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What's Your Idle Energy Effectiveness Ratio?

Okay, that is probably a trick question as so far as I can tell no one has yet codified that metric, or anything remotely like it. Idle Energy Effectiveness relates a component's, device, system, and even a complete data center's Idle Energy Consumption to its Peak Energy Consumption, both in rates of energy/time with time being short. Though power appears to work equally well we already have enough confusing metrics with 'power' in them.

Idle Energy Effectiveness Ratio is well defined by the two logical limits to the ratio: a ratio of 1 would be the worst case scenario where a device has no difference in energy consumption between idle and peak, and the other extreme (arguably a goal for an ideal scenario) would be a ratio of 0 (zero) where the device used no energy at idle. Most likely all of the devices in your data center fall somewhere in between. How close your ICT suite moves towards zero depends a lot upon software robustness and your use of various embedded and aftermarket server power management applications. No doubt emerging DCIM applications will play a vital role in optimizing idle performance characteristics.

Of course you can also get to zero by using the off switch. Something we covered previously but will take on more importance as we examine ICT device idle power.

Since there doesn't appear to be an industry recognized 'standard' for Idle Energy Effectiveness Ratio (IE²R), we are offering the concept to The Green Grid for further development. We envision this metric being applied from the component level all the way up to an entire data center with the 'sweet spot' most likely at a device level, such as a server, storage, or network device and perhaps extending to a system such as a compute cluster or HPC system. At the component and individual device level we envision the EPA and EU CoC developing IE²R targets that, like ENERGY STAR®, reflect best-in-class performance hurdles.

The Idle Energy Effectiveness Ratio is a quick way to identify the standby energy losses of a component, device, or system. Many devices are left on 24x7 with servers and television sets two prime examples. Examining a new ENERGY STAR LCD 42-inch TV we find that one can select from numerous models that have stand-by energy draws below one watt (as low as 0.1 W) and have maximum power draw around 120 watts. This yields an admirably low IE²R of less than .0009 or less than one-tenth of one percent!

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Now let's compare that to a modern server that will be deployed in a data center where it will reside for the next five plus years. It will be powered on 24x7 and, if we go by most recent anecdotal information, will only be used around 10 to 15% of the time not counting the nights and weekends where it will likely be a lonely orphan with nothing to do but the heat the surrounding space. Again, turning to ENERGY STAR for Servers we find a much shorter list of available product with a host of confusing factors to consider; processors, drives, system monitoring, even power supply efficiency and variable fan speed – you think they could make this as easy as selecting a TV, which today is almost equal to a high-end PC in IT performance and network connectivity.

Hold on to your hats! What we find in reviewing the ENERGY STAR Servers list confirms exactly what we have been saying for years – idle servers consume copious amounts of energy often in excess of 75% of the maximum power rating. There is not a single configuration of server that can meet a 25% performance level and forget about matching TVs. We did find a few with idle ratings of under 80 watts and maximum power of 165 watts yielding an IE²R of .485. Compare that to the ENERGY STAR TV's performance and you can see why leaving your servers idle in your data center does very little to reduce your total energy consumption!

If you really want to reduce total energy consumption in your data center you better go back to the basics. Follow the ten actions identified in Energy Logic, including the use of server power management, and you will be light-years ahead of your competition who are idly sending cash down the power lines to their utility.

And now for a few calls to action: 1, if you haven't started to adopt the Energy Logic actions to reduce total energy consumption within your data center – now is the time 2, help The Green Grid (and perhaps the EPA & DOE) define a new metric to report the Idle Energy Effectiveness Ratio of ICT components, devices, systems, and by extension data centers and 3, join the Green Grid to help us drive meaningful tools – like an on-line IE²R calculator – that will help you select those devices that will significantly reduce your stand-by energy loses.

E-mail me with your thoughts on reducing stand-by energy loses. FYI – my computer is physically switched OFF when I leave the office.

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