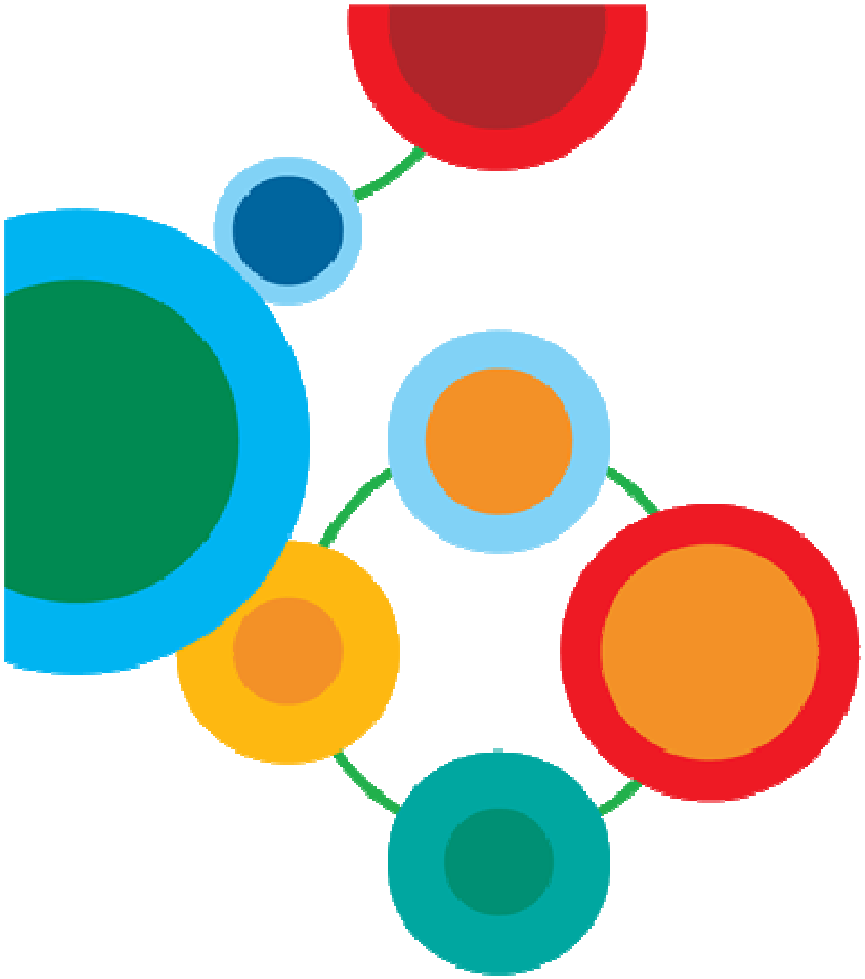


How to improve the communication between distributed and « z »

IMS-2821

Anne-Marie GRABETTE, development project manager, BNP Paribas

Eric BARTOLONE, development tools team leader , BNP Paribas

Isabelle BRUNEEL & Shyh-Mei HO, IBM. Software Group

IBM Software

Information On Demand 2011

Agenda

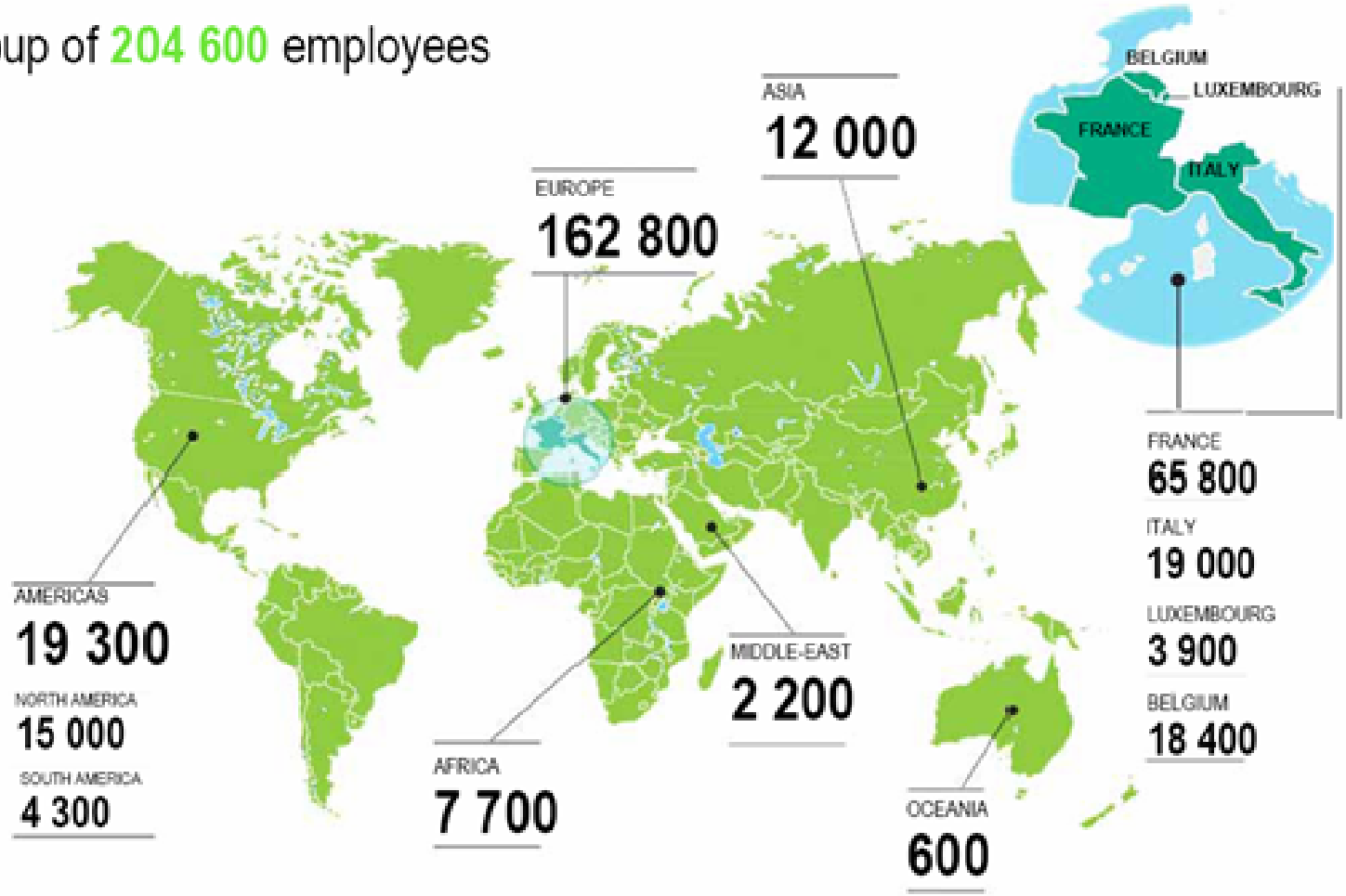
- ✓ BNP Paribas group brief overview
- ✓ Context, goal, needs
- ✓ Studies
  - ✓ IMS Soap Gateway
  - ✓ IMS TM RA
  - ✓ WOLA
- ✓ Questions, comments, and suggestions

BNP Paribas Group Story

Year	1999		2000	Mars 2011
	BNP	PARIBAS	BNP PARIBAS	BNP PARIBAS
Number of Employees	**50 000**	**30 000**	**80 000** (Including 55 000 in France)	**204 600**
International presence	France, North African countries, India, Hong Kong…	**Main Financial Markets:** London, New York, Frankfurt, Paris,…	**83 countries**	**81 countries**
Activities	Retail Corporate Banking	Investment Banking Specialized Financial Services	Retail Corporate & Investment Banking Specialized Financial Services Asset Management & Services	Retail Banking Corporate & Investment Banking Investment Solutions

Staff By Geographical Areas

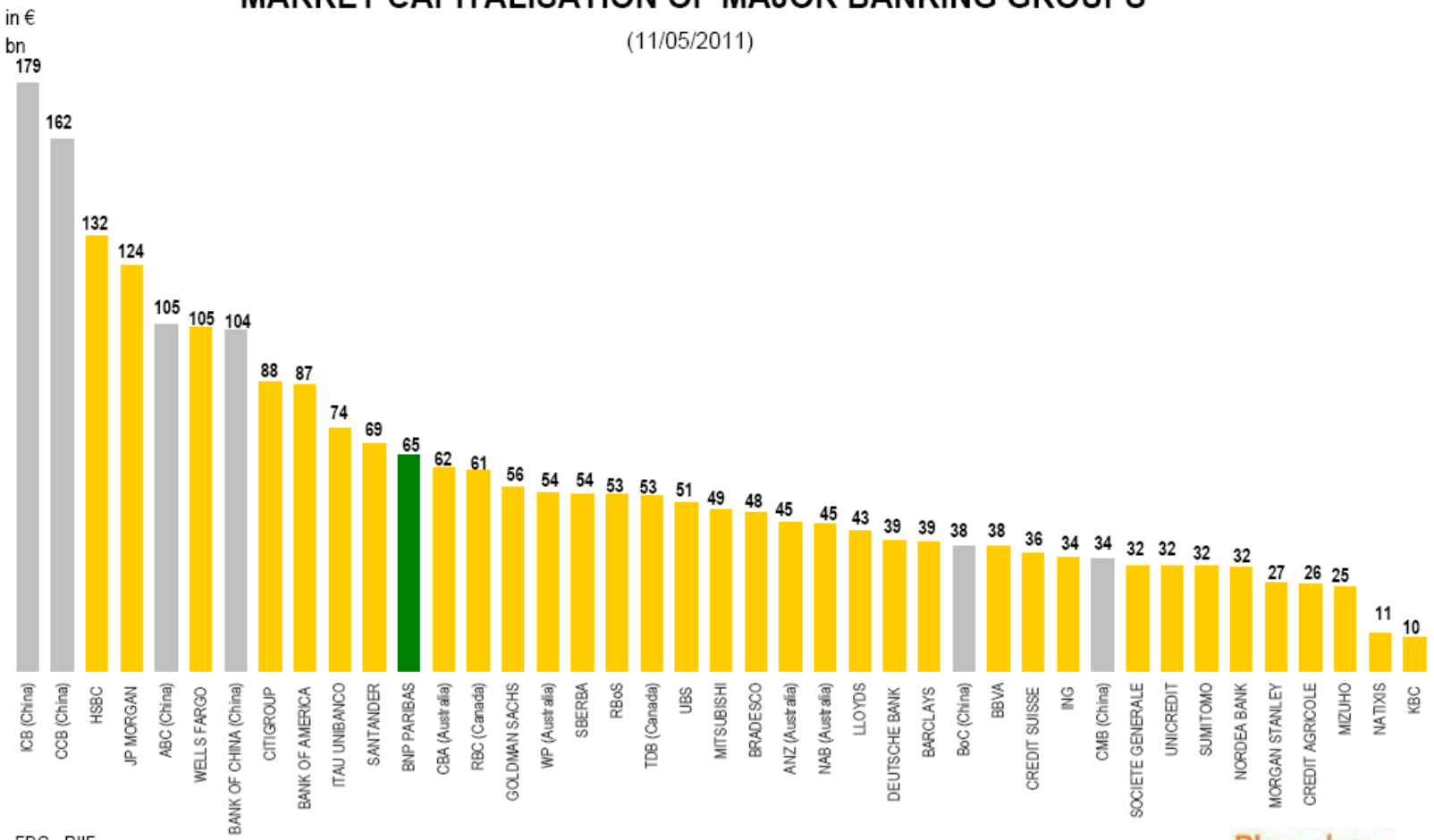
A group of 204 600 employees



Market Capitalization

MARKET CAPITALISATION OF MAJOR BANKING GROUPS

(11/05/2011)



FDG - RIIF

Source : Bloomberg

A Corporate Culture of Openness and Cohesion, Founded on Common Values

Responsiveness

- ***Speed*** *in the assessment of new situations and developments, and in identifying opportunities and* ***risks***
- ***Efficiency*** *in decision making and in* ***action***

Creativity

- *Encouraging* ***initiatives*** *and new* ***ideas***
- ***Recognising*** *contributions*

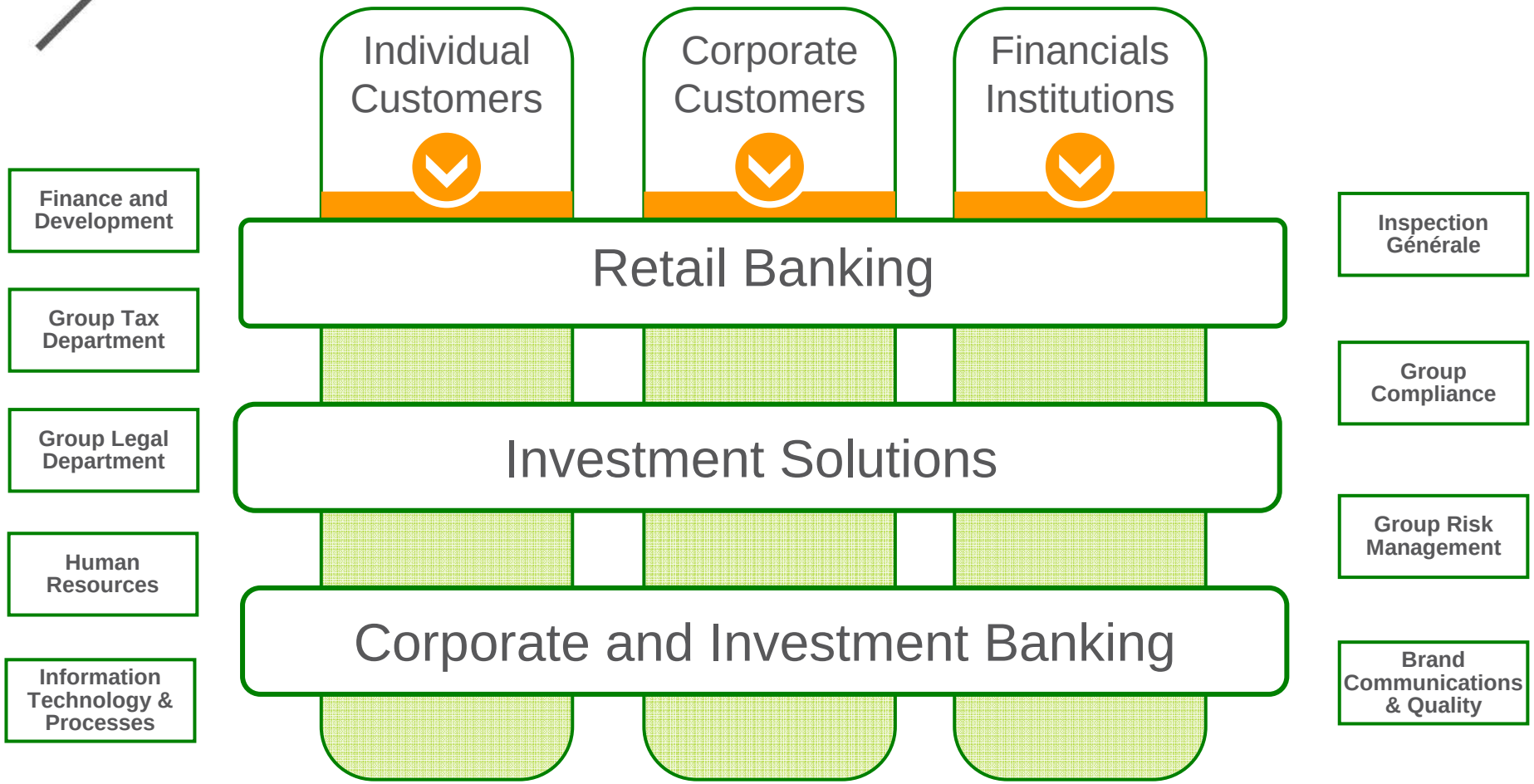
Commitment

- ***Commitment*** *to the service of clients and collective accomplishment*
- ***Exemplary*** *behaviour*

Ambition

- *Aspiration for* ***challenge*** *and* ***leadership***
- *Desire to obtain* ***team success*** *in the* ***competition*** *where the referee is the* ***client***

An Integrated Business Model



*"…Because it is diversified but integrated and focused on customers' needs and demands, this business model has turned out to be robust in a time of crisis and capable of generating the capital necessary to play a supporting role in the economic recovery…" » **B. Prot***

Investment Solutions
Professionals and Services Dedicated to Investors

- 29,900 employees
- Strong international presence in Europe and abroad
- Business Units:

BNP PARIBAS CARDIF

BNP PARIBAS REAL ESTATE

BNP PARIBAS INVESTMENT PARTNERS

BNP PARIBAS SECURITIES SERVICES

BNP PARIBAS PERSONAL INVESTORS

BNP PARIBAS WEALTH MANAGEMENT

Corporate and Investment Banking
Local Solutions for Global Activities

- 20,400 employees in 52 countries
- A powerful client-driven business model
- First-class core products and services:
  - Global leadership in Financing
  - A European powerhouse in Capital Markets
  - A world leader in Derivatives
  - A dynamic Advisory franchise in Europe and Asia
- A reinforced leadership in Europe and in those countries where our CIB platform is the strongest.

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Context

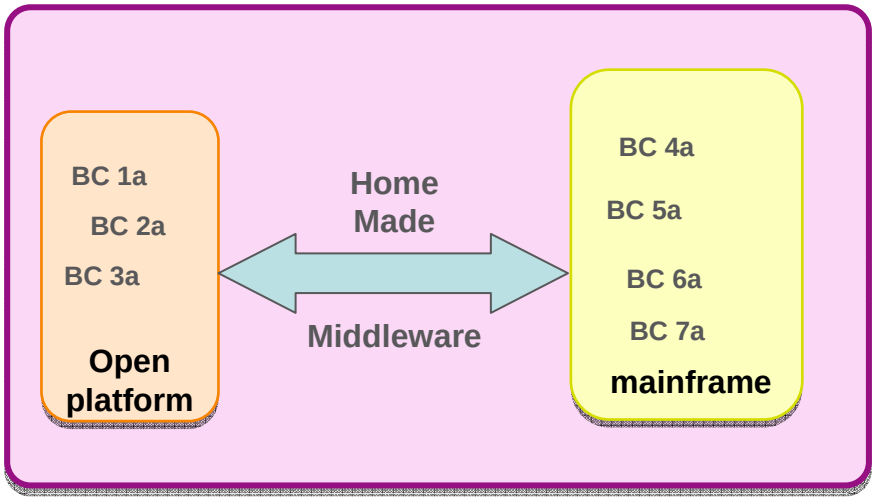
- ✓ BNP Paribas still needs mainframes :
  - ✓Powerful computer
  - ✓Huge number of computation
  - ✓Data warehousing
  - ✓High performance
  - ✓High availability
- ✓ But we use more and more distributed processes.
- ✓ We have to manage these exchanges between « z » and distributed, i.e. INTEROPERABILITY

Main Lines of Business

Main Lines of Business (LOB) using IMS TM/DB

- Retail Banking France – SEHD
  - 4 Way IMSPlex with Shared Queue
  - IMS TM: 32M tr/day, 45 M tr/day peak**, 1200** tr/sec peak
  - IMS DB: 245 DB
  - DB2: 17200 tables
- Retail Banking Belgium – Fortis
  - 4 Way IMSPlex with Shared Queue
  - IMS TM: 38M tr/day, **1350** tr/sec peak
  - IMS DB: 6000 DB
  - DB2: 9000 tables (prod)
- Retail Banking Italy – BNL
  - CICS: 12M tr/day & IMS TM: 3.5M tr/day
  - IMS DB: 2414 DB
  - DB2: 37000 tables (prod)

Today's Architecture



BNP PARIBAS — GOAL based on IMS Connect

BNL GRUPPO BNP PARIBAS — NBA based on CTG

BNP PARIBAS FORTIS — PROXIMA based On MQSeries

BC : Business Component

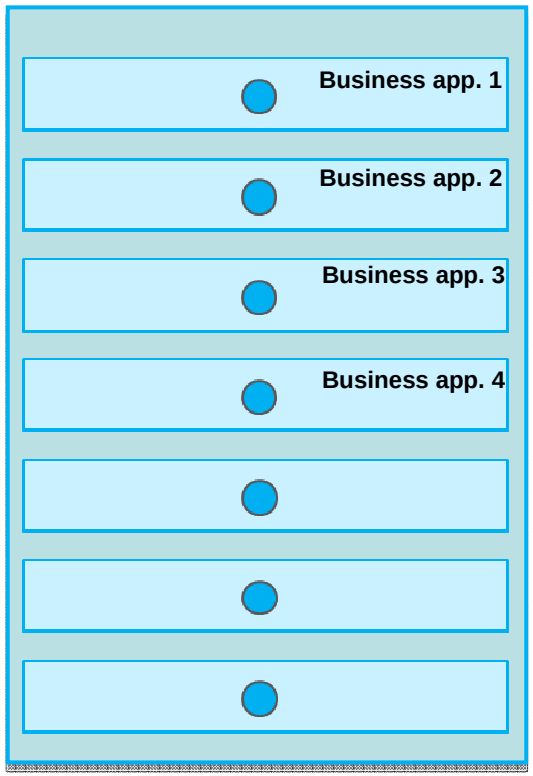
Develop once, Run everywhere

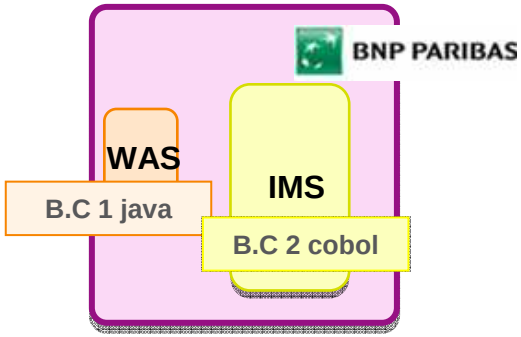
Implement business components “easily called” and able to run everywhere

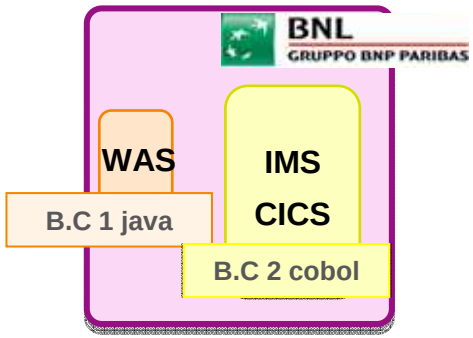
The challenge :

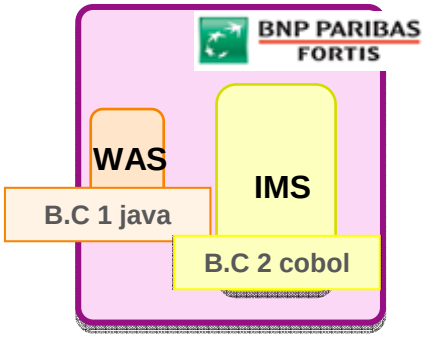
- No limitation about the platform to use, legacy and distributed
- No “HOME MADE” solutions
- Compliant with high availability

Future Architecture





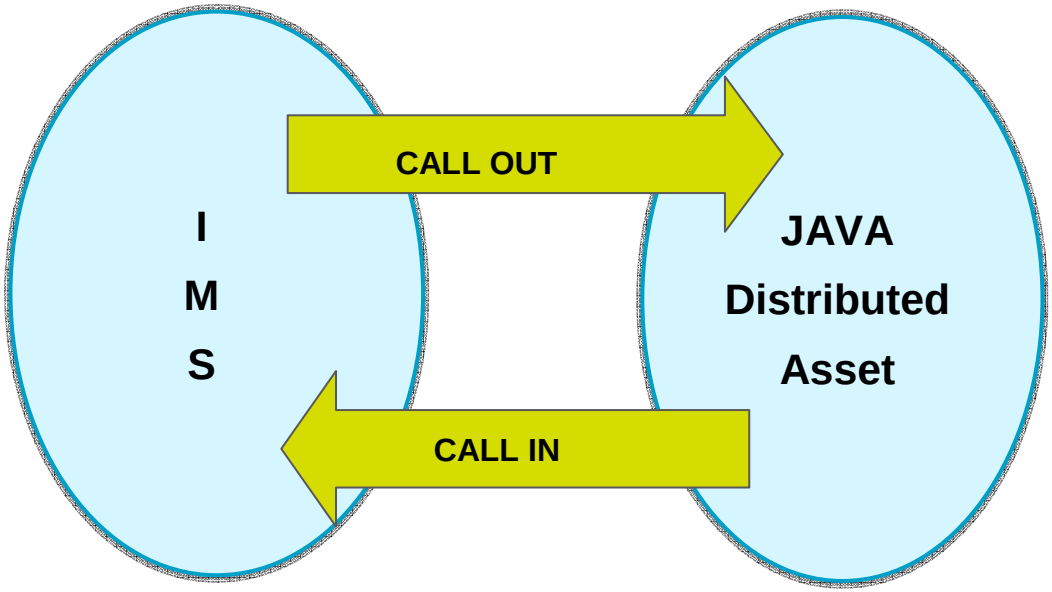




Needs and requirements

- ✓ High performance
- ✓ Avoid, as much as possible, intrusion into existing application code
- ✓ Same functionality
- ✓ Same safety
- ✓ Reliability, availability and scalability
- ✓ Improved, sustainable, standard and perennial solutions
- ✓ Data conversion between « z » and distributed
- ✓ Spreadable solution everywhere in I.T.

Scope and definitions



- Distant calls : provider and requester are on different computers
- Local calls : provider and requester are on the same computer

3 solutions tested

	CALL IN	CALL OUT
Web Services via IMS Soap Gateway		
IMS TMRA		
WOLA		

Pre-requisites : IBM tools and products

Tool/product	Used version (at least)
AIX	6.1
z/OS	1.10
WAS on AIX	7.0
WAS on z/OS	7.0.0.12
IMS with IMS Connect	11
IMS Soap Gateway with IMS Suite Entreprise	V1.R1 (Fix pack 2)
Rational Developper for « z »	8.0
Rational Application Developper	7.5

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  - ✓ WOLA WebSphere Optimized Local Adapter
- ✓ Questions, comments, and suggestions

Web Services via IMS Soap Gateway

SOA is often defined as services exposed using the Web Services Protocol Stack

WSDL Web Services Description Language

- *XML-based service description describing the public interface to the service*

SOAP

- *Protocol for exchanging XML-based messages over a network (usually HTTP)*

HTTP

- *Protocol used to transfer information*

XML

- *Language for describing data in message payloads*

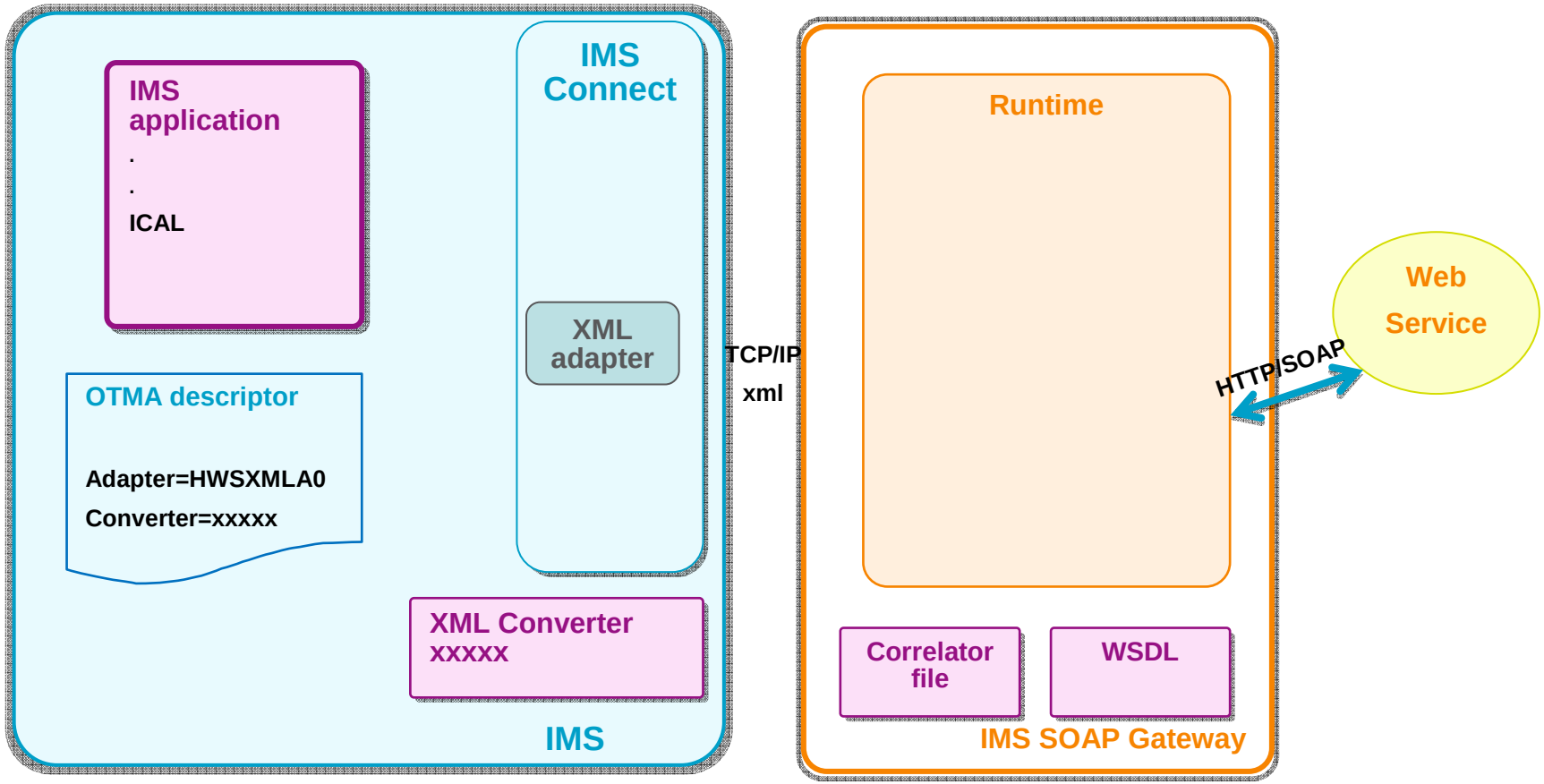
Web Services via IMS Soap Gateway

IBM gives solutions to IMS applications to communicate with distributed web services

SOA allows to expose existing IMS transactions as web services

The development tool RDz allows creation of the useful artifacts for the mapping COBOL vs. JAVA

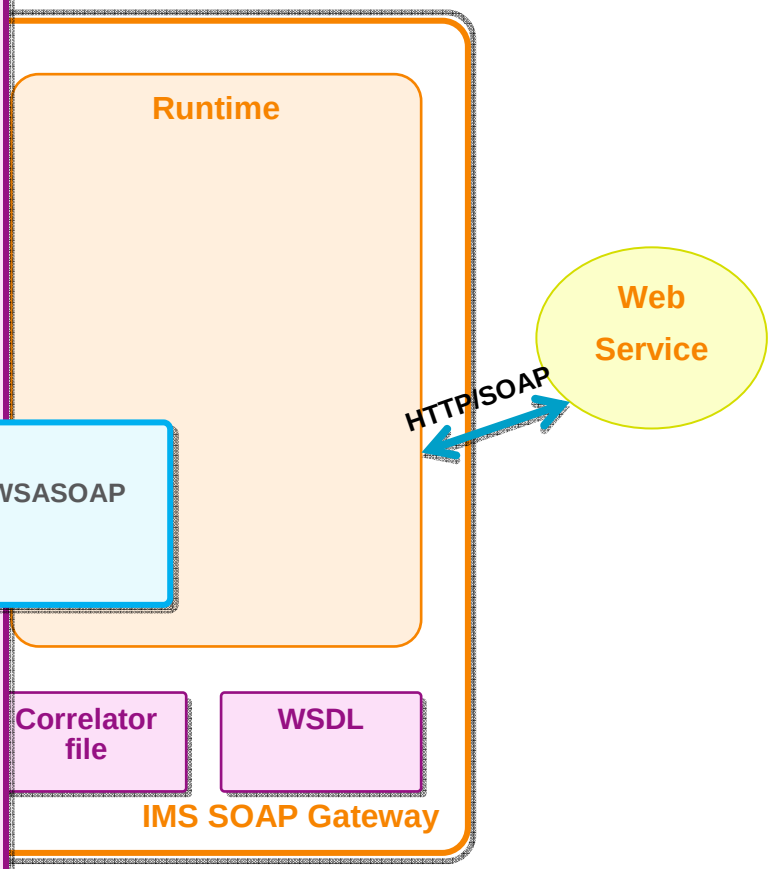
Web Services through IMS Soap Gateway – CALL OUT 1



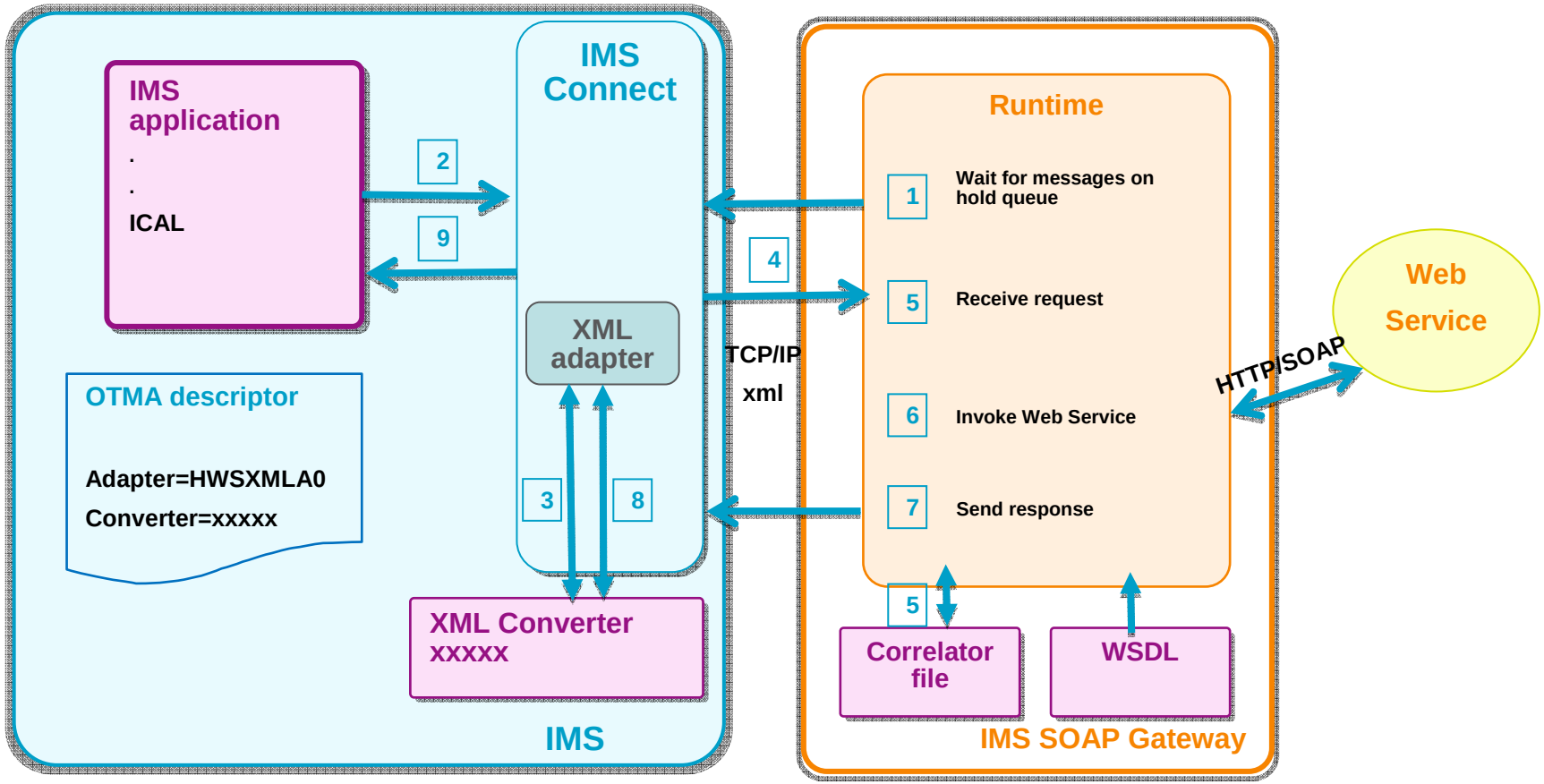
Web Services through IMS Soap Gateway – CALL OUT 2

```
01 AIB.
   05 AIBRID        PIC X(8) VALUE 'DFSAIB  '.
   05 AIBRLEN       PIC 9(9) BINARY.
   05 AIBSFUNC      PIC X(8) VALUE 'SENDRECV'.
   05 AIBRSNM1      PIC X(8) VALUE 'DESCNAME1'.
   05 AIBRSNM2      PIC X(8).
   05 AIBRESV1      PIC X(8).
   05 AIBOALEN      PIC 9(9) BINARY.
   05 AIBOAUSE      PIC 9(9) BINARY.
   05 AIBRSFLD      PIC 9(9) BINARY VALUE 0.
   05 AIBRESV2      PIC X(8).
   05 AIBRETRN      PIC 9(9) BINARY VALUE 0.
   05 AIBREASN      PIC 9(9) BINARY VALUE 0.
   05 AIB
   05 FILL
.
.
        MOVE LENGTH OF INPUT-MSG TO AIBOALEN.
        MOVE LENGTH OF AIB TO AIBRLEN.
        MOVE LENGTH OF OUTPUT-MSG TO AIBOAUSE.
        CALL 'AIBTDLI' USING ICAL,
                             AIB,
                             INPUT-MSG,
                             OUTPUT-MSG.
```

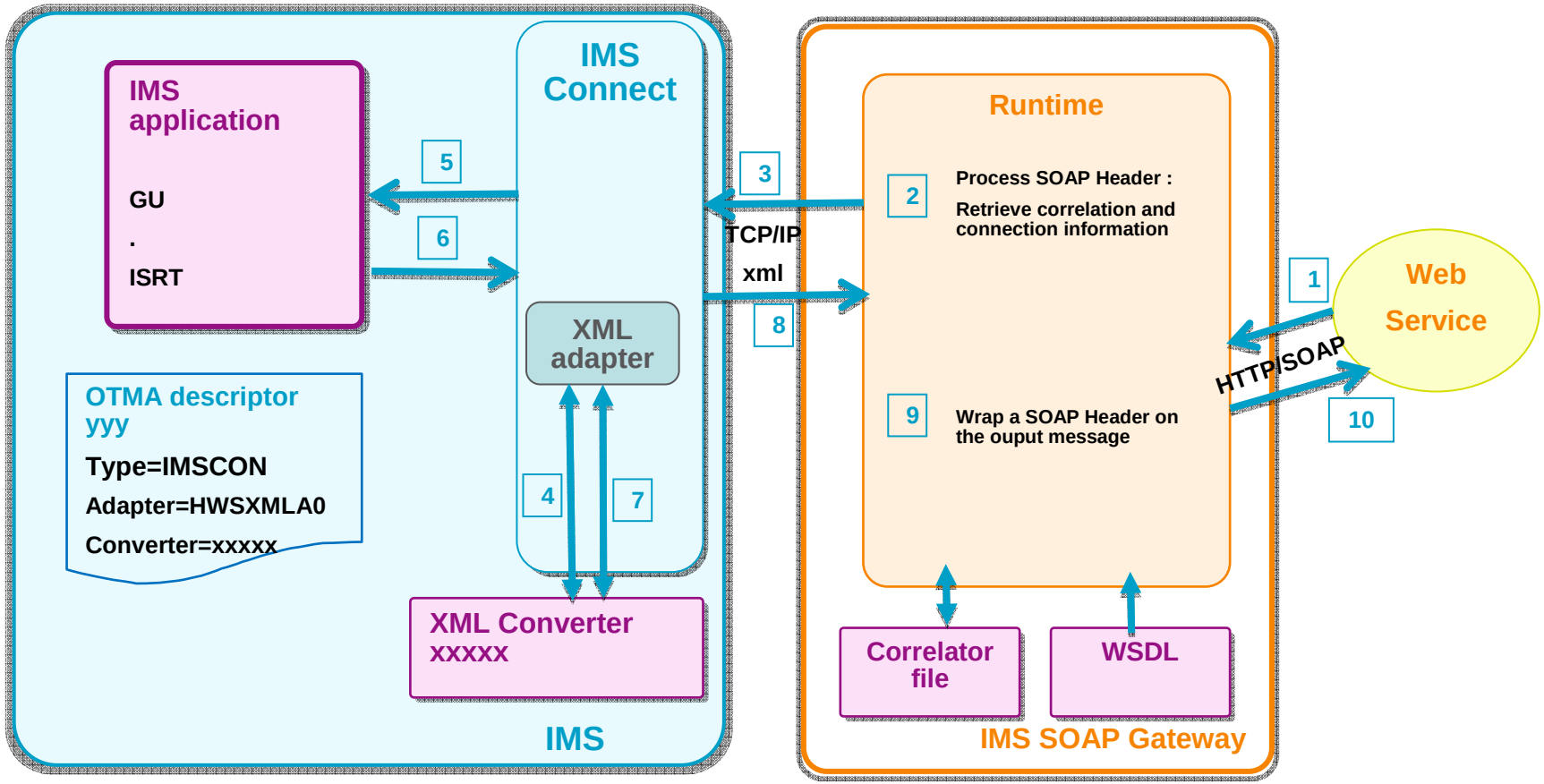
```
D DESCNAME1 TYPE=IMSCON TMEMBER=HWSAMEM1 TPIPE=HWSASOAP
D DESCNAME1 ADAPTER=HWSXMLA0 CONVERTR=PGMNAME1
```



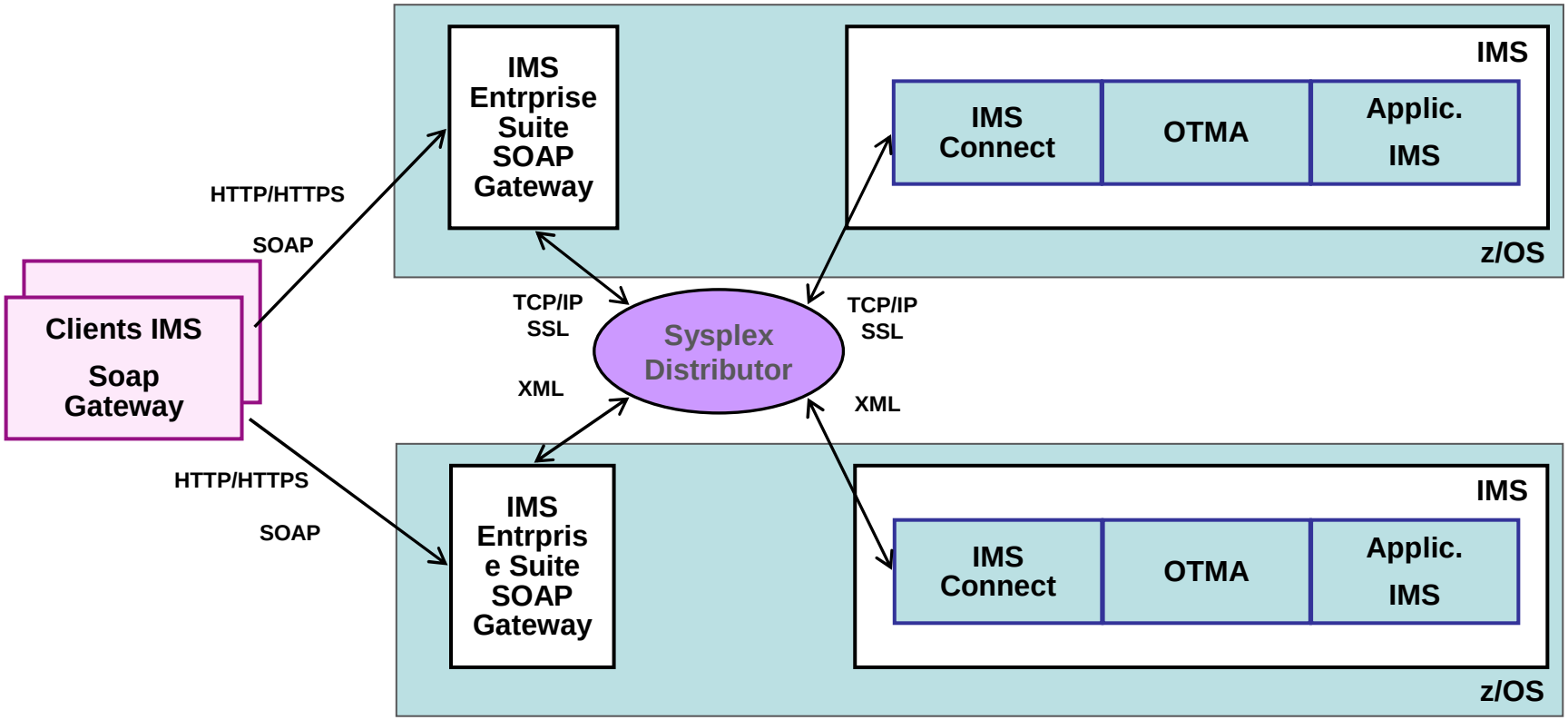
Web Services through IMS Soap Gateway – CALL OUT 3



Web Services through IMS Soap Gateway – CALL IN



IMS Soap Gateway And Sysplex



IMS Soap Gateway And Sysplex

Architecture # 1

2 instances IMS SOAP Gateway, 2 IMS Connect, 2 IMS

Scope : 2 partitions PROA and PROB

Per SOAP Gateway

- 1 single Connexion Bundle (*CalloutIMS*) having the same name with a different content on each partition
- 1 single descriptor file WSDL (*GOLSG01.WSDL*)
- 1 single correlator file XML (*GOLSG01.XML*)
- 1 single WEB service

Per IMS

- One single application (*GOLSG01*) with an OTMA descriptor having the same name but with a different content for each IMS

Per IMS Connect

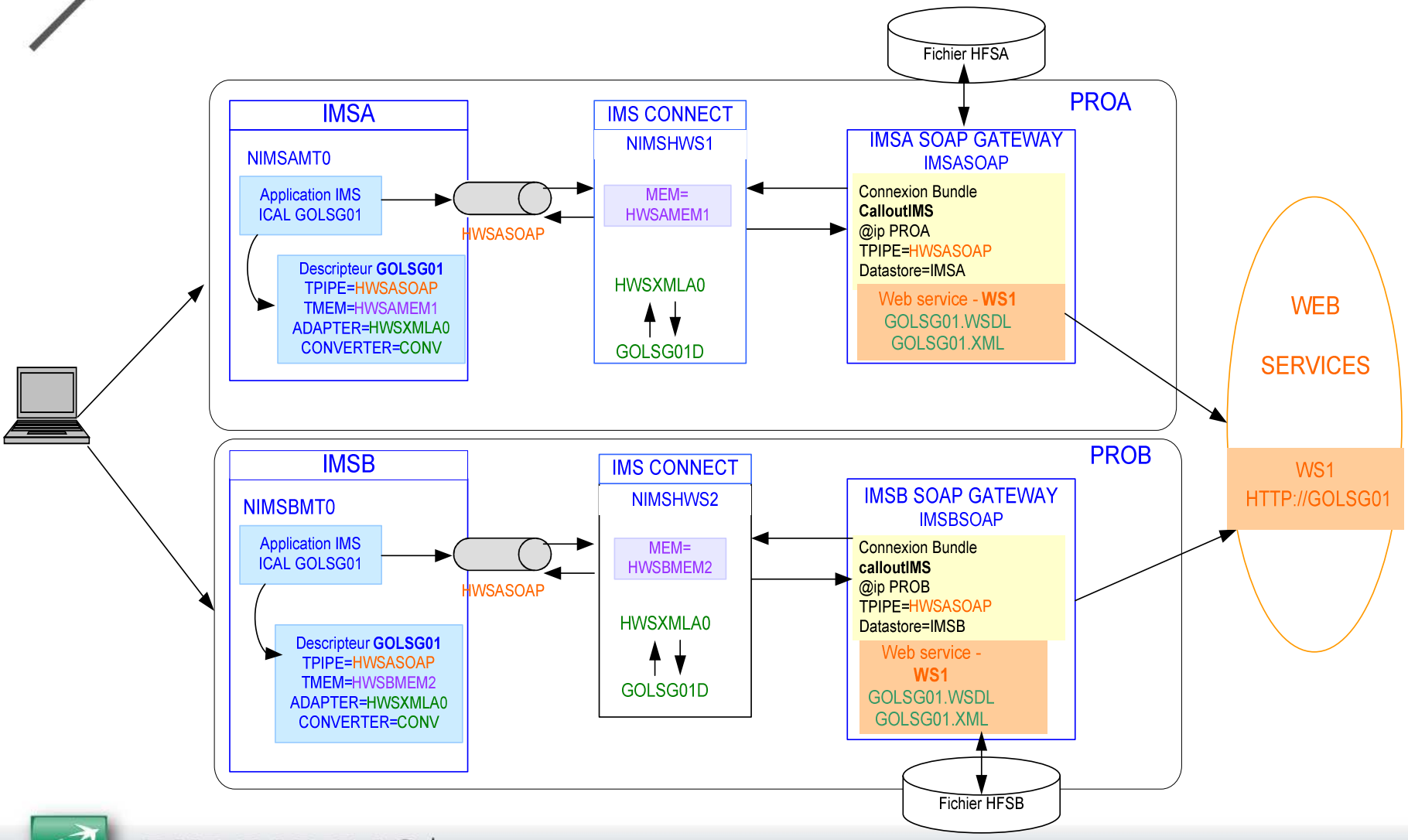
- One single XML convertor program *GOLSG01D on PROA and PROB*

Web Services side

- One single URL

It works but does not guarantee continuity of operations if we loose one component (IMS Connect or Soap Gateway).

IMS Soap Gateway And Sysplex: Architecture # 1



IMS Soap Gateway And Sysplex

Architecture # 2

2 IMS SOAP Gateway, 2 IMS Connect, 2 IMS

Scope : 2 partitions PROA and PROB

Per SOAP Gateway

- **Need to duplicate the same WEB service per Soap instance**
- 2 Connexion Bundle entries (CB) with different content (different IMS Datastore)
- 2 descriptor files WSDL
- 2 correlator files XML
- Physical partition IP address

Per IMS

- One single application with an OTMA descriptor having the same name but with a different content.

Per IMSConnect

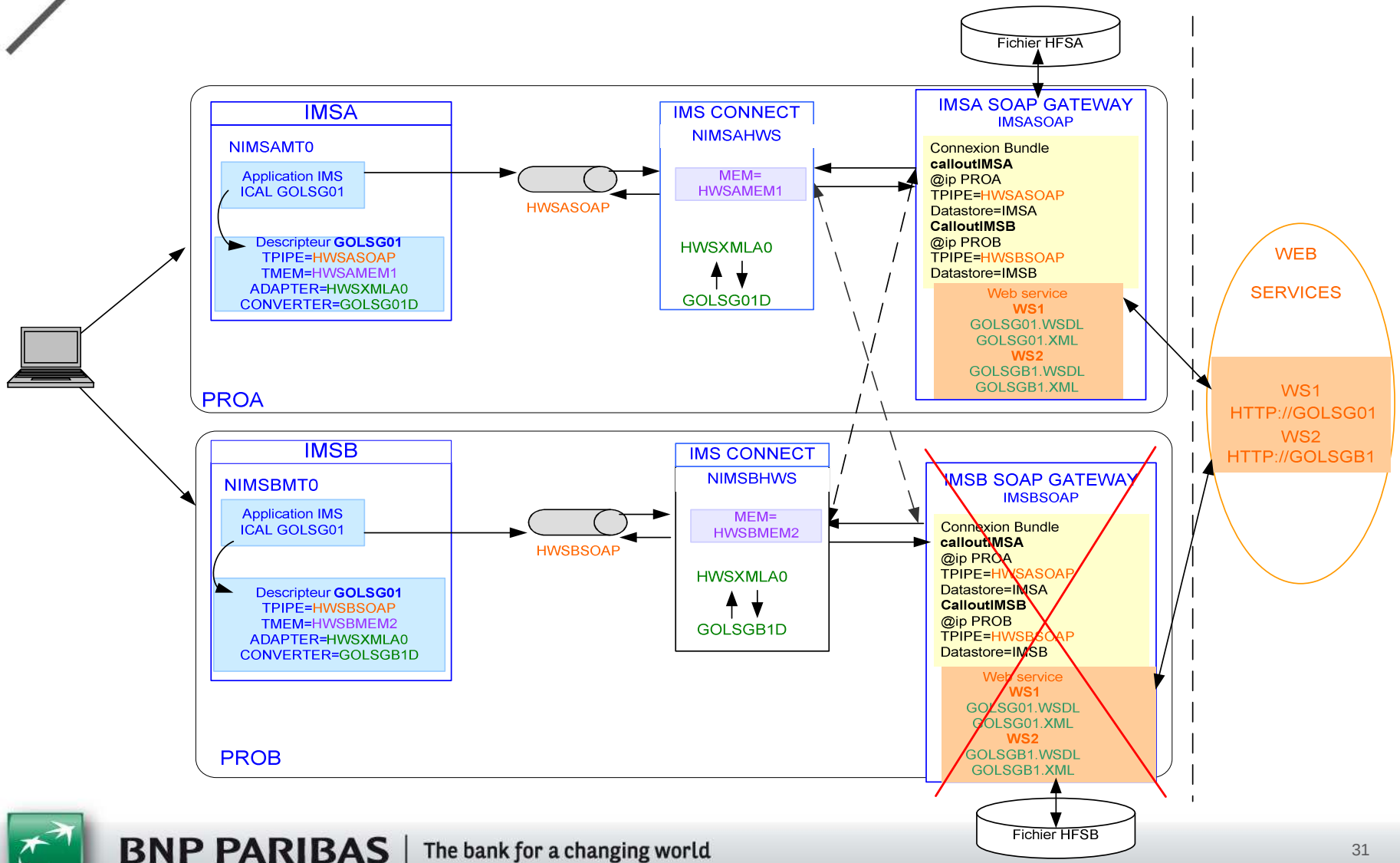
- A XML convertor program per web instance

Web services

- One URL per IMS member in the Sysplex.

IF ONE SOAP IS MISSING THE PROCESS IS HANDLED AUTOMATICALLY BY THE OTHER "STILL ACTIVE IMS SOAP GATEWAY"

IMS Soap Gateway And Sysplex: Architecture # 2



IMS Soap Gateway And Sysplex

Architecture # 3A and 3B

Same architecture as previously, with Supermember active.

Super Member is an IMS function which allows many IMS Connect in a z/OS sysplex to execute in parallel as there was only one. So IMS Connect instances are generic for applications. They belong to group super Member

Per SOAP Gateway

- …
- **Sysplex IP address (CPLPLEX)**

Per IMS

- A single and same application with an OTMA descriptor having the same name but with a different content, with **SMEM(Y) et TMEM=SOAP**

Per IMSConnect

- …
- **SMEMBER=SOAP**

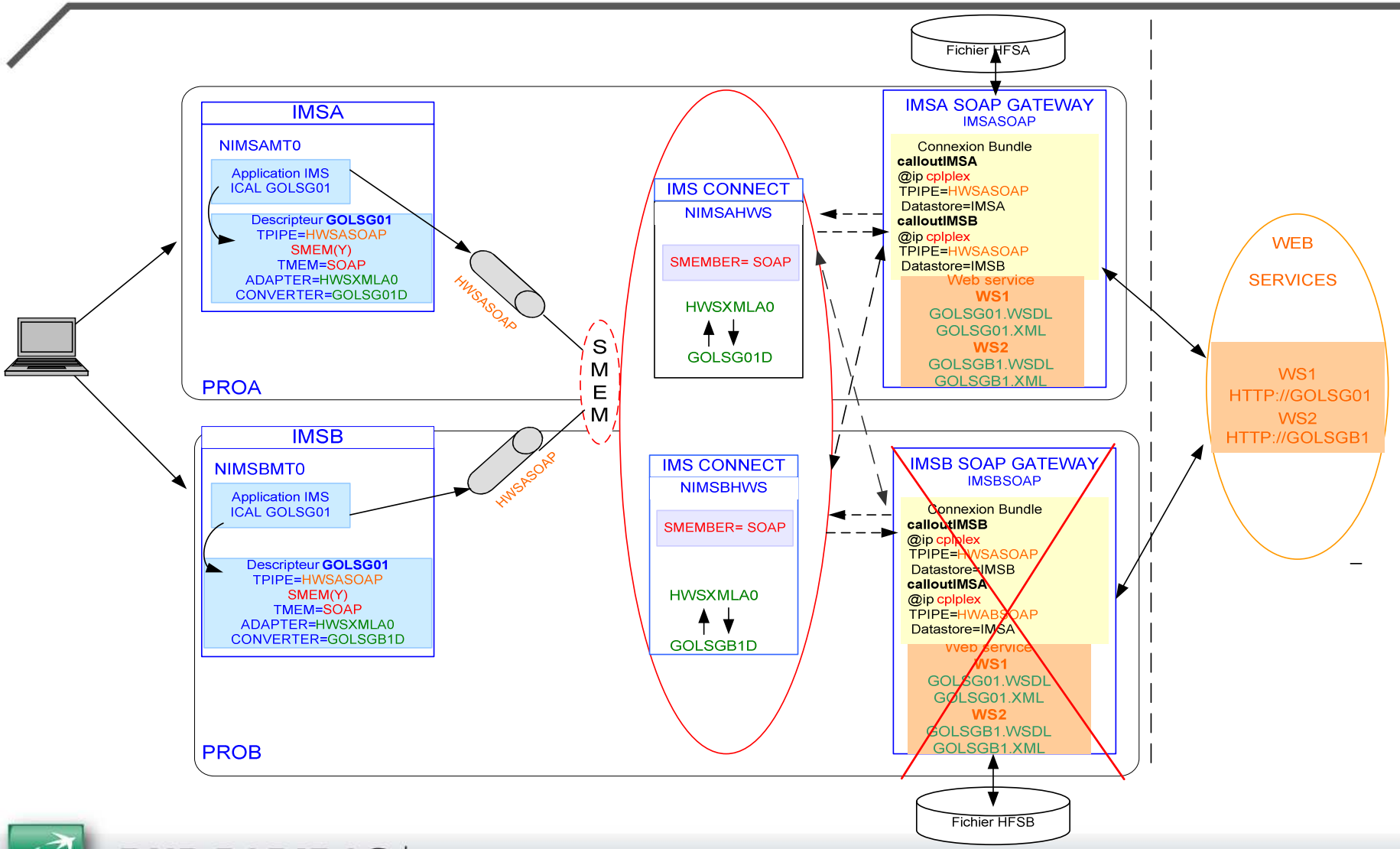
Web services

- An URL per IMS member in the **sysplex**

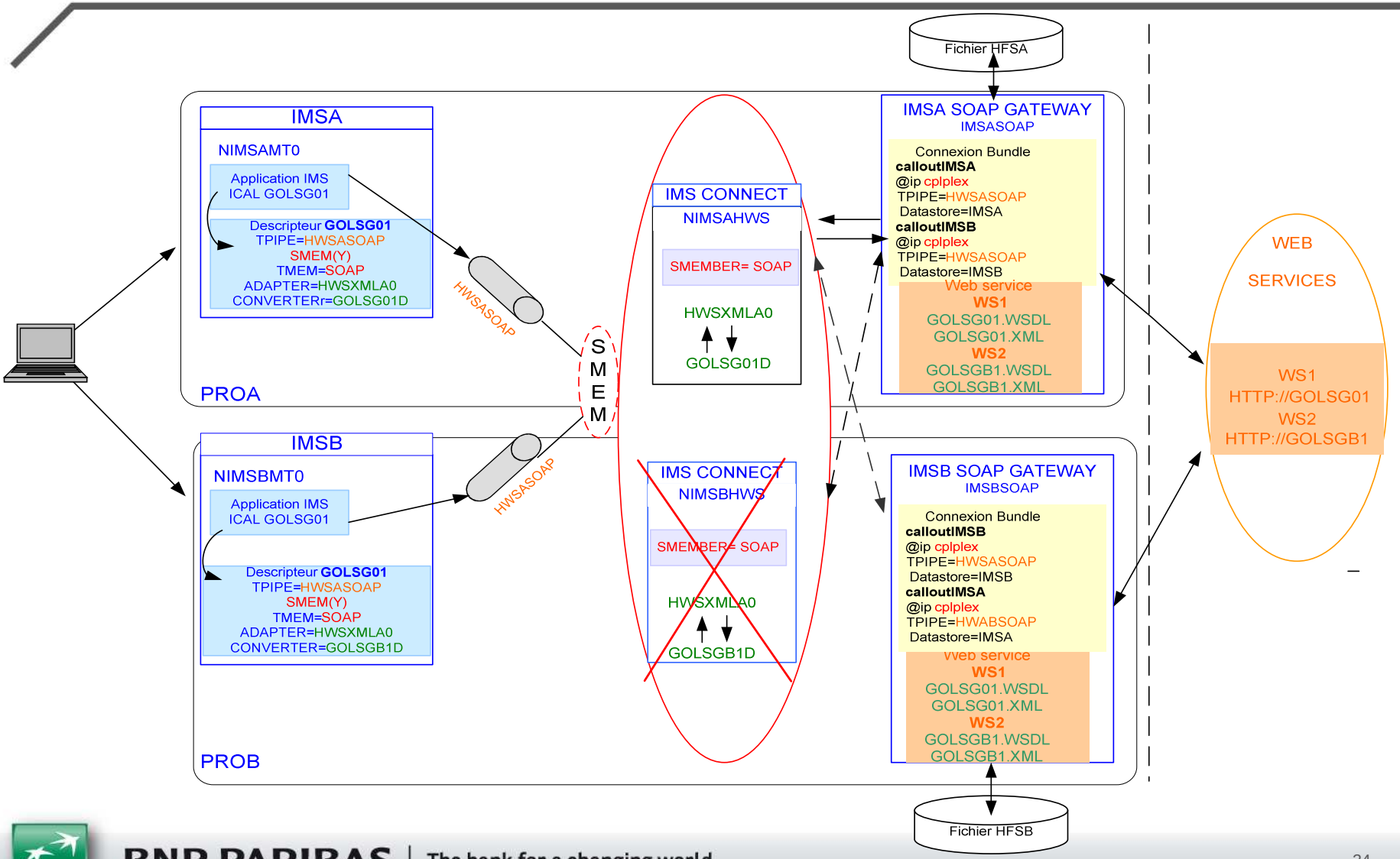
Scenario 3A shows continuity of operations when a SoapGW is down

Scenario 3B shows the same continuity of operations when an IMS Connect is down.

IMS Soap Gateway And Sysplex: Architecture # 3A



IMS Soap Gateway And Sysplex: Architecture # 3B



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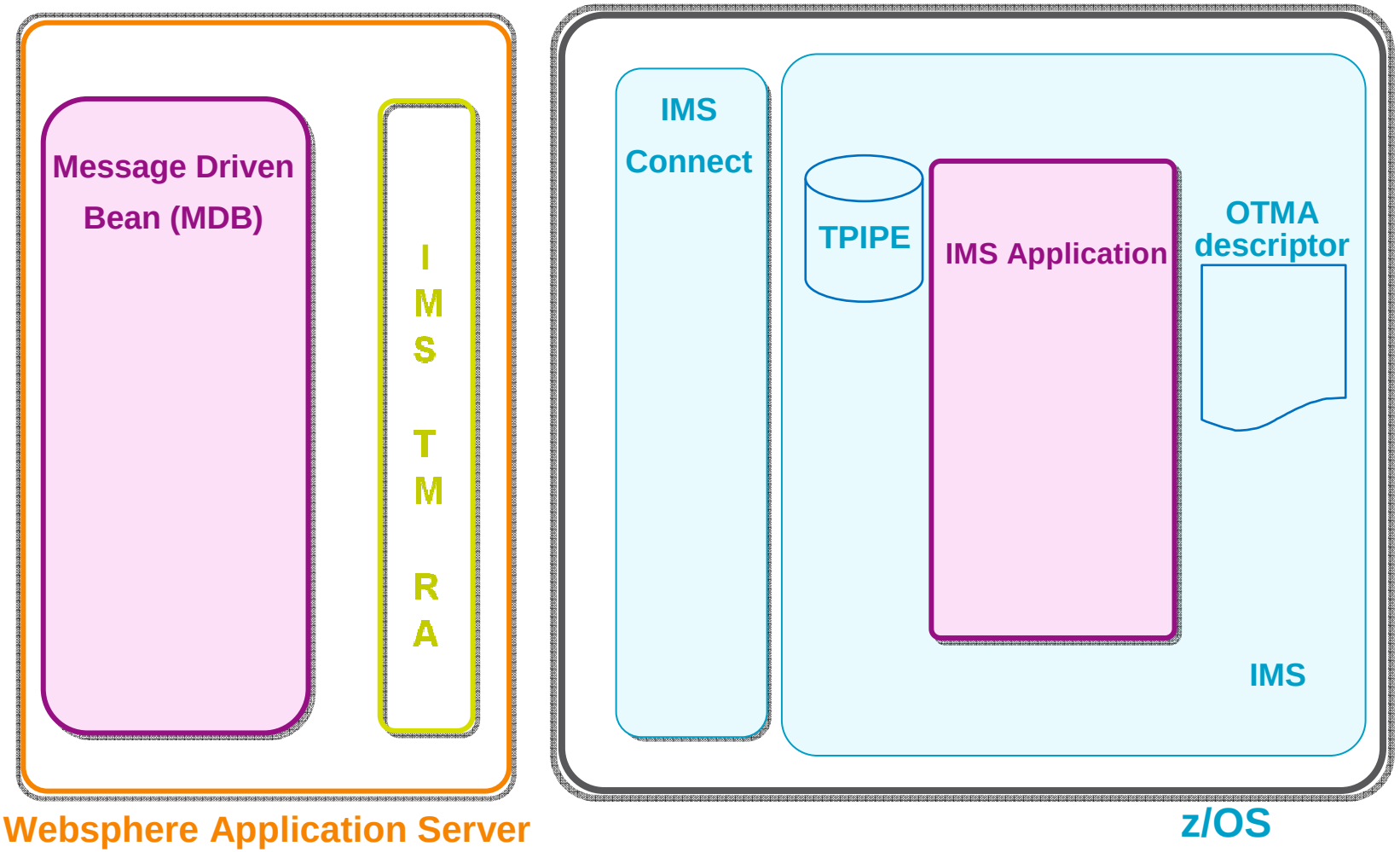
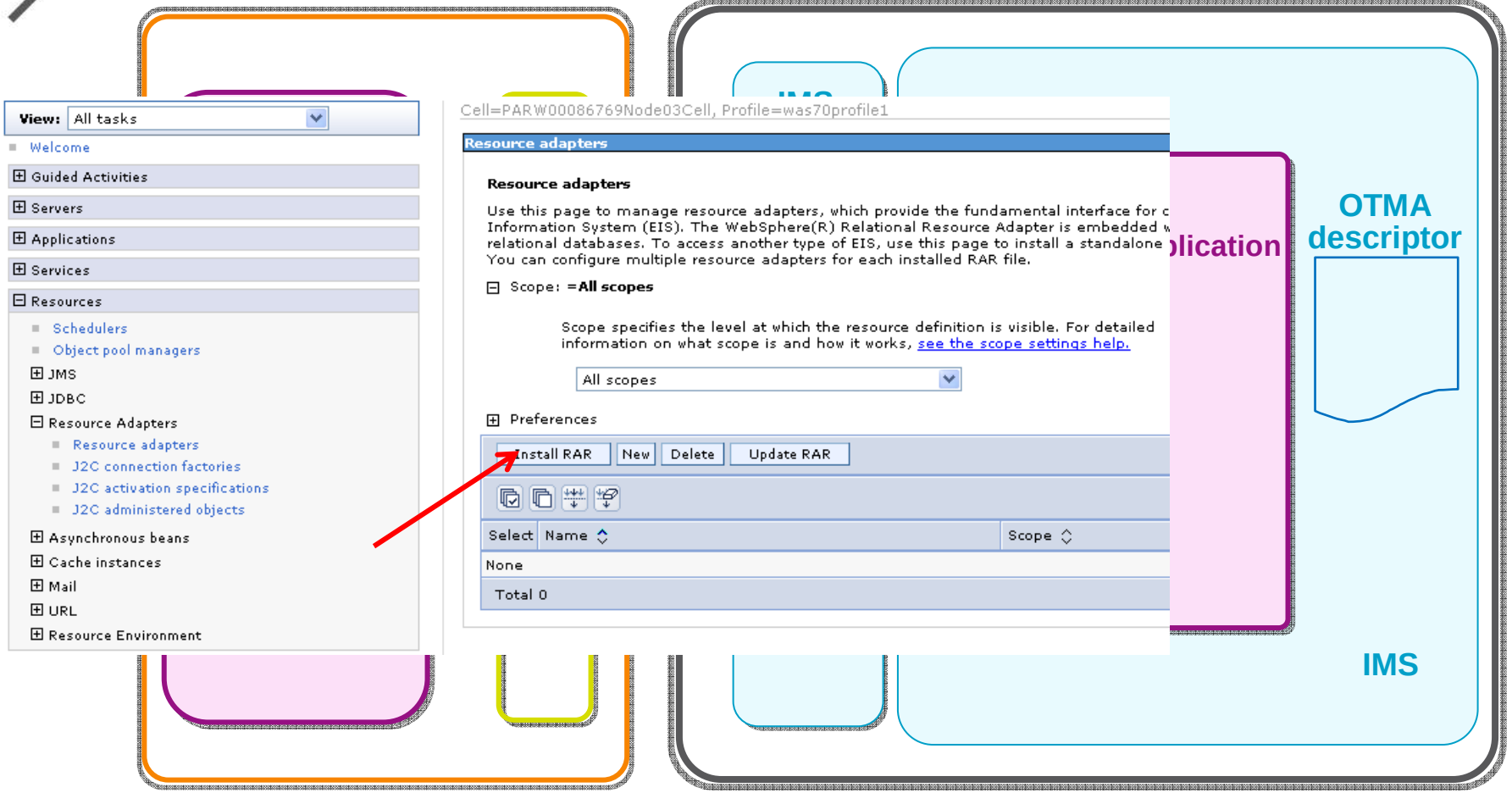
Callout with IMS TM Resource Adapter

- ✓ Callout from IMS transactions through IMS TM RA is based on a Message Driven Bean. (1 MDB per Tpipe)
- ✓ IMS TM RA runs in Websphere Application Server
- ✓ IMS TM RA communicates with IMS Connect in TCP/IP

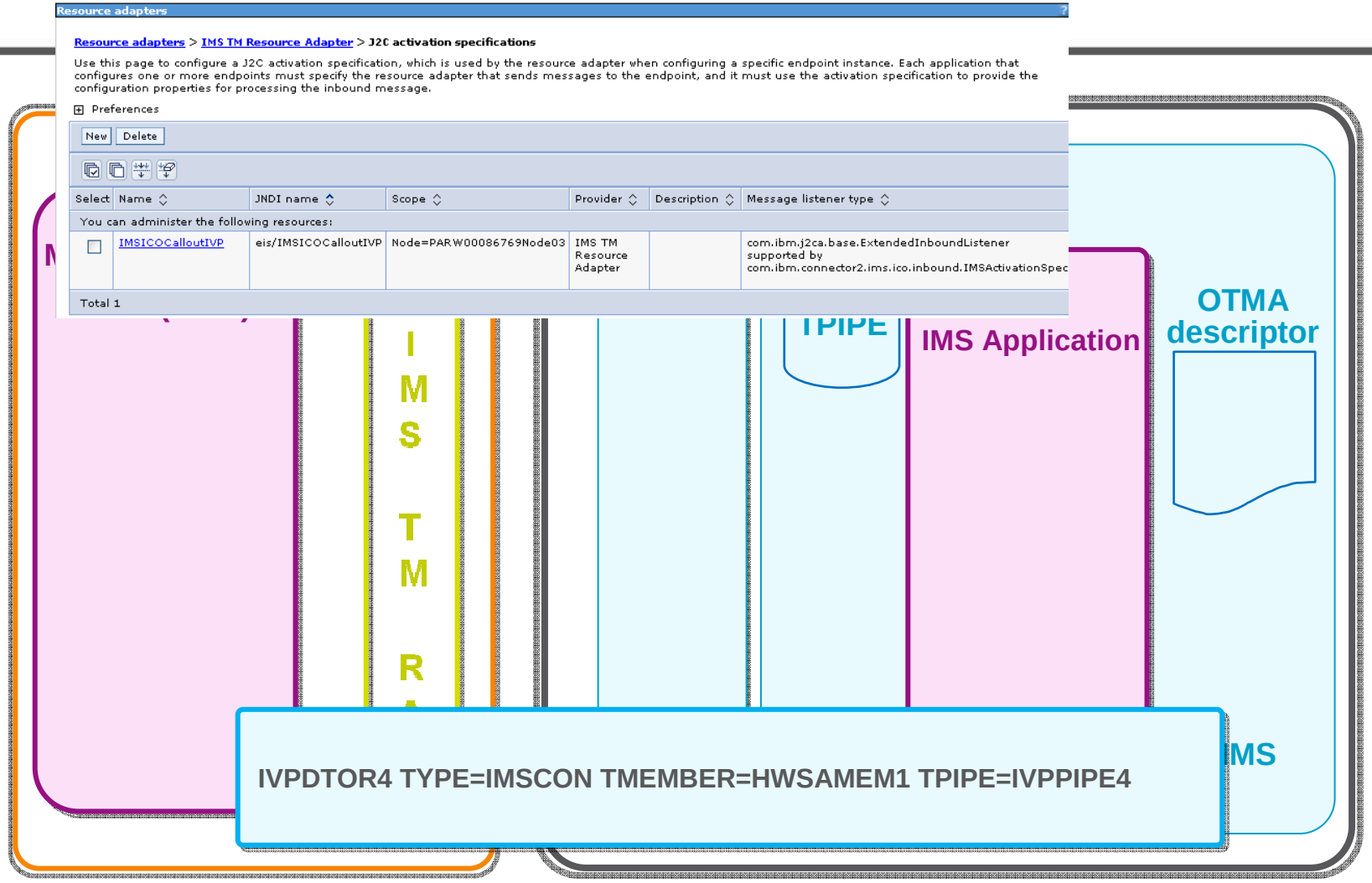
IMS TM Resource Adapter – CALL OUT 1



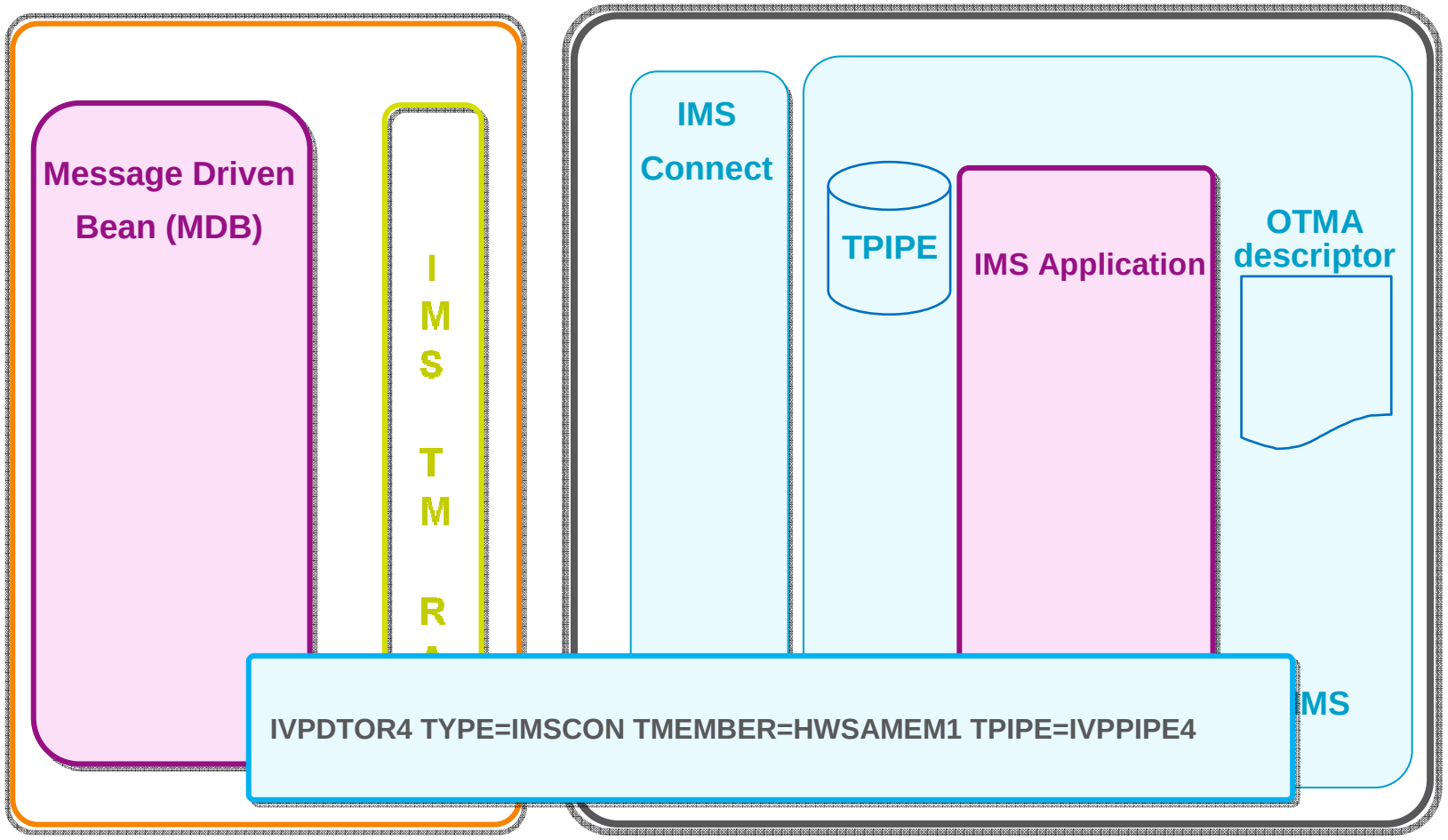
IMS TM Resource Adapter – CALL OUT 2



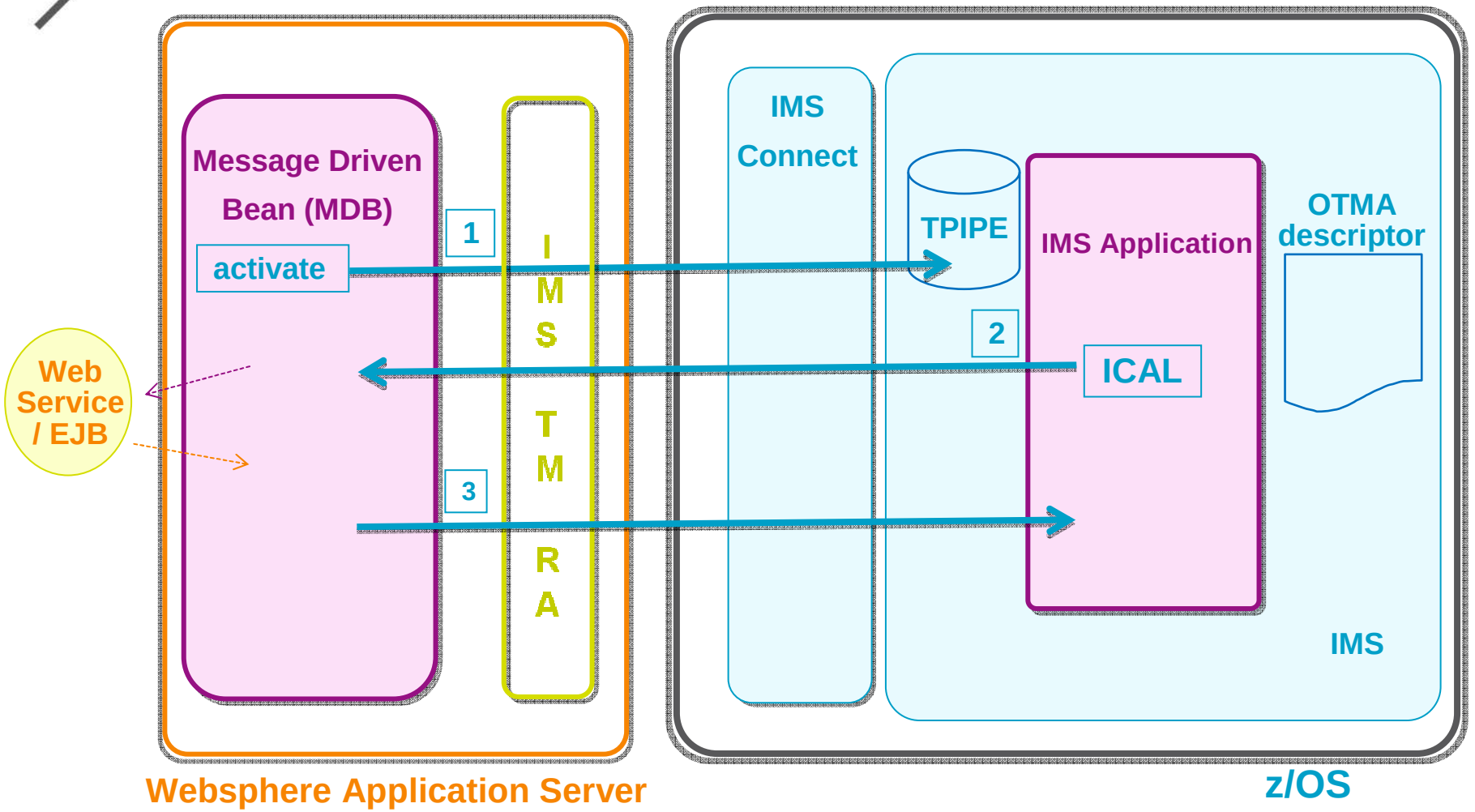
IMS TM Resource Adapter – CALL OUT 3



IMS TM Resource Adapter – CALL OUT 4



IMS TM Resource Adapter – CALL OUT 5



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Websphere Optimized Local Adapter

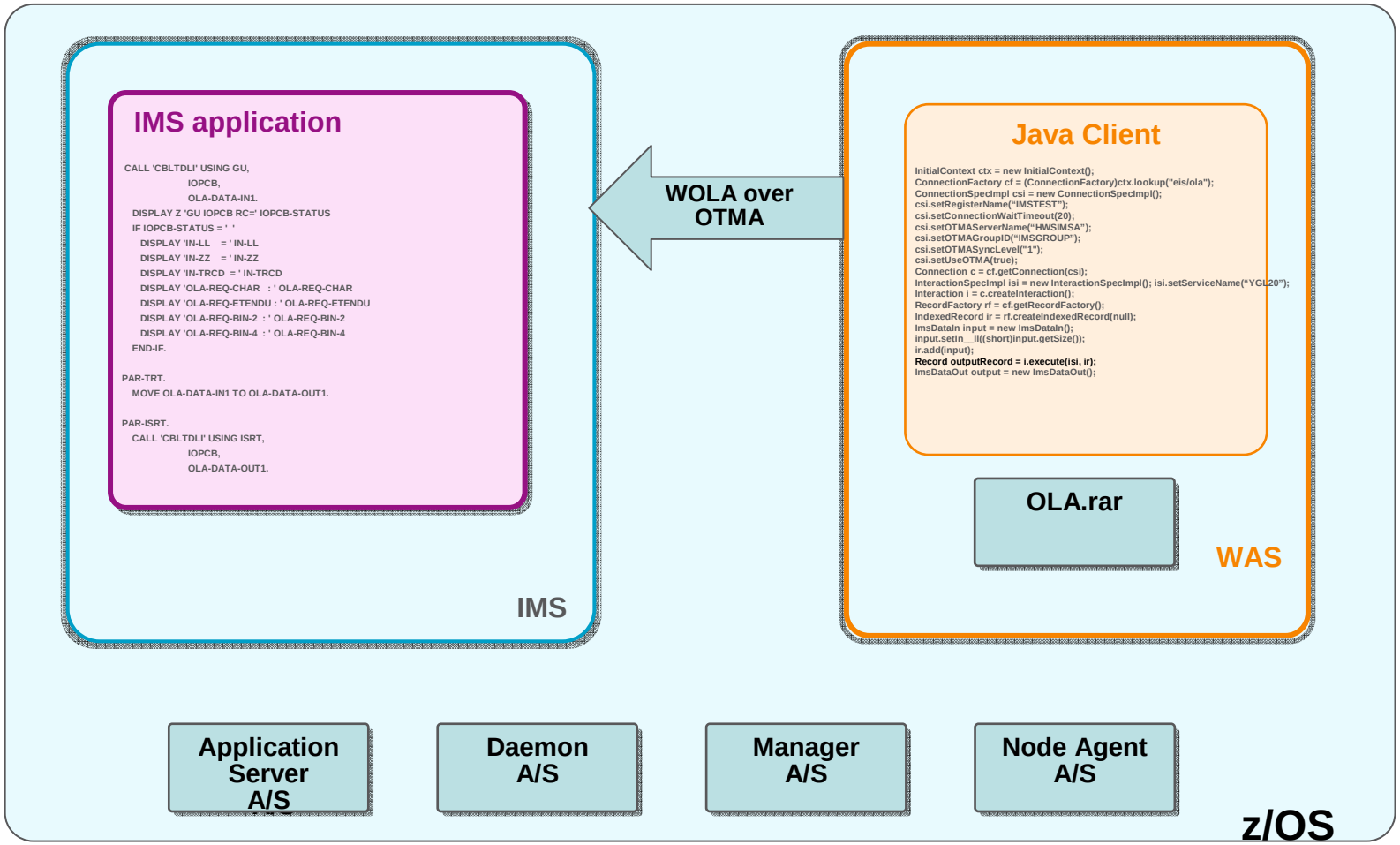
Deployed on WAS on z/OS

Allows Call in and Call out with external address spaces such as CICS, IMS, batch programs running in the same LPAR

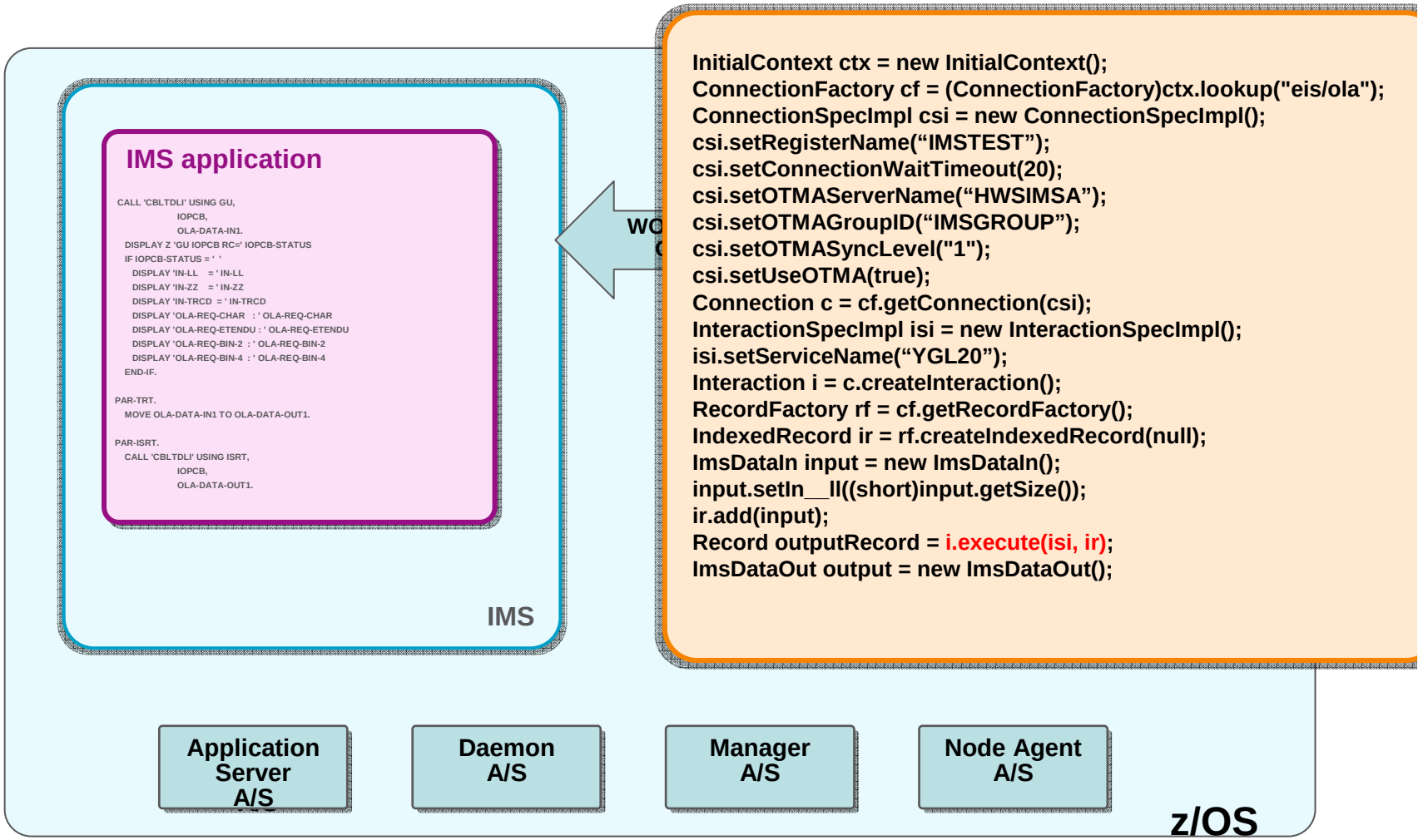
Data Transfer through a buffer in memory instead of network

WOLA supports synchronous or asynchronous operations (only sync tested)

WOLA – CALL IN 1

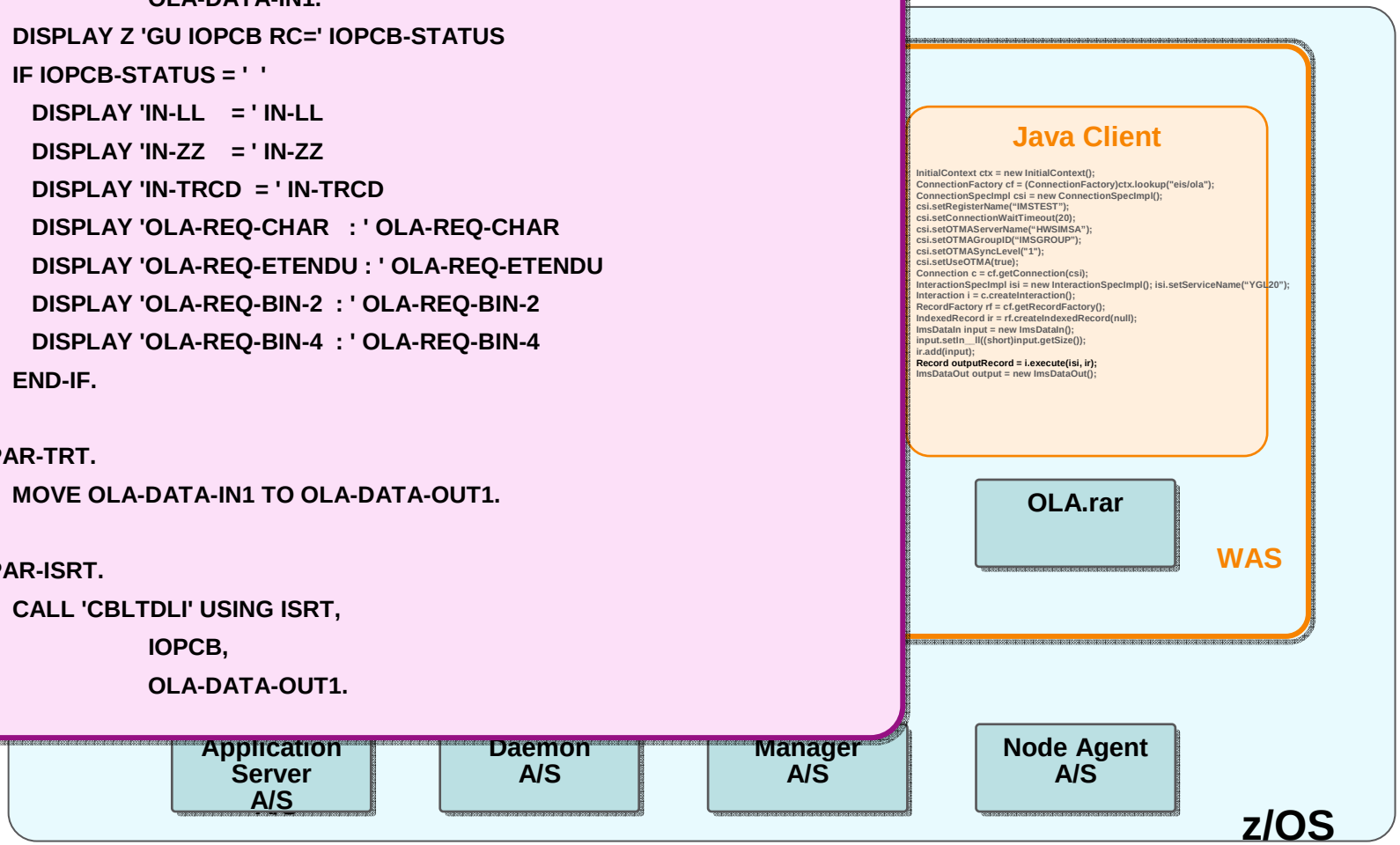


WOLA – CALL IN 2

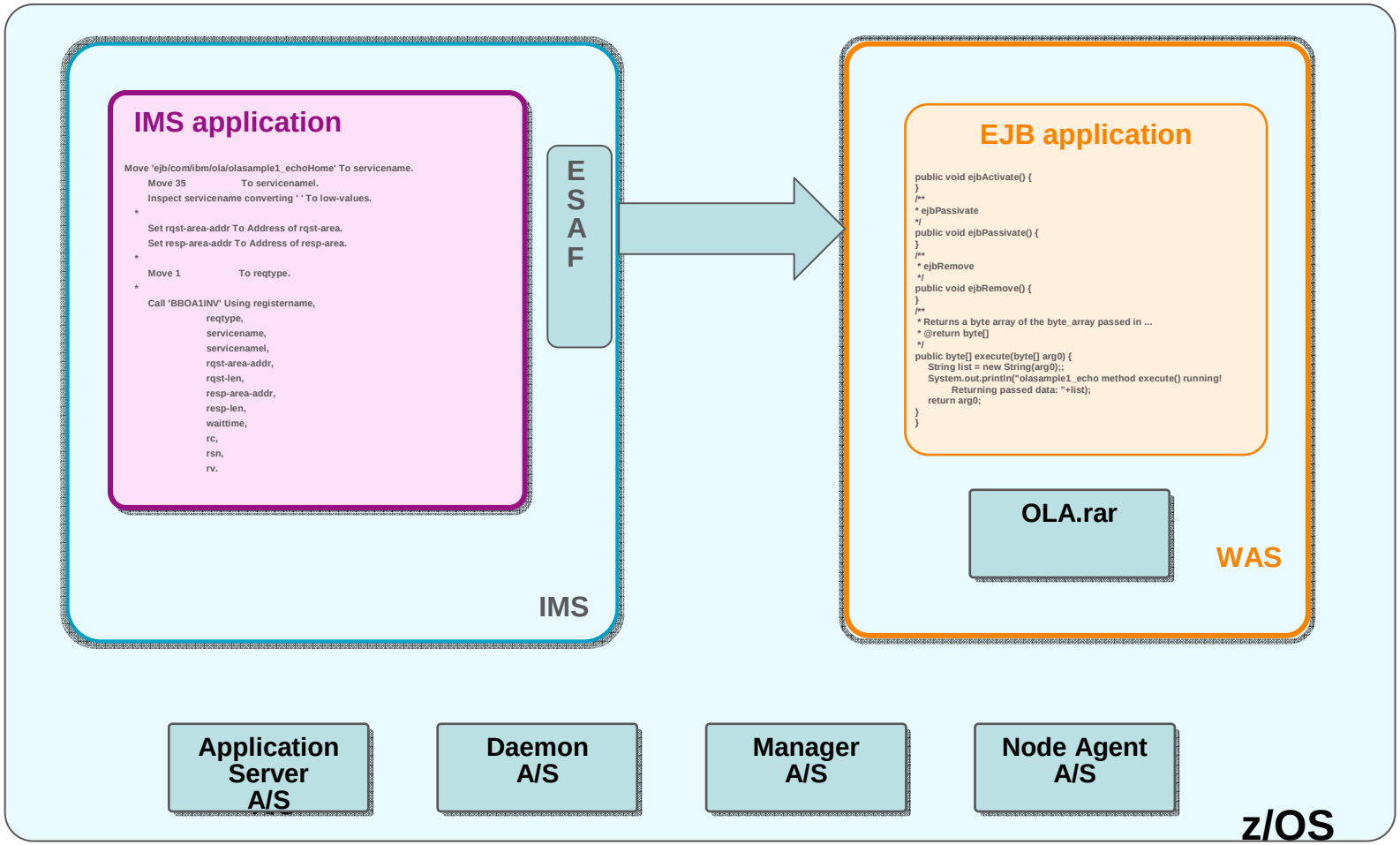


WOLA – CALL IN 3

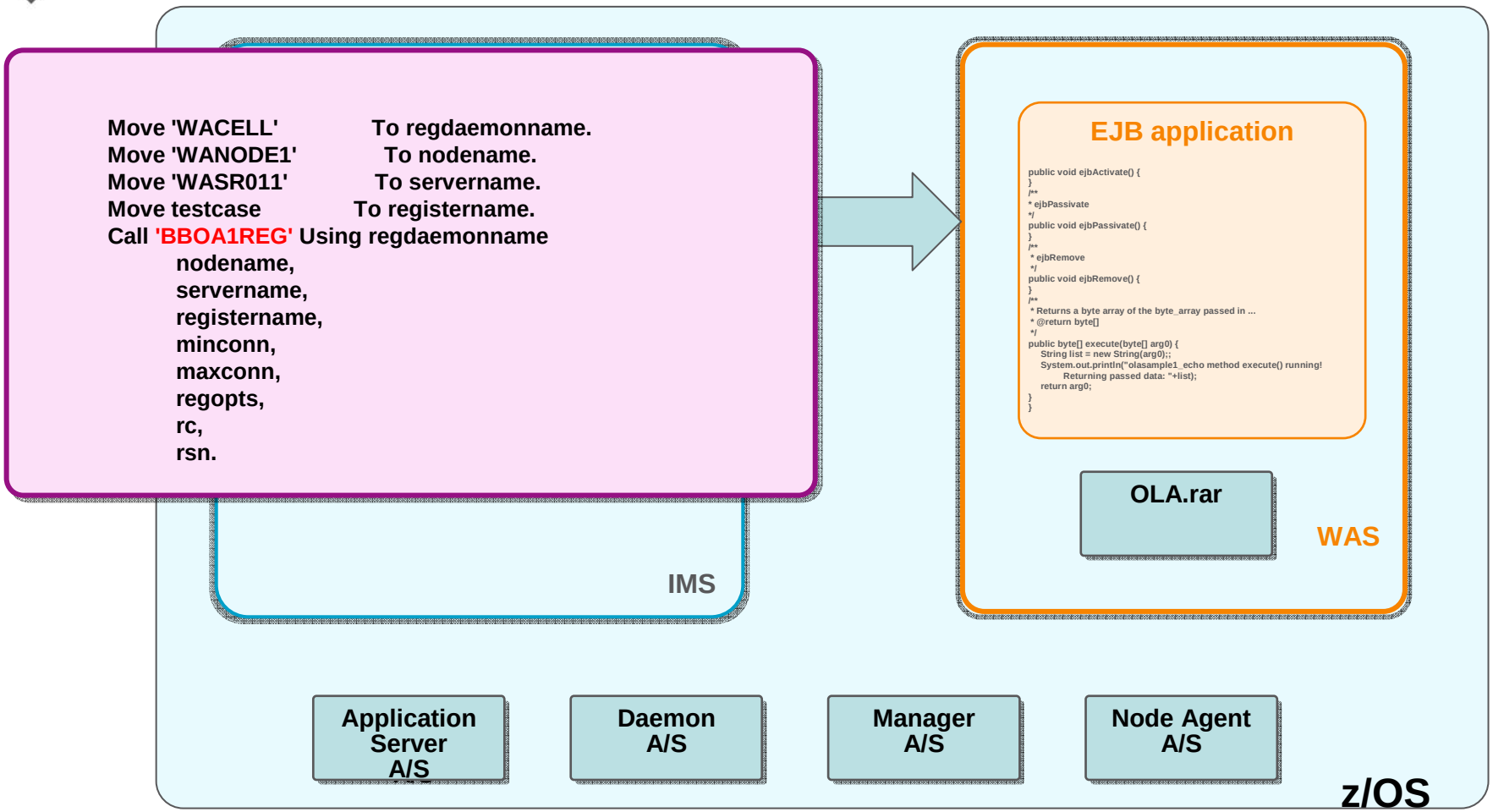
```
CALL 'CBLTDLI' USING GU,
                     IOPCB,
                     OLA-DATA-IN1.
   DISPLAY Z 'GU IOPCB RC=' IOPCB-STATUS
   IF IOPCB-STATUS = '  '
      DISPLAY 'IN-LL    = ' IN-LL
      DISPLAY 'IN-ZZ    = ' IN-ZZ
      DISPLAY 'IN-TRCD  = ' IN-TRCD
      DISPLAY 'OLA-REQ-CHAR   : ' OLA-REQ-CHAR
      DISPLAY 'OLA-REQ-ETENDU : ' OLA-REQ-ETENDU
      DISPLAY 'OLA-REQ-BIN-2  : ' OLA-REQ-BIN-2
      DISPLAY 'OLA-REQ-BIN-4  : ' OLA-REQ-BIN-4
   END-IF.

PAR-TRT.
   MOVE OLA-DATA-IN1 TO OLA-DATA-OUT1.

PAR-ISRT.
   CALL 'CBLTDLI' USING ISRT,
                     IOPCB,
                     OLA-DATA-OUT1.
```



WOLA – CALL-OUT 1

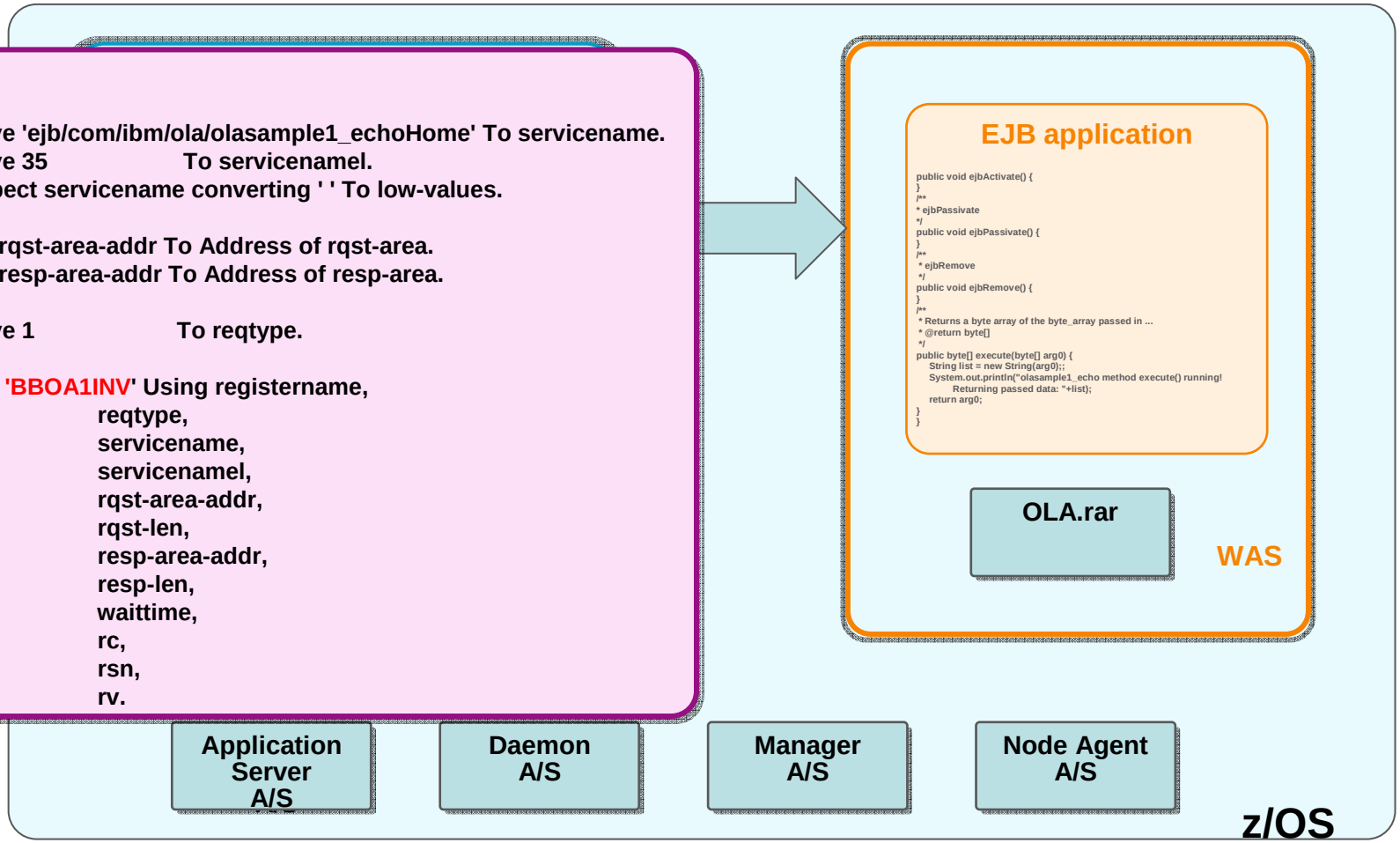


WOLA – CALL-OUT 2

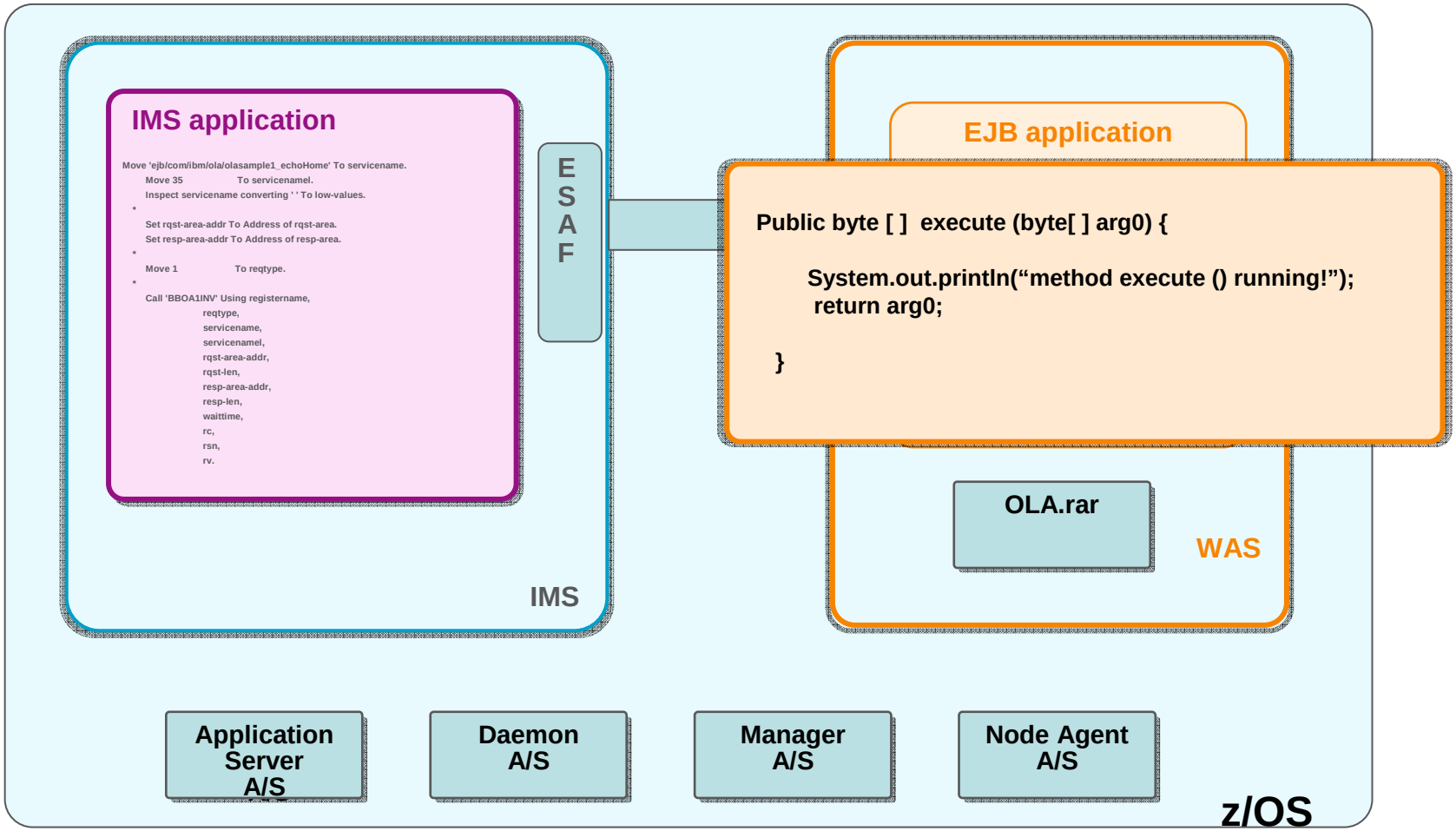


WOLA – CALL-OUT 3

```
Move 'ejb/com/ibm/ola/olasample1_echoHome' To servicename.
Move 35                  To servicenamel.
Inspect servicename converting ' ' To low-values.
*
Set rqst-area-addr To Address of rqst-area.
Set resp-area-addr To Address of resp-area.
*
Move 1                   To reqtype.
*
Call 'BBOA1INV' Using registername,
                      reqtype,
                      servicename,
                      servicenamel,
                      rqst-area-addr,
                      rqst-len,
                      resp-area-addr,
                      resp-len,
                      waittime,
                      rc,
                      rsn,
                      rv.
```

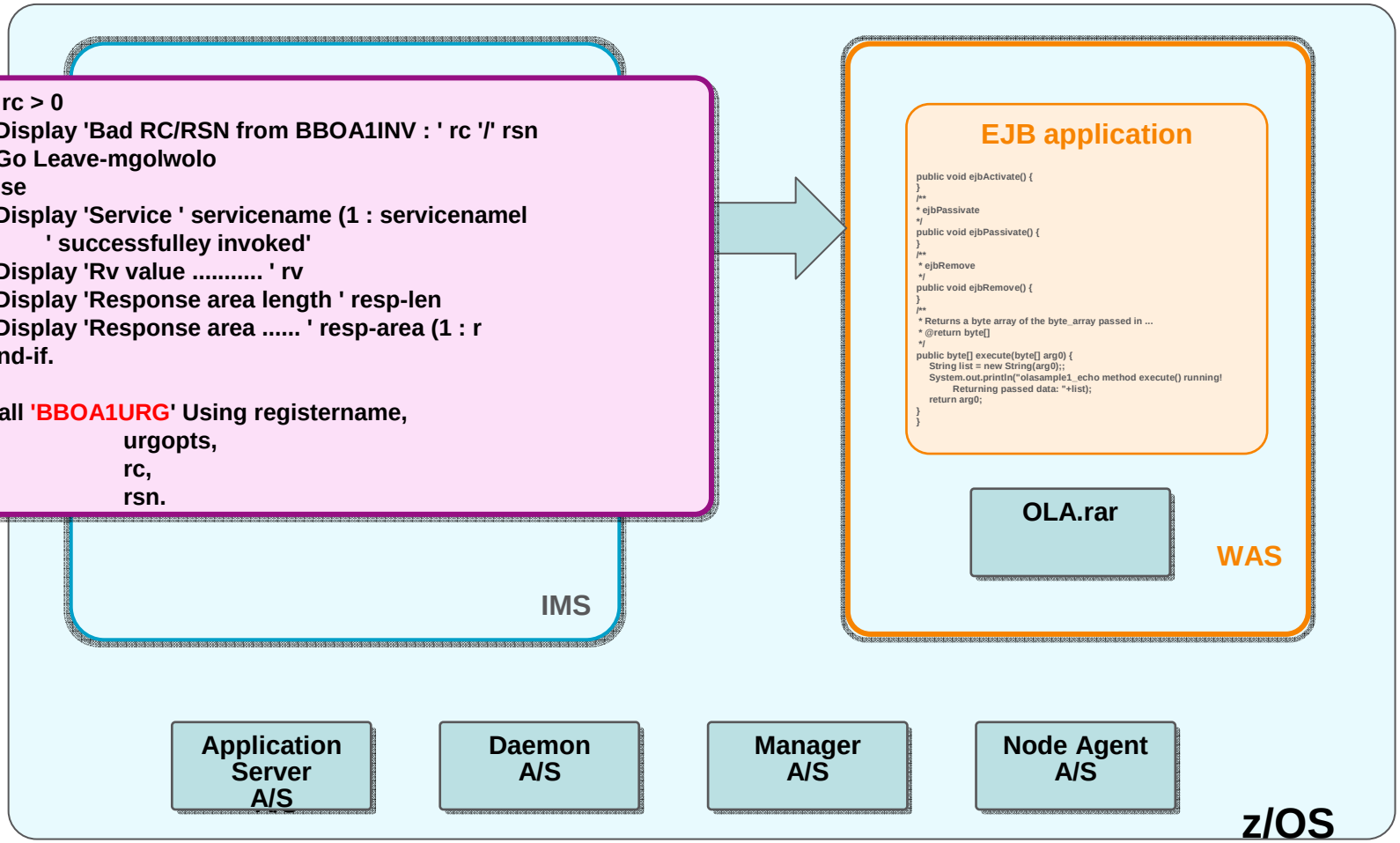


WOLA – CALL-OUT 4



WOLA – CALL-OUT 5

```
If rc > 0
  Display 'Bad RC/RSN from BBOA1INV : ' rc '/' rsn
  Go Leave-mgolwolo
else
  Display 'Service ' servicename (1 : servicenamel
        ' successfulley invoked'
  Display 'Rv value ..... ' rv
  Display 'Response area length ' resp-len
  Display 'Response area ..... ' resp-area (1 : r
End-if.

Call 'BBOA1URG' Using registername,
                      urgopts,
                      rc,
                      rsn.
```



Conclusion

	CALL IN	CALL OUT
Web Services via IMS Soap Gateway		
IMS TMRA		
WOLA		

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Questions/Discussion

QUESTIONS, COMMENTS AND SUGGESTIONS

Thank you !

Your feedback is important to us