



Lab Testing Summary Report

January 2005
Report number 050131

Product Category:
Large IP-PBXs

Vendor Tested:
Avaya, Inc.

Product Tested:
**S8710 Media Server
and G650 Media
Gateway**



Key findings and conclusions:

- Avaya beat out competitors' IP PBXs from Cisco, Siemens, Alcatel and ShoreTel
- Earned the top IP-PBX rating awarded in Miercom public testing, 90 out of 100 points
- Named "2005 Best-in-Test, Large IP PBXs" by *Business Communications Review (BCR)*
- Accolades for rich SIP support, desktop video, enhancements to security and mobility features

Avaya's high-end IP-PBX system, consisting of the S8710 Media Server running Avaya MultiVantage Communications Applications and G650 Media Gateway, was recently evaluated by Miercom in an open competitive review of large IP PBXs from leading vendors. An early release of the vendor's version 3.0 software was evaluated. The Avaya system emerged the "Best-in-Test" winner from among the participants, which included competitive high-end IP-PBX systems from Cisco, Siemens and others.

The results of this review were published in the January 2005 issue of *Business Communications Review (BCR)*, which sponsored and commissioned the testing. The comprehensive methodology examined the IP PBXs in six categories: Architecture, Endpoints, Management and Administration, Features, Security and Performance. Avaya emerged with the overall highest score, the highest score in half of the criteria categories, and the highest score awarded by Miercom in over five years of testing IP-telephony systems.

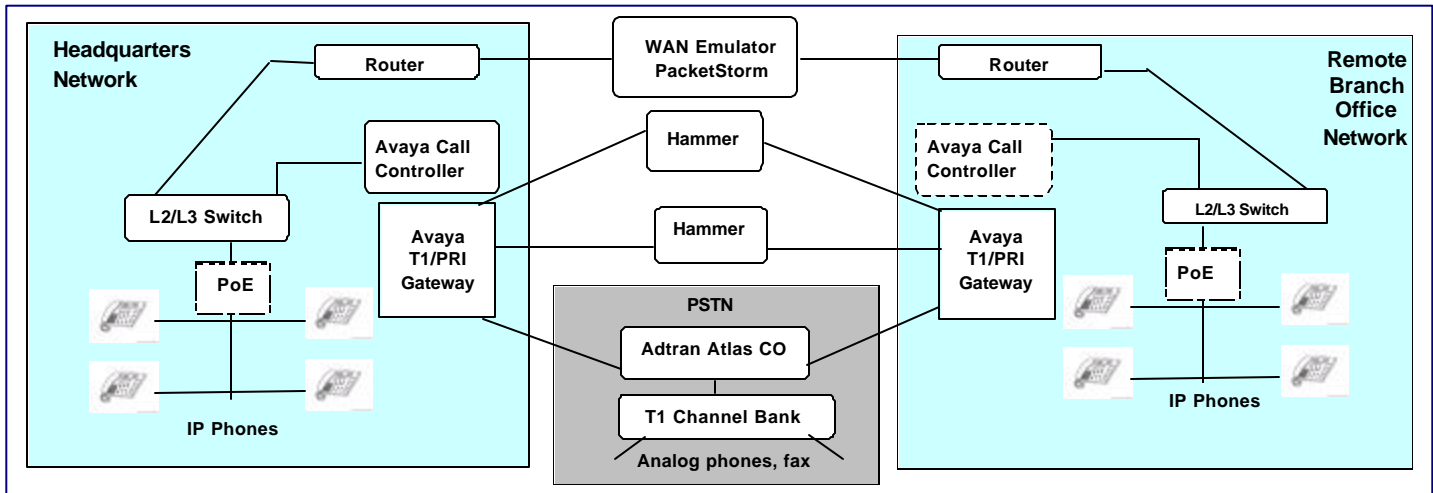
The Avaya package won many accolades from Miercom for its well-presented, intuitive, flexible, and in many cases user-settable, options. The system features nearly a dozen IP-phone endpoints, including several softphone versions and IP speakerphone. Additionally, the Multimedia Client, used in conjunction with Avaya's softphone, offers easy-to-use point-to-point video, along with instant messaging and presence.

Ranking by Category

BCR 2005 Public Review of Large IP PBXs

<u>Architecture</u>	<u>Endpoints</u>	<u>Features</u>
Avaya: 14	Avaya: 20	Avaya: 17½
Cisco: 12	Cisco: 19½	Cisco: 17½
Alcatel: 12	Alcatel: 19	ShoreTel: 17
Siemens: 11	Siemens: 18	Siemens: 16½
ShoreTel: 10½	ShoreTel: 17½	Alcatel: 15

Large IP-PBX Test-bed Environment



About the testing... The “Large IP-PBX” test bed consisted of two “simulated” sites, a company headquarters and a “remote” or branch office, connected by an IP WAN link. At “headquarters” the network infrastructure included Extreme Networks Summit 48 switches and a Cisco 7200 LAN/WAN Router. The same network structure was deployed at the remote site. The two sites were also connected by T1 links through an ADTRAN Atlas 800 central-office-switch simulator. This was used to test failover and re-routing scenarios. Fax support and other analog connectivity were tested via a Carrier Access Corp. Access Bank II channel bank.

Vendors had to provide their own PoE (Power over Ethernet) to power their IP hard phones. A PacketStorm Hurricane 1800E Network Emulator was used to simulate a typical IP LAN, or “campus” environment, as well as an IP-WAN link over the Internet. For the VOIP connection-quality tests the PacketStorm device applied latency, packet loss and jitter to simulate the various test scenario environments. All vendors’ IP softphones were loaded and tested on the same Compaq Presario 2500 laptop, employing a Plantronics DSP-400 USB headset.

Two Empirix Hammer Systems – Hammer FX and Hammer LoadBlaster 500 – generated the call loads for the performance tests. Various monitoring systems were used during the testing to verify network traffic and assess VoIP characteristics. These included Fluke Networks’ Optiview Protocol Expert; Ethereal; and BrixMon application with Brix 100 Verifier from Brix Networks.

The testing also reviewed the latest Avaya management package, which features wizard-like applets to simplify frequently performed management tasks, such as adding a new user. The test team also noted that Avaya’s IP-PBX security has been enhanced with strong endpoint authentication and protection of call information.

New Avaya Features

Several new offerings prompted Avaya’s earning the top score in the Features category of the review. Among them is impressive new desktop multimedia software.

The Multimedia Client offers easy-to-use, desktop point-to-point video conferencing, with the added advantages of Instant Messaging and “presence” propagation, which provides co-workers with users’ real-time availability status. Upcoming releases are expected to include multipoint video conferencing. With the Multimedia Client a user

can access the full array of features in Avaya’s Communication Manager software from their desktop, regardless of the user’s location.

Conferencing and Seamless Mobility

Portable and standards-based converged Web and audio conferencing capabilities are offered via Meeting Exchange, Avaya’s new SIP-based conferencing and collaboration package. A single Meeting Exchange server can host thousands of conference ports.

Of the vendors and systems tested, Avaya alone was offering users seamless local and remote communications through its new “dual mode” 802.11a and GSM wireless phone- dubbed the “Seamless Communications Solution.”.The new Motorola phone delivers an interface akin to Avaya’s desktop phone, and lets the user readily move between local wireless (802.11a) and remote GSM-based cellular environments. This expands the

definition of mobility and raises the bar for competitors' mobility offerings.

Avaya's innovative "Extension to Cellular" feature, built into Avaya Communication Manager, lets a user's traditional phone-system extension –with all of its attendant functionality – be mapped and delivered to an off-premises phone, including cell and home phones. For example, with the press of a button, an active cell-phone call can be transferred to any desk phone, and vice-versa. This enhances true mobility, since callers on the run can transfer and pick-up a call wherever they are. Desk-phone features can be mapped to the cell phone, including additional, idle line appearances.

Then there's Avaya's "Click to Dial" software feature, which lets the user click on and call any phone number appearing in any Web display. There's nothing special needed: The software scours whatever Web page that's being viewed and automatically identifies phone-number strings. Calling a number from a Web page thus becomes simple and fast: No muss, no fuss.

Management and administration

Avaya continues to enhance the management and administration of its IP PBX. The ASA (Avaya Site Administration) interface now offers the administrator an expanded set of time-saving wizard-like applets that are directly invoked and handle such frequently performed tasks as adding new users.

In Miercom's opinion, a separately available "VoIP Monitoring Manager" is a must-have for IP-telephony managers. This software tool effectively monitors and reports in real-time on all IP stations and IP-oriented activities and performance.

Security and peace of mind

All Avaya's phones – including its softphone – now support the latest 128-bit AES (Advanced Encryption Standard) security. Only Avaya, of the vendors tested, offered such complete support for encrypting RTP/VoIP streams. Our testing also confirmed that the quality of Avaya's encrypted calls is as good as non-encrypted calls.

The testers also found tightened security for access to all of Avaya's key nodes. Encryption is now standard with management-access connections.

Avaya, Inc. – Large IP PBX Tested Key Features and Specifications

System evaluated	S8710 Media Server & G650 Media Gateway; Communication Manager v3.0
IP-station, call-load capacity	Up to 12,000 IP stations, any mix of IP hard and softphones; up to 300,000 Busy-Hour Call Attempts (BHCA)
Call-load completion success	100 percent, perfect call-completion performance, validated by tests delivering 50,000 BHCA continuous for 9 hours, including complex voice prompts and DTMF tones
Protocols and standards supported	Native call control is H.323-based with Avaya extensions. A new standalone Converged Communications Server (CCS) provides rich SIP protocol support, lets over a dozen 3 rd party SIP endpoints connect and interoperate
Call control redundancy	Multiple levels of call-control redundancy and fail-over supported, from local hot-standby to off-site, survivable call controllers
Call-control fail-over time	Fastest call-control fail-over time of the systems tested; 6 seconds (local hot-standby, active-passive call control)
Endpoints	Awarded the only perfect Endpoint score (20) for breadth and depth of IP stations and endpoints. Over a dozen IP station endpoints, including several versions of softphone; desktop point-to-point video; SIP-based Meeting Exchange

Performance and Reliability

Avaya was the only vendor tested to achieve 100 percent call-completion success during heavy-load testing. The Avaya system also exhibited exceptional performance in every other aspect tested, including:

- Low latency for IP-endpoint calls
- Multiple levels of call-control survivability
- Immediate fail-over of gateways
- Excellent call quality, even with impairments
- Additional high-availability features

In summary, Miercom has concluded that the Avaya IP PBX's well-crafted and integrated architecture provide a consistent high level of performance to all users, including local desktops, remote teleworkers and mobile workers.

Conclusions

Based on Miercom's thorough workout of this system – and examination of its configuration, operation and features, as described herein - Miercom proudly attests to this system's performance, in particular:

- Avaya beat out competitors' IP-PBXs from Cisco, Siemens, Alcatel, ShoreTel and others, earning the top IP-PBX rating awarded in Miercom's public testing, 90 out of 100 points. The company is deservedly named "2005 Best-in-Test, Large IP-PBXs" by Miercom and Business Communications Review.
- Accolades for rich SIP support, desktop video, enhancements to security and unique mobility features.



Avaya has clearly struck an optimum balance between survivability, reliability, security, features and performance to deliver a package that is well-suited for today's distributed enterprises.



Avaya S8710 Media Server

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About Miercom's Product Testing Services...

With hundreds of its product-comparison analyses published over the years in such leading network trade periodicals as *Business Communications Review* and *Network World*, Miercom's reputation as the leading, independent product test center is unquestioned. Founded in 1988, the company has pioneered the comparative assessment of networking hardware and software, having developed methodologies for testing products from SAN switches to VoIP gateways and IP PBX's. Miercom's private test services include competitive product analyses, as well as individual product evaluations. Products submitted for review are typically evaluated under the "NetWORKS As Advertised™" program, in which networking-related products must undergo a comprehensive, independent assessment of the products' usability and performance. Products that meet the appropriate criteria and performance levels receive the "NetWORKS As Advertised™" award and Miercom's testimonial endorsement.



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