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## Vanguard Applications Ware TCP-to-BSC Conversion (VBIP)

# Notice

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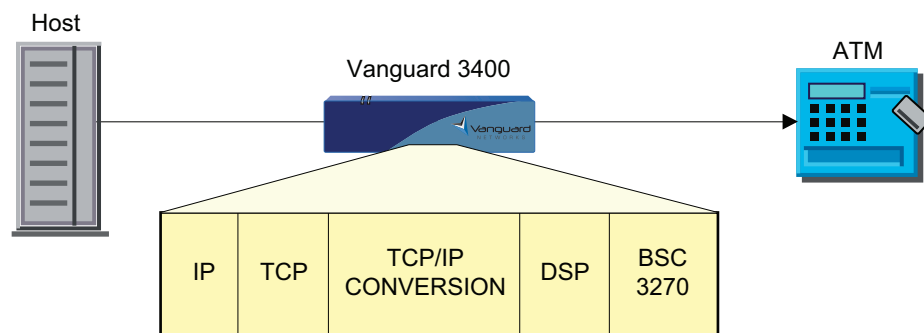
## Overview

### Introduction

The purpose of this document is to describe the BSC3270 to TCP/IP conversion feature targeted for a remote 3400 model Vanguard router.

### TCP to BSC Conversion

The BSC3270 to TCP/IP conversion feature provides an alternative means of termination into the (HP (Tandem) or IBM (mainframe) host using TCP/IP communications subsystem specifically for Automated Teller Machine (ATM) service providers and bank networks. This feature allows banks and ATM network providers to retain BSC3270 attached ATMs while providing LAN/WAN connection with the host. Figure 1-1 illustrates BSC3270 to TCP/IP conversion components within the Vanguard router.



**Figure 1-1. BSC3270 to TCP/IP Conversion**

### Automated Teller Machine (ATM)

The acronym (ATM) in this manual refers to Automatic Teller Machine.

#### ■ Note

Do not confuse Automated Teller Machine with Asynchronous Transfer Mode, a cell-switching and multiplexing protocol.

### Before Using This Manual

Before using this manual you should have experience using IBM or IBM-compatible equipment. You should be familiar with the IBM Binary Synchronous Communications (BSC) protocol and IP routing.

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**Related Vanguard Information**

Refer to these related Vanguard Applications Ware documents for additional information:

- Vanguard Basic Protocols Manual (Part No. T0113)
- Vanguard Router Basics Manual (Part No. T0100-01)
- Vanguard IP Routing Basics Manual (Part No. T0100-03)
- Vanguard IP and LAN Feature Protocols Manual (Part No. T0100-03)
- Vanguard Frame Relay Interface/Access Manual (Part No. T0106-02)
- Vanguard TCP/Telnet Basic Protocols Manual (Part No. T0106-07)
- Vanguard IBM BSC 3270 Manual (Part No. T0101-03)
- Vanguard SNMP/MIB Management Manual (Part No. T0106-04)
- Vanguard Alarms and Reports Manual (Part No. T0005) for details on alarms and reports generated by this feature
- Vanguard 3400 Series Installation Manual (Part No. T0288)
- Vanguard 6840 Installation Manual (Part No. T0287)

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**Related IBM Documentation**

3174 Establishment ControllerGA23-0218

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**Features**

BSC 3270-to-TCP conversion supports:

- Base24 or EPOC Host Applications
- TCP session to ATM mapping
- Server or Client role
- Up to 3 ATMs per node
- Cessation - prevents the Vanguard node from polling the ATM when the TCP session is down
- General or Specific polling
- Configurable Timers
- BSC3270 running version 5.3 or later Vanguard Application Ware

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**Cessation**

Configuration for Cessation is CESS+CESS3. Vanguard node will not connect with and poll ATM device while the TCP session is down.



# Theory of Operation

## Introduction

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The BSC3270 to TCP/IP conversion feature is designed to function in a remote Vanguard 3400 series router with sufficient memory and flash resources to support IP routing features, including BGP-4, QOS, Firewall, VPN, SSH Server, RADIUS Client, and SNMP for specific traps required for host status notification.

The theory of operation presented in the following subsection provides a basic description of how the BSC3270-to-TCP conversion feature is implemented in Vanguard products.

Among the financial industries host application programs supported are Base24 and EPOC, both of which run on an IBM or HP (Tandem) host platforms. The host application controls the ATM and all of its functions from displaying data, printing, and currency distribution.

Currently there is a significant number of ATM machines installed that use BSC3270 which requires a serial connection in the data center typically using an IBM-like Communications Controller or HP (Tandem) SWAN controller. Depending on the number of remote ATM machines this can result in hundreds of serial (leased) lines in the data center which for cost and maintenance reasons could be undesirable. The BSC3270 to TCP/IP conversion feature in the Vanguard router allows users to retain the remote BSC3270 ATM machines and connect them at the host using TCP/IP over a LAN interface, eliminating the need for serial line connections at the host.

Vanguard Networks was the first company to develop BSC3270 to SNA conversion allowing LAN connections at the host using IBM's SNA architecture. The new BSC3270 to TCP/IP feature 'VBIP' now adds host connectivity to include TCP/IP over a LAN/WAN connection.

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## How the BSC3270-to-TCP Conversion Works

### Introduction

BSC3270-to-TCP conversion is used in the financial, banking and network provider-environments where ATM's are networked into:

- Tandem K Series host computers
- Tandem S Series host computers
- Central-site IBM 3745 communications controllers
- Stratus Hosts
- IBM S/390 Servers

### Purpose

The BSC3270-to-TCP conversion allows banks and ATM network providers to retain BSC3270 attached ATMs while providing a LAN/WAN connection with the host.

This feature will allow the attached BSC3270 ATM machine to appear as a TCP/IP device, complete with its unique IP device address and TCP port address, mutually exclusive to the inherent IP router capability, running in the same physical node.

### Typical Application

Application #1 shown in Figure 1-2 below shows a typical application of BSC3270-to-TCP conversion. The network consists of these elements:

- Tandem Host
- Frame Relay WAN
- Vanguard 3410
- ATMs

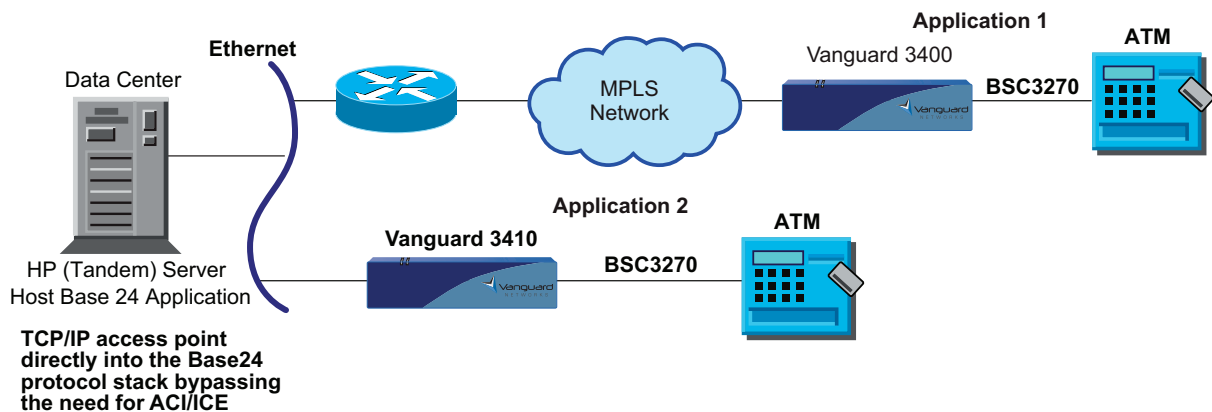
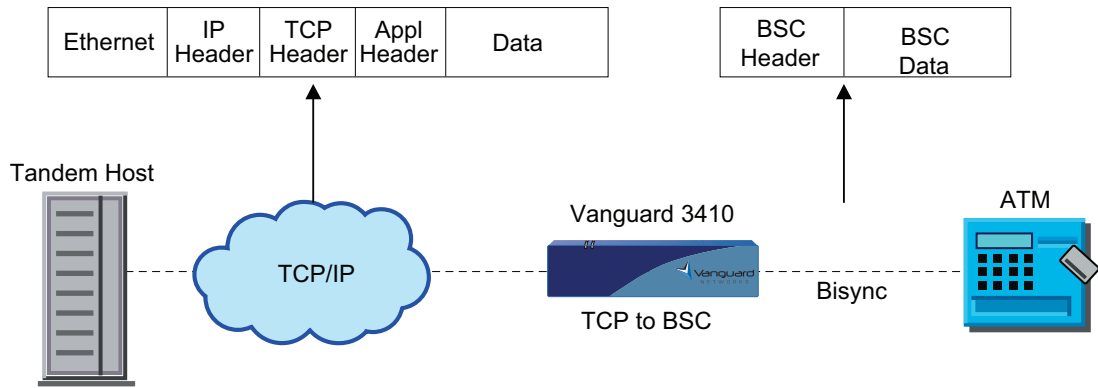


Figure 1-2. Typical BSC3270-to-TCP Application

**Data Conversion**

Figure 1-3 below shows the changes in the data formats as the packets pass through the network. Conversion is done in the Vanguard 3410.

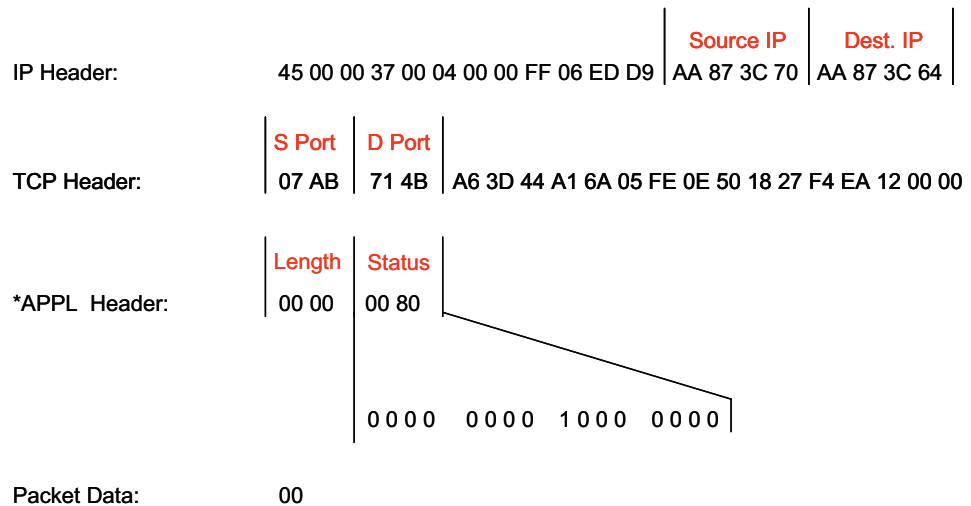


**Figure 1-3. Data Conversion Diagram**

**Application Header Device Status**

In the example shown Figure 1-4 in the frame contains source and destination MAC, IP and TCP port addresses.

The IP packet begins with inclusion of the VBIP header which in this case contains an "ATM Active" '00 80' status byte indicator. When status is sent to the host the Length field is '00' without any packet or application data. The Base24 application when configured to support VBIP requires at a minimum 'ATM Active' and 'ATM Inactive' status. In cases this may be the only status required by Base24.



**Figure 1-4. Application Header Status Diagram**

**ATM Active:** Sent when the BSC3270 TPAD sends a specific poll to the ATM and received a valid (EOT) response. ATM Active status is also used as a 'wake up' to the Base24 application indicating the downstream ATM machine is ready for activation or download.

BSC 3270 Specific Poll

```
TX: 32 32 37 32 32 C1 C1 40 40 2D
TX: 32 32 37 32 32 C1 C1 40 40 2D
TX: 32 32 37 32 32 C1 C1 40 40 2D
TX: 32 32 37 32 32 C1 C1 40 40 2D
RC: 32 32 37 *
```

\* Send 'ATM Active' status

**Figure 1-5. BSC 3270 Specific Poll**

**ATM Inactive:** This status is sent to the host at any time following a time out in BSC3270 TPAD. The 'ATM Inactive' status will be sent to the host from the VBIP when the downstream device fails to respond to a General or Specific poll. The time out is triggered when the BSC3270 TPAD tries counter reaches '0'.

**Device Status**

The Vanguard TCP/IP to BSC3270 conversion feature must include new functionality that will allow for exclusion and inclusion of a 4- byte application header used for (1) Presenting ATM terminal status to the host Base24 application program and (2) Calculating the byte count of the application data in the IP packet.

**Applications Header**

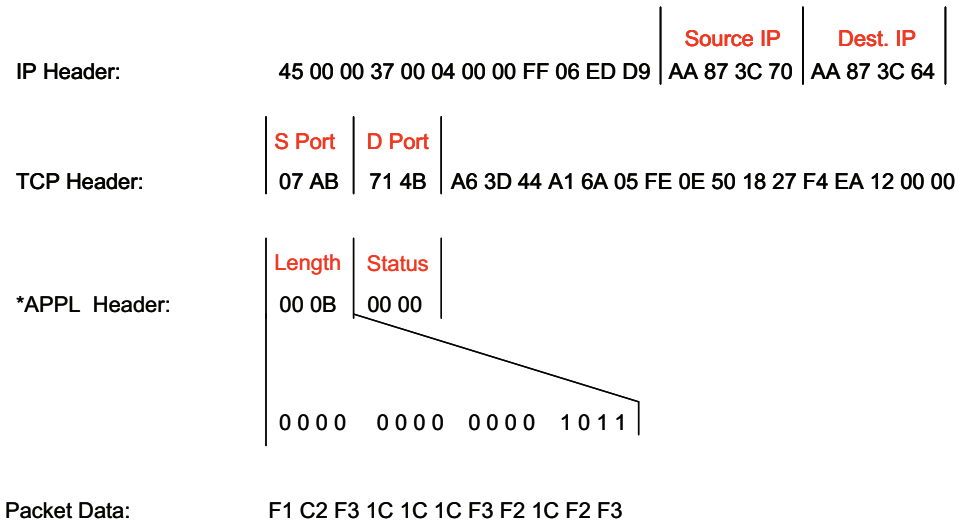
|            |  |  |
|------------|--|--|
| Byte 0 – 1 | Length Field (Data between STX and ETX only) |  |
| Byte 3 – 4 | Status Field                                 |  |
| Hex        | '80 00'                                      | BSC Device OK                            |
|            | '40 00'                                      | BSC Operational Check                    |
|            | '20 00'                                      | BSC Data Check                           |
|            | '10 00'                                      | BSC Equipment Check                      |
|            | '08 00'                                      | BSC Intervention Required                |
|            | '04 00'                                      | BSC Command Reject                       |
|            | '02 00'                                      | ATM Inactive                             |
|            | '01 00'                                      | BSC Msg. Received while Inactive/Dropped |
|            | '00 80'                                      | ATM Active                               |
|            | '00 40'                                      | BSC Device End                           |
|            | '00 20'                                      | BSC Unit Specify                         |
|            | '00 10'                                      | BSC Device Busy                          |

**Figure 1-6. Application Header Status Field**

**Application Header  
Packet Data Byte  
Count**

In the example shown in Figure 1-7, the frame contains source and destination MAC, IP and TCP port addresses.

The IP packet begins with inclusion of the VBIP header which in this case contains a packet byte count of '00 0B' (11 bytes) with no status bits set in Bytes 2 and 3.



**Note** Application Header length field does not include the header itself, only the data between the BSC 'STX' and the 'ETX'.

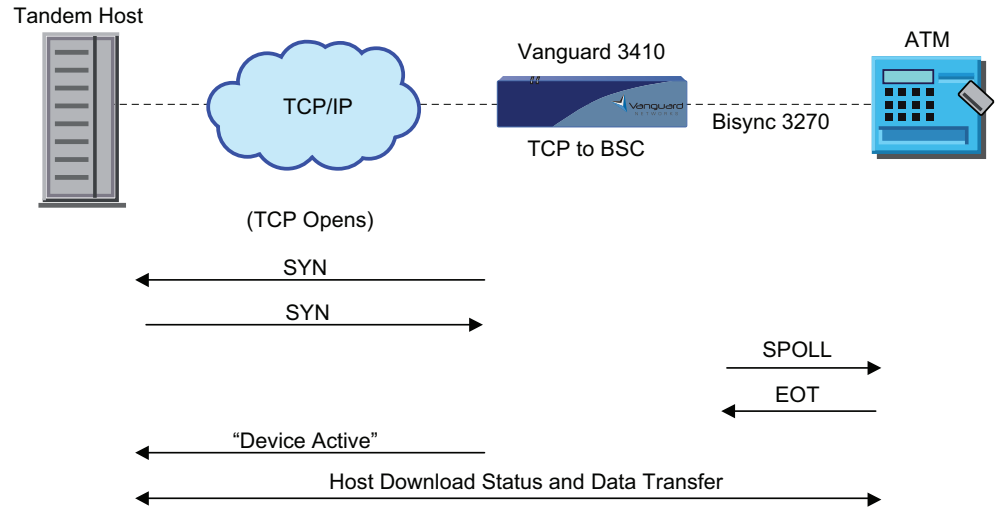
**Figure 1-7. Packet Data Byte Count**

**EBCDIC to ASCII  
Conversion**

Data sent from a BSC3270 ATM is EBCDIC encoded. The ACI Base24 application program will only support ASCII encoded application data from TCP/IP ATM's which the VBIP emulates. Therefore we must have a configurable option in the V3400 configuration menu for: (1) ASCII to EBCDIC conversion or (2) EBCDIC only. With a configurable option we can allow for this feature to be used with other host based application programs such as Advantage that may support EBCDIC data.

**Start-up Sequence in Server Mode**

Figure 1-8 shows an example of the start-up sequence of a typical BSC3270-to-TCP conversion. This start-up sequence establishes a TCP session between the Tandem host and the Vanguard 3400.



**Figure 1-8. Typical BSC3270-to-TCP conversion Start-Up Sequence**

**Note**

The BSC3270 node (the Vanguard 3400) must have the port configured with the Cessation option. Cessation prevents the Vanguard node from polling the ATM when the TCP session is down.

Fail/Recovery

Figure 1-9 shows an example of the BSC3270-to-TCP conversion Fail/Recovery:

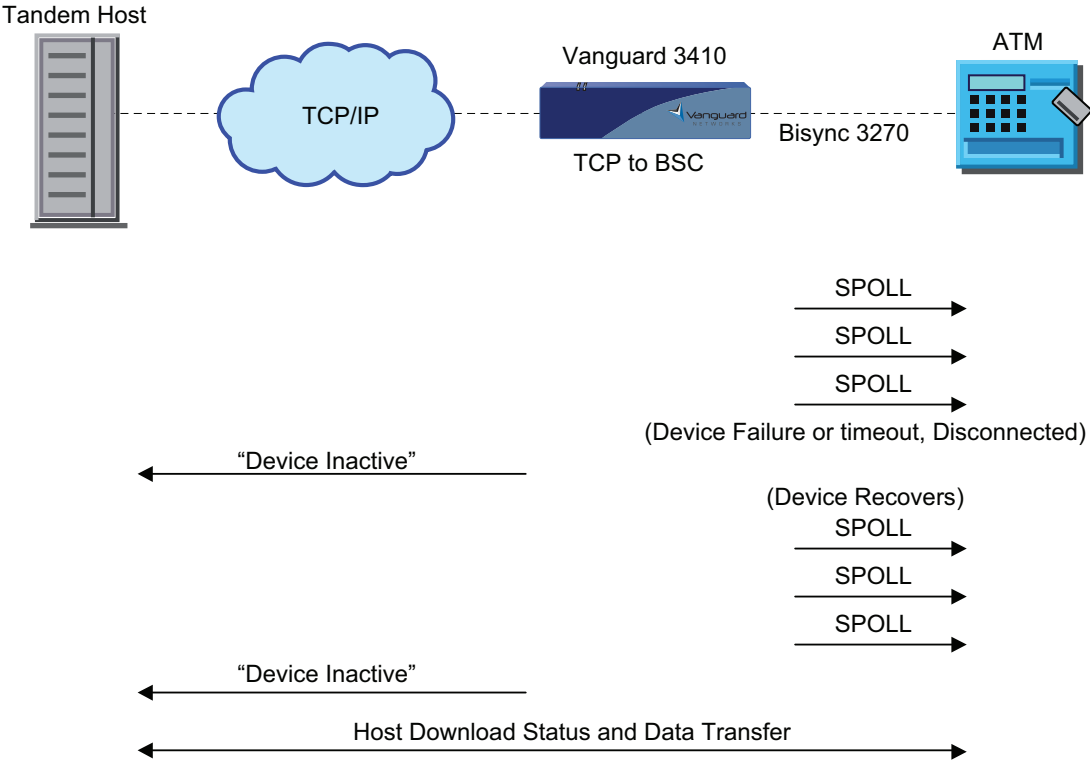
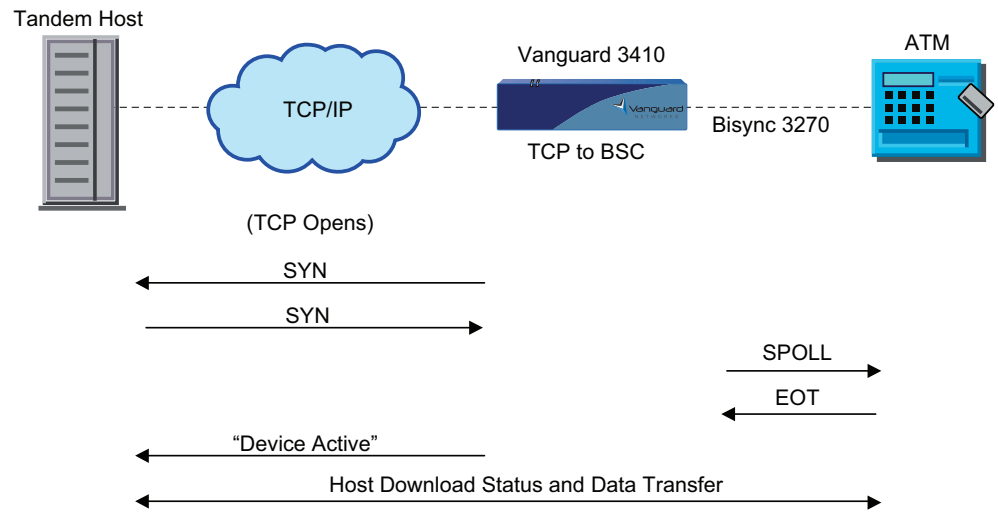


Figure 1-9. BSC3270-to-TCP conversion Fail/Recovery

**Device Enable in Server Mode**

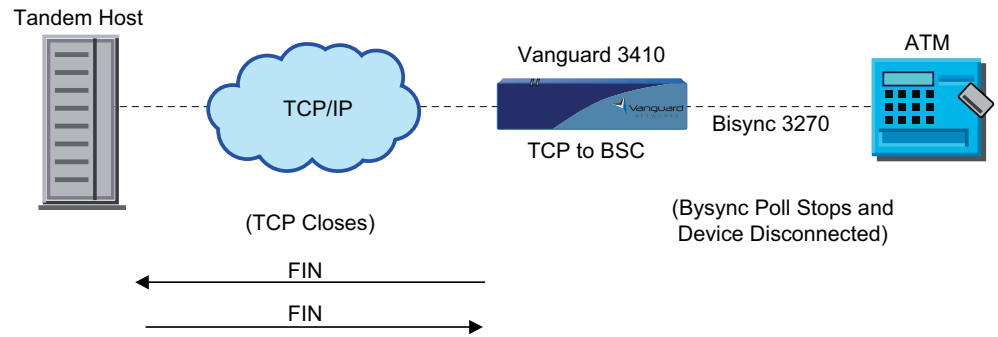
Figure 1-10 shows an BSC3270-to-TCP Device Enable (ATM) example:



**Figure 1-10. BSC3270-to-TCP Device Enable**

**Device Disable**

Figure 1-11 shows an BSC3270-to-TCP Device Disable example.



**Figure 1-11. BSC3270-to-TCP Device Disable**

Once disabled, the device unconditionally terminates the session. The system operator is responsible to ensure that an ATM customer is not in the middle of a bank transaction.

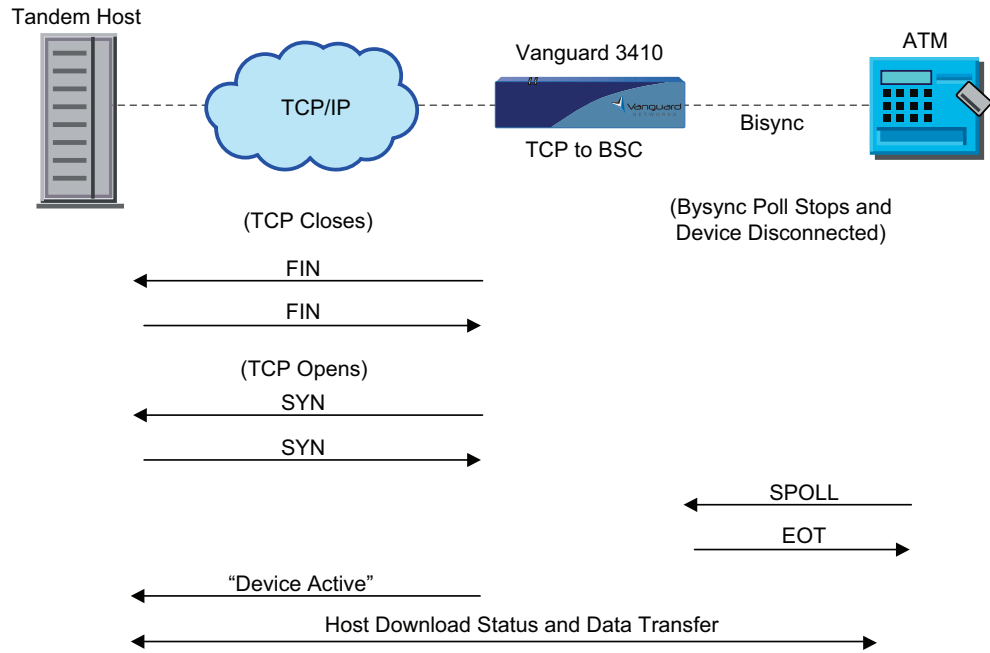
**Note**

The Cessation Option (CESS+CESS3) must be enabled so that the Vanguard 3400 does not send the poll to the ATM when the TCP session is down.



**Device Boot**

The device unconditionally terminates to a TCP session when booting. The system operator is responsible to ensure that an ATM customer is not in the middle of a bank transaction. Figure 1-12 shows a Device Boot example:



**Figure 1-12. Device Boot Example**

**Note**

The Cessation Option (CESS+CESS3) must be enabled so that the Vanguard 3400 does not send the poll to the ATM when the TCP session is down.



### Overview

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#### Introduction

This chapter provides configuration procedures and examples for BSC3270-to-TCP/IP operation.

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#### Before You Start

##### Online Help

Entering a ? displays online Help for the current parameter option on the screen.

##### Parameters with an asterisk (\*)

Parameters identified by an asterisk require a node boot for changes to the parameter to take effect.

This chapter provides configuration examples and procedures for BSC 3270-to-TCP/IP conversion.

## Configuration Information and Examples

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### Increase Parameters to Maximum Value for BSC-to-TCP

The guidelines below are required when using the BSC3270-to-TCP feature:

The following Node Record Parameters need to be set to accommodate the maximum number of BSC3270 to TCP sessions that can be configured:

- Mnemonic Table Size
- Quantity of DSP Devices
- Maximum Simultaneous Calls

Local Dynamic Port Creation Heap Size needs to be configured Bisync and AS/400.

#### ■ Note

When setting the Local Dynamic Port Creation Heap Size, refer to the Ease of Configuration information located in the Ease of Configuration and Enable Ease of Configuration sections of the Vanguard Applications Ware Basic Protocols Manual - Part No. T0106 (Click Applications Ware Protocols Documentation -> Basic->About this Manual).

A copy of your current configuration files should be saved before changing the Local Dynamic Port Create Heap Size.

## Configuration for BSC3270-to-TCP Operation

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### Introduction

To set up a Vanguard for BSC3270-to-TCP operation, configure the following:

- Node Record
- Ethernet Port Record
- Router (**see Note 1 below**)
- TCP (**see Note 2 below**)
- BSC3270 Port Record (**see Note 3 below**)
- BSC/DSP3270 Device Table (**see Note 3 below**)
- TCP-to-BSC Conversion Record Configure

#### ■ Note 1

For details on configuring your node for LAN/WAN operation, refer to:

- Vanguard Configuration Basics Manual, (Part Number T0113)
- Vanguard Router Basics Manual (Part No. T0100-01)
- Vanguard IP Routing Basics Manual (Part No. T0100-03)

#### ■ Note 2

For details on configuring your node for TCP operation, refer to:

- Vanguard TCP/Telnet Basic Protocols Manual (Part No. T0106-07)

#### ■ Note 3

Only the parameters required for BSC3270-to-TCP operation are discussed in this manual. For details on configuring your node for BSC3270 operation, refer to:

- Vanguard IBM BSC 3270 Manual (Part No. T0101-03)

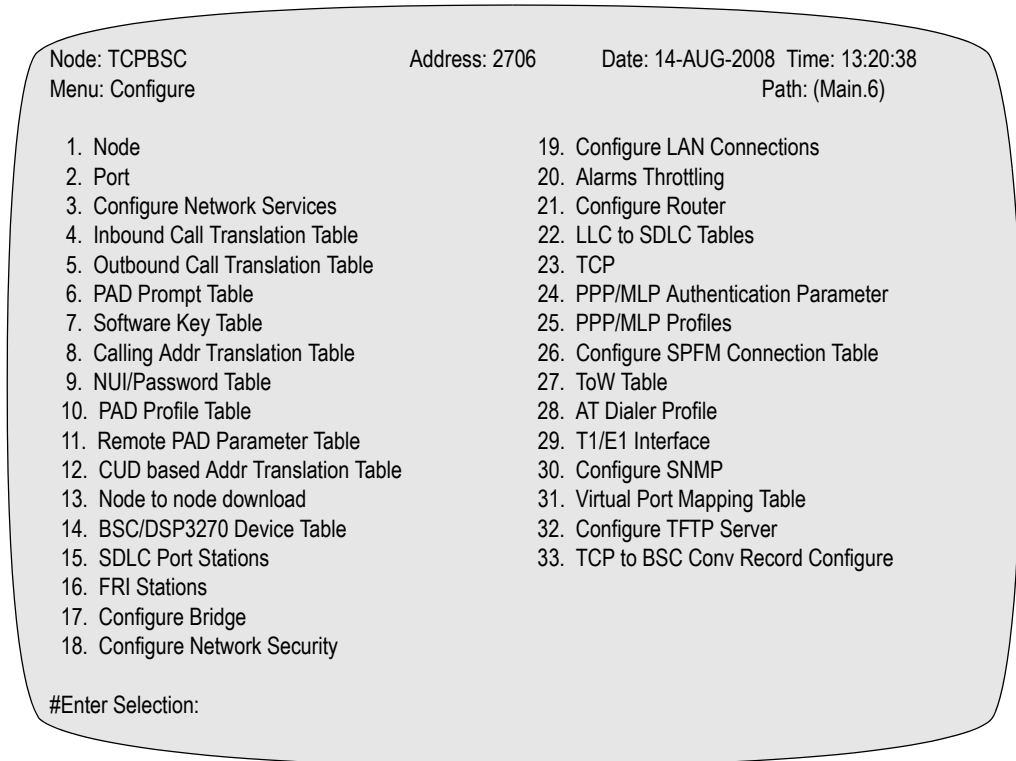
## Configuring a Node

Follow the steps in the table below to configure the Node Record parameters:

| <b>Step</b> | <b>Action</b>                                   | <b>Result</b>                |
|-------------|---|------------------------------|
| <b>1</b>    | Select <b>Configure</b> from the CTP Main menu. | The Configure menu displays. |

## Configuration Menu

Figure 2-1 below is a sample Configuration Menu:



**Figure 2-1. Sample Configuration Menu**

## Configuring Node Record

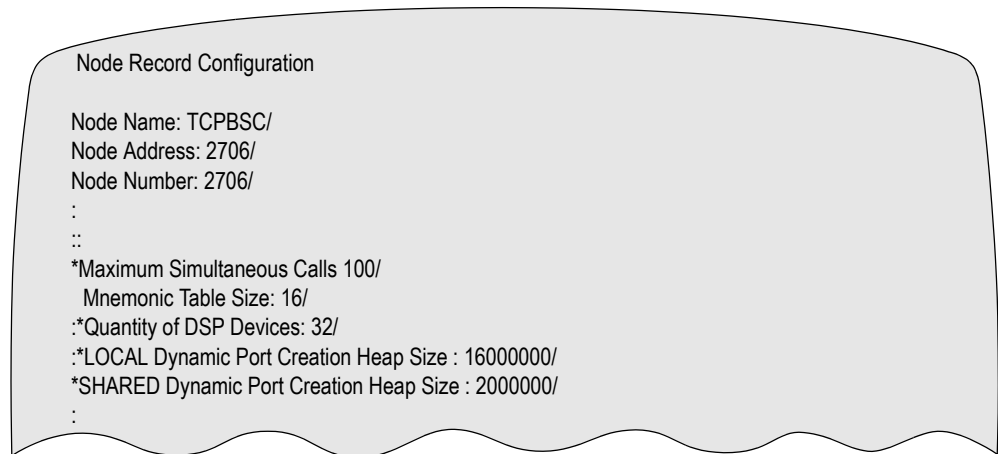
### Introduction

The Node Record stores the node configuration parameters.

### Configuration

Refer to Figure 2-2 and follow these steps to configure the Node Record:

| Step | Action  | Result   |
|------|---|--|
| 1    | Select <b>Configure</b> from the CTP Main menu. | The Configure menu displays.   |
| 2    | Select <b>Node</b> from the Configure menu.     | The Node Record Configuration screen displays, showing the Node Name: parameter. |



**Figure 2-2. Node Record Configuration Menu**

### Maximum Simultaneous Calls

|             |   |
|-------------|---|
| Range       | 0-2000  |
| Default     | 100   |
| Description | Limiting the number of calls allowed in the node will eliminate data loss in extreme traffic conditions.<br>0 - unlimited calls allowed |
| Boot Type   | A change to this parameter requires a node boot to take effect.   |

### Mnemonic Table Size

|         |        |
|---------|--------|
| Range   | 1-2000 |
| Default | 16     |

**Mnemonic Table Size** *(continued)*

|             |   |
|-------------|---|
| Description | Maximum permitted number of Mnemonic Table entries. The CMEM value of this parameter determines the maximum entry number for new CMEM table entries. It may be necessary to increase this size parameter value before adding new table entries. |
| Boot Type   | A change to this parameter requires a node boot to take effect.   |

**Quantity of DSP Devices**

|             |  |
|-------------|--|
| Range       | 1-1024   |
| Default     | 32   |
| Description | Maximum configured number of DSP type devices on this node.<br>For example BSC3270, BSTD, IBM2260 all use DSP devices. |
| Boot Type   | A change to this parameter requires a node boot to take effect.  |

**LOCAL Dynamic Port Creation**

|             |  |
|-------------|--|
| Range       | 16384-16000000   |
| Default     | 16000000   |
| Description | Select size of the special local memory pool dedicated for dynamic port deletion and creation.<br>Set size to 0 to disable the pool. |
| Boot Type   | A change to this parameter requires a node boot to take effect.  |

**SHARED Dynamic Port Creation**

|             |   |
|-------------|---|
| Range       | 16384-16000000  |
| Default     | 2000000   |
| Description | Select size of the special shared memory pool dedicated for dynamic port deletion and creation.<br>This entry is ignored if the local memory pool size is zero. |
| Boot Type   | A change to this parameter requires a node boot to take effect.   |

## Configuring Port Records

### Introduction

Port Records store the port configuration parameters, with each active port having a separate record. Active port number (location) and port type must be defined before you configure the remaining Port Record parameters.

### Configuration

Follow these steps to configure the Port Records:

| Step | Action  | Result  |
|------|---|---|
| 1    | Select <b>Configure</b> from the CTP Main menu.                                     | The Configure menu displays.  |
| 2    | Select <b>Port</b> from the Configure menu.   | The Port Number parameter displays.   |
| 3    | At the prompt, enter the number of the port you want to configure and press Return. | The parameters are successively displayed.<br><b>Note</b><br>When an asterisk appears beside a parameter in a record, a Node Boot is needed for any changes to that parameter to take effect. |

## Configuring the Ethernet Port Record

### Ethernet Port Record Parameters

The Ethernet Port record contains these parameters:

#### Port Number

|             |  |
|-------------|--|
| Range       | 23 or 24   |
| Default     | 23   |
| Description | Enter the number of the port to configure. This number is the Port Record reference number and represents both physical and virtual ports. Physical ports are located at the front and rear of the hardware chassis. |

#### Port Type

|             |   |
|-------------|---|
| Range       | NULL, ETH   |
| Default     | ETH   |
| Description | Specify the type of port you are configuring: <ul style="list-style-type: none"> <li>• NULL - NULL port type</li> <li>• ETH - Ethernet port type</li> </ul> |
| Boot Type   | A change to this parameter requires a node boot to take effect.   |



**Port MAC Address**

|             |  |
|-------------|--|
| Range       | 00-00-00-00-00-00 to FE-FF-FF-FF-FF-FF   |
| Default     | 00-00-00-00-00-00  |
| Description | Specifies the MAC address of the LAN port. The entered value of 00-00-00-00-00-00 is replaced by the Burned in Address (BIA) if the LAN hardware is present. |
| Boot Type   | A change to this parameter requires a node boot to take effect.  |

**Transmit Queue Limit**

|             |   |
|-------------|---|
| Range       | 20 to 500   |
| Default     | 50  |
| Description | Specifies the maximum number of frames that can be queued on the LAN transmitter before any frames are dropped. |

**Bridge Link Number**

|             |   |
|-------------|---|
| Range       | 1 to 5  |
| Default     | 1   |
| Description | Specifies the bridge link number associated with the LAN port. The corresponding bridge link record must be configured under the bridge configuration menu. |

**Router Interface Number**

|             |  |
|-------------|--|
| Range       | 1-50   |
| Default     | 1  |
| Description | Specifies the router interface number associated with this LAN port. |

**Port Operating Mode**

|             |   |
|-------------|---|
| Range       | AUTO, 1000FD, 100FD, 100HD, 10FD, 10HD  |
| Default     | AUTO  |
| Description | Specifies whether this LAN port runs in 1000Mbit Full-Duplex, 100Mbit Full-Duplex, 100Mbit Half-Duplex, 10Mbit Full-Duplex, 10Mbit Half-Duplex, or Auto-Negotiation mode.<br><br><b>Note</b><br>Vanguard 7300 Series - Release 6.4 and greater software supports 1000FD on ports 101 and 103 using the IBM750FX CPU card. ETH1 is port 101, ETH2 is port 103. Port 102 is the COM port. |

## Configuring TCP to BSC Tables

### Configuration

Refer to Figure 2-3 and follow these steps to configure the TCP to BSC Features Table record:

| Step | Action  | Result  |
|------|---|---|
| 1    | Select <b>Configure</b> from the CTP Main menu.   | The Configure menu displays.  |
| 2    | Select <b>TCP to BSC Conv Record Configure</b> from the Configure menu.   | The Port Number parameter displays.                                 |
| 3    | Select the feature to configure:<br>1 TCP to BSC Conversion Global Configure<br>2 TCP to BSC Conversion Records Configure | At the prompt, enter the number of the feature you are configuring. |

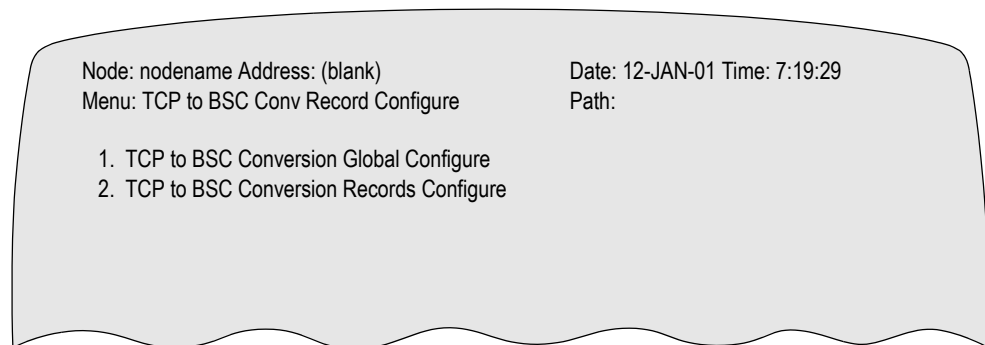


Figure 2-3. TCP to BSC Conversion Record Menu

### Configuring TCP to BSC Conversion Record Menu

Figure below shows the **TCP to BSC Conversion Record Configure** Menu.

#### TCP to BSC Conversion Global Configuration:

The TCP to BSC Conversion Global record contains these parameters:

##### Default Setting

For BSC 3270-to-TCP conversion use the default setting for the **TCP to BSC Conversion Global Configuration**.

##### Maximum # of Devices

|         |        |
|---------|--------|
| Range   | 1 to 3 |
| Default | 1      |

**Maximum # of Devices** *(continued)*

|             |  |
|-------------|--|
| Description | Maximum number of ATMs to be configured.<br><br><b>■ Note</b><br>This number must be at least the number of ATMs to be configured. |
|-------------|--|

**TCP Read and Write buffer size**

|             |  |
|-------------|--|
| Range       | 100-65000  |
| Default     | 2048   |
| Description | This parameter sets the size of read and write buffers posted to TCP by TCP BSC. |

**TCPBSC Window Size**

|             |  |
|-------------|--|
| Range       | 1-63   |
| Default     | 15   |
| Description | The window size that TCPBSC maintains with its peer. |

**TCP Maximum Segment Size**

|             |   |
|-------------|---|
| Range       | 1-2048  |
| Default     | 536   |
| Description | This parameter sets the maximum size of the segments sent out by TCP. |

**TCP Keep alive timer**

|             |  |
|-------------|--|
| Range       | Enabled,Disabled   |
| Default     | Enabled  |
| Description | Turn ON/OFF the TCP keep alive timer. If it is enabled, TCP sends keep alive packets every 1 minute. |

**Public Access TCP Port Number**

|             |   |
|-------------|---|
| Range       | 1-65535   |
| Default     | 0   |
| Description | This is the TCP port number that the TCPBSC Server will accept PUBLIC connections on. |

**TCP to BSC  
Conversion  
Records  
Configuration:**

The TCP to BSC Conversion record contains these parameters:

**Entry Number**

|             |   |
|-------------|---|
| Range       | 1-3   |
| Default     | 1   |
| Description | Entry number used to reference this table record. |

**TCP Role**

|             |  |
|-------------|--|
| Range       | CLIENT,SERVER  |
| Default     | CLIENT   |
| Description | CLIENT - TCPBSC is client<br>SERVER - TCPBSC is server |

**Destination IP Address**

|             |  |
|-------------|--|
| Range       | A valid IP address in dotted notation  |
| Default     | 0.0.0.0  |
| Description | (Client only) Specifies the destination IP address used for session establishment. |

**Destination Port Number**

|             |   |
|-------------|---|
| Range       | 256-65535   |
| Default     | 3000  |
| Description | (Client only) Specifies the destination TCP port number used for session establishment. |

**Source Interface Number**

|             |  |
|-------------|--|
| Range       | 0-36   |
| Default     | 0  |
| Description | Specifies the Interface Number referring to the source IP Address. Interface 0 refers to Internal IP Address. In Server role, Interface 0 or a LAN interface is ignored, but a WAN interface may be specified only to allow the remote client to access this node. |

### Source Port Number

|             |  |
|-------------|--|
| Range       | 256-65535  |
| Default     | 3000   |
| Description | (Server only) Specifies the source TCP port number used for session establishment. |

### BSC Device Type

|             |   |
|-------------|---|
| Range       | TERM,ATM  |
| Default     | ATM   |
| Description | TERM - device is a 3270 display<br>ATM - device is an ATM |

### Destination Control Unit Address

|             |   |
|-------------|---|
| Range       | 00-D9 hexadecimal   |
| Default     | 40  |
| Description | <p>Specifies control unit address on remote PAD.<br/>Used with Connection Request Mode = 2 or 3.<br/>When placing the call from TCPBSC (HPAD), it must match BSC Control Unit Control Unit Address in BSC3270 device table parameter.<br/>When placing the call from BSC3270 (TPAD), it must match Destination Control Unit Address in BSC3270 device table parameter.<br/>The address consists of two hexadecimal digits. Valid ranges depend on device Character Set as follows:</p> <p>EBCDIC:<br/>40,C1,C2,C3,C4,C5,C6,C7,C8,C9,4A,4B,4C,4D,4E,4F,50,D1,D2,D3,D4,D5,D6,D7,D8,D9,5A,5B,5C,5D,5E,5F</p> <p>ASCII:<br/>20,41,42,43,44,45,46,47,48,49,5B,2E,3C,28,2B,21,26,4A,4B,4C,4D,4E,4F,50,51,52,5D,24,2A,29,3B,5E</p> <p>■<b>Note</b><br/>For Connection Request Mode = 3, 0 can be specified as wild-card.</p> |

### Destination Device Address

|         |                   |
|---------|-------------------|
| Range   | 00-D9 hexadecimal |
| Default | 40                |

**Destination Device Address (continued)**

|             |  |
|-------------|--|
| Description | <p>Specifies device address on remote PAD.<br/>                 Used with Connection Request Mode = 2 or 3.<br/>                 When placing the call from TCPBSC (HPAD), it must match BSC Device Address in BSC3270 device table parameter.<br/>                 When placing the call from BSC3270 (TPAD), it must match Destination Device Address in BSC3270 device table parameter. This address consists of two hexadecimal digits. Valid ranges depend on device.<br/>                 Character Set as follows:<br/>                 EBCDIC:<br/>                 40,C1,C2,C3,C4,C5,C6,C7,C8,C9,4A,4B,4C,4D,4E,4F,50,D1,D2,D3,D4,D5,D6,D7,D8,D9,5A,5B,5C,5D,5E,5F<br/>                 ASCII:<br/>                 20,41,42,43,44,45,46,47,48,49,5B,2E,3C,28,2B,21,26,4A,4B,4C,4D,4E,4F,50,51,52,5D,24,2A,29,3B,5E</p> |
|-------------|--|

**TCP Host Applications**

|             |  |
|-------------|--|
| Range       | BASE24,EPOC  |
| Default     | BASE24   |
| Description | Type of TCP Host applications supported for this session |

**3270 Command/WCC inserted in outbound Message**

|         |                       |
|---------|-----------------------|
| Range   | 0000-FFFF hexadecimal |
| Default | F1C2                  |

**3270 Command/WCC inserted in outbound Message**

|             |  |
|-------------|--|
| Description | <p>Use only for data containing no 3270 command and WCC on outbound LU type 0.</p> <p>Specifies the 3270 Write Command and the WCC to be inserted at beginning of each outbound RU.</p> <p>The 2 hexadecimal or ascii digits for the 3270 Command as follows:</p> <ul style="list-style-type: none"> <li>'F1' or '31' - Write</li> <li>'F5' or '35' - Erase Write</li> <li>'6F' or '3F' - Erase All Unprotected</li> </ul> <p>The 2 hexadecimal digits for the WCC as follows:</p> <ul style="list-style-type: none"> <li>'C2' - Restore input key operation</li> <li>'C5' - Restore key operation and reset MDT bits in device buffer</li> <li>'0000' - nothing will be inserted in RU</li> </ul> <p>Example:</p> <ul style="list-style-type: none"> <li>'F1C2' - Write on screen and restore input keys operation</li> <li>'F5C5' - Erase and Write on screen, restore input keys operation, and reset MDT bits in device buffer.</li> </ul> |
|-------------|--|

**Autocall Mnemonic**

|             |   |
|-------------|---|
| Range       | 0-8 alphanumeric characters, use the space character to blank field   |
| Default     | (blank)   |
| Description | <p>This mnemonic references the remote X.25 address which will be auto-called.</p> <p>If blank, then autocalling is disabled, and the other end should initiate the call.</p> |

**EBCDIC/ASCII Translation**

|             |                  |
|-------------|------------------|
| Range       | Enabled,Disabled |
| Default     | Enabled          |
| Description |                  |

**TCPBSC Options**

|         |                                       |
|---------|---------------------------------------|
| Range   | NONE,NHOSTDA,TCPDBG,DSPDBG,TSTAUTOLOG |
| Default | NONE                                  |

**TCPBSC Options** *(continued)*

|             |  |
|-------------|--|
| Description | NONE - no user's TCPBSC option<br>NHOSTDA - Host will not send 'device active' status<br>TCPDBG - print TCP debug information<br>DSPDBG - print DSP debug information<br>TSTAUTOLOG - VanguardNW reserved setting for test only. |
|-------------|--|

**Connect Timer**

|             |   |
|-------------|---|
| Range       | 5-1000  |
| Default     | 10  |
| Description | The Connect Timer specifies the maximum length of time in seconds to wait for device to connect. This is the maximum amount of time the response to initial request from host would be delayed while attempting to connect to device. |

**Initial TCP Retry Timer**

|             |  |
|-------------|--|
| Range       | 5-1000   |
| Default     | 20   |
| Description | The TCP Retry Timer I specifies the length of time in seconds to wait before first retry to connect TCP. |

**Subsequent TCP Retry Timer**

|             |   |
|-------------|---|
| Range       | 5-1000  |
| Default     | 10  |
| Description | The TCP Retry Timer II specifies the length of time in seconds to wait before each subsequent retry to connect TCP. |

**Host Active bit Time**

|             |  |
|-------------|--|
| Range       | 5-1000   |
| Default     | 10   |
| Description | Used immediately after TCP is connected and NHOSTDA option is not specified. The Host Active Bit Timer specifies the length of time in seconds to wait for 'device active' bit from the host. If it times out, TCPBSC will then place the call with the BSC device, send 'device active' bit to the host and start Host Data Timer to wait for data from the host. A zero value will cause TCPBSC to permanently wait for the 'device active' bit. |



**Host First Data Timer**

|             |  |
|-------------|--|
| Range       | 5-1000   |
| Default     | 120  |
| Description | Used immediately after placing a call with the BSC device. The Host Data Timer specifies the length of time in seconds to wait for first data block from the host. If it times out, TCPBSC disconnect from the BSC device and start Host Data Retry Timer. |

**Host Data Retry Timer**

|             |   |
|-------------|---|
| Range       | 5-1000  |
| Default     | 10  |
| Description | Used immediately after clearing the call with the BSC device during attempt to receive data from the host. The Host Data Retry Timer specifies the length of time in seconds to wait before retrying. When it times out, TCPBSC will then place the call with the BSC device, send 'device active' bit to the host and start Host Data Retry Timer. |

**Calling Address**

|             |  |
|-------------|--|
| Range       | 0-15 BCD digits, use the space character to blank field  |
| Default     | (blank)  |
| Description | Calls placed from this node will have this address in the X.25 Calling Address. For calls received by this node, this field is compared to the X.25 Calling Address and a match must be made in order for the call to be accepted. |

**DSP Device Characteristics**

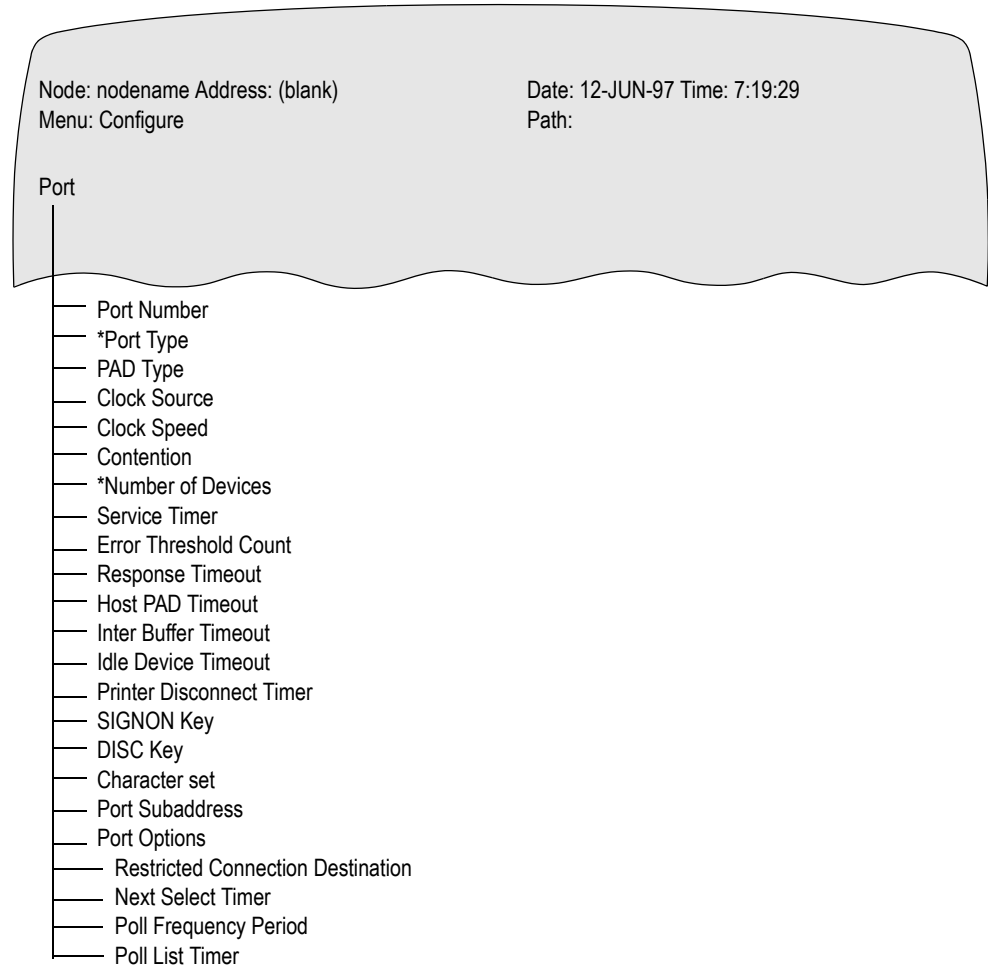
|             |   |
|-------------|---|
| Range       | NONE, XPAR, COLOR, PRINa  |
| Default     | NONE  |
| Description | NONE - no option<br>XPAR - device supports transparency<br>COLOR - device supports color<br>PRINa - printer is attached to a terminal device<br>Any combination of above specified by summin (eg. COLOR+PRINa). |

## Configuring BSC3270

### BSC3270 Port Configuration

To configure the BSC3270 Port CESS+CESS3 must be selected. Figure 2-4 below shows the parameters in the Configuration record.

#### Configure->Port->Port Options: CESS+CESS3



**Figure 2-4. CESS+CESS3 Port Menu**

**Port Options  
Parameter**

Select the option CESS+CESS3 from the Port Options parameter.

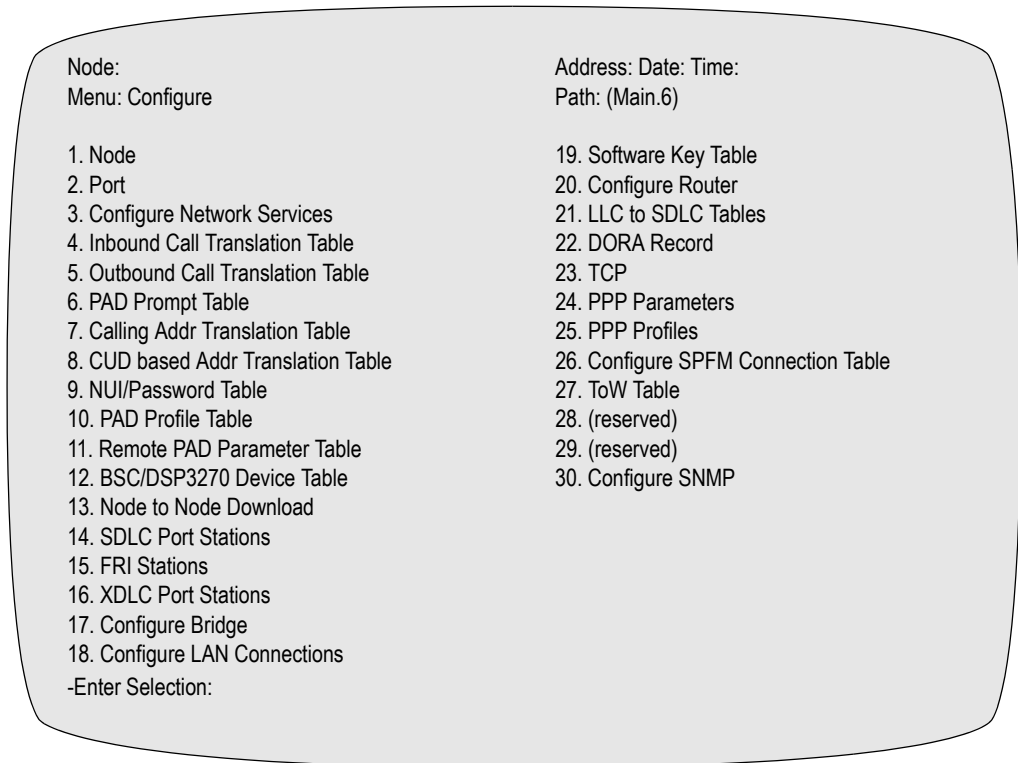
**Port Options**

|             |   |
|-------------|---|
| Range       | NONE, CESS, SINGLE, EPAD, CESS2, CESS3  |
| Default     | None  |
| Description | <p>Specifies the port type you are configuring:</p> <ul style="list-style-type: none"> <li>• NONE: No option is specified.</li> <li>• CESS: This option turns the polling cessation ON.</li> <li>• In the HPAD, a G-POLL is not responded to if none of the terminals configured on that controller are in a connected state (that is, no SVC in place) and there are no printers configured on that controller. An S-POLL or SELECT or a data message to a terminal is not responded to if that device is not in a connected state.</li> </ul> <p>In the TPAD, devices that are configured for AUTO+ORG are not polled until the connection (SVC) to the remote HPAD is established.</p> <ul style="list-style-type: none"> <li>• CESS2: On the HPAD, a GPOLL (General Poll) response is not generated if all devices configured on a controller are in a disconnected state (that is, no SVC in place) and it does not receive a Device End status message. A SPOLL (specific poll), select or a data message response is not generated if the device is in a disconnected state and it does not receive a Device End status message. (Remote Device or TPAD must send a Device End status message.)</li> <li>• CESS3: On the TPAD, when the call request is received, a SPOLL is sent to the device. If an EOT is received from the device, the call accept is sent to the HPAD immediately. Otherwise, if the device does not respond with an EOT, a call reject is sent to the HPAD. CESS3 must be configured in conjunction with CESS, for use with HPAD SNABSC Conversion, and the call must originate from the HPAD.</li> <li>• SINGLE: The HPAD transmits only one complete message (single or multiple block message) when responding to a SPOLL or GPOLL. This option only applies to HPAD ports.</li> <li>• EPAD: This option pertains to the ASCII character set only. The message terminating EPAD character is hex 7F and FF when this option is enabled, otherwise hex FF is used. Any combination of the above can be specified by summing. For example, CESS+SINGLE.</li> </ul> |

**BSC/DSP3270 Configuration**

Figure 2-5 below is a sample Configure Menu. SPEOT must be selected in the Device Control parameter.

**Configure->BSC/DSP3270 Device Table->Device Control: SPEOT**



**Figure 2-5. Sample Configuration Menu**

**Device Option Parameter**

Select SPEOT from the Device Option parameter in the BSC/DSP3270 Device Table.

**Device Control**

|         |   |
|---------|---|
| Range   | NONE, GPOLL, PSPOLL, SPOLL, MSPOLL, NSERV, NSTAT, RVI, SPEOT, SPEND, NCMD |
| Default | None  |

**Device Control** (continued)

|             |   |
|-------------|---|
| Description | <p>Specifies device control:</p> <ul style="list-style-type: none"> <li>• NONE: No device control parameter set.</li> <li>• GPOLL: Device is only polled by General Polls (TPAD only).</li> <li>• PSPOLL: Periodic specific polling of a device (TPAD only).</li> <li>• SPOLL: Forced specific polling of a device (TPAD only).</li> <li>• MSPOLL: Forced specific polling of a device, except when the controller is down (TPAD only).</li> <li>• NSERV: No service messages are sent to the device (TPAD only).</li> <li>• NSTAT: Disables the generation of dummy DEVICE END status messages.</li> <li>• RVI: Forces TPAD to send RVI as an ACK for terminal text/ status messages terminated with ETB or ETX (TPAD only).</li> <li>• SPEOT: SEL-ACK-TEXT-EOT-POLL-EOT or SEL-RVI-POLL-</li> <li>• EOT message exchanges between the TPAD and the controller disconnects the device's session to prevent a lockup condition due to a faulty controller (TPAD only).</li> <li>• SPEND: SPOLL is sent to every Service Timer Interval when the TPAD is flow controlled, that is, TPAD received WACK.</li> <li>• NCMD: Prevents the HPAD from checking for ESC and CMD codes in messages from the host. Consequently, the LCM flag is never sent in DSP messages to the TPAD. Printer devices are not supported.</li> </ul> <p><b>■Note</b><br/>Any combination of the above may be specified by summing, for example, GPOLL+SPOLL. GPOLL overrides SPOLL if both are selected; this situation is not recommended. Devices under a COMMON CU ADDRESS must have identical Polling methods.</p> <p>For example, if CU40 has 4 devices, all devices must be GPOLL, SPOLL, or neither</p> |
|-------------|---|

## Configuration Examples

### Application #1

Figure 2-6 and Figure 2-7 show how Node100 and Node 200 are configured to connect Base24 Host Server with BSC ATM Client in WAN environment. Note that TCP-to-BSC Conversion is in Node200 where Router and TCP-to-BSC Conversion Record are configured to use Internal Address as the source IP address through Source Interface Number 0 (internal IP address).

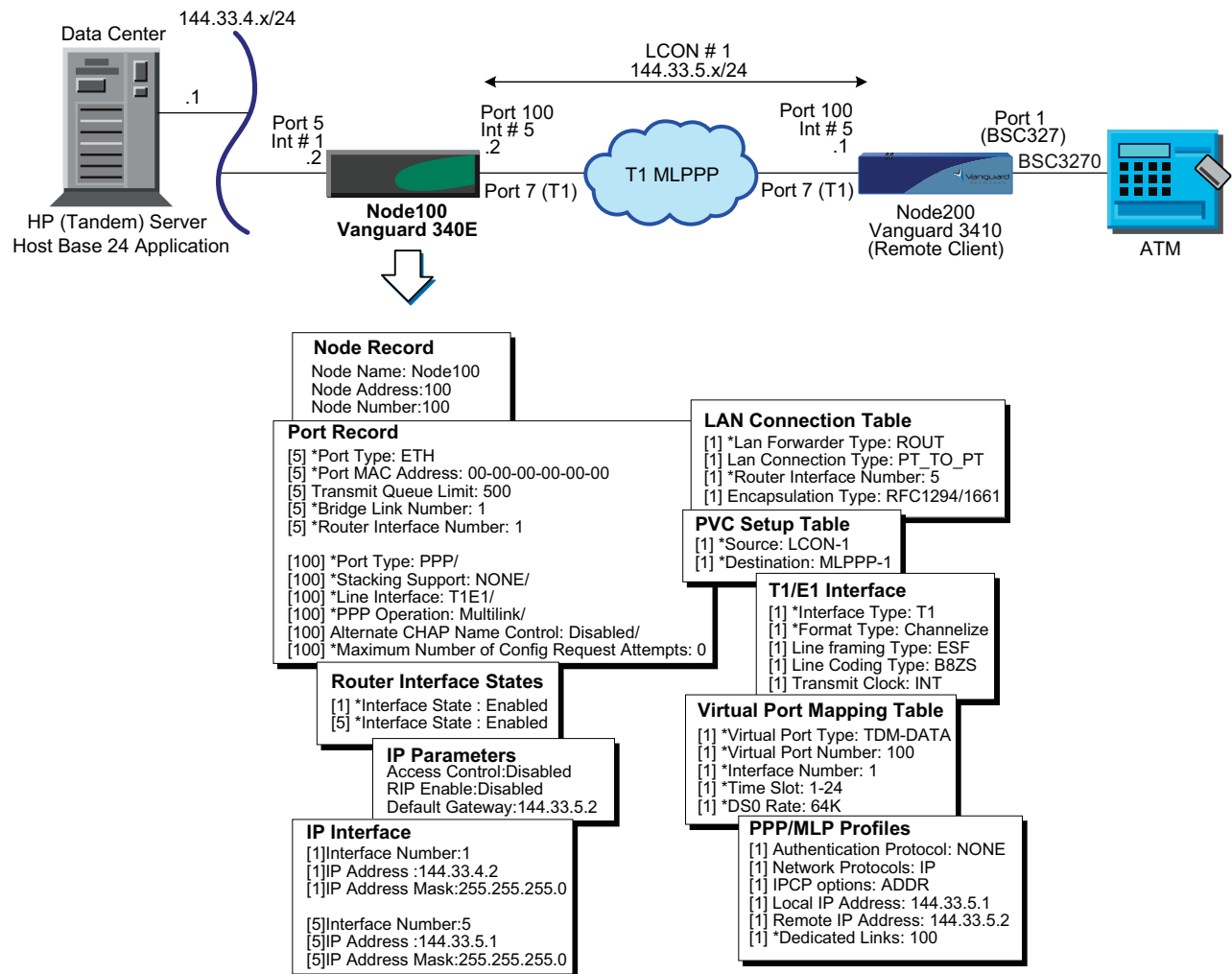
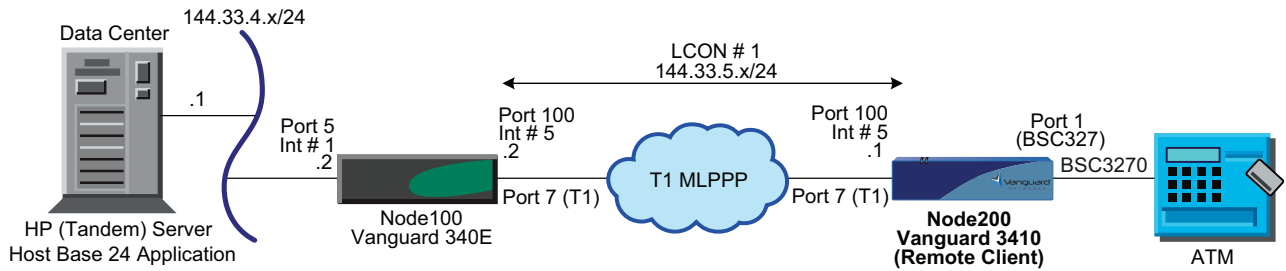


Figure 2-6. Example of Base24 Remote Client Application 1



**Node Record**  
Node Name: Node200  
Node Address:200  
Node Number:200

**Port Record**  
[1]Port Type: BSC3270  
[1]Interface Type:V.24  
[1]V.24 Interface Option:RI  
[1]PAD Type:TPAD  
[1]Clock Source:INT  
[1]Clock Speed:9600  
[1]Contention:FDX  
[1]Connection type:SIMP  
[1]\*Number of Devices:1  
[1]Port Options:CESS3  
  
[100] \*Port Type: PPP/  
[100] \*Stacking Support: NONE/  
[100] \*Line Interface: T1E1/  
[100] \*PPP Operation: Multilink/  
[100] Alternate CHAP Name Control: Disabled/  
[100] \*Maximum Number of Config Request Attempts: 0

**Router Interface States**  
[5] \*Interface State : Enabled  
[6] \*Interface State : Enabled

**IP Parameters**  
Internal IP Address:144.33.4.2  
Internal Net Mask:255.255.255.0  
Access Control:Disabled  
RIP Enable:Disabled  
Default Gateway:144.33.5.1

**IP Interface**  
[5]Interface Number:5  
[5]IP Address :144.33.5.2  
[5]IP Address Mask:255.255.255.0

**BSC/DSP3270 Device**  
[1]BSC Control Unit Address:C1  
[1]BSC Device Address:40  
[1]DSP Device Type:TERM  
[1]DSP Control:NONE  
[1]Device Control:SPOLL  
[1]Device Option:NONE  
[1]DSP Device Characteristics:XPAR  
[1]DSP Device Format Size:480  
[1]DSP Character Set Capability:NONE  
[1]DSP Application Identifier:0  
[1]Connection Request Mode:2  
[1]Destination Control Unit Address:C1  
[1]Destination Device Address:40

**Mnemonic Table**  
[1]Mnemonic Name:tcpbsc01  
[1]Call Parameters:20001

**LAN Connection Table**  
[1] \*Lan Forwarder Type: ROUT  
[1] Lan Connection Type: PT\_TO\_P  
[1] \*Router Interface Number: 5  
[1] Encapsulation Type: RFC1294/16

**PVC Setup Table**  
[1] \*Source: LCON-1  
[1] \*Destination: MLPPP-1

**T1/E1 Interface**  
[1] \*Interface Type: T1  
[1] \*Format Type: Channelize  
[1] Line framing Type: ESF  
[1] Line Coding Type: B8ZS  
[1] Transmit Clock: REC

**Virtual Port Mapping Table**  
[1] \*Virtual Port Type: TDM-DATA  
[1] \*Virtual Port Number: 100  
[1] \*Interface Number: 1  
[1] \*Time Slot: 1-24  
[1] \*DS0 Rate: 64K

**PPP/MLP Profiles**  
[1] Authentication Protocol: NONE  
[1] Network Protocols: IP  
[1] IPCP options: ADDR  
[1] Local IP Address: 0.0.0.0  
[1] Remote IP Address: 0.0.0.0  
[1] \*Dedicated Links: 100

**TCP to BSC Conversion Global Configure**  
Maximum # of Devices: 1/  
TCP Read and Write buffer size: 2048/  
TCPBSC Window Size: 15/  
TCP Maximum Segment Size: 536/  
TCP Keep alive timer: Enabled/  
Public Access TCP Port Number: 0/

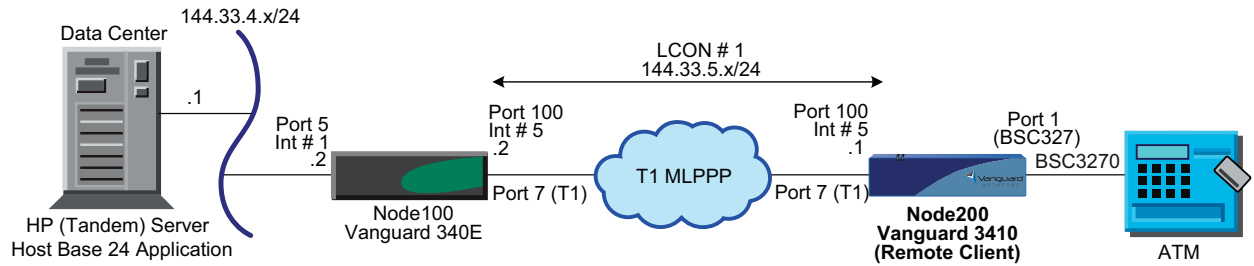
**TCP to BSC Conversion Record**  
[1]TCP Role:CLIENT  
[1]Destination IP Address:144.33.4.1  
[1]Destination Port Number:1024  
[1]Source Interface Number:0\*  
[1]BSC Device Type:ATM  
[1]Destination Control Unit [1]Address:C1  
[1]Destination Device Address:40  
[1]3270 Command/WCC inserted in outbound Message:0000  
[1]Autocall Mnemonic:tcpbsc01  
[1]EBCDIC/ASCII Translation:Enabled  
[1]Host Applications :BASE24  
[1]TCPBSC Options:NONE

\*NOTE: Use Internal IP Address as a source IP address

Figure 2-7. Example of Base24 Remote Client Application 2

**Application #2**

Figure 2-8 shows Router and TCP-to-BSC Conversion Record in Node 200 configured to use Source Interface Number 6 as the source IP address.



|   |   |   |
|---|---|---|
| <b>Node Record</b><br>Node Name: Node200<br>Node Address:200<br>Node Number:200   | <b>BSC/DSP3270 Device</b><br>[1]BSC Control Unit Address:C1<br>[1]BSC Device Address:40<br>[1]DSP Device Type:TERM<br>[1]DSP Control:NONE<br>[1]Device Control:SPOLL<br>[1]Device Option:NONE<br>[1]DSP Device Characteristics:XPAP<br>[1]DSP Device Format Size:480<br>[1]DSP Character Set Capability:NONE<br>[1]DSP Application Identifier:0<br>[1]Connection Request Mode:2<br>[1]Destination Control Unit Address:C1<br>[1]Destination Device Address:40           | <b>Mnemonic Table</b><br>[1]Mnemonic Name:tcpbsc01<br>[1]Call Parameters:20001  |
| <b>Port Record</b><br>[1]Port Type: BSC3270<br>[1]Interface Type:V.24<br>[1]V.24 Interface Option:RI<br>[1]PAD Type:TPAD<br>[1]Clock Source:INT<br>[1]Clock Speed:9600<br>[1]Contention:FDX<br>[1]Connection type:SIMP<br>[1]*Number of Devices:1<br>[1]Port Options:CESS3<br><br>[100] *Port Type: PPP/<br>[100] *Stacking Support: NONE/<br>[100] *Line Interface: T1E1/<br>[100] *PPP Operation: Multilink/<br>[100] Alternate CHAP Name Control: Disabled/<br>[100] *Maximum Number of Config Request Attempts: 0 | <b>TCP to BSC Conversion Global Configure</b><br>Maximum # of Devices: 1/<br>TCP Read and Write buffer size: 2048/<br>TCPBSC Window Size: 15/<br>TCP Maximum Segment Size: 536/<br>TCP Keep alive timer: Enabled/<br>Public Access TCP Port Number: 0/  | <b>LAN Connection Table</b><br>[1] *Lan Forwarder Type: ROUT<br>[1] Lan Connection Type: PT_TO_P<br>[1] *Router Interface Number: 5<br>[1] Encapsulation Type: RFC1294/16   |
| <b>Router Interface States</b><br>[5] *Interface State : Enabled<br>[6] *Interface State : Enabled  | <b>TCP to BSC Conversion Record</b><br>[1]TCP Role:CLIENT<br>[1]Destination IP Address:144.33.4.1<br>[1]Destination Port Number:1024<br>[1]Source Interface Number:6<br>[1]BSC Device Type:ATM<br>[1]Destination Control Unit Address:C1<br>[1]Destination Device Address:40<br>[1]3270 Command/WCC inserted in outbound Message:0000<br>[1]Autocall Mnemonic:tcpbsc01<br>[1]EBCDIC/ASCII Translation:Enabled<br>[1]Host Applications :BASE24<br>[1]TCPBSC Options:NONE | <b>PVC Setup Table</b><br>[1] *Source: LCON-1<br>[1] *Destination: MLPPP-1  |
| <b>IP Parameters</b><br>Access Control:Disabled<br>RIP Enable:Disabled<br>Default Gateway:144.33.5.1<br>IP Interface<br><br>[5]Interface Number:5<br>[5]IP Address :144.33.5.2<br>[5]IP Address Mask:255.255.255.0<br><br>[6]Interface Number:6<br>[6]IP Address :144.33.4.2<br>[6]IP Address Mask:255.255.255.0  | <b>T1/E1 Interface</b><br>[1] *Interface Type: T1<br>[1] *Format Type: Channelize<br>[1] Line framing Type: ESF<br>[1] Line Coding Type: B8ZS<br>[1] Transmit Clock: REC  | <b>Virtual Port Mapping Table</b><br>[1] *Virtual Port Type: TDM-DATA<br>[1] *Virtual Port Number: 100<br>[1] *Interface Number: 1<br>[1] *Time Slot: 1-24<br>[1] *DSO Rate: 64K                                    |
|   |   | <b>PPP/MLP Profiles</b><br>[1] Authentication Protocol: NONE<br>[1] Network Protocols: IP<br>[1] IPCP options: ADDR<br>[1] Local IP Address: 0.0.0.0<br>[1] Remote IP Address: 0.0.0.0<br>[1] *Dedicated Links: 100 |

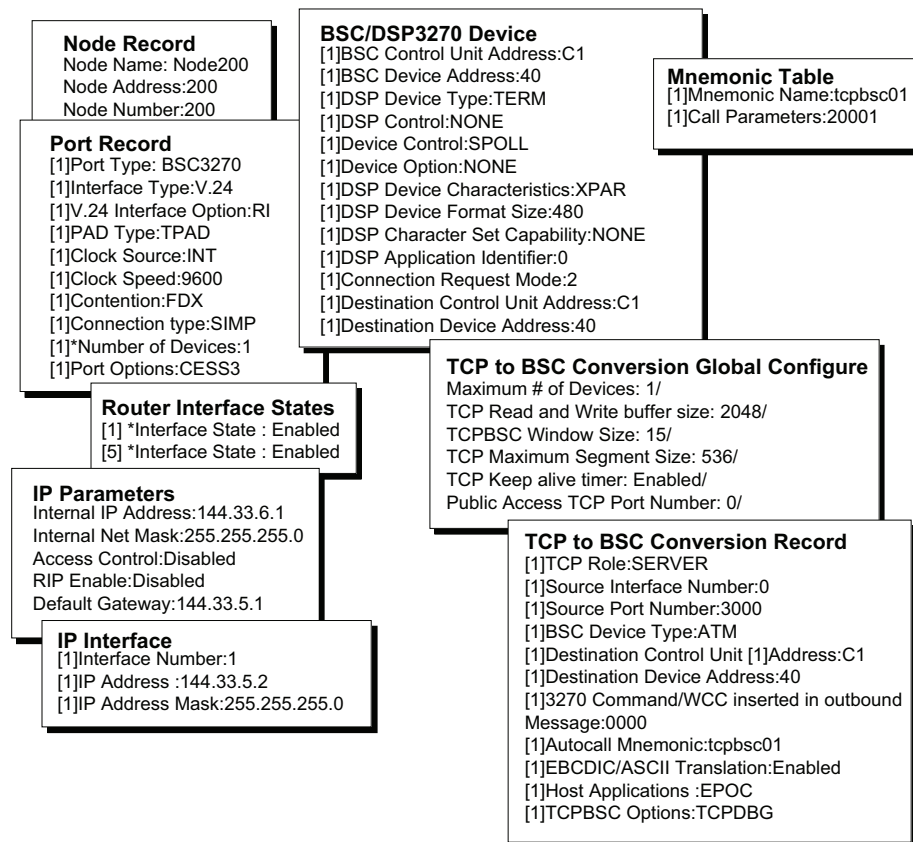
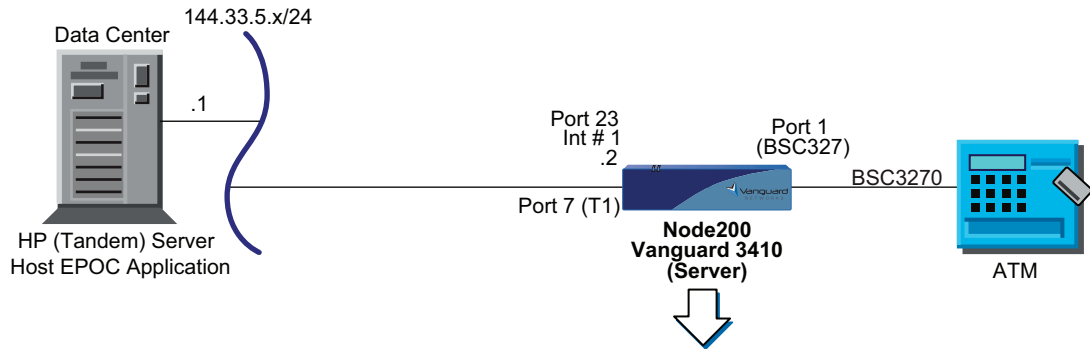
**\*NOTE:** Use Interface#6's IP Address as a source IP address.

**Figure 2-8. Example of Base24 Remote Client Router and TCP-to-BSC Conversion Record**



**Application #3**

Figure 2-8 shows TCP to BSC Conversion Record in Node 200 configured as a Server to EPOC Host Applications in LAN environment. Router and TCP-to-BSC Conversion Record are configured to use Internal Address as the source IP address through Source Interface Number 0.

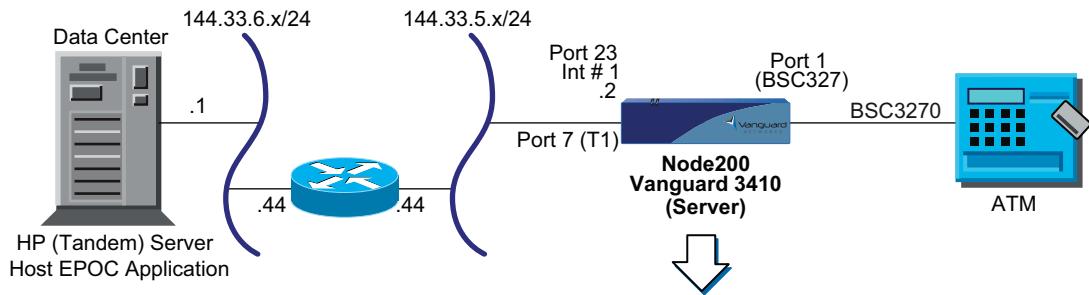


[Note\*: Use Internal IP Address as IP Address as a source IP address.]

**Figure 2-9. Example of TCP to BSC Conversion Record in Node 200 configured as a Server to EPOC Host Applications in LAN environment**

**Application #4**

Figure 2-9 show TCP to BSC Conversion Record in Node 200 configured as a Server to EPOC Host Applications in LAN environment using Interface #6 as the source IP address through Source Interface Number.



|  |  |  |
|--|--|--|
| <b>Node Record</b><br>Node Name: Node200<br>Node Address:200<br>Node Number:200  | <b>BSC/DSP3270 Device</b><br>[1]BSC Control Unit Address:C1<br>[1]BSC Device Address:40<br>[1]DSP Device Type:TERM<br>[1]DSP Control:NONE<br>[1]Device Control:S POLL<br>[1]Device Option:NONE<br>[1]DSP Device Characteristics:XPAR<br>[1]DSP Device Format Size:480<br>[1]DSP Character Set Capability:NONE<br>[1]DSP Application Identifier:0<br>[1]Connection Request Mode:2<br>[1]Destination Control Unit Address:C1<br>[1]Destination Device Address:40 | <b>Mnemonic Table</b><br>[1]Mnemonic Name:tcpbsc01<br>[1]Call Parameters:20001 |
| <b>Port Record</b><br>[1]Port Type: BSC3270<br>[1]Interface Type:V.24<br>[1]V.24 Interface Option:RI<br>[1]PAD Type:TPAD<br>[1]Clock Source:INT<br>[1]Clock Speed:9600<br>[1]Contention:FDX<br>[1]Connection type:SIMP<br>[1]*Number of Devices:1<br>[1]Port Options:CESS3 | <b>TCP to BSC Conversion Global Configure</b><br>Maximum # of Devices: 1/<br>TCP Read and Write buffer size: 2048/<br>TCPBSC Window Size: 15/<br>TCP Maximum Segment Size: 536/<br>TCP Keep alive timer: Enabled/<br>Public Access TCP Port Number: 0/   |  |
| <b>Router Interface States</b><br>[1] *Interface State : Enabled<br>[5] *Interface State : Enabled   | <b>TCP to BSC Conversion Record</b><br>[1]TCP Role:SERVER<br>[1]Source Interface Number:5 [Note*]<br>[1]Source Port Number:3000<br>[1]BSC Device Type:ATM<br>[1]Destination Control Unit [1]Address:C1<br>[1]Destination Device Address:40<br>[1]3270 Command/WCC inserted in outbound Message:0000<br>[1]Autocall Mnemonic:tcpbsc01<br>[1]EBCDIC/ASCII Translation:Enabled<br>[1]Host Applications :EPOC<br>[1]TCPBSC Options:TCPDBG                          |  |
| <b>IP Parameters</b><br>Access Control:Disabled<br>RIP Enable:Disabled<br>Default Gateway:144.33.5.44  |  |  |
| <b>IP Interface</b><br>[1]Interface Number:1<br>[1]IP Address :144.33.5.2<br>[1]IP Address Mask:255.255.255.0<br><br>[5]Interface Number:5<br>[5]IP Address : 144.33.6.2<br>[5]IP Address Mask:255.255.255.0   |  |  |

[Note\*: Use Interface#5's IP Address as IP Address as a source IP address.]

**Figure 2-10. Example of TCP to BSC Conversion Record in Node 200 configured as a Server to EPOC Host Applications in LAN environment Using Interface #6**











































