Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

- CICS®
- DB2®
- GDPS®
- Geographically Dispersed Parallel Sysplex
- HiperSockets
- IBM®
- IBM eServer
- IBM logo®
- IMS
- On Demand Business logo

* Registered trademarks of IBM Corporation

The following are trademarks or registered trademarks of other companies.

Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.

SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.

* All other products may be trademarks or registered trademarks of their respective companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user’s job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.
Disclaimer

• The information contained in this documentation is provided for informational purposes only. While efforts were many to verify the completeness and accuracy of the information contained in this document, it is provided “as is” without warranty of any kind, express or implied.

• This information is based on IBM’s current product plans and strategy, which are subject to change without notice. IBM will not be responsible for any damages arising out of the use of, or otherwise related to, this documentation or any other documentation.

• Nothing contained in this documentation is intended to, nor shall have the effect of, creating any warranties or representations from IBM (or its suppliers or licensors), or altering the terms and conditions of the applicable license agreement governing the use of the IBM software.

• Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user’s job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

• All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.
# WebSphere Application Server on z/OS Sessions

<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>12182</td>
<td>What’s New?</td>
<td>Monday</td>
<td>11:00</td>
<td>Golden Gate 1</td>
<td>Stephen / Hutchinson</td>
</tr>
<tr>
<td>12185</td>
<td>WAS on z/OS - In Real Life</td>
<td>Monday</td>
<td>1:30</td>
<td>Golden Gate 1</td>
<td>Rod Feak / Follis</td>
</tr>
<tr>
<td>12184</td>
<td>Lab</td>
<td>Tuesday</td>
<td>12:15</td>
<td>Union Square 23-24</td>
<td>Follis / Hutchinson / Loos / Stephen</td>
</tr>
<tr>
<td>12183</td>
<td>Liberty Server</td>
<td>Wednesday</td>
<td>11:00</td>
<td>Plaza B</td>
<td>Follis</td>
</tr>
<tr>
<td>12186</td>
<td>Spelunking the Admin Console</td>
<td>Wednesday</td>
<td>1:30</td>
<td>Plaza B</td>
<td>Hutchinson</td>
</tr>
<tr>
<td>12188</td>
<td>Being the Backup Administrator</td>
<td>Friday</td>
<td>9:30</td>
<td>Franciscan B</td>
<td>Loos</td>
</tr>
</tbody>
</table>
What is the Liberty profile?

• **A lightweight, dynamic, composable runtime**
  
• **Lightweight**
  • Server install is only about 55 MB
  • Extremely fast server starts – typically well under 5 seconds

• **Dynamic**
  • Available features are user selected and can change at runtime
  • Restarts are not required for server configuration changes

• **Composable**
  • Features are implemented as loosely coupled components with lazily resolved optional and mandatory dependencies
  • The availability of features and components determines what Liberty *can* do and what’s available to applications
What is the Liberty profile?

- **An easy to configure runtime environment**
- Simple, extensible, and sparse configuration model
  - Configuration can live in a single XML document
  - Configuration is by exception
    - Defaults are provided by contributing feature
    - Only modifications to the defaults are required
- Flexible configuration structure
  - Include mechanism allows for shared configuration elements
  - Variable indirection mechanism allows for customization when distributed across multiple JVMs
  - Easily managed by version control systems if desired
What is the Liberty profile?

- **A transportable runtime for your applications**
- Use “server package” to generate an archive that contains a tested, self-contained, pre-configured server instance that includes your application
  - Enables an application-centric deployment model that allows for easy scale-out
  - Light-touch admin builds on the ND job manager infrastructure to manage Liberty server instances

- **A runtime environment with fidelity to full WAS**
  - Liberty *is* WebSphere
  - Applications that are developed and tested on Liberty will run on the full profile
Lightweight configuration

```xml
<server description="tradeLiteServer">
  <featureManager>
    <feature>jsp-2.2</feature>
    <feature>jdbc-4.0</feature>
  </featureManager>
  <logging consoleLogLevel="INFO"/>
  <application type="war"
    id="tradeLite"
    name="tradeLite"
    location="${shared.app.dir}/webcontainer/tradeLite.war"/>
    <include location="jdbc-drivers.xml"/>
    <include location="${user.home}/custom.xml" optional="true"/>
    <dataSource id="jdbc/ DerbyTradeDataSource"
      jndiName="jdbc/TradeDataSource"
      jdbcDriverRef="DerbyEmbedded">
      <properties databaseName="${shared.resource.dir}/data/tradedb"/>
    </dataSource>
  </server>
```

**Features** control what’s available in the runtime

**Singleton** configurations specify properties for runtime services for which there is only one instance

**Instance** configurations allow multiple instances of resources and applications to be declared

**Includes** can be used to implement an extensible configuration model

**References** can be used in multiple elements to point share a common definition

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Composability – Based on features

<server description="composabilityIsKey">
  <featureManager>
    <feature>appSecurity-1.0</feature>
    <feature>jsp-2.2</feature>
    <feature>restConnector-1.0</feature>
    <feature>jpa-2.0</feature>
  </featureManager>
</server>
What is the WAS for z/OS Liberty profile?

- The WAS for z/OS Liberty profile is Liberty with optional, independently enabled extensions that exploit z/OS facilities
  - Only enable exploitation of z/OS features you need
  - Only configure the z/OS functions you use
- Focus of v8.5 is basic integration and exploitation

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Liberty and traditional profile capabilities

There are functional differences between traditional WAS and the Liberty profile – Liberty provides a useful subset of traditional WAS

<table>
<thead>
<tr>
<th>Liberty Profile</th>
<th>Traditional WAS Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bean validation</td>
<td>Everything Liberty has...</td>
</tr>
<tr>
<td>Blueprint</td>
<td></td>
</tr>
<tr>
<td>Java API for RESTful Web Services</td>
<td></td>
</tr>
<tr>
<td>Java Database Connectivity (JDBC)</td>
<td></td>
</tr>
<tr>
<td>Java Naming and Directory Interface (JNDI)</td>
<td></td>
</tr>
<tr>
<td>Java Persistence API (JPA)</td>
<td></td>
</tr>
<tr>
<td>Java Server Faces (JSF)</td>
<td></td>
</tr>
<tr>
<td>Java Server Pages (JSP)</td>
<td></td>
</tr>
<tr>
<td>JMX</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td></td>
</tr>
<tr>
<td>OSGi JPA</td>
<td></td>
</tr>
<tr>
<td>Remote connector</td>
<td></td>
</tr>
<tr>
<td>Secure Sockets Layer (SSL)</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
</tr>
<tr>
<td>Servlet</td>
<td></td>
</tr>
<tr>
<td>Session Persistence</td>
<td></td>
</tr>
<tr>
<td>Transaction</td>
<td></td>
</tr>
<tr>
<td>Web application bundle (WAB)</td>
<td></td>
</tr>
<tr>
<td>z/OS Security (SAF)</td>
<td></td>
</tr>
<tr>
<td>z/OS Transactions (RRS)</td>
<td></td>
</tr>
<tr>
<td>z/OS Workload Management</td>
<td></td>
</tr>
<tr>
<td><strong>Enterprise Java Beans (EJBs)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Messaging (JMS)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Web Services</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Service Component Arch (SCA)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Java Connector Architecture (JCA)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Clustering</strong></td>
<td></td>
</tr>
<tr>
<td><strong>WebSphere Optimized Local Adapters</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Administrative Console</strong></td>
<td></td>
</tr>
<tr>
<td><strong>WSADMIN scripting</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Multi-JVM Server Model</strong></td>
<td></td>
</tr>
<tr>
<td><strong>And much more ...</strong></td>
<td></td>
</tr>
</tbody>
</table>

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Angel – Enabling *authorized* services

- Many z/OS services require callers to be *authorized*
  - Typically documented as “in a system key or supervisor state”
  - These services, when abused, have side effects that could impact the stability or integrity of the system so the system requires callers to have extra privileges
- Exploiting most z/OS features requires authorized code
  - Workload management
  - Transaction management
  - SAF (security) interface exploitation
  - Cross-memory communications
- The *Angel* enables unauthorized Liberty profile servers to access these authorized services
Angel – Details

- The Angel is **not** the same as the WAS for z/OS daemon process
  - No communication endpoint is hosted by the process
  - No ties to the WebSphere topology (cells, nodes)

- The Angel is an **optional** process
  - Provides a system LX that enables Liberty JVMs to bootstrap and wire up PC routines
  - Only needed if Liberty JVMs need to run system authorized code
  - Provides fine grained access controls around authorized services

- The Angel does not execute code except in response to operator commands

- The Angel is structured to allow service without restart
  - MODIFY RELOAD will load a new version of code
WebSphere for z/OS – Processes

- Angel
  - Extremely light-weight started task
  - Single instance per system image \textit{regardless of WAS topology}
  - No configuration to manage
  - No code level dependency between angel and server

- Liberty profile server
  - Single process implementation
  - Uses agent infrastructure to exploit authorized z/OS services

- Traditional WAS
  - Split process
  - Requires daemon infrastructure

Installed version of application server
Angel – Version agnostic

devTestServer

Angel function stubs

Angel server function router

1.1.0 authorized functions

Angel Started Task

Angel Services

productionServer

Angel function stubs

Angel server function router

v1.0.2 authorized functions

v1.0.0 WLP Install

v1.1.0 WLP Install

v1.0.2 WLP Install

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Angel access control – Examples

• Allow a user to access the angel
  • RDEF SERVER BBG.ANGEL UACC(NONE)
  • PE BBG.ANGEL CLASS(SERVER) ACCESS(READ) ID(USERID)

• Allow a user to load the server authorized function module
  • RDEF SERVER BBG.AUTHMOD.BBGZSAFM UACC(NONE)
  • PE BBG.AUTHMOD.BBGZSAFM CLASS(SERVER) ACCESS(READ) ID(USERID)

• Allow a user to access RRS in support of local data access
  • RDEF SERVER BBG.AUTHMOD.BBGZSAFM.TXRRS UACC(NONE)
  • PE BBG.AUTHMOD.BBGZSAFM.TXRRS CLASS(SERVER) ACCESS(READ) ID(USERID)

• Allow a user to access workload management services:
  • RDEF SERVER BBG.AUTHMOD.BBGZSAFM.ZOSWLM UACC(NONE)
  • PE BBG.AUTHMOD.BBGZSAFM.ZOSWLM CLASS(SERVER) ACCESS(READ) ID(USERID)

• Allow a user to use native credential management services:
  • RDEF SERVER BBG.AUTHMOD.BBGZSAFM.SAFCRED UACC(NONE)
  • PE BBG.AUTHMOD.BBGZSAFM.SAFCRED CLASS(SERVER) ACCESS(READ) ID(USERID)
Feature – z/OS Transactions

- Extends the WebSphere transaction manager
  - Provides native transaction context management via MVS context services and resource recovery services (RRS)
  - Implements 2PC across JTA/XA resource managers and RRS enabled resource managers
- Required to support Local DB2 connectivity via JDBC

```xml
<server description="LocalDB2JDBC">
  <!-- Feature Manager:
  - zosTransaction-1.0
  - jdbc-4.0
-->
  <featureManager>
    <feature>zosTransaction-1.0</feature>
    <feature>jdbc-4.0</feature>
  </featureManager>

  <jdbcDriver id="DB2T2JDBC" libraryRef="db2SharedLibrary"/>

  <dataSource id="jdbc/DerbyTradeDataSource"
              jndiName="jdbc/TradeDataSource"
              jdbcDriverRef="DB2T2JDBC">
    <properties databaseName="LOC1" driverType="2" user="admin" password="secret"/>
  </dataSource>

</server>
```
Feature – z/OS Transactions: Performance

- **Optimized local connectivity for higher throughput**

![Throughput graph]

- z196, 4-way LPAR running z/OS 1.13
- 64bit IBM Java 6.0.1 with compressed references, 1M large pages, 2GB heap
- IBM DB2 for z/OS v10, JDBC with keepDynamic

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Feature – z/OS Workload Manager

- Adds support to classify HTTP requests with z/OS WLM
  - Classification associates response time goals and importance to work run in WebSphere
  - z/OS workload manager will manage the resources available on the system in a way that ensures the most important work runs while attempting to meet response time goals
  - RMF reports provide information about completed transactions, response times, etc by service class

```xml
<server description="mvsWorkloadManagement">
  <featureManager>
    <feature>zosWlm-1.0</feature>
  </featureManager>
  <wlmClassification/>
    <httpClassification transactionClass="WLPTRADE" resource="/tradelite/**" />
    <httpClassification transactionClass="WLPDFLT" />
  </wlmClassification>
</server>
```
RMF Report with WLM – Example

GOAL: RESPONSE TIME 000.00.00.250 FOR 80%

-----------RESPONSE TIME DISTRIBUTION-----------

<table>
<thead>
<tr>
<th>TIME</th>
<th>NUMBER OF TRANSACTIONS</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 00.00.00.125</td>
<td>830K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.150</td>
<td>830K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.175</td>
<td>831K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.200</td>
<td>831K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.225</td>
<td>831K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.250</td>
<td>831K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.275</td>
<td>831K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.300</td>
<td>832K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.325</td>
<td>832K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.350</td>
<td>832K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.375</td>
<td>832K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.00.500</td>
<td>832K</td>
<td>100</td>
</tr>
<tr>
<td>&lt;= 00.00.01.000</td>
<td>832K</td>
<td>100</td>
</tr>
<tr>
<td>&gt; 00.00.01.000</td>
<td>832K</td>
<td>100</td>
</tr>
</tbody>
</table>

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Feature – z/OS Workload Manager

- **The impact of enabling zWLM is under 5%**

![Graph showing throughput comparison between Type 2 DB2 JDBC with RRS and Type 2 DB2 JDBC with RRS & WLM, with a 4.6% decrease.]()

- z196, 4-way LPAR running z/OS 1.13
- 64bit IBM Java 6.0.1 with compressed references, 1M large pages, 2GB heap
- IBM DB2 for z/OS v10, T2 JDBC with keepDynamic

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Feature – z/OS Security: Authentication

- The z/OS Security feature provides two implementations of a user registry that perform authentication with z/OS SAF interfaces.
- The implementation that is used is based on the presence of an Angel and the server’s authorization to use the SAFCRED functions.

**Authorized**
- Requires an active angel and appropriate access to Liberty SAFCRED authorized functions.
- Uses the SAF IRRSIA00 callable service.
- Enables creation of native credentials required for SAF authorization.

**Unauthorized**
- Requires the server to run in an environment that satisfies the BPX.DAEMON requirements.
- Uses the LE / USS __passwd_applid implementation.
- Unable to create native credentials required for SAF authorization.
Feature – z/OS Security: Authorization

- SAF Authorization in Liberty allows a server to use the z/OS security product for access control checks
- Whenever a Subject tries to access a protected resource or requires access to an application role, the authorization check is rendered as a SAF check against a profile in the EJBROLE class
  - Class descriptor table entry allows for mixed case profile names
  - Maximum length of a profile is 246 characters
  - Rules to map role names to profile names can be configured
- Authorized credential services are required for SAF authorization
  - RACO / ACEE are passed to the SAF FASTAUTH service to perform access check
Feature – z/OS Security: Sandbox

- Extra access controls are provided with Liberty to prevent misuse of the SAF security interfaces. The user ID associated with a server process must be allowed to use the profile prefix.
  - RDEF SERVER BBG.SECPFX.BBGZDFLT UACC(NONE)
  - PE BBG.SECPFX.BBGZDFLT CLASS(SERVER) ACCESS(READ) ID(USERID)
- The calls to services that generate native credentials are provided with an “application ID” based on the “profile prefix”
  - The APPL class can be used to prevent credential creation
- All user IDs associated with a server process must have SECPFX access to the first qualifier of EJBROLE
  - Prevents users from scanning authorization rules for access
- Provides the infrastructure necessary to enable security integration in a mixed workload environment
z/OS Security – Example

- Full SAF exploitation
  - Authentication performed with the local z/OS security product
  - Credentials only created for users with access to the “BBGZDEMO” application ID
  - The local z/OS security product is used for authorization

```xml
<server description="securityExample">
    <featureManager>
        <feature>appSecurity-1.0</feature>
        <feature>zosSecurity-1.0</feature>
    </featureManager>

    <safRegistry id="saf" realm="was.pok.ibm.com"/>
    <safCredentials profilePrefix="BBGZDEMO" unauthenticatedUser="WLPGUEST"/>

    <safAuthorization id="saf"/>
    <safRoleMapper profilePattern="%profilePrefix%.%resource%.%role%"/>

</server>
```
z/OS Operations – Choose your interface

- Run from a shell or as a started task with the provided launchers and PROCs
- Important messages routed as WTOs for automation
- Modify commands enable changes to trace specification or to request a diagnostic dump
Why Liberty on z/OS?

• **Simplification**
  • Liberty environments don’t need significant z/OS configuration and customization
    • RRS, WLM, and SAF exploitation and configuration is optional
    • No authorized code is required to host applications
  • Liberty runs in a single process instead of 3+ started tasks
    • Significantly reduced resource consumption
    • No started task definitions are required
    • No need to create users and groups for controllers, servants
  • Server instances can be quickly created or cloned
    • `server create serverName [options]`
    • `server package serverName [options]`
Why Liberty on z/OS?

- **Application portability and stack consistency**
  - Liberty behaves *exactly the same* on all platforms out of the box
    - z/OS specific behaviour must configured if desired
  - Administration is the same for all platforms out of the box
    - Server operations are controlled by the same server script
    - Logs, trace, and configuration live in the hierarchical file system and are tagged with the appropriate code page for easy viewing and editing
    - Existing server configurations can be brought to z/OS from distributed without modification
  - An extremely light-weight, single process runtime
    - Removes deployment and runtime complications introduced by the split process, multi-JVM runtime of traditional WAS for z/OS
Why Liberty on z/OS?

- **Performance: Startup time – 3.2 seconds!**

  ![Graph showing comparison between Traditional and Liberty startup times and CPU usage.](image)

- Liberty – 64bit IBM Java 6.0.1, 64/64MB min/max heap, 60MB shared class cache, TradeLite installed
- Traditional – 64bit IBM Java 6.0.1, 1SR,128/256MB min/max CR heap, 256/512MB min/max SR heap, 75MB CR shared class cache, 75MB SR shared class cache, no applications installed

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Why Liberty on z/OS?

- **Performance: Memory footprint – 80% reduction**

![Server Footprint Diagram]

- Liberty – 64bit IBM Java 6.0.1, 64/64MB min/max heap, 60MB shared class cache, TradeLite installed
- Traditional – 64bit IBM Java 6.0.1, 1SR, 128/256MB min/max CR heap, 256/512MB min/max SR heap, 75MB CR shared class cache, 75MB SR shared class cache, no applications installed

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Why Liberty on z/OS?

- **Performance: Throughput – Up to 35% improvement**

![Graph showing throughput comparison between Traditional and Liberty with INET_FASTPATH](image)

- z196, 2-way LPAR running z/OS 1.13
- 64-bit IBM Java 6.0.1 with compressed references, 1M large pages, 2GB heap
- IBM DB2 for z/OS v10, JDBC T4 with keepDynamic
- `_BXK_INET_FASTPATH=*` set to enable CommServer “fast path” for Liberty

Complete your sessions evaluation online at SHARE.org/SanFranciscoEval
Liberty for z/OS – Key Use Cases

*Accelerate application development and deployment while leveraging z/OS qualities of service*

- **Test Web Applications using z/OS Resources** – Easily perform z/OS platform testing of web applications regardless of development platform

- **Lightweight Production** – Where a lightweight application server is appropriate for production web applications, leverage the rapid startup and small footprint of Liberty profile based applications

- **Incremental adoption of unique z/OS extensions** – Enable incremental exploitation of optional z/OS extensions to leverage z/OS qualities of service

- **Efficient packaging and deployment of applications** – Create and deploy Liberty profile applications as packages that include both the application and configuration
New Alpha Features for the Liberty Profile

• Programming Model
  • Java EE 6 Web Profile
    • EJB 3.1 Lite, CDI, managed beans 1.0, Interceptor 1.0 completes Java EE 6 Web profile
  • JAX-WS web services
• Messaging:
  • JMS
  • Embedded Messaging Provider
• Admin:
  • NextGen Admin UI Tech Preview
• Security:
  • Custom User Registry
• Extensibility: third party features and Service Programming Interfaces (SPIs)
• Updated Tools in WDT 8.Next Alpha
EJB 3.1 Lite

- Configure new feature in server.xml:
  - `<feature>ejblite-3.1</feature>`
- Create stateless and singleton local EJBs via annotations
  - `@Stateless` and `@Singleton`
- Reference EJB from Servlet via annotations
  - `@EJB`
- EJB security:
  - Declarative security
    - `@DeclareRoles`, `@DenyAll`, `@PermitAll`, `@RolesAllowed`, `@RunAs`
  - Programmatic Security:
    - Methods on SessionContext:
      - `GetCallerPrincipal`
      - `GetCallerIdentity`
      - `IsCallerInRole`
CDI
(Contexts and Dependency Injection)

• Configure new feature in server.xml:
  • <feature>cdi-1.0</feature>

• Look up CDI managed bean through Expression Language (EL), e.g,
  • <c:out value="${namedBean.message}"/>

• Inject managed bean within a CDI managed bean

```java
@RequestScoped
@Named
public class NamedBean {
    private @Inject InjectedBean bean;
    ...
}
```
JAX-WS Web Services

• Configure new feature in server.xml
  • `<feature>jaxws-2.2</feature>`

• Alpha includes:
  • Servlet based endpoints
  • Catalog facility
  • `@WebServiceRef/@Resource` client reference injection
  • `@Resource` injection to access WebServiceContext
  • Handler chain
  • Addressing/MTOM
  • `webservices.xml` deployment plan (servlets)
Third Party Extensibility

- Supports third party extension of the runtime
- 3rd party feature life cycle
  - Package and install
  - Extend configuration
  - Integrate with runtime
- 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

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

- File is named <extension name>.properties
Custom User Registry

• Pluggable user registries supported as 3rd party features using WAS CUR SPI:
  • com.ibm.websphere.security.UserRegistry
• Example:

```xml
<featureManager>
  <feature>ssl-1.0</feature>
  <feature>appSecurity-1.0</feature>
  <feature>customRegistrySample-1.0</feature>
</featureManager>
<keyStore id="defaultKeyStore" password="{xor}EzY9Oi0rJg==" />

<fileRegistrySample
usersFile="${server.config.dir}/resources/security/users.props"
groupsFile="${server.config.dir}/resources/security/groups.props" />
```
Liberty Profile Admin UI Tech Preview

- Tech preview of NextGen console
  - Early feedback to guide GUI direction
- Evolve from one-size-fits-all console
- Lightweight, task-oriented applications / app store approach with customizable toolbox for “right-sized” UI per user / device
- Alpha GUI function
  - view/start/stop liberty applications
WebSphere Application Server Liberty Profile

David Follis
IBM

February 6, 2013
Session Number 12183