

Vanguard Managed Solutions

Vanguard Applications Ware
Basic Protocols

Async Bypass Mode

Notice

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TCOP/TBOP/Async Bypass Mode

Overview

Introduction

This manual describes TCOP/TBOP/Async Bypass Mode feature for the Vanguard Series of products.

This feature allows you to pass TBOP, TCOP, and Async port traffic directly to an FRI DLCI station without using Annex G and is part of the basic set of protocols found in Vanguard Applications Ware.

Alarms & Reports

For information about TCOP/TBOP/Async Bypass alarms refer to the *Vanguard Applications Ware Alarms and Reports Manual* (Part Number T0005).

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Overview of TCOP/TBOP/Async Bypass Mode

Introduction

This feature allows TBOP, TCOP, and Async PAD access port types to establish permanent virtual connections to FRI Bypass Stations on the same node, and pass data over a Frame Relay network. For node management, the CTP is accessed by another DLCI-Annex G, and SNMP is accessed by either a DLCI-Annex G or another DLCI-Bypass.

Software Features

TCOP/TBOP/Async Bypass Mode provides the following features:

- Up to 128 PVC connections of TBOP, TCOP, or Async PAD ports to FR bypass stations provide direct access to an FR network for a point-to-point configuration.
 - Multiplexing of up to 16 TBOP/TCOP/Async PAD ports in a single data stream saves on number of DLCIs.
 - Ability to access Multicast Services on an FR Network for broadcast applications.
 - Ability to force one-way traffic in either direction.
 - No change in the FRI Bypass Station and Serial Port interfaces.
 - In Sequence data delivery.
 - Data is neither queued nor segmented before forwarding over the FR.
 - Optional Data sequencing for data loss detection and notification to the receiving port.
 - No data loss protection over the FR network.
 - X25 type channel Reset and Interrupts are optionally ported end to end.
 - Improved delay and network traffic.
 - Access to the CTP and SNMP for node management.
 - Configuration, statistics, and management commands under the CTP.
 - Feature benefits applications where end-to-end polling or half duplex protocols are used (reduced delay, easier recovery, [e.g., polls and unidentified responses do not get out of sync]).
-

Feature Applications

Introduction

The feature is provided to specifically accommodate the following applications:

Broadcast

In financial applications broadcast generators with BOP type traffic get access to Multicast servers on Frame Relay networks which replicate and distribute financial broadcast messages to end users with access to FR network access ports. Vanguard products provide connectivity between the broadcast originator and a multicast server on an FR network, as well as between the end user and the FR network. Strategic selection of the Multicast servers' location and configuration results in reduced traffic and more efficient network utilization. Synchronous COP and ASYNC type broadcast traffic is also supported provided its characteristics are compatible and accommodated by the existing Vanguard serial port's TCOP or ASYNC.

Point-to-Point Connections over FR

This is suitable for non-spoofed protocols. Data loss protection is traded for improved delay and network traffic. Applications using end-to-end polling or half-duplex protocols will benefit from this feature. The feature connects applications to high-speed backbone FR networks to take advantage of its speed and the reduced transmission delays so that it can perform end-to-end polling. The feature bypasses the Annex G interface to FR for greater efficiency and less overhead and does not use a data protection and retransmission scheme to recover data lost over the FR network. Applications where poll responses do not identify their source will recover easier when poll responses are dropped and not retransmitted by the network.

Simple Multiplexing over an FRI DLCI Bypass Station

The new facility also allows up to 16 of the later port types to be multiplexed over a single FRI DLCI Bypass Station. Cost savings can be realized by reducing the number of DLCIs required.

Example Applications

Introduction

The following sections outline some example applications that use this feature.

Phase 1: Broadcast This application is for SDLC broadcast over a Frame Relay network using Two-Way Multicast Service (see Figure 1). Traffic flows strictly one way from the broadcast originator SDLC port to each recipient SDLC port. No data from the recipient SDLC ports is permitted into the FR network. No data from the FR Network can be sent to the broadcast originator. The software can support either the TCOP or ASYNC type of financial message broadcasting.

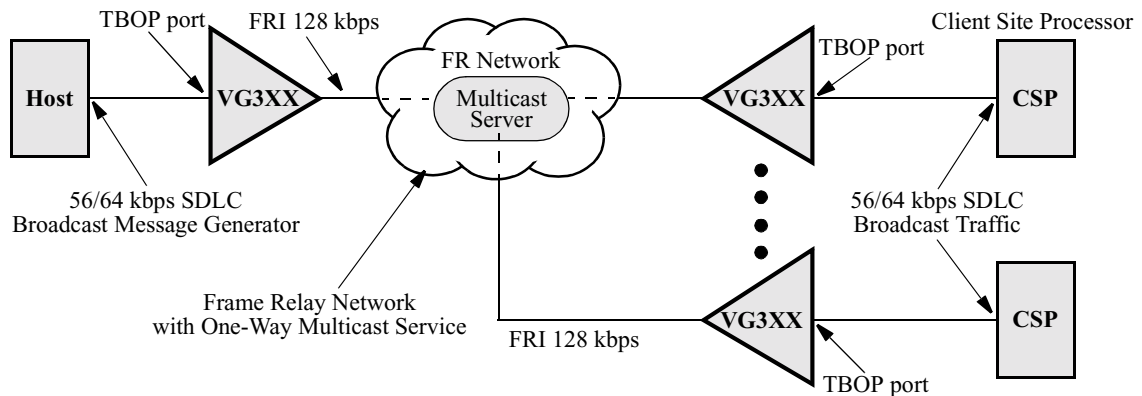


Figure 1. Broadcast Application with Two-Way Multicast Service

In this example, the Vanguard 3XX is providing Host to Client Site Processor (CSP) connectivity. On the Host side, the Vanguard 300 captures the bare host SDLC broadcast traffic received by a TBOP port type, encapsulates it in FR format, and forwards it over a configured multicast DLCI to a Multicast server of the FR network. The Multicast server on the FR network duplicates and forwards the SDLC broadcast traffic over established DLCIs between the FR Multicast server and each remote Vanguard 3XX.

Each remote Vanguard 3XX passes the DLCI traffic to a local TBOP port connected to a dedicated SDLC broadcast receive port on the CSP. No traffic flows in the CSP to Host direction on the broadcast channel.

This application generates only SDLC broadcast traffic. The host transmits broadcast frames up to 56/64 kbps, in SDLC/HDLC frame formats and in a simplex fashion. Host frames are of fixed sizes and up to 128 octets in length. The host does not require frame acknowledgments.

Other applications generate Synchronous Character Oriented protocol formats or Asynchronous formats of broadcast messages. The Vanguard 3XX must be capable of handling broadcast traffic received by either a TCOP port or an Async or Async/Polled PAD.

Phase 2: Point-to-Point and Simple DLCI Multiplexing

In this application, TBOP, TCOP, or Async PAD Ports are connected over an FR bypass station in a full duplex point-to-point configuration (see Figure 2). Connections are of the PVC type and are configurable via a 128-entry table. There is no change in the FRI Bypass Station interface, and no change in the Serial Ports to X.25 interface. Overhead of X.25 (Annex G) ARQ over the FR is eliminated.

Packets forwarded by serial port are not split before forwarding over FR. No new data queues are introduced between the serial port and the FR port. No data loss protection occurs over the FR network.

Optional data sequencing is available for data loss detection. X25 type channel Reset and Interrupts are optionally ported end to end. There is improved delay and network traffic; up to 16 TBOP, TCOP, or Async PAD Ports are multiplexed over a single FRI DLCI Bypass Station. Configuration, statistics, and management commands are under the CTP.

This feature benefits applications where end-to-end polling or half duplex protocols are used (reduced delay, easier recovery because polls and unnumbered acknowledgments do not get out of sync).

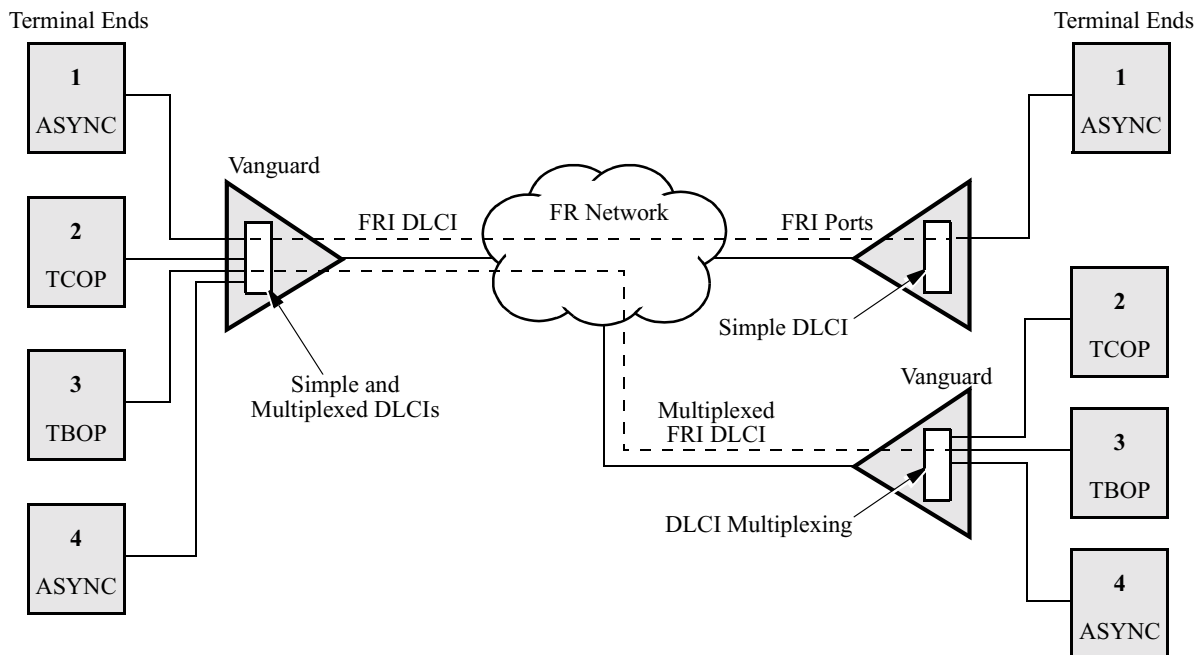


Figure 2. Point-to-Point and Multiplexing of Serial Ports

This example depicts typical serial port interconnections over an FR network. The Vanguard 3XX provides connectivity between two terminal ends in a point-to-point configuration over the FR network using a single FRI DLCI Bypass Station. It also connects a number of paired terminal ends in a point-to-point configuration over the FR network using a single multiplexed FRI Bypass Station.

Example Applications

The Vanguard 3XX is required to capture bare TBOP/TCOP/Async PAD traffic received by the serial port, encapsulate it in FR format, and forward it to a configured FRI Bypass station of the FR network. The FR network carries the TBOP/TCOP/Async PAD traffic over an established DLCI to the remote Vanguard 300. The remote Vanguard then receives the DLCI traffic and forwards it to the local TBOP/TCOP/Async PAD port. Traffic is full duplex. A serial port of a different traffic type is multiplexed over a single DLCI bypass station.

Software Configuration

Introduction

To accommodate this new feature, a new configuration item has been added to the CTP. This is the Serial Ports Forwarder Multiplexer (SPFM). The following sections describe how to configure the SPFM for TCOP/TBOP/Async Bypass Mode.

SPFM Connection Table Configuration

The CTP Configure Menu reflects the Configure SPFM Connection Table option as shown in Figure 3. When you select this option, the screen in Figure 4 appears.

```

Node:                Address:                Date:                Time:
Menu: Configure
Node                Configure Router
Port                Configure SPFM Connection Table
Configure Network Services (reserved)
Inbound Call Translation Table (reserved)
Outbound Call Translation Table (reserved)
PAD Prompt Table (reserved)
Calling Addr Translation Table (reserved)
NCRBSC Controller Table (reserved)
NUI/Password Table (reserved)
PAD Profile Table (reserved)
Remote PAD Parameter Table (reserved)
FRI Stations        Configure SNMP
Node to node download
BSTD Station Table
IBM2260 Station Table
Configure Bridge
Configure LAN Connections
Software Key Table

#Enter Selection:

```

Figure 3. Configure Menu

```

SPFM Connection Table Entry Configuration

Entry Number: 1/
[1] *Serial Source Description: P2/
[1] *FRI Port Number: 3/
[1] *FRI Station Number: 1/
[1] DLCI Slot Number: 1/
[1] Transmission Mode: NORMAL/
[1] Connection Options: MBIT+RESET+SEQ/

```

Figure 4. Example SPFM Connection Table Entry Configuration Screen

SPFM Connection Table Entry Parameters

These tables identify the parameters that make up the SPFM Connection Table Entry.

■ Note

Unless otherwise indicated, you must perform a Node boot for changes to these parameters to take affect.

Table Entry Number:

Range:	1-128
Default:	
Description:	Entry number used to reference this table record.

Serial Source Description:

Range:	0 to 15 characters
Default:	(blank)
Description:	This is the identifier of the source Serial Port which is to be connected to a selected FRI Bypass Station via a permanent virtual connection. Entries are not case sensitive. For example: <ul style="list-style-type: none"> • P3 Select port 3 as the serial source. • TBOP-8 Select TBOP port 8 as the serial source. • TCOP-9 Select TCOP port 9 as the serial source. • PAD-5 Select PAD port 5 as the serial source.

FRI Port Number:

Range:	0 to 54
Default:	0
Description:	This parameter specifies the FRI port number of the node to which the selected Serial Port of the node will be connected via a permanent virtual connection.

FRI Station Number:

Range:	1 to 254
Default:	1
Description:	This parameter specifies the Bypass station number of the FRI port to be assigned to the selected Serial Port number.

DLCI Slot Number:

Range:	1 to 16
Default:	1
Description:	<p>This parameter specifies a Slot number that will be used to multiplex Serial Port data within the assigned DLCI bypass station of the selected FRI port. A Slot number is associated with the same slot number on the remote FRI Bypass Station DLCI, and it constitutes a point-to-point permanent virtual connection.</p> <p>■ Note You must perform a SPFM Connection Table boot for changes to this parameter to take affect.</p>

Transmission Mode:

Range:	NORMAL, HD_FRN, HD_PORT
Default:	NORMAL
Description:	<p>This parameter selects the transmission mode of the Serial port to FRI Bypass Station PVC connection.</p> <ul style="list-style-type: none"> • NORMAL: Allows Full Duplex data transmission. • HD_FRN: Allows only data transmission in the Serial port to FR Network direction for broadcast applications. • HD_PORT: Allows only data transmission in the FR Network to Serial port direction for broadcast applications. <p>■ Note You must perform a SPFM Connection Table boot for changes to this parameter to take affect.</p>

Connection Options:

Range:	NONE, MBIT, QBIT, RESET, SEQ, TRANS
Default:	MBIT + RESET + SEQ
Description:	<p>These options control the Vanguard SPFM mode of operation when bypassing a port to an FRI bypass station. These options must be set identically on both ends of the connection.</p> <ul style="list-style-type: none"> • NONE: This is the default mode of operation. No options are selected. • MBIT: Enables transparency of the more bit for frame delineation. Normally used in async traffic. • QBIT: Enables data segments arriving from the serial port or channel with the Q bit set (as per X.25) to be transmitted to the remote end. Otherwise qualified data segments are discarded. • RESET: Enables channel resets and interrupts to be transmitted to the remote end. • SEQ: Enables the use of sequence numbers in the data segments for data loss detection. • TRANS: Transparent mode of operation. The Vanguard SPFM does not prefix the data segments with a control header. Cannot be combined with other options. <p>■ Note You must perform a SPFM Connection Table boot for changes to this parameter to take affect.</p>

SPFM Connection Table Entry Boot

An SPFM connection can be individually booted from the Boot Menu as shown in Figure 5.

```

Node: Nodename      Address: 100      Date: 14-JUNE-1995  Time: 15:34:35
Menu: Boot          Path: (Main.7)

  1. Port                      19. (reserved)
  2. FRI Station                20. (reserved)
  3. Table and Node Record      21. (reserved)
  4. Node (warm)                22. (reserved)
  5. Node (cold)                23. (reserved)
  6. Node (cold from alternate bank) 24. (reserved)
  7. Bridge                     25. (reserved)
  8. Bridge Link                26. (reserved)
  9. LAN Connection            27. (reserved)
 10. Update Software.          28. (reserved)
 11. Router Events             29. (reserved)
 12. Protocol Priority          30. SNMP Agent boot
 13. SPFM Connection Table Entry
 14. (reserved)
 15. (reserved)
 16. (reserved)
 17. (reserved)
 18. (reserved)

#Enter Selection:13

SPFM Connection Number: 1/

WARNING: Booting the SPFM Connection may result in data loss on the circuit.

Proceed (y/n): y
(1) Nodename 14-JUNE-1995 15:34 SPFM Connection #1. Boot operation is
complete.
    
```

Figure 5. Boot Menu

Configure SPFM Connection

Follow these steps to perform an SPFM Connection Table Entry boot:

Step	Action	Result
1	From the CTP Main menu, select Boot .	The Boot menu appears.
2	Select SPFM Connection Table Entry from the Boot menu.	The following warning is displayed: <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note Booting the SPFM Connection may result in data loss on the circuit.</p> </div>
3	Type: y	The SPFM Connection Table Entry is rebooted.

Statistics

Introduction

The following statistics related to SPFM are kept for each connection:

- SPFM Entry number
- SPFM Connection:
 - Serial port address
 - Destination FRI Bypass Station
 - DLCI Slot number assigned
- Connection state
- Data Loss detections
- Frame counts

The Status/Statistics menu is shown in Figure 6.

```

Node:                Address:                Date:                Time:
Menu: Status/statistics                Path: (Main.5)

 1. Node Stat                19. (reserved)
 2. Detailed Port Stat      20. (reserved)
 3. Flash to Flash Transfer Stat 21. (reserved)
 4. Detailed Link Stat      22. (reserved)
 5. FRI Station Statistics   23. (reserved)
 6. Detailed Pad Stat        24. (reserved)
 7. Network Services Stats   25. (reserved)
 8. Hardware Stats           26. (reserved)
 9. DCP Statistics           27. (reserved)
10. Reset Port Stats         28. (reserved)
11. Reset All Stats          29. (reserved)
12. Software Option Statistics 30. SNMP Statistics
13. Bridge Statistics
14. Lan Connection Statistics
15. TFTP Stats
16. Router Stats
17. SPFM Connection Statistics
18. (reserved)

#Enter Selection:
    
```

Figure 6. Status/Statistics Menu

Access SPFM Connection Statistics

Follow these steps to view SPFM Connection statistics:

Step	Action	Result
1	From the CTP Main menu, select Status/Statistics .	The Status/Statistics menu appears.
2	Select SPFM Connection Statistics from the Status/Statistics menu.	The SPFM Connection Statistics menu appears.

The SPFM Connection Statistics menu appears in Figure 7.

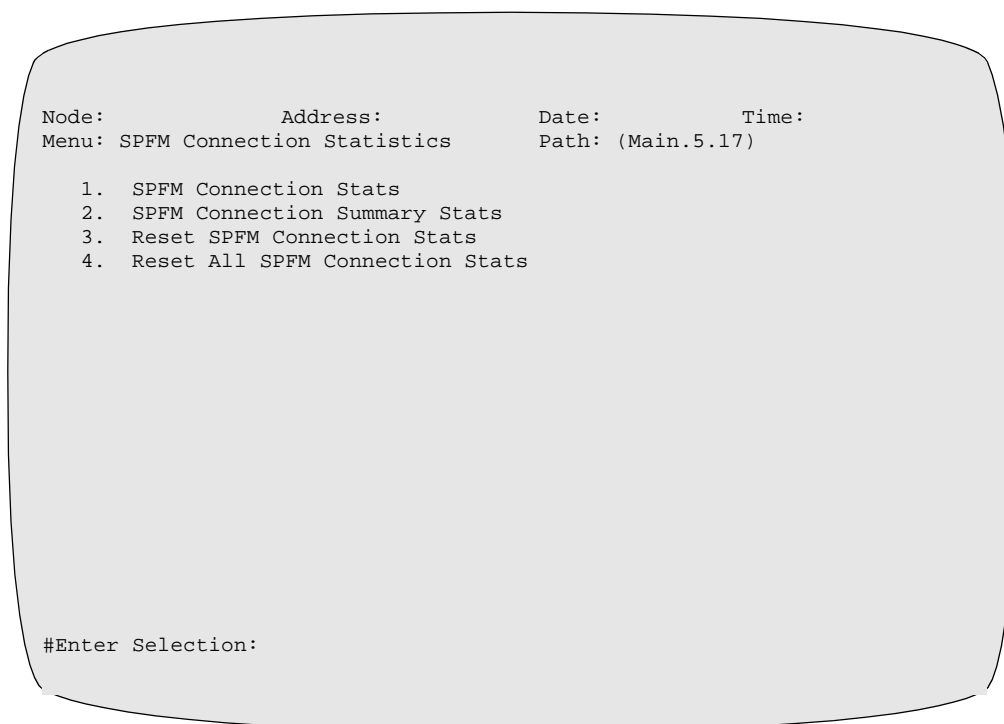


Figure 7. SPFM Connection Statistics Menu

Four statistics activities can be performed from this menu:

- View SPFM Connection Stats
- View SPFM Connection Summary Stats
- Reset SPFM Connection Stats
- Reset All SPFM Connection Stats

**Access SPFM
Detailed
Connection
Statistics**

Follow these steps to view SPFM Connection statistics:

Step	Action	Result
1	From the CTP Main menu, select Status/Statistics .	The Status/Statistics menu appears.
2	Select SPFM Connection Statistics from the Status/Statistics menu.	The SPFM Connection Statistics menu appears.
3	Select SPFM Connection Stats from the SPFM Connection Statistics menu.	You are prompted to select the SPFM table entry you wish to view.
4	Select the SPFM Table Entry you wish to view.	The statistics screen for that table entry is displayed.

Pages 1 and 2 of the SPFM Connection Statistics screens appear in Figures 8 and 9.

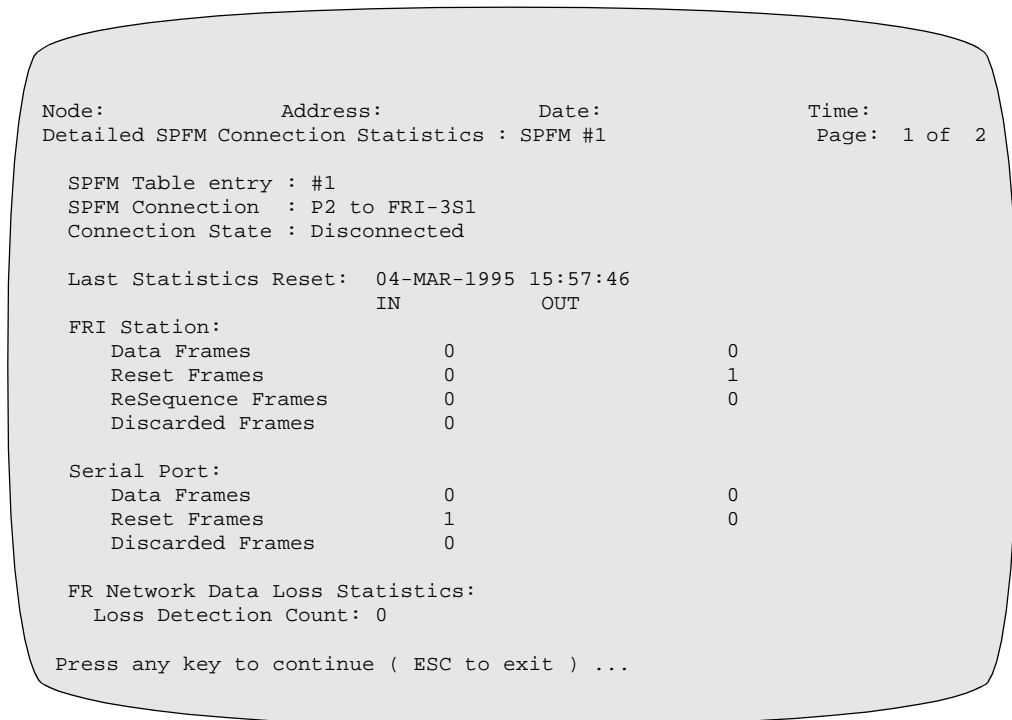


Figure 8. Detailed Port Statistics - Page 1

```

Node:                Address:                Date:                Time:
Detailed SPFM Connection Statistics : SPFM #1                Page: 2 of 2

SPFM Main Channel   : FRI-3S1
Channel mode : Multiplexed      Total slots : 2      Active slots : 0
SPFM Serial Ports  :
Serial Port:      DLCI Slot: Connection Status:      V(S):      V(R):
P3                5          Disconnected          1           1
P2                1          Disconnected          1           1
    
```

Figure 9. Detailed Port Statistics - Page 2

Access SPFM Connection Summary Statistics

Follow these steps to view SPFM Connection Summary statistics:

Step	Action	Result
1	From the CTP Main menu, select Status/Statistics .	The Status/Statistics menu appears.
2	Select SPFM Connection Statistics from the Status/Statistics menu.	The SPFM Connection Statistics menu appears.
3	Select SPFM Connection Summary Stats from the SPFM Connection Statistics menu.	The statistics are displayed for all SPFM Table Entries.

The SPFM Connection Summary screen appears in Figure 10.

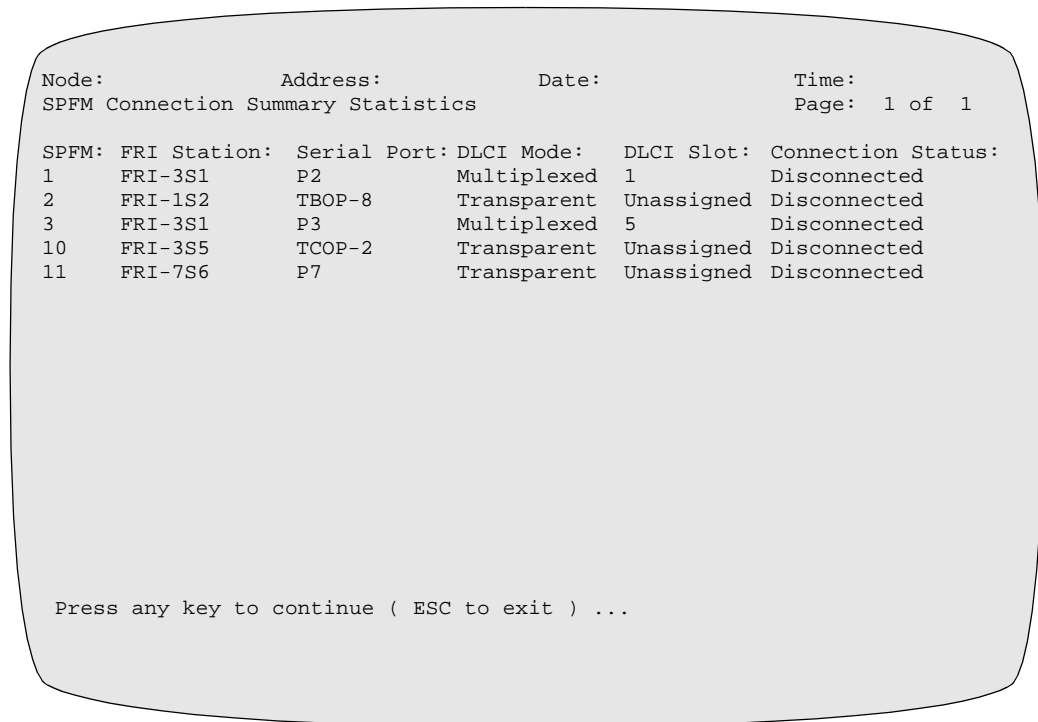


Figure 10. SPFM Connection Summary Statistics

Connection Status The following types of Connection Status may be displayed:

- “Connected”: Data Link is up.
- “Disconnected”: Data Link is down.
- “Disabled (Serial Port)”: Data Link to the serial port is disabled.
- “Disabled (FRI Station)”: Data Link to the FRI station is disabled.

DLCI Modes The following DLCI Modes can be displayed:

- “Multiplexed” Two or more ports or channels are connected to the same DLCI.
- “Transparent” The DLCI is configured for transparent mode of operation.

Reset SPFM Statistics

Follow these steps to reset SPFM Connection statistics for a specific table entry:

Step	Action	Result
1	From the CTP Main menu, select Status/Statistics .	The Status/Statistics menu appears.
2	Select SPFM Connection Statistics from the Status/Statistics menu.	The SPFM Connection Statistics menu appears.
3	Select Reset SPFM Connection Stats from the SPFM Connection Statistics menu.	You are prompted to select the SPFM table entry you wish to view.
4	Select the SPFM Table Entry you wish to reset.	The statistics screen for that table entry are reset.

Reset All SPFM Connection Statistics

Follow these steps to Reset All SPFM Connection statistics:

Step	Action	Result
1	From the CTP Main menu, select Status/Statistics .	The Status/Statistics menu appears.
2	Select SPFM Connection Statistics from the Status/Statistics menu.	The SPFM Connection Statistics menu appears.
3	Select Reset all SPFM Connection Summary Stats from the SPFM Connection Statistics menu.	The statistics are reset for all SPFM Table Entries.

Other Menus Supporting SPFM Connection Tables

Introduction

The following menus also generate information regarding the SPFM Connection Table.

Examine Menu

Figure 11 shows an example of the first level of the Examine menu. Figure 12 shows the resulting information from the examination of the SPFM Connection Table.

```
Node:                Address:                Date:                Time:
Menu: Examine        Path: (Main.2)

 1. Node                19. Examine Router
 2. Port                20. Examine SPFM Connection Table
 3. Examine Network Services  21. (reserved)
 4. Inbound Call Translation Table  22. (reserved)
 5. Outbound Call Translation Table  23. (reserved)
 6. PAD Prompt Table      24. (reserved)
 7. Calling Addr Translation Table  25. (reserved)
 8. NCRBSC Controller Table  26. (reserved)
 9. NUI/Password Table    27. (reserved)
10. PAD Profile Table     28. (reserved)
11. Remote PAD Parameter Table  29. (reserved)
12. FRI Stations         30. Examine SNMP
13. Node to node download
14. BSTD Station Table
15. IBM2260 Station Table
16. Examine Bridge
17. Examine LAN Connections
18. Software Key Table

#Enter Selection:
```

Figure 11. Example Examine Menu

```
SPFM Connection Table Entry Examination

Entry Number: 1/

Node:                Address:                Date:                Time:
Table Entry Examination: Entry 1                Page: 1 of 1

[1] *Serial Source Description: P2
[1] *FRI Port Number: 3
[1] *FRI Station Number: 1
[1] DLCI Slot Number: 1
[1] Transmission Mode: NORMAL
[1] Connection Options: MBIT+RESET+SEQ
```

Figure 12. Example Table Entry Examination Screen

List Menu

Figure 13 is an example of the first level of the List menu. Figure 14 shows the resulting information from an SPFM Connection Table List request.

```

Node:                Address:                Date:                Time:
Menu: List                               Path: (Main.3)

  1. Node
  2. Port
  3. List Network Services
  4. Inbound Call Translation Table
  5. Outbound Call Translation Table
  6. PAD Prompt Table
  7. Calling Addr Translation Table
  8. NCRBSC Controller Table
  9. NUI/Password Table
 10. PAD Profile Table
 11. Remote PAD Parameter Table
 12. FRI Stations
 13. Node to node download
 14. BSTD Station Table
 15. IBM2260 Station Table
 16. List Bridge
 17. List LAN Connections
 18. Software Key Table

19. List Router
20. List SPFM Connection Table
21. (reserved)
22. (reserved)
23. (reserved)
24. (reserved)
25. (reserved)
26. (reserved)
27. (reserved)
28. (reserved)
29. (reserved)
30. List SNMP

#Enter Selection:
    
```

Figure 13. Example List Menu

```

SPFM Connection Table Entry List
[1], P2, 3, 1, 1, NORMAL, MBIT+RESET+SEQ
[2], TBOP-8, 1, 2, 5, NORMAL, MBIT+RESET+SEQ
[3], P3, 3, 1, 5, NORMAL, MBIT+RESET+SEQ
[10], TCOP-2, 3, 5, 1, NORMAL, TRANS
[11], P7, 7, 6, 1, NORMAL, TRANS

Press any key to continue (ESC to exit)...
    
```

Figure 14. SPFM Connection Table Entry List Screen

Print Selection Menu

The Print Selection menu (Figure 15) includes the print SPFM Connection Table function.

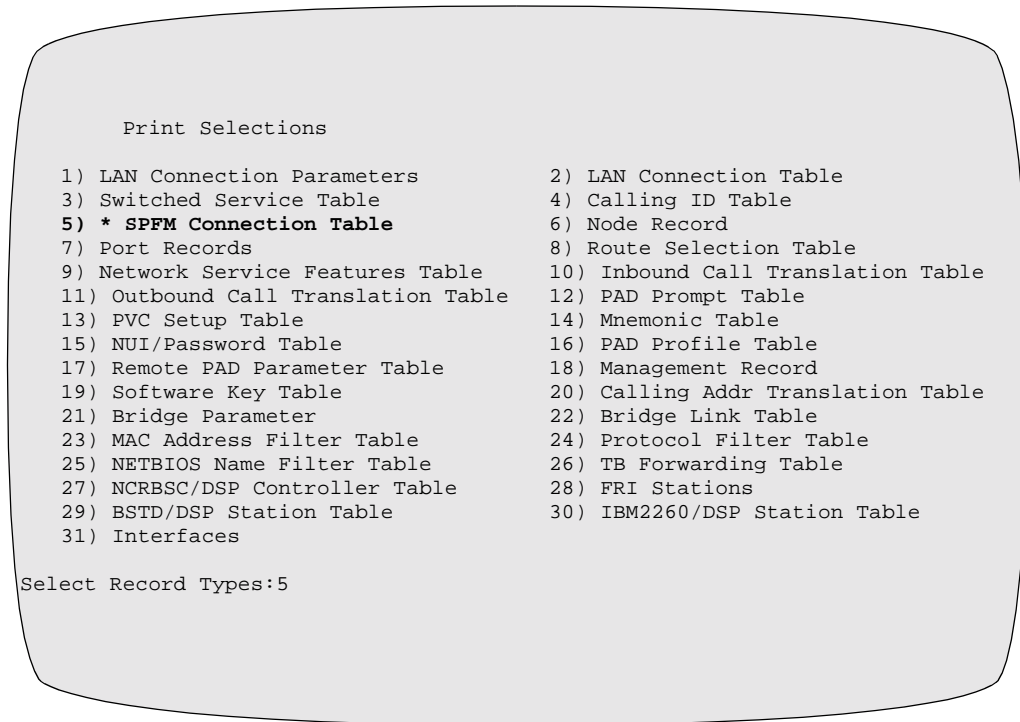


Figure 15. Example Print Selection Menu

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