

GlassFish v3.1 EJB One Pager

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1. Introduction

1.1. Project/Component Working Name

EJB Container

1.2. Name(s) and e-mail address of Document Author(s)/Supplier

Ken Saks : ken.saks@oracle.com

1.3. Date of This Document

May 21, 2010 (Review Ready)

2. Project Summary

2.1. Project Description

Enterprise Java Beans features for GlassFish V3.1.

- **SFSB Checkpointing**
- **EJB Timer Clustering / Failover**
- **Support Weblogic EJB descriptor**
- **Full EJB 3.1 feature support in Embeddable EJB API**
- **Retain SFSB / EJB Timer state across redeployment**
- **User-specified thread pools for EJB timer and async callbacks**
- **Option to disable V2 vendor-specific JNDI names**
- **Additional DTrace probes**

2.2. Risks and Assumptions

The highest priority features are SFSB checkpointing and EJB Timer Clustering / Failover core admin / deployment clustering support, as well as on GMS. Delays in availability of affect the delivery of the EJB clustering features.

3. Problem Summary

3.1. Problem Area

This work will provide the necessary EJB container updates to achieve high availability at

release. Time allowing, it will also add some requested features that could not be achieved

3.2. Justification

The main drivers for this work are the HA/failover requirements in V3.1. Clustering and high availability applications means support is needed for Stateful Session bean high availability, EJB timer, Remote EJB load balancing and failover over IIOP(covered in a separate document).

SFSB Checkpointing

Feature parity with V2. Also part of the top-priority feature set for V3.1

EJB Timer Clustering / Failover

Feature parity with V2. Also part of the top-priority feature set for V3.1

Support Weblogic EJB descriptor

Enable WebLogic applications developed by ISVs to run on GlassFish.

Enable users to develop applications with simple WebLogic extensions on Glassfish and t

Full EJB 3.1 feature support in Embeddable EJB API

Improves ease of development by allowing a larger set of EJB applications to be portably

Retain SFSB / EJB Timer state across redeployment

Ease of development

User-specified thread pools for EJB timer and async callbacks

Better performance for applications using the new EJB 3.1 features

Option to disable V2 vendor-specific JNDI names

Ease of use

Additional DTrace probes

Better monitoring support

4. Technical Description

4.1. Details

All EJB clustering and high availability behavior from GlassFish V2 will be fully backward compatible. For the most part this will be accomplished by porting the existing V2 code to V3. The one new area is support for cluster-based automatic timer creation. Automatic timer creation is a new specification and first appeared in GlassFish V3.

Feature list :

4.1.1. SFSB Checkpointing

Support high availability of stateful session bean state in the cluster. This requires checkpointing backing store. The details of the backing store implementation are hidden from the container. The store are made through an abstracted store interface. All behavior will be identical to V2. Includes support for handling the serialization / deserialization of EJB reference objects stateful beans and HTTP Sessions. Configuration of this behavior will be identical to V2.

4.1.2. EJB Timer Clustering / Failover

Support correct timer semantics in the cluster, as well as timer high availability. The basic semantics in a cluster is that for each unique EJB timer, each timer callback happens on exactly one server instance. The application is not dependent on which server instance is chosen, nor is there any assumption that the same server instance will be chosen for multiple callbacks of the same timer. All V2 functionality will be retained. New functionality is support for EJB 3.1 automatic timer creation. Configuration of this behavior will be identical to V2.

4.1.3. Support Weblogic EJB descriptor

Support Weblogic dtd elements marked as "low" impact during initial analysis. These are straightforward direct mapping to existing glassfish behavior.

4.1.4 Full EJB 3.1 feature support in Embeddable EJB API

The EJB 3.1 spec only requires the Embeddable EJB API implementation to support at minimum the EJB API covered by EJB 3.1 Lite (essentially local session beans and container-managed beans). GlassFish V3 implementation went beyond that subset a bit to support asynchronous invocation. However, more work is needed to support the entire EJB 3.1 API within the embeddable API. Missing features are : message-driven beans, web service endpoints, remote EJBs with no local interface, and the timer service.

4.1.5 Retain SFSB / EJB Timer state across redeployment

This will allow Stateful session bean instances and persistently created EJB timers to be retained across redeployments. A similar feature was added in GlassFish V3 for HTTP Session retention. The default behavior of no retention will still apply in GlassFish V3.

Certain restrictions governing the allowable changes to an application between redeployments will be in place for this feature to work. For example, no changes to the set of instance variables in the

User-level configuration will be controlled by a new `keepEjbState={false|true}` option on command. The default is false.

4.1.6 User-specified thread pools for EJB timer and async callbacks

Threads used for EJB timer callbacks and asynchronous invocation dispatches are currently private to the container that have hard-coded configuration values. This feature provides the glassfish-configured thread pool whose threads should be used for these callbacks.

Two new optional elements will be added at the top (module) level of the `gf-ejb-jar.xml` : `<timer-thread-pool-id>`. If set, all asynchronous invocation callbacks or timer callback associated module will use the glassfish thread pool associated with the given thread pool

4.1.7 Option to disable V2 vendor-specific JNDI names

Now that the EJB 3.1 specification defines portable EJB JNDI names, there is less need for JNDI names. By default in V3, GlassFish-specific default JNDI names are applied automatically for compatibility, but that can lead to some ease-of-use issues. For example, deploying two modules containing a Remote EJB component that exposes the same remote interface will cause a conflict of JNDI names. The default GlassFish-specific JNDI name behavior will stay the same in V3. An element called `<disable-non-portable-jndi-names>` will be added to `gf-ejb-jar.xml`.

4.1.8 Additional DTrace Probes

Add more monitoring probes, especially covering the invocation of `javax.ejb.*` APIs.

4.2. Bug/RFE Number(s)

Feature	RFE
4.1.4	https://glassfish.dev.java.net/issues/show_bug.cgi?id=9950
4.1.5	https://glassfish.dev.java.net/issues/show_bug.cgi?id=7119 https://glassfish.dev.java.net/issues/show_bug.cgi?id=7121
4.1.6	https://glassfish.dev.java.net/issues/show_bug.cgi?id=7138 https://glassfish.dev.java.net/issues/show_bug.cgi?id=11393
4.1.7	https://glassfish.dev.java.net/issues/show_bug.cgi?id=11729

4.3. In Scope

// Aspects that are in scope of this proposal if not obvious from above.

None

4.4. Out of Scope

// Aspects that are out of scope of this proposal if not obvious from above.

None

4.5. Interfaces

4.5.1 Public Interfaces

// List new, public interfaces this project exports.

Interface	Comments
New asadmin redeploy option --keepEjbState	
New gf-ejb-jar.xml elements : async-thread-pool-id, timer-thread-pool-id, disable-non-portable-jndi-names	

4.5.2 Private interfaces

None.

4.5.3 Deprecated/Removed Interfaces

None.

4.6. Doc Impact

The EJB portion of existing cluster/HA documentation can be reused as is.

A man page update will be needed for the new asadmin redeploy option, and the new gf-€ need to be documented in the developer guide.

4.7. Admin/Config Impact

CLI

Add keepEjbState attribute to asadmin redeploy command.

Support v2 asadmin listTimers <target> and migrateTimers commands.

GUI

Enable manual timer migration through GUI.

4.8. HA Impact

HA functionality is covered by the SFSB checkpointing and clustered EJB timer features.

4.9. I18N/L10N Impact

None

4.10. Packaging, Delivery & Upgrade

4.10.1 Packaging

No impact.

4.10.2 Delivery

No impact.

4.10.3 Upgrade and Migration

No impact.

4.11. Security Impact

No impact.

4.12. Compatibility Impact

No incompatible changes.

4.13. Dependencies

4.13.1 Internal Dependencies

Admin / Deployment clustering support, GMS, HA backing store

4.13.2 External Dependencies

None.

4.14. Testing Impact

// How will the new feature(s) introduced by this project be tested?
// Do tests exist from prior releases (e.g. v2) that can be reused?
// Will new tests need to be written? Can they be automated?

All existing V2 clustering tests that cover SFSB state or EJB timers can be reused. Additions will need to be written to improve coverage. New tests will need to be written for automatic other new features. All tests will be capable of automation.

5. Reference Documents

None.

6. Schedule

6.1. Projected Availability

Feature	Integrated
SFSB Checkpointing	MS3
EJB Timer clustering / failover	MS3
Full EJB 3.1 feature support in Embeddable EJB API	MS4
Support WebLogic EJB descriptor	MS5
Additional DTrace Probes	MS4
Retain SFSB/EJB Timer state across redeployment	MS5
User-specified thread pools for EJB timer / async callbacks	MS5
Option to disable V2 vendor-specific JNDI names	MS5