Redback Networks

Subscriber Management System 500

Powerful, cost effective solution for managing high speed subscribers

The Redback® Subscriber Management System™ (SMS) 500 is a powerful, highly intelligent networking device that bridges the operational gap between high speed access equipment in the telco central office or cable/wireless head-end and service provider backbone routers (see Figure 1). Deployed by network service providers at a Point of Presence (POP), the SMS 500 accepts a large concentration of high speed data traffic from such devices as DSL Access Multiplexers (DSLAMs), Cable Modem Termination Systems (CMTSs) and wireless head-ends (see Figure 2). The SMS 500 applies scalable user configuration and management to the data streams, and then grooms the traffic for a service provider's backbone routers – offloading the routers of the intensive processing that could create bottlenecks in high speed networks.

KEY BENEFITS

- *Scalable port density, transmission speeds, and reach*
- *Production proven – Redback Subscriber Management Systems have been used in production networks worldwide by leading carriers and service providers*
- *Integrated broadband support – one system for integrated xDSL, cable, FTTC, leased line aggregation and wireless support*
- *Ease of provisioning – rapid time to market through RADIUS integration and standard management interface*
- *Dynamic Service Selection – allows customer selection of a variety of provider-offered services*

Redback NETWORKS

Support for xDSL, cable, FTTC, leased line aggregation and wireless access technologies

The SMS 500 is a complete subscriber management system for enabling service providers to provision high speed Internet access. It supports all of the popular high speed access technologies being deployed today (see Figure 3):

- xDSL, including ADSL, SDSL, IDSL, HDSL, VDSL and G. Lite
- Cable modems
- Fiber to the curb (FTTC)
- Leased line aggregation
- Wireless

Thus, a service provider could decide to provision ADSL and IDSL today using a Redback SMS 500, and later add a wireless service offering through the same Redback Subscriber Management System.

Redback Network's SMS platforms have been extensively tested for interoperability with leading xDSL, cable modem, FTTC and wireless access systems.

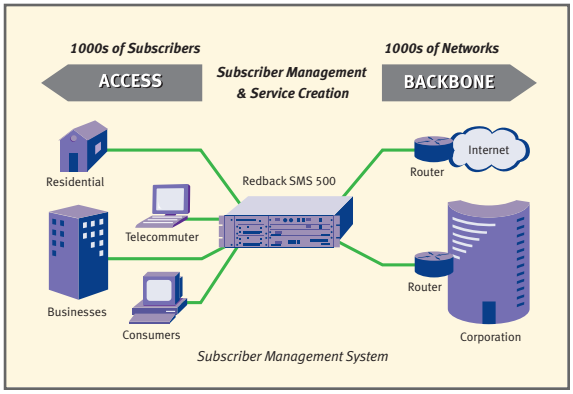

Figure 1: Bridging the gap between high speed subscribers and the Internet

Enables rapid, scalable deployment of high speed Internet access

Like traditional dedicated services, DSL and other high speed access technologies require special provisioning and configuration. The SMS 500 gives service providers a competitive advantage by greatly accelerating the time it takes to bring high speed access services to market. Because it leverages all of the existing — and familiar — access provisioning, accounting, and management control systems service providers already have in place, the SMS 500 can greatly speed the deployment of DSL and other access technologies.

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Like Remote Access Servers (RAS) managing dial access to the Internet, the SMS 500 provides "customer touch" functionality — leveraging the same RADIUS database used for dial subscribers. This RADIUS integration results in far less staff training required and lower operational expense. Additionally, the SMS 500 works with service providers' existing backbone routers, isolating and offloading them of all subscriber management functions. As a result, the service provider can be assured that performance remains high and new routers will not need to be purchased to support subscriber management functions.

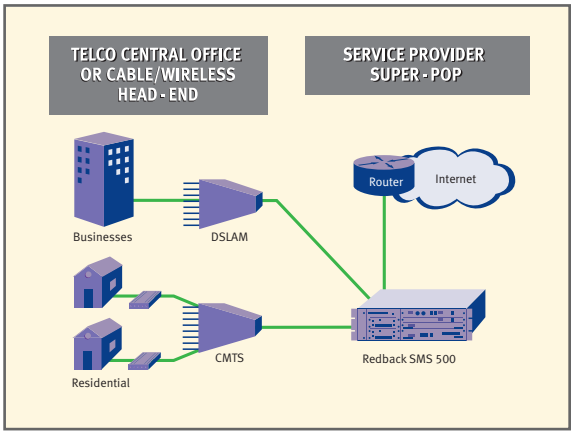


Figure 2: The SMS 500 accepts a large concentration of high speed subscribers

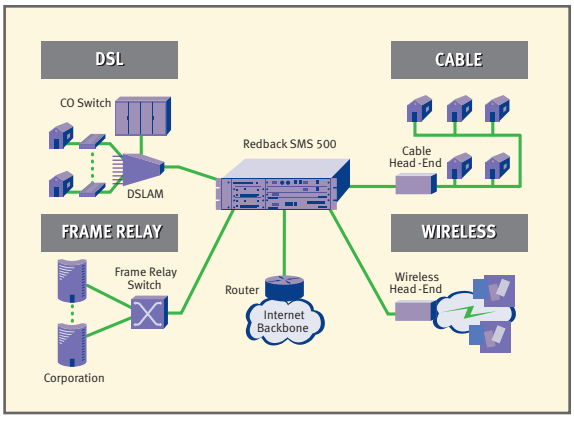


Figure 3: The SMS 500 supports all high speed access

Service creation enables new revenues for service providers

In addition to enabling service providers to rapidly provision high speed Internet access, the SMS 500 provides new revenue opportunities through a wide array of service creation capabilities. Through the SMS 500's multiple context functionality—which is the ability to partition the system into multiple virtual routers—the system provides a new level of flexibility for service providers. Subscribers can be configured to access multiple services across the same physical link, either simultaneously or independently.

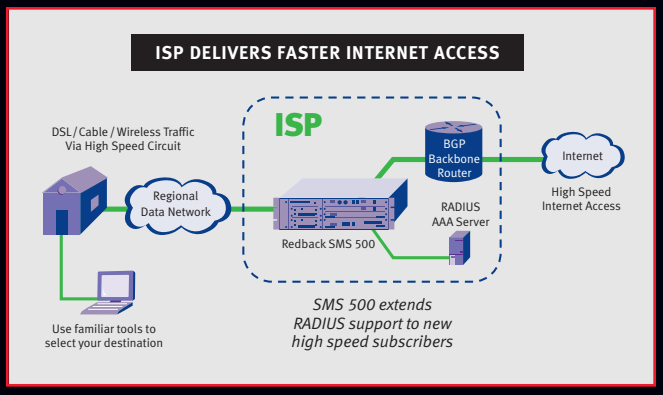
For example, a subscriber using DSL for remote access to his corporation's LAN during the day might want to access the Internet at night for his own enjoyment. Under normal circumstances, this dedicated connection makes Internet access impossible without going through the corporate LAN. However, his employer might have a strict policy about off-duty personal Internet usage.

Through Redback Networks' Dynamic Service Selection capability, a service provider can add value to its high speed access services by "re-profiling" and "re-selling" lines to subscribers multiple times. Any number of potential services can be resold to the end user, from "business by day/family at night" billing to different qualities or classes of service. The result is the service provider can gain multiple revenue streams from a single high speed Internet connection sold to a subscriber.

SMS 500 System

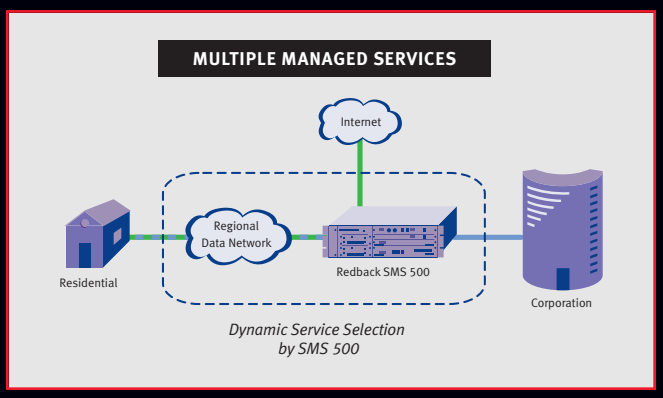
The SMS 500 base system is semi-modular, and includes a Forwarding Engine (FE), Control Engine (CE) and a single 10/100 Mbps Ethernet port (RJ-45). In addition, the chassis includes two slots for I/O modules. These modules include:

Module	Ports
ATM OC-3c/STM1	1
ATM DS-3	1
ATM E3	1
ATM T1	4
Packet E3	1
ATM E1	4
Packet DS-3	1
Packet T1	4
Packet E1	4
10/100 Base-T	1



Provisioning basic high speed consumer or business Internet access

A service provider wants to deploy a high speed Internet access service for its customer base and prospects. The ISP uses a Redback SMS 500 to terminate a circuit (ATM or frame relay) from the network provider (ILEC, CLEC, MSO, etc.) and manages the individual PPP sessions. The SMS 500 grooms IP streams for the backbone router and integrates with the existing RADIUS database(s) used for dial subscribers. The subscriber uses familiar Windows Dial-up Networking icons to access his new high speed connection.



Provisioning high speed access with multiple service offerings

The service provider creates and sells multiple services over the same high speed connection. Businesses pay for a specialized telecommuting service for their remote workers, but aren't forced to act as a de-facto ISP at night. Telecommuters are able to purchase a separate "family access" service on their high speed line for personal use. Other specialized services can also be offered, such as high quality video conferencing, etc.

The service provider uses the Dynamic Service Selection capabilities of the SMS 500 to create multiple contexts (one for each service offered). Each service would have its own context: access to Corporation A, access to Corporation B, the "family service" offering, video services, etc. Each SMS 500 supports up to 10 contexts, or specialized service offerings.

SPECIFICATIONS

Software

LAN Protocols	IP, Ethernet
WAN Protocols	HDLC, PPP, ATM, Frame Relay
Encapsulations	Ethernet v2, RFC1483 ATM (bridged & routed, VC multiplexed), RFC1490 Frame Relay (bridged & routed, VC multiplexed) RFC1973 PPP over Frame Relay, RFC2364 PPP over ATM, PPP over Ethernet, Cisco HDLC
Packet Forwarding	Routed, Bridged, Tunneled
Routing Protocols	Static, RIP, RIPv2, OSPF, BGP4
Subscriber Awareness	Subscriber Name, Session, or IP Address
Address Management	DHCP Relay, IPCP parameter negotiation
Bandwidth Management	Independent traffic shaping for 1000s of connections, Multiple QoS Classes including CBR, VBR-rt, VBR-nrt, UBR, and CIR, rate limiting per PPP session or per L2TP/L2F tunnel
Virtual Private Networks	L2TP, L2F, Multiple Contexts (LAC, LNS, Tunnel Switching & Tunnel Interworking), Generic Routing Encapsulation (GRE) per RFCs 1701 and 1702
Multicast	IGMP v1, v2
Security	PAP, CHAP, and RADIUS authentication, multiple levels of administrative passwords, transmit and receive packet filtering (Access Control Lists), service access lists, Stateful Firewall, Source Address Validation, Secured ARP
Accounting	Per subscriber and per channel, statistics, SNMP and RADIUS support
Network Management	TELNET, SNMP v1 & v2c, SYSLOG, Command Line Interface, Web-based Management Interface, Frame Relay ITU Annex A, Frame Relay ANSI Annex D
Advanced Features	Multiple Context (independent management views, multiple virtual routers and RADIUS clients, private address and name spaces), Dynamic Provider Selection, Dynamic Service Selection, L2TP, L2F, SONET APS

Hardware

System Chassis	
Dimensions	5.2”H x 17”W x 10.3”D
Rack Mount	19” option
Weight	19lbs. without I/O modules; 20 lbs. loaded
Interface Modules	Up to 2 in any combination
Power Options	Redundant load sharing 150 W supplies, -36 to -60 VDC or 90 to 240 VAC @ 47 to 63 Hz

Hardware (continued)

Operating Requirements	
Temperature	32-104 F (0-40 C)
Altitude	0-10,000 feet (0-3048 meters)
Relative Humidity	10%-85% (non-condensing)
Safety Certifications	UL 1950, CSA 950
Emissions	FCC Class A, CISPR A, DoC A, VCCI
Telco	NEBS in process, FCC pt. 68 compliant
Control Engine	
Processor	Intel Pentium
L2 Cache	512 KB Fast SRAM
DRAM	64 MB
FLASH	8 MB
PCMCIA Slots	2
Serial Ports	1 EIA 232-D Console Port
10/100 Base-T/TX	1 Auto-sensing
Software Upgrades	Via Built in Flash RAM, or Remote download
Forwarding Engine	
Processor	Intel Pentium
Memory	8 MB Sync SRAM

Interface Modules

Item	Ports	Connectors	Comments
ATM OC-3c/STM1	1	SC type	8k VCs/Port, SONET APS
ATM DS-3	1	RJ-59 BNC	4k VCs/Port
ATM E3	1	RG-59 BNC	4k VCs/Port
ATM T1	4	RJ-48c	Inverse Muxing, 1k VCs/Port
Packet E3	1	RG-59 BNC	PPP or Cisco HDLC, Frame Relay
ATM E1	4	RJ-48c	Inverse Muxing, 1k VCs/Port
Packet DS-3	1	RJ-59 BNC	PPP or Cisco HDLC, Frame Relay
Packet T1	4	RJ-48c	PPP or Cisco HDLC, Frame Relay
Packet E1	4	RJ-48c	PPP or Cisco HDLC, Frame Relay
10/100 Base-T	1	UTP Cat5 RJ-45	Auto-sensing

Redback NETWORKS

1195 Borregas Avenue, Sunnyvale, CA 94089 USA

Tel: 408.571.5200 Fax: 408.541.0570 info@redback.com; www.redback.com