IBM z Systems

z Systems Update

2015 Q1 z Software Announcements

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IBM

Agenda

- Z13 related announcements
  - z/OS V2.2
  - Compilers
  - Licensing
- z/Linux Patterns
- API Management
- Other z Systems announcements
  - CICS betas
  - Integration Business Suite V10
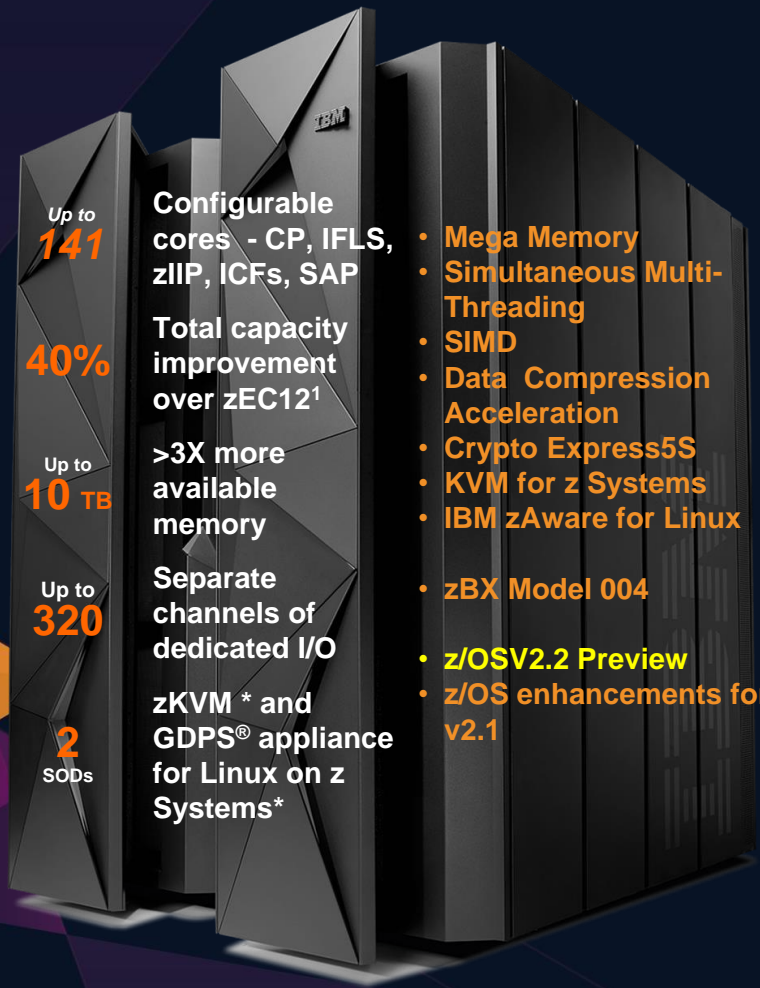 - SPSS Modeller 17

z13 Announcement Overview

Mobile

- Mobile Solution Kit
- IBM Mobile CoCs
- Enterprise Ready Mobile Apps
- US Mobile ISV partnership
- Enterprise Compilers
- UrbanCode™ 6.1.1
- CICS® TS v5.3 SOD
- Rational® Test Workbench 8.7
- Mobile Application Throw down
- BPM and Monitor v8.5.6 for Linux® on IBM z Systems™
- IBM Integration Bus v10
- IBM zSecure® Audit Reporting

Analytics

- IBM DB2® Analytics Accelerator v5 (SOD)
- CPLEX Optimizer for z/OS
- IBM DB2 BLU for zLinux
- InfoSphere® BigInsight™ Connector Technology (for Hadoop)
- IBM SmartCloud® Analytics + Log Analysis z/OS Insight Packs

Up to 141

40%

Up to 10 TB

Up to 320

2 SODs

Configurable cores - CP, IFLS, zIIP, ICFs, SAP

Total capacity improvement over zEC12[1]

>3X more available memory

Separate channels of dedicated I/O

zKVM * and GDPS® appliance for Linux on z Systems*

- **Mega Memory**
- **Simultaneous Multi-Threading**
- **SIMD**
- **Data Compression Acceleration**
- **Crypto Express5S**
- **KVM for z Systems**
- **IBM zAware for Linux**

- **zBX Model 004**

- **z/OSV2.2 Preview**
- **z/OS enhancements for v2.1**

Plus...
- New Workload Container Pricing
- zTPF Transformation Engine

Cloud

- Enterprise Cloud System v2
- Elastic Storage / GDPS virtual appliance for Linux (sod)
- BlueMix™ Catalog
- Cloud Patterns on zLinux
- Postgres, Docker
- Joint Development Agreements
- Managed Services Offerings (RD&T, CLM)
- Cloud Manager w Openstack® v4.2
- New cloud Workload Scheduler
- Optimized WebUI for z Systems

Skills

- Master the Mainframe Country Contests
- Master the Mainframe World Championship
- New Jobs Board/Connector

z/OS V2.2

A Trusted Platform with exceptional QoS to support analytics, cloud and mobile workloads for the new digital enterprise

z/OS V2 is designed to support the mobile generation

Driven by z/OS security, resiliency, improved economics

- Fortified security – encrypt up to 2X as fast with z13 CPACF
- Helps you pass audits. Digitally Signed SMF records to help meet compliance needs
- "Mobilize" z/OS through z/OS Connect to link Mobile or Cloud to back end z/OS
- Meet compliance and regulatory requirements with stronger encryption such as with RACF passwords
- Leverage secured communications on z and z/OS

z/OS V2 delivers a platform for analytics, data serving

Powered by data accelerators, compression, batch, networking

- Support for SIMD instructions available to drive new graphics and analytics apps, used by COBOL,C, C++ and Java V8
- Store up to 4X more data with zEDC now offering additional exploiters (DFSMS)
- Unleash the power of batch with JES 2 options, ad-hoc batch, deadline scheduling
- Drive prioritization and automation into the I/O Fabric, with Fabric Priority
- RoCE –now supports 31 z/OS images per card
- Granular VSAM record level sharing locks

z/OS V2 offers quality of service for a trusted cloud system

Fueled by server scale, simultaneous multithreading, large memory

- Up to 141 core support - 128 with SMT
- z/OS does not use SMT for GP processors
- Support many users, and workloads with 85 LPARs, a 40% increase
- zIIP performance capacity leverages the value of multithreading
- Envision new apps with Large memory (up to 4TB per LPAR)
- Huge scale -up to 1M JES2 jobs
- Comm Server 64 bit addressing mode for VSCR

With Improved Management and Economics Built in

- z/OSMF now included in the base
- Improved economics with MPO migration pricing option
- Mega memory pricing
- Drive huge mobile workloads economically with Mobile Workload Pricing

z/OS Management Facility
Extend Skills and Improve Quality of Administration

New!…z/OSMF Delivered as part of z/OS

- **z/OSMF … a base element of z/OS**
  - Included automatically for superior management and administration
  - Helps improve quality, self service, automation -- which means lower costs

- **Monitor Resources**
  - Retrieve historical performance data from Resource Monitoring as well as real time data; export data to a spreadsheet for further analysis

- **Manage capacity and workloads**
  - Support the provisioning of capacity based on overall CPC-wide utilization

- **z/OSMF workflow enhancements**
  - Migration Workflow for z/OS V2.2, simplifying migration
  - Use nested workflows for component based design and reuse
  - Support default values and automatic step execution

- **Manage problems across sysplexes**
  - View incidents across sysplexes and manage from a single point of control

- **Software Management enhancements**
  - Easier to add many non-SMP/E-managed data sets to a software instance to associate other files with the instance

"The IBM z/OS Management Facility is the most important new facility since the Workload Manager and Parallel Sysplex®. Every z/OS staff should be planning for their z/OSMF implementation now. This is a 'must have' for the system programmers of tomorrow (or even today)." Cheryl Watson, Watson and Walker Inc.

z/OS Management Facility
Visualization to Simplify Management

z/OSMF helps system programmers by simplifying day to day z/OS operations and administration

Interpret job output quickly
- z/OSMF Jobs REST API is designed to allow retrieval of *step-level* completion codes for granular management
- SDSF also to display batch job step-level completion codes so you can have more granular control over processing

Recent Enhancements

- **Bring the Power of SDSF to z/OSMF:**
  - View familiar SDSF displays in graph/text format
  - Work with jobs easily from an intuitive user interface
    - For instance, easily cancel a job
  - Show the largest consumers of CPU
  - Retrieve recent history of commands and responses
- **Improve productivity with a simple interface**
  - A simplified GUI for a rich user experience with new SDSF functions of ISPF and TSO/E
  - Improved usability with automation of workflow steps

A new UI for SDSF, a powerful tool you are already familiar with!
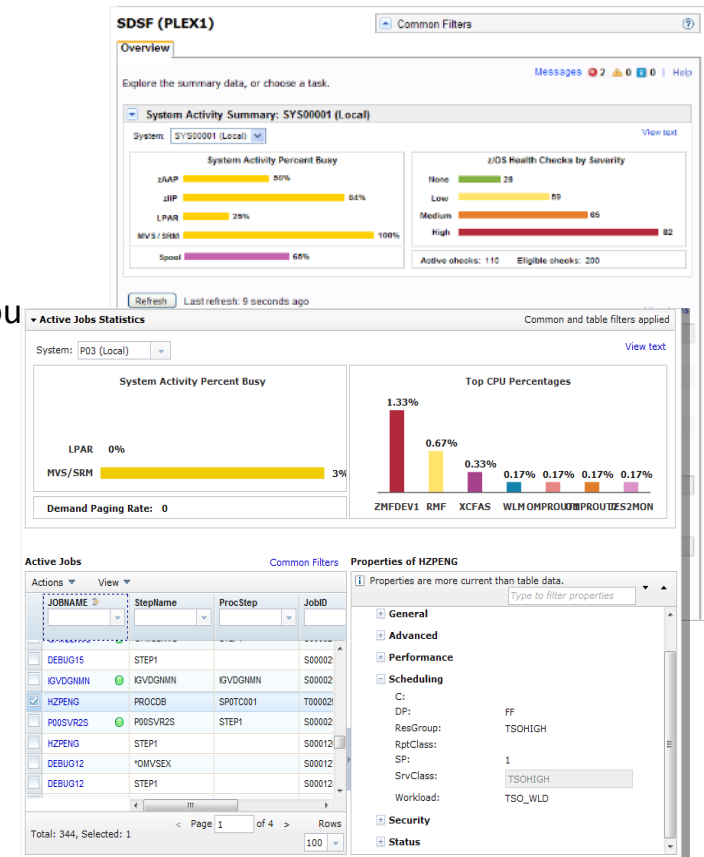
Shows jobs that are the largest consumers of CPU, as well as CPU busy

Select Enhancements Rolled Back
Refer to the Preview: z/OS V2.2 announcement letter

CORES

- z/OS V2.2 will be designed to support up to 141-way multiprocessing (SMP) in a single LPAR on IBM z13 systems, or up to 128 physical processors (256 logical processors) per LPAR in SMT mode. This support is also available for z/OS V2.1 with the PTFs for OA43366, OA43622, OA44101, and OA44439. z/OS V1.13 supports up to 100 processors configured in a single LPAR in non-SMT mode.

FLASHCOPY

- z/OS V2.2 DFSMS will be designed to provide new FlashCopy function by supporting up to 12 targets for incremental FlashCopy. This function is also available for z/OS V1.13 and z/OS V2.1 with the PTFs for APARs OA45412 and PI22256,

FABRIC IO PRIORITY

- I/O priority is set throughout much of the system by the I/O supervisor (IOS) and z/OS Workload Manager (WLM) components. This new function requires a z13 processor. It is planned to be available with z/OS V2.2 at its general availability and available for z/OS V1.13 and z/OS V2.1 with PTFs for APARs OA44529 and OA44431

FOUR SUBCHANNELS

- z/OS V2.2 is planned to support up to four subchannel sets on z13 server. All four subchannel sets support FICON and zHPF protocols. This support is also available on z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA43495

zHYPERWRITE

- IBM zHyperWrite is a new technology that combines DS8000 and z/OS enhancements that deliver performance benefits for writing operations to DB2 logs in the Metro Mirror (PPRC) environment. This new technology can help reduce up to 43% of the DB2 log write time2. zHyperWrite requires z/OS V2.1 with the PTF for APAR OA44973 or z/OS V2.2, either DB2 10 (5605-DB2) or DB2 11 (5615-DB2) with the PTF for PI25747, and an IBM DS8870 Storage

zEnterprise Data Compression (zEDC)

- z/OS V2.2 DFSMSdss and DFSMShsm are designed to exploit this capability for dumping and restoring data and whenDFSMShsm uses DFSMSdss to move data. These capabilities are also available on z/OS V2.1 with the PTF for APAR OA42243.

XMLSS SIMD

- z/OS V2.2 XML System Services is planned to use the new vector (SIMD) instructions available on z13 processors. This function, also available on z/OS V2.1 with the PTF for APAR OA44545, is intended to help improve performance for nonvalidating XML parsing.

4 SUBCHANNELS

- z/OS V2.2 is planned to support up to four subchannel sets on z13 servers. This support is also available on z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA43495.

SIMD

- z/OS V2.2 is planned to provide support for the new vector extension facility (SIMD) instructions available on z13 servers. This new support, also planned to be available for z/OS V2.1 with the PTFs for APARs OA43803 and PI12412

RACF ENCRYPTION

- RACF will offer better protection for offline attacks against encrypted passwords by allowing you to use stronger encryption. This support is also available in z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA43999.

- z/OS V2.2 running on z13 processors with IBM System Storage DS8000 series devices and a minimum MCL is planned to support a new *health check for FICON dynamic routing.* This support, also planned to be available for z/OS V1.13 and z/OS V2.1 with the PTF for APAR OA43308

ROCE

- z/OS V2.2 Communications Server is planned to support the new virtualization capability planned for the RDMA over Converged Ethernet (RoCE Express) features on z13 processors. The virtualization is planned to be available on z/OS V2.1 with the PTF for APARs OA44576 and PI12223 and the corresponding RMF support with the PTF OA44524

z/OS Support Summary
zOS provides significant durability for your hardware investments

Service Extension available												

z/OS	z890 z990	z9 EC Z9 BC	z10 EC™ z10 BC™	z196 z114	zBX	zEC12 zBC12	z13	DS8000 DS6000®	TS1140 TS7700	End of Service	Coexists with z/OS	Planned Ship Date[2]
R12	X	X	X	X	X	X	X	X	X	9/14[1]	V2R1	
R13	X	X	X	X	X	X	X	X	X	9/16[2]	V2R2[2]	
V2R1		X	X	X	X	X	X	X	X	2H18[2]	V2R3[2]	
V2R2[2]			X	X	X	X	X	X	X	2H20[2]	V2R4[2]	2H15[2]

1. Fee based extension available for defect support
2. All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Economics
z/OS Support Extends your Investments
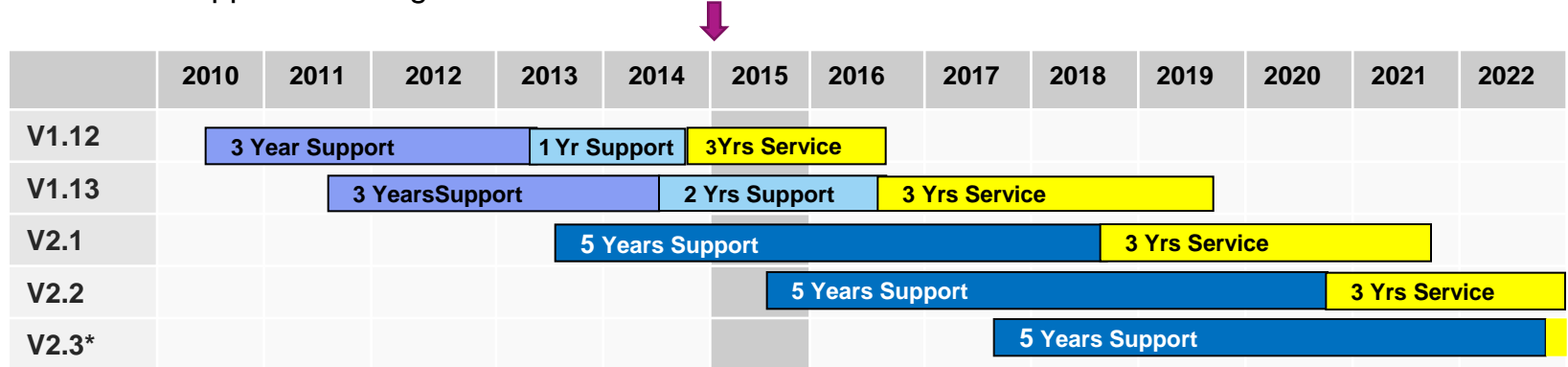*Protect and Extend your Investments with z/OS V2*

60% longer service and support period for z/OS Version 2 over z/OS Version 1

Service:

With z/OS V2, IBM plans to provide **5** years of z/OS support, with **3** years of optional fee-based extended service

z/OS V1policy is **3** years of support with a **2** year optional fee-based extended service

Support:

z/OS V2.1 is supported through **9/2018** to allow customers appropriate time to deploy new functions

z/OS V1.13 is now supported through **9/2016.**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
V1.12	3 Year Support				1 Yr Support	3Yrs Service							
V1.13		3 YearsSupport				2 Yrs Support	3 Yrs Service						
V2.1				5 Years Support					3 Yrs Service				
V2.2						5 Years Support					3 Yrs Service		
V2.3*								5 Years Support					

*Chart represents current IBM plans and are subject to change

Compilers exploitation of z13

C/C++

PL/1

COBOL

Java 8

z13

SMT

SIMD

CPAPF

New Instructions

IBM

IBM z13 – Taking Java Performance to the Next Level

Continued aggressive investment in Java on Z

Significant set of new hardware features tailored and co-designed with Java

Simultaneous Multi-Threading (SMT)

- *2x hardware threads/core for improved throughput*
- *Available on zIIPs and IFLs*

Single Instruction Multiple Data (SIMD)

- *Vector processing unit*
- *Accelerates loops and string operations*

Cryptographic Function (CPACF)

- **Improved performance of crypto co-processors**

New Instructions

- **Packed Decimal ⇔ Decimal Floating Point**
- **Load Immediate on Condition**
- **Load Logical and Zero Rightmost Byte**

New 5.0 GHz 8-Core Processor Chip

480Mb L4 cache to optimize for data serving

Up to **50%** improvement in throughput for generic applications

Up to **2X** improvement in throughput per core for security enabled applications

Deliver Value with Smarter Compilers-

Designed for Speed
Continued Modernization

✓ Dynamic XL C/C++ lets you use a single source file and select different levels of hardware architecture at runtime for more flexibility

✓ Optimize code with XL C/C++ support for the new z13 processor*, with new ARCH(11) and TUNE(11) parameters

✓ Improved compiler performance with SIMD

– COBOL V5.2 and XL C and C++ use SIMD for string operations.

– XML System Services use SIMD on z13 for character and string manipulation

Note: The C/C++function is also planned to be available in February 2015 for z/OS V2.1 XL C/C++ with a web deliverable

*Enterprise COBOL 5.2 provides up to **14%** reduction in CPU time for compute intensive batch COBOL programs executing on z13 compared to the same program compiled with the Enterprise COBOL 5.1 GA compiler executing on zEC12.**

*With recompilation of C and C++ modules on z13 you can achieve improved throughput to drive up to **17%** more work with the same capacity***

IBM z13 Systems Pricing Announcements
Extending software price/performance for the z13 …

- **IBM continues its strategy to enhance software price/performance for the latest hardware**
  - Announcing "Technology Update Pricing for z13" called TU3
  - Published exhibit of AWLC price reductions for z13, delivers 5% price/performance on average

Major new structural enhancements coming … formal announcements in 1H15

- **IBM Collocated Application Pricing (ICAP) -** Run your systems the way you want to run them

  - For new applications, workloads priced as if in a dedicated environment while technically integrated with other workloads
  - Applicable to new applications on all zEnterprise and later machines, z196 to z13
  - ICAP eligible applications will have no effect on the reported MSUs for other subcapacity middleware, and reduced impact on z/OS (adjusts MSUs like an offload engine, similar to Mobile Workload Pricing)
  - ICAP enhancement to MWRT subcapacity tool coming

- **Country Multiplex Pricing -** Evolution from Sysplex pricing, a shift to greater flexibility and simplicity

  - A Multiplex is the collection of all zEnterprise and later machines in a country, measured like one machine for software subcapacity reporting (new multiplex sub-capacity reporting tool coming)
  - Flexibility to move and run work anywhere with the elimination of Sysplex pricing rules
  - A new way of measuring and pricing MSUs, as opposed to aggregating under current rules
  - For anyone selecting Multiplex Pricing there will be a pricing transition, shifting to this model is about growth and flexibility going forward (baseline + growth)

Custom Patterns for Linux on z Systems

✓ *One dozen patterns covering 50% of Linux on z Systems portfolio revenue*

✓ *Clear commitment from IBM to pattern-enable middleware products for Linux on z Systems*

✓ *Organisations will be able to build out complex Cloud workload instances on z Systems in a fraction of the time*

Time Savings

Reduces multi-product deployment durations by up to 80%
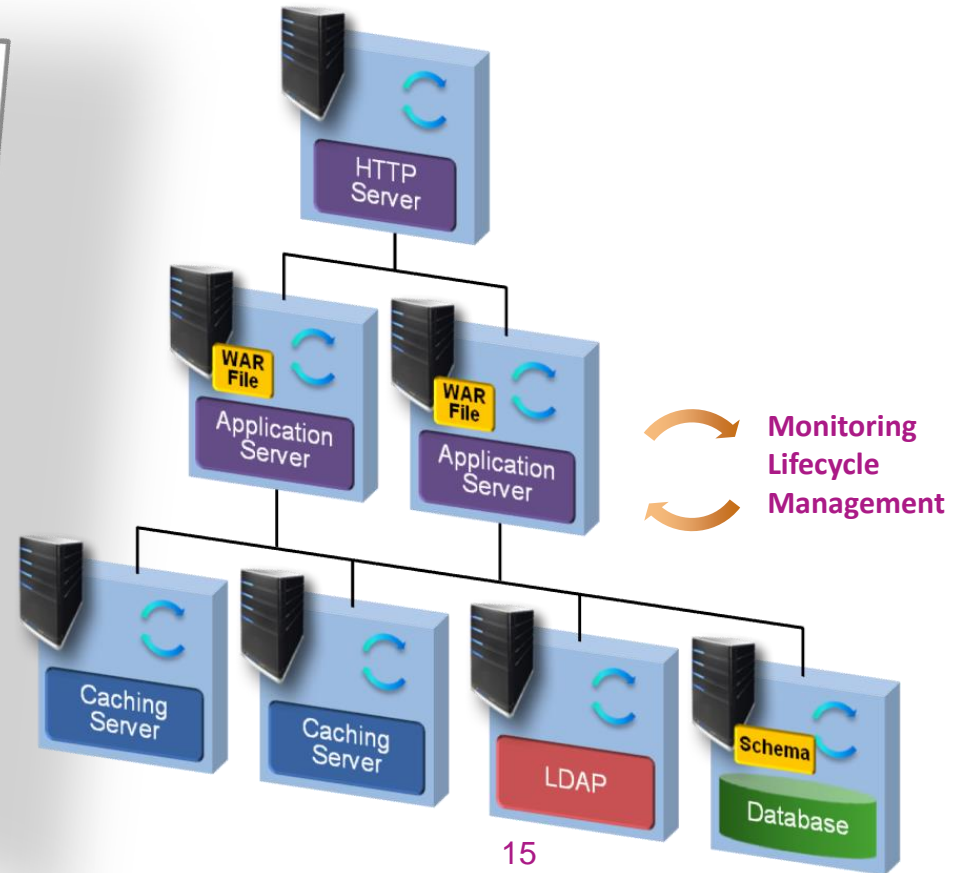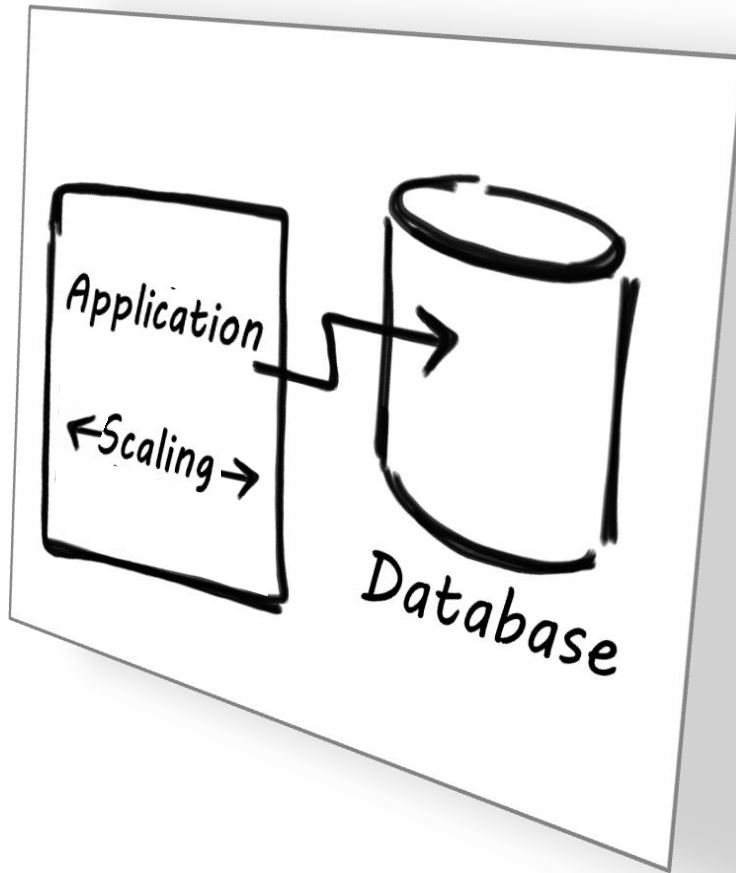
Reduces deployment error/fix durations

Quality and Efficiency

Reduces need for deep product skills

Improves quality of delivery

What the business wants…

What's required…

Monitoring
Lifecycle
Management

IBM Custom Patterns for Linux™ on z Systems™

- Dramatically accelerates infrastructure agility and time to value that leads to increased business agility.
- Helps reduce operating and capital expenses through accelerated deployment.
- Takes advantage of delivering an automated approach that helps to reduce errors and the need for specialized skills.
- Helps improve delivery quality by using proven deployment patterns combined with testing and validation.

- WebSphere Application Server Network Deployment V8.5.5 with Custom Pattern for Linux on z Systems
- WebSphere Application Server Liberty Core V8.5.5 with Custom Pattern for Linux on z Systems
- DB2 Enterprise Server Edition V10.5 with Custom Pattern for Linux on z Systems
- WebSphere MQ V8.0 with Custom Pattern for Linux on z Systems
- Integration Bus V9.0 with Custom Pattern for Linux on z Systems
- Decision Center V8.7 with Custom Pattern for Linux on z Systems
- Decision Server Advanced V8.7 with Custom Pattern for Linux on z Systems
- Process Center Advanced V8.5.5 with Custom Pattern for Linux on z Systems
- Process Server Advanced V8.5.5 with Custom Pattern for Linux on z Systems
- Business Monitor V8.5.5 with Custom Pattern for Linux on z Systems
- WebSphere Portal Server V8.5 with Custom Pattern for Linux on z Systems
- MobileFirst Platform Foundation V6.3 with Custom Pattern for Linux on z Systems

http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/9/872/ENUSAP15-0049/index.html&lang=en&request_locale=en

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APIs – the building blocks for apps
Application Programming Interface

The **"API economy"** has changed how developers think about building apps, and how organizations deploy software in the cloud

Many of the core business functions reside in z based services (CICS, IMS, WAS, TPF)

Bank Externalized Services

Examples across Industries
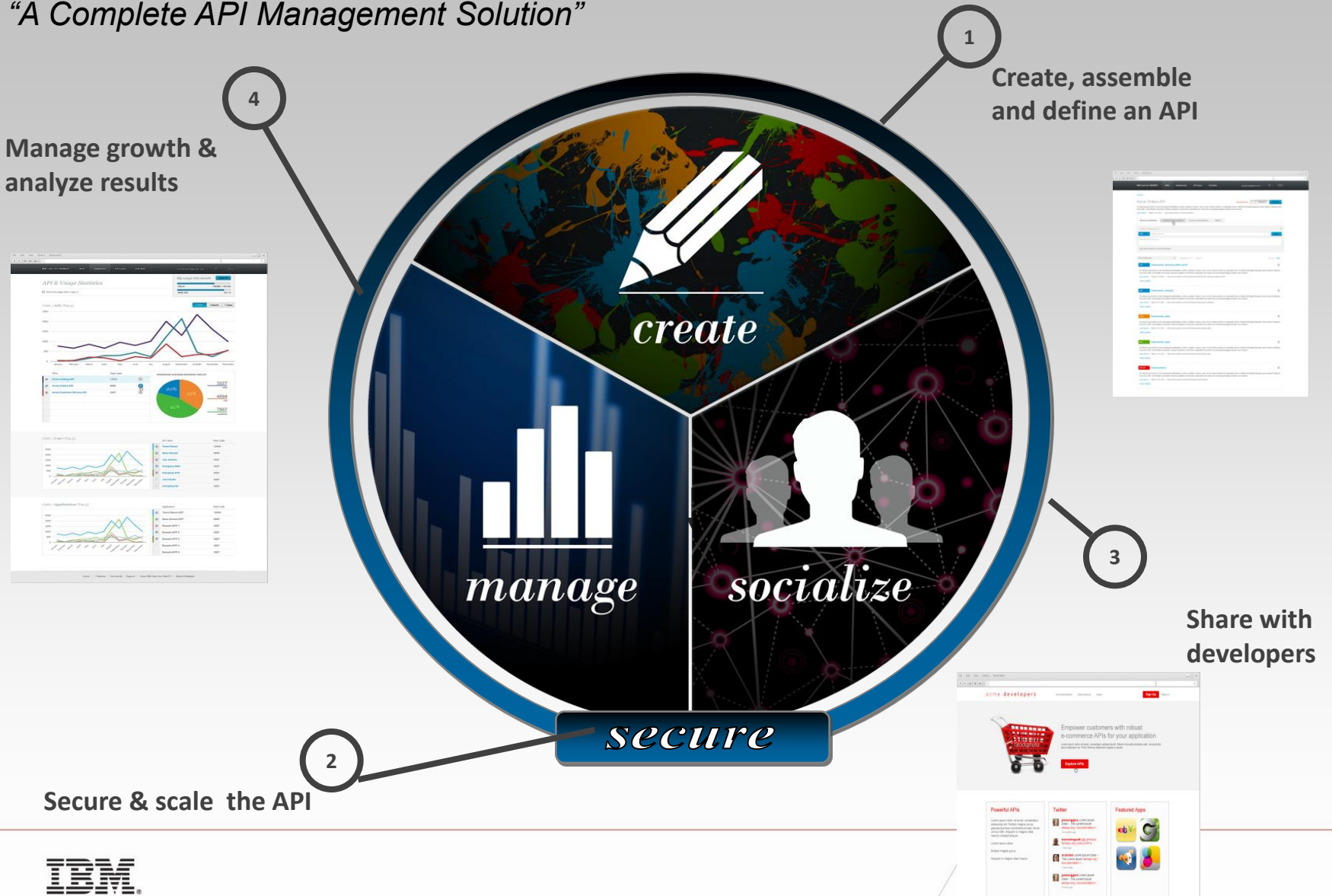- Quote interest rate and Loan application
- Checking room availability and reservation
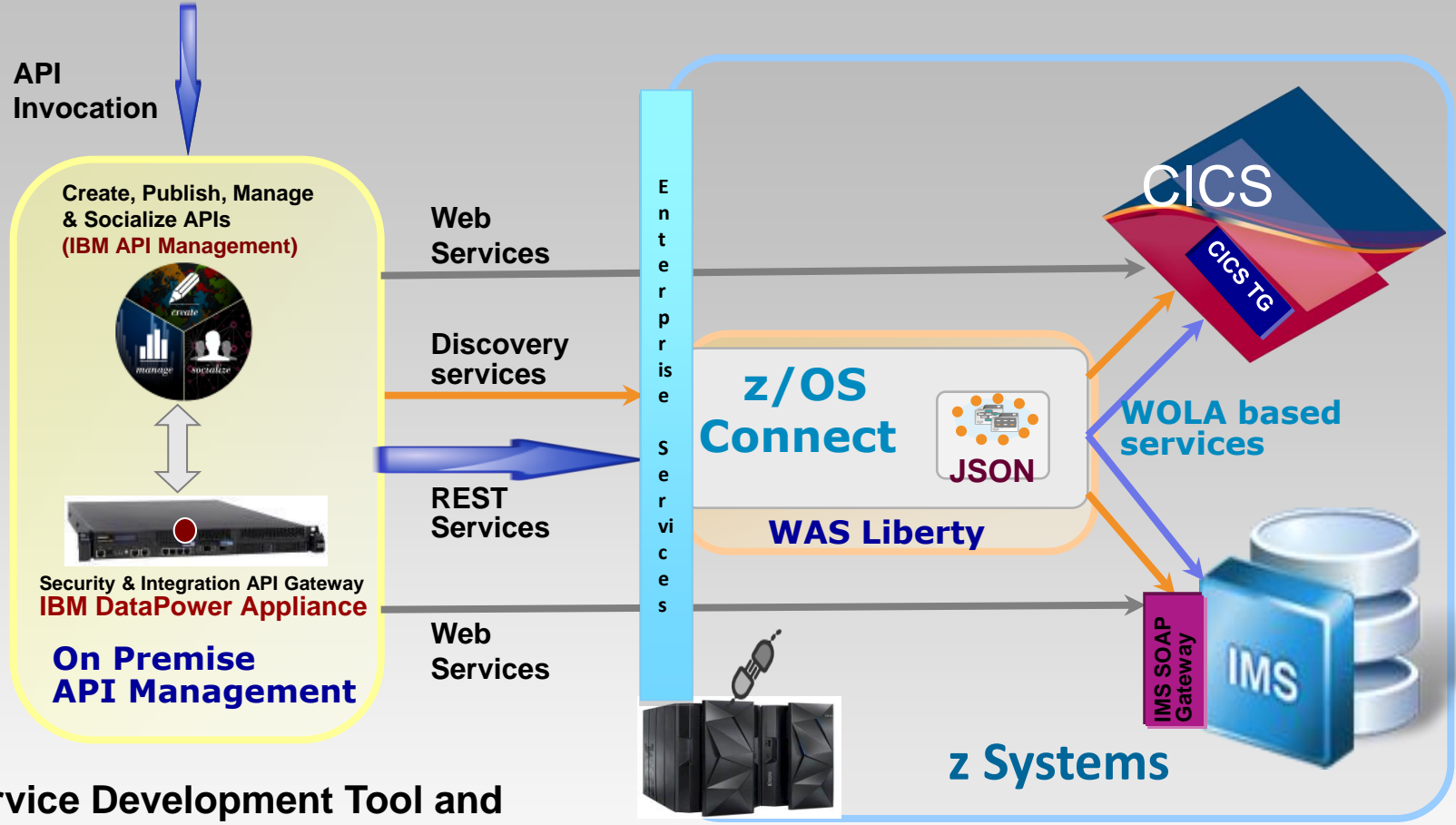- Looking up an item at a store location and purchase

Bank APIs

Mortgage
Online Payment
Loans
Account Query
Calculators

Developers

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Introducing IBM API Management:
"A Complete API Management Solution"

1

Create, assemble and define an API

4

Manage growth & analyze results

create

manage   socialize

secure

3

Share with developers

2

Secure & scale the API

Discovery and invocation of z Systems based Services

API Invocation

Create, Publish, Manage & Socialize APIs
(IBM API Management)

Security & Integration API Gateway
IBM DataPower Appliance

On Premise API Management

Web Services

Discovery services

REST Services

Web Services

Enterprise Services

z/OS Connect
JSON
WAS Liberty

CICS
CICS TG

WOLA based services

IMS SOAP Gateway
IMS

z Systems

Service Development Tool and Enablement Runtimes

- ❑ **Web Services**
  CICS and IMS provides separate tools and runtimes; TPF provides runtime libraries

- ❑ **REST/JSON**
  CICS and IMS use common z/OS Connect runtime

Discovery of z Services for API Development

1. *Get a list of deployed services* (Service Identification)
   - *Filter based on technical and business service attributes*
2. *Get schema for a specific service* (API Definition)
3. *Get additional deployment details for a service* (API Assembly)
   - *e.g., security protocol support, invocation uri*

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CICS Open Betas

CICS TS V5.3
- Service agility. Enhanced support for Java and Liberty profile
- Operational efficiency. Performance, enhanced metrics, and additional security.
- Cloud with DevOps. Introduces new cloud and DevOps support to automate CICS deployments.

CICS Operational Insights
- CICS OI is a new service that is designed to provide insights into potential improvements to your CICS environment. This cloud-based service offering uses operational data securely provided by the user. A web interface provides access to insights generated from their data that highlight areas of potential improvement, such as showing CPU savings by implementing thread-safety for CICS transactions.

CICS Transaction Gateway V9.2
- CICS Intercept plug-in, which provides powerful capabilities for continuous integration testing for JSON web services and all remote CICS TG applications.
- Supports the CICS TS V5.3 open beta offering.

CICS Operational Insights Open Beta

- New Cloud based Service to identify opportunities to tune your CICS

- Understand your operational characteristics to target improvements

- Upload a snapshot of operational data and get a Threadsafe Assessment (more insights to follow)

- Threadsafe can help you get more efficient and save money

- Free of charge during open beta
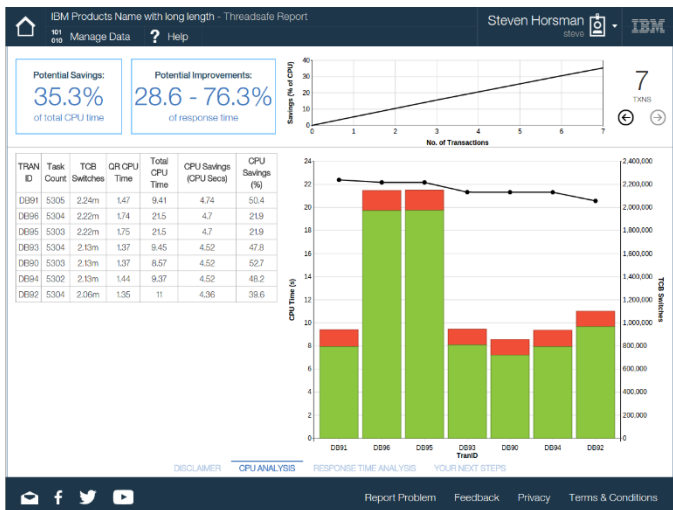
Generally available February 23

Try it out at
https://cicsoi.mybluemix.net/

Have your say on new insights on
https://ibm.biz/cicsoi-forum

IBM Integration Bus for z/OS V10

Flexible interactions with IBM WebSphere® MQ that extend support to offer connections to multiple local queue managers when getting and putting messages.

Easier administration by using the Integration Bus for z/OS web-browser user interface, which includes new capabilities for deployment, creating, editing, and attaching policy documents.

Enhanced functionality for integrating applications both on-premise and in the cloud, which include REST APIs, Graphical Data Mapper and Data Format Description Language (DFDL) improvements, and support for MQ Telemetry Transport messages.
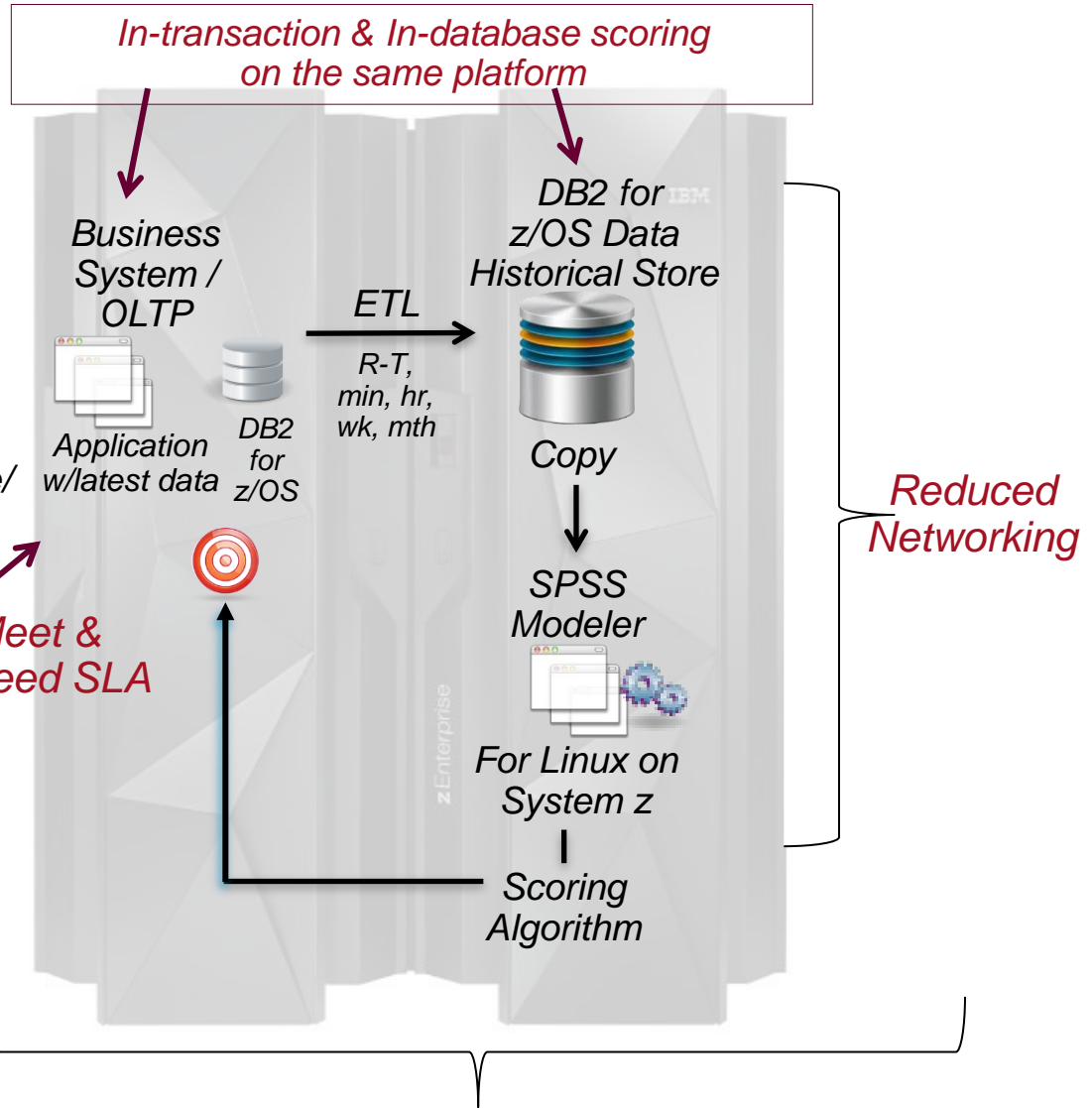
SPSS Modeller 17

In-transaction & In-database scoring on the same platform

Business System / OLTP

Data In

ETL

R-T, min, hr, wk, mth

DB2 for z/OS Data Historical Store

Real-Time Score/ Decision Out

Application w/latest data

DB2 for z/OS

Copy

SPSS Modeler

Meet & Exceed SLA

For Linux on System z

Reduced Networking

Scoring Algorithm
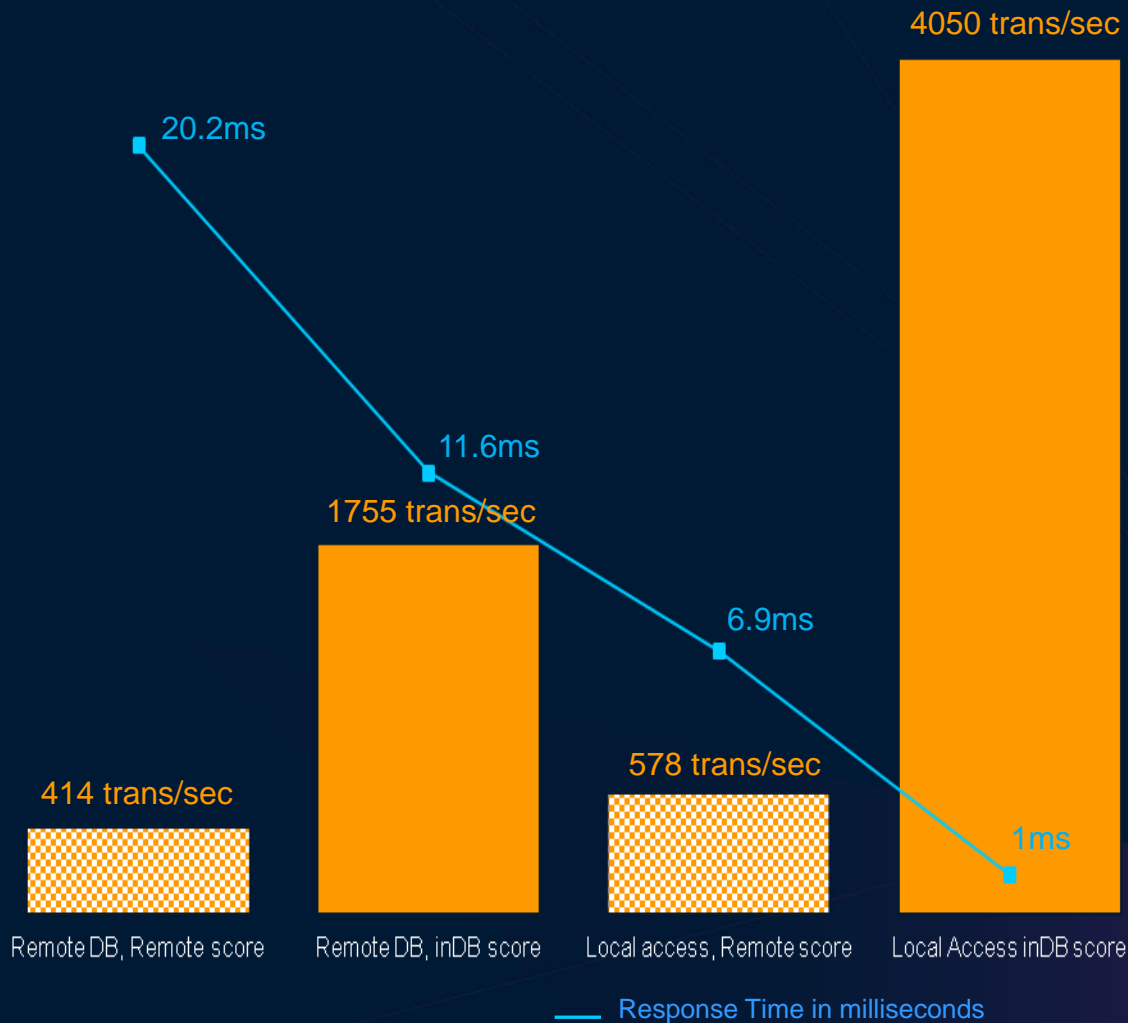
Highlights of SPSS Modeler V17.0 :

- Expanded big data analytics

- Geospatial analytics

- Deeper embedded analytics

- Flexible deployment

Consolidates Resources

In-transaction analytics scoring performance

Remote scoring vs UDF in Database scoring

4050 trans/sec

20.2ms

11.6ms

1755 trans/sec

6.9ms

578 trans/sec

414 trans/sec

1ms

Remote DB, Remote score   Remote DB, inDB score   Local access, Remote score   Local Access inDB score

—— Response Time in milliseconds

DB2 on z/OS
z196 LPAR with 2 CPs

SPSS
Linux on z
z196 LPAR with 2 IFL

- Measurements optimized for maximum throughput on fully utilized system.

- Response times include full transaction with multiple DB accesses

IBM z Systems