



SDXI TWG

2024 Review and 2025 Plans

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SDXI TWG 2024 Accomplishments

- SDXI TWG Charter
 - <https://www.snia.org/sdxi>
 - The Smart Data Accelerator Interface (SDXI) is a standard for a memory-to-memory Data Mover and acceleration interface.
- Recent completed work – summary
 - TWG Formed in 2020
 - 1st SDXI Proof of Concept Demo at Memcon 2024 by a member company (AMD)
 - SDXI Presentation @CMS SNIA Summit 2024
 - SDXI presentation @FMS2024
 - SDXI v1.1 preview presentation @SDC 2024
 - https://www.youtube.com/watch?v=W24NTa5E0WE&list=PLH_ag5Km-YUa-zoYgkl6l8Q1i4JHizk_U&index=4
 - SDXI+CS subgroup panel presentation @SDC 2024
 - https://www.youtube.com/watch?v=O5_COTXN8T0&list=PLH_ag5Km-YUa-zoYgkl6l8Q1i4JHizk_U&index=15
 - Highly attended SDXI BoF @SDC 2024
 - 20+ feature wishlist documented in BoF interaction
 - SDXI presentation @OCP 2024
 - <https://www.youtube.com/watch?v=Zmeg8C7pfjU&list=PLAG-eekRQBSirit-Eh2vYdkSWsfzbypgV&index=15&t=539s>
 - SDXI v1.1 draft for public review released!
 - <https://www.snia.org/sites/default/files/technical-work/sdxi/draft/SDXI-Specification-v1.0.3r5.pdf>
 - New data mover operations for smart acceleration (Posix Memory ops, Double Copy, CRC, DIF/DIX)
 - A framework for Definable Operations
 - PASID Privileged Mode configuration
 - Read Barrier Feature support
 - Memory Ordering fixes and improvements
 - SDXI v1.0.a errata released
 - <https://www.snia.org/sites/default/files/technical-work/sdxi/release/SNIA-SDXI-Specification-v1.0a-bundle.zip>
 - 22 SNIA Member companies, 80+ SNIA individual members from member companies on the roster as of Dec 2024

SDXI TWG Work Items slide 1 of 2

■ SDXI Software Work items

- Release libsdxi v1.0
 - OS-independent user space software library for applications
 - Encourages adopting companies to work towards compliant software implementations and driver models.
- TWG is continuing to enable efforts on SDXI driver for Operating systems
 - Linux and Windows Drivers developed outside SNIA
- TWG is discussing efforts on SDXI emulation implementation
 - Need volunteers, and contributors!

■ Release SDXI v1.1

- SDXI specification items remaining for v1.1
 - Connection Management Architecture review to ensure forward and backward compatibility
 - Security Review/fixes and Threat modeling
 - SDXI device operation in Confidential Computing environments(Single Address Space)

SDXI TWG Work Items slide 2 of 2

- SDXI specification features for consideration in v1.2 and Beyond
 - Architected Connection Manager Specification
 - New Data mover operations (Compression, Encryption, AI related memory Operations)
 - Scalable IOV based device model
 - Memory data movement across Confidential Memory regions(Confidential Computing use case) – Multi-Address Space solution
 - SDXI Interhost Support (Beyond what is supported in v1.0, and v1.1)
 - SDXI Chaining/Compound Operations
 - Resumable Operations for certain class of errors
- Computational Storage TWG collaboration
 - A joint SDXI+CS Subgroup is working on combined architectures, and proposals to complement NVMe storage with SDXI operations
- CMS Community
 - Evangelizing SDXI work at Industry conferences.
- OCP
 - Evangelizing SDXI specification and public artifacts at OCP groups, e.g., Near-Data Processing Workstream(OCP Server project)

SDXI TWG Membership as of 1/15/2025

- Advanced Micro Devices(AMD)
- Broadcom Inc./VMware
- Dell Inc.
- Hewlett Packard Enterprise
- Huawei Technologies Co. Ltd
- IBM(includes Red Hat, Inc)
- Inspur Electronic Information Industry Co Ltd.
- KIOXIA
- Lenovo
- Magnition
- Marvell
- Micron Technology Inc.
- Microchip Technology Inc.
- Micron
- Microsoft Corporation
- Samsung Electronics Co., LTD
- Scaleflux
- Solidigm
- StorageX Technology, Inc
- Western Digital
- ZeroPoint Technologies AB
- Independent members

SDXI TWG Participation

- What is the expected industry impact of this work
 - Standardize data movement across multiple address spaces securely with SDXI Function implementations
 - Standardize in-memory data transforms with accelerators
 - Context:
 - Software memcopy is the current data movement standard
 - Takes away from application performance and incurs software overhead to provide context isolation.
 - Offload DMA engines and their interface are vendor-specific and not standardized for use by user-level software.
 - The SDXI TWG -
 - Develops and standardizes an extensible, forward-compatible memory to memory data mover interface that is independent of actual data mover implementations and underlying I/O interconnect technology.
- What is the industry segment relevance
 - System vendors (OEMs, cloud vendors), OS vendors (including Hypervisor software), ISV software vendors, HW acceleration vendors (including AI accelerators), Storage Vendors, HW IP vendors, Test and Measurement vendors, AI Solution Frameworks (Pytorch, Tensorflow)
- Why you should join and participate in this TWG
 - Influence, contribute, learn
- Who to contact for additional information
 - sdxitwgchair@snia.org