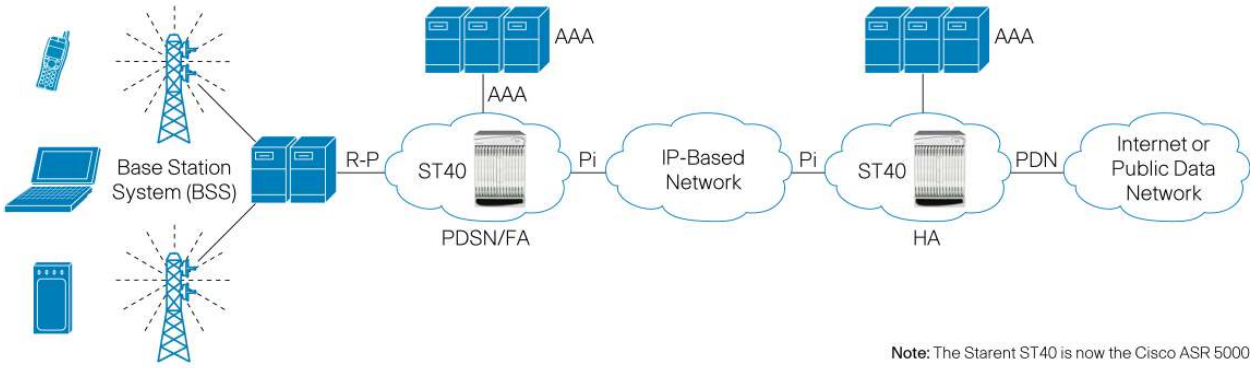
Cisco ASR 5000 PDSN:
Packet Core Connectivity for CDMA Networks

Mobile subscribers are increasingly consuming email, the Internet, mobile video, instant messaging, and other multimedia services through a mobile broadband connection. This requires mobile operators to deploy a robust, scalable packet core network capable of massive amounts of throughput with exceptional reliability and availability.

Cisco PDSN/HA Packet Data Serving Node and Home Agent are the packet core gateways of choice for many of the world's 3rd Generation Partnership Project 2 (3GPP2) network operators deploying Code Division Multiple Access (CDMA) and High Rate Packet Data (HRPD) networks.

Supported on the Cisco® ASR 5000 the PDSN and Home Agent deliver exceptional throughput, call transaction rates, capacity, and packet processing, along with significant memory resources. These performance capabilities are combined with subscriber and network intelligence, reliability, and high availability to offer an industry-leading solution that mobile operators can count on to deliver robust multimedia services. As a result, the PDSN and HA allow mobile operators to focus on building high-margin revenue streams without worrying about the packet core. Figure 1 shows how Cisco's PDSN and HA deliver enhanced voice, data, and multimedia services for CDMA networks.

Figure 1. Cisco's PDSN and Home Agent as the Packet Core Gateways



The PDSN manages point-to-point protocol (PPP) sessions between the HA and external packet- or IP-based networks, such as the Internet. Once a session is initiated, the PDSN identifies and authenticates the subscriber, then routes the subscriber's session through the core network to the specified external packet network. The HA is the anchor point for subscriber sessions, helping enable mobility and maintaining session continuity as the subscriber moves through the network.

Migrating to 4G/LTE

With simple software upgrades, the Cisco ASR 5000 can support both current and future technologies to protect your investments as your network evolves, including support for Long Term Evolution (LTE)/Evolved Packet Core (EPC) and other access requirements such as Wi-Fi, femtocell, etc.

When deploying a 3G network, it is important to consider the implications for your 4G strategy. In a CDMA network, one evolution method includes the ability to support an HRPD Serving Gateway (HSGW) for evolved HRPD (eHRPD) networks. The HSGW helps ensure converged mobility and management between the HRPD and LTE networks. The Cisco HSGW can be colocated with the PDSN. In addition, the ASR 5000 supports Direct-LTE HRPD-to-LTE evolution paths.

In-line Services

The Cisco ASR 5000 integrates network- and service-enhancing capabilities called In-line Services, which are deployed within the call flow, as opposed to requiring the call to be offloaded to service-provisioning servers and load balancers. This simplifies network topology and reduces capital and operating expenses.

In-line Services take advantage of the Cisco ASR 5000 platforms' powerful processing and abundant memory to help ensure more efficient traffic flow end-to-end, and a more secure and satisfying subscriber experience. In-depth session awareness 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 and intelligent traffic steering to offer the following:

- Enhanced traffic monitoring, metering, and charging
- Application detection and optimization for peer-to-peer (P2P) 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

Features and Benefits

- In-depth session awareness allows management on per-subscriber, per-session basis and deployment of content-aware applications.
- PDSN and HA interact easily with RADIUS AAA, billing, and policy servers.
- PDSN and HA can be combined on a single platform to maximize efficiency and flexibility, reduce latency, and simplify network architecture.
- Simple IP, Proxy Mobile IP, Mobile IP, and IPv6 applications can operate independently or simultaneously within a single platform.
- High-value In-line Services increase revenue opportunities and network efficiency.
- High-availability platform helps ensure subscriber satisfaction and 99.999 percent service uptime.

Table 1. PSDN Features

Description	Specification
Interfaces	• 10 Gigabit Ethernet • Fast Ethernet
Authentication, authorization, and accounting RADIUS AAA server groups	• RADIUS custom dictionaries • Hotlining (Dynamic RADIUS CoA) • RADIUS IS835C prepaid accounting • Diameter Credit Control Application (DCCA)
IP address allocation	• AAA assignment • Local pools (dynamic or static) • Overlapping private IP address pools
VPN and tunneling	• Multiple enterprise-specific contexts or resource pools • Simple IP, Proxy Mobile IP, and Mobile IP • 3GPP-3GPP2 inter-technology roaming (integrated GGSN/Foreign Agent and/or Home Agent services) • IPsec • 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 • 6 to 4 tunneling • IEEE 802.1q VLANs
Quality of service	• Multiflow and per-flow accounting
Routing	• Simple IPv4, Mobile IPv4, Simple IPv6 and Client Mobile IPv6 • Routing Information Protocol (RIP) • Open Shortest Path First Version 2 (OSPFv2) • Border Gateway Protocol 4 (BGP4)
Enhanced applications	• Alternative point-to-point protocol (Alt-PPP) • Smooth cellular-to-wireless LAN cross-bearer mobility • Robust Header Compression (ROHC) support for primary and/or auxiliary service connections • Intelligent traffic control and per-flow bandwidth management • Broadcast and Multicast Services (BCMCS)

For More Information

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