

High-end computers

Snapshot of costs for higher-end computers, including compute cluster systems (high performance, HPC). Purchasing, buying. Contact ChemIT to discuss your needs.

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Pricing example for 24 cores

Questions

Value/ utility of (Intel) hyperthreading?

Summary

You want 24 cores. Here are some options, and prices as of Jan 2014.

Top-level options	Cost	Price analysis	Proc	Notes
Typical compute cluster nodes 2 computers in one 1U rack-mount box. 24 cores, 128GB RAM, 4TB storage. (12 cores, 64GB RAM, 2TB storage per computer)	\$5.4K	Getting 24 cores on procs spread over 2 computers represents good value.	Intel Xeon E5 2620 V2	4 procs, 2 on each of 2 motherboards.
Typical compute cluster nodes 2 computers in one 1U rack-mount box. 32 cores, 128GB RAM, 4TB storage. (16 cores, 64GB RAM, 2TB storage per computer).	\$7.3	Getting 32 cores on procs spread over 2 computers (instead of 24 cores, above). Pay extra for these extra cores: \$960 to get 2 more cores on each chip	Intel Xeon E5 2640 V2	Again, 4 procs, 2 on each of 2 motherboards. Those procs are twice the price. 8-core proc price is \$890ea, or a full \$480ea more than 6-core proc.
Single computer, rack-mount. 24 cores, 128GB RAM, 4TB storage.	\$8.5K	To get similar power as \$5.4K system (24 cores), but merged into a single system. Pay extra: \$1,920 for 4-capable chips upgrade \$1,180 for 4-capable motherboard upgrade	Intel Xeon E5 4607 (V2 coming soon)	4 procs, but on one single motherboard. Those procs are twice the price. 4-proc capable proc price is \$890ea, or a full \$480ea more than 2-proc capable proc.
Singe computer, desktop (but noisy and hot!) 24 cores, 128GB RAM, 4TB storage.	\$9.5K	In addition to above \$8.5K upgrade, pay extra: ~\$1K for chassis upgrade (still noisy and hot, though)	Intel Xeon E5 4607 (V2 coming soon)	Again, 4 procs, but on one single motherboard. Those procs are twice the price. 8-core proc (4-core capable) price is \$890ea, or a full \$480ea more than 6-core proc (4-core capable).

Details

For each option:

- Each proc (processor) is 6 cores. 4 total procs
 - More cores/ proc are available, but much more expensive. (Ex. An 8 core proc is twice the price.)
- Each option has a total of 128GB RAM. And 4TB of HD storage over 2 hard drives.

Spec's selected to allow an apples-to-apples price comparison, not because of a "sweet spot" for each scenario, and not necessarily "fitted" to your research needs.

- You may need to adjust the final specs, once you select a top-level option.

Does not include

Anything other than "the box".

- May also need UPS (\$170), network cabling and switch (\$100 or less)- not much else.

Base data

- \$410 for each 6 cores chip, 2-capable (Intel Xeon E5 2620 V2)
- \$890 for each 8 cores chip, 2-capable (Intel Xeon E5 2640 V2)
- \$890 for each 6 cores chip, 4-capable (Intel Xeon E5 4607; V2 coming soon)
- \$1,600 for each 8 cores chip, 4-capable (Intel Xeon E5 4620; V2 coming soon)

Dropping from 64GB per node to 32GB per node drops about \$250 per node (\$500 for a 2-node system). (And 16GB instead of 32GB is saving very little money, of course.)

- Question: Brian's quotes from Dell imply that our 64GB RAM (vs. \$32GB) costs \$1,000, not \$500. How to account for the extra \$500 (\$1,000-500) in ChemIT's quote?

Compare proc specs

- <http://www.intel.com/content/www/us/en/processor-comparison/compare-intel-processors.html?select=server>

Compare proc prices

- E5-2600v2 series (new chips from September 2013)
 - <http://ark.intel.com/products/series/75291>
- E5-4600 series chips (v2 coming soon; current ones are ~one year old)
 - <http://ark.intel.com/products/series/64581>

Other ideas to consider

- Confirm limiting factor by using CISER's service to help tune where to invest (cores, RAM, hard drives space).
- Cut down on hard drive space by using file server space, in certain situations.
- Merge your investment into an existing cluster. Shared resources cost much less than standing up your own, small cluster.
- Confirm operational value of a single, "powerful enough" system (say, most large jobs done in 24 hours or less), vs. multiple, less powerful systems.