WebSphere Liberty ~~Profile~~ and WebSphere ~~Full Profile~~ Classic – What's New? And Common Problems

Session 17366
August 12, 2015
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SHARE is an independent volunteer-run information technology association that provides **education**, professional **networking** and industry **influence**.

WebSphere Application Server

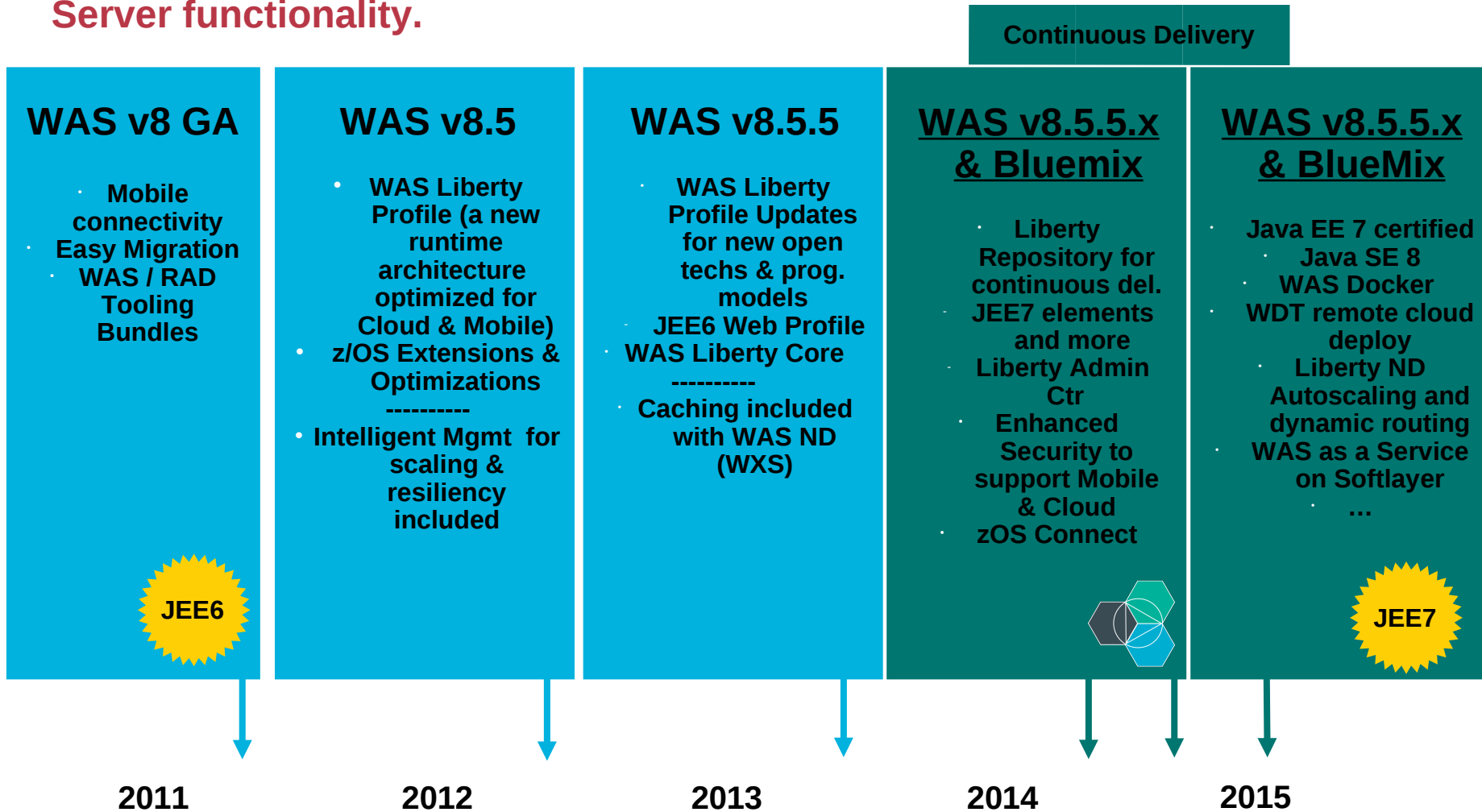| Session	Title	Time	Room
17363	Debug 101-Using ISA Tools for Apps in WebSphere Application Server z/OS	Monday 11:15	Europe 11
17367	WebSphere Liberty on Windows and z/OS (Among Other Things) Hands-On Lab	Tuesday 10:00	Asia 5
17361	ABCs of WAS	Tuesday 1:45	Oceanic 7
17368	z/OS Connect: Opening up z/OS Assets to the Cloud and Mobile Worlds	Tuesday 3:15	Oceanic 7
17362	Configuring Timeouts for WebSphere Application Server on z/OS	Wednesday 8:30	Oceanic 7
17366	WebSphere Liberty and WebSphere Application Server Classic - What's New?	Wednesday 11:15	Oceanic 7
17364	IBM Installation Manager for z/OS System Programmers: Web-based Installs, Fix Packs, and How iFixes Really Work	Thursday 4:30	Oceanic 7
17365	JSR 352 - The Future of Java Batch and WebSphere Compute Grid	Friday 10:00	Oceanic 6

Agenda

- WAS 8.5.5 Family – Where are we now?

- WebSphere Liberty Overview

- WebSphere Liberty – What's New?

- WebSphere Classic – What's new?

- Common Problems – Liberty and Classic

Recent WAS History and Java EE

Going on 16 years of leading the industry and setting the bar for app Server functionality.

Continuous Delivery

WAS v8 GA

- **Mobile connectivity**
- **Easy Migration**
- **WAS / RAD Tooling Bundles**

JEE6

WAS v8.5

- WAS Liberty Profile (a new runtime architecture optimized for Cloud & Mobile)
- z/OS Extensions & Optimizations

- Intelligent Mgmt for scaling & resiliency included

WAS v8.5.5

- WAS Liberty Profile Updates for new open techs & prog. models
- JEE6 Web Profile WAS Liberty Core

- Caching included with WAS ND (WXS)

WAS v8.5.5.x & Bluemix

- Liberty Repository for continuous del.
- JEE7 elements and more Liberty Admin Ctr
- Enhanced Security to support Mobile & Cloud
- zOS Connect

WAS v8.5.5.x & BlueMix

- Java EE 7 certified
- Java SE 8
- WAS Docker
- WDT remote cloud deploy
- Liberty ND Autoscaling and dynamic routing
- WAS as a Service on Softlayer
- …

JEE7

2011   2012   2013   2014   2015

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WebSphere Liberty Overview

WebSphere Liberty v8.5.5

WAS v8.5.5 delivers significant enhancements to Liberty profile, including new programming models, administration, qualities of service and development tools

Dynamic Server Profile
Not static like Web Profile; configured by app at a fine-grained level

"Developer First" Focus *Enhanced!*
Simplified, shareable XML server config. New integrated messaging server, DynaCache support, new prog. models, such as Web Services, JMS & EJB-Lite.

Start fast, run efficiently
Starts in <3s; Mem footprint <50MB; (TradeLite benchmark)

Small Download
50MB for Web Profile features

Integrated tools *Enhanced!*
Powerful tools in WDT Eclipse feature. Enhanced for v8.5.5 prog models, Maven integration, ++

Dynamically Extensible *New!*
Install new features from repository (local or remote) with no svr restart

WAS v8.5.5 Liberty & WAS Developer Tools for Eclipse (WDT) WDT Remote

Lightweight cluster Mgmt *New!*
Liberty servers can join a lightweight cluster for workload balancing and high availability

Java EE7 Certified
Create apps for the Java EE7 Full Profile standard.

Unzip install and deploy *Enhanced!*
IM or unzip to install. New option to deploy "server package" of app + config + required subset of server runtime for highest density deploy

Liberty Extensions *New!*
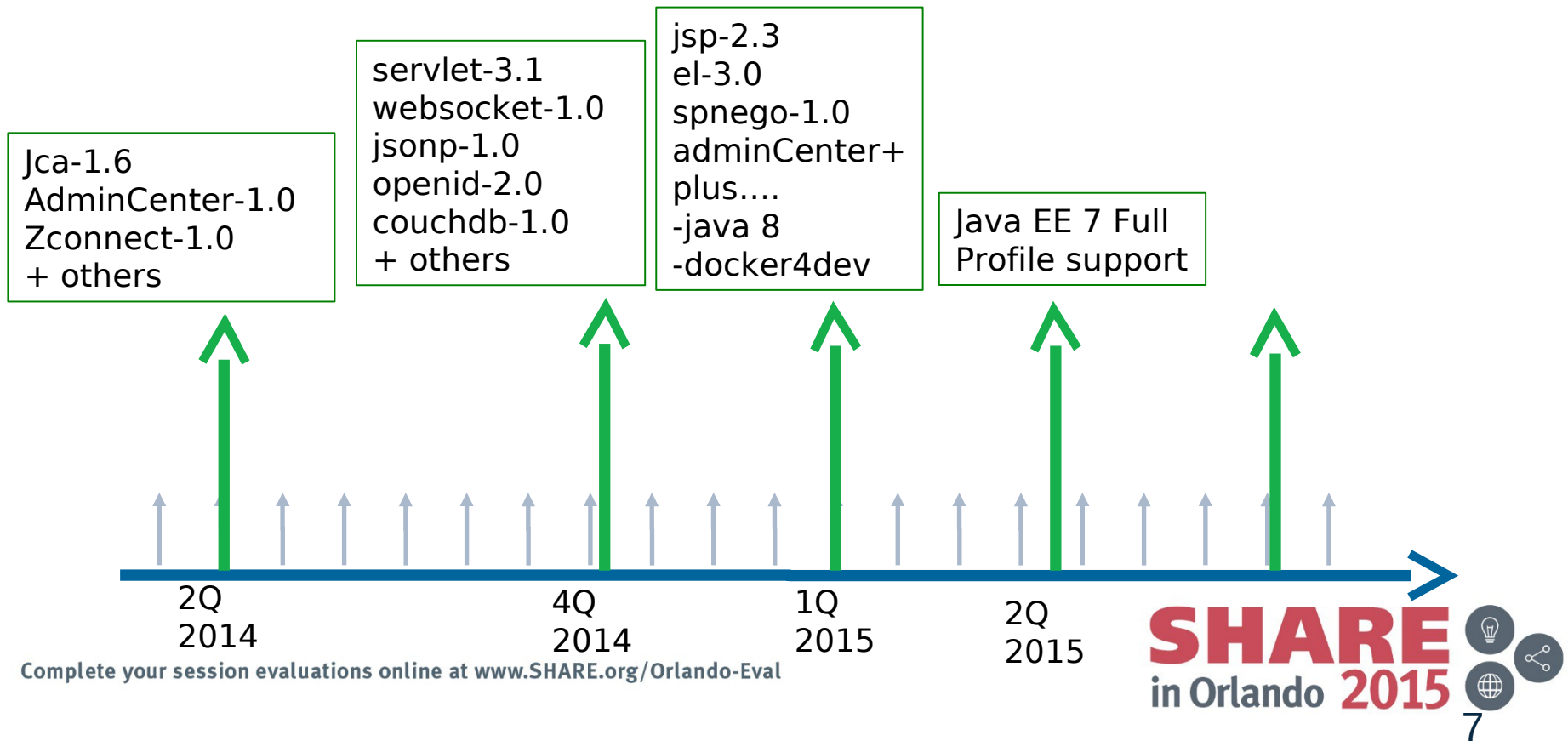Add custom features and integrate 3rd party components via Liberty extensions interface

Fidelity to full profile WAS
Same reliable containers & QOS. Develop on Liberty profile and deploy to Liberty or full-profile WAS

Continuous Delivery of new function

- Bluemix and beta drivers every month
- GA features delivered regularly via Liberty Repository
- Java EE7 features started 4Q2014
- Java EE7 Full Profile supported in 2Q2015

Jca-1.6
AdminCenter-1.0
Zconnect-1.0
+ others

servlet-3.1
websocket-1.0
jsonp-1.0
openid-2.0
couchdb-1.0
+ others

jsp-2.3
el-3.0
spnego-1.0
adminCenter+
plus....
-java 8
-docker4dev

Java EE 7 Full
Profile support

2Q
2014

4Q
2014

1Q
2015

2Q
2015

Continuous consumption!

Zero migration for unchanged apps on WAS Liberty, regardless of Java EE version

java -jar wlp-developers-runtime-8.5.5.2.jar

8.5.5.2

Bring your config

WLP_USER_DIR → Your configuration, applications, resources

8.next

java -jar wlp-developers-runtime-8.next.jar

Choice: Features limit runtime behavior change
Existing features remain unchanged eg. servlet-3.0
New feature versions contain updates, eg. servlet-3.1
No custom properties for behavior switching

Point to your existing JRE

Within supported software levels. Java 6 will not last forever
New Java EE features may require higher versions of Java

Online Repository for Extending Liberty
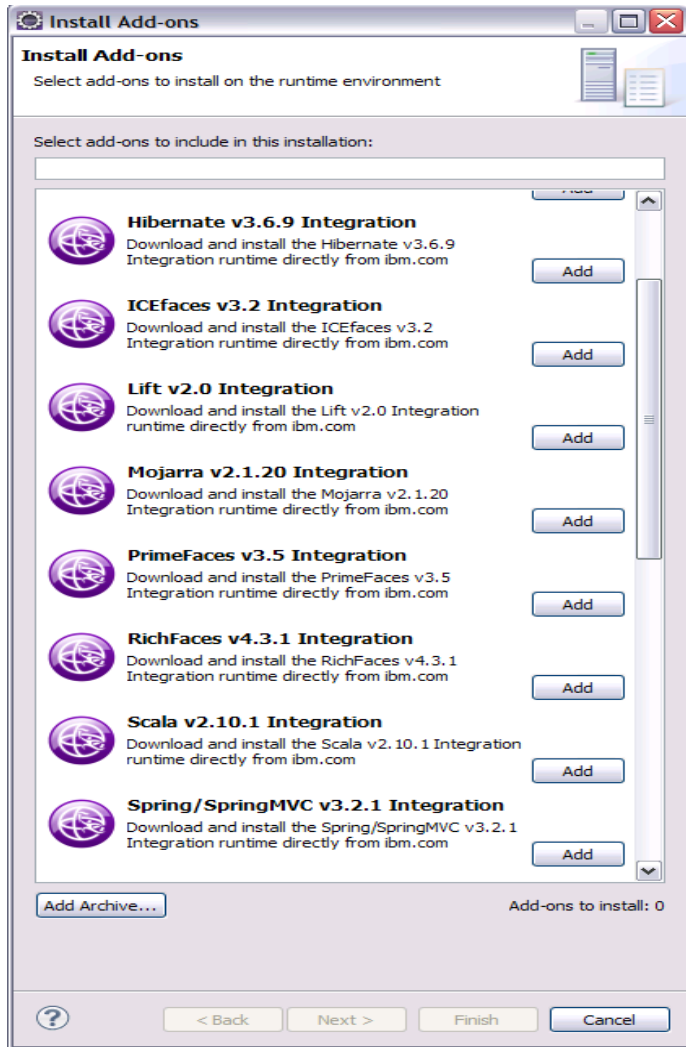
- An **online repository** to deliver **Liberty platform extensions**
- Content includes:
  - Open source project integration
  - Individual Liberty features
  - Samples
- Enables more **fine-grained**, early access content, simplest possible **integration with external open source**
- Install using Liberty command-line tools or WDT/RAD

On **www.wasdev.net**

WebSphere Liberty – What's New?

Optimized Local Adapters

Optimized Local Adapters provides an efficient low-latency mechanism to exchange data bi-directionally between Liberty z/OS and other address spaces:
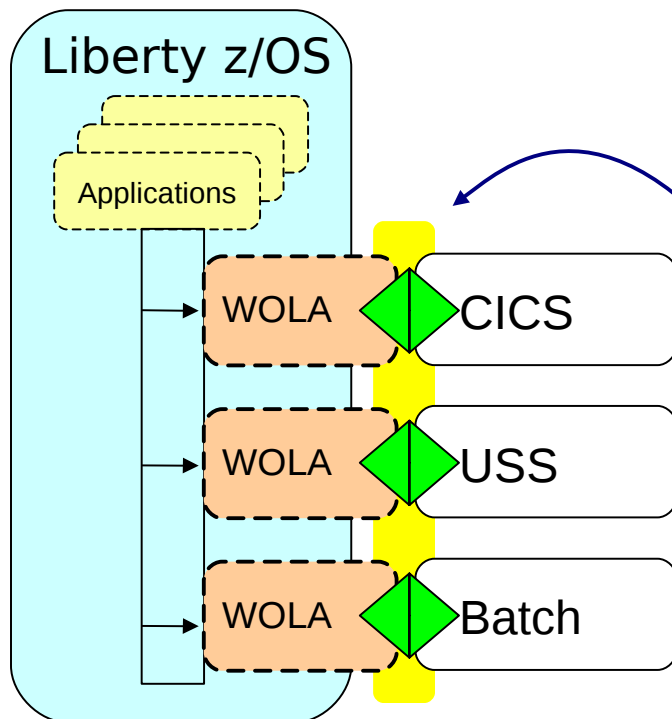
- Very efficient byte-array transfer
- First available with Liberty z/OS 8.5.5.2
- Bi-directional

Outbound -- Java in WAS invokes program in external
Inbound -- Program in external invokes Java in WAS

- Identity assertion to / from CICS
- Supplied JCA resource adapter for applications going outbound
- Supplied native APIs for cases where their usage is indicated

COBOL, C/C++, PL/I, High Level Assembler
31-bit and 64-bit modules
See WP101490 for "Primer" on API usage

- WP101490 Techdoc for much more

Integrating Java/Non-Java: WOLA

Enabling some of your GP work to be refactored to Java

Current Non-Java Workload → **GP**

Java Workload / **WOLA** / **Non-Java Workload** → **GP**, **zAAP zIIP**
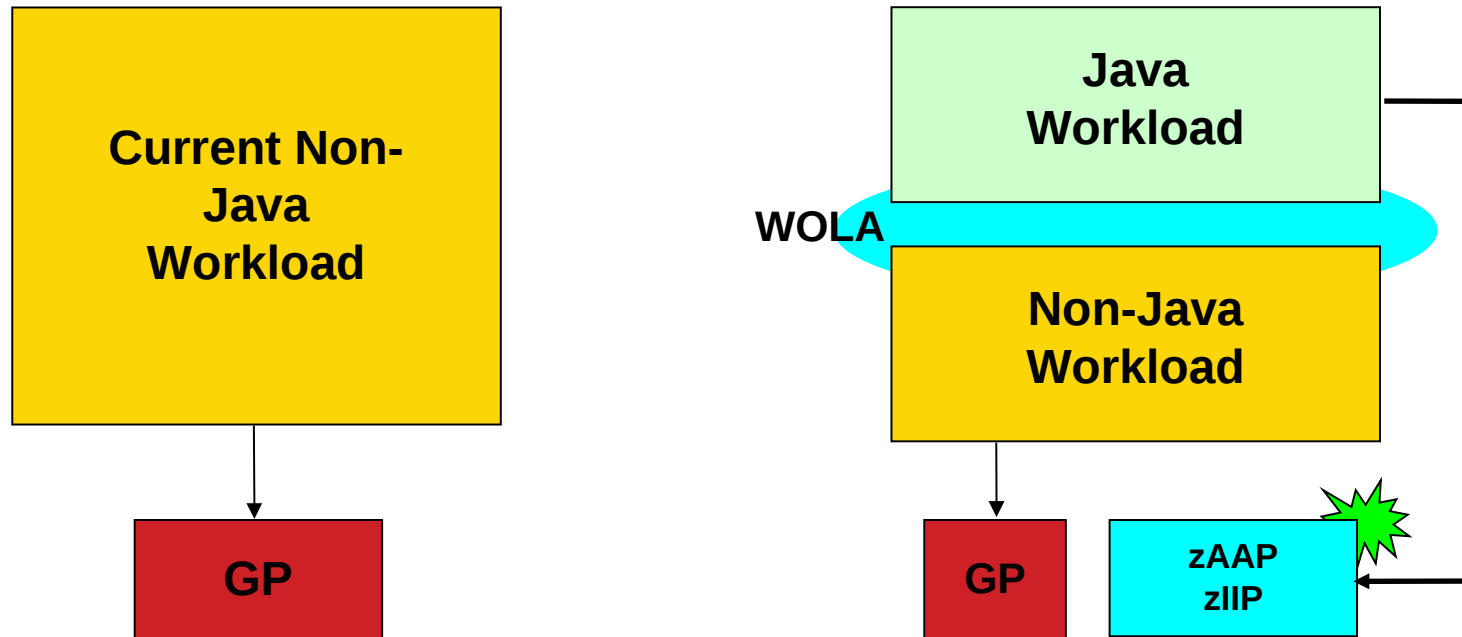
WOLA is a technology that enables integration of Java and non-Java assets in a way that provides high throughput and security

WOLA: Classic WAS and Liberty

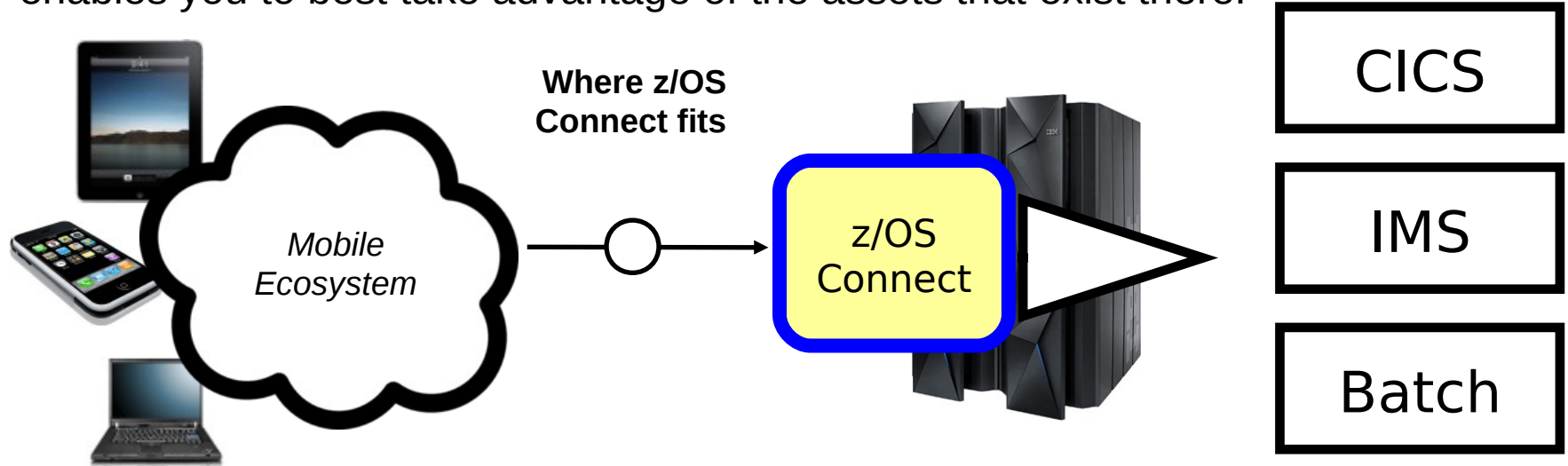- **There are many points of similarity, but some points of difference:**

  - *Similarities*

    - **Outbound JCA programming interfaces are the same**
    - **Inbound native API programming model is the same**
    - **CICS Link Server Task function very similar in design and operation**
    - **Security assertion with CICS both directions supported**
    - **Supplied samples nearly identical**

  - *Differences*

    - **Global transaction not supported with Liberty WOLA**
      - **Applications that start global transactions will need to be modified before using with Liberty WOLA**
    - **Target EJB for inbound must be EJB 3.x and has Liberty-specific design requirements**
    - **Round-Robin and Alternate JNDI not supported**
      - **Relied on function of traditional WAS not present in Liberty**
    - **Liberty WOLA and IMS not supported**
    - **No WOLA MODIFY commands or SMF 120.10 for WOLA**

z/OS Connect – What is it?

It's about getting REST and JSON into your mainframe environment in a way that enables you to best take advantage of the assets that exist there:

Where z/OS Connect fits

Mobile Ecosystem

z/OS Connect

CICS

IMS

Batch

Other

- Feature in Liberty Profile Server for z/OS
- Function IBM wrote to run in Liberty Profile
- No charge function provided with license entitlement to WAS z/OS, CICS or IMS

REST – Representational State Transfer … the use of HTTP URLs that map to a 'service', such as 'query account' or 'update data'

JSON – JavaScript Object Notation … a standard of representing data as a set of name/value pairs. This is passed back and forth along with REST request/responses

Why z/OS Connect?

This represents another component to configure and maintain in your environment. So what value does it bring?
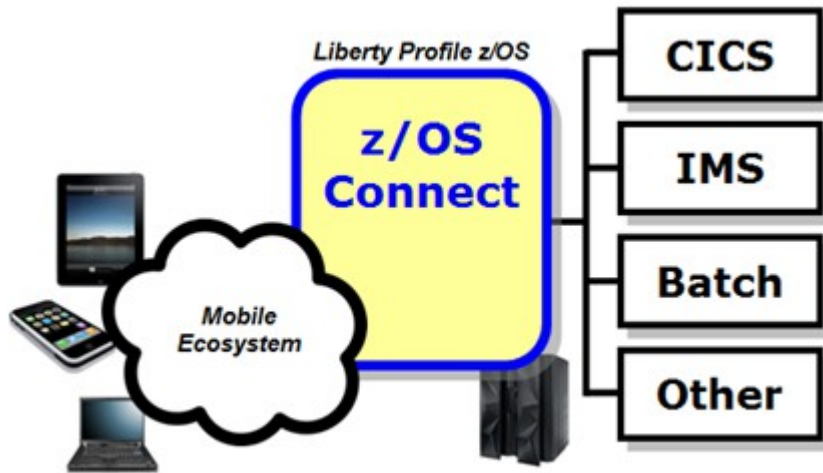
You *could* enable Mobile access without z/OS Connect
z/OS Connect simplifies and makes the environment more consistent and manageable

- Provides a common and consistent entry point for mobile access to one or many backend systems
- Java, so runs on specialty engines
- Shields backend systems from requiring awareness of RESTful URIs and JSON data formatting
- Provides point for authorization of user to invoke backend service
- Provides point for capturing usage information using SMF
- Simplifies front-end functions by allowing them to pass RESTful and JSON rather than be aware of or involved in data transformation

z/OS Connect Summary in One Picture

WebSphere Liberty for z/OS
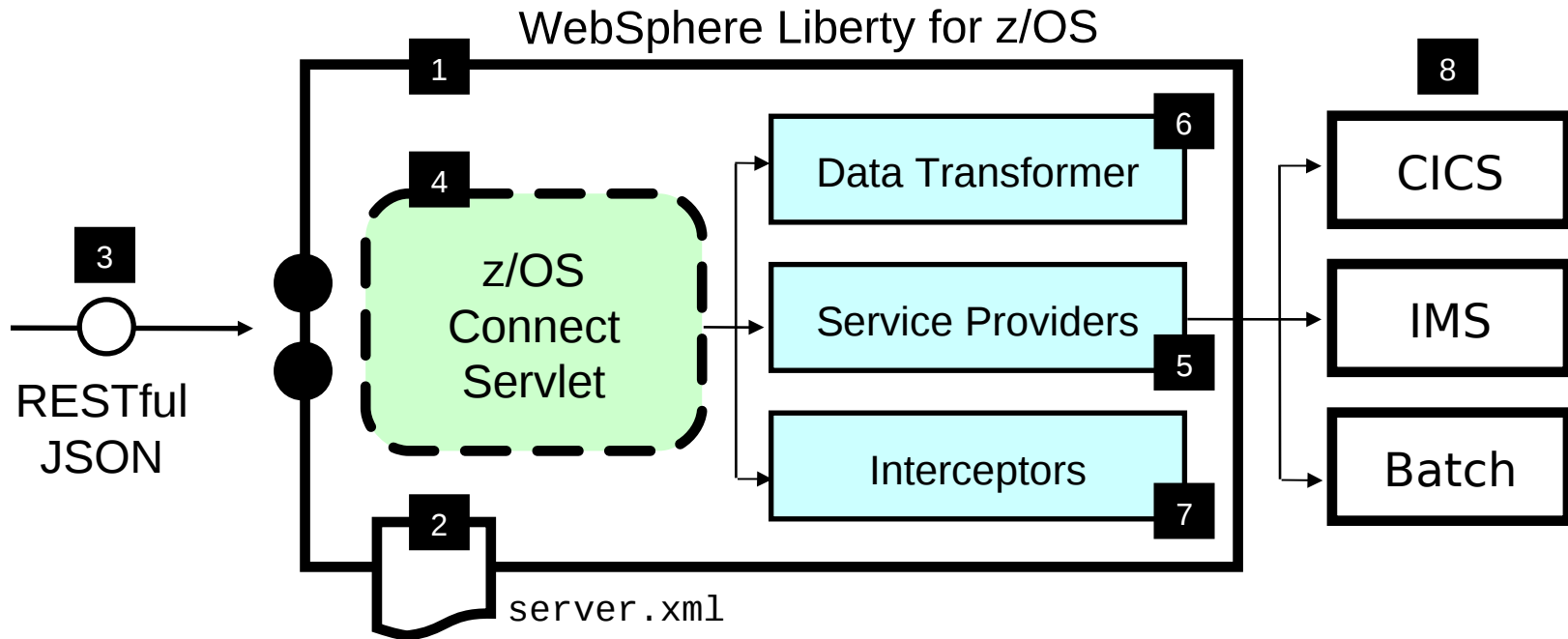
1 z/OS Connect is software function that runs in WebSphere Liberty for z/OS.

2 z/OS Connect is described and configured in the Liberty `server.xml` file

3 z/OS Connect is designed to accept RESTful URIs with JSON data payloads

4 One part of z/OS Connect is a servlet that runs in Liberty Profile z/OS.

5 A **'Service Provider'** SPI can be implement to provide connectivity to backend systems

6 z/OS Connect provides the ability to transform JSON to the layout required by backend with a **'Transformer'** SPI

7 **'Interceptors'** are callout points where software can be invoked to do things such as SAF authorization and SMF activity recording

8 Backend systems supported are CICS, IMS and Batch (DB2 announced)

Java Road Map – Language Updates

Java 5.0
New Language features:
- Autoboxing
- Enumerated types
- Generics
- Metadata

Java 6.0
Performance Improvements
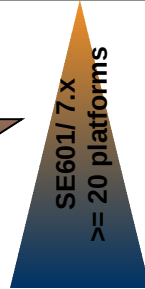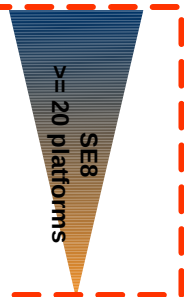Client WebServices Support

Java 7.0
- Support for dynamic languages
- Improve ease of use for SWING
- New IO APIs (NIO2)
- Java persistence API
- JMX 2.x and WS connection for JMX agents
- Language Changes

Java 8.0**
- Language improvements
- Closures for simplified fork/join

IBM Java 8 (J9 R28)
- **Improvements in**
- **Performance**
- **RAS Monitoring**
- **z13™ Exploitation**
- **SIMD**
- **SMT**
- **Crypto acceleration**

>= 20 platforms SE8 platforms

EE 5

EE 6.x

| 04 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |

WAS 6.0
SE 5.0 18 platforms

WAS 6.1
SE 6.0 20 platforms

WAS 7.0

SE601/ 7.x >= 20 platforms

WAS 8.5
SE601/ 7.x >= 20 platforms

EE 7

IBM Java Runtimes

IBM Java 5.0 (J9 R23)
Improved performance
- Generational Garbage Collector
- Shared classes support
- New J9 Virtual Machine
- New Testarossa JIT technology
First Failure Data Capture
Full Speed Debug
Hot Code Replace
Common runtime technology
- ME, SE, EE

IBM Java 6.0 (J9 R24)
Improvements in
- Performance
- Serviceability tooling
- Class Sharing
XML parser improvements
z10™ Exploitation
- DFP exploitation for BigDecimal
- Large Pages
- New ISA features

IBM Java 6.0.1/Java 7 (J9 R26)
Improvements in
- Performance
- GC Technology
z196™ Exploitation
- OOO Pipeline
- 70+ New Instructions
JZOS/Security Enhancements

IBM Java 7 (J9 R26 SR3)
Improvements in
- Performance
zEC12™ Exploitation
- Transactional Execution
- Flash 1Meg pageable LPs
- 2G large pages
- Hints/traps

IBM Java 7R1 (J9 R27)
Improvements in
- Performance
- RAS
- Monitoring
zEC12™ Exploitation
- zEDC for zip acceleration
- SMC-R integration
- Transactional Execution
- Runtime instrumentation
- Hints/traps
Data Access Accelerator

**Timelines and deliveries are subject to change.

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# IBM SDK for z/OS, Java Tech. Edition, Version 8 (IBM Java 8)

- **New Java8 Language Features**
  - Lambdas, virtual extension methods
- **IBM z13 exploitation**
  - Vector exploitation and other new instructions
  - Instruction scheduling
- **General throughput improvements**
  - Up-to 7% better application throughput
  - Significant improvements to ORB
- **Improved crypto performance for IBMJCE**
  - Block ciphering, secure hashing and public key
    - Up-to 4x improvement to Public Key using ECC
    - CPACF instructions: AES, 3DES, SHA1, SHA2, etc.
- **Significantly improved application ramp-up**
  - Up-to 50% less CPU to ramp-up to steady-state
  - Improved perf of ahead-of-time compiled code
- **Improved Monitoring**
  - JMX beans for precise CPU-time monitoring
- **Enhancements to JZOS Toolkit for Java batch**

Liberty z/OS – SSL-Enabled DayTrader3.0 (8.5.5.5)
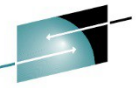
Liberty plans to support Java 8 in 1Q15 – with 8.5.5.5

Secure Application Server with SSL (clear key)
1 CP and 4 zIIPs

zEC12 Java 7 SR4	1.00	
zEC12 Java 7.1 SR1	1.11	
zEC12 Java 8	1.5	
z13 noSMT Java 7.1 SR1	1.41	
z13 SMT Java 7.1 SR1	1.84	
z13 noSMT Java 8	2.01	
z13 SMT Java 8	2.62	
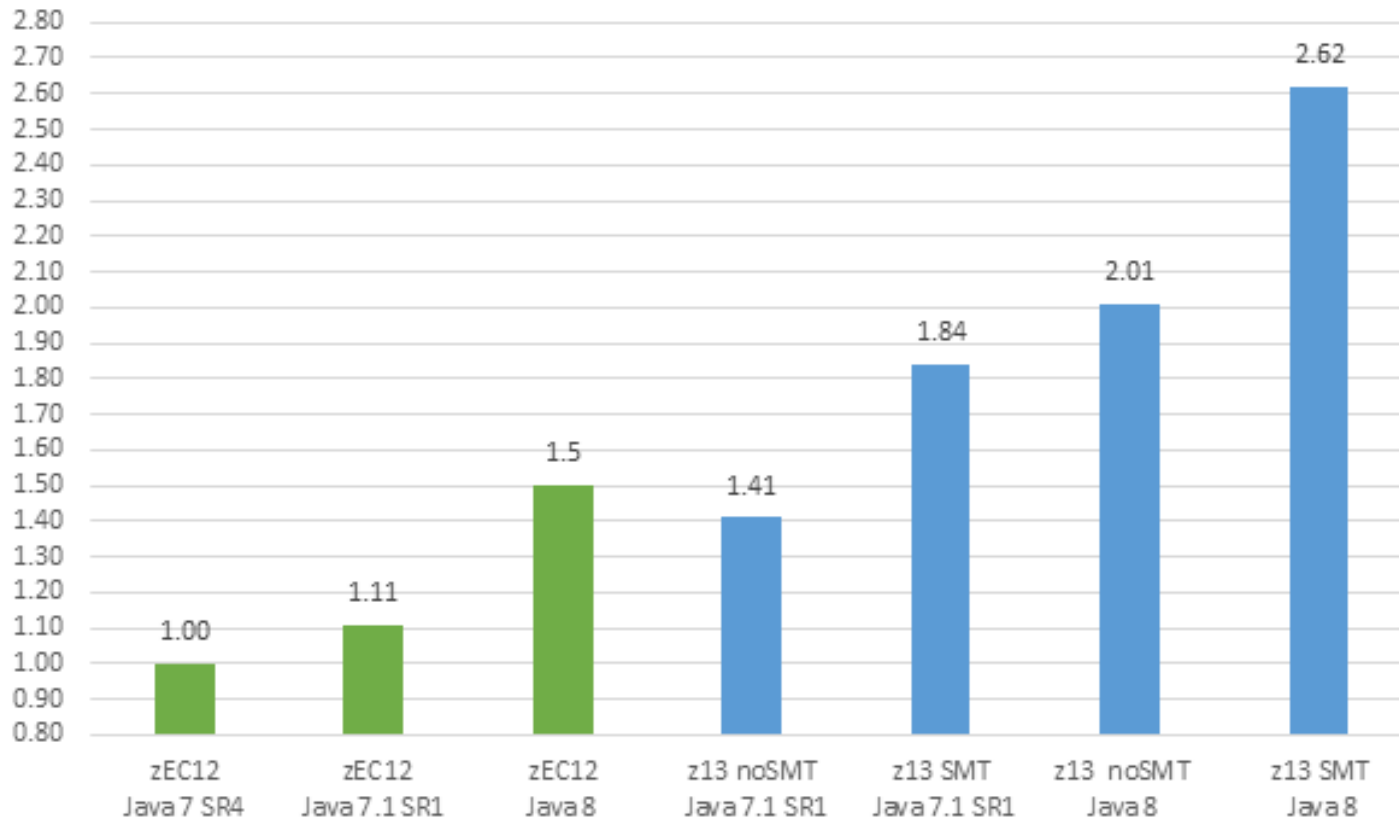
2.62x improvement in throughput with IBM Java 8 and IBM z13

(Controlled measurement environment, results may vary)

Distributed ID to SAF Identity Mapping (8.5.5.5)

- Single or multiple distributed identities can be automatically mapped to SAF credential (UserID).
- Delivered by APAR PI26630

http://www-01.ibm.com/support/docview.wss?uid=swg1PI26630

- Enable in server.xml :

`<safCredentials mapDistributedIdentities="true"/>`

- The following example illustrates the syntax for creating a distributed identity filter that uses the RACMAP command:
- RACMAP ID(<SAFUser>) MAP USERDIDFILTER(NAME('<distributedUserId>'))
- REGISTRY(NAME('<distributedRealmName>')) WITHLABEL('<someLabel>')

In the *example*:
The *<SAFUser>* element is the SAF user in z/OS security.
The *<distributedUserID>* element is the distributed identity.
The *<distributedRealmName>* element is the realm name of the distributed identity.
The *<someLabel>* element is a field that describes this distributed identity filter.
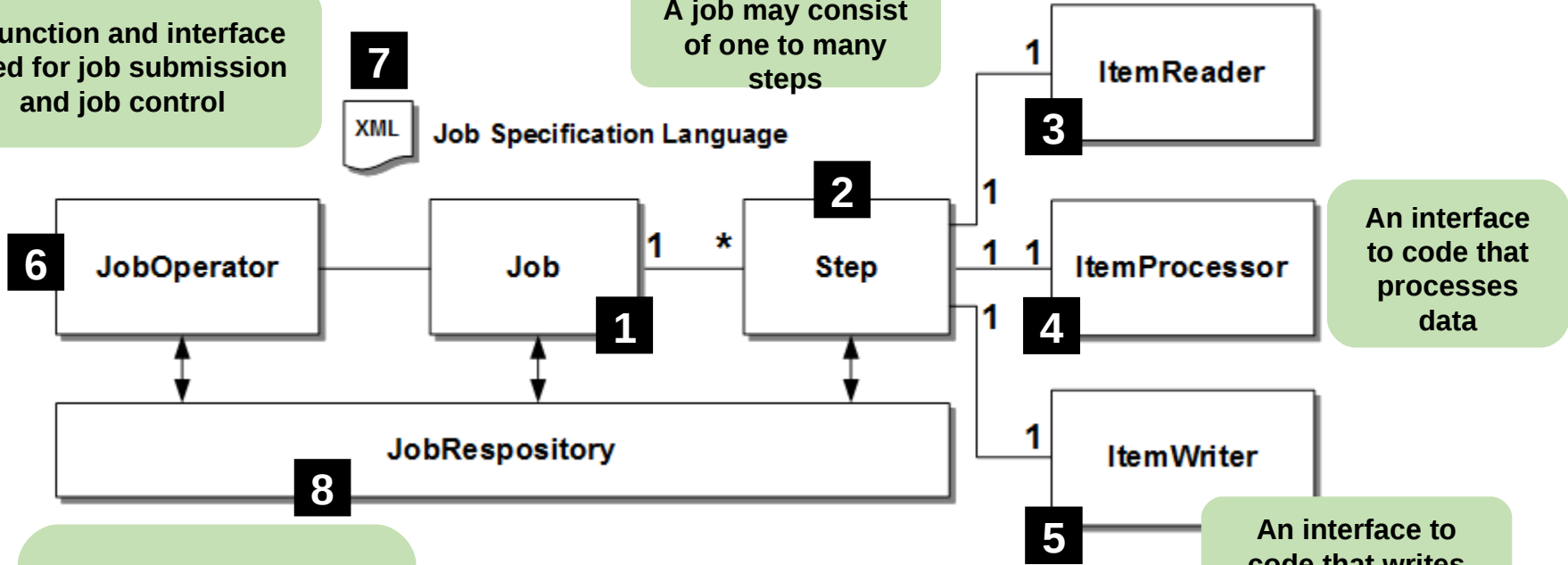
The JSR 352 Architecture

A file that declares the specifics of the job and the steps contained in the job

A job is a logical representation of the batch processing

An interface to code that reads data

A function and interface used for job submission and job control

A job may consist of one to many steps

7

XML Job Specification Language

1 **ItemReader**

3

2

6 JobOperator — 1 * Job — **1** Step 1 1 1 **ItemProcessor**

4

An interface to code that processes data

1

JobRespository

8

1 **ItemWriter**

5

An interface to code that writes data

A mechanism to persist information about the state of jobs in the environment. For example, a set of relational database tables.

You'll see how this is implemented in an upcoming section of this presentation

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Java Batch (Beta) – Liberty support

IBM

JSR 352

Java EE 7

Liberty Profile

IBM Java SDK
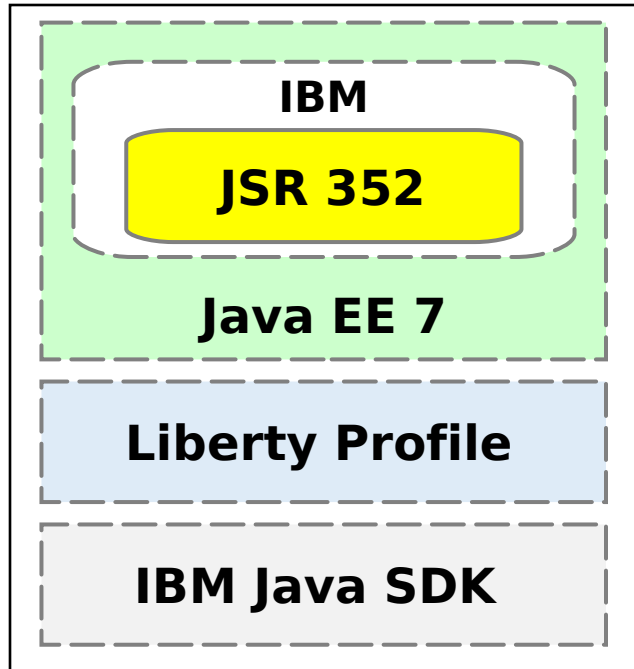
All Platforms Supported By Liberty Profile

Liberty Profile 8.5.5.6 and above
IBM's fast, lightweight, composable server runtime
Dynamic configuration and application updates
JVM Stays Active Between Jobs
Avoids the overhead of JVM initialize and tear down for each job
IBM Extensions to JSR 352
JSR 352 is largely a *programming* standard
IBM extensions augment this with valuable *operational* functions
Includes:
Job logs separated by job execution
REST interface to JobOperator
Command line client for job submission
Integration with enterprise scheduler functions
Multi-JVM support: dispatcher and endpoint servers provide a distributed topology for batch job execution

JobRepository Implementation
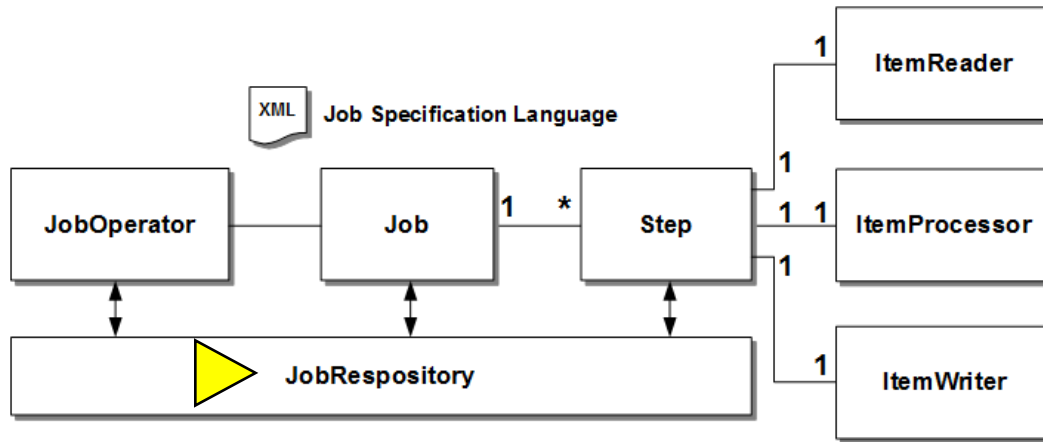
The JSR 352 standard calls for a JobRepository to hold job state information, but it does not spell out implementation details

IBM JSR 352 provides three options for this:

An in-memory JobRepository

> For development and test environments where job state does not need to persist between server starts
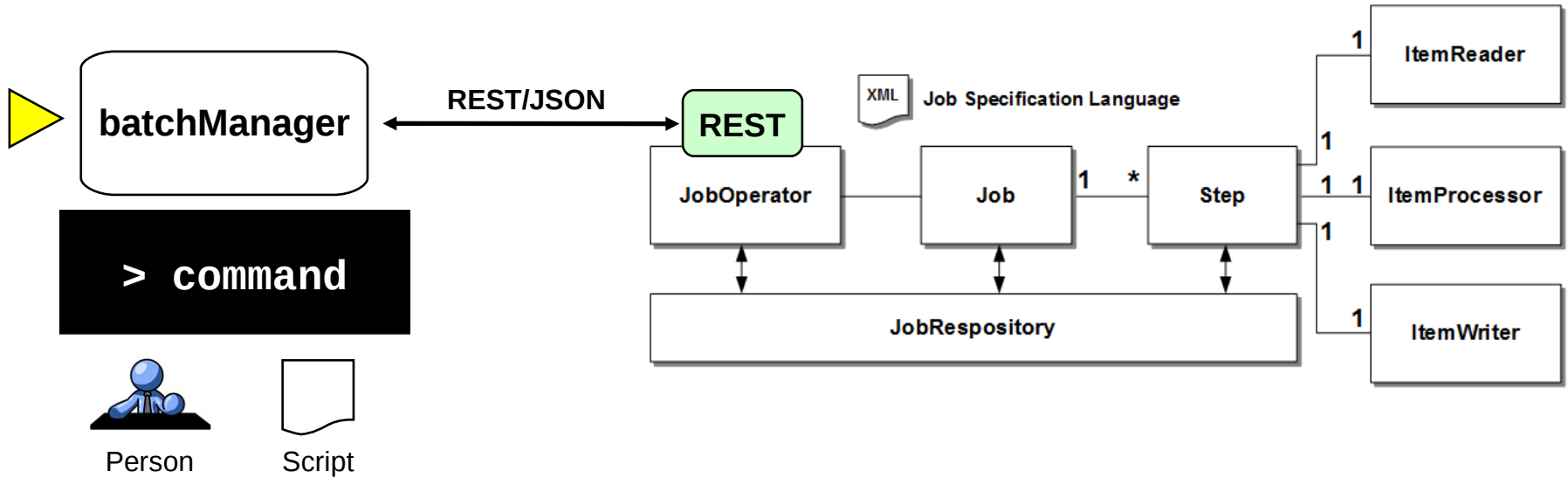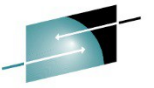
File-based Derby JobRepository

> For runtime environments were a degree of persistence is desired, but a full database product is not needed

Relational database product JobRepository

> For production and near-production environments where a robust database product is called for

Table creation is automatic. Relatively easy to drop one set of tables and re-configure to use a different data store.

Command Line Client to REST Interface

REST/JSON

batchManager

> command

Person   Script

REST

JobOperator — Job `1` `*` Step

JobRespository

XML Job Specification Language

`1` ItemReader
`1`
`1` `1` ItemProcessor
`1`
`1` ItemWriter

The batchManager command line interface client provides:

A way to submit, monitor and control jobs remotely using a command line interface
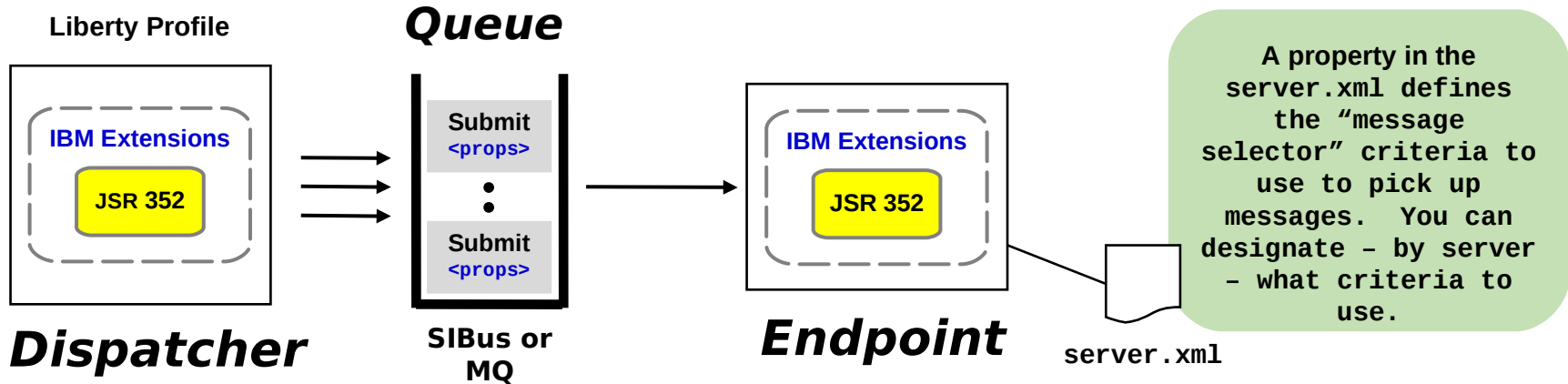 On the same system, or a different system … different OS … doesn't matter: TCP/IP and REST/JSON
Uses the REST interface on the IBM Java Batch server
  Which means the same security model is in effect: SSL, authentication, role-based access
External schedulers can use this to submit and monitor job completion
  batchManager parameters allow the script to "wait" for Java to complete. Parameters allow for discovery of job log information, and a mechanism to retrieve the job log for archival if desired.

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Multi-JVM Support: Get Jobs Based on Endpoint Criteria

Liberty Profile

IBM Extensions

JSR 352

Dispatcher

Queue

Submit **<props>**

⋮

Submit **<props>**

SIBus or MQ

IBM Extensions

JSR 352

Endpoint

`server.xml`

> A property in the server.xml defines the "message selector" criteria to use to pick up messages. You can designate – by server – what criteria to use.

```
… messageSelector="com_ibm_ws_jbatch_applicationName = 'BatchJobA'"
```
1

```
… messageSelector="com_ibm_ws_jbatch_applicationName = 'BatchJobA'
                OR com_ibm_ws_jbatch_applicationName = 'BatchJobB'"
```
2

```
… messageSelector="com_ibm_ws_jbatch_applicationName = 'BatchJobA'
                AND com_ibm_ws_jbatch_myProperty = 'myValue'"
```
3

Submit jobs and have them run only when intended server starts and picks up the submission request

Have jobs run in intended servers based on selection criteria of your choice

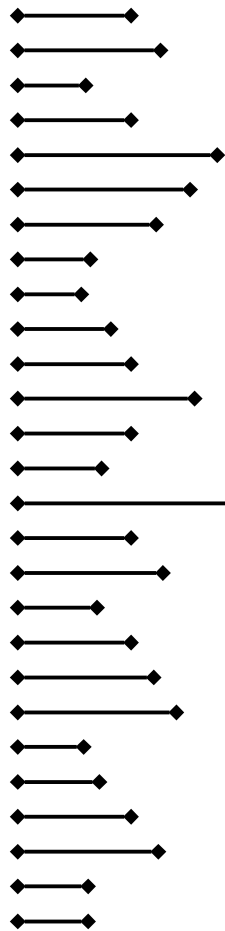Not limited to system, not limited to platform … may span systems and platforms
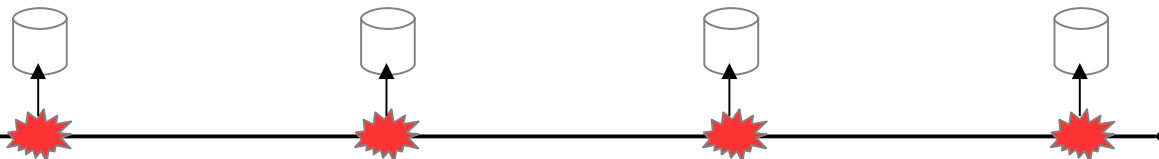
WebSphere Classic – What's New?

Dispatch Progress Monitor (DPM)

Look at the response times of a lot of requests over time....

Most will be fairly short

And collect the configured doc (javacore, etc) at that interval

But occasionally one takes much longer than normal

Set the DPM Interval to a value greater than the normal response time

Dispatch Progress Monitor (DPM) Settings

```
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="_____">
```

DPM stands for Dispatch Progress Monitor. It is a function that will process a dump action every *n* seconds.
`dpm_interval` is the interval period expressed in seconds
`dpm_dump_action` is the same as we just saw for the other dump action: `svcdump`, `javacore`, `heapdump`, `traceback`, `javatdump` and `none`

This function has a set of `MODIFY` commands that may be used to clear DPM settings or reset to XML settings See WP102023 for the details on these `MODIFY` actions for DPM

Message routing

Server

Console

Logstream

Hardcopy Log
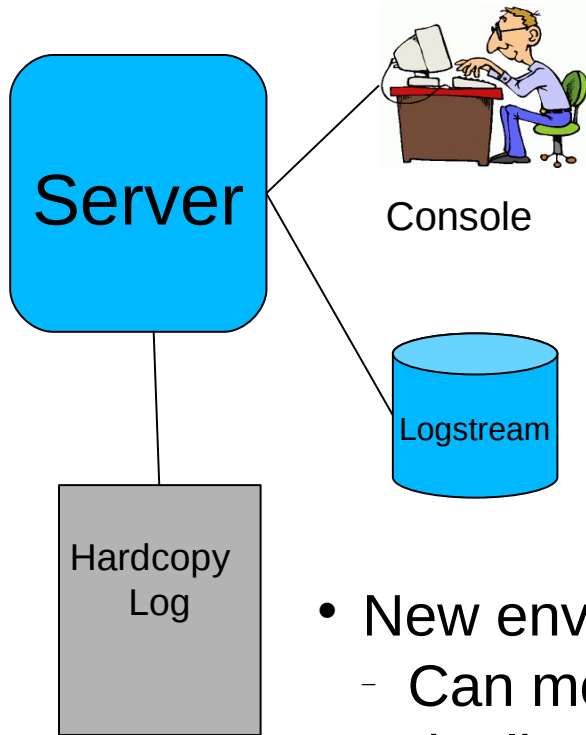
- Messages are written as:
  - WTOs to the console
  - WTOs to the log
  - Writes to SYSOUT or Logstream
- The destination for a message is determined by the code that issues it

- New environment variables override the code
  - Can move the message to a new place entirely, or duplicate it elsewhere
- Force messages (by ID) to a chosen target
- Or 'NONE' to suppress entirely
- Update dynamically with MODIFY
- Use DISPLAY to see current configuration

PM74923 – Server Output Management

Provides a means of routing SYSPRINT and SYSOUT to a UNIX file rather than JES with better file management than simple output routing we had before

Introduced In

In development and test environments Java developers wish to view server output from UNIX file, not JES. Ability to push server output to UNIX file has existed for some time, but output file management was very limited.

V7.0.0.29
V8.0.0.6
V8.5.0.2

With PM74923 comes two new variables:
`DAEMON_redirect_server_output_dir` (for the Daemon)
`redirect_server_output_dir` (for everything else)

Point to path where output files will be written

The output file names will be uniquely named by WAS
`F <server>,ROLL_LOGS` will close existing and start new
Use whatever UNIX file viewing mechanism you wish

`ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102267`

More detail, including how the IHS Apache webserver can be used to list output files, control access to those files, and browse the files

Common Problems

collector.sh on WebSphere App Server z/OS

- collector.sh translates its output ASCII > EBCDIC, which causes problems on z/OS

- Issue these 3 USS commands from a directory outside of your WebSphere config directory (ie. /tmp)

  export IBM_JAVA_OPTIONS=-Dfile.encoding=ISO8859-1
  WAS_HOME/DeploymentManager/profiles/default/bin/collector.sh
  WAS_HOME/AppServer/profiles/default/bin/collector.sh

- May see 'deprecated' message… don't be alarmed...

collector.sh on WebSphere App Server z/OS

- File created in the directory where the commands were run:

  hostname.cellname.nodename.default-WASenv.jar

- When sending in files prepend PMR# to the filenames:

  eg:

  12251.999.000. boss0181.pok.ibm.com-bcell1-bnode1-default-WASenv.jar

- Feed into ISA Tool:

  'WebSphere Application Server Configuration Visualizer [Report]'

Collecting HFS Configuration Files

Save time and help expedite problem resolution by sending in all configuration files in once.

WebSphere Classic

Run the collector shell script to obtain files with extensions xml, xmi, props, properties, ffdc logs, and others.

```
export IBM_JAVA_OPTIONS=-Dfile.encoding=ISO8859-1
/WAS_HOME/AppServer/profiles/default/bin/collector.sh
```

Ignore messages about deprecation.
This will create a jar labeled hostname.cellname.nodename.default-WASenv.jar in the directory that you ran the command from.

WebSphere Liberty

Run the server dump command to create a zip file containing server.xml, server.env, ffdc logs.
Ensure you have your JAVA_HOME set to the JVM location and WLP_USER_DIR set to the Liberty Profile directory.

```
export JAVA_HOME=/usr/lpp/zWebSphere/Liberty/V8R5/java/java_1.7_64
export WLP_USER_DIR=/WebSphere/Liberty
/usr/lpp/zWebSphere/Liberty/V8R5/bin:>server dump <servername>
```
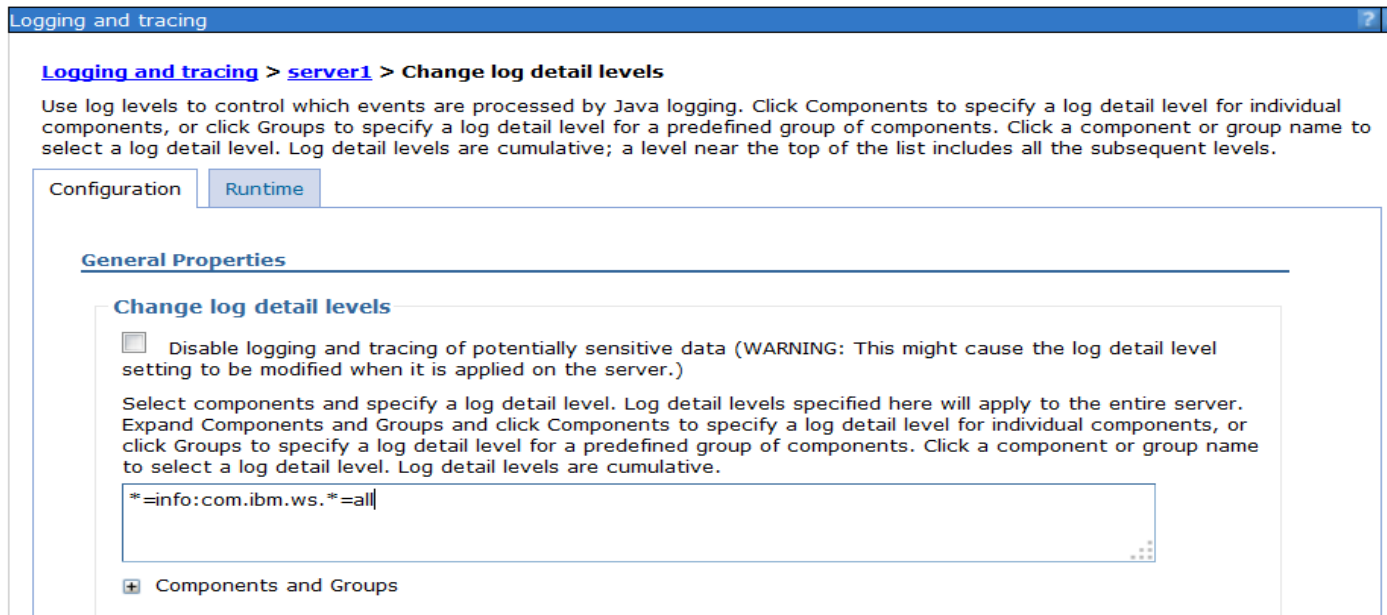
This will create a zip file called servername.dump-year.month.day_hour.minute.second.zip in the WLP_USER_DIR/severs/servername directory.

Enabling Trace for WebSphere Classic

WebSphere Classic

Using the administrative console

Logging and tracing > servername > Change log detail levels

Enabling Trace for WebSphere Liberty

Add the logging XML tag with your traceSpecification to server.xml

Edit ASCII file server.xml

`/WebSphere/Liberty/servers/server1/server.xml`

```
<server description="new server">
    <!-- Enable features -->
    <featureManager>
        <feature>jsp-2.2</feature>
    </featureManager>

    <httpEndpoint id="defaultHttpEndpoint"
                  host="localhost"
                  httpPort="9080"
                  httpsPort="9443" />

<logging traceSpecification="*=info:com.ibm.ws.*=all"/>
</server>
```

Dynamic Tracing for WebSphere Classic and Liberty

WebSphere Classic

Enabling a trace using the modify command

```
F BBOS1,TRACEJAVA='com.ibm.ws.*=all'
BBOO0211I MODIFY COMMAND TRACEJAVA='com.ibm.ws.*=all' COMPLETED SUCCESSFULLY
```

Resetting a trace using the modify command

```
F BBOS1,TRACEINIT
BBOO0211I MODIFY COMMAND TRACEINIT COMPLETED SUCCESSFULLY
```

WebSphere Liberty (requires servers to be started using angel BBZANGL and server BBGZSRV procs)

Enabling a trace using the modify command

```
F BBGZSRV,LOGGING='com.ibm.ws.*=all'
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Logging
+CWWKB0002I: MODIFY COMMAND LOGGING='com.ibm.ws.*=all' COMPLETED SUCCESSFULLY.
```

Resetting a trace using the modify command

```
F BBGZSRV,LOGGING=RESET
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Logging
+CWWKB0002I: MODIFY COMMAND LOGGING=RESET COMPLETED SUCCESSFULLY.
```

Obtaining a Javacore

WebSphere Classic

```
wsadmin.sh/Jython
wsadmin.sh [-host host_name] [-port port_number] [-user userid[-password password]
jvm = AdminControl.completeObjectName('type=JVM,process=SERVER_NAME,*')
AdminControl.invoke(jvm, 'dumpThreads')

F BBOS1,JAVACORE
BBOO0211I MODIFY COMMAND JAVACORE COMPLETED SUCCESSFULLY
JVMDUMP034I User requested Java dump using
'/SY1/var/WebSphere/home/WSCFG1/javacore.20150227.190936.67008.0001.txt' through JVMRI

BBOO0211I MODIFY COMMAND JAVACORE COMPLETED SUCCESSFULLY
JVMDUMP034I User requested Java dump using
'/SY1/var/WebSphere/home/WSSR1/javacore.20150227.190937.67012.0001.txt' through JVMRI
```

WebSphere Liberty

```
server javadump servername
/usr/lpp/zWebSphere/Liberty/V8R5/bin:>server javadump server1
Dumping server server1.
Server server1 dump complete in
/WebSphere/Liberty/servers/server1/javacore.20150224.102206.83952322.0001.txt.

F BBGZSRV,JAVACORE
JVMDUMP034I User requested Java dump using
'/WebSphere/Liberty/servers/defaultServer/javacore.20150224.162944.66238.0002.txt'
through com.ibm.jvm.Dump.JavaDump
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Javacore  Command Handler.
+CWWKB0002I: MODIFY COMMAND JAVACORE COMPLETED SUCCESSFULLY.
```

Obtaining a Portable Heapdump PHD

WebSphere Classic

```
wsadmin.sh/Jython
wsadmin.sh [-host host_name] [-port port_number] [-user userid[-password password]
jvm = AdminControl.completeObjectName('type=JVM,process=SERVER_NAME,*')
AdminControl.invoke(jvm, 'generateHeapDump')

F BBOS1,HEAPDUMP
JVMDUMP034I User requested Heap dump using '/SY1/var/WebSphere/home/WS
SR1/heapdump.20150227.211036.67012.0002.phd' through JVMRI
```

WebSphere Liberty

```
server javadump servername –include=heap
/usr/lpp/zWebSphere/Liberty/V8R5/bin:>server javadump server1 --include=heap
Dumping server server1.
Server server1 dump complete in
/WebSphere/Liberty/servers/server1/javacore.20150224.102223.83952322.0002.txt.
Server server1 dump complete in
/WebSphere/Liberty/servers/server1/heapdump.20150224.102223.83952322.0003.phd.

F BBGZSRV,HEAPDUMP
JVMDUMP034I User requested Heap dump using
'/WebSphere/Liberty/servers/defaultServer/heapdump.20150224.163149.66238.0003.phd'
through com.ibm.jvm.Dump.HeapDump
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Heapdump  Command Handler.
CWWKB0002I: MODIFY COMMAND HEAPDUMP COMPLETED SUCCESSFULLY.
```

Security Vulnerabilities

Yes…..vulnerabilities get reported

>   News media

>   Network of friends / co-workers

>   CVE – Common Vulnerabilities and Exposures

No… WebSphere App Server z/OS Level 2 cannot discuss them

>   So where do you get the information ?

>   System z Security Portal

>>   contains all pertinent information regarding security vulnerabilities for products on the z/OS platform, and how to resolve them

System z Security Portal

- **z/OS and z/VM customers access security and Integrity PTFs via the System z Security Portal.**

  - IBM recommends that you promptly install security and integrity PTFs
  - SECINT PTFs are included in RSUs periodically
  - The System z Security Portal can help you stay more current with SECINT PTFs by providing SMP/E HOLDDATA you can use to identify these fixes before they are marked RSU
  - The System z Security Portal also provides associated Common Vulnerability Scoring System (CVSS) V2 ratings for new APARs*
  - To get this information, you must register!
    - Because widespread specifics about a vulnerability could increase the likelihood that an attacker could successfully exploit it
    - In response to customer requests to maintain the confidentiality
    - Other requirements on the website

  - IBM recommends that you visit the System z Security Portal site at http://www-03.ibm.com/systems/z/solutions/security_subintegrity.html to get the informationyou need to register

  - Questions can be directed to: syszsec@us.ibm.com

    - Note: According to the Forum of Incident Response and Security Teams (FIRST), the Common Vulnerability Scoring System (CVSS) is an "industry open standard designed to convey vulnerability severity and help to determine urgency and priority of response." IBM PROVIDES THE CVSS SCORES "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMERS ARE RESPONSIBLE FOR ASSESSING THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY IN THEIR SPECIFIC ENVIRONMENT. IBM DOES NOT PROVIDE A CVSS ENVIRONMENT SCORE. THE CVSS ENVIRONMENT SCORE IS CUSTOMER ENVIRONMENT SPECIFIC AND WILL IMPACT THE OVERALL CVSS SCORE. CUSTOMERS SHOULD EVALUATE THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY IN THEIR SPECIFIC ENVIRONMENT.

    - IBM DOES NOT PROVIDE A CVSS ENVIRONMENT SCORE. THE CVSS ENVIRONMENT SCORE IS CUSTOMER ENVIRONMENT SPECIFIC AND WILL IMPACT THE OVERALL CVSS SCORE. CUSTOMERS SHOULD EVALUATE THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY AND CAN CALCULATE A CVSS ENVIRONMENT SCORE.

WebSphere Classic Migration

- Migrating large topology with many Applications

  - You can Migrate the App Servers alone

  - Generate job to migrate applications later

    - Break up the generated job when large number of Apps

- Knowledge Collection: Migration planning for WebSphere Application Server

http://www.ibm.com/support/docview.wss?rs=180&uid=swg27008724

- IBM WebSphere Application Server Migration Toolkit

http://www.ibm.com/developerworks/websphere/downloads/migration_toolkit.html

IBM HTTP Server on z/OS

- Domino Powered ☐ Apache Powered

- DGW no longer shipped in z/OS 2.2

- Documentation available

  - DGW Migration Frequently Asked Questions FAQ

http://publib.boulder.ibm.com/httpserv/ihsdiag/dgw_migration_faq.html

  - Brief description of config directive differences

http://publib.boulder.ibm.com/httpserv/ihsdiag/conversion.html

  - Redpaper – "IBM HTTP Server on z/OS"

http://www.redbooks.ibm.com/redpapers/pdfs/redp4987.pdf

  - 3.1.2 of Redpaper how you can download for **FREE!!**

/admin URL does not forward to /ibm/console

- Fixpack 8.5.5.6 and above

- web.xml for adminredirector.war was updated to work correctly when the disallowServeServletByClassname is defaulted to true

- New web.xml is used when new profiles are created after installing the fixpack(s)

- Profiles that existed prior need to be updated by running the script attached to Techdoc

  http://www.ibm.com/support/docview.wss?uid=swg21962852

/admin URL does not forward to /ibm/console

- Other options:

  - Reinstall the console using the deployConsole.py script

  - Just do a remove and install

    http://www-01.ibm.com/support/knowledgecenter/SSAW57_8.5.5/com.ibm.websphere.nd.doc/ae/tcon_console_inst_uninst.html?lang=en

- Just use /ibm/console URI instead of /admin URI

Java in WebSphere Classic

JDK 6.1

    Installed with WebSphere Classic 8.5.0.0

    Updated with WebSphere FixPack Maintenance

JDK 7.0

    Delivered with WebSphere 8.5.0.0

    Optionally installed

    MUST install JDK 7.0 BASE Level FIRST, before installing JDK 7.0 FixPacks

JDK 7.1

    Available at WebSphere 8.5.5.2

    Base level JDK 7.1 (Must install base before FixPacks JDK 7.1)

Java in WebSphere Liberty

No JDK installed

Liberty supports running with JAVA 8

PI45300: Ship Java 8 SR1 FP10 for WSAS Liberty profile V855X

Where to get it:

http://www-01.ibm.com/support/docview.wss?uid=swg24040415

Java in WebSphere Blog Updates

Recent BLOG Entry:

> WebSphere
> > Application Server for z/OS: Your first cup of Java is included !

> Where to get them

> How to Install

> How to switch to use them

This BLOG for Classic WebSphere, Liberty Blog coming soon

WAS Timeout – ABENDEC3 RC=04130004

Servant Region internal Worker thread default = 3

Cross memory deadlock within the Servant Region

SR threads make mbean request back to CR

  Seen admin related requests / use SR internal worker thread

These can then make additional mbean requests

  Using SR internal worker thread

With only 3, it can tie them up quickly

XD, Portal Server, BPM seem to use this function

WAS Timeout – ABENDEC3 RC=04130004

Server custom property

private_bboo_internal_work_thread_pool_size

Admin console -> Environment -> WebSphere Variables -> <Select server> <scope>

Variable name: private_bboo_internal_work_thread_pool_size

Value: greater than 3 (the default)
    10 seems to be a good number

Questions?