How IBM Operations Analytics solves your top Z business challenges

Nathan Brice - IBM

Domenico D'Alterio - IBM

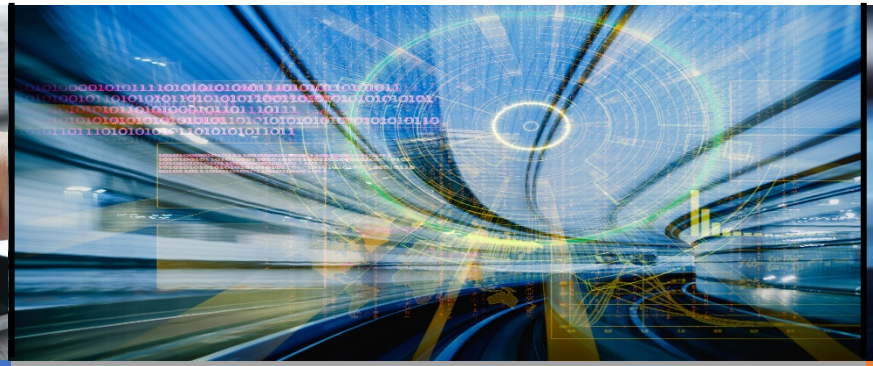
November 2018

Session OJ

Please note

- IBM’s statements regarding its plans, directions, and intent are subject to change or withdrawal without notice and at IBM’s sole discretion.
- Information regarding potential future products is intended to outline our general product direction and it 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 our products remains at our sole discretion.
- Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user’s job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

The Digital Economy is forcing businesses to transform



- **Explosion in transaction growth**
  - *driven by mobility and the Internet of Things*

- **Analytics is moving to real time**
  - *to capture new opportunities at the point of impact*

- **IT- driven business agility**
  - *for delivering service, security, and efficiency*

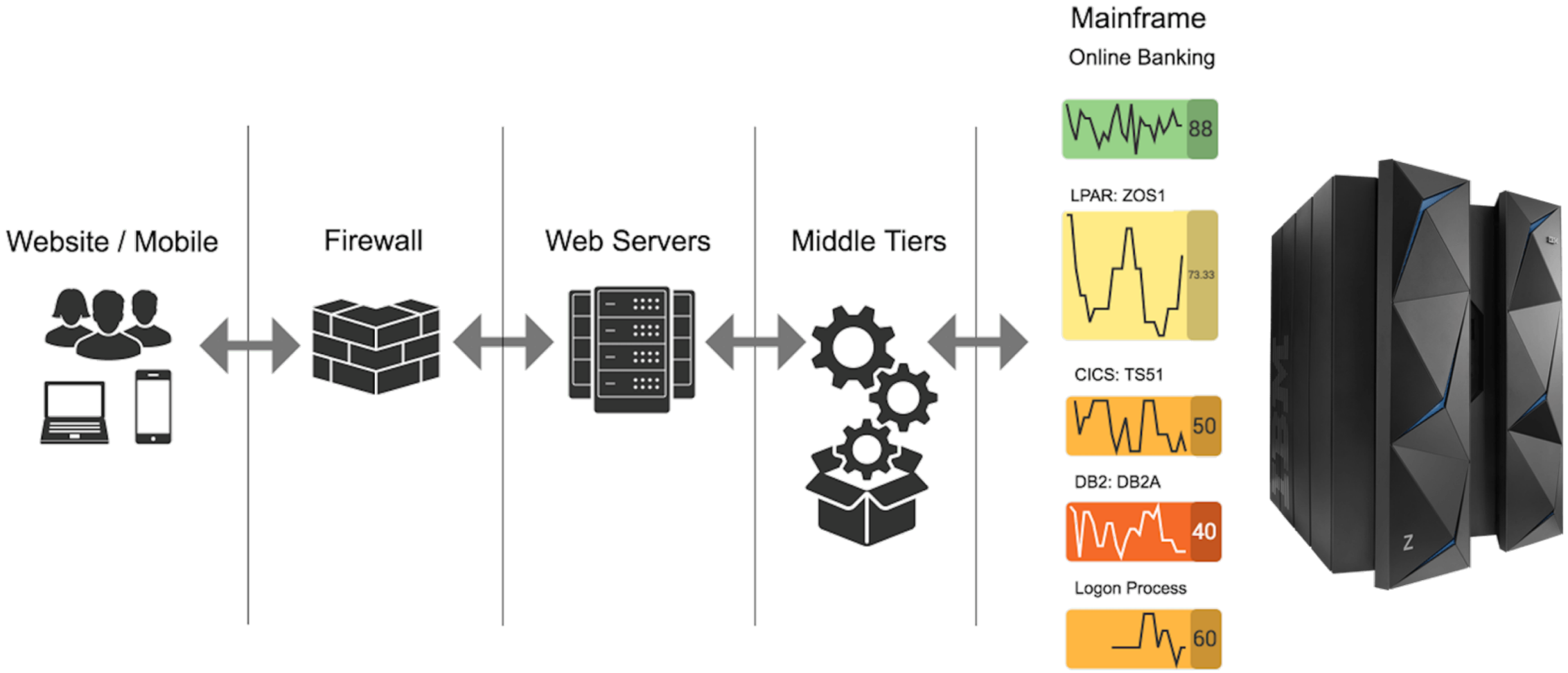
Business challenges for IT Operations

Joe
Operations

What keeps me up at night…

- The mainframe is a big black box to the business
- Valuable time is spent proving the mainframe is not the problem
- Outages must be quickly resolved and ideally prevented
- Workloads are much less predictable
- I don’t have the budget to do what I need to and we risk losing our experts
- I’m being asked to support new business services going online

View of Today's Hybrid IT Operations



IT operations and the digital enterprise: 3 paradigm shifts

GUIDE SHARE EUROPE UK REGION

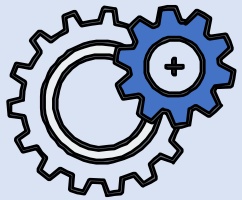
PAST

Operating in Siloed teams

Manual reporting on historical data

Solely relying on deep experts

TODAY



Manage visibility into hybrid applications

Real time

Leverage operational data for reporting & capacity planning

Near real time & historical

Empower operations with analytics

Predictive

FUTURE

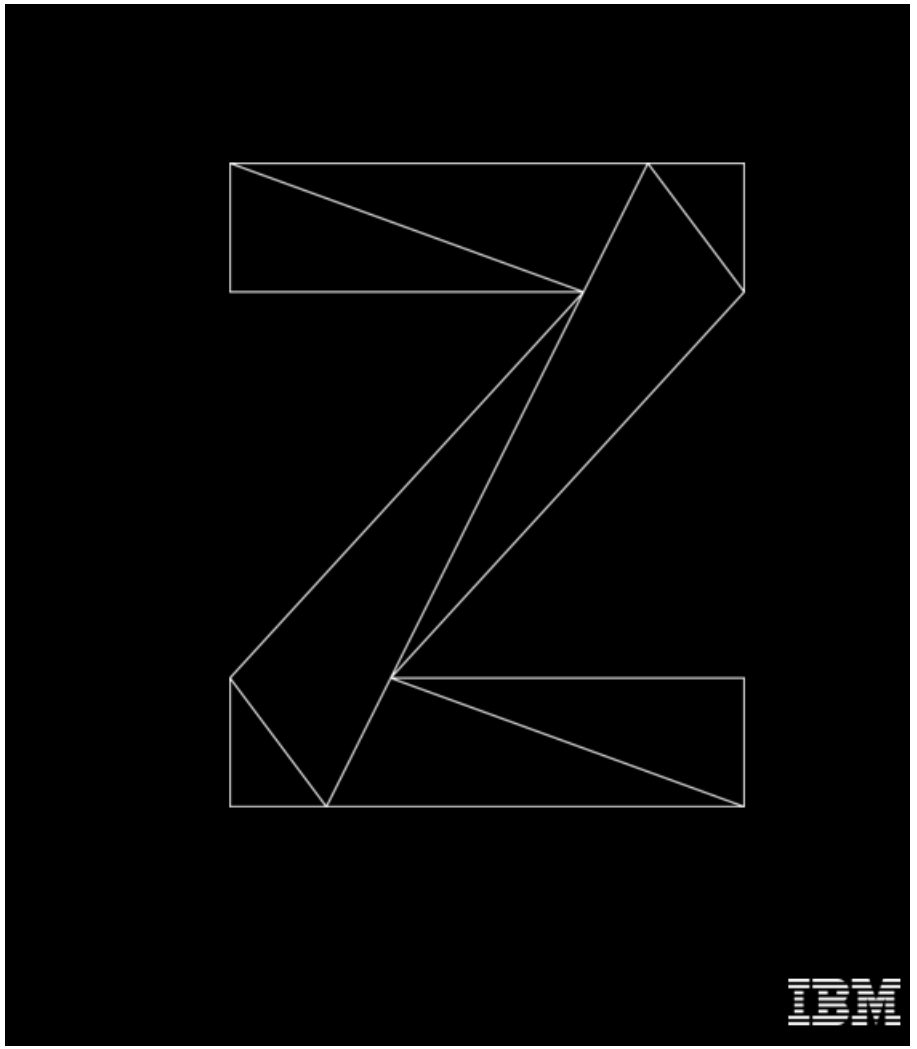
Automation

Your Next Generation of Systems Management

What is IT Operations Analytics?

- *IT operations analytics is an approach to:*
  - ***Collecting IT data** from different sources,*
  - ***Examining that data** in a broader context, and*
  - ***Proactively identifying problems** in advance of their occurrence.*

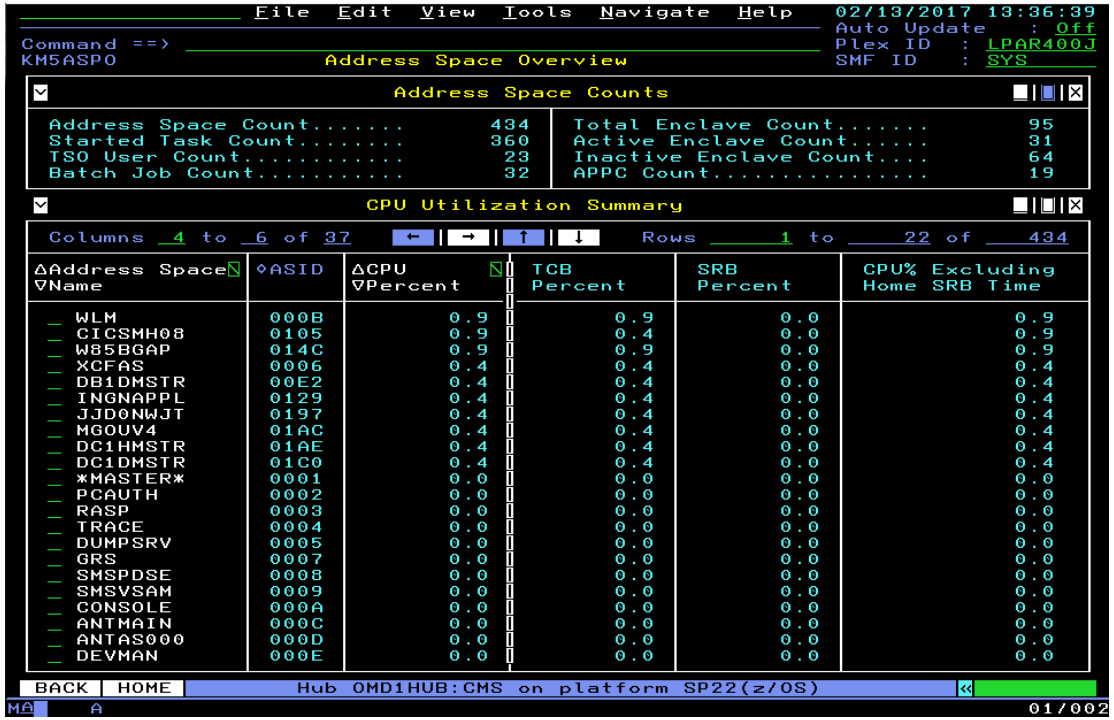
I’m responsible for our new LOB application SLAs and I have no idea what’s happening if a transaction start to slow down in the mainframe



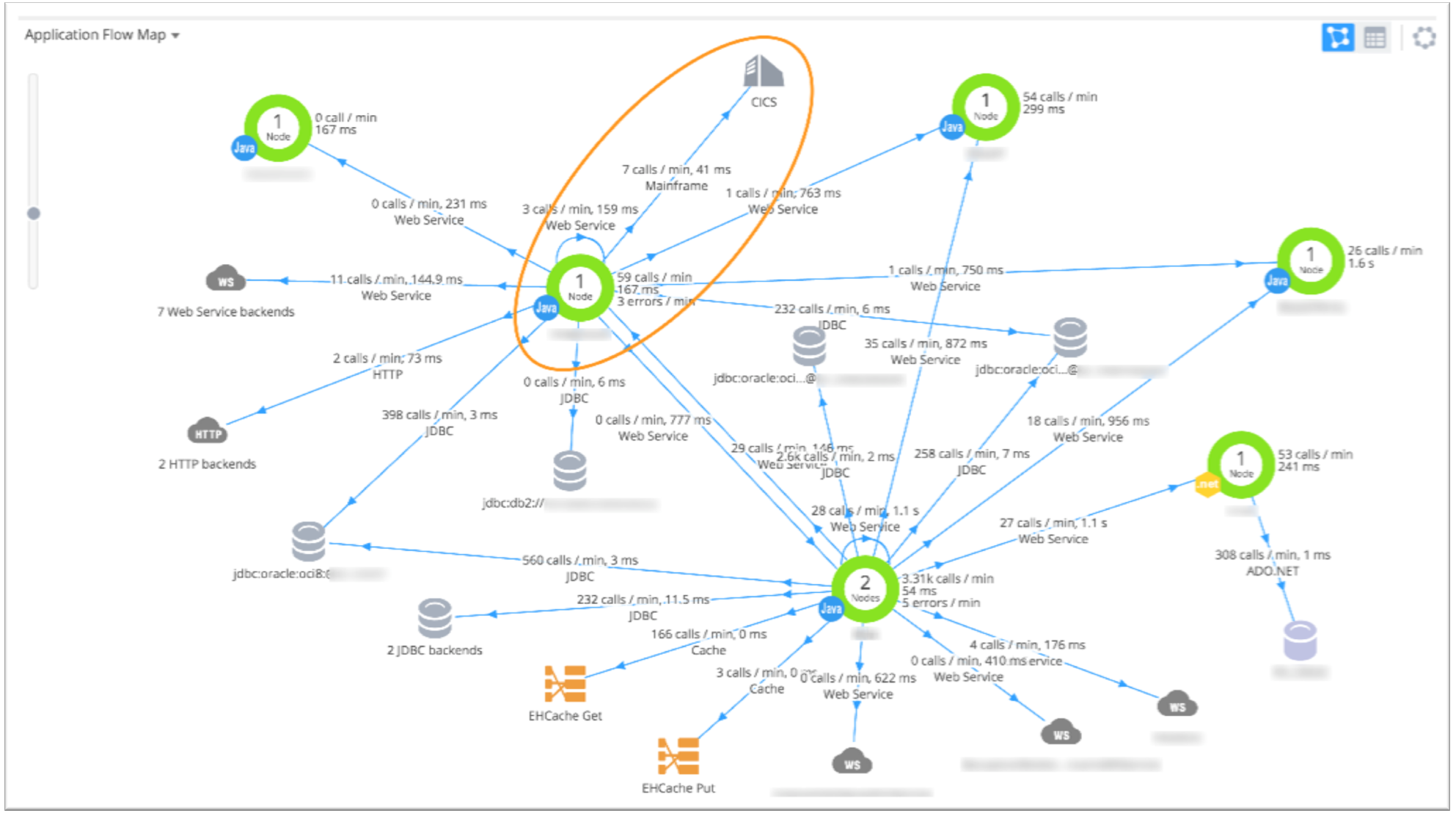
Personas Involved During a Mainframe Issue

Miki,
IT Ops Practitioner

Jim,
Z Subject Matter Expert



Out of the Box, AppDynamics Flowmaps Show the Mainframe as a Black Box



Typical Troubleshooting Workflow Today

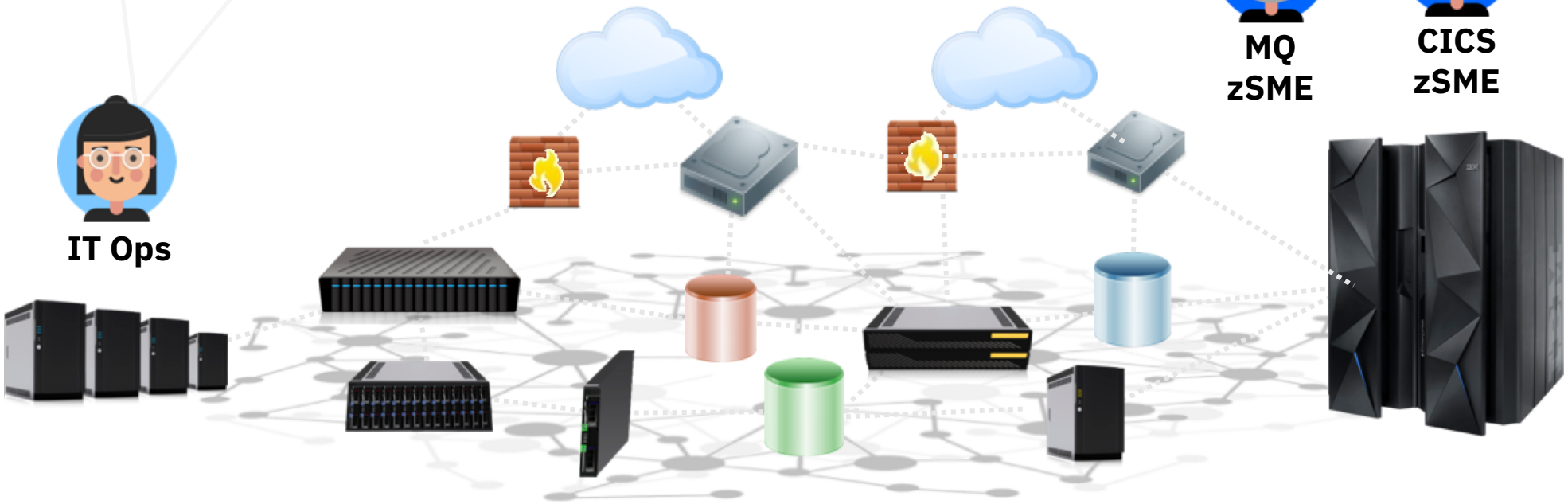
AppDynamics generated a alert showing a performance deviation.

I can see the response is slower than normal calling the mainframe. I'm going to speak to MQ zSME.

MQ looks ok to me. I'll check with the CICS zSME

CICS is looking good. Must be Db2....

Uh-oh!
That transaction is waiting on a lock slowing down the response time.



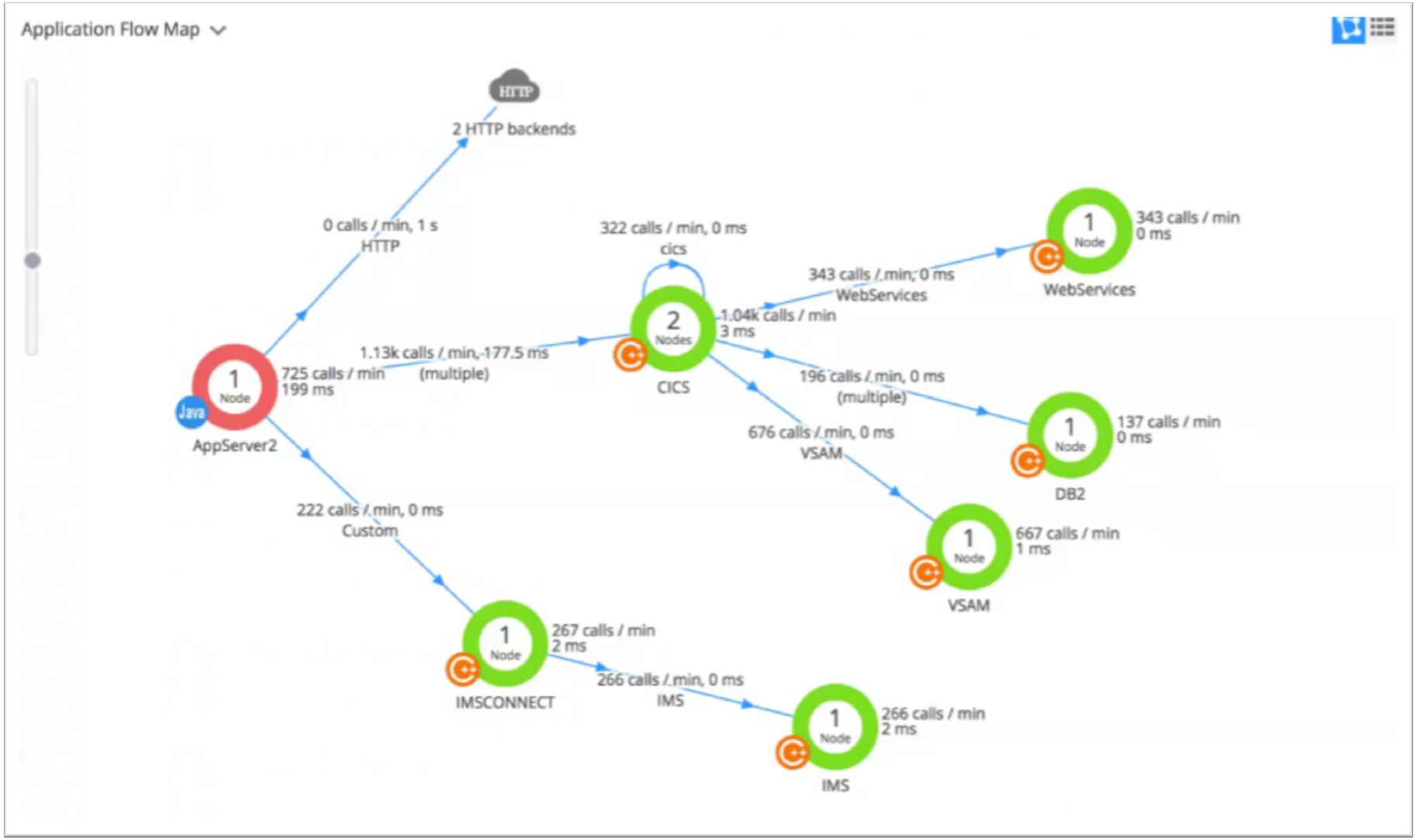
IT Ops

MQ zSME

CICS zSME

Z DB Admin

Mainframe Transactions Now Visible with IBM Z APM Connect



Troubleshooting Workflow with Z APM Connect

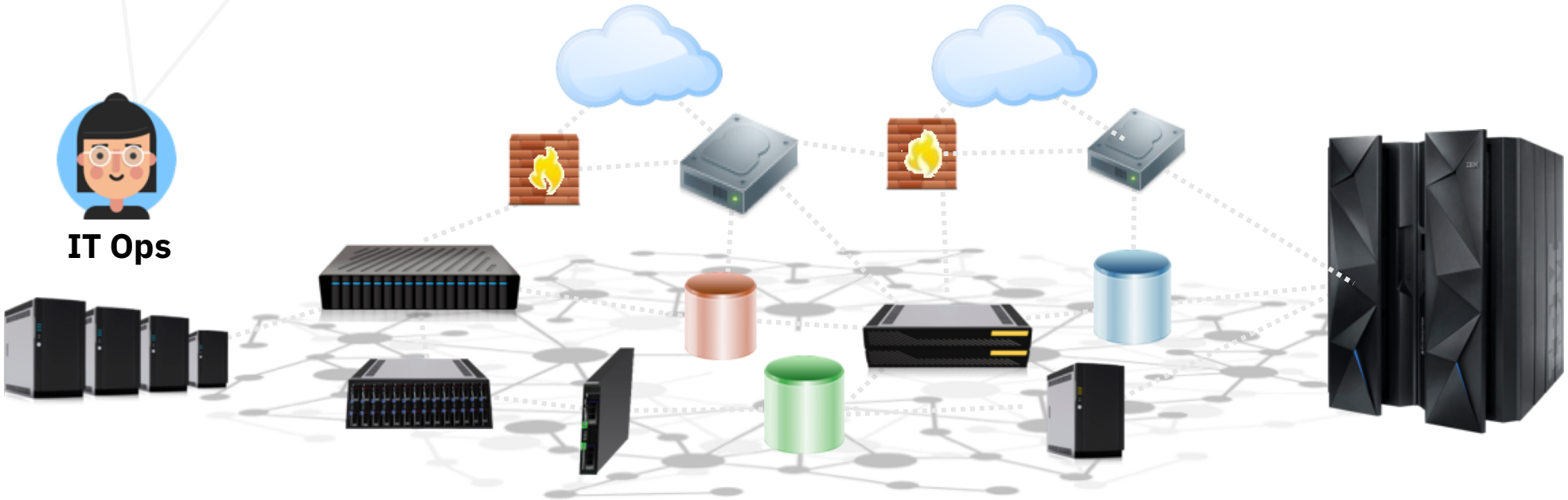
AppDynamics generated a alert showing a performance deviation.

I can clearly see the z/OS Db2 response is slower than normal. I'm going to speak to Db2 zSME.

Faster isolation & fixes

Reduced application downtime

Fewer false positives for mainframe SMEs



IT Ops

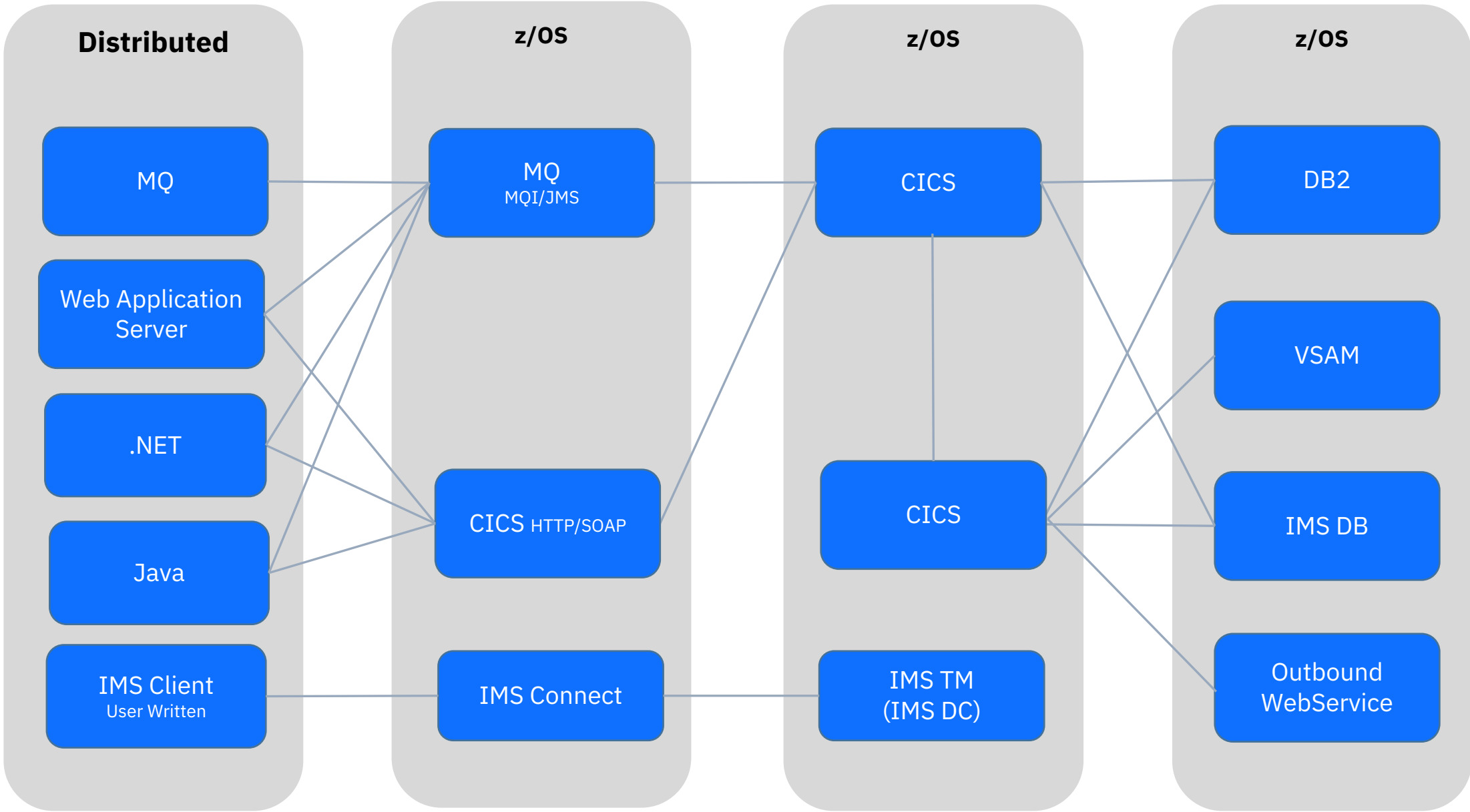
Uh-oh!
That transaction is waiting on a lock slowing down the response time.

Z DB Admin

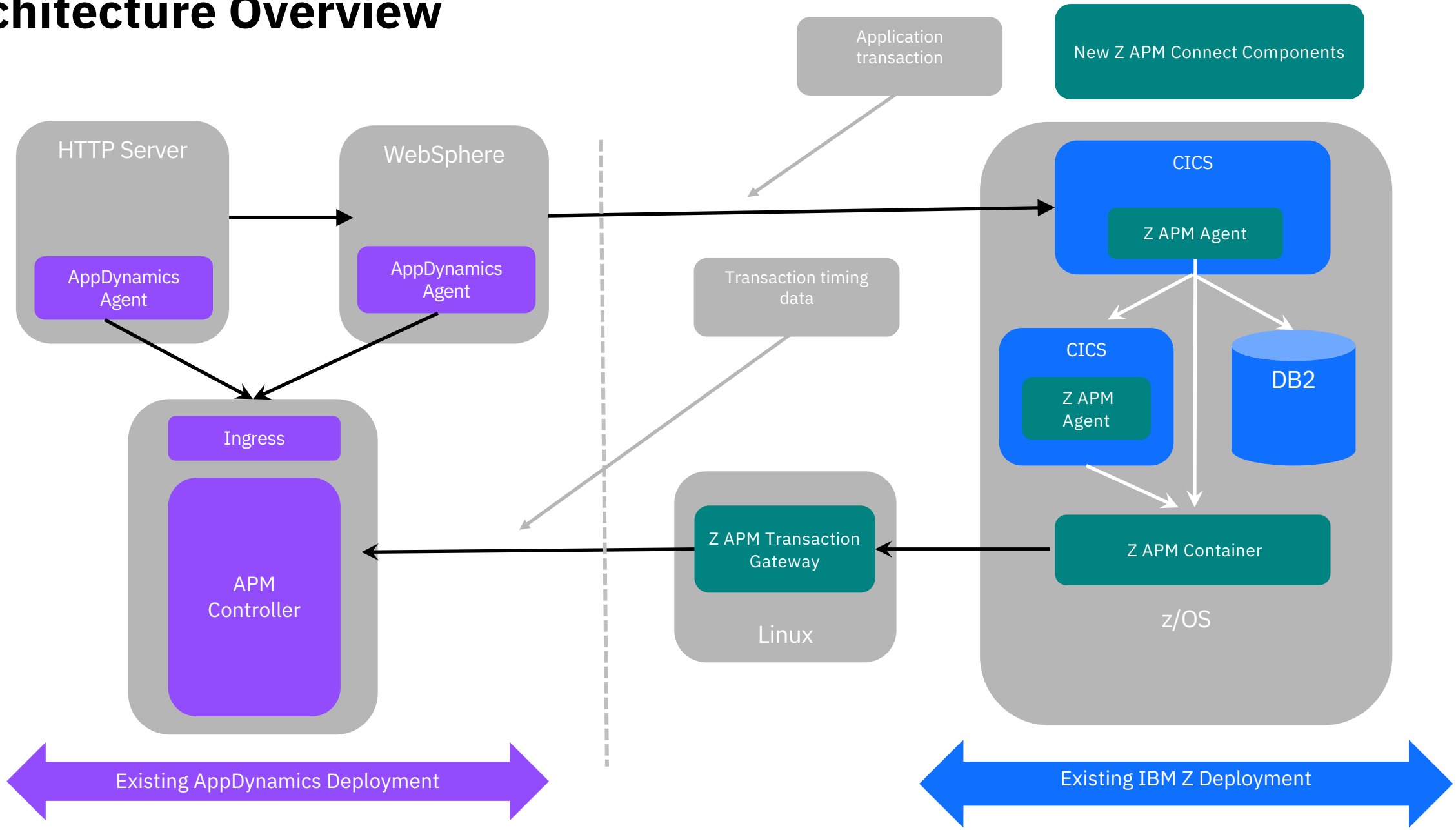
“Too much information in the wrong hands can be dangerous. You’re going to give someone information they don’t understand, and I find that quite scary.”

- Head of Mainframe at South Africa’s largest bank

Currently Supported z/OS Transaction Flows



Architecture Overview



IBM Z APM Connect's First Year

4Q17
- First release with robust CICS and MQ support

1Q18
- Performance enhancements
- Bug fixes

2Q18
- Initial IMS flows
- Greater MQ detail

3Q18
- Multi-controller support
- Execution based pricing

4Q18
- Additional IMS flows
- Performance enhancements

Execution Based Pricing

To enable a more agile digital transformation of your business, Z APM Connect will now be available to purchase per LPAR rather than based on the size of your z/OS deployment

Multiple Controller Support

For large deployments of AppDynamics, customers will multiple AppDynamics controllers will have an even greater level of visibility

Client Feedback

“Before this integration, the mainframe was just a black box and we couldn’t truly manage our applications end-to-end”

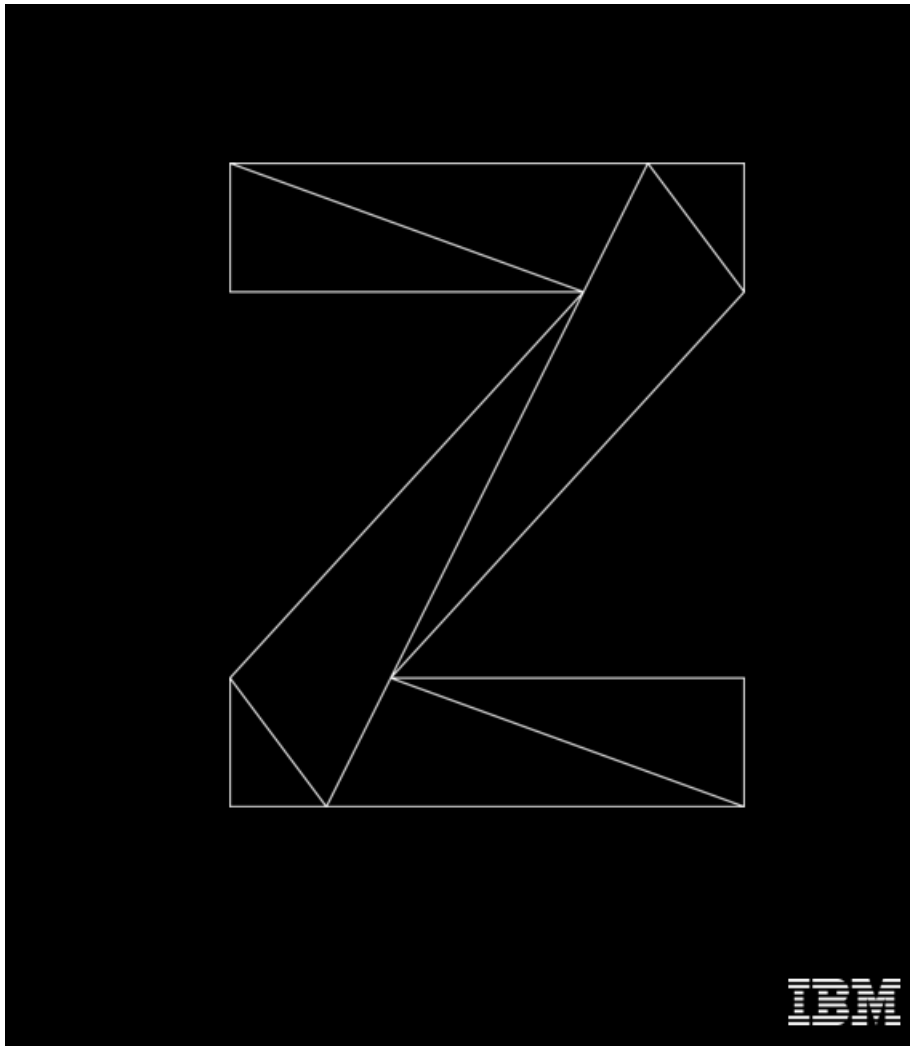
- Large Nordic Bank

"With this step, System Z is a fully integrated component in the global eco-system which enables us to manage applications transparency end-to-end. Stop finger-point and focus on the real problem!”

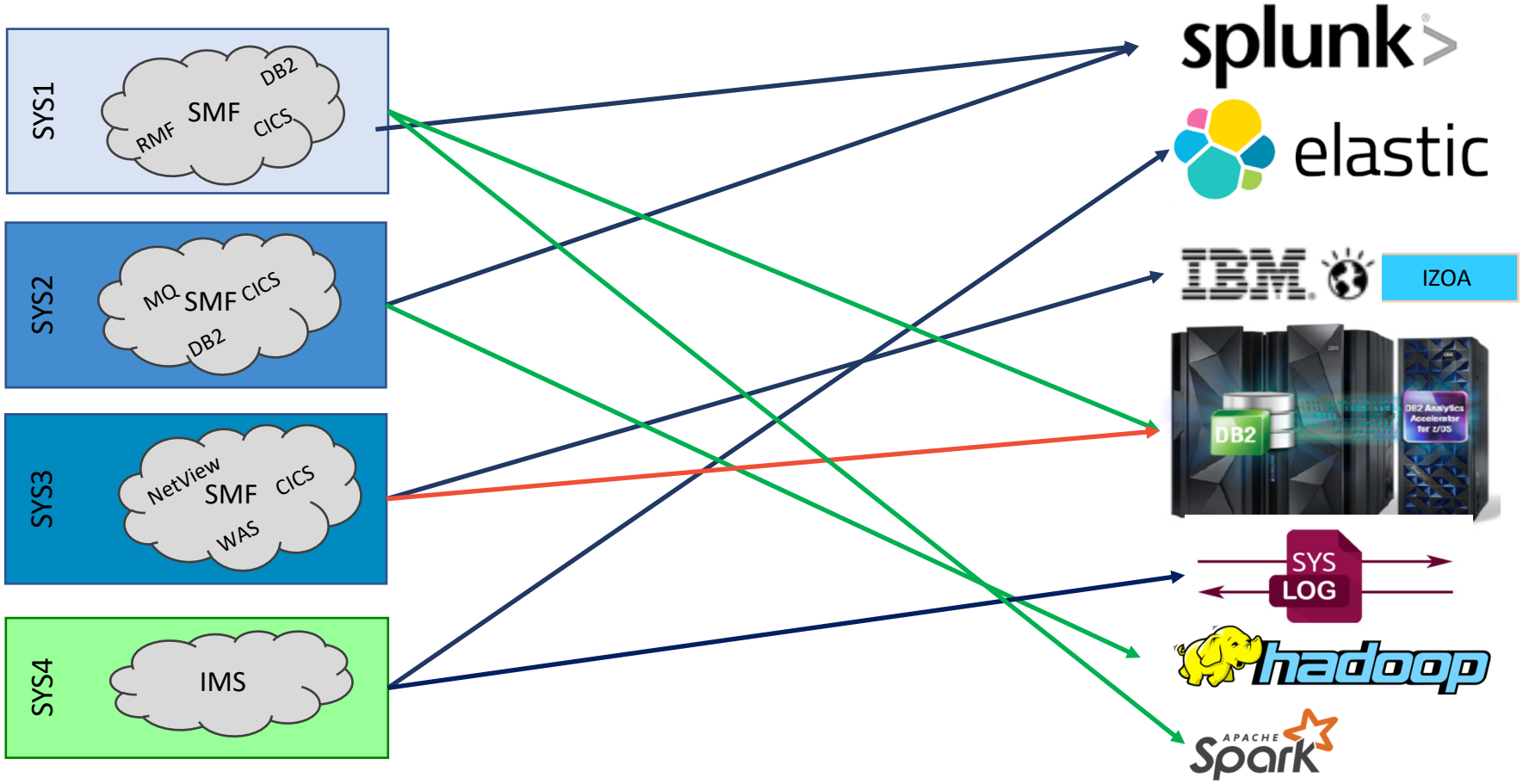
- Swiss Bank

The mainframe is literally just a big black box to our lines of business, security, and compliance teams.

Getting access to Z data will eliminate this blind spot.



Z IT Operations challenge:
Multiple Data Sources – increasing number of consumers



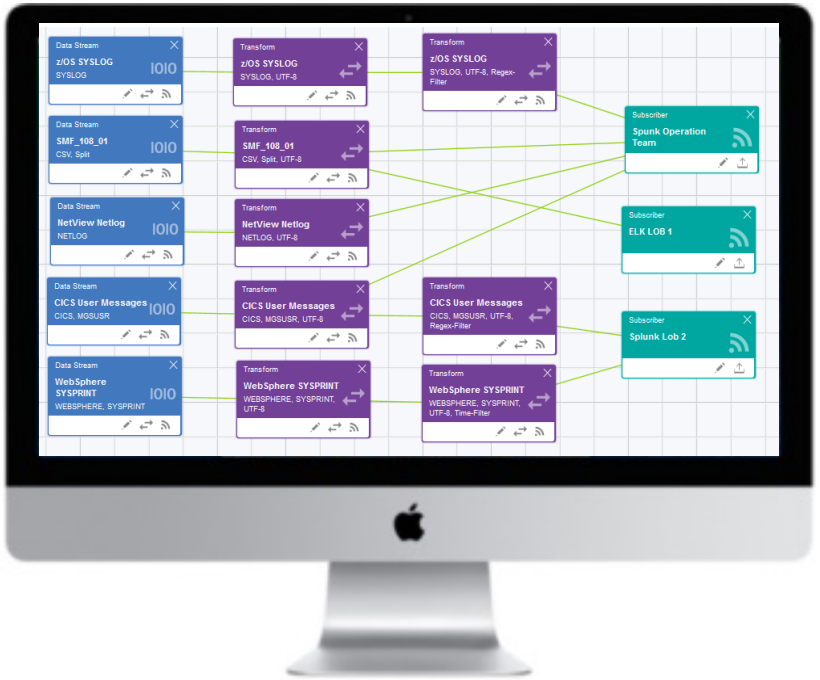
Same data requested by different consumers

Different data to be sent to the same consumers

IBM Common Data Provider for z Systems

GUIDE SHARE EUROPE UK REGION

Near real time collection of structured and unstructured IT operational data available to your analytics solution



IBM Common Data Provider for z Systems (CDPz) enables users to gather IBM Z IT operational data through a single interface, providing structured and unstructured data in near real time to a variety of analytics solutions. Data can be provided both on and off platform in a consistent, consumable format. OTC licensing means no data ingestion charges.

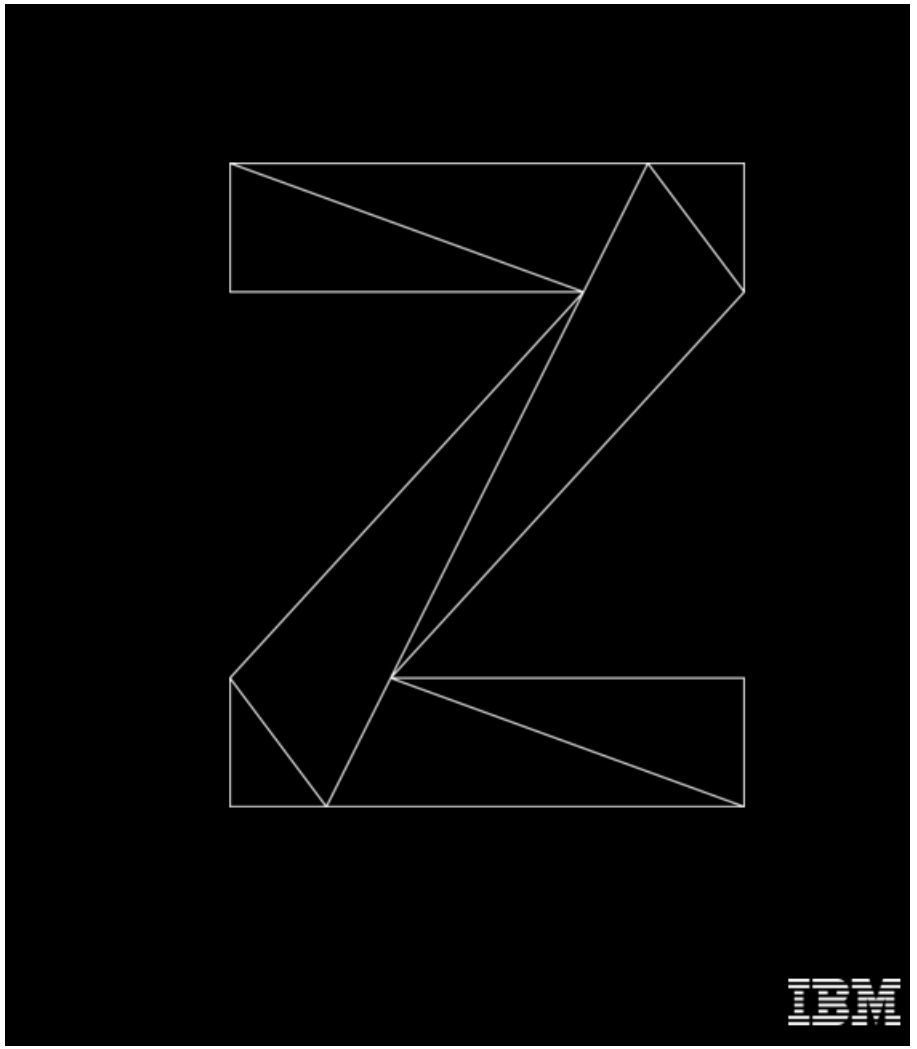
Open ecosystem: The Common Data Provider is the standard way to gather operation analytics data in near real time for analytics engines such as **Splunk**, **ELK stack** and IBM products like IBM Z Operations Analytics (IZOA).

Learn more

"The Power to Stream z IT Operational Data to the Analytic Engine of Your Choice"

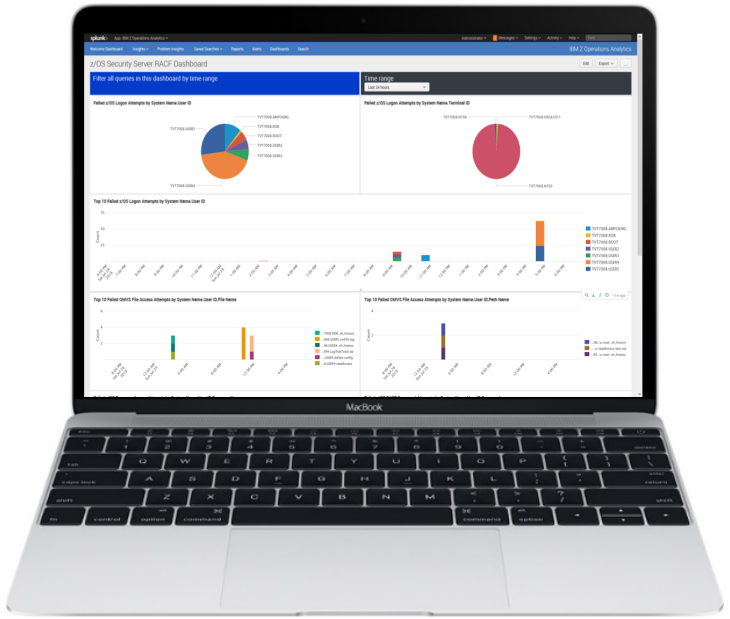
Session OK - Magny Cours, Wednesday: 10:45 – 11:45

I spend all of my time **pouring through Z data to get to the root cause of issues**, often to prove its not the mainframe….



Problem Analytics for your IBM Z

IBM Z Operations Analytics 3.2



- Expand domain expertise through domain-specific **out-of-the-box analysis, insights, and expert advice** including z/OS, WebSphere, DB2, CICS, IMS, MQ, Network, and Security

Now available on Splunk and Kibana (ELK) in addition to IBM Log Analysis

Included - Common Data Provider for z Systems streams data in near real time to where you want to analyze your data

Reduce outages by **proactively detecting operational anomalies** and notifying operations when they occur

Reduce time required for root cause analysis by 60% with rapid data analysis and suggested actions

- **Eliminate trouble ticket queue hopping** with an **end-to-end view of the enterprise** and the reduction of blind spots

Rapid data analysis of large amounts of data

Visualize search results

Problem Insights speeds problem determination

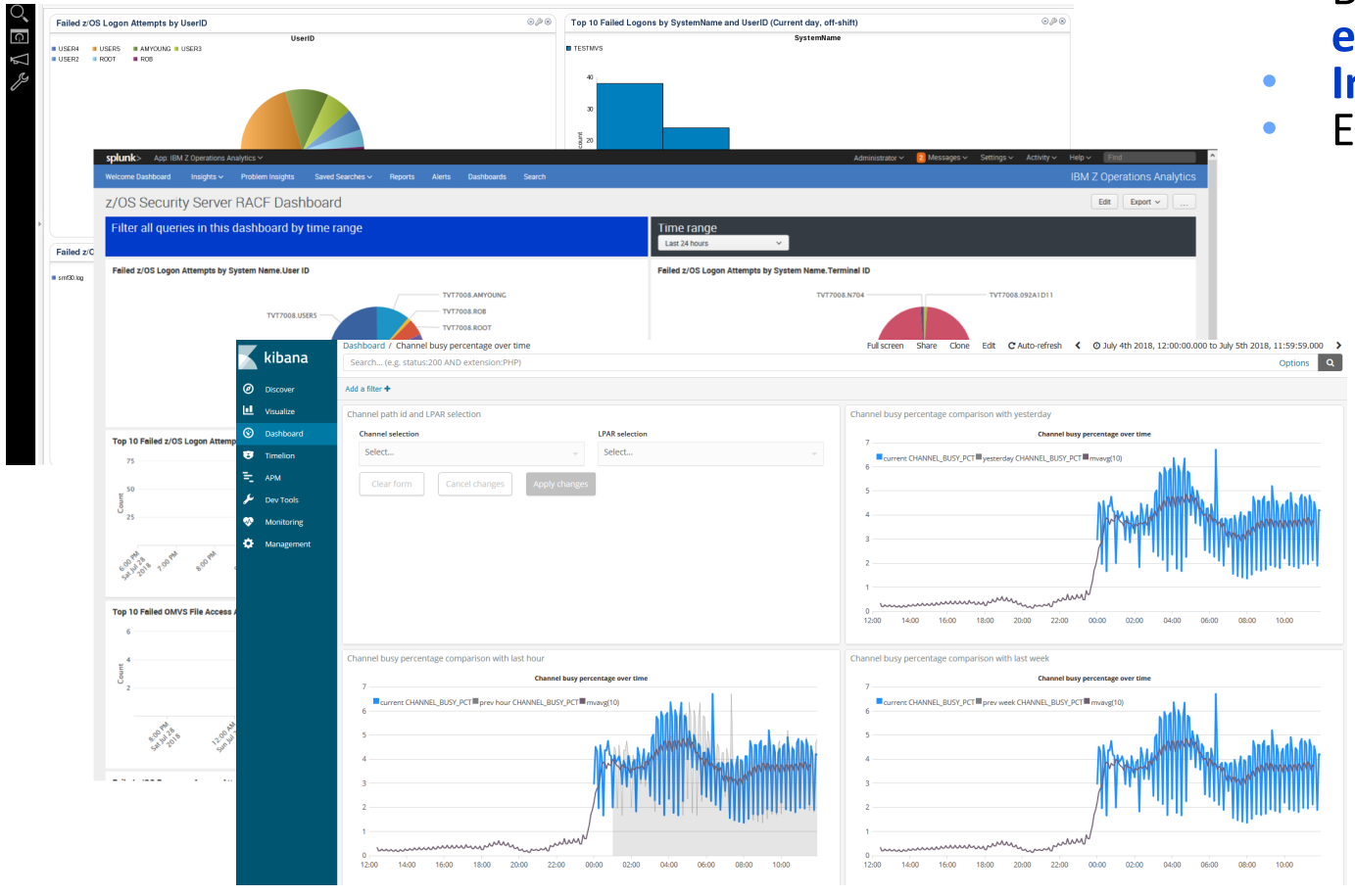
Reduce Blind Spots

Expert advice and suggested actions

Faster mean time to recovery for outages

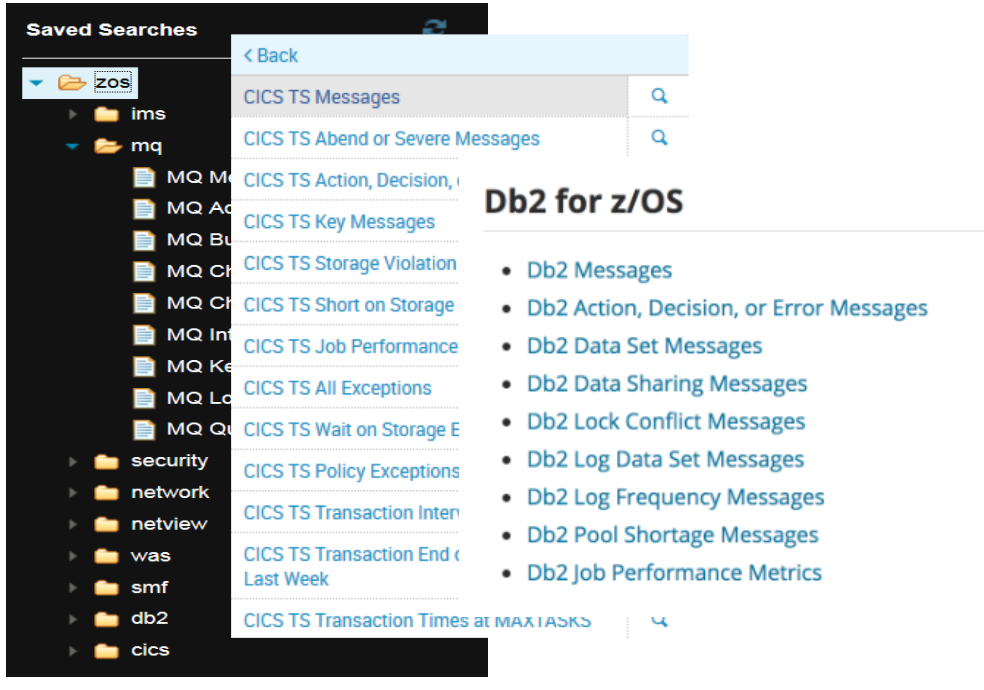
Dashboards and Searches
Insight into IBM Z Operational Data

Use out-of-the-box dashboards on IBM, Splunk and Elastic or build your own with a click of the mouse



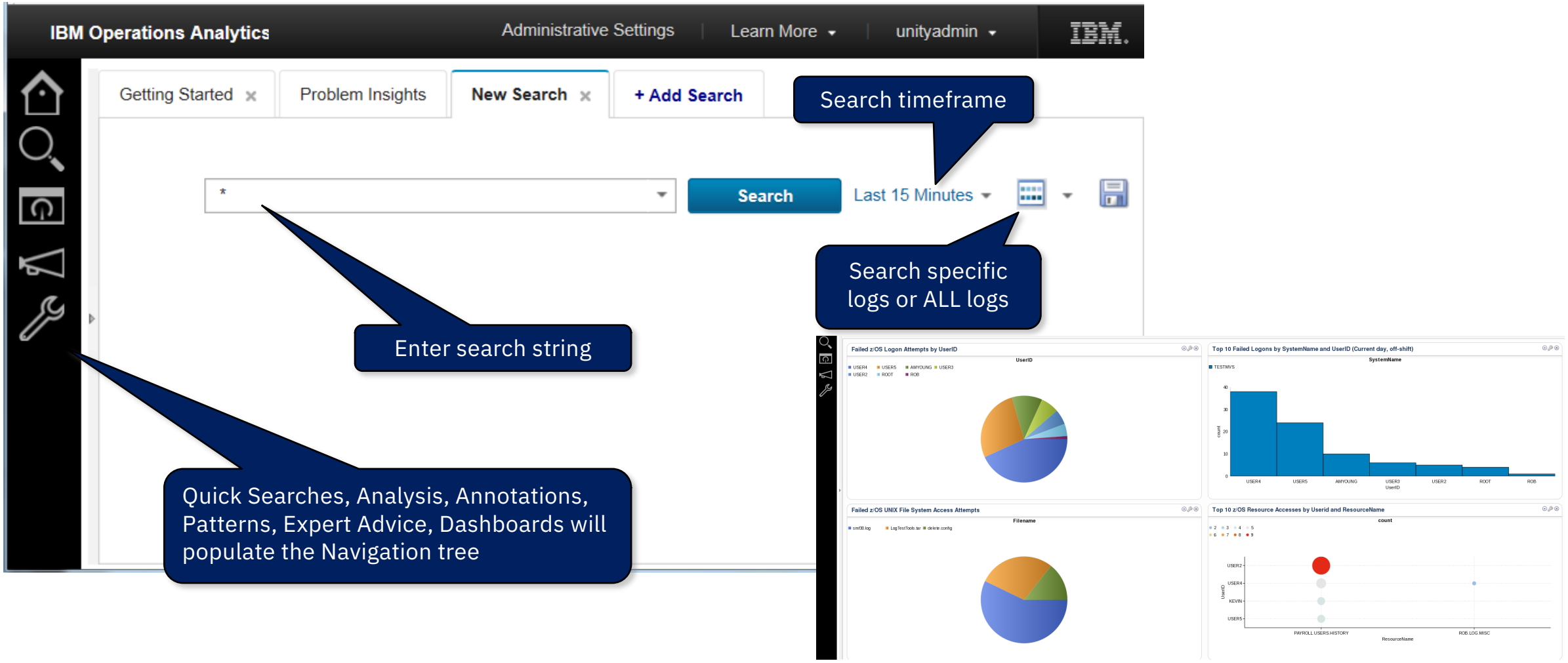
Domain-specific 'Quick Searches' available out-of-the-box

- Based on the combined experience of **subject matter experts, support teams and customers**.
- **Immediate value** out of the box.
- Easy to modify or create and **save your own**.



IZOA IBM Log Analysis
Simple Interface – Easy to Configure

Log data is analysed and insights are surfaced as you search
Find problems you didn't know existed



Success Story:
IT Operations Analytics for z Systems

GUIDE SHARE EUROPE UK REGION

Customer:
A large South American bank was able to reach new heights of service continuity by stopping IT performance issues in their tracks

Business Challenge:
A drop in service levels can lose the bank's customers, and incur fines from regulators. The bank **wanted better insight into IT performance** to help it stop issues in their tracks.

Transformation:
The customer is reaching new levels of service continuity with a powerful operations analytics solution, which enables the bank to **identify and resolve IT performance issues at speed and low effort**.

Results:

Reduces
risk by raising customer satisfaction levels and meeting regulatory requirements

Enhances
efficiency by notifying the right people when issues occur

Boosts
internal security by flagging up password attacks

"With help from IBM, we are taking an increasingly proactive approach to ensuring that nothing gets in the way of our service quality."

— Z Analyst

"It used to take up to 30 minutes to parse through logs looking for errors using command tools, now they just pop up on our screens automatically, in an easy-to-understand format."

— Z Analyst

Success Story:
IT Operations Analytics for z Systems

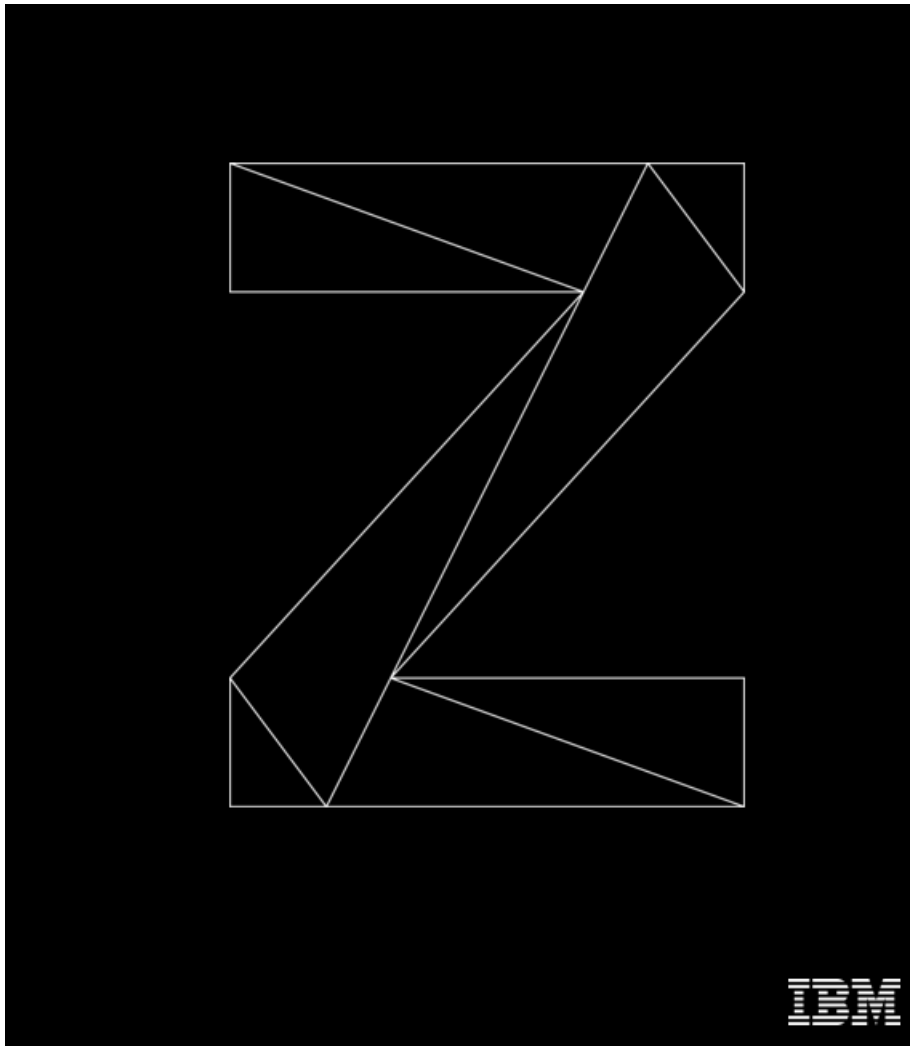
A large insurance company

(Problem Identification from 29 hours down to 29 minutes)

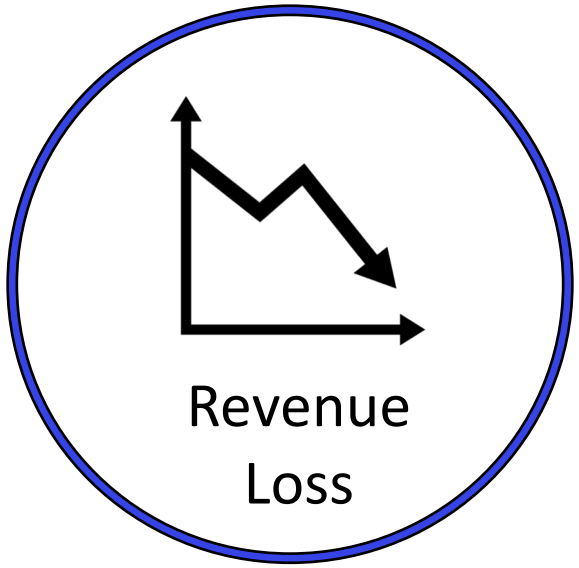
The Insurance company experienced an **application outage** that resulted in the team working around the clock for **29 hours**. Multiple customers and IBM support staff poured through logs and traces to determine the root cause of the issue.

After the issue was resolved, the logs were captured and sent to IBM lab for analysis using IBM Z Operations Analytics. **Within minutes**, the IBM team was able to focus in on the root cause of the problem and to find the relevant PTF to resolve the issue through the integrated expert advice.

Outages cost the business money, customers, and our reputation. I need help to **prevent outages** from occurring in the first place.



Cost of an Outage



Problem Analytics for your IBM Z

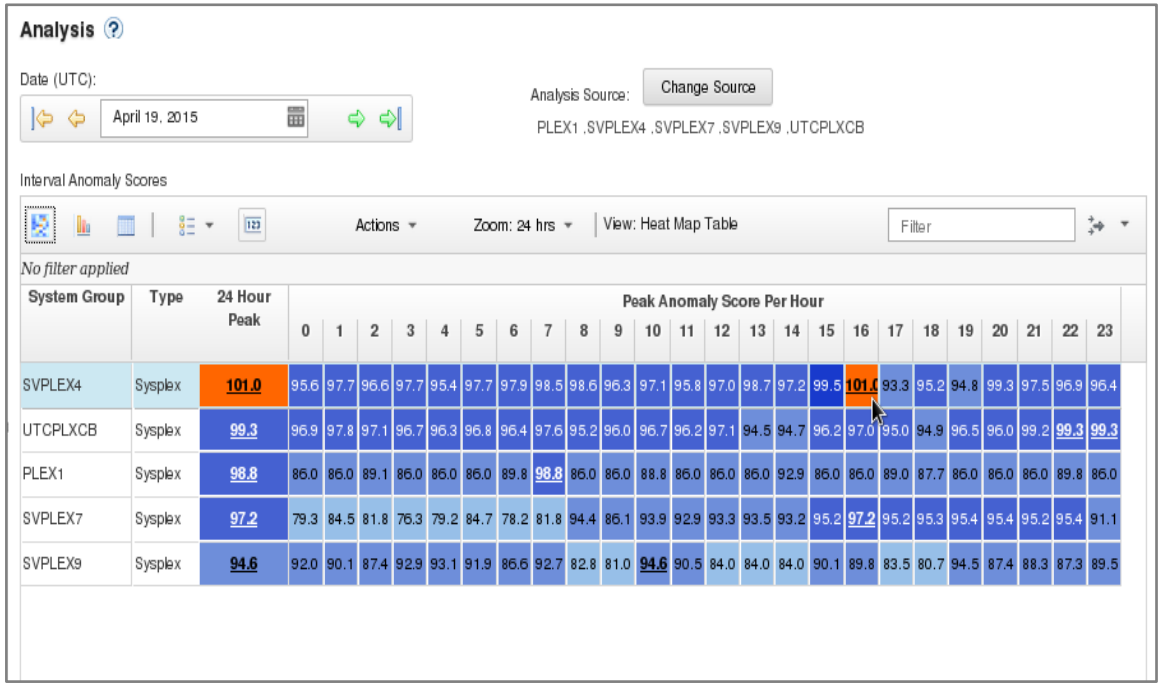
IBM Z Operations Analytics 3.2

GUIDE SHARE EUROPE UK REGION

zAware Message Based Anomaly Detection

IBM zAware software appliance

- **Anomaly** detection with z/OS and Linux for Z message logs
- Proactive outage avoidance with alerts for identified anomalies
- View the **history of an anomalous message** for faster problem resolution
- **Launch in context** into logs
- ***Improve problem determination intelligently*** *using anomaly detection on IT operational data for* ***better Mean Time to Recovery***



Rapid data analysis of large amounts of data

Visualize search results

Problem Insights speeds problem determination

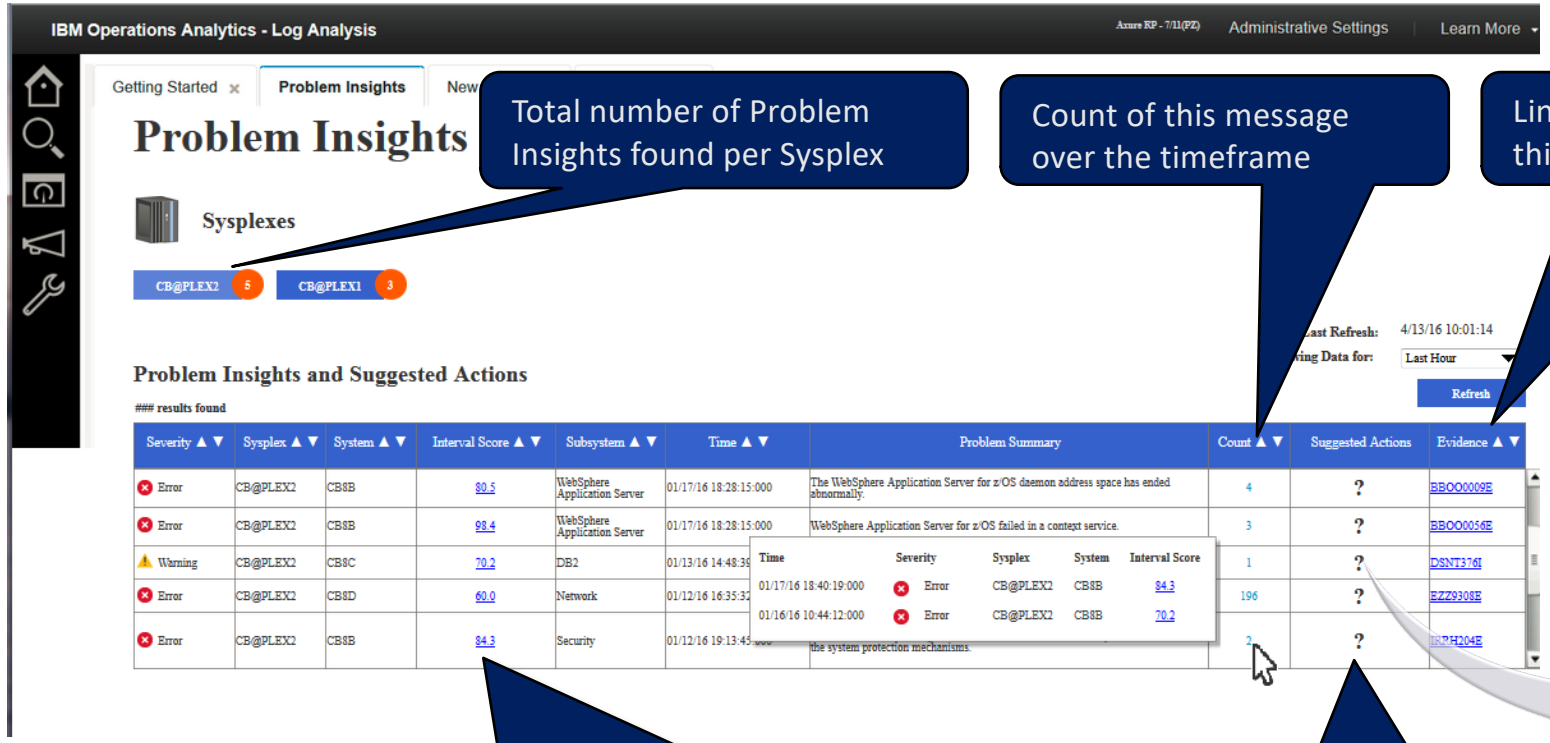
Launch in context into logs

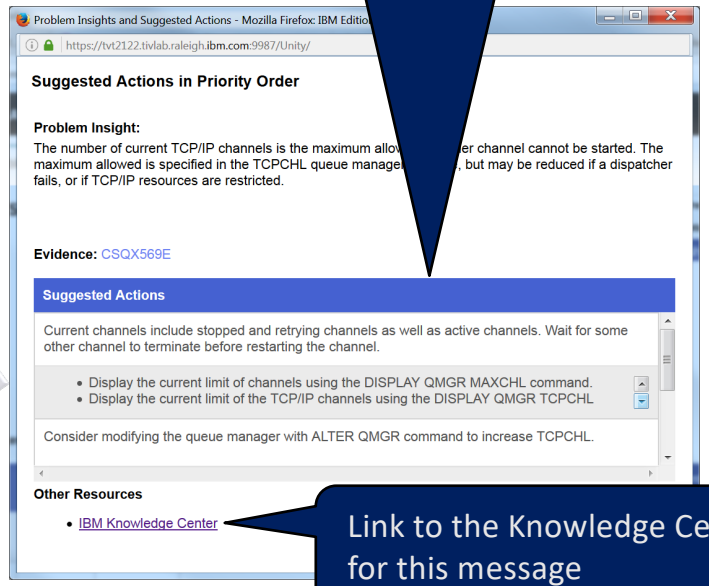
Expert advice and suggested actions

Faster mean time to recovery for outages

IBM IZOA Problem Insights

- **Automatically surfaces important messages** found in the log data
- Provides easy to read **problem summary** and **suggested actions** for problem resolution
- Displays Anomaly Interval scores from IBM zAware





Total number of Problem Insights found per Sysplex

Count of this message over the timeframe

Link to search for this message in this time period

Suggested Actions to investigate/resolve the issue

Interval Score column shows anomaly score for the last time the problem occurred on this system

Click to show the suggested actions for this message

Link to the Knowledge Center for this message

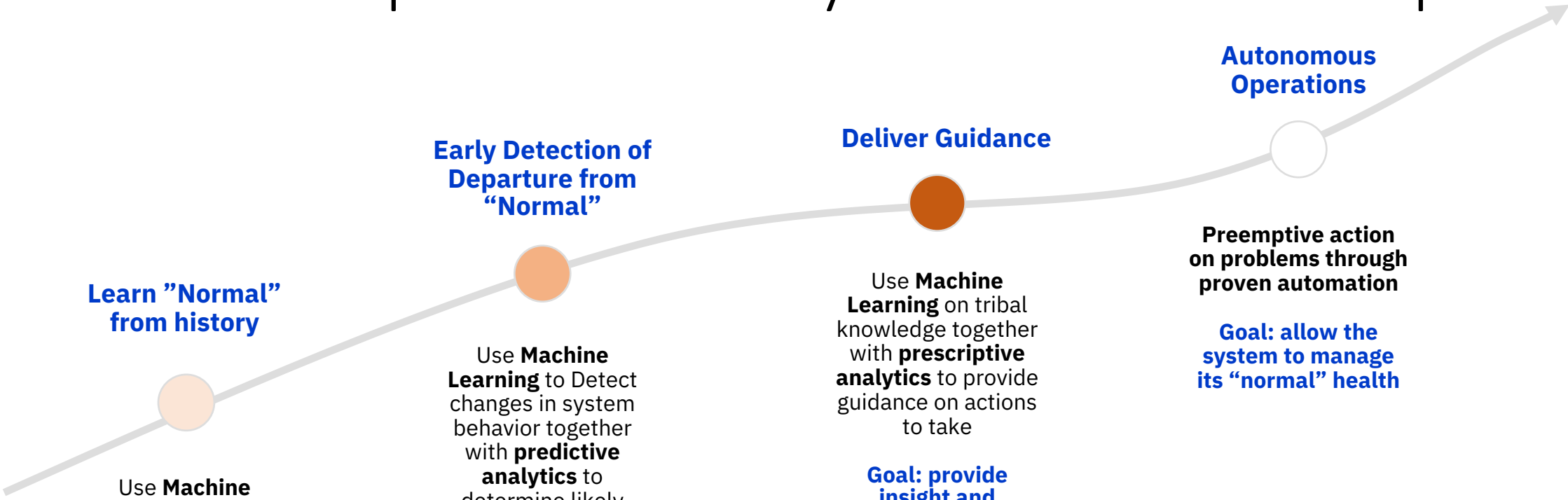
Statement of Direction: Embedding Machine Learning into IBM Z Operations Analytics

… IBM intends to continue enhancing the Problem Insight dashboard available in Z Operations Analytics to help organizations ensure their IT operations meet their business goals ...

… New insights are expected to advance the existing IBM System z Advanced Workload Analysis Reporter (IBM zAware) anomaly detection by leveraging new IBM Machine Learning for z/OS models and problem signatures based on IBM data science and expertise to forecast when system behavior may lead to broader user impacts and system outages.

Users can expect to be alerted to system behavior changes based on historical data trend analysis across multiple subsystems.

IBM Z Operations Analytics Vision Roadmap



Learn "Normal" from history

Use **Machine Learning** to Leverage historical normal system behavior to establish baseline

Early Detection of Departure from "Normal"

Use **Machine Learning** to Detect changes in system behavior together with **predictive analytics** to determine likely outcomes to alert operations for early intervention

Goal: Eliminate / Reduce Impact from service disruptions

Deliver Guidance

Use **Machine Learning** on tribal knowledge together with **prescriptive analytics** to provide guidance on actions to take

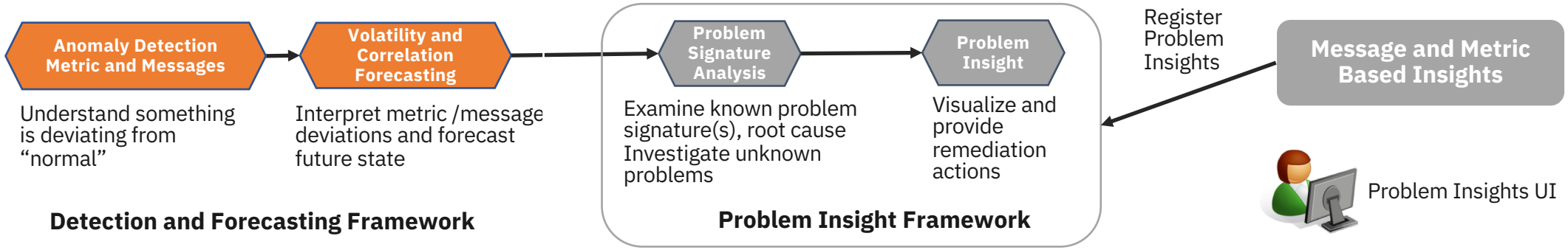
Goal: provide insight and recommend remediation

Autonomous Operations

Preemptive action on problems through proven automation

Goal: allow the system to manage its "normal" health

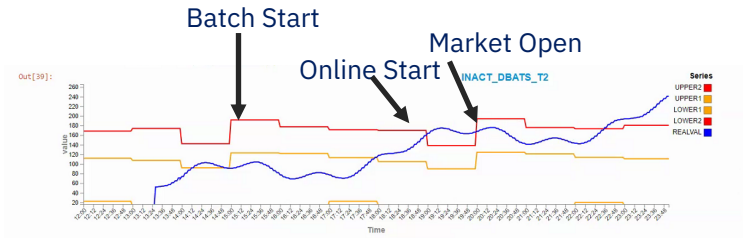
IZOA Problem Insights with Machine Learning



Detection

Identify a set of potential future problems triggered by a change in behavior

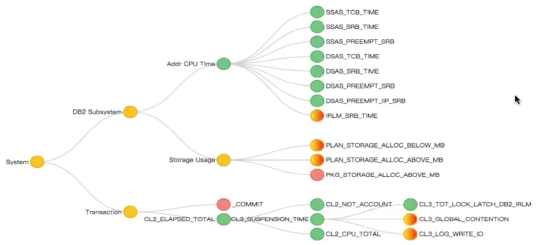
"something is different"
"some change is not normal"



Analysis

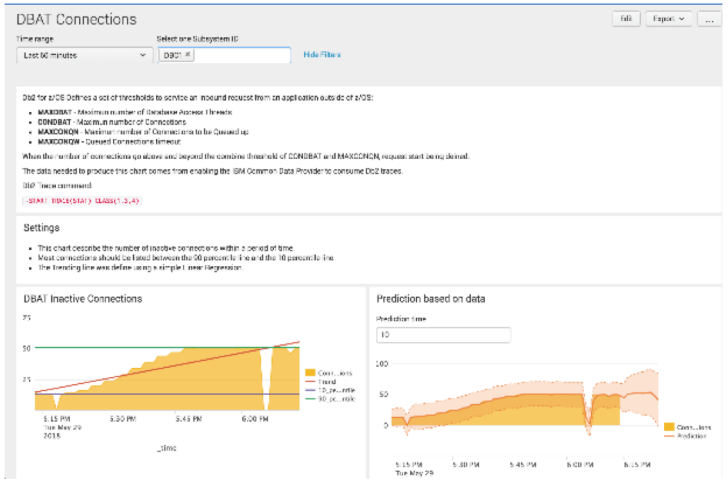
Identify specific problems – problem signatures using one or more detectors

"how does the change impact future state"
"context-aware problem signatures"

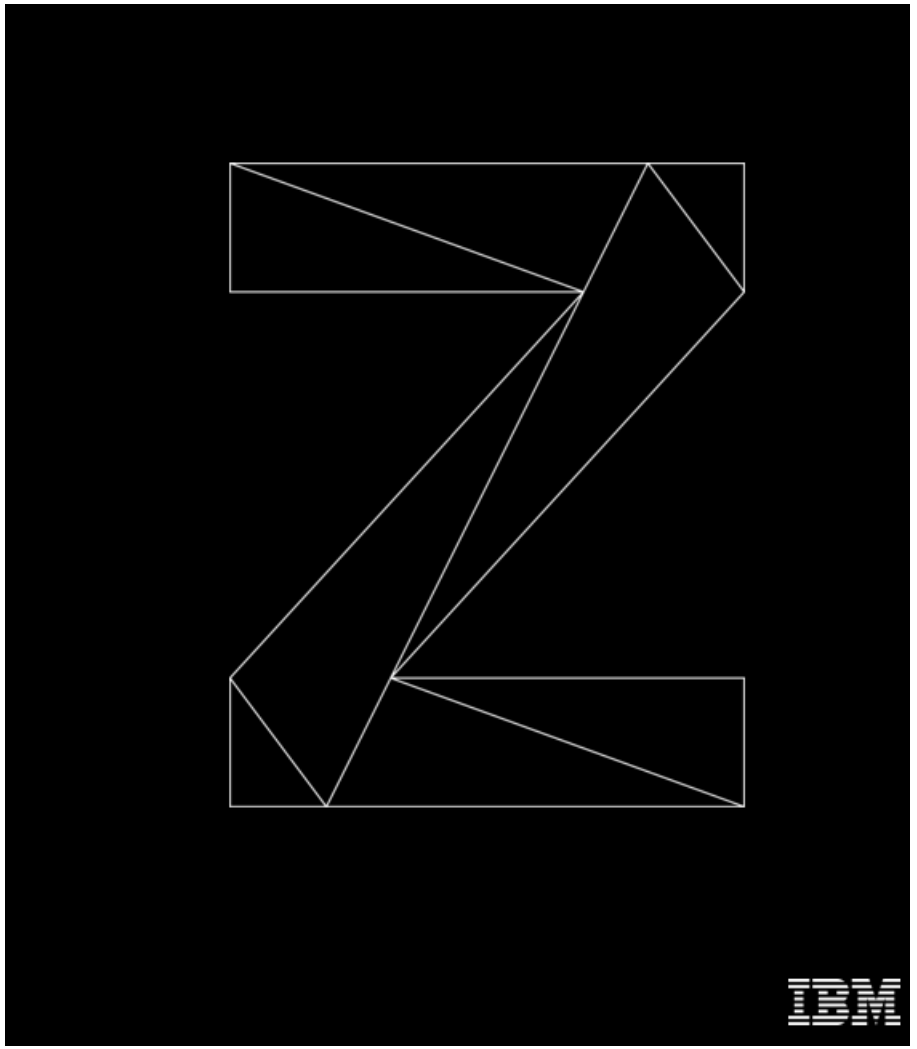


Problem Insights

Problem visualization, suggested actions, evidence



Workloads are always changing across the enterprise. I need to ensure proper **system performance and availability** to support our critical business applications.

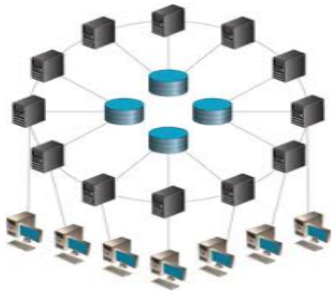


Business challenge:
Ensure system performance and availability

More and more **different systems** and **subsystems** contributes to the Enterprise System Health …

Mainframe

Distributed Systems



Windows

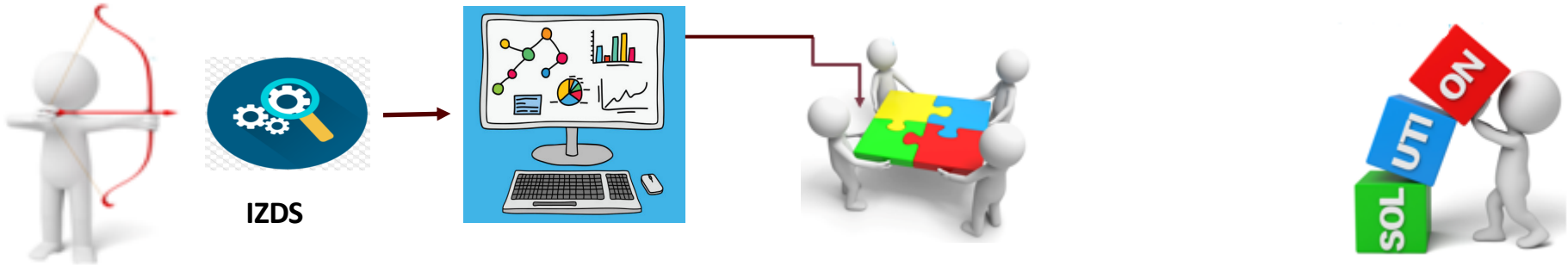
iSeries

Do more with Less

An incredible amount of "**different**" data available … for analysis

A lot of expertise is needed to **gain actionable insight** from all of these data

IBM Z Decision Support



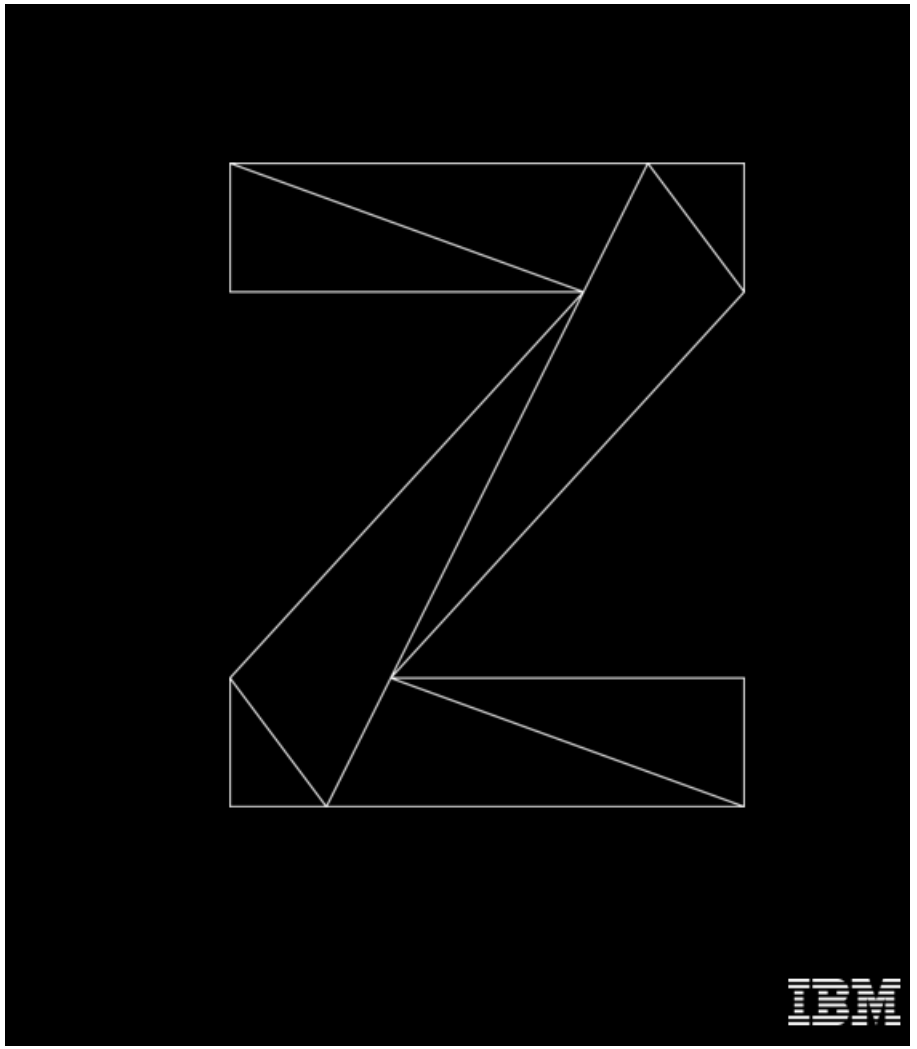
- Gain an **integrated enterprise view of operational data** to achieve business/IT alignment, increase IT efficiency, and reduce cost:
- Reduce time to key insights using **automated, real-time gathering and continuous curation** of SMF data to **report on today's data today**
  - Z IT Operational data: **CICS, IMS, DB2, MQ, RACF** and **all standard SMF** record types
  - **Windows, Unix/Linux Servers, iSeries** data collected
  - **1085** out of the box **reports**
- Convert transactional data to analytical data to **discover complex patterns** in high volumes of IT system availability and performance data: reduce time to value for **actionable insights** with IZDS Curated Content
  - **Drill down** and **Root cause analysis** abilities (**SMF timestamp-based data** for detailed analysis)
- **Exception reporting:** signals when pre-set **thresholds** are exceeded, **Exception Report** for daily system health check
- **Publish** IZDS summary records to **analytic platforms** help you analyze the data under **Splunk and ELK**

Learn more

"Conquer performance challenges with IBM Z Decision Support insight and analytics"

Session OL - Magny Cours, Wednesday: 12:00 – 13:00

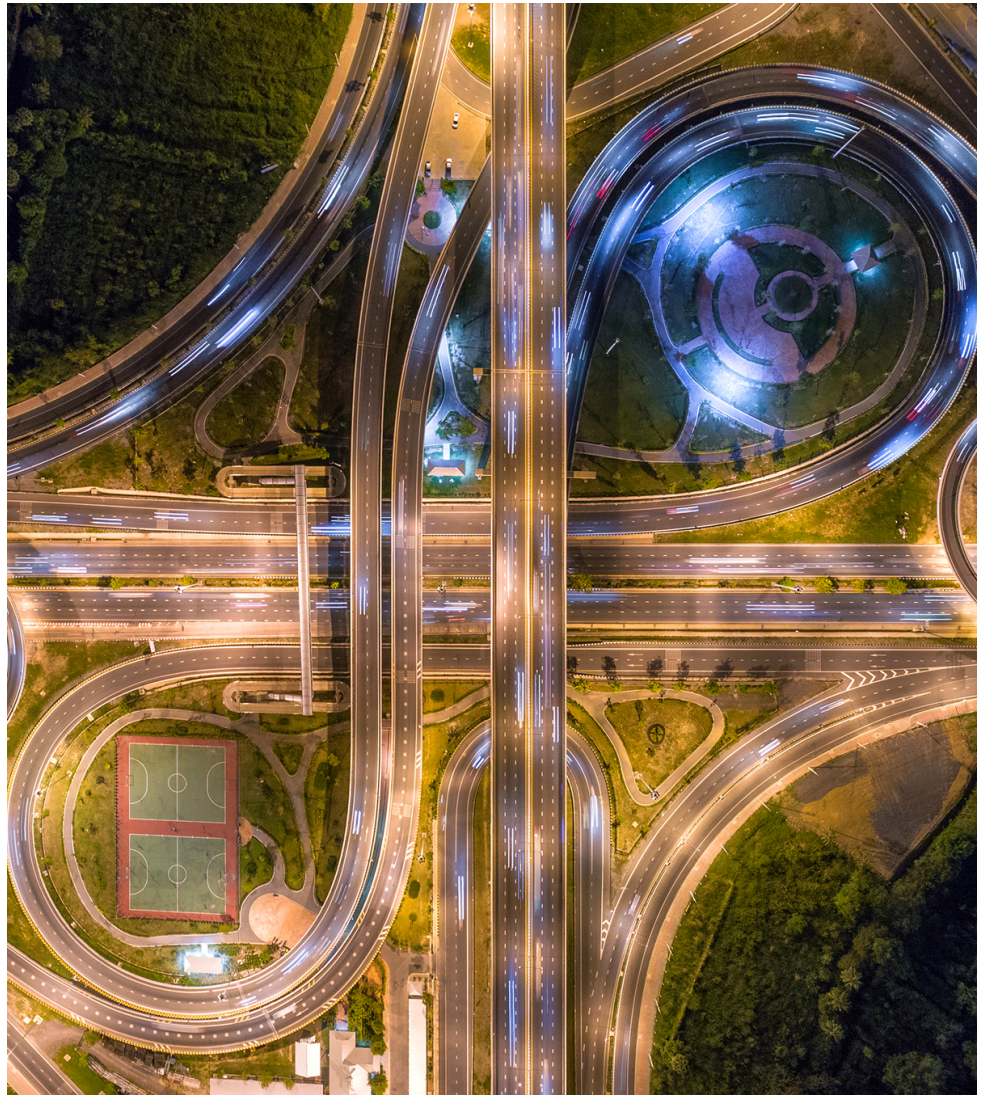
IT budgets are always becoming more constrained. I need to ensure **optimal utilization** of Z and make reliable plan for the future …



Business challenge: avoid future capacity issues

Maintain sufficient resources for an increasingly unpredictable workload

- **Access to insightful information** for managing workloads and problems is not timely
- **Capacity issues** need to be prevented before they happen to avoid business impacts
- **Predictive analysis** is needed to make resource upgrade decisions based on historical knowledge and business growth
- ‘Tribal knowledge’ is disappearing, elongating the time to identify and resolve problems



IBM Z Decision Support for Capacity Planning

The E2E solution for Capacity Management and Planning

- ***Baseline reports*** *on current/historical usage and trends*
- ***Predictive capabilities*** *based on historical data*
  - Forecasting of resource utilization (**CPU, Memory, DASD and Tape**)
  - Aggregation levels: **Hourly, Daily and Monthly**
  - Forecasting @ **CEC, LPAR, Workload and Application level**
  - Multiple statistical modelling available
- ***Predictive analysis***
  - Identification of **unusual usage patterns**, based on historic use
  - Reports to compare **actual vs forecast** resource utilization
- *Out-of-the-box* ***Capacity Planning reports*** *on and off-platform*
  - **Publish** summary records and forecast reports to **analytic platforms** like **Splunk and ELK**

Learn more

“How to perform Capacity Management and Planning on IBM Z”

Session OM - Magny Cours, Wednesday: 14:00 – 15:00

Further information

IBM Common Data Provider product page	ibm.biz/CDPzInfo
IBM Z Operations Analytics product page	ibm.biz/IZOAInfo
IBM Z Decision Support product page	ibm.biz/izdsinfo
IBM Z Decision Support for Capacity Planning product page	http://ibm.biz/CapPlanInfo
IBM Z APM Connect Product page	ibm.biz/ZAPMConnect
IBM Z ITSM Newsletter	ibm.biz/zITSMNewsletterSubscribe

Nathan Brice: NBRICE@uk.ibm.com
Domenico D'Alterio: ddalteri@it.ibm.com

We want your feedback!

- Please submit your feedback online at ….
  - ➢http://conferences.gse.org.uk/2018/feedback/oj

- Paper feedback forms are also available from the Chair person

- This session is OJ