



# Migrating SS7 Signaling Networks to Sigtran

## Optimize Evolution to IP

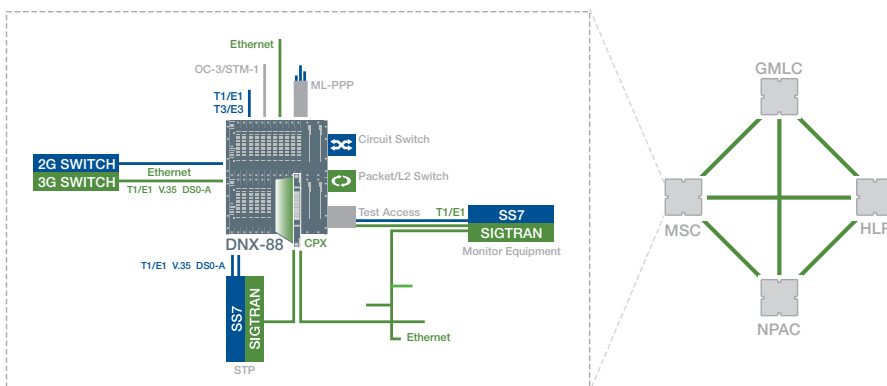
### Signaling Network Migration Challenges

The explosive growth in mobile services is causing an exponential increase in SS7 signaling traffic. To enhance scalability, many signaling network operators are considering Sigtran solutions. Sigtran is a group of IETF protocols for the transport of packet-based PSTN signaling over IP networks. SS7 networks have long been hallmarks of availability and resiliency, and Sigtran takes rigorous SS7 functional requirements into account. Nevertheless, Sigtran deployments move signaling networks away from dedicated, highly reliable circuit-switched TDM transport and into the realm of shared, packetized IP transport – which may increase scalability, but lacks important OAM&P features.

### Carrier-Class Circuit/Packet Interworking

The Circuit Packet eXchange (CPX) module set adds circuit/packet interworking to DNX-11/88 Multiservice Cross-Connect platforms. The CPX/DNX solution integrates a proven-reliable cross-connect with a high-performance packet processing engine for SS7/IP Layer 3 forwarding and a wire-speed Ethernet switch. This unique combination allows for a sensible, incremental approach to SS7 network evolution. Operators can scale high-growth links to Sigtran while leaving low-speed and T1 SS7 links in place. In addition, CPX provides the option of transporting Sigtran traffic over bundled T1 links using ML-PPP technology (Figure 1). By taking full advantage of high-speed interfaces on STP signaling elements, and leveraging a carrier-class transport network, CPX enables circuit-expert SS7 engineers to overcome the bandwidth limitations of current uplinks while maintaining signaling network autonomy and integrity.

Deploying routers for Sigtran implementations introduces operational difficulties. Routers fall short of the required availability level, and lack the diagnostic and test access facilities needed to operate a highly reliable signaling network. CPX technology brings traditional equipment-side and network-side monitoring and diagnostic features to Sigtran (SplitE/F), applying them to both Ethernet and TDM interfaces.

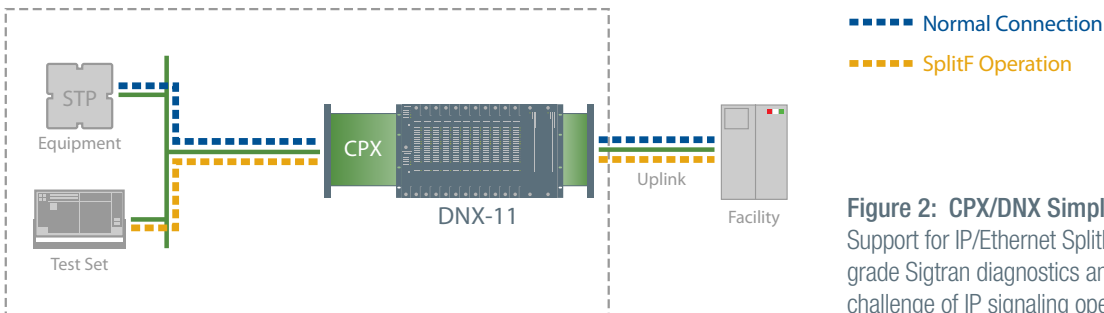


**Figure 1: CPX/DNX Carrier-Class Circuit/Packet Interworking**

Operators can scale high-growth links to Sigtran while leaving low-speed and T1 SS7 links in place; and leverage the carrier-class transport network by carrying Sigtran traffic over bundled T1 links using enhanced ML-PPP.

### Features and Benefits

- Robust, Integrated Circuit/Packet Functions
- Innovative IP/Ethernet Diagnostics
- Enhanced Link Visibility and Management
- Carrier-Class Network Reliability
- Retention of Signaling Network Autonomy



**Figure 2: CPX/DNX Simplifies Sigtran Network Monitoring**  
Support for IP/Ethernet SplitE/F and MonE/F enables carrier-grade Sigtran diagnostics and test access, alleviating the major challenge of IP signaling operations.

### Enhanced Link Visibility and Management

Router-based Sigtran deployments continue to use an ML-PPP bundle as long as a single link within that bundle is viable. Yet, loss of connectivity of any member link in an ML-PPP bundle can cause congestion and unacceptable signaling performance. Even worse, unlike SS7 TDM links, Sigtran endpoints are unaware of link degradation and associated congestion, because a router has no mechanism for alerting Ethernet-attached devices that bandwidth has deteriorated. Sigtran endpoints maintain a connection long after a link begins to cause congestion and delays.

The CPX ML-PPP implementation allows operators to specify a minimum number of operational links, forcing an ML-PPP bundle to become inactive when too few links are viable and preventing continued operation at significantly diminished bandwidth. Providing unprecedented visibility into Sigtran links enables robust, carrier-class signaling operations. Together, enhanced ML-PPP provisioning and SplitE/F monitoring provide visibility into Sigtran traffic that equates to the manageability of SS7 links.

### SS7/Sigtran Traffic Grooming and Aggregation

The CPX/DNX solution leverages integrated circuit/packet processing capabilities and a variety of transport interfaces to groom and aggregate SS7 and Sigtran traffic onto a common transport facility (e.g., DS-3 or OC-3/STM-1). Doing this within a single, compact device extends the grooming and aggregation efficiencies of SS7 to Sigtran traffic, while giving operators the flexibility to use the best transport option available – and reducing OpEx. Combining TDM-based SS7 and IP-based Sigtran traffic over a single network ensures maximum operational and cost efficiency.

### Industry-First IP/Ethernet Test Access

Sigtran presents formidable challenges to network monitoring and maintenance. For operators, the limited OAM&P functionality of Ethernet transport causes legitimate worries about Sigtran reliability. CPX meets these concerns head on. In addition to the comprehensive diagnostic and test features on DNX platforms, the CPX module set includes IP/Ethernet MonE/F test access (with support for remote monitoring of up to 7 Ethernet ports) and an industry-first Ethernet-to-TDM SplitE/F function for isolating and troubleshooting segments of the Sigtran network (Figure 2). Operators can use the same reliable and resilient operations practices on Ethernet Sigtran links that they use for TDM SS7 transport.

### Optimized Sigtran Introduction

Migrating from SS7 to Sigtran overcomes bandwidth and signaling platform bottlenecks, allowing signaling operations to keep pace with network and service expansion. Sycamore Networks makes it possible to realize those benefits without relinquishing SS7 reliability or control. The CPX/DNX solution provides a way to introduce Sigtran that ensures the reliability of the SS7 network and eliminates the need to build and operate an overlay router network. Simultaneous support for circuit and packet technologies in a single, carrier-grade system facilitates a smooth and successful migration from SS7 to Sigtran.

**For more information about our intelligent networking products and solutions, please contact your Sycamore Sales Representative.**

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