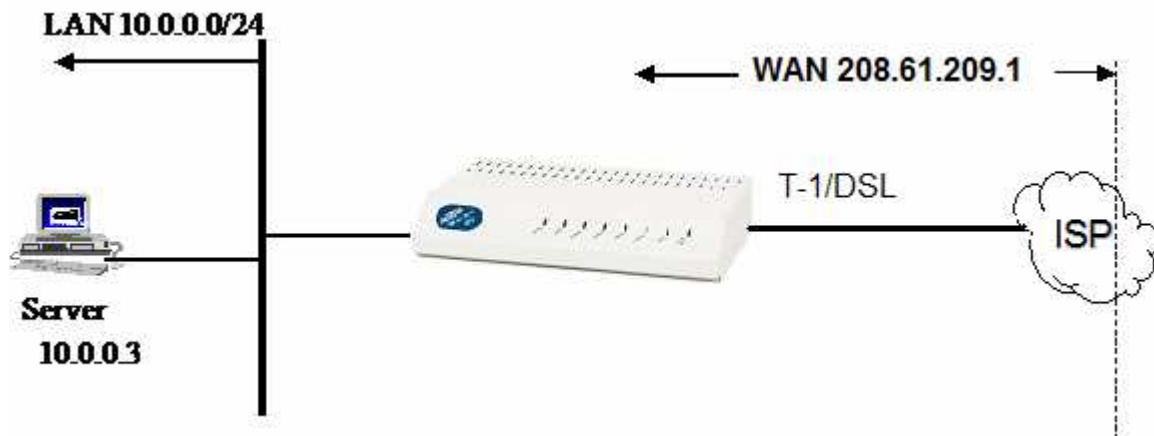


---

# Total Access IAD Router IP Routing Over Frame Relay with NAT and Static Translations Tech Note

---



## ROUTING INFORMATION

- Private LAN Network is 10.0.0.0
- Numbered public WAN address of 208.61.209.1 with Subnet Mask of 255.255.255.252
- Default Gateway of the Total Access IAD Router is the next hop router across the WAN (208.61.209.2)
- No RIP or Static Routes necessary in the Total Access IAD
- NAT address is the Total Access IAD WAN Interface (208.61.209.1)
- Inbound Ping and SMTP traffic translated to private network server 10.0.0.3 through the public WAN address

1. Map the data channels (DSOs 17-24 for this example) to the internal router.

```
WANLAB TA 612 Gen3/DS0 Maps/Edit/View Map 1[17]
Edit/View Map 1x DS0 Service Port Rbs
Edit/View Map 2x 6 open n/a n/a
x 7 open n/a n/a
x 8 open n/a n/a
x 9 open n/a n/a
x 10 open n/a n/a
x 11 open n/a n/a
x 12 open n/a n/a
x 13 open n/a n/a
x 14 open n/a n/a
x 15 open n/a n/a
x 16 open n/a n/a
x 17 TA IAD Router 64K n/a
x 18 TA IAD Router 64K n/a
x 19 TA IAD Router 64K n/a
x 20 TA IAD Router 64K n/a
x 21 TA IAD Router 64K n/a
x 22 TA IAD Router 64K n/a
x 23 TA IAD Router 64K n/a
x 24 TA IAD Router 64K n/a
MODE: T1 IAD SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: NET: up *
DS0 Status: -----rrrrrrr User: ETH: up
^Z=help 16:48
```

## CONFIGURE THE IP ROUTING SETTINGS

2. Verify that the Mode is set to Route IP for your Ethernet Interface under L2 Protocol. This enables IP routing.

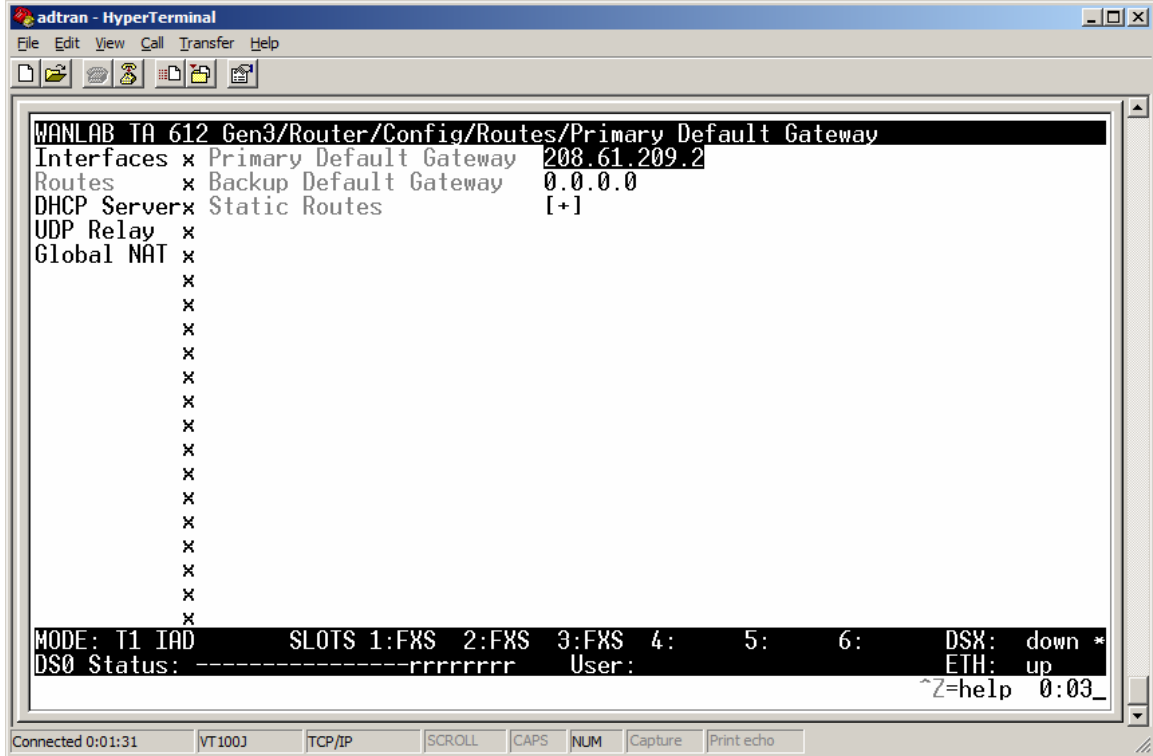
```
WANLAB TA 612 Gen3/L2 Protocol[11]/Config
Config Mode Route IP
Statusx
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
MODE: T1 IAD SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: NET: up *
DS0 Status: -----rrrrrrr User: ETH: up
^Z=help 16:57_
```

3. Specify the Ethernet IP address and Subnet Mask.



```
adtran - HyperTerminal
File Edit View Call Transfer Help
WANLAB TA 612 Gen3/Router/Config/Interfaces[11]/Setup/Primary IP/IP Address
Primary IP x IP Address 10.0.0.1
Secondary IPs Subnet Mask 255.255.255.0
x RIP [+]
x Proxy ARP No
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
MODE: T1 IAD SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: NET: up *
DS0 Status: -----rrrrrrr User: ETH: up
^Z=help 17:02
Connected 0:15:26 | VT100J | TCP/IP | SCROLL | CAPS | NUM | Capture | Print echo
```

- Specify the Default Gateway. This is the next hop router across the WAN (ISP serial WAN address).



### Configure the WAN/Serial Interface

- Set the appropriate L2 Protocol (Frame Relay is used for this example).

```

adtran - HyperTerminal
File Edit View Call Transfer Help
WANLAB TA 612 Gen3/L2 Protocol[0]/Protocol
System Info x
System Config x 0 T1 FRE [+] [+]
System Utility x 1 ETH 802.3 [+] [+]
Interfaces x
L2 Protocol x
Bridge x
Router x
Security x
DS0 Maps x
x
x
x
x
x
x
x
x
x
x
MODE: T1 IAD SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: DSX: down *
DS0 Status: -----rrrrrrr User: ETH: up
^Z=help 0:09_
Connected 0:06:37 VT100J TCP/IP SCROLL CAPS NUM Capture Print echo

```

6. Verify the Frame Relay signaling type is *Annex D*. This option is called *Maintenance Protocol*.

```

adtran - HyperTerminal
File Edit View Call Transfer Help
WANLAB TA 612 Gen3/L2 Protocol[0]/Config
Config Maintenance Protocol Annex D (ANSI)
Status Polling Frequency (5-30) 10
x DLCI Mapping [+]
x BECN Timeout (msec) 50
x
x
x
x
x
x
x
x
x
x
x
x
x
x
MODE: T1 IAD SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: NET: up *
DS0 Status: -----rrrrrrr User: ETH: up
^Z=help 0:09_
Connected 0:07:11 VT100J TCP/IP SCROLL CAPS NUM Capture Print echo

```





```
adtran - HyperTerminal
File Edit View Call Transfer Help
TA 612 RCU/L2 Protocol101/Status/Port
Port      Port Index      0
PVC(s)    Signal State     UP
          Tx Frames      7
          Rx Frames   8
          Tx Bytes    98
          Rx Bytes   123
          Current Utilization (Kb/s) 0
          Current Utilization %      0
          Average Utilization (Kb/s) 0
          Average Utilization %      0
          Full Status Tx Frames      2
          Full Status Rx Frames     2
          Link Integrity Status Tx Frames 5
          Link Integrity Status Rx Frames 5
          Drop Unknown DLCI          0
          Drop Invalid DLCI          0
          Clear Stats                 <+>

MODE: T1 IAD      SLOTS 1:FX0 2:FXS 3:FXS 4: 5: 6: NET: up
DS0 Status: -----rrrrrrr
^Z=help 1:11
Connected 5:34:50 VT100 9600 8-N-1 SCROLL CAPS NUM Capture Print echo
```

If Signaling State is DOWN, verify the following:

- T1 is not in alarm and does not have errors
- DS0s mapped to the Router coincide with the channels configured at the Frame Switch
- Signaling Type (i.e., Annex D, LMI) matches the Frame Relay switch. Make sure this is not AUTO.

11. Verify the PVC/DLCI Status



```

adtran - HyperTerminal
File Edit View Call Transfer Help
TA 612 /L2 Protocol[01/Status/PVC(s)][1]
PVC(s)[1] DLCI 16
           State Active
           Tx Frames 0
           Rx Frames 0
           Tx Bytes 0
           Rx Bytes 0
           De Count 0
           Cr Count 0
           Becn Count 0
           Fecn Count 0
           Unkown Frame Rx 0
           Clear Stats <+>

MODE: T1 IAD SLOTS 1:FXO 2:FXS 3:FXS 4: 5: 6: NET: up
DS0 Status: -----rrrrrrr ^Z=help 1:13_
Connected 5:36:35 VT100 9600 8-N-1 SCROLL CAPS NUM Capture Print echo

```

## CONFIGURE STATIC TRANSLATIONS FOR REMOTE ACCESS TO PRIVATE NETWORK DEVICE

12. Verify that the Port Translation is *Enabled* using the WAN *Interface* Address.

```

adtran - HyperTerminal
File Edit View Call Transfer Help
WANLAB TA 612 Gen3/Router/Config/Interfaces[21/Setup/NAT/Port Translation
NATx Port Translation Enabled
RIPx Public IP Address Mode Interface
   x Translate Body of Unmapped Ports Disabled
   x Translation Table [+]
   x NAT View [+]
   x NAT Address 208.61.209.1
   x Entry Count 0
   x Entry Overflow Count 0
   x
   x
   x
   x
   x
   x
   x
   x
   x
   x
   x
MODE: T1 IAD SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: NET: up *
DS0 Status: -----rrrrrrr User: ETH: up
Enable Port Translation for this interface ^A=more ^Z=help 6:04
Connected 0:02:03 VT100J TCP/IP SCROLL CAPS NUM Capture Print echo

```

13. Enter into the *Translation Table* menu and right arrow over one time.

```

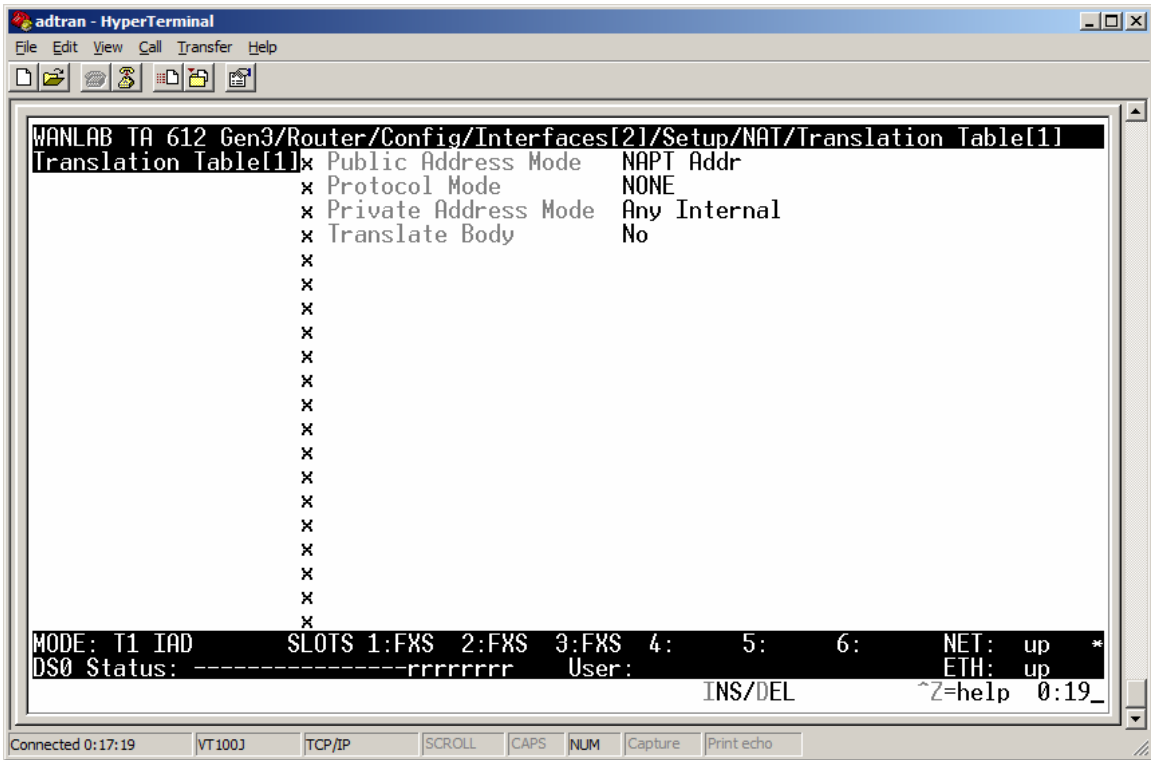
adtran - HyperTerminal
File Edit View Call Transfer Help
WANLAB TA 612 Gen3/Router/Config/Interfaces[2]/Setup/NAT/Translation Table[1]
Translation Tablex  Pub A/Mode  Pub Addr  Prot Mode  Prot  Prot Type  P
NAT View           x  1  NATP Addr  NONE
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
x
MODE: T1 IAD          SLOTS 1:FXS  2:FXS  3:FXS  4:  5:  6:  DSX: down *
DS0 Status: -----rrrrrrr  User:          INS/DEL      ^Z=help  0:35
Connected 0:33:23  VT100J  TCP/IP  SCROLL  CAPS  NUM  Capture  Print echo

```

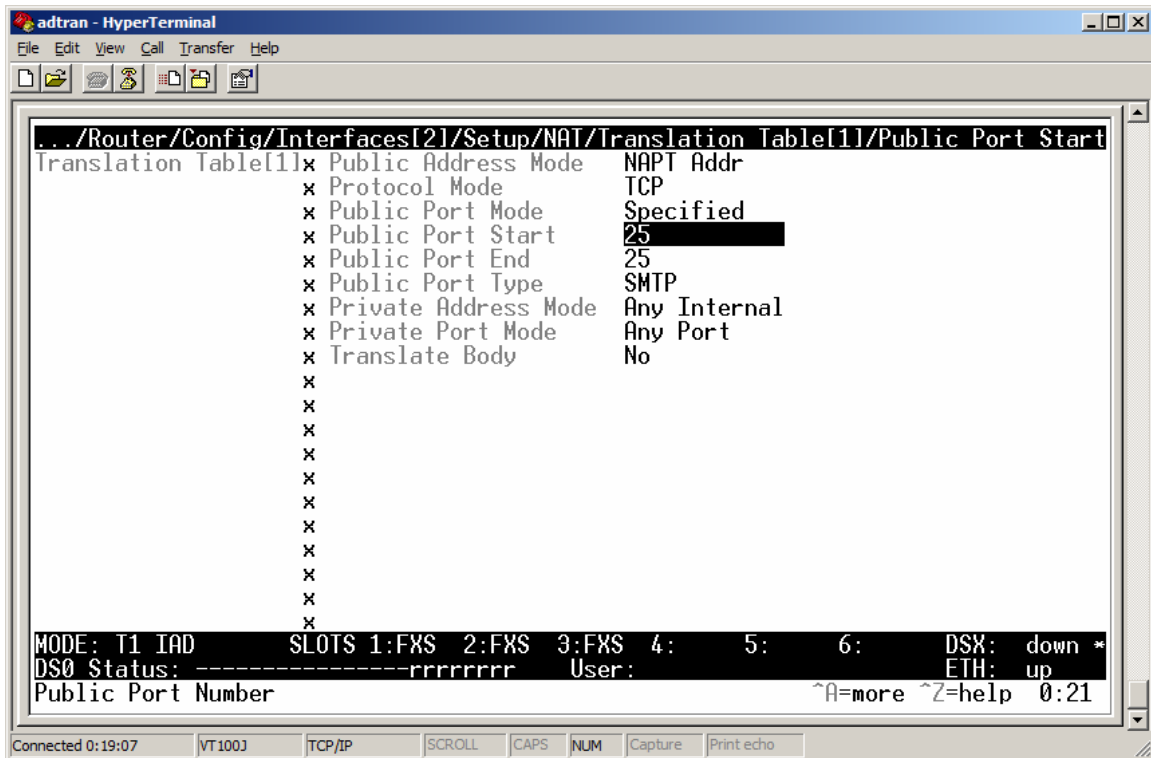
## SMTP ACCESS

14. Enter on the list entry number 1 to edit the first translation.





15. Configure the Protocol to be *TCP*. Configure the Public Port Mode to be *Specified* in order to enter a specific TCP port for this translation. Configure the Public Port Start to 25 for SMTP. The Public Port End should automatically fill in as 25 and the Public Port Type should say SMTP.



```
adtran - HyperTerminal
File Edit View Call Transfer Help
[Icons]
.../Router/Config/Interfaces[21]/Setup/NAT/Translation Table[11]/Public Port Start
Translation Table[11]
x Public Address Mode      NAPT Addr
x Protocol Mode           TCP
x Public Port Mode        Specified
x Public Port Start       25
x Public Port End         25
x Public Port Type        SMTP
x Private Address Mode    Any Internal
x Private Port Mode       Any Port
x Translate Body          No
x
x
x
x
x
x
x
x
x
x
x
x
MODE: T1 IAD          SLOTS 1:FXS 2:FXS 3:FXS 4: 5: 6: DSX: down *
DS0 Status: -----rrrrrrr User:          ETH: up
Public Port Number          ^A=more ^Z=help 0:21
Connected 0:19:07 | VT1003 | TCP/IP | SCROLL | CAPS | NUM | Capture | Print echo
```

16. Configure the Private IP Address Mode as *Specified*. Configure the private IP address for the translated SMTP. Enter the network server address *10.0.0.3*.

```
adtran - HyperTerminal
File Edit View Call Transfer Help
...n3/Router/Config/Interfaces[21]/Setup/NAT/Translation Table[11]/Private Address
Translation Table[11]x Public Address Mode    NAPT Addr
                    x Protocol Mode       TCP
                    x Public Port Mode   Specified
                    x Public Port Start  25
                    x Public Port End    25
                    x Public Port Type   SMTP
                    x Private Address Mode Specified
                    x Private Address    10.0.0.3
                    x Private Port Mode  Any Port
                    x Translate Body     No
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
MODE: T1 IAD      SLOTS 1:FXS  2:FXS  3:FXS  4:  5:  6:  DSX: down *
DS0 Status: -----rrrrrrr  User:      ETH: up
Private IP Address used for translating this entry    ^A=more ^Z=help  0:22_
Connected 0:19:39  VT1003  TCP/IP  SCROLL  CAPS  NUM  Capture  Print echo
```

17. Configure the translation to use the same Telnet port on the private side.

- Private Port Mode = *Specified*
- Private Port = 25 (Should fill in automatically)

```
adtran - HyperTerminal
File Edit View Call Transfer Help
WANLAB TA 612 Gen3/Router/Config/Interfaces[21]/Setup/NAT/Translation Table[11]
Translation Table[11]x Public Address Mode    NAPT Addr
                    x Protocol Mode       TCP
                    x Public Port Mode   Specified
                    x Public Port Start  25
                    x Public Port End    25
                    x Public Port Type   SMTP
                    x Private Address Mode Specified
                    x Private Address    10.0.0.3
                    x Private Port Mode  Specified
                    x Private Port      25
                    x Translate Body     No
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
                    x
MODE: T1 IAD      SLOTS 1:FXS  2:FXS  3:FXS  4:  5:  6:  NET: up *
DS0 Status: -----rrrrrrr  User:      ETH: up
INS/DEL          ^Z=help  0:22
Connected 0:20:24  VT1003  TCP/IP  SCROLL  CAPS  NUM  Capture  Print echo
```

## Forward ICMP

18. Return to the main Translation Table menu. Highlight the number 1 and enter an "i" to insert another static translation in the table.

```

WANLAB TA 612 Gen3/Router/Config/Interfaces[21]/Setup/NAT/Translation Table[2]
Translation Table#  Pub A/Mode  Pub Addr  Prot Mode Prot  Prot Type P
NAT View          x 1  NAPT Addr  TCP
                  x 2  NAPT Addr  NONE
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
MODE: T1 IAD     SLOTS 1:FXS 2:FXS 3:FXS 4:  5:  6:  DSX: down *
DS0 Status: -----rrrrrrr  User:          ETH: up
                                         INS/DEL ^Z=help 0:25_
    
```

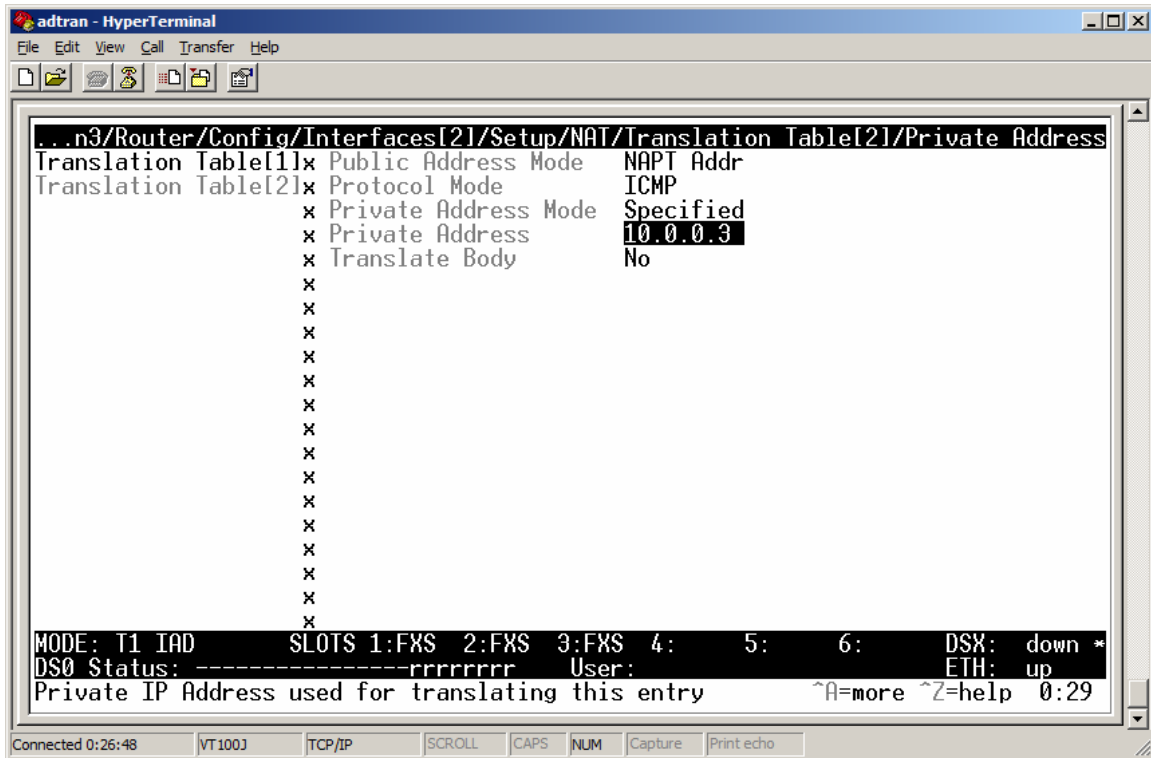
19. Enter on list entry number 2 to edit the second translation. Change Protocol to ICMP.

```

...Gen3/Router/Config/Interfaces[21]/Setup/NAT/Translation Table[21]/Protocol Mode
Translation Table[1]x Public Address Mode  NAPT Addr
Translation Table[2]x Protocol Mode      ICMP
                  x Private Address Mode Any Internal
                  x Translate Body      No
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
                  x
MODE: T1 IAD     SLOTS 1:FXS 2:FXS 3:FXS 4:  5:  6:  DSX: down *
DS0 Status: -----rrrrrrr  User:          ETH: up
Protocol being translated   ^A=more ^Z=help 0:28_
    
```

20. Configure the ICMP translation to the private server address.

- Private Address Mode = *Specified*
- Private Address Mode = *10.0.0.3*



```
adtran - HyperTerminal
File Edit View Call Transfer Help
..n3/Router/Config/Interfaces[2]/Setup/NAT/Translation Table[2]/Private Address
Translation Table[1]x Public Address Mode   NAPT Addr
Translation Table[2]x Protocol Mode       ICMP
                   x Private Address Mode Specified
                   x Private Address   10.0.0.3
                   x Translate Body    No
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
                   x
MODE: T1 IAD      SLOTS 1:FXS  2:FXS  3:FXS  4:   5:   6:   DSX: down *
DS0 Status: -----rrrrrrr  User:
Private IP Address used for translating this entry  ^A=more ^Z=help 0:29
Connected 0:26:48 | VT100 | TCP/IP | SCROLL | CAPS | NUM | Capture | Print echo
```

## VERIFY THE STATIC TRANSLATIONS TO THE SERVER

21. View the dynamic translation entries under *NAT*

*View.*

The screenshot shows a HyperTerminal window titled "adtran - HyperTerminal" with a menu bar (File, Edit, View, Call, Transfer, Help) and a toolbar. The main display area shows the following text:

```
TA /Router/Config/Interfaces[21]/Setup/NAT/NAT View
Translation Table
NAT View
```

Entry	Priv Addr	Pub Addr	Serv Addr	Proto
1	10.0.0.3	172.16.1.2	172.16.1.1	TCP
2	10.0.0.3	172.16.1.2	172.16.1.1	ICMP

Below the table, the following status information is displayed:

```
MODE: T1 IAD SLOTS 1:FX0 2:FXS 3:FXS 4: 5: 6: NET: up
DS0 Status: -----rrrrrrr
NAT view list of active sessions ^Z=help 2:08
```

The bottom status bar of the HyperTerminal window shows: Connected 0:44:12, VT100, 9600 8-N-1, SCROLL, CAPS, NUM, Capture, Print echo.