Software Define Storage with a Full Hardware NVM Express Solution

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Resources Scaling Issues

• How to scale efficiently?

More computing resources

High latency

Not efficient resources management

More storage resources
More efficient resources management: power, cost

What about latency?
Current Fastest Technologies

- Limitations in storage access over network

- 1000-2000µs latency between NIC and All Flash Array
- 300-500µs latency between CPU and SSD

5x higher latency between local and external storage => Low performance
NVM Express

- Optimized, high performance, scalable host controller
NVMe over Fabrics

- Low latency protocol

8-10µs overhead latency

300-500 latency
NVMe SSD Controller Architecture

- Full HW architecture for high performance
- Optional software support for flexibility
FPGA-Based reference design

- Gen2 x4 configuration performances:
  - IOPS: 385k
  - Latency: 12µs
Low Latency SDS

NVMe over fabrics
8-10µs

Storage Controller

PVMe

Fabrics

PCle

NVM

IPM-NVMe

Application #1

Application #2

Application #3

CPU

RAM

200ns Latency
Summary

• NVMe latency with HW architecture: 200ns
• Today’s technology: about 15-20µs
• Future: compatible with emerging memories and silicon photonics
Thanks

Visit IP-Maker booth #717
NVMe live demo!

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