



IBM Systems & Technology Group

## Hard- and Software News

zSeries, z/VM, z/VSE, Linux on zSeries

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z/VSE Systems Mgr & Linux Techn Support Mgr  
Bad Reichenhall, Nov. 2005



**July 2005 Announcement Overview**  
from a VM/VSE and Linux Perspective

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# Agenda

- § **IBM Systems Agenda**
- § **Linux on System z9 and zSeries**
- § **z/VM**
- § **z/VSE**
- § **Solution Scenarios**
- § **Summary**



# The IBM Systems Agenda for On Demand Business

*Announced July 26, 2005*



**Virtualize Everything**

The move toward “virtualizing everything” offers an improved approach to systems design, development and delivery which will dramatically enhance the ability to simplify.

**Commit to Openness**

Don’t just design and build based on open and industry standards, but share in such a way that systems integrate better and more easily.

**Collaborate to Innovate**

Opportunities to collaborate extend from within a department to the entire company — even beyond to industry-based communities and customers.

# IBM System z9™ – Redefines the Role of the Mainframe

## *Delivering the IBM Systems Agenda*



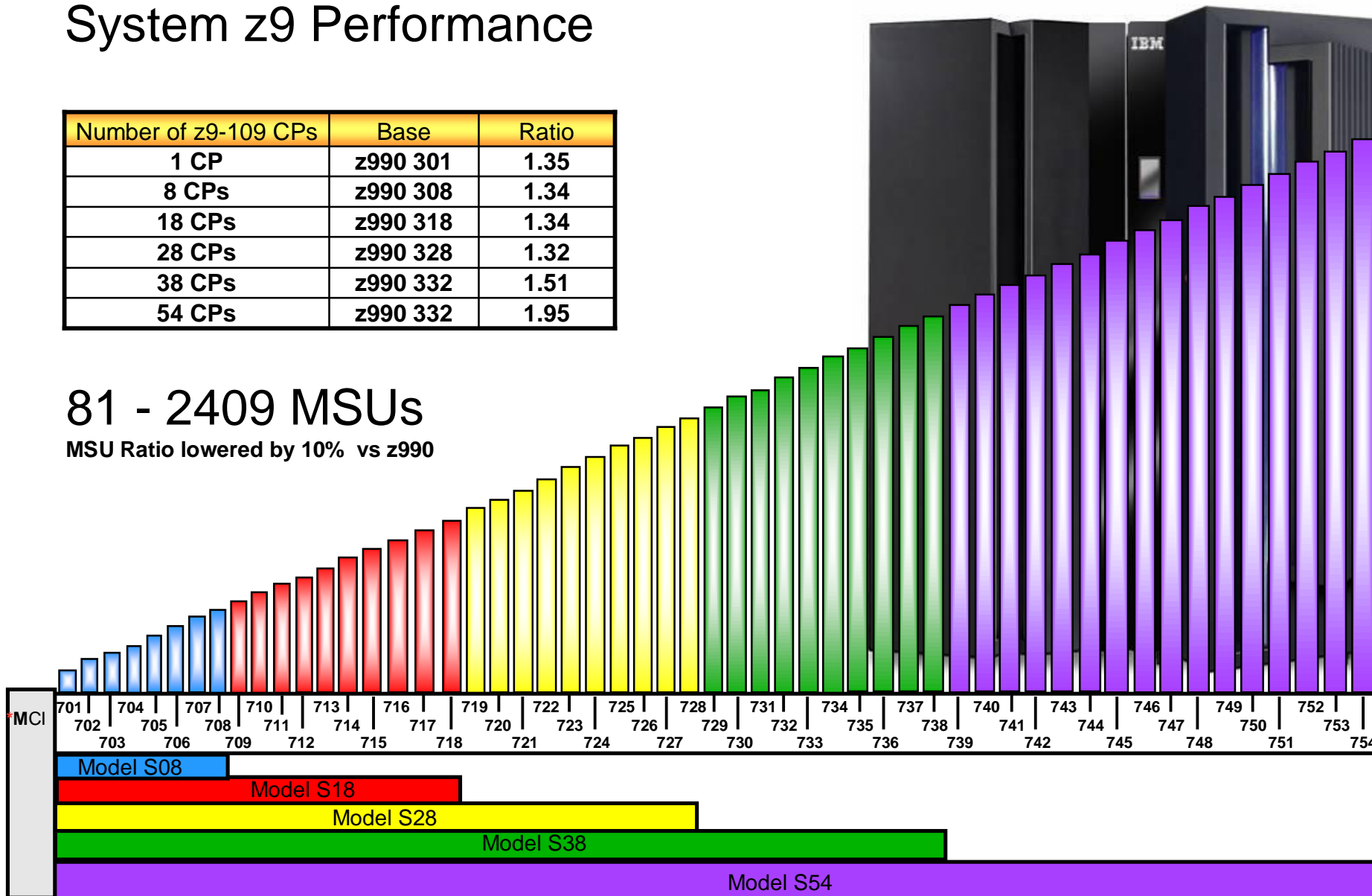
- § 5 Models - S08, S18, S28, S38 and S54
- § Processor Units (PUs)
  - 12 (16 for Model S54) PUs per book
  - 2 SAPs per book, standard
  - 2 spares per server
  - 8, 18, 28, 38 or 54 PUs available
    - CPs, IFLs, ICFs, zAAPs, optional SAPs
- § Improved performance over the z990
- § Up to 512 GB of central processor storage
- § Up to 4 Logical Channel SubSystems (LCSSs)
  - Up to 1024 channel paths / Up to 15 LPARs per LCSS
- § Up to 60 LPARs
  - LPAR Mode only - No basic mode
- § FICON Express2/FICON Express
  - Up to 84 features / 336 channels (FICON Express2)
- § Up to 1024 ESCON® channels
- § N\_Port ID Virtualization
- § OSA-Express2/OSA-Express
  - Up to 24 features
  - Fast Ethernet, 1000BASE-T Ethernet, Gigabit Ethernet, 10 Gbit Ethernet
- § Up to 8 configurable Crypto Express2
- § IPL from FCP-attached SCSI disks
- § Up to 16 HiperSockets

# System z9 Performance

Number of z9-109 CPs	Base	Ratio
1 CP	z990 301	1.35
8 CPs	z990 308	1.34
18 CPs	z990 318	1.34
28 CPs	z990 328	1.32
38 CPs	z990 332	1.51
54 CPs	z990 332	1.95

## 81 - 2409 MSUs

MSU Ratio lowered by 10% vs z990



## System z9 Operating System Software

Operating System	ESA/390 (31-bit)	z/Arch (64-bit)
<b>z/OS Version 1 Release 4, 5, 6, 7</b>	No	Yes
<b>Linux, 64-bit distribution</b>	No	Yes
<b>Linux, 31-bit distribution</b>	Yes	No
<b>z/VM Version 5 Release 1, 2</b>	No	Yes
<b>z/VM Version 4 Release 4</b>	Yes	Yes
<b>z/VSE™* 3.1, VSE/ESA™ 2.6, 2.7</b>	Yes	No
<b>z/TPF Version 1</b>	No	Yes
<b>TPF Version 4 Release 1 (ESA mode only)</b>	Yes	No

\*z/VSE can execute in 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 z9 and eServer zSeries hardware. Note: Please refer to the latest PSP bucket for latest PTFs for new functions/features.



# Agenda

§ IBM Systems Agenda

▶ § Linux on System z9 and zSeries

§ z/VM

§ z/VSE

§ Solution Scenarios

§ Summary





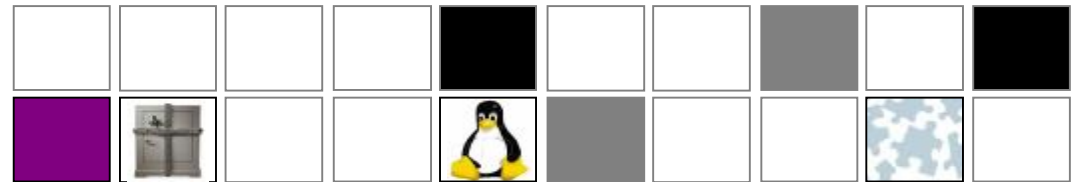
## Linux on IBM System z9

- § General Availability (GA) of System z9 was on Sept. 16, 2005
- § At GA time, all supported releases of Linux and z/VM support IBM System z9 :
  - z/VM 4.4 and 5.1
  - z/VM 5.2 to GA in 12/2005
  - Novell: latest Service Packs of SLES 8 and SLES 9
  - Red Hat: latest Updates of RHEL 3 and RHEL 4
- § Further exploitation of IBM System z9 features/functions is planned with an upcoming Linux Code Drop :
  - More high-availability functions
  - MSS (Multiple Subchannel Sets) support
  - NCP CDLC (Channel Data Link Control) support via OSA Express
  - FCP NPIV (N\_Port ID Virtualization)
  - FCP program-directed Re-IPL support
  - Crypto Fast Path support in z90crypt device driver
  - 10 Gbit Ethernet performance improvements



Statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only

# Linux on IBM System z9



## § Business Resiliency and Security

- Geographically Dispersed Multiplatform Resiliency (e.g., GDPS)
- Additional secure crypto algorithms supported by high performance cryptographic co-processor
- Enhanced system and storage scalability

## § Systems Management

- Virtualization Engine enablement
  - IBM Director
- Enhancements for virtual networking, virtual Fibre Channel, virtual processor accounting

## § Business Integration

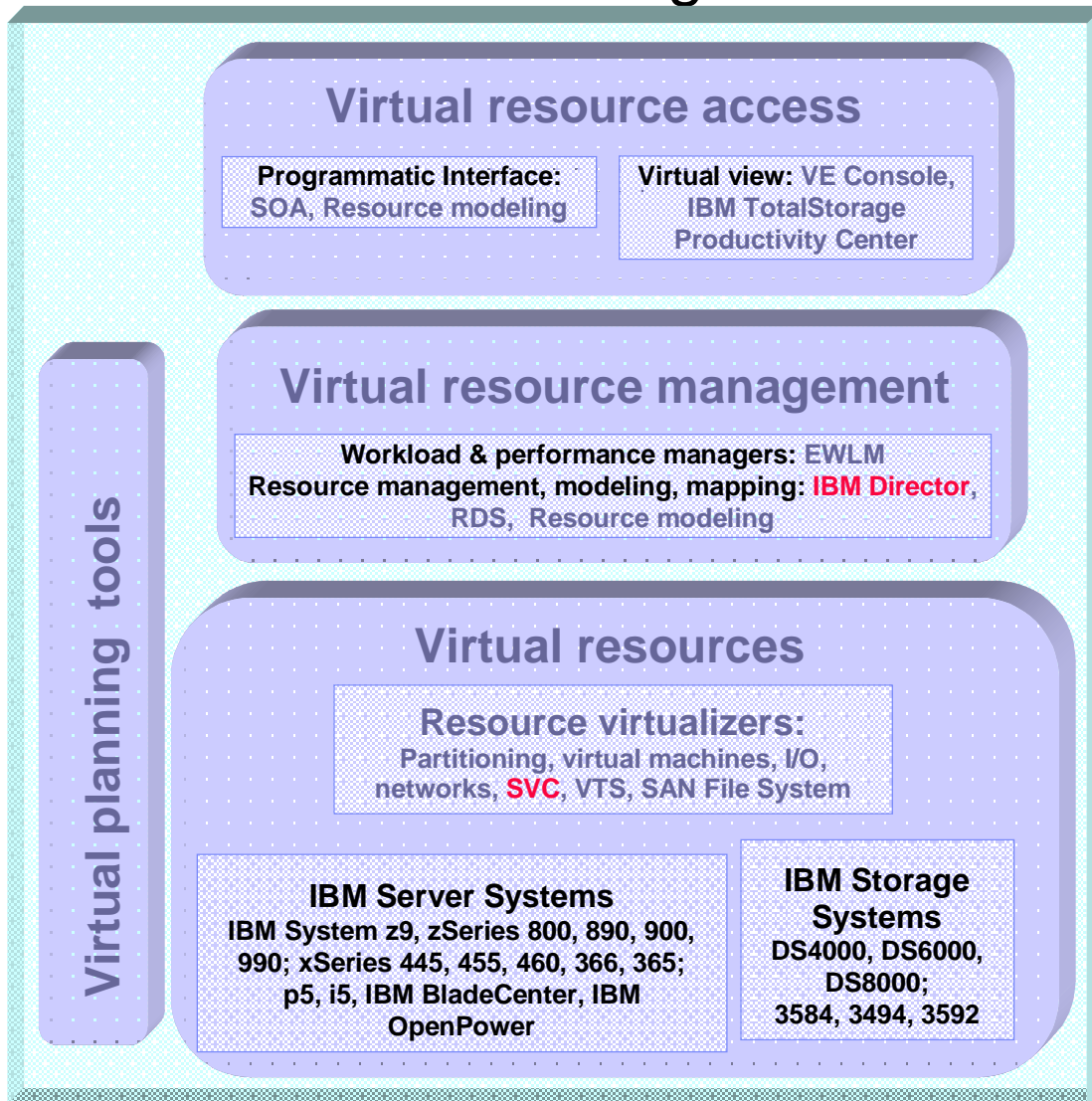
- Network integration of SNA and NCP protocols
  - IBM Communication Controller, IBM Communication Server
- Improvements in OSA layer 2 networking support for virtualized network adapter

## § Enhance your Linux investment with System z9 and z/VM

- Linux can benefit from the more powerful IFLs on z9-109
  - More virtual servers or more users or more throughput for same IFL price

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# IBM Virtualization Engine™



- There are a number of VE V2 enhancements relevant to Linux on System z9 and zSeries, e.g.
  - SAN Volume Controller
  - IBM Director

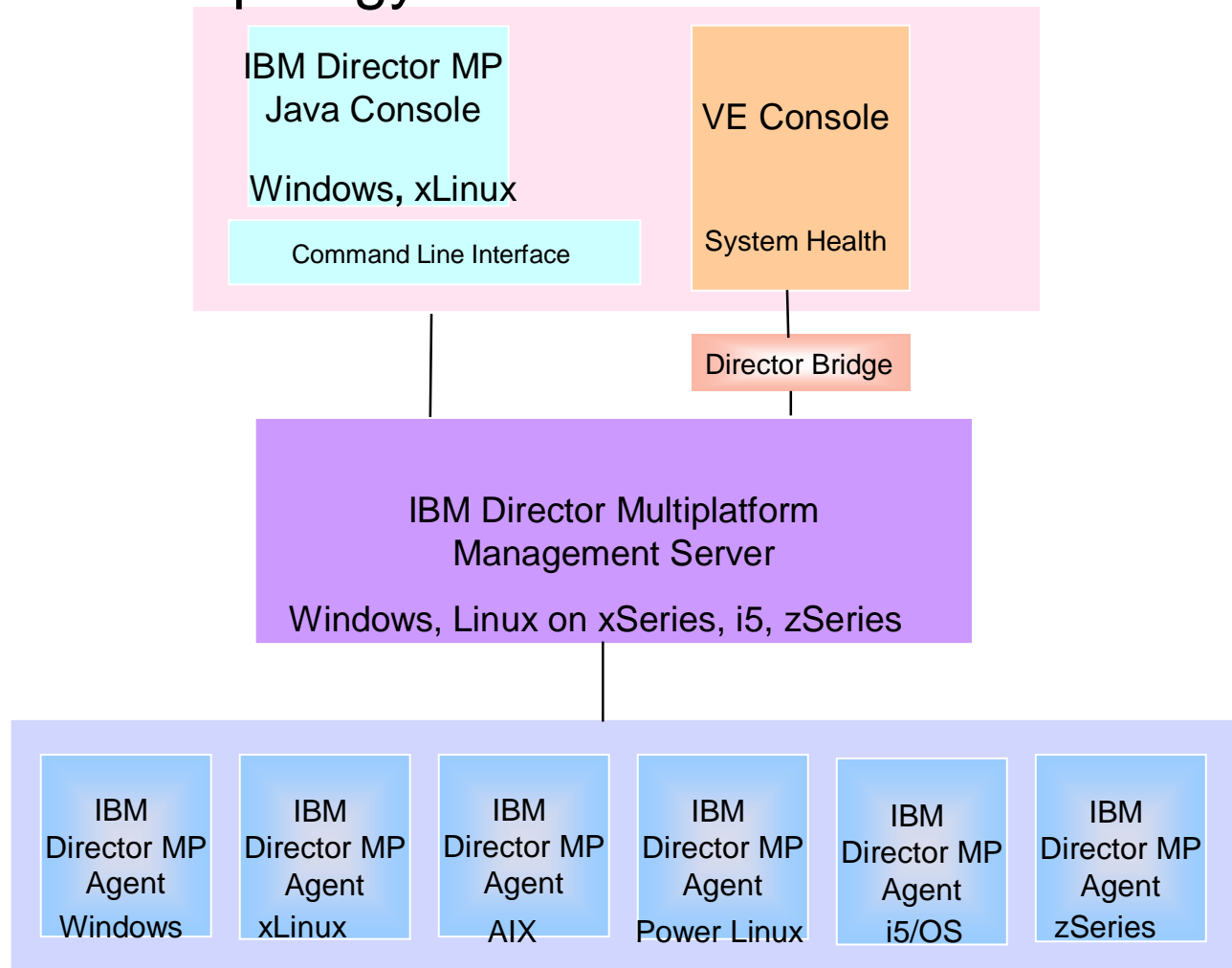
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# IBM Director – 3-Tier Topology

Director Multiplatform Console

Director Multiplatform Management Server

Director Multiplatform Agents



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# IBM Director on zSeries – Tasks Overview

## § Base Management

Monitor & Alert Linux on zSeries

## • Deployment

Virtual server deployment –  
deploy z/VM Linux guest  
systems

Server Complex -  
Manage Virtual Server  
Multi-tier workload

## § Optimize – Capacity Management

xSeries only

## § Maintain & Update

Software Distribution

The screenshot displays the IBM Director Console interface. The main window is titled 'IBM Director Console' and contains a menu bar (Console, Tasks, Associations, View, Options, Window, Help) and a toolbar. The interface is divided into three main sections:

- Groups:** A tree view on the left showing various system categories such as 'All Groups', 'All Managed Objects', 'Chassis and Chassis Members', 'Clusters and Cluster Members', 'Hardware Status Critical', 'Hardware Status Information', 'Hardware Status Warning', 'Level 2: IBM Director Agents', 'Platforms and Platform Members', 'SNMP Devices', 'Systems with ASF', 'Systems with ASF Secure Remote Manage', 'Systems with Asset ID', 'Systems with CIM', 'Systems with Linux', 'Systems with SNMP Agent', and 'Systems with Windows 2000'. The 'z/VM Systems' category is expanded.
- All Managed Objects (15):** A table in the center displaying a list of managed objects with their names and TCP/IP addresses.
 

Name	TCP/IP Addresses
BLD03-05	9.152.27.124
boeid101	9.152.24.141
boeid107	9.152.24.147
BOEVMID1	9.152.24.149
BOEVMID2	9.152.24.170
ID1BPU01	9.152.24.142
ID1DME01	9.152.24.148
ID1HBR01	9.152.24.151
ID1HBR02	9.152.24.152
ID1HDE01	9.152.24.153
ID1HDE02	9.152.24.157
ID1WBL01	9.152.24.144
id2map01	9.152.24.170
id2map01	9.152.24.170
Inxdir64	9.152.24.188
- Tasks:** A list of tasks on the right side, including 'Asset ID', 'CIM Browser', 'Configure Alert Standard Format', 'Configure SNMP Agent', 'Event Action Plans', 'Event Log', 'External Application Launch', 'File Transfer', 'Hardware Status', 'Inventory', 'Microsoft Cluster Browser', 'Network Configuration', 'Process Management', 'Remote Control', 'Remote Session', 'Resource Monitors', 'Scheduler', 'SNMP Browser', 'Software Distribution', 'System Accounts', 'z/VM Center', 'z/VM Server Complexes', and 'z/VM Virtual Server Deployment'.

The status bar at the bottom indicates 'Ready', 'Host: boeid210', 'User ID: ibmdir', and '4:31 AM PDT'.

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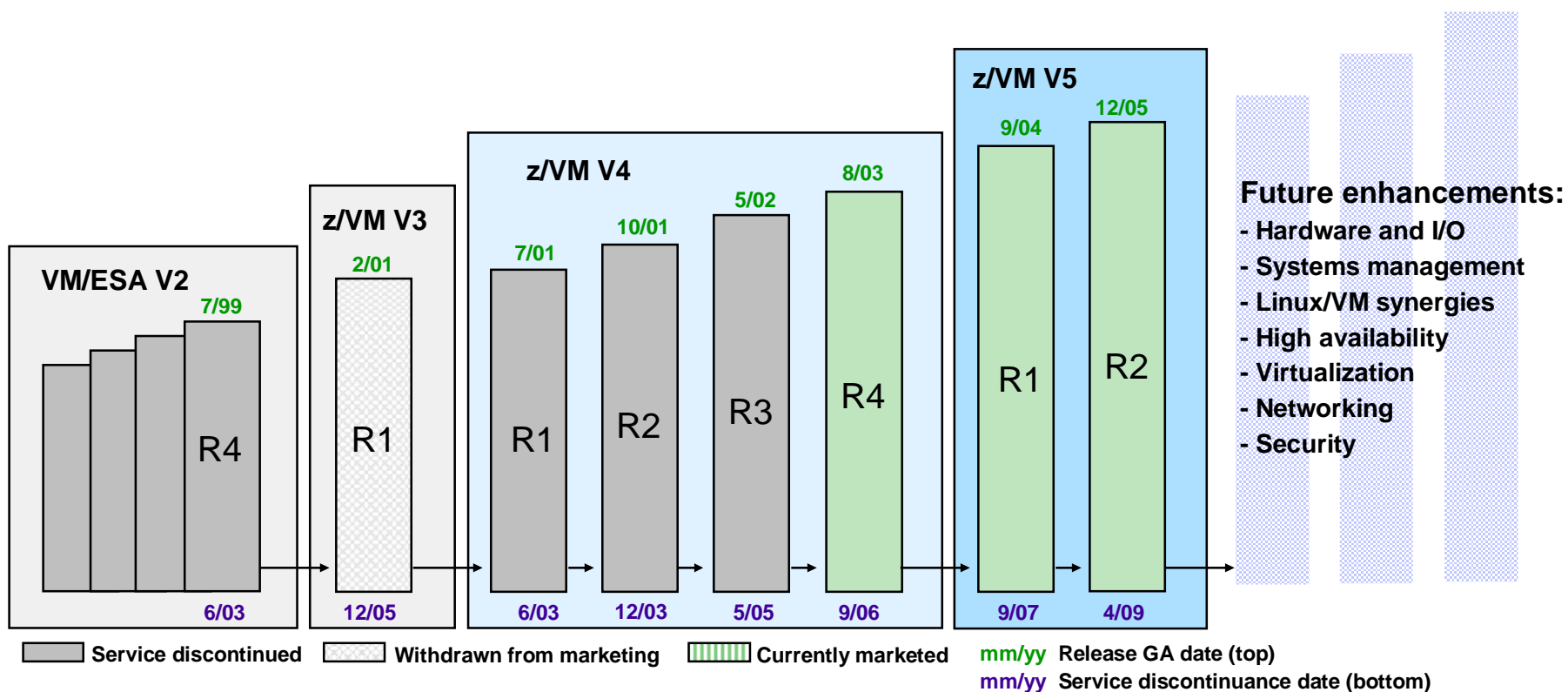
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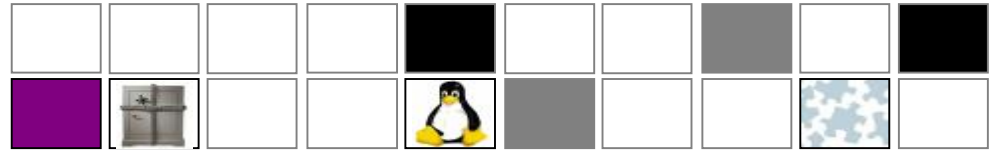
# Recent VM Release History

## z/VM Version 5: High-Value Virtualization Technology

- « Generating new business with Linux on zSeries
- « Enabling growth for existing VM customers



# z/VM V5.2 Overview



## § Business Resiliency and Security

- Crypto Express2 supported as an accelerator card for Crypto sharing among Linux guests
- Enhanced dynamic routing capabilities with new MPRoute server
- Dynamic addition / deletion of an LPAR name

## § Workload Management

- Enhanced exploitation of large real memory that can provide constraint relief and cost savings
- Enhanced performance assists for z/VM guests for OSA-Express, FCP, and HiperSockets
- Improved ease of use for creating and managing Linux or other virtual images
- Simplified user administration with the coordination of DirMaint™ and RACF changes
- Improved directory management performance

## § Business Integration

- Improved problem determination for Guest LANs and Virtual Switches
- Improved performance of SCSI disk I/O
- N\_Port ID Virtualization support
- Upgraded SSL server support for Red Hat and additional SUSE LINUX distributions





# Enhanced z/VM Support for Large Real Memory

## *Constraint Relief for Memory-Intensive Virtual Server Environments*

### § z/VM V5.2 Control Program (CP) offers improved performance and scalability for environments with high demand on storage below 2 GB

- I/O data can now be transferred from buffers located anywhere in memory
- QDIO structures may now reside above the 2 GB address line
- Most CP control blocks may now reside above the 2 GB address line

### § Storage above 2 GB address line is included in dumps

- CP hard and soft abend dumps and SNAPDUMPs
- Standalone z/VM dumps or VMDUMPs of z/Architecture virtual machines

### § TCP/IP for z/VM exploitation of 64-bit Diagnose 98

- Enhanced QDIO device driver uses I/O buffers above 2 GB when possible
- Helps reduce chance of server failure due to lack of buffer space

### § Block I/O (Diagnose 250) support

- Virtual machines can specify parameter addresses and I/O buffers above the 2 GB address line
- IBM is working with its Linux distribution partners to exploit this function in future Linux on System z9 and zSeries distributions or service updates



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# z/VSE V3.1 and V3.1.1 Overview

## § Business Resiliency and Security

- Basic Security Manager
- Crypto Express2
- CPACF

\* z/VSE can execute in 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 z9 and zSeries hardware.

## § Workload Management

- Up to 60 LPARs, MSS
- FCP-SCSI disk support
  - High I/O rate
  - Shared disk storage

## § Business Integration

- OSA Express2, including GbE, 10 GbE, and 1000BASE-T
- HiperSockets for fast communications with Linux on System z9
- OSA-ICC for simplification

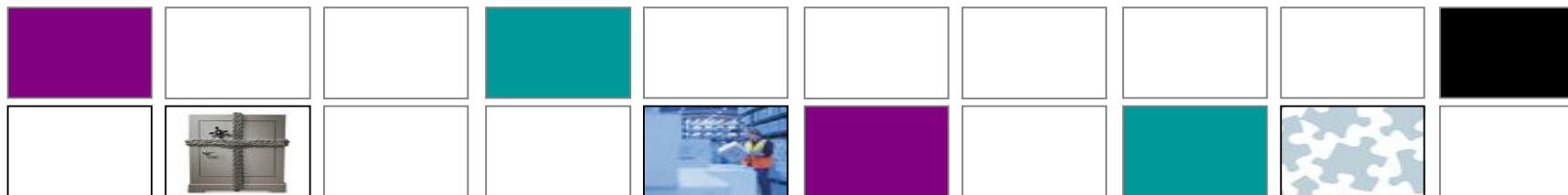
Plus . . .

Interoperability:

- VSE connectors
- VSE Web services
- IBM Middleware

IBM TotalStorage:

- DS8000 & DS6000 disk
- Advanced Copy Support
- Virtual Tape Server
- 3494 Tape Library



## VSE Release Support Status



VSE Version and Release	Marketed	Supported	End of Support
<b>z/VSE V3.1</b>	<b>Yes</b>	<b>Yes</b>	<b>tbd</b>
VSE/ESA V2.7	No	<b>Yes</b>	<b>2/2007</b>
VSE/ESA V2.6	No	<b>Yes</b>	<b>3/2006</b>
VSE/ESA V2.5	No	No	12/2003

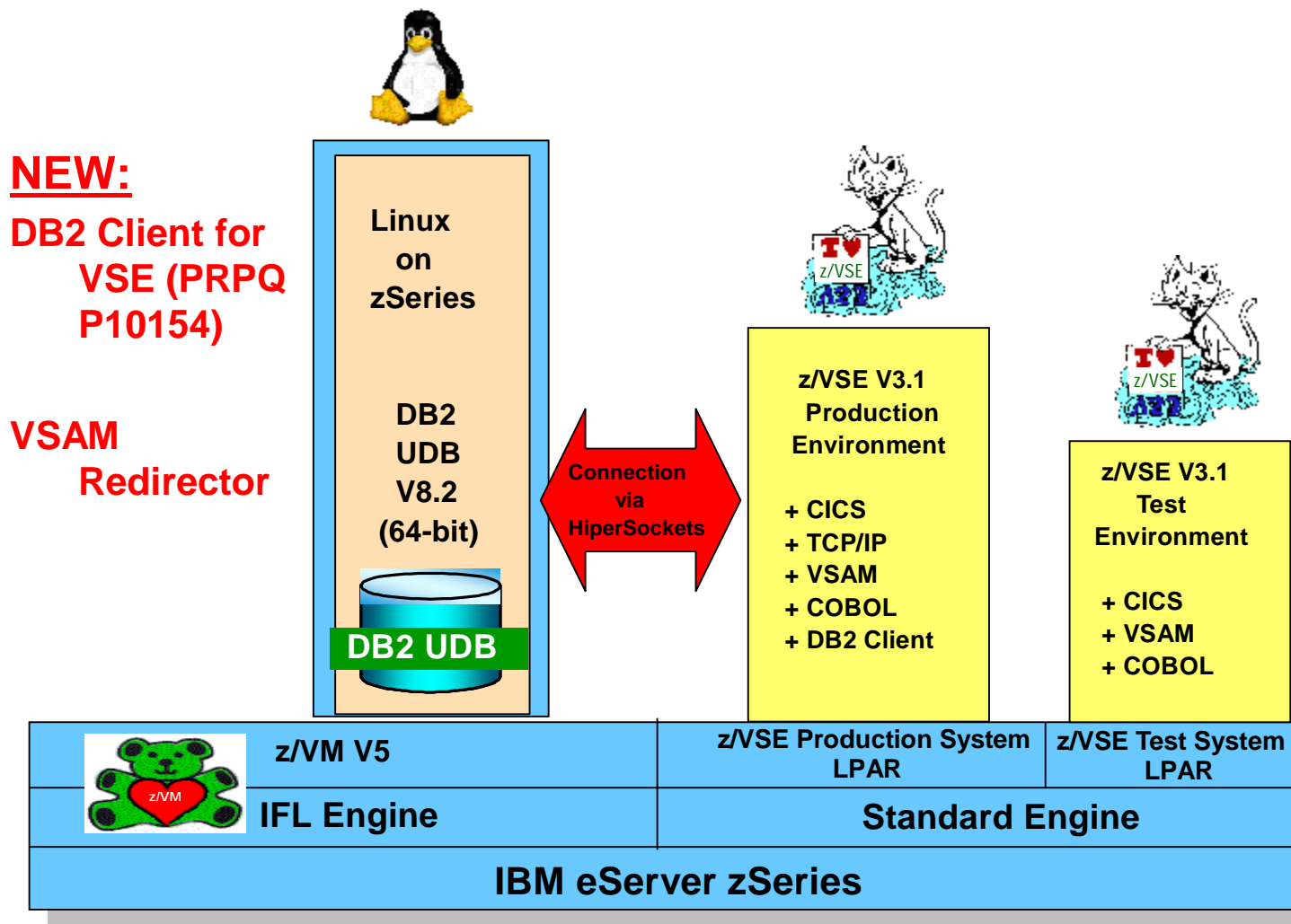
Note 1: VSE/ESA V2.7 has been marketed in parallel with z/VSE V3.1 until 9/2005.

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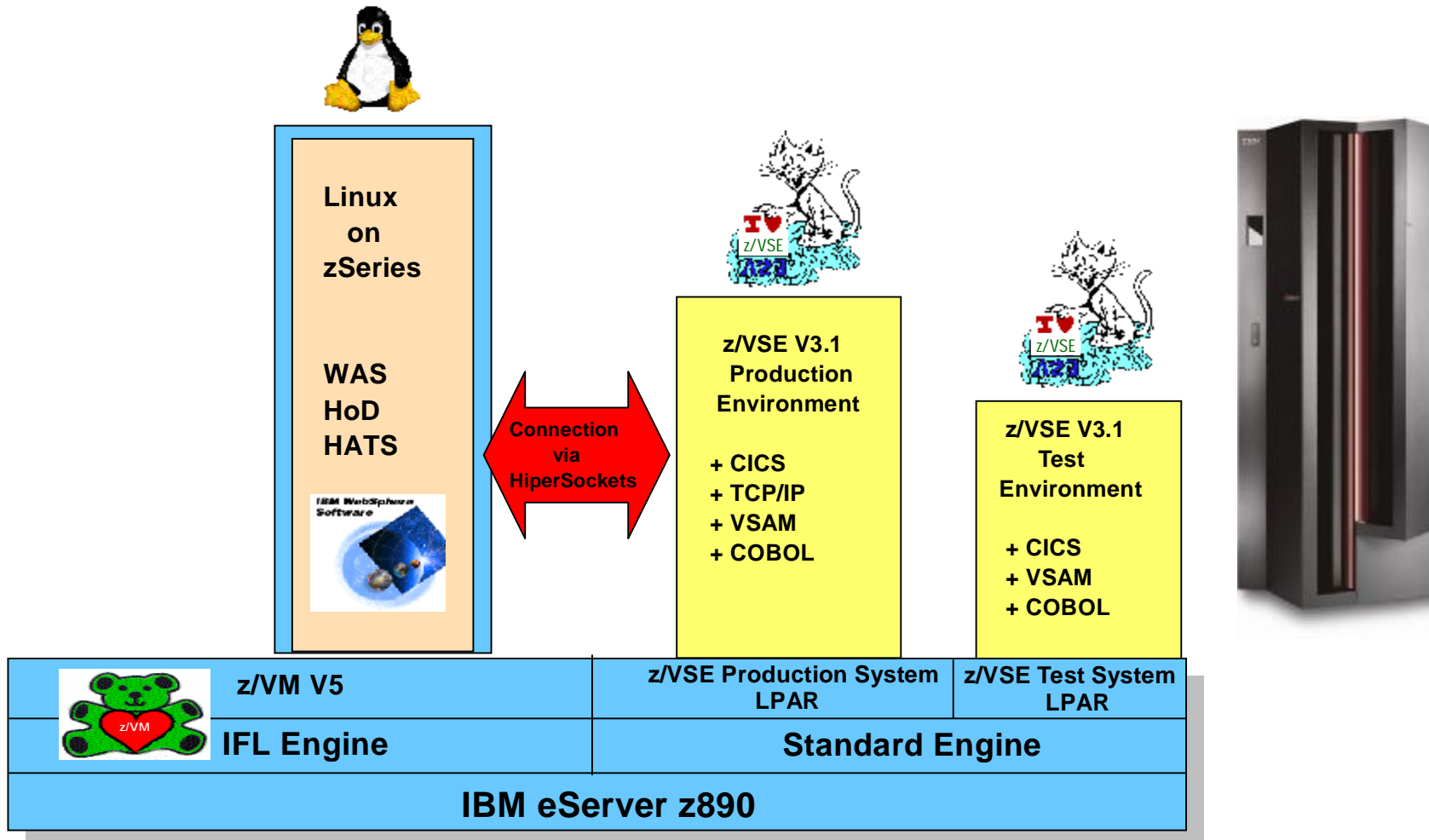


# Scenario 1: DB2 UDB (64-bit) for VSE Customers



# Scenario 2: „Webification“ for VSE Customers

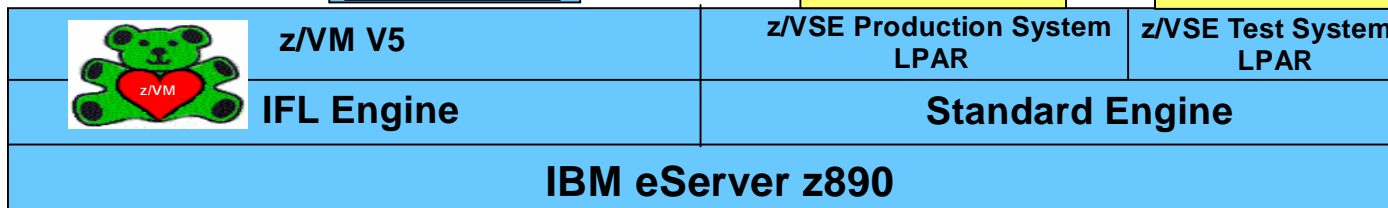
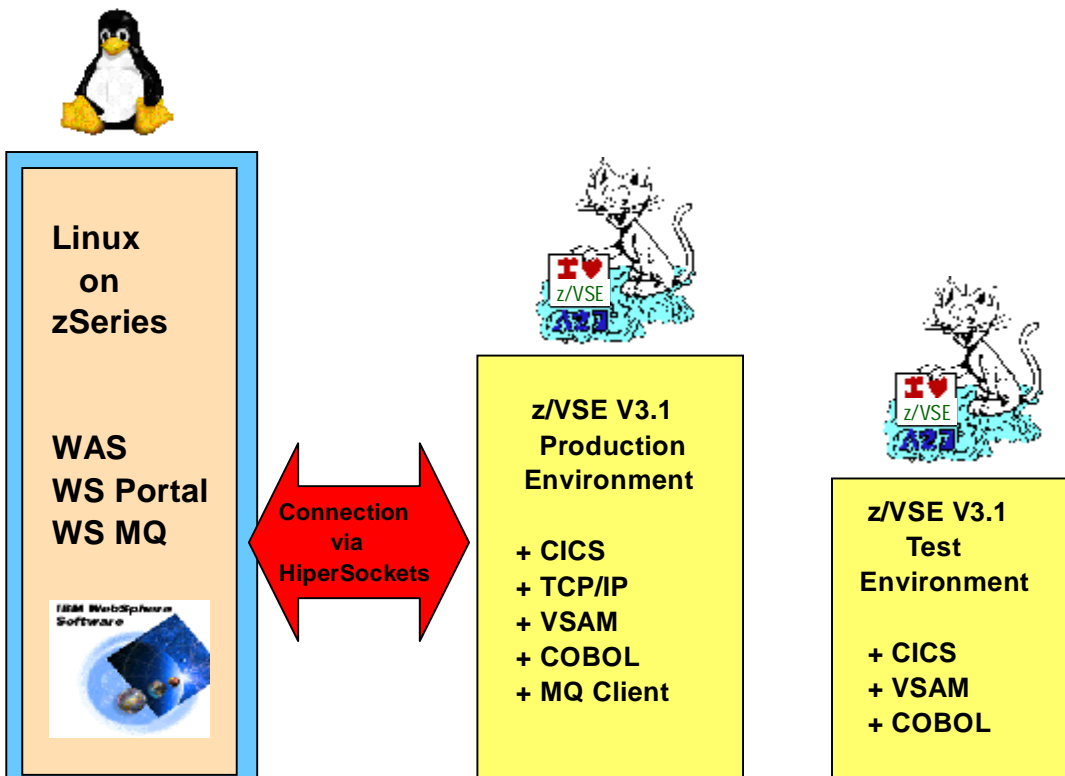
Web-enable existing applications through an Inter/Intranet Frontend



# Scenario 3: WebSphere Portal for VSE Customers

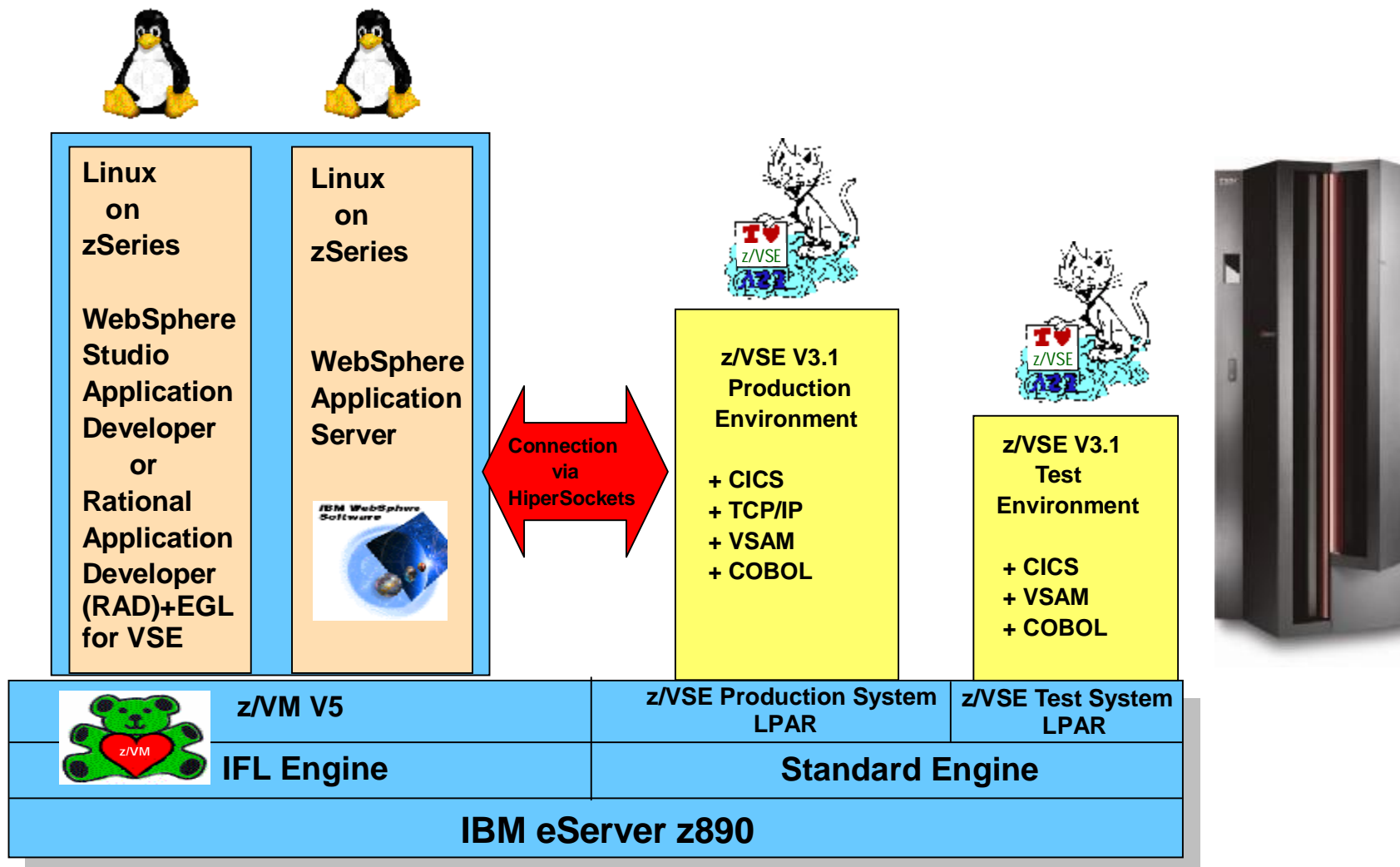
A Portal for Administration & Integration of Employees/Customers/Suppliers

**NEW:**  
MQ Client  
for VSE,  
free of  
charge

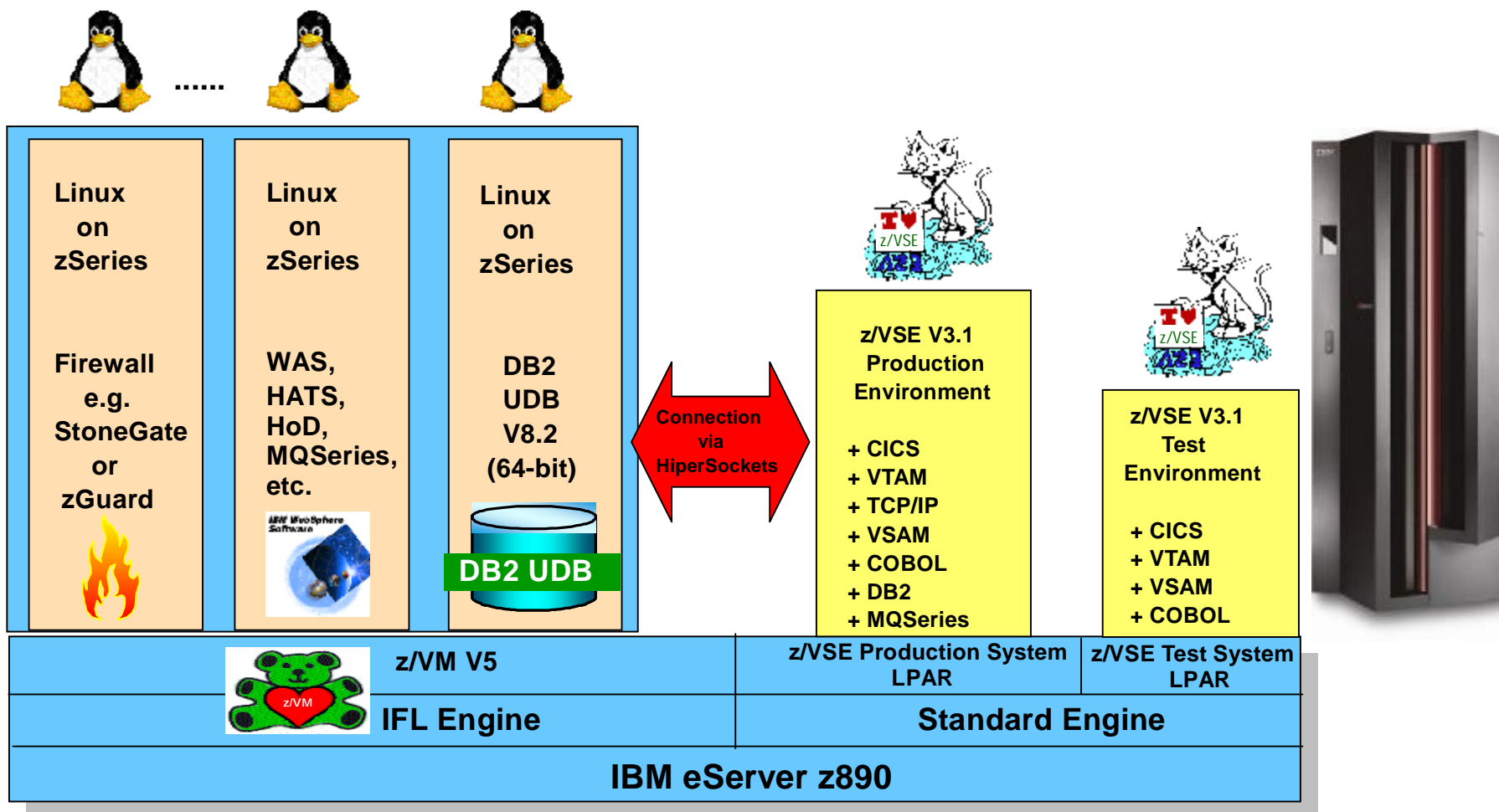




# Scenario 4: Application Development for VSE Customers

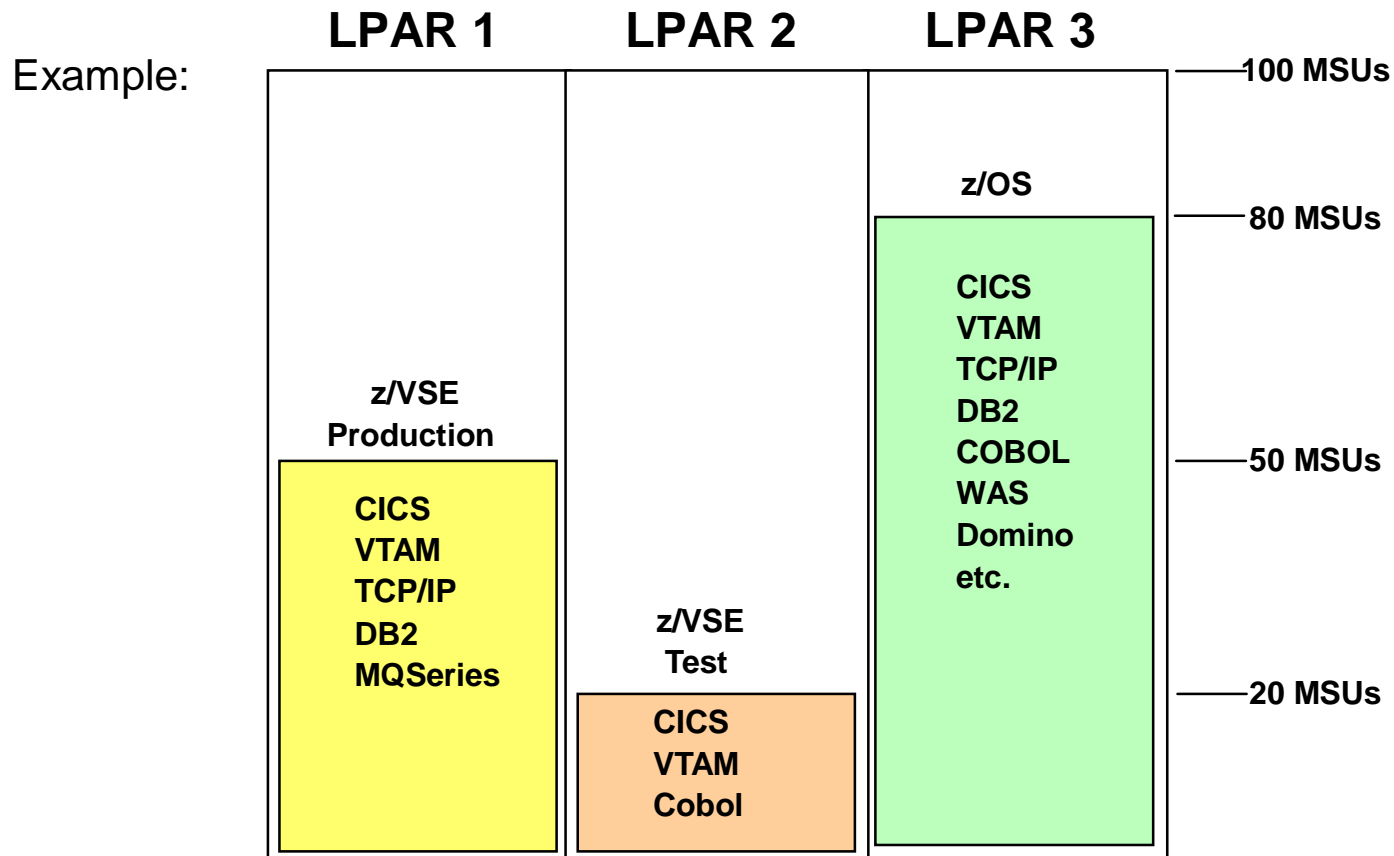


# Growth Scenarios with VSE & Linux on zSeries



# VSE Sub Capacity Measurement Tool

Statement of Direction as part of IBM System z9 announcement:  
VSE will provide a sub capacity measurement tool.

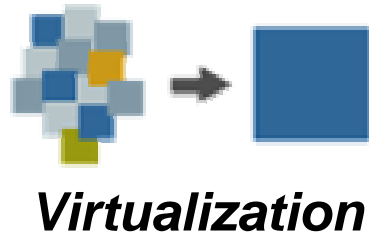


# Agenda

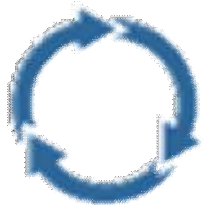
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## IBM Systems Agenda for On Demand Business



**Virtualize everything** using the Virtualization Engine which is a comprehensive virtualization portfolio enabling customers to virtualize resources



**Commit to openness** to redefine how to acquire systems, avoid being “locked in” and achieve needed integration



**Collaborate to innovate** with the capability to share information, processes and functions across the enterprise and beyond, as well as participation in industry innovation networks

# Summary: Typical Architecture for On Demand Business

