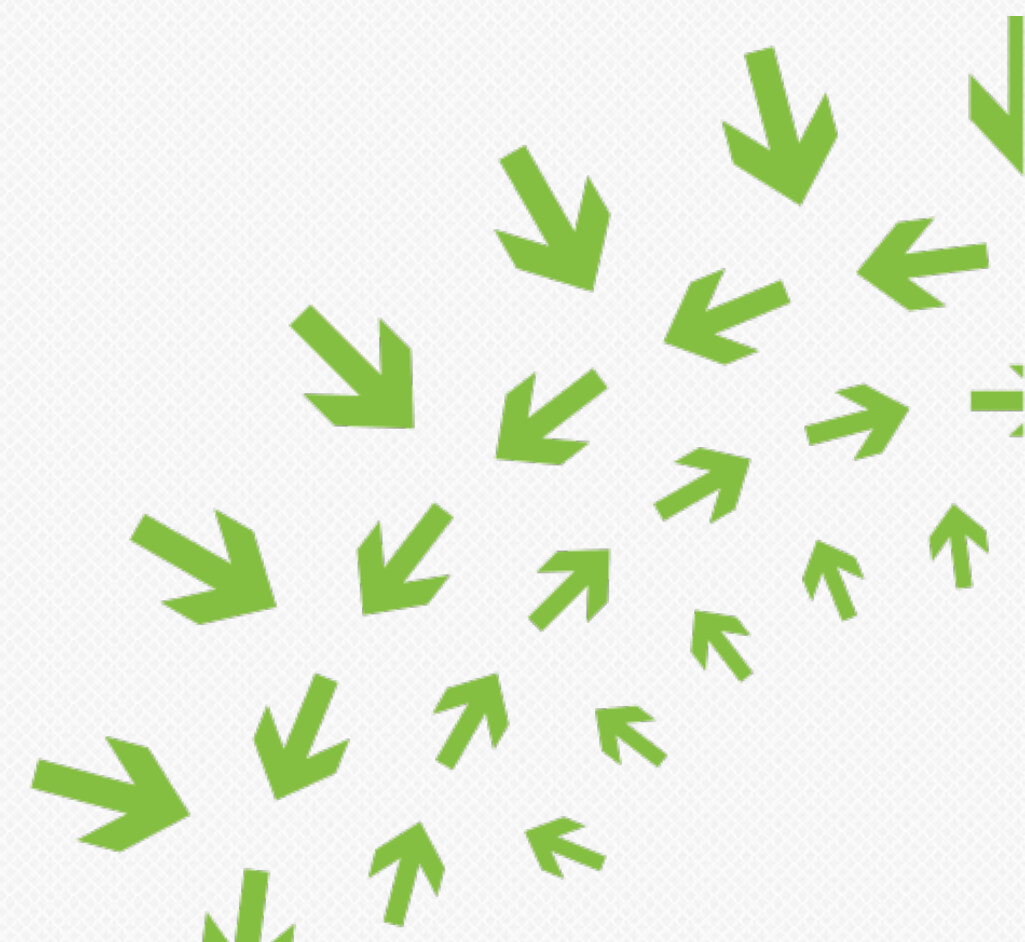




S5, the ALL-FLASH Software Defined Storage for CLOUD

Redesigned Storage Architecture and Hardware

Vince Zhou
NetBRIC Technology
Founder & CEO

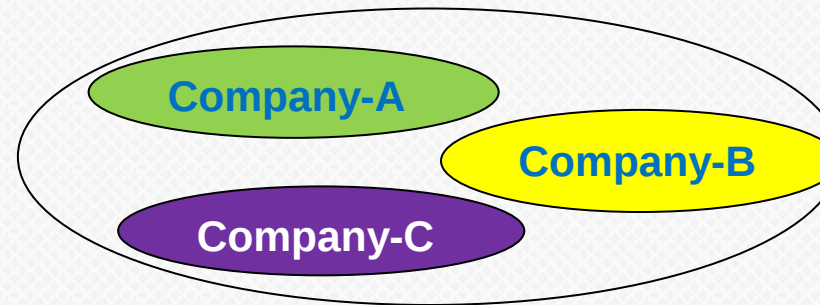


Software Defined Storage is the next big thing

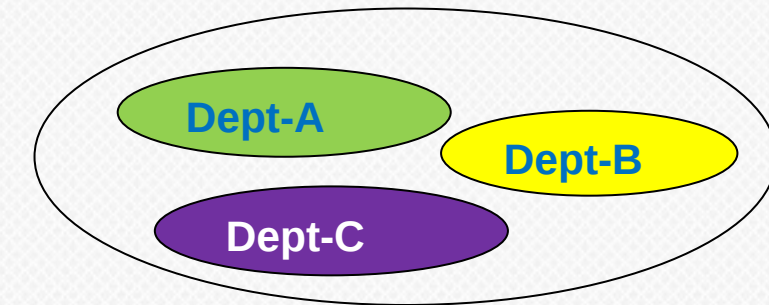
Cloud Data Center Infrastructure

Public Cloud

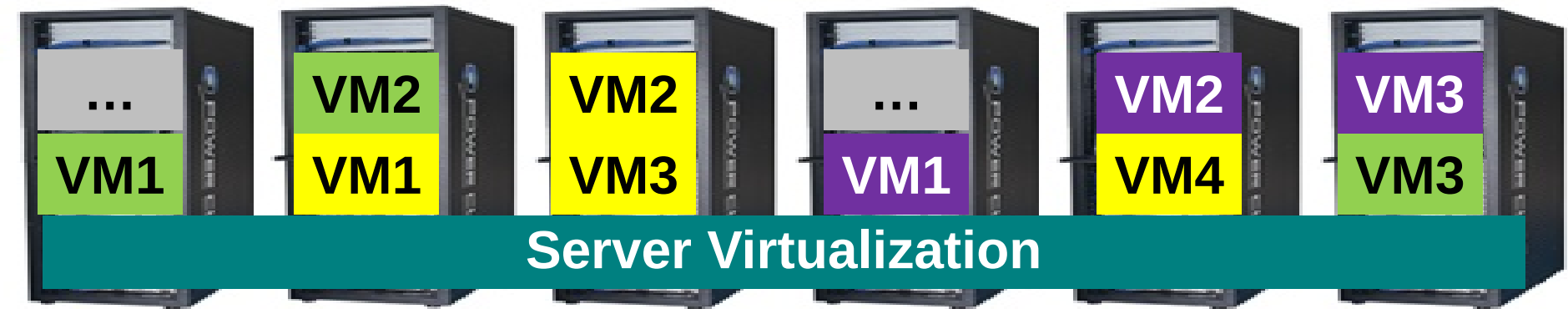
Private Cloud



or



MOS(Management, Orchestration, Security)



Virtual Private Network

Virtual Private Storage

Software Defined Network (SDN)

Software Defined Storage (SDS)

Firstly, IOPS matters

HDD is impossible to ensure IOPS. **FLASH can.**
And **IOPS are valuable**, for key applications

Volume Type	EBS General Purpose (SSD)	EBS Provisioned IOPS (SSD)	EBS Magnetic
Use Cases	Boot volumes Small to Med DBs Dev and Test	I/O intensive Relational DBs NoSQL DBs	Infrequent Data Access
Storage Media	SSD-backed	SSD-backed	Magnetic disk-backed
Max Volume Size	1TB	1TB	1TB
Max IOPS/volume	3,000 (burst)	4,000	40 - 200
Max throughput/volume	128MBps	128MBps	40 - 90MBps
Price*	\$.10/GB - Month	\$.125/GB - Month \$.065 / provisioned IOPS	\$.05/GB - Month \$.05/million I/O

Source: AWS website



Secondly, QoS matters

Since IOPS are valuable, **how about Thin Provision on IOPS ?**

Think about this:

Volume-1_**Tenant-A**: IOPS= 200; SLA=Bronze

Volume-2_**Tenant-A**: IOPS= 2,000; SLA=Silver

Volume-1_**Tenant-B**: IOPS=10,000; SLA=Gold

Volume-2&3&4_**Tenant-B**: IOPS= 2,000; SLA=Silver

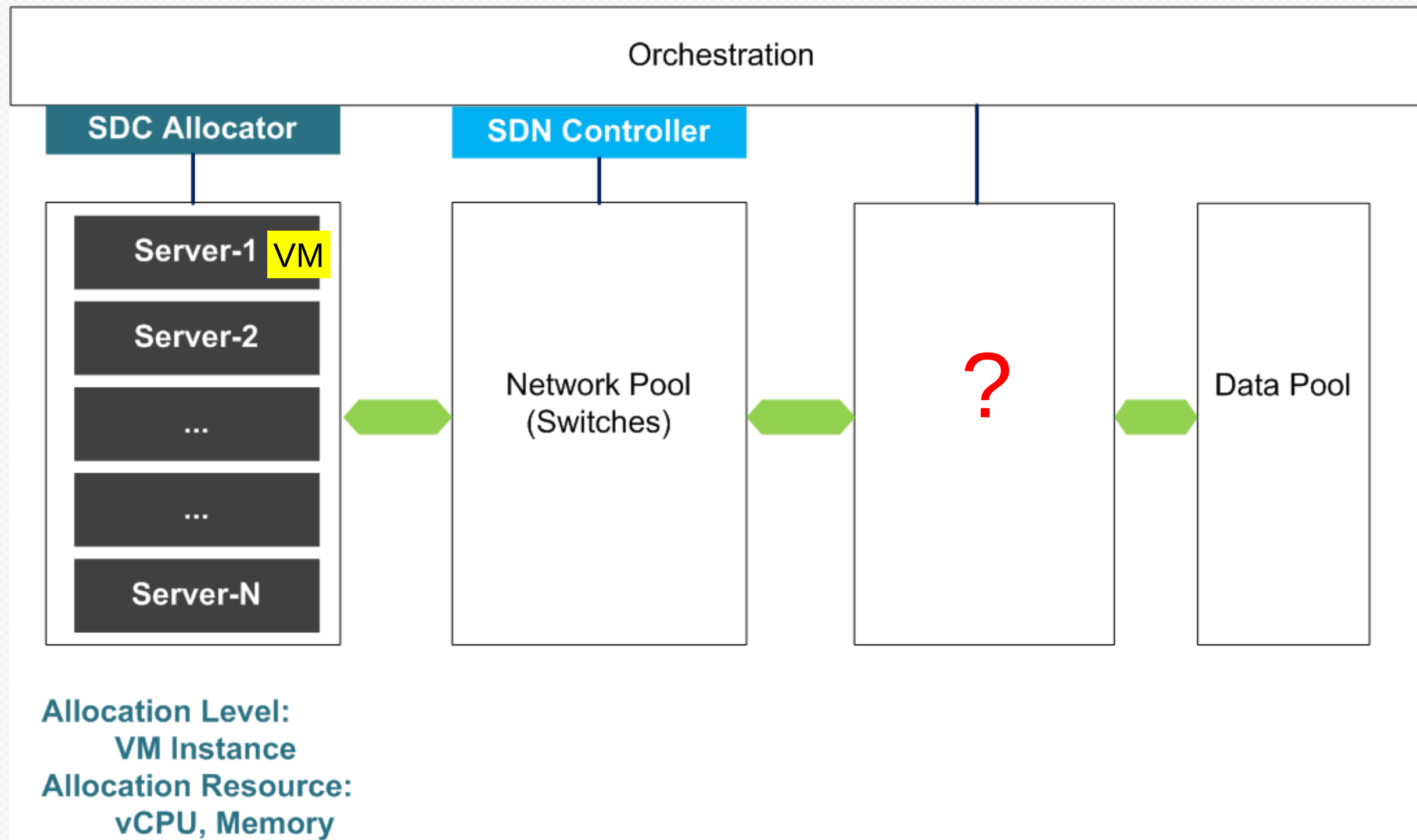
--- Volume group Level

All-Volumes_**Tenant-C**: IOPS=50,000; SLA=Gold

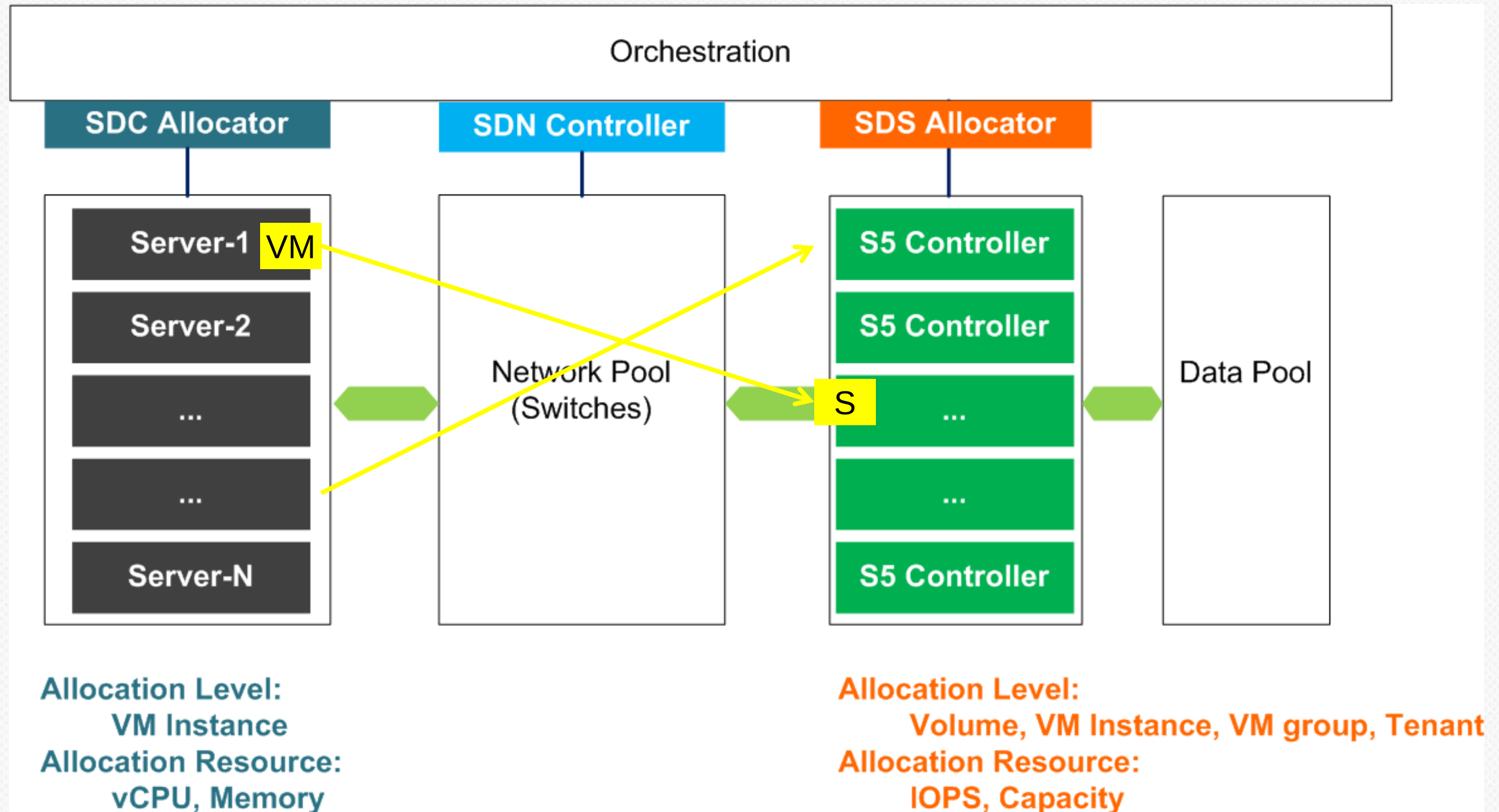
--- Tenant Level



Cloud IAAS Architecture



NetBRIC S5, All FLASH SDS for Cloud



NetBRIC S5 Storage Controller



3U, 19"

480TB raw NAND FLASH

16x40GE network

Up to 8M IOPS (8K Random)

100us latency

VM/Tenant level QoS

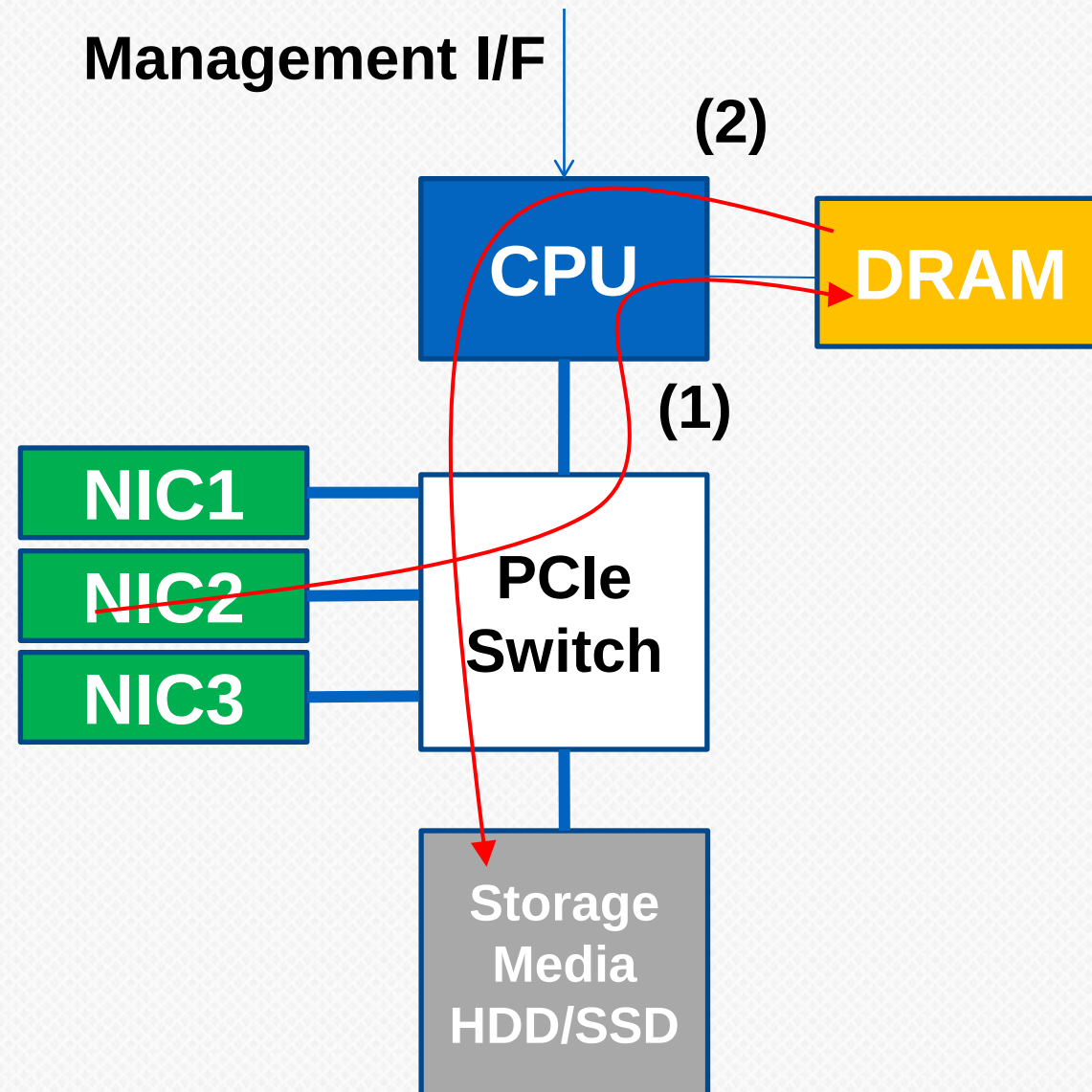
SLA: 99% at 99.99% time

Scale-Out

Find us at Booth #D15



Rethink on System Architecture



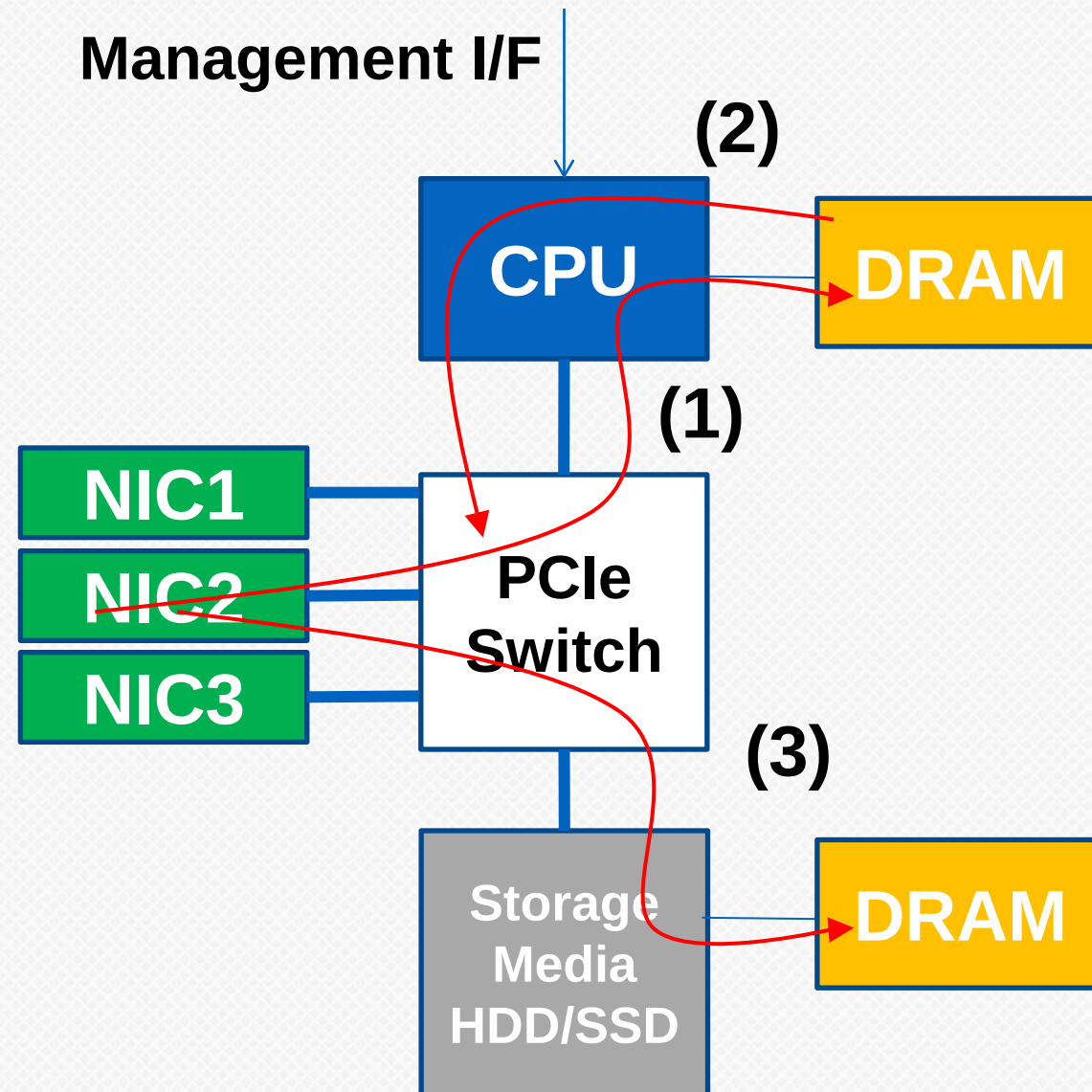
Traditional Arch

Limitations:

CPU become the bottleneck for IOPS
Storage software restrict consistent QoS



Some Improved Architecture example



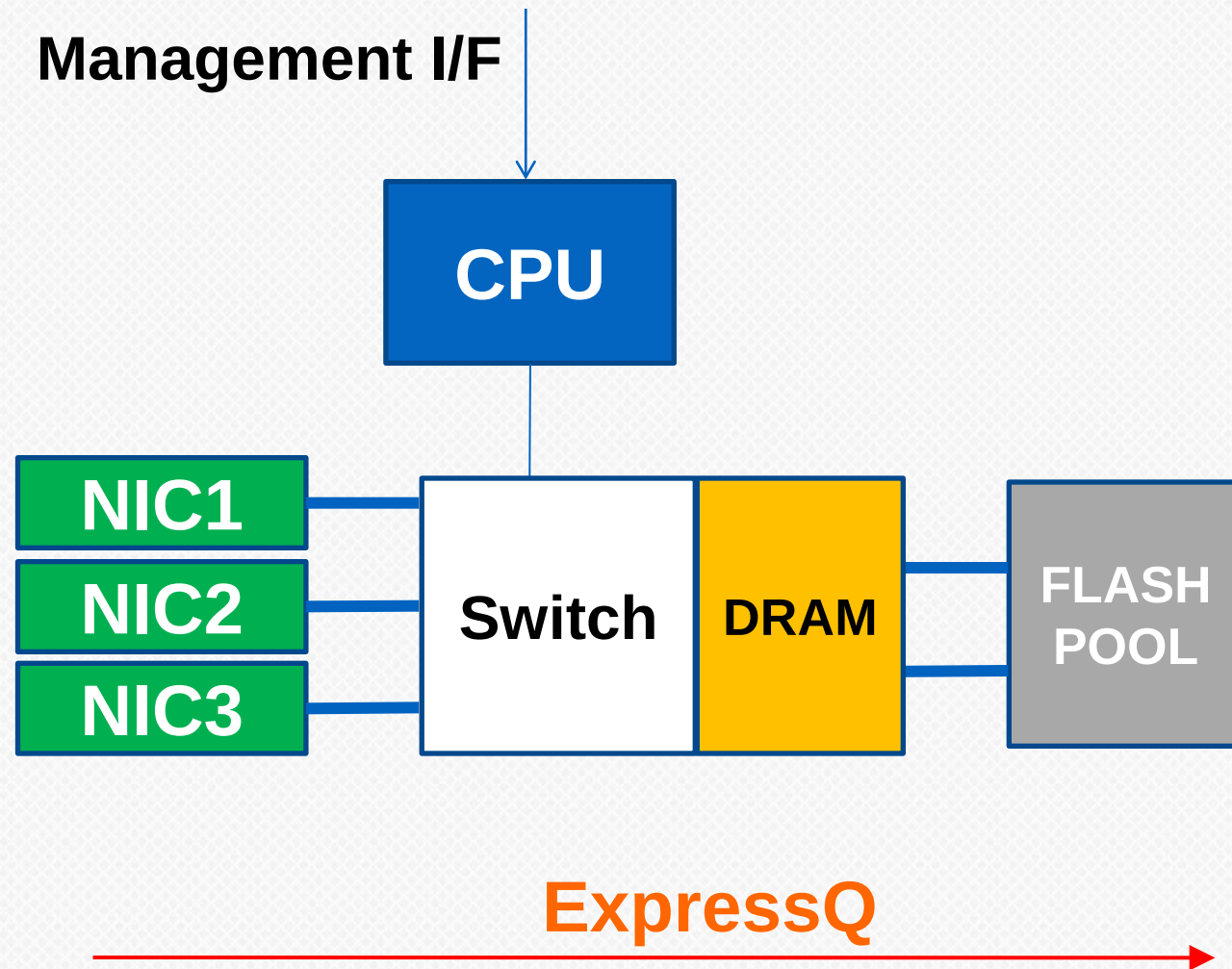
Upgrade:
Leverage PCIe MultiCast
Release CPU from data flow

Limitations:
PCIe Switch restrictions
No data processing supported

SATA/SAS is not for FLASH and PCIe too



NetBRIC: Redesigned Architecture



Innovations:

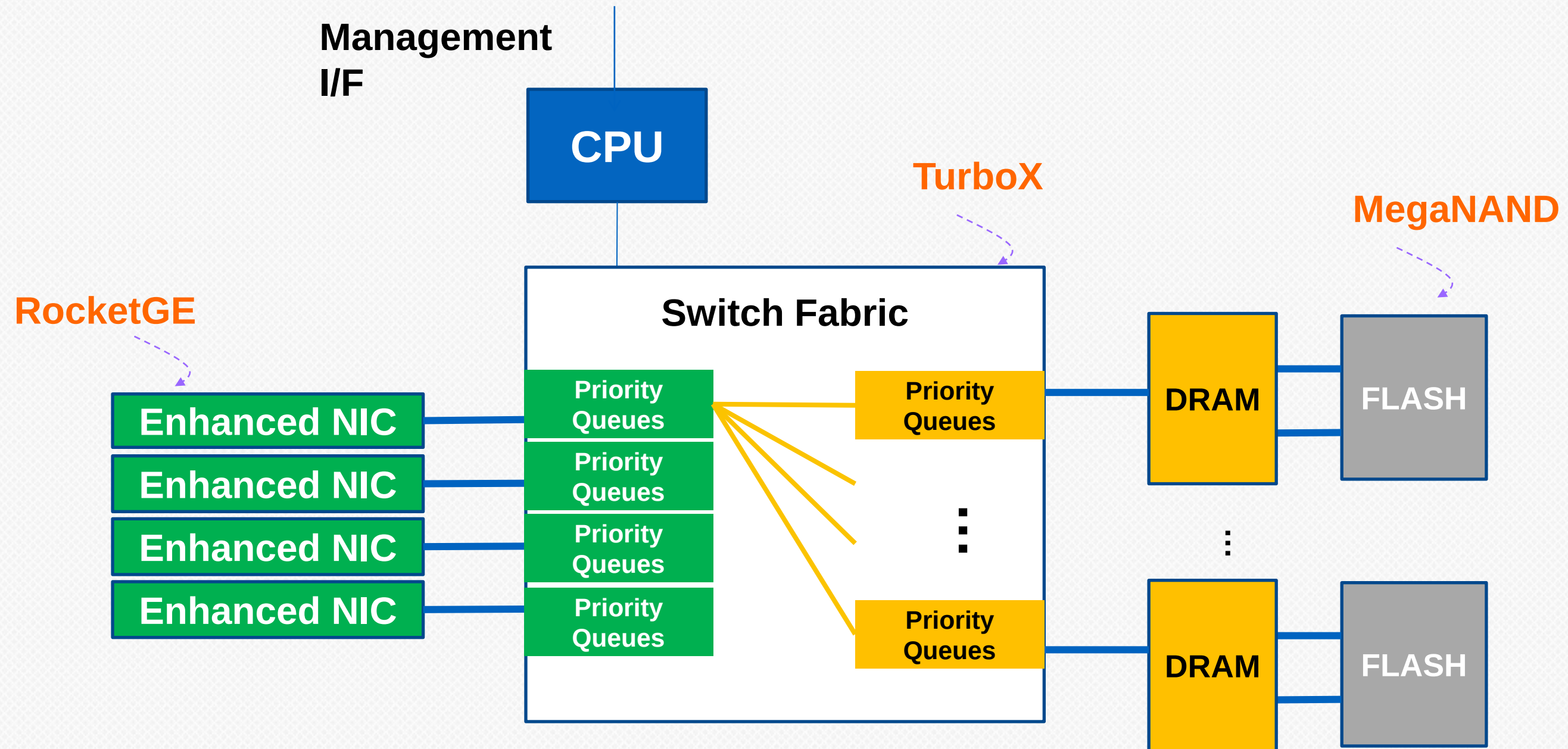
Eliminate CPU from Data Path for IOPS

ASIC based Priority Queue for QoS

Eliminate PCIe fabric for high FLASH density



NetBRIC: Redesigned Architecture

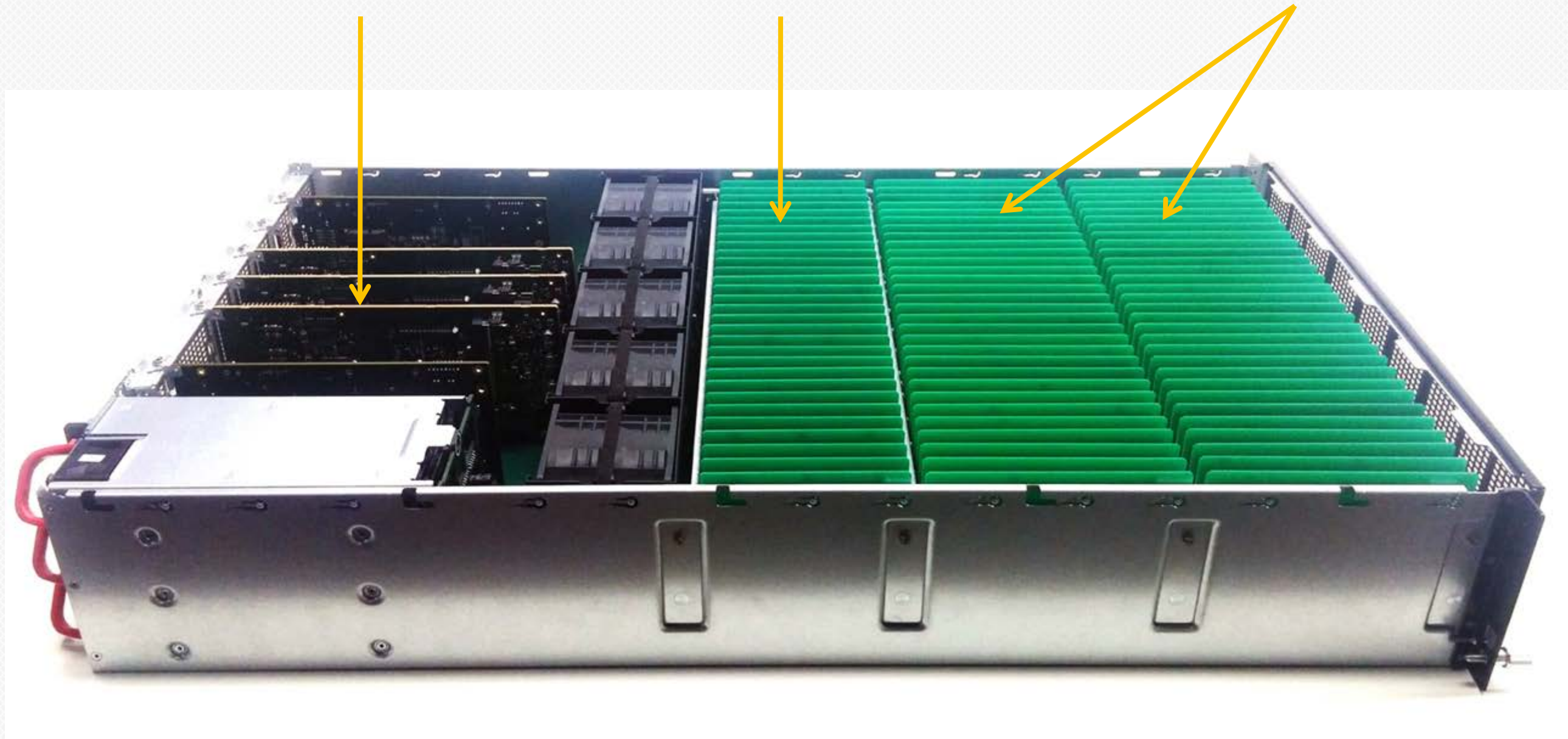


NetBRIC: Redesigned Hardware

Network Controller Boards
4x40GE per adapter

Switch Fabric Boards
with DRAM

NAND FLASH Boards
60 x 8TB



Contribute S5 Storage Controller to OCP community

First Chinese Company to join OCP

First Contribution from China

First ALL FLASH project in OCP platform

v0.1 version, Mar'2015 (Done)

v0.5 version, Apr'2015 (Planned)

Call for partners on ODM, eco-system, solution, etc

Assist on OCP China

Promote OCP to industry companies

Organize meetups

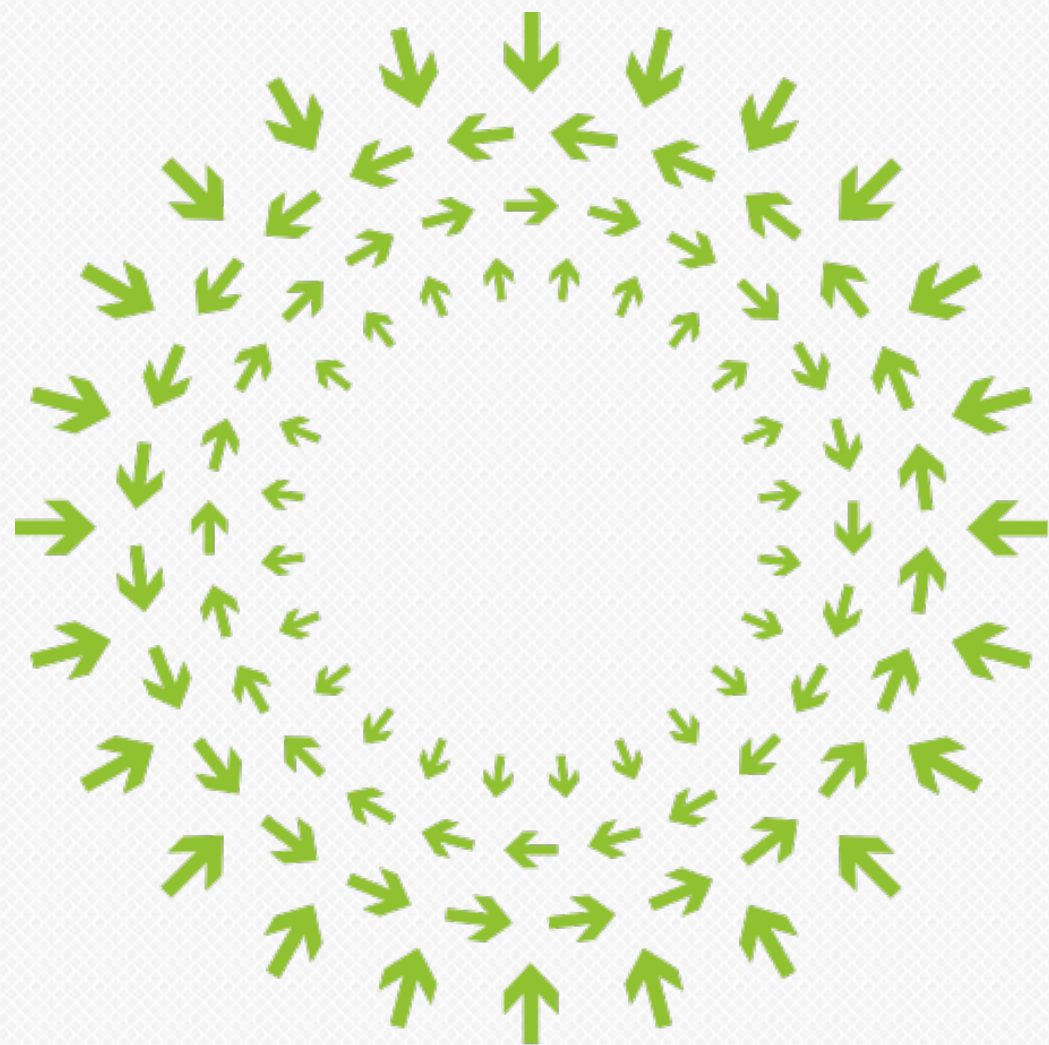
Develop OCP China website and translations



Thanks

For more details, welcome to visit us at **Booth D15**
or send Email to **info@netbric.com**





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Compute Summit

March 10–11, 2015

San Jose