WebSphere Liberty Profile and Traditional WebSphere Application Server – What's New?

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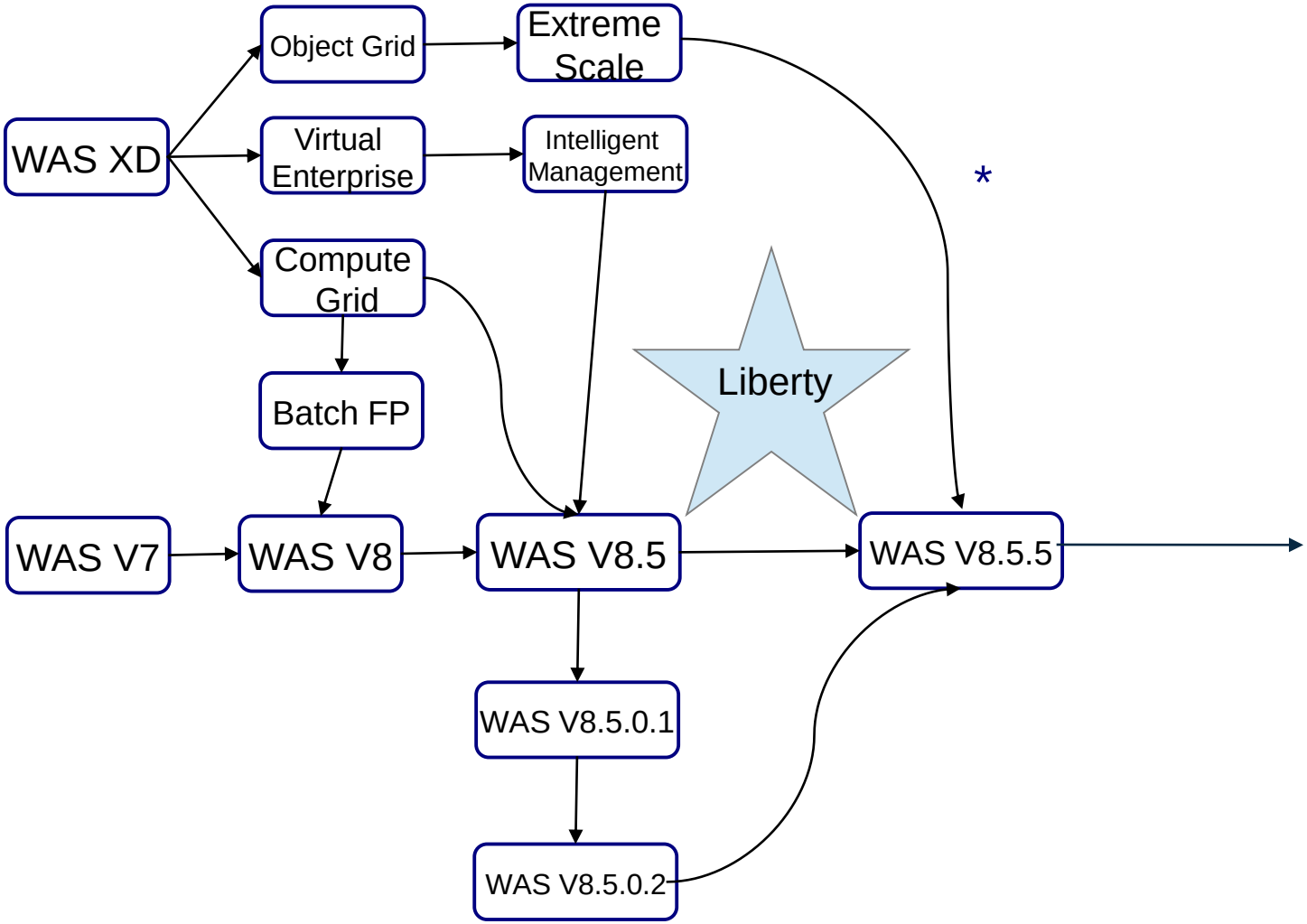
WebSphere Application Server

Session	Title	Time	Room	Speaker
16379	WebSphere Liberty Profle, Windows and z/OS, Hands-on Lab	Monday 4:30	Redwood	Follis/Stephen
16380	z/OS Connect: Opening up z/OS Assets to the Cloud and Mobile Worlds	Tuesday 1:45	Virginia	David Follis
16381	WebSphere Liberty Profile and Traditional WebSphere Application Server – What's New?	Tuesday 3:15	University	Follis/Stephen
16509	Debug 101-Using ISA Tools for Apps in WebSphere Application Server z/OS	Wednesday 3:15	Virginia	Mike Stephen, Joran Siu
16383	IBM Installation Manager for z/OS System Programmers: Web-based Installs, Fix Packs, and How iFixes Really Work.	Thursday 8:30	University	Don Bagwell, Bryant Panyarachun
16384	JSR 352 - The Future of Java Batch and WebSphere Compute Grid	Thursday 10:00	University	David Follis
16382	Common Problems and Other Things You Should Know about WAS on z/OS	Thursday 4:30	Virginia	Mike Stephen
16385	Configuring Timeouts for WebSphere Application Server on z/OS	Friday 10:00	Virginia	Follis/Stephen

The Big Picture



* Client Only on z/OS

WebSphere Application Server Full Profile (T-WAS) What's New?

USS APAR OA43650

- z/OS UNIX Services is changing the behavior of several interfaces to restrict the symbolic links that can be used for UNIX files that are loaded or executed from APF-authorized or must-stay-clean (RACF program controlled) address spaces.
- These interfaces will now require that any symbolic link that comprises the pathname to a target executable file have an owning UID of 0.
- For WAS on z/OS, we believe the only affected paths are:
  - startServer.sh shell script provided with WAS
  - node agent start during federation
- Symptoms include:
  - BPXP029I OPEN ERROR FOR FILE PATH asv85config/azcell/azdmnode/DeploymentManager/lib/s390-31/bboorb DEVICE ID 18 INODE 348.
  - ABEND EC6-xxxC04A
- WAS will ship an update in:
  - 7.0.0.35, 8.0.0.10, 8.5.5.4
  - iFixes and ++APARs will be available for other levels
- This update changes how authorized code to issue the START console command is accessed
- If you only start/stop the servers from the admin console or with MVS console START and STOP commands, and manually start node agents after federation then WAS is unaffected.

XML File Extended -- Control Driven to Request Level

As we saw, the XML file identifies requests ... this new function then picks up and drives various WAS behavior controls from server level down to the request level:

```
<Classification schema_version="1.0">
   <InboundClassification type="http" schema_version="1.0"
      default_transaction_class="Z9DEFLT" >
      <http_classification_info
           uri="/SuperSnoopWeb/*" transaction_class="Z9TRANA"
           description="Snoop"                                  />
      <http_classification_info
           uri="/MyIVT/*" transaction_class="Z9TRANB"
           description="MyIVT"                                  />
   </InboundClassification>
</Classification>
```

Granular Control to Request Level

Granular Control to Request Level

- Various Timeouts
- Stalled Thread Dump Actions
- CPU Time Used Limit
- DPM Interval and Dump Action
- SMF Recording
- Tracing
- Message Tagging
- Timeout Recovery Actions

Topics to Cover in this Section:

- What those functions are and how they work
- How to dynamically reload a new or updated XML file
- How to dynamically revert to previous XML file

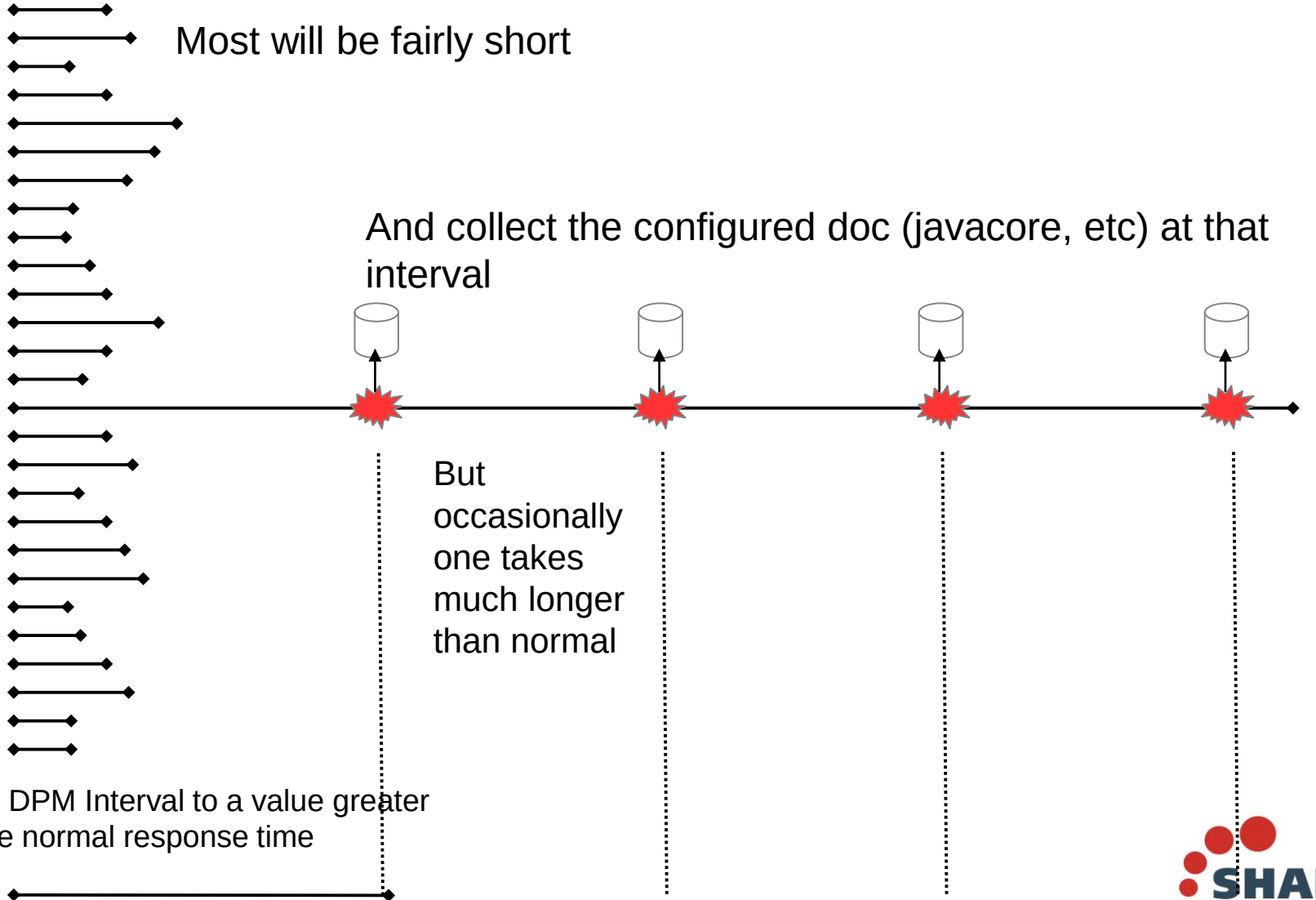
InfoCenter rrun_wlm_tclass_dtd

TechDocs WP102023

Dispatch Progress Monitor (DPM)

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

Most will be fairly short



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

Use of the WLM Health API

Provides a way to ratchet up the WLM server "health" value so Sysplex Distributor flows work gradually to a server that's been restarted, but not yet fully "warmed up"

Introduced In

7.0.0.31
8.0.0.8
V8.5.5.1

Prior to this function, a server freshly restarted would be seen as having a WLM health value of 100% ... that told Sysplex Distributor to treat it as equal to other servers in the cluster.
The issue is a freshly restarted server has not yet gone through JIT processing and caching of various objects. It has not "warmed up" to handle work equal to other servers.

Provide a way to modify WLM "health" value over time so a server has a chance to "warm up" before being considered equal to other servers in cluster

```
wlm_health_increment=15
wlm_health_interval=15
```

Ratchet up the health value in increments of 15% every 15 seconds

```
11.56.14 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 0
11.56.44 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 15
11.56.59 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 30
11.57.14 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 45
11.57.29 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 60
11.57.44 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 75
11.58.00 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 90
11.58.15 STC00085 BBOO0411I SERVER WLM HEALTH PERCENTAGE IS NOW 100
```

Requires Sysplex Distributor config VIPADISTRIBUTE DISTMETHOD set to SERVERWLM.
Careful with mixed levels – see APAR PI14413 – in 7.0.0.33

Proper handling of CARTs

Modify commands issued with a Command And Response Token (CART) don't have the CART included in WTOs issued in response

Automation that issues console commands via MGCRE that include a CART expect to have that CART value included with WTOs issued in response to the command.

This allows the automation to easily find the response.

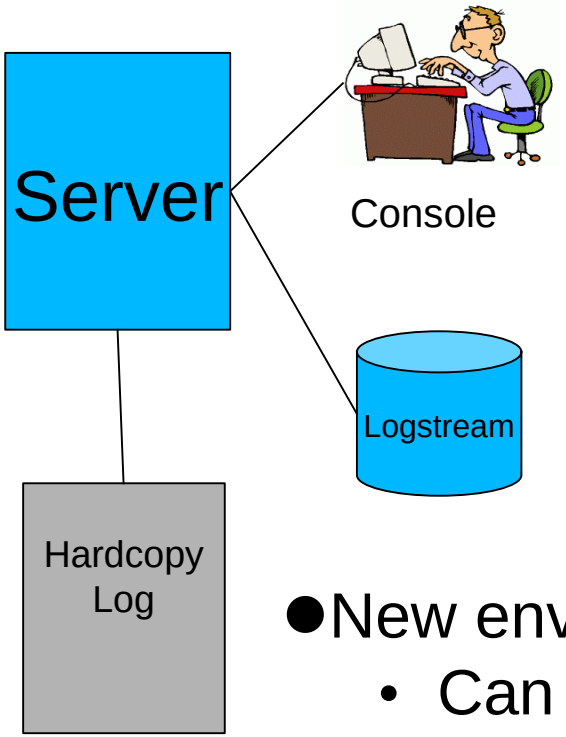
WebSphere Modify command handling ignores CARTs

Introduced In

V8.5.5.2

WTOs issued in response to Modify commands issued via MGCRE (or TSO CONSOLE) with a CART will include the CART.

Message routing



- 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

Taking Action on Java Out Of Memory (OOM)

- The JVMTI (Tool Interface) provides a way to take action when various events occur
- One such event is 'heap resource exhaustion'
- Function added to WAS to register a JVMTI exit and optionally take some action when an Out Of Memory occurs
- Controls:
  - ras_java_oom_action=**NONE** | WTO | SVCDUMP
  - ras_java_oom_interval=**600** | # of seconds
  - MODIFY server,JAVAOOM,INTERVAL= | ACTION= | RESET
  - MODIFY server,DISPLAY,JAVAOOM
- BBOO0404E JVM OUT OF MEMORY IN ASID=nnnnX
- Available in 8.0.0.3 and in 7.0.0.23

PM85194 (Dynamically adjust CR threads)

The number of Control Region worker threads is fixed at startup.

Configurable from Application Servers → <SERVER> → Container Services → ORB Service → Custom Properties → was.controlThreads (default is 25)

Thread pool size is fixed once the server starts.

Under certain conditions, the thread pool can deadlock with all threads synchronously waiting for work to complete, but the work is stuck on the queue.

Although rare, a server restart is required at this point.

Introduced In

V8.0.0.8
V8.5.5.2

Introduced a new environment variable to allow the pool to grow:

```
control_region_thread_pool_maximum_size
```

Default is “0”, but under the covers “0” means “determine a sensible maximum size based on the number of Servants and worker threads per Servant”.

The thread pool starts at the same size as before, but can now dynamically grow to the maximum when deadlocks are detected.

PM74923 - Better Living Through Server Output Mgmt

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

V7.0.0.29
V8.0.0.6
V8.5.0.2

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.

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

DISPLAY WORK Support for Message from the CRA

Provides a way to use DISPLAY WORK to show work coming out of the CRA, for either SIBus (internal messaging) or Activation Spec support for MDBs:

Prior to this function, work coming out of the CRA (SIBus and/or ActSpec for MDBs) was not included in DISPLAY,WORK

Introduced In

7.0.0.31
8.8.0.8
V8.5.5.1

F BBOS001,DISPLAY,WORK,CRA

```
BBOO0255I TIME OF LAST WORK DISPLAY 2013/04/30
21:31:37.470352
BBOO0256I TOTAL CRA REQUESTS 1000 (DELTA 0)
BBOO0257I CURRENT CRA REQUESTS 100
BBOO0258I CRA REQUESTS IN DISPATCH 100
BBOO0410I HIGHWATER CRA REQUESTS 500
BBOO0267I TOTAL CRA TIMEOUTS 0 (DELTA 0)
BBOO0188I END OF OUTPUT FOR COMMAND
DISPLAY,WORK,CRA
```

100 in flight, all dispatched, so none queued right now

DISPLAY WORK "Highwater" Reporting

Provides a way to know not just how many requests are in the server right now, but also the maximum number seen since the server was started:

Introduced In

7.0.0.31
8.0.0.8
V8.5.5.1

Prior to this function, the DISPLAY,WORK only showed work currently in the server. There was no "high water" indicator.

F BBOS001,DISPLAY,WORK,SERVLET

SERVLET is one command operand that displays all HTTP work. Other operands exist: EJB, MDB, etc.

```
BBOO0255I TIME OF LAST WORK DISPLAY 2013/05/13
21:04:27.773915
BBOO0256I TOTAL SERVLET REQUESTS 1000 (DELTA 0)
BBOO0257I CURRENT SERVLET REQUESTS 100
BBOO0410I HIGHWATER SERVLET REQUESTS 500
BBOO0258I SERVLET REQUESTS IN DISPATCH 100
BBOO0267I TOTAL SERVLET TIMEOUTS 0 (DELTA 0)
BBOO0188I END OF OUTPUT FOR COMMAND DISPLAY,WORK,SERVLET
```

Tracing|Logging Large Callstacks and BUFFER OVERFLOW

Provides a way to capture the full Java stack trace into an FFDC record. Still see the buffer overflow in the SYSOUT, but now you have additional doc

Introduced In

V7.0.0.31
V8.0.0.8
V8.5.5.1

Many Java stack traces show up looking something like this:

```
Java stack line
Java stack line
Java stack line
  :
Java stack line
*** BUFFER OVERFLOW ***
Java stack that doesn't show up
Java stack that doesn't show up
```

Original design of WAS z/OS back in the 31-bit JVM day did this to protect against very large output consuming the heap as part of converting the stack to EBCDIC

And all too often the really interesting part of the stack trace would be down here ... not shown because it came after the clip-point for overflow

---

In maintenance levels shown above the same "BUFFER OVERFLOW" occurs, but the full stack is *also* put out to an FFDC incident record

```
***BUFFER OVERFLOW*** TRACE DATA ROUTED TO FFDC REPORTING A NativeMessageOverflowException***
FFDC1003I: FFDC Incident emitted on <path and file> processEvent NativeMessageOverflow_1
```

The actual FFDC will have the sequence number as part of the title so you can match them up.

Need to trace a single Thread / TCB in WebSphere?

- Why you might need this
  - There is a thread that is accumulating CPU
  - Occasional javacore dumps have not proven beneficial
- You COULD turn on ALL Tracing for a few seconds
  - Get MANY lines of trace output
  - Have to filter to find the one thread you are interested in
- What if you could turn Trace on for the ONE thread

Need to trace a single Thread / TCB in WebSphere?

- NEW MODIFY server command: TRACEBYTHREAD
- Set the ASID / TCB you want to trace: (in hex)
- → MODIFY server,TRACEBYTHREAD,ASIDX=nnnn,TCBX=nnnnnn
- Enable the tracing you want
- → MODIFY server,TRACEJAVA='com.ibm.ws.security.*=all;SSL=all‘
- IMPORTANT - When you have the tracing you want, turn tracing back off
- → MODIFY server,TRACEINIT
- AFTER tracing is turned off, disable trace by thread
- → MODIFY server,TRACEBYTHREAD,RESET

- Introduced in FixPack 8.5.5.2
- For this and other nuggets:
- Whitepaper: **Hidden Gems in the WAS z/OS Maintenance Stream**
  - http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP102371

collector.sh on WebSphere App Server z/OS

- collector.sh translates its ouput ASCII > EBCDIC
- causes problem on z/OS
- Issue these 3 USS commands from 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]'

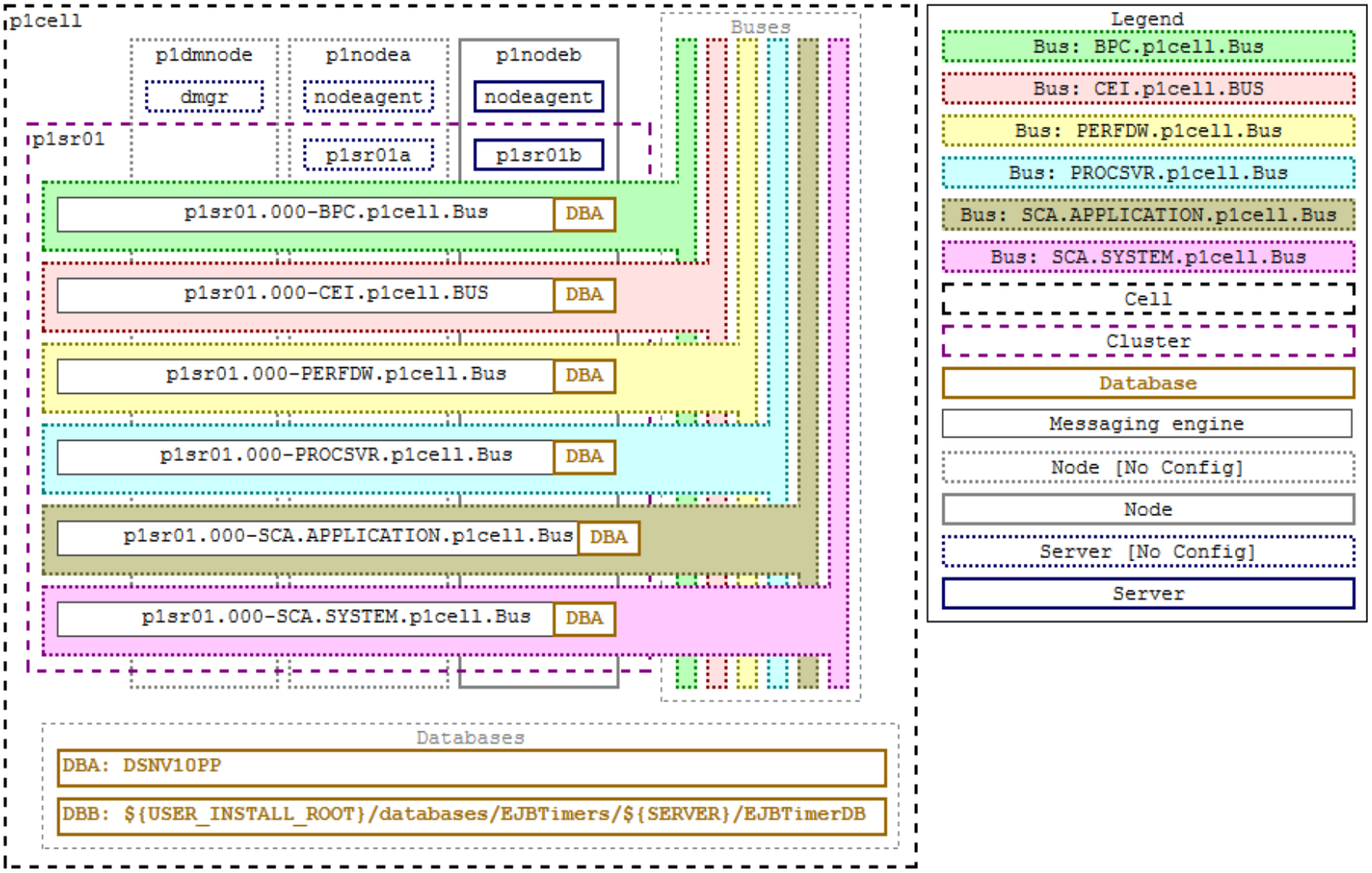
WebSphere Application Server Configuration Visualizer

- Generates an interactive HTML visualization of a WebSphere Application Server configuration. Accepts any combination of archive files containing configuration directories, such as Data Collector output. Configurations from multiple nodes in a cell will be merged into a single visualization, and multiple cells can be displayed in the output.
- It works with any (full profile) WebSphere Application Server based product, such as IBM Business Process Manager Advanced, WebSphere Process Server, WebSphere Enterprise Service Bus, WebSphere Service Registry and Repository.
- Nodes are laid out vertically, with the servers (including nodeagent/dmgr) contained in the node that hosts it.
- The clusters are shown horizontally, spanning the servers in that cluster.
- Default messaging provider (Service Integration Bus) buses are shown vertically on the right, with the messaging engines overlaid on the servers/clusters that host them.

WebSphere Application Server Configuration Visualizer

- Unique database names are shown at the bottom, from analyzing all the JDBC Data Sources in the cell.
- If you have multiple core groups, the core group membership is shown for each server and a summary of the core groups is shown at the bottom.
- If you click on an item such as a cell, cluster or server, you can see more detail such as the applications deployed, the port numbers, log locations, thread pools etc.
- A list of all the deployed applications is shown if you click on the cell name (top left corner of the outer box).
- The deployment details of each application module are shown under the cluster/server to which it is deployed (highlighted if you click the link in the 'module deployments' on the cell).
- The mapping from resource references to JNDI resources is shown for the application deployments, such as JMS Connection Factories
- and JNDI Data Sources.

WebSphere Application Server Configuration Visualizer



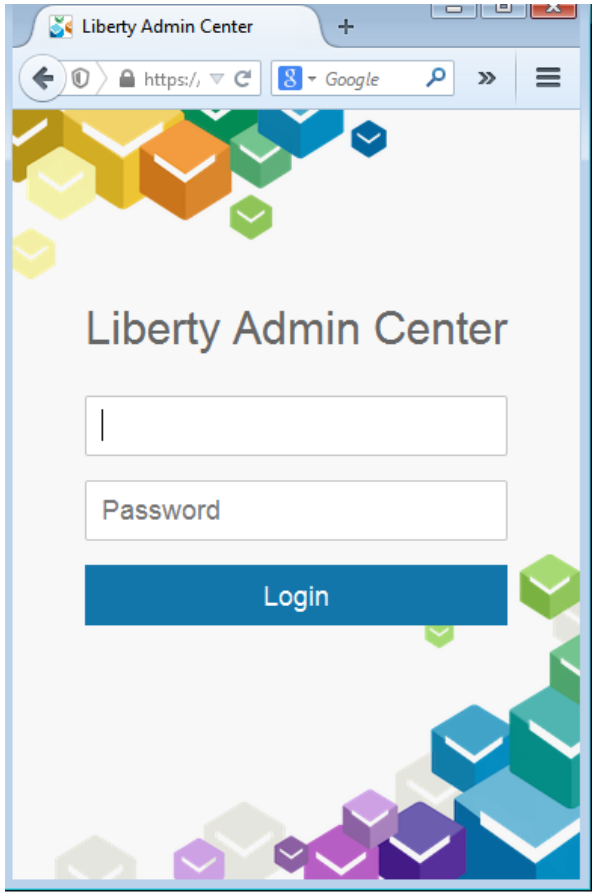
Show all detail for browser search

WebSphere Liberty Profile – What's New?

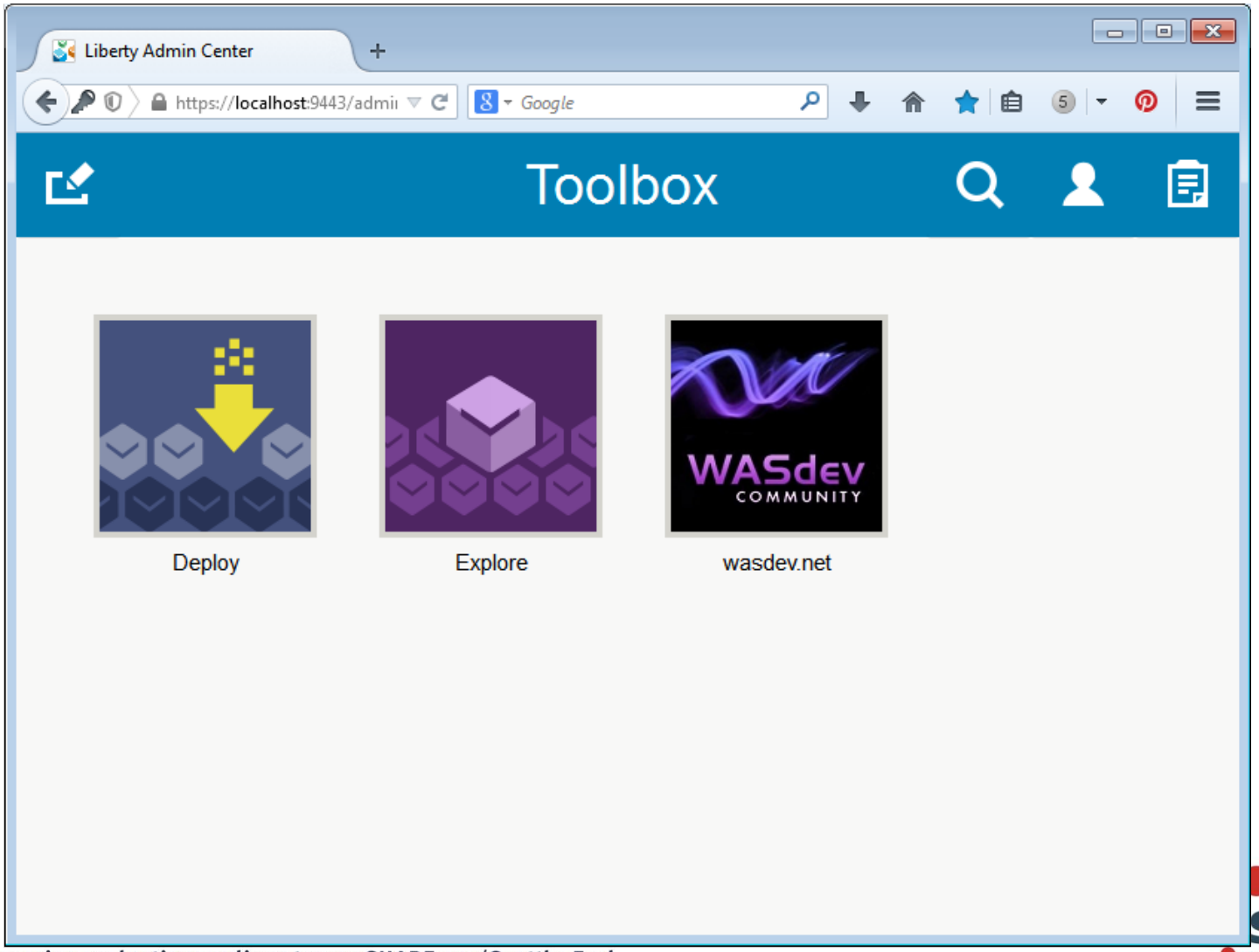
Liberty Administrative Center

Existing administrative tools for the lightweight Liberty Profile of the WebSphere Application Server include Eclipse developer tools and a command line interface.

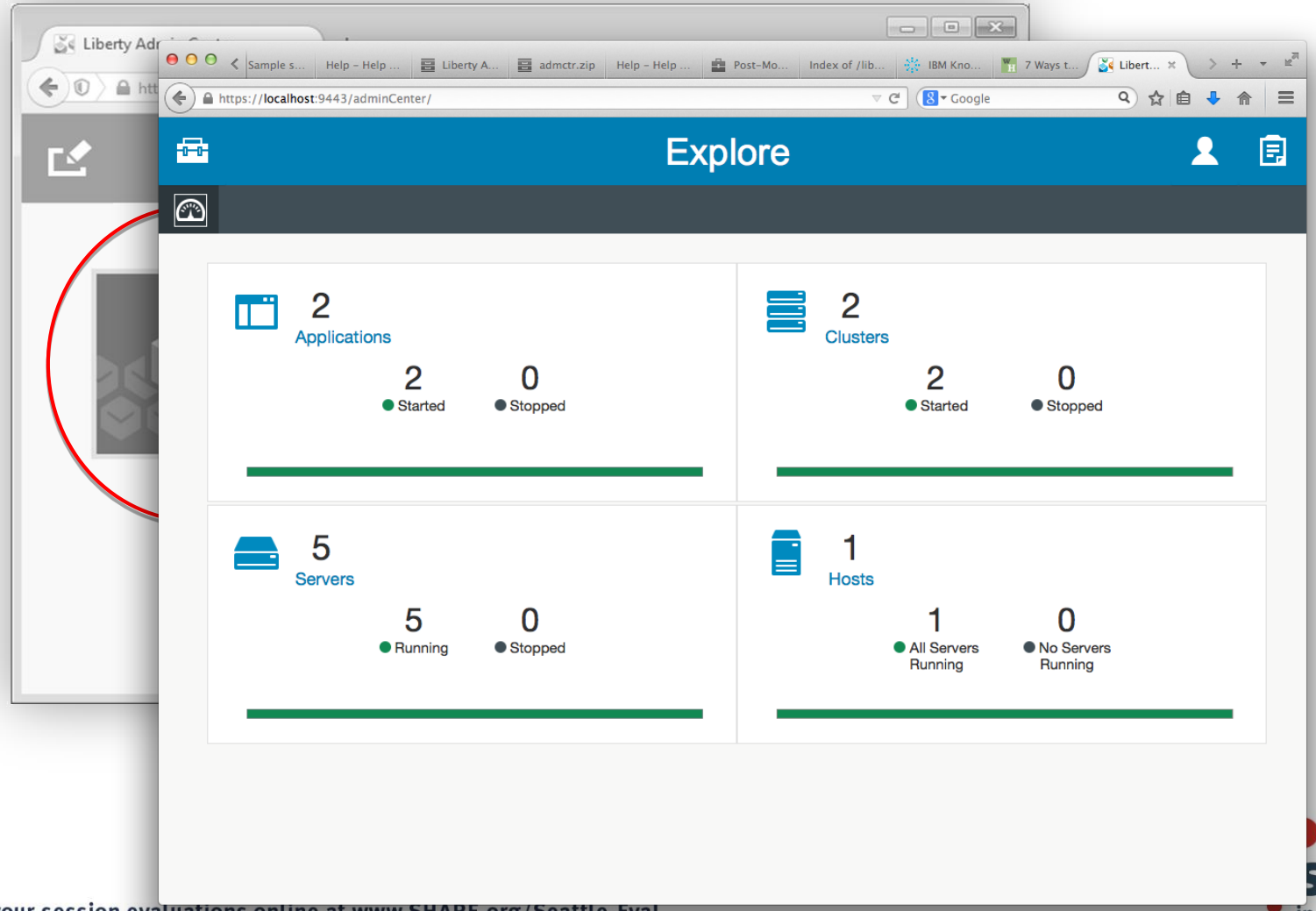
The Liberty admin center extends these capabilities to include a browser-based interface for deploying, configuring, and administering Liberty environments via desktop, tablet and smartphones.



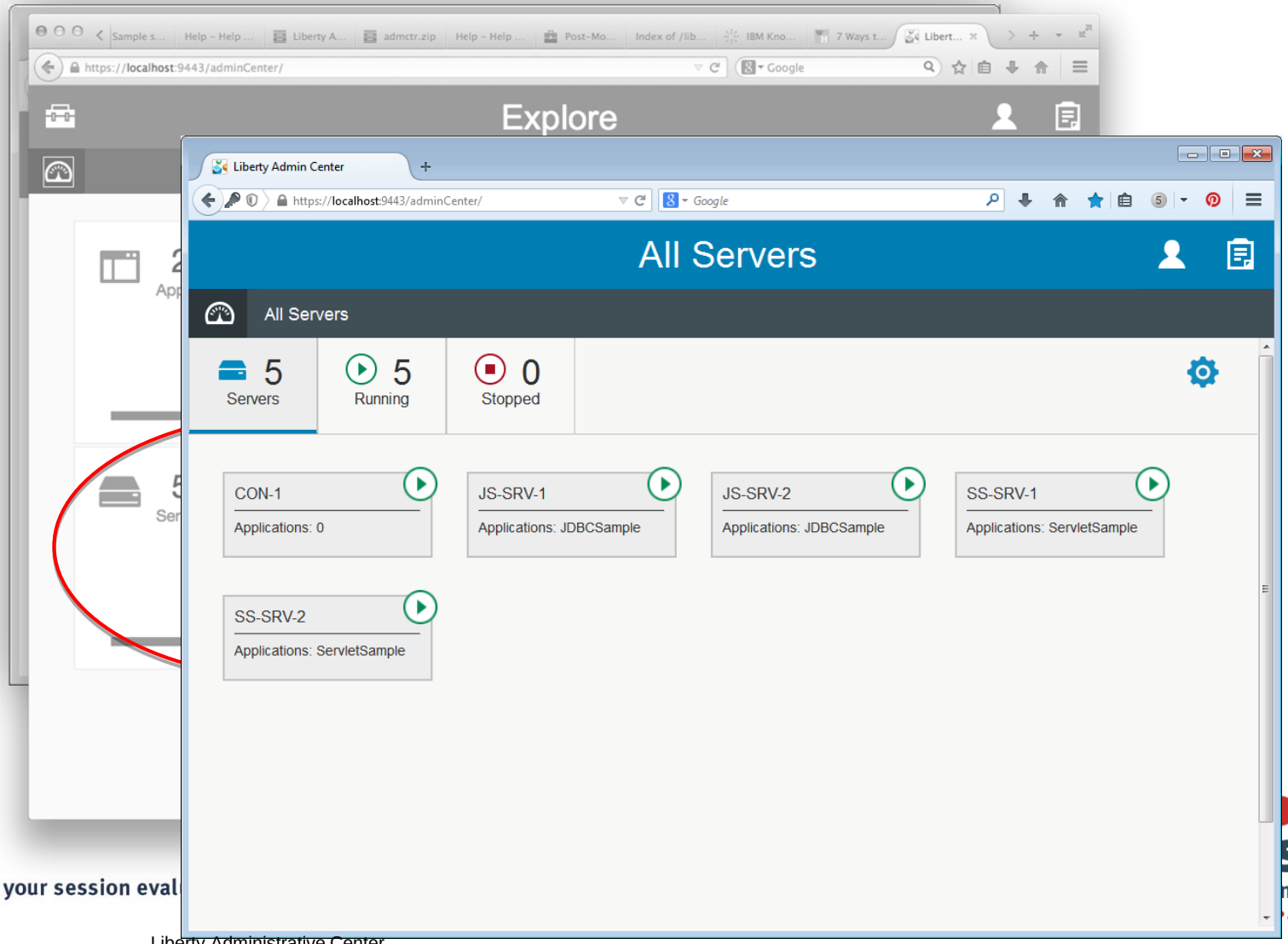
Collective Default Toolbox



Explore the Collective



Explore the Collective Servers

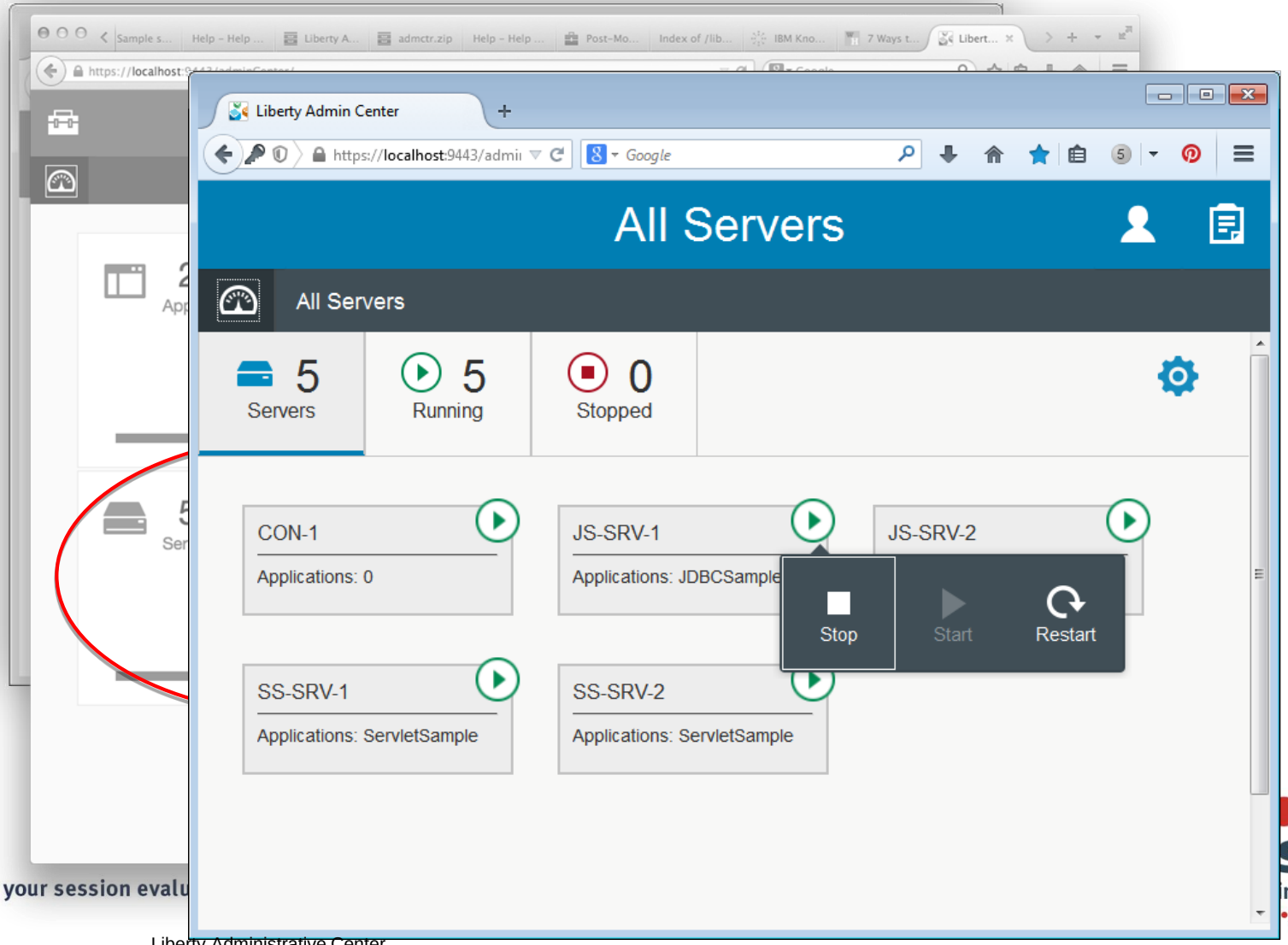


Lifecycle Actions

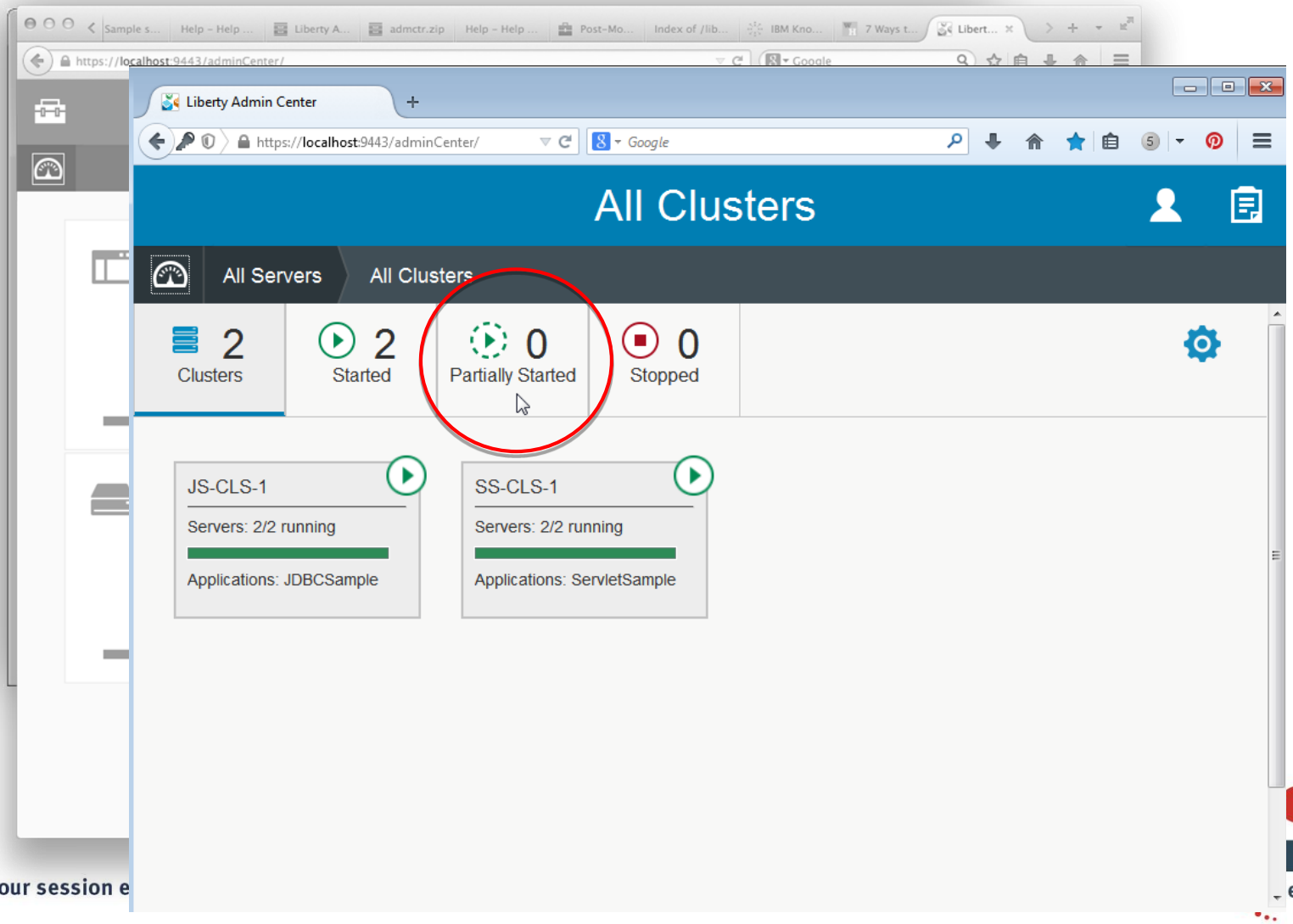
As an Admin…

- I want to start and stop my servers
- I want to start and stop my clusters
- I want to start and stop my applications
- I want to identify potential problems

Start/Stop/Restart a Server



View Potential Problems



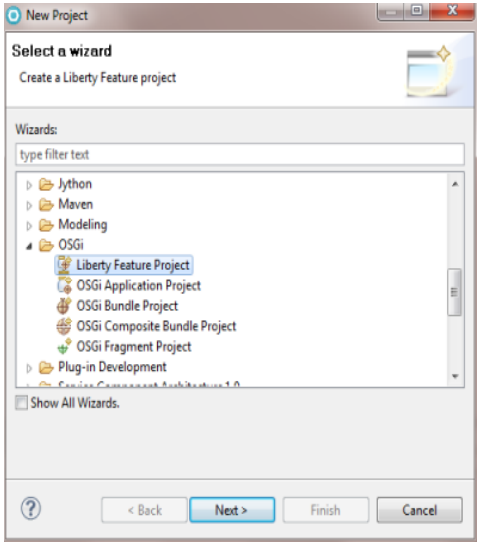
More Info…

- **The ‘GO-TO’ place for Liberty**
  - https://developer.ibm.com/wasdev
  - https://developer.ibm.com/wasdev/downloads
    - ALL the features.. Including the Admin Center
- **Setting up Admin Center**
  - https://www.youtube.com/watch?v=NkNXxMp5fAc
- **Touring the Liberty profile Admin Center**
  - https://www.youtube.com/watch?v=Gn4wiYNWkNE
  -
  -

Third Party Extensibility

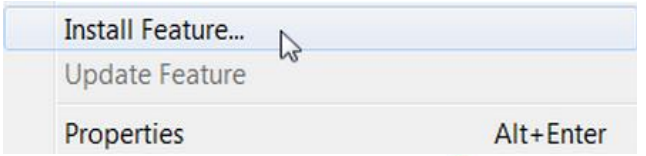
The Liberty Extensions System Programming Interface (SPI) provides the ability to extend the Liberty profile with custom features, including full life cycle management

- Supports third party extension of the runtime
  - Provide extension features enabled from server.xml just like base Liberty features
  - Receive configuration information from server.xml
  - Integrate with runtime by accessing Liberty SPIs
  - Expose APIs that applications can access
- WDT project type for feature development
- A product extension is a directory on disk structured like the wlp dir
- All content for a feature is relative to the extension location the feature is installed to
- Registered in wlp/etc/extensions
  - One file per extension



  - File is named <extension name>.properties

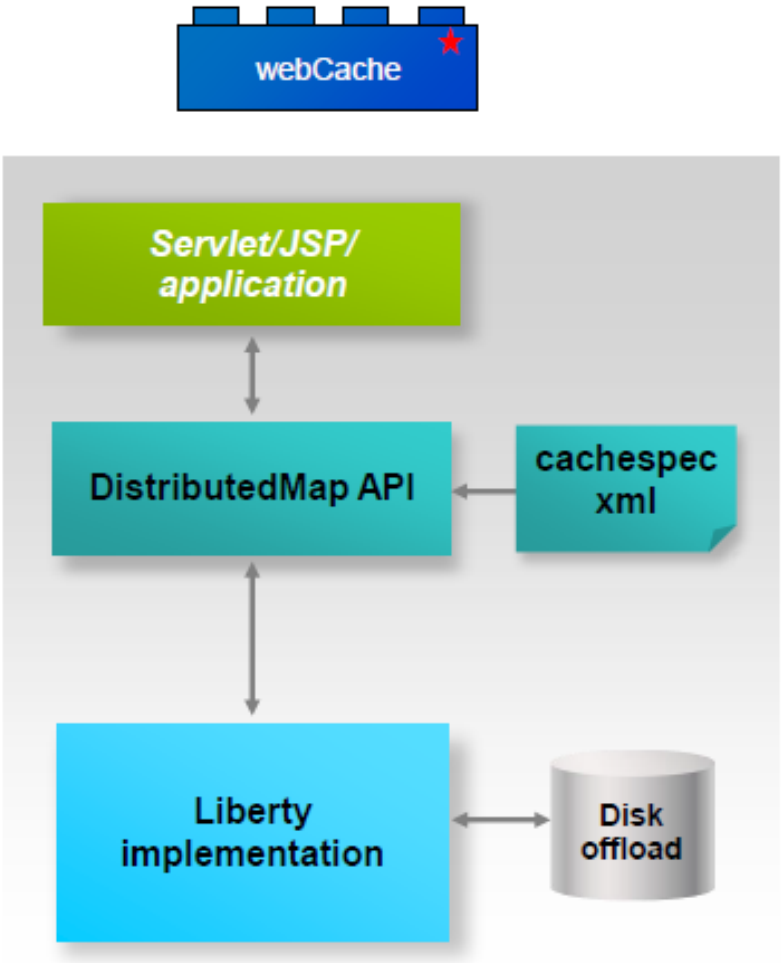
```
com.ibm.websphere.productId=<your product id>
com.ibm.websphere.productInstall=<absolute, or relative file path>
```



Liberty – Support for WebSphere Web Cache

WAS v8.5.5 provides support for WebSphere Web Cache, a.k.a. DynaCache, enabling a local caching service for simplified development of applications

- Local server cache for dynamic web content
- Enables developers to easily develop / test applications for local server caching solutions
- Same API as full WAS
- Optional disk offload
- LRU replacement policy
- Run as local server cache in production or move applications unchanged to distributed caching via WebSphere eXtreme Scale

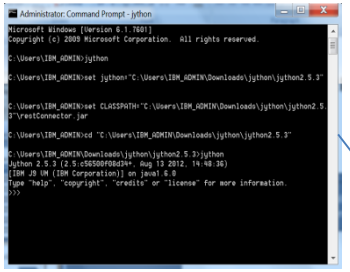


Liberty “Collective” Administration

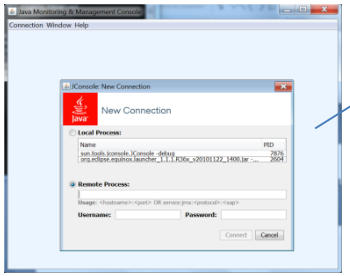
WAS v8.5.5 introduces a new administrative model enabling the grouping of Liberty servers into collectives for common management and static clustering

- New Liberty collective management infrastructure
  - Lightweight centralized management of Liberty profile servers
  - Agent-less administration
  - Deployment of topology of WAS Liberty profile servers
  - Static cluster management
  - Application and server deployment/update
  - JMX API through Java, Jython, and Jconsole clients
- Configuration:
  - Controller (requires WAS ND or WAS z/OS license):
    - *<feature>collectiveController-1.0</feature>*
    - *Highly available*
  - Managed server:
    - *<feature>collectiveMember-1.0</feature>* *(All Editions)*
    - *<feature>clusterMember-1.0</feature>* *(ND+ only)*
- Scales to 1000s of JVMs

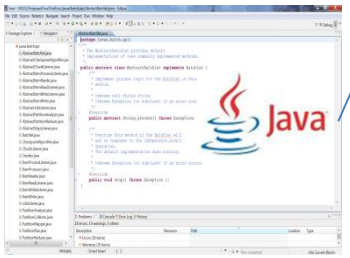
Liberty Collectives (WAS ND)



jython



jconsole



java

Collective Controller

- Provides Operational Registry
- Access all members through controller
- Highly Available
- Secure, Scalable
- Agentless
- No central config

<collectiveMember controllerHost=…/>

Liberty Profile (Collective Member)

Collective Member

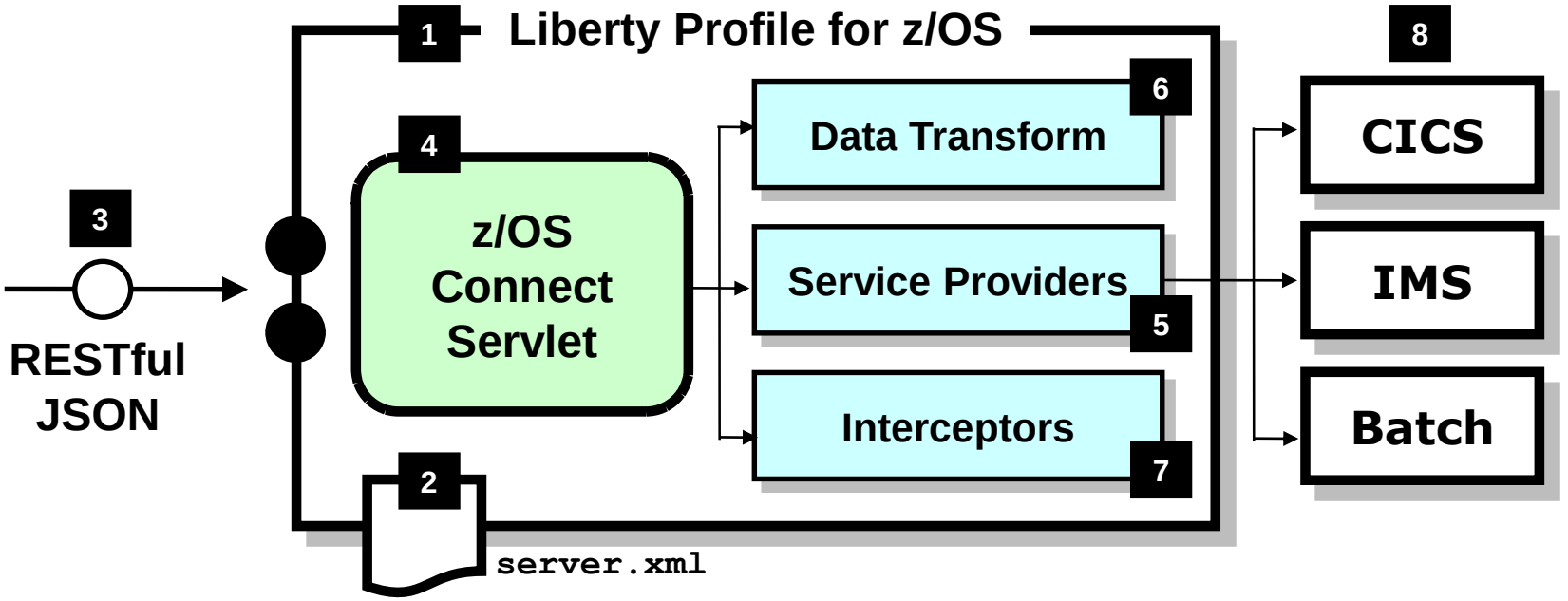
<collectiveMember controllerHost=…/>
<clusterMember name=…/>

Liberty Profile (Collective Member)

App Cluster

- Members "join" collective
- Profiles self-assign to clusters
- Simple config updates
- Easily reversed, reconfigured

z/OS Connect – a brief summary



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

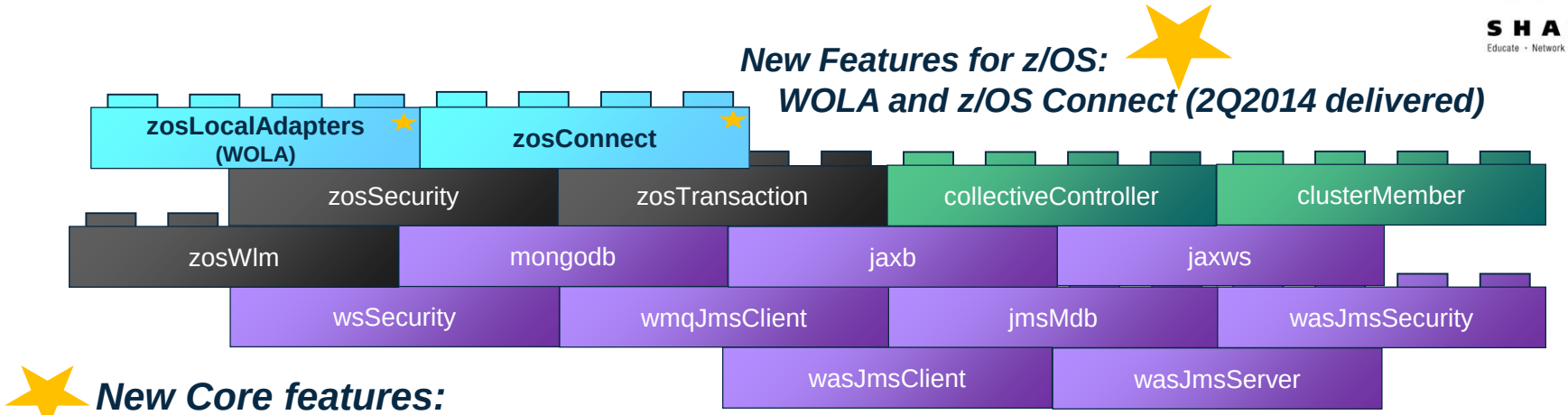
5 A 'Service Provider' is software that provides the connectivity to the backend system

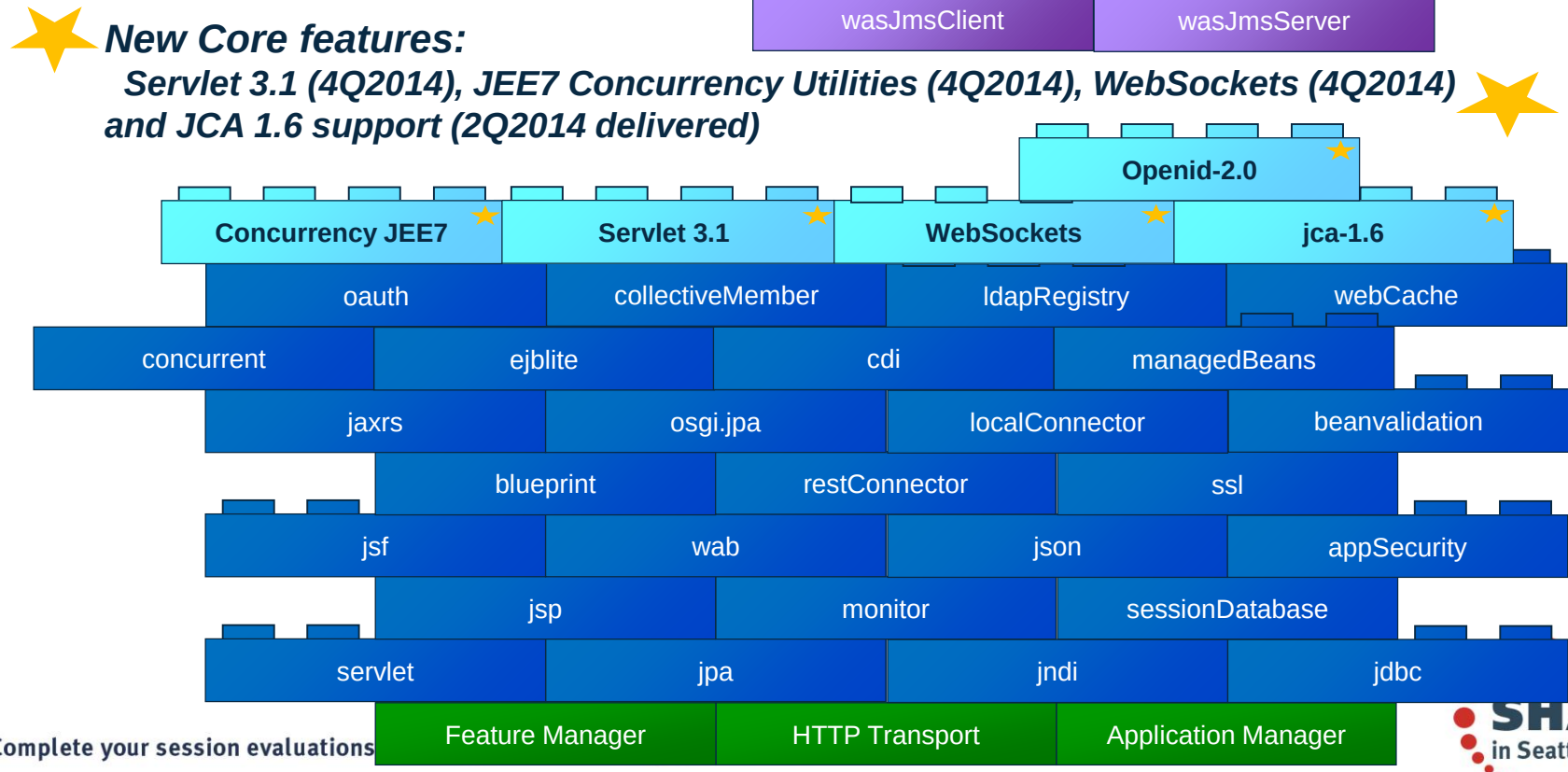
6 z/OS Connect provides the ability to transform JSON to the layout required by backend

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

8 Initially the backend systems supported will be CICS, IMS and Batch

WAS 8.5.5.x new features





Delivered in 4Q2014 - 8.5.5.4

Enhance applications with **new Java EE7 features** that enable exploitation of HTML5 and associated technologies for dynamic and responsive user experience

- Leverage **Java Servlet 3.1** feature for async I/O to improve server-side application efficiency and scalability.
- Use the new **Java API for WebSocket 1.0** feature to support interactive duplex data-exchanges with clients
- Simplify data-parsing using the new **Java API for JSON** Processing feature.
- Create portable and scalable asynchronous applications using the new **Concurrency Utilities for Java EE** feature.

ND **Intelligent Management** for Liberty Collectives

- Automatically scale your Liberty ND collectives, based on workload, using declarative scaling policies.

Flexible **federated security**

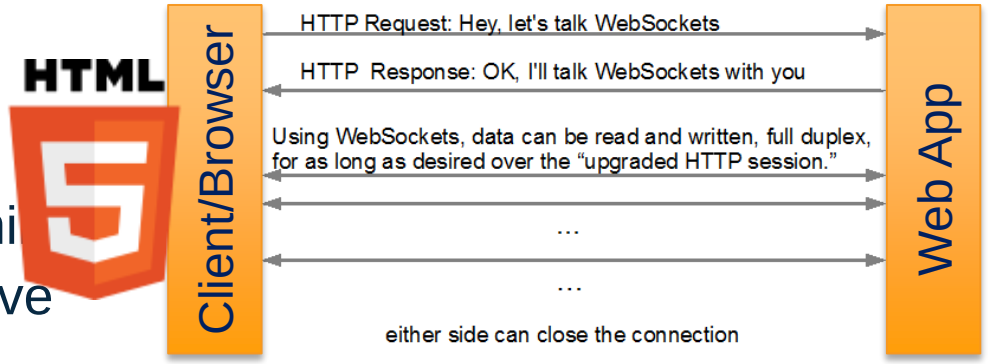
- Configure security integration with an **OpenID 2.0** security provider
- Configure Liberty to use **OpenID Connect** for single-sign on (SSO) across cooperating security third-party domains.

WebSockets

WebSockets solves difficulties of 2-way HTTP Communications.

- Previous options:
  - HTTP Polling
  - HTTP Long Polling
  - HTTP One Way Streami
  - Combination of the above

WebSockets:



@ServerEndpoint annotated POJOs packaged in WARs – simple server-side programming model.

HTML5-compliant devices as clients

- Also Java client API and @ClientEndpoint annotation for POJOs.

Distributed ID to SAF Identity Mapping

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

  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.

Zero Migration By Design

There is **no migration needed for Liberty configuration**

- the same server configurations can be used with different versions and service levels of the runtime
- set WLP_USER_DIR to shared configuration and apps

Existing features **will not change behavior**

- new feature 'versions' will be added and will contain all updates and changes

Supported versions of Java (J2SE) will move forward

- Several of the Java EE 7 technologies require Java 7
- Java 6 will go out of support at some point
  - WebSphere Application Migration Tool already has support to identify J2SE 6 -> 7 changes needed by an application

Tech preview

WebSphere Application Migration Toolkit

Liberty Technology Preview for API Analysis

- Provides a high level report showing which Java EE technologies your application uses
- Run in eclipse against application source
- Provides an indication of support by WAS profile and edition
- Compatible with WDT V8.5.5 and other Migration Toolkit features, e.g. Tomcat and Competitive Migration tools

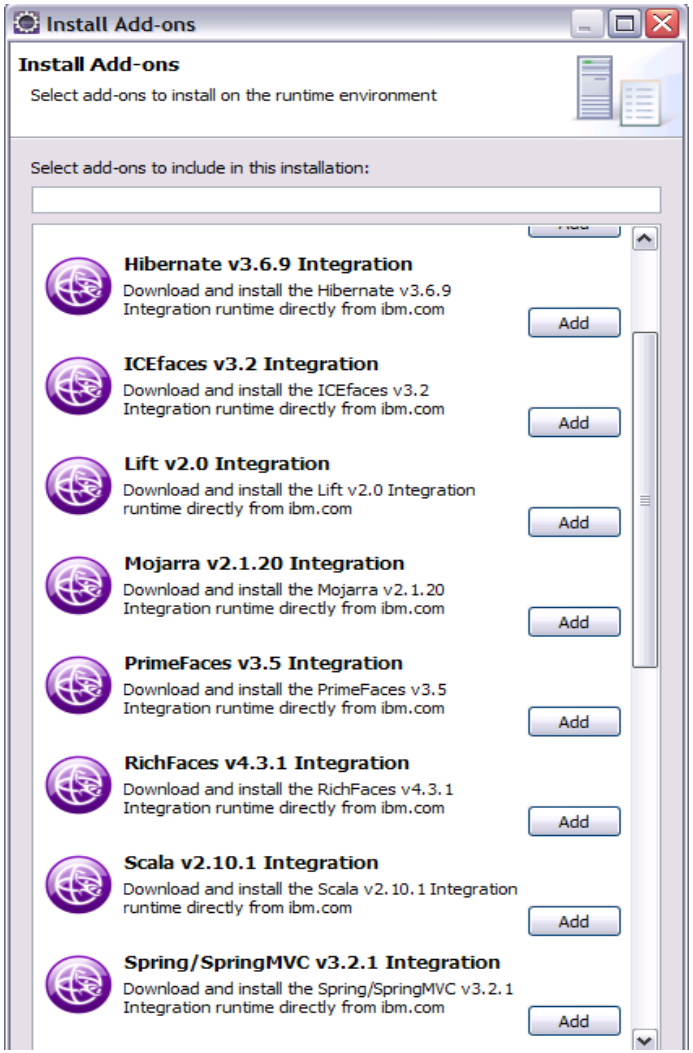
Technology Evaluation Report

Your application uses technologies available in these editions and profiles:

Product Edition	WebSphere Application Server 8.5.5 - Liberty Core	WebSphere Application Server 8.5.5
Profile	**Liberty profile**	**Liberty profile**
Web services technologies		
Java API for RESTful Web Services (JAX-RS) 1.1	✓	✓
Web application technologies		
Java Servlet 3.0	✓	✓
JavaServer Faces (JSF) 2.0	✓	✓

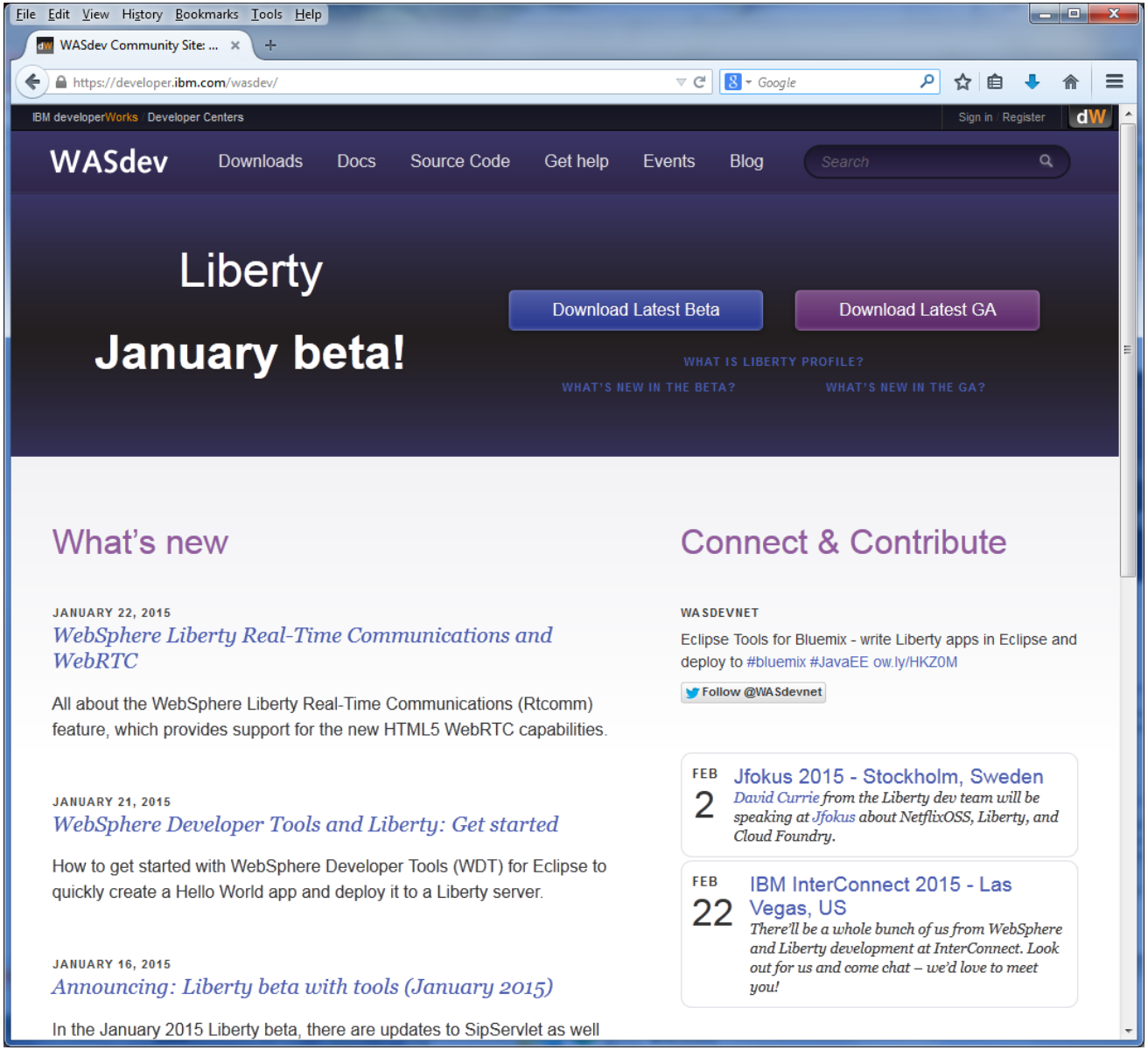
https://developer.ibm.com/wasdev/downloads/#asset/tools-Migration_Toolkit_Liberty_Tech_Preview

Online Repository for Extending the 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

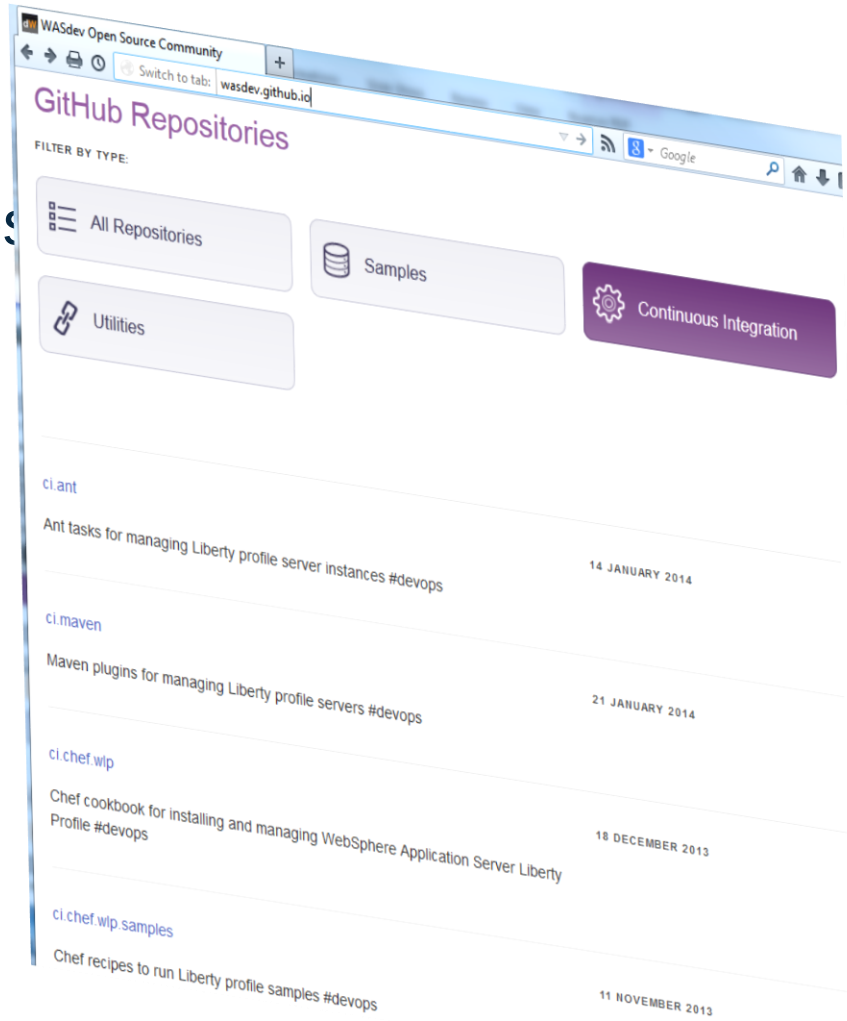
Visit WASdev.net for downloads/resources



Complete your

WASdev Open Source Community on GitHub

- WASdev Open Source community extension to the WASdev developer community
  - http://wasdev.github.io
  - https://github.com/wasdev
- GitHub - 3.5M users, 6M repos
- Apache License, Version 2.0
- Resulting binaries hosted on Liberty Repository
  - https://www.ibmdw.net/wasdev/repo



Java Road Map

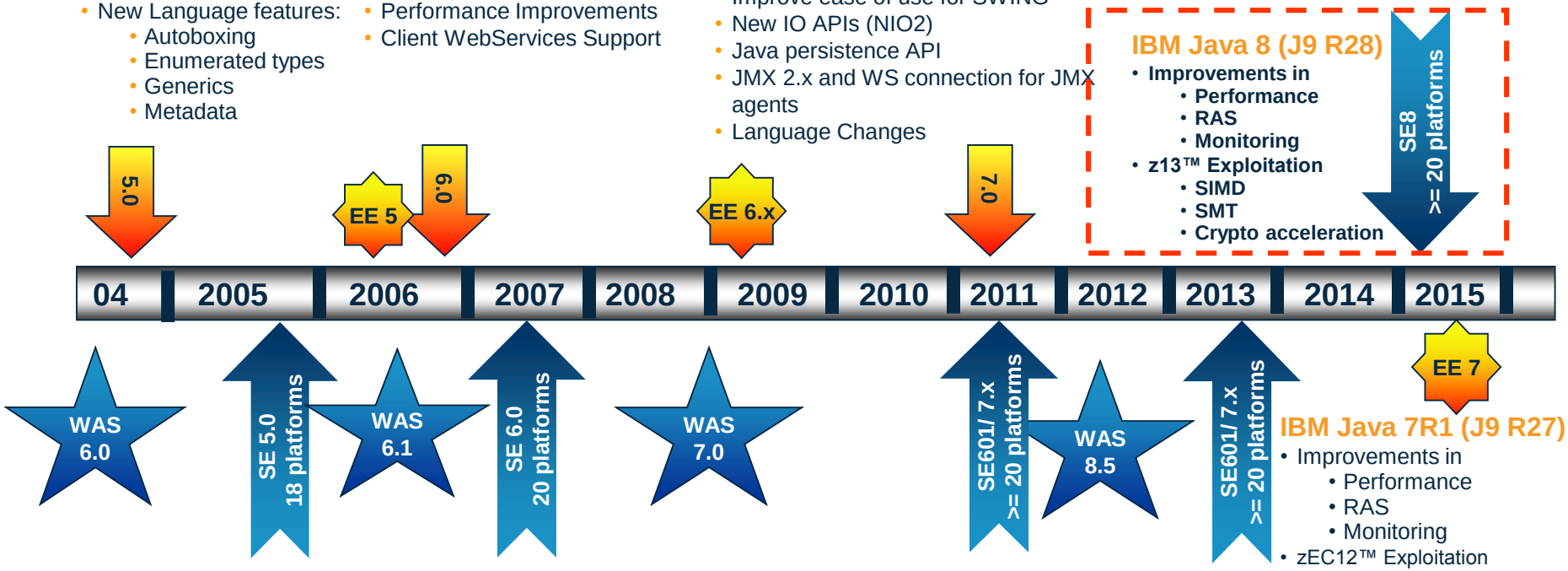
Language Updates

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 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

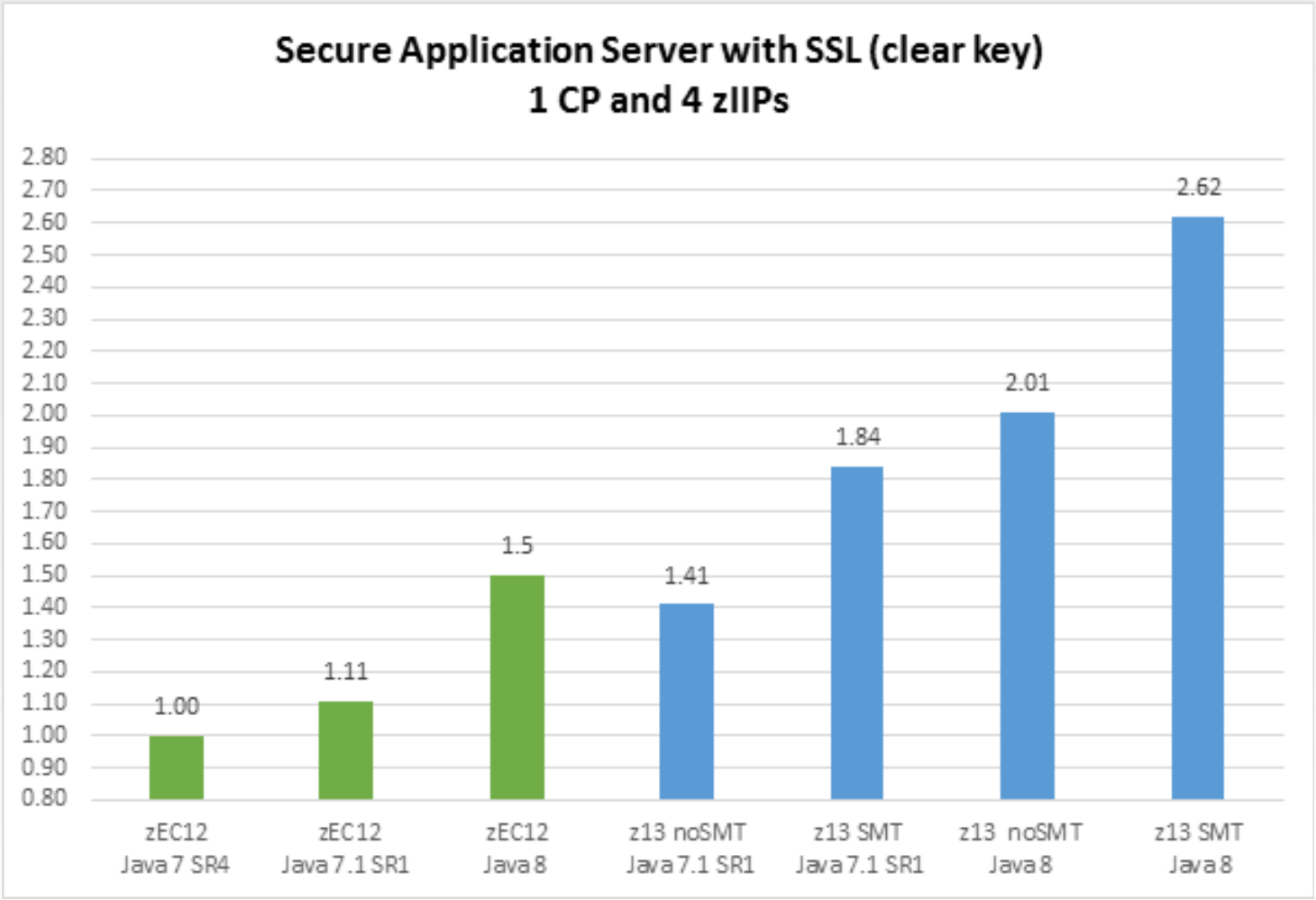
IBM Java 7R1 (J9 R27)
- Improvements in
  - Performance
  - RAS
  - Monitoring
- zEC12™ Exploitation
  - zEDC for zip acceleration
  - SMC-R integration
  - Transactional Execution
  - Runtime instrumentation
  - Hints/traps
- Data Access Accelerator

IBM Java 7 (J9 R26 SR3)
- Improvements in
  - Performance
- zEC12™ Exploitation
  - Transactional Execution
  - Flash 1Meg pageable 4's
  - 2G large pages
  - Hints/traps

**Timelines and deliveries are subject to change.

Liberty z/OS - SSL-Enabled DayTrader3.0

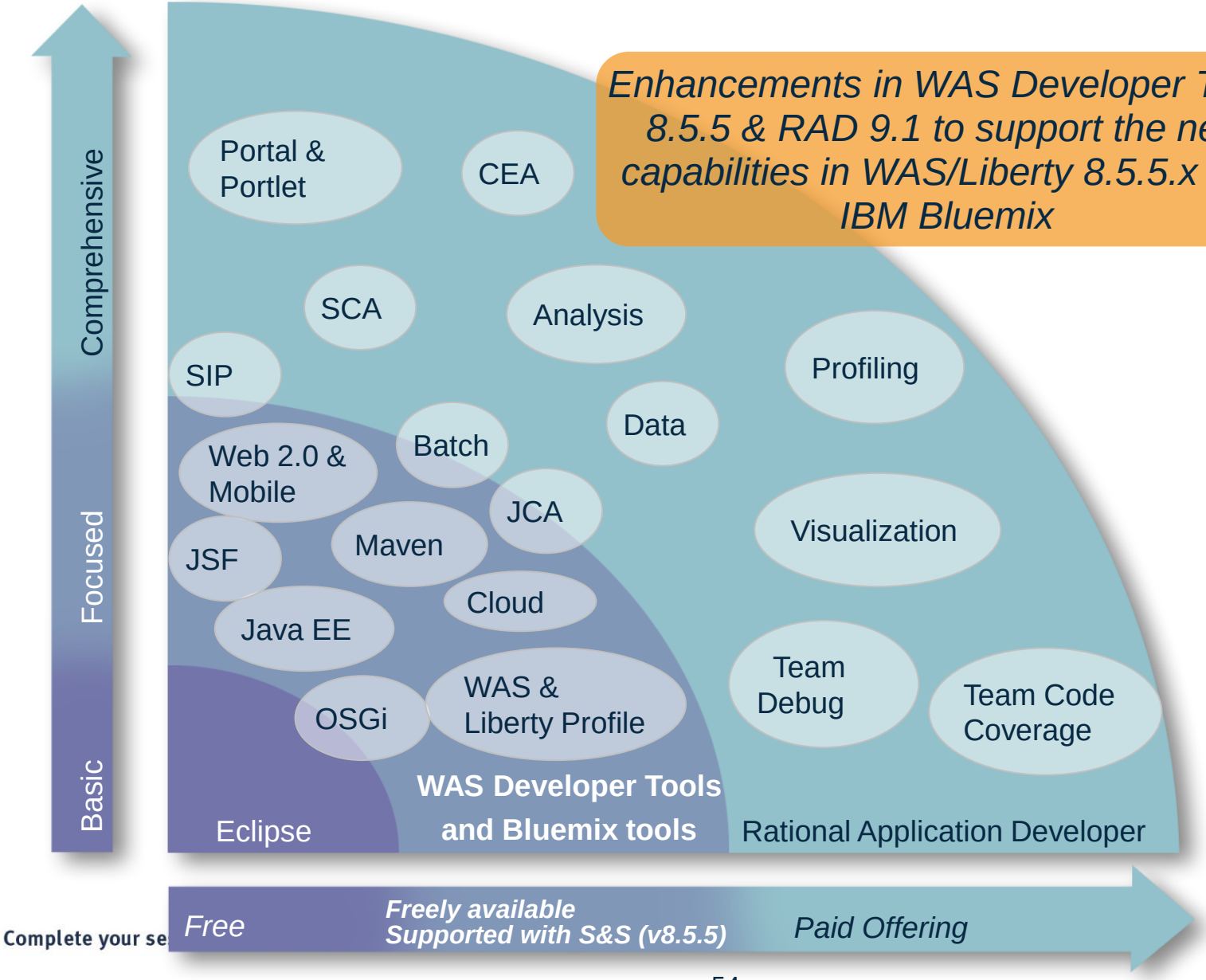
Liberty plans to support Java 8 in 1Q15 – with 8.5.5.5



2.62x improvement in throughput with IBM Java 8 and IBM z13

(Controlled measurement environment, results may vary)

WAS Developer Tools



Enhancements in WAS Developer Tools 8.5.5 & RAD 9.1 to support the new capabilities in WAS/Liberty 8.5.5.x and IBM Bluemix

WebSphere Developer Tools- Remote (8.5.5.5)

- Liberty on a remote server can be started/ stopped/administered using WDT.
- Applications can be deployed/debugged/un-deployed in the remote server.
- This is supported on ALL platforms **– including z/OS!**