



## Lab Testing Summary Report

December 2008

Report 081221A

Product Category:

### Unified Communications

Vendor Tested



Product Tested:

Avaya Unified  
Communications  
Solution for 2,000  
Users



### 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
- Avaya Modular Messaging consolidates storage of voice, email and fax messages on one platform
- G650 Gateway supports TDM and IP-telephony, preserving original equipment investments
- Modular Messaging is scalable and integrates into existing messaging systems
- External audit showed a commitment to environmentally-conscious manufacturing and reducing environmental impact

**A**vaya Unified Communications Solution, configured for 2,000 users at multiple sites, was evaluated for its energy efficiency and environmental impact. Miercom observed the individual UC components as well as the system as a whole.

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.

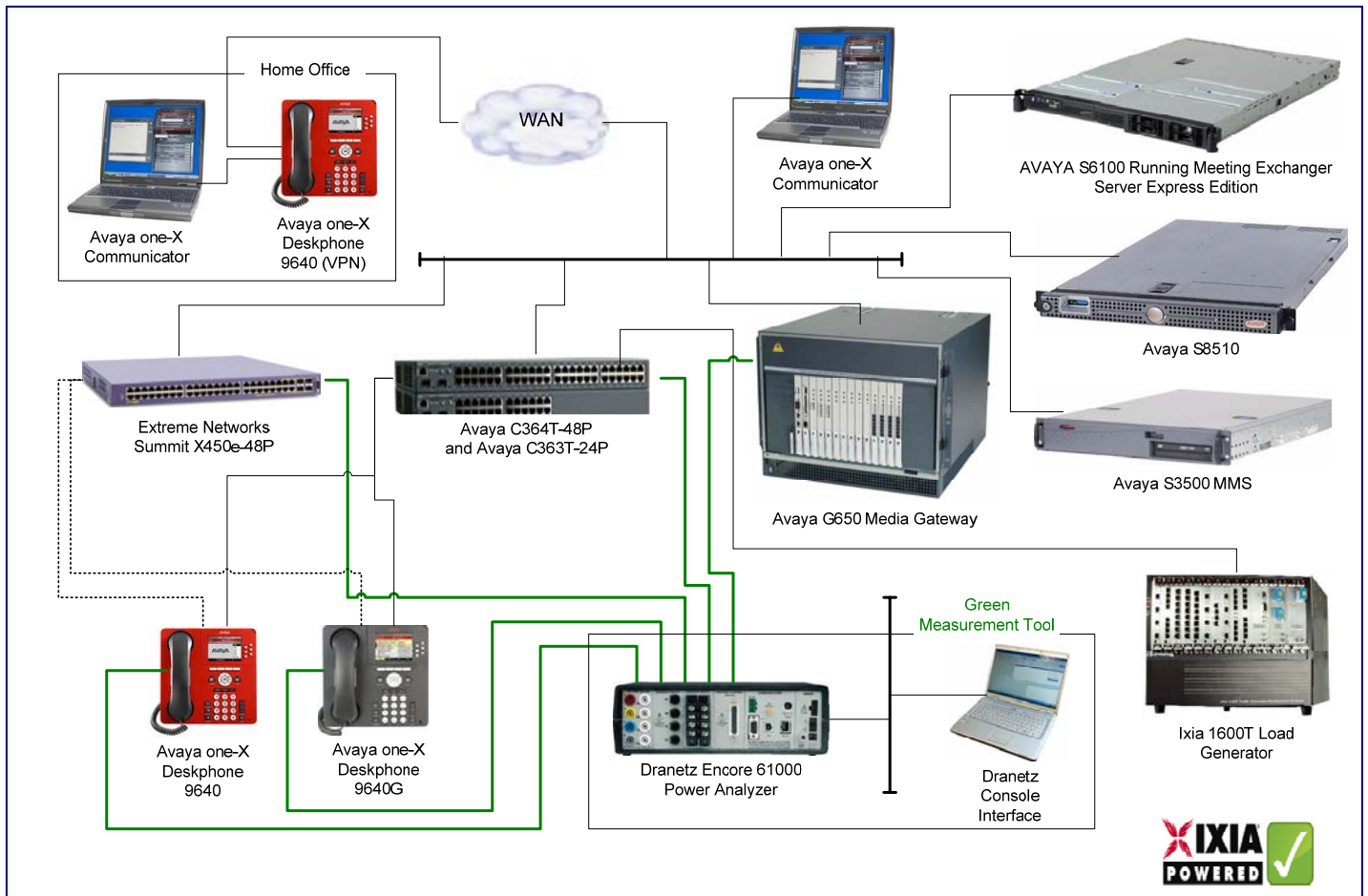
The analysis included verification of the Avaya solution through hands-on testing in a lab environment under moderate load and varying network conditions. Case study site analyses of UC systems deployed in live network environments were also conducted in this audit. The products' power-usages were weighed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

In substantial size IP PBX environments, our industry assessment revealed endpoint devices have the biggest impact 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 impressed us by offering high-quality unified communications, consolidated services, superior interface density and all in a compact energy efficient device.



*The Avaya S8510 server supports RAID Level-1, with dual hard disk drives for redundancy and can be configured as a Local Survivable Processor (LSP)*

## Test Bed Diagram



## How We Did It

The Avaya Unified Communications solution, configured for a 2000-user normal 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](http://www.dranetz-bmi.com). 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, measurements were taken during registration, call generation, speaker/handset usage, while utilizing both Power over Ethernet (PoE) and a 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](http://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, we placed different call loads on the gateway server to obtain the measurements in 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 also tested.

## Product Efficiency

The Avaya 9640 and 9640G IP Phones include efficiency-enhancing innovations in the product design that bring business communications enabling features while reducing energy consumption.

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

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

Even with all the useful features, the 9600-series devices are listed by the Institute of Electrical and Electronic Engineers (IEEE) as being power-over-Ethernet (PoE) Class 2 devices. Many IP phones offered in the marketplace are of the more power-hungry PoE Class 3.

Miercom testing found the Avaya 9640 to have an average power consumption of 4.35 watts while the industry average tested for similar 10/100 phones is 7.61 watts. The Avaya 9640G consumed an average of 4.51 watts, less than the industry average for gigabit-capable phones of about 6.6 watts. Both Avaya units are well

below the IEEE Class 2 device maximum power figure of 6.49 watts.

Miercom engineers noted that there are other IP phones on the market with some special features and functions not found in Avaya endpoints, such as touch screens. Consumers should conduct a feature comparison and needs analysis to determine if the PoE Class 3-rated units they are considering include the desired features and, if so, whether those features are worth the additional extra cost and power consumption.

Our testing of the phones included monitoring the effect on power use of various features, such as turning on the speaker and placing a call. The test showed only a small variation, about a half-watt, between full feature use and idle (See chart on Page 4).

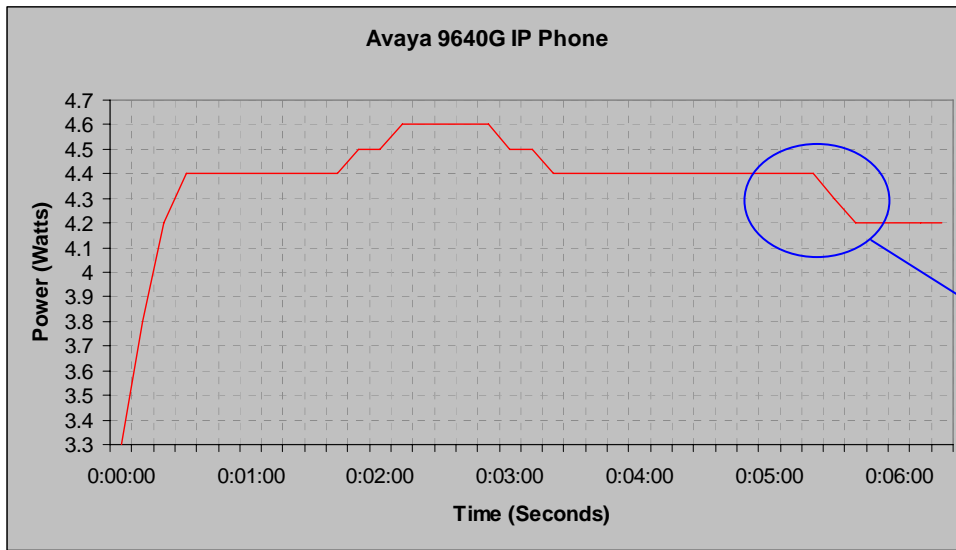
Minor wattage variations between competing phones might not seem of concern. However, even in a relatively small deployment such as the one tested here, the cumulative effect of multiple endpoints can add up.

As shown below, a system with 1,800 Avaya 9640 phones averages 5,863 fewer watts usage than the industry average for a comparably sized system. The 9640G meanwhile saved 3,703 watts compared to the industry average. This equates to a 43% and 32% reduction in energy consumption.

Power Consumption for 1,800 IP Deskphones			
	Watts		
Phone type:	Minimum	Maximum	Average
Avaya 9640 10/100	7,560	8,100	7,830
Industry Average 10/100 IP phones	10,182	17,205	13,693
Avaya 9640G 10/100/1000	7,956	8,280	8,118
Industry Average 10/100/1000 IP phones	11,408	16,646	11,821

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

Avaya 9640G IP phones are **32% more efficient** than the industry average



The energy consumption of the Avaya 9640G IP phone fluctuated less than 0.5 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 360 watts in our testing of 1,800 IP phones.

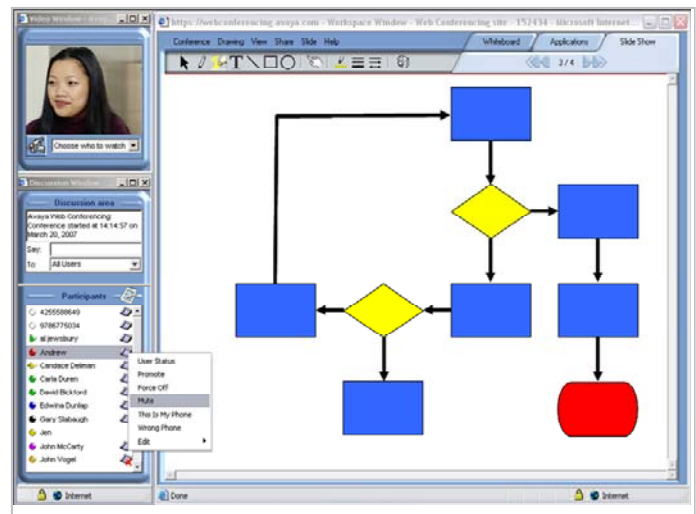
Time	Phone Activity	Watts	
		Phone	Phone & Switch
01:40	Call generated	4.5	72.7
02:20	Call on speaker	4.6	72.8
03:30	Call terminated	4.4	72.6
05:40	Power Save Mode	4.2	72.4

The Avaya G650 Gateway employed in the tested solution reflects Avaya's continual evolution of its telephony products. The cards and power supplies are hot swappable; the gateway does not need to be powered down when a card or power supply requires replacement or upgrade.

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 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 availability and optionally bringing them into an existing conference with ease. The product can handle conferences of up to 3,200 participants, meaning it is powerful enough to enable large, dispersed segments of a company workforce to meet without having to leave their work locations.



Avaya Meeting Exchange Server Edition window includes presence indicators, video feed and shared presentation. The product enables remote collaboration and increases productivity 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, 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.

## Miercom Certified Green

The energy-saving attributes of the Avaya Unified Communications solution for a 2000 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

# AVAYA

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