

MODEL 9

MODEL9 CLOUD BACKUP AND RECOVERY FOR z/OS

RUN ON zIIP ■ USE ANY CLOUD STORAGE ■ IMPROVE RECOVERY
CUT COSTS ■ ACCESS MF DATA IN THE CLOUD

Model9 Cloud Backup and Recovery for z/OS performs backup, restore, archive (migrate) and automatic recall for all z/OS data sets and volume types, including z/OS UNIX file-level backup and restore, space management and stand-alone restore.

Our patented technology connects the mainframe directly over TCP/IP to any network-attached storage of your choice and allows you to supplement or completely eliminate the need for virtual tape libraries and physical tapes. With Model9, you can take advantage of any storage device from low cost NAS or SAN to highly scalable, geographically dispersed, flexible and affordable object storage, on-premise and in the cloud. All popular storage platforms are supported.

Model9 consolidates the functionality of multiple backup and tape management software products into a single solution that dramatically reduces costs and provides either added capabilities such as write once protected copies, or a complete replacement of existing backup and tape management software. It can coexist side-by-side legacy backup and tape management products for simplified migration.

Model9 supports the following data management functions:

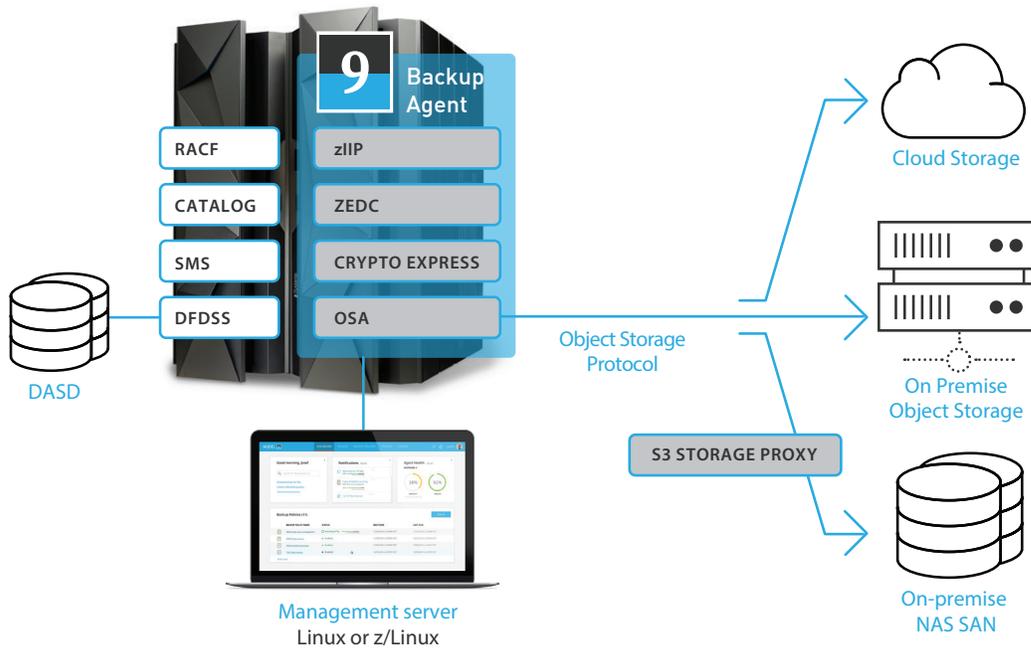
- Incremental data set backup and restore
- Full volume dump and restore
- Data set archive (migrate) with automatic recall
- SMS compatibility
- SAF-based authentication and authorization
- z/OS UNIX file-level backup and restore

BENEFITS

- **Replace costly tape hardware (VTS, VTL etc.)**
With any open storage system or cloud storage
- **Cut costs by 50% or more**
By reducing MSU consumption, consolidating software licenses and using cheaper storage
- **Improve RPO and RTO**
With additional recovery points and malware protected backup copies
- **Gain unlimited flexibility in storage options**
By using any accessible storage, on-premise or in the cloud
- **No vendor lock-in**
Data is stored in DFDSS dump format and can be recovered with standard mainframe tools
- **Alleviate ETL load and constraints**
By accessing MF data in the cloud for analytics, AI and ML
- **Secured**
Data is protected with mainframe-controlled end-to-end encryption, and subject to mainframe security software
- **Easy to install, easy to use**
1 hour installation time, intuitive web-based user interface

- Space management functions
- Quick search for data set backup version and archives
- Graphical reports
- Compression and encryption
- JCL and TSO/E command interfaces

Model9 architecture consists of an Agent running on z/OS and a Management Server running in a Docker container on Linux or z/Linux, as shown in the diagram below.



The Model9 Agent is a zIIP-eligible Java application running on z/OS. It uses z/OS data management functions and standards, such as using DFDSS as the underlying data mover, updating system catalogs, full compliance with SMS policy and relying on RACF authorization controls. The Model9 Agent utilizes zEDC and CryptoExpress cards for compression and encryption when available and can leverage zIIP engines when cards are not available.

The Management Server provides management, audit and reporting capabilities and can drive stand-alone recovery in case your mainframe is down. It communicates with the agents running in z/OS over secured TCP/IP connection. The Management Server runs in a Docker container on Linux or z/Linux and provides APIs to easily integrate with monitoring and DevOps tools. The Management Server is not part of the data path – all mainframe data can be retrieved directly from z/OS even when the Management Server is not available.

COMMON USE CASES

Cloud archive and backup

Store archives and backups directly in any network-attached storage, including object storage, NAS and SAN, on-premise or in the cloud. To maximize your benefit of cloud economics, cloud storage tiers (such as Amazon Glacier and Microsoft Azure cold storage) are supported.

The cloud is directly accessible from your mainframe -- no additional hardware, disk or tape emulation layer is required. All leading cloud providers are supported, including Amazon S3 and Glacier, Microsoft Azure, Google Cloud Storage and more.



Access mainframe data in the cloud for analytics, AI and ML

Mainframe data stored by Model9 in object storage on-premise or in the cloud can be extracted, transformed and accessed by standard cloud analytic and ETL tools. Data in the cloud can be accessed securely using standard cloud services without requiring any access to the Mainframe.

Cyber-threat protection and business resumption

Model9 provides an industry-first solution for mainframe cyber threat protection and business resumption, enabling z/OS customers to create highly secured, off-platform backup copies and quickly recover in case of an attack – all at minimal cost.

Backup software replacement

Consolidate legacy backup (such as IBM DFHSM, CA-Disk, FDR/ABR), tape management (IBM RMM, CA-1, CA-TLMS, BMC Control-M/Tape), encryption and reporting software products into a single modern solution.

Virtual tape reduction / elimination

Model9 performs standard mainframe data management functions while utilizing network-attached cloud storage systems and the cloud instead of virtual tape hardware. Storing data set backup copies, archives and full volume dumps on cloud storage, can substantially reduce the amount of data currently managed by your VTL.

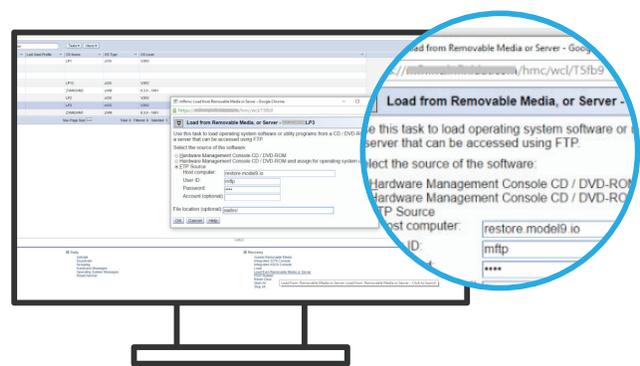
Data retrieval for recovery, restore, manual and automatic recall are supported directly from cloud storage. Moreover, a bare-metal recovery option is included to allow full recovery in DR situations without relying on the existing mainframe operating system.

Improve RPO

When using DASD snapshot technologies (such as FlashCopy) to create a consistent recovery point, Model9 allows you to reuse the snapshot target capacity for additional snapshots by moving the snapshot to cheaper cloud storage right away. This enables you to take more snapshots daily without allocating additional DASD storage. The backup copy can be used to restore a single data set, a full volume or the complete snapshot.

Disaster Recovery

The Management Server and the target storage may be located at a remote site or in the cloud and can function as a vault backup for disaster recovery situations. In bare-metal recovery situations, a stand-alone restore program is IPLed, over the network, directly from the Management Server (using the HMC “Load from removable media or server” action). The stand-alone restore program is used to restore volumes and data sets without requiring the agent to be running in z/OS.



Using the HMC to IPL a restore program from the backup server

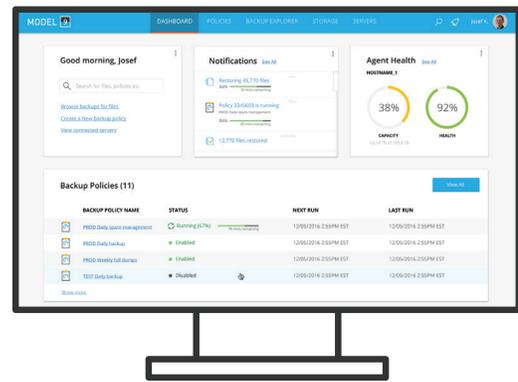
z/OS Unix (USS) file-level backup and restore

Model9 supports file-level backup and restore for z/OS UNIX files on z/OS. This unique capability saves backup space and shortens backup window for UNIX files by incrementally backing up only files that have changed, in contrast to frequently backing up the complete entire HFS or zFS data set. During restore, only the specified UNIX files are restored directly to the USS file system, without having to restore the full HFS/ zFS data set first.

USER INTERFACE

Users connect to Model9's web-based UI to perform daily activities. Administrators can use the UI to define and monitor the data protection policies and SLAs. Other users can use the UI to search and restore their data as needed. The dashboard was designed to help you ensure your data is protected at a glance. The UI includes Google-like search functionality to quickly find and restore data sets. The UI also provides detailed reports and analytics to help you understand data usage and prepare in time for growth.

Users log-in with their existing mainframe credentials. Authorization for all user actions is checked against the existing mainframe security software (such as RACF, CA-TSS or CA-ACF2).



Dashboard provides a quick overview of backup operations

SYSTEM REQUIREMENTS

Management Server

Linux

Minimum recommended hardware:

- 2 dual-core CPUs
- 4 GB memory
- 10 GbE network adapter

Supported operating systems (may run as a virtual machine):

- Ubuntu Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

Linux on z

Minimum recommended hardware:

- 2 IFLs
- 4 GB memory

S3 Proxy software is supplied with the Management Server to connect non-S3 storage to the mainframe

z/OS Agent

Minimum recommended hardware:

- 1 zIIP
- 4 GB memory

Additional supported hardware (optional):

- zEDC
- Crypto Express

Operating system prerequisites:

- z/OS V2R1 and up
- Java 8 64-bit

COEXISTENCE

Legacy Backup

IBM DFHSM
CA-DISK
FDR/ABR

Tape Management

IBM RMM
CA-1
CA-TLMS
BMC Control-M/Tape

Virtual Tape Software

IBM VTFM
CA-VTape

Security Software

RACF
CA-TSS
CA-ACF2

SUPPORTED STORAGE PROVIDERS

Cloud

Amazon S3
Amazon Glacier
Microsoft Azure
Google Cloud
IBM Cloud

Object

Hitachi Content Platform
IBM Cloud Object Storage
EMC Elastic Cloud Storage
NetApp StorageGRID
Microsoft Azure Stack

Immutable

Amazon Vault Lock
Hitachi HCP
NetApp StorageGRID

Traditional

NAS
SAN
DASD