STA
SCSI Trade Association

Build a Better Data Center with 24G SAS

STA WEBCAST

Presented by:

Rick Kutcipal, Dennis Martin and Bill Martin

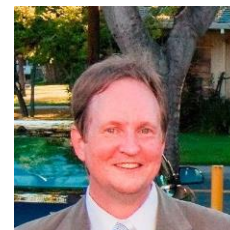This webcast available at https://www.brighttalk.com/webcast/663/290969

Rick Kutcipal, President, SCSI Trade Association; Product Planner, Broadcom Ltd.

Dennis Martin, President, Demartek

Bill Martin, Co-chair, SNIA Technical Council; Chair, INCITS T10; SSD/IO Standards, Samsung Electronics

SNIA at-a-glance

160
unique member
companies

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active contributing
members

50,000
IT end users & storage
pros worldwide

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@SNIA

STA at-a-glance

◆ 20 Year Old Industry Alliance of Key Ecosystem Partners

◆ STA Promotes Small Computer System Interface ("SCSI")

◆ We Welcome All to Join STA & Promote / Contribute to the Evolution of SCSI

Storage industry leaders are members of STA

Amphenol®   BizLink™   BROADCOM connecting everything®   ConnPro Industries Inc.   FIT Foxconn Interconnect Technology

Fujikura   intel   MARVELL®   Microsemi Power Matters.   molex one company › a world of innovation

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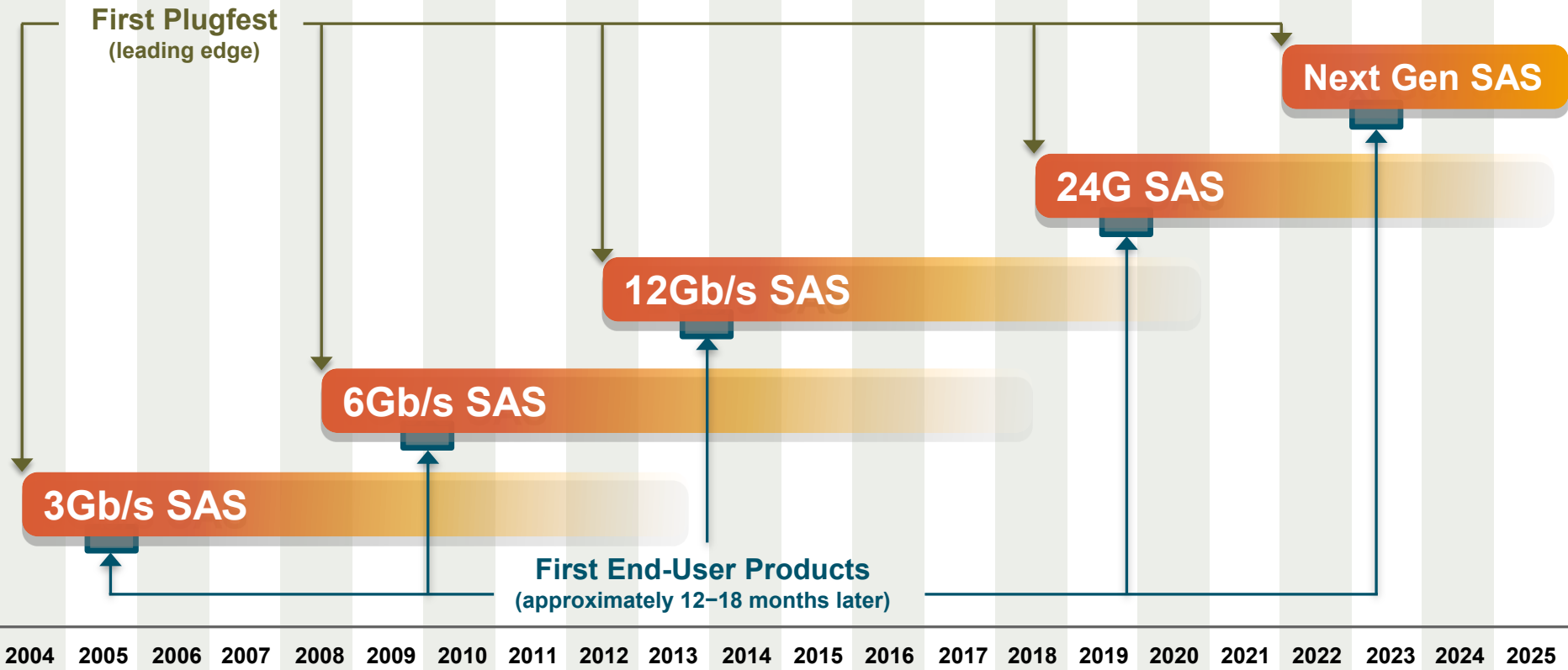
◆ 24G SAS Update – Rick Kutcipal

◆ What's New – Rick Kutcipal
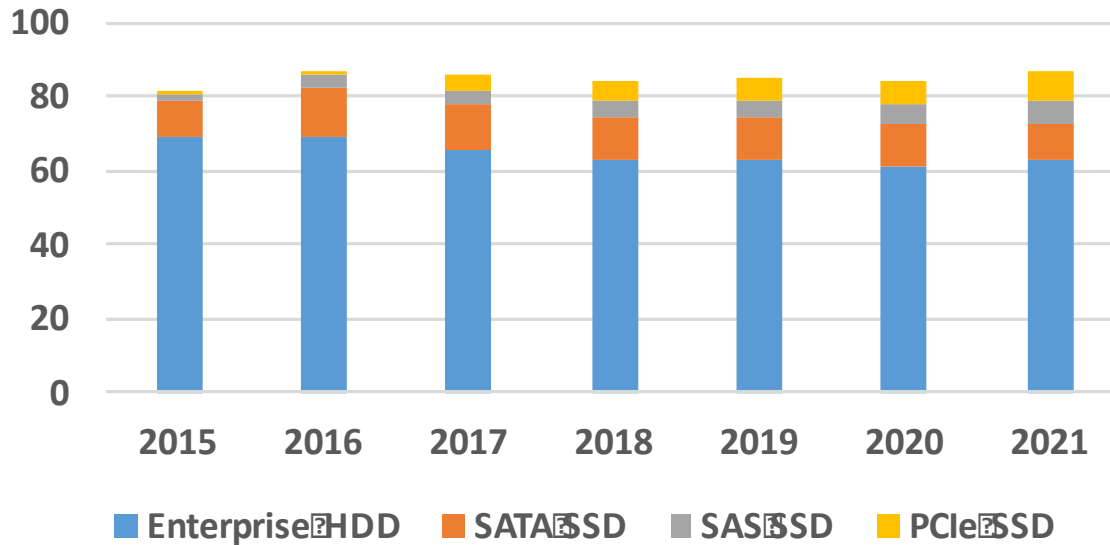
◆ Build a Better Data Center with 24G SAS – Dennis Martin

SAS Technology Roadmap

First Plugfest
(leading edge)

Next Gen SAS

24G SAS

12Gb/s SAS

6Gb/s SAS

3Gb/s SAS

First End-User Products
(approximately 12−18 months later)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025

Enterprise Media Shipments (Mu)

SAS Infrastructure Enables >90% of Storage Devices in 2021

Source: TRENDFOCUS 2017 Long-Term Forecast

◆ 22.5 Gbaud

◆ Efficient Encoding – 128b/130b

◆ 20 Bit Forward Error Correction

● Targeting a 30dB channel

◆ APTA (Active PHY Transmitter Adjustment) – Continuous Adaptation

◆ Fairness Enhancements

◆ Other Features Aligning with 24G SAS

● MultiLink SAS™ - wide port SAS for increased performance

● Storage Intelligence – optimized for solid state storage

● Zoned Block Commands – enhancements for capacity-optimized media (SMR)

About Demartek

◆ Industry analysis and ISO 17025 accredited test lab

◆ Lab includes enterprise servers, networking and storage (6/12Gb SAS, 10/25/40/50/100GbE, 8/16/32GFC, NVMe)

◆ We prefer to run real-world applications to test servers and storage solutions (databases, Hadoop, etc.)

◆ Demartek is an EPA-recognized test lab for ENERGY STAR data center storage testing

◆ Website: www.demartek.com/TestLab

Demartek Storage Interface Comparison

◆ Free reference page on demartek.com

- www.demartek.com/Demartek_Interface_Comparison.html
- Search engine: "storage interface comparison"
- Includes transfer rates, history, roadmaps, cabling, connectors, etc.

◆ Demartek is NOT a product vendor

- We use these technologies in our lab:

24G SAS

- ◆ Bandwidth
  - Each 24G SAS lane has 19.2 Gbps of bandwidth
  - Each PCIe 4.0 lane has 15.8 Gbps of bandwidth

- ◆ Compatibility
  - 24G SAS is compatible with SATA, 6Gb/s SAS and 12Gb/s SAS
  - Backwards compatibility allows mix-and-match

- ◆ Scales to thousands of devices
 - Built-in support from very small to very large-scale implementations

24G SAS Dual-port & MultiLink SAS™

◆ Dual-ported

- Typically used for redundancy in either active/active or active/passive configurations

- Devices have an "A" and "B" channel
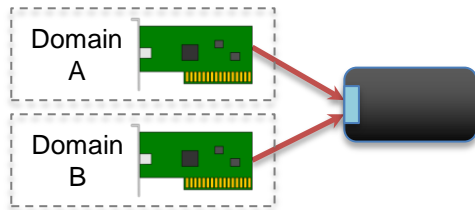
Dual-port example
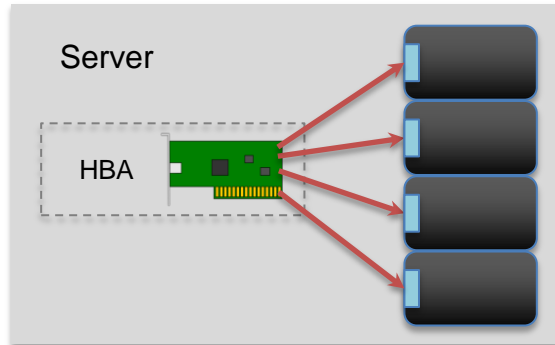
◆ MultiLink SAS™

- Provides the option for additional bandwidth and additional host connections

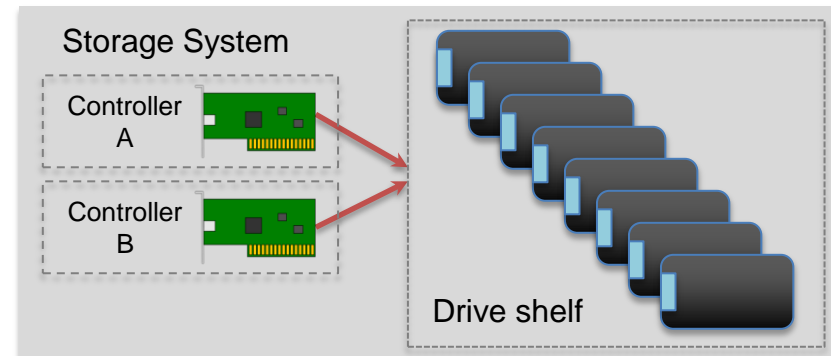- Can provide 2, 3, 4, 8 or more SAS lanes
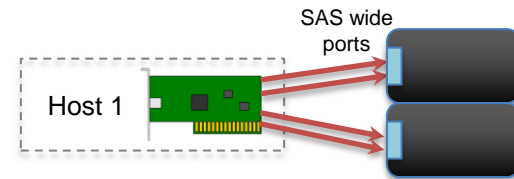
MultiLink example

◆ Server Use Case

- Typically want matching number of HBA ports and devices to have balanced bandwidth between HBA and device ports

◆ Storage Array Use Case

- Bandwidth oversubscription possible because devices typically are not generating full bandwidth I/O all the time

- System architected to handle this

24G SAS Support

- Hot-swap (surprise insert/removal)

- Multi-path I/O (MPIO)

- Broad operating system and hypervisor support
  - OEMs are moving to 24G SAS

- Management infrastructure

Benefits of SAS White Paper

- ◆ Public white paper
- ◆ SAS ecosystem
- ◆ Expanders, JBODs
- ◆ Dual-ported drives
- ◆ MPIO, Hot-swap
- ◆ Power consumption
- ◆ Cabling and connectors

http://www.demartek.com/Demartek_Benefits_of_SAS_2017-07.html

http://www.scsita.org/content/library/the-benefits-of-sas/

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