IBM Systems & Technology Group
March 2007

The facts behind HP's power and cooling claims

IBM BladeCenter vs. HP BladeSystem

On March 5, 2007, HP released a report claiming up to a 27% power and cooling advantage over IBM BladeCenter®. As with all things, it is possible to derive an outcome through carefully planned test parameters and use cases. This test—and the resulting press release—is an example of how far HP is willing to go to bend the truth. HP claims to have tested comparable HP and IBM hardware, but a deeper look at the test report shows that this is not the case. IBM—and more importantly many of our clients—have been testing comparable IBM and HP configurations over the past several quarters, and none have been able to showcase HP as being more efficient than IBM. Let's look at HP's claims and IBM's response.

HP says: HP claims to have a 27% advantage over IBM in power consumption.

IBM says: To achieve a 27% advantage, HP picked a 90mm BladeCenter HS21 with a Memory and I/O Expansion Blade and a Storage and Expansion Blade. This IBM configuration is available to give clients greater flexibility and functionality, however it is not likely that a client would be running both of these expansion blades at once. **Bottom line:**

- This is an unrealistic comparison at best. Over 90% of our clients use a base HS21—or now HS21 XM—configuration without expansion blades. This is similar to comparing a high-performance 2U to a low-cost 1U. By the way, HP didn't mention that the IBM configuration above yields double the number of I/O ports and RAID-5—both of which the HP blade cannot do.
- HP is validating recent IBM testing stating IBM is more power efficient. IBM testing shows the HS21 with the Memory and I/O Expansion Blade and Storage and Expansion Blade as using 40-50% more power than a base HS21. If HP's results are only showing them as having a 27% advantage on this configuration, that validates IBM testing stating IBM is up to 24% more energy efficient than HP.

Of note: HP did test more comparable configurations—IBM HS21 versus HP BL460c. In these tests, run under HP rules, with HP hand-picked conditions and HP-chosen parameters, the best that HP could claim was a tie. Client testing in real-world conditions with real-time applications is the best judge of who has the superior power consumption story. IBM is confident that through smarter design, BladeCenter wins hands down.

HP says: IBM BladeCenter H uses 1.7 to 2.5 times as much airflow.

IBM says: This claim has several major flaws. First, it uses the same unlikely configuration—90mm BladeCenter HS21 with a Memory and I/O Expansion Blade and a Storage and Expansion Blade—that that increases the amount of air per server blade. Second, and more important, is that HP used down-level BladeCenter Advanced Management Module code for this testing.

Inside BladeCenter and BladeCenter H, the Advanced Management Module controls blower speeds as well as the chassis reaction to external events. In doing so, the Advanced Management Module controls the amount of air flow needed by the chassis. The HP-designed tests were run using Advanced Management Module code from almost a year ago. IBM has made substantial changes to the environmental management aspects of the code. These improvements allow the chassis to draw less air when lower-power processors are used and when operated in lower operating temperatures. Less air means less power consumption, which will also lower the per-blade power consumption HP reports. **Bottom line**: If HP had tested BladeCenter with the current code, IBM is confident it would have resulted in clear IBM leadership in power efficiency per blade.

HP says: The HP BladeSystem c-Class has a superior cooling approach over BladeCenter

IBM says: IBM and HP both agree that one aspect of efficiency is air volume required by the server. This affects the cost to cool the server. The other and more important air usage is maintaining safe temperatures for all internal components. IBM testing has shown that even with 80W parts (80W Intel® Xeon® 5160 or 80W Xeon Quad Core) HP's thermal solution fails to maintain DIMM and processor temperature at what the industry considers safe operating conditions. We have measured the DIMMs running at 85C and higher with 80W versions of the newest Intel processors. These higher temperatures will likely lead to lower mean time before failure (MTBF), single-bit memory errors and inevitably more downtime for the c-Class-hosted application. IBM provides adequate airflow to cool the high-density DIMMS for the Xeon roadmap of 65W/80W/120W processors in the blade form factor and we are able to maintain the DIMM thermal profile within reliable operating temperature limits (<85C).

Bottom line: IBM was a leader and innovator in cooling server blades through its Calibrated Vector Cooling™ technology and shared-blower approach. As such, IBM understands how shared cooling works and how it's managed. HP criticized shared cooling throughout the life of the p-Class chassis, but ironically adopted it with their c-Class chassis. We'll see if HP has fallen into a trap that will limit what the c-class chassis is capable of in the very near future. Maybe HP will need to introduce yet another enterprise chassis.

Summary: Power and cooling is extremely important for all clients today. One thing that IBM and HP agree on is that blades provide a more power-efficient solution than standard 1U and 2U servers. However, HP was willing to go to great lengths to create unrealistic test parameters that favored them. Had HP picked blades that more resemble what clients install today, used current-level IBM code and looked at internal part temperatures, the study would have been consistent with IBM testing results that concluded clear IBM leadership.

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Produced in the United States of America
03-07