State of OpenEJB 3.0

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History

OpenEJB 1

- EJB 1.1 Only
- CMP with Castor JDO
- Embeddable
- Tomcat Integration
- Standalone Capable

OpenEJB 2

- EJB 2.1 Certified
- CMP with TranQL
- IoC Ready
- Geronimo Integration
- Geronimo Only

OpenEJB 3 - Best of Both, plus more…

- EJB 3.0 (including EJB 1.1, 2.0, 2.1)

- Embeddable

- IoC Ready

- Geronimo Integration

- Tomcat Integration

- Standalone Capable

- CMP 2.1 through JPA (if possible)

- Simplicity Beyond EJB 3.0

Build Layout

```
[INFO] ------------------------------------------------------------------------
[INFO] Reactor Summary:
[INFO] ------------------------------------------------------------------------
[INFO] OpenEJB :: Project ...................................... SUCCESS [2.151s]
[INFO] OpenEJB :: iTests ....................................... SUCCESS [12.576s]
[INFO] OpenEJB :: Container POM ................................ SUCCESS [0.113s]
[INFO] OpenEJB :: Container :: Core ............................ SUCCESS [36.727s]
[INFO] OpenEJB :: Container :: Spring .......................... SUCCESS [4.102s]
[INFO] OpenEJB :: Container :: XBean ........................... SUCCESS [3.528s]
[INFO] OpenEJB :: Container :: GBean ........................... SUCCESS [5.528s]
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[INFO] OpenEJB :: Server :: Client ............................ SUCCESS [2.451s]
[INFO] OpenEJB :: Server :: Core .............................. SUCCESS [1.967s]
[INFO] OpenEJB :: Server :: EJBd .............................. SUCCESS [18.202s]
[INFO] OpenEJB :: Server :: Admin ............................. SUCCESS [0.955s]
[INFO] OpenEJB :: Server :: Http .............................. SUCCESS [16.586s]
[INFO] OpenEJB :: Server :: Telnet ............................ SUCCESS [1.829s]
[INFO] OpenEJB :: Server :: XFire ............................. SUCCESS [0.934s]
[INFO] OpenEJB :: Server :: Axis .............................. SUCCESS [2.203s]
[INFO] OpenEJB :: Server :: CORBA ............................. SUCCESS [1.135s]
[INFO] OpenEJB :: Assembly :: Embedded ........................ SUCCESS [1.032s]
[INFO] OpenEJB :: Assembly :: Standalone ...................... SUCCESS [2.005s]
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Dependency Rules

- No direct dependencies from Container to Server

- No dependencies between Client and Container

- No dependencies on IoC Framework

Architecture

Server Services

Local	EJBd	CORBA	HTTP	XFire	Axis

Stateless	Stateful	BMP	CMP	MDB	XBean	Spring

Containers

Embedded	Standalone	Geronimo	Tomcat
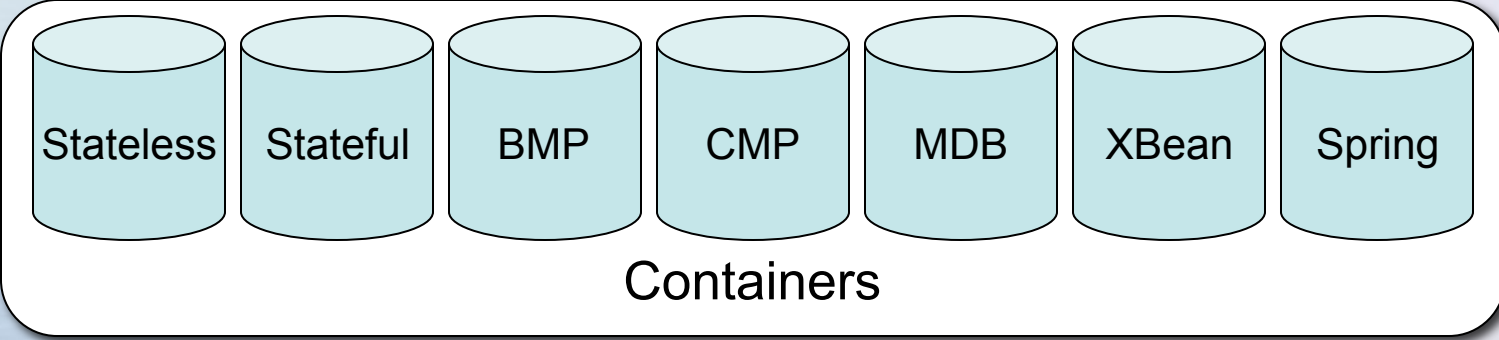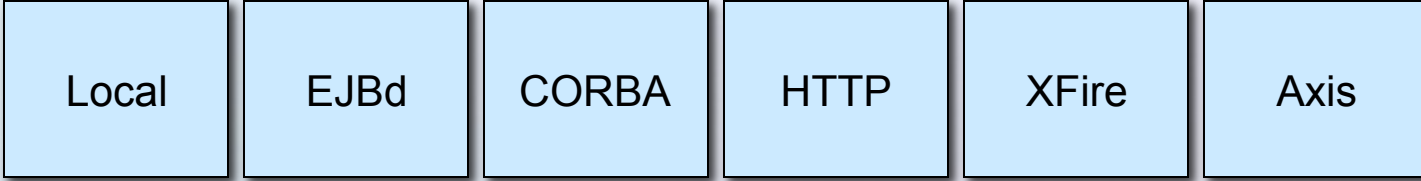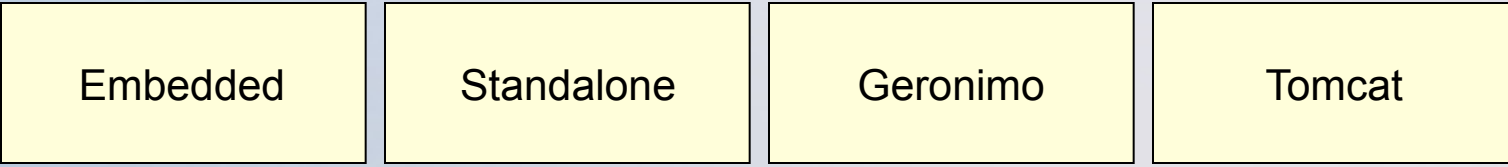
Platforms

Containers

Full Containers:

- Core (EJB 3 Core Contracts)

Adapting Containers:

- XBean

- Spring

- GBean

- Container
- Server Service
- Assembly

Server Services

- Local -- same vm calls

- EJBd -- custom and tight, ejb specific protocol

- HTTP -- can carry other protocols like EJBd, Axis or Admin

- Axis -- more an adapter for Axis. Requires HTTP

- Xfire -- Same, but for XFire

- CORBA -- Also an adapter. Requires an ORB.

- Telnet -- Text server-console usable by any telnet client

- Admin -- Custom protocol for remote start/stop/deploy tools

More protocols coming…

- Container
- Server Service
- Assembly

Server Services - xinet.d style config

- All Server Services support standard IoC-compatible properties

```
service admin {
    server      = org.openejb.server.admin.AdminDaemon
    bind        = 127.0.0.1
    port        = 4200
    disabled    = false
    threads     = 1
    only_from   = localhost
}
service ejbd {
    server      = org.openejb.server.ejbd.EjbServer
    bind        = 127.0.0.1
    port        = 4201
    disabled    = false
    threads     = 200
}
service telnet {
    server      = org.openejb.server.telnet.TelnetServer
    bind        = 127.0.0.1
    port        = 4202
    disabled    = false
    threads     = 5
    only_from   = 192.168.1.0
}
```

Assembly

- All parts can be assembled to fit the needs of the environment

- Planned assemblies are:

  - Embedded

  - Standalone

  - Geronimo

  - Tomcat

- More are possible

- Container

- Server Service

- Assembly

Geronimo

Server Services

| Local | EJBd | CORBA | HTTP | XFire | Axis |

Containers

| Stateless | Stateful | BMP | CMP | MDB | XBean | Spring |

| Embedded | Standalone | Geronimo | Tomcat |
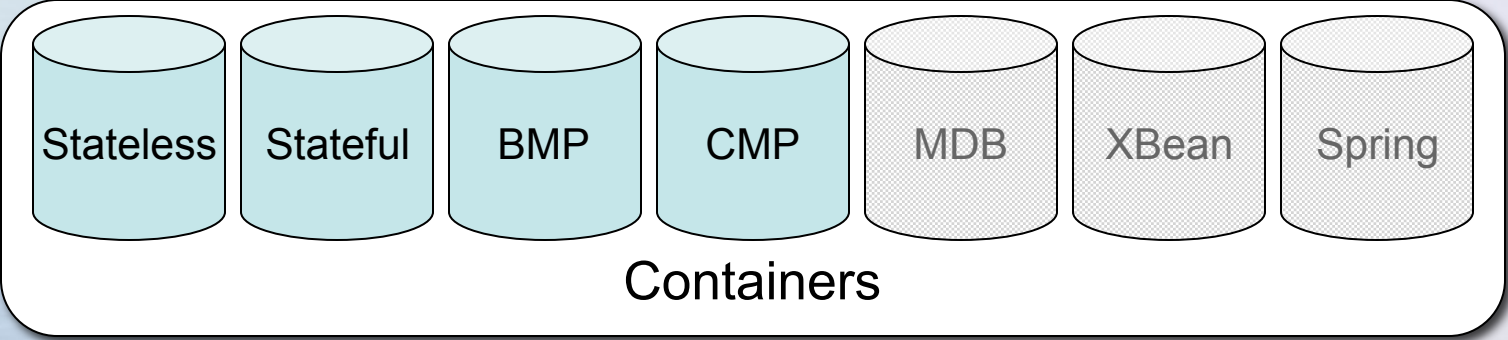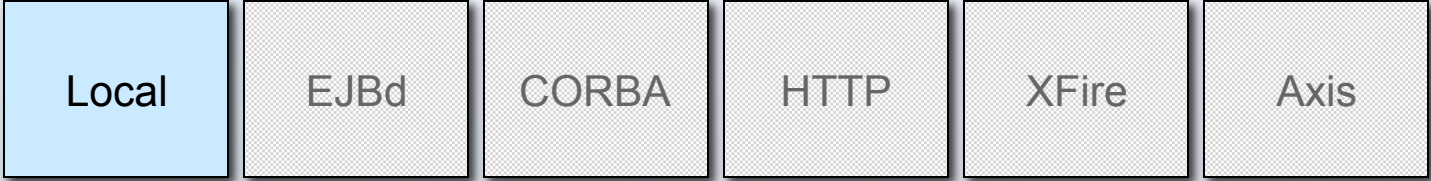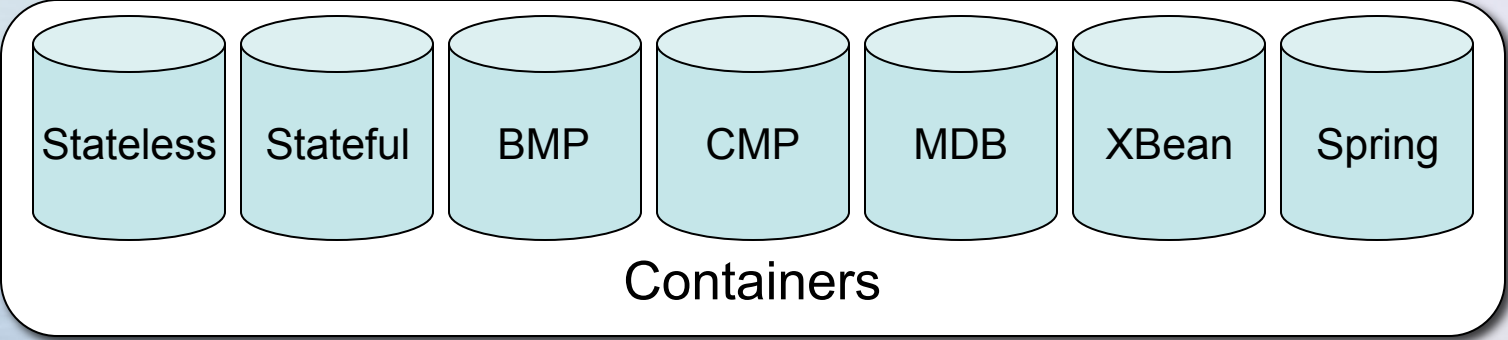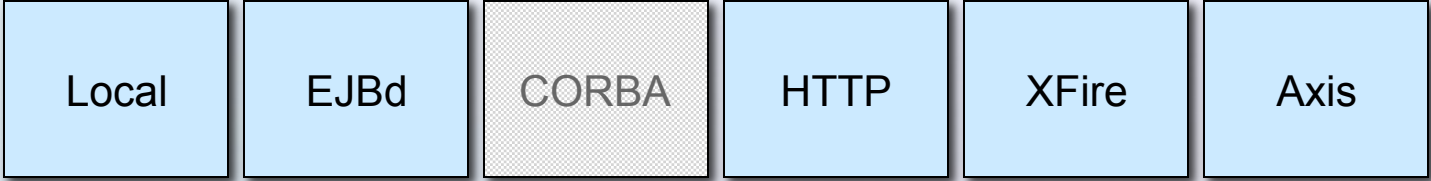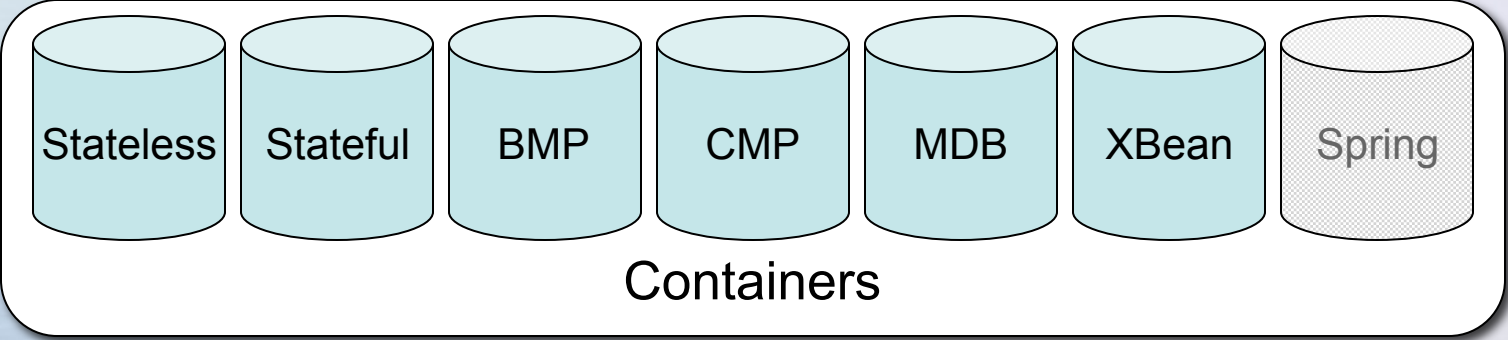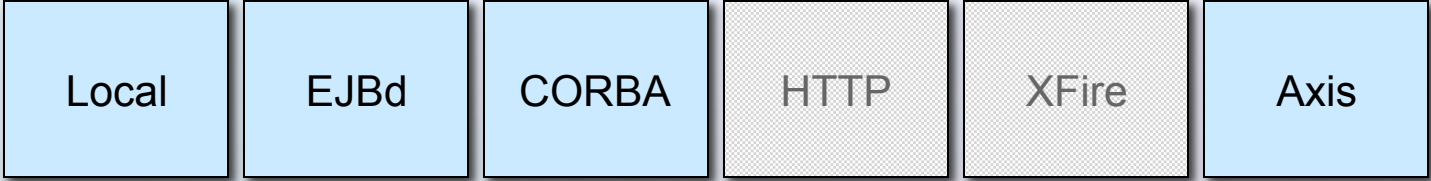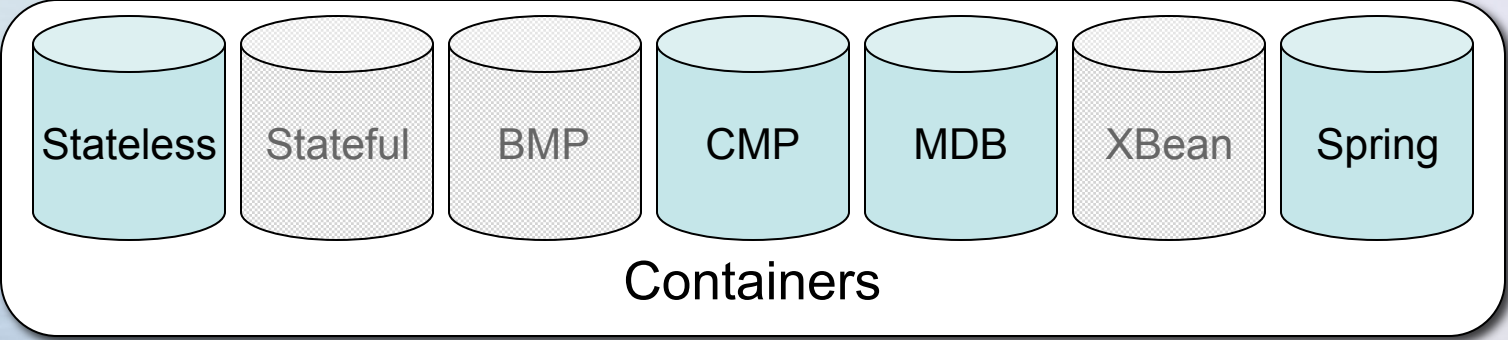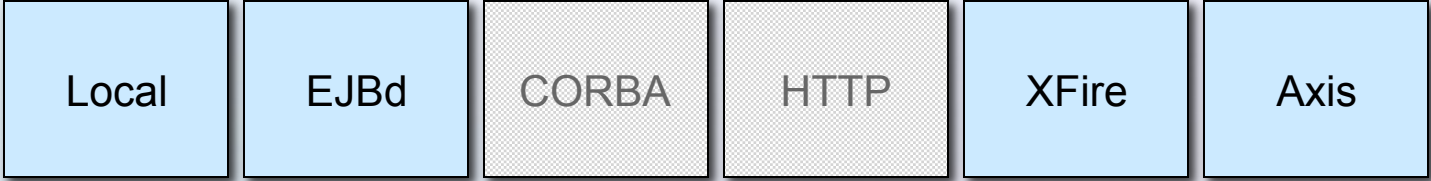
Platforms

Geronimo Light?

Server Services

Local | EJBd | CORBA | HTTP | XFire | Axis

Stateless | Stateful | BMP | CMP | MDB | XBean | Spring

Containers

Embedded | Standalone | Geronimo | Tomcat
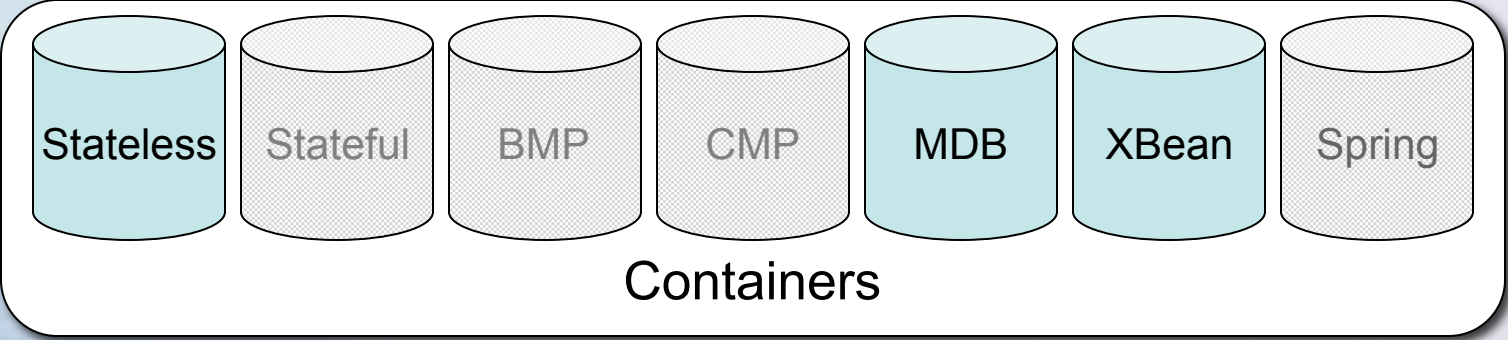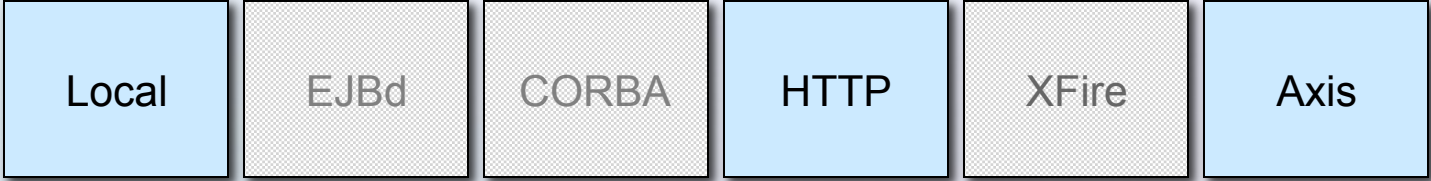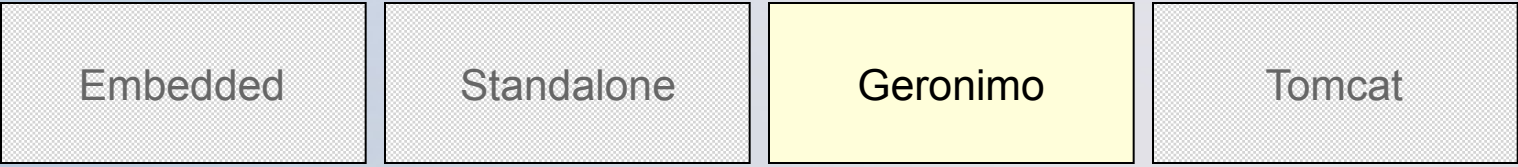
Platforms

EJB 3 Requirements

- Annotation-based deployment

- Business Interfaces

- Interceptors

- Dependency Injection

- Container side of JPA

Annotations for Deployment Meta-Data

Example annotations:

- @Stateless *<class>*

- @TransactionAttribute(REQUIRED) *<method>*

- @RolesAllowed("Manager") *<method>*

Effort to Implement:

- Impact: Highest

- Current code very XMLBeans-centric

- Requires earlier classloading

- Annotations

- Interfaces

- Interceptors

- Injection

- Managed JPA

Annotations for Lifecycle

Example usage on ShoppingCart Stateful Bean:

- `@PreDestroy public void cleanCart(){…}`

Effort to Implement:

- Impact: Minimal

- The code to execute Lifecycle callbacks is already cleanly split from the code that manages the lifecycle.

- Annotations

- Interfaces

- Interceptors

- Injection

- Managed JPA

Business Interfaces

• Any plain Java interface can be used for local or remote invocations

Effort to implement:

• Low/Medium

• Lots of futzing with code that assumed legacy interface types

• Annotations
• Interfaces
• Interceptors
• Injection
• Managed JPA

Interceptors

- Share the lifecycle of an individual Bean instance

- Chains can be defined at a:

    - Package level

    - Class level

    - Method level

- Annotations
- Interfaces
- Interceptors
- Injection
- Managed JPA

Interceptors

Effort to implement:

- Low

- Containers already implemented that way

- Similar to Web Service Handler support

- Annotations

- Interfaces

- Interceptors

- Injection

- Managed JPA

Dependency Injection

IoC Styles:

- Public, non-final, field

- Public setter

Annotations:

- `@Resource` *<field or method>*

- `@EJB` *<field or method>*

- Annotations

- Interfaces

- Interceptors

- Injection

- Managed JPA

Container-Managed JPA

Requires Container to track and associate EntityManager references to transactions

Effort to Implement:

• Medium/High

• It's like having to implement Connectors all over again

• Could get lucky with a couple improvements to our current TransactionContext code

• Annotations

• Interfaces

• Interceptors

• Injection

• Managed JPA

Beyond EJB 3

- META-INF/lib and /classes

- Constructor Injection

- Expanded env-entry types

- Package-scoped JNDI ENC

Third-Party Libs

- MANIFEST.MF: Class-Path sucks!

- Why not take a page from webapps

Example ejb jar:

```
/META-INF/ejb-jar.xml
/META-INF/lib/
/META-INF/lib/commons-logging.jar
/META-INF/lib/xstream.jar
/META-INF/lib/standard-utils.jar
/META-INF/classes/
/META-INF/classes/org/acme/MyFooBean.class
/META-INF/classes/org/acme/MyBarBean.class
/META-INF/classes/org/acme/DoItInterface.class
...
```

- Lib/classes

- Constructors

- Entry Types

- App JNDI

Constructor Injection

• We love and use private final fields and initialization in the constructor, why not give it to you?

Example:

• `@Resources(…)` *<constructor>*

Note:

• Shh, don't tell… We really don't even need the annotation.

• Not sure if we'll allow EJB references in Constructors for circular dependency reasons. Preferences?

• Lib/classes

• Constructors

• Entry Types

• App JNDI

Expanded env-entry Types

• If a PropertyEditor exists for it, you can have the type. Some will be guaranteed, like java.lang.Class

Example:

```
<env-entry>
<env-entry-name>taxRules</env-entry-name>
<env-entry-type>java.lang.Class</env-entry-name>
<env-entry-value>org.acme.CATaxStrategy</env-entry-value>
</env-entry>

<env-entry>
<env-entry-name>standardDateFormat</env-entry-name>
<env-entry-type>java.text.SimpleDateFormat</env-entry-name>
<env-entry-value>YYYY-MM-DD</env-entry-value>
</env-entry>
```

• Lib/classes

• Constructors

• Entry Types

• App JNDI

Expanded env-entry Types

Gives you great convenience in injection

Example:

```
public class AccountingBean {
    private SimpleDateFormat standardDateFormat;
    private TaxStrategy taxRules;

    @Resource
    public void setStandardDateFormat(SimpleDateFormat format) {
        this.standardDateFormat = format;
    }

    @Resource
    public void setTaxRules(Class taxRulesClass) throws Exception
{
        Object object = taxRulesClass.newInstance();
        this.taxRules = (TaxStrategy)object;
    }
}
```

- Lib/classes
- Constructors
- Entry Types
- App JNDI

Package-scoped JNDI ENC

• Who want's to cut and paste over and over again? Not me.

• Servlets can share JNDI entries, why not EJBs?

Rules:

• Define what you want in the <assembly-descriptor>

• Override in the <session> or <entity> sections

• Lib/classes

• Constructors

• Entry Types

• App JNDI

Package-scoped JNDI ENC - Example

```xml
<session>
    <ejb-name>AccountingBatchProcessor</ejb-name>
    <ejb-class>org.acme.AccountingBatchProcessor</ejb-class>
    <transaction-type>Container</transaction-type>
    <message-destination-ref>
        <message-destination-ref-name>AuditingWorkQueue</message-destination-ref-name>
        <message-destination-type>javax.jms.Queue</message-destination-type>
        <message-destination-usage>Produces</message-destination-usage>
    </message-destination-ref>
</session>
<assembly-descriptor>
    <resource-ref>
        <res-ref-name>accountingDatabase</res-ref-name>
        <res-type>javax.sql.DataSource</res-type>
        <res-auth>Container</res-auth>
    </resource-ref>
    <env-entry>
        <env-entry-name>taxRules</env-entry-name>
        <env-entry-type>java.lang.Class</env-entry-name>
        <env-entry-value>org.acme.CATaxStrategy</env-entry-value>
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        <env-entry-value>YYYY-MM-DD</env-entry-value>
    </env-entry>
</assembly-descriptor>
```

RoadMap

Lots to do…

- OPENEJB-76 - Lifecycle Callbacks: PostConstruct/PreDestroy
- OPENEJB-77 - Lifecycle Callbacks: PostActivate/PrePassivate
- OPENEJB-78 - Business Method: AroundInvoke
- OPENEJB-80 - InvocationContext
- OPENEJB-86 - Package-level Interceptors (aka Default Interceptors)
- OPENEJB-87 - Class-level Interceptors
- OPENEJB-88 - Method-level Interceptors
- OPENEJB-89 - 2.1 interface -> 3.0 Session Bean compatibility
- OPENEJB-79 - Interceptor classes and chain
- OPENEJB-91 - Remote business interfaces via EJBd Server
- OPENEJB-94 - SessionContext.getBusinessObject(interface)
- OPENEJB-95 - JNDI ENC Business Interface references
- OPENEJB-93 - Local business interfaces via IntraVM Server
- OPENEJB-92 - Remote business interfaces via IntraVM Server
- OPENEJB-90 - Business Interface support
- OPENEJB-97 - SessionContext.getInvokedBusinessInterface
- OPENEJB-99 - Dependency Injection: Public field
- OPENEJB-100 - Dependency Injection: Setter
- OPENEJB-101 - Injection of Environment Entries
- OPENEJB-102 - Injection of EJB References
- OPENEJB-103 - Injection of Resource Manager Connection Factory References
- OPENEJB-104 - Injection of Resource Environment References
- OPENEJB-105 - Injection of Message Destination References
- OPENEJB-106 - Injection of Persistence Unit References

RoadMap

- OPENEJB-98 - Dependency Injection
- OPENEJB-107 - Injection of Persistence Context References OPENEJB-82 - Reimplement protocol with enum grammar
- OPENEJB-96 - Global JNDI Business Interface references
- OPENEJB-113 - Port CORBA server code from openejb 2
- OPENEJB-114 - Port Axis server support from 2
- OPENEJB-115 - Port/rewrite the XFire server support from 2 into 3
- OPENEJB-117 - Port Stateless Container
- OPENEJB-118 - Port Stateful Container
- OPENEJB-119 - Port BMP Container
- OPENEJB-116 - Port EJB Containers from 2 into 3
- OPENEJB-121 - Port MDB Container
- OPENEJB-123 - CMP 2.x support via JPA
- OPENEJB-120 - Port CMP Container
- OPENEJB-122 - JCA Support via Jencks project
- OPENEJB-124 - META-INF/lib and META-INF/classes support for ejb jars
- OPENEJB-125 - ejb-jar scoped JNDI ENC
- OPENEJB-126 - Constructor Injection
- OPENEJB-127 - Expanded types for env-entries in JNDI
- OPENEJB-63 - New Castor CMP Container
- OPENEJB-132 - New Global Tomcat/OpenEJB integration

… and much much more

Team

- Aaron Mulder
- Alan D. Cabrera
- Dain Sundstrom
- Daniel Diephouse
- Daniel Haischt
- David Blevins
- David Jencks
- Giany Damour
- Hiram Chirino

- Jacek Laskowski
- Jeff Genender
- Jeremy Boynes
- Jeremy Whitlock
- Kevan Miller
- Lajos Moczar
- Matt Hogstrom
- Paulo Lopez
- Tim Urberg

Join the fun!

- http://www.openejb.org/

- dev-subscribe@openejb.org

Soon to be:

- http://incubator.apache.org/openejb

- openejb-dev@incubator.apache.org