

Nortel Networks

Wireless Solutions

The Shasta 5000 BSN is uniquely positioned to effectively target the emerging wireless Internet

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Overview

The Nortel Networks Shasta 5000 Broadband Service Node (BSN) is uniquely positioned for mobile wireless applications — effectively targeting the emerging wireless Internet, and next-generation wireless Internet Protocol (IP) technologies using Code Division Multiple Access (CDMA), Global System for Mobile communication (GSM) and Time Division Multiple Access (TDMA) networks.

The Shasta 5000 BSN supports a complete suite of next-generation, value-added IP services such as subscriber aggregation, traffic engineering, Quality of Service (QoS) for service level guarantees, security firewalls, Virtual Private Networks (VPNs) and personal network portals — and makes it possible to implement them all on a single platform. Using the Nortel Networks Service Creation System (SCS), any or all of these features can be associated with one or multiple subscribers. Users can also deploy service subscription-based billing or targeted bundled strategies quickly and easily in any market.

Wireless Mobile Solutions

CDMA

The next-generation IP data solution for CDMA is 1xRTT. The 1xRTT architecture adds a new component to the existing wireless network: the Packet Data Service Node (PDSN) (Figure 1). The primary functions of the PDSN are to provide mobility management, network aggregation and routing of IP sessions. The Nortel Networks Shasta 5000 BSN acts as an effective PDSN, providing value-added IP services, in addition to basic aggregation.

The goal of the 1xRTT architecture is to move all IP data onto its own backbone. The Base Station Controller (BSC) will redirect all IP traffic to the PDSN. Since only voice traffic is then routed over the switch, this alleviates the congestion caused by Internet data traffic. The PDSN resides at the subscriber edge of the Internet where value-added services are easily applied.

GSM and TDMA

Although GSM and TDMA are deployed as different and separate voice networks, they in fact share a common architecture. Due to the high level of commonality, these two technologies will evolve to a common next-generation IP data platform and eventually to Universal Mobile Telecommunication System (UMTS).

The resulting network standard is referred to as GPRS-EDGE (General Packet Radio Service - Enhanced Data for a GSM Environment). GPRS introduces two new pieces of hardware, the Serving GPRS Support Node (SGSN) and the Gateway GPRS Support Node (GGSN) (Figure 2).

Using the Nortel Networks Passport product, the SGSN handles all mobility management functions such as detecting new mobiles and packet routing. The GGSN provides IP gateway functionality, routing and aggregation, as well as the value-added subscriber services offered by the Shasta 5000 BSN.

The Base Station Controller (BSC) will redirect all IP traffic through the SGSN to the GGSN. Since only voice traffic is then routed over the switch, this alleviates the congestion caused by Internet data traffic. The GGSN resides at the subscriber edge of the Internet where value-added services are easily applied.

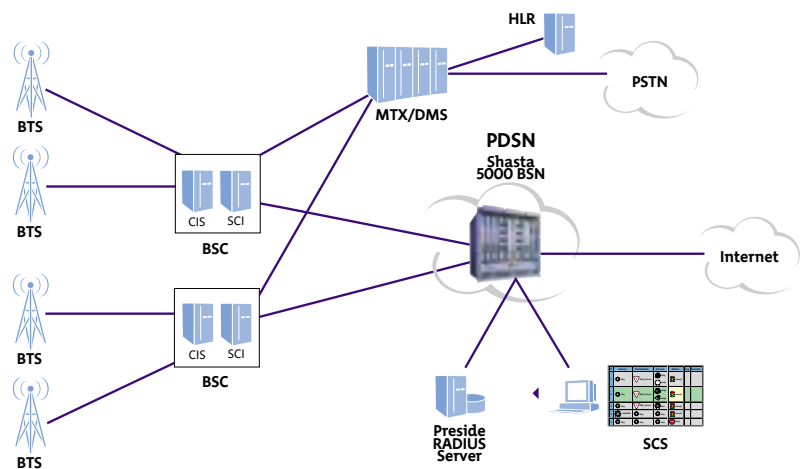


Figure 1: The Shasta 5000 BSN provides value-added IP services and basic aggregation

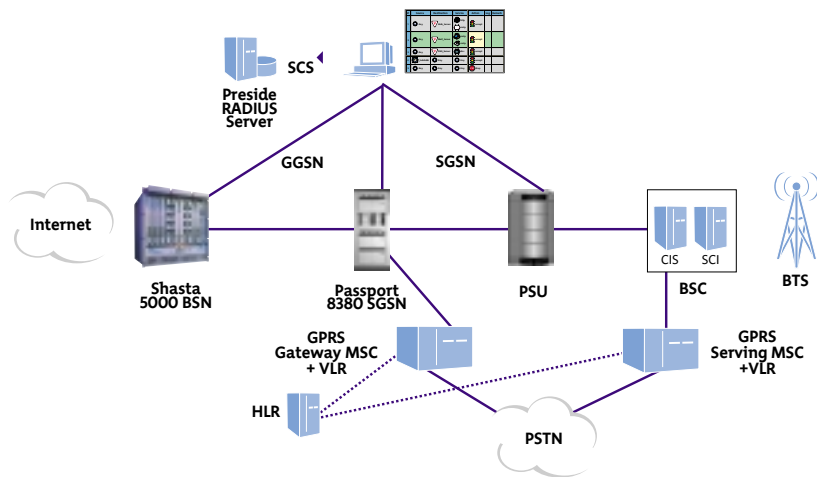


Figure 2: Nortel Networks Wireless Solution

Features:

The Service Creation System (SCS) is at the heart of the Shasta 5000 BSN value-added services. The SCS is a powerful service-definition system, designed to allow the rapid creation of customized IP service policies. Some of these value-added services are:

- Security – Firewalls, anti-spoofing
- Virtual Private Networks
- Queuing – defining burst sizes as in Frame Relay
- Differentiated Services – DiffServ, for setting grade of services
- Accounting
- Policing
- Support for Content Filtering Services
- Personal Network Portals

The SCS allows operators to create system-wide service policies and service profiles that can be applied to individual subscribers or groups of subscribers. In addition to access-based fees, the Shasta 5000 BSN allows operators to bundle features in order to drive subscription-based revenue. As a further source of revenue, personal network portals can automatically direct customers to personalized web pages, with customized content. These websites can be hosted by the wireless operator or by content and service provider partners.

Shasta 5000 BSN Product Specifications:

General Characteristics

- 14 slots at 622 Mbps or 1.2 Gbps operation
- Logical midplane for non-stop operation
- All modules capable of hot-swap and redundancy
- Distributed DC entry (AC optional)
- 4 systems per 7' telco rack

Modules

- One or two Control and Management Cards (CMC) modules providing routing and management for the system and each equipped with 2xFE server ports
- One or two 10, 5, or 2.5 Gbps non-blocking Switch Fabric Cards (SFC) with full per flow queuing
- Up to seven Subscriber Service Cards (SSC), each with up to four Subscriber Service Modules (SSMs) processor groups

Interfaces

- 4 port OC3/STM-1 ATM – SM or MM
- 3 port DS3/E3 + 1 port OC3/STM-1 ATM – SM and MM
- 8 port FE(UTP5) Fast Ethernet Modules
- 2 port OC12/STM 4 ATM – SM or MM
- 4 port Channelized DS3
- 2 port Channelized OC3[†]
- 1 port Gigabit Ethernet
- 4 port OC3/STM-1 POS[†]

Connectivity / Access Services

- RFC2684 Bridging and Routing
- RFC2225 IP and ARP over ATM
- RFC2331 ATM Signaling Support for IP over ATM
- PPP over ATM and PPPoE (RFC2516)
- ATM PVCs (UNI 3.x/4.0)
- ATM ILMI and OAM
- ATM SVCs[†]

WAN Support

- FR Multiprotocol encapsulation 1490 bridged, 2427 routed
- PPP over FR (RFC1973)
- LMI auto-detect

Routing Protocol Support

- Full OSPF support, LDAP support
- Full BGP support, Peer-group, Route flap dampening, Route reflector, Aggregation, Confederation
- RIP V1,2
- IS-IS
- Multicast via IGMP proxy
- MPLS[†]

Security Features

- Packet filtering, anti-spoofing
- State-aware firewalls, NAT
- Source address verification
- Personal Network Portals
- Firewall – state-aware firewalling and filtering
- Anti-spoofing (egress-ingress)
- Authentication through password, SecurID, and interfaces to existing RADIUS and Authentication, Authorization and Accounting (AAA) systems
- Strong encryption - IPsec 3DES and DES56
- Logging
- Network-based state-aware firewalling at line rate
- Application-aware firewalling: support for streaming audio, video, H323, games, etc
- Trivial denial of service type attacks protection and (resiliency) NAT/PAT protocol support with full security policy integration

Traffic Management and QoS

- Traffic steering
- IP Diffserv with per-hop behavior
- RADIUS accounting
- LDAP support
- QoS-based routing and steering
- Hierarchical Weighted Fair Queuing
- Web cache interaction
- Support for provider SLAs

VPNs

- L2TP LNS, LAC, and tunnel switching
- Context-based VPNs
- Virtual Private Dial Networks (VPDNs) via L2TP
- Virtual Private Routed Networks (VPRNs)
- IPsec Authentication Header (AH)
- IPsec Encapsulating Security Payload (ESP) (DES56, 3DES)
- Dedicated encryption/security co-processor (DES/3DES)
- Internet Key Exchange (IKE)

MIB Support

- The Shasta 5000 BSN supports SNMPv2 and implements the relevant IETF, FR and ATMF MIBs

Interoperability Testing[†]

- All commonly deployed DSLAMs and associated CPE, including Nortel Networks Universal Edge 3000
- Relevant core routers, ATM switches, RADIUS Servers, and Web cache solutions
- The Shasta 5000 BSN is the IP services component of Nortel Networks end-to-end IP architecture, and is fully integrated with industry leading access and core products in the Nortel Networks solutions portfolio

Certifications

- NEBS Level 3
- Appropriate safety/EMI as described below
- International Computer Security Association (ICSA) for IPsec and Firewalling

Physical Characteristics

- Dimensions:
 - 19" W x 19.25" H x 18" D
 - 48cm W x 49cm H x 46cm D
- Weight:
 - 135 lb (61 kg) fully loaded
 - 39 lb (18 kg) empty
- DC Power:
 - 1500 watts fully loaded
 - 38V DC min to -60V DC max; 40 Amps
- AC Power:
 - 90 to 260 VAC @ 50 to 60 Hz; 60 Amps
 - 16 Amps per input
- Altitude:
 - 197 to 10,000 ft (-60m to 3048m)
- Temperature:
 - 32-104°F (0-40°C) operational
 - 23-132°F (-5-55°C) short-term (16 hours)
 - 40-70°C non-operational
- Humidity:
 - 10-90% non-condensing
- Safety:
 - UL 1950, CSA 950, CE Mark
- EMI:
 - FCC Part 15 Class A
 - EN 550 22A

Service and Support

Nortel Networks IP Services Web page:
www.nortelnetworks.com/ipservices
Support and Upgrades:
www.nortelnetworks.com/servsup

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<http://www.nortelnetworks.com/ipservices>



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