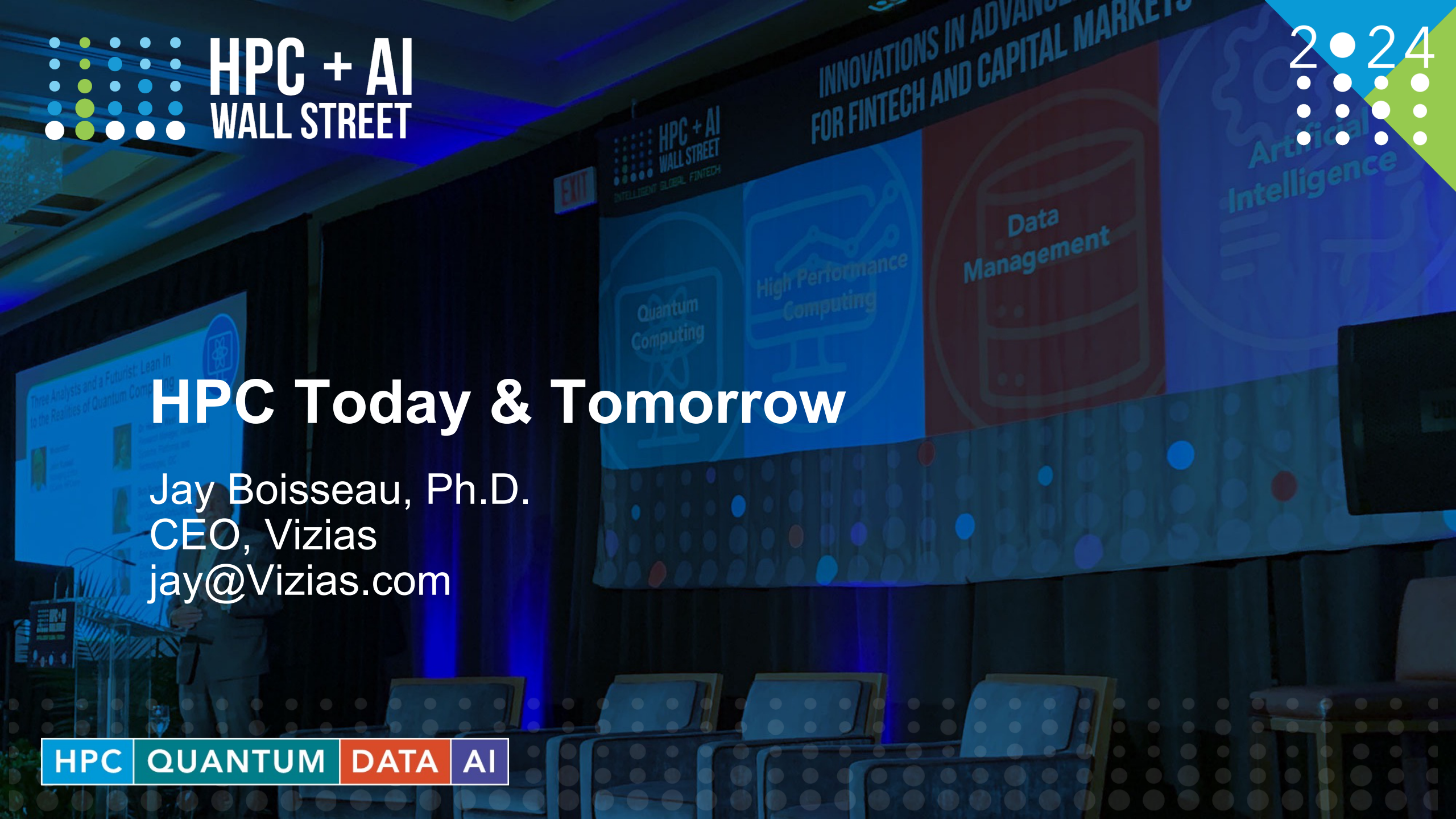

HPC Today & Tomorrow

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HPC | QUANTUM | DATA | AI

Last Year's HPC Opening

Today (Sept 2023)

- HPC is always about performance, but also often about problem size
- HPC is dominated (currently) by cluster-based architectures of commodity technologies (with some extra engineering for very large-scale systems)
- Cloud HPC is still a fraction of on-prem HPC, but top cloud vendors are comparable to on-prem vendors in annual revenue!
- HPC is commonly used in financial services: ***HFT***, ***fraud detection***, ***risk analysis, portfolio optimization, more!***

Tomorrow (Sept 2023)

- Acceleration of Accelerators
  - For power efficiency & reduced opex
  - For **HPC for AI**
- Cloud HPC continues to grow % of TAM
- Digital twins of complex systems
- Sustainability/power sources
- Beyond Exascale emphasis begins
- Quantum computing is here/imminent/coming soon (single digit years?)…

HPC Landscape Today

- Arm processors and AI accelerators are both fully mainstream
- AI is enabled by HPC, integrated with HPC, advancing HPC
- Power issues larger than ever, but…
- Power generation sources are still largely carbon-based — need more effort in green data centers
- Cloud % of HPC still growing
  - Limited by interconnects, costs, but
  - Fueled by AI, hyperscalers
- Hyperscalers have increased influence on silicon design, adoption
- Quantum computing hype exploded in 2024 (more later)

HPC Horizon

HPC + AI WALL STREET

- Likely:
  - AI continues driving HPC near term: mixed precision, algorithms, more
  - Hyperscalers drive their own silicon into mainstream (e.g. Graviton, TPUs)
  - RISC-V starts to gain traction, at least in research
  - Quantum computing continues weekly press releases of groundbreaking results! ☺ (more later)
- Maybe/hoping:
  - Power availability/cost drives green energy for data center a bit more
  - Power availability drives more edge computing
  - More fluid (if not seamless) use of hybrid multicloud? (OK, 2026-27…)
  - Quantum computing gets a ‘real’ quantum advantage result (if not quantum value yet)