



Access Point 450

Next-generation IP Services Router

Access Point™ 450 is a next-generation, high performance IP services router optimized for service providers wishing to quickly introduce managed IP services at small to medium-sized branch and regional enterprise customer premises locations. Access Point 450 is purpose-built to deliver IP services with multi-access routing, Quality of Service (QoS) with Class-Based Queuing (CBQ), secure Virtual Private Networks (VPN), firewall security, and policy management. And the service provider has the advantages of easy deployment to multi-sized customer premises locations, and the implementation of flexible management facilities that can be both customer and/or service provider managed.

Users can migrate from basic IP access to more advanced virtual private network (VPN) and Service Level Agreement (SLA) managed IP services with a single, purpose-built IP services platform. The integrated traffic measurement and monitoring capabilities allow service level monitoring, enhanced network planning, and billing support. And as a fully Simple Network Management Protocol (SNMP) managed system, Access Point 450 is easily integrated into existing network management systems and back-office services.

Access Point 450 employs an advanced system architecture that achieves high-speed packet forwarding while applying advanced services at very fine granularity. With data forwarding rates of up to 200 Mbps and 3DES encrypted traffic forwarding rates of up to 80 Mbps, Access Point 450 sets new price and performance standards for mid-range IP Services routers.

Access Point Product Family

The Access Point product family consists of the five AP 300 fixed configurations, AP 450 LS, AP 450 HS, and AP 1000 IP Services routers. Supported WAN interface modules and protocols, routing performance, and applications capabilities differentiate the models' IP services characteristics.

The Access Point 450 LS and HS models are differentiated by the WAN interface modules and protocols supported, as well as their routing

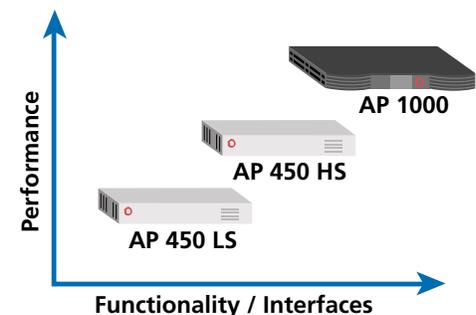


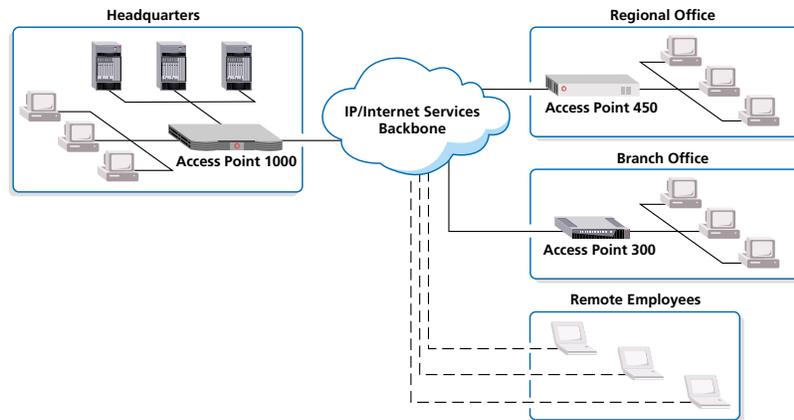
performance and application fit. Both models can be easily deployed at small to medium-sized enterprise regional and branch locations, with AP 450 LS targeted at the smaller facilities. The AP 450 LS supports serial, T1/E1, and ISDN WAN interface modules. The AP 450 HS extends the capabilities of the AP 450 LS interfaces to include HSSI, Frame DS3, and ATM DS3/OC-3 support; plus, DVMRPv3, IS-IS, ATM, and SMDS routing, connectivity, and WAN protocols. The AP450 HS typically provides a 20% performance increase over the AP 450 LS, with added applications functionality such as access aggregation and enhanced routing.

With data forwarding rates of up to 50 Mbps and 3DES encrypted traffic forwarding rates of up to 5 Mbps, the Access Point 300 sets new price and performance standards for small and medium-sized branch office IP services routers.

Service providers can expand capabilities and functionality with the complementary Access Point™ 1000 IP services router which is ideally suited for both customer premises and network edge (point-of-presence/POP) managed IP services. With data forwarding rates of 500 Mbps and 3DES encrypted traffic forwarding rates of up to 155 Mbps, the Access Point 1000 further expands the AP family's price and performance standards for high-end IP services routers.

Access Point Product Family Overview





Features

- Robust IP Routing Services**—Access Point 450 combines high performance, Internet certified and deployed IP routing with a comprehensive suite of world class IP services.
- Advanced IP Quality of Service**—Class-Based Queuing (CBQ) provides the most flexible and scalable ability to assign, monitor and manage bandwidth policies for the users and applications of the network.
- Standards-based VPN Security**—High-performance IPSec tunneling and encryption, L2TP Network Server, and stateful and stateless packet-filtering firewall features are integrated into a single, highly secure VPN services platform.
- Industry Leading Price/Performance**—Access Point 450 supports forwarding rates up to 200 Mbps with encrypted traffic throughput up to 80 Mbps and up to 450 site-to-site or 3000 simultaneously active remote access VPN tunnels.
- LAN/WAN Interface Modularity**—Access Point 450 includes four interface module slots supporting a series of LAN and WAN configurations. Options include 10/100 Ethernet, MSSl, Quad T1/E1, HSSI, Frame DS3, ATM DS3, ATM OC-3, and ISDN BRI (Option cards are model dependent).
- Centralized VPN, QoS, Firewall, and NAT Policy Management**—Access Point QVPN Builder is a centralized policy manager enabling large scale VPN and QoS networks with secure, policy-enabled provisioning of VPN, CBQ, NAT, and firewall rules.
- A Complete Family of Next-Generation IP Services Platforms**—Access Point 450 IP services routers address the small to medium regional and branch office customer premise requirements within the Lucent family of IP Services platforms, which support basic access routing, next-generation IP services routing and switching, plus VPN firewalls.

Broadest Range of IP Applications

With its complete suite of advanced IP services, the Access Point 450 is used by service providers for a broad range of IP applications:

- High speed, enterprise WAN/Internet access with advanced, policy managed bandwidth QoS
- Combined site-to-site and remote access Internet VPNs that require end-to-end security and SLAs
- High quality Internet/IP access services for the individual tenants of multi-tenant properties
- Scalable, secure bandwidth QoS for Web and application hosting environments
- High speed, OC-3 rate IP routing (AP450 HS), from a service provider's access POP to the Internet backbone
- Enhanced remote access services or internet-working between the Internet and existing frame relay networks using high capacity L2TP tunneling

An Integrated IP Services Architecture

The Access Point 450 combines best-of-breed IP services with the price/performance and scale required to meet the needs of next-generation IP services. Users can migrate from basic routing to advanced IP services in a single platform that is easy to deploy and manage. Key features include:

- Robust multi-access IP routing
- Leadership IP QoS with CBQ
- Advanced VPN Security Features
- Rich management services

The Access Point platform features a 200 MHz RISC processor with a fast-memory subsystem designed for high-performance with very low, switch-like latencies. The embedded software is based on an industry standard real-time operating system with a fast classification and transmission

architecture that achieves high-speed packet transmission while applying very granular service level control.

Robust Multi-access IP Routing

The Access Point 450 features robust IP routing that has been certified and deployed by the industry's leading Internet providers. The standards-compliant IP routing solution includes full support for RIP, OSPF, BGP-4, IGMPv2, DVMRPv3, IS-IS, policy forwarding, and static routing.

The BGP-4 implementation is fully interoperable with the most widely installed backbone routers and is critical to providing reliable, multi-homed connections from an enterprise customer premises to a backbone IP network. The ability to operate as a full BGP-4 peer further allows deployment of the Access Point 450 as an edge router connecting a carrier's access POP to the Internet/IP backbone.

For high availability environments, the Access Point 450 supports redundant access from the corporate LAN to a primary or back-up default gateway via support for the IETF-defined VRRP (Virtual Router Redundancy Protocol).

Additional IP features, including IP Load Sharing, Network Address Translation, and Multicast, further enable a broad base of value-added IP services and applications.

Leadership IP QoS with CBQ

The Access Point 450 provides leadership IP QoS based on Class-Based Queuing (CBQ), an open, non-proprietary bandwidth management technology defined by leading members of the Internet community. With CBQ, a network administrator can establish and enforce specific bandwidth policies while gaining the visibility necessary to actively manage cost and QoS. This heightened level of control ensures that the required amount of bandwidth is delivered to the right users when and where they need it.

With CBQ, user traffic is easily classified based on information found in the IP packet header. Bandwidth is then explicitly allocated according to the priorities of the network provider. Bandwidth efficiency is achieved with CBQ's bandwidth borrowing capability, which allows a traffic class to burst above its allocated bandwidth if there is idle bandwidth on the link. Ease-of-use is assured with CBQ AutoClass, which enables the Access Point 450 to automatically create a set of bandwidth policies or profiles that can then be enforced across many applications and users.

In a VPN environment, the Access Point 450 provides bandwidth QoS for the "virtual trunks" connecting secure VPN sites while also allowing customers to policy manage application and user

access to the bandwidth of those secure virtual trunks.

The Access Point 450 further enables end-to-end QoS with its support for IETF-defined differentiated services and Type of Service (ToS) marking. By combining CBQ and DiffServ, a network operator can first prioritize user traffic to meet internal business needs and then map that traffic into the different end-to-end service levels offered by the IP/Internet backbone.

Advanced VPN Security Features

Secure IP Tunneling and Encryption

With its rich security features, performance, and scale, the Access Point 450 is ideally suited to operate as a fully integrated VPN router or a QoS-enabled VPN gateway that co-exists with already installed routers. The system supports secure site-to-site and remote access VPNs with up to 450 site-to-site/3000 remote access IPsec tunnels and 3DES encrypted packet-forwarding rates of up to 80 Mbps.

The Access Point IPsec tunneling and encryption is certified by ICSA, supporting both 56-bit DES and 168-bit 3DES encryption, with HMAC-MD5 and HMAC-SHA1 message authentication. Session keys are managed dynamically with IKE, while user level authentication is supported via local passwords, Remote Authentication Dial-In User Service (RADIUS), SecureID, or via X.509v3 formatted digital certifications.

L2TP Network Server

Access Point 450 also operates as an L2TP Network Server (LNS), terminating remote user L2TP/PPP tunnels at a network service provider POP or a large corporate site. The L2TP Network Server supports up to 1,000 L2TP/PPP tunnels with support for IPCP, PAP/CHAP, MLPPP and optional IPsec security.

Integrated, Stateful Packet Filtering Firewall

Access Point 450 assures high performance access control via its integrated ICSA-certified, stateful and stateless, packet filtering firewall. The firewall provides robust security beyond T3 rates, protecting the corporate LAN/WAN demarcation, while preserving application performance and QoS attributes. Centralized, policy-enabled provisioning of the Access Point 450 firewall eliminates site-by-site configuration complexity, while also reducing the risk of security holes originating from configuration errors.

Rich Management Services

The Access Point offers a number of management services that are fully compatible with the service provider's enterprise customers network environment.

SNMP Management

Full SNMP management support offers complete compatibility with existing SNMP reporting systems within a standards-based enterprise environment running Hewlett-Packard® OpenView™ or Sun® MicroSystems Solstice™. Network administrators can easily generate a variety of useful statistical reports, support user charge-back and perform service monitoring.

Web Management Navigator

The Access Point Web management navigator enables an administrator to easily control the Access Point 450 using a choice of an intuitive Command Line Interface (CLI), an industry standard SNMP manager, or a graphical Web management navigator. The CLI establishes a new standard for ease of configuration management, while the Web interface provides a powerful graphical tool for continuous monitoring and control of Access Point routers.

The Access Point Web management navigator is fully compatible with installed SNMP management and reporting systems. And a flexible split-horizon management allows separate web-accessible management domains to meet the respective needs of network provider and user.

Comprehensive RADIUS Support for Authentication

The Access Point 450 has an on-board RADIUS client that integrates Access Points in RADIUS managed environments. As a result, user management of VPN and dial-in clients is centralized and simplified for user authentication, call accounting, and support of IPSec client configuration data. In addition, the Access Points share the same user records and call accounting features of other RADIUS supported network services.

Centralized VPN, QoS, Firewall and NAT Policy Management

The Access Point QVPN Builder™ is a centralized policy manager allowing policy-based, end-to-end provisioning of site-to-site VPN and QoS networks. Using QVPN Builder, network providers can cost-effectively deploy, manage and scale IP services solutions. Information, such as VPN topology, security profiles, NAT configuration, firewall rules, and QoS policies are translated into detailed site-level configurations. QVPN Builder then automatically distributes the information to each Access Point site, securely via SNMPv3, non-disruptively and within minutes. By automating and centralizing this process, VPN and QoS networks can more easily and quickly scale to hundreds of individual user sites.

Delivering Next-Generation IP Services Platforms

The Access Point IP services routers are part of the Lucent family of next-generation IP services platforms. Lucent offers a full portfolio of IP services solutions with service intelligence that deliver basic access routing, IP services routing, and IP services switching to satisfy a range of managed IP services applications and site configurations. Service providers have tremendous flexibility, functionality, and scalability in deploying managed IP services to the customer premises and network edge. The award winning, Lucent VPN Firewall family of solutions complements these next-generation IP services platforms. And to support design and deployment of managed IP services, customers can choose from a full suite of comprehensive global professional services and customer support, providing full network and application analysis, design, implementation, and technical support.

Hardware Specifications**Dimensions**

17.38" W x 2.62" H x 14" D
(44.1cm x 6.7cm x 35.6cm)

Standard rack mountable

Weight

14.5 lbs (6.6 kg) with two interface modules

Available Slots

Four expansion slots for interface modules and one encryption accelerator module

LAN Interface Module (AP 450 LS and AP 450 HS)

10/100 Base-TX Ethernet (RJ-45)

WAN Interface Modules**AP 450 LS:**

MSSI—up to 8 Mbps (V.35 or X.21)

Quad T1/E1 with integrated

DSU/CSUs (RJ-48C)

ISDN BRI S/T and U interfaces

AP 450 HS:

MSSI—up to 8 Mbps (V.35 or X.21)

HSSI—up to 45 Mbps

Quad T1/E1 with integrated DSU/CSUs (RJ-48C)

ISDN BRI S/T and U interfaces

Frame-based DS3 with integrated DSU (BNC)

ATM DS3 with integrated DSU (BNC)

ATM OC-3/STM-1 Multimode Fiber (SC Duplex)

ATM OC-3/STM-1 Single Mode Fiber—intermediate reach (SC Duplex)

ATM OC-3/STM-1 Single Mode Fiber—long reach (SC Duplex)

Processor

MIPS 5000

Hardware Assisted Encryption (AP450 LS and AP450 HS)

Supports single encryption accelerator module

Memory Configurations**AP 450 LS:**

64MB DRAM, upgradeable to 128MB DRAM, No SRAM supported

AP 450 HS:

128MB DRAM, 4MB SRAM

Management Ports

2 x RS232 Console Port

Power Requirements

AC power input range: 90-240 VAC, auto-selecting, 50/60 Hz nominal

Consumption: 200 Watts maximum

Hardware Specifications (continued)**Environmental Requirements**

Operating temperature: 0°–50° C

Storage temperature: -30°–65° C

Relative humidity: 5-95%
(non-condensing)

Safety Certifications

UL 1950, third edition; CSA C22.2,
No. 950; TUV/EN 60950; AS/NZS
3260 and TS001; IEC 950/CB
Scheme

EMI/EMC

FCC Part 15 class A; ICES-003;
EN 55022:1992 and EN 55082-
1:1992, AS/NZS 3548; VCCI;
CNS 13438

Homologation/Network**Certifications**

US/Canada: FCC Part 68; CS03;
ISDN-ST; ISDN-U; quad T1/E1

Europe: quad T1/E1; CTR-12, CTR13;
MSSI: CTR-1, CTR-2; ISDN-ST BRI
CTR 3

Australia: TS-0016

Management

Command line interface via console,
Telnet or Secure Shell (SSH); Secure
Copy (SCP): embedded browser
interface (HTTP/HTTPS); SNMPv2
and SNMPv3 support with standard
and private MIBs; Split horizon man-
agement for customer and network
provider; Access Point QVPN Builder
for centralized policy management of
QoS, Firewall, VPN, and NAT features

Performance**AP 450 LS:**

IP Forwarding Rate
(non-encrypted): 170 Mbps

IP Packet Throughput
(non-encrypted): 125 Kpps

3DES IP Forwarding Rate: 65 Mbps

IPSec Remote Access Tunnels: 2500

IPSec Site-to-Site Tunnels: 300

L2TP Tunnels: 800

AP 450 HS:

IP Forwarding Rate
(non-encrypted): 200Mbps

IP Packet Throughput
(non-encrypted): 148 Kpps

3DES IP Forwarding Rate: 80Mbps

IPSec Remote Access Tunnels: 3000

IPSec Site-to-Site Tunnels: 450

L2TP Tunnels: 1000

Software Specifications**Routing Protocols Supported****AP 450 LS:**

IP, RIP, RIP-2, OSPF, BGP-4, IGMPv2,
Policy forwarding, Static routing

AP 450 HS:

IP, RIP, RIP-2, OSPF, BGP-4, IGMPv2,
DVMPv3, ISIS, Policy forwarding,
Static routing

VPN Tunneling Protocols**Supported**

ICSA-certified IPsec, L2TP (LNS),
IP-IP, GRE

WAN Protocols Supported**AP 450 LS:**

Frame Relay, PPP, Multilink PPP

AP 450 HS:

Frame Relay, PPP, Multilink PPP,
ATM, SMDS

Firewall

ICSA-certified packet filtering
firewall with stateful and stateless
packet/port control

Network Address Translation (NAT)

- Basic NAT

- Port Translation NAT

- Load Sharing NAT

Denial of Service Protection

Interoperable with third party email
content verification tools

IPSec encryption/authentication

ICSA-certified IPsec ESP with
DES/3DES encryption, MD5/SHA1
authentication, anti-replay protection

Key Management

IKE, PKI, X.509 digital certificates,
Certificate Revocation Lists (CRLs)
via LDAP or HTTP

Quality of Service

Class-based queuing with classifica-
tion and auto-classification by
IP address, protocol, port number,
domain name, TOS byte; DiffServ
classification and marking; band-
width borrowing

VLAN QoS based on 802.1 p/q

Policy Forwarding using source-
based routing

Redundancy

Virtual routing redundancy
protocol (VRRP)

BGP-4 multi-homing
(128MB DRAM required)

User Authentication

PAP, CHAP, RADIUS, SecureID

To learn more, contact
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Representative, Authorized
Reseller, or Sales Agent.
Or, visit our Web site.
www.lucent.com

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