



# Using WebSphere Application Server Optimized Local Adapters (WOLA) to migrate your COBOL to zAAP-able Java

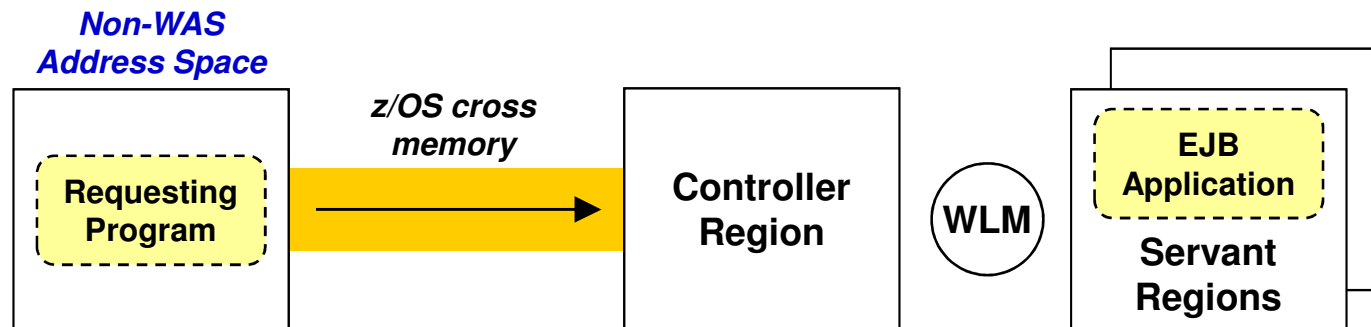
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IBM

August 13, 2013  
13644



# WebSphere Optimized Local Adapters

*Level setting : What is WOLA? – calling in to WAS*

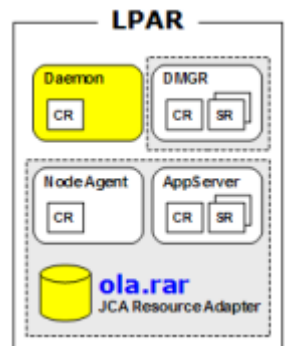


## Overview and Considerations:

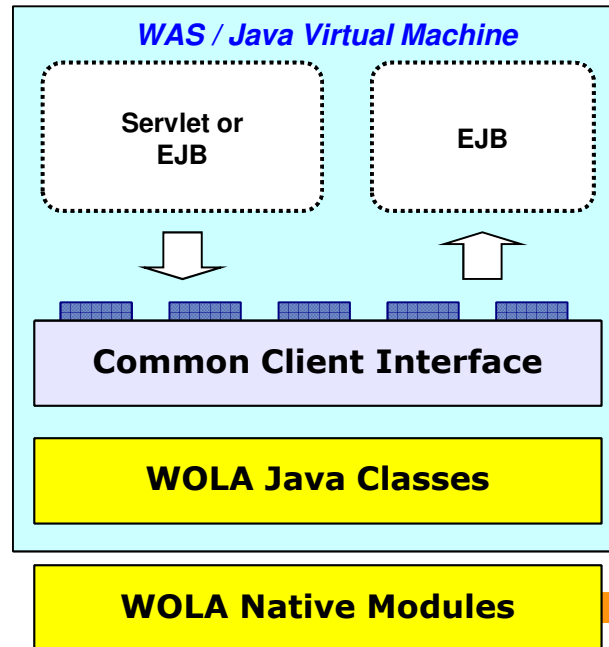
- **WAS z/OS exclusive ... exploits z/OS cross-memory services**  
*Very fast with a minimum of latency and overhead*
- **Non-WAS address space: CICS, IMS, Batch Program**  
*Must be on same z/OS LPAR as target WAS z/OS application server*
- **Target application in WAS is a stateless EJB**  
*That implements interfaces using supplied WOLA class libraries*
- **Requester program uses supplied APIs to invoke target and get response**

# WebSphere Optimized Local Adapters

*Level setting : What is WOLA? – it's bi-directional*



*More detail* →

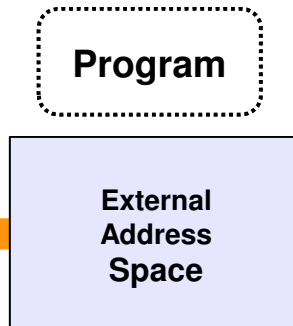


## Inbound

- Must be Stateless Session EJB
- Must implement `execute()` and `executehome()` using WOLA class files

## Outbound

- Servlet or EJB
- Use standard CCI methods
- Pass in key parameters related to WOLA (i.e. register name, target program name)
- WOLA specifics are generally well hidden from the application



# WebSphere Optimized Local Adapters

## Level setting : What is WOLA? – Environments supported

EJBs that initiate a call to WOLA do so through a supplied JCA adapter. Several WOLA-specific methods used to invoke services over WOLA

A Batch program that wishes to initiate an outbound connection must write to the WOLA APIs

### WebSphere Environment

Enterprise Java Bean  
(Or Servlet)

Enterprise Java Bean

WOLA JCA Adapter

WOLA Execute ()  
ExecuteHome ()

EJBs that will be the target of inbound calls need to implement the WOLA-supplied Execute() and ExecuteHome() classes.

Calls into CICS come across WOLA-supplied BBO\$/BBO# task and transaction. Target CICS program unchanged if able to be invoked over COMMAREA or Channel/Container

### Batch Environment

Batch Program

WOLA Modules/APIs

**WOLA**

WOLA BBO\$/BBO#

### CICS Environment

CICS Program

CICS Program

A CICS program that wishes to initiate an outbound connection must write to the WOLA APIs

### IMS Dependent regions

BMP/MPP/  
IFP

WOLA IMS  
ESAF

WOLA OTMA

A WAS application can call an existing unchanged IMS transaction using OLA over OTMA

You make modules/classes available: STEPLIB, DFHRPL, DFSESL, ola.rar and ola\_apis.jar

Batch

CICS

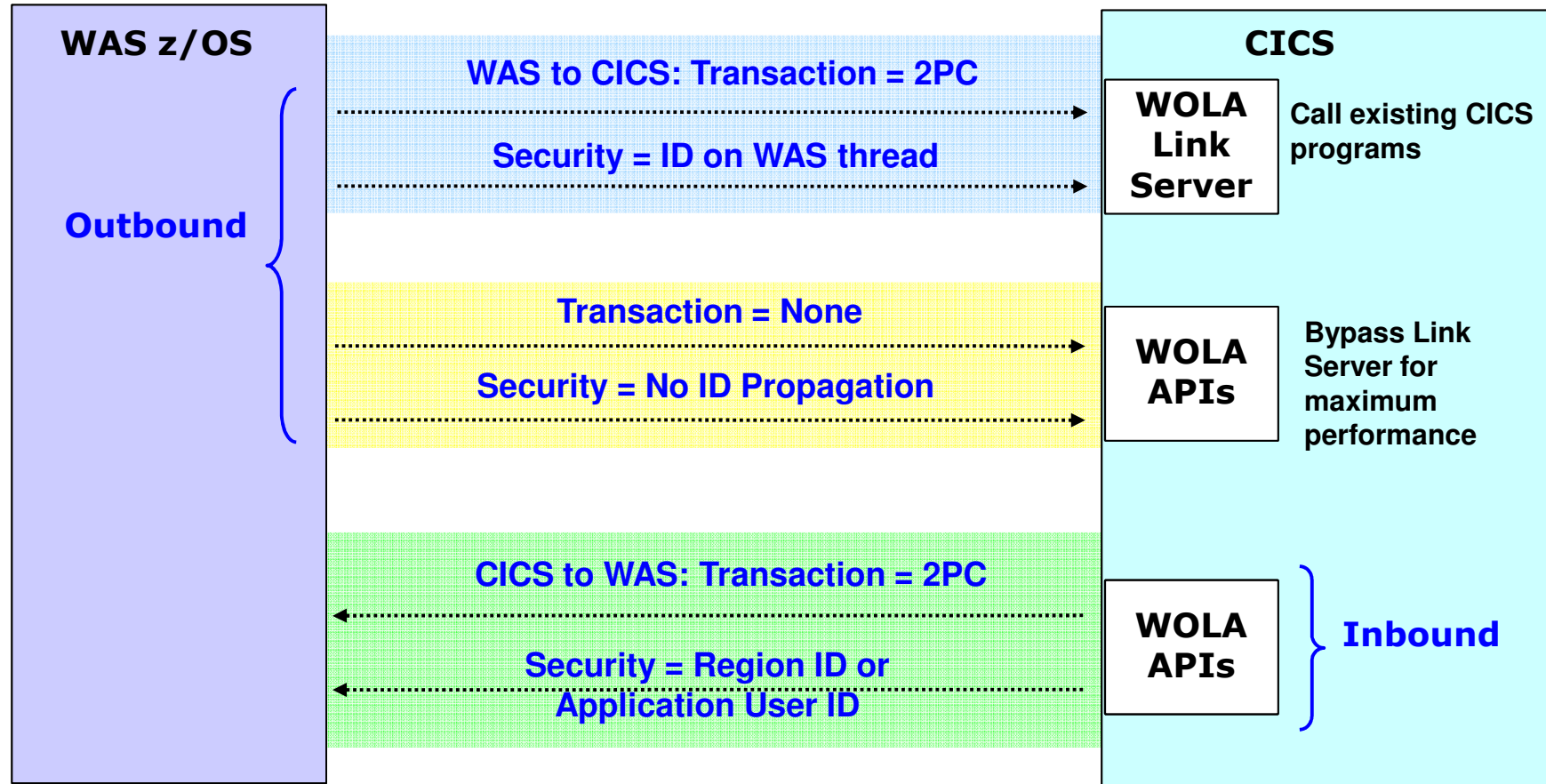
IMS

WAS

Development Tool

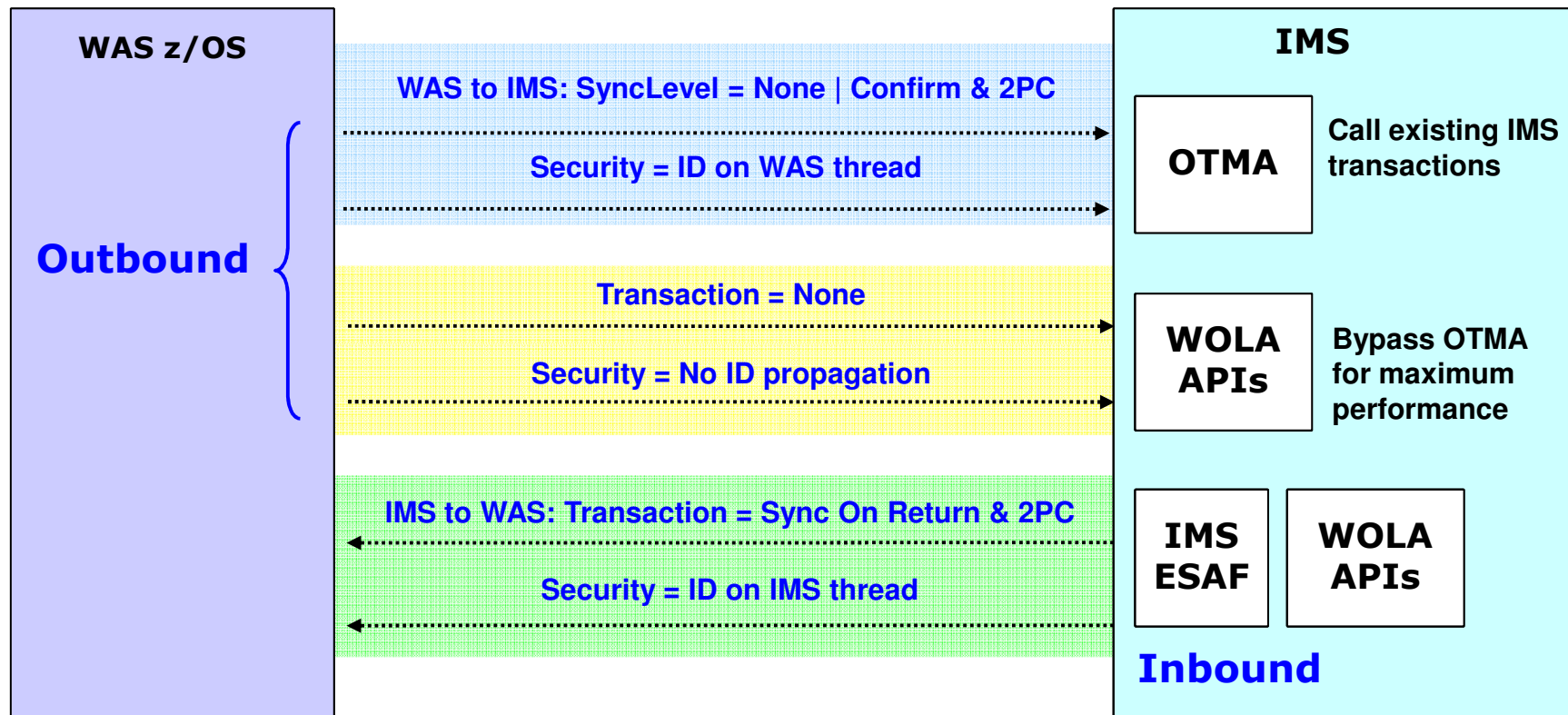
# WebSphere Optimized Local Adapters

*Level setting : What is WOLA? – CICS value add*



# WebSphere Optimized Local Adapters

*Level setting : What is WOLA? – IMS value add*



# WebSphere Optimized Local Adapters

*Level setting : Cobol (and other languages) / Java data binding*

- **Rational tools – RAD, RD/z**

*These tools are able to generate Java getter/setter helper classes from Cobol copybooks, PL/I include files and C header files. The getter/setters provide access to the byte array data and help in dealing with code page translation, etc. There is good collateral demonstrating this for WOLA (YouTube demos, etc).*

- **IBM Integrated Developer (IID- formerly WID)**

*This tool was enhanced to allow for assets in CICS, IMS and batch to be included in Process Server (BPM) and WESB business flows and WOLA is used for the transport (ie: means existing apps can be called in a process flow over WOLA without having to actually write any code in WAS).*

- **More coming in this space soon ...**

# New workloads exploiting offload technology



*Examples of real world re-engineering projects with WAS z/OS and WOLA that are driving new work onto specialty engines on z/OS ...*



# Customer Examples

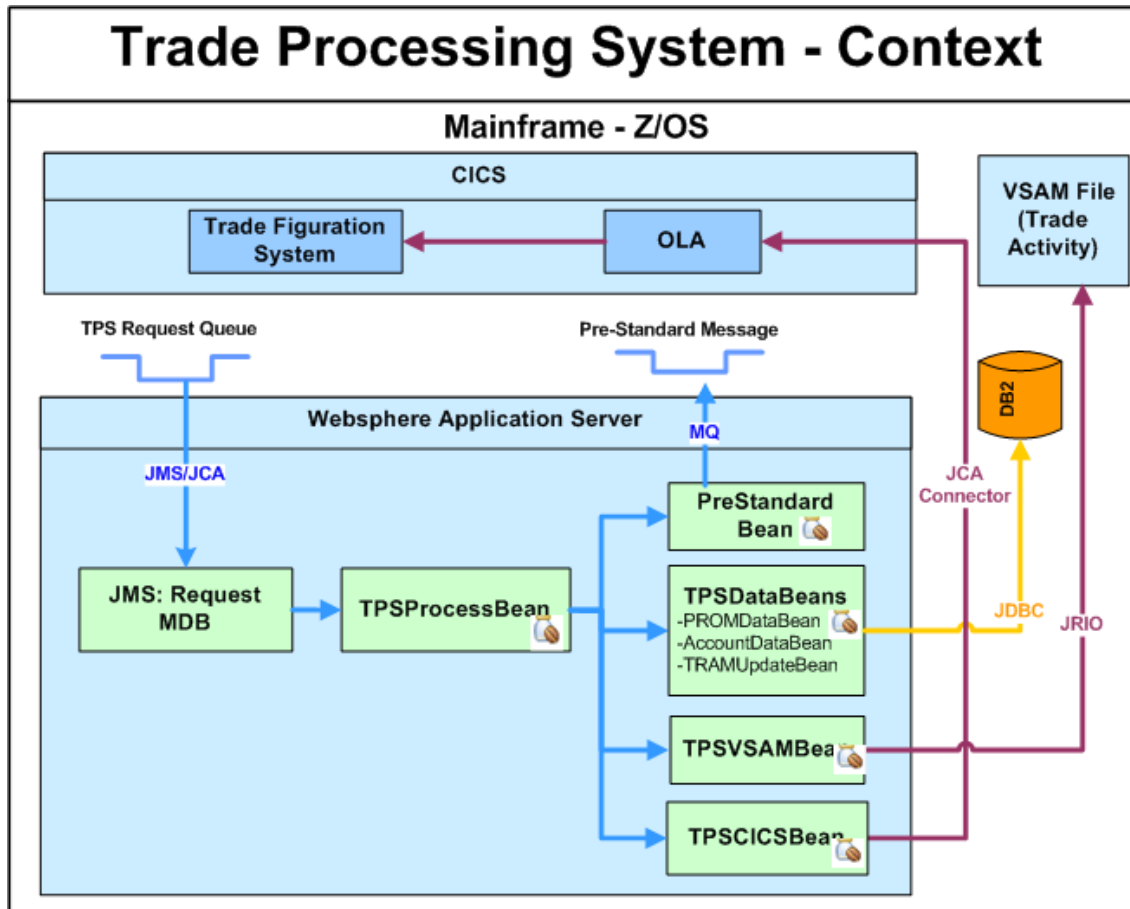
## *Large U.S. financial company's internal study on zAAP/zIIP offload*

### Background – Why Specialty Engines?

- Reduce total cost of ownership for our applications.  
'Trade Processing System' (TPS) is one of our most expensive applications
  - Cost for hardware and software charge back: multi-million a year
- Address Mainframe Capacity concerns
  - High Volume Application: TPS processes multi-million trades a day
  - Mainframe CPU utilization reaching 100%
- Depends on other legacy mainframe applications
  - Data sources needed for processing (i.e., Account details, security master and others) are all on mainframe
  - Downstream system: position and balance system, settlement systems are all on mainframe

# Customer Examples

*Large U.S. financial company – target application*



**TPSCICSBean uses WOLA JCA adapter to access local CICS region**

# Customer Examples

## *Large U.S. financial company - results*

### Two applications are now running in production

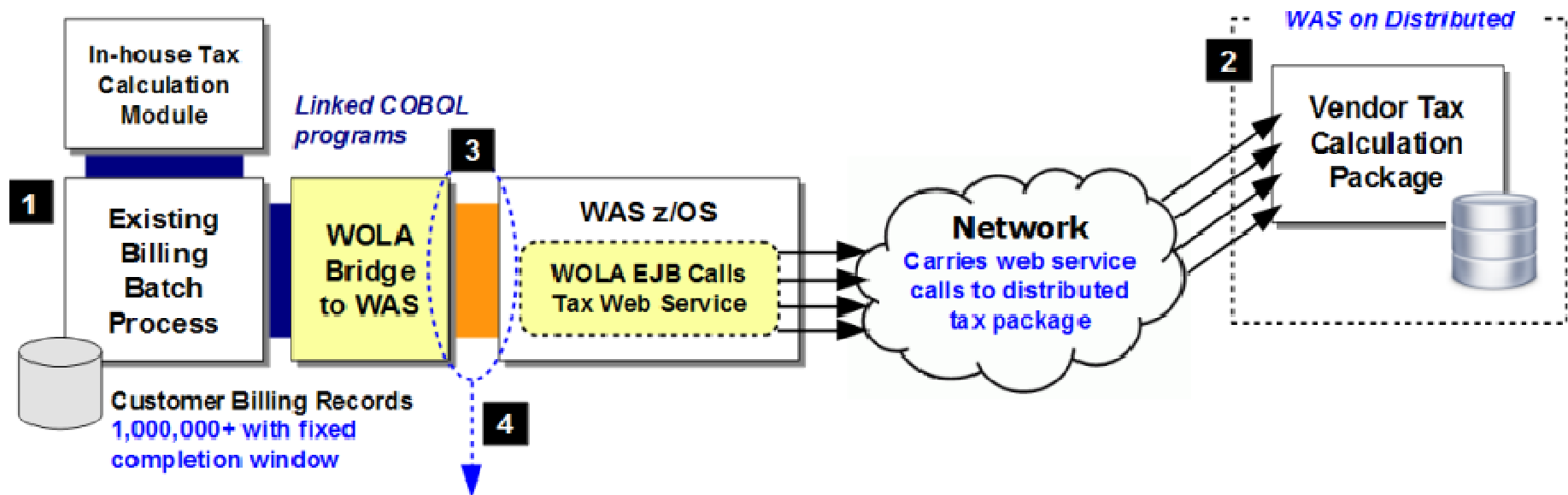
- Total CPU via JAVA and CICS are very similar with less than 5% difference.
- CICS GP MIPS have converted into 26% JAVA GP MIPS and 74% JAVA zIIP MIPS on average
- DB2 GP MIPS are reduced to 60% with 40% zIIP MIPS

### 2012 TCO Reduction Template

	CICS GP	DB2 GP	JAVA GP	JAVA zIIP	DB2 zIIP	Reduction in GP CPU
CICS Application	428 MIPS	572 MIPS				
Java Application		342 MIPS	130 MIPS	300 MIPS	228 MIPS	47.2%

# Customer Examples

## Large U.S. Telecommunications Company – Cobol batch to Java



### Advanced inbound APIs with asynchronous control

Asynchronous because COBOL is single-threaded and web service call to external tax package is the slowest link. Asynchronous APIs allows COBOL to get program control immediately.

### 150 connections kept loaded with work and busy

Maximum connections over WOLA to EJB. All 150 loaded up with work requests. COBOL then loops through array to see if response received. If so, then process back results and load that connection with another request. Connections kept fully busy in this manner.

### Multi-threaded Java then parallelized web service calls

WAS z/OS and WAS distributed are multi-threaded. Given sufficient processing capacity, the work requests from COBOL may then be handled in a parallel execution fashion.

# Customer Examples

## Large U.S. investment bank – WOLA round robin routing

### Environment Variable

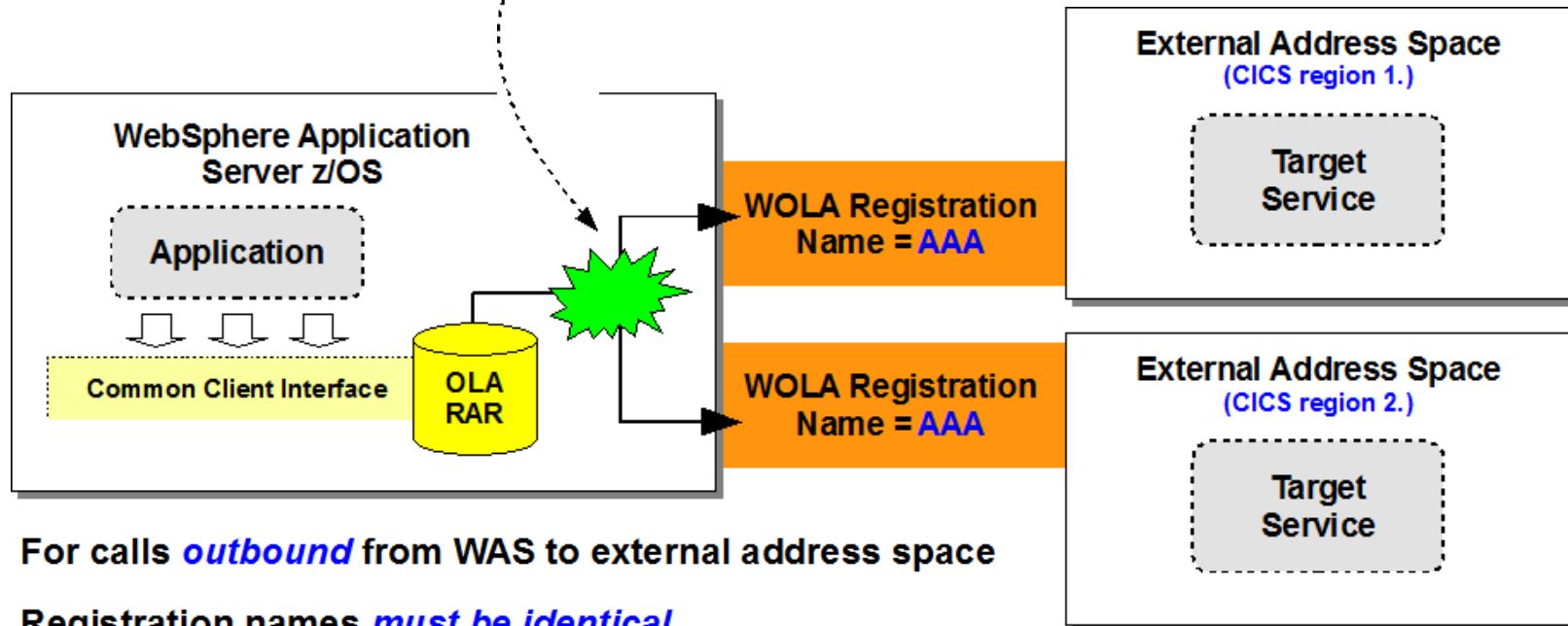
`ola_locate_service_search_algorithm`

1

The last external address space to register in gets work

2

Round-robin across like-named registrations



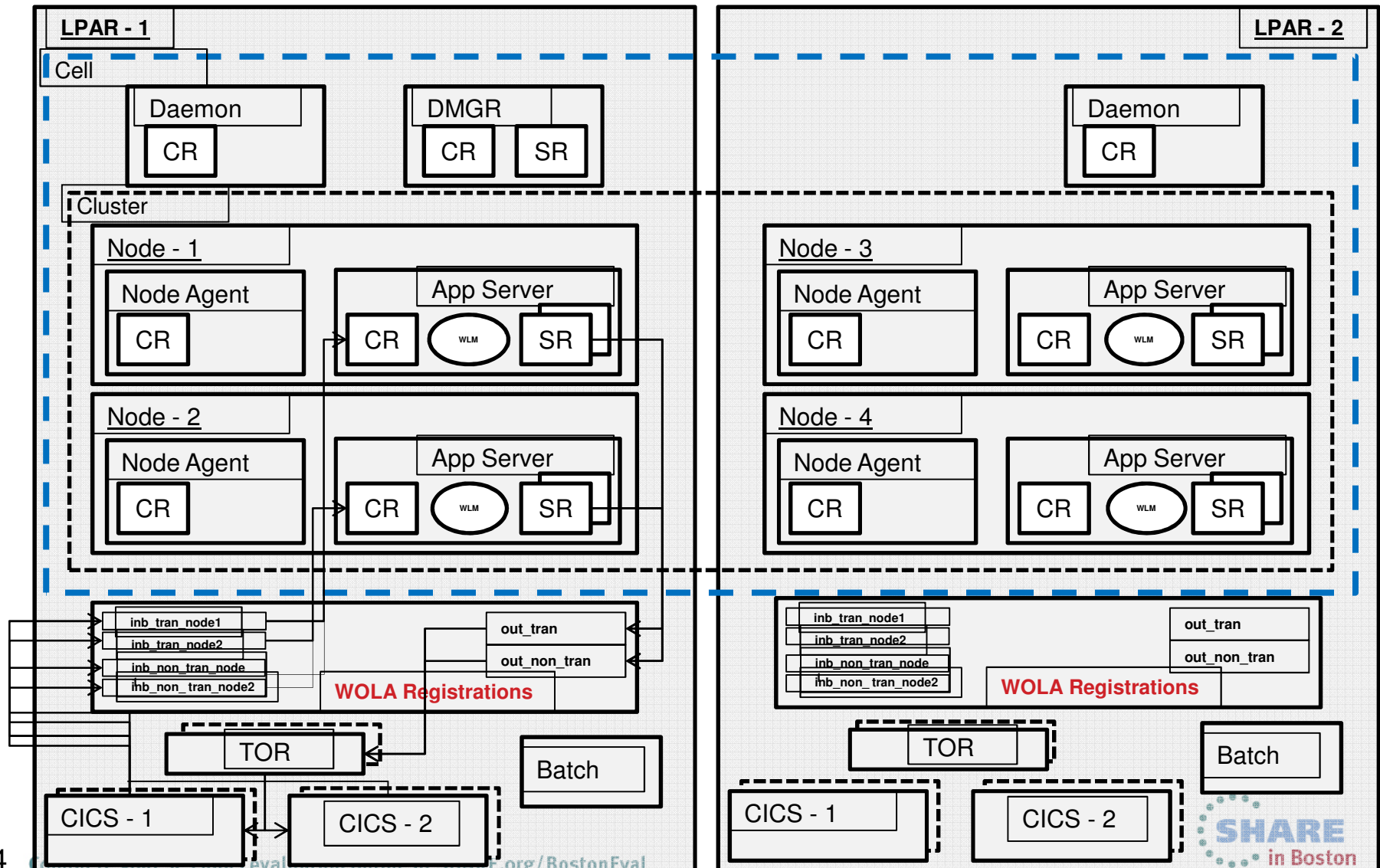
For calls *outbound* from WAS to external address space

Registration names *must be identical*

Targeted service must be present in address spaces participating in the work distribution

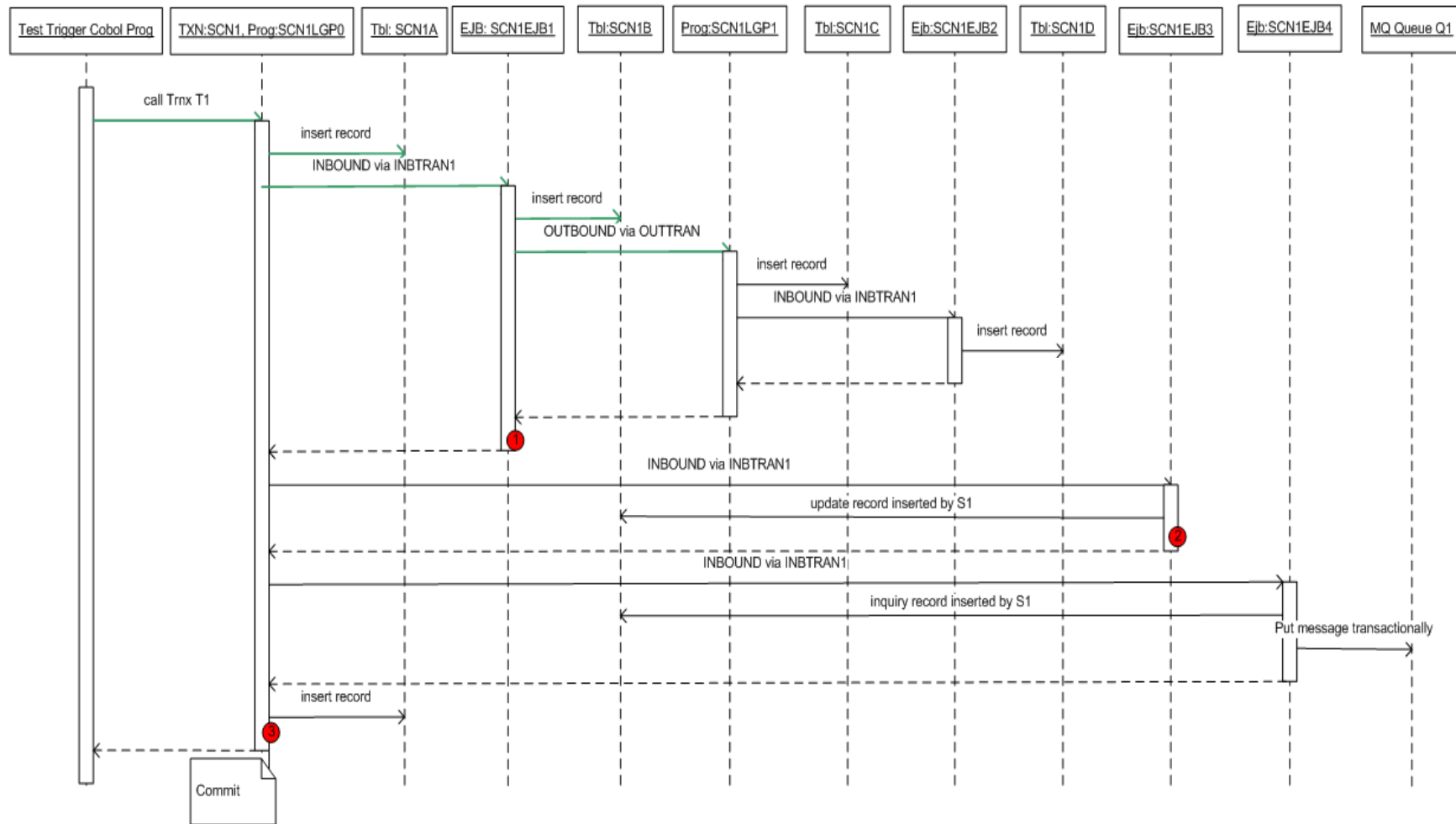
# Customer Examples

## Large Turkish Bank – WAS/CICS global transactions



# Customer Examples

## Large Turkish Bank – WAS/CICS global transactions



# WebSphere z/OS and Java batch Collateral



Topic	Link
<b>Guide to WebSphere on z/OS Collateral</b> –Updated master list of links to collateral	<a href="http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102205">http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102205</a>
<b>WebSphere Java Batch</b> –Overview and z/OS Specifics –Presentation, whitepaper, videos	<a href="http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101783">http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101783</a>
<b>Why WAS for z/OS</b> –Executive Brochure –History of release enhancements –Technical Presentation, videos	<a href="http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101532">http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101532</a>
<b>WAS for z/OS Liberty Profile</b> –Executive Brochure –Quick Start Guide and Samples	<a href="http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102110">http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102110</a>
<b>WebSphere Optimized Local Adapters (WOLA)</b> –Overview, whitepapers, videos –History of WOLA updates	<a href="http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101490">http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101490</a>
<b>Training – z/OS Wildfire Workshops</b> –WAS for z/OS v8.5 –WebSphere Compute Grid (Batch)	<a href="http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1778">http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS1778</a>
<b>WebSphere on z Virtual User Group</b> –Join the User Group –Download previous webcasts	<a href="http://www.websphereusergroup.org/zos">http://www.websphereusergroup.org/zos</a>



# WebSphere Application Server on z/OS

## Share Sessions



Day	Time	Room	#	Title	Speaker
Monday	9:30	203	13597	Getting Started with WebSphere Liberty Profile on z/OS	David Follis
Monday	4:30	203	13600	Managing Server Output from WAS on z/OS	Mike Loos
Tuesday	9:30	203	13644	Using WAS Optimized Local Adapters (WOLA) to migrate your COBOL to zAAP-able Java	Jim Mulvey
Tuesday	11:00	203	13640	Need A Support Assistant? Check Out IBM's! (ISA)	Mike Stephen
Tuesday	1:30	207	13953	What Would Life Be Like If You Ran Your Internet Applications On z/OS?	Ed McCarthy
Tuesday	3:00	203	13641	zWAS: In Real Life	Rod Feak
Wed.	1:30	202	13601	Lab: WebSphere Liberty Profile on z/OS	everybody
Thursday	11:00	203	13598	Getting Started With Compute Grid	John Hutchinson
Thursday	3:00	203	13645	Configuring Security for Liberty	Mike Loos

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