



Safe-T-Net Frame Relay Dial Backup with ATLAS and the IQ series

Introduction

Safe-T-Net™ provides a complete disaster recovery solution for frame relay networks. Safe-T-Net, when deployed through the ADTRAN ATLAS system, allows end-users to be proactive in their disaster recovery plans by designing a complete dial-around-the-cloud solution. In this technical support note, the ATLAS 800^{PLUS} will be backing up the TSU IQ via ISDN. The configurations shown for the ATLAS 800^{PLUS} will work for the ATLAS 550 and the ATLAS 810^{PLUS}. The configurations shown for the TSU IQ will work for the TSU IQ +, DSU IQ, and IQ Probe. The NxIQ module for the TSU products will be configured the same under the PVC Options as the others, but an external terminal adapter, such as the ISU 128, will handle the dial functions.

Before You Begin

To perform this application, the ATLAS 800^{PLUS}/810^{PLUS} must be at firmware revision E.02 or higher, the ATLAS 550 must be at firmware revision B.01 or higher and the IQ products must be at firmware revision 3.28 or higher. These firmware files are attached to this article in the knowledge base. In order to do bonding of B-channels on the ISDN dial backup call, an IMUX module is required in the ATLAS.

Safe-T-Net Frame Relay Dial Backup Example Network

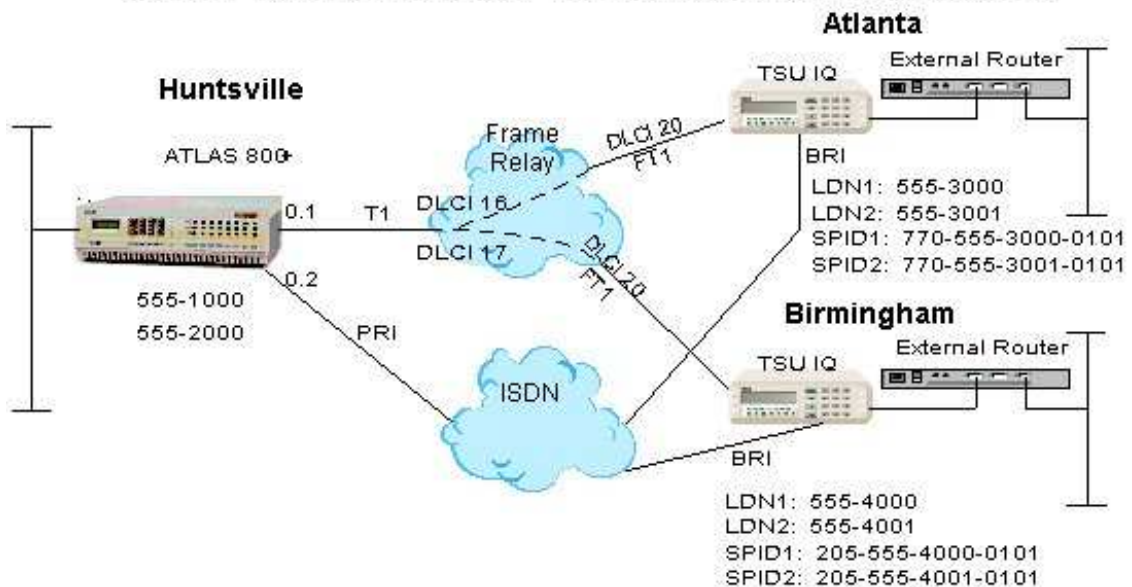


Figure 1

Configuring Timing

Under **System Config**, configure **Primary Timing Source** to take timing from the frame relay network, and **Backup Timing Source** to take timing from the PRI in case the frame relay goes down. In the example network of Figure 1, the frame relay line is connected to Slot 0, Port 1, and the PRI is connected to Slot 0, Port 2. Therefore the timing will be configured as shown in Figure 2 below.

```

Telnet Connection - 10.2.15.55
Session Edit Options Capture Help
ATLAS 800 Plus/System Config
System Info Primary Timing Source T1/PRI Slot:0 Port:1 Sys Ctrl
System Status Backup Timing Source T1/PRI Slot:0 Port:2 Sys Ctrl
System Config ADLP Address 9999
System Utility Session Timeout 0
Modules Max Telnet Sessions 12
Packet Manager Ethernet Port [+]
Router Chain Port [+]
Dedicated Maps SNMP [+]
Circuit Status Event Logging [+]
Dial Plan Syslog Setup [+]
Real Time Clock [+]
Access Passwords [+]
Licenses [+]
BONDING Config [+]

SYS: OK CSU:ONLN 1: -- 2: -- 3: -- 4: -- 5: -- 6: -- 7: -- 8: --
System Configuration menu ^Z=help 8:50
    
```

Figure 2

Configuring Packet Endpoints

1. Under **Packet Manager, Packet Endpoints, and Config**, create three packet endpoints: one endpoint for the primary connection to the frame relay cloud, one endpoint for dial backup (DBU) to the Atlanta remote site, and a third endpoint for dial backup to the Birmingham remote site. Choose Frame Relay as the Protocol for all endpoints as shown in Figure 3. Both the primary line and the DBU endpoints will use RFC 1490 Frame Relay encapsulation.



Figure 3

2. Configure the primary frame relay endpoint by pressing <enter> on **Config** for that endpoint. Select **User** for the **Signaling Role** of this endpoint. Select the appropriate **Signaling Type**, either **Annex D** or **LMI**, to match what the Frame Relay Provider is using on their frame relay switch. In this example, the frame relay switch is using Annex D signaling, as shown in Figure 4. If the signaling type is not known, it may be set to **Auto**.

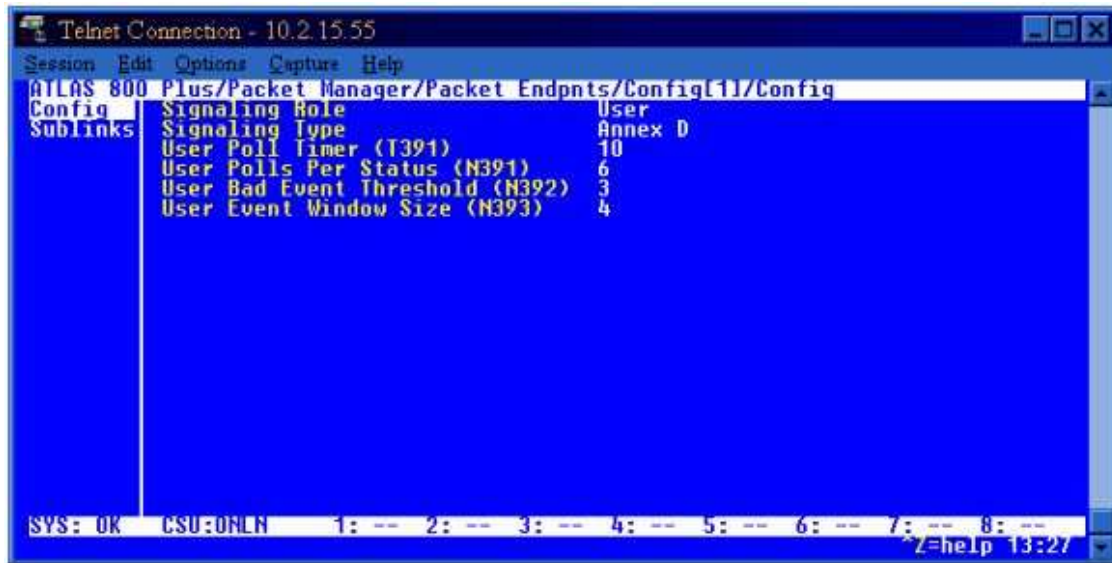


Figure 4

- Configure the DBU endpoints by pressing <enter> on **Config** for each endpoint and selecting **Off** for the **Signaling Role**. There is no frame relay signaling over a dial backup connection because there is no frame switch in the ISDN path to respond to the polls. The **Signaling Type** may be left as default since it will not be used (see Figure 5).



Figure 5

- Configure the Permanent Virtual Circuits (PVCs) under **Sublinks** for each of the three endpoints. Start with the primary packet endpoint by pressing <enter> on the **Sublinks** option for that endpoint. Name the PVC and enter the locally significant

DLCI for each, as shown in Figure 6. In this example, the PVCs are named for the remote site location that the PVC is mapped to on the far end of the frame relay network. Press <enter> on the **Config** option of this **Sublinks** menu. By default, the **Primary | Backup Selection** should be *Primary*.



Figure 6

- Now configure the PVC for each DBU endpoint by going to the **Sublinks** menu for each DBU endpoint. When backing up Frame Relay between an ATLAS and an IQ the DLCI for a DBU endpoint is the DLCI at the remote site. There should be only one DLCI or sublink for each DBU endpoint. In the example network shown in Figure 1, the DLCI for both DBU endpoints is 20. Figure 7 shows how the **Sublinks** menu is configured for the Atlanta DBU endpoint.



Figure 7

- Now that the **Sublinks** menu has been configured with DLCI numbers for the two DBU endpoints, the endpoint must be declared as a DBU endpoint. Press <enter> on the **Config** option (as shown in Figure 7) for the sublink of one of the DBU endpoints and select *Backup* for the **Primary | Backup Selection** option. Select the primary endpoint to be backed up in the **Primary Packet Endpt** field. For the **Primary Sublink** field, select the sublink to be backed up on that primary endpoint. Leave **Backup Mode** configured for *Auto* and this will allow the ATLAS to go into dial backup if one or more of the criteria is met. The three criteria are **Switch on Sublink Down**, **Switch on LMI Inactive**, and **Switch on Backup Active**. By default, all three criteria are set to Yes. The **Backup Delay in Seconds** is the number of seconds that the ATLAS has to detect the failed criteria before it goes into backup mode. The **Restore Delay in Seconds** is the number of seconds that the ATLAS has to detect the primary endpoint active again before it comes out of backup mode and switches back to the primary endpoint. Figure 8 shows what the **Sublinks/Config** menu looks like as configured for the Atlanta DBU endpoint. The configuration shown in Figure 8 reflects that this DBU endpoint will be backing up the *Atlanta* sublink of the primary *FR Cloud* endpoint. Configuration of the Birmingham DBU endpoint's **Sublinks/Config** menu looks similar, except that it will be backing up the *Birmingham* sublink of the primary *FR Cloud* endpoint.

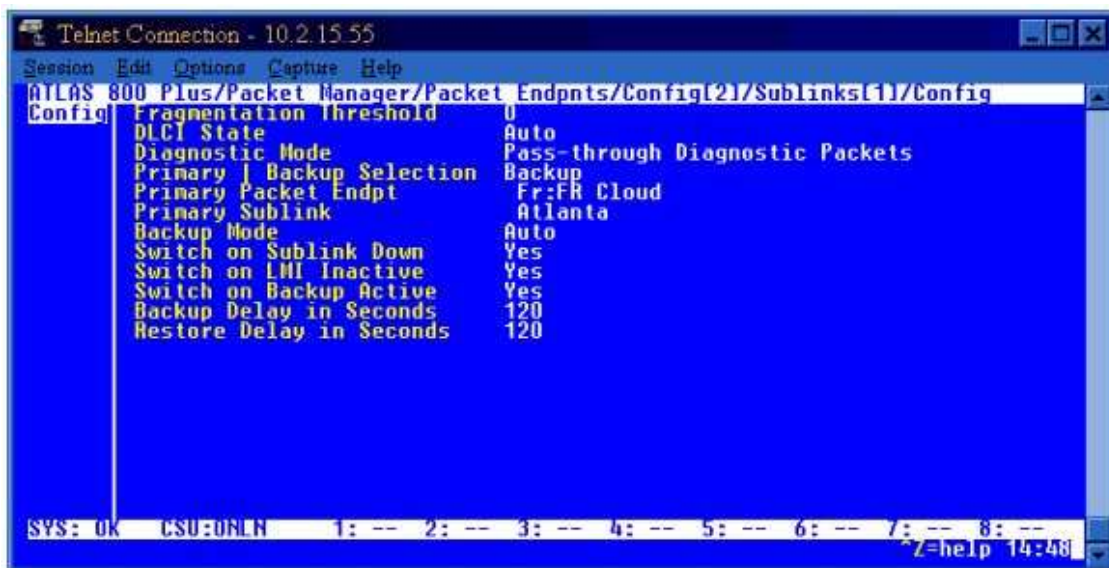


Figure 8

- Return to the **Sublinks** menu of the primary endpoint and press <enter> on the **Config** option for one of the sublinks. Note that **Enable Backup Support** is now set to *Yes*, and **Backup Packet Endpt** and **Backup Sublink** are now set to the appropriate endpoint and sublink. This is automatically configured based on the backup endpoint's **Sublink/Config**. Leave **Backup Mode** configured for *Auto* and

this will allow the ATLAS to go into dial backup if one or more of the criteria is met. The backup criteria and timer options displayed are the same as for the DBU endpoints (see Figure 9).



Figure 9

Configuring Packet Connects

After all the packet endpoints are created and configured, the endpoints need to be linked. In this example, we will be using the ATLAS' internal router. This will require a packet connect from the primary endpoint, *Atlanta* sublink, to the internal router, as well as a packet connect from the primary endpoint, *Birmingham* sublink, to the internal router (see Figure 10). If implementing an application that does not use the internal router, an additional packet endpoint would need to be created for the external router, then a packet connect would be required between the primary frame relay endpoint and the external router endpoint.



Figure 10

Configuring Dedicated Maps

Now that the packet endpoints have been created and linked, the primary endpoint must be mapped to a physical port on the ATLAS. Under **Dedicated Maps**, press <enter> on **Create/Edit Maps**, then **Connects**. For the **FROM Slot** and **Port** fields, select the physical slot and port to which the frame relay T1 line will be connected. For the **TO Slot/S** field, select *PktEndpt*. For the **Port/PEP** field, select the primary frame relay endpoint. Press <enter> on the **From Config** field and designate the number of channels to be used on the T1. In the example, all 24 channels are being used, as shown in Figure 11. Figure 12 shows how the **Connects** menu looks as configured for the example in Figure 1, which uses the internal router. If an external router was being used, there would be an additional entry in the **Connects** menu which maps the external router endpoint to the V.35 port.

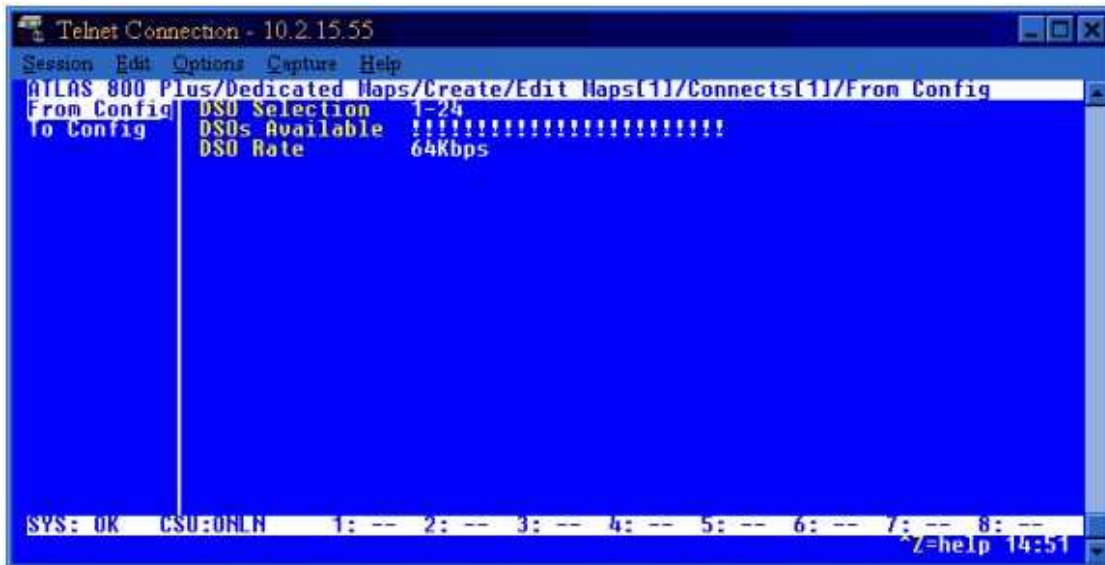


Figure 11

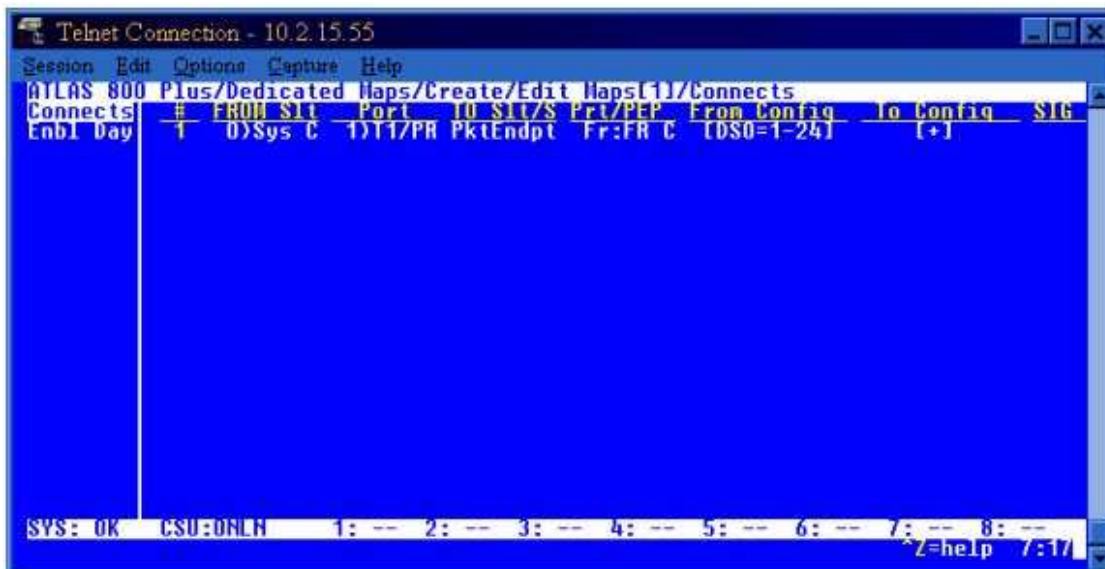


Figure 12

Configuring Dial Plan

1. Now that all of the primary frame relay connections have been made, the inbound and outbound DBU calls need to be configured. The PRI line that connects to Telco will be configured on **Network Term**. For **FROM Slt** and **Port**, select the slot and port to which the PRI is being connected. Press <enter> on **Out#Accept** and enter \$ for the **Outgoing # Accept** which will allow any number to be dialed

out on that interface. In the **Ifce Config** menu, the **Switch Type**, **First DS0**, and **Number of DS0s** need to be configured with the information provided by the ISDN service provider. For the example in Figure 1, a full PRI is being used with a switch type of National ISDN (see Figure 13 and 14).



Figure 13



Figure 14

2. The User Term must be configured with the DBU packet endpoint created earlier. For **Slot/Svc**, select *PktEndpt*. For **Port/PEP**, select the DBU endpoint. Configure **In#Accept** to be the number that the remote site associated with that DBU endpoint will be calling if it goes into DBU. Be sure to enter the exact digit string

that Telco will be sending in the call setup message. In the **Ifce Config** menu, for **Out Dial Number**, enter the number of the remote that the ATLAS needs to dial if it detects a failed criteria on the PVC for that remote. Configure **Route Incoming Call** for *Using DBU Handshake*. If you want to bond B-channels in the ISDN call, configure **Min DS0s** and **Max DS0s** for the minimum number of channels to be bonded and the maximum number of channels to be bonded, respectively. Since the remote TSU IQ BRI card in the example is capable of bonding, we will configure the ATLAS to bond both B-channels, meaning that **Min DS0s** and **Max DS0s** will be set to 2. Note that bonding requires the ATLAS 800^{PLUS} to have an IMUX module. For the example in Figure 1, the **User Term** will look like Figure 15 and the **Ifce Config** will look like Figure 16.

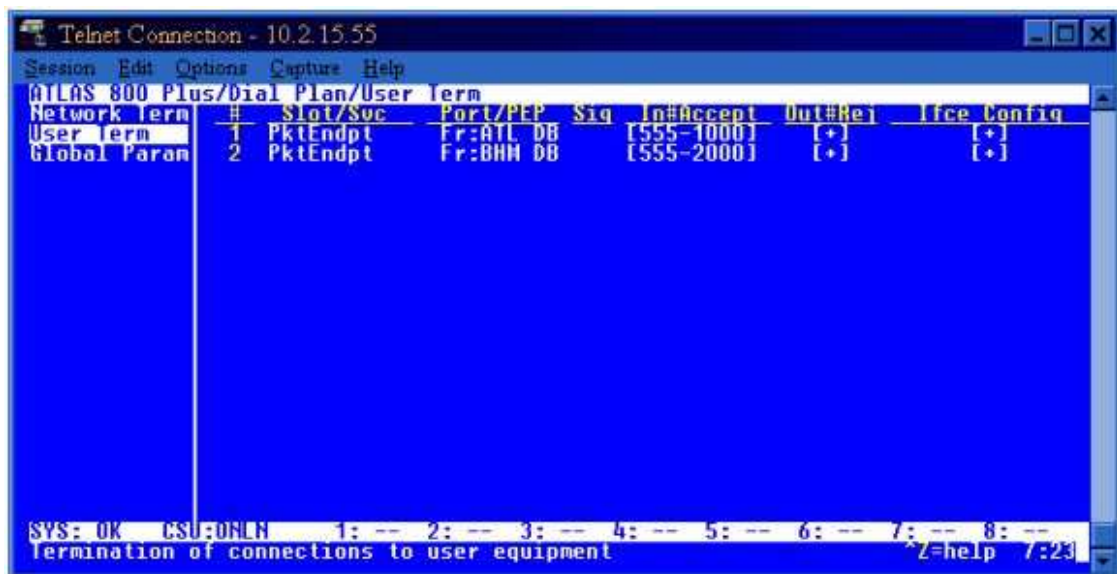


Figure 15



Figure 16

Configuring the TSU IQ

1. To configure the remote site TSU IQs, telnet or connect a terminal to the unit. The unit may also be accessed using the front panel. However, for the purposes of this technical note, we will use the telnet menus. Under **Configuration, DTE Port, Physical Layer Options**, verify that the **CTS, DSR, and CD Options** are *Forced On*, as shown in Figure 17.



Figure 17

2. Under the **Frame Relay Options** of the **DTE Port, Signaling Responses** need to be set to *Always On*, as shown in Figure 18. This allows the connection between the DTE port and the router to maintain an active DLCI(s) while the TSU IQ is dialing to make a backup connection. If **Signaling Responses** is set to *Follows Net*, the DLCI(s) between the DTE port and the router will go inactive when the network goes down and would be used if you wanted the router to do dial backup.

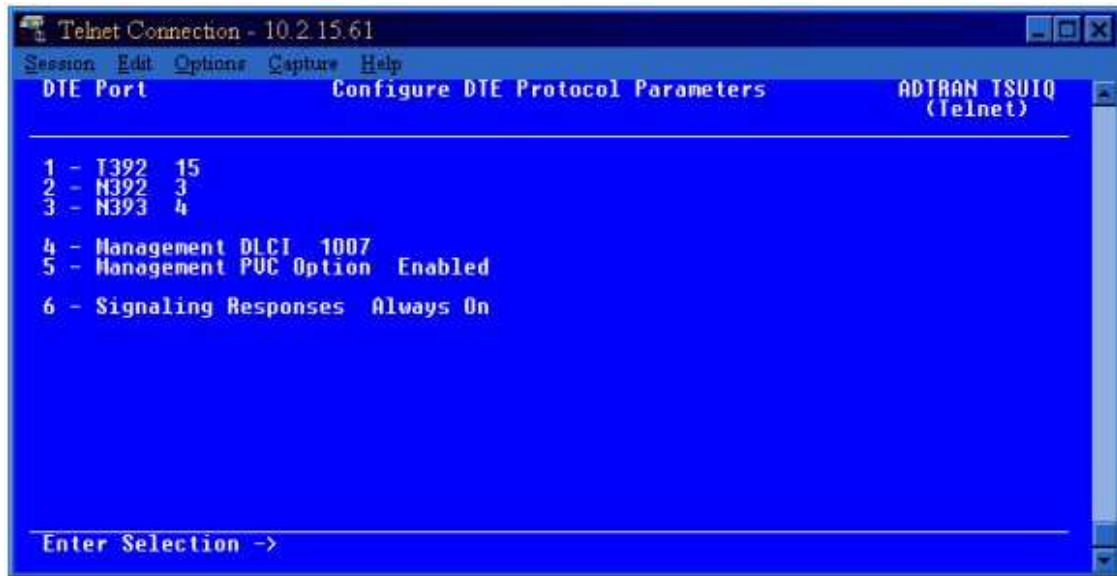


Figure 18

3. Under **Configuration, Network Port**, configure the **PVC Options** to allow the proper DLCI information to be passed to the ATLAS when initiating dial backup. **DLCI** must be configured for the locally significant DLCI. If the unit is already connected to the frame relay line and is not in alarm, you may verify the local active DLCI in the **View Statistics, DLCI List** menu. **DLCI List** presents a real-time display of DLCI numbers and their status ('A' for Active, 'I' for Inactive) as advertised by the service provider's frame relay switch. **DBU DLCI** must be configured for the DLCI number of the far end ATLAS 800^{PLUS}. In other words, the **DBU DLCI** is the primary endpoint DLCI of the host ATLAS 800^{PLUS}. For the Atlanta remote site, **DLCI** and **DBU DLCI** should be 20 and 16, respectively (see Figure 19). For the Birmingham remote site, **DLCI** and **DBU DLCI** should be 20 and 17, respectively. **DBU Phone Number** is the number that the TSU IQ will dial when that PVC meets one or more of the DBU criteria. The remaining options in **PVC Config** are for statistical purposes only and may be left as default. **Note:** When using firmware revision 3.28 in the TSU IQ, the **DBU Phone Number** is located under **Configuration, Dial Backup, Phone Numbers**.

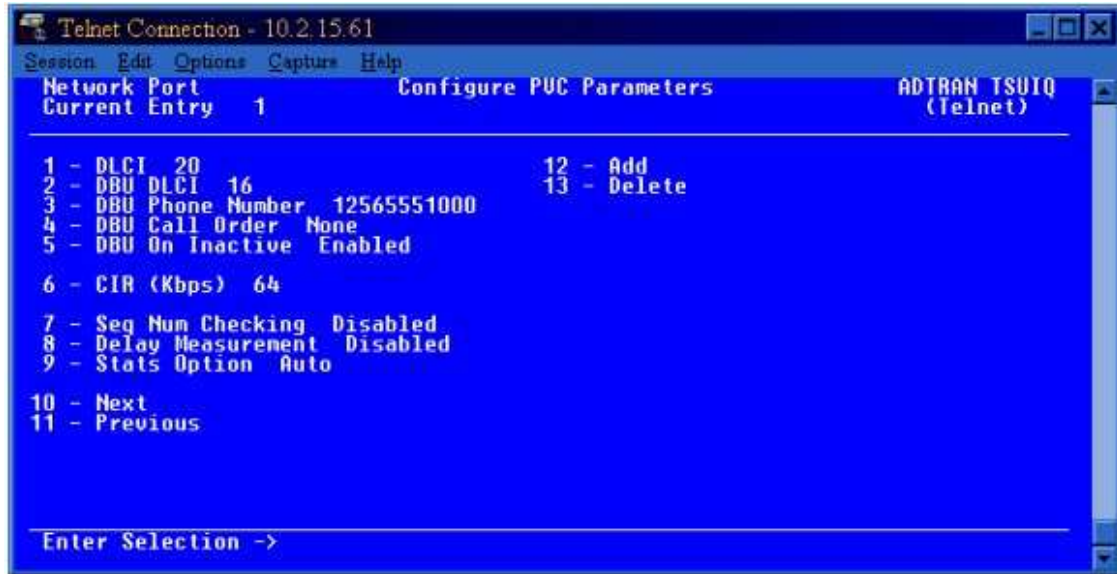


Figure 19

4. Configure the DBU options by going to **Configuration**, then **Dial Backup**. Set **Auto DBU** to *Enable* if you want the TSU IQ to automatically go into dial backup on a failed criteria condition. Under **DBU Criteria**, configure the criteria to be used to decide when the TSU IQ will go into backup. The different types of criteria are defined as follows:

With Network Failure	T1 alarm, such as Loss of Signal, Red Alarm, or Blue Alarm
With No LMI	Frame relay signaling is down
* With PVC Inactive	PVC goes to inactive state

* Not available in version
3.28

5. The **DBU Criteria** needs to be set as shown in Figure 20 to allow the TSU IQ to go into dial backup if there is a T1 failure or if frame relay signaling is lost between the TSU IQ and the frame relay switch.



Figure 20

5. In the **Dial Backup** options, the **ISDN Options**, shown in Figure 21 below, must be configured to allow the ISDN line to register with the ISDN switch. The ISDN service provider must give you the ISDN **Switch Type** and **SPID** numbers. The **LDN** numbers can be derived from the **SPID** number by stripping off the area code and using the next 7 digits. The **B-Channel Bit Rate** should be *64K* unless your ISDN service is restricted to 56K calls. The **Number of B-Channels** should be 1 unless the ATLAS 800^{PLUS} has an IMUX module and is configured to do bonding of B-channels.



Figure 21

Completing the Application

Now that both sides have been configured to use the Safe-T-Net application, the units should be tested to ensure proper functioning before a true outage occurs. The easiest and fastest way to test dial backup is by removing the T1 line from the TSU IQ and letting it dial the ATLAS 800^{PLUS}. After an ISDN connection is made, verify that data and/or voice works as normal to prove the path is good. If this is successful, plug the T1 back in to restore the main line. To ensure proper configuration on the ATLAS 800^{PLUS}, complete the same process of pulling the primary frame relay line on the ATLAS 800^{PLUS} to allow it to initiate dial to the TSU IQ.

Using another ATLAS in place of the TSU IQ

To use an ATLAS 800^{PLUS} or ATLAS 550 at both the host and the remote locations, the following modifications will need to be made to the configuration discussed above.

1. From the main menu, go to **Dial Plan/User Term/IFCE Config(on the line that contains your Packet Endpoint)/Support DBU Handshake** and change this option to *NO*.
2. From the main menu, go to **Packet Manager/Packet Endpoints/Config** and locate the endpoint you have created for your dial backup. On this endpoint, go to **Config/Signaling Role** and make sure it is set to *Off*.
3. From the main menu, go to **Packet Manager/Packet Endpoints/Config** and locate the endpoint you have created for your dial backup. Go to **Sublinks/DLCI** and add the DLCI number that you are using. This DLCI number will need to be configured as the same number on both the host and remote ATLAS units.

Sample Configuration Files

The sample configuration files (see below) are examples of the application described in this note. These files may not contain all the configuration options needed for your specific application and are not meant to be used as a working configuration for a live network.

WARNING: Loading these sample configuration files will overwrite any existing configuration on your ATLAS product.

NOTE: Prior to loading a configuration file to the ATLAS, disengage any modules currently installed in the ATLAS. The configuration file may contain modules configured in certain slots which conflicts with modules installed in your ATLAS. If a configuration file is loaded onto an ATLAS in which the configured modules do conflict with installed modules, then the portion of the configuration relating to those modules ports will not be loaded.

Download the configuration

1. Download the appropriate configuration bundle, which is attached to this article, according to which ATLAS product you have.

ATLAS 800^{PLUS} safe800p.exe

ATLAS 810^{PLUS} safe810p.exe

ATLAS 550 safe550.exe

2. Save the executable file to an empty folder on your PC's hard drive.
3. Browse the folder where the file is saved. Execute the file by double clicking on it.
4. The configuration file and a readme.txt file will be automatically extracted to the **c:\adtnutil** folder on your computer.
5. Please refer to the readme.txt file for full instructions on downloading the configuration file to the ATLAS unit.