Intelligent Infrastructure Webinar

Ask the Experts
Unified Storage for Enterprise AI

Participants

- **Ken Clipperton**
  - Lead Analyst, Storage
  - Data Center Intelligence Group

- **Rajeev Sharma**
  - Principal Product Manager
  - Tintri IntelliFlash Product Line

Data Center Intelligence Group (DCIG)

- Analysts with industry experience provide actionable guidance to decision-makers

- Research covers cloud, data protection, and data storage technologies

- Independent analysis and sponsored research

Agenda

- Drivers for AI in the enterprise

- Effect of AI on infrastructure requirements

- Unified storage benefits

- Tintri IntelliFlash for AI workloads

- Q&A

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Drivers for AI in the Enterprise

Government

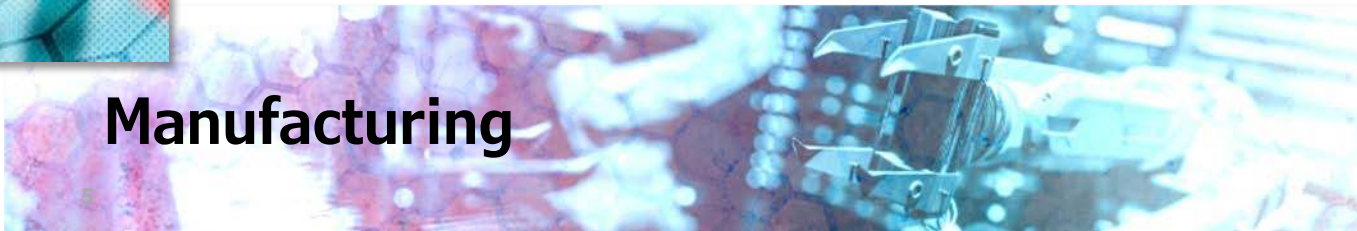Pharmaceuticals

Education

Health Care

Retail

Finance

Manufacturing

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AI Use Cases

Enterprise AI

- HPC-like workflows, driven by AI and analytics at massive scale

- Pre-built AI app environments

- Workgroup and mid-range GPU-based workloads
  - Needs fast-read filesystem and high-density storage

Video Surveillance

- Filesystem, virtualization and block in one architecture for simplified video solution

- Advances in commercially supported video analytics

- Dense, cost-effective storage for longer data retention

File Services

- Scale to support AI apps at petabyte scale

- High-res images driving massive capacity growth

- High storage efficiency with inline compression, dedupe, snapshot, multi-PB capacity

Backup/Archival

- Data protection: backup, archiving, replication, DR

- Ecosystem integration for data movement across multiple storage vendor platforms

- Inline dedupe and compression to maximize usable capacity

Poll Question

Where is your organization on its AI journey?

Answer options:

- Investigating

- Proof of concept (PoC)

- Pilot project(s)

- 1st production workload

- Multiple workloads in production

Enterprise AI Expectations

- AI workloads are not just for large scale (at-scale) environments

- Enterprises need to manage multi-PB of structured and unstructured AI data

- AI and ML apps are increasingly used to gain value from that data

- These apps access data via file-based workloads. These workloads drive AI-led innovation

- Data growth + need for real-time analytics is driving demand for scalable, high-performance file storage

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What do businesses need to do to move quickly to support AI workloads that create new value?

Poll Question

What obstacles might affect your ability to enable AI in your business?

Answer options:

- Data center infrastructure (compute, networking, storage)

- Lack of exemplars in my industry

- ROI - lack of clarity on feasibility, costs, and benefits

- No executive champion

- Lack of relevant IT or business staff expertise

AI Infrastructure Considerations

- Demand for consistent performance at scale

- Optimized use of multiple storage media

- Unified storage

- Integrated enterprise data protection

- Management tools to simplify and automate

- Intelligent infrastructure analytics

- Experienced solution provider

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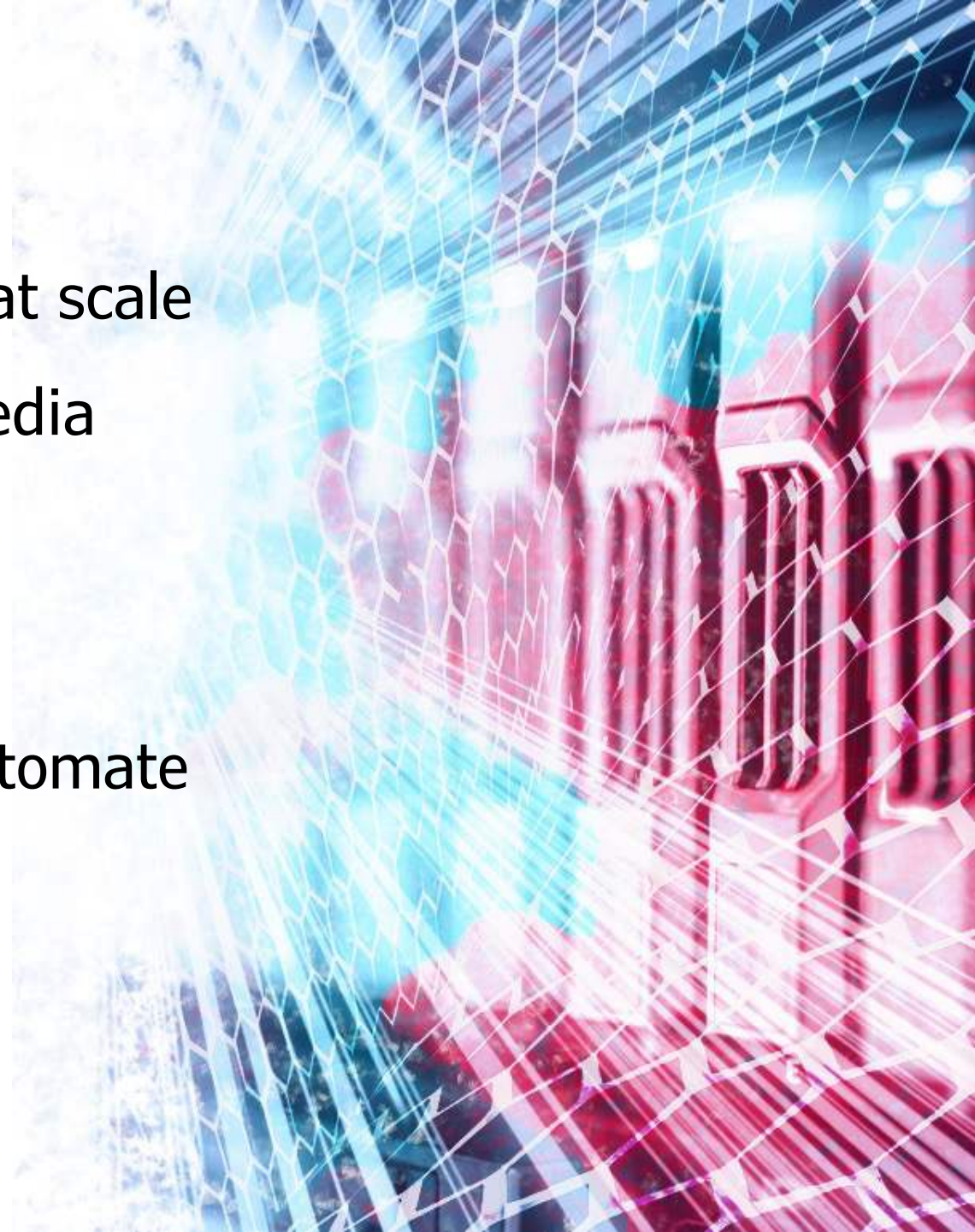
Addressing the Biggest Storage Challenges for AI

Need to deploy, manage, maintain separate file-based NAS

- Long AI solution development time
- Additional power, cooling, space requirements

Performance degradation as data grows to PB scale

- Inability to scale from proof-of-concept to production
- Data protection and mixed media configs limit storage utilization

Complex infrastructure integration and optimization

- Inability to predict problems or trends for uptime or efficiency
- Spending time and money on administration, not business value

Additional cost for new or advanced features

- Difficulty adapting to business use cases and driving consumption
- Different, platform-specific OS and / or feature sets

What's the role of analytics in enabling successful AI initiatives? And what storage capabilities are most critical?

Persistent Storage for Containerized Applications

- Increasing number of containerized enterprise applications

- Pre-built AI applications, pre-trained models (NVIDIA NGC Catalog)

- Increasing sources of data for Enterprise AI

- Adoption of CI/CD pipelines
  - CSI drivers – both file and block
  - High-performance

Persistent Storage for Containerized Applications

Backup and Manage Applications, Not Storage

- Microservices are driving the growth of containerized apps

- Multitenant application architecture is a key adoption factor

- Solves operational challenges of running Kubernetes apps at high performance

- Container-centric backup, snapshot and archival let you manage apps according to your business needs

File

Block

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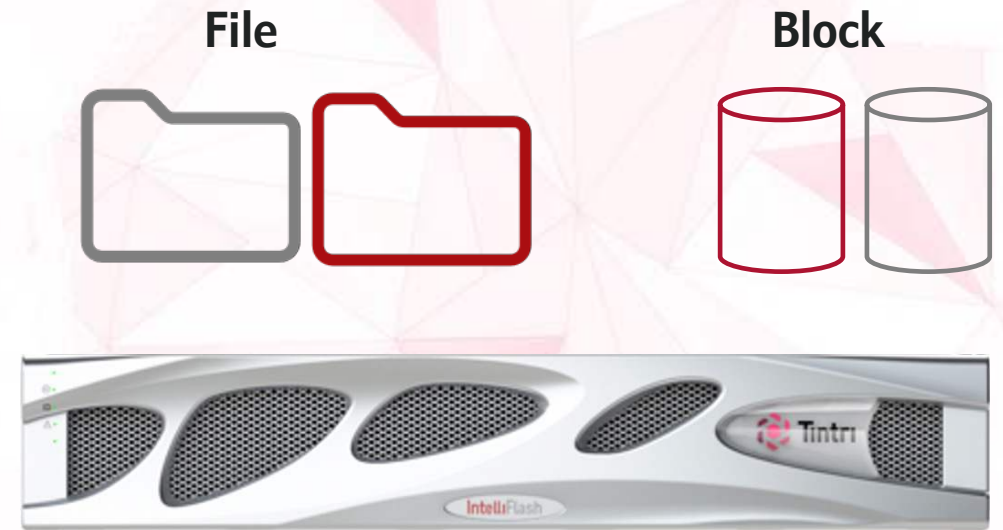
Unified Storage Benefits for Enterprise AI

- Makes data available across the AI/ML lifecycle

- Eliminates management overhead

- Enables consistent data protection

- Consolidation minimizes data center costs

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# Key observations from DCIG about IntelliFlash for AI workloads ?

Addressing the Biggest Storage Challenges for AI

IntelliFlash Benefits

Challenges	How IntelliFlash Addresses Them

• **Need to deploy, manage, maintain separate file-based NAS**
   ○ Long AI solution development time
   ○ Additional power, cooling, space requirements
	• Unified storage with multiprotocol support
	• **Benefit:** Enables efficient workload consolidation

• **Performance degradation as data grows to PB scale**
   ○ Inability to scale from proof-of-concept to production
   ○ Data protection and mixed media configs limit storage utilization
	• Consistent performance at scale
	• **Benefit:** Performance to meet fast data growth

• **Complex infrastructure integration and optimization**
   ○ Inability to predict problems or trends for uptime or efficiency
   ○ Spending time and money on administration, not business value
	• Intelligent infrastructure analytics
	• **Benefit:** Delivers greater IT value to the business

• **Additional cost for new or advanced features**
   ○ Difficulty adapting to business use cases and driving consumption
   ○ Different, platform-specific OS and / or feature sets
	• Single, all-inclusive operating environment
	• **Benefit:** Simplifies and economizes AI adoption

Intelligent Insights | Cloud-Based Predictive Analytics

- Self-service portal

- Global monitoring
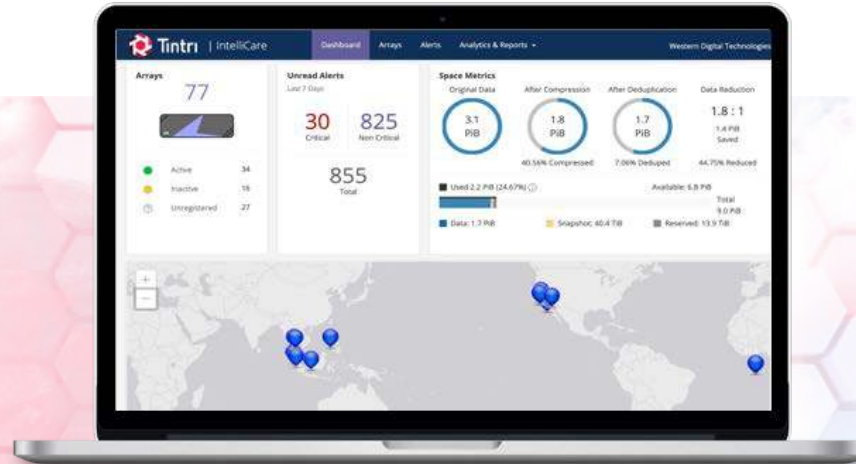
- Predict and prevent issues

- Modeling and recommendations for resource planning

**In-depth system telemetry**

Trending using data analytics

**Machine learning and modeling**

Pre-emptive support and automated remediation

Gathering **Information** from your systems globally to offer **Insights** into your application and storage infrastructure and provide **Intelligence** to maximize application uptime and efficiency.

Success Factors and Results for Enterprise AI Customers
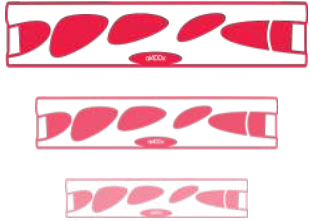
Scale, efficiency, and end-to-end optimization for an effective data strategy
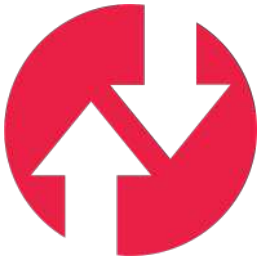
Flexible and versatile data movement between on-premises environments and from on-premises to public cloud

Powerful management tools and integrated enterprise features for data protection

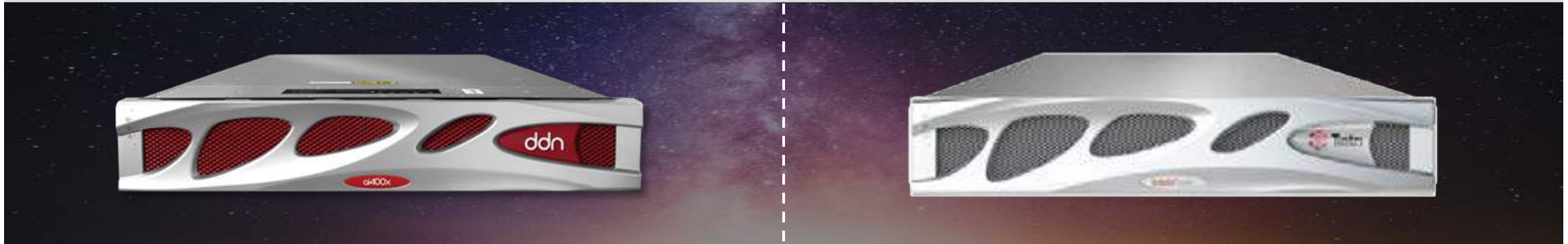# Proven Success with Thousands of Customer Deployments

- Successful deployments of the leading ZFS-based appliances

- 4th generation NVMe appliance delivers balanced performance for a broad application set

- Proven Intelligent Infrastructure

- Powering 20% of Fortune 500

- 4.8/5.0 CSAT rating - among industry's highest

DDN Portfolio Value for AI

ENTERPRISE AI

a3i

IntelliFlash

- DDN has consistently been the leading storage provider for at-scale AI and HPC environments

- Known for deep understanding of data intensive workloads with outstanding performance and scale

- A^{3}I is an HPC-grade solution that accelerates AI, DL and Big Data apps with fast, easy management

- IntelliFlash brings AI-ready storage to the Enterprise with multi-PB scale unified platform

Range of Tintri and DDN Solutions for AI

Tintri Solutions

DDN A³I Solutions

Midrange Enterprise AI
Shared AI infrastructure for data science and enterprise workloads with **structured** data

At-Scale Standalone AI
Dedicated AI infrastructure for data-intensive workloads with **unstructured** data

AI Development Center
Enterprise Center of Excellence

Complete AI Data Solution with DDN and Tintri

- Optimize your end-to-end AI data architecture

- DDN and Tintri combination delivers a best-in-class storage solution for AI

DDN A³I Parallel Filesystem
Full GPU Saturation for AI Workloads and unlimited Scaling

IntelliFlash for Home Directories and Containers
NFS, SMB and supports Container Volumes, databases, VM Environments

DDN DataFlow
Backup and Archival Software and Hardware

IntelliFlash NAS Archive
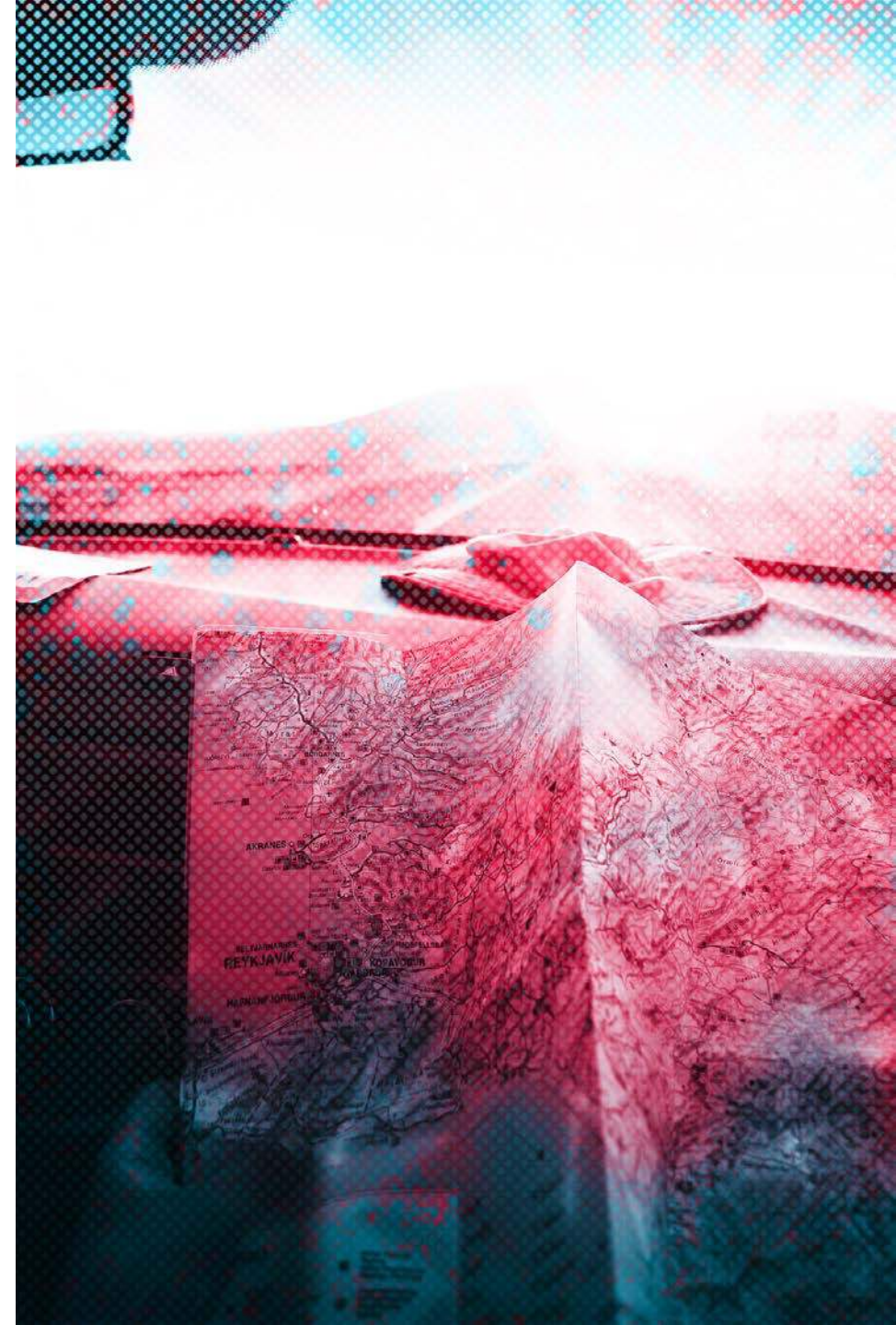Space Efficient Archive, Fast flexible Target for DDN DataFlow

Q & A

Where to go Next?

- <u>IntelliFlash AI home page</u>

- <u>DDN A^{3}I home page</u>

- <u>DCIG Brief: Unified Storage for Enterprise AI</u>

- <u>IntelliFlash OS Tech Brief</u>

- <u>IntelliFlash Analytics Tech Brief</u>

- Sign up for DCIG weekly newsletter at <u>www.dcig.com</u>

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Thank you!