DT-6061

TN-3270 Troubleshooting Guide
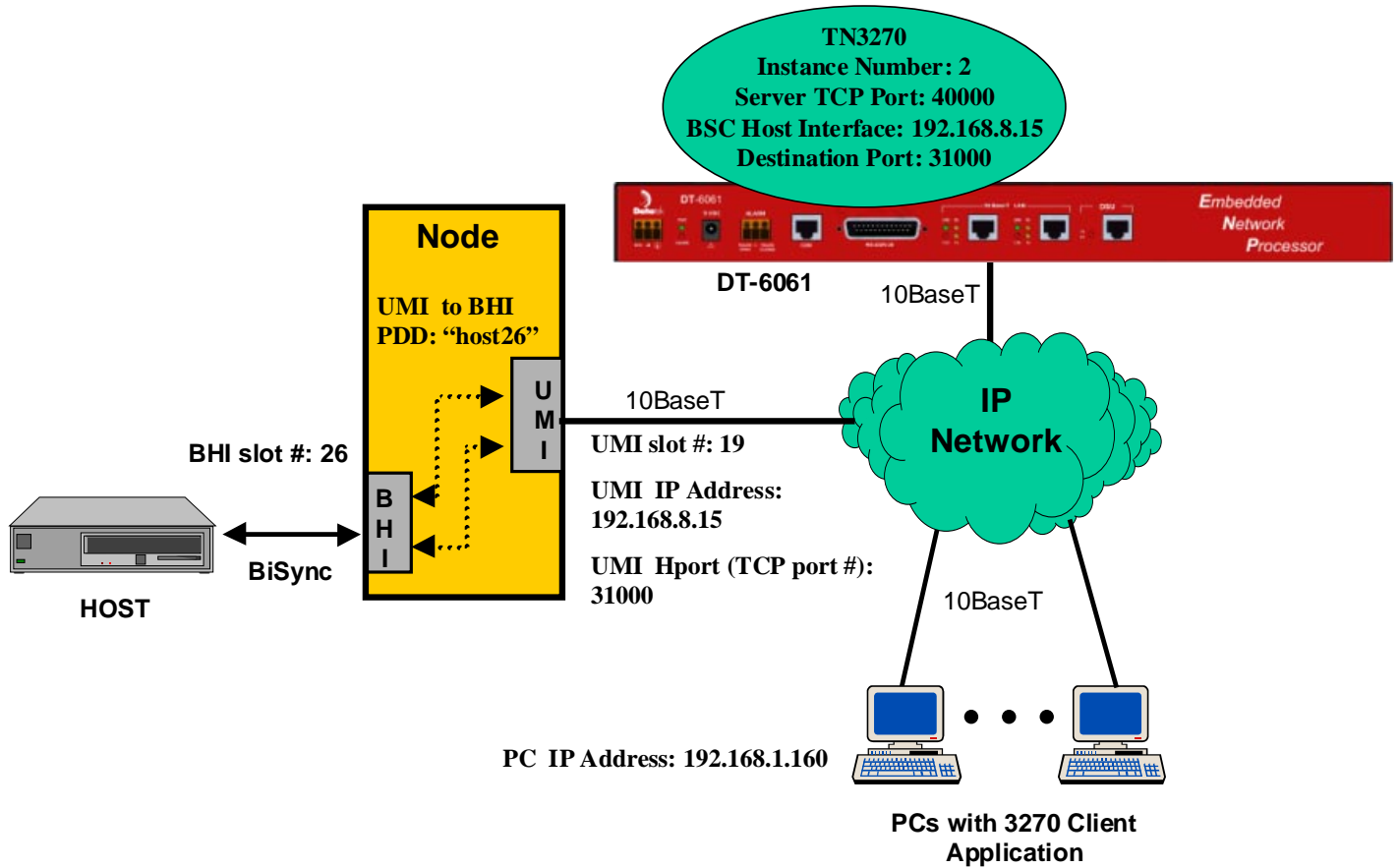
1 INTRODUCTION

The TN-3270 server application for the DT-6061 Embedded Network Processor allows PCs running 3270 client software and physically connected to an IP network to access a BiSync host via a BNS-2000 sync8-based BiSync Host Interface (BHI) module. It thus replaces the TN-3270 DKAP application, in an integrated, i.e., IP + BNS environment.

This guide is meant to assist in troubleshooting and circuit tracing of the DT-6061 TN-3270 Server Application and other relevant components of a typical network. It is intended to supplement, rather than replace, the *DT-6061 TN-3270 Server Application User's Manual*, with which readers of this document are assumed to be already very familiar. In addition, since the Universal Mediation Interface (UMI) module is also a key component of an integrated IP/BNS network and will therefore be considered as part of the sample network utilized in this document, readers should also be familiar with the *UMI User's Manual.* Finally, the *DT-6061 Platform User's Manual* will also serve as a reference for some of the diagnostic commands used in this document. All of the above-mentioned documents are available on the Datatek web site, www.datatekcorp.com.

2 TYPICAL CONFIGURATION

The diagram below depicts a typical configuration involving a PC-based 3270 client accessing a BiSync host in an integrated BNS-2000 / IP networking environment.

TN3270
Instance Number: 2
Server TCP Port: 40000
BSC Host Interface: 192.168.8.15
Destination Port: 31000

DT-6061

10BaseT

Node

UMI to BHI
PDD: "host26"

U M I

10BaseT

UMI slot #: 19

UMI IP Address:
192.168.8.15

UMI Hport (TCP port #):
31000

BHI slot #: 26

B H I

BiSync

HOST

IP Network

10BaseT

PC IP Address: 192.168.1.160

PCs with 3270 Client
Application

In the preceding diagram, the 3270 client software on one of the PCs accesses the BiSync host by using the IP address of the DT-6061 and the TCP port number associated with a TN-3270 server instance. This TN-3270 server instance connects through the UMI to a line on the BiSync host, which requires proper configuration of the TN-3270 application, the UMI module, and the BNS-2000 node (aspects of which pertain to both the BHI and UMI). The *DT-6061 TN-3270 Server Application User's Manual* describes all the necessary configuration steps for a network with the same topology as the one shown here.

2.1   Checking Configuration Data

Since this is a complex configuration prone to errors in many places, let's begin by verifying that everything is correctly configured. To do so, we need to separately examine each participating networking element.

2.1.1   3270 Client

Check that the 3270 client software on the PC is configured with the correct IP address, TCP port number, and terminal type. Based on this example network, the configured IP address should be 192.168.8.250 (the IP address of the DT-6061 that the TN3270 application resides on). The TCP port is determined by the instance number (the default setting) or it can be administered. In this case, the administered TCP port number (shown in the green bubble above the DT-6061) is 40000, which is the value that should be configured on the 3270 client software. The terminal type on the client must match the terminal type configured on the TN-3270 application (shown in the next section), "IBM-3278-2" in this case.

2.1.2   TN3270 Application

We can log in to the TN3270 application console by establishing a telnet connection to the DT-6061's IP address and TCP port number 10002 (10000 + application instance number). From the TN3270 console use the *vfy* command to display the application configuration.

<TN3270> vfy

   Verify TN3270 Instance Configuration

   Local IP Address: 192.168.8.250, Instance Number: 2

   BiSync Host Interface: 192.168.8.15 Port 31000.

   Number of Sessions: 100

   Terminal Type: IBM-3278-2

   Delay after Host connect: 0

   Server TCP Port: 40000

   Console Inactivity Timeout DISABLED

   Session Inactivity Timeout DISABLED

The following items in this report should be verified for your network configuration:

- Check that the application is configured with the correct Server TCP port. This must agree with the value configured on the 3270 client software on the PC. If necessary, use the *server* command to change the setting.

- Verify that the BiSync Host Interface IP address and TCP port are pointing to the correct UMI module and UMI Hport, respectively. These must agree with the values configured on the UMI, which will be verified next.

- Verify that the terminal type is correct. This must match the configuration of the BiSync line.

This is also a good time to use the *ver* command to verify that your are running the latest software build.

2.1.3   UMI - Module Side

We can log in to the UMI console by establishing a telnet connection to the UMI's IP address and TCP port number 1023. From the UMI console use the *vfy mod* command to check the UMI module-level configuration.

<UMI> vfy mod

Current Configuration:

  DK Module Type ==> TN1015 (TRK-T1) w/Serial# 0.

  Service State ==> In Service.

  Local MAC Address ==> 0.96.29.2.52.22

  Local IP Address ==> 192.168.8.15

  Subnet Mask ==> 255.255.255.0

  Gateway IP Address ==> 192.168.8.1

  DNS Name Server Address ==> Not defined.

  SNMP Trap Manager ==> Not defined.

Make sure the module is in service and the **Local IP Address** indicated in this report agrees with the **BiSync Host Interface** (IP address part) from the TN3270 Application report in the previous section.

Now use the **vfy vport all** command to check the UMI virtual port settings:

<UMI> **vfy vport all**

   Virtual Ports   1 - 32 :

    Type ==> TCP Port 31000 w/Call Listen.

    Service State ==> In Service.

    Protocol ==> Synchronous.

   Virtual Ports 33 - 504 :

    Type ==> TCP Port 12345 w/Call Listen.

    Service State ==> Out of Service.

    Protocol ==> Synchronous.

There should be a group of receive-type virtual ports (indicated by "Call Listen") using a TCP port number which agrees with the **BiSync Host Interface** (port number part) from the TN3270 Application report in the previous section. The protocol must be synchronous and the virtual port group must be in service. Use the **vport** command to change settings if needed. (If the virtual ports are not in service, they must be put in service using **restore sam** on the BNS-2000 node. Refer to the *UMI User's Manual.*)

This is also a good time to use the *ver* command to verify that your are running the latest UMI software build.

2.1.4   UMI - Node Side ("SAM 504")

This part of the exercise confirms that the correct "SAM 504" ports (as the BNS-2000 node controller views the UMI virtual ports) are set up with a pre-defined destination (PDD) corresponding to the BHI module. Refer to Appendix A, which contains a conversion table from the *UMI User's Manual* showing the UMI virtual port to SAM504 board/port mapping. Based on the virtual port assignments indicated in the UMI *vfy vport all* report in the previous section, all 32 ports on "board 1 of the SAM 504" are being used, and each needs to have a correctly-administered PDD ("host26" in the example being used). In addition, the port type must be "term", and the protocol must be "bisync".

From the node console, use the *vfy sam p <mod#> <board#> <port#>* to display the configuration. Use *ch sam p* to change settings if necessary.

CC0> vfy sam p 19 1 2

01-05-08 14:58:57 NODE=WOODY

M   verify sam port 19 1 2

MODULE ADDRESS: 19

MODULE TYPE: sam504   NCHLS: 512

SERVICE STATE: in   SECS BEFORE DISCONNECT: 50

TRUNK TYPE: t1   LINE SPEED: 1.544M

TOTAL BOARDS: 16

DOWNLOAD SERVER: controller

VERSION: standard

COMMENT: UMI

BOARD ADDR	SERVICE STATE	SOFTWARE VERSION
1	in	standard

01-05-08 14:58:57 NODE=WOODY

M verify sam port 19 1 2

PORT	DEV TYPE	NWK FC	FC	XANY	BAUD	CHAR	ATT ACT	ATT PARITY	SRVC	BILL	VDM	GROUP
2	term	N/A	N/A	N/A	9600	N/A	N/A	N/A	in	off	N/A	sambsc

01-05-08 14:58:57 NODE=WOODY

M verify sam port 19 1 2

PORT	CALL HOLD	RBAUD	ECHO	NRZI	PAP	NODE OUT	BLD TYPE	CABLE BITS	BITS	STOP PROTO	CODE
2	N/A	N/A	N/A	no	no	254	dce	N/A	N/A	bisync	ebcdi

01-05-08 14:58:57 NODE=WOODY

M verify sam port 19 1 2

PORT EPN   CUG PROFILE BFLUSH   FRMFILL

   2   N/A   N/A

01-05-08 14:58:57 NODE=WOODY

M verify sam port 19 1 2

PORT PDD

   2   host26

01-05-08 14:58:57 NODE=WOODY

M verify sam port 19 1 2

PORT   COMMENT

   2

3 CONNECTION TRACING

Assuming you have successfully completed all the configuration checks in the previous section - on your network, we'll now trace the path of a session, starting at the originating point of the call. In the command sequence shown, the configuration from the previous section is still being used. To aid in troubleshooting your actual network, print out the network diagram in Appendix B, which should be very similar to the topology of your network. Fill in the blanks to get a diagram of your configuration, which can be used for reference and noting results from these troubleshooting steps.

3.1 Step 1 - Check IP Network Connectivity

From the DT-6061 console, ping the client PC and the UMI, using the ***diag ping <IP Address>*** command, to verify network connectivity. If both respond, proceed to Step 2. If there is no response in either case, examine the IP network for possible faults. Are the physical connections (cables, hub port) ok? Are the correct gateways and sub-net masks configured?

3.2 Step 2- Find Remote TCP Port Associated with Client

From the DT-6061 console, run the ***diag addr <client PC address> 0*** command. This report will display all connected sessions associated with the client PC's IP address.

<DT-6061> diag addr 192.168.1.160 0

Instance=2 type=tn3270 FD=6 IP=192.168.1.160.2385

The report shows that the client PC is connected to the TN3270 application assigned to instance number 2. The TCP port used by the client software (2385) is shown in addition

to the IP address of the client PC itself. Proceed to Step 3 if you get a result like this. Otherwise, go to sec. 4 for additional troubleshooting.

3.3   Step 3 - Find DT-6061 Local Port Associated with Client

From the TN3270 console run the *dconn* (or just *dc*) command. This report will display the far-end IP addresses and TCP ports of up to 100 clients.

<TN3270> dc

Active Connections:

.

.

.

Client 4 ==> at 192.168.1.160 port 2385: local port 2721 Connected

.

.

.

7 Client and 7 Host connections are Active.

The report shows that "Client 4", the PC/client whose session is being traced through the network, has an outgoing connection via local TCP port 2721. This should be the connection to the UMI. Proceed to Step 4 if you get a result like this. Otherwise, go to sec. 4 for additional troubleshooting.

3.4   Step 4 - Find UMI Virtual Port Associated with Client

Now go to the UMI console and run the ***dc*** command. This report will show the far-end IP addresses and TCP port numbers of up to 504 UMI connections. Find the connection associated with the IP address of the DT-6061 and TCP port number obtained in Step 3.

<UMI> dc

Active Connections:

.

VPort 2: connected to 192.168.8.250 port 2721

.

.

.

The report indicates that virtual port 2 on the UMI is connected to the TN3270 application on the DT-6061, and specifically to the session established by the PC client in question. At this point the IP network connections from client to UMI have been verified. Proceed to Step 5.

3.5   Step 5 - Find SAM504 Connection Associated with Client

This step will verify the connection between the UMI and BHI modules across the BNS-2000 node. Using the information obtained in Step 4, we know that the call we are attempting to trace is established on virtual port 2 of the UMI. From the previous configuration checks we also know that virtual port 2 on the UMI appears to the node as Board 1 Port 2 of a SAM 504 in slot 19 (where the UMI is located).

From the node console run the *dis conn mod <slot#>* command.

CC0> dis conn mod 19

01-05-08 14:33:41 NODE=WOODY

M display connections mod 19

MODULE: 19

CH/PT	CU/TM	GROUP	PKT CNT	STATE	TO MOD	CH/PT	CU/TM	GROUP	PK
		BOARD		(+ = PDD				BOARD	
		CS/LCH		or PVC,				CS/LCH	
		PT/LCH		# = RRC)				PT/LCH	
		PT/DLCI						PT/DLCI	
1		****	330668	ACTIVE					
3		****	83	ACTIVE					
8/1	1	sambsc	11555	+IDLE					
9/2	1	sambsc	16381	+TALKING	26	2005		host26	
10/3	1	sambsc	0	+IDLE					
11/4	1	sambsc	0	+IDLE					

The report shows that there is an active PDD connection ("+TALKING") from port 2 of "board 1" of module 19 to module 26 and destination group "host26", which agrees with the PDD information which was verified earlier (sec. 2.1.4). This completes the steps needed to trace a TN3270 session from the client PC to the BHI terminal port.

4 CONNECTION PROBLEM TROUBLESHOOTING

This section contains some troubleshooting strategies which can be used if a specific client can not establish a connection.

4.1   Diag Addr

If you do not see a connection between a specific client and the TN3270 application, telnet to the DT-6061 console, and use ***diag addr*** to see if there are any other client connections associated with the TN3270 server port. Use the DT-6061's IP address and the TN3270 server port as arguments, as follows:

<DT-6061> diag addr 192.168.8.250 40000

Instance=2 type=tn3270 FD=6 IP=192.168.8.250.40000

The report output in this case indicates that there currently is a connection to the TN3270 application with the expected instance and server port numbers, which would rule out the DT-6061 and the TN-3270 application as being the source of the problem.

Similarly, to help isolate problems with connections between the TN3270 application and the UMI, a report of all current host-side connections for all TN3270 instances configured for a Bisync Host Interface connection through a specific UMI may be obtained. Use ***diag addr*** with the UMI's IP address and configured TCP port number, as follows:

<DT-6061> diag addr 192.168.8.15 31000

Instance=2 type=tn3270 FD=7 IP=192.168.8.15.31000

The report output in this case indicates that from the perspective of the DT-6061, there currently is a connection between the TN3270 application with the expected instance and the specified UMI.

4.2   Display Log (Dlog)

From the TN3270 console, the *dlog* command can also be used to diagnose connection problems.

The following example shows a connection being attempted using the incorrect terminal type. The bang (!) symbol preceding the message indicates that this is a new alarm since the command was previously run. The *dlog clr* command will clear all logged messages.

<TN3270> dlog

M Display Error Log

**   Address   Event**

!   192.168.1.160.4299   0 Could not negotiate TERMTYPE, 2.2 sec ago

The next example shows that a UMI / Host connection has been lost.

\<TN3270\> dlog

M Display Error Log

       Address   **Event**

! 192.168.1.160.4300 4384 Cannot read data from Host, 3.0 sec ago

5 APPENDIX A: SAM504 - UMI PORT MAPPING

There is an implicit one-to-one mapping of *SAM504* boards/ports (as the node views them) to the **UMI**'s virtual ports ("vports"), as shown in the following table. These associations are built into the **UMI** module software, and will need to be kept in mind for proper coordination of node and module administration procedures.

BNS Controller *(SAM504)* Board/Port ←------→ UMI Virtual Port mapping

SAM504 Board/Port Numbers	UMI Virtual Port Numbers
Board 1 Ports 1-32	Ports 1-32
Board 2 Ports 1-32	Ports 33-64
Board 3 Ports 1-32	Ports 65-96
Board 4 Ports 1-32	Ports 97-128
Board 5 Ports 1-32	Ports 129-160
Board 6 Ports 1-32	Ports 161-192
Board 7 Ports 1-32	Ports 193-224
Board 8 Ports 1-32	Ports 225-256
Board 9 Ports 1-32	Ports 257-288
Board 10 Ports 1-32	Ports 289-320
Board 11 Ports 1-32	Ports 321-352
Board 12 Ports 1-32	Ports 353-384
Board 13 Ports 1-32	Ports 385-416
Board 14 Ports 1-32	Ports 417-448
Board 15 Ports 1-32	Ports 449-480
Board 16 Ports 1-24	Ports 481-504

6 APPENDIX B: NETWORK DIAGRAM FOR TROUBLESHOOTING

TN3270
Instance Number: __
Server TCP Port:_____
BSC Host Interface: _____
Destination Port: _____

DT-6061

10BaseT

Node

UMI to BHI
PDD: _____

U M I

10BaseT

UMI slot #: ___

UMI IP Address:
_____

UMI Hport (TCP port #):
_____

BHI slot #: ___

B H I

BiSync

HOST

IP Network

10BaseT

PC IP Address: _____

PCs with 3270 Client Application