ALCATEL-LUCENT IP AND MICROWAVE INTEGRATION

FULLY INTEGRATED IP/MPLS ROUTING AND PACKET MICROWAVE

- **Combine the power of IP/MPLS routing with the access freedom and flexibility of packet microwave**
- **Streamline and simplify operations with full integration and single network element management**
- **Flexibly deliver any traffic over packet microwave – IPv4, IPv6, Ethernet or legacy services**

Operators can now deploy advanced, differentiated functionality, together with a consistent operational model for managing all cell sites, including those reached through microwave media. This enables the delivery of a consistent level of service and quality of experience (QoE) to all mobile subscribers regardless of location and media attachment type.

OVERVIEW

As mobile network infrastructures evolve from time division multiplexing (TDM) to IP, and with the shift in radio technology from 2G/3G to LTE and beyond, the ability to extend IP/MPLS networking out to the furthest reaches of the mobile backhaul network delivers real operational value. In locations where fiber is unavailable or not economic to deploy, micro-wave access is a well-proven and commonly deployed alternative. As it becomes increasingly common to deploy both IP routing and micro-wave access to locations within the backhaul network, a need for truly integrated IP/MPLS and microwave equipment has emerged.

Alcatel-Lucent is uniquely positioned in the industry to bring together its industry-leading 7705 Service Aggregation Router (SAR) and 9500 Microwave Packet Radio (MPR) platforms to deliver a fully integrated, efficient solution for deploying IP/MPLS mobile backhaul over microwave links.

This capability is complemented by other net-working components such as the Alcatel-Lucent 7750 Service Router (SR) for a massively scalable, end-to-end backhauling solution.

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Simplified operations reduce OPEX

The Alcatel-Lucent 9500 MPR-e is fully integrated with the Alcatel-Lucent 7705 SAR as a single network element, under common network management. This unique capability brings a number of operating expense (OPEX) advantages. Regardless of how many radio instances exist, network element maintenance procedures, such as software upgrades and configuration backups, are done only once to all components.

Further reduction in OPEX is achieved as microwave radios can be directly powered by the 7705 SAR with lightning protection and voltage surge suppression. This simplifies and optimizes cell site battery feed planning and installation.

Collapsing two platforms into a single compact and very flexible platform brings a number of advantages in reducing real estate requirements, operations complexity and energy costs.
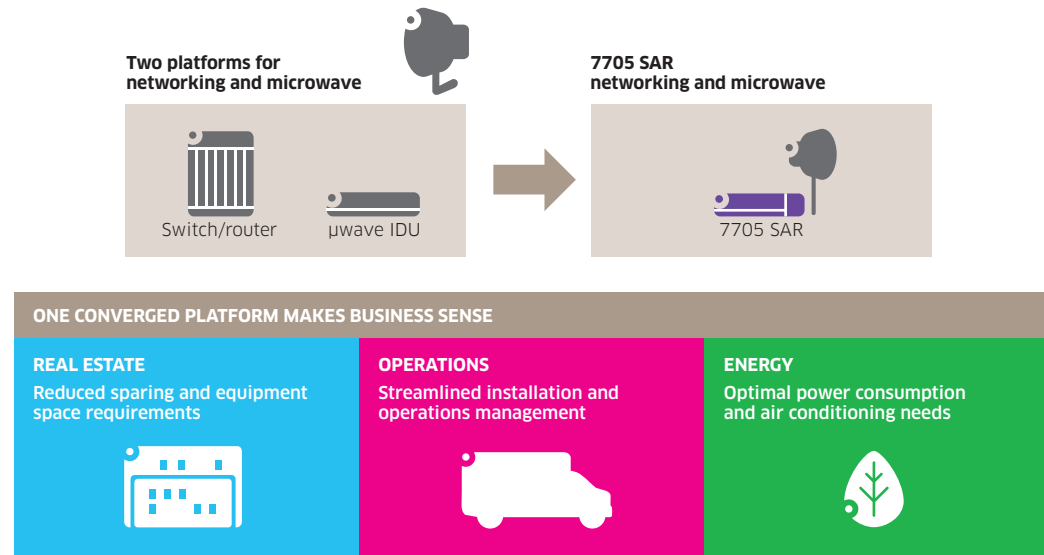
Flexible deployment for Layer 1, Layer 2, and Layer 3 services

Whether the traffic to be backhauled is IPv4, IPv6, Ethernet, TDM, or legacy services such as ATM or Frame Relay, the 7705 SAR has the flexibility to support a diverse traffic mix with advanced quality of service (QoS) and a full suite of operations, administration, and maintenance (OAM) tools.

Seamless interconnect and evolution to fiber

With support for Gigabit Ethernet (GigE) and 10 GigE links, all traffic collected from the microwave domain by the 7705 SAR can be seamlessly forwarded to a fiber core network.

Figure 1. Advantages of an Integrated Approach

Consistent network operations are maintained over the combined fiber/microwave infrastructure.

Advanced features for increased system throughput and resiliency

The 9500 MPR-e supports advanced features such as hitless adaptive modulation, cross-polarization (XPIC), 1+1 hot standby with spatial diversity, and header compression for boosting throughput. Operators can thus optimize the spectrum efficiency and link reliability of microwave links.

The 7705 SAR brings strong platform resiliency functions such as control plane, fan and power supply redundancy. There are a number of

options to protect against microwave link failure, including a range of rapid response fast reroute (FRR) redundancy mechanisms.

Synchronization functionality and resiliency

The solution provides a range of frequency and phase/time-of-day synchronization options suitable for different environments. These include external synchronization, Synchronous Ethernet, and IEEE 1588v2. With a unique approach to clock recovery over copper-based Ethernet, the Alcatel-Lucent packet microwave solution boosts system availability, as it can support clock source switching with no disruption to mobile traffic and services.

Part of an end-to end mobile backhaul solution

The Alcatel-Lucent IP/MPLS Mobile Backhaul solution delivers a strong set of features and capabilities to support the evolution to 4G/LTE wireless broadband. During the transition, the solution efficiently supports 2G and 3G. Newer trends, such as metro cell deployment and network infrastructure sharing, are well supported. Fixed Mobile Convergence and IP transformation for energy, transportation, and public sector communications are also enabled and augmented by the solution.

COMPONENTS

9500 MPR-e

The 9500 MPR-e is a full outdoor transceiver from the industry-leading 9500 MPR portfolio. It offers advanced packet compression that can increase channel capacity by as much as 300 percent, hot standby and space diversity protection, frequency reuse, adaptive modulation, and coding. Supported frequency ranges span 6 GHz to 38 GHz.

7705 SAR

The Alcatel-Lucent 7705 SAR portfolio is optimized for multiservice adaptation, aggregation and routing, especially on a modern Ethernet and IP/MPLS infrastructure. Leveraging the powerful Alcatel-Lucent Service Router Operating System (SR OS) and the Alcatel-Lucent 5620 Service Aware Manager (SAM), the 7705 SAR is available in compact, low power consumption, indoor and outdoor platforms that deliver highly available services over resilient and flexible network topologies.

5620 SAM

The Alcatel-Lucent 5620 SAM enables end-to-end network and service management across all domains of the all-IP network, including in integrated IP/microwave networks. This helps service providers quickly maximize operational efficiencies through fast provisioning and trouble-shooting, proactive assurance and flexibility that eases integration into the network. The 5620 SAM also provides precertified OSS partner application integrations to speed deployment and simplify integration into the network.

THE ALCATEL-LUCENT ADVANTAGE

Learn More

Visit Alcatel-Lucent web sites to learn more about mobile backhaul:
www.alcatel-lucent.com/mbh

7705 SAR portfolio:
www.alcatel-lucent.com/7705SAR

9500 MPR portfolio:
www.alcatel-lucent.com/9500MPR

5620 SAM:
www.alcatel-lucent.com/5620SAM

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