CA NetMaster® Network Management for SNA

Administration Guide

r12

CA Product References

This document references the following CA products:

- CA NetMaster® Network Management for SNA (CA NetMaster NM for SNA)
- CA NetSpy™ Network Performance (CA NetSpy)
- CA SOLVE:Access™ Session Management (CA SOLVE:Access)
- CA Common Services™ for z/OS (CA Common Services for z/OS)
- CA OPS/MVS® Event Management and Automation (CA OPS/MVS EMA)
- CA Network and Systems Management (CA NSM)
- CA Service Desk for z/OS (CA Service Desk)
- CA TCPaccess™ Communications Server for z/OS (CA TCPaccess CS)
- CA SOLVE:Central™ Service Desk for z/OS (CA SOLVE:Central), which includes CA SOLVE:Problem

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- Online and telephone contact information for technical assistance and customer services
- Information about user communities and forums
- Product and documentation downloads
- CA Support policies and guidelines
- Other helpful resources appropriate for your product

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Contents

Chapter 1: Introduction

This section contains the following topics:

Intended Audience

This guide is intended for technical personnel responsible for the planning, setup, and maintenance of your product's functions and services.

Typographic Conventions

This section explains the conventions used when referring to various types of commands and when indicating field attributes.

Convention	Description
Commands	Commands such as SYSPARM and SHUTDOWN are shown in upper case.
User Entries	Information to enter onto panels is displayed in **bold** text.
Cross-References	Cross-reference links to other sections of the book are displayed as underlined blue text.
Shortcuts	Shortcuts to menus or options are displayed in **bold**, for example, **/PARMS**.

Chapter 2: Starting and Stopping a Region

This section contains the following topics:

Start SOLVE SSI

To start the SOLVE SSI, issue the following command:

```
S ssiname
```

For a region to connect to SOLVE SSI, it must first know the SSID to connect to. To do this, specify the SSID JCL parameter or use Customizer parameter groups. When this connection is complete, authorized region users can issue SOLVE SSI commands.

The region can use the SSID JCL parameter to establish an early connection to SOLVE SSI during initialization.

This parameter has the following format:

```
SSID={ NO | * | name }
```

NO

No connection to SOLVE SSI is attempted. The connection is only started (or attempted) after a SYSPARMS SSID command is issued. This is the default.

*****

Starts or attempts a connection to an SSID with the first four characters of the region's job name

name

Starts or attempts a connection to the specified SSID

If asterisk (*) or *name* is specified, an attempt to connect to the SSI is immediately made. If it fails, it retries every *n* seconds, depending on the default value of the SSI retry interval.

Note: To change the value of the SSID to connect at any time, update the SSI parameter group (enter **/PARMS**). You can use this parameter group to change the SSID value or to specify an SSI retry interval.

Stop SOLVE SSI

You can terminate SOLVE SSI in *one* of the following ways:

- By using the SSI STOP command.
- By using the operating system MODIFY (F) command, in the format:

  ```
  F ssiname,FSTOP
  ```

Note: If you are using cross-memory services, the address space running SOLVE SSI is terminated and is not available until after the next IPL.

Start a Region

To start a region, you need to run it as a job or a started task. A started task should have been set up during the installation process.

To start a region, issue the following command:

```
S rname
```

Users log on to a region by using the user IDs and passwords specified in their UAMS (or external security package) records.

Respond to WTOR Confirmation Message

If you have implemented region startup confirmation, the RMIWTO06 WTOR message is displayed and startup pauses.

The WTOR message enables you to change the startup parameters. If a reply to the message is not made in 120 seconds, startup continues.

For information about startup confirmation, see the help for the AUTOIDS parameter groups.

Continue Startup with No Change

To continue startup with no change to the parameters, reply as follows:

```
R n,U
```

n is the identification number of the WTOR message.

Continue Startup with Changes

To continue startup with changes to the parameters, reply as follows:

```
R n,parameter-1=value-1[,parameter-2=value-2[,…[,parameter-n=value-n]]]
```

The following table lists the RMIWTO06 WTOR Message—Reply Parameters that you can use in your reply. It matches the parameters with the fields in the corresponding parameter group specification panels.

Parameter Name	Field Label
System image load (AUTOIDS parameter group)	
SYSTEM	System Image Name
VERSION	Version
MODE	Automation Mode
COLD	Cold Start on Next Restart?

If you reply to change parameters, you are asked to confirm your changes. You can then make additional changes or accept the displayed values.

Example

The following reply changes the system image to load to PROD version 2:

```
R n,SYSTEM=PROD,VERSION=2
```

Stop a Region

If you have the necessary authority, you can shut down the region by issuing the SHUTDOWN or FSTOP command.

SHUTDOWN Command

The SHUTDOWN command stops the region when the last user logs off. When you issue the SHUTDOWN command, a broadcast is issued to all users. No further logons are accepted until the region is restarted, or the SHUTDOWN CANCEL command is issued.

You can issue the SHUTDOWN command from OCS or Command Entry. Alternatively, you can issue it as a z/OS MODIFY command.

For more information about the SHUTDOWN command, see the online help.

FSTOP Command

The FSTOP command immediately disconnects user sessions and shuts down the region.

Use of the FSTOP command should be restricted.

You can issue the FSTOP command from OCS or Command Entry. Alternatively, you can issue it as a z/OS MODIFY command.

Important! If you are running another product in the same region, it also stops if the FSTOP command is issued.

For more information about the FSTOP command, see the online help.

Preserve Data When Region Stops and Restarts

You may want to preserve some data when a region stops so that this data is available when the region restarts. You can use global variables to preserve data. You can save global variables that the region reloads when it restarts. Saved global variables are known as persistent global variables.

To preserve data, create global variables with data you want to preserve and save them, for example:

- Use the Persistent Variables Administration option (access shortcut is /PVARS).
- Call the $CAGLBL procedure using the SAVE option.

  Note: For information about the $CAGLBL procedure, see the *Network Control Language Reference Guide*.

Create Persistent Global Variables Using the User Interface

You can create persistent global variables from the Persistent Variables List panel. The panel also lets you maintain those variables, for example, update, purge, or reload them.

To create a persistent global variable using the user interface

1. Enter the **/PVARS** panel shortcut.

   The Persistent Variables List panel appears.

2. Press F4 (Add).

   The Persistent Variable - Add panel appears.

3. Specify the name of the variable (without its global prefix) and its value. Press F3 (File).

The variable is saved so that it can be loaded the next time the region starts up.

Prevent the Reloading of Preserved Data

If problems occur during region startup because of invalid data being loaded, you can disable the reloading of the preserved data.

To prevent the reloading of preserved data, enter the following command when you start the region:

```
S rname, PARM='XOPT=NOPVLOAD'
```

The region starts without reloading the preserved data.

Chapter 3: Configuring a Region

This section contains the following topics:

How to Configure a Region

After you have completed installation and startup, your region is operational at a basic level; however, you must configure it to suit your requirements.

Use JCL Parameters to Configure a Region

JCL parameters enable you to configure a region. You use JCL parameters to set information such as the names of your INIT and READY procedures, and the types of security exit to use in your region.

This information is supplied by the PPREF statements in the RUNSYSIN member.

You can also pass this information in the START command using the JCL PARM field. If you specify multiple parameters, separate each with a comma.

Note: For more information, see the *Reference Guide*.

Display and Change JCL Parameter Settings

You can display the current settings of all the JCL parameters with the SHOW PARMS command from OCS or Command Entry. To change any of these parameters, specify their new values in the RUNSYSIN member and then restart the region.

For more information about JCL parameters, see the *Reference Guide*.

Identify the Region to Users

If you have multiple regions or communicate with other regions, you can set the domain ID and put titles on the panels.

Identify Domains and Panels

The NMDID JCL parameter identifies the domain ID for each region. If you have multiple regions, ensure that you have a different domain ID for each one. For more information about the NMDID parameter, see the *Reference Guide*.

You can use the SYSTEMID (System Identifications) parameter group in Customizer to help identify your regions. This parameter group specifies a system identifier that is used when you link to other regions. Ensure that each of your regions has a different system identifier.

This parameter group also specifies the titles to display on the logon panel and the OCS console panel. This helps users to identify the region that they have logged on to.

Note: The system ID parameter takes effect when the region is initialized.

Customize a Region Using Customizer

Customizer lets you review and update parameter groups.

You use Customizer to initialize and customize your region. Customizer is an initialization facility that lets you implement a region rapidly and easily. Also, Customizer enables you to customize parameters easily at a later stage.

When you first install a product, you need to set various parameters to get the product up and running. Customizer helps you set up these parameters. An initial dialog is supplied for the first time user, to walk you through the customization process. You are prompted to supply required parameter values and given the opportunity to supply optional parameter values.

To access the parameter groups, enter **/PARMS**.

What Are Parameter Groups?

System parameters are grouped by category (such as Security) in logical parameter groups, to simplify the process of initializing and customizing a region.

Groups of individual parameters translate into one or more of the following:

- SYSPARMS that determine how your region functions
- Global variables that are used by various NCL applications to control their functions
- Local parameters that define how to implement actions associated with parameter groups

Print Parameter Group Settings

You can print the parameter group settings in a region for analysis. The output is in the same format as the initialization file (see page 185).

To print parameter group settings

1. Enter the **/PARMS** panel shortcut.

   The Parameter Groups panel appears.

2. Enter **PRINT** at the Command prompt.

   The Confirm Printer panel appears.

3. Specify your printing requirements, and press F6 (Confirm).

   The parameter group settings in the region are printed.

Update System Parameters

Most customization of your region is performed by using Customizer.

You can also use the SYSPARMS command to customize your region. Each operand of the SYSPARMS command lets you specify options to change and customize the way your region works. For ease of maintenance, you can use the Display/Update SYSPARMS panel, which is accessible by using the /SYSPARM panel shortcut.

Notes:

- SYSPARMS set by Customizer parameter groups can only be updated using Customizer.
- For SYSPARMS without a corresponding parameter group, set the SYSPARMS in the INIT and READY procedures so that they are applied when the region starts, and then update them dynamically using the SYSPARMS command.
- For more information about SYSPARMS operands, see the *Reference Guide*.

Use the SYSPARMS Command

To change a SYSPARMS operand with the SYSPARMS command, enter the command at the OCS command line.

This command has the following format:

```
SYSPARMS operand=value operand=value ...
```

Example: Use the SYSPARMS Command

To display the time at the beginning of the OCS title line, enter the following command:

```
SYSPARMS OCSTIME=YES
```

Initialization Operands

There are some SYSPARMS command operands that cannot be changed while the region is operational. These operands must be included in your INIT procedure so that they are executed during initialization. For a complete list of SYSPARMS commands, see the *Reference Guide*.

If you specify new values for these initialization operands, the new values do not take effect until the region is initialized. All other SYSPARMS can be changed during region operation by authorized users.

Transient Log Tuning

A *transient log* is a log of activities associated with a resource that is monitored. One transient log exists for each resource definition loaded in a region and exists as long as the definition remains loaded in the region. You can specify the age over which logged activities are deleted to keep their number down. When the default size parameters do not suit your requirements, you can customize them. You can also change the size of the transient logs for selected resources.

Customize Tuning Parameters

The AUTOTABLES parameter group contains the tuning parameters for transient logs. The parameters control the default and maximum sizes, and the deletion of logged activities that are over a specified age. For example, when overflows occur in the logs, you can lower the maximum size while you investigate the cause of the problem.

To customize the tuning parameters for transient logs

1. Enter the **/PARMS** panel shortcut.

   The Parameter Groups panel appears.

2. Enter **F AUTOTABLES**.

   The cursor locates the AUTOTABLES parameter group.

3. Enter **U** beside the group.

   The group opens for updating.

4. Customize the parameters for transient logs to suit your requirements. Press F6 (Action).

   The changes are applied in the region.

5. (Optional) Press F3 (File) if you want to make the changes permanent.

   The group is updated with the changes.

Resize Selected Transient Logs

After your region operates for a while, you may find that you need to tune the size of some transient logs. You may also find that you need to change the resource definition templates to suit your requirements.

Important! Resizing a transient log updates the resource definition. It is recommended that if a resource needs a large transient log size, it should be updated individually. If you have a large system image and you set all resource transient logs to the maximum size, there could be system performance degradation and storage issues.

To resize selected transient logs

1. Access the list of system images that contain the resources for which you want to resize logs. For example, enter /RADMIN.I.L to access the list of local system images.

   A System Image List panel appears.

2. Enter **STL** beside the required image.

   A Set TLog Size Specification panel appears.

3. Select the required resources using the Resource Class and Resource Name fields, specify the required size for their logs, and then press F6 (Action).

   A message appears, indicating the number of resource definitions affected.

4. Press F6 (Action).

   The resource definitions are updated with the specified size. If the image is active, the affected logs are also resized.

Note: For active system images, you can also resize the transient logs from the monitors using the SETTLOG command.

Resize Multiple Transient Logs in an Image

If the transient logs for certain resources become full, you can resize them from a resource monitor.

Important! Resizing a transient log updates the resource definition. It is recommended that if a resource needs a large transient log size, it should be updated individually. If you have a large system image and you set all resource transient logs to the maximum size, there could be system performance degradation and storage issues.

To resize multiple transient logs in an image from a resource monitor

1. Enter **SETTLOG** at the Command prompt.

   You are prompted to select the image that contains the resources whose logs you want to resize.

2. Enter **S** beside the required image.

   A Set TLog Size Specification panel appears.

3. Select the required resources using the Resource Class and Resource Name fields, specify the required size for their logs, and then press F6 (Action).

   A message appears, indicating the number of resource definitions affected.

4. Press F6 (Action).

   The resource definitions are updated with the specified size, and the affected logs are resized.

Chapter 4: Customizing Your Product

This section contains the following topics:

Perform Administrative Tasks

Using the facilities that have been authorized for your use, you can perform various administrative tasks to implement and customize the facilities to suit your installation.

Implement Features

The tasks required to implement various features are described in the following sections. Many of these tasks are performed using parameter groups, as shown in the following table.

To implement...	Use parameter group...	See section...
The Network Services Control file	NSCNTL	Implement Network Services Control File (see page 34)
NEWS databases	NEWS	Implement NEWS Databases (see page 35)
The NTS log database	NTS	Implement the NTS Log Database (see page 35)
Your initialization procedure	SNAINIT	Identify Your Initialization Procedure (see page 36)
NSCNTL cache options	NSCNTLCACHE	Implement NSCNTL Cache Options (see page 37)

To implement...	Use parameter group...	See section...
NEWS database logging options	NEWSDBOPTS	Implement NEWS Database Logging Options (see page 38)
Event filters	CNMFILTERS	Implement Event Filters (see page 39)
Performance objectives for event recording	CNMPERFOBJ	Implement Performance Objectives for Event Recording (see page 40)
SMF event recording options	SMFT37	Implement SMF Event Recording Options (see page 41)
The PPI receiver	PPINETVALRT	Implement the PPI Receiver (see page 42)
Device support	DEVICESUPP	Implement Device Support Diagnostics (see page 42)

Implement Network Services Control File

To define a Network Services (NSCNTL) database for your region

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the NSCNTL parameter group.

   The NSCNTL - NSCNTL File Specifications panel appears.

3. Enter the NSCNTL File ID. This specifies the file name of your Network Services (NSCNTL) database, which is a required database.

   For more information about the fields, press F1 (Help).

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Implement NEWS Databases

You can define the following NEWS databases for your region:

- Network Error (NEWSFILE) database
- Network Error Backup (NEWSBKP) database.

Note: If you do not define the NEWSFILE database, no CNM events can be saved. If you do not define the NEWSBKP database, you cannot perform an online reorganization of the NEWSFILE database.

Define NEWS Databases

To define the NEWSFILE and NEWSBKP databases

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the NEWS parameter group.

   The NEWS - NEWS File Specifications panel appears.

3. Enter the NEWS Database File ID. This specifies the file name of your Network Error database. If you do not enter a value here, no Network Error database is allocated.

4. Complete the remaining fields on the panel. For more information about the fields, press F1 (Help).

5. Press F8 (Forward).

   The second panel for this parameter group appears.

6. Enter the NEWSBKP Database File ID. This specifies the file name of your Network Error Backup database. If you do not enter a value here, no Network Error database is allocated.

7. Complete the remaining fields on the panel. For more information about the fields, press F1 (Help).

8. Press F6 (Action).

   The entries are actioned.

9. Press F3 (File).

   The settings are saved.

Implement the NTS Log Database

You can define a Network Tracking Log (NTSLOG) database for your region.

Note: If you do not define the NTSLOG database, no session awareness or session trace data can be saved.

Define NTSLOG Database

To define the NTSLOG database

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the NTS parameter group.

   The NTS - NTSLOG File Specifications panel appears.

3. Enter the NTSLOG Database File ID. This specifies the file name of your Network Tracking Log database. If you do not enter a value here, no NTSLOG database is allocated.

4. Complete the remaining fields on the panel. For more information about the fields, press F1 (Help).

5. Press F6 (Action).

   The entries are actioned.

6. Press F3 (File).

   The settings are saved.

Identify Your Initialization Procedure

A default initialization procedure, $NSINIT, is provided. If you make a copy of this procedure and customize it, you need to identify your customized initialization procedure to CA NetMaster NM for SNA .

To identify a customized initialization procedure

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the SNAINIT parameter group.

   The SNAINIT - NetMaster for SNA Init Process panel appears.

3. If you have copied and customized the default initialization process, $NSINIT, enter your process name under NetMaster for SNA Initialization Details.

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Implement NSCNTL Cache Options

By setting an optimum cache size for the Network Services control file, you can improve the performance of NEWS processing by eliminating as much VSAM activity as possible.

The control file is a database that controls all NEWS CNM record processing. The Control File contains codes and messages that are used to control NEWS functions. It is front-ended by a cache that holds the most recently retrieved records from the Control File. Once full, the cache discards an infrequently referenced record when a new record is added.

Note: The cache is an in-storage vartable. Actioning this parameter group results in the vartable being deleted and redefined.

To implement the NSCNTL cache options

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the NSCNTLCACHE parameter group.

   The NSCNTLCACHE - NSCNTL Cache Size panel appears.

3. Enter a value in the Maximum Number of Records Cached field, or leave the default value.

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The entries are saved.

Implement NEWS Database Logging Options

You can control the performance of record logging to the NEWS database by implementing the NEWS Database Recording Options (NEWSDBOPTS) parameter group. This parameter group controls how many records are stored on the NEWS database for each resource name, per category.

To implement NEWS Database Logging options

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the NEWSDBOPTS parameter group.

   The NEWSDBOPTS - NEWS Database Recording Options panel appears.

3. Enter the maximum number of records to capture for each category shown, or leave the default value. For more information, press F1 (Help).

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Examples

To receive a warning message every time a device information record is discarded, type the value **1** in the Device Information field.

To receive no warnings after the initial notification that logging has been suspended, type **0** in the Device Information field.

Implement Event Filters

You can control how network events are processed by defining which events are recorded, how they are processed, and what severity alert is generated. You do this by implementing the Event Recording Filters (CNMFILTERS) parameter group.

The use of resource masks restricts the processing of event records to a subset of the network only. The Event Recording Filters parameter group lets you set resource masks for further filtering of records in the selected event type. You can specify any combination of include or exclude mask type for an event type.

To implement the Event Recording Filters parameter group

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the CNMFILTERS parameter group.

   The CNMFILTERS - Event Recording Filters panel appears. This panel has ten pages (each with two types of event filter) that you can scroll through to define filters for each event category (see page 53). For a list of event types, see Network Error Warning System.

3. Enter the Processing Option and Alert Severity for each event category, if you want to change the default values.

   Note: If you enter an Alert Severity value between 1 and 4, NEWS events appear in the Alert Monitor.

4. Define an Include Mask or an Exclude Mask for each event category for which you want further filtering. For more information, press F1 (Help).

5. Press F6 (Action).

   The entries are actioned.

6. Press F3 (File).

   The settings are saved.

Examples

To prevent an event generating an alert that appears on the Alert Monitor, specify an Alert Severity of **0**.

To write an event to the Events Category, specify a Processing Option of **E**.

Implement Performance Objectives for Event Recording

The Performance Objectives (CNMPERFOBJ) parameter group lets you set threshold values for certain network statistics that create a performance event when the values are reached or exceeded.

The following network statistics are used for performance objectives:

- 3x74 RTM Data
- RECMS Statistics
- FCS RECFMS 04 Data

To define performance objectives

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the CNMPERFOBJ parameter group.

   The CNMPERFOBJ - Performance Objectives panel appears. This panel has three pages that you can scroll through to define performance objectives for each type of event.

3. Enter the threshold values for each type of performance event to create. For more information, press F1 (Help).

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Implement SMF Event Recording Options

By setting SMF recording options (SMFT37), you can control the generation of SMF records from NEWS events and statistics.

When turned on, these options cause CNMPROC to write the specified NEWS records to the SMF file in type 37 format.

To implement SMF Event Recording options

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the SMFT37 parameter group.

   The SMFT37 - SMF Type 37 Recording Options panel appears.

3. Complete the following fields:

   Events and Attentions

   Specify the types of NEWS event records for which you want to write SMF records. For more information, press F1 (Help).

   Statistics

   Specify whether you want to write SMF records for statistics.

4. Press F6 (Action)

   This is to action your entries.

5. Press F3 (File)

   This saves your settings.

Implement the PPI Receiver

The PPI receiver (PPINETVALRT) processes external events that are queued to the NETVALRT PPI resource by other tasks.

To define details for starting and stopping the PPI receiver

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the PPINETVALRT parameter group.

   The PPINETVALRT - NETVALRT PPI Receiver Process panel appears.

3. Specify **YES** or **NO** in the Initially Active? field.

   This field indicates whether to start the PPI receiver during initialization.

4. Specify **YES** or **NO** in the Currently Active? field.

   This field indicates whether to start or stop the PPI receiver now.

5. Press F6 (Action).

   The entries are actioned.

6. Press F3 (File).

   The settings are saved.

Implement Device Support Diagnostics

NEWS device support lets you diagnose problems with SNA controller devices. The DEVICESUPP parameter group lets you specify which options to display on your SNA : Device Support Diagnostics Menu.

To implement device support diagnostics

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the DEVICESUPP parameter group.

   The DEVICESUPP - Device Support Diagnostics Menu appears.

3. Enter **YES** or **NO** for each option shown to control whether the option appears on the Device Support Diagnostics Menu. For more information about the fields, press F1 (Help).

4. Press F6 (Action).

   Your entries are actioned.

5. Press F3 (File).

   Your settings are saved.

Customize Facilities

The tasks required to customize facilities for various features are described in the following sections.

Customize NEWS Facilities

To customize NEWS facilities in your region, you can update the following parameter groups that you reviewed when implementing your region:

- NEWS File Specifications
- NEWS Database Recording Options

You can also do the following:

- Review your NEWS parameters to suit your installation.
- Manage your network focal points and entry points by using the NEWS : Control Functions Menu.

More information:

Network Error Warning System (see page 49)

Customize NTS Facilities

To customize NTS functions to suit your installation, use the SYSPARMS and DEFCLASS commands. These commands are normally included in the initialization procedure, $NSINIT (see page 44).

Customize NCPView Facilities

To customize NCPView facilities to suit your installation, you can do the following:

- Configure the NCPView NCL exit.
- Define additional NCPs to monitor.

Customize NCS Facilities

To customize NCS facilities in your region, you can do the following:

- Limit the size of display lists and individual node displays
- Integrate NCS with a configuration management database

Configure the Startup Procedure

The $NSINIT procedure is executed during initialization and is designed for actions specific to CA NetMaster NM for SNA.

You must review the $NSINIT procedure for the following purposes:

- To enable Tivoli NetView operator command emulation, if required.
- To set up NTS.

Note: $NSINIT is the default procedure. If you copy this procedure and customize it, you need to identify your customized procedure in the SNAINIT parameter group.

Enable Tivoli NetView Operator Command Emulation

You can use Tivoli NetView operator commands in CA NetMaster NM for SNA.

To enable Tivoli NetView operator command emulation

1. Add the following statement to the $NSINIT member.

   ```
   EXEC $VWCALL OPT=INIT
   ```

   Alternatively, if this statement already exists, remove the comment symbols (-*) beside the statement.

2. After you update your ..., enter the following command at the command prompt:

   ```
   unload proc=$NSINIT at OCS (=o)
   ```

   Your $NSINIT procedure is unloaded.

3. Action the SNAINIT (see page 36) parameter group for the changes to take effect.

Note: You can also use an NCCF-like facility that lets you execute some existing Tivoli NetView REXX procedures. For information about how to use this facility, see the *NetMaster REXX Guide*.

More information:

Configuring Tivoli NetView Operator Command Emulation (see page 125)

Set Up NTS

In the $NSINIT procedure, review the following:

- SYSPARMS parameters to control NTS functions
- DEFCLASS commands to control NTS data collection

These are administrative tasks that you can perform now or after startup.

For more information about the SYSPARMS parameters for NTS, see the *Reference Guide*

Security

Access to a region is controlled by the User ID Access Maintenance Subsystem (**/UAMS**).

For more information, see the *Security Guide*.

Security Considerations for Existing Users

If you are using a pre-existing UAMS database, perform the following tasks to ensure that users are authorized to operate in the region:

- Ensure that the group definitions are authorized for CA NetMaster NM for SNA.
- Ensure that the background users are defined by using the $RMBUSER group definition. For more information, see the *Security Guide*.

Check Existing User Group Definitions

To ensure that the group definitions are authorized

1. Enter **/UAMS** at the prompt.

   The UAMS : Primary Menu appears.

2. Type **L** at the prompt and **$RM** in the User field.

   The group definitions are listed.

3. Update each of the $RMADMIN, $RMBUSER, $RMMON, $RMNOPER, and $RMOPER definitions to ensure that the following fields are specified correctly:

Panel	Field	Value
3rd	Network Management field on the Access Authorities panel	Y
7th	NEWS Access field on the Network Management Details panel	Y
7th	Reset Authority field on the Network Management Details panel	N for $RMMON; Y for others
7th	NTS Access field on the Network Management Details panel	Y
7th	NCS Access field on the Network Management Details panel	Y
7th	NCPView Authority field on the Network Management Details panel	1

Define User Exits

If you have NEWS or NTS user exits, you can define them to CA NetMaster NM for SNA by using the CNM and SAW parameter groups.

Note: For more information, see the *Installation Guide*.

Implement NCS Display Limits

To set a maximum number of lines in NCS display lists and a maximum number of subnodes displayed for a node, use the SNA Node Display Limits parameter group.

To implement NCS display limits

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the NCS parameter group.

   The NCS - SNA Node Display Limits panel appears.

3. Complete the following fields:

   Maximum Number of Display Lines

   Specify the maximum number of resources to display in NCS.

   Maximum Number of Sub-node

   If you are using Fujitsu VTAM-G, specify the maximum number of sub-nodes to display in VTAM.

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The entries are saved.

Chapter 5: Network Error Warning System

This section contains the following topics:

Data Available to NEWS

NEWS processes a wide variety of data received from different sources and responds to the data it receives in an appropriate (user-definable) way. NEWS receives the following types of data:

- Unsolicited data
- Solicited data
- Response time data

NEWS also processes solicited and unsolicited data from the 3x74 Response Time Monitor.

Unsolicited Data

Unsolicited data—which originates from network nodes and distributed devices—received by NEWS includes the following:

- Traffic statistics
- Temporary and permanent error statistics
- Errors detected by network nodes
- Alert data generated by network components

Solicited Data

As a management application, NEWS can solicit data from network components by issuing requests using the CNM interface. The following types of data can be requested:

- Device-dependent error data
- Microcode level data
- Link error data recorded by network devices

Response Time Data

NEWS supports the 3x74 Response Time Monitor (RTM). This enables NEWS to receive response-time data, both solicited and unsolicited, that is maintained by the 3x74. The RTM data can be displayed in numeric or bar-graph format. NEWS also enables you to change the status of the RTM component in a 3x74. For instance, you can start or stop monitoring, or change the response time limits.

How NEWS Obtains Data

NEWS is linked to VTAM and your SNA network by two Access-method Control Blocks (ACBs), through which specific types of data are channeled.

The ACBs are as follows:

- The primary CA NetMaster NM for SNA ACB
- The Communications Network Management (CNM) ACB

NEWS obtains data from the following sources, using the specified routes:

Source	Route
The local SNA subarea network	VTAM System Services Control Point (SSCP) and the CNM ACB
The Control Points (CPs) of APPN nodes	LU 6.2 sessions, which carry SNA management data, and the CA NetMaster NM for SNA primary ACB
Connected regions	Intersystem routing (ISR) connection
Applications running on the same host that use PPI	Program-to-program interface (PPI)

These forms of data delivery are discussed in the following sections.

SNA Networks and the CNM Interface

The CNM interface lets a suitably authorized CNM application (such as NEWS) maintain a session with an SSCP, to acquire data from Physical Units (PUs) in your SNA network. This session is established when NEWS successfully opens its VTAM CNM ACB, allowing data to be exchanged with the SSCP of the VTAM under which NEWS is running.

NEWS receives the following types of data from the SSCP:

- Unsolicited, as a result of some network event
- Solicited, as a reply to a previous request for data issued by NEWS itself
- As a solicitation from the SSCP, requesting that NEWS send some data in response

NEWS sends data to the SSCP for the following reasons:

- To solicit data from a network resource
- In response to a solicitation request from the SSCP

APPN Networks and SNA Management Services

When CA NetMaster NM for SNA starts, a primary ACB that links it to VTAM opens. During initialization, NEWS registers with Multiple Domain Support (MDS) as the ALERT-NETOP application that acts as a focal point for alert collection from your APPN network.

MDS is a component of SNA Management Services (SNAMS), which facilitates the routing of management data between applications. It enables management roles—that is, which node is the focal point for the receipt of which data—to be negotiated between nodes.

For more information about the functions and services associated with SNAMS, see the IBM publication, *SNA Management Services Reference*.

SNA Management Services Units

SNA data units are known as Management Services Units (MSUs). There are various types of SNA MSUs and many reasons for the generation of each type. As a result, NEWS needs to apply rules to classify incoming records, to determine the relative importance of the data that each carries, and whether a response is appropriate.

SNAMS Data Transfer

The SNAMS architecture makes use of SNA Management Services transport, which consists of a number of APPC transactions used to transport SNA MSUs across the network.

&SNAMS Verb

The &SNAMS verb enables NCL procedures to participate as management applications in the SNAMS architecture. The partner application can exist in the same CA NetMaster region, a remote CA NetMaster region, or any other region that supports MDS functions.

For more information about the &SNAMS verb, see the *Network Control Language Reference Guide*.

NEWS and Intersystem Routing

The Intersystem Routing (ISR) feature enables data to be transparently routed to remote processing environments in other regions.

NEWS takes advantage of ISR to exchange data with remote regions. Requests, including CNM requests, can be routed to remote NEWS regions for processing, and the results returned to the originating region. This can be used to change the operation of, or solicit data from, a device managed by VTAM in the remote region.

ISR also enables a NEWS region to deliver unsolicited records to a remote NEWS region for processing.

By using ISR, you can implement centralized management, resulting in one NEWS region processing all data received by NEWS in linked regions. This lets you control all database logging from one region.

NEWS and PPI

Applications running on the same host can communicate using PPI, a support facility provided by the subsystem interface or Tivoli NetView. Users of PPI can send various types of data to this interface, which then distributes the data to the application registered to receive that particular type of data.

NEWS registers with PPI, as the receiver of generic alerts, to monitor and report on the state of other applications using PPI.

Processing Concepts

This section explains the various concepts relating to the processing of all records received by NEWS.

Network Services Control File

The processing requirements for records received by NEWS are determined by a control database called the Network Services Control File (NSCNTL). This database contains control codes that describe the processing to perform for each type of record received by NEWS. It also acts as a data dictionary and is used to interpret the control codes present in the record.

This approach of determining processing requirements through data held on a control database provides extensive flexibility. The NEWS Control Function menu provides functions that allow you to add support for non-standard devices and requirements, or modify a control record held on the database. Any alterations or additions made to the control database are effective immediately.

NSCNTL is used by CNMPROC, a specialized NCL procedure, to process all records received by NEWS.

Events

Any record received by NEWS is classified as an *event*, or as having the capacity to generate an event. The concept of the event enables different types of data to be grouped into one broad category, to provide a chronological record for a network node.

Generally, unsolicited records notifying NEWS of network errors are immediately classified as events. Records carrying statistical data have the potential to generate an event, if they include values that exceed thresholds set by your installation.

Event Types

Although it is convenient to group various sources of network data under the events umbrella, additional information is required to assist processing. Each event record is classified as one of the following types:

- Permanent error (PERM)
- Temporary error (TEMP)
- Performance (PERF)
- Intervention required (INTV)
- Customer application (CUST)
- End user (USER)
- SNA summary (SNA)
- Intensive mode record (IMR)
- Availability (AVAL)
- Notification (NTFY)
- Environmental problem (ENV)
- Installation problem (INST)
- Operational or procedural error (PROC)
- Security (SCUR)
- Delayed recovery (DLRC)
- Permanently affected resource (PAFF)
- Impending problem (IMP)
- Bypassed (BYPS)
- Redundancy lost (RLST)
- Unknown (UNKN)

Each record contains a field that identifies the type of data in the record, and determines the event type.

Event Characteristics

The characteristics that identify an event are generally represented by one or more codes in the record. These codes may describe the following:

- The reason why the event was generated
- The probable cause or causes of the event
- The severity of the problem associated with the event
- The resources affected by this problem
- The recommended remedial action

The codes may also provide additional information that assists in determining the cause of the associated problem, and are used by NEWS in conjunction with the control file, to determine record processing.

Event Filtering

Different installations have different network configurations and employ a variety of device types, some of which have their own special requirements. Also, installations assign differing levels of importance to particular network events and problems in their environments.

NEWS provides for this situation by passing all event records through a process termed *event filtering*, using parameters set in the Control File. This process enables you to discard those event records not required by your installation, while bringing to the attention of the network operator those considered important.

For each of the event types described on the previous page, you can filter by using resource masks. You can also set options that control how the event is recorded in the NEWS database and whether an alert is generated for display on the Alert Monitor.

Event filtering is performed by the NEWS and user CNM processing procedures. CNMPROC uses control values that you set through the CNMFILTERS parameter group to perform filtering.

More information:

Implement Event Filters (see page 39)

Resource Masks

Because all records are sent by, or on behalf of, a network resource, it is possible to restrict the processing of certain types of data to particular resources.

Resource masks are defined generically and are used to include or exclude records based on the originating resource name. Records that do not satisfy resource masking criteria are discarded.

Alert Monitor

You can generate alerts to increase operator awareness of important events in the network using NEWS. Any record received by NEWS can be classified, through event filtering, as an alert. The alert monitor contains the most recent alerts produced by NEWS. The display is updated as new alerts arrive, or the status of alerts on the display change.

CNMPROC Record Processing

CNMPROC is a special NCL procedure that acts as a focal point application for SNA management data. CNMPROC executes in a background environment under user ID *xxxx*CNMP, where *xxxx* is the four-letter domain ID. A working version of CNMPROC is distributed as $NWCNMPR.

The function of CNMPROC is to do the following:

- Analyze the content of each record delivered to it, in conjunction with the Network Services Control File (NSCNTL), to determine the processing requirements
- Process the record accordingly

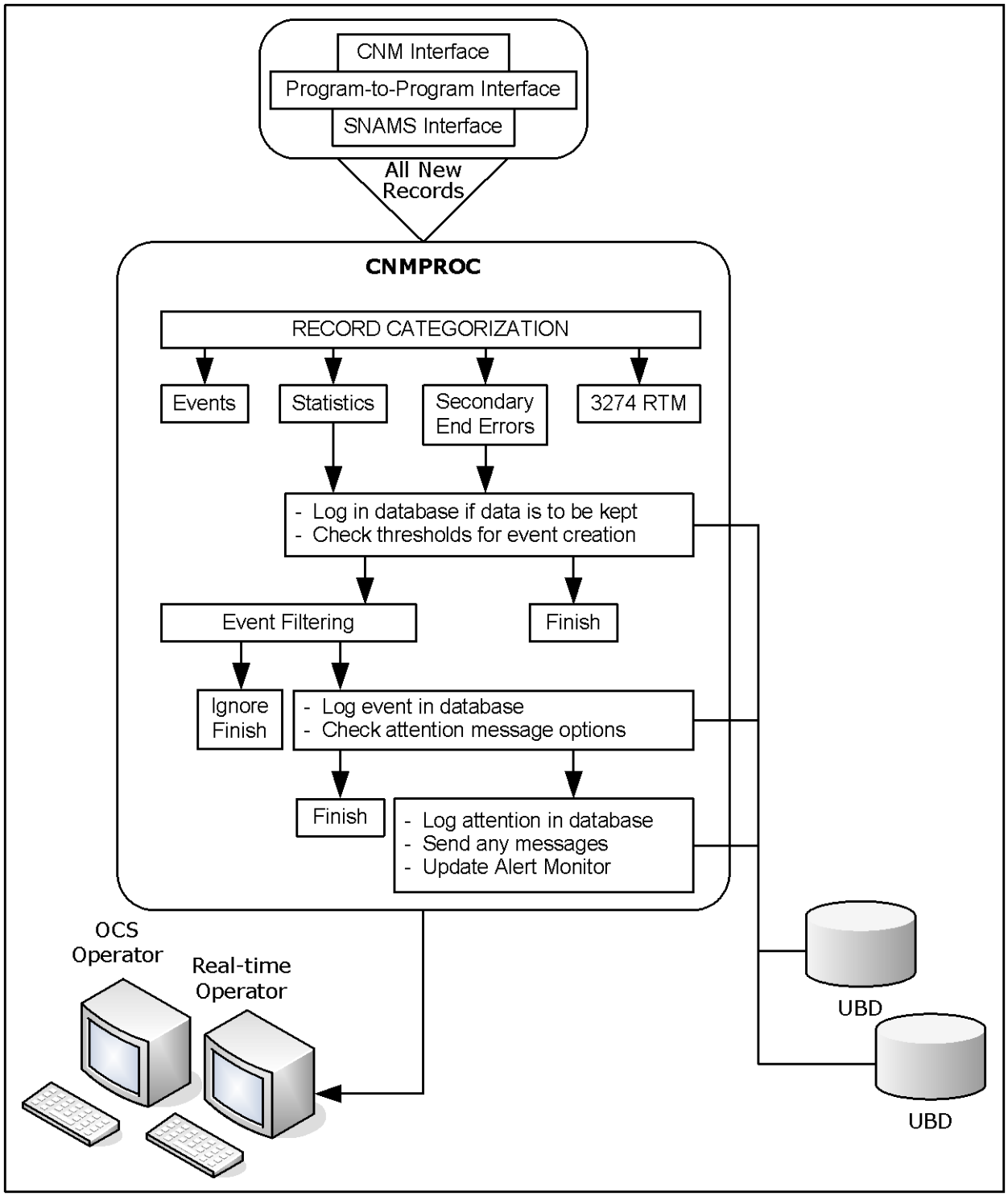
CNMPROC is written as a continuous procedure (like PPOPROC and LOGPROC) and uses the &CNMREAD verb to receive each record as it becomes available for focal point processing. CNMPROC does some pre-processing to identify the record and then calls other procedures to perform further processing.

CNMPROC can be activated to process the following:

- All records that arrive unsolicited from VTAM across the CNM interface
- Records from APPN nodes sent to the ALERT-NETOP application using the Management Services implementation of MS Transport
- Solicited records delivered to it by users
- Alerts created by the &CNMALERT verb

Messages generated by CNMPROC are sent to OCS users who have monitor capability, and have a prefix of C to identify their origin.

The following illustration shows how CNMPROC processes data arriving from the SNA network.



Keep the following in mind when reviewing this illustration:

- All records received through the CNM interface from VTAM are processed by CNMPROC, including the following:
  - RECMS records from NCPs with statistical and error data
  - Unsolicited RECFMS and NMVT RUs containing alerts and statistical data from SNA controllers
  - Solicited RECFMS and NMVT RUs
- CNMPROC categorizes records and logs those that are to be kept in the NEWS database.
- Installation options define the event generation and filtering processes.
- Attention messages providing notice of important events may be sent to operators.

NEWS Facilities

NEWS provides NCL programming facilities, and commands for customization and diagnosis.

NCL Verbs and Procedures

NEWS provides NCL procedures, and NCL verbs and system variables, to perform different functions.

The following is a summary of NEWS NCL verbs and system variables:

&CNMALERT

Sends a CNM alert to a local or remote NEWS region for processing.

&CNMCLEAR

Clears any outstanding Response Units (RUs) which have been solicited by an &CNMSEND statement and not processed by an &CNMREAD statement.

&CNMCONT

Used in CNMPROC to send the current CNM record across specified ISR links.

&CNMDEL

Used in CNMPROC to delete the current CNM record or stop the current CNM record from being sent across specified ISR links.

&CNMPARSE

Produces tokenized data from the $CNM mapped MDO used by NEWS.

&CNMREAD

Makes the next CNM record received from VTAM available to CNMPROC, or the next outstanding RU available to a user procedure that has solicited data using an &CNMSEND statement.

&CNMSEND

Sends an RU across the CNM interface.

&CNMVECTR

Parses supplied hexadecimal data in the form of a CNM record into NCL tokens that correspond to the CNM vectors present.

&NEWSAUTH

Indicates whether the user ID of the user invoking a procedure is authorized for NEWS (system variable).

&NEWSRSET

Indicates whether the user ID of the user invoking a procedure is authorized to delete records from the NEWS database (system variable).

&SNAMS

Provides the SNA Management Services interface which enables NCL procedures to participate as management applications in an APPN network.

For more information about NEWS NCL verbs and system variables, see the *Network Control Language Reference Guide*.

Unattended Solicitation

NEWS supplies NCL procedures to solicit various types of network data, including RTM, VPD, EC level data, FCS, and LPDA2 data.

More information:

Line Command Procedures (see page 264)

NEWS Commands

The following is a summary of NEWS commands:

CNM

Starts and stops the VTAM CNM interface.

CNMTRACE

Defines a trace of records that come across the CNM interface. By default, all trace data is recorded.

DEFALIAS

Defines an alias entry for the Alias Name Translation Facility of NEWS.

DELALIAS

Deletes an alias entry used by the Alias Name Translation Facility of NEWS.

REPALIAS

Replaces an alias name entry used by the Alias Name Translation Facility of NEWS.

REQMS

Sends data across the CNM interface.

SHOW CNMTRACE

Displays active CNM trace requests.

SHOW DEFALIAS

Displays one or more DEFALIAS entries used by the Alias Name Translation Facility of NEWS.

SHOW SNAMS

Displays a list of all applications registered with SNA Management Services.

SYSMON

Logs the user on to the System Monitor residing in a 3600 or 4700 controller and sends data to the Monitor.

SYSPARMS

Initializes or modifies system parameter values.

XLATE

Performs name translation testing through the Alias Name Translation Facility of NEWS.

Testing NEWS Events

You can use NEWS alerts, also called NEWS events, to test processing in the structure of NEWS.

You can create the following types of NEWS events:

- Hardware events
- Software events

Alerts can be used to test the CNM record processing. This allows the testing of record support, which may not otherwise be possible until a CNM record arrives through the CNM interface. If the processing path for the record is incomplete or incorrect, or if a processing procedure fails, then a valuable record may be lost.

Test with Pre-existing Events

If there are NEWS events already created, you can test them instead of creating new alerts.

To test with pre-existing events

1. Enter /SNAHIST to display the NEWS : Database Review menu, and enter **2**.

   The NEWS : Events Review menu appears.

2. Tab to a node and enter **S**.

   Another NEWS : Events Review panel appears.

3. Tab to one of the records and enter **S**.

   The NEWS : Generic Alert Display panel appears.

4. Enter **C** at the command prompt.

   The control codes that relate to that event appear. The codes determine what category on the control file defines the descriptive text.

5. Enter **D** at the command prompt.

   A dump of the event appears.

6. Enter **RESEND** at the command prompt.

   The alert is generated again, and, if you have made changes to the control file, the event will be reprocessed and will display updated values.

Create an Alert Menu

The NEWS : Create an Alert menu lets you create the following NMVT alerts:

- Operator Alerts
- Non-generic (Basic) Alerts
- Generic Alerts

Create an Operator Alert

You can produce operator alerts in the form of text messages to send to network operators.

To create an operator alert

1. Enter **/SNADIAG.CA** at the prompt.

   The NEWS : Create an Alert Menu appears.

2. Enter **1** at the prompt.

   The NEWS : Create an Operator Alert panel appears.

3. Complete the following fields:

   Text Message

   Type a maximum of 10 lines of text, each of 60 characters.

   The text is entirely free-form and can contain any information required by the operator.

   Node Name

   If you want to change the default, then type the name of a resource in the Node Name field.

   By default, the user ID of the operator creating the alert is used as the name of the resource sending the alert. The receiving NEWS region logs the record in the NEWS database under the name of the resource which sent the alert.

4. Perform the following steps if remote routing is required:

   a. In the Link Name field, type a link name to send the alert to the associated remote region.

   b. In the SSCP Name field, type an SSCP name to send the alert to the associated remote region.

5. Press Enter.

   If successful, a message appears; otherwise, the alert is sent to the Alert Monitor as a NTFY Operator notification. Use the D option to display.

Create a Non-Generic (Basic) Alert

You can create a basic NMVT alert to report user-defined events, or to test the existing CNM processing path for any type of alert. The alert is queued to the targeted CNMPROC (on a local or remote region) for processing.

Much of the alert information is built to form subvectors. Each subvector carries information that helps describe the alert condition.

Note: For a description of these subvectors, see the IBM publication, *SNA Formats and Protocols Reference*.

To create a non-generic (basic) alert

1. Enter **/SNADIAG.CA** at the prompt.

   The NEWS : Create an Alert Menu appears.

2. Enter **2** at the prompt.

   The first NEWS : Create a Basic (Non-generic) Alert panel appears. The panel provides fields for the following alert information:

   - Basic alert
   - Detail qualifiers

3. Obtain the relevant reference codes associated with the subvector from IBM's *SNA Formats and Protocols Manual* and enter this information as follows:

   a. Enter information in the Basic Alert section. This information is built to form the following required subvector:

      - X'91'—Describes the condition that led to the generation of the alert, the possible causes of the alert condition, the recommended action, and may also supply a Detail Text Reference code to further describe the alert condition.

   b. Enter information in the Detailed Qualifiers section. When you enter detail qualifiers, you specify how data for the detail text of an alert message is transmitted for display. The detail text describes in detail what condition caused the generation of the alert and is defined by the reference code you entered in the Detail Text field in the Basic Alert subvector.

      You can either transmit the detail data in text characters using the text contents of the subvector X‘91’ to type the text characters for the detail data in each Qualifiers field, or you can transmit the hexadecimal representation of the data by typing the hexadecimal equivalent of the contents of the subvector X‘91’. The hexadecimal representation is converted to EBCDIC text before being displayed.

      The information in this section is built to form the following optional subvectors:

      - X'A0'—Supplies a qualifier that is added to the Detail Text when it appears and only applies if a Detail Text Reference code was supplied in the X'91' subvector. The qualifier contained in this subvector is in character form and is not interpreted before being displayed.
      - X'A1'—Supplies a qualifier that is added to the Detail Text when it appears and only applies if a Detail Text Reference code was supplied in the X'91' subvector. The qualifier contained in this subvector is in hexadecimal form and is translated into character format before being displayed.

4. Press F8.

   The next panel appears. The panel provides fields for the following alert information:

   - Alert sender PSID
   - Indicated resource PSID
   - Resource hierarchy
   - Remote routing

5. Continue to enter the reference code information you obtained from IBM's *SNA Formats and Protocols Manual* in the Alert Sender PSID and Indicated Resource PSID sections. This information is built to form the following optional subvector:

   - X'10' (Product Set ID)—Describes a network resource. The alert can contain up to two of these subvectors. The first, if present, describes the resource sending the alert. This resource, called the Alert Sender, may be reporting an alert condition in another resource. If this is the case, a second Product Set ID subvector may be present, which describes the indicated resource. These resources are identified by their Common Hardware or Common Software name. For example, an IBM 3174 Control Unit would have a Common Hardware name of 3174.

6. Enter information in the Resource Hierarchy section by typing resource names and types in descending order, so that the resource immediately connected to the reported resource is the last in the hierarchy list.

7. Enter information in the Remote Routing section to direct the alert to a remote region for processing by using the NEWS ISR facilities.

   Note: If no remote routing is requested, then the alert is directed to the local CNMPROC.

Create a Generic Alert

You can create Generic NMVT alerts to report events in the network or to test the existing CNM processing path for such an alert. The alert is queued to the targeted CNMPROC (on a local or remote region) for processing.

Much of the alert information is built to form subvectors. Each subvector carries information that helps describe the alert condition.

To create a generic alert

1. Enter **/SNADIAG.CA** at the prompt.

   The NEWS : Create an Alert Menu appears.

2. Enter **3** at the prompt.

   The first NEWS : Create a Generic Alert panel appears. The panel provides fields for the following alert information:

   - Generic alert data
   - Probable causes
   - User causes
   - Install causes
   - Failure causes

3. Obtain the relevant reference codes associated with the subvector from IBM's *SNA Formats and Protocols Manual* and enter this information as follows:

   a. Enter information in the Generic Alert Data section. This information is built to form the following required subvector:

      - X'92'—Describes the severity of the condition which led to the generation of the alert, and gives a code which describes the alert condition.

   b. Enter information in the Probable Causes section. This information is built to form the following required subvector:

      - X'93'—Provides codes which describe the probable causes of the alert condition. A maximum of three Probable Cause codes can be entered.

   c. Enter information in the User Causes section. This information is built to form the following optional subvector:

      - X'94'—Provides codes that describe possible user-related causes of the alert condition, and supplies Recommended Action codes. A maximum of three User Cause codes and three Recommended Action codes can be entered.

   d. Enter information in the Install Causes section. This information is built to form the following optional subvector:

      - X'95'—Provides codes describing errors which may have been made during the installation of the resource which may have caused the alert condition, and supplies Recommended Action codes. A maximum of three Install Cause codes and three Recommended Action codes can be entered.

   e. Enter information in the Failure Causes section. This information is built to form the following optional subvector:

      - X'96'—Provides codes which describe possible device or software failures which may have caused the alert condition, and supplies Recommended Action codes. A maximum of three Failure Cause codes and three Recommended Action codes can be entered.

4. Press F8 (Forward).

   The next panel appears. The panel provides fields for the following alert information:

   - Undetermined cause
   - Self-defining text message
   - Alert sender PSID
   - Indicated resource PSID
   - Resource hierarchy
   - Remote routing

5. Continue to enter the reference code information you obtained from IBM's *SNA Formats and Protocols Manual* as follows:

   a. Enter information in the Undetermined Cause section. This information is built to form the following optional subvector:

      - X'97'—Specifies Recommended Action codes to describe the necessary action. If the cause for the alert condition is not known or cannot be expressed in the previous cause code subvectors, this subvector must be included in the alert. It carries no Cause codes. A maximum of three Recommended Action codes can be entered.

   b. Enter information in the Self-defining Text Message section. This information is built to form the following optional subvector:

      - X'31'—Carries text which can help with further diagnosis of the condition leading to the generation of the alert.

   c. Enter information in the Alert Sender PSID and Indicated Resource PSID sections. This information is built to form the following optional subvector:

      - X'10' (Product Set ID)—Describes a network resource. The alert can contain up to two of these subvectors. The first, if present, describes the resource sending the alert. This resource, called the Alert Sender, may be reporting an alert condition in another resource. If this is the case, a second Product Set ID subvector may be present, which describes the indicated resource. These resources are identified by their Common Hardware or Common Software name. For example, an IBM 3174 Control Unit would have a Common Hardware name of 3174.

6. Enter information in the Resource Hierarchy section by typing resource names and types in descending order, so that the resource immediately connected to the reported resource is the last in the hierarchy list.

7. Enter information in the Remote Routing section to direct the alert to a remote region for processing by using the NEWS ISR facilities.

   Note: If no remote routing is requested, then the alert is directed to the local CNMPROC.

Review Parameters to Send and Receive CNM Data

To send and receive CNM data, you must set fields on the first page of the CNM parameter group.

In the CNM parameter group, specify the required CNM ACB name. The CNM ACB name is the name of the ACB used to send and receive CNM requests and responses, and optionally, used to receive unsolicited CNM data.

Note: If the ACB specified is unable to receive unsolicited CNM data, then the name of the CA NetMaster NM for SNA or Tivoli NetView region where it resides must be specified in the ISR Link Name field on the ISRIN Initialization Parameters panel.

More information:

Advanced Configuration Tasks (see page 129)

Configure NEWS Database Options

The NEWS database options lets you control how many records are stored on the NEWS database for each resource name, per category.

To implement the NEWS database options, use the NEWSDBOPTS parameter group.

More information:

Implement NEWS Database Logging Options (see page 38)

Review NCP Parameters and Operations

The NCP generates statistics records whenever certain internal counters overflow. Generally speaking, the counters for SNA devices overflow fairly frequently because the transmission counters include poll-type transmissions, and so the arrival rate of statistics for those devices is normally high. However, the counters for non-SNA devices include data transmissions only and by default wrap only after 65535 transmissions or 255 temporary errors. The arrival rate for statistics records for these devices can be quite low.

To adjust the statistics arrival rate for SNA and non-SNA devices, specify the SRT NCP generation parameter. You can specify it on a PU macro for an SNA controller or a TERMINAL macro for a non-SNA terminal. We recommend that the parameter be utilized, particularly for non-SNA devices, so that statistics can be kept as current as possible.

Another concern for statistics collection is that of network shutdown. Whenever VTAM varies an NCP inactive, that NCP delivers statistics for all devices connected to it. If the network is shutdown using the Z NET,QUICK command, VTAM varies all NCPs inactive, which then deliver their statistics. However, it is possible that your region is terminating because of the Z NET,QUICK command and therefore will not accumulate those statistics.

We recommend that an orderly network shutdown be implemented whereby all NCPs are made inactive before VTAM is halted.

Customize Device Configuration

You may consider customizing the configuration to include the following features:

- LPDA support
- RTM support
- FCS support

Utilize LPDA Support

To utilize LPDA support

1. Consider the inclusion of LPDA support.
2. Set the LPDATS operand on the LINE macro to YES; otherwise, the solicitation of link status and DTE data from such devices fails.

Note: Use if 386X type modems are used in the installation only.

Utilize RTM Support

To utilize the support NEWS provides for the 3x74 RTM feature, you must customize the controller for host support.

To utilize RTM support

1. During the customization process for the 3x74, select any one of the options available that provide host support. The specific option depends on your other requirements.
2. Configure the default RTM definition and boundary values for all attached devices. These values can subsequently be changed by NEWS.

FCS Support

For NEWS to converse with a 3600/4700 controller, the controller must include the expanded System Monitor with Communications Network Management/Controller Support (CNM/CS).

For more information about the generation statements required and CNM support, see the appropriate *3600/4700 Subsystem Instruction and Macros Reference*, *Programmer's Guide*, *System Programmer's Guide*, *Component Descriptions,* and *Principles of Operation* guides.

Maintain Control File Records

You can configure the processing of NEWS facilities by maintaining the Network Services Control File (also called the NSCNTL database). The Control File contains records that control NEWS processing and provide a database of messages for the display of solicited and unsolicited records about network events. NEWS uses the control file to determine the CNM processing path for solicited and unsolicited records.

The SNA : Control File Administration panel lets you browse, modify, or add existing support for Control File records of a specified category.

Access the SNA : Control File Administration Panel

This panel lets you list and maintain control records.

To access the SNA : Control File Administration Panel

1. Enter **/SNACFA** at the prompt.

   The SNA : Control File Administration menu appears.

Managing Control Records

To browse, modify, or add control records

1. From the SNA : Control File Administration menu, enter **M** at the prompt.

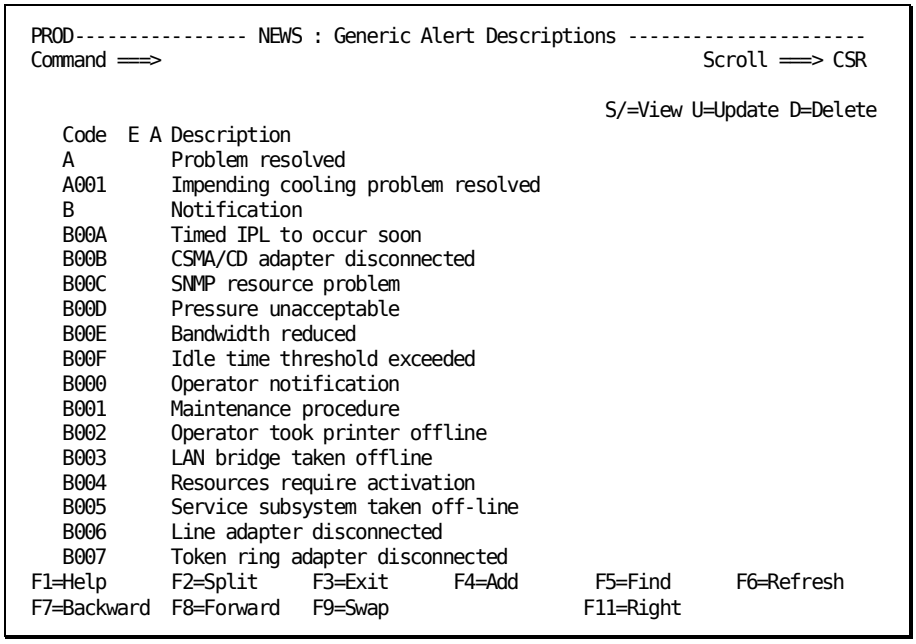
   The NEWS : Category Selection list appears.

   Note: If you enter **L** on the SNA : Control File Administration menu, then you can browse records from the selection list of records for a category only.

   The NEWS : Category Selection Panel appears.

2. Enter **S** next to the category you want.

   A selection list of records for that category appears. The following figure is an example.



From this list you can select records to browse, modify, update, or delete. You can also add new records.

Add Control Records

To add control records

1. Press F4 (Add).

   A panel for record details of that type appears in Add mode.

2. Enter details of the new record. For more information about how to define each type of record, press F1 (Help).

3. Press F3 (File).

   The control records are saved.

Note: Control records are stored in the Network Services Control File (NSCNTL), which can be shared between multiple regions. Before you update records, you must open the file for update and limit it to one region.

Browse Control Records

To browse a record from the selection list of records for a category

1. Enter **S** next to the record.

   The selected record appears in Browse mode.

Modify Control Records

To modify control records

1. To modify a record from the selection list of records for a category, enter **U** next to it.

   The selected record appears in Update mode.

2. Modify the record as required. For more information about how to modify each type of record, press F1 (Help).

3. Press F3.

   The changes are filed.

Delete Control Records

To delete control records

1. Enter **D** next to the record you want to delete.

   A message appears, asking you to confirm your delete request.

2. Press Enter to confirm your delete request or F12 to cancel the request.

Alias Name Translation Facility

NEWS provides VTAM alias name translation services for those levels of VTAM that require this function. VTAM requests alias name translation if the CNM Routing table entry for the CNM ACB contains the translate-inquiry RU. When establishing cross-domain or cross-network sessions, VTAM can request the translation of LU names, COS names, and LOGMODE names.

Generic name definitions allow ranges of names to be translated by NEWS from a single translation definition. You display and maintain translation definitions by using NEWS commands.

More information:

Advanced Configuration Tasks (see page 129)

Reviewing and Reporting on Data

After data has been filtered and recorded in the NEWS database, you can review it by using the NEWS menus and full-screen panels, or have it exported to a data set for analysis by external applications.

If you want to analyze or report on NEWS data using an external application, do *one* of the following:

- Use the supplied user exits to archive all required records to a sequential data set.
- Generate SMF records by activating SMF recording.

If required, you can enable the generation of type 37 SMF records for all event, attention, and statistics records that pass NEWS filtering.

NEWS also provides predefined reports. For more information about these reports, see the *User Guide.*

Maintain the NEWS Database

The NEWS Control Functions let you set NEWS parameters and tune the various features of NEWS after you have installed NEWS.

You can improve the capacity of the NEWS database by deleting database records or by reclaiming unused VSAM space.

The Database Maintenance panel lets you delete specific records from the database, delete all records, or perform a manual reorganization of the database to reclaim VSAM space.

Implement CNMPROC Logging Options

The CNMLOGGING parameter group lets you turn logging on and off for the NEWS database and to define what is to happen if the NEWS database is filled:

- Logging a reminder message after a specified number of lost records
- Whether to automatically reorganize the NEWS database

To implement the CNMPROC logging options

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the CNMLOGGING parameter group.

   The CNMLOGGING - NEWS Database Logging Options panel appears. This panel has two pages that you can scroll through to define CNMPROC logging options.

3. Complete the following fields:

   Logging Active?

   Enter **NO** to suspend logging, or **YES** to resume logging.

   Lost Record Reminder

   Specify what is to happen if the NEWS database is full.

   Auto-reorg?

   Specify what is to happen if the NEWS database is full.

   For more information about the fields, press F1 (Help).

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Access Database Maintenance

The NEWS : Database Maintenance panel lets you do the following:

- Delete specified records
- Delete all records
- Perform a reorganization of the NEWS database.

To access Database Maintenance

1. Enter **/SNADBA** at the prompt.

   The NEWS : Database Maintenance menu appears.

2. Specify the parameters that you want to delete.

Delete Records Generically by Date and Node

To delete specified records generically from the NEWS : Database Maintenance menu

1. Choose option **1** - Delete Records Generically by Date and/or Node.
2. Complete the following fields:

   Keep Date

   Specify a date to delete any records that arrive before the specified date. For more information about date formats, press F1 (Help).

   Node Name

   Specify *one* of the following:

   - A node name
   - A generic node name, by typing a generic node name and the wild character *****
   - All nodes, by typing the wild character *****

   Delete Masters

   Type **Y** to delete master and detail records, or **N** to delete detail records only.

   The Master record contains information, in a record category for a specific node, about when detailed records were collected, the record count, and the record collection period.

   Detail records contain detailed information for a specific node.

   A panel appears showing the number of detail records deleted, the number of master records updated, and the number of master records deleted.

   Note: If you deleted large numbers of records, we suggest that you perform a database reorganization (see page 77) to reclaim unused VSAM space.

Delete All Records

To delete all records from the NEWS database

1. From the NEWS : Database Maintenance menu, choose option **2** - Delete All NEWS Database Records.

   A confirmation message appears.

Note: After clearing the database, it is recommended that you perform a database (see page 77) reorganization (see page 77) to reclaim unused VSAM space.

Reorganize the NEWS Database

Reorganizing the NEWS database lets you reclaim any unused VSAM space.

Note: NEWS can perform automatic database reorganization if you enable the Auto Re-org facility by using the CNMLOGGING - NEWS Database Logging Options panel.

Before you reorganize the database, ensure you have appropriate VSAM definitions.

To reorganize the NEWS database

1. Review the VSAM cluster definition of NEWSFILE on the NEWS - NEWS File Specifications parameter group panel and ensure that the NEWSFILE is defined with the REUSE option. For some levels of VSAM, this is possible where the data set has been sub-allocated only.
2. Review the backup file (NEWSBKP) definition on the NEWS - NEWS File Specifications panel and ensure that the backup data set is large enough to contain all database records.
3. Go to OCS (**=O**) and enter SHOW UDBUSERS to check that the NEWSFILE ID is not being used (see page 77).

Release the NEWSFILE from CNMPROC

The NEWSFILE file ID would normally be in use by CNMPROC and any users currently using NEWS options involving access to the database. Certain options, such as the System Support Services menu, are entered without allocating the file until a specific requests required its use.

You can release the NEWSFILE from CNMPROC by suspending database logging, using the CNMLOGGING parameter group.

Reorganize the Database Manually

This action invokes NCL procedure $NWCNMRO, which builds IDCAMS control statements and calls the utility program UTIL0007 to attach IDCAMS and perform the actual reorganization.

To manually reorganize the NEWS database

1. From the NEWS : Database Maintenance menu, choose option **3** - Perform Re-org of the NEWS Database.

   A confirmation message appears.

   Note: If the reorganization is unsuccessful, determine the reason for the failure by referring to the message issued to the activity log.

2. Restart CNMPROC or reactivate database logging by using the CNMLOGGING - NEWS Database Logging Options parameter group panel.

Chapter 6: Network Tracking System

This section contains the following topics:

Data Available to NTS

The primary objects that concern NTS are network-addressable units, also called resources, and sessions between these resources. The resources can be in the same domain, in different domains, or even in different networks.

The following data types are available to NTS:

- Session awareness (SAW) data, which consists of session start and session end notifications from VTAM
- Session data that contains information about the performance and status of a session, including the following:
  - Session trace data
  - Response time data
  - Route configuration data

Session Awareness Data

VTAM supplies NTS Session Awareness (SAW) data relating to sessions that the local SSCP maintains. This includes data about SSCP-SSCP, SSCP-PU, SSCP-LU, LU-LU and CP-CP sessions.

If linked to other NTS regions, NTS can also receive SAW data from VTAMs in remote domains.

Composition

SAW data consists of the following data:

Session Identification Data

Includes the following:

- Session partner names (or aliases, if applicable) and addresses
- PCIDs
- Session start and end time
- Session type and class (such as: same domain, cross domain)

Session Connectivity Data

Includes the following:

- Explicit Route (ER)
- Virtual Route (VR) and Transmission Priority (TP) that the session is using
- Logmode and Class of Service (CoS) table entries the session is using

Session Hierarchy Data

Includes the following:

- Controlling PU name
- Link name, and subarea PU name (where relevant) for each session partner resource

Session Exception Data

Includes the following:

- Sense codes describing any error conditions that occurred while the session was in progress

Session Trace Data

Through NTS, you can issue requests to VTAM to start tracing sessions that involve resources in the local VTAM domain. As a result, NTS receives trace data from VTAM and associates it with session records in storage. NTS can also solicit trace data collected by VTAMs in other, linked NTS regions.

Composition

Trace data consists of copies of Path Information Units (PIUs) that flow on traced sessions. PIUs are message units that comprise the following:

- A Transmission Header (TH)
- A Request/response Header (RH)
- Any Request/response Unit (RU)

For session control RUs, the entire RU is included; otherwise, for performance reasons, only the first 11 bytes are retained.

For more information about how to obtain extended trace information, see the STRACE command description in the online help.

Response Time Monitoring Data

Response Time Monitoring (RTM) data is a measure of how long it takes for an operation to transmit between a display station and a host.

NTS obtains the response time information from the cluster controller at session end, then associates the response time obtained for a display station with the session record in storage.

Note: For RTM data to be available to NTS, the cluster controller must support host programming.

The cluster controller sends solicited and unsolicited data to NTS. This data originates from PUs that implement RTM (3x74s or equivalent) for their attached LUs.

NTS can also solicit RTM data collected by other NTS regions.

Composition

RTM data received from the cluster controller consists of the following:

Boundary Values in Seconds

These boundaries demarcate *buckets* into which individual response times are counted; an overflow bucket is also provided.

Bucket Counts

These counts represent the total number of response times in the specified boundaries since the beginning of the session, or since the response times were last reset.

Route Configuration Data

NTS receives solicited and unsolicited route configuration data from VTAM and other subarea nodes. You can dynamically request ER and VR configuration information from subarea nodes visible to NTS.

Composition

Route configuration information includes the following:

- Source, destination, and adjacent subarea numbers
- Source, destination, and adjacent control point names if the session involves APPN
- The status of the ER, VR, and TP
- Session route information for the current APPN subnetwork if available

How NTS Obtains Data

NTS derives its data from the following sources:

- Standard host access method interfaces (VTAM)
- Other NTS regions
- The Multiple Application Interface (MAI) component of CA SOLVE:Access

VTAM Interfaces

VTAM is aware of all sessions that have at least one session partner defined in its domain. These sessions are presented to the local NTS region across a VTAM interface, resulting in NTS building up an image of the logical network activity in this domain.

VTAM interfaces to NTS include the following:

- A CNM interface, through which NTS requests are issued to VTAM, and RTM, VR, and ER information is collected
- A local VTAM interface (ISTPDCLU), through which the following sessions are conducted:
  - An LU-LU session with VTAM for the collection of SAW data (and some route configuration data)
  - An LU-LU session with VTAM for the collection of session trace data

Intersystem Routing

NTS uses the Intersystem Routing (ISR) feature to obtain more information about cross-domain and cross-network sessions.

VTAM is only aware of sessions that have at least one session partner defined in its domain. It is possible to centralize (or distribute) the monitoring of logical network activity by expanding the sources of data available to an NTS regions to include the following:

- SAW data collected by NTS regions in other domains
- Session trace, accounting, and RTM data collected by NTS regions in other domains

In a cross-network environment, extra configuration data relating to cross-network sessions is made available to the host that controls the SNA gateway. This data includes network addresses and route information for sessions in the adjacent network.

To make the most effective use of NTS, you must run NTS on the gateway host. Use ISR to link other NTS regions to the gateway host NTS region. This ensures that NTS has maximum accessibility to all session data.

The other NTS regions may or may not be in the same SNA network.

The user of an NTS region that is linked to other NTS regions is presented with a single image of the following:

- Sessions between resources throughout the networks
- Performance and problem determination data collected for these sessions

This single image is preserved in the NTS database and NTS SMF exit.

More information:

Enable Multisystem Support (see page 131)
How NTS-SI Works (see page 251)

MAI Sessions

MAI is a component of CA SOLVE:Access that lets you operate multiple sessions concurrently.

MAI provides NTS with information about the logical relationship between the real half-sessions that form the MAI virtual session. When the MAI/NTS interface is first activated, MAI provides NTS with this information for all currently existing MAI sessions. MAI then notifies NTS as new MAI sessions are started.

More information:

MAI Support (see page 113)

Collect NTS Data

Before you can productively use NTS, you must activate session awareness processing. If session awareness processing is not activated, no NTS data is collected. The NTS function then available is the review of historical information in the NTS database only.

Open the VTAM CNM Interface

NTS uses the CNM interface to transmit various commands to VTAM and to receive solicited and unsolicited data from VTAM. You must open the CNM ACB before you can start session awareness processing.

Note: The CNM interface is primarily used by NEWS.

To open the CNM ACB, use the CNM parameter group.

Enable NTS Session Awareness

Before NTS can process session awareness data, it must establish a session with VTAM.

After a session is established between NTS and VTAM, VTAM sends session start notifications for all currently active sessions to NTS. This is the start of NTS session awareness and is termed a *warm start.* From this point, VTAM sends session start and session end notifications to NTS as they occur for as long as session awareness remains active.

Define NTS Classes

Processing performed by NTS is determined by *class definitions*.

In a given network, there are various different types of sessions and resources. You may want NTS to collect specific types and amounts of data for each different session type, and require different forms of processing for different session types. You may also want to map session data to the underlying resource hierarchy.

You can achieve these objectives by defining the following types of NTS classes to suit your installation needs:

- Session classes
- Resource classes
- SAW classes
- RTM classes

By default, only SAW data is collected, and for *all* sessions, which may not suit your installation. No accounting, RTM, or resource statistics data is collected until you define your classes.

More information:

Understanding the Session Awareness Interface (see page 235)

Specify the DEFCLASS Command

To define the attributes of the various categories or classes of session that control how NTS is to collect and process data, use the DEFCLASS command.

For more information about the attributes used to set up the class definitions, see the online help.

To define classes

1. Decide which classes you need and the attributes each class should have.
2. Specify the DEFCLASS SESSION, RESOURCE, SAW, and RTM commands, and appropriate operand values in your initialization procedure (normally $NSINIT).
3. Periodically review the data collected by NTS and adjust any class definitions to suit new requirements.

To subsequently add class definitions, issue a DEFCLASS command from OCS. You must enter all operands, except those that have default values. If you do this while the region is running, the new class definitions do not affect any existing sessions NTS is aware of but are used by any new sessions.

Define Session Classes

Session class definitions provide the following:

- The session selection criteria that determine to which session class each session belongs
- The names of SAW and RTM classes from which the member sessions derive their SAW and RTM class values

Each session class definition contains the following information:

- A unique session class identification name
- Parameters that a session must match, to be considered a member of this session class:
  - Full and partial names of primary and secondary resources
  - The subarea and APPN COS (Class-Of-Service) name for the session
  - An explicit route number and a virtual route number
  - A subarea and an APPN transmission priority
  - The session type and class
  - The source of the session
  - An SSCP name (identifying the domain of origin of the session)
- The names of the SAW and RTM class definitions that can be used by sessions in this class

Valid characters for operands in session classes include the following:

Character	Description
*	Can be used in any position to represent a single wild character.
>	Can be used as a suffix to indicate one or more trailing wild characters.
-	Can be used as a suffix (for an LU only) to indicate one or more trailing wild characters for LU names that are *not* displayed.

Note: If any session class selection operands are omitted, any value of the omitted parameter is considered valid. For example, if no PRI operand is specified, any primary name is considered valid.

Valid Values for the DEFCLASS SESSION Command Operands

Operand	Values	Associated Action
SAWCLASS	=sawclass	Sessions take their SAW class attributes from this class.
RTMCLASS	=rtmclass	Sessions take their RTM class attributes from this class.
PRI	=name	Names the primary resources consider in this session class.
SEC	=name	Names the secondary session partner for sessions considered as being in this session class.
COS	=cosname	Specifies the cosname of sessions considered as being in this session class.
APPNCOS	=cosname	Specifies the APPN cosname of sessions considered as being in this session class.
ER	=0-7	Provides the Explicit Route number (0 - 7) that sessions must have for them to be considered as being in this session class.
VR	=0-7	Provides the Virtual Route number (0 - 7) that sessions must have for them to be considered to be in this session class.
TP	=0-2	Provides the Transmission Priority number (0 - 2) that sessions must have for them to be considered to be in this session class.
APPNTP	=0-3	Provides the APPN Transmission Priority number (0 - 3) that sessions must have for them to be considered to be in this session class.
SCLASS	=SD =XD =XN	Provides the class of session as SD (same domain), XD (cross domain), or XN (cross network) that sessions must be for them to be considered as being in this session class.
STYPE	=LL =SL =SP =SS =MAI =CC	Provides the type of session as LL (LU-LU), SL (SSCP-LU), SP (SSCP-PU), SS (SSCP-SSCP), MAI (Multiple Application Interface), or CC (CP-CP) that sessions must be in for them to be considered as being in this session class.

Operand	Values	Associated Action
SOURCE	=LOCAL =REMOTE =ALL	Provides the source of the session as LOCAL (sourced from VTAM on this system) or REMOTE (sourced from an ISR link with another NTS region), or ALL (sourced from local or remote).
SSCP	=sscpname	Valid if SOURCE=REMOTE is specified. Provides the name of the SSCP at the system where a session was sourced.

Example: Session Class Definition

The following is an example of a session class definition:

```
DEFCLASS     SESSION=TSOB  PRI=TSO>  SEC=ASYD>
             SAWCLASS=NOLOG  RTMCLASS=TSO
```

In this example, the session class is called TSOA. For this class:

- Members are *primary* resources with a name that commences with the letters TSO, and *secondary* resources with a name that commences with the letters ASYD.
- Members use SAW class NOLOG, which specifies that session data be retained, but not logged.
- Members use RTM class TSO.

Use Generic Names for Logging

All information logged to the NTS database is session-related and is stored under the session partner names. Together, the two network-qualified session partner names form a *session name pair*.

To limit the number of session name pairs stored in the NTS database, your session class definition parameters can specify generic session names (or part names), where possible.

For example, an application such as TSO has many ACB names that all begin with a common prefix, TSO>. This means that different sessions between a terminal and various TSO ACBs can all be logged under the same session pair name (that is, TSO>).

Define Resource Classes

Resource class definitions determine the way NTS processes information for different network resources or groups of resources.

Resource class definitions contain the following information:

- A unique resource class identification name
- Parameters that resources *must* match (potentially: specific link, PU, or LU names) to be considered members of the resource class

  Note: At least one of the following must be specified per resource definition: a LINK, PU, or LU name.
- Whether accounting statistics are collected
- A limit range (from 0 to 255) for the number of intervals that can occur before the statistics for the oldest interval are overwritten
- The names of the RTM class definitions that can be used by resources in this class

Valid characters for operands in resource classes include the following:

Character	Description
*	Can be used in any position to represent a single wild character.
>	Can be used as a suffix to indicate one or more trailing wild characters.
-	Can be used as a suffix (for an LU only) to indicate one or more trailing wild characters for LU names that are *not* displayed.

If you specify parameters other than the parameter that defines the level of the resource class, this has the effect of limiting the range of resources that match the resource class definition.

For example, if you specify the PU and the LU parameters in the same resource class definition, the range of matching LUs is narrowed to those *owned* by the nominated PU(s). Because all resources should have unique names, this level of detail is worthwhile only if the value of the hierarchically lowest parameter in the class definition is generic, for example: LU=TSO>.

Valid Values for the DEFCLASS RESOURCE Command Operands

Operand	Values	Associated Action
LINK	=*name*	Provides the full or partial link name that must be used by resources that are to be considered as being in this resource class.
PU	=*name*	Provides the full or partial PU name that must be used by resources that are to be considered as being in this resource class.
LU	=*name*	Provides the full or partial LU name of any LUs that are to be considered as being in this resource class.
STATS	=YES =NO	Provides the resource accounting statistics collection option for resources in this class.
LIMIT	=0-255	Valid when STATS=YES is specified only. Specifies in minutes (0 to 255) the interval to occur before the statistics for the oldest interval are overwritten.
RTMCLASS	=*rtmclass*	Specifies the RTM class name from which resources are to take their RTM class attributes if RTM summarization is required for this class.

Examples: Resource Class Definitions

The following shows two examples of resource class definitions:

```
DEFCLASS     RESOURCE=ALLINK  LINK=>  STATS=YES
             RTMCLASS=CICS

DEFCLASS     RESOURCE=TSO  LU=TSO>  STATS=YES
```

In the first example, the resource class is called ALLINK. For this class:

- All links are considered to belong to this class, as indicated by the specification LINK=>.
- Statistics are collected for members of this class.
- Members use RTM class CICS. The format of RTM responses received by a resource are compared to the format defined in this RTM class definition, and statistics kept when a match is found.

In the second example, the resource class is called TSO. For this class:

- All LUs that have names starting with the letters TSO are considered members of this class (LU=TSO>).
- Statistics are collected for members of this class.
- Because no RTMCLASS parameter is specified, no RTM statistics are collected; accounting statistics are, however, still collected.

Define SAW Classes

Each SAW class that you define to NTS describes a set of processing options for all session awareness information, including whether to retain such information. Therefore, SAW classes can be used to ensure that no unwanted session data is collected, thereby saving processing time and storage space.

SAW class definitions contain the following information:

- A unique SAW class identification name
- Whether to collect accounting statistics
- Whether to generate EDS events
- Whether to keep session records
- Whether to log NTS data, and under what conditions
- The depth of the initial and final trace queues

The following table shows the valid operands for the DEFCLASS SAW command, and the valid values for each operand. Default values are underscored.

Operand	Values	Associated Action
ACCT	=YES	Accounting data *is* accumulated for this class.
	=NO	No accounting data is accumulated for this class.
EVENT	=YES	Generates $$NTS.*xxx* events.
	=NO	Does not generate events.
KEEP	=YES	Keeps data for this class.
	=NO	Does not keep data for this class.
	=LOCAL	Sends data to a remote NTS.

Operand	Values	Associated Action
LOG	=SUMMARY	Logs all data (except for trace data) at normal end of session; if session ends in error, all data, including trace data, is logged.
	=DATA	Logs all data if any exists, otherwise logs no session data.
	=ERROR	Logs all data if session ends in error.
	=ALL	Logs all data.
	=NO	Does not log any data.
TRACE	*=(n,n)*	Sets depth of the initial and final trace queue (default is 4,20).

Examples: SAW Class Definitions

Two examples of SAW class definitions are shown and explained below.

```
DEFCLASS    SAW=KEEP                ACCT=YES  KEEP=YES  LOG=ALL
                                              TRACE=(4,20)
DEFCLASS    SAW=NOKEEP              KEEP=NO
```

In the first example, the SAW class is, aptly, called KEEP. It specifies the following:

- SAW data for sessions with which this class is associated is retained by NTS (KEEP=YES).
- Accounting data is accumulated for sessions with which this class is associated (ACCT=YES).
- All session and SAW data is unconditionally logged (LOG=ALL).
- The trace queue depth is restricted to 4,20 (that is, 4 PIUs in the initial queue and 20 in the final queue).

Associate only the type of sessions for which you specifically wanted to retain *all* data with this SAW class.

In the second example, the SAW class is called NOKEEP.

Because KEEP=NO is specified, NTS discards SAW data for any sessions with which this class is associated. This means that no information about these sessions is available and no other NTS information can be collected for such sessions; therefore, there is no reason to specify other operands for this class. This avoids the collection of unwanted session data.

Define RTM Classes

To enable NTS to collect RTM information from network control units, you need to define one or more RTM classes. In addition, your control units (which can be 3274s, 3174s, or compatible devices) must have the required RTM hardware or microcode level support for the collection of RTM data, and have a host-modifiable RTM definition configured.

RTM class definitions contain the following information:

- A unique RTM class identification name
- Objective response times for this class
- Percentage of overall responses that must meet the objective response time for this class. Together, the values mean, for example, 90% of responses will be 1.5 seconds or less.
- Collection boundaries to set in the control unit
- Definition criteria, to indicate what RTM data is kept

When NTS receives a session for which RTM data is collected, the boundary values for that class are set in the control unit, and retained for the duration of the session.

The objective response times and objective percentage for the class are used to monitor network response times, and can lead to the automatic generation of attention messages.

The following table shows the available operands for the DEFCLASS RTM command and the valid values for each operand. Default values are underscored.

Operand	Values	Associated Action
OBJTIME	*=mm:ss.t*	Specifies the acceptable response time for the session. Range is from 0.1 seconds to 30 minutes. Can also be specified as *mm:ss, ss,* or *ss:t* (where *t* is a tenth of a second). This value must correspond to one of the boundary values.
OBJPC	*=1-100*	Specifies the objective percentage for this class.
BOUNDS	*=(value 1, value 2, ...value 4)*	Specifies up to four boundary values that are to be set in the control unit. One of the boundary values must be the same as the *objtime*.

Operand	Values	Associated Action
RTMDEF	=FIRST	Response time measured until the first character of the host data stream is received.
	=KEYBD	Response time measured until the keyboard is unlocked.
	=CDEB	Response time measured until an SNA Change Direction or End Bracket order is received.
	=LAST	Response time measured until the last character of the host data stream is received.

Examples

The following shows two examples of RTM class definitions:

```
DEFCLASS    RTM=CICS  OBJTIME=1.0  OBJPC=90
            BOUNDS=(0.5, 1.0, 2.0, 5.0)

DEFCLASS    RTM=TSO  OBJTIME=2.0  OBJPC=80
            BOUNDS=(1.0, 2.0, 5.0, 10.0)  RTMDEF=CDEB
```

In the first example, the RTM class is called CICS. For this class:

- The objective response time for the session is one second (OBJTIME=1.0).
- The objective percentage for this RTM class is 90 percent (OBJPC=90).
- Four boundary values are set in the control unit and used to accumulate RTM data for each session using this class {BOUNDS=(0.5,1.0,2.0,5.0)}.

Because the RTMDEF operand is not specified, response time is measured until the first character of the host data stream is received (this is the default).

In the second example, the RTM class is called TSO. For this class:

- The objective response time for the session is two seconds (OBJTIME=2.0).
- The objective percentage for this RTM class is 80 percent (OBJPC=80).
- Four boundary values are set in the control unit and used to accumulate RTM data for each session using this class (BOUNDS=(1.0,2.0,5.0,10.0)).
- Response time is measured until an SNA change direction or end bracket order is received (RTMDEF=CDEB).

Modify NTS Class Definitions

After you have been using NTS for a time, you may want to modify one or more NTS class definitions. You would normally do this while session awareness is inactive.

Display Definitions

To display NTS class definitions

1. Use the SHOW DEFCLASS command.
2. Specify the type of class or classes you want to display—session, SAW, RTM, or resource—and, if you want to limit the display, the class name or partial name.

Example: Display Definitions

This is an example of the use of the SHOW DEFCLASS command.

```
SHOW DEFCLASS RTM=CICS
```

All RTM classes starting with the letters CICS are listed.

Update Class Definitions

To replace or delete class definitions, use the REPCLASS and DELCLASS commands.

To change one or more attributes of a class, use the REPCLASS command to redefine the entire class. This command shares the same operands as the DEFCLASS command.

Example: Update Class Definitions

To delete the RTM class called CICS, issue the following command:

```
DELCLASS RTM=CICS
```

Set NTS System Parameters

NTS system parameters are used to do the following:

- Define the NTS environment to VTAM.
- Specify global data collection options.
- Optimize NTS performance characteristics.
- Enable and disable data collection interfaces.
- Enable and disable NTS outputs.

Specify the SYSPARMS Command

In addition to enabling and disabling certain NTS functions by setting system parameters, you can set or modify certain system values by using the SYSPARMS command. This lets you improve or modify NTS operations to suit your installation requirements. In most cases, the default values supplied by NTS should be adequate.

The NTS functions or parameter settings that you can configure and the associated SYSPARMS operands are listed in the following table.

Configurable Function or Setting	Related Operand
Collection of accounting data	NTSACCT
Collection of resource statistics	NTSRSTAT
Logging of active sessions at shutdown	NTSCLOSE
Intensive message logging	NTSINTSV
Notification of MAI sessions	NTSMAISV
Generation of NTS events	NTSEVENT
Queuing of NTS CNM requests	NTSCNMQ
Consolidation of trace final queue buffers when first wrap occurs	NTSTRBFX
Presentation of MAI sessions to the NTS user exit	NTSMAIEX
Correlation of data	NTSCINTV
Trace activity	NTSMAXTR NTSMAXTP

Configurable Function or Setting	Related Operand
Session keep counts	NTSSKEEP
VTAM session and trace data buffers	NTSSAWBF NTSTRCBF
Resource statistics collection intervals	NTSRSINT NTSRSLIM
GMT/Local Timestamp in SMF T39 Record	NTSSMFTM

For more information about the SYSPARMS command syntax, and the valid operand values and their significance, see the *Reference Guide*.

Collect NTS Session Accounting Data

To enable the collection of NTS session accounting data, use the NTSACCT operand. Collection of this data can be *selective* (the default) or *global.*

When session awareness processing is active, you can specify NTSACCT=NO only.

To change to any other value

1. Stop session awareness.
2. Make the required modification.
3. Restart session awareness.

Selective Accounting

NTSACCT=SELECTIVE is set by default. This means that accounting data for a session is collected only if the DEFCLASS ACCT operand is set to YES in the SAW class definition associated with the session.

To collect NTS accounting data for a particular session class

1. Define an appropriate SAW class, with ACCT=YES specified.
2. Associate this SAW class with the session class, by specifying the SAW class as the value for the DEFCLASS SAWCLASS operand in the session class definition.

Global Accounting

If you enable or disable the accounting function globally, SAW class definition accounting options are ignored.

To enable or disable the accounting function globally, specify NTSACCT=ALL or NTSACCT=NO.

Collect NTS Resource Statistics

To enable the collection of NTS resource accounting and RTM statistics, use the NTSRSTAT operand. This operand globally enables or disables resource statistics collection when you specify a value of YES or NO. The default is NO.

Also consider the following actions:

- Because NTS resource statistics are derived from session accounting data, ensure that NTSACCT=ALL is specified if you want resource accounting data collected.
- There is a hierarchy governing statistics collection for resources:
  - Collection must be enabled for the link used by a PU before statistics can be collected for the PU itself.
  - Collection must be enabled for the owning PU before statistics can be collected for an LU.
- If you specify NTSRSTAT=YES, but you do not want statistics collected for certain types of resources, specify STATS=NO in the resource class definitions for those types of resources.
- If the resource statistics function is globally disabled, the NTS resource class statistics collection option is ignored.
- When session awareness processing is active, you can disable resource statistics collection only.

To change from NTSRSTAT=NO to NTSRSTAT=YES

1. Stop session awareness.
2. Make the required change.
3. Restart session awareness.

Important! Carefully evaluate the requirements of your installation for resource statistics collection, because summarizing many resources may not give useful results and may adversely impact the performance of NTS.

Rules Governing Statistics Collection

The rules governing statistics collection are as follows:

- To collect statistics for an LU, statistics collection must be enabled for the PU that owns the LU.
- To collect statistics for a PU, statistics collection must be enabled for the link used by the PU.
- Accounting statistics for resources above the LU level are summarized from statistics collected for resources directly below them in the hierarchy. That is, PU accounting statistics are derived from statistics collected for LUs owned by the PU. Link accounting statistics are derived from statistics accumulated for the PUs that use the link.

Where a resource class specifies that statistics are collected, NTS accumulates resource statistics for resources that match the class, *at the level of the resource class*. For example:

- If the resource is an LU, and the selected resource class is at the LU level, statistics are collected for the specified LU *in isolation*.
- If the resource is an LU, and the selected resource class is at the PU level, statistics are collected for the specified LU, and are added to statistics collected from peer LUs owned by the same PU, to form the statistics for the owning PU. Statistics are not retained for the LU alone.

Monitor NTS Resource Availability

If you have enabled the collection of statistics for a particular resource, NTS automatically uses SAW data to monitor the availability of that resource. A resource is considered *available* if it is participating in a session with the SSCP of the domain in which it is defined.

If NTS is monitoring resource availability, it automatically passes SMF records that indicate changes in the status of a resource to the NTS User Exit, if you have defined one.

Log Active Sessions at Shutdown

When your region is being shut down, all NTS activities must cease. It is likely that a number of sessions will be active and that session data collected by NTS for those sessions will not be logged.

To treat these residual sessions as ended for the purpose of logging, set the NTSCLOSE operand of the SYSPARMS command to YES. The sessions are queued for output processing and the NTS class definitions checked to determine whether logging is required.

Because there is only a small delay (approximately 10 seconds) between the time that NTS is notified of the impending shutdown and the actual termination of your region, this setting is useful only when the residual session count is small.

An alternative method of closing sessions is available through the SAWARE STOP CLOSE command.

Note: To improve performance during NTS logging, operate the NTS database using VSAM Local Shared Resources (LSR) and deferred I/O capabilities.

More information:

NTS Storage Estimates (see page 321)

Enable Intensive Message Recording

NTS receives large quantities of data from VTAM and may not process data that it cannot understand. For example, NTS cannot collect trace data indefinitely for a session of which it has no knowledge. As a result, at some stage it purges such data. At other times, NTS may receive data that is not in the expected format and this data is discarded. During normal operation, these kinds of data are purged on a regular basis and may go unreported by NTS.

If you suspect that data is missing, to aid problem detection, you can enable intensive message recording to see if NTS is discarding any data.

To enable intensive message recording, set the NTSINTSV operand to YES. This creates log messages whenever the conditions of data inconsistencies arise.

Enable MAI Session Visibility

To enable NTS to be aware of MAI sessions, specify NTSMAISV=YES (the default is NO).

For trace and accounting data to be available for an MAI session, collection must be requested for the primary half-session component of an MAI virtual session. When trace data is received for the primary half session and you have requested trace or accounting data collection for MAI sessions, NTS indicates that the MAI session has such data available. If you request the display of trace or accounting data for an MAI session, primary or secondary, then the data collected for the primary half session appears.

If you specify NTSMAISV=NO when the interface is already active, NTS retains knowledge of existing MAI sessions, but is not notified of any new MAI sessions.

Enable NTS Session Event Generation

To enable NTS event generation

1. Specify NTSEVENT=YES.
2. Ensure that appropriate SAW classes (with EVENT=YES specified) are defined for and associated with sessions for which events are generated.

Modify Processing for Active Sessions

After NTS has built a session record for an active session, the future processing for that session is fixed by the various values extracted from the matching class or classes. However, you may need to modify such processing options under certain circumstances, especially since sessions can remain active for extended periods.

To modify the processing options for an active session, use the NTSMOD command.

NTSMOD Command

The NTSMOD command lets you do the following:

- Alter the trace queue depths; this can be useful, for example, if you want to collect more trace data for a session that is experiencing problems.
- Modify the NTS log options to collect additional data for a session that is experiencing problems by doing the following:
  - Logging all data when the session ends, regardless of the original SAW class log options
  - Forcing the current data to be logged in its present form, for future reference (a historical record)
  - Forcing the current session data to be presented to the NTS user exit instead of, or as well as, being logged to the NTS database

Example: NTSMOD Command

This is an example of the use of the NTSMOD command.

```
NTSMOD NAME=CICS TRACE=(4,50) LOG=FORCE
```

In this case, the following occurs:

- The trace queue depth for sessions with the name CICS is modified.
- Sessions with the name CICS are flagged for force-logging and immediately placed on the output queue. The currently stored session data is logged, while normal NTS processing of the session continues.

When you review CICS session data at a later stage, the display of an **F** next to the end time for each session on the NTS Session List Panel indicates that these sessions were force-logged before they ended.

For more information about the NTSMOD command and its operands, see the online help.

Note: If you issue the NTSMOD command with neither the TRACE nor the LOG operand specified, then the sessions specified by the NAME operand are listed, so that you can determine the scope of the command prior to making any modifications.

Set the Data Correlation Interval

One of the primary functions of NTS is to gather data from a number of sources and correlate it at session level.

The sequence in which data arrives and the interval between such arrivals, is beyond the control of NTS. Under certain circumstances, such as a network failure, anticipated data may not arrive.

To protect NTS from waiting indefinitely for such session data, there is an interval defined that represents the time limit for data correlation. The default correlation interval is 30 seconds.

To change the default correlation interval, use the NTSCINTV operand.

We recommend that the length of the correlation interval be kept constant throughout the network.

Limit NTS Trace Activity

The STRACE command is used to start and stop global or specific NTS tracing. This command provides operands that let you select the precise session trace activity that you want. For more information about these operands, see the online help.

Global tracing consumes large amounts of system resources. To avoid this, NTS provides parameters to limit the number of outstanding trace requests.

The PIU operand of the STRACE command lets you do a PARTIAL or FULL tracing. In most instances, PARTIAL tracing provides sufficient data for problem determination.

Important! Before you issue a request to trace a complete RU from VTAM, take note that an RU can be very large.

Limit the Number of Concurrent Traces

To set the maximum number of specific trace requests that can be outstanding at any time, specify the limit in the value of the SYSPARMS NTSMAXTR operand.

- This value includes the following requests:
- Specific trace start requests (even if these are pending)
- When global tracing is active, specific trace stop requests
- Any specific trace requests started by the NTS selective accounting function, which operate automatically if you specify ACCT=YES in a SAW class definition.

NTS rejects any attempt to issue a specific trace request that would result in the value set for NTSMAXTR being exceeded.

Set Trace Limits

To impose limits on the number of specific trace requests that can be outstanding, use the NTSMAXTR operand.

Limit Trace PIU Collection

To set the trace queue depths for the initial and final trace queues for a session, set the values in your SAW class definitions. These values determine the maximum number of PIUs that can be stored for a session at any given time.

To override the values in the SAW definition, issue the SYSPARMS NTSMAXTP command.

Note: After you define values for NTSMAXTP, you cannot define a new SAW class with trace queue depths exceeding these values or change the trace queue depths of an existing SAW class to be greater than the values set for this system parameter.

Set Session Keep Counts

The session keep count refers to the number of session incidences that are stored concurrently in the NTS database for any session name pair. The default session keep count is 10.

To modify the default count, use the NTSSKEEP operand.

Note: The session keep count is used the first time a session incidence for a new name pair is written to the database only. The value is subsequently stored with the records in the database. To modify this value, use the NTSDBMOD command.

Set VTAM Session and Trace Data Buffer Allocations

When NTS session awareness processing begins, requests are sent to VTAM specifying the number and size of the buffers to allocate for the collection of session awareness and session trace data.

To modify these values, use the NTSSAWBF and NTSTRCBF operands.

Default Allocations

NTS allocates the following by default, which should be adequate for normal usage:

- Two buffers of 4K each to accommodate the flow of session awareness data from VTAM
- Four buffers of 4K each for the collection of session trace data

However, during times of exceptionally heavy trace activity, the allocation may be insufficient.

When These Allocations are Insufficient

If NTS cannot service the data buffers quickly enough, VTAM overwrites the data in the oldest, unprocessed buffer, with the result that you lose data. NTS can detect this data loss and notify operators by issuing a monitor message.

In times of intense system activity, you may lose some trace data in this way.

Overcoming the Problem

If buffer overrun conditions occur, allocate a larger number of *smaller* buffers, rather than a smaller number of larger buffers. If more buffers are available to VTAM, they are likely to be available to NTS at any time.

Other factors influence the delivery of data to NTS, especially the ability of the operating system to dispatch data. If its dispatching priority is too low, it may not be able to service large amounts of trace data in times of intensive activity. You need to check the dispatching priority and ensure that it is set just below that of VTAM.

Set Resource Statistics Collection Intervals

Resource statistics are collected and presented by NTS as counts of events that occurred in a specified time interval. Statistics gathered during different intervals can be compared for the purpose of network performance monitoring and analysis.

The valid range for the resource collection interval is 1 to 480 minutes (8 hours), and the default is 30 minutes.

To configure the duration of the interval, use the NTSRSINT operand to set the value you require.

To set the value of the number of intervals that can occur before NTS overwrites the statistics collected for the oldest interval, use the DEFCLASS RESOURCE LIMIT operand, or set the global default by using the SYSPARM NTSRSLIM operand. The valid range of values for this operand 0 to 255; the default is 16.

Important! High settings for this operand can consume large amounts of storage.

GMT/Local Timestamps in SMF Type 39 Records

All application timestamps records in type 39 SMF records consist of the first four bytes of the system TOD clock value, plus a 4-byte signed number for the time zone adjustment value, in seconds. By definition, the first four bytes represent GMT time in approximately 1-second intervals. However, Tivoli NetView (NLDM) writes the first four bytes of these timestamps in local time.

- To write timestamps in type 39 SMF records in local time, specify NTSSMFTM=LOCAL.
- To write timestamps in type 39 SMF records in GMT time, specify NTSSMFTM=GMT.

The default is GMT.

Maintain the NTS Database

To maintain the NTS database, use the NTSDBMOD command. This command lets you do the following:

- Delete session records.
- Alter session keep counts for sessions stored in the NTS database.
- Cancel the execution of a previously issued NTSDBMOD command.

Example: Maintain the NTS Database

This is an example of the use of the NTSDBMOD command:

```
NTSDBMOD PRINAME=CICS KEEPDATE=01/03/31
```

In this case, all stored records for sessions with the primary name of CICS that predate April 1, 2001, are deleted.

For more information about the NTSDBMOD command and its operands, see the online help.

Modify the Database Session Keep Counts

After the first session incidence has been recorded for a session name pair, the master record contains the session keep count for that name pair.

To display this value, use the SHOW SKEEP command.

To modify this value, use the NTSDBMOD command.

To delete all records for the session name pair, including master and cross-reference records, set a new session keep count of zero in the NTSDBMOD command.

The NTSDBMOD command lets a generic name specification permit mass update and deletion with a single command.

Write NTS Records to SMF for Further Processing

You can convert NTS session records to SMF type 39 format to use the output in report-generating applications. To do this, you must specify the name of an NTS user exit in the SAW parameter group.

NTS automatically passes SMF-formatted records to this exit. The supplied exit can be customized to perform further processing of the data before the data is passed to SMF and finally to a report-generating application, such as SAS, to produce statistical reports based on the raw NTS data.

More information:

NTS SMF Record Format (see page 303)

Network Definitions and Names Used by NTS

NTS does not require definitions of the network or VTAM environment in which it is executing. All such knowledge is derived by NTS through standard access method interfaces. NTS panels display the network ID for the host VTAM under which NTS runs.

Because NTS operates in SNA Network Interconnection (SNI) environments, all NTS resource names are qualified by the network name (that is, both the resource name and the network name are required to identify an SNA resource), and alias names are fully supported. The network in which NTS is executing is always the assumed default. Therefore, the use of network qualified names by NTS in a single network environment (or in the default network in an SNI environment) is totally transparent to the user.

System Resource Utilization

NTS defines buffer pools for allocating all resource records, session records, and trace data kept in virtual storage. No storage is allocated until NTS begins SAW processing. Storage allocation and NTS processing are carefully managed to produce low system overheads and paging rates. All NTS buffers are located above the 16MB line.

It is possible to retain all session information and to trace all session activity on most installations, with little or no loss of performance. This does, of course, depend on the extent of system resource consumption during network operation.

How Session Start Notification Works

As part of session start notification, the following processing occurs:

1. VTAM passes to NTS the SSCP name or names that identify the domain or domains in which the participating resources reside.
2. If either resource does not reside in the local domain, NTS determines whether an ISR link to the NTS in the other domain exists.
3. If there is a suitably configured link, NTS is able to solicit session data from the other domain; if not, data for the session will be incomplete.
4. NTS then proceeds to classify the session using the DEFCLASS session definitions to determine the DEFCLASS SAW definition that controls data retention and logging options.

Output Processing

Session records can be queued for output processing by NTS for any of the following reasons:

- Session start notification—applies only to sessions for which accounting information has been requested
- Forced logging by an operator through an NTSMOD command
- Session awareness close processing when CLOSE=ALL is specified on SAW STOP
- Normal end-of-session processing

For sessions placed on the output queue, logging commences immediately after one of the following:

- Session start notification (accounting information is logged)
- Being force-logged by an operator
- Being closed by session awareness close processing when WAIT=NO is specified on SAW STOP

How Session End Processing Works

All data associated with an active session is kept in storage until the session ends. When termination notification for a session is received from VTAM, NTS queues the session for output processing, which occurs as follows:

1. Firstly, NTS correlates all session data, such as session awareness data and any other statistical or problem-determination data, waiting for the correlation interval if necessary.
2. This final session data is then passed to a user exit, if one is active, and logged in the NTS database (unless the user exit suppresses logging).
3. When output processing is complete, the session data is purged from storage and is subsequently available (in the NTS database) as historical data only.

NTS User Exit Processing

If an exit is defined, all session records scheduled for logging (this is determined by the record type) are first passed to this exit. The exit can perform additional record processing, and can set a flag to indicate that the record be ignored by the subsequent NTS logging function.

More information:

Implementing the NTS User Exit (see page 295)

System Event Generation

Event Distribution Services (EDS) is a component that lets NCL procedures listen for and generate events.

If requested by SYSPARMS NTSEVENT and the SAW class definition, EDS generates events on behalf of NTS at the following times:

Time	Event Name
At session start	$$NTS.SESSION.START
At session end	$$NTS.SESSION.END
On session failure	$$NTS.SESSION.FAIL
When RTM objectives are exceeded	$$NTS.RTM.OBJ.EXCEEDED

A data field containing all information relating to the session accompanies the event notification. Any SNA sense code supplied appears in the reference code field of the event notification.

NTS Database

All information logged to the NTS database is session-related and is stored under the session partner names. Together, the two network-qualified session partner names form a *session name pair* and each session logged in the database is termed a *session incidence*. For each session name pair, there exists a master and a cross-reference record, both of which are created when the first session for the name pair is logged to the database.

Session Keep Counts and Database Slots

The session incidence count for any given session name pair is restricted by the *session keep count*. The default session keep count is 10, but this can be modified. This value is stored as part of the master record when the first session incidence for a session name pair is logged.

Each session incidence is allocated a single *slot* in the database. When a new session is due to be logged, the master record is checked to determine whether the number of slots used for the session name pair has reached the session keep count. If it has, the oldest session incidence data is overwritten; otherwise, a new database slot is allocated.

The advantage of database slots is that the key used to access session incidence data can be reused, which means that database maintenance is minimized. For example, if the database contains as much data as it is required to hold, then it can be used for session logging indefinitely without requiring reorganization. However, it takes some time before the database reaches such an ideal state.

Connect and Disconnect the NTS Database

For historical recording purposes, NTS session awareness data can be logged to the NTS database.

The SAWLOG parameter group lets you stop and start SAW logging on an ad-hoc basis, without needing to stop and start normal SAW processing.

Connect the NTS Database

To connect the NTS database

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the SAWLOG parameter group.

   The SAWLOG - Session Awareness (SAW) Logging panel appears.

3. Enter **Yes** in the Logging Active? field, to start logging SAW records at any time after initialization. For more information about the fields, press F1 (Help).

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Disconnect the NTS Database

To disconnect the NTS database

1. Enter **/PARMS** at the prompt.

   The Parameter Groups panel appears.

2. Enter **U** beside the SAWLOG parameter group.

   The SAWLOG - Session Awareness (SAW) Logging panel appears.

3. Enter **No** in the Logging Active? field to stop logging SAW records at any time after initialization. For more information about the fields, press F1 (Help).

4. Press F6 (Action).

   The entries are actioned.

5. Press F3 (File).

   The settings are saved.

Error Handling

If an error occurs in the NTS database during output processing, the NTSLOG file ID is released. NTS continues to function normally without a database, apart from the fact that it cannot perform database logging until you allocate and open a new database. In the case of a file full condition, you can use the NTSDBMOD command to delete unwanted data (see page 107).

MAI Support

The Multiple Application Interface (MAI) component of CA SOLVE:Access enables you to operate multiple sessions simultaneously

Note: For more information about MAI, see the *CA SOLVE:Access User Guide* or the *CA SOLVE:Access Administrator Guide*.

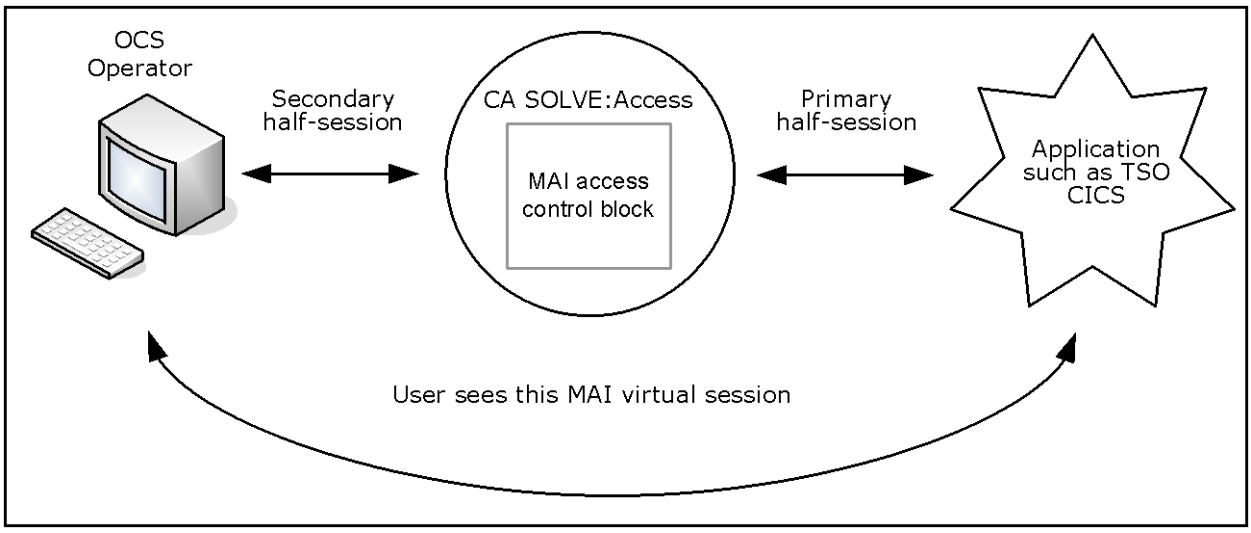
Understanding MAI Sessions

An *active* MAI session consists of two real SNA sessions. MAI relates these sessions by transferring data received for one session across to the other. The result is that, to the user, the endpoints of two distinct sessions appear to be in session with one another.

For identification, the sessions related by MAI are termed the primary and secondary *half-sessions* of an MAI *virtual session.* These half-sessions, which are transparent to the MAI user, comprise the following elements:

- The primary half-session has an application as its primary session partner and an MAI ACB (an ACB defined to CA SOLVE:Access for the use of MAI) as its secondary session partner.
- The secondary half-session has CA SOLVE:Access as its primary partner and a terminal as its secondary partner.

The following illustration show this MAI Session process.



VTAM presents NTS with SAW data for each of the MAI half-sessions, but is unaware that they are logically related. MAI, using the NTS/MAI interface, advises NTS that the half-sessions are logically related.

This relationship is presented on a special MAI Session Configuration panel. (You can display a Session Configuration panel for each of the half-sessions.)

Note: For more information about the NTS Session Configuration panel, see the *User Guide*.

MAI/NTS Interface

When active, NTS is aware of all real sessions that have at least one partner in its domain. Using the NTS/MAI interface, MAI provides NTS with information about the logical relationship between the real half sessions that form the MAI virtual session or sessions.

From this, NTS builds information from the two half sessions into a single virtual session. This virtual session can be listed, selected, and displayed in the same manner as real sessions in NTS.

No RTM data is collected or available for MAI sessions.

You can implement the NTS and MAI features in different domains on the same host. To route MAI data across ISR, ensure that the following conditions are met:

- NTS is licensed in both domains.
- SYSPARMS NTSMAISV=YES is specified in both domains.

The NTS ISR link is configured for unsolicited message flow *from* the domain where MAI is resident, *to* the domain in which NTS is active.

MAI Sessions on the NTS Database

When an MAI session is logged to the NTS database, NTS checks if any trace or accounting data, or both, is flagged as available for the MAI session. If this is the case, NTS logs the trace or accounting data (or both) collected for the primary half session with the MAI session incidence record. (This avoids the need to log the primary half session to the database if the MAI session is the preferred record of the session incidence.)

MAI Sessions and the NTS User Exit

The user ID of the user who started the MAI session is provided by the MAI/NTS interface. This data is passed to the NTS user exit in an additional field added to the session configuration section of the type 39 SMF record. This field contains nulls for non-MAI sessions.

Chapter 7: NCPView

This section contains the following topics:

How NCPView Works

NCPView monitors IBM 3720, 3725, 3745, and 3746-900 communications processors that are running NCP version 4, 5, 6, or 7.

Note: Although NCPView can obtain information about a 3746-900 communications processor, it cannot communicate directly with this type of resource. NCPView obtains what information it can about a 3746-900 communications processor from the associated 3745 processor.

NCPView obtains NCP data using the VTAM secondary program operator (SPO) interface, by using VTAM display commands.

NCPView identifies NCPs at initialization by issuing a D RSCLIST,IDTYPE=PUT45 command.

NCPView obtains its information about the NCPs using the standard VTAM command—D NET,NCPSTOR,ADDR=*xx*.

Alternatively, NCPView can obtain its information from an NCP unformatted dump. This is achieved by NCPView reading a section of storage in the unformatted dump instead of issuing a D NET,NCPSTOR,ADDR=*xx* command.

NCPView and Connected Domains

To view all NCPs in your enterprise from one domain, you must operate in a multisystem environment supported by your region.

More information:

Administering a Multisystem Environment (see page 189)

NCP Monitoring

NCP monitoring enables you to do the following:

- View performance information about the NCPs in your network
- Perform diagnostics on selected NCPs

Before you can use the NCP monitor, you must have a system image that defines the resources you want to monitor. You can specify whether performance monitoring is done for each resource defined in the system image.

Performance monitoring uses data sampled at regular intervals. The information retrieved by data sampling is used to do the following:

- Trigger alerts if the monitored performance is outside defined boundaries
- Generate online reports that can be viewed from the NCP monitor

System Images

The system image represents the set of resources you can monitor and control. Each system image has a name and a version number. You can define multiple system images, but one system image only can be active in a region at a time. The system image becomes active when it is loaded. A system image is loaded in *one* of the following ways:

- At region startup
- By issuing the LOAD command

Your region uses a default system image if no system image is successfully loaded during startup.

During system image load the following occurs:

- Performance monitoring is started for the NCPs defined in the system image.
- The NCPs are defined to the NCP monitor.

NCP Definitions

NCP definitions are qualified by the following:

- The system image name and version
- The NCP name

Work with NCPs

The NCP administration facilities let you do the following:

- Update, copy, and delete the NCPs defined when you implement your region
- Add new resources
- Define which NCPs are monitored
- Set the attributes to monitor for each NCP
- Define the conditions that raise alerts and the actions taken

Monitor Resources in a Multisystem Environment

In a multisystem environment, you can view and perform diagnostics from a single monitor on the resources from the connected systems.

In a multisystem environment, each region must load a different system image. Each NCP's system image name is visible on the NCP monitor. For subordinate regions, the system image name must match the name supplied during the multisystem linking process.

Define a System Image

If you do not want to use the default system image, you can define a system image to your region.

To define a system image

1. Enter **/RADMIN.I** at the prompt.

   The System Image List panel appears. This panel lists the system images defined to your system.

2. Press F4 (Add).

   The system image definition panel appears.

3. Specify the name of the system image, its version, and a short description of the system image in this panel.

   One system image is required for each region. If you are defining a system image for a subordinate, use the name assigned during the multisystem linking process.

4. Press F3 (File).

   The system image is added to the knowledge base.

Define NCP Resources

Your existing NCP resources are automatically defined when you implement your region. After implementation you can use the resource definition facility to do the following:

- Update, copy, or delete existing definitions
- Add new resource definitions

Note: To monitor NCPs, ensure that the value specified for the OPTIONS keyword in the NCP SYSCNTRL definition statement is STORDSP. This value lets storage information display by NCPView. For more information, see the IBM *NCP, SSP, and EP Definition Reference* guide.

To define a new NCP resource to be monitored by the NCP monitor

1. Enter **/RADMIN.R** at the prompt.

   The ResourceView : Resource Definition panel appears. This panel displays the system image name and lists the resource classes that you can maintain.

2. Enter **S** in front of the NCPMON (NCP Monitor) class.

   The ResourceView : NCP Monitor List panel appears. The NCP resources already defined to the system image are listed on this panel.

3. Press F4 (Add).

   The ResourceView : NCP Monitor General Description panel appears.

4. Enter the NCP Monitor Name.

   This defines the NCP resource.

5. Set Monitoring to Active and provide a description of the NCP resource.

6. Press F8 (Forward).

   The ResourceView : NCPMON Monitoring Definition panel appears.

7. Set the frequency that you want to take monitor samples in the Monitor Interval field—this can be from 5 to 60 minutes.

8. Press F10 (Attributes) to edit the list of attributes to monitor.

   By default, two attributes only are dynamically defined. If you want to add more to the list, press PF4 to display a full list of attributes that can be monitored by NCPView.

9. Press F8 (Forward).

   The ResourceView : NCPMON Automation Log Details panel appears. This panel defines the resource transient log.

   It is recommended that you accept the default settings for this feature. For more information, press F1 (Help).

10. Press F8 (Forward).

    The ResourceView : NCPMON Owner Details panel appears. The fields on this panel are for documentation purposes only.

    (Optional) Complete the fields on the panel and press F3 (File).

    The NCP resource definition is added.

Allocate NCP Unformatted Dumps

To use an NCP unformatted (raw) dump, you need to allocate it to NCPView, so that NCPView can access information in the dump as though it is a real NCP.

To access the NCP Dump Menu

1. Enter **/NCPDUMP** at the prompt.

   The NCP : NCP Dump Menu appears.

   From this menu, you can allocate (option AL) or unallocate (option UN) an unformatted NCP Dump file. For more information about the fields, press F1 (Help).

   Note: The DD Name that is specified must not conflict with DDs already allocated and also cannot conflict with an existing NCP name.

   When the process is complete, the following message appears:

   ```
   ZNC0702 FUNCTION COMPLETED SUCCESSFULLY
   ```

   For example, if a dump file was allocated using the option **AL** on the NCPView Control Functions menu with a DD name of PRODDUMP specified, then the NCP selection list includes an NCP with the name PRODDUMP with all the information that a real NCP has displayed. This line on the list appears in blue to distinguish it from real NCPs.

Expected Unformatted Dump File Characteristics

The first record in the unformatted dump file is a control record. The device type that produced the dump is indicated in the first word of the control record.

The format of the first word is XXXXXXTT. The following are possible values of the TT byte:

- X'00' indicates a 3705 dump (not supported by NCPView)
- X'01' indicates a 3725/3720
- X'02' indicates a 3745

In a valid 3725/3720/3745 NCP dump, the actual NCP storage begins in the second record. The first word of the second record must contain X'714C01AA'.

The LRECL of the dump must be equal to 512 or 2048.

Estimate Storage Requirements for Processing NCP Dumps Using NCPView

When a dump is accessed, only the required amount of storage is read into memory. For example, if you browse storage that is in the middle of the dump, then only half of the dump is read into memory. If the dump is not accessed for 30 minutes, the dump stored in memory is released, thus freeing memory; therefore, further access to the dump causes the dump to be read into memory again.

Most dumps are 4 or 8 Mb in size, although they can be up to 16 MB in size.

When considering how much virtual storage a dump may consume, the general rule is as follows:

```
storage_required = size _of _dump + 300K
```

Ensure that the size of your region is set to an appropriate value.

Note: All storage is above the 16 MB line.

Configure the NCPView NCL Exit

An NCL exit, *dsnpref*.NMC0.CC2AEXEC(ZNCUX000), which lets you configure NCPView functions, is distributed with NCPView. This exit is called at the end of NCPView initialization to let you include code specific to your installation. You can, for example, include code that does the following:

- Filters out NCPs that you do not want monitored
- Allocates NCP unformatted dump files

Whenever NCPView finds an NCP, ZNCUX000 is called to determine whether the NCP is included in NCPView's monitoring scope. This process can happen during NCPView initialization, or whenever NCPView detects a new NCP being activated.

Important! If modifications are required, we recommend that you create an SMP/E ++USERMOD to record and control the changes. Alternatively, you can copy the distributed member to the region's TESTEXEC data set for modification.

Note: For more information about how to change these functions, see the comments in the ZNCUX000 procedure.

The following procedure shows you how to configure the exit using the alternative method.

To configure the ZNCUX000 NCL exit

1. Place a copy of ZNCUX000 in the *dsnpref.rname*.TESTEXEC library.
2. Change any of the following functions, as required:
   - Exclude one or more NCPs.
   - Allocate NCP dumps.

Chapter 8: Network Control System

This section contains the following topics:

How NCS Works

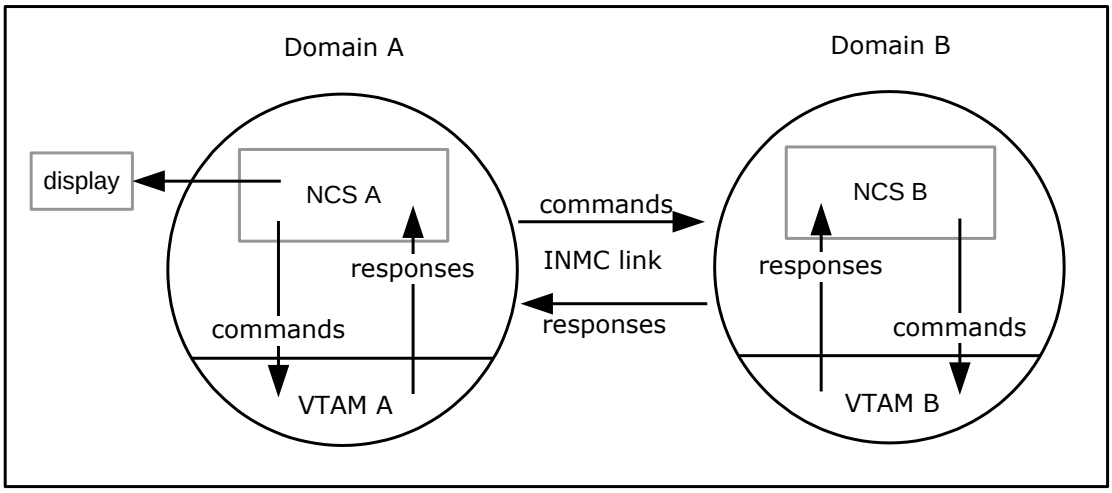
The Network Control System (NCS) provides summary displays of resource types, and graphic displays of individual resources and their subordinate nodes.

NCS functions by issuing VTAM Display commands and interpreting the responses received.

Transfer of NCS Data Across an INMC Link

NCS also collaborates with other, linked CA NetMaster NM for SNA regions, by using the Inter-Management Services Connection (INMC) facility. VTAM Display commands can be executed on other CA NetMaster NM for SNA regions in other VTAM domains for processing, and responses can be returned to the original NCS for display, as shown in the following illustration.

Note: This can occur only if the user has access to the other NCS, and the user IDs in both regions are the same.



In the previous illustration, note the following:

- Arrows indicate the flow of data.
- NCS in domain A sends VTAM display command requests to NCS in domain B, which returns responses. These responses can be displayed by NCS A.

Chapter 9: Configuring Tivoli NetView Operator Command Emulation

This section contains the following topics:

Tivoli NetView Operator Command Emulation Facility

The Tivoli NetView operator command emulation facility assists former Tivoli NetView users with the commands used in CA NetMaster NM for SNA.

This lets users operate CA NetMaster NM for SNA by using the same commands and procedures they are accustomed to using with Tivoli NetView.

Modify Table Entries

The command emulation tables are contained in a CAS table called EQUATES. Each table entry represents a Tivoli NetView operator command and can be defined as ACTIVE or INACTIVE. You can modify the EQUATES table while your region is running by using CAS Table Services.

To modify table entries

1. Enter **/CASTAB** at the prompt.

   The CAS : Table Definition List appears.

2. Enter **L $VW** at the prompt.

   The CAS : Table Definition List repositions.

3. Enter **U** next to $VWEQUATES.

   The CAS : Table Description panel appears.

4. Press F6 (Entries).

   The CAS : Table Entries for Field $VW.EQUATES appears.

5. Enter **U** beside a command.

   The CAS : Table Entry Definition panel appears.

6. Change the Active? (Yes/No) field and press F3 (File).

   The CAS : Table Entries for Field $VW.EQUATES appears.

7. Press F3 (Exit)

   The CAS : Table Description panel appears.

8. Press F3 (File).

   The CAS : Table Definition List appears.

9. Enter **R** beside $VWEQUATES and enter SUBMIT BSYS -START $VWCALL OPT=INIT from OCS or Command Entry.

   The changes take effect.

Considerations When Modifying Table Entries

Any changes you make are limited by the following rules:

- Changing an entry from INACTIVE to ACTIVE does not set a global equate. To do this, you must restart the region.
- Changing an entry from ACTIVE to INACTIVE takes affect after the table is reloaded. When an entry is set to INACTIVE, the NetView operator command is not operational.

  Note: When you inactivate Tivoli NetView operator commands that have the same name as MS commands, that is ACT and INACT, the inactivation does not become effective until the region is next restarted.
- If an entry is INACTIVE when the operator tries to use it, the command is executed as if it were an NCL procedure name and an error message may result, for example:

  ```
  START commandname
  N04005 NCL PROCEDURE commandname DOES NOT EXIST IN LIBRARY COMMANDS.
  ```

The Tivoli NetView operator commands initialization process, described in the *Installation Guide*, can be performed on entry to OCS; however, this means that the following applies:

- The equates are effective only while the operator remains in OCS.
- You cannot set an equate for a command that has the same name as a Management Services (MS) command, that is, the ACT and INACT commands.

Chapter 10: Advanced Configuration Tasks

This section contains the following topics:

Load a System Image

The region loads a system image during region initialization. During operation, you may need to change the system image by loading another image.

Note: When you request to load a system image, the $RMEXSTR exit NCL procedure is executed before the starting process. This procedure may be customized at your site to perform any required tasks before any automated resources are started. The starting process cannot proceed if the exit sets a non-zero return code.

To load a system image

1. Enter **/RADMIN.I** at the prompt.

   The System Image Definition Menu appears.

2. Select the type of system image that you want to load.

   The System Image List appears.

3. Enter **L** beside the system image that you want to load.

   The LOAD Command Parameter Specification panel appears.

4. Complete the following fields:

   SysName to be Loaded

   Enter **?** and select a system image from the displayed prompt list.

   Global Automation Mode

   Specify the global operation mode for your system image.

   Perform COLD Start?

   If the Checkpoint Restart Status field is set to ACTIVE, you can enter NO in the Perform COLD Start? field to specify a warm load.

5. Press F6 (Action) to load the system image.

   The Command Confirmation panel appears.

6. Enter **CONFIRM** in the Response field.

   The system image is loaded.

Important! Resources that are monitored by the region are defined to the system image. Loading a system image affects all users of this region.

Cold and Warm Load Features

When you load a system image, you can specify that a cold or warm load be performed. This is dependent on the setting of the Checkpoint Restart Status field in the $RM AUTOIDS parameter group.

When a cold load is performed, resources defined to the system image are checked, and if automated, are brought into the desired state. The system image is loaded as if this was the first time it was loaded.

When a warm load is performed, resources are placed in the state they were in when this system image was last in use. All manual overrides performed on resources defined to the system image are retained when this system image is loaded.

The Checkpoint Restart Status field displayed on the LOAD Command Parameter Specification panel displays the status as specified in $RM AUTOIDS parameter group.

Enable Multisystem Support

If you have regions on different systems, you can link them together, using INMC links, to form a multisystem configuration.

A multisystem configuration enables you to log onto your local region and view and control the resources of linked regions. For example, you can do the following:

- Display a VTAM node in a remote region
- Display the alerts raised from all the linked regions
- Monitor NCP utilization in all the linked regions

Multisystems are set up and administered from the Automation Services : Multi-System Support Menu. To access this menu, enter **A.M** at the prompt of the Primary Menu.

For more information about this menu, press F1(Help).

More information:

Administering a Multisystem Environment (see page 189)

Define ISR Communications

The Intersystem Routing (ISR) facility provides communication services between NEWS features and between NTS features in multiple regions.

To enable these services, define ISR network traffic between the peers through the ISRIN and ISROUT parameter groups. You must define the parameters on the appropriate region, as shown in the following example.

Example: Define ISR Communications

To send ISR traffic from region A to region B, do the following:

- Define ISROUT on region A, specifying region B's link name
- Define ISRIN on region B, specifying region A's link name

Define ISR Inbound Parameters (ISRIN)

To define ISR inbound parameters

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups panel appears.

2. Enter **U** beside the ISRIN parameter group.

   The ISRIN - ISR (Inbound) panel appears.

3. Specify link names for PPO messages, CNM data, and SAW data.
4. Specify whether these links are to Tivoli NetView (PPO messages and CNM data only).
5. Press F6 (Action).

   The parameters are actioned.

6. Press F3 (File).

   The parameters are saved.

Define ISR Outbound Parameters (ISROUT)

To define ISR outbound parameters

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups panel appears.

2. Enter **U** beside the ISROUT parameter group.

   The ISROUT - ISR (Outbound) panel appears.

3. Specify link names for PPO messages, CNM data, and SAW data.

4. Press F6 (Action).

   The parameters are actioned.

5. Press F3 (File).

   The parameters are saved.

Manage Focal Points

The Focal Point Management menu options apply to APPN network nodes and allow authorized users to manage and maintain the definitions of the backup and nesting focal points for the Problem Management category of SNA Management Services (SNAMS). Managing these definitions ensures that Problem Management information from the APPN network flows to a centralized management focal point.

For more information about SNAMS and focal point management, see the following IBM guides:

- *SNA Management Services Reference*
- *SNA Transaction Programmer's Reference Manual for LU Type 6.2*

Focal Points and Entry Points

In Advanced Peer-to-Peer Networking (APPN), roles are established through the interchange of SNAMS capabilities between two nodes. One of these nodes assumes the role of a *focal point*, the other becomes the *entry point*. When this exchange has been established, the entry point is said to come under the sphere of control of the focal point.

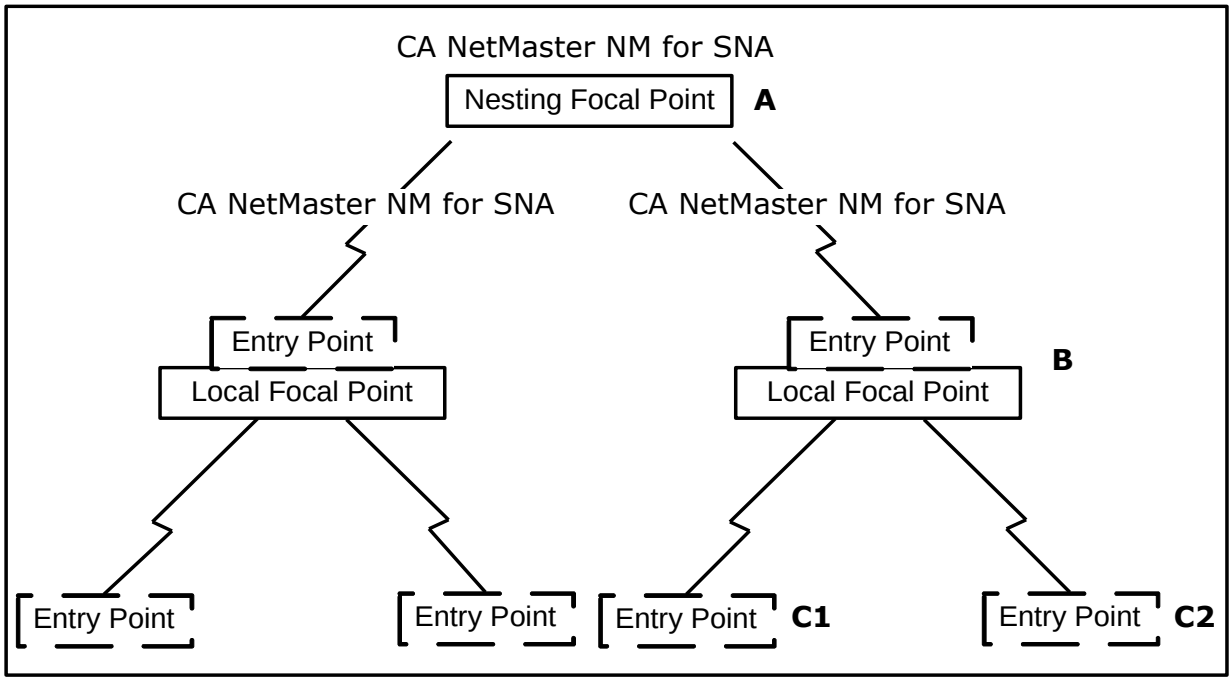
A focal point provides centralized management for one or more entry points under its sphere of control. Each entry point can have one focal point only, but the same focal point can provide services for multiple SNAMS categories.

Both focal points and entry points are dynamic. This means that if a primary focal point becomes unavailable, a *backup focal point* can be requested. This also means that higher ranked focal points can replace existing focal points.

Nest Focal Points

One focal point can come under the control of another focal point. This is called *nesting*. Nesting is typically used where each focal point is managing a different level of SNAMS.

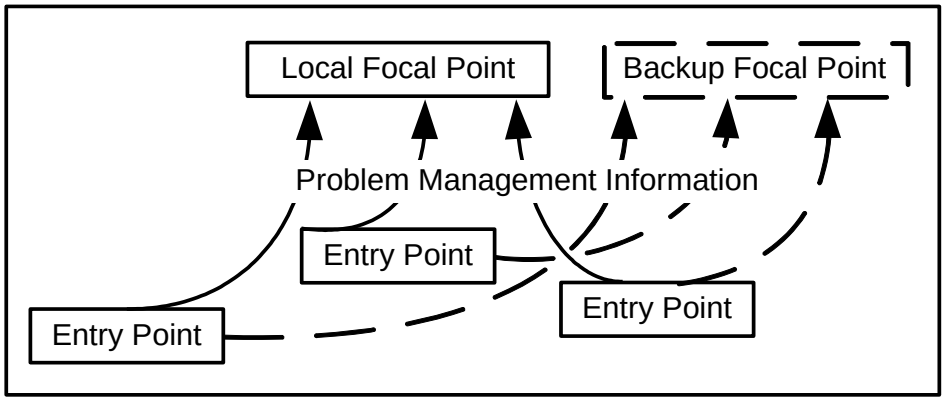
In an SNA environment, a nesting focal point, shown in the following illustration, is a focal point that has registered a local focal point as an entry point.



For example, in the previous illustration, the local focal point B sends any Problem Management information, passed to B from entry points C1 and C2, on to the nesting focal point A.

Local and Backup Focal Points

A *local focal point* is a focal point with entry points locally registered to it. A local focal point may become inactive after acquiring entry points. In this event, any Problem Management information from the entry points that the local focal point has acquired is sent to a *backup focal point*, as shown in the following illustration.



Browse, Update, or Delete Focal Points

You can browse, update, and delete focal points from the SNA : Focal Point Administration menu.

To access the SNA : Focal Point Administration menu, enter **/SNAFPA** at the prompt.

```
PROD------------------ SNA : Focal Point Administration ---------------/SNAFPA
Select Option ===>

   BB  - Browse Backup Focal Point Definition
   BN  - Browse Nesting Focal Point Definition
   UB  - Update Backup Focal Point Definition
   UN  - Update Nesting Focal Point Definition
   DB  - Delete Backup Focal Point Definition
   DN  - Delete Nesting Focal Point Definition
   X   - Exit

 F1=Help      F2=Split     F3=Exit      F4=Return
                           F9=Swap
```

To browse, update, or delete a backup focal point or a nesting focal point, type the relevant letters for the option you want at the prompt.

For more information about these options, press F1 (Help).

If you choose a browse, update, or delete option for a backup focal point, the NEWS : SNAMS Backup Focal Point Definition panel appears.

If you choose a browse, update, or delete option for a nesting focal point, the NEWS : SNAMS Nesting Focal Point Definition panel appears.

Define Backup Focal Points

The NEWS : SNAMS Backup Focal Point Definition panel displays definitions for the SNAMS backup focal point.

To define a backup focal point

1. From the SNA : Focal Point Administration menu, type **UB** at the prompt.

   The NEWS : SNAMS Backup Focal Point Definition panel appears.

2. Complete the following fields:

   Focal Point Name

   Specify a name in the form *Network Identifier* and *Network Addressable Unit* (NAU) separated by a period (for example, NTWKNAME.NAUNAME).

   Application Name

   Type a four-byte hexadecimal quoted string (in the format *'aabbccdd'*X) if the string contains non-display characters.

3. Press F3 (File).

   The backup focal point is saved.

Define Nesting Focal Points

The NEWS : SNAMS Nesting Focal Point Definition panel displays the definition for the SNAMS nesting focal point.

To define a nesting focal point

1. From the SNA : Focal Point Administration menu, type **UN** at the prompt.

   The NEWS : SNAMS Nesting Focal Point Definition panel appears.

2. Specify a focal point name in the form *Network Identifier* and *Network Addressable Unit* (NAU) separated by a period (for example, NTWKNAME.NAUNAME).

3. Press F3 (File).

   The nesting focal point is saved.

Manage Entry Points

The SNA : Entry Point Administration menu lets you manage and maintain the definitions of the Entry Points for the Problem Management category of SNA Management Services (SNAMS). It also lets you acquire entry points for the focal point so that the focal point can receive Problem Management information from them.

From the SNA : Entry Point Administration menu, you can access the NEWS : SNAMS EP Definitions panel to maintain entry point definitions or get a full or partial list of currently defined entry points.

Activate a Focal Point

To activate a focal point

1. Enter **/SNAEPA** at the prompt.

   The SNA : Entry Point Administration menu appears.

2. Type **ACT** at the prompt and complete the following field:

   Entry Point Name

   Specifies the fully-qualified node name in the form *Network Identifier* and *Network Addressable Unit* (NAU) separated by a period (for example, NTWKNAME.NAUNAME).

   If you enter the NAUNAME portion of the name only, NEWS prefixes it with the name of the network in which this region is active.

   Press Enter.

   The NEWS : SNAMS EP Definitions panel appears.

Maintain Entry Point Definitions

The NEWS : Entry Point Definitions panel displays a list of entry point definitions that can be registered to the Problem Management focal point. From the list, you can select an entry point definition to browse, update, or delete.

To list entry point definitions

1. Enter **/SNAEPA** at the prompt.

   The SNA : Entry Point Administration menu appears.

2. Enter **M** at the prompt.

   The NEWS : Entry Point Definitions panel appears.

   Note: To narrow the range of entry points listed, specify a prefix in the Entry Point Name field. Entry point names beginning with the entered prefix only are listed.

3. Press Enter.

   The NEWS : Entry Point Definitions panel appears in update mode.

Update an Entry Point

To update an entry point

1. From the NEWS : Entry Point Definitions panel, enter **U** beside an entry point name on the list.

   The NEWS : SNAMES EP Definitions panel appears for the selected entry point.

2. Edit the details, as required.

3. Press F3 (File).

   The changes are filed.

4. Press F4 (Save).

   The changes are saved.

Define an Entry Point

To define an entry point

1. From the NEWS : Entry Point Definitions panel, press F4 (Add).

   The NEWS : SNAMS EP Definitions panel appears.

2. Complete the following fields:

   Entry Point Name

   Type a name in the form *Network Identifier* and *Network Addressable Unit* (NAU) separated by a period (for example, NTWKNAME.NAUNAME).

   Initial Status

   Type **ACTIVE** or **INACTIVE**.

3. Press F3 (File).

   The changes are filed.

4. Press F4 (Save).

   The changes are saved.

Delete an Entry Point

To delete an entry point

1. From the NEWS : Entry Point Definitions panel, enter **D** beside the entry point that you want to delete.

   The entry point is deleted.

Maintain Resource Alias Names

NEWS provides VTAM with alias name translation services for those levels of VTAM that request this function. Alias names are used to differentiate between same name resources in interconnected networks.

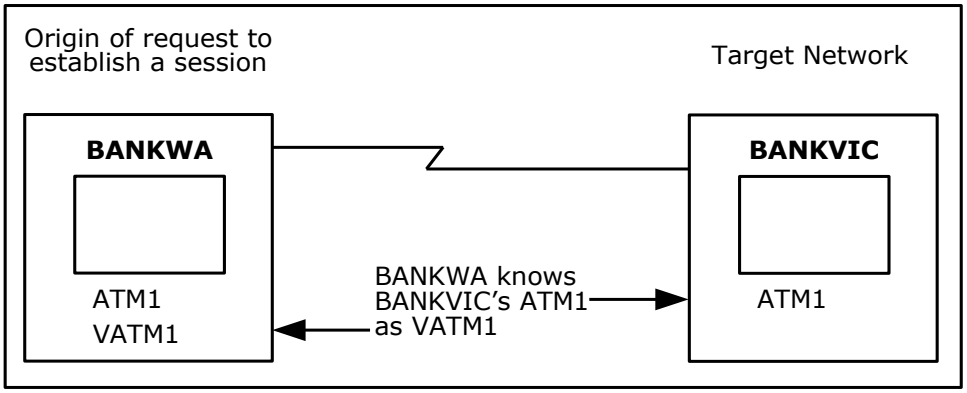
Note: Alias name translation is not necessary if there are no resource name clashes when sessions are being established between interconnected networks. A name clash occurs if a resource name in one network is also defined in the other network.

Alias Name Translation

You can maintain the translation definitions by using the DEFALIAS REPALIAS, and DELALIAS commands.

You do not need to restart your region after changing or adding definitions. However, you may not be able to immediately use the new definitions for session establishment.

In the following illustration, which shows an example of alias name translation, the BANKWA network defined the alias name VATM1 to the resource ATM1 existing in the BANKVIC network because the name ATM1 was already assigned in the BANKWA network.



When multiple SNA networks are connected using a gateway function called SNA Network Interconnections (SNI), each network is known by a unique network identifier but otherwise retains its individual SNA characteristics.

During cross-network sessions in such an environment, resources that exist in a particular network may need to be known by an alias name in other networks.

Consequently, the process of establishing a cross-network session may require alias names in one network to be translated to the real resource names in another network. The Alias Name Translation Facility provides this service.

The facility can meet VTAM requests for translation from the alias name to the real name, and from real name to alias name.

Session establishment also requires the use of Class-of-Service (COS) and Logmode names. Such a name may be defined in one network but unknown in another network. However, that other network may have an equivalent definition of the name. The Alias Name Translation Facility can be used to resolve the name difference between the networks.

Example: Resource Alias Name Translation

An LU, named X, in network A needs to connect to an application in network B. However, there is already a resource named X in network B. To establish a session, an alias name for use in network B must be provided for the resource X in network A.

Example: Class-of-Service or Logmode Alias Names Translation

A file transfer application in network A always uses logmode X, and needs to connect to an application in another network, B. If the logmode X does not exist in network B, but an equivalent logmode exists, then the Alias Name Translation Facility can be used to assign the equivalent logmode in network B.

Display Alias Name Definitions

By using the SHOW DEFALIAS command, you can display one or more alias definitions used by the Alias Name Translation Facility of NEWS. By default, you can have an authority level of 0 to display alias name definitions.

For a full explanation and examples of the SHOW DEFALIAS command and details of operands, see the online help.

Example: Display Alias Names

The diagram in Alias Name Translation shows an example of alias name translation, where the alias name VATM1 is defined in BANKWA for the real name ATM1 existing in BANKVIC.

To display the defined alias name, enter at a command line:

```
SHOW DEFALIAS
```

All defined alias names are displayed in a list (see the following figure, which shows the SHOW DEFALIAS Results*).*

```
Command ===> show defalias
 N38304 -ALIAS--  --NET---  -RNAME--  --RNET--  -RCDRM--
 N38301  VATM1     BANKWA   ATM1     BANKVIC   -
 N38305 1 LU ENTRY DISPLAYED.
```

ALIAS

Specifies the alias name.

NET

Specifies the name of the network in which the alias resource name is to be known, and the origin of the translation request.

RNAME

Specifies the real name of the resource as it is known in the target network.

RNET

Specifies the network identifier for the target network in which the real resource name can be used.

RCDRM

Specifies the CDRM that owns the LU.

Note: Applies to LUs only.

Define Alias Names

By using the DEFALIAS command, you can add an alias name to NEWS for use by the Alias Name Translation Facility. By default, you must have an authority level of 4 to add an alias name.

For a full explanation and examples of the DEFALIAS command and details of operands, see the online help.

Note: The addition of definitions is normally a function of the INIT procedure processing.

Example: Define an Alias Name

The diagram in Alias Name Translation shows the alias name VATM1 defined in BANKWA for the real name ATM1 existing in BANKVIC.

To define the alias name of VATM1 as an LU in BANKWA, at a command line, enter:

```
DEFALIAS NAME=VATM1 NET=BANKWA
         RNAME=ATM1 RNET=BANKVIC
```

A message confirming the definition appears.

To see the result of the definition, at a command line, enter:

```
SHOW DEFALIAS NAME=VATM1
```

Define Generic Names

You can reduce the number of DEFALIAS commands used and simplify subsequent modifications by defining generic alias names and network names.

You can also override the generic definitions by one or more specific conditions.

For a full explanation and examples of the command and details of operands, see the online help.

Define Generic Alias Names

You can define a generic alias name and real name pair when you want to map a range of similarly named resources (for example, MAIVF001 to MAIVF999) to some other range (for example, AMF001 to AMF999) in the target network.

By generically defining the two prefix strings only (that is, MAIVF and AMF), the Alias Name Translation Facility can carry the trailing suffix during the translation (that is, it translates MAIVF034 to AMF034).

Define Generic Network Names

You can generically define the networks in which an alias name is known. By using a totally generic network name (that is, a name that any network name matches), in a single DEFALIAS command, you can define an alias to exist in all networks.

When a network name is generically defined, any network name that matches the generic network name contains the alias resource name defined to that network.

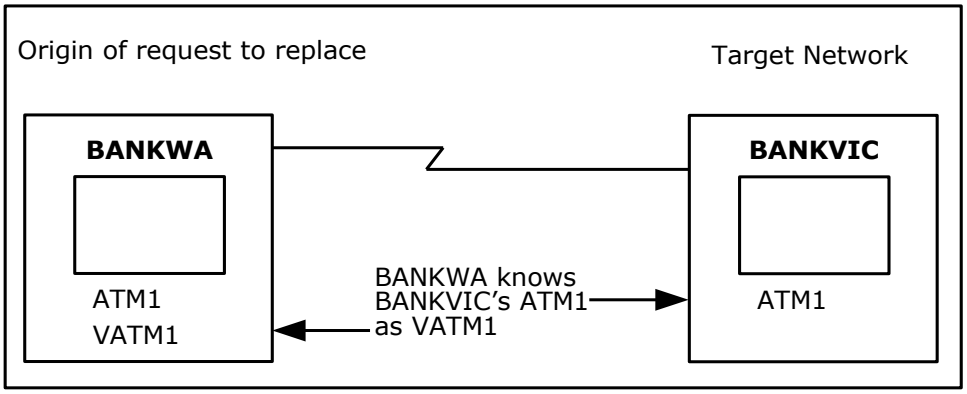
Replace Alias Names

By using the REPALIAS command, you can replace the real name and network defined for an existing alias name and network combination. You must have an authority level of 4 to replace an alias name.

For more information about the REPALIAS command, see the online help.

Example: Replace an Alias Name

The following illustration shows the real name defined for the alias name VATM1 in BANKWA replaced with ATM2 existing in the BANKVIC network.



To replace the real name defined for VATM1 in BANKWA, at a command line, enter the following:

```
REPALIAS NAME=VATM1 NET=BANKWA
         RNAME=ATM2 RNET=BANKVIC
```

A message confirming the replacement appears.

To see the result of the replaced real name, enter at a command line:

```
SHOW DEFALIAS NAME=VATM1
```

The following results are displayed:

```
Command ===> show defalias
 N38304 -ALIAS--   --NET---   -RNAME--   --RNET--   -RCDRM--
 N38301  VATM1      BANKWA     ATM2      BANKVIC    -
 N38305 1 LU ENTRY DISPLAYED.
```

The definitions of the results are explained below.

ALIAS and NET

Specifies the resource name and network ID that identify the real name definition being replaced.

RNAME

Specifies the real name that replaces the previously defined real name.

RNET

Specifies the real network ID that replaces the previously defined real network ID.

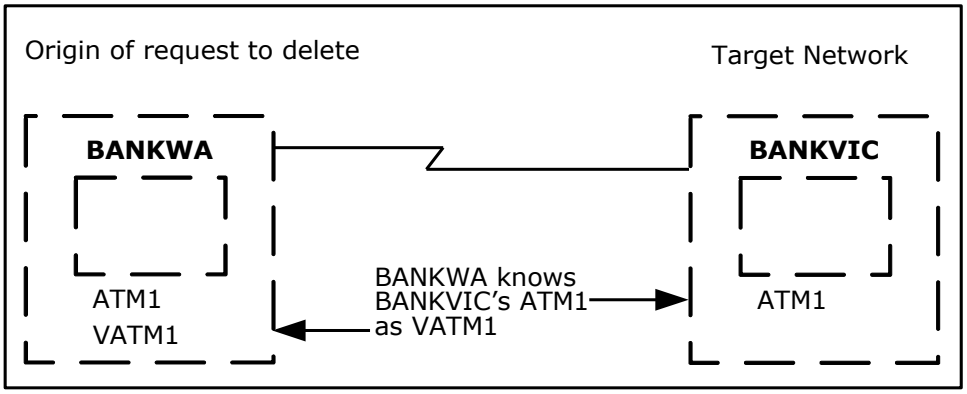
Delete Alias Names

By using the DELALIAS command you can delete the alias name defined for a real resource in a target network. By default, you must have an authority level of 4 to replace an alias name.

For more information about the DELALIAS command, see the online help.

Example: Delete an Alias Name

The following illustration shows the alias name of VATM1 in BANKWA defined for ATM2 in BANKVIC.



To delete the alias name VATM1, at a command line, enter the following:

```
DELALIAS NAME=VATM1 NET=BANKWA
```

A message confirming the deletion appears.

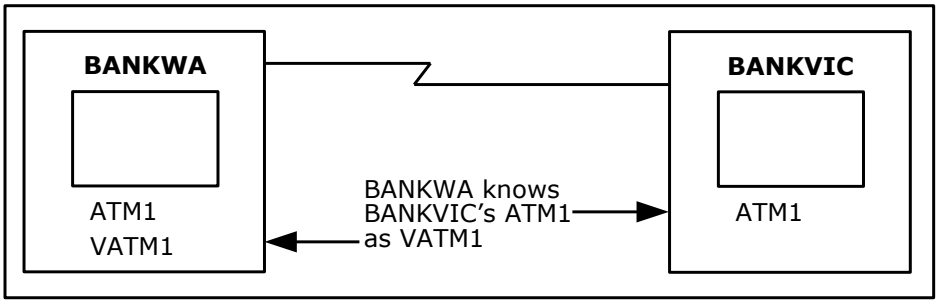
Test Alias Names Translation

By using the XLATE command, you can test alias name translation. This command lets you see the translated name that the Alias Name Translation Facility returns to VTAM when requested to perform translation. By default, you must have an authority level of 1 to test alias name translation.

For more information about the XLATE command, see the online help.

Examples: Test Translation

The following illustration shows the testing performed to determine that real name ATM2 existing in network BANKVIC is translated to the alias name VATM1 for the target network of BANKWA.



Example 1: Test Translation

To test that real name ATM2 existing in network BANKVIC is translated for the target network of BANKWA for the alias name of VATM1, at a command line, enter the following:

```
XLATE NAME=ATM2 NET=BANKVIC TARGNET=BANKWA REAL
```

The following results are displayed.

```
N38504 LU REAL NAME/NET = ATM2/BANKVIC ; ALIAS NAME/NET = VATM1/BANKWA.
```

Example 2: Test Translation

To test that the alias name VATM1 in network BANKWA is translated to the real name ATM2 for the target network BANKVIC, at a command line, enter the following:

```
XLATE NAME=VATM1 NET=BANKWA TARGNET=BANKVIC
```

The following results are displayed.

```
N38504 LU ALIAS NAME/NET = VATM1/BANKWA ; REAL NAME/NET = ATM2/BANKVIC.
```

Chapter 11: Implementing Activity Logs

This section contains the following topics:

Activity Logs

The activity logging facility records all the activity in your region. You can use the activity logs to help determine the cause of problems.

Two separate activity log formats exist:

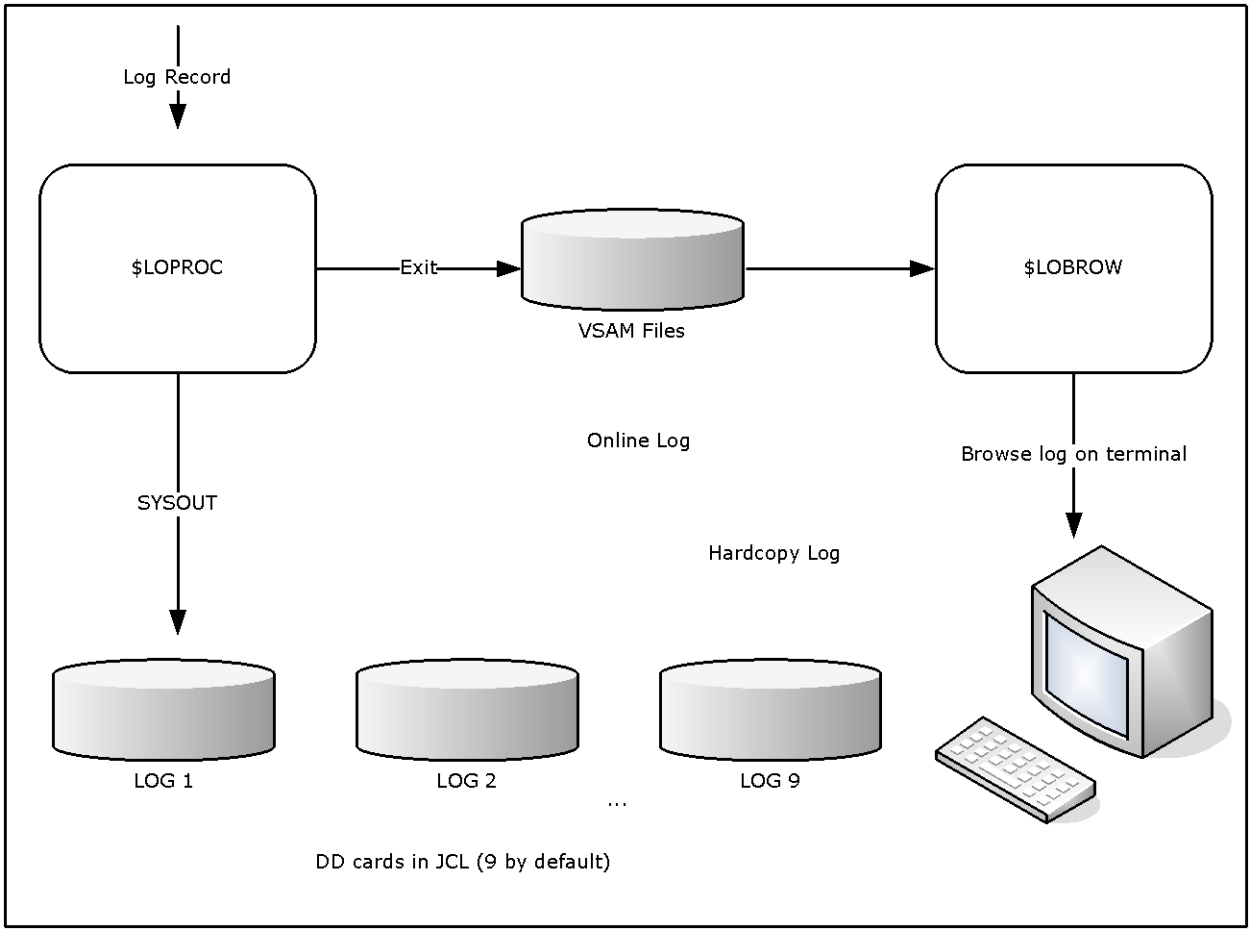
- Online
- Hardcopy

Log records are written to both formats.

By default, activity logs contain the following information:

- All commands entered
- All responses to commands entered
- Any unsolicited messages received from VTAM or the operating system, provided the related interfaces are available
- All messages explicitly written to the log by NCL procedures

The following illustration shows the path that the log record takes in the system.



The online activity log is supplied by the distributed procedure $LOPROC. The $LOPROC procedure writes log data to VSAM files (three by default). The VSAM files are accessed by a second procedure, $LOBROW, which allows online browsing of the log.

Note: $LOPROC and $LOBROW are the default procedure names. You can change these names by using the LOGFILES parameter group in Customizer (**/PARMS**).

Implement Online Activity Logging

During initialization, the region allocates, by default, three VSAM log files for online logging. However, you can allocate up to seven files.

Note: The log file IDs are of the form NMLOG*nn* and the data set names are of the form *dsnpref.rname*.NMLOG*nn*. (*dsnpref* is the data set prefix used during product installation and *rname* is the name of the region.)

Use Additional Log Files

If you want to make more than three files available to the region, define the new VSAM files and then customize the LOGFILES parameter group by defining additional logging data sets.

To customize the LOGFILES parameter group

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups list appears.

2. Enter **U** beside the LOGFILES parameter group.

   The Customizer : Parameter Group panel for the LOGFILES parameter group appears.

3. Press F8 (Forward) to display the next page.

4. Complete the fields for each file you want to make available. To allocate more files, press F8 (Forward) again.

5. When you have specified the required number of log files, press F6 (Action) to allocate and open the files.

6. Press F6 (Action).

   The changes are applied.

7. Press F3 (File).

   The changes are saved.

Note: For more information about using this panel, press F1 (Help).

Administer Online Activity Log Files

From the Activity Log : Administration menu, you can do the following:

- Swap active activity logs
- List all days contained in log files and browse logs for a particular date
- List all log files and browse a particular file

To administer online activity log files

1. Enter **/LOADMIN** at the prompt.

   The Activity Log : Administration menu appears.

Note: For information about the options available on this menu, press F1 (Help).

Swap the Online Log

The online activity log automatically swaps to a fresh VSAM file when each file fills up.

You can manually swap your currently active VSAM file if you want to free a particular log file (for example, for backups).

Important! Swapping the current VSAM log causes the $LOPROC procedure to write all subsequent activity log records to the next VSAM log. If this log was previously used, it is reset. Therefore, you can no longer browse the old records that it contained.

To swap the online activity log

1. Enter **/LOGSWAP** at the prompt.

   The Activity Log Services : Confirm Swap Log panel appears.

2. Press F6 to request the log swap, or F12 to cancel your request.

   Note: If the $LOPROC procedure encounters a VSAM error when it is logging activity to an online log file, it automatically swaps to the next log file.

Use a Log Exit for the Online Log

You can create an NCL procedure to intercept, analyze, and react to the messages that are sent to the activity log.

Use the LOGFILES parameter group in Customizer to specify the name of your exit.

The exit is executed every time a message is sent to the log. Using the exit to perform complex functions can degrade the performance of the region.

Note: Ensure that your log exit procedure is well-tested before you put it into production.

Variables Available to the Activity Log Exit

The following variables are available to the activity log exit:

&#LO$RECORD

Contains records of the following formats:

time_generated user_id terminal_id message_text

The text of the message starts at the fourth word of the record.

arrival_time origin region* $$AOMTIME$$ *aom_time message_text

The text of the message starts at the sixth word of the record. This format lets you identify AOM-sourced messages.

You can change the contents of this variable. To suppress the message from the log, set the variable to NOLOG.

Note: For more information, see the &LOGREAD verb in the *Network Control Language Reference Guide*.

$LOG

Specifies a Mapped Data Object (MDO) that contains the message attributes. The MDO is mapped by the $MSG map.

You can use the &ASSIGN verb to query the MDO.

Note: For information about querying MDO components and additional variables, see the *Network Control Language Programmer Guide*.

Example: Remove Messages from the NCL Log

The following shows an example procedure:

```
&CONTROL
-*-----------------------------------------------*
-* TO REMOVE IKJ56247I MESSAGES FROM THE NCL LOG. *
-*-----------------------------------------------*
&PARSE DELIM=' ' VARS=#LO$WORD* DATA=&#LO$RECORD
&IF .&#LO$WORD4 EQ .IKJ56247I &THEN +
        &#LO$RECORD = NOLOG
```

Enable the Log Exit

To enable the log exit

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups list appears.

2. Enter **U** beside the LOGFILES parameter group.

   The Customizer : Parameter Group panel for the LOGFILES parameter group appears.

3. Enter the name of your activity log exit in the Log Exit Name field.

4. Press F6 (Action).

   The changes are applied.

5. Press F3 (File).

   The changes are saved.

Replace Your Online Logging Procedure

The default online logging procedure is $LOPROC. This procedure is designed to work in conjunction with the online browsing procedure $LOBROW.

You can replace the $LOPROC and $LOBROW procedures with your own customized NCL procedures. Alternatively, you can write a customized log browsing procedure to present the supplied data files (from $LOPROC) in your own format.

Write a Log Browsing Procedure

To write your own customized NCL procedure to replace $LOBROW, use the &FILE OPEN statement with FORMAT=DELIMITED.

The physical file structure of the supplied log files (NMLOG01, NMLOG02, and NMLOG03) is as follows:

Key Format

YYYYMMDDHHMMSSHS*nnnn*

nnnn=1000 + (reset every 100th of a second) and key length=20 bytes

Record Contents

ORIGIN

Terminal name

REGION

User ID

TEXT

Message text to display in the activity log

MSGATTR

2-byte color/highlight indicator. Colors are R=red, Y=yellow, W=white, B=blue, G=green, T=turquoise, or P=pink. Highlight values are R=reverse, B=blink, U=uscore, or N=none.

ORIGTIM

Remote domain time

ORIGDMN

Originating domain name

ORIGSRC

Remote terminal ID

For more information, see the following:

- The description of the &FILE OPEN verb in the *Network Control Language Reference Guide*.
- The *Network Control Language Programmer Guide*.

Write Logging and Browsing Procedures

You can store your log records in whatever file format you want. If you do this, your log browsing procedure must match this file format.

For more information, see the descriptions of the following verbs in the *Network Control Language Reference Guide*:

- &LOGREAD
- &LOGCONT
- &LOGDEL

Implement Logging and Browsing Procedures

If you write your own browsing procedure or your own logging and browsing procedures, you need to implement them.

To implement your procedures, update the LOGFILES parameter group in Customizer with your parameter names and then action the group.

Hardcopy Activity Log

A region can have more than one hardcopy activity log, of which only one is open for logging.

Your region can be configured to perform logging to disk, tape, or hard copy. From one to nine logs can be specified by including the required number of DD statements in the execution JCL. Logging can be specified to wrap when the last log is full or is swapped.

To obtain the status of these logs, use the SHOW LOGS command.

Note: When logging to disk the following DCB attributes should be used:

```
DSORG=PS,RECFM=VBA,LRECL=137,BLKSIZE=15476
```

Format of Logged Information

Each entry recorded on the log is in the following format:

```
12.04.23.12   SMITH     TERM54    +V NET,ACT,ID=NCP001
```

This entry consists of the following information:

- A time stamp in the format *hh*.*mm*.*ss*.*hs* (where *hh* is the hour, *mm* is the minute, *ss* is the second, and *hs* is the hundredth of a second)
- The user ID that entered the command or logged the message
- The terminal from which the command was entered or to which a message is sent
- The text of the message or command

Commands are highlighted with a plus sign (+) prefixed to the text to make it easier to distinguish commands from messages when browsing the log. If the command entered is an unsolicited VTAM command, it is highlighted and prefixed with an equals sign (=).

Format of Logged Timer-initiated Commands

Commands that are executed as the result of a timer-initiated command are prefixed by a plus sign, followed by the identity number of the timer command responsible. This is in the format *#nnnn*.

Example: Logged Timer-initiated Command

```
15.00.00.01   NETOPER   CNTL01    +#0005 D BFRUSE
```

Format of Logged Commands Executed in Background Environments

Commands executed under the control of background environments are identified by the following keywords in the user ID field for the command text and any resulting messages:

BG-SYS

Background System Processor

BG-MON

Background Monitor

BG-LOG

Background Logger

Format of Logged Commands from NCL Procedure-dependent Environment

If a command is executed from an NCL procedure-dependent environment (&INTCMD), the node field on the log contains the NCL ID of the process issuing the command.

Format of the Hardcopy Log

The hardcopy log data set has the following format:

- A heading on each page—contains the day and date on which the log was created and the system identifier (NMID) of the originating region.
- A log identifier on the right side of the page. The log identifier is the DD name under which the log was created. This log identifier assists log collation after printing.
- 60 lines on each page—this can be altered to suit your requirements using the SYSPARMS LOGPAGE operand. For information about LOGPAGE, see the *Reference Guide*.

Swap the Hardcopy Log

Swapping the current log frees the log for immediate printing. To swap the log, use the LOGSWAP command. Swapping the log is possible only when another unused log remains to which logging can continue. You can specify up to nine logs. Logs do not need to be consecutive.

When a log is swapped, the log status, the requesting user ID, and the reason for the swap are recorded. You can display these details with the SHOW LOGS command.

Each of the logs is identified in the JCL by the LOG DD name followed by a single digit in the range one to nine.

Example: Log Name

```
//LOG4    DD   SYSOUT=A,FREE=CLOSE
```

Mixing of device types is also valid. Inclusion of FREE=CLOSE prints the log when it is released by the LOGSWAP command.

Wrap the Hardcopy Log Data Sets

Wrapping lets you reuse a LOG data set when all of the available LOG data sets have been used.

The LOGWRAP SYSPARM determines whether log data set wrapping is allowed. You set the value of this SYSPARM in the Are Activity Logs to Wrap? field when you customize the LOGFILES parameter group in Customizer (**/PARMS**).

If you specify NO (the default) in the Are Activity Logs to Wrap? field, then wrapping is not permitted. When all the LOG data sets have been used due to successive LOGSWAP commands, the previous LOG data sets cannot be reused. After the last LOG data set is used, any further LOGSWAP commands are rejected.

If you specify YES in the Are Activity Logs to Wrap? field, log wrapping is allowed according to the following rules:

- If you are directing your LOG data sets to SYSOUT, then, as each LOG*n* DD card is used, the data set is dynamically unallocated as a result of the FREE=CLOSE option. In this case, you can reissue an ALLOC command to reallocate another SYSOUT file under the same DD name. For example:

  ```
  ALLOC DD=LOG3 SYSOUT=A FREE=CLOSE
  ```

  This DD name is now available for use as another LOG data set. Subsequent LOGSWAP operations can now reuse this LOG data set rather than rejecting the command when the last LOG data set is used.
- If YES is specified but the LOG DD cards point to sequential data sets, log wrapping overwrites the earlier LOG data held in these data sets. You should take precautions to archive the existing data before allowing the wrap to occur.

Cross-Reference Hardcopy Logs

To make it easier for operations staff to piece the full log together, certain information is recorded on the last and first lines of LOG data sets that have been swapped.

The first line of a new log that is used in place of a swapped log contains the reason for the swap, or the initiating user ID.

The last message printed on a swapped log is the DD name of the new log. Also printed at the start of the new log is the DD name or logical ID for the previous log.

I/O Errors on the Hardcopy Log

If an I/O error occurs on a log, the log is closed and the next available log is automatically swapped to, if one is available, and logging continues. This also applies to data set full conditions when logging to disk.

If the I/O error occurs on the last available log, a warning message is sent to all monitor terminals informing them that logging has ceased. The STATUS command also includes a warning message if logging is stopped. All log messages are passed to LOGPROC for analysis even if no log output is possible.

Write to the System Log

The SYSPARMS SYSLOG operand can be used to direct your region to write all logged output to the system log and to its own log, or to write all VTAM PPO messages received to the system log.

For information about the SYSPARMS SYSLOG operand, see the *Reference Guide*.

Chapter 12: Setting Up the Alert Monitor

This section contains the following topics:

Access Alert Administration

Alert Monitor administration lets you define Alert Monitor interfaces, filters, and formats that apply to all users.

You perform Alert Monitor administration functions from the Alert Monitor : Administration Menu.

To access Alert Monitor administration functions

1. Enter **/ALADMIN** at the prompt.

   The Alert Monitor : Administration Menu appears.

```
PROD---------------- Alert Monitor : Administration Menu --------------/ALADMIN
 Select Option ===>

    I   - Define Trouble Ticket Interface                    ALTTI
    D   - Define Trouble Ticket Data Entry                   -
    F   - Define Filters                                     ALFILT
    L   - Define List Formats                                -
    MIF - Invoke Alert Filter Migration Utility              -
    ST  - Alert Monitor Self Test                            ALTEST
    X   - Exit
```

Alert Monitor Trouble Ticket Interface

The Alert Monitor provides an interface that lets you send alert information in the form of a *trouble ticket* to another interface automatically or manually.

The Alert Monitor supports the following interfaces for raising trouble tickets:

Electronic Mail

Sends an email describing the problem to a problem management application or a particular person. This method can be used to send tickets to multiple problem management applications.

Custom

Lets you write your own NCL procedure to deliver the trouble ticket to an application by whatever means you choose. For example, you can do the following:

- Invoke a REXX procedure, and pass alert variables.
- Send to any external interface, for example, problem-management product.
- Send to MVS system facilities, for example, system console, data sets, SMF user records, or batch jobs.
- Invoke applications, for example, FTP.

Service Desk

Creates a new CA Service Desk request from the alert details.

Note: If your CA Service Desk installation is configured with the optional ITIL application, incidents are created instead of requests.

Note: You can choose one interface only.

If you want the operator to supply information when requesting the creation of a ticket, you also need to set up the trouble ticket data entry definition.

Define a Trouble Ticket Interface

If you want to enable operators to raise trouble tickets on alerts, you must define the trouble ticket interface.

To define a trouble ticket interface between the Alert Monitor and another application

1. From the Alert Monitor Administration Menu, select option **I** - Define Trouble Ticket Interface.

   The Alert Monitor : Interface Definition panel appears.

2. Enter the type of interface that you want to define in the Interface Type field.

   Note: To obtain a selection list of valid values, enter **?** in this field.

3. Press F6 (Action).

   A panel appears where you can define an email (see page 165), custom (see page 167), or CA Service Desk (see page 168) interface. The type of panel displayed varies, depending on the interface type that you specified.

Define an Email Trouble Ticket Interface

This option enables alert details to be sent using email.

Note: To enable this option, you must ensure that your Systems Programmer enables SMTP support on this region's TCP/IP stack.

To define an email trouble ticket interface

1. Enter **/ALADMIN** at the prompt.

   The Alert Monitor : Administration Menu appears.

2. Select option **I** - Define Trouble Ticket Interface.

   The Alert Monitor : Trouble Ticket Interface Definition panel appears.

3. Enter **EMAIL** in the Interface Type field, and press F6 (Action).

   The Email a Trouble Ticket panel appears.

4. Leave the &$USRNAME variable in the Mail Address field. The variable works with the default trouble ticket data entry definition (see page 170) to specify the email address of the trouble ticket system to which you want to send the message. The data entry definition lets operators specify the address.

   If you do not want operators to be able to change the address, specify the address in the Mail Address field and delete the fields in the data entry definition.

   Complete the other fields:

   Host Name

   (IBM's Communications server only) Specifies the host name of this system. This is usually the NJE node name.

   SMTP Node Name

   (IBM's Communications Server only) Specifies the NJE node name on which the SMTP server runs. This is usually the same value as the Host Name.

   SMTP Job Name

   (IBM's Communications server only) Specifies the name of the address space in which SMTP runs. This is usually SMTP.

   SMTP DEST Id

   (CA TCPaccess CS only) Specifies the destination ID in the REMOTE parameter of the SMTP statement in member APPCFG*xx* of the PARM data set.

   Exit Procedure Name

   Specifies the name of an NCL exit routine, in which you can customize the email message sent by this trouble ticket.

   Subject

   Specifies the heading to display as the subject of the email message.

   Enter Mail Text Below

   Specifies the mail message text. Press F1 (Help) for information about variables.

   Press F3 (File).

   The definition is saved.

Define a Custom Trouble Ticket Interface

You use the custom interface if you want to use your own procedure to send trouble tickets.

To define a custom trouble ticket interface

1. Enter **/ALADMIN** at the prompt.

   The Alert Monitor : Administration Menu appears.

2. Select option **I** - Define Trouble Ticket Interface.

   The Alert Monitor : Trouble Ticket Interface Definition panel appears.

3. Enter **CUSTOM** in the Interface Type field, and press F6 (Action).

   The Custom Trouble Ticket panel appears.

4. Complete the following fields:

   Procedure Name

   Specifies the name of your NCL procedure for delivering tickets.

   Important! The NCL procedure must be in your region's COMMANDS concatenation. To list the concatenation, enter **/ALLOC**.

   Enter Parameters Below

   Specifies any parameters that you want the NCL procedure to receive. Press F1 (Help) for information about variables.

Example 1: Define a Custom Trouble Ticket Interface

The following example shows an interface that uses the distributed CA SOLVE:Central exit, $RMPB06S, to send tickets to a CA SOLVE:Central region with the ACB name SOLVPROB and other required values.

```
PROD---------------- Alert Monitor : Custom Trouble Ticket ----Columns 001 074
Command ===>                                    Function=Update Scroll ===> CSR

Procedure Name  $RMPB06S

                              Enter Parameters Below

**** ****************************** TOP OF DATA ******************************
0001 ACBNAME=solvprob
         parm1=value1
         parm2=value2
**** ***************************** BOTTOM OF DATA *****************************
```

Example 2: Define a Custom Trouble Ticket Interface

You can use the NCL procedure to execute a REXX procedure.

The following example shows the format of an NCL statement that executes a REXX procedure in your environment:

```
REXX rexx_procedure parm_1 … parm_n
```

Define a CA Service Desk Trouble Ticket Interface

The CA Service Desk integration (see page 179) feature must be implemented before you can send alert trouble tickets to it; otherwise, all alert forwarding requests fail.

Note: For more information, see the *CA Common Services for z/OS Service Desk Integration Guide*.

To define a CA Service Desk trouble ticket interface

1. Enter **/ALADMIN** at the prompt.

   The Alert Monitor : Administration Menu appears.

2. Select option **I** - Define Trouble Ticket Interface.

   The Alert Monitor : Trouble Ticket Interface Definition panel appears.

3. Enter **SERVICEDESK** in the Interface Type field, and press F6 (Action).

   The Service Desk Trouble Ticket Setup panel appears.

4. Complete the following fields:

   CA Service Desk Server Web Services HTTP URL

   Specifies the HTTP URL of the web services definitions on the target CA Service Desk server.

   Default: If left blank, the CA Common Services CAISDI/soap component chooses the default server.

   Note: This URL points to the web services definitions that CAISDI/soap invokes to create the requests. This is not the same as the URL that is used to log on to CA Service Desk. Contact your CA Service Desk administrator for the URL.

   CCI Sysid

   Specifies the CCI system ID of the LPAR where the CAISDI/soap task is active. This is the SYSID name specified in the CAICCI startup JCL.

   Default: If left blank, the local CAICCI on this LPAR locates a suitable CAISDI/soap task.

   Request Description Format

   Specifies whether the USD Request Description field is produced with HTML formatting or in plain text (TEXT).

   Default: HTML

   Note: In most cases, leaving the CA Service Desk Server Web Services HTTP URL and CCI Sysid fields blank will suffice. This lets the CAISDI/soap component use its default values.

   Press F3 (File)

   The definition is saved.

Set Up the Trouble Ticket Data Entry Definition

If you want the operator to supply information when creating a trouble ticket, you need to set up the ticket data entry definition.

To set up the trouble ticket data entry definition

1. Enter **/ALADMIN** at the prompt.

   The Alert Monitor : Administration Menu appears.

2. Select option **D** - Define Trouble Ticket Data Entry.

   The Trouble Ticket Data Entry Definition panel appears.

3. In the free-format data entry section of the panel, enter the data entry definition for the panel that the operator will use when creating a ticket.

   You can create multiple field names by replicating the key variables linked by default.

   Note: For more information about completing this section, press F1 (Help).

Example: Data Entry Definition to Prompt Operators for Email Address

The following example shows a definition that prompts the operator to identify the receiver of the ticket.

```
PROD--------- Alert Monitor : Trouble Ticket Data Entry Definition ------------
Command ===>                                    Function=Update Scroll ===> PAGE

**** ****************************** TOP OF DATA ******************************
0001 FIELD NAME=$USRNAME
0002  VALUE="Problem@sydney.enterprise.com"
0003  DESC="Send Email to:"
0004  COMMENT="(name for email)"
0005  REQUIRED=YES
0006  LENGTH=40
**** ***************************** BOTTOM OF DATA ****************************
```

Considerations

To make the panel more user-friendly, you can change this panel by creating a trouble ticket data entry definition.

Example: Data Entry Definition

Here is an example of the data entry definition.

```
PROD--------- Alert Monitor : Trouble Ticket Data Entry Definition ------------
Command ===>                                          Function=Update Scroll ===> CSR
AMTTDED08 TROUBLE TICKET DATA ENTRY DEFINITION SAVED
**** ****************************** TOP OF DATA *******************************
0001 FIELD NAME=$USRX
0002  VALUE=
0003  DESC="Press F6 to send the ticket"
0004  COMMENT=
0005  REQUIRED=NO
0006  LENGTH=0
**** ***************************** BOTTOM OF DATA ******************************
```

```
PROD---------------- Alert Monitor : Trouble Ticket Details -------------------
Command ===>

Press F6 to send the ticket ..
```

Implement Trouble Ticket Interface for Multiple Email Addressees

You can use an exit procedure, together with the trouble ticket interface and data entry definitions, to implement an interface that prompts operators for more than one email address.

To implement a trouble ticket interface for multiple email addressees

1. Create an NCL procedure with the following statements, and save it to your TESTEXEC:

   ```
   &IF .&$USRNAME1 NE . &THEN +
   &$AMTADDRESS1 = &$USRNAME1
   &IF .&$USRNAME2 NE . &THEN +
   &$AMTADDRESS2 = &$USRNAME2
   ...
   ```

   Note: The number of &IF statements sets up the number of addresses you want to provide.

2. Update the trouble ticket data entry definition (see page 170) with the following fields:

   ```
   FIELD NAME=$USRNAME1
   VALUE="&$AMTADDRESS1"
   DESC="EMAIL ADDRESS #1"
   COMMENT=""
   REQUIRED=NO
   LENGTH=40
   FIELD NAME=$USRNAME2
   VALUE=""
   DESC="EMAIL ADDRESS #2"
   COMMENT=""
   REQUIRED=NO
   LENGTH=40
   ...
   ```

   Notes:

   - The number of fields corresponds to the number of email addresses in the procedure you created.
   - The value &$AMTADDRES1 must be specified.

3. Define the email trouble ticket interface (see page 165) specifying a default address in the Mail Address field and the name of the procedure in the Exit Procedure Name field.

   The trouble ticket interface prompts operators for email addresses when they enter TT next to an alert.

Example: Implement a Trouble Ticket Interface for Two Email Addresses

To create an NCL procedure named EXAMPLE that sends emails to two addresses

1. Create an NCL procedure named EXAMPLE with the following statements, and save it to the TESTEXEC:

```
&IF .&$USRNAME1 NE . &THEN +
&$AMTADDRESS1 = &$USRNAME1
&IF .&$USRNAME2 NE . &THEN +
&$AMTADDRESS2 = &$USRNAME2
...
```

2. Enter **/ALADMIN** at the prompt.
3. Select option **D** - Define Trouble Ticket Data Entry.
4. Complete the panel as follows:

```
PROD-------- Alert Monitor : Trouble Ticket Data Entry Definition -------------
Command ===>                                    Function=Update Scroll ===> CSR

****** ***************************** TOP OF DATA ******************************
000001 FIELD NAME=$USRNAME1
000002  VALUE="&$AMTADDRESS1"
000003  DESC="EMAIL ADDRESS#1"
000004  COMMENT=""
000005  REQUIRED=NO
000006  LENGTH=40
000007 FIELD NAME=$USRNAME2
000008  VALUE=""
000009  DESC="EMAIL ADDRESS #2"
000010  COMMENT=""
000011  REQUIRED=NO
000012  LENGTH=40
****** **************************** BOTTOM OF DATA ****************************
```

5. Enter **/ALTTI** at the prompt.
6. Enter **EMAIL** in the Interface Type field and press F6 (Action).

7. Complete the panel as follows:

```
PROD--------------- Alert Monitor : Email A Trouble Ticket -Columns 00001 00072
Command ===>                                      Function=Update Scroll ===> CSR

Mail Address              defaultaddress@tt.com_____________________________
Host Name      (IBM)      HOSTNAME
SMTP Node Name (IBM)      NODENAME
SMTP Job Name  (IBM)      SMTP____
SMTP DEST Id (TCPaccess)  ________
Exit Procedure Name       EXAMPLE_
Subject                   &$AMDESC_____________________________________________

                             Enter Mail Text Below

****** ***************************** TOP OF DATA ******************************
```

Result

When an operator enters **TT** next to an alert, they are prompted for an email address as follows:

```
PROD--------------- Alert Monitor : Trouble Ticket Details --------------------
Command ===>

Email Address #1 ... defaultaddress@tt.com
Email Address #2 ...
```

Define Alert Monitor Filters

You can filter the alerts displayed on the Alert Monitor by applying a set of criteria to each of the fields in the alert. The filters that you create can be named and stored for later use, using the FILTER command.

To define an Alert Monitor filter

1. Enter **/ALFILT** at the prompt.

   The Alert Monitor : Filter Definition List panel appears.

2. Press F4 (Add).

   The Alert Filter panel appears.

3. Complete the following fields:

   Name

   Specifies the name of the filter.

   Description

   Describes the filter.

   Filter Expression

   Specifies the Boolean expression that determines what alerts are passed by the filter. For more information about creating Boolean expressions, press F1 (Help).

   Press F3 (File)

   The Alert Monitor filter is saved.

Alert Monitor Display Format

The Alert Monitor display format determines the information displayed for the alerts on the Alert Monitor, for example, the columns and the order in which they appear.

You specify the Alert Monitor display format on the List Format panel.

For each type of information you want to display on the Alert Monitor, you need to specify two items: a static heading and a variable that contains the required information.

You can create a multiscreen Alert Monitor display with up to 10 screens, enabling you to display more information on the monitor. The screens can be accessed by pressing the F11 (Right) or F10 (Left) function keys from the monitor.

The variable contains the information you want to display. The name of a variable can sometimes be longer than the data to display. You can enter a shorter name and then make that shorter name an alias of the actual name.

Create the Alert Monitor Display Format

You can create format definitions that can be used to customize the information displayed on the Alert Monitor.

To create the Alert Monitor display format

1. Enter **/ALADMIN.L** at the prompt.

   The List Definition List appears.

2. Enter **C** beside the DEFAULT display format definition.

   A copy of the List Description panel appears.

3. Enter a new value in the List Name field to identify the new definition, and update the Description and Title fields.

   Press F8 (Forward) three times.

   The List Format panel appears.

4. Enter column headings and variables using the text editor to specify the information to display on the Alert Monitor.

   Note: For more information about the text editor, press F1 (Help).

5. (Optional) Press F5 (Fields) to create aliases.

6. Press F3 (File).

   The details are saved.

Enable Alerts from External Applications

You can generate alerts (to view on the Alert Monitor) from external applications such as CA OPS/MVS EMA EMA.

Note: To utilize this feature, the SOLVE SSI must be active.

To enable alerts from external applications

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups list appears.

2. Enter **U** beside the $NM ALERTS parameter group in the Interfaces category.

   The ALERTS - Alert Monitor Interface panel appears.

3. Enter **YES** in the Enable External Alerts? field.

4. Press F6 (Action).

   The changes are activated immediately.

5. Press F3 (File).

   The settings are saved.

Forward Alerts

Alerts are displayed on the Alert Monitor; however, you can also forward them to the following platforms:

- EM Console in CA NSM
- UNIX platforms as SNMP traps
- CA NetMaster NM for SNA or Tivoli NetView (TME10) systems, as generic alert NMVTs
- CA Service Desk servers (see page 179), as CA Service Desk requests or incidents

You can apply filter criteria to forward different types of alerts to different platforms.

Alert forwarding does not require manual intervention; it occurs automatically when the alert is created.

Implement Alert Forwarding

You implement alert forwarding by using Customizer parameter groups.

Note: TNGTRAP and SERVICEDESK do not have clear alert events. Only alert open and considerations are forwarded.

To implement alert forwarding

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups list appears.
2. Enter **U** in front of the ALERTS parameter group in the Interfaces category.

   The parameter group opens for update.
3. Complete the following field:

   Dest Type

   Specifies the type of alert forwarding to use.

   Press Enter.

   The fields dynamically change to match the specified destination type.
4. Review the fields, and update as required.

   (Optional) Press F8 (Forward), and repeat Step 3 for each Definition ID.

   Note: Press F1 (Help) for information about the fields.
5. Press F6 (Action).

   The changes are applied.
6. Press F3 (File).

   The settings are saved.

SNMP Trap Definition

The MIB definition for alerts forwarded as SNMP traps is provided in member $AMTRAP, supplied in the CC2DSAMP data set. You can download this member to your UNIX system and compile it.

Note: When copying this member to your UNIX system, you can rename it to avoid problems on some UNIX systems where the $ sign has special meaning.

The supplied MIB defines two traps with the following object identifiers:

- $AMTRAP = 1.3.6.1.4.1.1126.1.2.1.2 (for an alert)
- $AMTRAPC = 1.3.6.1.4.1.1126.1.2.1.3 (when an alert is cleared)

Forward to Tivoli NetView

To receive alerts in a Tivoli NetView region, the CNMCALRT task must be defined and active. The alerts are formatted as Operator Notification generic alerts.

To forward alerts to Tivoli NetView

1. Check the DSIDMN (or DSIDMNB) member in the DSIPARM PDS. DSIPARM.PDS is allocated by the Tivoli NetView started task.
2. Ensure that the CNMCALRT task is included and is initialized (INIT=Y). For example:

   ```
   TASK MOD=CNMCALRT,TSKID=CNMCALRT,PRI=6,INIT=Y
   ```

   Note: This statement is necessary for the z/OS software alert forwarding function.

Implement CA Service Desk Integration

The CA Service Desk Integration feature creates CA Service Desk requests from forwarded alerts and alert trouble tickets, or both.

You can define multiple forwarding destinations to CA Service Desk, with each one pointing to a different CA Service Desk server.

Note: If your CA Service Desk installation is configured with the optional ITIL application, incidents are created instead of requests.

This feature is used by many CA mainframe products to consolidate their problem notification on a specified CA Service Desk server. It uses W3C SOAP (Simple Object Access Protocol) to invoke web services provided by CA Service Desk.

Software Requirements

CA Service Desk Integration has the following software requirements:

- CA Service Desk r11 or r11.1
- CA Common Services for z/OS r11, specifically the CAICCI and CAISDI/soap components

How Requests Are Created

To create a CA Service Desk request from an alert, the following internal steps are performed:

1. The CA Common Services for z/OS CAICCI component is used to pass the request to the CA Common Services for z/OSCAISDI soap component. CAISDI/soap is a z/OS-hosted SOAP client.
2. CAISDI/soap sets up an IP connection with the CA Service Desk server, then uses HTTP/HTTPS requests to invoke the necessary web services on the CA Service Desk server to create the new request or incident.
3. The request or incident number is returned and annotated in the alert.

Request Assignment

By default, CA Service Desk requests created by your region appear as *assigned* requests, with an assignee and an end user of System_NetMaster_User.

Your CA Service Desk administrator can customize the product templates to change these assignments to suit your organization.

Request Updating

A CA Service Desk request created from an alert is static. It reflects the alert details that were current at the time it was created.

Note: A CA Service Desk request is not subsequently updated with any changes to the alert, nor closed when the corresponding alert is closed.

Requests are intended for initial problem notification to a wider and more general data center audience. CA Service Desk Integration complements the functions of the Alert Monitor; it does not replace the Alert Monitor.

Every request (if HTML format is used) contains hyperlinks to various WebCenter pages, including the Alert Monitor. You should use the Alert Monitor for real-time dynamic alerting functions.

For recurring alerts, a request is created for the first occurrence only.

Other Ways to Create Requests or Incidents

In addition to Alert Monitor forwarding and trouble tickets, CA Service Desk requests or incidents can also be created from the following functions:

- Operator Console Services (OCS)
- MVS console

Operator Console Services

The OCS command SDCREATE can be used to create a CA Service Desk request from the OCS command line, for example:

```
SDCREATE Problem xxx has occurred
```

This attempts to open a request on the default CA Service Desk server. The request will have a severity of 4, and a summary and description of *Problem xxx has occurred*. Like other requests raised, it is assigned to System_NetMaster_User.

Use the SDTEST command to check if a default server is implemented.

MVS Console

As with any product command, you can also issue SDCREATE from the MVS system console, for example:

```
F rname,SDCREATE Problem xxx has occurred
```

Request Description Format

By default, your region generates CA Service Desk request description content in HTML format.

By default, CA Service Desk does not render embedded HTML directives in the request description field. To support this, you must customize your CA Service Desk server. This task involves customizing the detail_cr.htmpl form to add keeptags and keeplinks support.

Note: For more information, see the *Service Desk Modification Guide*.

Implement the Alert History Function

The Alert Monitor retains data in an alert history file. You can define the time period that alerts are retained.

To specify the time period that alerts are retained

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups list appears.

2. Enter **U** in front of the $NM ALERTHIST parameter group in the Files category.

   The ALERTHIST - Alert History File Specification panel appears.

3. Complete the following fields:

   Days to Retain Alerts

   Specifies the number of days that you want to retain alerts in the history file.

   Limits: 999 days

   Default: 7 days

   Time of Day for Alert Purge

   Specifies the time of day (in the format hh.mm) at which alerts older than the value in the Days to Retain Alerts field are deleted from the history file.

   Press F6 (Action).

   The changes are applied.

4. Press F3 (File).

   The settings are saved.

Reorganize Files and Monitor Space Usage

Over time, the alert history file can become fragmented. You can reorganize the file to improve its efficiency.

To reorganize the Alert History database for optimum space usage

1. Copy (REPRO) the alert history file to a backup file.
2. Delete and redefine the original file.

Use the same attributes that were used when the file was defined at region setup. See the generated S01LCALC member in your INSTALL.JCL data set; this has the original VSAM definition JCL for the file.

You should also monitor the amount of disk space used by the data set, to estimate the optimal file size and optimal frequency of reorganization.

Example

```
//BKALERTH EXEC  PGM=IDCAMS
//SYSPRINT DD  SYSOUT=*
//IN   DD  DSN=?prefix.ALERTH,DISP=SHR
//OUT  DD  DSN=?prefix.ALERTH.BACKUP.SEQ,DISP=OLD
//SYSIN    DD  *
 REPRO  INFILE(IN)   OUTFILE(OUT)
/*
```

An example format for sequential backup files is:

```
DSORG=PS,RECFM=VB,LRECL=32756,BLKSIZE=32760
```

Extract Alert Data for Reporting

You can extract alert data from the Alert History database in a character separated values (CSV) format for processing by external reporting and analysis tools. The default field separator character is comma (,). You can change it in the ALERTHIST parameter group.

To extract alert data for reporting and analysis

1. Allocate a sequential data set with the following attributes:

Attribute	Value
RECFM	VB
LRECL	Greater than or equal to 300 bytes

2. Enter **/ALHIST**.

   The History Menu appears.

3. Type **EX** at the prompt, and specify the data set name that you have allocated in the Extract DSN field.

   (Optional) If you want to limit the data to be extracted, select an Alert Monitor filter (see page 175) through the Filter Name field.

   Press Enter.

   The data is extracted to the specified data set.

4. Transfer the data set to your personal computer (PC) in ASCII format, and save it with an appropriate extension. (For example, if you plan to use Microsoft Excel to process the data, use the .csv extension.)

   The extracted data is saved in a text file.

5. Open the text file by using your preferred PC application.

   The extracted data is presented in your preferred format for analysis.

6. Analyze your data by applying facilities such as graphs and charts, tables, and macros.

Chapter 13: Setting Up the Initialization File

This section contains the following topics:

Generate an Initialization File

If you are deploying multiple regions, each region must be configured for its local environment. When you have configured your first region, you can build an initialization file from that region and then configure it for use with your other regions. This removes the need to customize each region with Customizer.

The tasks outlined below show how to configure a region from an initialization file. The initialization file is produced from a running region for your product.

To generate an initialization file

1. From the Primary Menu, enter **/CUSTOM**.

   The Customizer panel appears.

2. Select option G - Generate INI Procedure.

   The Customizer : Generate INI Procedure panel appears.

3. Enter the data set name and the member name of the file in the Generate INI File Details section.

   Note: The data set must be in the commands concatenation of the RUNSYSIN member for the region in which it is used.

4. Ensure that the member name and data set name are correct. Enter **YES** in the Replace Member? field if you are replacing an existing member.

5. Press F6 (Action).

   The initialization file is generated.

6. Make a note of the data set and member names and press F6 (Confirm).

   The details are saved.

Configure the Initialization File

The initialization file must be configured before it can be used on other systems. You can do this as follows:

- Configure an individual initialization file for each region.
- Configure a common initialization file for multiple regions.

You can use system variables and static system variables with both of these methods. The variables substitute for the initialization parameters in the INI file.

Configure a Common Initialization File

You can customize an initialization file using variables so that it can be used for multiple regions.

To configure a common initialization file

1. Create a data set that is available to every region to be initialized from the common initialization file, for example, PROD.INIFILES.
2. Add the newly created data set to the COMMANDS concatenation of the RUNSYSIN member to every region to be initialized from the common initialization file.

   Note: RUNSYSIN is located in TESTEXEC.
3. Copy the initialization file generated into the new INIFILES data set.
4. Use your TSO editing tool to open the initialization file in edit mode.

5. Replace the relevant generated variables in the initialization file with the following system variables:

   &ZDSNQLCL

   The local VSAM data set qualifier.

   &ZDSNQSHR

   The shared VSAM data set qualifier.

   &ZACBNAME

   The primary VTAM ACB name used by the region.

   &ZDSNQLNV

   The local non-VSAM data set qualifier.

   &ZDSNQSNV

   The shared non-VSAM data set qualifier.

   &ZNMDID

   The domain identifier.

   &ZNMSUP

   The system user prefix.

6. Replace the relevant generated variables in the initialization file with the z/OS static system symbols as follows:

   &SYSCLONE

   The short name for the system.

   &SYSNAME

   The name of the system.

   &SYSPLEX

   The name of the sysplex.

   &SYSR1

   The IPL VOLSER.

7. Save the changes to the initialization file.

Configure Individual Initialization Files

You can customize an initialization file generated from one region so that it can be used for another region.

To configure an individual initialization file for each region

1. Use your TSO editing tool to open the initialization file in edit mode.
2. Substitute the parameters in the initialization file with *one* of the following:
   - Hard-coded data set names for the region in which the file is used
   - System variables

   This enables the initialization file to work in regions with different data sets than the region in which it was generated.
3. Save the changes to the initialization file.
4. Copy the initialization file to the region's TESTEXEC or one of the other libraries in the COMMANDS concatenation.
5. Repeat steps 1 to 4 for each initialization file needed.

Note: The region from which the original initialization file was generated should have the same product sets as the destination regions that will use that initialization file.

Start Your Region from an Initialization File

The name of the initialization file must be specified by the INIFILE parameter in the RUNSYSIN member.

Updating your RUNSYSIN member causes your region to set its initialization parameters from the initialization file. All Customizer parameter settings are overwritten.

To update your RUNSYSIN member

1. Use a text editor to open your RUNSYSIN member.
2. Insert the line PPREF='INIFILE=*membername*' into your RUNSYSIN member.
3. Save the member.

Chapter 14: Administering a Multisystem Environment

This section contains the following topics:

Multisystem Operation

Your product provides focal point management to support multisystem operation, that is, management at a focal point with subordinates and other focal points feeding information to it, as follows:

Focal

Supports full connectivity between multiple regions. Regions linked in this way are known as focal point regions.

When regions are communicating with each other, authorized users can monitor and control all managed resources from any terminal connected to any region.

All focal point regions have the knowledge base synchronized.

Subordinate

Enables you to reduce the amount of traffic in your multisystem environment. You link subordinates to focal point regions that provide central monitoring and control. A subordinate has visibility and control of the resources that belong to the local system image only.

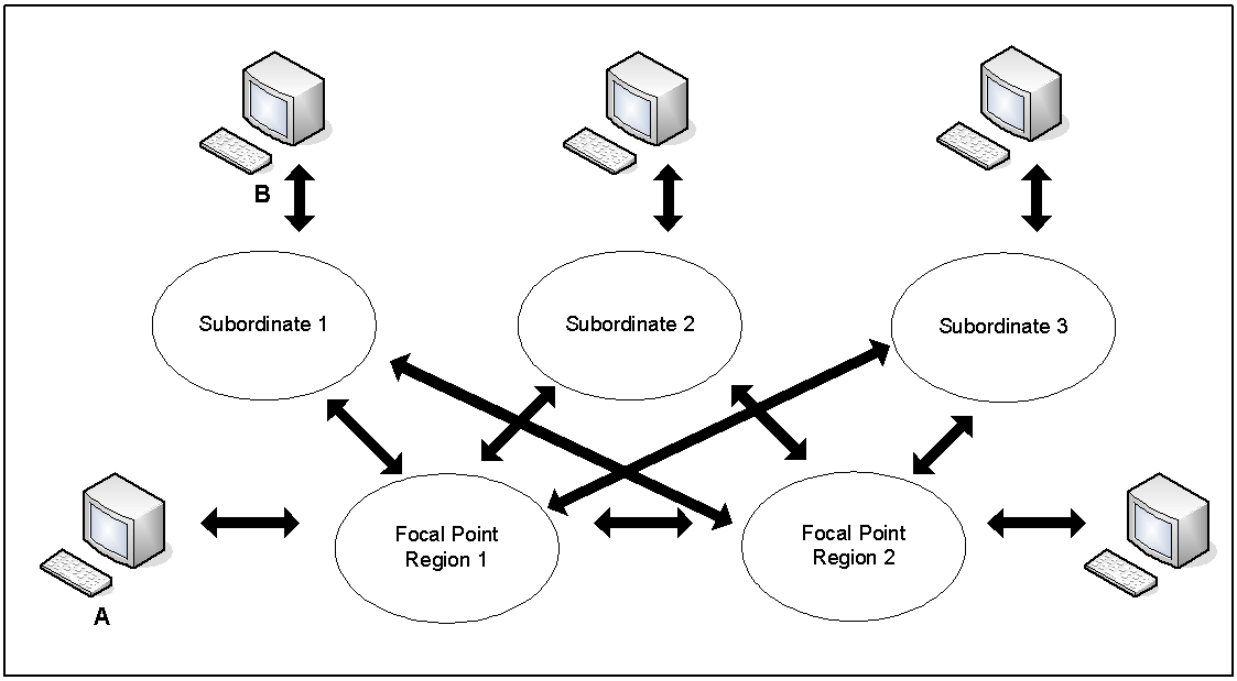
In a multisystem environment, each region runs independently of the other regions. If no communication links are available, each region still provides full monitoring, control, and automation of its own managed resources.

To link a focal point region to another focal point region, or to link a subordinate to a focal point region, you need to link and synchronize the regions.

Notes:

- You can link as focal points only those regions that are configured for the same products. For a subordinate-focal point link, the products configured in the subordinate region can be a subset of the products configured in the focal point region.
- Subordinate regions assume a system image name that cannot be used for any other region in the multisystem environment. We recommend that you use a unique system image name for subordinate regions running on the same LPAR. If you use express setup, the system image name defaults to the SMF ID.

The following diagram shows an example of a multisystem environment. Logging on to Console A allows visibility to all resources. Logging on to Console B allows visibility to the subordinate system image only.



Notes:

- A focal point region links to all other focal point regions and subordinates.
- A subordinate links to focal point regions but does not link to other subordinates.

Links in a Multisystem Environment

The link established between two regions in a multisystem environment is an INMC link. The link is used to pass knowledge base updates, status change notification, and other information between the two regions. The link can use any combination of the following communications protocols: VTAM, TCP/IP, and EPS. VTAM is the default.

For each region, the communication access methods available to it are specified by the MULTISYS Customizer parameter group. If TCP/IP is used, you must also ensure that the SOCKETS parameter group is activated.

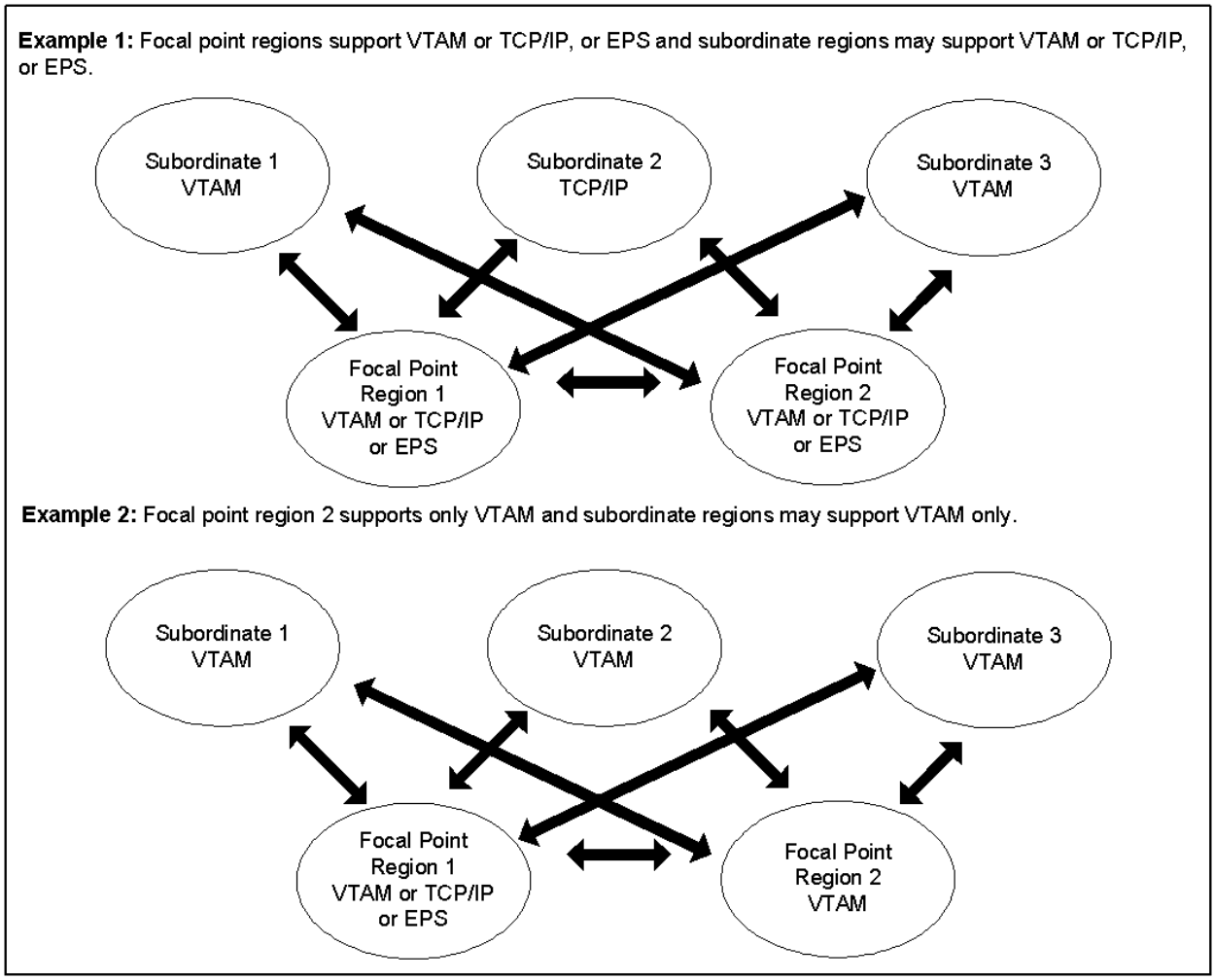
Note: When a region is linked in a multisystem environment, you cannot change the access methods in its MULTISYS parameter group without first unlinking the region.

The INMC link between any two regions uses the access methods enabled by *both* regions (that is, the intersection of the two MULTISYS parameter groups). When multiple access methods are enabled, the link can use all these methods. This improves reliability because the link functions when one of the enabled methods is available.

When you plan your multisystem environment, you must ensure the following:

- All focal point regions must support at least one common type of access method.
- A subordinate region must support an access method that is also supported in all the focal point regions.

This following diagram shows some examples of multisystem link configurations.



Multisystem Support in a Sysplex

With the EPS access method, you can use the sysplex cross-system coupling facility (XCF) to implement your multisystem environment.

Notes:

- To support the EPS access method, a SOLVE SSI region must be active in each of the co-operating systems and must be registered to XCF.
- To register the SSI region to XCF, ensure that XCF=YES is set in the SSI parameters member of the SSIPARM data set. This is the default setting at installation.

Multisystem Implementation Considerations

When you implement your multisystem environment, consider the following:

- Ensure that the link requirements (see page 191) are satisfied for the planned multisystem environment.
- When you link two regions, the knowledge base in one region overwrites the knowledge base in the other region. *You must transmit all system images used by the local region to the target focal point region prior to synchronization.*
- You can only link a region to a focal point region. The focal point region can be a stand-alone region or part of a multisystem environment.
- You can only link a stand-alone region into a multisystem environment.

Establish a Multisystem Environment

When you install your product, two databases are downloaded. These databases, which can be customized to suit your requirements, are:

- An icon panel database, where icon panel definitions are stored for the graphical monitor
- The RAMDB, where system image, resource, availability map, process, macro, command, and other definitions are stored

Together, these databases form the knowledge base.

Populate these databases with definitions specific to your environment. These definitions may include the system image definitions for any other regions that you want to install in your environment in the future.

As you establish regions, link the new regions to the first region by using the Link Region and Synchronize Database (see page 194) option. When databases are linked, future synchronization is automatic. You can make changes to the database in one region and the changes are sent to the databases in the linked regions that have visibility to those resources and system images.

Note: Synchronization does not apply to the NCL procedures represented by the registered commands and macros. Changes to these NCL procedures are not automatically reflected in the linked regions.

In a multisystem environment, you can monitor and control the resources in all linked regions from a single focal point.

Link Regions and Synchronize Databases

When the first region is created in your environment, two databases are downloaded and can be customized for your environment. Together, these two databases (the Automation Services database and the icon panel library) form the knowledge base.

To build a multisystem environment, you start by linking two regions, and then continue to link in any other regions. The linking process also synchronizes the knowledge bases of these regions.

Notes

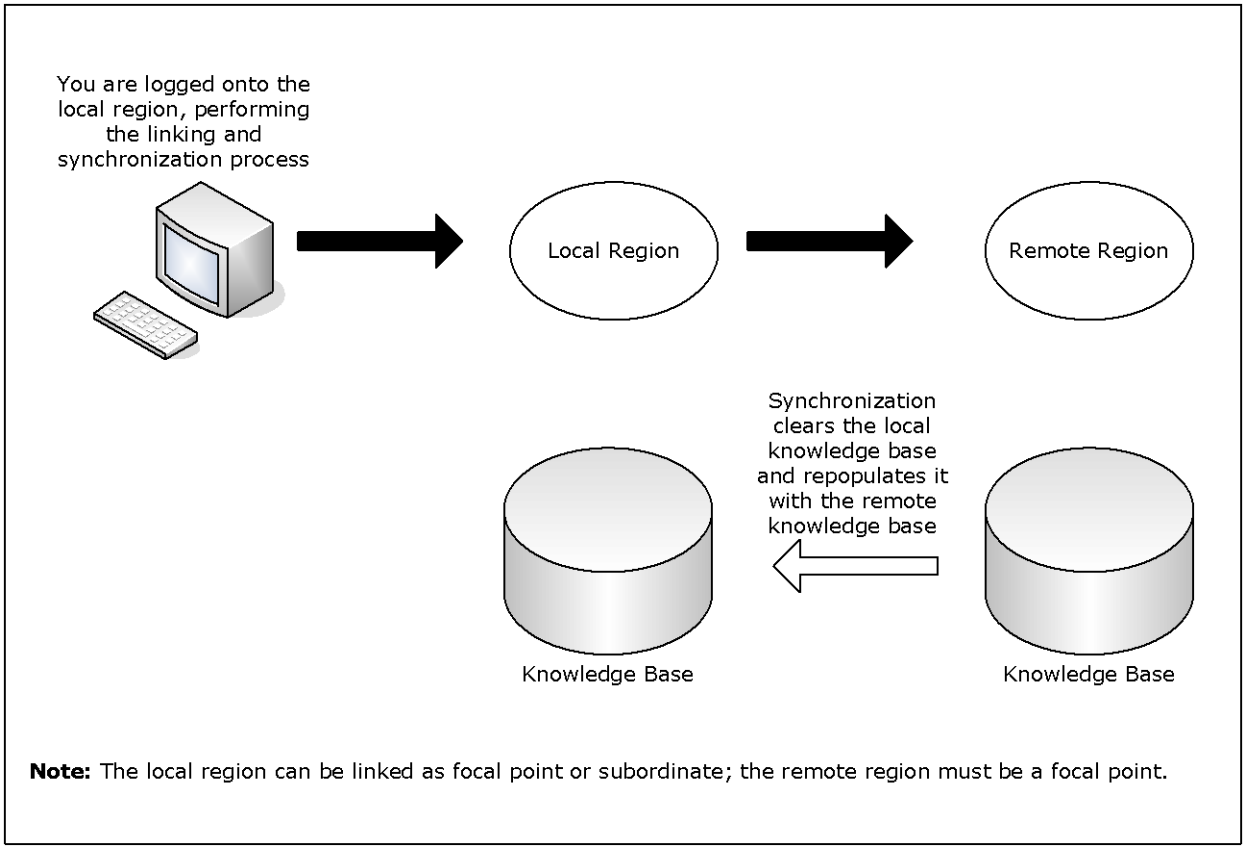
- For linked focal point regions, synchronization is complete and the focal point knowledge bases are identical.
- For linked subordinates, synchronization is complete only to the extent of the relevant definitions in the knowledge base. For example, a subordinate knowledge base does not contain all system images. A subordinate knowledge base contains only those images that represent the environment the subordinate is managing.

When you link two regions, the local region in which you perform the link operation receives the knowledge base from the remote region you want to link to, which must be a focal point region. When you link a region into an existing multisystem environment, that region must be a stand-alone region.

Important! During the linking and synchronization process, the knowledge base in the local region is overwritten by the knowledge base from the remote focal region. If the local knowledge base has been customized and contains definitions that you want to retain in the synchronized knowledge bases, you must transmit these definitions to the remote knowledge base before you link the regions; otherwise, the local knowledge base definitions are overwritten and lost.

Note: If the local region terminates during the linking and synchronization process, the local knowledge base can become corrupted and you may not be able to restart the region. Replace the corrupted knowledge base with your backup, restart the region, and resynchronize the knowledge base. For more information about backups, see the *Reference Guide*.

The following illustration shows the link and synchronization operation.



Note: The local region can be linked as focal point or subordinate; the remote region must be a focal point.

After you link the regions, the knowledge bases are synchronized and remain synchronized. If you change the knowledge base in one region, the changes are propagated to the other regions.

Background User Considerations

When you establish a region, a UAMS background system (BSYS) user ID for that region is automatically defined. The background user ID comprises the four-byte region domain ID, followed by the characters BSYS. To establish fully-functioning communication links between regions, the BSYS user ID of each region must be duplicated in each linked region.

During a link and synchronize procedure, any required BSYS user IDs are defined automatically to UAMS, provided that the following conditions apply:

- You have UAMS maintenance authority on *all* the linked regions.
- The existing multisystem linked regions are active when the request is made.

If either of these conditions does not apply, then any required BSYS user IDs must be defined manually to UAMS. The simplest way to do this is to copy the BSYS user ID for the current region from the UAMS User Definition List and update the user ID. To access the UAMS maintenance functions, enter the **/UAMS** shortcut.

The link and synchronize request is rejected if *both* of the following apply:

- You do not have UAMS maintenance authority in the local or the remote region. (The user ID of the person who requests the link and synchronize procedure must be defined in the local and remote regions.)
- The required BSYS user IDs are not defined in the local or the remote region.

Important! If you use an external security system, you must manually define the BSYS user IDs of the remote systems to your external security system.

Transmit Records

You can transmit (that is, copy) knowledge base records from the local region to a remote region that is not linked to it.

You cannot transmit a system image to a region in which the image is currently loaded.

By specifying the appropriate transmission mode on the Remote System Identification panel, you can specify how to update the records in the remote region.

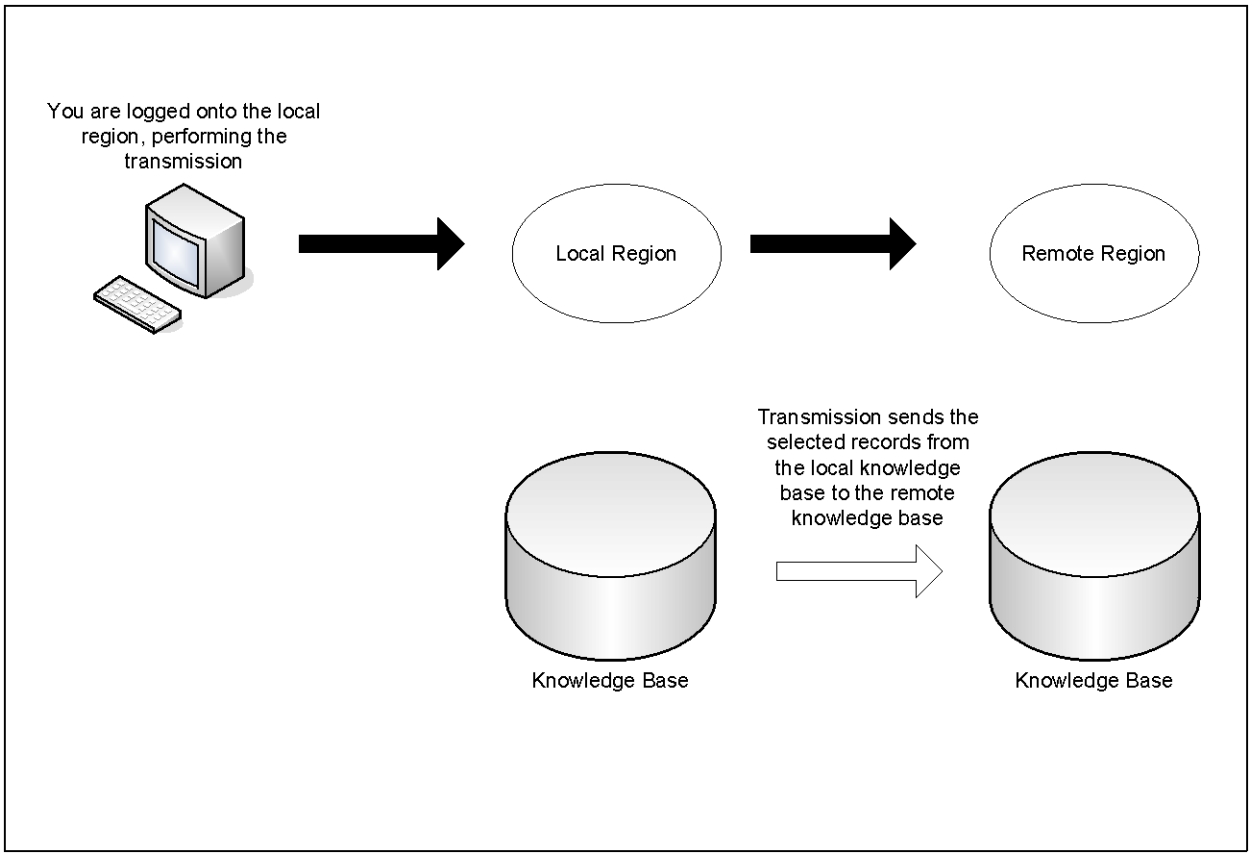
The following transmission modes are available:

- Replace (R) deletes any existing remote records, then transmits the local records.
- Overlay (O) replaces existing remote records with the same name, adds records that do not already exist, but does not delete any records in the remote knowledge base.

Merge (M) adds records that do not already exist, but does not have any affect on existing records in the remote knowledge base.

Transmission Procedure

This diagram shows the transmit operation:



To transmit knowledge base records

1. Log on to the region from which you want to transmit the records.
2. Enter **/MADMIN** at the prompt.

   The Multi-System Support Menu appears.
3. Specify the option you want at the prompt and press Enter.

   A Remote System Identification panel appears.
4. Specify the ACB name (primary name) of the region to which you want to transmit records.

   If you specified the TI option, go to step 5. If you specified any other transmission options, go to Step 6.
5. Complete the System Name and Version fields.

   Note: For information about the fields, press F1 (Help)

6. Do *one* of the following:
   - If you want to replace a set of records or all elements of a component, enter REPLACE in the Transmission Mode field.
   - If you want to update a region by adding new records without updating existing records, enter MERGE in the Transmission Mode field.
   - If you want to update a region by adding new records and updating existing records, enter OVERLAY in the Transmission Mode field.
7. Specify the communication access methods to use for transmitting the selected records. You can enable any combination of the access methods.
8. Press F6 (Action) to select the specified option.

   If a selection list appears, go to step 9. If the Confirm Transmit panel appears, go to step 11.
9. Do *one* of the following:
   - If you selected option TC with a transmission mode of REPLACE, enter **S** beside the categories that you want to transmit.
   - If you selected option TC with a transmission mode of MERGE or OVERLAY, enter **S** beside the categories that you want to transmit. To select specific definitions in a category for transmission, enter **L** (List) beside the category to list the definitions, then enter **S** beside the definitions to transmit.
   - If you selected other transmission options with a transmission mode of MERGE or OVERLAY, press F4 (All) to transmit all definitions or enter **S** beside the definitions that you want to transmit.
10. Press F6 (Transmit).

    A Confirm Transmit panel appears.
11. Press Enter to confirm transmission.

    A status panel appears, showing the progress of the transmission.

    Note: If you choose to exit the status panel, you can check the status of the task by viewing the administration task log. Before you exit, note the task number for future reference.

Link and Synchronize Regions

Important! Do not add, update, or delete knowledge base records in any linked regions while synchronization is in progress. These changes may not be propagated to the new region. Before you perform synchronization, ensure that you back up the knowledge base.

To link and synchronize regions

1. Log on to the region to synchronize with the source (remote) region.

   The source region contains the knowledge base you want.

2. Enter **/MADMIN** at the prompt.

   The Multi-System Support Menu appears.

3. Select option **SD**.

   This establishes a link between the local region and another region, and updates the knowledge base of the current region.

   The Remote System Identification panel appears.

4. Complete the following fields:

   Primary Name

   Specifies the ACB name of the remote focal point region to which you want to link this region.

   Role in Multi-System Operation

   Specifies whether this region is a focal point region or a subordinate region. A focal point region must satisfy the following conditions:

   - The product sets in all focal point regions match.
   - At least one access method must be available.

   Subordinate System Image Name

   (Optional) If you specified subordinate, specify the name of the system image that is to be used by it.

   Important! Each subordinate is assigned a unique system image name, and it can use an image by that system image name only. When you build your environment for a subordinate, you must build the environment under the system image name specified during the linking operation.

   Subordinate regions are restricted to loading only system images with the name specified here. Different system image versions can be maintained under the system image name.

   Work Dataset

   (Optional) Specifies the VSAM data set to use to reduce the time for synchronization.

The following fields specify the communication access methods to be used during synchronization. You can select any combination of the access methods; however, you can only select an access method if it is enabled in the MULTISYS parameter group.

Use VTAM?

(Optional) Specifies whether to use VTAM for communication.

Use EPS?

(Optional) Specifies whether to use EPS for communication.

TCP/IP Host Name/Addr

(Optional) Specifies the TCP/IP host name and address of the remote region.

Port Number

(Optional) Specifies the TCP/IP port number of the remote region.

5. Press F6 (Action) to initiate the linking process.

   A confirmation panel appears.

6. Press F6 (Confirm) to initiate region linking and knowledge base synchronization.

   A status panel appears.

   Note: Press F3 (Exit) to exit the status panel at any time without affecting the link and synchronize procedure. If you exit early, note the task number for later reference.

Monitor the Synchronization Procedure

While the synchronization procedure is in progress, the Synchronize Database Status panel is refreshed automatically every 10 seconds. This panel can be refreshed manually at any time by pressing the Enter key.

To check the status of the synchronization

1. From the Multi-System Support Menu, select option L to view the administration task log.
2. Enter S beside the appropriate entry from the log to view the status of the task.

The administration task log may contain up to 50 entries at any given time. Each task is allocated a sequential task number (between 1 and 50) as it commences. When the maximum task number is reached, allocation restarts from one and the oldest status records are overwritten. To delete a completed or failed task from the log, apply the D (Delete) action.

Knowledge Base Synchronization Maintenance

Automation Services maintains synchronization between linked knowledge bases by using a staging file.

When a knowledge base update occurs, information about the update is stored in the staging file as follows:

- For an update in a focal point region, a separate update record is written for each affected linked region.
- For an update in a subordinate region, a single update record is written for a linked focal point region.

A record stays in the staging file until the update is performed successfully in the destined region. If the region is inactive, the record stays in the staging file until the region is started.

Important! If the staging file becomes full, knowledge base synchronization cannot be maintained and the local region is unlinked automatically. A staging file can become full if a remote linked region remains inactive for an extended period of time. If an extended downtime is planned for a linked region, unlink the remote region before inactivation.

Display Linked Regions

To list the linked regions in your multisystem environment

1. Enter **/LISTREG** at the prompt.

   The Linked Regions panel displays the ACB names, the mode these regions are linked in, and a brief description of the linked regions. It also displays the status of the data flow traffic managers.

   Press F11 (Right) to scroll right to display more information.

Unlink Regions

You may want to unlink a region from the other regions in a multisystem environment (for example, for maintenance purposes). If a region is no longer of use and you want to remove it, ensure that you unlink it first. An unlinked region is a stand-alone region.

To unlink a region

1. Log on to the region you want to unlink and enter **/MADMIN.U** at the prompt.

   The Confirm Unlink Panel appears.

   Note: To cancel the unlinking procedure, press F12 (Cancel) now.

2. Press Enter to proceed with the unlinking procedure.

To relink a region, link that region with one of the regions in the multisystem environment.

Chapter 15: Implementing the NetMaster-to-NetSpy Interface

This section contains the following topics:

Customize the NetMaster-to-NetSpy Interface

If you use CA NetSpy, you can define an interface to it to perform some CA NetSpy functions from your CA NetMaster region.

To customize the interface, update the NETSPYLINKS parameter group in Customizer.

To update the NETSPYLINKS parameter group

1. Enter **/PARMS** at the prompt.

   The Customizer : Parameter Groups list appears.

2. Enter **U** beside the NETSPYLINKS parameter group.

   The NETSPYLINKS - Links to NetSpy Applications panel appears.

3. In the Connections fields, specify the values of the NSYXNAME parameter in the INITPRM member of the CA NetSpy that you want to link to your region.

4. Enter a value in each field that you require.

   For more information about completing this panel, press F1 (Help).

5. Press F6 (Action).

   The changes are actioned.

6. Press F3 (File).

   The changes are saved.

   Note: The Enable NetSpy Alert Processing field in the NETSPYLINKS parameter group lets you switch off the receipt of all alerts from CA NetSpy. Normally, you should leave the field to its default value of YES; however, you may want to enter **NO** to switch the alerts off under abnormal conditions (for example, when the region is flooded by these alerts).

Manage NetMaster-to-NetSpy Connections

Your region provides a control for the NetMaster-to-NetSpy interface. From this interface you can do the following:

- Activate and inactivate connections to CA NetSpy.

  Note: These connections are defined in the NETSPYLINKS parameter group.

- Use the console command interface to modify control parameters for CA NetSpy.
- Stop the interface to CA NetSpy.

To control connections to CA NetSpy

1. Enter **/NASCON** at the prompt.

   The NetSpy Connections panel appears. This panel displays the status of defined links to CA NetSpy.

```
PROD  ----------------------- NetSpy Connections -------------------------------
 Command ===>                                                 Scroll ===> CSR

                                        A=Activate I=Inactivate P=Stop F=Modify
    Link Name    ACB Name Status     System   Ver  STC      ITVL
    $ESLA31IVS40 -        FAILED     -        -    N/A         0
    $ESLCSNM21NX -        FAILED     -        -    N/A         0
    $ESLCSNM22NX CSNM22NS RUNNING    XE61     11.0 N/A        60
    $ESLQANM1NX  -        FAILED     -        -    N/A         0
    **END**
```

   Note: For more information about the information displayed and actions available on this panel, press F1 (Help).

Manage CA NetSpy Alerts and Monitors

Your region can receive alerts from CA NetSpy. CA NetMaster alerts are generated for each alert generated by CA NetSpy that is received. The following types of alerts are generated:

Alerts from EPS Services

For general Alert Monitors defined through CA NetSpy.

Alerts from the NetMaster-to-NetSpy interface

For user Alert Monitors defined through CA NetMaster.

Manage NetSpy User Alert Monitors in CA NetMaster

To manage CA NetSpy user Alert Monitors

1. Enter **/NASMON** at the prompt.

   The NetSpy Monitors List appears. This panel lists the CA NetSpy user Alert Monitors defined for a resource.

   Note: For more information about the information displayed and actions available on this panel, press F1 (Help).

Define CA NetSpy User Alert Monitors

Authorized users can define, delete, and update CA NetSpy user Alert Monitors for a particular resource.

To define a CA NetSpy user Alert Monitor

1. Enter **/NASMON** at the prompt.

   The NetSpy Monitors List appears.

   Note: For more information about these monitors, press F1 (Help)

2. Press F4 (Add).

   The NetSpy : Monitor Definition panel appears.

3. Complete the fields on this panel and press F3 (File).

   The definition is saved.

Issue CA NetSpy Commands

Your region supports a CA NetSpy command interface. This interface allows a subset of display commands to return information to your region.

To issue a command

1. Enter **/NASCMD** at the prompt.

   The NetSpy Commands panel appears. This panel lists the CA NetSpy commands that you can issue.

2. Enter **S** next to the command.

   The NetSpy : Command Arguments panel appears.

3. Enter values in the fields for any operands that you want to use.

4. Press F6 (Action).

   The command output appears.

   Note: You can also issue a command, together with any operands, by entering it directly at the command prompt on the NetSpy Commands panel. If you enter a command without any operands, it is issued with its default operands.

Chapter 16: Implementing Print Services

This section contains the following topics:

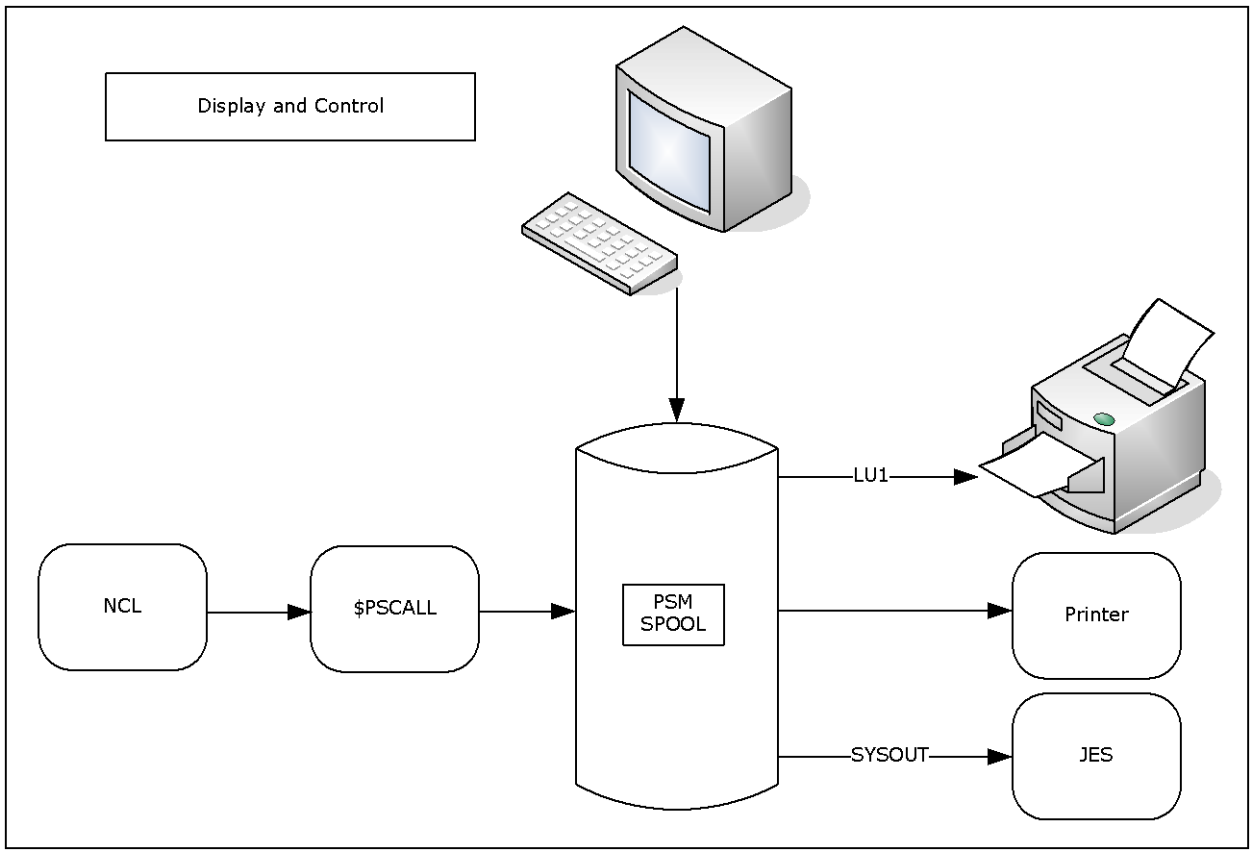
Print Services Manager

Print Services Manager (PSM) allows you to specify the format of a print request and on which printer it is printed. Print requests can be viewed online before or after printing and can be redirected to files rather than printers.

PSM provides the following features, which can be customized to suit your requirements:

- Printer definition facilities
- Form definition maintenance
- Setup definition maintenance
- Default printer assignment maintenance
- Alias printer name definitions
- Banner page customization on output
- Spooled print request browsing, retention, and redirection to a different printer
- Integration with NCL-based components

The following illustration shows the different ways that PSM can be used to control printing requirements.



Access PSM

The customizable functions of PSM are accessed from the PSM : Primary Menu.

To access PSM, enter **/PSM** at the prompt.

Note: You can also access PSM directly by invoking the $PSCALL NCL procedure from OCS or an installation written NCL procedure. The PSM NCL interface is described in the *Network Control Language Reference Guide*.

Add a Printer Definition

A printer definition defines where, how, and on what paper output is printed. A printer definition is required for each printer at which output is printed.

To add a printer definition

1. Enter **/PSMPRTR** at the prompt.

   The PSM : Printer Definition List appears.

2. Press F4 (Add).

   The PSM : Printer Definition panel appears.

3. Complete the fields, as required.

   Note: For information about the fields, press F1 (Help).

4. Press F3 (File).

   The definition is saved.

List Printer Definitions

You can display a list of all the printer definitions defined for your region. This lets you browse and perform maintenance on the listed definitions.

To list all printer definitions, enter **/PSMPRTR** at the prompt.

Add a Form Definition

A form definition is required for each type of paper on which output is printed. The Form Definition Menu is used to set up and administer these form definitions.

To add a form definition

1. Enter **/PSMFORM** at the prompt.

   The PSM : Form Definition List appears.

2. Press F4 (Add).

   The PSM : Form Definition panel appears.

3. Complete the fields and press F3 (File).

   The form definition is saved.

   Note: For information about the fields, press F1 (Help).

List Form Definitions

You can list all of the form definitions defined for your region and then browse and perform maintenance on them.

To list all form definitions, enter **/PSMFORM** at the prompt.

Add Control Characters

Control characters are sent to a printer before or after (or both) the output is printed. They are defined in setup definitions.

To add control characters

1. Enter **/PSMSET** at the prompt.

   The PSM : Setup Definition List appears.

2. Press F4 (Add).

   The PSM : Setup Definition panel appears. To access the second panel of the setup definition, press F8 (Forward).

   Complete the fields, as required.

   Note: For information about the fields, press F1 (Help).

3. Press F3 (File).

   The setup definition is saved.

List Control Characters

You can display a list of all the setup definitions defined for your region. This list lets you browse and perform maintenance on the listed definitions.

To list control characters, enter **/PSMSET** at the prompt.

Add a Default Printer for a User ID

Each user ID in your region can be assigned a default printer. Default printer assignments let you define the printer to which output is sent whenever a user ID does not specify a printer.

To add a default printer for a user ID

1. Enter **/PSMDFTP** at the prompt.

   The PSM : Default Printer Assignment List appears.

2. Press F4 (Add).

   The PSM : Default Printer Assignment panel appears.

3. Complete the following fields:

   User ID

   Specifies the User ID of the user to whom the printer is assigned a default.

   Printer Name

   Specifies the name of the printer to which this user's printing is sent.

   Press F3 (File).

   The default printer assignment is saved.

List Default Printers

You can display a list of all the default printer assignments defined for each user ID. This list lets you browse and perform maintenance on the listed definitions.

To list default printers, enter **/PSMDFTP** at the prompt.

Clear the Printer Spool

Print requests are retained on the print spool if an error occurs during printing or if HELD is specified on the PSM : Print Request panel. The PSM clear spool panel is used to clear print requests from the print queue.

Note: This function is available to authorized users only.

To clear the print spool

1. Enter **/PSMADMN** at the prompt.

   The PSM : Administration Menu appears.

2. Enter **CS** at the prompt.

   The PSM : Clear Spool panel appears.

3. Complete the following field:

   Date

   Specifies that all print requests added to the spool before or on this date are deleted.

   Press F6 (Action).

   The print requests are deleted.

Send Print Requests to a Data Set

Two printer exit procedures are distributed with your product. Each writes the output for a print request to a data set. The procedure $PSDS81X can be customized to specific site requirements. The procedure $PSDS81Z offers the same functionality with improved performance, but cannot be customized. The target data sets for both procedures can be sequential or partitioned.

Parameters that control the operation of the exit are defined in the Exit Data portion of the printer definition. Procedures that pass data to PSM for printing have the ability to override the exit data specified in the PSM printer definition.

The procedures use the parameters contained in the exit data to do the following:

- Determine the target data set
- Determine how to process a data line with a skip amount of zero
- Set the length of the lines print

How the Procedures Process a Print Request

The procedures read each line of print data and write it directly to the nominated data set. Each print line is analyzed according to skip control before processing. This continues until all lines of data for the print request have been received from PSM and written to the nominated data set.

$PSDS81X and $PSDS81Z Parameters

The $PSDS81X and $PSDS81Z parameters, which are coded as keyword parameters, are as follows:

```
  DSN=datasetname
[ DISP={ SHR | OLD | NEW | MOD } ]
[ LRECL={ n | 80 } ]
[ SKIP0={ NEWLINE | DISCARD | DESTRUCTIVE |
          NONDESTRUCTIVE } ]
[ CYL= pri [,sec] [,dir] ]
[ TRK= { pri [,sec ] [,dir] | 15,5 } ]
[ BLKSZ = n ]
[ STORC= storclas ]
[ MGMTC= mgmtclas ]
[ DATAC= dataclas ]
[ VOL= volser ]
[ UNIT= { unit | SYSALLDA} ]
[ RECFM= { F | FB | V | VB } ]
```

DSN=*datasetname*

Specifies the target data set name. If the data set is partitioned, the member name must be included or the data set is corrupted.

You can use the following symbolics in the *datasetname* parameter:

- &USERID—Requesting user ID
- &DAY—Day of week (such as MON)
- &YYYY—Year
- &YY—Year
- &MM—Month
- &MON—Month (such as JAN,FEB)
- &DD—Day
- &HHMMSS—Time
- &HH—Hour
- &MIN—Minute
- &SYSID—System ID
- &SYSNAME—System name
- &JOBNAME—Job name
- &JOBID—Job ID
- &NMID—Region ID
- &NMDID—Region domain ID (DID)
- &GRPNAME—Sysplex name

Symbolics are delimited by a period (.) or another symbolic (that is, &YY&MM. is the same as &YY.&MM.). Symbolics are also allowed in a member name.

For example,

```
DSN=NM.&SYSID..&USERID..D&YY&MM&DD..T&HHMMSS..DATA
```

is converted to

```
DSN=NM.SYSA.MYUSER.D040915.T144505.DATA
```

DISP={ SHR | OLD | NEW | MOD }

Specifies the disposition of the output data set.

- SHR specifies shared use of the data set.
- OLD specifies exclusive use of the data set.
- NEW allocates a new data set.
- MOD appends the output in the file.

Default: SHR.

LRECL={ *n* | 80 }

Specifies the output record length.

Limits: 1 to 250

Default: 80.

SKIP0={ NEWLINE | DISCARD | DESTRUCTIVE | NONDESTRUCTIVE }

Specifies how to process a data line with a skip amount of zero.

- NEWLINE creates a new line of data.
- DISCARD discards the line of data.
- DESTRUCTIVE causes the data to replace the existing data line.
- NONDESTRUCTIVE overlays the data on the existing data line, but only where blanks were present on the existing data line. No existing non-blank characters are modified.

Note: The PSM print options NEWPAGE and USCORE are ignored by the procedures

Default: NEWLINE.

The following additional parameters are applicable when DISP=NEW is specified:

CYL=*pri,sec,dir*

Primary and secondary space allocation values are in cylinders. If a partitioned data set is used, specifies the number of directory blocks.

TRK=*pri,sec,dir*

Primary and secondary space allocation values are in tracks. Number of directory blocks if partitioned data set.

Default: TRK=15,5.

BLKSZ=*blocksize*

Specifies the block size.

STORC=*storclas*

Specifies the storage class.

MGMTC=*mgmtclas*

Specifies the management class.

DATAC=*dataclas*

Specifies the data class.

VOL=*volser*

Specifies the volume serial number.

UNIT= { *unit* | SYSALLDA }

Specifies the unit.

Default: SYSALLDA if volser is specified.

RECFM= { F | *FB* | V | VB }

Record format.

Default: FB.

Example: Printer Exit Definition

This example directs the output for a PSM print request, assigned to the printer named DSEXIT, to the member TEST1 in the data set PROD.PSM.DATA. The record length of this data set is 80. Overlay lines in the data are removed.

Printer Name:	DSEXIT
Type:	EXIT
Description:	Print to a data set
Lower Case:	YES
Line Limit:	0
Form Name:	FORM0
Exit Name:	$PSDS81Z
Exit Data:	DSN=PROD.PSM.DATA(TEST1) LRECL=80 SKIP0=DISCARD

Note: Previous references to parameters WKVOL, CYL, and LIST in the Exit data are no longer required. You must remove them from the printer definition prior to using $PSDS81Z or $PSDS81X, or the print request fails.

Print-to-Email

The $PSEMAIL printer definition lets you email the output of a printing request, which can be either as an attachment or in the body of the email. When the output is sent as an attachment, the email uses the PS8803 message as its body and the PS8804 message as its salutation:

```
Data attached for email_subject

Yours,
user_name
```

user_name

Displays the sender name defined in UAMS.

You can maintain these messages from the Message Definition List panel. The shortcut to the panel is /CASMSG.

Note: For information about how to maintain messages, see the *Managed Object Development Services Programmer and Administrator Guide*.

Appendix A: Security Exit Support Requirements

This section contains the following topics:

Structured Field Descriptions

The following table lists the structured fields, the supported CA NetMaster NM for SNA component, and a brief description of the support.

Structured Field	Component	Function
X'0022'	-	Defines Network Management access.
X'0026'	NEWS	Defines NEWS access privilege.
X'0150'	NEWS	Defines NEWS reset privilege.
X'0151'	NTS	Defines NTS access privilege.
X'002D'	NCS	Defines NCS access privilege.
X'0090'	NCPView	Defines NCPView access privilege.

Note: Network Management access is a prerequisite for all other access privileges.

If you have installed a full security exit to replace the UAMS security component, then your exit must provide all processing associated with the retrieval and verification of user ID information normally performed by UAMS.

Note: For more information about the structure and method of operation of an installation-supplied full security exit, see the *Security Guide*.

Appendix B: Understanding the CNM Interface

This section contains the following topics:

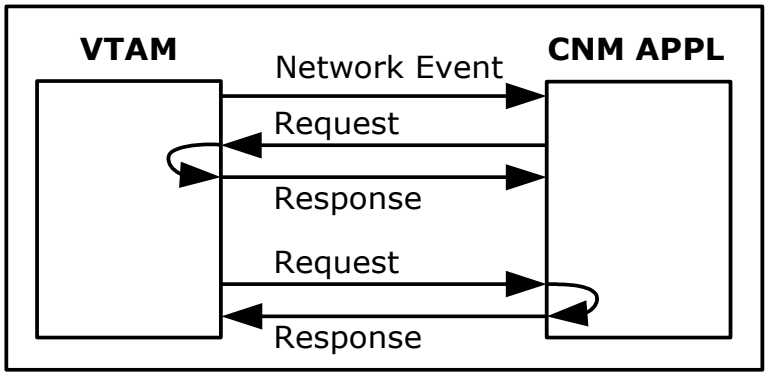
CNM Interface

The CNM interface provides a means by which a suitably authorized VTAM application program (referred to here as the CNM application) can maintain a session with the System Services Control Point (SSCP) of the VTAM under which the application is executing. A session is established when the application successfully opens its VTAM ACB, enabling it to exchange data with the SSCP.

The CNM application can receive data from an SSCP in one of the following forms:

- Unsolicited, as a result of some network event
- Solicited, as a reply to a previous request for data issued by the CNM application
- A solicitation, requesting that the CNM application send some reply data in response

The following illustration shows how a CNM interface lets a CNM application maintain a session with the VTAM SSCP.



The CNM application can send data to the SSCP for the following reasons:

- To solicit reply data from a network resource
- As a reply to a solicitation from the SSCP

Network Services Request Units (NS RUs)

There following types of NS RUs can be received or sent by an application that is using the CNM interface:

Deliver RUs

Delivers data to the CNM application, for example, Record Formatted Maintenance Statistics (RECFMS) and Record Maintenance Statistics (RECMS) RUs.

Forward RUs

Sent by the CNM application to request data delivery, for example, Request Maintenance Statistics (REQMS) RUs.

Network Management Vector Transport (NMVT) RUs

Performs delivery and request functions

If an NS RU is solicited, then reply data is always returned to the soliciting application. If the NS RU is unsolicited, then delivery is influenced by the contents of the VTAM CNM Routing Table. Other factors, such as the functional capabilities of the SSCP and the CNM application, also have a bearing on the nature of data exchanged across the CNM interface.

CNM Data from Network Resources

When a CNM application requires an SSCP to perform a particular service, it sends a Forward RU to the SSCP with which the destination network resource is associated. Among other data, this RU contains the node name of the network resource to which the request applies.

Embedded in the Forward RU is the NS RU describing the service required. The following are the most common forms of embedded RUs:

- Request Maintenance Statistics (REQMS) RUs
- Network Management Vector Transport (NMVT) RUs

If a REQMS or NMVT is destined for a resource in the network, then the SSCP forwards the NS RU to the destination resource across an SSCP-PU session.

One or more NS RUs can be sent in reply by the network resource. These flow back to the originating SSCP, which in turn presents them, embedded in a Deliver RU, to the soliciting CNM application.

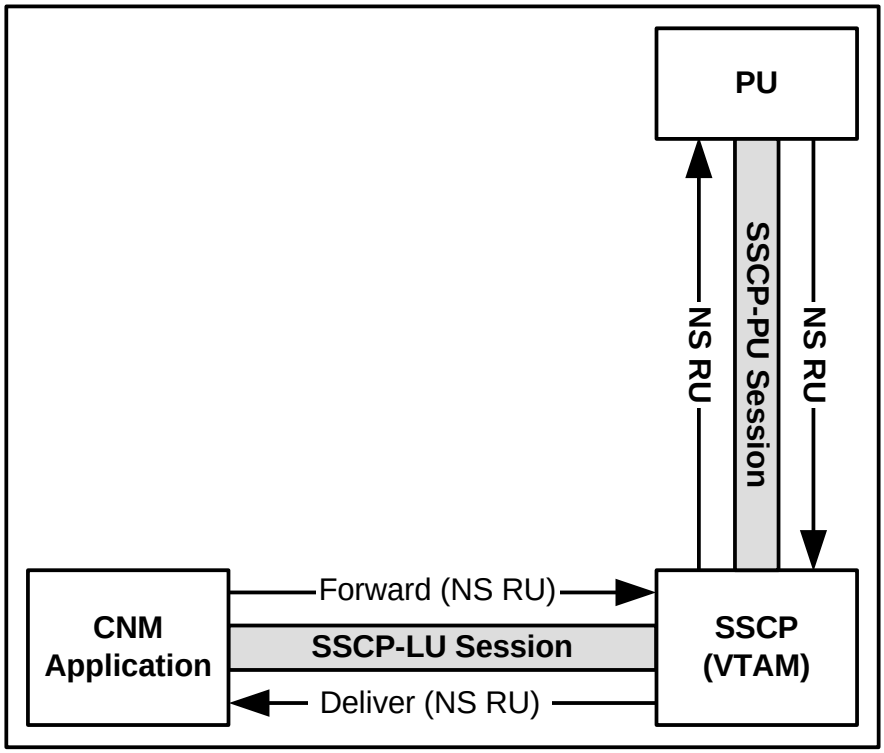
Deliver Request Units

When an SSCP has some data to send to a CNM application on behalf of a network resource, it sends a Deliver RU to that application. The Deliver RU contains the name of the network resource to which the data applies and a resource hierarchy list.

Embedded in this RU is an NS RU, which describes the type of data being made available. The most common forms of RUs are the following:

- Record Formatted Maintenance Statistics (RECFMS) RUs
- Record Maintenance Statistics (RECMS) RUs
- Network Management Vector Transport (NMVT) RUs

The following illustration shows the flow of the sessions used by Network Services RUs.



Network Services RUs are used to carry management data for an SSCP-PU session between network PUs and VTAM. The CNM application communicates with VTAM using SSCP-LU sessions, receiving NS RUs embedded in Delivery RUs, and issuing NS RU requests for data embedded in Forward RUs.

NMVT NS Request Units

The Network Management Vector Transport RU provides a more general structure for carrying requests and replies. It consists of one or more SNA MS major vectors that describe the type of network data contained in the request unit, each of which includes one or more Management Services sub-vectors.

An NMVT RU can be issued by the CNM application as a request for data.

Alternatively, an NMVT RU can be sent to the CNM application under the following circumstances:

Unsolicited

Certain devices generate unsolicited records in response to the occurrence of a local event. For example, some operator alerts are produced in the form of an NMVT RU.

Solicited

A reply to an NMVT RU can be sent in response to a request NMVT RU issued by the host application.

Generic and non-generic (Basic) NMVT alerts can also be sent by a device in the network to report an error or failure. The alert record contains data explaining the type of error or failure, the likely causes of the error or failure, and action that can be taken to remedy the situation.

Host CNM support for the 3x74 uses NMVT RUs to request Response Time Monitor data. An NMVT RU carrying RTM data may be sent by the 3x74 as an unsolicited record following a controller-detected event or as a reply to a solicitation request.

The following is the format of a Generic Alert NMVT:

Content	Length
CNM Header	8 bytes
NS-RU	8 bytes
Generic Alert Major Vector Subvectors	Varying Varying
Hierarchy information	Varying

REQMS NS Request Units

The REQMS NS RU (embedded in a Forward RU) enables a CNM application to solicit data from a network resource. Six types of data that can be solicited are defined, although not all devices support all data types. Some devices support non-standard types and formats; therefore NEWS lets any format be transmitted.

REQMS can be sent to a resource that is owned by (that is, is in the domain of) the SSCP of the VTAM under which the CNM application is running only, unless ISR is operating.

Defined REQMS Data Types

The following are the defined REQMS data types:

REQMS Type 1

Solicits link test statistics from a Physical Unit (PU). PUs that support this function maintain details of the number of link test frames (from a VTAM Link-Level 2 test) received and the number responded to.

REQMS Type 2

Solicits summary counters from a PU. PUs that support this function maintain three categories of error counters: internal hardware errors, communications adapter errors, and negative responses.

REQMS Type 3

Solicits communications adapter errors from a PU. PUs that support this function maintain various categories of communications adapter error counters.

REQMS Type 4

Solicits PU/LU-dependent data from those PUs that support this type. The type of data sent varies according to the device type involved. For instance, REQMS type 4 RUs are sent to 3600/4700 subsystems to access the system monitor functions of that device type.

REQMS Type 5

Solicits EC-level data. PUs that support this function return data such as their microcode EC level, or part numbers installed. The reply format varies depending on the device type.

REQMS Type 6

Solicits link connection subsystem data. Used in conjunction with some modem types to retrieve link-related data.

RECFMS NS Request Units

The RECFMS RU is sent to a CNM application by an SSCP under the following circumstances:

- As a reply to a previous REQMS request from the SSCP: when a network resource receives a REQMS, it formats a RECFMS in reply, and VTAM forwards it to the CNM application.
- As an unsolicited record: certain network resources can generate unsolicited RECFMS records under some circumstances.

Network resources always deliver RECFMS RUs to the SSCP that owns them (that is, the SSCP for the local domain).

Defined RECFMS Data Types

The types of RECFMS RUs are categorized in the same way as REQMS RUs. This means that a type 1 REQMS receives a type 1 RECFMS in reply (and so on), and that certain devices may generate a RECFMS of one of the types without being requested to do so. For instance, the 3600/4700 subsystem can generate RECFMS type 4 records to inform the host of a variety of conditions.

One additional RECFMS type exists, known as type 0. Because there is no matching REQMS type 0, the RECFMS type 0 is always unsolicited, and is classified as an alert message. Its content is not explicitly defined, so the exact data sent is device-dependent.

RECMS NS Request Units

NCPs in a network generate RECMS RUs under a variety of conditions, and there are a large number of RECMS types. Some of these types are described in the following examples:

Statistical

Each time certain counters for a particular node in the NCP reach a set threshold (that is, wrap), the NCP generates a statistical RECMS record, containing such data as traffic counts and temporary error counts. The frequency at which the counters wrap can be adjusted using NCP generation. The records are also forwarded whenever a node or the NCP itself is varied inactive (that is, the device is inoperative as far as the SSCP is concerned).

Error notification

A variety of error conditions cause the generation of RECMS records. These include permanent link and device failures, and temporary errors. The RECMS records provide an indication of the most likely cause of the error by including a snapshot of various NCP control blocks.

Software failure

Records can be generated as a result of NCP software failures or abends.

Hardware failure

Records can be generated as a result of communications controller hardware errors.

NCP delivers RECMS RUs to the SSCPs that own the resource to which they refer (that is, they are in the local domain of the SSCP).

SSCP-Related CNM Requests

All the NS RUs discussed previously are concerned with the transportation of network management requests between the host CNM application and network devices. As described, these requests are transported in *one* of the following ways:

- Embedded in a forward RU and passed to the SSCP for onward propagation to a network device
- Embedded in a deliver RU on arrival from a network device for delivery to the CNM application

Another class of requests also make use of the CNM interface. These requests contain data relating to the services of the SSCP directly and do not involve the redirection of RUs to other network devices. Such SSCP-related requests are sourced from the SSCP and delivered to the CNM application, or from the CNM application for delivery to the SSCP. In either case, since no further propagation of the request is necessary, these requests are not embedded in a deliver RU (if sourced from the SSCP) or a forward RU (if sourced from the CNM application).

Some important SSCP-related CNM requests are described in the following sections.

Translate Inquiry and Reply Request Units

NEWS supports the unembedded *Translate-Inquiry* and *Translate-Reply* RUs. These request units are used for alias name translation by certain levels of VTAM.

The Translate-Inquiry RU (see page 141) is sent to NEWS from the SSCP and solicits a Translate-Reply RU in response.

CNM-RU

The CNM-RU is a control request unit used by the Network Tracking System (NTS) feature. It is also passed unembedded across the CNM interface and is ignored by NEWS.

How Records Are Processed

This section describes how the processing requirements of the record are determined using the Network Services Control File (NSCNTL) and how the requirements are met by the execution of the nominated NCL procedures.

Record Type Recognition

Each record received by NEWS using the CNM interface is an RECMS record, an RECFMS record, or an NMVT record. The record type is further qualified as follows:

- For NMVT records, the MS major vector type
- For RECMS records, the recording mode
- For RECFMS records, the record type

Alerts received by NEWS from the APPN network arrive as SNA MSUs containing one or more major vectors. MSUs are processed as if they are NMVTs, which also contain major vectors.

Processing Code Assignment

CNMPROC extracts the resource identifier from the record and uses the NSCNTL to identify the device from which the record was sourced. On this basis, the NSCNTL assigns two codes to the record to identify its processing requirements:

- A Resource ID (RID), used to group similar resource types
- An Event ID (EID), used to qualify later record processing

NMVT Records and MDS-MUs

NMVT records (and MSUs) normally contain a Product Set ID (PSID) sub-vector field that contains the hardware or software common name or machine type of the resource that sent the record. The PSID is used to obtain, from Category 001 (Product-Set Identification) of the NSCNTL table, a description of the resource and the associated RID and EID to assign to the record.

If no matching PSID exists in the NSCNTL table, the RID and EID are set to UNKNOWN.

RECFMS Records

RECFMS records contain a block number field that identifies the type of resource that sent the CNM record. The block number is used to obtain from Category 002 (Block Number Identification) of the NSCNTL table a description of the resource, and the associated RID and EID to assign to the record. If no matching block number exists in the NSCNTL table, the RID and EID are set to UNKNOWN.

Processing Path Selection

After the RID and EID have been selected, NEWS uses the NSCNTL to select a processing path for the record. This processing path describes the arrival and display processing requirements for the record, and is represented by a single control code called the PID. The PID is dependent on the following:

- RU type
- RID
- Record type (NMVT major vector type, RECMS recording mode, or RECFMS record type)

The PID is retrieved from Category 003—Record to PID Conversion—of the NSCNTL by CNMPROC. The PIDs (Category 004) then define the processing path for the records. This selection process allows common processing paths for different types of records. The selection process lets a PID be assigned to any record type from any device.

RECMS Records

RECMS records have no resource identifier specified; therefore, these codes cannot be assigned. Instead, RECMS records are assigned an Event ID during PID selection, as described in the next section.

Process Path Definitions

Process path definitions detail the processing requirements for the record. Included are the names of several NCL procedures that are used to perform NEWS record arrival processing functions. The procedures are classified into the following groups:

- NEWS record arrival processing procedures, which are responsible for interpreting the contents of the record during processing by CNMPROC
- User intercept procedures, which provide further processing during processing by CNMPROC
- Display procedures which provide display formatting and presentation services. These procedures are executed to format and display data retrieved from the record.

These procedures are all optional. Where a procedure has been nominated and is enabled, it is executed by NEWS during record arrival processing.

How Processing Solicited CNM Records Works

Solicited records can be processed by any NCL procedure. The process works as follows:

1. Data is solicited from devices in the network by using the &CNMSEND verb.
2. The replies to these solicitation requests are retrieved using the &CNMREAD verb.
3. The READ= operand on the &CNMSEND verb is checked to determine whether the reply is processed by CNMPROC, the soliciting procedure, or both.
4. If the reply is to be processed by the soliciting procedure, the $NWDSPLY procedure is usually executed. This procedure does the following:
   - Performs NEWS record arrival processing to determine the PID for the record
   - Invokes display processing procedures nominated in the PID description to display the results
5. If any logging is required, the reply is directed to CNMPROC because the $NWDSPLY procedure does not perform any SMF or NEWS database logging functions.

How Unsolicited CNM Record Processing Works

All unsolicited CNM records received by NEWS are directed to CNMPROC for processing. CNMPROC does the following processing:

1. Determines the processing requirements for the record
2. Executes the procedures defined in the processing path for the record
3. Performs SMF and NEWS database logging, if required

References

The formats of individual records and RUs, and more information about the CNM interface appear in a number of IBM manuals, including the following:

- Communications Server manuals
- NCP/EP manuals
- SNA Architecture manuals

Various product-related manuals may also contain information about record formats that are peculiar to their device types.

Appendix C: Understanding the Session Awareness Interface

This section contains the following topics:

NTS Classes

In a given network, different session types need different types and amounts of data collected by NTS. It is also useful to map this data onto the underlying resource hierarchy.

These objectives are achieved through use of the following types of NTS classes:

- SAW classes
- RTM classes
- Session classes
- Resource classes

When NTS receives a session start notification from VTAM, it determines, from the NTS class definitions, which options are to apply to the session. NTS extracts and stores these options, with other information about the session, for use in subsequent processing. This means that all NTS class definitions should be in place before collection of SAW data is started. Defining classes when SAW processing is active does not affect existing sessions, only new ones.

By default, if no classes are defined to NTS, SAW data only is collected for *all* sessions. Trace data can also be collected by operator request, but no accounting, RTM, or resource statistics data are collected.

SAW Classes

Each SAW class defined to NTS describes a set of processing options for all SAW information, including whether such information is required.

By default, NTS keeps in storage information concerning every session that is currently active. However, if this is not necessary or is impracticable due to storage restrictions, you must have a SAW class definition with the KEEP=NO option (using the DEFCLASS or REPCLASS command) to prevent NTS from collecting any data for sessions in that class. In this case, no other SAW class options are meaningful; therefore, only one such SAW class definition should be necessary because many session classes can nominate to use the same SAW class definition.

SAW class definitions specify the conditions under which all or any session data is logged to the NTS database at session end. For example, you may want to log session data if an error occurs that terminates the session, or perhaps whenever the operator collects trace data. Various SAW class options exist that cater for these and other requirements.

You can set the initial and final trace queue depths with the SAW class definition. This allows differing amounts of trace data be kept for different sessions.

You can also use SAW classes to determine whether accounting information should be collected when NTS selective accounting is requested (that is, SYSPARMS NTSACCT=SELECTIVE is specified or defaulted).

RTM Classes

NTS lets you collect RTM data for particular sessions. For NTS to collect RTM information from network control units, you must define one or more RTM classes. In addition, it is necessary for the control units (which may be 3274s, 3174s or compatible devices) to have the required RTM hardware or microcode level support for the collection of RTM data and host-modifiable RTM definition configured.

Each RTM class specifies a set of up to four boundary values to use for the collection of RTM data. These boundary values are ascending times in the range 0.1 seconds to 30 minutes. For sessions using the RTM class, these boundary values are set in the control unit for the duration of the session to capture the RTM data.

In addition, for each RTM class an *objective response time* and an *objective percentage* value are defined. These values can be used to represent a level of service so that you can compare the measured service level with that specified in a service agreement. You can also define *RTM definitions*, which are the response criteria that indicate what RTM data is kept.

The objective values are used in performance monitoring for network response times and can lead to attention message creation.

The objective response time must correspond to one of the boundary values allocated for the objective percentage comparison to be accurate. We recommend that the second or third boundary contain the objective value. This lets you observe how the responses are distributed and decide whether to revise the objective value upward or downward.

Note: For an understanding of RTM data collection in the network control units, or their attached distributed function devices, see the relevant component description guides.

Session Classes

Session class definitions provide a dual function. They provide the session selection criteria that determine to which session class each session belongs, and they also provide the SAW and RTM class names from which the sessions falling in each session class should take their SAW and RTM class values. Hence, unless each SAW and RTM class defined is nominated by at least one session class definition, their attributes are never used by NTS.

Session partner names are available as session selection attributes, and the definition for the class can use *wild* character positions and generic character strings as the criteria to match. Therefore, you can select a specific name, such as an application, or generic names, such as all terminals on a certain line or NCP, and any number of combinations of such names.

Other session selection criteria include the following:

- The Class-Of-Service name (COSNAME) for the session
- A SSCP name
- An Explicit Route (ER) number
- A Virtual Route (VR) number
- The Transmission Path (TP)
- Session type (for example, LU-LU)
- Session class (for example, XDOM)
- The source of the SAW data (SAW data may come from the local VTAM or from a remote VTAM if you are using NTS-SI)

Session classes are defined using the DEFCLASS command.

Session Classification

When NTS receives a new session start notification from VTAM, it searches your session class definitions for the best match. Session attributes are checked in the following order:

- Primary session partner name
- Secondary session partner name
- COSNAME
- ER number
- VR number
- TP

More specific attributes are checked before less specific ones; for example, the name TSO1B is checked before the generic name TSO>. Any attributes not specified are considered *wild*, and to match any session value.

When a match is found, NTS stores the options defined for the SAW, RTM, and resource class names (if present) with the session data. These options determine the form of subsequent processing for the session.

Next Best Match

If an RTM definition is not supplied for the class with which the session is initially matched, the search continues for an RTM class definition in the next most suitable session class.

Similarly, if a SAW definition is not supplied for the class with which the session is initially matched, the search continues for a SAW class definition in the next most suitable session class.

Session data can therefore be derived from more than one session class. For example, session data can include the following:

- SAW options, derived from the session class that has a matching primary session partner name
- RTM options, derived from the session class that has a matching secondary session partner name

It is also possible to have a session class definition where every attribute is *wild* (that is, every session matches it). This enables you to supply default SAW or RTM classes for those sessions that do not match any of the more selective session classes.

Session Class Definitions

The following table shows a representation of NTS class definitions, and examples of the NTS class selection process using these definitions.

Pri-name	Sec-name	COSNAME	ER	VR	TP	SAW Class	RTM Class
CICS	LCL>	*	*	*	*	CICS	CICSLCL
CICS	REM>	*	*	*	*	CICS	CICSREM
TSO	*	*	*	*	*	NOKEEP	
TSO>	*	*	*	*	*	TSO	
*	LCL>	*	*	*	*		RTMLCL
*	*	ISTVTCOS	0	*	*	NOLOG	
*	*	*	*	*	*	SAWDEF	

In this example, names ending with > indicate that any sequence of characters can follow the prefix, and an asterisk in any column represents a don't care condition. Using this example, the NTS class selection process proceeds as follows:

- For a session between CICS and terminal REMA007, the SAW class name CICS and RTM class name CICSREM is selected.
- When a user logs on to TSO from a terminal named LCLB002, an initial session between TSO and LCLB002 is established. It selects the SAW class NOKEEP and the RTM class name RTMLCL. The ensuing session between the TSO target application (named, for example, TSO0019) and LCLB002 uses the SAW class name TSO and the same RTM class name, RTMLCL.
- Any session using the COSNAME ISTVTCOS and ER 0, and not involving CICS and TSO, selects the SAW class name NOLOG.
- A session between NMT and N8L4A01 on ER 1 selects the last entry, yielding a SAW class of SAWDEF and no RTM class.

NTS processes sessions according to your class definitions.

RTM Class Processing

When NTS receives a session for which RTM data is to be collected, the boundary values for that class are set in the control unit and retained for the duration of the session.

The objective response times and objective percentage for the class are used to monitor network response times and automatically generate attention messages.

Resource Classification

To match a resource with a resource class definition, NTS must be aware of the resource and its position in the hierarchy. The time when this occurs depends on the domain in which the resource is defined:

- If the resource is in the same domain as NTS, then NTS becomes aware of the resource and its position in the hierarchy when it receives session data for a session in which the resource is participating.
- If the resource is in another domain, then NTS becomes aware of its hierarchical position only if a suitably configured intersystem routing (ISR) link to the NTS in the other domain exists, and the link is active.

Having been made aware of a resource and its position in the hierarchy, and providing that you have defined at least one resource class, NTS selects the resource class definition that best matches the attributes of the resource. If no class definition matches the attributes of the resource, no data is collected for it.

Resource Levels

The level of the resource class is the level of the hierarchically lowest parameter specified in the class definition. In this context, a link is at a higher level than a PU, which is at a higher level than an LU. Links are said to *own* PUs that use the link, as well as the LUs that are defined on those PUs. PUs *own* LUs that are defined on the PU.

A resource matches a resource class if all operands of parameters in the resource class definition are matched by the actual resource in the hierarchy. It is possible for a resource to match more than one resource class definition, but data from one class definition only can be stored for the resource. NTS searches resource class definitions in order from most to least specific, and selects the first resource class definition that matches the attributes of the resource.

Mechanics of Resource-matching

NTS compares resource attributes to the values of resource class definition parameters as follows:

- If an attribute of a resource matches the value of a parameter in more than one resource class definition, then NTS selects the class in which the match is most specific, in the order LU, then PU, then link.
- If higher level parameter values in a resource class definition are matched, then NTS attempts to match resources with resource class definitions at the same level.

  For example, if the resource is an LU, NTS first searches resource class definitions that have the LU parameter as the hierarchically lowest parameter, for a match.
- If the resource does not match any resource class definitions at its own level, then NTS checks to see if there is a resource class at a level above with a member that owns the current resource. If there is more than one, then NTS selects the resource class that is hierarchically closest to the current resource.

  For example, if the resource is an LU, a matching PU-level class is selected before a matching link-level class.
- A resource cannot match a resource class if the level of the resource is higher than the level of the class.

  For example, if the resource is a PU, it cannot match class definitions that have the LU parameter as the hierarchically lowest parameter.

Resource class definitions determine the way NTS processes data for different network resources or groups of resources.

Collect Resource Statistics

Resource statistics are requested on the basis of resource classes. A resource class can specify that statistics are collected and NTS collects statistics for any resource that matches the resource class, provided that the resource statistics function is *not* disabled.

Collection Intervals

NTS collects resource statistics at specified intervals. These intervals can be thought of as discrete *buckets* into which NTS accumulates all accounting data for a particular resource during that period. When the specified interval expires, NTS resets the counters to zero and starts collecting data in a new *bucket*. After a specified (or default) number of intervals, NTS wraps, that is, overwrites the counters for the oldest interval, and so on.

Intervals provide one of the basic units for the analysis performed by the NTS Resource Statistics option.

Resource RTM Statistics

NTS attempts to collect RTM statistics for PUs (specifically, cluster controllers) if both of the following conditions apply:

- Resource statistics collection is enabled (both globally and in the resource class definition).
- The resource class definition includes the name of a defined RTM class.

On the expiry of an interval, NTS solicits RTM data from a resource that meets these requirements, while simultaneously resetting the RTM counters of the resource. In this way, accurate response time data is collected for each interval.

NTS collects the following sets of RTM statistics:

- *Aggregate* statistics, derived from *all* RTM responses received from a resource, irrespective of the format of the response
- *Detailed* statistics, derived from those RTM responses received from a resource that have the exact format specified in the RTM class that matches the resource class definition

If no RTM responses received from a resource have the exact format specified in the matching RTM class, aggregate RTM statistics are collected only.

Cross-Domain Statistics

If one resource involved in a session is defined in a remote domain, NTS can still collect statistics for the cross-domain resource, provided the following conditions apply:

- There is an ISR link between the two domains that is configured to allow unsolicited data transfer.
- Resource statistics collection is enabled in both NTS systems.

When an ISR link is established, a *handshake* occurs that lets each NTS calculate the time difference between the system clocks. This figure is then used to calculate the completion time of the resource statistics collection interval of the other NTS. The remote NTS waits until this time before forwarding the collected statistics to the local NTS.

If no suitably-configured ISR link exists or if resource statistics collection is disabled in either NTS, no cross-domain statistics collection occurs.

Monitor Resource Availability

If NTS has been instructed to collect statistics for a particular resource, it automatically uses SAW data to monitor the availability of that resource. A resource is considered *available* if it is participating in a session with the SSCP of the domain in which it is defined.

When NTS is notified by VTAM of the first session involving a resource, an SMF record is presented to the NTS User Exit, indicating that the resource is *available*. When notified of the termination of the last session in which the resource was involved (that is, the session with the SSCP), NTS presents an SMF record to the NTS User Exit indicating that the resource is *unavailable*. In addition, SMF records containing interval-based resource statistics are presented to the NTS User Exit, indicating what the current status of the resource is.

NTS Resource Statistics Logging

When the resource statistics collection interval expires, NTS waits for a period of up to the correlation interval for any outstanding statistics. These statistics may consist of the following:

- Statistics collected for resources—owned by the local SSCP—that are participating in cross-domain sessions. These statistics have been collected by NTS systems in one or more remote domains.
- RTM data solicited by NTS at interval expiry

NTS reports the arrival or non-arrival of statistics from other domains in the activity log. In the case of the non-arrival of statistics, the log entry specifies why statistics were not received from other domains. A separate log entry is created for each SSCP of which NTS is aware.

When this process is complete, NTS writes an entry to the activity log signaling that logging is about to commence. In this way, you can gain an accurate indication of the completeness of the statistics collected for each resource statistics collection interval.

Finally, NTS passes all the statistics collected during the interval to the NTS user exit, if one is active.

Note: Resource *statistics* are not logged to the NTS database, but passed to SMF for processing.

Collect Further Data

When NTS is aware of active sessions and resources, further data can be collected and stored with the appropriate session records in its database.

Session and Resource Data

NTS keeps session records that are flagged to be kept by the matching SAW class only. (The only exception is SSCP-SSCP session records, which are always kept.) Any trace, accounting, or RTM data collected by NTS is stored with the appropriate session record.

NTS stores both *resource* records and *session* records in its database. For each session record that is kept, there is always a resource record that represents the session partner. In addition, NTS keeps a record for every resource in the domain of the VTAM host system in which it is running, regardless of whether sessions with that resource are kept or not.

Note: The only way that NTS can be made aware of resources is through SAW. NTS is therefore only aware of resources that are currently active; that is, are involved in an SSCP-PU or an SSCP-LU session. NTS may have database records for additional resources, but each of those resources must have been active at some previous time when NTS was running.

Session Trace Data

NTS provides a trace monitoring capability that selects and formats trace data (which consists of copies of Path Information Units (PIUs) that flow on traced sessions) for a specific resource as it arrives from VTAM. Trace data is time-stamped by VTAM before being passed to NTS for correlation with other data related to the appropriate session.

NTS stores session establishment PIUs with session records in an initial queue. When this queue is full or when session establishment is complete, subsequent PIUs are placed in a final queue. When the final queue is full, wrap processing occurs (that is, the oldest PIUs are deleted to make way for the newest ones). The depth of the queue is determined by the SAW class definition for the session.

Formatted trace PIUs are directed to a user's OCS screen, the activity log, or both, according to the options you specify. This facility lets an OCS operator closely monitor a particular resource, or an NCL procedure can be written to examine the session data flow.

Resource Trace Request

When a specific resource is being traced, data is collected for all sessions that involve the resource.

If the resource is unknown to NTS when the trace request is issued, the request is nevertheless accepted and passed to VTAM. Provided that the major node to which the resource is defined is currently active, VTAM accepts the request. NTS remembers such requests, which remain in a pending state until the resource is activated.

Similarly, if a resource being traced is deactivated, NTS places the trace request in a pending state until it is reactivated, or until a trace termination request is received.

Accounting Data

NTS accounting data is extracted from the trace data supplied by VTAM; therefore, it is dependent on the capture of trace data. Trace PIUs, which are not relevant to accounting, are discarded unless the STRACE command is issued.

NTS can only collect accounting data for selected sessions, or globally for all sessions, depending on the value of the SYSPARMS NTSACCT operand.

Selective Collection of Accounting Data

When selective accounting (the default) is specified, accounting data is collected for those sessions that match SAW classes requiring the collection of accounting data.

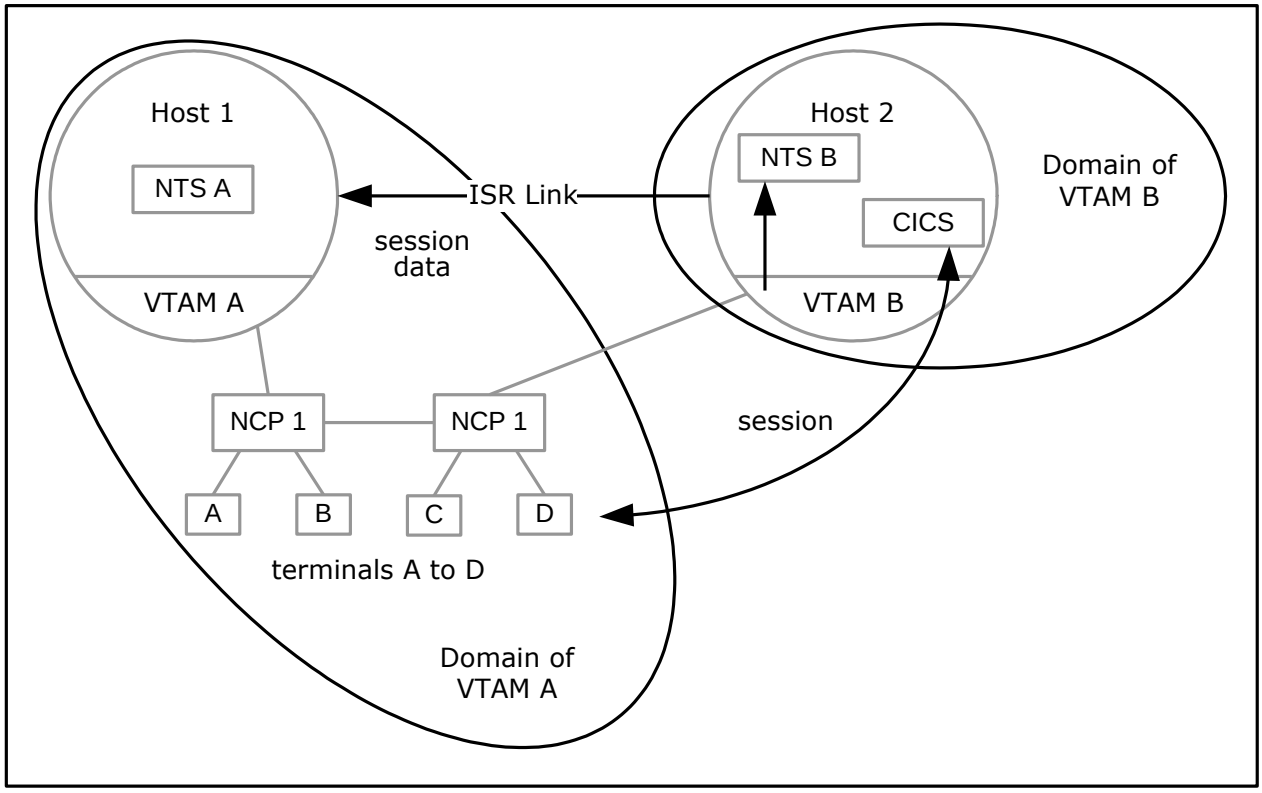
A specific trace request is issued by NTS to the session partner that resides in the VTAM subarea (or to the primary partner, if both session partners reside in the local subarea). This is because VTAM captures trace data only when the session traffic transits the VTAM host. In other words, unless one session partner resides in the VTAM subarea, no trace data is captured by VTAM.

Collection From Another VTAM Domain

The NTS Single Image (NTS-SI) feature does, however, allow you to access data from domains other than the domain in which your NTS region is active. Provided that the NTS systems are linked by suitably configured ISR links, NTS-SI lets you access trace data from other NTS systems in other domains exactly as if the session partners were both in the local domain.

Capturing Trace Data

In the following illustration, VTAM A is aware that there is an existing session between terminal D and CICS. However, because this session does not transit VTAM A, trace data is not delivered directly to NTS A. Trace data for this session is received from NTS B, due to the existence of a suitably configured ISR link.



Note the following in this illustration:

- Host 1 manages the entire network, except for applications, which are managed by Host 2.
- Arrows indicate the flow of data.

Global Collection of Accounting Data

When global accounting is specified, NTS starts all global tracing options, to capture trace data for every available session. In this case, the starting and stopping of trace data collection by means of the STRACE command does not affect data capture, but whether trace PIUs are retained or not.

Response Time Monitor Data

NTS attempts the collection of RTM data for LU-LU sessions that are matched with an RTM class only. Additionally, the following must apply:

- The secondary resource involved in the session must be in the domain of the VTAM in the host where NTS is running.
- The PU name of the terminal control unit for the secondary device must be known to support RTM (NTS assumes that a PU supports the RTM facility, unless a response to the contrary is received).

When the session start notification is received for such sessions, the RTM class values are extracted by NTS and stored with the session record. At the same time, a request is sent to the terminal control unit to set the RTM boundary and definition parameters for the device according to these RTM class values. If the PU indicates it does not support the RTM function, or does not support host programming, then no further requests are sent to the control unit.

When a session for which RTM data is being collected ends, the RTM data collected by the secondary device is sent unsolicited to NTS and stored with other session information.

Solicit RTM Data

RTM data can also be solicited during NTS review functions or more systematically, through the standard NEWS RTM procedures that allow collection on a timer or interval basis (see the *User Guide*). Whenever RTM data is solicited by any means, NTS updates its statistics for the session.

Analyze RTM Data

As RTM data arrives, it is first examined by NTS to determine whether or not the performance objectives defined for the RTM class have been met. If not, this information is appended to the CNM record and made available to NEWS. This can lead to generation of performance events and, ultimately, attention messages to notify network operators of a performance problem.

When a session for which RTM data is being collected ends, a performance event notification is also generated by NTS if the response time objectives are not met.

Data Correlation

One of the primary functions of NTS is to gather data from a number of sources and correlate it at session level. To protect NTS from waiting indefinitely for session data, you define an interval that represents the time limit for data correlation.

Enforce the Correlation Interval

The NTS correlation interval is enforced in the following situations:

- When session trace data arrives from VTAM before NTS has been notified by VTAM of the start of that session. All trace data for the pending session is kept until the session start notification is received or the NTS correlation interval expires (in which case it is discarded).
- While waiting for all session-related data to arrive before committing a session record for logging after the session has ended:
  - Following receipt of session end notification from VTAM, NTS determines whether any trace or RTM data is pending. If such data is expected, NTS waits for it to arrive, or for the correlation interval to expire, before continuing output processing.
  - When waiting for unsolicited data from a connected NTS region, either at session end or after a resource statistics collection interval expiry, NTS waits for it to arrive, or for the correlation interval to expire, before continuing with the logging process.

How NTS-SI Works

The NTS Single Image (NTS-SI) feature lets you access data from domains other than the domain in which your NTS region is active. Provided that the NTS regions are linked by suitably configured ISR links, NTS-SI lets you access trace data from other NTS regions in other domains exactly as if the session partners were both in the local domain.

It is possible to centralize the monitoring of logical network activity in multiple domains by expanding the sources of data available to an NTS region to include the following types of data:

- *Session awareness (SAW) data* collected by NTS regions in other domains
- *Session data*—that is, session trace, accounting, and RTM data—collected by NTS regions in other domains

The NTS regions may be in the same network or different networks. You are presented with a *single image* of the sessions between resources throughout the network, and of the performance and problem determination data collected for these sessions, provided that you do the following:

- Correctly configure your NTS regions
- Correctly configure the ISR links using which your NTS regions communicate

This single image perspective is preserved in the NTS database and NTS user exit.

The user is not aware that data originates from both local and remote domains. Actions performed by NTS in response to requests to view information may differ, depending on the source of the information, but all commands, panels, and general presentation of data are consistent, irrespective of the data source.

NTS-SI Configuration

NTS-SI lets SAW data and session data collected in one domain be passed on to another NTS running in another domain, provided that a direct ISR link exists.

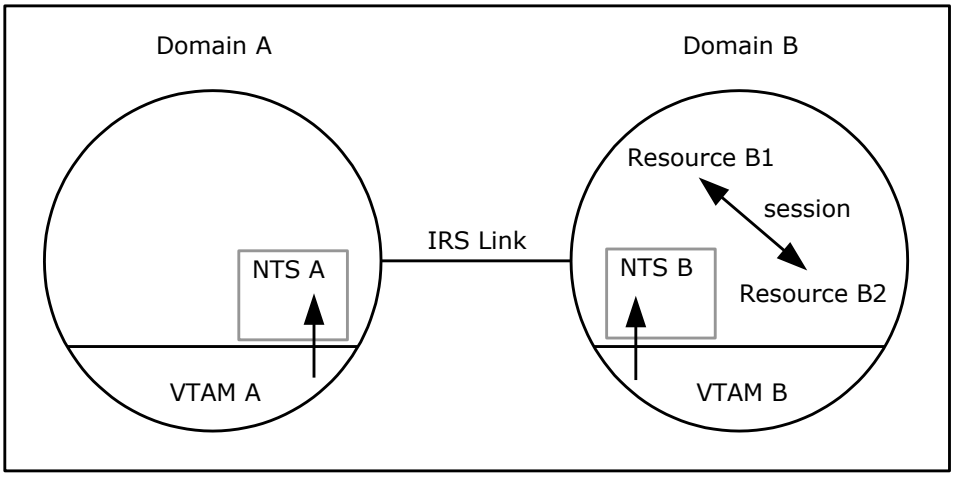
Transfer of Session Data Using an ISR Link

Suppose that session B1-B2 exists between two resources, B1 and B2, in domain B. For the NTS in domain A to be aware of SAW and session data for this session, the following conditions must be true:

- NTS must be active in both domains.
- An ISR link must exist between the domains. The link must be configured so that NTS A is specified as the receiving region (that is, the SAW operand of the ISR command is set to INBOUND) and NTS B is specified as the sending region (that is, the SAW operand of the ISR command is set to OUTBOUND).
- Class definitions in NTS B must specify that data associated with session B1-B2 is to be forwarded.
- Class definitions in NTS A must specify that data associated with session B1-B2 is to be retained.

Provided that these conditions are met, a session start notification received by NTS B from VTAM B is forwarded across the ISR link to NTS A. If any session data arrives for session B1-B2 from VTAM B, NTS B forwards an indication to NTS A that this data is available. Users of NTS A can solicit this data, as required, from NTS B. When the session ends, a session end notification received by NTS B from VTAM B is forwarded to NTS A. NTS A performs end-of-session processing for this session according to the session class definition.

The following illustration shows this process.



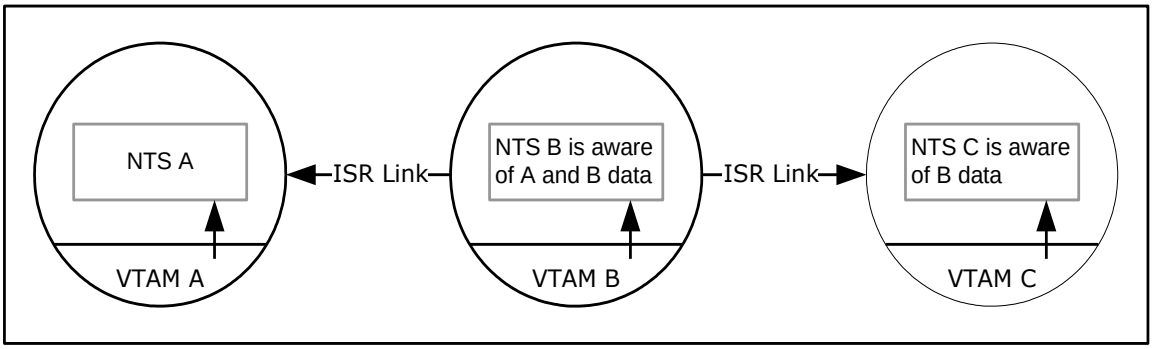
Note the following in this illustration:

- VTAM in domain B supplies NTS B with data relating to teh session between resources B1 and B2, which in turn is forwarded to NTS A.
- Arrows indicate the flow of data.

Data Propagation Across ISR Links

In a cross-domain environment (single network), NTS forwards data it has received from the local VTAM to other NTS regions. SAW and session data received using ISR from a remote VTAM are not forwarded, shown in the following illustration.

In this illustration, NTS B has information for sessions in domains A and B. NTS B forwards data relating to sessions in domain B to NTS C, but does not forward data relating to sessions in domain A. Therefore, when constructing a network image, NTS C cannot include SAW and session data from domain A.

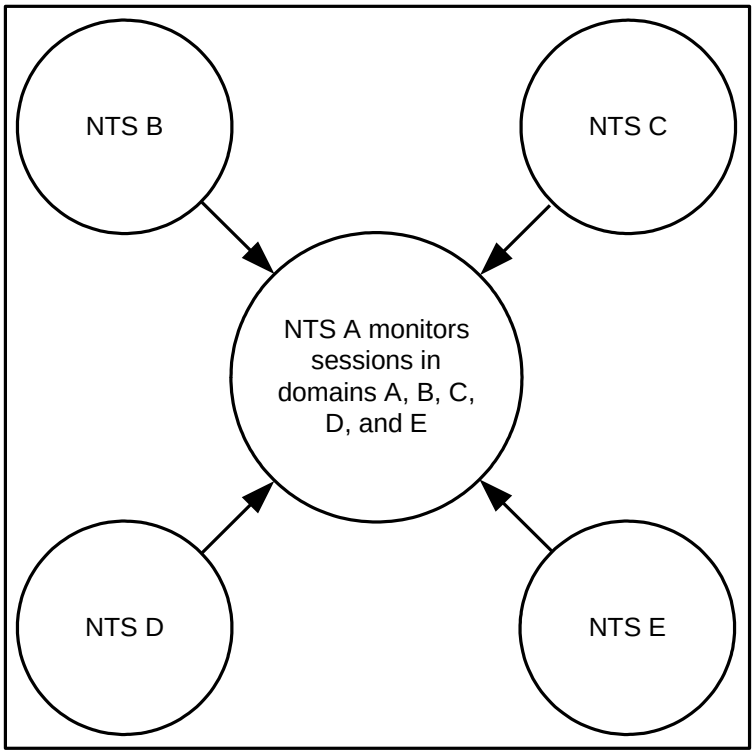


Note the following in this illustration:

- The NTS in doman C does not include data from domain A in its single image because there is no direct link from A to C.
- Arrows indicate the flow of data.

Star Network Configuration

For single network image presentation, the most useful configuration of NTS regions is a star network, which enables the monitoring of network activity to be centralized (or distributed). The following illustration shows an optimum NTS-SI configuration for a five-domain network (arrows indicate the flow of data).



The central (hub) NTS region monitors all network activity in its own domain and in the outlying (spoke) domains; the spoke NTS regions monitor the activity in their own domains only. This configuration parallels the Communication Management Configuration (CMC), where a hub domain *owns* all the devices and the applications reside in the spoke domains.

How NTS Systems Share Data

Data sharing between NTS regions is controlled by the manipulation of the attributes of ISR links between the systems. The types of data able to flow across an ISR link (that is, SAW or session data, or both) and the direction of flow (inbound or outbound) are determined by the values of ISR command parameters.

Reference Network Concept

Because NTS-SI makes it possible to share SAW data between NTS systems in different networks, NTS has a *reference network* concept. Although a cross-network session is actually a single, logical connection, the session has a different appearance (due to alias names and network addresses) to VTAMs in each network. NTS commands that display or manipulate session information have a REFNET operand that allows a specific reference network ID to be specified.

Dormant NTS Concept

It is possible to start an NTS region solely for the purpose of having it receive SAW and session data using ISR links; that is, you can disable data collection from the local VTAM. This is referred to as a *dormant* NTS region.

SAW Data Sharing

NTS-SI enables NTS to obtain SAW data for sessions that are unknown to the local VTAM. For SAW data sharing between NTS regions to occur, an ISR link must be active between the regions, with an NTS conversation currently enabled for the following:

- Outbound transfer of SAW data from the sending region
- Inbound receipt of SAW data by the receiving region

It is possible for one NTS region to send and receive SAW data at the same time, but SAW data sharing terminates if one of the conditions required for transfer is disabled.

To facilitate the operation of SAW data sharing, the ISR command supports specialized parameters that are valid for NTS conversations only.

SAW Data Sharing Rules

NTS regions determine which SAW data is available for sharing with other regions, on the basis of the following rules (some rules are dependent on whether the link is cross-network or cross-domain):

Rule 1

SAW data is forwarded to another NTS region only if it is not accessible to the VTAM in that domain. (NTS is able to determine whether SAW data for a particular session is visible to the VTAM in another domain.)

The application of this rule means that no unnecessary ISR traffic is generated.

Note: Applies to all link types.

Rule 2

SAW data is available for forwarding only if it was received from the local VTAM. This means that, for an NTS region to see all network activity in a particular domain, one of the following must be true:

- It must be in session with the VTAM in that domain.
- It must have a direct, suitably configured ISR link with an active NTS region in that domain.

Note: Applies to cross-domain links only.

Rule 3

SAW data is available for forwarding only if it was collected from the local VTAM, or from an NTS region in the same network as the local VTAM. This means that SAW data received across ISR can be forwarded to an NTS region in another network, provided that the data was derived from an NTS region *in the local network*. A corollary to this is that SAW data received from an NTS region in another network cannot be forwarded.

Note: Applies to cross-network links only.

Rule 4

A single NTS region can receive SAW data from one NTS region in another network at any one time. Any attempt to enable multiple ISR links for SAW data receipt from multiple NTS regions in other networks fails.

This rule enforces a *gateway* concept, where SAW data is sent to a central NTS region in one network before being forwarded to an NTS region in another network.

Note: Applies to cross-network links only.

SAW Data Clean-up

When an NTS region detects that SAW data sharing with another NTS region has terminated for any reason, it purges from storage any SAW data that was received exclusively from that region. This precaution is taken in case the data is no longer up to date. In this way, the image presented by NTS is kept accurate and current.

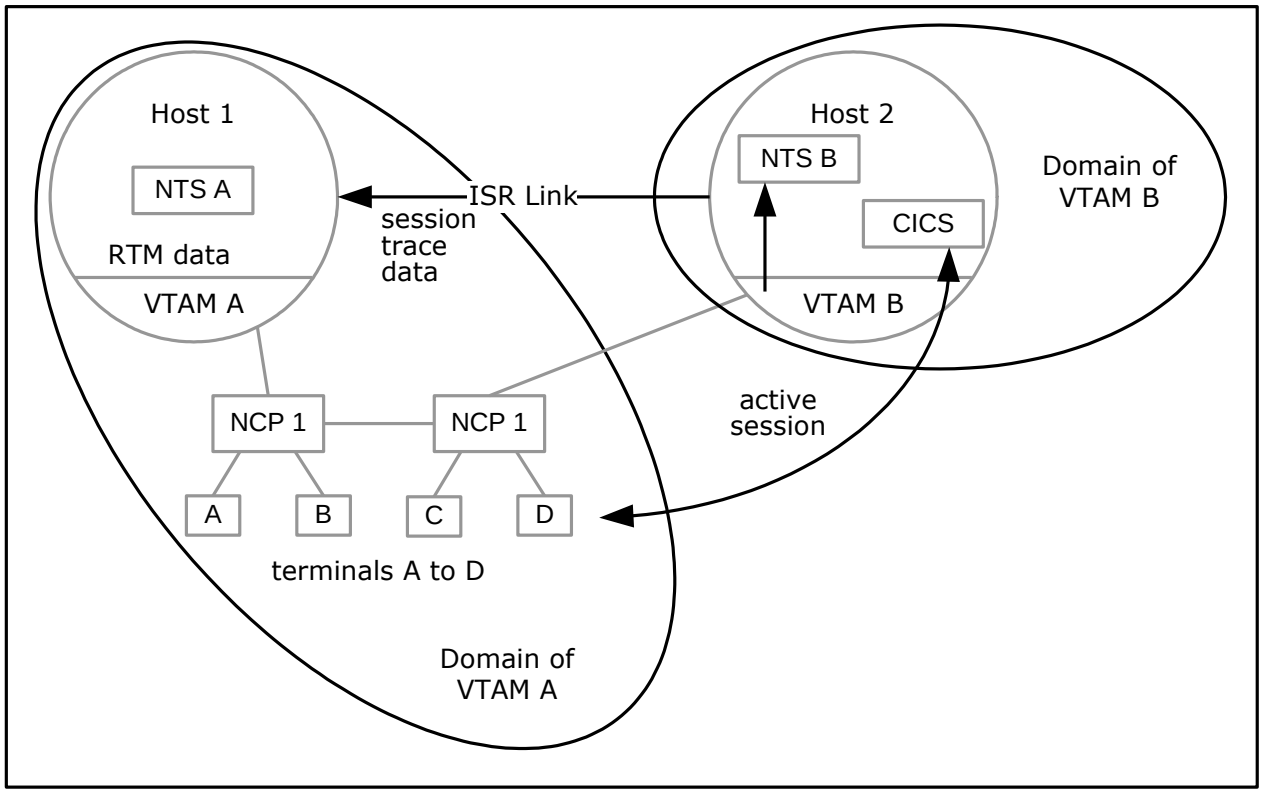
Session Data Sharing

Unless NTS-SI is operating, complete session data may not be available to an NTS region (even if one of the session partners is in the local domain).

Capture Trace Data from Another Domain

You may have a situation where accounting and trace data are only accessible using the local VTAM, even though cross-domain SAW data is easily accessible to NTS regions running in different domains that are linked by ISR. In addition, RTM data can be collected in the domain in which the controller is defined only. Therefore, in the case of a cross-domain session between an application and a remote terminal, one NTS region has access to the accounting and trace data, and another has access to the response time information for the same session. If you are using NTS-SI, you nevertheless have access to all the session data—accounting, trace, and response time—for any session visible to either VTAM.

The following illustration shows how trace data can be captured from another domain.



Note the following in this illustration:

- RTM data for the active session is collected by VTAM A. Trace data for the active session is collected by VTAM B and passed to VTAM.
- Arrows indicate the flow of data.

Necessary Conditions

You request session data by using the ISR command. For session data sharing between NTS regions to occur, the following conditions must exist:

An ISR link must be active between the regions, with an NTS conversation currently enabled for these types of data transfer and receipt:

- Outbound unsolicited transfer of data from the sending region
- Inbound unsolicited and solicited receipt of data by the receiving region

It is possible for one NTS region to send and receive session data at the same time, but session data sharing terminates if one of the conditions required for transfer is disabled.

Session Data Sharing Rules

NTS regions determine which session data is available for sharing with other regions on the basis of the following rules (some rules are dependent on whether the link is cross-network or cross-domain):

Rule 1

Session data is forwarded to another region only if it is likely to be unavailable to the other region. In some cases, session data is visible to the two VTAMs in two different domains, and therefore to the NTS regions running in these domains.

NTS is able to determine whether the data is visible in more than one domain, and whether the NTS in the other domain is likely to be collecting data for this session or not.

Note: Applies to all link types.

Rule 2

Session data is available for forwarding only if it was collected by the local VTAM from the local domain. Session data received from another region is *not kept in* storage but handled in one of the following ways:

- Displayed directly as part of an NTS display
- Logged immediately to the NTS user exit and the NTS database

Note: Applies to cross-domain links only.

Rule 3

Session data received from a cross-domain ISR link can be forwarded to an NTS region in another network, *provided that* the receiving NTS region verifies that SAW data relating to this session has been forwarded to the cross-network NTS region.

This means that the *gateway* NTS region performs a routing role, to ensure that:

- Cross-network session data requests are forwarded to the NTS region that is able to respond to them (that is, the region that can collect the information directly from VTAM).
- Unsolicited session data and session data notifications are forwarded to linked networks, to provide the cross-network region with a complete picture of network activity.

Note: Applies to cross-network links only.

Session Data Flows

Session data sharing is implemented by the following separate transaction types or flows that can occur in the scope of a single session:

- Session data availability notifications
- Session data solicitations (request and reply)
- Unsolicited data records at session end

Session Data Availability Notifications

When an NTS region receives trace or RTM data for a session for the first time, or when the NTS region becomes aware that accounting data for a session needs to be collected, it checks to see whether either of the following is true:

- SAW data sharing is in progress between the local NTS region and any other NTS regions.
- The session is cross-domain—and if it is, is there is a suitably configured ISR link to an active NTS region in the other domain.

If an NTS region accepts a data available notification, it indicates the availability of this data on any NTS Session List display as follows:

After Session Awareness Activation

You can initiate session data sharing after session awareness has been activated in the sending region. In this case, session data may already have been collected. When the sending region detects that session data sharing with another region has become active, it sends data available notifications to this region for the sessions for which data has been collected.

On Session Termination

If an NTS region detects that session data sharing with another region has been terminated for any reason, it resets the session data present indicators that were set exclusively in response to session data available notifications received from that other NTS region. This is because the data can no longer be solicited.

Session Data Solicitation

After an NTS region has received notification of data availability, it can send a solicitation request to the collecting region to view all or part of the data. This occurs when a user requests a particular display. The solicitation requests that the collecting region immediately forward a reply containing all collected data of the specified type.

Session data received in reply to a solicitation request appears immediately. When the user exits the display, the data is discarded. Another user request to view the session data results in another solicitation. Refreshing the current display also discards the current data and issues another solicitation. In this way, NTS guarantees that the data displayed is the most recent (and therefore most accurate) available and that the *data is actually stored in one location in the network only*.

Unsolicited Session Data at Session End

When an NTS region detects the end of a session, the following processing occurs:

- The NTS region determines whether there are any other NTS regions that are aware of the session but do not have actual visibility of the session data. If this is the case, then the NTS region forwards locally sourced data that is not visible (or not being collected) in the other domain, to the other NTS region. In this way, the complete data for the session is made available to the other NTS user exit and database.
- The NTS region determines whether there is any session data type that has been requested but has not yet arrived. If this is the case, then the NTS region determines whether it has any suitably configured ISR links to any regions that could provide the data and waits for a limited period of time for the data to arrive using the ISR link or links.

When session data arrives from another NTS region, the receiving region determines whether this session data was requested or not. Any data that was not requested is discarded. If the data was requested, then it is immediately logged to the NTS database or user exit (or both, depending on what is requested) and the session and accompanying data is purged from storage.

Appendix D: NEWS Device Solicitation Procedures

This section contains the following topics:

NEWS Device Solicitation

You can solicit data from network devices using the NEWS Device Support option from an OCS window or on an unattended basis using the AT and EVERY commands. The NEWS command procedures are a means of passing solicited data to other procedures in an automated operations environment, so that these procedures can act upon the data returned.

When a request for data has been successfully completed and the response returned to the user, the format of the response is similar to that used by VTAM (that is, each line of data is returned as a message with a message number that is unique to that data).

Line Command Procedures

The NEWS line command procedures are used primarily to pass solicited data to other procedures in an automated operations environment so that they can act upon the data returned.

The procedures are similar in format to current commands and the parameters are, overall, keyword driven.

$NW386SO

Solicits link status or DTE test results from a 386x type modem configured with the LPDA-1 option.

$NWDS13B

Provides a batch command interface for the Central Site Control Facility (CSCF).

$NWFCSSO

Solicits loop status, loop errors, and response time data from an IBM 3600/4700 Financial Communication System devices. The data is always returned to CNMPROC for logging.

$NWLPDA2

Records or changes, configuration or coupler parameters; changes the modem's functional characteristics; or runs online diagnostic tests for an LPDA-2 device.

$NWRTMSO

Solicits RTM data from a 3x74 controller that supports the RTM function. RTM data may be requested for a single LU, or for those LUs with non-zero data only.

$NWRUNCM

Packs a command into an NMVT RU to be sent to, and executed by, a service-point application. Responses received are displayed as text messages.

$NWSOLCT

Solicits secondary end errors and engineering change level data from a PU that supports such requests. Secondary end errors include link test statistics, summary error data, communications adapter error statistics and EC level information. Any or all of these summaries may be requested.

$NWVPDSO

Solicits vital product data from a PU (and its port-attached devices).

$NW386SO Procedure

This procedure solicits link status or DTE test results from a 386x type modem configured with the LPDA-1 option. The data is always returned to CNMPROC for logging. You can also obtain this data by selecting options 6 or 7 from option G of the NEWS Device Support menu.

```
$NW386SO    NODE=network_name
            REPORT={ LINK | DTE }
          [ NCP=NCP_name ]
          [ RESET={ YES | NO } ]
          [ LINK=link_name  |
            SSCP=SSCP_name ]
```

Operands: $NW386SO Procedure

NODE

Specifies the network name of the device from which the data is solicited.

REPORT= LINK | DTE

Specifies the type of data required:

LINK

Specifies the link status test.

DTE

Specifies the DTE test.

NCP

Specifies the name of the NCP owning the specified node.

RESET=YES | NO

Specifies whether the counters in the controller are reset after solicitation has completed.

LINK

Specifies the name of the link to the region on the system in which the node name is located.

SSCP

Specifies the name of the SSCP controlling the node.

Example: $NW386SO Procedure

```
$NW386SO NODE=TSTM386 NCP=NCP01 REPORT=DTE
```

This example requests a DTE test at node TSTM386 controlled by NCP NCP01.

$NWDS13B Procedure

The CSCF Batch Command Interface enables the execution of all CSCF functions in a batch NCL mode. This enables you to control a controller through automation, so that an end user does not have to be logged on to execute controller functions. The command interface is the execution of the $NWDS13B procedure with parameters dictating processing flow.

$NWDS13B FUNC = LOGON

```
&CONTROL SHRVARS=($NWCS#,$NW#USR,$GP) NOVARSEG

$NWDS13B      FUNC=LOGON
            { NODE=node_name }
            [ OP=command line text ]
            [ LINK=link_name ]
            [ SSCP=sscp_name ]
            [ PRINT={ YES|nnn|LOG } ]
```

Note: Print is skipped if RETCODE greater than 4 occurs.

$NWDS13B FUNC = ACTION

```
&CONTROL SHRVARS=($NWCS#,$NW#USR,$GP) NOVARSEG

$NWDS13B      FUNC=ACTION
            { KEY=PFnn|ENTER }
            [ OP=command line text ]
            [ DATA1-n=xx ]
            [ PRINT={ YES|nnn|LOG } ]
```

Note: Print is skipped if RETCODE greater than 4 occurs.

$NWDS13B FUNC = LOGOFF

```
&CONTROL SHRVARS=($NWCS#,$NW#USR,$GP) NOVARSEG

$NWDS13B    FUNC=LOGOFF
```

Parameters: $NWDS13B Procedure

FUNC

Indicates to the batch procedure what process to take. This is a required parameter where the valid values must be:

$NWDS13B FUNC = LOGON

LOGON the session ID; must be first call.

$NWDS13B FUNC = ACTION

Indicates that some type of action is to take place.

$NWDS13B FUNC = LOGOFF

LOGOFF the session ID after processing is completed.

NODE

Specifies the 3174 node name, required on the logon call only.

OP

Specifies the command to enter. This represents what would be the command line on an on-line panel; that is, any valid CSCF command or option (for example /5,2). The F key command text is not supported at the command line (RETURN, for instance).

KEY

Specifies the key (one of PF1 to PF24, or Enter) to enter once at an indicated panel.

DATA1-20

Specifies the data to enter for each input field on a panel. If the third data item on a panel is updated, DATA3 is passed with the data to enter.

LINK

Specifies the link name if remote controller operations are desired on the logon call only.

SSCP

Specifies the SSCP name if remote controller operations are desired on a logon call only.

PRINT

Specify YES to print screen using user's default PSM printer ID; or specify a specific printer; or specify LOG to send screen capture to the log. This option is skipped if a non-zero RETCODE occurs. The PRINT will occur after all OP and/or KEY parameters are processed.

Return Variables: $NWDS13B

&RETCODE

0

Batch process completed. This means that a command was sent to the controller and a response was received from the controller.

4

Key supplied is not active on current panel.

8

Processing error.

12

Unable to log on.

16

Invalid parameters.

&SYSMSG

Error message.

&$NW#USR#Lnn

Variables where Lnn represents up to 24 lines of panel data.

Example 1: IML the controller.

```
EXEC $NWDS13B FUNC=LOGON NODE=ACSC11
EXEC $NWDS13B FUNC=ACTION OP=14 KEY=ENTER
EXEC $NWDS13B FUNC=ACTION OP=1,2,41 KEY=ENTER
EXEC $NWDS13B FUNC=ACTION OP=password KEY=ENTER
```

Example 2: Reset event logs, cable errors and trace data.

```
EXEC $NWDS13B FUNC=LOGON NODE=ACSC11 OP=/4,2
EXEC $NWDS13B FUNC=LOGOFF
```

Example 3: Change configuration data (update controller vital product data).

```
EXEC $NWDS13B FUNC=LOGON NODE=ACSC11 OP=/5,2
EXEC $NWDS13B FUNC=ACTION KEY=PF04 DATA3=CINCY
EXEC $NWDS13B FUNC=LOGOFF
```

Example 4: Display configuration data and print out to specified printer.

```
EXEC $NWDS13B FUNC=LOGON NODE=ACSC11 OP=/2,2 PRINT=U33
EXEC $NWDS13B FUNC=ACTION KEY=PF8 PRINT=U33
EXEC $NWDS13B FUNC=ACTION KEY=PF8 PRINT=U33
EXEC $NWDS13B FUNC=ACTION KEY=PF8 PRINT=U33
EXEC $NWDS13B FUNC=ACTION KEY=PF8 PRINT=U33
EXEC $NWDS13B FUNC=LOGOFF
```

Note: Two methods are available when selecting options from the command line. You can specify only the option number and get to the desired option one screen at a time or you can use the forward slash (/) as a means of panel skipping. Example 1 above shows the one-screen-at-a-time route; all other examples show the fast route. See sample procedure $SANWCSF as a working example.

It is a requirement that data with embedded blanks be assigned to the DATA*n* keyword using a variable. For example:

```
&LOCATION = &STR Cincinnati, Ohio

DATA5=&LOCATION
```

As noted above, &CONTROL NOVARSEG must be in effect or a RETCODE 16 (SYSMSG EWKB01 invalid keyword parameter) occurs.

Note: In example 1, there is no need for a LOGOFF call as the session is implicitly terminated by the IML process.

$NWFCSSO Procedure

This procedure solicits loop status, loop errors, response time data, or all of these from an IBM 3600/4700 Financial Communication System device. You can also obtain this data by selecting any of the first four options from option 3 of the NEWS Device Support menu. The data returned is always delivered to CNMPROC for logging.

```
$NWFCSSO      NODE=network_name
            [ REPORT={ STATUS | ERRORS | RESPTIME | ALL } ]
            [ RESET={ YES | NO } ]
            [ LINK=link_name |
              SSCP=SSCP_name ]
```

Operands: $NWFCSSO Procedure

NODE

Specifies the network name of the device to which the request is to be sent.

REPORT={ STATUS | ERRORS | RESPTIME | ALL }

Specifies the type of data required.

ERRORS = Loop errors

RESPTIME = Response time data

STATUS = Loop status

ALL = All of the above

RESET = { YES | NO }

Indicates whether the counters in the controller are reset after solicitation.

LINK

Specifies the name of the link to the region on the system in which the node name is located.

SSCP

Specifies the name of the SSCP controlling the node to be specified.

Example: $NWFCSSO Procedure

```
$NWFCSSO NODE=FCS00001 REPORT=ERRORS LINK=TEST01
```

This example requests loop errors to be sent to controller FCS00001 across the link TEST01.

$NWLPDA2 Procedure

This procedure records or changes configuration or coupler parameters, changes the functional characteristics of the modem, or runs on-line diagnostic tests for an LPDA-2 device. You can also obtain this data by selecting option 7 of the NEWS Device Support menu. The following operands are required to execute this procedure.

```
$NWLPDA2    { DISPLAY={ CONFIG | COUPLER } |
              CHANGE={ CONFIG | COUPLER } |
              SPEED={ FULL | BACKUP } |
              DIAL [ =(num1,num2,prefix) ] |
              DISC | CONTACT={ OPEN | CLOSE | QUERY } |
              TEST={ LA | MS | TR(n) } }
              STATION=node_name
              NCP=ncp_name
            [ LEVEL={ 1 | 2 } ]
            [ MODEM={ LOCAL | REMOTE | BROADCAST } ]
            [ FILE={ YES | NO | ONLY } ]
            [ LINK=link_name | SSCP=SSCP_name ]
```

Operands: $NWLPDA2 Procedure

DISPLAY = { CONFIG | COUPLER }

Displays the modem's configuration parameters or the coupler's configuration parameters for the modem.

CHANGE = { CONFIG | COUPLER }

Changes the modem configuration parameters or the coupler configuration parameters for the modem.

Note: The CHANGE operand is valid only if executed from a full-screen environment and FILE=ONLY is not specified.

SPEED = { FULL | BACKUP }

Sets the modem's transmission speed to FULL or BACKUP.

DIAL [= (*num1, num2, prefix*)]

Establishes SNBU connections using the phone numbers stored in the configuration fields or the supplied prefix and extensions. If the prefix and extensions are supplied, the total length of the numbers (including pauses) must not be greater than 41 characters.

DISC

Disconnects the line at the remote modem.

CONTACT = { OPEN | CLOSE | QUERY }

Opens or closes the modem's built-in relay or reports the status of the built-in relay (open or closed) and whether or not electric current is flowing through the sensor.

TEST = { LA | MS | TR(*n*) }

Performs modem diagnostic tests as described by the following options:

LA

Performs a line analysis test.

MS

Performs Modem and Line Status test or Modem Self-test.

TR(*n*)

Performs a test-pattern exchange between the local and remote modem to determine the line quality and number of transmission errors. *n* is the number of sequences of 16 blocks of data to exchange. *n* + 1 sequences are sent.

STATION=*nodename*

Specifies the network name of the device to which the request is sent.

NCP=*ncpname*

Specifies the name of the NCP in which the station is located.

LEVEL = { 1 | 2 }

Determines where the command is sent. The primary link is indicated by 1 and the tailed link by 2.

MODEM = { LOCAL | REMOTE | BROADCAST }

Identifies the type of modem to receive the command:

LOCAL

Indicates the command is sent to the local modem.

REMOTE

Indicates the command is sent to the remote modem.

BROADCAST

Indicates the command is sent to all secondary modems. This parameter is valid only when used in conjunction with the SPEED and DISC operands.

FILE = { YES | NO | ONLY }

Directs how the returned results of the command are processed.

YES

Indicates the results of the command are displayed and sent to CNMPROC.

NO

Indicates the results of the command are displayed and not sent to CNMPROC.

ONLY

Indicates the results of the command are sent to CNMPROC only.

LINK

Specifies the name of the link to the region on the system in which the node name is located.

SSCP

Specifies the name of the SSCP controlling the node to be solicited.

Examples: $NWLPDA2 Procedure

```
EXEC $NWLPDA2 DISPLAY=COUPLER STATION=STATION1 NCP=NCP1+
           FILE=YES
EXEC $NWLPDA2 SPEED=FULL STATION=STATION1 NCP=NCP1+
    MODEM=REMOTE
EXEC $NWLPDA2 CHANGE=CONFIG STATION=STATION1 NCP=NCP1
```

Return Variables: $NWLPDA2 Procedure

&RETCODE

0

Batch process completed. This simply means that a command was sent to the controller and a response was received from the controller.

8

Processing error.

$NWRTMSO Procedure

This procedure solicits RTM data from a 3x74 controller that supports the RTM function. You can also obtain this data by selecting option 2.2 from the NEWS Device Support menu. You can request RTM data for a single LU, or for those LUs with non-zero data only. The following operands are required to execute this procedure.

```
$NWRTMSO      NODE=network_name
            [ LU={ ALL | 2 ...  255 } ]
            [ RESET={ YES | NO } ]
            [ RESPONSE={LOG | USER | BOTH } ]
            [ LINK=link_name | SSCP=SSCP_name ]
```

Parameters: $NWRTMSO Procedure

NODE

Specifies the network name of the device to which the request is sent.

LU={ ALL | 2 ..... 255 }

Indicates if all LUs are solicited or the LU specified by number only.

Note: If an LU number is specified it must be in the range 2 to 255.

RESET={ YES | NO }

Indicates whether the counters in the controller are reset after solicitation.

RESPONSE={ LOG | USER | BOTH }

Indicates where the responses are delivered:

LOG

Indicates response data is sent to CNMPROC.

USER

Indicates response data is returned to the requesting procedure.

BOTH

Indicates response data is delivered to CNMPROC and the requesting procedure.

Note: If NTS is active in the region sending the request, then the LU name can be substituted for the node name on the NODE= operand, and the LU= operand ignored (that is, if data from one LU is required only).

LINK

Specifies the name of the link to the region on the system in which the node name is located.

SSCP

Specifies the name of the SSCP controlling the node to be solicited.

Example: $NWRTMSO Procedure

```
$NWRTMSO NODE=RTMNODE1 LU=ALL RESET=NO RESPONSE=BOTH
```

This example requests RTM data for ALL LUs to be sent to controller RTMNODE and the responses to be delivered to CNMPROC and the soliciting procedure.

$NWRUNCM Procedure

This procedure sends a command to be executed by a service-point application. Responses received are displayed as text messages.

```
$NWRUNCM      NODE=service_point_name
            [ LINKNAME=link_name | SSCP=remote_sscp ]
              APPL=application_name
              DATA=command_text
```

Operands: $NWRUNCM Procedure

NODE

Specifies the name of the service point (PU) for executing the command.

LINKNAME

(Optional) Specifies the ISR link name for routing the request to a remote host that is the focal point for the NODE specified and will act as the source of the application command. If LINKNAME and SSCP are omitted, the request is sent from the local host.

SSCP

(Optional) Specifies the name of a remote host that is the focal point for the NODE specified and will act as the source of the application command. If LINKNAME and SSCP are omitted, the request is sent from the local host.

APPL

Specifies the name of an application residing on the specified NODE which is to execute the command.

DATA

Specifies the command text intended for the application. It must be specified as the last operand to the $NWRUNCM procedure. The SNA-imposed limit on this is 253 characters.

Example 1: From Command Entry

```
$NWRUNCM NODE=ASYD61 APPL=NETWARE DATA= +
     SNAME=RESEARCH Query Volume USpaceAllowed +
     VolName=SYS UserName=user01
```

The following responses are written to the Command Entry screen:

```
EW0019 NODE=ASYD61, DATE=....
EW0020 NTWK=SDINET1, SSCP=....
EWR003 MESSAGE TEXT
EWR004 SNAME=RESEARCH USERNAME=USER01 VOLNAME=SYS
EWR004 USPACEALLOWED=10000KBYES
EW0018 *END*
```

Example 2: From an NCL procedure

```
&INTCLEAR
&INTCMD $NWRUNCM NODE=ASYD61 APPL=NETWARE DATA= +
          SNAME=RESEARCH OP=user01 Remove File Trustee+
          Path=SYS:USER01\TEST UserName=user02
&MSGNO =
&DOWHILE .&MSGNO NE .EW0018
     &INTREAD STRING=(RSPMSG)
     &PARSE VARS=MSGNO REMSTR=MSGTXT +
          DATA=&RSPMSG
     ...
     ...
&DOEND
```

$NWSOLCT Procedure

This procedure is used to solicit secondary end errors and engineering change level data from a PU that supports such requests. Secondary end errors include: link test statistics, summary error data, communications adapter error statistics, and EC level data. Any or all of these summaries can be requested. You can also obtain this data by selecting any of the first five options for option 1 of the NEWS Device Support menu.

```
$NWSOLCT      NODE=network_name
            [ REPORT={ LINK | SUMMARY | COMMS | EC | ALL }]
            [ RESET={ YES | NO } ]
            [ RESPONSE={ LOG | USER | BOTH } ]
            [ LINK=link_name |
              SSCP=SSCP_name ]
```

NODE=*aaaaaaaa*

Specifies the network name of the device to which the request is sent.

REPORT={ LINK | SUMMARY | COMMS | EC | ALL }

Specifies the type of data required:

LINK

Specifies link test statistics.

SUMMARY

Specifies summary error data.

COMMS

Specifies communications adapter error statistics.

EC

Specifies engineering change level data.

ALL

Specifies all of the above.

RESET={ YES | NO }

Indicates whether the counters in the controller are reset after solicitation.

RESPONSE={ LOG | USER | BOTH }

Indicates where the responses are delivered.

LOG

Indicates response data is sent to CNMPROC.

USER

Indicates response data is returned to the requesting procedure.

BOTH

Indicates response data is delivered to CNMPROC and the requesting procedure.

LINK

Specifies the name of the link to the region on the system in which the node name is located.

SSCP

Specifies the name of the SSCP controlling the node.

Example: $NWSOLCT Procedure

```
$NWSOLCT NODE=TSTC01
```

This example requests link test statistics, summary error data, communication adapter error statistics, and EC level data to be sent to controller TSTC01, and in the results being processed by CNMPROC.

Notes:

- If REPORT=EC is specified, you can use LOG for the RESPONSE= operand only.
- When REPORT=ALL is specified, Engineering Change level data is always sent to CNMPROC only, no matter what option has been chosen for the RESPONSE= operand.
- If REPORT=EC is specified, and the PU to be solicited is a 3174 or equivalent, then you must issue the command twice to solicit all EC and RPQ data.

$NWVPDSO Procedure

This procedure solicits vital product data from a PU (and its port-attached devices).

```
$NWVPDSO      NODE=network_name
            [ REPORT={ PU | ALL } ]
            [ RESPONSE={ LOG | USER | BOTH | FILE }
            [YEARFMT={ YY | YYYY }
            [ FILEDD=ddname ]
            [ LINK=link_name |
              SSCP=SSCP_name ]
```

Operands: $NWVPDSO Procedure

NODE

Specifies the network name of the device to which the request is sent.

REPORT={ PU | ALL }

Specifies whether the data is sent for the PU only or the PU and its port-attached devices (if the PU supports such a request).

PU

Specifies the product data is from the PU only.

ALL

Specifies the product data is from the PU and all port-attached devices.

RESPONSE={ LOG | USER | BOTH | FILE }

Indicates where the responses are delivered:

LOG

Indicates response data is sent to CNMPROC.

USER

Indicates response data is returned to the requesting procedure.

BOTH

Indicates response data is delivered to CNMPROC and the requesting procedure.

FILE

Indicates response data is written to the file specified by the FILEDD=*ddname* operand.

Example 1

```
$NWVPDSO NODE=PU374501 REPORT=PU LINK=TEST01
```

This example requests vital product data for the PU to be sent to the PU PU374501 across the link TEST01 and the results to be returned to CNMPROC.

Example 2

```
$NWVPDSO NODE=TSTC02 RESPONSE=FILE FILEDD=VPDFILE
```

This example requests vital product data to be sent to device TSTC02 and all its port-attached devices with the result of the solicitation (if successful) written to the file allocated by the DD name VPDFILE.

File Format for the Vital Product Data File

Key

One of the following:

NODENAME (8 chars)

UNIQUE PORT NUMBER (3 digits)

YY/MM/DD (8 chars) (by default)

YYYYMMDD (if YEARFMT=YYYY has been specified)

HH:MM:SS (8 chars)

Fields

Note: All fields will probably not be used for all records contained in this file.

Device hierarchy in the standard NEWSFILE record format

Hardware Common Name

Hardware Machine Type (and model (MODEL xxx))

Hardware Serial Number

Hardware Repair ID

Emulated Hardware Machine Type (and model (MODEL xxx))

Microcode EC Level

Software Product Common Name

Software Product Common Level (Vx.x.x)

Software Product Program Number

Software Serviceable Component

Software Serviceable Component Release Level (xxx)

Software Customization

Software Customization Date and Time (YY/MM/DDHH:MM)

Primary LU Address

Hardware Group

Port Type

Port Number

Vendor ID

Physical Location

LAN Universal Address

Additional Attribute Label

Additional Attribute Data

Appendix E: Implementing the NEWS User Exit

This section contains the following topics:

NEWS User Exit

NEWS can present all records received across the VTAM CNM interface to an installation-supplied user exit before any processing is performed for the record.

The exit can perform any desired processing of the record and can indicate that the record is to be ignored by NEWS, unless it was generated in response to a solicitation request by an &CNMSEND statement.

Note: APPN alerts sent to the ALERT-NETOP NEWS application, and records from remote regions arriving over ISR links are not passed to the exit.

Sample NEWS Exits

Two sample NEWS exits are supplied as working models that can be modified as required. The exits are members of the *?dsnpref*.NMC0.CC2ASAMP library distributed on the installation tape.

NEWSEXIT

NEWSEXIT takes a copy of each CNM record received and writes it to a sequential data set.

Any DD cards required by the exit to write the CNM records to a data set should be included in the execution JCL. The NEWSEXIT sample exit provided writes all records to a variable blocked data set which requires a DD card with a DD name of DDNEWS.

NEWSXSMF

NEWSXSMF takes a copy of each CNM record and formats an SMF record which can then be processed by external packages that use SMF data.

The Assembler macro $NMSMF, distributed in the macro library, provides mapping for the format of the SMF record generated.

How the NEWS Exit Is Called

Note: To implement a NEWS exit, you must define the exit name in the CNM parameter group. For more information, see the *Installation Guide*.

NEWS is initialized when your region starts and a subtask that acts as the driver for the exit is attached. The subtask mainline routines handle communications between the subtask and the NEWS components in the mother task.

When the subtask is attached, subtask mainline routines do the following:

1. Load the load module specified as the installation-supplied user exit.
2. Call the exit using conventional branching and linking.
3. Pass an initialization parameter list to the exit.

NEWS Exit Execution

Because the user exit executes as part of a subtask, no restrictions are placed on the functions that the exit can perform. This is because the activities of the subtask do not impact the performance of the main task, and the exit subtask runs at a lower dispatching priority than the main task.

Processing of CNM records by the main task is, however, delayed by processing occurring in the CNM exit.

NEWS Exit Coding Requirements

This section describes the coding requirements for NEWS exits.

Maintain Registers on Entry to an Exit

You must observe standard linkage conventions when coding an exit.

On entry, the registers must be saved in the caller's save area, and on exit, restored (except R15, which must contain a return code).

On entry, register contents are as follows:

R0	Unpredictable
R1	Address of a parameter list
R2-R12	Unpredictable
R13	Address of the caller's standard save area
R14	Caller's return address
R15	Address of the entry point of the user exit

On exit, the same registers should be restored except for R15, the exit return code.

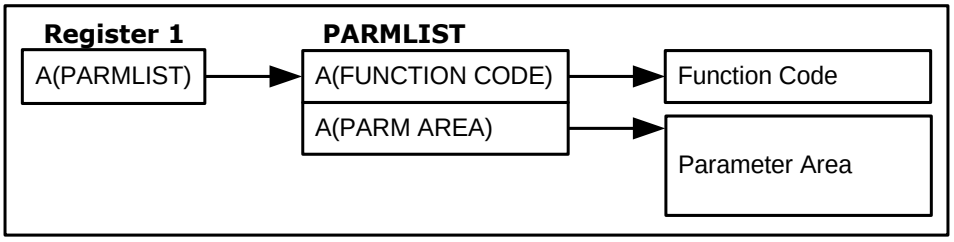
Parameter List Format

The parameter list addressed by Register 1 on entry consists of one or two contiguous fullwords. If there are two fullwords, the first contains the address of another fullword that holds a function code indicating the reason that the exit is being called.

The second fullword of the parameter list is present for function codes 0 and 4 only. The high-order bit of this last (or solitary) fullword is not set; therefore, the length of the parameter list must be determined by examination of the function code as follows:

- For function code 0, the second word of the parameter list contains the address of an area that contains system data that may be of value to the exit in determining its processing options.
- For function code 4, the second word of the parameter list contains the address of the CNM record being passed to the exit for examination.
- For function code 8, the parameter list contains one word.

The following illustration shows the structure of the NEWS user exit parameter list pointers.



Exit Function Codes

The function code contained in a fullword addressed by the first word of the parameter list is a binary value that is right-aligned, with all high-order bits set to zero. The following function codes are used:

- X‘00000000’ = initialization call
- X‘00000004’ = CNM record available
- X‘00000008’ = termination call

Function Code 0

This indicates that the region has just been initialized. Any initialization processing that the exit needs to do, such as opening required data sets, should be done now.

The second word of the parameter list passed to the exit for function code 0 contains the address of an area, formatted as described below.

Byte	Description
00:03	In this full word, the exit can store the address of a message that is to be logged to the activity log and sent to Monitor class operators. On return from any call to the exit, this word is checked; if the value is non-zero, it is assumed to be the address of a half-word length followed by the text.
04:04	Operating system indicator. Values are:
	X‘02’ MSP, MSP/AE, MSP/EX
	X’10’ z/OS
05:05	SMF record identifier set by the SYSPARMS SMFID= command.

Byte	Description
06:17	System identifier set by the SYSPARMS ID= command.

When processing completes successfully, the exit returns control to the caller with a return code of 0 in register 15. Any other value in R15 is regarded as indicating that processing was unsuccessful and the exit subtask is terminated abnormally and assigned User Abend reason code 390-01.

Function Code 4

This indicates that a CNM record has been received by NEWS. For this function code only, the second word of the parameter list contains the address of the CNM record received. The actual CNM record is prefixed by a length field, so the format of the record presented to the exit is described in this section.

Byte	Description
00:01	Length of record including this 4-byte prefix
02 :03	Always X'0000'
04 :*nn*	Length of CNM record data (variable)

The processing performed by the exit on the record received is unrestricted, but it should be noted that extensive delays in processing may cause NEWS to reach internal queue limits and result in CNM records being lost.

Note: The record presented to the exit is a copy of the record received by NEWS only. No modification can be made to the record actually processed by NEWS when the exit returns control. The record with its length field prefix is suitable for writing to a variable blocked data set.

When control is returned by the exit, R15 must be set to one of the following (decimal) return codes:

Return Code	Description
0	Processing complete. NEWS continues processing this record and passes the next CNM record to the exit when it arrives.
4	Processing complete. NEWS ignores this record and passes the next CNM record to the exit when it arrives. Records that have this return code are not passed to CNMPROC.

Return Code	Description
8	Processing complete. NEWS continues processing this record but makes no further calls to the exit.
12	Processing complete. NEWS ignores this record (unless it is a solicited response) but makes no further calls to the exit.

Any other value in R15 is regarded as indicating unsuccessful processing and the exit subtask is abnormally terminated and assigned User Abend reason code 390-02.

Translate-Inquiry RUs

Although TR-INQ RUs (Translate-Inquiry RUs) are passed to the user exit, the return code set by the exit for these RUs is not checked. Processing of TR-INQ RUs proceeds by the Alias Name Translation Facility of NEWS being called to format a TR-REPLY RU.

Function Code 8

This indicates that your region is terminating. It alerts the exit to perform any cleanup processing required, such as closing data sets. The termination of your region cannot proceed until the exit returns control.

On successful completion of processing, the exit returns control to the caller with a return code of 0 in register 15. Any other value in R15 is regarded as indicating unsuccessful termination and the exit subtask is abnormally terminated with User Abend reason code 390-03.

Separate Messages from the NEWS Exit

You may require the exit to communicate with operators to notify them of particular conditions that have been detected.

You can use the exit to generate message text and place its address in a fullword contained in the area addressed by the second fullword of the initialization call parameter list.

A message can be generated following any call to the exit, and its address placed in this fullword. The message must be formatted as follows:

Byte	Description
00:01	Length of message text (excluding these 2 bytes)
02:*nn*	Message text.

The maximum message length is 130 bytes. Excess length is ignored and the message truncated.

NEWS SMF Record Formats

The NEWS SMF exit program (NEWSXSMF) is provided as a sample user exit that receives a copy of every NEWS CNM record and writes each record to the SMF log file.

NEWSXSMF writes data to the SMF log file in the following formats:

- CNM records have a header followed by the CNM record section.
- 4700 Support Facility (TARA) data have a header followed by one or more sections containing statistical information. Such data is sent from 36xx/47xx Finance Communications Systems (FCS) devices and contained in RECFMS type X'04' records.

You must configure NEWSXSMF to indicate which format is to be used, depending on the type of data you want to collect. You can indicate one of the following options:

- Write all CNM records out in the CNM record format.
- Write only TARA data in TARA data format, and ignore all other records.
- Write TARA data in TARA data format, and write all other records in the CNM record format.

For more information about how to configure the NEWSXSMF program, see the comments provided in the program.

The macro $NMSMF defines a DSECT describing the contents of the SMF records.

In the following pages, all field names are those defined in that DSECT. The following pages also describe the various sections that may be present in the NEWS SMF record.

All records contain the header section. The header is followed by one section, or more, depending on whether the data is CNM record data or TARA statistical data.

SMF Header Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNMLEN	SMF record length	Binary
+2	+2	2	SMFNMSEG	Segment descriptor	Binary

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+4	+4	1	SMFNMFLG	System indicator X'3E' for z/OS	Binary
+5	+5	1	SMFNMRTY	SMP record type, set by SYSPARMS SMFID=	Binary
+6	+6	4	SMFNMTME	Time stamp set by SMF in hundredths of a second	EBCDIC
+10	+A	4	SMFNMDTE	Record was moved to the external log buffer on this date. The format is 00YYDDDF where F is the sign	EBCDIC
+14	+E	4	SMFNMSID	System identifier	EBCDIC
+18	+12	1	SMFNMCAT	Record subcategory X'03' for CNM Deliver RU record X'04' for CNM record, not embedded	Binary
+19	+13	1	(Reserved)	X'00'	Binary
+20	+14	12	SMFNMID	NMID value, set by SYSPARMS ID=	EBCDIC
+32	+20	40	(Reserved)	X'00'	Binary
+72	+48	8	SMFNWNCP	Name of the NCP through which the device is connected. Blank, if the name is unknown.	EBCDIC
+80	+50	8	SMFNWLNK	Name of the link through which the device is connected. Blank, if the name is unknown.	EBCDIC
+88	+58	8	SMFNWPU	Name of the PU device. Blank, if the name is unknown.	EBCDIC
+96	+60	8	SMFNWLU	LU name, if applicable. Blank, if name is unknown.	EBCDIC

CNM Record Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+104	+68	Variable	SMFNWRU	The CNM record as it was received by your region	Binary

TARA Header Section

The header section for TARA data contains the following fields, in addition to those in the common SMF Header Section in this appendix.

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+104	+68	8	SMFWKSTA	Installation-defined string	EBCDIC
+112	+70	4	SMFWKSID	Workstation ID, WK*nn,* where *nn* is the workstation number	EBCDIC
+116	+74	Variable	SMFSTATS	Start of statistical information section	-

TARA Data Section

There can be one or more data sections for each SMF record in TARA data format. Each section has the following fields.

Offset Dec. *	Offset Hex. *	Length Bytes	Field Name	Description	Type
n+0	*n*+0	8	SMFTNAME	Installation-defined name to represent the type of information contained in this section	EBCDIC
n+8	*n*+8	3	SMFMIN	Minimum response time value	Binary
n+11	*n*+B	3	SMFMAX	Maximum response time value	Binary
n+14	*n*+E	4	SMFCUM	Total cumulative response time value	Binary
n+18	*n*+12	2	SMFINTV	Number of response time measurements	Binary
n+20	*n*+14	4	SMFRAVG	Average response time (that is, SMFCUM divided by SMFINTV)	Binary

* *n* is the start of the section.

Appendix F: Implementing the NTS User Exit

This section contains the following topics:

NTS User Exit

All session data that has been captured by NTS and queued for output processing is first passed to an installation-supplied user exit, where one exists. Following any exit processing, the session record is returned to NTS and considered for logging on the NTS database.

The user exit can perform any desired processing on the session data and may indicate that the session record is to be ignored by the subsequent NTS logging function.

Sample NTS Exit

A sample NTS user exit named NTSXSMF is provided in source form and can be modified as required. The exit is a member of the *?dsnpref*.NMC0.CC2ASAMP library distributed on the installation tape.

The sample exit is extensively documented and provides an example of an exit that writes, to the System Management Facility (SMF) database, all NTS session data queued for output processing.

This exit takes the record as passed from NTS and inserts the SMF record type of 39. Since SMF fills out the SMF header area for system type records this is all that the exit need do before issuing the SMFWTM macro to write the record to SMF.

The Assembler macro $NMSMF, distributed in the macro library provides mapping for the format of the SMF record generated.

How the NTS Exit Is Called

NTS is initialized when your region starts and a subtask that acts as the driver for the exit is attached. The subtask mainline routines handle communications between the subtask and the NTS components in the main task.

When the subtask is attached, subtask mainline routines do the following:

1. Load the load module specified as the installation-supplied user exit.
2. Call the exit using conventional branching and linking.
3. Pass an initialization parameter list to the exit.

Note: To implement an NTS exit, you must define the exit name in the SAW parameter group. For more information, see the *Installation Guide*.

NTS Exit Execution

Because the user exit executes as part of a subtask, no restrictions are placed on the functions that the exit can perform. This is because the activities of the subtask do not impact the performance of the main task, and the exit subtask runs at a lower dispatching priority than the main task.

However, all processing of NTS session records on the output queue by the main task is delayed by processing occurring in the NTS user exit.

NTS Exit Coding Requirements

This section describes the coding requirements for the NTS exit.

Maintain Registers on Entry to an Exit

You must observe standard linkage conventions on entry to an exit.

On entry, the registers must be saved in the caller's save area, and on exit, restored (except R15, which contains a return code).

On entry, register contents are as follows:

R1	Contains address of a parameter list.
R2-R12	Unpredictable.
R13	Contains address of caller's standard save area.
R14	Caller's return address.
R15	Contains address of entry point of user exit.

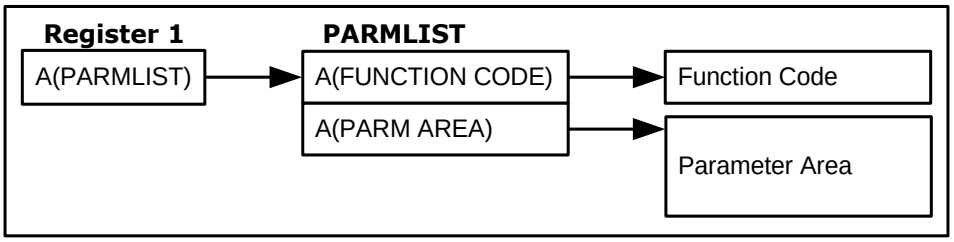
Parameter List Format

The parameter list addressed by Register 1 on entry consists of one or two contiguous fullwords. If there are two fullwords, the first contains the address of another fullword that holds a function code indicating the reason that the exit is being called.

The second fullword of the parameter list is present for function codes 0 and 4 only. The high-order bit of this last (or solitary) fullword is not set; therefore, the length of the parameter list must be determined by examination of the function code as follows:

- For function code 0, the second word of the parameter list contains the address of an area that contains system data that may be of value to the exit in determining its processing options.
- For function code 4, the second word of the parameter list contains the address of the NTS session record being passed to the exit for examination.
- For function code 8, the parameter list contains one word.

The following illustration shows the structure of the NTS user exit parameter list pointers.



Exit Function Codes

The function code contained in a fullword addressed by the first word of the parameter list is a binary value that is right-aligned, with all high-order bits set to zero. The following function codes are used:

- X‘00000000’ = initialization call
- X‘00000004’ = SMF record available
- X‘00000008’ = termination call

Function Code 0

This indicates that the region has just been initialized. Any initialization processing that the exit needs to do, such as opening required data sets, should be done now.

The second word of the parameter list passed to the exit for function code 0, contains the address of an area, formatted as described next.

Byte	Description
00-03	In this fullword, the exit can store the address of a message to log to the activity log and send to Monitor class operators. On return from any call to the exit, this word is checked; if the value is non-zero, it is assumed to be the address of a message.
04-04	Operating system indicator. Value is:
	X’10’ z/OS
05-05	SMF record identifier set by the SYSPARMS SMFID= command.
06-17	System identifier set by the SYSPARMS ID= command.

When processing completes successfully, the exit returns control to the caller with a completion code of 0 in register 15. Any other value in R15 is regarded as indicating that processing was unsuccessful and the exit subtask is terminated abnormally and assigned User Abend reason code 75D-01.

Function Code 4

This indicates that a session record has been placed on the NTS output queue. For this function code only, the second word of the parameter list contains the address of the record passed to the exit.

The session record passed to the exit is formatted as an SMF Type 39 system record. The full record layout is available in the macro DSECT $NMSMF, which is located in the distributed management services macro library.

To map the NTS session record description, code the following:

```
label $NMSMF TYPE=NTS
```

Note that the area after the SMF record header contains variable information relating to the offset and length of those subsections present in the record. As the various data subsections are not always available to NTS, their inclusion is not guaranteed. This means that all access to such data subsections must proceed through the offset and length fields which relate to the subsections that are present. All offsets are from the first byte of the entire area passed (that is, the start of the SMF record header).

Record Subtype Identification

A copy of the session information is passed to the user exit and this data can be modified in any way without affecting subsequent NTS output processing. A halfword field labeled SMFNSUBT in the DSECT macro $NMSMF, and located at an offset of 22 bytes from the start of the record, contains the record subtype. NTS sets this field as follows:

01 The record passed contains RTM data collected for the session and was force-closed by the operator or closed during session awareness termination, but the session had not ended.

02 The record passed is a session end notification for a session that required NTS accounting.

03 The record passed is a session start notification for a session that requires the NTS accounting facility.

04 The record passed was force-closed by the operator, or closed during session awareness termination, but the session had not ended.

05 The record passed contains all data available at session end.

06 The record passed contains notification of a BIND rejection at session initialization.

07 The record passed contains notification of a session initialization failure that occurred before a BIND request was sent.

255 The record passed contains resource-based information. The type of information contained is indicated in the SMFNPSUB field. For more information, see the *Reference Guide*.

The processing performed by the exit on the record received is unrestricted, but it should be noted that exit processing is serialized and no additional NTS session records are processed on the output queue until the exit returns control to NTS.

Return Code Values

When control is returned by the exit, R15 must be set to one of the following (hexadecimal) return codes:

00 Processing complete. NTS continues processing the session record and passes the next record to the exit when it is available.

04 Processing complete. If this is a normal end of session record (record subtype 5) NTS does not log the record, otherwise this return code is treated in the same way as return code 0.

08 Processing complete. NTS processes the record but no further calls are made to the exit.

0C Processing complete. As for return code 04, but no further calls are made to the exit.

Any other value in R15 is regarded as indicating unsuccessful processing and the exit subtask is abnormally terminated and assigned User Abend reason code 75D-02.

Function Code 8

This indicates that your region is terminating. It alerts the exit to perform any cleanup processing required, such as closing data sets. The termination of your region cannot proceed until the exit returns control.

On successful completion of processing, the exit returns control to the caller with a completion code of 0 in register 15. Any other value in R15 is regarded as indicating unsuccessful termination and the exit subtask is abnormally terminated and assigned User Abend reason code 75D-03.

Generate Messages from the NTS Exit

You may want the exit to communicate with operators to notify them of particular conditions that have been detected.

You can use the exit to generate message text and place its address in a fullword contained in the area addressed by the second fullword of the initialization call parameter list.

A message can be generated following any call to the exit, and its address placed in this fullword. The message must be formatted as follows:

Byte	Description
00-01	Length of message text (excluding these 2 bytes)
02-*nn*	Message text.

The maximum message length is 130 bytes. Excess length is ignored and the message truncated.

Appendix G: NTS SMF Record Format

This section contains the following topics:

System Management Facility

Session data and resource statistics captured by NTS are, when queued for output, first passed to an installation defined exit, if one exists. NTS organizes the data passed to the exit into records with a format compatible with that required by the System Management Facility (SMF) database.

The record is composed of a header, plus a number of other sections. Always included, and directly following the header, is the Data Section. It is used to indicate the presence of all other sections, and their location as an offset from the start of the entire SMF record. The presence of the optional sections depend on the type of record being generated, and the information available to NTS at that time.

The macro $NMSMF is distributed with your region. It defines a DSECT describing the contents of the SMF records.

In the following pages all field names are those defined in that DSECT. Following is a description of the various sections that may be present in the NTS SMF record.

NTS SMF Record Description for All Sub-types

All records contain the following sections:

SMF Header Section

This section is present in all standard SMF records. NTS SMF records are recognizable by SMFNMRTY=X'27'(SMF Type 39). Following the standard header is the Type 39 extension providing the product identifier and record sub-type field SMFNSUBT.

Data Section

This section is present in all NTS SMF records and provides a map giving the number and offsets for all other SMF data sections contained in the record.

Product Section

One product section is always present. This section includes the product identifier (NETM), the product version information, and the record sub-type field. This sub-type field, SMFNPSUB, is set to the same value as SMFNSUBT (above) except where SMFNSUBT=X'FF' (Sub-type 255). Sub-type 255 records are NTS defined, and are further sub-divided by the SMFNPSUB field.

NTS SMF Record Sub-type 1 to 7 Description

Session information records (sub-types 1 to 7) contain the following sections only:

Session Configuration Section

One session configuration section may be present, and includes the following:

- The type of session and session start and end times
- The names, types and positions in the network hierarchy of the session partners
- The MAI session user ID if the session is an MAI session and MAI session visibility is enabled

Session Accounting Section

One session accounting section may be present. It provides any accounting data collected for the session.

Session RTM Section

One session RTM section may be present. It provides RTM data that may have been collected for the session.

Explicit Route Section

One explicit route data section may be present. It provides information about explicit routes associated with the subject sessions.

NTS SMF Record Sub-type 255 Description

Resource statistics records (sub-type 255) contain the following sections only:

Resource Configuration Section

One resource configuration section may be present. It includes the following:

- The name, type and position in the network hierarchy of the resource
- Resource availability

Resource Accounting Section

One resource accounting section may be present. It provides accounting statistics that may have been collected for the resource.

Resource RTM Data Section

One session RTM section may be present. It provides RTM data that may have been collected for the resource.

SMF Header Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNMLEN	SMF record length	Binary
+2	+2	2	SMFNMSEG	Segment descriptor	Binary
+4	+4	1	SMFNMFLG	System indicator: X‘3E’ for z/OS	Binary
+5	+5	1	SMFNMRTY	Record type X‘27’	Binary
+6	+6	4	SMFNMTME	Time stamp set by SMF in hundredths of a second	EBCDIC
+10	+A	4	SMFNMDTE	Record was moved to the external log buffer on this date. The format is 00YYDDDF where F is the sign	EBCDIC
+14	+E	4	SMFNMSID	System identifier	EBCDIC
+18	+12	4	SMFNSID	NetMaster subsystem equals “NETM”	EBCDIC

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+22	+16	2	SMFNSUBT	Record Sub-type number: ■ X'01' for session RTM ■ X'02' for session end ■ X'03' for session start ■ X'04' for session acct/avail ■ X'05' for combined ■ X'06' for BIND failure ■ X'07' for INIT failure ■ X'FF' for NTS data	Binary

Data Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	4	SMFNPOFF	Offset to product section	Binary
+4	+4	2	SMFNPLEN	Product section length	Binary
+6	+6	2	SMFNPNUM	Number of product sections	Binary
+8	+8	4	SMFNCOFF	Offset to configuration section	Binary
+12	+C	2	SMFNPLEN	Configuration section length	Binary
+14	+E	2	SMFNCNUM	Number of configuration sections	Binary
+16	+10	4	SMFNEOFF	Offset to explicit route data	Binary
+20	+14	2	SMFNELEN	ER data section length	Binary
+22	+16	2	SMFNENUM	Number of ER data sections	Binary
+24	+18	4	SMFNEOFF	Offset to TRM data section	Binary
+28	+1C	2	SMFNRLEN	RTM data section length	Binary
+30	+1C	2	SMFNRNUM	Number of RTM data sections	Binary
+32	+20	4	SMFNAOFF	Offset to accounting section	Binary
+36	+24	2	SMFNALEN	Accounting section length	Binary

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+38	+26	2	SMFNANUM	Number of accounting sections	Binary

Product Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNPSUB	Record subtype for data same as SMFNSUBT except, where SMFNSUBT= X'FF': ■ X'0001' for Resource Statistics ■ X'0002' for Resource Availability	Binary
+2	+2	2	SMFNPVER	Product version/ release equals X'0041' for MS V6.5.	Binary
+4	+4	4	SMFNPNAM	Product name equals "NETM"	EBCDIC

Session Configuration Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNCONR	Config data revision level equals X'0041' for MS V6.5.	Binary
+2	+2	8	SMFNCPLU	Primary resource name	EBCDIC
+10	+A	8	SMFNCPPU	Primary's controlling PU	EBCDIC
+18	+12	8	SMFNCPLK	Primary's controlling link	EBCDIC
+26	+1A	8	SMFNCPSU	Primary's subarea PU	EBCDIC
+34	+22	8		Reserved	
+42	+2A	8	SMFNCSLU	Secondary resource name	EBCDIC
+50	+32	8	SMFNCSPU	Secondary's controlling PU	EBCDIC

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+58	+3A	8	SMFNCSLK	Secondary's controlling link	EBCDIC
+66	+42	8	SMFNCSSU	Secondary's subarea PU	EBCDIC
+74	+4A	8		Reserved	
+82	+52	8	SMFNCSCL	SAW class name for this session	EBCDIC
+90	+5A	8	SMFNCCOS	COS entry for this session	EBCDIC
+98	+62	2	SMFNCER	ER number for this session	Binary
+100	+64	2	SMFNCRER	Reverse ER number for session	Binary
+102	+66	2	SMFNCVR	VR number for this session	Binary
+104	+68	2	SMFNCTP	Trans pri for this session	Binary
+106	+6A	8	SMFNCCID	Unique VTAM session ID	Binary
+114	+72	1	SMFNCSTY	Session Type: ■ X'01' for LU/LU ■ X'02' for SSCP/LU ■ X'03' for SSCP/PU ■ X'04' for SSCP/SSCP ■ X'05' for LU-LU session through MAI ■ X'06' for APPN CP-CP session	EBCDIC
+115	+73	1	SMFNCXNT	Cross network sess ind (Y/N)	EBCDIC
+116	+74	1	SMFNCUNB	BIND fail/UNBIND reason codes	Binary

Extension of Session Configuration Section

Note: The following extension to the Session Configuration section is provided by NTS but is not usually found in the SMF Type 39 record.

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+117	+75	1	SMFNCATP	APPN transmission priority	Binary
+118	+76	2		Reserved	
+120	+78	8	SMFNCSTM	Session start time	Binary
+128	+80	8	SMFNCETM	Session end time Zero if session not ended.	Binary
+136	+88	8	SMFNCUSR	MAI session user ID Nulls if not an MAI session	EBCDIC
+144	+90	8	SMFNCACO	APPN class of service	EBCDIC
+152	+98	8	SMFCCPP	Control point name of APPN node which owns the PLU	EBCDIC
+160	+A0	8	SMFNCCPS	Control point name of APPN node which owns the SLU	EBCDIC

Note: All time stamps consist of the first 4 bytes of the system clock value, plus a 4-byte signed number being the time zone adjustment value in seconds.

Session Accounting Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNACCR	Accounting data revision level: X'0041' for MS V6.5.	Binary
+2	+2	2		Reserved	
+4	+4	8	SMFNASTM	Start time stamp Period start time for accounting data collection.	Binary
+12	+C	8	SMFNAETM	End time stamp Period end time for accounting data collection.	Binary
+20	+14	4	SMFNAPCP	Pri-Sec control PIUs	Binary
+24	+18	4	SMFNAPCB	Pri-Sec control bytes	Binary
+28	+1C	4	SMFNASCP	Sec-Pri control PIUs	Binary
+32	+20	4	SMFNASCP	Sec-Pri control bytes	Binary
+36	+24	4	SMFNAPTP	Pri-Sec text PIUs	Binary
+24	+18	4	SMFNAPTB	Pri-Sec text bytes	Binary
+28	+1C	4	SMFNASTB	Sec-Pri text PIUs	Binary
+20	+14	4	SMFNASTP	Sec-Pri text bytes	Binary

Session Route Configuration Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNERR	Route element revision level	Binary
+2	+2	2	SMFNETOT	Route element total count	Binary
+4	+4	2	SMFNECNT	Route element present count There can be between 1 and 5 route elements present. Each route element entry occupies 10 bytes formatted as below.	Binary
+0	+0	8	SMFNESNM	Route element subarea name	EBCDIC

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+8	+8	2	SMFNETG	Route element TG outbound	Binary

Session Response Time Measurement Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNRTMR	RTM data revision level X‘0041’ for MS V6.5.	Binary
+2	+2	8	SMFNRSTM	Start time stamp Period start time for RTM data collection.	Binary
+10	+A	8	SMFNRETM	End time stamp Period start time for RTM data collection.	Binary
+18	+12	2	SMFNROPC	RTM objective percentage	Binary
+20	+14	2	SMFNROCT	RTM objective count	Binary
+22	+16	1	SMFNRDEF	RTM Definition	Binary
+23	+17	1	SMFNROOK	RTM Objective met? (Y or N)	EBCDIC
+24	+18	4	SMFNRTCT	RTM Total transaction count	Binary
+28	+1C	4	SMFNRTRT	RTM Total response time	Binary
+32	+20	4 X 4	SMFNRBND	RTM Boundary values	Binary
+48	+30	5 X 4	SMFNRCNT	RTM Boundary counts + Overflow	Binary
+68	+44	4	SMFNROT	RTM Objective Response Time	Binary

Resource Configuration Section

Offset Dec	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNRCR	Config data revision level: X'0041' for MS V6.5.	Binary
+2	+2	1	SMFNRCF1	Resource availability flag: '00' for unavailable '80' for available	Binary
+3	+3	1	SMFNRCTP	Resource Type: X'F3' for LU X'F1' for PU X'FC' for channel link X'F9' for TP link X'F4' for SSCP	EBCDIC
+4	+4	8	SMFNRCNW	Resource network ID	EBCDIC
+12	+C	8	SMFNRCNM	Resource name	EBCDIC
+20	+14	8	SMFNRCSS	Resource owning/adjacent SSCP	EBCDIC
+28	+1C	8	SMFNRCSP	Resource subarea PU name	EBCDIC
+36	+24	8	SMFNRCLN	Resource link name	EBCDIC
+44	+2C	8	SMFNRCPU	Resource PU name	EBCDIC
+52	+34	8		Reserved	
+60	+3C	8	SMFNRCST	Time of reported state change or end of interval time. That is, if SMFNPSUB=1 then this is the interval completion time; if SMFNPSUB=2 this is the time at which the named resource changed state.	Binary

Resource Accounting Section

Offset Dec.	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNRAR	Accounting data revision level: X'0041' for MS V6.5	Binary
+2	+2	2		Reserved	
+4	+4	4	SMFNRAIN	Interval length (in seconds)	Binary
+8	+8	8	SMFNRAST	Interval start time stamp	Binary
+16	+10	8	SMFNRAET	Interval end time stamp	Binary
+24	+18	4	SMFNRASP	PIUs Sent	Binary
+28	+1C	4	SMFNRASB	Bytes sent	Binary
+32	+20	4	SMFNRASR	Response PIUs sent	Binary
+36	+24	4	SMFNRASC	Response byte count sent	Binary
+40	+28	4	SMFNRASN	Negative responses sent	Binary
+44	+2C	2	SMFNRASM	Maximum PIU data count sent	Binary
+46	+2E	2		Reserved	
+48	+30	4	SMFNRARP	PIUs received	Binary
+52	+34	4	SMFNRARB	Bytes received	Binary
+56	+38	4	SMFNRARR	Response PIUs received	Binary
+60	+3C	4	SMFNRARC	Response byte count received	Binary
+64	+40	4	SMFNRARN	Negative responses received	Binary
+68	+44	2	SMFNRARM	Maximum PIU data count received	Binary
+70	+46	2		Reserved	

Resource Response Time Measurement Section

Offset Dec	Offset Hex.	Length Bytes	Field Name	Description	Type
+0	+0	2	SMFNRRR	RTM data revision level: X'0041' for MS V6.5	Binary
+2	+2	8	SMFNRRST	Interval start time stamp	Binary
+10	+A	8	SMFNRRET	Interval end time stamp	Binary
+18	+12	2	SMFNRROP	RTM objective percentage	Binary
+20	+14	2	SMFNRROC	RTM objective count	Binary
+22	+16	1	SMFNRRDF	RTM Definition	Binary
+23	+17	1	SMFNRROK	RTM Objective met? (Y or N)	EBCDIC
+24	+18	4	SMFNRRTR	RTM Total transaction count	Binary
+28	+1C	4	SMFNRRTM	RTM Total response time	Binary
+32	+20	4 X 4	SMFNRRBD	RTM Boundary values	Binary
+48	+30	5 X 4	SMFNRRCT	RTM Boundary counts + Overflow	Binary
+68	+44	4	SMFNRROB	RTM Objective Response Time	Binary
+72	+48	8	SMFNRRCL	RTM Class Name	EBCDIC

Appendix H: NTS SNA Descriptor Table

This section contains the following topics:

Descriptor Tables

SNA hexadecimal codes can be translated to an equivalent SNA description for the NTS trace summary display. You can access these translations by modifying the supplied descriptor tables.

These tables are used for SNA code translation and provide the following:

- Meaningful descriptions associated with data flows
- New RUs and sense codes that you enter in the tables when defining them
- The ability to make site-specific Function Management Headers (FMHs) and LU6.2 FMHs visible on the NTS trace summary display

The member NMNTTABS distributed in the *?dsnpref*.NMC0.CC2ASAMP library contains the tables in their default form. Macros are provided so that you can create new entries as needed.

You can modify, compile, and link the table. The tables are reloaded when you start Session Awareness. This lets you update the tables without restarting your region.

Macro Syntax

The macros provided for the generation of table entries are described in this section.

$NTRUDEF

The $NTRUDEF macro is used to define an RU description.

This macro has the following format:

```
$NTRUDEF        CATEGORY=(FMD|DFC|NC|SC),
                CODE=xxxxxxxx,
                DESC='cccccccccccccc'
```

FMD

Specifies the function management data.

DFC

Specifies data flow control.

NC

Specifies network control.

SC

Specifies session control.

xxxxxxxx

Specifies a hexadecimal string of up to 8 hexadecimal digits in length.

cccccccccccccc

Specifies a character string of up to 15 characters in length.

Note: All definitions in the same category must be grouped together.

Example:

```
$NTRUDEF CATEGORY=SC,CODE=31,DESC='BIND'
```

$NTSCDEF

The $NTSCDEF macro is used to define a sense code description.

This macro has the following format:

```
$NTSCDEF        CATEGORY=(00|08|10|40|80),
                SENSE=xx,
                DESC='ccccccccccccccc'
```

xx

Specifies a hexadecimal string two characters in length.

ccccccccccccccc

Specifies a character string of up to 38 characters in length.

Notes:

- All definitions in the same category must be grouped together.
- Definitions in the same category must be in ascending SENSE order.

Example

```
$NTSCDEF CATEGORY=10,SENSE=03,DESC='FUNCTION NOT SUPPORTED'
```

$NTFMHDF

The $NTFMHDF macro is used to define a function management header description.

This macro has the following format:

```
$NTFMHDF FMH=xx,DESC='ccccccccccccccc'
```

xx

Specifies a hexadecimal string two characters in length.

ccccccccccccccc

Specifies a character string of up to 15 characters in length.

Example

```
$NTFMHDF FMH=12,DESC='FMH-12'
```

Table Formats

The member NMNTTABS in the *?dsnpref*.NMC0.CC2ASAMP library contains the tables in their default source form. All macros of a type are grouped together to form a table. In the case of the RU tables all RUs of the same category are grouped together to form sub-tables. Sense codes must be in ascending code sequence. Compile-time error messages (see page 318) are generated if you do not adhere to these guidelines.

Macro Compile Errors

Incorrect use of the macros provided generates the following errors:

$NTRUDEF

- MACRO CALLS OUT OF SEQUENCE
- INVALID CATEGORY SPECIFIED
- DESCRIPTION LENGTH EXCEEDS 15 CHARACTERS
- RUCODE LENGTH EXCEEDS 8 HEX DIGITS
- RUCODES CONSIST OF HEX DIGITS ONLY
- RUCODE APPEARS UNDER INCORRECT CATEGORY

$NTSCDEF

- MACRO CALLS OUT OF SEQUENCE
- INVALID CATEGORY SPECIFIED
- DESCRIPTION LENGTH EXCEEDS 38 CHARACTERS
- SENSE CODE LENGTH EXCEEDS 2 HEX DIGITS
- SENSE CODES CONSIST OF HEX DIGITS ONLY
- SENSE CODES MUST BE IN ASCENDING SEQUENCE

$NTFMHDF

- MACRO CALLS OUT OF SEQUENCE
- DESCRIPTION LENGTH EXCEEDS 15 CHARACTERS
- FMH CODE LENGTH EXCEEDS 2 HEX DIGITS
- FMH CODES CONSIST OF HEX DIGITS ONLY

Table Modification Procedure

To modify the table, you can create an SMP/E ++USERMOD to record and control the changes. Alternatively, you can copy the distributed member to the region's TESTEXEC data set for modification.

To modify and implement changes to the table

1. In an SMP maintained system, create a USERMOD using SMPCNTL and SMPPTFIN statements as shown in the following example, and SMP receive and apply it.

   When maintenance is applied to the system that affects NMNTTABS, you are advised through the SMP Regression Report, and you can review your modifications and reapply the USERMOD.

2. Alternatively, copy *dsnpref*.NMC0.CC2ASAMP(NMNTTABS) to another data set (for example, the *dsnpref*.*rname*.TESTEXEC library), and make the required modifications. Leave the original member intact in case of problems and for any regular maintenance.

3. If you want to compile and link NMNTTABS outside SMP, use the supplied sample JCL that is in the *dsnpref*.NMC0.CAIJCL(NTSASM) member.

4. Stop and restart session awareness by using the SAW parameter group.

Example: SMP USERMOD

```
//SMP1.TESTEXEC DD DISP=SHR,DSN=dsnpref.rname.TESTEXEC
//SMP1.SMPCNTL  DD *
 SET BDY(GLOBAL) .
 RECEIVE S(NTSUMOD) .
 SET BDY(CAIT66) OPTIONS(CAI) .
 APPLY S(NTSUMOD) REDO RC(RECEIVE=13) .
/*
//SMP1.SMPPTFIN DD *
++USERMOD(NTSUMOD) .
++VER(Z038) FMID(CC2D660) .
++SRC(NMNTTABS) DISTLIB(CC2ASAMP) TXLIB(TESTEXEC) SYSLIB(CC2DLOAD) .
/*
```

Appendix I: NTS Storage Estimates

This section contains the following topics:

Active Session Data

All active session data which has been captured by NTS is kept in main memory. This storage is above the 16 MB line. The actual amount of storage required for any given network configuration varies depending upon the NTS processing options. As a guide, the following scenario may be useful.

Example

Consider an NTS region operating in a single VTAM domain that contains 500 terminals, of which 400 are continually in session with one of several applications.

- If all active sessions (that is the 400 LU-LU sessions, 500 SSCP-LU sessions, plus a handful of SSCP-PU sessions) are to be kept by NTS, the storage requirement would be approximately 350K.
- By keeping LU-LU sessions only, this is reduced to about 180K.
- Gathering accounting data takes no extra storage.
- To collect RTM data for all 400 LU-LU sessions would require an extra 40K.
- If the default trace queue limits were used, and trace data collected for every LU-LU session, then this could reach a requirement of up to an extra 700K. However, it is not usual for all sessions to be concurrently holding the maximum number of trace PIUs in storage. New sessions take some time to reach this wrap level, while for ended sessions, the trace data is logged then purged from storage.

When Using NTS-SI

If your NTS region is configured to receive session awareness data through NTS Single Image, this must be considered when calculating the storage requirements of NTS. The local NTS receives session awareness from the remote NTS and maintain this data in storage. This data includes SSCP-SSCP, SSCP-PU, SSCP-LU and LU-LU session data. Session data (trace, RTM, and accounting) is solicited from the remote NTS when requested and is discarded when the data is not being viewed.

NTS Database

The space requirements of the NTS database vary according to the amount of data collected and logged. To store a single session incidence for a session name pair requires approximately 800 bytes. Each additional session incidence requires an extra amount of approximately 350 bytes. Further requirements are an extra 128 bytes for each record of session accounting or RTM data, and around 1200 bytes if trace data is logged (assuming the default trace queue depths are used).

Hence, for the default session keep count of 10 session incidence records per session name pair, the total database space requirement per session name pair is as follows (approximately):

- 4KB when no additional session data is logged
- 6.6KB when all accounting and RTM data is logged
- 18KB when all trace data is additionally logged

Extrapolating further, with a 500-terminal network in which up to six different applications can be used by all terminals, this translates to an overall database storage requirement of the following (approximately):

- 10 MB when no additional session data is logged
- 18 MB when all accounting and RTM data is logged
- 50 MB when all trace data is additionally logged

Follow the sizing formula and calculate a primary space allocation. Allow an additional 25% primary allocation for growth, and provide a 5% secondary allocation and index allocation. For example, if the calculation indicates that the data requires 80 cylinders, use CYLS(100 5) for the data allocation and CYLS(5 1) for the index allocation.

Note: These figures are intended as a guide only for the initial implementation, as in operation many changing factors can affect the amount of data stored in the NTS database.

NTS Database Management Strategy

CA NetMaster uses the NTSLOG database in a slot-managed fashion. This means that as session instances are logged, space is reserved for the records for that session combination. The data set grows as CI/CA splits occur. Eventually, as all combinations to be recorded occur for the site, the database stabilizes. When this occurs, the NTSLOG mirrors the needs of the NTS session logging options in terms of session pairs and number of session instances.

When the NTSLOG data set has grown and stabilized, perform a reorganization. This once only cleanup removes all of the splits and reclaims any split CAs not used. The new define can have a more exact space allocation (reducing multiple extents). It must retain the minimal free space specifications. Also, if a VSAM analyser is available, analyse the data set (particularly the index) and determine an optimal index CI size based on data CI/CA size, average record length, and key compression statistics. CI size changes must be reflected in the region's LSR pool definitions.

Ensure that you avoid the following:

- Large free space percentage allocation
- Frequent reorganization
- Using NTSDBMOD followed by a reorganization (unless session recording options have reduced the recording requirements).
- VSAM choosing CI sizes

Appendix J: Health Checks

This section contains the following topics:

CA Health Checker

The CA Health Checker provides a simple and consistent method for CA products to create health checks to run under the IBM Health Checker for z/OS. The IBM Health Checker for z/OS helps you identify potential problems in your z/OS environment by checking system or product parameters and system status against recommended settings. CA NetMaster NM for SNA health checks are automatically activated on the target system when the product is started on a system with IBM Health Checker for z/OS installed and configured.

The CHECK_OWNER for all CA NetMaster NM for SNA health checks is CA_NM.

Use either CA SYSVIEW or SDSF Health Checker displays to list and view the checks. View messages generated by CA health checks in the MVS System Log.

NM_ACB

Description

Checks that the region's primary ACB is open. This check runs every 5 minutes.

Best Practice

VTAM is required to access the 3270 interface. If you primarily use the WebCenter interface to access you region, you can lower the priority of this health check.

Parameters accepted

None.

Debug Support

No.

Verbose Support

No.

Reference

None.

Non-exception Messages

The following messages can appear in health checker:

- This region's primary ACB, *acbname*, is open.
- The region is shutting down. Check is not relevant at this time.

Exception Messages

If an exception occurs, the following messages are issued as WTOs and written to the SYSLOG:

- CAH0001E The check timed out while waiting for a response to a command.
- NMH0106E This region's primary ACB, *acbname*, is not open.

NM_INITIALIZATION

Description

Checks region initialization. The check runs once at region startup. If an exception occurs, the check repeats every 5 minutes until initialization is successful.

Best Practice

Follow the Install Utility procedures in the *Installation Guide* to set up your region, and ensure that the parameters are specified correctly.

Parameters Accepted

None.

Debug Support

No.

Verbose Support

No.

Reference

See the online help for region parameter groups.

Non-exception Messages

The following messages can appear in health checker:

- The region has initialized successfully.
- The region is initializing. Check is not relevant at this time.
- The region is shutting down. Check is not relevant at this time

Exception Messages

If an exception occurs, the following messages are issued as WTOs and written to the SYSLOG:

- CAH0001E The check timed out while waiting for a response to a command.
- NMH0104E Initialization errors have occurred in region *regionname*.

NM_SOCKETS

Description

Checks that the sockets are available to support the web interface. The check runs every 15 minutes.

Best Practice

To help ensure IP connections, the connection's port number must be specified and not in use by another task.

Parameters Accepted

None.

Debug Support

No.

Verbose Support

No.

Reference

None.

Non-exception Messages

The following messages can appear in health checker:

- Sockets are configured and active. HTTP port is *nnnn* URL is http://*nnn.nnn.nnn.nnn:nnnn*
- The region is initializing. Check is not relevant at this time.
- The region is shutting down. Check is not relevant at this time

Exception Messages

If an exception occurs, the following messages are issued as WTOs and written to the SYSLOG:

- CAH0001E The check timed out while waiting for a response to a command.
- NMH0110E TCP/IP interface is not active, status is *cccccccc*.
- NMH0111E No port number has been specified for this region.

NM_SSI

Description

Checks that the SOLVE SSI SSID is defined and connected. The check runs every 15 minutes.

Best Practice

Ensure that the following conditions are met:

- The SOLVE SSI started task is active.
- The region's SOLVE SSI SSID the value matches the SSID= parameter for the SOLVE SSI started task.
- The SOLVE SSI SSID and the AOM SSID are different.

Parameters Accepted

None.

Debug Support

No.

Verbose Support

No.

Reference

None.

Non-exception Messages

The following messages can appear in health checker:

- SOLVE SSI SSID correctly defined and connected. SSID is *ssidname*.
- The region is initializing. Check is not relevant at this time.
- The region is shutting down. Check is not relevant at this time.

Exception Messages

If an exception occurs, the following messages are issued as WTOs and written to the SYSLOG:

- CAH0001E The check timed out while waiting for a response to a command.
- NMH0108E SSID error, no SSID specified.
- NMH0108E SSID error, *ssidname* is not connected.
- NMH0108E SSID error, SSID matches AOM SSID(*ssidname*).

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