Troubleshooting an ADTRAN TSU with a Cisco router on the Nx56/64 port

Introduction

This note explains how to verify that the TSU and Cisco router are communicating properly with each other. It also explains how to perform loopback testing on the TSU to get protocol up on the Cisco router.

Before You Begin

This tech note assumes that the TSU is configured and that the correct DS0s are mapped to the Nx56/64 port.

Troubleshooting

1. Hard loop the network port of the TSU as described in KB Article # 1607 (disconnect the network cable from the Smart Jack, i.e. wall outlet, demarc, then plug it into the loopback connector on the TSU power cord). The cable should be connected between the Network port of the TSU and the loopback connector.
2. On the router, ensure the protocol is set to HDLC (**show interface Sx**, where "x" is the serial port number of the router connected to the TSU). Look for the encapsulation type. This should show **Encapsulation HDLC**.
    Note: If it is not HDLC, note the existing encapsulation so it can be restored after testing. Then enter the router command **Encapsulation HDLC** for the respective serial interface to change the protocol to HDLC.
3. Again, enter the command **show interface Sx**. The first line of the returned text should be **Serial UP Protocol UP (looped)**.
    o   If this is the case, then the router and TSU at this location appears to be working properly and the problem could be with the T1 line or with equipment at the remote location.
    o   If not, traverse the TSU test menus to loopback the TSU Nx56/64 port. Under port config for port x.1 Nx56/64, change **DCD** from **Normal** to **Force On**. Enter the **show interface Sx** command at the router.
    o   If this does not return **Serial UP Protocol UP (looped)**, the problem is most likely with the router or the serial port cable between the router and TSU.

- o If it does return **Serial UP Protocol UP (looped)**, the problem lies within the TSU configuration or possibly the TSU itself.
4. When testing is completed, return the router to the correct encapsulation (protocol) with the command **Encapsulation xxxx**, where "xxxx" is the original protocol noted in Step 2 above. Also change **DCD** to **Normal** and cancel loopback tests.

Quick Reference

The flow chart below can be used as a quick reference guide for troubleshooting.

```
                        ┌──────────────────┐
                        │       (1)        │
                        │  Hard loop Network│
                        └────────┬─────────┘
                                 │
                                 ▼
┌──────────────────┐         ◇─────────◇
│  Note existing   │        ╱     (2)    ╲
│ encapsulation and│◄──No──◇  show int sX  ◇
│  change to HDLC  │        ╲ Encapsulation= ╱
└────────┬─────────┘         ◇   HDLC    ◇
         │                        │
         │                       Yes
         └──────────────────────►│
                                 ▼
┌──────────────────┐      ◇──────────◇        ┌──────────────────┐
│       (4)        │     ╱    (3)     ╲        │  Check T1 line or │
│ Test Menus: Loopback│◄─No─◇ show int sX ◇─Yes─►│ remote location. │
│  Nx54/64 port &  │     ╲Serial=up Prot=up╱     │ Router and TSU on this│
│  DCD=Forced On   │      ◇  (looped)  ◇         │ side are working  │
└────────┬─────────┘                            │    properly.     │
         │                                      └────────┬─────────┘
         ▼                                               │
   ◇──────────◇      ┌──────────────────┐               ▼
  ╱ show int sX ╲     │                  │      ┌──────────────────┐
 ◇  Serial=up   ◇─Yes─►  Check TSU and   ├─────►│       (5)        │
  ╲ Protocol=up ╱     │  configuration   │      │Restore encapsulation│
   ◇ (looped) ◇       └──────────────────┘      │ & DCD to normal. │
        │                                       │  Cancel all tests │
        │             ┌──────────────────┐      └──────────────────┘
        └────No───────►Check router and serial│
                      │    port cable    │
                      └──────────────────┘
```