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GSE UK Conference 2019
Dock into the Dark Side

IBM Z-Monitoring the modern mainframe and API economy

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IBM UK Ltd

November 2019
Session OD

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Session Objectives

- Changes in how enterprises manage their IT operations are driving changes in how service management is provisioned and utilized. From new workloads based on Java, to the ability to track performance end-to- end across a hybrid cloud including the mainframe, the requirements for a monitoring solution are evolving.
- Recent updates to the OMEGAMON family includes features to monitor the latest levels of z/OS, storage infrastructure and major subsystems delivering innovative user experience updates with improved deployment processes.
- Updated monitoring for z/OS Connect EE give you more insight than ever before into API performance on z/OS
- Learn about these updates for proactively monitoring key z/OS-based workloads.

Topics

- Digital Transformation
- IBM Z Monitoring
  - IBM OMEGAMON monitoring
  - Recent Updates
- OMEGAMON for JVM API Monitor
- Future Plans
  - What Zowe Means for Monitoring
- Final Questions

72% of disruption comes from innovative industry incumbents

IBM Institute for Business Value survey

IBM Z powers 72% of customer facing apps, but organizational challenges limit ability to support

Forrester

$1.2– $2.5B annual spend on unplanned app downtime

Gartner

56% of customers have no succession plan for IBM Z skills

Forrester

The cost of an outage

14% of outages cost > $5M per hour

33% of outages cost > $1M per hour

Single incidents can cost > $100M

Regulatory fines can cost > $70M

Customer Challenges

Need to Manage Multicloud Environments Fueled by IBM Z

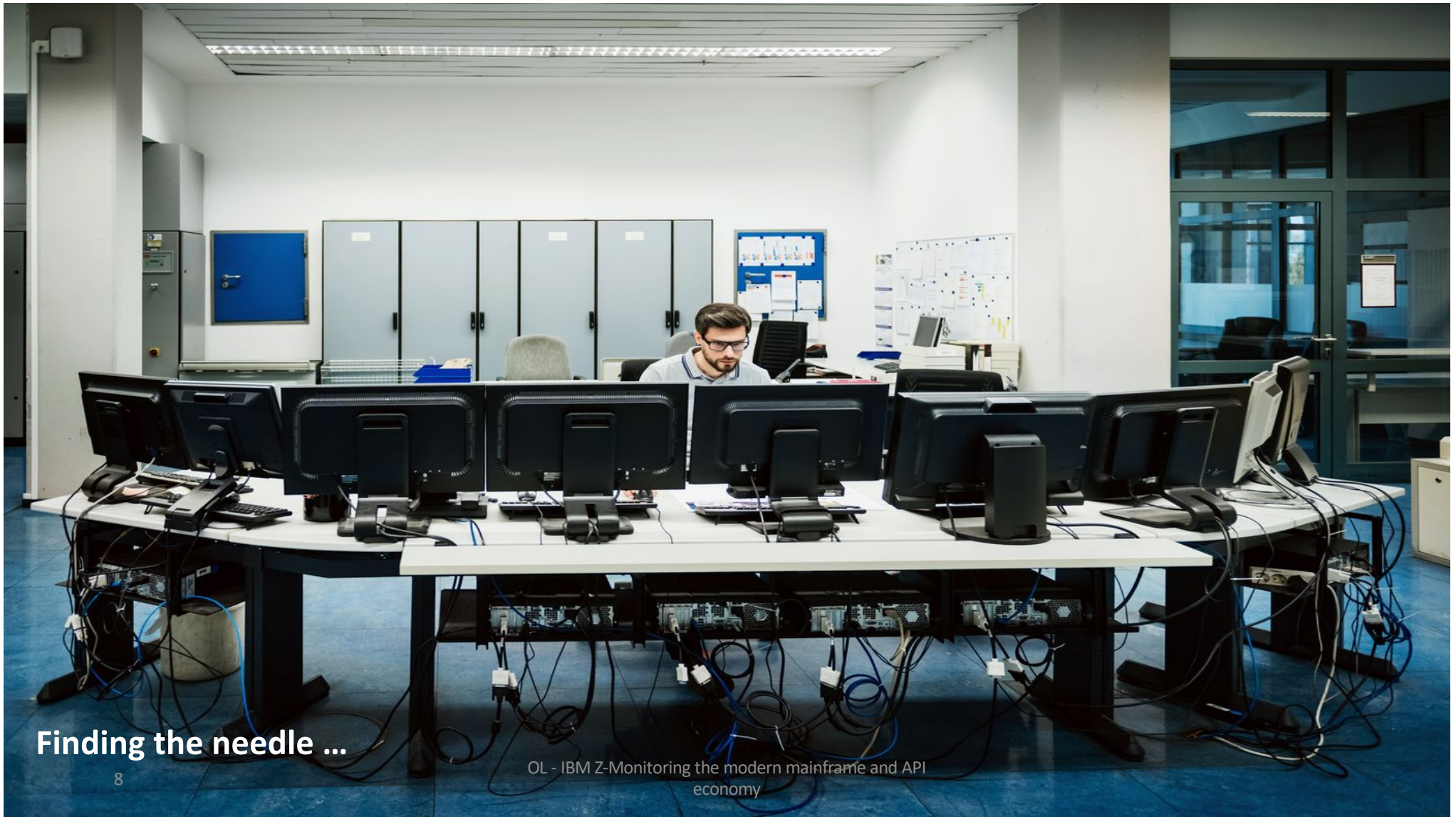
- Connected Monitoring Solution
- Single Source of Information
- Single Point of Control
- Day 1 subsystem support for rapid deployment

Need Integrated Views of Subsystems

- Avert problems before impact
- Quickly establish root cause
- 360-degree view across subsystems
- Avoid Costly outages
- Eliminate War rooms

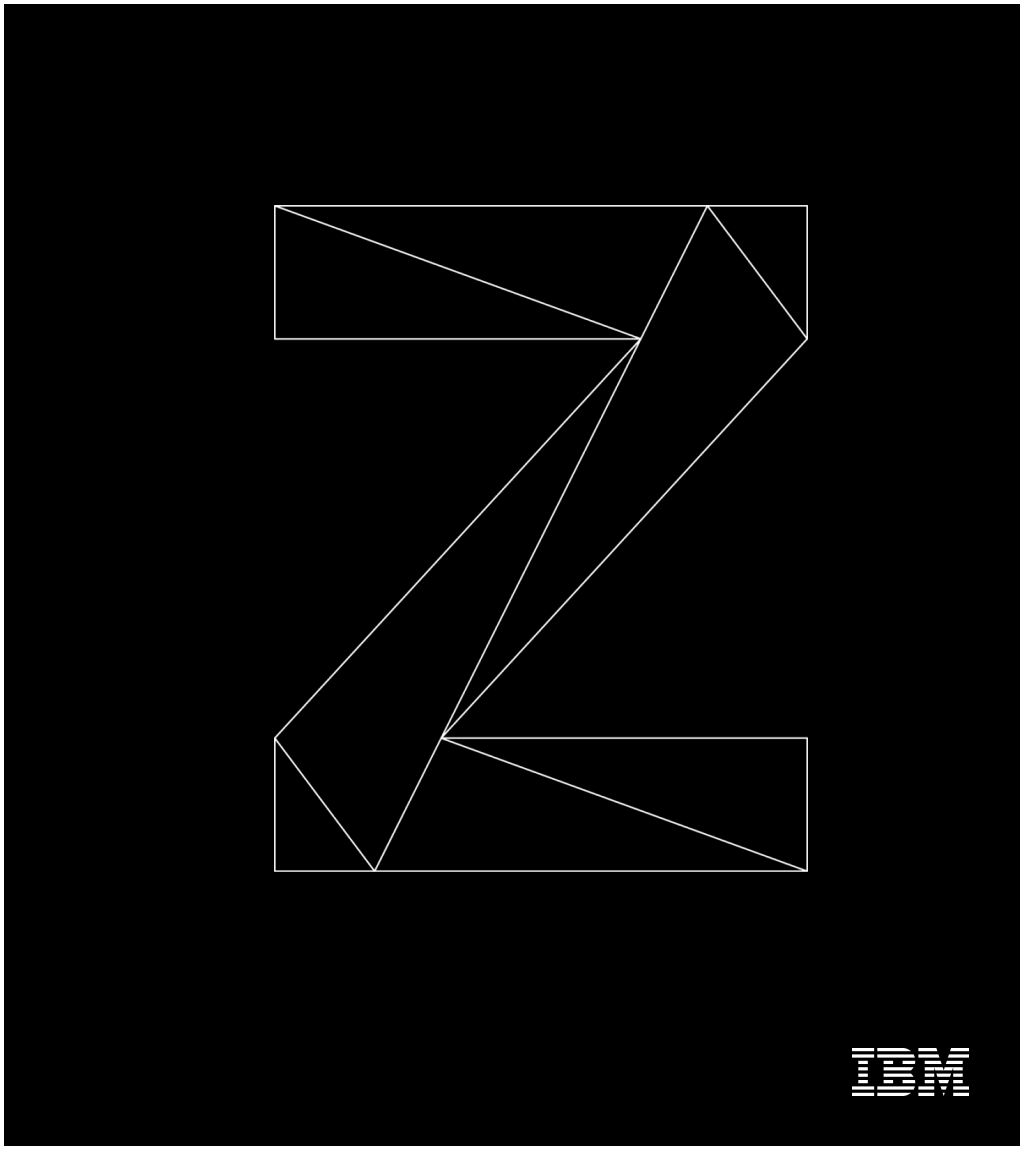
Need to Simplify and Integrate Through Open Access

- Foster Generational shift with familiar, open access
- Simple for New talent
- Capture Z system and tribal knowledge
- Right view for the right workstream

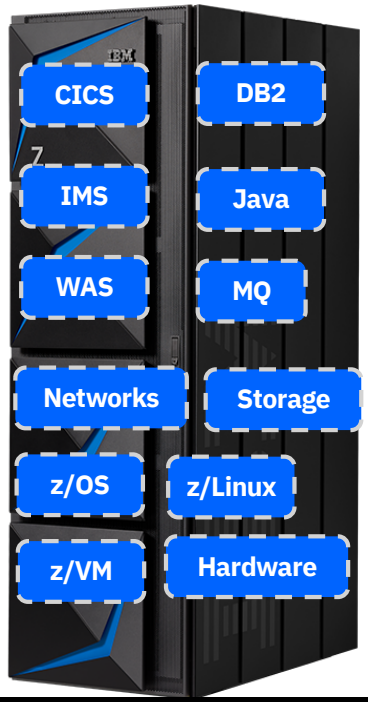


Finding the needle …

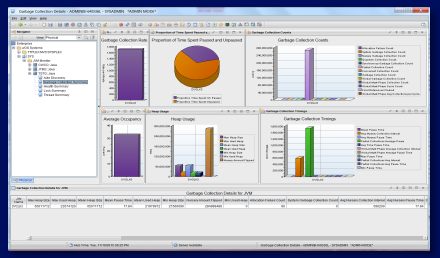
IBM Z Monitoring



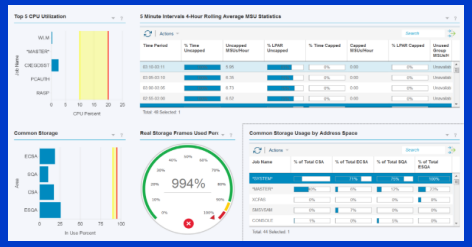
IBM Z Monitoring



Management View of Z Performance & Availability for Hybrid Cloud

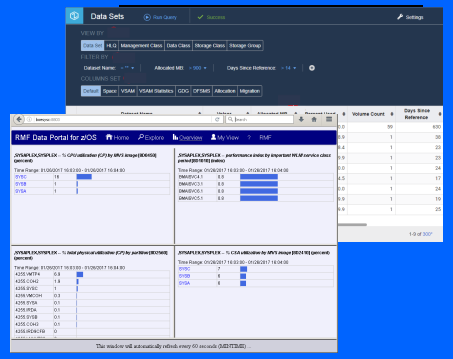


Operator Diagnostic Dashboards



Zowe Conformant
APP FRAMEWORK - 2019

Expert Deep Dive Domain Views & Tools

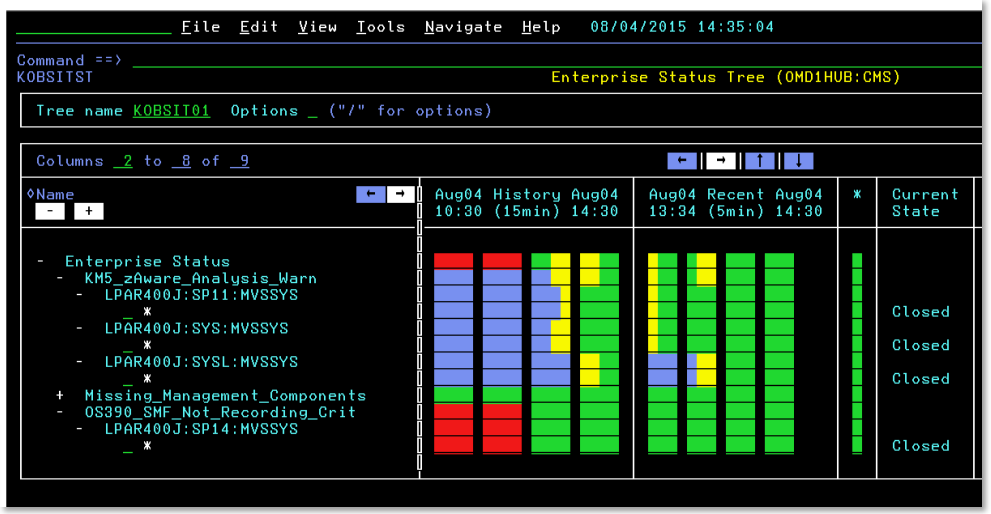


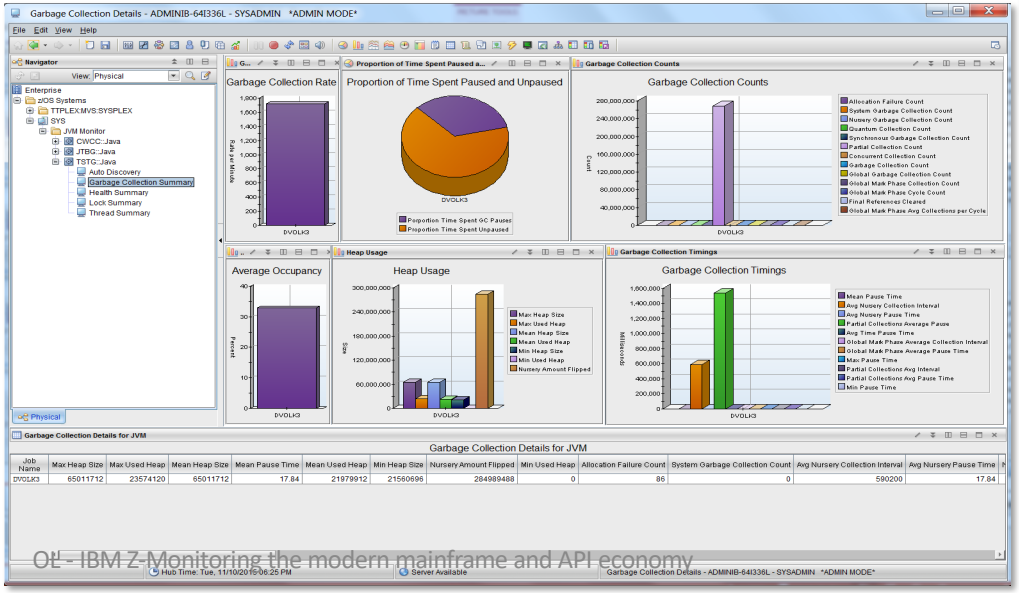
Intelligent Alerts Automated Actions Custom Views Historical Data
Expert Advice Automation and Scheduling Links

IBM OMEGAMON for mainframe management

The IBM OMEGAMON family provides a **comprehensive performance and availability** solution for **monitoring**, **analyzing**, and **managing** mainframe operating systems, databases and other environments

IBM OMEGAMONs will assist in **detecting bottlenecks** and other **potential problems**, identifying the **root cause**, and **proactively resolving** performance issues





Key capability

- **Comprehensive management** for z/OS, Storage, Network, Java, CICS, IMS, DB2, MQ
- Powerful **GUI & 3270 user interfaces** provide a “single pane of glass” comprehensive enterprise view
- Proactive monitoring of key resources and **alerting of anomalies** using Situations
- **Built-in best practices** based on problem-solving scenarios streamline problem resolution
- **High performance and low overhead** designed to have minimal impact on the subsystems being monitored

Who uses OMEGAMON?

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Primary Users: Systems Programmers / Administrators and Operators

- Responsible for keeping business-critical systems online
- Respond to alerts where problems are detected and system performance may be affected
- Need access to system information fast
- Require access to systems to take corrective action where needed
- Looking to increase the degree of automation for systems management

Secondary Users: Junior Operators / Developers / LoB / ...

- Need to be alerted to system performance problems
- Triage alerts and isolate problems
- Able to fix simple issues
- Understand impact of application changes to systems
- View performance reports on application performance and trending

Core OMEGAMON Features

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All OMEGAMON agents provide the following capabilities:

Situations

Situations describe a condition or set of conditions you want to examine to determine if a potential problem exists in the systems and resources you are monitoring and will notify operations

Enables proactive monitoring, and ability to take reflexive actions (including integration with SA on z/OS)

Each OMEGAMON provides their own “out-of-the-box” Situations to start monitoring with, and are fully customizable

Historical Data

Historical data refers to snapshots of the current system details that are collected regularly and stored for potential problem investigation.

Historical data can also be used to generate reports about performance and tracking of SLA goals

Data is normally collected and stored locally on z/OS before being warehoused after 24 hours

Integrated UI

There are multiple User Interfaces that focus on the skill level and requirements of the end user.

Data collected from all OMEGAMON agents are available on these UIs and cross-product linkage

Workspaces are fully customizable

Access to data can be limited to certain systems or subsystem types through SAF settings.

Faster problem resolution with *Situations*

- What are they?
- *Situations* describe a condition or set of conditions you want to examine to determine if a potential problem exists in the systems and resources you are monitoring and will notify operations

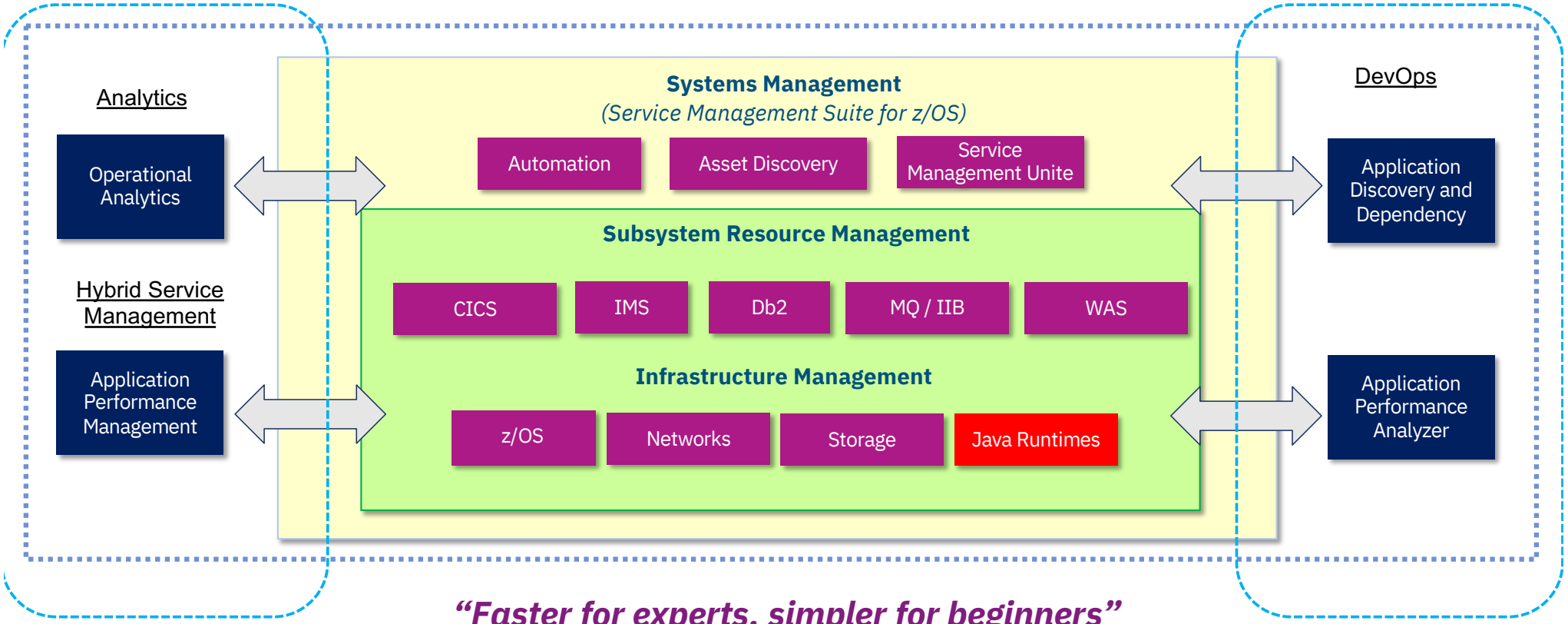
Why use them?

- Proactively monitor the performance of your system
- You pick which metrics to monitor out of many hundreds to use and on which systems to run
- Resolve problems automatically using Take Action (reflex automation)
- Provide customized expert advice

Situations provide continuous observation of your systems!

IBM Z IT Service Management Family

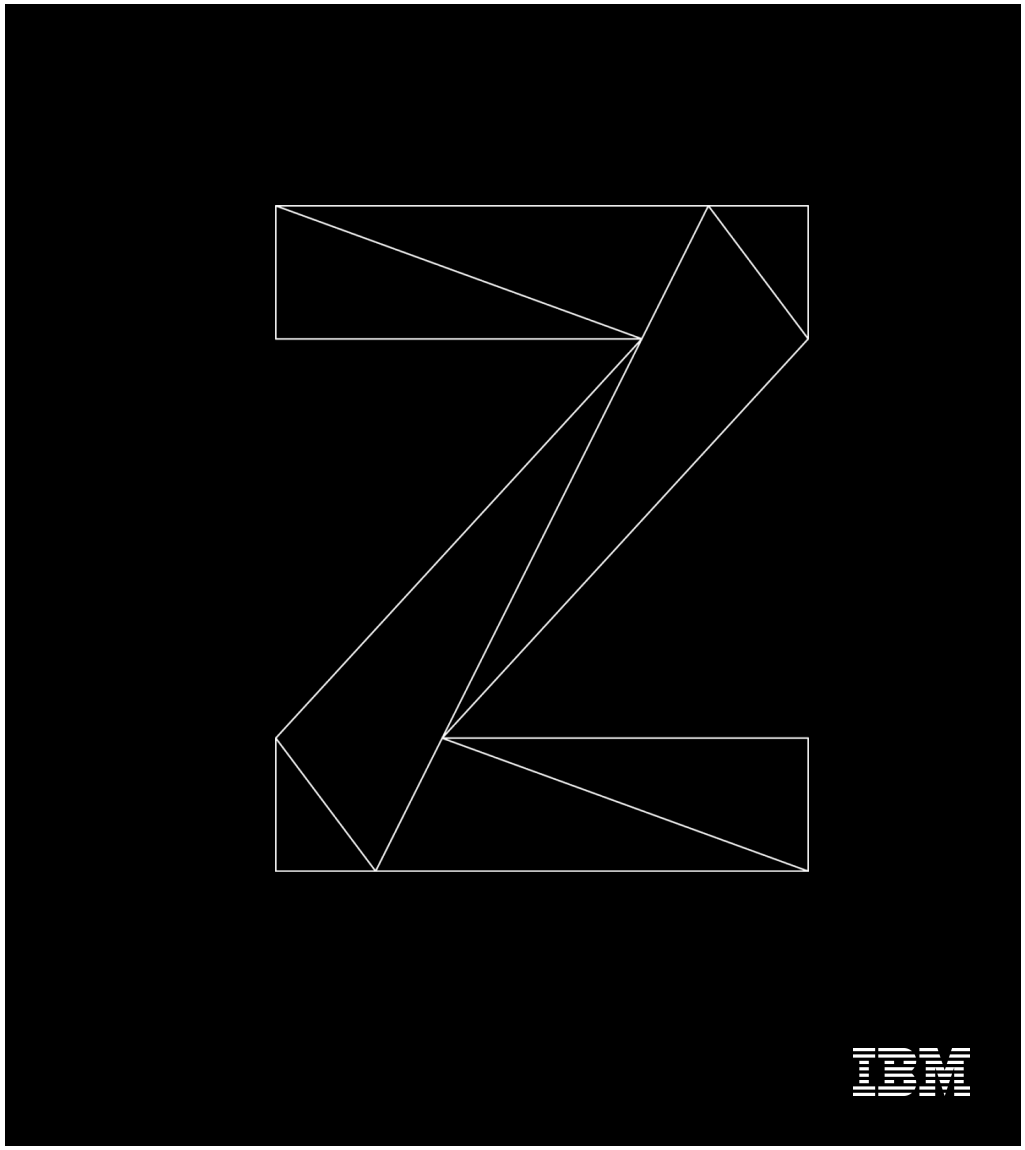
The OMEGAMON family integrates into a broad portfolio of IBM Products



"Faster for experts, simpler for beginners"

OMEGAMON Overview

Recent Updates



OMEGAMON Family – Currency updates

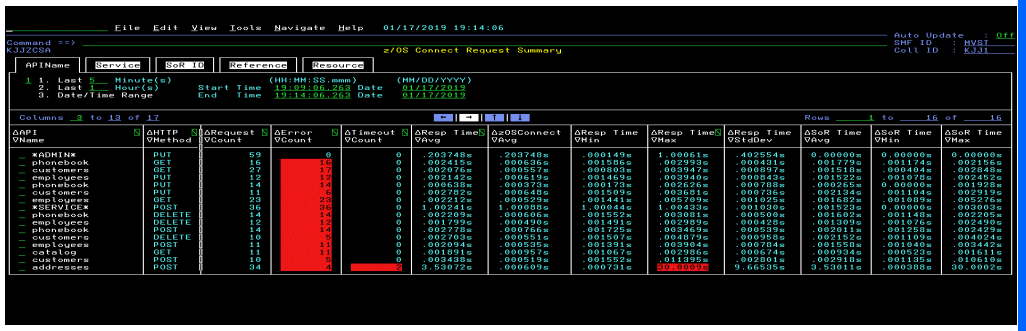
- **Monitoring support for z15**
- **Support for z/OS V2.4**
- **Support for new Storage Hardware (DS8990F)**
- **Reduce risk of undetected blind spots within monitoring environment as you roll out updates**
- **OMEGAMONs are usually engaged in Early Support programs to support the various domains**

OL - IBM Z-Monitoring the modern mainframe and API economy

IBM OMEGAMON for JVM on z/OS

Extended z/OS Connect Request Details

- **APAR OA56263#**
  - Records **every** request
  - Response Time breakdown
  - Extended service provider metrics



11 new workspaces

5 Summary Workspaces in a tabbed pane

- Total response time
- z/OS Connect time
- SoR Time

- System of Record (SoR) information
- Service name and type
- Target Application (SoR ID)
- Target transaction/program (SoR Resource)
- Service connector ID (SoR Reference)

 # Requires z/OS Connect 3.0.20 or later

Try today for free with zero install via IBM Z Trial → ***ibm.biz/omegJVMZTrial***

Sessions this week

- **Monitoring Java and z/OS Connect EE API workloads-Discover-Alert-Optimize**

Code: (OL)
Presenter: Ashok Mahay
Stream: System Automation, Monitoring and Analytics
Room: Magny Cours
Day: Wednesday
Time: 16:30 - 17:30

- **z/OS Connect EE performance and workload management considerations**

Code: (GP)
Presenter: Nigel Williams
Stream: CICS
Room: Hungaroring
Day: Thursday
Time: 13:00 - 14:00

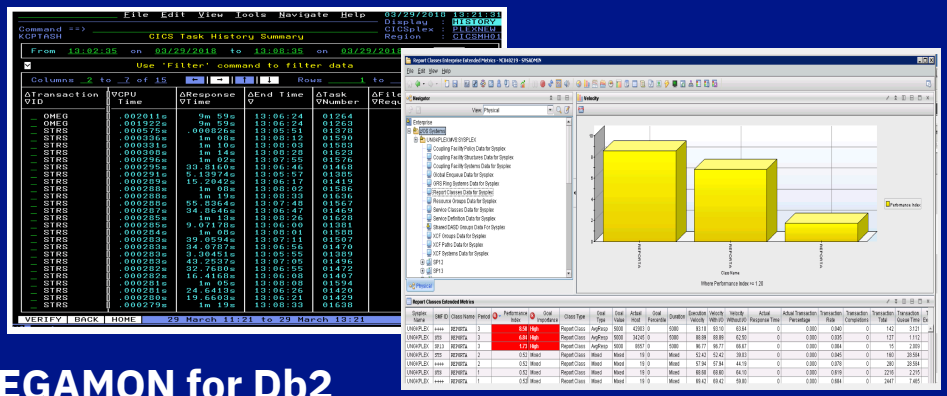
Other OMEGAMON Updates

OMEGAMON framework

- APAR OA57133 provides Support for Passphrase and Multi-Factor Authentication (MFA) - both the OMEGAMON Classic and Enhanced 3270UI.
- OA55918: ENGINE MEMORY REWRITE (EMR) - 31-bit memory management was changed to use memory more efficiently (CPU improvements).
- OA56925: Enhanced 3270UI Multi-tenancy support (e3270UI)

OMEGAMON for z/OS – FP4

- New Enterprise Central Processing Complex Overview workspaces
- Updated Sysplex Level Overview workspace
- New WLM Service and Report Class Extended Metrics workspaces
- New workspace to display RMF historical data



OMEGAMON for Db2

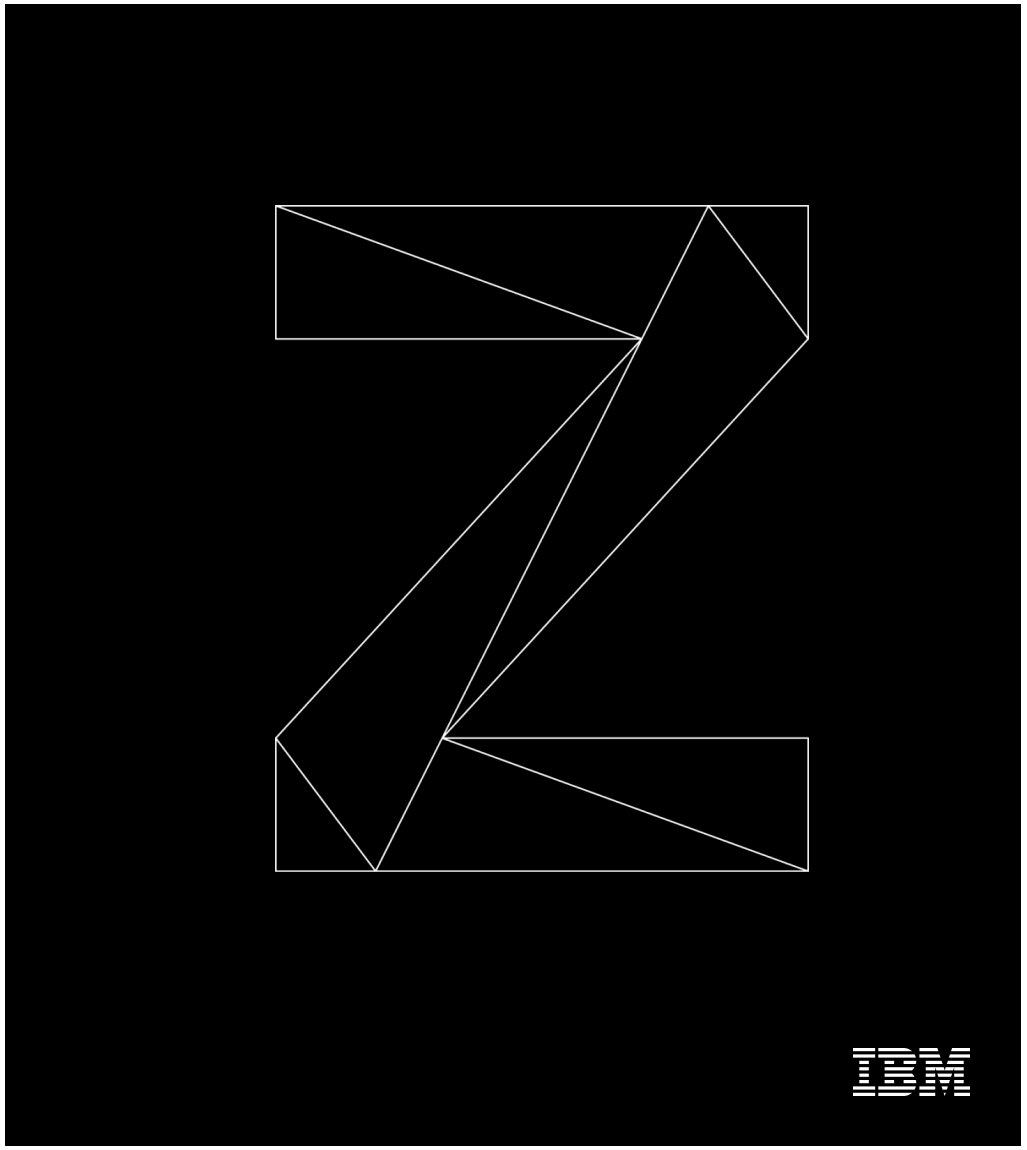
- Support CICS TS 6.1
- Add Buffer Pool Data to Enhanced 3270 UI Thread Detail

OMEGAMON for Storage

- OA57903: Realtime Dataset Metrics Export Enhancement.
  - Updated Zowe level that was/is incorporated into OM Storage, to then-current level.
  - Export from RDM Viewer to spreadsheet

Monitoring the API Economy

OMEGAMON for JVM – API monitor



We are living through an API Revolution!

Your mainframe System of Record doesn’t need to be a cost center

Developers are the new customers of mainframe assets

Leverage key assets stored on the Open Mainframe

Avoid blind spots as you embrace the API economy

Identify changes in workload performance

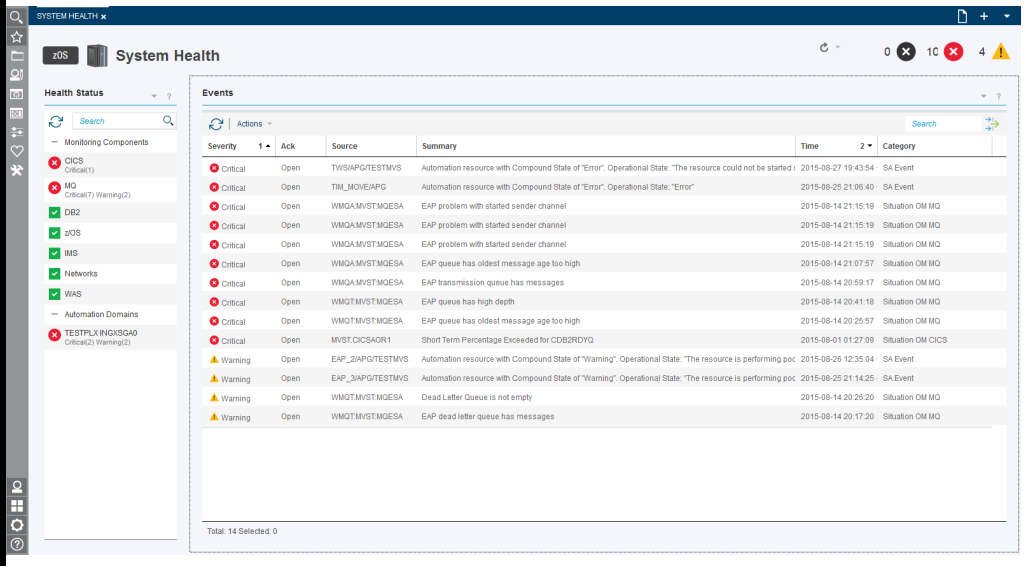
Monitor response time and throughput

Proactive alerting

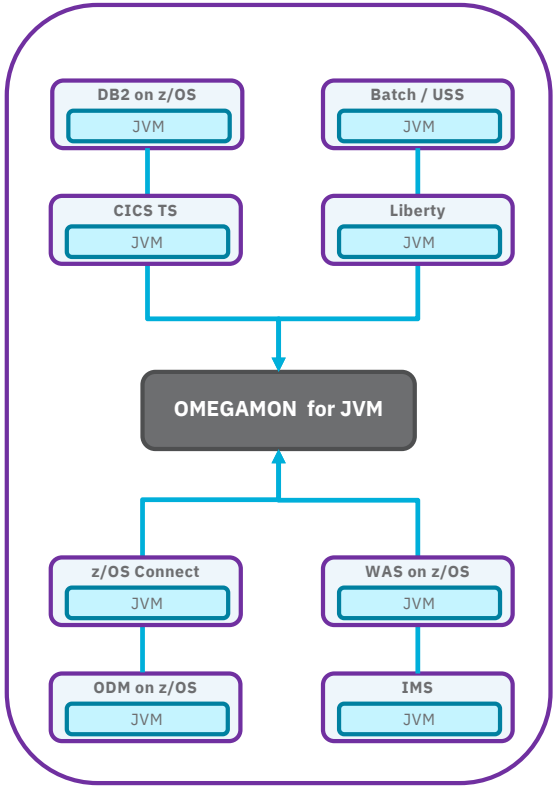
Identify API Response Time

Understand if the infrastructure is able to handle current workloads

z/OS Connect EE performance



IBM OMEGAMON for JVM on z/OS



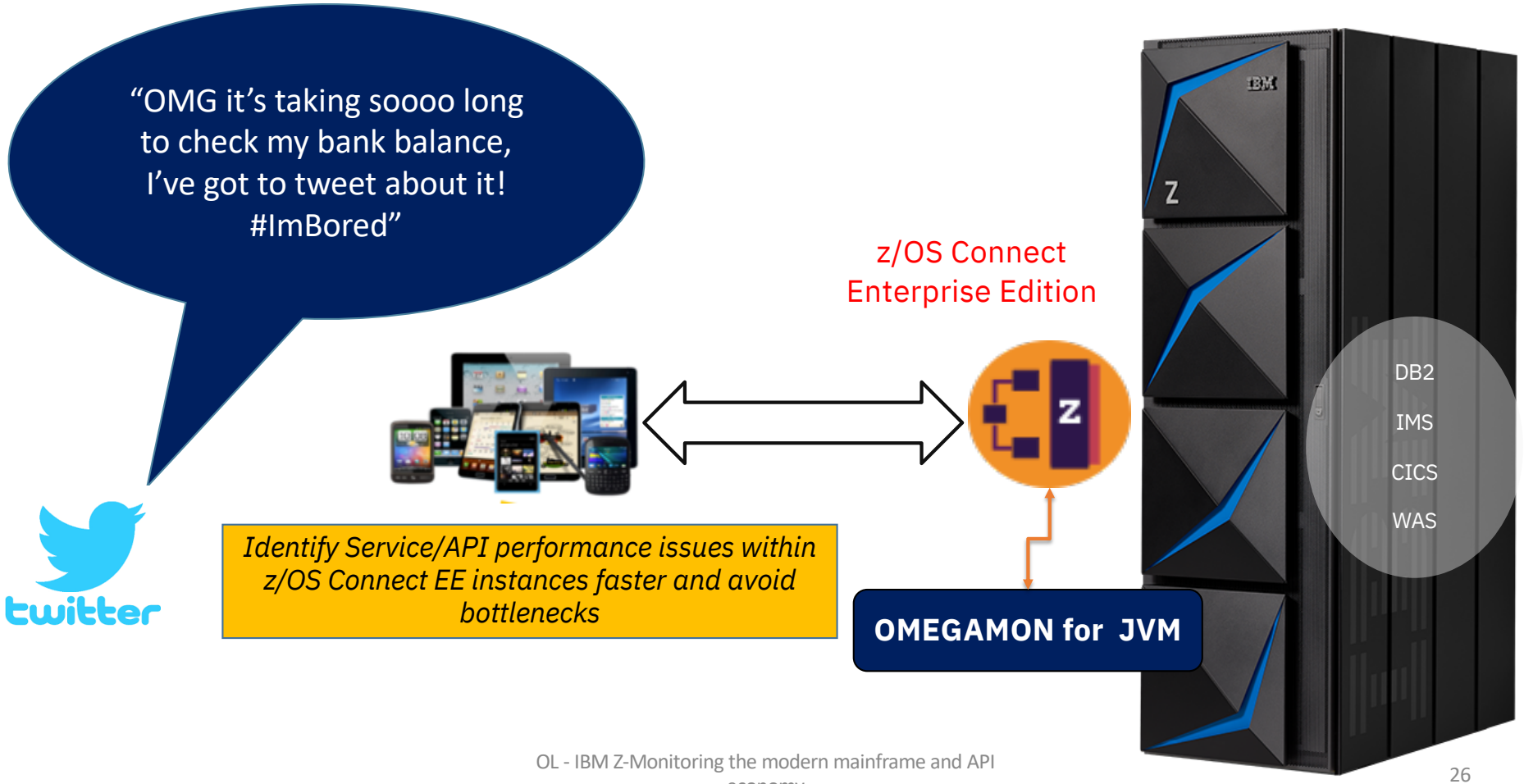
Reduce Blind Spots by Monitoring Java Runtimes on z/OS

IBM OMEGAMON

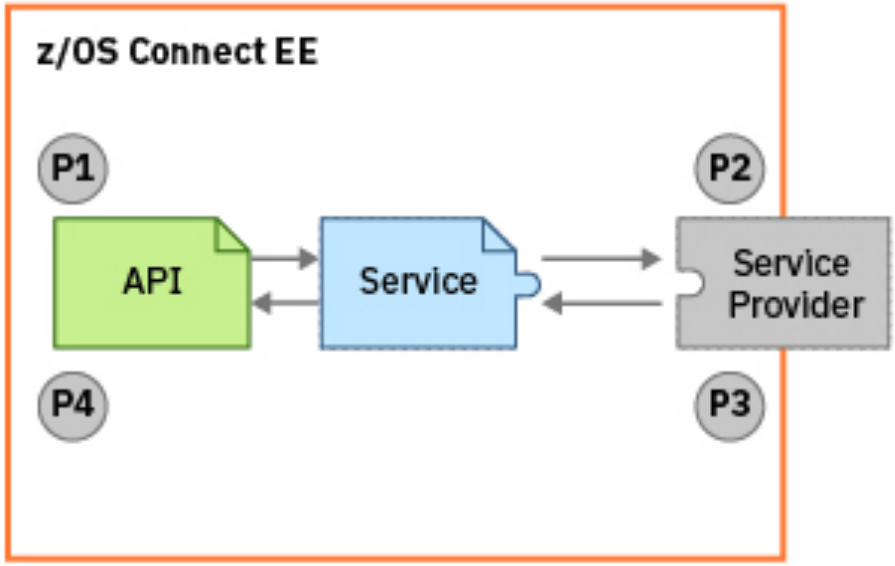
Resource level monitoring of *all* Java Virtual Machines (JVMs) on z/OS

- **Auto-discover** all JVMs
- **Lightweight overhead data collection (no instrumentation)**
- **Valuable overview of KPIs that affect z/OS users specifically (zIIPs, Native)**
- Identify **problematic thread and locking issues**, sub-optimal JVM **garbage collection performance**, looping thread and **CPU performance issues**
- **View all JVMs side-by-side**
- **API monitoring of z/OS Connect Enterprise Edition**

Scenario: Slow API reports are coming in

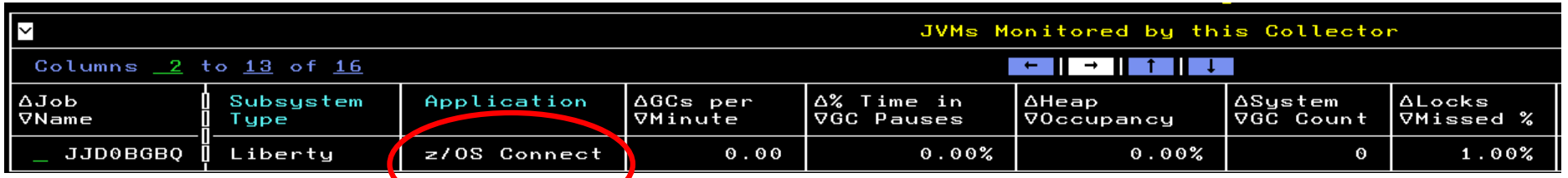


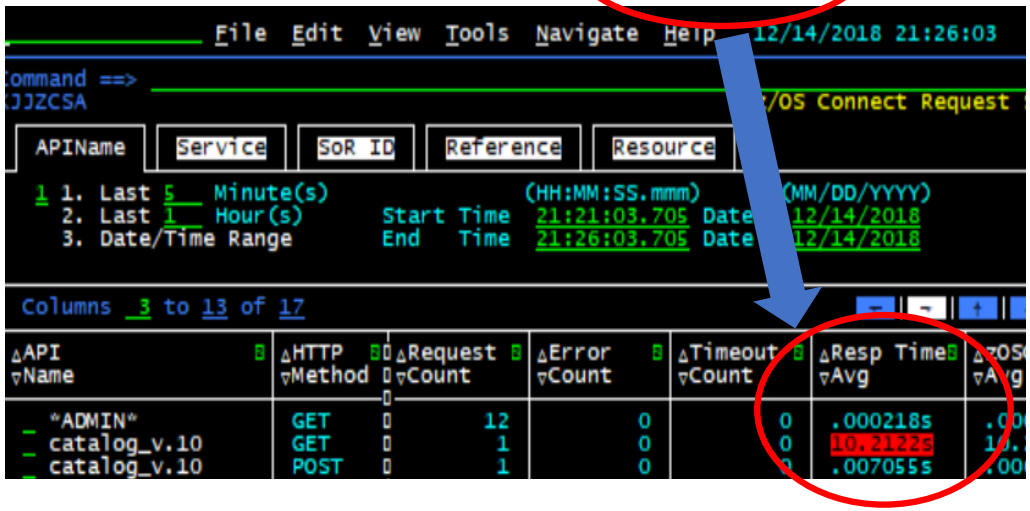
zCEE v3.0.18 introduced additional data points for interceptors



P1 - captures information about the request as it comes into z/OS Connect to be processed
P2 - captures information about the request just before it is sent to the System of Record
P3 - captures information about the response from the System of Record
P4 - captures information about the response before it is sent to the client

Scenario: Slow API Response Time

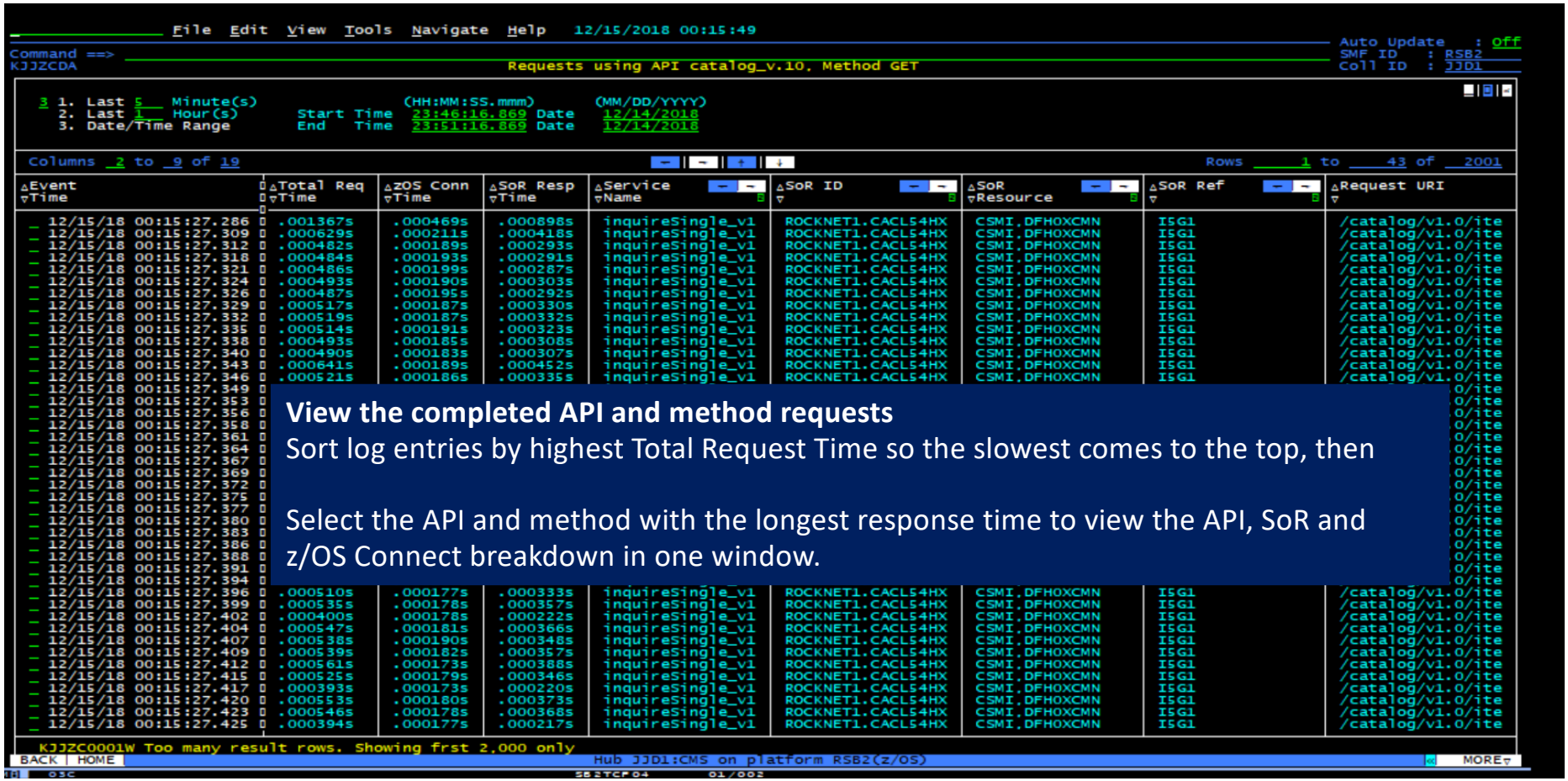




Identify the z/OS Connect Job by looking at the Application field. Select the Job using option 'Z'

Sort the rows by 'Avg Response Time' - Identify and select the API name with highest Avg Response Time. Selecting option 'S' will display log of all requests completed in the last time interval

View all completed requests for a given API over time



View the completed API and method requests

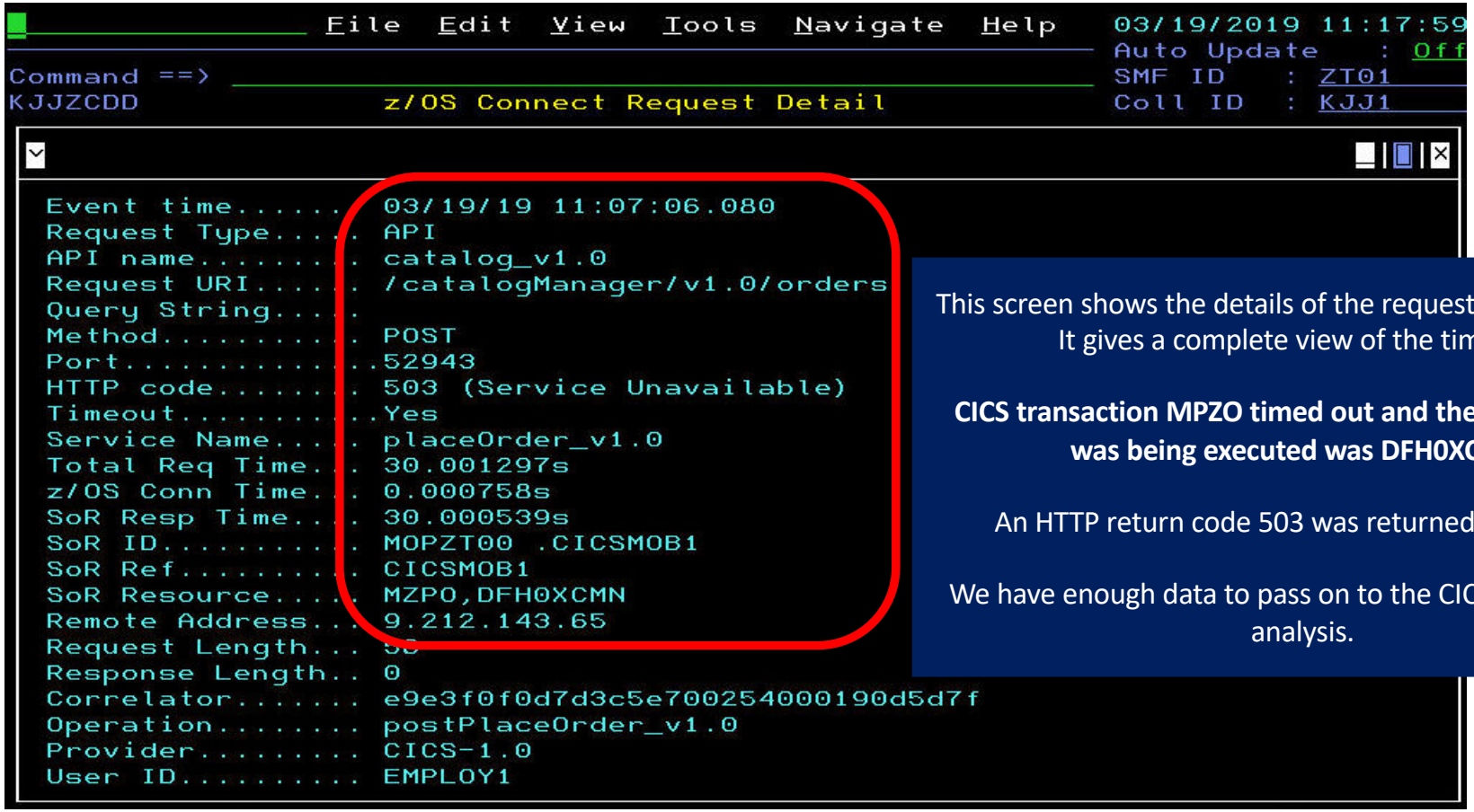
Sort log entries by highest Total Request Time so the slowest comes to the top, then

Select the API and method with the longest response time to view the API, SoR and z/OS Connect breakdown in one window.

Selective time series range

Use the filter fields to zoom in to specific time frame – view trends.

NEW - Detailed z/OS Connect Request Details page



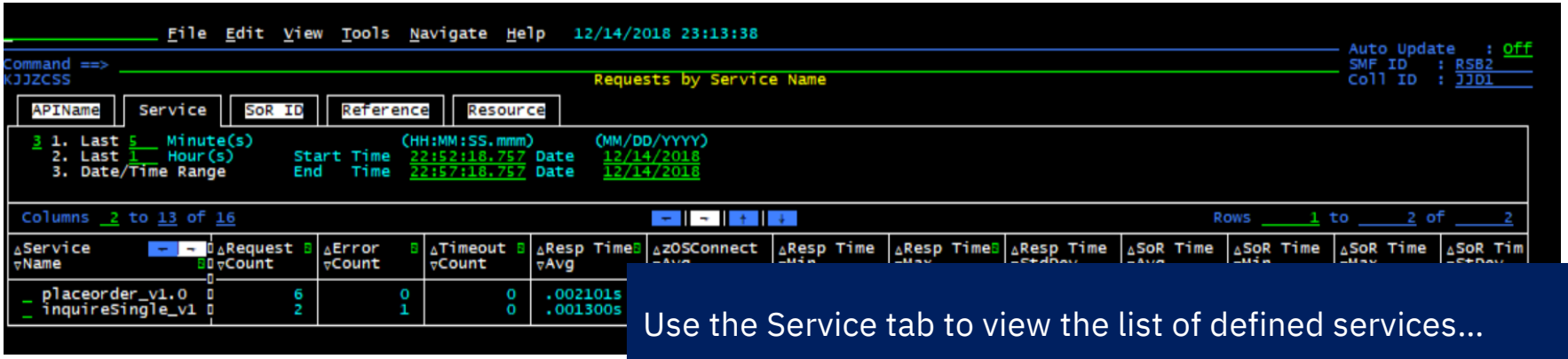
This screen shows the details of the request that timed out. It gives a complete view of the timeout:

CICS transaction MPZO timed out and the program that was being executed was DFH0XCMN.

An HTTP return code 503 was returned to the client.

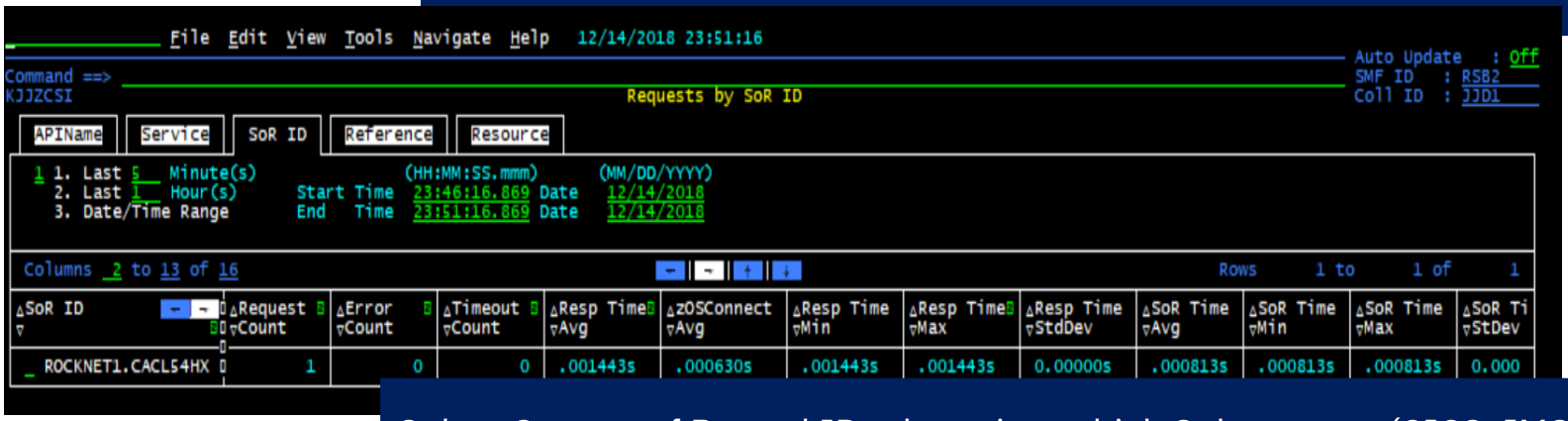
We have enough data to pass on to the CICS SME for final analysis.

Check tabs in e3270UI for other views of data



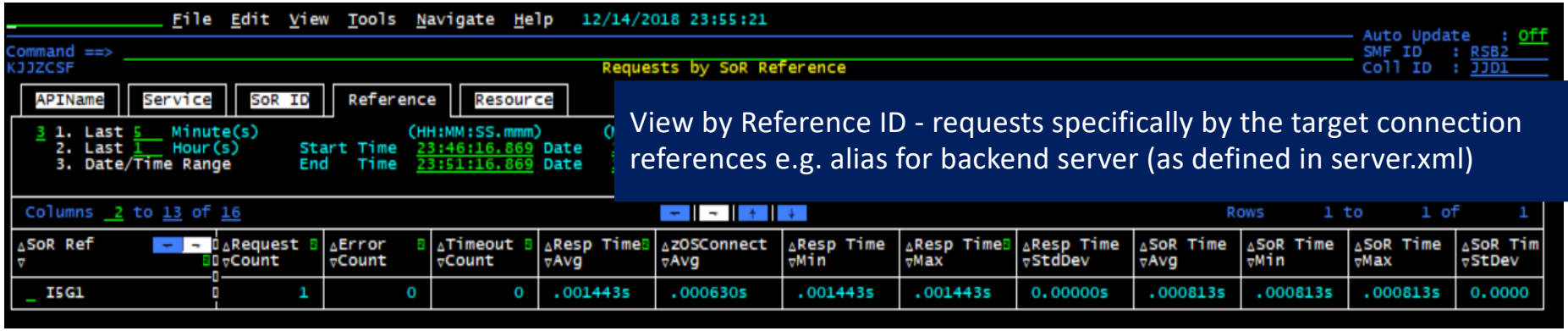
Use the Service tab to view the list of defined services…

Look at the data passing through z/OS Connect in other views

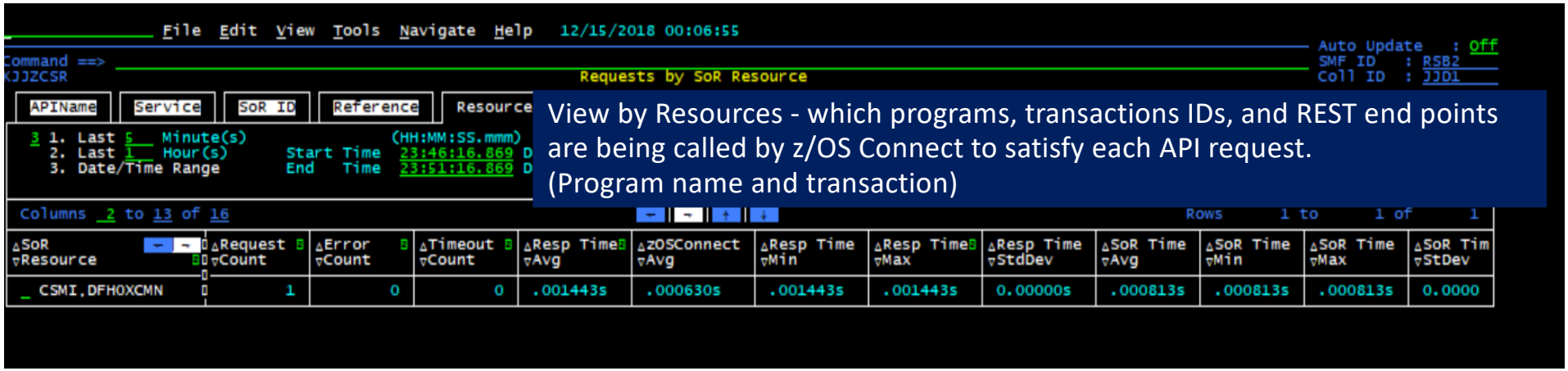


Select System of Record ID tab to view which Subsystems (CICS, IMS etc) are processing API requests and if there were any errors.
This example shows the qualified APPLID for a CICS region

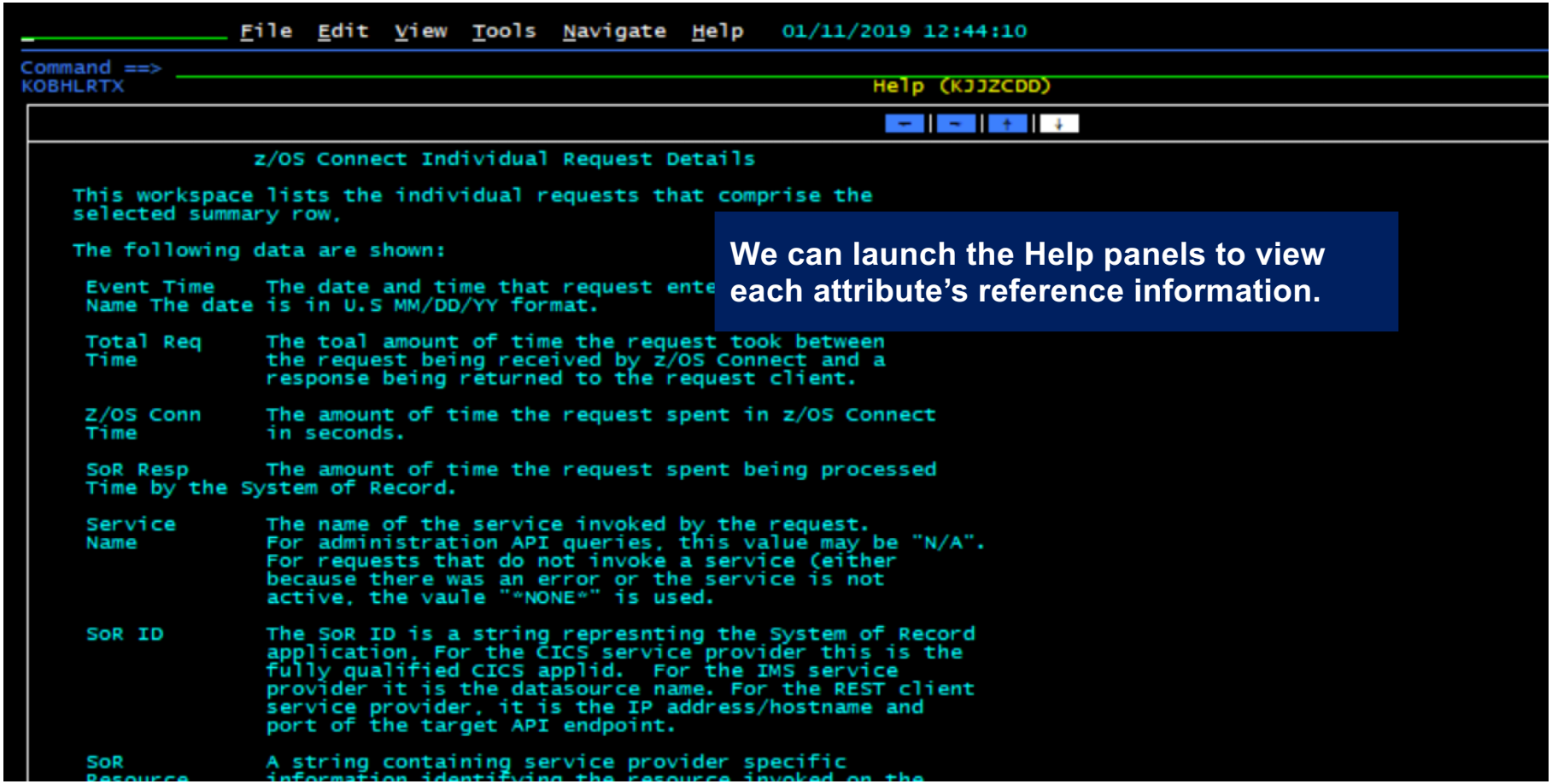
Ordering by Reference or Resource



View by Reference ID - requests specifically by the target connection references e.g. alias for backend server (as defined in server.xml)

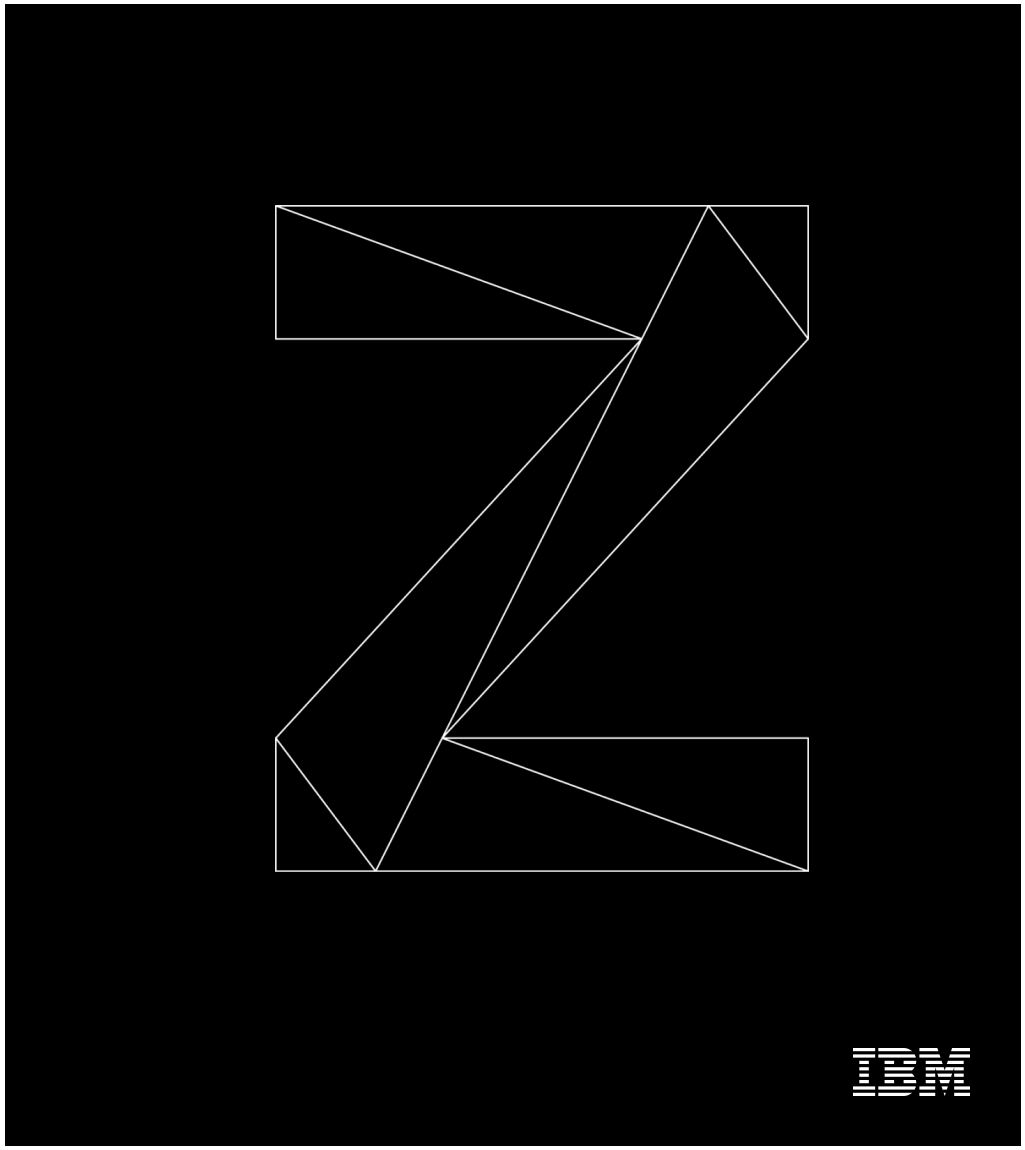


View by Resources - which programs, transactions IDs, and REST end points are being called by z/OS Connect to satisfy each API request.
(Program name and transaction)


File Edit View Tools Navigate Help 01/11/2019 12:44:10
Command ==>
KOBHLRTX
Help (KJJZCDD)
z/OS Connect Individual Request Details
This workspace lists the individual requests that comprise the selected summary row.
The following data are shown:
Event Time Name The date and time that request ente
The date is in U.S MM/DD/YY format.
Total Req Time The toal amount of time the request took between the request being received by z/OS Connect and a response being returned to the request client.
Z/OS Conn Time The amount of time the request spent in z/OS Connect in seconds.
SoR Resp Time by the System of Record. The amount of time the request spent being processed
Service Name The name of the service invoked by the request. For administration API queries, this value may be "N/A". For requests that do not invoke a service (either because there was an error or the service is not active, the vaule "*NONE*" is used.
SoR ID The SoR ID is a string represnting the System of Record application. For the CICS service provider this is the fully qualified CICS applid. For the IMS service provider it is the datasource name. For the REST client service provider, it is the IP address/hostname and port of the target API endpoint.
SoR A string containing service provider specific
We can launch the Help panels to view each attribute's reference information.

Zowe – IT Operations

What Zowe Means for Monitoring



“DISCLAIMER”....

- Zowe is an open source project - IBM was a founding member
- Zowe is not an IBM product
- All the information presented in this session is public information but subject to change
- Future plans depends on the open community decisions. Time frames for delivery are not guaranteed since it depends on the staffing and time commitment of the open community
- You are encouraged to get involved in the community for the latest information and to influence the project direction and priorities

Zowe Vision Statement

— Attract new people

- ✓ Demystify the Z platform
- ✓ Enhance integration and consumability
- ✓ Promote Open community of practice

— Reduce learning curve

- ✓ Improve productivity
- ✓ Modern, platform-neutral interfaces
- ✓ Cloud-like experience

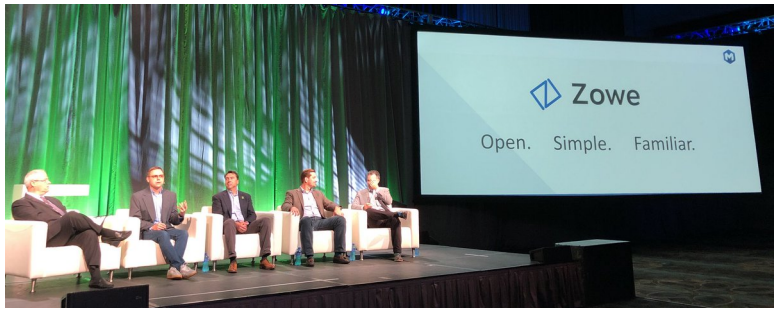
— Simplify architecture

- ✓ Reduce operational overhead
- ✓ Improve co-existence
- ✓ Enable rich ecosystem of free and commercial solutions

Quick Facts about Zowe

- Zowe 1.0 Announced at THINK conference
  - Pronounced as “Zoe” – [zoh-ee] in English
    - Not an acronym – just a simple, fun and easy name
    - Using the spelling “Zowe” allowed trademarking
- Open Source by Open Mainframe Project (OMP)
  - Collaborative project within the Linux Foundation
- Currently available at V1.5
  - Alpha release is available with SMP/E

Zowe



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What's in Zowe?

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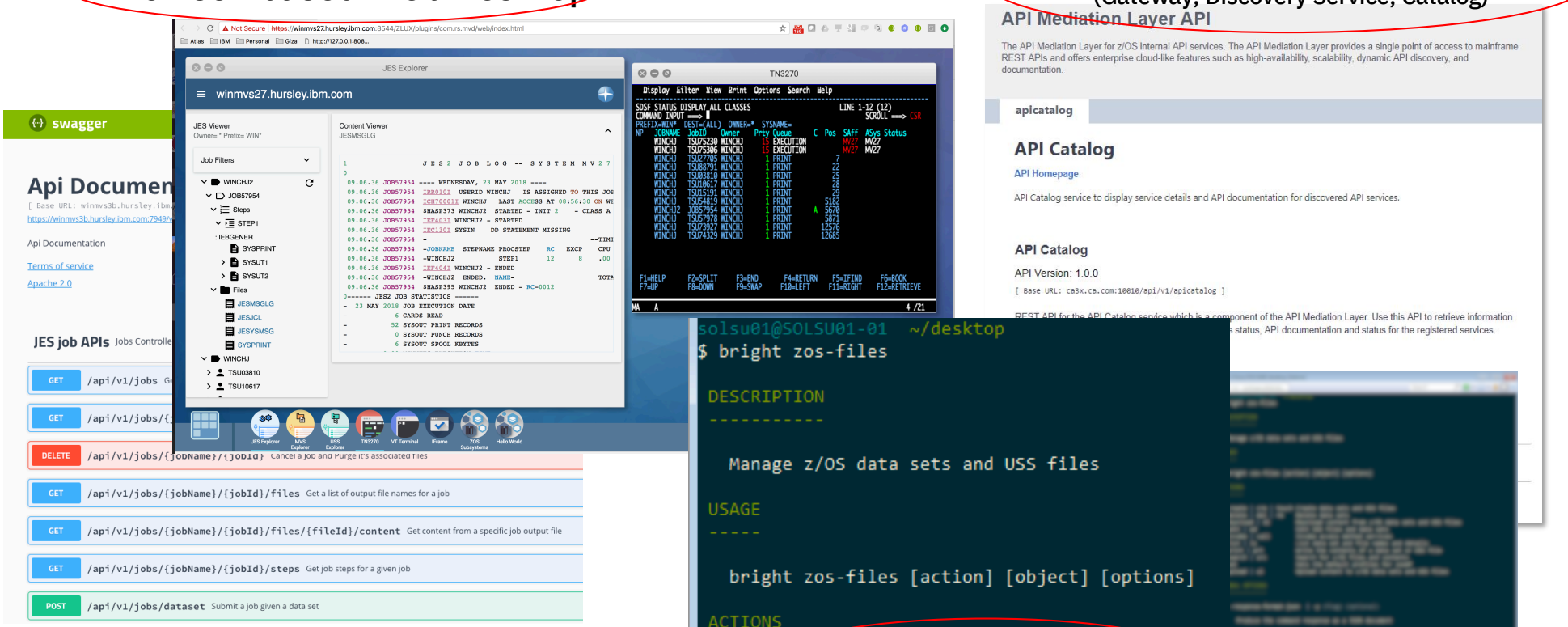
Integrated 3270 Emulator

Browser-based Web Desktop

API Mediation Layer
(Gateway, Discovery Service, Catalog)



Swagger-defined z/OS REST APIs

Node.js- based CLI

What does Zowe mean for Operations?

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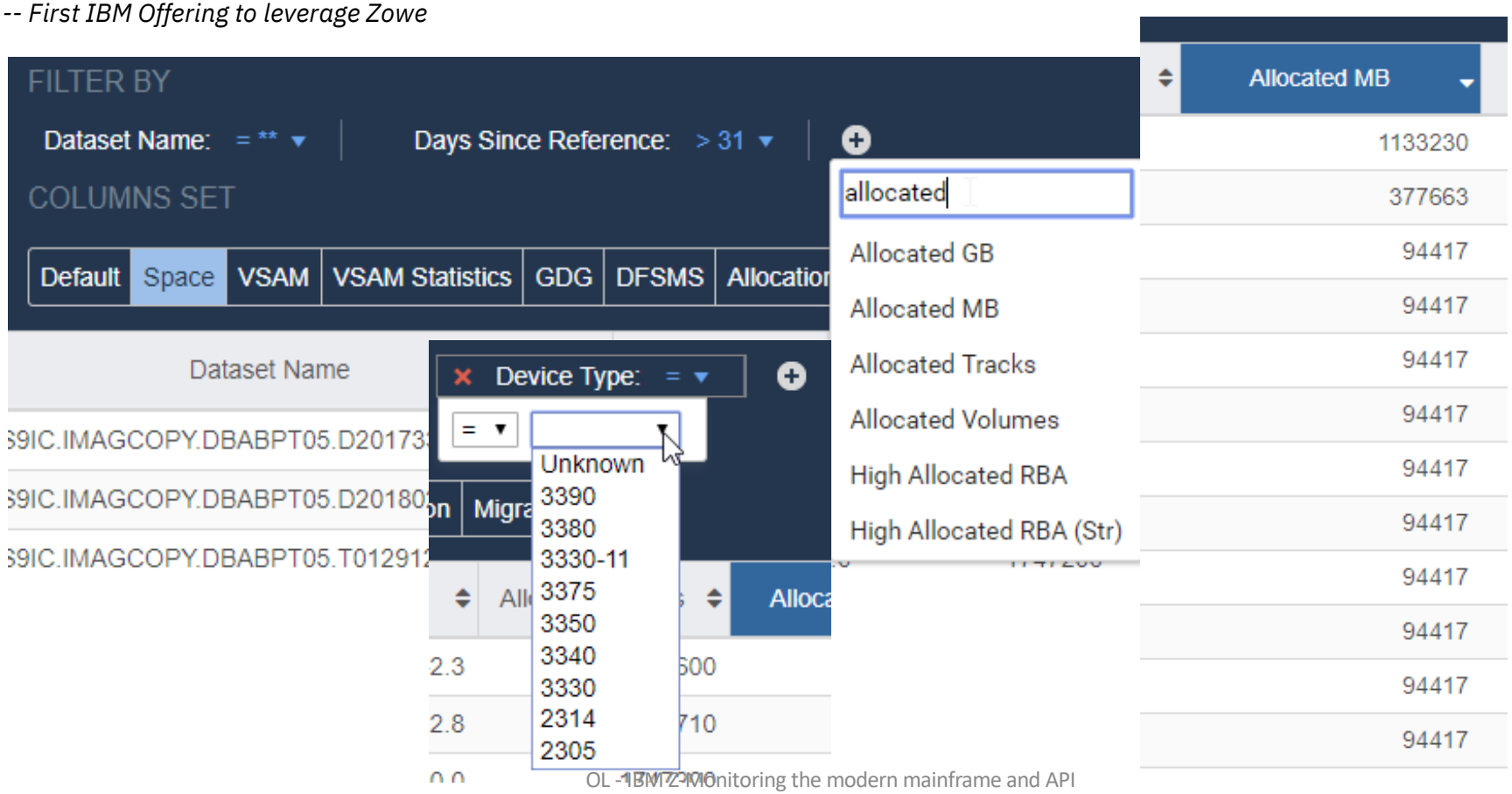
- **Leverage core Zowe capabilities such as single sign-on and API access to data**
- **Evolve current UI for modern user requirement while leveraging existing investments**
- **Increase integration between tool sets from TEP to Service Management Unite and Enhanced 3270UI**
- **Simplify installation and workflows to lower skills barrier to monitor and manage**

...we've already got started

OMEGAMON for Storage V5.5 – September 2018

-- First IBM Offering to leverage Zowe



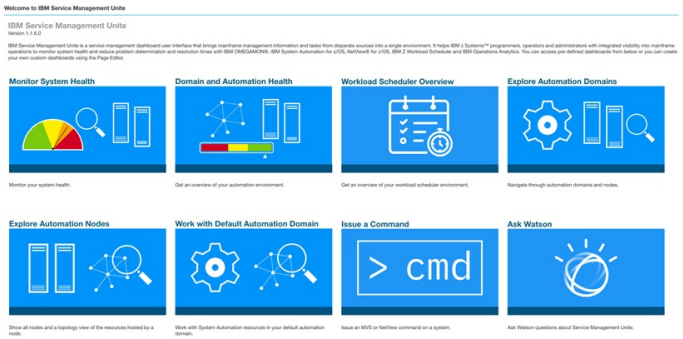
IBM Service Management Unite at a glance

The Web interface for Operations mainframe team

Analytics (ZIOA)

docker

Performance (OMEGAMON)



Automation (SAz and NVz)

IBM Watson

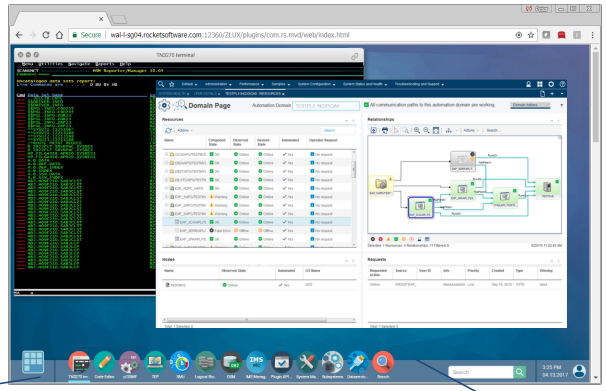
Zowe APIs, Apps

Scheduling (DWC)

Time saving Integrated Web Dashboards built for mainframe Operations!

SMU is now a Zowe Desktop Application

- SMU Zowe plugin is alongside Zowe core JES/MVS dataset Explorer plugins
- Instant access to 3270 tooling and other popular applications “All of the old”



Zowe

Service Management Unite v1.1.5 – December 2018

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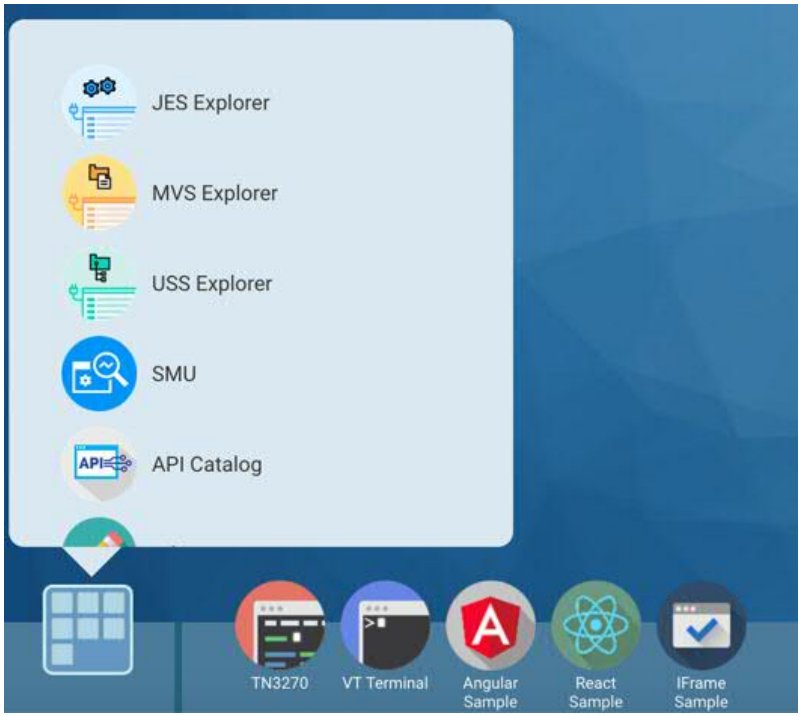
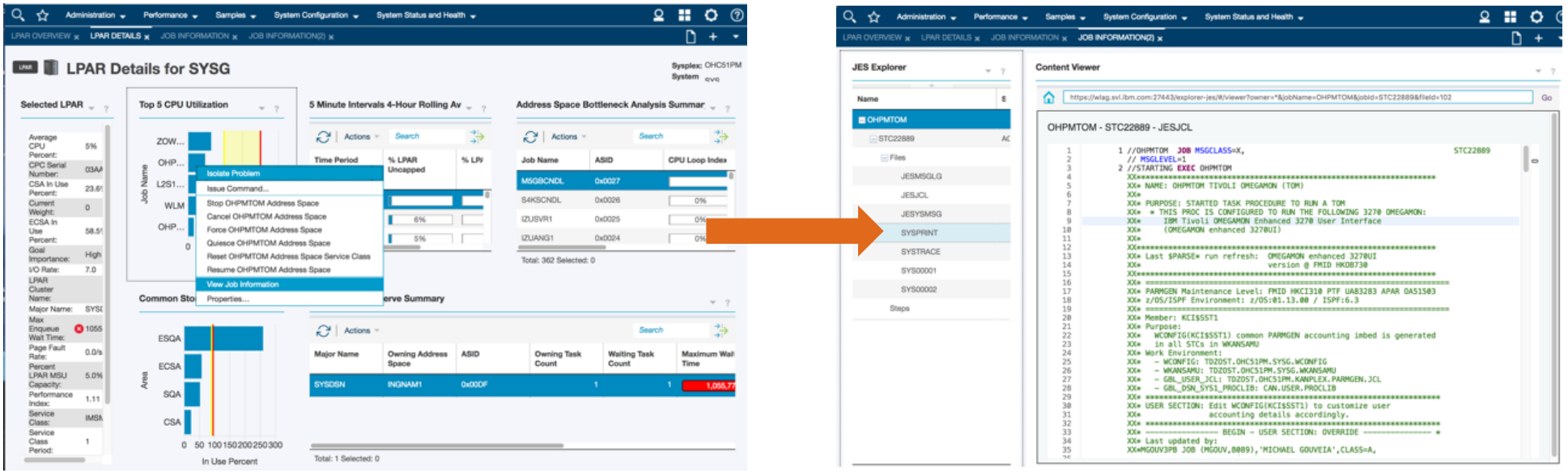
Zowe

- **View JES Job Information in SMU using Zowe JES Explorer**
- **View and edit data sets in SMU using Zowe MVS Explorer**
- **SMU Simplified Installation**
- **SMU Z Trial for JVM Monitoring**



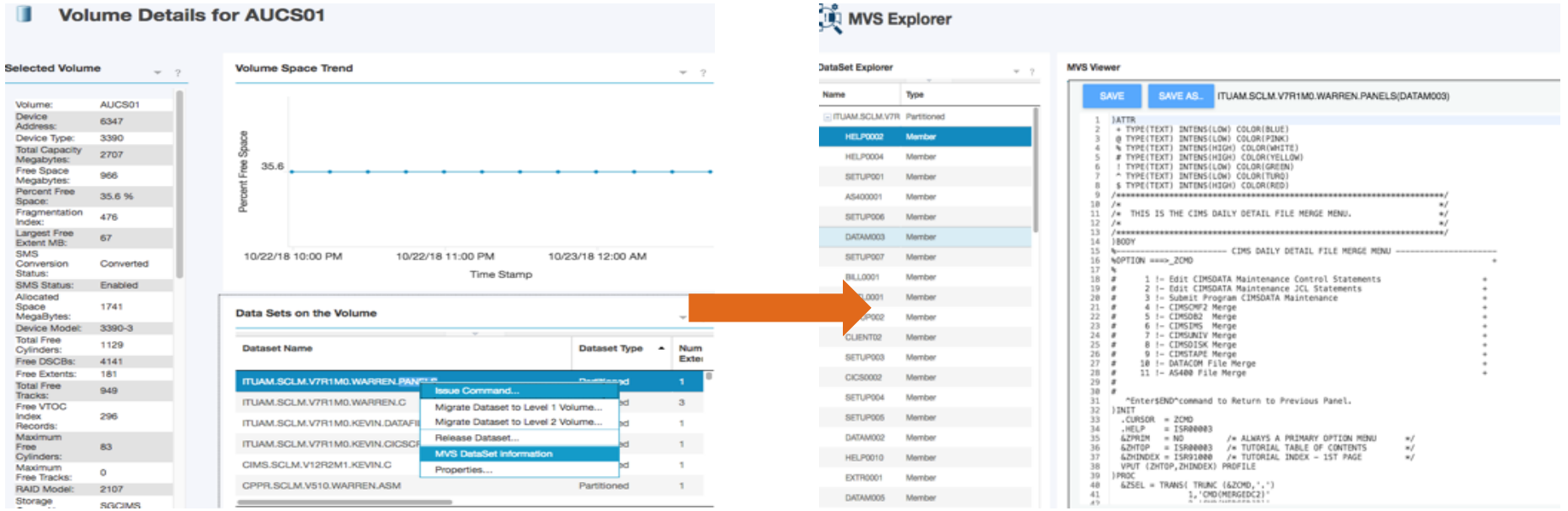
Improved Problem Analysis using Zowe JES Explorer

- Enable mainframe operators to isolate environmental issues by offering seamless navigation into Zowe's JES Explorer to view any job content without the need to switch the application or even use another terminal



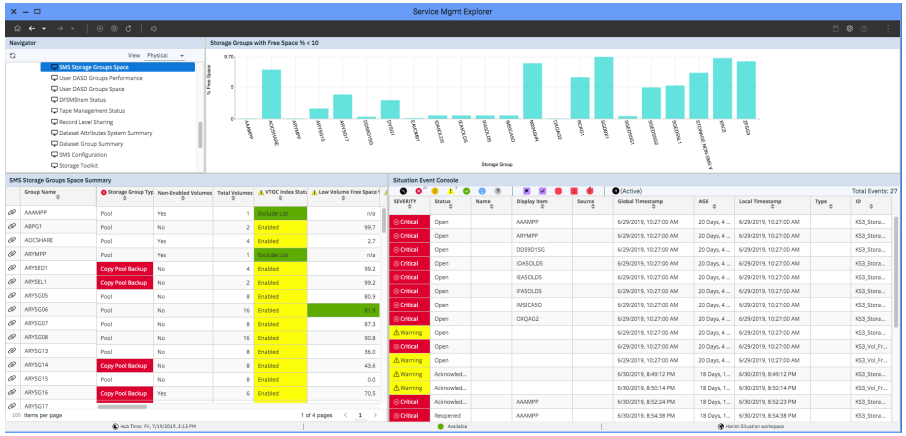
Improved Problem Analysis using Zowe MVS Explorer

- View/Edit Data Set Member or sequential Data Set content
- View Data Set attributes, like blksize, LRECL and so on.
- Enable/Disable Explorer page according to Data Set type



A bit about IBM Z Service Management Explorer (IZSME)...

What / Why / Direction



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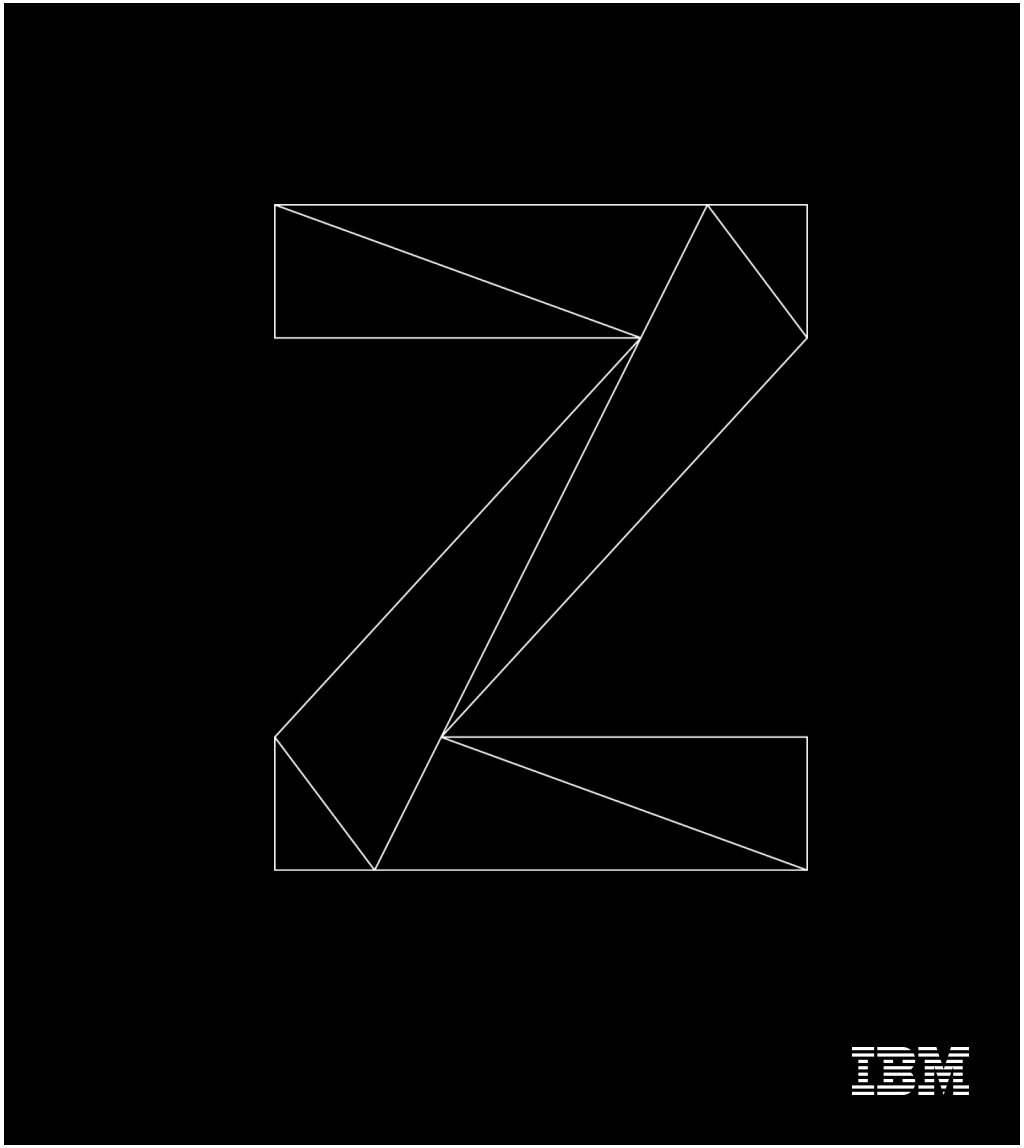

Statement of Direction

Statement of Direction – 14-Feb-2019

IBM intends to modernize the user experience for z/OS users of the Tivoli Enterprise Portal (TEP) by enabling the use of Zowe to provide a full web browser-based implementation of the current capability, while automatically capturing and preserving the investment that clients have made in customization. The new web-based capability, when fully delivered, will remove all dependency on client-side Java, making it easier to have a consistent experience and eliminating impacts from Java version and service levels.

Statements by IBM regarding its plans, directions, and intent are subject to change or withdrawal without notice at the sole discretion of IBM. Information regarding potential future products is intended to outline general product direction and should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for IBM products remain at the sole discretion of IBM

IBM Z Service Management Explorer (IZSME) Goals:

- Provide completely web-based solution, eliminating need for Java client
- Easy install / config – self-discovery, input credentials and port number, then users are ”instantly-on”
  - No PARMGEN changes!
  - No changes to where and how you run TEMS server(s)
- Lift & Shift now – opens architecture for future expansion
- Automatically incorporate ALL customizations without migration or re-creation
- Ultimately allow TEPS server to run on z/OS as well as zLinux, etc.
- Provide UX modernization platform through Zowe implementation
- Display distributed platform agent data in addition to IBM Z

IBM Z Service Management Explorer:

Delivery Phases

- While bringing IZSME online, users can also continue using TEP
  - Phase 1 - Read-only IZSME, need TEP client for editing/creation tasks
    - Some users can remove client workstation Java
  - Phase 2 – General Administrative, Create/Edit capability added
    - Completely eliminate client workstation Java dependency
  - Phase 3 – TEPS function can be hosted on Zowe server
    - All necessary functions on Zowe platform (on z/OS)

IBM Z Service Management Explorer:

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IBM Service Management Explorer Phase 1 Beta:

Beta 1 Contains:

- Easy and automated installation, discovery, and configuration
- Navigator panels w/custom navigators
- Table views w/thresholds
- Situation event viewer
- Histogram views

Beta 2 - available soon:

- LDAP support
- Pie charts
- Line charts
- Workspace links

Beta 3 (plan) available later…:

- More custom graphics
- Topology view
- Notepad & web page views
- "Java Extensions"
- …more

IBM **OMEGAMON**

Zowe

How to get Involved:

- Join our Early Access Program (EAP)
- Benefits:
  - Webinars – how-to, upcoming functions, and more…
  - Opportunity to provide feedback to IBM
  - Early access to beta code for :
    - OMEGAMONs
    - E3270UI
    - IBM Z Service Management Explorer
    - IBM Service Management Unite
- To Join: Email EAP Program Administrator
  - Laura Rosensteel (lrosens@us.ibm.com)

Phase 1 Deliverable:

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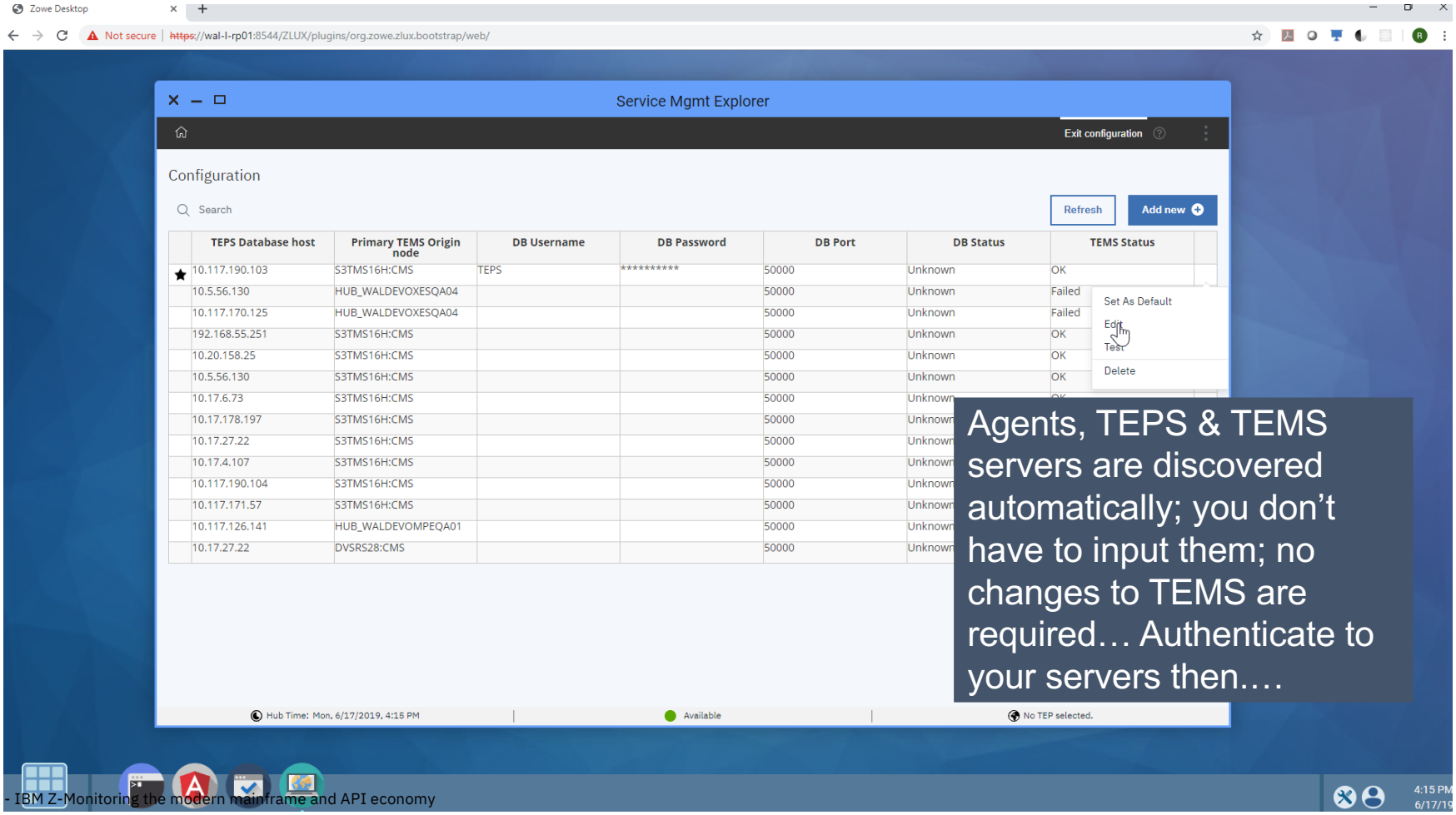
How will IZSME Compare to TEP?

- Easy installation
- Self-discovery of servers
- View and navigation familiar
- Modernized graphics & appearance
- Some navigator shortcuts to make life easier
- Full scope of query results returned
- Sorting & filtering on full data returned
- MFA support (via Zowe)

High Availability:

- IZSME Zowe plug-in inherits HA/FT from Zowe
- Node will detect TEPS DB or TEMS failures
- IZSME components will switch to failover locations
- Failover locations specified by user

What Would Migration to a TEP based on Zowe look like?



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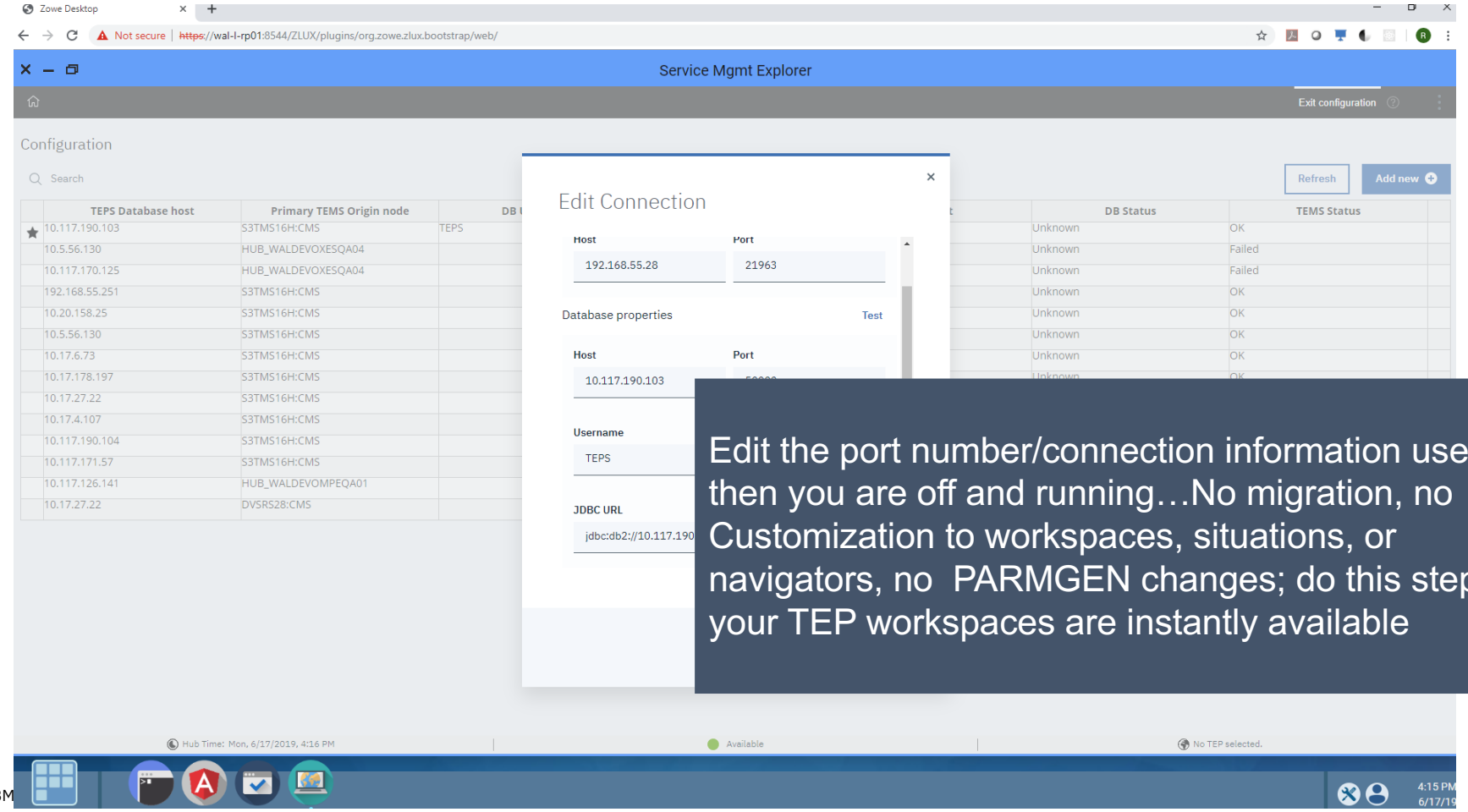
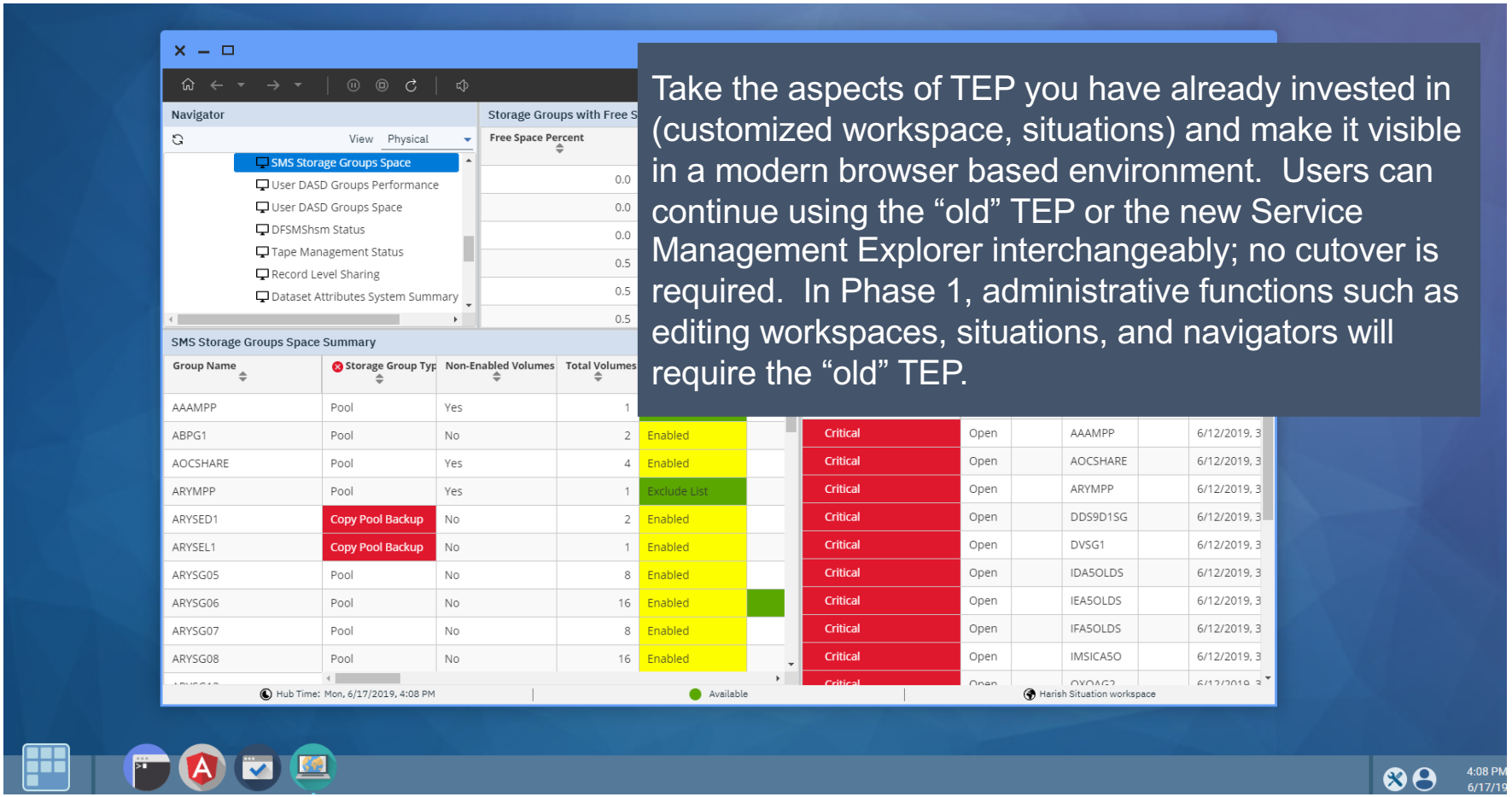


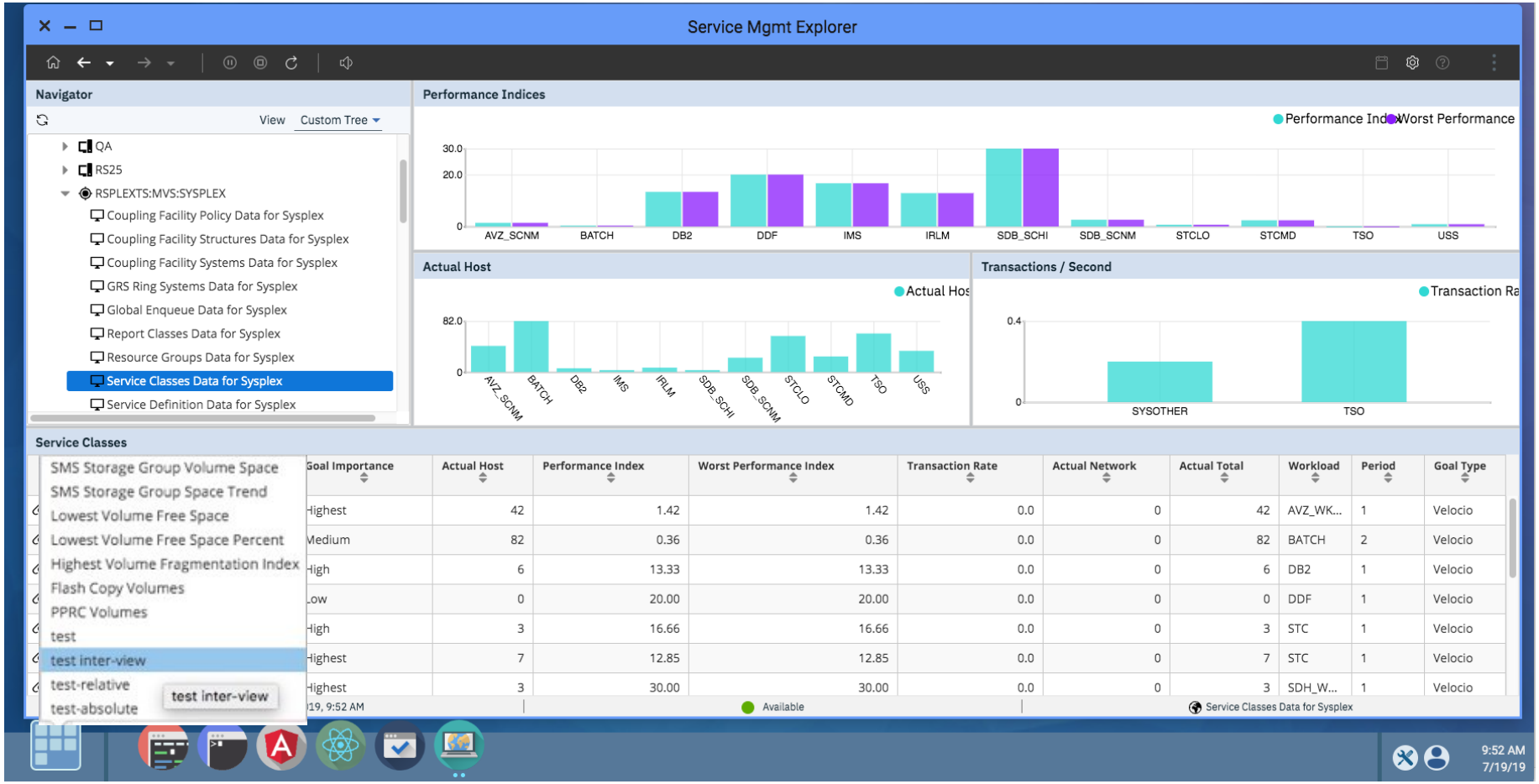
Edit the port number/connection information used – then you are off and running…No migration, no Customization to workspaces, situations, or navigators, no PARMGEN changes; do this step and your TEP workspaces are instantly available

What could a TEP based on Zowe look like?



Take the aspects of TEP you have already invested in (customized workspace, situations) and make it visible in a modern browser based environment. Users can continue using the “old” TEP or the new Service Management Explorer interchangeably; no cutover is required. In Phase 1, administrative functions such as editing workspaces, situations, and navigators will require the “old” TEP.

IZSME – Nav tree, Tables with links, Histograms, tooltips



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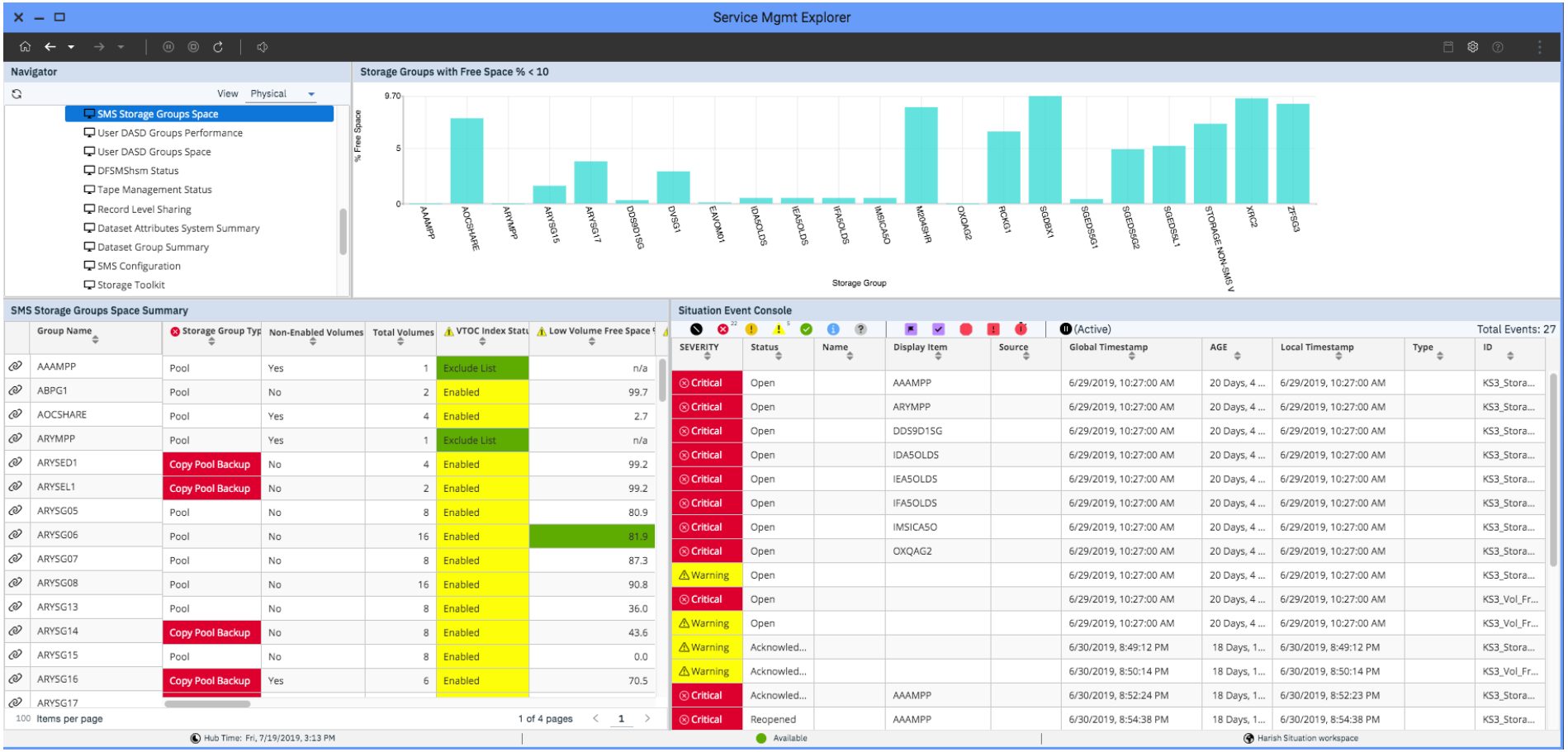
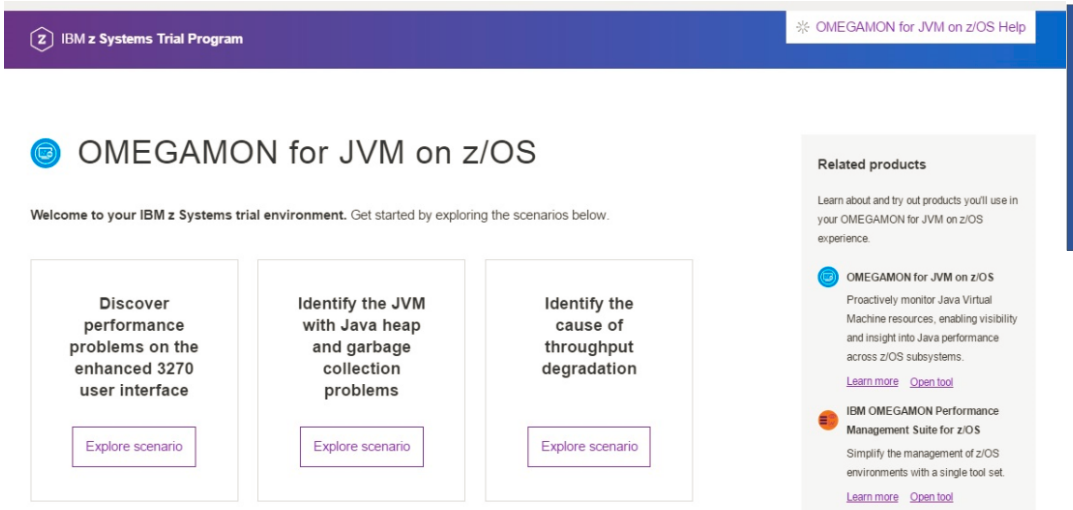
IZSME – Situation event console and pagination



Try IBM OMEGAMON for JVM for Free

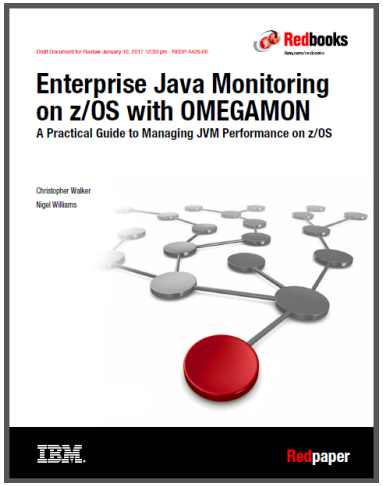


No charge, on-demand environment with tutorials for monitoring z/OS Connect EE with OMEGAMON for JVM

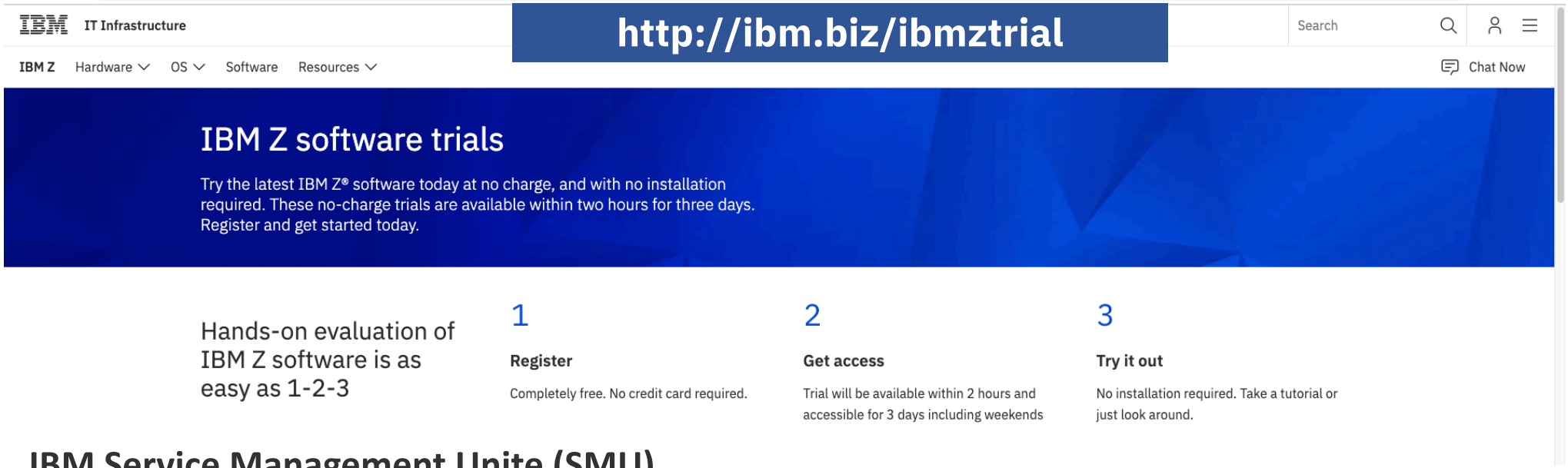
http://ibm.biz/ibmztrial

Learn more about Java monitoring on z/OS with OMEGAMON with this Redpaper
"Enterprise Java Monitoring on z/OS with OMEGAMON"

http://ibm.biz/omegJVMRedpaper



Try IBM Service Management Unite for Free



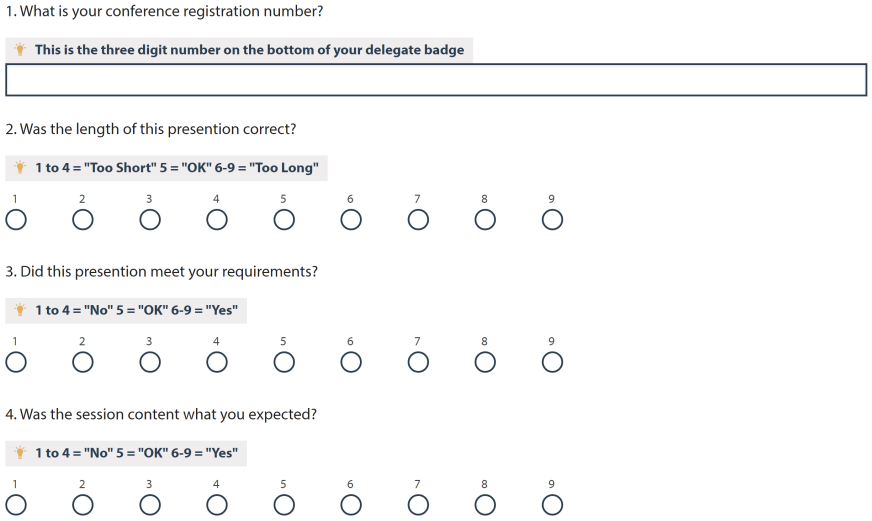
IBM Service Management Unite (SMU)

This customized user interface provides dashboards to monitor the overall health status of automation domains/nodes in IBM Z environments and to monitor and manage z/OS, network, storage and other subsystems.

zTrial includes hands-on tutorials showing how to:

- Identify a JVM performance problem.
- Isolate high JVM garbage collection / restore service.
- Isolate slow performance to a JVM's blocked threads and restore service.

Q
&
A

Please submit your session feedback!

- Do it online at http://conferences.gse.org.uk/2019/feedback/OD
- This session is OD