

## IBM DS8900F

### High-performance hybrid multicloud storage solutions for mission-critical environments

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#### Highlights

- 18 microseconds response time for mainframe environments
- Enterprise resiliency with better than seven 9s availability
- Seamless hybrid multicloud integration with Transparent Cloud Tiering
- 3 and 4 site replication with 2 to 4 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 LinuxONE III single frame solutions

More than 85% of enterprises around the world now operate in hybrid multicloud environments, and in the next few years nearly all will move to these architectures.<sup>1</sup> 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.<sup>2</sup>

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*IBM DS8900F all-flash storage system*

The IBM DS8900F family of data systems offers an ideal solution for accelerating the dynamic hybrid multicloud environments that characterize 21<sup>st</sup> business. IBM DS8900F brings proven, market-leading capabilities, with the performance, security, reliability, 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 and LinuxONE servers as well as data-intensive workloads in distributed environments. Built with the most advanced POWER9 processors, IBM DS8900F solutions offer ultra-high performance, transparent hybrid multicloud connectivity for infrastructure simplification, massive capacity, and leading-edge cyber resilience.

The DS8900F family includes three 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 existing 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 superior performance and higher capacity, enabling the consolidation of mission-critical workloads for IBM Z, IBM LinuxONE, IBM Power Systems, and distributed environments under a single enterprise storage solution.

All three DS8900F solutions provide:

- Persistent highly available storage with advanced business continuity capabilities for container environments where continuous operations are crucial. IBM Z compression accelerator technology enables consolidation of multiple containerized workloads under a single IBM DS8900 all-flash solution, helping enterprises manage business data growth while reducing overall TCO.
- The powerful encryption capabilities required for Data Privacy Passports. IBM DS8900F enables IBM Fibre Channel Endpoint Security so valuable data can only be accessed by trusted servers and storage devices within and across data centers without application, operating system, or file system changes and without consuming IBM Z CPU cycles.
- Ultra-fast data access, with storage latencies as low as 18 microseconds, twice the throughput as previous DS8000 solutions – with substantially increased IOPS.

- Transparent Cloud Tiering (TCT) that provides substantial savings in CPU utilization while enabling hybrid multicloud architectures that accelerate AI and real-time analytics applications.
- More than “seven nines” availability and multi-site data replication for disaster recovery. The systems deliver continuous access to data before, during, and after system recovery. HyperSwap technology provides no-data-loss capabilities within metropolitan distances, and at more than 1,000 miles, IBM Geographically Dispersed Parallel Sysplex enables the fastest operations recovery time in the market for IBM Z, with 2 to 4 seconds RPO and less than 60 seconds RTO.<sup>3</sup>
- A highly resilient architecture that has helped protect data from malware, ransomware, cyberattacks, and many other threats for decades.<sup>4</sup> Recently introduced Safeguarded Copy functionality provides powerful cyber resilience to help mainframe-based enterprises stay one step ahead of cyber threats.

## On-going innovation

Mainframe technologies and environments are evolving vibrantly to meet ever-changing business and research requirements. This evolution is driving the need for storage solutions such as IBM DS8900F that can keep pace and even help accelerate innovation. For example, recently, the memory cache in all-flash IBM DS8900F storage solutions has been increased by 70% to a whopping 3.4 terabytes. This enhancement enables users to consolidate more IBM Z and LinuxONE workloads into IBM DS8900F memory for nanosecond performance that can lead to substantial CapEx and OpEx savings.

IBM DS8900F has added the capability to compress data prior to transfer across TCP/IP connections to [IBM TS7770](#) virtual tape library (VTL) systems configured as Object Storage targets. This new feature offers multiple benefits. The compression engine does not affect overall system IOPS. After compression, less network bandwidth is required to move data, which can increase performance across multicloud environments. And essentially three times more data can be stored at the target system, lowering storage requirements and costs. Plus, this new feature comes with the intelligence to maximize system resources and efficiency by avoiding redundant compression if these tasks have already been performed by the IBM Z host.

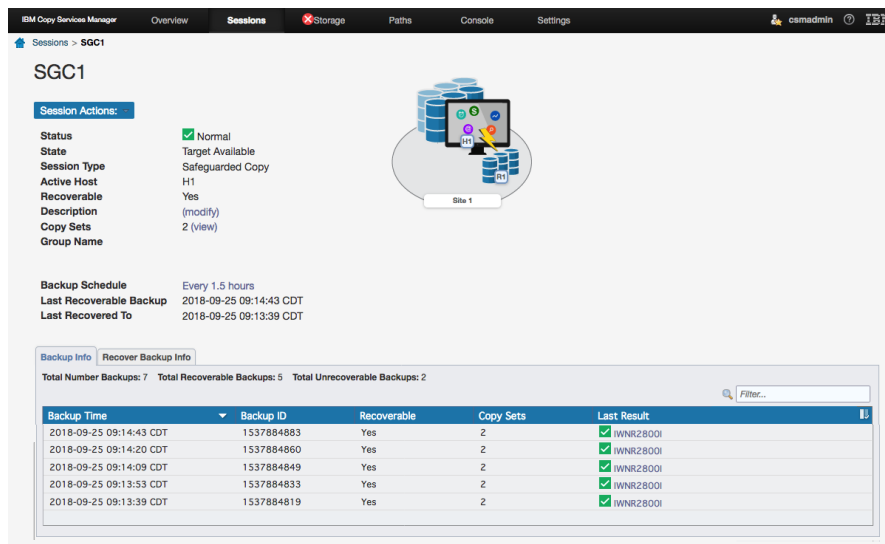
Data security is another area of enhancement within the IBM DS8900F family. Now, SP 800-131A compliant encryption can be extended to data in flight between IBM DS8900F arrays and all individual VTL systems in a TS7770 grid. And because there's no need to configure key groups, key managers, or other configurable items, encryption is now even easier within DS8900F / TS7770 environments.

## Powerful cyber resilience

The IBM DS8000 family is the leader in the external storage market for mainframe environments;<sup>5</sup> these proven data systems have been deployed in business-critical environments for more than two decades. Nine of the top ten banks worldwide use IBM DS8000 storage.<sup>6</sup>

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 multicloud 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.

In combination with IBM DS8900F, IBM Copy Services Manager simplifies and automates the management of data replication solutions 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.

## 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 microseconds response time; this represents a 10x improvement compared to High-performance FICON (zHPF). In addition, zHyperLink can be integrated with IBM HyperSwap to meet the needs of high performance in high availability environments.

## Hybrid multicloud integration

IBM Storage supports business transformation into a multicloud ecosystem through a series of innovations centered around [Red Hat OpenShift Container Platform](#), [IBM Cloud Paks](#), 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 Cloud Paks – including Cloud Paks for Applications, Data, Integration, Multicloud Management, Automation, and Security – 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, or IBM TS7700 virtual tape libraries configured as object storage targets.

TCT off-loads the data movement responsibility to the DS8900 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.

<sup>1</sup> IBM Institute for Business Value: A blueprint for data in a multicloud world, October 2019  
<https://www.ibm.com/thought-leadership/institute-business-value/report/multicloud-data-strategy>

<sup>2</sup> ESG White Paper: Enhancing Cyber Resilience in IBM Z Environments, August 2020

<sup>3</sup> Less than 60 seconds RTO with replication si configured with Geographically Dispersed Parallel Sysplex (GDPS) Continuous Availability

<sup>4</sup> 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

<sup>5</sup> IDC WW Quarterly Enterprise Storage Systems Tracker” file published on March 12, 2020

<sup>6</sup> Based on rankings documented by S&P Global Market Intelligence: The World's 100 Largest Banks 2020, April 2020

## DS8900F at a glance

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

Table of specifications			
Offering	DS8910F Rack Mounted	DS8910F Racked Solution	DS8950F
Controller model	993	994	996
Expansion model	N/A	N/A	E96
POWER9 cores per system (min / max)	16 / 16	16 / 16	20 / 40
System cache (min / max)	192 GB / 512 GB	192 GB or 512 GB	512 GB / 3.4 TB
Flash cards (min / max)	16 / 96	16 / 192	16 / 384*
Maximum physical capacity	1.5 PB	2.95 PB	5.9 PB*
Host ports (min / max)	4 / 32	4 / 64	4 / 128*
Number of frames (min /max)	N/A	1 / 1	1 / 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	90 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 • 1 year on 5331 models • 2 years on 5332 models • 3 years on 5333 models • 4 years on 5334 models		
Supported systems	For details on supported servers, visit the <a href="#">IBM System Storage Interoperation Center (SSIC)</a>		

\* With an expansion frame



## 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/marketplace/ds8000f](https://ibm.com/marketplace/ds8000f)

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

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