Fully Accessible System Topology "FAST"

COMTECH EF DATA

Application Note

Industry Requirements

Satellite communications requirements are continuing to expand and change. These changes (along with increased customer demand or satellite transponder constraints) often require unexpected upgrades of the service providers' equipment. Frequently, these demands necessitate changes made to the satellite data modem in the field. The most common solutions to these ever-changing requirements are service upgrades to existing modems. However, when the requirement change cannot tolerate down time, the only option is to order a replacement modem. Requesting expedited delivery can be costly, and replacing the existing modem with the new one creates a "shelf spare," which takes up valuable storage space.

Comtech EFData leads the satellite industry in offering the most rapid service available for upgrading modems. The service provider's nightmare, costly down time, is minimized by Comtech EFData's quick response and ability to provide upgrade service, both on site or at the factory.

Comtech EFData maintains a tradition of responding to customers' needs with yet another industry first: Fully Accessible System Topology (FAST). The development of FAST acknowledges the uniquely demanding needs of service providers, and supplies them with an Error Free solution.

FAST is an exclusive feature available in Comtech EFData's exciting new generation of modem products. Designed in response to customers' requirements, FAST provides:

- Greater flexibility when ordering modems
- FASTer serviceable upgrades to enhance system performance

Until now, a clean, cost-effective solution has eluded service providers. The only choices were to buy a modem with full capabilities and risk paying for features that would never be used, or to purchase a more cost-effective modem with limited capabilities and risk expensive future replacement or upgrades.

Theory

FAST is an enhancement feature available only in Comtech EFData products, enabling on-location upgrade of the operating feature set—in the rack—without removing a modem from the setup. When service requirements change, the customer can upgrade the topology of the modem to meet those requirements within minutes after confirmation by Comtech EFData. This accelerated upgrade can be accomplished only because of FAST's extensive use of programmable devices incorporating Comtech EFData-proprietary signal processing techniques. These techniques allow the use of a unique access code to enable configuration of the available hardware. The access code can be purchased at any time from Comtech EFData. Once purchased, the access code is loaded into the unit through the front panel keyboard or the rear remote port. Additional upgrades can be made to the same modem in the future.

With the exclusive FAST technology, customers have maximum flexibility for enabling functions as they are required. Now available in Comtech EFData's new generation of modems, FAST allows a system designer or purchaser to order a modem precisely tailored for the initial application, reducing risk and cost overruns during the application integration process.

Implementation

FAST is factory-implemented in the modem at the time of order. Hardware options for basic modems (like Reed-Solomon and overhead cards) can be ordered and installed either at the factory or in the field. This approach is readily accepted for existing applications requiring such options, but what about the standard service that does not require the hardware?

Examining Comtech EFData's SDM-300A modem will highlight some of the FAST features that apply in such a situation. The purchase price of the modem reflects the customer's initial requirements. In the case of the SDM-300A, the requirements can be as basic as a single data rate, sequential decoding, and no overhead, resulting in cost savings at the time of purchase. FAST makes this purchase worry-free, as illustrated in the following example.

Example:

Service is established using SDM-300A modems equipped with a single 64 kbit/s data rate filter and sequential decoding. After just two months, the customer requires a service enhancement to cover a rapidly expanding requirement for data. The customer requests an upgrade to 2,048 kbit/s with variable data rates using Viterbi decoding, and the need is for immediate delivery. Comtech EFData is contacted for the upgrade; the customer is assured that service will be established shortly. Once the upgrade purchase is approved, Comtech EFData requests the serial number(s) of the SDM-300A(s) that will be enhanced. The customer is then given an alphanumeric code for the SDM-300A(s). The codes are entered into each SDM-300A from the front panel (or remote port) and then the SDM-300A(s) will re-initialize. The enhanced feature sets purchased in the upgrade are immediately available.

In the example above, the SDM-300A has changed from a single, low-data-rate sequential modem to a variable, mid-level data rate with sequential and Viterbi decoding. The whole upgrade process can take less than one hour. The FAST upgrades available for the SDM-300A are indicated in Figure 1.

HARDWARE	Single Data Rate	Variable Data Rate (up to 512 kbit/s)	Variable Data Rate (up to 2.5 Mbit/s)	Sequential Decoder	Viterbi Decoder	Asymmetrical Loop Timing	Reed-Solomon Codec	ASYNC/AUPC Overhead	Open Network (IDR/IBS)	Drop and Insert
Basic Platform SDM-300A	X									
FAST Options		X	X	X	X	X				
FAST Options with Reed-Solomon Hardware							X			
FAST Options with Overhead Hardware								X	X	X

Figure 1. FAST Upgrades