Rapidly deploy existing CICS applications into a J2EE-based Service Oriented Architecture

global transactional integrity with CICS Transaction Gateway V6.1

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Today's Agenda - SOA

The main topics for consideration over the next 50 minutes

- **What is Service Orientation and SOA? and how does it relate to my zSeries enterprise assets?**

- **What is the CICS Transaction Gateway? And how does it help me achieve a SOA?**

- **What is 'two-phase commit'? Why do I need it? How does it work?**

- **Where does all this fit in to the 'Big Picture'?**

- **Any questions?**

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What is SOA?
(A familiar concept for CICS system programmers)

… a service?

A **repeatable business task** – e.g., check customer credit; open new account

… service orientation?

A way of integrating your **business as linked services** and the outcomes that they bring

… service oriented architecture (SOA)?

An IT **architectural style** that supports service orientation

… a composite application?

A set of **related & integrated** services that support a business process built on an SOA

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IBM

SOA is not just for new development
Bank of Montreal assembles mainframe-based assets

BMO Financial Group

What is the business challenge?
Revitalize customer relationship management across multiple banking channels

Benefits

- Unified view of customer for personal banking line of business

- Existing investments preserved and re-used

Action taken

- Re-used and assembled CICS assets with new Web services interfaces into new CRM business process

- Used CICS Transaction Server, CICS Transaction Gateway and IBM Application Development tooling

- Web service interfaces deployed on WebSphere Application Server on zSeries to access CICS assets

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The Value of the IBM SOA Foundation
Provides What You Need to Get Started with SOA

IBM SOA Foundation: Integrated, open set of software, best practice, and patterns

Supports complete lifecycle with a *modular* approach

Extends value of your existing investments, regardless of vendor

Scalable; start small and grow as fast as the business requires

Extensive business and IT standards support; facilitating greater *interoperability & portability*

IBM SOA Foundation

Software

Assemble

Deploy

Model

Manage

Governance & Best Practices

Skills & Support
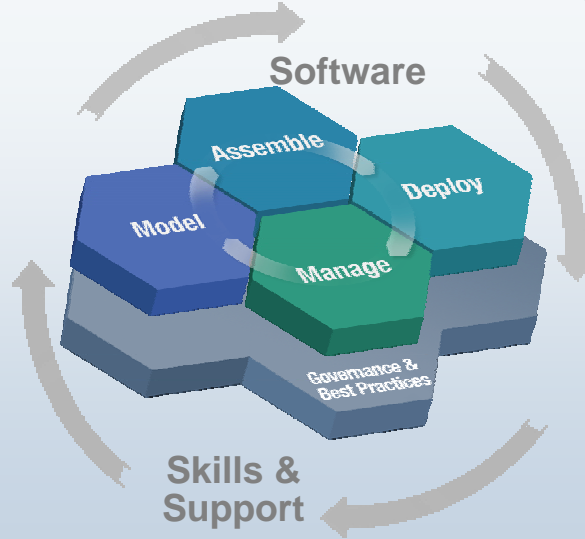
Leveraging existing IT Infrastructure

ORACLE   SAP   bea   CICS   IBM WebSphere   IMS   Microsoft   ca   **Custom Apps.**

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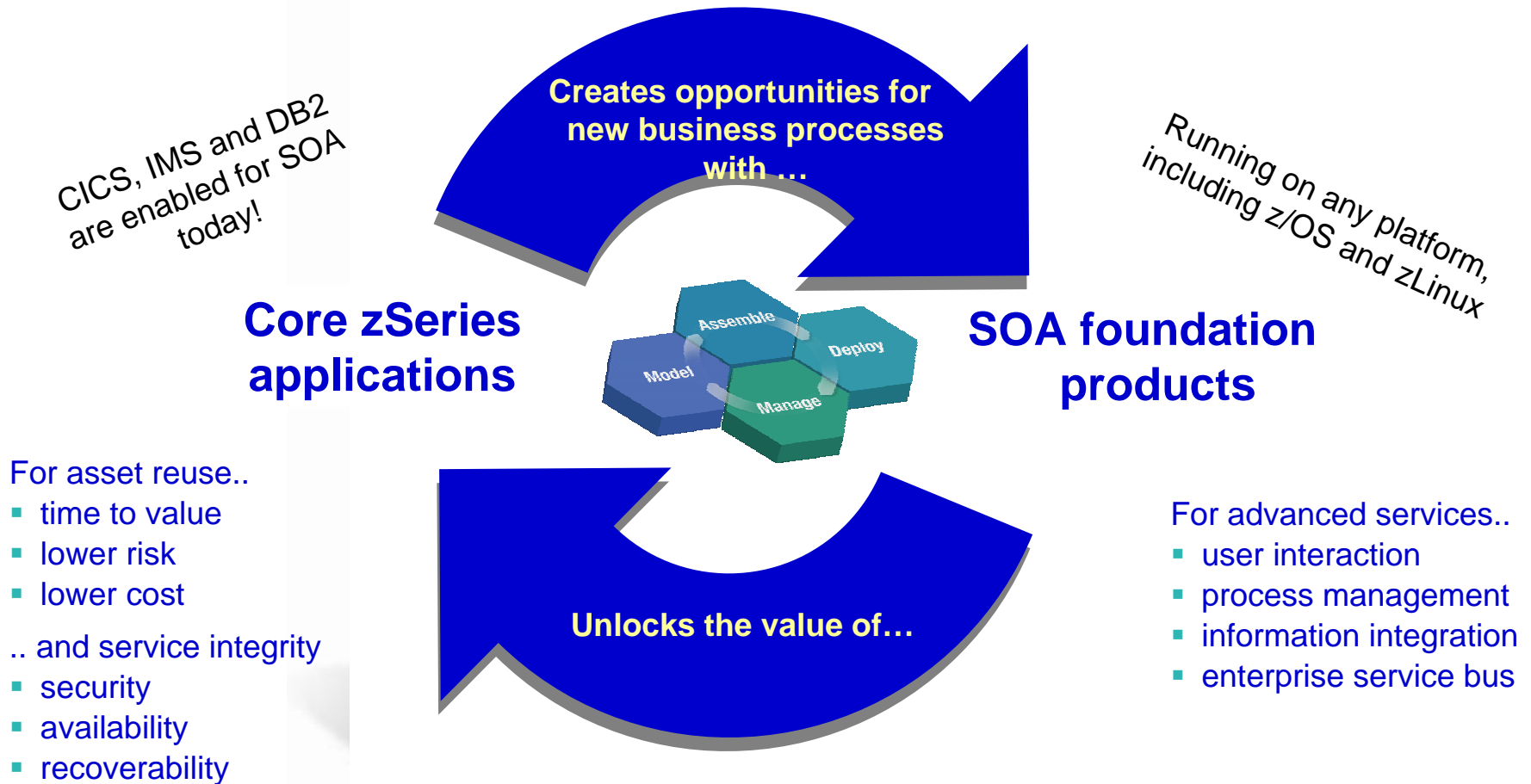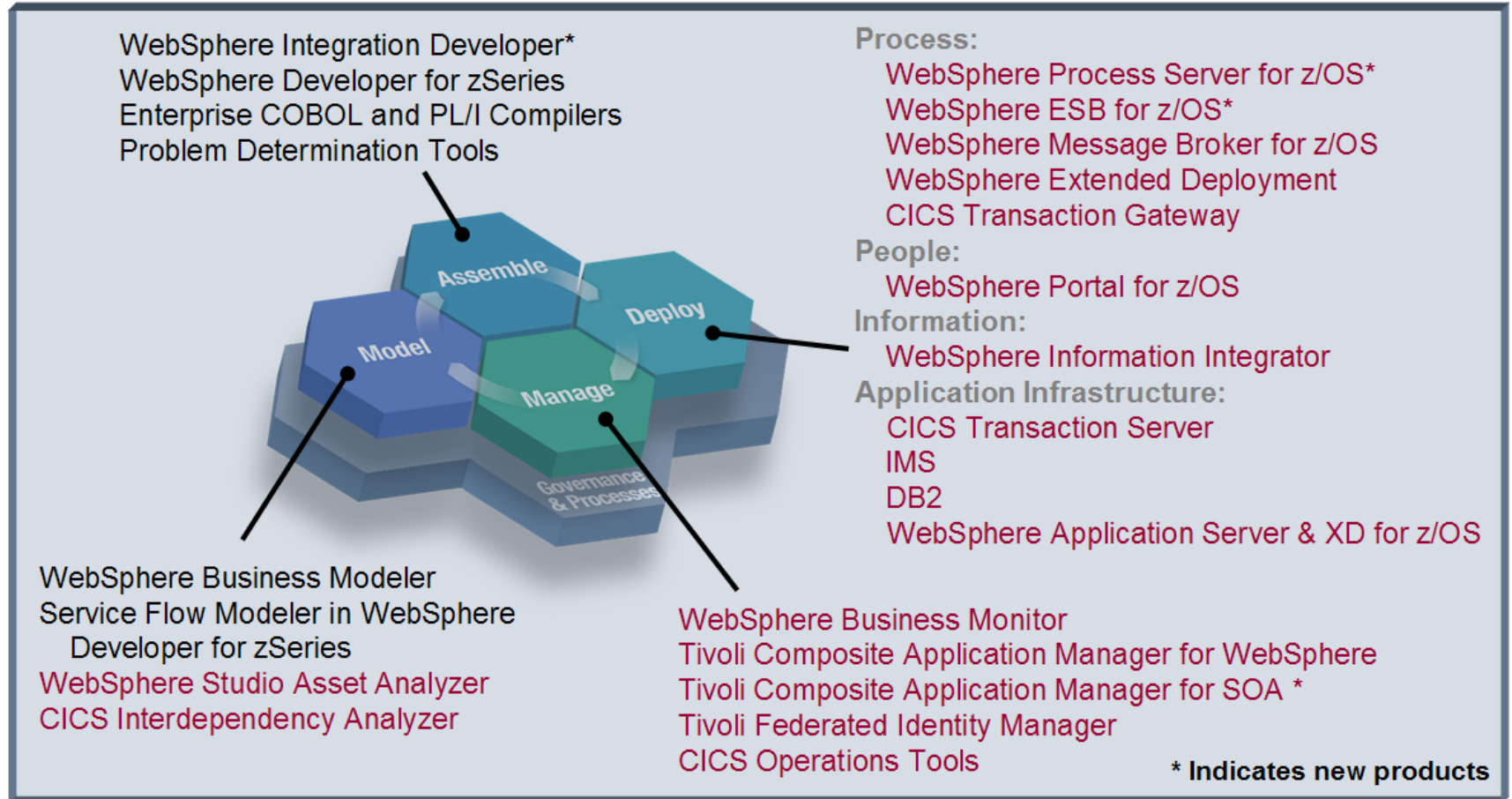
SOA on zSeries – Modernizing your most valuable assets!
Extend and enrich core CICS, IMS and WebSphere applications

CICS, IMS and DB2 are enabled for SOA today!

Creates opportunities for new business processes with …

Running on any platform, including z/OS and zLinux

Core zSeries applications

Assemble
Deploy
Model
Manage

SOA foundation products

Unlocks the value of…

For asset reuse..
- time to value
- lower risk
- lower cost

.. and service integrity
- security
- availability
- recoverability

For advanced services..
- user interaction
- process management
- information integration
- enterprise service bus

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Announcing New and Enhanced Products
Strengthening the IBM SOA Foundation

WebSphere Integration Developer*
WebSphere Developer for zSeries
Enterprise COBOL and PL/I Compilers
Problem Determination Tools

Process:
WebSphere Process Server for z/OS*
WebSphere ESB for z/OS*
WebSphere Message Broker for z/OS
WebSphere Extended Deployment
CICS Transaction Gateway

People:
WebSphere Portal for z/OS

Information:
WebSphere Information Integrator

Application Infrastructure:
CICS Transaction Server
IMS
DB2
WebSphere Application Server & XD for z/OS

WebSphere Business Modeler
Service Flow Modeler in WebSphere
  Developer for zSeries
WebSphere Studio Asset Analyzer
CICS Interdependency Analyzer

WebSphere Business Monitor
Tivoli Composite Application Manager for WebSphere
Tivoli Composite Application Manager for SOA *
Tivoli Federated Identity Manager
CICS Operations Tools

(Diagram labels: Assemble, Deploy, Model, Manage, Governance & Processes)

* Indicates new products

Indicates products currently running – or with stated plans to run – natively on System z9 and zSeries.

Indicates Eclipse-based products running on distributed platforms/workstations, and can deploy composite applications on System z9 and zSeries.

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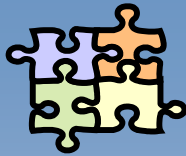
Introducing the CICS Transaction Gateway

Rapidly deploy existing CICS applications in a SOA

Plumbing

Primary connector into CICS

- High performing and scalable inbound connector to CICS applications
- Provides connectors to COMMAREA and 3270-based CICS applications
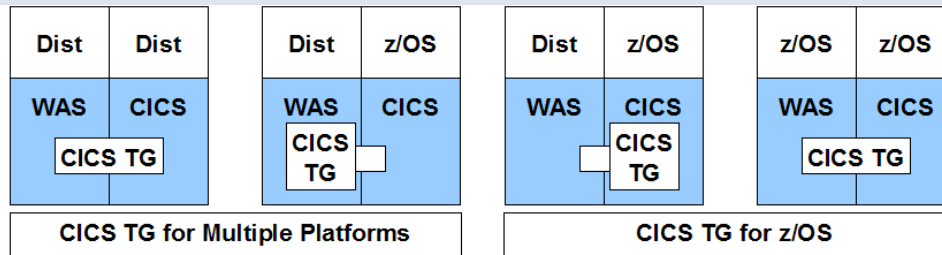
Interfaces

Java and non-Java API's

- Standard JCA interface is strategic and provides best Qualified of Service
- Base Java, C, C++, COBOL and COM interfaces are supported but stabilized

Integration

WebSphere, CICS and others

- Every in support CICS server on every platform to WebSphere SOA foundation servers
- 5 SNA servers (AIX, Windows, Linux on zSeries)

Dist	Dist
WAS	CICS
CICS TG	

Dist	z/OS
WAS	CICS
CICS TG	

Dist	z/OS
WAS	CICS
CICS TG	

z/OS	z/OS
WAS	CICS
CICS TG	

CICS TG for Multiple Platforms

CICS TG for z/OS

Good ←————— Qualities of Service —————→ Best

Supported Platforms

- IBM's flagship z/OS
- Linux on Intel, POWER, & zSeries
- AIX, HP-UX and Solaris
- Windows

Key characteristics of IBM CICS Transaction Gateway
IBM's most popular connector from WebSphere to CICS

- **Popular with the business community because:**

  - **High performing**
    - Can support thousands of Transactions Per Second (TPS) with optimised data handling
  - **Secure**
    - Industry standard Secure Socket Layer (SSL) implementation and good integration with CICS and z/OS
  - **Scalable**
    - Multi-Threaded technology and load balancing capabilities maximise scalability and availability

- **Popular with the technical community because:**

  - **Ease of System Administration**
    - Minimal changes to CICS and usually no changes to CICS applications
    - Simple, familiar mechanisms to configure and manage your gateway
  - **Ease of Application Development**
    - Implements the industry standard J2EE Connector Architecture (JCA) interface
    - Transactional scope, connection pooling and security context all managed outside of the application for easier development

In summary, IBM CICS Transaction Gateway delivers:

- High-performing, security-rich and scalable J2EE standards-based access to CICS applications

- Requiring minimal changes to CICS systems and usually no changes to existing CICS programs

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The J2EE Connector Architecture (JCA)
J2EE standards based access to Enterprise Information Systems

- A component of the Java™ 2 Platform Enterprise Edition specification, alongside other standard services, such as JMS, JDBC and JNDI

- Standard programming interface to all Enterprise Information Systems (EIS), such as CICS, IMS and SAP

- Widely supported in education materials and software tooling from IBM and non IBM vendors

- Delegated management of Connections, Transactions and Security for better, faster application development

In summary, the J2EE Connector Architecture (JCA):

- Enables better applications to be developed faster

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Direct Connection or Web Service into CICS?
Comparing and contrasting two complimentary SOA technologies

- The difference between a 'direct connection' and a 'Web service' depends on whether or not the presentation applications are directly bound to the business logic.

- 'Tightly coupled' direct connections and 'loosely coupled' Web services coexist to fully exploit the agility of an on demand environment

Direct Connection

- High QoS Today

- Mature technologies

- Existing application interfaces

- Few application/system level changes required

- Good where application has fewer reusable purposes
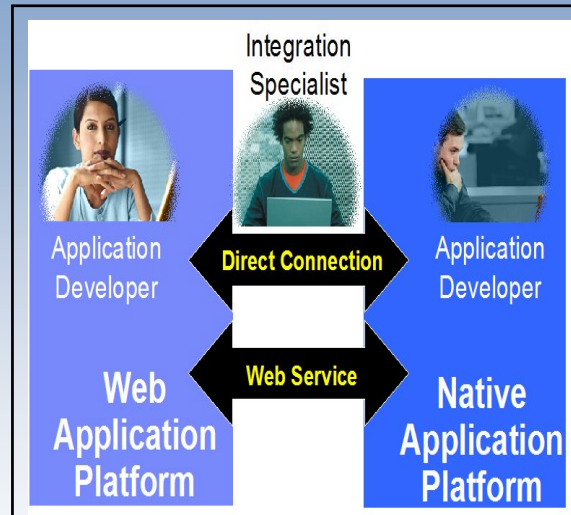
Web Services

- QoS improving via standards

- Emerging technologies

- Web Services interface

- Some application/system level changes required

- Good where application has many reusable purposes

In summary, IBM provides different CICS integration technologies to:

- Exploit an appropriate set of complimentary technologies needed for different business problems

- Integrate all your CICS assets in an enterprise class Service Oriented Architecture

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CICS Transaction Gateway Version 6.0
Delivers major enhancements in four key value areas

Qualities of Service

- Performance enhancements and product optimizations via exploitation of the latest J2EE and Linux standards
- Considerable availability and scalability enhancement on our flagship z/OS platform

Systems Management

- Improved administration of the connector through a more functional interface, better aligned with the native operating environment
- Problem determination and management has been enhanced through better recording and control of system information

Security

- Enhanced support for the Industry leading SSL protocol enables fine tuned control of your network security
- Exploitation of the advanced z/OS security features provides a faster and more comprehensive security solution

Ease of Use

- New, industry standard installations vastly simplify the process of installing, migrating and applying maintenance
- Redesigned and searchable Eclipse-based information center provides a greatly improved interface for online documentation

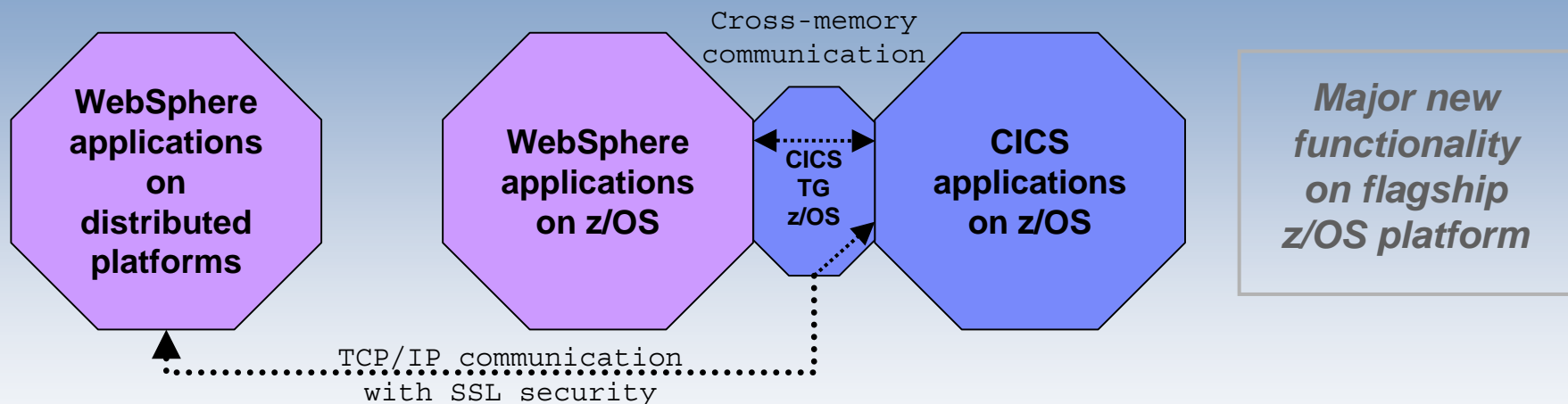|		
IBM CICS Transaction Gateway for Multiplatforms V6.0	Software Announcement 204-284	Nov. 30, 2004
IBM CICS Transaction Gateway for z/OS V6.0	Software Announcement 204-283	Nov. 30, 2004
IBM CICS Transaction Gateway for Multiplatforms V6.01	Software Announcement 205-147	Jun. 14, 2005

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CICS Transaction Gateway for z/OS Version 6.1
Delivers major enhancements in two key value areas

Maximum Transactional Integrity

- Provides global transactional integrity through support for the XA transaction standard
- Adds two-phase commit transactional integration between distributed WebSphere applications and CICS applications running on z/OS
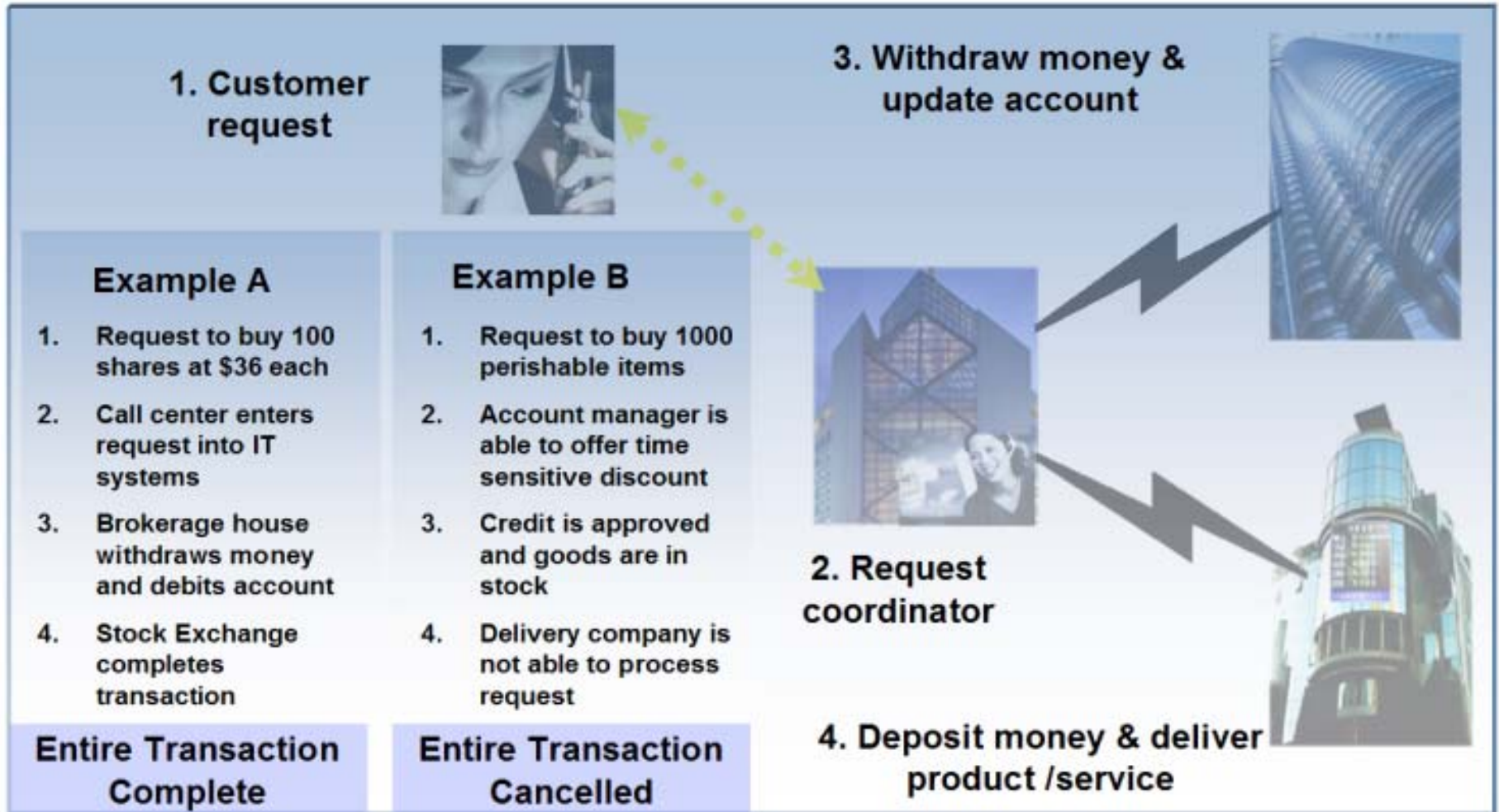
Cross-memory communication

WebSphere applications on distributed platforms

WebSphere applications on z/OS

CICS TG z/OS

CICS applications on z/OS

Major new functionality on flagship z/OS platform

TCP/IP communication with SSL security

Enhanced Communications

- Delivers four major enhancements to the reliability, availability and serviceability (RAS) of TCP/IP network communications
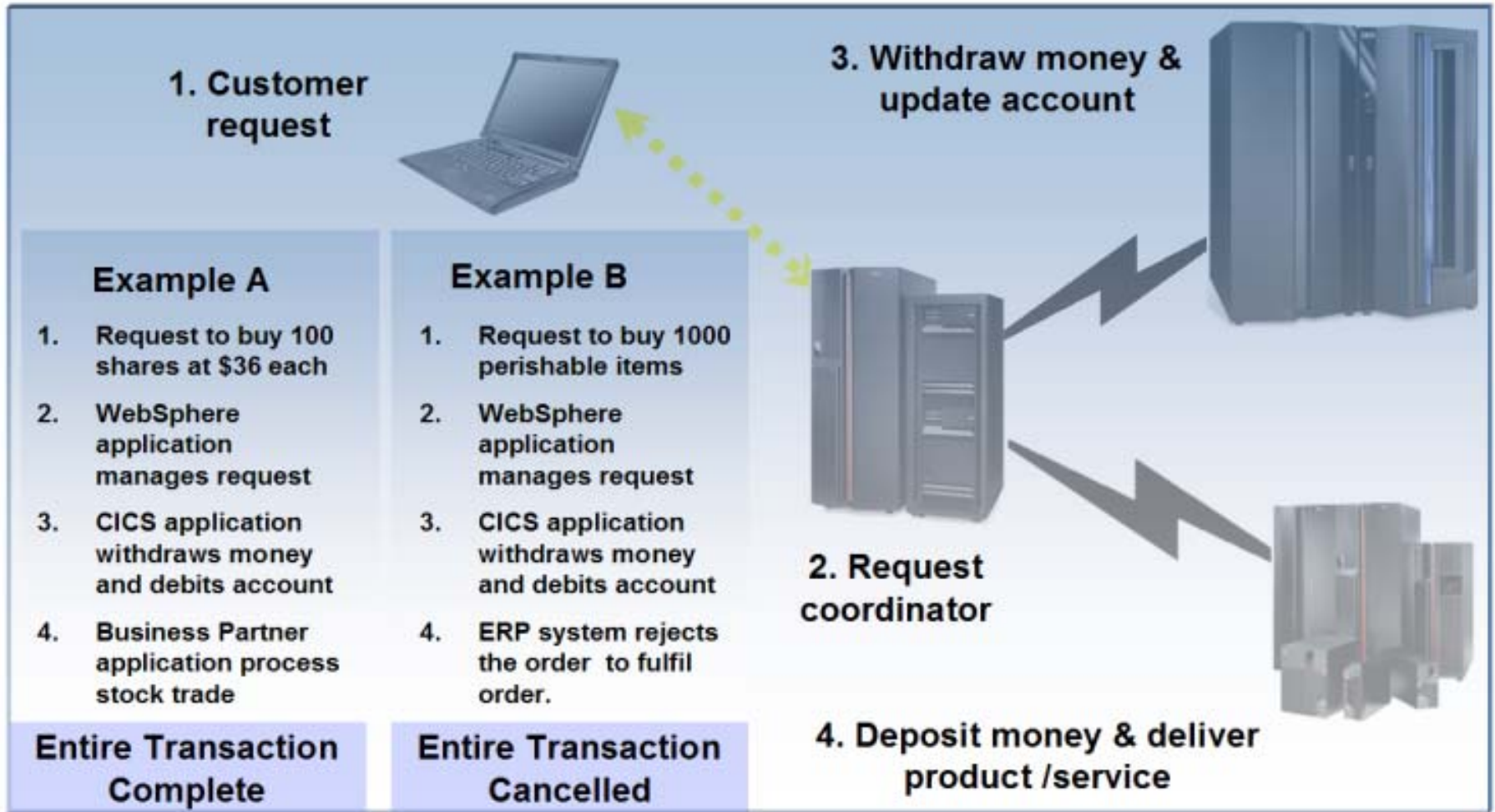
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The business value of coordinated transactions
Updating multiple business systems whilst maintaining data integrity

1. Customer request

3. Withdraw money & update account

Example A

1. Request to buy 100 shares at $36 each
2. Call center enters request into IT systems
3. Brokerage house withdraws money and debits account
4. Stock Exchange completes transaction

Example B

1. Request to buy 1000 perishable items
2. Account manager is able to offer time sensitive discount
3. Credit is approved and goods are in stock
4. Delivery company is not able to process request

2. Request coordinator

Entire Transaction Complete

Entire Transaction Cancelled

4. Deposit money & deliver product /service

The technical importance of transactional integrity
*Ensuring data integrity across distributed, heterogeneous systems*

1. **Customer request**

3. **Withdraw money & update account**

Example A

1. Request to buy 100 shares at $36 each
2. WebSphere application manages request
3. CICS application withdraws money and debits account
4. Business Partner application process stock trade

Entire Transaction Complete

Example B

1. Request to buy 1000 perishable items
2. WebSphere application manages request
3. CICS application withdraws money and debits account
4. ERP system rejects the order to fulfil order.

Entire Transaction Cancelled

2. **Request coordinator**

4. **Deposit money & deliver product /service**

Two-phase commit in the CICS Transaction Gateway
Maintaining data integrity across multiple resource managers

CICS Transaction Gateway for z/OS V6.1 implements the XA Specification, two-phase commit (2PC) protocol.

2PC requires a PREPARE command to be confirmed by each resource manager, before a COMMIT command makes all transaction changes permanent.

Two-phase commit, XA transactional coordination is implemented as part of the JCA 1.5 specification.
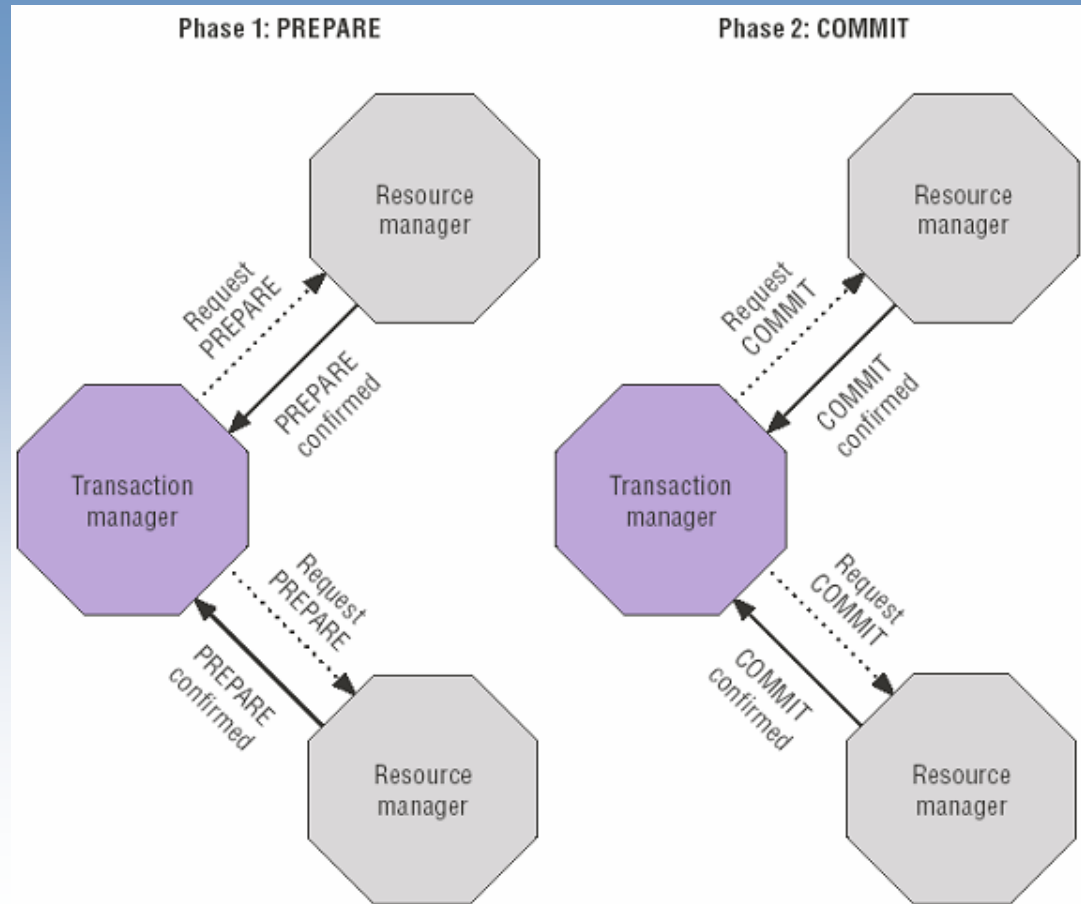
The BIG picture
Snapping together the building blocks of a Service Oriented Architecture

- Lets look at what we have created:

  - **A Service..**
    - Reused multiple, separate and disparate business services
  - **A Service Orientation**
    - Discovered ways to connect separate business services together to form an innovative solution
  - **A Service Oriented Architecture**
    - Used J2EE standards based technologies to begin to form a part of your SOA Foundation
  - **A Composite Application**
    - Built a solution that encompasses many technologies in order to build new business value
    - And build an infrastructure for these applications that is flexible enough to respond to future requirements.

In summary, IBM provides different CICS integration technologies to:

- Exploit an appropriate set of complimentary technologies needed for different business problems

- The CICS Transaction Gateway delivers high performing, security rich and scalable access to CICS

- Integrate all your CICS assets in an enterprise class Service Oriented Architecture

Summary – What we talked about

Rapidly deploy existing CICS applications into a J2EE-based SOA

- **Service Oriented Architecture**
  - ▸ What is a Service Oriented Architecture
  - ▸ Modernizing your most valuable assets
  - ▸ IBM SOA Foundation and zSeries

- **IBM CICS Transaction Gateway**
  - ▸ Key Characteristics of CICS Transaction Gateway
  - ▸ The J2EE Connector Architecture (JCA)
  - ▸ Direct Connection or Web Service into CICS?
  - ▸ Enhancements in Version 6.0 and Version 6.1

- **Maximum Transactional Integrity**
  - ▸ Business Importance of coordinated business systems
  - ▸ Technical value of global transactional integrity
  - ▸ Two-Phase commit in CICS Transaction Gateway V6.1

Core takeaway:

- SOA is about moving to a more flexible infrastructure
- The most important thing to do - is to start that journey now!

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Questions and More Resources

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www.ibm.com/cics/ctg

- **Any Questions?**

- **Website is the best place for up to date information:**
  - ▶ Announcement Letters
  - ▶ Datasheets/Brochures
  - ▶ Redbooks
  - ▶ Whitepapers
  - ▶ Presentations
  - ▶ Technical Library
  - ▶ And more….

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