zPL3046 – IBM z/VSE Trends and Directions

Klaus Goebel
z/VSE Systems Manager
IBM Research & Development, Boeblingen, Germany

2015

IBM Systems Technical University

IBM z Systems • IBM Power Systems • IBM Storage

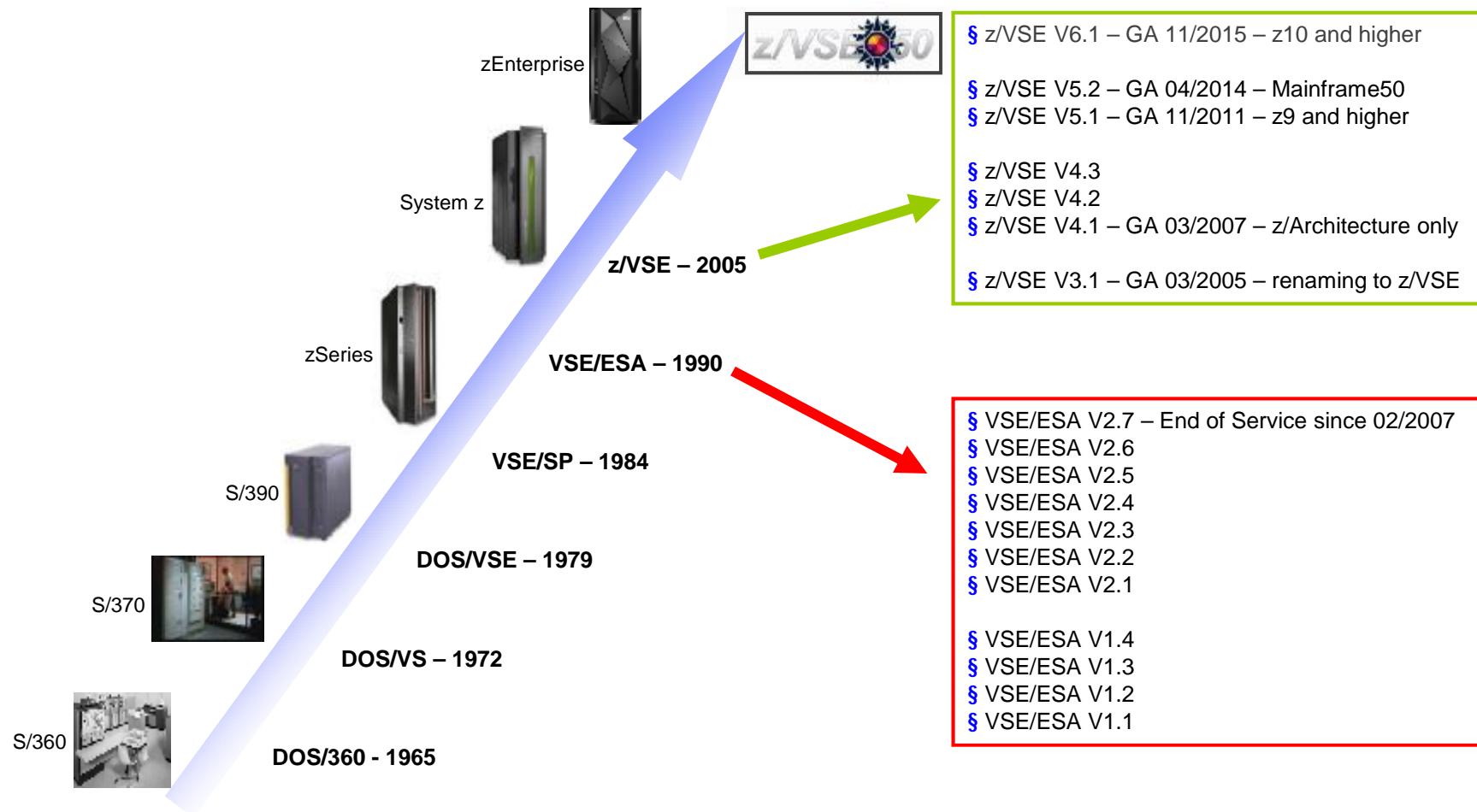October 5–9 | Hilton Orlando, Florida

Agenda

- **z/VSE Status & Support**

- **z/VSE Strategy & Modernization**

- **z/VSE Reference Customers & Learning**

- **z/VSE Functional Enhancements**
  - **z/VSE V5.2**
  - **z/VSE V6.1**

- **Wrap-up**

The cat turned 50 !

From DOS/360 to z/VSE – Still going strong!

zEnterprise

z/VSE V6.1 – GA 11/2015 – z10 and higher

System z

§ z/VSE V5.2 – GA 04/2014 – Mainframe50
§ z/VSE V5.1 – GA 11/2011 – z9 and higher

§ z/VSE V4.3
§ z/VSE V4.2
§ z/VSE V4.1 – GA 03/2007 – z/Architecture only

zSeries

z/VSE – 2005

§ z/VSE V3.1 – GA 03/2005 – renaming to z/VSE

VSE/ESA – 1990

VSE/SP – 1984

S/390

§ VSE/ESA V2.7 – End of Service since 02/2007
§ VSE/ESA V2.6
§ VSE/ESA V2.5
§ VSE/ESA V2.4
§ VSE/ESA V2.3
§ VSE/ESA V2.2
§ VSE/ESA V2.1

DOS/VSE – 1979

S/370

§ VSE/ESA V1.4
§ VSE/ESA V1.3
§ VSE/ESA V1.2
§ VSE/ESA V1.1

DOS/VS – 1972

S/360

DOS/360 - 1965

§ **Traditional mainframe operating system with mostly homegrown core applications.**

z/VSE software support status (as of Oct 2015)

VSE Version and Release	Marketed	Supported	End of Support
z/VSE V5.2 requires z9 or newer system	**a**	**a**	**tbd**
z/VSE V5.1 requires z9 or newer system	**r**	**a**	**06/30/2016**
z/VSE V4.3 requires z900 or newer system	**r**	**r**	10/31/2014
z/VSE V4.2 incl CICS/VSE V2.3, DL/I V1.11	**r**	**r**	10/31/2012
z/VSE V4.1[2]	**r**	**r**	04/30/2011
z/VSE V3.1[1]	**r**	**r**	07/31/2009
VSE/ESA V2.7	**r**	**r**	02/28/2007

[1] z/VSE V3 is 31-bit mode only. It does not implement z/Architecture, and specifically does not implement 64-bit mode capabilities. z/VSE is designed to exploit select features of IBM System z10, System z9, and zSeries hardware.
[2] z/VSE V4 is designed to exploit 64-bit real memory addressing, but will not support 64-bit virtual memory addressing

z/VSE hardware support status (as of Oct 2015)

IBM z Systems	z/VSE V6.1 (planned)	z/VSE V5.2	z/VSE V5.1	z/VSE V4.3 (EoS)	z/VSE V4.2 (EoS)
IBM z13	a	a	a	a	a
IBM zEnterprise EC12 & BC12	a	a	a	a	a
IBM zEnterprise 196 & 114	a	a	a	a	a
IBM System z10 EC & z10 BC	a	a	a	a	a
IBM System z9 EC & z9 BC	r	a	a	a	a
IBM eServer zSeries 990 & 890	r	r	r	a	a
IBM eServer zSeries 900 & 800	r	r	r	a	a

z/VSE on IBM z13

§ **IBM z13 Toleration / Exploitation:**

– Together with the **GA of z13** we delivered toleration **PTFs for z/VSE 5.1 and 5.2**

– z/VSE
  • can run in **more LPARs (85)**
  • supports **new Crypto Express5S** in coprocessor and accelerator mode
  • supports **more than 16 domains** with the new Crypto Express5S
  • supports **new FICON Express16S**

    FICON-attached devices

    FCP-attached SCSI disks
  • supports existing **OSA Express4S and 5S**
  • supports **newest version of SCRT**

z/VSE support of IBM zEnterprise EC12 and BC12

§ **z/VSE Release Support**

– z/VSE supports the zEC12 and zBC12 with z/VSE V4.3,
z/VSE V5.1 and V5.2

  • No PTFs are required
  • For IOCP, EREP and HLASM PTFs, see PSP (subset
    2827/ZVSE of 2827DEVICE, or subset 2828/ZVSE of
    2828DEVICE, respectively)

§ **OSA-Express5s 1000BASE-T – new with zBC12**

– No z/VSE PTF required

  • 1000BASE-T supported with existing z/VSE functionality
  • Allow to configure OSA-Express5S with OSA/SF in HMC

§ **Configurable Crypto Express4s – new with zEC12**

– z/VSE toleration PTF required to use Crypto Express4s

  • Toleration PTF (DY47414) provided for z/VSE V5 only

– Crypto Express4s supported with existing z/VSE
cryptographic functionality

  • Supported modes: (CCA) coprocessor and accelerator
  • PKCS #11 (EP11) coprocessor not supported
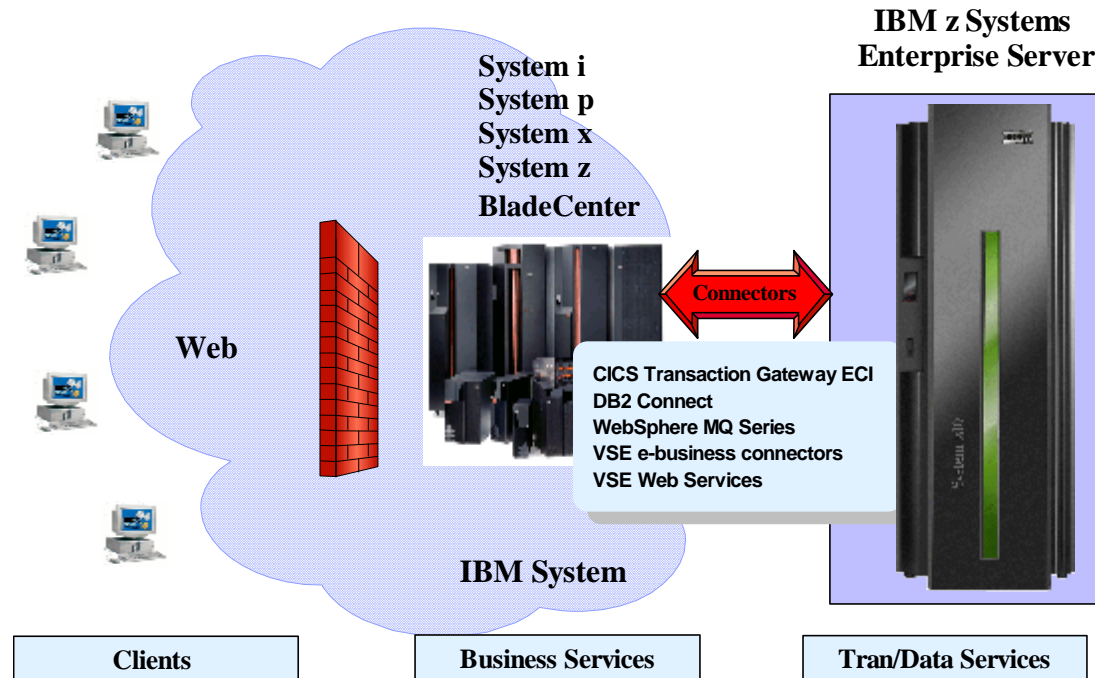
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z/VSE strategy – invented in Year 2000, still valid today and into the future

alias

§ 3-tier Strategy

§ Hybrid Strategy

§ Connector Strategy

§ Migration Strategy

§ Coexistence Strategy

§ Linux Surround Strategy

§ **PIE Strategy**

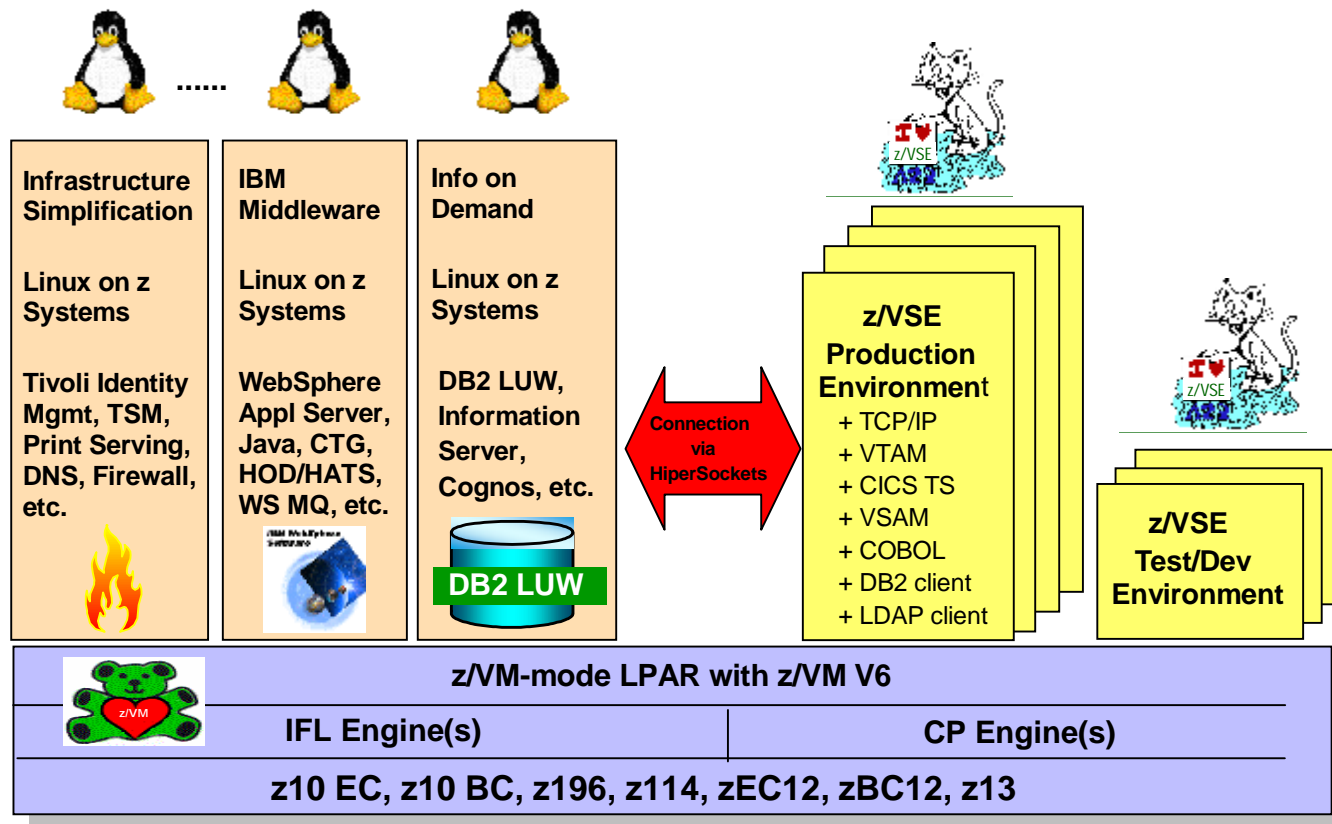**IBM z Systems Enterprise Server**

System i
System p
System x
System z
BladeCenter

Web

Connectors

CICS Transaction Gateway ECI
DB2 Connect
WebSphere MQ Series
VSE e-business connectors
VSE Web Services

IBM System

Clients	Business Services	Tran/Data Services

Protect existing z/VSE investments

Integrate using middleware and z/VSE connectors

Extend with another platform to access new applications & solutions

z/VSE strategy with Linux on z Systems

Hybrid Environment leveraging z/VSE, z/VM, and Linux on z Systems

Protect existing z/VSE investments

Integrate using middleware and z/VSE connectors

Extend with Linux on IBM z Systems technology & solutions

Infrastructure Simplification

Linux on z Systems

Tivoli Identity Mgmt, TSM, Print Serving, DNS, Firewall, etc.

IBM Middleware

Linux on z Systems

WebSphere Appl Server, Java, CTG, HOD/HATS, WS MQ, etc.

Info on Demand

Linux on z Systems

DB2 LUW, Information Server, Cognos, etc.

DB2 LUW

Connection via HiperSockets

z/VSE Production Environment
+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2 client
+ LDAP client

z/VSE Test/Dev Environment

z/VM-mode LPAR with z/VM V6

IFL Engine(s)	CP Engine(s)

z10 EC, z10 BC, z196, z114, zEC12, zBC12, z13

z/VSE SOA and interoperability

Connector Functions	z/VSE V5.2	z/VSE V5.1	z/VSE V4.3	z/VSE V4.2	z/VSE V4.1
z/VSE Connectors (no additional charge)					
VSAM, POWER, Librarian, ICCF lib, console	Yes	Yes	Yes	Yes	Yes
VSAM Redirector	Yes	Yes	Yes	Yes	Yes
SOA Web Services, i.e. SOAP and XML *Updated with V5.2*	Yes	Yes	Yes	Yes	Yes
z/VSE Script and DL/1	Yes	Yes	Yes	Yes	Yes
DB2 Stored Procedures for VSAM and DL/1	Yes	Yes	Yes	Yes	Yes
VTAPE interface to IBM Tivoli Storage Manager (TSM)	Yes	Yes	Yes	Yes	Yes
LDAP client (LDAP server on another platform req.) *Updated with V5.2*	Yes	Yes	Yes	Yes	
SNMP agent	Yes	Yes	Yes		
LFP from z/VSE to Linux TCP/IP in z/VM-mode LPAR	Yes	Yes	Yes		
z/VSE z/VM IP Assist (VIA)	Yes	Yes			
GDPS client	Yes	Yes			
LFP via zEnterprise HiperSockets Completion Queues	Yes	Yes			
z/VSE Database Call Level Interface (DBCLI) connector	Yes	Yes			
IPv6 support for z/VSE connectors *New with V5.2*	Yes				
z/VSE trigger monitor for WebSphere MQ client *New with V5.2*	Yes				
IBM Middleware (priced)					
CICS Transaction Gateway ECI	Yes	Yes	Yes	Yes	Yes
Host on Demand / Host Application Transformation	Yes	Yes	Yes	Yes	Yes
DB2 Connect / DB2 UDB (DB2 Server for z/VSE V7.5 Client)	Yes	Yes	Yes	Yes	Yes
WebSphere MQ (z/VSE Client no charge)	Yes	Yes	Yes	Yes	Yes

Updated **Red**book – SG24-8091

Update available since December 31, 2014
http://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg248091.html

This IBM Redbooks publication helps you install,
tailor, and configure new networking options for
z/VSE that are available with TCP/IP for VSE/ESA,
IPv6/VSE, and Fast Path to Linux on System z
(Linux Fast Path). We put a strong focus on
network security and describe how the new
OpenSSL-based SSL runtime component can
be used to enhance the security of your business.

Chapter 1. Networking options overview

Chapter 2. TCP/IP for VSE/ESA

Chapter 3. IPv6/VSE

Chapter 4. Fast Path to Linux on System z

Chapter 5. OpenSSL

Chapter 6. Comparison of stacks and protocols

Appendix A. API reference

IBM

Enhanced Networking on IBM z/VSE

Learn how to use IPv6 on z/VSE

Experience the benefits of OpenSSL

Use LFP on Z/VM and in LPAR for selected applications

Joerg Schmidbauer
Jeffrey Barnard
Ingo Franzki
Karsten Graul
Don Stoever
Rene Trumpp

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Redbooks

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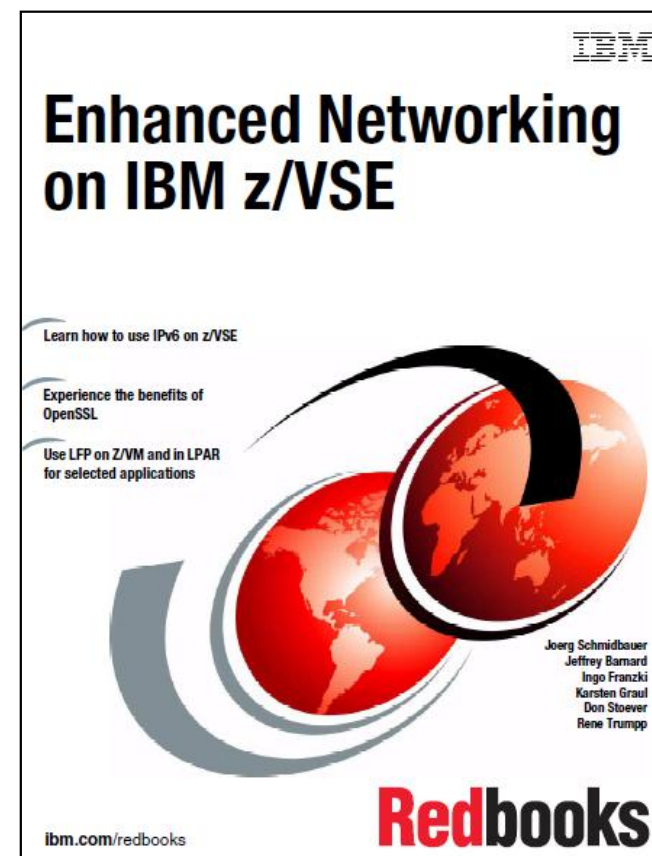
The No1 scenario – DB2 LUW for z/VSE customers

Data consolidation & data warehouse solutions with DB2 LUW on z Systems

Linux on z Systems

Cognos

DB2 LUW (64-bit)

DB2 LUW

VSAM

DB2 VSE/VM

Connection via HiperSockets

z/VSE Production Environment

+ CICS
+ TCP/IP
+ VSAM
+ COBOL
+ DB2 Client
+ VSAM Redir.

z/VSE Test Environment

+ CICS
+ VSAM
+ COBOL

LPAR or z/VM

z/VSE Production System LPAR or z/VM

z/VSE Test System LPAR or z/VM

IFL Engine

Standard Engine

IBM z Systems

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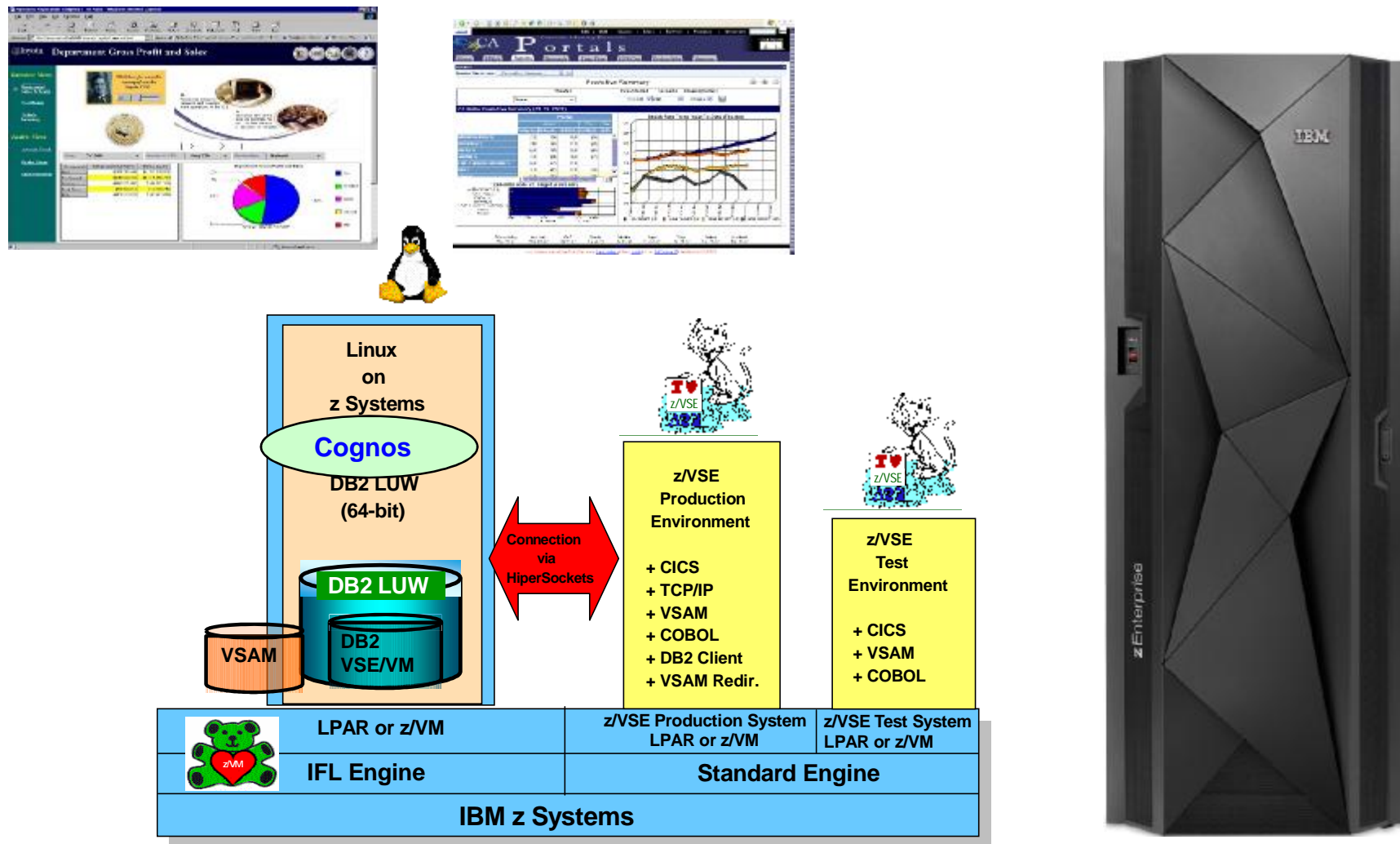
DB2 with BLU acceleration for Linux on z Systems

Super simple, super fast

DB2 with BLU

Large order of magnitude benefits
- **Performance**
- **Storage savings**
- **Time to value**

New technology in DB2 for analytic queries
- CPU-optimized unique runtime handling
- Unique encoding for speed and compression
- Unique memory management
- Columnar storage, vector processing
- Built directly into the DB2 kernel

Revolution or evolution
- BLU tables coexists with traditional row tables
  - in same schema, storage, and memory
- Query any combination of row or BLU tables
- Easy conversion of tables to BLU tables
  - Change everything, or change incrementally

Options
- Upgrade of DB2 LUW for Linux on z clients
- Replacement of Linux on z Oracle installations
- Satisfy requirement for a columnar in-memory db
- DB2 with BLU Acceleration is the preferred solution for customers who do not have DB2 for z/OS but would like to run analytics on z Systems Linux data
- Enhanced opportunity for distributed consolidations onto z Systems

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Evolving scenario – Backup/Restore concept for z/VSE

Integrate z/VSE with TSM on Linux on z Systems
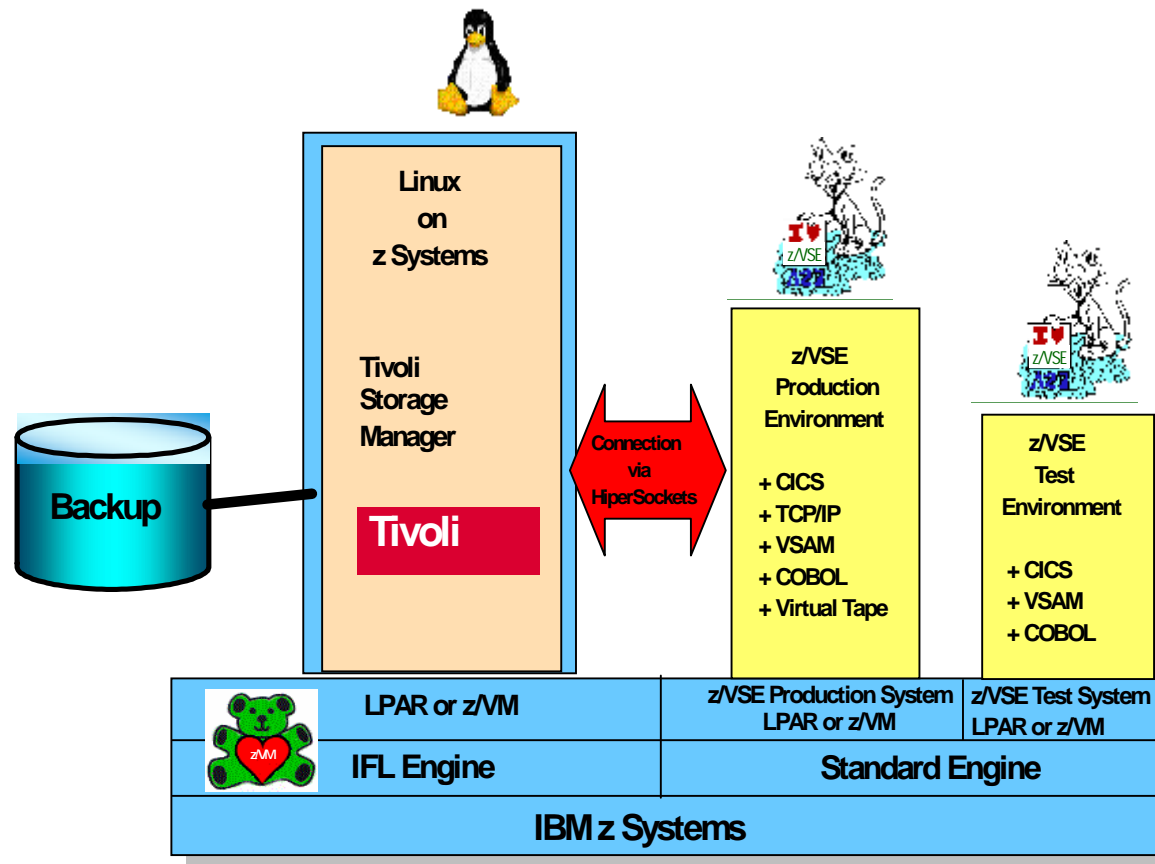
IBM MobileFirst Platform Foundation (former Worklight)

Connect your mobile apps to data on z Systems
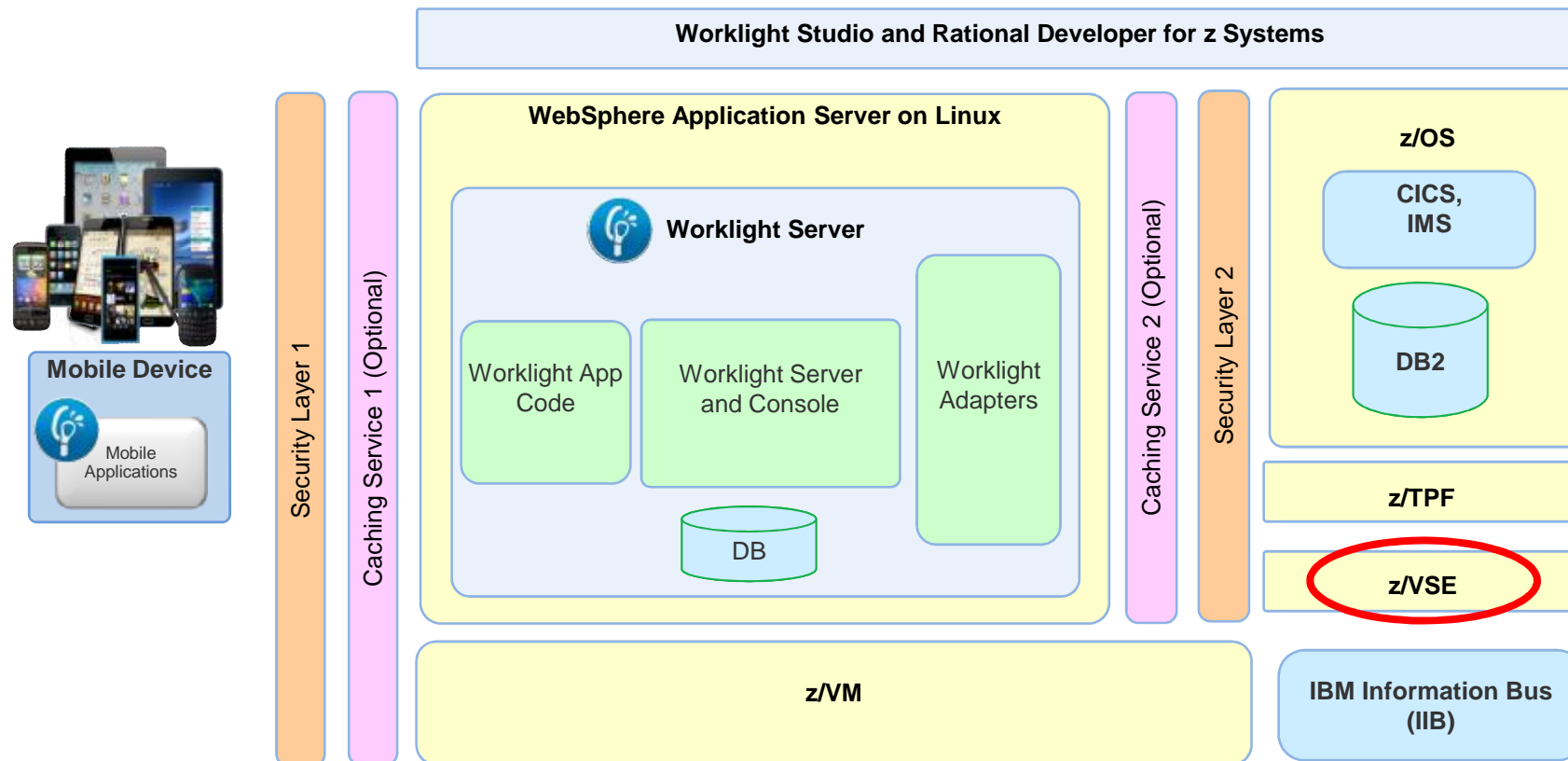
CICS connectivity with IBM MobileFirst Platform Foundation
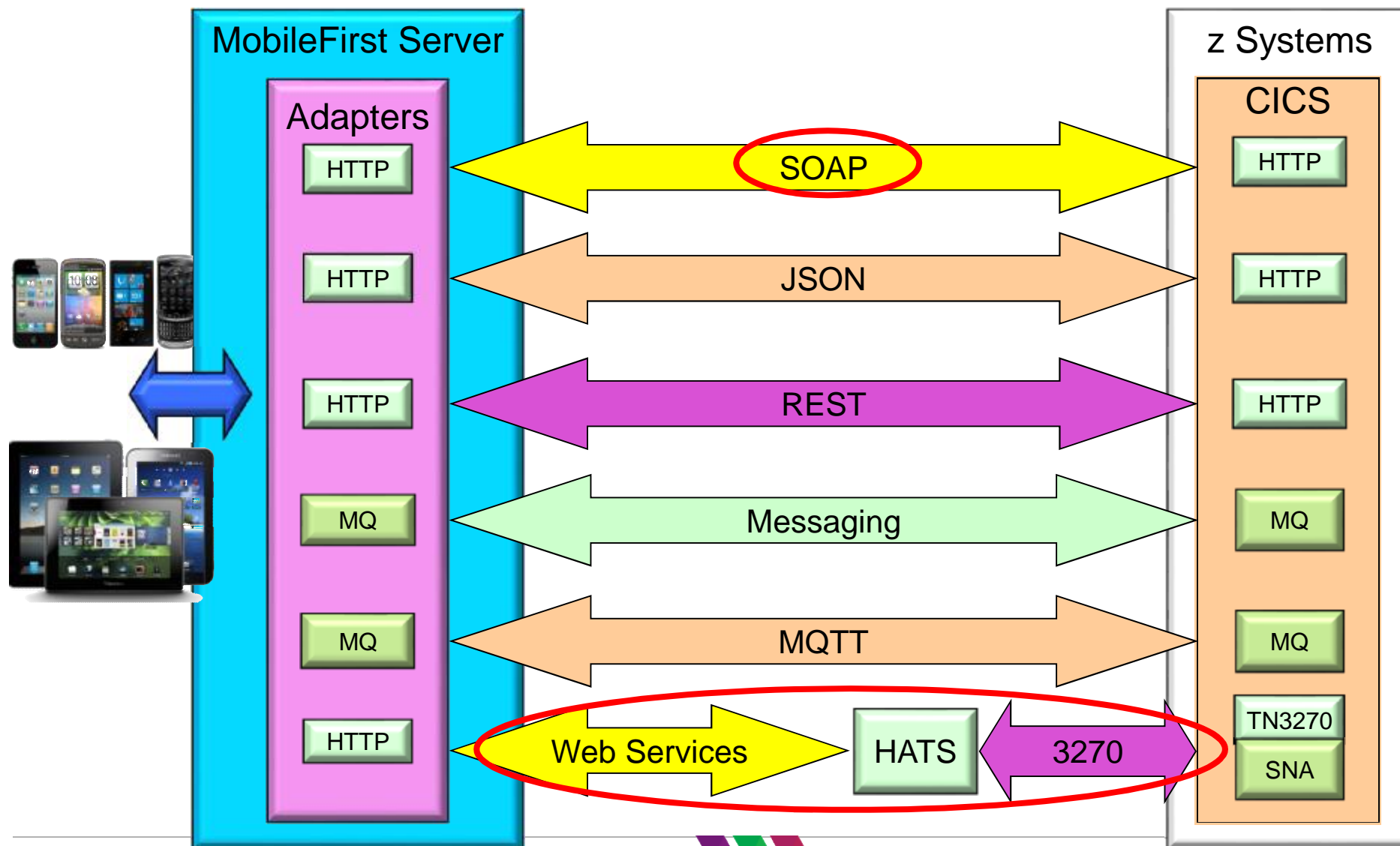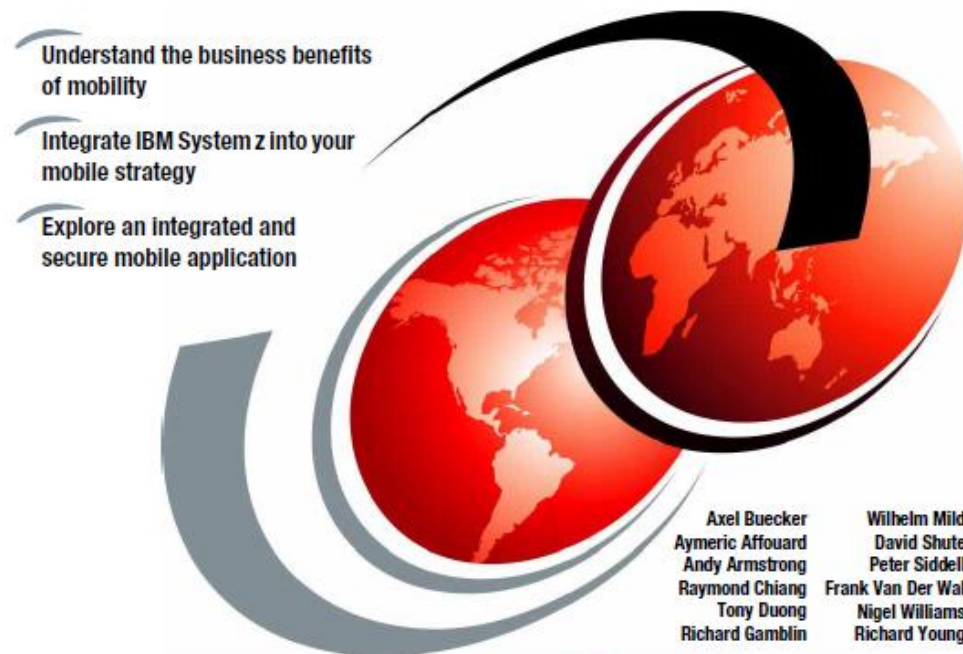
New Redbook – SG24-8215

Table of Contents:

1. Understanding the business context in a mobile world
   – Business drivers
   – IBM MobileFirst
   – SoE and SoR
   – IBM Worklight
   – Industry use cases
2. Architecting and planning the solution
   – Deployment models
   – Enterprise architecture
   – Designing for resilience
   – Designing for security
3. Customer scenario
   – Overview of scenario
   – Agile approach to deliver applications
   – Deploying to a HA infrastructure
   – Enabling E2E security
   – Mobile analytics

http://www.redbooks.ibm.com/abstracts/sg248215.html

NEW!

IBM System z in a Mobile World

Providing Secure and Timely Mobile Access to the Mainframe

Understand the business benefits of mobility

Integrate IBM System z into your mobile strategy

Explore an integrated and secure mobile application

Axel Buecker   Wilhelm Mild
Aymeric Affouard   David Shute
Andy Armstrong   Peter Siddell
Raymond Chiang   Frank Van Der Wal
Tony Duong   Nigel Williams
Richard Gamblin   Richard Young

Redbooks

ibm.com/redbooks

Combine the scenarios, manage software cost

Protect existing z/VSE investments

Integrate using middleware and z/VSE connectors

Extend with Linux technology and new solutions
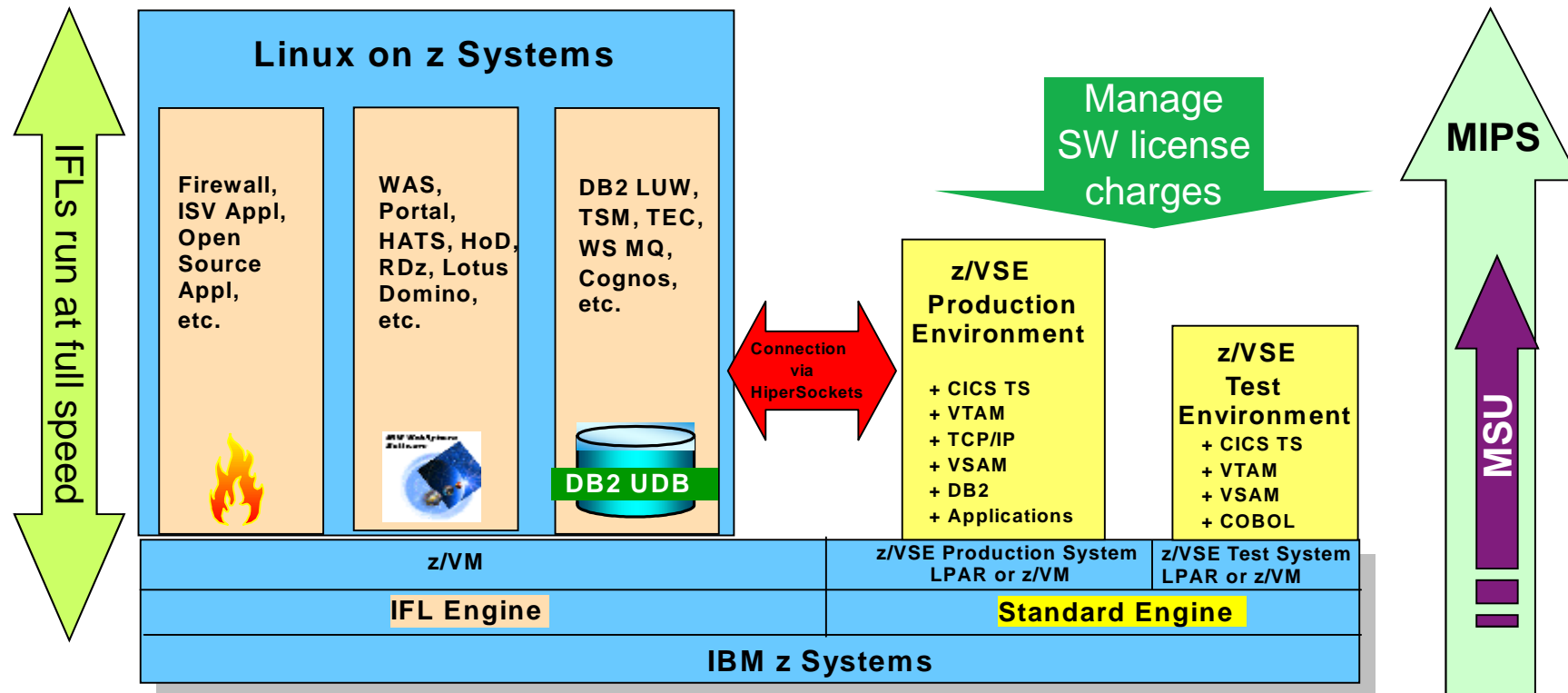
IFLs run at full speed

Linux on z Systems

Firewall, ISV Appl, Open Source Appl, etc.

WAS, Portal, HATS, HoD, RDz, Lotus Domino, etc.

DB2 LUW, TSM, TEC, WS MQ, Cognos, etc.

DB2 UDB

Connection via HiperSockets

Manage SW license charges

z/VSE Production Environment
+ CICS TS
+ VTAM
+ TCP/IP
+ VSAM
+ DB2
+ Applications

z/VSE Test Environment
+ CICS TS
+ VTAM
+ VSAM
+ COBOL

MIPS

MSU

z/VM

z/VSE Production System LPAR or z/VM

z/VSE Test System LPAR or z/VM

IFL Engine

Standard Engine

IBM z Systems

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  - z/VSE V5.2
  - z/VSE V6.1

- **Wrap-up**

Supreme Court of Virginia
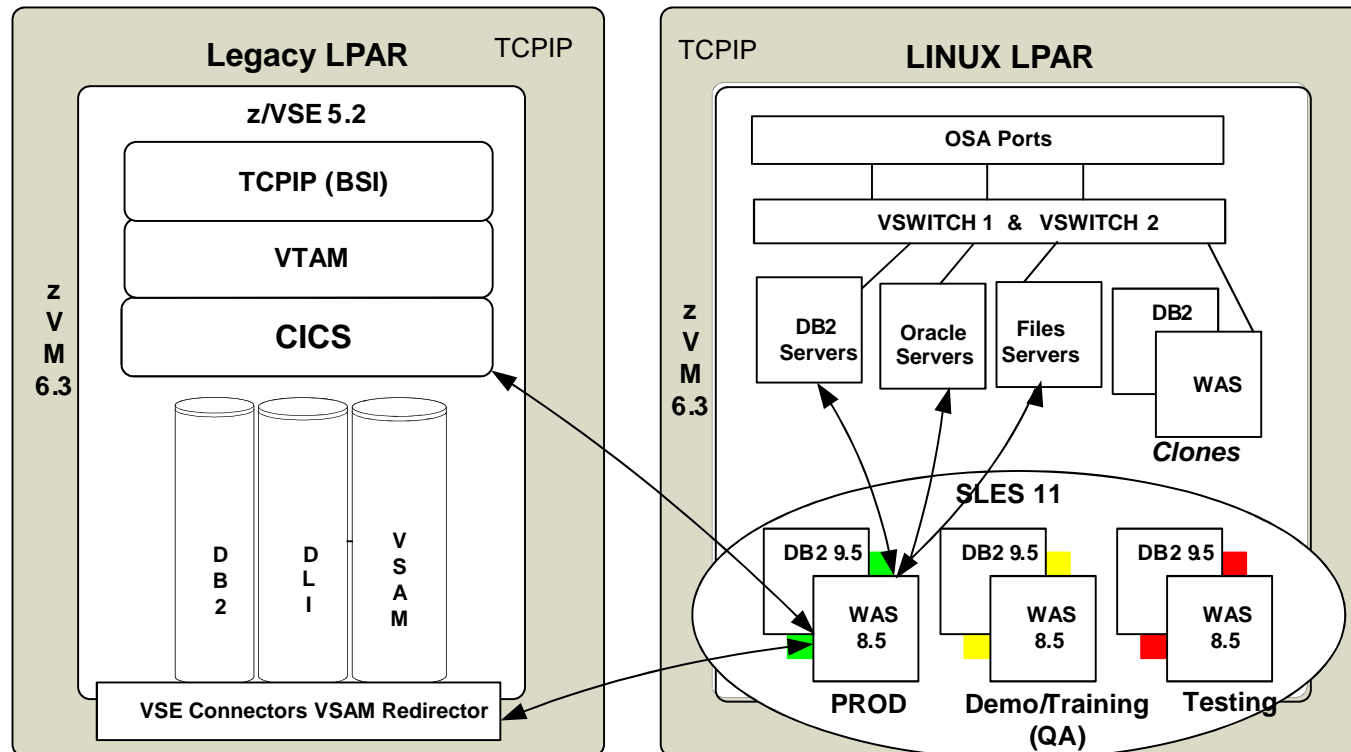
- 1 + 1 zBC12 (M01/M02)
- 2 + 1 CPs
- 8 + 8 IFLs
- 240 + 240 GB memory
- 4 z/VM V6.3 LPARs
- 12 z/VSE V5.2 guests
- 156+ SLES 11 guests
- WAS V8.5
- DB2 V9.5
- Oracle on z (10g)

§ **2x zBC12 (M01/M02), 1x production, 1x development**
- Serves 325 courts, 5.000+ users (3.8 million new cases in 2013)
- Integrating z/VSE, DB2/UDB and WebSphere applications
- eMagistrate system serves 125 locations, 3100 trans per day
- eCommerce* applications integrating z/VSE and WebSphere appls

VJEFS- Virginia Judicial Electronic Filing System

Winner of the Governor's 2013 Commonwealth Technology Award

Email from batch or CICS

AFP / PSF via IPaddress

IPM

StreamServe

300 files every day transfered to different operating systems (zLinux, Linux, Microsoft)

FTP

DB2 client to Linux DB2 UDB on IFL

VSAM Redirector Server via HiperSockets to zLinux DB2 and via Vswitch OSA QDIO to SQL Server

Microsoft SQL server

Production Environment

z/VSE V4 TCP/IP

TCP/IP for Telnet

Virtual Tape

CICS TS SOAP via HiperSocket

CICS TS web

VSE Navigator

z/VSE Health Checker

Security and Performance

redhat **version 5** zLinux Java application running on Tomcat

www.oliocarli.it

z/PMon SEE WHAT YOU'VE BEEN MISSING.

400,000 CICS transactions every 14 hours from 400 Telnet connections

Olio Carli

the leading producer of premium olive oil sold directly to consumers

America First Credit Union

Building a thriving member base on next-generation infrastructure

25% cost saving
by consolidating Linux environment

Simplifies licensing
to provide a transparent cost structure for software

More processing power
within smaller footprint, supporting growth

Solution components
Software
- IBM z/VSE®
- IBM DB2® for Linux, UNIX and Windows
- IBM Tivoli®
- IBM WebSphere®

Hardware
- IBM® zEnterprise® EC12
- IBM Power Systems™
- IBM XIV® and IBM System Storage®

The transformation: AFCU wanted to tackle escalating transaction volumes before they ran the risk of limiting its growth. By dramatically increasing processing power within a higher-density footprint, the organization gained headroom for future expansion without sending costs spiraling.

"IBM is helping us stay ahead of the curve."
—Scott Ellis, Senior IS Manager of Information Systems and Data Services, America First Credit Union

ZSP03883-USEN-00

AMERICA FIRST
CREDIT UNION

Vitec AutoData as, Norge

Success Story

AutoData Norge AS

AutoData Norge AS runs SUSE® Linux Enterprise Server for System z* alongside z/VSE on an IBM* zEnterprise* z114 mainframe. The SUSE operating system provides a lower-cost and more flexible platform for creating new web-based applications, helping AutoData to expand its offerings in an efficient manner.

Automotive Spare Parts Distributor AutoData Norge AS added **SUSE® Linux Enterprise Server** to existing IBM® mainframe running **z/VSE®** for **IBM System z®**

Reliable and flexible environment for serving customers

Reduced software maintenance cost by running new workloads on an **I**ntegrated **F**acility for **L**inux while keeping all licensed MIPS available for z/VSE

Combined **reliability and long standing experience** on z/VSE with **simplicity, support and agility** of Linux on System z

"Everything we do is driven by our customers, and SUSE Linux Enterprise Server for System z allows us to be much more responsive to their needs."
Stein Sandvold Chief Operating Officer AutoData Norge AS

www.suse.com/success/stories/autodata-norge-as.html

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z/VSE live virtual classes (webcasts)

- *Future topic*
  - z/VSE for beginners
- *2015*
  - VSE/VSAM Fundamentals, hints & tips and best practices
  - Preview announcement of z/VSE V6, and more
  - Analyzing CICS TS SOS problems in z/VSE
  - How to determine CICS wait time from CICS traces
  - Mobile access to existing z/VSE applications
- *2014*
  - z/VSE SCSI support and migration options
  - z/VSE VSAM enhancements
  - z/VSE connectors update
  - Introduction to tuning VSAM file performance under CICS TS in z/VSE
  - Tapeless initial installation
  - z/VSE Version 5 update
  - TCP/IP for z/VSE update
  - Update on encryption and SSL

- *2013*
  - Exploit new z/VSE solutions with zBC12 in a virtualized environment
  - Language Environment for z/VSE
  - z/VSE CMT and SCRT update
  - How to avoid or handle CICS storage availability problems
  - z/VSE security enhancements
  - Important update on z/VSE enhancements
  - z/VSE release migration considerations - Part 1&2
- *2012*
  - System z hardware exploitation in z/VSE
  - VSE/POWER – all the news since z/VSE 4.2
  - Securing data transfers using IPv6/VSE
  - The new z/VSE Database Connector (DBCLI)
  - IPv6 in z/VSE
  - Monitoring principles and z/VSE monitoring options

Replays available!
Dates and replays @
ibm.com/systems/z/os/zvse/education/

z/VSE Android reference app

z/VSE Android Reference App

http://www-03.ibm.com/systems/z/os/zvse/#inaction

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- **Wrap-up**

z/VSE continues to demonstrate IBM's commitment

NEW!

Hardware Support
More Capacity
Quality
z/OS Affinity
Interoperability
Protect Integrate Extend

z/VSE V6.1 - 4Q2015
- Øz13 exploitation
- ØALS to System z10
- ØCICS TS for z/VSE V2.1 incl CICS Explorer update, support for channels & containers
- ØTCP/IP for z/VSE V2.1
- ØIPv6/VSE V1.2

z/VSE V5.2 - 2Q2014
- ØAdditional zEnterprise exploitation
- ØDVD install
- ØNetworking and security enhancements

z/VSE V5.1.1 - 2Q2012
- ØCICS Explorer Monitoring
- ØUniversal database connector
- ØLinux Fast Path in LPAR

z/VSE V5.1 - 4Q2011
- ØzEnterprise exploitation
- ØIEDN connection to zBX
- Ø64-bit virtual memory objects
- ØALS to System z9
- Øz/VSE z/VM IP Assist (VIA)

z/VSE V5.1.2 - 2Q2013
- Ø64-bit I/O for applications
- ØNetworking enhancements
- ØSecurity enhancements

+ SoD: New version of z/VSE, ALS to System z10, support for channels & containers in CICS TS for z/VSE

+ SoD: Secure z/VSE Software Delivery

+ SoD: CICS Explorer, LFP in LPAR

+ SoD: CICS Explorer Update, DVD Install, IPv6/VSE price reduction

Announced on April 7, 2014, jointly with Mainframe50 anniversary

Announced on Oct 5, 2015, 50 years after DOS/360

z/VSE Version 5 Release 2

Announced April 7, 2014, General Availability April 25, 2014

§ **Hardware Exploitation**
- Integration of PTFs delivered with z/VSE V5.1.2+
  - zBC12 exploitation (incl. support for Crypto Express4S, OSA-Express5S)
  - TS1140 tape drive (incl. encryption capabilities)
- Virtual disk in 64-bit virtual memory objects

§ **Ease of Use**
- Install from DVD for ECKD devices
  - Tape-less system for initial install

§ **Networking**
- IPv6 enhancements

§ **Security**
- Auditing enhancements
- OpenSSL integration

§ **Customer Requirements**

§ **New z/VSE Statements of Direction**

z/VSE Statements of Direction (SoD)

Announced April 7, 2014 – jointly with Mainframe50 Anniversary

- **IBM intends to provide new capability in a future release of IBM CICS Transaction Server for z/VSE to provide:**
  - i. Updates to CICS resources for CICS Explorer, and
  - ii. Channels and Containers to enable the transfer of large amounts of data between CICS applications.

- **Support for CICS Distributed Data Management (DDM) is stabilized in CICS TS for VSE/ESA V1.1.1. In a future release of CICS TS for z/VSE, IBM intends to discontinue support for CICS DDM.**

- **z/VSE V5.2 will be the last release that supports IBM System z9. Future releases of z/VSE will support IBM System z10 and higher.**

- **IBM intends to rename the product z/VSE Central Functions to z/VSE in a new z/VSE version.**
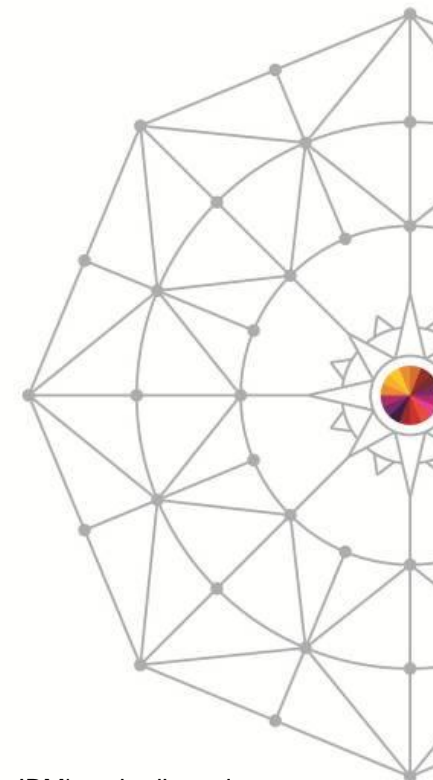
Note: IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. 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.

z/VSE Version 6 Release 1

Announced October 5, 2015, General Availability November 27, 2015

- § **Exploitation of** innovative IBM z13 technology
  - Configurable Crypto Express5S for data encryption and SSL acceleration
  - FICON Express16S supporting a link rate of 16 Gbps
- § **New version of CICS TS for z/VSE V2.1**
  - Update and control capabilities to CICS resources for the CICS Explorer system management tool
  - New API to enable the transfer of large amounts of structured data between CICS applications to meet the needs of growing workloads
- § **TCP/IP for z/VSE V2.1** (new version): designed to include firewall functionality
- § **IPv6/VSE V1.2** (new release) will provide firewall functionality, increased network availability, and other enhancements
- § Add **trigger functionality for the WebSphere MQ Client** for z/VSE
- § Selected enhancements are also available with PTFs for z/VSE V5.x
- § z/VSE V6.1 requires an initial installation
  - Fast Service Upgrade (FSU) from z/VSE V5.x is not supported
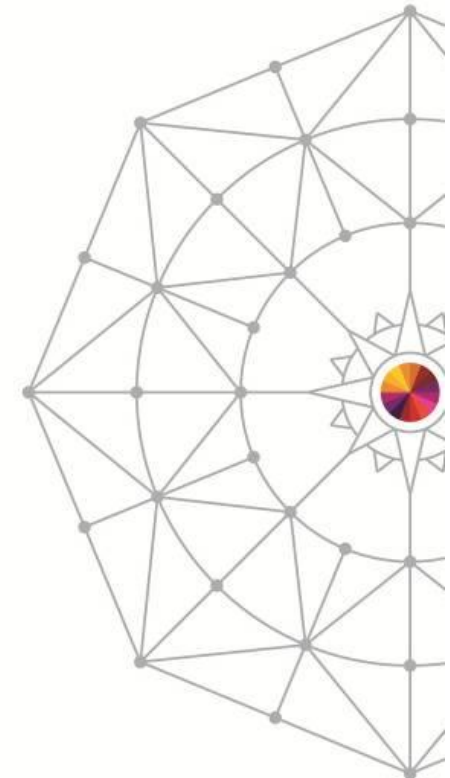
Agenda

- **z/VSE Status & Support**

- **z/VSE Strategy & Modernization**

- **z/VSE Reference Customers & Learning**

- **z/VSE Functional Enhancements**
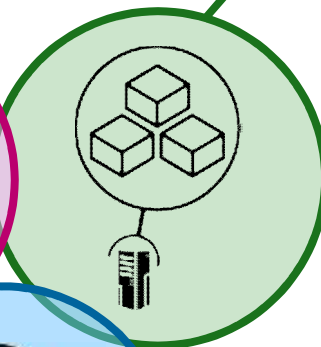 - **z/VSE V5.2**
  - **z/VSE V6.1**

- **Wrap-up**

z/VSE V6.1 follows the successful PIE strategy

Protect existing investments

Legacy applications and data on z/VSE

New version of CICS TS
Exploitation of z13 technology
Crypto Express5S
FICON Express16S
Support of enhanced IBM System Storage options

Integrate with other Systems

Connect to, and run backend System z applications

z/VSE Connectors to Java capable clients

WebSphere MQ Client trigger function

TCP/IP and IPv6/VSE enhancements

Extend for new workloads

Use the combination of Linux on z Systems and z/VSE
IBM MobileFirst Platform Foundation

z/VSE 50
50 years of innovation

z/VSE continues to deliver customer value

z/VSE 50
50 years of innovation

Protect
Integrate
Extend

Hardware Support
Capacity
Quality
z/OS Affinity
Interoperability

z/VSE V6.1　　　　　　　　**Nov 27, 2015**
- ALS to System z10 (and higher), z13 exploitation
- CICS TS for z/VSE V2.1 incl. CICS Explorer update, channels & containers
- TCP/IP for z/VSE V2.1, IPv6/VSE V1.2

z/VSE V5.2　　　　　　　　**April 25, 2014**
- zEC12 / zBC12 exploitation, DVD base install
- Networking & security enhancements
- SoD for CICS TS enhancements, z/VSE Vnext

z/VSE V5.1.2　　　　　　　**Jun 14, 2013**
- 64-bit I/O, security & DBCLI enhancements
- SoD for IPv6/VSE pricing, DVD base install

z/VSE V5.1.1　　　　　　　**Jun 15, 2012**
- CICS Explorer Monitoring
- LFP in LPAR, DBCLI connector

z/VSE V5.1　　　　　　　　**Nov 25, 2011**
- z196 / z114 exploitation
- ALS to System z9 (and higher)
- 64-bit virtual addressing, LFP w/ z/VM
- SoD for CICS Explorer, LFP in LPAR

z/VSE V4.3　　　　　　　　**Nov 26, 2010**
- Virtual storage (24-bit) constraint relief
- 4-digit device addressses, IPv6/VSE
- Security / Crypto / Networking enhancements

z/VSE V4.2　　　　　　　　**Oct 17, 2008**
- More tasks, PAV, SVC, SCRT, LDAP Client
- SoD for CICS/VSE, RBD V7, WMQ V3

z/VSE V4.1　　　　　　　　**March 16, 2007**
- z/Architecture only / 64-bit real addressing
- MWLC full & sub-cap pricing

z/VSE V3.1　　　　　　　　**March 4, 2005**
- selected zSeries features, FCP/SCSI
- 31-bit mode only

VSE/ESA V2.7　　　　　　　**March 14, 2003**
- enhanced interoperability
- ALS2 servers only

I ♥ z/VSE
AZH

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- [1] z/VSE V3 is 31-bit mode only. It does not implement z/Architecture, and specifically does not implement 64-bit mode capabilities. z/VSE is designed to exploit select features of IBM System z10, System z9, and zSeries hardware.
- [2] z/VSE V4 is designed to exploit 64-bit real memory addressing, but will not support 64-bit virtual memory addressing
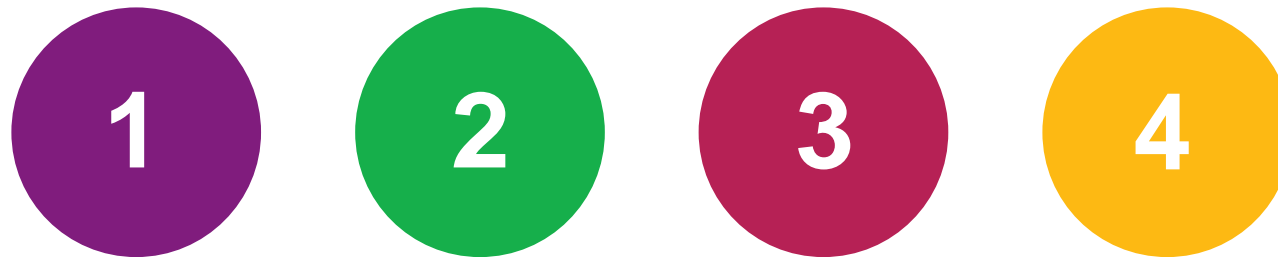
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50 years of innovation

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