:\InCharge6* (on Windows), but you cannot change the <*productsuite*> location under the root directory.

For more information about the directory structure of NCM software, refer to the *Network Connectivity Monitor System Administration Guide*.

Additional Resources

In addition to this manual, Cisco provides the following resources.

Commands

Descriptions of commands are available as HTML pages. The *index.html* file, which provides an index to the various commands, is located in the ***BASEDIR****/smarts/doc/html/usage* directory.

Documentation

Readers of this manual may find other documentation (also available in the ***BASEDIR****/smarts/doc/pdf* directory) helpful.

Network Connectivity Monitor Documentation

The following documents are product independent and thus relevant to users of all Network Connectivity Monitor products:

- *Release Notes for Network Connectivity Monitor 1.1*
- *Network Connectivity Monitor Documentation Roadmap*
- *Network Connectivity Monitor System Administration Guide*
- *ICIM Reference*
- *InCharge ASL Reference Guide*
- *Cisco Network Connectivity Center Perl Reference Guide*

Network Connectivity Monitor Service Assurance Management Documentation

The following documents are relevant to users of the CNCC NCM Service Assurance Management product suite.

- *Network Connectivity Monitor Service Assurance Management Suite Installation Guide*
- *An Introduction to Network Connectivity Monitor Service Assurance Manager*

- *Network Connectivity Monitor Operator's Guide*
- *Network Connectivity Monitor Service Assurance Manager Configuration Guide*
- *InCharge Service Assurance Manager Business Dashboard Configuration Guide*
- *InCharge Service Assurance Manager User's Guide for Business Impact Manager*
- *InCharge Service Assurance Manager User's Guide for Report Manager*
- *InCharge Service Assurance Manager Failover System User's Guide*

The following documents are relevant to CNCC NCM Service Assurance Manager adapters.

- *Network Connectivity Monitor Service Assurance Manager Notification Adapters User's Guide*
- *InCharge Service Assurance Manager SQL Data Interface Adapter User's Guide*
- *Network Connectivity Monitor Service Assurance Manager Adapter Platform User's Guide*
- *InCharge XML Adapter User's Guide*
- *InCharge Service Assurance Manager User's Guide for Remedy Adapter*
- *InCharge Service Assurance Manager User's Guide for Concord eHealth Adapter*
- *InCharge Connectivity Monitor Service Assurance Manager User's Guide for InfoVista Adapter*

Common Abbreviations and Acronyms

The following lists common abbreviations and acronyms that are used in the InCharge guides.

ASL	Adapter Scripting Language
CDP	Cisco Discovery Protocol
ICIM	InCharge Common Information Model
ICMP	Internet Control Message Protocol

IDS	Incremental Device Support
IP	Internet Protocol
MSFC	Multilayer Switch Feature Card
MIB	Management Information Base
MODEL	Managed Object Definition Language
RSFC	Router Switch Feature Card
RSM	Router Switch Module
SNMP	Simple Network Management Protocol
TCP	Transmission Control Protocol
VLAN	Virtual Local Area Network

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Cisco Technical Support Website

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http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

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Introduction

You can use a CNCC NCM Notification Adapter (notifier) to pass information contained in CNCC NCM Service Assurance Manager notifications to other applications or to users. For example, you can use a notifier to convert notifications into e-mail messages or SNMP traps, write the notification text to a log file, or execute a script upon receiving a notification. Table 4 describes the purpose of each notifier.

ADAPTER	DESCRIPTION
E-Mail Adapter	Sends notifications from a global manager to specific addresses in an e-mail system
Log File Adapter	Logs notifications from a global manager to a file
SNMP Trap Adapter	Converts notifications into SNMP traps and sends the traps to specified locations
Script Adapter	Calls a custom script when a notification is received
CNCC Adapter for TIBCO Rendezvous	Publishes notifications as TIB/Rendezvous messages so that other TIB/Rendezvous applications can subscribe (listen) to them

Table 4: **Notification Adapters and Descriptions**

Note: Although you can use a notifier to pass information contained in any CNCC Manager's notifications, we recommend that you always pass information from a Service Assurance Manager.

The notifiers operate similarly, but are independent of each other.

The following are additional examples of typical notifier usage:

- Write notifications to a log.
- Execute a program, such as a paging service or email, upon receipt of a notification.
- Extend and get additional information about a notification.
    - Get the impact when you receive a notification.
    - Get the system location of a failing device.
- Open a trouble ticket using a third-party package.

2

Running the Notification Adapters

This section contains the common operator tasks for the CNCC NCM Notification Adapters (notifiers). Any differences between the notifiers are noted and discussed in detail in the following sections.

Configuration Files

When a notifier starts, it reads a configuration file (*.*conf*). Original versions of the adapter configuration files are installed to the ***BASEDIR****/smarts/conf/notifier* directory. You should retain, unedited, the original version of each configuration file. If you intend to modify a configuration file you should use the *sm_edit* utility provided with your software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory. For more information on modifying files and using *sm_edit* refer to *Editing NCM Notification Adapter Files* on page 4. Table 5 lists the name of each notifier's configuration file.

ADAPTER	CONFIGURATION FILE NAME
E-Mail Adapter	*mail-notify.conf*
File Adapter	*file-notify.conf*
SNMP Trap Adapter	*trap-notify.conf*
Script Adapter	*script-notify.conf*
CNCC Adapter for TIBCO Rendezvous	*tibrv-notify.conf*

Table 5: Notification Adapter Configuration Files

The configuration files for each of these notifiers share some common parameters and subscription information. The configuration files are text files.

Note: Whenever you modify a configuration file, you must stop and restart the notifier for the changes to take effect.

Editing NCM Notification Adapter Files

As part of the NCM deployment and configuration process, you will need to modify certain files. User modifiable files include tool scripts, configuration files, rule set files, and templates. Original versions of these files are installed into appropriate subdirectories under the ***BASEDIR****/smarts/* hierarchy. For example, on UNIX operating systems the original versions of Global Manager configuration files are installed to */opt/InCharge6/SAM/smarts/conf/ics.*

To edit a user modifiable file, create a local copy of the file in ***BASEDIR****/smarts/local* or one of its subdirectories. For example, a modified *ics.conf* file should be saved to */opt/InCharge6/SAM/smarts/local/conf/ics.* InCharge software is designed to first search for user modifiable files in ***BASEDIR****/smarts/local* or one of its subdirectories. If a modified version of a file is not found in the local area, NCM software then searches appropriate nonlocal directories.

Note: Original versions of files may be changed or updated as part of a software upgrade. However, files located in ***BASEDIR****/smarts/local* are always retained during an upgrade.

To facilitate proper file editing, Cisco provides the *sm_edit* utility with every product suite. When used to modify an original version of a file, this utility automatically creates a local copy of the file and places it in the appropriate location under ***BASEDIR/****smarts/local.* This ensures that the original version of the file remains unchanged. In both UNIX and Windows environments, you can invoke *sm_edit* from the command line. Optionally, you can configure Windows so that *sm_edit* is automatically invoked when user-modifiable files are double-clicked in Windows Explorer.

To invoke the *sm_edit* utility from the command line, specify the path and the name of the file you want to edit under ***BASEDIR/****smarts.* If multiple NCM products are running on the same host, you should ensure that you invoke *sm_edit* from the *bin* directory of the product suite whose files you wish to edit. For example, to edit the configuration file for the Global Manager, you invoke the *sm_edit* utility as follows:

```
# /opt/InCharge6/SAM/smarts/bin/sm_edit conf/ics/ics.conf
```

The *sm_edit* utility automatically creates a local copy of the *ics.conf* file in the ***BASEDIR/****smarts/local/conf/ics* directory, if necessary, and opens the file in a text editor. If a local version of the file already exists, the *sm_edit* utility opens the local version in a text editor. In addition, *sm_edit* creates any necessary directories.

For more information about how to properly edit user modifiable files and how to use the *sm_edit* utility, refer to the *Network Connectivity Monitor System Administration Guide*.

Subscriptions

The notifiers can subscribe to either Service Assurance Manager or to a CNCC NCM IP application. You define this in the Subscriptions section of the notifier's configuration file. We recommend you subscribe to Service Assurance Manager notifications.

Service Assurance Manager

You use a notification list to subscribe an adapter to a Service Assurance Manager. For example, to subscribe the Log File Notifier to the default notification list, use the following:

```
SubscribesTo =
{
GA_NLSubscription::file-Default-NLSubscriptions
{
                        NLName = "Default"
}
                }
```

CNCC NCM IP Applications

Use the choice subscription to subscribe an adapter to a CNCC NCM IP application (for example, Availability Manager). This notification list is defined in the *ics.conf* file. For example, to subscribe the CNCC Adapter for TIBCO Rendezvous to all problems reported in the NCM domain, use the following:

```
SubscribesTo =
{
GA_ChoiceSubscription::tibrv-All-Problems-Subscriptions
         {
                        className = ".*"
                     instanceName = ".*"
                        eventName = ".*"
                         problems = TRUE
                       aggregates = FALSE
                         symptoms = FALSE
         }
```

Starting a Notification Adapter

Note: The installation process does not configure the notifiers to run automatically. However, the notifiers can be installed as services, and started and stopped with the use of the sm_service utiltiy. See the *Network Connectivity Monitor System Administration Guide* for additional information on the use of the sm_service utility.

You start these notifiers manually. To start the notifiers, use the following command:

```
% BASEDIR/smarts/bin/sm_notify --output=<file>
<notifier_name>
```

Table 6 lists the notifier names to use with **sm_notify**.

ADAPTER	ADAPTER NAME
E-Mail Adapter	mail
File Adapter	file
SNMP Trap Adapter	trap
Script Adapter	script
CNCC Adapter for TIBCO Rendezvous	tibrv

Table 6: **Notification Adapters and Names**

You can use additional parameters with the **sm_notify** command to override information about the global manager or the Service Assurance Broker, change logging information, or run the notifier as a daemon (UNIX only). Table 7 lists some of the parameters to be set for **sm_notify**.

PARAMETER	DESCRIPTION
`--server=<name>`	This parameter sets the global manager connection. If this is not specified, the notifier uses the value in the configuration file.
`--broker=<location>`	This parameter overrides the use of the variable SM_BROKER (Environment variable in UNIX and System variable in Windows). The format of <location> is <host>:<port>.
`--daemon`	This parameter runs the process as a daemon (UNIX only).
`--output[=<file>]`	This parameter redirects the output to ***BASEDIR****/smarts/local/logs/<file>.log*. If you run multiple instances of the same notifier on the same machine, you must specify an output location for each of the log files. The notifiers cannot write to the same log file.
`--conf`	This parameter specifies the configuration file to use for the notifier. This parameter is useful if you need to use the **sm_notify** command to start more than one notifier (such as two E-Mail Notifiers) on a single host. Since each notifier references a unique configuration file, the notifiers can be configured to behave differently by, for example, subscribing to different notifications or sending the notifications to different locations.
`--confdir`	This parameter specifies the location (directory) of the notifier's configuration file. This parameter can also be used to start multiple copies of a notifier on the same host or it can be used to start many notifiers from a centrally located set of configuration files.

Table 7: **sm_notify Parameters and Descriptions**

Running Multiple Copies of a Notification Adapter

If you want to start more than one copy of the same notifier, for example, to use two File Notifiers with a different global manager or to have two E-Mail Notifiers subscribe to different notifications from the same global manager, you should use the `--conf` or `--confdir` parameters.

Stopping a Notification Adapter

To stop a notifier you need to kill the process in UNIX or use the Task Manager in Windows. The Task Manager is accessed using Ctrl+Alt+Delete and clicking Task Manager.

To kill the process in UNIX, you need to first find the process ID and then kill the process:

```
% ps -elf | grep sm_notify
janedoe  14563 3830  0 14:38:14 pts/35   0:01 sm_notify mail
% kill 14563
```

Logging Notification Adapter History

When the `--output` option is specified, each notifier stores its working history in a log file. Every time a notifier starts, when errors occur, or when the connection with a global manager is lost, the notifier logs information to the log file.

Each notifier writes its log file to ***BASEDIR****/smarts/local/logs*. When the notification notifiers run on the same machine, you must specify a unique name for the log file of each notifier.

All log files have a "*.log*" file type. The name of a CNCC server's log file is based on the server's name. For example, if the name of the Domain Manager is NCM, the log file is named *NCM.log*.

NCM software can maintain up to 1,000 different copies of backup log files. The number of copies is determined by the value of the SM_BACKUP_FILE_LIMIT environment variable. When an adapter starts up, it renames a file that matches its log file name, adding a *".bak"* to the name; for example, *NCM.log* to NCM*.log.bak*. If a file with this name already exists, it is renamed *NCM.log.bak.NNN*, and a new *NCM.log.bak* is created.

Log files grow indefinitely, though slowly under normal conditions.

Starting a New Log File

You can request that a CNCC NCM adapter start a new log file, often referred to as *rolling over* a log file. Typically, this is done when a log file becomes quite large.

The roll_log command is invoked through *dmctl* utility, which requires that you attach to the adapter with administrative privileges. The syntax of the command is as follows:

```
roll_log [file-name]
```

The *file-name* option enables you to specify a new name for subsequent log files. If you omit this option, the current naming convention is retained. If you specify a name, the new log file uses that name. Any new log files created with roll_log will also use this name if a different name is not specified. The new name specified by file-name is handled in exactly the same manner as the `--output` option to the sm_server command.

When roll_log is invoked, the adapter writes an informational message to the end of the current log file, then repeats the steps it executed at startup, moves the current *".log"* file to the *".log.bak"* file, and opens a new *".log"* file. All subsequent logging information goes to the new file.

You can repeat the log file roll-over process as many times as you like. Note, however, that the level of log file backup maintained is limited by the value of SM_BACKUP_FILE_LIMIT. If you need to retain log files beyond this limit, you should copy or at least rename the *".log.bak"* files as soon as they are created.

For more information about managing and rolling over log files, refer to the *Network Connectivity Monitor System Administration Guide*.

Alternative Method for UNIX Systems

On UNIX systems *only*, it is also possible to request that a notifier "roll over" its log files. You do this by sending a **SIGUSR1** signal to the process ID writing the log file. Use the kill command of your shell:

```
% kill -USR1 <pid>
```

Upon receipt of the USR1 signal, a notifier first writes an informational message to the end of the current log file, then repeats the steps it executed at startup, moves the current ".log" file to the ".log.bak" file, and opens a new ".log" file. All subsequent logging information goes to the new file. You can repeat the log file roll-over process as many times as you like. If you need to retain older log files, you should copy or at least rename the ".log.bak" files as soon as they are created.

3

E-Mail Adapter

The E-Mail Adapter (Notifier) sends e-mail, based on notifications, to a designated list of users via an SMTP server.

All notifications received by the E-Mail Notifier are sent as e-mail to one or more users, as shown in Figure 1. The E-Mail Notifier sends the same information to all of the recipients.

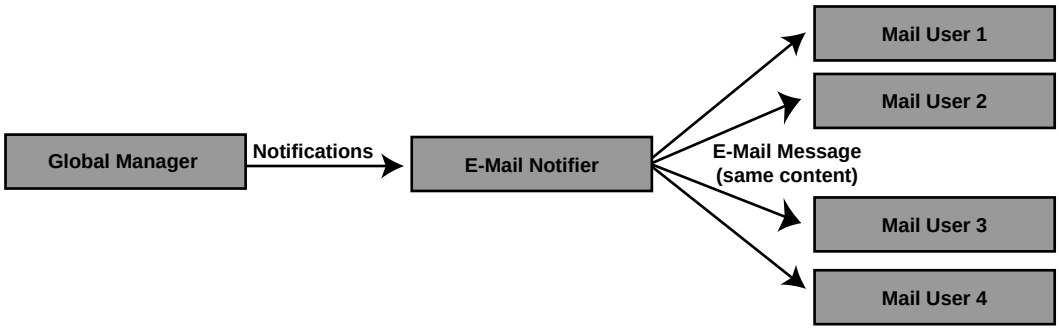

Figure 1: **E-Mail Notifier**

The E-Mail Notifier sends information about event notifications. By default, it does not send information when an event is cleared.

Each e-mail sent has the form:

Subject:

```
NOTIFY <Affected_Instance_Name> <Event_Name>
```

Body:

```
CNCC Server <serverName>:
```

```
NOTIFY <Class_Name> <Affected_Instance_Name> <Event_Name>
(<Certainty %>)
<Event_Description>
```

Configuring the E-Mail Adapter

The file, *mail-notify.conf*, configures the notifier. The original version of the file is located in ***BASEDIR****/smarts/conf/notifier*. You should retain, unedited, the original version of the configuration file. A local copy should be made if you intend to make any modifications. If you intend to modify a configuration file you should use the sm_edit utility provided with your software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory. For more information on modifying files and using sm_edit refer to *Editing NCM Notification Adapter Files* on page 4.

If you modify the configuration file while the notifier is running, you will need to restart the notifier so that it re-reads its configuration file.

E-Mail Adapter Parameters

Before this notifier will work, you must set values for the following parameters:

- MailServer
- SenderId
- Recipients

The other parameters may remain unchanged. You can also change the subscriptions for this notifier (see *Subscriptions* on page 5). Table 8 describes each parameter for the E-Mail Notifier.

PARAMETER	DESCRIPTION
serverName	This is the default name of the global manager to connect to. Note that this is the name of the global manager, not the name of the host it is running on. The default is NCM-SA.
eventSmoothingInterval	This is the time that an event must remain active before the notifier sends a notification. The default is 0 seconds. Service Assurance uses the value from the NotificationList definition.
minimumCertainty	This is the threshold above which notifications are sent. Any notification with a certainty below the threshold is discarded. The default is a certainty of 0.01. This value must be a number between 0.0 and 1.0. Service Assurance uses the value from the NotificationList definition.
initialEventDelay	This describes the time interval the notifier should wait after it connects to the global manager before accepting events. The default is 0 seconds.
MailServer	This is the name for the mail server.
SenderId	This is the e-mail address associated with the notifier. Users can reply to this address. This address must be recognized by the mail server.
Recipients	This is a comma separated list of the recipients of the e-mails. The recipients in the list must be recognized by the mail server.

Table 8: **E-Mail Notifier Parameters and Descriptions**

For an example of how to customize the E-Mail Adapter, refer to *Customizing the E-Mail Adapter* on page 39.

4

Log File Adapter

The Log File Adapter (Notifier) places, in a file, the notifications that it subscribes to. This notification file can include event notifications (including cleared events). The output is a single line with the following information:

```
Current_Time
Event_Type
Class_Name
Affected_Instance_Name
Event_Name
Certainty
Event_Description
```

The notifier saves the notification file to the ***BASEDIR****/smarts/local/logs* directory. By default, the name of the file is:

```
<global manager>-alarms.log
```

Figure 2 illustrates how the Log File Notifier receives alarms and adds them to a notification file.

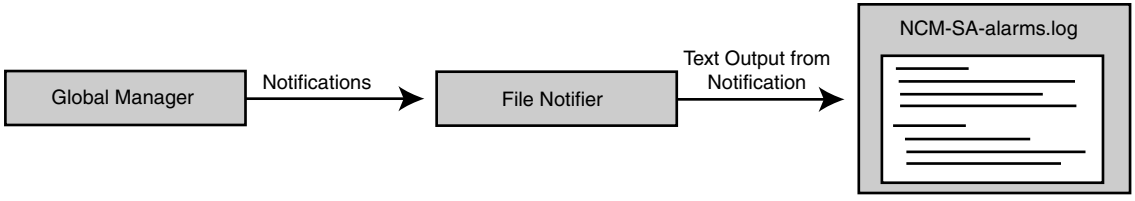

Figure 2: **Log File Notifier**

Configuring the Log File Adapter

The configuration file, *file-notify.conf*, configures the notifier. The original version of the file is located in ***BASEDIR****/smarts/conf/notifier*. You should retain, unedited, the original version of the configuration file. If you intend to modify a configuration file you should use the sm_edit utility provided with your software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory.

You do not need to change any of the parameters in the configuration file before starting this notifier. But, if you decide you want to change a parameter, be sure to use the sm_edit utility to edit the configuration file. For information on how to modify files and use sm_edit, refer to *Editing NCM Notification Adapter Files* on page 4. If you edit the configuration file while the notifier is running, you will need to restart the notifier so that it rereads its configuration file.

Log File Adapter Parameters

Table 9 describes each parameter for the Log File Notifier. See *Subscriptions* on page 5, to learn how to optionally change the subscriptions for this notifier to receive different types of notifications.

PARAMETER	DESCRIPTION
serverName	This is the default name of the global manager to connect to. Note that this is the name of the global manager, not the name of the host it is running on. The default is NCM-SA.
eventSmoothingInterval	This is the time that an event must remain active before the notifier sends a notification. The default is 0 seconds. Service Assurance uses the value from the NotificationList definition.
minimumCertainty	This is the threshold above which notifications are sent. Any notification with a certainty below the threshold is discarded. The default is a certainty of 0.01. This value must be a number between 0.0 and 1.0. Service Assurance uses the value from the NotificationList definition.
initialEventDelay	This describes the time interval the notifier should wait after it connects to the global manager before accepting events. The default is 0 seconds.
fileName	This is the full name of the notification file. The name cannot contain path separators. If you do not assign a value, the name of the notification file is <global manager>-alarms.log.

Table 9: **Log File Notifier Parameters and Descriptions**

5

SNMP Trap Adapter

The SNMP Trap Adapter (Notifier) converts notifications into SNMP traps. This notifier sends the traps to specific trap receivers on the network as shown in Figure 3.

Figure 3: **SNMP Trap Notifier**

All of the traps sent by the SNMP Trap Notifier have the same features:

- Agent Address = IP address for host running the notifier
- Enterprise OID = enterprises.733 (Full OID is .1.3.6.1.4.1.733)
- Generic Trap Number = 6
- Varbind sequence always the same for all of the traps

Table 10 shows the types of traps that the SNMP Trap Notifier sends.

TRAP NAME	TRAP NUMBER
smTrapNotification	4
smTrapNotificationClear	7

Table 10: **Trap Types**

Table 11 shows the nine varbinds of the SNMP Traps sent by the SNMP Trap Notifier.

VARBIND NAME	VARBIND NUMBER	DESCRIPTION
smNotifTimestamp	enterprises.733.2.1.1.0	Timestamp of the notification. (unsigned 32-bit integer)
smNotifServer	enterprises.733.2.1.2.0	Name of the global manager sending events to the SNMP Trap Notifier. (string)
smNotifClass	enterprises.733.2.1.3.0	Class name associated with an event. (string)
smNotifInstance	enterprises.733.2.1.4.0	Instance display name associated with an event. (string)
smEventName	enterprises.733.2.1.5.0	Name of the event. (string)
smNotifInstanceID	enterprises.733.2.1.6.0	Combination of class name and the instance name (as stored in the repository). Has the form <class name>::<instance name>. (string)
smNotifDescription	enterprises.733.2.1.7.0	Description of the event. (string)
smNotifCertainty	enterprises.733.2.1.8.0	Printed value of a floating point number that is the certainty of an event. (string)
smNotifSeverity	enterprises.733.2.1.9.0	Severity of the event. (integer)

Table 11: **Varbinds of the SNMP Traps**

Configuring the SNMP Trap Adapter

The file, *trap-notify.conf*, configures this notifier. The original version of the file is located in ***BASEDIR****/smarts/conf/notifier*. You should retain, unedited, the original version of the configuration file. If you intend to modify the configuration file you should use the sm_edit utility provided with your software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory. For more information on modifying files and using sm_edit refer to *Editing NCM Notification Adapter Files* on page 4.

If you edit the configuration file while the notifier is running, you will need to restart the notifier so that it rereads its configuration file.

SNMP Trap Adapter Parameters

Before this notifier will work, you must set values for the destinations. The other parameters may remain unchanged. Table 12 describes the parameters for the SNMP Trap Notifier. See *Subscriptions* on page 5 to learn how to change the subscriptions for this notifier.

PARAMETER	DESCRIPTION
serverName	This is the default name of the global manager to connect to. Note that this is the name of the global manager, not the name of the host it is running on. The default is NCM-SA.
eventSmoothingInterval	This is the time that an event must remain active before the notifier sends a notification. The default is 0 seconds. Service Assurance uses the value from the NotificationList definition.
minimumCertainty	This is the threshold above which notifications are sent. Any notification with a certainty below the threshold is discarded. The default is a certainty of 0.01. This value must be a number between 0.0 and 1.0. Service Assurance uses the value from the NotificationList definition.
initialEventDelay	This describes the time interval the notifier should wait after it connects to the global manager before accepting events. The default is 0 seconds.
Destinations	This is a table of destinations for the SNMP traps. Each row consists of three different values: host name or IP address, port number and SNMP version. The values are separated by commas. Surround each row with curly braces. Each row is also separated from the next by a comma. Also surround the complete set of rows with curly braces.

Table 12: **SNMP Trap Notifier Parameters and Descriptions**

The format for destinations is:

```
Destinations = { {"host_or_IP", port_number, "SNMP_Version"}
             }
```

You need to surround each single destination with a pair of curly braces and the entire set of destinations with another pair of curly braces. Even for a single destination, you must use both pairs of braces. For multiple destinations, separate each destination with a comma.

Surround the host name or IP address with quotation marks.

Valid values for SNMP_Version are V1 and V2C. You must use uppercase letters and quotation marks.

An example of destinations:

```
Destinations = { {"localhost", 162, "V1"},
                 {"other-host", 30162, "V2C"}
               }
```

Note: If there are any mistakes in the configuration file, the notifier will generate error messages on start and abort.

6

Script Adapter

The Script Adapter (Notifier) allows you to automatically take an action when a notification is received. Upon receiving a notification, the Script Notifier invokes a custom script supplied by you that performs user-defined actions. For example, you can create a Script Notifier to send a page, using a paging service. Another Script Notifier might invoke an audible alarm when mission critical notifications are received.

Figure 4 illustrates how the Script Notifier receives notifications and invokes a script.

Figure 4: **Script Notifier**

Configuring the Script Adapter

The configuration file, *script-notify.conf*, configures this notifier. The original version of the file is located in ***BASEDIR****/smarts/conf/notifier*. You should retain, unedited, the original version of the configuration file. If you intend to modify a configuration file you should use the sm_edit utility provided with your SMARTS software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory. For more information on modifying files and using sm_edit refer to *Editing NCM Notification Adapter Files* on page 4.

If you edit the configuration file while the notifier is running, you will need to restart the notifier so that it rereads its configuration file.

In order for the Script Notifier to function, you need to create a script to perform the desired action. Whenever the notifier receives a notification, it will call the script you have created. Save your custom script in ***BASEDIR****/smarts/local/actions.* The Script Adapter arguments for your script are located in ***BASEDIR****/smarts/local/rules/notifier/script/script-custom.asl*.

You also need to change the scriptName parameter in the *script-notify.conf* file by deleting the # at the beginning of the line and replacing the string "myScript" with the name of the custom script you want to run.

The script files must have appropriate read/execute permissions, and must return an exit status of 0 for success and non-zero for failure.

Script Adapter Parameters

Table 13 describes each parameter for the Script Notifier. See *Subscriptions* on page 5, to learn how to optionally change the subscriptions for this notifier to receive different types of notifications.

PARAMETER	DESCRIPTION
serverName	This is the default name of the global manager to connect to. Note that this is the name of the global manager, not the name of the host it is running on. The default is NCM-SA.
scriptName	This is the base name of the script to execute. The name cannot contain path separators.
eventSmoothingInterval	This is the time that an event must remain active before the notifier sends a notification. The default is 0 seconds. Service Assurance uses the value from the NotificationList definition.
minimumCertainty	This is the threshold above which notifications are sent. Any notification with a certainty below the threshold is discarded. The default is a certainty of 0.01. This value must be a number between 0.0 and 1.0. Service Assurance uses the value from the NotificationList definition.
initialEventDelay	This describes the time interval the notifier should wait after it connects to the global manager before accepting events. The default is 0 seconds.

Table 13: **Script Notifier Parameters and Descriptions**

Script Adapter Versus sm_adapter Automated Tools

Service Assurance Manager also provides the **sm_adapter** command line option, which you can use to automate a server tool (script). One primary difference between this and the Script Notifier is that automated tools set up by **sm_adapter** also must be available from the Global Console. Therefore, if you do not want access to your script from the Global Console, you may prefer to use the Script Notifier to automate your action. The following summarizes other functional differences between an automated tool action and a Script Notifier action.

- Automated Service Assurance actions must be configured in the ToolSection of global manager's *ics.conf*; Script Notifier actions do not need to be configured in this file.
- Script Notifier actions cannot be invoked from the Global Console.
- Automated Service Assurance actions execute on the global manager by the user running the global manager (with all the security implications, and the overhead for the global manager process); Script Notifier actions run on any **sm_notify** adapter host (with all the connectivity implications), by any user. For more information on security implications, refer to the *Network Connectivity Monitor System Administration Guide*.
- Parameters to automate Service Assurance actions are passed as environment variables, pre-configured (hard-coded) by Cisco; parameters to Script Notifier actions are passed from the *script-custom.asl*, and are user configurable.
- Automated Service Assurance actions can return an output to the caller; Script Notifier actions can only return a status.
- Script Notifier actions are synchronous; by default, automated Service Assurance actions are synchronous as well, but you can use asynchronous actions if you make minor modifications to the *auto-action.asl* file.
- Script Notifier actions can be used with any NCM application, not just Service Assurance; this means that you can subscribe and trigger a Script Notifier action upon receipt of a notification from any NCM application.

For additional Information about automated tools, refer to the *Network Connectivity Monitor Service Assurance Manager Configuration Guide*.

7

CNCC Adapter for TIBCO Rendezvous

The CNCC Adapter for TIBCO Rendezvous (TIBCO Adapter) receives notifications and publishes (sends) them as TIBCO Rendezvous messages. Other TIBCO Rendezvous applications can subscribe (listen) to the messages published by this notifier.

Figure 5 illustrates how the TIBCO Adapter publishes notifications as messages.

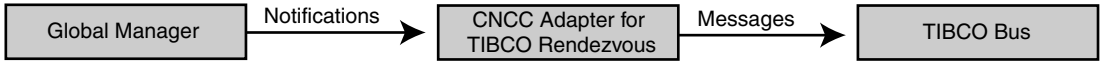

Figure 5: **CNCC Adapter for TIBCO Rendezvous**

The messages sent by the TIBCO Notifier contain the following fields:

ID	FIELD NAME	DATATYPE	VALUE	DESCRIPTION
1	timestamp	DATETIME	icTimestamp	CNCC timestamp of the event
2	id	STRING	icId	A unique identification of this event. If a previously notified event is cleared, changed, or deleted, the new message will have the same icID as the original event. Any code that needs to match such messages, should use this field.
3	server	STRING	icServerName	Name of the global manager that sent this event.
4	sources	STRING	icSourceDomainName	Name of the underlying notification source for this notification. If more than one underlying source contains overlapping topology, all sources are included in a comma-separated list.
5	class	STRING	icClassDisplayName	CNCC class display name of the object that triggered the event.
6	instance	STRING	icInstanceDisplayName	CNCC display name of the object that triggered the event.
7	event	STRING	icEventDisplayName	CNCC display name of the event.
8	description	STRING	icEventDescription	CNCC description of the event.
9	certainty	F64	icCertainty	CNCC certainty of the event.
10	systemName	STRING	icSystemName	Name of the CNCC system associated with the event.
11	systemType	STRING	icSystemType	Type of CNCC system associated with the event.

Table 14: **TIBCO Notifier Message Fields**

Configuring the TIBCO Adapter

The configuration file, *tibrv-notify.conf*, configures this notifier. The original version of the file is located in ***BASEDIR****/smarts/conf/notifier*. You should retain, unedited, the original version of the configuration file. If you intend to modify a configuration file you should use the sm_edit utility provided with your software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory. For more information on modifying files and using sm_edit refer to *Editing NCM Notification Adapter Files* on page 4.

If you edit the configuration file while the notifier is running, you will need to restart the notifier so that it rereads its configuration file.

TIBCO Adapter Parameters

Table 15 describes each parameter for the TIBCO Adapter.

Under typical networking environments, the default values for the service, network, and daemon parameters are sufficient. However, certain conditions require special treatment and should be considered before configuring this notifier. For more information, refer to your TIBCO Rendezvous documentation.

See also, *Subscriptions* on page 5, to learn how to optionally change the subscriptions for the TIBCO Adapter to receive different types of notifications.

PARAMETER	DESCRIPTION
serverName	This is the default name of the global manager sending the notifications. Note that this is the name of the global manager, not the name of the host it is running on. The default is NCM-SA.
service	This is the UDP service used by rvd for communicating with other processes. The service value can either be a service name, searched by getservbyname() or an equivalent system mechanism, or a UDP port number. Use this parameter if you want to override the default settings of the TIB/Rendezvous messaging interface. The default is empty, "". If empty, the default searches for service name "rendezvous" and if that fails, uses UDP port "7500".
network	This specifies the network interface to use for outbound messages and multicast addressing details. The network parameter consists of up to three parts (network; multicast groups; send address), separated by semicolons. The network part can be either a host-name, an IP-address, a network-name, a network-IP-number, or an interface-name. The multicast groups part is a comma-separated list of zero or more multicast groups to join, specified as IP addresses. The send address part is the IP address to which multicast data is sent. Refer to the configuration file for examples. Use this parameter to override the default settings of the TIB/Rendezvous messaging interface. The default is empty, "". If empty, network defaults to the primary network interface for the host computer.
daemon	This specifies the host and TCP port on which the "rvd" daemon is listening. Use this parameter if you want to override the default settings of the TIB/Rendezvous messaging interface. In most cases, programs connect to a local daemon, running on the host computer. Certain situations require a remote daemon, running on a different host. A local daemon is specified as a "port" number and is started automatically if it is not already running. A remote daemon is specified as "host:port" and is not started automatically. Specifying "127.0.0.1:7500" or "<local-host-name>:7500" will use a local daemon, but will not attempt to start one automatically. The default is empty, "". If empty, defaults to TCP port "7500" on the host computer.

PARAMETER	DESCRIPTION
certified	This specifies whether to use certified message delivery for publishing messages. The default is FALSE.
name	This specifies the certified message correspondent name. If non-empty, this is a reusable correspondent name representing a persistent correspondent. If empty, a unique non-reusable name is used for the duration of the notifier process, representing a transient correspondent. The default is empty, "".
ledger	This specifies the ledger, in which the notifier's certified messages transport records information about every unresolved outbound certified message. If non-empty, ledger must be a file base-name without any path separators. The actual ledger file is located in BASEDIR/data/ledger. A file-based ledger is used across process restarts. If empty, a process based ledger is used. A process-based ledger keeps track of certified messages only as long as the process is running. The default is empty, "".
limit	This is the time limit, in seconds, for all outbound certified messages. Every certified message sent by this notifier has a time limit, after which the sender no longer certifies delivery. The limit represents the minimum time that certified delivery is in effect. If the value is zero, there is no limit. The default is 0.
subjectPrefix	Messages sent by this notifier will have subjects subjectPrefix.<TYPE>, where <TYPE> is the type of message (NOTIFY or CLEAR). The default prefix is SMARTS.OUT.EVENT, resulting in subjects SMARTS.EVENT.NOTIFY and SMARTS.EVENT.CLEAR.
eventSmoothingInterval	This is the time that an event must remain active before the notifier sends a notification. The default is 0 seconds. Service Assurance uses the value from the NotificationList definition. The default is 0.
minimumCertainty	This is the threshold above which notifications are sent. Any notification with a certainty below the threshold is discarded. The default is a certainty of 0.01. This value must be a number between 0.0 and 1.0. Service Assurance uses the value from the NotificationList definition. The default is 0.01.

PARAMETER	DESCRIPTION
initialEventDelay	This describes the time interval the notifier should wait after it connects to the global manager before accepting events. The default is 0 seconds.

Table 15: **TIBCO Notifier Parameters and Descriptions**

Setting Environment Variables

In order to run the TIBCO Notifier, you must set up the PATH and SM_LIBPATH environment variables, to include TIBCO's executable and runtime libraries. Specifically, the following variables must be set:

- PATH must include *TIBRV/bin*
- SM_LIBPATH must include *TIBRV/lib*

This can be done by adding the following to ***BASEDIR****/smarts/local/conf/runcmd_env.sh*:

```
PATH=${PATH}:TIBRV/bin
export PATH

if [ -z "${SM_LIBPATH}" ]; then
   SM_LIBPATH=TIBRV/lib
else
   SM_LIBPATH=${SM_LIBPATH}:TIBRV/lib
fi
export SM_LIBPATH
```

Note: TIBRV represents the actual location of the TIB/Rendezvous software.

8

Notification Adapter Framework

The notification adapter framework is comprised of five ASL scripts (rulesets) that control the operation of a notification adapter. Each notification adapter uses its own version of each ASL script. Each ASL script performs a specific function. The original versions of the ASL scripts are located in ***BASEDIR****/smarts/rules/notifier/<adapter_name>*, where <adapter_name> is the name of the notification adapter (for example, mail, file, trap, script or tibrv).

You should retain, unedited, the original version of the ASL scripts. If you intend to modify an ASL script you should use the sm_edit utility provided with your SMARTS software. This will ensure that you modify a copy of the file and that the copy is placed in the proper local subdirectory. For more information on modifying files and using sm_edit refer to *Editing NCM Notification Adapter Files* on page 4.

If you edit the file while the notifier is running, you will need to restart the notifier so that it rereads its framework script file.

- Init <*adapter_name*>*-init.asl*
- Sync <*adapter_name*>*-sync.asl*
- Filter <*adapter_name*>*-filter.asl*
- Notify <*adapter_name*>*-notify.asl*
- Custom <*adapter_name*>*-custom.asl*

For example, the file notifier's scripts are: *file-init.asl*, *file-sync.asl*, *file-notify.asl*, *file-filter.asl*, and *file-custom.asl*.

Table 16 contains descriptions for the ASL scripts associated with each of the CNCC NCM IP and Service Assurance Manager notification adapters. Table 16 also indicates whether an ASL script is intended to be modified during the customization process.

ASL Script Filename	To Be Modified	Description
Init *<adapter_name>-init.asl*	No	Invoked when the adapter starts and shuts down. Adapter-specific initialization and pre-shutdown tasks are included in this script.
Sync *<adapter_name>-sync.asl*	No	Invoked whenever the adapter connects or disconnects from a Domain Manager. This script is used for synchronization with the Domain Manager.
Filter *<adapter_name>-filter.asl*	Yes	This ASL script is the first to be run during normal event processing. Its purpose is twofold: • It can filter out events, terminating further processing. • It may initiate customizations that will occur before main processing. Within this script, add the "sentByCustom = TRUE" flag in order to execute customizations.
Notify *<adapter_name>-notify.asl*	No	This ASL script is responsible for processing notifications and contains most of the processing directions. It performs the defined actions such as sending traps or Emails.
Custom *<adapter_name>-custom.asl*	Yes	This is the last ASL script invoked during normal event processing. Any customizations that need to be made belong in this ASL script.

Table 16: **CNCC NCM Notification Adapter Scripts**

Typically, it is not necessary to edit the ASL scripts. This is reserved for more advanced adapter customizations. For an example of how to customize an adapter, refer to *Customizing the E-Mail Adapter* on page 39.

9

Notification Attributes

This section describes notification attributes for the CNCC NCM IP applications and CNCC NCM Service Assurance Manager.

Overview of the Notification Object

The Domain Manager stores topology and event information (the notifications) it receives in its repository. Topology and notifications are stored as objects; instances of classes defined in the InCharge Common Information Model™ (ICIM).

A notification object contains data about the current event for which the notification is generated. These attributes describe the properties of the notification such as the time the event occurred, the name of the object where the event occurred, the type of event and much more information.

The *filter*, *notify* and *custom* scripts retrieve the values of a notification's attributes from the notification object. The current event is identified by a handle to the notification object in the *notify* script (<*adapter_name*>*-notify.asl*). For example:

```
currentEvent = notifier->CurrentEvent ? LOG,STOP;
```

The notification object contains information that is to be sent to the desired destinations - files, Emails, scripts, SNMP traps or TIBCO Rendezvous messages.

Notification Attributes For CNCC NCM IP Applications

Table 17 describes the notification attributes that are contained in notifications generated by an NCM Domain Manager. When customizing the notification adapters, you can use these attributes to retrieve the specific information you require regarding each notification.

Note: The following attributes must be used with their "ic" prefix when configuring adapters. When configuring Domain Manager or Global Manager functions, the attributes are used without the "ic" prefix.

NOTIFICATION ATTRIBUTE	TYPE	DESCRIPTION
icCertainty	Float	Confidence that this notification is the correct diagnosis. Value ranges from 0 to 100.
icClass	String	The class of the object that triggered the event.
icDisplayName	String	The display name of the object that triggered the event.
icDisplayClassName	String	The display class name of the object that triggered the event.
icEventDescription	String	The event description.
icEventDisplayName	String	The name of the event as it is displayed in the Console.
icEventName	String	The event name.
icEventType	String	The event type. The valid types are: • PROBLEM • SYMPTOM • EVENT • AGGREGATION
icInstance	String	The instance name of the object that triggered the event.
icSystemName	StrEmailing	Name of the system associated with the event.
icSystemType	String	Type of the system associated with the event.
icSystemDescription	String	Description of the system associated with the event.
icTimestamp	Integer	The timestamp of the event.
icType	String	Notification Type. The valid types are: • NOTIFY • CERTAINTY_CHANGE • CLEAR

Table 17: **CNCC NCM IP Notification Attributes**

Notification Attributes For CNCC NCM Service Assurance Applications

Table 18 describes the notification attributes that are contained in notifications generated by the CNCC NCM Service Assurance Manager Global Manager. When customizing the notification adapters, you will combine these attributes to include the specific information you require regarding each notification.

Note: You may have seen the attributes in the following table without the "ic" prefix when configuring Domain Manager or Global Manager functions. This prefix is used when configuring the adapters as described in this document.

NOTIFICATION ATTRIBUTE	TYPE	DESCRIPTION
icAcknowledged	Boolean	TRUE if the notification has been acknowledged, FALSE if not.
icActive	Boolean	TRUE if the event is active, FALSE if not.
icCategory	String	Type of notification sent by the global manager: • Availability • Discovery • Error • Operational • Performance • PowerSupply • Resource • Temperature
icCertainty	Float	Confidence that this notification is the correct diagnosis. Value ranges from 0 to 100.
icClass	String	Class of the object that triggered the event.
icClassDisplayName	String	Name of the class that is displayed to the user.
icDisplayName	String	Name of the notification that is displayed to the user.
icDisplayType	String	Display string of the notification type that abstracts the difference between the notification list and standard notifications.
icElementClassName	String	Class name of the managed element most closely related to this event.
icElementName	String	Name of the managed element most closely related to this event.
icEvent	String	Event name such as DOWN or NOT RESPONDING.
icEventDescription	String	Description of the event.

NOTIFICATION ATTRIBUTE	TYPE	DESCRIPTION
icEventType	String	The event type. The valid event types are: • MOMENTARY • DURABLE
icFirstNotifiedAt	Integer	Timestamp of the first notification.
icId	String	A unique identification for this notification. As previously-received notifications are cleared (CLEAR), changed (CHANGE) or deleted (DELETE), these new messages have the same ID as the original notification (NOTIFY). Customizations to the ASL scripts that needs to match such messages should use this attribute.
icImpact	Integer	Numeric value that indicates the effect of this event on related elements.
icInMaintenance	Boolean	TRUE if the device is in maintenance mode, FALSE if not.
icInstance	String	Instance name of the object that triggered the event.
icInstanceDisplayName	String	Name of the instance that is displayed to the user.
icIsRoot	Boolean	TRUE if the notification is an authentic problem (root cause), FALSE if not.
icLastChangedAt	Integer	Time, in seconds, when the status of the notification last changed.
icLastClearedAt	Integer	Time, in seconds, when the notification was last cleared.
icLastNotifiedAt	Integer	Time, in seconds, when the notification recipients were last notified.
icNLObjectName	String	The object name of the notification list that generated this notification.
icNotificationName	String	Name of the notification object. It can be used to retrieve additional information about the notification not streamed to the adapter by default.
icOccurrenceCount	Integer	Number of times the notification has occurred.
icOwner	String	Name of the person responsible for this notification. Value is SYSTEM when acknowledged by the global manager.
icSeverity	Integer	Level of severity for the notification: 1 = CRITICAL 2 = MAJOR 3 = MINOR 4 = UNKNOWN 5 = NORMAL Note that only the numbers, not the text descriptions are passed by the global manager.

NOTIFICATION ATTRIBUTE	TYPE	DESCRIPTION
icSourceDomainName	String	A comma-separated list of sources for this notification. For standard notifications, this is the name of the attached server (same as icServerName); for the Notification List, these are names of the underlying notifying sources. There may be more than one in case underlying sources have an overlapping topology.
icSystemDescription	String	Description of the CNCC system associated with the event. A description of the higher level object specified in icSystemName.
icSystemName	String	The name of the CNCC system associated with the event. The actual CNCC object triggering an event could be a low-level object in a complex hierarchal class tree, in which case this attribute could be a higher level object that one wishes to reference. In cases when there is no system associated with the notified object the attribute's value will be an empty string.
icSystemType	String	Type of CNCC system associated with the event. It is the type of higher level object specified in icSystemName.
icTimestamp	Integer	The CNCC timestamp of the event.
icTroubleTicketId	String	Trouble ticket id.
icType	String	Notification Type. The valid types are: • NOTIFY • CERTAINTY_CHANGE • CLEAR • NL_NOTIFY • NL_CHANGE • NL_CLEAR • NL_DELETE Note that at this time the notification adapters do not send notifications for NL_CHANGE or NL_DELETE event types so you cannot use an adapter to inform another application about notification changes or deletions.
icUserDefined1	String	User defined field 1.
icUserDefined2	String	User defined field 2.
icUserDefined3	String	User defined field 3.
icUserDefined4	String	User defined field 4.
icUserDefined5	String	User defined field 5.
icUserDefined6	String	User defined field 6.
icUserDefined7	String	User defined field 7.

NOTIFICATION ATTRIBUTE	TYPE	DESCRIPTION
icUserDefined8	String	User defined field 8.
icUserDefined9	String	User defined field 9.
icUserDefined10	String	User defined field 10.

Table 18: **CNCC NCM Service Assurance Notification Attributes**

A

Customizing the E-Mail Adapter

This section provides an example procedure for customizing the E-Mail Adapter (notifier) to display specific CNCC NCM Service Assurance Manager notification information.

Customization Overview

1. Stop the Email Adapter if it is running
2. Modify the Filter script.
3. Modify the Custom script.
4. Modify the configuration file.

Note: Original versions of the ASL and configuration files for adapters should not be changed. Use the sm_edit utility to ensure that the original versions are retained and that modified files are saved to the proper local directory. For more information on using sm_edit, refer to *Editing NCM Notification Adapter Files* on page 4.

Stopping the Email Adapter

If you are currently running an Email Adapter, you need to stop it before making any customizations. To stop the Email Adapter, you need to kill the process in UNIX or use the Task Manager in Windows.

To kill the process in UNIX, you need to first find the process ID and then kill the process:

```
% ps -elf | grep sm_notify
janedoe 14563 3830 0 14:38:14 prs/35  0:01 sm_notify mail
%kill 14563
```

Modifying Local Copies of the ASL Scripts

Original versions of the ASL and configuration files for adapters should not be changed. The ASL scripts for the E-Mail Adapter are found in the ***BASEDIR****/smarts/rules/notifier/mail* directory. Be sure to use the sm_edit utility to edit the configuration and rules file. For information on how to use sm_edit, refer to *Editing NCM Notification Adapter Files* on page 4.

Modifying the mail-filter.asl Script

The *mail-filter.asl* script filters network events from being processed any further as notifications and also contains some instructions for processing notifications that will utilize the E-Mail Adapter. Add a variable called `sentByCustom` which invokes the script running the customization actions you want from the *mail-custom.asl* script.

To modify the *mail-filter.asl* script:

1. Using sm_edit, open the *mail-filter.asl* script. For example, open the file with the following command (entered on one line):
   ```
   % BASEDIR/smarts/bin>sm_edit rules/notifier/mail/
   mail-filter.asl
   ```
2. Add the following line to the end of the script:

```
...
START() {
    OMIT_CLEAR_EVENTS
}
OMIT_CLEAR_EVENTS() filter {
    (currentEvent->icType == "CLEAR" || currentEvent->icType
== "NL_CLEAR")
} do {
    currentEvent->filterMe = TRUE;
} do {
    currentEvent ->sentByCustom = TRUE;
    }
```

3. Save the modified script. The sm_edit utility automatically saves the script to the appropriate local directory, located in ***BASEDIR****/smarts/local/rules/notifier/mail*.

Note: For a full sample of this configuration file, refer to *Example E-Mail Configuration Files* on page 47.

Sending Emails for CLEAR Notifications

By default, when a network problem is resolved and a CLEAR notification is received, an Email is not sent to the administrators involved in the repair. Within the *mail-filter.asl* script, you can use the `filterme` variable to indicate whether or not you want an Email to be delivered when a notification is cleared (when the problem is resolved). To have Emails sent on CLEAR Notifications, change the `filterMe = TRUE` boolean value to `FALSE` (as shown in bold type):

```
OMIT_CLEAR_EVENTS() filter {
    (currentEvent->icType == "CLEAR" || currentEvent->icType
     == "NL_CLEAR")
} do {
    currentEvent->filterMe = FALSE;
}
```

Modifying the mail-custom.asl Script

The *mail-custom.asl* contains the details of the script. Modifying the *mail-custom.asl* script allows you to specify which combination of notification attributes will be included in the Email. Use the sm_edit utility to modify the ASL script. The sm_edit utility ensures that the original version is retained and that the modified file is saved to the proper local directory. For information on how to use sm_edit, refer to *Editing NCM Notification Adapter Files* on page 4.

To modify the *mail-custom.asl* script:

1. Using sm_edit, open the *mail-custom.asl* script. For example (entered on one line):
   ```
   % BASEDIR/smarts/bin>sm_edit rules/notifier/mail/mail-
   custom.asl
   ```
2. Add the notification attributes for the subject and body of the Email message you want generated for the notification.

   For example, if you want to add the timestamp attribute to the subject and the event type attribute to the body of the Email message, you would edit *mail-custom.asl* as follows (the bold attributes indicate the modifications):

```
START() {
local subject = "";
local body = "";
     } filter {
      /*
```

```
        * Only send here if sentByCustom is TRUE.
        */
    (!currentEvent->sentByCustom)
        } do {
           subject = currentEvent->icTimestamp." ".
         currentEvent->icType." ".
                     currentEvent->icDisplayName."
        ".currentEvent->icEventName;
           body = ( "  CNCC Server " . serverName . ":\n  ".
        currentEvent->icType . " " .
                    currentEvent->icDisplayClassName . " " .
                    currentEvent->icDisplayName . " ".
                    currentEvent->icEventType . " ".
                    currentEvent->icEventName );
           if (currentEvent->icType != "CLEAR") {
          body = body . " (" . currentEvent-> icCertainty"%)";
           }
  body = body . ":\n  " . currentEvent-> icEventDescription .
"\n";

mailer->sendmail(sender, recipients, subject, body)?LOG,
STOP;
}
```

3 Save the modified script. The sm_edit utility automatically saves the script to the appropriate local directory, located in ***BASEDIR****/smarts/local/rules/notifier/mail*.

Modifying the Configuration File

When you start and run a notification adapter, it reads a configuration file. The Email Adapter configuration file is called *mail-notify.conf* and the original version can be found in the ***BASEDIR****/smarts/conf/notifier* directory. Be sure to use the sm_edit utility to edit the configuration file. For information on how to use sm_edit, refer to *Editing NCM Notification Adapter Files* on page 4. The configuration files are text files and can be modified using any text editor. Use the following procedure to modify the configuration file to run your customizations.

The configuration file contains the subscription information required to activate the notification Emails. For each notification for which you want to send an Email, you are going to create a separate configuration file. In other words for each notification list (in Service Assurance) or choice and prime subscriptions (In CNCC NCM Availability Manager) you subscribe to, you will create an individual *.conf* file.

Note: Whenever you modify a configuration file, you need to stop and restart the notifier for the changes to take effect.

1 Using the sm_edit utility, open the configuration file:

```
% BASEDIR/smarts/bin>sm_edit conf/notifier/mail-notifier.conf
```

2 Rename the configuration file, giving the file a relevant name (for example, if you are going to customize the Email adapter to send Emails for all problems related to Routers, you could name the file *mail-notify-Router.conf*). The sm_edit utility automatically saves this file to a local directory in ***BASEDIR****/smarts/local/conf/notifier*.

3 Modify the file to change the name of the NCM Domain Manager or Service Assurance Global Manager:

```
serverName = <YOUR_DOMAIN_MANAGER>
```

4 Define the host name of the appropriate mail server.

```
MailServer = "localhost"
```

5 Define the recipients for the notification Email. Multiple Email addresses should be separated by a comma.

```
Recipients = "root@localhost",
"recipient@your_company.com"
```

6 Define the Email address of the sender. This address will display in the "From" field of the Email message.

```
SenderId = "daemon@localhost"
```

Note: If there is a comment sign (#) beside any of the parameters you just defined (such as `MailServer`, `Recipients`, `serverName` or `SenderID`) remove the comment sign to activate the parameter.

7 Add the following lines to specify the ASL scripts that contain your customizations. The lines should be added to the end of the file below the `initialEventDelay` parameter:

```
filterRuleSet = "notifier/mail/mail-filter.asl"
customRuleSet ="notifier/mail/mail-custom.asl"
```

8 Modify the `SubscribesTo` parameter to define the specific notifications for which you want Email alerts sent:

In Service Assurance Manger, you indicate which notifications generate Emails by defining a notification list in the `Subscriptions` section.

```
SubscribesTo =
      {
            #
            # NL subscription.
            #
            GA_NLSubscription::mail-Default-Subscriptions
            {
                  NLName = "Default"
            }
      }
```

Note: For a full sample of these configuration files, refer to *Example E-Mail Configuration Files* on page 47.

Running the Customized Email Notification Adapter

After creating configuration files and ASL scripts for each of the Email adapters you want to run, you have to start the adapter.

Startup Parameters

These startup parameters are used with the **sm_notify** command to override the default configuration files for each adapter. Table 19 lists the **sm_notify** parameters that can be used during customization.

PARAMETER	DESCRIPTION
`--conf=<file>`	This parameter specifies the configuration file to use for the adapter. This parameter is useful if you need to use the **sm_notify** command to start more than one adapter (such as two Email Adapters) on a single host. Since each adapter references a unique configuration file, the adapters can be configured to behave differently by, for example, subscribing to different notifications or sending the notifications to different locations.
`--confdir=<dir>`	This parameter specifies the location (directory) of the configuration file to use for the adapter. This parameter can also be used to start multiple copies of a adapter on the same host or it can be used to start many adapters from a centrally located set of configuration files.

Table 19: **sm_notify Parameters and Descriptions**

Note: If you have renamed your configuration files but have kept them in default ***BASEDIR****/smarts/local/conf/notifier* directory, use the `--conf` startup parameter. If your configuration files retain the default names but are in a new location, use the `--confdir` startup parameter.

Starting the Email Adapter

The Email adapter is started manually using the `sm_notify` command. When starting the customized Email adapter, you must also specify the location and name of the configuration file that contains the customization information.

Use the following command to start a customized Email adapter:

```
BASEDIR/smarts/bin/sm_notify mail --confdir=<DIRECTORY>
          --conf=<CONF_FILE_NAME>
```

For example, to start the Email adapter defined in *Modifying the Configuration File* on page 42, you would use the following command:

```
BASEDIR/smarts/bin/sm_notify mail --confdir
          =BASEDIR/smarts/Custom/mail/conf
          --conf=mail-notify-Router.conf
```

Running Multiple Copies of a Notification Adapter

You may have developed more than one customized E-Mail adapter (especially if you want to send Emails based on different notification subscriptions). Since you created separate configuration files for each adapter, you must specify the location and filename of the configuration file at startup.

The adapters should be started individually by specifying the appropriate configuration file for that adapter. To do this, you should use the `--confdir` or `--conf` startup parameters.

B

Example E-Mail Configuration Files

These are sample configuration files (*mail-notify.conf*) for the E-Mail Notifier for both CNCC NCM Availability Manager and Service Assurance Manager.

Example E-Mail Configuration File For CNCC NCM Availability Manager

```
# mail-notify.conf - Configuration for the mail notification
# adapter
#
# Copyright (C) 1999-2000 System Management ARTS (SMARTS)
# All Rights Reserved
#
# $Id: mail-notify.conf,v 1.4 2000/08/22 13:16:51 boaz Exp $
#

GNA_Notifier::mail-Notifier
{
    #
    # Name of the CNCC Server from which to receive
    # notifications.
    #
    serverName = "NCM-AM"

    ConfiguredBy = MailConfiguration::Mail-Configuration
    {
        #
```

```
     # Name of mail server host.
     #
     MailServer = "localhost"

     #
     # Sender identity.
     # Must be a valid email address, recognized by the
     # mail server.
     #
     SenderId = "sender@"

     #
    # Comma-separated list of users to whom notifications
     # should be sent to.
     #
     Recipients = "root@localhost"
}

ReadsInputFrom = GA_SubscriberFE::mail-Subscriber-
FrontEnd
{
     #
     # How long, in seconds, an event must remain active
     # before the adapter sends a notification.
     #
     eventSmoothingInterval = 0

     #
    # Notification threshold; discard notifications with
     # a certainty below this value, which should be
     # between 0.0 and
     # 1.0.
     #
     minimumCertainty = 0.01

     #
     # Subscriptions.
     #
     SubscribesTo =
     {
          #
          # Choice subscription.
          #
          GA_ChoiceSubscription::mail-All-Subscriptions
          {
                    className = ".*"
                 instanceName = ".*"
                    eventName = ".*"
                     problems = TRUE
                   aggregates = FALSE
```

```
                        symptoms = FALSE
                }

#               #
#               # Profile subscription.
#               #
#               GA_ProfileSubscription::file-Default-Profile-

Subscriptions
#               {
#                    profileName = "default"
#               }
          }
     }

     #
     # How long, in seconds, to ignore notifications from the
     # server after it connects.  Use this parameter to avoid
     # receiving the initial flood of notifications when the
     # server (re)connects.
     #
     initialEventDelay = 0

     filterRuleSet = "$Basedir/smarts/Custom/mail/rules/mail-
     filter.asl"

     customRuleSet = "$Basedir/smarts/Custom/mail/rules/mail-
     custom.asl"

}
```

Example E-Mail Configuration File For Service Assurance Manager

```
# mail-notify.conf - Configuration for the mail notification
# adapter
#
# Copyright (C) 1999-2000 System Management ARTS (SMARTS)
# All Rights Reserved
#
# $Id: mail-notify.conf,v 1.4.8.1 2001/06/13 14:42:01 boaz
# Exp $
#

GNA_Notifier::mail-Notifier
{
    #
    # Name of the CNCC Server from which to receive
    # notifications.
    #
    serverName = "NCM-SA"

    ConfiguredBy = MailConfiguration::Mail-Configuration
    {
         #
         # Name of mail server host.
         #
         MailServer = "localhost"

         #
         # Sender identity.
         # Must be a valid email address, recognized by the
mail server.
         #
         SenderId = "daemon@localhost"

         #
        # Comma-separated list of users to whom notifications
         # should be sent to.
         #
         Recipients = "root@localhost"
    }

    ReadsInputFrom = GA_SubscriberFE::mail-Subscriber-
FrontEnd
    {
         #
         # How long, in seconds, an event must remain active
         # before the adapter sends a notification.
         #
```

```
            eventSmoothingInterval = 0

            #
            # Notification threshold; discard notifications with
            # a certainty below this value, which should be
            # between 0.0 and 1.0.
            #
            minimumCertainty = 0.01

            #
            # Subscriptions.
            #
            SubscribesTo =
            {
                  #
                  # NL subscription.
                  #
                  GA_NLSubscription::mail-Default-Subscriptions
                  {
                           NLName = "Default"
                  }

            }
      }

      #
      # How long, in seconds, to ignore notifications from the
      # server after it connects.  Use this parameter to avoid
      # receiving the initial flood of notifications when the
      # server (re)connects.
      #
      initialEventDelay = 0

      filterRuleSet = "notifier/mail/mail-filter.asl"

      customRuleSet = "notifier/mail/mail-custom.asl"

}
```

C

Example ASL Files

The following is a sample ASL file (*mail-filter.asl*) for the E-Mail Notifier for both CNCC NCM Availability Manager and Service Assurance Manager.

```
/* mail-notify.asl - Main script for the mail notification
adapter.
 *
 * Copyright (C) 1999-2000, System Management ARTS (SMARTS)
 * All Rights Reserved
 *
 * RCS $Id: mail-notify.asl,v 1.6 2002/01/30 23:27:26 boaz Exp
$
 */


/*
 * No word delimiter needed.
 */
delim = "";


/*
 * Required variables.
 */

default debug = FALSE;
default test = FALSE;

default NotifierName = "<error>";
notifier = self->object("GNA_Notifier", NotifierName) ?
LOG,STOP;
```

```
currentEvent = notifier->CurrentEvent ? LOG,STOP;

mailer = self->object("ACT_Mail", "ACT-Mail") ? LOG,STOP;
mailer->test = test;
mailer->trace = debug;

serverName = notifier->serverName;

/*
 * User-provided parameters.
 */

sender = notifier->ConfiguredBy->SenderId;
recipients = notifier->ConfiguredBy->Recipients;


/*
 * Rules.
 */

START() {
    local subject = "";
    local body = "";
} filter {
    /*
     * Only send here if sentByCustom is FALSE.
     */
    (!currentEvent->sentByCustom)
} do {

    subject = currentEvent->icType." ".
              currentEvent->icDisplayName." ".currentEvent-
>icEventName;
    body = ( "  CNCC Server " . serverName . ":\n  " .
             currentEvent->icType . " " .
             currentEvent->icDisplayClassName . " " .
             currentEvent->icDisplayName . " ".
             currentEvent->icEventName );
    if (currentEvent->icType != "CLEAR") {
        body = body . " (" . currentEvent->icCertainty . "%)";
    }
   body = body . ":\n  " . currentEvent->icEventDescription .
"\n";

   mailer->sendmail(sender, recipients, subject, body) ? LOG,
STOP;
}


/*
```

```
* Local Variables:
* mode: C++
* End:
*/
```

D

Troubleshooting Adapters

This appendix contains resolutions to common issues experienced by adapter users involving notification adapters

Each section begins by addressing general issues. For example, the first issue covered may describe what to check if this type of adapter fails to start. Subsequent sections address issues specific to a particular adapter. For each issue there may be more than one suggested action to follow.

Table 20 shows the complete list of issues covered in this appendix, organized by adapter. Under each adapter is a list of common issues corresponding to the heading in the appendix that discusses the solution.

ISSUES	SOLUTION (HEADING IN APPENDIX)
E-Mail Notifier	
Does not start.	*Notification Adapter Fails to Start* on page 59
Does not connect to CNCC Manager.	*Notification Adapter Starts, but Fails to Connect to the CNCC Manager* on page 59
No e-mail is received.	*E-Mail Not Received* on page 60
Only some e-mail is received.	*E-Mail Received, but Not for All Events* on page 61
File Notifier	
Does not start.	*Notification Adapter Fails to Start* on page 59
Does not connect to CNCC Manager.	*Notification Adapter Starts, but Fails to Connect to the CNCC Manager* on page 59
Notification file is not created or updated.	*Notification File Not Created* on page 62
Notification file does not include all events.	*Information in Notification File Does Not Include all Events* on page 63

ISSUES	SOLUTION (HEADING IN APPENDIX)
SNMP Trap Notifier	
Does not start.	*Notification Adapter Fails to Start* on page 59
Does not connect to CNCC Manager.	*Notification Adapter Starts, but Fails to Connect to the CNCC Manager* on page 59
Destinations do not receive any traps.	*No Traps Delivered to Destination* on page 63
Destinations receive only some traps.	*Not all Traps Delivered to Destination* on page 63
Script Notifier	
Does not start.	*Notification Adapter Fails to Start* on page 59
Does not connect to CNCC Manager.	*Notification Adapter Starts, but Fails to Connect to the CNCC Manager* on page 59
Script is not invoked.	*Script is Not Invoked for Script Notifier* on page 64

Table 20: **Issues Covered in this Appendix**

Notification Adapter Issues

The issues covered here apply to:

- E-Mail Notifiers
- File Notifiers
- SNMP Trap Notifiers
- Script Notifier

Notification Adapter Fails to Start

Applies to: E-Mail Notifier, File Notifier, SNMP Trap Notifier, Script Notifier

When a notification adapter appears not to start, check the status of its process. In UNIX, use:

```
ps -ef | grep sm_notify
```

The command returns a list of process statuses for the notification adapters. To identify each adapter, look for the adapter name: mail, file, trap, or script.

Under Windows 2000, check the Task Manager for the sm_notify process.

Notification Adapter Starts, but Fails to Connect to the CNCC Manager

Applies to: E-Mail Notifier, File Notifier, SNMP Trap Notifier, Script Notifier

When an adapter cannot connect to a CNCC Manager, it is usually for one of the following reasons:

- CNCC Manager is not running.
- Name of the CNCC Manager is not the same as the name specified in the adapter's configuration file.
- CNCC Manager cannot be reached from the host running the adapter.

Check the Status of the CNCC Manager

Use the **brcontrol** command to check the status of the CNCC Manager. The syntax is:

```
brcontrol
```

By default, this command returns a list of CNCC Managers registered with the broker and their current state. The list indicates whether a CNCC Manager's state is RUNNING or DEAD.

If the CNCC Manager is not running or not included in the list, restart the CNCC Manager.

Check the Name of the CNCC Manager in the Configuration File

The configuration file of each adapter contains the name of the CNCC Manager it connects to. This value in the configuration file can be overridden by using the `--server` option with the **sm_notify** command.

In cases where an adapter cannot connect, check that the `--server` option, if used, points to a valid CNCC Manager. If that is not the issue, check that the appropriate CNCC Manager is specified in the adapter's configuration file. Table 21 lists the configuration file and parameter to check for each adapter.

ADAPTER	LOCATION AND NAME (RELATIVE TO BASEDIR/SMARTS/CONF)	CNCC MANAGER PARAMETER
E-Mail Notifier	/notifier/mail-notify.conf	serverName
File Notifier	/notifier/file-notify.conf	serverName
SNMP Trap Notifier	/notifier/trap-notify.conf	serverName
Script Notifier	/notifier/script-notify.conf	serverName

Table 21: **Adapters and CNCC Manager Parameters**

Check Communication to the CNCC Manager's Host

If the adapter and the CNCC Manager run on different hosts, the adapter's host might not be able to communicate with the CNCC Manager's host. From the adapter's host run the following command:

```
dmctl --server=<domain manager> ping
```

The results of this command show whether the CNCC Manager is alive or unavailable.

E-Mail Not Received

Applies to: E-Mail Notifier

When the E-Mail Notifier starts and connects to the NCM Domain Manager and the intended recipient receives no e-mail, the issue is usually an incorrect configuration. The configuration file for the E-Mail Notifier is *mail-notify.conf*. This file resides in the ***BASEDIR****/smarts/notifier directory.*

There are three parameters that specify where the E-Mail Notifier delivers information. Table 22 lists these parameters.

PARAMETER	DESCRIPTION
MailServer	This is the name for the mail server.
SenderId	This is the e-mail address associated with the adapter. Users can reply to this address. This address must be recognized by the mail server.
Recipients	This is a comma separated list of the recipients of the e-mails. The recipients in the list must be recognized by the mail server.

Table 22: **Parameters Needed to Receive E-Mail**

Check the parameters in the configuration file and verify them with your e-mail administrator. All three of them must have a valid value in order for the E-Mail Notifier to work. In order for the changes to the configuration file to take effect, the adapter must be restarted.

E-Mail Received, but Not for All Events

Applies to: E-Mail Notifier

If the E-Mail Notifier does not seem to be sending messages for all of the right events, it could be that the subscription profile is incorrect or that you expect the adapter to be sending messages when notifications clear.

Modify the Subscription Profile

When the E-Mail Notifier sends e-mail, but does not send them for all of the expected events, the issue usually is improper subscriptions. See "Subscriptions" on page 5 for instructions about how to modify the subscription profile for this adapter.

Change the E-Mail Notifier to Send Notifications of Cleared Events

By default, the E-Mail Notifier does not send messages when a notification clears. It only sends messages for new notifications or when the certainty of the notification changes.

To enable the E-Mail Notifier to send CLEAR notifications, change the following in the file, ***BASEDIR****/rules/notifier/mail/mail-filter.asl*:

```
START () {
     OMIT_CLEAR_EVENTS
}
```

to

```
START () {
//   OMIT_CLEAR_EVENTS
}
```

After making changes to the file, you must restart the adapter in order for the changes to take effect.

Notification File Not Created

Applies to: File Notifier

When the File Notifier starts and connects to the NCM Domain Manager but it does not appear to create the notification file, check to make sure that the file name is the one you expect. The configuration file contains the name of the notification file. The adapter always creates the notification file in the ***BASEDIR****/smarts/local/logs* directory.

The File Notifier's configuration file is *file-notify.conf*. This file resides in the ***BASEDIR****/smarts/notifier* directory. The parameter, fileName, defines the name of the notification file the adapter creates for its output. If you do not specify a value, the adapter creates a file named <*domain manager*>*-alarms.log*.

Do not confuse this adapter's output file with its log file. The log file also appears in the ***BASEDIR****/smarts/logs* directory. You determine the log file's name when the adapter starts using the `--output` command option. The default name of the output file is *sm_notify_file.log*.

Note: You should never use the same name for both the notification file and the File Notifier's log file.

Information in Notification File Does Not Include all Events

Applies to: File Notifier

When the File Notifier sends information to the notification file, but does not send it for all of the correct events, the issue usually is improper subscriptions. See "Subscriptions" on page 5 for instructions about how to modify the subscription profile for this adapter.

No Traps Delivered to Destination

Applies to: SNMP Trap Notifier

When the SNMP Trap Notifier starts and connects to the NCM Domain Manager and does not send the SNMP Traps, the issue is usually the format of the parameter Destinations.

The parameter, Destinations, is a table that contains the SNMP trap destinations. Each row in the table is surrounded by curly braces and consists of three different values: host name or IP address, port number, and SNMP version. The values are separated by commas. There are two valid values for SNMP version: V1 and V2C. These values and the values for host name or IP address must be surrounded by quotation marks. The port number is an integer value with no quotation marks.

Each row in the table is separated from the next by a comma. Place a comma after the curly brace that marks the end of each row in the table except for the last. An outer set of curly braces defines the entire table.

For example, the Destinations parameter could appear as follows.

```
Destinations = {
                  {"localhost", 162, "V1"},
                  {"other-host", 30162, "V2C"},
                  {"195.67.23.103",21539, "V2C"}
                }
```

Not all Traps Delivered to Destination

Applies to: SNMP Trap Notifier

When the SNMP Trap Notifier sends traps, but does not send them for all of the correct events, the issue is usually improper subscriptions. See "Subscriptions" on page 5 for instructions about how to modify the subscription profile for this adapter.

Script is Not Invoked for Script Notifier

Applies to: Script Notifier

1. Be sure your script is located in ***BASEDIR****/smarts/local/actions*, and that it is readable and executable.
2. Check the configuration file to see that you have altered the file to include the correct name for the script you want to invoke.

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