Virtualize your z/VSE and Linux for efficiency and cloud

Wilhelm Mild
IT Architect
IBM Germany

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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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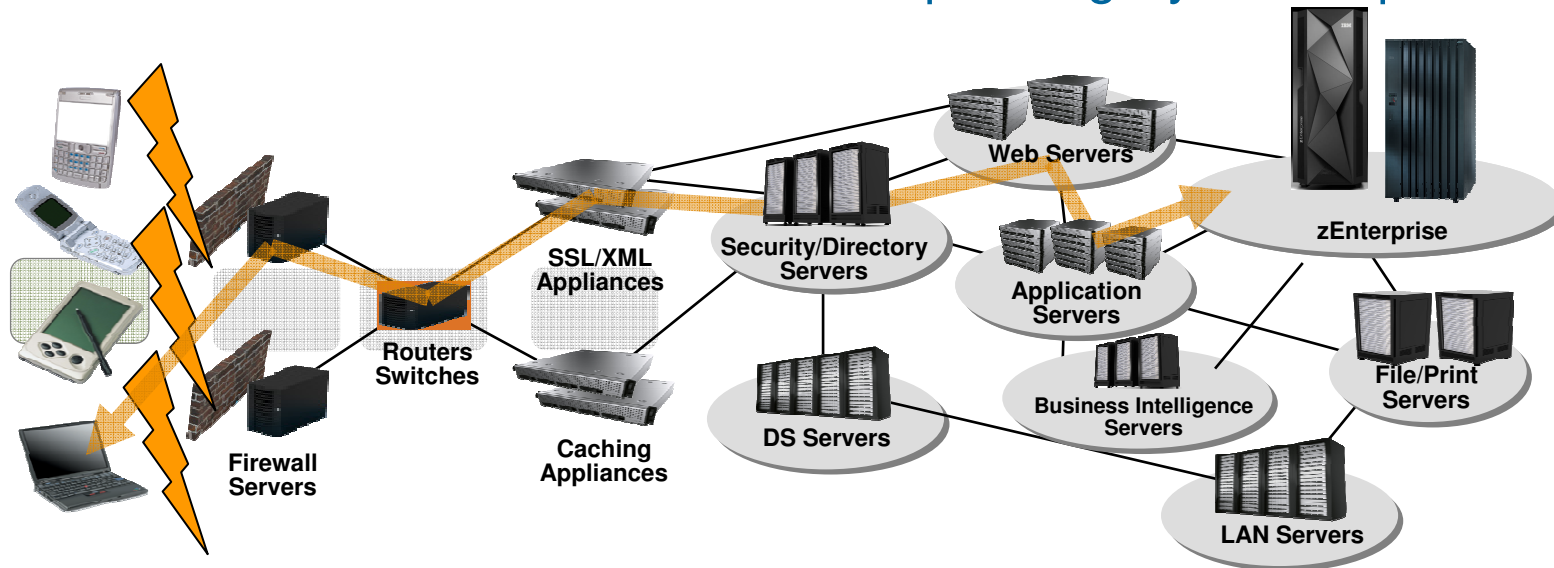
2

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Agenda

- **zEnterprise and z/VSE V5**

- **z/VSE Modernization Options**

- **Wrap-up**

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Motivation for change / optimization
 - Server Sprawl Limitations   - Architecture diversification
 - Platform 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?**
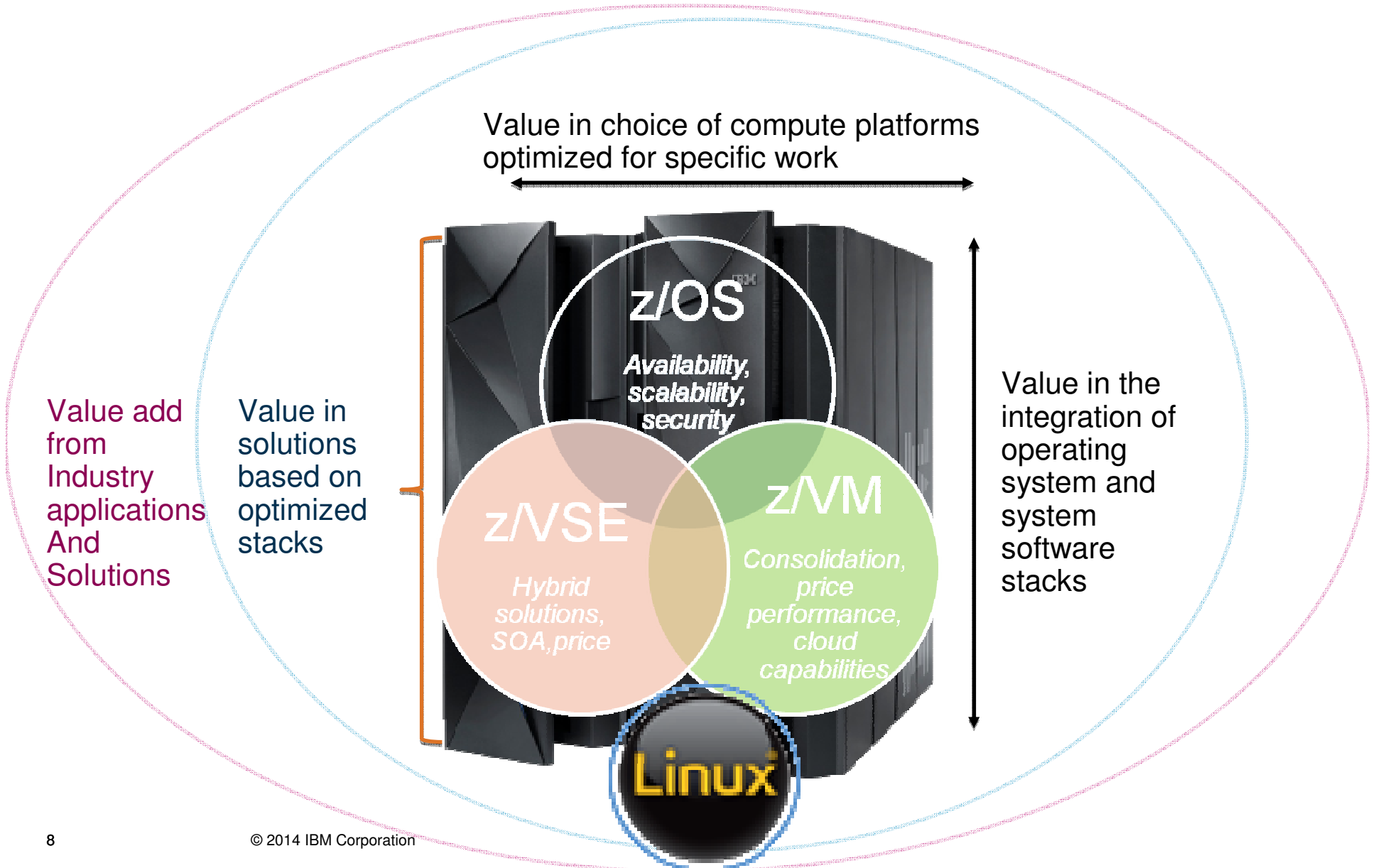- **How can IT availability ensured, what happens in the case of a disaster?**

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

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# z/VSE supports zEnterprise zEC12 and zBC12 from start !

- Availability date of zEC12 September 19, 2012
- **z/VSE supports the zEC12 with z/VSE 4.3 and later**
  - No PTFs are requried to run z/VSE on zEC12.
  - As always, there will be PTFs for IOCP, EREP, HLASM.
- **zEC12 offers the new Crypto Express4s card.**
  - A z/VSE PTF toleration PTF is required to use the configurable Crypto Express4s.
  - This PTF will be offered for z/VSE 5.1 only, that is Crypto Express4s can't be used with z/VSE V4.
  - z/VSE 5.1 (with PTF) supports the Crypto Express4s in (CCA) coprocessor and accelerator mode.
    - PKCS #11 (EP11) coprocessor is not supported

- **z/VSE supports zEC12 with new OSA Express4s 1000BASE-T card**
  - No z/VSE PTF is required.
  - OSA/SF support is already included in existing PTFs.
  - z/VSE supports the OSA Express4s 1000BASE-T with existing z/VSE functionality.
- Information will also be available on the z/VSE home page.
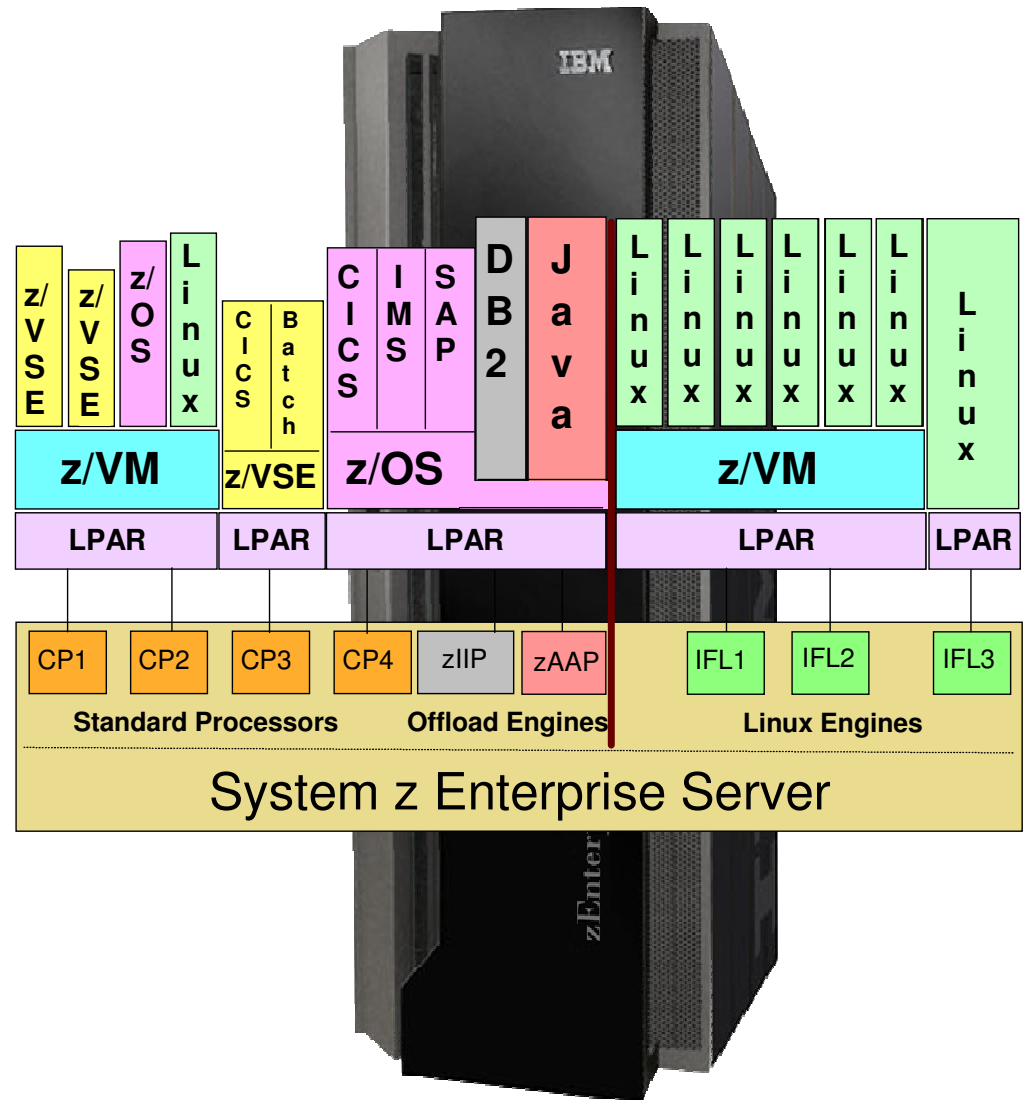
zEnterprise Value Through Integration and Optimization

Value in choice of compute platforms optimized for specific work

Value add from Industry applications And Solutions

Value in solutions based on optimized stacks

z/OS

Availability, scalability, security

z/VSE

Hybrid solutions, SOA, price

z/VM

Consolidation, price performance, cloud capabilities

Linux

Value in the integration of operating system and system software stacks

z/VSE positioning among traditional IBM System z Operating Systems

- 25% of worldwide System z Servers have VSE* installed
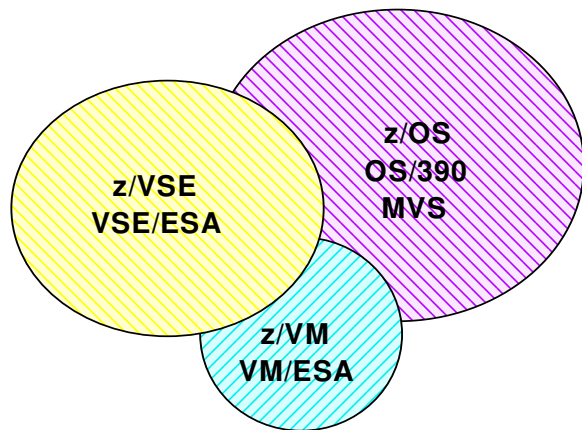
- VSE population is 40% in US, 40% in Europe, 20% other GEOs
- Worldwide 50% run VSE under z/VM, in Europe 90+% are VSE under z/VM
- IFLs play an important role in VSE's strategy
- zIIP/zAAP have no meaning to VSE (not exploited)
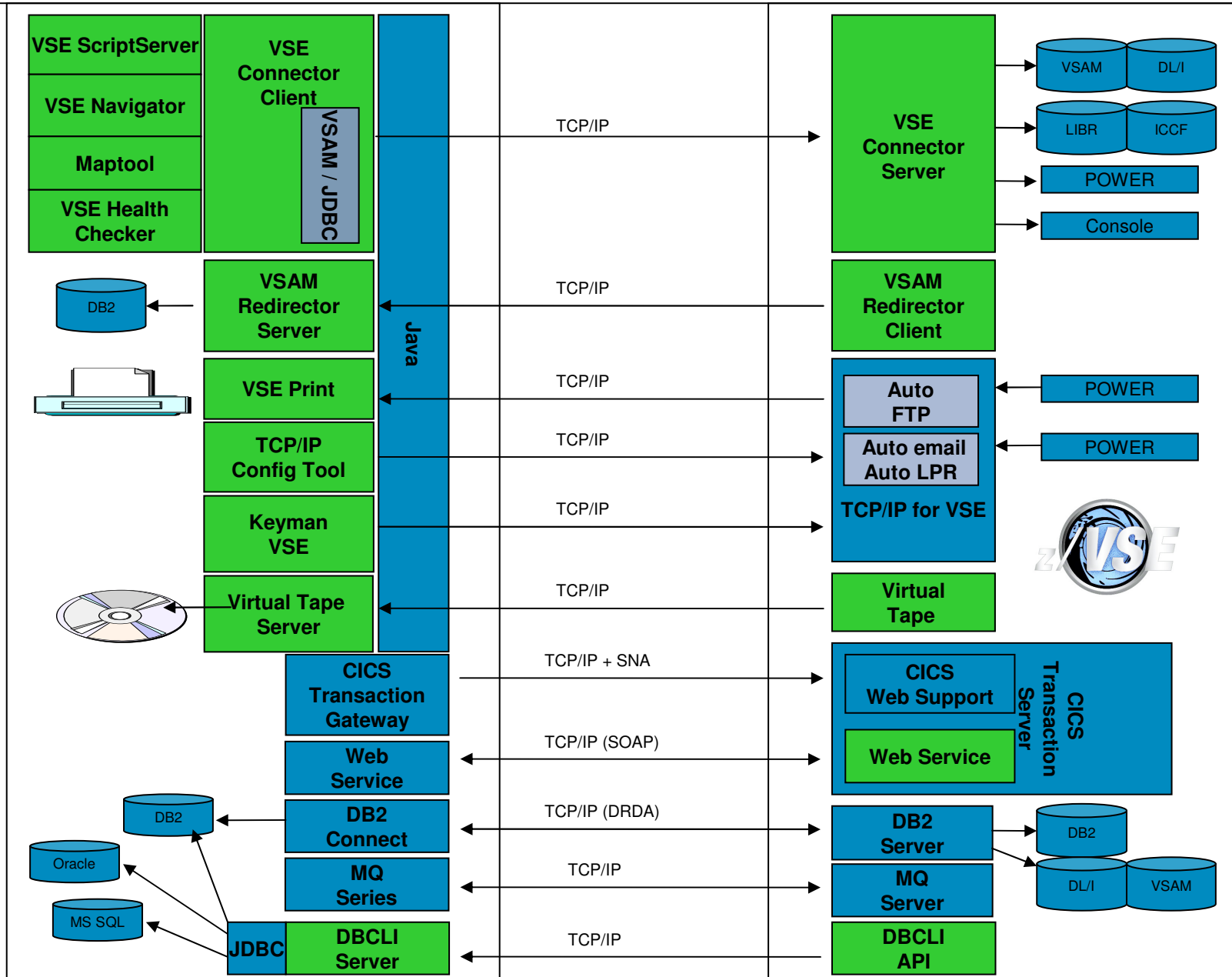
(*) The term "VSE" stands for both, VSE/ESA and z/VSE.

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Extending z/VSE with Linux on System z

z/OS

Parallel Sysplex
Systems Mgmt, Capacity (incl. 64-bit), Availability

z/OS

IMS DC TSO	CICS TS OS/390 ACF/VTAM, TCP/IP LE COBOL, PL/1, C DFSORT, MQSeries DB2, IMS DB, VSAM	*UNIX services heavy duty e-business i.e.. WebSphere App. Server Enterprise JavaBeans hardware encryption*

Unique to z/OS

z/VSE + Linux on System z

No ←

CICS TS VSE/ESA ACF/VTAM, TCP/IP LE COBOL, PL/1, C DFSORT, MQSeries DB2, DL/1, VSAM	*WebSphere App. Server Enterprise JavaBeans*

z/VSE   *connectors* **Linux on System z**

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Integration of z/VSE using IBM Middleware & Connectors

z/VSE V5 and zEnterprise exploitation

IBM

VSE ScriptServer	**VSE Connector Client**		
VSE Navigator			
Maptool		VSAM / JDBC	
VSE Health Checker			

VSE Connector Client — VSAM / JDBC

Java

DB2

VSAM Redirector Server — TCP/IP

VSE Print — TCP/IP

TCP/IP Config Tool — TCP/IP

Keyman VSE — TCP/IP

Virtual Tape Server — TCP/IP

CICS Transaction Gateway — TCP/IP + SNA

Web Service — TCP/IP (SOAP)

DB2 Connect — TCP/IP (DRDA)

DB2
Oracle
MS SQL
JDBC

MQ Series — TCP/IP

DBCLI Server — TCP/IP

VSE Connector Server
VSAM   DL/I
LIBR   ICCF
POWER
Console

VSAM Redirector Client

Auto FTP ← POWER
Auto email Auto LPR ← POWER
TCP/IP for VSE

Virtual Tape

z/VSE

CICS Transaction Server
CICS Web Support
Web Service

DB2 Server → DB2
MQ Server → DL/I   VSAM

DBCLI API

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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

| z/VSE | z/VSE | Linux | CMS | | Non-z Distributed |

z/VM CP

FBA Emulation   Spooling   Paging

SAN with 8 Gbps Fabric

Storwise 7000

SAN Volume Controller

Multi-vendor SCSI disk systems

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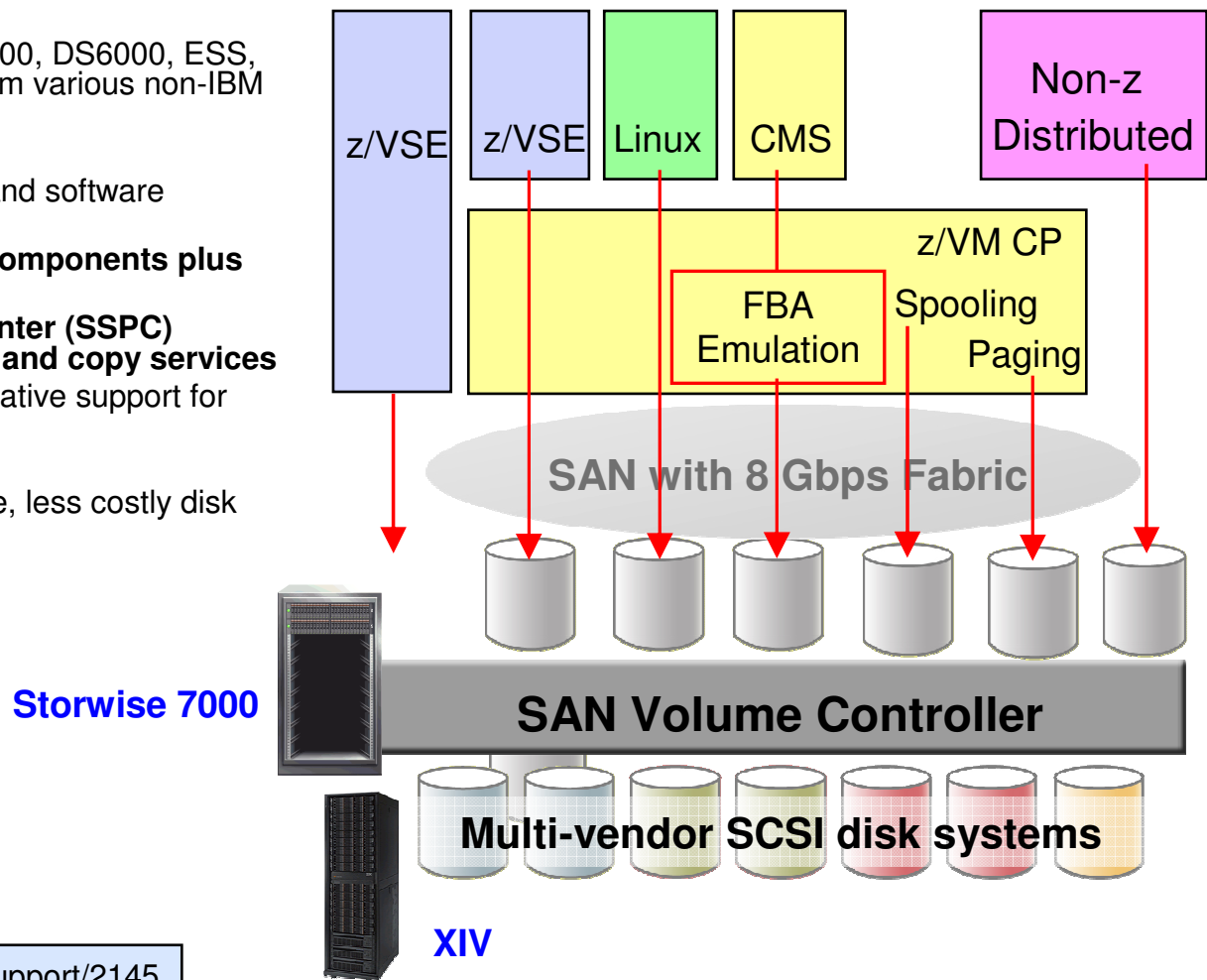
Learn more at: **ibm.com**/storage/support/2145

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

Without LFP

With LFP

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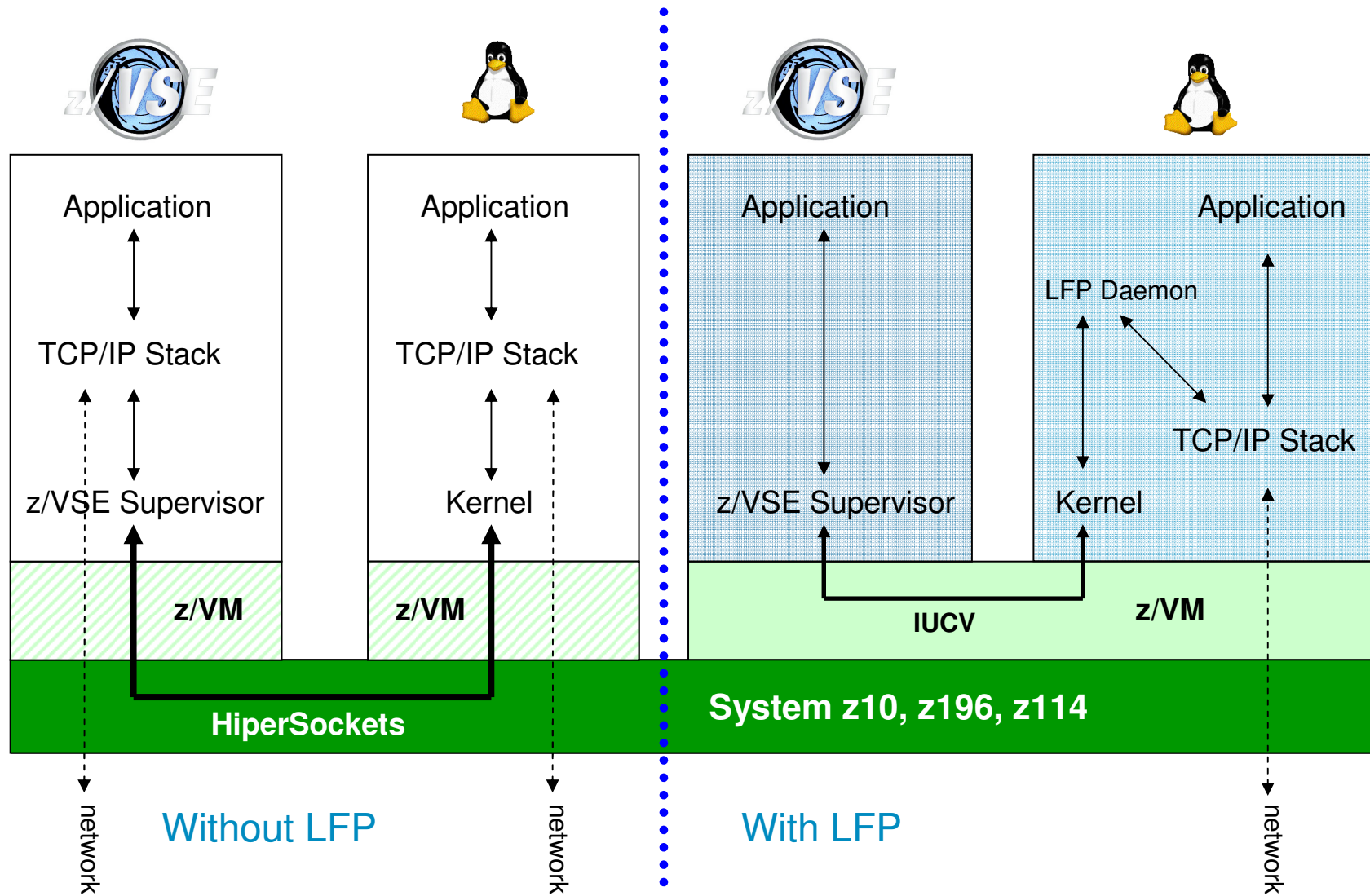
z/VSE z/VM IP Assist (VIA) - Supported by z/VSE V5.1
No Linux on System z is needed to utilize the LFP advantage

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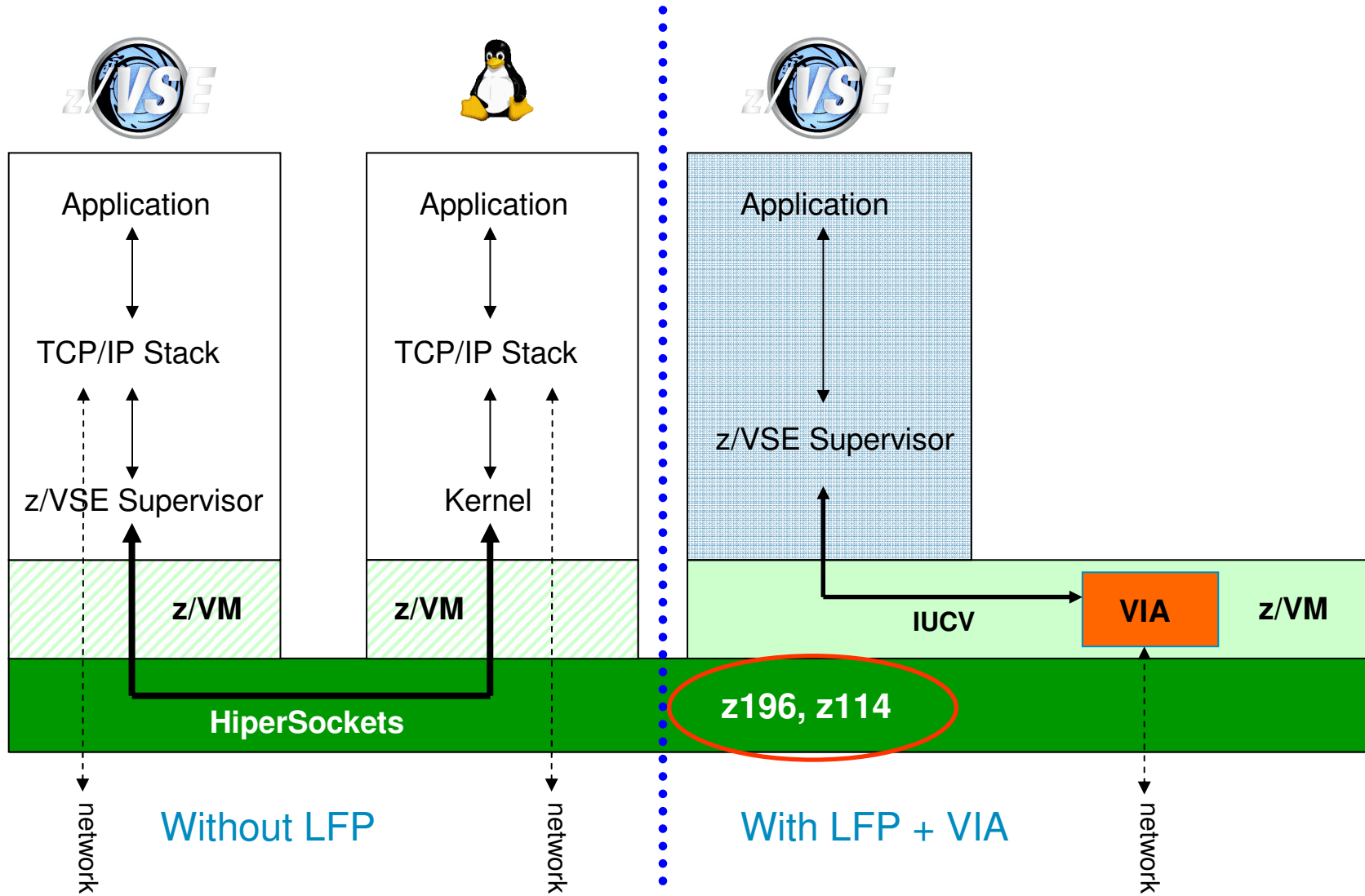
Fast Path to Linux on System z (LFP) in LPAR

- 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

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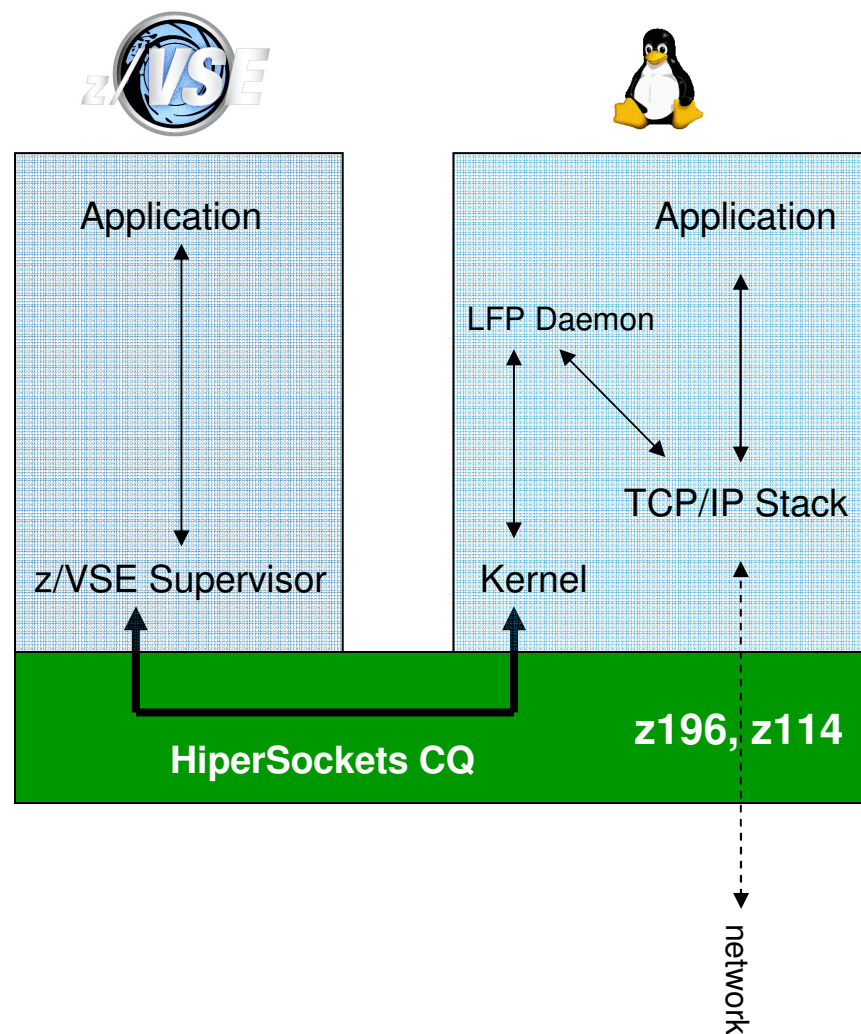
z/VSE Strategy w/ Linux on System z
*Hybrid Environment leveraging
z/VSE, z/VM, and Linux on System z*

Protect existing VSE investments
Integrate using middleware and VSE connectors
Extend with Linux on IBM System z technology & solutions

Infrastructure Simplification

Linux on Sytem z

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

IBM Middleware

Linux on System z

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

Info on Demand

Linux on System z

DB2 9, Information Server, Cognos 8 BI

DB2 LUW

Connection via HiperSockets

z/VSE V4/V5 Production Environment
+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2 client
+ LDAP client

z/VSE V4/V5 Test/Dev Environment

z/VM-mode LPAR with z/VM V6

IFL Engine(s) | **CP Engine(s)**

IBM System z10, z196, or z114

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Agenda

- **zEnterprise and z/VSE V5**

→ - **z/VSE Modernization Options**

- **Wrap-up**

Mixed Workload consolidation on zEnterprise

Linux on z + zEnterprise

Consolidation

z/VSE

z/VSE

inter partition communication
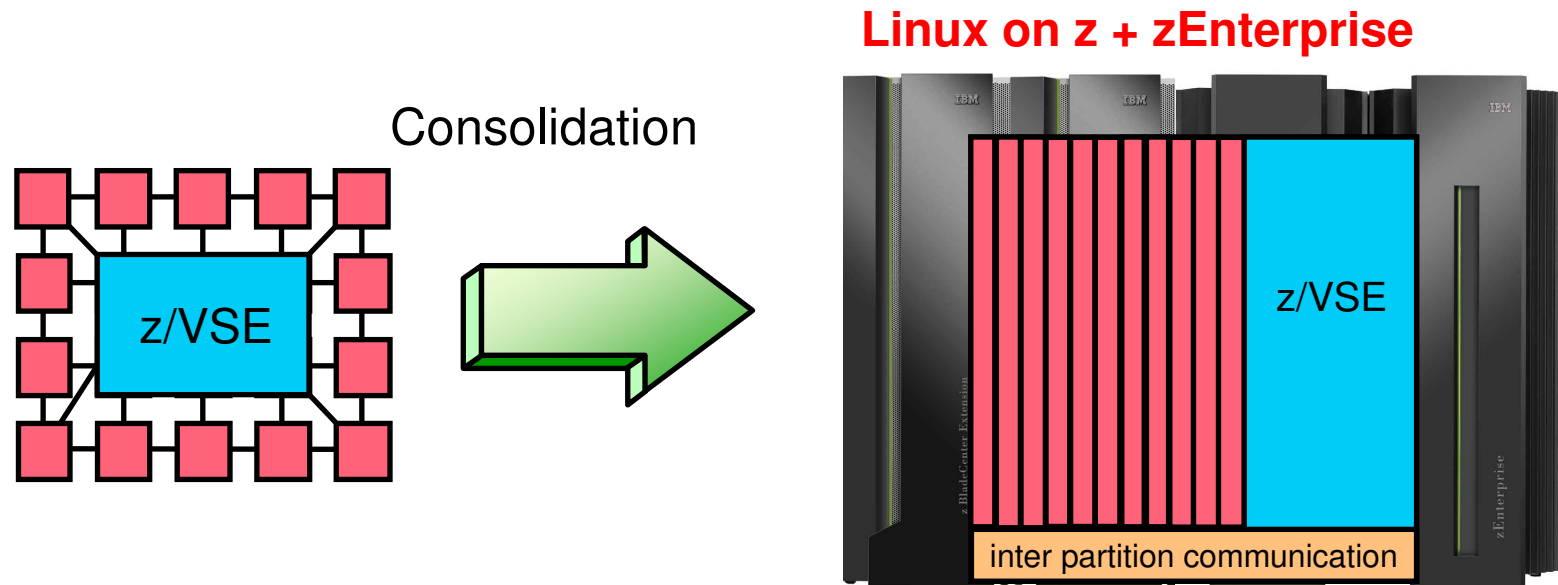
For z/VSE customers, zEnterprise opens
new horizons:

- 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

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Global Virtualization – with System z

IBM System z / zEnterprise

z/VM

Linux

z/VSE

z/VSE

HiperSockets   **HiperSockets**
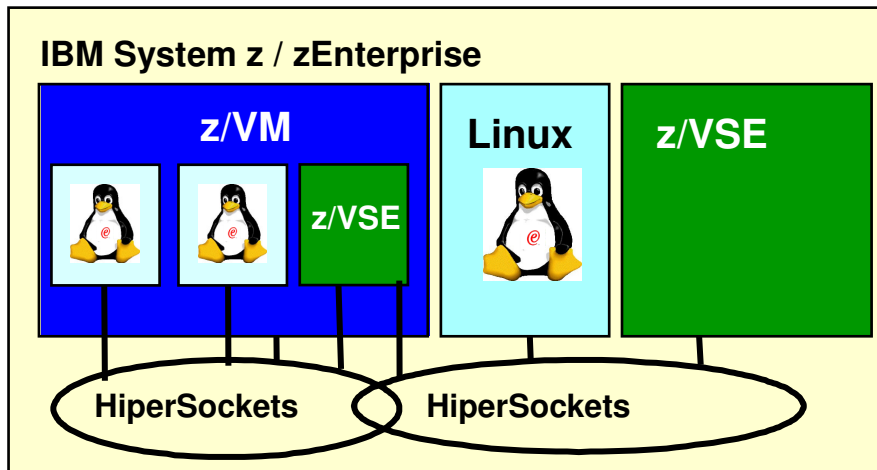
- Network Virtualization
- Memory Virtualization
- Processor Virtualization
- System Virtualization
- Disk Virtualization

Production / Dev /Test and Optional Failover

z/VSE	z/VSE	z/VM	CMS	Linux	Linux

z/VM

LPAR

IBM System z

CP	CP	IFL	IFL	IFL	IFL	IFL

SAN with 8 Gbps Fabric

SAN Volume Controller

Multi-vendor SCSI disk systems

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VSE Script Connector

		z/VSE	
		VSE Script Client (Batch or CICS)	

Linux System (Java)

VSE Script Server

VSE Conn. Client

z/VSE

VSE Connector Server

MS Office (Non-Java App)

VSE Script Client (Windows DLL)

execute script

Script Repository

Script

call/execute

External Process (running on distributed system)

LIBR   POWER   VSAM

VSE Script Client (Java)

VSE Script Connector can be used to:
- Access VSE resources from distributed non-Java applications
- Call/Execute processes on distributed systems from z/VSE applications or Jobs

z/VSE controls processes in a heterogeneous IT environment

HTTP

Application Server (e.g. WAS)

Web Services (SOAP) WebSphere MQ

Database

Intranet Internet

Conclusion:

→ **z/VSE can trigger processes on distributed systems.**

→ **z/VSE Job scheduler can be used to trigger z/VSE job as well as distributed processes.**

→ **z/VSE has full control of the remote process.**

→ **Output and feedback is passed back to z/VSE.**

→ **z/VSE can react on failing distributed processes.**

HTTP

File system

Linux on System z as Central Access Point

Web enable, improve interface, simplify, extend existing applications

Linux on
System z

WS Portal

HATS

WAS

z/VSE
Environment

SOA
+ CICS
+ TCP/IP
+ COBOL

Connection
via
HiperSockets

Linux
DB2
ORACLE

Windows/
DB2
MS SQL

z/VM

LPAR or z/VM

IFL Engine (s)

Standard CP Engine (s)

IBM zEnterprise

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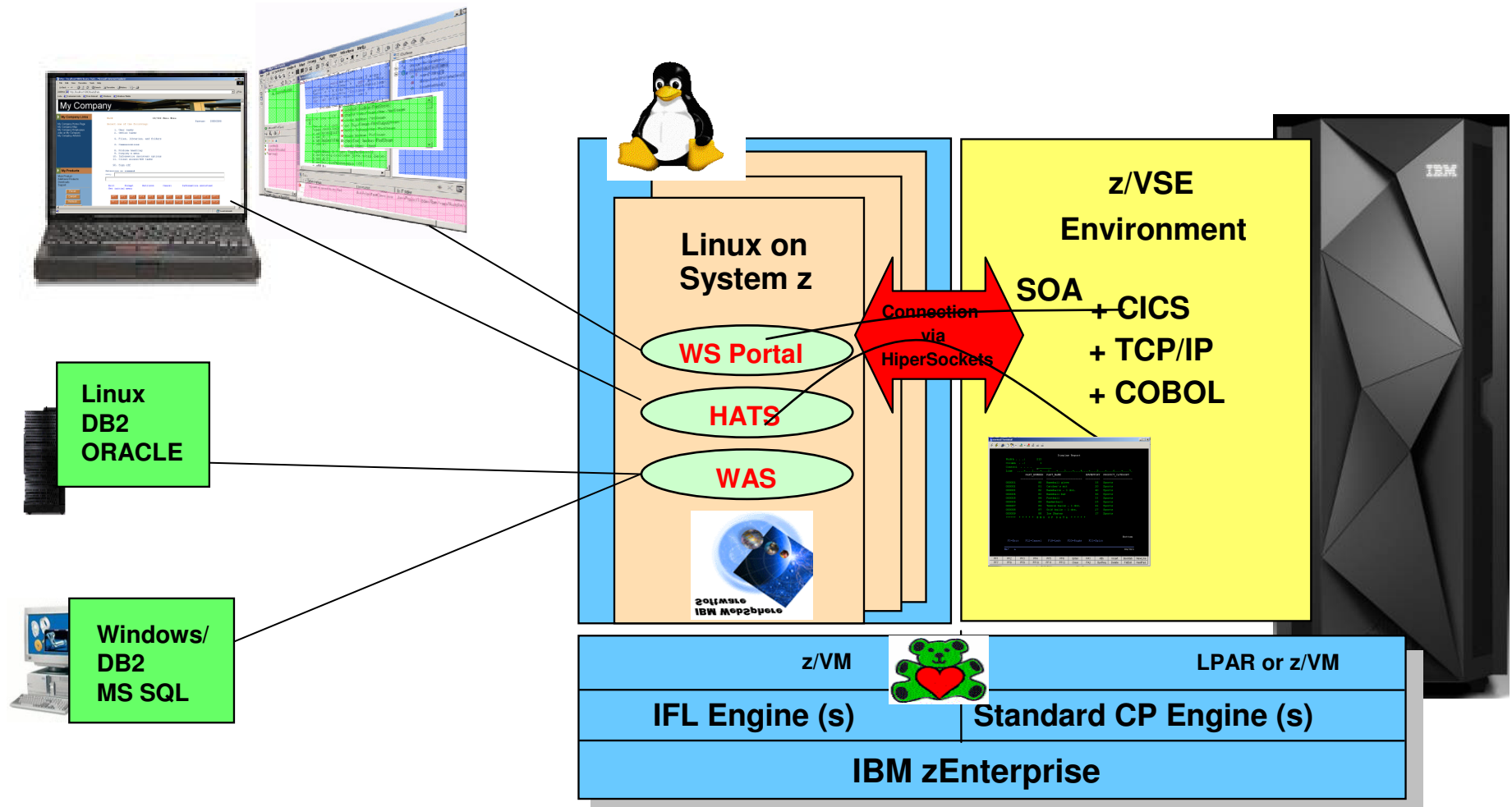
Central Authentication Options – LDAP in Linux or LDAP/RACF in z/VM

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

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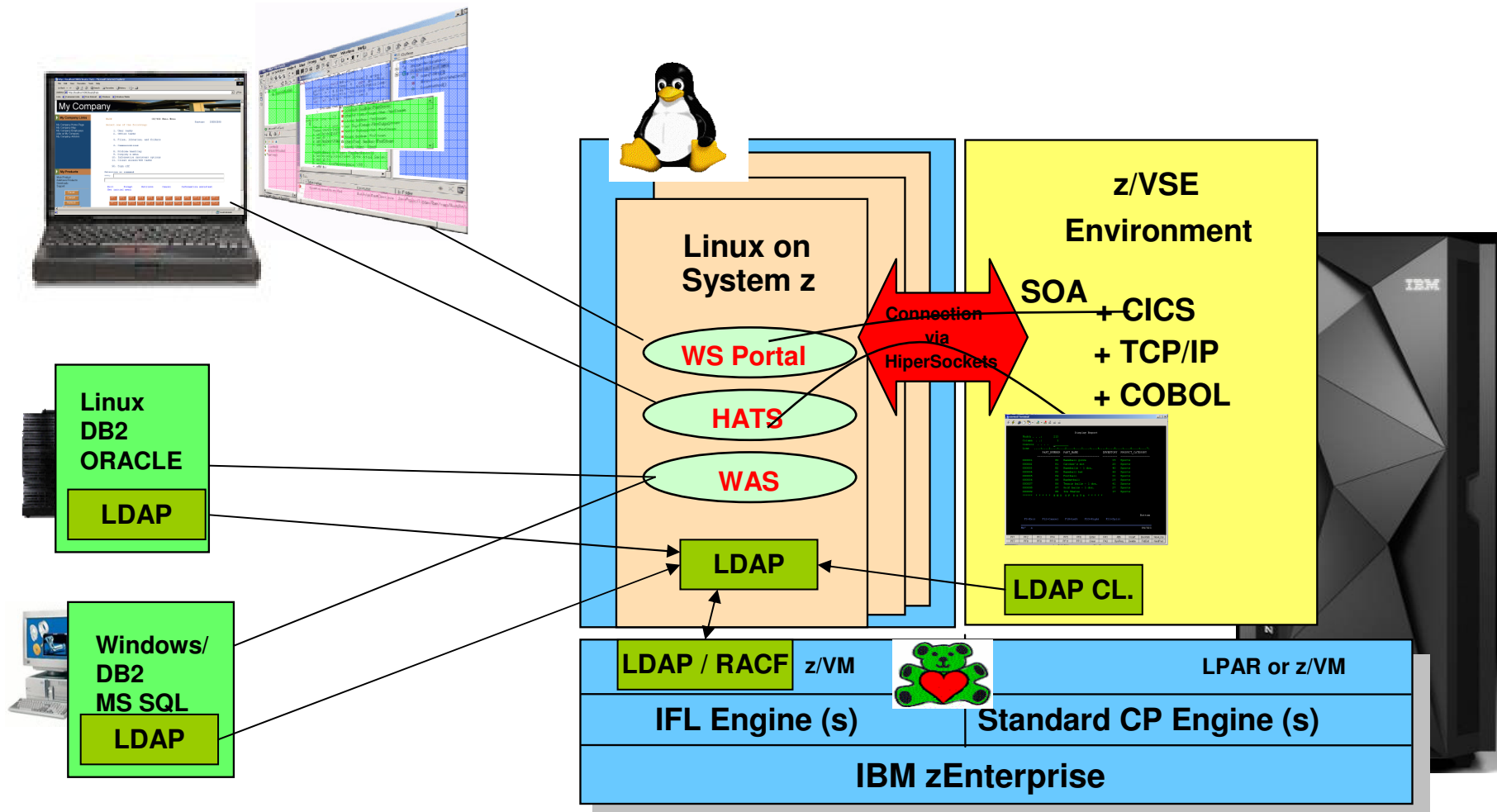
z/VSE Security Components
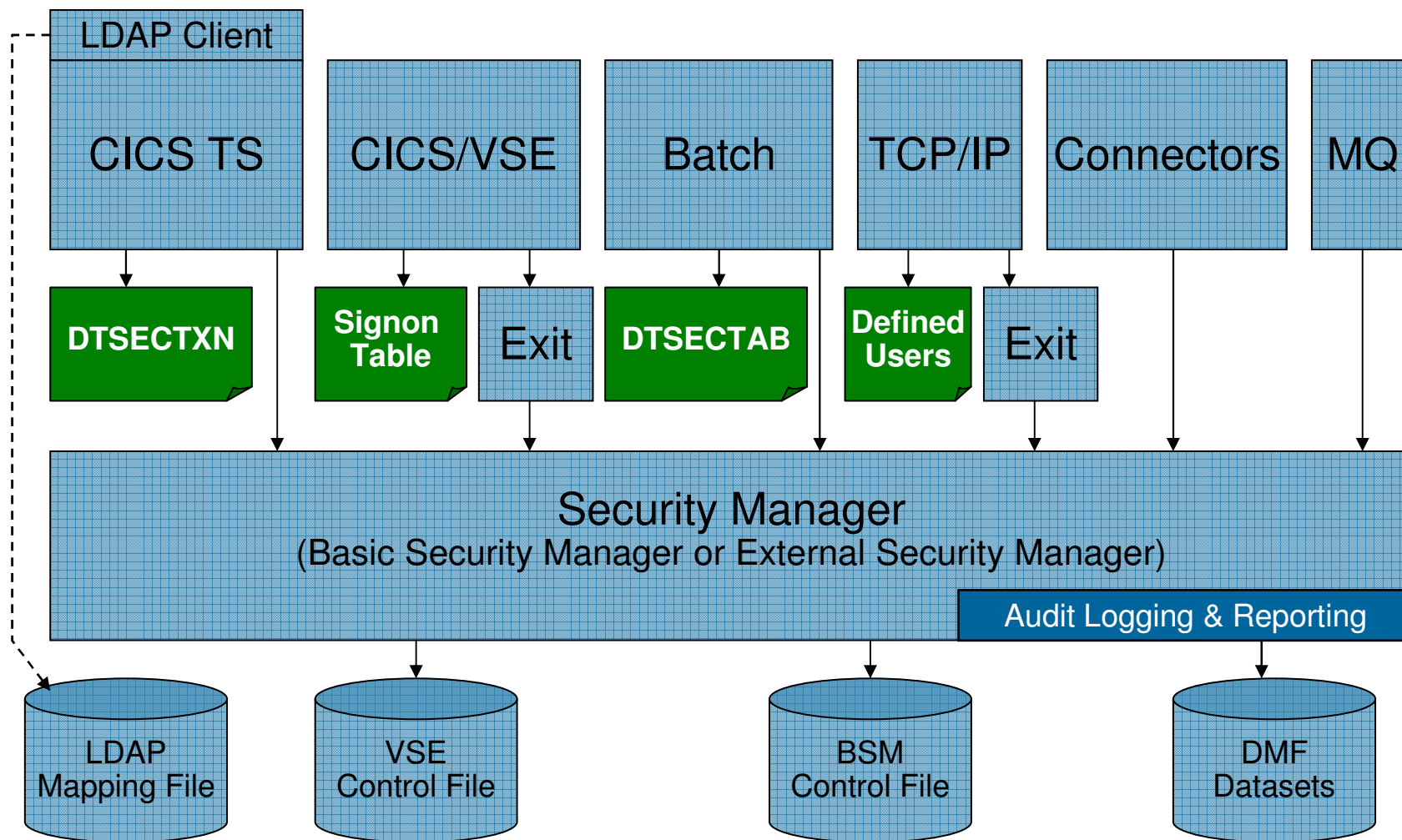
Web Integration with traditional CICS transactions

Browser

CICS/TS

User Appl

ISC

Linux on System z

CICS/TS

Hipersockets

Websphere Application server

CWS

HATS / HOD

CTG – ECI

MQ Series client/server

SOAP client/server

User Appl

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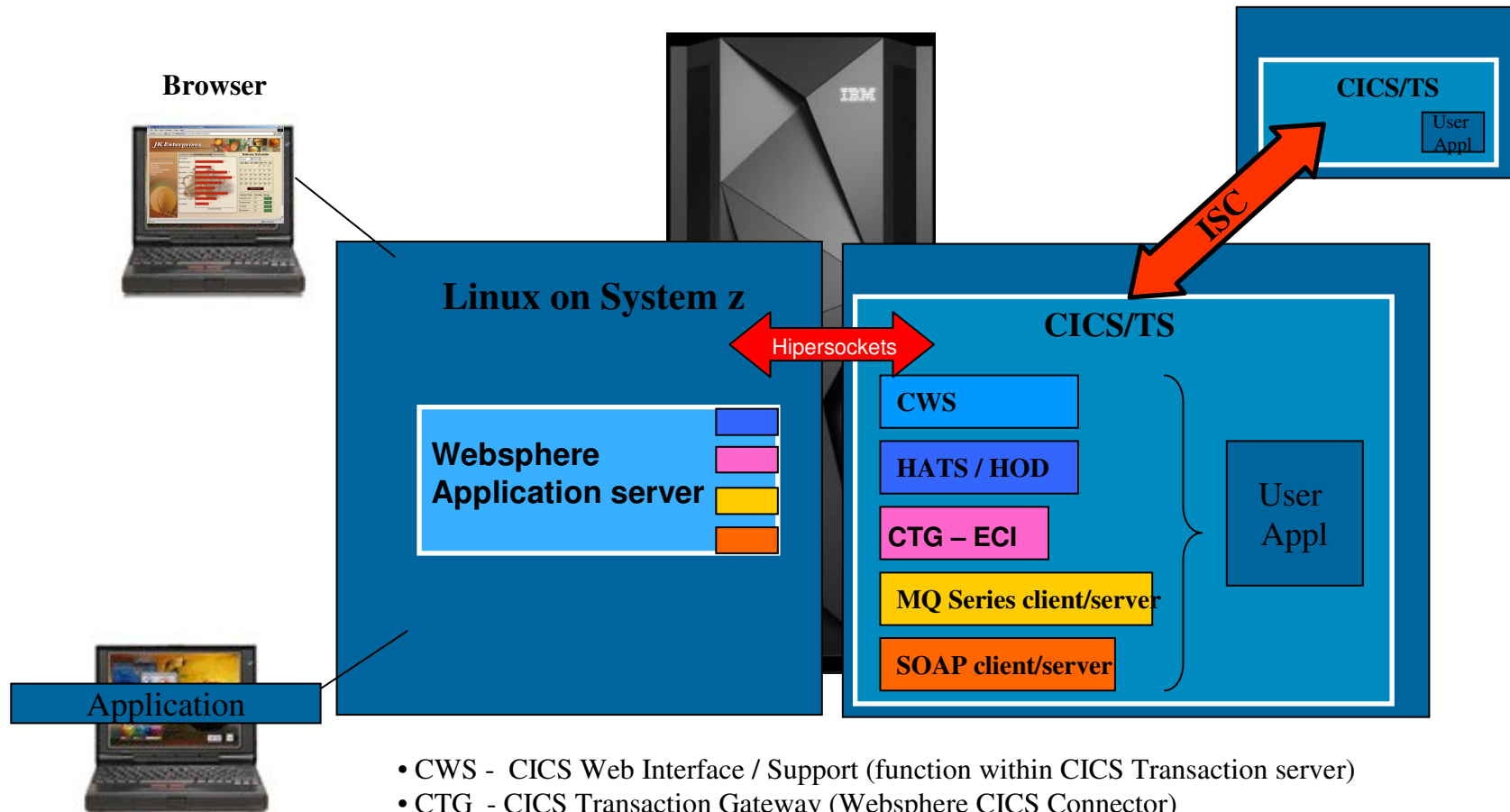
- CWS - CICS Web Interface / Support (function within CICS Transaction server)
- CTG - CICS Transaction Gateway (Websphere CICS Connector)
- HATS – Host Access Transformation Server
- HOD - Host OnDemand (Websphere Host Integrator)
- SOAP - Simple Object Access Protocol (Web Services based with XML data)

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
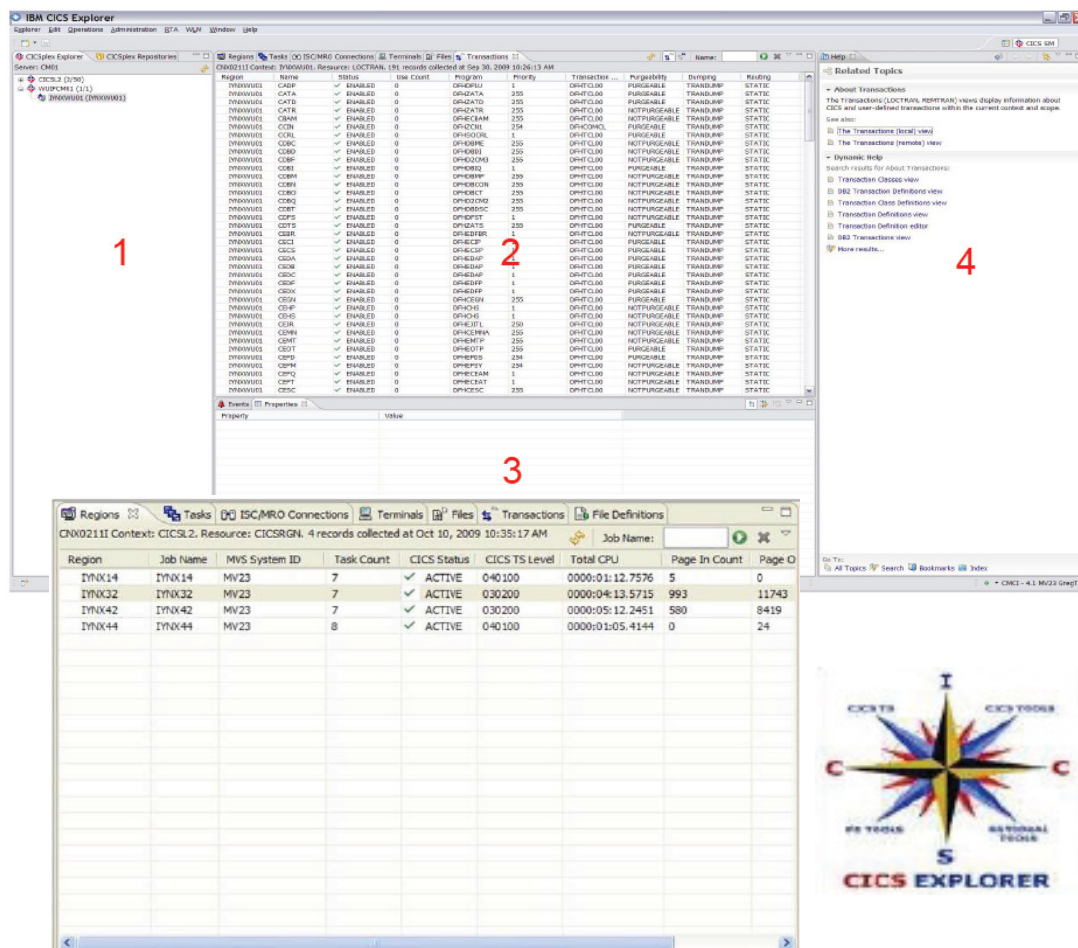
Fulfills Statement of Direction:
"IBM intends to provide CICS Explorer capabilities for CICS TS for VSE/ESA, to deliver additional value."

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Connectivity to CICS transactions

HTTP Access:
CICS Web Interface/Services (CWI/CWS) within CICS

WAS — **B** — HTTP → CICS TS — **B** ← DB2 — **D** — VSAM
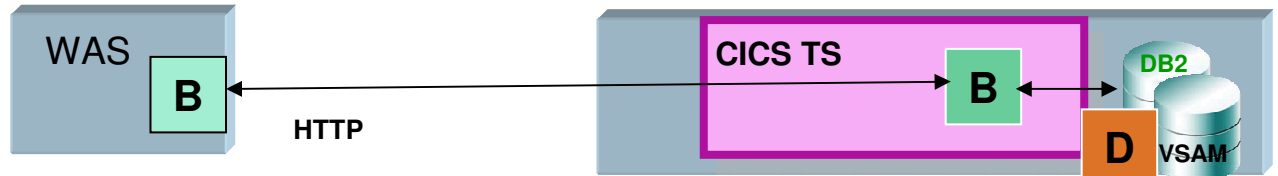
WebSphere
Host Access Transformation Services (HATS)

WAS — WebSphere HATS — **B** — 3270 → CICS TS — **P** — **B** ← DB2 — **D** — VSAM
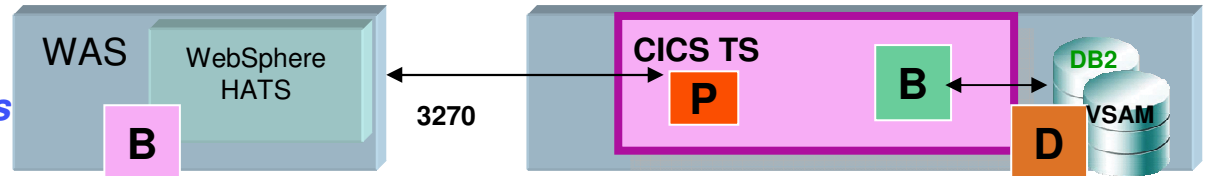
J2C Connector:
CICS Transaction Gateway (CTG)

WAS — **B** — CICS TG — ECI → CICS TS — **B** ← DB2 — **D** — VSAM
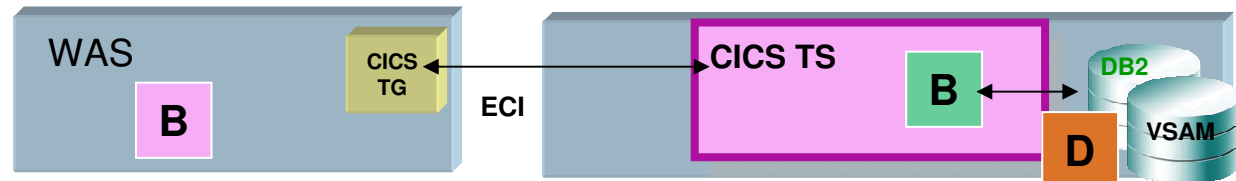
JMS Connector:
MQ to CICS Bridge

WAS — **B** — JMS to MQ — MQ — Queues — MQ — MQ-CICS — CICS TS — **A** — **B** ← DB2 — **D** — DL/I
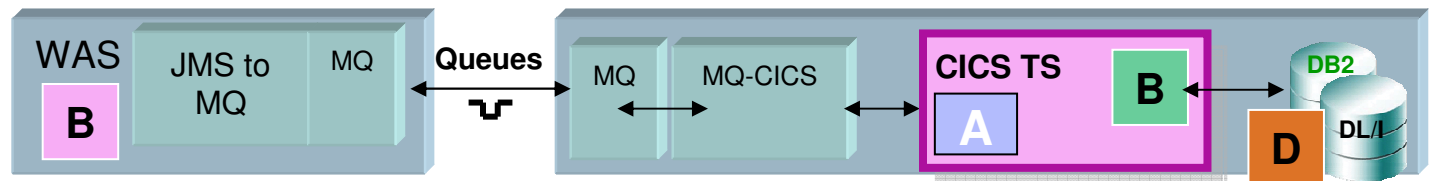
SOA Integration:
Web Services access to CICS

B — SOAP → CICS TS — **A** — **B** ← DB2 — **D** — VSAM
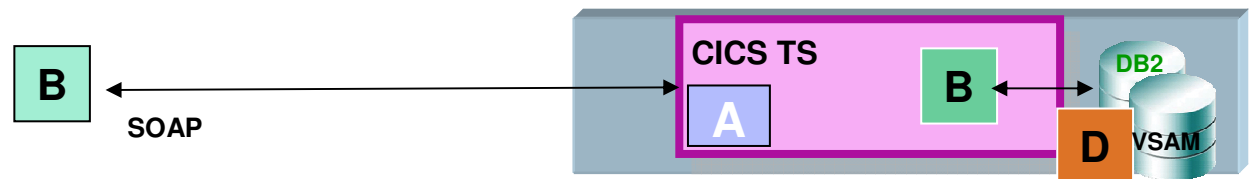
WAS can be on Linux on z or on zBX in an zEnterprise Ensemble. Qualities of Services will vary.

Integrating Logic in an SOA

Application

Call Web Service (Get Condition)

Process Credit

Generate invoice

Calculate discount

Calculate quote

Request ship date

Get price

Get customer

Save quote

Update inventory

Services

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

IBM

The Two Models of SOA CICS Integration via Web Services

Other/Any   **CICS TS** **(direct SOA access to CICS)**

Business Function

| Web Service Client | **SOA** → | CICS Web Services | → | Integration logic **I** | Business logic **B** | Data access **D** | → |

Other/Any   **Intermediate (Linux)**   **CICS TS**

CICS Program

| Web Service Client | **SOA** → | Web services end-point | **connector** **CTG** HATS Socket HTTP | → | **A** Business logic **B** | → |
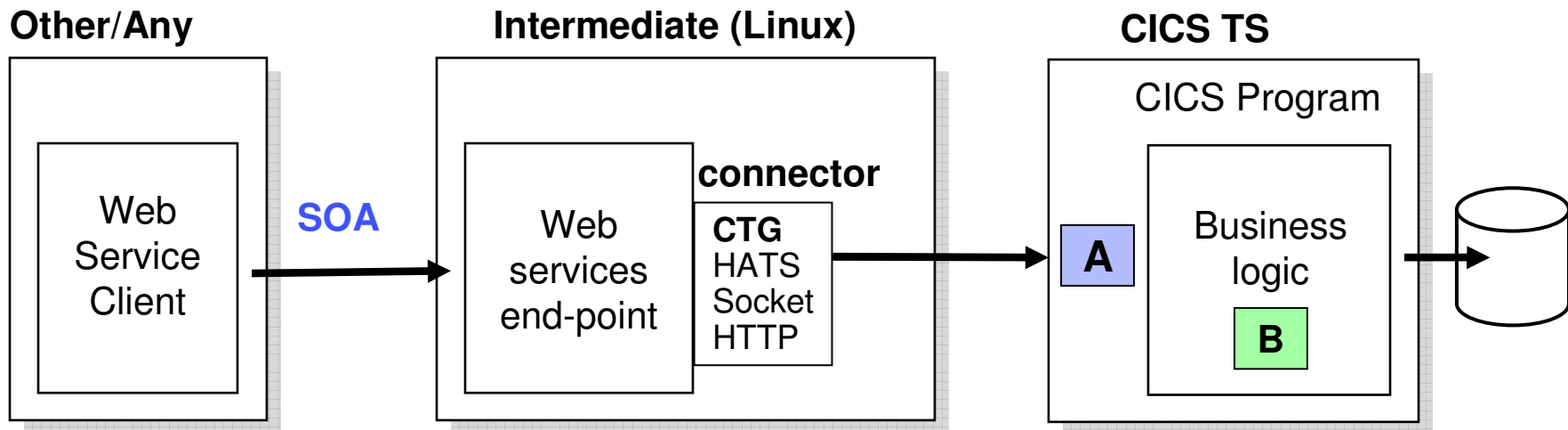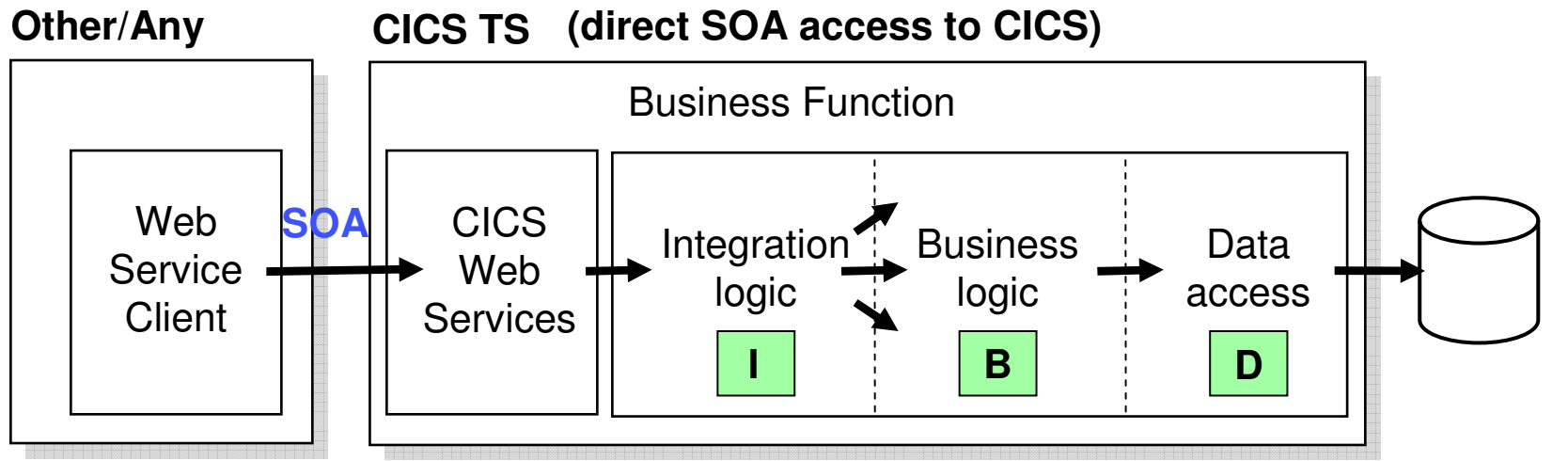
Integration using an Enterprise Service Bus

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**

Portal Service

SOAP Connected
Component (e.g. .Net)

B2B
Interactions

Service
Orchestration

Enterprise Service Bus

Existing Apps
and Legacy
Systems

Common Runtime Environment

New Service
Logic

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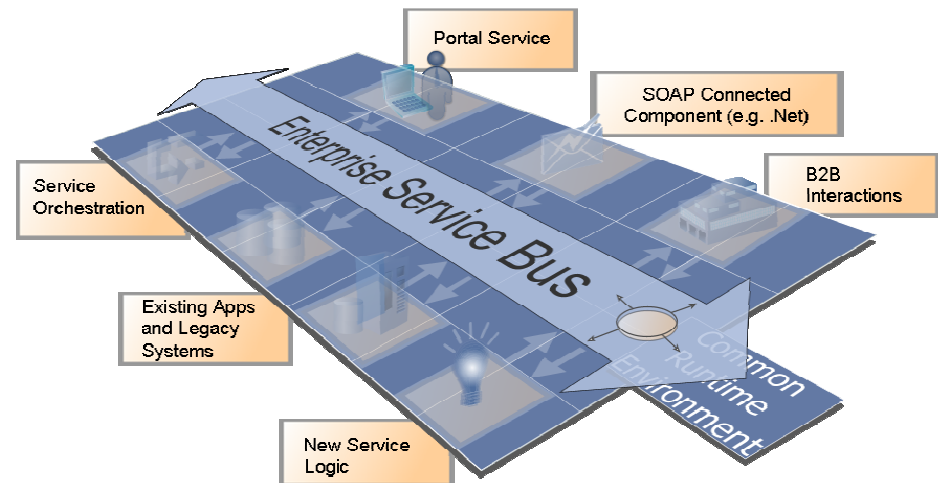
SOA – it is the implementation phase

- Active Projects in several customer sites.

Sample SOA Architecture

Orders Web

Orders Call Center

Orders Retail

Business Control (BI)

Internet

Security

Enterprise Service Bus (ESB)

Order processing

Packaging

Budget Control

Advertisement

Shipping (Retail, Delivery)

Central data pool

Marketing Campaign Mgmt Automation

BI

DWH
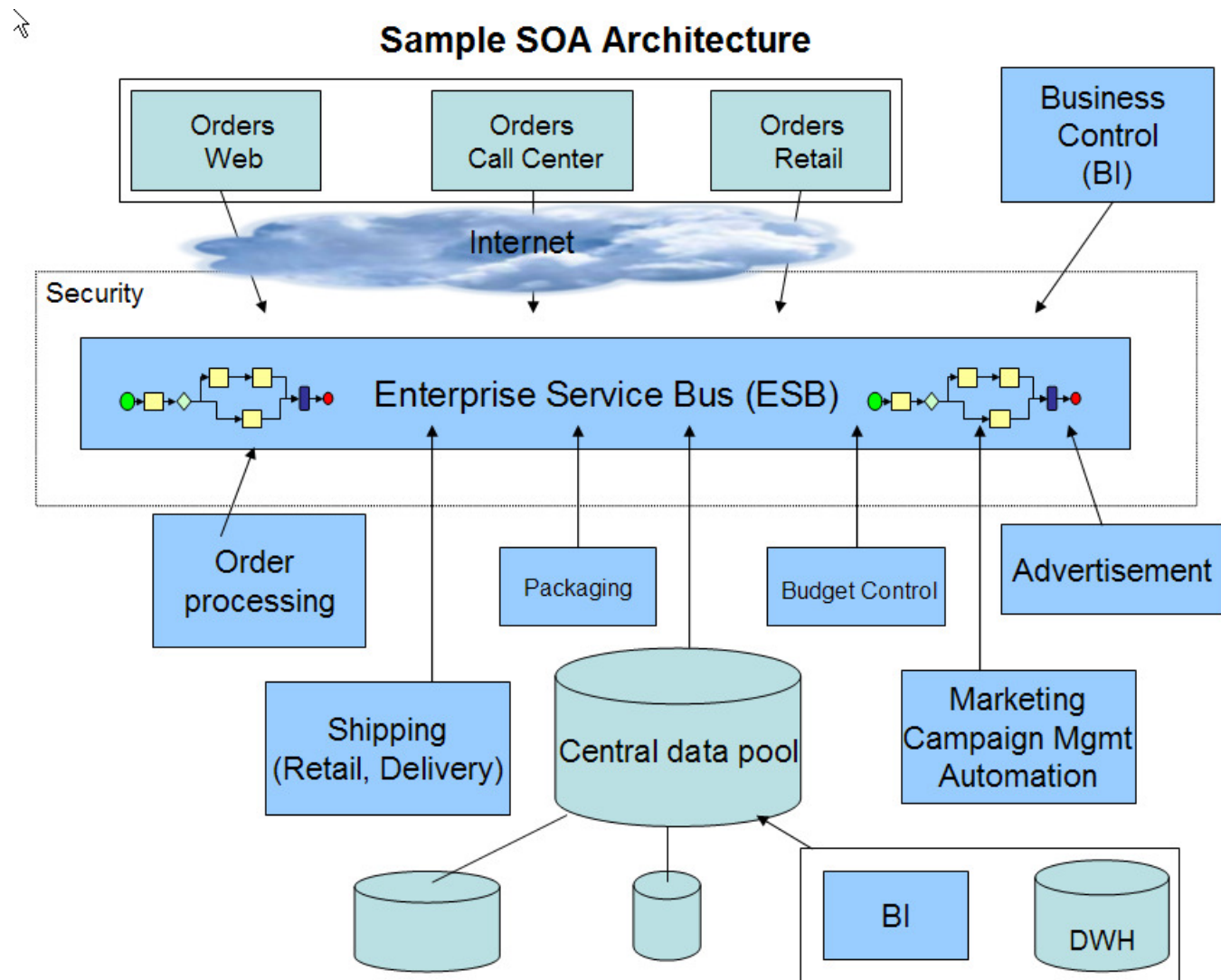
Service Oriented Architecture (SOA) – the way to new solutions

- Applications look the same for all users
- Existing core applications can become a Web service
  (independent of their language, COBOL, ASM, PL/I, Java, C#)
- New business logic is built

Increased success for the Enterprise

Linux on System z

appl-x

New Logic

Web Services
IIB (WMQ)

DB2
LUW

WAS

DB

Product Catalog:
- **pictures**
- **description**
- **specifications**
- **testimonials**

Traditional System z

MQ

debit check

shipping

restock

VSAM

DB2

IMS

LPAR or z/VM

LPAR or z/VM

System z

System z
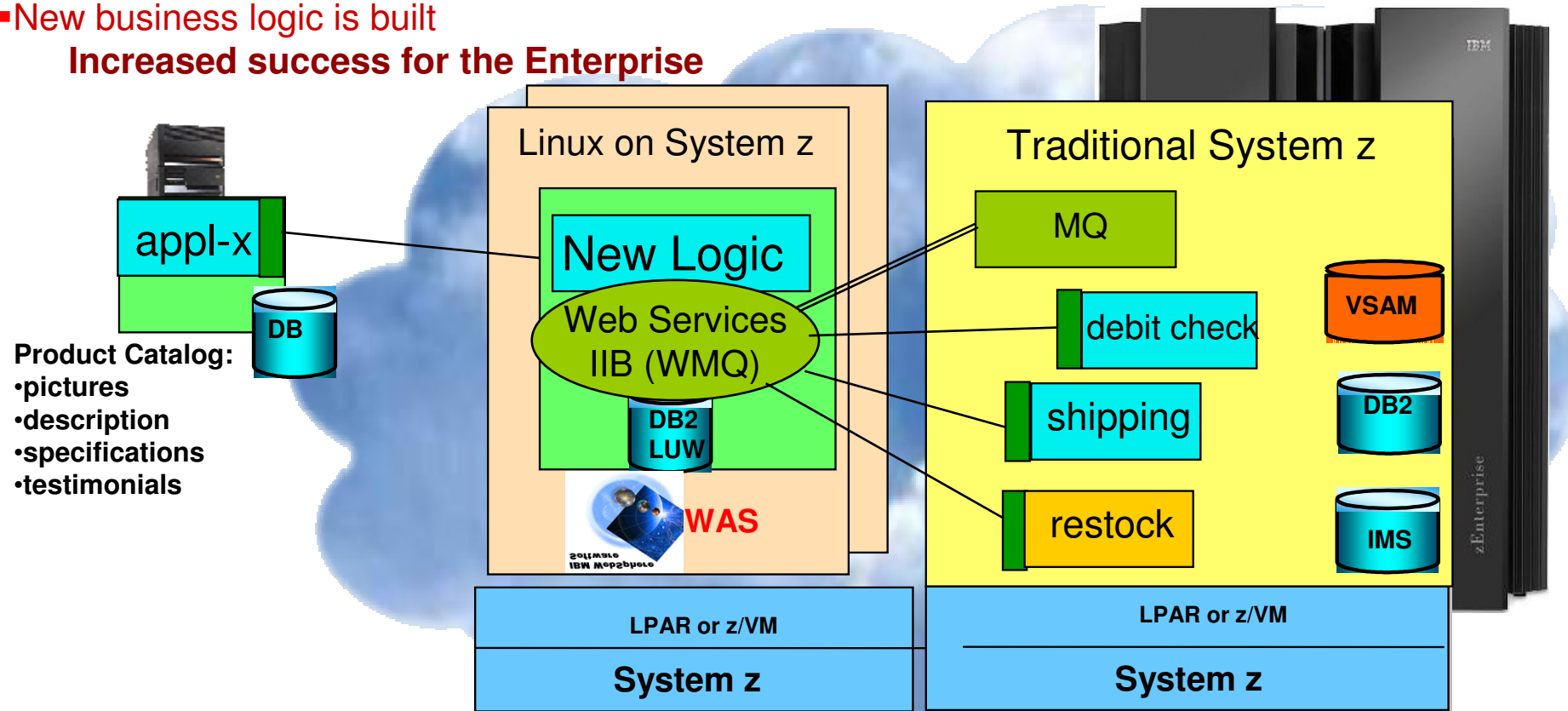
Integration of Processes

Web Services with z/VSE

SOA and XML data interchange with
CICS transactions in VSE

Microsoft .NET
Websphere
Apache SOAP
AXIS
Java

SOAP Client/Server

HTTP (HTTPS)

SOAP Envelope

z/VSE

CICS TS

XML Parser

XML

SOAP Engine

XML to Commarea proxy

Commarea

★ Transaction

Welcome to the CICS2WS Toolkit!

CICS2WS

Create a Web Service from a CICS Application

Use a Web Service with a CICS Application

CICS2WS Toolkit

Tool to generate the Proxy code
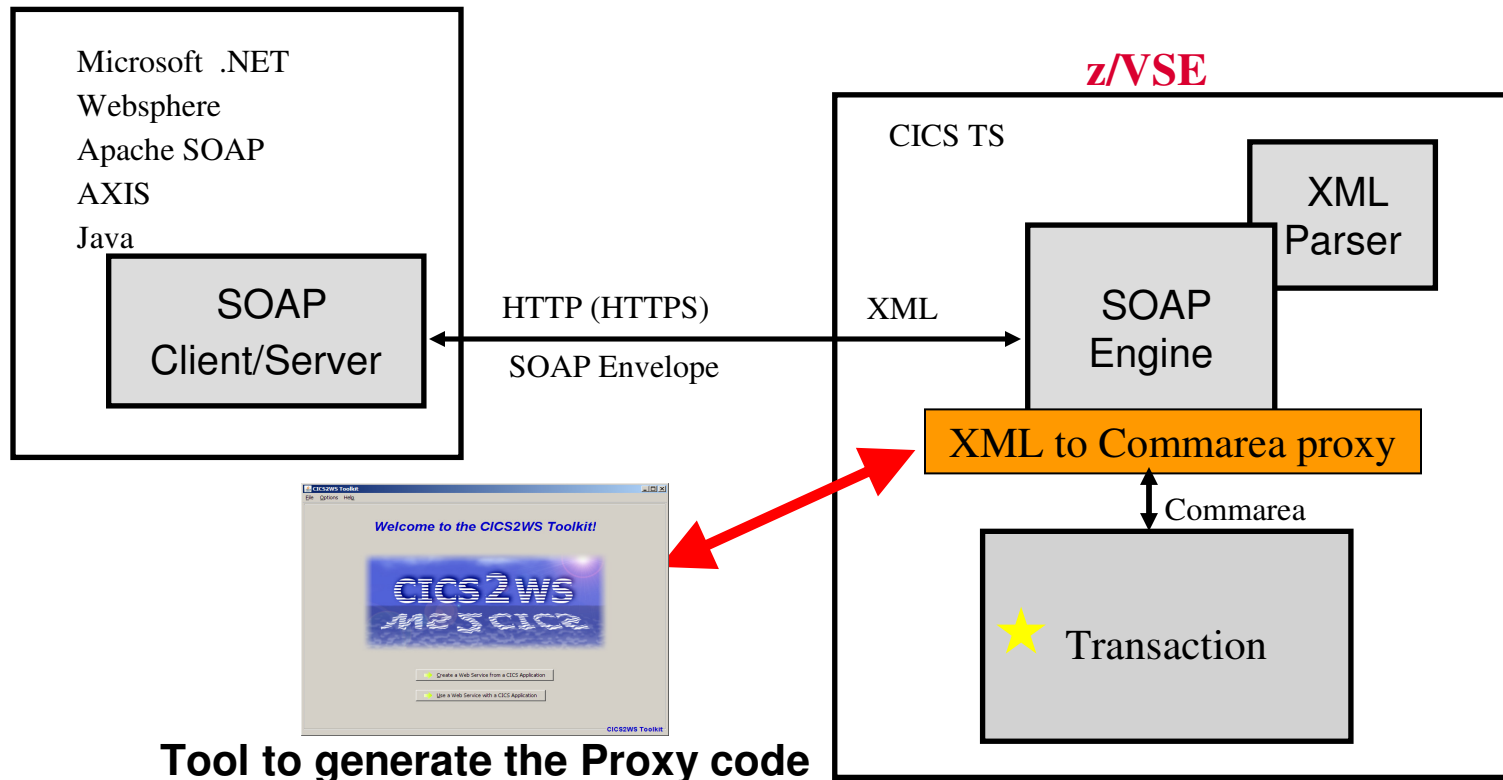
★ Existing VSE Transactions as Web Service

★ Existing Transactions can call a remote Web Service

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OpenStack and z/VM with cross platform Open source **xCAT** tool

SmartCloud Technology Products

I know z/VM

xCAT Appliance

SMAPI Services

Directory Product
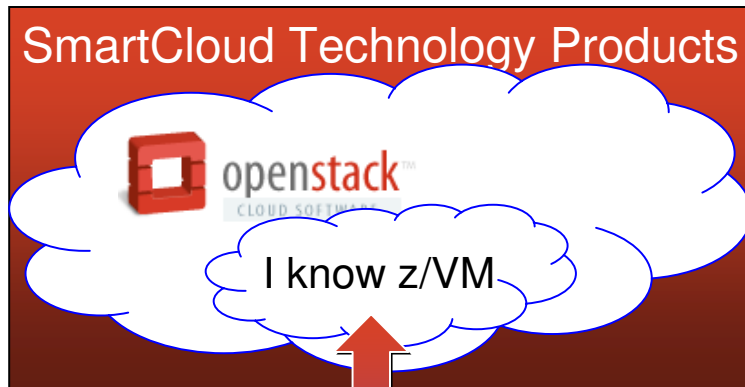
- **OpenStack and z/VM:**
  - OpenStack, a Open Source project to provide Multi-platform Infrastructure as a Service mangement
  - Consists of separate projects to handle different types of resources
  - Portions of OpenStack support know z/VM (i.e. code that connects and understands how to talk to z/VM).

- **Bottom Half of the Solution:**
  - Rest APIs are used to communicate with the OpenStack code from the top half.
  - The xCAT appliance utilizes new and existing Systems Management APIs (SMAPI) to interact with the z/VM system
  - SMAPI can interact with additional products or features (e.g. a directory manager).

Product with OpenStack Support

z/VM 6.3 Product

Additional Product or Feature
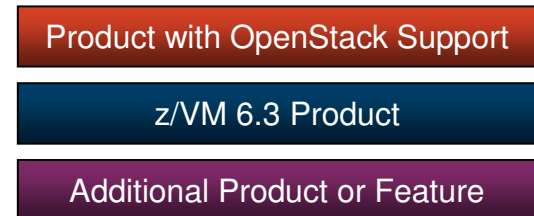
IBM WAVE - the new IBM tool - *visualizes virtual and physical resources*

IBM-WAVE provides the graphical interface that simplifies and helps to automate the management of z/VM guests and Linux on System z virtual servers.

- Monitors and manages virtual servers and resources **from a single graphical interface**

- Simplifies and Automates **tasks**

- Provisions virtual resources **(Guests, Network, Storage)**

- Supports advanced z/VM capabilities **such as Single System Image and Live Guest Relocation**

- Allows delegation of administrative capabilities **to the appropriate teams**
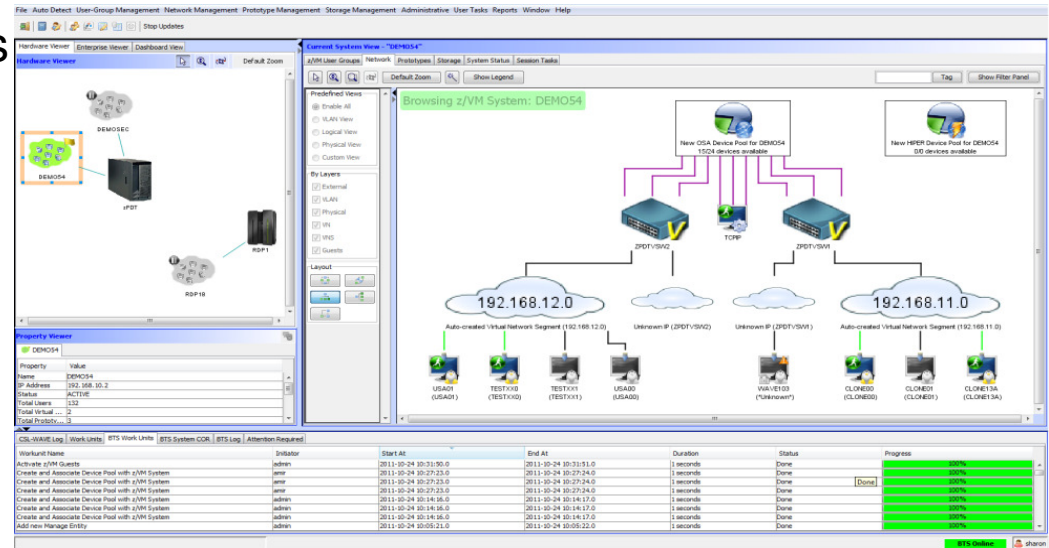
A simple, intuitive graphical tool providing management, provisioning, and automation for a z/VM environment, supporting Linux virtual servers.

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

Network simplification with zBX or Linux & z/VM

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

IBM zEnterprise

z/VSE V5

Connectors

IBM zBX

AIX, Linux,Windows,

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

Tran/Data Services

Business Services

Clients

Private data network (IEDN)
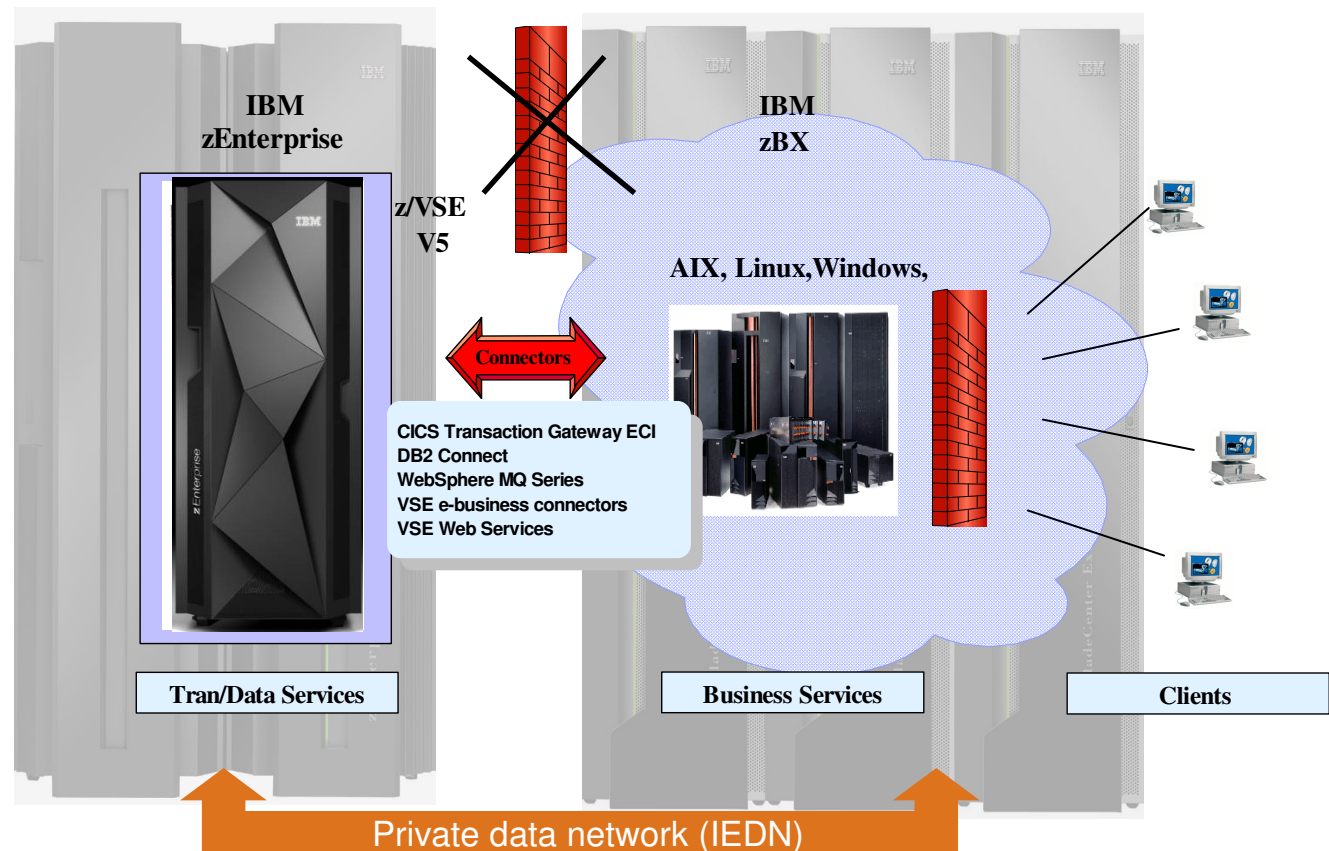
Protect existing z/VSE investments

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

Over 600 Cables

Backbone

Network

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

After

Backbone

Just 10 Cables!
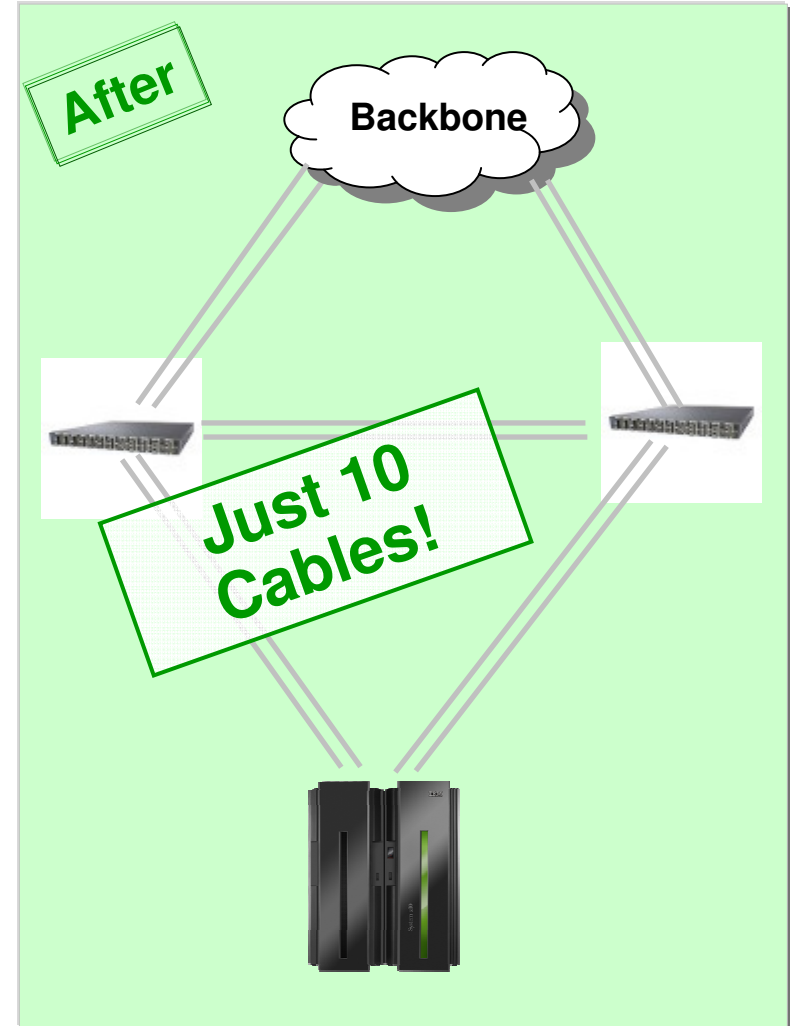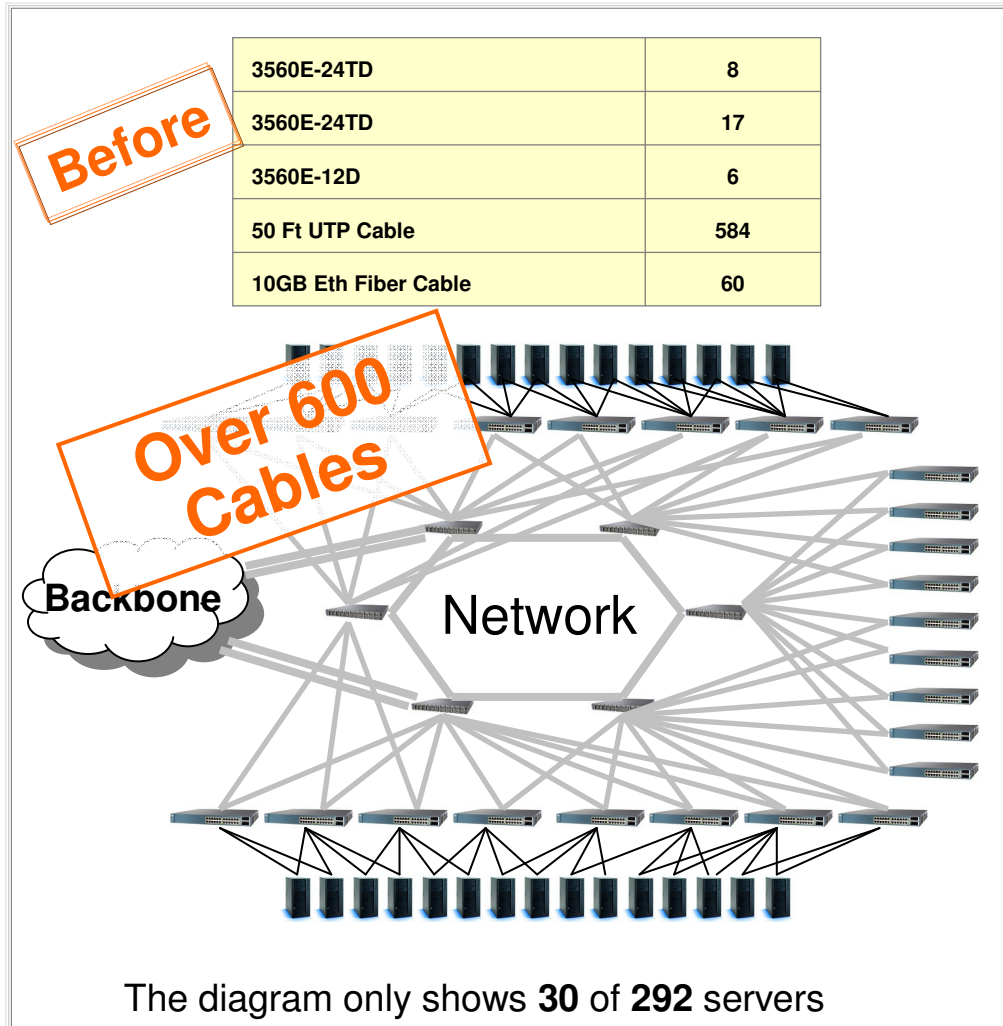
Data is based on real client opportunity and on internal standardized costing tools and methodologies.
Client results will vary by types of workloads, technology level of consolidated servers, utilization factor, and other implementation requirements. Savings will vary by client.

Data Warehouse and BI with Linux on System z

Consolidate, Integrate, Evaluate - DB2 Client, VSAM Redirector

Linux on System z

Cognos

Data Warehouse

DB2 LUW

DB2

Windows/ Linux DB2 ORACLE

DB2 LUW

Windows/ Linux DB2 ORACLE

DB2 LUW

Connection via HiperSockets

z/VSE

Environment

+ TCP/IP

+ CICS

+ VSAM

+ COBOL

VSAM

DB2 VSE/VM

z/VM or LPAR	LPAR or z/VM
IFL Engine (s)	Standard CP Engine (s)
IBM System z	

© 2014 IBM Corporation
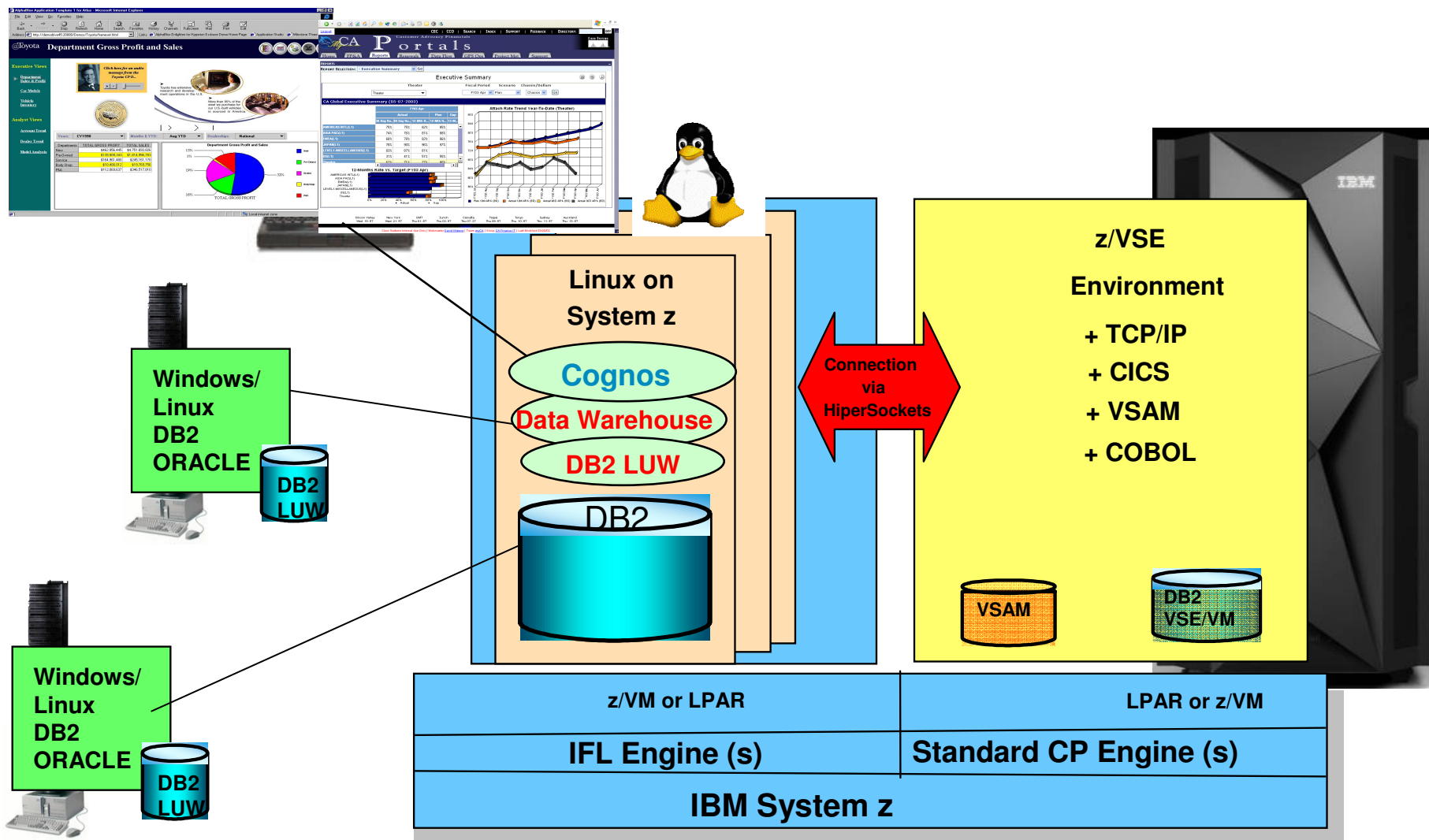
(B)PUSH scenario: VSE/VSAM applications, access remote relational databases

(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 Apply processing

   b) MQ Exit and MQ Series solutions

PUSH-

scenario

z/VSE Server

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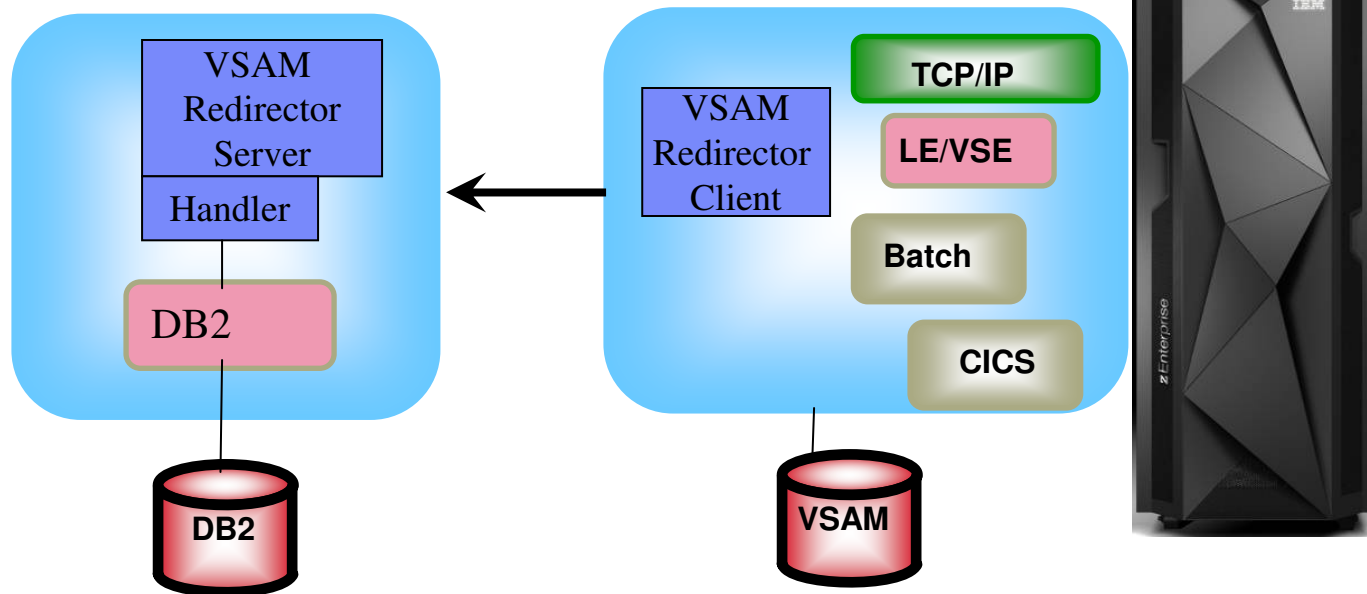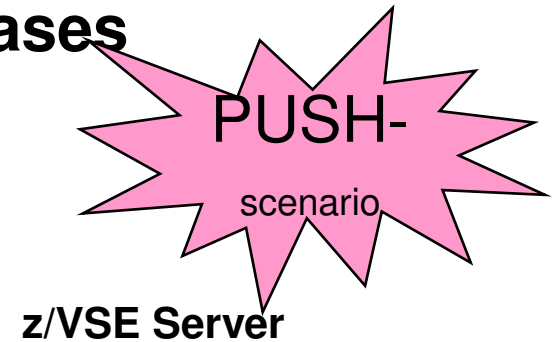
VSE/VSAM applications, access remote relational databases
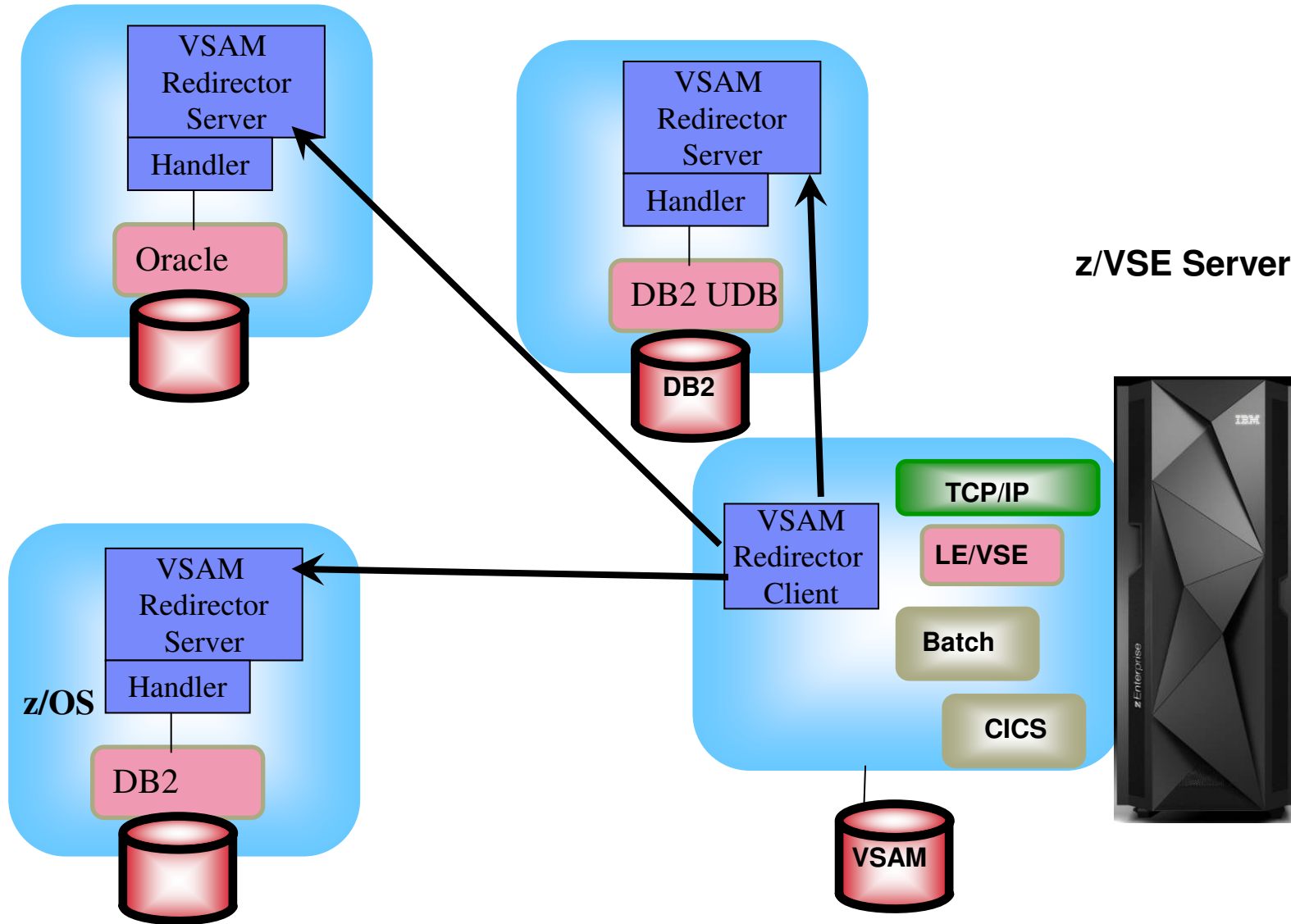
Applications on z/VSE
access 'any' remote relational databases

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

Java Server

| DB2 Server |
| DBCLI Server |
| JDBC v3+ |

TCP/IP

z/VSE Server

TCP/IP

| DB2 Client | **Batch** |
| DBCLI Client | **CICS** |

DB2

MS SQL

Oracle

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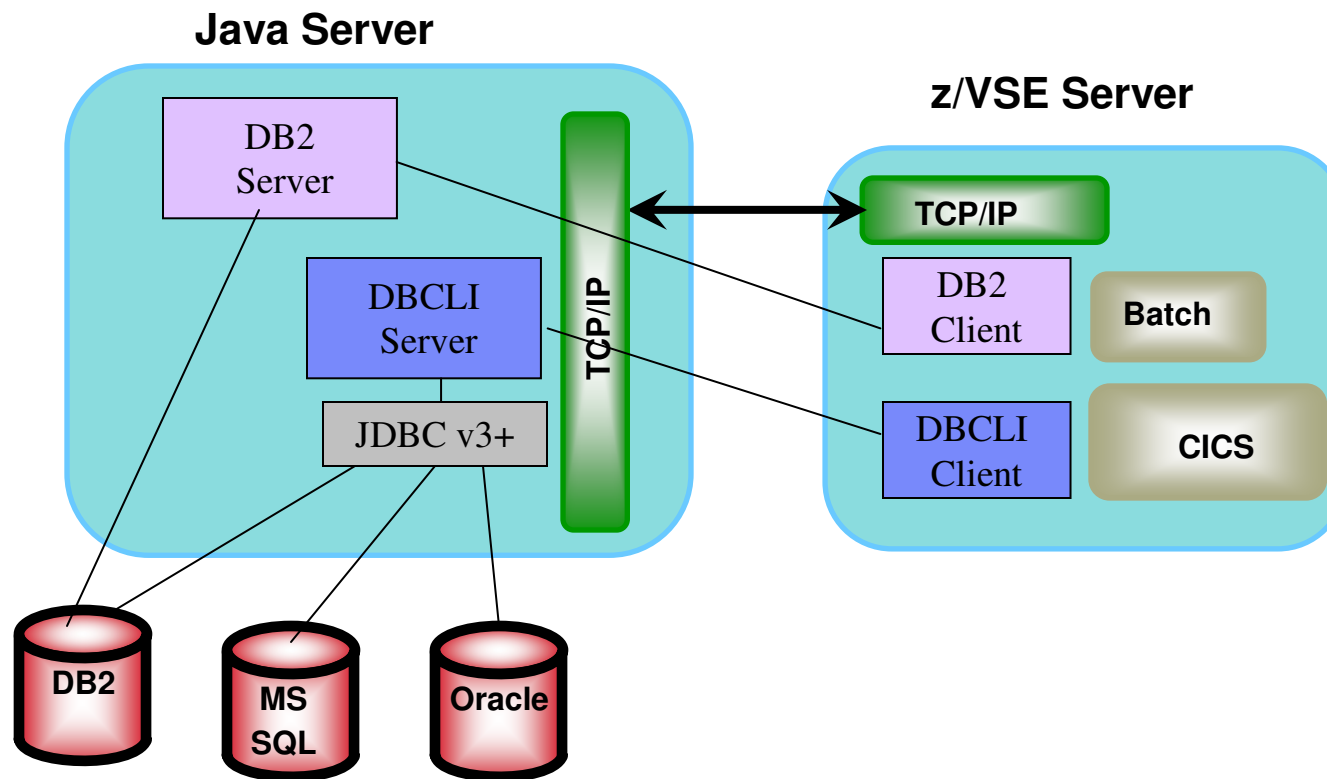
z/VSE database connector for z/VSE applications

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	Java capable platform (e.g. Linux on System z)	Database Server (may run on the same system as the DBCliServer)
Batch or CICS application		
DBCLI API		
DBCLI Client	**DBCliServer**	**Database** • IBM DB2, • IBM Informix • Oracle, • MS SQL, • MySQL
TCP/IP or Linux Fast Path → TCP/IP →	**JDBC V3 Driver** → TCP/IP or local →	

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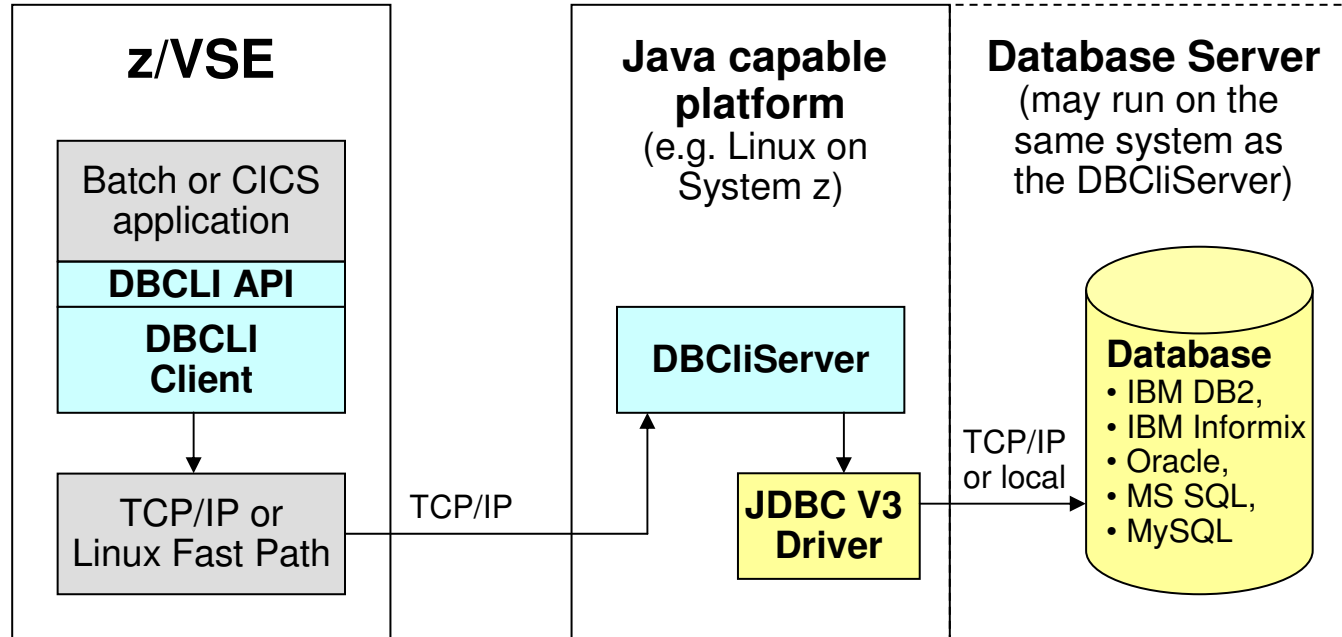
InfoSphere Federation Server on Linux on System z

- 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

SQL

InfoSphere
Federation Server

| Oracle | VSAM IMS Data | DB2 | Software AG Adabas | CA Datacom | MS SQL |

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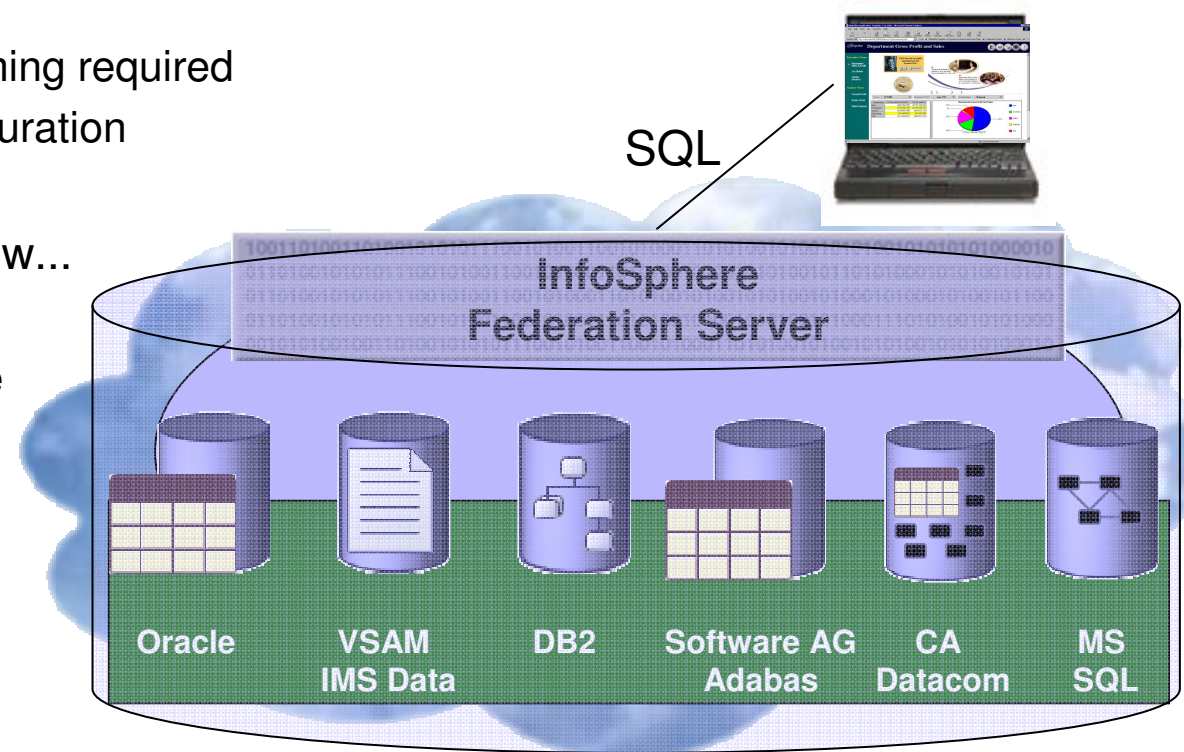
Leverage z/VSE data and resources from Java

Leverage VSE/VSAM data using VSAM Connectors on Linux on System z

Linux on System z

WAS

VSE Connector Client (Java)

JDBC (VSAM)

VSE-supplied VSAM client (no additional charge)

Connection via HiperSockets

z/VSE Production Environment

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

VSAM

z/VSE Test Environment

+ CICS
+ VSAM
+ COBOL

z/VM	LPAR or z/VM	LPAR or z/VM
IFL Engine (s)	**Standard CP Engine (s)**	

IBM System z
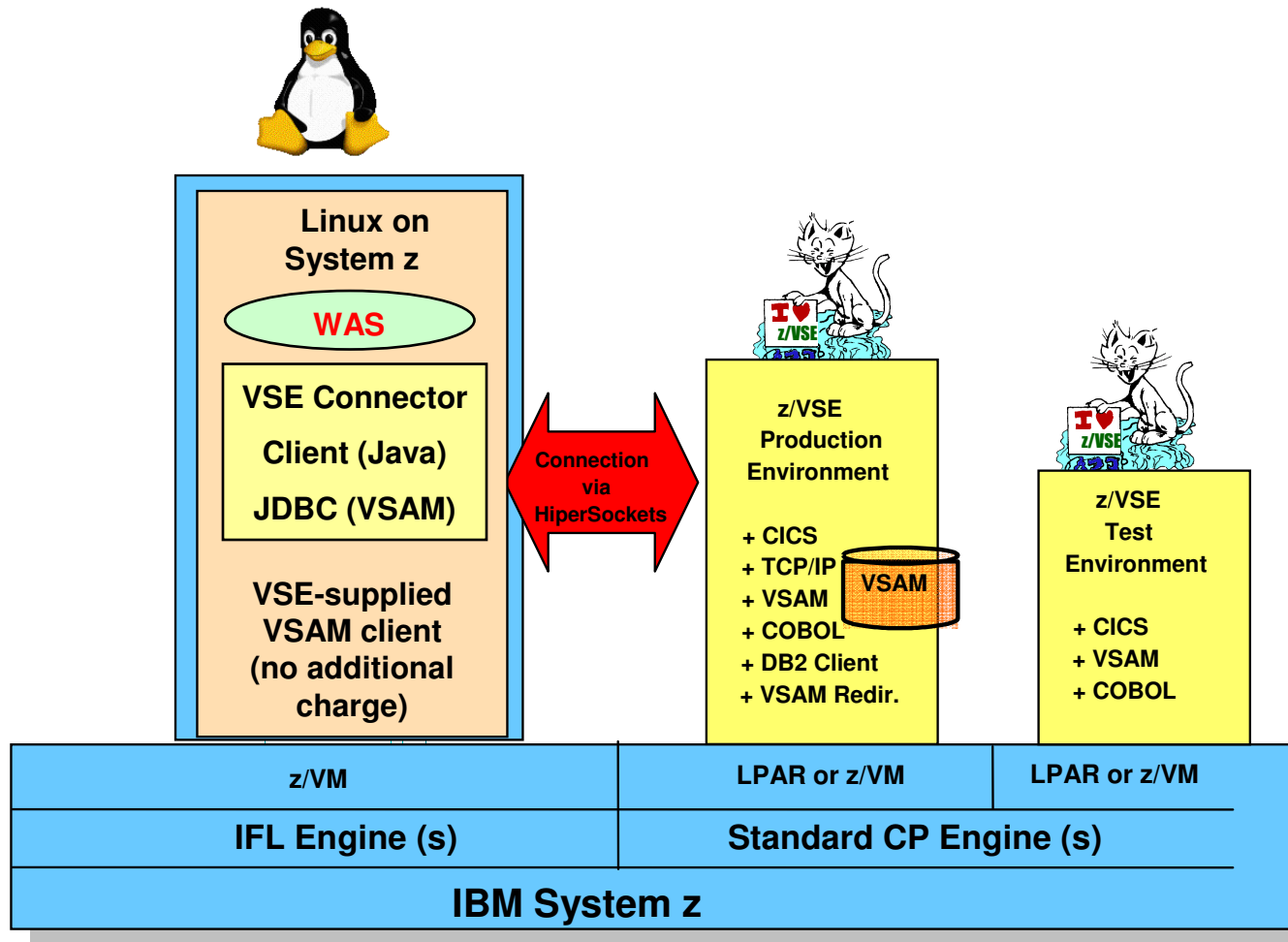
Real time access to VSE resources using the Java–Based Connector (feature included in z/VSE)

z/VSE

Linux on System z
zBX –Intel Linux

web client

Web Application Server

VSEScript

TCP/IP

Java Program

TCP/IP

Connector Server

LIBR

Power

ICCF

Console

DL/I

VSAM

Connector Client

JDBC

mapped files

VSAM
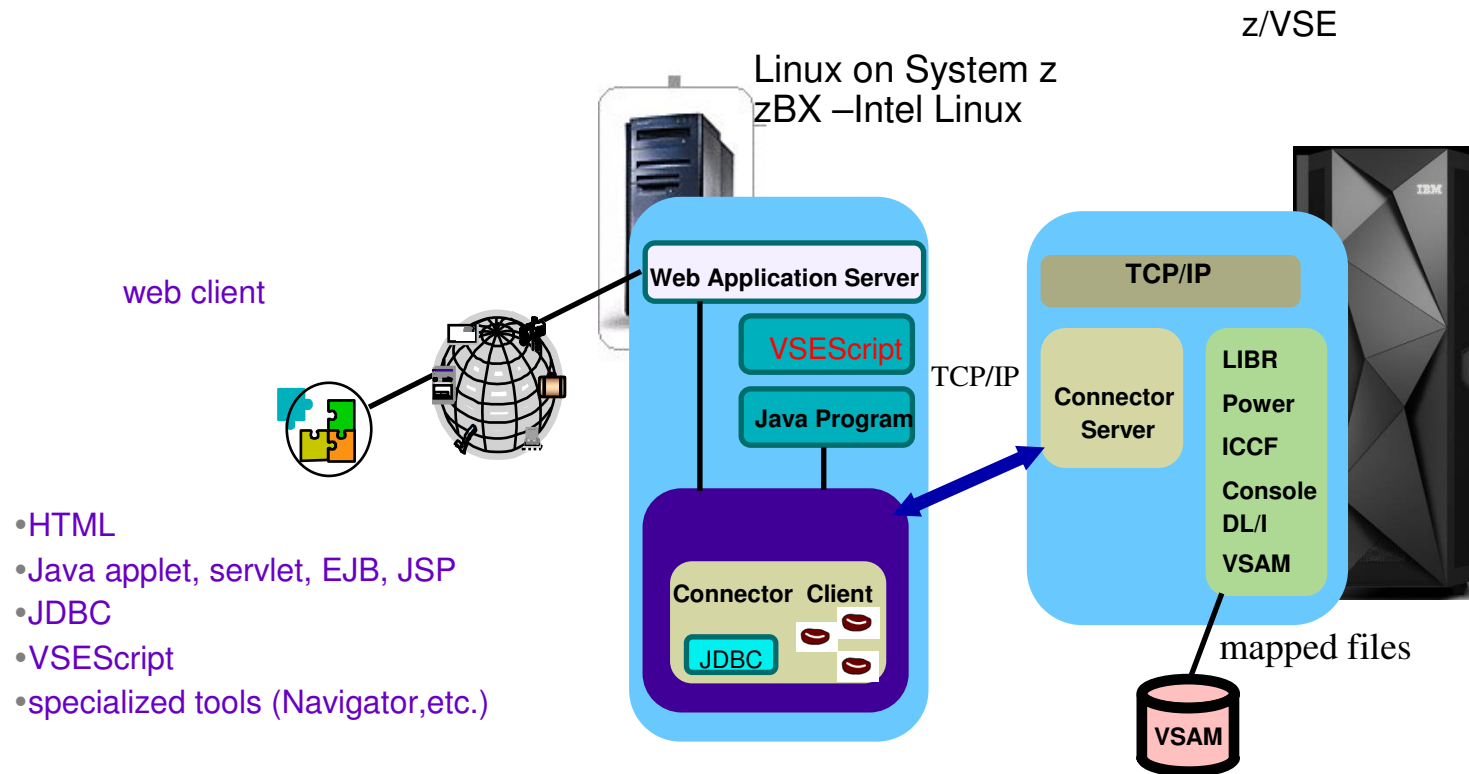
- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized tools (Navigator,etc.)

- real time access to VSE resources from remote systems
- new possibilities for leveraging the VSE investment

Multi-tier Mobile Apps – THE Trend in Industry

Client Tier Devices

Middle Tier Server

Back-end Data & Services

Mobile-specific challenges:
✓Lots of device targets
✓Provisioning rules and artifacts
✓Curated App Stores
✓Dependent upon backend service versions

The Mobile-specific challenges are mainly:
1. Dealing with the **specific issues in the Mobile Client tier**
2. And subsequently **coordinating separate pipelines** for each tier:
   - **Mobile Client**
   - Middleware
   - Back-end data and services

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IBM

IBM Worklight Server - Architecture on Linux on System z

Linux on z

z/OS or z/VSE

Device

PhoneGap

Worklight

- Security and Authentication
- Back-end Data Integration

Application Code

Worklight Server on WAS

Server-side Java App Code -- WAS	Application Center Enterprise App Store
Worklight Console	JSON Translation
Push Notifications	Authentication
Analytics	Adapter Library

SAP

SQL

WMB

SOAP

HTTP/REST

Cast Iron

CICS

CICS Web Service

Worklight Video: http://www.youtube.com/watch?feature=player_embedded&v=zHnFw70XXXo

z/VSE CICS Connectivity Options with Worklight

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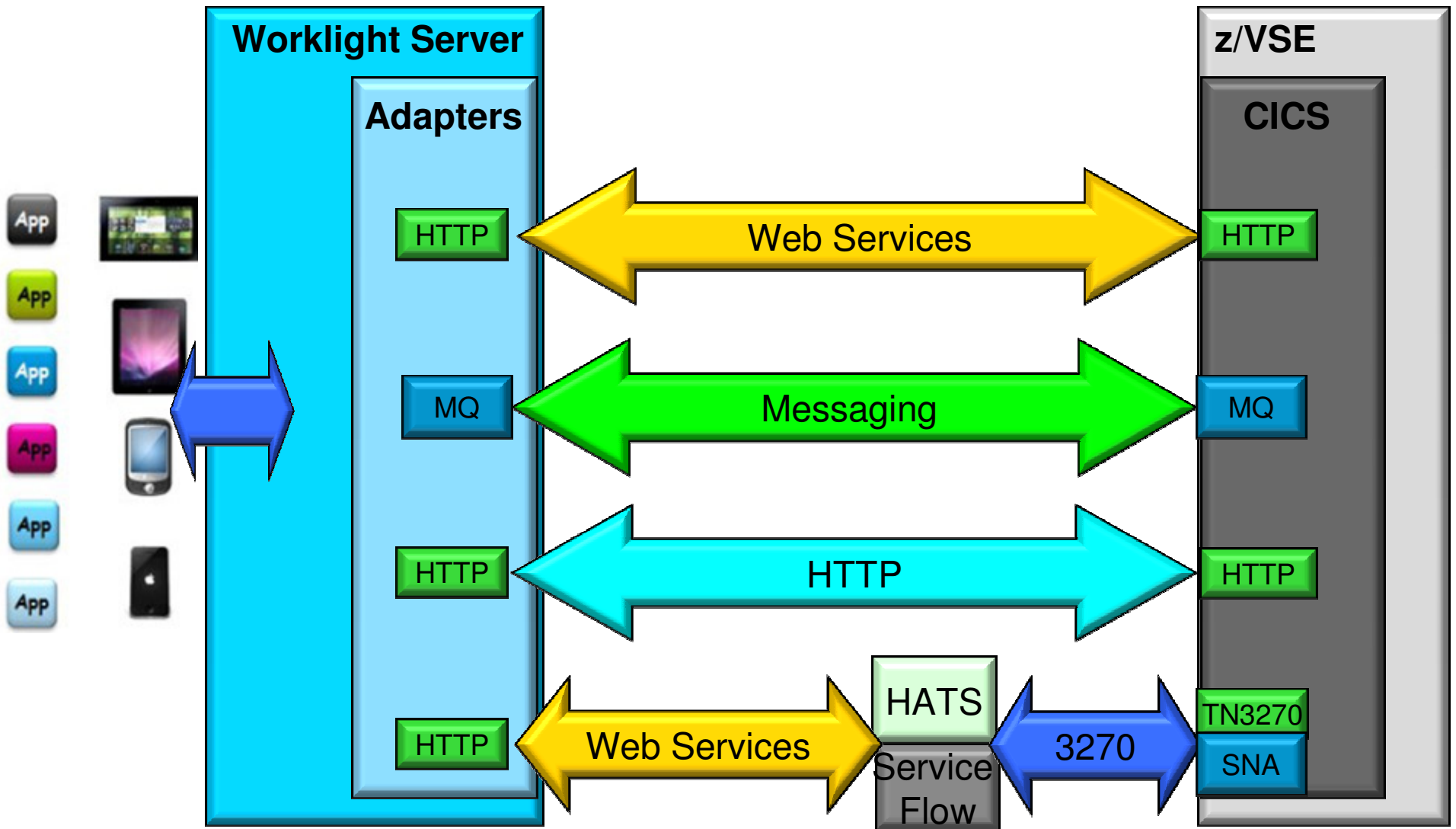
Worklight Modernizes the CICS Web Service Enabled App

Mobile Client

3270 Client

Worklight Server

Linux on z

Web Services

CICS Web Service

CICS

Main

Enhanced Search

Shopping Cart

Browse

Place Order
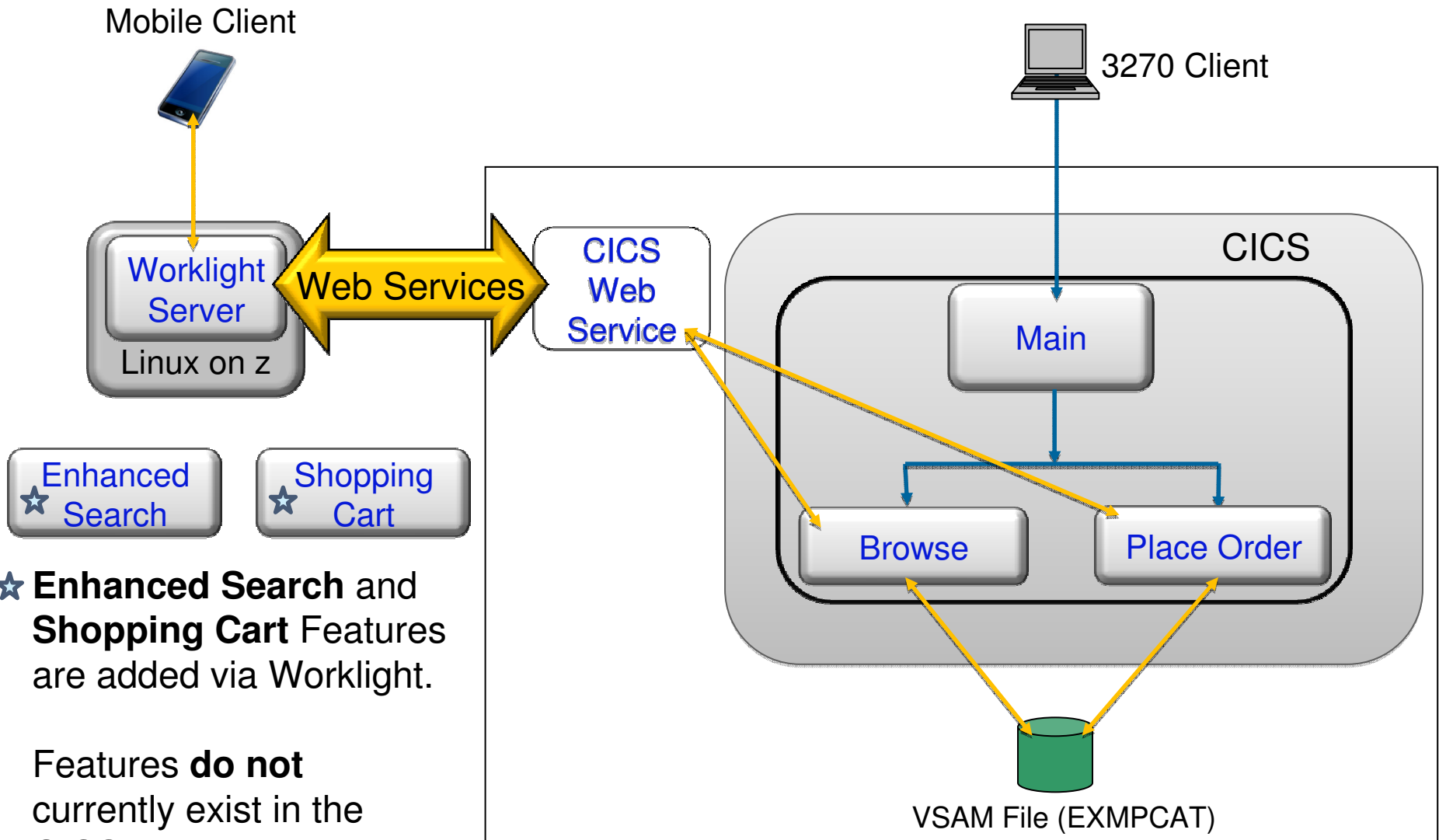
☆ **Enhanced Search** and **Shopping Cart** Features are added via Worklight.

Features **do not** currently exist in the CICS application.

VSAM File (EXMPCAT)

Architecture overview diagram

IBM

MEAP is hosting the server side Apps for all platforms. In addition it delivers operational support, Application Management, Version Control, Access Control

Mobile apps should unlock the Enterprise Application and Data. Therefor it is important to have connectivity to back-end services that handle protocol transformation

Mobile Device

Mobile Applications

Security Layer 1

Caching Service (Optional)

Mobile Enterprise Application Platform (MEAP)

App Code

interface with mobile devices.

App Server and Console

Provides Mobile services:
• Application Mgmt
• Services Mgmt.
• Operational Support
• Mobile use Analytics.

Back-end Adapters

interface with back-end data and transaction services.

Caching Service (Optional)

Security Layer 2

CICS

data

zLinux

z/VSE

HiperSocket

Implement TSM on Linux on System z as central Backup Hub

**Linux
DB2
ORACLE**

**Windows
DB2
MS SQL**

**Linux on
System z**

**Linux on
System z**

**z/VSE
Production
Environment**

**TSM Server
(Tivoli
Storage
Manager)**

**DB2 LUW
Data
Warehouse**

**Connection
via
HiperSockets**

+ **VTAPE**
+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2

Tivoli

DB2 LUW

Storage Pools

DASD

Tapes / VTS

z/VM

z/VM or **LPAR**

z/VM or LPAR

IFL Engine(s)

CP Engine(s)

IBM System z

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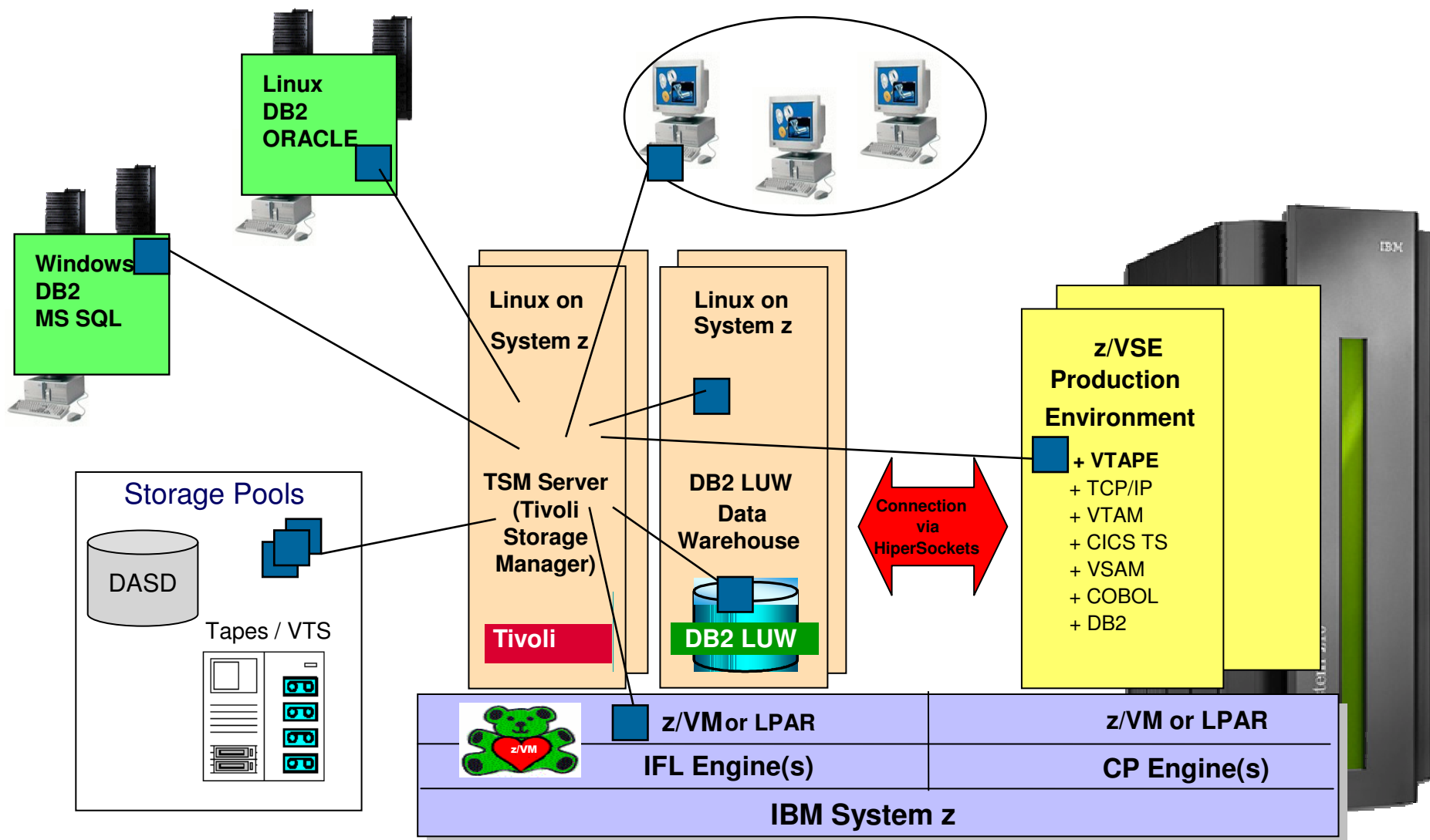
Exploitation of IBM System Storage options with z/VSE V5

- **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

XIV

Storwize V7000

Midrange size system with great highend features

Highend 99.999 system without sophisticated options

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

z/VSE V5 – 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

TS3500
Tape Robot

→ Real Tape

VTS
TS7700
(D/R)

VTS
TS7740
(Prod)

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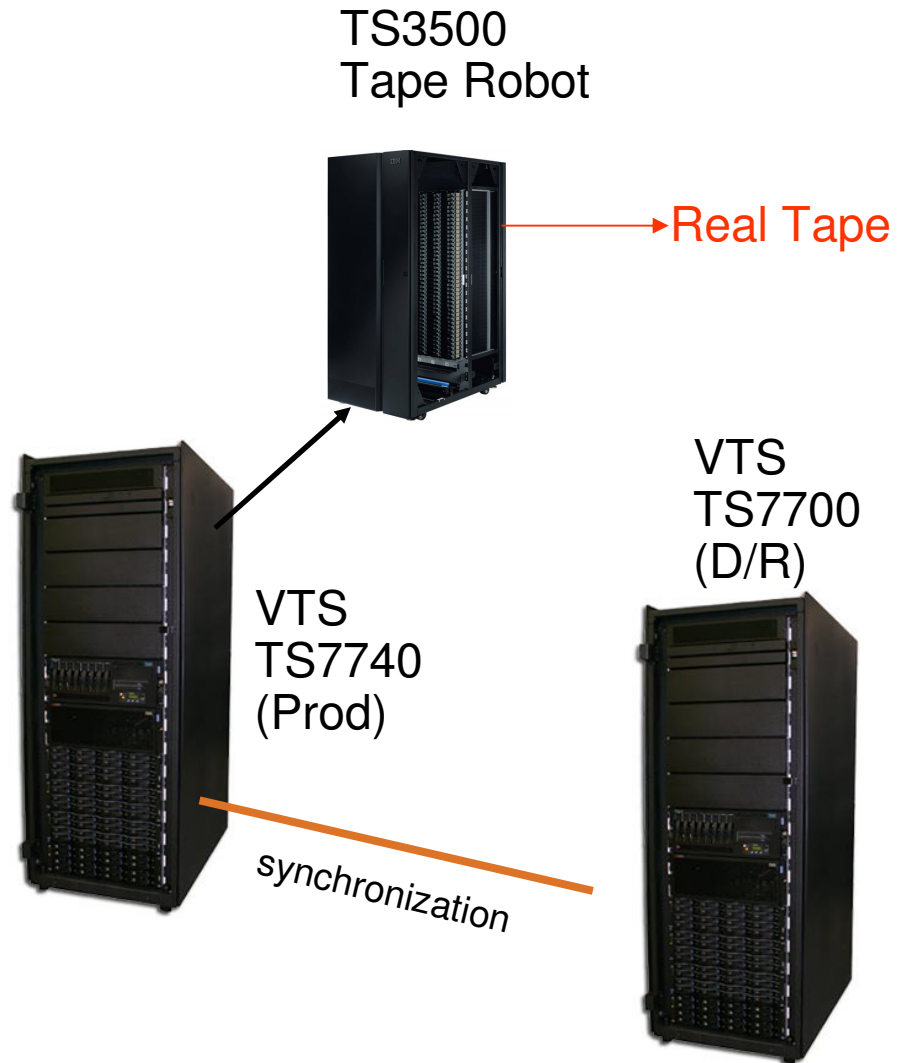
z/VSE Monitoring possibilities
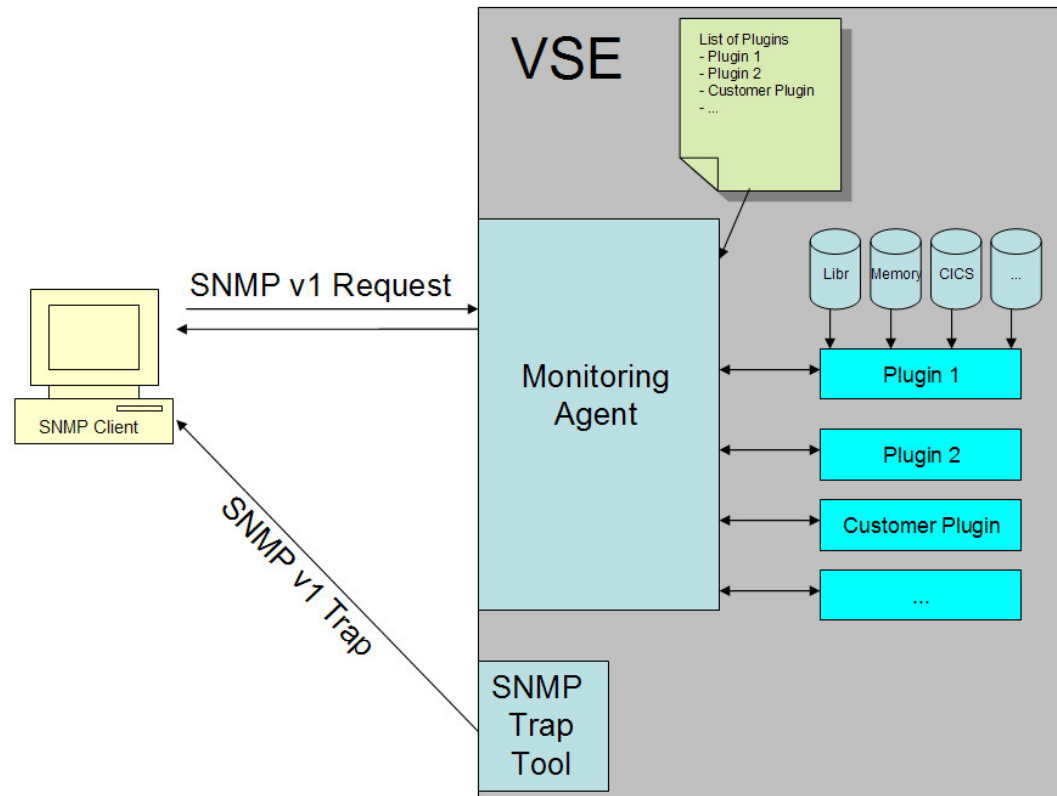
- ■ Monitoring Agent based on SNMP V1
  - – Real time monitoring
    - • retrieve z/VSE specific system and performance data
  - – Event driven monitoring using SNMP Trap tool and API
    - • Helps to automate processes in z/VSE with SNMP traps

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'Common' development Environment…

Java
C++
Visual …

COBOL
PL/I
Assembler

Internet

Rational
Developer
Tools

**Central
Code Repository**

Eclipse helps !

IBM
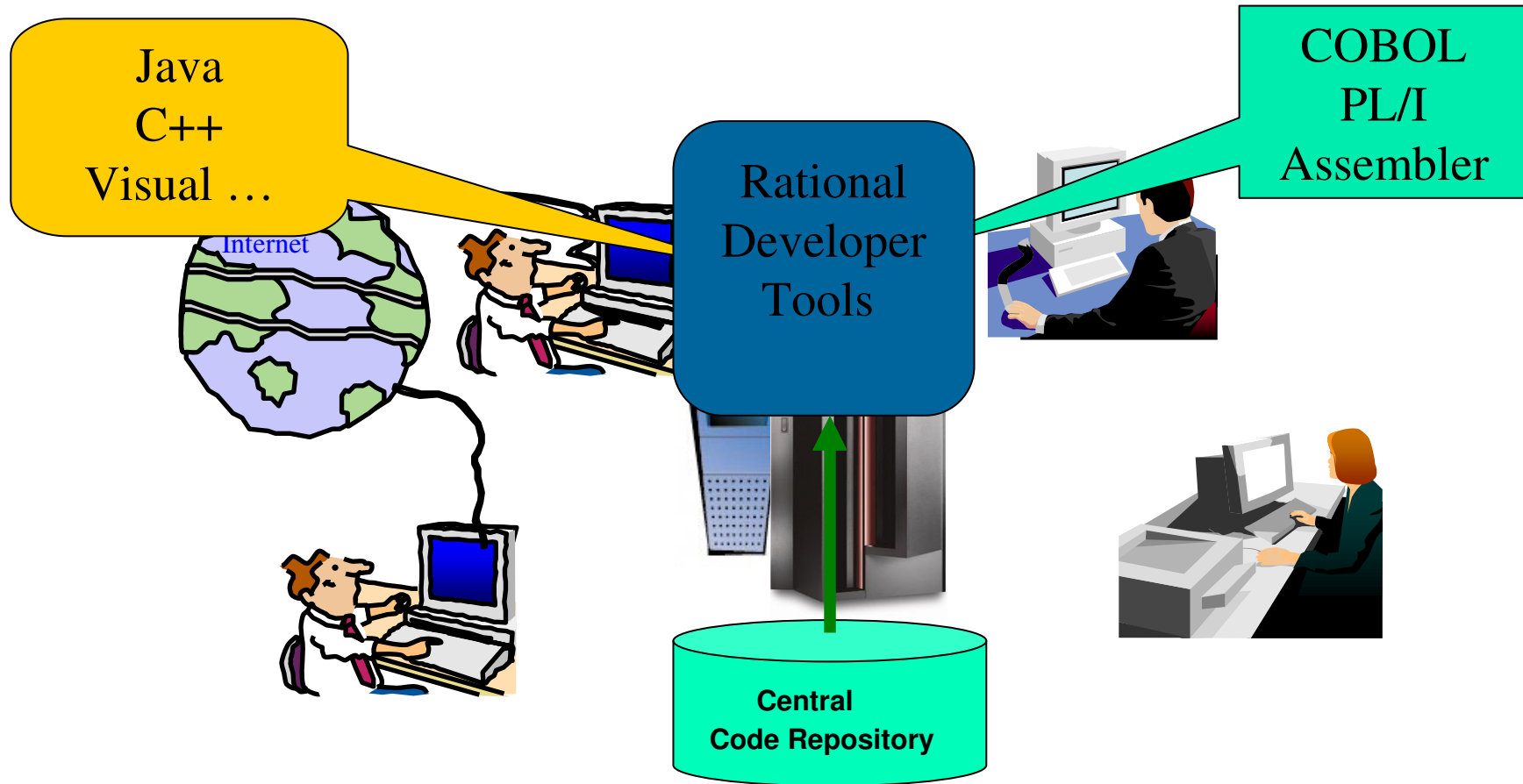
Eclipse based Development Environments for z/VSE

Eclipse – the open Standard for application development

RBD **HATS** **RDz**

| Rapid AD Tools | Web Tooling | IDE | Modeling Tool |

Standalone Tool

Desktop

Platform APIs / Extension Points

Common Services
- Resource Management
- Project Model
- Team Programming Model
- Debugging
- Extensibility framework

Common Frameworks
- Widget Toolkit
- UI Frameworks
- Editing Frameworks
- Builders, Markers, Help

| CCLT Interface | Repository Interface | Other Interfaces |

Repository (CVS, Subversion, IBM ClearCase*)

●━●━● Extension points

| ISV plug-in | functional extensions to Eclipse |

www.eclipse.org

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

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

Development for IBM Worklight on System z

IBM Worklight Studio with Rational Developer for zEnterprise

Business ⟷ Development

Design — Code — Test — Deploy

COBOL | WL Adapters | Java | Native App with HTML, JS, CSS

System z

WebSphere Application Server with IBM Worklight Server
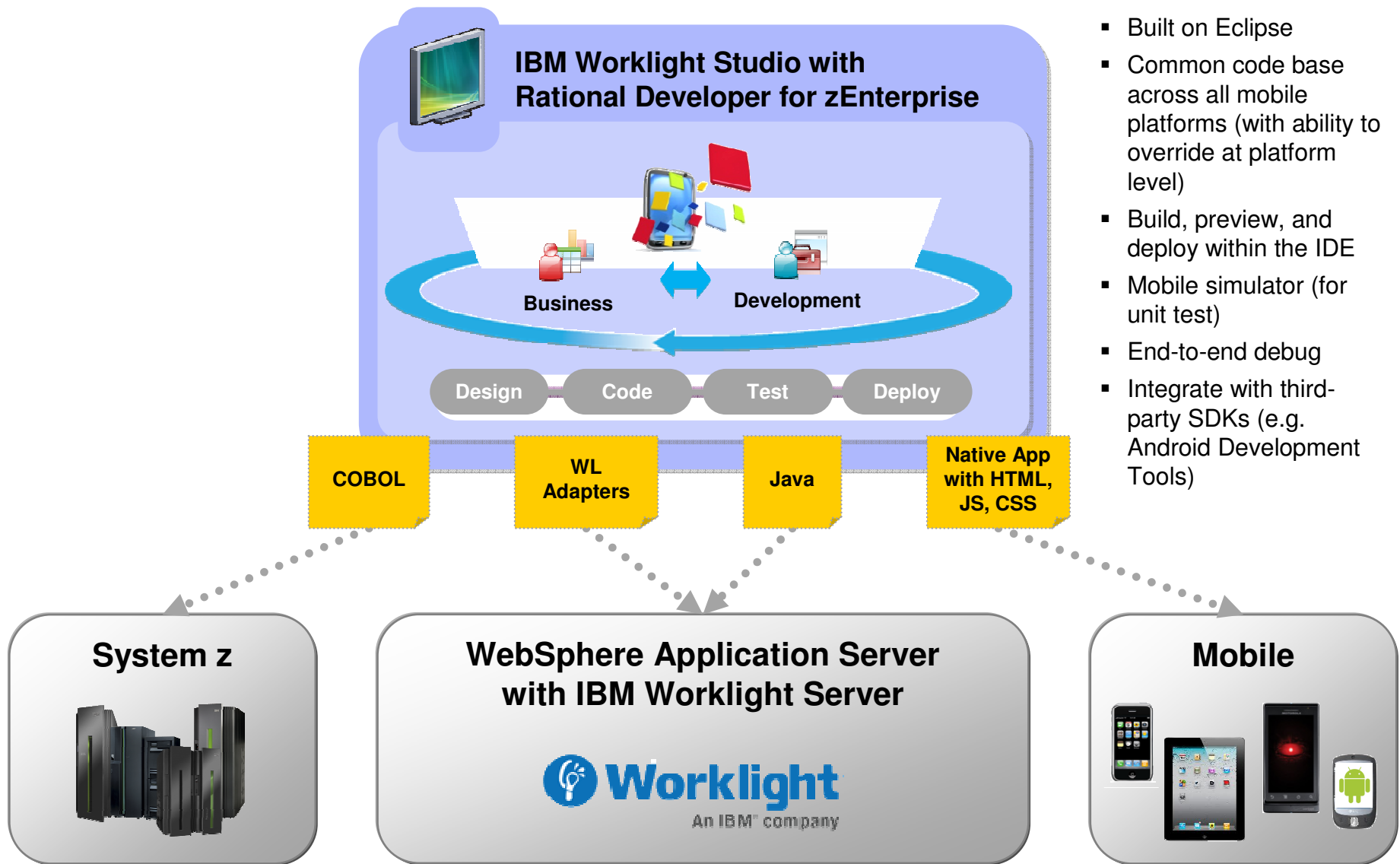
Mobile

- Built on Eclipse
- Common code base across all mobile platforms (with ability to override at platform level)
- Build, preview, and deploy within the IDE
- Mobile simulator (for unit test)
- End-to-end debug
- Integrate with third-party SDKs (e.g. Android Development Tools)

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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

ZSP03505-USEN-00

More than a decade
Linux on System z and z/VSE

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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

Overview - All Tools

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

z/VSE Navigator: Windows-like VSE Interface

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Be current: http://www.twitter.com/IBMzVSE
Subscribe to be get on the distribution list for latest news for z/VSE

Be Social with System z

Join **System z Advocates** (Subgroup **z/VSE**)
www.linkedin.com

Read **at the IBMs System z Blog**
www-304.ibm.com/connections/blogs/systemz/

Connect **at Facebook**
www.facebook.com/IBMsystemz

Watch **on YouTube**
www.youtube.com/user/IBMSystemZ

z/VSE Homepage:
www.ibm.com/zVSE

Twitter
www.twitter.com/IBMzVSE

Ingolf's z/VSE Blog
www.ibm.com/developerworks/mydeveloperworks/blogs/vse/

For more information, please see the z/VSE web site:
http://www.ibm.com/zvse/

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Questions?

Wilhelm Mild

IBM Executive IT Architect

THE *Open* GROUP
Master
Certified IT Architect

IBM Deutschland Research
& Development GmbH
Schönaicher Strasse 220
71032 Böblingen, Germany

Office: +49 (0)7031-16-3796
mildw@de.ibm.com