ASN Access Service Network Gateway: Connectivity for WiMAX Core Networks

Mobile operators require more than basic data transport from their packet infrastructure equipment. They need to build intelligent networks that deliver a broad array of value-added services to increase average revenue per user (ARPU) and accelerate the return on their platform investments.

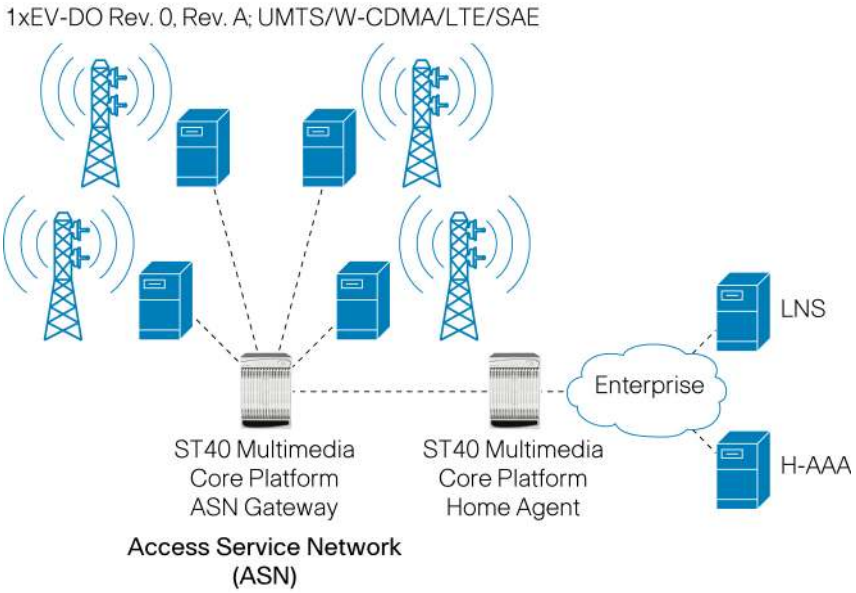
Cisco provides a natural extension of its leading packet-core product portfolio with its Access Service Network (ASN) Gateway for Mobile WiMAX broadband access networks (IEEE 802.16e). Supported on Cisco's ASR 5000 multimedia core platform, the ASN Gateway provides an unsurpassed level of subscriber and network intelligence, superior performance, high availability, carrier-class fault tolerance, and multimedia service integration.

The ASN Gateway supports connection and mobility management across cell sites and inter-service-provider network boundaries through processing of subscriber control and bearer data traffic between WiMAX networks and Code Division Multiple Access (CDMA), Universal Mobile Telecommunications Standard (UMTS), Wi-Fi, and femtocell access networks.

It also serves as the Extensible Authentication Protocol (EAP) authenticator for subscriber identity and acts as a RADIUS client to the operator's authentication, authorization, and accounting (AAA) servers.

Our high-capacity, linear scaling platform concentrates traffic from hundreds to thousands of base stations, reducing the number of gateways needed in a network. This in turn reduces the number of devices to manage and AAA transactions, and also minimizes connection setup latency by decreasing the number of call handoffs in the network.

Figure 1. ASN Gateway Deployment Example



Universal Roaming

The flexibility of the ASN Gateway allows it to be integrated with a Home Agent, Packet Data Serving Node (PDSN), Gateway GPRS Support Node (GGSN), or Security Gateway for easy mobility between multiple access networks. The ASN Gateway also provides network-based mobility to non-mobile-IP-capable user access devices.

The benefits of integration include network simplification, streamlined network management, service ubiquity with no impact on the access network being utilized, and reduction of capital and operational expenses.

The Right Platform

The ASN Gateway requires a platform like ASR 5000, which supports high subscriber session processing, high transaction processing, mobility management, session policy enforcement, and session security.

Running on the ASR 5000, the ASN Gateway delivers connection to WiMAX and mobility session management, multiple access gateway integration, high-value Cisco In-line Services, and high redundancy and availability.

In-Line Services

ASR 5000 feature the unique ability to deploy services “in-line” meaning they’re integrated into the bearer traffic plane at the edge of the packet core network. This provides in-depth session awareness that allows network management on a per-subscriber basis and deployment of content-aware applications. Tasks are performed without introducing latency, session interruption, or other kinds of signal degradation.

In-line Services use deep packet inspection (DPI) and intelligent traffic steering to offer the following:

- Enhanced traffic monitoring, metering, and charging
- Application detection and optimization for peer-to-peer detection and control
- Network-based traffic optimization to achieve QoS based on volume, usage, time-of-day, and traffic type
- Stateful firewall
- Content filtering for parental control, black/white listing

Table 1. ASN Gateway Specifications

Description	Specification
Interfaces	• Gigabit Ethernet • Fast Ethernet
Connectivity	• Simple IP • Proxy Mobile 6M per rack IPv4 • Client Mobile IPv4 • Intra-ASN mobility • Inter-ASN mobility (R4) • Connectivity service network (CSN) anchored mobility (R3)
Authentication, authorization, and accounting (AAA)	• RADIUS AAA client support • EAP authenticator ◦ Single EAP, user, device, or user/device authentication ◦ EAP-MD5, EAP-PSK, EAP-AKA, EAP-TLS, EAP-TTLS • Accounting – per-session, per R6 bearer connection, or per-application service flow • RADIUS AAA server groups • RADIUS custom dictionaries • Hotlining (Dynamic RADIUS attributes – COA, DM)
IP address allocation	• AAA assignment allocation • Local pools (dynamic or static) • Overlapping private IP address pools • Dynamic Home Agent address allocation • DHCP proxy server

Description	Specification
VPN and tunneling	• Multiple enterprise-specific contexts or resource pools • Home Agent 3G/4G smooth inter-technology mobility • IPsec (IKEv1/IKEv2 signaling) • Mobile IP NAT Traversal for Wi-Fi-attached subscribers • L2TP Access Concentrator (LAC) and L2TP Network Server (LNS) • IP-in-IP tunneling • Generic Routing Encapsulation (GRE) tunneling • IEEE 802.1q VLANs
Quality of service	• Network admission control • Service flow authorization • Multi-flow QoS traffic classification • Intelligent Traffic Control (ITC) • DiffServ Code Point marking/re-marking
Routing	• Routing Information Protocol (RIP) • Open Shortest Path First Version 2 (OSPFv2) • Border Gateway Protocol 4 (BGP4)
Enhanced applications	• Paging controller • Location register • Enhanced content charging • Content filtering/parental control • Stateful firewall • Peer-to-peer (P2P) detection and control

For more information, please visit www.cisco.com/go/mobileinternet.

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Printed in USA C78-609226-00 06/10