Future HPCC Computational Resources

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MICHIGAN STATE UNIVERSITY

ICER

My Spiel

- Plans for 2016
  - Compute
  - Storage
  - Network
  - Services
- Future HPC platforms
- Long term planning
- Q & A

About Me

- Long time HPC practitioner, passionate teacher
- Cray Research Inc, SGI, General Motors, KAUST, Intel, UberCloud, Fermi Lab
- http://www.linkedin.com/sharankalwani
- Active Discussion Groups:
  - Innovative Uses of HPC
  - IDC HPC User Forum

Cluster 2016

- Started active planning
- Intensively Data Driven
- Organically grow this
- Bring innovative approaches
- Goal: help propel MSU higher up the Research Computing landscape

Cluster 2016

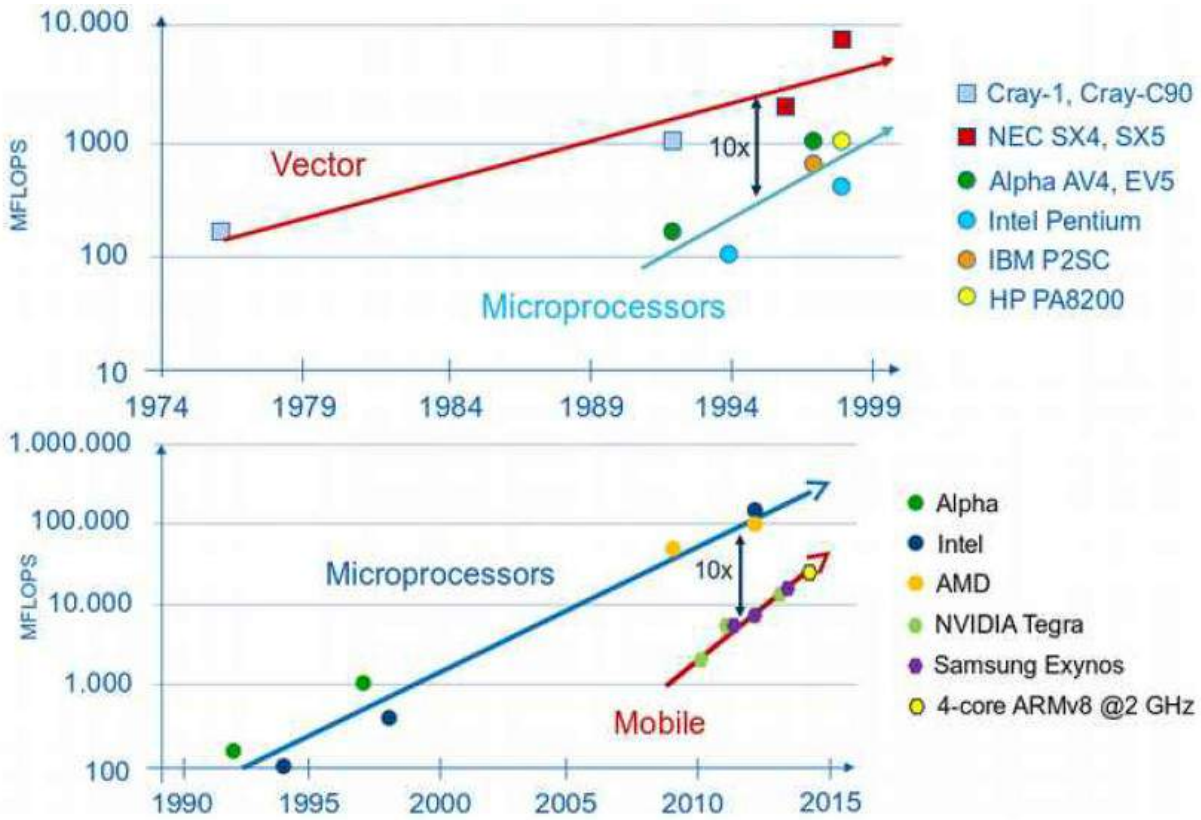
- Considering all aspects
- Diverse needs:
  - GPGPUs,
  - Classical cluster
  - Large Memory needs
  - High Core counts
  - Fast access to primary memory
  - Ubiquitous access to storage/data

Cluster 2016

- Very data driven
- *"If we can measure it, we can improve it"!*
- Process similar to Formula 1

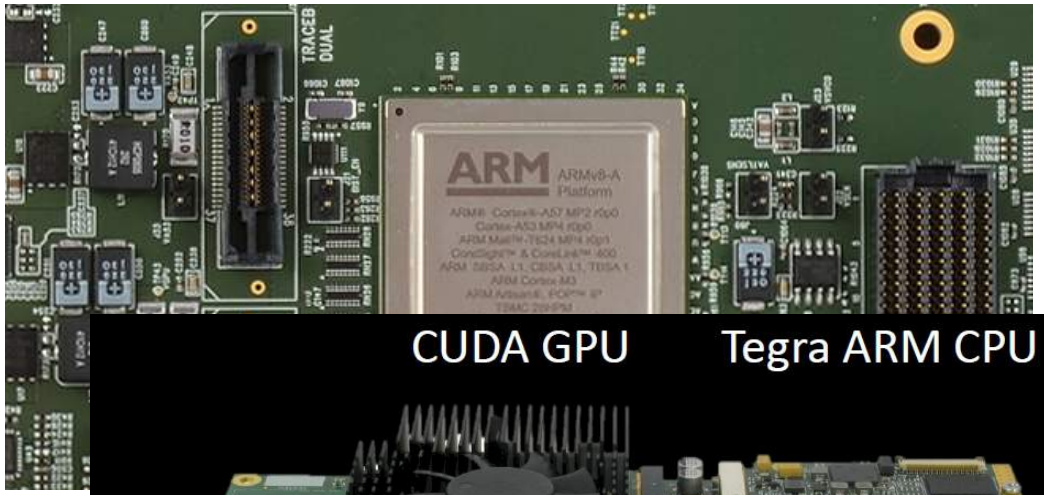
Future Possible Platforms

- ARM



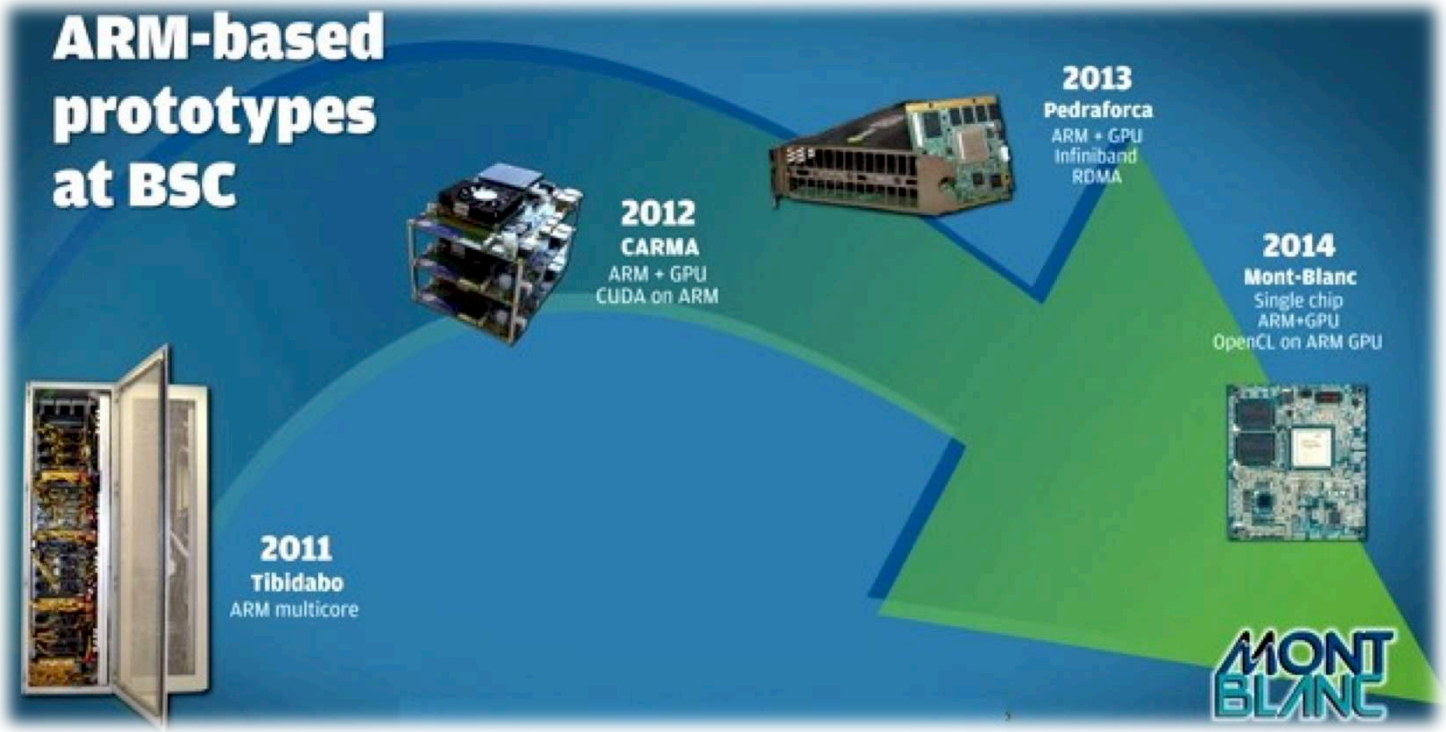
Future Possible Platforms

- ARM



Future Possible Platforms

- ARM

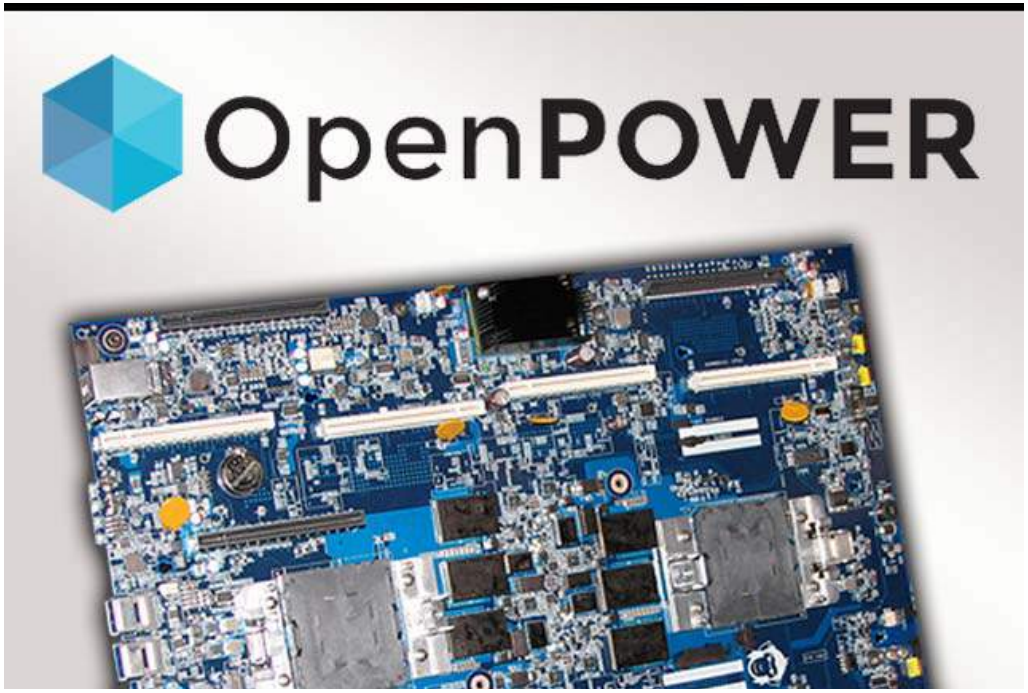


Future Possible Platforms

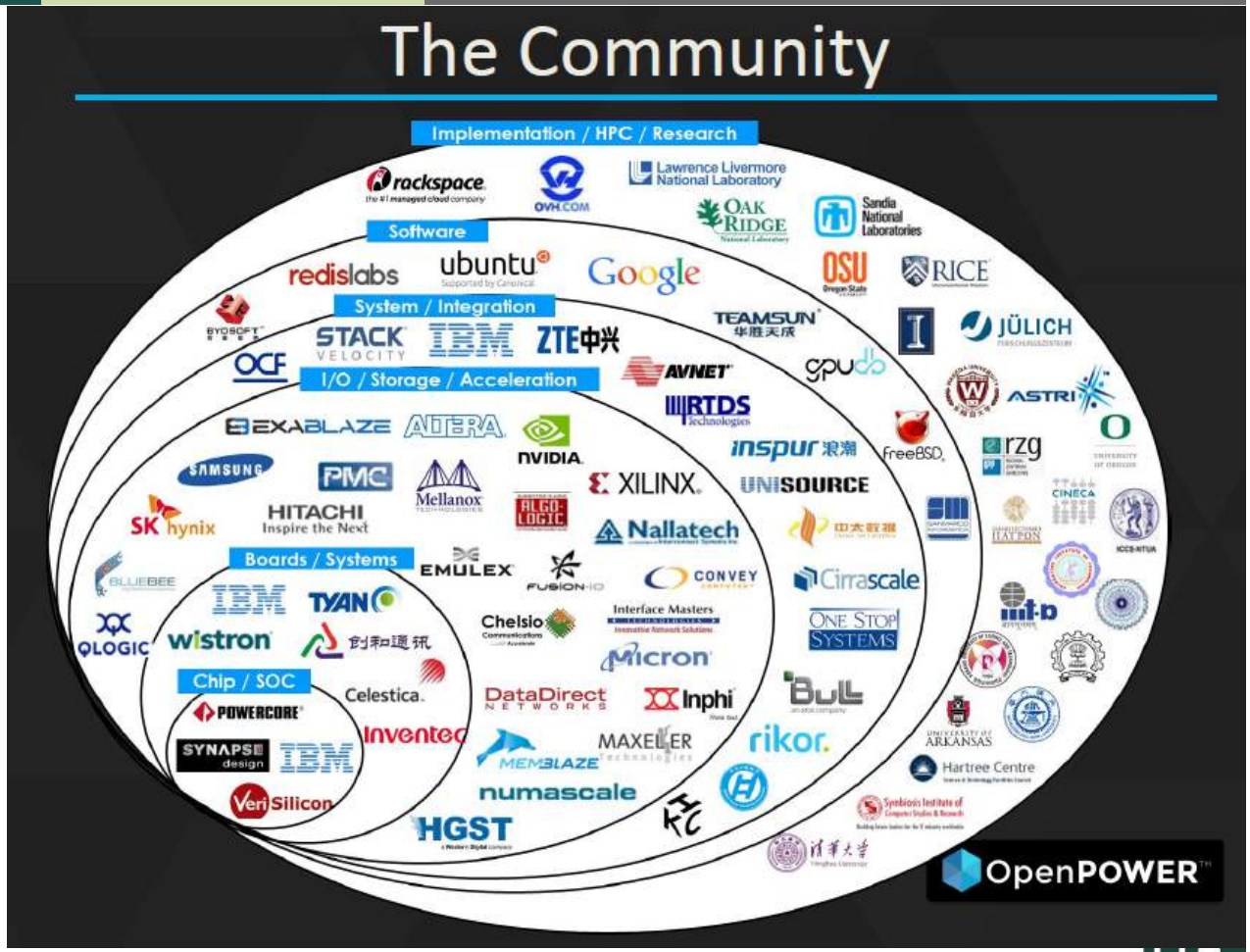
- ARM

Future Possible Platforms

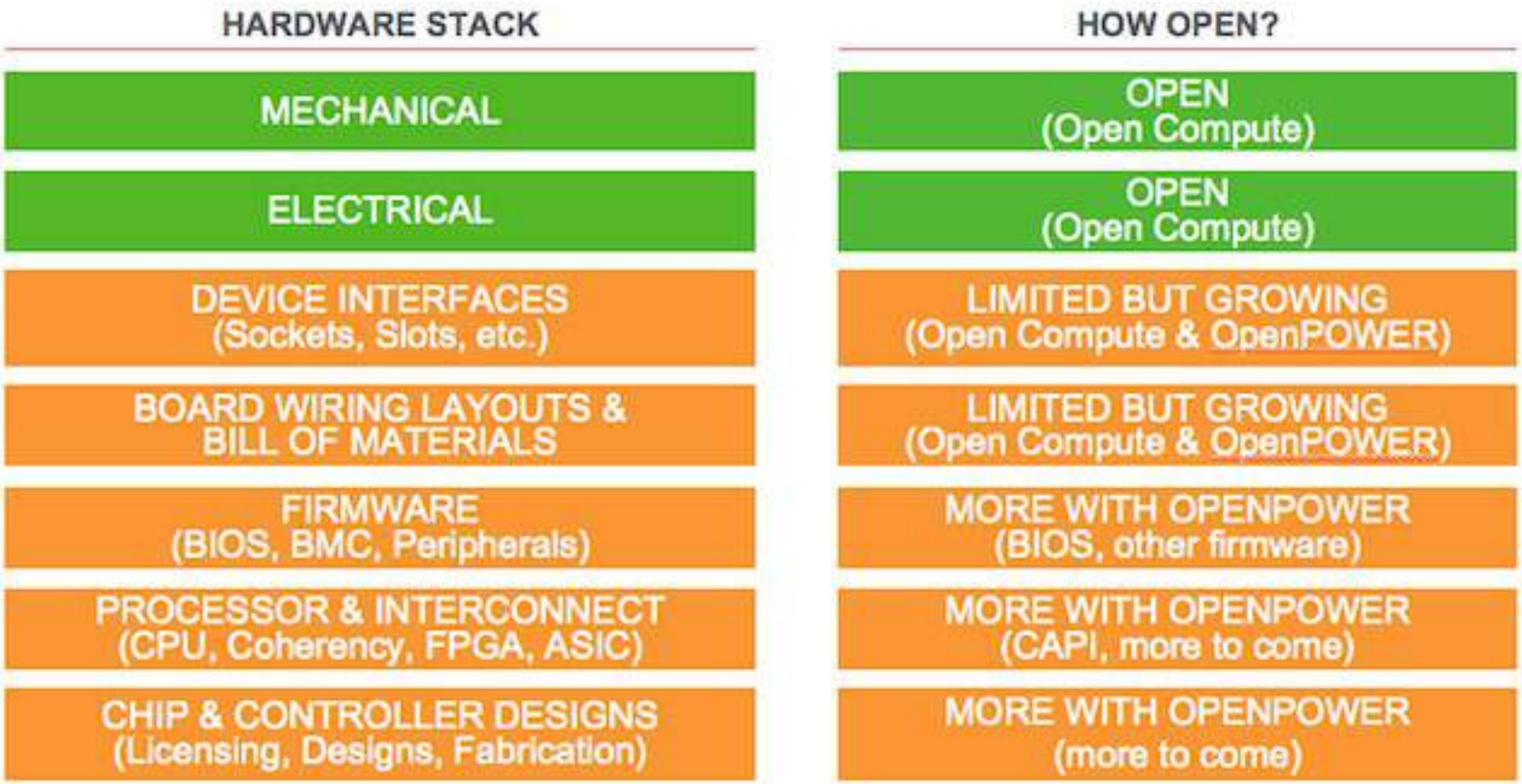
- OpenPOWER



Future Possible Platforms

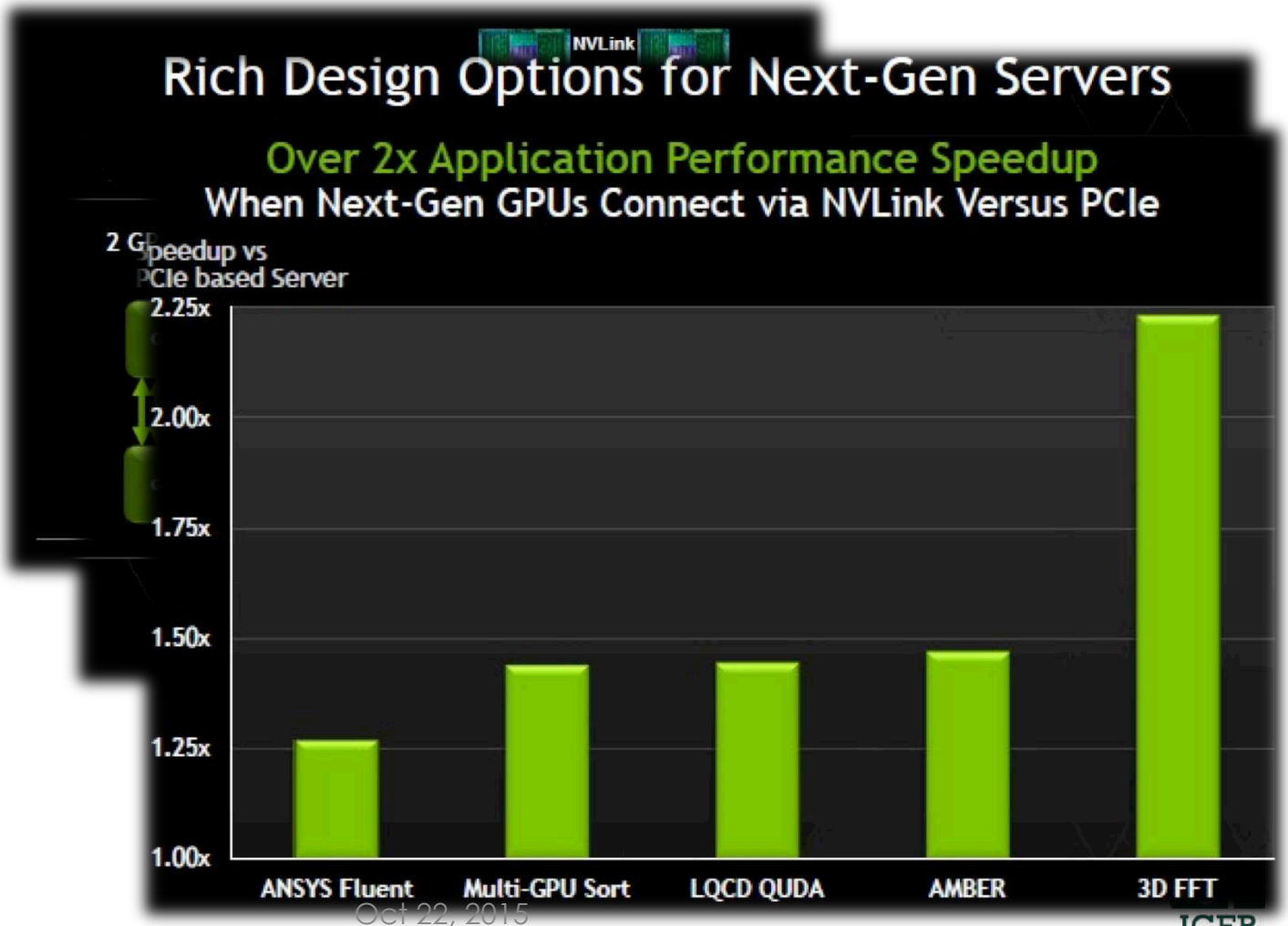


Reasons for OpenPOWER



In between?

- NVlink



Future (2018-)

- Data Center planning
- iCER/HPCC key part
- Helping drive our needs strategically & tactically
- Innovative approaches across the spectrum
- Talent Development (lynchpin)

Future (2018-)

- Cloud?
  - Virtualization
  - Containers
  - Bottlenecks ~ straw in between!
  - Certain use cases
  - Public vs Private vs Hybrid ←

Questions?