

Vanguard Managed Solutions

Vanguard Applications Ware
SNA Feature Protocols

Remote TN3270 Server

Notice

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Mansfield, Massachusetts 02048
(508) 261-4000
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Part No. T0101-10, Rev A
Publication Code DS
First Printing November 1998

Manual is current for Release 6.3 of Vanguard Applications Ware.

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

Overview

Before Using This Manual

Before using this manual you should have experience using IBM or IBM-compatible equipment and should be familiar with System Network Architecture (SNA) and the IP protocol.

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Remote TN3270 Server

Introduction

Remote TN3270 Server allows IP devices to communicate with an SNA mainframe. Users running a TN3270 emulator on their workstation can map an IP address to an LU session.

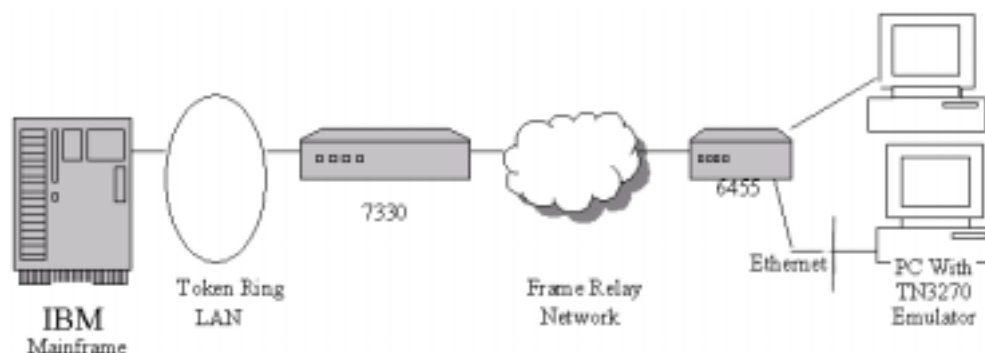


Figure 1. Remote TN3270 Server Application

Application

The TN3270 Remote Server allows an IP workstation running a TN3270 emulator at remote branch sites to gain access to a SNA Mainframe at a host site across a Frame Relay network. Figure 1 shows an example of a remote Server application. In this example the TN3270 Remote Server software is running in the Vanguard 6455. It maps the SNA Data Frames that it receives on the Frame Relay Network to the appropriate IP address that is assigned to the workstation running the TN3270 Emulator. In the opposite direction the TN3270 data frames from the workstation are mapped to SNA data frames before being transmitted to the Frame Relay Network. The TN3270 data frames are transported across the Ethernet in IP packets. QLLC-to-SDLC conversion stations are the only stations that support TN3270 LU's. QLLC provides a guaranteed Data Link Layer for transport of SNA frames and runs over X.25, Frame Relay Annex G, and ATM FRST stations.

TN3270 Emulator Support

The TN3270 Emulator best choice is E-Term For IBM. E-Term For IBM Emulator information is available on the web at www.dcsi.com. Other TN3270 Emulators tested and supported are:

- E-Term For IBM, Vendor: DCSi (*IND\$FILE transfers supported*)
- Hummingbird Host Explorer (*IND\$FILE transfers excluded*)
- IBM Host On-Demand 2.0 Client (*IND\$FILE transfers excluded*)

■ Note

Vanguard Managed Solutions only supports the TN3270 terminal emulators listed above.

**IP Address and
TCP Port Number**

The IP address used by clients to access the TN3270 server is the IP address of the VanguardMS router interface.

The TCP port number that the client should use is the port number specified in the TN3270 parameters table. The destination TCP port Number that is configured in the client PC must be the port number specified in the TN3270 server parameters.

**Device Access
Using LU Name**

TN3270 Emulators that support TN3270E (Enhanced) can be configured to use a specific Display LU name, LU group name or Printer LU name in the Vanguard's TN3270 Server. This is done by specifying the same LU name in the TN3270 Emulator setup as is used in the Vanguard's display or printer device record.

When using a Display Device Group, the TN3270E Emulator will only use a display LU from the specific group if the LU name configured in the emulation software matches one of the group names in the Display Device Group.

Please note that the LU Name configured in a TN3270E client takes precedence over the configured IP Address in the TN3270 Device record.

**Telnet CTP Server
TCP Port**

A new parameter has been added to the Node Record called Telnet CTP Server TCP Port. This parameter is needed because telnet and TN3270 protocols both use Port 23 by default. For TN3270 and Telnet to co-exist in VanguardMS routers simultaneously, their configured TCP Port Numbers must be different. The user has the capability from the Telnet sub-menu in the Diagnostics Menu to specify a port number when invoking telnet. This allows users to access nodes which may have had the telnet port number in their node record modified to a number other than 23.

Node Record**Telnet CTP Server TCP Port**

Range:	1 to 65535
Default:	23
Description:	This is the TCP port on which the TELNET CTP Server will accept connections.

Dynamic Memory Support

Before configuring Remote TN3270 Server you must enable Dynamic Memory Support. These parameters are located under the Node record and require a node boot to take effect.

***LOCAL Dynamic Port Creation Heap Size**

Range:	0 to 16000000
Default:	0
Description:	<p>This specifies the size of the special shared memory pool dedicated for Ease of Configuration.</p> <ul style="list-style-type: none"> • To disable this parameter set to zero (0). • To enable Ease of Configuration, set this parameter to the maximum value. <p>■ Note A change to this parameter requires a node boot to take effect.</p>

***SHARED Dynamic Port Creation Heap Size**

Range:	0 to 16000000
Default:	0
Description:	<p>This specifies the size of the special shared memory pool dedicated for Ease of Configuration.</p> <ul style="list-style-type: none"> • To disable this parameter set to zero (0). • To enable Ease of Configuration, set this parameter to the maximum value. <p>■ Note A change to this parameter requires a node boot to take effect.</p>

Logmode Configuration

LOGMODE must be configured in the host to the following specifications for TN3270 Remote Server to work.

```

*          DISPLAY LOGMODE FOR REMOTE TN3270 SERVER          * 19700000
*          VANGUARD MODEL 340 AND 340A ONLY                  *
*          PRIMARY SCREEN 24 X 80 (1920)                     * 19750000
*          NO ALTERNATE SCREEN DEFINED                       * 19800000
* CHANGE LOG:                                               *
* *                                                         *
* *                                                         *
***** 19900000
MODETAB3 MODETAB
VMSDSP01 MODEENT LOGMODE=VMSDSP01,                          *15100003
          FMPROF=X'03',                                     *
          TSPROF=X'03',                                     *
          PRIPROT=X'B1',                                     *
          SECPROT=X'90',                                     *
          COMPROT=X'3080',                                   *
          RUSIZES=X'87C7',                                   *
          PSNDPAC=X'00',                                     *
          SRCVPAC=X'00',                                     *
          SSNDPAC=X'00',                                     *
          PSERVIC=X'0200000000000000000000000200',        *15200002
          APPNCOS=#CONNECT
MODEEND
END

```

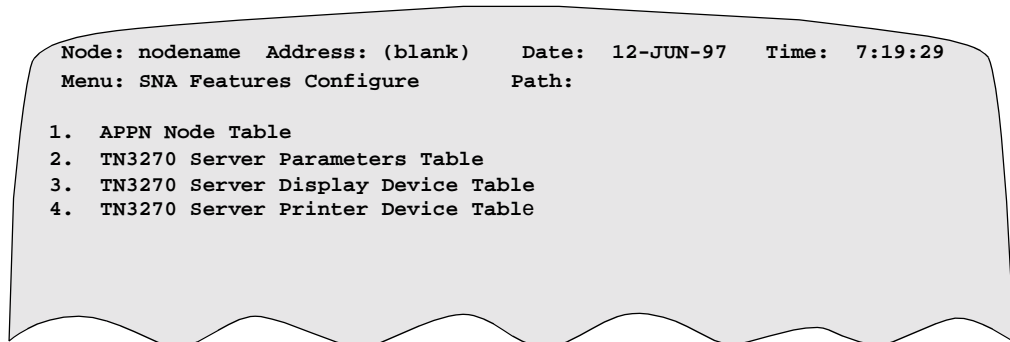
Figure 2. Logmode Configuration

Remote TN3270 Configuration Record

What You See in This Record

The Remote TN3270 Configuration Record contains parameters that define the TN3270 server characteristics for the node. It includes many key values.

Figure 3 shows the Remote TN3270 Configuration Record.



```
Node: nodename Address: (blank) Date: 12-JUN-97 Time: 7:19:29
Menu: SNA Features Configure Path:

1. APPN Node Table
2. TN3270 Server Parameters Table
3. TN3270 Server Display Device Table
4. TN3270 Server Printer Device Table
```

Figure 3. Remote TN3270 Server Parameters

Configuring Remote TN3270 Server

Before You Begin Before you can configure parameters, you must log on to the local node's Control Terminal Port.

Steps to Configure Remote TN3270 Server Follow these steps to access the TN3270 Server:

Step	Action	Result
1	From the CTP Main menu, select Configure .	The Configure menu appears.
2	Select SNA Features Configure from the Configure menu.	The SNA Features table appears.
3	Select the features you wish to change. Then press ; when you finish.	This saves your changes to the record.
4	Press <ESC> .	The Configure menu appears.

Remote TN 3270 Parameters

TN3270 Server Parameters Table

This section describes the Remote TN3270 parameters. Any parameter preceded by an asterisk (*) requires a node boot to implement changes. Below are the selections for the TN3270 Parameters Table:

Force Responses

Range:	Enable, Disable
Default:	Disable
Description:	If force responses is enabled, all SNA printer messages sent from the TN3270 server will request a definite response from the client, even if SNA messages do not require a definite response.

*Public Access TCP Port Number

Range:	1 to 65535
Default:	24
Description:	This is the TCP port number that the TN3270 Server will accept all connections on unless a different port number is specified and IP Filtering is Enabled in the Display LU or Printer LU Table. ■ Note This must be different from the Telnet CTP Server TCP Port in the node configuration.

TN3270 Enhancements Enable

Range:	Enable, Disable
Default:	Enable
Description:	This parameter enables or disables the TN3270 Enhancements for all connections. If the TN3270 emulator can not support the TN3270 Enhancements, this parameter must be set to Disabled. ■ Note Device must be restarted after parameter boot.

TN3270 Server Display Device Table

These are the selections for the TN3270 Server Display LU's Table:

Definition Type

Range:	Single, Group
Default:	Single
Description:	This specifies the type of definition. When single is selected, a single LU is created. When GROUP is selected, a set of LUs is created given the LU base name and the number of LUs to be created. For example, with an LU base name of 'SNALU', a base LU ADDR of 2, and a number of LU's to be created set to 3, three LU's will be created when the system is started called SNALU002, SNALU003, and SNALU004.

Group Base LU Name (Definition Type = Group)

Range:	1 to 5 alphanumeric characters (use the space character to blank field)
Default:	Blank
Description:	This is the first portion of the LU name for the set of LU's being created. A number ranging from 002 to 254 will be appended to the end of the LU base name when each individual LU in the group is created. The name may must begin with a letter and must consist of numbers and letters only (no underscores). ■ Note The names DISPLAY and PRINTER are reserved by the system and cannot be used.

Name (Definition Type = Single)

Range:	1 to 8 alphanumeric characters (use the space character to blank field)
Default:	Blank
Description:	This is the name of the LU. The name must begin with a letter and must consist of letters and numbers only (no underscores). ■ Note The names DISPLAY and PRINTER are reserved by the system and cannot be used.

Base LU ADDR (Definition Type = Group)

Range:	2 to 254
Default:	2
Description:	This is the starting LU identification number used in creating a group of LU's.

Number of LU's (Definition Type = group)

Range:	2 to 32
Default:	2
Description:	This is the number of LU's in the group.

LU ADDR (Definition Type = single)

Range:	2 to 32
Default:	2
Description:	This is the LU identification number.

Display Type

Range:	3278-2, 3278-2
Default:	3278-2
Description:	This specifies the type of Display LU. 3278-2 3278-2-E - (24 row x 80 col display)

Link Station Name

Range:	1 to 16 alphanumeric characters (use the space character to blank field)
Default:	Blank
Description:	This is the name of the LLC to SDLC Station that the specific LU or the LU group is being defined for. This parameter should be entered the same as what is entered for LLC to SDLC station in the Route Selection Table. For example, use the following: <ul style="list-style-type: none"> • lsc-qlc3 - for QLLC station 3

IP Address

Range:	A valid IP address in dotted notation
Default:	0.0.0.0
Description:	This is the IP address of the specific client that will use this access record. A value of 0.0.0.0 means that any TN3270 client may access the device without restriction.

TN3270 Enhancements Enable

Range:	Disable, Enable
Default:	Enable
Description:	This parameter enables or disables the TN3270 Enhancements. If the TN3270 emulator can not support the TN3270 Enhancements this parameter must be set to Disabled. ■ Note Not configurable if IP address = 0.0.0.0

**TN3270 Server
Printer Device
Table**

These are the selections for the TN3270 Server Printer Device Table:

LU Name

Range:	1 to 8 alphanumeric characters (use the space character to blank field)
Default:	Blank
Description:	This is the name of the LU. The name must begin with a letter and must consist of letters and numbers only. ■ Note The names DISPLAY and PRINTER are reserved by the system and cannot be used. LU names MUST be unique for LUs defined for the same LLC-SDLC station

LU ADDR

Range:	2 to 254
Default:	2
Description:	<p>This is the LU identification number that should correspond to the LOCADDR in the Switch Major Node LU definition.</p> <p>■ Note LU identification number MUST be unique for LUs defined for the same LLC-SDLC station</p>

Link Station Name

Range:	1 to 16 alphanumeric characters (use the space character to blank field)
Default:	Blank
Description:	<p>This is the name of the LLC to SDLC Station that the specific LU or the LU group is being defined for. This parameter should be entered the same as what is entered for LLC to SDLC station in the Route Selection Table.</p> <p>For example, use the following:</p> <ul style="list-style-type: none"> lsc-qllc3 - for QLLC station 3

IP Address

Range:	A valid IP address in dotted notation.
Default:	Enable
Description:	<p>This is the IP address of the specific client that will use this access record. A value of 0.0.0.0 means that any TN3270 client may access the device without restriction.</p>

TN3270 Enhancements Enable

Range:	Enable, Disable
Default:	Enable
Description:	<p>This parameter enables or disables the TN3270 Enhancements. If the TN3270 emulator can not support the TN3270 Enhancements this parameter must be set to Disabled.</p> <p>■ Note Not configurable if IP address = 0.0.0.0</p>

QLLC Link Station

Overview

The QLLC Link Station Feature supports SLAC Stations that uses a link type of TN3270 or SNA BSC. In Figure 4 the Vanguard 6455 is running Bisync-to-SNA Conversion and serving as a TN3270 Remote Server. QLLC Link station 1 is configured with a Link Type of SNABSC. QLLC Link Station 2 is configured with a Link Type of TN3270. In the Vanguard 7330, the two QLLC stations are compatible to the Token Ring SLAC Stations that are configured to attach to the IBM Mainframe. Across the network, the data is being passed as QLLC frames over X.25. The X.25 may be passed using Frame Relay Annex G, ATM FRST Stations, or X.25 ports. Dial On Demand, DCP, Hunt Group, LLC Profiles, and LLC Options are not supported on QLLC Link Stations.

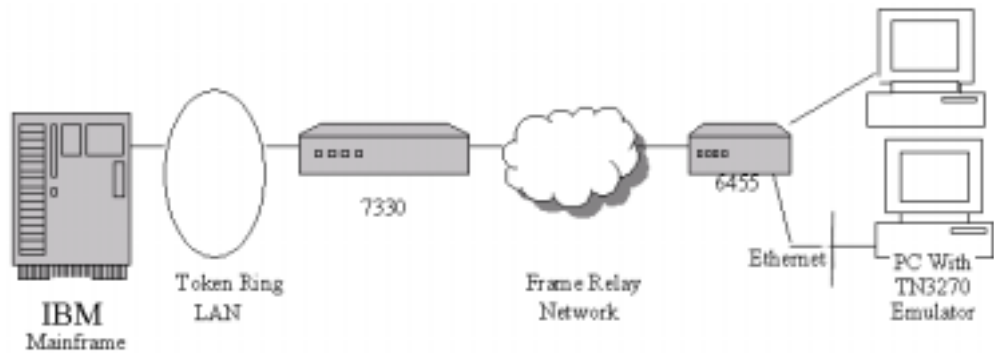


Figure 4. TN3270 Remote Server QLLC Application Example

QLLC Link Station Configuration

The QLLC Link stations are configured from the LLC to SDLC Tables.

Main LLC to SDLC Configuration Table

Node: node2	Address: 102	Date: 8-FEB-2003
Menu: LLC to SDLC Tables		Path: (Main.6.17)

1. LLC Profile Table
2. Frame Relay Station Table
3. Ethernet Station Table
4. QLLC Station Table

Figure 5. LLC to SDLC Configuration Table

QLLC Link Station Table

These are the selections for the QLLC Link Station Table:

Link Station Type

Range:	TN3270, SNABSC
Default:	TN3270
Description:	<ul style="list-style-type: none"> • TN3270 - SNA PU type 2.0 Link Station for support of TN3270 Server. • SNABSC - SNA PU type 2.0 Link Station for support of SNA-to-BSC Conversion. <p>■ Note A change to this parameter requires a node boot to take effect</p>

QLLC Station Address

Range:	01-FE hexadecimal
Default:	01
Description:	<p>The station address is used for QLLC control procedures. This parameter is used to differentiate between QLLC primary and secondary stations:</p> <ul style="list-style-type: none"> • Select a value in the range 01-FE for QLLC secondary (TPAD) stations. • Select FF for QLLC primary (HPAD) stations (FF not allowed for MAC address autolearn).

QLLC Options

Range:	NONE, CUG
Default:	NONE
Description:	<ul style="list-style-type: none"> • NONE - no option specified • CUG - check closed user group in incoming calls, and insert closed user group facility in outgoing calls.

XID Value

Range:	0 to 14 hexadecimal digits (use the space character to blank field)
Default:	Blank
Description:	This is the identification sent by a TPAD station in the form of a QXID response when External PU Type is set to 2.

X.25 Network Password

Range:	0 to 24 hexadecimal digits (use the space character to blank field)
Default:	Blank
Description:	Only QLLC Secondary (TPAD) initiated autocall packets shall use this feature. The X.25 Network Password, which may be up to 12 bytes long, is inserted in the CUD of the Call Request packet. Padding with spaces bar must be added as necessary. Configure the Protocol ID to C3 01 00 00.

Calling Address

Range:	0 to 15 BCD digits (use the space character to blank field)
Default:	Blank
Description:	This is the full Calling Address inserted into the Call Request Packet when autocalling is enabled.

Protocol ID

Range:	0 to 8 hexadecimal digits (use the space character to blank field)
Default:	C3000000
Description:	The protocol identifier is inserted into the CUD of the Call Request packet, and indicates that the X.25 call is for a QLLC logical circuit.

Autocall Mnemonic

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

CUG Membership

Range:	0 to 8 two digit numbers
Default:	--,--,--,--,--,--,--
Description:	The station may be a member of up to 8 different Closed User Groups (CUGs). Each CUG membership must be a two digit number (except --) and separated by a comma. Example: (12,34,56,09,02,03). --No CUG Membership 00-99 - CUG Membership

Billing Records

Range:	OFF, ON
Default:	OFF
Description:	This controls billing account records for calls on this station.

Traffic Priority

Range:	LOW, MED, HIGH, EXP
Default:	MED
Description:	This is the traffic priority of X.25 calls generated by this station, and is the priority of this station in Frame Relay SVC or PVC to which this station is assigned.

TN3270 Statistics

TN3270 Device Statistics

The TN3270 Device Statistics are available from the SNA Statistics menu. There are three types of statistics; the TN3270 Device Summary Statistics, the TN3270 Device Detailed Statistics, and the TN3270 Device Summary for LLC Station.

```
Node: Vanguard Address: 102Date: 10-MAY-2003 Time: 17:55:36
Menu: SNA Features Statistics Path: (Main.5.27)

1. TN3270 Device Summary
2. TN3270 Device Summary for LLC Station
3. Detailed TN3270 Device Statistics
4. Reset TN3270 Device Statistics

Enter Selection:
```

Figure 6. SNA Features Statistics Menu

TN3270 Device Summary Statistics

The TN3270 Server Summary Statistics provides a list of all of the Display and Printer LU's. The state of the PU, LU to LU, and SSCP to LU sessions is provided. APPL Conn is "up" if the TN3270 server client is active, or down if the TN3270 server client is inactive. If the LU is a part of a group of LU's the entry number will be the same. The client address and the remote TCP port will be displayed when a 3270 host session is established.

```
LLC to SDLC Station: LSC-QLLC1

Node: node102   Address: 102           Date: 15-JUN-2003   Time: 0:08:36
TN3270 Device Summary Statistics           Page: 1 of 1

  Ent
LU Name  Num Link Stn   LU   SSCP  APPL LULU      TCP  DEF DEV
=====  ==  =====  ==  ==  ==  ==  =====  ==  ==
VAN002   1  LSC-QLLC1    2  up/up down down      0  SGL DISP
```

Figure 7. TN3270 Device Summary Statistics

TN3270 Device Statistics

The TN3270 Device Statistics provide some additional statistics over what was provided by the Device Summary Statistics. These additional statistics are the LU-SSCP Detailed Session Statistics and the PLU-SLU Detailed Session Statistics, as well as the local and remote TCP information. The LU Name must be entered correctly to get the detailed statistics. In this example, "VAN002" that was seen in the Summary Stats has been entered. VAN002 is one of the LU's from a group. The only way to know its name is by looking at the summary statistics. See Figure 8 and Figure 9.

```

Node: Vanguard Address: 102 Date: 11-MAY-2003 Time: 18:47:00
Detailed TN3270 Device Statistics Page: 1 of 1

LU Name: VAN002 LU Address: 2 Device Type: DISPLAY
PU Name: LSC-QLLC1 TN3270 Option: TN3270 Display Type: IBM-3278-2

SSCP-PU Session State : down LU-SSCP Session State : Down
TN3270 Client State : Down PLU-SLU Session State : Down

LU-SSCP Detailed Session Statistics:
RU Summary: Send Receive Data Summary: IN OUT
RU Size: 0 0 Data Frames: 0 0
Max BTU Size: 0 0 FMD Frames: 0 0
Current Window Size: 0 0 Data Bytes: 0 0
Max Window Size: 0 0 FMD Bytes: 0 0

PLU-SLU Detailed Session Statistics:
RU Summary: Send Receive Data Summary: IN OUT
RU Size: 0 0 Data Frames: 0 0
Max BTU Size: 0 0 FMD Frames: 0 0
Current Window Size: 0 0 Data Bytes: 0 0
Max Window Size: 0 0 FMD Bytes: 0 0

```

Figure 8. TN3270 Device Statistics - Page 1

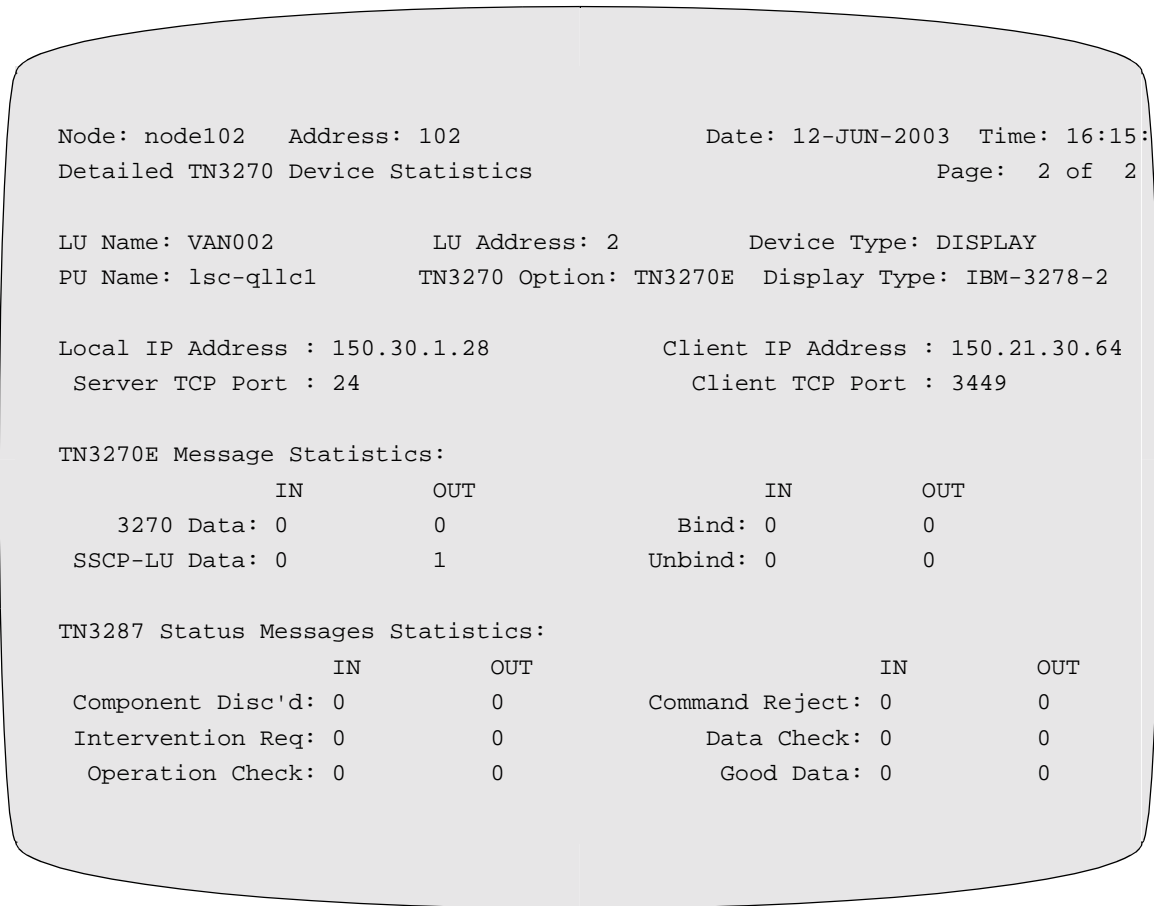


Figure 9. TN3270 Device Statistics - Page 2

QLLC Link Station Statistics

Introduction

The QLLC Summary and Detailed Statistics are available from the LLC to SDLC Statistics menu. Refer to Figure 10.

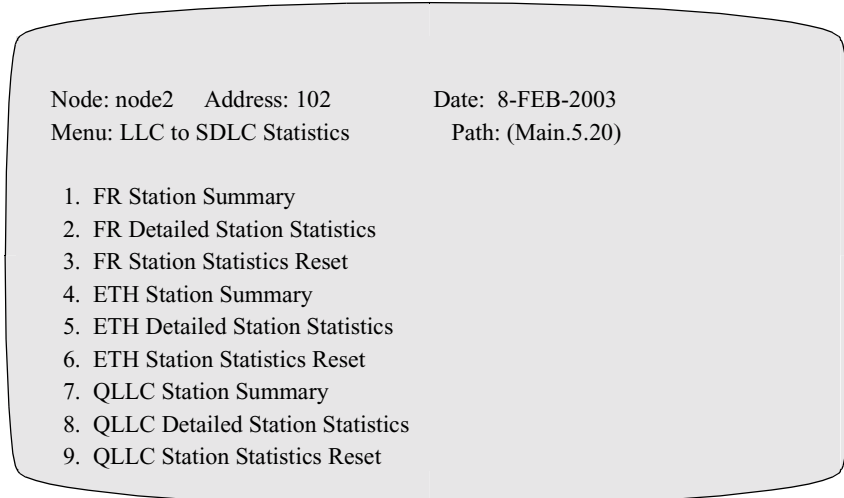


Figure 10. QLLC Summary and Detailed Statistics

QLLC Station Summary Statistics

The QLLC Station Summary Statistics indicates the status of the SVC and the direction of the call. Under Called Address the address of the destination SVC is displayed. Data Frames In/Out records data activity on the station. Refer to Figure 11.

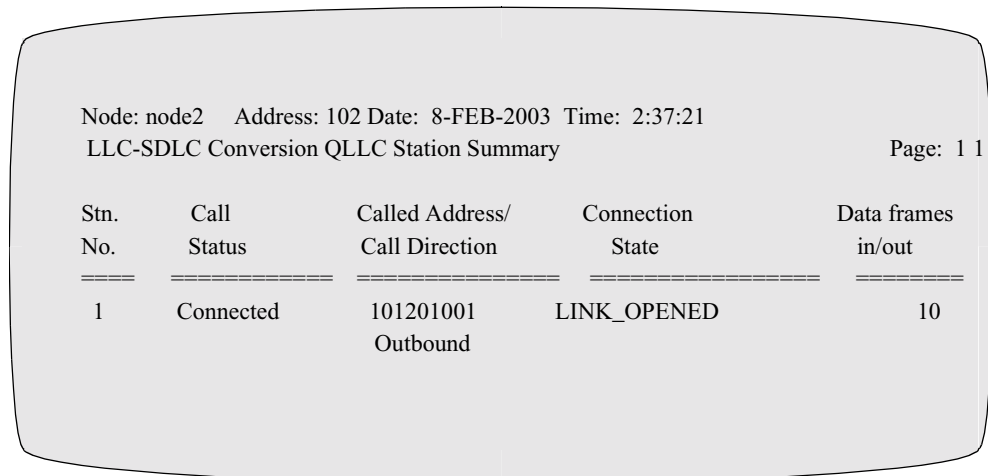


Figure 11. QLLC Server Summary Statistics

QLLC Link Detailed Statistics

QLLC Link Detailed Statistics consists of three pages and gives a detail list of activity on the link. Refer to Figure 12,13,14.

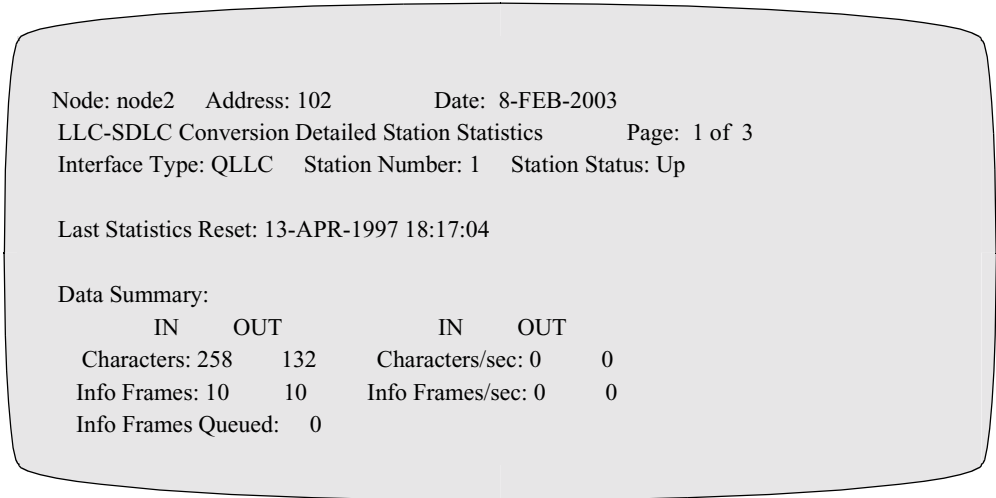


Figure 12. QLLC Link Detailed Statistics - Page 1

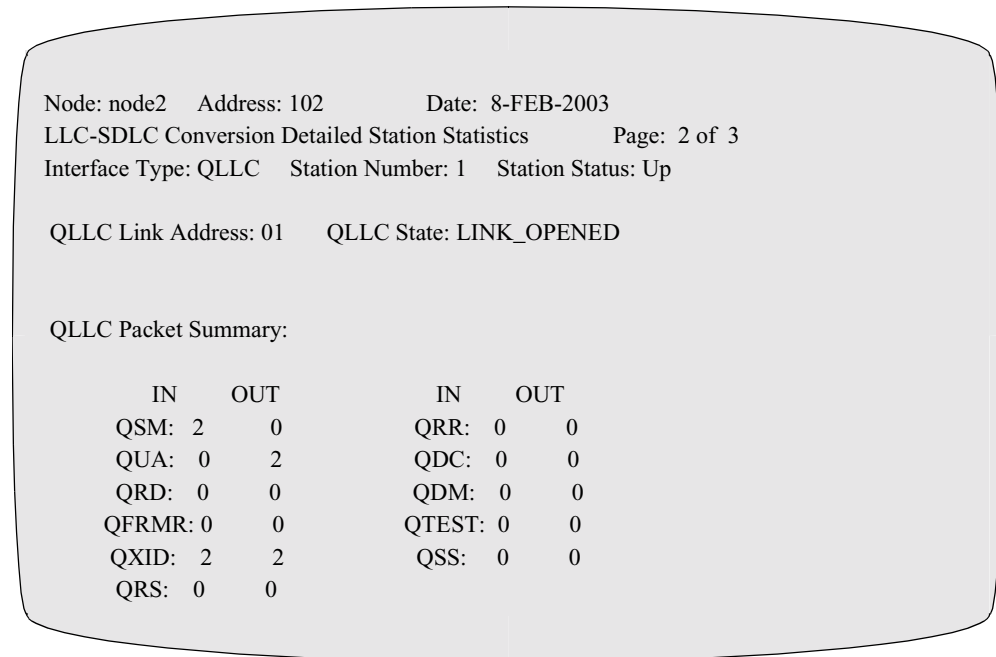


Figure 13. QLLC Link Detailed Statistics - Page 2

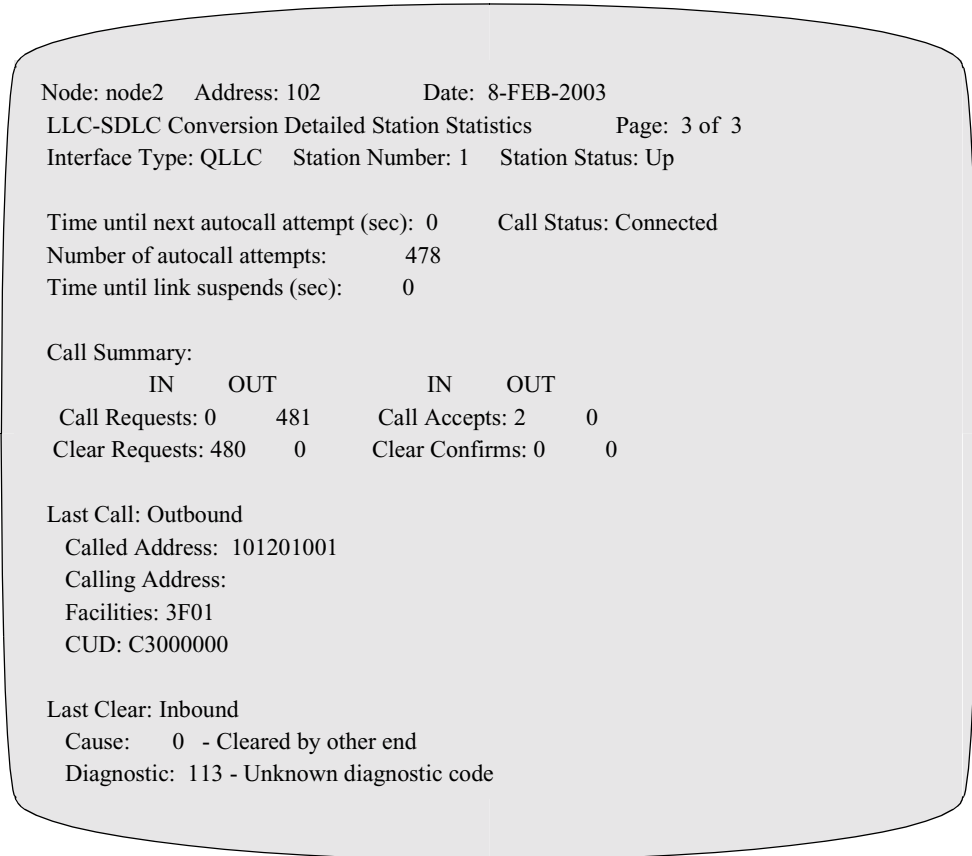


Figure 14. QLLC Link Detailed Statistics - Page 3

TN3270 Server Boot

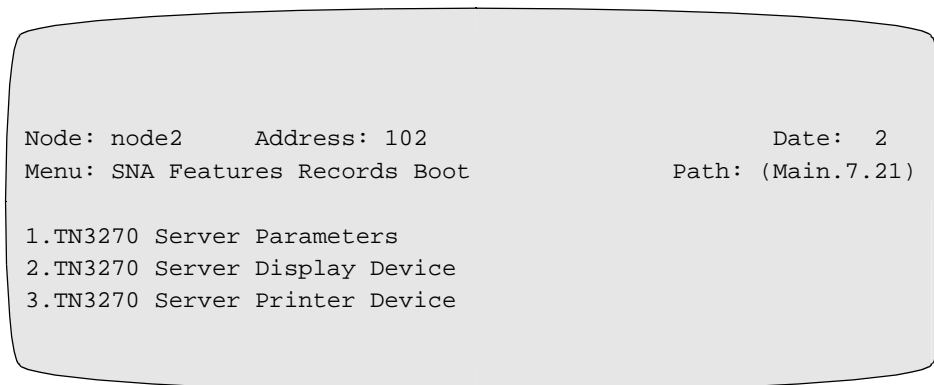
Boot Menu

The SNA Features Records Boot Menu allows booting the TN3270 Server Parameters which are used by all of the TN3270 sessions.

Please note the following conditions when booting a display or printer device. If changes are made to an existing display or printer configuration the QLLC station must first be disabled before the display or printer device can be booted. Once the display or printer device boot has completed the QLLC station can be enabled again.

■ **Note**

Disabling the QLLC station causes all SNA sessions to be terminated at the host. Depending on the host environment, individual PU's and their associated LU's may have to be manually re-activated at the host once the QLLC station is enabled .



```
Node: node2      Address: 102                Date:  2
Menu: SNA Features Records Boot          Path: (Main.7.21)

1.TN3270 Server Parameters
2.TN3270 Server Display Device
3.TN3270 Server Printer Device
```

Figure 15. SNA Features Records Boot

QLLC Station Boot

Introduction

The QLLC Link Station boot is available from the LLC to SDLC Boot Table shown below in Figure 16.

```

Node: node2   Address: 102       Date: 8-FEB-2003
Menu: LLC to SDLC Stations      Path: (Main.7.14)

1. Frame Relay Stations
2. All Frame Relay Stations
3. Ethernet Stations
4. All Ethernet Stations
5. QLLC Stations
    
```

Figure 16. LLC to SDLC Boot Table

QLLC Link Station Boot Menu

Booting the LLC-SDLC Conversion QLLC Station.

```

Boot LLC-SDLC Conversion QLLC Station

Entry Number: 1/?
Range = 1-32
Default = 1
Entry number used to reference this table record.
    
```

Figure 17. QLLC Link Station Boot Menu

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B

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