Ivy Bridge Based FatTwin™ Servers 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 FatTwin™ server solutions. The FatTwin™ system selected for these tests is the 8-node front I/O model. The reduction, in watts per system translates to operational expenditure (OPEX) savings in a data center. The initial acquisition cost savings per system results in a data center captital expenditure (CAPEX) savings. Together these two savings, which contributing to total data center TCO savings, are measured for a 1,250 system implementation that includes 10, 000 server nodes. 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	Micron C400 256GB 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, 21ºC)*

Results

Power consumption for the new Ivy Bridge and current generation servers are measured using the High Performance Linpack benchmark. The power consumptions for these two generations of servers are measured and compared. The result is that the new Ivy Bridge server saves 171W per system at 50% load and 310W per system at 100% load over the current generation server, while the performance is improved by 8%.

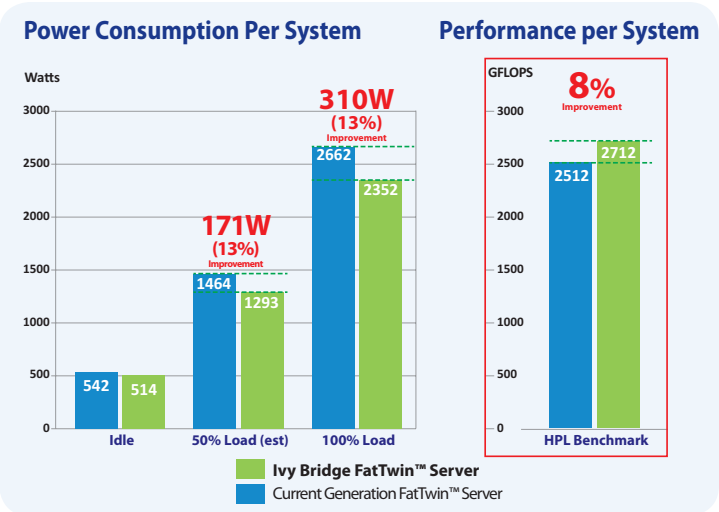

Figure 1: *Server power per 8-node system (HPL [floating point] test), with power savings in red.*

FatTwin™ Server System SYS-F617R3-FT

Using the current generation 8-node 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 System

	Watts Saved Per 8-Node System *(see Figure 1)*	$ Savings Per 8-Node System
50% Load	**171W**	~$2550
100% Load	**310W**	~$4650
Average	**240W**	~$3600

$ Savings per System

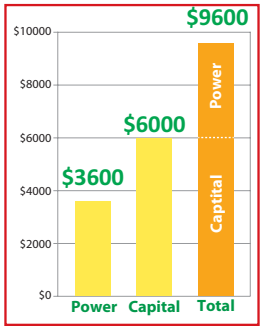

Table 2: *Power Savings per 8-node system (4 Years)*
** See http://www.supermicro.com/products/nfo/files/FatTwin/FatTwin-White-Paper.pdf*

TCO Savings

Based on this case study, a new Ivy Bridge Supermicro FatTwin™ server outperforms a current generation FatTwin™ server system in terms of power saved (=129W), while operating at an 8% higher performance level. The power savings during a 4-year server lifetime is substantial, up to **$4,500,000** for a 1,250 system deployment. In addition, the new Ivy Bridge server tested also saves over **$6,000** per system in acquisition costs (CAPEX) or **$7,500,000** for a 1,250 system data center deployment. These savings from the new Ivy Bridge system add to **$12,000,000**† 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.*