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JumboSwitch Backhaul Mobility Application Note

by TC Communications

Bandwidth Efficiency

SONET/SDH networks are designed to use fixed bandwidth circuits which contribute to overall complexity and operation inefficiencies. For example, in many cases users over-subscribe to accommodate for traffic bursts during peak usage. This over-provisioning, combined with the redundancy required for self-healing, results in very inefficient use of available network capacity. In contrast, as shown in figure 1, the statistical multiplexing nature of traditional Ethernet provides more efficient network utilization for service providers.

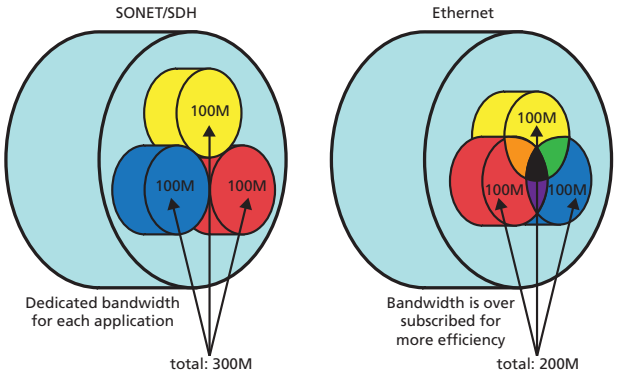

Fig. 1: SONET/SDH vs. Ethernet Bandwidth Efficiency

The need for more bandwidth efficiency is most noticeable in mobile backhaul applications. Changing cell phone habits and the emergence of 3G and 4G technologies have triggered an exponential increase in data content for mobility backhaul. This has created an ongoing need to add more transmission capacity. The rub is that Voice centric SONET/SDH-based networks no longer offer a viable and cost-effective solution to handle the increase in data traffic for backhaul transport.

In the past, addressing increased voice traffic involved simply deploying larger number of T1/E1 circuits between the cell sites and the network core. The generous revenue stream from these voice calls easily justified the cost of additional T1/E1 circuits.

In contrast, adding additional data traffic is more complex. Installing more T1/E1 circuits to handle increased data traffic is not cost effective because, compared to voice, data traffic generates a much smaller revenue stream per MB of traffic. The cost effective solution is Ethernet.

Ethernet is a connectionless packet technology that inherently supports statistical multiplexing. Ethernet-based backhaul transport can easily accommodate data increases with a much smaller incremental increase of backbone bandwidth through the proper use of over-subscription and statistical multiplexing. Industrial Ethernet layer 2 switches can be deployed in the following two areas to increase overall bandwidth efficiency:

- Terminating T1/E1 circuits over Ethernet at the cell sites takes advantage of Ethernet's statistical multiplexing capabilities to reduce bandwidth needs for backhaul.
- Using Ethernet switches instead of SONET/SDH ADMs at the aggregation points to reduce overall Capital Expenditure (CAPEX) as well as Operational Expenditure (OPEX).

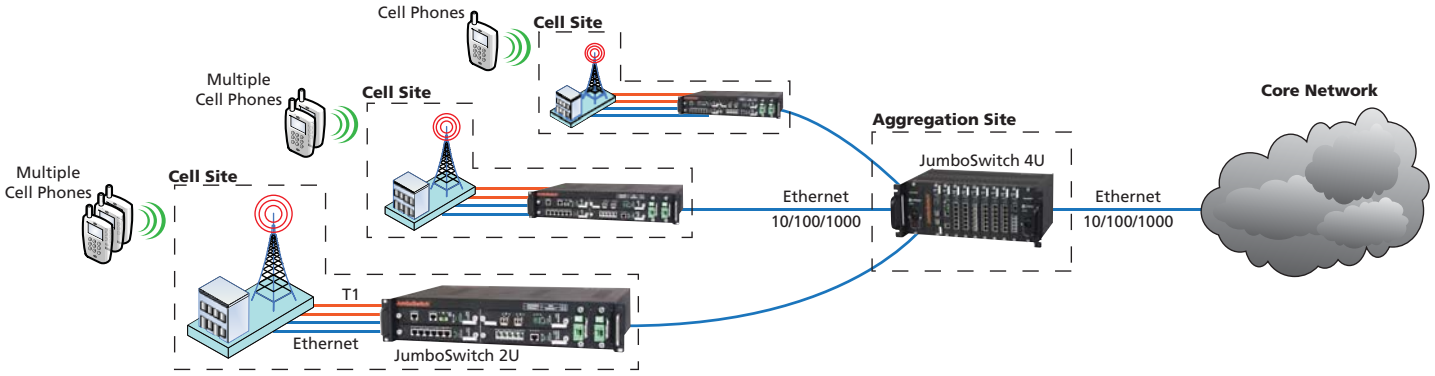

Fig. 2: Mobility Backhaul

Summary

With data requirements inundating network traffic, legacy voice-centric SONET/SDH platforms no longer offer viable or cost-effective backbone solutions. Future network deployments will be dominated by Ethernet and simplified by the inevitable blurring of the boundaries between LANs, MANs, WANs and Industrial networks.

In a society were technology is continuously growing Backhaul technology is needed in every area of communication. The flexible Ethernet Backbone technology, provided by TC Communication's JumboSwitch is cost effective and reliable making it the perfect solution for any Backhaul application.

JumboSwitch® Industrial Gigabit Ethernet Modular Switch Product Family

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