DDN @ SambaXP 2020

Sven Oehme – Chief Research Officer

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my history with Samba ☺

1998 - worked on AFS and leveraged Samba for SMB exports to windows

2000 - contracted Volker to fully support Samba on AIX on top of AFS

2001 - started working on GPFS

2005 - convinced Volker and Tridge that you can cluster SMB ☺

2006 - the first commit of CTDB landed

2007 – launch of Service Offering - SOFS

2010 – launch of Scale Out NAS - SONAS

2016 – DDN Media Scaler 2.0

2019 - added scale out SMB Support to EXAScaler

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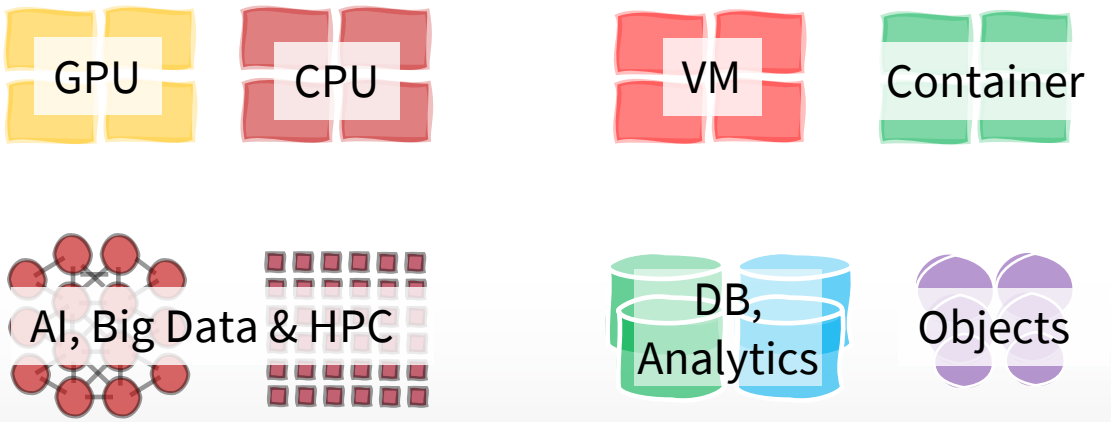
Who is DDN ?

DDN is the World's Largest Privately held Storage Company

At Scale | Enterprise



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At Scale Storage & Data Management

DDN's mission is to **change the way data moves and is managed** for the AI-powered era to **bring simplicity and hyper efficiency** to our customers.

No more slow applications and inefficient Flash implementations. No more inhibitors to scale. No more failed AI projects with immature and unproven Software and Hardware.

- >1000 Employees
- 10 Technology Centers
- >10,000 Customers
- 150+ Patents

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Our Customers

AI and Analytics Solutions

- Security at the scale you need to accelerate cancer research and personalized medicine
- The world's largest autonomous car solutions
- Fast, in-place analysis of all your financial data
- Low latency systems designed for real time image processing

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NVIDIA SuperPOD

Optimized for DGX, Installed and record-breaking in ½ day

40 AI400X Appliances (15 PB ALL NVME, 1.6TB/sec)

First 10 appliances deployed onsite in 4 hours

Filesystem delivered > 400GB/s read throughput out of the box

Fastest production system on IO500 10 node challenge at SC19

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US Autonomous Driving

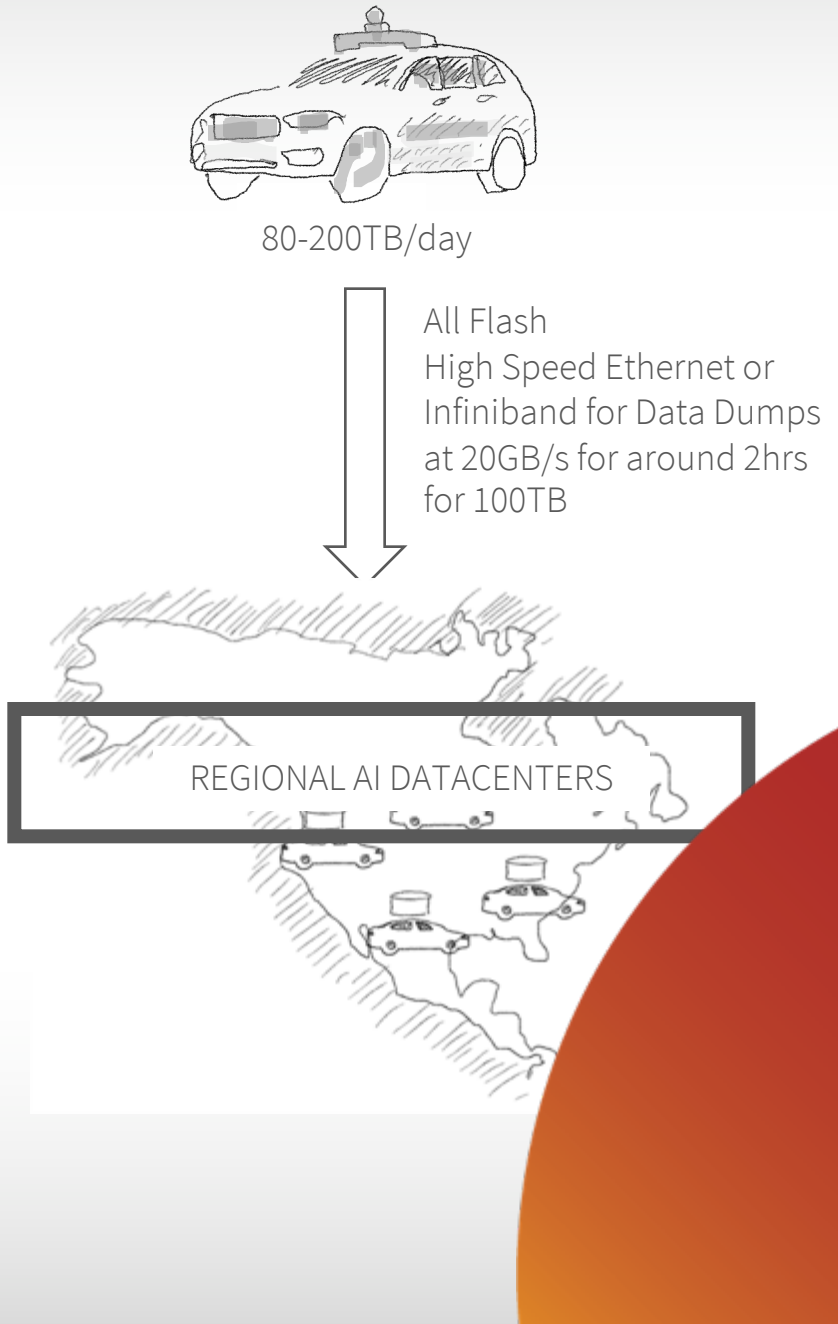
HyperScale R&D made practical with EXAScaler

Hyperscale Autonomous Driving solution across the US with EXAScaler

Performance at Web Scale – over 1.6TB/s Aggregate Performance.

Cost Effective approach to very large capacities and flat namespace performance for each Region.

DDN provided complete at scale management environment for provisioning and monitoring.



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European Autonomous Driving

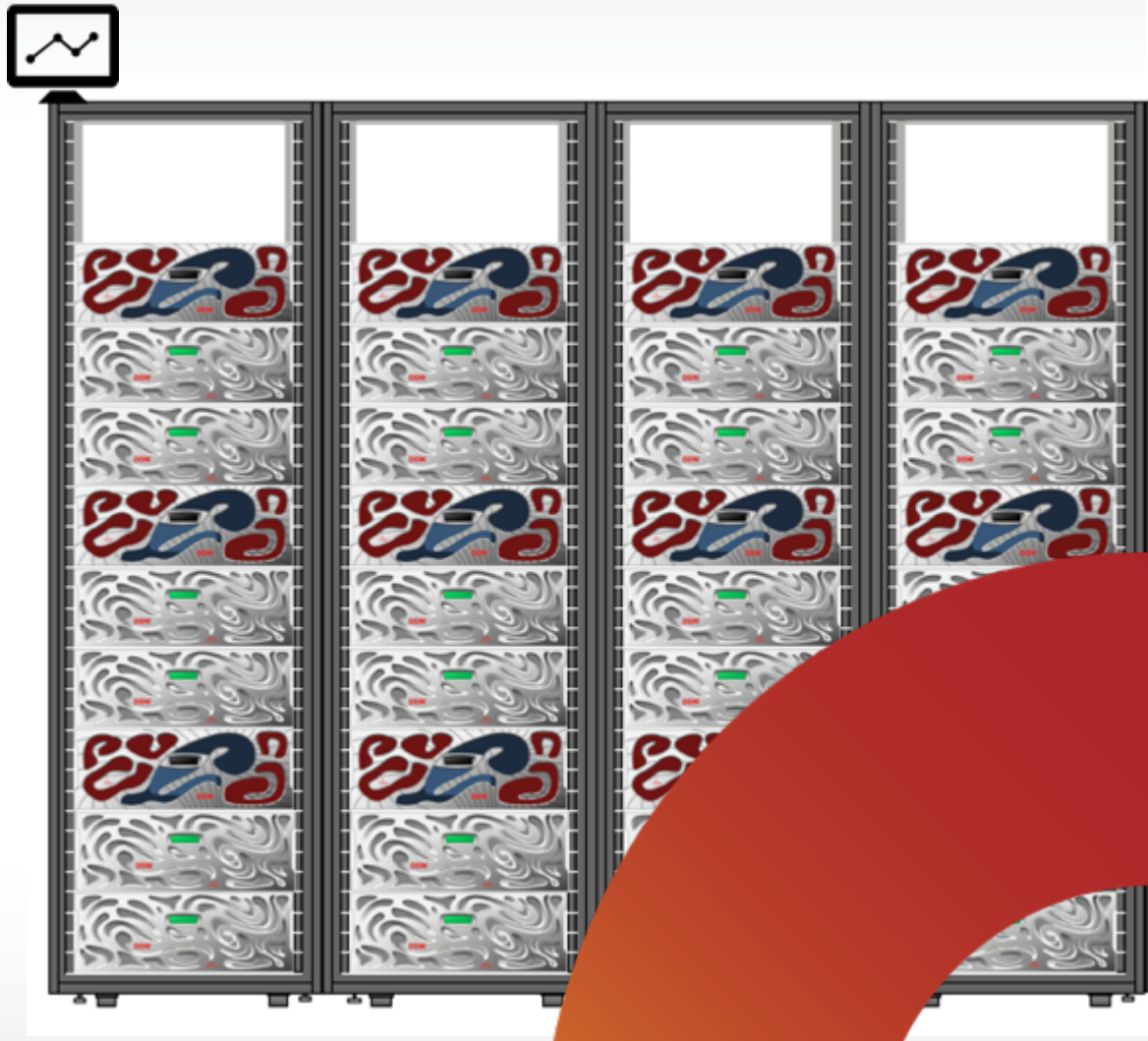
Modular and Scalable AI Storage for Leading Vehicle Manufacturer

Multiple Installations, each of

200 GB/s throughput

27 PB net per EXA5 filesystem

DDN Insight Scalable Monitoring Solution allows fine grained visibility into user and workload as well as system performance and health



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DDN @ Scale Products

COMPREHENSIVE DATA PLATFORMS FOR SCALE

DDN®
AI · BIG DATA · HPC

IME®	EXA5	SFA®	A³I™	DataFlow
All-Flash Cache	**File Storage**	**Block Storage**	**AI Storage**	**Data Management**
Acceleration for all workflows, file systems and applications	Fast parallel file storage for every workload and data type	Fastest time to insight with limitless scaling and best efficiency	Turnkey acceleration for artificial intelligence and deep learning	Synchronize, Backup, Archive at any Scale

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EXAScaler Platforms and Specifications

ES200NVX	ES400NVX	ES7990X	ES18KX
24GB/s 1.5M IOP/s	48GB/s 3M IOP/s	24GB/s 800K IOP/s	76GB/s 3M IOP/s
24 NVME Slots	24 NVME Slots Up to 360 SAS Slots	Up to 450 SAS Slots	48 NVMe Slots Up to 1872 SAS Slots
EDR/HDR100 IB (4)	EDR/HDR100 IB (8)	EDR/HDR100 IB (4)	EDR/HDR100 IB (16)

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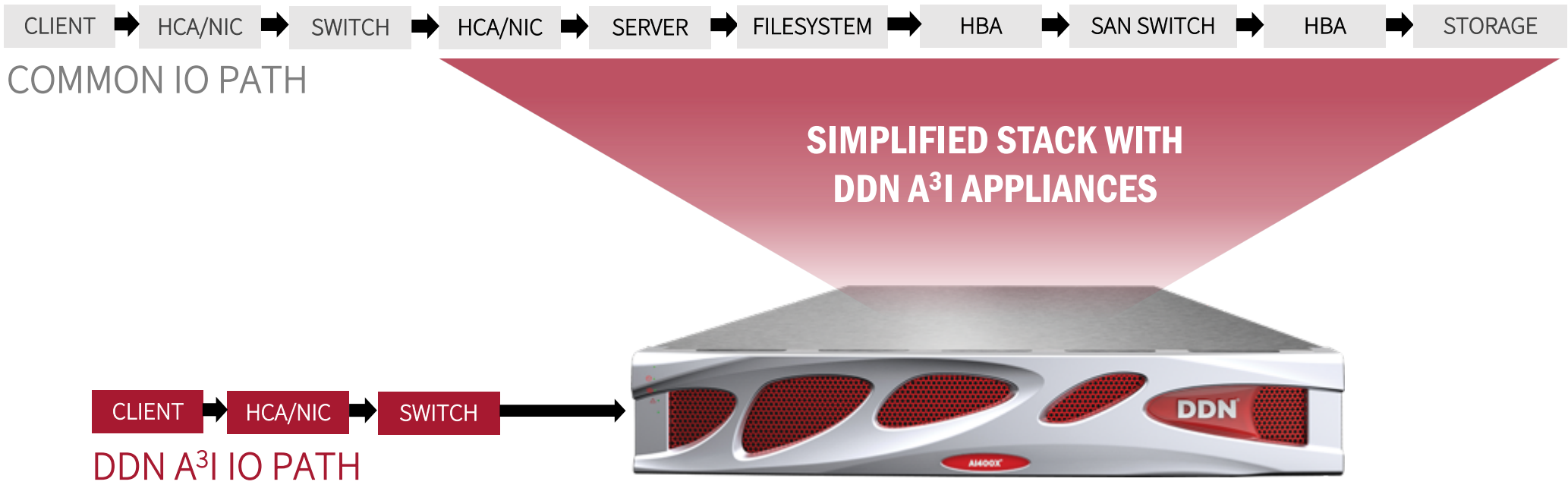
A³I APPLIANCES REDUCE COST AND COMPLEXITY



SIMPLE TO DEPLOY, MANAGE AND SCALE!

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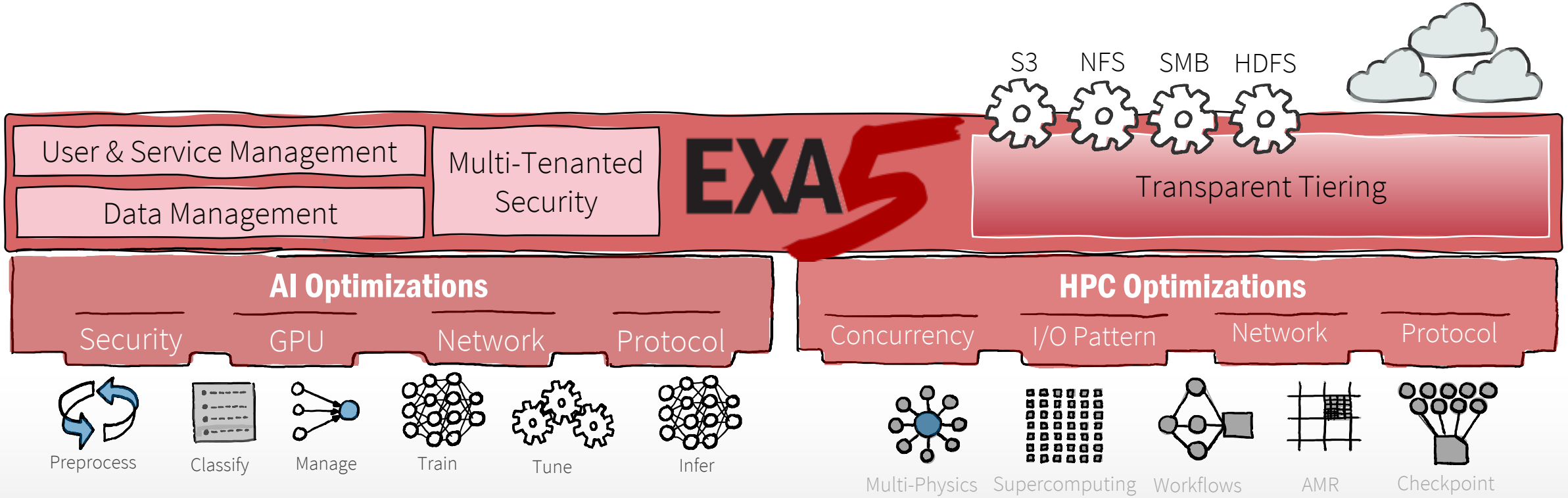
The Intelligent, Optimized Environment for AI and HPC

- Deep Optimizations for both AI and HPC delivers for the highest efficiencies and the right capabilities
- *Your data in the right place at the right time*



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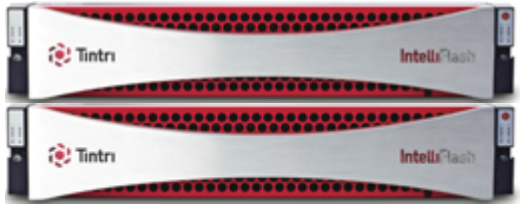
DDN Enterprise Products

IntelliFlash Portfolio

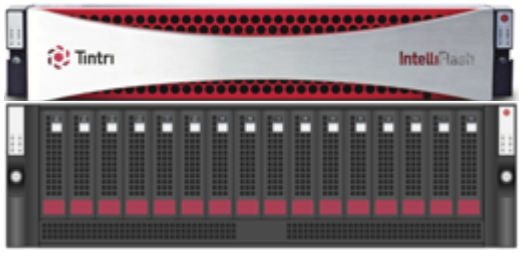
N Series

NVMe All-Flash Arrays
200 **µ**sec latency



HD Series

High-Density All-Flash Arrays
< 1ms latency



T Series

Hybrid SAS Flash Arrays
1ms – 2ms latency

ONE Operating Environment | ONE Feature Set | ONE User Experience

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- IntelliFlash brings unified all-flash and hybrid appliances for high performance enterprise workloads
  - Unified access for block, file and object
  - Performance – high IOPs and low latency
  - S3 cloud migration for backup and DR
  - Cloud-based storage analytics
- Target workloads
  - Mission critical applications demanding performance
  - OLTP, OLAP and databases
  - Enterprise AI and Analytics

Applications

ORACLE Gold Partner · SAP HANA · openstack.* · vmware · Microsoft Hyper-V · Windows Server · CITRIX XenServer

amazon web services™

Data Management

veeam · COMMVAULT · rubrik · VERITAS NETBACKUP

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* 3.11 brings Openstack support based on NFS

N-Series Advantages

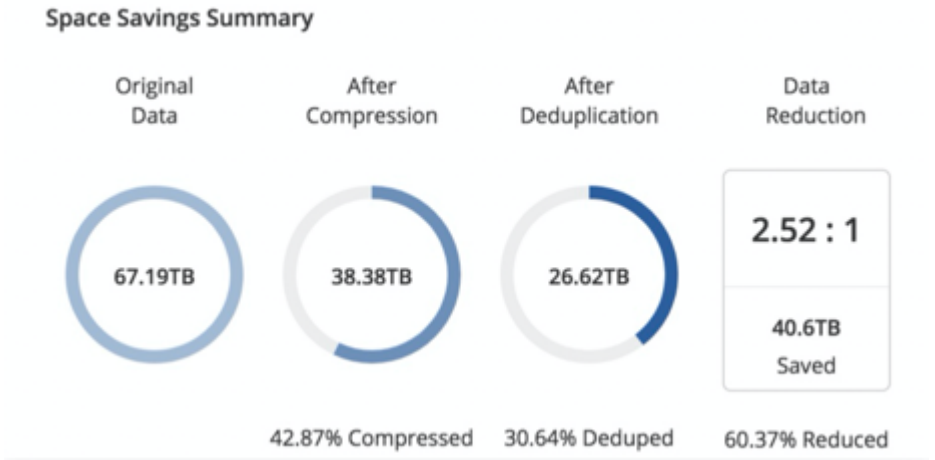
60% Savings

2.5x Data Reduction

~300us latency/response time

4X Faster

>800K IOPs per system



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Tintri VMstore

- Simplicity – Single Datastore for all VMs - Mgmt & Desktops
- VAAI & VCAI Offloading (Full Clones)
- Improve Deployment speeds for Citrix and VMware View
- Automation - PowerShell Toolkit & REST API support
- Tintri Global Center – Per-VM Analytics & Mgmt at Scale
- Latency Visualization (Host/Network/Storage + Mirror)
- QoS Dynamic QoS (Noisy Neighbor Isolation)
- Per-VM Granularity (Logical Live Size – i.e. PVS write cache)
- Long-term Trending & Modeling (Tintri Analytics)
- Mix and Match Workloads (VDI, Infrastructure, Server Apps, etc.)

Two challenges

Challenges for the community

- Samba is lacking behind on some key workloads e.g. single threaded seq read/write
  - High Speed collect of sensory data
  - DNA sequencer
  - Autonomous vehicle

- Target single file writes at ~2-3 GB/sec from a windows 10 client to a distributed storage system, today we see 100's of MB/sec

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Challenges for the community

What would it take to build an optimized SMB Server for a KV Storage Backend ?

- assume super fast low latency (10’s of usec) KV Client library in userspace
- Highly resilience and scalable to quadrillions of keys and 100’s of PB in size
- Completely elastic and resilient backend with zero end-user touch

What would an ideal interface for SMB to KV Store look like ?

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Thank You