ERICSSON

Interception Management System

CELLNET Drop 2

Course Objectives:

After this course, participants will be able to:

- Understand the Interception Concept
- Understand the Remote Control Equipment Subsystem functions
- Overview of XMATE Platform - WIOZ Tool and Transaction Log Tool
- Use the IMS platform functions to:
  I. Initiate a warrant
  II. Audit a warrant
  III. Monitor a warrant
  IV. Terminate a warrant

Course Objectives:

After this course, participants will be able to:

- To manage the directory structure and files
- To manage the security and access control / authorisation
- To have an overview of the Monitoing Tool
- To administer the IMS transmission process
- To administer the IMS database
- To manage the IMS backup and recovery
- To have an overview of system upgrade procedure
- To manage Third Party Software Components

Table of Contents

Table of Contents

1. Overview

Module Objectives

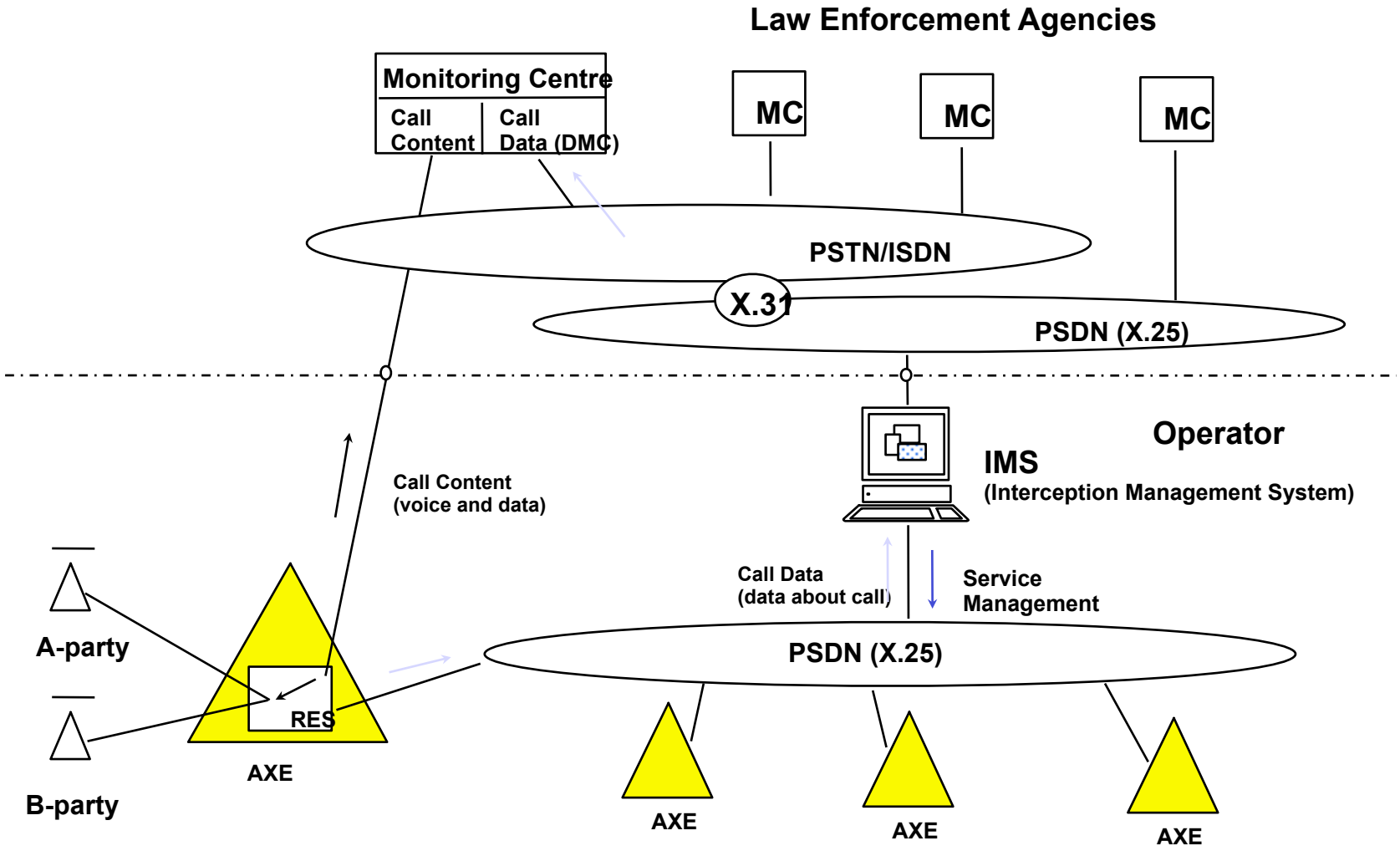
Be able to explain:

- Intercept Concept
- IMS Architecture Platform
- IMS Application and Relationship

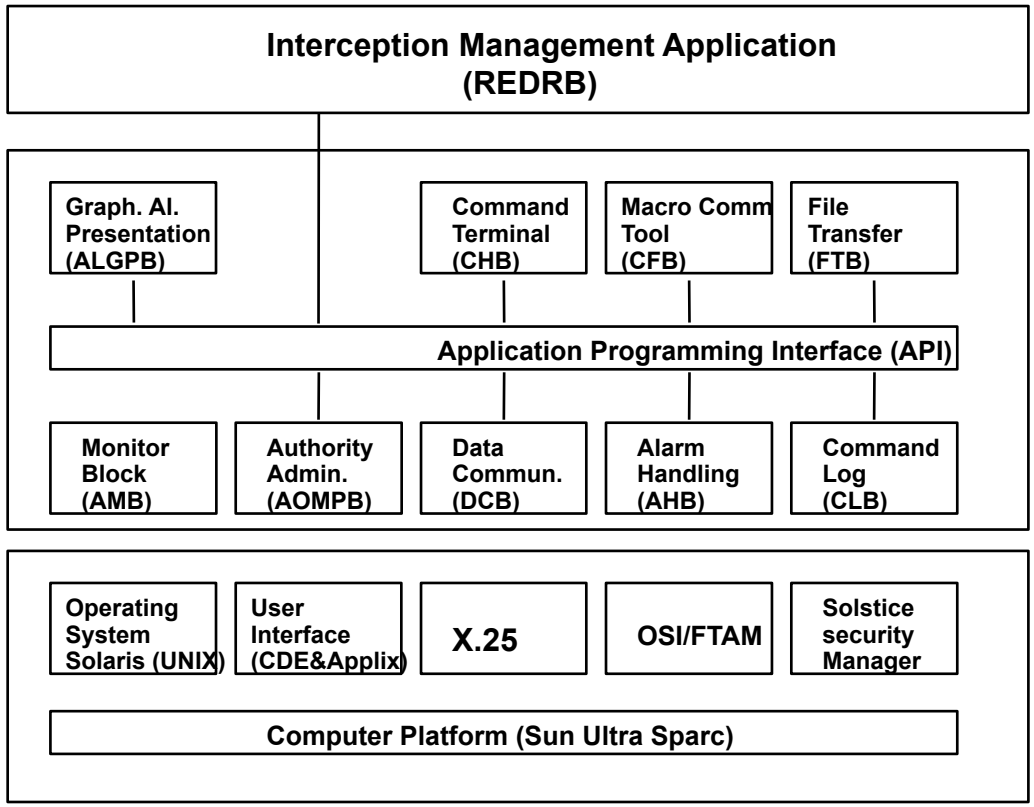
1.1 IMS General Functions

- Server Functions
  Sending of commands to the Network Element
- Operator Functions
  Management of the interception service performed by an IMS operator
- Administration Functions
  Configure & maintain the application

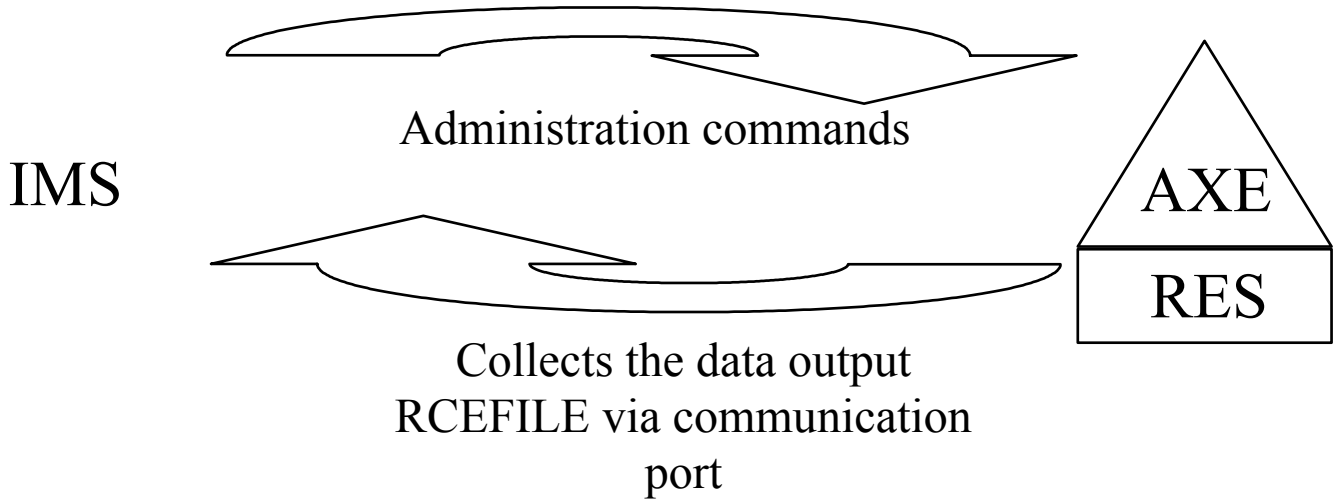
1.2 Interception Concept



1.3 IMS Architecture Platform



1.4 Network Interface Communication



1.5 Communication to AXE
Link supervision

OMC

Supervision based on the heart-beat reception from AXE (1 min)

IMS

Supervision based on the time scheduled polling from IMS (defined by Administrator, recommended 5-10 min)

Includes supervision of:

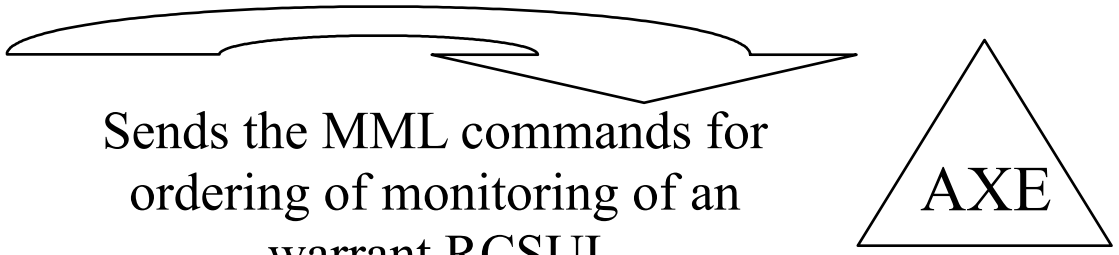
- Data Communication Server (DCS)
- Physical connection to the data network (IMS connection)
- Physical connection of AXE to the data network

1.6 Warrant Handling
Characteristics

- Warrant Activation/deactivation
- Warrant subscription monitoring (Audit, reload related update)
- Checking Monitoring number operational status
- Security access control
- Event logging
- Security input of the interception sensitive information

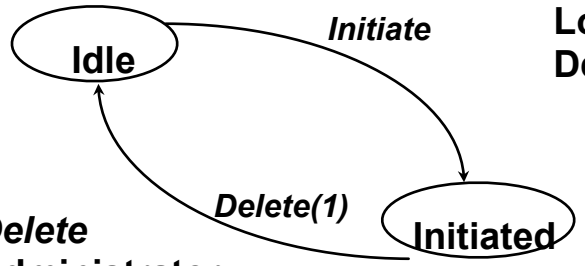
1.7 Broadcast Ordering

Activation



Deactivation

1.8 Warrant Handling
Initiate State machine model

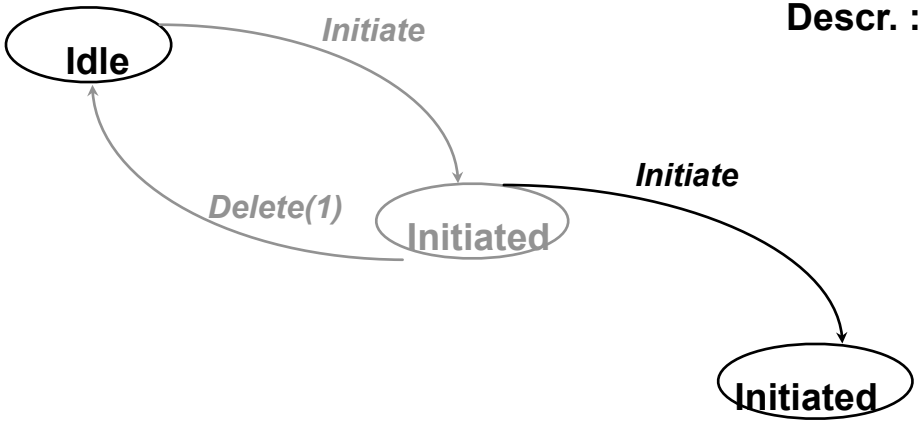


Action: *Initiate*
Actor : Operator
Tool : Warrant Init.
Log : Yes
Descr. : Warrant initiated in the IMS DB but not in the network

Action: *Delete*
Actor : Administrator
Tool : DB Admin
Log : Yes
Descr. :

(1) Deletion of the warrant in the IMS DB. No warrant in the network

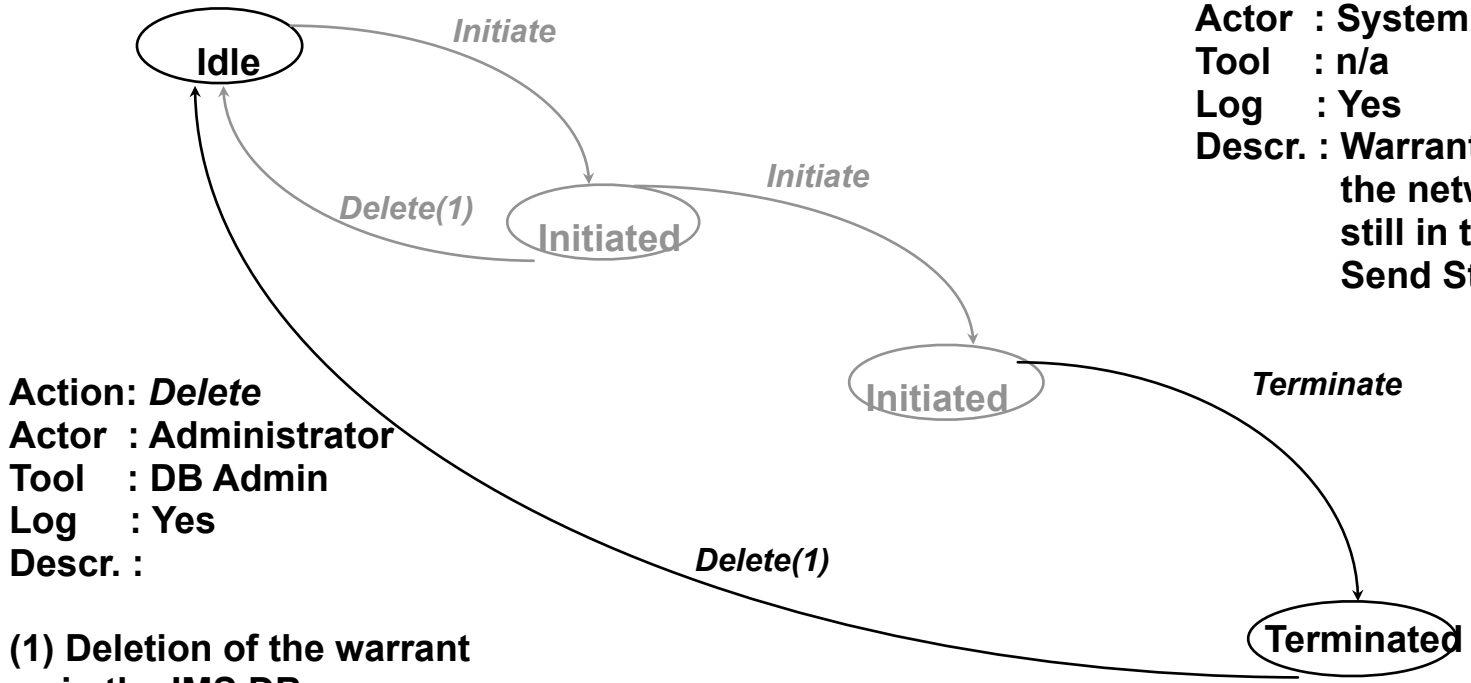
1.8 Warrant Handling
Initiate State machine model



Action: *Initiate*
Actor : System (automatic)
Tool : n/a
Log : Yes
Descr. : Warrant initiated in the IMS DB and in the network. Send Start Data Record. Increment respective warrant statistic counter

1.8 Warrant Handling

Terminate State machine model



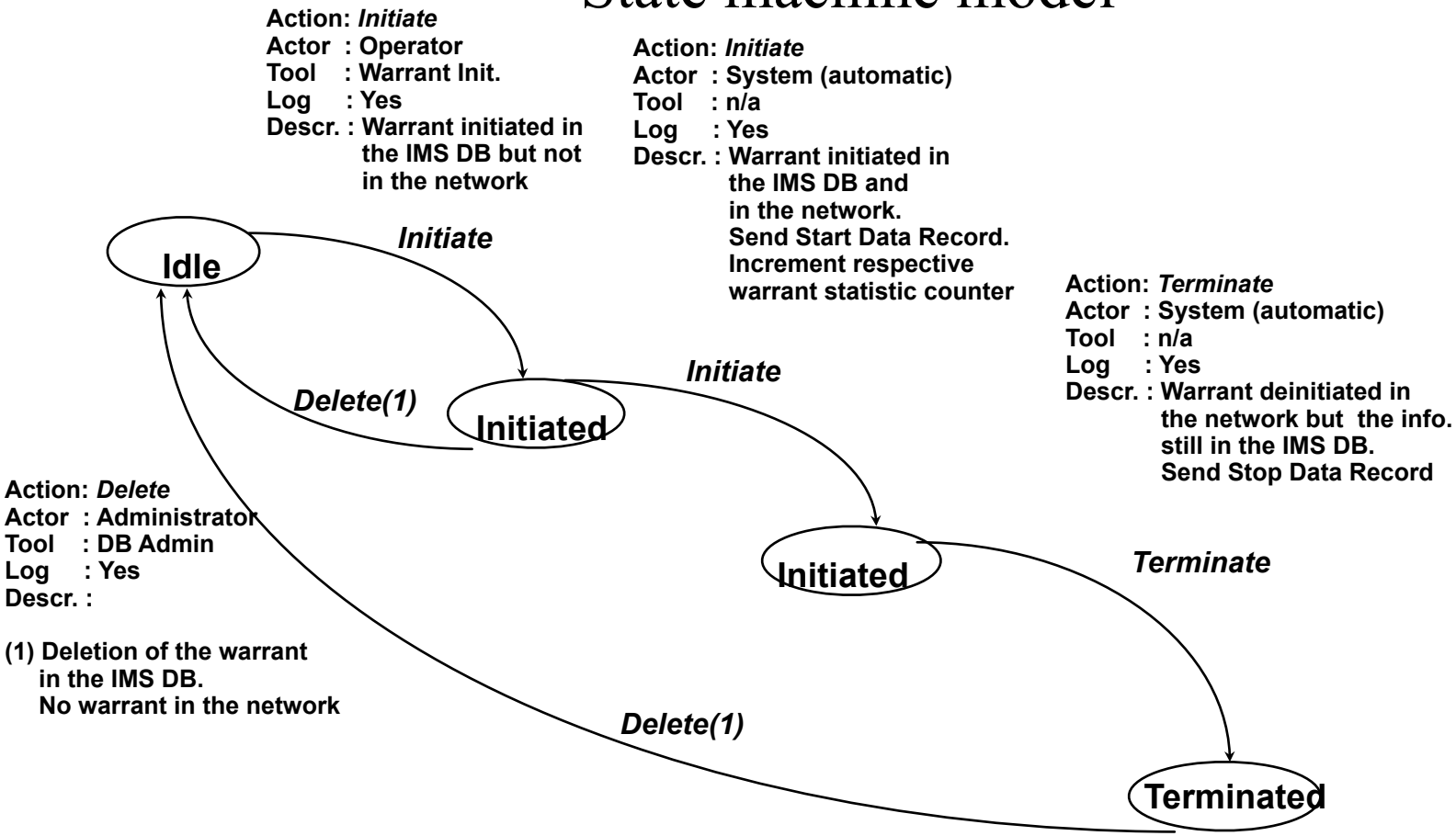
Action: *Terminate*
Actor : System (automatic)
Tool : n/a
Log : Yes
Descr. : Warrant deinitiated in the network but the info. still in the IMS DB. Send Stop Data Record

Action: *Delete*
Actor : Administrator
Tool : DB Admin
Log : Yes
Descr. :

(1) Deletion of the warrant in the IMS DB. No warrant in the network

1.8 Warrant Handling

State machine model



1.9 Grouping of Network Element

- NE can be grouped according to characteristics like location, and type of services
- A NE can be member of multiple groups
- Benefit of grouping NE:
  - time saving when updating, upgrading and maintaining
  - centralize the controlling function

2. Remote Control Equipment Subsystem

Module Objectives

Be able to:

- Use the AXE MML commands

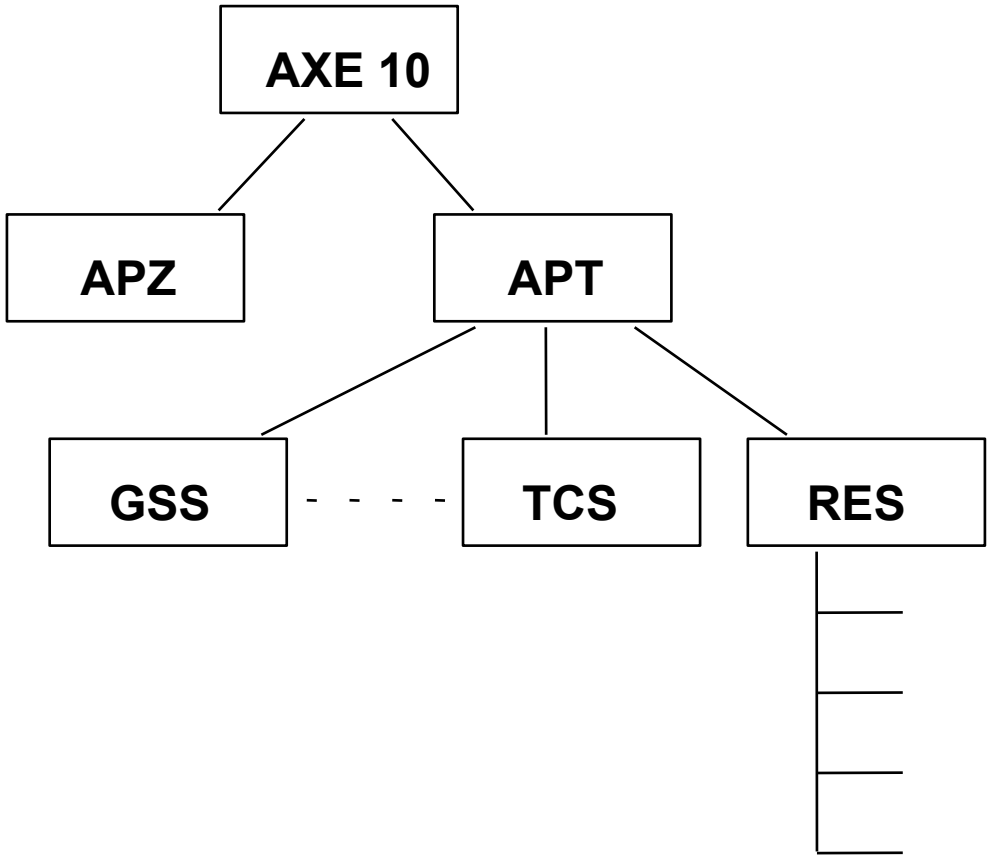
2.1 Remote Control Equipment Subsystem

- The content of the call can be speech or data
- Both calls to & from a target subscriber can be monitored

2.1 Remote Control Equipment Subsystem Implementation

- IMS functions are implemented as a function block (REDRB) on the XMATE system application platform.
- Communication with the external system is provided via DCB
- DCB provides a gateway function between the internal network based on TCP/IP protocol & external communication networks based on the X. 25 protocol

2.2 Remote Control Equipment Subsystem



2.3 Useful RES Commands

Here are some sample RES commands:

- **RCSUI for initiating of a monitoring**
  Parameters: MONB, MCNB, CTYPE, RCE, CUG, NI, SUPPRESS and MUID
- **RCSUE for ending of a monitoring**
  Parameters: MONB, MUID
- **RCSUP for printing defined data**
  Parameters: MONB, MUID

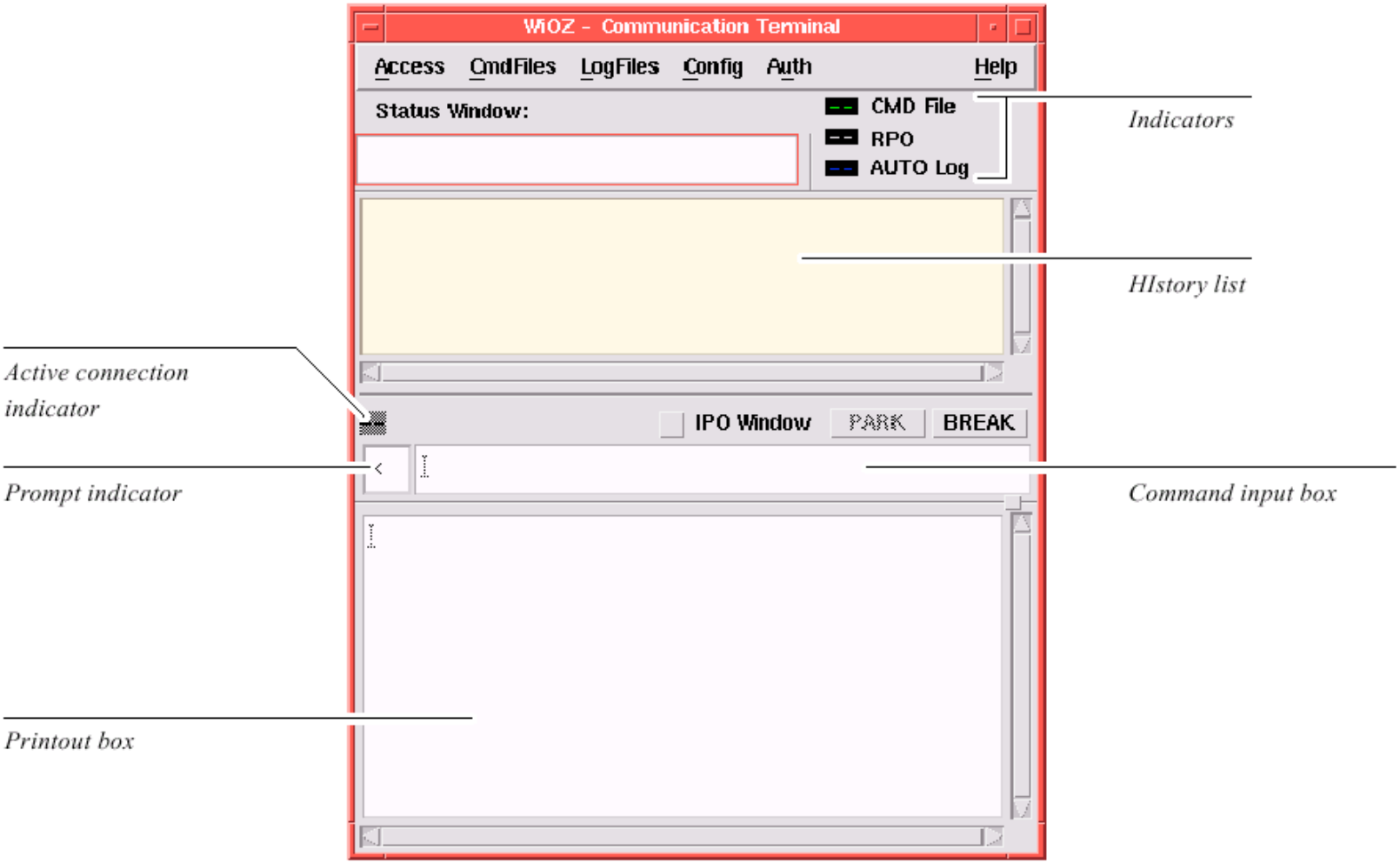
3. Overview of XMATE Platform

Module Objectives

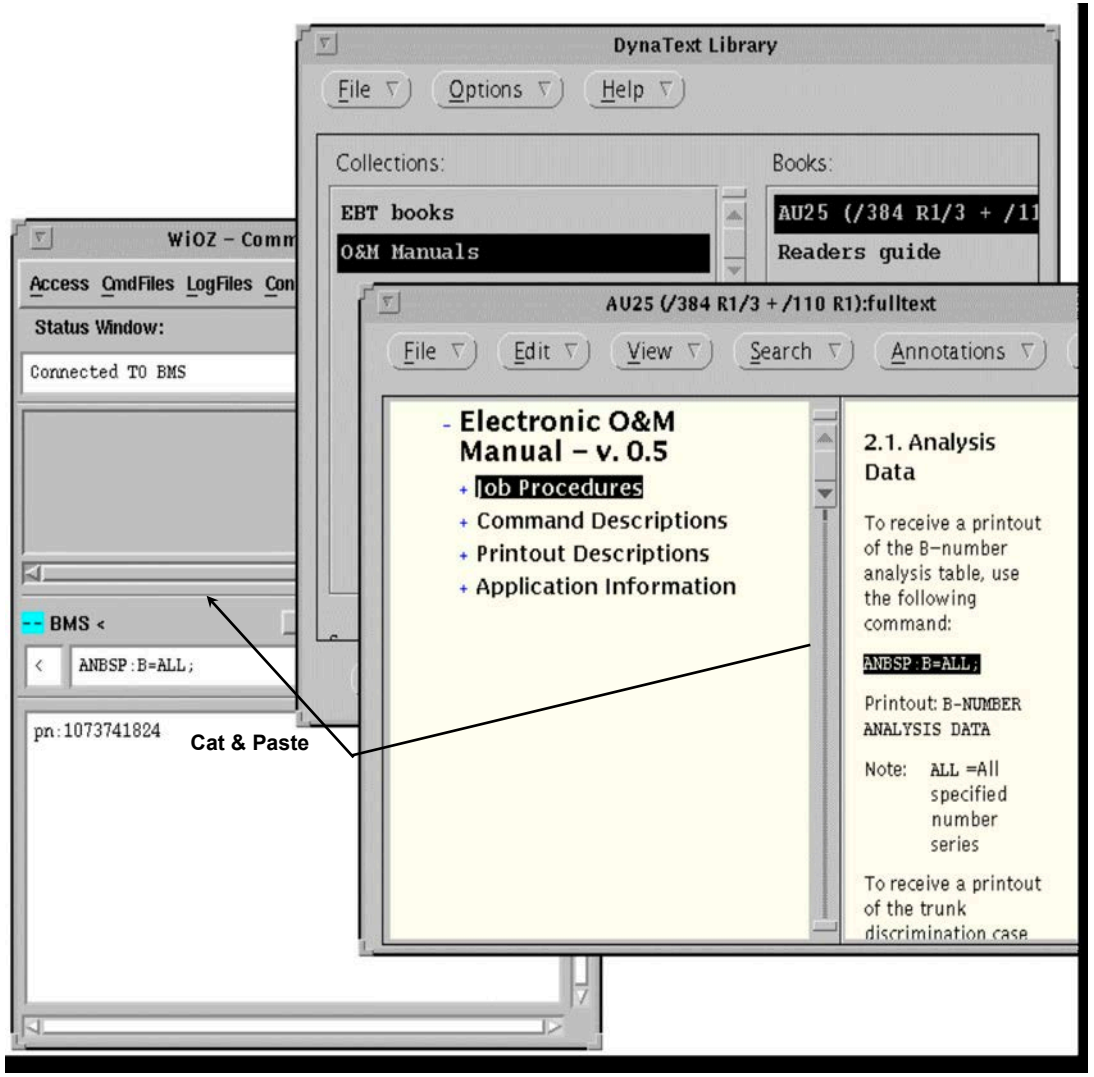
Be able to operate:

- WIOZ Tool
  Man Machine Language (MML) Command Terminal Tool
- Transaction Log Tool

3.1 Man Machine Language Command (MML) Terminal Tool



3.2 MML Terminal Tool Interaction with the electronic manual



Supports:

- Automatic log of commands and responses (Autolog)
- Authority and access control
- Dangerous command notification
- Command log
- Support for the remote FC

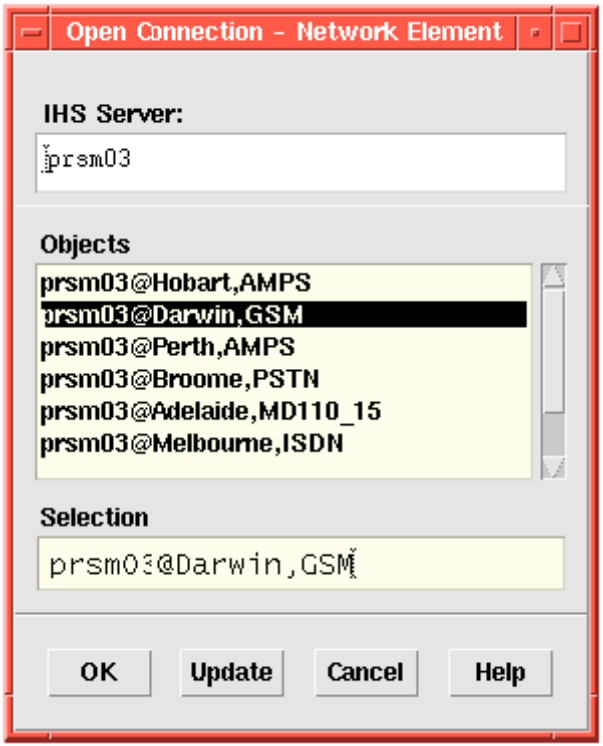
3.3 Setting up user preferences

- The system administrator may set up various standard preferences when installing XMATE which you may wish to change to suit yourself.

3.4 Connecting to a network element

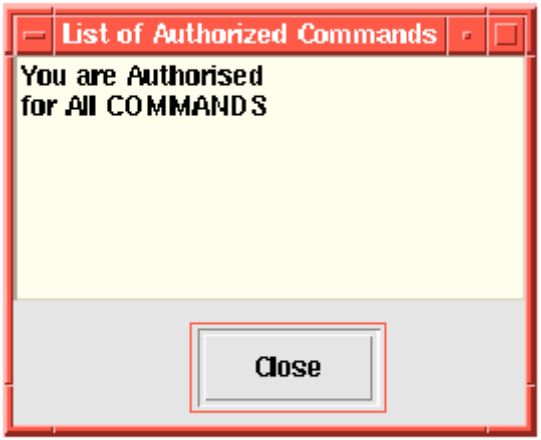
- You can only connect a WiOZ Communication Tool session to a single network element at a time.
- WiOZ Communication Tool session may connect to any network element via a DCS gateway running on any host on you local area network.
- The DCS gateway handles the external connection to remote network elements.
- If you need to connect to several elements, launch additional sessions.

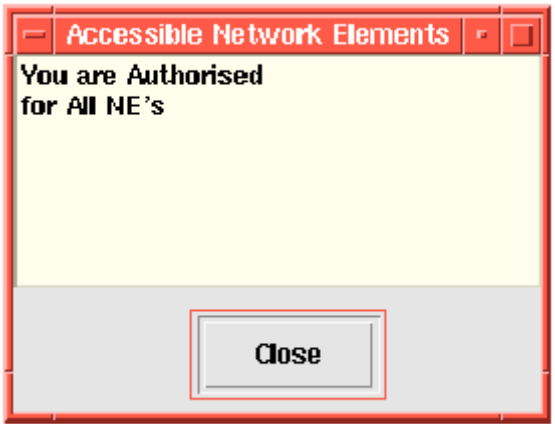
3.5 To open a connection to a network element



3.6 To view your authorisation settings

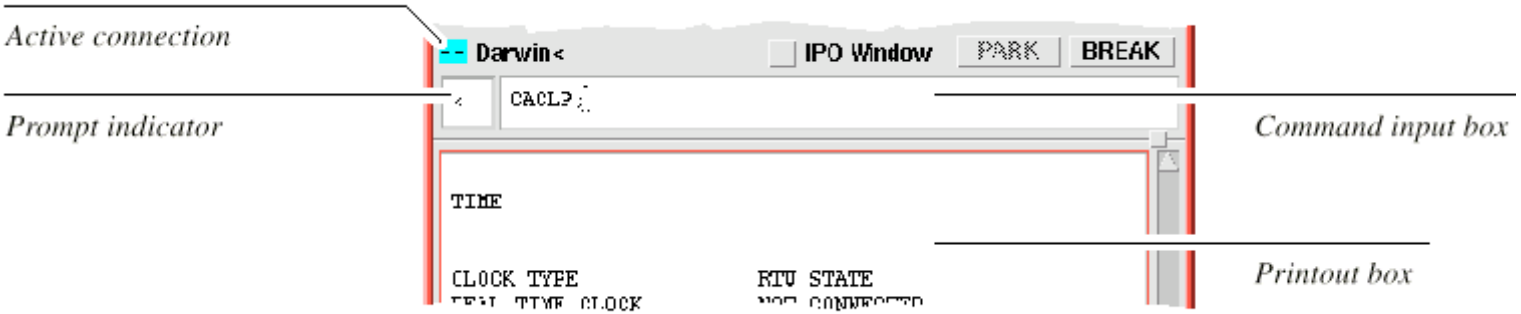
- The system administrator sets up your user authorisation file so that you can only connect to particular network elements and send them particular commands. You can view permitted network elements and commands.





3.7 Sending commands to network elements

- You send all commands to a network element from the command input box.
- The network element returns all responses – whether immediate printout (IPO) or delayed result printout (RPO) – to the printout box.



3.8 To edit and re-send a command sent previously

- Find the command in the history list and click it only *once*. The command copies to the command input box.
- Edit the command as required and press Return to send it. When the IPO Window button is visible, an immediate response appears in the printout box. The command also appends to the history list regardless if any changes have been made.

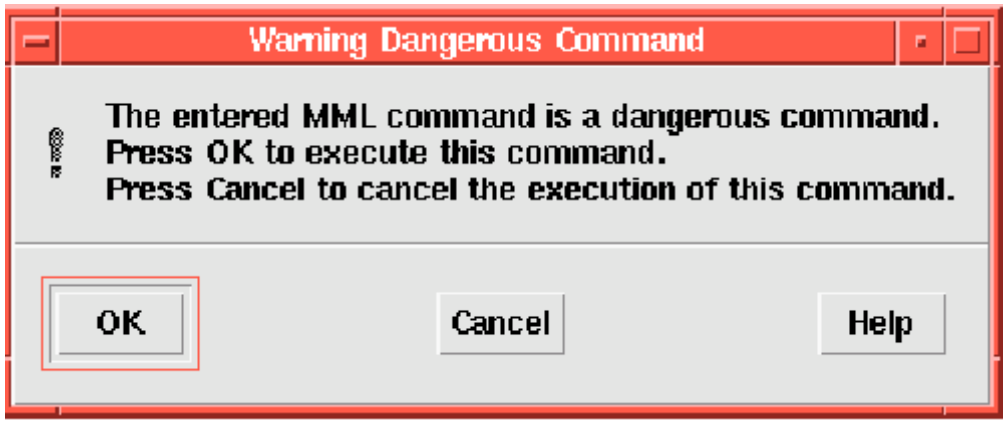
3.9 To immediately re-send a command sent previously

- Find the command in the history list and double-click it.
- WiOZ Communication Tool sends the command immediately without copying it to the command input box. When the IPO Window button is visible, an immediate response appears in the printout box. The command does *not* append to the history list compare with ‘To edit and resend a command sent previously’ above.

3.10 Entry Commands and Sub Commands

- Entry command is a command which establishes a session with the specified Support Processor Group (SPG) for various sub-system.
- It enables the operator to subsequently enter sub-commands which are executed in the SPG.

3.11 Dangerous commands



3.10 To step through a command file – *in sequence*

- You must create command files before you can send any to a network element – see.
- This method only lets you send commands in strict sequence from first to last. And you can only see one command at a time.

3.11 To step through a command file – *out of sequence*

- You must create command files before you can send any to a network element.
- This method lets you see all the commands in a command file before you begin sending them.
- You can also send them in any order.

3.12 Handling the output from network elements

- If the IPO window is currently being displayed, the RPO indicator at the top right will illuminate when WiOZ Communication Tool receives a result printout (RPO).
- You can then switch the printout box to view the contents of the RPO.

3.13 To view either immediate or result printouts (IPO or RPO)

- Click the IPO Window button in the WiOZ – Communication Terminal window.
- The button changes to ‘RPO Window’ and the printout box displays the delayed RPO buffer.
- Click the RPO Window button in the WiOZ – Communication Terminal window.
- The button changes to ‘IPO Window’ and the printout box displays the IPO buffer.

3.14 To end a lengthy printout prematurely

- Acknowledgement responses in the immediate printout (IPO) buffer are usually short.
- Result printouts (RPO) can be lengthy and you may wish to cut them short.
- Click the Break button in the WiOZ – Communication Terminal window.
- The response in the printout box ends immediately when viewing either the IPO or
- RPO buffer.

3.15 To save all or part of session printouts to log files

- You may save all or part of the printout box to a log file.
- You can save only the immediate printout (IPO) or only the Result printout (RPO), or you have been switching auto logging on and off, and need to save the entire session.

3.16 To delete the contents of the printout box

- You may want to start with a clean printout box, especially if you wish to save a record of a new session of commands and responses.
- Right-click in the printout box and choose the Clear Window menu option.

3.17 Working with the history list

- When you send a man-machine language (MML) command to a network element, WiOZ Communication Tool appends the command to the history list.
- As you send commands, WiOZ Communication Tool appends them to the top of the history list box, that is, the earliest command is at the bottom and the latest at the top. The line numbers show you the order and help you keep track when resending commands.
- When you save the history list to a command file, the file is ordered as you would expect – earliest commands at the beginning and latest commands at the end.

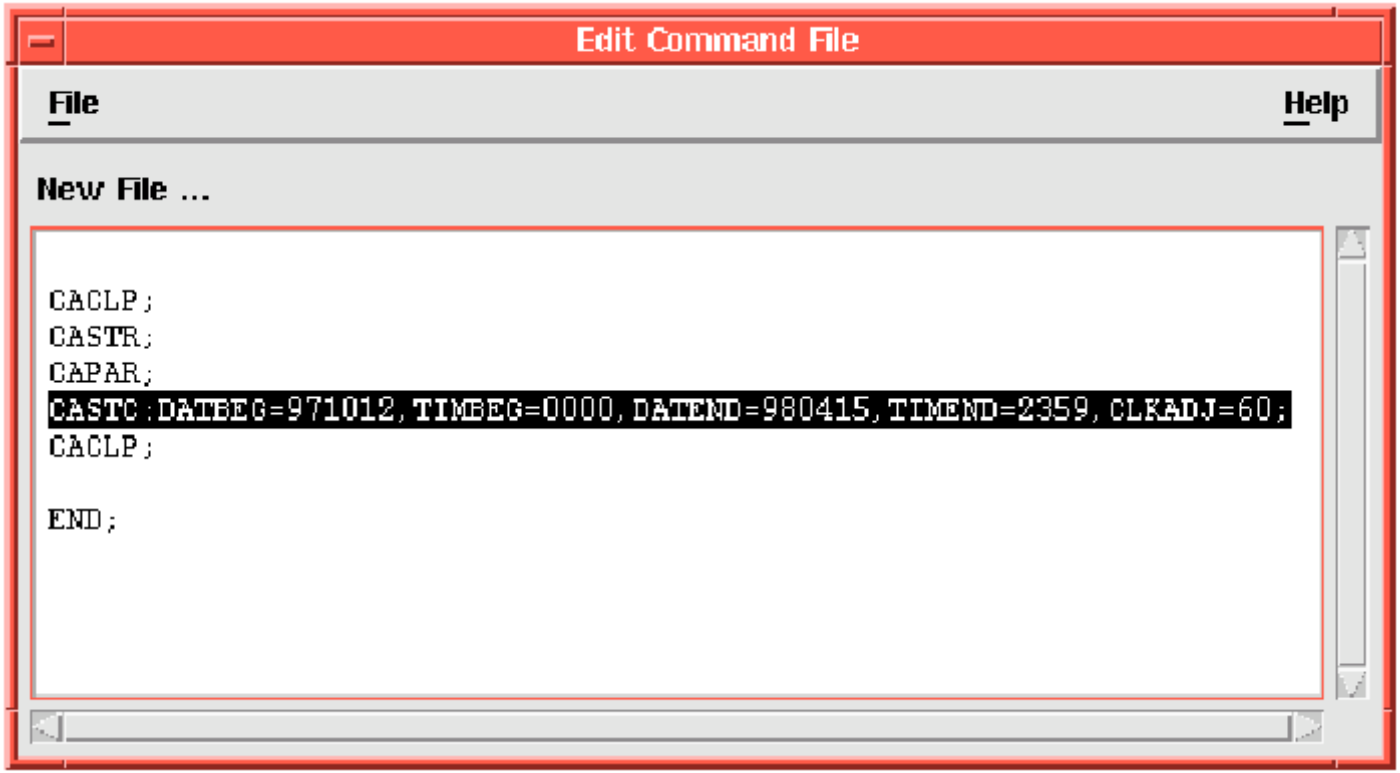
3.18 Working with command files

- Command files consist of a series of man-machine language (MML) statements, one to a line, in the same syntax as you would type them in the command input box.
- In a command file, the first command to execute is at the ‘top’ or beginning of the file and the last to execute is at the ‘bottom’ or end.
- When you open a command file in the history list, WiOZ Communication Tool reverses the displayed order.
- The line numbers tell you which are earlier or later. Keep these differences in mind when you are creating and editing command files.

3.19 To save the history list to a command file

- Right-click in the history list and choose the Save To CmdFile menu option.
  The **File Selection Box dialogue** opens at the default directory for command files.
  You may navigate to a different directory if you wish.
- Type the name for the new command file and click OK.

3.20 To create new command files



3.21 To edit command files

- A command file is just an ordinary ASCII text file. So you may prefer another editor, such as Text Editor. Or you may use a traditional UNIX editor, such as `vi` or `emacs`.

3.22 To open or import existing command files

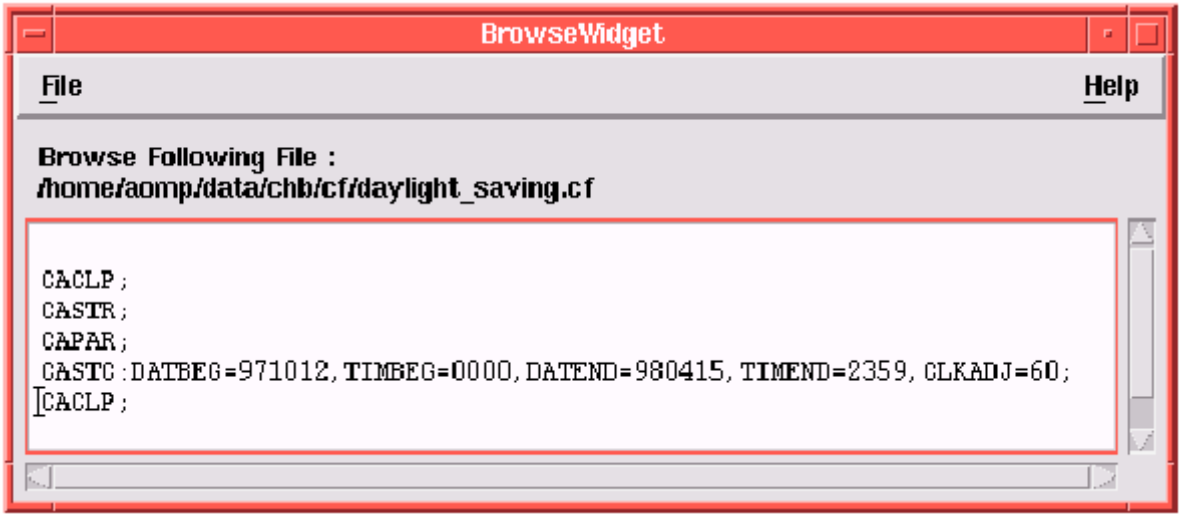
- Consider clearing the current contents of the Edit Command File window.
- A file does not open into a *new* window. Instead, WiOZ Communication Tool inserts the file at the location of the insertion point in the *current* window.
- Choose the File > New menu option to start with an empty window.

3.23 To end an editing session

- **CAUTION No warning of unsaved file**
  WiOZ Communication Tool does not warn you if you quit the Edit Command File window while its contents are unsaved.
- Choose the File > Save menu option and save the contents of the Edit Command File window if not already saved.
- Choose the File > Quit menu option.

3.24 Managing command files

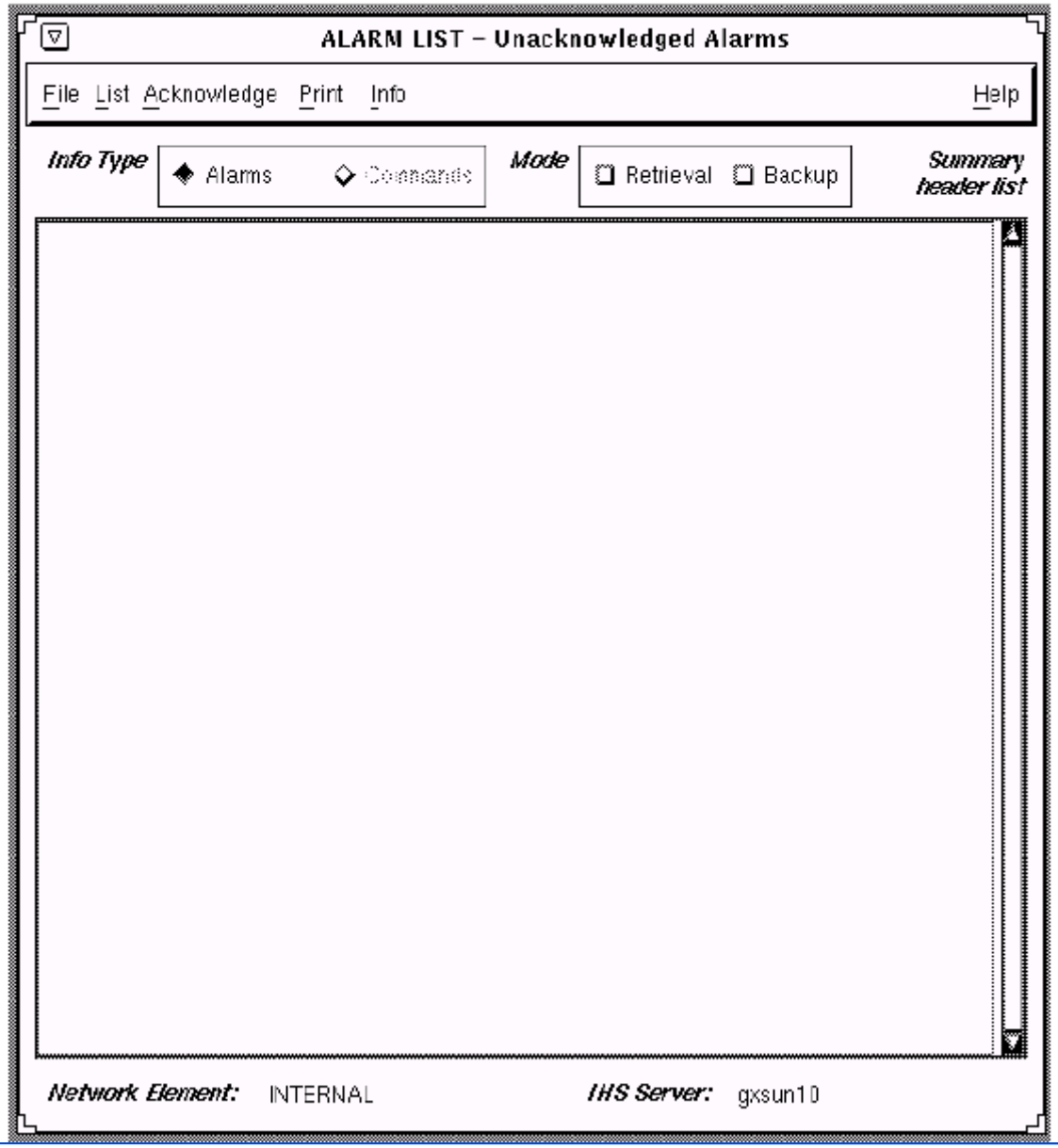
- You may use the File Manager of the Common Desktop Environment (CDE) to copy, rename, and move command files. See the Common Desktop Environment.
- **CAUTION Deleted files are gone forever** Once you delete a command file the only way you might be able to recover it is if the system administrator can restore it from a back up tape.



3.25 Working with session log files

- Log files are a permanent record of the commands sent to a network element and its responses as displayed in the printout box.
- They are useful when you are developing command files and you need a record of the interactions with an network element for debugging.
- Log files can be an audit trail during network operations to record how the behaviour of the network is altered.

3.26 Transaction Log Tool



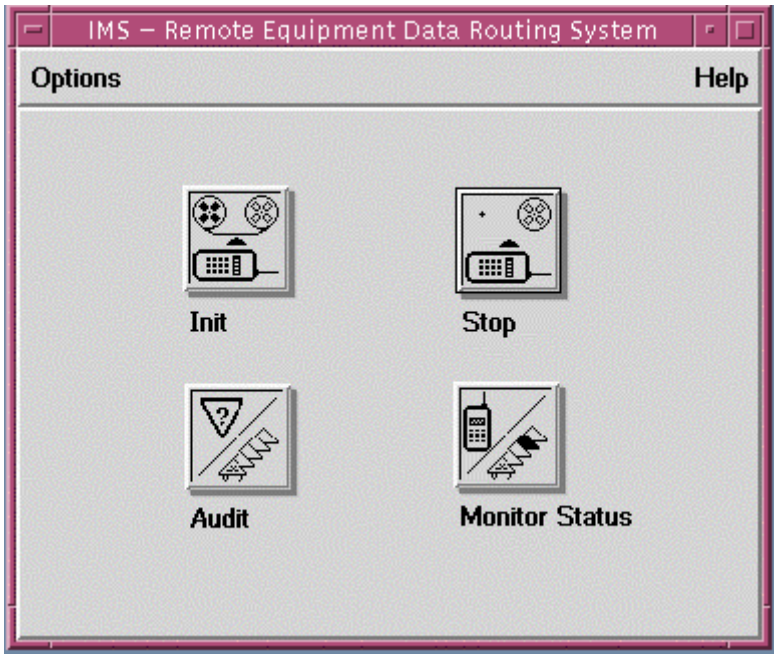
4. IMS Operation

Module Objectives

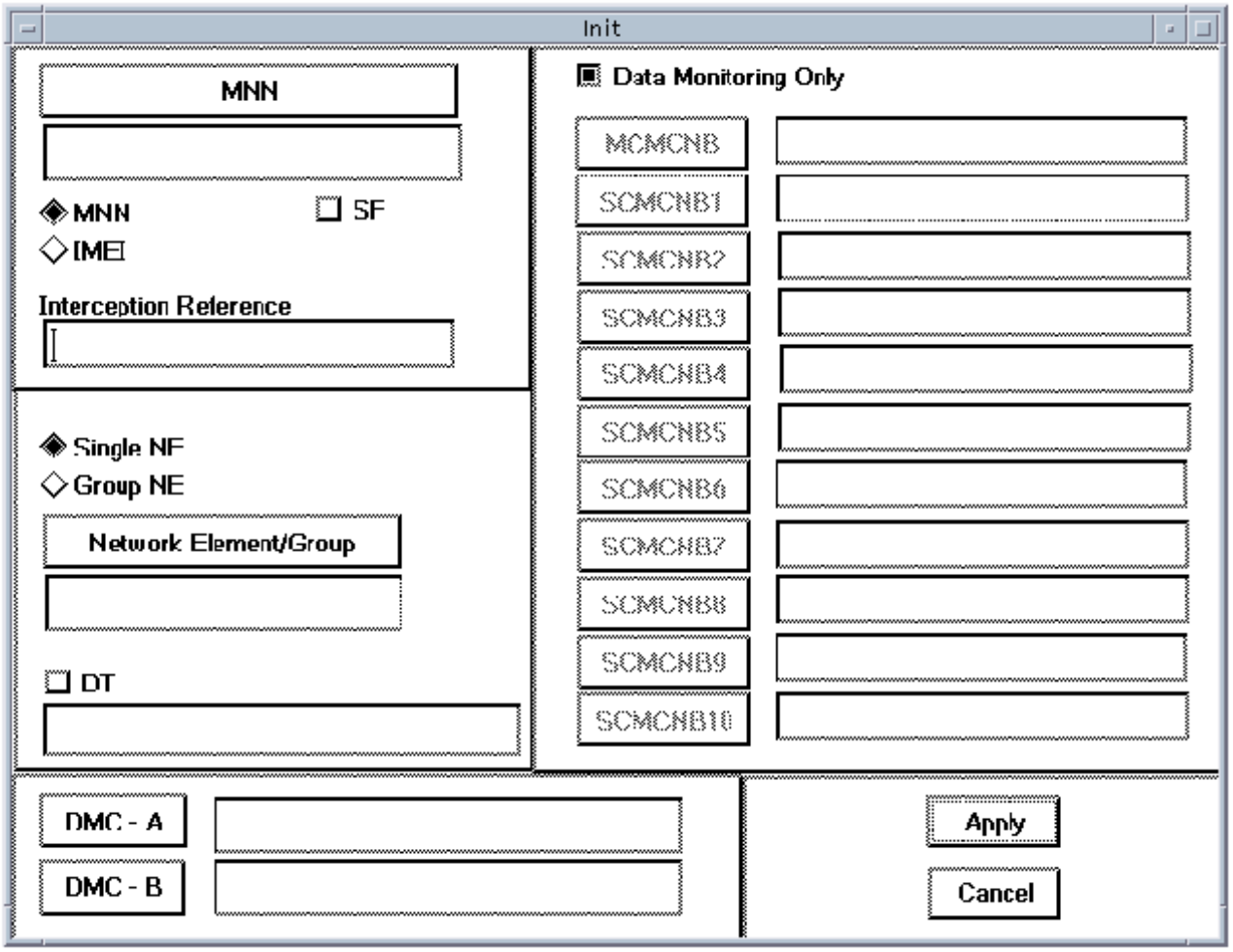
Be able to:

- Initialise a warrant
- Stop a warrant
- Audit the network
- Monitor network status

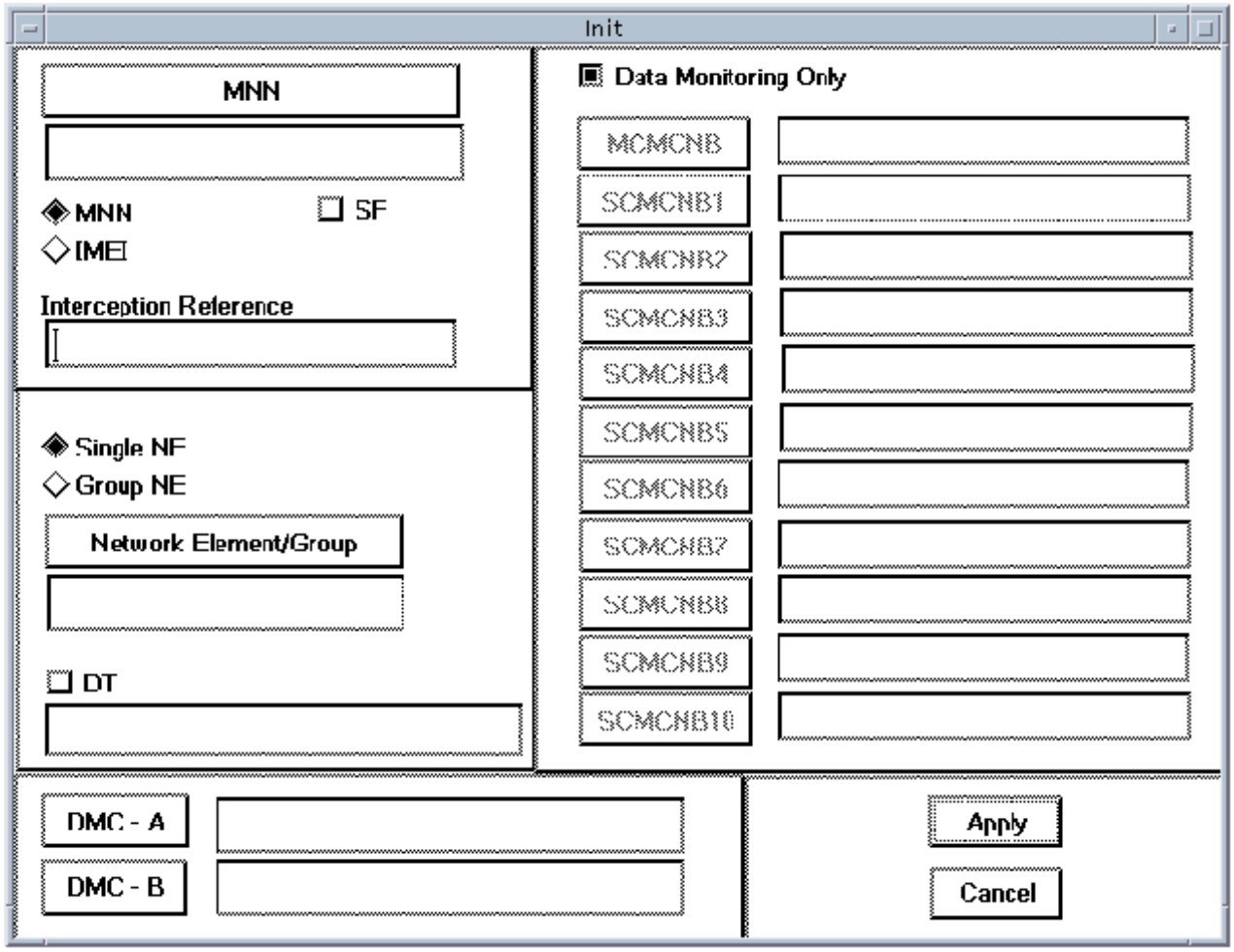
4.1 WARRANT MANAGEMENT USER INTERFACE



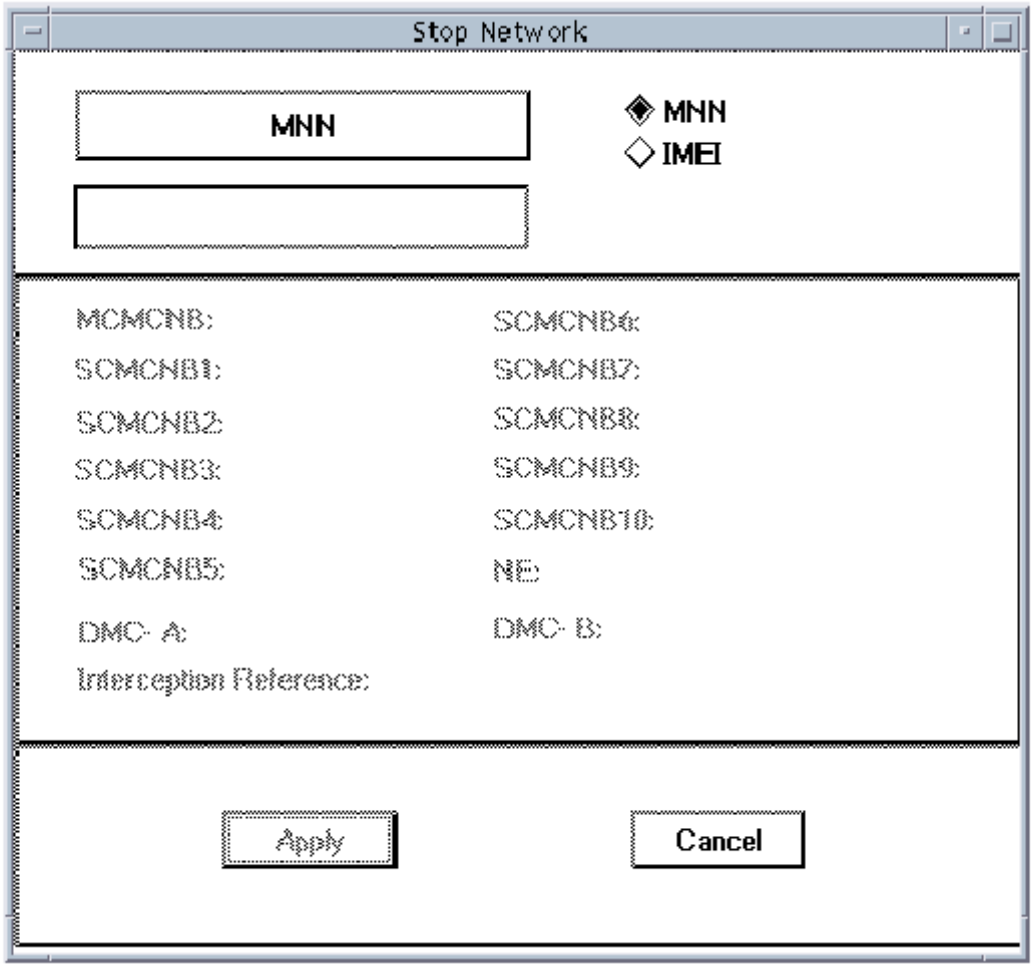
4.2 Warrant Initiation



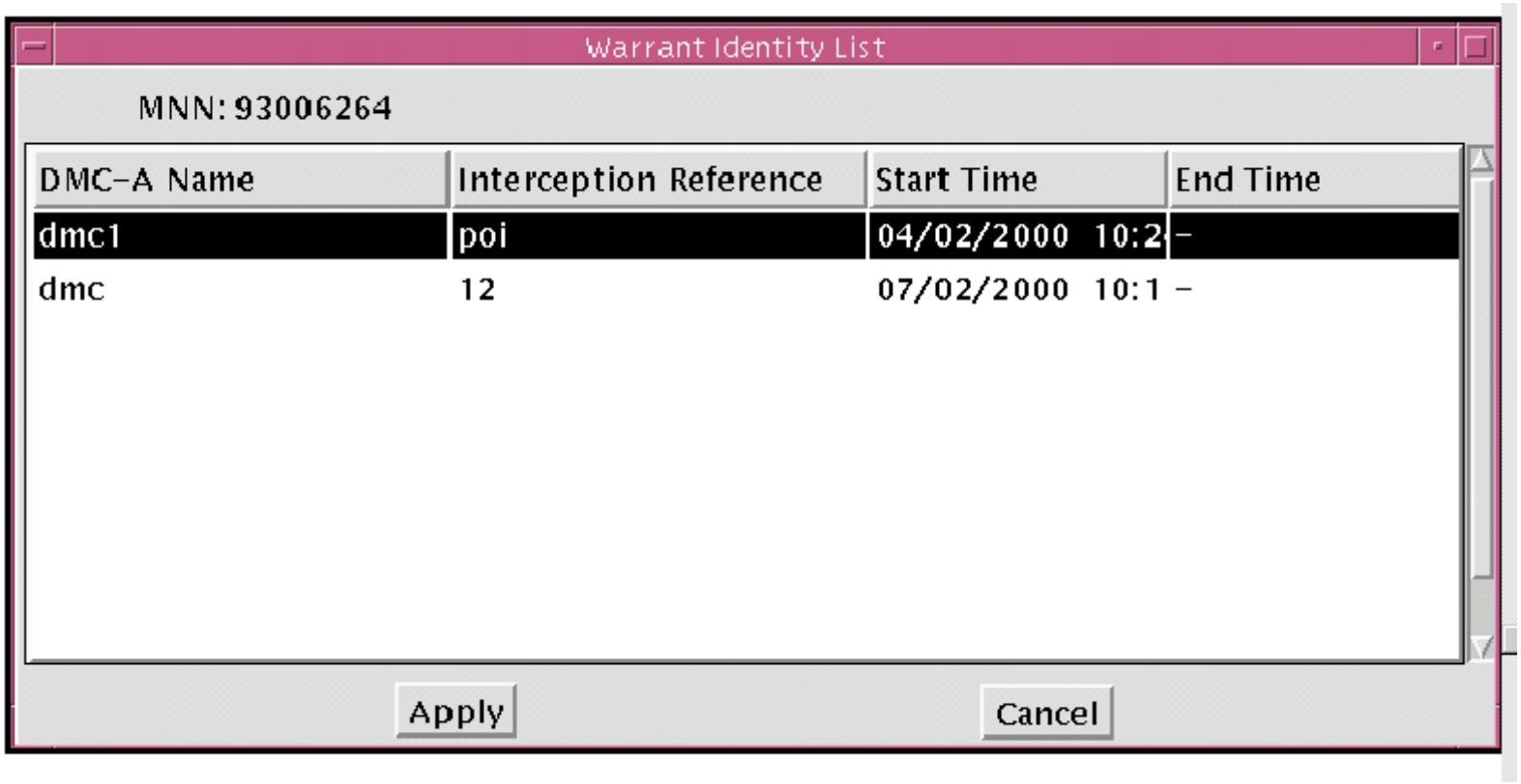
4.3 Warrant Initiation



4.4 Warrant Stopping



4.5 Warrant Stopping



4.6 Audit the Network

The audit function can be used to obtain these details:

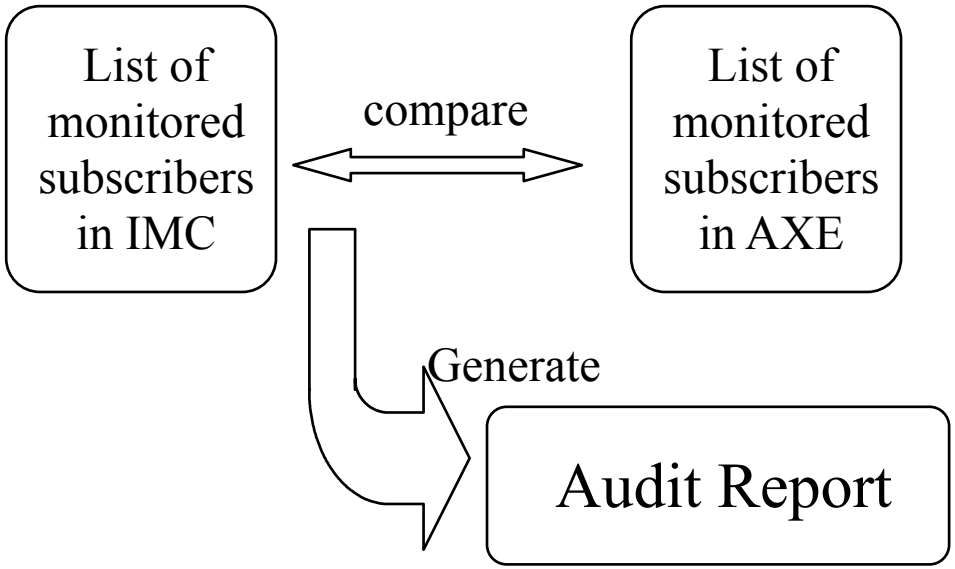
- what interceptions have been initiated for a particular network element or group of network elements.
- which network elements or groups of network elements are actively intercepting calls.
- which subscribers are the targets of interceptions.

4.7 Synchronise the IMS & NE Database

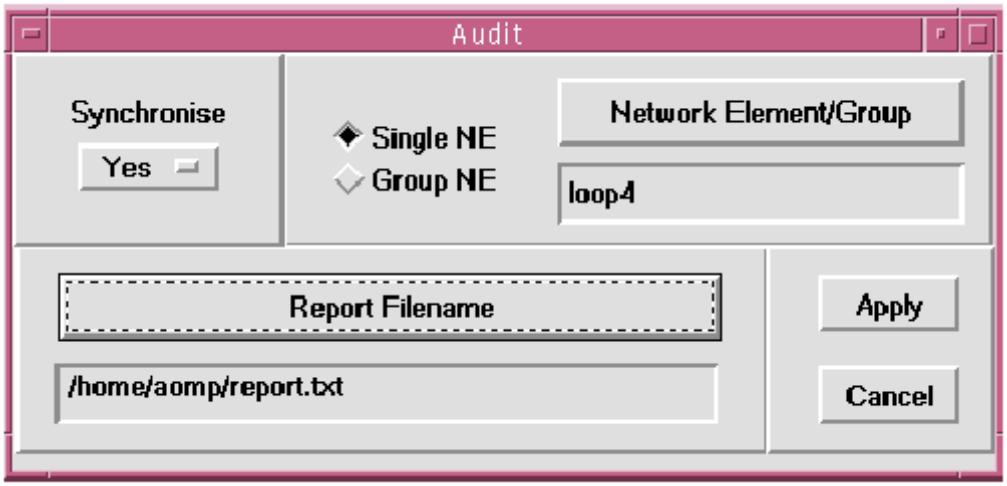
- Synchronising forces the specified network elements to be updated based on the audit report contents.
- The IMS Database is assumed to be correct, hence all activation in the network elements are synchronised to be consistent with the IMS Database.

4.8 Audit Process

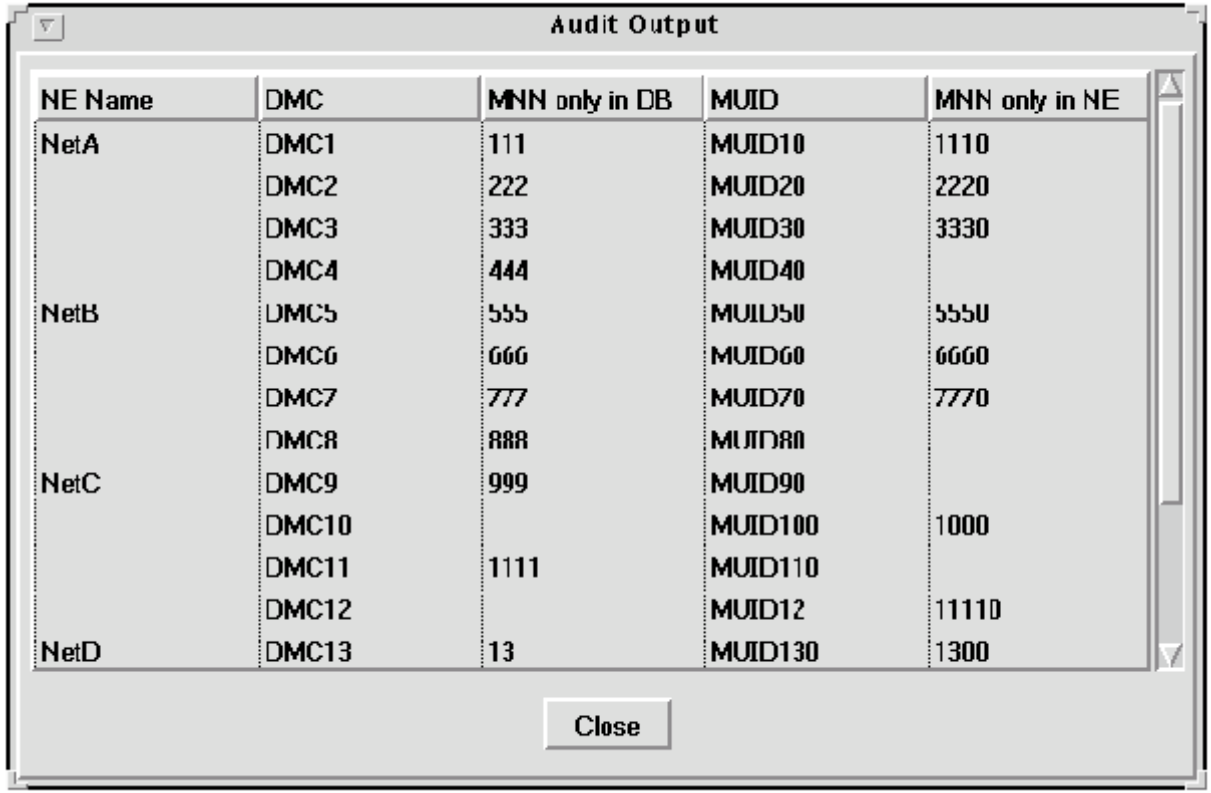
- Provides a comparison between the list of monitored subscribers in an AXE & the IMS.



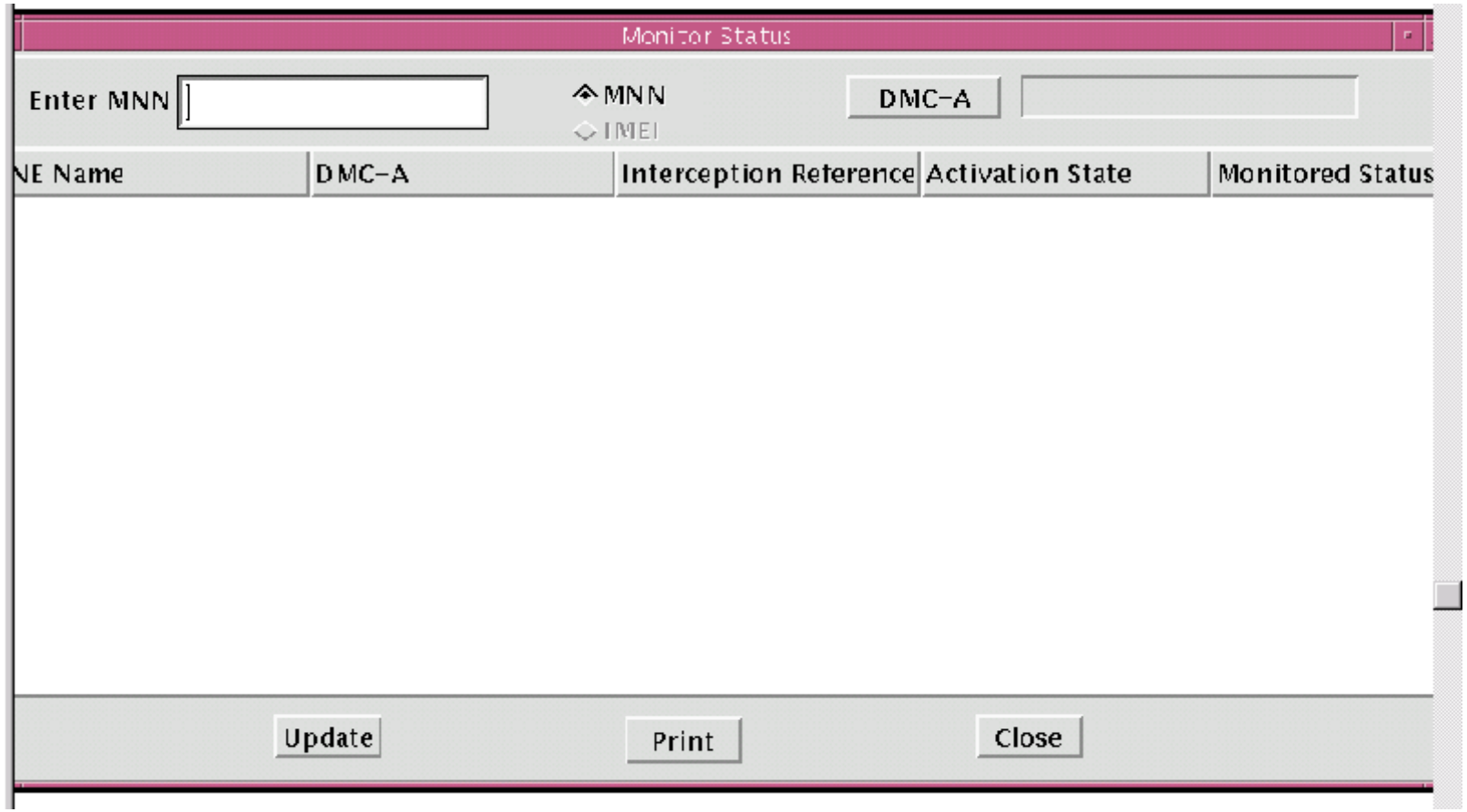
4.9 Audit User Interface



4.10 Audit Output



4.11 Monitoring Status



5. Administering IMS

Module Objectives

Be able to:

- Manage the directory structure and files
- Manage the configuration parameters

5.1 IMS Directory Structure

- READM
  Database admin/search application (user interface)
- RRS
  Rerouting application (user interface)
- irun
  Script used to start IMS applications
- irun_debug
  Debug version of the irun script
- ims_run
  Script used to start IMS applications on an executive server host
- ims_app
  IMS Application (Operator) startup script

5.2 $AOMPHOME/bin/admin Directory

- TR_PARAM
  IMS Server Administrator and Configuration Application (user interface)
- CTB
  Collection and Transmission Server
- imas
  Mediation and Activation Server
- DCFTAM
  FTAM Protocol module of DCS

5.3 Other Directories

- /etc/rc2.d/ ([SK]98xmateims)
  Automatic server startup scripts after server host reboot
- $AOMPHOME/axhome/macros
  Applix(tm) Macros for IMS Application (Operator) user interface
- $AOMPHOME/scripts/imsau.abo
  Applix(tm) IMS Application (Operator) user interface
- $AOMPHOME/log
  Various log files
- $AOMPHOME/data/redrs/jobq
  Default placement of job queue and DMC destination queues
- $AOMPHOME/setup/redrs
  IMS system configuration area and database
- $AOMPHOME/doc
  Contains a pdf version of the IMS Operator and Administrator Manual

5.4 IMS Configuration Files $AOMPHOME/setup/redrs Directory

* This is the IMS database - RTDS.REDRS.

* It contains all information relevant for warrant processing, operation and data product management.

* This file is the main runtime configuration repository, containing such items as Network Elements, DMCs, all warrants and warrant related information and status, etc.

* It is useful to backup this file on a regular basis as it constitutes all runtime knowledge of the IMS system.

5.5 IMS Configuration Files $AOMPHOME/setup/redrs/text Directory

- IMSAttribute
  This is the main IMS configuration file. Any updates to this file will become visible to the IMS system after the first subsequent administrator invocation of the IMS Administration (READM) user interface. There is no need to restart any of the IMS servers. The content of this file is listed and explained separately.

5.6 IMS Configuration Files
CTB Run-Time Variables

Parameter file

The files consist of the variable names followed by the appropriate value.

 # Maximum number of concurrent activation/termination sessions (Default: 10)
mas_max_conc_conn 10

 # Automatic retry activation/termination period in min. (def: 0=disabled)
res10actterm1_retry_period 1

 # Act/Term retry expiry counter (def:0=infinite retry)
res10actterm1_expiry 5

5.8 $AOMPHOME/setup Parameters of Interest

 # Subscribe to DCS-es for alarm logging (ie enable/disable alarm logging from
 # DCSes and network elements)?

log_ne_dcs_alarms no

5.9 dcs_password Configuration

```
#
# Logical_name    Id      User_name       Password        Info
#
iog11             1       SYSTEM          INIT            ""
anon              2       anon            -               ""
DMC1              3       dmc1            o.tel.o         ""
DMC2              4       dmc2            o.tel.o         ""
DMC3              5       dmc3            o.tel.o         ""
DMC4              6       dmc4            o.tel.o         ""
```


6. Security and Access Control / Authorisation

Module Objectives

Be able to:

- Create IMS Operator
- Create IMS Administrator

6.1 Security & Access Control / Authorisation

- User Access Security is based on the security management function implemented in the application platform (XMATE)

- The security management in XMATE operates at 4 levels:
  - Access to the system
  - Access to the application
  - Access to the Network Element
  - Authorization to issue individual commands

- All the 4 levels controlled by UNIX authorization features

6.2 Create new Operator & Administrator and Assign Authorisation

- Use admintool to create the groups. The following user group parameters are recommended:
- Group Id Id number Users
  aompadm 81 aomp
  aompusr 83 aompop1,aompop2,aompop3

6.3 Adding/removing User Authorisation Privileges

An user privileges is defined by:

- The User Authority Group file (UAGF) –UsrAuthG
- An MML Command Group File (CGF) – CmdAuthF.<n>
- An Alarm Authority Group File (AUF) – AlarmAuthF.<m>
- A Script Authority Group File (SGF) – ScrAuthF.<p>
- n: Command Group Number (CGN) greater than 0 (i.e. 1–N)
- m: Alarm Group Number (AGN) greater than 0 (i.e. 1–N)
- p: Script Group Number (SGF) greater than 0 (i.e. 1–

7. XMATE Monitor Tool

Module Objectives

Be able to:

- Add/remove the Information Handling Server (IHS)
- Add/remove the Data Communication Server (DCS)
- Add/remove the File Transfer Server (FTS)
- Activate and deactivate the IHS, DCS, FTS
- Add/delete NE to/from XMATE

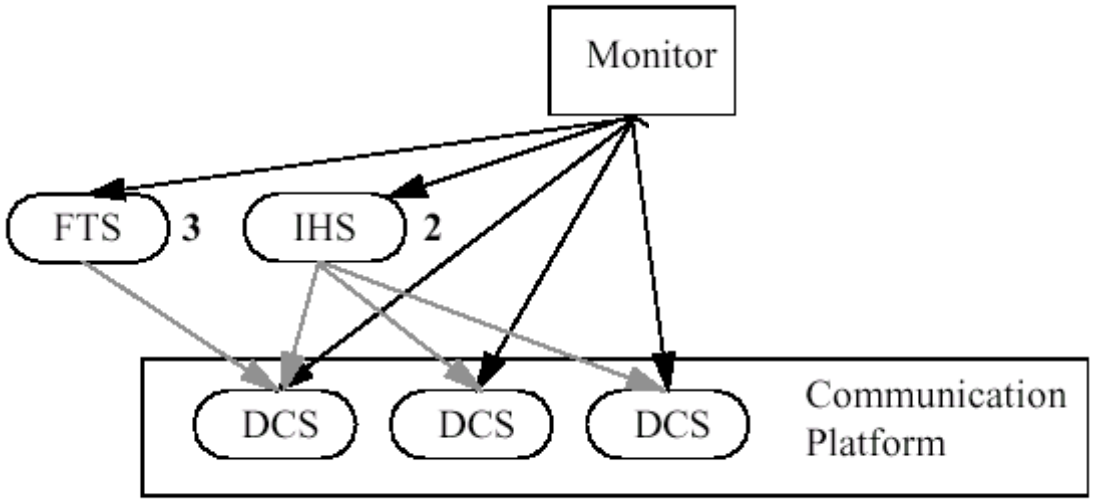
7.1 XMATE Monitor

- The XMATE monitor is used to control these servers:
  - Information Handling Server (IHS)
  - Data Communication Server (DCS)
  - File Transfer Server (FTS)
- IHS and DCS must be active for all XMATE functions
- FTS must be active if file transfers are to be performed.
- The monitor is used to activate, deactivate, and examine all of the servers that are on the network.

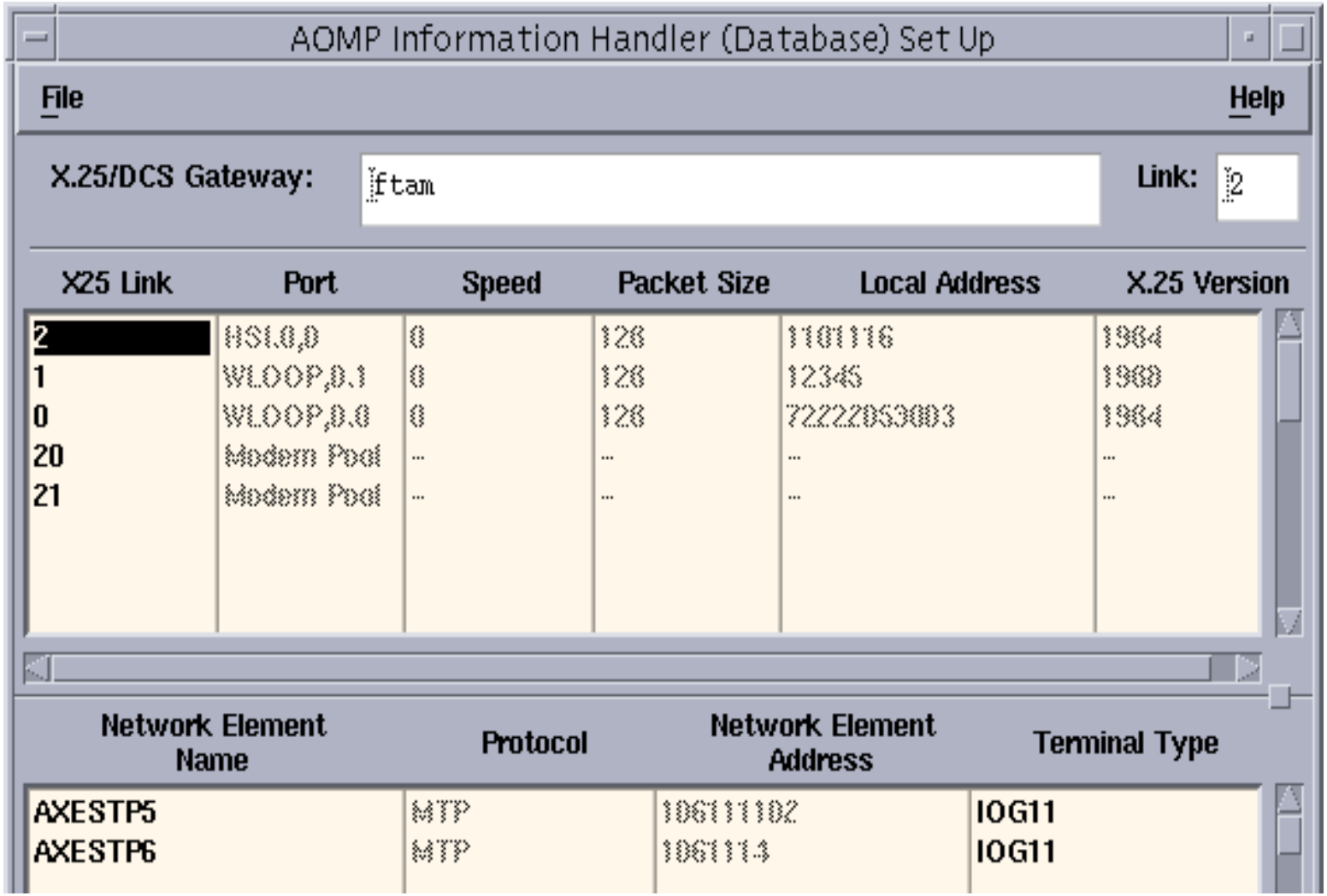
7.2 Server Configuration

- XMATE can be configured in many ways, either standalone with IHS, DCS, and FTS all running on the same machine, or over a network, with the four servers running on different machines. On a network, there may be multiple DCS and FTS servers.
- **Only one IHS server per XMATE system should run.** This handles all alarms

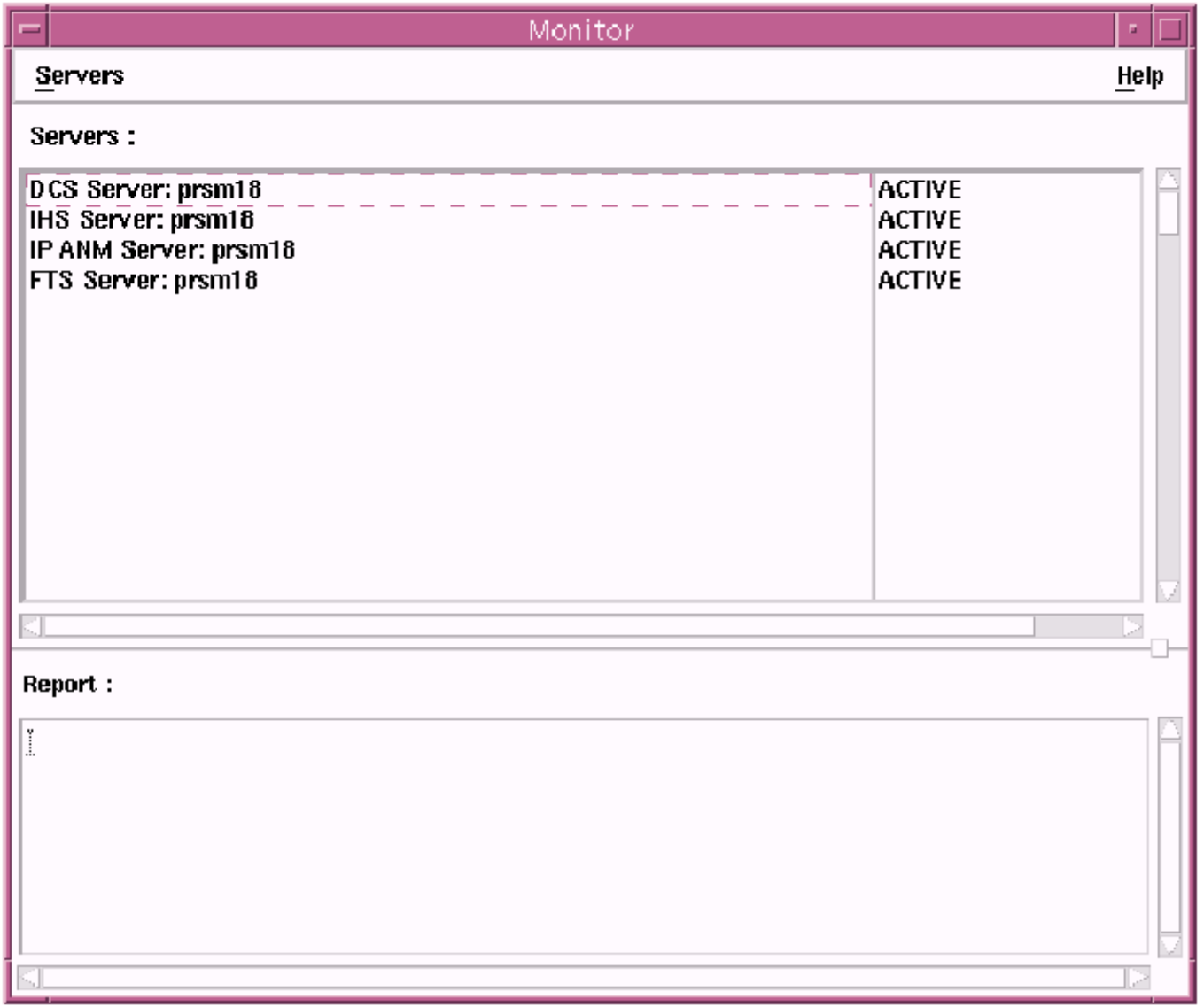
7.3 Starting And Stopping Servers



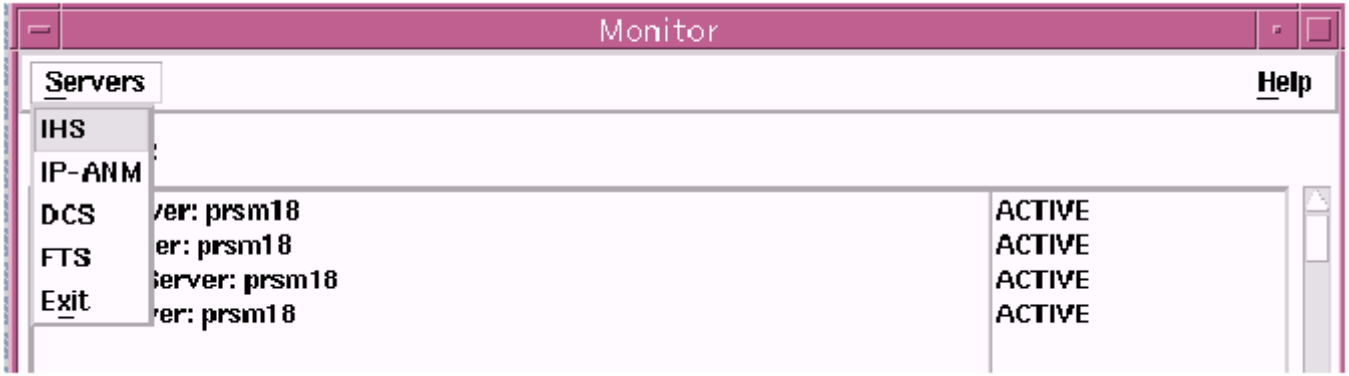
7.4 Add/Remove NEs and DMCs IN XMATE (Network Elements/Data Monitoring Centres)



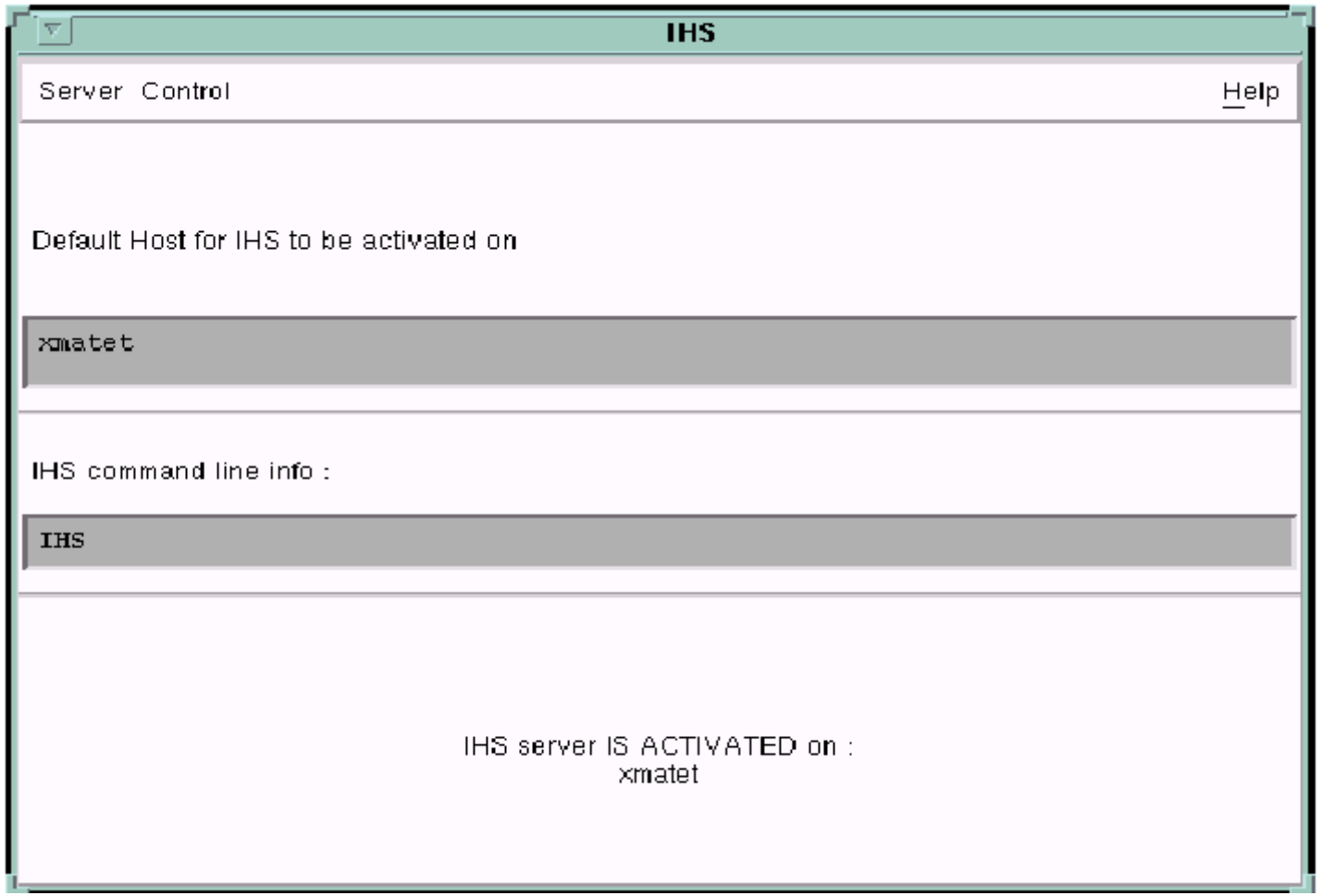
7.5 The Monitor Window



7.6 Adding Servers

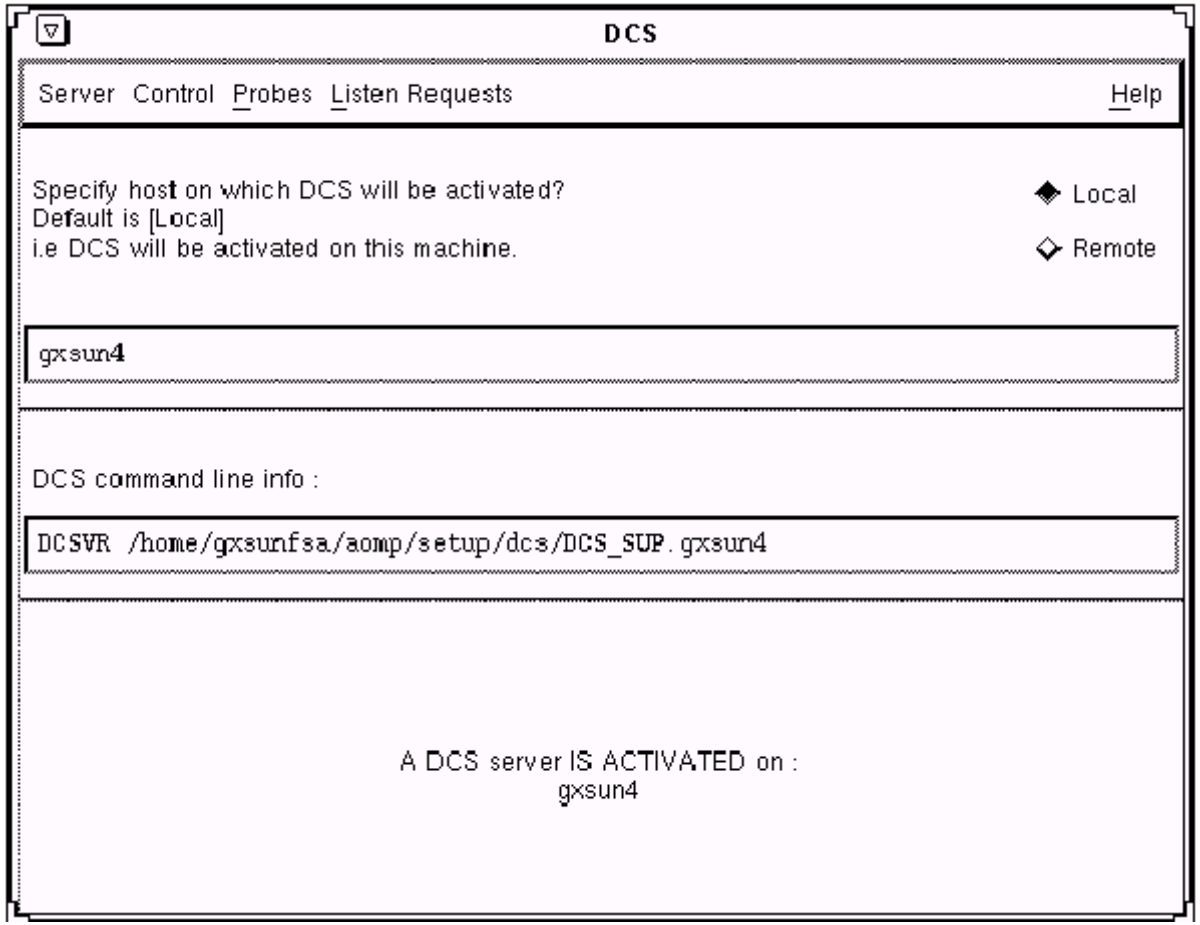


7.7 Adding an IHS server

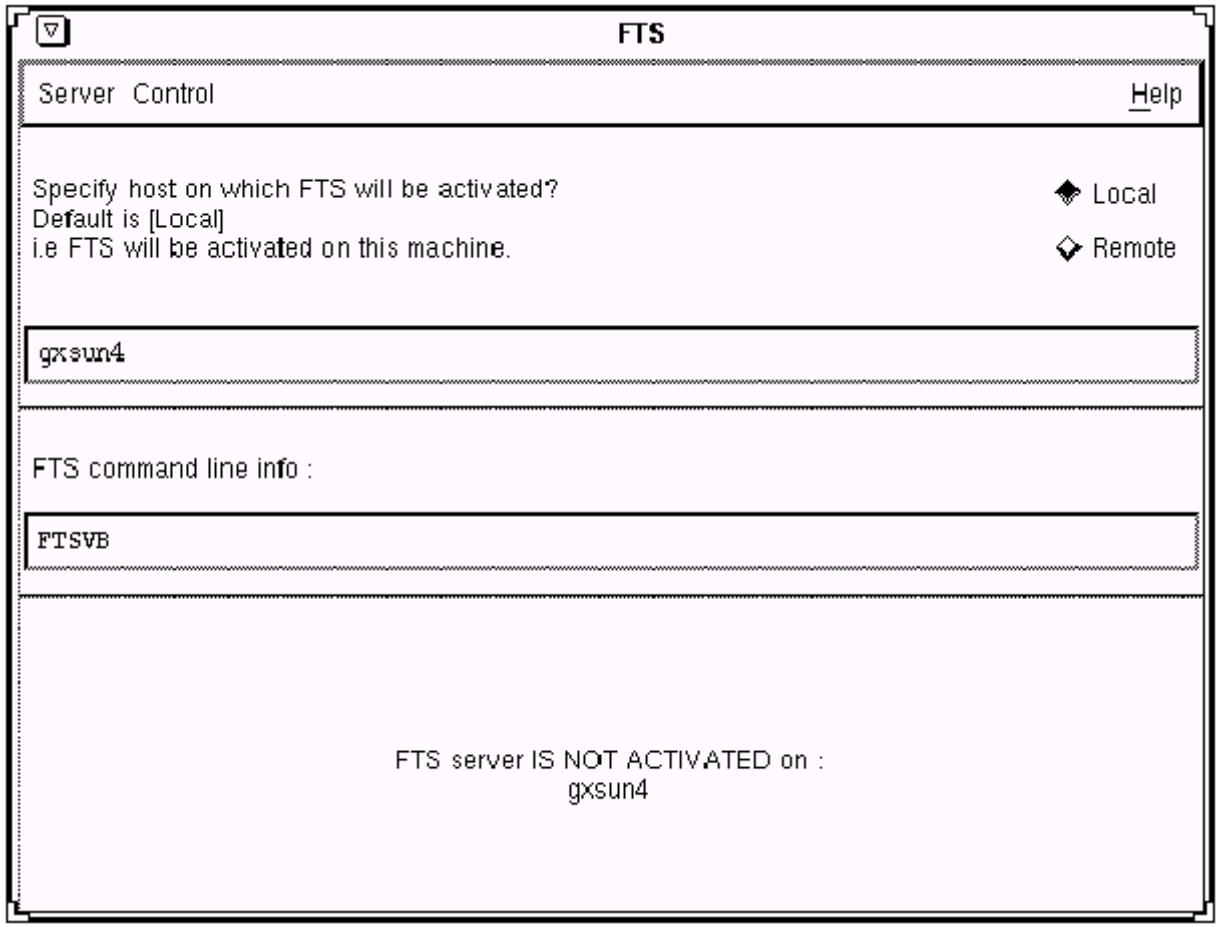


This window is used to control and examine an IHS server on a given host.

7.8 Adding a DCS server

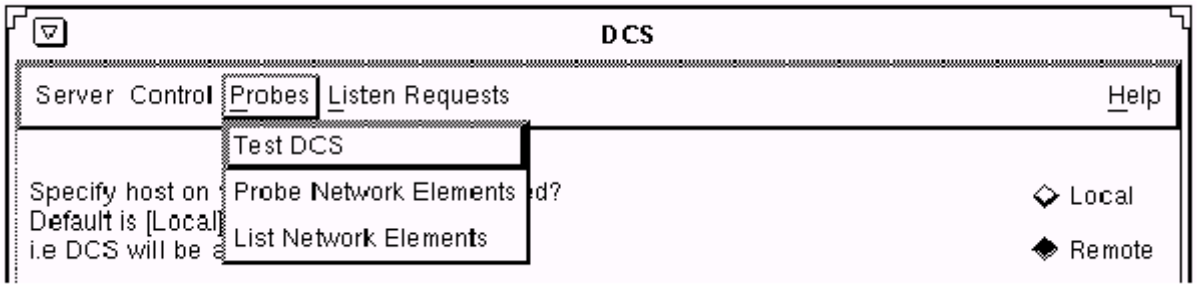


7.9 Adding a FTS server



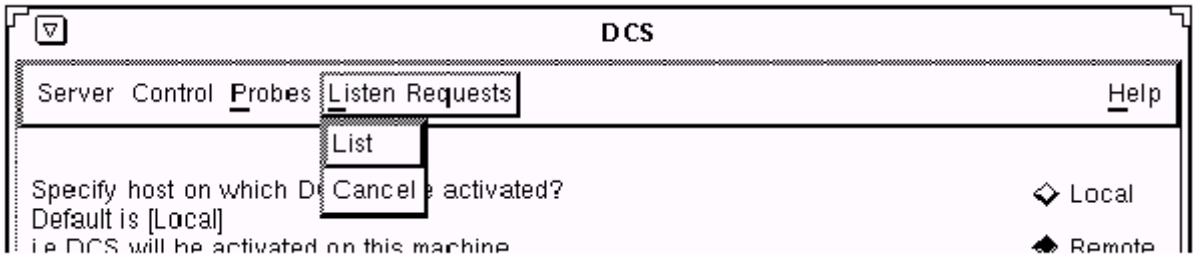
7.10 Information And Probes

- It is possible to perform several different tests on theDCS server.



7.11 Listen Requests

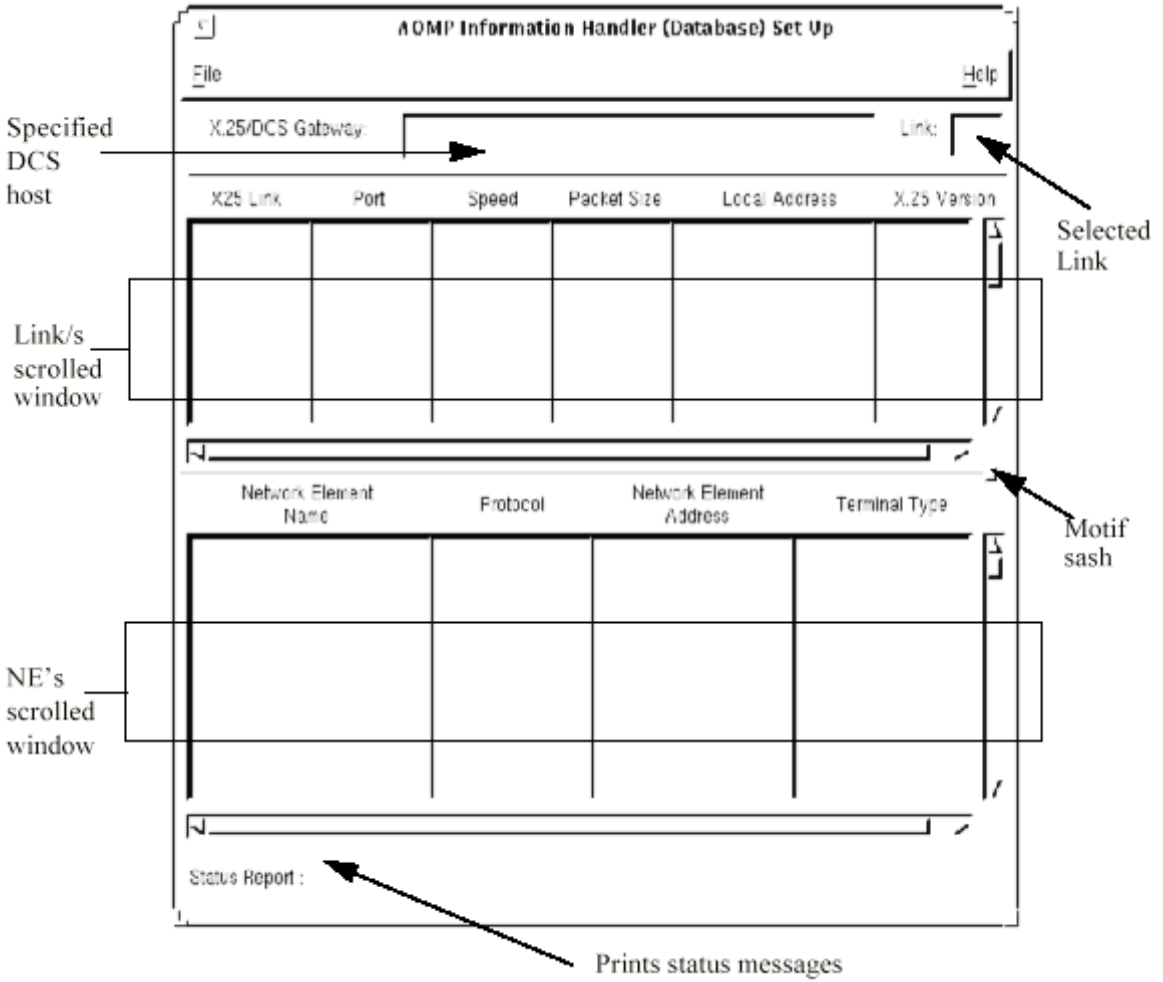
- Certain applications make listen requests to the DCS server. Occasionally applications will exit abnormally, and are unable to cancel their listen requests.
- The monitor must then be used to cancel the requests.
- Every listen request made by applications to DCS is listed in the report window.



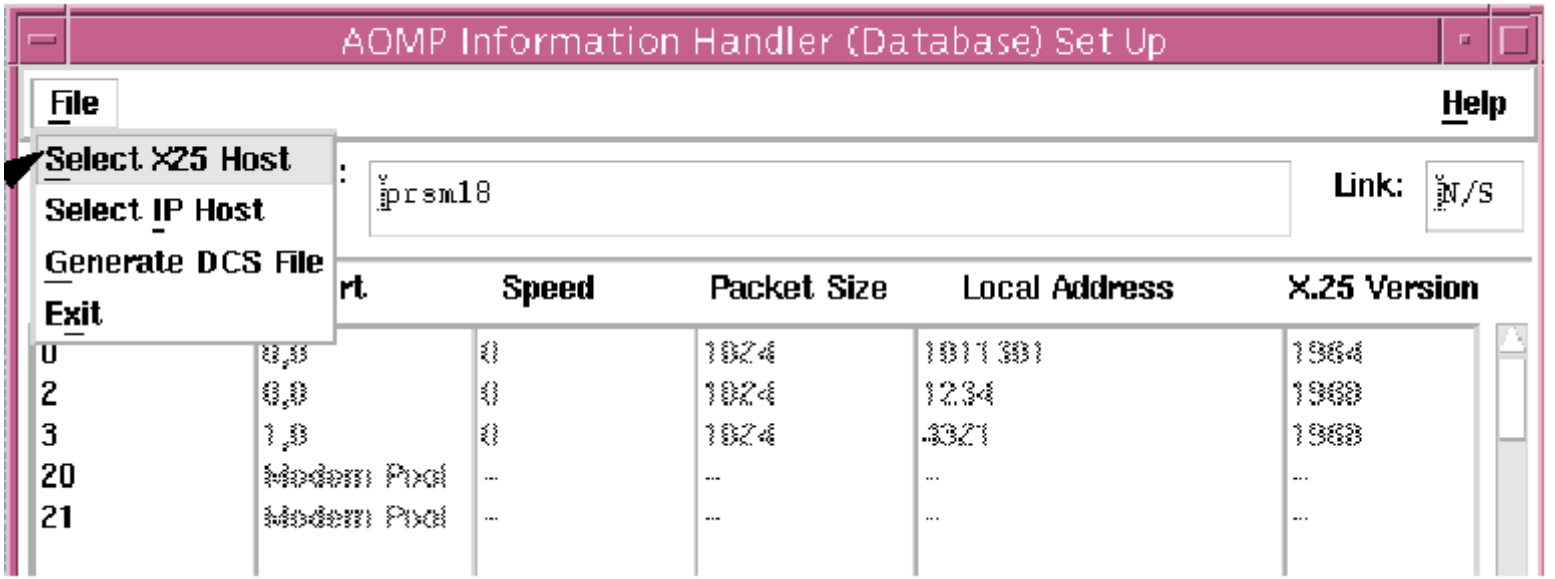
7.12 Network Element Setup

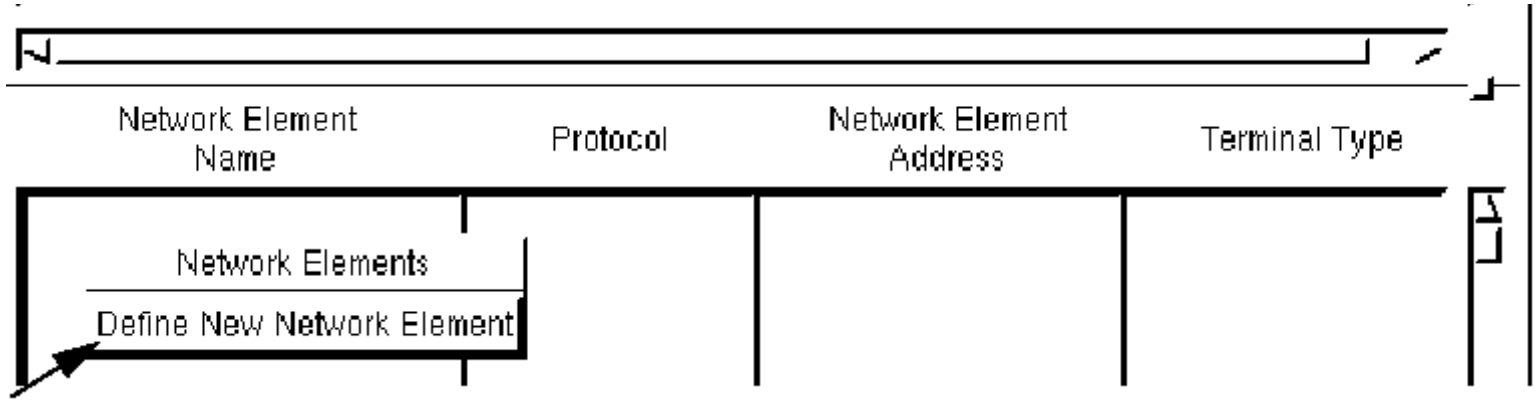
- The Network Element Setup U/I enables the XMATE System Administrator to configure the NetWork Map (NWM). Configuring the NWM involves defining Network Elements (NEs) for one or more Data Communication gateways (DCSs). The NWM contains information of an XMATE system domain comprising: DCS gateways, NEs and their characteristics.

7.13 Running The X.25 NE Setup Interface



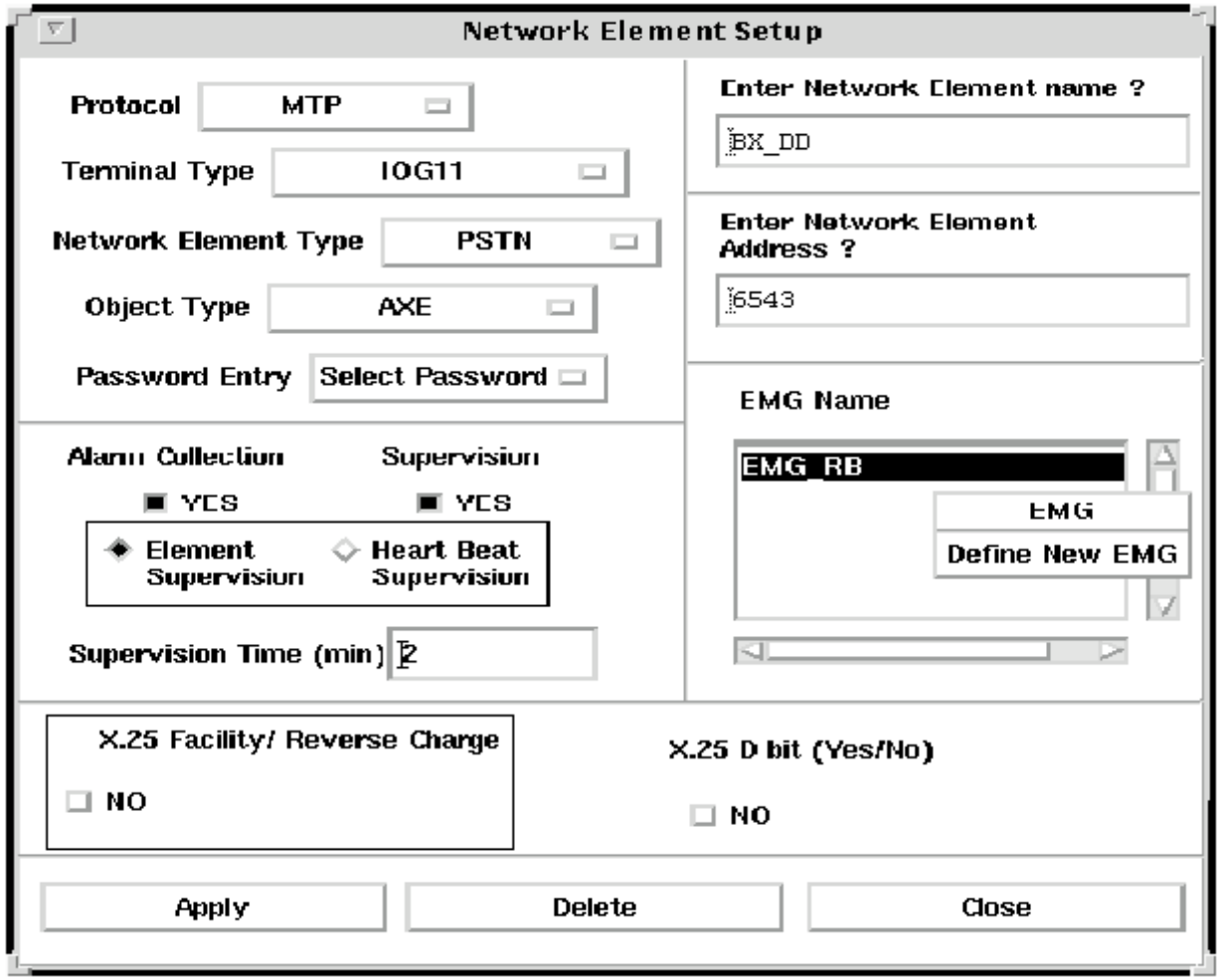
7.14 Configuring An X.25 Network Element





7.15 Network Element Setup

- Defining a new NE
- Modifying an existing NE
- Deleting an existing NE



7.16 Generating The DCS

- After making changes to all links for the specified DCS host, **generate** a setup file which will be used by the DCS gateway when it is invoked on the DCS host.
- If a DCS gateway is already running it will automatically detect that the setup file has changed and update its internal NE memory list.
- To generate the DCS File select **Generate DCS File** from the **File** bar menu option.

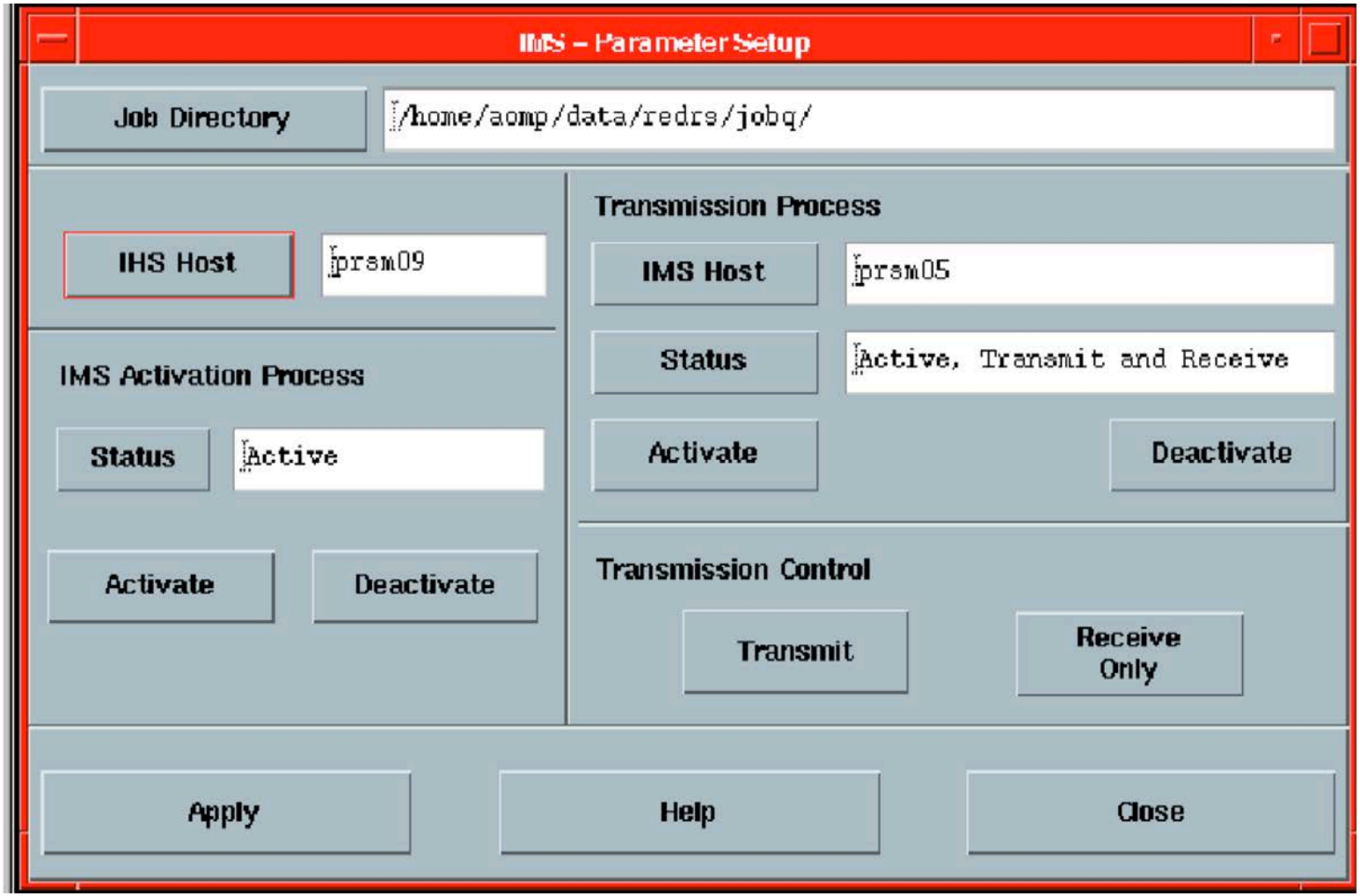
8. Administering IMS Transmission Process

Module Objectives

Be able to perform:

- Start/Stop the IMAS server
- DMC/NE Synchronization

8.1 IMS Application Process



8.2 Starting/stopping the IMAS server

- To start the imas server, click the ‘Activate’ button.
- To stop the imas server, click the ‘Deactivate’ button.
- The current status of the server can be displayed at any time by pressing the Status button.

8.3 Usage Error

These errors can occur when the Apply button has been clicked.

Not all fields are filled in

Applied failed.

Not all fields are filled in.

Invalid Job Directory

Applied failed.

Invalid job directory.

Couldn’t save parameters

Applied failed.

Couldn’t save parameters in file.

8.4 Starting/stopping the transmission process

- Not used by Cellnet.

9. Administering IMS Database

Module Objectives

Be able to manage interception and monitoring elements:

- To add a network elements to the database
- To delete a network elements from the database
- To modify a network elements in the database
- To create a network element group
- To add a DMC in the database
- To delete a DMC in the database
- To update NE and DMC in the database
- To search in the database

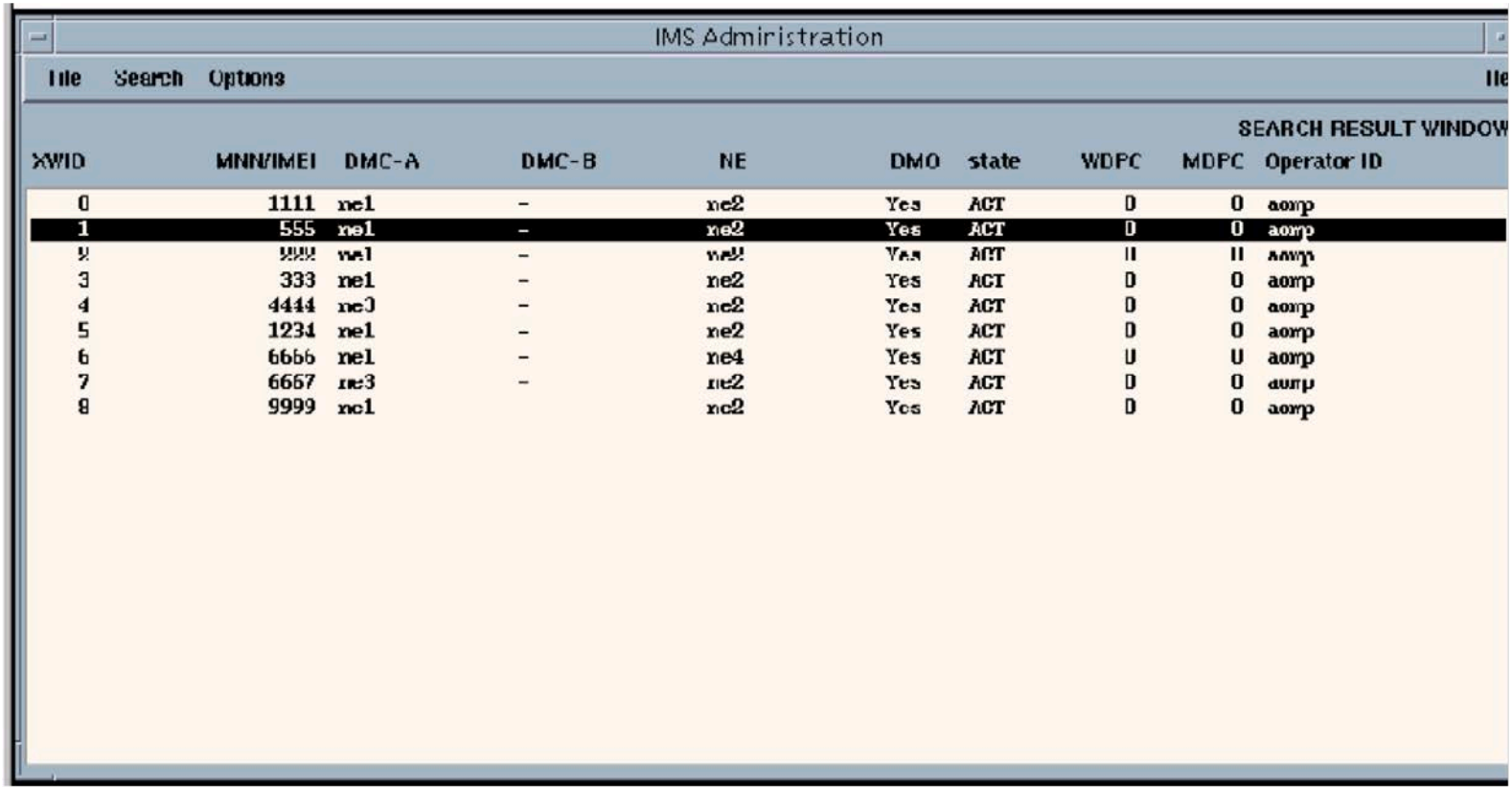
… continue 9. Administering IMS Database

Module Objectives

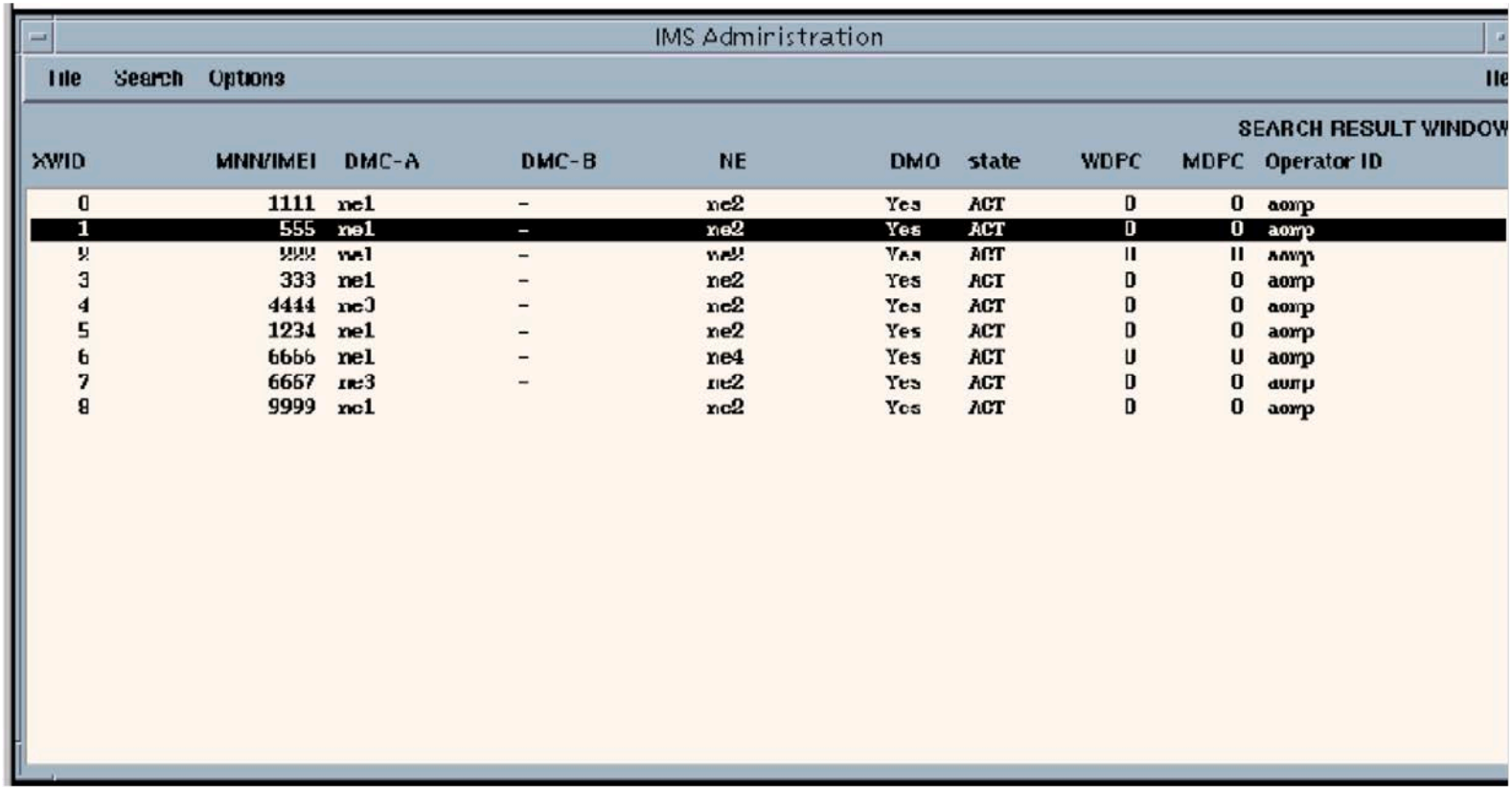
Be able to manage the database:

- To view and print target subscriber details
- To add, edit & delete target subscriber entries in the database
- To reset the Measurement Data Product Counter (MDPC)

9.1 Administering IMS Database



9.2 Administering IMS Database



9.3 Pop-up menu

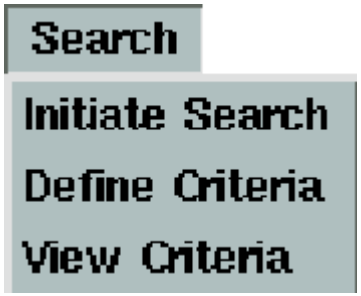
Right-clicking in the IMS Administration window pops up a menu which gives immediate access to updating and management dialogues as follows:

9.4 File menu

The File menu lets you set up the IMS database with the details of network elements, data monitoring centres (DMC), and target subscribers' numbers (monitored network numbers – MNN).

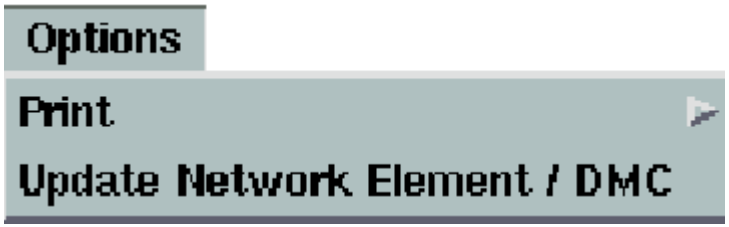
9.5 Search menu

The Search menu lets you define the criteria for searching the IMS database, then search for items matching those criteria.

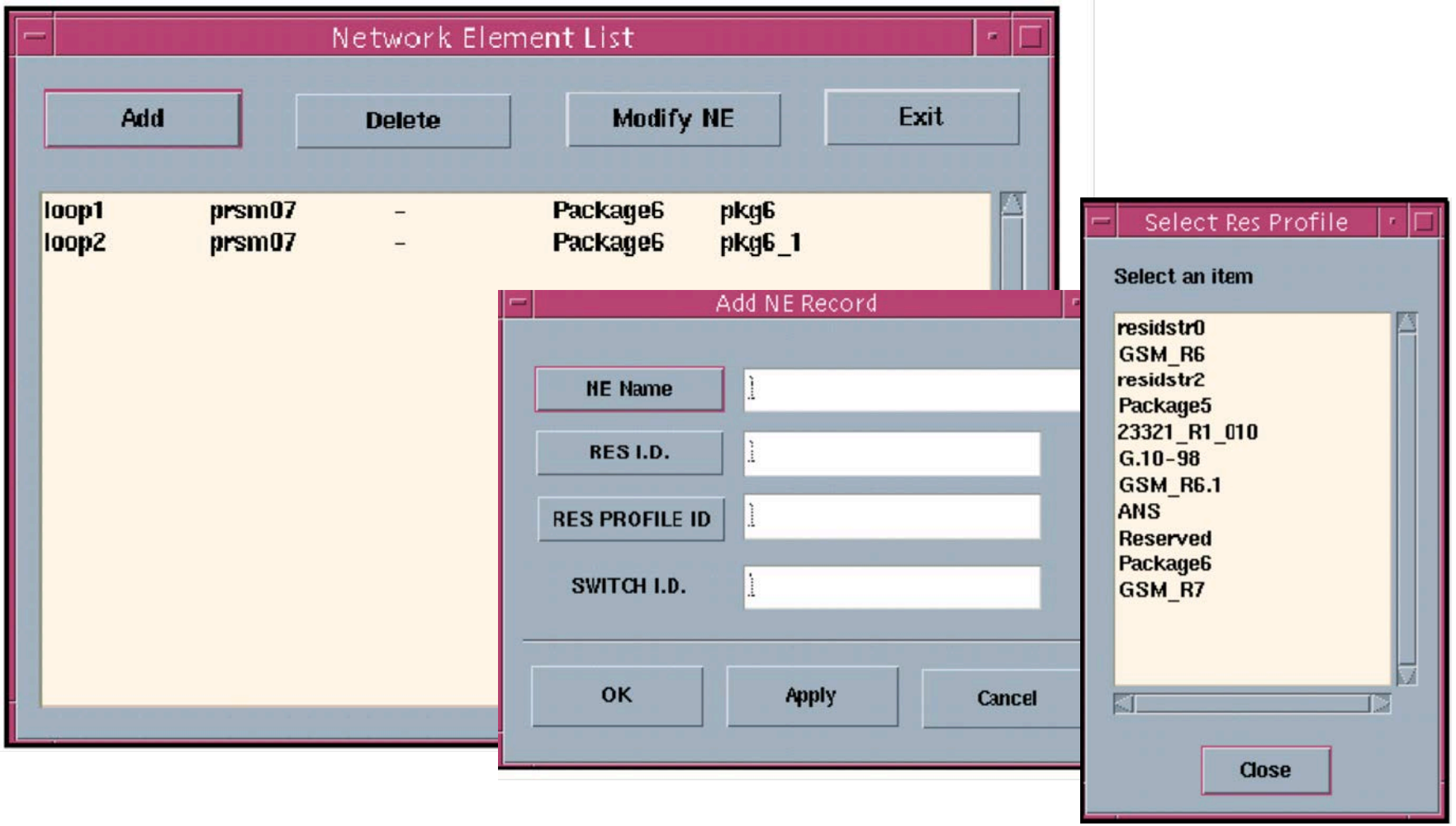


9.6 Options menu

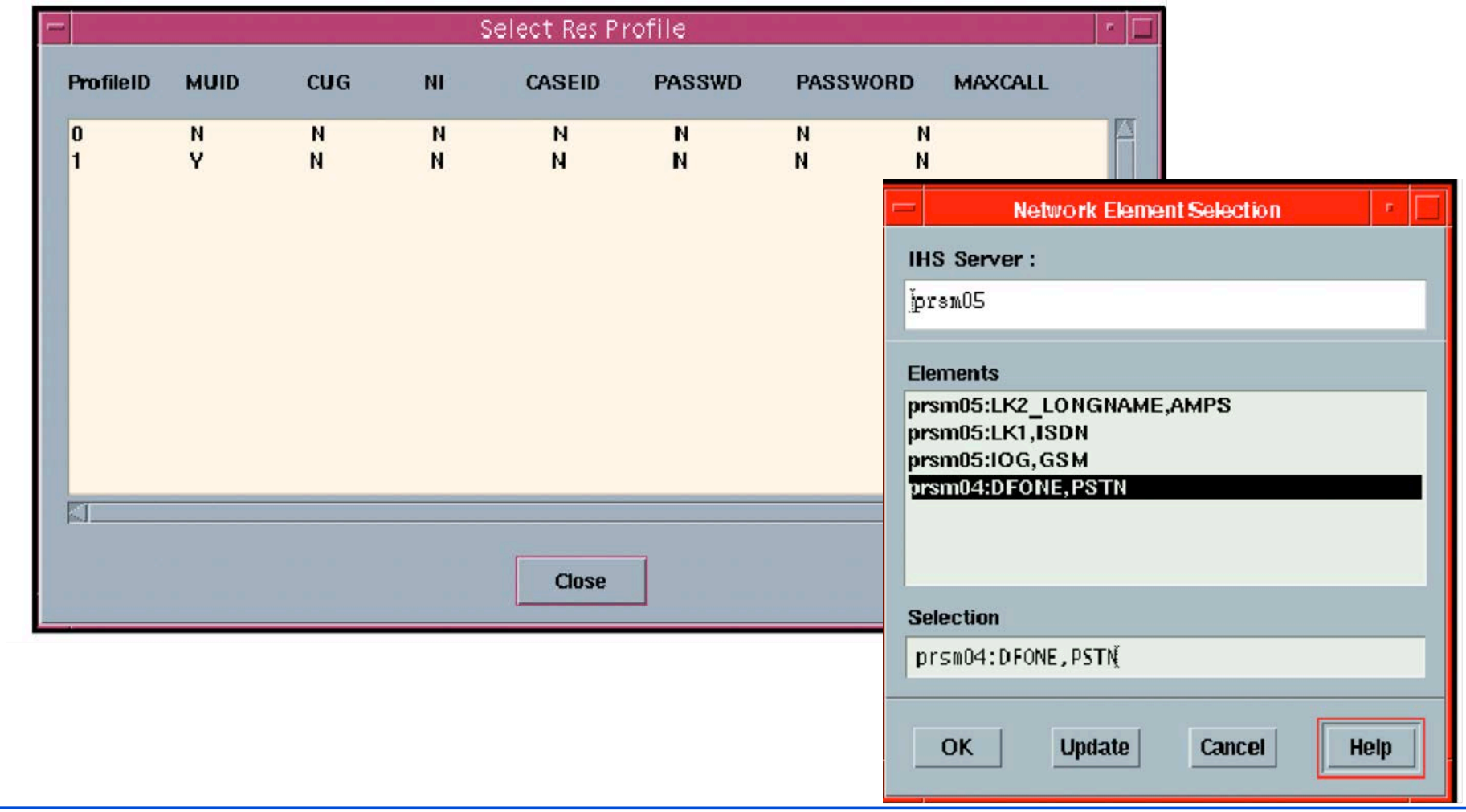
The Options menu lets you print details of selected entries in the IMS Administration window and update the database with network elements and data monitoring centres (DMC) data.



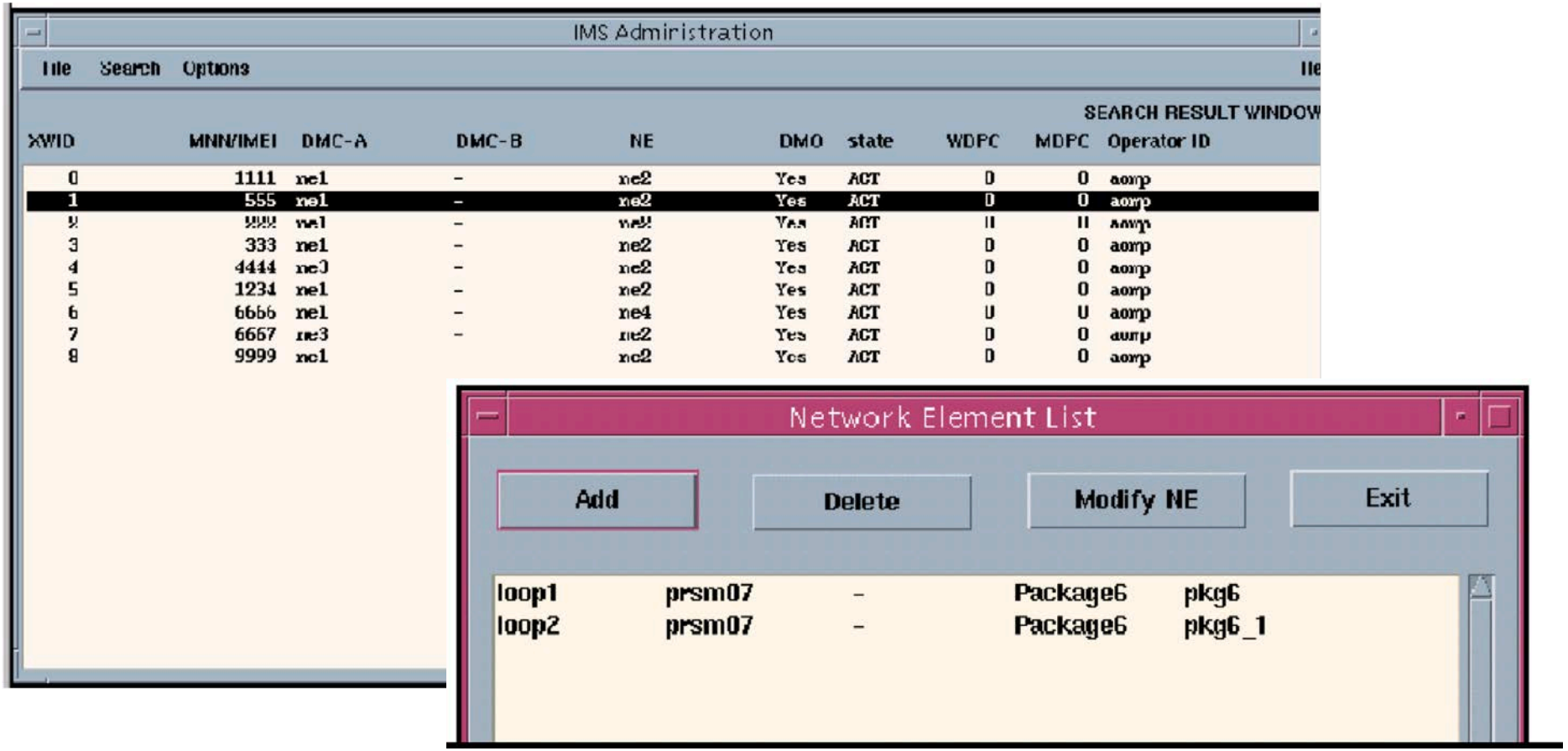
9.7 To add a Network Element to database



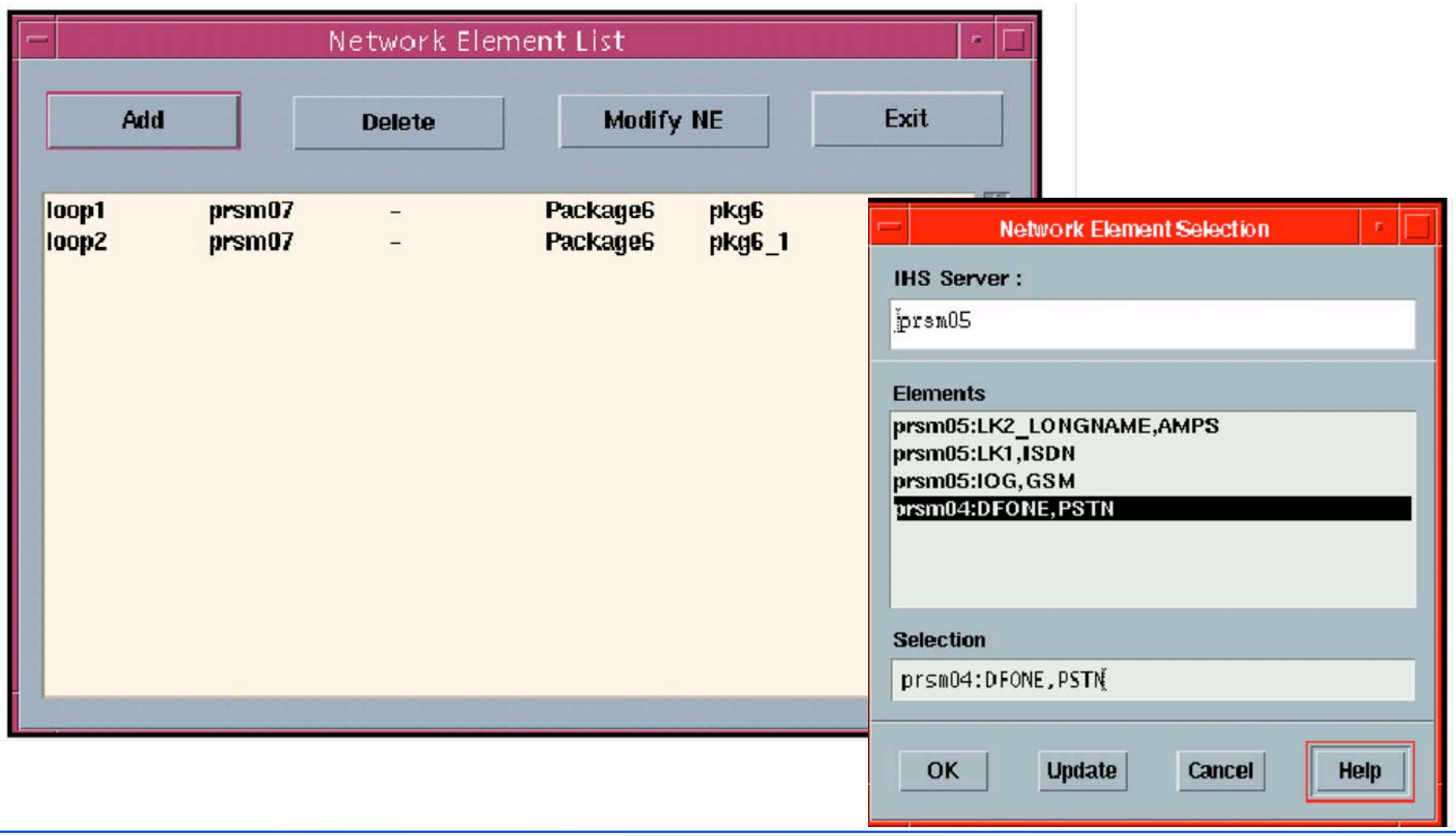
9.8 To add a Network Element to database



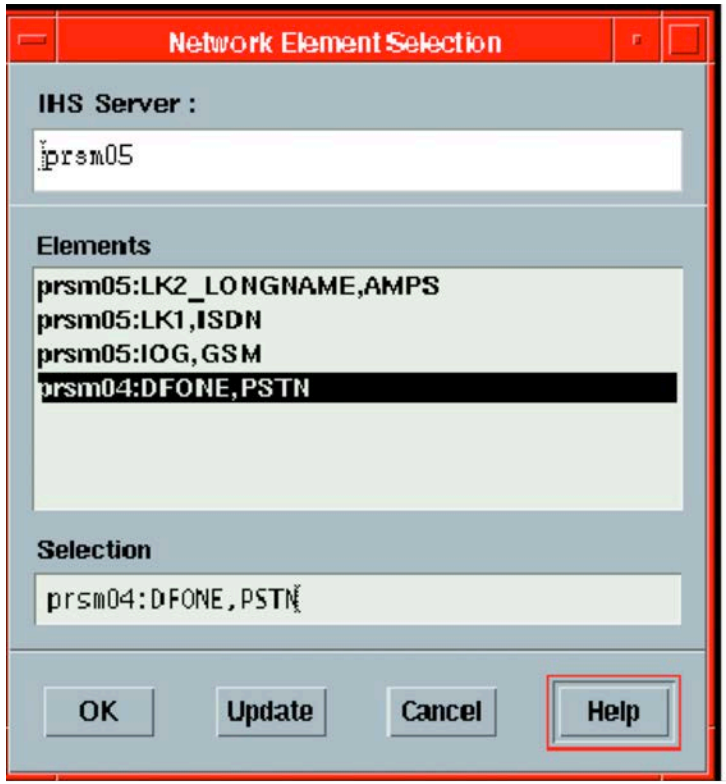
9.9 To delete a Network Element from database



9.10 To modify a Network Element in the database



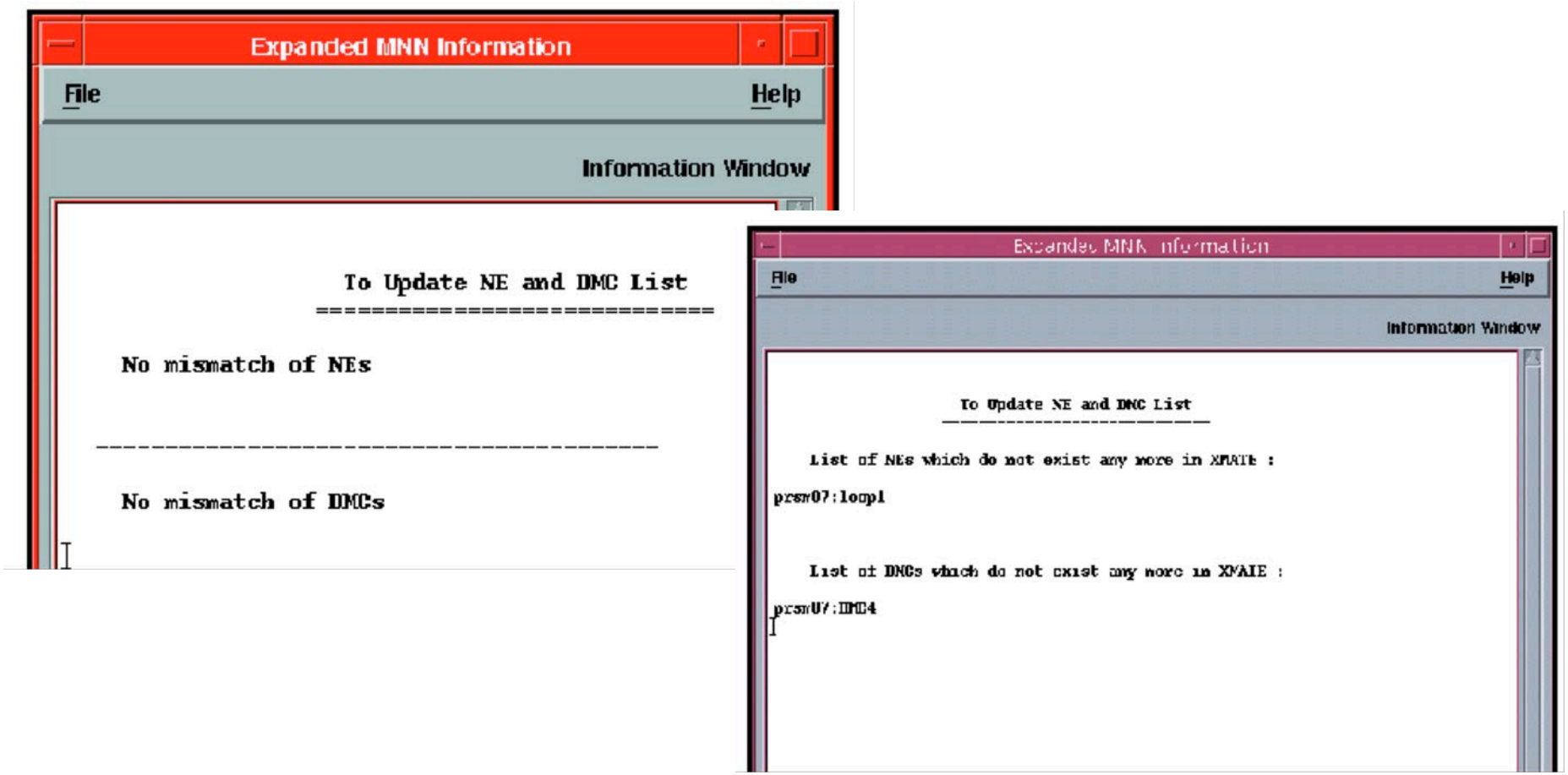
9.11 To add a data monitoring centre in the database



9.12 To delete a data monitoring centre in the database

- Choose the File > Setup > DMC List menu option in the **IMS Administration window**.
- The **Data Monitoring Centres dialog box** displays any data monitoring centres (DMC) that are currently defined.
- Click on one DMC and then click on the Delete button.
- You cannot delete a primary (DMC-A) or secondary (DMC-B) data monitoring centre that is still receiving data products from IMS.
- A DMC cannot be deleted under the following circumstances:
  - - if another DMC is re-routed to the DMC to be deleted.
  - - if there is an active warrant against the DMC to be deleted.
  - - if the DMC to be deleted has entries in its queue even if the warrant is in TERMINATE state.

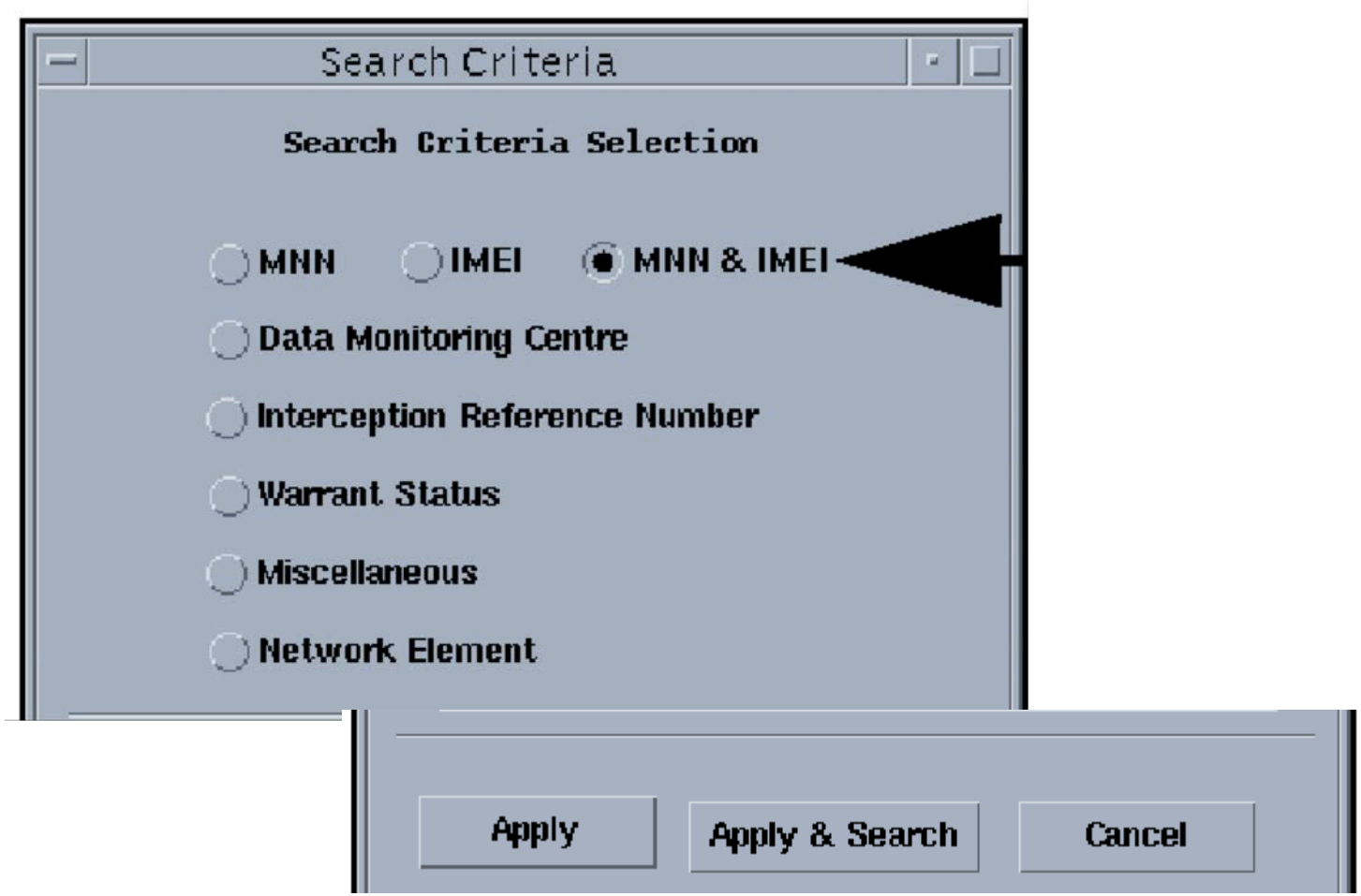
9.13 To update network elements and data monitoring centres in the database



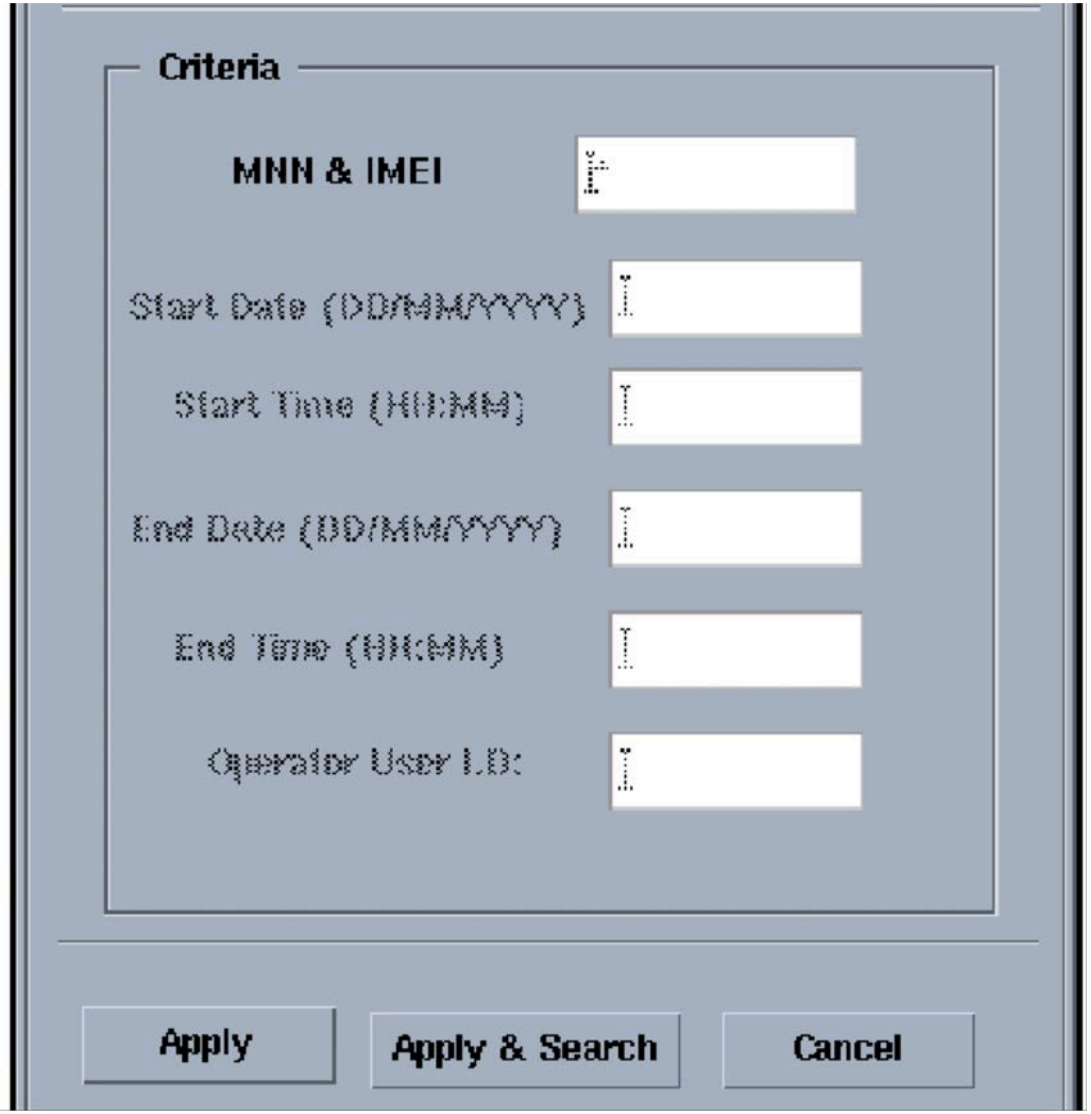
9.14 Searching the database

- You must find a target subscriber's details before you can update them in the database. IMS search capabilities allows these details to be found using different searching criteria.
- This section shows how
  - To specify search criteria
  - To search for database entries

9.15 To specify search criteria



9.16 To specify search criteria

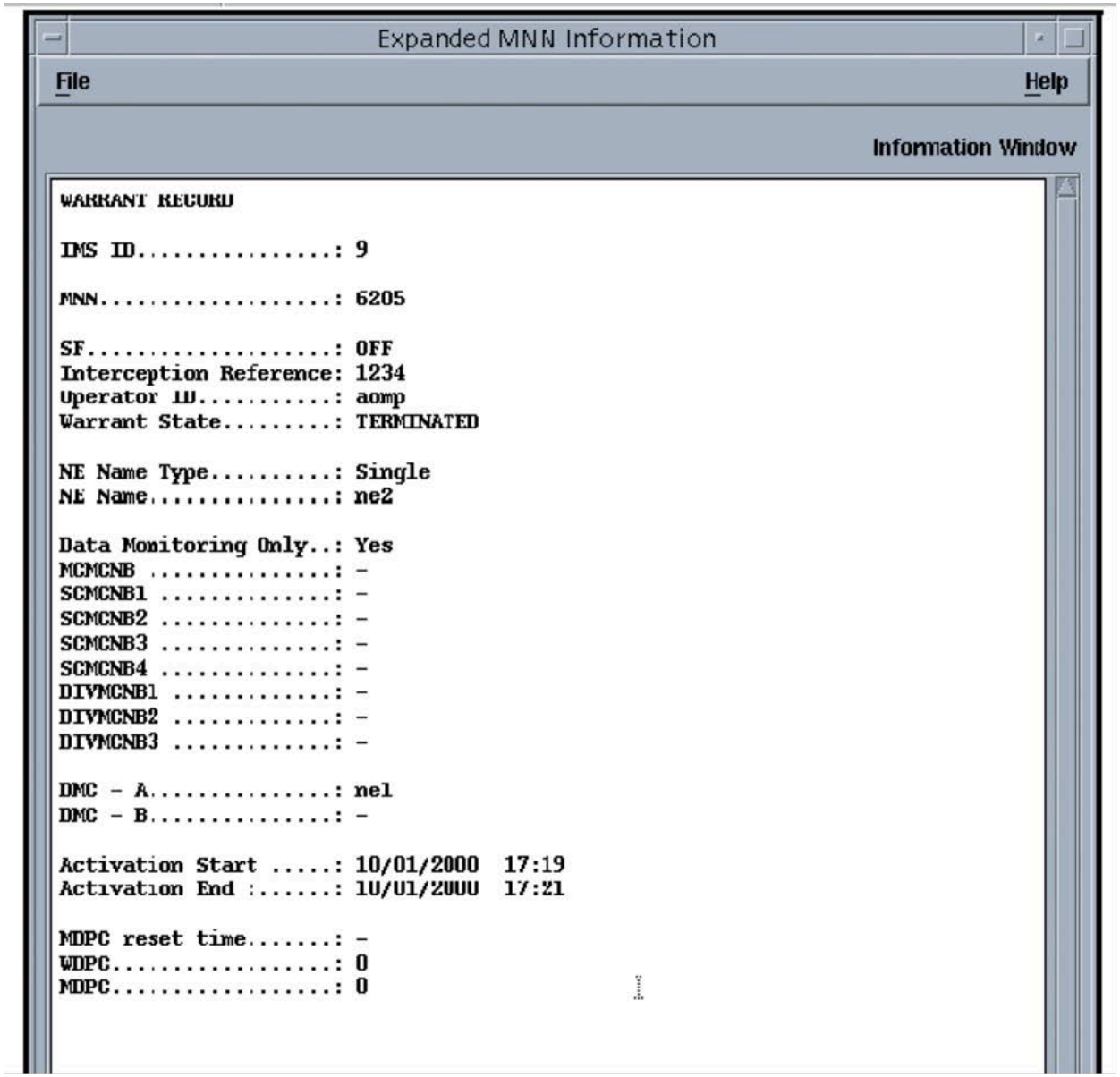


9.17 To specify search criteria

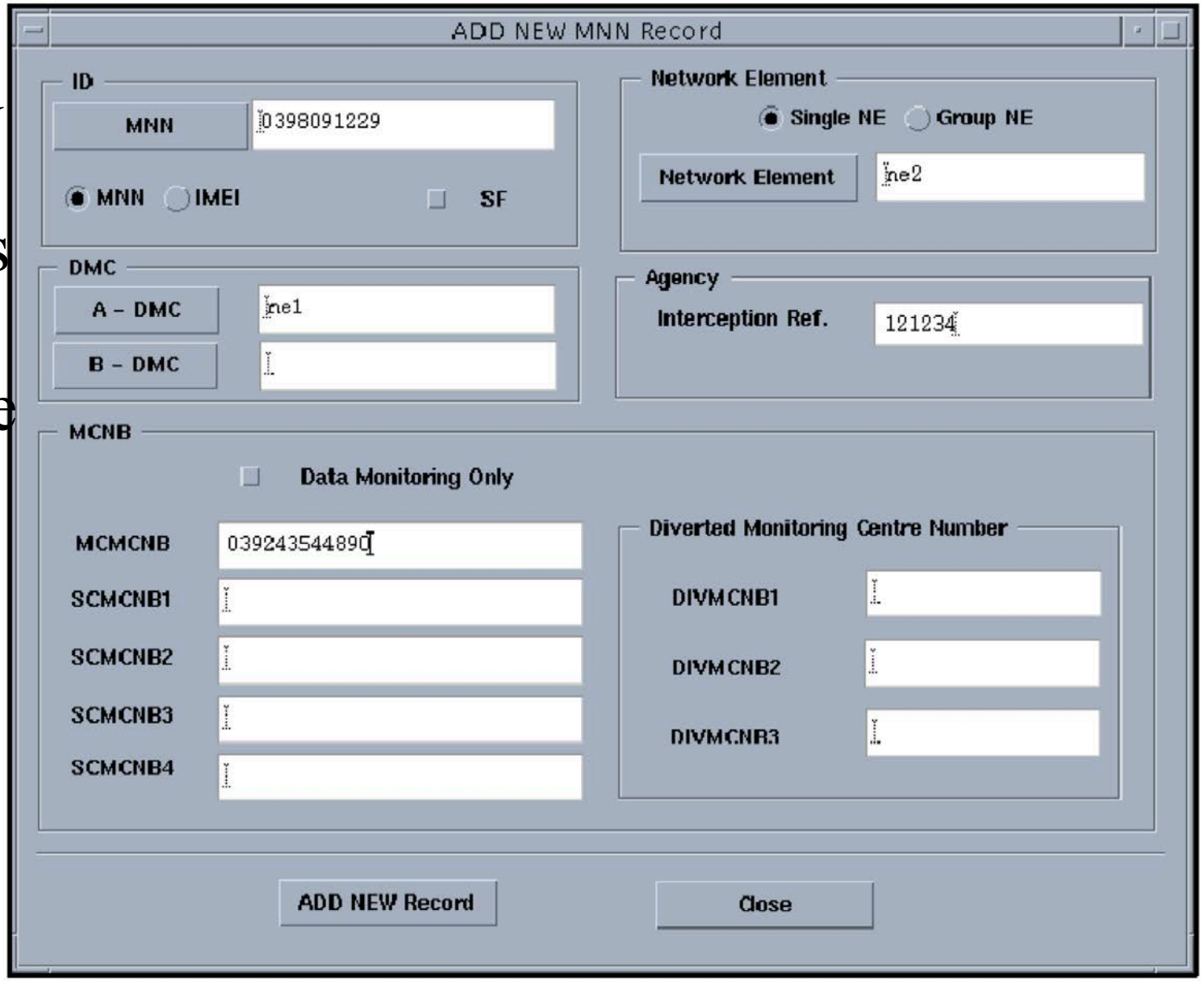
9.18 Managing database

- Normally IMS maintains and updates the database automatically. But you may need to edit the database manually when faults occur in the network.
- This section describes the major task areas of:
  - Viewing and printing target subscriber details
  - Adding, editing, and deleting target subscriber entries

9.19 To view or print the details of a single entry



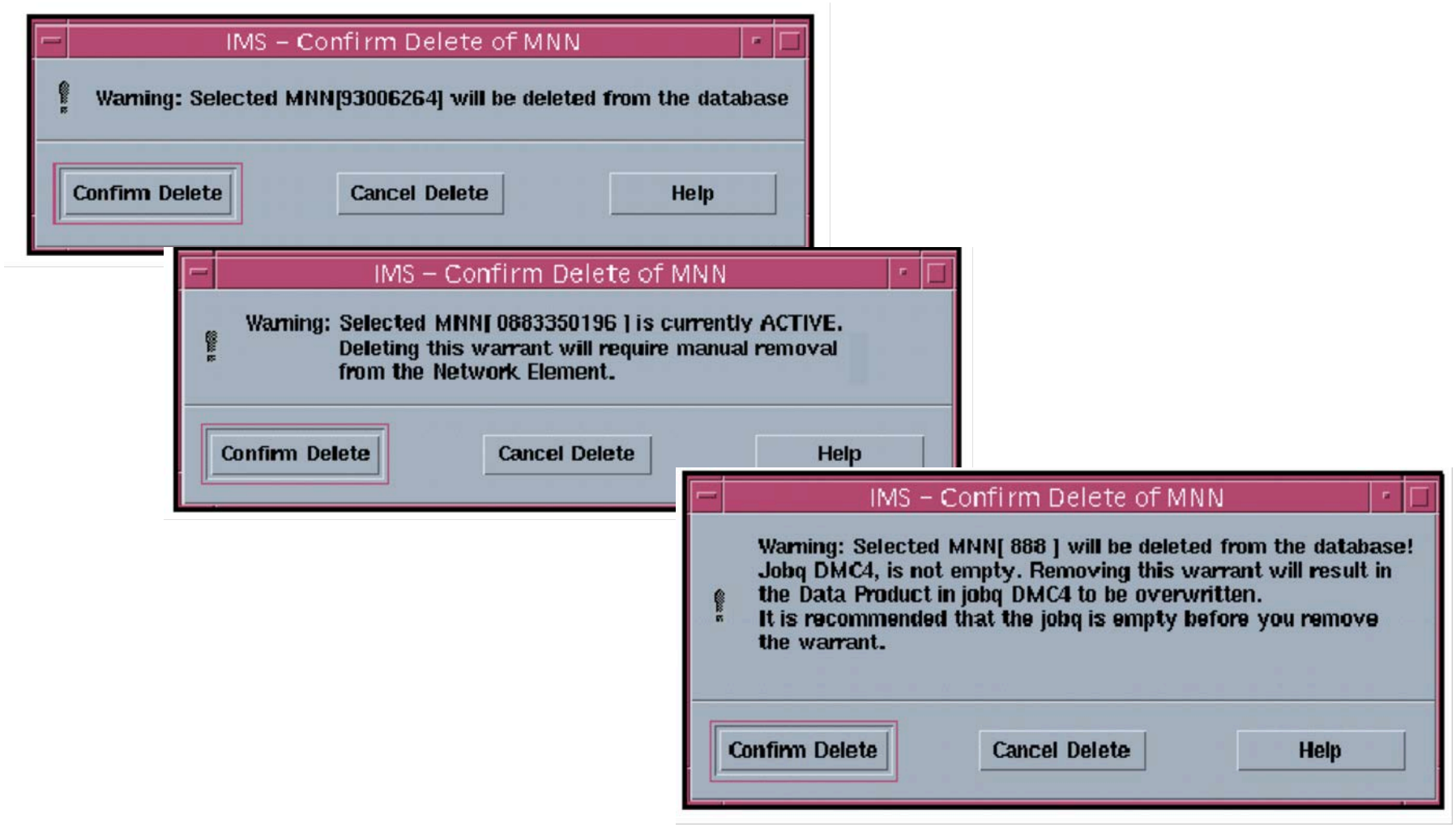
9.20 To add target subscriber's number to the database



9.21 To add a target subscriber's number to the database

- A confirmatory alert appears when the MNN or IMEI is successfully added to the database.
- An error alert appears if the target MNN (or IMEI) is already in the database.
- Activate the newly added warrant
  Deactivate and activate the IMS Mediation and Activation server in order for it to activate the monitoring of the newly added warrants in the network elements.

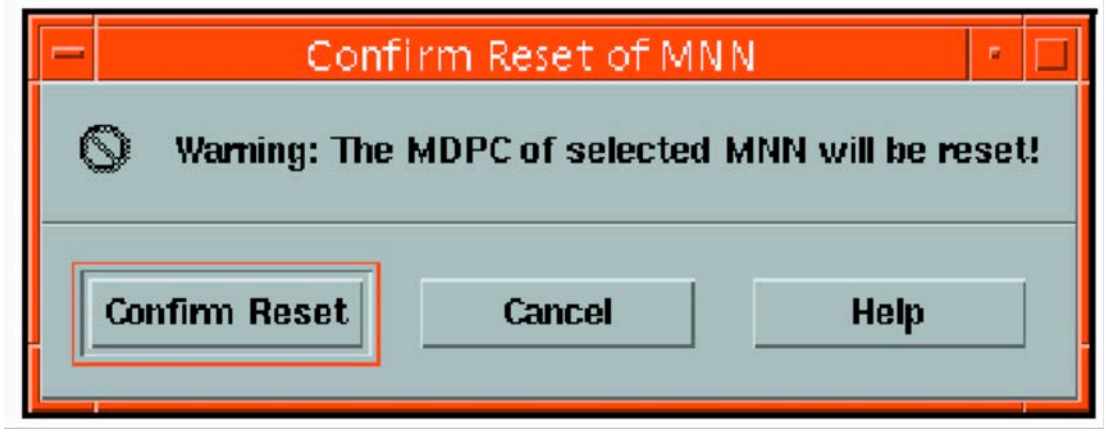
9.22 To delete subscriber's entry from the database



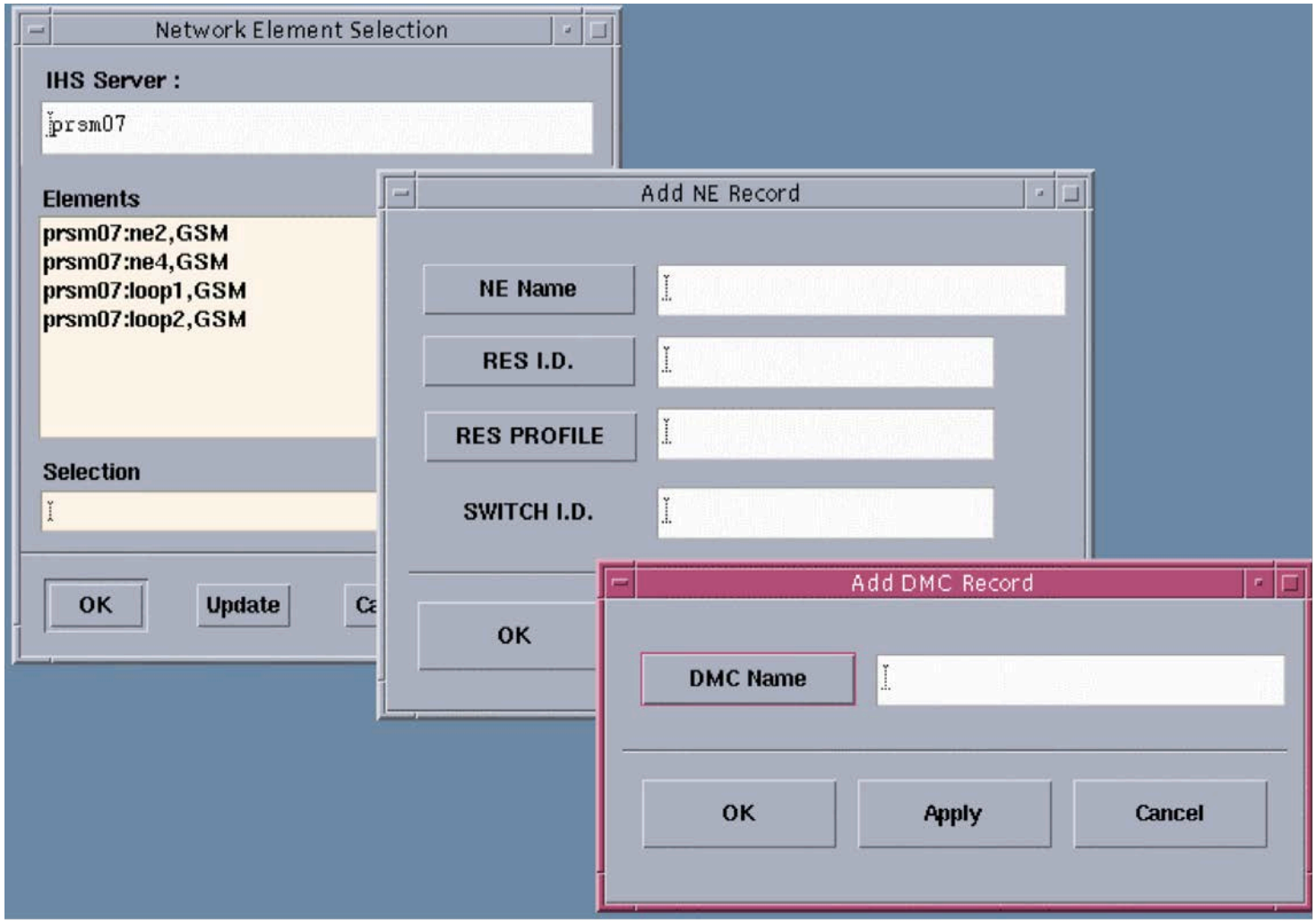
9.23 Statistics Review -- Counting Traffic

- Two traffic counters are implemented in the Dbase for each monitored subscriber.
- The counters are incremented for each received data output for the life of the warrant.
- WDPC -- Warrant Data Product Counter
- MDPC -- Measurement Data Product Counter

9.24 To reset the measurements data-product counter (MDPC)



9.25 Add/Remove NEs and DMCs IN IMS (Network Elements/Data Monitoring Centres)



10. System Maintenance Backup and Recovery

Module Objectives

Be able to perform:

- UNIX System maintenance (HD backups)
- XMATE platform transaction log backups
- IMS Database backup

10.1 System Administration and Maintenance

- UNIX system backups (cron)
- IMS database backup (cron)
- IMS Alarm and Command Log backup
- Deletion of old warrants
- Directory maintenance (DP, Billing, Log)

11. Third Party Software Component

Module Objectives

- An overview of the third party software components used by XMATE/IMS

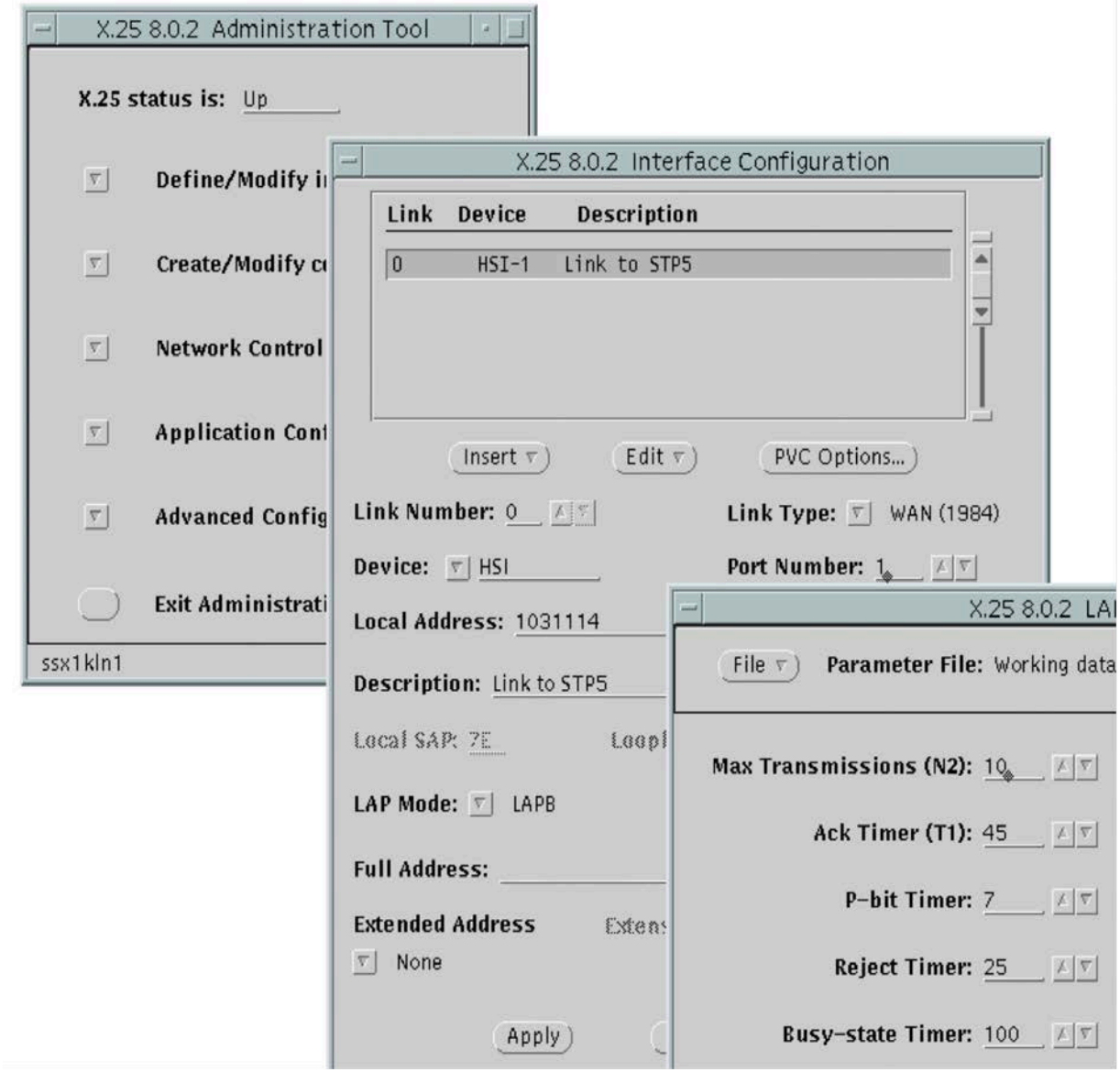
11.1 Third Party Software Components: User Interface and Presentation

- Applix Software System
  - /home/applix/applix

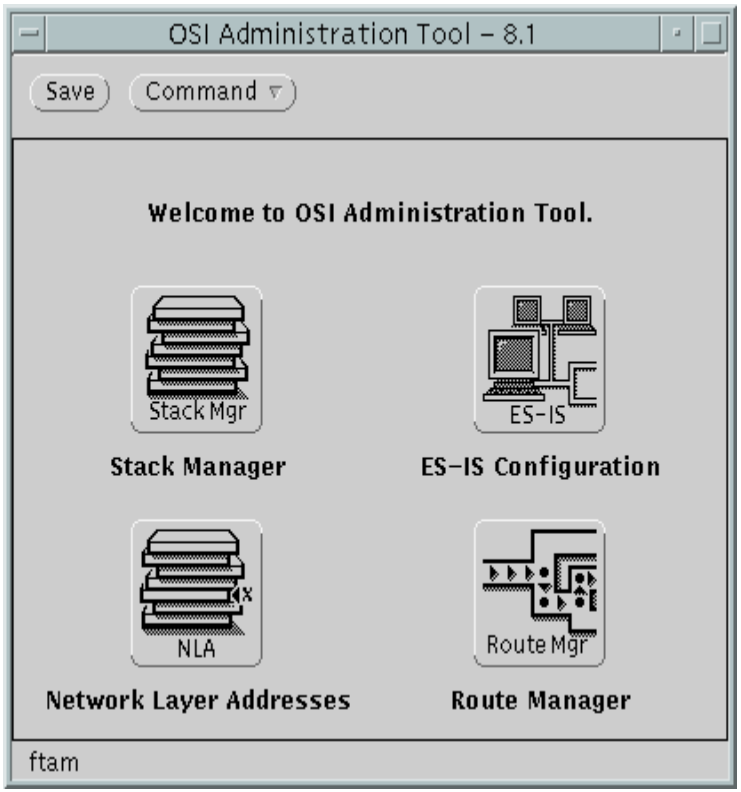
11.2 Third Party Software Components: Network Communication

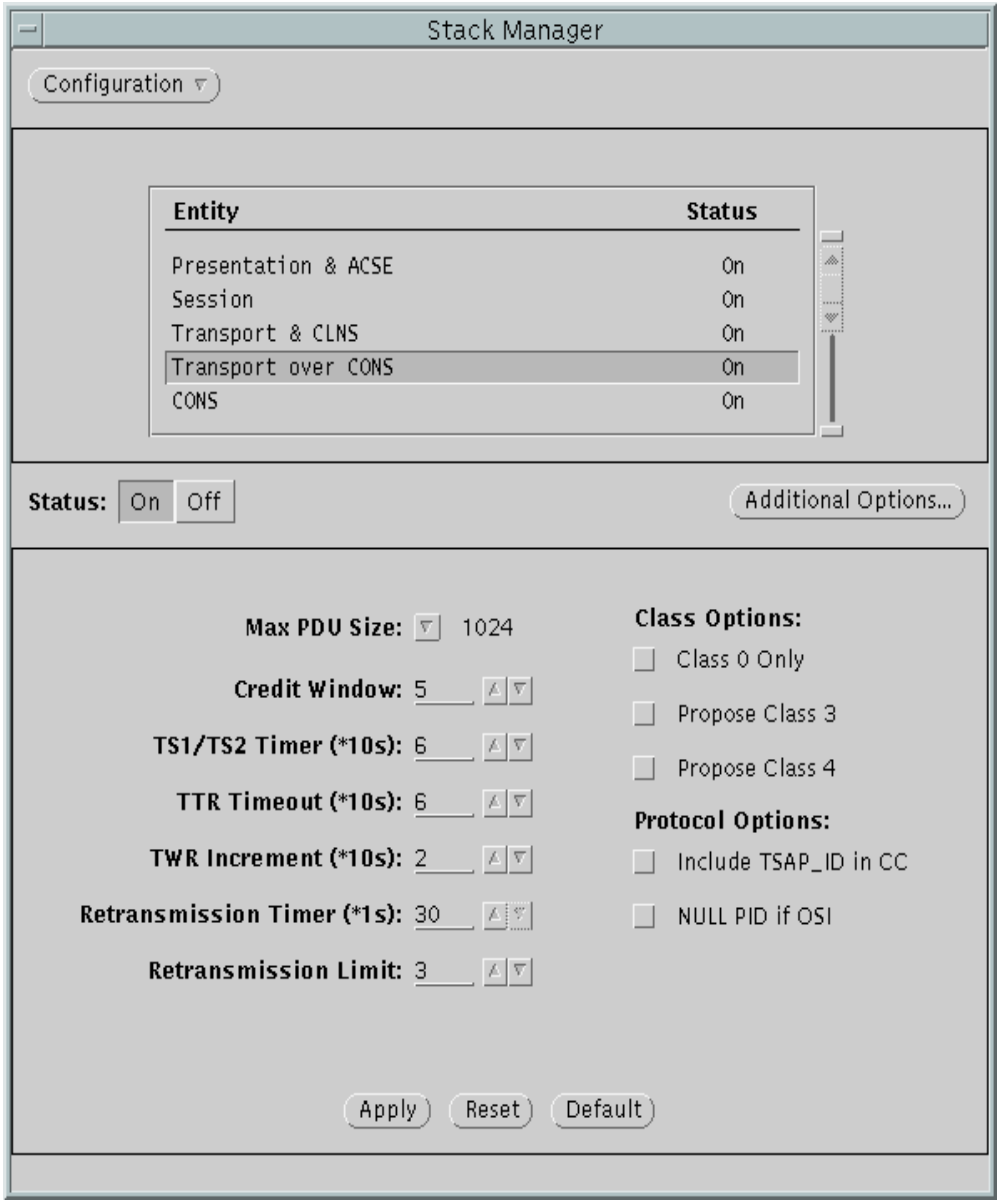
- SunLink X.25
  - /opt/SUNWconn/bin/x25tool
  - /opt/SUNWconn/bin/x25trace -t -i /dev/lapb -l 0
  - /opt/SUNWconn/bin/vcstat -i 3 [-L]
- Solstice OSI
  - /opt/SUNWconn/bin/ositool
- Solstice FTAM
  - /opt/SUNWconn/bin/ftamtool
  - /opt/SUNWconn/bin/osiftam

11.3 X.25 Tool

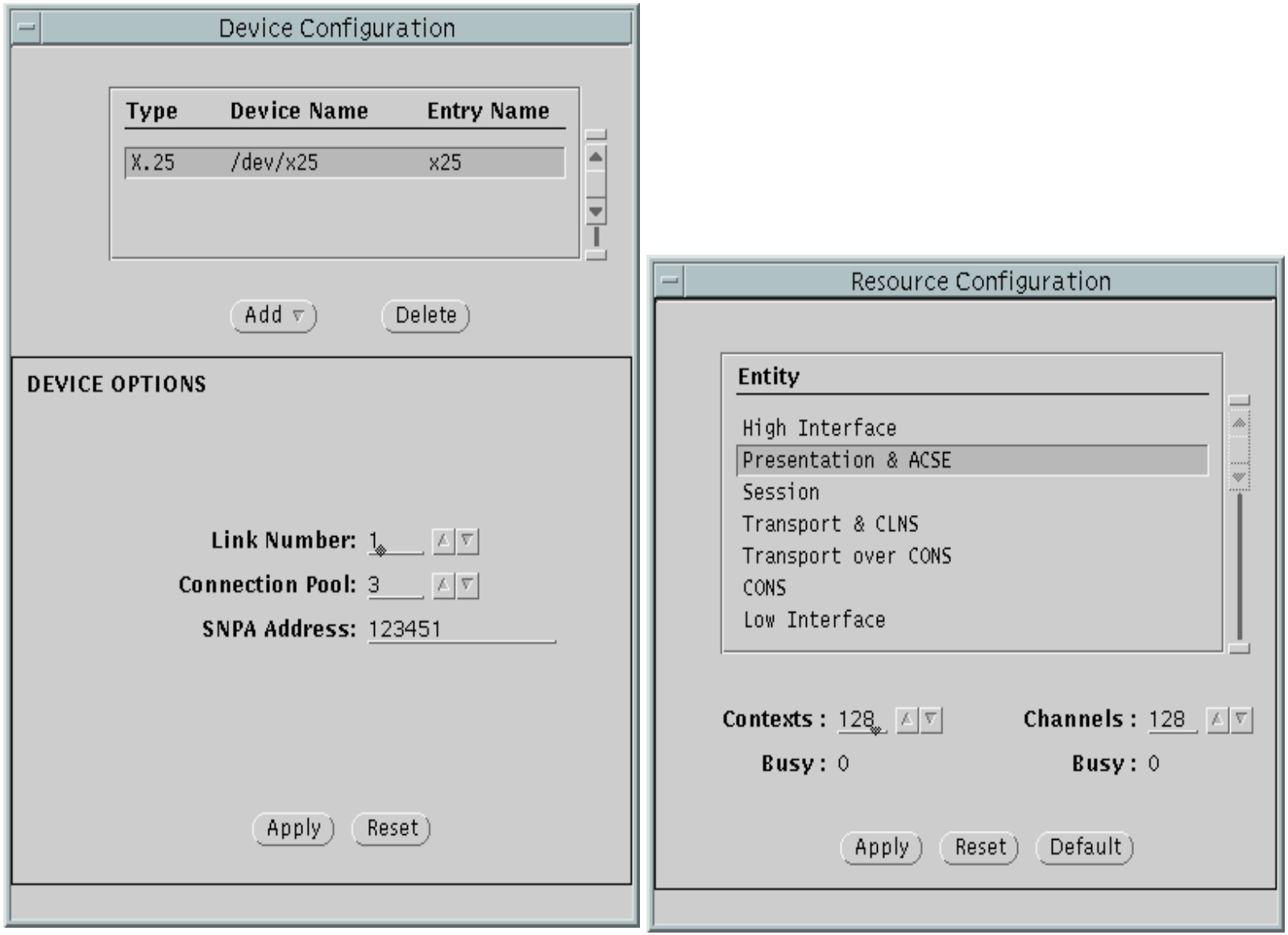


11.4 OSI Tool & Stack Manager

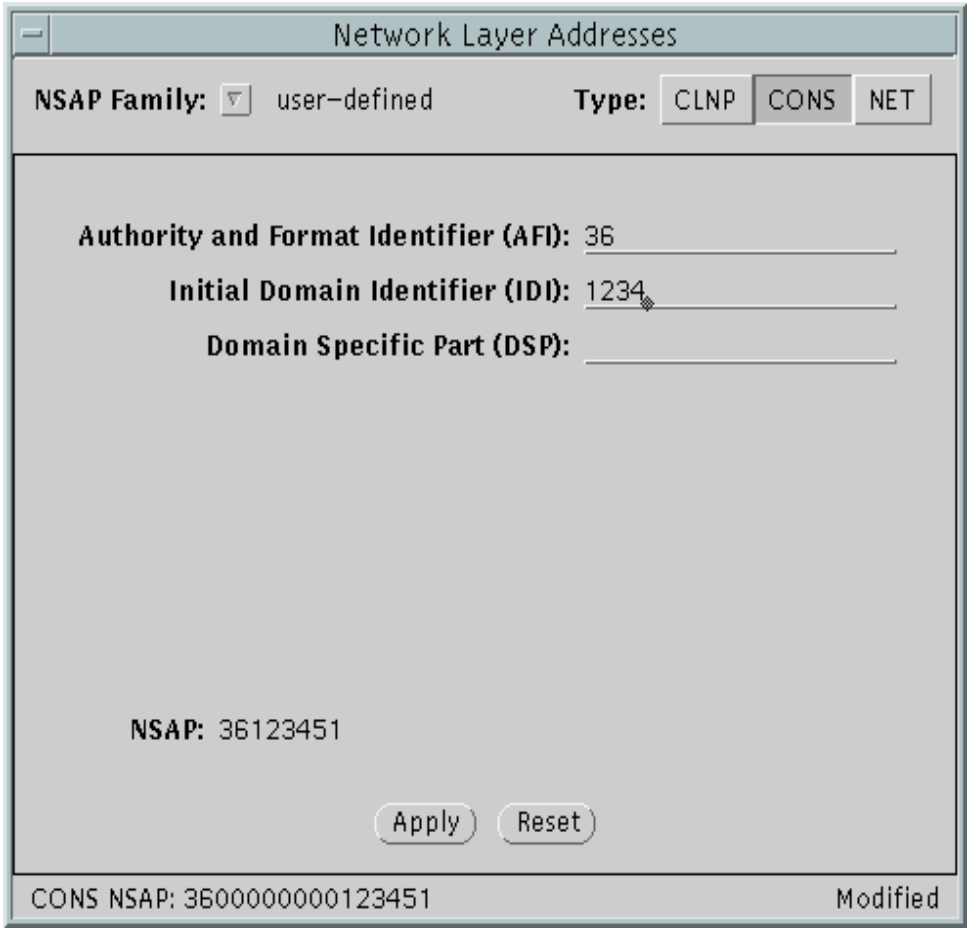


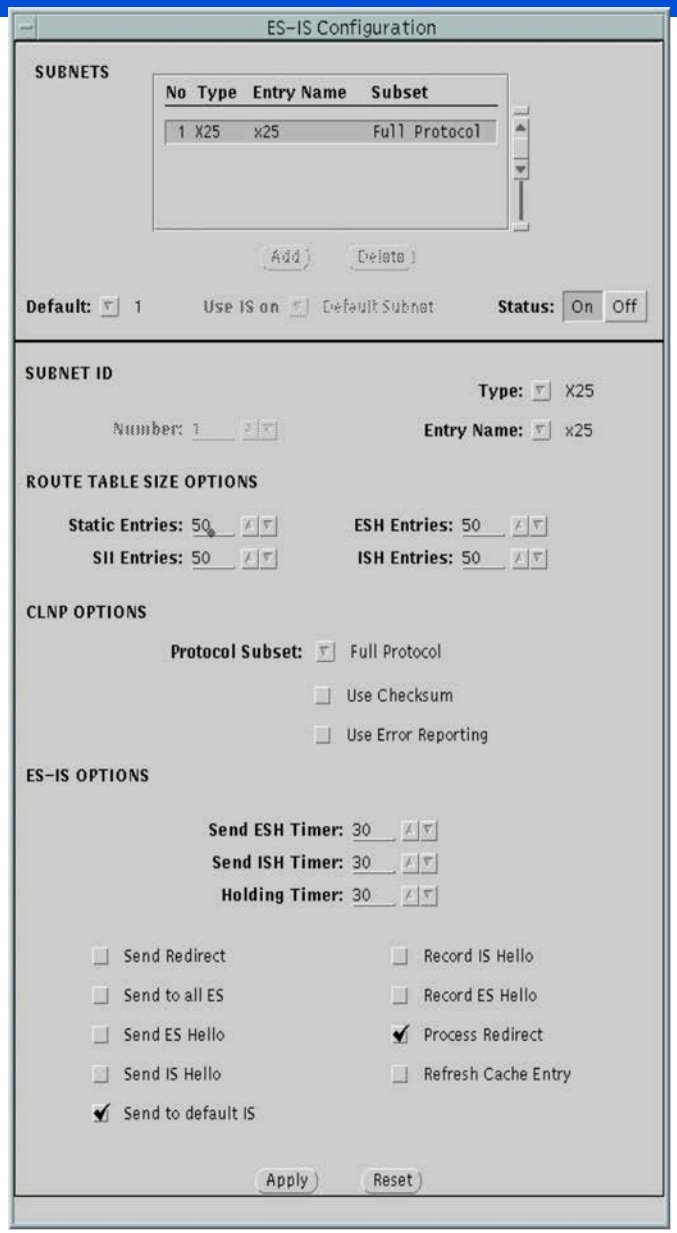


11.5

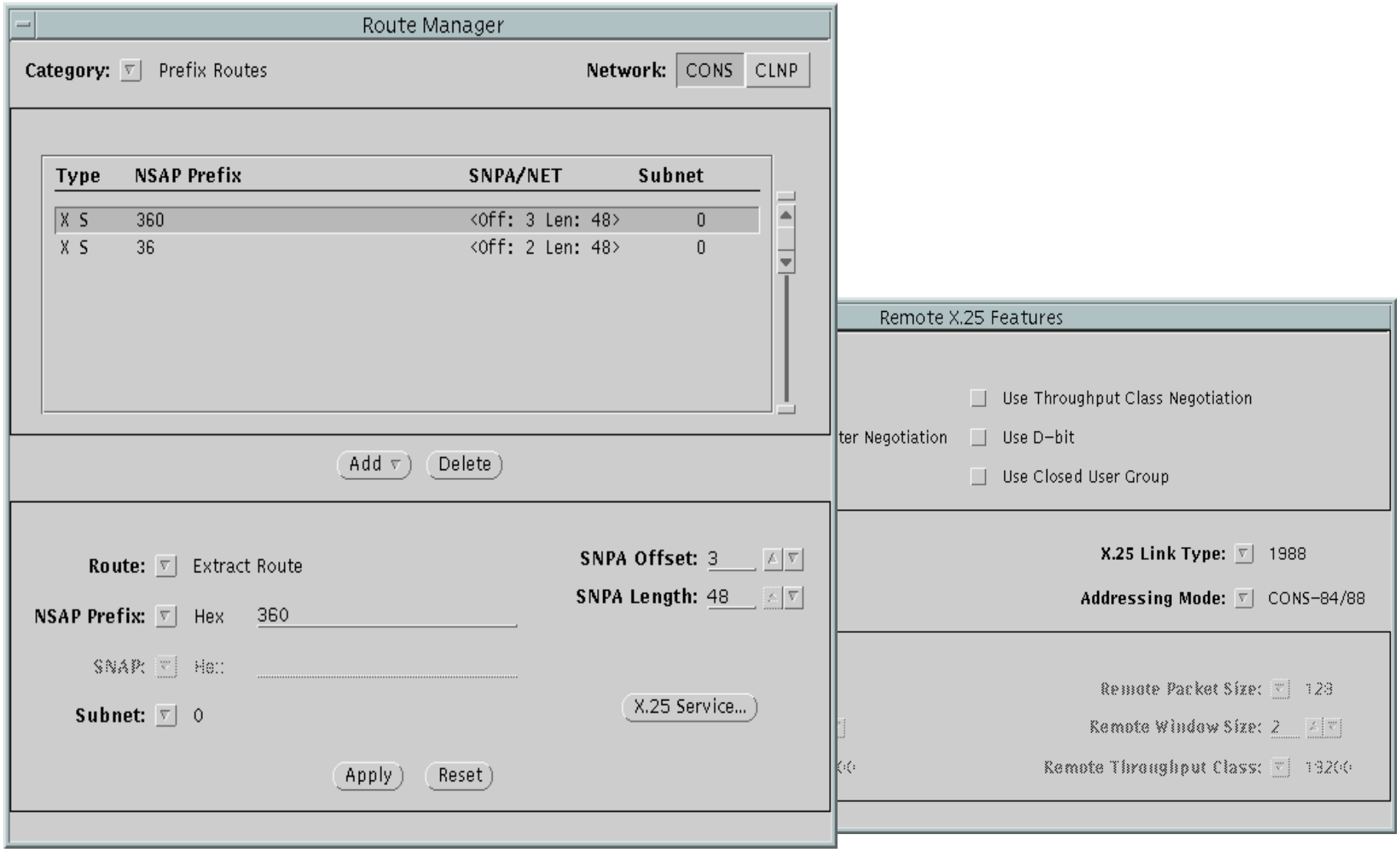


11.6 OSI Tool: Addressing and ES-IS Configuration

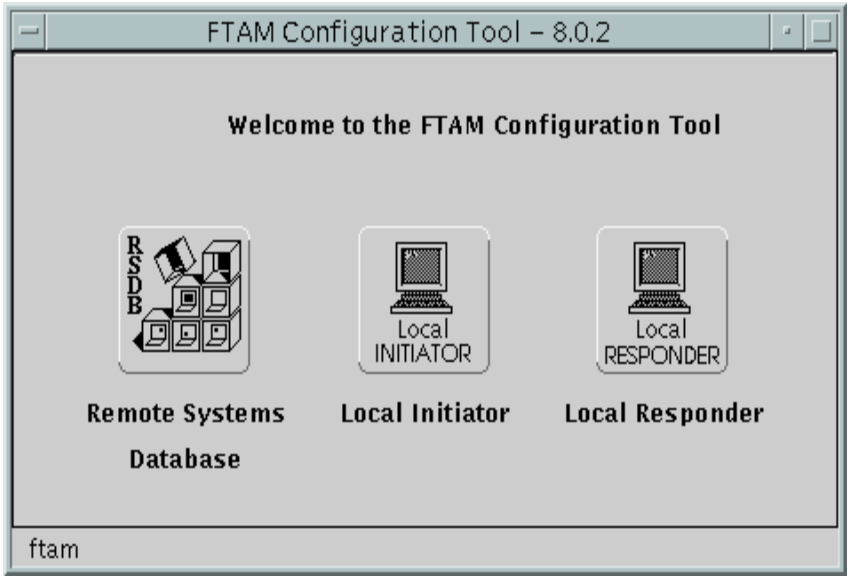


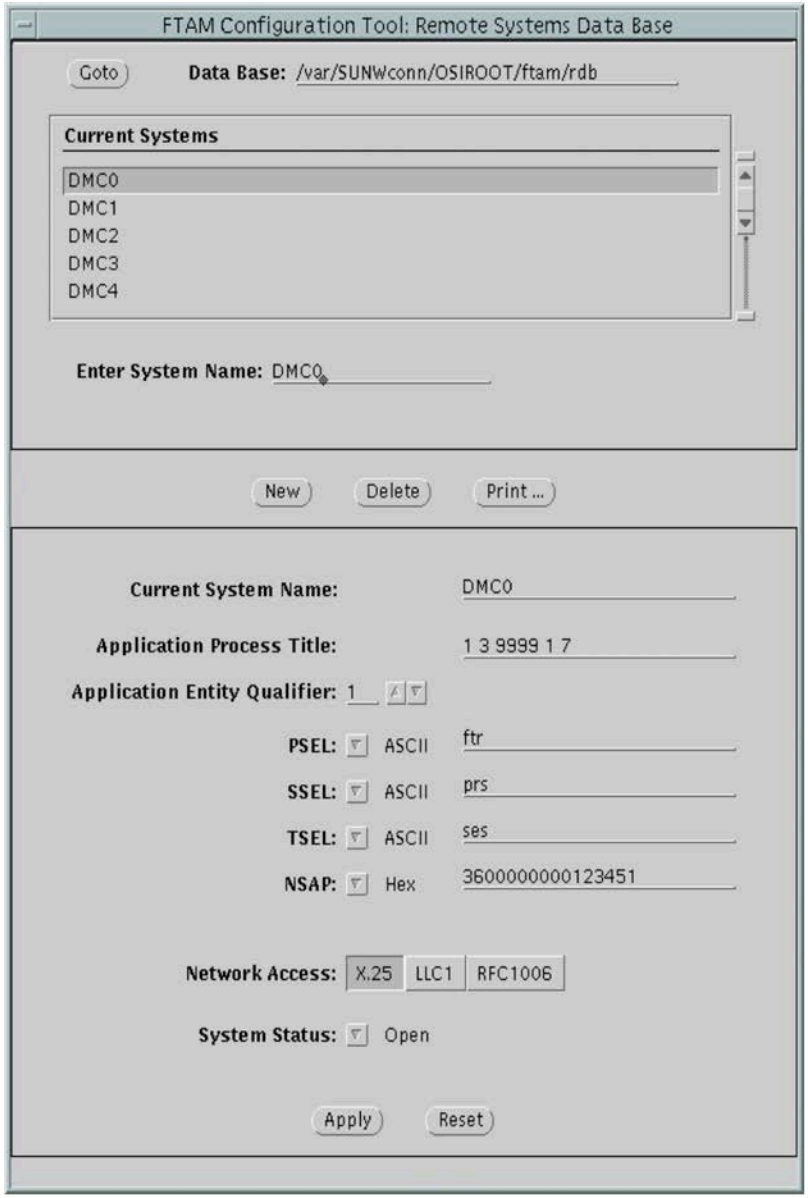


11.7 OSI Tool: Route Manager

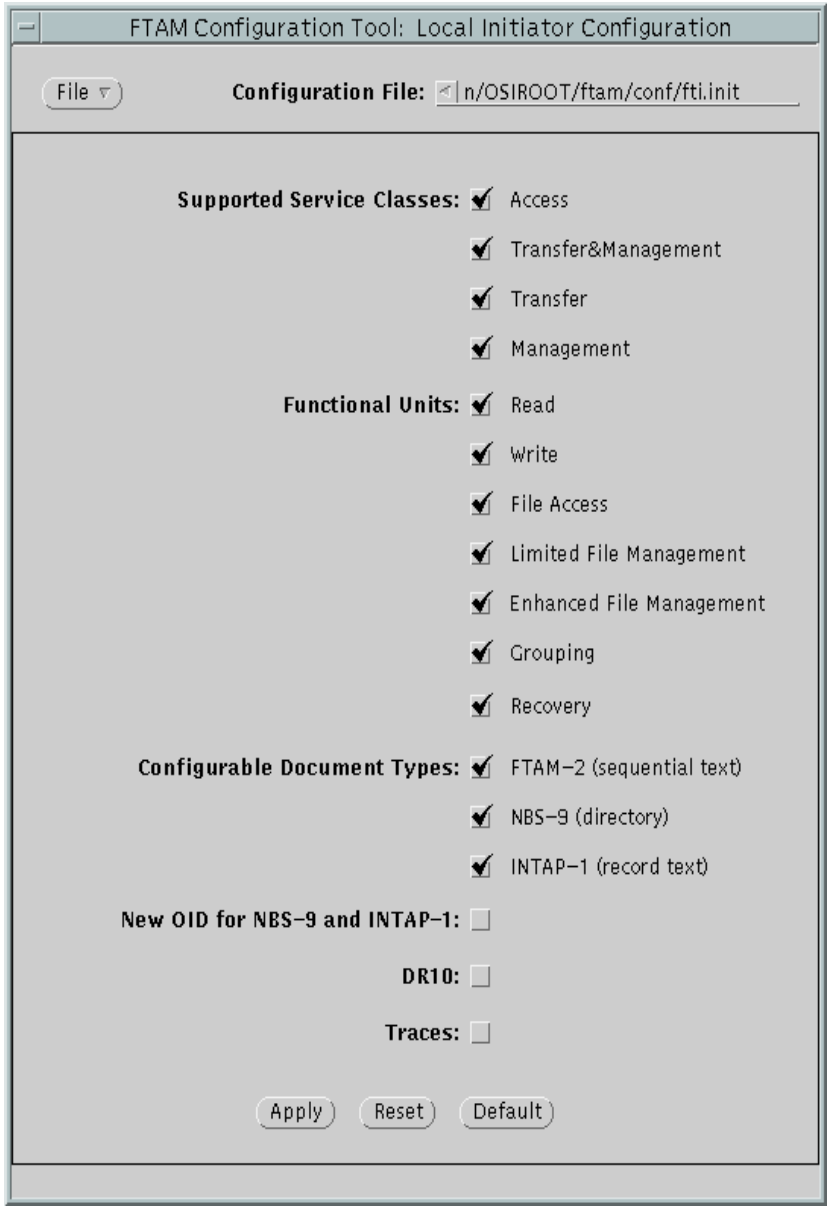


11.8 FTAM Tool

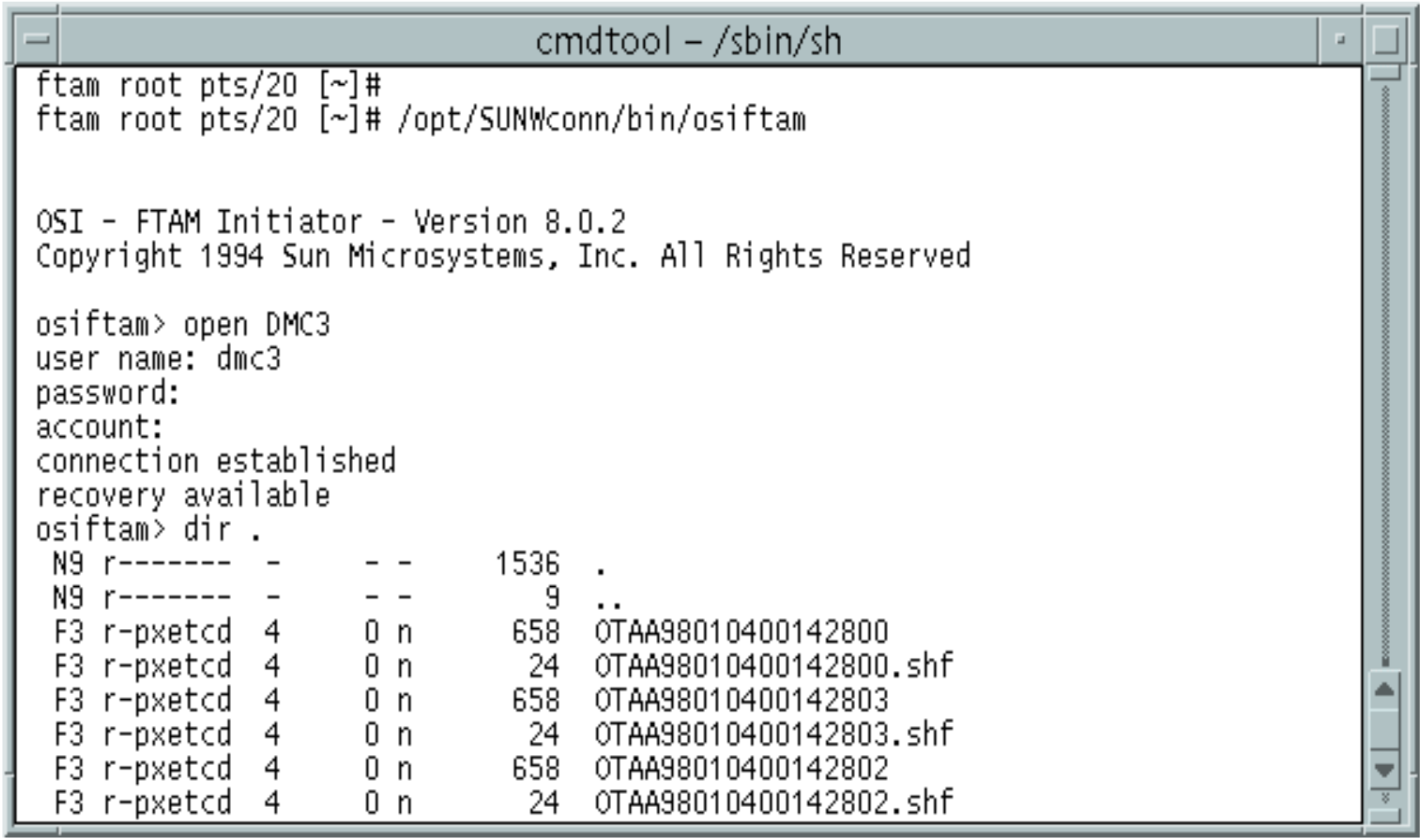




11.9 FTAM Configuration Tool



11.10 OSIFTAM



References:

- LZBP 101 289 Rev J
  IMS Administrator & Operator Manual