



NESiGate-CO

NetEx/IP Offload Channel-to-IP Gateway

Release 2.7.6

Reference Manual

Revision Record

Revision	Description
01 (April 2001)	Initial manual release by Network Executive Software.
02 (July 2001)	Added messages and NRBSTAT Session error codes
03 (Oct 2001)	Incorporate NetEx/IP Release 6.2.5.
04 (Jan 2002)	Updated for Red Hat 7.2 distribution and miscellaneous corrections and additions.
05 (Apr 2002)	<ul style="list-style-type: none"> • Added documentation for new initialization parameters. • Added documentation for additional NetEx operator commands.
06 (xxx 2002)	Added documentation for Hitachi IBM-compatible configuration requirements.
07 (Oct 2002)	Added documentation for NG_CO service
08 (Dec 2002)	Removed Integration section to NESiGate Software Installation Guide
09 (Jun 2005)	Added Software RAID to installation
10 (Aug 2005)	Updated for release 2.7.2
11 (Jan 2006)	Updated for release 2.7.4
12 (Jan 2006)	Updated for release 2.7.5
13 (Feb 2006)	Updated for release 2.7.6

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Notice to the Customer

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Always include the complete title of the document with your comments.

Introduction

The purpose of this manual is to provide an overview of the procedures used to integrate and customize the NetEx/IP components onto a NESiGate channel offload platform, and to provide a description of the command and web browser interfaces.

This manual is divided into the following sections:

- 1) **Integration:** Integration of Red Hat Linux and NESiGate software on the hardware platform is covered in the NESiGate Software Installation Guide. Refer to that guide, then return to this manual to complete the configuration of NESiGate as a Channel Offload (CO) type device
- 2) **Customization:** this section is targeted to the end-user who is responsible for customizing the NESiGate appliance for use as a NetEx/IP channel offload device. It is assumed the NESiGate already has the appropriate level of the Linux operating system installed. To complete the customization, the reader must be familiar with channel device and network addressing concepts.
- 3) **Web Browser Interface:** this section is targeted to the end-user who is responsible for customizing the NESiGate appliance for use as a NetEx/IP channel offload device, and who is responsible for configuring and controlling operational aspects of the device.

Customization

Overview

The purpose of this section is to provide an overview of the procedures used to complete the customization of the NESiGate Offload channel-to-IP NetEx/IP gateway for use with NetEx/IP offload products. This section is targeted to the end-user responsible for customizing a NESiGate appliance for use as a NetEx/IP offload channel device. It is assumed the NESiGate already has the appropriate level of the Linux operating system installed. To complete the customization, the reader must be familiar with channel device and network addressing concepts.

The customization process consists of these major steps:

1. Configure NESiGate
2. Configure NetEx/IP
3. Update DNS or local 'hosts' file (optional)
4. Reboot NESiGate

Device addressing

Prior to performing the Device and IP customization tasks, it would be beneficial to review NESiGate device and network addressing concepts.

There are three important addressing elements involved in delivering NetEx/IP channel data that is not IP-aware, and transferring it over an IP network to the correct destination:

- Device Number
- GNA Address
- IP Address

Device Number

The Device Number on the host and Device Index on the NESiGate channel board are numeric representations of the same unique "device". On the Host operating system, a "Device Number" is defined as a Unit Address on a Logical Control Unit (a physical control unit may consist of from 1-16 logical control units). The Physical Control Unit may be connected to a Port on an ESCON Director. Multiple inbound Host channels may be connected to the ESCON Director and provide connectivity to the device from multiple partitions (LPARs) across multiple hosts.

Similarly, on the NESiGate ESCON board, a "Device Index" is defined as a Unit Address on a Logical Control Unit (up to 16 may exist). The Physical Control Unit may be connected to a Port on an ESCON Director, which may provide connectivity to multiple LPARs across multiple hosts.

Since both the Device Number and Device Index represent the same unique device (from different perspectives), the same addressing components must be specified *exactly the same* in both definitions. Failure to do so will prevent the NESiGate devices from functioning properly.

When defining devices on the ESCON channel board, the following items are specified: Device Unit Address, Logical Control Unit, the Director port to which the host channel is connected, and Partition-id (LPAR). The Device Index values are not specified by the user. They are automatically generated when the channel configuration is defined.

A maximum of 64 devices are supported by a NESiGate-CO appliance, consisting of either up to 64 devices on a single ESCON interface, or up to 32 devices on each of two ESCON interfaces.

Refer to the “**Error! Reference source not found.**” button on page 14 for a description of defining the channel devices.

GNA Address

The GNA address represents a NetEx/IP network address that is associated with a given device. It is specified in the NetEx/IP Network Configuration Table (NCT). It is also specified during the customization of the NESiGate Channel Driver. At that time, an association is established between a particular GNA address and a Device Index.

IP Address

The IP address represents a NetEx/IP network node address. There is no channel device awareness inherent in an IP address. However, during the NESiGate customization task, IP host names are defined, each having a format based on its GNA address. This enables NESiGate to perform a direct mapping between GNA and IP addresses. This mapping is transparent to the NetEx/IP running on the host, as well as to all NetEx/IP applications.

Using a Web Browser to Configure NESiGate

The NESiGate Web Browser Interface may be used to configure NESiGate. Before configuring the NG-CO specific items, the common System and Network configuration should be completed. See the "Installation Guide" (NG-SW) manual for details.

Refer to the "Web Browser Interface" section on page 7 for a complete description of the commands used in this section.

Define the Channel Boards(s)

Select the *Board* link located on the bottom toolbar, or select the *Channel Board Commands* link from the *NESiGate Displays & Configuration Commands* screen.

This will open the page that is titled:

NESiGate Channel Board Commands

Refer to the "NESiGate Board/Channel Commands" section on page 10 for a description of this command.

Define the Devices

This step is required. If this step is not performed, the ESCON devices will respond as the correct device without regard to LPAR or ESCON director port affinity. If this does not match the real configuration, incorrect results will occur.

Select the *Board/Channel* link located on the bottom toolbar. This will open the page that is titled: *NESiGate Channel Interface*.

Using the device configuration data from a completed worksheet provided in "Appendix A: Configuration Worksheet" on page 17, use the "Channel Define Interface" button to define the devices. Refer to page 14 for a description of this command.

Repeat this step as many times as necessary until all required channel interfaces are defined.

Configure NetEx/IP

There are three steps to configure NetEx/IP for NESiGate:

- create and download an NCT
- make a pamfile for this NESiGate
- modify default parms for this NESiGate

NCT

The NCT can be created on any network-attached host and placed in a file named '`<nesigate>.nct`' where `<nesigate>` is the configured hostname of the NESiGate being configured.

Refer to the “*Netex Configuration Manager*” manual for a description of the NCT parameters.

The NCT can then be downloaded to the NESiGate using the CLI or web ‘`receiveFile`’ command.

PAM

The pamfile is an internal file built from the NCT by the Configuration Manager. It contains a configuration image of the NCT relative to a particular host.

Run the CLI or web ‘`buildPam`’ command providing the hostname for which you are creating the pamfile.

NETEX parameters

The `ntx_default` file provides a set of default initialization parameters, Refer to “Appendix B: Initialization Statements” on page 19 for a description of the parameters contained in `ntx_default`.

2 parameters MUST be changed in order to make Netex functional (“`local`” and “`device1`”) and one may be changed in order to improve performance on some networks (“`segsz`”). See “Modify Netex Defaults” on page 16 for details.

Update DNS (optional)

NetEx/IP Offload performs dynamic mapping of GNA addresses to IP addresses. Dynamic mapping is performed at NetEx/IP initialization time for all hosts defined in the NCT. A DNS lookup is done for a hostname entry in the following format:

`NTX0000UUSS`

where *UU* is the network address and *SS* is the subaddress. (*Note: the "NTX" DNS entry names must all be upper case*).

These addresses comprise the HYPERchannel *toGNA* address, as defined in the NetEx/IP NCT by the NETADDR (*UU*) and SMGDREF (*SS*) parameters. If the DNS lookup is successful, an entry is dynamically created in the NetEx/IP routing table that maps the *toGNA* and *toIP* addresses. Subsequent searches of the table for any outgoing and incoming messages will find this new entry, thus avoiding additional DNS lookups.

If a host is not defined in the NCT, or if a DNS entry does not exist for the host, the NetEx/IP command ‘`set ip gna ipaddress`’ can be used to statically define the mapping for NetEx/IP.

Reboot NesiGate

After the configuration changes have been made, the NESiGate unit must be rebooted to make the changes effective:

- Vary the devices offline to the host operating system.
- Browse to the “System Configuration” page of the NESiGate

- In the “Misc Command” menu, select “REBOOT”
- Click the “DoIt” button
- After NESiGate is back up vary the devices offline to the host operating system

Web Browser Interface

Overview

The Apache web server is used on NESiGate to provide a web-enabled configuration facility. Connecting NESiGate to an intranet infrastructure enables usage of a web browser to configure the Channel, Router, IP, and Control components. The browser can also be used to display configuration information, and control various operational aspects of the components.

Browser Considerations

The browser can be hosted on any system, as long as that system has connectivity to NESiGate. However, the browser must be configured to refresh pages on each page reference.

Initial Screen

When the browser first connects to NESiGate, a password entry window will be displayed. Enter the ngadmin userid you have been assigned and its password to gain access to the NesiGate. Default userids and passwords are described in the common NESiGate Installation Manual.

The initial screen displayed when the password has been accepted includes a “Welcome” screen with general information on the right and a list of the available command frames and HELP links on the left.

System & Network Configuration

The links near the bottom of this page will bring you to the area for re-configuring and displaying common system & network information. Refer to the NESiGate Installation Manual for a description of these commands.

NESiGate Components Commands

This screen is used to define, process, or view component configuration data.



From this drop-down menu, the following commands can be initiated -

- Display EMSG Components Configuration
- Get EMSG Memory Trace

After selecting the desired command, click the **GO** button to process. Results of the command will be returned to the browser for display.

Display EMSG Components Configuration

This command shows the list of components selected to be loaded and the locations of the component's configuration files, as illustrated in Figure 1.

NESiGate Display EMSG Components Configuration

```
DO_NETEX=yes  
DO_NESIGATE_MSG_LOAD=yes  
DO_MSG=yes  
MSG_CONFIG=/etc/nesigate/conf/msg.cfg
```

Figure 1. Output from 'Display EMSG Components Configuration'

Get EMSG Memory Trace

This command dumps the current event trace buffer to the browser screen. This may be needed if requested by Network Executive Software, Inc. for debugging purposes.

Set EMSG Memory Trace

This button sets logging of events to the memory trace by component:

Channel: sets event logging for the Channel component.

Modify EMSG Components Configuration

This button marks various components to be automatically loaded at start-up time:

Load Modules
Start EMSG
Start NetEx/IP

Display Log File

Tail Log File

This button displays the contents of each component's event log file ("Tail" displays just the last page of data):

EMSG: view the content of the Control log file.
Escon Config Define: view the content of the ESCON device definition log file.
Escon Config Load: view the content of the ESCON configuration load log file.
Console Messages: view the content of the Console log file.

NESiGate Board/Channel Commands

Display Board Config

This button displays the channel boards that have been previously defined.

Prior to selecting this button, provide the following data on the selection screen:

Board Name the name of the board to display.

If no name is specified in the Board Name window, then all defined channel boards are displayed.

Channel Define/Undefine Board

This button deletes or adds the specified channel board from the configuration.

Prior to selecting this button, provide the following data on the selection screen:

Board Name a 1-8 character name by which the board will be identified in subsequent define and display commands.

For 'Define Board' the following additional information is needed:

Channel Type select either ESCON/SBCON, or
If the board is a Bus&Tag interface, select either DCI, 3.0 MB, or 4.5 MB, depending on the speed of the channel to which the board is connected.

PCI Bus PCI bus number on which the ESCON board is installed.

PCI Device PCI device in which the ESCON board is installed.

Refer to the NESiGate Software Installation Guide for a description of the model dependent PCI bus and device definitions.

NESiGate Channel Interface Commands

This screen is used to define, control, or view channel interface data.

Command drop-down menu

GO

From this drop-down menu, the following commands can be initiated -

- Channel Display Interface Config
- Channel Display ESCON Config
- Channel Display Info
- Channel Display Stats
- Channel Clear Stats
- Channel Start Interface
- Channel Stop Interface
- Channel Undefine Interface

After selecting the desired command and entering the necessary parameters, click the **GO** button to process. Results of the command will be returned to the browser for display.

Channel Display Interface Config

This command displays the current channel configuration. Prior to selecting this button, provide the following data on the selection screen:

IFname - specify the name of the channel interface to display.

If IFname is not specified, all defined channel interfaces are displayed.

Channel Display ESCON Config

This command shows the currently defined and currently loaded ESCON subchannel ranges and their index values, as illustrated in Figure 2.

Prior to selecting this button, provide the following data on the selection screen:

IFname - specify the name of the channel interface to display.

If IFname is not specified, all defined channel interfaces are displayed.

NESIGate Channel Display Escon Config

Current Loadable (/etc/nesigate/conf/chlescon.cfg)

```
;ESCON configuration
;indexNN=subchannel,emulation,controlunit,channellink,lpar,tag
slot=196609
index1=0,HCM,1,ef,0,nesiweb
index2=1,HCM,1,ef,0,nesiweb
index3=2,HCM,1,ef,0,nesiweb
index4=3,HCM,1,ef,0,nesiweb
index5=4,HCM,1,ef,0,nesiweb
index6=5,HCM,1,ef,0,nesiweb
index7=6,HCM,1,ef,0,nesiweb
index8=7,HCM,1,ef,0,nesiweb
```

Figure 2. Output from 'Display ESCON Configuration'

Channel Display Info

This command displays detailed channel interface information.

Prior to selecting this button, provide the following data on the selection screen:

- IFname - specify the name of the channel interface to display. If not specified, all defined channel interfaces are displayed.
- SubChannel - limit the display of the channel interface to a particular device. For an ESCON channel interface running in “configured” mode, this parameter is the Device Index. For an ESCON channel interface running in “non-configured” mode, or for a Bus & Tag channel interface, this parameter is an offset from the UADD specification. If the UADD parameter is not used, this parameter is an offset from the low-order byte of the startGNA address.

Channel Display Stats

This command displays statistics for a particular channel interface.

Prior to selecting this button, provide the following data on the selection screen:

- IFname - specify the name of the channel interface to display. If not specified, all defined channel interfaces are displayed.
- SubChannel - limit the display of the channel statistics to a particular device. For an ESCON channel interface running in “configured” mode, this parameter is the Device Index. For an ESCON channel interface running in “non-configured” mode, or for a Bus & Tag channel interface, this parameter is an offset from the UADD specification. If the UADD parameter is not used, this parameter is an offset from the low-order byte of the startGNA address.

Channel Clear Stats

This command clears all or selected channel statistics. Prior to selecting this button, provide the following data on the selection screen:

- IFname - specify the name of the channel interface to clear.
- SubChannel - limit the clear of the channel interface to a particular device. For an ESCON channel interface running in “configured” mode, this parameter is the Device Index. For an ESCON channel interface running in “non-configured” mode, or for a Bus & Tag channel interface, this parameter is an offset from the UADD specification. If the UADD parameter is not used, this parameter is an offset from the low-order byte of the startGNA address.

Channel Start Interface

This command starts a defined channel interface. Prior to selecting this button, provide the following data on the selection screen:

IFname - specify the name of the channel interface to start.

Channel Stop Interface

This command stops a defined channel interface. Prior to selecting this button, provide the following data on the selection screen:

IFname - specify the name of the channel interface to stop.

Channel Undefine Interface

This command removes a defined channel interface.

Prior to selecting this button, provide the following data on the selection screen:

IFname - specify the name of the channel interface to stop.

Channel Define Interface

Channel Define Interface

This button defines a channel interface, which consists of a range of devices for use by a particular NetEx/IP.

⇒ *Note: a channel board must be defined first before defining any channel interfaces.*

Prior to selecting this button, provide the following data on the selection screen:

IFname	name by which the interface will be identified.
Type	the type of protocol message. For NetEx/IP Channel Offload, EMSG must be specified.
Prot	the channel protocol version. For NetEx/IP Channel Offload, HCM must be specified.
On board	the name of the board on which this interface is being defined.
UADD	the unit address of the device.
StartGna	the GNA address of the first device, in the format 'UUSS', where 'UU' and 'SS' each specify a value in the range x'00' through x'FF'. The value specified is used for the first channel device, and is incremented by 1 for each subsequent device, up to the number of channel devices that are defined. The value specified for the channel StartGna does not have to be the same as the GNA value specified in the NetEx/IP NCT. The channel GNA is independent of the NCT, and is also independent of the GNA values specified in the allocation tables used by the NetEx/IP channel offload host drivers. However, all of the GNA addresses assigned to channel devices must be unique across all channel interfaces on the NESiGate appliance.
Number of Devices	number of devices being defined for this interface (Note: 2 devices are required for each concurrent NetEx/IP session using NG-CO).
Input	(optional) low-order byte of the input device.
Max Data -	(optional) memory allocation size used by the Channel driver to buffer data coming off or going on the channel. This value must be at least as large as the NetEx/IP segsize parameter. The default is 65535 bytes.

For ESCON devices only -

CU	the control unit number. Up to sixteen control units can be specified, ranging from 0-F. A unique Control Unit should be defined for each concurrent host, or host partition, running NetEx/IP. Note: CU 0 must be used if connection is to a Unisys system.
CHlink	the ESCON director port number to which the channel is connected that is used for communicating to the ESCON board. If the ESCON interface is connected directly to the channel without going through an ES-

CON Director, a port number of 1 should be specified if connection is to an IBM or Hitachi IBM-compatible system; a port number of 2 should be specified if connection is to a Unisys system.

LPAR the partition number of the host driving this interface if the channel is defined as SHARED. If the system is running in BASIC mode, or if the system is running in LPAR mode but the channels are defined as either RECONFIGURABLE or DEDICATED, then the value specified for LPAR must be zero.

⇒ Caution: It is extremely important that the values specified for UADD, CU, Chlink, and LPAR exactly match the values specified in the host system's device configuration. Failure to do so will make the devices unusable.

The total number of devices supported on each ESCON interface board is 64 if there is a single ESCON interface board in the appliance, or 32 if there are two ESCON interface boards in the appliance. Use this selection button multiple times until all required device interfaces are defined.

Channel Set Debug

Channel Set Debug

This button sets the debug trace level for all interfaces, or for a specific channel interface. Prior to selecting this button, provide the following data on the selection screen:

- IFname the name of the channel interface for which to enable debug.
- Debug Level the debug level desired.
- Global for setting the debug level across all interfaces.

NesiGate NETEX Commands

This screen is used to issue commands to the embedded Netex/IP stack.

NetEx Local Command

Enter any NetEx/IP command in the window, then select the 'Issue NetEx Command' button. The results of the NetEx/IP command are displayed in the browser display window.

Refer to "Appendix C: NetEx/IP Commands" on page 27 for a description of the NetEx/IP commands.

Netex Remote Command

Enter the name of any configured remote Netex host and a valid remote Netex command in the windows, then select the 'Remote Netex Command' button. The results of the command are displayed in the browser display window.

Refer to "Appendix C: NetEx/IP Commands" on page 27 for a description of the commands.

Miscellaneous Netex Commands

ShowNtxLog - This command displays the NetEx/IP log file (/etc/nesigate/netex/ntxlog). Refer to the "Viewing NetEx/IP Messages" section on page 67 for a description of how this file can be set up and viewed.

showNTXdefault - displays the NetEx/IP initialization parameters file: /etc/nesigate/netex/ntx_default.

showNCT - displays the Configuration file (/etc/nesigate/netex/nct.txt). Note that this may not correspond to the loaded Pamfile if that was created and loaded from another Netex host.

buildPAM - This command runs the configuration manager on the current NCT file creating a loadable PAM file.

showPAM - displays the interpreted contents of the current pam file (/etc/nesigate/netex/ntx_pam).

Modify Netex Defaults

Certain Netex parameters must agree with NCT-configured values for proper initialization. These can be changed by using the "Modify Netex Defaults" button.

Local Host – must agree with the hostname used for buildPAM

Local GNA - must agree with the netaddr/smgdref of the local ADAPTER in the NCT.

Segment Size – may be adjusted from the default value (32768) for better performance in your configuration.

Appendix A: Configuration Worksheet

This worksheet can be used to record the necessary NESiGate configuration information.

HOST & IP Information <i>(Used for Network Configuration)</i>	<i>Example</i>	Site Configuration
Host name	<i>netfin3</i>	
IP address	<i>10.1.2.27</i>	
Domain name	<i>netexsw.com</i>	
Network mask	<i>255.255.255.0</i>	
Default gateway	<i>10.1.2.50</i>	
IP address of name server	<i>10.1.3.1</i>	
OS device information <i>(Used for OS Definitions)</i>	<i>Example</i>	Site Configuration
Device number (or name)	<i>5200</i>	
Number of devices	<i>14</i>	
Director port (device director port)	<i>F3</i>	
Control unit number (or name)	<i>1</i>	
Unit address	<i>0</i>	
LPAR number	<i>0</i>	
Channel board Information <i>(Used for NESiGate board definitions)</i>	<i>Example</i>	Site Configuration
Board name	<i>Board-es1</i>	
Channel type (ESCON, Bus & Tag)	<i>ESCON</i>	
For Bus & Tag channels:		
Speed (DCI, 3.0MB, 4.5MB)		

NESiGate Channel Information <i>(Used for NESiGate device definition)</i>	<i>Example</i>	Site Configuration
IFname	<i>IBM5200</i>	
Type (must be emsg)	<i>EMSG</i>	
Board (name of channel board)	<i>Board1</i>	

UADD (unit address)	0	
StartGNA (starting GNA address)	EA00	
Number of devices	14	
Input device	0	
Max Data	65535	
For ESCON devices only:		
CU (control unit)	1	
CHlink (channel director port)	EA	
LPAR	0	
NESiGate DNS Entries <i>(Used for NESiGate Dynamic Routes definitions) (Note 1)</i>	<i>Example</i>	Site Configuration
Add entries to the DNS server	NTX0000A110 10.1.2.25	

Note 1: Either **Static** or **Dynamic** routing definitions must be used for each NetEx/IP GNA-to-IP mapping requirement.

Appendix B: Initialization Statements

This section contains a description of the initialization statements contained in the file –

`/etc/nesigate/netex/ntx_default`

Note: “local” and “device1” must be correct or Netex will not initialize.

NetEx/IP Parameter	Default	Description
local	LOCAL	Local host name. This is the same name that is defined in the HOST statement in the NCT and during the MAKEPAM phase of building the PAM file.
logerrors	default	The two allowed values are – DEFAULT – this value logs adapter and communications errors that are uncommon. Some of these errors are normal but normally occur only once every few hours. ALL – this value logs all adapter and communication errors.
mbxname	/usr/nesi/netex/netexserver	This is the name of the pipe used to move NRB and DATA requests from user space into NetEx/IP space.
pamfile	/usr/nesi/netex/site/ntx_pam	This is the name of the PAM file NetEx/IP uses to load the initial NCT. This name should match the name specified in the Configuration Manager MAKEPAM command.
ntxlogname	/usr/nesi/netex/site/ntxlog	This is the name of the NetEx/IP log file. Messages associated with the operation of NESiGate NetEx/IP are logged in this file.
cctable	/usr/nesi/netex/site/cctable	This is the default name of a user customized code conversion table. If not specified, NetEx/IP defaults to the built-in table.
ackcredit	2	This is the number of buffers that NetEx/IP sends without returning an explicit ack. Note: More buffers may be in the process of being sent. Increasing this value has little effect on system load and may decrease NetEx/IP throughput.
bufcnt	500	This is the number of “segment” sized buffers available for all input and output.

NetEx/IP Parameter	Default	Description
		Note: This parameter should be increased to the maximum amount of data expected to be in transit (being sent but not yet acknowledged) divided by "segment".
connto	25	This is the initial value for CONNECT TIMEOUT
datato	300	This is the initial value for DATA TIMEOUT. In a heavily loaded system or during transfer to tape, this value should be increased to about 1000.
deadto	60	This is the initial value for DEAD TIMEOUT
debugreq	0	This parameter enables or disables the tracing of user requests arriving at the NetEx/IP protocol stack. A value of 0 turns tracing off; any other value turns tracing on.
debugret	0	This parameter enables or disables the tracing of user responses being returned from the NetEx/IP protocol stack. A value of 0 turns tracing off; any other value turns tracing on.
debugmsg	0	This parameter enables or disables the tracing of HYPERchannel messages between NetEx/IP and the network. A value of 0 turns tracing off; any other value turns tracing on.
debugdata	0	This is the maximum number of data bytes to trace for any associated data block.
defblkln	32768	This is the default value for NRBLKLN, if the value zero is specified.
defblkout	32768	This is the default value for NRBLKOUT, if the value zero is specified.
defmsecsonewaydelay	0	This is the propagation delay of the network, expressed in milliseconds, and is used if there is no delay value specified in the PAM for this network path. For Type 2 protocol connections, this value represents a fixed propagation delay that never changes. For Type 4 protocol connections, this value represents a starting point that is used for internal bandwidth capacity calculations. However, the delay is continuously measured during each session, and if it changes, the updated value is used for subsequent internal bandwidth capacity calculations.
dreadqueue	6	This is the number of reads that NetEx/IP has

NetEx/IP Parameter	Default	Description
		outstanding to the DRIVER. This value may need to be increased, if many very small transfers are needed.
highresmsecs	10	This is the value of the internal high resolution timer. It is used for internal rate throttling, and should not be changed.
idleto	6	This is the initial value for IDLE TIME. In networks with many errors or contention, it may help to drop this value to 2 or 3.
maxblkIn	65400	This is the maximum NRBBLKIN value in bytes.
maxblkout	65400	This is the maximum NRBBLKOUT value in bytes.
maxkbitspersec	0	This is the maximum rate at which NetEx/IP will deliver data to the network for each network connection. If zero is specified, data will be delivered with no internal throttling. This value is only used for connections to hosts that do not have a 'rate' value specified in the PAM. This value is specified in Kbits per second. For example, a value of 50 means 50Kbs; a value of 50000 means 50Mbps (i.e. 50,000 Kbs).
maxmbxxfer	32768	This is the maximum block which can be sent across the STREAMS pipe facility.
mbufin	5	This is the number of input blocks that NetEx/IP will allow to be outstanding for each user. This may have to be increased for long telecommunications delays.
mbufout	5	This is the number of output blocks that NetEx/IP will allow to be outstanding for each user. This may have to be increased for long telecommunications delays.
msglvl	6	This is the value that controls the verbosity of the message displays. A value must be specified as one of the following: immediate important interesting moderate monitor debug blither

NetEx/IP Parameter	Default	Description
		A value of 'important' (or less) must be specified to enable NetEx/IP session establishment messages to be recorded in the 'ntxlog' file.
multihost	ON	When set ON, allows Netex to distinguish between SOFFERs of the same application name from multiple locally attached hosts (LAN or channel). Set to OFF if there is only one attached host or if all SOFFERs will have unique names.
numlogs	5	This value defines the maximum number of 'ntxlog' files that are saved by the 'swlog' command.
prefprot	4	Defines the default preferred protocol type to use when connecting to hosts that support multiple NetEx/IP protocol types.
rcvratesecs	6	This is the time interval (in seconds) after which the receive rate for a network connection is recalculated. The receive rate refers to the rate at which the application is receiving data from NetEx.
segsize	32768	This is the maximum size of a single transmission data block over the network.
smax	110	This is the maximum number of users active at any one time. If this value is changed, the file specified by "mbxname" above should be deleted.
timer	2	This is the initial value for the watchdog timer.
The following parameters are only applicable to protocol type 4 connections:		
defstartkbitspersec	0	<p>This is the starting throughput rate at which NetEx/IP will attempt to deliver data to the network for each network connection. If zero is specified, data will be delivered with no internal throttling. This value is only used for connections to hosts that do not have a 'rate' value specified in the PAM or NRB.</p> <p>This value is specified in Kbits per second. For example, a value of 50 means 50Kbs; a value of 50000 means 50Mbs (i.e. 50,000 Kbs).</p>

NetEx/IP Parameter	Default	Description
ratedelaydecp	250 (25.0%)	This is the percentage factor used to decrease the sending rate of a network connection if the round-trip delay increases. This recalculation is performed after the expiration of each interval specified by the 'rtdelayincsecs' parameter. The value specified represents a percentage multiplied by a factor of 10.
rateequivph	975 (97.5%)	This is the upper bound of the send and receive equivalence adjustment (see 'rateequivps'). The value specified represents a percentage multiplied by a factor of 10.
rateequivpl	500 (50.0%)	This is the lower bound of the send and receive equivalence adjustment (see 'rateequivps'). The value specified represents a percentage multiplied by a factor of 10.
rateequivps	850 (85.0%)	This is the percentage factor used to determine equivalence of the send and receive rates for each network connection. These rates are assumed to be equal if they fall within this percentage of each other. This is the initial value used for each network connection, and can be dynamically adjusted based on activity and performance of the network. The value specified represents a percentage multiplied by a factor of 10.
rcvdataqhbytes	5000000	This is the high threshold value (in bytes) for the size of the receiving NetEx DataQueue for each network connection. If the size of the Data Queue exceeds this value, subsequent blocks received on the network that are greater than the highest received LRN are NAK'ed and discarded. Subsequent blocks will continue to be discarded until the size of the DataQueue is reduced to the value specified by 'rcvdataqlbytes'.
rcvdataqlbytes	3000000	This is the low threshold value (in bytes) for the size of the receiving NetEx DataQueue for each network connection. See the 'rcvdataqhbytes' parameter for the description of how this value is used.
rtdelayincsecs	60	This is the interval (in seconds) used by the sending side of a network connection after which a check is made for an increase in the round trip delay.
sndratedecsecs	18	This is the interval (in seconds) used by the

NetEx/IP Parameter	Default	Description
		sending side of a network connection after which a check is made for a rate decrease (i.e. the receive rate is less than 'rateequivps' of the send rate). If an adjustment is required, the sending rate is decreased by the current value of 'sndrateps'.
sndrateincsecs	60	This is the interval (in seconds) used by the sending side of a network connection after which an attempt is made to increase the sending rate, as long as a decrease in the sending rate has not occurred during the interval.
sndrateph	500 (50.0%)	This is the high bound of the 'sndrateps' adjustment for each network connection. The value specified represents a percentage multiplied by a factor of 10.
sndratepl	10 (1.0%)	This is the low bound of the 'sndrateps' adjustment for each network connection. The value specified represents a percentage multiplied by a factor of 10.
sndrateps	100 (10.0%)	This is the percentage factor used to increase or decrease the send rate for each network connection. The send rate may be increased after the expiration of the interval specified by 'sndrateincsecs'. The send rate may be decreased after the expiration of the interval specified by 'sndratedecsecs'. The value specified represents a percentage multiplied by a factor of 10.
startratep	750 (75.0%)	This is the percentage factor used to calculate the initial send rate of each network connection. This value is applied against the maximum rate for the connection, as specified in the PAM, NRB, or by the 'defstartkbitspersec' parameter. During the course of the connection, the actual send rate may be adjusted, based on network activity. The value specified represents a percentage multiplied by a factor of 10.
Resume common parameters:		
iprecv	250000	This is the size of the IP receive buffer.
ipsend	250000	This is the size of the IP send buffer.
iplintrf	1	
device1	UDP-6950- <i>ddnnuuss</i>	This is the name of the NetEx/IP device. The " <i>ddnn</i> " must be specified as either '0000' or

NetEx/IP Parameter	Default	Description
		'0101'; " <i>uuss</i> " represents the unit number and subaddress portions of the GNA address of this device. The " <i>uu</i> " value must be the same as the "netaddr" value specified on the ADAPTER statement for this host in the NCT, and the " <i>ss</i> " value must be the same as the "smgdref" value specified on the same ADAPTER statement.
device2		This is the name of a second NetEx/IP device, and is only used if there is a second NIC card.
device3		This is the name of a third NetEx/IP device, and is only used if there is a third NIC card.
device4		This is the name of fourth NetEx/IP device, and is only used if there is a fourth NIC card.

Appendix C: NetEx/IP Commands

This section contains a description of the NetEx/IP commands that can be issued with the NetEx/IP operator interface.

Operator Command	Description
CLEAR LOG	Clears the NetEx/IP log file.
CLEAR IPROUTE	Clear IP routing table entries.
DISPLAY HOST	Displays all hosts defined to NetEx/IP
DISPLAY IPROUTE	Displays the GNA-to-IP address mapping
DISPLAY LOG	Displays the last 100 lines of the NetEx/IP log.
DISPLAY MEMORY	Displays the current memory allocations for various internal control blocks and data buffers.
DISPLAY NETWORK	Displays a list of network connections currently pending or in progress on the operator's host
DISPLAY PARMS	Displays parameter values controlled by SET commands and initialization parameters
DISPLAY SESSION	Displays a list of sessions currently pending or in progress on the operator's host
DISPLAY TRANSPORT	Displays the current state and progress of all transport services requested by user processes.
DISPLAY USAGE	Displays the current memory allocations for various internal control blocks and data buffers.
DISPLAY VERSION	Displays the current version level of the NetEx/IP component.
DRAIN HOST	Prevents connections with a specified host.
DRAIN NETEX	Gracefully terminates all NetEx/IP activity.
HALT SREF	Immediately stops a NetEx/IP session.
HELP	Provide NetEx/IP help information.
KILL NETEX	Immediately stops all NetEx/IP resources.
LOAD NCT	Transfers pamfiles created by the configuration manager
SET CONTIME	Specified the maximum number of seconds that NetEx/IP waits for a transport connect message to generate a response from the destination host.
SET DBGDATA	Specifies the maximum number of data bytes to trace for any associated data block.

Operator Command	Description
SET DBGMSG	Enables or disables tracing of messages between NetEx/IP and the network.
SET DBGREQ	Enables or disables tracing of user requests arriving at the NetEx/IP protocol stack.
SET DBGRET	Enables or disables tracing of user responses returned from the NetEx/IP protocol stack.
SET DEADTIME	Specifies the number of seconds transport waits until it disconnects a connection due to no response from the remote host.
SET DEFBI	Specifies the default maximum input buffer size for a connection.
SET DEFBO	Specifies the default maximum output buffer size for a connection.
SET IDLETIME	Specifies the number of seconds a transport waits before sending an idle message to verify the continued existence of a party at the other end of a logical connection.
SET IPROUTE	Specifies the IP address mapping for a GNA address
SET HOST	Specifies the logical name of the host under which this copy of NetEx/IP is running.
SET MAXBI	Specifies the maximum input buffer size a user can specify on a CONNECT or OFFER call.
SET MAXBO	Specifies the maximum output buffer size a user can specify on a CONNECT or OFFER call.
SET MAXKBS	Specifies the maximum rate at which NetEx/IP will deliver data to the network for each network connection.
SET MSGLVL	Specifies the level of messages to display.
SET NTXOPER	Enables and disables the remote operator service.
SET PREFPROT	Specifies the default preferred protocol type to use when connecting to hosts that support multiple NetEx/IP protocol types.
SET READTIME	Specifies the number of seconds the NetEx/IP transport retains user data waiting for the receiver to issue a READ request.
SET ROPCLASS	Specifies the class of operator commands that the remote operators can issue.
SET SESMAXIMUM	Specifies the number of session connections (or OFFERs) permitted at one time.
SET WDOGINT	Specifies the number of seconds to elapse between NetEx/IP checking for timed-out conditions in the NRB requests.
START NETEX	Restarts NetEx/IP that has been terminated by a DRAIN NETEX command.
START HOST	Restarts a remote host that has been terminated by a DRAIN HOST command.

Operator Command	Description
SWLOG	Saves the current 'ntxlog' file as 'ntxlog.n', and starts using a new 'ntxlog' file.

CLEAR LOG

Command	Operands
Clear LOG	

Description: Clears the NetEx/IP log file.

Operands: (none)

CLEAR IPRROUTE

Command	Operands
Clear IPRoute	[uuss ALL]

Description: Clear all or a selected IP routing table entry. Use caution using the “clear ip all” – it is useful only if you plan to do a “load nct” right afterwards or to manually re-enter all entries.

Operands: uuss. The NCT defined NETADDR and SMGDREF of a host adapter.
all. Clear all table entries.

DISPLAY HOST

Command	Operands
Display Host	[hostname]

Description: Lists the hosts defined on the network. If a host name is not specified, a summary line is displayed for each host. If a host name is specified, more detailed information is displayed for that particular host.

Operands: hostname (optional). Specifies the name of a NetEx/IP host on the network.

Example 1:

The following figure shows a sample DISPLAY HOST command when the hostname parameter is omitted:

```

ntxoper d h

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
15:35:57          Host NETFIN5          Current Routes
Dest Host  Proto  Routes  State          Dest Host  Proto  Routes  State
-----
NTXLCL    2      1          NTXLCL00    2      1
DALE      2      2          TANDEM    2      2
TANDEM    2      2          DXU20      2      1
MINGH     2      2          FLASHH     2      2
DXUB3     2      1          HP          2      2
MINGE     2      2          FLASHE     2      2
TANDEMSE  2      2          OS390      2      3

```

The fields in the display are defined as follows:

- Dest Host The name of each host on the network. The names correspond to the names used on the NCT HOST statement.
- Proto Type of protocol supported by the destination host, as defined in the NCT HOST statement.
- Routes The number of routes defined by the Configuration Manager to reach the destination host.

If a host is currently drained, DRAINED appears on the right side of the display for that host.

Example 2:

The following display is an example of the DISPLAY HOST command when a hostname is specified:

```

ntxoper d h aix1

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
15:36:19          Host NETFIN5          Routes to aix1
pam header - len= 14 segsize= fffb
                maxrate=    0 delay=    0
pam entries --
  pam entry    1 -> 6  1 80 88 a5  1
  pam entry    2 -> 6  1 40 88 d9  5
-----
pam header - len= 14 segsize= fffb
                maxrate=    0 delay=    0
pam entries --

```

```
pam entry 1 -> 6 1 80 88 a5 1
pam entry 2 -> 6 1 40 88 a9 1
-----
```

The fields in the display are defined as follows:

- Host This field shows the NetEx/IP name of the local host.
- Routes to This field shows the NetEx/IP name of the destination host.
- len This field shows the length of the PAM for this route.
- segsz This field shows the maximum segment size supported on this route.
- maxrate This field shows the maximum rate of transmission on this route, specified in Kbs (kilobits per second).
- delay This field shows the amount of time to wait between successive transmissions on this route. Time is specified in milliseconds.
- pam entry This field shows the PAM route component entry for each adapter in the route (length, type code, flag, trunk mask, dref [two bytes]).

DISPLAY IPROUTE

Command	Operands
DISplay IProute	gna

Description: Lists the GNA-to-IP mapping table.

Operands: gna (optional). Specifies a particular GNA address to display.

Example 1:

The following figure shows a sample DISPLAY IP command when the gna parameter is omitted:

```

ntxoper d ip

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
09:05:50          Host NETFIN5          Current GNA to IP Mapping Table:
GNA      IP Adr      Source          GNA      IP Adr      Source
-----
  2080    10.1.2.25    Local          2400    10.1.2.25    Local
  6100    10.1.2.27    Local          6204    10.1.5.27    Local
  a600    10.1.2.27    Local          b4b0    10.1.2.25    Local
  b5c0    10.1.2.25    Local          b610     0.0.0.0    Unknown
  cb40    10.1.2.25    Local          db00    10.1.2.25    Local
  dc00    10.1.2.25    Local          a501    10.1.2.26    Local
  a801    10.1.2.29    Local          a901    10.1.2.28    Local
  ab01    10.1.2.17    Local          ac01    10.1.2.10    Local
  ad01     10.1.2.5    Local          ae01     10.1.2.3    Local
  af01     10.1.2.1    Local          ba01    10.1.2.24    Local
  bb01    10.1.5.24    Local          d805     0.0.0.0    Unknown
  d905    10.1.2.25    Local          dd01    10.1.2.25    Local
  de05    10.1.2.25    Local          df01    10.1.2.25    Local

```

Example 2:

The following figure shows a sample DISPLAY IP command when a gna parameter is specified:

```
ntxoper d ip 2080

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
09:14:04          Host NETFIN5          GNA to IP Mapping:
GNA      IP Adr      Source
-----  -
      2080      10.1.2.25  Local
```

The fields in the output from the DISPLAY IP command are defined as follows:

GNA	This field shows the GNA address.
IP Adr	This field shows the IP address associated with the GNA address.
Source	This field shows the source of the GNA-to-IP mapping. local – indicates the IP address was obtained from DNS oper – indicates the IP address was entered with a ‘SET IP’ command

DISPLAY LOG

Command	Operands
Display Log	

Description: Displays the last 100 lines from the NetEx/IP log file.

Operands: None.

DISPLAY MEMORY

Command	Operands
Display Memory	

Description: Displays the current memory allocations for various internal control blocks and data buffers.

Operands: None.

DISPLAY NETWORK

Command	Operands
Display Network	[nref]

Description: Lists the network connections that are currently pending or in progress. If the nref parameter is not specified, a summary line is displayed for each connection. If the nref parameter is specified, more detailed information is displayed for that particular connection.

Operands: nref (optional). Specifies the Nref for the connection. If not specified, information for all Nrefs is displayed.

Example 1:

The following figure shows a sample DISPLAY NETWORK command when the Nref parameter is omitted:

ntxoper d n

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.

15:37:22 Host NETFIN5 Active Network Connections

nref	username	state	rnref	blksin	blkout
------	----------	-------	-------	--------	--------

190	root	offered			
3659	NTXOPER	offered			
4078	root	data	5119	4722	9442
4124	root	data	17742	8	8
4135	root	data	17756	47	47
4138	root	data	17763	9	8
4140	root	offered			
65535	SESSMGR	offered			

Example 2:

The following figure shows a sample DISPLAY NETWORK command when the Nref parameter is specified:

```
ntxoper d n 4138

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
15:38:26          Host NETFIN5          Nref 4138
Name= root       Pid= 34706368  State=data
Writes=         8  Reads=         9  Nubblki= 32768  Nubblko= 32768
Readto=         16

Physical Address Map (PAM)
pam header --
  len=14 segsize=ffff maxrate= 0 delay= 0
pam entries --
  pam entry 1-> 6 1 80 88 a5 1
  pam entry 2-> 6 1 40 88 a6 0
end of pam
```

The fields in the output from the DISPLAY NETWORK command are defined as follows:

Nref	This field shows the unique identifier that distinguishes this network connection from all other active network connections to this NetEx/IP. This reference identifier must be used in operator commands that modify a network connection, and may be used with this command to get detailed information about this network connection.
Name	This field shows the name of the process requesting network services.
State	This field shows the current status of the network connection. This is useful for tracking the progress of a connection. The possible states are as follows: closing A close has been issued by the user. No additional data may be sent, but additional data may be received. Confirm CONECT message received, waiting for the confirm call. Data Connection completed and user may exchange data. Connect Connect request issued by user, waiting for confirm. Disconnect Disconnect detected, but not yet complete. Offered Offer has been issued by user, waiting for connect. Smgr conn A user is in the process of connecting to a remote session manager. This process is internal to NetEx/IP. The user's connect is in progress. Assigning A user is in the process of being identified as a network user. This state is internal to NetEx/IP. The user's offer or connect is in progress.
Rnref	This field shows the destination (or remote) host's Nref for this network connection. If a connection does not currently exist, this column will be blank.
Reads	This field shows the number of user messages received during this session.
Writes	This field shows the number of user messages transmitted during this session.
Nubblki	Maximum input blocksize.
Nubblko	Maximum output blocksize.
Read to	Read timeout.

DISPLAY PARMS

Command	Operands
Display Parms	

Description: Displays most parameter values controlled by the SET command and initialization statements.

Operands: (none)

Example:

The following figure shows a sample DISPLAY PARMS command:

```
ntxoper d p

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
15:57:09      Host NETFIN5      Parameters
contime=  25  deadtime=  60  idletime=   6  readtime=  300
maxbi= 32768  maxbo=  32768  defbi=  32768  defbo=  32768
maxseg= 32768  wdogint=   2  msglvl=immediate
max ses=  110  max tran=   0  max net=   0  dreadque=   6
cur ses=   4  cur tran=   7  cur net=   7  status=NORMAL
RmtOper=  ON  Class=   G  Multihost=  ON
prefprot=  4  mxkbs=   0
```

The fields in the output from the DISPLAY PARMS command are defined as follows:

Contime	This field shows the maximum number of seconds that NetEx/IP will wait for a transport connect message to generate a response from the remote host. This parameter may be changed using the SET CONTIME operator command or the CONTIME initialization statement.
deadtime	This field shows the maximum number of seconds that NetEx/IP will wait before it disconnects a transport connection (or attempts an alternate path) because there was no response from a remote host. This parameter may be changed using the SET DEADTIME operator command or the DEADTIME initialization statement.
idletime	This field shows the maximum number of seconds that NetEx/IP transport will wait before sending an idle message to verify the continued existence of a party at the other end of a logical connection. This parameter may be changed using the SET IDLETIME operator command or the IDLETIME initialization statement.
readtime	This field shows the number of seconds that NetEx/IP transport will retain user data while waiting for the receiver to issue a read request. This parameter may be changed using the SET READTIME operator command or the READTIME initialization statement.
Maxbi	This field shows the maximum buffer input size (in bytes) that a user may specify for data coming in to this host in a single message. This parameter may be changed using the SET MAXBI operator command or the MAXBI initialization statement.
Maxbo	This field shows the maximum buffer output size (in bytes) that a user may specify for data going out from this host in a single message. This parameter may be changed using the SET MAXBO operator command or the MAXBO initialization statement.
defbi	This field shows the default buffer input size (in bytes) that a user may specify for data coming in to this host in a single message. This parameter may be changed using the SET DEFBI operator command or the DEFBI initialization statement.
defbo	This field shows the default buffer output size (in bytes) that a user may specify for data going out from this host in a single message. This parameter may be changed using the SET DEFBO operator command or the DEFBO initialization statement.
Maxseg	This field shows the maximum segment size that will ever be used for any connection from this host. This parameter may be changed using the SET MAXSEG operator command or the MAXSEG initialization statement.
Wdogint	This field shows the number of seconds that the watchdog timer waits before checking NRB timeout values. This parameter may be set using the SET WDOGINT operator command.

Msglvl	This field shows the minimum level of severity necessary to display a message to the operator. This parameter can be set using the SET MSGVLV command or the MSGVLV initialization statement.
Maxses	This field shows the number of session connections or OFFERs permitted at one time. This parameter may be changed using the SET MAXSES operator command or the SESMAX initialization statement. It can never exceed the value specified for SESLIM.
Maxtran	This field shows the number of direct transport connections or OFFERs permitted at one time. This parameter is always zero.
Maxnet	This field shows the number of direct network connections or OFFERs permitted at one time. This parameter is always zero.
Dreadque	This field shows the number of reads queued up for each driver connection.
Cur ses	This field shows the number of session connections in progress or being OFFERed.
Cur tran	This field shows the number of transport connections in progress or being OFFERed.
Cur net	This field shows the number of network connections in progress or being OFFERed.
Status	This field shows the current status of NetEx/IP. The status can be any of the following: DRAINED A DRAIN command has been issued and no sessions are active. DRAINING A DRAIN command has been issued, but some sessions are still active. NORMAL All sessions are active.
RmtOper	This field shows whether the remote operator service is ON or OFF. The remote operator status may be changed with the SET NTXOPER command.
Class	This field shows the privilege class of remote operator service (may be changed by the SET ROPCLASS command). 'A' indicates that all commands are allowed; 'G' indicates that only display commands are allowed.
Multihost	This field shows whether the Multihost capability is ON or OFF. Multihost support means this Offload NetEx/IP can be used concurrently by NetEx/IP Requesters on multiple hosts.
prefprot	This field shows the default preferred protocol type to use when connecting to hosts that support multiple NetEx/IP protocol types.

maxkbs This field shows the maximum rate at which NetEx/IP will deliver data to the network for each network connection. If zero is specified, data will be delivered with no internal throttling. This value is only used for connections to hosts that do not have a 'rate' value specified in the PAM. This value is specified in Kbits per second. For example, a value of 50 means 50Kbs; a value of 50000 means 50Mbs (i.e. 50,000 Kbs).

DISPLAY SESSION

Command	Operands
Display Session	[sref]

Description: Lists the session connections that are currently pending or in progress. If the sref parameter is not specified, a summary line is displayed for each connection. If the sref parameter is specified, more detailed information is displayed for that particular connection.

Operands: sref (optional). Specifies the Sref for the connection. If not specified, information for all Srefs is displayed.

Example 1:

The following figure shows a sample DISPLAY SESSION command when the Sref parameter is omitted:

```

ntxoper d s
08:41:06      Host NETFIN3      Active Sessions
Sref  User    Pid   State      Name      Host      Rnref  Msg In  Msg Out  Tid
-----
   2  root     01952 offered  NTXNCTL0
   8  root     33128 data     NETEXEAT UNISYS      354      1      7378  3302
 126  root     45104 data     NETEXEAT NETFIN5     939      1      47951 bb07
 667  root     10696 data     NETEXEAT OS390H     388     53445      1  bb01
 677  NTXOPER    -2  offered  NTXOPER
 679  root     74392 data     NETEXEAT NETFIN5    1597     3164      1  bb05
 680  root     31704 offered  NETEXEAT

```

Example 2:

The following figure shows a sample DISPLAY SESSION command when the Sref parameter is specified:

```
NtxOper> d s 663

14:38:14      Host NETFIN3      Sref  663
User =  root      State=data      Dest =  NETFIN3  Rnref=      637
Mxbi =    32768  Mxbo =      400  Class=      2  Rate =      0
Reads=      67  Writes=      67  Pid  = 134930288  Name =  NTXOPER
Ruser=  ROOT      Tid  =    00003306
```

The fields in the output from the DISPLAY SESSION command are defined as follows:

Sref	This field shows the unique identifier that distinguishes this session from all other active sessions to this NetEx/IP. This reference identifier must be used in operator commands that modify a session, and may be used with this command to get detailed information about this session.
User	This field shows the username and process id requesting session services.
Pid	This field shows the process-id of the user of this session. If pid = -2, this is the remote operator's session.
state	This field shows the current status of the session connection. This is useful for tracking the progress of a connection. The possible states are as follows: <ul style="list-style-type: none"> closing A close has been issued by the user. No additional data may be sent, but additional data may be received. Confirm CONECT message received, waiting for the confirm call. Data Connection completed and user may exchange data. Connect Connect request issued by user, waiting for confirm. Disconnect Disconnect detected, but not yet complete. Offered Offer has been issued by user, waiting for connect. Smgr conn A user is in the process of connecting to a remote session manager. This process is internal to NetEx/IP. The user's connect is in progress. Assigning A user is in the process of being identified as a session user. This state is internal to NetEx/IP. The user's offer or connect is in progress.
Name	This field shows the name of the process using this session.
Host	This field shows the name of the remote host using this session.
Rnref	This field shows the destination (or remote) host's network reference number for this session connection. If a connection does not currently exist, this column will be blank. If the connection is a type 1 connection, this number represents the destination host's session reference number.
Msg In	This field shows the number of user messages received during this session.
Msg Out	This field shows the number of user messages transmitted during this session.
Tid	This field shows the task-id associated with this session.
Dest	This field shows the name of the destination host.
Mxbi	This field shows the maximum input block size (bytes).
Mxbo	This field shows the maximum output block size (bytes).
Class	This field shows the class of service.

Rate This field shows the data transfer rate for this session.
 Reads This field shows the number of SREAD's issues for this session.
 Writes This field shows the number of SWRITE's issues for this session.

DISPLAY TRANSPORT

Command	Operands
Display Transport	[tref]

Description: Displays the current state and progress of all transport services. If the Tref parameter is not specified, a summary line is displayed for each connection. If the Tref parameter is specified, more detailed information is displayed for that particular connection.

Operands: Tref (optional). Specifies the Tref for the connection. If not specified, information for all Trefs is displayed.

Example 1:

The following figure shows a sample DISPLAY TRANSPORT command when the Tref parameter is omitted:

```

ntxoper d t

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
15:40:06          Host NETFIN5          Active Transport Connections
tref username  segsz   state   rnref blksin duprecv blkout rexmit
-----
  190 root      32768 offered
 3659 NTXOPER  32768 offered
 4150 root      32768 data      5120     1     0    2495     0
 4161 root      32768 disconnect 17793     6     0     4     0
 4169 root      32768 disconnect 17805     6     0     4     0
 4170 root      32768 disconnect 17804    48     0     3     0
 4171 root      32768 offered
65535 SESSMGR  32768 offered
  
```

Example 2:

The following figure shows a sample DISPLAY TRANSPORT command when the Tref parameter is specified:

```
ntxoper d t 4150

NtxOper v1.3, COPYRIGHT (C) 1999, Network Executive Software, Inc.
15:40:33          Host NETFIN5          Tref 4150
Name = root      User = 134692376      State=data      RmtNref=      5120
AckQ =          1 InQ =          0      OutQ =          0      DataQ=          0
Maxtblok=       5 Mblk0=       32768      Mrate=          0      Segsize=     32768
Maxrblok=       5 Mblk1=       32768      Reads=          1      Writes=     3066
CurrKBS=        0 CurrMsRTDl=    0      PipeB=     163840      CurrOB=     16000
MinRTDMs=       3 MaxRTDMs=       3
Prot=           2 RcvKBS=        0      RmRcvRt=       0      CurPmRt=       0
RateP=         100 EquivP=       800      DataQB=  4675440      DataQHM=  5009400
Transmitter:    Tlrn =       3066      Clnr =          6      Tpbm =       3066
                Rexmt=          0      Tack =          0      Tpbna=         0
                Curtb= 134913960      Tto =          6      Ackcr=         2
Receiver:       Plrn =          2      Rlrn =       3070      Rpbm =         1
                Rpbnr=          1      Rack =          0      Rpbnl=     3066
                Currb= 134865176      Rto =          6      Ackcr=         2
```

The fields in the output from the DISPLAY TRANSPORT command are defined as follows:

Tref	This is the NetEx/IP transport reference identifier.
Name	This field indicates the name of the process requesting transport services.
User	This field indicates the user-id of the process requesting transport services.
state	This field shows the current status of the connection. This is useful for tracking the progress of a connection. The possible states are as follows: <ul style="list-style-type: none"> closing A close has been issued by the user. No additional data may be sent, but additional data may be received. Confirm CONECT message received, waiting for the confirm call. Data Connection completed and user may exchange data. Connect Connect request issued by user, waiting for confirm. Disconnect Disconnect detected, but not yet complete. Rdconnect Offer has been issued by user, waiting for connect. Smgr conn A user is in the process of connecting to a remote session manager. This process is internal to NetEx/IP. The user's connect is in progress. Assigning A user is in the process of being identified as a session user. This state is internal to NetEx/IP. The user's offer or connect is in progress.
RmtNref	This field indicates the remote network reference number
AckQ	This field shows the number of blocks queued waiting for acknowledgment.
InQ	This field shows the number of segments waiting to go on the DataQ.
OutQ	This field indicates the number of segments waiting to be written.
DataQ	This field shows the number of blocks queued waiting for read requests.
Maxtblok	This field shows the maximum number of transmitting buffers.
Mblko	This field shows the maximum output block size (bytes).
Mrate	This field indicates the rate in Mbs (megabits per second).
Segsize	This field indicates the maximum size of a data block on the network.
Maxrblok	This field shows the maximum number of receive buffers.
Mblki	This field shows the maximum input block size (bytes).
Reads	This is the number of TREADs completed.
Writes	This is the number of TWRITEs completed.
CurrKBS	This is the current send rate in KBS (Kilobytes per second).
CurrMsRTDI	This is the current round trip time on the network (milliseconds).

PipeB	This is the current network capacity (bytes).
CurrOB	This is the current amount of unacknowledged data on the network (bytes).
MinRTDMs	This is the minimum round trip time (in milliseconds) that has been calculated for this connection in the last 60 second time interval.
MaxRTDMs	This is the maximum round trip time (in milliseconds) that has been calculated for this connection in the last 60 second time interval.
Prot	This field indicates the protocol type (2 or 4).
RcvKBS	This is the current receive rate in KBS (Kilobytes per second).
RmRcvRt	This is the current remote receive rate in KBS (Kilobytes per second).
CurPmRt	This is the current rate in Kbs (kilobits per second) found in the PAM.
RateP	This is the current value of the percentage factor used to increase or decrease the send rate for this connection. The value displayed represents a percentage multiplied by a factor of 10. For example, a value of 100 means the send rate will be adjusted by 10.0%.
EquivP	This is the current value of the percentage factor used to determine equivalence of the send and receive rates for this connection. These rates are assumed to be equal if they fall within this percentage of each other. The value specified represents a percentage multiplied by a factor of 10. For example, a value of 850 means the send and receive rates are determined to be equivalent if they are within 85.0% of each other.
DataQB	This is the current size (in bytes) of the NetEx DataQue for this connection.
DataQHM	This is the size (in bytes) that represents the high water mark of the NetEx DataQue for this connection.
Transmitter:	
Tlrn	This is the last LRN (Logical Record Number) assigned.
Clrn	This is the last transmitter credit received.
Tpbn	This is the last PBN (Physical Block Number) assigned.
Rexmt	This is the number of re-transmissions.
Tack	This is the ACK/NAK information bit signal received.
Tpbna	This is the last PBN returned in an ACK.
Curtb	
Tto	This is the transmit timeout (idle time).
Ackcr	This is the outgoing ACK credit (number of messages before an idle ACK).
Receiver:	
Plrn	This is the next LRN (Logical Record Number) given to the user.
Rlrn	This is the last LRN (Logical Record Number) received.
Rpbn	This is the last PBN received.

Rpbnr	This is the last PBN reported as sent in an ACK.
Rack	This is the ACK/NAK information bit signal to be sent.
Rpbnl	This is the last PBN reported as sent in an ACK.
Currb	
Rto	This is the receive timeout (communications lost).
Acker	This is the incoming ACK credit.

DRAIN NETEX

Command	Operands
DRAIN NETEX	

Description: Prevents new sessions from being established. This command gracefully terminates all NetEx/IP activity. When all sessions have completed, a message appears indicating that NetEx/IP is drained.

Connections in progress are not affected. Offers are completed with a 3522 NRBSTAT code. Local users attempting to establish a connection receive a 3505 NRBSTAT code. Remote users attempting to establish a connection receive a 3523 NRBSTAT code.

Operands: (none)

DRAIN HOST

Command	Operands
DRAIN HOST	rmthost

Description: Prevents users from establishing a connection with a host. A user attempting to establish a connection will receive a 3507 NRBSTAT code.

Operands: rmthost. Specifies the name of the remote host (as specified in the NCT) to be drained.

HALT SREF

Command	Operands
HALT SREF	n

Description: Immediately terminates a session. Local users with an outstanding read receive a 3422 NRBSTAT code or a 3100 code on the next write request. An outstanding OFFER is terminated with a 3422 NRBSTAT code.

Operands:

n specifies the SREF for the session to halt. Use the DISPLAY SESSION command to determine the SREF number.

HELP

Command	Operands
HELP ?	

Description: Provides a list of NetEx/IP commands and command formats.

Caution: This command can be entered as either 'help' or '?' when entered with the Web Browser. However, the '?' format may be required from various remote NTXOPER sources, since several implementations of NTXOPER use 'HELP' to provide local NTXOPER help information.

Operands: (none)

KILL NETEX

Command	Operands
KILL NETEX	

Description: Immediately stops NetEx/IP resources and terminates all NetEx/IP activity. Connections in progress are terminated and a 0512 NRBSTAT code is returned in all active NRBs.

Operands: (none)

LOAD NCT

Command	Operands
Load Nct	filename

Description: Transfers pamfiles (data structures describing paths to remote hosts) created by the configuration manager to NetEx/IP. Local adapter information cannot be changed by using this command.

The user must first modify the NCT data file containing the configuration statements, and run the CM utility to create the PAMfile (refer to "PAM" on page 5). The filename given on the MAKEPAM statement must be the same name given on the LOAD command. Also, the local hostname specified on the MAKEPAM statement must be the same as the local host specified in the ntx_default file). If the message "file not in PAMFILE format" is returned, check to see if the host name matches the NetEx/IP host name.

Operands:

filename specifies the name of the PAM file to be loaded.

SET CONTIME

Command	Operands
SET CONTIME	seconds

Description: Specifies the maximum number of seconds that NetEx/IP will wait for a transport connect message to generate a response from the destination host. If this time is exceeded, the transport will assume the destination host is down and return appropriate status to the user. The transport connect message is resent every IDLETIME seconds until CONTIME seconds have passed.

Operands:

seconds specifies the number of seconds that NetEx/IP waits to generate a response to a transport connection message

SET DBGDATA

Command	Operands
SET Contime	Byte_count

Description: Specifies the maximum number of data bytes to trace for any associated data block.

Operands:

Byte_count Specifies an integer to indicate the maximum number of data bytes to trace for any associated data block. The default is 0, which indicates that debug tracing is disabled.

SET DBGMSG

Command	Operands
SET DBGMSG	value

Description: Enables or disables the tracing of NetEx/IP messages between NetEx/IP and the network.

Operands:

value Specifies whether debug tracing is enabled or disabled. Specify 0 to disable tracing; specify any other value to enable tracing. The default is 0.

SET DBGREQ

Command	Operands
SET DBGREQ	value

Description: Enables or disables the tracing of user requests arriving at the NetEx/IP protocol stack. When tracing is enabled, the user's NRB is traced.

Operands:

Value Specifies a value to indicate whether user requests are traced. Specify 0 to disable tracing; specify any other value to enable tracing. The default is 0.

SET DBGRET

Command	Operands
SET DBGRET	value

Description: Enables or disables the tracing of user responses returned from the NetEx/IP protocol stack. When tracing is enabled, the state of the user's final NRB is traced.

Operands:

Value Specifies a value to indicate whether user responses are traced. Specify 0 to disable tracing; specify any other value to enable tracing. The default is 0.

SET DEADTIME

Command	Operands
SET DEadtime	seconds

Description: Specifies the amount of time transport waits until it disconnects a connection because there was no response from the remote host. The remote host normally generates an idle message every IDLETIME seconds based on its own IDLETIME parameter. Receipt of any message from the remote host keeps the DEADTIME timer from expiring.

Operands:

seconds specifies the number of seconds that NetEx/IP waits until it disconnects a connection due to no response from the remote host.

SET DEFBI

Command	Operands
SET DEFBI	size

Description: Specifies the default maximum input buffer size for a connection. This default value is used if the user does not specify a maximum input buffer size in the CONNECT or OFFER request.

Operands:

Size Specifies the default maximum input buffer size in bytes. DEFBI can range from 64 bytes to the MAXBI value.

SET DEFBO

Command	Operands
SET DEFBO	size

Description: Specifies the default maximum output buffer size for a connection. This default value is used if the user does not specify a maximum output buffer size in the CONNECT or OFFER request.

Operands:

Size Specifies the default maximum output buffer size in bytes. DEFBO can range from 64 bytes to the MAXBO value.

SET IDLETIME

Command	Operands
SET Idletime	seconds

Description: Specifies the amount of time that transport will wait before sending an idle message to verify the continued existence of a party at the other end of a logical connection. The transmission of any message resets the timer.

Operands:

seconds specifies the number of seconds that NetEx/IP waits before sending an idle message to the remote host.

SET HOST

Command	Operands
SET HOST	name

Description: Specifies the logical name of the host under which this copy of NetEx/IP is running. The logical name must have been previously defined in the NCT table with a HOST statement in the network configuration file.

Operands:

Name Specifies the logical NCT name assigned to the host.

SET IPROUTE

Command	Operands
SET IProute	gna ip

Description: Specifies the static mapping of a GNA address to a corresponding IP address. This command can be used as an alternative to using DNS services for specifying the GNA-to-IP address mapping.

Operands:

gna Specifies the gna address
ip Specifies the ip address

SET MAXBI

Command	Operands
SET MAXBI	size

Description: Specifies the maximum input buffer size that a user may specify on a CONNECT or OFFER call. This parameter sets a system wide maximum user buffer size. Its value and the size of the user buffer region determine possible fragmentation of the region and the maximum number of connections that can be supported.

Operands:

Size Specifies the maximum input buffer size (in bytes) that users can specify on a CONNECT or OFFER call. Size may range from 64 to 32768 bytes, but must be greater than or equal to the default block-in value.

SET MAXBO

Command	Operands
SET MAXBO	size

Description: Specifies the maximum output buffer size that a user may specify on a CONNECT or OFFER call. This parameter sets a system wide maximum user buffer size. Its value and the size of the user buffer region determine possible fragmentation of the region and the maximum number of connections that can be supported.

Operands:

Size Specifies the maximum output buffer size (in bytes) that users can specify on a CONNECT or OFFER call. Size may range from 64 to 32768 bytes, but must be greater than or equal to the default block-out value.

SET MAXKBS

Command	Operands
SET MAXKBS	[n]

Description: Sets the maximum rate at which NetEx/IP will deliver data to the network for each network connection. If zero is specified, data will be delivered with no internal throttling. This value is only used for connections to hosts that do not have a 'rate' value specified in the PAM.

Operands: n. Specifies the maximum rate in Kbits per second. For example, a value of 50 means 50 Kbs; a value of 50000 means 50 Mbs (50,000 Kbs).

SET MSGLVL

Command	Operands
SET MSGLvl	level

Description: Controls the severity of messages printed on the operator's console. All messages with the specified level of severity or greater are displayed. The default setting is 'immediate'.

Important Note: to view session initiation messages in the 'ntxlog' file, the msglvl parameter must be set to 'important' or less (i.e. important, interesting, moderate, monitor, debug, or blither).

Operands:

level	Specifies a keyword to indicate the level of messages to be displayed on the operator's console. Specify one of the following values:
immediate	Messages that require immediate action by the operator. Example: NetEx/IP termination.
important	Messages that are of great interest to the operator and may require operator action. Examples: notification of all set, drain, start, and clear commands; remote operator messages.
interesting	Messages regarding events that are of interest in closely monitored environments.
moderate	(reserved)
monitor	(reserved)

debug	(reserved)
blither	Messages that are intended for diagnostic or debugging purposes.

SET NTXOPER

Command	Operands
SET NTXOPer	value

Description: Specifies whether the remote operator service is enabled or disabled.

Operands:

Value	Specifies whether the remote operator services is enabled or disabled. Specify ON to enable the remote operator service; specify OFF to disable the remote operator service. The default is ON.
-------	---

SET PREFPROT

Command	Operands
SET PREFPROT	value

Description: Sets the default preferred protocol type to use when connecting to hosts that support multiple NetEx/IP protocol types.

Operands: value. Specifies the default preferred protocol type. Specify 2 to use type-2 as the default protocol; specify 4 to use type-4 as the default protocol.

SET READTIME

Command	Operands
SET REAdtime	seconds

Description: Specifies the number of seconds NetEx/IP transport retains user data waiting for the receiver to issue a READ request. When this timer expires, a disconnect will be flagged and sent to the remote process connected. The local process will be sent a disconnect message for READTIME seconds, if there is one not already there. When a disconnect times out, the transport connection will be cleared out and the Tref will become invalid for future user requests.

Operands:

seconds specifies the number of seconds that NetEx/IP transport retains user data waiting for a READ to be issued from the receiver.

SET ROPCLASS

Command	Operands
SET ROPClass	class

Description: Specifies the class of operator commands that the remote operators will be allowed to issue.

Operands:

class Specifies a value to indicate the class of operator commands to be available to remote hosts. Specify 'A' to allow all commands; specify 'G' to allow only display commands.

SET SESMAX

Command	Operands
SET SESMaximum	number

Description: Controls the number of session connections or OFFERs permitted at one time. If the current number of sessions is greater than the new value specified, the command will not affect sessions in progress, but will deny any new requests until other sessions are disconnected. If the current number of sessions is less than the new value, then there will be no immediate effect.

Operands:

number Specifies the number of connections and OFFERs to allow at one time (from 2 to the SESLIM value).

SET WDOGINT

Command	Operands
SET Wdogint	seconds

Description: Specifies the number of seconds that elapse between NetEx/IP's checking for timed-out conditions in the NRB requests. If a READ has a timeout value specified as 10 seconds, and the WDOGINT is also 10 seconds, the READ will actually timeout in the range of 10-20 seconds.

Operands:

seconds Specifies the number of seconds that NetEx/IP uses as a base unit for checking time-out values.

START NETEX

Command	Operands
START NETEX	

Description: Restarts NetEx/IP after it has been drained using the DRAIN NETEX command.

Operands: (none)

START HOST

Command	Operands
START HOST	rmthost

Description: Starts a remote host that had been previously drained.

Operands:

Rmthost Specifies the name of the remote host being started.

SWLOG

Command	Operands
SWLOG	

Description: Saves the current 'ntxlog' file as 'ntxlog.n', and starts using a new 'ntxlog' file. When this command is entered, the current 'ntxlog' file becomes 'ntxlog.1', the previous 'ntxlog.1' file becomes 'ntxlog.2', etc. The number of 'ntxlog' files that are saved is determined by the value of the 'numlogs' initialization statement contained in the 'ntx_default' file. When the archive name of an old 'ntxlog' file equals the 'numlogs' specification, the file is deleted.

For example, if 'numlogs' is specified as 5, the following 'ntxlog' files will exist after the 'swlog' command is entered 4 times:

ntxlog	current file
ntxlog.1	current-1 file
ntxlog.2	current-2 file
ntxlog.3	current-3 file
ntxlog.4	current-4 file

Entering another 'swlog' command results in the following:

- ntxlog.4 is deleted
- ntxlog.3 is renamed to ntxlog.4
- ntxlog.2 is renamed to ntxlog.3
- ntxlog.1 is renamed to ntxlog.2
- ntxlog is renamed to ntxlog.1
- A new 'ntxlog' is created

Operands:

none

Appendix D. NetEx/IP Messages

This section contains a description of the messages issued by NetEx/IP. These messages are displayed in the 'ntxlog' file if the value of the *'msglvl'* parameter is set to *'important'* (or less).

Each message is prefixed with a date and timestamp of the following format:

```
Sun Sep 16 01:03:52 2001
```

Viewing NetEx/IP Messages

NetEx/IP messages are recorded in the 'ntxlog' file. There are two ways to view this file:

- 1) Using the NetEx/IP Web Browser Interface
- 2) Using a native Linux 'telnet' session

Using the Web Browser Interface

To view the 'ntxlog' file using the Web Browser Interface, follow the instructions contained in the "Web Browser Interface" section on page 7, and select the "NetEx/IP Commands" button. The recording of NetEx/IP session messages in the 'ntxlog' file requires the *'msglvl'* parameter to be set to *'important'* (or less). This can be set by using either the *'msglvl'* initialization statement or the *'set msglvl'* operator command. To use the initialization statement, place the following statement in the 'ntx_default' initialization file:

```
msglvl important
```

To use the operator command, issue the following command after NetEx/IP is initialized:

```
set msglvl important
```

This command should be entered following the procedures in the "SET MSGLVL" section on page 59.

After this command is issued, select the "Display NetEx/IP Log" button to view the log.

Using a Native Linux 'Telnet' Session

The following procedure can be used to view the 'ntxlog' file using a native Linux 'telnet' session:

- 1) Login as user 'nesi'
- 2) Issue the following commands to change the *'msglvl'* to *'important'*:

To invoke the 'ntxoper' program:

```
/usr/local/bin/ntxoper
```

At the NTXOPER prompt, enter:

```
set msglvl important
```

If desired, view the new '*msglvl*' setting by entering:

```
d p
```

Leave the NTXOPER prompt by entering:

```
q
```

3) Issue the following command to get to the location of the 'ntxlog' file:

```
cd /usr/nesi/netex/site
```

4) Issue the following command to display the "end" of the 'ntxlog' file:

```
tail -f ntxlog
```

This will result in a continuously updated display of the 'ntxlog' file in the telnet window.

Messages:

```
ISOFFR nref n uname      : offering pname at hname, t secs
```

Description: An OFFER has been issued by the NetEx/IP application that is running under the user name 'uname'.

n identifies the internal NetEx/IP session reference number
uname identifies the user name under which the NetEx/IP application is running.
pname identifies the NetEx/IP OFFER name of the application.
hname identifies the name of the host on which the OFFER occurred (local host)
t identifies the OFFER timeout value specified by the application.

User Response:

None.

```
ISCONN nref n uname      : connecting to pname at hname,  
path from aa to bb
```

Description: A CONNECT has been issued by the NetEx/IP application that is running under the user name 'uname'.

n identifies the internal NetEx/IP session reference number
uname identifies the user name under which the NetEx/IP application is running.
pname identifies the NetEx/IP name of the remote application (remote OFFER name).
hname identifies the name of the host being connected to (remote host).
aa identifies the local unit portion of the network path address
bb identifies the remote unit portion of the network path address

User Response:

None.

```
ISCONF nref n uname      : pname confirming to nref m at hname
```

Description: An OFFER has been completed (connected to) by a remote NetEx/IP application, and the subsequent CONFIRM has been issued.

n identifies the internal NetEx/IP session reference number of the local application.
uname identifies the user name under which the NetEx/IP application is running.
pname identifies the NetEx/IP OFFER name of the application.
m identifies the internal NetEx/IP session reference number of the remote application
hname identifies the name of the host on which the OFFER occurred (local host)

User Response:

None.

```
ISCLOS nref n uname      : closing
```

Description: A CLOSE has been issued by the NetEx/IP application that is running under the user name 'uname'.

n identifies the internal NetEx/IP session reference number of the local application.

uname identifies the user name under which the NetEx/IP application is running.

User Response:

None.

```
ISDISC nref n uname      : disconnecting
```

Description: A DISCONNECT has been issued by the NetEx/IP application that is running under the user name 'uname'.

n identifies the internal NetEx/IP session reference number of the local application.

uname identifies the user name under which the NetEx/IP application is running.

User Response:

None.

```
FINISHSESSION nref n : nrbreq = rr, nrbstat = ssss, nrbind = i
```

Description: A NetEx connection is terminated, due to the reason indicated in the message.

- n identifies the internal NetEx/IP session reference number of the local application.
- rr identifies the NetEx/IP request type.
- ssss identifies the reason for the session failure. Refer to “Appendix E. NRB Status Error Codes” on page 73 for a description of the possible status codes.
- i identifies the status of the connection
 - 6 session is disconnected

User Response:

None.

```
NEXTPAM nref n : new path from aa to bb
```

Description: An APR (alternate path retry) operation has occurred for the indicated session connection.

- n identifies the internal NetEx/IP session reference number
- aa identifies the local unit portion of the new network path address
- bb identifies the remote unit portion of the new network path address

User Response:

None.

Appendix E. NRB Status Error Codes

The following status codes are Session level errors that are returned in the NRBSTAT field, indicating the completion status of a NetEx/IP request.

All errors that result in the loss of the connection and a Disconnect Indication in NRBIND are indicated by an asterisk (*) following the error code number.

3005	During a WRITE operation, the length of the buffer as specified by NRBLLEN exceeds the maximum buffer size found in NRBBLKO. The WRITE operation is rejected. The connection remains outstanding.
3006	The length of PDATA sent on a CONNECT, CONFIRM, or DISCONNECT is greater than the maximum allowed. The request is rejected.
3008	During a WRITE, NRBLLEN exceeds segment size.
3100	The Sref specified by NRBNREF is not in use or is not owned by this applications program. The request is rejected. The status of other connections owned by this application remain unchanged.
3101	On an SWRITE request for intra-host communications, a DATAMODE was specified that is not supported for internal communications.
3103	The quantity of Odata provided exceeds an implementation defined maxim. The request is rejected.
3300	An SREAD or SOFFER request timed-out before a response was received on the network. If the timed request is an SREAD, the status of the connection was not affected. If an SOFFER timed out, then the connection will not have taken place.
3301	SCONNECT, SOFFER, or SCONFIRM has been issued for a connection that is already fully established. The request is rejected. The status of the connections remains unchanged.
3302	A connect indication was received by a preceding SOFFER, and a request other than SCONFIRM or SDISCONNECT was issued. The request is rejected. NETEX will continue to wait for the confirm or disconnect request.
3303	An SCONNECT request was previously issued, then a request other than an SREAD or SDISCONNECT was issued. The request is rejected. NETEX will continue to wait for the SREAD or SDISCONNECT request.
3304	The number of SWRITE requests outstanding against a single connection exceeds an implementation defined maximum (usually one). The SWRITE request is rejected. The status of the connection and the previous SWRITE requests remains unchanged.
3305	The number of SREAD requests outstanding against a single connection exceeds an implementation defined maximum (usually one). The SREAD request is rejected. The status of the connection and the previous SREAD requests remains unchanged.

3306	A SWRITE has been issued to a session connection that is in the process of servicing a remote caller or NETEX initiated Disconnect. A Disconnect Indication is pending from NETEX.
3307	A SREAD request has been issued to a session connection that is in the process of servicing a remote caller or NETEX initiated Disconnect. A Disconnect Indication is pending from NETEX.
3308	A write type request (SWRITE or another SCLOSE) has been issued against a connection that has accepted a previous SCLOSE.
3402*	The remote application has failed to issue an SREAD request for a period of elapsed time (READTO) specified by the installation systems programmer on the remote host. The connection is terminated. A Disconnect Indication will be found in NRBIND.
3403*	The remote application exited without issuing an explicit Disconnect back to the local application. The connection is terminated. A Disconnect Indication will be found in NRBIND.
3422	HALTSREF was issued by operator.
3500*	A connect message was repeatedly sent to the remote host in response to a previous TCONNECT request, but no response was received for a period of elapsed time (CONTO) specified by the installation systems programmer. Probable cause is the absence of the NETEX software on the remote host. The SCONNECT terminates with a Disconnect Indication in NRBIND.
3501*	The PNAME specified is not OFFERed on the HOST specified during the SCONNECT. The SCONNECT terminates with a Disconnect Indication in NRBIND.
3502*	The PNAME specified was not OFFERed on the HOST specified during the SCONNECT. However, a session that was previously established by OFFERing the requested PNAME is now in progress on the remote machine. If the remote application elects to re-OFFER the connection in the future the service might be available at that time. (In other words, the remote application is "busy.")
3503*	The number of user session connections permitted by NETEX has been exceeded. Session service can not be offered at this time. The SCONNECT or SOFFER is rejected.
3504*	Session service is not directly available to applications programs. This service can only be made available by the installation systems programmer.
3505*	NETEX is currently being "drained" by the computer operator. No new requests for Session services (SCONNECT and SOFFER) are being accepted.
3506*	The HOST specified in an SCONNECT request does not exist anywhere on the network generated by the installation systems programmer. The SDISCONNECT terminates with a Disconnect Indication in NRBIND.
3507*	The HOST specified exists on the installation generated network configuration, but the local computer operator has specified that no session level connections take place with that particular host. The SCONNECT terminates with a Disconnect Indication in NRBIND.
3508*	The HOST specified exists on the installation generated network configuration, but no communications path exists between the local host and the specified remote host. The SCONNECT terminates with a Disconnect Indication in NRBIND.

3509*	The specified value of NRBLKO exceeds an installation or implementation defined maximum. The connection request is rejected.
3510*	The specified value of NRBLKI exceeds an installation or implementation defined maximum. The connection request is rejected.
3511*	The Class of Service request is not currently implemented.
3522*	NETEX was drained while this outstanding OFFER was not complete.
3523*	NETEX was DRAINEd when a connect was received. This error is returned by the Session Manager to the connector.
3550*	The local host specified on an SOFFER or SCONNECT does not exist in the NETEX Administrator's NCT. The request is rejected at the Administrator.
3552*	The local host specified on an SOFFER or SCONNECT request is not in the NETEX Administrator's domain. The request is rejected.
3553*	The Physical Address Map (PAM) sent along with an OFFER or CONNECT request to the Administrator does not match any PAM that the Administrator can generate. The request is rejected.

Appendix F: NESiGate Sense Bytes

NESiGate ESCON

Table 1. NESiGate ESCON (Bus & Tag) Sense Bytes lists the decode of sense bytes that are returned from the NESiGate ESCON or Bus & Tag interface board.

Sense Bytes				
0	8	31
X'80' – Command Reject	X'80' – Data Timeout	X'2A' – Data Timeout
X'10' – Equipment Check		X'10' – Waitmsg Timeout		X'2B' – Waitmsg Timeout

Table 1. NESiGate ESCON (Bus & Tag) Sense Bytes

Subchannel not started error – only two bytes of sense are returned X'8200'

On NESiGate offload (CO type) boxes, connect completion and write completion errors are returned as follows:

Sense Byte						
0	..	10	11	12 - 13	14 - 17	18 – 21
X'80' – Command Reject	..	X'03'	X'00'	“nrstat”	“nrbind”	“nrbrref”

Table 2 NESiGate Offload (CO) Sense Bytes

See Appendix E. NRB Status Error Codes on Page 73 for details on “nrstat” codes.

