SBC*
Telecom

Ameritech

Southwestern Bell

SBC
global
network
*

SNET

PACIFIC BELL

NEVADA BELL

CELLULARONE

SBC Priorities and Objectives for Resilient Packet Ring Development

George Young

SBC Technology Resources, Inc.

IEEE 802.17 - March 12, 2001

802.17 **IEEE 802.17 RPRWG**

SBC | SBC Technology Resources, Inc.

Evolution to Resilient Packet Ring Transport

• Ethernet physical layer transport has emerged from the LAN, scaled in speeds up to 10 Gb/s and will be optimized to provide bandwidth efficiencies and **carrier-class functions** for transport of packet-based services across metropolitan and wide area networks.

• Ethernet-like "RPR" transport protocols are being developed with the promise of supporting:
  • Connectionless "plug and play" operation - reduced circuit administration
  • Shared media access for efficient bandwidth utilization with higher physical line rates
  • Robust protection mechanisms equivalent to SONET, DWDM layer protocol performance
  • Better optimization for Layer 3 (IP) packet services versus TDM or ATM circuit transport

• GbE and 10 GbE Ethernet physical layer transport will be most important to support cost-effective implementations as network overlays where SBC transport services are positioned to support focused traffic demand for transport of native packet applications.

• Transition phases will support packet transport over fiber, incumbent SONET and emerging metro DWDM physical layers.

Next Generation Optical Transport with "Resilient Packet Rings"
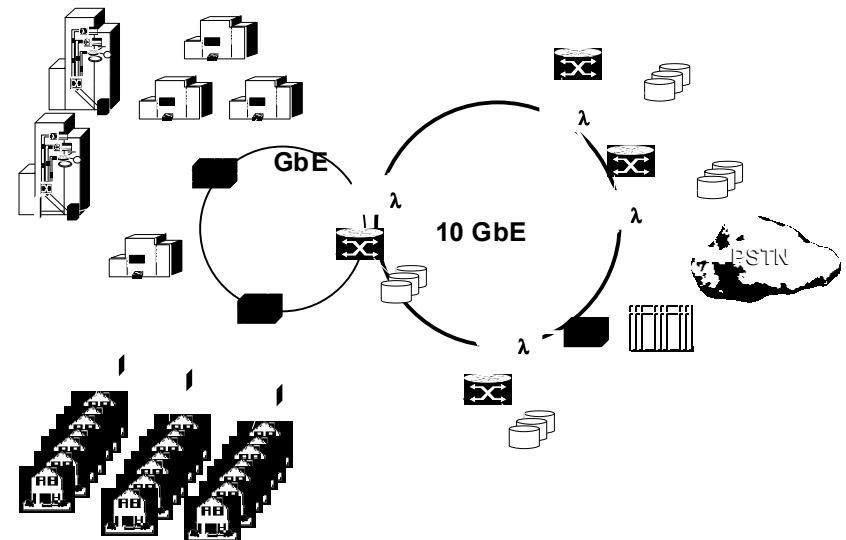
What will it take for the 802.17 RPR Standard to allow for delivery of **Carrier-class** functions?

- Development of "Carrier-class" functions does not just occur unilaterally, but is supported primarily through active, collective carrier/supplier participation in accredited telecommunications standards bodies such as ATIS T1 Technical Subcommittees, Industry Forums, ITU-T Study Groups.

- 802.17 RPRWG remains in control, but needs to develop the appropriate, necessary liaisons at the right times to pertinent standards groups, including:

    – T1X1.5 (Optical Hierarchical Interfaces) and T1X1.3 (Sync), (ITU-T SGs 13, 15) - Transport Protocol Payload Mapping, Circuit Emulation, Sync...

    – T1M1.5 (Internetwork Operations, Testing, Operations Systems and Protocol), (ITU-T SG 4) - Management and Fault/Performance Primitives

    – T1A1.3 (Performance of Digital Networks and Services), (ITU-T SG 12) - Service Performance Measurement, Characterization, Specifications

    – ATIS Network Services Integration Forum (NSIF) Switched Optical Network Workgroup - Interoperability and Interworking Specifications

SBC Objectives - RPR Interoperability, Internetworking and Interchangeability

- SBC founded and chaired (1994-2000) the SONET Interoperability Forum, now the ATIS Network and Services Integration Forum (NSIF).

- Telecom industry understandings of specifications and implementations:
  - Supplier Functional Interoperability
  - Protocol Layer Interworking
  - Transport Service/Client Internetworking

- NSIF Switched Optical Network Management Workgroup is formed to "identify requirements for management and control architectures, functions, and interfaces to enable efficient and interoperable setup of connection-oriented and connectionless services in multi-technology networks". (http://www.atis.org/pub/atis/press/030501.pdf)

- SBC requirements are for transport platform functional supplier inter-changeability, not universal intra-architecture element interchangeability.

SBC Objectives - Ring Architecture
Interoperability versus Interworking
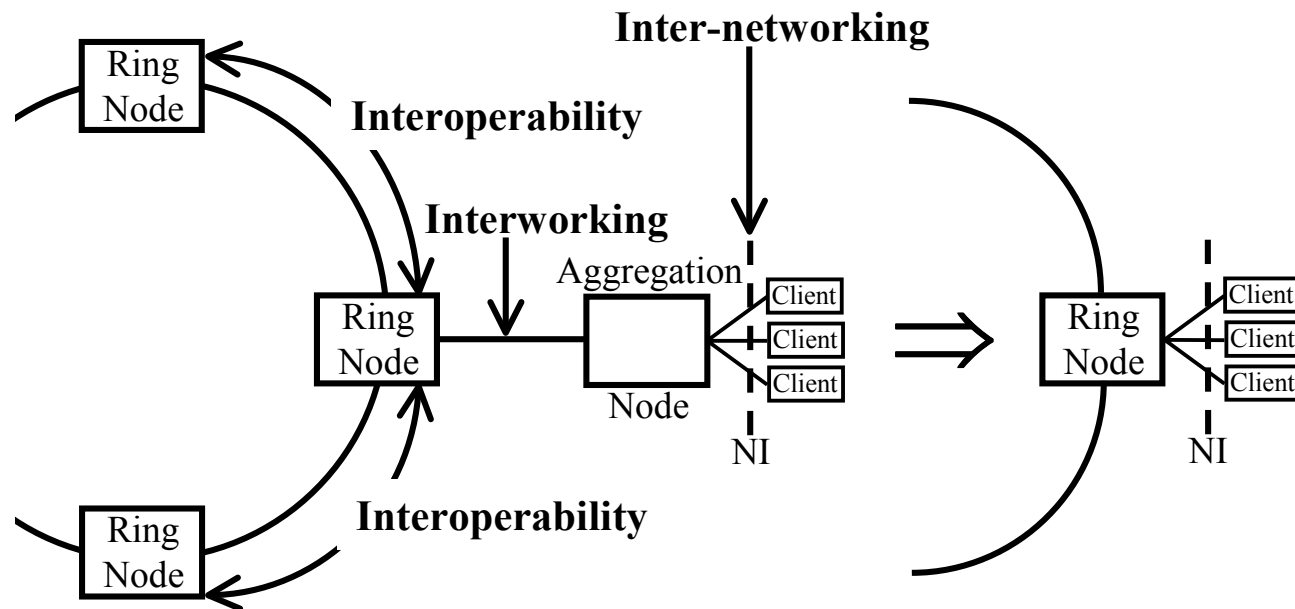
Develop common interoperability specifications to reduce unnecessary back-to-back interworking functions

SBC Priorities - Incumbent to Next Generation (SONET) PHY Transport

- Generic Framing Procedure (GFP) - Intended for Determination by ITU-T by October 2001, Frame Mapped versus Transparent Mapped Support for Jumbo Frames, Need to Liaison Now with T1X1.5

- Support for Lower rate (STS-3c and higher) SONET payload mappings - T1.105.02 - "SONET-Payload Mappings", Completed January 2001

- Support for High-order STS Virtual Concatenation (STS-1/3c-Xv SPEs, (T1.105 - "SONET-Basic Description including Multiplex Structure, Rates and Formats", Completed January 2001.

- Support for STS Virtual Concatenation (High-order) Link Capacity Adjustment Scheme (LCAS) also in T1.105 - 2001.

SBC Priorities - Resilient Packet Ring Topologies and Architecture Functions

- SBC multi-node ring topologies remain dominant and continue to be targeted for both metropolitan access and interoffice architecture applications.

- Develop RPR objectives to support multi-node ring versus other arbitrary topologies so as to optimize protection and shared media access performance characteristics in both hybrid and overlay network applications.

- Develop RPR objectives to emphasize optimization of service offerings for variable bandwidth transport of connectionless native packet applications while not precluding adaptations for TDM circuit transport emulation.