



# DELL POWERPROTECT DD SERIES APPLIANCES

## The ultimate protection storage appliance

DD series enables organizations to protect, manage and recover data at scale across their diverse environments. DD series is the next generation of Data Domain appliances, that are now setting the bar for data protection from edge to core to cloud. DD series provides the ecosystem support, efficiency, powerful data protection and cloud-enabled capabilities that customers have come to expect and appreciate from Data Domain and takes it to the next level.

The DD Operating System (DDOS) is the intelligence that powers DD series. It provides the agility, security and reliability that enables DD series to deliver high-speed, scalable, and industry-leading multicloud protection storage for backup, archive, and disaster recovery. DDOS integrates seamlessly with existing infrastructures, enabling ease-of-use with leading backup and archiving applications, and offers superior performance in conjunction with Dell PowerProtect Data Manager and Data Protection Suite. When purchasing a new DD series appliance, you can now consume DDOS as a subscription providing flexibility for deployment while minimizing upfront costs.

## Fast, secure and efficient data protection

DD series minimizes the risk of data loss and leverages the value of protected data, while meeting ever more demanding SLAs and increasing ROI. DDOS drives DD series to deliver up to 38% faster backups and up to 45% faster restores at higher compression levels.\*\* This improved level of compression efficiency typically increases the logical capacity by up to 30% per TB\*.

DD series can now scale up to a physical capacity of 1.5PB in a single rack, thereby utilizing minimal floor space and lowering power and cooling by up to 41%.\*\*\* By employing denser disk drives, DD series has lowered the required rack space by up to 39%.

DD series provides up to an additional 3PB of cloud capacity for long-term retention, with Cloud Tier.

DD series supports high availability within the single rack. By doing so, DD series can further reduce the total cost of ownership by reducing downtime in the unlikely event of a hardware failure. DD series delivers high speed networking connectivity with support for 25GbE and 100GbE network adapters.

## Key benefits

### Fast, secure, and efficient

- 1.5PB usable capacity in a single rack
- Up to 3PB capacity for long-term retention
- Improved logical capacity of up to 30%\*
- Instant access and instant restore of up to 64VMs and 100k IOPS\*\*\*\*
- High speed network connectivity – 10GbE, 25GbE and 100GbE
- Seamless integration and superior performance with PowerProtect Data Manager and Data Protection Suite
- Supports leading enterprise backup and archive applications

### Industry-leading multicloud protection

- Software-defined protection storage on-premises with PowerProtect DD Virtual Edition (DDVE) and in-cloud with APEX Protection Storage for Public Cloud
- DDVE scales up to 96TB and APEX Protection Storage up to 256TB in-cloud
- Improves in-cloud restore performance by up to 10x\*\*\*\*
- Cloud Tier delivers simple and efficient long-term retention to a public, private or hybrid cloud
- Low-cost disaster recovery to the cloud

### Operational simplicity

- Enhanced DD System Manager provides complete chassis view
- Single point of management for all DD series by DD Management Center
- Support for Smart Scale making managing data at scale less complex

### Energy efficiency on Dell Storage

- Dell is committed to improving energy efficiency in our storage portfolio with each generation

\* Based on Dell internal testing and field telemetry data. January 2023. Actual results may vary.

\*\* Based on Dell internal testing compared to the previous generation, January 2023. Actual results may vary.

\*\*\* When comparing 1 petabyte of data on a DD9800 with Cloud Tier and PowerProtect DD9900 with Cloud Tier. Actual results may vary. March 2023.

\*\*\*\* Based on Dell internal testing when comparing DDVE 7.7 to DDVE 7.1. Actual results may vary. March 2023.

\*\*\*\*\* When using DDOS 7.7 and later on the DD9900. Based on Dell internal testing. Actual results may vary. January 2023

## Smart Scale for PowerProtect appliances

Organizations must often manage multiple data centers and cloud environments, add, upgrade, and retire protection storage infrastructure, accommodate new evolving applications and optimize capacity and performance. Not an easy task but one that Dell is helping companies overcome with Smart Scale. Smart Scale allows you to manage up to 32 DD series appliances in a single system pool under a unified name space driving down management complexity while increasing storage efficiency. Smart Scale is deployed free of charge through our single pane of glass management console, PowerProtect DD Management Center. Smart Scale is supported on the DD9900, DD9400, DD6900, DD6400 and DDVE on-prem. For software integration we support Dell PowerProtect Data Manager, Dell NetWorker, and third-party backup applications. Smart Scale introduces mobile storage units providing flexibility and transparent mobility of backup data in each pool.

## Instant access and instant restore

Instant access and instant restore delivers high performance of VMs with up to 100K IOPS with the ability to instantly access up to 64 VMs simultaneously.\*\*\*\*\*

Instant access and instant recovery save time, minimizing mean time to repair (MTTR), by enabling instant access to data from the backup image on the included DD series SSD drives. It also saves primary storage space with the ability to manage data on the appliance itself and lowers cost by better utilizing the physical resources in both the data protection as well as the production environments.

In case of a failure or disaster recovery in a virtualized environment, DD series can spin-up production-oriented VMs immediately within the appliance itself. By doing so, the customer can continue their daily routine without experiencing any downtime, while the failed VMs are restored to the production environment.

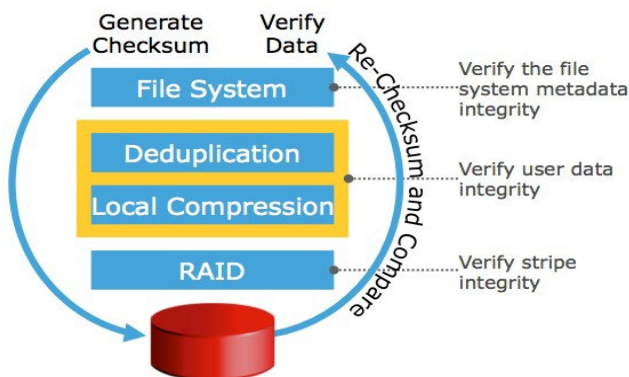
## Data Invulnerability Architecture

DD series is designed as the storage of last resort – providing you with the confidence that you can always reliably recover your data. The Data Invulnerability Architecture is built into DDOS and DD series to provide the industry's best defense against data loss. Inline write and read verification protects against and automatically recovers from data integrity issues during data ingest and retrieval while RAID-6 and hot spares protect against disk failure.

Capturing and correcting I/O errors inline during the backup process eliminates the need to repeat backup jobs, ensuring backups complete on time and satisfy service-level agreements. In addition, unlike other enterprise arrays or file systems, continuous fault detection and self-healing ensures data remains recoverable throughout its lifecycle on DD series.

### End-to-end data verification

End-to-end data verifications reads data after it is written and compares it to what was sent to disk, proving that it is reachable through the file system to disk and that the data is not corrupted. Specifically, when DDOS receives a write request from backup software, it computes a checksum over the data. After analysing the data for redundancy, it stores the new data segments and all the checksums. After all the data is written to disk, DDOS verifies that it can read the entire file from the disk platter and through PowerProtect DD, and that the checksums of the data read back match the checksums of the written data. This confirms the data is correct and recoverable from every level of the system.



End-to-end data verification

## Comprehensive DD series portfolio

	DDVE - 96TB	DD3300	DD6400	DD6900	DD9400	DD9900
Backup Ingest (w/DD Boost)	Up to 11.2TB/hr	Up to 7.0TB/hr	Up to 27.7 TB/hr	Up to 33TB/hr	Up to 57TB/hr	Up to 94TB/hr
Logical Capacity (w/Active Tier)	Up to 4.8PB	Up to 1.6PB	Up to 11.2PB	Up to 18.7PB	Up to 49.9PB	Up to 97.5PB
Usable Capacity (w/Active Tier)	1TB-96TB	4TB-32TB	8TB-172TB	24TB-288TB	192TB-768TB	576TB-1.5PB

Logical capacity based on up to 50x deduplication (DD3300) and up to 65x deduplication (DD6400, DD6900, DD9400, DD9900) based on additional hardware-assisted data compression of up to 30% better than previous generation. Actual capacity & throughput depends on application workload, deduplication, and other settings.

### Seamless integration

DD series integrates easily with existing infrastructures, enabling ease-of-use with leading backup and archiving applications, and offers superior performance in conjunction with PowerProtect Data Manager and Data Protection Suite.

DD series can simultaneously support multiple access methods including NFS and/or CIFS, VTL, NDMP and DD Boost™ all applications and utilities can be supported in the same DD series at the same time to enable greater protection storage consolidation. A system can present itself as a file server, offering NFS, CIFS access over Ethernet; as a virtual tape library (VTL) over Fibre Channel; as an NDMP tape server over Ethernet; or as a disk target using application specific interfaces like DD Boost. DD VTL is qualified with leading open systems and IBMi enterprise backup applications.

### Industry-leading multi-cloud protection

DD series simplifies and obtains operational efficiencies including resiliency and scale as you grow in any cloud environment – private, public and hybrid. DD series supports the most extensive cloud ecosystem – AWS, Azure, VMware Cloud, Google Cloud, Alibaba Cloud, and Dell ECS to deliver excellent in-cloud data protection at reduced costs. DD series can natively tier deduplicated data to any supported cloud environment for long-term retention with Cloud Tier. DD series provides fast disaster recovery with orchestrated DR and provides an efficient architecture to extend on-premises data protection with lowered costs.

### PowerProtect DD Virtual Edition and APEX Protection Storage for Public Cloud

PowerProtect DD Virtual Edition (DDVE) and APEX Protection Storage for Public Cloud leverage the power of DDOS to deliver software-defined protection storage on-premises and in-cloud. DDVE and APEX Protection Storage are fast and simple to download, deploy and configure – and can be up and running in minutes.

DDVE can be deployed on-premises on any standard hardware, converged or hyper-converged, and runs in VMware vSphere, Microsoft Hyper-V, and KVM. DDVE is also certified with VxRail and Dell PowerEdge servers. An assessment tool can be run during deployment to check the underlying infrastructure and ensure it meets recommended requirements. A single DDVE instance can scale up to 96TB.

APEX Protection Storage runs in-cloud with AWS, AWS GovCloud, VMware Cloud, Azure, Azure Government Cloud, Alibaba Cloud, and Google Cloud. APEX Protection Storage can scale up to 256TB.

Within DDVE and APEX Protection Storage, capacity can easily be distributed between virtual systems and/or locations and can scale in increments of 1TB allowing you to grow capacity as the business demands. DDVE and APEX Protection Storage maintain the core DDOS features and include DD Boost, DD Encryption and DD Replicator. DDVE and APEX Protection Storage can be configured and managed using DD System Manager and centrally manage multiple instances, on-premises and in-cloud, through PowerProtect DD Management Center.

## Long-term retention and disaster recovery in-cloud

With Cloud Tier DDOS can natively tier data to a public, private or hybrid cloud for long-term retention. Only unique data is sent directly from DD series to the cloud and data lands on the cloud object storage already deduplicated. It supports AWS, AWS Gov Cloud, Azure, Google Cloud, IBM Cloud, Alibaba Cloud, Seagate Lyve Cloud, and Dell Elastic Cloud Storage (ECS). With deduplication ratios of up to 65x, storage footprint is greatly reduced lowering overall TCO. Cloud Tier can scale up to 3PB of usable capacity. With DD Encryption, data in the cloud remains secure. Cloud Tier works with DDVE for on-prem deployments.

Cloud Disaster Recovery (Cloud DR) allows enterprises to copy backed-up VMs from their on-premises DD series environments to the public cloud (AWS, VMware Cloud on AWS, Azure) and to orchestrate DR testing and failover of workloads to the cloud in a disaster scenario with end-to-end orchestration.

## Operational simplicity

DD series is very simple to install and manage resulting in lower administrative and operational costs. Administrators can access DDOS through command line over SSH or through DD System Manager, a browser-based graphical user interface.

Multiple DD series appliances can be managed and monitored through a single interface, PowerProtect DD Management Center, or DDMC. Customizable dashboards provide visibility into aggregate status, status by geo, and the ability to drill-down to system-level details. DDMC can now provide insights into current and projected capacities at the system level for DD series and legacy Data Domain systems allowing for enhanced forecasting and capacity management. Role-based access allows different levels of access via assigned user roles for various levels of expertise within the organization. Simple programmability as well as SNMP monitoring provides additional management flexibility. DDMC offers a pre check option before scheduling a DDOS upgrade to make sure your environment is compatible with the update. Once the pre check is complete you can schedule a one-to-many upgrade allowing you to schedule multiple DDOS upgrades as opposed to one to one updates. Configuring multiple DD series appliances is simple with DDMC by allowing you to create and apply configuration templates to your appliances. With cyber-attacks and threats on the rise, DDMC can provide compliance alerts when a system's configuration is out of compliance. In the event of a DDOS upgrade failure the appliance will automatically default back to the previous OS release minimizing system downtime and allowing for continuous backup operations.

In addition, DD series has an automatic call-home system reporting called auto-support, which provides email notification of complete system status to Dell support and a selected list of administrators. This non-intrusive alerting and data collection capability enables proactive support and service without administrator intervention, further simplifying ongoing management.

DD series appliances are now integrated with Dell CloudIQ. CloudIQ provides proactive insights and performance analytics across supported storage, data protection, and hyper-converged products through one UI.

## DD series software add-ons

### DD Boost

DD Boost software delivers an advanced level of integration with backup applications and data base utilities, enhancing performance and ease of use. Dell also provides a DD Boost File System Plug-In (BoostFS) with DD Boost for even greater application support, which enables all the benefits of DD Boost for applications that use NFS for data protection. Rather than sending all data to the system for deduplication processes, DD Boost enables the backup server or application client to send only unique data segments across the network to the system.

### DD Replicator

DD Replicator software provides automated, policy-based, network-efficient, and encrypted replication for disaster recovery and multi-site backup and archive consolidation. DD Replicator software asynchronously replicates only compressed, deduplicated data over the WAN. Cross-site deduplication further reduces bandwidth requirements when multiple sites are replicating to the same destination system. This improves network efficiency across all sites and reduces daily network bandwidth requirements making network-based replication fast, reliable and cost effective. To meet a broad set of DR requirements, DD Replicator provides flexible replication topologies, such as full system mirroring, bi-directional, many-to-one, one-to-many, and cascaded.

## Future-Proof Program and Dell Technologies APEX

The Future-Proof Program is a customer facing program that gives our customers additional peace of mind with guaranteed satisfaction and investment protection through a comprehensive set of world class technology capabilities and programs for future technology changes. DD series participates in this Future-Proof Program. DD series is part of the Dell Technologies APEX program allowing for flexible payment options including pay as you go, pay as you use, and provided as-a-Service offerings.



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