WebSphere Application Server Version 8 Overview

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IBM

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WebSphere Application Server Sessions

Day	Time	#	Title	Speaker	Room
Wednesday	3:00	9483	Using IBM's New Cross-Platform Installer on z/OS	Mierzejewski	Oceanic 5
Thursday	8:00	9482	WAS Version 8 – Overview	Follis	Europe 2
Thursday	9:30	9486	WAS Version 8 – Batch Update	Hutchinson	Europe 2
Thursday	11:00	9485	WAS Version 8 – New z/OS Exploitation/Differentiation Features	Follis	Europe 2
Thursday	1:30	9484	WAS Version 8 – High Availability Enhancements	Follis	Europe 2
Thursday	3:00	9488	WAS - Back to Basics Part 1	Loos	Europe 2
Thursday	4:30	9489	WAS - Back to Basics Part 2	Stephen	Europe 2
Friday	8:00	9490	WAS for z/OS - Level 2 Update	Stephen	Europe 2
Friday	9:30	9487	WAS for z/OS – PotPourri	Follis, Hutchinson, Loos, Mierzejewski, Stephen, etc.	Europe 2

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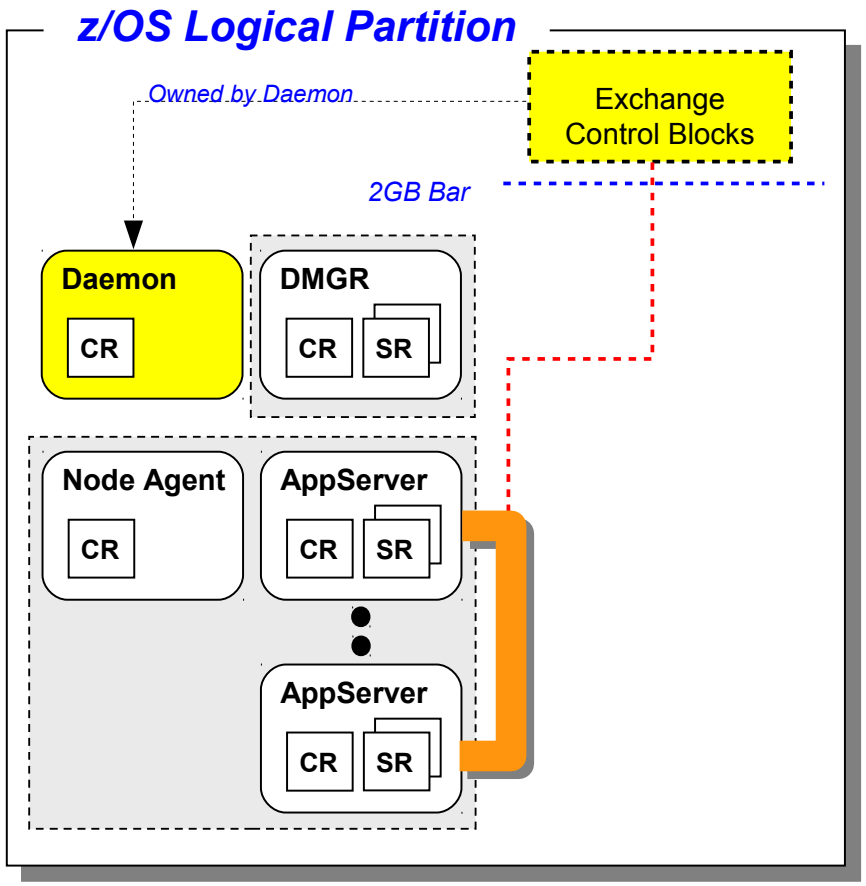
WOLA 7.0.0.4 and 7.0.0.12

In The Beginning Was "Local Comm"

This has been around since the early days of WAS on z/OS. It's a way to bypass the TCP/IP stack for internal IIOP calls between servers on the same LPAR:



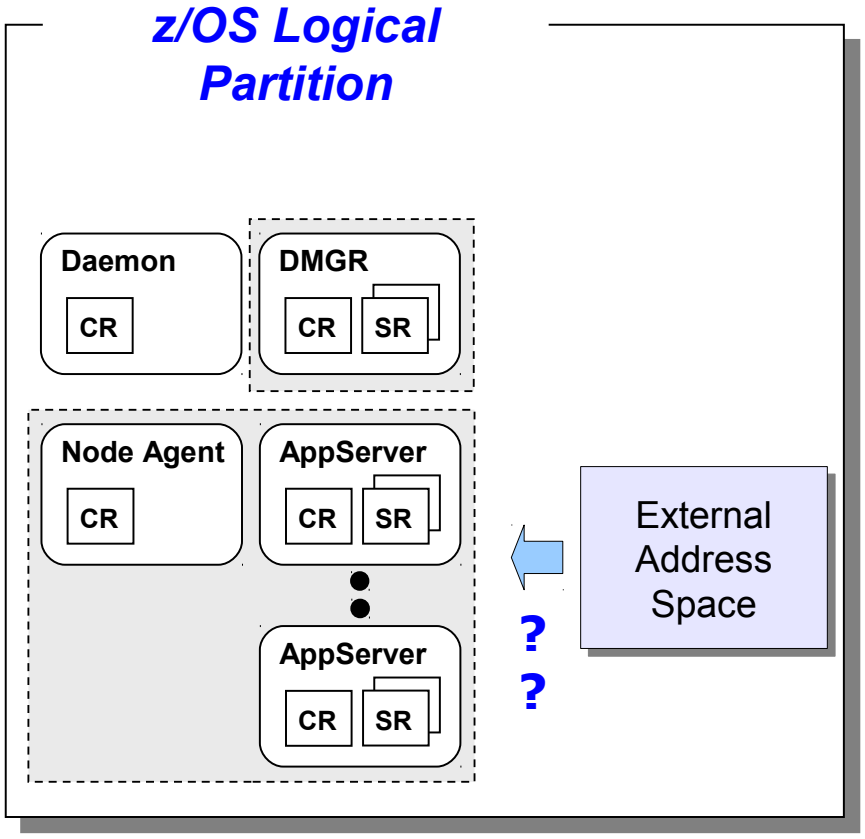
If an IIOP call is made and WAS z/OS sees it's on the same LPAR, then this is automatically done

The Daemon server plays a key role in this; it owns the above-the-bar space used shared space and does the inter-address switching

It's very fast with very low overhead

The Motivation Behind WOLA

It *started out* as a way to allow program access *into* WAS for high transaction rate batch programs. Other solutions existed, but they all had limitations:



Inbound to WAS?

As more and more solutions are built based on Java EE, there is a growing desire to access them by batch, CICS and IMS programs

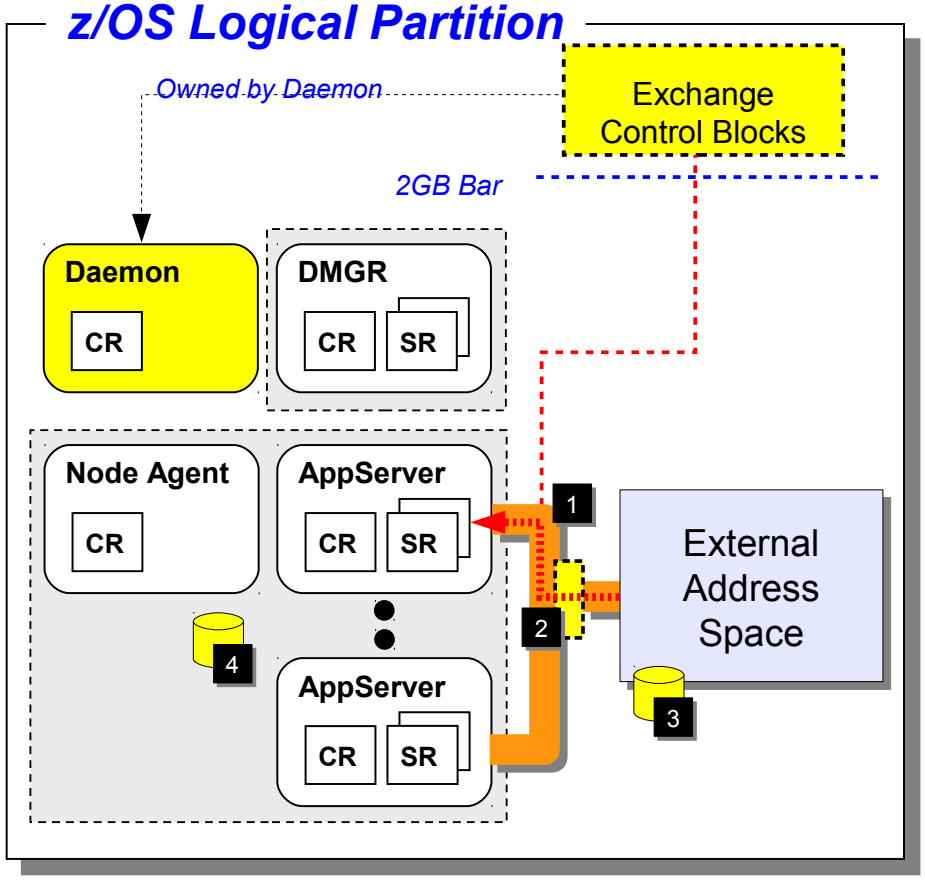
MQ or Web Services?

Both are very good technologies and have their role. But for very high throughput and low overhead, each has their drawbacks.

Something else was needed ... something *very fast* with as *little overhead* per exchange as possible

Answer: Externalize the Local Comm Function

The Local Comm function was there. It just needed interface modules so external address spaces could access it:



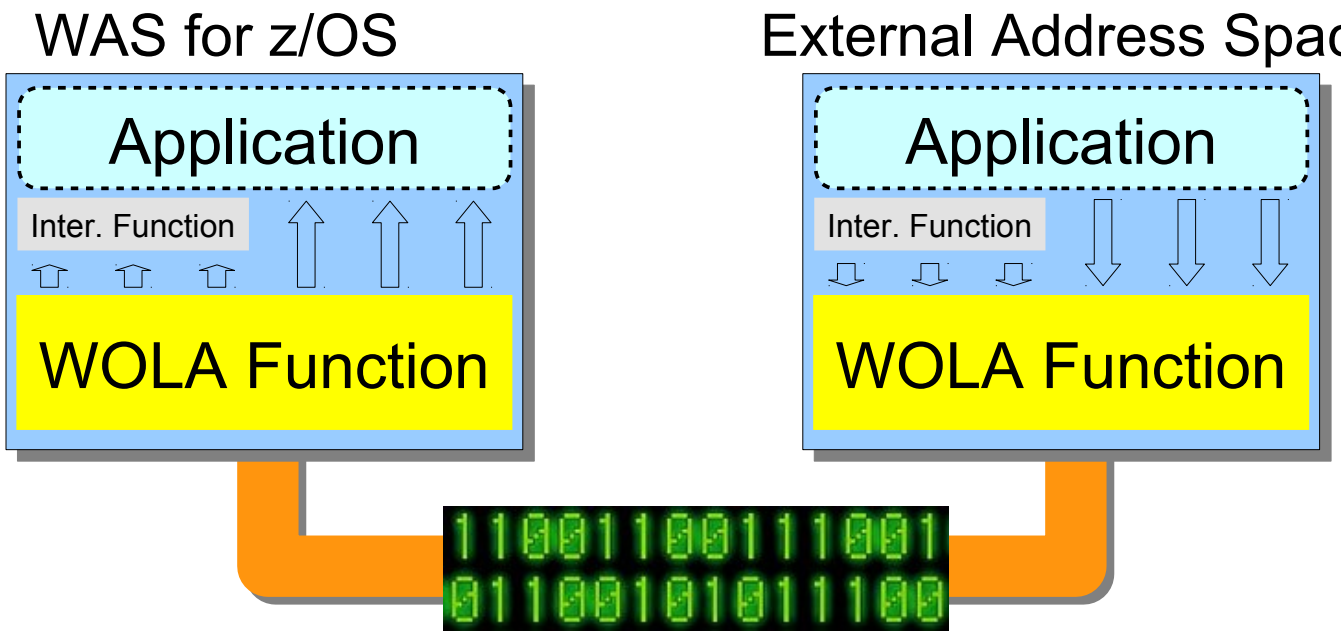
WOLA was born

1. Existing Local Comm exploited
2. Externalization routines written
3. Programming APIs for external address spaces provided
4. Standard JCA adapter for the WAS server provided

Just Inbound? No! This is a bi-directional technology. Outside into WAS, and WAS out to external address space

Concept #1 - WOLA is a Byte Array Pipe

As such it pays no attention to format or code page. That's why it's so fast.



The two sides of the exchange must have some awareness of each other so that the data can be in the proper format, layout and codepage

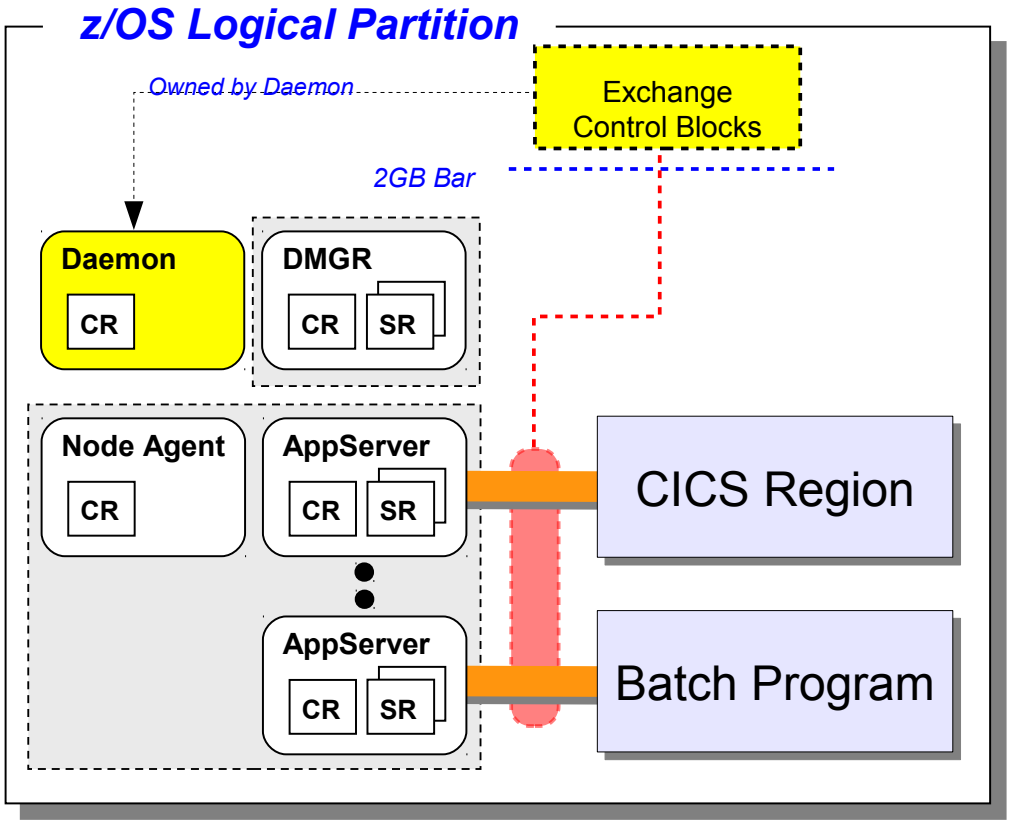
There are Eclipse based wizards to help with COBOL COPYBOOKS for CICS programs

Concept #2 - WOLA is Address Space to Address Space

This is a very low-level mechanism between address spaces:

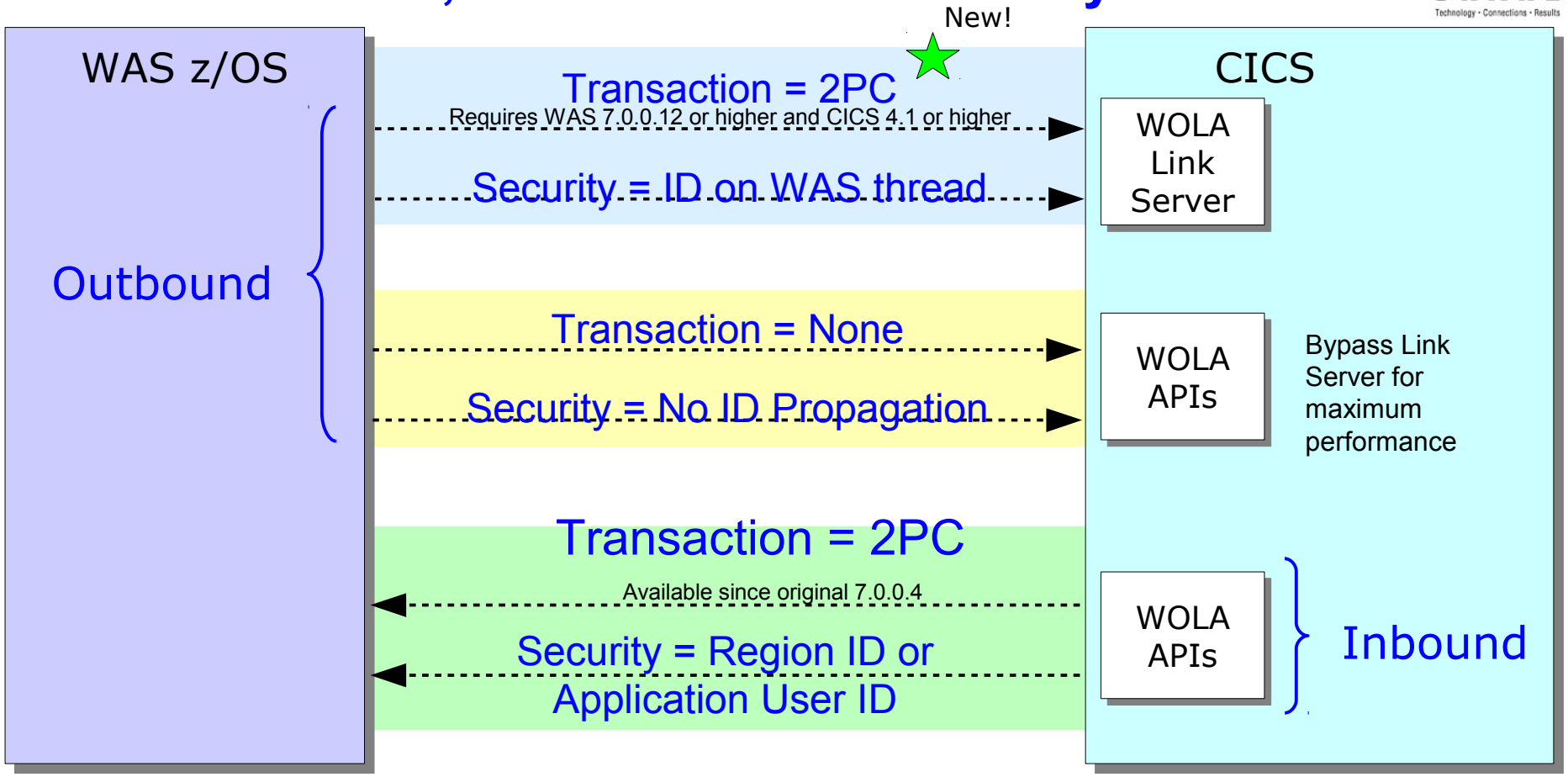
To exchange with an application in a server, it is required to register to *that specific server*

WOLA does not provide general access to the WAS cell, it provides very low-level access to the specific server and applications in that server



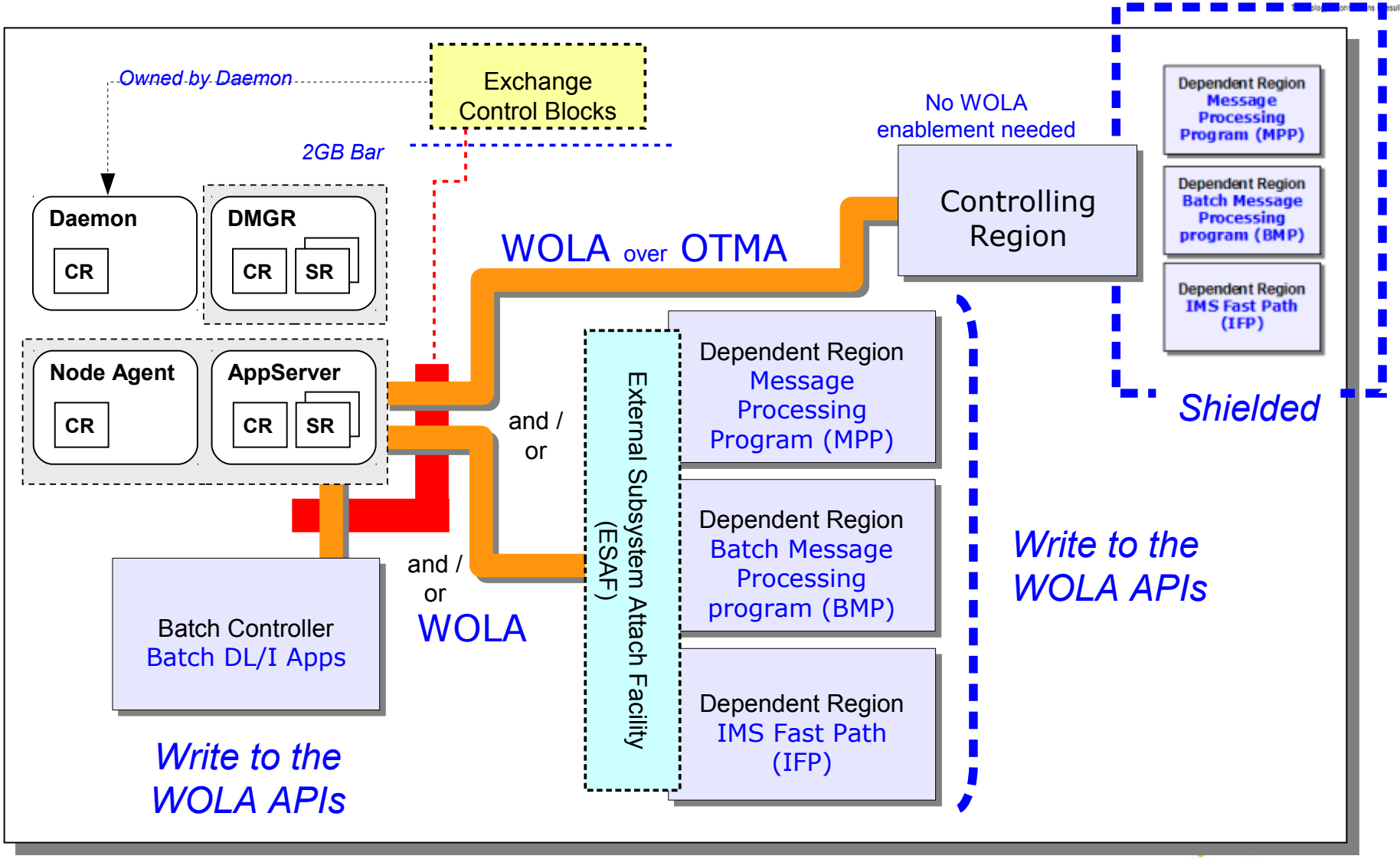
Multiple registrations permitted, to the same server or different servers

WOLA and CICS, Transaction and Security



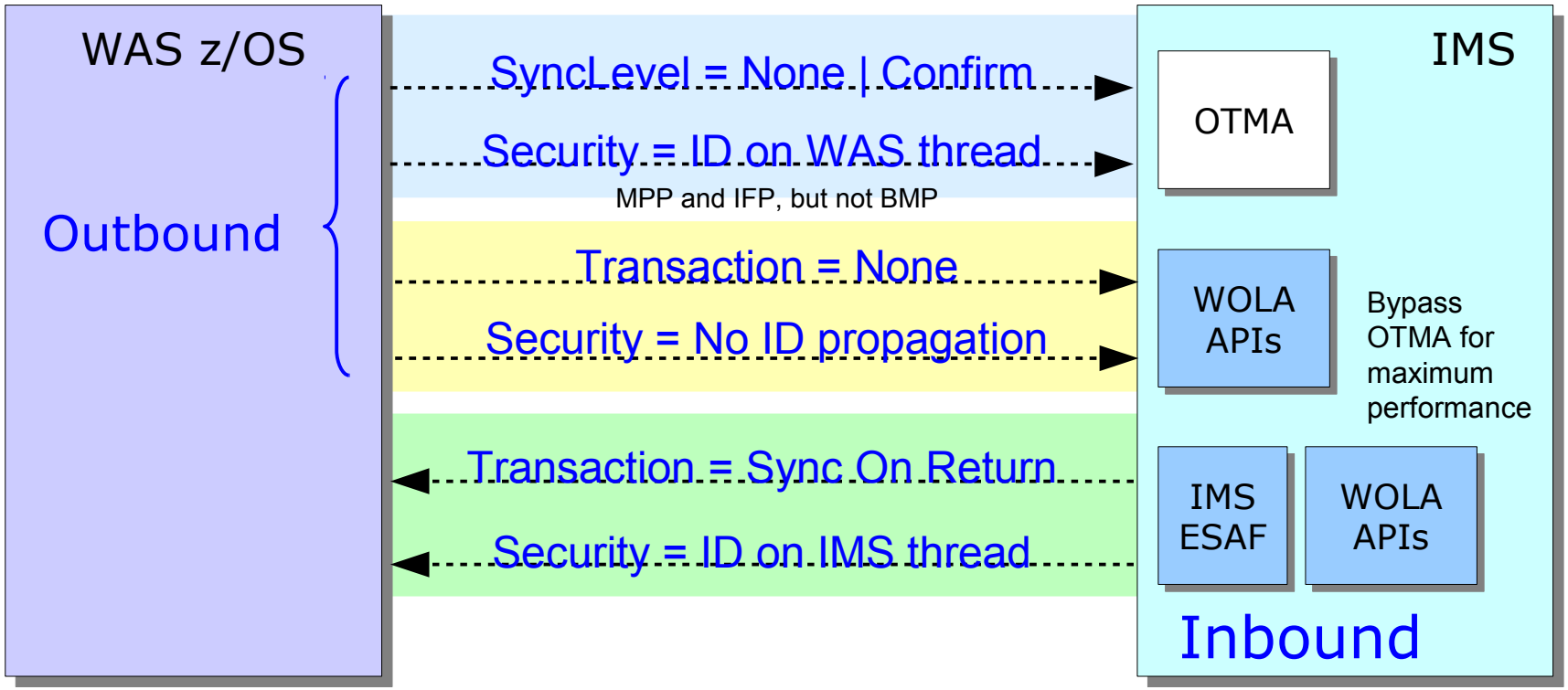
See the WP101490 "Design and Planning Guide or the InfoCenter for the specific details of this

High Level Overview of IMS Support – all new with 7.0.0.12



WOLA and IMS, Transaction and Security

A summary picture:



Version 8

Versions, Dates, and Service Levels...

	GA	End of Marketing	End of Support
Version 6.0	3/25/2005	2/23/2009	9/30/2010
Version 6.1	6/30/2006	7/25/2011	**9/30/2012**
Version 7	9/26/2008		
Version 8	6/17/2011		

- End of Service announced for V6.1
- GA of Version 8
- Service level naming convention change:
  - V6.1 and V7 – even numbers z/OS only, odd numbers common
  - V8 – all levels are common (no more z/OS only levels)

The Key Technical Messages

Further refinement of proven base

- Updated specifications (Java EE 6, EJB 3.1, Servlet 3.0, JSP 3.0, etc)
- Enhanced web services: JAXB, JAX-RS, JAX-WS
- Feature packs rolled in: SCA, XML, OSGi, JPA, Web 2.0, WOLA, Batch
- Continued focus on tightening and refining programming

Enhanced commonality across platforms

- Common installation process using Installation Manager
- Common high-performance logging function

Greater z/OS exploitation

- More granual settings for timeouts and tracing w/ dynamic control
- Resource routing for data source and connection factories

WAS V8: Enhanced, Not Retooled

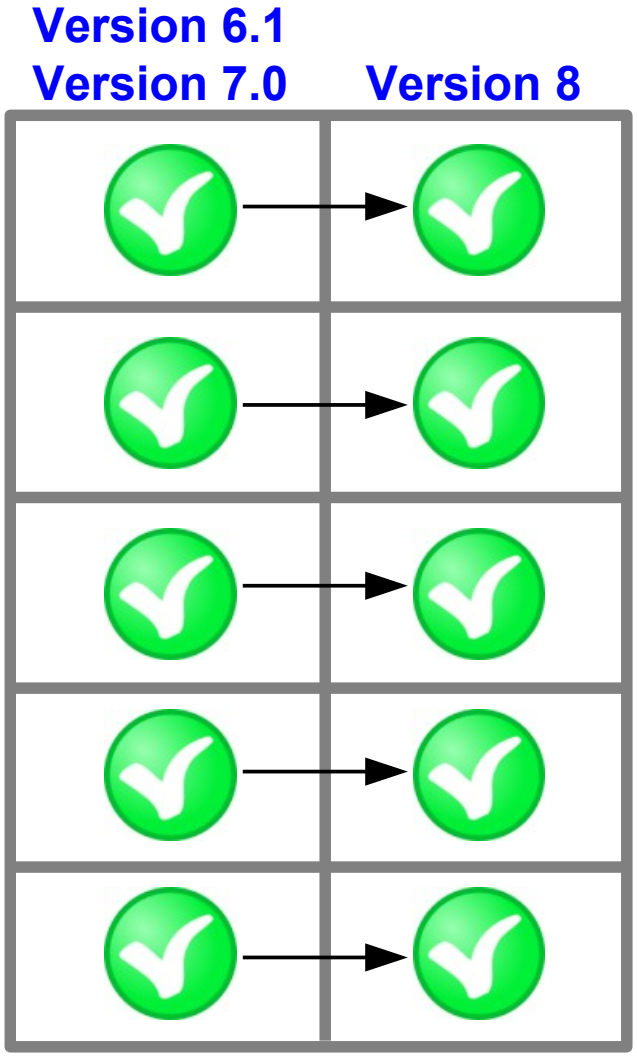
Administrative Console Skills

Application Development Skills

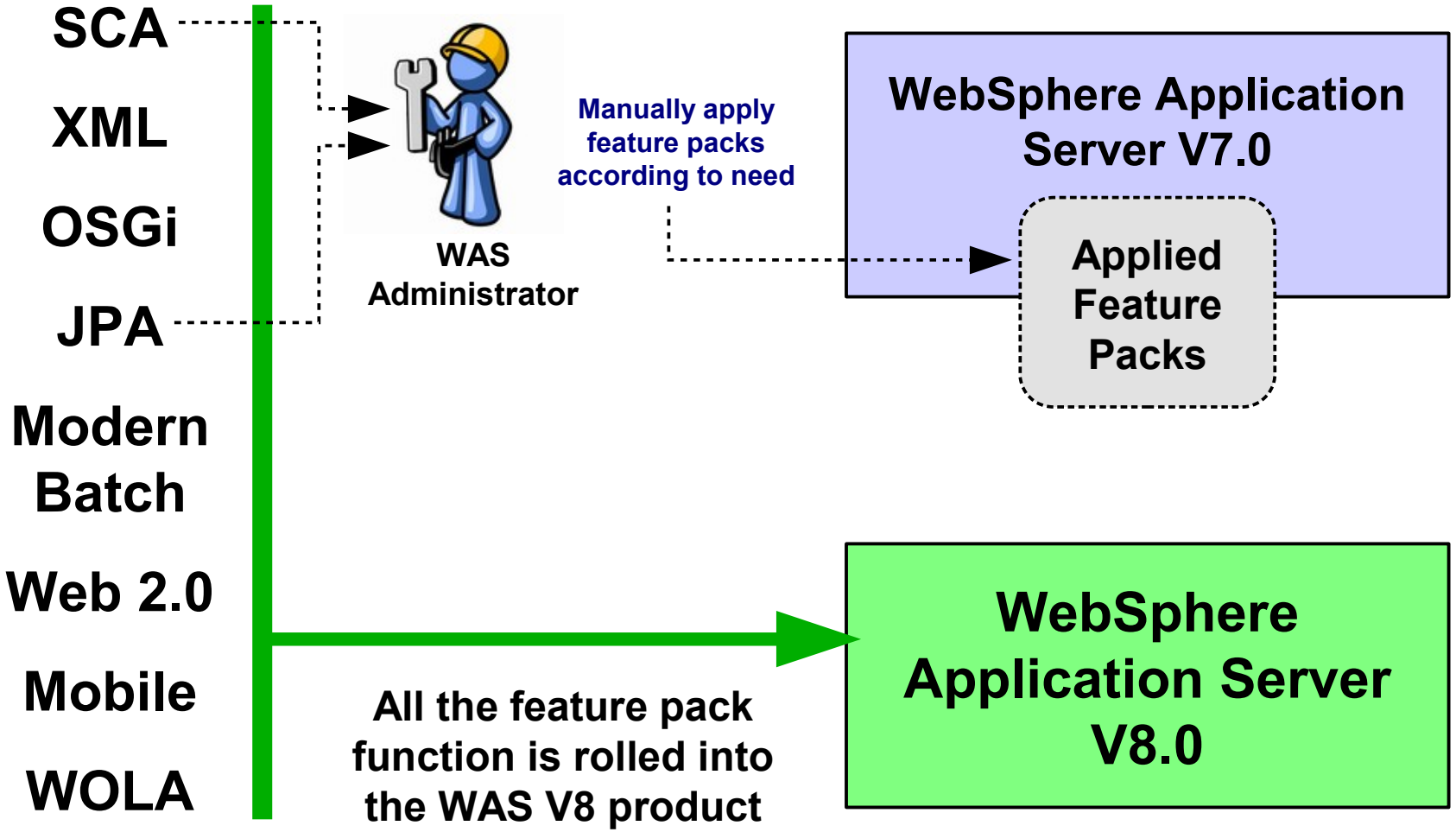
WSADMIN Scripting Assets and Skills

z/OS Operator Skills

Server Runtime Construction Skills



Rollup of Prior Feature Packs



New Version = Updated/New Specs

Best place to understand the new specs is to go to the InfoCenter and search on

`rovr_specs`

Network Deployment (z/OS), Version 8.0 > Reference > Supported configurations and limitations

Specifications and API documentation

The WebSphere® Application Server product supports various ir
specifications and application programming interface (API) docu
previous product releases.

Components

- Any application type
- Web applications
- Portlet applications
- SIP applications
- EJB applications
- Client applications
- Web services
- Service Component Architecture
- Service integration
- Data access resources
- Messaging resources
- Mail, URLs, and other Java EE resources
- Security
- Web Services Security
- Naming and directory
- Object Request Broker
- Transactions
- WebSphere extensions
- Administration

Any application type

Table 1. Supported specifications for any application type. The product supports the specifications or APIs in this table.

Specification or API	Version 8.0	Version 7.0	Version 6.1	Version 6.0
Java™ Platform, Enterprise Edition (Java EE) specification Prior to Java EE 5, the specification name was Java 2 Platform, Enterprise Edition (J2EE).	Java EE 6 (JSR 316) New Java EE 5 J2EE 1.4 J2EE 1.3	Java EE 5 New J2EE 1.4 J2EE 1.3	J2EE 1.4 J2EE 1.3 J2EE 1.2	J2EE 1.4 New J2EE 1.3 J2EE 1.2
Java Platform, Standard Edition (Java SE) specification Prior to Java SE 6, the specification name was Java 2 Platform, Standard Edition (J2SE).	Java SE 6	Java SE 6 New	J2SE 5	J2SE 1.4.2
ISO 8859 specifications	ISO 8859 applies to these versions.			

Java EE 6 (JSR 316)

Continues trend towards increased function and a simpler development model

Java Servlet 3.0 (JSR 315)

Enhancements to support modern web development

EJB 3.1 (JSR 318)

Further simplifies development of EJBs

JCA 1.6 (JSR 322)

Update specification architecture based on feedback from experts and users

Java, JVM, and Platform-Awareness

Version 8 still provides Java 6 (though called “6.0.1”). What’s new is the JVM inside the supplied Java, and the z196-awareness:

Application

Application still “sees” Java 6, but benefits from the performance enhancements below

Java 6 Specification Definition

Java Virtual Machine

z-Aware Native Layer

- Significant enhancements to JIT optimization technology
- New Balanced GC policy to reduce max pause times
- z196 exploitation of instructions and new Out-of-Order-Execution pipeline

z196 processor has faster chips, larger and better cache, an Out-of-Order-Execution pipeline and additional instructions

Background on IBM Installation Manager

IBM Installation Manager is a product intended to install software, update software, and keep track of levels installed.

Introduced in 2006, it now has over 120 IBM products using it

Things it can do:

- **Install software**
- **Update with fix packs**
- **Modify features and functions**
- **Rollback features and functions**
- **Uninstall software**

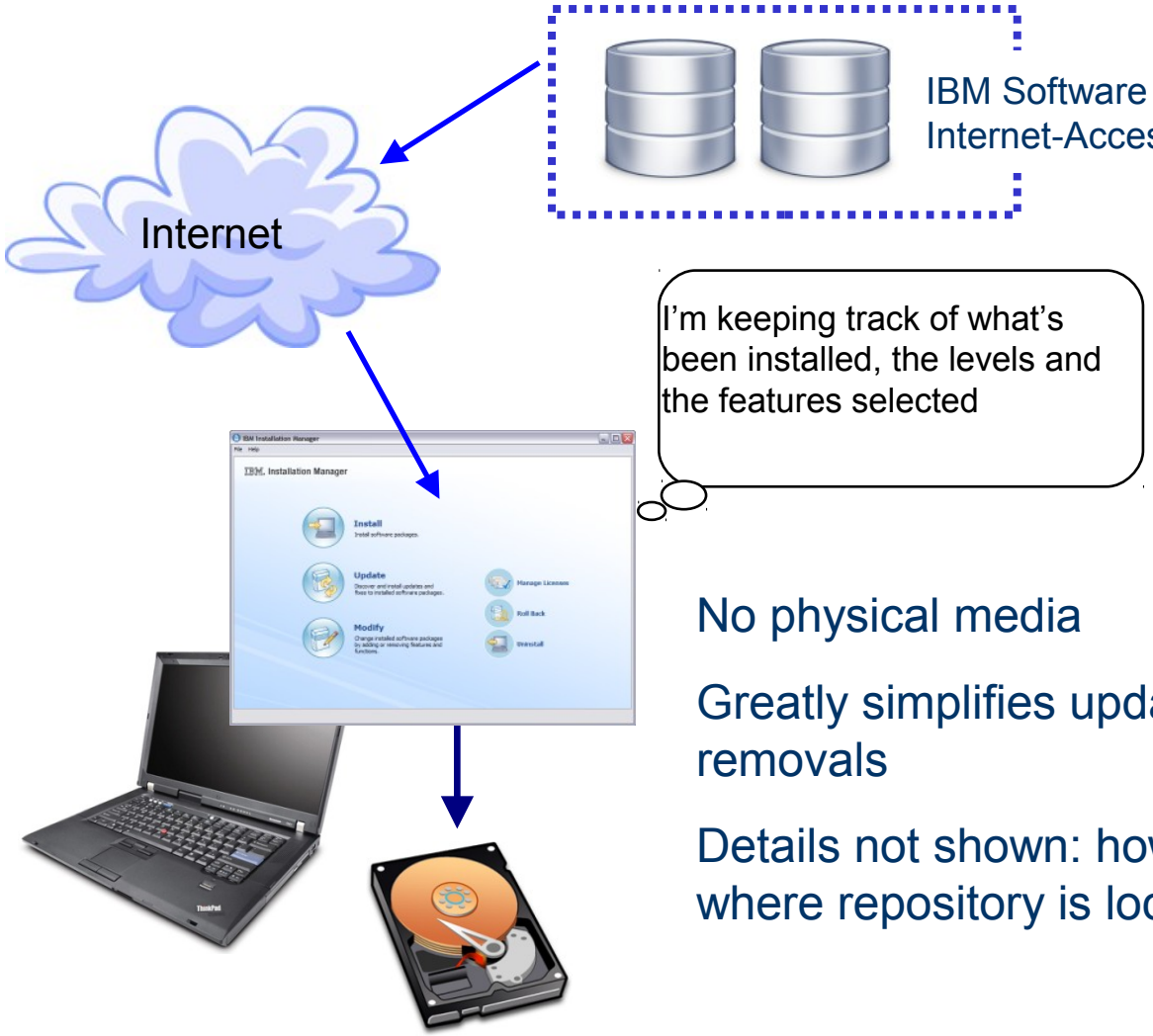
Most commonly thought of as a workstation tool, it *does* have a z/OS command line component

For WebSphere Application Server z/OS V8, IM is used for two things:

1. **Creating/maintaining the hlq.SBBOHFS file system on z/OS**
2. **Installing/maintaining the WCT V8 tool on your workstation**

Key Concept: IM “Repository”

Think of a respository as the place where Installation Manager goes to get the software files and any updates to installed software:



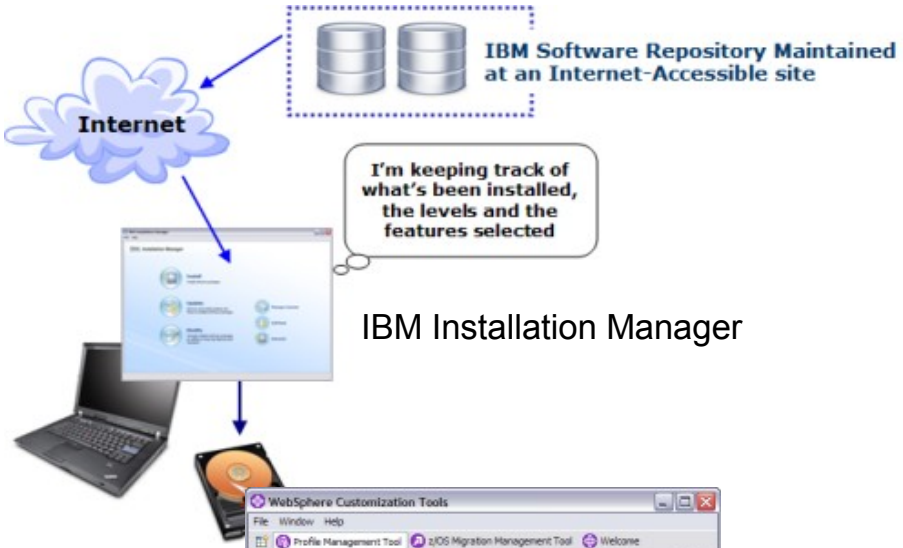
No physical media

Greatly simplifies updates and feature additions and removals

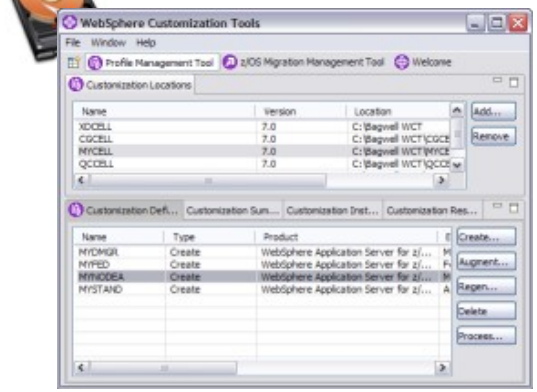
Details not shown: how identity/security is provided, where repository is located, steps to install software

IM and Workstation

The "WebSphere Customization Tool" (WCT) is what's used to create the customized jobs that build your runtime. IM installs that for WCT V8:



IBM Installation Manager



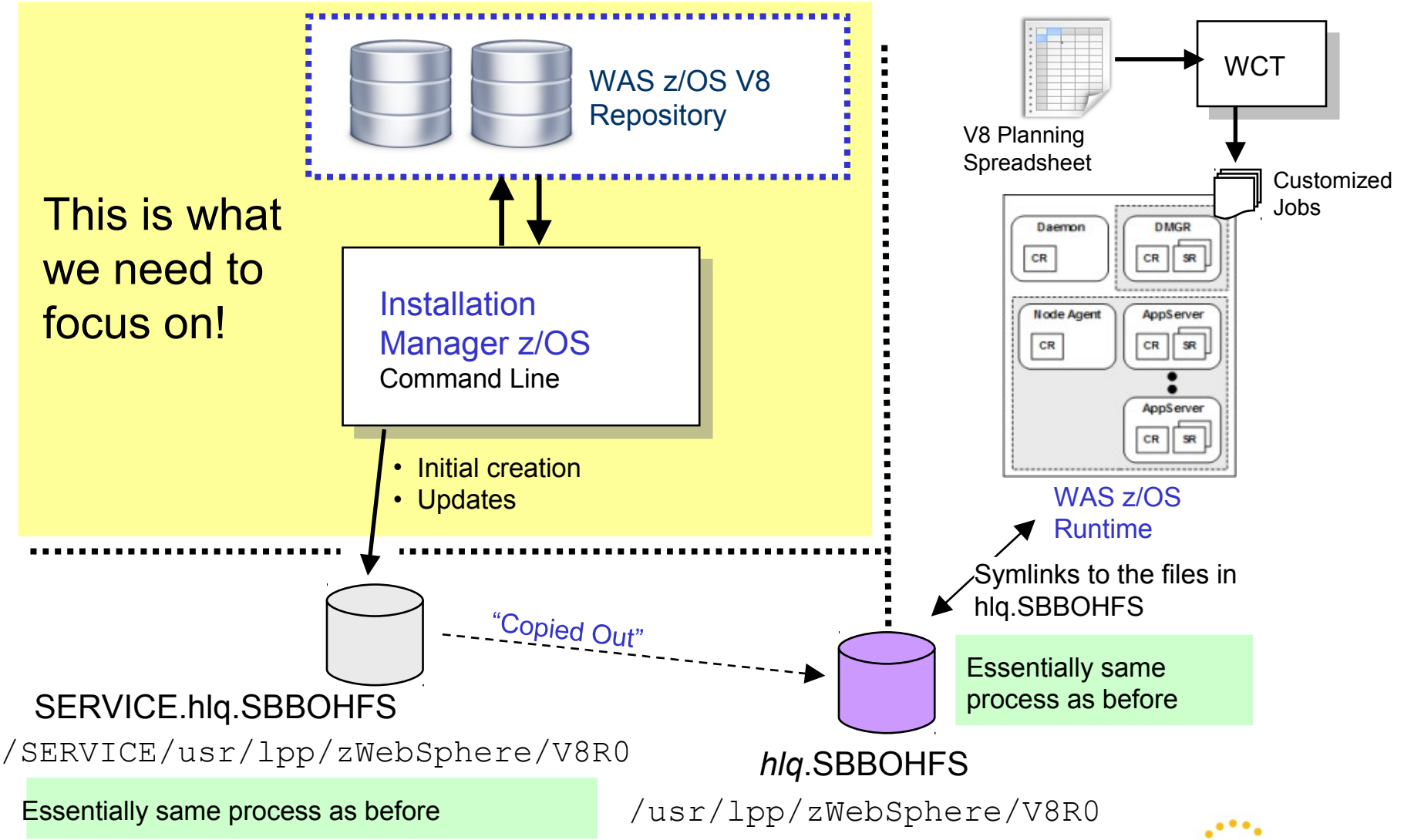
WebSphere Customization Tools V8

Process:

- **Install IM on your workstation (no-charge software; download, double-click and take most defaults)**
- **Point IM to IBM repository where WCT V8 is available (WCT is no-charge as well)**
- **Use WCT much like you did for Version 7:**
  - **Plan runtime with spreadsheet (updated for V8)**
  - **Generate customized jobs and upload to z/OS system**
  - **Submit execute jobs**
  - **Start the runtime**
- **Use IM to updated WCT with any extensions for feature packs or stack products**

IM and z/OS

This is entirely new for WAS z/OS V8 … the use of command line IM on z/OS to create and maintain the hlq.SBBOHFS file product file system:



Installing the Installation Manager Itself

It's delivered as an SMP/E package. The result is a file system that contains the IM code. You then run simple job to create runtime instance:

SMP/E installable Installation Manager
(Comes with WAS z/OS V8)

Product Repository
Initial WAS V8 Install
Fixpacks, Feature Packs, Stack Products

Focus on this next!

GIN2INST job creates a function instance of the Installation Manager

/InstallationManager/V1R4

SMP/E Administrator

SMP/E Process

CSI

Installation Manager z/OS
Command Line

/SERVICE/usr/lpp/InstallationManager/V1R4

SMP/E managed copy of the IM installation image

IM managed copy of the WAS z/OS V8 hlq.SBBOHFS product file system

The WAS V8 Product Repository

We have a two-part story here: one for the initial product delivery, then the opportunity to use IBM's hosted repository for fixpacks/feature packs

Initial Acquisition of WAS z/OS V8 from IBM

SMP/E installable
Local Repository

SMP/E Process

CSI

Local Repository
(Mounted File System)

Fixpack and Feature Pack Updates

Internet

IBM-hosted Repository

/InstallationManager/V1R4

Installation Manager z/OS
Command Line

SERVICE.hlq.SBBOHFS
/SERVICE/usr/lpp/zWebSphere/V8R0

Summary of Installation Manager

- IBM's key software installation and update management product
- Used extensively by other IBM products (i.e. Rational tools)
- Now used for WAS z/OS V8
- SMP/E still plays a role for now:
  - **Installation of IM itself**
  - **Installation of the initial local repository**
- Fixpacks and updates may be then drawn from IBM hosted respository
  - **IM generates UCLIN you may then apply to keep SMP/E information current**
- Feature Packs binaries are added to WAS z/OS product file system, not hung off to side and symlinked to as it's done today
- Stack products may be installed through IM
- Add hot updates without need for ++APAR
- Back-out updates easily using IM

IM is a powerful product and is the direction IBM is headed. Some learning curve involved but we are confident you will become proficient quickly and will come to understand the value of IM into the future

High Performance Extensible Logging (HPEL)

Very High Level Overview of HPEL

This is an optional mechanism to format traces and logs into a WAS binary format. A utility is then used to offload to a viewable text file:

Configurable on a Server-by-Server Basis

WebSphere Application Server Version 8
All Supported Platforms

- Java Trace
- Java Logs
- System.out
- System.err

More efficient use of space, faster write operations

WAS-specific binary format log file

Write to memory buffer, then file

Controls to dictate size limits, what to do when limit reached, how to trim files, start new files, etc.

Log Viewer Utility

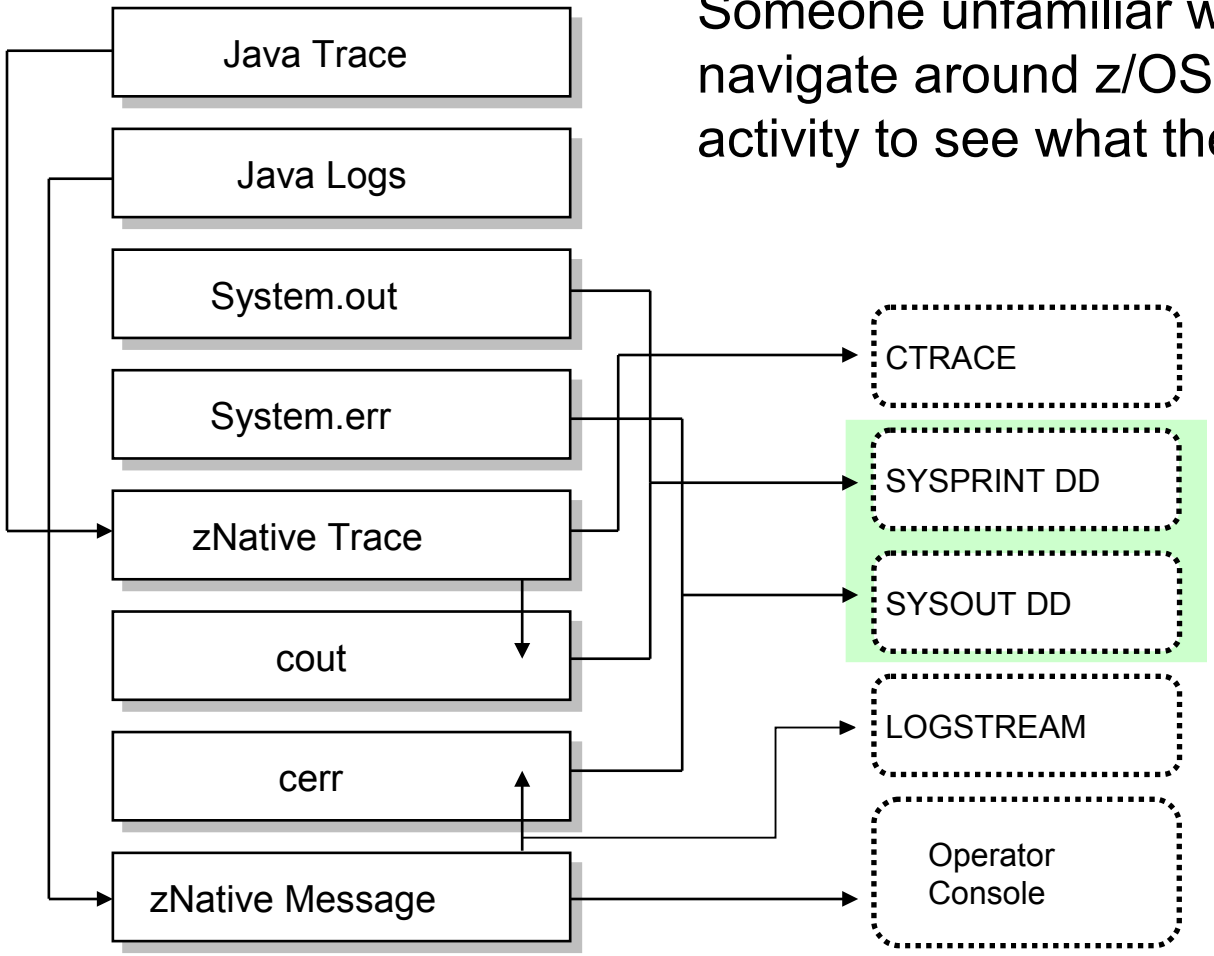
Common across all platforms

Use whatever view/edit tool you prefer

ASCII readable file

For z/OS: Output We Have Today

This is known as “Basic” in Version 8. On the next chart we’ll see where HPEL affects the picture

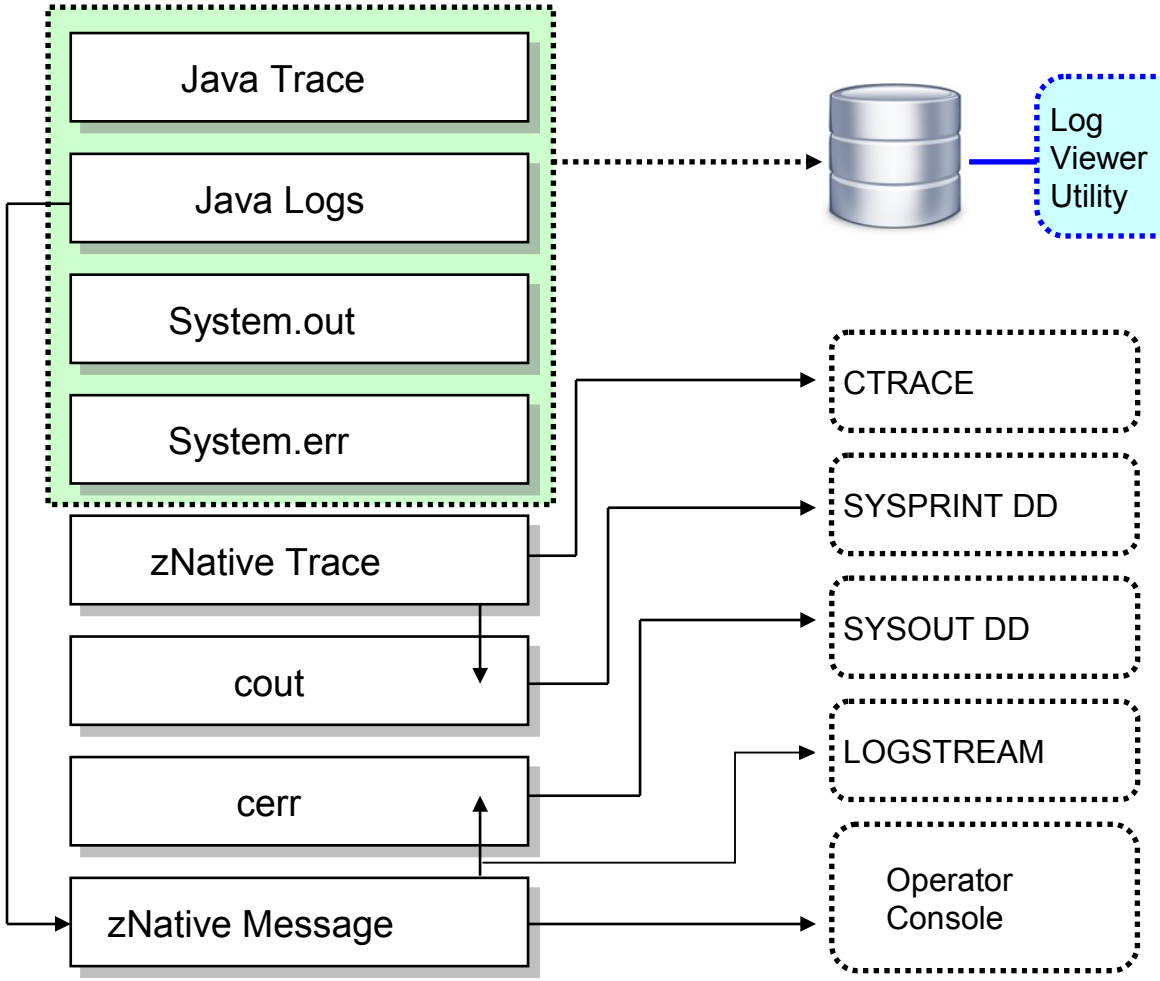


Someone unfamiliar with System z had to navigate around z/OS-specific log and trace activity to see what they needed to see

This portion could be routed to JES or USS/MVS output

For z/OS: With HPEL in Effect for Server

And here's what it looks like when you put HPEL into effect:



Log and trace format consistent across all platforms

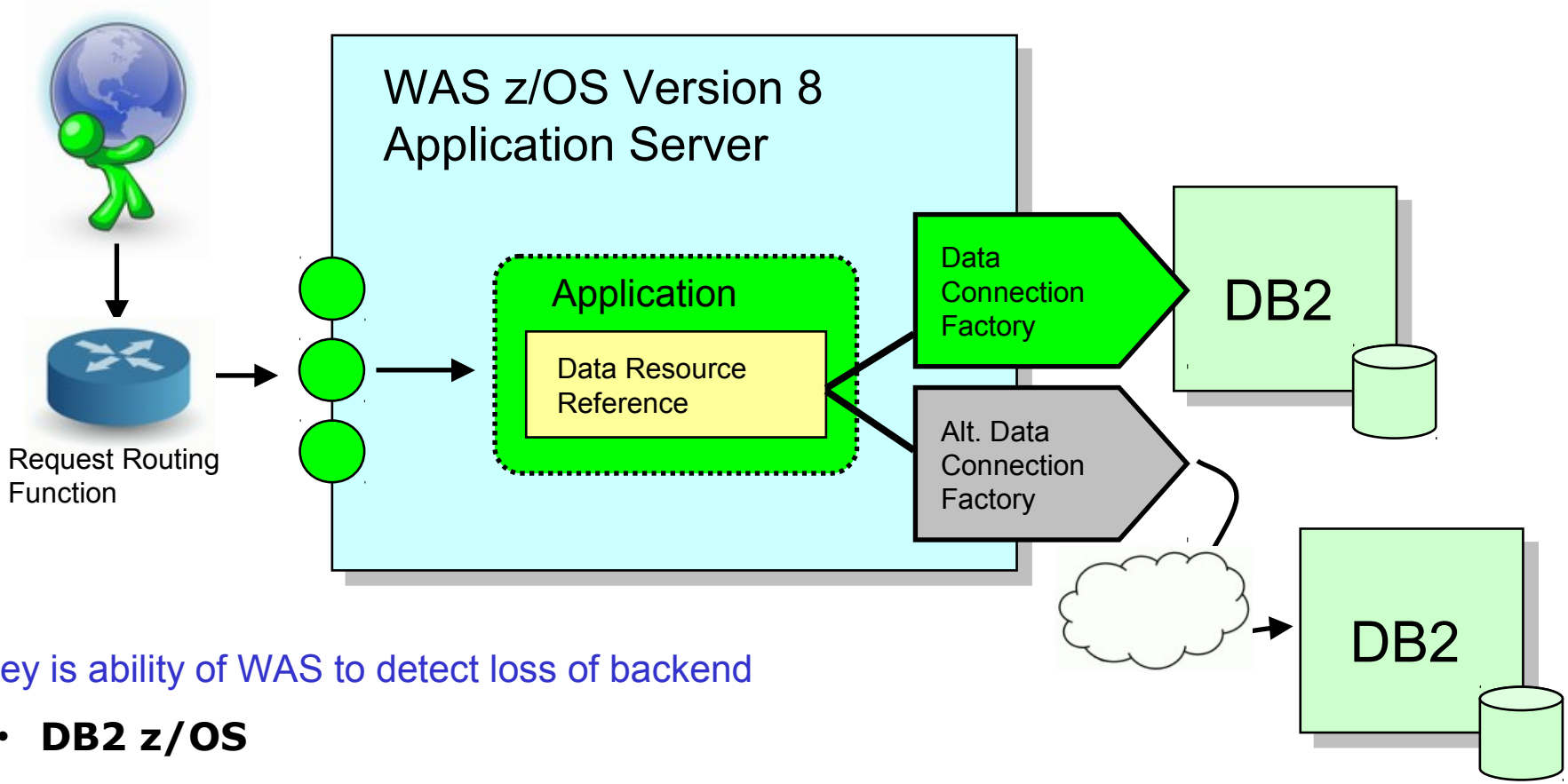
These now contain z-specific content of interest to system programmers

Better leveraging and focusing of existing skills in the organization

Data Resource Routing

High Level Overview of this Function

This function allows you to configure an alternative connection factory so in the event of a data resource loss the defined backup can be used:

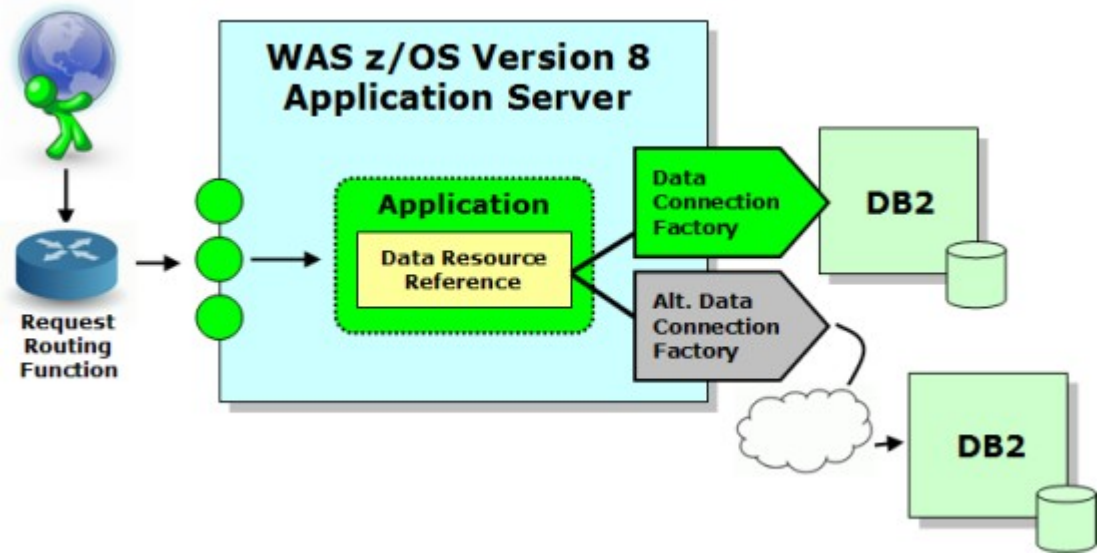


Key is ability of WAS to detect loss of backend

- **DB2 z/OS**
- **IMS if you're at a relatively recent level of maintenance**
- **Not yet CICS if using CTG functionality**

Further z/OS Exploitation

Some of what was shown on prior page is common across platforms. WAS z/OS V8 adds an additional layer:



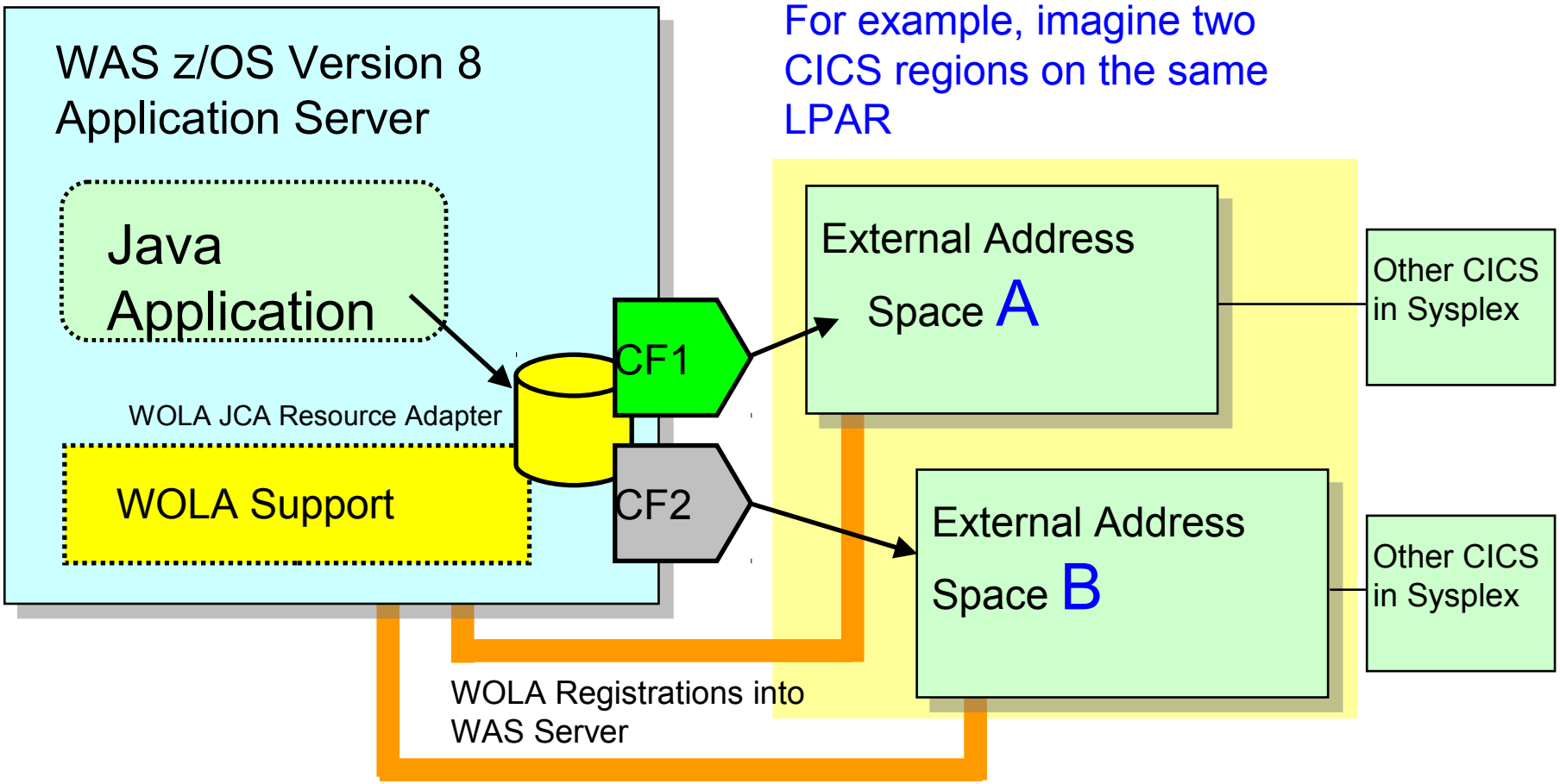
Imagine the backup DB2 is also lost, or you've not configured for an alternative connection factory. What then?

Three further configurable options:

1. **Have WAS issue a Write to Operator (WTO) and use that to take further system automation action**
2. **Have WAS issue PAUSELISTENERS, thus turning off input ports to server, allowing front-end routers to detect and go elsewhere**
3. **Have WAS determine which applications are affected and stop just those applications, leaving other applications up and running**

WOLA Variation on This New Function

WOLA participates in this as well in that a backup registered external address space now be used in the event the primary is lost:



WOLA is by definition “same LPAR,” and this gives you a degree of availability by allowing routing to secondary registered external address sapce

Granular RAS

RAS Function Control Down to Request

This new function leverages existing classification file to extend scope of certain RAS functions down to the request level:

Not just HTTP … any classifiable input type (IIOP, MDB, etc.)

```
<http_classification_info transaction_class="_____"
        :
  dispatch_timeout="_____"
  queue_timeout_percent ="_____"
  request_timeout="_____"
  stalled_thread_dump_action="_____"
  cputimeused_limit="_____"
  cputimeused_dump_action="_____"
  dpm_interval="_____"
  dpm_dump_action="_____"
  SMF_request_activity_enabled="__"
  SMF_request_activity_timestamps="__"
  SMF_request_activity_security="__"
  SMF_request_activity_CPU_detail="__"
  classification_only_trace="__"
  message_tag="_____"
  timeout_recovery="_____">
```

- Additional XML values permitted in the classification file
- These control behavior when classification identification is made by this function
- MODIFY command allows you to dynamically enable a new file, or dynamically revert back to previous
- Enhances granularity. Previously down to server level; now to request.

WAS 8 Security Default Changes

	WAS8	Prior release
VMM Active Directory for User look up for performance	(ObjectCategory=User)	(ObjectClass=Person)
VMM Active Directory and Adam for Group membership lookup for performance	"memberOf" attribute with "Direct" scope	none
VMM LDAP attribute search cache dist policy	None	Push
EJB/CSIv2 transport	SSL-required	Supported
Session security integrity	Enabled	Disabled
“Use available authentication data when an unprotected URI”	Checked	Uncheck
HttpOnly	Enabled	Disabled
Generated Certificate Key Length	2048	1024
z/OS java.security file location	/WAS_HOME/properties	jre/lib/security
DataPower Certificated	Now need to import	

Companion Videos on YouTube

WASZOSV8 - Intro to WAS V8 - Part 1 of 4 HD

April 2, 2011 02:15 PM | This sets the stage for WebSphere Application Server V8 by str...

Edit Insight

4m:50s

WASZOSV8 - Intro to WAS V8 - Part 2 of 4 HD

April 2, 2011 02:16 PM | In this part we review the updated open standards and the roll...

Edit Insight

6m:30s

WASZOSV8 - Intro to WAS V8 - Part 3 of 4 HD

April 2, 2011 02:18 PM | In part 3 we look at two functions added to WAS V8 z/OS that a...

Edit Insight

8m:54s

WASZOSV8 - Intro to WAS V8 - Part 4 of 4 HD

April 2, 2011 02:13 PM | In this final section we look at z/OS-specific functionality -...

Edit Insight

18m:00s

Search on key string WASZOSV8 to find these videos

Videos about WOLA

Part	Title and URL	Duration	Abstract
1	**WP101490 - WOLA - Essentials of WOLA** http://www.youtube.com/watch?v=bpUiJ-wp0qA	11:59	Provides an overview of the framework and concepts of WOLA
2	**WP101490 - WOLA - CICS** http://www.youtube.com/watch?v=d3WWNWiQMJI	14:21	Provides an overview of how WOLA is implemented in CICS
3	**WP101490 - WOLA - IMS** http://www.youtube.com/watch?v=BDBQ1qbsRqo	7:07	Provides an overview of how WOLA is implemented in IMS
4a	**WP101490 - WOLA - Native APIs Part 1 of 2** http://www.youtube.com/watch?v=lNyg6tMUkXc	10:39	First of two parts on the WOLA native APIs
4b	**WP101490 - WOLA - Native APIs Part 2 of 2** http://www.youtube.com/watch?v=7wNESRJ9lXY	14:07	Second of two parts on the WOLA native APIs
5	**WP101490 - WOLA - Java Considerations** http://www.youtube.com/watch?v=oVFSY_F6ceY	14:45	Overview of the Java programming considerations for WOLA

WebSphere Compute Grid and Modern Batch

1	**WP101783 - IBM Modern Batch - Part 1 of 4** http://www.youtube.com/watch?v=3eeUTpi1iAA	8:44	Overview of "Batch Modernization" and comparisons of technologies
2	**WP101783 - IBM Modern Batch - Part 2 of 4** http://www.youtube.com/watch?v=kLtHsKeh1Ok	14:22	Overview of the IBM architectural approaches to modern batch
3	**WP101783 - IBM Modern Batch - Part 3 of 4** http://www.youtube.com/watch?v=jcyhaNtp4mI	9:02	Demonstration of job submission and execution
4	**WP101783 - IBM Modern Batch - Part 4 of 4** http://www.youtube.com/watch?v=IqqOiTl19r4	12:55	Demonstation of scheduler integration
1	**WP101783 - WCG/TWS Integration - Part 1 of 2** http://www.youtube.com/watch?v=g_mLklap8bM	11:03	Powerpoint screenshow of concepts related to integration of schedulers with WCG.
2	**WP101783 - WCG/TWS Integration - Part 2 of 2** http://www.youtube.com/watch?v=NLuZYXUWX0c	8:51	

WebSphere Application Server Basics

1	ATSWAS101 - The Essentials - Part 1 of 4 http://www.youtube.com/watch?v=Pshlp0E1Vp8	9:00	Background of what "Application Server" is.
2	ATSWAS101 - The Essentials - Part 2 of 4 http://www.youtube.com/watch?v=BE7Zeh-fsOc	8:27	Overview of Java and the JVM
3	ATSWAS101 - The Essentials - Part 3 of 4 http://www.youtube.com/watch?v=ocr2XzSUsRk	11:26	Overview of WebSphere Application Server
4	ATSWAS101 - The Essentials - Part 4 of 4 http://www.youtube.com/watch?v=Z8ZQ_qeDbV4	5:09	Very quick peek at WAS z/OS; more to come.
1	ATSWAS201 - The Essentials - Part 1 of 3 http://www.youtube.com/watch?v=SHvWFJK5g9M	7:59	Background on platform exploitation in general
2	ATSWAS201 - The Essentials - Part 2 of 3 http://www.youtube.com/watch?v=4Lfxb9YQqJY	14:22	A look at the split JVM model and some of the other ways WAS z/OS takes advantage of z/OS.
3	ATSWAS2101 - The Essentials - Part 3 of 3 http://www.youtube.com/watch?v=9G4iZzc-J2I	12:10	A tour of an actual WAS z/OS ND cell.