

Miercom

Lab Testing Summary Report

December 2008

Report 081231

Product Category:

**Unified
Communications**

Vendor Tested

AVAYA

Products Tested:

**Avaya Unified
Communications
Solution for
5,000 Users, includes
500 contact center
agents**



Key findings and conclusions:

- Avaya IP deskphones while providing full unified communications features use 30 to 40% less power than the industry average for this product class
- Communications Manager platform and endpoints support seamless remote worker communications
- Preservation of original equipment investment, G650 gateway supports TD and IP telephony
- External audit showed a commitment to environmentally-conscientious manufacturing and reducing environmental impact
- Savings proven scalable for reducing energy consumption and conserving business resources

Avaya Unified Communications Solution, configured for 5,000 users at multiple sites, of which 500 are contact center agents, was evaluated by Miercom for its environmental impact. Miercom observed the system working as a whole and individual components as well.

Avaya Communication Manager 5.1 IP PBX platform, augmented with Avaya Modular Messaging and Avaya Meeting Exchange conferencing provides feature rich functions for efficient communication while reducing costs. Telecommuting, branch office operation and remote system management are enabled, thereby providing a viable alternative to large office complexes and reducing business travel with effective multi-media services.

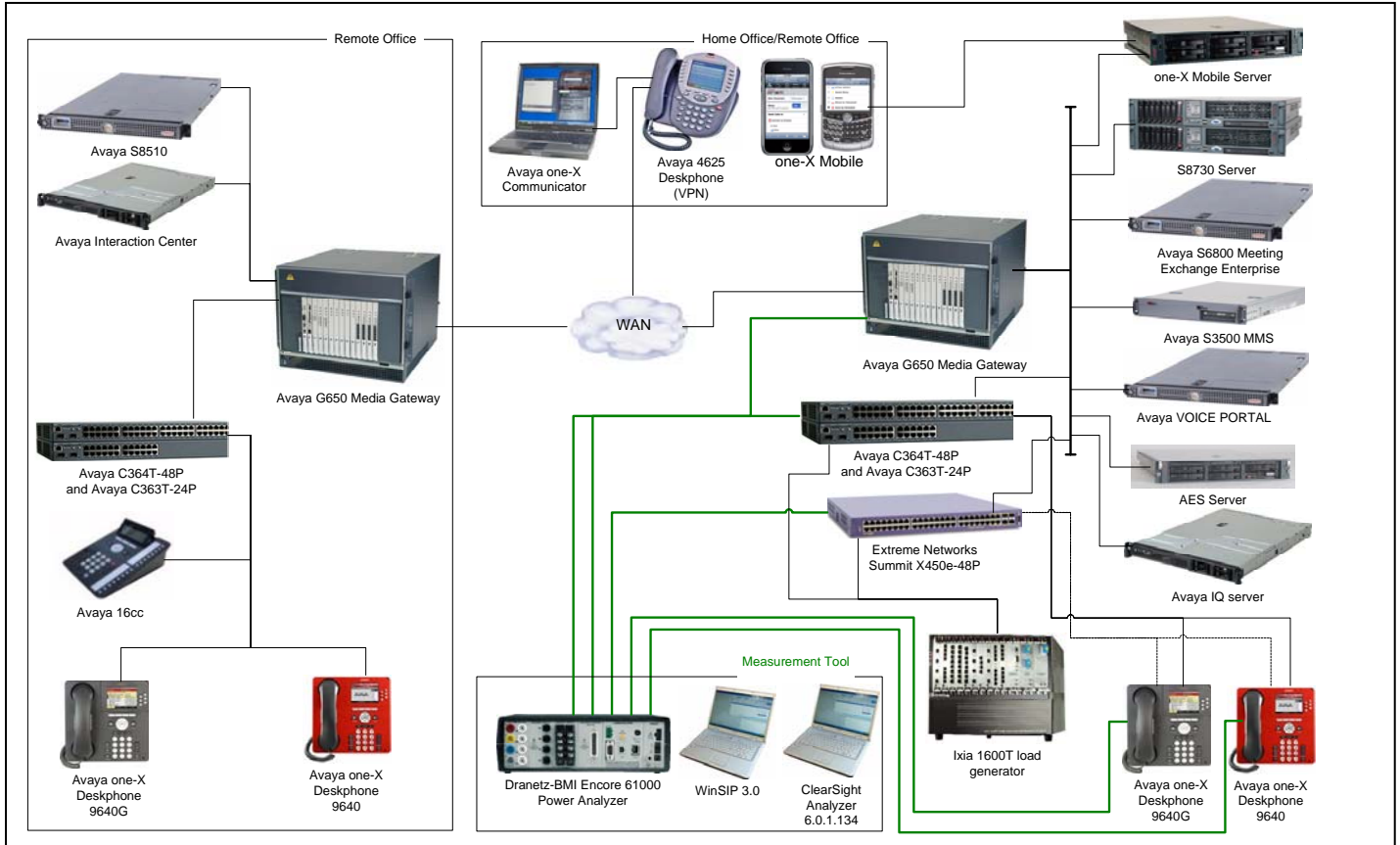
The analysis included verification of the Avaya solution through hands-on testing in a lab environment under moderate load and varying network conditions. Case study site analyses of UC systems deployed in live network environments were also conducted in this audit. The products' power-usages were weighed against their performance to ascertain true energy-to-service ratio.

In substantial size IP PBX environments, endpoint devices have the biggest draw in terms of power consumption. The Avaya IP deskphones proved to be very power-efficient and contributed to the Certified Green rating. The new G650 Media Gateway is impressive, and offers high-quality unified communications, consolidated services, superior interface density and all in a compact energy efficient device.



The Avaya S8730 media servers use a DL385G2-type HP server designed to comply with the energy efficiency initiatives of the Climate Savers Computing Initiative.

Environment Evaluated



How We Did It

The Avaya Unified Communications solution, configured for a 5000-user high resiliency environment, was evaluated for environmental impact by looking at the individual components depicted above as well as the system as a whole. Lab testing of each component was conducted for power consumption under load as well as measurements and audit results compiled using real-site survey assessments.

Measuring Power Consumption: To obtain total voltage, current and power on the entire Avaya solution, we measured power consumption per component with a tool from Dranetz-BMI (Encore Series) www.dranetz-bmi.com while the product was heavily loaded with call volume and other services enabled for unified communications. Power consumption readings on the endpoints, switch, gateway and server were measured while stressing the different features each component offered.

Endpoint Analysis: On the 9640 and 9640G IP Phones, we took measurements during registration, call generation, speaker/handset usage, while utilizing both Power over Ethernet (PoE) and an external power adapter, at idle and in "power save" mode. The solution also included 40 analog phones that received operating power from the gateway.

PoE Switch Analysis: On the C363T-PWR, C364T-PWR and Extreme Summit X-450e-48p switches, we obtained measurements in idle state, as well as with multiple PoE endpoints connected. We also used a traffic generator from Ixia (Ixia 1600T) www.ixiacom.com to obtain a full environmental reading spectrum with a mix of traffic on each port at different processor utilization rates.

Voice Gateway Analysis: With custom load-generation equipment, different call loads were placed to the gateway server to obtain the measurements on idle state as well as with different percentages of CPU utilization.

Environmental Analysis: Miercom's environmental review of the Avaya solution also entailed an examination of the Avaya company-wide and product-specific environmental impact reduction efforts. We conducted onsite visits to three locations and interviews with Avaya personnel focusing on environment-related features of the equipment and applications. Our analysis included comparisons to the industry average for competitive products we have tested.

Product Efficiency

The Avaya 9640 and 9640G IP phones tested include efficiency-enhancing innovations that bring business communications enabling features with reduced energy consumption.

The 9600-series endpoints are Avaya's top-of-the line IP deskphones. They come with customizable interfaces, high-resolution color displays, one-touch softkeys and wideband audio reproduction. The endpoints can be expanded by adding up to three 24-button modules.

Avaya 9640/9640G phones include an innovative power-saver mode that extends the life of the color display and reduces power when not in use.

Even with all these features, the 9600-series devices are classified as IEEE PoE (Power-over-Ethernet) Class 2 as devices. Many IP phones offered in the marketplace are PoE Class 3 requiring 7 watts.

During tests it was determined the Avaya 9640 has an average power consumption of 4.35 watts while the industry average for similar 10/100 phones is 7.61 watts. The Avaya 9640G drew an average of 4.51 watts, also less than the industry average, 6.6 watts for gigabit-capable phones. Both Avaya units are well below the IEEE Class 2 device maximum power figure of 6.49 watts.

Testing of the phones included monitoring the power used when various features are enabled, such as using a speaker phone to place a call. The tests showed only a small variation, 0.4 watts, between full feature use and idle (see chart on page four).

As shown below, a system with 4,000 Avaya 9640 phones operating at their maximum, uses 20,233 fewer watts than a similar system equipped with phones drawing the industry average. With minimum usage energy savings of 7,852 watts are also realized with 9640G IP phones as shown in the first column in the chart below.

A new energy reducing feature is power saver mode. After two minutes of inactivity, the Avaya phone will automatically revert to a power save mode. With the .2 watt decrease applied throughout the IP phone system, a savings of 800 watts can also be achieved with little or no effort, see chart on page four.

The configuration tested used two Avaya S8730 media servers running Avaya Communication Manager 5.1, the core IP PBX platform. It also included two Avaya G650 media gateways, one for each of the two sites displayed.

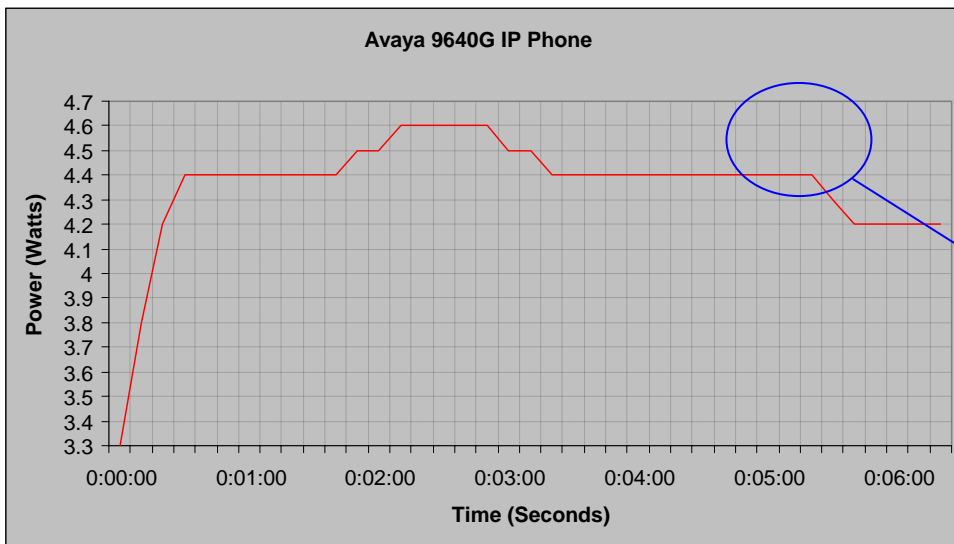
The solution provides a high degree of reliability and survivability. This was accomplished by the use of dual power supplies and dual hard-drives in the twin Avaya S8730 media servers.

Besides the 4,000 Avaya 9640 and 9640G IP deskphones an additional 500 analog units were deployed. To reach the 5,000 users 500 Avaya 16CC Agent Deskphones were included as part of the configuration. Miercom confirmed the Agent deskphones are IEEE Class 2 devices and use less power than the Class 3 phones used in other vendors' call-centers.

Power Consumption for 4,000 P Deskphones			
Phone type:	Watts		
	Minimum	Maximum	Average
Avaya 9640 10/100	16,800	18,000	17,400
Industry Average 10/100 IP phones	22,627	38,233	30,430
Avaya 9640G 10/100/1000	17,680	18,400	18,040
Industry Average 10/100/1000 IP phones	25,532	26,992	26,268

Avaya 9640 IP Phones use 43% less energy than the average of other IP phones tested in Miercom's Unified Communications Industry Study.

Avaya 9640G IP phones use 42% less energy than the industry average



The energy consumption of the Avaya 9640G IP phone fluctuated only 0.4 watts during the testing of each of the phone's features.

The 9640G IP phone's power save mode provides energy savings of 0.2 watts equating to a solution-wide reduction of 800 watts in our testing of 4,000 IP phones.

Time	Phone Activity	Watts	
		Phone	Phone & Switch
01:40	Call generated	4.5	72.7
02:20	Call on speaker	4.6	72.8
03:30	Call terminated	4.4	72.6
05:40	Power Save Mode	4.2	72.4

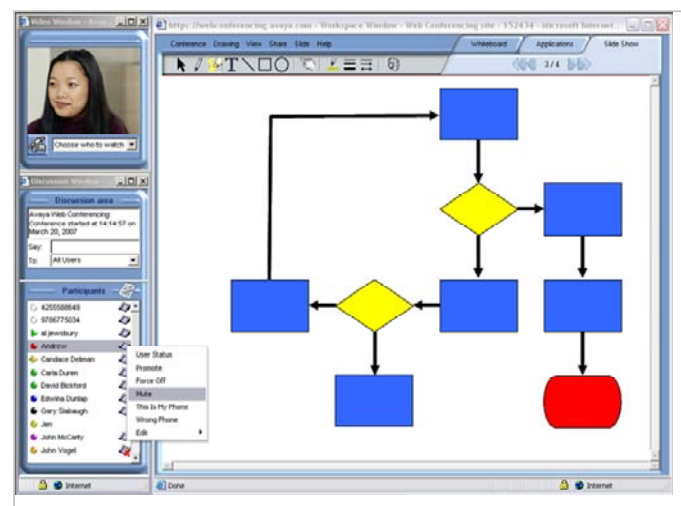
The Avaya S8730 can support up to 36,000 stations with 16,000 used for IP endpoints such as the Avaya 9600-series units. Scalability of that level allows expansion without purchasing additional media servers.

The tested solution included Avaya Modular Messaging and Avaya Meeting Exchange Server Edition. These products, combined with the unified communication capabilities of Communication Manager 5.1 and the Avaya 9600-series IP deskphones, bring employee communication flexibility.

Avaya Meeting Exchange provides a credible alternative to face-to-face conferencing. Open standards based, Avaya Meeting Exchange is a secure audio, video and web conferencing package that offers a wide range of features for scheduling, launching and managing conferences. A secure and reliable solution with hot swappable components that supports redundant deployment, it has been designed to interoperate with voice platforms from many vendors.

Features include identification of speakers and conference joiners, click to call functionality, colleague presence information and optionally

bringing them into an existing conference with ease. The product scales to your needs, starting with audio conferences of up to 3,200 participants on one server. Scales audio, video and web across servers and sites to support the conferencing needs of dispersed workforce segments without requiring travel.



Avaya Meeting Exchange Server Edition window includes presence indicators, video feed and shared presentation. The product enables remote collaboration while reducing the need to travel.

Avaya Modular Messaging is an IP-enabled, standards based voice and fax messaging platform that includes call answering, voice messaging and speech capabilities. It is designed to integrate with legacy Avaya Octel and Intuity systems without requiring changes to those voice and data infrastructures and it supports integrations with PBX products from at least 10 vendors.

Because Avaya Modular Messaging allows users to access messages any time, anywhere via a telephone using simple and intuitive speech commands, it can increase worker and company efficiency. Messages can be accessed with phones, fax machines or computers.

Also available is Avaya one-X Speech, a product that bolsters remote productivity by enabling the use of simple voice commands to access unified communication functions. During testing, this feature worked rapidly and accurately, proving to be a worthwhile time-saver.

Found to work as designed was Avaya Speech-to-Text, an adjunct product via Avaya's relationship with Mutare/Spinvox, which comes as an option with Avaya Modular Messaging. Our testers' voicemail messages were accurately converted to text by the program, a feature that can make checking voicemail a lot faster, especially when callers leave phone numbers or other information that ideally should be in writing.

Avaya demonstrated how Avaya Modular Messaging can also help reduce the number of servers in an enterprise. This can be accomplished because the product consolidates message storage. Voice, email and faxes can be stored on one platform, be it the Avaya Message Storage Server, Microsoft Exchange or IBM Lotus Domino. This consolidation of systems can reduce capital expenses, simplify administration and boost reliability.

Server consolidation not only affords the benefit of reduced CPU power consumption with fewer servers, but cooling considerations in the data center such as air handlers, room size and power are decreased with smaller footprint.

Green Innovation

Avaya continuously improves the efficiency of its IP phones. Miercom verified in testing that the power consumption for the Avaya 9640 and Avaya 9640G is more than three watts less than the previous Avaya 4625 IP phone even after adding colored higher resolution displays and Gigabit Ethernet interfaces.

First launched in 2002, the Avaya 4620 used 7.7 watts. The very next year, improvements to the 4620 cut power consumption to 5.9 watts. Another revision, a year later, once again reduced the phone's energy to 4.6 watts.

The company's current IP endpoints are 40 percent more efficient than they were six years ago despite having added more features, such as better displays and audio quality. Additionally Avaya conferencing bridges have seen their power consumption reduced by 86 percent due to the use of newer technology.

Other innovation demonstrated by Avaya included replacing previous hardware-based solutions such as their conferencing product in favor of an all-software design solution that can be more efficiently deployed.

Avaya also leverages the energy efficiency innovations achieved through component providers such as Intel Corporation that provide the processors for the S8300C. Intel continually develops chipsets with improved efficiency of processing power relative to power consumption.

Avaya GigE phones were integrated with Extreme Networks or HP ProCurve intelligent switching solutions. Elaborate and effective scheduling of POE provisioning was proven possible.

By combining Avaya Unified Communications with the advanced power management options in these switches, a reduction in end point power consumption can be realized. An office with 200 employees working Monday thru Friday 9 to 5 had the desk phones powered on 24X7 even though not in use. By classifying the 200 desk phones as non-essential and using the management utilities

which are standard SNMP V3 based, a 75% reduction in end point power consumption was achieved. These phones can be automatically powered down on Friday at 5:00 PM and re-activated with an external motion sensor, other activity or automatically on Monday morning.

Affiliations and Certifications

As of July 2006, Avaya ensured that its products sold in Europe, the Middle East and Africa must comply with the RoHS European Union directive regarding the Restriction of certain Hazardous Substances (RoHS).

Manufacturing Process

Our audit confirmed that Avaya designs products with environmental impact minimization and efficiency in mind. Avaya has a commitment to continue supporting the principles of Energy Star requirements for North American Market and the German Blue eco-label for the European Market.

Avaya maintains a lengthy list of chemicals and substances not allowed in the manufacture of its products. These prohibited substances are banned from all Avaya product manufacturing and packaging worldwide.

Avaya's Business Processes

Avaya is in the process of removing paper and CD/DVD documentation. The company is replacing, with a single sheet of paper, the CD/DVD and paper copies of manuals. The document informs users where they can get product guides on Avaya's Web site.

Technology becomes outdated quickly, leaving an incredible amount of equipment – much of it containing potentially hazardous substances – facing improper disposal. The company's "Authentic Avaya" initiative in North America provides consumers the ability to sell back or trade in legacy products such as Definity PBX wares. Avaya also takes part in the EU's Waste Electrical and Electronic Equipment (WEEE) initiative, which minimizes the amount of this type of waste that ends up in a landfill.

Not only does Avaya buy back older equipment, but the components are salvaged and sold as warranty-covered spares or replacement parts.

Any unusable components are disposed of in a responsible manner with a priority to reclaim materials through recycling. Avaya accepts old TDM equipment from its competitors and offers a credit toward the purchase of a new, more efficient Avaya IP PBX solution. The company also conducts audits and other reviews of its suppliers to ensure they are aligned with Avaya's environmental goals.

Companies that pass these tests get placed on Avaya's Approved Vendors List. However, providers continue to face annual audits, which we verified with one of Avaya's suppliers. Many of the Avaya products enable and enhance the inherently green practice of telecommuting. In 2008 13% of the Avaya workforce were virtual office workers, and specific groups in North America reached 50% as virtual office workers.

Avaya is developing a PC Refresh Lifecycle Model in which it will replace legacy computers at its facilities with only those that are Energy Star rated. The company is also consolidating its datacenters to save energy and space.

As part of IT consolidation and streamlining through 2010, Avaya plans to decommission 100 internally utilized software applications with their relevant servers and related equipment. This disposal must be done in an environmentally compliant fashion.

Customer Business Enablement

Many of the Avaya products enable and enhance the green practice of telecommuting. Avaya has applied this concept to worker roles where telecommuting is a natural way to conduct business.

The results of a 2008 cross-functional and world-wide Avaya internal survey demonstrate that 26% refer to their homes as their primary work location, 46% work at home one day a week, and 75% worked from home occasionally. Global sales and channel enablement replies indicated 71% and 73% respectively, worked from home one day per week.

Most companies take advantage of online Avaya courses to train employees. 92% of Avaya's VoIP training and 86% of modular messaging courses are available online, reducing travel time formerly spent by workers needing training.

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Miercom Certified Green

The energy-saving attributes of the Avaya Unified Communications solution for a 5,000 user environment were evaluated by in accordance with the Certified Green Testing Methodology. The products in this single-site deployment scenario achieved sufficient scores in each of the rated criteria to achieve the Miercom Certified Green award.

Based on our hands-on testing and the verified representations made by Avaya, Miercom confirmed that the Avaya solution is designed to provide enterprise customers an effective and environmentally sound communications solution.



Avaya 9640 Deskphone



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About Miercom's Product Testing Services

Miercom is a leading, independent product test center with hundreds of its product-comparison analyses published over the years in leading network trade periodicals. Our reports regularly appear in Internet Telephony, Network World, Business Communications Review - NoJitter, Communications News, xchange and other publications.

The company, founded in 1988, has pioneered the assessment of networking hardware and software. We employ our own proprietary methodologies for testing products from enterprise class VoIP gateways and IP PBX's to carrier grade switching equipment. Miercom's private test services include competitive product analyses as well as individual product evaluations.

Miercom features comprehensive certification and test programs including [Certified Reliable](#), [Certified Secure](#) and [Certified Green](#). Products may also be evaluated under the [NetWORKS As Advertised](#) program, in which networking-related products must pass a comprehensive, independent assessment of their usability and performance as compared to advertised specifications.

