z/OS Management Services Catalog

—

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IBM

Thank you for attending our presentation.

The functions we are sharing today are not currently available. IBM has provided a [Statement of Direction](#) with what we intend to deliver with z/OS 2.5. What we are sharing today is a mix of early code and concepts. There is no commitment by IBM to deliver these capabilities, but we are excited to hear your feedback.

Engineering and offering management

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Content Developer

Personas

Zach

Senior Systems
Programmer with 25+
years of experience.

Alice

Mid-level Systems
Programmer with 15
years of experience.

Christina

Entry-level Systems
Programmer with 2
years of experience.

7 Customers

60 Hours

Research Insight #1

Early in the project we learned z/OS System Programmers need a tool to allow them to create their own z/OS System Management services, in order to transfer knowledge within an organization.

Research Insight #2

Quantitative user data helped us determined which z/OS management tasks to offer as IBM Provided Services to address user pain points.

As-Is Scenario

Christina is learning entry-level tasks required to manage her organization's z/OS environment.

The following story is an example of a task she has to perform...

An application developer that Christina supports alerts her that a file system he uses is 99% full.

She does not know what to do to address the problem and asks Zach for help.

Zach tells her she needs to increase the size of the zFS, but the process is complicated and his shop has a very specific way of doing it.

Normally, he would just it himself, but the *"I'll just do it"* lifestyle is unsustainable.

He is already buried with work, and...

"We want to decrease the learning curve, refresh skills faster, we can't rely on baby boomers any more..."

Global Mainframe Manager, GTS

...he plans to retire soon!

"Mainframe tribal knowledge will be lost after 'Gen 2' people retire, because 'Gen 3' people don't want to wait the five years it take to gain that critical knowledge."

Director of Engineering Technology and Operations, BMO

Zach decides to document the process so that Christina and others can do it without him.

It's a doozy...

Slide 60

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Example 5 - increase a file system

- **Steps to increase a file system**
  a. Verify file system is out of space
  b. Allocate a larger file system
  c. Verify old file system is not in use
  d. Unmount the old file system and mount it "Read only" to a directory
  e. Mount the new file system to a directory
  f. Change permissions, owner and group owner of the new directory to match the old directory
  g. Run copytree
  h. Unmount file systems and mount new file system to the correct directory

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Example 5a – verify file system is out of space

- **An HFS can be out of space for several reasons:**
  - HFS has reached 123 extents
  - The volume is out of space
  - The HFS was allocated with 0 secondary extents
- **Use ISPF 3.4 to determine the cause and also use the USS command df –kPv path, i.e.**

  df –kPv /u/neilsx

- **Use ls –al or use ISHELL–> File -> Attributes to get the owner and permissions of the directory (we will need this later)**

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Example 5b – allocate new file system

- **Allocate a larger HFS file system with a new name using either of the two methods below**
  1. `ISHELL -> File_systems -> 2. New HFS`
  2. JCL

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Example 5c – check if file system is in use

- **Verify no one is using the file system using the by issuing the fuser command or the fsinuse command (you can get the fsinuse command from the USS Tools and Toys website):**

  http://www-03.ibm.com/servers/eserver/zseries/zos/unix/bpxa1ty2.html

  - fuser -u /u/neilsx
  - fsinuse /u/neilsx

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Example 5c – verify file system in use summary

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Example 5d – unmount filesystem

- **Unmount the old file system from** `ISHELL -> 1. Mount Table` **– then place a U next to the file system you want to unmount and on the next screen select option 1 for Normal.**
- **If you receive an I/O error you may need to unmount it with option 3 for Immediate and/or option 4 for Force.**

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Example 5e – mount file systems

- **Mount the old file system in Read only mode using** `ISHELL -> File_systems -> 3. Mount` **and select Read-only file system**
- **Mount the new filesystem**
- **I generally use the following convention:**
  - /u/neils/old for the old file system
  - /u/neils/new for the new file system

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Example 5e – mount using ISHELL

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Example 5f – change permissions/owner/group

- **Using the output of ls –al in step a, issue the appropriate chown and chmod commands for the new filesystem or use** `ISHELL-> File -> 2. Attributes -> Edit -> 1. Mode fields, then 2. Owning User and then 3. Owning Group` **to change the values:**
  - chown userid:group /u/neils/new
  - chmod ppp /u/neils/new

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Example 5g – copy file system

- **Use the df –kPv commands to verify you have mounted the file systems correctly with the correct mount modes (Read only for the old file system).**
- **You can use copytree from batch or from USS or use the pax command. For this presentation we will use copytree. copytree is located in /samples. Here is the syntax:**

  copytree from_directory to_directory

- **So in our example it would be (-s option switches to uid=0 assuming the user has access to BPX.SUPERUSER):**

  copytree -s /u/neils/old /u/neils/new

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Example 5g – copytree JCL

```
//STEPA  EXEC  PGM=IKJEFT01,REGION=0M
//SYSEXEC   DD  DSN=NEILS.REXX,DISP=SHR
//SYSPRINT  DD  SYSOUT=*
//SYSTSPRT  DD  SYSOUT=*
//SYSTSIN   DD  *
copytree -s /u/neils/old
 /u/neils/new
//*
```

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Example 5h – unmount file systems

- **Issue the df –kPv commands to verify the old and new file systems look ok**
- **Unmount the file systems**
- **Rename the file systems**
- **Mount the new file system**

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Example 5e – mount file systems

- **Mount the old file system in Read only mode using `ISHELL ->
  File_systems -> 3. Mount` and select `Read-only` file system**
- **Mount the new filesystem**
- **I generally use the following convention:**
  - /u/neils/old for the old file system
  - /u/neils/new for the new file system

66

Tribal knowledge alert

Christina takes Zach's document and does the best she can, but she still needs to ask a lot of questions along the way.

Eventually, she increases the size of the zFS and moves onto her next task, wondering if it will be as puzzling as the one she just finished.

Why are routine tasks so manual?

"I would love user-friendly tools to help me do bureaucratic tasks quicker."

z/OS System Programmer
with <u>five years</u> experience

Why do I always need to use an old-fashioned green screen?

"I use mainly 3270 emulator...z/OS tools... we have our self-tooling to do our job in a quick and reliable way...we aren't that glad with the tools that IBM provides."

z/OS System Programmer
with 17 months experience

I like a challenge, but the effort I'm putting in to this one doesn't seem worth it.

"Documentation is not an easy way to learn how to manage such a system."

z/OS System Programmer with <u>17 months </u>experience

I want to be as skilled as Zach one day, and I'm eager to tap into the power of Z, but I'm having trouble getting started.

"It has taken me six months to start feeling like I can contribute, and a year to contribute independently."

z/OS System Programmer
with <u>two years </u>experience

An experienced Systems Programmer can reduce the complexity of their organization's z/OS management processes so they can transfer their knowledge to the next generation

An early tenure Systems Programmer can perform z/OS management tasks by using a modern interface that does not expose them to the complexities of ISPF, command line, operator console, or JCL jobs

IBM Statement of Direction

IBM z/OS Management Services Catalog

In an ongoing effort to modernize how system programmers manage their z/OS environments, IBM intends to extend z/OSMF with the z/OS Management Services Catalog framework. This framework leverages the power of z/OSMF workflows to enable system programmers to run services that help complete z/OS management tasks faster and with fewer errors. In the future, experienced z/OS system programmers will be able to create a catalog of customized services, each written with unique institutional knowledge, protocols, and processes.

IBM plans to provide an initial set of services to help z/OS system programmers of all skill levels get started, demonstrate accepted practices, and simplify information sharing. These services are expected to help system programmers spend less time on routine tasks and more time leveraging their z/OS environment. In addition, the z/OS Management Services Catalog intends to offer these capabilities:

Powerful graphical interface for creating new services, editing IBM-provided services, and updating existing services

Step-by-step guidance for completing z/OS management tasks

Overview of all services submitted to run on a system

To prepare for the release of the z/OS Management Services Catalog, IBM encourages z/OS system programmers to start creating their own workflow assets, with the plan that the z/OS Management Services Catalog will help maintain and manage workflows in the future. You can learn more and watch for future developments on the release at the z/OS Management Services Catalog content page.

z/OS Management Services Catalog leverages z/OSMF workflows to enable Christina to run services that help her complete z/OS management tasks faster and with fewer errors. While Zach can create a catalog of customized services with unique institutional knowledge, protocols, and processes.

Demo of zOS
Management
Services Catalog

Workflows

z/OSMF workflow is the underlying technology for z/OS Management Services Catalog.

Workflows are a mechanism to modernize and automate systems management tasks.

Current Exploiters of workflow

- z/OS Upgrade
- DB2 migration workflow
- z/OSMF Configure workflow
- z/OSMF Config Assist workflow
- zCX Provisioning
- z/OS Cloud Provisioning
  - CICS, MQ, Db2, WLP, IMS, z/OS Connect

What is a z/OSMF workflow?

A framework to perform a guided flow of steps in order to accomplish tasks on a system.

Allows the user to customize tasks for different user environments via variables.

Can execute a variety of different step types

- JCL

- REXX

- Shell scripting

- REST calls

- Other workflows

Workflow glossary

Workflow Editor task
z/OSMF plug-in that provides a UI to create workflow definition files.

Workflow instance
A single entity generated from a workflow definition file inside of the Workflows Task.

Workflow definition file
An XML file that defines steps, variables and metadata. These are used to create workflow instances.

Workflows task
A z/OSMF plugin that creates and manages workflow instances from workflow definitions.

Workflows properties file
An optional text file used to define variable values when creating workflow instances.

IBM Provided Services

1. RACF Certificate Management

2. RACF User ID Management

3. z/OS Catalog Management

4. z/OS UNIX System Services Management

5. zFS Management

Descriptions of IBM Provided Services

1 RACF Certificate Management ──────────┐ 1 Create a RACF digital certificate

2 RACF User ID Management   │ 2 Download SMP/E receive order certificate

3 z/OS Catalog Management   │

4 z/OS UNIX System Services Management   │

5 zFS management   │

Descriptions of IBM Provided Services

1 RACF Certificate Management

2 RACF User ID Management

3 z/OS Catalog Management

4 z/OS UNIX System Services Management

5 zFS management

Descriptions of IBM Provided Services

1 RACF Certificate Management

2 RACF User ID Management ——— **1** Create a RACF user ID

3 z/OS Catalog Management **2** Delete a RACF user ID

4 z/OS UNIX System Services Management

5 zFS management

Descriptions of IBM Provided Services

1   RACF Certificate Management

2   RACF User ID Management

3   z/OS Catalog Management

4   z/OS UNIX System Services Management

5   zFS management

Descriptions of IBM Provided Services

1 RACF Certificate Management

2 RACF User ID Management

3 z/OS Catalog Management

       1 Delete an alias from a catalog

4 z/OS UNIX System Services Management

       2 Modify an alias entry in a z/OS catalog

5 zFS management

Descriptions of IBM Provided Services

1. RACF Certificate Management

2. RACF User ID Management

3. z/OS Catalog Management

4. z/OS UNIX System Services Management

5. zFS management

Descriptions of IBM Provided Services

1 RACF Certificate Management

2 RACF User ID Management

3 z/OS Catalog Management

4 z/OS UNIX System Services Management

5 zFS management

1 Mount a zFS file system

2 Unmount a zFS file system

Descriptions of IBM Provided Services

1 RACF Certificate Management

2 RACF User ID Management

3 z/OS Catalog Management

4 z/OS UNIX System Services Management

5 zFS management

Descriptions of IBM Provided Services

1 RACF Certificate Management

2 RACF User ID Management

3 z/OS Catalog Management

4 z/OS UNIX System Services Management

5 zFS management

1 Create a zFS file system

2 Encrypt a zFS file system

3 Expand a zFS file system

Administration

Manage and create z/OS management services

Manage services
Last refresh 30 seconds ago

| Filter by categories ⌄ | Filter by statuses ⌄ | Search | | New service + |

Service name	Status	Category	Last modified ↓	
Create and format a zFS data...	Unpublished	zFS Management ⌄	15 May 2020, 8:45 AM	⋮
Move a catalog	⏱ Pending approval	Catalog management	10 Aug 2019, 9:00 AM	⋮
Copy a zFS data set	Archived	zFS management	10 Aug 2019, 8:00 AM	⋮
Create a master catalog	Published	Catalog management	2 Aug 2019, 7:45 PM	⋮
Delete an alias from a user catalog	✓ Ready to publish	Catalog mangement	18 Jun 2019, 6:23 PM	⋮
Rename a zFS data set	Unpublished	zFS management	7 Jan 2019, 3:23 PM	⋮
Remove expired certificates	Published	Certificate management	5 Dec 2018, 10:00 PM	⋮
Delete a user catalog	⏸ Suspended	Catalog management	5 Dec 2018, 4:21 PM	⋮
Create a personal digital certificate	Published	Certificate management	28 Oct 2018, 12:34 PM	⋮
Mount a file system	Published	UNIX system services	17 May 2018, 2:23 PM	⋮

| Items per page: 10 ⌄ | 1-10 of 20 items | | 1 ⌄ of 2 pages | ◀ ▶ |

Modify

Customize an IBM Provided Service or your own service.

Create

Create your own service for a specific z/OS management task

Review

Review and approve services before publishing

Publish

Publish a service to the catalog

Run Service

Run specific service from Catalog

Change management

Integrate with change management system

Certificate management

Help   ⌄   ✕

Create a personal digital certificate *saved 30 seconds ago*

Target system: DALPLEX.SYS21

Status: Draft

- ⊘ General
- ⊘ Encryption Algorithm
  Optional
- ⊘ Advanced
  Optional
- ● Runtime info

Back   Run service

Change record ⓘ

Placeholder text

I want to run this service ⓘ

◉ Now

○ Between specific dates

JOB statement ⓘ

A default JOB statement has been provided. You can make edits below.

Restore default ↺

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7--

//CREATZFS JOB (ACCTINFO),CLASS=A,MSGCLASS=0,
//            MSGLEVEL=(1,1),REGION=0M,NOTIFY=IBMUSER
```

Object ID ⓘ

07c518a-1a9e4e4-b1e747c-56a8e1a

General page summary   Edit

Certificate owner

csmith

Run window

Specify the time period during which the service can be manually run

Catalog   In progress   History   Manage

Create service   Settings ▾   🔔

Certificate management

Create a personal digital certificate *saved 30 seconds ago*

Help   ↙   ✕

Target system: **DALPLEX.SYS21**

Status: **Draft**

✓ General

✓ Encryption Algorithm
  Optional

✓ Advanced
  Optional

● Runtime info

Change record ⓘ

Enter a change record number

I want to run this service ⓘ

○ Now

◉ Between specific dates

Back   Run service

Start date   **End date**

mm/dd/yyyy 📅   mm/dd/yyyy 📅

12:00   AM   EST ▾

12:00   AM   EST ▾

JOB statement ⓘ

A default JOB statement has been provided. You can make edits below.

Restore default ↻

```
----+----1----+----2----+----3----+----4----+----5----+----6----+----7--

//CREATZFS JOB (ACCTINFO),CLASS=A,MSGCLASS=0,
//          MSGLEVEL=(1,1),REGION=0M,NOTIFY=IBMUSER
```

Activity

See all submitted services that are either running or queued for future execution.

Create service

Activity   Last refresh 30 seconds ago

Help

Service name	Status	Submitter	Target system	Start of run window ↑	End of run window
Create personal digital cert...	◐ Running for 2 hrs 3 mins...	gsmith	DALPLEX.SYS21	—	—
Expand a PAX file	✓ Ready to run	christina	LONPLEX.PRODSYS	30 Dec 2019, 12:00 AM	3 Jan 2020, 10:30 AM
[Test] Create certificate	◐ Running for 23 mins, 2 of 3...	gsmith	DALPLEX.SYS21	30 Dec 2019, 12:00 AM	2 Jan 2020, 12:00 AM
Delete user ID	Queued	christina	DALPLEX.SYS21	1 Feb 2020, 12:00 AM	5 Feb 2020, 12:00 AM
Mount a file system	🚫 Failed on step 2 of 3	egendreau	LONPLEX.PRODSYS	1 Feb 2020, 12:00 AM	10 Feb 2020, 5:00 PM
Delete a user ID Suspended	Being modified by zach	christina	DALPLEX.SYS21	1 Feb 2020, 12:00 AM	5 Feb 2020, 12:00 AM
Create personal digital cert...	Queued	palv	DALPLEX.SYS21	2 Feb 2020, 12:00 AM	5 Feb 2020, 12:00 AM
Alter user ID attributes	Queued	palv	LONPLEX.PRODSYS	2 Feb 2020, 12:00 AM	27 Feb 2020, 4:00 AM

History

See all services that have run, been terminated, or expired

Provides details that can be used for audit purposes.

"... [the create service tool] does make sense, visually it's presented in a way that it's ...simple and clean. I can definitely follow it and I can see myself using something like this."

A large US bank, Early tenure z/OS Systems Programmer

"For me personally, [the create service tool] does make sense of course. It gives you the customer more flexibility designing a service. For me it's a good approach."

A large international bank, Senior z/OS System Programmer

"...I would take some of the processes that I've got stored away in data sets and turn them into services that [Christina] and other new people coming on board could use."

A large US bank, Senior z/OS System Programmer

"I'm really positive about this notion of catalog creator and catalog run, that separation."

A large Canadian bank, Director

"...Have only one workflow...especially for the newcomers coming to our team, because sometimes it is very difficult to explain...all the stuff they would be normally using. That way it is quite simple and they can do it through z/OSMF–that is really astonishing."

IBM-GTS, Mid-level z/OS System Programmer

Q & A

Thank you

If you have any questions or comments regarding z/OS Management Service Catalog please contact Hiren Shah at hiren@us.ibm.com or Sofia Gutierrez at sgutierrez@us.ibm.com