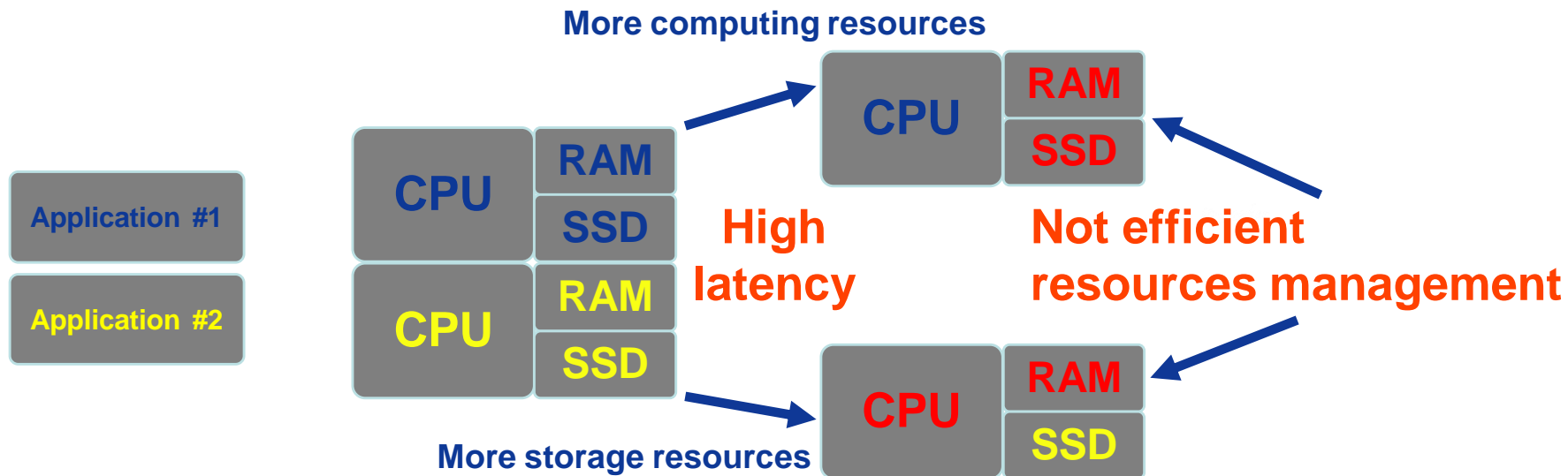


Software Define Storage with a Full Hardware NVM Express Solution

Jerome Gaysse, IP-Maker

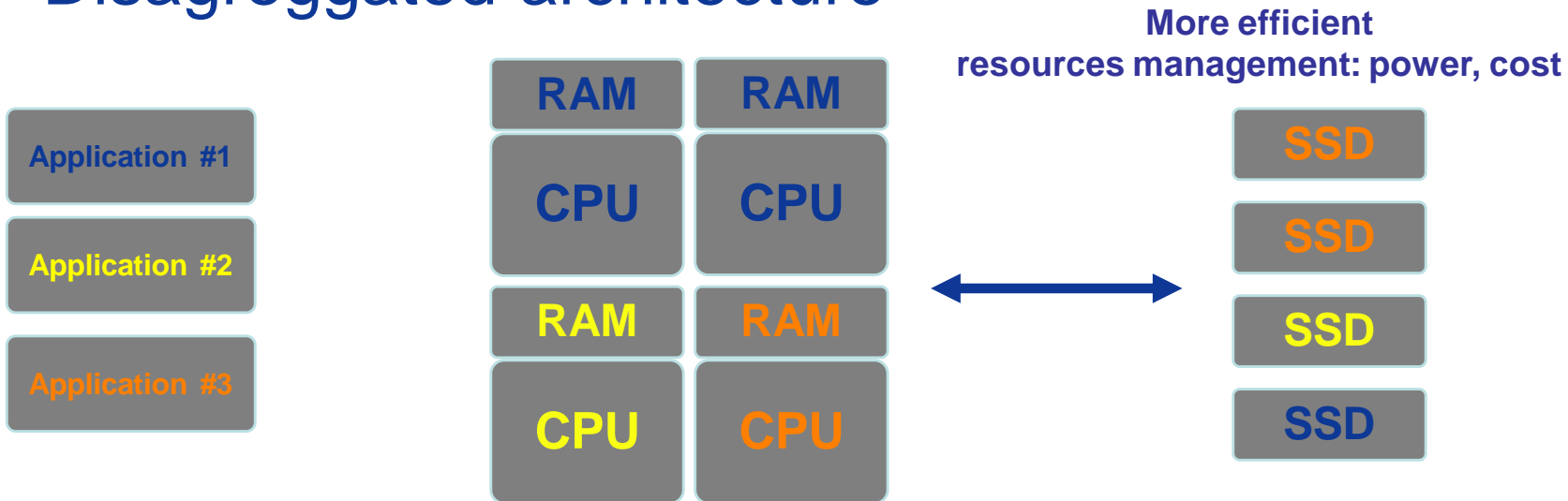
Resources Scaling Issues

- How to scale efficiently?



Software Defined Storage

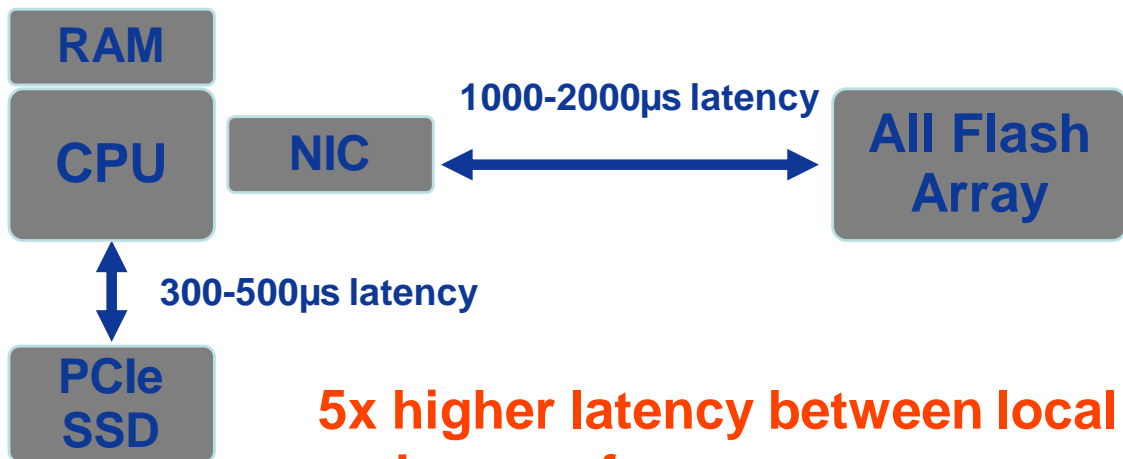
Disaggregated architecture



What about latency?

Current Fastest Technologies

- Limitations in storage access over network



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

NVM Express

- Optimized, high performance, scalable host controller

ORACLE

SAMSUNG

DELL

intel

Microsoft

CISCO

HGST
a Western Digital company

EMC²

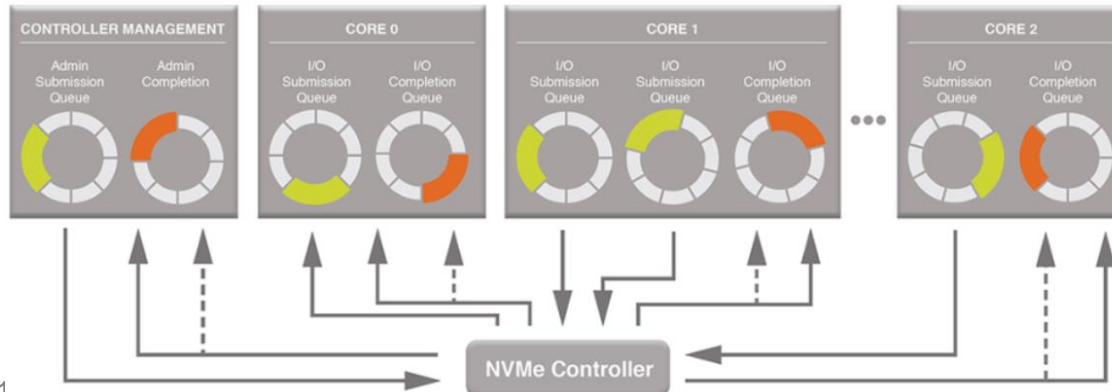
PMC

SEAGATE

Micron

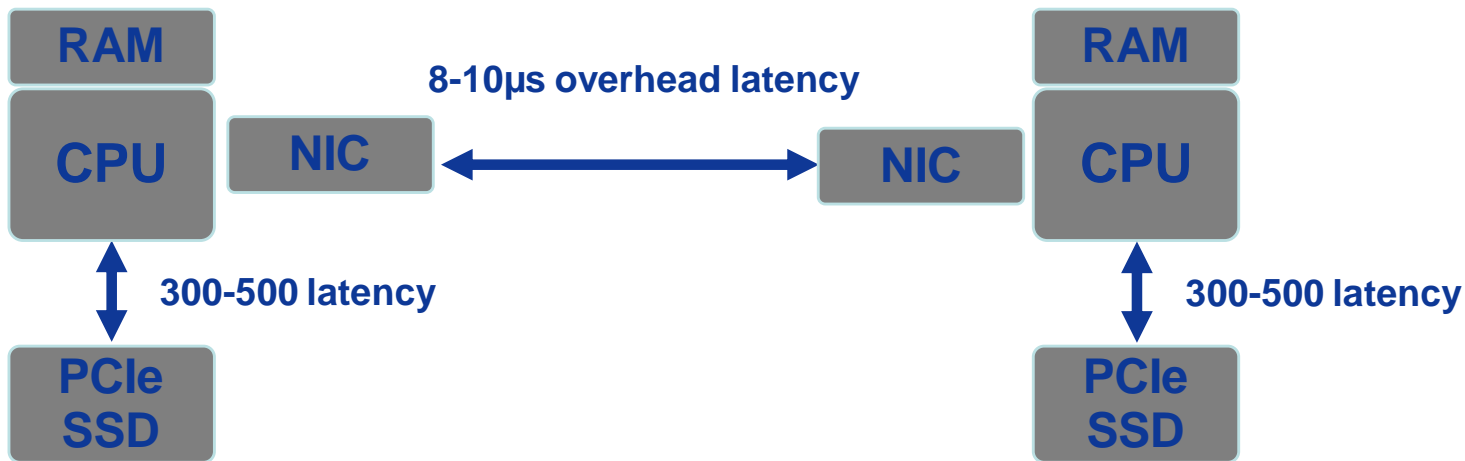
NetApp

SanDisk



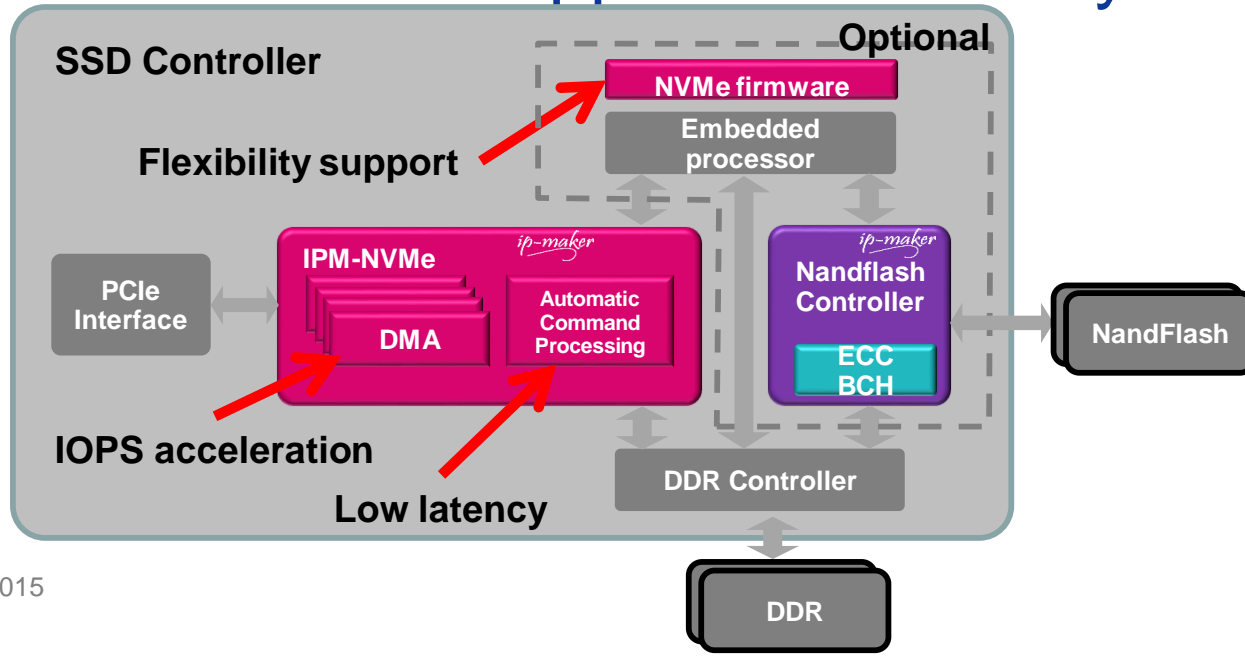
NVMe over Fabrics

- Low latency protocol



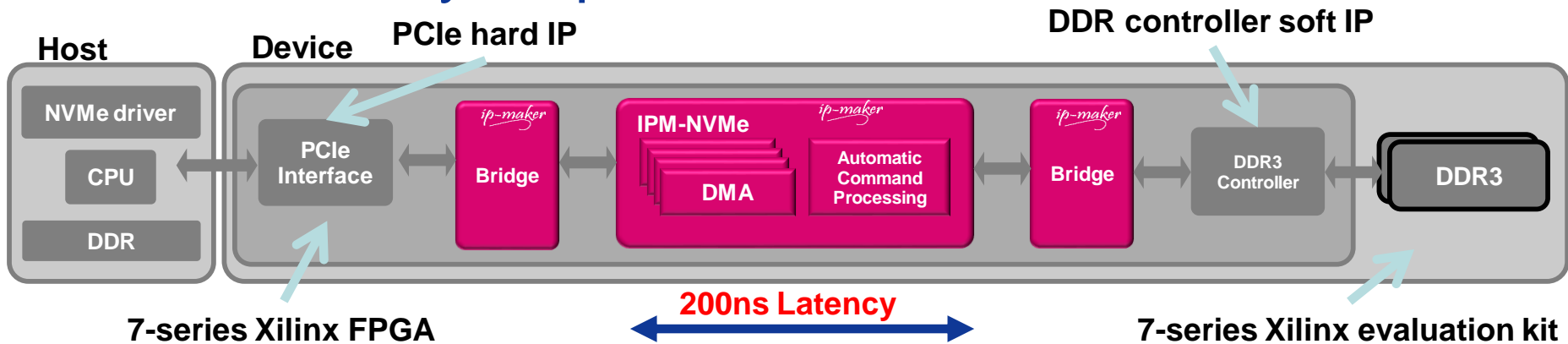
NVMe SSD Controller Architecture

- Full HW architecture for high performance
- Optional software support for flexibility



FPGA-Based reference design

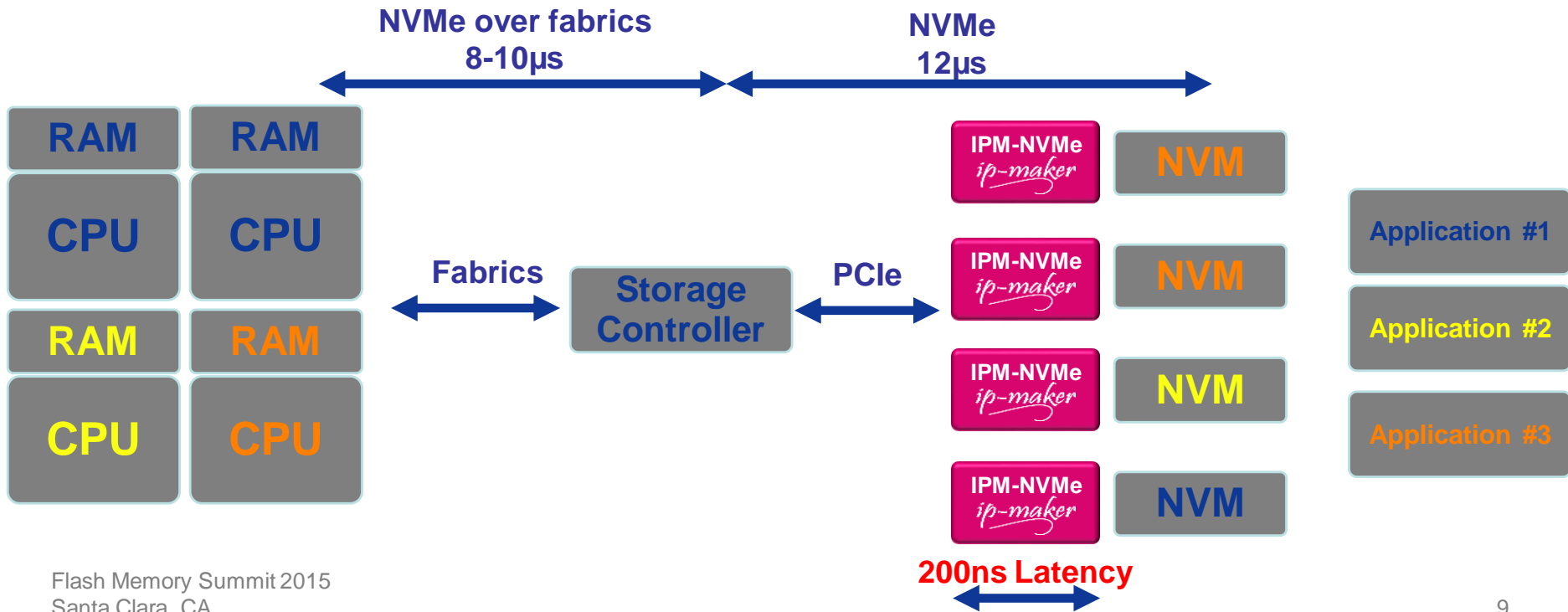
- Gen2 x4 configuration performances:
 - IOPS: 385k
 - Latency: 12 μ s



7-series Xilinx FPGA

7-series Xilinx evaluation kit

Low Latency SDS



Summary

- NVMe latency with HW architecture: 200ns
- Today's technology: about 15-20 μ s
- Future: compatible with emerging memories and silicon photonics



Thanks

Visit IP-Maker booth #717
NVMe live demo!

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