Vanguard Managed Solutions

Vanguard Applications Ware
SNA Feature Protocols

BSC 2780/3780

Notice

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To comment on this manual, please send e-mail to LGEN031@vanguardms.com

Overview

Introduction

This manual describes the IBM BSC 2780/3780 option for the Vanguard products and is part of the SNA Feature Protocols Manual.

The IBM BSC 2780/3780 option lets BSC 2780/3780 devices use Vanguard nodes to communicate with other 2780/3780 devices over X.25 or Frame Relay networks.

Before You Use This Manual

Some knowledge of the IBM 2780/3780 BSC protocol is required to implement the BSC 2780/3780 option on your node.

Related Documentation

- *Vanguard Configuration Basics Manual* (Part Number T0113)
- *Vanguard Basic Protocols Manual* (Part Number T0106)
- *General Information - Binary Synchronous Communications* from the IBM Systems Reference Library (IBM number TP-09, Order No.-GA27-3004-2)

Alarms & Reports

Refer to the *Vanguard Applications Ware Alarms and Reports Manual* (Part Number T0005) for details on alarms and reports generated by the BSC 2780/3780 option.

In This Manual

About the BSC 2780/3780

Introduction

This section describes the characteristics of the IBM BSC 2780/3780 protocol option for Vanguard Products.

The BSC 2780/3780 feature provides the capability to transfer data between two devices via an X.25 or Frame Relay network. It is a peer-to-peer protocol. Vanguard products use a full-duplex, point-to-point circuit, as the physical transmission path.

Features

The BSC 2780/3780 option supports:

- Access for IBM Binary Synchronous Communication (BSC) 2780/3780 devices to a BSC host or other BSC 2780/3780 devices and emulators
- Local BSC acknowledgment to reduce network delay
- 801 Autodialer Emulation to eliminate the need for an external 801 Autodialer which reduces line costs and long-distance charges
- V.25 bis Emulation to allow a BSC 2780 port to originate calls using the Packet Switched Network address of the destination BSC 2780 port
- Data integrity provided by a proprietary transport layer protocol
- Low network delay of messages
- Session integrity provided by a proprietary session layer protocol
- Support for the full and half duplex modem emulation (EMRI)
- Handling of the RI EIA signal to wake up the scanner (EMRI)
- Idle Disconnect Timer starts when the PAD receives an EOT from the device (Idle Disconnect Timer)
- Non-spoofing mode (ACK)
- PAD not sending a TTD control character (NOTTD)
- Passing of the initial line bid/response with the host/terminal ID to the remote device (TID)
- Connection to full and half duplex modem (DIMO)

BSC 2780/3780 Connectivity

BSC 2780/3780 is typically used to connect BSC 2780/3780 devices while using a proprietary Session/Transport mechanism over a network.

The BSC 2780 feature also allows for connection to a ZENGIN or JCA terminal, and NCR or ICL scanner, through a BSC 2780 device.

The ZENGIN and JCA protocols are the control character level subset of IBM 2780. The ZENGIN protocol does not have the TTD and RVI control characters, and the JCA protocol does not have an ETB control character. Also, the half- or full-duplex modem is used in the network configuration to connect to the PSTN (Public Switched Telephone Network).

The NCR and ICL scanners have a unique line bid and response sequence. This consists of ENQ with the host name, and ACK with the store number. Also, the RI (ring indicator) EIA signal is used to wake up the NCR scanner.

Interface Line Characteristics

The BSC 2780/3780 interface line support includes:

- Compatibility with IBM BSC 2780/3780 protocol
- Peer-to-peer communication
- Full-duplex support (EIA control only – data transfer is always half-duplex)
- Half-duplex support for EIA control of half-duplex modems
- X.25/Frame Relay compatibility with all Vanguard Products and other X.25/ Frame Relay products
- Use of ASCII and EBCDIC code sets
- Internal/External clocking
- 1200 to 80 Kbps, including 64 Kbps rate
- Low network delay
- Transparent text support

Platform Support

The BSC 2780/3780 option is supported on all Vanguard platforms.

Synchronous Device Support

The BSC 2780/3780 option supports these IBM Front End Processors (FEPs) controlling IBM 2780/3780 devices:

- 3705
- 3720
- 3725
- 3745

These terminal devices are also supported:

- Any IBM 2780/3780 device
- AST 3780, AST Research, Inc., Irvine, California, 92714–4992
- ZENGIN or JCA terminal, and NCR or ICL scanners

Mainframe Sites Supporting Remote Devices

Mainframe sites that support the BSC 2780/3780 protocol for remote devices may have different configurations of hardware and applications software; yet the BSC 2780/3780 support requirements remain constant, with only minor exceptions.

BSC 2780/3780 Operation

What Is It?

The BSC 2780/3780 option is a software feature that gives Vanguard products the capability of passing data traffic between two BSC 2780/3780 devices. Because of its point-to-point nature, the BSC 2780/3780 option can only support one device on each line. Figure 1 shows a typical 2780/3780 application.

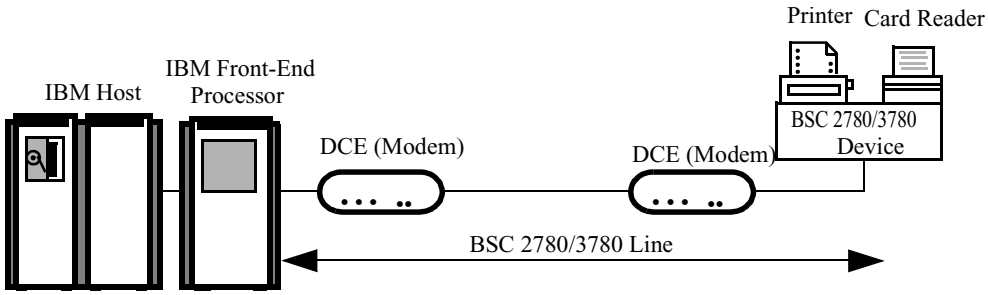

Figure 1. Typical IBM BSC 2780/3780 Environment

How BSC 2780/3780 Passes Data Traffic

BSC 2780/3780 is called a peer-to-peer protocol because either side may initiate data transfer by bidding for the line. Line bidding is performed by issuing an Enquiry (ENQ) character. All transmissions are preceded by a pair of Synchronization (SYN) characters. If the receiver is ready, it responds with the first Acknowledgment (ACK 0).

Once the receiver confirms that communications may begin, the sender transmits data, beginning with a Start of Text (STX) character, in the following format:

STX Text ETB CRC1 CRC2

The last block of text in a transmission cycle uses an End-of-Text (ETX) character in place of the End-of-Text-Block (ETB) character along with the Cyclical Redundancy Check (CRC) 1 and 2.

How ACKs Work

If the data is properly received, the receiver responds with alternating ACK 1 and ACK 0 sequences. The first text message receives ACK 1. If an error is detected (invalid CRC characters), the receiver responds with Negative Acknowledgment (NAK). The sender should then retransmit the original data block which had the error. ACK 0 and ACK 1 transmission carries forward from the point at which it had left off. If too many transmission errors occur, the sender or the receiver may abort the sequence by sending End of Transmission (EOT) instead of text retransmission or NAK.

If the receiver has text to send to the transmitter, it may replace an ACK 0 or ACK 1 with a Reverse Interrupt (RVI). The sender may either terminate its transmission, or continue sending its text.

Enquiry

If the transmitter receives no response to its text after a configurable timeout period (three seconds on standard IBM equipment), it issues an ENQ response. Upon receipt of the ENQ, the receiver repeats its last protocol sequence (either ACK 1 or ACK 0). Based on which sequence it receives, the transmitter can determine whether the timeout was due to the receiver not recognizing the last data block, or the transmitter not recognizing the last protocol sequence. The transmitter may then either retransmit the last block, or continue with the next one accordingly.

Wait for Acknowledgment

The receiver may flow control the transmitter by issuing a Wait for Acknowledgment (WACK) sequence in response to text. For maximum efficiency, the receiver should postpone this transmission for a time period just shorter than the ENQ timer mentioned earlier. After this timeout, the transmitter sends another ENQ in order to contend for the channel a second time. The receiver may then either keep waiting and sending a WACK, or resume data flow by sending the proper acknowledgment sequence.

Temporary Text Delays

If the transmitter does not have the next data to be sent immediately available, it may stall the line by sending periodic Temporary Text Delay (TTD) sequences. The receiver responds with NAK to these sequences, but does not count them as line errors. As with the WACK sequence in the previous paragraph, there should be a short delay between each TTD sequence.

End of Text

When all data has been transmitted, the transmitter closes the transmission cycle by issuing EOT. Either side may then take control of the line by bidding with ENQ as described above.

Example of Passing Data Traffic

The IBM FEP or the 2780/3780 device must bid for the line to be able to transfer data.

For example, if you put a stack of cards in a card reader, the device sends ENQ to prepare the host to receive data. Figure 2 shows how data traffic passes between two BSC 2780/3780 devices.

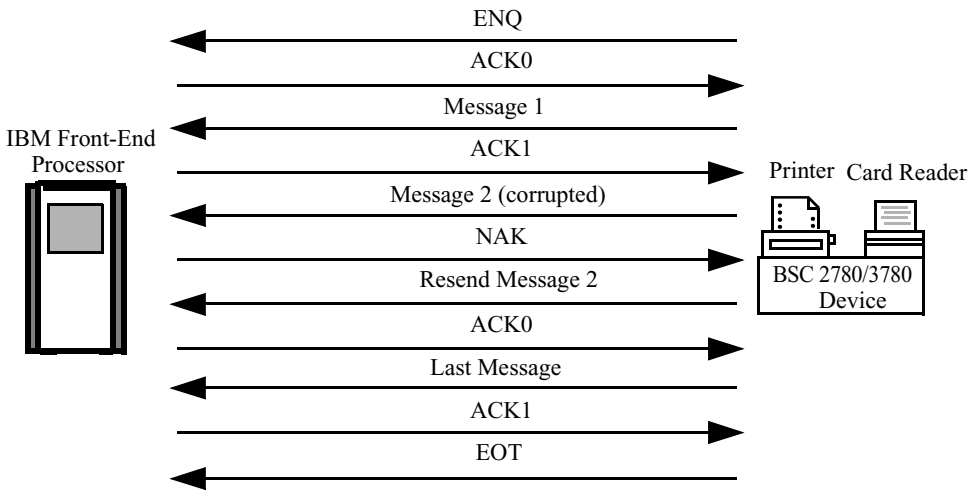

Figure 2. Typical IBM BSC 2780/3780 Line Operation

Example of a Busy Network

If the host is not ready when the ENQ is received, it can respond with WACK. A NAK can be sent by the host to discontinue the request.

Figure 3 shows a typical busy network. A terminal or host may also be busy for an indefinite period of time.

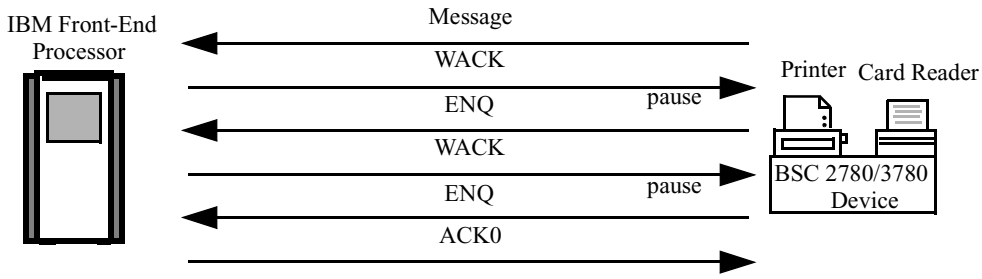

Figure 3. IBM BSC 2780/3780 Communication With Occupied Host

V.25 bis

V.25 bis lets a BSC 2780 port originate calls using the Packet Switched Network address of the destination BSC 2780 port. This lets a BSC 2780 port access all other BSC 2780 ports on the PSN without reconfiguring the port. The V.25 bis implementation is a subset of the CCITT 1988 recommendation for V.25 bis for mode 108/2.

Zengin or JCA Terminal Application

A typical application that uses the BSC 2780 protocol could include a ZENGIN or JCA terminal connected to a Vanguard unit BSC 2780 TPAD port either directly or via modem. This Vanguard port, in turn, is connected through switched virtual circuits over an X.25 network to another Vanguard unit with a BSC 2780 HPAD port, and then connected to another ZENGIN or JCA terminal either directly or via a modem, as shown in Figure 4. You could also have a similar application using a Frame Relay network in place of the X.25 network.

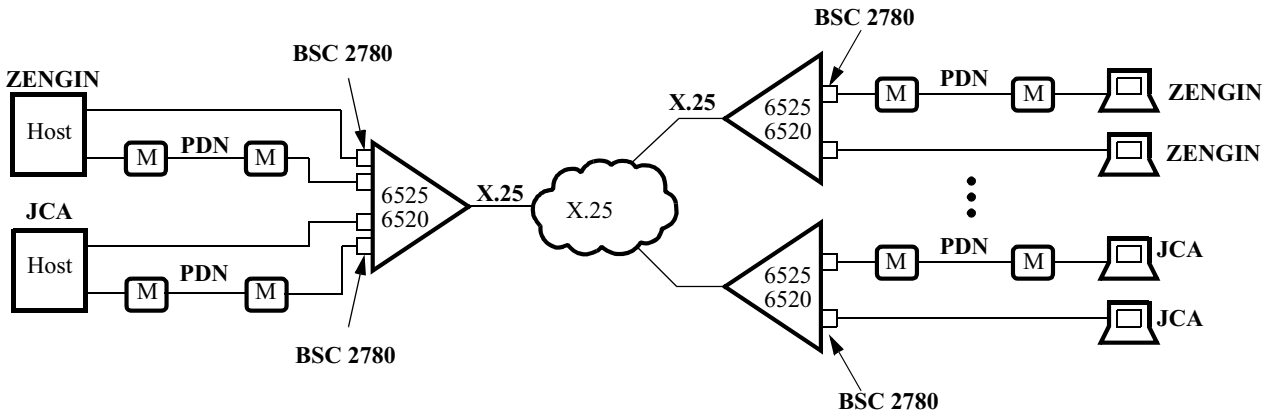

Figure 4. BSC 2780 Application Environment (ZENGIN or JCA)

NCR or ICL Scanner Application

Another typical application using BSC 2780 includes an NCR or ICL scanner connected to a Vanguard device BSC 2780 TPAD port. This, in turn, is connected through switched virtual circuits over an X.25 network to another Vanguard device with a BSC 2780 HPAD port, and then connected to the IBM host. This configuration is shown in Figure 5. You could also have a similar application using a Frame Relay network in place of the X.25 network.

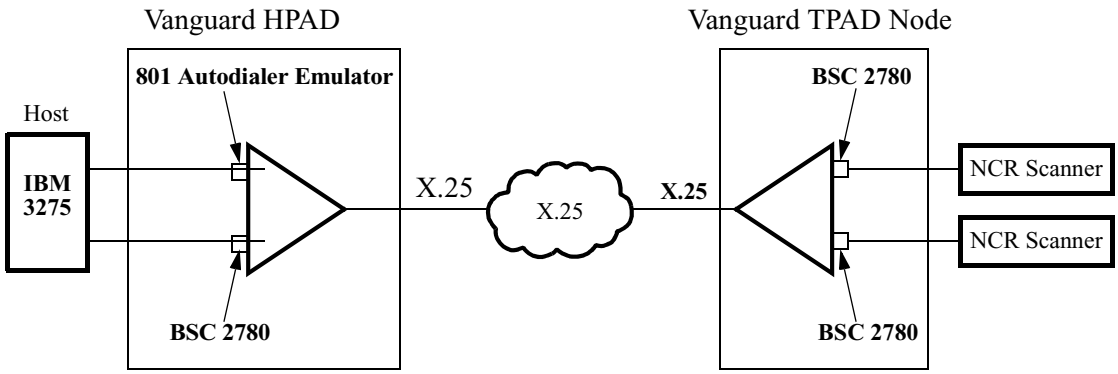

Figure 5. BSC 2780 Application Environment (NCR or ICL)

BSC 2780/3780 PAD Port

Description

The IBM BSC 2780/3780 interface ports enable two 2780/3780 devices to communicate with each other over an X.25/Frame Relay network.

When one device bids for the line, Vanguard establishes a call using a preconfigured mnemonic. Once the call is in place, data transfer begins. Once data transmission is complete, the call is disconnected when the calling BSC PAD port receives a DLE EOT. If the call is not accepted on the first attempt, the calling IBM BSC 2780/3780 PAD port will retry after another ENQ is received.

Network delay is reduced by transmitting parts of a message over the link prior to the block checksum character being received by the BSC PAD port.

The called 2780/3780 port starts to transmit the message upon receipt. If the subsequent part of the message is not yet received, the called BSC 2780/3780 PAD port holds the BSC line by sending sync characters. This process of sending sync characters is known as *sync fill*. Sync fill continues until the subsequent part of a message is received or the configured inter-buffer timeout occurs.

Error Threshold

The number of errors tolerated by the BSC 2780/3780 PAD port is configurable. When this value is exceeded, the device is assigned a DOWN status. Additionally, the X.21 call to the device can be disconnected.

Full-Duplex and Half-Duplex Modem Operation

BSC 2780/3780 PAD ports support both full-duplex and half-duplex modems. Use full-duplex wherever possible to obtain greater throughput. Both ends of a BSC 2780/3780 connection do not have be identical. You can configure one end as full-duplex while the other end is configured as half-duplex.

Figure 6 shows the sequence of communication exchanges in the BSC 2780/3780 PAD during a call setup, data transfer, and call disconnect operation.

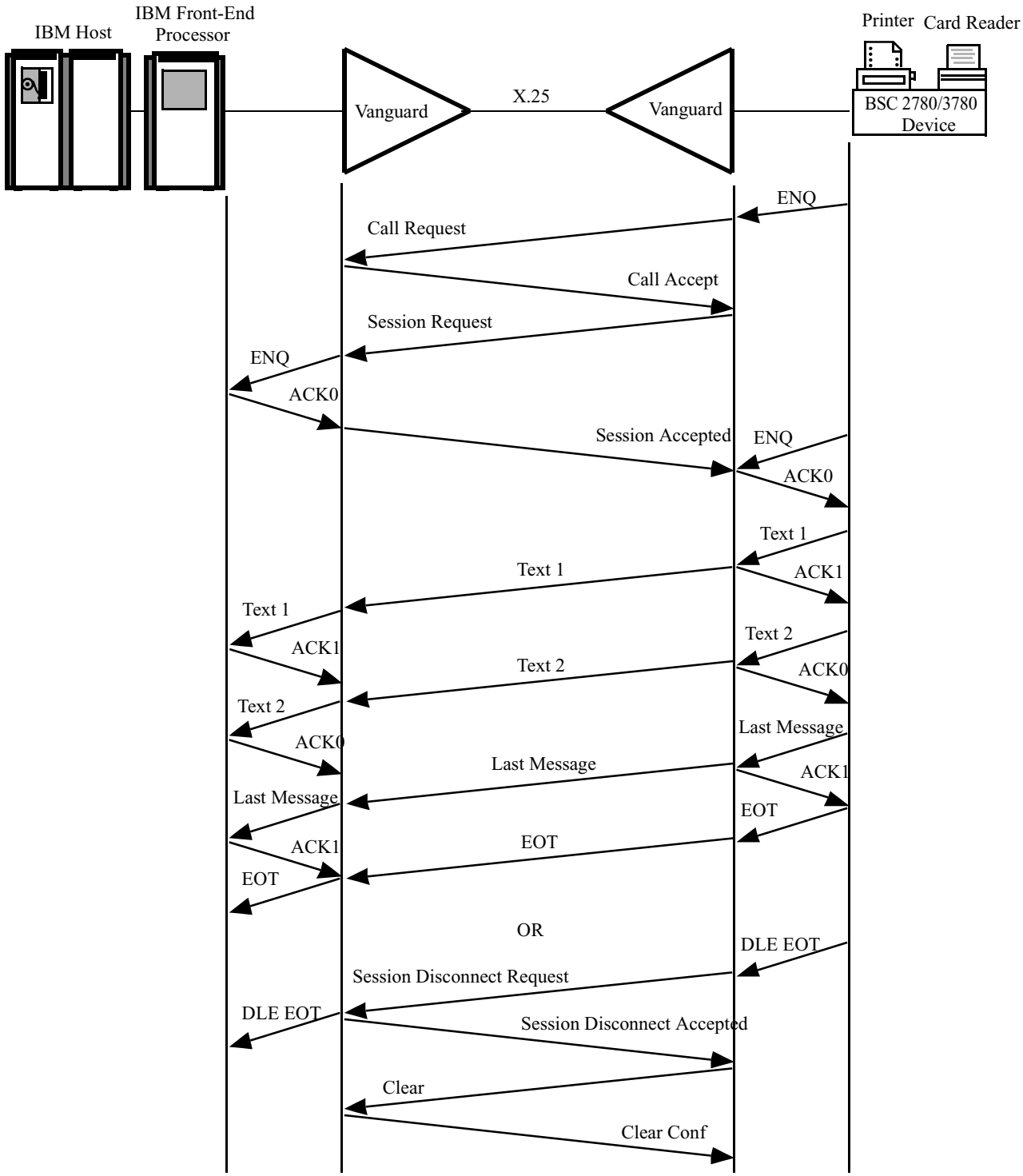

Figure 6. IBM BSC 2780/3780 Communication With 2780/3780 PAD

X.25 Connection

X.25 Support

Vanguard Products operational software uses a full-duplex point-to-point circuit as a physical transmission path to the Public Data Network (PDN) or to other equipment that adheres to the X.25 procedures defined by CCITT. Vanguard products support the 1980 and 1984 CCITT X.25 specifications.

Because the majority of X.25 network equipment has a DCE appearance, Vanguard products are normally set to appear as X.25 DTE logical appearance on the X.25 trunk. When interconnecting to some types of network equipment, you may have to set up a Vanguard node to operate as an X.25 DCE. In addition to the DTE or DCE logical appearance setting, Vanguard lets you tune the trunk parameters (frame window, packet window, and so on) to match the characteristics of the X.25 network.

X.25 Packet Transmission

All data transmitted over an X.25 trunk is in packet form. A Vanguard running the BSC 2780/3780 option does not change or rearrange data received from a device. Rather, it assembles received characters into packets and disassembles received packets into characters.

Supported Packet Size

Networks normally support packets containing up to a maximum of 128 bytes of user data as a standard default packet size. However, some networks handle a larger default packet size. For example, the normal arrangement for the Canadian DATAPAC network is 256-byte packets. Vanguard supports 128-, 256-, 512-, and 1024-byte packets for both incoming and outgoing packets.

Facilities are available to allow negotiation for packet sizes different from the default size.

Number of Characters in a Packet

The number of characters in a packet varies, up to the maximum packet size, depending on the amount of data sent to the Vanguard device by the BSC 2780/3780 device.

For BSC connections, Vanguard forwards a data block to the network using one or more packets. That is, upon receipt of a complete BSC data block, Vanguard forwards as many packets as needed to accommodate the complete BSC data block. If the data block size exceeds the packet size, the Vanguard sets the M-bit to indicate a continuation of the data block.

801 Autodialer

What Is It?

The 801 Parallel Autodialer Emulation software lets you configure an RS366 port on a Vanguard product running the BSC 2780/3780 option, without additional 801 Autodialer hardware. Once a Vanguard port is configured as an RS366 port, it can connect to an FEP (or any device that supports an RS366-A interface) and receive X.21 call information.

An associated BSC 2780/3780 port (specified during configuration) is then directed to place an X.121 call and transfer data after the connection is established.

Example

Figure 7 shows a simple network using the 801 Parallel Autodialer Emulation software.

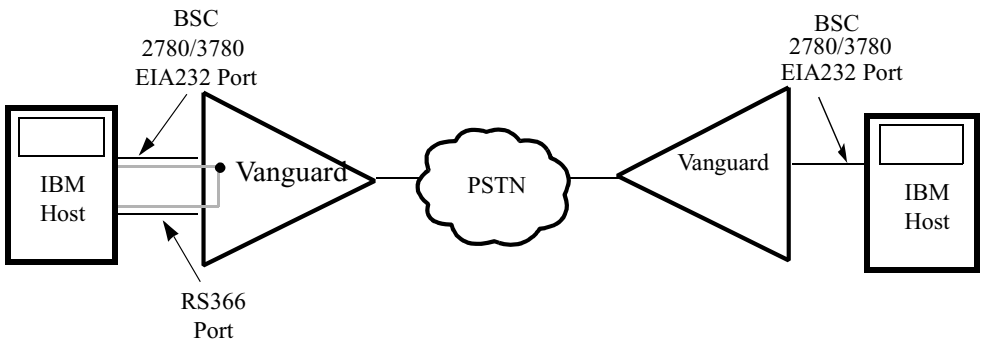

Figure 7. Simple 801 Autodialer Emulation Network

The 801 Parallel Autodialer Emulation feature eliminates the need for an external 801 Autodialer, and reduces line costs and long-distance charges.

Hardware Flow Control

To handle hardware flow control with character-oriented protocols on an EIA232 port, the port must have an external clocking source to control data transmission flow. BSC2780 does not have the hardware flow control auto-enable feature that is required by character-oriented protocols.

Configurations Supported

Example

Figure 8 shows a BSC 2780/3780 sample configuration.

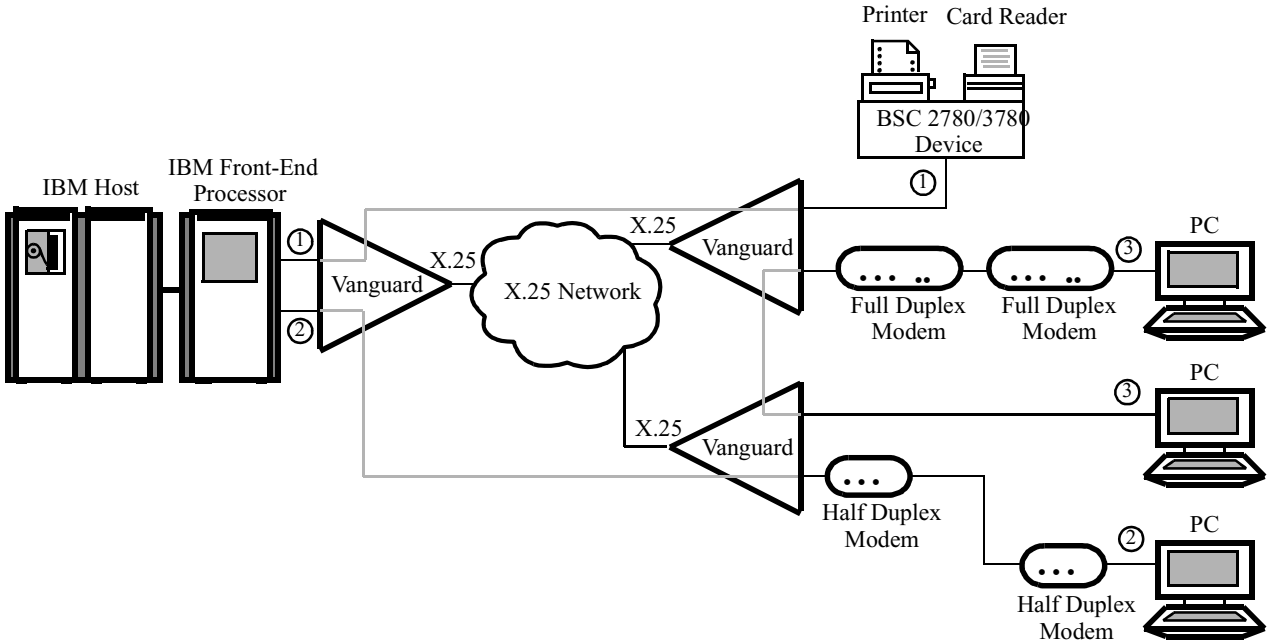

Figure 8. BSC 2780/3780 Sample Configuration

Most Common Configurations

A Vanguard product running BSC 2780/3780 supports three major configurations:

- Connections from host to 2780/3780 devices
- Connections from host to 2780/3780 emulators running on a personal computer (PC)
- Connections from PC to PC using 2780/3780 emulators

Note

Connections between 2780/3780 ports and devices can be full-duplex or half-duplex.

BSC 2780/3780 Configuration and V.25 bis Emulation

Without V.25 bis Emulation

A standard BSC 2780/3780 configuration supports point-to-point applications. Figure 9 shows a typical BSC 2780 configuration *without* V.25 bis emulation.

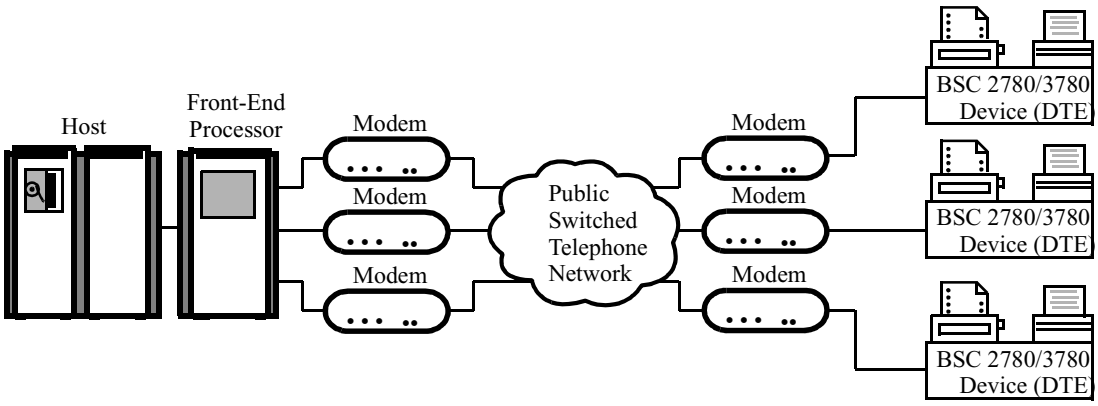

Figure 9. BSC 2780 Configuration Without V.25* bis *Emulation

Figure 9 shows a Front-End Processor with three ports running BSC 2780/3780. Each port controls a V.26 modem. The Public Switched Telephone Network (PSTN) is used to access several Electronic Point of Sale (EPOS) devices. Each EPOS connects to the PSTN via a V.26 modem. In this particular configuration, V.25 bis is the interface used to originate calls and receive calls through the V.26 modems.

See Figure 10 for an example of this same configuration *with* V.25 bis emulation.

With V.25 bis Emulation

By using V.25 bis emulation on Vanguard, as shown in Figure 10, you can reduce line and dial costs by replacing the host modems with a Vanguard PAD. The modems used with the Electronic Point of Sale (EPOS) devices are also replaced with the Vanguard PADs.

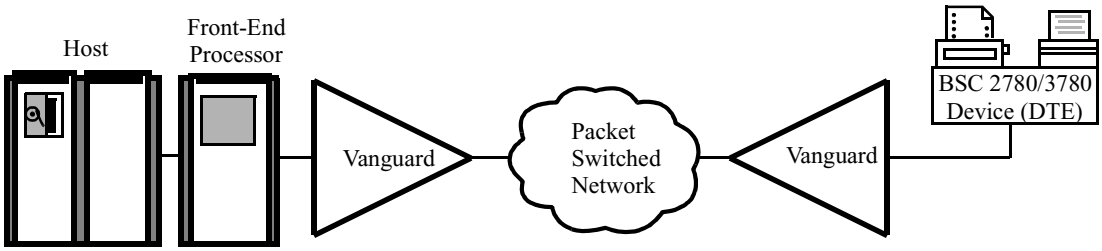

Figure 10. BSC 2780 Configuration With V.25* bis *Emulation

Configuration and Administration

Introduction

This section provides information for configuring your Vanguard product for BSC 2780/3780 operation.

Before You Begin

Before you configure a port for BSC 2780/3780 operation, make sure the BSC 2780/3780 option is installed on the Vanguard you are configuring. You do this by checking the port type options available from the Port Type parameter in the Port record. If you do not see BSC 2780/3780 available, the option is not installed on the node.

What You See in This Record

The Port Record contains parameter values that define a port's BSC 2780 characteristics.

Figure 11 shows the parameters available from the BSC 2780 Port Record.

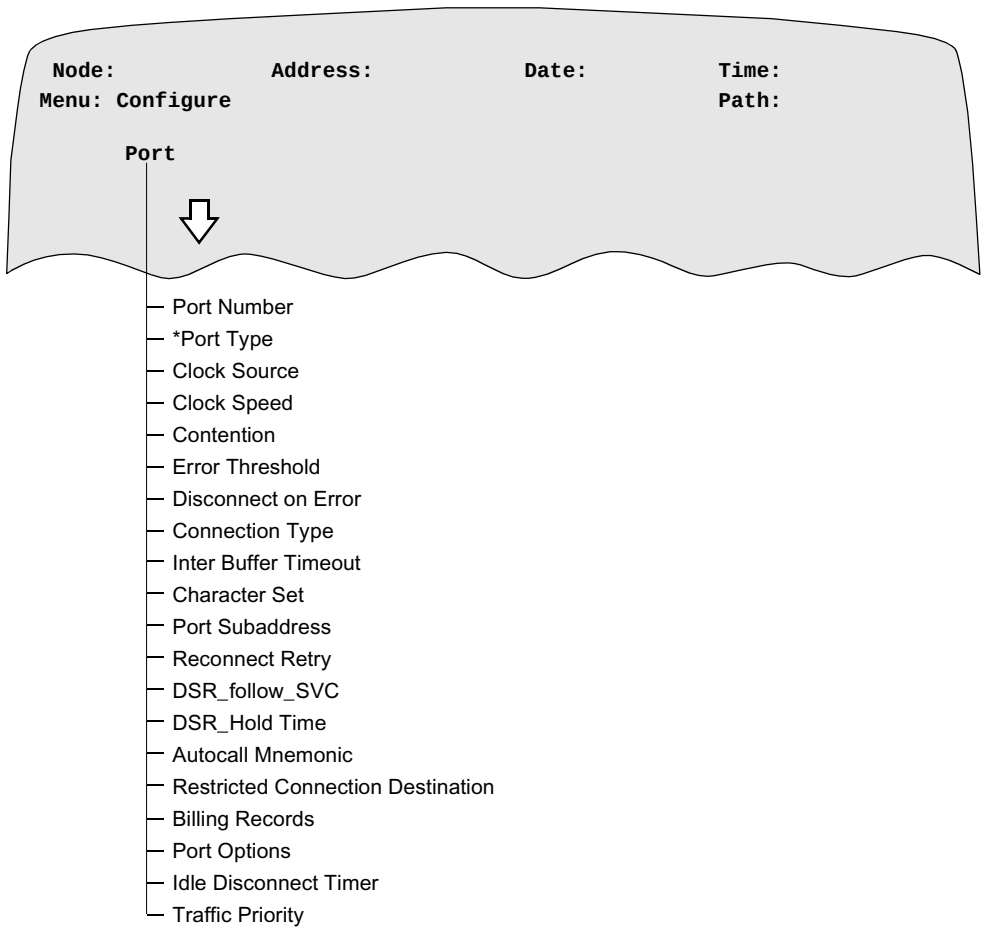

Figure 11. BSC 2780 Port Record Configuration Parameters

Steps to Configure the Port Record

Follow these steps to configure your port for BSC 2780/3780 operation:

Step	*Action*	*Result*
1	Select **Configure** from the CTP Main menu,	The Configure menu appears.
2	Select **Port** from the Configure menu.	The first parameter appears, as shown in Figure 11.
3	Enter parameter values, and press **;** when you finish.	This saves your changes to the Port record.
4	Press **<ESC>.**	The Configure menu appears.

Implementing Changes to Port Record Parameters

Follow these steps to implement changes to a record after entering parameter values:

Step	*Action*
1	Select **Boot** from the CTP Main menu.
2	Select **Warm Boot** from the Boot menu.
3	Select **<y>** when this prompt appears: **Booting the node will cause all current calls to be abnormally disconnected. This operation may result in lost data and disruption of network user sessions. Proceed <y/n>**
4	Press **<y>** to boot the node.

BSC 2780/3780 Configuration Parameters

Parameters

You need to configure these Port record parameters for BSC 2780/3780 operation on your node.

Note

If you have enabled Ease of Configuration, you need to boot only the port to make changes to the parameters marked with an asterisk. For more information, refer to the Ease of Configuration section in the introductory portion of the binder (*SNA Feature Protocols Manual,* Part Number T0101).

Port Number

Range:	1 to 48
Default:	1
Description:	Enter the number of the port to configure. This number corresponds to the physical port position at the rear of the unit and is the Port Record.

*Port Type

Range:	NULL, PAD, X.25, BSC 2780
Default:	PAD
Description:	Enter BSC 2780 to define the port for BSC 2780/3780 operation. **Note** If the node does not accept BSC 2780 as a valid Port Type, then the BSC 2780 option is not installed on the node.

Clock Source

Range:	INT, EXT
Default:	EXT
Description:	• INT: Internal clock source • EXT: External clock source (required for hardware flow control)

Clock Speed

Range:	1200 to 80000 (1.2 Kbps to 80 Kbps)
Default	4800
Description:	This is the port speed in bits per second when using internal clocking.

Note

Speeds above 19.2 Kbps are only supported when EBCIDIC is selected as the character set.

Note

The sum of the speeds of all BSC2780 ports on a node should not exceed 80 Kbps.

Contention

Range:	FDX, HDX
Default:	FDX
Description:	Indicates whether half-duplex or full-duplex modem signals are being generated. RTS/CTS handshake takes place regardless of contention mode. • FDX: DCD is on at all times. • HDX: DCD is on only when the node is transmitting.

Error Threshold Count

Range:	1 to 255
Default:	5
Description:	Specifies the number of consecutive errors that can occur before a device is considered down.

Disconnect on Error

Range:	YES, NO
Default:	YES
Description:	Specifies whether a session should be disconnected if a control unit has not responded once the Error Threshold Count has been exceeded.

Connection Type

Range:	SIMP, RS366, V.25b, EMRI, DIMO
Default:	SIMP
Description:	Specifies the control signal handshake required for a connection to be made to this port: • SIMP : Simple, no control signals required • V.25b : Port emulates a dial modem using V.25 bis 108/2 • RS366 : Port emulates data port for the 801 autodialer • EMRI : Port emulates a dial modem with ring indicator (RI) • DIMO : Port handshakes with attached modem **Note** NODE BOOT will be required when this type is changed to/from RS366 or V.25b. The default SIMP specifies that the connection is simple and no control signals are required. This option enables the V.25 bis Emulation function. The port emulates a dial modem using V.25 bis mode 108/2.

Inter-Buffer Timeout

Range:	1 to 255
Default:	30
Description:	Specifies the maximum amount of time in seconds that the PAD will wait until the end of a multipacket message from the network. If this time is exceeded, the PAD will abort the entire message and request retransmission.

Character Set

Range:	EBCIDIC, ASCII
Default:	EBCIDIC
Description:	Indicates whether Terminal/Printer devices on this port support the ASCII or EBCDIC character set. The Character Set parameter(s) must match the value configured in the BSC host or BSC controller as applicable to the HPAD or TPAD, respectively.

Remote Type

Range:	T2780, SNAINT
Default:	T2780
Description:	T2780 - Remote is the BSC2780 PAD SNAINT - Remote is the SNA/2780 Interactive

Data Link Role

Range:	Secondary, Primary
Default:	Secondary
Description:	Specifies which role when bidding for the line: Secondary or Primary. **Note** This parameter appears if SNAINT is selected in the Remote Type parameter.

Port Subaddress

Range:	0 to 3 decimal digits
Default:	Designated Port number
Description:	Calls addressed to this node and with this subaddress will be routed to this port. Press the space bar to blank the field.

Reconnect Retry

Range:	0 to 255
Default:	10
Description:	Specifies the number of times connection will be reattempted after a network-induced disconnect.

DSR_follow_SVC

Range:	NO, YES
Default:	NO
Description:	If NO is configured, DSR is ON when the port is enabled. If YES is configured, DSR is ON only while the port has a Switched Virtual Circuit connected to the remote BSC 2780 port. **Note** The DSR_follow_SVC parameter is available only when the connection type is SIMP. If the Connection Type is V.25bis, NO is the only acceptable value for the DSR_follow_SVC parameter.

DSR_Hold Time

Range:	50 to 3000 ms
Default:	250 ms
Description:	Time in steps of 50 ms to drop DSR signal after the circuit is disconnected in DSR_Follow_SVC mode. This timer value is ignored for other Connection Type settings.

Autocall Mnemonic

Range:	0 to 8 alphanumeric characters
Default:	(Blank)
Description:	This mnemonic name is used if the device is configured as a call originator. Press the space bar to blank the field.

Restricted Connection Destination

Range:	0 to 32 alphnumeric characters
Default:	(blank)
Description:	All calls originating from this port will be routed to the destination specified in this parameter, irrespective of route selection table entries. For example, to route calls to Port 1, use P1. To route calls to P1, Station 4, use P1S4. Press the space bar to blank the field.

Billing Records

Range:	OFF, ON
Default:	OFF
Description:	Controls whether billing (accounting) records will be created for calls on this port.

Port Options

Range:	NONE, EOT, ACK, TID, NOTTD
Default:	NONE
Description:	Specifies any of these port control options. • NONE: No specific option selected. • EOT: EOT will be dropped when no data has been sent across the network. • ACK: End-to-end acknowledgments are to be used. • TID: Host/Terminal ID (0 to 120 characters in length) with initial Bid/Response exchanged. • NOTTD: Does not send TTD control character.

Idle Disconnect Timer

Range:	0 to 60
Default:	0
Description:	The call on this port will be cleared when this timer (in msec) expires. This timer will be started when it received an EOT. **Note** A value of 0 disables the timer.

Traffic Priority

Range:	LOW, MED, HIGH, EXP
Default:	MED
Description:	This is the traffic priority of the 2780 device. EXP (Expedited) has the highest priority, and is typically reserved for internal system messages. You should not assign EXP to protocol traffic.

Inbound Burst Count

Range:	0 to 65535
Default:	4
Description:	Specifies the number of text blocks received from the local device before the PAD responds with RVI if there is text from remote. This is useful only where RVI is supported by the local device. This is to allow text from remote to interrupt data flow from the local device, turn the line around and send text to the local device. • 0- No burst limit on text blocks received from the local device. EOT is received from the local device only. • 1 to 65535 - Number of text blocks received from the local device before the PAD responds with RVI. **Note** This parameter appears if SNAINT is selected in the Remote Type parameter.

Outbound Burst Count

Range:	0 to 65535
Default:	4
Description:	Specifies the number of text blocks to be sent to the local device before the PAD will send EOT to the device. This is to allow the local device to turn the line around and sent text inbound, if it has any. If this value is non-zero, trnarnd_tmr must also be configured. • 0 - No burst limit on text blocks sent to the local device. EOT is sent to the local device only when there is no immediate text from remote, that is, only on expiration of nxtrtext_tmr. • 1 to 65535 - Number of text blocks sent to the local device before EOT is forced sent. **Note** This parameter appears if SNAINT is selected in the Remote Type parameter.

Remote Text Time-out

Range:	1 to 65535
Default:	2
Description:	Specifies the number of 1/20th seconds the PAD waits for next text from remote. If this time limit is exceeded, the PAD sends EOT to the device and immediately go to control mode. This timer is used only for SNA interactive Mode where EOT is not sent across the network. Instead, the PAD uses this timer to determine if there is more text from remote before sending EOT to the device locally. **Note** This parameter appears if SNAINT is selected in the Remote Type parameter.

Text From Device Time-out

Range:	1 to 65535
Default:	20
Description:	Specifies the number of 1/20th seconds the PAD waits for text from the local device. This applies only after the outbound burst reached the configured limit, or after the local device responds to last outbound text with RVI. If this time limit is exceeded, the PAD immediately goes to control mode and bids for the line if there is more text from remote. This timer is used only for SNA Interactive Mode, where the outbound burst count is configured and/or RVI is supported by the local device. **Note** This parameter appears if SNAINT is selected in the Remote Type parameter.

801 Autodialer Port Configuration

Configuring 801 Autodialer Port

After you install 801 Autodialer Emulation software in the Vanguard node, go to the Configure Port Record and select the port you want to configure. When the parameter Port Type appears, select RS366. The rest of the entry contains only those parameters needed for configuring an RS366 (801 Autodialer) port.

Example

Figure 12 shows the RS366 port configuration parameters.

Note

Boot the node to implement RS366 port configuration.

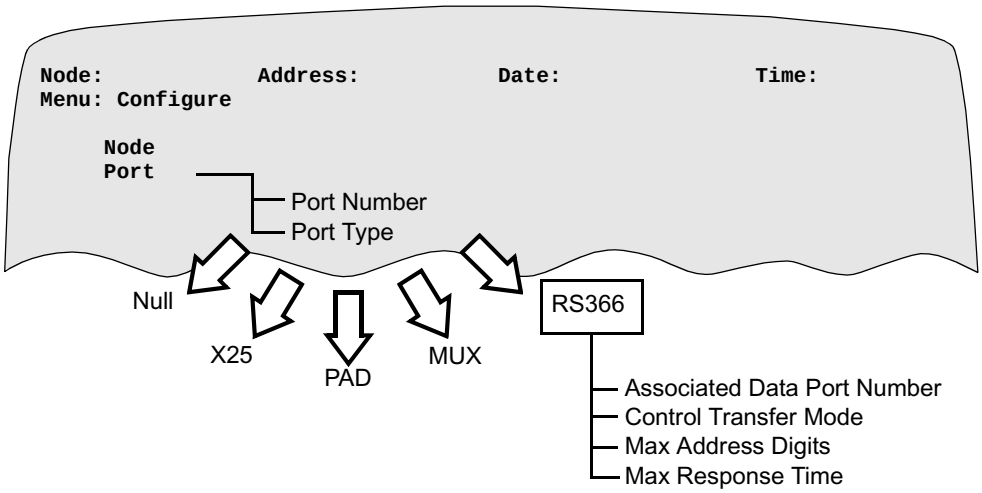

Figure 12. Configure RS366 Record and Parameters

801 Autodialer (RS366) Parameters

Introduction

This section lists the parameters used for RS366 port configuration parameters.

Parameters

Use the following parameters for RS366 port configuration.

Associated Data Port Number

Range:	1 to 54
Default:	1
Description:	This is the port over which data will be sent. This port must be configured as a BSC 2780 port.

Control Transfer Mode

Range:	EON, EBT
Default:	EON
Description:	Specifies when control is transferred to the associated port. • EON : Transfer control after the end-of-number digit is detected. • EBT : Transfer control after the maximum number of address digits has been accumulated and the answer-back tone is received.

Max Address Digits

Range:	1 to 15
Default:	1
Description:	This is the number of digits necessary to transfer control when Control Transfer Mode = EBT. When Control Transfer Mode = EON, this parameter does not have to be set and it defaults to 15.

Max Response Time

Range:	0sec, 32sec, 48sec, 96sec
Default:	0sec
Description:	This is the maximum time in seconds that the port will wait for an EIA signal before timing out. 0sec disables the timer.

Statistics

Introduction

The BSC 2780/3780 option provides Detailed Port Statistics to report on the status of the configured port. You can also report on the 801 Autodialer (RS366) feature, if configured on your node.

How to Display Statistics

Follow these steps to display statistics for the BSC 2780/3780 configured port.

Step	*Action*	*Result*
1	Select **Status/Statistics** from the CTP Main menu.	Options for Status/Statistics appears.
2	Select one of the following reports: • **Detailed Port Statistics** • **RS366 Stats**	A prompt appears.
3	Enter the number of the port you want statistics for, and press Return.	The port statistics screen(s) for that port appears.

Detailed Port Statistics

What You See

Two screens display statistics for the designated BSC 2780 port, as shown in Figures 13 and 14.

```
Node:                  Address:           Date:          Time:
Menu: Detailed BSC2780 Port Statistics: Port 3           Page: 1 of 2

   Port Number:3             Port Type: BSC2780 TPAD   Port Status: Down
   Port Speed: 0             Port State: SEL/POL
   Port Utilization In: 0%   Port Utilization Out 0%

   Physical:
     CRC/BCC Errors: 0


   Data Summary:          Last Statistic Reset:
                          IN        OUT                        IN   OUT
   Characters:            0         0      Characters/sec:     0    0
   Messages:              0         0      Messages/sec:       0    0

   Interface Summary: EIA 232-D DCE       INPUT               OUTPUT
                                     DTR  RTS   MB  P14     DSR DCD  RI  CTS
State: Connected (SIMPLE)             L    L    L   L       H   H    L   H

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

Figure 13. Detailed Port Statistics Screen - Page 1.

```
Node:       Address:                    Date:          Time:
Detailed BSC2780 Port Statistics: Port 3               Page: 2 of 2

Message Summary:
                          IN        OUT
Positive Acknowledgment:  0         0
Negative Acknowledgment:  0         0
Enquiry (ENQ):            0         0

Number of Messages Retransmitted: 0









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

Figure 14. Detailed Port Statistics - Page 2

Screen Terms

This table describes the screen parameters shown in Figures 13 and 14.

Screen Term	*Description*
Port Number	Shows the port number assigned to the configured BSC 2780/3780 port.
Port Type	Shows the port type. This field should show BSC 2780 TPAD or BSC 2780 HPAD.
Port Status	The Port Status field indicates whether or not the port switched on and is ready for operation. This field may be qualified by either UP, DOWN, or DSBL. If the port is up and running, UP appears. If the port is down, DOWN appears. If the port has been disabled, DSBL appears.
Port Speed	Shows the configured speed for the BSC 2780/3780 port.

Screen Term	Description (continued)
Port State	The current operating state of the port: • DISC: No call is currently connected to the specified port. The port is idle. • PENDACC : Port is waiting to accept a call. • DATA: Port is busy. Data traffic is being passed between BSC 2780/37890 device and host. • PENDACK: Port sent a message (test) or enquiry (ENQ) and is waiting for an acknowledgment (ACK). • EOT: Port received an End of Transmission (EOT). Port is waiting for a new line bid. • DRO: Outbound Data is restrained. • DRI: Inbound Data is restrained. • PENDISC: Port is waiting for a disconnection. The device sends and EOT prior to accepting a call. • SEL/POL: Port is selected and being polled.
Port Utilization In	Shows the amount of bandwidth in use for incoming data.
Port Utilization Out	Shows the amount of bandwidth in use for outgoing data.
Physical: CRC/BCC Errors	Number of CRC errors received on this port since last node boot or statistics reset.
Data Summary: Characters: IN/OUT	Number of characters received or transmitted by the LSC station from or to the BSC 2780 port since the last statistics
Messages: IN/OUT	Number of messages received or transmitted by the LSC station from or to the BSC 2780 port since the last statistics reset.
Characters/sec: IN/OUT	Number of characters transmitted or receive per second by the LSC station to or from the BSC 2780 port.
Messages/sec: IN/OUT	Number of messages received or transmitted per second by the LSC station from or to the BSC 2780 port.
Interface Summary	Shows the type of EIA signal connected: • EIA 232-D DCE • EIA 232-D DTE

Screen Term	Description (continued)
State	This part of the Statistics screen shows the state of the connection between the BSC 2780 and the FEP, by type and EIA leads: • Connected (SIMPLE) EIA leads INPUT states: • DTR = Data Terminal Ready. High indicates DTE is ready for transmission • RTS = Request to Send. Signal from DTE requesting clearance to transmit. • MB = Make/Break signal. • P14 = Pin 14 signal. EIA leads OUTPUT states: • DSR = Data Set Ready. Signal from DCE indicating modem is connected. • DCD = Data Carrier Detect. • RI = Ring Indicator. Indicates to an attached DTE that an incoming call is present. • CTS = Clear to Send.
Positive Acknowledgments	Number of positive acknowledgments seen IN/OUT of this port.
Negative Acknowledgment	Number of negative acknowledgments seen IN/OUT of this port.
Enquiry (ENQ)	Number of enquiries seen IN/OUT of this port.
Number of Messages Retransmitted	Number of messages that were resent.

RS366 Port Statistics

What You See

Figure 15 shows an example of the Detailed RS366 Port Statistics screen.

```
Node:              Address:              Date:          Time:
Detailed RS366 Port Statistics: Port 5                  Page: 1 of 1

Port Number:    5
Port Type:      RS366
Port Status:    Enabled
Data Port Num:  9
Current State:  Waiting for CRQ On
Last Event:     NULL_EVENT
Input Eia Status:      CRQ     DPR     NB8     NB4     NB2     NB1
                       OFF     OFF     0       0       0       0

Output Eia Status:     PWI     ACR     DSC     DLO     PND
                       ON      OFF     OFF     OFF     OFF
Last Called Address:
Number of Calls Made:          0
Number of Calls Failed:        0
Number of Protocol Timeouts:   0
Number of Illegal digits rcvd: 0
Connected to Data Port:        NO


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

Figure 15. Example of an RS366 Detailed Port Statistics Screen

Screen Descriptions

Most of the information on the Detailed RS366 Port Statistics screen is self-explanatory. However, two areas require some explanation: Input EIA Status and Output EIA Status.

Input EIA Status indicates the state of the RS366 signals from the DTE to the DCE:

- DPR - Data present
- CRQ - Call request
- NB1 - Bit 1
- NB2 - Bit 2
- NB4 - Bit 4
- NB8 - Bit 8

Output EIA Status indicates the state of the RS366 signals from the DCE to the DTE:

- ACR - Abandon call and retry
- PND - Present next digit
- DSC - Distant Station Connected
- PWI - Power up
- DLO - Data line occupied

SNMP MIB Support for EIA Monitoring

Introduction

The SNMP MIB has been enhanced to allow EIA summary information to be accessed from an SNMP manager station for Vanguard nodes running the BSC 2780/3780 protocol.

What Can You Monitor?

The following statistics objects are available using SNMP commands from the SNMP manager station.

SNMP Object	*EIA Parameter*
cdx6500StatEIAEntryPort Number	Port number of the applicable port.
cdx6500StatEIAEntryDimtype	Dim Type These can be any one of: • dim_type_none(0) • dim_type_not_installed(1) • dim_type_EIA_232_d(2) • dim_type_x21(3) • dim_type_v35(4) • dim_type_v36(5) • dim_type_v11(6) • dim_type_EIA_530(7) • dim_type_dsu(8)
cdx6500StatEIAEntryDimCfgn	Dim Configuration These can be any one of: • dim_cfgn_dte(0) • dim_cfgn_dce(1)
cdx6500StatEIAEntryEiaState	EIA State
cdx6500StatEIAEntrySignalStatus	EIA Signal Status
cdx6500StatEIAEntryConnType	EIA Connection Type

Samples of SNMP Get and GetNext Commands

These sample commands show how to access the EIA information.

get cdx6500StatEIAEntryEiaState.2

This is a request to retrieve the value of EIA State for Port 2.

getnext cdx6500StatEIAEntrySignalStatus.1

This is a request to retrieve the value of EIA Signal Status for the first port number higher than 1 that has a connection to the EIA module.

getnext cdx6500StatEIAEntrySignalStatus

This is a request to retrieve the value of EIA signal status for the first port, on which EIA monitoring is supported.

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