

IntelliFlash

PRODUCT BROCHURE



IntelliFlash



BOOST INNOVATION AND TACKLE YOUR MODERN BUSINESS DATA CHALLENGES

IntelliFlash



▶ ENTERPRISES CHOOSE INTELLIFLASH BECAUSE IT IS THE INDUSTRY'S MOST VERSATILE INTELLIGENT INFRASTRUCTURE SOLUTION PORTFOLIO

Businesses can run all their applications with maximum reliability and scalable performance on a single unified storage system with concurrent multimedia and multi-protocol support.

Organizations gain a differentiated combination of performance, intelligent insights, and time-saving management features to efficiently drive their most valuable enterprise workloads.

AI-driven analytics and autonomous workload optimization simplify operations for effortless IT productivity and an exceptional user experience.

▶ AVOID RISK WITH INDUSTRY-LEADING RELIABILITY AND SECURITY

Enterprise IT is under constant pressure to deliver continuous application services. And it can't take chances when it comes to supporting critical workloads. With IntelliFlash, your IT department can confidently deploy a system with no single point of failure on the industry's most mature platform for NVMe, all-flash and hybrid storage. IntelliFlash provides advanced analytics and deep visibility to help IT rapidly resolve bottlenecks and proactively avoid failures.

What about unexpected infrastructure or site outages? Interoperability across high-performance all-flash and economical hybrid systems protects all your enterprise data with a cost-effective DR solution.

Data centers today are also dealing with a growing number of operational risks and security threats, including ransomware, which can disrupt continuous access to business application data.

IntelliFlash helps you mitigate the impact of malicious attacks and encryption viruses by restoring all data with ultra-low RTO. You can also take advantage of tamper-proof immutable snapshots by integrating with leading data protection solutions – on premises or in the cloud.

▶ CONSOLIDATE AND SCALE WITH PREDICTABLE PERFORMANCE

Enterprise data management is complex. Data continues to grow rapidly for nearly every business – along with the types of data and protocols being used.

Today's unified storage solutions can help simplify heterogeneous data management, but they struggle to support large scale growth without sacrificing performance. IntelliFlash simplifies data and workload consolidation, so data centers can avoid the need for multiple systems and the cost and complexity of disparate storage silos.

Organizations gain the architectural freedom and flexibility to meet business and technical goals. With concurrent support for NAS and SAN protocols, mixed storage media types, and combined flash and hybrid pools you can support a range of workloads with a single system.

Autonomous optimization eliminates IO contention and patented intelligent caching accelerates data access on DRAM and flash, so you can maintain consistent performance for all your workloads, even at multi-petabyte scale.

You can also perform a range of inline data protection and data reduction activities, including encryption, snapshots, cloning, deduplication and compression – all with zero performance impact.



The ability to provide NAS and SAN, virtualized and non-virtualized workloads, and different storage media – concurrently in a single system – that can scale to multi-petabytes is a major selling point for enterprises looking to consolidate workloads and multiple storage media types.

Our customers greatly appreciate the ease of use, excellent system analytics and health management capabilities that enable IT generalists to run IntelliFlash systems.

The all-in-one licensing approach is really the icing on the cake.

~ **Dustin Miller**
President | CommLink IT



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IntelliFlash blew us away with its speed and economics. We looked at a few others, but they didn't even come close.

And we already had a very positive experience with the hybrid [systems], so it was a no-brainer.

~ Rob Sheppard
Data Center Manager
United Center

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▶ **DRIVE EFFICIENCIES WITH INTELLIGENT INFRASTRUCTURE**

Many IT organizations are experiencing a skills gap caused by a rapid expansion of data center assets and the limited availability of experts to manage these growing resources.

IntelliFlash systems closes the skills gap, offering operational simplicity that enables IT generalists to manage enterprise storage with zero training, so your expert staff members can focus their efforts on strategic activities.

Built-in multi-point intelligence keeps your production workloads unaffected and reduces the amount of time spent on support issues. IT leaders can accelerate decision-making with a dashboard view of all systems, including deep, granular visibility into performance characteristics and bottlenecks at the application, VM and container level.

Secure, cloud-based predictive analytics help improve resource planning for capacity and performance requirements so you can avoid unnecessary costs due to overprovisioning.

▶ **WHY CHOOSE INTELLIFLASH?**

Because IntelliFlash is a uniquely positioned unified storage solution for file and block data, that's optimized for virtualized and native environments.

Whether your applications need the exceptional performance of NVMe-flash, the sustained performance and high density of SAS-flash or an optimal balance of performance and capacity offered by a hybrid system, the IntelliFlash portfolio can cost-effectively satisfy all these requirements.

To further reduce operational complexity and expense all IntelliFlash systems share the same operating environment, feature set, and management experience – and a single all-inclusive license that covers all current and future product functionality.

INTELLIFLASH WORKLOADS

BUSINESS CRITICAL APPLICATIONS

Databases

Virtualization

Containers

FILE SERVICES

DATA PROTECTION

HOME DIRECTORIES VIDEO SURVEILLANCE LIFE SCIENCES

MEDICAL IMAGING AI DATA STORAGE ANALYTICS FOR FINANCE

veeam
wasabi
COMMVAULT
dataflow

▶▶▶▶▶▶▶▶▶▶
Integrated Backup and DR Workflows

IntelliFlash Storage Systems



Our database queries run incredibly fast. Having extremely low latency is so important to the visitor experience, and everything runs smoothly. With latency in sub-millisecond range, patrons are able to seamlessly enjoy a world-class art experience without interruption.

~ **Tom Hood**
Director of Technology Operations
Cleveland Museum of Art



N-SERIES

All NVMe performance to power the most demanding enterprise workloads



IntelliFlash N-Series, built on the industry's most mature NVMe platform, offers outstanding performance, operational simplicity and unmatched innovation in NVMe flash management.

Enterprises that need NVMe performance to accelerate their most demanding workloads can now experience the lowest latencies and fastest data access for improved insights, decision-making and business results.

H-SERIES

NVMe-accelerated hybrid solution for enterprise workloads that require optimized performance and capacity



IntelliFlash H-Series hybrid flash systems combine the performance of NVMe with the economics of HDD for exceptional value.

Enterprises can cost-effectively consolidate workloads with concurrent multiprotocol support for virtualized and native SAN and NAS workloads.

You can drive large-scale enterprise AI, analytics and HPC workloads and multipetabyte file services without performance degradation.

ABOUT DDN

DataDirect Networks (DDN) is the world's leading big data storage supplier to data-intensive, global organizations. DDN has designed, developed, deployed, and optimized systems, software, and solutions that enable enterprises, service providers, research facilities, and government agencies to generate more value and to accelerate time to insight from their data and information, on premise and in the cloud.

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IntelliFlash™

Features

The IntelliFlash Intelligent Infrastructure is a fifth-generation storage solution portfolio that delivers an exceptional user experience. It does this through automation, analytic insights, and a variety of time-saving management features to drive your most valuable workloads in today's data centers.

Our comprehensive portfolio of **ALL-FLASH** and **HYBRID STORAGE SYSTEMS** is powered by a common **INTELLIFLASH OPERATING ENVIRONMENT**. This intelligent platform includes several patented technologies designed to deliver consistently high performance at low latency while maximizing uptime and streamlining data protection.

With IntelliFlash, you can transform data into actionable information faster and achieve new levels of efficiency, simplicity, and cost savings.

► FLEXIBLE ARCHITECTURE

IntelliFlash gives you the flexibility to deploy multiple tiers of persistent storage media within a single system: NVMe™ SSDs, SAS SSDs/HDDs, and hybrid. The operating environment intelligently places data on different storage media to deliver optimal performance and capacity.

► METADATA ACCELERATION

IntelliFlash systems automatically separate metadata from data to deliver high performance. The metadata is then organized, aggregated, and placed on high-performance, low-latency persistent storage, accelerating advanced data services such as deduplication, compression, snapshots, clones, and thin provisioning.

► INLINE COMPRESSION AND DEDUPLICATION

Data is compressed and redundant blocks are removed before they are written to persistent storage. These techniques not only reduce the storage footprint, they also help to free cache space in DRAM and flash for faster reads and writes.

► INTELLIFLASH DATA RESILIENCY

IntelliFlash systems employ multi-parity protection schemes and dynamic stripe widths to eliminate performance overhead and media wear from read- modify-write operations. Supported RAID levels include dual parity RAID, two-way mirroring, and three-way mirroring.

► INTELLIGENT CACHING

Intelligent caching algorithms place the most frequently accessed application data in DRAM, NVMe or flash. These caching algorithms are optimized for various I/O patterns and seamlessly adapt to differing media latencies across multiple tiers of cache.

► FLASH ENDURANCE

IntelliFlash features enterprise-class SSDs — offering 10X the endurance of consumer-grade MLC while delivering consistently high performance. IntelliFlash systems further extend the life of SSDs by optimizing I/O for the geometry of flash media. Writes are aligned to sector boundaries and native page sizes to avoid I/O fragmentation and unnecessary media writes. Data is intelligently relocated to ensure uniform wear leveling.

► THIN PROVISIONING

Increase your storage utilization rates by not over-allocating capacity while provisioning. Thin provisioning automatically allocates physical storage as data is being written. Any space that's been allocated but hasn't been consumed remains available for other applications.

► UNIFIED STORAGE

IntelliFlash natively supports both block (SAN) and file (NAS) protocols, enabling you to run applications and manage files on a single system, for virtualized and non-virtualized environments. Supported protocols include iSCSI, Fibre Channel, NFS, and SMB 3.0.

► GENERAL FILE SERVICES (NAS)

IntelliFlash Network Attached Storage (NAS) systems provide file storage and sharing services for clients using NFS, SMB, or both protocols. In a multi-protocol environment, IntelliFlash system presents a single data store to Unix and Windows clients and the users can access the same file through the same directory structure, but through different protocols. This helps customers consolidate Windows and UNIX/Linux file serving functionality into a single system that provides storage efficiency, high performance, and scalability to petabytes.

► POINT-IN-TIME SNAPSHOTS AND REPLICATION

Take an instantaneous snapshot of your data for backups. Snapshots are VM-aware and application consistent. They are space-efficient and incur no performance overhead. You can replicate for DR and restore data instantaneously from the local or remote system.

► NO-IMPACT READ/WRITE CLONES

Accelerate the development, test, and QA timeframes of mission-critical applications by creating multiple read/write clones without incurring a performance hit. As with snapshots, clones are space-efficient, consuming storage only for changed blocks.

► SYNCHRONOUS REPLICATION

Synchronous replication enables IntelliFlash All-flash or Hybrid system located in different data centers to act as peers to each other, presenting continuous storage with zero data loss protection. This capability allows you to configure a high-availability solution between two IntelliFlash systems across multiple data centers, providing continuous application data availability and transparent data mobility to maximize uptime for your business-critical applications in the face of disasters.

► DATA INTEGRITY

To protect against silent data corruption, IntelliFlash systems perform a checksum process to match data blocks as reads and writes occur, and automatically fix corrupt blocks. They also store the checksum and data in separate nodes of the block tree for further protection.

▶ **NON-DISRUPTIVE OPERATIONS**

All IntelliFlash hardware components, including SSDs and HDDs, can be replaced online with zero downtime. Software upgrades can also be performed while maintaining system uptime and data access.

▶ **NO SINGLE POINT OF FAILURE**

All media (SSDs and HDDs) in IntelliFlash systems are dual-ported and accessible through a pair of highly available, redundant controllers. The controllers are configured in an active/active manner and can be used simultaneously for data access.

▶ **ANALYTICS FOR INTELLIFLASH**

IntelliFlash systems include integrated cloud-based intelligent analytics, enabling you to quickly and easily monitor the health, performance, and usage of all your IntelliFlash systems. Predict future requirements and detect problems before they develop into component and system failures. By maximizing system uptime and efficiency while simplifying storage administration, you can focus instead on adding value to your business.

▶ **ENCRYPTION**

Security features include 256-bit AES encryption for data at rest. IntelliFlash also delivers inline encryption of data on SSDs and HDDs with negligible impact on performance. Key management for encryption is performed natively in the system without requiring any user intervention.

▶ **APPLICATION-AWARE PROVISIONING**

Automatically tune volumes for specific applications at the click of a button. Select a use case — such as database, server virtualization, and virtual desktop infrastructure — to instantly optimize the volume's configuration (block size, compression and deduplication settings, etc.)

▶ **CONTAINER-AWARE PROVISIONING**

IntelliFlash CSI interface for Kubernetes (K8s) Container Orchestration uses CSI drivers to provide persistent storage volumes over file and block protocols. This interface enables a secure multitenant application architecture for provisioning storage for containerized microservices / applications.

▶ **VMWARE® INTEGRATION**

IntelliFlash systems take advantage of VAAI to minimize I/O on the storage network and hypervisor host. The IntelliFlash Operating Environment also includes a vCenter plug-in, enabling you to provision datastores, manage snapshots and restores, and monitor I/O status, space usage, and latency from within vCenter.

▶ **MICROSOFT® INTEGRATION**

IntelliFlash systems integrate with a broad set of Microsoft technologies, including CSV for failover, clustering for Hyper-V; VSS for application-consistent snapshots and clones; and SMB 3.0 protocol.

▶ **CITRIX® READY**

IntelliFlash systems have been tested and verified as part of the Citrix Ready® VDI Capacity Program Verified for Citrix XenDesktop®. This enables you to leverage best practices and ensure optimal performance and capacity for your VDI.

▶ **VALIDATED ORACLE® DESIGNS**

IntelliFlash systems have been tested and certified with Oracle VM and validated with Oracle Linux® with UEK in single instance and Oracle RAC deployments.

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