Introducing IBM z/OS Change Tracker for z/OS V2.5!

Session ID: 367

March 29, 2022

Marna Walle, IBM Corporation

mwalle@us.ibm.com

Chris Taylor, 21st Century Software, Inc.

christay@21csw.com

Trademarks

* Registered trademarks of IBM Corporation

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.
BMC is a registered trademark of BMC, Inc in the United States, other countries, or both.
Broadcom, CA are registered trademarks of Broadcom, Incds in the United States, other countries, or both.
IntelliMagic is a registered trademark of Intellimagic, Inc in the United States, other countries, or both.
IT Infrastructure Library is a Registered Trade Mark of AXELOS Limited.
ITIL is a Registered Trade Mark of AXELOS Limited.
Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.
Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
Zowe™, the Zowe™ logo and the Open Mainframe Project™ are trademarks of The Linux Foundation.
Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.
MXG is a registered trademark of Merrel Systems Group, Inc in the United States, other countries, or both.
Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.
Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.
Rocket is a registered trademark of Rocket Software, Inc in the United States, other countries, or both.
SAS is a registered trademark of SAS, Inc in the United States, other countries, or both.
UNIX is a registered trademark of The Open Group in the United States and other countries.
VMware, the VMware logo, VMware Cloud Foundation, VMware Cloud Foundation Service, VMware vCenter Server, and VMware vSphere are registered trademarks or trademarks of VMware, Inc. or its subsidiaries in the United States and/or other jurisdictions.
Zetaly is a registered trademark of Zetaly, Inc in the United States, other countries, or both.
Other product and service names might be trademarks of IBM or other companies.

Legal Disclaimer

Statement of Direction announced March 15, 2022

IBM z/OS Change Tracker

As IBM continues to provide a suite of robust tools to help system programmers manage z/OS, IBM intends to offer a new priced feature of z/OS V2.5, IBM z/OS Change Tracker. This feature is a comprehensive configuration change management tool for tracking, controlling, and managing software changes.

A Content Solution page with technical details is planned to be provided at a future date, concurrent with an availability announcement and GA date.

Because IBM z/OS Change Tracker's availability date is after the availability of z/OS V2.5, those wishing to acquire IBM z/OS Change Tracker will need to install it on their existing z/OS V2.5 systems.   After IBM z/OS Change Tracker's GA, it will be included in all subsequent z/OS V2.5 orders.

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Agenda

- Overview of IBM z/OS Change Tracker

- Monitoring and protecting

- Recovery

- Audit

- Snapshots

Includes planned future deliverables

IBM z/OS Change Tracker

The Problem

What challenges is the customer facing?

- Customers have no auditable tracking mechanism to know when changes are made to critical z/OS system, ISV software or application libraries, putting them at risk for application failures, or in worst case, a system outage.
- System changes can be performed by authorized users, intentionally or not, at any time and may or may not be logged.

Personas

Who are the primary stakeholders?

- z/OS System Programmer – "I need to have a consistent way to monitor who's making changes to libraries, and when, in case we have a problem, I also need to provide a means for backout for all the products I'm managing"
- Risk and Compliance – "I need to provide the auditors with proof that we're only allowing authorized users to change critical libraries in our environments, and that any changes are tracked"

Customer Value

How does the solution solve the problem?

- Real-time, system-wide change tracking and control for systems libraries
- Member-level recovery of real-time changes
- Fingerprinted members provide integrity verification for changes
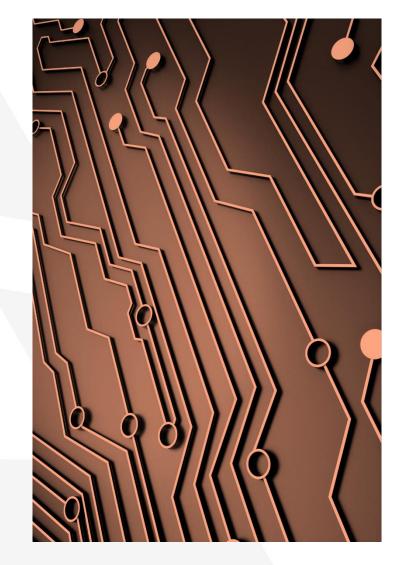
Compliance and Auditability

- Addresses regulations and industry standards such as Sarbanes-Oxley, COBIT, ISO and ITIL
- Provides regulatory compliance by automatically creating member backups when protected libraries are updated
- Changes at the member level are recorded for auditing purposes

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Why IBM z/OS Change Tracker?
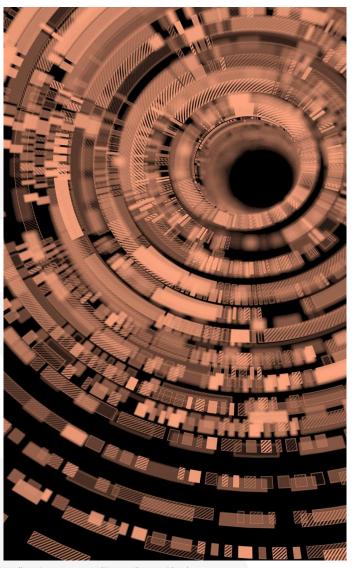
- To create a more secured z/OS and resilient IT environment

- To bring an automated process and transparency to system software change control and management (z/OS, IMS, Db2, CICS and vendors' software) in SYSPLEX environments

- To reduce the costs and complexities of meeting auditing and compliance requirements by providing a process and a control structure

- To improve quality and reliability by quickly ascertaining what has changed in software environments, and to reduce system or application outages

- To create an environment that promotes software integrity, added security, and reliability

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Top uses of IBM z/OS Change Tracker

- Change tracking and control for systems libraries

- Member-level recovery of real-time changes

- On-line documentation of changed members at the time of edit/save

- Exclusive member-level ownership, and source library management

- Detect system-wide changes for z/OS and USS environments

- Local or remote compare of software environments (z/OS and USS)

- Regularly validate DR software with the production software

- Rollback capabilities to undo the effect of unplanned/undesired changes

- Provide auditable evidence for compliance

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker

z/OS Change Tracker is a change management tool for tracking, controlling, and managing changes in software, intending to enhance the security, resiliency, and compliance of z/OS operating environments.

Key Features

Automatic, real-time monitoring of change activities

- Limits library changes to select user groups
- Establishes base versions for protected library members and automatically generates member versions as users introduce changes

Detection and recording of key elements of changes:
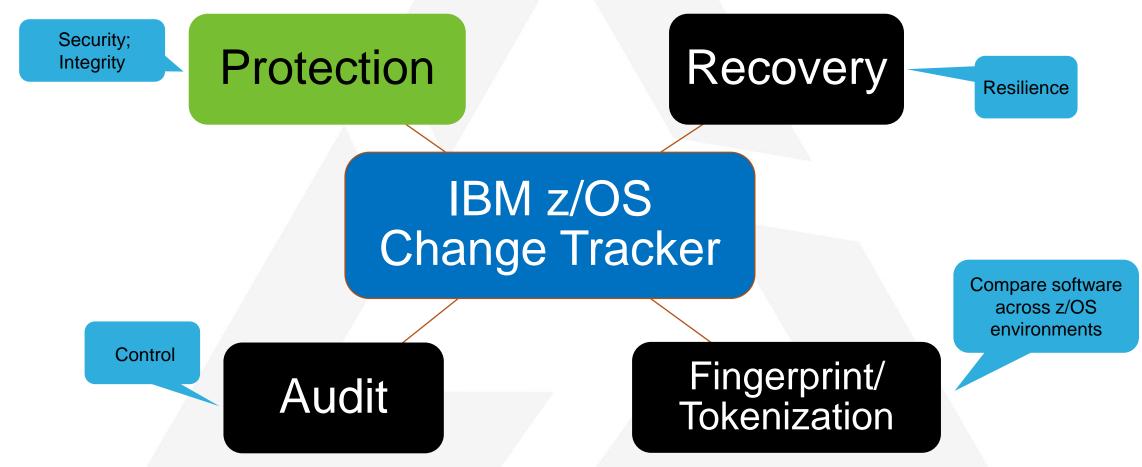
- Who made the change?
- What was changed? (Compares multiple environments for configuration and/or content changes)
- How was the change made? (With what utility?)
- When was the change made?
- Why was the change made? (Enforces change documentation)

Automated member-level backup for protected resources

Member-level recoverability with a view of previous member versions and their changes

IBM z/OS Change Tracker core functions

Comprehensive software configuration management (SCM) tool for tracking, controlling, and managing changes in software

Security; Integrity

Protection

Recovery

Resilience

IBM z/OS Change Tracker

Control

Audit

Fingerprint/ Tokenization

Compare software across z/OS environments

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker core functions

Comprehensive software configuration management (SCM) tool for tracking, controlling, and managing changes in software

Security; Integrity → **Protection**

Recovery ← Resilience

IBM z/OS Change Tracker

Control → **Audit**

Fingerprint/ Tokenization ← Compare software across z/OS environments

IBM z/OS Change Tracker core functions

Comprehensive software configuration management (SCM) tool for tracking, controlling, and managing changes in software

Security; Integrity

Protection

Recovery

Resilience

IBM z/OS Change Tracker

Compare software across z/OS environments; Cost saving

Control

Audit

Fingerprint/ Tokenization

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker core functions

Comprehensive software configuration management (SCM) tool for tracking, controlling, and managing changes in software

Security; Integrity

Protection

Resilience

Recovery

IBM z/OS Change Tracker

Control

Audit

Fingerprint/ Tokenization

Compare software across z/OS environments; Cost saving

Fundamental capabilities:
The IBM z/OS Change Tracker Started Task (STC)

SYSPLEX

STC SYSA

STC SYSB

STC SYSC

Control/Data Files
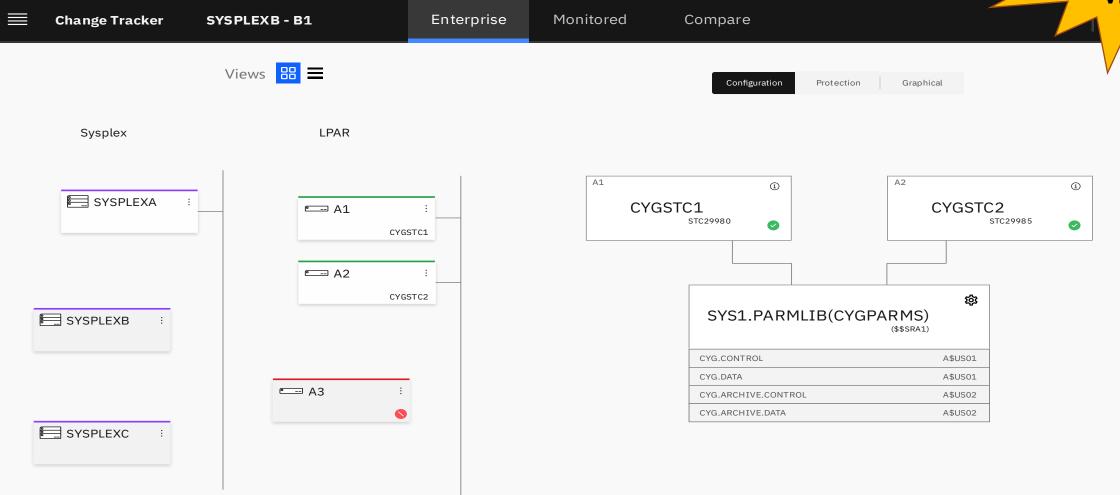
Audit REPORT

VIEW, COMPARE or RECOVER Versions

Multiple Sysplex configuration

z/OSMF Planned Vision

| Change Tracker | SYSPLEXB - B1 | Enterprise | Monitored | Compare |

Views

Configuration | Protection | Graphical

Sysplex

SYSPLEXA

SYSPLEXB

SYSPLEXC

LPAR

A1
CYGSTC1

A2
CYGSTC2

A3

A1
CYGSTC1
STC29980

A2
CYGSTC2
STC29985

SYS1.PARMLIB(CYGPARMS)
($$SRA1)

CYG.CONTROL	A$US01
CYG.DATA	A$US01
CYG.ARCHIVE.CONTROL	A$US02
CYG.ARCHIVE.DATA	A$US02

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Multiple Sysplex configuration

z/OSMF Planned Vision

Protect critical system libraries
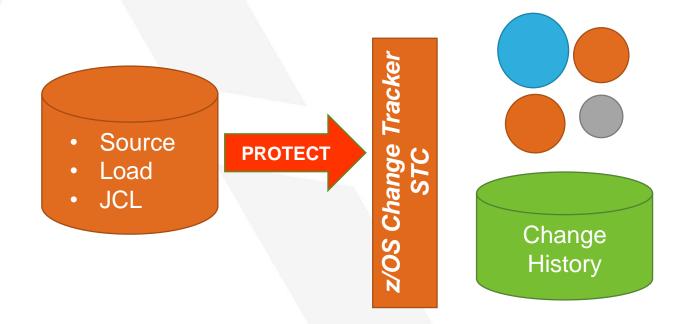
- PROTECT your critical system libraries to achieve auditability, version control, and exclusive component ownership.
  - LOCK=YES or NO
  - INITIAL=YES or NO
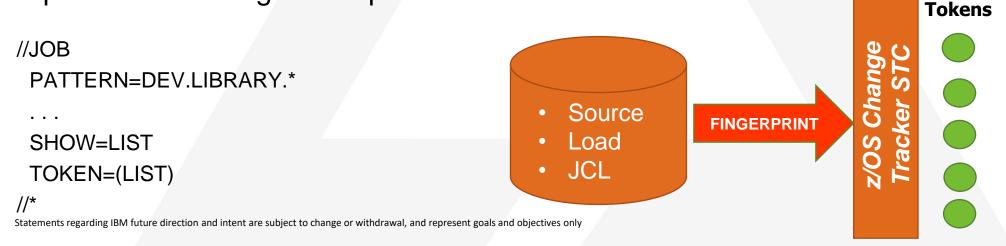
```
//JOB1
 PROTECT=(DSN=SYS1.PARMLIB,
    LOCK=YES,
    INITIAL=Y,
    COPIES=30)
//*
```

Source
Load
JCL

PROTECT

z/OS Change Tracker STC

Change History

Fingerprint your software environment

- The powerful z/OS Change Tracker fingerprint technology establishes "content" reference tokens for files
- A token represents the content of a file: PS or DA files, members of a PDS or PDS/E, files in USS, or zFS paths
- Tokens are stored in the z/OS Change Tracker Control File, or optionally to an external file
- Prior to change, snapshot your software environments of any size and configuration to establish the reference tokens
- Use the z/OS Change Tracker MODS identification function to automatically identify and report on the changed components

```
//JOB

  PATTERN=DEV.LIBRARY.*

  . . .

  SHOW=LIST

  TOKEN=(LIST)

//*
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Tokens

- Source
- Load
- JCL

FINGERPRINT

z/OS Change Tracker STC

z/OS Change Tracker high-level compare (local/remote)

- High-level compare of two libraries, two groups of libraries, two DASD volumes, or two groups of DASD volumes (local or remote)
  - Missing data sets
  - Member-level report: SAME, DIFF, MATCH, MISMATCH and MODS

PDS1 ← High-level Compare → PDS2

DIFFERENCE A
DIFFERENCE B

MONITORING AND PROTECTING

Monitoring and protecting

Alice

Mid-level System Programmer

Alice is responsible for running the mainframe IT environment, including installing, configuring, and maintaining z/OS systems in test and production.

Pain Point

- I need to know my A1 and A2 systems in Sysplex A are monitoring and protecting the same critical resources.

- I want to see what has changed in two collections of data sets, between Sysplex A and Sysplex B. (Something might have deployed incorrectly or become corrupted.)

Monitoring and protecting

24/7 Real-time monitoring
- Automatic backups whenever a monitored PDS member is changed
- Optional e-mail notification

Protect critical libraries
- Locked members cannot be changed without permission granted by administrator

Member-level management
- Administrator can grant/revoke update access of members to specific users
- PDS and PDSE member-level management

Delight Point

As an IBM Change Tracker for z/OS administrator:

- I can see, at a glance, that A1 and A2 are in sync for monitoring and taking automatic backups of my critical configuration data sets.

- It was easy to see the differences in data set collections between two different sysplexes in a snap.

IBM z/OS Change Tracker
No data sets protected


```
                 IBM z/OS Change Tracker                    00001
                   Version 1.0 Mod 17


     Tue   2022/03/01 07:09:15   CPU:6A28-8562   z/OS V2R5 SCB2


CYG101I CYGPARM DSN         : SYS1.PARMLIB.SCB2.USER(CYGPARMS)
        Current User        : CTAYLOR   is a Global Admin
        LINKLIB (APF)       : CYG.CTAYLOR.BLD00017.SCYGLNK
        Print Utility       : VPSPRINT
        USS Token File HLQ  : CYGUSS
        USS target dir      : /u/changetracker
        Options Settings    : MASSCOPY,StopBatchforLocked
        Panel National Lang : ENU
        Email file data set :
        Protection List     : To be built

CYG102I Control File        : CYG.CTAYLOR.BLD00017.CONTROL
        Data File           : CYG.CTAYLOR.BLD00017.DATA
        Archive Control File: CYG.CTAYLOR.BLD00017.ARCHIVE.CONTROL
        Archive Data File   : CYG.CTAYLOR.BLD00017.ARCHIVE.DATA
        Files Access Level  : FULL ACCESS

CYG116I Opened successfully : CYG.CTAYLOR.BLD00017.CONTROL


CYG116I Opened successfully : CYG.CTAYLOR.BLD00017.ARCHIVE.CONTROL

CYG802I Opened successfully : CYG.CTAYLOR.BLD00017.DATA

CYG410I z/OS Change Tracker is being initialized


00000000 RC-from-ADD: IGGPRE00_EXIT     CYGMLPG        80BC6000   LOADPT
00000000 RC-from-ADD: IGG_STOW_START    CYGMLPST       961FB000   LOADPT
00000000 RC-from-ADD: IFG_OPEN_START    CYGMLPOP       961FC000   LOADPT
00000000 RC-from-ADD: IFG_CLOSE_START   CYGMLPCL       961FD000   LOADPT

CYG414I z/OS Change Tracker has been initialized


           Protection List is Refreshed: 2022/03/01 07:09:28
    Legend: A(Alert) N(Notify/CSAVE) L(Lock) F(Force) I(Initial) V(Never) Q(Quick)

Dsname................................................ Vol Stat   ATTRIBUTES   Member   Checker RACF
-------------------------------------------------------------------------------------------------
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protection added to key data sets


```
                Protection List is Refreshed: 2022/03/01 07:09:28
          Legend: A(Alert) N(Notify/CSAVE) L(Lock) F(Force) I(Initial) V(Never) Q(Quick)

Dsname.......................... Vol Stat    ATTRIBUTES   Member    Checker RACF
-----------------------------------------------------------------------------------------

                Protection List is Refreshed: 2022/03/01 07:33:26
          Legend: A(Alert) N(Notify/CSAVE) L(Lock) F(Force) I(Initial) V(Never) Q(Quick)

Dsname.......................... Vol Stat    ATTRIBUTES   Member    Checker RACF
CTAYLOR.DEV.DEMO.CNTL               B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.INSTALL            B$US01 C    - - L - I -
CTAYLOR.DEV.DEMO.JCL                B$US02 C    - - L - I -
CTAYLOR.DEV.DEMO.LINKLIB            B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.MAC                B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PANELS             B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PARMLIB            B$US02 C    - N L F I -
CTAYLOR.DEV.DEMO.PDSE               B$US01 C E  - - - - I -
-----------------------------------------------------------------------------------------
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF

```
SCB2                                    IBM z/OS Change Tracker - (Ver 1.0 MOD 17)
Option ===> 1_

0    Options              Set processing options and review the PARMs
1    Administration       Manage the protected resources
2    Audit                Audit change activities in protected resources
3    Recover              Browse, edit and recover backups
4    Disaster Recovery    Tokenize and compare PROD and DR environments
5    Utilities            Perform utility functions
                                              Split Session ID: 1
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF


```
SCB2                                                      Administration
Option ===> 3_

1   Check Out                    Grant ownership of a set of members
2   Check In                     Check in members previously checked out
3   Protect a Resource           Protect a PDS or PDSE
4   Modify Protection            Change the LOCK status of a resource
5   Remove Protection            Remove protection from a resource
6   Backup                       Backup members of a protected resource
7   Delete or Archive Backups    Delete or archive member backups
8   Checked Out Resources        Display checked out members
9   Show Archive Reports         Show archived backups or actions
10  Show Logs                    Show logged Administrator activities
11  Recover Archived Backups     Recover an archived member backup
12  Prepare Tokens               Reference Tokens to identify MODS
13  Identify MODS                MODS since Reference Tokens generated
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF

```
SCB2                               IBM z/OS Change Tracker - Protect (1 of 3)
Command ===> _____

Cataloged or uncataloged data set
1    1. Cataloged
     2. Uncataloged
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF


```
SCB2                                    IBM z/OS Change Tracker - Protect (2 of 3)
Command ===> _____

   Specific DSN or Dsname Level
_  CTAYLOR.DEV.DEMO.SOURCE
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
_  _____
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF

```
SCB2                              IBM z/OS Change Tracker - Protect (3 of 3)
Command ===> _____

Protection Options:
    Enter "/" to select option        Locking
    _    CSAVE Notify at Edit          1   1. None
                                           2. Lock
    Email Alert  NONE                      3. Lock and force CSAVE

Processing Options:
    Comment  . .  Additional Demo Data Set_____
    Job Name       PROTECT

Backup Options:
    Backups                            Keep backups
    2   1. Suppress initial versions   1   1. Max copies  30
        2. Generate initial versions       2. Max days    0
        3. None                            3. Always

X  Data Set Name                          Prompt
_  CTAYLOR.DEV.DEMO.SOURCE
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF


```
//*  _____
//*  PROTECT A RESOURCE
//*  -----------------
//STEP1     EXEC PGM=CYGMAIN,REGION=0M                    SKEL CYGPRO
//* The default CYGPARMS member will be used. Tailor and uncomment
//* the following statement if a different one is required.
//*CYGPARM  DD DISP=SHR,DSN=@_parm_dsn(CYGPARMS)
//STEPLIB   DD DISP=SHR,DSN=CYG.CTAYLOR.BLD00017.SCYGLNK
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//CYGIN     DD *
 LOGCOMMENT='Additional Demo Data Set'
 PROTECT=(NOTIFY=N,
          FORCE=N,
          EMAIL=NONE,
          LOCK=N,
          INITIAL=Y,
          DSN=CTAYLOR.DEV.DEMO.SOURCE,
          COPIES=30,
          DAYS=0)
*
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Protecting a resource using ISPF

IBM z/OS Change Tracker
Editing a member in a protected data set


```
SCB2      EDIT      CTAYLOR.DEV.DEMO.PANELS              Row 0000001 of 0000632
Command ===>                                                 Scroll ===> CSR
         Name       Prompt        Size    Created           Changed            ID
E_____  CYGCAPP   *Edited        109    2015/06/18   2022/03/02 01:15:55  CTAYLOR
_____   CYGCBKP                   84    2021/09/28   2021/09/28 15:12:46  ROBH
_____   CYGCBKPL                  52    2021/09/28   2021/09/28 15:12:48  ROBH
_____   CYGCBKPS                  99    2021/09/28   2021/09/28 15:12:49  ROBH
_____   CYGCBUND                 106    2015/06/18   2020/11/12 18:14:23  ROBH
_____   CYGCBUN1                  50    2015/06/18   2020/11/12 18:14:34  ROBH
_____   CYGCBUN2                  49    2015/06/18   2020/11/12 18:14:39  ROBH
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Editing a protected member


```
SCB2          CTAYLOR.DEV.DEMO.PANELS(CYGCAPP) - 36.05        Columns 00001 00080
Command ===>                                                   Scroll ===> CSR
****** ****************************** Top of Data ****************************
''''''   Inserted Line 1
''''''   Inserted Line 2_
000001 )ATTR
000002 /** Proprietary Statement **********************************************/
000003 /*                                                                     */
000004 /*    IBM Confidential                                                 */
000005 /*    OCO Source Materials                                             */
000006 /*    5650-ZOS © Copyright Teracloud S.A. 2021                         */
000007 /*                                                                     */
000008 /*    The source code for this program is not published or otherwise   */
000009 /*    divested of its trade secrets, irrespective of what has been     */
000010 /*    deposited with the U. S. Copyright Office.                       */
000011 /*                                                                     */
000012 /** End Proprietary Statement **************************************/
000013    % Type(text) color(white)
000014    + Type(text) color(blue)
000015    } type(output) intens(low) pad(' ') caps(off) just(left) color(yellow)
000016    { Type(text) color(red)
000017
000018    @ type(input)  intens(high) pad('_') caps(on)  just(left)
000019    $ type(input)  intens(high) pad('_') caps(on)  just(left)
000020    ¬ type(input)  intens(high) pad('_') caps(off) just(left)
000021
000022    # type(output) intens(low)  pad(' ') caps(off)  just(left)
000023    ~ type(output) intens(low)  pad(' ') caps(on)   just(right)
```

IBM z/OS Change Tracker
Editing a protected member

```
CYG8801W Protected by z/OS C B$US02   CTAYLOR.DEV.DEMO.PANELS
```

IBM z/OS Change Tracker
Editing a member in a protected data set


```
Dsname..........................................   Vol Stat   ATTRIBUTES   Member    Checker RACF
CTAYLOR.DEV.DEMO.CNTL                             B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.INSTALL                          B$US01 C    - - L - I -
CTAYLOR.DEV.DEMO.JCL                              B$US02 C    - - L - I -
CTAYLOR.DEV.DEMO.LINKLIB                          B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.MAC                              B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PANELS                           B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PARMLIB                          B$US02 C    - N L F I -
CTAYLOR.DEV.DEMO.PDSE                             B$US01 C E  - - - - I -
CTAYLOR.DEV.DEMO.SOURCE                           B$US01 C    - - - - I -
-------------------------------------------------------------------------------------------------
2022/03/02 01:23:30 CYGCAPP   UPD CTAYLOR   SCB2       IKJEFT01 -      CTAYLOR.DEV.DEMO.PANELS                  B$US02
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Editing a member in a locked protected data set

Dsname.........................	Vol Stat	ATTRIBUTES	Member
CTAYLOR.DEV.DEMO.CNTL	B$US01 C	- - T - I -
CTAYLOR.DEV.DEMO.INSTALL	B$US01 C	- - L - I -
CTAYLOR.DEV.DEMO.JCL	B$US02 C	- - L - I -
CTAYLOR.DEV.DEMO.LINKLIB	B$US01 C	- - - - I -
CTAYLOR.DEV.DEMO.MAC	B$US02 C	- - - - I -
CTAYLOR.DEV.DEMO.PANELS	B$US02 C	- - - - I -
CTAYLOR.DEV.DEMO.PARMLIB	B$US02 C	- N L F I -
CTAYLOR.DEV.DEMO.PDSE	B$US01 C E	- - - - I -
CTAYLOR.DEV.DEMO.SOURCE	B$US01 C	- - - - I -

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Editing a member in a locked protected data set


```
SCB2 T - Data Sets Matching CTAYLOR                          Row 1 of 30
Command ===> _____         Scroll ===> CSR

Command - Enter "/" to select action              Message              Volume
----------------------------------------------------------------------------
         CTAYLOR                                                       *ALIAS
         CTAYLOR.CLIST                                                 B$US01
         CTAYLOR.COMMAND.FILE.SCB2                                     B$US02
         CTAYLOR.DEMO.JCL                                              B$US02
         CTAYLOR.DEV.DEMO.CNTL                                        B$US01
         CTAYLOR.DEV.DEMO.INSTALL                                     B$US01
         CTAYLOR.DEV.DEMO.JCL                                         B$US02
         CTAYLOR.DEV.DEMO.LINKLIB                                     B$US01
         CTAYLOR.DEV.DEMO.MAC                                         B$US02
         CTAYLOR.DEV.DEMO.PANELS                                      B$US02
E_       CTAYLOR.DEV.DEMO.PARMLIB                                     B$US02
         CTAYLOR.DEV.DEMO.PDSE                                        B$US01
         CTAYLOR.DEV.DEMO.SOURCE                                      B$US01
         CTAYLOR.DSS.DUMP.DEMO.D022822                                B$US02
         CTAYLOR.IBMCHNGE.LOG.SCB2                                    B$US02
         CTAYLOR.RECOVERY.CYG22060.T0743255                           B$US01
         CTAYLOR.SCB1.ISPF.ISPPROF                                    B$US02
         CTAYLOR.SCB2.ISPF.ISPPROF                                    B$US02
         CTAYLOR.SCB2.SPFLOG1.LIST                                    B$US02
         CTAYLOR.SCB2.SPFTEMP0.CNTL                                   B$US02
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Editing a member in a locked protected data set


```
CYG8804W This is a locked resource and you may not change any members.
CYG8804W This is a locked resource and you may not change any members.

***  _
```

IBM z/OS Change Tracker
Editing a member in a locked protected data set


```
CYG8804W This is a locked resource and you may not change any members.
CYG8804W This is a locked resource and you may not change any members.

***  _
```

- This message also is written to the syslog, if configured
  - STCPrintOff in CYGPARMS will stop messages being issued to syslog

IBM z/OS Change Tracker
Add members to protected data set


```
SCB2 T - Data Sets Matching CTAYLOR.DEV                    Row 1 of 9
Command ===>                                          Scroll ===> CSR

Command - Enter "/" to select action          Message            Volume
-------------------------------------------------------------------------
         CTAYLOR.DEV.DEMO.CNTL                                    B$US01
         CTAYLOR.DEV.DEMO.INSTALL                                B$US01
co_      CTAYLOR.DEV.DEMO.JCL                                     B$US02
         CTAYLOR.DEV.DEMO.LINKLIB                                B$US01
         CTAYLOR.DEV.DEMO.MAC                                     B$US02
         CTAYLOR.DEV.DEMO.PANELS                                  B$US02
         CTAYLOR.DEV.DEMO.PARMLIB                                 B$US02
         CTAYLOR.DEV.DEMO.PDSE                                    B$US01
         CTAYLOR.DEV.DEMO.SOURCE                                  B$US01
*********************** End of Data Set list *************************
```

IBM z/OS Change Tracker
Add members to protected data set


```
SCB2       COPY      CTAYLOR.DEV.DEMO.JCL              Row 0000001 of 0000006
Command ===>                                          Scroll ===> CSR
         Name         Prompt        Size    Created           Changed              ID
S_____  CMPUCOPY                      7    2016/11/09   2016/11/10 00:34:52   IBMUSER
S_____  CMPUCPU                       7    2016/11/09   2016/11/10 00:35:14   IBMUSER
S_____  CMPUDIR                       7    2016/11/09   2016/11/10 00:35:33   IBMUSER
_____   CMPUDR                        7    2016/11/09   2016/11/10 00:35:55   IBMUSER
_____   CMPUFBVB                      7    2016/11/09   2016/11/10 00:36:22   IBMUSER
_____   CMPUPARM                      7    2016/11/09   2016/11/10 00:36:51   IBMUSER
         **End**
```

IBM z/OS Change Tracker
Add members to protected data set

```
SCB2                          COPY Entry Panel
Command ===>


CURRENT  from data set: 'CTAYLOR.DEV.DEMO.JCL(CMPUCOPY)'
Multiple Move/Copy actions will be processed.
To Library                         Options:
   Project . . .  _____           Enter "/" to select option
   Group . . . :  _____           _   Replace like-named members
   Type  . . . :  _____           /   Process member aliases

To Other Data Set Name
   Name  . . . . . . .  DEV.DEMO.CNTL_
   Volume Serial . . .  _____        (If not cataloged)

NEW member name  . . .  _____     (Blank unless member to be renamed)

Options
   Sequential Disposition        Pack Option          SCLM Setting
   2   1. Mod                     3   1. Yes           3   1. SCLM
       2. Old                         2. No                2. Non-SCLM
                                      3. Default           3. As is

Press ENTER to perform action.  Press CANCEL to cancel action.
```

IBM z/OS Change Tracker
Add members to protected data set

```
CYG8804W This is a locked resource and you may not change any members.
CYG8804W This is a locked resource and you may not change any members.

CYG8801W Protected by z/OS C B$US01   CTAYLOR.DEV.DEMO.CNTL
```

- CTAYLOR.DEV.DEMO.CNTL is the target data set and is not a locked resource.
  - Locked resource refers to source data set, in this case.

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Delete member from protected data set


```
SCB2       BROWSE      CTAYLOR.DEV.DEMO.CNTL           Row 0000001 of 0000004
Command ===>                                                Scroll ===> CSR
          Name        Prompt           Size    Created              Changed                   ID
D_____  ASMUTL                        32    2016/11/09  2016/11/10 00:34:07   IBMUSER
_____  CMPUCOPY                        7    2016/11/09  2016/11/10 00:34:52   IBMUSER
_____  CMPUCPU                         7    2016/11/09  2016/11/10 00:35:14   IBMUSER
_____  CMPUDIR                         7    2016/11/09  2016/11/10 00:35:33   IBMUSER
          **End**
```

IBM z/OS Change Tracker
Add/delete/rename members in protected data set


```
         Protection List is Refreshed: 2022/03/02 06:13:09
      Legend: A(Alert) N(Notify/CSAVE) L(Lock) F(Force) I(Initial) V(Never) Q(Quick)

Dsname............................... Vol Stat   ATTRIBUTES  Member    Checker RACF
CTAYLOR.DEV.DEMO.CNTL                 B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.INSTALL              B$US01 C    - - L - I -
CTAYLOR.DEV.DEMO.JCL                  B$US02 C    - - L - I -
CTAYLOR.DEV.DEMO.LINKLIB              B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.MAC                  B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PANELS               B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PARMLIB              B$US02 C    - N L F I -
CTAYLOR.DEV.DEMO.PDSE                 B$US01 C E  - - - - I -
CTAYLOR.DEV.DEMO.SOURCE               B$US01 C    - - - - I -
-------------------------------------------------------------------------------------
2022/03/02 06:25:10 CMPUCOPY ADD CTAYLOR   SCB2      IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                B$US01
2022/03/02 06:25:10 CMPUCPU  ADD CTAYLOR   SCB2      IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                B$US01
2022/03/02 06:25:10 CMPUDIR  ADD CTAYLOR   SCB2      IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                B$US01
2022/03/02 06:30:47 ASMUTL   DEL CTAYLOR   SCB2      IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                B$US01
2022/03/02 06:32:43 CMPUCT1  REN CTAYLOR   SCB2      IKJEFT01 CMPUCOPY  CTAYLOR.DEV.DEMO.CNTL                B$US01
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Batch updates to protected data set


```
SCB2         CTAYLOR.DEMO.JCL(CYGT6UPD) - 11.08              Columns 00001 00080
Command ===> sub_                                             Scroll ===> CSR
******  *****************************  Top of Data  *********************************
000001 //CHRISUPD JOB (),CLASS=A,MSGCLASS=H,NOTIFY=&SYSUID
000002 //*
000003 //*********************************************************************
000004 //*********************************************************************
000005 //**        PROCEDURE:   CYGT6UPD                                   **
000006 //**                                                               **
000007 //**        FUNCTION:                                              **
000008 //**                                                               **
000009 //**           THIS JOB UPDATES THREE PROTECTED RESOURCES IN BATCH. **
000010 //**           THE INTENTION IS TO SHOW HOW BATCH UPDATES OF        **
000011 //**           PROTECTED RESOURCES ARE RECORDED BY THE STC.        **
000012 //**                                                               **
000013 //**                                                               **
000014 //**           EXPECTED COND CODE: 0000                            **
000015 //**           ACTIVITY: TESTED ON FEB 16, 2022                    **
000016 //**                                                               **
000017 //*********************************************************************
000018 //STEP1 EXEC PGM=IEBCOPY
000019 //SYSPRINT DD SYSOUT=*
000020 //IN        DD DISP=SHR,DSN=MMADANI.DEV3.JCL
000021 //OUT       DD DISP=SHR,DSN=CTAYLOR.DEV.DEMO.PDSE      <== PROTECTED
000022 //SYSIN DD *
000023  COPY INDD=IN,OUTDD=OUT
000024  SELECT MEMBER=((ALLOC,,R))
000025 //*
000026 //STEP2 EXEC PGM=IEBCOPY
000027 //SYSPRINT DD SYSOUT=*
000028 //IN        DD DISP=SHR,DSN=MMADANI.DEV3.JCL
000029 //OUT       DD DISP=SHR,DSN=CTAYLOR.DEV.DEMO.MAC       <== PROTECTED
000030 //SYSIN DD *
000031  COPY INDD=IN,OUTDD=OUT
000032  SELECT MEMBER=((ALLOC,,R))
000033 //*
000034 //STEP3     EXEC PGM=IDCAMS,REGION=0M
000035 //SYSPRINT DD SYSOUT=*
000036 //SYSIN     DD *
000037   DELETE   CTAYLOR.DEV.DEMO.CNTL(CMPUCPU)
000038   DELETE   CTAYLOR.DEV.DEMO.CNTL(CMPUDIR)
000039 //*
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Batch updates to protected data set

```
2022/03/02 06:25:10 CMPUCOPY ADD CTAYLOR   SCB2       IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                    B$US01
2022/03/02 06:25:10 CMPUCPU  ADD CTAYLOR   SCB2       IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                    B$US01
2022/03/02 06:25:10 CMPUDIR  ADD CTAYLOR   SCB2       IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                    B$US01
2022/03/02 06:30:47 ASMUTL   DEL CTAYLOR   SCB2       IKJEFT01 -         CTAYLOR.DEV.DEMO.CNTL                    B$US01
2022/03/02 06:32:43 CMPUCT1  REN CTAYLOR   SCB2       IKJEFT01 CMPUCOPY  CTAYLOR.DEV.DEMO.CNTL                    B$US01

2022/03/02 06:41:00 ALLOC    ADD CHRISUP   SCB2       IEBCOPY  -         CTAYLOR.DEV.DEMO.PDSE                    B$US01
2022/03/02 06:41:00 ALLOC    ADD CHRISUP   SCB2       IEBCOPY  -         CTAYLOR.DEV.DEMO.MAC                     B$US02
2022/03/02 06:41:01 CMPUCPU  DEL CHRISUP   SCB2       IDCAMS   -         CTAYLOR.DEV.DEMO.CNTL                    B$US01
2022/03/02 06:41:01 CMPUDIR  DEL CHRISUP   SCB2       IDCAMS   -         CTAYLOR.DEV.DEMO.CNTL                    B$US01
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for locked protected data sets

- The Check out process allows the Administrator to assign access to a user or group for a protected and locked resource.

- This is usually performed on the member level or on a list of members.

- Comments can also be added to explain the reason for the Check out.

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2                                           Administration
Option ===> 1_

1    Check Out                 Grant ownership of a set of members
2    Check In                  Check in members previously checked out
3    Protect a Resource        Protect a PDS or PDSE
4    Modify Protection         Change the LOCK status of a resource
5    Remove Protection         Remove protection from a resource
6    Backup                    Backup members of a protected resource
7    Delete or Archive Backups Delete or archive member backups
8    Checked Out Resources     Display checked out members
9    Show Archive Reports      Show archived backups or actions
10   Show Logs                 Show logged Administrator activities
11   Recover Archived Backups  Recover an archived member backup
12   Prepare Tokens            Reference Tokens to identify MODS
13   Identify MODS             MODS since Reference Tokens generated
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2                                  IBM z/OS Change Tracker - Check Out (1 of 2)
Command ===> _____

Job Name     CHECKOUT

                                              Protection      Check Out
S Protected Resource                   Volser Attributes      Y/N Count
_ CTAYLOR.DEV.DEMO.CNTL                   -        -  -  -  -  I N   -
S CTAYLOR.DEV.DEMO.INSTALL                -        -  -  L  -  I N   -
_ CTAYLOR.DEV.DEMO.JCL                    -        -  -  L  -  I N   -
_ CTAYLOR.DEV.DEMO.LINKLIB                -        -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.MAC                    -        -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.PANELS                 -        -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.PARMLIB                -        -  -  L  F  I N   -
_ CTAYLOR.DEV.DEMO.PDSE                   -        -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.SOURCE                 -        -  -  -  -  I N   -
************************************************ Bottom of data ****************************************
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2                                        IBM z/OS Change Tracker - Check Out (2 of 2)
Command ===> _

Selected Resource  . :  CTAYLOR.DEV.DEMO.INSTALL
Checker User ID  . . .  CTAYLOR     or RACF Group  . . . . . _____
Comment  . . . . . . .  Allow access to CYGARC

S  Name        VV MM Created     Changed             Size  Init  Mod  ID
S  CYGARC      48.11 15/06/18    21/03/04  12:43       54    49    0  ROBH
_  CYGCHECK    01.11 15/06/18    21/03/04  12:30       37    33    0  ROBH
_  CYGCOPY     01.21 15/06/18    21/07/15  11:57       35   134    0  ROBH
_  CYGCOPY2    01.22 15/06/18    21/07/15  11:58       41   139    0  ROBH
_  CYGCSAVE    01.23 15/06/18    21/06/17  13:27       59   213    0  ROBH
_  CYGCSAVM    47.04 15/06/18    21/03/04  14:56       65    56    0  ROBH
_  CYGCSAV1    47.05 15/06/18    21/03/04  14:58       10   101    0  ROBH
_  CYGDROP1    26.07 18/08/08    20/12/17  07:41       48    39    0  ROBH
_  CYGDROP2    13.09 17/05/28    20/12/17  07:42       64    55    0  ROBH
_  CYGDROP3    10.09 16/09/09    20/12/17  07:42       50    41    0  ROBH
_  CYGDYNAM    01.15 15/06/18    20/12/17  07:49       19   114    0  ROBH
_  CYGEMDAT    01.07 15/06/18    20/12/02  08:26       31    31    0  ROBH
_  CYGEMDOC    10.24 16/09/09    21/09/09  14:36       86    63    0  ROBH
_  CYGEMJCL    01.19 15/06/18    21/09/09  14:36       58    26    0  ROBH
_  CYGESR      01.20 15/06/18    21/09/15  16:14       43    32    0  ROBH
_  CYGESRE     10.07 16/09/09    20/12/17  07:37       75    71    0  ROBH
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets

```
//CTAYLORX JOB (0),'',
//          CLASS=A,NOTIFY=&SYSUID,MSGCLASS=X
//*
//****************************************************************
//** Proprietary Statement ***************************************
//** Licensed Materials - Property of Teracloud S.A.         **
//** 5650-ZOS © Copyright Teracloud S.A. 2021                **
//** All Rights Reserved.                                     **
//**                                                          **
//** US Government Users Restricted Rights - Use, duplication or **
//** disclosure restricted by GSA ADP Schedule Contract with IBM Corp.**
//**                                                          **
//** End Proprietary Statement ***********************************
//****************************************************************
//*
//* _____
//* CHECKOUT A COMPONENT AND BACKUP IT UP; NOTE TO HAVE RUN CYGUPARM
//* ------------------------------------------------------------
//STEP1    EXEC PGM=CYGMAIN,REGION=0M                SKEL CYGCHKOU
//STEPLIB  DD DISP=SHR,DSN=CYG.CTAYLOR.BLD00017.SCYGLNK
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//CYGIN    DD *
  CHECKOUT=(MEM=CYGARC,
      DSN=CTAYLOR.DEV.DEMO.INSTALL,
      USERID=CTAYLOR,
      COMMENT=('CKO: ','Allow access to CYGARC'))
*
  ENDCHECK
*
  TRIGGERREFRESH
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
         Protection List is Refreshed: 2022/03/03 01:08:50
   Legend: A(Alert) N(Notify/CSAVE) L(Lock) F(Force) I(Initial) V(Never) Q(Quick)

Dsname................................ Vol Stat    ATTRIBUTES  Member    Checker RACF
CTAYLOR.DEV.DEMO.CNTL                  B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.INSTALL               B$US01 C    - - L - I -  CYGARC    CTAYLOR  -
CTAYLOR.DEV.DEMO.JCL                    B$US02 C    - - L - I -
CTAYLOR.DEV.DEMO.LINKLIB               B$US01 C    - - - - I -
CTAYLOR.DEV.DEMO.MAC                    B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PANELS                B$US02 C    - - - - I -
CTAYLOR.DEV.DEMO.PARMLIB               B$US02 C    - N L F I -
CTAYLOR.DEV.DEMO.PDSE                   B$US01 C E  - - - - I -
CTAYLOR.DEV.DEMO.SOURCE                B$US01 C    - - - - I -
-----------------------------------------------------------------------------------
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2                                                    Checked Out Resources
Command ===>  _____

                                         Protection        Check Out
S Protected Resource              Volume Attributes        Y/N Count
_ CTAYLOR.DEV.DEMO.CNTL             -       -  -  -  -   I   N    -
L CTAYLOR.DEV.DEMO.INSTALL          -       -  -  L  -   I   Y   001
_ CTAYLOR.DEV.DEMO.JCL              -       -  -  L  -   I   N    -
_ CTAYLOR.DEV.DEMO.LINKLIB          -       -  -  -  -   I   N    -
_ CTAYLOR.DEV.DEMO.MAC              -       -  -  -  -   I   N    -
_ CTAYLOR.DEV.DEMO.PANELS           -       -  -  -  -   I   N    -
_ CTAYLOR.DEV.DEMO.PARMLIB          -       -  -  L  F   I   N    -
_ CTAYLOR.DEV.DEMO.PDSE             -       -  -  -  -   I   N    -
_ CTAYLOR.DEV.DEMO.SOURCE           -       -  -  -  -   I   N    -
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2                                    IBM z/OS Change Tracker - Checked Out Members
Command ===> _

Selected Resource CTAYLOR.DEV.DEMO.INSTALL

Checked Out Member Checker ID Check Out Comment
CYGARC              CTAYLOR     CKO: Allow access to CYGARC
*********************************************************** Bottom of data *****************************************
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2            CTAYLOR.DEV.DEMO.INSTALL(CYGCHECK) - 01.11          Columns 00001 00080
Command ===> SAVE                                                   Scroll ===> CSR
****** *************************** Top of Data ***************************
000001 //*JOBCARD JOB
000002 //** Proprietary Statement ***********************************************
000003 //** Licensed Materials - Property of Teracloud S.A.                    **
000004 //** 5650-ZOS © Copyright Teracloud S.A. 2021                          **
000005 //** All Rights Reserved.                                              **
000006 //**                                                                   **
000007 //** US Government Users Restricted Rights - Use, duplication or       **
000008 //** disclosure restricted by GSA ADP Schedule Contract with IBM Corp. **
000009 //**                                                                   **
000010 //** End Proprietary Statement ***********************************************
000011 //SEARCH   JCLLIB ORDER=(TGTHLQ.INSTALL)
000012 //***********************************************************************
000013 //***********************************************************************
000014 //**                                                                   **
000015 //**     PROCEDURE:  CYGCHECK                                          **
000016 //**                                                                   **
000017 //**     FUNCTION:                                                     **
000018 //**        THIS JOB EXAMINES ALL PROTECTED DATA SETS AND IDENTIFIES   **
000019 //**        ANY STRUCTURAL ERRORS IN THE Z/OS CHANGE TRACKER CONTROL   **
000020 //**        FILE. IF THE JOB ENDS WITH NO ERRORS OR WARNINGS, THAT'S   **
000021 //**        AN INDICATION THAT THE Z/OS CHANGE TRACKER CONTROL FILE    **
000022 //**        IS IN GOOD CONDITION.                                      **
000023 //**        YOU MAY RUN THIS JOB BEFORE STARTING THE Z/OS CHANGE       **
000024 //**        TRACKER STC ONLY ON ONE OF THE LPARS.                      **
000025 //**                                                                   **
000026 //**     NOTE:                                                         **
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
CYG8801W Protected by z/OS C B$US01   CTAYLOR.DEV.DEMO.INSTALL
CYG8801W Protected by z/OS Change Tracker: CTAYLOR.DEV.DEMO.INSTALL
         MEMBER (CYGCHECK) is NOT saved.

*** _
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets


```
SCB2         CTAYLOR.DEV.DEMO.INSTALL(CYGARC) - 48.11          Columns 00001 00080
Command ===> SAVE                                               Scroll ===> CSR
****** ************************************** Top of Data **********************************
000001 //*JOBCARD JOB
000002 //** Proprietary Statement ************************************************ **
000003 //** Licensed Materials - Property of Teracloud S.A.                       **
000004 //** 5650-ZOS © Copyright Teracloud S.A. 2021                              **
000005 //** All Rights Reserved.                                                  **
000006 //**                                                                       **
000007 //** US Government Users Restricted Rights - Use, duplication or           **
000008 //** disclosure restricted by GSA ADP Schedule Contract with IBM Corp.     **
000009 //**                                                                       **
000010 //** End Proprietary Statement ************************************************ **
000011 //SEARCH   JCLLIB ORDER=(TGTHLQ.INSTALL)
000012 //*
000013 //** ****************************************************************************
000014 //** ****************************************************************************
000015 //*                                                                        **
000016 //**      PROCEDURE:   CYGARC                                              **
000017 //**                                                                       **
000018 //**      FUNCTION:                                                        **
000019 //**        THIS JOB PERFORMS AN AUTO-ARCHIVE FUNCTION. IT EXAMINES THE    **
000020 //**        RETENTION PERIOD OR THE NUMBER-OF-COPIES-TO-KEEP VALUES        **
000021 //**        PRESET FOR PROTECTED LIBRARIES, AND ARCHIVES ANY EXTRA         **
000022 //**        VERSIONS TO THE Z/OS CHANGE TRACKER ARCHIVE SYSTEM.            **
000023 //**                                                                       **
000024 //**        IT IS RECOMMENDED TO RUN THIS JOB WEEKLY BEFORE RUNNING        **
000025 //**        YOUR REGULAR BACKUP/RESTORE JOB TO ORGANIZE THE VSAM           **
000026 //**        CLUSTERS. PLEASE READ THE NOTE BELOW:                          **
000027 //**                                                                       **
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check out process for protected data sets

```
CYG8801W Protected by z/OS C B$US01   CTAYLOR.DEV.DEMO.INSTALL

***
```

IBM z/OS Change Tracker
Check in updated protected data sets

```
SCB2                                                    Administration
Option ===> 2

1   Check Out                   Grant ownership of a set of members
2   Check In                    Check in members previously checked out
3   Protect a Resource          Protect a PDS or PDSE
4   Modify Protection           Change the LOCK status of a resource
5   Remove Protection           Remove protection from a resource
6   Backup                      Backup members of a protected resource
7   Delete or Archive Backups   Delete or archive member backups
8   Checked Out Resources       Display checked out members
9   Show Archive Reports        Show archived backups or actions
10  Show Logs                   Show logged Administrator activities
11  Recover Archived Backups    Recover an archived member backup
12  Prepare Tokens              Reference Tokens to identify MODS
13  Identify MODS               MODS since Reference Tokens generated
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check in updated protected data sets


```
SCB2                                       IBM z/OS Change Tracker - Check In (2 of 2)
Command ===> _____

Selected Resource      CTAYLOR.DEV.DEMO.INSTALL
Volume Serial  . : -
Comment  . . . . .    Checked CYGARC back in_____

S Checked Out Member    Checker ID  Prompt
S _CYGARC                CTAYLOR
************************************************************************** Bottom of data **************
```

IBM z/OS Change Tracker
Check in updated protected data sets

```
SCB2         CYG.CTAYLOR.JCL(CHECKIN) - 01.00                Columns 00001 00080
Command ===> SUB_                                            Scroll ===> CSR
****** ********************************** Top of Data ****************************
000001 //CTAYLORX JOB (0),'',
000002 //        CLASS=A,NOTIFY=&SYSUID,MSGCLASS=X
000003 //*
000004 //***********************************************************************
000005 //** Proprietary Statement *********************************************
000006 //** Licensed Materials - Property of Teracloud S.A.                 **
000007 //** 5650-ZOS © Copyright Teracloud S.A. 2021                        **
000008 //** All Rights Reserved.                                           **
000009 //**                                                               **
000010 //** US Government Users Restricted Rights - Use, duplication or    **
000011 //** disclosure restricted by GSA ADP Schedule Contract with IBM Corp.**
000012 //**                                                               **
000013 //** End Proprietary Statement *************************************
000014 //***********************************************************************
000015 //*  _____
000016 //* CHECKIN A COMPONENT AND BACKUP OF THE COMPONENT
000017 //* -----------------------------------------------
000018 //STEP1      EXEC PGM=CYGMAIN,REGION=0M              SKEL CYGCHKIN
000019 //STEPLIB   DD DISP=SHR,DSN=CYG.CTAYLOR.BLD00017.SCYGLNK
000020 //SYSPRINT DD SYSOUT=*
000021 //SYSUDUMP DD SYSOUT=*
000022 //CYGIN     DD *
000023   LOGCOMMENT='Checked CYGARC back in'
000024 *OPTION=NOBACKUPATCHECK        UNCOMMENT TO SKIP BACKUP CREATION
000025 *
000026   CHECKIN=(MEM=CYGARC,
000027      DSN=CTAYLOR.DEV.DEMO.INSTALL,
000028      COMMENT=('CKI: ','Checked CYGARC back in'))
000029 *
000030   ENDCHECK
000031 *
000032   TRIGGERREFRESH
****** ****************************** Bottom of Data ****************************
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Check in updated protected data sets


```
SCB2                                    IBM z/OS Change Tracker - Check Out (1 of 2)
Command ===>

Job Name   CHECKOUT

                                           Protection    Check Out
S Protected Resource            Volser  Attributes    Y/N Count
_ CTAYLOR.DEV.DEMO.CNTL             -       -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.INSTALL          -       -  -  L  -  I N   -
_ CTAYLOR.DEV.DEMO.JCL              -       -  -  L  -  I N   -
_ CTAYLOR.DEV.DEMO.LINKLIB          -       -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.MAC              -       -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.PANELS           -       -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.PARMLIB          -       -  -  L  F  I N   -
_ CTAYLOR.DEV.DEMO.PDSE             -       -  -  -  -  I N   -
_ CTAYLOR.DEV.DEMO.SOURCE           -       -  -  -  -  I N   -
```
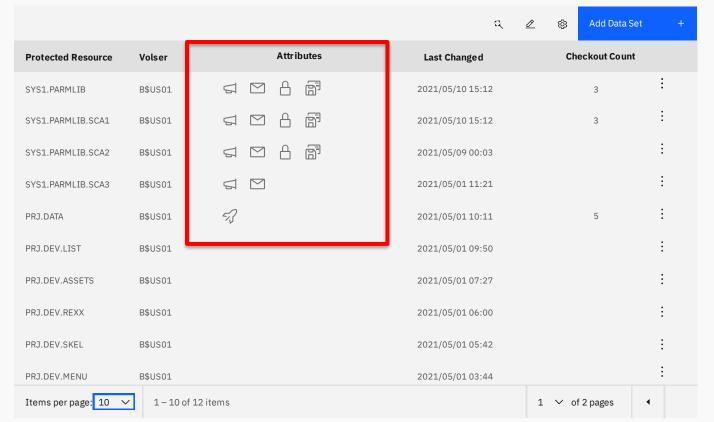
Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

DYLANF - Admin

Enterprise   Monitored   Compare

SYSPLEXB - B1

z/OSMF
Planned
Vision

Monitored Resources

Views

Protected Resource	Volser	Attributes	Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01	📢 ✉ 🔒 💾	2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA1	B$US01	📢 ✉ 🔒 💾	2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA2	B$US01	📢 ✉ 🔒 💾	2021/05/09 00:03		⋮
SYS1.PARMLIB.SCA3	B$US01	📢 ✉	2021/05/01 11:21		⋮
PRJ.DATA	B$US01	🚀	2021/05/01 10:11	5	⋮
PRJ.DEV.LIST	B$US01		2021/05/01 09:50		⋮
PRJ.DEV.ASSETS	B$US01		2021/05/01 07:27		⋮
PRJ.DEV.REXX	B$US01		2021/05/01 06:00		⋮
PRJ.DEV.SKEL	B$US01		2021/05/01 05:42		⋮
PRJ.DEV.MENU	B$US01		2021/05/01 03:44		⋮

Add Data Set +

Items per page: 10   1 – 10 of 12 items   1 ⌄ of 2 pages   ◀

Checkout List

Showing All Members

File	Checked out to	Checkout date
PRJ.DEV.RES(ARC113)	CJENKINS	21/03/18
PRJ.DATA(A)	CJENKINS	21/03/18
PRJ.DATA(B)	CJENKINS	21/03/18
PRJ.DATA(C)	CJENKINS	21/03/18
PRJ.DATA(D)	CJENKINS	21/03/18
PRJ.DATA(E)	CJENKINS	21/03/18
PRJ.DEV.ASM(CYGQESR)	DYLANF	21/03/18
PRJ.DEV.COPY(DATA4)	DYLANF	21/03/18
PRJ.DEV.LIB(PRINTSRC)	ROBH	21/03/18
PRJ.DEV.RES(ARC114)	ROBH	21/03/18
PRJ.DEV.DATA(NAMES)	ROBH	21/03/18

DYLANF - Admin

Enterprise   **Monitored**   Compare

SYSPLEX - B1

Monitored Resources

Views

z/OSMF Planned Vision

	Audit	Backup	Recovery	Modify	Browse

Protected Resource	Volser	Attributes				Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01	📢	✉	🔒	💾	2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA1	B$US01	📢	✉	🔒	💾	2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA2	B$US01	📢	✉	🔒	💾	2021/05/09 00:03		⋮
SYS1.PARMLIB.SCA3	B$US01	📢	✉			2021/05/01 11:21		⋮
PRJ.DATA	B$US01	✈				2021/05/01 10:11	5	⋮
PRJ.DEV.LIST	B$US01					2021/05/01 09:50		⋮
PRJ.DEV.ASSETS	B$US01					2021/05/01 07:27		⋮
PRJ.DEV.REXX	B$US01					2021/05/01 06:00		⋮
PRJ.DEV.SKEL	B$US01					2021/05/01 05:42		⋮
PRJ.DEV.MENU	B$US01					2021/05/01 03:44		⋮

Items per page: 10 ⌄   1 – 10 of 12 items   1 ⌄ of 2 pages   ◀

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date

No checked out members to display

DYLANF - Admin

Enterprise | Monitored | Compare

SYSPLEX - B1

z/OSMF Planned Vision

Monitored Resources

Views

Protected Resource	Volser	Attributes	Last Changed	Checkout Count
		Audit	Backup	Recovery	Modify	Browse		

Protected Resource	Volser	Attributes				Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01					2021/05/10 15:12	3	
SYS1.PARMLIB.SCA1	B$US01					2021/05/10 15:12		
SYS1.PARMLIB.SCA2	B$US01					2021/05/09 00:03		
SYS1.PARMLIB.SCA3	B$US01					2021/05/01 11:21		
PRJ.DATA	B$US01					2021/05/01 10:11		
PRJ.DEV.LIST	B$US01					2021/05/01 09:50		
PRJ.DEV.ASSETS	B$US01					2021/05/01 07:27		
PRJ.DEV.REXX	B$US01					2021/05/01 06:00		
PRJ.DEV.SKEL	B$US01					2021/05/01 05:42		
PRJ.DEV.MENU	B$US01					2021/05/01 03:44		

Items per page: 10 | 1 – 10 of 12 items | 1 ∨ of 2 pages ◄

Member(s) to Check Out ✕

SYS1.PARMLIB.SCA3(PROGA3)

+ Add Resource

User to Check Out to

ROBH

Checkout

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date
No checked out members to display		

DYLANF - Admin

Enterprise   Monitored   Compare

SYSPLEX - B1

z/OSMF Planned Vision

Monitored Resources

Views

	Audit	Backup	Recovery	Modify	Browse

Protected Resource	Volser	Attributes	Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01		2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA1	B$US01		2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA2	B$US01		2021/05/09 00:03		⋮
SYS1.PARMLIB.SCA3	B$US01		2021/05/01 11:21		⋮
PRJ.DATA	B$US01		2021/05/01 10:11	5	⋮
PRJ.DEV.LIST	B$US01		2021/05/01 09:50		⋮
PRJ.DEV.ASSETS	B$US01		2021/05/01 07:27		⋮
PRJ.DEV.REXX	B$US01		2021/05/01 06:00		⋮
PRJ.DEV.SKEL	B$US01		2021/05/01 05:42		⋮
PRJ.DEV.MENU	B$US01		2021/05/01 03:44		⋮

Items per page: 10   1 – 10 of 12 items   1 ⌄ of 2 pages   ◀

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date
SYS1.PARMLIB.SCA3(PROGA3)	ROBH	30/09/21 - 15:23

DYLANF - Admin

Enterprise | Monitored | Compare

SYSPLEX - B1

z/OSMF Planned Vision

Monitored Resources

Views

Protected Resource	Volser	Attributes				Last Changed	Checkout Count	
		Audit	Backup	Recovery	Modify		Browse	
SYS1.PARMLIB	B$US01					2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA1	B$US01					2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA2	B$US01					2021/05/09 00:03		⋮
SYS1.PARMLIB.SCA3	B$US01					2021/05/01 11:21		⋮
PRJ.DATA	B$US01					2021/05/01 10:11	5	⋮
PRJ.DEV.LIST	B$US01					2021/05/01 09:50		⋮
PRJ.DEV.ASSETS	B$US01					2021/05/01 07:27		⋮
PRJ.DEV.REXX	B$US01					2021/05/01 06:00		⋮
PRJ.DEV.SKEL	B$US01					2021/05/01 05:42		⋮
PRJ.DEV.MENU	B$US01					2021/05/01 03:44		⋮

Items per page: 10   1 – 10 of 12 items   1 ∨ of 2 pages   ◀

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date
	No checked out members to display	

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

RECOVERY

Recovery

Alice

Mid-level System Programmer

Alice is responsible for running the mainframe IT environment, including installing, configuring, and maintaining z/OS systems in test and production.

Pain Point

- That last change that Christina, the early-tenure system programmer, did was a problem.

- I want to look back one or two versions, to see what she did.

Recovery

Members in monitored data sets can be restored to previous versions.

Backed up versions can be viewed and compared side-by-side to review changes before restoring.

Delight Point

As an IBM Change Tracker for z/OS administrator:

- Ah! I see what Christina did, and when it happened.
- I'll need Zach to help out, so I'll let him do the changes without any interference.
- Or I could can simply revert back to the level I know was correct.

IBM z/OS Change Tracker
Backup recovery

```
SCB2                             IBM z/OS Change Tracker - (Ver 1.0 MOD 17)
Option ===> 3_

0    Options               Set processing options and review the PARMs
1    Administration        Manage the protected resources
2    Audit                 Audit change activities in protected resources
3    Recover               Browse, edit and recover backups
4    Disaster Recovery     Tokenize and compare PROD and DR environments
5    Utilities             Perform utility functions

                                           Split Session ID: 1
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2                                     IBM z/OS Change Tracker - List of Protected Resources (1 of 3)
Command ===>  _____

                                                    Protection      Check Out
S Protected Resource                    Volume Attributes       Y/N Count
_ CTAYLOR.DEV.DEMO.CNTL                  B$US01 -   -   -   -   I N    -
_ CTAYLOR.DEV.DEMO.INSTALL               B$US01 -   -   L   -   I N    -
_ CTAYLOR.DEV.DEMO.JCL                   B$US02 -   -   L   -   I N    -
_ CTAYLOR.DEV.DEMO.LINKLIB               B$US01 -   -   -   -   I N    -
_ CTAYLOR.DEV.DEMO.MAC                   B$US02 -   -   -   -   I N    -
S CTAYLOR.DEV.DEMO.PANELS                B$US02 -   -   -   -   I N    -
_ CTAYLOR.DEV.DEMO.PARMLIB               B$US02 -   N   L   F   I N    -
_ CTAYLOR.DEV.DEMO.PDSE                  B$US01 -   -   -   -   I N    -
_ CTAYLOR.DEV.DEMO.SOURCE                B$US01 -   -   -   -   I N    -
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2 /OS Change Tracker - Recover or View Member Versions Online (2 of 3)
Command ===> _____

Protected Resource   CTAYLOR.DEV.DEMO.PANELS
Volume   .  .  .  .  :  B$US02        ("-" indicates cataloged)
Member   .  .  .  .  .  *_____

Show versions in the following date range
From  .  .  .  .  .  .  _____     (YYYY/MM/DD)
To  .  .  .  .  .  .  .  _____     (YYYY/MM/DD)

Select the mode
1    1.  List backups
     2.  Detailed report of backups
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery

```
SCB2                                    IBM z/OS Change Tracker - Backup Versions of Member (*)
Command ===>  _____

Change Reporting:
    Job Name RECOVER

    Enter "/" to select option
    _    Batch execution

   Name        Version   VV MM  Created       Changed              Size    Init    Mod ID
_  CYGCAPP        0       36.08  15/06/18  2022/03/02  01:23        111      98       0  CTAYLOR
_  CYGCAPP       -1       36.07  15/06/18  2022/03/02  01:21        109      98       0  CTAYLOR
_  CYGCAPP       -2       36.06  15/06/18  2022/03/02  01:18        111      98       0  CTAYLOR
_  CYGCAPP       -3       36.05  15/06/18  2022/03/02  01:16        109      98       0  CTAYLOR
_  CYGCAPP       -4       36.04  15/06/18  2022/03/02  01:15        111      98       0  CTAYLOR
_  CYGCAPP       -5       36.03  15/06/18  2022/03/01  07:32        109      98       0  ROBH
_  CYGCBKP        0       01.00  21/09/28  2022/03/01  07:32         84      84       0  ROBH
_  CYGCBKPL       0       01.00  21/09/28  2022/03/01  07:32         52      52       0  ROBH
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
                   10        20        30        40        50        60              000065
        ....+....+....+....+....+....+....+....+....+....+....+....+....+
      *
      *
1-1   SHOW=BACKUPS=(MEM=*,
  -2      DSN=CTAYLOR.DEV.DEMO.PANELS)
      *
      *
      *

Backups for: VOL= catlg   DSN=CTAYLOR.DEV.DEMO.PANELS                            000066
Name/Ver   VV MM Created        Changed        Size   Init    Mod    ID     Date/Time-of-Backup
CYGCAPP    36.08 15/06/18 22/03/02 01:23    111     98       0 CTAYLOR 2022/03/02 01:23:30
                                                                      STC: -UPD IKJEFT01 CTAYLOR
-1         36.07 15/06/18 22/03/02 01:20    109     98       0 CTAYLOR 2022/03/02 01:21:08
                                                                      No Comment.
-2         36.06 15/06/18 22/03/02 01:18    111     98       0 CTAYLOR 2022/03/02 01:18:13
                                                                      STC: -UPD IKJEFT01 CTAYLOR
-3         36.05 15/06/18 22/03/02 01:15    109     98       0 CTAYLOR 2022/03/02 01:16:01
                                                                      STC: -UPD IKJEFT01 CTAYLOR
-4         36.04 15/06/18 22/03/02 01:15    111     98       0 CTAYLOR 2022/03/02 01:15:40
                                                                      STC: -UPD IKJEFT01 CTAYLOR
-5         36.03 15/06/18 20/11/12 18:13    109     98       0 ROBH    2022/03/01 07:32:54
                                                                      SYS: -Initial Version
CYGCBKP    01.00 21/09/28 21/09/28 15:12     84     84       0 ROBH    2022/03/01 07:32:54
                                                                      SYS: -Initial Version
CYGCBKPL   01.00 21/09/28 21/09/28 15:12     52     52       0 ROBH    2022/03/01 07:32:54
                                                                      SYS: -Initial Version
CYGCBKPS   01.00 21/09/28 21/09/28 15:12     99     99       0 ROBH    2022/03/01 07:32:54
                                                                      SYS: -Initial Version
CYGCBUND   01.02 15/06/18 20/11/12 18:14    106     95       0 ROBH    2022/03/01 07:32:54
                                                                      SYS: -Initial Version
CYGCBUN1   52.02 15/06/18 20/11/12 18:14     50     39       0 ROBH    2022/03/01 07:32:54
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2 /OS Change Tracker - Recover or View Member Versions Online (2 of 3)
Command ===>  _____

Protected Resource    CTAYLOR.DEV.DEMO.PANELS
Volume  .  .  .  .  . :  B$US02        ("-" indicates cataloged)
Member  .  .  .  .  .   CYGCAPP___

Show versions in the following date range
From  .  .  .  .  .  .  _____     (YYYY/MM/DD)
To  .  .  .  .  .  .  .  _____     (YYYY/MM/DD)

Select the mode
1    1. List backups
     2. Detailed report of backups
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2                                    IBM z/OS Change Tracker - Backup Versions of Member (CYGCAPP)
Command ===> _____

Versions for the Date Range: not specified

Change Reporting:
    Job Name RECOVER

    Enter "/" to select option
    _    Batch execution

  Name        Ver   Changed               ID          Backup Comment
V CYGCAPP      0    2022/03/02 01:23    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP     -1    2022/03/02 01:21    CTAYLOR    No Comment.
_ CYGCAPP     -2    2022/03/02 01:18    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP     -3    2022/03/02 01:16    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP     -4    2022/03/02 01:15    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP     -5    2022/03/01 07:32    ROBH       SYS: -Initial Version
******************************************************************** Bottom of data ********************************
```

IBM z/OS Change Tracker Recovery

```
SCB2          CTAYLOR.RECOVERY.CYG22062.T0205069(CYGCAPP) - 36.08      Columns 00001 00080
Command ===>                                                            Scroll ===> CSR
****************************** Top of Data ***********************************************
000001  Inserted Line 1
000002  Inserted Line 2
000003  )ATTR
000004  /** Proprietary Statement *****************************************************/
000005  /*                                                                            */
000006  /*    IBM Confidential                                                        */
000007  /*    OCO Source Materials                                                    */
000008  /*    5650-ZOS © Copyright Teracloud S.A. 2021                                */
000009  /*                                                                            */
000010  /*    The source code for this program is not published or otherwise          */
000011  /*    divested of its trade secrets, irrespective of what has been            */
000012  /*    deposited with the U. S. Copyright Office.                              */
000013  /*                                                                            */
000014  /** End Proprietary Statement *************************************************/
000015    %  Type(text) color(white)
000016    +  Type(text) color(blue)
000017    }  type(output) intens(low) pad(' ') caps(off) just(left) color(yellow)
000018    {  Type(text) color(red)
000019
000020    @  type(input)  intens(high) pad(' ') caps(on)  just(left)
000021    $  type(input)  intens(high) pad('_') caps(on)  just(left)
000022    ¬  type(input)  intens(high) pad('_') caps(off) just(left)
000023
000024    #  type(output) intens(low)  pad(' ') caps(off) just(left)
000025    ~  type(output) intens(low)  pad(' ') caps(on)  just(right)
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery
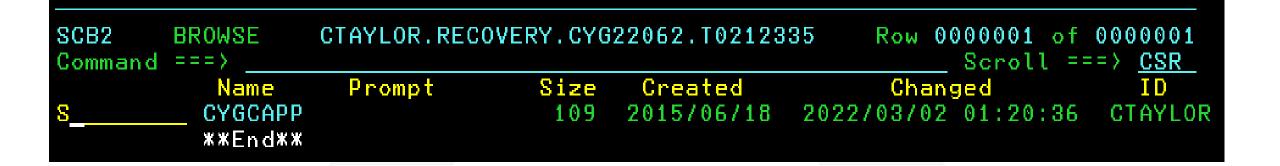
```
SCB2                              IBM z/OS Change Tracker - Backup Versions of Member (CYGCAPP)
Command ===>  _____

Versions for the Date Range: not specified

Change Reporting:
    Job Name RECOVER

    Enter "/" to select option
    _    Batch execution

  Name       Ver   Changed              ID        Backup Comment
_ CYGCAPP     0    2022/03/02 01:23    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
V CYGCAPP    -1    2022/03/02 01:21    CTAYLOR    No Comment.
_ CYGCAPP    -2    2022/03/02 01:18    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP    -3    2022/03/02 01:16    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP    -4    2022/03/02 01:15    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_ CYGCAPP    -5    2022/03/01 07:32    ROBH       SYS: -Initial Version
*************************************************************** Bottom of data *******************************************
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2          CTAYLOR.RECOVERY.CYG22062.T0208502(CYGCAPP) - 36.07      Columns 00001 00080
Command ===> _                                                         Scroll ===> CSR
****** ************************************* Top of Data *************************************
000001 )ATTR
000002 /** Proprietary Statement ***********************************************/
000003 /*                                                                   */
000004 /*    IBM Confidential                                               */
000005 /*    OCO Source Materials                                           */
000006 /*    5650-ZOS © Copyright Teracloud S.A. 2021                       */
000007 /*                                                                   */
000008 /*    The source code for this program is not published or otherwise */
000009 /*    divested of its trade secrets, irrespective of what has been   */
000010 /*    deposited with the U. S. Copyright Office.                     */
000011 /*                                                                   */
000012 /** End Proprietary Statement ********************************************/
000013   % Type(text) color(white)
000014   + Type(text) color(blue)
000015   } type(output) intens(low) pad(' ') caps(off) just(left) color(yellow)
000016   { Type(text) color(red)
000017
000018   @ type(input)  intens(high) pad(' _') caps(on)  just(left)
000019   $ type(input)  intens(high) pad('_') caps(on)  just(left)
000020   ¬ type(input)  intens(high) pad('_') caps(off) just(left)
000021
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2                                    IBM z/OS Change Tracker - Backup Versions of Member (CYGCAPP)
Command ===>

Versions for the Date Range: not specified

Change Reporting:
    Job Name RECOVER

    Enter "/" to select option
    _    Batch execution

Name        Ver   Changed              ID         Backup Comment
_  CYGCAPP     0    2022/03/02 01:23    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
S  CYGCAPP    -1    2022/03/02 01:21    CTAYLOR    No Comment.
_  CYGCAPP    -2    2022/03/02 01:18    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_  CYGCAPP    -3    2022/03/02 01:16    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_  CYGCAPP    -4    2022/03/02 01:15    CTAYLOR    STC: -UPD IKJEFT01 CTAYLOR
_  CYGCAPP    -5    2022/03/01 07:32    ROBH       SYS: -Initial Version
*********************************************************** Bottom of data ***********************************
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery

```
SCB2                                IBM z/OS Change Tracker - Backup Versions of Member (CYGCAPP)
Command ===>

Versions for the Date Range: not specified

Change Reporting:
    Job Name RECOVER

    Enter "/" to select option
    _    Batch execution

    Name       Ver   Changed              ID        Backup Comment
_   CYGCAPP    -1    2022/03/02 01:21     CTAYLOR   No Comment.
_   CYGCAPP    -2    2022/03/02 01:18     CTAYLOR   STC: -UPD IKJEFT01 CTAYLOR
_   CYGCAPP    -3    2022/03/02 01:16     CTAYLOR   STC: -UPD IKJEFT01 CTAYLOR
_   CYGCAPP    -4    2022/03/02 01:15     CTAYLOR   STC: -UPD IKJEFT01 CTAYLOR
_   CYGCAPP    -5    2022/03/01 07:32     ROBH      SYS: -Initial Version
******************************************************************* Bottom of data ****************************************************************







                                   CYG007 Version CYGCAPP recovered to PDS: CTAYLOR.RECOVERY.CYG22062.T0212335

*DSLIST    SDSF       DSLIST    -SDSF
```

IBM z/OS Change Tracker Recovery


```
SCB2      BROWSE      CTAYLOR.RECOVERY.CYG22062.T0212335      Row 0000001 of 0000001
Command ===>                                                  Scroll ===> CSR
          Name        Prompt          Size    Created        Changed            ID
S_____  CYGCAPP                     109    2015/06/18  2022/03/02 01:20:36  CTAYLOR
          **End**
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker Recovery


```
SCB2 E        CTAYLOR.RECOVERY.CYG22062.T0212335(CYGCA Line 0000000000 Col 001 080
Command ===>                                              Scroll ===> CSR
******************************** Top of Data *********************************
)ATTR
/** Proprietary Statement ****************************************************/
/*                                                                         */
/*    IBM Confidential                                                     */
/*    OCO Source Materials                                                 */
/*    5650-ZOS © Copyright Teracloud S.A. 2021                             */
/*                                                                         */
/*    The source code for this program is not published or otherwise       */
/*    divested of its trade secrets, irrespective of what has been         */
/*    deposited with the U. S. Copyright Office.                           */
/*                                                                         */
/** End Proprietary Statement  ***********************************************/
   %  Type(text)  color(white)
   +  Type(text)  color(blue)
   }  type(output)  intens(low)  pad(' ')  caps(off)  just(left)  color(yellow)
   {  Type(text)  color(red)

   @  type(input)   intens(high)  pad('_')  caps(on)   just(left)
   $  type(input)   intens(high)  pad('_')  caps(on)   just(left)
   ¬  type(input)   intens(high)  pad('_')  caps(off)  just(left)

   #  type(output)  intens(low)   pad(' ')  caps(off)   just(left)
   ~  type(output)  intens(low)   pad(' ')  caps(on)    just(right)

)BODY width(&zscreenw) expand(!!)
%! !List of CRs Pending Approval! !
%Command ===>@cygpcmd                                    +%SCROLL===>_AMT +
+
+To approve a pending CR,%Validate+the CR first to ensure there is no conflict.
 Resolve the conflicts if there is any.  Then, select+the CR for%Approval+by a
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Real-life example

- Parmlib subsystem initialization member was being shared between Prod and Test environments.

- Change was made to the initialization for Test and the Production environment failed to come up.

- A backup copy of the data set and member were eventually found at a remote site location
  - This took a number of hours to find.

- IBM z/OS Change Tracker could have restored to the previous version within minutes.
- It can be used for key system components, not just IBM z/OS products.
  - ISV products libraries can also be protected.

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

z/OSMF Planned Vision

DYLANF - Admin

Enterprise   Monitored   Compare   **SYSPLEXR - B1**

Monitored Resources

Views

	Audit				Browse			Checkout List	

								...RMLIB.SCA3	
								Checked out to	Checkout date

Protected Resource	Volser								
SYS1.PARMLIB	B$US01								
SYS1.PARMLIB.SCA1	B$US01								
SYS1.PARMLIB.SCA2	B$US01								
SYS1.PARMLIB.SCA3	B$US01								

Recovery ✕

● Member Select ○ Version Select

Select the members you wish to recover

SYS1.PARMLIB.SCA3

Select	Name	VV.MM	ID	Created	Changed
☐	BPXPRMA3	01.11	JOHNC	21/03/18	10/5/2021 07:59
☐	COMMNDA3	01.06	JOHNC	21/03/18	10/5/2021 07:58
☐	IEASYMA3	01.01	JOHNC	21/03/18	10/5/2021 07:57
☐	IEFSSNA3	01.00	JOHNC	21/03/14	10/5/2021 07:50
☐	IOEFSPA3	01.03	JOHNC	21/02/11	10/5/2021 07:44
☑	PROGA3	01.10	JOSEPHH	21/03/18	10/5/2021 07:39

View and Recover

PRJ.DATA	B$US01								
PRJ.DEV.LIST	B$US01								
PRJ.DEV.ASSETS	B$US01								
PRJ.DEV.REXX	B$US01	2021/05/01 06:00	⋮						
PRJ.DEV.SKEL	B$US01	2021/05/01 05:42	⋮						
PRJ.DEV.MENU	B$US01	2021/05/01 03:44	⋮						

Items per page: 10 ⌄   1 – 10 of 12 items   1 ⌄ of 2 pages ◀

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Monitored Resources

z/OSMF
Planned
Vision

Views

Protected Resource	Volser	Attributes	Last Changed	Checkout Count
SYS1.PARMLIB	B$US01		2021/05/10 15:12	3
SYS1.PARMLIB.SCA1	B$US01			
SYS1.PARMLIB.SCA2	B$US01			
SYS1.PARMLIB.SCA3	B$US01			
PRJ.DATA	B$US01			
PRJ.DEV.LIST	B$US01			
PRJ.DEV.ASSETS	B$US01			
PRJ.DEV.REXX	B$US01			
PRJ.DEV.SKEL	B$US01		2021/05/01 05:42	
PRJ.DEV.MENU	B$US01		2021/05/01 03:44	

Audit   Backup   Recovery   Modify   Browse

Items per page: 10   1 – 10 of 12 items   1 ⌄ of 2 pages ◀

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date

...hecked out members to display

SYS1.PARMLIB.SCA3(PROGA3) ✕

◉ Member Select   ● Version Select

Compare, view or recover the versions below

Select	Version	VV.MM	ID	Created	Changed
☐	Current	01.11	JOSEPHH	21/03/18	28/9/2021 07:59
☐	-1	01.11	JOSEPHH	21/03/18	28/9/2021 07:48
☑	-2	01.10	JOHNC	21/03/18	10/5/2021 09:12
☐	-3	01.10	JOHNC	21/03/18	10/5/2021 08:20

View   Compare   Recover

DYLANF - Admin   Enterprise   Monitored   Compare   SYSPLEXB - B1

DYLANF - Admin

Enterprise   **Monitored**   Compare

SYSPLEXB - B1

z/OSMF Planned Vision

Monitored Resources

Views

Audit	Backup	Recovery	Modify	**Browse**

Protected Resource	Volser	Attributes	Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01	📢 ✉ 🔒 🗄	2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA1	B$US01	📢 ✉ 🔒 🗄	2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA2	B$US01	📢 ✉ 🔒 🗄	2021/05/09 00:03		⋮
SYS1.PARMLIB.SCA3	B$US01	📢 ✉	2021/05/01 11:21		⋮
PRJ.DATA	B$US01	🚀	2021/05/01 10:11		
PRJ.DEV.LIST	B$US01		2021/05/01 09:50		
PRJ.DEV.ASSETS	B$US01		2021/05/01 07:27		
PRJ.DEV.REXX	B$US01		2021/05/01 06:00		⋮
PRJ.DEV.SKEL	B$US01		2021/05/01 05:42		⋮
PRJ.DEV.MENU	B$US01		2021/05/01 03:44		⋮

Items per page: 10 ⌄   1 – 10 of 12 items   1 ⌄ of 2 pages ◄

Confirm ✕

Recovering SYS1.PARMLIB.SCA3(PROGA3) to Version -2 (10/5/21)

Are you sure you want to do this?

No   **Yes**

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date

No checked out members to display

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

z/OSMF Planned Vision

DYLANF - Admin

Enterprise   Monitored   Compare

SYSPLEX - B1

Monitored Resources

Views

| Audit | Backup | Recovery | Modify | Browse |

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

Protected Resource	Volser				Checked out to	Checkout date
SYS1.PARMLIB	B$US01					
SYS1.PARMLIB.SCA1	B$US01					
SYS1.PARMLIB.SCA2	B$US01					
SYS1.PARMLIB.SCA3	B$US01					
PRJ.DATA	B$US01					
PRJ.DEV.LIST	B$US01					
PRJ.DEV.ASSETS	B$US01					
PRJ.DEV.REXX	B$US01					
PRJ.DEV.SKEL	B$US01		2021/05/01 05:42			
PRJ.DEV.MENU	B$US01		2021/05/01 03:44			

SYS1.PARMLIB.SCA3   ✕

Select	Name	VV.MM	ID	Created	Changed
☐	BPXPRMA3	01.11	JOHNC	21/03/18	10/5/2021 07:59
☐	COMMNDA3	01.06	JOHNC	21/03/18	10/5/2021 07:58
☐	IEASYMA3	01.01	JOHNC	21/03/18	10/5/2021 07:57
☐	IEFSSNA3	01.00	JOHNC	21/03/14	10/5/2021 07:50
☐	IOEFSPA3	01.03	JOHNC	21/02/11	10/5/2021 07:44
☑	PROGA3	01.10	JOHNC	21/03/18	10/5/2021 07:39

| View | Check out | Backup |

Items per page: 10   1 – 10 of 12 items   1 ⌄ of 2 pages   ◀

AUDITING ACTIVITIES

Audit

Derek

*Compliance
Evidence Provider*

Derek is a security
engineer. He spends a lot
of time looking after
access management

Pain Point

- There are a lot of critical configuration data sets for z/OS. I need to know who has been changing them, how, and when.

Audit

Out-of-the-box audit reports of monitored datasets.

List all changes to specified library, member, or name pattern

Filtering options:

- Event type (ADD, UPDATE, DELETE, RENAME, ZAP)

- Date and time range

- Member-level of dataset-level

- Specific libraries or all protected libraries

Delight Point

As an IBM Change Tracker for z/OS auditor:

- Wow! I can clearly see what critical configuration data sets have been updated.

- I know who made the change, how, and when, in just one click. My job is so much easier!

IBM z/OS Change Tracker
Auditing change activities in protected data sets


```
SCB2                              IBM z/OS Change Tracker - (Ver 1.0 MOD 17)
Option ===> 2

0   Options              Set processing options and review the PARMs
1   Administration       Manage the protected resources
2   Audit                Audit change activities in protected resources
3   Recover              Browse, edit and recover backups
4   Disaster Recovery    Tokenize and compare PROD and DR environments
5   Utilities            Perform utility functions
                                            Split Session ID: 3
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Auditing change activities in a protected data set


```
SCB2                                    IBM z/OS Change Tracker - Audit
Command ===>  _____

Member     *_____

Actions
1   1. ALL
    2. ADD
    3. DEL
    4. REN
    5. UPD


                                      Protection       Check Out
S Protected Resource          Volume Attributes       Y/N Count
S CTAYLOR.DEV.DEMO.CNTL         -     -  -  -  -   I N   -
_ CTAYLOR.DEV.DEMO.INSTALL      -     -  -  L  -   I N   -
_ CTAYLOR.DEV.DEMO.JCL          -     -  -  L  -   I N   -
_ CTAYLOR.DEV.DEMO.LINKLIB      -     -  -  -  -   I N   -
_ CTAYLOR.DEV.DEMO.MAC          -     -  -  -  -   I N   -
_ CTAYLOR.DEV.DEMO.PANELS       -     -  -  -  -   I N   -
_ CTAYLOR.DEV.DEMO.PARMLIB      -     -  N  L  F   I N   -
_ CTAYLOR.DEV.DEMO.PDSE         -     -  -  -  -   I N   -
_ CTAYLOR.DEV.DEMO.SOURCE       -     -  -  -  -   I N   -
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Auditing change activities in a protected data set


```
         10        20        30        40        50        60
    ....+....+....+....+....+....+....+....+....+....+....+....+....+
1        OPTIONS=ALL
2-1      SHOW=ACT=(MEM=*,
 -2            DSN=CTAYLOR.DEV.DEMO.CNTL)
         *
         *
         *
         *
         *

              DSN=CTAYLOR.DEV.DEMO.CNTL                                    -
ASMUTL      CTAYLOR   DEL   2022/03/02 06:30   SCB2      IKJEFT01   STC: -DEL IKJEFT01 CTAYLOR      -
CMPUCOPY    CTAYLOR   ADD   2022/03/02 06:25   SCB2      IKJEFT01   STC: -UPD IKJEFT01 CTAYLOR      -
CMPUCOPY    CTAYLOR   DEL   2022/03/02 06:11   SCB2      IKJEFT01   STC: -DEL IKJEFT01 CTAYLOR      -
CMPUCOPY    CTAYLOR   ADD   2022/03/02 06:09   SCB2      IKJEFT01   STC: -UPD IKJEFT01 CTAYLOR      -
CMPUCPU     CHRISUP   DEL   2022/03/02 06:41   SCB2      IDCAMS     -                               -
CMPUCPU     CTAYLOR   ADD   2022/03/02 06:25   SCB2      IKJEFT01   STC: -UPD IKJEFT01 CTAYLOR      -
CMPUCPU     CTAYLOR   DEL   2022/03/02 06:11   SCB2      IKJEFT01   STC: -DEL IKJEFT01 CTAYLOR      -
CMPUCPU     CTAYLOR   ADD   2022/03/02 06:09   SCB2      IKJEFT01   STC: -UPD IKJEFT01 CTAYLOR      -
CMPUCT1     CTAYLOR   REN   2022/03/02 06:32   SCB2      IKJEFT01   STC: -REN IKJEFT01 CTAYLOR      CMPUCOPY
CMPUDIR     CHRISUP   DEL   2022/03/02 06:41   SCB2      IDCAMS     -                               -
CMPUDIR     CTAYLOR   ADD   2022/03/02 06:25   SCB2      IKJEFT01   STC: -UPD IKJEFT01 CTAYLOR      -
CMPUDIR     CTAYLOR   DEL   2022/03/02 06:11   SCB2      IKJEFT01   STC: -DEL IKJEFT01 CTAYLOR      -
CMPUDIR     CTAYLOR   ADD   2022/03/02 06:09   SCB2      IKJEFT01   STC: -UPD IKJEFT01 CTAYLOR
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Showing changes in protected data sets (Batch)

```
//CHRISACT JOB (),CLASS=A,MSGCLASS=H,NOTIFY=&SYSUID
//*
//*****************************************************************
//*****************************************************************
//**        PROCEDURE:   CYGT7ACT                              **
//**                                                            **
//**        FUNCTION:                                           **
//**                                                            **
//**           THIS JOB SHOWS THE REAL-TIME ACTIVITIES IN ALL PROTECTED **
//**           LIBRARIES. A DATE RANGE CAN BE SPECIIFED TO LIMIT THE **
//**           REPORTING OF THE ACTIVITIES ONLY FOR A DESIRED RANGE. **
//**                                                            **
//**           THE FORMAT OF THE DATE RANGE IS:                 **
//**              BEGDATE=YYYY/MM/DD_HH:MM (00:00 INDICATES START OF DAY) **
//**              ENDDATE=YYYY/MM/DD_HH:MM (23:59 INDICATES MIDNIGHT) **
//**                                                            **
//**        NOTE:                                               **
//**              MODIFY THE JOB CARD AND SUBMIT IT             **
//**                                                            **
//**        EXPECTED COND CODE:  0000                           **
//**        ACTIVITY: TESTED ON FEB 15, 2022                    **
//**                                                            **
//*****************************************************************
//STEP1      EXEC PGM=CYGMAIN,REGION=4096K
//STEPLIB    DD DISP=SHR,DSN=CYG.CTAYLOR.BLD00017.SCYGLNK
//CYGPARM    DD DISP=SHR,DSN=CYG.CTAYLOR.BLD00017.PARMLIB(CYGPARMS)
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//OUTFILE    DD DUMMY
//CYGIN      DD *
*OPTION=FOREIGNDATA              /* IN CASE THE STC IS OPERATING WITH */
*                               /* ANOTHER CONTROL FILE              */
 DATE=TODAY                     /* DATE MUST PRECEDE ALL COMMANDS */
*
*BEGDATE=2010/01/01_00:00  DATE RANGE (JAN 01, 2010)
*ENDDATE=2010/01/10_23:59  DATE RANGE (JAN 10, 2010 MIDNIGHT)
*OPTION=DEL
*
 SHOW=PROTECTIONS
 SHOW=ACTIONS=LIST
/*
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Showing changes in protected data sets (Batch)
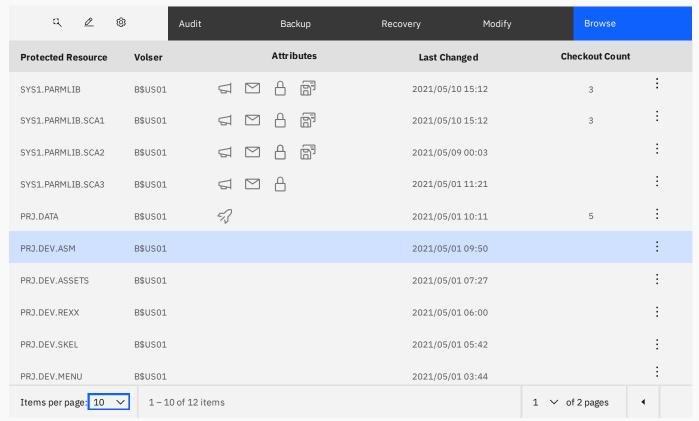
```
                    List of Activities in Protected Libraries
                                 2022/03/02  06:59

DATE=TODAY        (2022/03/02: Midnight)
OPTIONS=ALL

               By-User    Act    Action-Date-Time    System     Program     Oldname
                                DSN=CTAYLOR.DEV.DEMO.CNTL                              -
ASMUTL         CTAYLOR    DEL    2022/03/02  06:30    SCB2       IKJEFT01    STC: -DEL IKJEFT01 CTAYLOR    -
CMPUCOPY       CTAYLOR    ADD    2022/03/02  06:25    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CMPUCOPY       CTAYLOR    DEL    2022/03/02  06:11    SCB2       IKJEFT01    STC: -DEL IKJEFT01 CTAYLOR    -
CMPUCOPY       CTAYLOR    ADD    2022/03/02  06:09    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CMPUCPU        CHRISUP    DEL    2022/03/02  06:41    SCB2       IDCAMS      -                             -
CMPUCPU        CTAYLOR    ADD    2022/03/02  06:25    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CMPUCPU        CTAYLOR    DEL    2022/03/02  06:11    SCB2       IKJEFT01    STC: -DEL IKJEFT01 CTAYLOR    -
CMPUCPU        CTAYLOR    ADD    2022/03/02  06:09    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CMPUCT1        CTAYLOR    REN    2022/03/02  06:32    SCB2       IKJEFT01    STC: -REN IKJEFT01 CTAYLOR    CMPUCOPY
CMPUDIR        CHRISUP    DEL    2022/03/02  06:41    SCB2       IDCAMS      -                             -
CMPUDIR        CTAYLOR    ADD    2022/03/02  06:25    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CMPUDIR        CTAYLOR    DEL    2022/03/02  06:11    SCB2       IKJEFT01    STC: -DEL IKJEFT01 CTAYLOR    -
CMPUDIR        CTAYLOR    ADD    2022/03/02  06:09    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -

                                DSN=CTAYLOR.DEV.DEMO.INSTALL                           -
                                ** NOC **

                                DSN=CTAYLOR.DEV.DEMO.JCL                               -
                                ** NOC **


                                DSN=CTAYLOR.DEV.DEMO.LINKLIB                           -
                                ** NOC **

                                DSN=CTAYLOR.DEV.DEMO.MAC                               -
ALLOC          CHRISUP    ADD    2022/03/02  06:41    SCB2       IEBCOPY     STC: -ADD IEBCOPY  CHRISUP    -

                                DSN=CTAYLOR.DEV.DEMO.PANELS                            -
CYGCAPP        CTAYLOR    UPD    2022/03/02  01:23    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CYGCAPP        CTAYLOR    UPD    2022/03/02  01:21    SCB2       SURV        No Comment.                   -
CYGCAPP        CTAYLOR    UPD    2022/03/02  01:18    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CYGCAPP        CTAYLOR    UPD    2022/03/02  01:16    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -
CYGCAPP        CTAYLOR    UPD    2022/03/02  01:15    SCB2       IKJEFT01    STC: -UPD IKJEFT01 CTAYLOR    -

                                DSN=CTAYLOR.DEV.DEMO.PARMLIB                           -
IEFSSN00       CTAYLOR    UPD    2022/03/02  03:07    SCB2       IKJEFT01    STC: -      Added VTAM to the subs -

                                DSN=CTAYLOR.DEV.DEMO.PDSE                              -
ALLOC          CHRISUP    ADD    2022/03/02  06:41    SCB2       IEBCOPY     STC: -ADD IEBCOPY  CHRISUP    -

                                DSN=CTAYLOR.DEV.DEMO.SOURCE                            -
                                ** NOC **

CYG238I        9 DSNs checked for activities
               4 DSNs determined to have no activities
               5 DSNs determined to have activities
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

z/OSMF Planned Vision

Monitored Resources

Views

	Audit	Backup	Recovery	Modify	Browse

Protected Resource	Volser	Attributes	Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01		2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA1	B$US01		2021/05/10 15:12	3	⋮
SYS1.PARMLIB.SCA2	B$US01		2021/05/09 00:03		⋮
SYS1.PARMLIB.SCA3	B$US01		2021/05/01 11:21		⋮
PRJ.DATA	B$US01		2021/05/01 10:11	5	⋮
PRJ.DEV.ASM	B$US01		2021/05/01 09:50		⋮
PRJ.DEV.ASSETS	B$US01		2021/05/01 07:27		⋮
PRJ.DEV.REXX	B$US01		2021/05/01 06:00		⋮
PRJ.DEV.SKEL	B$US01		2021/05/01 05:42		⋮
PRJ.DEV.MENU	B$US01		2021/05/01 03:44		⋮

Items per page: 10   1 – 10 of 12 items   1 ⌄ of 2 pages ◀

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date
SYS1.PARMLIB.SCA3(PROGA3)	ROBH	30/09/21 - 15:23

DYLANF - Admin

Enterprise   **Monitored**   Compare

SYSPLEXB - B1

z/OSMF Planned Vision

Monitored Resources

Views

	Audit	Backup	Recovery	Modify	**Browse**

Protected Resource	Volser			Attributes	Last Changed	Checkout Count	
SYS1.PARMLIB	B$US01				2021/05/10 15:12	3	
SYS1.PARMLIB.SCA1	B$US01						
SYS1.PARMLIB.SCA2	B$US01						
SYS1.PARMLIB.SCA3	B$US01						
PRJ.DATA	B$US01						
PRJ.DEV.ASM	B$US01						
PRJ.DEV.ASSETS	B$US01						
PRJ.DEV.REXX	B$US01						
PRJ.DEV.SKEL	B$US01				2021/05/01 05:42		
PRJ.DEV.MENU	B$US01				2021/05/01 03:44		

Items per page: 10   1 – 10 of 12 items   1 ∨ of 2 pages ◀

Checkout List

Showing Members of SYS1.PARMLIB.SCA3

File	Checked out to	Checkout date
SYS1.PARMLIB.SCA3(PROGA3)	ROBH	30/09/21 - 15:23

Audit information for PRJ.DEV.ASM
This shows an audit trail of changes to any protected resources within PRJ.DEV.ASM

Action	User	Member	Program	System	Time
Add	ROBH	TSTPRG5	IKJEFT01	SCA2	29/09/2021 07:59
Update	ROBH	DRVR1	SURV	SCA2	28/09/2021 10:58
Update	ROBH	DRVR3	SURV	SCA2	28/09/2021 10:57
Delete	CJENKINS	TSTPRG2	IKJEFT01	SCA3	10/5/2021 07:50
Update	JOSEPHH	TSTPRG1	SURV	SCA2	10/5/2021 07:44
Update	BENH	DRVR3	SURV	SCA1	10/5/2021 07:39
Update	BENH	DRVR3	SURV	SCA1	10/5/2021 07:33
Update	ROBH	TSTPRG4	SURV	SCA3	10/5/2021 07:22
Update	CJENKINS	DRVR2	SURV	SCA3	10/5/2021 07:12
Update	CJENKINS	DRVR2	SURV	SCA3	10/5/2021 07:03

☰ **Change Tracker**   **SYSPLEXA - A2**   Enterprise   Monitored   Compare

z/OSMF Planned Vision

Views ▦ ☰

Configuration   Protection   **Graphical**

Sysplex

▤ SYSPLEXA	⋮

▤ SYSPLEXB	⋮

▤ SYSPLEXC	⋮

LPAR

▭ A1	⋮
	CYGSTC1

▭ A2	⋮
	CYGSTC2

▭ A3	⋮
	🚫

Events by File

Bar chart — x-axis: RPJ.DEV.SOURCE, PRJ.DEV.CNTL, PRJ.DEV.SAMPLE, PRJ.DEV.ASM, PRJ.DEV.REXX; y-axis 0–30

Events by User

Pie chart legend: ■ DYLANF ■ BENH ■ CJENKINS ■ ROBH

Events by Sysplex

Pie chart: SYSPLEX C, SYSPLEX B, SYSPLEX A — B1, B2, B3, B4

Visualisation Options

Display events for last	12h ⌄
System:	A2 ⌄

Label options:
Names	✅
Values	⚪
Legends	⚪

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only
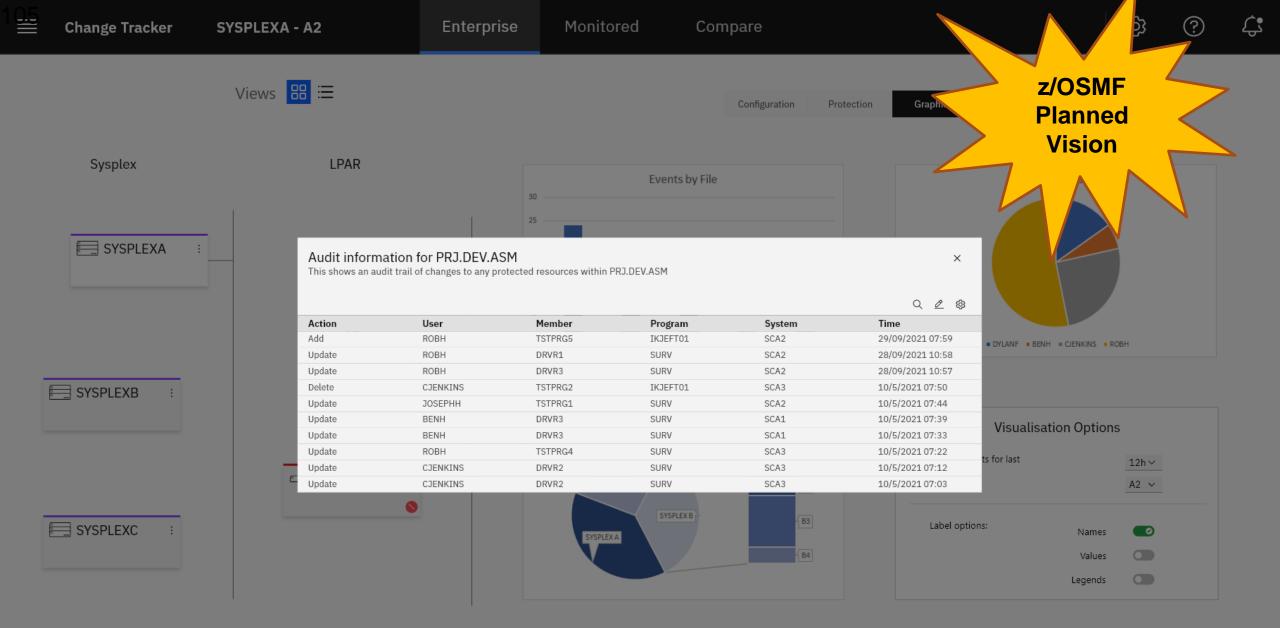
SNAPSHOTS

What are IBM z/OS Change Tracker snapshots?

Snapshots are collections of data sets
- From a single file to an entire DASD volume

Each member of each data set in the snapshot is fingerprinted when the snapshot is created.

Snapshots can be compared against a live system, or against each other.

Very high-speed comparison for large collections of data
- Provides information on what, how and when modifications have been made
- At the dataset-level and the member-level

IBM z/OS Change Tracker
Fingerprinting/Tokenizing data sets

```
//CHRISTOK  JOB  (),CLASS=A,MSGCLASS=H,NOTIFY=&SYSUID
//*
//*
//*************************************************************
//**        PROCEDURE:   SYCT4TOK                          **
//**                                                       **
//**        FUNCTION:                                      **
//**                                                       **
//**          THIS JOB TOKENIZES THE DEV ENVIRONMENT BEFORE WE START **
//**          THE DEMO.                                    **
//**                                                       **
//**        NOTE:                                          **
//**          ARROWS "<==" POINT TO LINES WHICH REQUIRE CUSTOMIZATION. **
//**                                                       **
//**                       1.  HLQ OF THE APF LINKLIB      **
//**                       2.  HLQ OF THE PARMLIB DATA SET **
//**                                                       **
//**        EXPECTED COND CODE: 0000                       **
//**        ACTIVITY: TESTED ON FEB 15, 2022               **
//**                                                       **
//*************************************************************
//*  _____
//*  CREATES THE REFERENCE TOKENS
//*  --------------------------------------------------------
//STEP1     EXEC PGM=CYGMAIN,REGION=6796K
//STEPLIB   DD DISP=SHR,DSN=CYG.CTAYLOR.BLD00017.SCYGLNK
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//CYGIN     DD    *
 PATTERN=CTAYLOR.DEV.DEMO.*
 SHOW=LIST
*
 TOKEN=(LIST)
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Fingerprinting/Tokenizing data sets


```
              10        20        30        40        50        60
      ....+....+....+....+....+....+....+....+....+....+....+....+
   1         PATTERN=CTAYLOR.DEV.DEMO.*
   2         SHOW=LIST
         *
   3       TOKEN=(LIST)
CYG200I COMMANDS PROCESSED: 3

   SEQ List of resolved data sets or USS paths

   1 CTAYLOR.DEV.DEMO.CNTL
   2 CTAYLOR.DEV.DEMO.INSTALL
   3 CTAYLOR.DEV.DEMO.JCL
   4 CTAYLOR.DEV.DEMO.LINKLIB
   5 CTAYLOR.DEV.DEMO.MAC
   6 CTAYLOR.DEV.DEMO.PANELS
   7 CTAYLOR.DEV.DEMO.PARMLIB
   8 CTAYLOR.DEV.DEMO.PDSE
   9 CTAYLOR.DEV.DEMO.SOURCE

CYG828I  Reference Tokens generated successfully; RC=0
         VOL= catlg  DSN=CTAYLOR.DEV.DEMO.CNTL

CYG947I  Action is logged.

CYG828I  Reference Tokens generated successfully; RC=0
         VOL= catlg  DSN=CTAYLOR.DEV.DEMO.INSTALL

CYG947I  Action is logged.

CYG828I  Reference Tokens generated successfully; RC=0
         VOL= catlg  DSN=CTAYLOR.DEV.DEMO.JCL

CYG947I  Action is logged.

CYG828I  Reference Tokens generated successfully; RC=0
         VOL= catlg  DSN=CTAYLOR.DEV.DEMO.LINKLIB

CYG947I  Action is logged.

CYG828I  Reference Tokens generated successfully; RC=0
         VOL= catlg  DSN=CTAYLOR.DEV.DEMO.MAC

CYG947I  Action is logged.

CYG828I  Reference Tokens generated successfully; RC=0
         VOL= catlg  DSN=CTAYLOR.DEV.DEMO.PANELS

CYG947I  Action is logged.
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
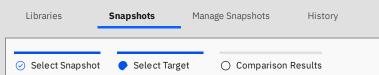# Fingerprinting/Tokenizing data sets


```
_              10        20        30        40        50        60
       ....+....+....+....+....+....+....+....+....+....+....+....+....+
  1        OPTION=DIFF
       *
       *    COMPARES DEV WITH PROD; MUST SPECIFY SHOW=LIST AFTER EACH SET
       *    --------------------------------------------------------------
  2        PATTERN=CTAYLOR.DEV.DEMO.*
  3        SHOW=LIST
       *
  4        PATTERN=CTAYLOR.TEST.DEMO.*
  5        SHOW=LIST
       *
  6        STRREP=('DEV.','TEST.')
  7        GROUPCOMPARE
CYG200I COMMANDS PROCESSED: 7

  SEQ List of resolved data sets or USS paths

     1 CTAYLOR.DEV.DEMO.CNTL
     2 CTAYLOR.DEV.DEMO.INSTALL
     3 CTAYLOR.DEV.DEMO.JCL
     4 CTAYLOR.DEV.DEMO.LINKLIB
     5 CTAYLOR.DEV.DEMO.MAC
     6 CTAYLOR.DEV.DEMO.PANELS
     7 CTAYLOR.DEV.DEMO.PARMLIB
     8 CTAYLOR.DEV.DEMO.PDSE
     9 CTAYLOR.DEV.DEMO.SOURCE

  SEQ List of resolved data sets or USS paths

     1 CTAYLOR.TEST.DEMO.CNTL
     2 CTAYLOR.TEST.DEMO.INSTALL
     3 CTAYLOR.TEST.DEMO.JCL
     4 CTAYLOR.TEST.DEMO.LINKLIB
     5 CTAYLOR.TEST.DEMO.MAC
     6 CTAYLOR.TEST.DEMO.PANELS
     7 CTAYLOR.TEST.DEMO.PARMLIB
     8 CTAYLOR.TEST.DEMO.PDSE
     9 CTAYLOR.TEST.DEMO.SOURCE
```

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

IBM z/OS Change Tracker
Fingerprinting/Tokenizing data sets

Change Tracker   SYSPLEXA - A2   Enterprise   Monitored   Compare

Libraries   **Snapshots**   Manage Snapshots   History

● Select Snapshot   ○ Select Target   ○ Comparison Results

Snapshot Compare

Views ⊞ ☰   🔍 ✎ ⚙ | SYSPLEXA - A2   ⌄ | Import Snapshot + | **Create Snapshot +** |

Snapshot	Description	Snapshot Date
Test1	Test Snapshot 1	January 01, 2021
Test2	Test Snapshot 2	January 01, 2021
Test3	Test Snapshot 3	January 01, 2021
Test4	Test Snapshot 4	January 01, 2021
Alpha1	Snapshot at Alpha1 Checkpoint	March 01, 2021
Alpha2	Snapshot at Alpha2 Checkpoint	March 06, 2021
0.8 Beta	Snapshot of Initial Beta release	April 04, 2021
0.9 Beta	Snapshot of Beta 0.9	April 22, 2021
V1.0	V1.0 Snapshot	May 27, 2021
V1.1	V1.1 Snapshot - plugin added	July 5, 2021
V1.2	V1.2 Snapshot - reworked the plugin	August 13, 2021 ⋮
V1.3	V1.3 Snapshot - removed the plugin	September 29, 2021

Items per page: 12 ⌄   1 – 12 of 18 items   1 ⌄ of 2 pages   ◄ ►

z/OSMF Planned Vision

Snapshot Information

Name	V1.3
Location	CYG.SNAP.S3 (SYSPLEXA - A2)
Date Created	13:52 -29/09/2021
Description	V1.3 Snapshot - removed the plugin

Snapshot Contents   🔍 ✎ ⚙

File	ID	Created
PRJ.DEV.ASM	BENH	21/03/18
PRJ.DEV.CLIST	ROBH	21/03/18
PRJ.DEV.LIB	CJENKINS	21/03/18
PRJ.DEV.RES	CJENKINS	21/03/18
PRJ.DEV.REXX	CJENKINS	21/03/18
PRJ.DEV.JCL	CJENKINS	21/03/18
PRJ.DATA.A	CJENKINS	21/03/18
PRJ.DATA.B	CJENKINS	21/03/18
PRJ.DATA.C	CJENKINS	21/03/18

Cancel   Back   **Next**

Change Tracker   SYSPLEXA - A2   Enterprise   Monitored   Compare

Libraries   **Snapshots**   Manage Snapshots   History

⊘ Select Snapshot   ● Select Target   ○ Comparison Results

Comparison Target

⦿ Live System
○ Second Snapshot

Options

Include Mismatched Members
Partial DSN Mapping

Mapping

PRJ.DEV   -> PROD.V103
PRJ.DATA -> PROD.V103.DATA

Set Options

Set Mapping

Views

SYSPLEXA

SYSPLEXB

SYSPLEXC
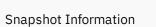
B1
CYGSTC1

B2
CYGSTC2

B3
CYGSTCA

B4
CYGSTCB

z/OSMF Planned Vision

Snapshot Information

Name	V1.3
Location	CYG.SNAP.S3 (SYSPLEXA - A2)
Date Created	13:52 -29/09/2021
Description	V1.3 Snapshot - removed the plugin

Snapshot Contents

File	ID	Created
PRJ.DEV.ASM	BENH	21/03/18
PRJ.DEV.CLIST	ROBH	21/03/18
PRJ.DEV.LIB	CJENKINS	21/03/18
PRJ.DEV.RES	CJENKINS	21/03/18
PRJ.DEV.REXX	CJENKINS	21/03/18
PRJ.DEV.JCL	CJENKINS	21/03/18
PRJ.DATA.A	CJENKINS	21/03/18
PRJ.DATA.B	CJENKINS	21/03/18
PRJ.DATA.C	CJENKINS	21/03/18

Statements regarding IBM future direction and intent are subject to change or withdrawal, and represent goals and objectives only

Cancel   Back   Next

Change Tracker   **SYSPLEXB - B1**   Enterprise   Monitored   Compare

Libraries   **Snapshots**   Manage Snapshots   History

✦ **z/OSMF Planned Vision**

⊘ Select Snapshot   ⊘ Select Target   ● Comparison Results

Common Members: 14,251   Unpaired Members: 9

14,241   **10**   **5**   **4**

Matched Content   Changed Content   Additions   Deletions

MODS By

■ PRJ.DEV.REXX ■ PRJ.DEV.CLIST ■ PRJ.DEV.ASM ■ PRJ.DEV.LIB ■ PRJ.DATA.A
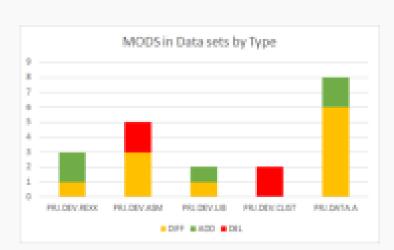
Data Sets
Snapshot V1.3 : SYSPLEXB - B2 (Live)

DSN/Member	Result	Last Modified in V1.3	Last Modified on B2
⌄ PRJ.DEV.REXX (3)			
BUILD	🟡 Changed	10/09/2021 - 10:47	03/04/2021 - 16:32
RESET	🟢 Added	-	25/09/2021 - 10:47
FORMAT	🟢 Added	-	25/09/2021 - 10:47
⌄ PRJ.DEV.CLIST (2)			
EDITMAC	🔴 Deleted	4/09/2021 - 13:22	-
SAVEMAC	🔴 Deleted	16/04/2021 - 14:42	-
﹥ PRJ.DEV.ASM (4)			
﹥ PRJ.DEV.LIB (2)			

MODS in Data sets by Type

PRJ.DEV.REXX   PRJ.DEV.ASM   PRJ.DEV.LIB   PRJ.DEV.CLIST   PRJ.DATA.A

■ DIFF ■ ADD ■ DEL

Back   OK

WORKFLOW EXAMPLES

z/OSMF configuration workflow

z/OSMF configuration workflow

z/OSMF configuration workflow

z/OSMF Security Configuration Assistant

z/OSMF Security Configuration Assistant

Questions?

Your feedback is important!

SH▲RE
EDUCATE ▸ NETWORK ▸ INFLUENCE

Submit a session evaluation for each session you attend:

www.share.org/evaluation

www.share.org/evaluation

Introducing IBM z/OS Change Tracker for z/OS V2.5!

Session ID: 367

March 29, 2022

Marna Walle, IBM Corporation

mwalle@us.ibm.com

Chris Taylor, 21st Century Software, Inc.

christay@21csw.com