ALCATEL-LUCENT 7750 SERVICE ROUTER

NEXT-GENERATION MOBILE GATEWAY FOR LTE/4G AND 2G/3G AND ANCHOR FOR CELLULAR-WI-FI CONVERGENCE

The Alcatel-Lucent 7750 Service Router is a next generation mobile packet core data plane platform that supports 3GPP cellular-Wi-Fi integration and can be deployed as:

- **A standalone Long Term Evolution (LTE) Serving Gateway (SGW) or LTE Packet Data Network Gateway (PGW)**
- **A standalone 2G/3G/3G+ Gateway GPRS Support Node (GGSN)**
- **A combined PGW/GGSN or SGW/PGW/GGSN (single node)**
- **A Wi-Fi (Wireless LAN, WLAN) gateway**
- **High capacity IPsec Security Gateway (SeGW).**

The 7750 SR combines advanced edge routing and 3GPP mobile gateway functions in a single element with exceptional performance and scalability and with high operational flexibility, to address the exponential rise in the number of mobile users, connected devices and network applications. The 7750 SR enables massive delivery of consumer and enterprise mobile services with highest scale, performance and Quality of Service (QoS).

OVERVIEW

The Alcatel-Lucent 7750 SR Mobile Gateway has been engineered for the further evolution of mobile broadband to address the exponential increase in the number of users, devices and applications as well as higher bandwidth usage, lower latency and longer duration of data sessions. This next-generation data plane platform with exceptional performance and scalability and high operational flexibility can converge and consolidate LTE and 3G+ mobile cores.

The 7750 SR is the flagship element of Alcatel-Lucent's IP/MPLS service router portfolio, which has been deployed in more than 350 service provider networks in 110 countries around the world. It is also a key element of the Alcatel-Lucent High Leverage Network™ (HLN) architecture. HLN enables operators to deliver traffic more reliably, efficiently and at the lowest cost with the ability to uniquely leverage network intelligence to generate revenues from sophisticated managed services and applications.

Table 1. Alcatel-Lucent 7750 SR Mobile Gateway: overview of key features

MOBILE GATEWAY FEATURE	
Purpose-built next-generation architecture	✓
Dedicated processors for data plane processing	✓
Dedicated CPUs for 3GPP control plane processing	✓
Dedicated CPUs for advanced Layer 4-Layer 7 data plane processing	✓
Service awareness with in-line Application Assurance (Layer 4-Layer 7 DPI)	✓
Persistent DPI flow processing	✓
Port-independent Layer 3-Layer 7 classification for all applications (SIP, p2p, http)	✓
http processing with per-flow charging accuracy for realistic web usage patterns	✓
Extended IP protocol support with richness, stability and maturity	✓
Proven scaling of IP services for large IP environments	✓
Full IPv4/IPv6 support	✓
Advanced, real-time Policy Charging Enforcement Functionality (PCEF) for integration into Policy and Charging Control (PCC) architectures	✓
Support for standard offline and online charging interfaces	✓
Flow-based metering and charging	✓
Support for Wi-Fi interworking based on S2a (3GPP SaMOG)	✓
Integrated network management for wireless packet core, E-UTRAN and mobile backhaul	✓

The 7750 SR extends vast set of advanced Layer 2/Layer 3 IP/MPLS capabilities to 3GPP all-IP features and supports full integration with charging and billing systems. It comes with integrated (in-line) Layer 4-Layer 7 Deep Packet Inspection (DPI) - Mobile Application Assurance (Mobile AA) capabilities.

The 7750 SR's high performance, reliability and scalability, coupled with the most advanced set of traffic processing capabilities turn the 7750 SR into a powerful engine for delivery of mobile broadband services to consumers and enterprises.

POWERFUL DATA ENGINE FOR MASSIVE MOBILE BROADBAND

The Alcatel-Lucent 7750 SR Mobile Gateway is a data plane cornerstone of the Alcatel-Lucent Wireless Packet Core (see Figure 1).

The ability of the 7750 SR to scale to support millions of users and connected devices translates into the ability for massive delivery of high-quality mobile broadband. At the same time, the 7750 SR is able to ensure granularity of the highest QoS on a per-user, per-device and per-application level, significantly improving and enhancing the quality of end-user experience.

The ability to support a high number of IP flows (sessions) with high aggregate bandwidth in a compact form factor results in improved cost efficiency for network operators.

MANAGEMENT

The Alcatel-Lucent 7750 SR Mobile Gateway is managed by the Alcatel-Lucent 5620 Service Aware Manager (SAM), which provides end-to-end network management across Alcatel-Lucent Wireless Packet Core. The 5620 SAM expands its network management capabilities to the E-UTRAN and across the underlying IP/MPLS backhaul network and also ensures network management integration of third-party elements.

CONVERGED WIRELESS IP ANCHORING

Combining the LTE PGW and GGSN application in a single system results in converged IP anchor functionality for 2G, 3G, 4G/LTE and Wi-Fi deployment.

Common IP anchoring is critical to ensure seamless 2G/3G and 4G/LTE interworking and cellular to Wi-Fi roaming.

The 7750 SR Mobile Gateway converges all 2G/3G (GGSN) and LTE gateway (SGW or PGW) functionality in a single system.

CELLULAR-WI-FI CONVERGENCE

The Alcatel-Lucent 7750 SR Mobile Gateway also acts as a converged IP anchor for the Alcatel-Lucent lightRadio™ Wi-Fi solution.

Following the 3GPP S2a-based Mobility over GTP (SaMOG) standard, the 7750 SR can be deployed as both a WLAN gateway and a GGSN/PGW, terminating all Wi-Fi access connections on the 7750 SR Mobile Gateway and extending its routing and gateway capabilities uniformly to unlicensed wireless technology – Wi-Fi.

Termination of all cellular and Wi-Fi connections on the 7750 SR Mobile Gateway allows preservation of IP address (IP address continuity) and seamless inter-mobility between cellular and Wi-Fi access.

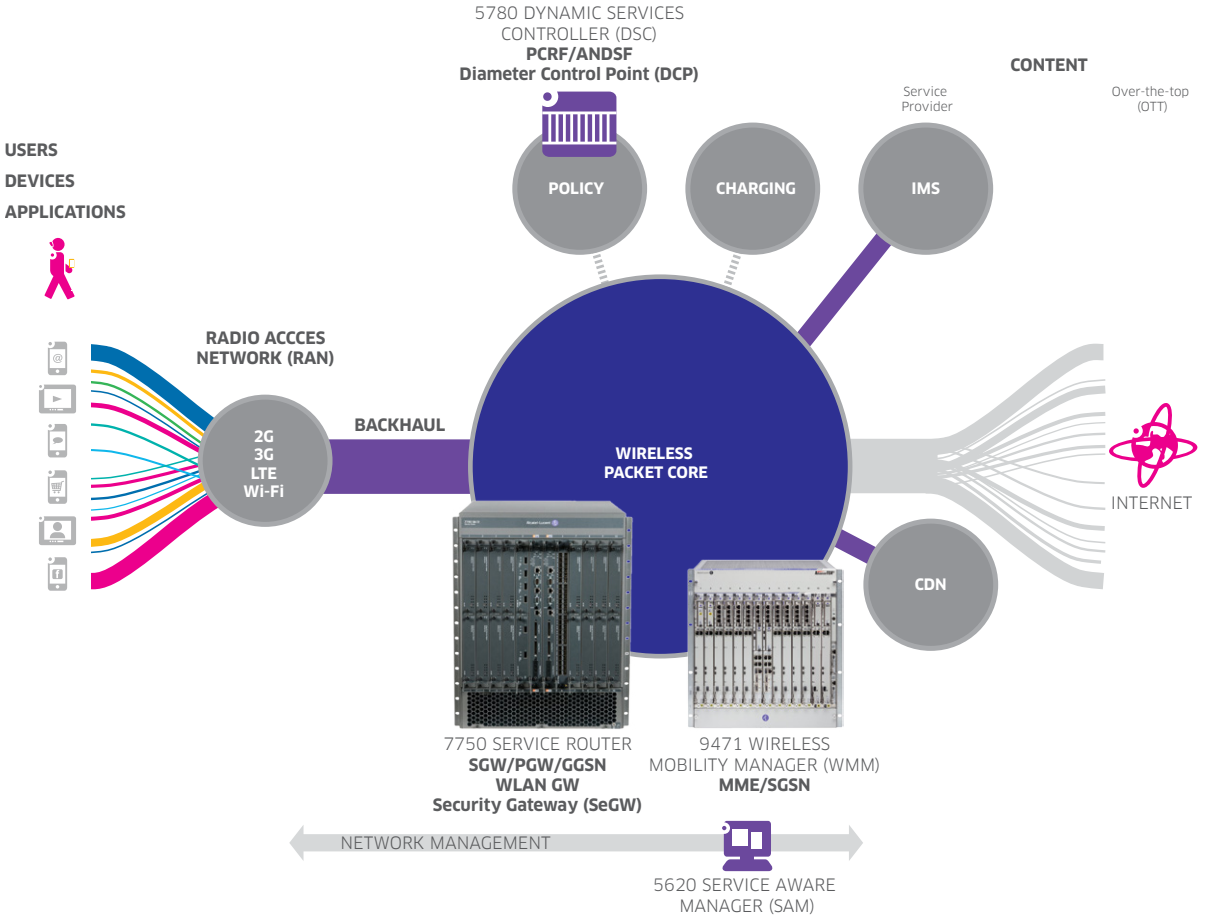
ARCHITECTURE

The advanced and comprehensive feature set of the 7750 SR enables it to be deployed in wireline networks as a Broadband Network Gateway (BNG) for residential services, or as a Multiservice Edge (MSE) for Carrier Ethernet and IP VPN business services. In mobile networks, the 7750 SR can be used as an aggregation router for mobile backhaul, a SeGW, a WLAN gateway, or as a mobile packet gateway for 2G, 3G, LTE and Wi-Fi.

SILICON POWER

Using the 7750 SR as a mobile data gateway brings immediate benefits from the 7750 SR's proven ability to process high volumes of IP packets in real time, thanks to Alcatel-Lucent's in-house developed silicon technology (FP2 chipset with 100 Gbps capability and the new FP3 chipset set with 400 Gbps capability). The native support for NAT, IPv6 and small packet sizes (which is critical for services like VoLTE) delivers high performance without degradation across multimedia services.

Figure 1. Alcatel-Lucent Wireless Packet Core



ADVANCED MOBILE FEATURES

The Alcatel-Lucent 7750 SR Mobile Gateway provides dedicated hardware for mobile user (data) and control plane (signaling) processing: the Mobile Gateway – Integrated Services Module (MG-ISM) – a full-height card that plugs into the 7750 SR (SR-7 and SR-12).

This dedicated hardware provides all control and data plane processing of mobile gateway functions.

Sophisticated software support coupled with 1+1 hardware redundancy of the MG-ISM allows stateful protection for all gateway applications (SGW, GGSN and PGW) and cost-effective geo-redundancy.

MOBILE APPLICATION ASSURANCE

To meet the need for efficient, real-time policy enforcement (PCEF) of all mobile traffic, which may require Layer 4-Layer 7 traffic processing performed on most or all traffic, the MG-ISM is equipped with an in-house-developed multicore CPU that enables real-time, in-line, stateful Layer 4-Layer 7 flow inspection, application detection and QoS/policy/charging processing for all applicable IP flows. This CPU is not shared with the rest of the system and it is not involved in other control or user plane processing, only in this Layer 4-Layer 7 processing – Mobile AA.

THE ALCATEL-LUCENT ADVANTAGE

RELIABILITY

The Alcatel-Lucent 7750 SR Mobile Gateway leverages advanced service router hardware and software architecture to achieve data and control plane reliability levels not easily achievable in all-IP environments (more than 99.999 percent availability).

SCALABILITY

The advanced 7750 SR architecture as a foundation for a mobile gateway results in mobile traffic processing that is fully independent of the physical ports mobile traffic is routed across. This processing facilitates scaling of the advanced traffic processing functionality with a uniform processing approach for all traffic and application of policy (rules) across all interfaces.

EFFICENT MOBILE BROADBAND DELIVERY

The Alcatel-Lucent 7750 SR Mobile Gateway can efficiently facilitate delivery mobile broadband services to consumers and enterprises. It can handle extremely heavy packet processing while delivering granular high-QoS with differentiated policy and charging treatment, based on content or application type. With support for standard online and offline charging interfaces, the 7750 SR can easily be integrated into policy, billing and charging environments.

The Alcatel-Lucent 7750 SR Mobile Gateway delivers:

- Advanced mobile gateway and edge router functionality in a single platform
- Integrated Layer 4-Layer 7 traffic processing (Mobile Application Assurance)
- High reliability for data and control plane
- Full isolation of mobility control plane from Layer 3 IP control plane
- High aggregate throughput (over 200 Gb/s at the mobile layer) and high-rate throughput of line interfaces (up to 100 Gb/s)
- Service awareness with advanced traffic management capabilities: per-subscriber, per-application, per-session and hierarchical QoS (H-QoS)
- Advanced policy enforcement (PCEF), for integration into PCC architectures

7750 SERVICE ROUTER MOBILE GATEWAY

LEARN MORE

The Alcatel-Lucent 7750 SR is a data plane cornerstone of the Alcatel-Lucent Wireless Packet Core – a solution that provides mobile operators with complete, standards-compliant 2G/3G and LTE/4G converged wireless packet core.

Alcatel-Lucent Wireless Packet Core is an all-IP packet core designed and built for the further evolution of mobile broadband.

Alcatel-Lucent Wireless Packet Core has been design-optimized to deliver the performance, scalability and reliability needed for new LTE/4G packet core – Evolved Packet Core (EPC) – with support for 2G/3G packet core functionality (SGSN/GGSN). Alcatel-Lucent Wireless Packet Core is based on advanced, next-generation platforms that are mirroring the architectural split of data plane (mobile gateways), control plane (mobility management) and service plane (policy management) in LTE/4G and beyond.

To learn more about Alcatel-Lucent Wireless Packet Core, please visit:
www.alcatel-lucent.com/solutions/wireless-packet-core

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