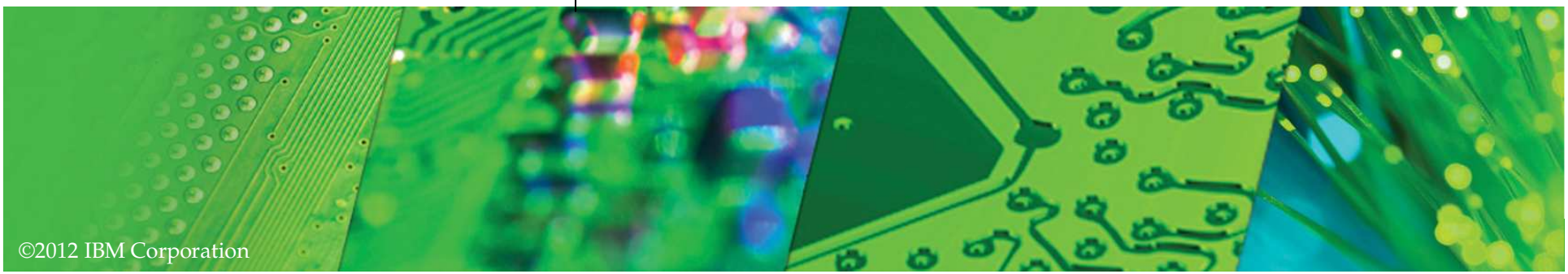
2012
IBM System z Technical University

Enabling the infrastructure for smarter computing

zVSE 51 and zEnterpise exploitation

zDG07

Wilhelm Mild



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Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon 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 throughput improvements equivalent to the performance ratios stated here.
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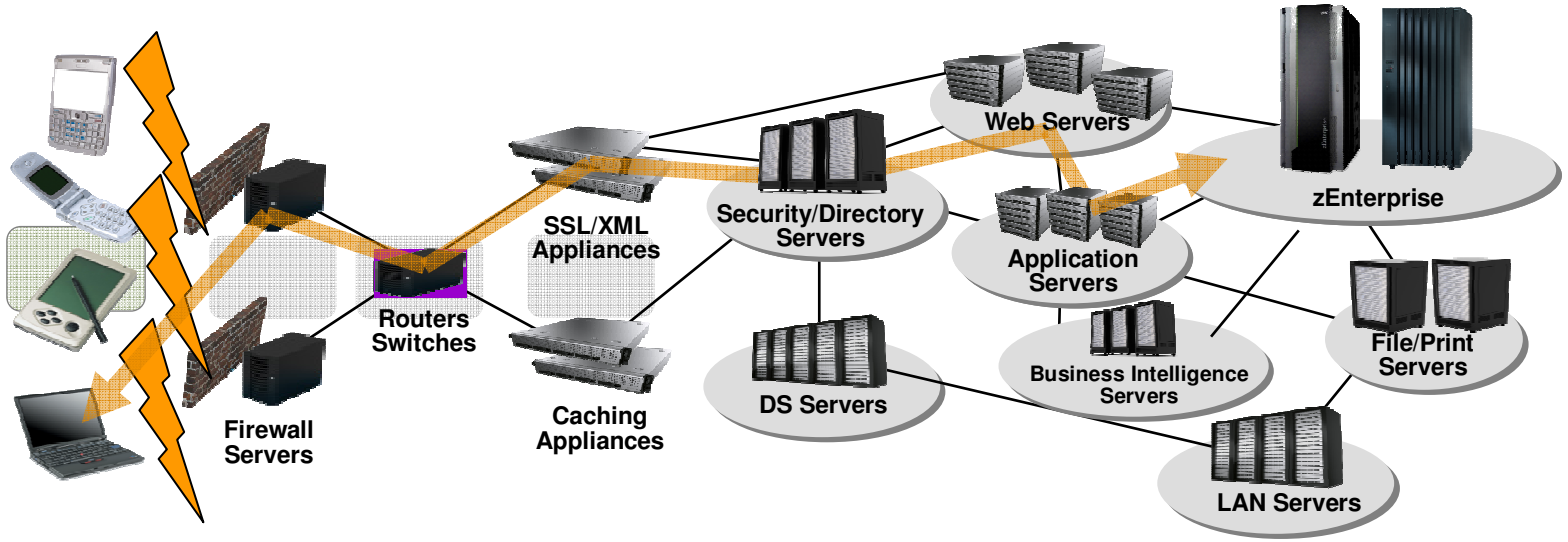
Agenda

- **zEnterprise and z/VSE 5.1**
- **z/VSE Modernization Options**
- **Wrap-up**

Motivation for change / optimization

- Server Sprawl Limitations
- Platform diversification
- Architecture diversification
- Operating Systems sprawl

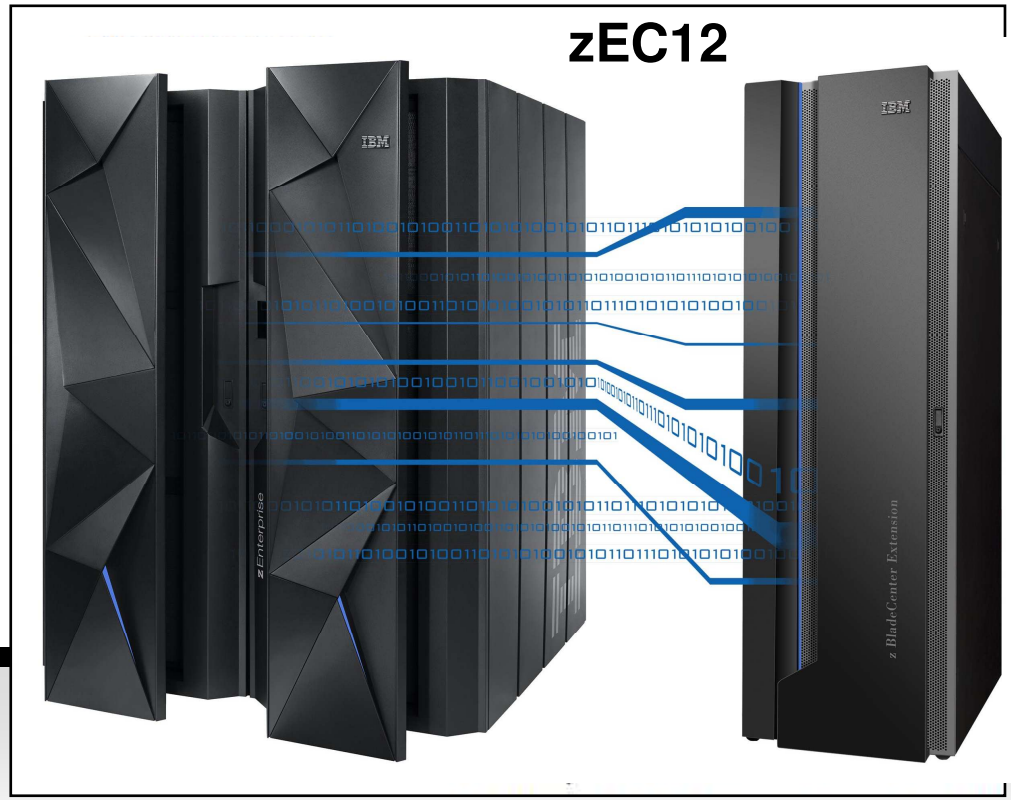


- **How many x86/Unix servers are deployed every month?**
- **How much data center space is available, or will it become a problem?**
- **How big is the energy consumption growing?**
- **How many additional people are required to maintain the constantly growing number of servers?**
- **How will the software license cost grow, including the virtualization software?**
- **How can IT availability ensured, what happens in the case of a disaster?**

Do you have to re-think your IT server strategy?

IBM zEnterprise System – one for everything !

Re-write the rulebook and set new standards for business-centric IT with IBM System z, to be the world's premier workload-optimized platform for enterprise applications.

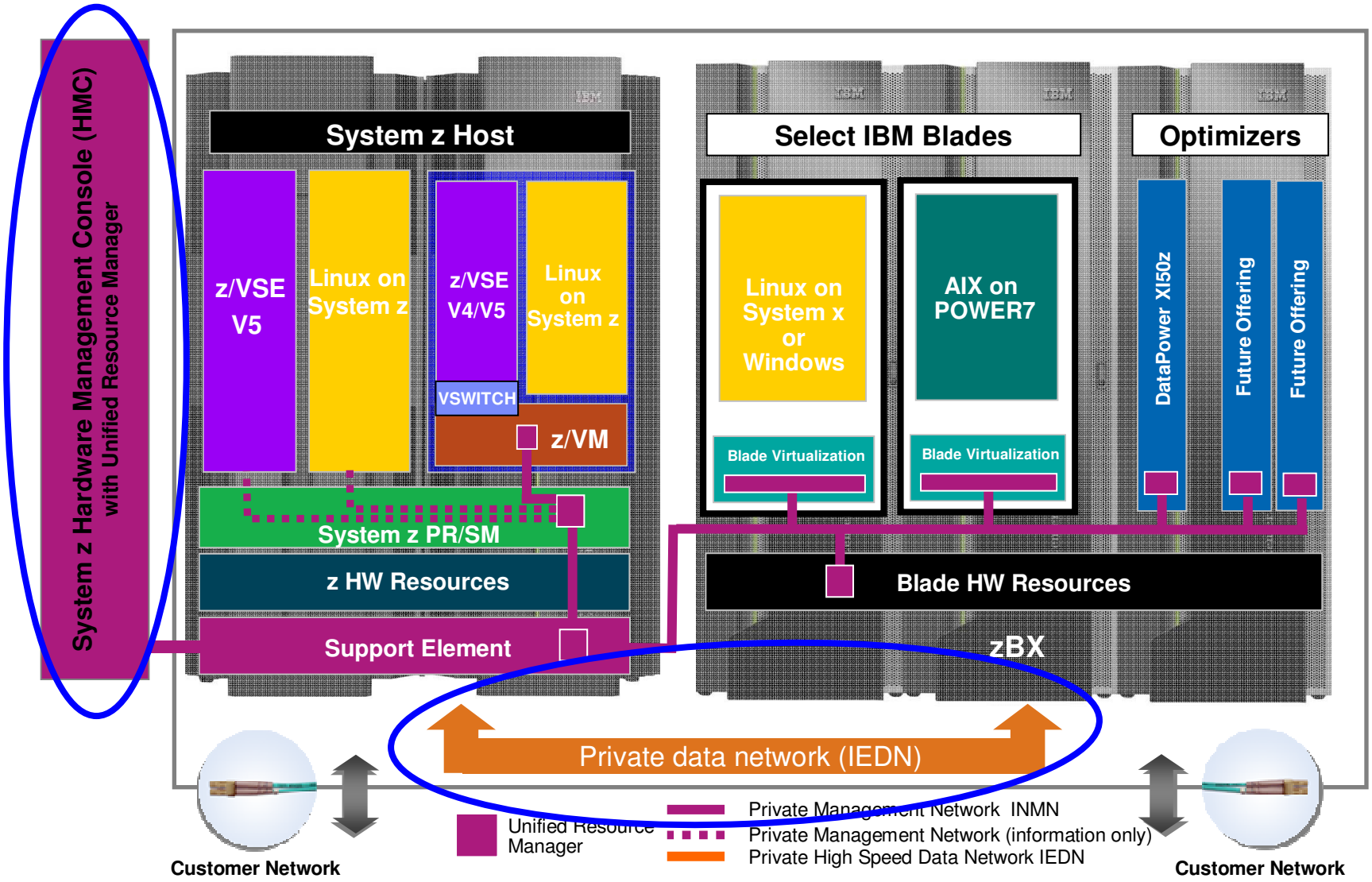


Our Vision:

An IT environment driven with one centralized System
- IBM zEnterprise System -

Deliver the best of all worlds - Mainframe, UNIX, x86 and single function processors - integrated in a single system for ultimate flexibility and simplicity to optimize service, risk, and cost across multiple heterogeneous workloads.

z/VSE 5 Support for IBM zEnterprise



z/VSE Support for IBM Mainframe Servers

IBM Servers	z/VSE V5.1.1	z/VSE V4.3	z/VSE V4.2 (Service till 31.10.2012)	z/VSE V4.1 (out of service)
IBM zEnterprise zEC12 **IBM zEnterprise z196 & z114**	✔	✔	✔	✔
IBM System z10 EC & z10 BC	✔	✔	✔	✔
IBM System z9 EC & z9 BC	✔	✔	✔	✔
IBM eServer zSeries 990 & 890	✘	✔	✔	✔
IBM eServer zSeries 900 & 800	✘	✔	✔	✔

On June 14, 2011, IBM announced withdrawal of service for Multiprise 3000 (7030-H30, -H50, -H70), to become effective December 31, 2012.

Please note:

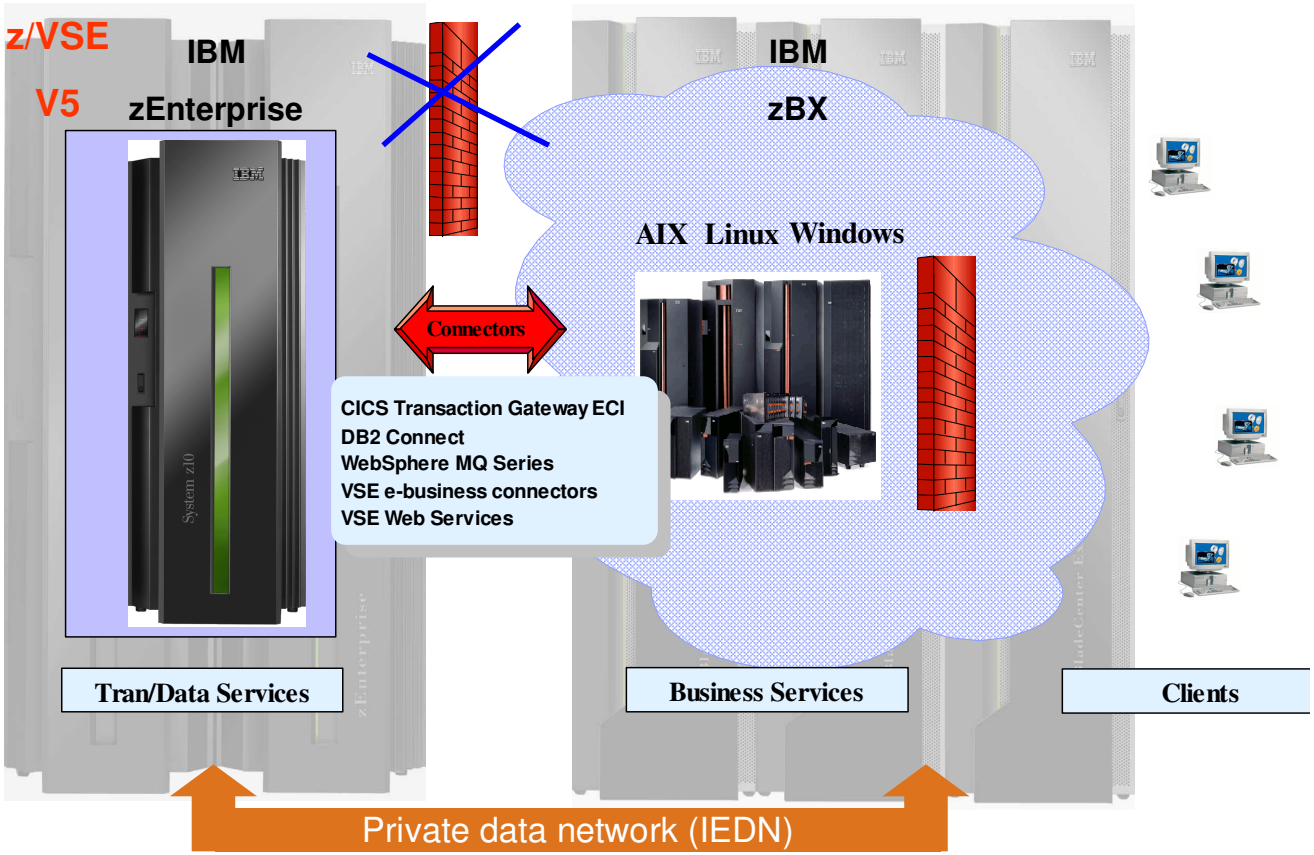
- z/VM V6 requires System z10 technology (or higher)
- SUSE SLES 11 requires System z9 technology (or higher)
- Red Hat RHEL 6 requires System z9 technology (or higher)

z/VSE Strategy – successfully established since 2000

z/VSE V5 Strategy with zEnterprise - More options, highly integrated

alias

- 3-tier Strategy
- **Hybrid Strategy**
- Connector Strategy
- Migration Strategy
- Coexistence Strategy
- Linux Surround Strategy
- **PIE Strategy**



Protect existing z/VSE investments

Integrate using middleware and z/VSE connectors

Extend with zBX or with Linux on z to access new applications & solutions

z/VSE Evolution

PIE-Strategie:

Protect
Integrate
Extend

Quality

Connectivity

z/OS Affinity

Capacity

NEW!

z/VSE 5.1.1 GA June 15, 2012
- CICS Explorer,
- LFP in LPAR,
- Database connector

NEW!

z/VSE V5.1 Nov. 25, 2011
- zEnterprise exploitation
- ALS to System z9 (and higher)
- 64-bit virtual addressing

z/VSE V4.3 Nov. 26, 2010
- Virtual storage (24-bit) constraint relief
- 4-digit device addresses
- Security/crypto/networking enhancements

z/VSE V4.2 Oct. 17,2008 (EoS: 10/2012)
- More tasks, PAV, LDAP Client,
- IPv6/VSE

z/VSE V4.1 March 16, 2007
- z/Architecture only, 64 bit real addressing,
- MWLC – full and sub-capacity pricing

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

z/VSE Evolution from z/VSE 4.3 till z/VSE 5.1.1

z/VSE V4.3 - 4Q2010

- z196 toleration / exploitation
- 4-digit device addresses
- 24-bit virtual storage constraint relief
- IPv6/VSE as optional product
- Linux Fast Path (with z/VM)

z/VSE V5.1 - 4Q2011

- No CICS/VSE support
- z196 / z114 exploitation
- 64-bit virtual memory objects
- ALS to System z9 (and higher)

z/VSE V5.1.1 - 2Q2012

- 64-bit I/O for applications
- CICS Explorer support
- Linux Fast Path in LPAR
- Database connector

+ SoD: 64-bit virtual support

+ SoD: CICS Explorer & LFP in LPAR

z/VSE V5.1 - General Availability since 11/25/2011

- **Introduction of an Architectural Level Set (ALS) that requires System z9 (or later)**
  - z/VSE V5 will run on System z9 BC/EC, z10 EC/BC, and zEnterprise z196/z114
- **64-bit virtual addressing for growing / future workloads**
  - Keep 'more data in memory' to benefit from increased processor storage
  - Built upon 64-bit real addressing, compatible API with z/OS
- **IBM zEnterprise exploitation**
  - Support Static Power Save Mode for MWLC clients with subcapacity option on z196
  - 4096-bit RSA keys with Crypto Express3 for enhanced security
  - Support of OSA-Express for zBX (CHPID OSX) to participate in an Intra Ensemble Data Network (IEDN)
  - z/VSE z/VM IP Assist (VIA)
- **Exploitation of IBM System Storage options**
  - Copy Export function of TS7700 Virtualization Engine for disaster recovery
  - IBM Storwize V7000 Midrange Disk System
- **Networking enhancements**
  - IPv6 support added to Linux Fast Path connector
  - GDPS client for high availability in z/VSE
- **Statement of Direction**
  - CICS Explorer capabilities for CICS TS for VSE/ESA to deliver addition
  - Allow the Linux Fast Path function to be used in an LPAR environment

z/VSE V5.1.1 Add'l Enhancements - GA 06/15/2012

- **Support IBM CICS Explorer – the new face of CICS Transaction Server for VSE/ESA**
  - Add value to CICS TS for VSE/ESA
  - New systems management framework for CICS TS (consists of client and server part)
  - Client part of CICS Explorer common for z/OS and z/VSE, server part requires CICS TS and z/VSE V5.1
  - *Fulfills SOD in z/VSE V5.1 Preview Announcement (RFA54520), 04/12/2011*

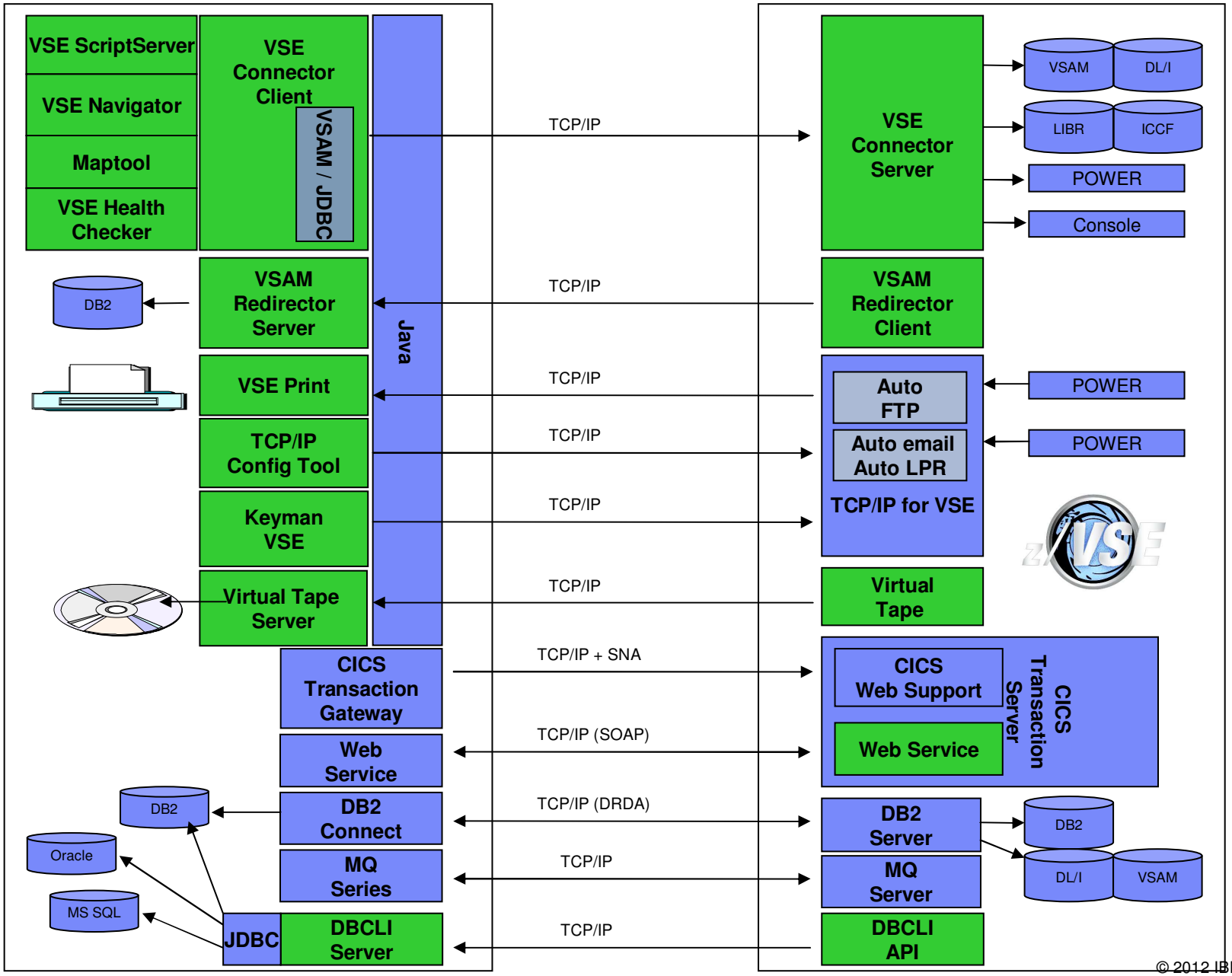
- **Fast Path to Linux on System z (LFP) in LPAR**
  - Allows TCP/IP applications to communicate with TCP/IP stack on Linux w/o using a TCP/IP stack on z/VSE
  - LFP in a z/VM guest environment available since z/VSE V4.3 – now LPAR support is added
  - LFP in LPAR requires HiperSockets Completion Queue function of zEnterprise
  - *Fulfills SOD in zEnterprise Announcement (RFA54727), 07/12/2011*
  - *Fulfills SOD in z/VSE V5.1 Announcement (RFA55492), 10/12/2011*

- **z/VSE database connector for z/VSE applications**
  - Allows to utilize a new Call Level Interface (CLI) to advanced database functions
  - Flexibility to use a database server on a platform other than z/VSE (for example in a zBX environment)

- **64-bit I/O processing for applications**
  - 64-bit virtual storage can also be used for I/O buffers
  - Allows ISVs and customers to exploit 64-bit virtual storage

- **IPv6/VSE Secure Socket Layer (SSL) support**
  - Secure TCP/IP data transmission in IPv4 and IPv6 for z/VSE

Integration of z/VSE using IBM Middleware & Connectors



IPv6/VSE Secure Socket Layer (SSL) support

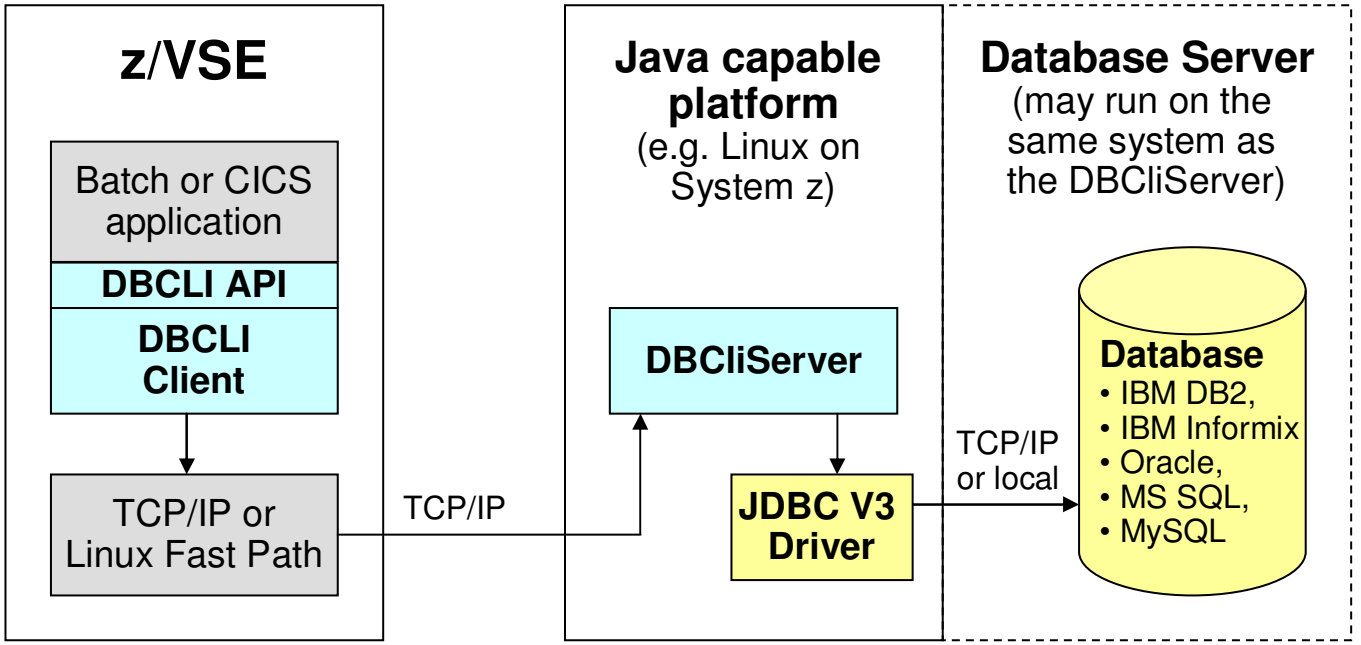
- **Secure TCP/IP data transmission**

- z/VSE 5.1 enhancements
  - Large TCP window support, can increase throughput
  - 64 bit virtual exploitation, large TCP window storage allocated above the bar
  - Layer 2 (data link layer) and Layer 3 (IP layer) support
  - VLAN support
  - On extended base tape

z/VSE database connector for z/VSE applications

z/VSE Database Call Level Interface (DBCLI)

- Allows z/VSE applications to access a relational database on any suitable database server
  - IBM DB2, IBM Informix, Oracle, MS SQL Server, MySQL, etc.
    - → *The database product must provide a JDBC driver that supports JDBC V3.0 or later*
- Utilize advanced database functions and use SQL statements
- Flexibility to use a database server on a platform other than z/VSE
  - for example zBX environment



z/VSE's evolution to 64-bit Addressing

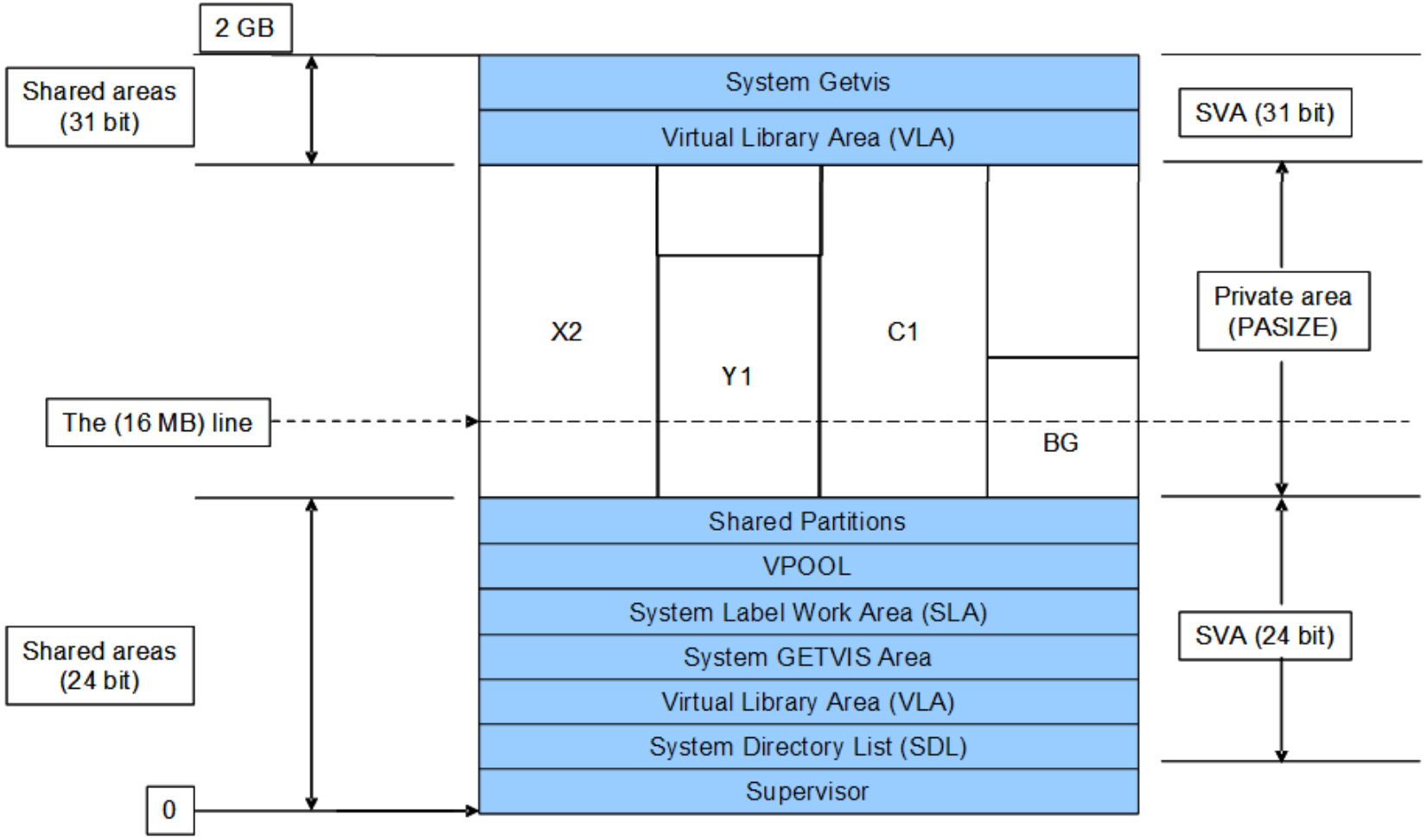
- z/VSE 4.1 implemented the z/Architecture – required for 64 bit addressing – and supported real memory up to 8 GB. To access the real memory above 2 GB the page manager has to switch into AMODE 64 (real addressing only).

- z/VSE 4.2 increased the supported real memory to 32 GB, moved page manager control blocks above 2 GB and added support for 64 bit general purpose registers (64 bit registers).

- z/VSE 4.3 implemented 1 MB frames (large pages) for data spaces, which will be the base for a 64 bit virtual sub-function. However, large pages for address spaces will not be implemented in z/VSE 5.1.

- z/VSE 5.1 will support 64 bit (virtual) address spaces for static partitions as well as dynamic partitions.

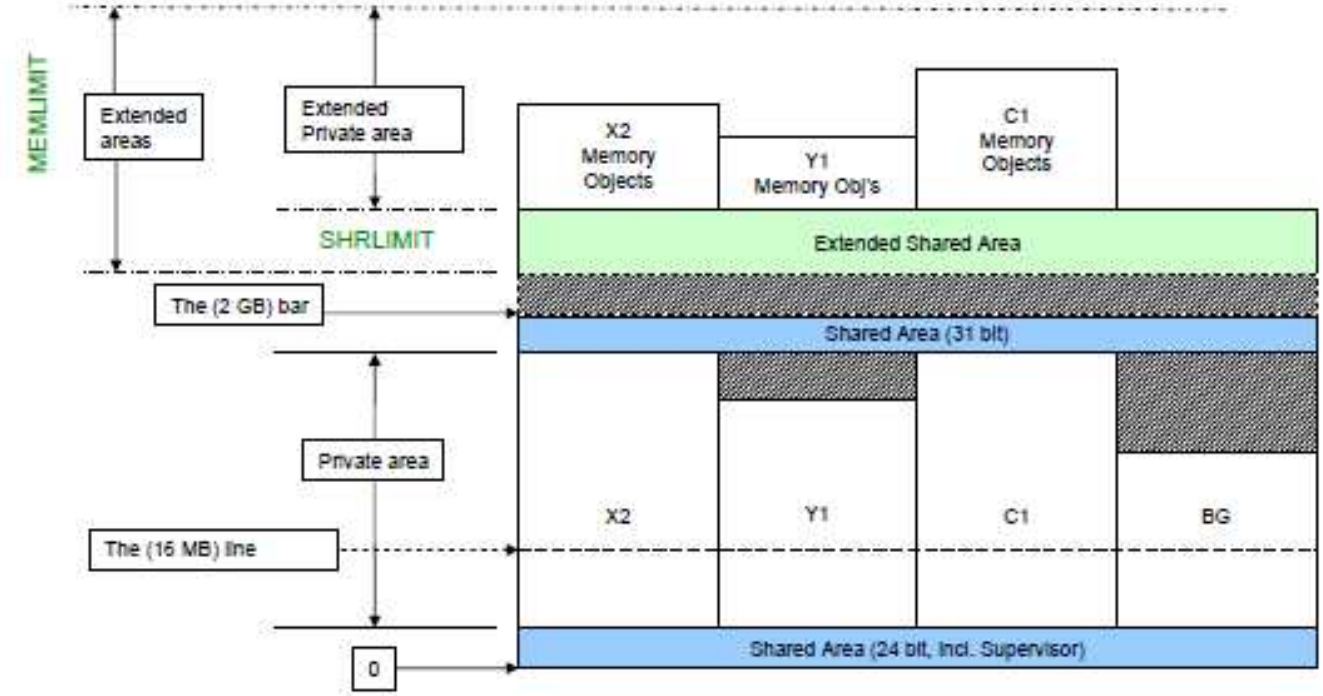
z/VSE 31-bit Address Space layout



31 bit address space layout

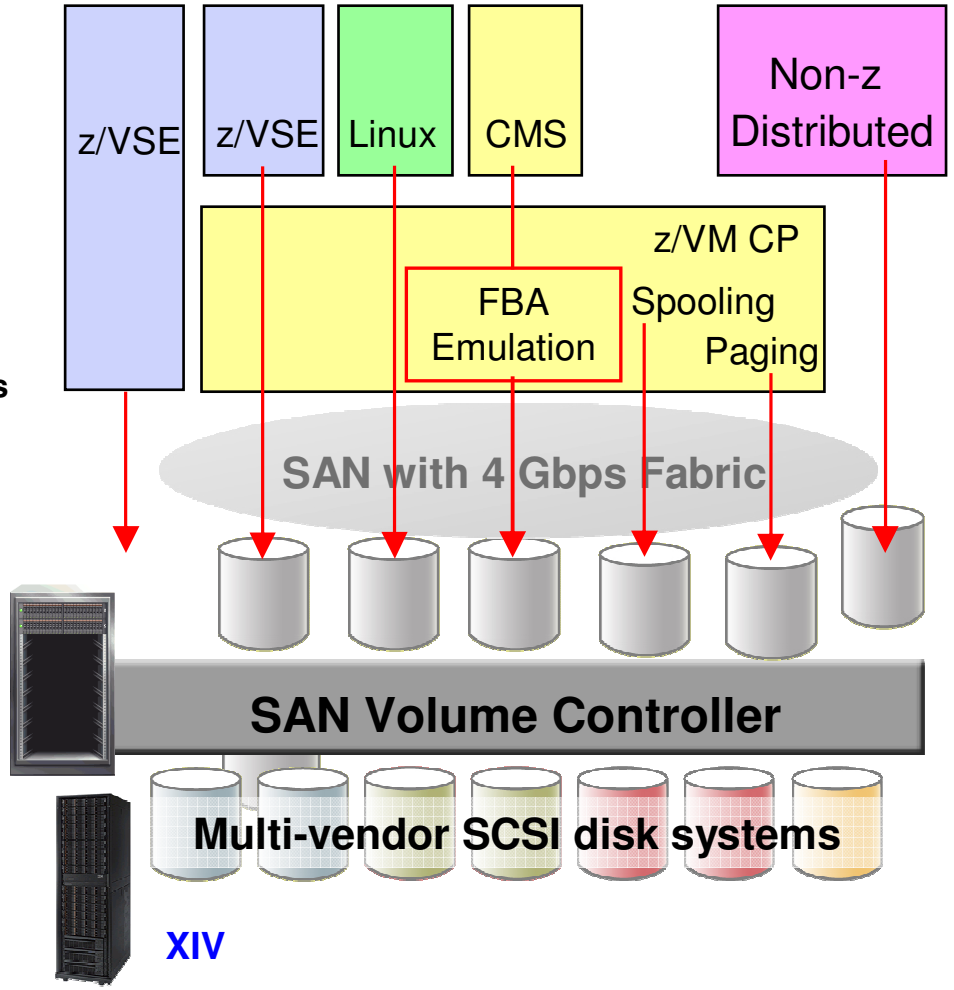
64-bit I/O processing for applications

- 64-bit virtual storage can also be used for I/O buffers
- With 64-bit I/O processing, clients have the flexibility to also use 64-bit virtual storage for I/O buffers and thus benefit from increased processor storage available with the latest IBM System z servers.
- Allows ISVs and customers to exploit 64-bit virtual storage
- Exploits increased processor storage of System z servers



z/VSE V5.1 SAN integration: SAN Volume Controller (SVC)

- SAN Volume Controller (SVC) creates a single pool of SCSI disk capacity
- Disk storage options include IBM DS8000, DS6000, ESS, DS4000, etc. plus qualified systems from various non-IBM vendors
- SVC *platform* includes both hardware and software components:
  - **SVC 'nodes' provide redundant components plus cache**
  - **Systems Storage Productivity Center (SSPC) software provides administrative and copy services**
- z/VSE can be interated in a SAN with native support for Storwise 7000 and XIV
- Benefits include a simpler, more flexible, less costly disk storage infrastructure



Learn more at: **ibm.com**/storage/support/2145

Exploitation of IBM System Storage options with z/VSE V5

- **Copy Export function of the TS7700 Virtualization Engine Series**
  - can be used for disaster recovery purposes
- **Multi-Cluster Grid Support of the TS7700 Virtualization Engine Series**
  - enables disaster recovery or high availability solutions
- **FCP-attached SCSI disks can additionally be used with:**
  - IBM Storwize V7000 Midrange Disk System
  - IBM XIV Storage System

DS8000

Highend 99.999 system with sophistication, complex 3-site copies, ultra-low latency

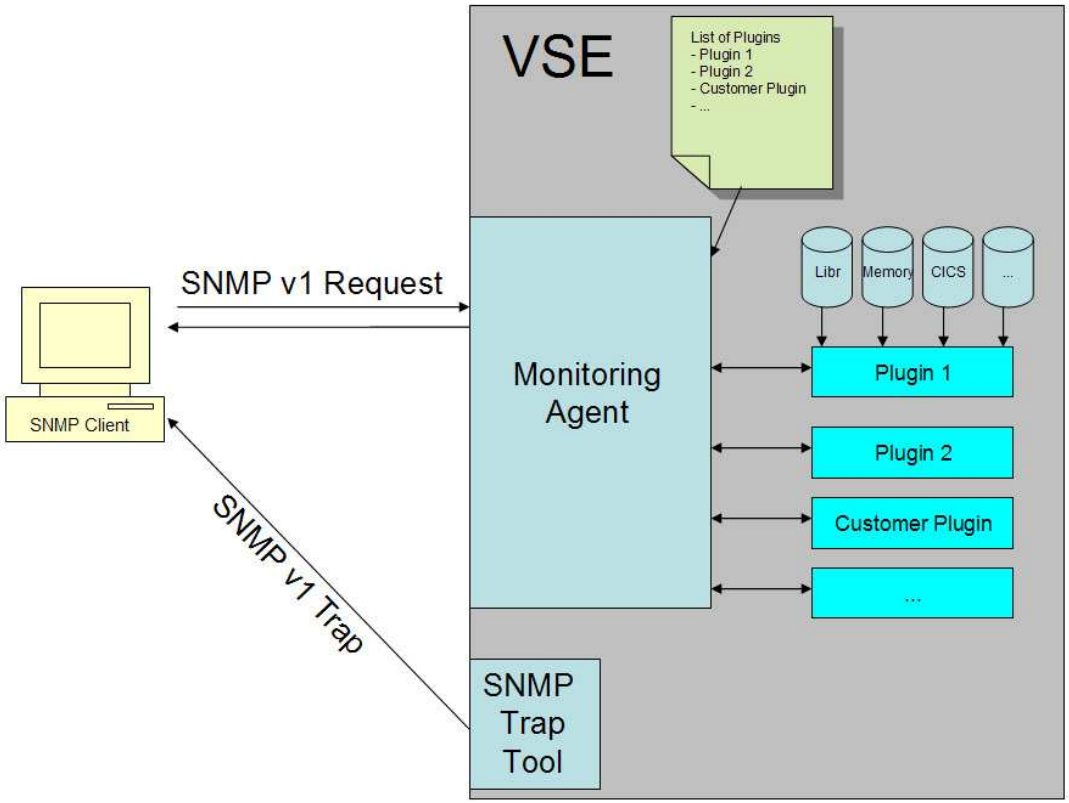
XIV

Highend 99.999 system without sophisticated options

Storwize V7000

Midrange size system with great highend features

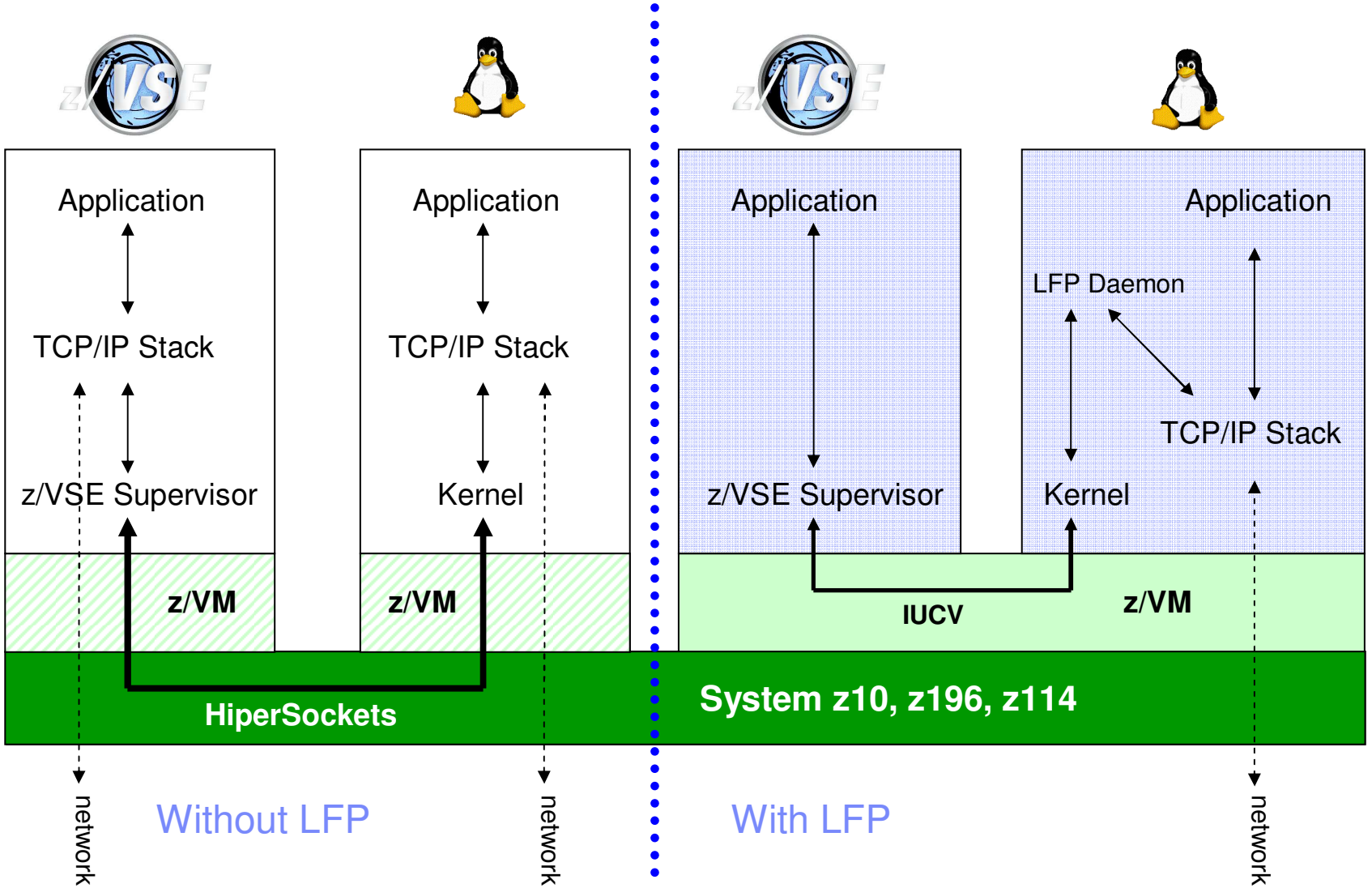
z/VSE Monitoring enhancement



- Monitoring Agent based on SNMP V1
  - Real time monitoring
    - retrieve z/VSE specific system and performance data
  - Event driven monitoring using SNMP Traps
    - In z/VSE 5.1 a Trap API was introduced to the Trap Tool
    - Helps to automate processes in z/VSE with SNMP traps

Linux Fast Path in a z/VM-mode LPAR - Supported by z/VSE V4.3 + V5.1

Faster communication between z/VSE and Linux applications under z/VM



Press

zJournal: April/May 2011

Clipper Group: Sep 2011

The z/VSE Fast Path to Linux on System z

Print this article

TRANSLATE

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by Ingo Franzki, Karsten Graul

April 6, 2011

Linux on System z has been an important part of z/VSE's Protect, Integrate and Extend (PIE) strategy for many years. It:

- Protects customers' enormous cumulative investment in their core z/VSE applications
- Integrates z/VSE systems and applications into a heterogeneous IT environment
- Extends z/VSE's capabilities with features and functions provided by Linux on System z or other platforms.

Linux on System z provides many useful functions that z/VSE doesn't provide. It offers WebSphere, Java, DB2 Universal Database, a rich set of development tools, and a growing selection of packaged applications. On the other hand, z/VSE provides excellent, cost-effective capabilities to run traditional workloads such as CICS transactions or batch jobs.

To allow easy integration of z/VSE with other systems and applications, z/VSE provides a huge set of so-called connectors that allow access to various types of z/VSE data and applications from remote applications

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Published Since 1993 Report #TCG2011031LI September 6, 2011

IBM Continues Extension of z/VSE — More Function for Midrange Mainframe Users

Analyst: Stephen D. Bartlett

Management Summary

Long, long ago in a land far, far away, and way before the *Web-year* became the standard unit of time in the IT industry (actually it was in Washington, D.C., in the mid 1960's), there was a young sales rep who worked for a very large, prestigious computer company. In that young sales rep's briefcase were two binders, fairly thick, but manageable: one contained detailed descriptions and important elements of all the hardware products that his company sold and similarly the other contained all the company's software. For the most part, those binders contained all the building blocks required for almost any enterprise, public or private, to create, operate, and maintain an extensive information system to support their diverse missions. That is not to say that there weren't at least seven other companies whose sales reps could make the same claim as our young rep, but the other vendors' solutions were not as durable, as history demonstrated.

Fast forward, if you will, to the present. That large, prestigious company remains, but that company's products and services are far, far larger than whose descriptions could be contained within a few binders. Moreover, this company is surrounded, and we also would have to say intermeshed and interconnected, with numerous other vendors that now constitute this industry, one that seems to be expanding and being redefined almost exponentially. In the early 1950s, the most common unit of computer input and data storage was a hole in a paper card 7-3/8 by 3-1/4 inches (approx. 187.3 by 82.6 mm); now it is most often a digital stream that flows between end points located almost anywhere in the world and transmitted through or stored in a cloud of immeasurable dimensions. Every facet of our lives is influenced or touched by this phenomenon; one could argue that our modern culture could not exist without it. The constructs of the IT universe are manifold and their taxonomy is large and dynamic. However, not a week goes by in which some player in this mash up does not declare to have invented something new.

Thus, is there any wonder that something can easily get lost in the morass of information that surrounds this industry, even within the more limited universe of the IBM Corporation? For instance, let's stipulate that computer operating systems are a fairly erudite subject, but nevertheless an absolutely essential element of the IT universe and, as it turns out, one can count the developers and distributors of such on your two hands. (Let's not split hairs by arguing for the mega-multiple authorship of Linux.) Let's just count those that officially run on IBM server families. There is *AIX* and *IBM i* on *Power Systems*, *Linux* (from various distributors) on each family, Microsoft *Windows* on *System x* servers, and *z/OS*, *z/VM*, *z/TPF*, and *z/VSE* on System z. It would be no surprise if z/VSE is only vaguely familiar; it seems to have become the stepchild, but not a homely one, lost in the hyper-universe dominated by z/OS and Linux on zEnterprise systems. This seems to have become a dilemma for not only IBM but for its loyal z/VSE customers as well, but should they be concerned? We think not, but if you want to know why, then please read on.

IN THIS ISSUE

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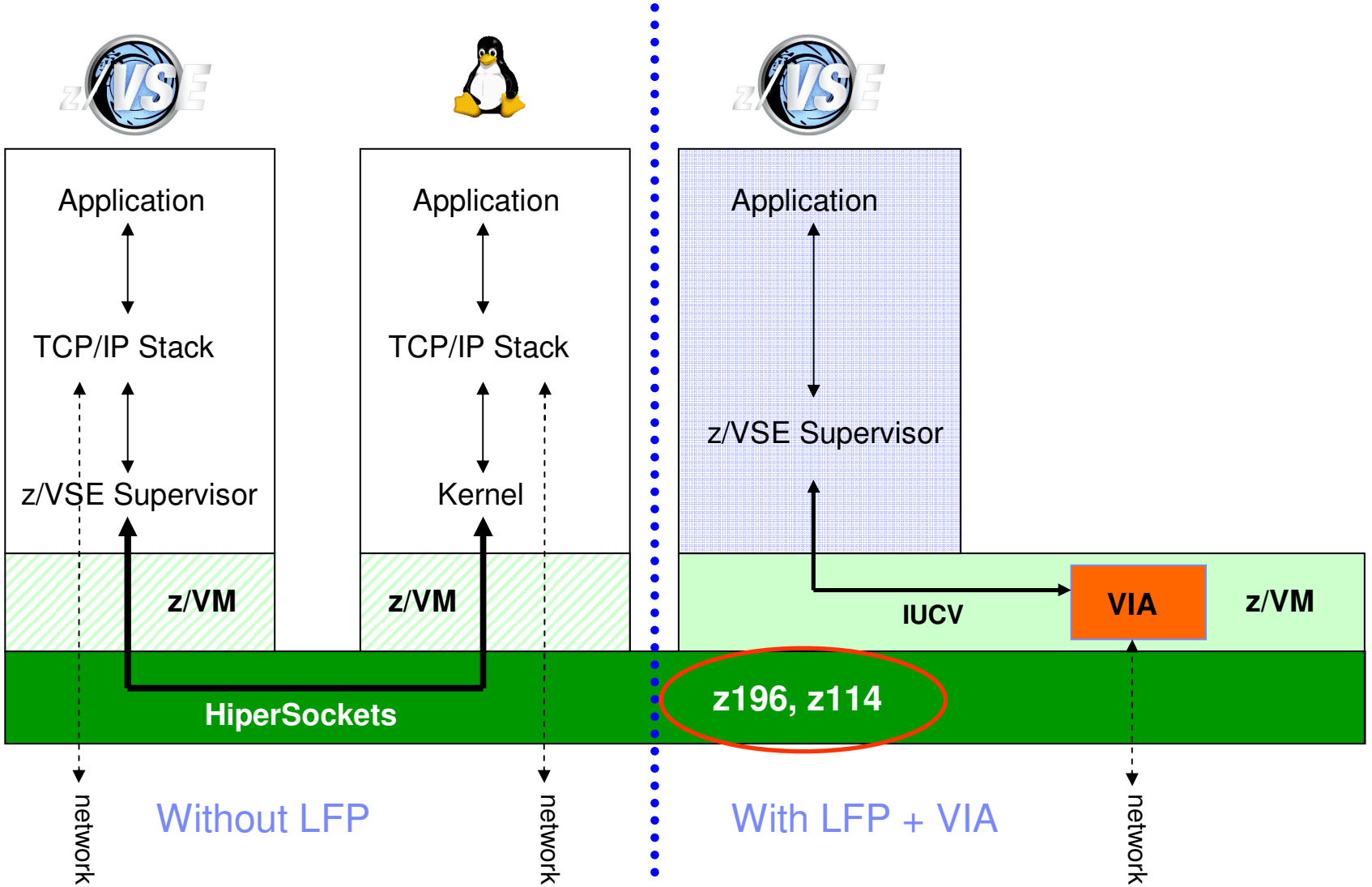
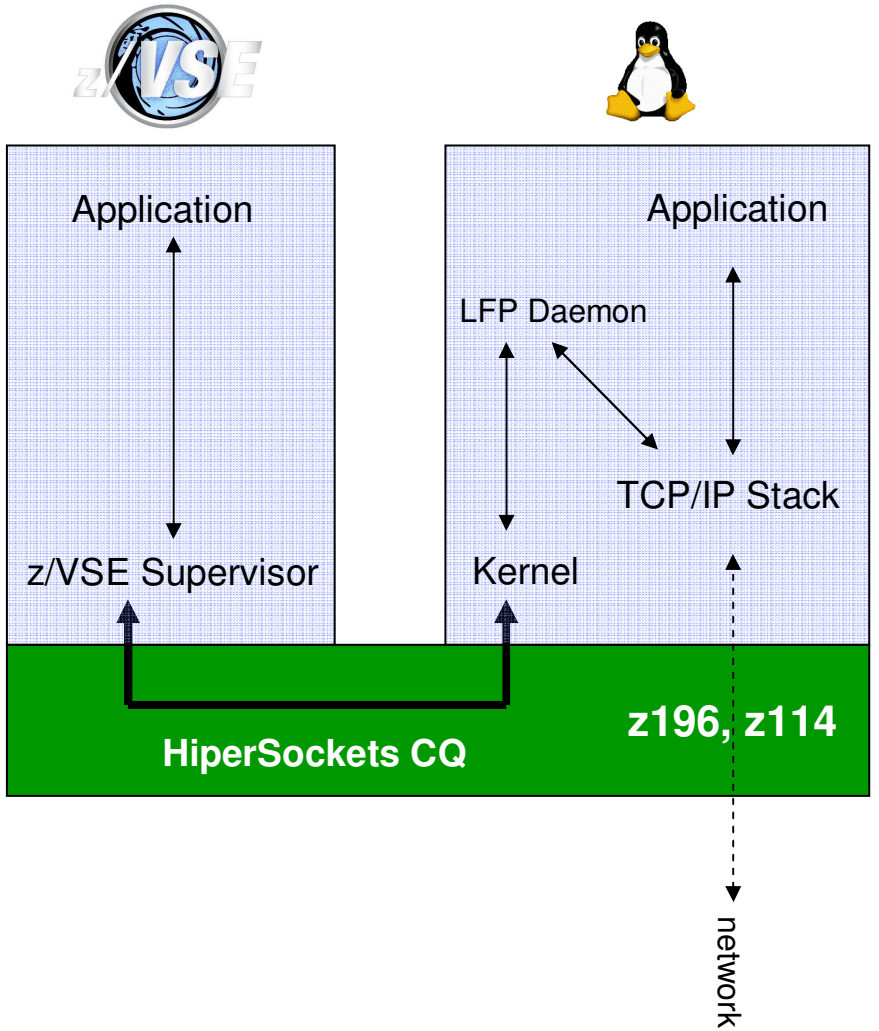
z/VSE z/VM IP Assist (VIA) - Supported by z/VSE V5.1

No Linux on System z is needed to utilize the LFP advantage



Fast Path to Linux on System z (LFP) in LPAR

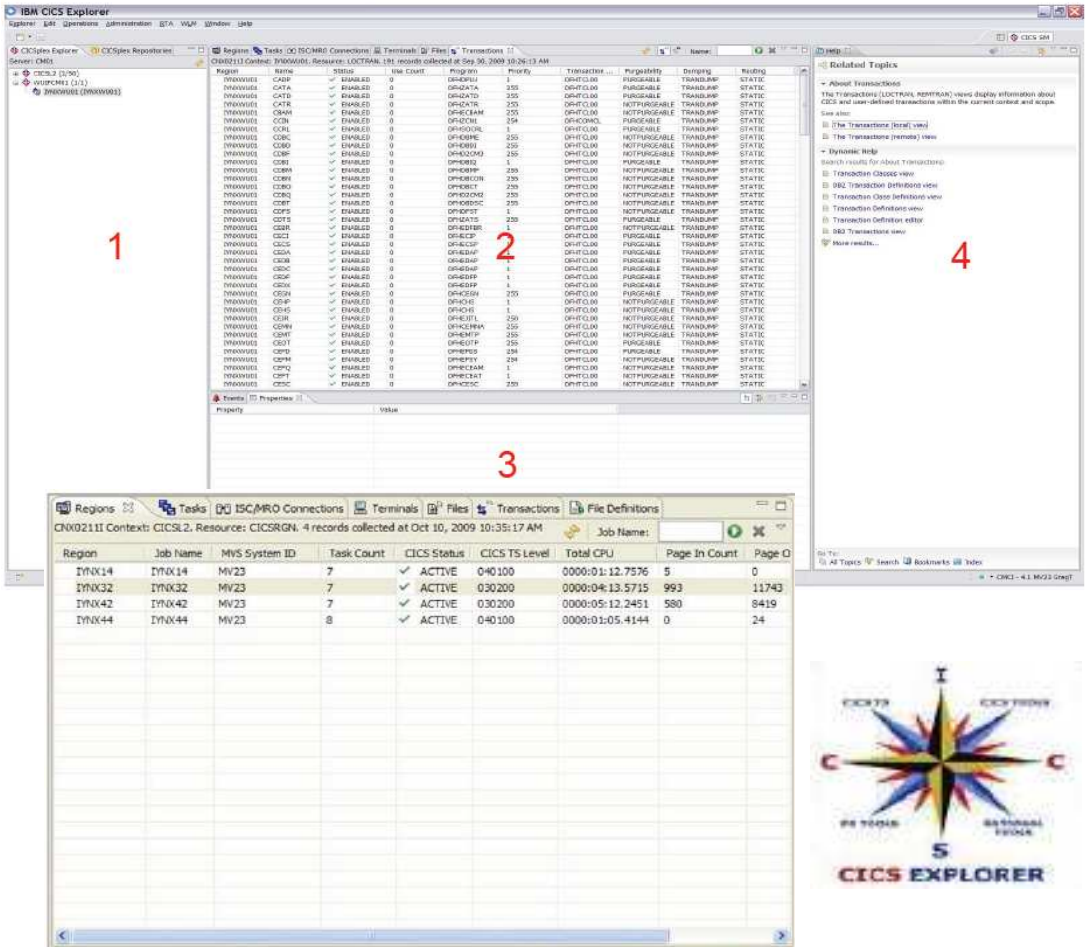
- Allows TCP/IP applications to communicate with TCP/IP stack on Linux w/o using a TCP/IP stack on z/VSE
- Provides (for example) fast access to a data base server on Linux
- LFP in a z/VM guest environment available since z/VSE V4.3 – now LPAR support is added with z/VSE V5.1 + PTFs
- LFP in LPAR requires HiperSockets Completion Queue function of zEnterprise



z/VSE support for IBM CICS Explorer – The “new face of CICS Transaction Server for VSE/ESA“

CICS Explorer

- New systems management framework for CICS TS
- Consists of client and server part
- Based on the Eclipse Rich Client Platform (RCP)
- Provides integration platform
- Scalable and intuitive way to monitor CICS systems
- Can be extended via plug-ins
- Client part of CICS Explorer common for z/OS and z/VSE
- Server part requires CICS TS and z/VSE 5.1



Fulfills Statement of Direction:

“IBM intends to provide CICS Explorer capabilities for CICS TS for VSE/ESA, to deliver additional value.“

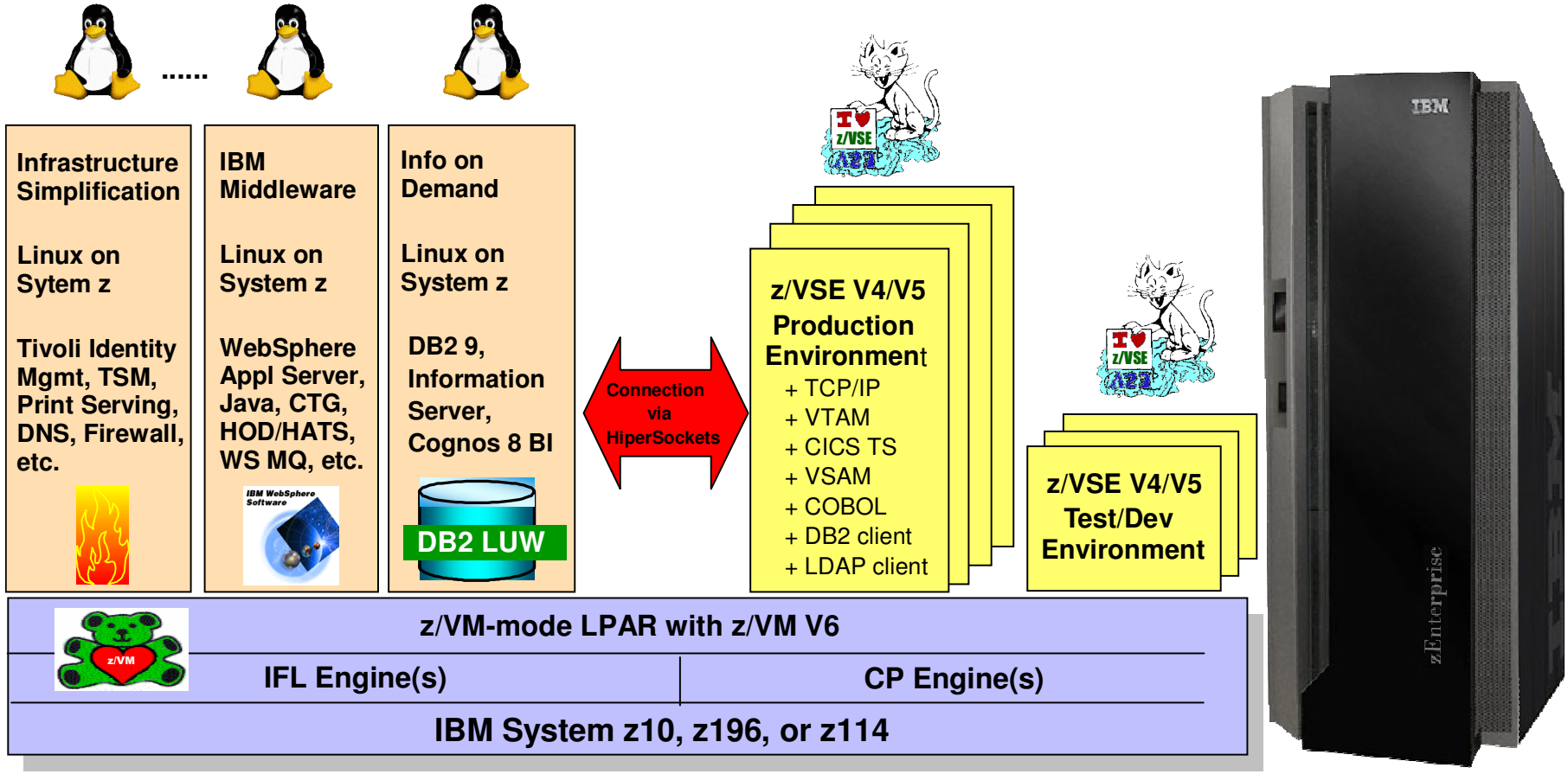
z/VSE Strategy w/ Linux on System z

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

Protect existing VSE investments

Integrate using middleware and VSE connectors

Extend with Linux on IBM System z technology & solutions



Agenda

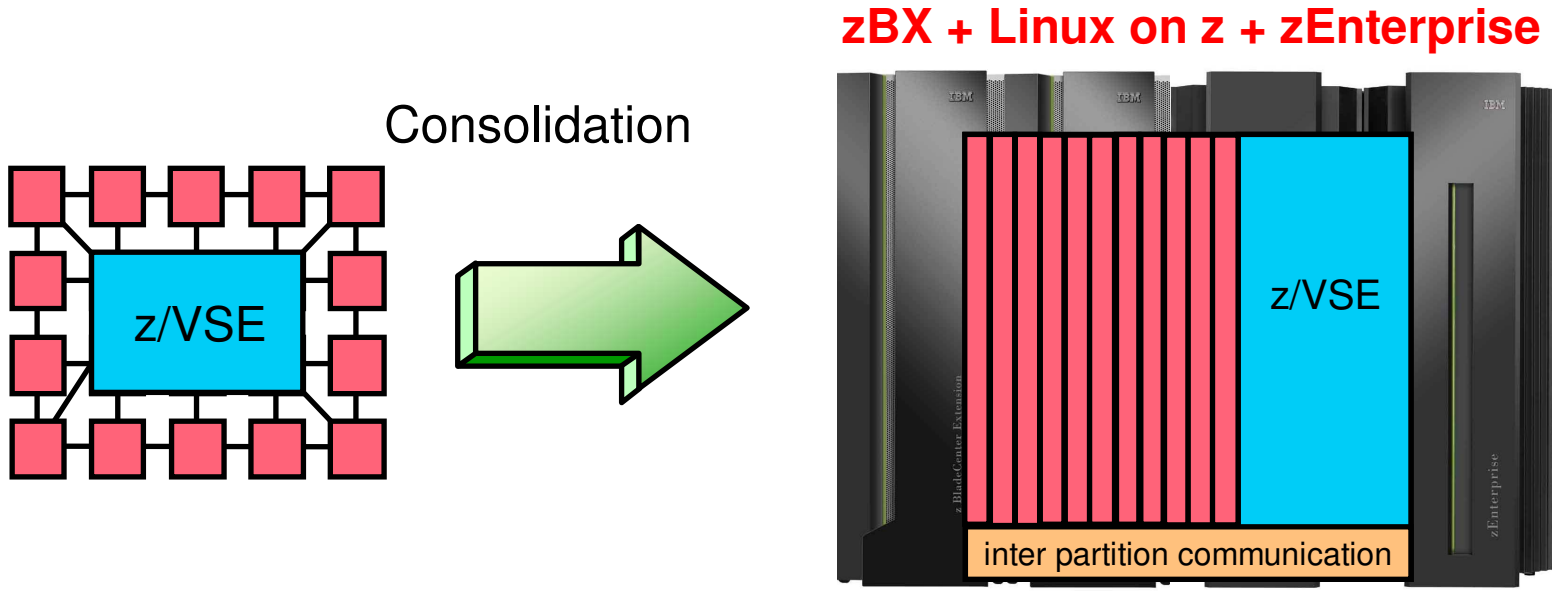
- **zEnterprise and z/VSE 5.1**
- **z/VSE Modernization Options**
- **Wrap-up**

Mixed workload consolidation with zEnterprise

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

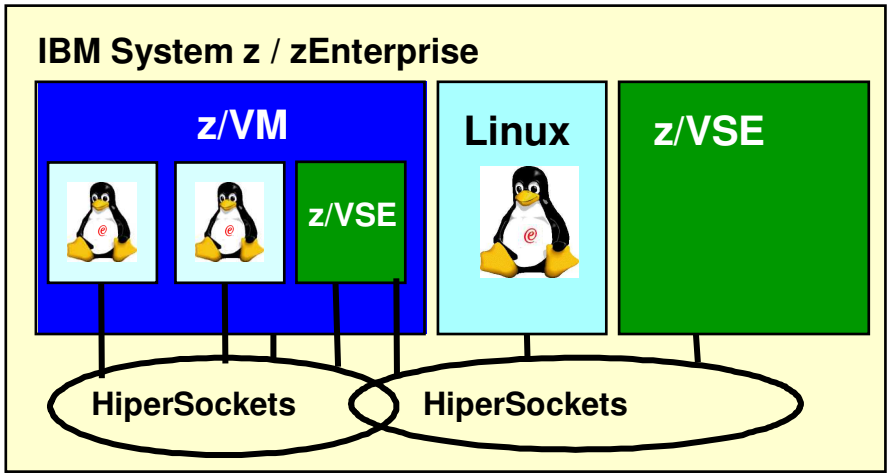
Mixed Workload consolidation on zEnterprise



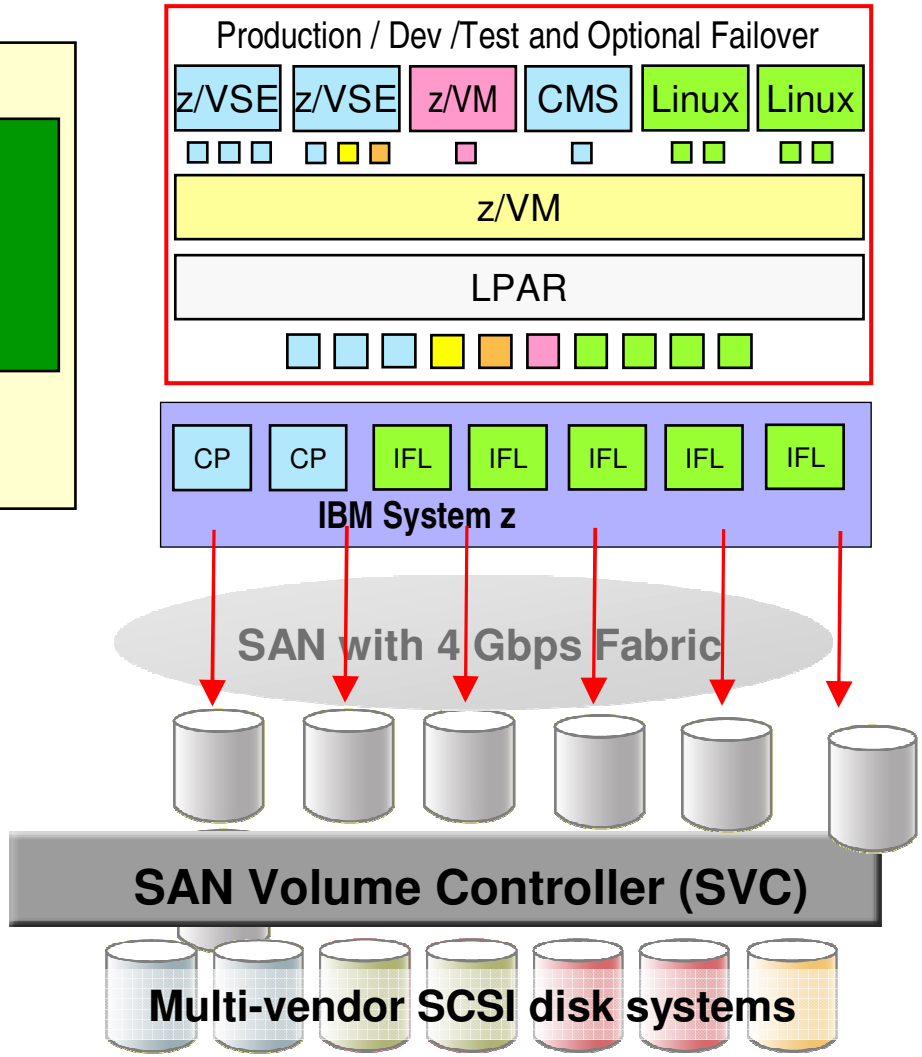
For z/VSE customers, zEnterprise opens new horizons:

- Integration of multiple platforms of the Enterprise
- A big variety of standard applications
- The integration of existing applications and data using e-business Connectors
- Modern, scalable new solutions

Global Virtualization – with System z



- Network Virtualization
- Memory Virtualization
- Processor Virtualization
- System Virtualization
- Disk Virtualization



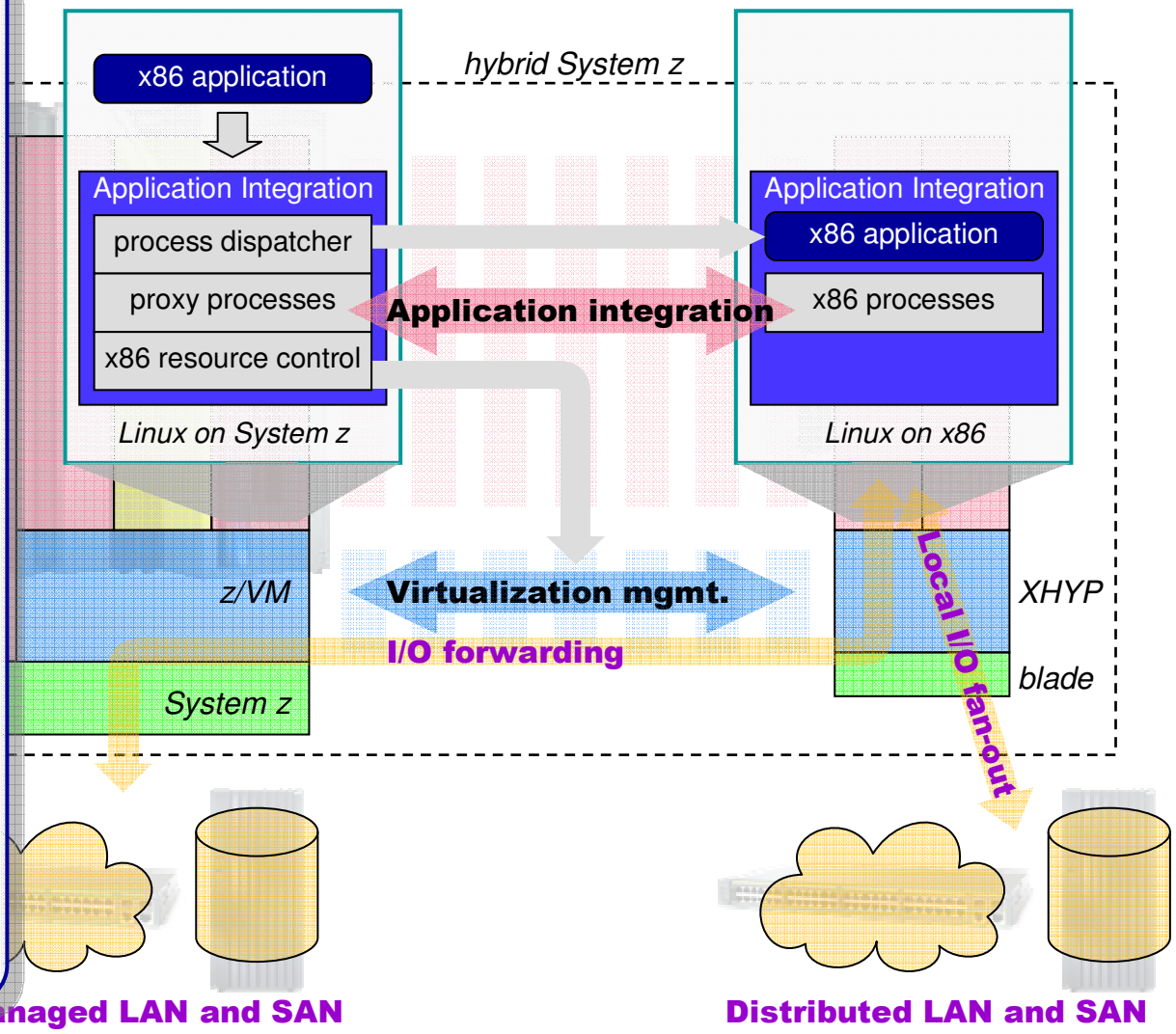
Linux Application Integration

Capabilities:

- Reduce complexity: present single system image
- run x86 Linux applications from Linux on System z
- x86 blades feel like additional processor and memory capacity

Values:

- reduced number of application management endpoints
- retains certified x86 distribution environments
- leverage Linux on System z security model for x86 systems
- can integrate with eWLM, TSA, Energy Management
- converged data management to better comply to regulatory requirements
- offline and online package management for both sides
- complete consolidation scenarios



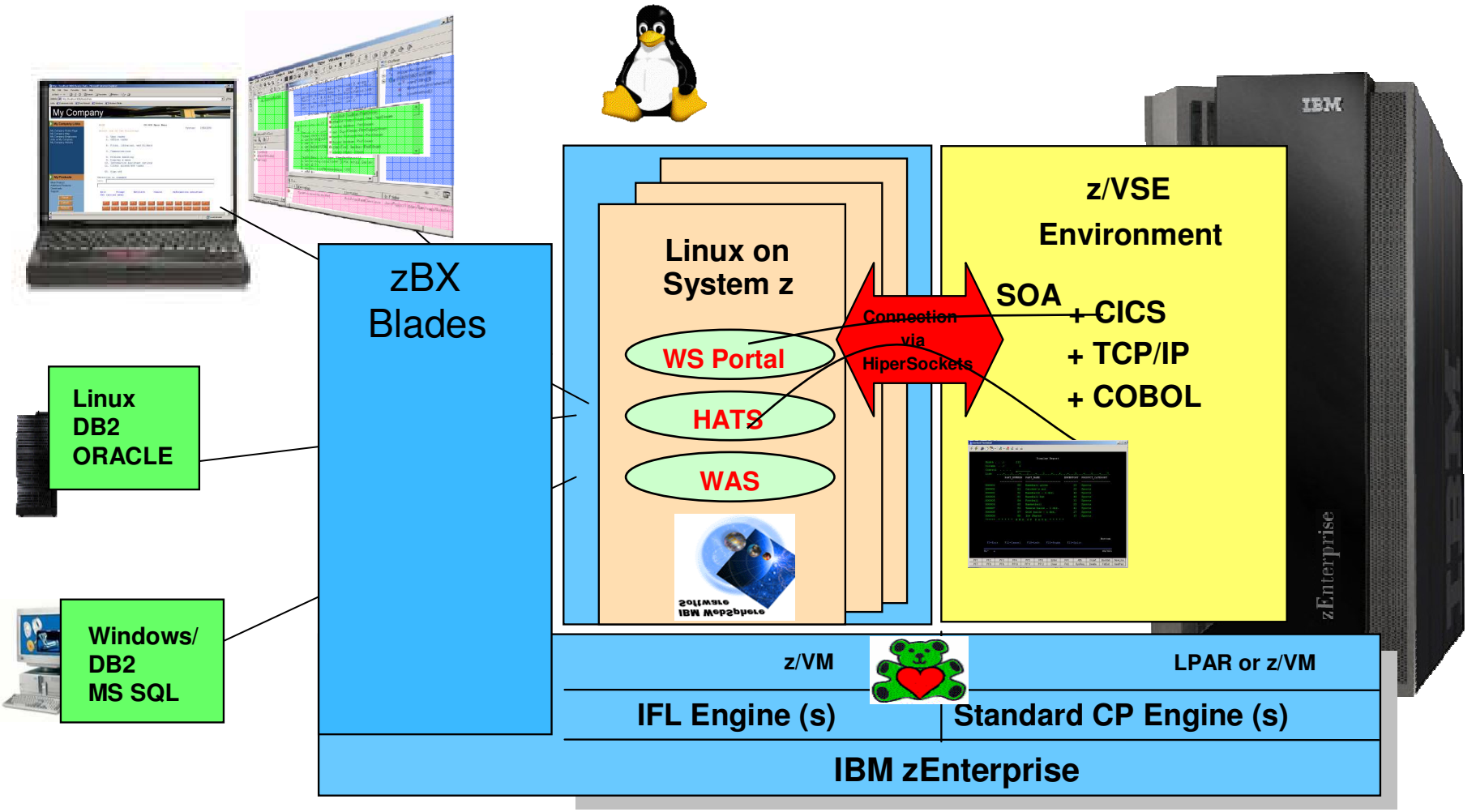
Web integration with Linux and z/VSE

http://www.ibm.com/zVSE

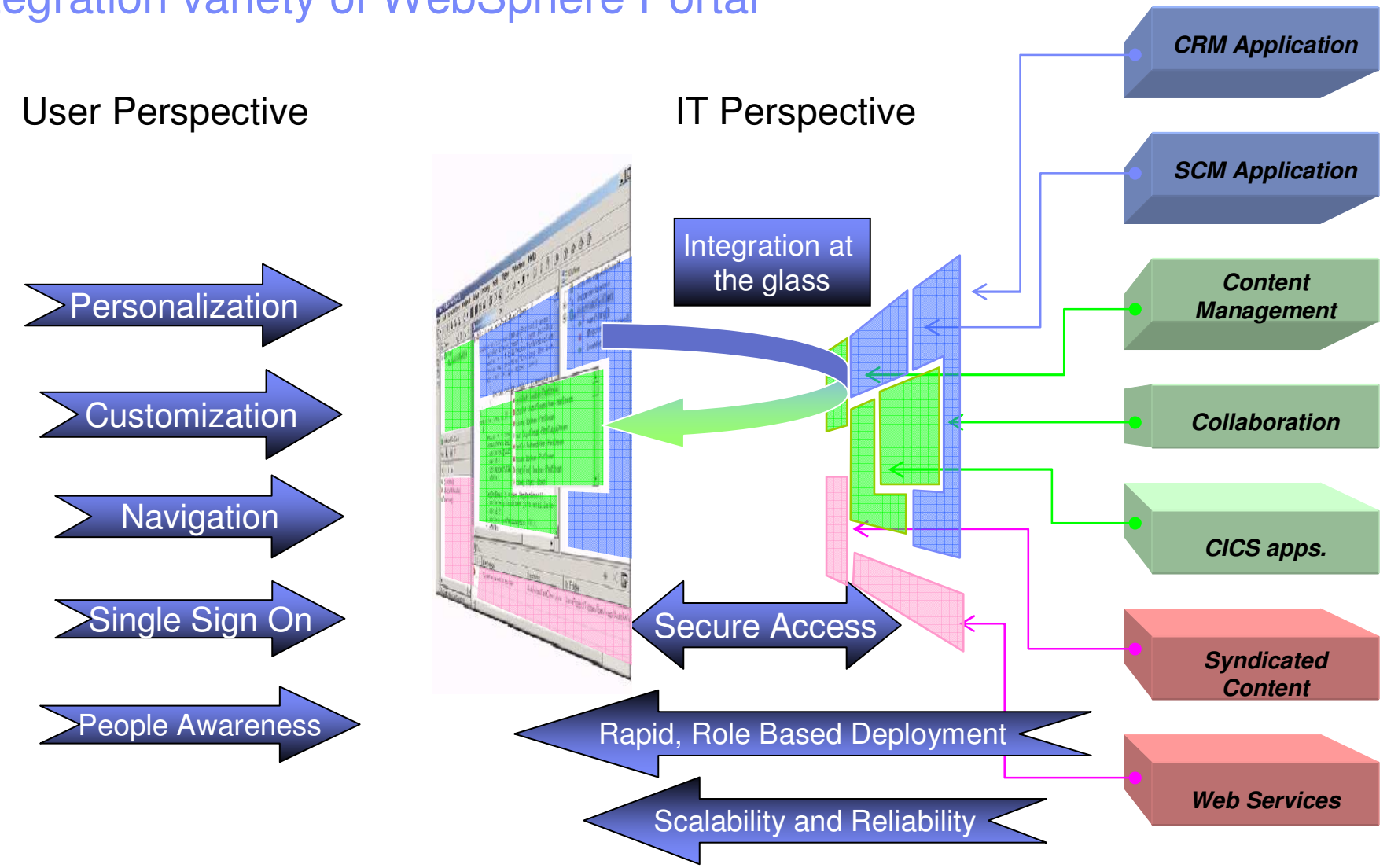
http://twitter.com/IBMzVSE

Linux on System z as Central Access Point

Web enable, improve interface, simplify, extend existing applications

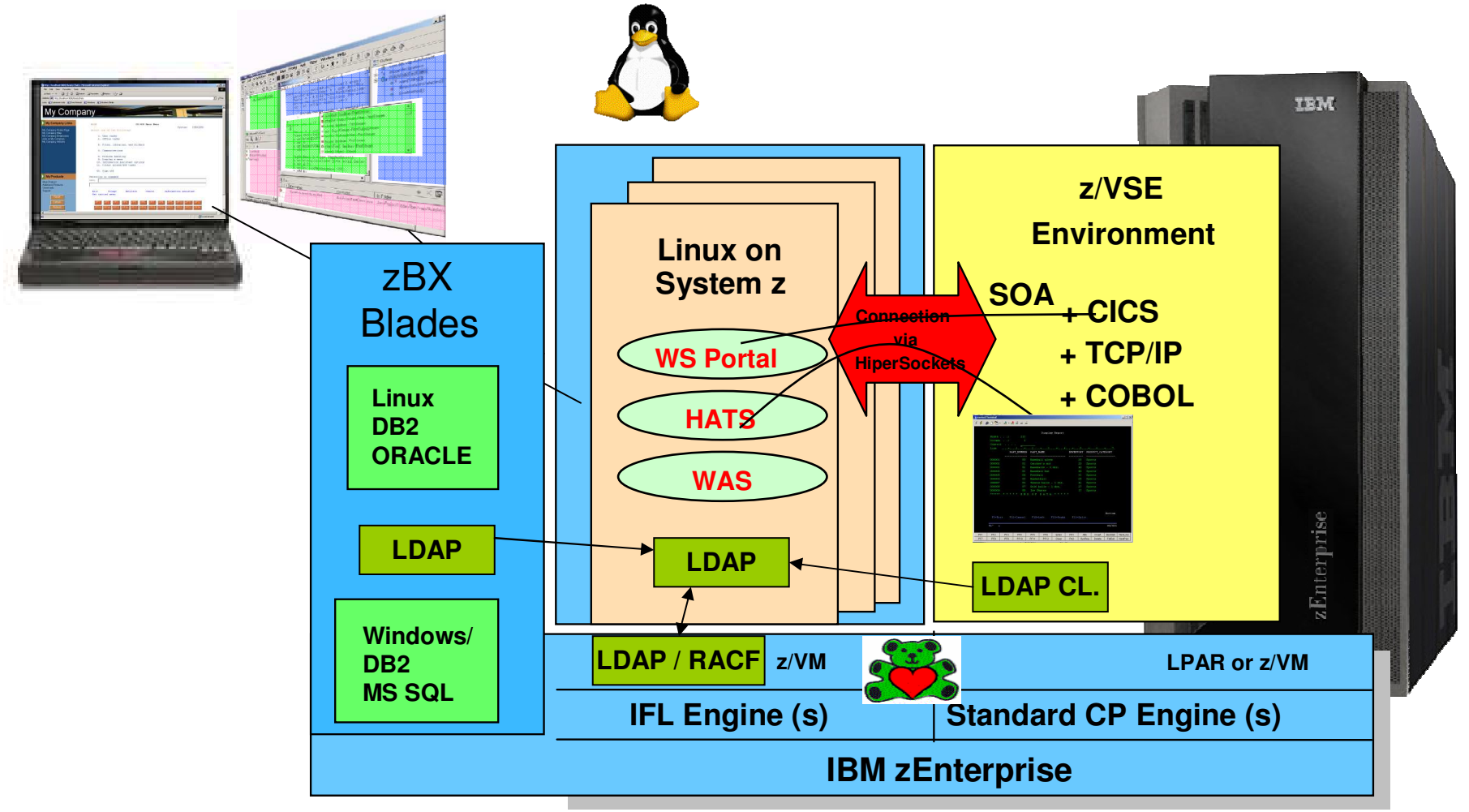


Integration variety of WebSphere Portal



Central Authentication Options – LDAP in Linux or LDAP/RACF in z/VM

Single sign on, Web enable, improve interface, simplify, extend existing applications

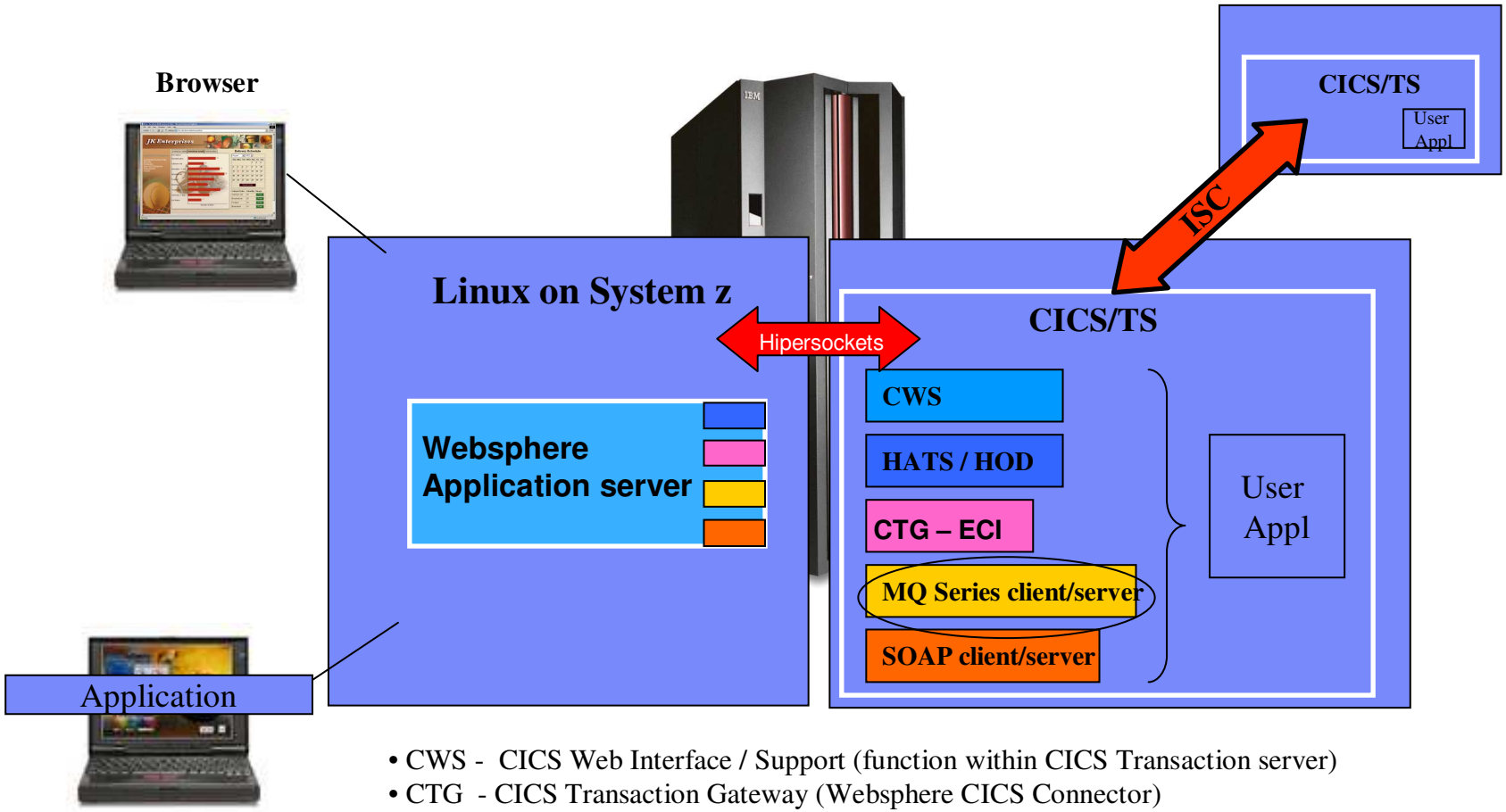


CICS workload integration with Linux on System z

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

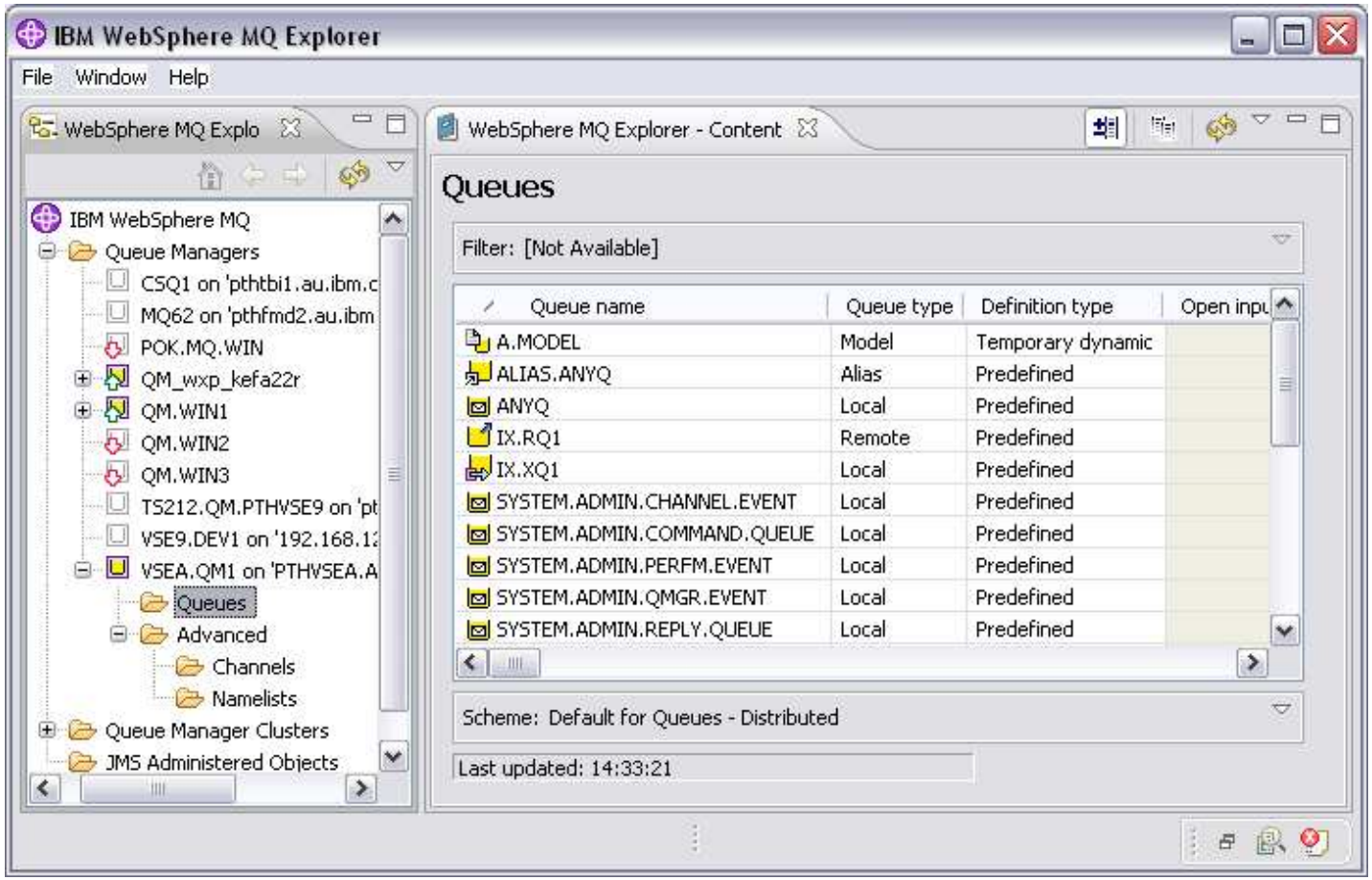
Web Integration with traditional CICS transactions



- CWS - CICS Web Interface / Support (function within CICS Transaction server)
- CTG - CICS Transaction Gateway (Websphere CICS Connector)
- HATS – Host Access Transformation Server
- HOD - Host OnDemand (Websphere Host Integrator)
- SOAP - Simple Object Access Protocol (Web Services based with XML data)

New in WMQ for z/VSE V3R0

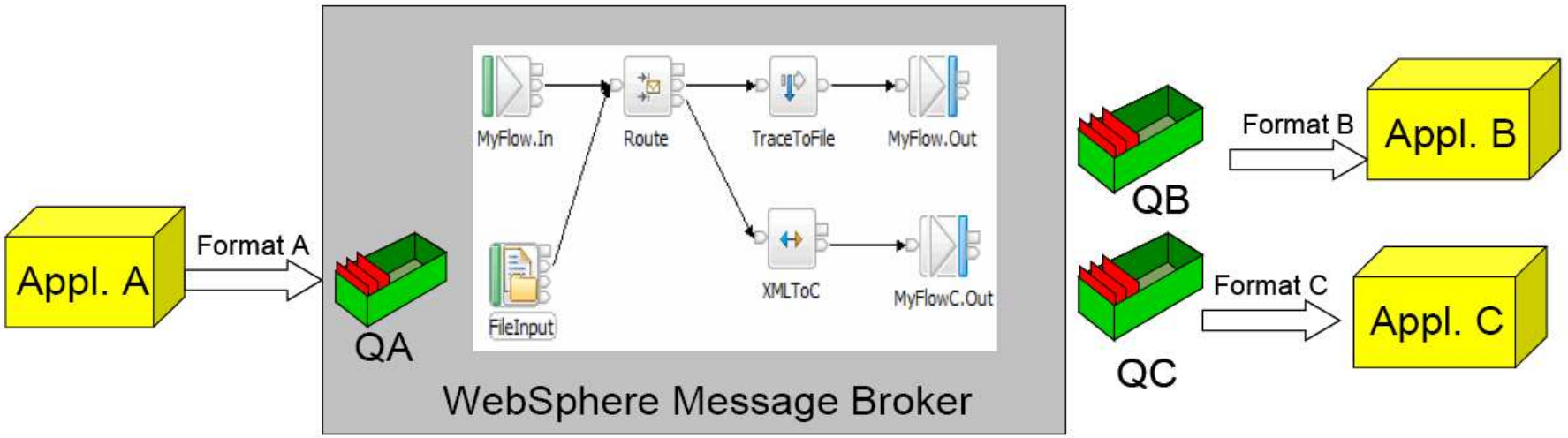
Graphical administration of WebSphere MQ for z/VSE Queues with WMQ Explorer



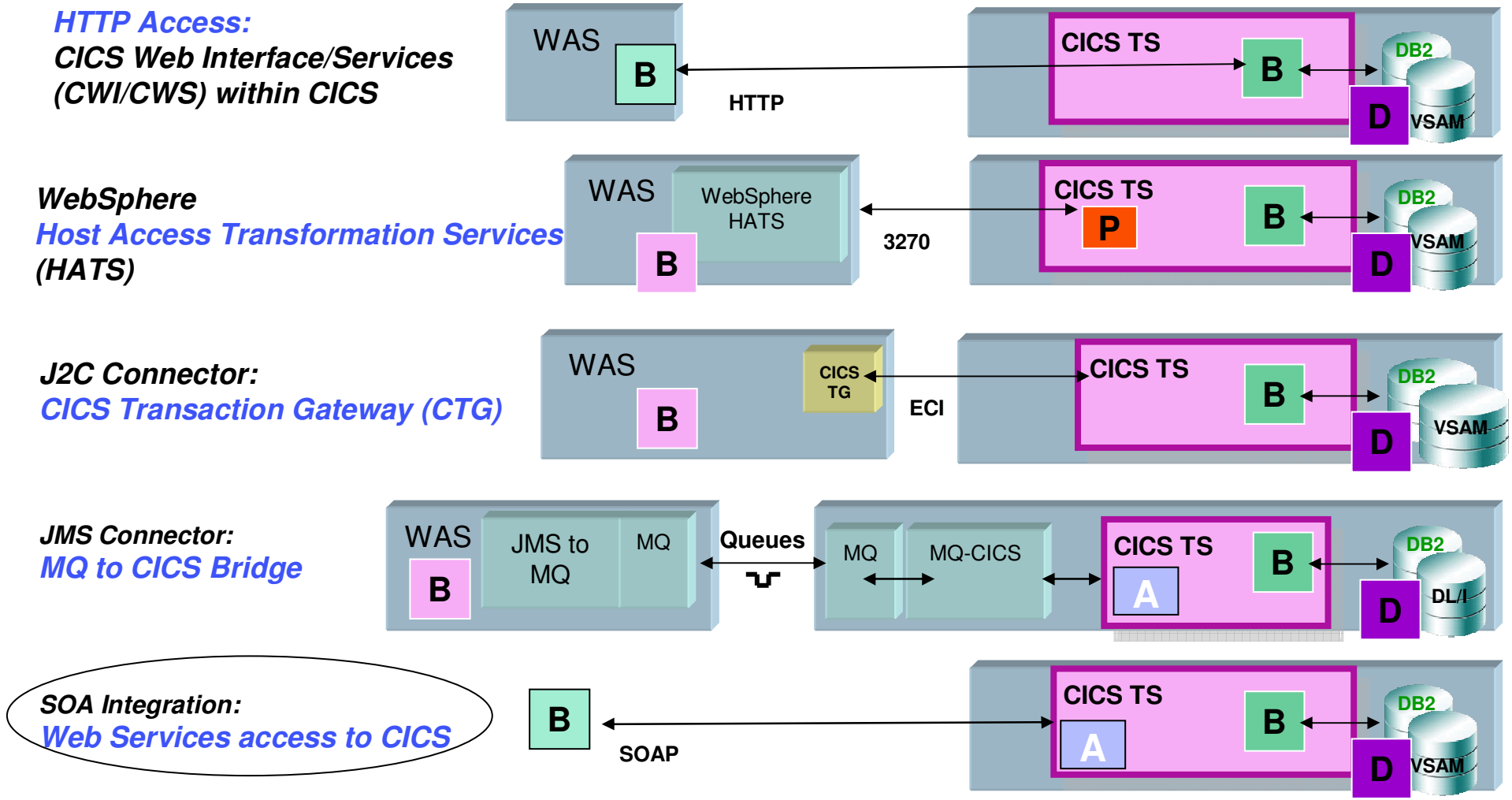
You can use Explorer to administer the z/VSE queue manager, its queues, channels and namelists, including create, delete, modify and display.

WMQ Message Broker - Workflow handling
MQ with Message Broker can be the ESB for SOA

- **Distributes information and data generated by business events in real time to applications, and devices throughout your enterprise and beyond.**
- **Using WebSphere Message Broker decouples the applications.**
  - **Application A writes a message into a queue QA.**
  - **Application B reads its messages from the queue QB and application C reads its messages from the queue QC.**
  - **These applications do not have to be aware of each other and their used format. The message mediation, routing and transformation is done by the WebSphere Message Broker.**

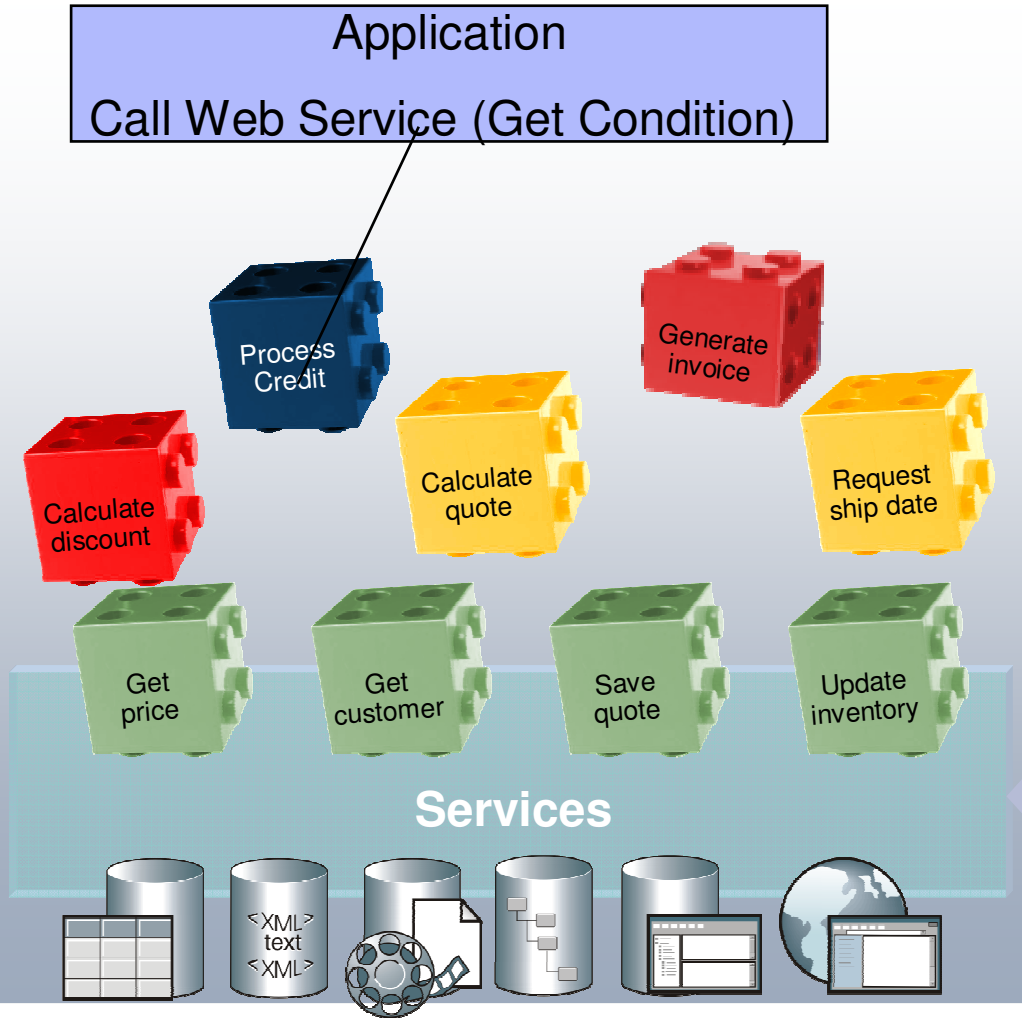


Connectivity to CICS transactions



WAS can be on Linux on z or on zBX in an zEnterprise Ensemble. Qualities of Services will vary.

Integrating Logic in an SOA

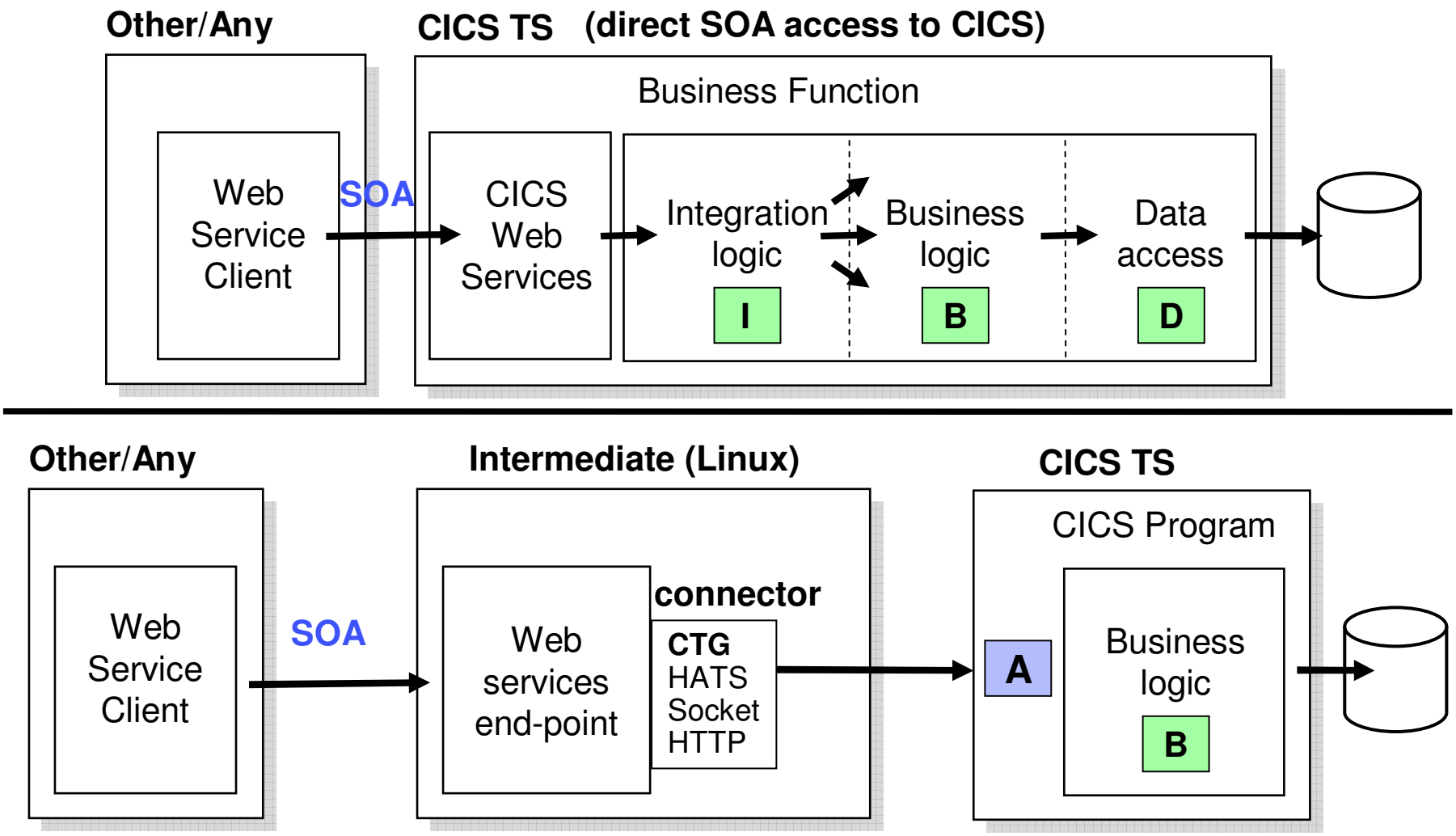


Information as a service makes information more accessible, consistent, and flexible

Publishing consistent, reusable services for information that make it easier for processes to get the information they need from across a heterogeneous landscape of application and data.

- Select data from sources
- Run Business logic
- Transform data to target

The Two Models of SOA CICS Integration via Web Services



Integration using an Enterprise Service Bus

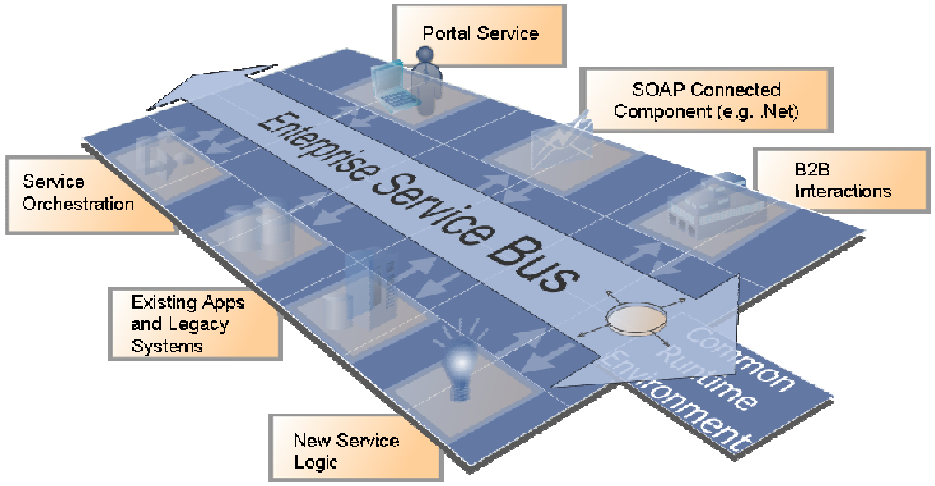
What is an Enterprise Service Bus?

An Enterprise Service Bus (ESB) is a flexible Infrastructure for services and application integration

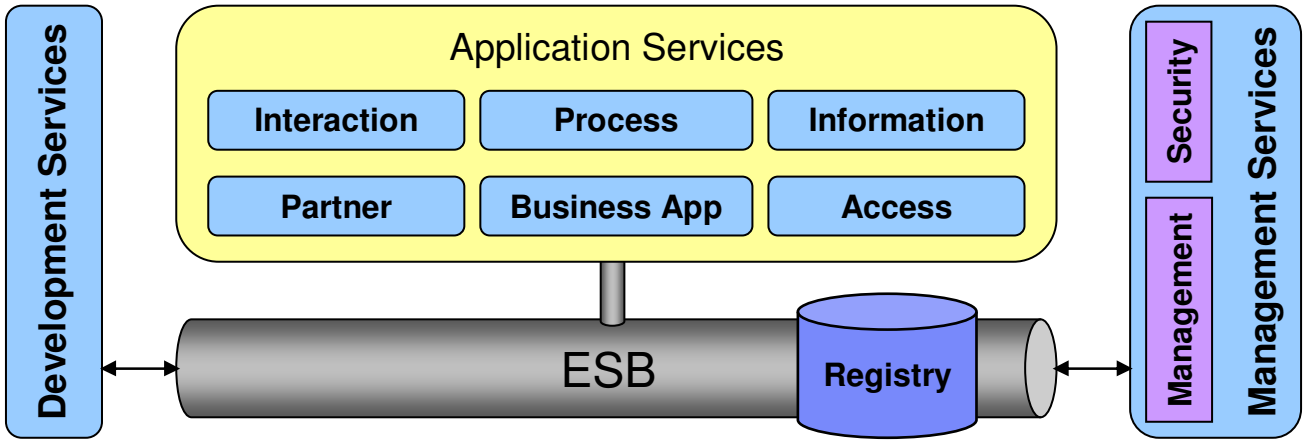
An ESB reduces the number, size and complexity of your interfaces in a SOA solution.

An ESB realizes following tasks between requestor und service

- **ROUTING of messages between Services**
- **CONVERTING the transport protocol between requestor and service**
- **TRANSFORMING message formats between requestor and service**
- **HANDLING of business events between different types of services**



An Enterprise Service Bus (ESB) -centric view of the Logical Model



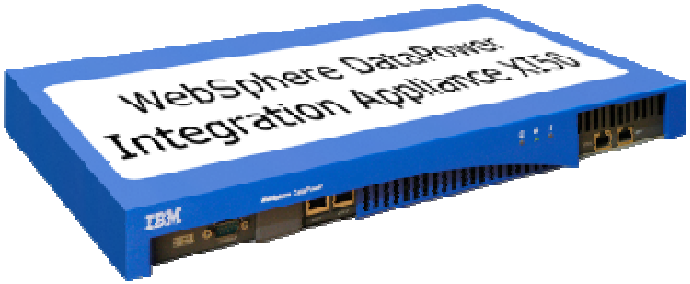
- Outside ESB
  - Business Logic (Application Services)
    - ESB ***does*** contain integration logic or connectivity logic
    - Criteria: semantics versus syntax; aspects
- Loosely coupled to ESB
  - Security and Management
    - Policy Decision Point outside the ESB
    - ESB can be Policy Enforcement Point
- Tightly coupled to ESB
  - Service Registry
    - •Registry a Policy Decision Point for ESB
    - •ESB a Policy Enforcement Point for Registry
    - •But, Registry has a broader scope in SOA
- Tooling required for ESB
  - Development
  - Administration
  - Configures ESB via Service Registry

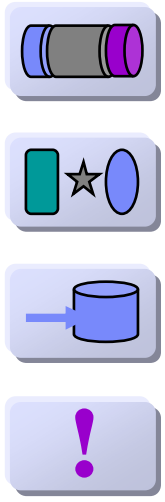
More details at: http://www.ibm.com/developerworks/library/ar-esbpat1/

ESB Integration Appliance XI50

Purpose-built hardware for Enterprise Service Bus functionality

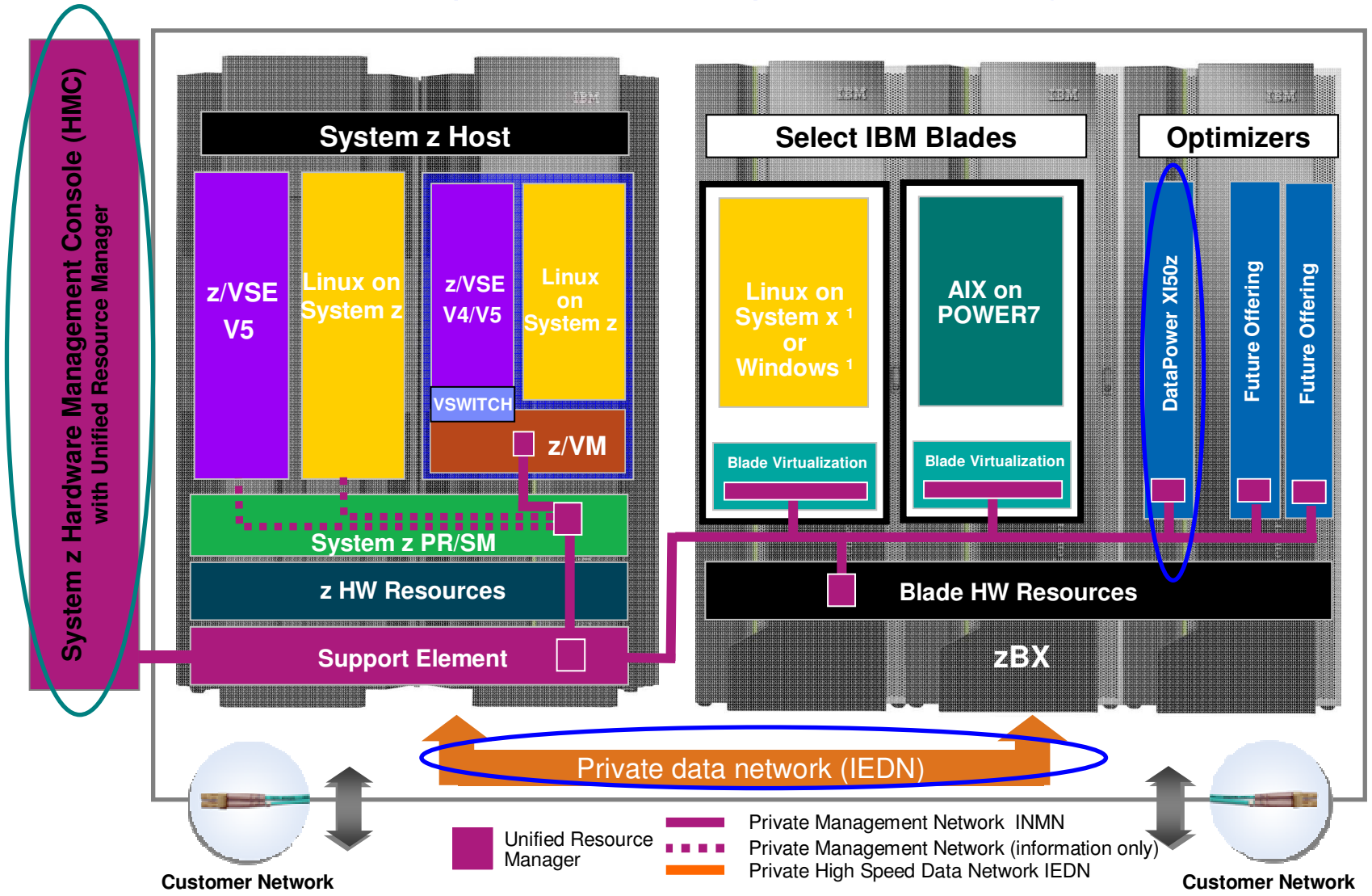
- **SOA Integration / ESB Message Enrichment / Web Service virtualization for legacy applications**
- **Enforce high levels of security independent of protocol or payload format**
- **Integrate with enterprise monitoring systems**
- **Service level management options to shape traffic**





- **Advanced protocol-bridging seamlessly supports a wide array of transports, including HTTP, WebSphere MQ, WebSphere JMS, Tibco EMS, FTP, NFS, et al.**
- **Any-to-any "DataGlue" engine supports XML and Non-XML (Binary) payloads, promoting asset reuse and enabling integration without coding**
- **Direct database access enables message-enrichment and data-as-a-service messaging patterns (DB2, Oracle, MS-SQL, Sybase)**
- **High performance architecture creates low-cost, easily-scalable ESB solution for Smart SOA needs**

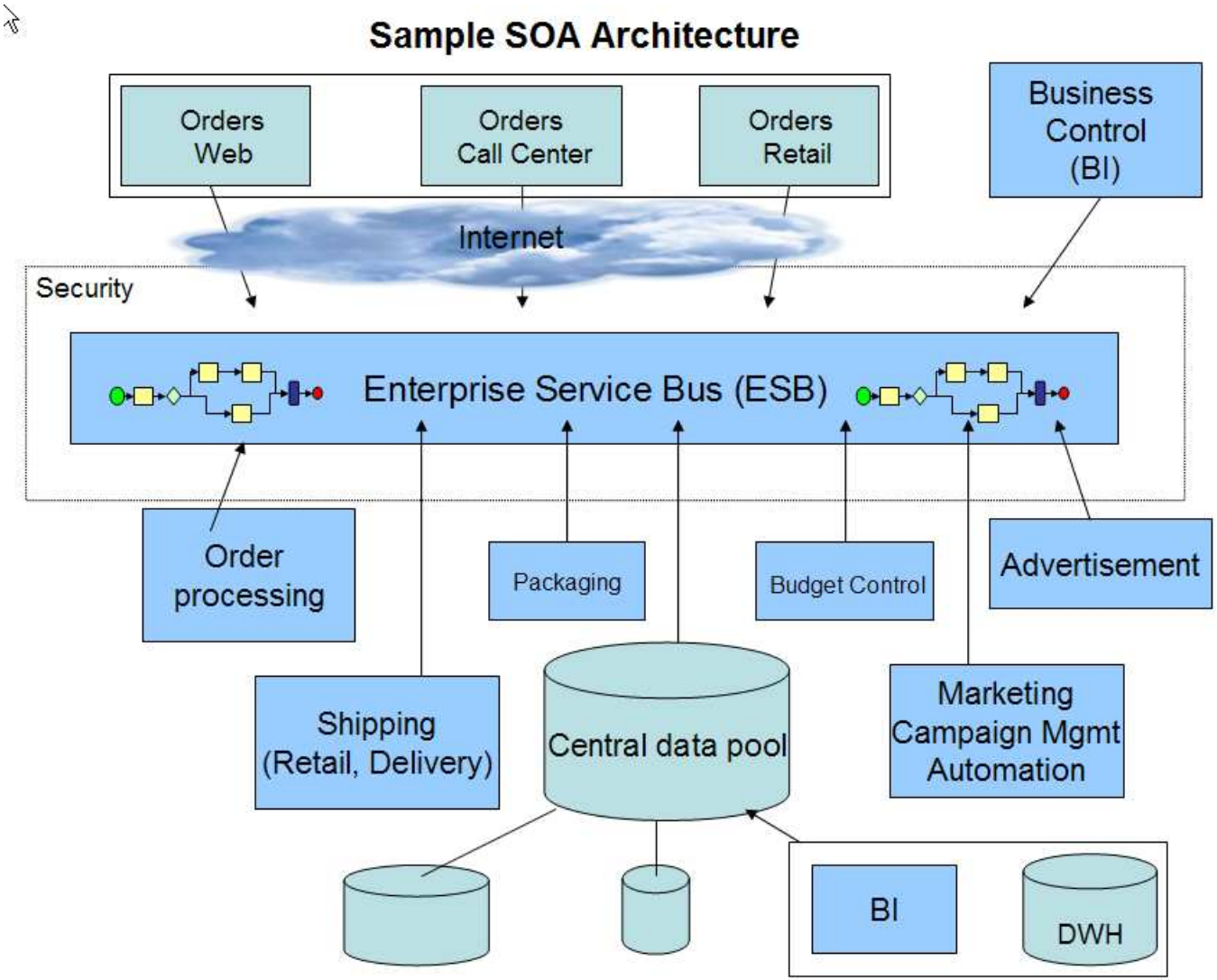
The SOA ESB with Datapower in zEnterprise connecting via IEDN to z/VSE



[1] All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

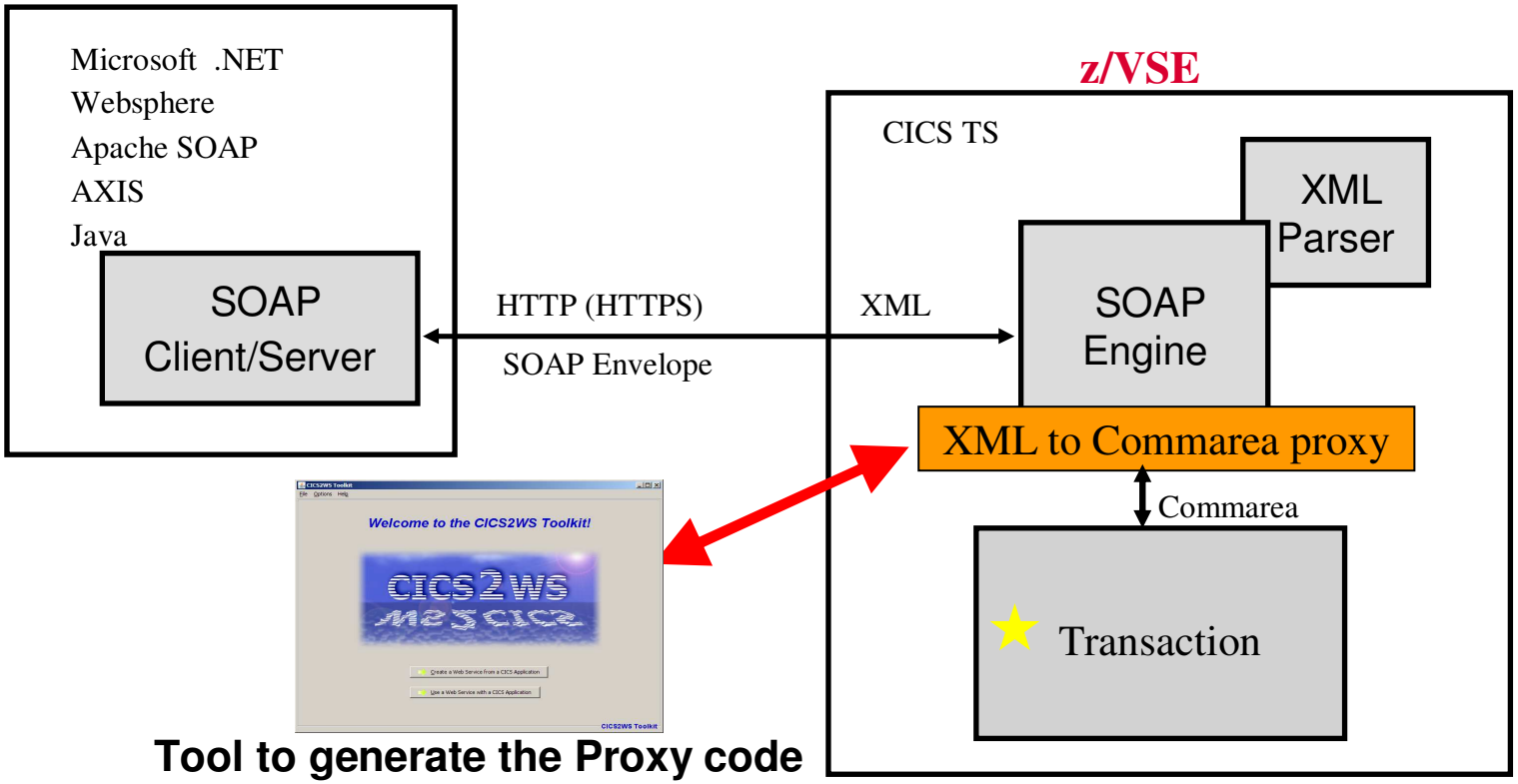
SOA – it is the implementation phase

- Active Projects in several customer sites:
  - Germany
  - Italy
  - Ecuador
  - Philippines



Web Services with z/VSE

SOA and XML data interchange with CICS transactions in VSE



Tool to generate the Proxy code

- Existing VSE Transactions as Web Service
- Existing Transactions can call a remote Web Service

Reducing Network complexity and balance traffic with zEnterprise

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

z/VSE V5 Strategy with zEnterprise - More options, highly integrated

Network simplification with zBX

Reduce
- Routers
- Switches
- Firewalls

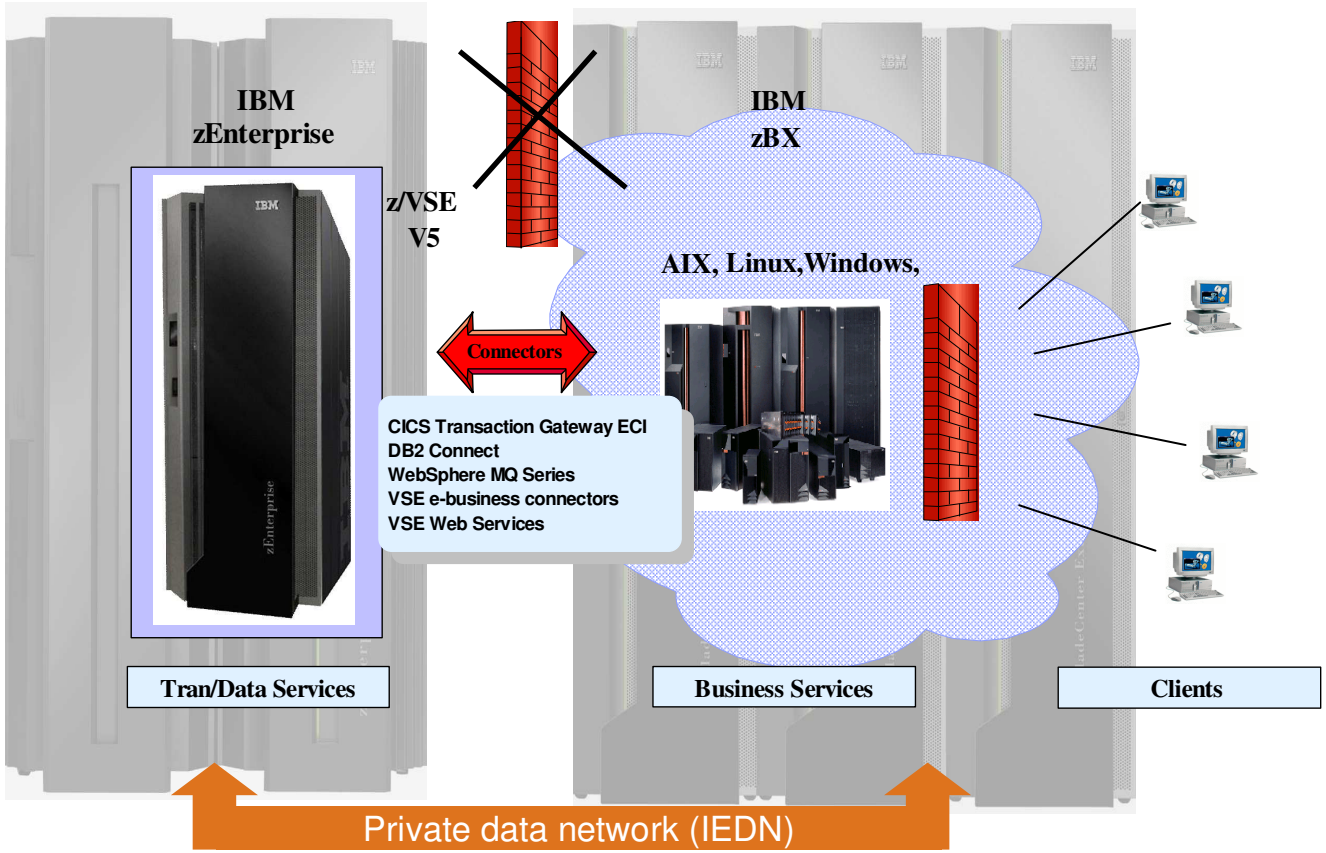
▪Centralize
- DNS Server
- Network filtering
- Work balancer
- Edge Server

▪ LDAP security integration

➢Uses the internal IEDN network.

➢No need for additional DMZ security to z/VSE

➢use standard Intel based software



Protect existing z/VSE investments

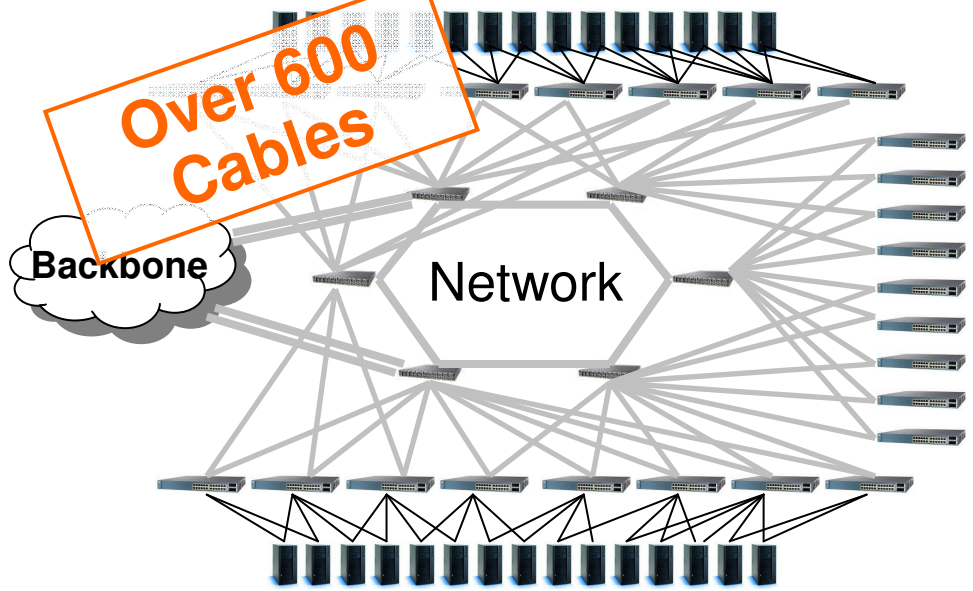
Integrate using middleware and z/VSE connectors

Extend with zBX or with Linux on z to access new applications & solutions

Insurance Company Consolidated 292 Servers to a z10

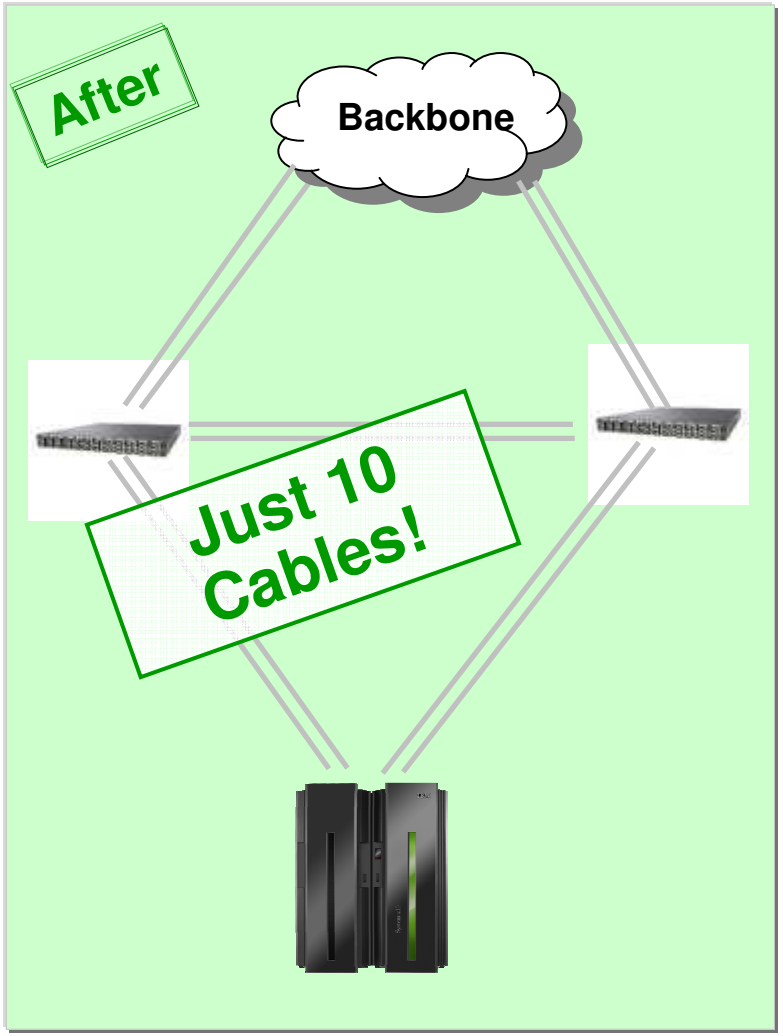
Before

3560E-24TD	8
3560E-24TD	17
3560E-12D	6
50 Ft UTP Cable	584
10GB Eth Fiber Cable	60



The diagram only shows **30** of **292** servers

After



Data is based on real client opportunity and on internal standardized costing tools and methodologies.
Client results will vary by types of workloads, technology level of consolidated servers, utilization factor, and other implementation requirements. Savings will vary by client.

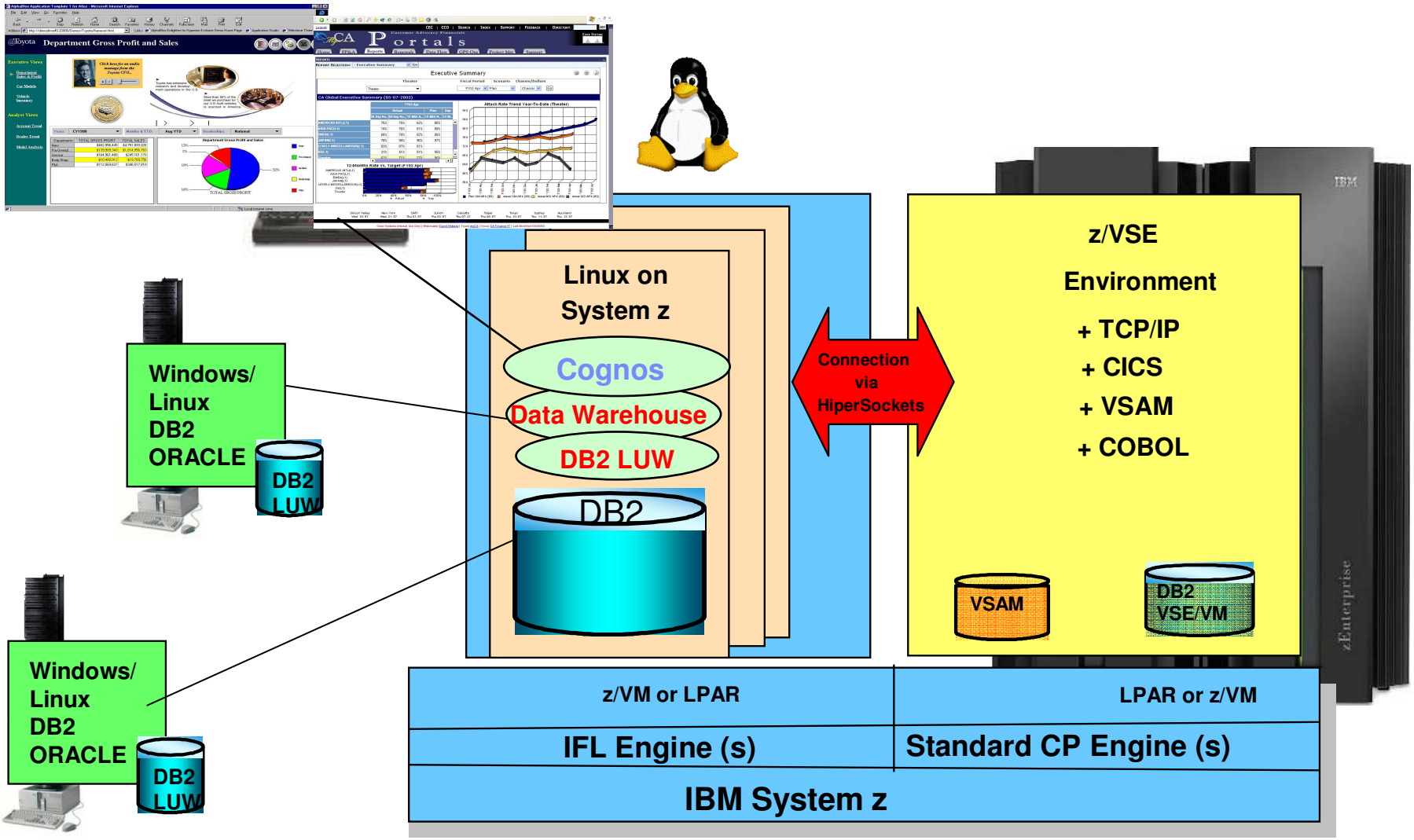
Data Warehouse and BI Solutions with Linux on System z

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

Data Warehouse and BI with Linux on System z

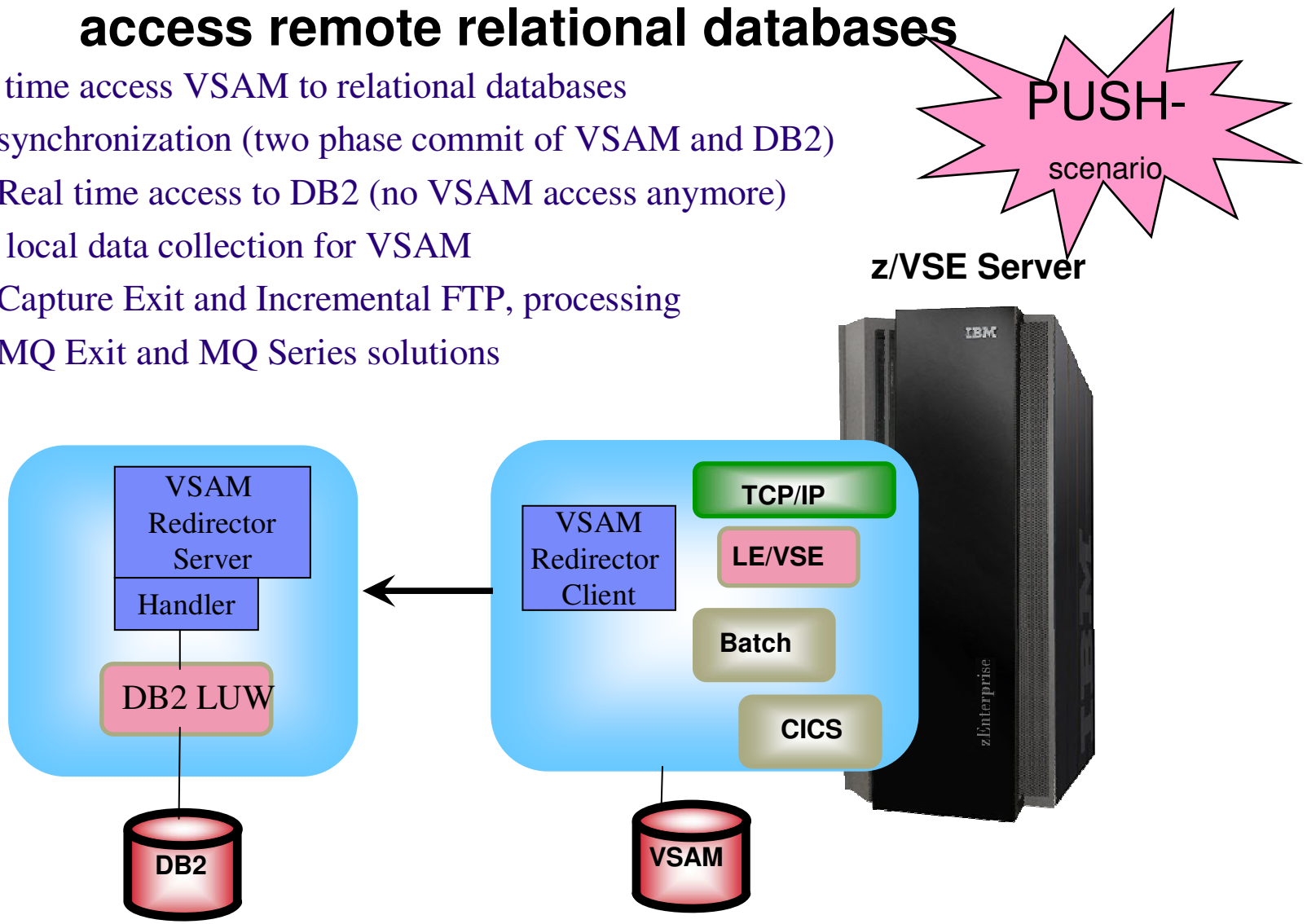
Consolidate, Integrate, Evaluate - DB2 Client, VSAM Redirector



(B)PUSH scenario: VSE/VSAM applications, access remote relational databases

(1) Real time access VSAM to relational databases
   a) synchronization (two phase commit of VSAM and DB2)
   b) Real time access to DB2 (no VSAM access anymore)

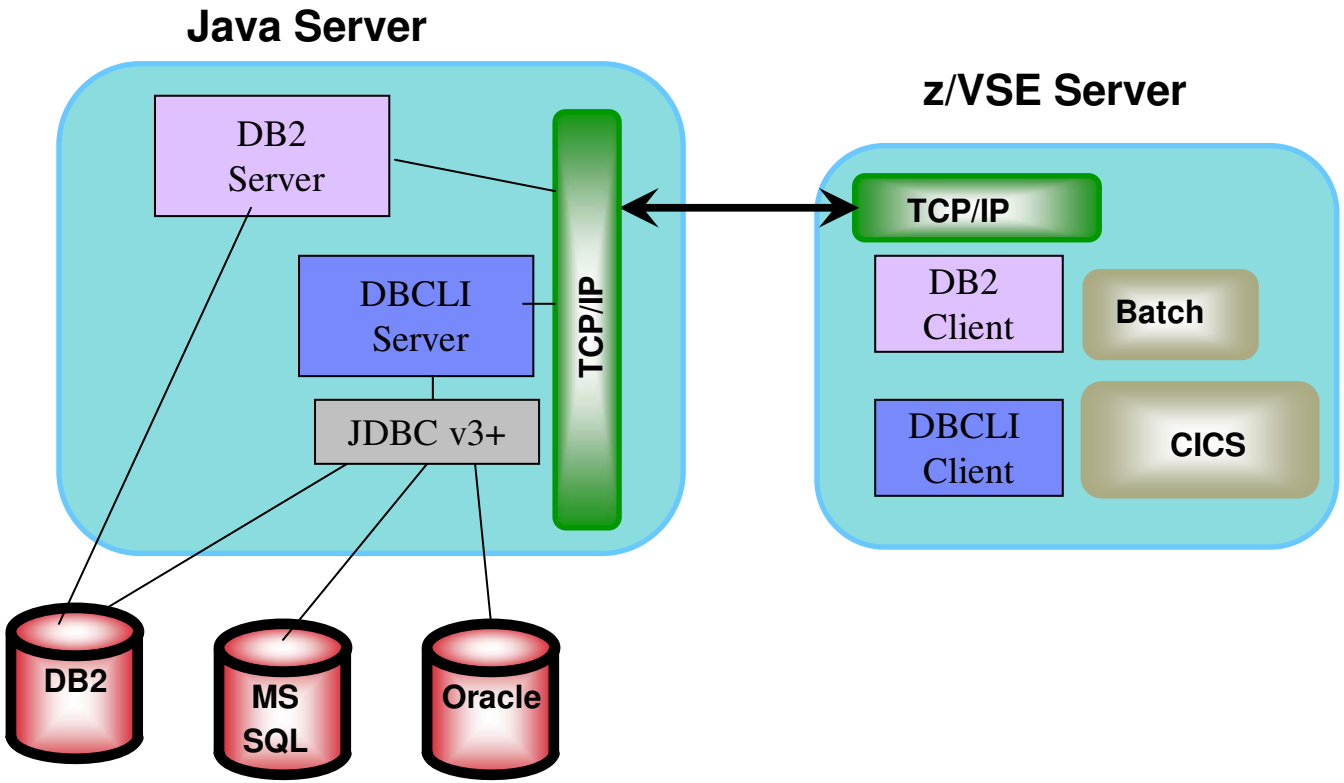
(2) VSE local data collection for VSAM
   a) Capture Exit and Incremental FTP, processing
   b) MQ Exit and MQ Series solutions



Applications on z/VSE access 'any' remote relational databases

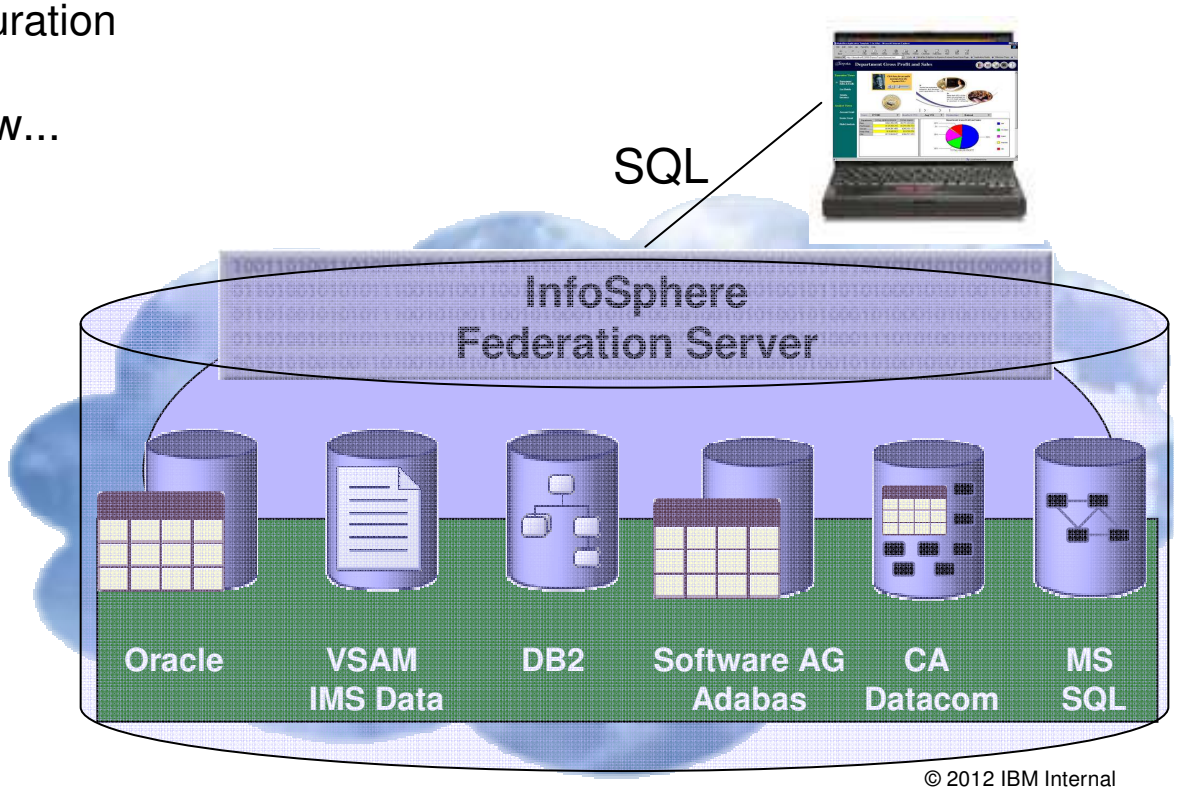
New in z/VSE 5.11

- Real time access to Relational databases
  - two different ways from batch and CICS
  - Access based on z/VSE DBCLI interface **AND / OR** DB2 Client



InfoSphere Federation Server on Linux on System z

- Integrating at the data layer – Federation of data
  - Read from and write to federated mainframe data sources using SQL
  - Standards-based access via JDBC, ODBC, or Call Level Interface
    - Including for mainframe VSAM data and flat files
  - Multithreaded with native drivers for scalable performance
  - Metadata-driven means...
    - No mainframe programming required
    - Fast installation & configuration
    - Ease of maintenance
  - Works with existing and new...
    - Mainframe infrastructure
    - Application infrastructure
    - Toolsets



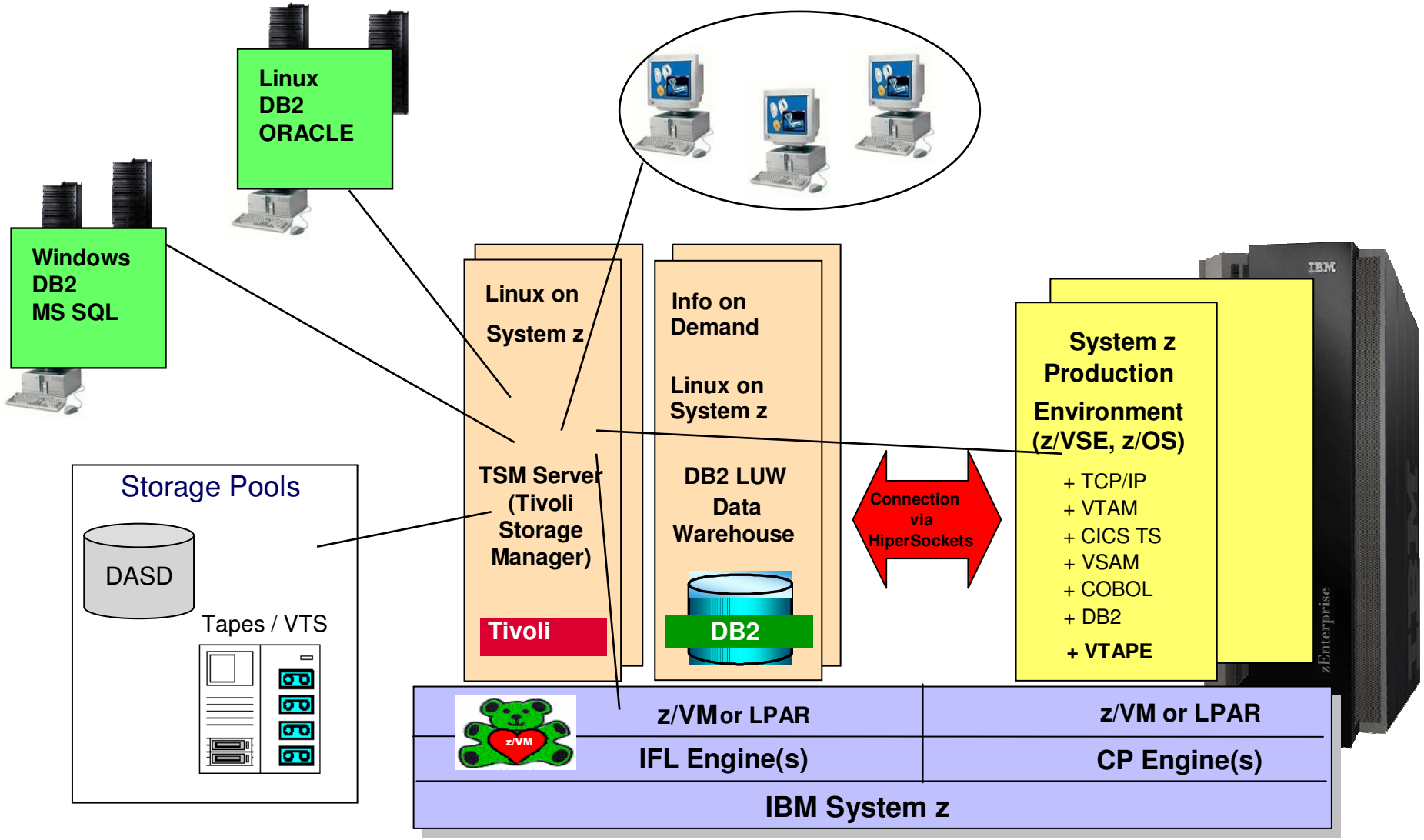
Enterprise Backup and z/VSE Virtual Tape support

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

Enterprise Backup with Linux on System z

Implement TSM on Linux on System z as central Backup Hub



z/VSE 5.1 – System Storage Support – D/R

Virtual Tape Library TS7700

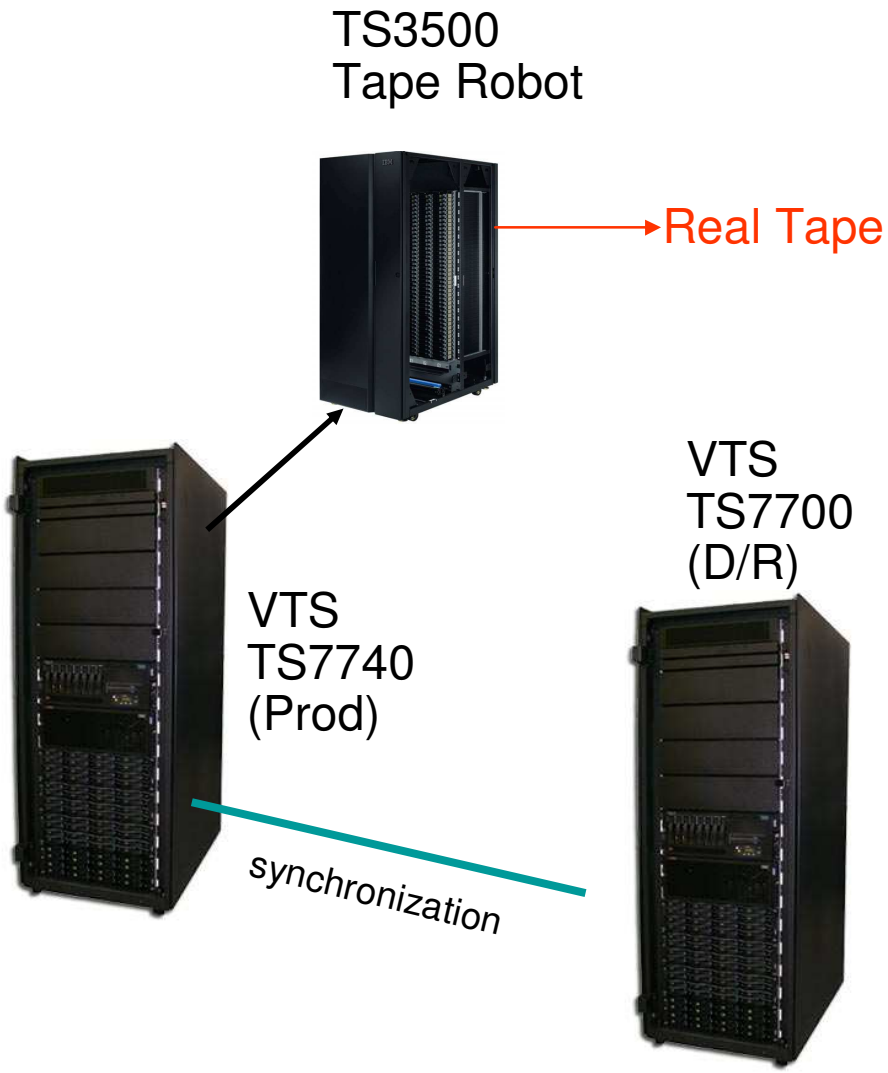
Tape Library : logical

TS7700 Virtualization Engine

Standalone System support only in z/VSE (GRID in z/VSE 5.1)

TS7740 Virtualization Engine (TS3500 can be attached)

- New: z/VSE 5.1 Copy Export support – for Real Tape
- Maximum of 256 virtual drives (3490E) and 1,000,000 virtual volumes
- Web-based management tools
- up to 6 TB native tape volume cache
- Supports TS1120 / TS1130 tape drive-based encryption

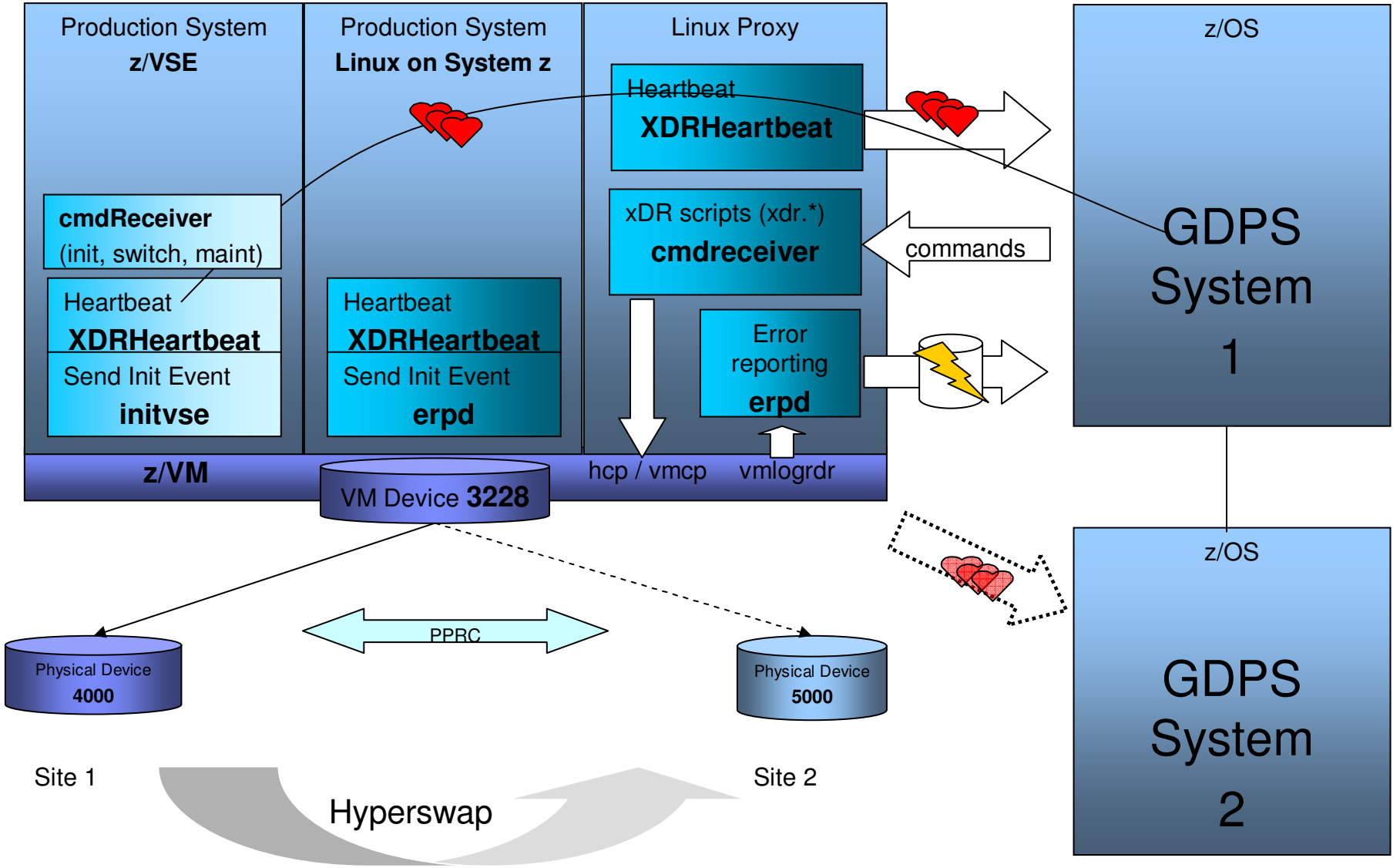


Extended Disaster Recovery (xDR) with z/VM and Linux on System z

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

xDR Support for z/VSE as active guest under z/VM

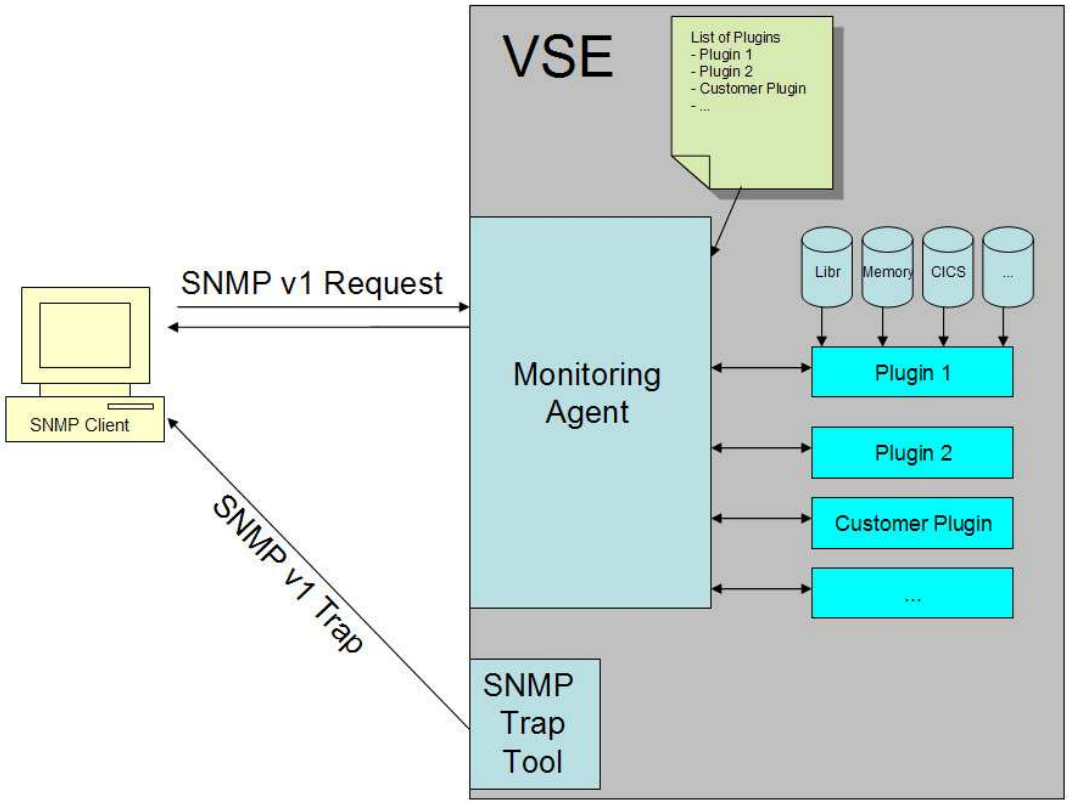


Monitoring interface for z/VSE

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

z/VSE Monitoring possibilities

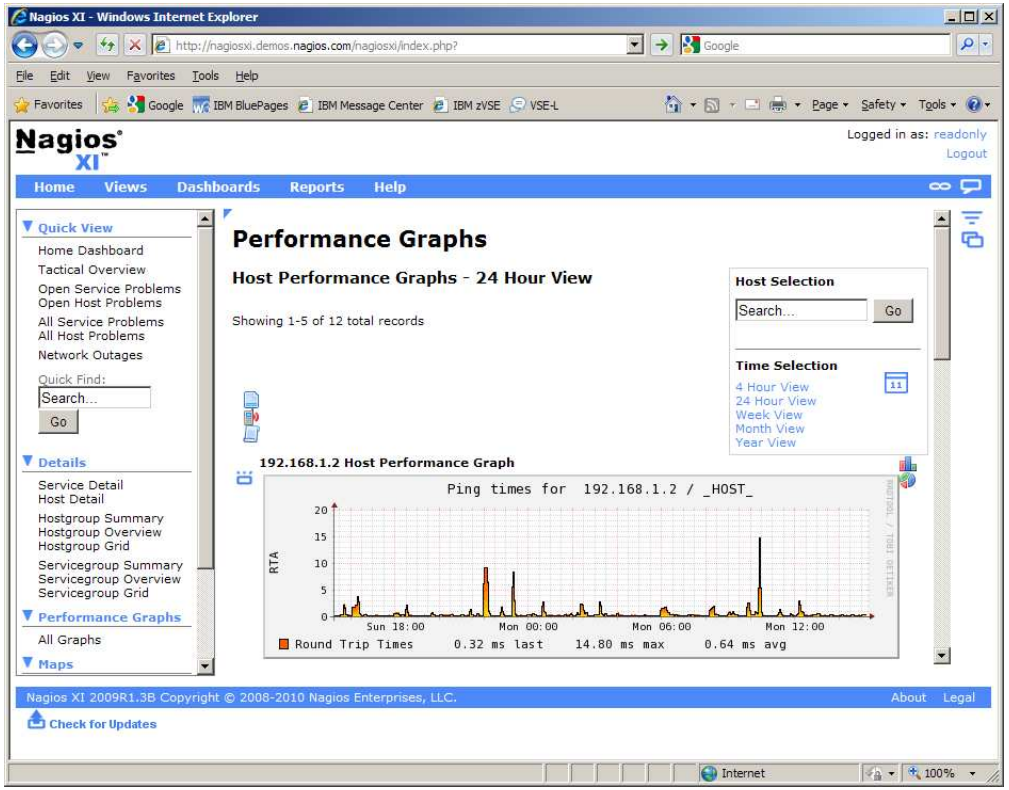


- Monitoring Agent based on SNMP V1
  - Real time monitoring
    - retrieve z/VSE specific system and performance data
  - Event driven monitoring using SNMP Trap tool and API
    - Helps to automate processes in z/VSE with SNMP traps

z/VSE 4.3 – SNMP Monitoring Agent support

- **Standard SNMP based monitoring tools can be used to collect, display and analyze z/VSE performance monitoring data**
  - e.g. ITM (IBM Tivoli Monitoring), Velocity monitoring, Nagios,…

- **z/VSE SNMP Trap client**
  - Sends SNMP V1 traps to inform one or more monitoring stations or servers about important events
  - For example:
    - The end of a job stream is reached.
    - An error has occurred during a job stream
  - **z/VSE 5.1 the Trap client was enhanced to be a callable API (SNMP Trap API) from within an application**

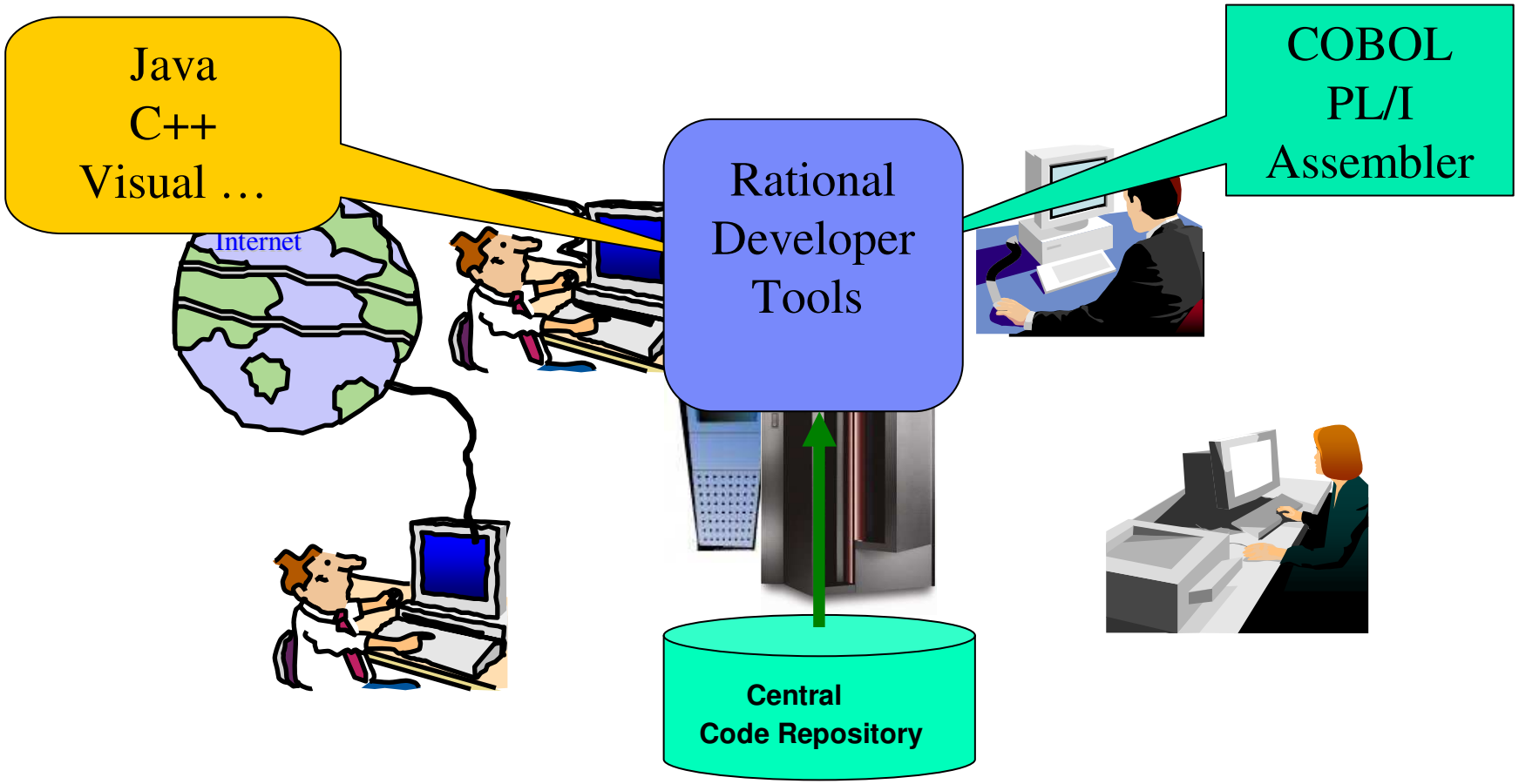


Modern Development Environments for z/VSE

http://www.ibm.com/zVSE

http://twitter.com/IBMzVSE

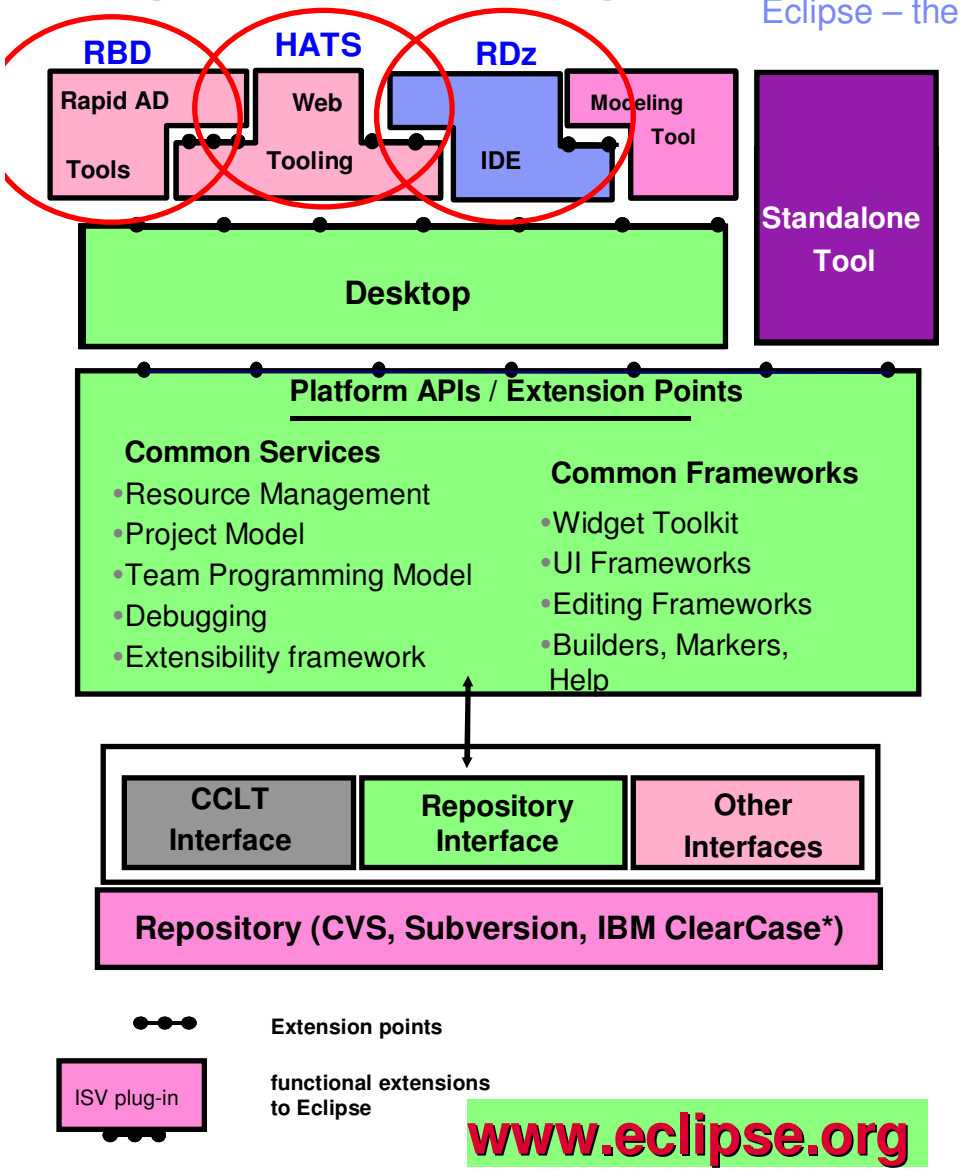
‘Common’ development Environment…



Eclipse helps !

Eclipse based Development Environments for z/VSE

Eclipse – the open Standard for application development



What is Eclipse about:

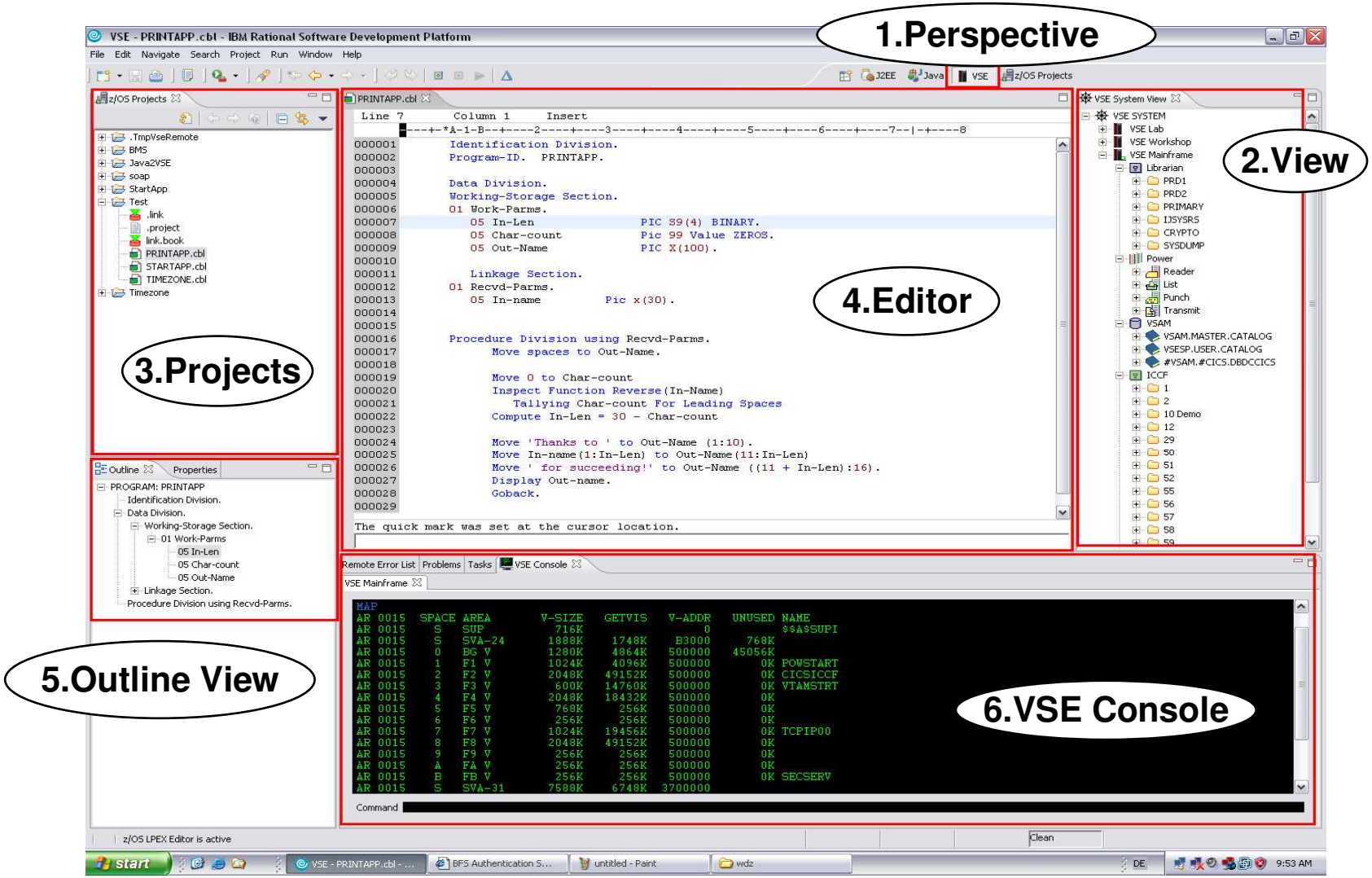
- Open source development framework
  - with modern Editors
  - syntax help & check
  - semantic check
- Centralized source code maintenance
  - entire source code in central Repository
  - cross platform project administration
- Versioning software interface
  - CVS, Subversion, or IBM ClearCase
  - automatic Workgroup-control
- Open for ISVs development Plug-Ins

  1) Integrated Development Environment (IDE)
  - Rational Developer for System z (RDz)
  - for Java, COBOL, PL/I, ASM,C

  2) IBM HATS Development Plug-In
  - develop new front-ends to 3270 applications

  3) IBM EGL development for z/VSE
  - Rational Business Developer (RBD)
  - EGL Plug-In for z/VSE
  - follow-on to Visual Age GeneratorIBM HATS

IBM Rational Developer for system z - the z/VSE Perspective



Summary

The demands placed on the data center have never been greater.

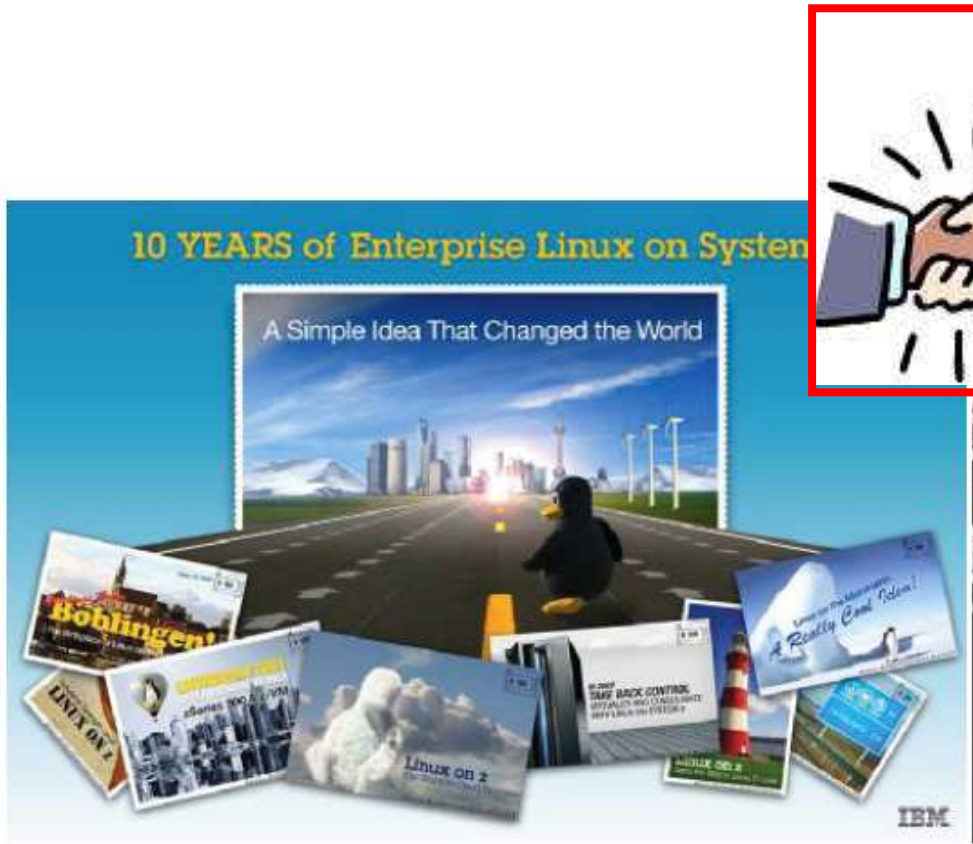
IBM System zEnterprise:

1. Enables **mixed workload Business Processes** to be deployed, and centrally managed
2. Allows z/VSE **optimized integration** of data, applications, and web serving with
3. Delivers **dynamically responsive IT** with **lower acquisition and operating costs**
4. **Meets the need** of **heterogeneous data centers**

A strategic systems platform….
Helping to free up resources for critical projects and establish a base for the future

More than a decade

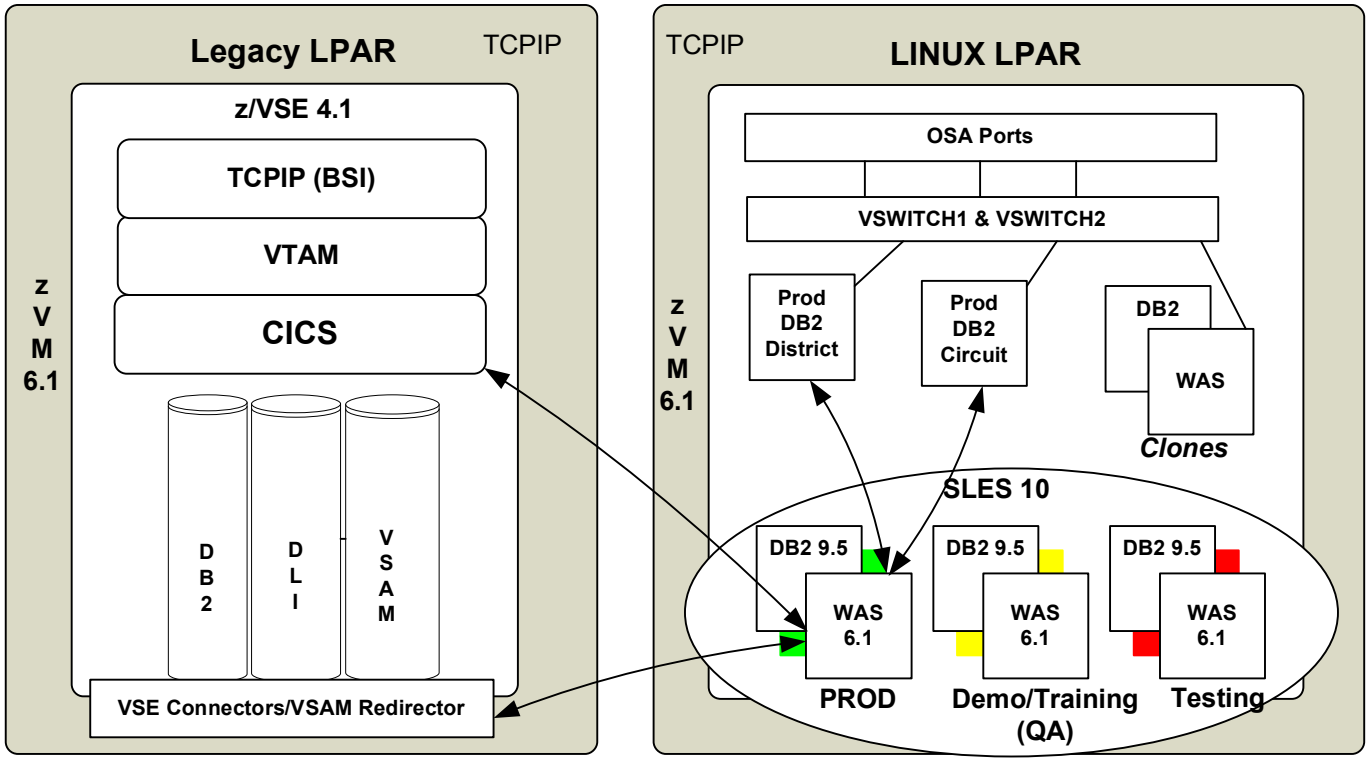
Linux on System z and z/VSE



z/VSE customers with Linux on System z, - in a variety of industries

- Fashion
- Financial Institutes / Insurance
- Hotel chain / Vacation clubs
- Health institutes/ Hospitals
- Public Sector / County
- Payroll accounting
- Whole Sale – Home Articles, Pharma, Car parts
- Grocery
- Furniture manufacturing
- Horse Racing – Bets
- Church administration
- Bakery
- National Sport clubs

Customer Example: Supreme Court of Virginia



- 1 + 1 z10 BC L02
- 2 + 2 CPs
- 5 + 5 IFLs
- 112 + 112 GB memory
- 2 + 2 z/VM V6.1 LPARs
- 8 + 4 z/VSE V4.1 guests
- 73 + 24 SLES 10 SP2 guests
- WAS V6.1, DB2 V8.2, DB2 V9

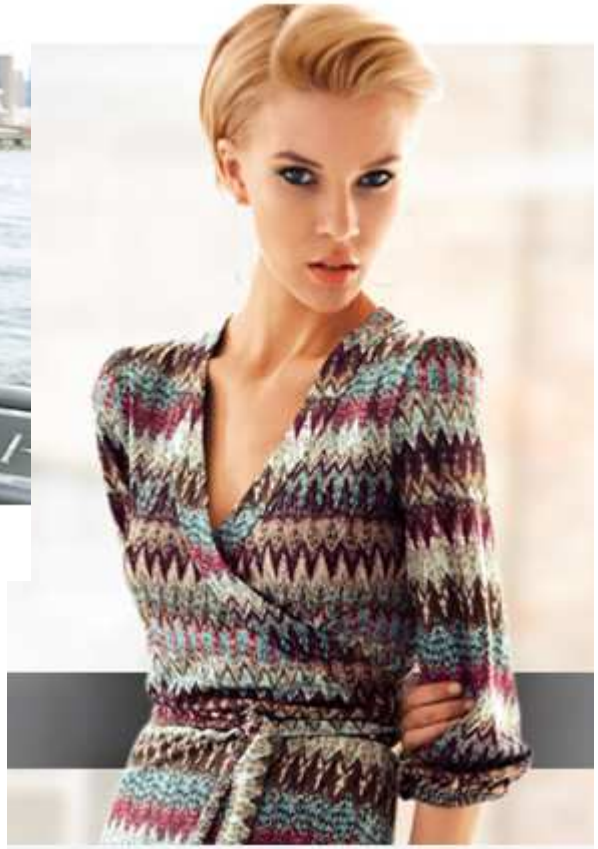
- **z10 BC L02 for Court System (internal)**
  - Serves 325 courts, 5.000+ users, 4.2 million new cases in 2009
  - Integrating z/VSE, DB2/UDB and WebSphere applications
  - eMagistrate* system serves 125 locations, 2.800 trans per day

  2007 ComputerWorld Honors Program Laureate
- **z10 BC L02 for Internet**
  - eCommerce application integrating z/VSE and WebSphere appls

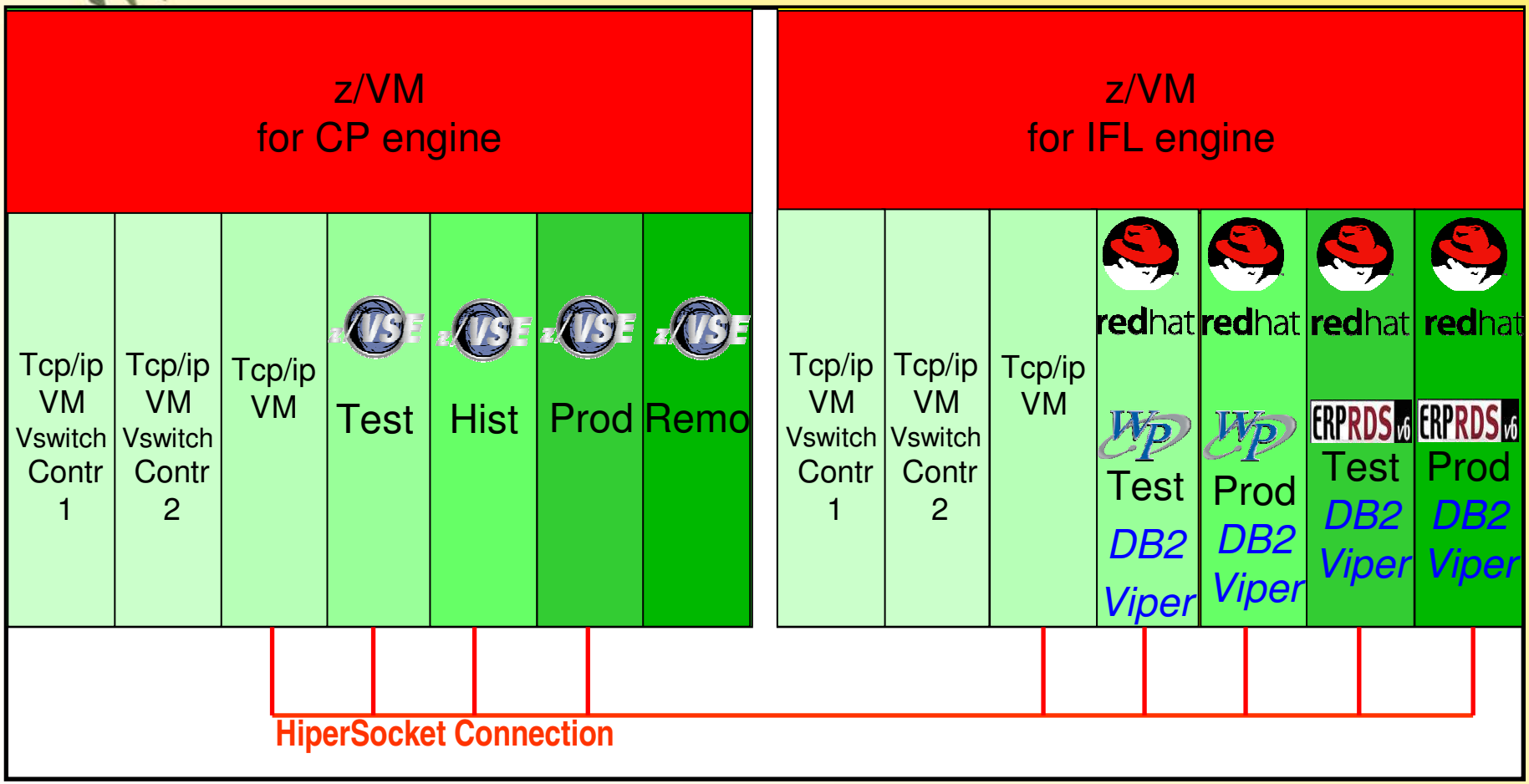
Peter Hahn - Fashion

Modische Twinsets

In attraktiven Formen und Farben



Customer Reference: Fratelli Carli, Italy



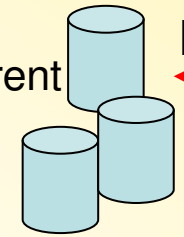
OlioCarli

the leading producers of premium olive oil sold directly to consumers

Email from batch or cics

AFP / PSF via ipaddress

300 files every day transferred to different operating systems (Zlinux, linux, microsoft)



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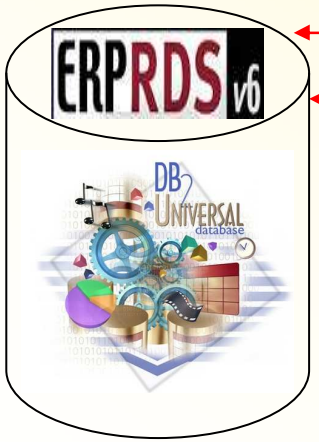


Db2 udb z/linux applications

Vsam redirector Server via hipersocket to z/linux DB2 and via vswitch Osa QDIO to Sql Server

Production Environment

Tcp/ip 1.5.E

Tcp/ip 1.5.E
only for
telnet applications

Virtual Tape

CICS TS web SOA via hipersocket

Java Application running on Tomcat

Z/Vse Health checker

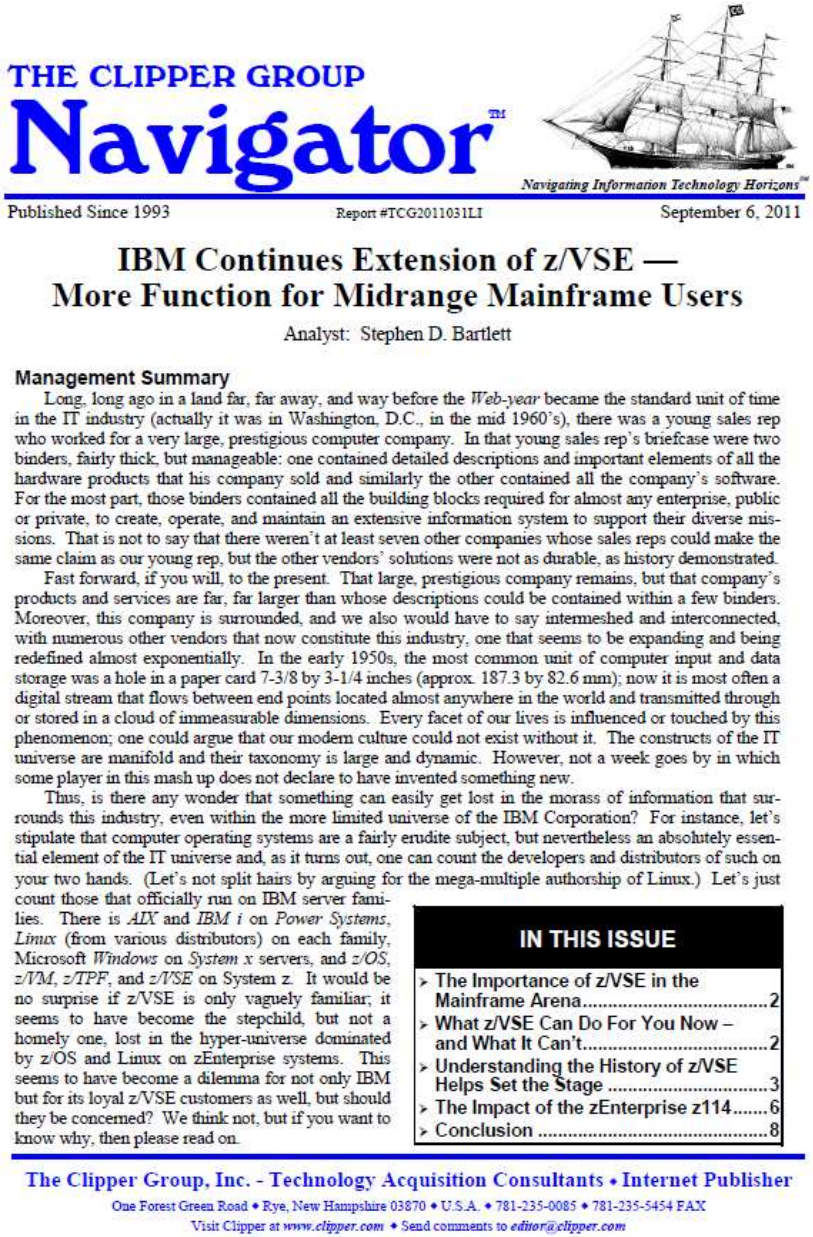
Every day 240,000 cics transactions from 400 telnet connections

the leading producers of premium olive oil sold directly to consumers

The Clipper Group
Sept 2011

Get the paper from:
www.clipper.com

or from the z/VSE homepage:
http://www-03.ibm.com/servers/eserver/zseries/zvse/



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IBM Continues Extension of z/VSE — More Function for Midrange Mainframe Users

Analyst: Stephen D. Bartlett

Management Summary

Long, long ago in a land far, far away, and way before the *Web-year* became the standard unit of time in the IT industry (actually it was in Washington, D.C., in the mid 1960's), there was a young sales rep who worked for a very large, prestigious computer company. In that young sales rep's briefcase were two binders, fairly thick, but manageable: one contained detailed descriptions and important elements of all the hardware products that his company sold and similarly the other contained all the company's software. For the most part, those binders contained all the building blocks required for almost any enterprise, public or private, to create, operate, and maintain an extensive information system to support their diverse missions. That is not to say that there weren't at least seven other companies whose sales reps could make the same claim as our young rep, but the other vendors' solutions were not as durable, as history demonstrated.

Fast forward, if you will, to the present. That large, prestigious company remains, but that company's products and services are far, far larger than whose descriptions could be contained within a few binders. Moreover, this company is surrounded, and we also would have to say intermeshed and interconnected, with numerous other vendors that now constitute this industry, one that seems to be expanding and being redefined almost exponentially. In the early 1950s, the most common unit of computer input and data storage was a hole in a paper card 7-3/8 by 3-1/4 inches (approx. 187.3 by 82.6 mm); now it is most often a digital stream that flows between end points located almost anywhere in the world and transmitted through or stored in a cloud of immeasurable dimensions. Every facet of our lives is influenced or touched by this phenomenon; one could argue that our modern culture could not exist without it. The constructs of the IT universe are manifold and their taxonomy is large and dynamic. However, not a week goes by in which some player in this mash up does not declare to have invented something new.

Thus, is there any wonder that something can easily get lost in the morass of information that surrounds this industry, even within the more limited universe of the IBM Corporation? For instance, let's stipulate that computer operating systems are a fairly erudite subject, but nevertheless an absolutely essential element of the IT universe and, as it turns out, one can count the developers and distributors of such on your two hands. (Let's not split hairs by arguing for the mega-multiple authorship of Linux.) Let's just count those that officially run on IBM server families. There is *AIX* and *IBM i* on *Power Systems*, *Linux* (from various distributors) on each family, Microsoft *Windows* on *System x* servers, and *z/OS*, *z/VM*, *z/TPF*, and *z/VSE* on System z. It would be no surprise if z/VSE is only vaguely familiar; it seems to have become the stepchild, but not a homely one, lost in the hyper-universe dominated by z/OS and Linux on zEnterprise systems. This seems to have become a dilemma for not only IBM but for its loyal z/VSE customers as well, but should they be concerned? We think not, but if you want to know why, then please read on.

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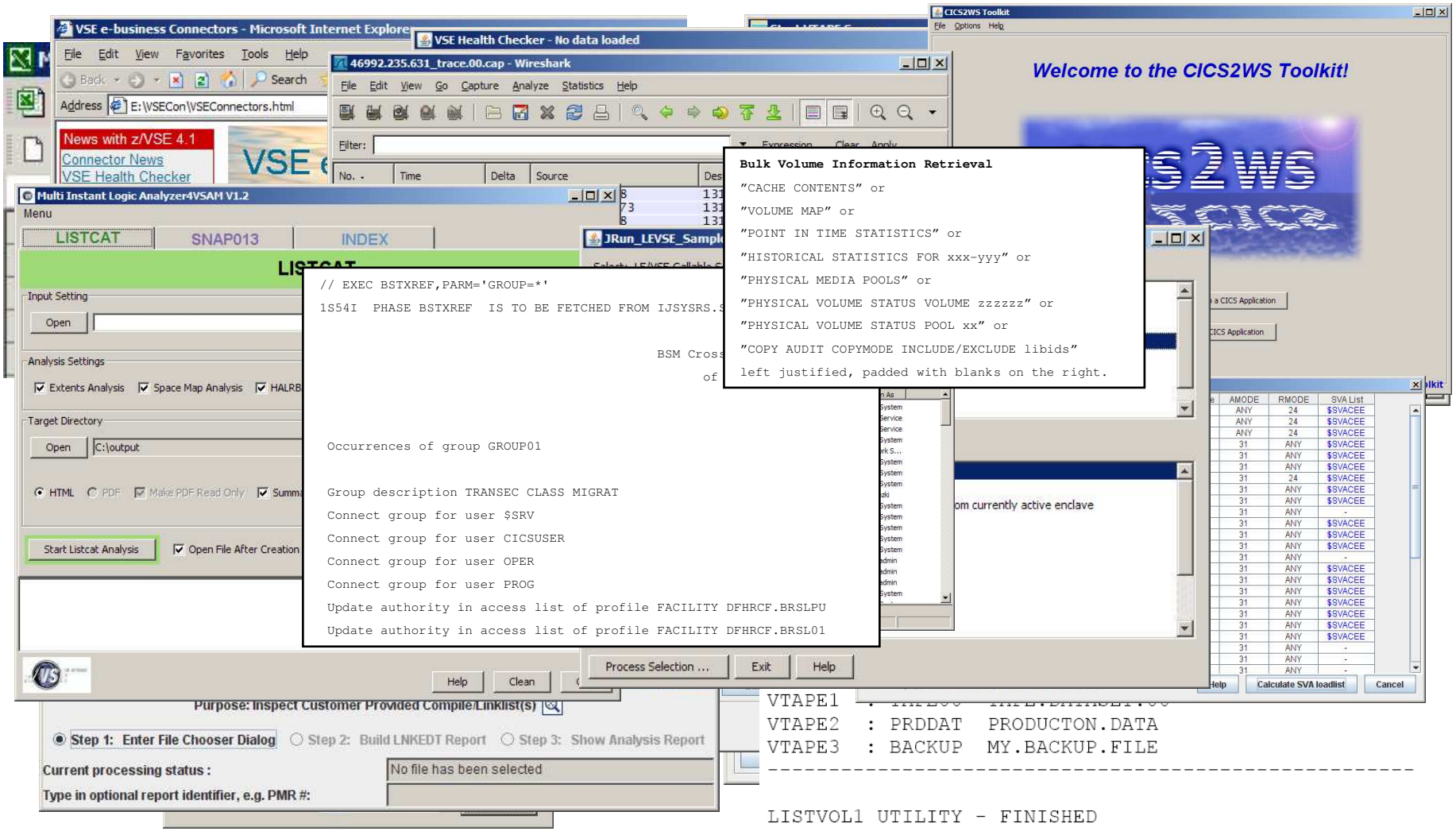
Overview - All Tools

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



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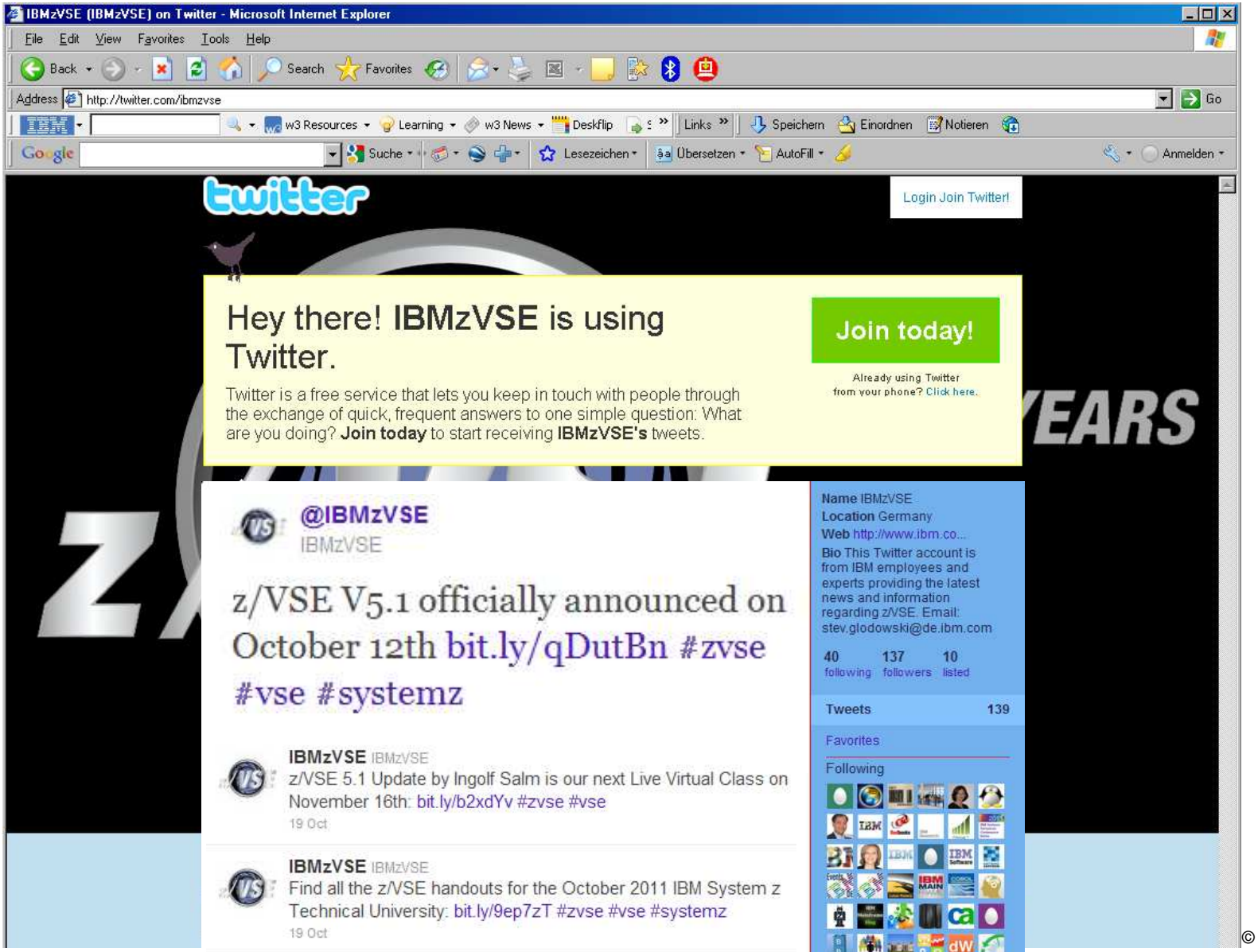
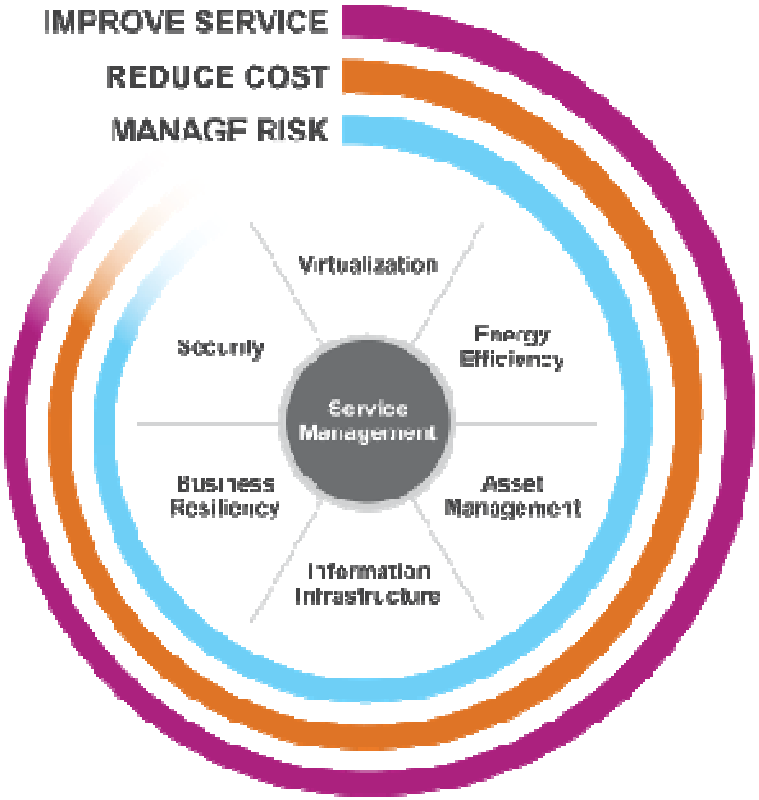


The Future runs on System z, the largest scalable server



… System z delivers extreme business value by helping you reduce cost, manage risk, and improve service.

For more information, please see the z/VSE web site:

http://www.ibm.com/zvse/

Questions?

Wilhelm Mild

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