

# Mobile Transport with Tellabs® 8600 Managed Edge System

The Tellabs® 8600 Managed Edge System is a mobile transport solution for WCDMA and CDMA2000 networks. The Tellabs 8600 system packet switching technology with multiservice features enables IP, MPLS, Ethernet, ATM, Frame Relay, PPP, HDLC and TDM services in a single network. This enables the convergence of the existing 2G, 2.5G, 3G and wireline services into a single network. Advanced quality of service features with testing capabilities enable real-time voice and best-effort data services in the same network. QoS testing features provide the user with tools to verify the performance of the services.

## Overview

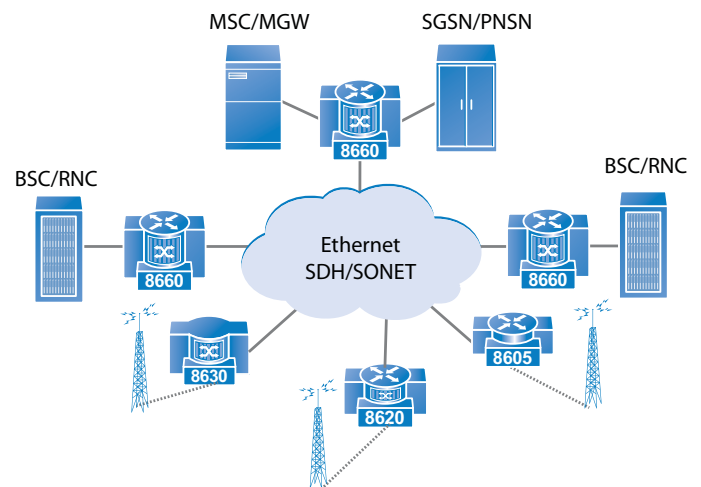
The Tellabs 8600 system provides a unique set of features that together make it an optimal solution for mobile transport applications in both access and core network:

- Wide range of equipment with flexible interfaces and cost-optimized design.
- Advanced network management system supporting network configuration, connection provisioning, performance and fault management. Even large networks containing thousands of base stations can be provisioned and monitored with easy-to-use graphical tools.
- Multiprotocol design supporting IP, MPLS, ATM, Ethernet, Frame Relay, PPP, HDLC and TDM, which enable the convergence of existing 2G, 2.5G and 3G networks into a single network.
- Packet-based switching technology with quality of service, enabling both voice and data services in a common network. The quality of real-time services can be guaranteed while taking advantage of data bandwidth savings by using statistical multiplexing.
- Robust synchronization supporting both the line timing and packet based mechanisms. The high-quality internal oscillator provides good quality synchronization even if the timing reference is lost.
- The unique Packet Loop Test feature, enabling testing of quality-of-service parameters (delay, jitter, packet loss, bandwidth). This built-in feature of the hardware requires no additional measurement equipment or site visits.
- Multiservice features enabling wireless and wireline services like IP and Ethernet services with the same platform.

## Network applications

The Tellabs 8600 system's applications range from the cell site to the mobile core. The platform consists of five product variants:

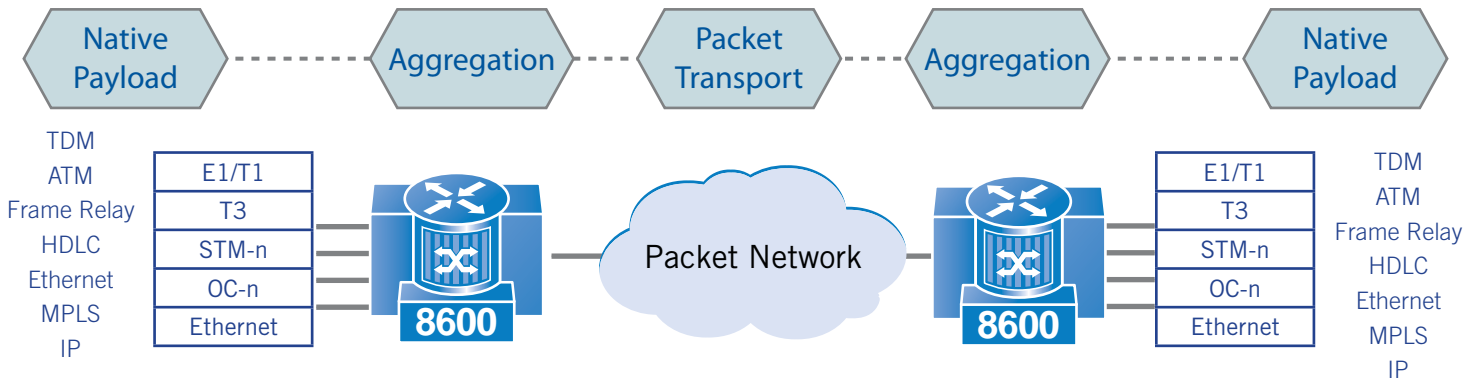
- Tellabs® 8660 Edge Switch for large aggregation sites having BSC, RNC, Media Gateway, SGSN or PDSN
- Tellabs® 8630 Access Switch for small and medium aggregation sites
- Tellabs® 8620 Access Switch for cell sites and small aggregation sites
- Tellabs® 8605 Access Switch for cell sites



The Tellabs 8600 system provides a transport solution for all 2G, 2.5G and 3G mobile technologies, including GSM, CDMA, CDMA-2000/EV-DO and WCDMA. The Tellabs 8600 system provides a future-proof packet-based solution transporting TDM, ATM, Frame Relay, PPP and HDLC protocols, common in the existing networks, as well as IP, Ethernet and MPLS without SW or HW upgrade.

## Multiprotocol support

Today the 2G base station backhaul networks use TDM while the 3G networks are based on the combination of TDM and packet technology. As Ethernet transport becomes more widely available with the promise of cost savings, operators need a solution for merging the existing networks into Ethernet. The Tellabs 8600 system provides a solution that helps the operator to migrate the existing networks to packet technology cost-effectively.



2G Technologies	Protocol
GSM	TDM
CDMAOne (IS-95)	TDM
IDEN	TDM
TDMA	TDM
2.5G Technologies	Protocol
GPRS/EDGE	TDM
1xRTT	FR, HDLC
3G Technologies	Protocol
WCDMA R99	ATM
WCDMA R5	IP
CDMA2000 EV-DO	IP

The Tellabs 8600 system has all of the common TDM (PDH, SDH, SONET) interfaces as well as Ethernet interfaces. TDM, ATM, Frame Relay and HDLC are forwarded using MPLS pseudowires, which can be carried over Ethernet, SDH or SONET network. This provides flexibility for choosing the optimal network technology for transport.

Today IP routing is used in CDMA2000 EV-DO radio access networks. It will be available as an evolution option in WCDMA R5 networks as well. The Tellabs 8600 system supports IP routing in all interfaces, providing seamless evolution when an operator installs IP-capable base stations in the network.

Instead of using IP, the future transport networks using the Tellabs 8600 system platform can be based on Ethernet as soon as the radio infrastructure equipment supports it.

The Tellabs 8600 system is also suited to mobile core network applications for 2G, 2.5G and 3G, as the transport requirements are very similar. TDM voice traffic can be moved to the packet network by using TDM pseudowires. GPRS data carried on Frame Relay as well as 3G voice circuits carried on ATM can be transported using the MPLS pseudowires. Data services require IP routing, or, alternatively, they can be carried using Ethernet or ATM pseudowires.

### Moving from TDM to packet

Packet networks provide an optimal solution for bursty data services. Packet switches save aggregate bandwidth by means of statistical multiplexing. This is based on an assumption that the average bandwidth of a connection is much less than the peak rate. The averaging of the bandwidth increases the queuing delay, especially if the bursts arrive at the same time from several sources. This is, however, usually accepted for data services.

Voice and other TDM services require constant bandwidth and minimal delay and jitter over the network. This is achieved by assigning these services the highest priority.

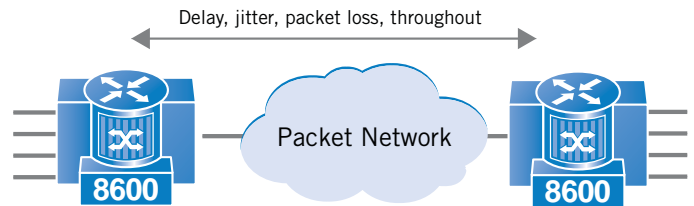
The Tellabs 8600 packet scheduling supports both the real-time and data services in the same network. Delay-critical services will be assigned highest priority to guarantee the best performance. At the same time, data services can utilize statistical multiplexing with a high overbooking factor, which saves transmission bandwidth in the packet network.

## Quality-of-service testing

The Tellabs 8600 system includes a unique packet loop test feature that enables testing of services. The following tests are supported:

- delay
- jitter
- packet loss
- throughput

The testing takes traffic priority into account also, enabling individual tests for voice and data services. The user can schedule regular testing and create thresholds that trigger an alarm if the limits are exceeded. This provides a consistent way of monitoring connections. The test feature is built into the hardware and does not require any additional measurement equipment. The tests can be configured remotely from the Tellabs® 8000 Network Manager, and the results are stored in the database for later analysis.



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