

AccuCell



Multi-Threaded Runtime Benchmark



SILVACO

Digital CAD

Machine Specification

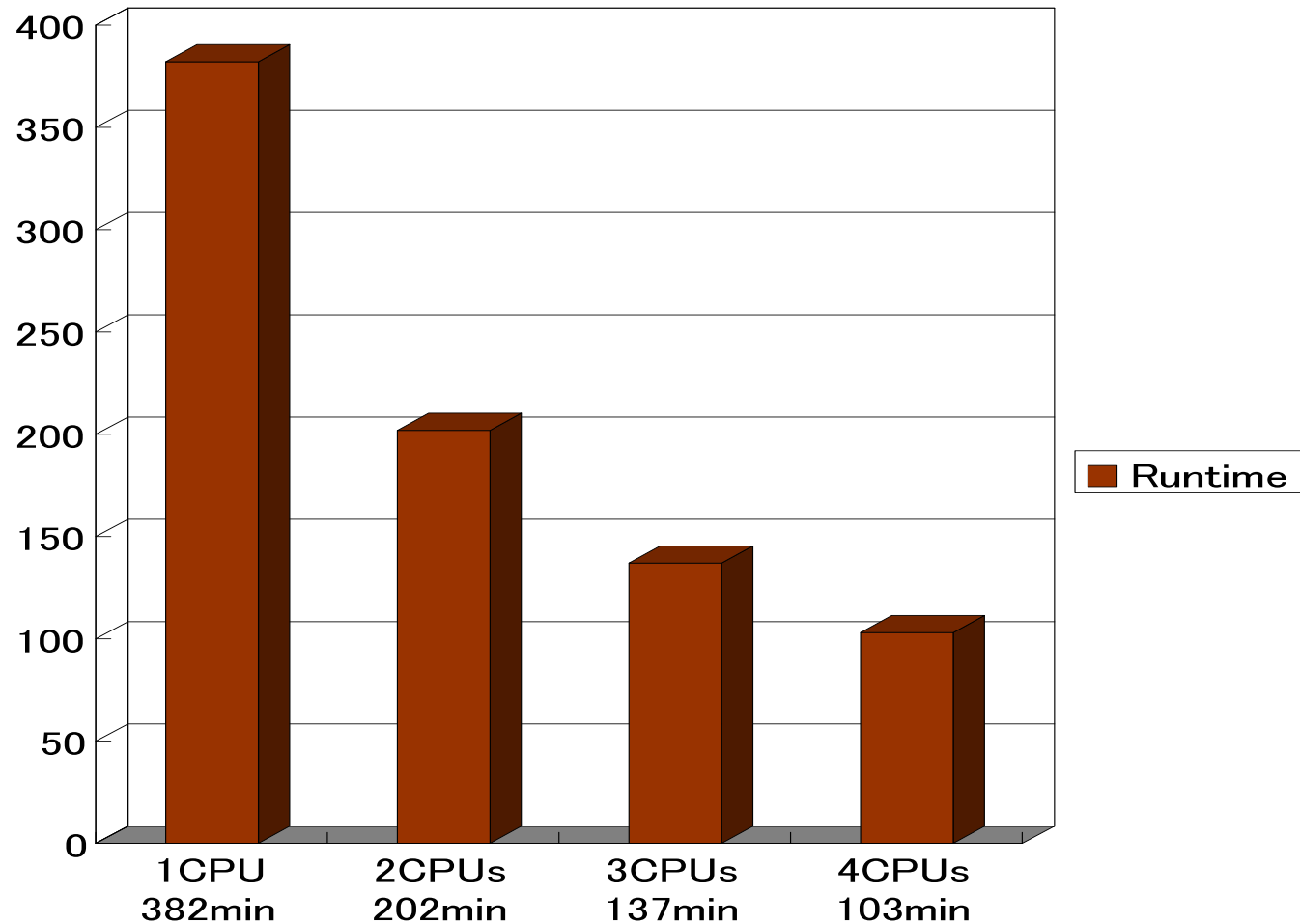
- Dual Core AMD Opteron Processor 280
- 4 Threads
- 8 GByte RAM
- Red Hat Enterprise Linux 64-bit
- No other applications running during test

Library Specification

- Si2 Open Cell Library
- A full 117 cell library and a selected subset of 47 cells were both tested

Digital CAD

Runtimes for full library of 117 cells



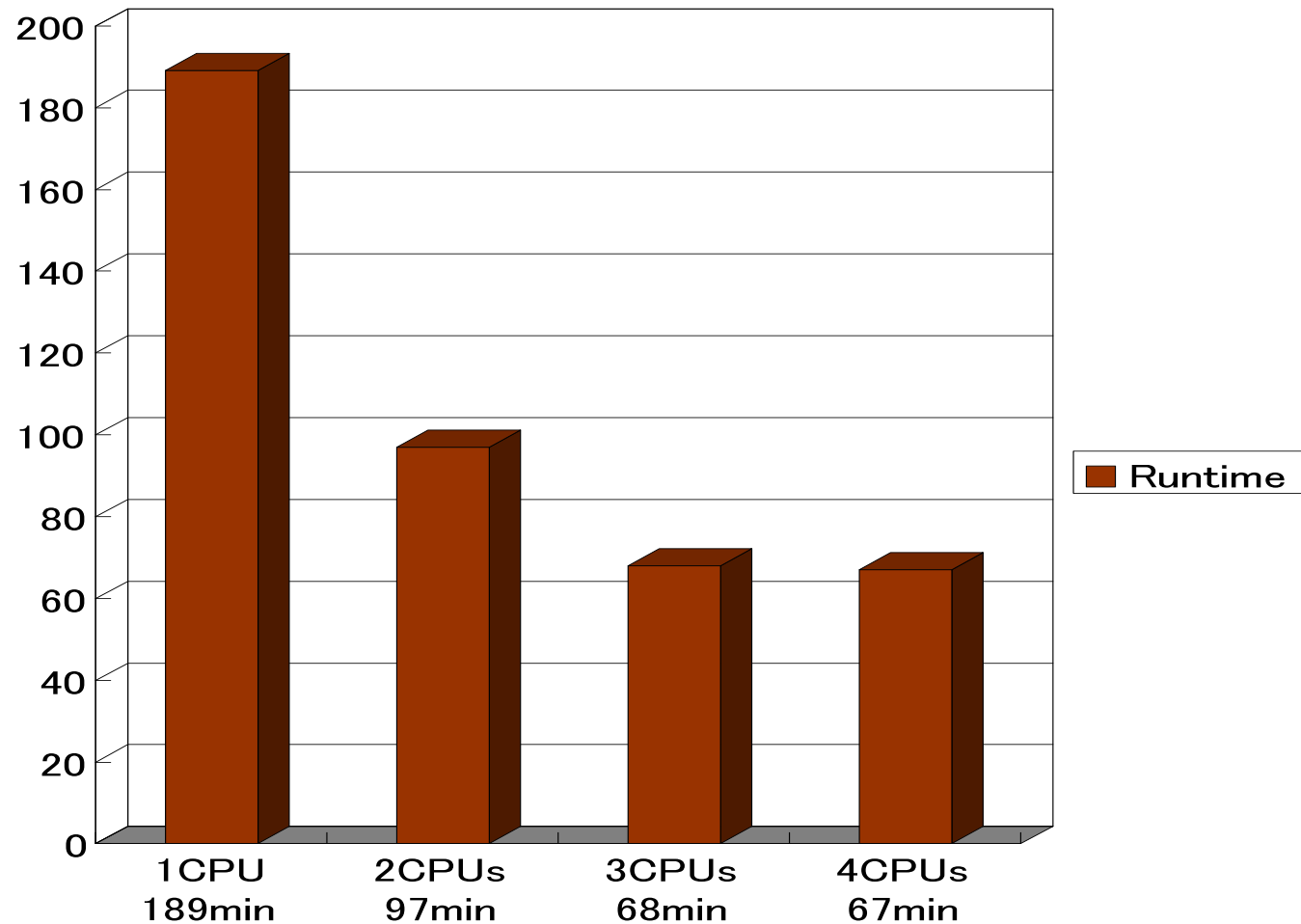
Digital CAD

Selected subset of 47 cells (8FFs, 3 latches, and 36 gates)

- AND2 x1
- AND3 x1
- AND4 x1
- AOI211 x1
- AOI21 x1
- AOI221 x1
- AOI222 x1
- AOI22 x1
- BUF x1
- BUF x16
- CLKBUF x1
- DFFRS x1
- DFFR x1
- DFFS x1
- DFF x1
- DLH x1
- DLL x1
- FA x1
- HA x1
- INV x1
- INV x16
- MUX2 x1
- NAND2 x1
- NAND3 x1
- NAND4 x1
- NOR2 x1
- NOR3 x1
- NOR4 x1
- OAI211 x1
- OAI21 x1
- OAI221 x1
- OAI222 x1
- OAI22 x1
- OAI33 x1
- OR2 x1
- OR3 x1
- OR4 x1
- SDFFRS x1
- SDFFR x1
- SDFFS x1
- SDFF x1
- TBUF x1
- TBUF x16
- TINV x1
- TLAT x1
- XNOR2 x1
- XOR2 x1

Digital CAD

Runtimes for selected subset of 47 Cells



Conclusion

- 2010 baseline release supports AccuCell multi-threading
- AccuCell multi-threaded performance scales approximately linearly with the number of CPUs used for characterization. There is no limit on the number of CPUs that can be used.
- On average, 4 CPU AccuCell runs are 3 times faster than on 1 CPU
- As the cell library to be characterized becomes larger and more complex, 4 or more CPUs are more advantageous for characterization with AccuCell
- For smaller libraries, like the 47 cell example presented here, on average 3 CPUs are sufficient