



CHAPTER 1

Overview of the Cisco ASN Gateway

This chapter provides an overview of the Cisco Access Service Network Gateway (ASN GW), and identifies its function within an end-to-end fixed or mobile IP network.

Overview

The Cisco ASN-GW functions in the gateway role in WiMax networks, designed as an end-to-end IP architecture. WiMAX is a standards-based wireless technology that offers high throughput broadband connections over long distances. WiMAX can be used for a number of applications, including “last mile” broadband connections, fixed and mobile cellular service, hotspots and cellular backhaul, and high-speed enterprise connectivity for business.

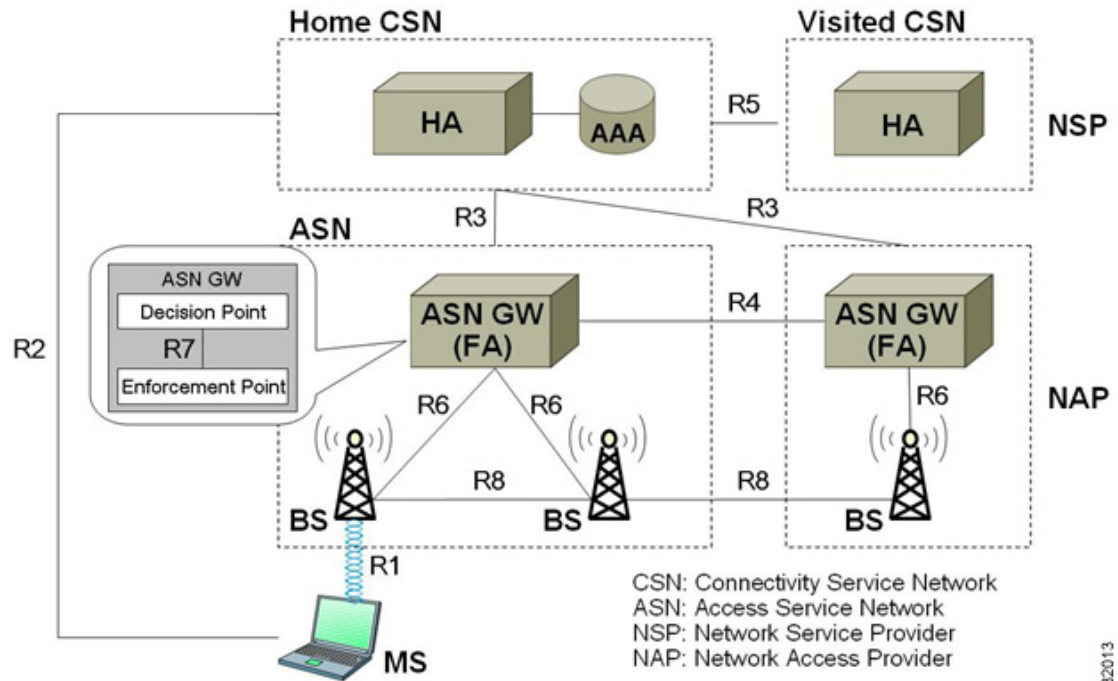
WiMAX is based on the IEEE 802.16d standard for fixed wireless, and the 802.16e standard for mobile wireless. This standard is appealing to customers because it allows mass production of chipsets that reduce CPE costs, ensure multi-vendor interoperability, and reduce investment risk for operators.

The architectural framework of a WIMAX network consists of the Access Service Network (ASN) and the Core Service Network (CSN). For new, or small deployments addressing the fixed/nomadic markets, only an independent ASN is possible in this release. Release 1.0 only addresses the standalone Access Service Network Gateway (ASN GW).

[Figure 1-1](#) illustrates the WiMAX Network Reference Model.

Figure 1-1 WiMAX Network Reference Model

WiMAX Forum NWG - Mobile WiMAX NRM (Network Reference Model)



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Access Service Networks

An Access Service Network is a set of network functions that provide radio access to a WiMAX subscriber. The ASN typically provides functions such as network discovery and selection, connectivity service between the MSS and Core Services network (CSN), Radio Resource Management, Multicast and Broadcast Control, Intra-ASN mobility, Paging and Location Management.

The Wimax architecture consists of both mobile and fixed subscribers, as well as the ASN and CSN. The interface between the ASN and those subscribers is based on the IEEE 802.16 (“d” for fixed and “e” for mobile subscribers). An ASN is comprised of base stations (in one, or more base station clusters), and ASN Gateway(s). An ASN may be shared by more than one Connectivity Service Networks (CSN).

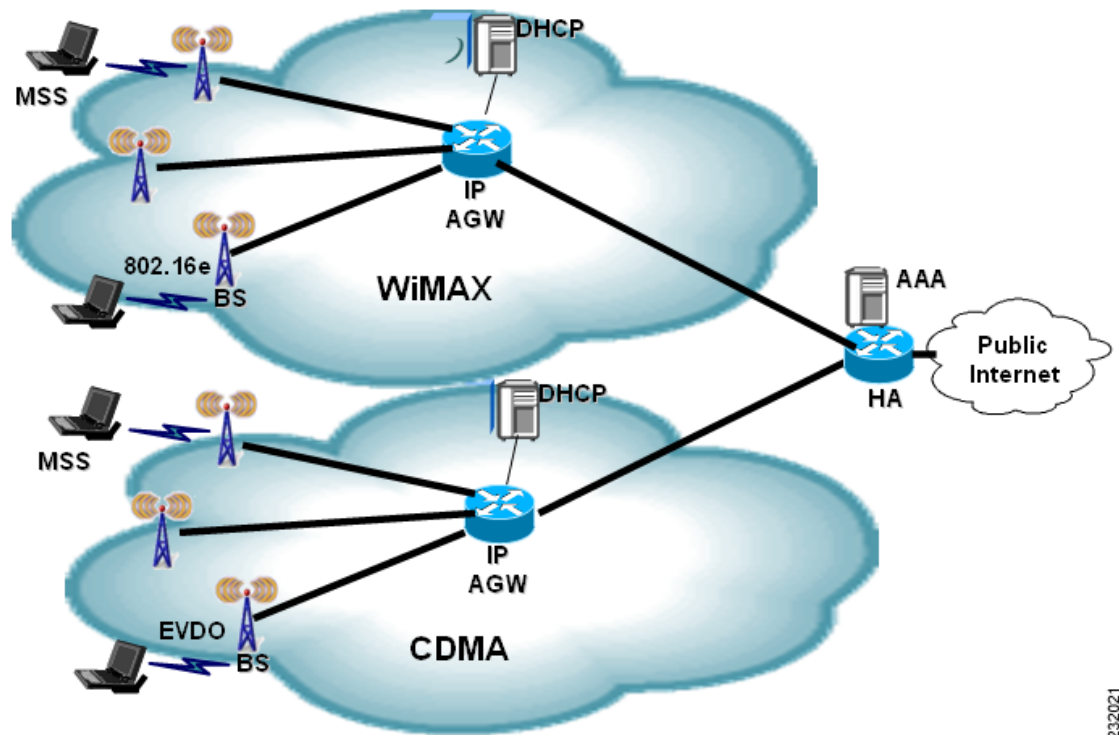
A Network Access Provider (NAP) is a business entity that provides WiMAX radio access infrastructure to one or more WiMAX Network Service Providers (NSPs). A NAP implements this infrastructure using one or more ASNs.

A Connectivity Service Network (CSN) is defined as a set of network functions that provide IP connectivity services to the WiMAX subscriber(s). CSN may comprise network elements such as routers, Home Agent, AAA proxy/servers, user databases, Policy servers, Content Service Gateways, Service Selection gateways, Interworking gateway devices.

With the emergence of an all-IP end-to-end mobile network, there is a need for an all IP Broadband Access Gateway (ASN GW). The IP Access Gateway is radio agnostic and handles mobility and security. It also pushes IP service delivery to the radio network. In short, the ASN GW allows intelligence to be shared between the Base Station (BS) and the IP network. All radio independent control is part of the ASN GW, while all radio dependent control is part of the BS.

Figure 1-2 illustrates elements of a WiMAX network.

Figure 1-2 Elements of a Wimax Network



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Cisco's ASN Gateway

The Cisco ASN GW provides access gateway functions between the 802.16e wireless domain and the IP network. It is the first hop IP router from the user's perspective and provides NAS and Accounting client capabilities for interaction with AAA servers.

The ASN GW supports Access Network authentication and security functions.

The ASN GW provides local mobility anchor capability, so that users can move between base-stations. The ASN GW also caches authentication and security identification to accommodate fast roaming of users across base-stations or between ASN GWs.

The ASN GW is the key to the IP mobility scheme. It provides the termination of the mobility function across base-stations and the foreign agent function. The ASN GW maps the radio bearer to the IP network. It works with the CSN and the policy servers to control policy on behalf of the user. Additionally, it acts as an IP gateway for the IP host function that is located on the base station. The ASN gateway brings together IP functions performed for the access network including end-to-end Quality of Service, Mobility and Security.

Cisco IOS Release 12.4(15)XL is optimized for the Cisco ASN GW feature on the Cisco 7301 Series router, and on the the SAMI card on the Cisco 6500 Catalyst Switch platform and 7600 Series router.

Cisco ASN GW Release 1.0 is supported on the following platforms:

- Cisco 7600 Series Router platform with a SAMI blade installed—Please refer to the following URL for installation and configuration information:

http://www.cisco.com/en/US/products/hw/routers/ps368/prod_installation_guides_list.html

- The Supervisor module (Sup720-3BXL, SUP IOS Release 12.2(33)) on the 7600 supports IOS-SLB functionality, and is enhanced to support ASNGW selection capability.
- A maximum of 8 blades can be supported per chassis.
- The ASN GW can coexist with CSG2 and the HA on co-located blades.

- Cisco 7301 Series Router platform—Please refer to the following URL for installation and configuration information:

http://www.cisco.com/en/US/products/hw/routers/ps352/products_installation_and_configuration_guide_book09186a0080134551.html


Note

The Load Balancing and Session Redundancy features are not available for the ASN GW on the Cisco 7301 Series Router platform.

The Supervisor 720 and Supervisor 32 are supported, both in single and redundant mode. For the Supervisor 720, the 3B and 3BXL versions are supported, with the latter recommended and tested.

Cisco 6500 Catalyst Switch	ASN GW Software Feature Set	Sup720-3BXL, SUP IOS Release 12.2(33)	256 MB	512MB	RAM
Cisco 7600 Internet Router	ASN GW Software Feature Set	Sup720-3BXL, SUP IOS Release 12.2(33)	256 MB	512MB	RAM