Until recently, the service model for carriers and service providers focuses on delivering bandwidth to a stable, predictable customer base through the deployment of various transport technologies. In today’s telecommunication jungles, unfortunately, the old paradigm no longer holds. Successful carriers will be those that can build out new services quickly, while keeping a tight rein on the infrastructure outlays and maintenance costs.

RAISECOM TECHNOLOGIES’ Multi-service access platform offers a winning and innovative access network deployment strategy for the CLEC and incumbents. MSAP enables service providers to speed up the return on the investment in access network equipment as well as to generate additional revenue streams from enhanced services.

Multi-Service Access Platform Family
The flexibility and range of RAISECOM’s multi-service access device lowers the cost of entry of introducing new services, offering economical and easy connection of potential customers to any existing backbone such as SDH network or Metro Ethernet.

MSAP: Integrated Scalable Solutions
RAISECOM’s multi-service access platform, which is non-stop total solution for the last mile access, is based on deploying and concentrating RAISECOM’s specialized multi-service access equipment on customer premises, in local loop, and at POP of carriers. MSAP product family includes the RCMS2811 series optical multiplexer, OPCOM310x series SDH ADM and Terminal multiplexer, RC551 series Intelligent Ethernet Demarcation, ISCOM series Ethernet switch, RC953 series Inverse multiplexer, and RC852 series fiber Modem with single E1/V.35 interface on customer premises as well as modules in central chassis for SDH connectivity and optical line access.

Flexible Customer Premises Solutions
RCMS2811 series optical multiplexer features multiple E1s and wire-speed 100M Ethernet interface simultaneously for the multi-service on customer premises with redundant power supply and redundant optical uplink to the optical line access module in MSAP for the maximum networking uptime. RAISECOM’s OPCOM310x series STM-1 optical multiplexer offers a wide range of E1s up to 63 and Ethernet interfaces up to 8 ports with standard SDH 1+1 APS protection for critical multi-service mission on customer premises. Intelligent Ethernet Demarcation and ISCOM Ethernet switch could provide from single Ethernet port up to 48-port with full range of L2 features such as 4K VLAN, QoS, rate-limiting, ACL, Q-in-Q, IGMP snooping and IP STACKING to deliver the intelligence on customer premise access. Inverse multiplexer could offer carrier Ethernet service over single E1 or up to 8E1s according to the customer ever-growing bandwidth demand with VLAN forwarding or VLAN swapping or VLAN stacking function. RAISECOM’s fiber optical modem feeds E1 or V.35 interface to customer premise routers for the leased line service.

Connect Customers to Existing Backbone
MSAP also enables carriers to benefits from planned incremental deployment of all
modules for the last mile access network. Rather than having to estimate user service requirements in last mile access on the unproven projections, MSAP allows carriers to roll out their access network according to actual customer needs, expanding the access network as requirement increases. Moreover, MSAP concentrates all the RAISECOM specialized CPEs with optical fiber uplink into the single platform to generate revenues immediately over the existing SDH or Metro Ethernet backbone without a major capital outlays for new infrastructure.

OPCOM3500 is 19” wide 6Unit high with ETSI standard. The network management system common logic card is located in slot 0; STM-1 aggregation unit is in slot 7th; power supply modules are occupied the 13th and 14th slots and the other slots are all for tributary units. The functions of NMS module include: (1) communicate with high level NMS software; (2) Manage OPCOM3500 and the CPE which are working oppositely; (3) Provide external synchronous clock interfaces including 2Mbit and 2MHz for OPCOM3500. The Aggregation Unit OPCOM3500-STM1-M module in slot 7th is an indispensable core and it constructs basic system of OPCOM3500 with NMS for timeslot cross connecting, clock synchronization, link protection of OPCOM3500. Two STM-1 optical interfaces provide 1+1 APS protection for terminal multiplexing or work as east and west connection for add/drop multiplexing in a STM-1 ring. This module has a built-in cross connecting matrix for16*16VC4/ 48*48VC3/1008*1008VC12 capability, and provides three kinds of clock timing mode such as locking up, reserving and free oscillation.

The backplane of OPCOM3500 has three communication buses. The Telecom-Bus connects all the tributary Units to Aggregation Unit (in slot 7th), and it’s used for aggregate all tributary VC12 stream. The Ethernet Aggregation Bus provides a connectivity for specific Ethernet traffic to Ethernet aggregation module (in slot 9th) with combo GE uplink according to the configuration, and it’s used for aggregate all the wire-speed 100M Ethernet services in each CPE on remote site. The Management Bus, working in HDLC, UART, or Fast-Ethernet signals, provides a connectivity of NMS module to all other modules including aggregation module and tributary modules. It could manage the local modules and all the remote Raisecom CPEs working oppositely.
Concentration of Corporate Voice and Data service

RAISECOM’s MSAP product line makes it easy and more cost-effective for carriers to roll out mixed voice and data services to the outlying area. MSAP deliver and extend the E1 tributaries as well as Ethernet interfaces simultaneously over single fiber to customer premises where PBX and Ethernet switch/router or WiMAX access point are deployed to provide voice and data services for the enterprise customers. Voice services of PBX are transported through E1 line to connect to PSTN. IP and data traffic routed to the appropriate data switches at the POP, according to pre-configured time-slot allocations. OPCOM3500-P240EOS is a tributary module, and could offer redundant optic fiber links to connect PDH optic multiplexer RCMS2811 on remote site which could offer 8 E1s and 100Mbps wire speed Ethernet traffic. All the E1s will be mapped of VC12 directly, and the Ethernet traffic will be mapped to VC12 group with the Ethernet over SDH technology simultaneously or the Ethernet traffic could switch to the Ethernet aggregation unit to directly connect to IP network for much more bandwidth. The NMS could monitor and configure remote RCMS2811 CPE directly through the over-head in PDH fiber.

By the way, OPCOM3500-240x2 is a kind of PDH fiber tributary module delivering E1 service only. It is including 2 independent PDH unit and each of them includes up to 8 E1s. Raisecom RC8xx series standalone PDH fiber multiplexer could work oppositely with OPCOM3500-240x2. SNMP management is available for local and remote site.

Multi-service SDH Access

By incorporating the OPCOM3500-STM1-M into the chassis, RAISECOM is unique in offering ADM with a built-in VC12 cross-connect. OPCOM3500 supports GFP, VCAT and LCAS and creates a transmission layer fully compatible with regional and national SDH networks. Modular design makes carriers to deploy easily both E1 (up to 63E1s) and Ethernet (mapping up to 63 VC12) services into chassis. Synchronous interfaces are available for both 2Mbit and 2MHz.
OPCOM3500-16E1 is E1 service tributary module and it can provide 16 75 ohm unbalanced E1 interfaces. OPCOM3500-16E1-BL provides 16 120 ohm balanced E1 interfaces. OPCOM3500-EOS-8FX is an Ethernet access tributary unit of OPCOM3500. It has 8 separate 100Base-Fx Fast Ethernet optical SPF ports, to deliver 8 FE optical links to remote Media converters or Ethernet switches. Ethernet traffic is encapsulated by GFP/LAPS protocol and mapped into SDH network with N*VC12. NMS could manage remote Raisecom’s RC511-FE, RC601-FE series media converters directly through our proprietary RC-LINK OAM technology.

Carrier Ethernet Deployment with Ethernet over E1 or bonded E1s (PDH)
Because customer access to data networks today typically runs at data rates 2M or bonded E1s, it makes good business sense to groom this rate to E1 access concentrator or channelized STM-1 multiplexer. Carriers benefit by saving expensive E1 WAN ports on their access switching equipment and by installing cost-effective multiplexers and access concentrators instead of more expensive switching equipment at the distribution node. There are embedded eight independent converters from Ethernet to E1 in OPCOM3500-EOP-FXE1x8 tributary module. OPCOM3500-EOP-FXE1x8 has 8 100M Ethernet optical interfaces with SFP slot. They can be connected to Raisecom’s remote Media Converters/ Ethernet switch or some product with optical Ethernet uplink of other vendors such as IP DSLAM. Ethernet optical signal is encapsulated in HDLC, and mapped into Telecom-Bus to connect to backplane. Cross-connection function of aggregation unit enables these traffic to map into SDH signal. On the remote side, Raisecom standalone Ethernet over E1 converter RC952-FEE1 could be deployed on the remote site as P-to-P application opposite with OPCOM3500.
Raisecom Technology is also developing the Point-to-MP application using Ethernet over PDH technology integrated with inverse multiplexing. This module could aggregate different types Raisecom inverse multiplexers up to 63 E1s on remote site and switch all the Ethernet traffic into GE interface which could connect directly to routers.

STM-1 Tributary Extension to Customer Premise
MSAP Optical multiplexers enable carriers to quickly and effectively extend E1 and LAN services over STM-1 link with APS protection from ADM located at the distribution node to remote locations up to 120km. Carriers benefit by saving many E1 and Ethernet ports on their ADMs using cost effective STM-1 optical multiplexer at customer premises or remote distribution node for provisioning E1 and LAN services.
OPCOM3500-STM1-S is a STM-1 tributary module and it provides 1+1 STM-1 protection optical interfaces which can connect with remote SDH STM-1 CPE to meet point-to-point, daisy chain applications. All timeslots could be groomed to aggregation unit module OPCOM3500-STM1-M through Telecom-Bus in the backplane for concentration or cross connection. OPCOM3500-STM1-S does not have the cross connection function inside between the two STM-1 optical interfaces, so the two STM-1 optical interfaces are used for 1+1 APS protection only. The remote STM-1 CPE terminal multiplexer or add/drop multiplexer could be Raisecom OPCOM310x series equipment, or other vendor’s product. If it’s Raisecom CPE, it could be managed by NMS through the DCC channel directly.
E1/V.35 Leased Line Service Provisioning

MSAP Optical multiplexers make carriers to extend the E1 or V.35 leased line service over fiber, from the ADM located at the distribution node to remote locations up to 120km. Carriers benefit by saving lots of E1 and V.35 ports on their ADM using cost-effective PDH fiber optical modem at customer premises for E1 and V.35 private leased line services. OPCOM3500-30x8 is PDH fiber tributary unit, which includes 8 E1 optical links. There are 8 independent PDH fiber interface in this module, and each interface delivering one E1 signal. The eight PDH optical interfaces could be connecting remote Raisecom’s Fiber Modem RC852 series to deliver E1/V.35 service individually as well as Raisecom’s PCM Multiplexer RC310x series to deliver voice/Ethernet/V.35 services simultaneously. OPCOM3500-30x8 enables E1 signal of remote Fiber Modem or PCM equipment to map into SDH signal, realizing aggregation from remote customer premises to the concentrating POP. NMS could manage remote CPE directly through over-head in PDH fiber.
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 Delloitte Touche Tohmatsu Asia Pacific Technology Fast 500 for two consecutive years. Victory leads us to the next Victory.