

IBM DS8900F

High-performance storage solutions for mission-critical environments

Highlights

- 18 μ s response time for mainframe environments
- Enterprise resiliency with better than seven 9s availability
- Seamless hybrid cloud integration with Transparent Cloud Tiering
- 3 and 4 site replication with 2 seconds RPO at more than 1,000 miles
- Malware and ransomware protection with IBM Safeguarded Copy
- 100% data encryption, at-rest, in-flight and in the cloud
- Cloud-native transformation with Red Hat® OpenShift® and IBM Cloud Paks®
- Integration into IBM z15® and IBM® LinuxONE III single frame solutions

More than 90% of enterprises around the world now operate in hybrid cloud environments, and this is expected to grow to 95% in the following 18 months from now.¹ At the same time, many of the world's leading industries rely on mainframes as the backbone of their IT and data processing infrastructure. Mainframes are a major driver of worldwide commerce, including banking, airlines, credit card processing, and retail operations.²



IBM DS8900F Storage System

The IBM DS8900F family of data systems offers an ideal solution for accelerating the dynamic hybrid cloud environments that characterize 21st business. IBM DS8900F brings proven, market-leading capabilities, with the performance, security, data resilience, and cost-efficiency needed to handle mission-critical and mainframe-driven business application workloads.

Mission-critical capabilities

IBM DS8900F data systems are designed to accelerate IBM Z®, IBM® LinuxONE and IBM Power Systems™ as well as data-intensive workloads in open environments. Built with the most advanced processor technology, IBM DS8900F delivers next level performance, data resilience and enterprise availability to build faster, more efficient operations and make smarter decisions to transform data into business opportunities.

The DS8900F family includes four flexible models designed to address a wide variety of workloads and different business needs:

- IBM DS8910F model 993 is designed for medium-sized organizations looking for powerful enterprise capabilities delivered in a flexible, rack-mountable solution at the lowest entry cost. This solution can be integrated into [IBM z15 model T02](#), [IBM LinuxONE III model LT2](#), or customer provided 19-inch industry standard racks.
- IBM DS8910F model 994 is designed for midrange organizations looking to meet storage challenges with advanced functionality offered in a prepackaged 40U 19-inch industry standard rack.
- IBM DS8950F model 996 provides better performance and higher capacity, enabling the consolidation of mission-critical workloads for IBM Z, IBM LinuxONE, IBM Power Systems, and open environments under a single enterprise storage solution.
- IBM DS8980F model 998 delivers the best performance to help customers process transactions faster, while allowing them to expand their workload possibilities to AI and Business intelligence.

All four IBM DS8900F offerings provide the following benefits:

- The fastest application response time for mainframe environments, with latencies as low as 18 μ s.
Better than 99.99999 (“seven nines”) availability and no-data-loss automatic failover within metropolitan distances.
- The fastest disaster recovery solution for mainframe, with 2 seconds RPO and less than 60 seconds RTO at more than 1,000 miles.³
- Transparent Cloud Tiering (TCT) to enable hybrid cloud storage solutions as additional tiers for disaster recovery, data archiving and long-term retention in IBM Z environments.
- Encryption of data at-rest, in-flight and when it is transmitted to the cloud without any impact on performance.

- IBM Safeguarded Copy functionality to protect data from malware, ransomware, and many other adverse cyber events.
- Persistent storage for mission-critical containers with support for IBM Cloud Pak™ solutions to enhance and extend the functionality of Red Hat® OpenShift®.

On-going innovation

The IBM DS8900F family is the perfect storage foundation for consolidating transactional, cloud native, and AI workloads under a single all flash mission-critical solution, delivering the following benefits to customers as compared to the previous generation:

- **Up to 25% reduction in response time** for mainframe and 16% reduction in response time for Open Systems to process transactions faster, while expanding workloads to AI, Analytics and Business Intelligence.
- **2.15x more system cache** to improve the potential for cache hit rate and delivering faster background operations.
- **10x availability improvement** to maximize systems uptime with an average of only 3 seconds downtime in a year. From six (99.9999) to seven nines (99.99999) of availability.
- **2x greater bandwidth capacity** for the established Metro Mirror pair function with 32 GFC host adapters.
- **19% less weight and 5% less energy consumption** improving environmental while obtaining savings in maintenance and operating costs.

Data security is another area of enhancement within the IBM DS8900F family. Now, SP 800-131A compliant encryption can be extended to data in flight between IBM DS8900F arrays and all individual VTL systems in a TS7770 grid. And because there's no need to configure key groups, key managers, or other configurable items, encryption is now even easier within DS8900F / TS7770 environments. In addition, the IBM DS8900F family now has the option of a local key manager to enable and manage encryption at rest, protecting data and reducing complexity while keeping expenses and operation costs low.

Ultra-low application response times

In addition to an architecture optimized for high-performance flash storage media, IBM DS8900F solutions also offer extremely fast data access enabled by technologies such as IBM zHyperLink™ – the result of an IBM research project created to provide ultra-low latency links between mainframe servers and storage systems. IBM zHyperLink dramatically accelerates

access to data with less than 18 μ s response time and can be integrated with IBM HyperSwap[®] to meet the needs of high performance in high availability environments.

IBM DS8900F provides consistent performance for read operations in high availability environments for metropolitan regions, reducing the negative impact of increased latency caused by the separation distance between storage systems. This capability enables reads from a secondary site both over FICON[®] and zHyperLink to obtain the same response time as the primary system and better workload balance.

Powerful cyber resilience

The IBM DS8000 family is the leader in the external storage market for mainframe environments;⁴ these proven data systems have been deployed in business-critical environments for more than two decades, this is the reason why 18 of the top 20 banks worldwide use IBM DS8000 storage solutions.⁵

IBM DS8900F is designed to manage the full spectrum of storage workloads that exist in today's dynamic business environments and do it while offering very high performance and system availability, with industry-leading data protection and disaster recovery features. An important security feature offered by DS8900F is its comprehensive support for the IBM Z suite of data protection technologies collectively labeled *pervasive encryption*. These technologies enable extensive encryption of data in-flight and at-rest to substantially simplify encryption and reduce costs associated with protecting data.

The unrelenting tide of data breaches is driving increased interest in secure authentication across hybrid cloud environments. IBM provides a unique technology that ensures data is accessed only by authorized server and storage devices in order to reduce and eliminate insider threats of unauthorized access to the Storage Area Network. [IBM Fibre Channel Endpoint Security](#) is an end-to-end solution which ensures all data flowing on FICON and Fibre Channel Protocol (FCP) links from IBM Z to IBM DS8900F systems is encrypted. This solution provides in-flight protection for all data, independent of the operating system or access method in use.

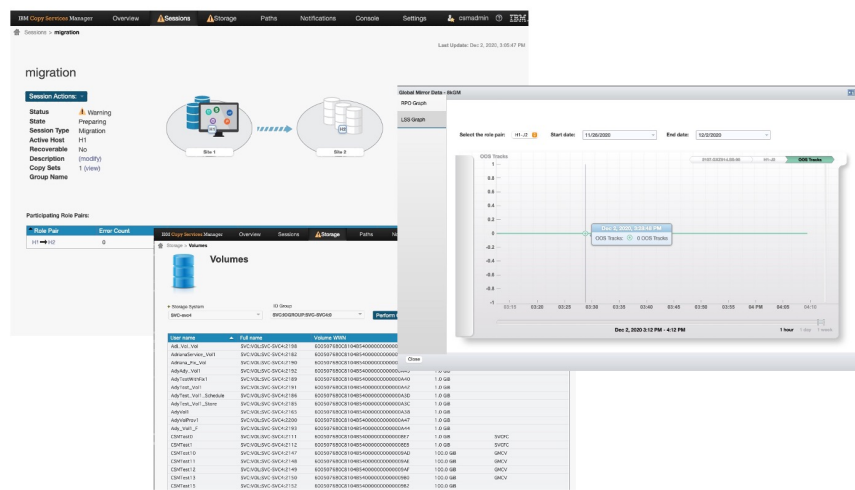
IBM DS8900F also offers the powerful data security functionality of IBM Safeguarded Copy. This technology provides immutable points of data recovery that are hidden and protected from being modified or deleted. These immutable copies are a trusted and secure source of data that can be used for forensic analyses or surgical or catastrophic recoveries. For increased security, Safeguarded Copy provides dual management control and can be integrated with different disaster recovery and high availability configurations.

In order to extend cyber resilience even further, IBM DS8900F can now back up full data volumes to the cloud where they can later be used to repair or recover production environments that have been compromised by user errors, malicious destruction, or ransomware attacks. This functionality leverages the benefits of TCT, including AES 256-bit encryption.

Business continuity made simple

In combination with IBM DS8900F, IBM Copy Services Manager (CSM) helps simplify and automate complex data replication tasks to be executed in just one step while providing high availability capabilities under a single point of control.

IBM Copy Services Manager supports FlashCopy®, Safeguarded Copy, and advanced disaster recovery functions with failover and failback operations across two, three, and four sites ensuring business continuity with extraordinary simplicity.



IBM Copy Service Manager

Seamless hybrid cloud integration

IBM Storage supports business transformation into a hybrid cloud ecosystem through a series of innovations centered around [Red Hat OpenShift Container Platform](#), [IBM Cloud Pak](#), and [IBM Storage Suite for Cloud Paks](#).

IBM has developed a series of middleware tools called IBM Cloud Paks designed to enhance and extend the functionality and capabilities of Red Hat OpenShift. The family of IBM Cloud Pak solutions give enterprises the fully modular and easy-to-consume capabilities they need to bring their workloads into modern, cloud-based environments.

IBM Storage Suite for Cloud Paks is the software-defined storage infrastructure supporting IBM Cloud Paks. These solutions are designed to give enterprises an open, faster, and more secure way to move core business applications to the cloud. They also bring workloads to production by

seamlessly leveraging Kubernetes as the management framework, supporting production-level qualities of service and end-to-end lifecycle management. In addition, IBM DS8900F provides persistent storage for mission-critical containers with support for Container Storage Interface (CSI), making data always available to the application, regardless of container location, planned downtime or unexpected disruptions.

IBM DS8900F data systems provide Transparent Cloud Tiering capabilities that allow organizations to introduce hybrid cloud as a new storage tier for data archiving, long term retention, and data protection in IBM Z environments. TCT does not require a server or gateway; it is a software-defined storage feature that leverages existing storage resources, avoiding the need for additional hardware infrastructure. TCT integrates with IBM Cloud Object Storage and can also provide transparent connectivity to IBM Cloud, Amazon S3 cloud storage resources, RStor or IBM TS7700 virtual tape libraries configured as object storage targets.

TCT off-loads the data movement responsibility to the IBM DS8900F without any impact on performance. Thanks to deep integration with z/OS®, TCT provides up to 50% savings in mainframe CPU utilization when migrating large data sets as compared to other traditional archiving methods. TCT offers an excellent solution for increasing cyber resilience by making use of the immutability features provided by cloud repositories. It can also be used to create full volume backups to the cloud which can then be restored to any system.

AI-driven management and proactive support

As any storage administrator knows, managing large storage systems requires many hours of monitoring, analysis, decision-making and adjustment. When problems arise, troubleshooting complex storage infrastructure and implementing the most effective solutions can be problematic, to say the least. To address these challenges and reduce both manual labor and mistakes, IBM DS8900F comes with Storage Insights, an enterprise-proven, AI, cloud-based system insights platform to help you better understand trends in storage capacity and performance and expedite resolution when support is required.

Storage Insights monitors the health, capacity and performance under management on a single pane of glass, helping IBM customers understand and plan storage capacity and performance. The program provides proactive best practices and uses AI-based analytics to help identify potential issues before they become problems. When support is needed, Storage Insights helps speed resolution by simplifying opening tickets, automating log uploads to IBM, and providing configuration, capacity and performance information to IBM technicians.

¹ *The Shift to Cloud Computing Persists as Organizations Use Multiple Public Clouds*, IDG, June 2020

² ESG White Paper: Enhancing Cyber Resilience in IBM Z Environments, August 2020

³ 2 seconds RPO and less than 60 seconds RTO in replication environments configured with GDPS® Continuous Availability

⁴ Based on DS8000® data system history and common use cases and IBM experience in real customer environments using high availability features to improve security and resiliency

⁵ Based on rankings documented by S&P Global Market Intelligence: The World's 100 Largest Banks 2020, April 2020

IBM DS8900F at a glance

IBM DS8900F data systems bring the security, performance, and cloud functionality demanded in today's data-intensive hybrid cloud environments. Build with flexibility, deliver with confidence, and protect the future of your business with these solutions from IBM Storage.

Offering	DS8910F Rack Mounted	DS8910F Racked Solution	DS8950F	DS8980F
Controller model	993	994	996	998
Expansion model	N/A	N/A	E96	E96
POWER9 cores per system	16	16	40	44
System cache	512 GB	512 GB	3.4 TB	4.3 TB
Flash cards	96	192	384*	384*
Maximum physical capacity	1.5 PB	2.95 PB	5.9 PB*	15.9 PB*
Host ports	32	64	128*	128*
Number of frames	N/A	1	2*	2*
Supported flash card sizes	800 GB, 1.6 TB, 1.9 TB, 3.2 TB, 3.84 TB, 7.68 TB and 15.36 TB			
Minimum response time	80 microseconds			
Minimum response time with zHyperLink	18 microseconds			
Host adapters	16 and 32 GFC encryption capable with IBM Fibre Channel Endpoint Security support			
RAID options	5, 6 and 10			
Dry bulb temperature	16°C – 32°C (60°F – 90°F)			
Relative humidity	20% - 80%			
Power frequency	50 Hz - 60 Hz			
Power phase options	Single phase or three phase			
Warranty	All models: onsite service, same day, 24x7 <ul style="list-style-type: none"> • 1 year on 5331 models • 2 years on 5332 models • 3 years on 5333 models • 4 years on 5334 models 			

* With an expansion unit.

Table of Specifications

For details on supported servers, visit the [IBM System Storage Interoperation Center \(SSIC\)](#)

Why IBM?

Whatever the requirements, only IBM can help with end-to-end solutions that include data systems, application servers, software, services, support and equipment financing. The IBM DS8900F data systems deliver mission-critical availability, superior flash performance, unparalleled synergy with IBM servers and leading-edge hybrid multicloud capabilities for organizations looking to achieve a true competitive advantage.

For more information

To learn more about IBM DS8900F, please contact your IBM representative or IBM Business Partner, or visit: ibm.com/products/ds8000f

For information on specific function availability, please contact your IBM storage specialist.

© Copyright IBM Corporation 2023.

IBM, the IBM logo, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at <https://www.ibm.com/legal/us/en/copytrade.shtml>, and select third party trademarks that might be referenced in this document is available at https://www.ibm.com/legal/us/en/copytrade.shtml#section_4.

This document contains information pertaining to the following IBM products which are trademarks and/or registered trademarks of IBM Corporation: IBM®, IBM Z®, IBM LinuxONE™, POWER9™, FlashCopy®, Geographically Dispersed Parallel Sysplex®, GDPS®, FICON®, Red Hat®, OpenShift®, IBM Cloud Paks™



All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.