Creating the Optimal Regression Farm Infrastructure That Meets All Your Team’s Simulation Requirements

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Challenge

Memory bandwidth/core is shrinking

- Adding more cores to the processor does not increase individual workload performance linearly
- More cores running EDA workloads such as simulations are competing for the same memory bandwidth

Impact on Sim Performance

Simulation Performance Degrades

- Each individual simulation takes longer to complete as a single socket is loaded with multiple simulations
- Experimental data confirms bottleneck

Optimize HW Configuration

Maximize Cache per Core

- It is better to choose processors with larger L3 cache over a processor with less L3 cache but a faster clock rate
- Performance boost provided by the faster clock rate is nullified by the limited amount of L3 cache

Don’t target higher clock speeds

- Even if more cores can handle more cache bandwidth, it is not possible to meet the requirement

Impact on Sim Performance

More Servers Brings More Value From Simulation Licenses

- More simulations use additional cores on a socket
- Single socket is loaded with multiple simulations

Optimize Total Cycles

Do use all available licenses

- Don’t run more jobs than cores
- 16 jobs complete with taskset

More Servers Brings More Value From Simulation Licenses

- To gain more overall cycles, run all licenses on whatever cores you have, ignoring negative simulation performance impact of running multiple cores

Optimize Costs

Server Upgrades Bring Value

- In regular server refreshes brings immediate results
- Experimental results between Gen8 and Gen9 HPE servers showed a 40% increase in simulation capacity

License Costs Dominate

- When considering total costs of simulation jobs (HW costs, license costs, infrastructure costs), license costs quickly dominate the overall costs
- Investing in more hardware and faster hardware directly optimizes your overall job cost

Don’t Leave Licenses Idle

- With a fixed server count, leaving licenses idle just to force less cores/socket to be in use does not produce enough individual simulation performance increase to yield more overall cycles