

JUNIPER NETWORKS SBR SERVICE PROVIDER SERIES

Delivering High Quality, Secure, and Mobile Services Across Multiple Access Technologies with Roaming Management

Challenge

As they migrate to next-generation, IP-based infrastructures, service providers must seamlessly deliver high-quality services across a wide variety of access technologies. They also must provide security, mobility, and roaming management for those services, subscribers, and devices.

Solution

A single, common physical platform, Juniper Networks SBR Service Provider Series meets the service provider's need for seamless migration by providing support for multiple technologies and backend systems across a wide variety of networks.

Benefits

- Proven reliability and scalability for managing authentication, authorization, accounting, and service delivery.
- Easy integration into existing mobile infrastructures, enabling operators to generate new revenue quickly.
- Works in multiple mobile network environments including 802.1X, WIMAX, UMA/GAN, Femtocell.
- Comprehensive management of IP addresses, mobility, roaming, billing, quality of service (QoS).

Among the most significant challenges facing service providers as they migrate from their legacy infrastructures to next-generation networks is delivering high quality services across a variety of legacy and IP access technologies. As if that weren't complex enough, they must simultaneously provide security, mobility, and roaming management for those services, subscribers, and their devices. Service providers whose networks are able to perform the required authorization, authentication, and accounting (AAA) functions will enjoy the most successful and seamless migration efforts. In addition, their subscribers will enjoy true mobility and the quality of experience they expect.

Choosing the right AAA solution will play a key role in the complex task service providers face in knitting their legacy infrastructures and backend systems together with emerging IP-based next-generation networks, devices, and services. The best solution will offer the integration capabilities necessary to accomplish this goal with limited impact to capital and operating expenses (CapEx/OpEx). Ideally, the AAA solution will offer service providers a high degree of integration, and it will facilitate interoperability between multiple types of networks and backend systems. Therefore, it is critical to choose a AAA solution that can connect to and interoperate with existing backend systems and databases.

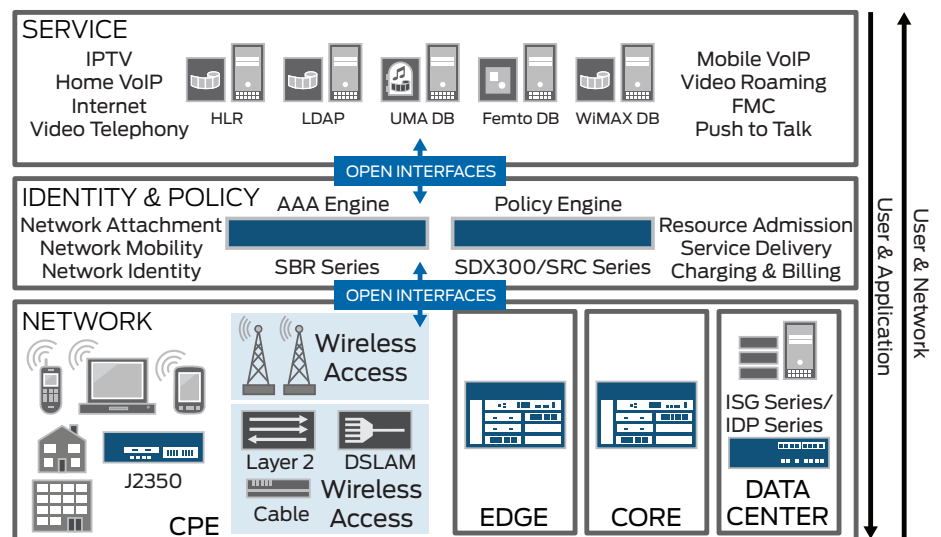


Figure 1: Identity and policy in today's multiservice environment

The Challenge

As service providers migrate to a single IP-based infrastructure, their networks will need to interact with one another and with multiple public and private landline and wireless networks. To achieve seamless migration and maintain high QoS as their networks evolve, service provider AAAs must be able to integrate with, and offer support for, multiple technologies and backend systems. They must implement future-proof solutions that support the AAA functions necessary to meet the needs of an ever-increasing number of end users and devices operating in multiple deployment and technology scenarios.

Evolutionary changes create challenges to service providers, but they also present new opportunities for managed, secure, value-added LAN service scenarios such as:

- Unlicensed Mobile Access/Generic Access Network (UMA/GAN) environments: Extend mobile voice and data services over an IP access network by allowing seamless roaming and handover between wireless networks like Wi-Fi and Bluetooth, or Global System for Mobile Communications (GSM) and universal mobile telecommunications system (UMTS) using the same dual-mode mobile phone.
- Femtocell environments: This network architecture also enables mobile operators to deliver voice, data, and IP-based applications to mobile phones in the home, but by leveraging second-generation/third-generation (2G/3G) radio resources instead of wireless LAN (WLAN) radio resources. This allows a broader range of devices to be used.

- Secure 802.1X hotspots: Enables customers and roaming partners to use a single identity across all access methods and services using multiple Extensible Authentication Protocol (EAP) methods.
- Secure open hotspots: Operators who have not yet adopted 802.1X need a AAA server that can be leveraged to authenticate hotspot users to the network, and deliver services based on out-of-band delivery of a secure one-time password via the short message service (SMS) text messaging protocol.
- Next-Generation Networks (NGNs): Facilitate the migration to a converged IP NGN by supporting SS7 and SIGTRAN (SS7 over IP) for HLR (Home Location Register) communication, enabling operators to seamlessly transition to next-generation IP-based signaling networks.

A best-in-class AAA server also must support complex security and accounting functions, mobility, and roaming management. Such comprehensive functionality will allow service providers to deliver IP-based services using their existing mobile infrastructures, including their HLR, billing platforms, and customer care systems.

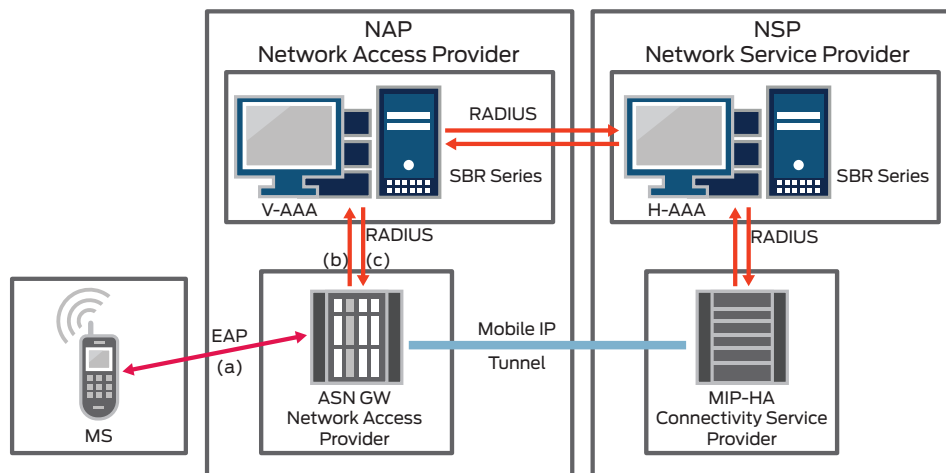


Figure 2: WiMAX authentication using Juniper Networks Steel-Belted Radius Carrier

Juniper Networks SBR Service Provider Series

The SBR Series supports service providers in their efforts to launch new mobile services and quickly begin generating new revenues. It allows them to provide end users with a seamless mobile experience by first authorizing and securely connecting subscribers or one-time users and their devices to the network. Once connected, the AAA platform manages the authentication of those users and their devices throughout the lifetime of each session, which may take place across multiple devices or networks. The AAA platform facilitates roaming and seamless handover between networks by providing an interface for passing subscriber credentials from IP networks to the Subscriber Identify Module (SIM)-based authentication information stored in the HLR/AUC (authentication center) over SS7- or SIGTRAN-based networks.

Service providers require a AAA platform that has the ability to act as a visited or home AAA in roaming scenarios. This ensures proper authentication and billing for subscribers or temporary users. The SBR Series also provides user/session and QoS flow-based accounting and reconciliation for all sessions. This enables operators to tailor services and rates to meet the needs of their subscribers and maximize the use of network resources as demands on those resources increase.

Each user calls or sessions must be managed and authorized with the appropriate quality of service and service level. This allows operators to authorize subscriber connections according to profile information provisioned in their HLR and backend databases. The modular design of SBR Service Provider Series enables and supports a variety of commonly used backend formats, including SQL, LDAP, and Proxy RADIUS. With this “front-end” approach, the SBR Series helps reduce the service provider’s CapEx and OpEx, regardless of service mix, access technologies, or backend systems. The SBR Series is the only system that can deliver on the vision of one AAA for all next-generation converged networks and is compatible with all of the various existing access technologies and databases acting as backend systems.

Features and Benefits

Table 1: SBR Series Features and Benefits

FEATURE	DESCRIPTION
Proven reliability and scalability	<ul style="list-style-type: none"> • Full-function RADIUS/AAA server manages authentication, authorization, accounting, and service delivery • Reliably handles even the busiest networks
Easily integrates into existing mobile infrastructures	<ul style="list-style-type: none"> • Enables operators to tap into new revenue opportunities • Gives operators the ability to offer IP-based services to customers without upgrading their customer care infrastructures • Allows operators to extend services into unlicensed radio networks such as Wi-Fi and Bluetooth • Gives operators the ability to authorize customers for specific services based on existing HLR/AUC profiles
Works in 802.1X, non-802.1X, UMA/GAN, and Femtocell environments	<ul style="list-style-type: none"> • Flexible authentication options permit subscriber authentication via EAP-SIM, EAP-AKA, or one-time password via SMS • Enables operators to leverage existing SIM or SMS infrastructure to facilitate secure subscriber provisioning, authentication, and billing • Creates a trusted foundation for UMA voice and data services and Fixed Mobile Convergence (FMC) as RADIUS migrates to DIAMETER • Integrates seamlessly into next-generation IP-based signaling networks
Mobility management	<ul style="list-style-type: none"> • Mobile IP key derivation • Mobile IP key distribution • Mobile IP resource assignment
IP-address management	<ul style="list-style-type: none"> • Static IP-address assignment from a user profile, LDAP, or SQL database • Dynamic IP-address management (IP-Pools)
Roaming	<p>Acts as:</p> <ul style="list-style-type: none"> • Home AAA - network attachment, QoS, service delivery, billing • Visited AAA - mobility management, resource management, QoS, billing
Quality of service	<ul style="list-style-type: none"> • Manages and assigns users' WiMAX QoS flows and authorizes their activation
Billing	<ul style="list-style-type: none"> • Provides user/session and service session/QoS flow-based accounting and reconciliation

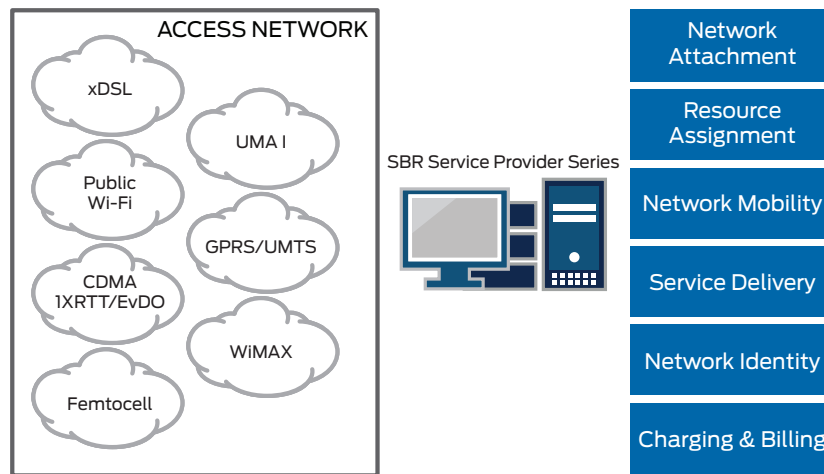


Figure 3: Juniper Networks Steel-Belted Radius Carrier applications and functions

Solution Components

- Juniper Networks® Steel-Belted Radius Service Provider Edition
 - High-capacity RADIUS/AAA server
 - Reliably manages user authentication and billing data
 - Scales to any service level
 - Seamlessly integrates into customer care and billing infrastructure
- Juniper Networks Steel-Belted Radius High Availability Server
 - Stateless high-availability AAA platform
 - Offloads and distributes aspects of SBR Series operation to a highly fault-tolerant database cluster shared by all SBR Series servers
 - Supports an extensive list of NAS devices to provide a vendor-agnostic RADIUS solution
- Juniper Networks SBR Mobile IP Module
 - Extends AAA functionality of SBR SP to support Third Generation Partnership Project 2 (3GPP2)-defined requirements for Code Division Multiple Access (CDMA) operators
 - Manages authentication and service delivery on 3G wireless networks
 - Supports “hotlining” for mobile terminal redirection to portal
- Juniper Networks SBR SIM Server
 - Full-function RADIUS/AAA server manages authentication and service delivery on GSM and CDMA networks
 - Enables IP-based services to GSM subscribers
 - Flexible authentication options permit subscriber authentication via EAP-SIM, EAP-AKA, or one-time password (via SMS)

Summary: Seamless, Secure, Next-Generation Services

Whatever the access mode, service mix, or business model, Juniper Networks SBR Service Provider Series provide mobility management and IP address assignment, roaming and user QoS flow management, billing, and legacy assets integration with next-generation elements. Today, more than 120 service providers worldwide rely on Juniper Networks SBR Series to meet their mission-critical AAA needs. The platform allows these service providers to monetize their networks by accurately accounting for and tracking each service and service level chosen by a mobile user. The single physical platform also allows a smooth network transition from a variety of technologies to the consolidated technologies of next-generation networks, supporting the carrier-class performance and scalability that service providers require to step into the future with confidence.

Next Steps

Additional information about the SBR Series can be found at www.juniper.net.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

Corporate and Sales Headquarters

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or 408.745.2000
Fax: 408.745.2100
www.juniper.net

APAC Headquarters

Juniper Networks (Hong Kong)
26/F, Cityplaza One
1111 King's Road
Taikoo Shing, Hong Kong
Phone: 852.2332.3636
Fax: 852.2574.7803

EMEA Headquarters

Juniper Networks Ireland
Airside Business Park
Swords, County Dublin, Ireland
Phone: 35.31.8903.600
EMEA Sales: 00800.4586.4737
Fax: 35.31.8903.601

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