Roll-Out of Digital Access 6000 Service

In the market for digital leased lines, there is a growing demand for faster throughput service options for enterprise networks and ISP access lines to accommodate increasing Internet usage, while at the same time there is a pronounced shift toward lower cost services. A range of economical, always-on digital access services options are currently available — 64, 128, and 1500 services — but now NTT East and NTT West are both requesting that a digital access 6000 service be added to the lineup of leased-line options that are available. In other words, they are calling for an economical, always-on service that supports throughputs up to 6 Mbit/s.

To meet this demand, NTT has upgraded the DSM*1, a system launched in August 1999, that is the hardware heart of the company’s leased-line network infrastructure. Essentially the development involved the creation of a new subscriber hardware module, a two-board OSU*2 interface, and an upgrade to the DSM NE-OpS software to control and monitor the new OSU interface.

We were able to implement the new service very quickly and cost-effectively to meet and exceed the expectations of NTT East and NTT West by taking full advantage of existing technology. The two-board OSU interface is based largely on the one-board OSU interface that is currently used to support the Digital Access 1500 service, and the scale of the software development was similarly kept to a minimum by reusing existing software as much as possible.

The architecture supporting the new service consists of a PDS that provides two-way communication over a single fiber, the two-board OSU*2 interface, and an upgrade to the DSM NE-OpS software to control and monitor the new OSU interface.

The Digital Access 6000 service was launched on April 2, 2001, and is already winning acceptance as a prefecture-level trunk network infrastructure. Essentially the development involved the creation of a new subscriber hardware module, a two-board OSU*2 interface, and an upgrade to the DSM NE-OpS software to control and monitor the new OSU interface.

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Development of 99 Version MHN-S and MHN-S (IC)

During the on-going process of revamping the STM network architecture, excellent progress is being made on the node system — particularly, 99 Version MHN-S*1 and MHN-S (IC) — that can accommodate analog telephony in addition to PHS and ISDN.

Essentially, the 99 Version MHN-S system permits the sharing of system functions, so that resources and capabilities not available in a particular service — processing, switching, SDH interfacing, and so on — can be shared, or can be added onto a service as the need arises. This, for example, would allow a subscriber line line-card to share analog and ISDN service capabilities, thus enabling a subscriber’s service to be switched back and forth between analog and ISDN functionality from a remote location, and would permit new service capabilities to be added quickly and easily by simply downloading them.

Furthermore, a diverse range of interconnection configurations are supported by adopting the same SDH interface used on transmission equipment for the node-link interconnect function. This permits interconnections via transmission equipment as well as direct coupling of optical fiber, and facilitates seamless switching.

In addition, the switching capacities of both the ASM*2 and SBM*3 modules implementing the 99 Version MHN-S have been expanded. The ASM is implemented using a building-block approach, so the module can be flexibly scaled to accommodate any size system. To achieve its designed optimum capacity in terms of cost, the switching capacity of the SBM was doubled.

The MHN-S (IC) is a large-capacity node that not only supports prefecture-wide trunk connections but also supports NTT Communications links and NCC gateway switching connections. The ASM of the MHN-S was adopted largely unchanged, and every effort was made in developing the MHN-S (IC) to utilize existing technology as much as possible. Trunk capacity was expanded by increasing switching capacity, increasing the number of shared line links, and by extending functional capabilities in other ways.

(NTT Service Systems Laboratories)

ASM: Architectural STM Module
SBM: Subscriber Module

*1 DSM: Dedicated Service Handling Module
*2 OSU: Optical Subscriber Unit
*3 ONU: Optical Network Unit

Hardware configuration of 99 Version MHN-S and MHN-S (IC)

Card sharing by ISDN and analog services
Both direct connections by optical fiber and connections via transmission equipment, and interchangeable switchover
Building-block configuration and expansion of switch capacity
Addition of functions needed by analog services in a block-by-block manner

Network Architecture