# CA Repository for z/OS

## Best Practices Guide

**r7.2**

# CA Product References

This document references the following CA products:

- CA Mainframe Software Manager (CA MSM)
- CA Repository for z/OS

# Contact CA

**Contact Technical Support**

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

- 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

**Provide Feedback**

If you have comments or questions about CA product documentation, you can send a message to techpubs@ca.com.

If you would like to provide feedback about CA product documentation, complete our short customer survey, which is also available on the CA Support website, found at http://ca.com/docs.

# Contents

# Chapter 1: Introduction

This section contains the following topics:

## Purpose of this Guide

The guide provides a brief introduction to CA's Mainframe 2.0 strategy and features, and describes the best practices for installing and configuring CA Repository for z/OS.

## Audience

The intended audience of this guide is systems programmers and administrators who install, configure, deploy, and maintain CA Repository for z/OS.

## 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 our 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 CA metadata input that identifies the component parts of a product and user-supplied input that identifies the deployment criteria, such as where it will go and what will it be called.

**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

### Use CA MSM

Use the CA Mainframe Software Manager (CA MSM) to acquire, install, and maintain your product.

**Business Value:**

CA MSM provides a common way to manage mainframe products. CA MSM provides a web interface, which works with ESD and standardized installation and management of mainframe products. You can use it to download and install CA Repository for z/OS.

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 Information:**

After you install the product, use the *CA Repository for z/OS Installation Guide* to set it up. CA MSM can continue to help you maintain your product.

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

## Use ESD

Download the product and maintenance releases using ESD. Although CA MSM is the preferred method for installing your CA mainframe products, some sites can decide to use ESD method instead.

**Business Value:**

ESD lets you download the product and maintenance releases over the Internet directly to your system from the CA Support website. When you order the product, you receive the authorizations and instructions to access, download, and prepare the installation files without the need for a physical tape. Thus, ESD is timelier, cost-effective, and environment friendly.

ESD uses standard z/OS utilities to prepare the product installation image on your system.

**More Information:**

For sites who have decided to use ESD, download the installation files from the CA Support website and install directly from your disk.

For information about the steps to download your CA products from the CA Support website for installation using the enhanced ESD pax process, see the *Mainframe Enhanced Electronic Software Delivery Guide* posted on the Download page of the CA Support website.

## CA Common Services

Verify that you have installed the most current release of CA Common Services.

**Business Value:**

The latest release of CA Common Services contains the most current infrastructure updates, allowing you to use newer features of CA Repository for z/OS, including the following:

- Licensing changes
- Service desk integration
- Product health checks

Staying on the current release and service pack of CA Common Services helps you avoid problems encountered by other users, getting you up to speed sooner and without as many problems.

**Note:** For more information about CA Common Services, see the *Installation Guide*.

## Apply PTFs

Apply all high priority PTFs. Check regularly for recent maintenance.

**Business Value:**

Being current on maintenance avoids system failures, resolves problems smoothly, and maximizes your investment by providing access to the latest features and functionality of CA Repository.

## Install on a Test Environment

Perform your installation and initial evaluations of the product and its components on a test system.

**Business Value:**

New releases of CA Repository for z/OS can be installed in different SMP/E zones or data sets to allow a new release to run on a test system while the old release continues to run on production systems. Evaluating the product in a test environment lets you detect any possible problems before you roll out the product to a production system, which helps ensure a seamless transition to the new release.

**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.

**Note:** For more information about upgrade considerations, see the *Installation Guide* before upgrading CA Repository for z/OS.

# Configuration

## Enable History Option

We recommend enabling the History Option.

**Business Value:**

Enabling the History Option allows you to track all updates and deletions for specific repository objects through the History tables (audit trail). The audit information contained in the history tables can then be queried using any SQL tool.

**Note:** For more information about how to enable the history option, see History Tables in the *Administration Guide*.

## Optimize the Migration Facility

We recommend that only the metadata you intend to migrate is in the FROM workstation (container).

**Business Value:**

You can achieve efficient and timely implementations by limiting the migration process to only the metadata being used.

**Additional Considerations:**

If all elements are kept in their own status then it is not necessary to include them in the FROM workstation.

**Note:** For more information, see Migrating Entities in the *Product Guide*.

## Use Unique Entity Identifiers

You can create unique entity identifiers using the NAME, STATUS, and VERSION attributes. We recommend using the STATUS attribute which mimics the phases of the Application Life Cycle (ALC), so that an entity's STATUS reflects its current position in the ALC. This method also works well if you choose to use only one status, for example, setting all production job statuses to *PROD* and having a unique VERSION number for each job.

**Business Value:**

Unique entity identifiers allow CA Repository for z/OS to assign unique job tracking and placement. These unique identifiers help prevent accidental updates when multiple metadata sources contain the same name as the one already populated from another source.

**Additional Considerations:**

CA Repository for z/OS uses the following three attribute types to uniquely identify each entity in the repository:

- NAME
- STATUS
- VERSION

STATUS and VERSION are used to qualify name, thus allowing two entities to have the same name, as long as they have a different status or version.

CA Repository for z/OS provides for automatic versioning and by default uses an incremental method.

## Debug SQL Errors

Set up SYSPRINT in the stored procedure's Work Load Manager (WLM) to go to SYSOUT.

**Business Value:**

When SQL errors occur in a stored procedure, they are written to the SYSPRINT DD in the WLM. You do not need to wait for a problem to reoccur to capture the messages for diagnosis.

# Chapter 3: Performance and Maintenance

This section contains the following topics:

## Perform RUNSTATS and REORG

We recommend that you routinely run the native DBMS RUNSTATS and REORG tools.

**Business Value:**

Regular performance tuning of frequently updated repository DB2 tables minimizes fragmentation and maximizes optimization.

**Note:** For more information, see REORG and RUNSTATS in the *RDBMS Administration Guide*.

## Avoid Long Running Concurrent Update Jobs

We recommend not running multiple concurrent batch jobs.

**Business Value:**

You can avoid deadlocks and timeouts by limiting the number of rows updated against the same tables in multiple concurrent batch jobs.

# Partition the DBX_XREF Table

We recommend that you partition the DBX_XREF table on the ENT_TYPE to help ensure referential integrity of data.

**Business Value:**

Partitioning the DBX_XREF table reduces the potential for getting deadlock conditions. Referential integrity helps ensure that every value of one attribute (column) of a relation (table) exists as a value of another attribute in a different (or the same) relation (table).

**Additional Considerations:**

CA Repository for z/OS is designed to use the DBX_XREF table to maintain the referential integrity of the data and to increase the performance of running impact analysis queries. Every row stored in one of the data tables contains a row in the DBX_XREF table. In addition, every row involved in an association is only stored on the DBX_XREF table.

Due to the design of the repository and the DB2 locking mechanisms, this table can become a constraint resulting in DB2 deadlock errors if long running batch update jobs attempt to access the same rows concurrently without doing frequent commits.

Multiple batch jobs can run while users are online, as long as these jobs or users are not updating the same data tables and the same partitions of the DBX_XREF table.

# Delete Orphans

We recommend running PRMORPH to delete orphaned metadata.

**Business Value:**

Deleting corrupted and orphaned data from your repository helps the system to run more effectively and efficiently. Subsequent loads to the repository of the same or related data may not work properly if there are orphans, and large numbers of orphans will cause noticeable performance degradation.

**Additional Considerations:**

An orphan exists when a row exists in one of the metadata tables and not in the DBX_XREF table, or, *the reverse*, when there is a row defined in the repository XREF table for an entity and there is no corresponding row in the repository metadata table. This condition can occur if the underlying repository tables are updated outside of the Repository tools.

The PRMORPH utility should be run on a regular basis.

**Note:** For more information about the PRMORPH utility, see the *Administration Guide*.

# WSO Administration

## Use XML Schema Definition

We recommend using XML Schema Definition (XSD).

**Business Value:**

XSD provides the syntax and defines a way in which elements and attributes can be represented in an XML document. XSD also provides a consistent industry-standard method to validate data.

**Additional Considerations:**

The repository administrators are authorized to generate an XSD for any Repository dialog that describes the entities and attributes contained within that Repository dialog. The XSDs enforce constraints on fields, data range (enumerations), data length, and valid values for each Repository dialog. Whenever a new dialog is added to the Repository, or a change occurs in an existing dialog, a new XSD must be generated.

**Note:** For more information, see the Appendix, Generating XSD for Repository Dialogs, in the *Webstation Option Administration Guide*.

## Use a Required Approval Process

We recommend using a required approval process.

**Business Value:**

Having a required approval process helps ensure data integrity by allowing only authorized persons, who have been granted approval access, to process modifications to the database. This process facilitates workflow and helps ensure that the metadata deployed to end users have been reviewed by the appropriate data stewards.

**Additional Considerations:**

All data modification requests made by users to modify a repository object have to go through an approval process if the Required Approval Process parameter is set to YES during product customization and enabled at the individual object level. Before Approvals can be enabled at the individual object level, it must first be enabled at the Product level. Webstation Option uses stewards to approve the pending request for all data modification actions such as update, insert, or delete for those objects with approval enabled.

**Note:** For more information, see Repository Approval Jobs in the *Webstation Option Administration Guide*.

# Exchanges and Scanners

## Load Data Structures before Program References

We recommend that data structure definitions be populated before importing programs that may reference them.

**Business Value:**

Data structure definitions from databases are more complete as compared to those provided by referencing programs. Programs may only reference parts of the data structure, therefore, may not describe the data structure in its entirety. By populating the data structure definitions first, and loading the more complete definition, this helps ensure that subsequent loads of referencing programs will be able to link up with the intended data structure. This allows for better reusability of metadata instances which will facilitate in data rationalization and impact analysis.

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