SNIA SSSI | SOLID STATE STORAGE

# SNIA's SSSI
# Solid State Storage Initiative

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# SNIA at a glance

SNIA SSSI | SOLID STATE STORAGE

**160**
unique member companies

**3,500**
active contributing members

**50,000**
IT end users & storage pros worldwide

Learn more: **snia.org/technical**

**@SNIA**

# The Trend: Memory & Storage Convergence

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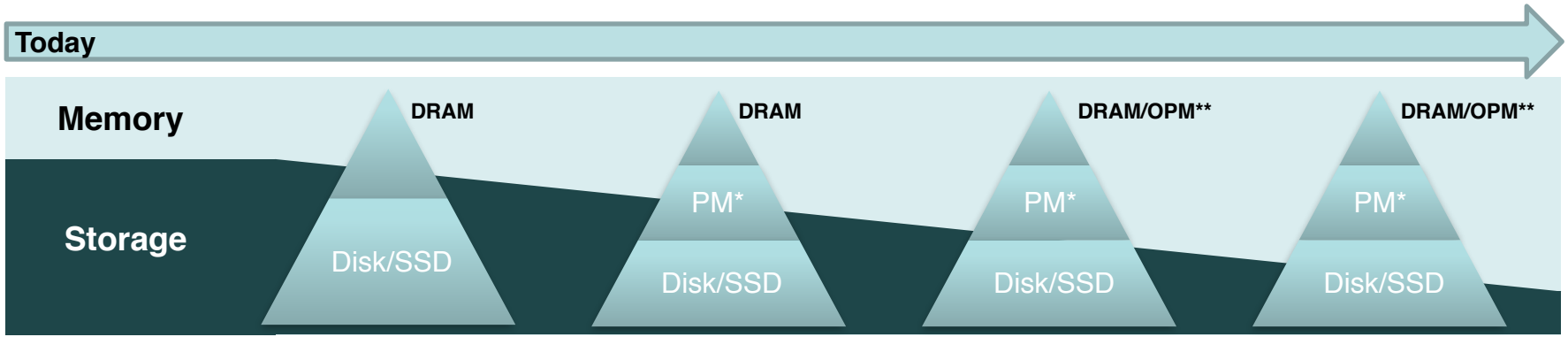
- **Volatile and non-volatile technologies are continuing to converge**




*PM = Persistent Memory

**OPM = On-Package Memory

**New and Emerging Memory Technologies**

| | | |
|---|---|---|
| HMC | 3DXPoint™ Memory | Low Latency NAND |
| HBM | MRAM | |
| RRAM | PCM | Managed DRAM |





Source: Gen-Z Consortium 2016

# Key 2018 SNIA SSI Initiatives

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- **Persistent Memory (PM)**
  - Drive system memory and storage into a single, unified “persistent memory” entity, with OS and application development & support
  - Support development of NVDIMM as platform for PM hardware
  - Extend persistent memory to data center scale with activities in persistent memory over fabrics (PMoF)
- **Storage Workloads**
  - Support capture of Real World Storage Workloads (RWSWs) for data center, enterprise, and client use cases
  - Workloads available for public review and use by SNIA Technical Work Groups in the development of SNIA Technical Positions.
- **Performance Benchmarks**
  - Define and develop industry standard tests and methodologies for the comparative performance test of solid state storage
  - PTS 2.0 benchmark tests for enterprise and client solid state storage
  - Investigate appropriate benchmark testing for Persistent Memory

# Persistent Memory (PM) Vision

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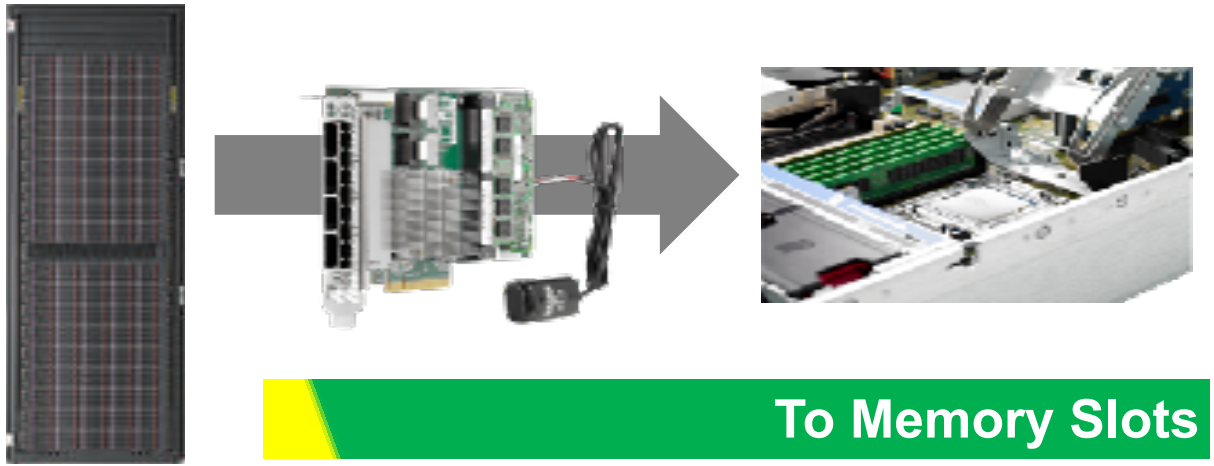
## Persistent Memory Brings Storage



**To Memory Slots**

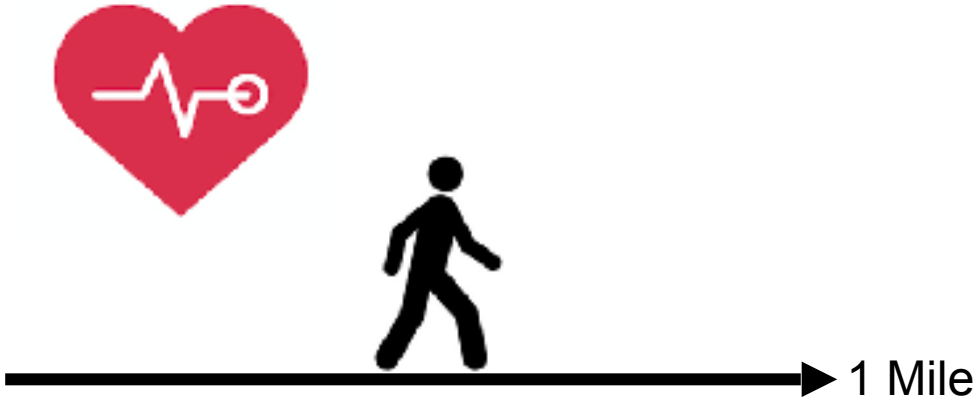
*Fast*
Like Memory

**Persistent**
Like Storage

- For system acceleration
- For real-time data capture, analysis and intelligent response

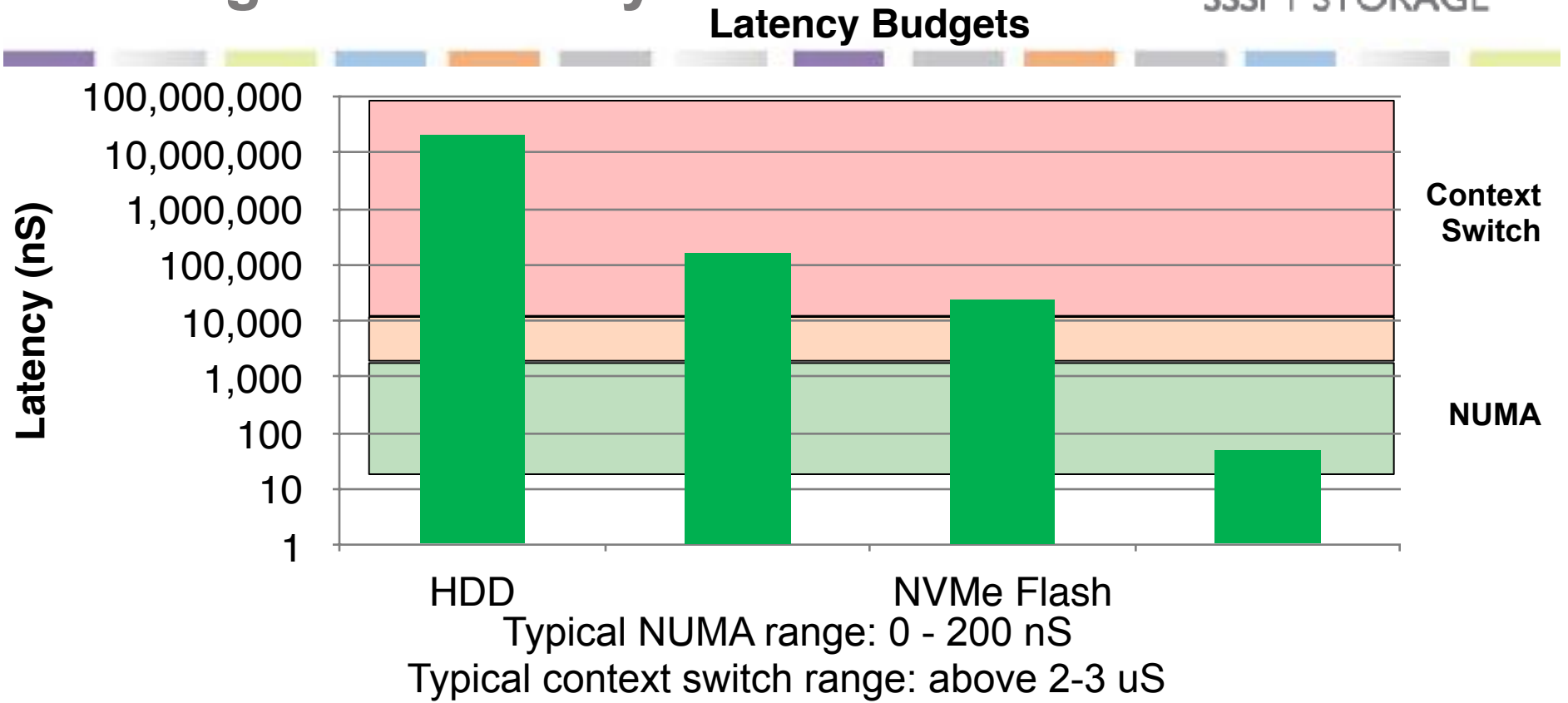
# Relative media speeds

- Memory (10's ns)
- SSD (10's us)
- HDD (10's ms)




# Storage vs. Memory





# Technology support driven thru TWGs and SIGs

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- Educate developers and users on Persistent Memory (PM) and Solid State Storage
- Develop and promote models and architectures
- Collaborate with leading industry alliances and organizations

- TWG (Technical Workgroups)
  - NVM Programming Model
  - Solid State Storage Device (S3)
  - Solid State Storage Systems (S4)
- SIG (Special Interest Groups)
  - NVDIMM
  - Data Recovery / Erase
  - PCIe SSD Committee
  - Technical Development Committee

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# Technology Support from SNIA TWGs

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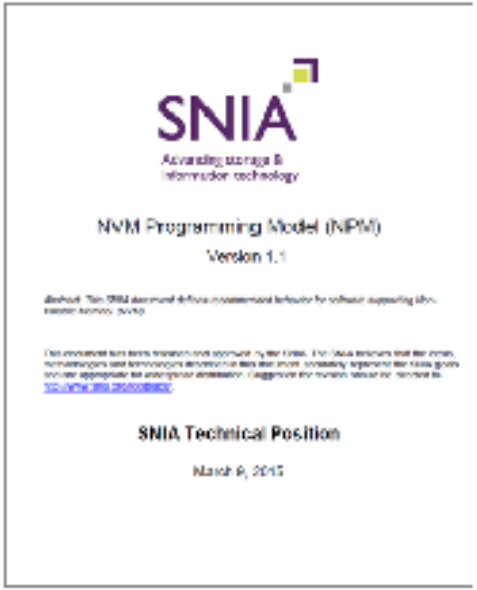
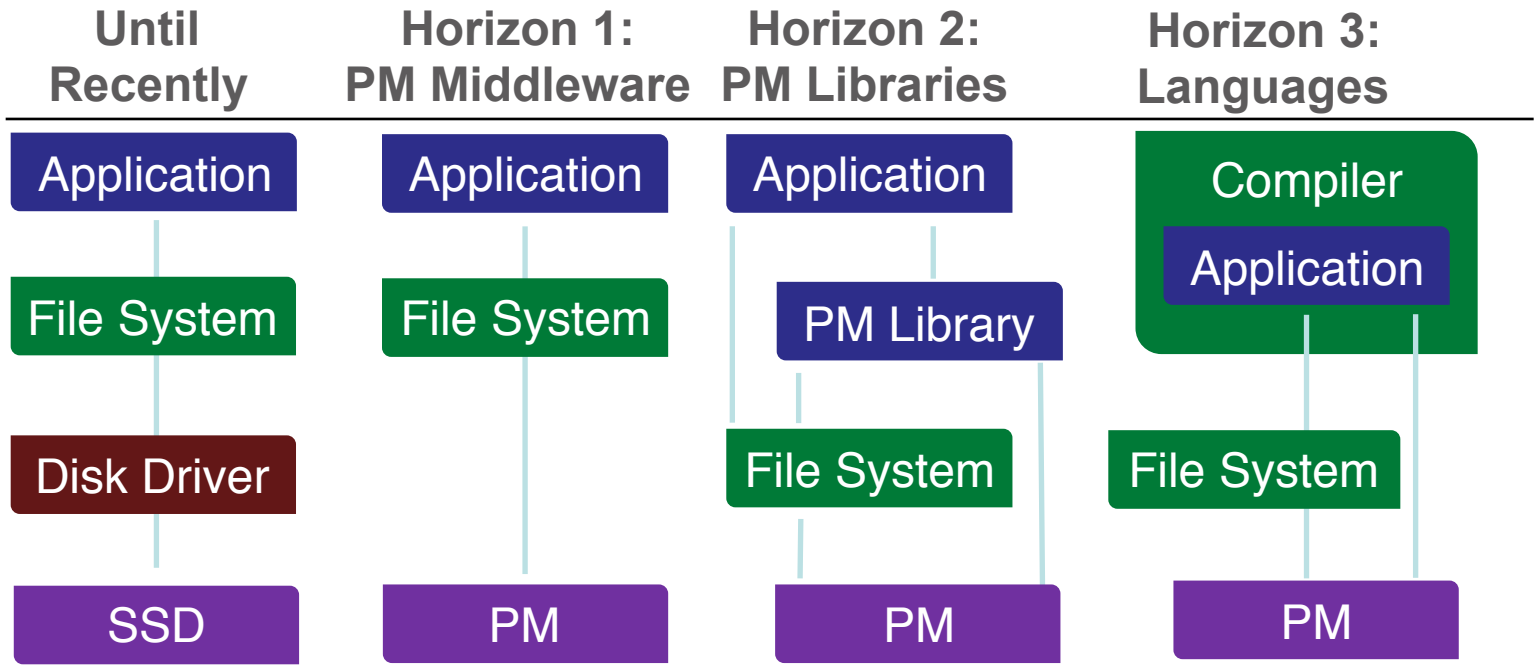
## NVM Programming TWG & the NVM Programming Model

- 40 contributing SNIA member companies
- Rallying the industry around a view of Persistent Memory that is:
  - Application centric
  - Achievable today
    - NVDIMMS (today)
  - Built for tomorrow
    - New: Media, Applications, Networking, Processors
- Vendor neutral
  - Supported in MS Windows & Linux
  - DAX (“Direct Access for files”)




Next Step: Persistent Memory over Fabrics (PMoF)

# Application Horizons



# NVDIMM Special Interest Group

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- Member companies collaborate to:
  - Provide education on how system vendors can design in NVDIMMs
  - Communicate existing industry standards, and areas for vendor differentiation
  - Help technology and solution vendors whose products integrate NVDIMMs to
  - Communicate their benefits and value to the greater market
- Develops vendor agnostic user perspective case studies, best practices and vertical industry requirements
- Evangelizes their activities at conferences, tradeshows, and by webcasts and presentations

# Technology Support from SNIA SIGs

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## NVDIMM Special Interest Group

- 16 member companies
- Contributing to
  - Common PM Specifications
  - Common PM Messaging
  - Common PM Taxonomy
  - PM Ecosystem Development
- Demonstrating that Powerful Persistent Memory is here

**NVDIMM-N**

- ✓ Memory-mapped DRAM
- ✓ JEDEC-standard
- ✓ Easily exploited in **Microsoft Windows Server 16** for extremely high performance read/write workloads, such as SQL

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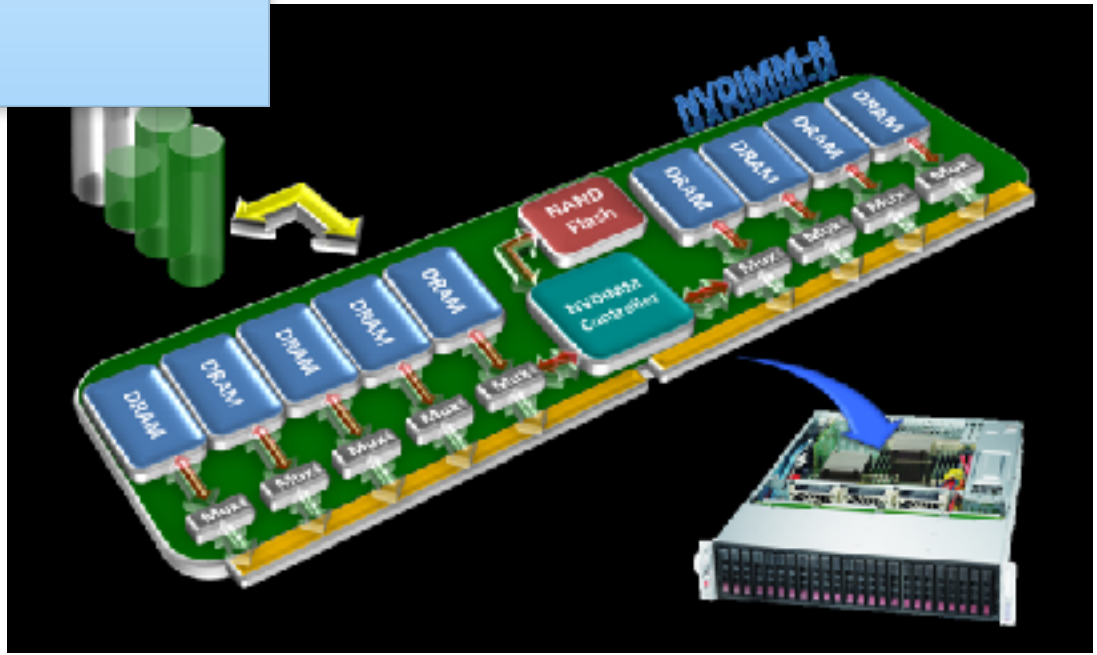

# NVM Programming Model & NVDIMMs

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- The NVM Programming Model is perfect for NVDIMMs
  - Multi-vendor PM Mode memory mapped storage available today
  - On display in the SNIA exhibit booth
- Use the NVM programming model with NVDIMMs
  - Enable a path forward for applications
  - Lead the way to innovation in NVM optimized software

# SNIA SSSI in Summary

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- TWG (Technical Workgroups)
  - NVM Programming Model
- SIG (Special Interest Groups)
  - NVDIMM SIG

**SNIA is Leading the Industry in Persistent Memory**

# Join Our Work in

SNIA SSSI | SOLID STATE STORAGE

*Advancing Solid State and Persistent Memory*

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**Access** technology visionaries and leading companies in the industry

**Collaborate** to guide technology strategic & technical directions

**Influence** Industry messaging and best practices

**Email** asksssi@snia.org to be included in open calls on technology topics and to learn more about how your company can join SNIA, the SSSI, and a SNIA Regional Affiliate

# Thank You!