



IBM Software Group

Transactions in WebSphere Process Server

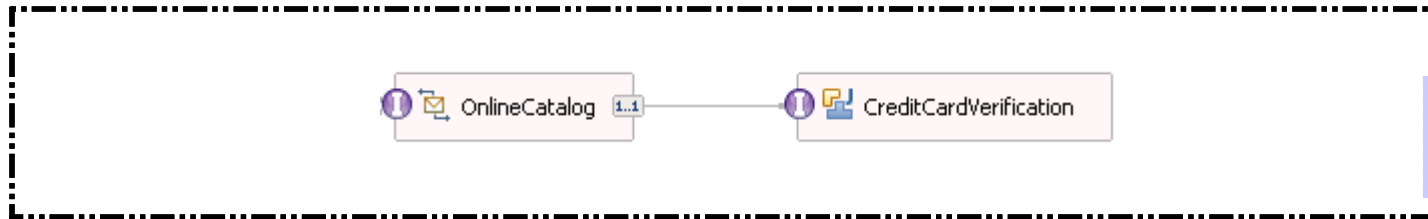
Lalitha Chandran



WebSphere® Support Technical Exchange



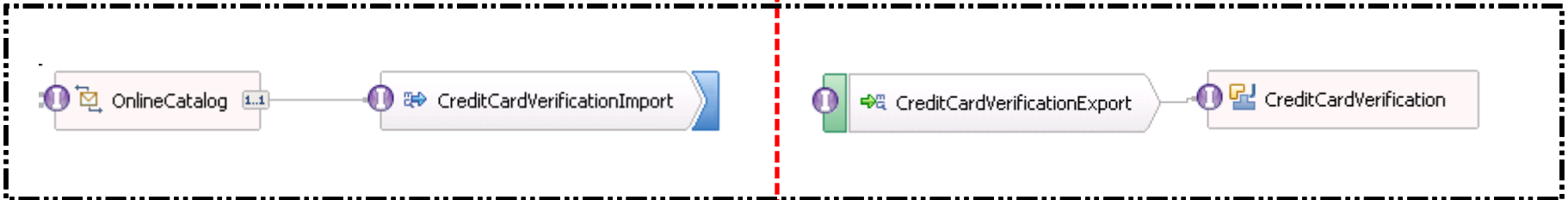
Agenda



Same Transaction

Module A

Module B



Agenda

- Transactions
- Invocation Styles
- Qualifiers
- **A**synchronous behaviors affecting Transaction boundary
- Examples
- References
- Q&A

I **Q** **A**
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Transactions

- What is transaction?
- Motivation behind transactions
- Real-world Example: Transfer of Money
 - ▶ Begin
 - Debit Account A
 - Credit Account B
 - Update history log
 - ▶ End

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Terminology

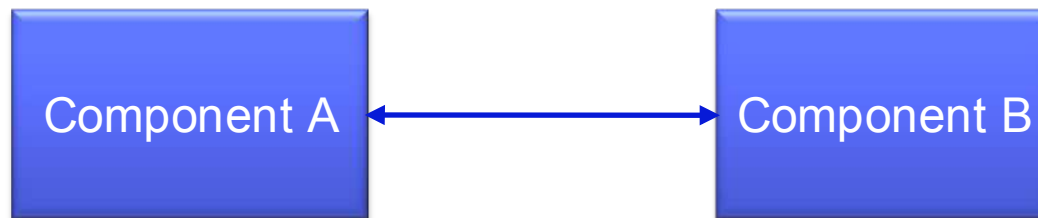
- Global transaction and Local transaction
- Transaction Boundary
- Commit/Rollback
- Container Managed Transaction (CMT)
- Bean Managed Transaction (BMT)

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Invocation Styles

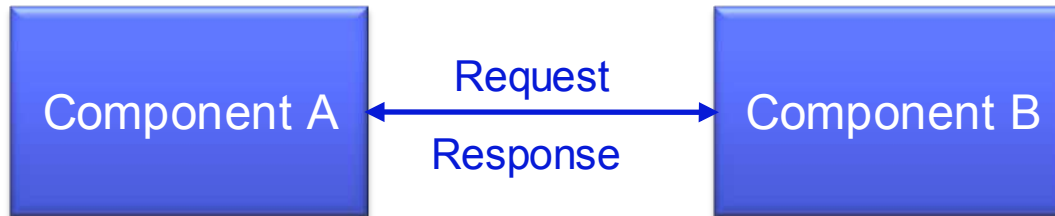
- What is invocation style?
- Invocation Style
 - ▶ Synchronous
 - ▶ Asynchronous
- Effect on transactions



Invocation Styles

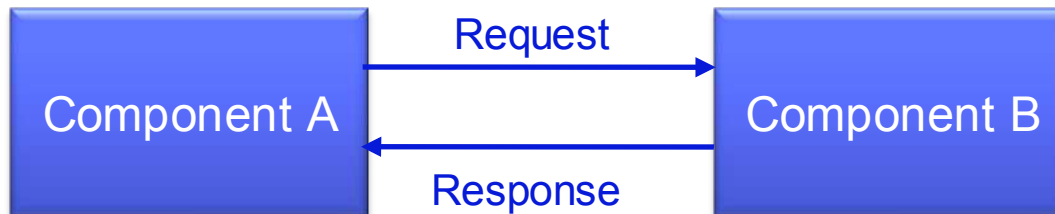
■ Synchronous invocation

- ▶ The source and the target are executed in the same thread
- ▶ No further processing in caller



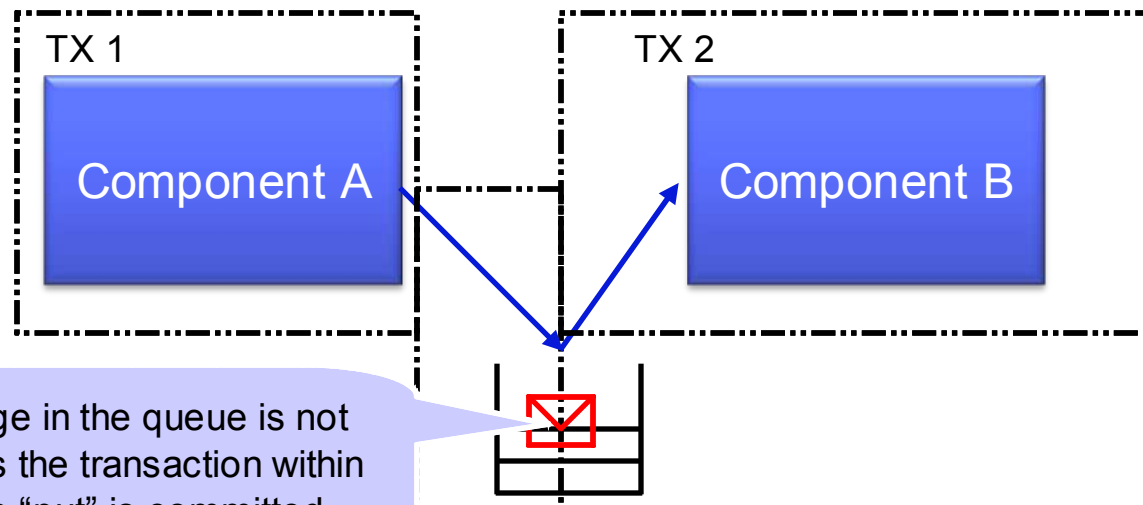
■ Asynchronous invocation

- ▶ The source and the target are executed in the different thread
- ▶ Further processing occurs



Asynchronous Invocation

- Asynchronous invocation is like snail mail, they are delivered and the sender can continue with other jobs.
- Once the receiver receives the mail, it is processed. If required, the response is sent later. 3



Expected Behavior

- Parameters affecting invocation style
 - ▶ Preferred Interaction Style
 - ▶ Request response or one-way operations
 - ▶ Target and Source component
 - ▶ API Calls
 - ▶ How the Source target is invoked

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Examples: Microflow Invocation Styles

Preferred interaction style of target component or import	One-way Operation	Request-response Operation
Synchronous	Synchronous invocation	Synchronous invocation
Asynchronous	Asynchronous invocation	Synchronous invocation
Any	Asynchronous invocation	Synchronous invocation

The screenshot shows the 'Properties' view for a component named 'Account (Java)'. The 'Interfaces' section is expanded, showing 'AccountInterface'. The 'Properties of Interface AccountInterface' are displayed, with the 'Preferred interaction style' set to 'Synchronous'. A red box highlights this property.

Operations

Operations and their parameters

Name	Type
operation	
Inputs	HIPSDATA
Outputs	HIPSDATA

Actual Behavior

- Turn on the trace SCA.*=fine
- Execute the invocation
- Search in the trace file for "Processing interaction: "

Synchronous:

Processing interaction: [invoke,getAccount] {MyModule}MyServiceRequestor.component#MyServiceInterfacePartner =>
{MyModule}MyServiceProvider.component

Asynchronous:

Processing interaction: [invokeAsync,getAccount] {MyModule}MyServiceRequestor.component#MyServiceInterfacePartner =>
{MyModule}MyServiceProvider.component

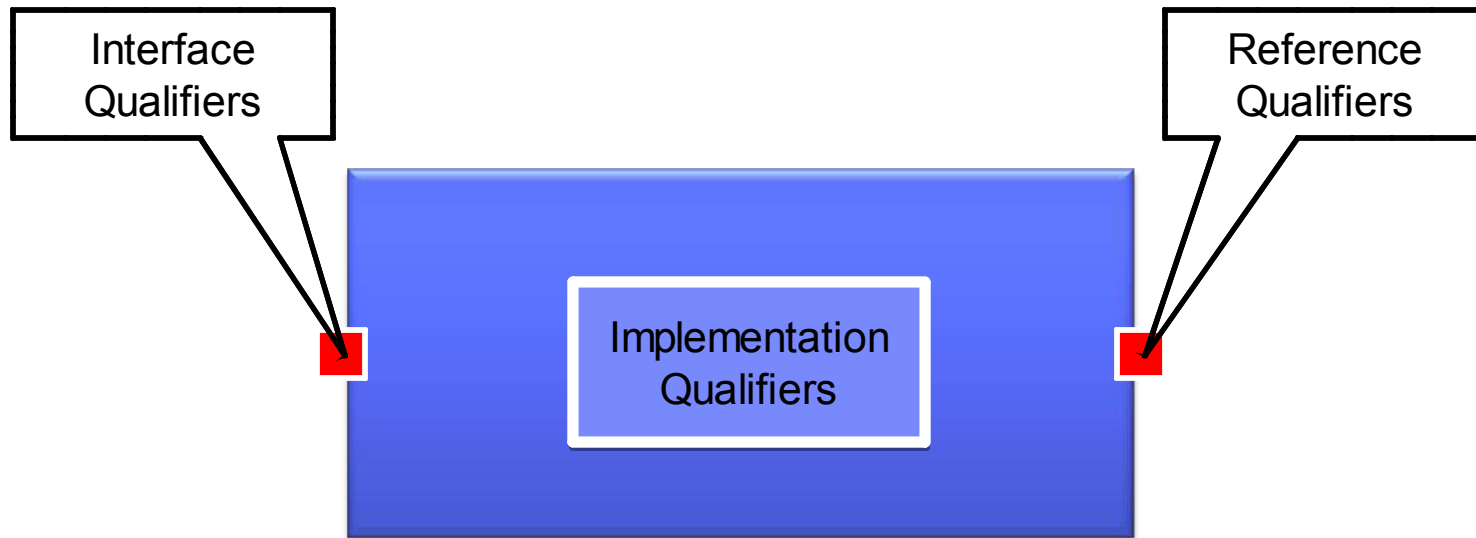


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Qualifiers

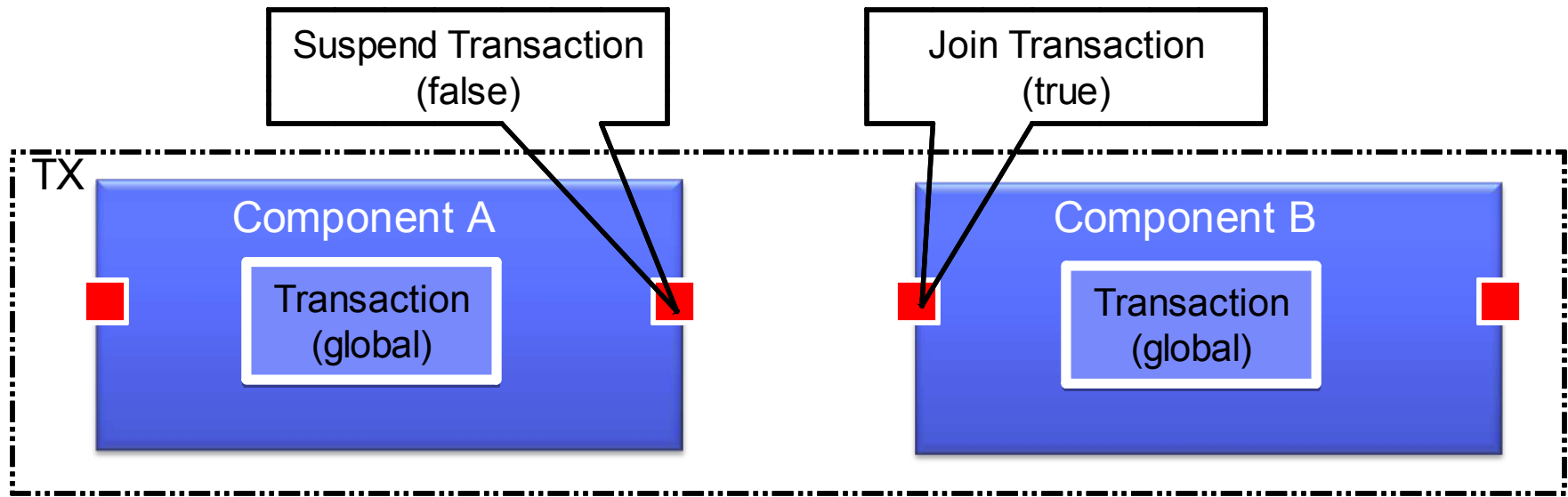
- Types of qualifiers



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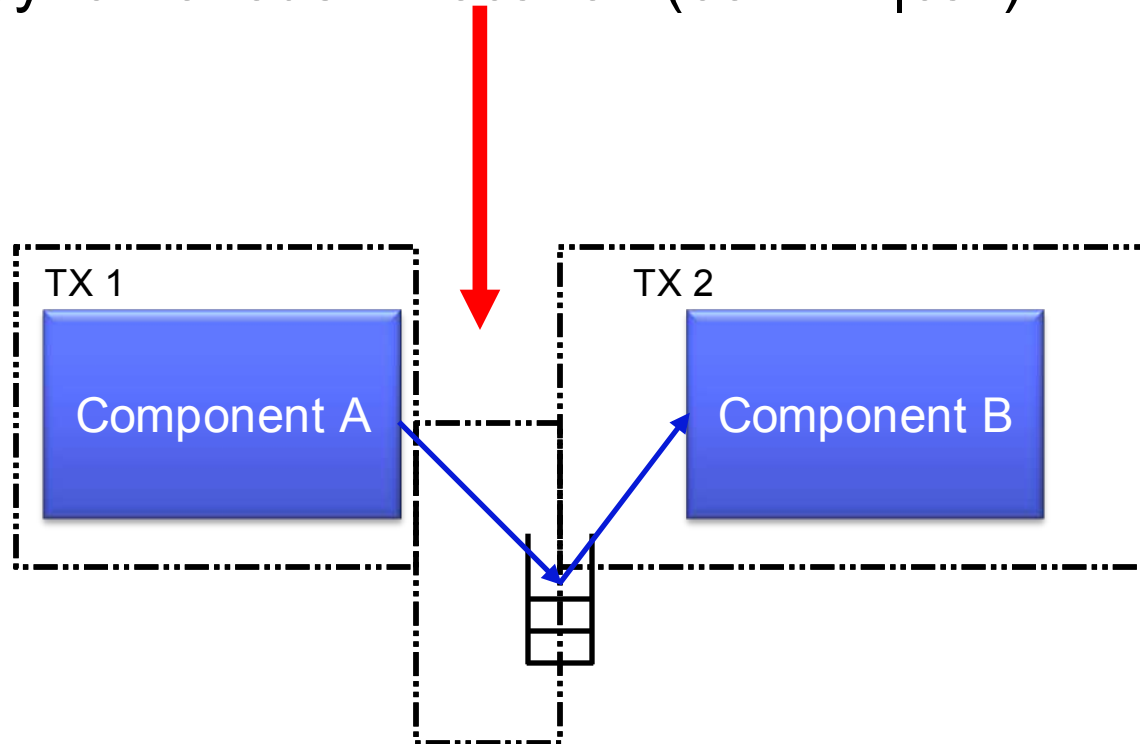
Transaction qualifiers

- Four Transaction related Qualifiers



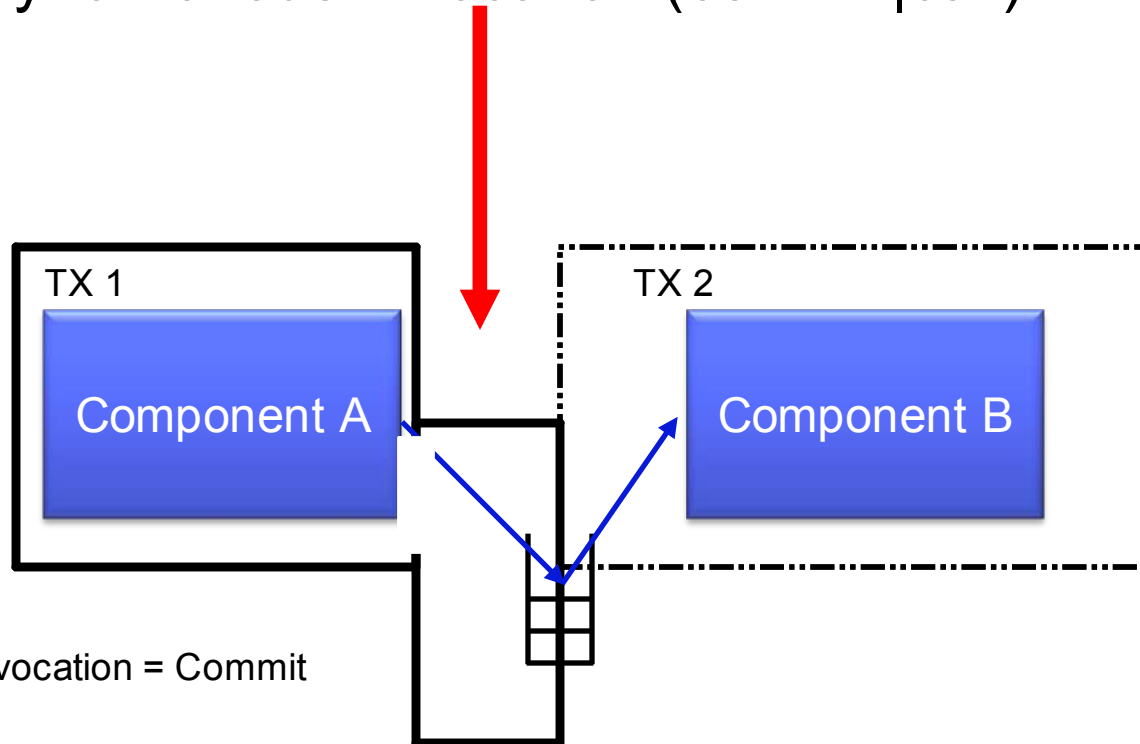
Transaction qualifiers

- Asynchronous Invocation (commit|call)



Transaction qualifiers

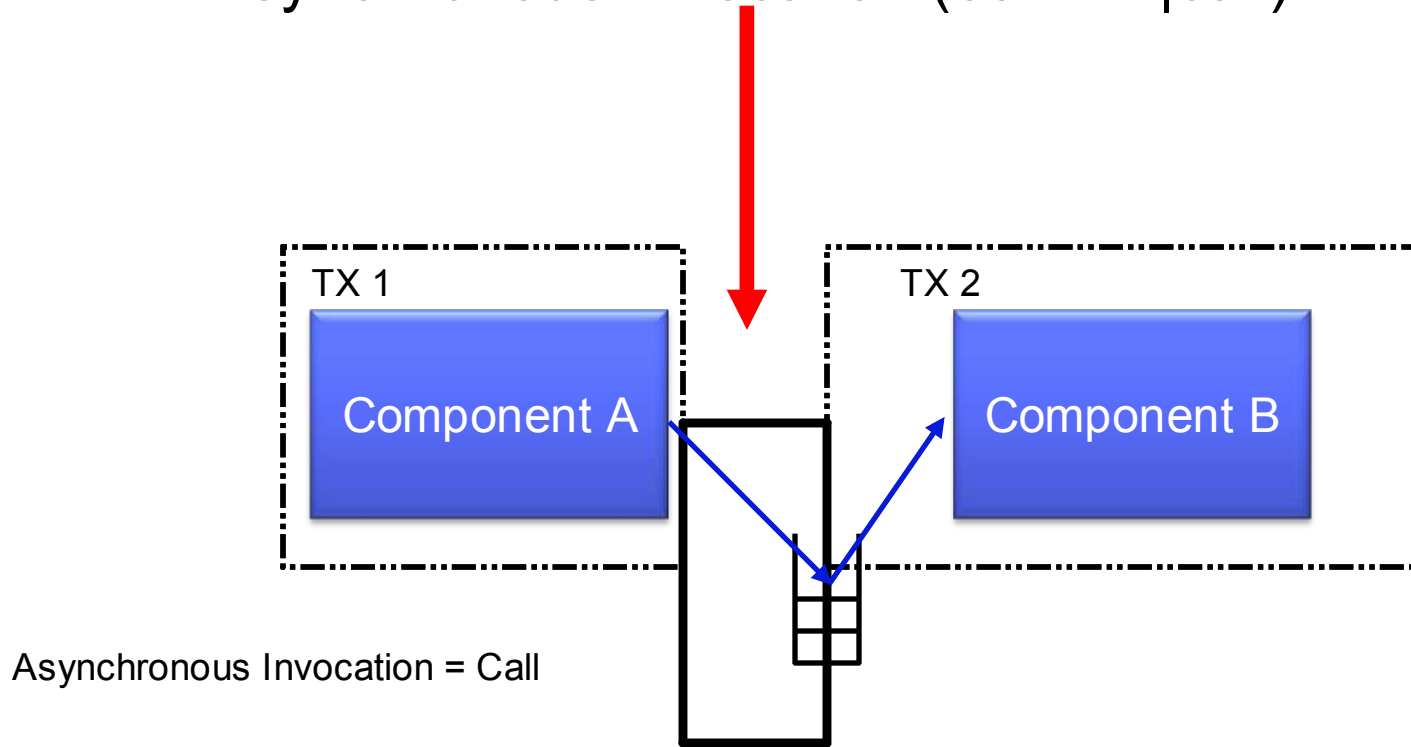
- Asynchronous Invocation (commit|call)



Asynchronous Invocation = Commit

Transaction qualifiers

- Asynchronous Invocation (commit|call)



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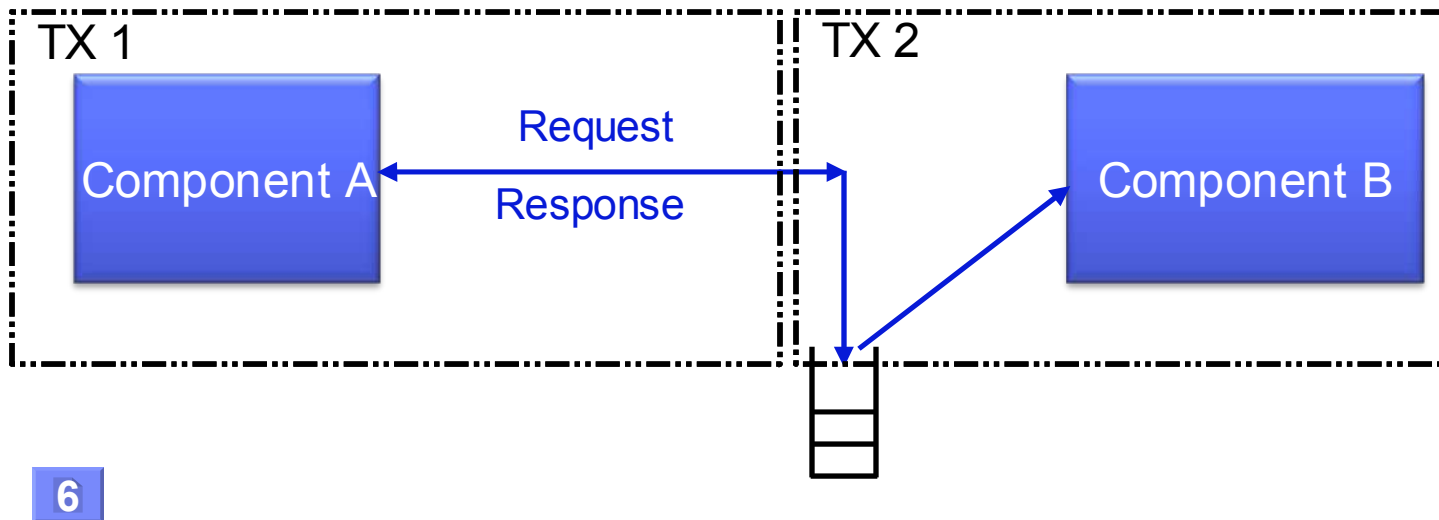


Asynchronous implementations

- Java™ Component (POJO) that implements the `ServiceAsyncImpl` interface
- Long running business process
- Human tasks
- JMS import
- MQ import

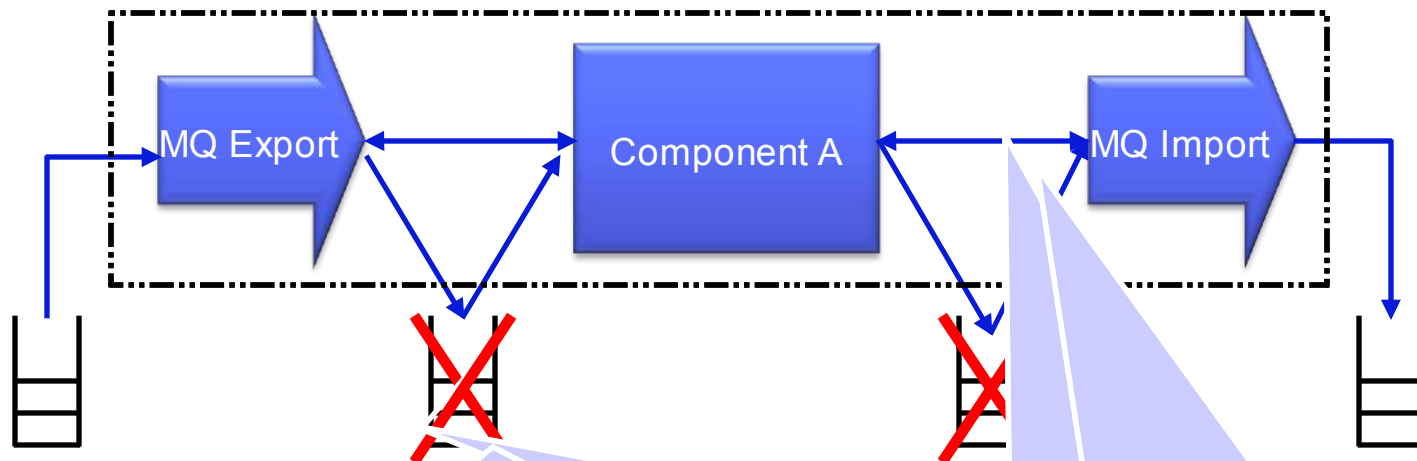
Sync-over-Async switch

- When an asynchronous invocation is invoked synchronously, a transaction boundary is introduced



Asynchronous hop reduction

- An asynchronous import binding is invoked asynchronously
- An asynchronous export invokes another component asynchronously



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When invoking a C
 For performance optimization re
 this asynchronous hop is elimi

Eliminating the transaction boundaries.
 Now the import or the export will execute
 in the same transaction as Component

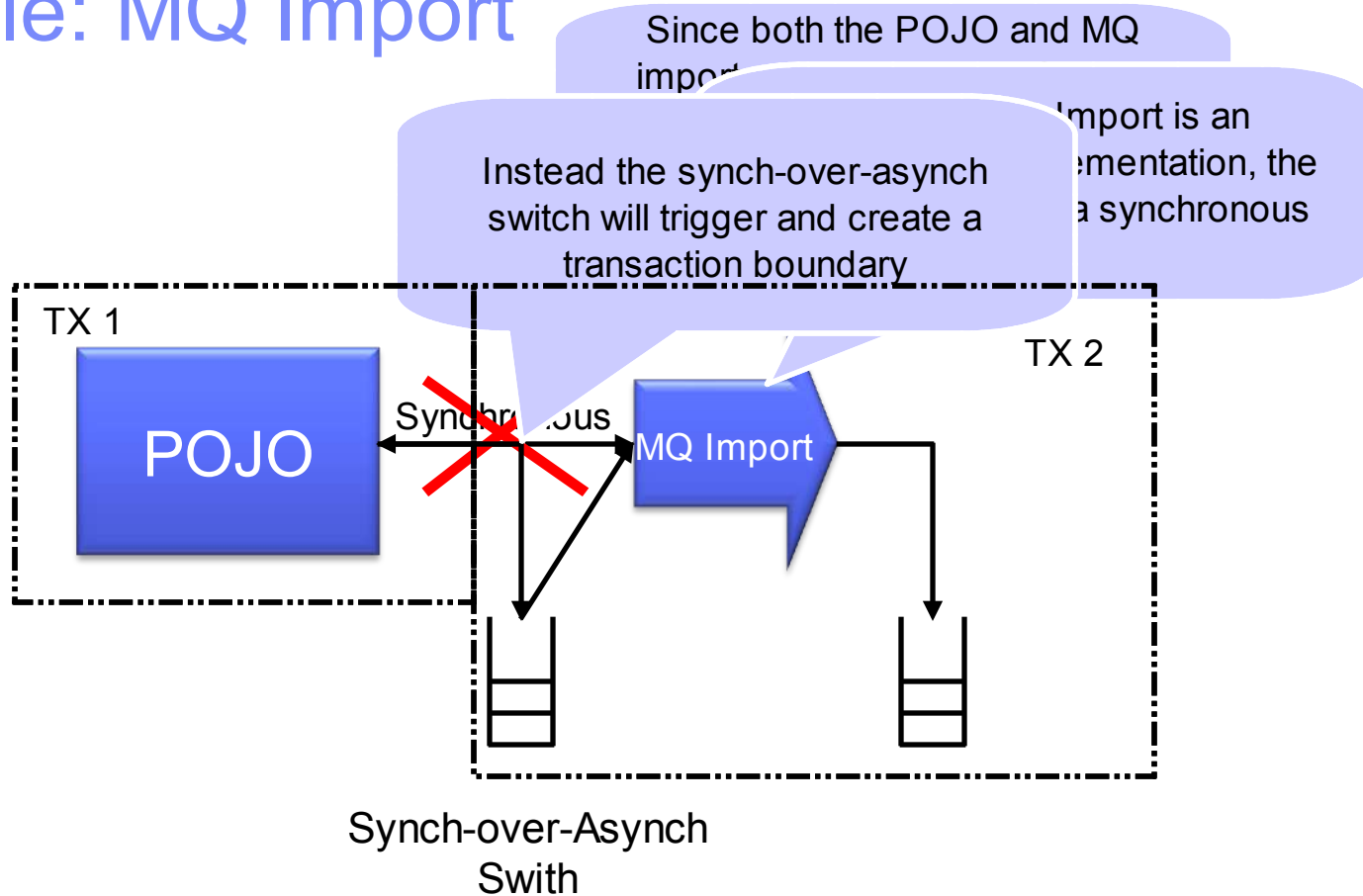
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Example: MQ Import

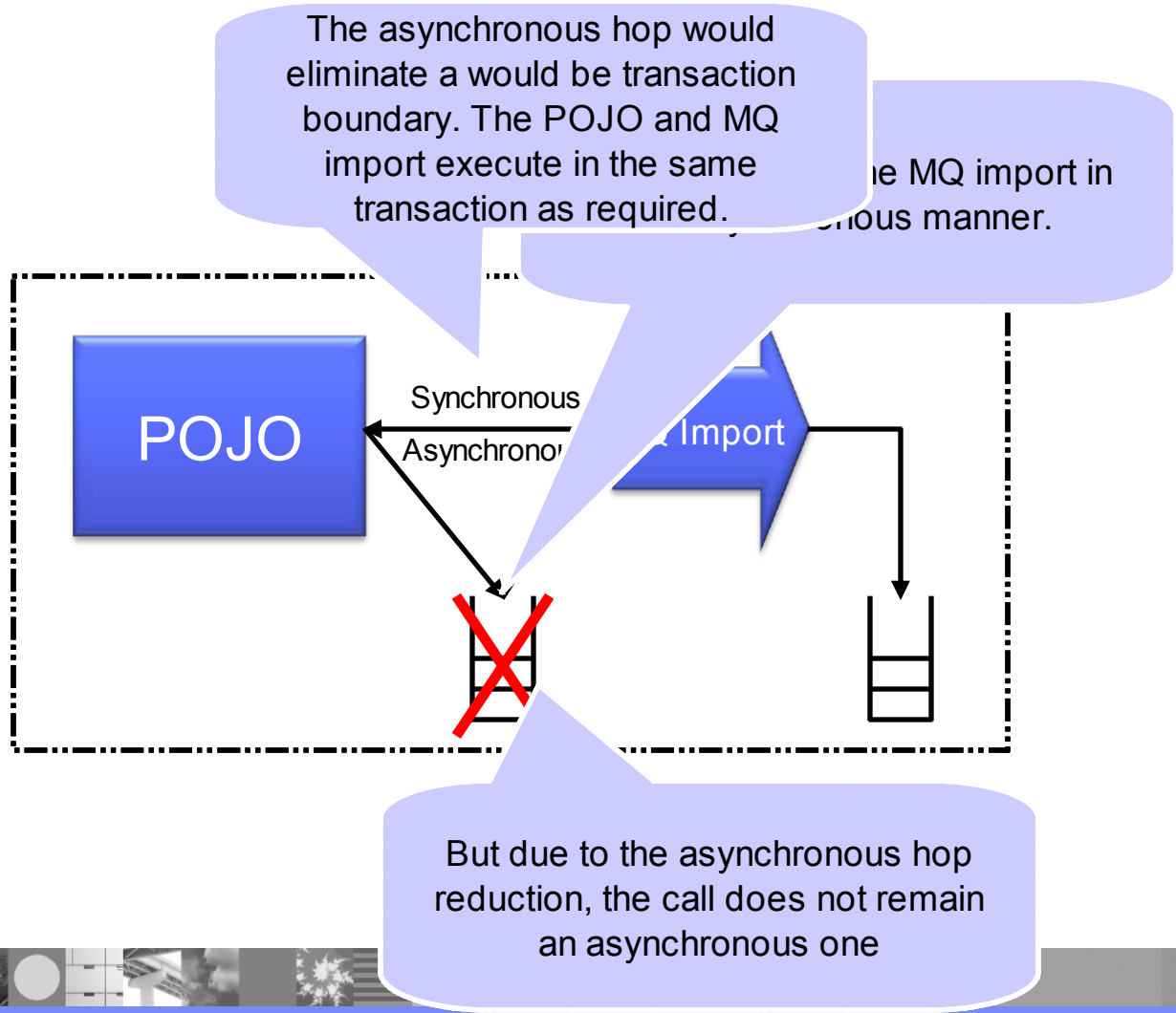
- Scenario
 - ▶ POJO invokes MQ import
- Requirement
 - ▶ Import and POJO should execute in the same transaction
- Reminder: MQ Import is an asynchronous implementation



Example: MQ Import

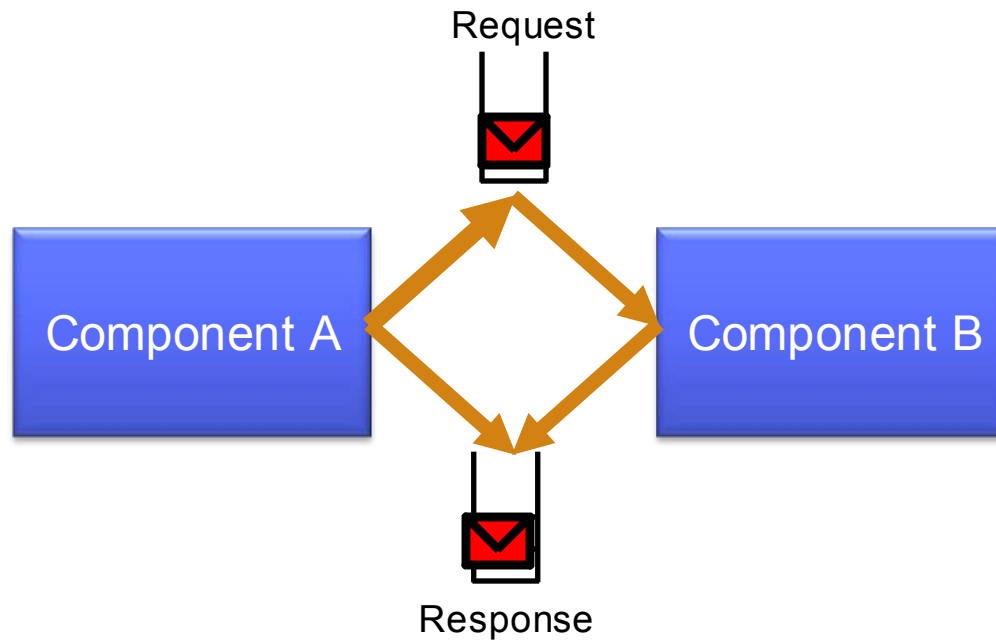


Example: MQ Import



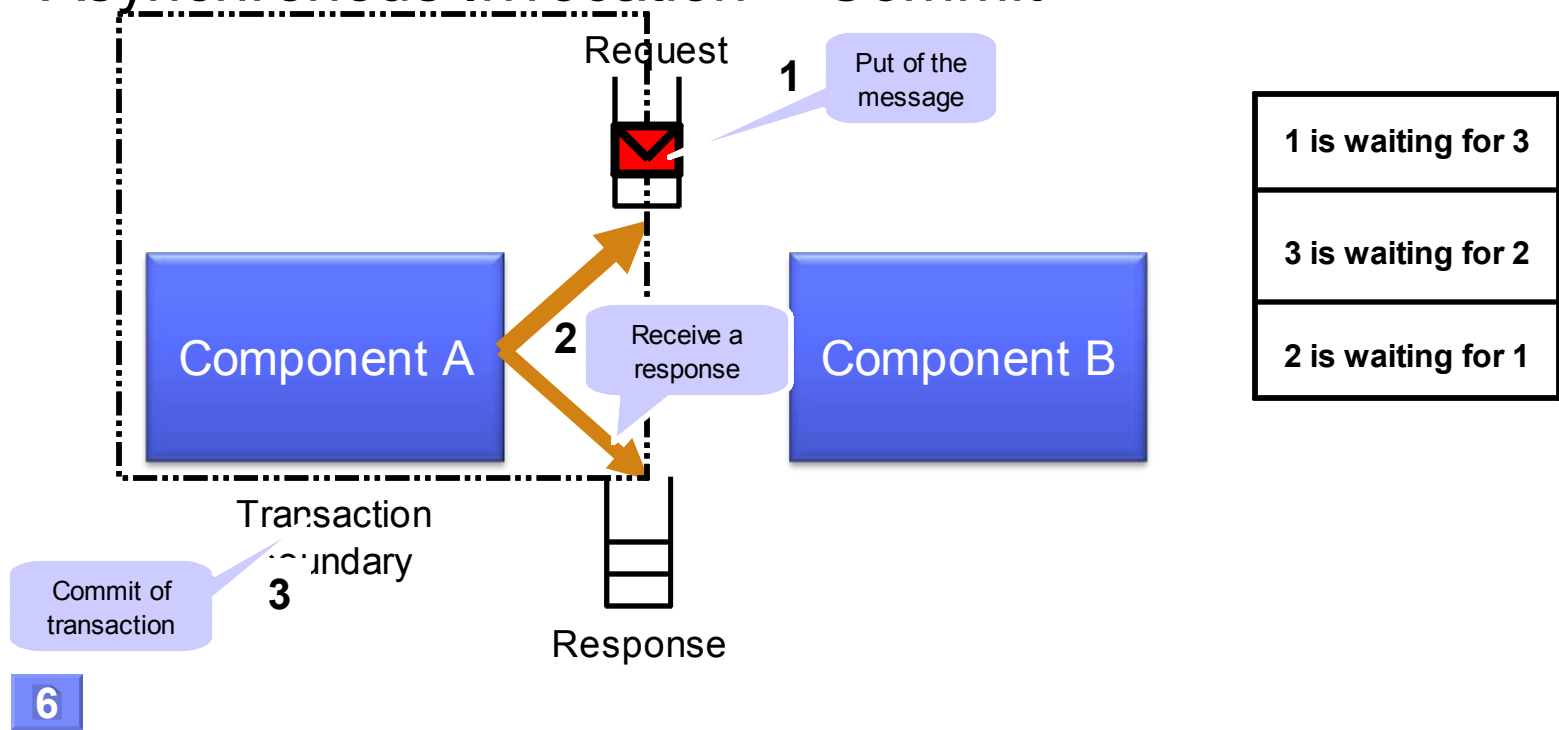
Example: Deadlock

- Asynchronous Deferred Response



Example: Deadlock

- Scenario: Request and response are located within the same transaction
- Asynchronous Invocation = Commit

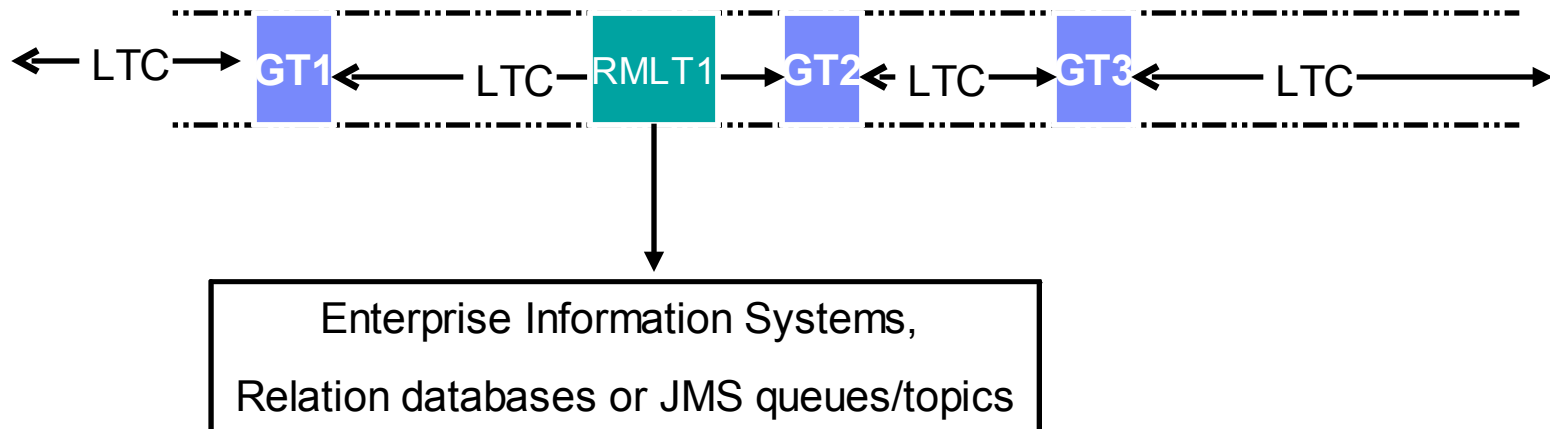


Example: Deadlock

- Asynchronous Invocation = Call, but this can cause an issue with duplicate messages.
- Review the article (6) in the references section for correct usage of this invocation style.

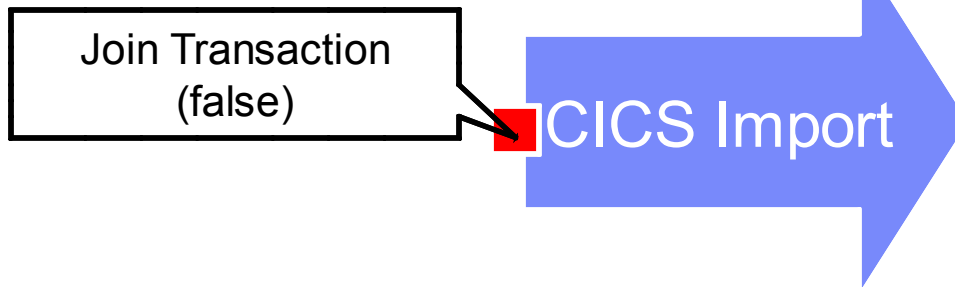
Example: CICS

- Global Transaction, Local Transaction Containment (LTC) and Resource Manager Local Transaction



Example: CICS

- Requirement: No active J2EE transaction while the Java EE Connector Architecture (JCA) Adapter for CICS is called



- Set the Resolver attribute to Application in the Enterprise JavaBeans (EJB) deployment descriptor

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Summary

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References

- 1 Transactions
- 2 An introduction to transactions
- 3 SCA asynchronous invocation patterns in depth
- 4 Invocation Styles
- 5 Qualifiers
- 6 Asynchronous processing in WebSphere Process Server
- 7 ECI_EXTEND_MODE in JCA Adapter for CICS
- 8 WebSphere and CICS

Additional WebSphere Product Resources

- Discover the latest trends in WebSphere Technology and implementation, participate in technically-focused briefings, webcasts and podcasts at:
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- Join the Global WebSphere User Group Community:
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- Access key product show-me demos and tutorials by visiting IBM® Education Assistant:
<http://www.ibm.com/software/info/education/assistant>
- View a webcast replay with step-by-step instructions for using the Service Request (SR) tool for submitting problems electronically:
<http://www.ibm.com/software/websphere/support/d2w.html>
- Sign up to receive weekly technical My Notifications emails:
<http://www.ibm.com/software/support/einfo.html>

Questions and Answers