Timing Modes on the TSU and TDU

Introduction

The available timing modes within the TSU and TDU products are as follows:

- Internal
- Network Timing
- Base DTE in 100/120
- Base DTE (Slot 1) in 600
- Base DSX in TSU 120
- Secondary (With DSX-1 or DS-1 module installed.)
- Normal/CSU (With DSX-1 or DS-1 module installed.)
- Dial Backup (Not a visible option.)

When a timing mode is selected, the timing source for **every** interface within the TSU is chosen. This includes DS-1, DSX-1, Nx56/64, OCU, and DSU. The important thing to remember about timing is that you can only have **ONE SOURCE OF TIMING** in the network to run without errors.

Timing Mode Options

Internal

When internal timing is selected and there is no secondary interface in the TSU, the internal oscillator and frame pulse generator are used.

Note: The internal oscillator is a stratum 4 clock.

Network Timing

The network is the source of timing. The received data clocking is looped back to the network where it is used to determine the transmission timing. This option is also referred to as looped timed as the transmission clock is derived from the received clock

DTE Timing

If the TSU 100 and TSU 120 are used, the base Nx56/64 is the only Nx port capable of providing timing. If you use the TSU 600 and are operating in DTE timing mode, the Nx being used must reside in slot 1.

The Nx takes the clock provided on the ETC pins on the V.35 interface and derives a T1 clock based on the number of DS0's assigned to the port. If the external router is providing a clock that

does not match the rate the Nx is expecting the T1 timing will be inaccurate and could cause the T-span not to clear alarms. To check this, set the TSU to internal timed and the alarms should clear if that is the issue.

Base DSX Timing

This allows the equipment on the built in 0.2 DSX-1 interface to provide timing to the network. This **is not** the same as CSU timing because the base DSX is not capable of driving a transmit frame pulse for the system. So even in this mode, if there are timing issues, you will see frame slips on the T1 interfaces.

Secondary Timing

This is essentially the same as Base DSX timing. All interfaces will derive their timing from the secondary interface modules timing. If the secondary interface is unplugged, the T1 framer on that interface will continue to generate timing for the system.

Normal (CSU) Timing

This mode makes the TSU appear transparent to timing. That is, the Secondary interface transmitter will use the receive timing from the Network interface and the Network interface transmitter will use the receive timing from the Secondary interface. Since the framing is also passed in the same manner, data will pass through transparently. If there is a timing problem in the circuit this **will not fix it**. It only moves the problem from our box to some other equipment (PBX or Telco). Figure 1 illustrates the framing and timing for CSU timing.
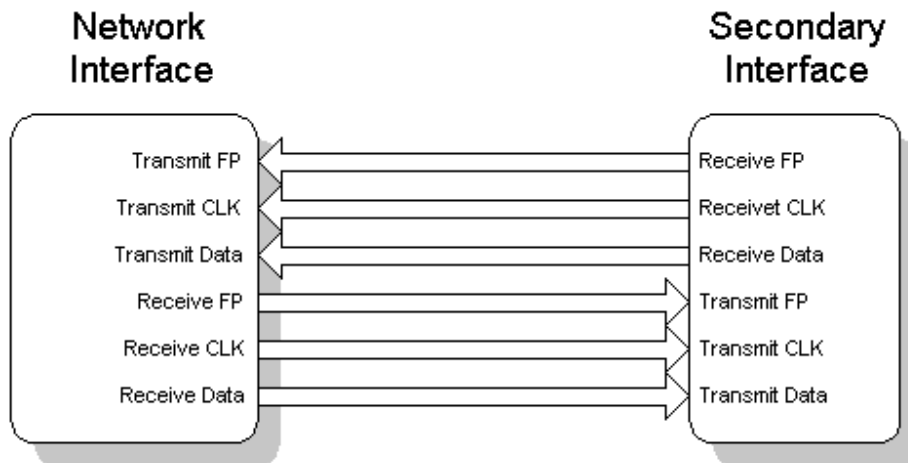

Figure 1. Block diagram of CSU timing.

Backup Timing

This is not an option visible from the front panel, but if a multi-port DBU module goes into backup, the whole system gets timed from the backup link. If the DBU is misconfigured for the wrong number of DS0's versus what the backup link provides, you may see the backup work properly but the T1 will never come back. This is because the timing on the T1 could be out of

specification due to the incorrect timing on the backup link.

Note: On units with the CSU timing option, you do not have to set the timing on the SI module.