Application Note

Mobile Backhaul over PSN

Typical Users
- Backhaul and transport providers
- Mobile operators
- Fixed-mobile carriers and incumbents

Typical Applications
- 2G service connectivity
- 3/3.5G (mobile broadband) and LTE backhaul
- Colocation and backhaul sharing

Mobile Demarcation Devices for Service Delivery and SLA Assurance

The transition to packet-based mobile backhaul and all-IP radio access networks enables operators and transport providers to curb their OpEx and better accommodate the onslaught of mobile broadband traffic. However, high-volume "pipes" are not enough to meet operators' demand for tight SLAs with guaranteed reliability and service quality. Backhaul providers are expected to meet performance commitments for packet loss, delay, jitter, and availability to ensure the hard QoS required for mobile services. The only way for them to control service KPIs (key performance indicators) and guarantee end-to-end SLAs over PSNs is by deploying a mobile demarcation device (MDD) at each point connecting their network to the operator's, such as at cell-sites, hub sites, etc.

Among others, MDDs provide end-to-end visibility across the entire service path. Such functionality is crucial for backhaul providers, who currently invest a substantial part of their OpEx in identifying and locating service-affecting faults. MDDs that include SLA management, performance monitoring and OAM diagnostic capabilities can therefore help providers segment their backhaul network to localize the problem and determine its origin – without requiring expensive truck rolls or service shut-downs to do so.

Demarcation, Synchronization and Differentiated SLAs by a Single Device

Transport providers offering Ethernet-based backhaul services must be prepared to support multiple operators, each with their own customized SLA. They must also guarantee service resiliency with sub-50ms failover and enable highly accurate clock transfer to ensure each operator receives timing data from their own clock source. Needless to say, such capabilities should be consistent over the myriad of access technologies and physical media today's heterogeneous RANs include. This is a tall order, which is complicated even further by the need to drive down CapEx to maintain profitability.

RAD's mobile demarcation devices are the first in the market to be deployed by Tier-1 backhaul providers to meet all these requirements efficiently and cost effectively. Installed at operator tower and controller sites, they feature sophisticated traffic management and service assurance capabilities. Furthermore, statistics analysis allows backhaul wholesalers to execute effective capacity planning to overcome the "peak to mean" gap, such that bandwidth is added only when needed based on actual usage trends. As an all-in one device, RAD's MDDs cut down provider costs by minimizing equipment needed for timing and demarcation.

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Features	Benefits
MEF-defined Ethernet service features with GbE access rates from the cell-site	• Standards-based service performance over Ethernet backhaul • Support mobile broadband throughput
L2/L3 classification and high EVC/flow count; shaping and CIR/EIR policing functionalities	• Hierarchical QoS per flow/service • Support service differentiation without increasing port density • Intelligent traffic management
Color-sensitive P-bit re-marking	Ensure metering continuity in color-blind networks and in color-aware networks with no “discard eligible” support
Complete set of Ethernet OAM standards, including hardware-based connectivity verification, fault management, service monitoring, and L1-L3 in-service and out-of-service loopbacks	• End-to-end service performance monitoring across backhaul network • Lower MTTR (mean time to repair) with remote fault identification and troubleshooting • Minimize service disruptions with real-time performance monitoring based on live traffic • Fast and reliable diagnostics with hardware-based OAM
SyncToP platform of accurate clock transfer mechanisms, including 1588v2, Synchronous Ethernet, adaptive clock, and NTR	• SDH/SONET-level service quality for mobile voice and data • No need for costly dedicated hardware • Bridge different timing and synchronization technologies • Support IP NodeBs with no built-in NTR capabilities
Uplink redundancy for high service resiliency	• Five Nines availability • Sub-50ms convergence for carrier-grade service continuity
Ethernet and TDM pseudowire capabilities	Multi-generation support for 2G, 3G, 3.5G and LTE

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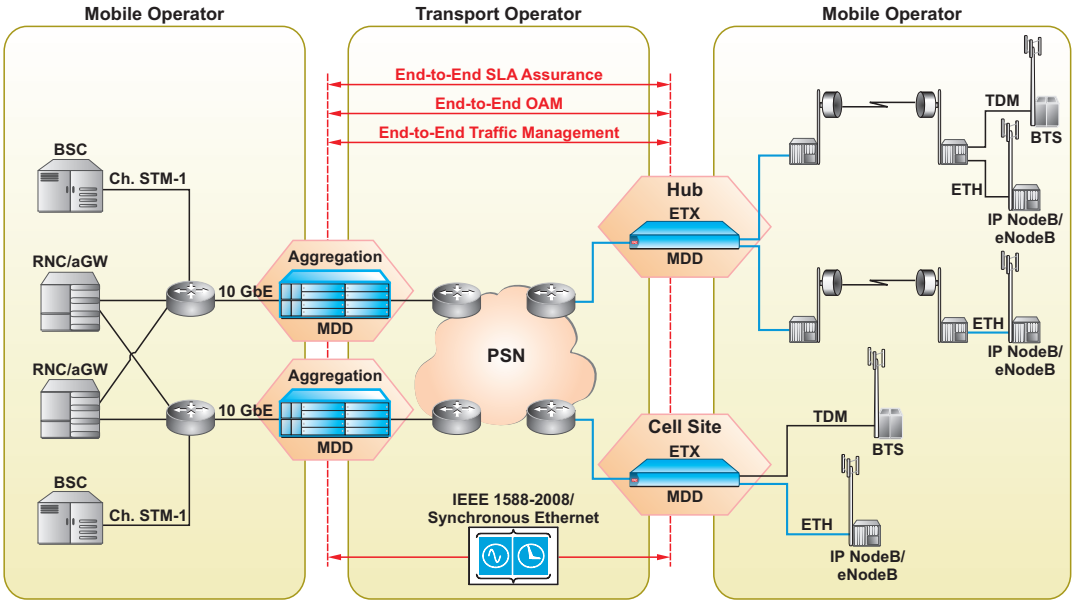

End-to-End Mobile Backhaul Service Delivery and SLA Assurance with MDDs

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