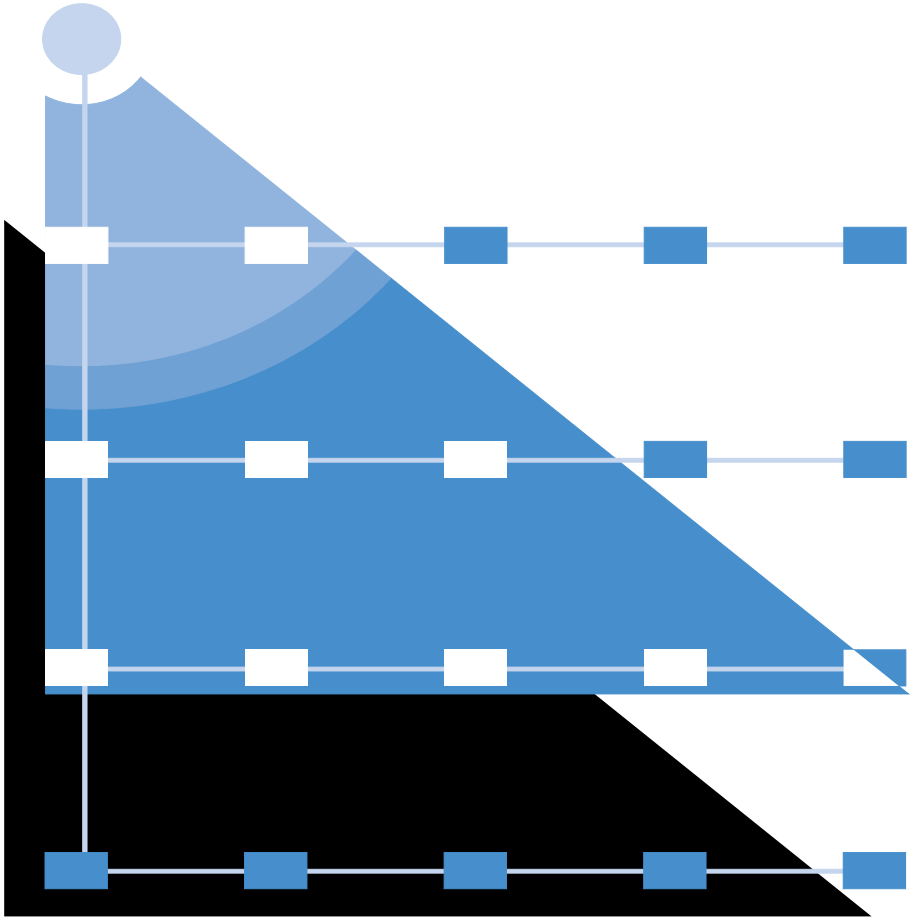
NTSE66FD **323-4001-057**

SONET Transmission Products

S/DMS Network Manager

Connection Management

Standard Rel 6 November 1996



NORTEL

NORTHERN TELECOM

SONET Transmission Products

S/DMS Network Manager

Connection Management

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November 1996

Standard for S/DMS Network Manager Release 6. Release 6 includes connection management enhancements (support for Virtual Tributary Bandwidth Manager (VTBM) and linear systems), revised network display for groups, and network element support for Tellab Titan 5500 Digital Cross-Connect System (DCS), DV45 Video Codec, and OC-192 network elements.

January 1996

Standard for S/DMS Network Manager Release 5. Release 5 adds STS connection management (provisioning) and service assurance functions to S/DMS Network Manager. Release 5 also introduces extensive changes to the user interface in the area of menu structure, node information, and display selection capabilities.

April 1995

Standard for S/DMS Network Manager Release 4. Release 4 includes updates for performance monitoring consolidation, remote inventory query and display, shelf-level graphics, provisionable span information, and support for additional users on certain S/DMS Network Manager hardware platforms.

September 1994

Standard for S/DMS Network Manager Release 3. Release 3 includes updates for centralized software management, enhanced alarm collection control, asynchronous alarm display, alarm filtering, alarm banner, TA-1230 ring configuration and traffic display, access to graphical OPC user interface, external device access, and enhancements to the S/DMS Network Manager software installation and upgrade process. This is also the first issue of the S/DMS Network Manager User Guide produced in full color.

January 1994

Standard for S/DMS Network Manager Release 2. Release 2 includes updates for user-defined network element groupings, transparent network element login access, detailed alarm information display, user-selectable link types, unrestricted network element node placement, and interwindow linking of network element nodes.

April 1993

Standard for S/DMS Network Manager Release 1. This user guide introduces the S/DMS Network Manager and describes the S/DMS Network Manager Release 1 network configuration and alarm monitoring capabilities.

Contents

About this guide

This book describes connection management within the S/DMS Network Manager Release 6 software.

Who should read this book

This book is intended for people who must view, provision, and edit connections on ring and linear systems.

S/DMS Network Manager documentation packaging

The documentation for S/DMS Network Manager is composed of one volume. The volume contains nine individual books:

- *Introduction* (323-4001-102) introduces the features and user interface of S/DMS Network Manager.
- *Installation and Administration* (323-4001-202) provides installation and administration information for S/DMS Network Manager. Also, this book provides information on configuring and bootstraping an operations controller (OPC), setting up serial ports for external device access, and customizing the S/DMS Network Manager user environment.
- *Connectivity* (323-4001-053) provides information on logging in and out of S/DMS Network Manager, controllers (OPC and TL1 MOA), network element user interfaces, and external devices.
- *Configuration* (323-4001-054) describes the Graphical Network Editor (GNE) tool of S/DMS Network Manager. The GNE is used to configure a network.
- *Fault Management* (323-4001-055) describes the Graphical Network Browser (GNB) tool of S/DMS Network Manager. The GNB is used for network surveillance.
- *Performance Management* (323-4001-056) describes centralized performance monitoring for the network elements monitored by S/DMS Network Manager.
- *Connection Management* (323-4001-057) describes viewing, provisioning, and editing connections on ring and linear systems.

- *Inventory Management* (323-4001-058) describes taking an inventory of remote network elements monitored by S/DMS Network Manager.
- *Software Management* (323-4001-059) describes controller and network element centralized software management.

Systems supported in this book

This book describes the operation of S/DMS Network Manager with S/DMS TransportNode, S/DMS AccessNode, Cornerstone Voice, SONET Radio 4/40, and TL1 MOA systems. The basic operation of S/DMS Network Manager is the same for each system. However, the availability of some features depends on the system S/DMS Network Manager is monitoring, and the software release installed on the system. For more information, see "Software release compatibility" in *S/DMS Network Manager Introduction*, 323-4001-102.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this book are shown as follows.

System prompts and responses

System prompts and responses are printed as follows:

```
system-prompts and RESPONSES looks like this
```

Command strings

Command strings typed at the keyboard are printed in bold type, followed by a Return or Enter symbol (↵), as follows:

this is what you type ↵

Type the command string exactly as shown, including spaces, and end by pressing the Return key.

Variable parameters are enclosed in angle brackets, as follows:

Install the software in directory <directory name>

An explanation of the variable follows the command string, as follows:

where

<directory name> is the name of the directory used to...

On-screen buttons and menu commands

Buttons and menu command items are printed in bold type as follows:

select the **Controller Status** command

Hardkeys

Hardkey (keyboard keys) names are printed in plain type as follows:

press Return

Results of an action and comments

Results of an action and comments are printed in italic type, as follows:

The Controller Status dialog appears.

Screen illustrations

The screen illustrations in this book are black and white approximations of the images displayed by S/DMS Network Manager.

References in this book

S/DMS Network Manager can monitor various types of Northern Telecom SONET transmission systems, each of which has its own version of Northern Telecom Publication (NTP). Throughout this book, references to NTPs include an “nnnn” notation in place of the NTP version number. Substitute the appropriate NTP version number for the “nnnn” according to the type of system that S/DMS Network Manager is monitoring, as shown in the following table.

System type	NTP version number
OC-3/OC-12	1111
OC-48	1201
OC-192	1301
S/DMS AccessNode	3001

For example, if this book refers you to *User Interfaces Description*, 323-nnnn-301, and S/DMS Network Manager is monitoring a Northern Telecom OC-48 system, use NTP 323-1201-301 to obtain the appropriate information.

The following NTPs and other documentation are referred to, but not included as an integral part of the *S/DMS Network Manager User Guide*.

- *System Description*, 323-nnnn-100
- *Signal Flow and Protection Switching Descriptions*, 323-nnnn-103
- *Performance Monitoring Description*, 323-nnnn-105
- *User Interfaces Description*, 323-nnnn-301
- *System Administration Procedures*, 323-nnnn-302
- *Software Administration Procedures*, 323-nnnn-303

- *Protection Switching Procedures*, 323-nnnn-311
- *Performance Monitoring Procedures*, 323-nnnn-520
- *Alarm and Trouble Clearing*, 323-nnnn-543
- *S/DMS Network Manager, Release 6.00 Planning Guide*, PG 96-04
- *MOA, Release 2.00 Planning Guide, PG 95-11*
- *HP Visual User Environment User's Guide*, Hewlett Packard Part No B1171-90042
- *HP Remote Access User's Guide*, Hewlett Packard Part No B1862-90011
- *HP-UX Installing Peripherals*, Hewlett Packard Part No B1864-90011
- *HP-UX System Administration Tasks manual*
- *Bellcore SONET BLSR Equipment Criteria* TA-NWT-001230 (issue 2)

Technical support and information

Additional technical support and information can be obtained by contacting the nearest service center. The service centers for the United States and Canada are listed in the following sections.

United States regional service centers

In the United States, contact the nearest regional service center for technical support and information.

For 24 hour emergency technical support For assistance restoring service on equipment which has been carrying traffic and is out-of-service, call the following toll-free number: **800-275-3827 (800-ASK-ETAS)**
For technical support from 8 a.m. to 10 p.m. Call the following toll-free number**:** **800-275-8726 (800-ASK-TRAN)**

Southern Region Northern Telecom Inc. 5555 Winward Parkway, Suite B, Alpharetta, Georgia 30201-3895 (404) 661-4000	**Northeast Region** Northern Telecom Inc. 200 Summit Lake Drive Valhalla, New York 10595 (914) 773-2559
Central Region Northern Telecom Inc. 475 Martingale Road Schaumburg, Illinois 60173 (708) 706-8000 or 8389	**Western Region** Northern Telecom Inc. 5575 DTC Parkway, Suite 150 Englewood, Colorado 80111 (303) 850-5600
Pacific Region (North) Northern Telecom Inc. 2305 Camino Ramon San Ramon, California 94583 (510) 867-2000	**Southwest Region** Northern Telecom Inc. 2221 Lakeside Blvd., FL 9 Richardson, Texas 75082-4399 (214) 684-4195 or 1000
Pacific Region (South) Northern Telecom Inc. 300 North Lake Avenue Pasadena, California 91101 (818) 584-2000	**Eastern Region** Northern Telecom Inc. 2010 Corporate Ridge McLean, Virginia 22102 (703) 712-8487

Canada technical assistance service centers

In Canada, contact the nearest technical assistance service center for technical support and information.

For 24-hour emergency technical support For assistance with problems that can lead to payload-affecting failures or issues that prevent payload protection switching, call the following numbers: **(800) 361-2465 or (514) 956-3500**
For 24-hour emergency recovery For assistance restoring service on equipment which has been carrying payload and is out of service, call ETAS at the following number: **613-226-5456**
For non emergency support from 8:00 a.m. to 4:00 p.m. Call the regional Field Service Engineering (FSE) group in your Technical Assistance Service Center.

FSE West **(Alberta)** Northern Telecom Canada Limited 10235, 101 Street Edmonton, Alberta T5J 3G1 (403) 441-3193	**FSE West** **(British Columbia, Yukon, and Northwest Territories)** Northern Telecom Canada Limited #410, 13251 Delf Place Richmond, British Columbia V6V 2A2 (604) 279-2258
FSE West **(Manitoba, North-Western Ontario)** Northern Telecom Canada Limited 180, 117 King Edward Street E. Winnipeg, Manitoba R3H 0Y3 (204) 788-7531	**FSE West** **(Saskatchewan)** Northern Telecom Canada Limited PO Box 770 Regina, Saskatchewan S4P 3A8 (1867 Hamilton Street, 8th floor) (306) 791-7100 or (306) 791-7110
Ontario Northern Telecom Canada Limited PO Box 3000 Brampton, Ontario L6V 2M6 (905) 452-2104	**Quebec** Northern Telecom Canada Limited PO Box 2110 St. Laurent, Quebec H4L 4Y7 (514) 744-8750
FSE East (Newfoundland) Northern Telecom Canada Limited 63 Thorburn Rd. St. John's, Newfoundland A1B 3M2 (709) 722-2500 or 1-800-661-4827	**FSE East (New Brunswick)** Northern Telecom Canada Limited 1 Brunswick Square, 4th Floor Saint John, New Brunswick E2L 4K2 (506) 632-8271 or (506) 632-8203
FSE East **(Nova Scotia, Prince Edward Island)** Northern Telecom Canada Limited 1701 Hollis St., Suite 900 Halifax, Nova Scotia B3J 3M8 (902) 421-2301	

Understanding connection management and service assurance

This chapter describes STS-1, STS-3c, and Virtual Tributary (VT) connection management and service assurance on S/DMS TransportNode OC-12 and OC-48 ring or linear systems as well as on AccessNode VTBM ring systems.

> ***Note:*** Connection management and service assurance is available only if the controller runs an S/DMS TransportNode OC-48 Rel 11 (or later), S/DMS TransportNode OC-3/OC-12 Rel 10 (or later), or S/DMS AccessNode Rel 12 (or later) software releases. Also, the controller software must been bridged. For more information on bridging, see "Bridging controller software" in *S/DMS Network Manager Configuration*, 323-4001-054.

Connection management

Connection management refers to provisioning, deprovisioning, editing, and viewing of STS and VT connections on ring or linear systems as follows:

- S/DMS TransportNode OC-48 ring bidirectional and unidirectional STS-1 connections and bidirectional STS-3c connections
- S/DMS TransportNode OC-12 ring bidirectional STS-1, STS-3c, and VT connections
- S/DMS TransportNode OC-48 and OC-12 linear system STS connections
- Transport Bandwidth Manager (TBM) multiplexer (MUX) provisioning for OC-12 connections subtending off OC-48 systems
- AccessNode Virtual Tributary Bandwidth Management (VTBM) ring bidirectional STS-1, STS-3c, and VT connections

There is the capability of defining multiple drop points on a unidirectional connection (OC-48 rings only). Connections on bidirectional line switched rings (BLSR) are provisioned on one BLSR at a time with multi-ring connections defined as a series of separate single-ring connections.

Up to three instances of the Connection Manager window can be opened at a time from a single Graphical Network Browser (GNB) display. This capability is useful for provisioning matched-node connections across multiple rings.

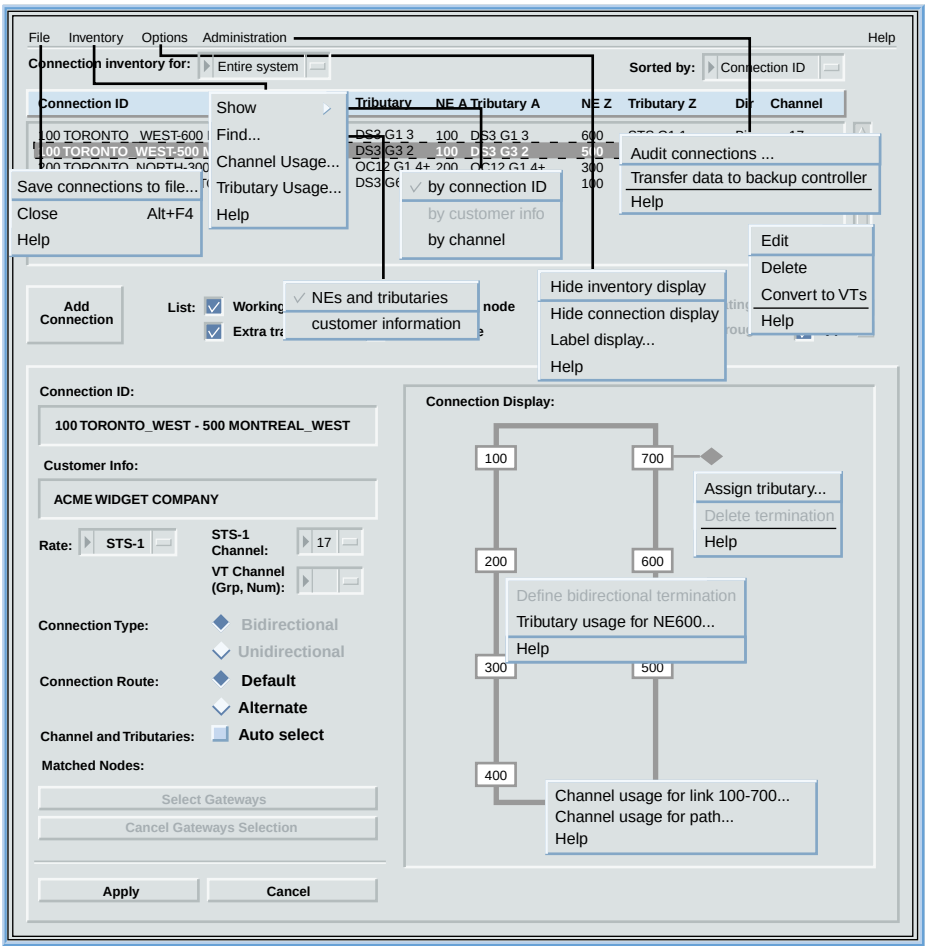
Service assurance

The service assurance feature allows you to view a list of connections associated with a specific network entity. You can view a list of all STS-1, STS-3c, and VT connections provisioned on a specified ring, terminated at and routed through a specified network element, or routed through a specified traffic link. Through this feature you can select a connection in a list, view the details of the connection, and modify it if necessary.

Connection Manager window

The Connection Manager window consists of the connection inventory and the connection display. Only the connection inventory section, the default, is shown initially. The window can be expanded to include the connection display using the manual method or by choosing to add, edit, or view a connection. If you prefer, the connection display section of the window may be shown by itself. The following illustration shows the Connection Manager window with both the connection inventory and the connection display. Where space permits, most of the sub menus are superimposed to provide additional information on the capabilities of the Connection Manager window.

NM-10641.1



The Connection Manager window is divided into two sections, the connection inventory and the connection display.

The connection inventory is determined by the object selected from Graphical Network Browser (GNB) which is used to open the Connection Manager window. This characteristic is referred to as the context of the Connection Manager window. The context of the connection inventory can be any one of the following:

- system—all connections on the specified system are listed in the connection inventory
- network element—only the connections terminated at and routed through the specified network element are listed in the connection inventory
- link—only the connections routed through the specified traffic link are listed in the connection inventory

The current context of the Connection Manager window is shown above the connection inventory in the Connection inventory for: field.

The connection inventory appears by itself or in the top half of the Connection Manager window and contains a list of STS-1, STS-3c, and VT connections associated with the context of the window. You can customize this list using the filtering and sorting options.

The Connection Display appears by itself or in the bottom half of the Connection Manager window and contains a graphical display of the ring associated with the current context of the window. The connection route is graphically superimposed on the system.

The Connection Display can be used to view a connection, edit connection parameters, or add (provision) a new connection. When the Connection Manager is in view connection mode, connections may be viewed but not modified, and no new connections can be provisioned. In add connection mode, new connections can be provisioned. In edit connection mode, existing connections can be modified.

The elements and associated operations of the connection inventory and the connection display sections of the Connection Manager window are described in the following subsections.

Connection inventory

The connection inventory displays the connections of the current context (network element, link, or system). The connection inventory is determined by how the window is accessed from GNB. The connection inventory fields (not including the check boxes) are as follows:

Connection inventory for	This field identifies the current context of the Connection Manager. The current context can be the connections on a network element, link, or system.
Sorted by	This field shows the current Sort option chosen from this data selector.
Connection ID	This field displays the 40-character connection identification string.
Customer Info	This field displays the 40-character customer information string. This field is shown only if you select the customer information option in the Show command of the Inventory menu.

NE A and NE Z	For bidirectional or linear connections, this field identifies the two endpoint network elements of the connection. If matched-node gateways are at either end, the network element corresponding to the primary gateway is used. For unidirectional connections, NE A is the add point and NE Z is the last drop point for the connection. If matched-node gateways are at the add point, NE A is the primary gateway. These fields are shown only if the NEs and tributaries option is selected in the Inventory menu.
Tributary A and Tributary Z	These fields identify the tributaries used at NE A and NE Z for a connection; for example “DS3 G1 1”. For a tributary for an STS-3c connection, a plus sign (+) is added to the string, for example “OC12 G1 1 +”. If “Unprov” appears in a Tributary field, the tributary selected for the connection is valid but not provisioned at the network element. If a question mark (?) appears in a Tributary field, there is a loss of association with the network element. These fields are shown only if the NEs and tributaries option is selected in the Inventory menu.
Dir	This field identifies the direction (Bi for bidirectional or Uni for unidirectional) of the connection.
STS-1	The STS-1 channel used by a connection. If the connection is an STS-3c connection, the range of channels used is shown. For an extra traffic connection, “ET” is displayed to the right of the channel designation. This may also represent the STS-1 channel in which the VT resides.
VT	The VT group and VT number within the STS-1 channel

On OC-48 rings, you can filter the connection inventory to include any or all of the following connections:

- working traffic
- extra traffic
- non-matched-node
- matched-node
- bidirectional
- unidirectional
- terminating
- pass through
- STS
- VT

On OC-12 rings, you can filter the connection inventory to include any or all of the following connections:

- working traffic
- non-matched-node
- matched-node
- bidirectional
- terminating
- pass through
- STS
- VT

Note: You cannot filter AccessNode OC-12 rings to include matched-node connections.

Connection display

The Connection Display shows a graphical representation of the ring associated with the current Connection Manager context. The network elements in the ring are identified by their numbers displayed inside each node representing a network element.

The Connection Display can be in one of three modes:

- view
- add
- edit

When the Connection Manager window is opened, the Connection Display does not appear. (This format is the default display setting for the Connection Manager window.) The Connection Display appears and changes to View mode when you select a connection item from the inventory list. View mode is used to view the STS connections for a particular item in the inventory. The Connection Display changes to Add mode when you select the Add Connection button. Add mode is used to provision new STS and VT connections. The Connection Display changes to Edit mode when you select the Edit command from the inventory list item menu. Edit mode is used to modify the parameters of existing STS and VT connections.

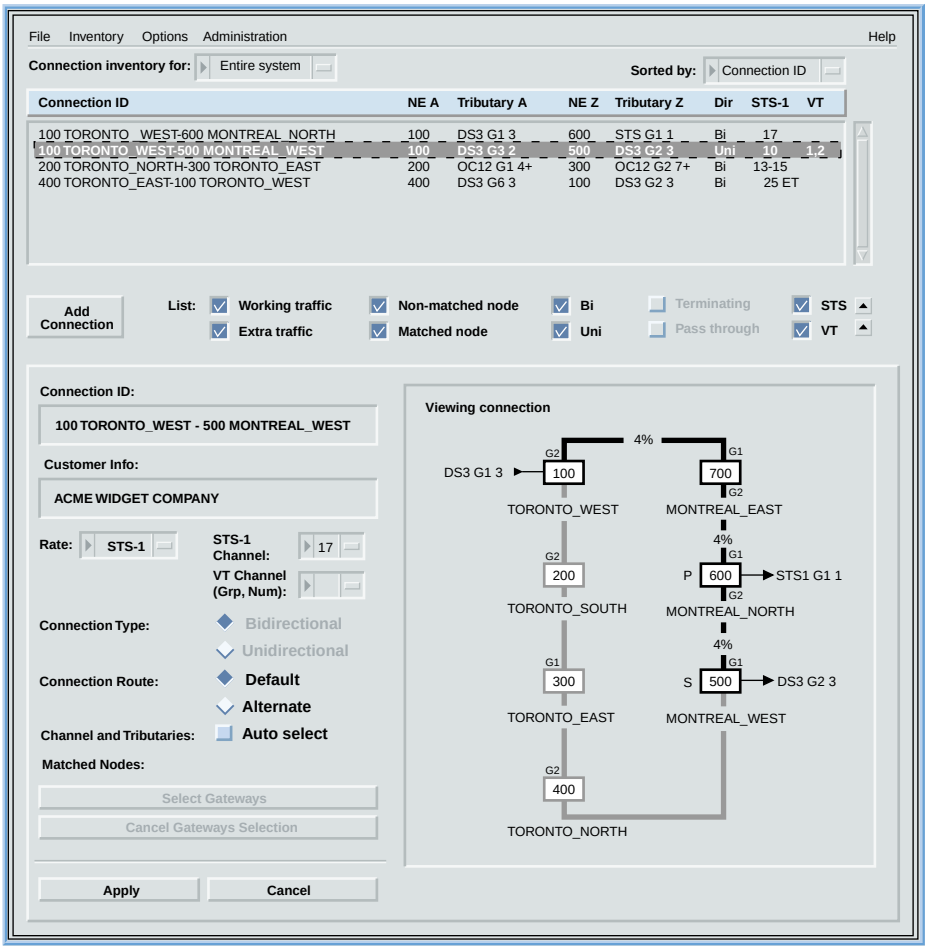
The current mode is indicated in a text line at the top of the Connection Display. When the window is first opened, and no connection is selected, the text line reads “Connection Display”. When you select a connection from the inventory list, the text line reads “Viewing connection”. When adding a connection, the text line reads “Adding <direction> connection”, where <direction> is unidirectional or bidirectional, depending on the type of connection you are adding (see “Connection type” on page 1-11). When editing a connection, the text line reads “Editing connection”.

When you select a connection in the inventory (view mode), the connection path is shown in the Connection Display by highlighting the network elements and links used for the connection route. Each termination in the connection is represented by a termination icon at the corresponding network element. A static text field beside the termination indicates the tributary used to terminate that connection.

The termination icon indicates the direction of the connection. Bidirectional connections are represented by diamond-shaped icons, and unidirectional connections by pointer-shaped icons. The pointer-shaped termination icon used in a unidirectional connection indicates the direction of the connection.

The following illustration shows the Connection Display after a connection is selected from the inventory list.

NM-10642.1

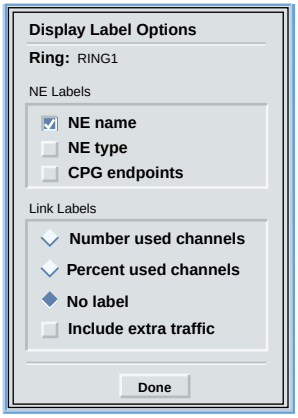


Display Label Options dialog

The Display Label Options dialog enables you to control which network element and link labels appear in the Connection Display area of the Connection Manager window.

The Display Label Options dialog is opened by selecting the Label display command from the Options menu. (See the following illustration.)

NM-10638



The network elements and links are labelled as you select options from the dialog. The label options are used only for the current session, and are applied only to the links and network elements in the window from which the Label options dialog was opened.

Provisioning connections

The following systems support the connection rates identified:

Rate	System Supported
STS-1	OC-48 and OC-12 ring and linear
STS-3c	OC-48 and OC-12 ring and linear[1]
VT1.5	OC-12 VTBM rings

1. Unidirectional connection not supported.

When provisioning a VT1.5 connection, the tributaries that can be used are DS1, STS-1, or OC-3. The recommended approach is to set up a VT1.5 connection using DS1 tributaries.

You can also set up a VT1.5 connection between a DS1 tributary and an OC-3 or STS-1 tributary, between an OC-3 tributary and an STS-1 tributary, or between two STS-1 or two OC-3 tributaries. However, due to current limitations in the behavior of STS-1 and OC-3 tributaries, these setups are not recommended. The virtual tributaries can not be individually switched at both ends and there is no advantage to setting up a VT1.5 connection between an OC-3 tributary and an STS-1 tributary, or two STS-1 or OC-3 tributaries.

When you provision a VT1.5 connection to terminate on an STS-1 or OC-3 tributary, you must assign the same VT group and number for the STS-1 or OC-3 tributary and the STS-1 channel. Otherwise, a VT connection provisioning mismatch alarm is raised.

If you provision a VT1.5 connection on an STS-1 channel to terminate on an STS-1 or OC-3 tributary at the end network element, all 28 VT1.5s within the STS-1 channel should go to the same STS-1 or OC-3 tributary on the end network element. If you do not provision all 28 VT1.5s within the STS-1 channel to terminate on the same STS-1 or OC-3 tributary, a provisioning mismatch occurs.

Adding a connection

The Add Connection button puts the Connection Manager in add connection mode for provisioning a new connection onto the ring associated with the current Connection Manager context.

Connection ID field

The Connection ID is a 40-character string used as an identifier for a connection. This field is optional and can be filled in manually when adding a new connection.

Customer Info field

The Customer Info field contains a 40-character identifier for the customer. This field is optional and can be filled in manually when adding a new connection.

> ***Note:*** The Customer Info field is disabled for AccessNode connection inventories.

Rate field

The default rate for a new connection depends on the type of system. The default rate for an OC-12 VTBM ring is VT1.5. The default rate for all other systems is STS-1. This connection rate is automatically displayed in the Rate field when you enter add connection mode.

OC-48 rings support STS-1 and STS-3c connections. OC-12 and AccessNode rings support STS-1, STS-3c, and VT1.5 connections. The connection rates available for the system are contained in the data selector for the Rate field.

STS-1 Channel field

The default channel for a new connection can be automatically selected or the channel can be entered manually by the user. To use the default channel, the Channel/Tributary Auto select option must be on. In this case, the channel field will be populated with the first available channel appropriate to the connection type. If the Channel/Tributary Auto select option is off, you can select the channel to be used by manually typing it in this field or by using the data selector.

VT Channel (Grp,Num) field

The VT group and number specify the VT timeslots within an STS-1 channel. An STS-1 channel is divided into 7 VT groups, each containing 4 VT1.5. The VT group and number may either be entered manually (typed in or entered using a data selector) or automatically (using the first available VT timeslot in the STS-1 channel) if the Auto select option is selected.

Connection type

When a new connection is provisioned, use the Connection Type buttons to select the type of the new connection, either bidirectional (enabled by default) or unidirectional (OC-48 rings only).

Connection route

When a new connection is provisioned, use the Connection Route buttons to select the route used between termination points. The Default button is the short route. The Alternate button is the long route.

Default (Short) route means that for a bidirectional connection, the route selected between the two termination points is the one which passes through the fewest intermediate network elements. If the Alternate (long) route button is selected, the route selected is the one which passes through the most intermediate network elements.

For a unidirectional connection, the selected route (Default or Alternate) is defined between the add point and the first drop point when the first drop point is defined. Afterwards, the same route is maintained as other drop points are added. The Connection Route buttons can be used to toggle between the two possible paths.

If both possible routes contain the same number of intermediate network elements, the route in the G1 direction from the first network element (the first termination point defined for a bidirectional connection or the add point for a unidirectional connection) is selected. The Connection Route buttons can then be used to toggle between the two possible paths.

> ***Note:*** If the add point of a connection is deleted and added back, the connection route selected by default conforms to the direction established to the first drop point.

If either termination point consists of matched-node gateways, the default route is the shortest path to either of the gateway network elements. If both termination points consist of matched-node gateway pairs, the default route is the shortest path between the two gateway pairs. If the two routes are equal, the route from the first primary gateway is selected.

The Connection Route buttons are enabled in only the add connection and edit connection modes. In addition, these buttons are disabled for a connection having collocated secondary gateways.

Provisioning matched-node gateways

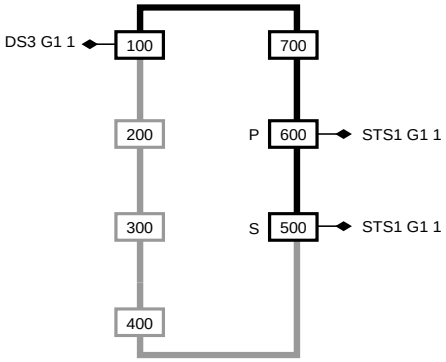
When a new bidirectional connection is provisioned, matched-node gateways can be defined at either or both termination points. For a new unidirectional connection, a matched-node connection across two or more rings can be provisioned as separate connections, one within each ring. The gateways that drop traffic off of each ring are provisioned as standard unidirectional drop points. The primary and secondary gateways through which traffic is added to each ring must be defined using the Select Gateways command.

Note: AccessNode connections do not support matched-node gateways.

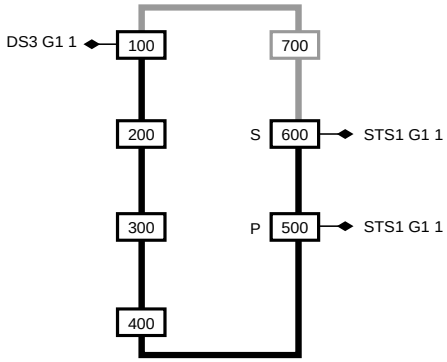
The Select Gateways button puts the Connection Manager in a mode in which everything is disabled except the ability to select gateway network elements. The Cancel Gateway Selection button exits this mode without defining gateways. Only one of these buttons is enabled at a time. In addition, the Select Gateways button is enabled only in add connection and edit connection modes, and disabled if the Rate field is set to STS-3c.

When two gateway network elements are selected, the Connection Manager automatically determines which network element is the primary gateway and which is the secondary gateway, based on the connection route selected. The primary gateway is always between the corresponding secondary gateway and the other end of the connection. The following illustration shows the two connection routes for a bidirectional connection with matched-node gateways at one end. On the left, the default route is selected. On the right, the alternate route is selected.

NM-10465.1 (R6)



Gateways at one end - default route



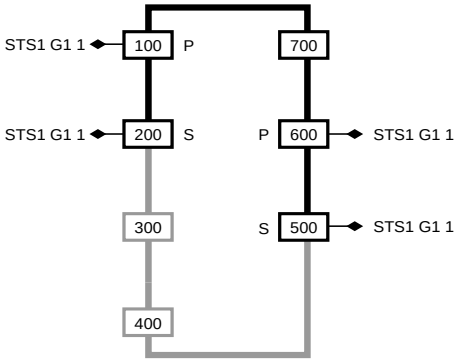
Gateways at one end - alternate route

Since the default route is the shortest path to either of the gateway network elements, the left of the illustration shows network element 600 designated as the primary gateway and network element 500 as the secondary gateway.

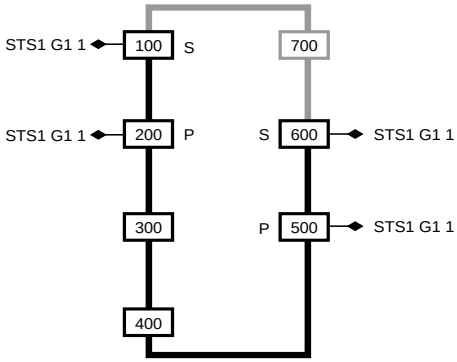
If the alternate route is selected the primary and secondary gateway network element designations are reversed. (See the illustration on the right.) In the counter-clockwise direction, the connection originates at network element 100, flows to the primary gateway, is dropped to a synchronous tributary, and continues on the same STS-1 channel to the secondary gateway. In the opposite direction, the primary gateway selects whether to accept the signal from the tributary or the secondary gateway and routes it to network element 100.

The following illustration shows a bidirectional connection with matched-node gateways at both ends (for example, the middle ring in a multiring connection). On the left, the default route is selected. On the right, the alternate route is selected.

NM-10466.1 (R6)



Gateways at both ends - default route



Gateways at both ends - alternate route

Since the default route is the shortest path between the gateway pairs, network elements 100 and 600 are designated as the primary gateways (see the illustration on the left). If the alternate route is selected, network elements 200 and 500 are the primary gateways (see the illustration on the right).

Tributary facility state provisioning

The state of a tributary facility provisioned on an NE can be changed to in service (IS) or out of service (OOS). This is accomplished through the Tributary Usage dialog. Selecting an item from the dialog displays the list item menu. You can now select the Set state to IS or Set state to OOS command to change the tributary state of the corresponding item.

TBM mux provisioning for OC-12 subtending off OC-48

An OC-12 TBM NE can be subtended off an OC-48 NE by provisioning the connection in either of the following ways:

- A linear point-to-point system with one OC-48 NE and one OC-12 NE
- a linear chain with one OC-48 NE and two OC-12 NEs (This is required to obtain complete DS1 terminations.)

The OC-48 NE is connected to the OC-12 NE through an OC-12 tributary. When the OC-48 NE is selected a termination icon is not shown. Instead, the OC-48 NE is highlighted and the connection is automatically shown as an OC-12 tributary which connects to an OC-12 NE.

Automatic or manual selection of the channel and tributaries

When the Channel/Tributary Auto select button is on, the tributaries and channel for a new connection are selected by default. The default channel is the first available channel on the selected route appropriate to the connection rate and directionality. The default tributary is the first available termination at the network element (appropriate to the connection rate and directionality). For matched-node gateways, the tributary selected is the first available synchronous tributary.

If the channel and tributaries are entered through the data selector or by typing in the data, the Auto select button must be off. The Channel/Tributary Auto select button is off by default and is enabled only in the add connection mode.

Saving or discarding connection data

When a new connection is provisioned or an existing connection edited, the Apply button saves the new or modified data. The Apply button is enabled only when the connection data is complete and valid. When you select the Apply button, the new or modified connection data is validated again. If the validation is unsuccessful (if errors are detected), the connection is not saved and the invalid fields are marked. If the validation is successful, the new or modified connection data is sent to the controller and the network elements, and the connection data (except for the system) is cleared from the Connection Display. The Apply button is enabled only in add connection and edit connection modes.

The Cancel button discards unsaved connection data and returns the Connection Manager window to the mode in which it was when it was opened (no connection data displayed). Confirmation is required for this command if there is unsaved connection data. This button is enabled whenever a connection is displayed.

Converting an STS connection to VT connections

An STS connection on a ring that supports VTBM can be converted to VT connections. To convert a connection, select the entry in the connection inventory list, display the list item menu, and select the Convert to VTs command. The conversion changes the STS-1 connection to 28 VT1.5 connections.

> ***Note:*** You cannot convert STS-1 connections to VT1.5 connections on S/DMS AccessNode network elements.

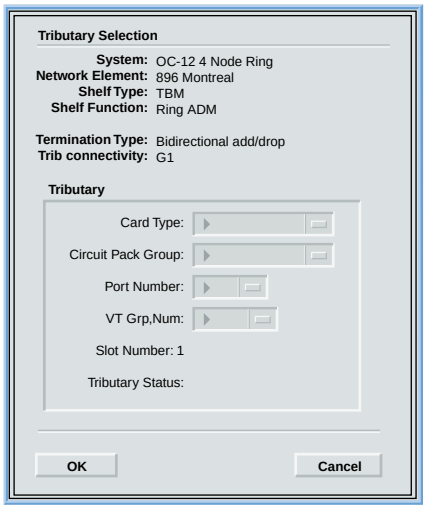
Tributary Selection dialog

The Tributary Selection dialog enables you to specify the details of a given termination point.

The object menu for the tributary icon contains commands for assigning, editing, viewing, and deleting tributaries. The Tributary Selection dialog appears when you select either the Assign tributary, Edit tributary, or View tributary command. Only one of these commands appears in the tributary icon menu depending on whether a new tributary is being defined, an existing tributary is being edited, or the Connection Display is in view mode.

To display the Tributary Selection dialog, double-click on the tributary icon in the Connection Display area.

NM-10623.1



When adding a connection the Tributary Selection dialog is automatically displayed but no data is filled in. This dialog can be used to manually enter a tributary string for the termination that is being added.

A tributary string identifies the specific tributary used at a network element to terminate the connection. The tributary string consists of the following four components:

- the card type (DS3, OC-12, etc.)
- the circuit pack group (G1, G2, etc.)
- the port number on the circuit pack group (for example, 1, 2, or 3 on a DS3 card)
- the VT group and number

An example of a valid tributary string is:

OC3 G1 2 7,4

The values for each component are provisioned at the network element, and are available from data selectors in the Tributary Selection dialog. The data selectors contain only entries which are provisioned on the network element, are not in use by other connections at the selected network element, and which apply to the termination type being provisioned. For example, only tributaries available in both directions are displayed for a bidirectional termination. The card type, circuit pack group, port number, and VT group and number of the tributary must be entered in that order. For example, the Circuit Pack Group data selector is disabled until a valid card type is entered.

The tributary string can also be entered manually if the tributary is currently unprovisioned at the network element.

The static fields in the Tributary Selection dialog are as follows:

System	Name of the system associated with the tributaries.
Network Element	Name of the network element for this termination.
Shelf Type	Shelf type of the NE.
Shelf Function	Shelf function of the NE.
Termination Type	Type of termination provisioned (bidirectional add/drop, unidirectional add, or unidirectional drop).

Trib connectivity	Optical CPG identifier such as G1, G2, G1s, Gs, or None with which the tributary is associated. If the tributary is used for termination that serves as a gateway function, the type of gateway is identified in parentheses beside the CPG information.
Slot Number	Slot number corresponding to the tributary (filled in when a valid tributary is entered).
Tributary Status	Status of the tributary string shown in the dialog (for more information, see “Tributary status”).

Tributary status

The Tributary Status field in the Tributary Selection dialog identifies the status of the tributary shown in the dialog. The status of the tributary can be one of the following:

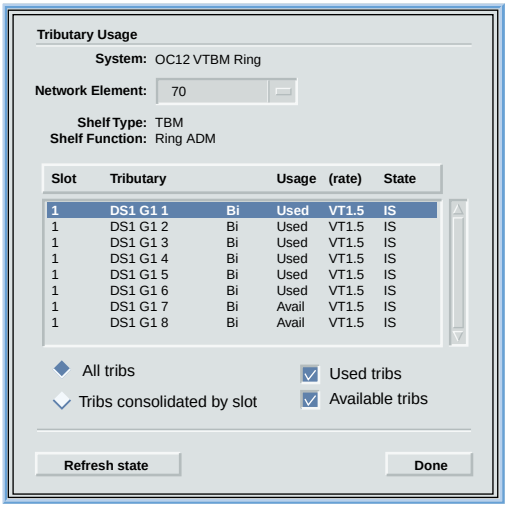
- Blank (empty): One or more of the input fields are empty, and non-empty fields contain valid data. This status is the initial Tributary Status when all fields are empty, for example, when the Tributary Selection dialog is opened to add a new tributary.
- Invalid: One or more of the tributary component fields contain invalid data.
- Provisioned: A valid tributary string has been input and the facility is provisioned on the network element.
- Unprovisioned: A valid tributary string has been input, but the facility is either unequipped or equipped, but the facility is not provisioned on the network element.
- Used: A valid tributary string has been input, but the tributary is in use by another connection. In this case, the component fields are also marked as invalid.
- Occupied: The data entered is valid, but the card provisioned on the network element in the corresponding slot is of a different type from the card type entered. For example, DS3 is entered as the card type and G1 is entered as the circuit pack group, but an STS-1 interface card is provisioned in the slot on the network element corresponding to DS3 G1.
- ?: The tributary status is unknown due to a loss of communications between the network element and S/DMS Network Manager.

Tributary Usage dialog

The Tributary Usage dialog provides a list of tributary facilities provisioned on a network element. The list includes tributaries terminating on STS or VT connections.

The Tributary Usage dialog is accessed using the Tributary usage command from either the Inventory list item menu or the network element object menu.

NM-10621.1



The Tributary Usage dialog is available in two versions: bidirectional and bidirectional/unidirectional. There are two tributaries for bidirectional connections, one for the add portion and one for the drop portion of the tributary.

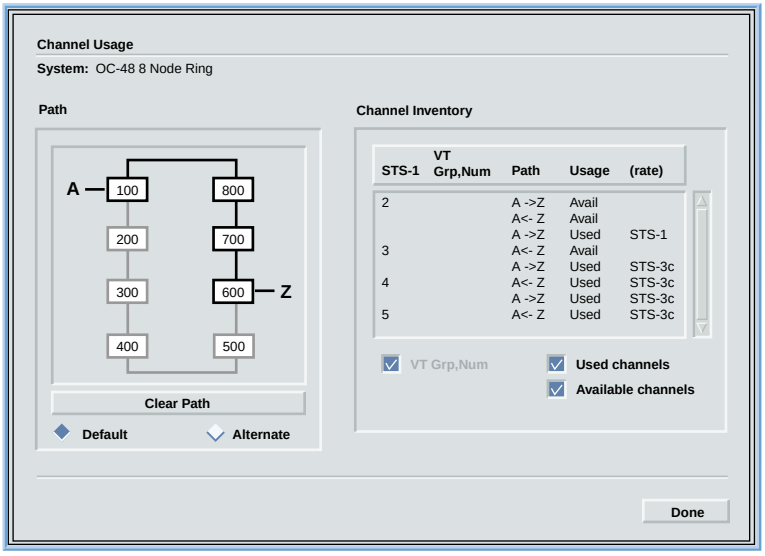
The Tributary Usage dialog can also be used to set the tributary state to in service (IS) or out of service (OOS).

Channel Usage dialog

The Channel Usage dialog provides a summary of how the channels on a specified path on the system are used. The main components of the dialog are the Path display area and the Channel Inventory list.

The Channel Usage dialog is accessed using the Channel usage command from either the link object menu or the Inventory list item menu.

NM-10620.1



The Path display area shows a graphical representation of the system. You can specify the path by selecting the Select Path button and two network elements in the Path display area. Highlighting is applied to the selected path. For ring systems, you can specify the direction around the ring using radio buttons at the bottom of the Path display area. The Default button selects the short route and the Alternate button selects the long route.

After a path is selected, the Channel Inventory list contains a list of all channels on the selected path. Each entry in the list describes how the specified channel is used. You can control the contents of the list using the check boxes at the bottom of the Channel Inventory list.

If the system only supports bidirectional connection provisioning, the channels are displayed in a bidirectional context. The context is indicated using A <-> Z in the Path column. If the system supports unidirectional connection provisioning, the channels are displayed in a unidirectional context. There are two entries for each channel, one in the A -> Z direction, and one in the A <- Z direction, as specified in the Path column.

Editing connections

Data for an existing STS-1, STS-3c, or VT1.5 connection can only be modified in edit mode. Text fields, such as the Connection ID and the Customer Info fields, can be edited by typing the new data into the field. The values for the connection rate, channel, and connection route can also be modified directly. The tributaries used to terminate the connection can be modified using the Tributary Selection dialog.

To change the type of connection (bidirectional or unidirectional), you must delete the existing connection and add a new one. For example, to convert a unidirectional connection to a bidirectional connection, you must delete all unidirectional add and drop points and then provision the bidirectional add and drop points.

To change the location of a termination point, you must delete the existing termination point and add a new one. Similarly, to change the location of a matched-node pair of gateways, the existing gateways must be deleted and redefined. If only one gateway is deleted, the other gateway in the pair becomes a nongateway termination.

Connection Manager compatibility with the controller

You can view, edit, and provision connections using the controller user interface. For Northern Telecom S/DMS TransportNode systems, the tool to provision connections resides on the Operations Controller (OPC). The tool is called the OPC Connection Manager. The OPC Connection Manager enables you to view, edit, provision, delete, and audit connections.

The network elements in a system can be viewed in a list and the configuration of the system can be modified using the OPC Configuration Manager. If the configuration of the currently displayed system is modified using the OPC Configuration Manager, the S/DMS Network Manager user is informed the system data is no longer up-to-date. Any unsaved connections provisioned on S/DMS Network Manager as well as the new configuration data are displayed.

When STS-1, STS-3c, and VT1.5 connections provisioned through the Connection Manager are validated, the new or modified data is sent to the active controller and the network elements. If the validation is not successful, the controller returns a warning message. If the validation is successful, no message is returned, the connection is added to the inventory, and the connection data (except for the system) is cleared from the Connection Display.

If only the backup controller is active, a warning message is displayed to the user. Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Failure to do so results in the new data on the backup controller being lost in the event of a data synchronization operation.

If the primary and backup controllers are both active, the user is prevented from opening the Connection Manager.

Connection data at one or all network elements in a system can be audited against the connection data at the active controller. If mismatches are found during the audit, the user can overwrite the network element connection data at the affected network elements with the controller connection data.

If the backup controller is active when the Audit connections command is invoked, a warning message is displayed alerting the user that the backup controller is being audited. Exercise care when deciding to overwrite network element connection data with data from a backup controller. If the primary and backup controllers are not synchronized and the network element data is overwritten from the backup controller, the data on the primary controller is not synchronized with the data on the network elements.

Audit capabilities are restricted by user class. For more information, see “Connection Manager user classes” on page 1-23.

Data synchronization between the primary and backup controllers can be performed manually from the Connection Manager using the Transfer data to backup controller command in the Administration menu. In addition, when the Connection Manager is closed, and changes made, the user has the option of performing a data synchronization.

In this manner, the controller database always contains all current connection data, whether this data is provisioned or modified through the OPC Configuration Manager tool or the S/DMS Network Manager Connection Manager.

Connection Manager user classes

The following table identifies the connection provisioning and audit capabilities associated with S/DMS Network Manager user classes.

User Class	Active Controller	
	Primary Controller	**Backup Controller**
surveillance	Connection display Audit only	Connection display Audit only
provisioning	Connection provision and display Audit only	Connection display Audit only
admin	Connection provision and display Audit and correct	Connection provision and display Audit and correct
layout	Connection display Audit only	Connection display Audit only

For more information on auditing connections on an active controller, see “Connection Manager compatibility with the controller” on page 1-21.

Provisioning and editing STS and VT connections

This chapter describes how to view, provision, and edit STS and Virtual Tributary (VT) connections on ring or linear systems. The following connections can be provisioned using the Connection Manager:

- S/DMS TransportNode OC-48 ring bidirectional and unidirectional STS-1 connections and bidirectional STS-3c connections
- S/DMS TransportNode OC-12 ring bidirectional STS-1, STS-3c, and VT connections
- S/DMS TransportNode OC-48 and OC-12 linear system STS connections
- Transport Bandwidth Manager (TBM) multiplexer (MUX) provisioning for OC-12 connections subtending off OC-48 systems
- AccessNode Virtual Tributary Bandwidth Management (VTBM) ring bidirectional STS-1, STS-3c, and VT connections

In addition to the above, the primary and backup controllers for the span of control can be synchronized through the Connection Manager. Connection data can also be audited using the Connection Manager. When connection data has been provisioned or modified and then validated through the Connection Manager, it is sent to the active controller.

Requirements

To perform the procedures in this chapter, you must do the following:

- read “Understanding connection management and service assurance” on page 1-1
- log in to the S/DMS Network Manager in a Graphical Network Browser (GNB) session (see “Logging in and opening an S/DMS Network Manager tool” in *S/DMS Network Manager Connectivity*, 323-4001-053)
- familiarize yourself with the S/DMS Network Manager graphical user interface described in “Getting to know the user interface” in *S/DMS Network Manager Introduction*, 323-4001-102
- read the conventions described in “About this guide” on page vii

- have admin or provisioning access classes in order to add (provision), edit, delete, audit, or synchronize connection data. Any user account with any access class can open or close the Connection Manager and display connection data. For more information see "Administering S/DMS Network Manager" in *S/DMS Network Manager Installation and Administration*, 323-4001-202

For all procedures except Procedure 2-1, "Opening the Connection Manager window", the Connection Manager must be open.

Chapter task list

Procedure 2-1
Opening the Connection Manager window

Use this procedure to open a Connection Manager window. The context of the connection inventory is determined on the network element, link, or system (ring or linear) used to open the window.

> ***Note:*** If no controller is active for the system, the Connection Manager is not available.

When the Connection Manager window is opened, the connection inventory is displayed in one of the following contexts:

- in a network element context, the inventory of connections that terminate at, or are routed through, a selected network element
- in a link context, the inventory of connections for which the primary path is provisioned through the selected link
- in a system context, the inventory of connections for the system (ring or linear) associated with the selected object

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	In the Graphical Network Browser, select a network element or a traffic display link between two network elements.
2	From the Configuration menu select the **Show connections for <ne/link>** command or the **Show connections for <system>** command. ***Note:*** The Show connections for <ne/link> command is also available in the object menu for network elements and links. *The Connection Manager window is opened in the context of the selected object. The connections for the selected object (network element or link) are displayed in the connection inventory. The Connection Display area is hidden.*
3	From the Options menu select **Show connection display**. *The ring or linear system for the current context is graphically displayed in the Connection Display area. The window can also be expanded to include the Connection Display by choosing to add, edit, or view a connection.* ***Note:*** If you only want the Connection Display, select the **Hide inventory display** command from the Options menu.

—end—

Procedure 2-2
Customizing the connection inventory

Use this procedure to customize data displayed in the connection inventory.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	You can customize the connection inventory list to show specific types of information and connections. **If** you want to — **Then** go to select the type of inventory information shown — step 2 filter the types of connections shown — step 4
2	From the Inventory menu select the **Show** command. *A cascade menu appears showing the display options for the connection inventory.*
3	You can display the tributary information, or the customer information for the connection inventory. **If** you want to — **Then** display the names and tributaries for NE A and NE Z in the connection inventory — select the **NEs and tributaries** option in the cascade menu. This option is the default selection. display the customer information in the connection inventory — select the **customer information** option in the cascade menu. ***Note:*** Customer information cannot be displayed for AccessNode connection inventories. *The connection inventory displays the selected data.* To further customize the connection inventory, return to step 1.
4	Use the **List** check boxes to specify the connection types you wish to display in the connection list. You can select any, or all connection types: Working traffic, Extra traffic, Non-matched node, Matched node, Bidirectional, Unidirectional, STS, and VT. For a network element you can also select Terminating, and Pass through connections.

—continued—

Procedure 2-2 (continued)
Customizing the connection inventory

Step	Action
	Note 1: The Extra traffic check box can only be checked on for OC-48 ring systems. ***Note 2:*** The Matched node check box can only be checked on for OC-48 and OC-12 ring systems. For connections on OC-48 rings and linear systems, most check boxes are checked on by default. The only exceptions are the VT and the Matched node check boxes. The VT check box is not checked on because OC-48 rings and linear systems do not provision down to the VT connection level. The Matched node check box is not checked on for linear systems. For connections on OC-12 rings and linear systems, the Working traffic, Non-matched node, Bi (bidirectional), STS boxes are checked on by default. The Matched node check box is checked on only for ring systems. The VT check box is checked on only if the system supports VTBM connections. The Uni (unidirectional), and Extra traffic boxes are disabled and checked off. The boxes cannot be checked on. For AccessNode rings, the Working traffic, Non-matched node, Bi (bidirectional), STS, and VT boxes are checked on by default. ***Note:*** For all systems the Terminating and Pass through check buttons are enabled only if the connection inventory is in network element context. *The connections in the connection inventory are filtered according to your selections.*
5	To filter connections for a specific network element, the Connection Manager must be in network element context. If the Connection Manager is not in network element context (refer to the *Connection inventory for:* field), select the desired network element from the *Connection Inventory for:* field data selector. *Connections for the selected network element are displayed in the connection inventory and the Connection Manager is placed in network element context.*
6	To display only connections terminating at the network element in context, check on the Terminating box, and check off the Pass through box. *The terminating connections at the network element in context are displayed in the connection inventory.*
7	If you want to display connections routed through the network element in context without terminating at the network element, check on the Pass through box and check off the Terminating box. *The Pass through connections at the network element in context are displayed in the connection inventory.*

—end—

Procedure 2-3
Sorting the connection inventory

Use this procedure to sort the connections in the connection inventory by connection identification, customer information, or channel.

Note: Customer information cannot be displayed for S/DMS AccessNode connection inventories.

Before starting this procedure, read "Requirements" on page 2-1.

Action

Step	Action
1	From the Connection Manager select the **Sorted by:** data selector. *A cascade menu appears, displaying the valid sort options.*
2	Select the desired sort option: • **Connection ID** to sort the connections alphabetically in ascending order of connection ID • **Customer info** to sort the connections alphabetically in ascending order of customer information (see Note) • **Channel** to sort the connections in increasing order of channel value The default sort order is by connection ID. ***Note:*** The Customer info option is enabled only if the **customer information** option is selected in the Show command in the Inventory menu (see Procedure 2-2, "Customizing the connection inventory"). *The connections in the connection inventory are sorted on the selected option.*

—end—

Procedure 2-4
Customizing the connection display

Use this procedure to modify the information in the Connection Display to suit your needs. The network element number is always displayed inside each network element icon. This procedure allows you to display additional information.

Before starting this procedure, read "Requirements" on page 2-1.

Action

Step	Action
1	Select the **Label display** command in the Options menu. *The Display Label Options dialog appears.*
2	To display the name of each network element in the Connection Display, check on the **NE name** box in the Display Label Options dialog. *When this button is checked on, the name of each network element is displayed under the network element icon in the Connection Display.*
3	To display the network element (NE) type on the Connection Display, check on the **NE type** box in the Display Label Options dialog. The default has the box checked off. *When this button is checked on, the NE type is displayed in the upper right corner for a ring or linear system, and beside each network element for a subtending TBM MUX system.*
4	If you want to display the optical circuit pack group (CPG) connectivity of each network element in the ring or linear system (G1 and G2 for OC-48 ring or linear systems, or G1 and G1s for OC-12 ring or linear system), check on the **CPG endpoints** box in the Display Label Options dialog. *When this button is checked on, the CPG endpoints are indicated at all network elements in the Connection Display.*

—continued—

Procedure 2-4 (continued)
Customizing the connection display

Step	Action
5	You can display link information by selecting a button in the Link Labels portion of the Display Label Options dialog. Only one Link label option can be selected at a time.

If you want to display	**Then**
the number of channels used on each link in the Connection Display	select the **Number user channels** button (see Note).
the ratio of used to total available channels on each link in the Connection Display	select the **Percent used channels** button (see Note).
no labels on the links	select the **No label** button. This button is selected by default.

Note: To include extra traffic connections in the statistics, check on the **Include extra traffic** check box.

The context for the link information is controlled by the value of the Rate field:

- For an STS-1 or STS-3c rate, the link labels refer to the number of used STS-1 channels (for example, 5/24 for an OC-48 BLSR).
- For a VT1.5 rate, the link labels refer to the number of used VT1.5 channels within the specified STS-1 channel (for example, 5/28). The link labels identify if the STS-1 channel is not specified (for example, ?/28).

In the case of a unidirectional connection, a connection path must be defined in order to provide a context for the link labels. The following rules apply:

- if the connection type is set to unidirectional and a path is not defined, all link labels display a question mark (?) in place of the number used (for example, ?/24)
- if the connection type is set to unidirectional and a path is defined, all link labels represent the channels used in the direction specified by the connection path

—end—

Procedure 2-5
Saving connections to a file

Use this procedure to save only the STS-1, STS-3c, and VT1.5 connections currently displayed in the connection inventory to a file on the S/DMS Network Manager disk.

Before starting this procedure, read "Requirements" on page 2-1.

Action

Step	Action
1	From the File menu select the **Save inventory to file** command. *The Connection Management Inventory Save dialog appears.*
2	Enter in the appropriate fields the format (see Note) of the output file, directory, and file name to which the connection data is to be written. ***Note:*** If you select export format, the data is saved in a format suitable for exporting to another application (for example, a spreadsheet program). If you select report format, the data is saved in a text file that can be viewed, edited, or printed. *The connection data for STS-1, STS-3c, and VT1.5 connections is saved in a file of the specified name and format on the S/DMS Network Manager disk.* **—end—**

Procedure 2-6
Creating a bidirectional connection

Use this procedure to provision a bidirectional connection between two termination points on the following connections:

- STS-1 or STS-3c
- VT1.5 for systems supporting OC-12 VTBM connections

For an STS-1 connection, matched-node gateways can be provisioned at either or both of the termination points for a connection on a ring system.

Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Otherwise, the new data on the backup controller is lost during a data synchronization.

Connection provisioning is available only on the active controller for an OC-12 or OC-48 ring or linear system, or a subtending TBM MUX system. However, connection provisioning is not supported if the primary and backup controller are active simultaneously on a split span of control for the system.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the **Add Connection** button in the Connection Manager window. *The connection data in the Connection Display area of the window is cleared. If there is any unsaved data, the system asks whether you wish to continue with the new Add Connection operation. If you answer yes, the unsaved connection data is discarded and the Connection Manager is placed in add connection mode. Otherwise, the Add Connection operation is canceled. The add connection mode is indicated at the top of the Connection Display.*
2	To use default values for the channel and tributaries, ensure the **Auto select** Channel/Tributaries box is checked on. If you do not want to use default values, ensure that this box is checked off.
3	In the Connection ID field (optional), type in the character string to be used as the identifier for this connection. The Connection ID can be up to 40 characters in length.
4	In the Customer Info field (optional), type in the character string to be used to identify the customer. The Customer Info string can be up to 40 characters in length.

—continued—

Procedure 2-6 (continued)
Creating a bidirectional connection

Step	Action
5	The default rate for a new connection depends on the type of system. The default rate for an OC-12 VTBM ring is VT1.5. The default rate for all other systems is STS-1. If the STS-3c rate is desired, select it from the data selector in the Rate field. Otherwise, go to the next step.
6	You can add a single-node termination or a matched-node gateway termination.

If this termination is	**Then**
a single-node termination point	go to step 7
a pair of matched-node gateways	go to step 8 (see Note)

Note: Matched-node gateways cannot be defined if the rate for the connection is STS-3c.

7 Using the left mouse button, select one of the network elements to be used as a termination point for the connection, or select the **Define bidirectional termination** command from the network element object menu.

The selected network element is highlighted as a termination point for a bidirectional connection in the Connection Display.

Note: The Tributary Selection dialog appears if the Auto select Channel/Tributaries box is checked off. The dialog does not appear when a bidirectional termination point is defined on a higher rate node of a TBM MUX system, or when the Auto select Channel/Tributaries box is checked off.

Go to step 12.

8 Click on the **Select Gateways** button.

*The Connection Manager enters a gateway selection mode. Everything is disabled except the ability to select network elements and the **Cancel Gateways Selection** button (see Note). The prompt text at the top of the Connection Display instructs you to select two gateway network elements.*

Note: The **Cancel Gateways Selection** button can be used at any time before two gateway network elements are selected to exit the gateway selection mode without defining gateways.

9 Select a gateway network element.

If you select a valid network element, the prompt text at the top of the Connection Display prompts you to select the second network element. If you select an invalid network element, a beep sounds and the prompt text informs you of the invalid selection.

—continued—

Procedure 2-6 (continued)
Creating a bidirectional connection

Step	Action
10	Select the second gateway network element. *If a valid network element is selected, the two selected network elements are highlighted as a matched-node pair in the Connection Display, and the Select Gateways mode is exited. The **Cancel Gateways Selection** button is disabled and the **Select Gateways** button is re-enabled. If an invalid network element is selected, a beep sounds and the prompt text informs you of the invalid selection.*
11	The Tributary Selection dialog is used to enter the details of the tributary used for the connection.

If the Tributary Selection dialog is	**Then**
displayed and the default tributary is not used (**Auto select** box is checked off)	go to step 12
not displayed and the default tributary is used (**Auto select** box is checked on)	*the first available bidirectional tributary (synchronous bidirectional tributary if the termination point is a matched-node pair) is selected at the network elements.* Go to step 13.
not displayed and the default tributary is not used (**Auto select** box is checked off)	with the left mouse button, doubleclick on the termination icon next to one of the two network elements or select the **Assign tributary** command from the tributary icon menu. *The Tributary Selection dialog appears.* Go to step 12.

12	Using the data selectors in the Tributary Selection dialog, enter the tributary to use for this connection and click on **OK**. You can also enter the tributary string manually, without using the data selectors. The format for a tributary string is **<card type> <circuit pack group> <port> <VT group and number>** For example, **OC3 G1 2 7,4** is a valid tributary string. *The tributary information appears in the field next to the network element. If the tributary string is invalid, the invalid fields are marked with an X.* ***Note:*** For a higher rate node of a TBM MUX system, the tributary string is the system rate of the subtending nodes.

—continued—

Procedure 2-6 (continued)
Creating a bidirectional connection

Step	Action
13	You can now select the second termination point. **If** the second termination point is — **Then** repeat a single network element — steps 7 and 11 a pair of matched-node gateways — steps 9 to 11 *The short route (the default) between the two termination points is highlighted in the Connection Display. For matched-node gateways, the primary and secondary gateways are automatically defined.* ***Note:*** The connection route is set to default for linear and TBM MUX systems.
14	For the long route, go to step 15. Otherwise, go to step 16.
15	Select the **Alternate** connection route button. *The long route between the two termination points is highlighted. For matched-node gateways, the positions of the primary and secondary gateways are automatically reversed.*
16	**If** — **Then** you use the default channel — *the STS and/or VT Channel field is populated with the first available bidirectional channel on the selected route.* you do not use the default channel — fill in the *STS and/or VT* Channel field by typing or by using the data selector (see Note). *The STS and/or VT Channel field is filled in with the selected channel.* ***Note:*** The valid range of STS-1 channels which can be used depends on the ring and on whether extra traffic is supported. For an STS-3c connection, the channel must be one of [1, 4, 7, ...]. The format for the VT Channel field is *g,n* where *g* is the VT group and *n* is the VT number. A comma separates the two values. Valid values for this field are [1-7] for the VT group and [1-4] for the VT number. The data selectors contain only those channels currently available on the specified route for the connection provisioned. If you enter a channel number that is not available on the selected connection route, the STS or VT Channel field is marked as invalid. If a protection channel is specified, an extra traffic indication is appended to the STS Channel field and a warning is displayed in the confirmation message when the connection data is saved.

—continued—

Procedure 2-6 (continued)
Creating a bidirectional connection

Step	Action
17	

CAUTION
Risk of data loss
Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Otherwise, the new data on the backup controller is lost during a data synchronization.

If you want to	**Then**
validate and save the new connection	click on the **Apply** button. *The connection data is validated. If the connection is valid, a confirmation message is displayed (it includes a warning if the backup controller is active). Selecting the Yes button sends the new or modified data to the active controller. The new connection appears in the connection inventory and the Connection Display is cleared. If the connection is not valid, a warning message is provided, prompting you to correct the data marked as invalid.*
cancel the new connection and discard the new data	click on the **Cancel** button. *A request for confirmation is displayed. If you answer yes, the new connection data is discarded and the new connection is not defined. The Connection Manager is placed in the mode in which it was initially opened (with no connection displayed).*

—end—

Procedure 2-7
Creating a unidirectional connection (OC-48 only)

Use this procedure to provision a unidirectional STS-1 connection between an add point and one or more drop points. More than one drop point can be provisioned for a unidirectional connection, but only one drop point can be provisioned at a specific network element.

A unidirectional matched-node connection across two or more rings can be provisioned as separate connections, one within each ring. The gateways that drop traffic off of each ring are provisioned as standard unidirectional drop points. The primary and secondary gateways through which traffic is added to each ring must be defined using the Select Gateways command.

Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Otherwise, the new data on the backup controller is lost during a data synchronization.

This procedure can be performed only on OC-48 ring and linear systems.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the **Add Connection** button in the Connection Manager window. *The connection data in the Connection Display area of the window is cleared. If there is any unsaved data, the system asks whether you wish to continue with the new Add Connection operation. If you answer yes, the unsaved connection data is discarded and the Connection Manager is placed in add connection mode. Otherwise, the Add Connection operation is canceled. The add connection mode is indicated at the top of the Connection Display.*
2	To use default values for the channel and tributaries, ensure the **Auto select** Channel/Tributaries box is checked on. If you do not want to use default values, ensure that this box is checked off.
3	In the Connection ID field (optional), type in the character string used as the identifier for this connection. The Connection ID can be up to 40 characters in length.
4	In the Customer Info field (optional), type in the character string to be used to identify the customer. The Customer Info string can be up to 40 characters in length.

—continued—

Procedure 2-7 (continued)
Creating a unidirectional connection (OC-48 only)

Step	Action
5	Select the **Unidirectional** connection type radio button.

If the add point for the termination is	**Then** go to
a single network element termination point	step 6
a pair of matched-node gateways	step 7

6 Using the left mouse button, select the network element to be used as the add point for the connection, or select the **Define unidirectional add point** command from the network element object menu.

If you select the add point using the left mouse button, and the Auto select button is checked off in step 2, the Tributary Selection dialog is displayed. The selected network element is highlighted as an add point for a unidirectional connection.

Go to step 11.

7 Click on the **Select Gateways** button.

*The Connection Manager enters a gateway selection mode. Everything is disabled except the ability to select network elements and the **Cancel Gateways Selection** button (see Note). The prompt text at the top of the Connection Display instructs you to select two gateway network elements.*

Note: The **Cancel Gateways Selection** button can be used at any time before two gateway network elements are selected to exit the gateway selection mode without defining gateways.

8 Select a gateway network element.

If you select a valid network element, the prompt text at the top of the Connection Display prompts you to select the second network element. If you select an invalid network element, a beep sounds and the prompt text informs you of the invalid selection.

9 Select the second gateway network element.

*If you select a valid network element, the two selected network elements are highlighted as a matched-node pair in the Connection Display, and the Select Gateways mode is exited. The **Cancel Gateways Selection** button is disabled and the **Select Gateways** button is re-enabled. If you select an invalid network element, a beep sounds and the prompt text informs you of the invalid selection.*

—continued—

Procedure 2-7 (continued)
Creating a unidirectional connection (OC-48 only)

Step	Action
10	The Tributary Selection dialog is used to enter the details of the tributary used for the connection.

If the Tributary Selection dialog is	**Then**
displayed and the default tributary is not used (**Auto select** box is checked off)	go to step 11
not displayed and the default tributary is used (**Auto select** box is checked on)	*the first available unidirectional tributary (synchronous unidirectional tributary if the add point is a matched-node pair) is selected at the network elements.* Go to step 12.
not displayed and the default tributary is not used (**Auto select** box is checked off)	with the left mouse button, doubleclick on the termination icon next to the network element (or one of the two network elements if this is a matched-node connection) or select the **Assign tributary** command from the tributary icon menu. *The Tributary Selection dialog appears.* Go to step 11.

11	Using the data selectors in the Tributary Selection dialog, enter the tributary to use for this connection and click on **OK**. You can also enter the tributary string manually, without using the data selectors. The format for a tributary string is **<card type> <circuit pack group> <port> <VT group and number>** For example, **OC3 G1 2 7,4** is a valid tributary string. *The tributary information appears in the field next to the network element. If the tributary string is invalid, the invalid fields are marked with an X.*
12	Select the network element to use for a drop point for this connection using the left mouse button, or select the **Define unidirectional drop point** command from the network element object menu. *If you select the drop point using the left mouse button, the Tributary Information dialog is displayed. The selected network element is highlighted as a drop point for a unidirectional connection. The short route (the default) between the two termination points is highlighted. If the add point is a matched-node pair, the primary and secondary gateways for the add point are automatically defined.*

—continued—

Procedure 2-7 (continued)
Creating a unidirectional connection (OC-48 only)

Step	Action
13	

If the Tributary Selection dialog is	**Then**
displayed and the default tributary is not used (**Auto select** box is checked off)	go to step 14
not displayed and the default tributary is used (**Auto select** box is checked on)	*the first available unidirectional drop tributary is selected at the network element* Go to step 15.
not displayed and the default tributary is not used (**Auto select** box is checked off)	with the left mouse button, doubleclick on the termination icon next to the network element or select the **Assign tributary** command from the tributary icon menu *The Tributary Selection dialog appears.* go to step 14

14 Using the data selectors in the Tributary Selection dialog, enter the tributary to be used for this connection and click on **OK**. You can also enter the tributary string manually, without using the data selectors. The format for a tributary string is

<card type> <circuit pack group> <port> <VT group and number>

For example, **OC3 G1 2 7,4** is a valid tributary string.

The tributary Information appears in the field next to the network element. If the tributary string is invalid, the invalid fields are marked with an X.

15 Repeat steps 12 and 13 at each drop point network element.

—continued—

Procedure 2-7 (continued)
Creating a unidirectional connection (OC-48 only)

Step	Action
16	

If	Then
the default channel is used	*the STS-1 Channel field is populated with the first available unidirectional STS-1 channel*
the default channel is not used	fill in the STS-1 Channel field by typing or by using the data selector (see Note). *The STS-1 Channel field is filled in with the selected channel.*

Note: The valid range of STS-1 channels which can be used depends on the type of OC-48 system. The data selector contains only those channels currently available on the specified route for the connection provisioned. If you select a channel that is not available on the selected route, the STS-1 Channel field is marked as invalid. If a protection channel is specified, an extra traffic indication is appended to the STS-1 Channel field and a warning is displayed when the connection data is saved.

—continued—

Procedure 2-7 (continued)
Creating a unidirectional connection (OC-48 only)

Step	Action
17	

CAUTION
Risk of data loss
Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Otherwise, the new data on the backup controller is lost during a data synchronization.

If you want to	**Then**
validate and save the new connection	click on the **Apply** button. *The connection data is validated. If the connection is valid, a confirmation message is displayed (it includes a warning if the backup controller is active). Selecting the Yes button sends the new or modified data to the active controller. The new connection appears in the connection inventory and the Connection Display is cleared. If the connection is not valid, a warning message is provided, prompting you to correct the data marked as invalid.*
cancel the new connection and discard the new data	click on the **Cancel** button. *A request for confirmation is displayed. If you answer yes, the new connection data is discarded and the new connection is not defined. The Connection Manager is placed in the mode in which it was initially opened (with no connection displayed).*

—end—

Procedure 2-8
Editing a connection

Use this procedure to modify the characteristics of an existing STS-1, STS-3c, or VT1.5 connection. Most properties of a connection can be changed by placing the Connection Manager in edit mode and modifying the characteristics as desired. However, to change the location of a termination point, the existing termination must be deleted and a new one added. Similarly, to change the location of a matched-node pair of gateways, the existing gateways must be deleted and re-defined. See Procedure 2-10, “Deleting a termination” and Procedure 2-11, “Deleting a matched-node gateway.”

To change the type of connection (bidirectional or unidirectional), the existing connection must be deleted and a new one added. For example, to convert a unidirectional connection to a bidirectional connection, all add and drop points must be deleted and bidirectional add/drop points provisioned.

Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Otherwise, the new data on the backup controller is lost during a data synchronization.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the connection to be edited in the connection inventory and select the **Edit** command from the list item menu. *The selected connection is displayed in the Connection Display. The edit connection mode is indicated at the top of the Connection Display.*
2	

If you want to	**Then** go to
edit the Connection ID or the Customer Info	step 3
edit the channel	step 4
edit the connection rate	step 5
edit the connection route	step 6
edit a tributary	step 7
end the editing session	step 9

—continued—

Procedure 2-8 (continued)
Editing a connection

Step	Action
3	Modify the information in the data entry field, as required, either by selecting and over-typing the current information, or by using the editing commands in the field menu. Return to step 2.
4	Enter the desired information in the STS-1 Channel and/or VT Channel fields, or use the data selector. Return to step 2.
5	Select the new connection rate from the data selector in the Rate field. *All data fields are validated to ensure they are valid for the new connection rate.* Return to step 2.
6	Select the desired Connection Route radio button. ***Note:*** The connection route is set to default for linear and TBM MUX systems. *The Connection Display is updated to show the modified route.* Return to step 2.
7	Double-click on the tributary icon with the left mouse button or select the **Edit tributary** command from the tributary icon menu. ***Note:*** You cannot edit tributaries on higher rate nodes of TBM MUX systems. *The Tributary Selection dialog is displayed.*
8	Using the data selectors in the Tributary Selection dialog, enter the tributary to use for this connection and click on **OK**. You can also enter the tributary string manually, without using the data selectors. The format for a tributary string is **<card type> <circuit pack group> <port> <VT group and number>** For example, **OC3 G1 2 7,4** is a valid tributary string. *The tributary information appears in the field next to the network element. If the tributary string is invalid, the invalid fields are marked with an X.* Return to step 2.

—continued—

Procedure 2-8 (continued)
Editing a connection

Step	Action
9	

CAUTION
Risk of data loss
Data provisioned on the backup controller must be reprovisioned on the primary controller when it becomes active again. Otherwise, the new data on the backup controller is lost during a data synchronization.

If you want to	**Then**
validate and save the new connection	click on the **Apply** button. *The connection data is validated. If the connection is valid, a confirmation message is displayed (it includes a warning if the backup controller is active). Selecting the Yes button sends the new or modified data to the active controller. The new connection appears in the connection inventory and the Connection Display is cleared. If the connection is not valid, a warning message is provided, prompting you to correct the data marked as invalid.*
cancel the new connection and discard the new data	click on the **Cancel** button. *A request for confirmation is displayed. If you answer yes, the new connection data is discarded and the new connection is not defined. The Connection Manager is placed in the mode in which it was initially opened (with no connection displayed).*

—end—

Procedure 2-9
Deleting a connection

Use this procedure to deprovision an STS-1, STS-3c, or VT1.5 connection at the controller and the affected network elements, and to remove it from the Connection Manager connection inventory.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the connection to be deleted in the connection inventory and select the **Delete** command from the list item menu. *A request for confirmation is displayed. If you confirm the deletion, the deletion request is sent to the controller. If the deletion is successful, the connection is removed from the connection inventory and deprovisioned at the controller and the affected network elements. If the deletion is unsuccessful, the controller responds with a message detailing the status of the deletion.* **—end—**

Procedure 2-10
Deleting a termination

Use this procedure to remove a termination point from a single network element (a network element that is not a matched-node gateway).

> ***Note:*** Deleting one or both of the termination points for a connection does not delete the connection. If a drop point is deleted from a unidirectional connection, the connection route is updated as necessary. If the add point is deleted from a unidirectional connection or if either or both of the termination points are deleted from a bidirectional connection, the termination points must be redefined. This procedure is useful for changing the location of a termination point or for changing the termination type from bidirectional to unidirectional, or vice versa. For example, to change a unidirectional connection to a bidirectional connection, the add point and all drop points must be deleted and bidirectional termination points defined. To delete a connection, see Procedure 2-9, "Deleting a connection."

Before starting this procedure, read "Requirements" on page 2-1.

Action

Step	Action
1	In the connection inventory, select the connection corresponding to the termination point to be removed, then select the **Edit** command from the list item menu. *The Connection Manager screen is placed in edit mode.*
2	In the Connection Display, identify the network element at which the termination is to be deleted. From the network element termination icon menu, select the **Delete termination** command. *The termination icon and tributary field are removed. The highlighting is removed from the network element. The connection route is adjusted accordingly.*

—end—

Procedure 2-11
Deleting a matched-node gateway

Use this procedure to remove the matched-node gateway functions from a pair of matched-node gateways, leaving one gateway as a non-gateway termination point.

Before starting this procedure, read "Requirements" on page 2-1.

Action

Step	Action
1	In the connection inventory, select the connection corresponding to the matched-node gateway to be removed, and then select the **Edit** command from the list item menu. *The Connection Manager screen is placed in edit mode.*
2	In the Connection Display, select the gateway network element termination icon, display the object menu, and select the **Delete termination** command. *The termination icon and tributary field are removed from the network element. The highlighting is removed from the network element. The primary or secondary designation is also removed from both network elements in the gateway pair. If the selected network element was a secondary gateway, the route between the primary and secondary gateways is deleted and the primary gateway becomes the new termination point. If the selected network element was a primary gateway, the route remains unchanged and the secondary gateway becomes the new termination point.*

—end—

Procedure 2-12
Converting an STS connection to VT connections

Use this procedure to convert an STS-1 connection to 28 VT1.5 connections.

> ***Note:*** You cannot convert STS-1 connections to VT1.5 connections on AccessNode network elements.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the STS-1 connection to be converted to VTs from the connection inventory using the right mouse button. This connection must have a rate of STS-1 on a ring that supports VTBM. ***Note:*** You cannot convert an STS-1 connection to VT1.5 connections if it is a matched node connection or if the connection terminates on an async tributary that does not support VT connections. *The list item menu appears.*
2	Select the **Convert to VTs** command from the list item menu. *A confirmation dialog is presented prior to the conversion.* *The connection converts to 28 VT1.5 connections. The Connection ID and Customer Information fields contain no values. If the STS-1 cannot be converted, a warning dialog appears.*

—end—

Procedure 2-13
Determining channel usage

Use this procedure to list the used and available channels at both the STS and VT levels over a specified path.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the **Channel Usage** command from the Inventory menu in the Connection Manager window. ***Note:*** The Channel Usage command is also available using the link object menu in Connection Display. Two versions of the command are available. If you specify channel usage for a link, the Channel Usage dialog displays the path set to the selected system link.To specify channel usage for a path, you must select a entry in the connection inventory list. Channel usage for a path displays the Channel Usage dialog with the path set to the defined connection route. *The Channel Usage dialog appears.*
2	When the Channel Usage command is selected from the Inventory menu, you must specify the two end nodes for the path by selecting them in the Path display area. Also, you must select the Connection Route (for ring systems only) by selecting the **Default** (short route) button or **Alternate** (long route) button. *The connection path is highlighted between the two end nodes and the Channel Inventory is populated.*
3	Filter the Channel Inventory list by selecting the appropriate check boxes under the inventory list. ***Note:*** The **VT Grp,Num** check box is only enabled for systems supporting VTBM and is checked on by default. *The channel inventory list shows only the information checked on.*
4	Select the **View STS connectivity** command from the Channel Inventory list item menu. *The Path display area shows the usage of the corresponding STS-1 channel.*
5	Select the **Clear Path** button if you want to view the channel usage for a different path. *The existing path display and channel inventory list are cleared putting the path display in node select mode.*

—end—

Procedure 2-14
Determining tributary usage

Use this procedure to provide a list of all tributaries provisioned on a network element. The list provides information on the usage and state of each provisioned tributary. For information on changing the state of a tributary facility, see Procedure 2-15, “Controlling the state of tributary facilities”.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the **Tributary Usage** command from the Inventory menu. ***Note:*** The Tributary Usage command is also available using the network element object menu in the Connection Display. *The Tributary Usage dialog appears.* ***Note 1:*** The Tributary Usage dialog is not available for higher rate nodes in TBM MUX systems. ***Note 2:*** If the Inventory menu is used, select the required network element from the Network Element data selector. The tributaries associated with the selected network element are listed.
2	If required, select the **Tribs consolidated by slot** button. *Only one entry is shown per slot allowing a convenient way of identifying the type of cards provisioned on the network element. The **All tribs** button is selected by default.*
3	Check off the **Used tribs** or **Available tribs** check boxes as required. Both check boxes are checked on by default. *Only the used tributaries or available tributaries are listed.*
4	Select an entry in the tributary list, display the object menu, and select the **Display connection** command. *The connection terminating on the selected tributary is highlighted in the Connection Display of the Connection Manager window. The Connection Display is in view mode.*

—end—

Procedure 2-15
Controlling the state of tributary facilities

Use this procedure to set the state of tributaries to in service (IS) or out of service (OOS).

The facility states are not automatically updated while the Tributary Usage dialog is open. The state is only updated when:

- the dialog is opened
- the Refresh state button is selected
- an IS/OOS state operation is initiated for a particular tributary facility

Note: State provisioning is not supported for OC-3 or OC-12 tributary facilities.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the **Tributary Usage** command from either the Inventory menu or the network element object menu in the Connection Manager window. *The Tributary Usage dialog appears. All tributaries are shown by default.*
2	Check off either the **Used tribs** check box or the **Available tribs** check box as required. Both boxes are checked on by default. *The appropriate tributaries appear.*
3	Using the right mouse button click on the tributary facility whose state you want to change. *The list item menu appears.*
4	Select either the **Set state to IS** command or the **Set state to OOS** command**.** Only one of the commands is enabled at a time. *If the tributary facility state is changed from IS to OOS, a confirmation message appears before the state change is sent to the NE. The state is changed to In service (IS) or out of service (OOS).*
5	If desired, you can select the **Refresh state** button to update the Tributary Usage dialog. *The state column information (IS or OOS) is updated.*

—end—

Procedure 2-16
Auditing connections

Use this procedure to audit the connection data on all network elements which belong to the ring or linear system in the current context against the connection data on the active controller.

Audit capabilities are restricted by user class. For more information, see "Connection Manager user classes" on page 1-23.

Before starting this procedure, read "Requirements" on page 2-1.

Action

Step	Action
1	

CAUTION
Risk of data loss
Exercise care when deciding to overwrite network element connection data with data from a backup controller. If the primary and backup controllers are not synchronized and the network element data is overwritten from the backup controller, the data on the primary controller is not synchronized with the data on the network elements.

Select the **Audit connections** command from the Administration menu in the Connection Manager window.

If	Then
only the primary controller is active	*the connection data on all network elements in the ring or linear system in the current context is audited against the connection data on the active controller.*
only the backup controller is active	*a warning message is displayed that the backup controller is being audited. The audit proceeds as for an active primary controller.*

If mismatches are detected by the audit, the network elements for which there are mismatches are listed. S/DMS Network Manager asks if you wish to use the controller data to update the connection data on the network elements. If you answer yes, the connection data on the affected network elements is overwritten with the controller connection data.

—end—

Procedure 2-17
Performing a manual data synchronization

Use this procedure to synchronize the connection data between the primary and backup controller modules in the current context of the Connection Manager.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	From the Administration menu select the **Transfer data to backup Controller** command. *A request is sent to the controller for which connection data is changed to synchronize its backup controller. The controller returns a message stating whether the data synchronization was successfully initiated at the controller.* *The results of the synchronization can be checked at the controller using the event browsing tools provided by the controller, if applicable.* **—end—**

Procedure 2-18
Closing the Connection Manager

Use this procedure to close a Connection Manager session.

Before starting this procedure, read “Requirements” on page 2-1.

Action

Step	Action
1	Select the **Close** command from the Connection Manager File menu. *If there is unsaved data, the system asks if you wish to continue with the close operation. If you answer yes, the unsaved data is discarded. Otherwise, the close operation is canceled. If connection data was changed during the session, the system asks if you wish to perform a controller data synchronization. If you answer yes, a request is sent to the controller for which connection data was changed to synchronize its backup controller. The Connection Manager window closes and the user returns to the Graphical Network Browser.* **—end—**

List of terms

ABM
Access Bandwidth Manager

ADM
add-drop multiplexer

alarm
a condition, such as a fault, that sends a signal to an indicator

AN
S/DMS AccessNode

ASCII
American Standard Code for Information Interchange

balloon
a balloon-shaped object that appears on a node to indicate alarm counts

BLSR
bidirectional line switched ring

CCITT
Consultative Committee on International Telegraphy and Telephony

CLFI
Common Language Facility Identifier

CMT
character-mode terminal

CNet
control network

CPC
corporate product code

CPG
circuit pack group

CSM
centralized software management

DARPA
Defense Advanced Research Projects Agency

DDS
digital data storage (tape)

DMS
Digital Multiplex System

DMS MAP
Digital Multiplex System Maintenance Access Position

DV45
Digital Video Codec

EDA
external device access

ftp
file transfer protocol

GNB
Graphical Network Browser

GNE
Graphical Network Editor

group
a logical collection of network elements

GUI
Graphical User Interface

highlighting
the graphical application of color to a node to indicate a certain alarm severity

HP
Hewlett-Packard

HP VUE
Hewlett-Packard Visual User Environment

indicator
an audible or visible alert to an alarm or status condition

ISO
International Standards Organization

LAN
local area network

log in
the action of opening a user interface element

log out
the action of closing a user interface element

LTE
line terminating equipment

MAPCI
Maintenance and Administration Position Command Interpreter

menu
a list of action options

menu bar
the portion of the graphical user interface that contains the status indicator, and the window menus

MOA
Managed Object Agent

network element (NE)
a collection of equipment at one location that functions and is administered as a single entity

node
graphic object representing groups or single network elements

NTP
Northern Telecom Publication

NUM
Network Upgrade Manager, an OPC tool

OAM&P
operations, administration, maintenance, and provisioning

OC-3

optical signal carrier level 3 (at 155.520 Mb/s)

OC-12

optical signal carrier level 12 (at 622.080 Mb/s)

OC-48

optical signal carrier 48 (at 2488 Mb/s)

OC-192

optical signal carrier 192 (at 9953.280 Mb/s)

OPC

operations controller

OSI

Open Systems Interconnect

PEC

product engineering code

PM

performance monitoring

SAM

System Administration Manager

S/DMS

Synchronous/Digital Multiplexing System

SOC

span of control

SONET

Synchronous Optical Network is a standard for optical transport that defines optical carrier levels and their electrical equivalent for synchronous transport signals. The SONET standard allows for a multivendor environment, positioning the network to transport new services, synchronous networking, and enhanced operations, administration, maintenance and provisioning (OAM&P).

span

all network elements under the control of a single operations controller (OPC)

STS-1

Synchronous Transport Signal (at 51.84 Mb/s)

subnetwork

a graphical collection of objects organized into groups to represent the network elements monitored by S/DMS Network Manager.

system

network elements associated with the same payload

TA-1230 ring

Bellcore standard for SONET BLSR Equipment Criteria, TA-NWT-001230 (issue 2)

TCP/IP

Transmission Control Protocol/Internet Protocol

UDLC

Universal Digital Loop Carrier

UI

user interface

USM

User Session Manager

VTBM

Virtual Tributary Bandwidth Management

window

a rectangular area of a display screen used to contain a particular application

WAN

wide area network

X.25

CCITT protocol used for wide-area packet switching. OSI Data communication standard

Index

S

T

U

SONET Transmission Products

S/DMS Network Manager

Connection Management

323-4001-057
Rel 6 Standard
November 1996
Printed in Canada

NORTEL
NORTHERN TELECOM