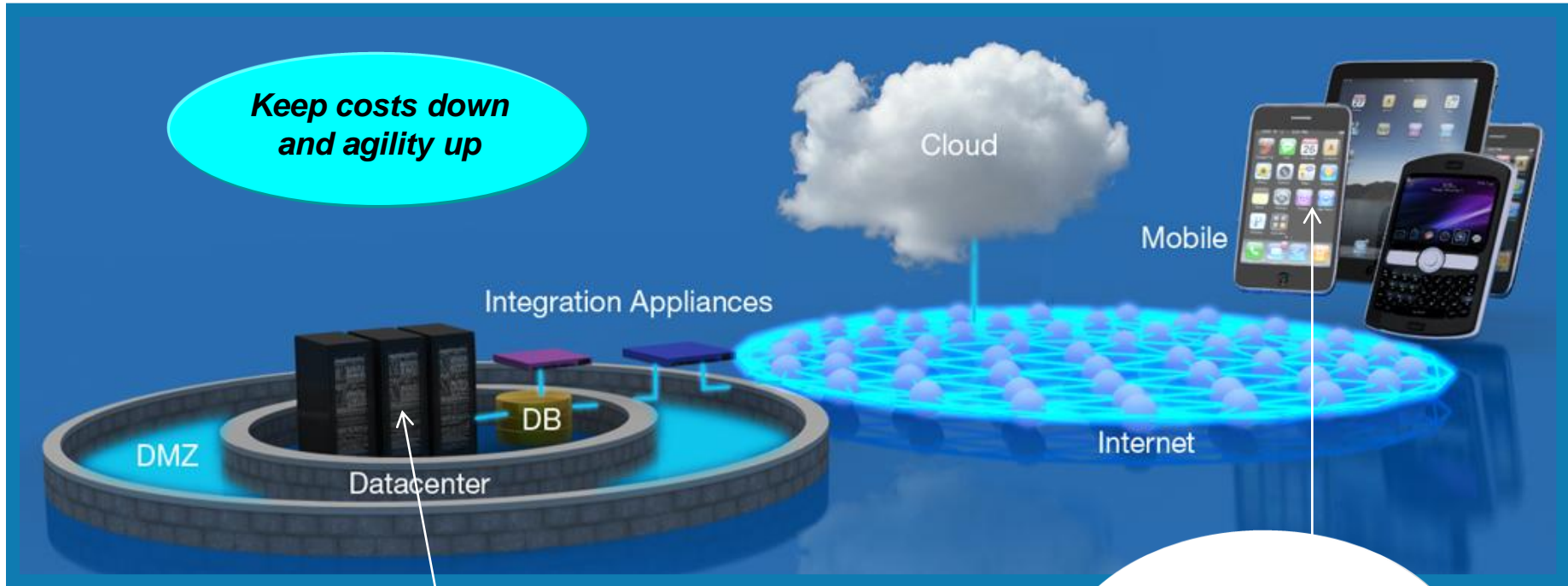# Smarter Computing: New Workloads Optimized for New Business Channels

Yvonne Perkins, Vice President,
Enterprise Platform Software,
IBM Software Group

April 2012

New workloads must be tuned to the task, designed for data, and ready to handle influx of users

Keep costs down and agility up

Cloud

Mobile

Integration Appliances

DB

DMZ

Datacenter

Internet

Mobile devices are creating new transaction channels with unprecedented user access

How to do you seamlessly extend workloads from optimized systems to Web services, cloud, and mobile devices?

Back-end infrastructure keeps pace with new front-end applications, greater user access

Extend the reach of Marriott's reservation community from the company-hosted website and systems to the websites and systems of worldwide channel partners that sell Marriott reservations along with other services.

At the time that the customer is shopping, the reservation transaction is simultaneously run on zEnterprise to access member status, inventory status and dynamic pricing models.

Transaction processing is 40 percent faster; cost per MIP dropped, 40 percent increase in capacity

Tuned to the Task – Are transaction systems prepared to handle the new ways of doing business?

Market Need

Growth of new channels (Cloud, Mobile, Social) is **causing security exposures, unpredictable usage spikes, outages**

Three Questions

1 Do your systems provide the flexibility to keep the integrity of your transactions?

2 How do you support growing application workloads and add extra capacity as you need it?

3 What techniques do you employ now to balance between full integrity and high transactional throughput ?

IBM WebSphere Application Server

IBM CICS Transaction Server

IBM Transaction Processing Capabilities

A spectrum of workload optimized TP capabilities that can be combined and recombined to meet the changing demands of the business

WebSphere Application Server V8, DB2, MQ
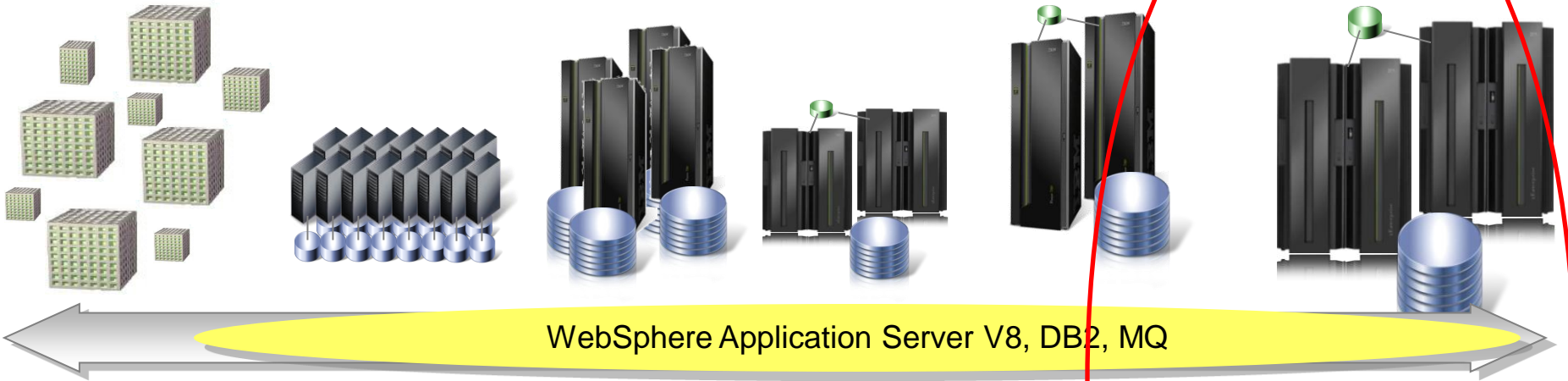
Extreme Scale-Out

- Elastic distributed caching, in-memory databases, and XTP/Data Grid applications

- Performance and QOS focused

- Data distributed out, stored in memory

WebSphere eXtreme Scale-
data distributed out, stored in memory

Broad Applicability in the Center

- *Extensive standards and language support*

- High ISV, application, and skill availability

- Broad platform and database support

WebSphere eXtended Transaction Runtime

TXSeries

WebSphere Transaction Cluster Facility

Extreme Scale-Up

- Optimized for centralized data

- Database options affect scale

- Performance & QOS focused

CICS V4.2

IMS

z/TPF

WebSphere software
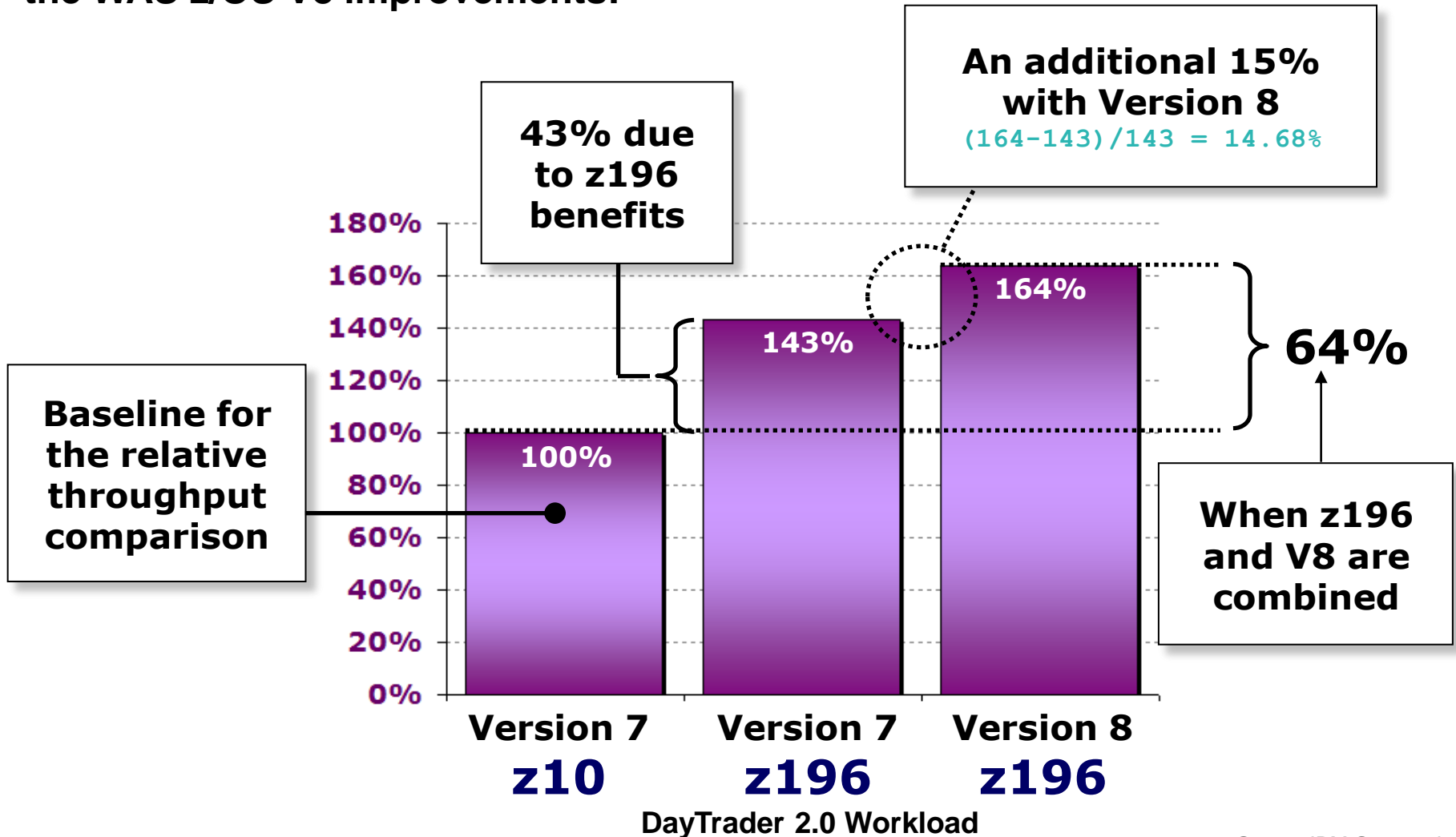
Built-in Transactional Integrity
WebSphere Application Server

- No transaction is ever lost or violated with WebSphere application infrastructure's built-in transactional integrity
  - Automatically detect and recover from problems
  - Tools, such as transaction log viewers and easy steps for specifying transaction recovery settings

- Built-in transaction coordination
  - Tightly-coupled, container-based service via an optimized for efficiency 2-Phase commit and recovery, with support for
    - Last Participant Support
    - Activity Session
  - Web Services Transactions
    - WS-Coordination
    - WS-Atomic Transaction
    - WS-Business Activity
    - Failed Events Recovery and Compensation Framework for loosely-coupled Web services

- Application Resilience and Continuous Operations
  - Automatic redirection and distribution of transaction requests

- High Availability Architecture
  - Peer Recovery Model with Active Hot Standbys for persistent transaction services
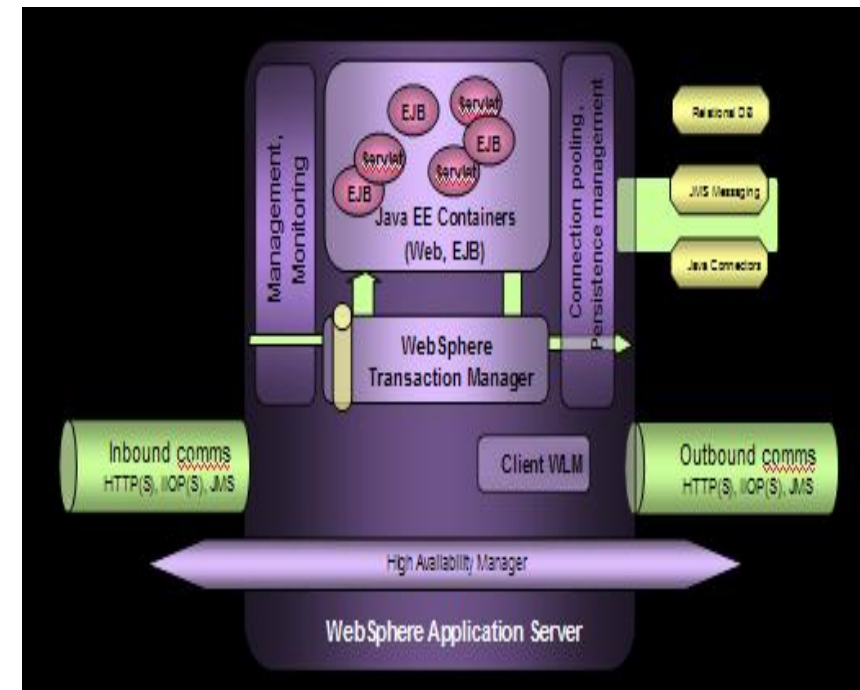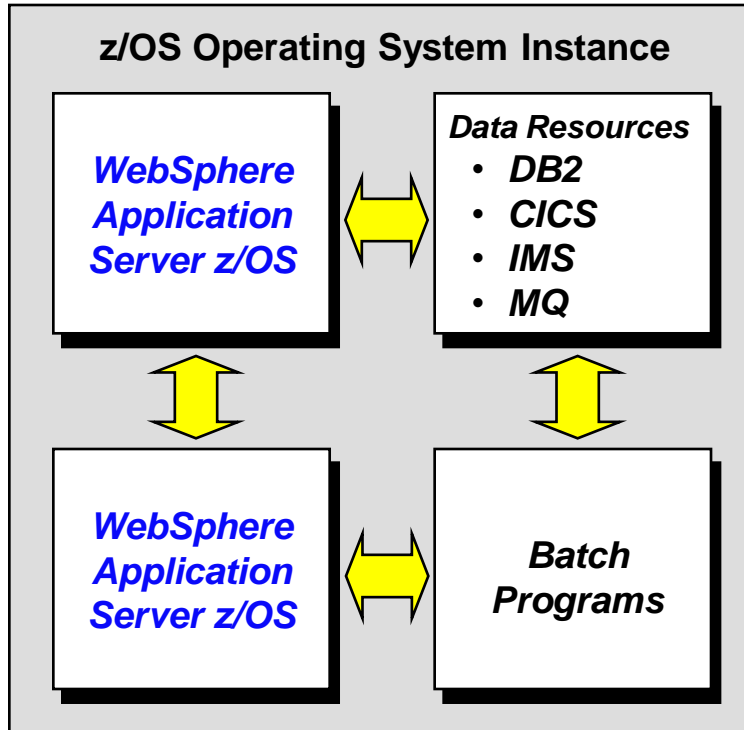
Benefit of z196 and WAS z/OS V8

Here we see the benefits of both the z196 hardware improvements as well as the WAS z/OS V8 improvements:

An additional 15% with Version 8
$(164-143)/143 = 14.68\%$

43% due to z196 benefits

Baseline for the relative throughput comparison

164%

143%

100%

64%

When z196 and V8 are combined

180%
160%
140%
120%
100%
80%
60%
40%
20%
0%

Version 7
z10

Version 7
z196

Version 8
z196

DayTrader 2.0 Workload

Integrate web or Java applications to back end systems with collocation

z/OS Operating System Instance

WebSphere Application Server z/OS

$\longleftrightarrow$

Data Resources
- *DB2*
- *CICS*
- *IMS*
- *MQ*

WebSphere Application Server z/OS

$\longleftrightarrow$

Batch Programs

- *Extremely* fast data transfer

- Tightly controlled by z/OS authorization processes

- Eliminate need to serialize and deserialize data and objects

- Eliminate need for encryption overhead
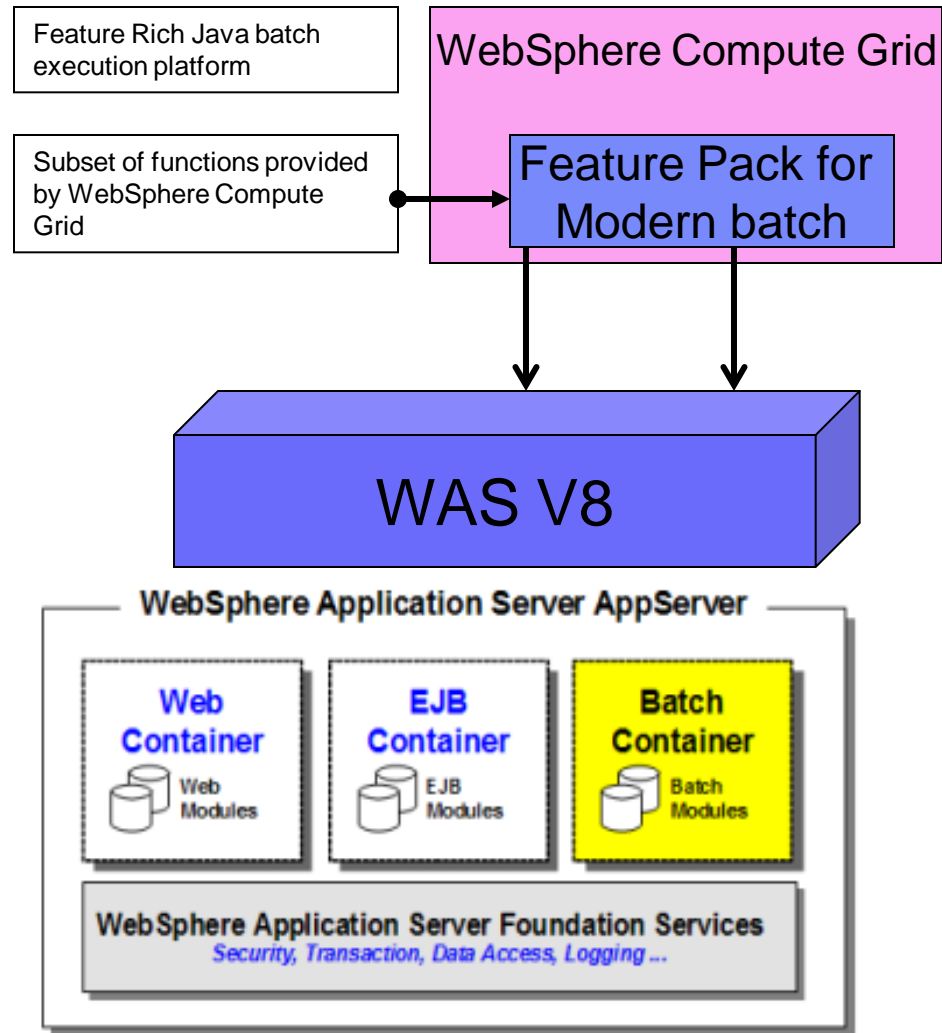
- Propagate several forms of user identity

Efficient -- very low overhead so scalability can be addressed

Secure -- no network, can't be sniffed or hacked

Fast -- for very high volume workloads

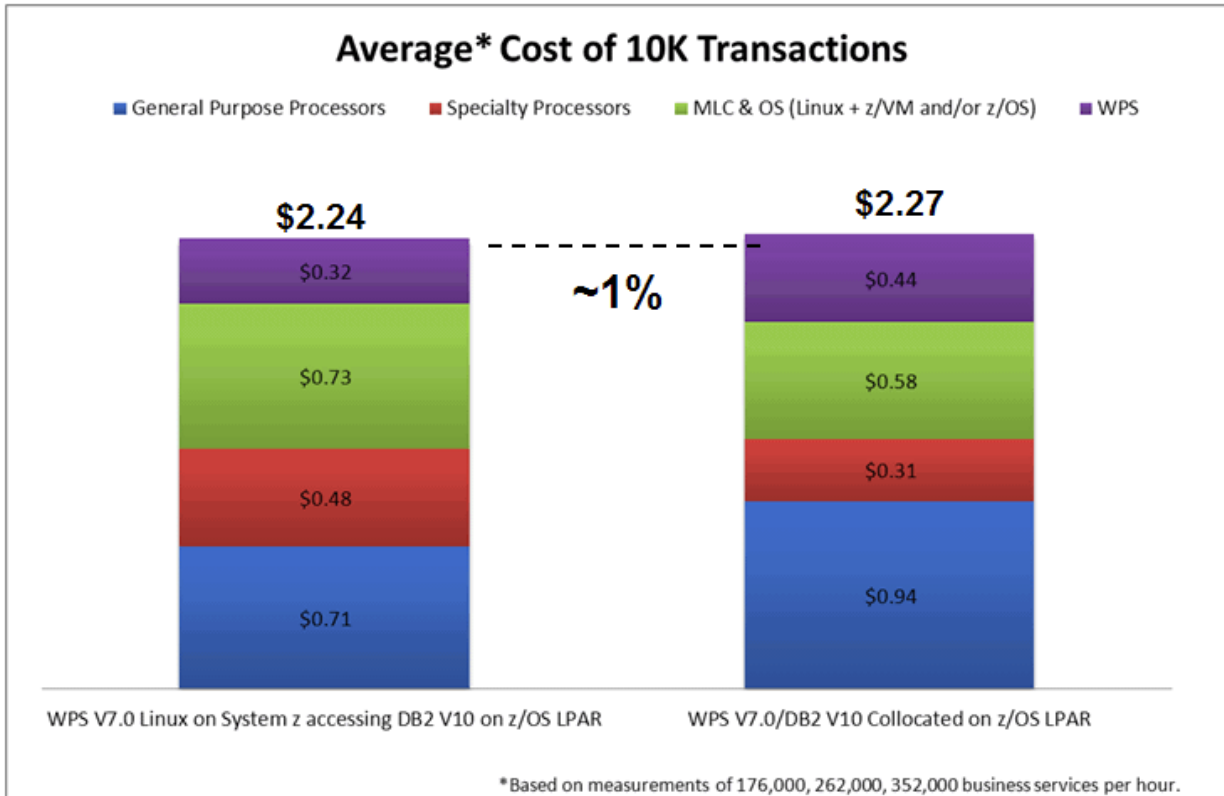# WAS enables concurrent execution of Java batch and OLTP for faster output, cost savings

Feature Rich Java batch execution platform

Subset of functions provided by WebSphere Compute Grid

WebSphere Compute Grid

Feature Pack for Modern batch

WAS V8

WebSphere Application Server AppServer

Web Container
Web Modules

EJB Container
EJB Modules

Batch Container
Batch Modules

WebSphere Application Server Foundation Services
Security, Transaction, Data Access, Logging ...

What is it?
Pre-integrated application framework to help increase developer productivity and time to value for Java batch applications allowing sharing of business logic between batch and OLTP applications

Value proposition
- Reduce cost of infrastructure due to concurrent execution of batch and OLTP workloads using shared business logic on a shared infrastructure integrated with WebSphere Application Server

- Reduced operational cost due to integrated administration of OLTP applications and batch jobs

- High throughput and low resource consumption on z/OS for Java Batch when collocated with data subsystems

Consider a collocated workload configuration rather than placing workloads in separate LPARs

Average* Cost of 10K Transactions

- General Purpose Processors
- Specialty Processors
- MLC & OS (Linux + z/VM and/or z/OS)
- WPS

$2.24

- WPS: $0.32
- MLC & OS: $0.73
- Specialty Processors: $0.48
- General Purpose Processors: $0.71

~1%

$2.27

- WPS: $0.44
- MLC & OS: $0.58
- Specialty Processors: $0.31
- General Purpose Processors: $0.94

WPS V7.0 Linux on System z accessing DB2 V10 on z/OS LPAR

WPS V7.0/DB2 V10 Collocated on z/OS LPAR

*Based on measurements of 176,000, 262,000, 352,000 business services per hour.

With a cost difference of approximately 1%, the 30% performance improvement weighs more heavily in the decision of where to place different workloads in customer organizations.

CICS Transaction Server V4.2 enhances events, Java development, connectivity, management, and scalability

- Events: including system health events to warn of potential problems

- Java: including 64-bit, multithreaded JVM, optimized for zEnterprise

- Connectivity: including option to offload Web services parsing to zAAPs

- Management: including cross system transaction tracking capabilities

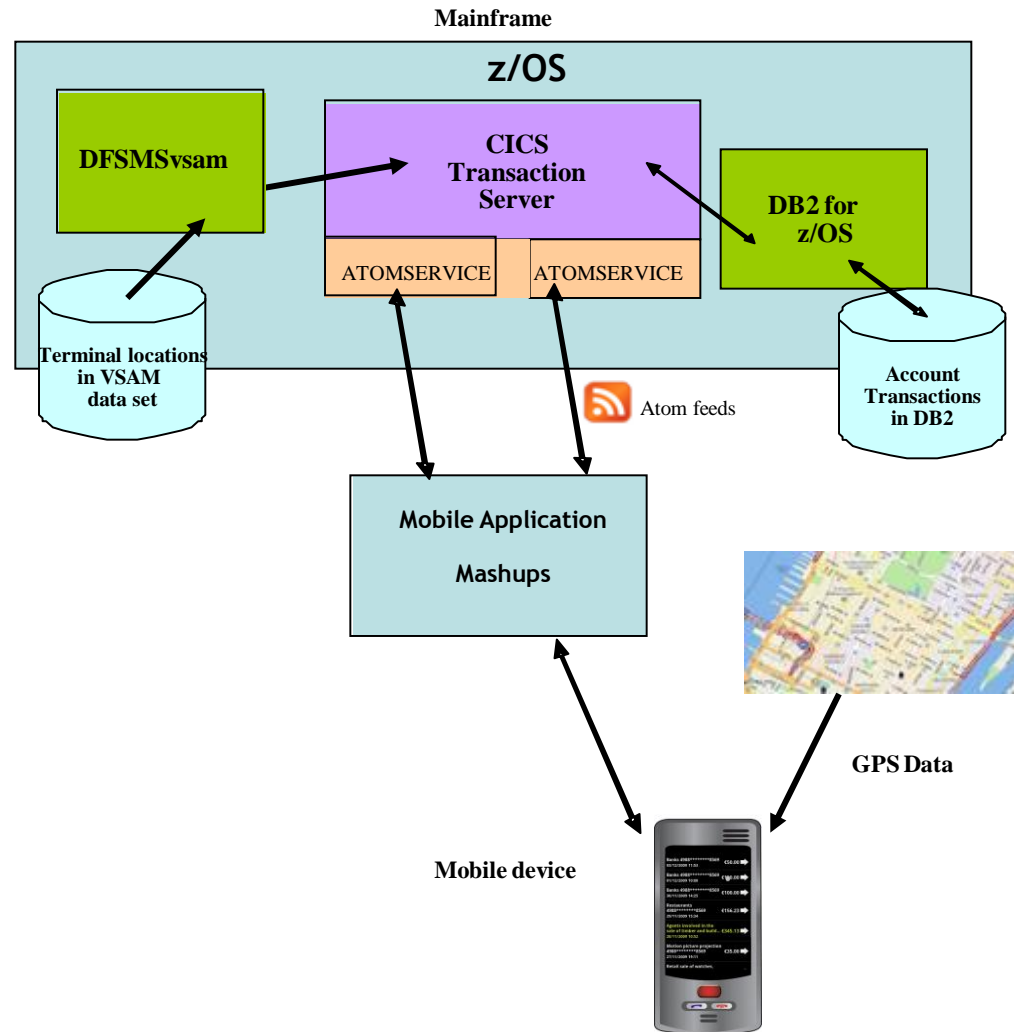- Scalability: including threadsafe and 64-bit exploitation

Consumable account information using Atom feeds from CICS

Business Need: Mobile application which provides added value to customer

- View account data

- Flag unusually large transactions

- Find location of nearest ATM

- Mashup of where transactions took place together with location of mobile device at the time

Solution:

- Atom feed of POS terminal and ATM locations

- Atom feed of account transactions

- Application on mobile device displays feed, flags up large transactions, and mashes up terminal locations with transactions and phone location

Mainframe

z/OS

DFSMSvsam

CICS Transaction Server

ATOMSERVICE   ATOMSERVICE

DB2 for z/OS

Terminal locations in VSAM data set

Atom feeds

Account Transactions in DB2

Mobile Application

Mashups

GPS Data

Mobile device

CICS delivers enhanced price/performance on z196

- **Workload**
  - Representative of a customer CICS WebServices Workload
    - Based on SOA Benchmark
    - XML SOAP messages directly into CICS via TCPIP
  - 5 CICS regions
    - 500 TCPIP clients per region
- **The Application**
  - Fairly complex XML
    - 3K and 69 elements inbound
    - 10K and 321 elements outbound
  - Back end application
    - COBOL Threadsafe OPENAPI
    - 1 additional link to another COBOL program
    - Average of 20 VSAM Reads
    - Data in memory
- **Hardware**
  - Systems under comparison
    - z10 2097-763 and z196 2817- 772
      - LPARs with 5 dedicated CPs
  - Separate LPAR for Network simulation
  - 4 data points highlighted on each machine
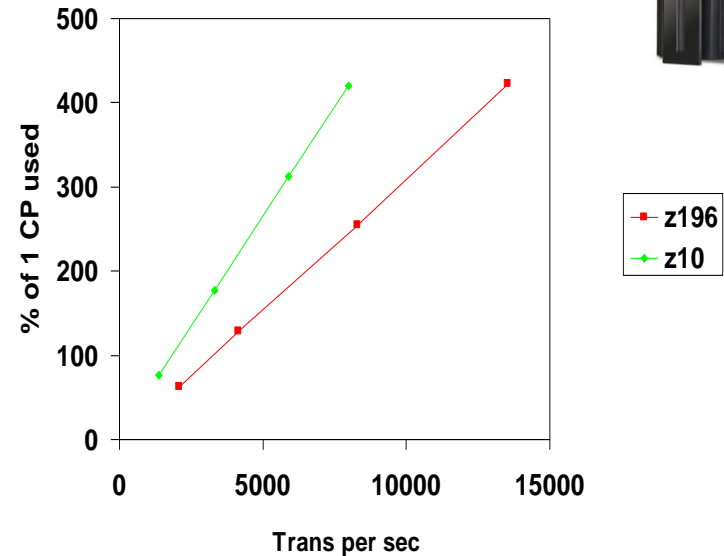
- Comparing 2097-705 with 2817- 705
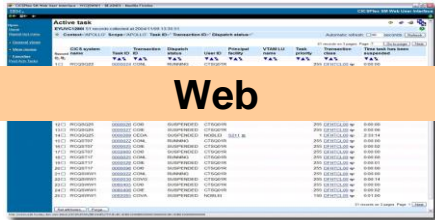- ITRs 9365 vs 16274 gives 73% improvement

The changing face of CICS tooling

CICS Explorer reduces need for multiple interfaces

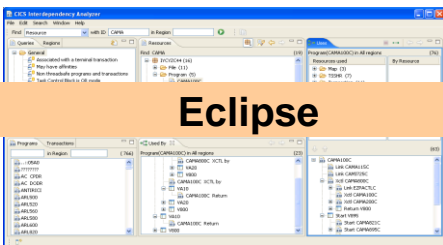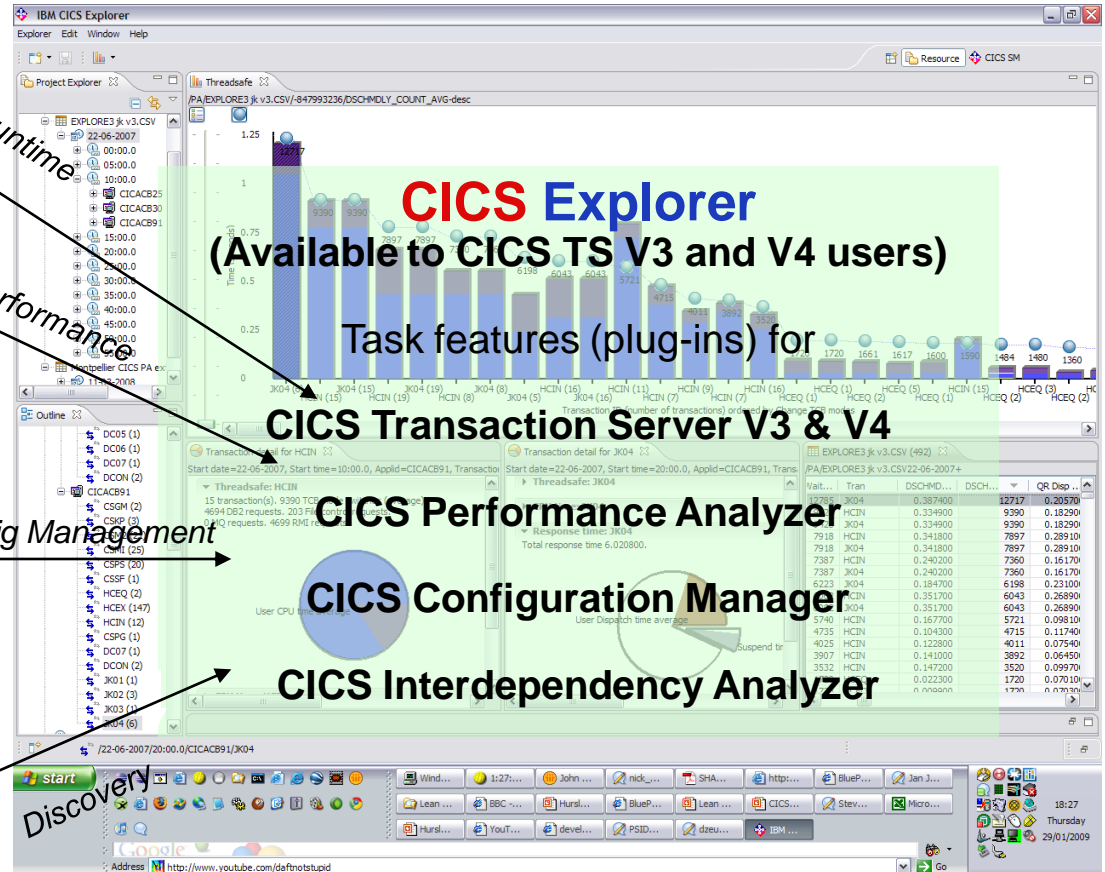*Previously…*   *Now …*

Web

ISPF

CICS 3270

Eclipse

Runtime

Performance

Config Management

Discovery

CICS Explorer
(Available to CICS TS V3 and V4 users)

Task features (plug-ins) for

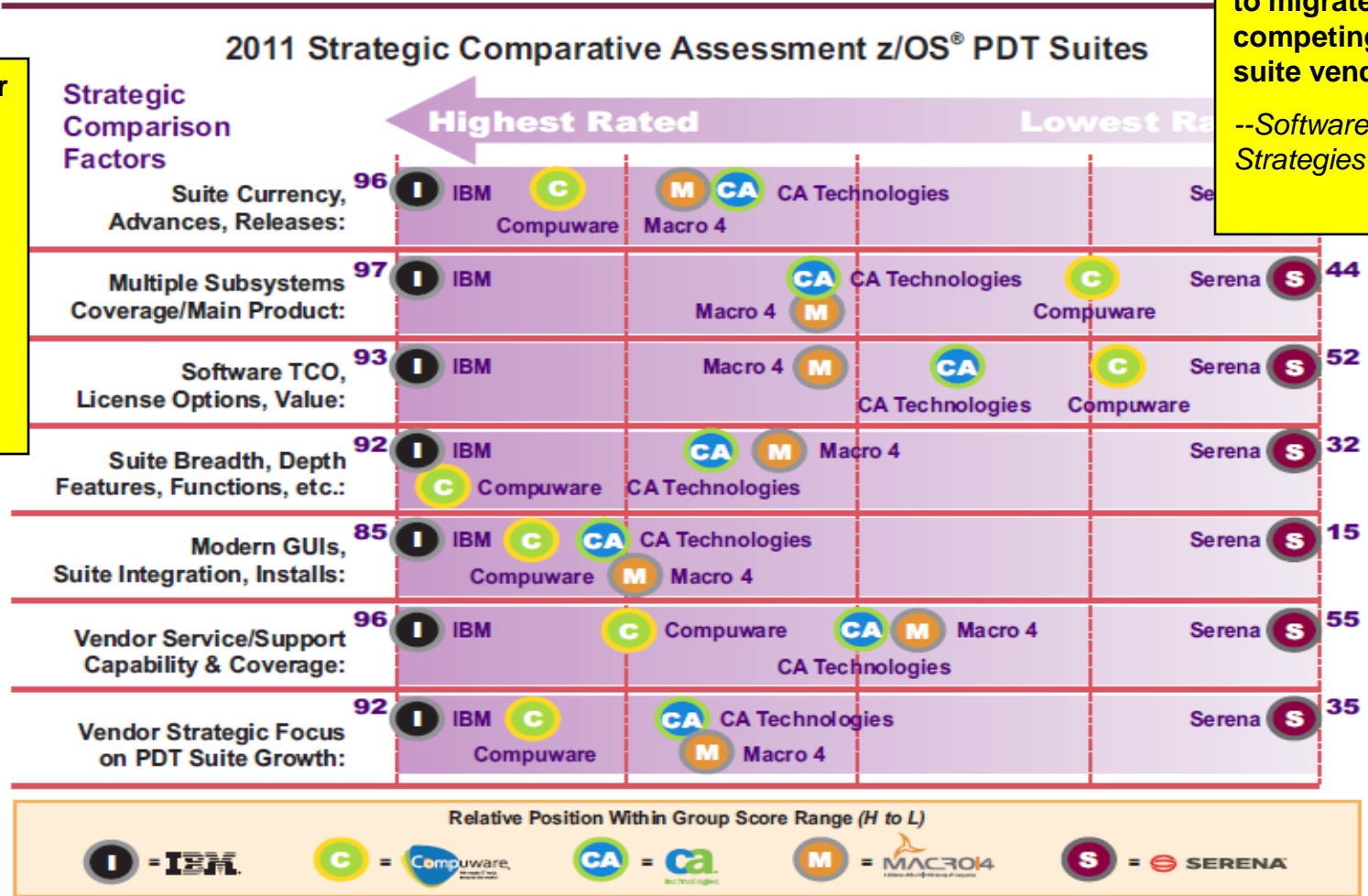**CICS Transaction Server V3 & V4**

CICS Performance Analyzer

CICS Configuration Manager

CICS Interdependency Analyzer

z/OS Tools Suites Vendor Comparison

2011 Strategic Comparative Assessment z/OS® PDT Suites

IBM PDT for z/OS suite maintains the highest currency with all System z touch points

Strategic Comparison Factors	Highest Rated → Lowest Rated				
Suite Currency, Advances, Releases:	96 IBM — Compuware	M Macro 4 / CA CA Technologies			Se...
Multiple Subsystems Coverage/Main Product:	97 IBM	CA CA Technologies / M Macro 4	C Compuware	Serena S	44
Software TCO, License Options, Value:	93 IBM	Macro 4 M	CA / CA Technologies	C Compuware	Serena S	52
Suite Breadth, Depth Features, Functions, etc.:	92 IBM — C Compuware	CA Macro 4 / CA Technologies			Serena S	32
Modern GUIs, Suite Integration, Installs:	85 IBM C CA CA Technologies / Compuware M Macro 4				Serena S	15
Vendor Service/Support Capability & Coverage:	96 IBM	C Compuware	CA M Macro 4 / CA Technologies		Serena S	55
Vendor Strategic Focus on PDT Suite Growth:	92 IBM C Compuware	CA CA Technologies / M Macro 4			Serena S	35

Relative Position Within Group Score Range (H to L)

I = IBM	C = Compuware	CA = ca technologies	M = MACRO 4	S = SERENA

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CICS Developer Trial

New

- No charge trial, fixed expiration
- Does not start SVC period
- For non-production environments
- Available through IBM ShopzSeries
- PID 5655-CIC

Based on CICS TS V4.2 (with restrictions)

- Performance
- Capacity
- License

https://www.ibm.com/developerworks/connect/cicsdev

More scalable, better connected infrastructure with WebSphere software and zEnterprise

ZZZS, based in Slovenia, is a pioneer in public e-health solutions. One such system is an online application which gives healthcare providers instant access to patients' health insurance status, and allows health insurance claims to be processed electronically.

As a cost-saving measure, installed zEnterprise BladeCenter® Extension solution for Linux with DataPower

Data Power is used as a security and data integration engine as well as the engine for parsing XML from multiple data sources.

Extend seamlessly - With a secure, fit-for-purpose integration portfolio based on SOA principles

Market Need

Data quality and reliability is required for governance/policy enforcement across **all integration domains**, inside and outside the firewall

Three Questions

1 Is connectivity an inhibitor to your widely deployed SOA?

2 How do you simplify the interconnection of interfaces and provide the flexibility to route requests to the optimal provider?

3 How do you handle complex transactions across multiple resource types and roll back when problems occur?

IBM WebSphere MQ

IBM WebSphere DataPower SOA Appliances

IBM WebSphere Message Broker

IBM WebSphere Enterprise Service Bus

WebSphere DataPower XI50 for zEnterprise

XI50 features optimized in a dense, high compute IBM zEnterprise BladeCenter Extension (zBX) **form-factor**

- – Supports all ESB, Security, and Integration capabilities of **DataPower XI50** v3.8.1

- **Purpose-built** Integration Appliance

- Tightly **integrated** with zEnterprise

  - – Unified hardware and firmware management through the Hardware Management Console (HMC)

  - – Inherits serviceability, monitoring and reporting capabilities of zEnterprise

- **Highest capacity** DataPower appliance for SOA workloads optimized for zEnterprise environments

Specific Enhancements for System z

IBM WebSphere MQ v7.1 on z/OS

APP MQPUT

APP MQGET

QM1

QM2

Shared Queue

Message 100K (ptr)

QM1 SMDS

QM2 SMDS

1 2 3 4

- • Automatic recovery capability for connectivity loss to MQ Shared Queue Structures in a Coupling Facility improves the already highly-available MQ Sysplex shared queues

- ▪ New Shared Message Datasets (SMDS) feature for large shared queue messages allow "large" to be customisable providing much greater customer control over usage of Coupling Facility storage

Availability Enhancements

Performance Enhancements

- ▪ Scaling improvements for multi-way configurations –

- ▪ Over **ONE MILLION messages/sec** (2KB non-shared) through a **single** Queue Manager on a 30-way z196

- ▪ Over 150,000 messages/sec (2KB shared) using a 3 Queue Manager QSG on a 30-way z196

- ▪ New Shared Message DataSets (SMDS) for storing large shared messages provide significant performance and capacity improvements over DB2

Reduce cost, increase agility, extract new intelligence by automating business processes

Europe-based world bank	One of the world's largest global banking groups is using IBM WebSphere Business Rules for z/OS to drive central processes to create, promote, and manage cross-selling opportunities

A rule change could be designed, developed, and implemented for further testing within two days

The IBM solution represented a 40% savings over traditional COBOL coding methods.

Designed for data: Delivering exceptional customer value

Market Need

Lack of visibility into business operations inhibits change and competitiveness. **LOB is out of synch with IT processes.**

Three Questions

1 What would a single view of cross-system processes mean to your LOB?

2 If you could automate processes end-to-end, would that result in any costing savings?

3 Do you have a need to create an extensible business-focused environment without changes to the transactional code?

IBM Business Process Manager

IBM WebSphere Operational Decision Management

Typical Process Problems
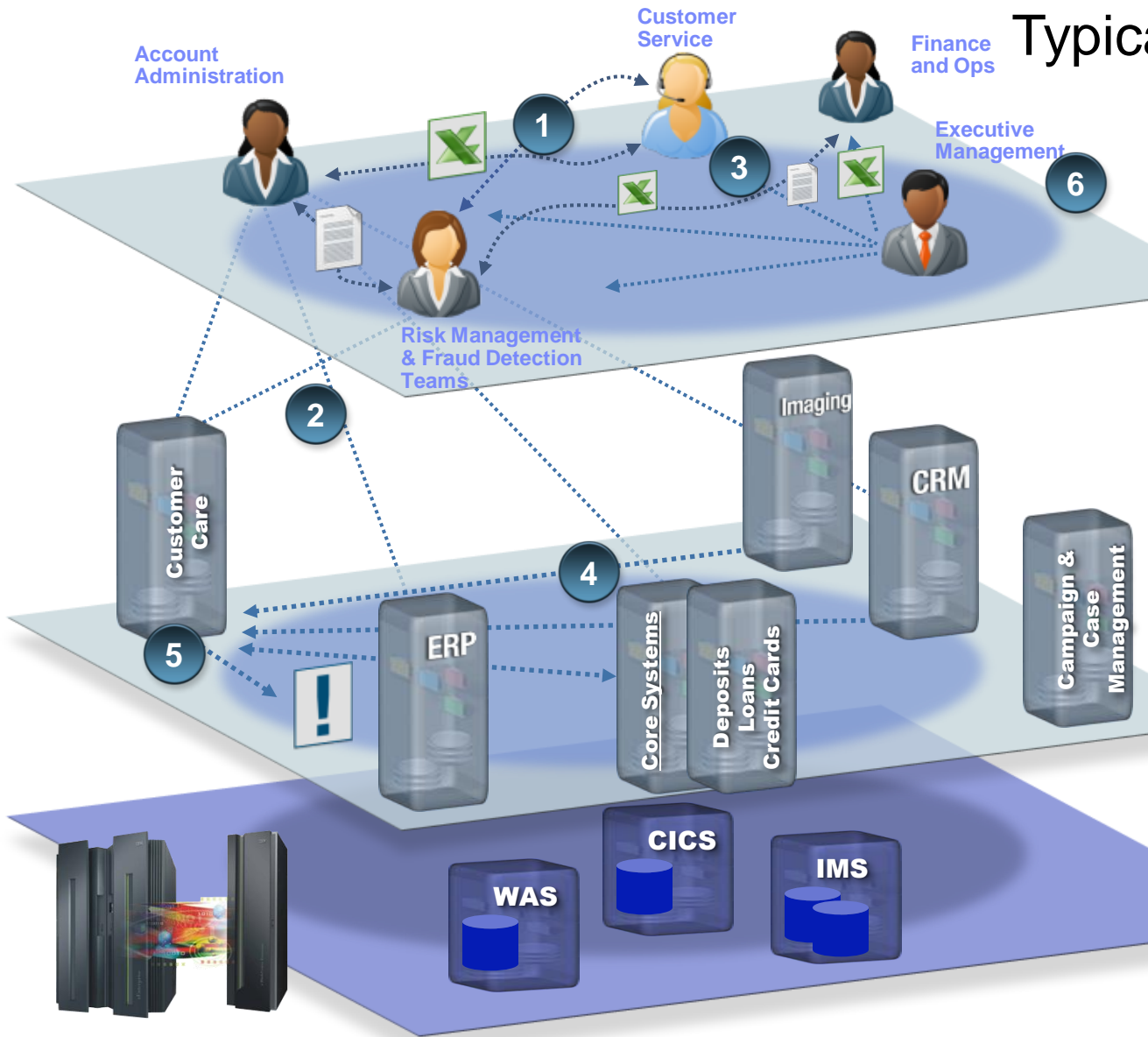
1) *"Customer initiates Account Opening"* **Unstructured tasks and communication slow the process**

2) *"Account Opening Service retrieves customer/product data from repositories"* **Inefficient working environment spans systems, adversely affecting reuse potential**

3) *"Assess financial risk associated with the customer for this account"* **Inconsistent prioritization, with rapid change being difficult to manage**

4) *"Customer Care process is triggered so that the bank staff can make the right decisions"* **Incomplete or inaccurate data flow between systems affects decisions**

5) *"Account is created in the Product Processor"* **Lack of control over system & events (exception handling) slows processes**

6) *"Account information returned to the customer"* **Poor visibility into process performance makes process optimization difficult**
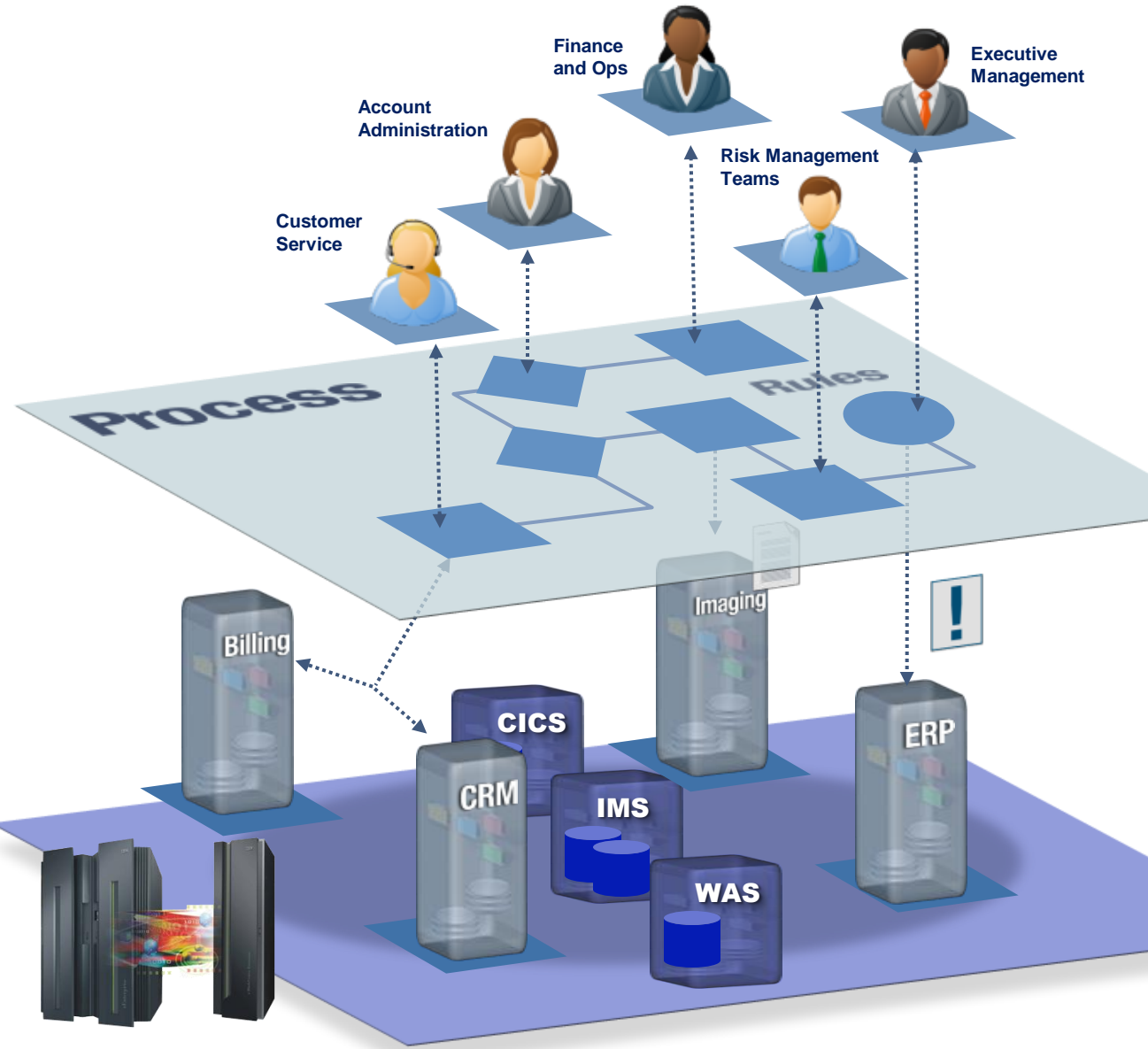
BPM on System Z Brings Order to the Chaos

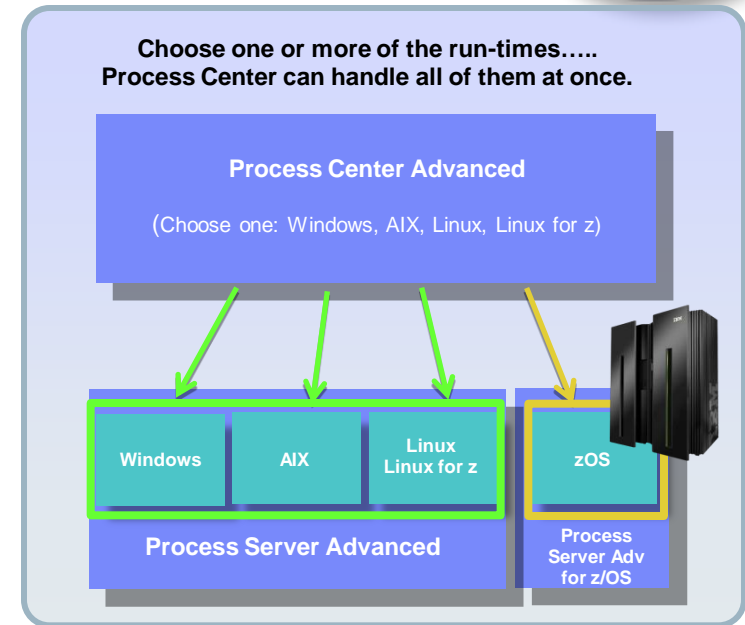*Extract maximum business value from existing assets*

1) Automated workflow and decision making

2) Reduce errors and improve consistency

3) Standardize resolution across geographies

4) Leverage existing systems and data

5) Monitor for business events and initiate actions

6) Real-time visibility and process control

Enabling Agile Business Processes on System Z

IBM Business Process Manager V7.5 for z/OS

- **Unified BPM platform** combines the **simplicity** of Lombardi Edition experience and the **power & scalability** of WebSphere Process Server – all integrated in a zEnterprise environment.

- **Leverages co-location** wit IBM System z programs for superior performance, scalability, and access to data

- **High volume process automation** with greater availability and qualities of service

**Choose one or more of the run-times…..
Process Center can handle all of them at once.**

Process Center Advanced

(Choose one: Windows, AIX, Linux, Linux for z)

| Windows | AIX | Linux Linux for z | zOS |

Process Server Advanced

Process Server Adv for z/OS

IBM BUSINESS PROCESS MANAGER V7.5 for z/OS

IBM Business Process Manager V7.5 for z/OS highlights

- Built-in SOA components for extensive enterprise-wide service integration and orchestration

- Full compatibility with the latest version of IBM WebSphere Process Server for z/OS

- Flexible deployment of process applications originally created with IBM WebSphere Lombardi Edition for Linux on System z or other platforms

- In-process rules authoring based-on WebSphere ILOG JRules technology

- Streamlined installation and configuration of BPM within IBM WebSphere Application Server on z/OS

Decision management in the hands of your business

IBM WebSphere Operational Decision Management V7.5 for z/OS and Linux on System z

- **Deploy once** and changes are immediately available for processes and business systems across the enterprise.

- Simplified decision versioning, auditing and change control through an **easy-to-use governance** system

- Detect and **react in real-time** to critical business situations
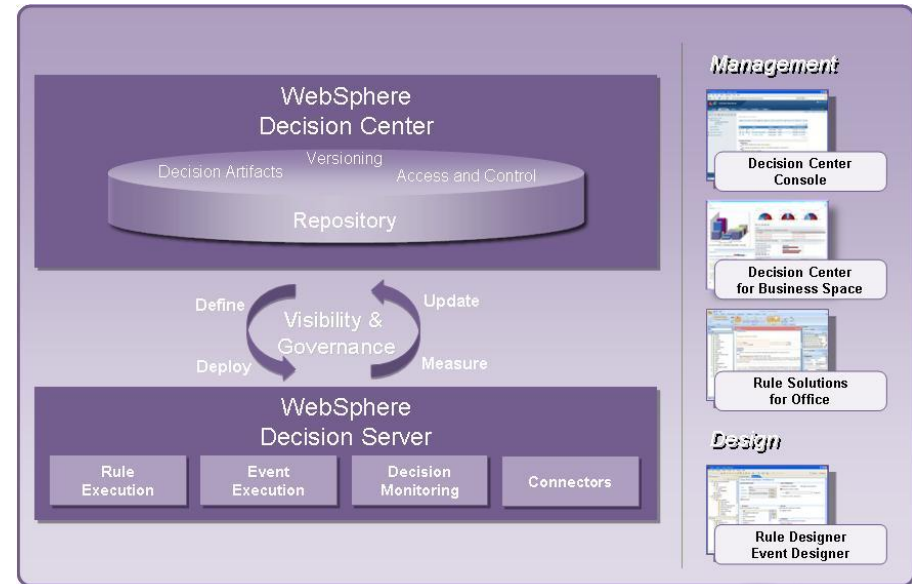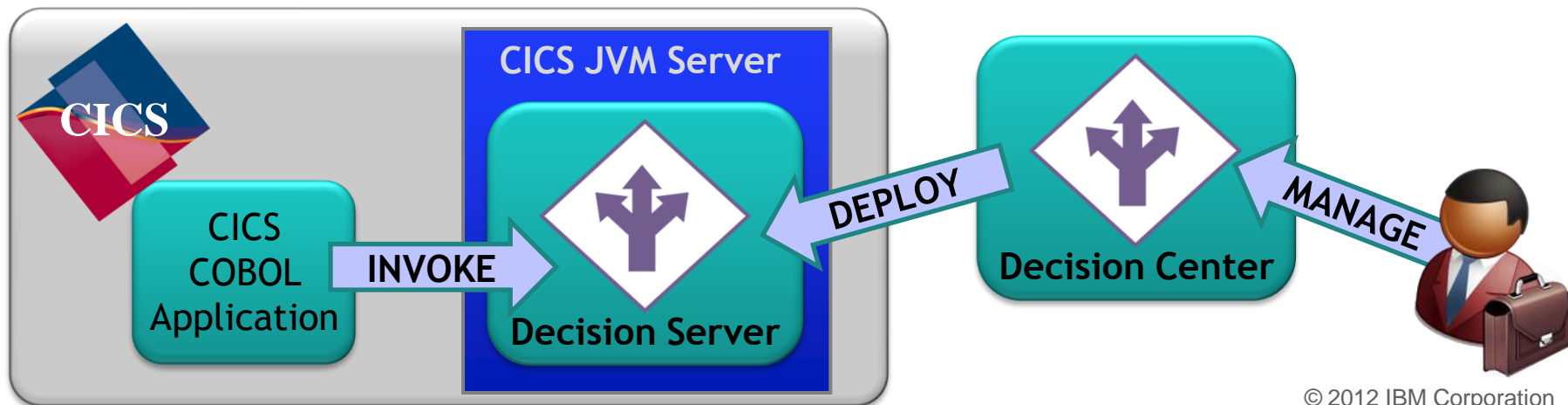

WebSphere Operational Decision Management 7.5 highlights

- Business experts can manage and validate decision logic, eliminating delays in business – IT hand-off

- Decision logic is defined in non-technical, intuitive syntax appropriate for business people

- Encourages collaboration which improves communication while aligning the organization to meet changing requirements

- Management of business rules and events in a unified environment improves visibility and control

- Leverage specific context and predictive models to customize decisions resulting in increased accuracy

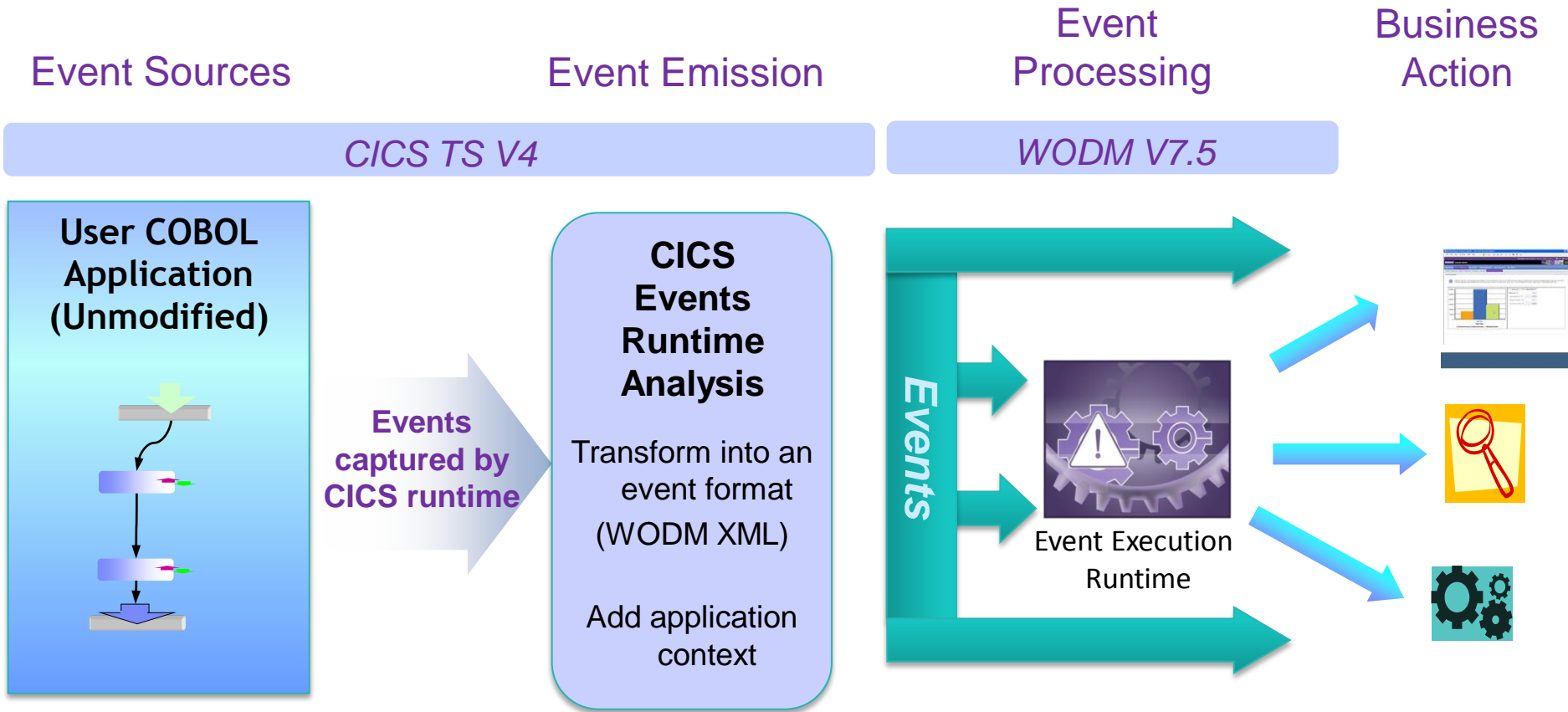- Execute high-volume even pattern and correlation analysis to mitigate risks and identify opportunities

WebSphere Operational Decision Management & CICS

Externalize embedded business rule logic & execute within CICS

- *Gain business agility with existing and new CICS applications*
  - Manage decision logic on a separate lifecycle to application code
  - Ability to react to changes in a fast paced, competitive marketplace
- *Lower the cost of maintaining your business applications*
  - Improvement operational efficiency and total cost of ownership
- *Consistent Decision evaluation across the enterprise*
  - Author decision rules once and deploy to multiple systems on z/OS and distributed
- *Optimized decision execution*
  - Highly efficient rule execution engine
  - Local optimization of Decision Server within the CICS JVM Server environment

Events from CICS TS V4 with WODM

Event Sources

Event Emission

Event Processing

Business Action

CICS TS V4

WODM V7.5

User COBOL Application (Unmodified)

Events captured by CICS runtime

CICS Events Runtime Analysis

Transform into an event format (WODM XML)

Add application context

Events

Event Execution Runtime

CICS Events help you to

- *Observe business processes*
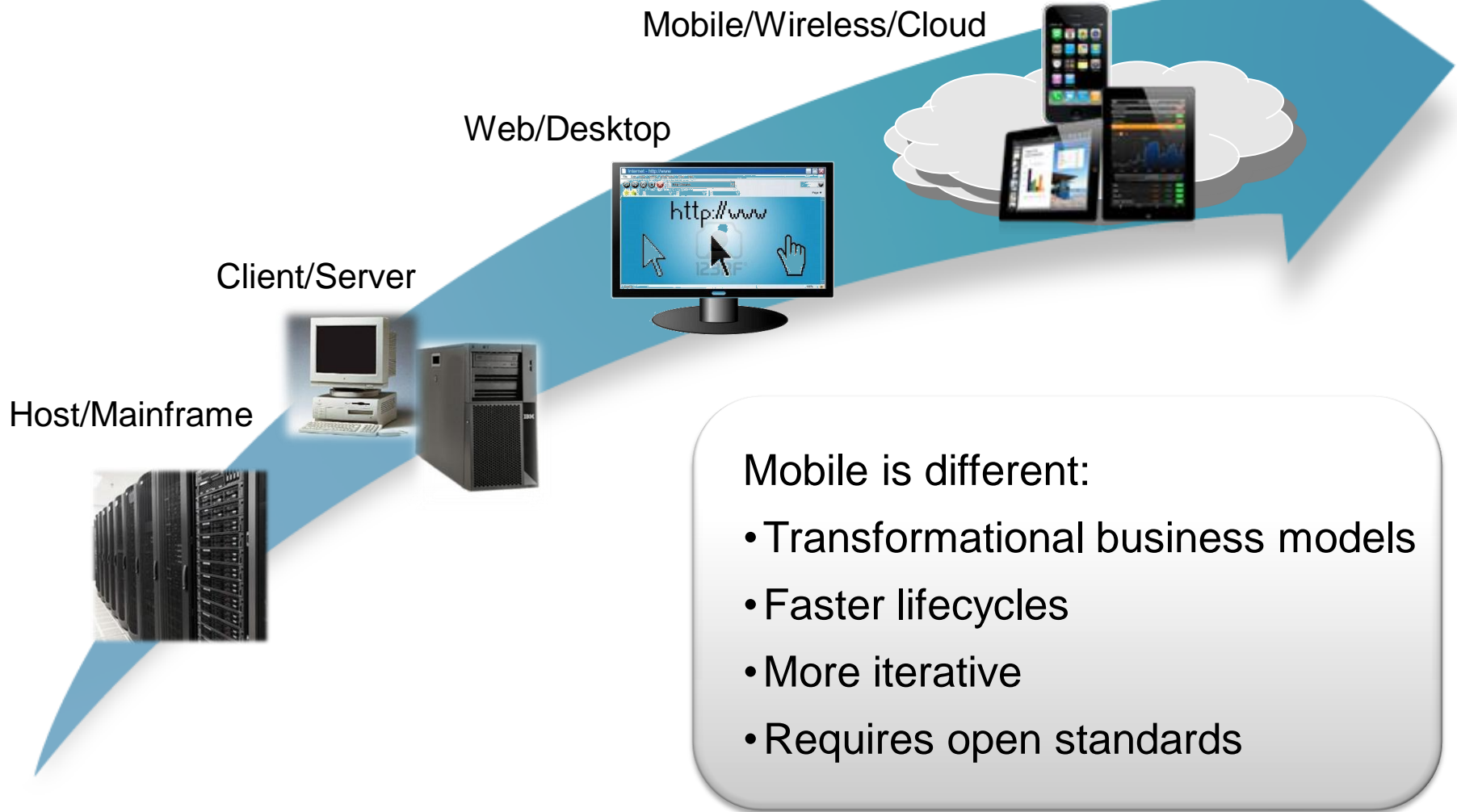- *Recognize suspicious activity*
- *Drive new processing*

IBM announces the intent to acquire Worklight to extend our enterprise mobile capabilities
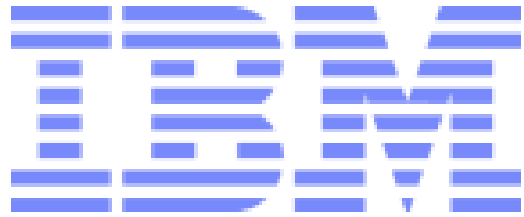
Worklight : a privately held company based in Tel Aviv and New York that provides a leading open standards based mobile application platform for smartphones and tablets letting you build and iterate mobile apps quickly
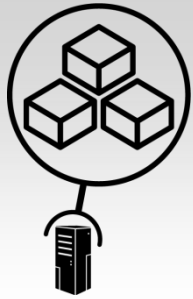
IBM and Worklight Together: With the combination of existing portfolio capabilities in Mobile Device Management, Mobile Web Application Development, Integration, Collaborative Tools and Mobile strategy, planning, implementation, and hosting services, with the acquisition of Worklight, IBM can now offer a complete end-to-end solution to enterprises looking to capitalize on the rapidly expanding mobile market.

Mobile is a significant component of the evolution of computing

Mobile/Wireless/Cloud

Web/Desktop

Client/Server

Host/Mainframe

Mobile is different:

- Transformational business models
- Faster lifecycles
- More iterative
- Requires open standards

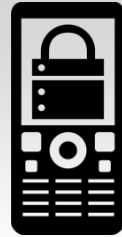# Customers are focused on a new set of initiatives

Client Initiatives

Build mobile applications

Connect to, and **run** backend systems in support of mobile

ING DIRECT
Save your money®
ING Canada

News Analysis
ING Direct praises IBM's Websphere for role in its mobile banking app
COMPUTERWORLD

Key Capabilities
- Mobile web app development
- Enterprise data, service, and application integration
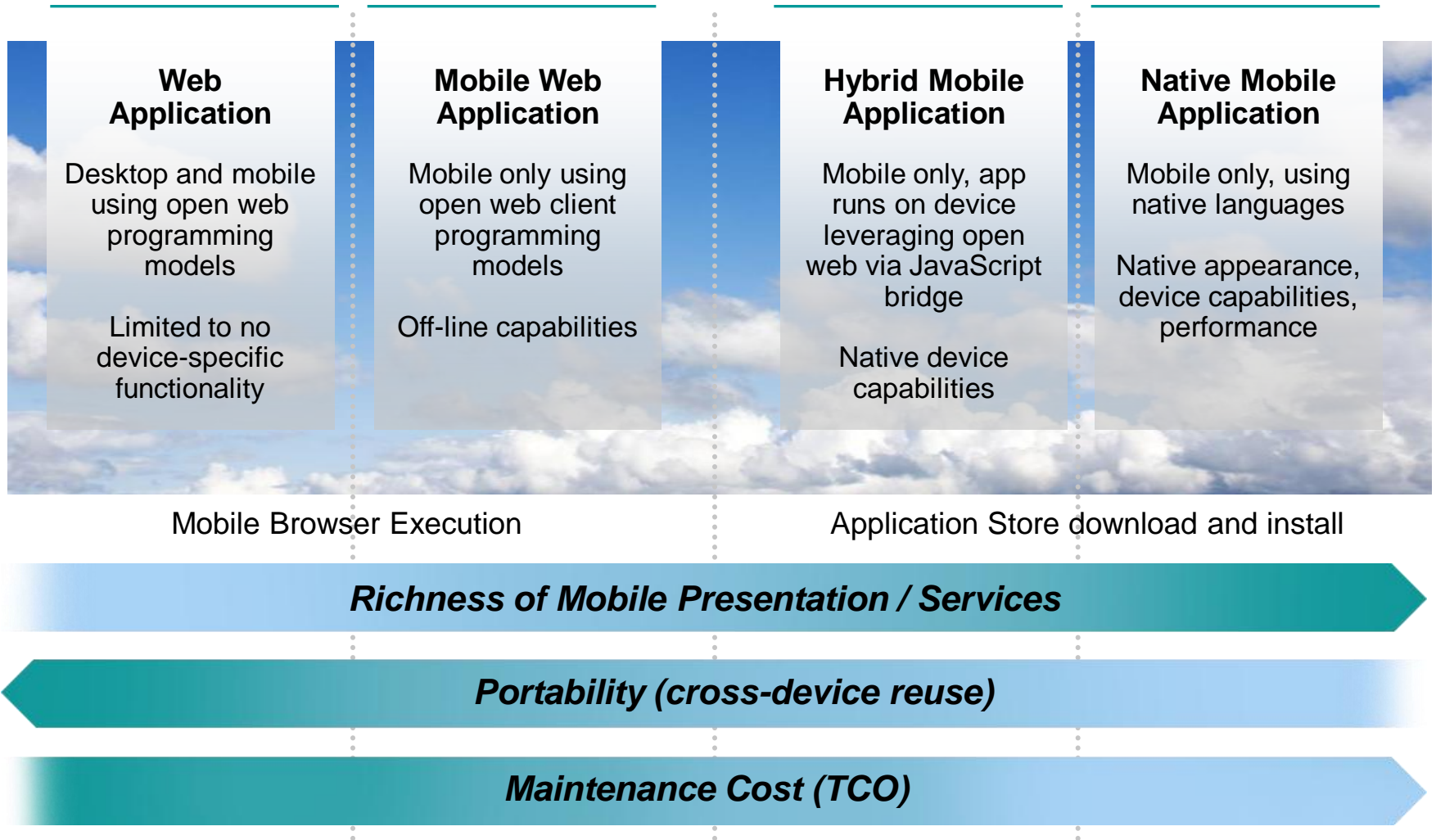- Mobile Technology Preview features

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Manage mobile devices and applications

Secure my mobile business

CONCORD HOSPITAL

Concord Hospital improved patch compliance 50%, reduced software license costs 25%, and has not had a single malware infection since implementation of IBM Endpoint Manager for patch management and core protection
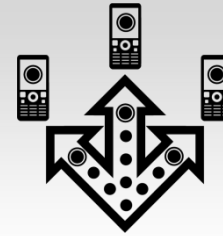
Key Capabilities
- Mobile Lifecycle Management
- Device analytics and control
- Secure Network Communications & Management

Extend existing business capabilities to mobile devices

Transform the business by creating new opportunities

THE CHAMPIONSHIPS WIMBLEDON

The Wimbledon App transforms the fan experience at the tournament by combining GPS location data with analytics and live-action feeds of all the tennis action
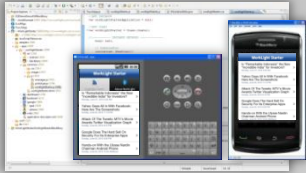
Key Capabilities
- Strategy and planning services
- Mobile-enabled solutions including analytics, commerce, and social business
- Implementation and hosting services

However, the cost of developing for multiple mobile platforms is rising

Web Application	**Mobile Web Application**	**Hybrid Mobile Application**	**Native Mobile Application**
Desktop and mobile using open web programming models	Mobile only using open web client programming models	Mobile only, app runs on device leveraging open web via JavaScript bridge	Mobile only, using native languages
Limited to no device-specific functionality	Off-line capabilities	Native device capabilities	Native appearance, device capabilities, performance

Mobile Browser Execution   Application Store download and install

Richness of Mobile Presentation / Services

Portability (cross-device reuse)

Maintenance Cost (TCO)

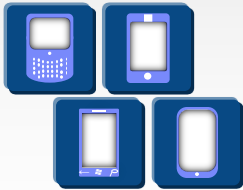# Worklight mobile platform overview

Worklight Studio
A complete, extensible environment with maximum code reuse and per-device optimization

Worklight Server
Unified notifications, runtime skinning, version management, security features, integration and delivery

Worklight Runtime Components
Extensive libraries and client APIs that expose and interface with native device functionality and the Worklight server
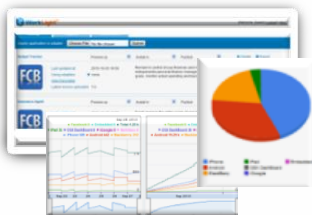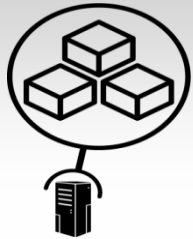
Worklight Console
A web-based console for real-time analytics and control of your mobile apps and infrastructure
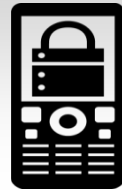
The Worklight server sits on WebSphere Application Server, connecting to back-end systems
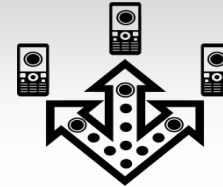
Client Initiatives

Build mobile applications

Connect to, and **run** backend systems in support of mobile

Manage mobile devices and applications

Secure my mobile business

Extend existing business capabilities to mobile devices

Transform the business by creating new opportunities

Build & Connect

- **Development and testing of mobile apps (native, hybrid, web/HTML5/Dojo/Sencha/jQuery)**
- **Traceability and collaboration across requirements, code and testing**
- **Tools for Mobile Software Development Lifecycle (SDLC)**
- **Large shared codebase across multiple devices and environments**
- **Integrated device SDKs**
- **Runtime skinning for apps**
- **Enhanced connections to enterprise data and apps**
- **Integration with device capabilities**
- **Packaging and publishing mobile apps for app stores and marketplaces**
- **Unified push notification framework**
- **Aggregated user statistics and event reporting for monitoring and analytics**

Manage & Secure

- **Device analytics and control**
- **Mobile environment analytics**
- **Endpoint & data protection**
- **Secure network communications & management**
- **Mobile lifecycle management**
- **Provisioning & configuration management**
- **Private app stores and Catalogs**
- **Device inventory & policy management**
- **Mobile security &aAccess management**
- **Mobile security intelligence**
- **Encrypted local device data storage**

Extend & Transform

- **Strategy and planning services**
- **Mobile-enabled solutions including analytics, commerce, and social business**
- **Implementation and hosting services**
- **Pre-built analytics, commerce, and social business apps**
- **IBM Interactive user interface design services**
- **Physical device management services**

*Blue pen = what Worklight brings

Smarter Computing means extracting maximum business value from existing assets

- Mobile, Cloud, Web Services
- Business Process Management
- Rules
- Enterprise Service Bus
- Events
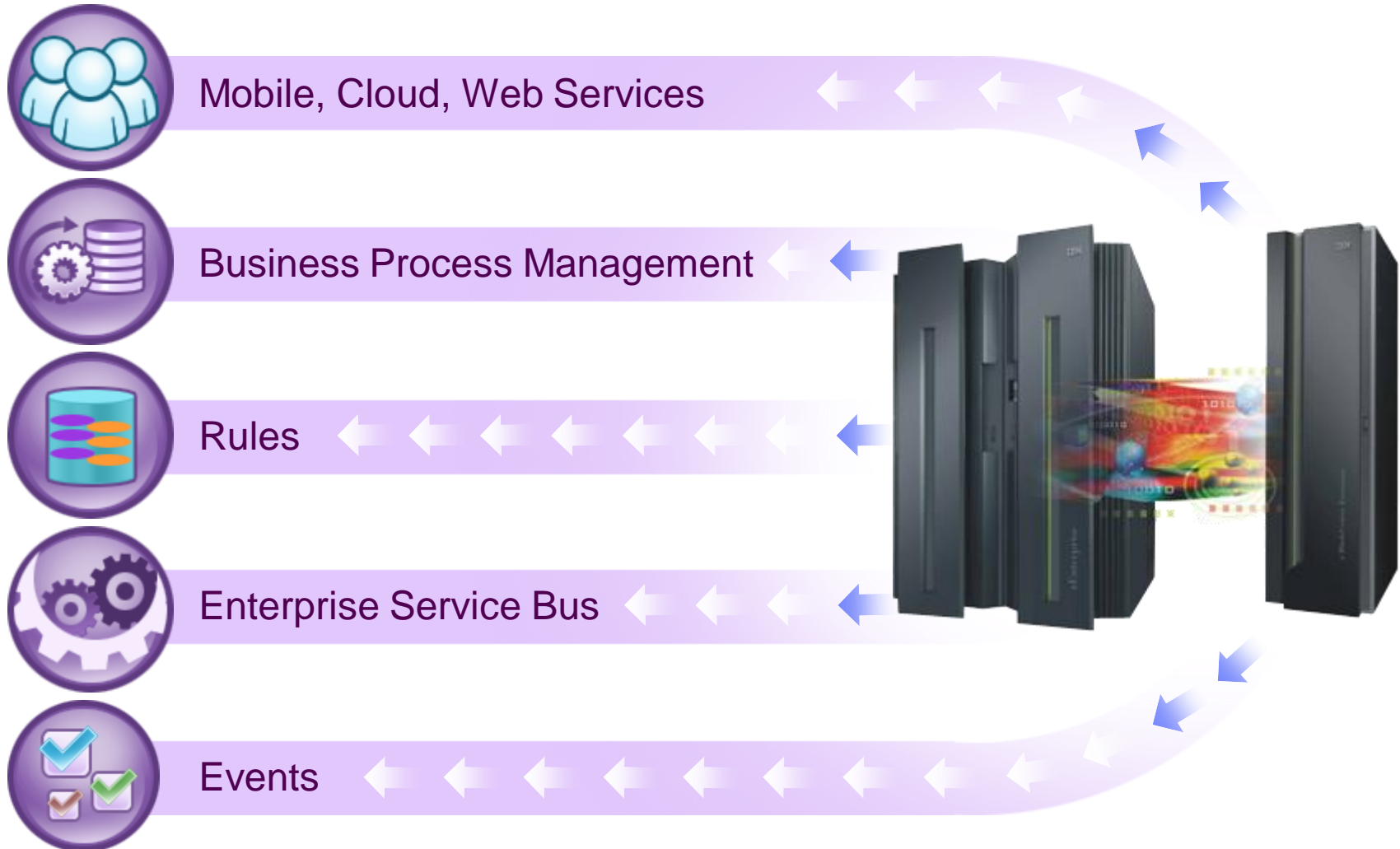
BACKUP

IBM CICS Explorer® V1.1

New!

Session and user views, Configuration, Broadcast, User and Admin commands	Daemon & Connection Status & Test
ISM	**TG**

Develop Test Etc	Configuration Status Control, Test	Status Situations Topology
RDz	**MQ**	**XE**

New!

Threadsafe, File, CPU, Response Time, Statistics, Alerts, Graphical and Sheet views	Deployment, Discovery, Visualization, Cloning, Automation & Control
PA	**DA**

Manipulate, browse z/OS data sets, z/FS, MQ	CICS, IMS, DB2, & z/OS Abend Reporting & Diagnosis
FM	**FA**

Execution Tree Dependencies Queries Command Flow	CRUD/Install History, Audit Backout Search, Compare
IA	**CM**

CICS, IMS, DB2, & z/OS Application Debugging	CICS, IMS, DB2, & z/OS Observation Requests & Reporting
DT	**APA**

CRUD/Install, Control Filter, Sort, Topol Events, ATOM. Java. z/OS, Txn Tracking, WLM
SM

Enhanced!

ibm.com/cics
ibm.com/cics/tools
ibm.com/cics/explorer

SM	**IBM Session Manager**
IA	**CICS Interdependency**
PA	**CICS Performance Analyzer**
CM	**CICS Configuration Manager**
DA	**CICS Deployment Assistant**
TG	**CICS Transaction Gateway**
ISM	**IBM Session Manager**

CICS TS

APA	**Application Performance Analyzer**
FA	
DT	**Fault Analyzer**
FM	**Debug Tool**
	File Manager
MQ	**WebSphere MQ**
XE	**OMEGAMON XE for CICS**
RDz	**Rational Developer for System z**