

SHARE 2024 Orlando March 3-7, 2024

By Ed Webb of SPARTA

Held at Rosen Center Hotel in Orlando, Florida

Items of Interest

SHARE 2024 Orlando is also SHARE 142

Technical Agenda <https://www.share.org/Events/SHARE-Orlando-2024/Technical-Agenda>

Presentations are currently only available via the SHARE app on your mobile device

They will be available to members in the Orlando proceedings whenever that's built

<https://www.share.org/Events/Past-Events/Proceedings>

search for SHARE Orlando 2024 ???

04Mar2024 Monday

SHARE Opening and Keynote

Mainframe Skills Council - customer and vendor and IBM

by Meredith Stovall, IBM

<https://newsroom.ibm.com/IBM-Mainframe-Skills>

Mainframe Skills Council - IBM, SHARE, other key organizations

More education and training

Simplification,, AI and Automation

Generative AI to accelerate modernization

Mentors, skill-up

Ensono VP Lisa Dyer

Integrating mainframe and public cloud: blueprint for digital excellence

“Mis en place” - all meal parts ready to assemble

efficiency, speed to plate

Similar to tech today - mainframe, cloud, other

Broadcom - Robbie Patel

1610 Galileo identifies Milky Way

1924 Hubble finds Andromeda galaxy

1990 Hubble Space Telescope photographs Andromeda

2022 James Webb Space Telescope

Technology moving faster - reprogrammable ink, computer vision, mainframe flexibility for 60 years

Rocket Software - Tim Willian?

Disruption for the island - hybrid cloud with best of mainframe and cloud

Mainframe high volume transactional processing

customer challenges

Culture (Mainframe resistance to change)

Silos (not working with others)

Skills (need those who know both platforms)

Data modernization strategy

Mainframe core transactional data and content

Cloud analytics, get native AI, predictive AI, web and mobile

Discover, catalog and govern

Access and virtualize

Replicate and synchronize

Archive

Security

Python, Go, perl, Zowe....

Security - configure Mainframe in secure way

Mainframe is center of Hybrid Cloud

SHARE Summer August 4-8, 2024 Kansas City, MO

Justin Wren, former mixed martial arts player, is keynote speaker

<https://www.fightfortheforgotten.org> Fight for the Forgotten

If you want to go fast, go alone

If you want to go far, go together

- Swahili proverb

If you think you are too small to make a difference, try sleeping in a closed room with a mosquito

Opportunity is greater than charity

Core Tech z/OS Track Welcome

by Art Gutowski

Core Tech Track includes Systems programming, hardware, storage, communication server

<https://www.ibm.com/cloud/wazi-as-a-service>

Critical z/OS Service APARs by John Shebey of IBM

OA65828 System SSL HIPER and Pervasive (closed on Feb. 27)

TLS 1.3 AT-TLS severed connection prematurely, potential loss of data if interruption occurs during data transfer

OA64549 z/OS Unix

HIPER PE z/OS 2.4 and up through 3.1 base

RSU2401 PTFs 7E0, 7D0, and 7C0

Possible loop burning CPU during TSO session create

OA64083 RSM

HIPER PE 2.4 and 2.5 SDUMP and Optimize=YES

Incomplete dump though reported Complete

RSU2308 PTFs

Red Alert - incomplete RSU2312 PTF list

Security Portal for IBM Z ibm.biz/security-portal-faq

Required registration and subscribe

IBM Flash for IBM z/OS WIC SMF records should be collected

Low overhead

RMF license allows WIC SMF record collection

ibm.biz/aprvirtualfair IBM Z Career Fair (online) April 11, 2024

Cheryl Watson Keynote and Farewell

Math and physics degrees

IBM 1620 1964 first computer she worked on

IBM 1401 1965 Autocoder was the programming language

Wrote a payroll system for 4K hardware

IBM 360 1966 COBOL and Assembler

1976 First SHARE when she was at EDS

3-ring binder of session handouts with tabbed sections

Share your SHARE experience, session reports

1985 First IBM PC

1986 met Tom Walker

1987 Barry Merrill brought MXG to SHARE

MXG was from SAS and he bought it from SAS

1991 Cheryl Watson's Tuning Letter

1995 WLM QuickStart Policy

1998 Cheryl's Hot Flashes session started at SHARE

2014 Frank Kyne joined W&W from IBM Redbooks

2015 GSE in Boblingen, Germany

2019 Frank Kyne became President of W&W

2023 CW rotator cup damaged, reverse shoulder replacement surgery

Deep brain stimulator to control tremors

2 months in Morocco and Spain

Decided to retire and enjoy life

CW is 79 in 2024, will be 80 later this year

Don't say no to any new skills

Travel as much of the world as you can to understand world and people

Governments are crap but people are great

Future mainframe

More attention to young people

Different vocabulary

Fewer nuts and bolts (i.e. parameters)

Controlled (managed) AI

Higher effort on security

What's New in IBM z/OS 3.1 - The Sunshine Edition

By Dave Surmon, Steve Warren, Marna Walle of IBM

AI-infused OS

WLM batch initiator management

z16 Enhanced zIIP Eligibility (including Python)

ICSF Hardware support, z/OS Validated boot

z/OS 3.1

Python AI Toolkit for IBM z/OS 1.1

Free and paid versions

AI Toolkit for IBM Z and LinuxOne

Free and paid versions

IBM Machine Learning offerings

z/OS Container Extensions zCX enhanced

zCX single node OpenShift (SNO) 4Q2023

Requires Semeru (Java) 11 and later in 2024 Semeru 17

JSON parser improvements, z/OS client Web enablement toolkit, OpenSSH updated, XML 11 is part of z/OS Base

EzNoSQL APIs

z/OSMF

Stay current on service which can add functions

Remote Desktops, Multiple Desktops

z/OS Data set and File compare on desktop

SCA Security Configuration Assistant

View, validate, change or fix access

- CFSizer
- REST APIs with Swagger Support
- z/OS 3.1 Upgrade Workflows
- Software Management for ServerPac
- z/OS Package Signing
 - can be exploited by IBM and vendors
- z/OSMF zFS improves PH56073
- Scalability and Performance
 - WLM
 - ZHyperlink write for multi-volume data sets (CD)
 - RMF UI-based on Open Source Grafano
- availability
 - Anomaly mitigation client points
 - PFA, RTD, SLIP/PER
 - System Recovery Boost
- System's Management
 - AI system services
 - SMF Explorer with Python (CD)
 - JES2 Policies and others
 - SDSF
 - IBM z/OS Change Tracker
 - zWIC RMF-licensed
- Networking
 - zERT (z/OS Encryption Readiness Technology)
- Data Serving and Storage
 - Cloud Data Access (CDA)
 - DD data set can be on cloud, private or public
 - Catalog - improved Modify catalog
 - Catalog services available earlier in IPL will improve performance
- Security
 - Encrypt a RACF database but not first encrypted data set
 - Password phrase interval
 - Custom fields in ACEE
 - ICSF
 - Master key ownership, can be divided and distributed
 - Read-only archive key support
 - z/OS Authorized Code scanner and monitor priced feature
 - z/OS Authorized code monitor for production

z/OS 3.1 Upgrade: Planning

By Marna Walle and Aaron Kippins of IBM

Upgrade workflow in z/OS Unix files at /usr/lpp/bcp/upgrade maintained via PTFs

Hardware upgrade workflows are separate from z/OS ones

=> TLS for TSO changing to Require AT-TLS for TSO secured access

=> ISFPARMS assembler macros removed

Is DOC4Z available yet?

=> Get entitled for z/OS 3.1 - new version, new entitlement needs to be processed

Update Java_Home environment variable to Java 11 (Required)

IBM Semeru (Java) 11 required for z/OS 3.1 execution, not for installing

November 2024 support ends

Only 64-bit support

Semeru 17 will be required later in 2024

3 components still need Java 8 but fixes coming soon

<https://www.marnasmusings.com/2023/08/having-your-java-and-drinking-it-too.html>

SDK for Node.js 18 orderable and supported by Zowe

SDK for Node.js 20 orderable but not supported by Zowe

FIXCAT IBM.Coexistence.z/OS.3.1

Root file system is much bigger

z/OS 3.1 is 5,555 CYLs so must change to EA (Extended Attribute)

FIXCAT IBM.DrivingSystem-RequiredService

Upgrade Workflow and Health Checks driven by WF

CB.** data set removed; remove these security profiles now

Data Class supports targets greater than 4GB

Port SMS to non-SMS during install

z/OS 3.1 Upgrade: Technical Actions

By Marna Walle mwall@us.ibm.com and Aaron Kippins of IBM

Upgrade workflows are in z/OS Unix files at /usr/lpp/bcp/upgrade on your z/OS 2.4 or 2.5 or 3.1 system

maintained via PTFs

Hardware upgrades separate from z/OS

Sysplex concerns

JCLPARM in DIAGxx CBATTR....

SDUMP OPTIMIZE=YES now default, IEA794I says OPTIMIZE used

ALLOCxx SYSTEM TAPELIB_PREF changed to BYDEVICES instead of EQUAL

CBLOC VIRTUAL31(IHAASVT) is recommended

OSPROTECT=SYSTEM definition is changed to same as =1 but SYSTEM is 3.1 default

No obvious performance protection

JES-supplied default job resource limits

Protect SPOOL resources from runaway resources

JES ACTIVATE z22 LEVEL before 2.5

RMF structural changes as of 2.5

Advanced Data Gatherer is new priced element

Data Gatherer is base element

Data set name changes

Update CLASS(PROGRAM) profiles for new and removed data sets

DDS requests must be standards (URI) compliant

z/OSMF Workflow

=> Undeclared referenced entities requires that you examine existing WF for problem

IZUWF0120E 3.1 entity not declared

Vim (a.k.a. VI) editor replaced by nano

OpenSSH ported level from 7.6p1 is now 8.4p1

Use Health Check; it's very comprehensive

RACF

- TSO Help gone, use IBM doc RACF Command Reference
- Remove IZP and ZOWE from Dynamic Classes, now in IBM-provided table
- Comm Server
 - FTP TLS changed to use AT-TLS
- See 2.5 “Big Migs” slide 27
- See 3.1 “Big Migs” slide 28

79612 z/OS 3.1 User Experience

By Ed Jaffe, Phoenix Software International
17+24=51+ attendees

- z/OS RFA 223-012 Announcement
- SPEs have new name Continuous Delivery
 - 778 SPEs in 106 weeks from 2.5 GA thru Oct. 17, 2023
 - Now 7.34 SPEs per week
- Customer Requirements Satisfied
 - <https://github.com/IBM/IBM-Z-zOS/tree/main/zOS-Requirements-Satisfied>
- OA62568 DAE EXPIRE(60|n) consider changing to 1 [day]
- z/OSMF Security Configuration Assistant (SCA)
 - Review & Fix
 - Security Definition File (SDF)
 - “No decision” cases is a fail
 - Creates specific profile names, not generics
 - Discrete, not generic
 - Good for z/OSMF security but review carefully before Submit for other products
- CF Sizing
 - z/OSMF Plug-in
 - CF level and other values from user
 - Update Policy on the fly
- WLM Policy Advisor
 - Z/OSMF plug-in reads SMF data and WLM service definition
 - Gives insights to your settings
 - SMF Selection Period choices could be improved
 - Performance Index tab
 - Goal tab
- SMF Explorer with Python
 - 70% zIIP-enabled
 - Max supported work station Python is 3.10
 - Fragility of off-platform technologies
 - Requires separate z/OSMF Server
 - Uses different APIs that disable existing APIs in z/OSMF
- File and Data Set Upload and Download
 - Download Unix files with content type
 - Easier than FTP or SFTP
 - Does not process MIGRATED files
 - Lots of options if defaults are not enough
 - Record upload and download OK but .record not supported
 - Wildcards in typeahead search!
- REST API for Hardcopy Message Data Set
 - Great of log processing
- REST API for System Symbols
 - Couldn't find documentation

REST API from CFRM Policies

- No polling required

- Swagger interface doc shows wrong URL

Management Services Catalog (MSC) - a z/OSMF Plug-in

- Lots of services available

- Swagger very helpful

- Get Service Submission details

- Just get dumped output, not very helpful

- JSON object is what you want

- Ed Jaffe likes MSC!

z/OS System UUID

- Every software instance - a way to identify SMP/E CSI that represents a given z/OS system

- Available in deployment workflow variable

Data Set Filesystem (DSFS) now supports SYSOUT, UNIX extattr utility had new sub commands and status info

Union Filesystem

PROC Filesystem in Unix system UJ94654 provides info about

Z shell (Zsh) 5.8.1

- Use instead bash

Unix failed "su" auditing

Unix recursive grep

z/OS Authorized Code Scanner

Grafana-Based user Interface for RMF - no doc found

- hands-on lab here has this for testing

ONLYIF command in ARCCMDxx

HSM Java hbackup command much faster

JES2 Resource Limits worked to prevent job taking over SPOOL

ISPF PDSE member generations

- Info shows lots of data

KC4z gone

- DOC4z is SOD for z/OS future

IPCS IEAVHELP is helpful

ABDISPCC= EXEC JCL keyword - data set disposition control for return code not just abends

05Mar2024 Tuesday

What's New in AI on IBM Z? Orlando Edition

By Andrew Sica of IBM

IBM z16 Integrated Accelerator for AI

- z/OS Model training and development

- Application running where data is

IBM Z Use Cases

- Fraud detection

Was calling off-Z for fraud detection - relatively slow, 15% transaction per second at peak. 60 milliseconds

- Moved model to Linux on Z LPAR collocated with credit card system

- Now process all transactions in 18 milliseconds each

- Credit card processing

- Offsite FICO service 20-30 seconds to respond

- Frequently unavailable for non-production

- Needed better business rules and upcoming AI

AI doesn't replaced your business rules but augments them
Implemented AI with business rules for faster implementation

Chatbot services
Medical image diagnostics
Insurance underwriting
Claims fraud

What's New

Discovery workshops to help customers to identify AI opportunities

AI Landscape

Explosion of large language model use cases

Traditional AI

Machine Learning and Deep Learning - Algorithm trading, demand forecasting, anti-money laundering, dynamic pricing, cost optimization, fraud detection

Foundation Models - new product synthesis, writing tasks, design tasks, client facing chatbots

AI Platforms and Ecosystem Overview

z/OS Native ML for z/OS, Apache Spark on zCX Classic

Db2 SQL Data Insights, Python toolkit for z/OS - zCX Openshift

Secure product review before offering to customers

Linux EnvZ

AI Toolkit for IBM Z and LinuxONE, Triton Inference Service, Deep Learning

Platform Entry Points on z/OS

Machine Learning for z/OS 3.1

Db2 SQL Data Insights (Db2 v13)

Imbedded Models

MLz Q4: trustworthy AI Model Explainability

Shows why model decision occurred with seamless configuration

optional feature does require zCX

MLz Q4: Snap ML

M-L library from IBM Research optimizes training and scoring of most popular ML models

Import PMML external tree ensemble models

AI Toolkit for IBM Z and LinuxONE (no charge optional element)

zCX or Linux on Z

MLz is solution-based offering

AIT more Open Source-based

Containers from IBM secure repository

Tensorflow accelerated- C++ model server, scales very well, targets on-chip accelerator

Snap ML

NVIDIA Triton Inference Server

High performance and scalable

IBM Z Deep Learning Compiler

Generates from ONNX DL models to execute on z/OS or Linux on Z

Open source models like these are command line, no GUIs

on-chip accelerator scales well, better utilized

Non-Z GPU shortage

IBM Z is a throughput machine

How to Get Started

AI Solution Templates

Jumpstart AI projects on IBM Z with hands-on guidance

Realistic sample data for training

Good for proof of concept

z/OS, zCX, Linux on Z

Financial solution templates coming in a few weeks

Others coming later

OpenMainframe Project Ambitus. <https://github...>
Redbooks - Finding an On-ramp to your AI journeys on IBM Z

Acquisition to Deploy: Software Management Best Practices Using z/OSMF session 10112

By Dawn, Michael, Jan from Broadcom
24 + 23 = 47 attendees plus 3 speakers

z/OSMF Software Management, Software Update, [Broadcom] Software Toolkit
Zowe - CLI, Explorer for VS Code and for IntelliJ IDEA, ...
Zowe releases updates about every 6 weeks

Acquisition - zowe download Portable Software Instance
Other acquisition techniques for Broadcom software
Secure FTP to upload to z/OS Unix
Secure download using GIMGTPKG from Broadcom directly to USS directory (recommended)

Register Zowe
Add PSI via Local files, z/OSMF, or other
Broadcom will include package signing in their offerings

Deploy and Configure
Deployable unit of installable software
Portable Software instances delivered to Customers
Software Instances included data sets that contain installed software
SMP/E and non-SMP/E data sets
Run deployment checklist including deploy jobs
Run configuration workflows

Managing Your software Risk
What's maintenance installed?
What maintenance has not been received?
Any missing critical maintenance
What is best way to acquire maintenance?
Proactive preventive maintenance via RECEIVE ORDER

z/OSMF Software Toolkit plugin
Analyze installed products
Status of SYSMODs
Quickly determine if missing service
Trigger SMP/E RECEIVE Order to acquire PTFs

Install Preventive Maintenance
Implement a strategy
install recommended service

Avoiding z/OSMF Pitfalls: Common Problems 3.1 Update

by Ken Irwin of IBM Irwink@us.ibm.com POK
by Trevor Geisler for z/OS RESTFILES Service tgeisle@us.ibm.com Tucson

z/OSMF provides more than 150 REST APIs
IBM zOSMF collection using Ansible a.k.a.
PH56207 PARMLIB Management plug-in
Use Security Configuration Assistant
SMF REST Services

Heavyweight interface

If installed on Primary z/OSMF, all other REST services disabled

Run SMF REST Services on separate z/OSMF server instance (another ANGEL service not required)

Upgrading to z/OS 3.1 from 2.4 or 2.5

Upgrade Workflow execution had SSL Exception

CSNDDSV error was addressed by Java APAR PH56022

8.0.8.15 refresh J8.0 refresh 8 service pack 15

UI94465 APAR PH58170 to implement this fix

z/OS 3.1 requires [Java] Semeru 11

Java and Liberty on 3.1

Java 11 (11.0.19.1) Semeru 64-bit implementation

<https://www.ibm.com/support/pages/node/6208335>

Liberty 23.0.0.3

Java/Semeru SYMLINK a cautionary tale

z/OSMF sets JAVA_HOME in PARMLIB IZUPRM00

JAVA_HOME('usr/lpp/java/J11.0_64')

See Java APAR IJ49451 fixes current_64 link (11.0.22 build UI95683)

Use z/OSMF Symlink

TLS V1.3

z/OSMF 3.1 default IZU_SSL_PROTOCOL=TLS

Actually protocols TLS 1.2 and 1.3, not from earlier 1.0 or 1.1

could be set explicitly to TLS1.3 but is your network TLS 1.3 in use?

RSA Hardware key usage

Affects TLS1.3 and 1.2

Java 11 and 17 requires RSASSA-PSS for IBMJCECCA provider (like z/OSMF)

Enforced at 11.0.19.0 and 17.0.7.0

Java 8 running on z/OS 3.1

8.0.8.5

Solution is regenerate RSA keys with RSASSA-PSS signature algorithm

Workaround -disable RSASSA-PSS algorithm within the JVM

/security/lib/security/java.security and update idk.tls.disabledAlgorithms

add RSASSA-PSS to list

<https://www.ibm.com/support/pages/node/7028845>

Workflow

PH56105 for 2.4, 2.5, and 3.1

"IZUG476E HTTP request" affects Upgrade Workflow

z/OSMF API common Pitfalls

REST APIs

Files and Dataset, Jobs, TSOAPP

Setup and customization

IZUPRMxx

RSTAPI_FILE and COMMON_TSO

TSOPROC IZUFPROC AUTHUSER

ACCTNUM IZUACCT AUTHUSER

Security Groups

User, admin, security

IZUUSER, IZUADMIN, IZUSECAD

Each API has specific requirements

See <https://www.ibm.com/docs/en/zos/2.5.0?topic=guide-security-structures-zosmf>

Security Configuration Assistant

On z/OSMF Desktop

Sample JOB to verify Security Configuration Assistant setup so it can be used

IZUFPROC Configuration

- Use sample and its DDnames in any customized PROC
- Locate in JES PROCLIB concatenation
- Multi-Logon Support
 - Use F CEA,DISPLAY,P MAXSESSPERUSER set to 10 at minimum
 - ISPFPROF Profile Sharing setup
- CSRF
 - IZUG846W remote REST request
 - CSRF_SWITCH(ON|OFF) in IZUPRMxx
- S222 Abends
 - z/OSMF TSO sessions end by S222
 - Normal operation
 - IDEA for voting ZOS-I-3687
- REST API Explorer (a.k.a. Swagger?)
 - Built in z?OSMF function
 - Allows testing of API requests in a browser
- Open a Case
 - Determine team by URL
 - /zosmf/restfiles... z/OSMF REST team
 - /zosmf/restjobs... z/OSMF JES team
 - /zosmf/tsoapp.... TSO team

PSP: Observability Revolutionized (Broadcom)

by Nicole Fagen and others from Broadcom
no handout

Watchtower (3 offerings) available today
Kubernetes install of Docker containers
Simple install commands
built on Broadcom products OPS/MVS, SYSVIEW, NetMaster, Vantage, others
If licensed for one of these, then download Watchtower today
SMF data

Anomalies via Machine Learning
Integrated with ServiceNow
Map your resources with SMF data and navigate path to where problem is occurring

Operations reporting problems provides more data with one view

z/IRIS integrated real-time information streaming

Embracing Open Mainframe
OpenMainframe, OpenAPI initiative, OPenTelemetry, zowe-compliant
<https://developer.mainframe.broadcom.com>

what's Next ...
Infrastructure health, resource dashboards, application health
network packet tracing and application insights via Easy Button

10564 Installing z/OS 3.1 Using z/OSMF Software Management

51 attendees
By Kurt Quackenbush of IBM

z/OSMF Software Management is for installing software, use Software Update for APPLYing maintenance

Software Instance - these are objects acted on by SM

Portable SI built by GIMZIP - pull from download server

Direct to z/OS, from local workstation

Be sure driving system is current, particularly IBM.DrivingSystem-RequiredService FIXCAT

ServerPac-install-zosmf/

Deployment

Target system - CSI, sysplex, Catalog choice

=> Why z/OS choice instead of data from PSI?

Missing SYSMODs for existing software

Configuring Deployment

Generate jobs

Submit jobs

Verify first job with Security - after completion, override as complete to continue

Post-install Workflows

Complete deployment

Delete temp catalog alias (similar to DELSSA)

Customizing z/OSMF Using Plug-ins

By Jerry Spencer of DTS Software LLC

Session 73329

Download IBM Sample plug-in

From GitHub, download TSO Backend and others

extract all

Install IBM sample plug-in

Steps described - follow them carefully!

Overcome personal issues

failed to download as binary

“Any sufficiently advanced technology is indistinguishable from magic” - Arthur C. Clarke

“Get all down in it if you want to understand it” - Williams

Understand IBM sample plug-in

Sample was written in Angular

“Learn Angular in 5 minutes”

Took more angular courses at Unity

Review var... files for application source

made minor changes then did build [analogous to compile]

Upload files as Binary

Create your own plug-in

Tweaked IBM's plug-in to create new application

Provide a DTS software interface for z/OSMF that mimics ISPF software

Update properties

Work-in-progress

Wrap up

why not workflows instead of plug-ins?

Retrieved example plug-in, installed and understood it, cloned it to make our own plug-in

Introduced Angular learning

Have rudimentary plug-in

SHARE 2024 Orlando Notes #4

Technical Agenda <https://www.share.org/Events/SHARE-Orlando-2024/Technical-Agenda>

06Mar2024 Wednesday

IBM z/OS Container Platform (zOSCP)

by Kershaw Mehta of IBM

zOS CP Announced 05Mar2024 at SHARE

Not zCX (z/OS Container Extensions)

No-charge for 2.5 and 3.1

zOSCP is OCI-compliant containers running native on z/OS

Evolution of Application Deployment

PCs>VMWare-like>Containers - isolate applications from each other

Types of Containers

OS-specific and HW-Architecture and Deployment Option

Windows>x86>Windows Server

Linux>x86 or S390x>

What are Containers?

standard unit of software that packages application code and all required dependencies

Use facilities provided by OS

Why z/OS CP?

Skills consistency - tools and skills are aligned across organization

Container Orchestration using Kubernetes

zOSCP uses Open Source Technologies

Kubernetes, cri-o, RUNC, Podman all ported to IBM Z

Open Container Initiative (OCI) formed under Linux Foundation

How to build and how to run are basic technologies

Kubernetes worker - one STC per LPAR

CRI-O - one STC per LPAR

RUNC is CLI (Command level Interface) tool for spawning and running containers

Workload in container determines whether zIIP is used or not

Podman is Main CLI tool to manage the entire lifecycle of a container

docker compatible (docker runs User ID 0) so Podman is better

Skopeo CLI for container repositories

Umoci is another image build CLI tool, Podman is much richer

Kubernetes control plane orchestrates containers across a cluster of worker nodes (run in Linux on

Z address space)

- appliance zCPA is a z/OS address space

- more than one zCPA for a cluster, odd number is recommended

- cluster is a Sysplex

New Syscalls in z/OS for runtime library

- built Go compiler for z/OS

- 76 calls written in Go

- enhanced existing syscalls & headers

- Linux concepts including namespaces and namespace utilities

- Union and /proc filesystem support - virtual filesystems, data not stored on disk

z/OS Unique technologies

WLM for new Service Class

New UNIXPRIV resource class

Hybrid networking support

Netstat utility updated

advanced Unix System Services

Implementation

7 namespaces in Unix

PID, IPC, UTs, Mount Namespaces implemented on z/OS

No cgroup namespaces because z/OS has WLM

No network namespace because z/OS has DVIPA

No User namespaces because z/OS uses External Security Manager

zOSCP Use Cases

Initially just z/OS Unix applications

Future is CICS, IMS, etc.

System programmers need additional skills and knowledge

GA - March 15, 2024

- later Kubernetes and other parts will be delivered
- order with z/OS 2.5 and 3.1
- install via 35 PTFs - **FIXCAT(IBM.z/OS.ContainerPlatform)**
- pull images from IBM Secure Registry

z/OS Containers Demo part 1 and 2

by Marie Laser Buzzetti and Neil Johnson

25+40+ attendees

z/OS Container Platform

Container Image

software package and dependencies (layers) and runtime configuration information

Build/package image (Podman)

Deploy containers (Podman and kubectl)

Isolated runtime instance

Distribute image (Podman and skopeo; container registries)

Demo continues image lifecycle with CLI tools on z/OS

First use Podman to build and distribute image

Use kubectl to deploy into production kubernetes cluster

z/OS tech in support of z/OS Containers

Union file system, namespaces, DVIPA, WLM

Code, Build, Provision, Deploy, Test

Image Building and testing - skopeo/podman

Copy ibmjava image to enterprise container registry

Pulling ibmjava for use by "normal" users (developers)

IBM images may need special authority to pull

- APF Authorized, Program Control, Shared library

[Image] admin pulls for other users

DVIPA setup

VIPADYNAMIC with ZCONTAINER parameter

Simplifies management of application implementation

For example, different Java release or service level for each application

Deploying with Kubernetes

Kubectl overview

standard command line interface for working with Kubernetes

Communicate with zCPA

Kubectl [command] [resource type] [name] [flags]

Deployment YAML

Describe desired configuration

Annotations section is z/OS specific

Networking: Hybrid (DVIPA)

userid: xxxxxx Run container under this identity (requires security setup)

WLM-qualifier: "SYSWLM_DEFAULT" or other WLM Service Class

node selector

Kubernetes.io/os: zos

NodePort Service

If container gets restarted it may get new IP address via DVIPA

Set a NodePort for Kubernetes to map service to whatever IP is assigned

Sweat the Small Stuff, before it becomes the Big Stuff

By Jerry Street of Intellimagic and Jim Horne of Lowe's Companies, Inc.

Cheryl Watson will be 80 in 2024, Barry Merrill is 83

"Aging is required, maturing is optional"

Types of Performance Analysis (Jim Horne)

OS perspective

RMF, WLM

Business perspective

RMF, SMF

Level of performance analysis using WLM (Jerry Street)

Performance analyst needs to be an interpreter and judge

5 cases of small stuff examples

Case 1 - Address spaces - CPU, I/O, and Elapsed Time (SMF Type 30)

Focus on loved ones, not loudest

Why does it matter?

It costs money, missed SLA (Service Level Agreement)

What we use?

SMF type 30, 42, RMF 72.3

How to perform the analysis ?

Case 2 - transaction rates and CPU per Transaction

Why? Transaction performance may affect business or costing the business

What? SMF 30, 42, 72.3; SMF 100-102 (db2), 110 (CICS), 120 (WebSphere)

How? Transactions impact on business, monitor rates and CPU per transaction, report results

Case 3 - Coupling Facility structures using too much z/OS CPU

Why? Synchronous requests drive GCP user...cost

What? RMF Type 74.4

How? R744SSTM field, CPU used LPAR basis

Case 4 - High Performance Indices

Why? Are service classes applications are meeting their goals?

What? RMF type 72.3

How? Daily PI profiles, long term PI trends, WLM Sampling

set baseline for review

I/O priority management should be turned off which is default

Case 5 - CPU usage (GCP and zIIP)

Why? Cost, application performance

What? RMF type 70.1 and 72.3

How? Use WLM Report classes, watch trends

Wrap-up

Exploring Future Directions for AI on IBM Z

By Andrew Sica of IBM
No handout

IBM z16 Integrated Accelerator for AI

Faster transactional workload
Scaling up to process all transactions instead of sampling

AI Evolving landscape

Ensemble AI intersection between traditional and foundation models
Traditional AI with Machine Learning and Deep Learning
Foundation models with generative AI models and non-generative models as well
New product synthesis, chatbot, design tasks, writing tasks
Ensemble - Anti-money laundering and Fraud detection, Know Your Customer research
training is computer-intensive then add subset of data for specific situations

Foundation Models

Trained on wide range of data Large Language Models (LLM)
generalize, wide abilities, self-supervised learning of unstructured data
Self-supervised learning
Unlabeled data and generates labels and input data
Trains with vast and heavy compute resources
Fine-tune to specific task
smaller task specialized data
transformer architecture
Long short-term memory models
issues with FM
Artificial intelligence hallucinations
Model generates nonsensical content
Lacks context to understand the prompt
Bias
Gender, race, etc. bias is output, such as associating certain occupation with a specific gender
Explainability
Complex, essentially black boxes
Where XAI is needed, this can block use
RAG models

IBM research

Using HuggingFace Open source
Ported to IBM Z
Beta coming
Encoder models which are smaller
PyTorch enhancements to clone to ONNX

z/OS work

Watsonx including .ai, .data, and .governance
Select>Tune>Infer>govern>Build
Synthetic-generated sets of data for proof of concepts
AI Solution Templates
AI at scale, AI Ecosystem and AI offerings, AI agility, others
MLz Q4 - trusted AI and explainable
Making these tools Telum-native

Secure Your Data Sets the Catalog Way!

By Frank McCune on IBM

SAF Systems Authorization Facility

Catalog makes lots of SAF calls for data set access
 RACF Generic and Discrete Profiles in DATASET Class
 Generic profiles require refreshing
 Recommend Catalog protected by Generic profile
 Discrete profiles are effective immediately
 Uncataloged data sets are volser sensitive

Levels of Auth

NONE, READ, UPDATE, CONTROL, ALTER

Catalog Administrator

In SMS, catalog is part of data set identify (must be cataloged)

Functions and Required Authority

DEFINE, DELETE, ALTER may require level of access to Catalog, Data Set, or both

Protecting Sequential, VSAM Clusters, others

Authority access to Master, User catalog for certain actions

FACILITY Class

IGG.CATLOCK protects ability to LOCK/SUSPEND and UNLOCK/RESUME a user catalog - require for catalog maintenance

STGADMIN Class

STGADMIN.IGG.... Profiles

Protecting Catalog Contents

Protecting existence of data set

LISTCAT, PRINT, EXPORT, DCOLLECT security controls

MLS Name-Hiding (Multi-Level Security)

In certain settings, security error message include data set name

Be sure restrictions in place to prevent error message

ERASE

RACF option is a DASD hardware function to overwrite data over deleted file

Protecting Catalog Commands

OPERCMD5 MVS.STC.MODIFY.CATALOG.CATALOG.SECURE

REPRO MERGECAT - no longer needs ALTER to data set itself

OA36138 delete non-VSAM data set flagged with rename-in-progress

STGADMIN.IGG.DELETE.RENAME

OA47269 and OA50118 DS Alias/Path/AIX changes

RACF XFACILIT STGADMIN class new in z/OS 2.4

DELETE Authorization changes

Look at Changes in z/OS 3.1 Change Tracker

By Chris Taylor of 21CS and Scott Marcella of IBM

Errors in setup and configuration can be stressful, damage customers or reputation

Change Tracker watches setup and configuration libraries

Auto-saves earlier parameters so recovery can be done quickly

Important because of Regulations around the world

IBM z/OS Batch Resiliency (IZBR)

How does CT manage your environment?

Resource monitoring for identified

Currently z/OS data sets only, zOS Unix support coming

Architecture: Started Tasks

z/OS 2.5 DFSMS exits changed-IGGPREF00,

IGG_STOW_START ,IFG_OPEN_START ,IFG_CLOSE_START

STC for CT for every system in Sysplex

Change and view monitor resources still controlled by SAF (External Security manager)

Emergency override mechanism? Shutdown CT STC if required, but changes are recorded when CT STC comes back up

Member backup is not using PDS Member generation function
z/OSMF Security Configuration Assistant to confirm CT setup

z/OSMF CT plug-in

Identify PDS data sets to be monitored

CT Administrator tool

Audit function has detailed log of actions, view by member or data set level

Backups stored in VSAM KSDS in proprietary format

Recovery

members backed up, easily recovered

IBM z/OS Unix Support

Directories and files are a planned goal

Directory level protection and all files monitored

PH56939 adds compare resources feature for CT

Snapshots coming for data sets from single file to entire volume

Shipped as priced element of z/OS 2.5 and 3.1 with workflows to implement

z/OSMF Guild Community: Advantages, Obstacles, Importance

Hiren Shah is z/OSMF Architect

Survey shows this guild is most effective source for z/OSMF users

Hosting since end of 2021

z/OSMF badge: z/OS Installation Using z/OSMF

<https://ibm.biz/zOSMFInstallBadge>

07Mar2024 Thursday

IBM SMF Explorer

By Alexander Giemsa of IBM

Access SMF records in modern programming language

Making data processing transparent

No z/OS skill needed to access and process data

Quick prototyping

ISE is framework for SMF data access using Python

Fetches pre-processed SMF data into panda dataframes

SMF Explorer Components

Raw Data

Data pre-processing - scale, simplify, make meaningful

SMF99-sp-putype - raw is 5, SE is zIIP

Virtual Fields

ex. - Trans per second computed from 2 SMF data fields

Samples

Group similar data fields

SMF99 - processor utilization

Plug-in could be from last three components

Why Python?

Popular, easy to learn and code readability, highly extensible and large standard library, packages for data analytics and machine learning, write code in fewer lines than other languages

Why Jupyter Notebooks?

- Web-based interactive development environment
- Easy entry point into IBM SMF Explorer
- Well established in data Science World
- Standardized format

Public GitHub Repository

- Notebooks and Setup Scripts
- GitHub.com/IBM/IBM-SMF-Explorer
- Open source

Architecture

- z/OS Host
 - Java runtime
 - SMF>Data Gatherer>Data Gatherer REST services[z/OSMF]>[off platform]
- Python Runtime
 - WLM plug-in RMF Plugin other plugins IBM SMF Explorer
 - [optional] Jupyter Lab/Hub>Notebooks

Demo

- ZTrial is available, IBM Z Topics, GitHub repository
- Limited by z/OSMF REST services 70-79, 113, 99 subtypes, 30 (all subtypes)
 - OA64270 for SMF30
- Python and Jupyter in zCX or z/OS Unix
- SMF data in tabular format
- Data filtering and sorting
- Multi-data access
- In-place documentation
- Utilities
- IBM z/OS Academy for early tenure sysprogs (2-10 years)

WSC System Programmer Hot Topics

by Meral Temel of IBM WSC

- IBM z/OS Community subscription to see Quarterly announcements
- z/OS Continuous Delivery smooths migration to release or version
- IBM z/OS Container Platform (zOSCP) 06Mar2024 announcement
- Statement of Directions (SOD)
 - Dashboard for Resiliency coming (Aug 2023 SOD)
- GitHub for Presentations (one of answer to less Redbooks)
- Weekly emails <https://www.ibm.com/support/entry/portal/support>
- My Notifications subscriptions for various HW and SW
- IBM Z Content Solutions Center ibm.com/support/z-content-solutions/
- Coexistence N-2 for SW and HW
- CF [Coupling Facility] 25 for z16 - see IBM z16 PR/SM Planning Guide
- Z16 enhanced System Recovery boost support
- z16 HW publications in ResourceLink has moved to IBM documentation website
- HMC Management: LPAR User Error Protection
 - Restrict user authority over each LPAR to reduce accidental interruptions
- IBM z16 Upgrade Recommendation
- zPCR Topology Window to view CPU - free tool
- IBM zSystems Functional Matrix

z/OS 3.1 Upgrade
 z/OS 3.1 Portable Software Instance (ServerPac)
 z/OS 3.1 Dedicated Memory - don't need >4TB to implement if needed
 AI framework for z/OS 3.1
 AI Base Component AIB
 AI System Services for z/OS
 z/OS 3.1 WLM Policy Advisor

Best practices

Failure Avoidance
 Avoid Single Point of Failure (HW, SW, Human Resources)
 Detect Earlier/Prediction
 Faster Recovery from Failure
 Enough resources to reduce Time to Recover
 Fast troubleshooting
 Capabilities for faster recovery
 Parameter Settings in PARMLIB
 Data Center and Site and Facility Related
 Setup Required Capabilities
 Performance Related
 IT Process related
 Architectural
 Inappropriate Health Checker Policy
 Don't disable HCs
 Use MIGRxxxx HCs
 Fast Resiliency
 SRB, ARM, SFM...
 Mean Time to Recovery (MTTR)
 Reduce IPL time - use SRB, start subsystems in parallel
 CF response time awareness

Managing Resources in JES2

By Tom Wasik of IBM

JES2 Monitor Tracking of Resources

\$JD Details(resources) reset automatically at top of the hour
 \$JD history(Bert) for example
 SMF 1153 for historic usage
 Display SPOOL (TGS), JOEs, and BERTs
 What is a BERT?
 Block Extension Reuse Table
 Variable size extensions used get store data in the CKPT
 Each extension section is called a BERTIE
 How many BERTs do I need? As many as you need, **Don't Run Out of BERTs**
 \$D CKPTSPACE,BERTIES or ,BERTUSE
 \$D LIMITS(resource) and ,MASVIEW
 Top ten users, current consumers
 JES2 3.1 Now tracking this information
 Counts by owning job

Initialization data set checker resource report

Bottom of report has summary of usage and Recommendations
 In 3.1, use Job Resource Group to track resource usage
 \$ADD RESGROUP and Init statement as well

- Job can only be in one resource group, defined before job is run
- Use JES2 Policy to assign job to resgroup
- \$D RDG and SDSF JRG
- \$HASP050 resource shortage reporting when WARN level is exceeded
- \$HASP055 resource shortage resolved
- Preventive Failure Analysis (PFA)
 - PFA_JES2_RESOURCE_EXHAUSTION
- Run Time Diagnostics (RTD)
 - F ZHR,ANALYZE
 - Shows JES2 resources
- In 3.1, Job Resource Limits
 - Limit runaway jobs TGs (SPOOL) and JOEs
 - Reach limit causes job to WAIT by default
 - At limit \$ command to RAISELIMITs for that JOB
 - Limit for a job assigned at conversion
 - Policies can be set in several places before job starts
- Privileged Space
 - See handout for details
- Emergency Subsystem (not a separate JES)

Cheryl and Her “Boy’s” Lukewarm Flashes

By Mario Bezzi and Frank Kyne of Watson and Walker

COBOL compiler currency (see slide 4)

- 2015 compiler rewrite, new release for each Z update for exploitation
- 2022 COBOL 6.4

COBOL 6.4 Java interoperability

- CALL ‘Java...’ USING n, n1, ...

Choose carefully when to use Java, transaction work can result in multiple units of work so resource coordinator needed to be sure work completes together

- Get latest service to improve this situation

IBM watsonx Code Assistant for Z

- pick and choose what to “modernize”

- Not lift-and-shift, identify in “understand” phase and refactored being before conversion

- Still need humans

Java currency on z/OS (see slide 12)

- Semeru 11 (OpenJDK Sept.2018, IBM G.A. Nov. 2021) z/OS 3.1 required

- Semeru 17 (OpenJDK Set. 2021, IBM G.A. Aug. 2023)

- OA65426 - Java zIIP usage and SMF 70.1

- OA65055 - Java zIIP usage and SMF 30

z/OS Container Platform (zOSCP)

- GA March 15, 2024 Kubernetes Orchestration coming later via PTF(s)

z/OS Cloud Data Access (CDA)

- z/OS application does not know where data came from and stored

- GDKUTIL to move data between Z and Cloud

zPCR and Modeling

- Virtual Low CPs and zIIPs

- Too many means high overhead to manage VL CPs and zIIPs

- Avoid VL CP and zIIPs

IBM zPCR Experiences

- Download for free and CP3KEXTR too

- Include SMF70 and 113 for EDF files for zPCR processing

- Use only data from important systems, not all systems
- Remove Parked LCPs is recommended
- Use to model LPAR configuration changes

zPCR Estimates of CF Capability

- Don't use CP numbers for CF sizing

CF Tips

- Keep microcode up to date, may improve performance
- D CF to watch switch to new level which happens when updated

Cheryl Watson is 80 with 60 years in Mainframe

- 33 year of Tuning Letter with last 10 written by Frank Kyne

Bit Bucket x'43'

By Mike Shorkend, Lionel Dyck, Henri Kuiper, Ed Jaffe

SHARE Requirements - Please

By Mike Shorkend
Share.org>Connect>Advocacy and Requirements

DSFS (data set file system)

By Lionel Dyck
ISPF interface for DSADM command for DSFS
Written in Rexx
Github.com/lbdyck/dsfsadm

Fork your own copy and make changes and post back to github where Lionel can review and approve

CBT tape file 312 - send updates to Lionel e-mail

System Z Enthusiasts on Discord by LD**bonus - github.com/lbdyck/prompters By LD**

get gum from GitHub.com/zOSOpenTools

New Function APARs URL by LD**Doing (some) "Stupid" things**

\$SYSSYMR/A and Dynamic Symbols "magic"
In -s "\$SYSSYMA/u/ibmuser/otownbb43/l-&HHMMSS." |
Unexpected results

What better for reading dataset in Python? ZOAUTIL or DSFS

DSFS is 53% faster than ZOAUTIL

Bob Shannon (1948-2023) - SHARE Icon and Co-Founder of Bit Bucket

By Ed Jaffe
SHARE volunteer history lost, deleted
Aron Eisenpress had old paper SHARE Interactions that helped reclaim BS history
Founded SHARE Hands-on-Lab and led to SHARE LPAR at IBM POK
Changed MVS Tech Steering to Singing and Drinking Society, now IBM Closed...