



# STAC Update for STAC-A2

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- Non-trivial Monte Carlo
  - Heston-based Greeks for multi-asset, path-dependent options with early exercise
  - Metrics: Speed, capacity, quality, efficiency
- Numerous reports
  - Some public, some in the STAC Vault
- Premium STAC members get:
  - Reports in STAC Vault
  - Detailed config info on public and private reports
  - Code from vendor implementations of the benchmarks

[www.STACresearch.com/a2](http://www.STACresearch.com/a2)

# STAC-A2 in Julia

- Julia: new technical programming language from MIT
  - See previous STAC Summit presentations
- STAC-A2 research program
  - First Julia implementation of STAC-A2 complete
  - First code and results are in STAC Vault
  - Julia working on multithreaded implementation

# STAC-A2 in OpenCL

- U Mass Lowell has completed the implementation
- Testing currently underway with Dell
  - x86
  - GPU
  - FPGA
- Results will be in STAC Vault in phases

# STAC-A2 on Broadwell EP

- Hardware
  - 2 x Intel Xeon E5-2699 v4 (Broadwell EP) @ 2.20GHz
  - Supermicro Superserver SYS-1028GR-TR
- Software
  - Intel Composer XE
  - Intel Threading Building Blocks
  - New revision of Intel STAC Pack (benchmark code)
  - RHEL 7.1
- 44 cores was the most ever in a 2-socket Intel Xeon server

# STAC-A2 on Broadwell EP

- In warm runs of the baseline Greeks benchmark (STAC-A2.β2.GREEKS.TIME.WARM), this solution was:
  - Faster than all other 2-socket Xeon servers that have been tested
  - Faster than all Intel Xeon 4-socket servers tested to date, except a the 4-socket Xeon 8890 v3 server which had 72 total cores
  - 47% faster than a solution with the same rack density using two Intel Xeon E5-2697 v3 processors with 28 total cores

[www.STACresearch.com/intelA2](http://www.STACresearch.com/intelA2)

# STAC-A2 on Knights Landing

Next talk...

# Working group activity

- Have made key decisions on the portfolio benchmarks
  - Ability of implementations to use different code paths vs single-option case
  - Ability of option processors to share information
  - Emphasis on portfolio results going forward (throughput and efficiency)
- Have made key decisions on energy- and space-efficiency benchmarks
  - Current numerator (Max Assets) is not ideal
  - New metrics:
    - Options per kWh
    - Options/second per cubic inch
- Public reports will start adopting these this summer