



# ISS Technology Update

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## BladeSystem enclosure amperage now in Onboard Administrator v2.30

IT administrators have been able to track the power use per server through Insight Power Manager. But before the release of Onboard Administrator v2.30, the only way to determine the power use for an enclosure was to calculate it as follows:

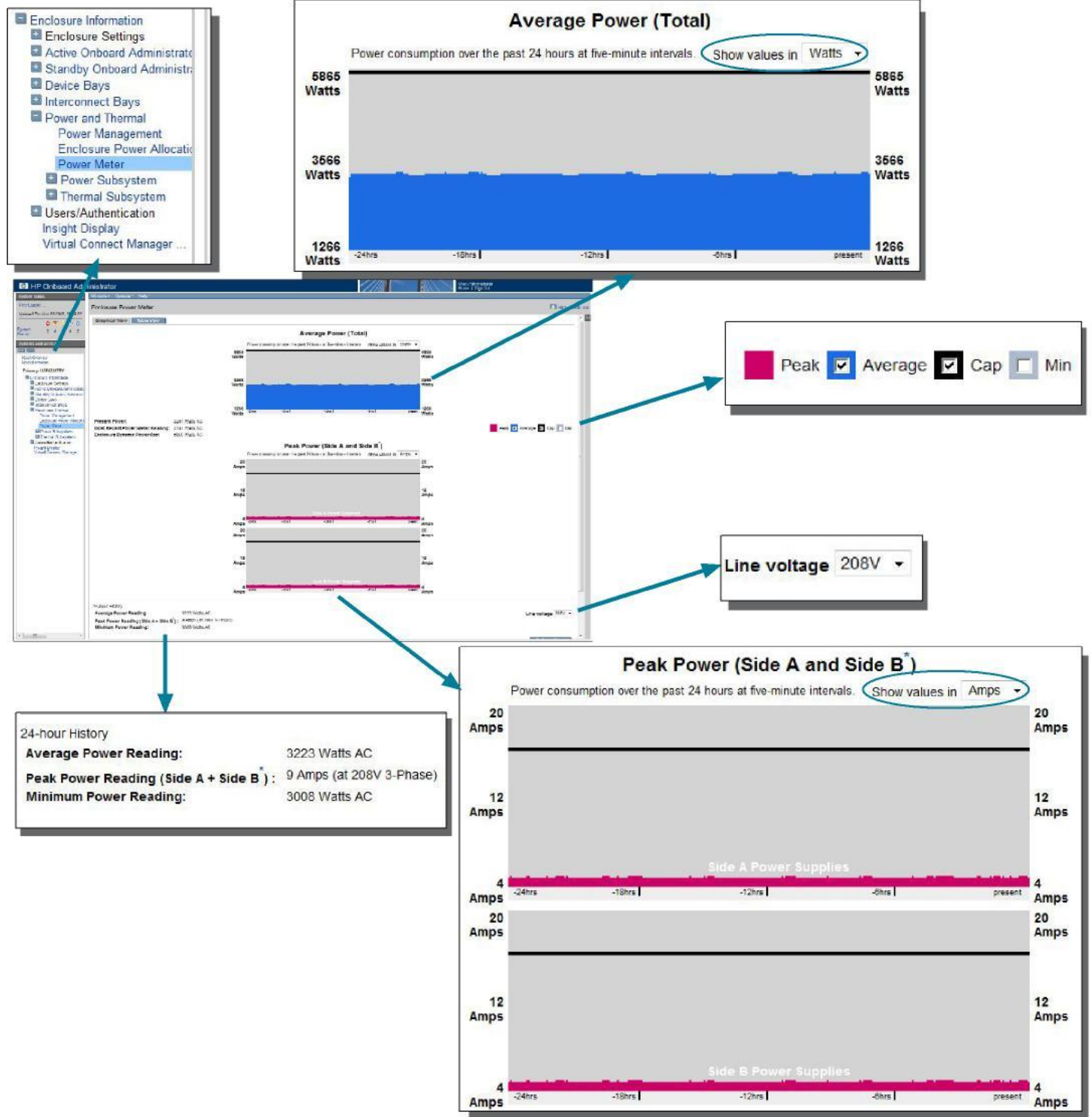
Single phase - Amps = watts/voltage

3-phase - Amps = watts/(voltage\* 1.74), where 1.74 is the 3-phase power factor

Now, through Power Meter in OA v2.30 (see Figure 1-1), users can track an enclosure’s average power use on the upper graph and choose to display the power cap and/or the minimum power by using the legend. The pull-down menu above the graph allows users to view the graph in Watts, BTU/hr, or Amps. The lower two graphs show peak power for both sides of the enclosure—defaulting to Amps—but changeable to BTU/hr or Watts.

OA does not have a voltage sensor. Therefore, the pull-down menu in the lower right corner allows users to change the voltage applied in calculating the Amps. The lower left corner displays 24-hour average, peak, and minimum power readings.

Figure 1-1. Power Meter in Onboard Administrator v2.30 allows users to track power use for the entire enclosure.



## Quick tip: Configuring a redundant domain controller when using Microsoft Active Directory and iLO or iLO 2

Server administrators using Microsoft Active Directory (AD) can integrate it with Integrated Lights-Out devices to maintain iLO user accounts. Integrating with a directory services application such as Active Directory allows administrators to use the Lightweight Directory Access Protocol (LDAP) directory to authenticate and authorize user privileges to multiple iLO devices.

The technology brief titled “Integrating HP ProLiant Lights-Out processors with Microsoft® Active Directory,” available at <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00190541/c00190541.pdf>, describes the integration steps. The document includes a statement about iLO being able to use a backup domain controller if the primary domain controller is unavailable.

In a Microsoft Active Directory configuration, there is no need to configure the actual iLO device to allow a backup domain controller. The Microsoft DNS server will automatically update the Domain Name System (DNS) name to reflect domain controller availability. Administrators should configure iLO to reference the DNS name of the domain, not the specific IP address of the domain controller. If the primary DC is unavailable, the DNS lookup of the domain will not return that server's IP, so that iLO can connect to the next available domain controller.

Alternatively, in the iLO configuration, administrators can use a comma or a semicolon between the IP addresses for iLO to try when contacting the AD (see Figure 2-1).

**Figure 2-1.** Multiple directory server addresses in iLO configuration

The screenshot displays the HP iLO 2 Administration console interface. The top navigation bar includes tabs for System Status, Remote Console, Virtual Media, Power Management, and Administration. The main content area is titled "Directory Settings" and contains several sub-sections: SSH Key, SSL Certificate, Two-Factor Authentication, Directory, Encryption, HP SIM SSO, and Remote Console. The "Directory" sub-section is active, showing "Authentication and Directory Server Settings".

Key configuration options visible include:

- Disable Directory Authentication:**
- Use HP Extended Schema:**
- Use Directory Default Schema:**
- Local User Accounts:**  Enabled  Disabled
- Directory Server Address:**
- Directory Server LDAP Port:**
- LOM Object Distinguished Name:**
- LOM Object Password:**
- LOM Object Password Confirm:**
- Directory User Context 1:**
- Directory User Context 2:**
- Directory User Context 3:**

## Additional resources

For additional information on the topics discussed in this article, visit:

Resource	URL
HP Integrated Lights-Out	<a href="http://www.hp.com/go/ilo">www.hp.com/go/ilo</a>
"Integrating HP ProLiant Lights-Out processors with Microsoft® Active Directory" Integration Note	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00190541/c00190541.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00190541/c00190541.pdf</a>
Microsoft TechNet online publication, "Understanding Domains and Forests", from Windows Server 2003 Product Help	<a href="http://technet.microsoft.com/en-us/library/cc780307.aspx">http://technet.microsoft.com/en-us/library/cc780307.aspx</a>

## Meet the Expert— David Koenen

David Koenen is a Master Engineer in HP Industry Standard Servers (ISS). His responsibilities include specifying I/O Virtualization features for NICs, Converge Network Adapters for FCoE, network performance consulting, and editor of the Energy Efficient Ethernet for Backplane PHYs on the IEEE 802.3az Task Force. Wayne Opland, David's manager, says "David is our networking scout. He is an engineer who understands current technology, what's coming, and how our customers use networking. He has been recognized by his peers in the industry by making him the editor for the Energy Efficient Ethernet standard." Wayne marvels at David's "ability to grasp complexity."

David has been married for 16 years to Lynda, and they have three children: Tamara (11), Geoffrey (9), and Andrew (7). He enjoys jogging, coaching youth sports, camping, boating, water skiing, snow skiing, snow-boarding, woodworking, and scrapbooks.

Below are excerpts from an interview with David (and Wayne).

### Why did you decide to become an engineer?

David: I was greatly inspired by my father who was a machinist, draftsman, an airline electrician (avionics), and an amateur carpenter. I watched and learned as he fixed things around the house, but most of all, he taught me about the development process—design on paper, make a list of materials, and build to the plan. He also showed me around the cockpits of commercial airliners and told me that the engineers who designed and built them "make the big bucks." I was also inspired by a tour of Kennedy Space Center in Florida during one of our vacations, so in my senior year in high school (1978) I took a really cool course in Digital Electronics. When I went to college, I chose the Aerospace Engineering program, but the odds of becoming an astronaut (50,000 applicants to 12 positions) were not in my favor. So, I took mostly electrical engineering electives. After graduating, I worked on military avionics for a while before coming to Compaq in 1991. Later, with Compaq's tuition reimbursement, I decided to go back and get an advanced degree in Electrical Engineering.



**Name:** David Koenen

**Title:** Master Engineer, ISS Server NIC Technologist

**Years at HP:** 17

**University/Degree:**

- University of Minnesota, Minneapolis, MN: Bachelor of Aerospace Engineering and Mechanics, 1984
- University of Houston, Houston, TX: Masters of Electrical Engineering, 1998

**U.S. Patents:** 9

**What is your most interesting research or invention?**

David: My personal favorite was an invention that required a system level understanding of a problem that spanned multiple disciplines, as well as the creativity to develop a comprehensive solution. During the late 1990s, ISS was developing a 32-processor, cache-coherent, Non-Uniform Memory Architecture (NUMA) server. I realized from looking at multiprocessor CPU traces, OS CPU scheduling, and simulation model results, that the system performance could be improved if the memory for a process/thread was located closest (in access time) to the CPU that was executing the code. But this required two crucial additions to the server and OS. First, it required that the server's CPU, cache, and bus topology and memory latencies of the boot configuration needed to be mapped or described for the OS to use. Secondly, the OS would have to make memory allocation and processes/thread scheduling decisions based on the proximity of memory to the CPU. So, I wrote an invention disclosure on how this should be done (Patent #7,143,412). Due to the HP merger, Compaq-ISS did not build that 32-processor system, but interestingly, IBM filed a patent claim on the first half of my invention covering the CPU-Memory mapping just 1 month prior to Compaq filing my patent. Therefore, the US PTO only granted me a patent claim on the second half, which described how to use those relationships in the OS scheduler and Page Fault manager for CPU-thread execution and memory allocation.

**How much customer input goes into the design of your products?**

Wayne: In the last year, David has made a point of visiting a variety of customer data centers with a goal of understanding how they use networking and the nature of their unresolved problems.

David: Knowledge is power, so I find customer input extremely valuable in the design of products. Engineering groups rely on, and benefit from, customer trip reports and the dissemination of customers' technical problems. I believe that if ISS disburses more of this information to engineering groups, the increased knowledge of customer problems will help power even more HP innovation.

**In your area of expertise, what technologies demonstrate HP leadership?**

David: HP has been concerned about server power consumption, capacity, and energy efficiency for several years. ISS recently introduced Dynamic Power Capping to manage the maximum power consumed by a group of servers in racks and blade chassis. We'll continue to develop more technologies and push for more energy efficient CPUs, memory, disk drives, power supplies and networking components to minimize the operating and infrastructure cost required to power and cool our servers.

## Recently published industry standard server technology papers

Title	URL
Implementing Microsoft <sup>®</sup> Windows <sup>®</sup> Server 2008 Hyper-V <sup>™</sup> on HP ProLiant servers	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01516156/c01516156.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01516156/c01516156.pdf</a>
Server virtualization technologies for x86-based HP BladeSystem and HP ProLiant servers, 3rd edition	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01067846/c01067846.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01067846/c01067846.pdf</a>
10 Gigabit Ethernet technology for industry-standard servers	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01608915/c01608915.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01608915/c01608915.pdf</a>
Implementing Microsoft Windows Server 2008 R2 pre-release build on HP servers	<a href="http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01639594/c01639594.pdf">http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01639594/c01639594.pdf</a>

Industry standard server technical papers can be found at [www.hp.com/servers/technology](http://www.hp.com/servers/technology).

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