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Next Steps in Samsung's Memory Evolution

Sangyeun Cho, Corporate SVP / Software Development
Memory Business, Samsung Electronics

December 2021

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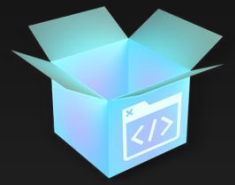
Open Source Journey

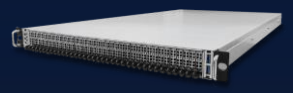
F2FS

Multi-Stream



Open MPDK

OPEN INSPIRED



Mission Peak

Poseidon Project

OPEN INSPIRED

OCP Compliant SSD

2012 ~ 2018 | 2019 | 2020 | 2021

Community Member

Silver Member

Gold Member

Future Technology Initiative

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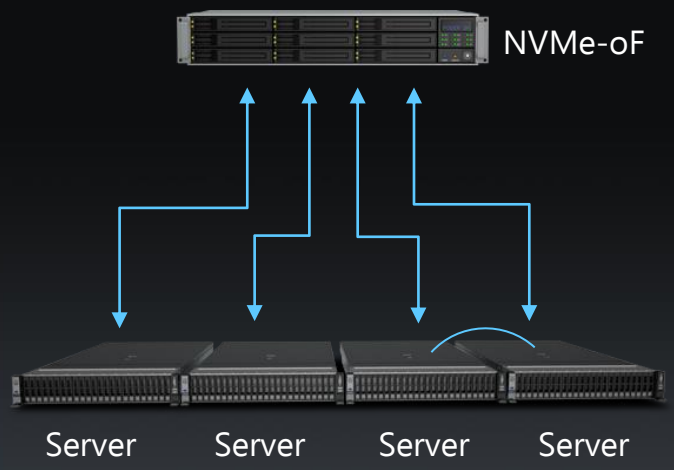
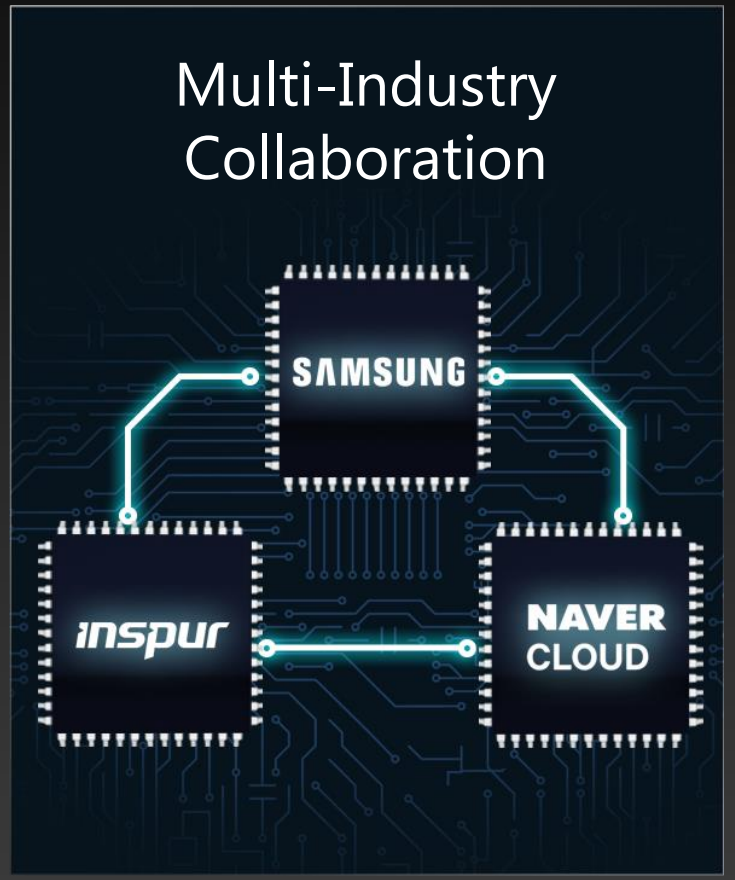
Poseidon V1

Announced in OCP 2020 vSummit

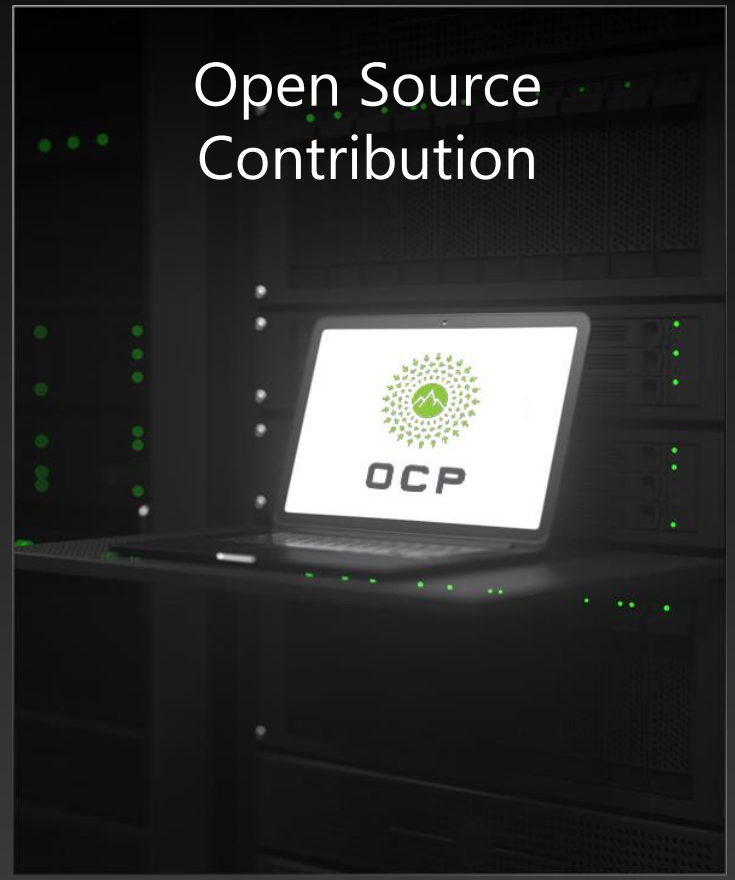
High Performance Storage Ref. Platform



Multi-Industry Collaboration



Open Source Contribution



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Our Accomplishments

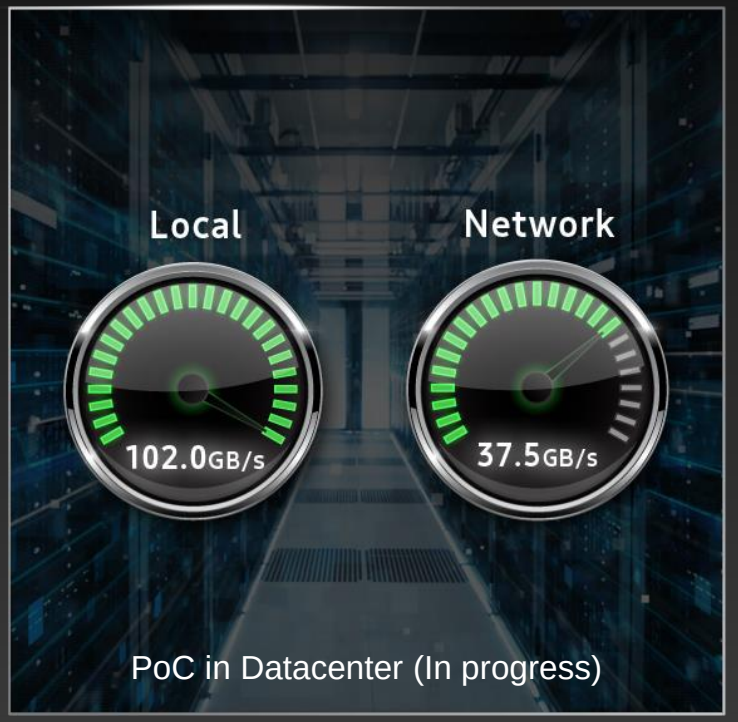
Reference System Development

Launched (March, ’21)

Open Source Contribution

Contributed (April, ’21)

Performance Achievement



PoC in Datacenter (In progress)

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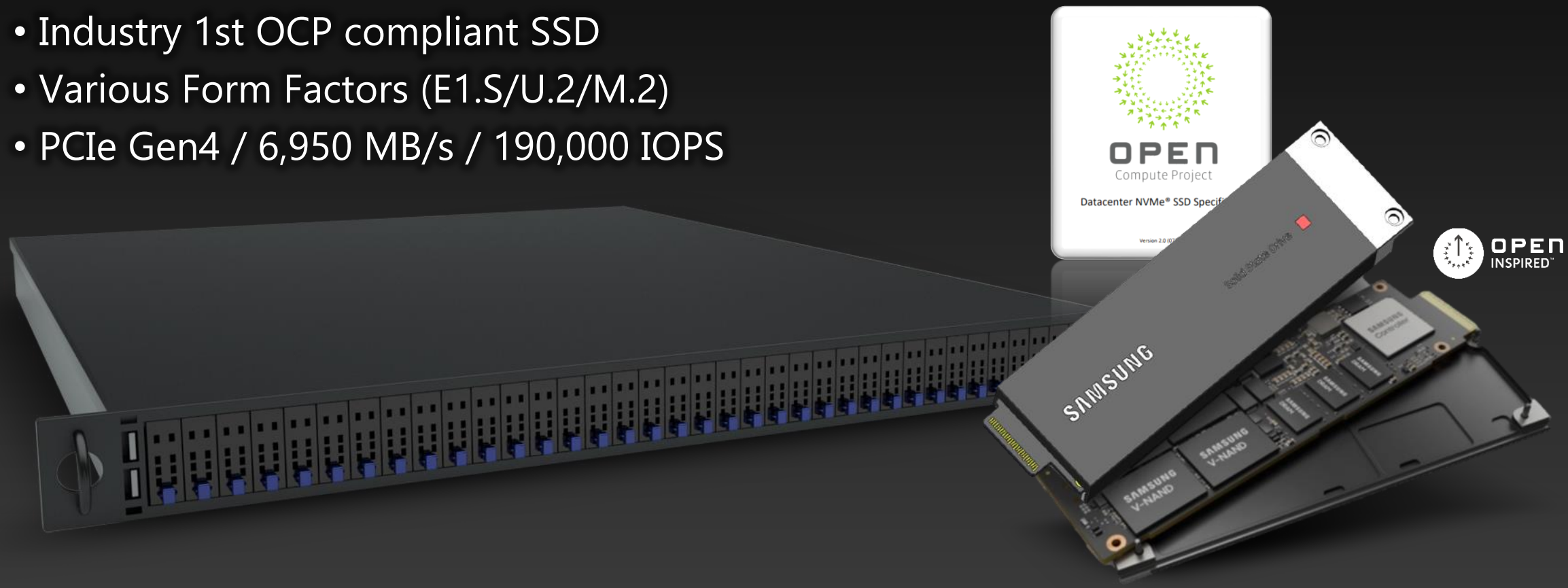
Datacenter NVMe SSD (PM9A3)

- Industry 1st OCP compliant SSD
- Various Form Factors (E1.S/U.2/M.2)
- PCIe Gen4 / 6,950 MB/s / 190,000 IOPS



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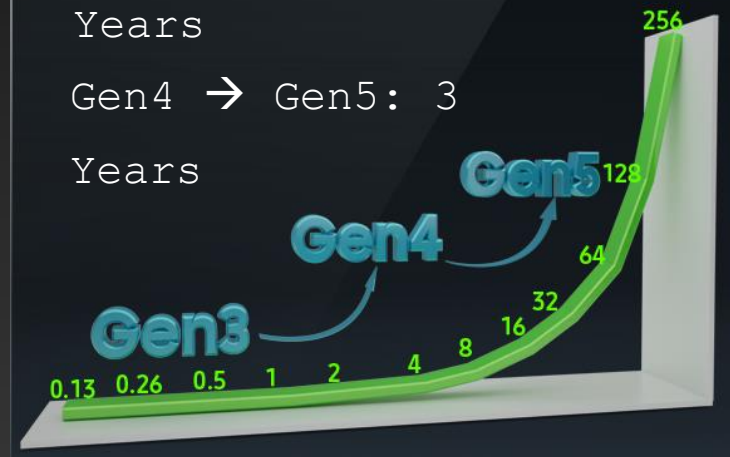
System Trends in Datacenter

High Speed Interface

Gen3 → Gen4: 7 Years

Gen4 → Gen5: 3 Years



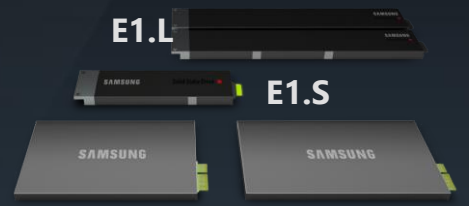
New Form Factor

Traditional Form Factor

M.2

U.2

EDSFF Form Factor



E1.L

E1.S

E3.S

E3.S 2T

Emerging Standards

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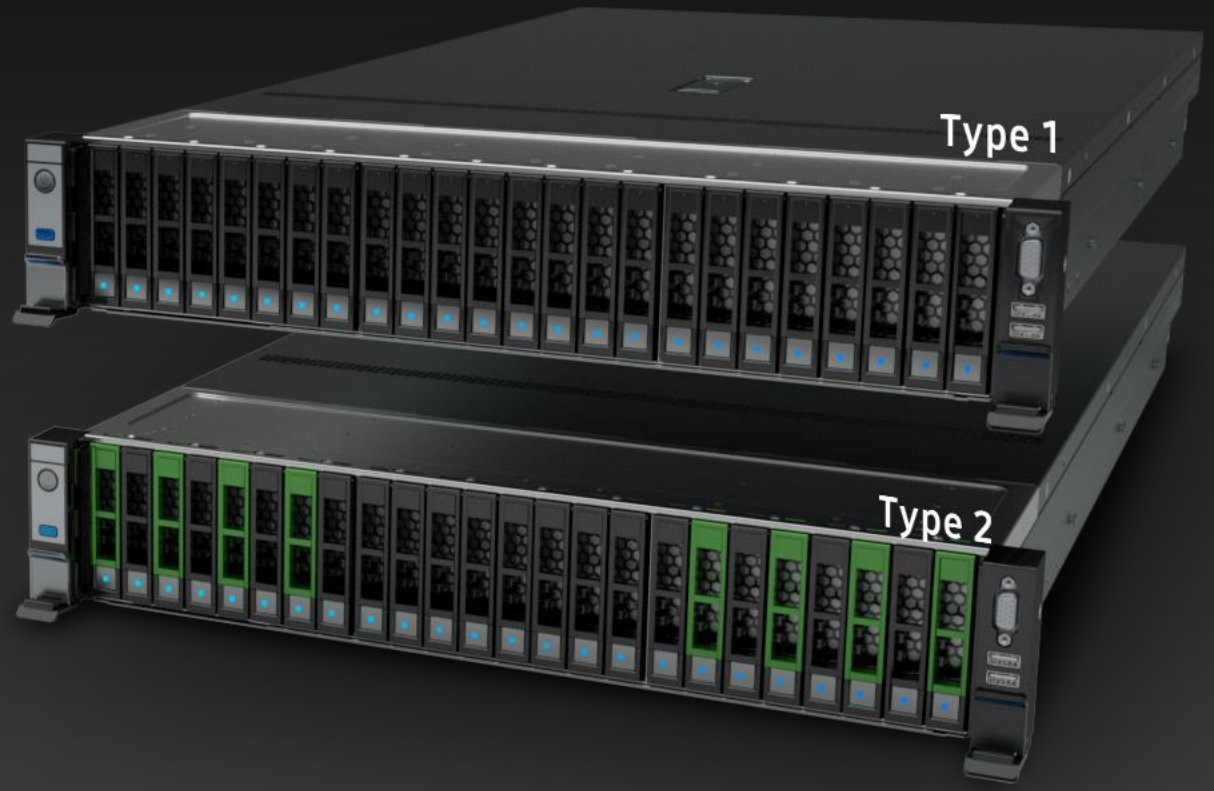
Poseidon V2

PCIe Gen5 based Open HW
Higher Performance

EDSFF E3 Reference
More Capacity

Two Types of Servers



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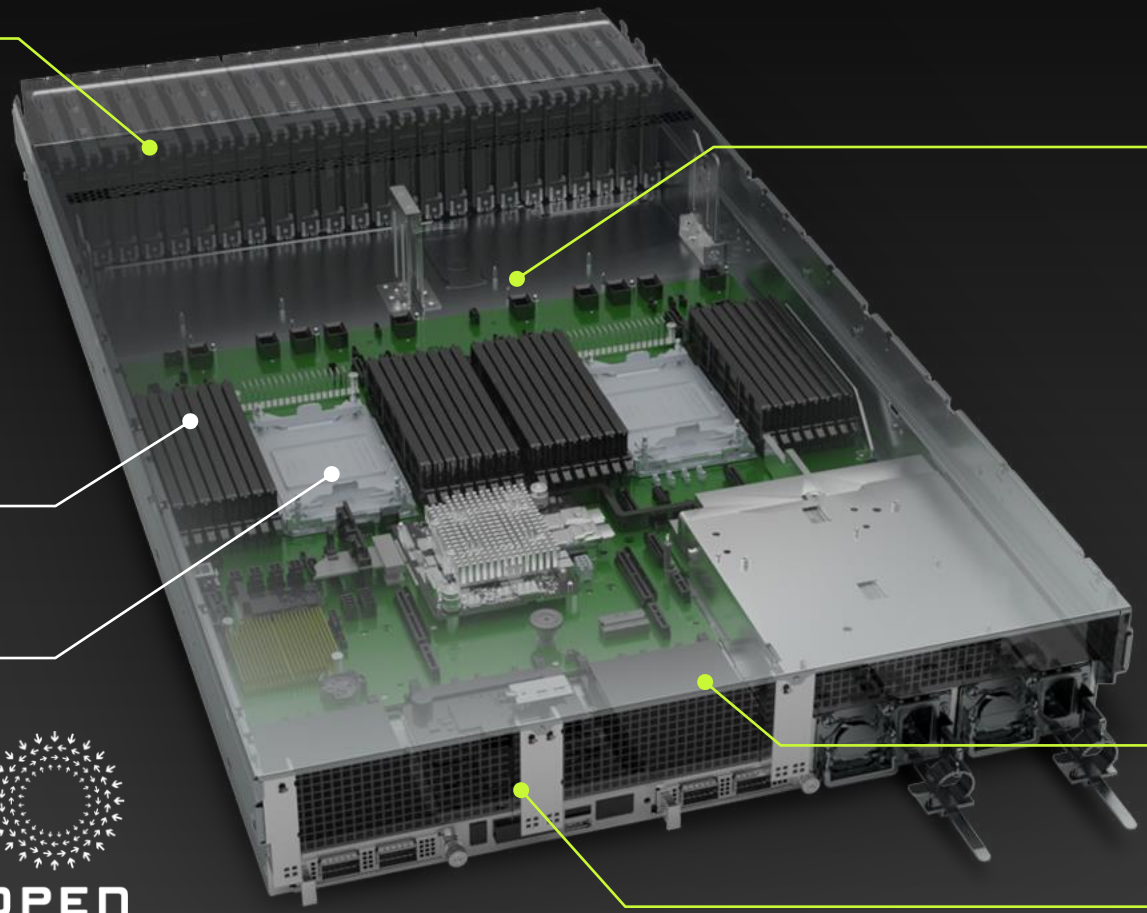
Key Components



OPEN
Compute Project

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Composable Architecture

High-Performance Shared Storage	High-Memory Server For Cloud Service	Accelerator Server For AI/ML
E3.S SSD x 24	CXL Memory Expander x 8 + SSD x 8	E3.S SSD x 8 + SmartSSD x 8

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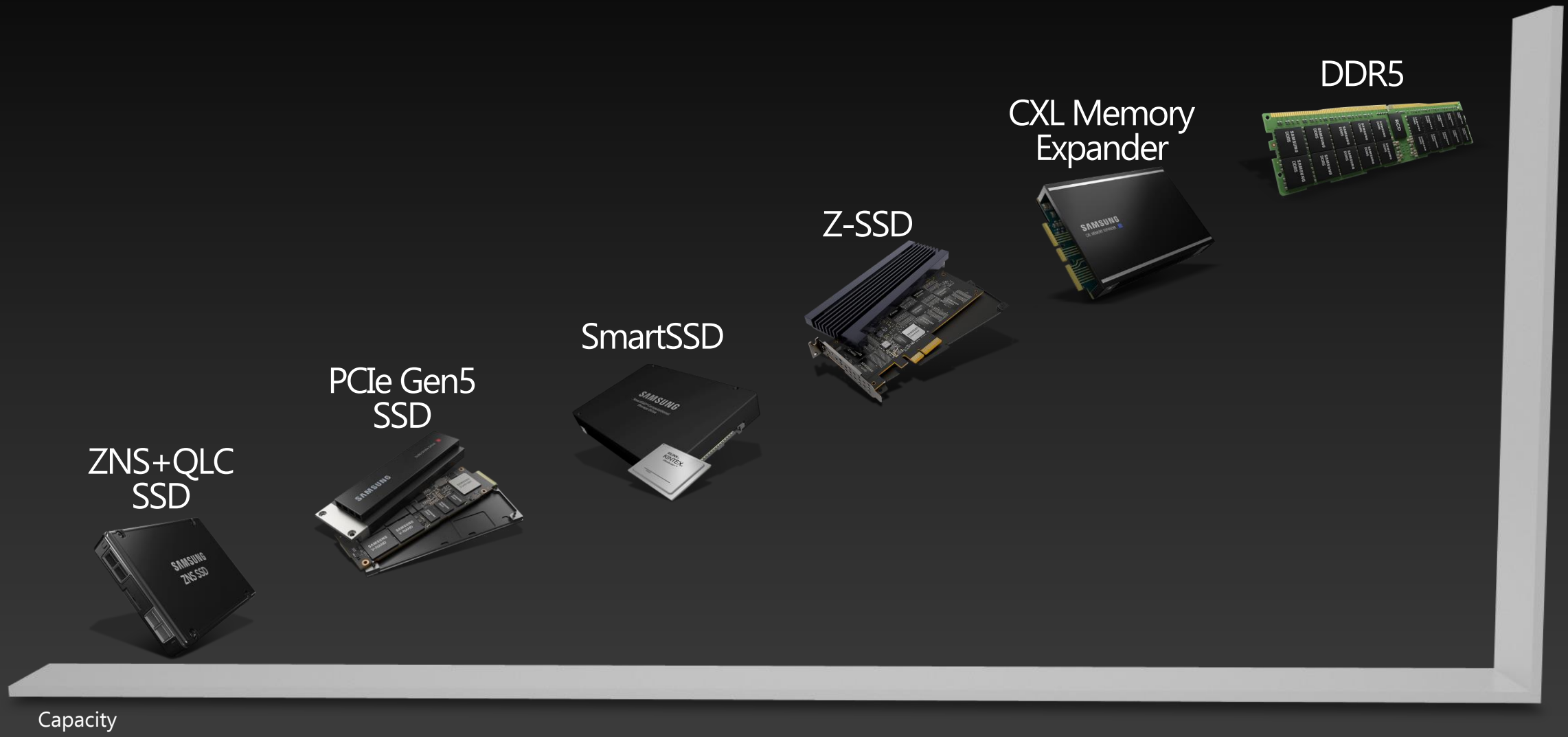
Samsung Solutions in Poseidon



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Poseidon Storage OS

Reference solution for
End-to-End integration
from SSD to Application

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OS Features

Storage Functions

Volume Management
Performance Throttling
Provisioning

Robustness

SW RAID
Multi-path Connection
2 Node HA

Performance Optimization

NUMA-aware Capability
NVMe Friendly IO path
Dedicated APIs

Manageability

Performance Profiler
Development APIs
Resource Monitoring

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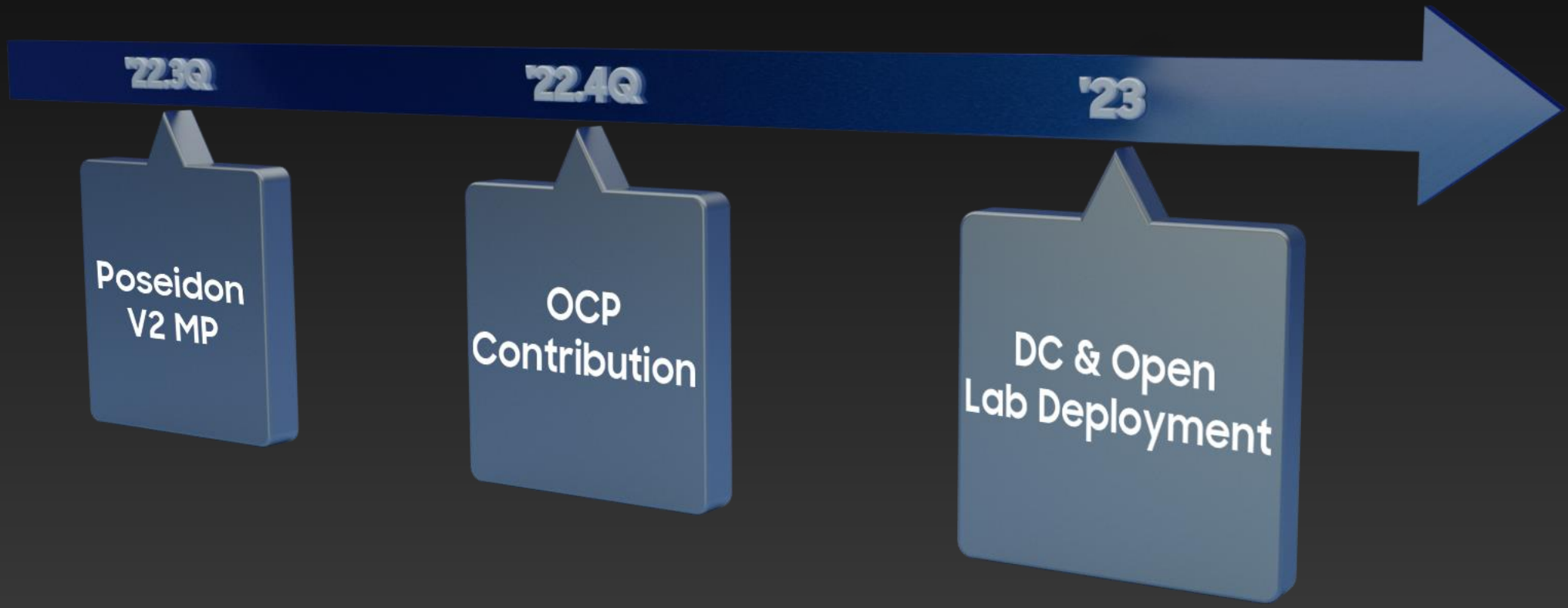
Roadmap



OCP Activities

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- **Datacenter Innovation through Open Source Community**
  - Eco build-up via OCP Sponsorship & Korea Community Support
  - Collaboration with various members in the community
- **Samsung's Contribution**
  - World 1st OCP Compliant SSD PM9A3
  - Poseidon Solutions: EDSFF E1/E3 Reference System & Storage OS
- **OCP Korea Activities**
  - Started in 2019 & co-sponsored by Samsung Electronics
  - Promoting Korea Community through various activities (Tech Day / Meetup / SNS)

KOREA
Regional Community

Join OCP Korea Community

- ✓ **Email: jungsoo.kim@opencompute.org**
- ✓ **Official Facebook Group :** https://www.facebook.com/groups/ocpkorea
- ✓ **Mailing List :** https://ocp-all.groups.io/g/OCP-Korea

OPEN Compute Project

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