Scalable Data Processing at Network transfer rates with nCorium Compute in Memory Modules

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OSS Layer Bottlenecks in HPC Facilities

- 10,000's servers

- Storage Layer

- OSS

- Compute Layer

- 10s of Peta Bytes of data moved in and out of Storage layer

- Challenges:
  1. Data processing on CPU unable to keep up with increase in network and storage speeds
  2. I/O throughput per node is limited
nCorium Compute in Memory Module

- DIMM form-factor
- Reconfigurable compute cores on the DIMM
- Off-load functions via libraries:
  - Compression
  - Erasure
  - Encryption
  - Video Transcoding
  - ….etc
- Data Stream based processing
nCIMMs + nC-Grid = Scalable nCorium-OSS

- nCIMM to off-load data processing
- nC-Grid to open wider I/O
- Scalable Architecture:
  - Number of nCIMMs
  - Functions to support
Performance of Gen-1 nCorium OSS: Q’1 19

5x for RDMA

3.4x for RDMA + Erasure

Performance compared with Intel Gold CPU based system

Gen-1 released in Q1’19
Performance of Gen-2 nCorium OSS

- Improved reconfigurable cores
- More off-load functionality
- Higher Power efficiency

Gen-2 now available

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<th>RDMA+ENC</th>
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Numbers extrapolated from initial data

Ref. Platform vs nCorium G1 and nCorium G2

~10x faster
Ongoing Work

• Parallel file system integration
  • Lustre
  • BeeGFS

• Other Applications
  ▪ Key-Value Storage
  ▪ Video Transcoding
  ▪ Inferencing
  ▪ Graph Analytics
  ▪ Cyber Security
  ▪ Content Distribution
Demos / Exhibits

StarLight: Booth 993

EchoStreams: Booth 1490

Thank you!