

## Raisecom EOS

The exponential growth of corporate Internet traffic and inter-office applications using the Ethernet protocol, such as intranet, email, enterprise, Voice over IP and video conferencing, are creating significant challenges for service providers and operators of MAN and WAN. On the other hand, data networks are still not optimized to carry traditional telephony or real-time broadcast video application efficiently. Furthermore, the recent slowdown in the telecommunication industry has impacted the build-out of converged data/voice access services, whether they are DSL or Gigabit Ethernet-based.

Concept of Ethernet over SDH/SONET

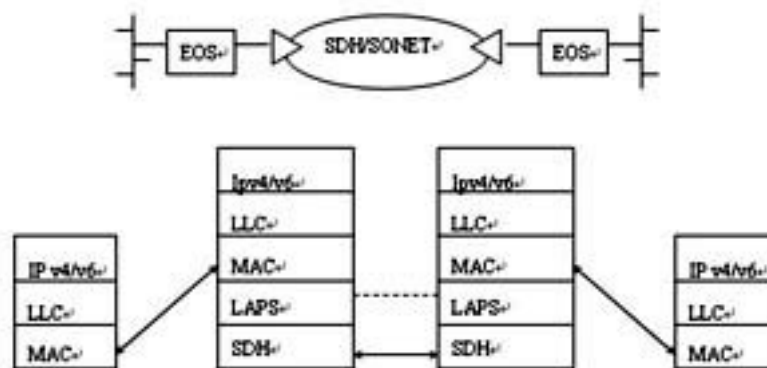


Figure 1

### Evolution of Ethernet over SDH/SONET

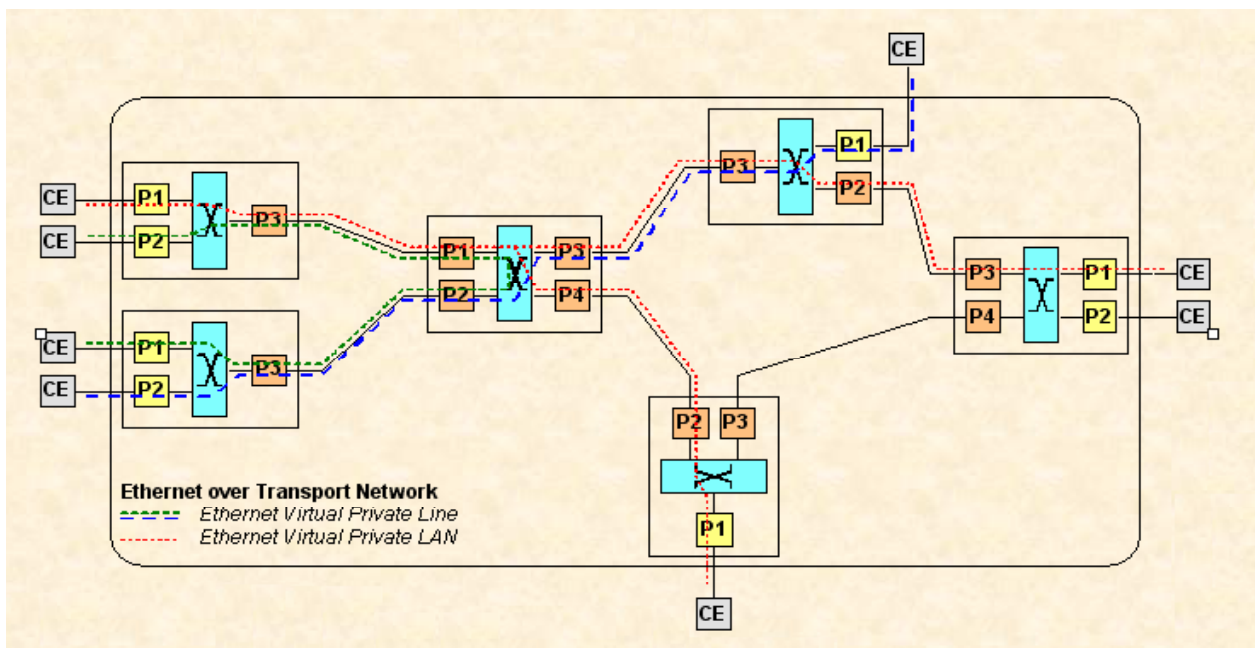
We have passed through 3 phases. One is transparent point-to-point LAN service over SDH/SONET based on STM-1. The second is supporting for generic framing procedure (GFP) and virtual concatenation with point-to-multipoint. The third is multiple service transmission platform (MSTP) over SDH/SONET based on 155M, 622M, 2.5G.

#### 1. Point-to-point

Much STM-1 resource is built-up decades ago and now Ethernet application is booming up in every field. The rest STM-1 can be convert to 100M BaseT for Ethernet services. This technology is beneficial for maximum the existing legacy resource and cost-effective.

## 2. Point-to-multipoint

Connect LAN traffic over existing SDH/SONET networks and support for generic framing procedure and virtual concatenation enable configuring the bandwidth of the IP channel in increments of 2Mbps for cost-effective adaptation of SDH/SONET infrastructure for LAN connectivity. It eliminates the rigid bandwidth restrictions usually imposed by SDH/SONET virtual containers, and allows for scalable and efficient next generation Ethernet services delivery.



EVPL & EVPLAN: defined by ITU-T

## 3. MSTP

Support all legacy TDM traffic services besides all above Ethernet services. So it is called multiple services transmission platform. It is a legacy, hybrid transport platform.

## Key technologies of EOS Basic technology

GFP: Transparent GFP provides an efficient mechanism for mapping constant bit-rate block-coded data signals across a SONET/SDH or OTN network. Performing the mapping on a client-character basis rather than a client-frame basis significantly reduces transport latency. Reducing latency is a critical issue for SAN protocols including Gigabit Ethernet. Translating the client block-codes into the more efficient 64B/65B mapping provides a significant bandwidth efficiency increase, while the superblock structure

itself provides robust error performance. Transparent GFP also improves the performance monitoring capability for the transport layer, while the ability to tunnel SDCC management information through an intervening network provides a powerful extension to network providers' capabilities.

**LAPS:** LAPS protocol and specification introduced in ITU-T Recommendation X.85/Y.1321, continue to be used to address its capabilities of providing the adaptation from Ethernet to LAPS. LAPS describes an HDLC-like framing structure to encapsulate IEEE 802.3 Ethernet MAC frame, provide a point-to-point full-duplex simultaneous bidirectional operation. Connecting The LAPS is a physical coding sub-layer, which provides point-to-point transferring over SDH virtual containers and interface rates. The supported UITS is a connectionless-mode service. The rate adaptation between LAPS and SDH is applied. It provides a mechanism that adjusts the rate of Ethernet MAC MII to SDH VC rate, and also prevents MAC frame going to SDH VC is written to the SDH overhead since SDH and MAC are operated in the way of period and burst respectively.

**PPP:** The Point-to-Point Protocol (PPP) originally emerged as an encapsulation protocol for transporting IP traffic over point-to-point links. PPP also established a standard for the assignment and management of IP addresses, asynchronous (start/stop) and bit-oriented synchronous encapsulation, network protocol multiplexing, link configuration, link quality testing, error detection, and option negotiation for such capabilities as network layer address negotiation and data-compression negotiation. PPP supports these functions by providing an extensible Link Control Protocol (LCP) and a family of Network Control Protocols (NCPs) to negotiate optional configuration parameters and facilities. In addition to IP, PPP supports other protocols, including Novell's Internetwork Packet Exchange (IPX) and DECnet.

## Advanced technology

**VCAT:** In virtual concatenation, no intermediate node support is required. Instead, each SPE within a concatenated group representing the data packet for transmission is given an identifier. Provided as part of SONET path overhead information in SPE, this identifier indicates the SPE's sequence and position within the group.

**LCAS:** The Link Capacity Adjustment Scheme (LCAS), as defined by the ITU (per ITU-T recommendation G.7042), is a complementary technology to Virtual Concatenation. LCAS allows hitless adjustment of the size of a virtually concatenated group of channels. LCAS takes care of the synchronization between the sender and receiver so that the size of a virtually concatenated circuit can be increased or decreased in a manner that does not corrupt or interfere with the data signal. LCAS, however, does

not participate in the end to end provisioning process for new services, which is better done using either MPLS and/or G-MPLS.

VCAT and LCAS, however, can be extremely useful when provisioning a transporting shared network over an existing SDH/SONET network. In this case, VCAT is used to provision point-to-point connections over the SDH/SONET network utilizing any available capacity to construct an XxSTS-1 sized pipe for packet traffic, RPR transforms the chain of point-to-point trails on the SDH/SONET network into a true shared medium, and LCAS can be used to hitlessly increase/decrease the size of the transport network.

## Vision

Beijing Raisecom Technology Co., Ltd (RAISECOM) was founded in 1999 when data communication was still popular with the base modem, ISDN and DDN. Since then, RAISECOM had found data communication a promising and glorious futures. Expanding the bandwidth continuously to provide broadband access based on fiber and Ethernet technology would be the next generation of data communication. So, RAISECOM started with Ethernet copper to fiber media converters and rapidly got the majority of marketing share with its own advanced technology, high stability and customer awarded service. Now RAISECOM has become the leader in R&D, manufacturing, and marketing of data communication equipment and network edge devices in China. Vision creates future.

## Versatility

Raisecom have designed and developed diversified product lines, including inverse multiplexers, interface converters, protocol converters, mode converters, PDH optical multiplexers, SDH terminal multiplexers, CWDM systems Ethernet over SDH and L2/3 Ethernet Switches, after Ethernet copper to fiber media converters has gained significant success. The solutions, applications and combinations of these products can satisfy different customer needs, and are flexible, scalable and adaptable for the changing needs of the market. Versatility makes continuous development.

## Victory

Over 1,000,000 units of media converter installation, versatile product lines, and over 100 R&D people, plus perfect marketing, sales and service systems make RAISECOM become the NO.1 annual installation vendor in the field of fiber optical access. RAISECOM has achieved 500% total sales volume increase for 4 consecutive years and enjoy more than 45% marketing share on the Chinese fiber optical access market. RAISECOM feels very proud of being an important part of the legend and having brought great value to our customers. Raisecom keeps on dedicating and contributing our best talent with the drastic growth of this marketing. In 2003 and 2004, RAISECOM was recognized as one of the Deloitte Touche Tohmatsu Asia Pacific Technology Fast 500 for two consecutive years. Victory leads us to the next Victory.

### **Raisecom Technology Co., Ltd.**

Address: No.617/619 Haitai Tower,  
229 Fourth North Loop Middle  
Road, Haidian District, Beijing,  
PRC. 100083

Tel: +86-10-82884499 Ext.878

Direct Tel: +86-10-82883305

Fax: +86-10-82883056

Http:// [www.raisecom.com](http://www.raisecom.com)

E-Mail: [export@raisecom.com](mailto:export@raisecom.com)