

Ivy Bridge Based DCO SuperServer® Power & Cost Savings

Case Study

This white paper summarizes the improvements in power and cost between new Supermicro Ivy Bridge based and current Sandy Bridge based Data Center Optimized (DCO) server solutions. The reduction, in watts per node translates to operational expenditure (OPEX) savings in a data center. The initial acquisition cost savings per node results in a data center capital expenditure (CAPEX) savings. Together these two savings, which contributing to total data center TCO savings, are measured for a 10,000 node implementation. The configurations tested for this study are shown in **Table 1** below:

Test Configuration

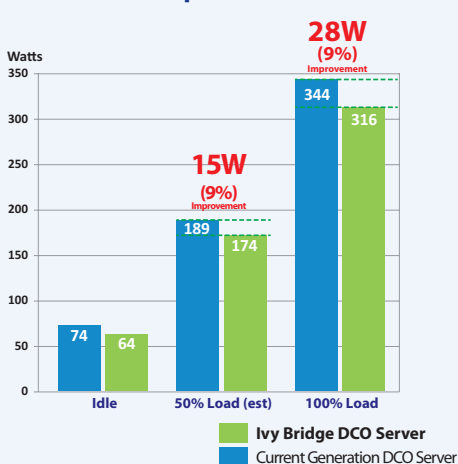
	CPU	Memory	SSD	Benchmarks
New Ivy Bridge Server	Intel® Xeon® E5-2650 v2 (2.6GHz, 8 GT/s QPI, 8-Cores, 95W)	8 Hynix 8GB DDR-1866 2Rx4 ECC Reg., 1.5V	1 Intel® 320 Series 300GB SATA 2.5" 3Gb/s	High-Performance LINPACK (HPL)
Current Generation Server	Intel® Xeon® E5-2670 (2.6GHz, 8 GT/s QPI, 8-Cores, 115W)			

Table 1: Test Configuration (at Room temperature, 21°C)

Results

Power consumption for the new Ivy Bridge and current generation servers were measured using the High Performance Linpack benchmark. The power consumptions for these two generations of servers were measured and compared. The result is that the new Ivy Bridge server saves 15W per node at 50% load and 28W per node at 100% load over the current generation server, while the performance is improved by 8%.

Power Consumption Per Node



Performance per Node

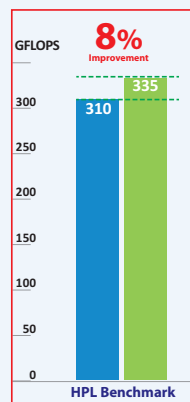
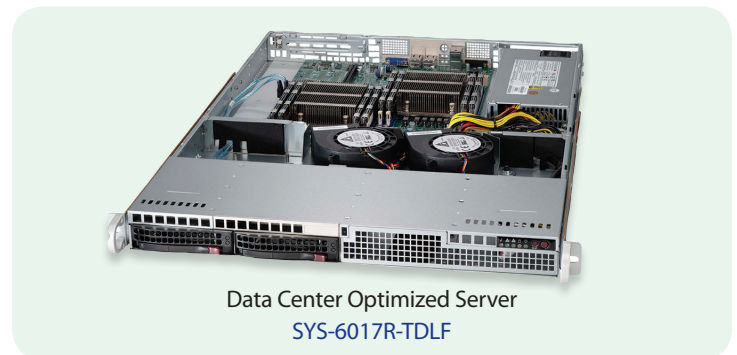


Figure 1: Server Power per Node (HPL [floating point] test), with power savings in red.



Using the current generation server system as a baseline, the cost savings for the new Ivy Bridge Supermicro systems were then calculated for a four-year estimated lifetime assuming PUE equals 1.5, a \$15 saving per data center watt reduced*, and processor workload between 50% and 100%. The results are shown in **Table 2** below:

Power Savings per Node

	Watts Saved Per Node (see Figure 1)	\$ Savings Per Node
50% Load	15W	~\$200
100% Load	28W	~\$400
Average	21.5W	~\$300

\$ Savings per Node

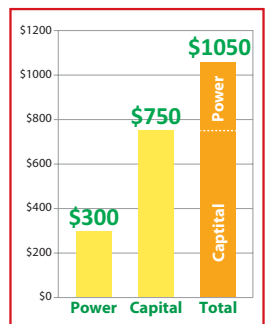


Table 2: Power Savings per Node (4 Years)

* See <http://www.supermicro.com/products/nfo/files/FatTwin/FatTwin-White-Paper.pdf>

TCO Savings

Based on this case study, a new Ivy Bridge Supermicro DCO server outperforms a current generation 1U server system in terms of power saved (=21.5W), while operating at an 8% higher performance level. The power savings during a 4-year server lifetime is substantial, up to **\$3,000,000** for a 10,000 node deployment. In addition, the new Ivy Bridge server tested also saves over **\$750** per node in acquisition costs (CAPEX) or **\$7,500,000** for a 10,000 node data center deployment. These savings from the new Ivy Bridge system add to **\$10,500,000**† in total cost of ownership (TCO) savings and are clearly significant and highly attractive for data center customers who select from Supermicro's full line-up of Ivy Bridge E5-2600 v2 server solutions, available now.

† The savings may vary depending on product configuration and application.