

CA Disk™ Backup and Restore

Best Practices Guide

r12.6, Second Edition



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CA Technologies Product References

This document references the following CA products:

- CA 1® Tape Management (CA 1)
- CA Auditor for z/OS
- CA Datacom®/AD
- CA Disk™ Backup and Restore (CA Disk)
- CA Service Desk Manager (CA SDM)
- CA Tape Encryption
- CA TLMS® Tape Management (CA TLMS)
- CA Vantage™ Storage Resource Manager (CA Vantage SRM)
- CA Graphical Management Interface (CA GMI)
- CA Vtape™ Virtual Tape System (CA Vtape VTS)

Contact CA Technologies

Contact CA Support

For your convenience, CA Technologies provides one site where you can access the information that you need for your Home Office, Small Business, and Enterprise CA Technologies products. At <http://ca.com/support>, you can access the following resources:

- Online and telephone contact information for technical assistance and customer services
- Information about user communities and forums
- Product and documentation downloads
- CA Support policies and guidelines
- Other helpful resources appropriate for your product

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Best Practices Guide Process

These best practices are based on customer experience reported through interviews with development, technical support, and technical services. Therefore, many of these best practices are a collaborative effort stemming from customer feedback.

To continue to build on this process, we encourage you to share common themes of product use that might benefit other users. Please [consider sharing](#) your best practices with us.

To share your best *practices*, contact us at techpubs@ca.com and preface your email subject line with "Best Practices for product name" so that we can easily identify and categorize them.

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Chapter 1: Introduction

This section contains the following topics:

[Purpose of this Guide](#) (see page 7)

[Audience](#) (see page 7)

[Mainframe 2.0 Overview](#) (see page 7)

[Mainframe 2.0 Features](#) (see page 8)

Purpose of this Guide

The guide provides a brief introduction to the CA Technologies mainframe management strategy and features, and describes the best practices for installing and configuring CA Disk.

Audience

The intended audience of this guide is systems programmers and administrators who need to install, configure, deploy, and maintain the product.

Mainframe 2.0 Overview

Mainframe 2.0 is our strategy for providing leadership in the mainframe operating environment. We intend to lead the mainframe marketplace for customer experience, Out-Tasking solutions, and solution innovation. After listening to customer needs and requirements to keep the mainframe operating environment viable and cost-effective, we are providing new tools to simplify usage and to energize this operating environment for years to come.

CA Mainframe Software Manager™ (CA MSM) is an important step in realizing the Mainframe 2.0 strategy. CA MSM simplifies and standardizes the delivery, installation, and maintenance of mainframe products on z/OS systems. CA MSM has a browser-based user interface (UI) with a modern look and feel for managing those solutions. As products adopt Mainframe 2.0 features and CA MSM services, you can acquire, install, and manage your software in a common way.

CA MSM provides software acquisition and installation that make it easier for you to obtain and install CA mainframe products, and apply the recommended maintenance. The services within CA MSM enable you to manage your software easily based on industry accepted best practices. The common browser-based UI makes the look and feel of the environment friendly and familiar.

We follow the IBM z/OS packaging standards using SMP/E, with some additional CA qualities of service added, to make installation simple and consistent. Additionally, through the synchronization of product releases and the use of common test environments, we will declare a yearly mainframe software stack that includes many new releases with enhanced functionality. This stack is certified for interoperability across the CA mainframe product portfolio and the base IBM z/OS product stack.

Mainframe 2.0 Features

Mainframe 2.0 has the following main features:

CA Mainframe Software Manager (CA MSM)

Delivers simplified acquisition, installation, and deployment capabilities using a common z/OS-based web application delivered through a browser-based UI. CA MSM includes the following services:

Product Acquisition Service (PAS)

Facilitates the acquisition of our mainframe products and services, including product base installation packages and program temporary fixes (PTFs). This service integrates the inventory of products available on your system with CA Support, providing a seamless environment for managing and downloading software and fixes onto your system.

Software Installation Service (SIS)

Facilitates the installation and maintenance of our mainframe products in the software inventory of the driving system. This service enables you to browse and manage the software inventory using a web interface, and automates tasks for products that use SMP/E to manage installation. You can browse downloaded software packages, and browse and manage one or more consolidated software inventories (CSIs) on the driving system.

Software Deployment Service (SDS)

Facilitates the deployment of CA Technologies mainframe products from the software inventory of the driving system. This service enables you to deploy installed products that are policy-driven with a set of appropriate transport mechanisms across a known topology. The enterprise system topology can include shared DASD environments, networked environments, and z/OS systems. Policies represent a combination of metadata input and user-supplied input. Metadata input identifies the component parts of a product. User-supplied input identifies the deployment criteria, such as where it goes and what it is named.

Electronic Software Delivery (ESD)

Enables you to get our products from an FTP server. We have improved this process so that you no longer need to build a tape to install the product.

Best Practices Management

Integrates with IBM Health Checker for z/OS to verify that deployed software follows our best practices. The health checks continually monitor the system and software to provide feedback on whether the software continues to be configured optimally.

Best Practices Guide

Provides best practices for product installation and configuration.

Note: For additional information about the CA Mainframe 2.0 initiative, see <http://ca.com//mainframe2>.

Chapter 2: Installation and Configuration Best Practices

This section contains the following topics:

[Installation](#) (see page 11)

[Configuration for Optimal Performance](#) (see page 11)

Installation

Use CA MSM to acquire, install, and maintain your product.

Business Value:

CA MSM provides a web interface, which works with ESD and standardized installation, to provide a common way to manage CA mainframe products. You can use it to download and install CA Disk.

CA MSM lets you download product and maintenance releases over the Internet directly to your system from the CA Support website. After you use CA MSM to download your product or maintenance, you use the same interface to install the downloaded software packages using SMP/E.

Additional Considerations:

After you install the product, use the Installation Guide to set it up. CA MSM can continue to help you maintain your product.

More Information:

For more information about CA MSM, see the *CA Mainframe Software Manager Guide*. For more information about product setup, see the *Installation Guide*.

Configuration for Optimal Performance

The following section explains the best practices for configuring CA Disk for optimal performance.

Control Access to Sensitive Data

Activate the Storage Administration FACILITY Class Profiles to control access to sensitive data.

Business Value:

Activating the Storage Administration FACILITY Class Profiles feature controls access to sensitive data. The Storage Administration FACILITY Class Profiles feature removes the necessity for storage administrators to have security access to the data sets. Instead, this feature allows the storage administrators to access the storage management functions. The storage management functions do not allow access to the actual data set content. They only allow access to the specific storage management activities required to protect and recover the data.

More Information:

For more information about Storage Administration FACILITY Class Profiles, see the *Installation Guide*.

Control CA Disk Archive and Backup Tapes with Less Risk

Use the External Data Manager (EDM) interface to manage CA Disk Archive and Backup tapes for products that maintain their own catalog of tape files and volumes.

Business Value:

The EDM interface provides the maximum control of tapes with the least amount of risk. Following are the advantages of using EDM:

- Simplified activation
- Centralized control for scratching a tape
- Improved tape handling

Additional Considerations:

The following products provide EDM interfaces:

- CA 1
- CA TLMS
- IBM DFSMSrmm

More Information:

For more information about controlling tapes through the EDM Interface, see the *Systems Guide*.

Use CA Service Desk Support

Use the CA Service Desk interface.

Business Value:

The CA Service Desk interface immediately notifies you of serious mainframe problems.

Additional Considerations:

CA Service Desk Manager is an optional product, which requires a separately installed licensed LMP Key. The CA Common Services component, CAISDI (Service Desk Integration), enables CA mainframe z/OS products to automatically open request tickets for CA Service Desk for serious conditions that have been detected. You can optionally assign the request tickets to individuals of your choice. Thus, important problems are brought to the attention of the selected individual just seconds after they have been detected.

Along with CA Disk, many other CA products are using the CA Service Desk Integration for centralizing the management of serious mainframe problems.

More Information:

For more information, see the *CA Common Services r11 Unicenter Service Desk Integration Guide*.

Activate the CA Tape Encryption Interface

Activate the CA Tape Encryption Interface.

Business Value:

Protect your valuable data by utilizing data encryption.

Additional Considerations:

CA Tape Encryption is an optional product, which requires a separately installed licensed LMP Key. You can encrypt and decrypt all archive tapes when the CA Tape Encryption Interface to CA Disk is installed and activated. The CA Tape Encryption Interface to CA Disk is activated through sysparms BTEITAPE (PRIM, COPY, or both) and BTEDATCL (DATACLAS).

More Information:

For more information, see the section Activating the Tape Encryption CA Disk Interface in the Chapter "Installation" in the *Installation Guide* and the Chapter "Sysparms" in the *Systems Guide*.

Activate Archive Output Tape Chaining

When using tape output media for Archive processing, activate Archive Output Tape chaining to reduce the number of EXCPs and to improve performance. The best practice is to set sysparm IOCHNBLK to 9.

Business Value:

Specifying the sysparm IOCHNBLK turns on Archive Output Tape chaining. The default value of 1 indicates no chaining will be done. Setting the value higher than 1 reduces the number of EXCPs needed to write the larger data sets to tape and reduces the elapsed processing time due to tape channel conflicts.

Additional Considerations:

The Sysparm IOCHNBLK can be set from 1 to 9. The value specifies the number of tape blocks to be written to the tape concurrently. A higher value of the sysparm IOCHNBLK reduces the number of EXCPs issued to the tape, and reduces the elapsed time due to tape channel conflicts. The IOCHNBLK parameter increases the storage utilization by $(n-1) * \text{tape blocksize} * 2$. If you are using disk output media instead of the tape output media for both primary and secondary output, the sysparm IOCHNBLK should be set to 1.

More Information:

For more information about the system parameter definitions, see the *Systems Guide*.

Automate Cartridge Capacity Calculations

Set the sysparm CARTCALC to (Y) to have CA Disk automatically calculate the capacity of each cartridge regardless of type.

Business Value:

Using Y for the sysparm CARTCALC allows the cartridge capacity to be requested from the device. This means a higher utilization for each cartridge regardless of type.

Additional Considerations:

Sun/STK and IBM high capacity tapes must have CARTCALC specified as Y or the cartridge will be underutilized.

More Information:

For more information about the CARTCALC parameter, see the *Systems Guide*.

Retrieve and Store SMS Class Data

Retrieve the SMS class data once and store the data internally for reuse.

Business Value:

Specifying the sysparm SMSCACHE as Y allows the SMS class data to be retrieved once and stored internally for reuse. Because fewer requests to SMS subsystem are generated, using the stored class data improves performance.

More Information:

For more information about the system parameter definitions, see the *Systems Guide*.

Use CA Datacom/AD for the Files Data Base

Use CA Datacom/AD r11 SP2 for the Files Data Base for increased performance.

Business Value:

CA Datacom/AD provides a state-of-the-art, high performance database for CA Disk. CA Datacom/AD improves scalability, removes limitations, and improves performance over the legacy Files Data Set.

Additional Considerations:

The data managed by CA Datacom/AD is controlled through a started task, Multi-User Facility (MUF). CA Datacom/AD is so flexible that you can employ a wide range of possible configurations and methodologies. For more information about configurations and methodologies suitable for CA Disk, see the CA Disk Integration Guide. All of the operational jobs related to the MUF and the databases within the context of CA Disk are also documented. Several example SQL jobs for querying your data once it has been moved under CA Datacom/AD control are also provided.

More Information:

For more information, see the chapter "Datacom Overview" in the *Integration Guide*. For more information about CA Datacom/AD, see the *CA Datacom/AD Installation and Maintenance Guide – z/OS*.

Use the Graphical Management Interface (GMI)

Use the Graphical Management Interface (GMI) to view and monitor CA Disk activity.

Business Value:

GMI is CA's graphical management interface product that allows you to view and manage CA Disk activity from a Windows PC. GMI's structure is object oriented and provides a common layout consisting of an object tree, and consistent menu options and icons. This common layout makes it easy to remember how to navigate and use features. It also supports having multiple windows open at the same time (not hierarchical like the 3270), which allows you to view and compare information simultaneously.

This point-and-click interface provides a common and consistent method for viewing and managing multiple CA products, which can save considerable cost and time on training and learning.

Additional Considerations:

GMI consists of PC clients which interface with a z/OS server component to allow access to basic z/OS server functions.

The following are the available PC clients:

Windows-based Client

This client provides full functionality. That is, you can manually perform view and analysis functions, filter and sort desired entries, zoom (drill-down) to related objects, and take actions upon selected entries. You can create customized colored reports in different formats, for example, tables and graphs. These reports can be printed and exported to your PC directory, servers, intranet, and so on. You can create, manage, and view Summary objects. This client also provides designer wizards to create scripts to monitor and respond to any condition, exceptional or routine, in automatic ways. These automation services let you replace many if not all of the manual processes of managing your system.

Web-based Client

This client can be used from any PC with internet access to the GMI application server. The current version of the Web-based Client provides the user-driven functionality of view and analysis, filtering and sorting, zooming, and the ability to take actions on selected entries. You can create customized colored reports in different formats, for example, tables and graphs, and you can also view Summary objects.

More Information:

For more information about GMI for CA Disk, see the CA Vantage SRM documentation set.

Use the Auto Restore Manager

Use the Auto Restore Manager (ARM) facility provided with CA GMI.

Business Value:

Using the ARM optimizes auto-restore functions groups together restore the requests for the same volume, which minimizes volume switches and improves response time.

Additional Considerations:

CA Disk provides a native Auto Restore function that initiates the DMSAR started task each time a data set under its archive control is referenced. The DMSAR task restores the requested data set while the requester (an online user or a batch job) waits. When the restore is complete, the DMSAR task terminates. The ARM enhances this process in two ways:

- ARM starts one or more DMSAR servers, optionally dedicating them to either tape or disk restore work, and leaves them active, that is, waiting for more work. These features increase the auto restore performance.
- ARM provides a JES2 Exit, which makes batch processing more efficient when the batch JCL references archived data sets. Instead of letting the job tie up an initiator while the requested data sets are restored one- by-one, the JES2 Exit support holds the job, and routes all the needed restores to ARM at one time. Multiple servers restore the data sets more efficiently. When all restores are completed, ARM releases the job.

Note: Use of the JES2 Exit is optional but strongly recommended.

More Information:

For more information, see the section Configure the Auto Restore Manager (ARM) - Enhance DMSAR in the chapter "Configuring CA Vantage SRM Interface for CA Disk" in the *CA Vantage SRM Configuration Guide*.

Install the CA Disk Supervisor Call

Install the CA Disk Supervisor Call (SVC) so that the CA Disk management tasks do not cause data sets to appear as used.

Business Value:

Using the CA Disk SVC will improve CA Disk processes by differentiating those data sets opened for management functions from those opened by applications. The CA Disk SVC minimizes the amount of time required to run storage management processes based on last-used criteria by allowing them to target the correct set of data.

Additional Considerations:

The CA Disk storage management tasks open data sets to perform management functions such as backup, migration, compression, and so on. Whenever management functions are run, IBM's SU 60 open Operating System Interface marks these data sets as used. Therefore, the other functions such as archive will be prevented from finding and processing data sets that are truly inactive.

This action can cause many data sets to appear to be in use and are kept on disk merely due to storage management jobs routinely being run. The CA Disk SVC exempts the management jobs from causing these updates.

More Information:

See the section The CA Disk SVC in the Chapter "Customization" in the *Installation Guide*.

Use the CA Auditor for z/OS Interface

Use the CA Auditor for z/OS Interface.

Business Value:

The CA Auditor for z/OS Interface provides installation verification and ensures runtime integrity.

Additional Considerations:

CA Auditor for z/OS is an optional product, which requires a separately installed licensed LMP Key. The Product Validation Interface (PVI) of CA Auditor for z/OS provides an installation verification service to ensure that the software products are correctly installed and to verify runtime integrity. PVI audits the z/OS operating system and reports its findings to users, auditors, systems security administrators, and so on. PVI allows direct queries to acquire information about CA Disk, its intercepts, exits, and other attributes of concern to the security and audit community. This capability is possible through the use of the Product Description Module (PDM), which is shipped with CA Disk. Once installed, the PVI uses the information described in the PDM to verify that CA Disk is correctly installed and running properly.

The CAIXXGN1 module is provided if you want to include CA Disk to the products audited. If you will be using the CA Disk CAIXXGN1 module, it must reside in the currently active LPA.

More Information:

For more information, see *Activating the CA Disk CA Auditor for z/OS Support in the Installation Guide*.

Set Recatalog Volume for Archived Data Sets

Set the sysparm RECATMIG to Y in your SYSPARMS member of PARMLIB.

Business Value:

RECATMIG Y keeps the SMS class and Generation Data Set (GDS) status information in the catalog when an SMS data set is archived. By keeping the GDG status information, archived GDGs can be rolled out of the sphere and remain cataloged depending on the GDG base attributes.

More Information:

For more information, see *System Parameter Definitions in the Sysparms section in the Systems Guide*.

Managing Generation Data Sets

Set the sysparm RECATMIG to Y in your SYSPARMS member of PARMLIB. Set the sysparm GDGRECAT to N in your SYSPARMS member of PARMLIB. Do not use CREATE parameter for restoring GDGs.

Business Value:

Setting the sysparm RECATMIG to Y keeps the SMS class and Generation Data Set (GDS) status information in the catalog when an SMS data set is archived. By keeping the GDG status information, archived GDGs can be rolled out of the sphere and still remain cataloged depending on the GDG base attributes. Setting the sysparm GDGRECAT to N keeps the sphere intact by not forcing the older uncataloged GDG versions to be recataloged as active. When the sysparm GDGRECAT is set as Y, the RECAT action can cause active DFSMS GDS entries to be rolled out of the sphere. Review use of the CREATE parameter for Restore/Recover. Create date is another factor used at restore time in determining generation sequence. If an older generation is restored with a new creation date and later re-archived, it could be selected for recovery out of sequence later.

More Information:

For more information, see System Parameter Definitions in the Sysparms section in the *Systems Guide*. Also see CREATE in the RESTORE/RECOVER section in the *User Guide*.

Merge Least Used Volumes First

Set the sysparm MERGSORT to S in your SYSPARMS member of PARMLIB.

Business Value:

Setting the sysparm MERGSORT to S allows MERGE to process the ARCHVOLs according to the least space used rather than alphanumeric order. This setting allows MERGE to process more efficiently when smaller processing windows are needed.

More Information:

For more information, see the section System Parameter Definitions in the chapter "Sysparms" in the *Systems Guide*.

Gracefully Shutdown the IXMAINT Utility

Set the sysparm IXMREPLY to Y to allow a graceful shutdown during IXMAINT processing.

Business Value:

A graceful shutdown of the IXMAINT job allows more flexibility in your daily operation.

Additional Considerations:

IXMAINT is a CA Disk utility that provides the capability to process the entire CA Disk archive data set name index and delete records that meet specific criteria. CA Disk IXMAINT processing can be instructed to allow the operator to terminate any IXMAINT job normally through an operator reply. To activate this feature, specify Y for the value of IXMREPLY. The default value of N deactivates the feature.

A graceful shutdown allows the jobs to complete all work in progress and produces the normal reports for error conditions encountered and work successfully completed before the jobs terminate. With IXMREPLY active, a message is issued to the operator at the beginning of the job and remains on the console for the duration of the job. If the operator replies END to this message, the processing stops early. When using a FILES Data Base, an inquiry is made to validate whether the ARCHVOL record is empty, that is the ARCHVOL record has no DSNINDEX records. So, the ARCHVOL record can be deleted even when the IXMAINT is shutting down. However, when using a Files Data Set, all the DSNINDEX records must be processed before deleting an ARCHVOL record. So, when using the shutdown option for an FDS, no ARCHVOLs will be deleted.

You must have PTF RO08476 to take advantage of this best practice.

More Information:

For more information, see the section Graceful Shutdown in the chapter "FILES Maintenance" in the *User Guide*.

Gracefully Shutdown MERGE and XCOPY Processing

Set the sysparm MERREPLY to Y to allow a graceful shutdown during MERGE or XCOPY processing.

Business Value:

A graceful shutdown of the MERGE or XCOPY jobs allows more flexibility in your daily operation.

Additional Considerations:

CA Disk MERGE or XCOPY processing can be instructed to allow the operator to terminate the process normally through an operator reply, between any input tape mount. WTOR Message 4254 is issued for MERGE and WTOR Message 4255 is issued for XCOPY. Activate the graceful shutdown by specifying Y for the value of MERREPLY. For both MERGE and XCOPY, an operator response of END to the WTOR will gracefully shutdown the job at the end of the current input volume. For MERGE only, an operator response of NOW to the WTOR will gracefully shutdown MERGE at the end of the current input data set. The default value is N.

More Information:

For more information, see the section System Parameter Definitions in the Chapter "Sysparms" in the *User Guide*.

Gracefully Shutdown the DSCL Jobs

Set the sysparm DSCLRPLY to Y to allow a graceful shutdown during any data storage command language (DSCL) job.

Business Value:

A graceful shutdown of the DSCL jobs allows more flexibility in your daily operation.

Additional Considerations:

This enhancement allows you the option of shutting down any DSCL job prematurely. By setting DSCLRPLY to Y, an outstanding message is displayed on the operators console for the duration of any DSCL job. Replying to this message simply shuts down the job after processing the current resource, producing a complete set of reports including grand totals.

Backup and archive jobs can be shutdown gracefully by using the sysparm DSCLRPLY. A graceful shutdown allows the jobs to complete all work in progress and produces the normal reports for error conditions encountered and work successfully completed before the jobs terminate.

Note: If jobs are canceled instead of being gracefully shutdown, data sets could be left in a partially processed state and the normal reports will not be produced.

With DSCLRPLY set to Y, a message is issued to the operator at the beginning of the job, and remains on the console for the duration of the job. If the operator replies END to this message, the processing stops early.

More Information:

For more information, see DSCL Graceful Shutdown in the *User Guide*.

Allow Data Set Volume Pooling

Set the sysparm DSNDUPVL to Y in your SYSPARMS member of PARMLIB.

Business Value:

Setting the sysparm DSNDUPVL to Y allows a data set to move to different volumes and still be recognized as the same data set for functions like IXMAINT, FAST ARCHIVE, and MERGE processing.

More Information:

See System Parameter Definitions in the Systems Guide.

Monitor the CA Disk Health Checks

Monitor the health checks generated for CA Disk.

Business Value:

Health checks alert you to conditions that could prevent CA Disk from running properly, if left uncorrected. They guide you in addressing the problem.

Extra Considerations:

The following health checks are provided for CA Disk:

DISK_SYSPARM_CARTCALC_N

To get the best utilization of the tape device by using the least number of resources, set the sysparm CARTCALC to Y. This setting offers a higher utilization for each cartridge regardless of type. A tape library with mixed capacity tapes or with high capacity tapes must have CARTCALC specified as Y, or you can have underutilized cartridges.

DISK_SYSPARM_DSNDUPVL_N

Set the sysparm DSNDUPVL to Y if you use volume pooling. A default to N can cause an incorrect selection of an older DSNINDEX record. The selection can happen when a data set is moved or restored to a different volume.

DISK_SYSPARM_IOCHNBK_1

Set the sysparm IOCHNBK to 9 to get the best performance on tape I/O activity during a Backup or Archive job. The best performance on tape I/O gives reduced processing time for your required Backup and Archive jobs, shrinking the Backup/Archive processing window.

DISK_SYSPARM_IOTRACKS_1

Set the sysparm IOTRACKS to 30 to get the best performance on disk I/O activity during a Backup or Archive job. Getting the best performance on DASD I/O results in reduced processing time for your required Backup and Archive jobs.

DISK_SYSPARM_IXMQTIME_0

Set IXMQTIME to 0300 (30 seconds) to allow the needed data sets to be restored in a timely manner. When using a Files Data Set (FDS), integrity is maintained using enqueues which can prevent other CA Disk jobs from processing. Because IXMAINT is typically a longer running job, restoring critically needed data sets can be delayed.

DISK_SYSPARM_MERGSORT_S

To allow MERGE to process the ARCHVOLs by the least space used, set the sysparm MERGSORT to S. This setting allows MERGE to process more efficiently when smaller processing windows are needed.

More Information:

For more information, see the appendix Health Checks in the *User Guide*.