

1. Introduction

1.1. Project/Component Working Name:
Group Management Service (GMS-Shoal project)

1.2. Name(s) and e-mail address of Document Author(s)/
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1.3. Date of This Document:
04/06/2010

2. Project Summary

2.1. Project Description:
GMS configuration

2.2. Risks and Assumptions:

No risks. But there is a plan to change certain property names to make them easier to understand. So there needs to be backward compatibility in place.

3. Problem Summary

3.1. Problem Area:

The domain.xml needs to have the information regarding the GMS configuration. This is necessary so that the server can start up and function with the right values for GMS related properties.

3.2. Justification:

The main theme for Glassfish 3.1 is Clustering and HA. GMS being an important piece of this theme needs to be configured correctly. Hence the need for support of the GMS configuration through domain.xml.

4. Technical Description:

4.1. Details:

The work mainly comprises of bringing 3.1 to 2.1.1 parity. All the GMS related attributes/properties that were supported in domain.xml will be brought over to 3.1.

There are some attributes whose names need to be changed just so that the names reveal the real reason behind the attribute and are not confusing to understand. For this, backward compatibility will need to be preserved. Some properties that were introduced in 2.1.1 need to be promoted to attributes. A few new attributes will need to be introduced due to support for Grizzly as the underlying transport layer.

4.2. Bug/RFE Number(s):
None so far.

4.3. In Scope:
Everything explained in 4.1.

4.4. Out of Scope:

4.5. Interfaces:

The Config API will need to be modified in order to incorporate the new GMS config changes.

- 2.1.1 structure in domain.xml

```
<cluster config-ref="dev-cluster-config" heartbeat-enabled="true",
heartbeat-address="any value in the range of 225.0.0.0 to 231.255..255.255",
heartbeat-port="any integer" name="dev-cluster">
  <property name="gms-bind-interface-address"
value="228.234.54.55"/>
</cluster>
```

```
<config dynamic-reconfiguration-enabled="true" name="dev-cluster-
config">
```

```
...
<group-management-service fd-protocol-max-tries="3"
  fd-protocol-timeout-in-millis="2000"
  merge-protocol-max-interval-in-millis="10000"
  merge-protocol-min-interval-in-millis="5000"
  ping-protocol-timeout-in-millis="5000"
  vs-protocol-timeout-in-millis="1500">
  <!-- property below configures gms so when it attempts to
connect to a suspected failed server instance,
  -- the tcp socket creation timeout should be set to 3
```

seconds. This value is probably too small but was necessary
-- to achieve goal of detecting hw failure within 15
seconds. Default value of 10 seconds detects hw failure in 28
seconds.

```
-->  
<property name="failure-detection-tcp-retransmit-timeout"  
value="3000"/>  
</group-management-service>  
</config>
```

```
<log-service alarms="false" file="{com.sun.aas.instanceRoot}/  
logs/server.log" log-rotation-limit-in-bytes="2000000" log-  
rotation-timelimit-in-minutes="0" log-to-console="false" retain-  
error-statistics-for-hours="5" use-system-logging="false">  
  <module-log-levels admin="INFO" classloader="INFO"  
cmp="INFO" cmp-container="INFO" configuration="INFO"  
connector="INFO" corba="INFO" deployment="INFO" ejb-  
container="INFO" group-management-service="INFO" javamail="INFO"  
jaxr="INFO" jaxrpc="INFO" jdo="INFO" jms="INFO" jta="INFO"  
jts="INFO" management-event="INFO" mdb-container="INFO"  
naming="INFO" node-agent="INFO" resource-adapter="INFO"  
root="INFO" saaj="INFO" security="INFO" self-management="INFO"  
server="INFO" synchronization="INFO" util="INFO" verifier="INFO"  
web-container="INFO"/>  
</log-service>
```

Need to make sure that the above way of specifying the log
level works for GMS in v3.1. Need to eliminate the need to
specify the ShoalLogger property.

- New 3.1 structure in domain.xml

The above structure will stay as is in 3.1. A few
attribute names need to change. We will talk about that in
the next topic.

Also as seen above, the *bind-interface-address* was a
property in 2.1.1. It needs to be an attribute.

2 new attributes need to be added since they are
required for GMS over Grizzly : *tcp-start-port* and *tcp-
end-port*. These attributes define the range between which
grizzly will select a port for listening to. With this, an
instance can be part of different groups by listening on
separate ports.

3 new attributes have been introduced : *member-type*, *is-bootstrap-seed*, *list-virtual-multicast-uri*. *member-type* defines whether the instance is a CORE member or a SPECTATOR member. *is-bootstrap-seed* defines if this node will be a bootstrapping host for other members to use for discovery purposes. *list-virtual-multicast-uri* is a comma separated list of initial bootstrapping tcp addresses. This address list must be specified on all members of the cluster through this property.

Added a new element under the *group-management-service* element called *failure-detection*. This element holds all the failure-detection related attributes. Also the property *failure-detection-tcp-retransmit-timeout* has been made into an attribute of *failure-detection*.

Removed *merge-protocol-max-interval-in-millis* and *merge-protocol-min-interval-in-millis* since they are never used.

Need to specify a symbolic value that can be replaced per instance for *bind-interface-address* and *member-type*.

Essentially the structure should look as follows (after changing the names of some attributes) :

```
<cluster config-ref="dev-cluster-config" gms-enabled="true"
multicast-address="228.8.20.94" multicast-port="17227" bind-
interface-address="228.234.54.55" name="dev-cluster"/>
```

```
<config dynamic-reconfiguration-enabled="true" name="dev-cluster-
config">
```

```
...
```

```
<group-management-service
  member-type="CORE"
  is-bootstrap-seed="yes/no"
  list-virtual-multicast-uri=""
  group-discovery-timeout-in-millis="5000"
  tcp-start-port="9120"
  tcp-end-port="9270">
```

```
  <failure-detection max-missed-heartbeats="3"
    heartbeat-frequency-in-millis="2000"
    verify-failure-waittime-in-millis="1500"
    tcp-retransmit-timeout="3000"/>
```

```
</group-management-service>
</config>
```

- Property name changes

fd-protocol-max-tries changed to *failure-detection.max-missed-heartbeats*

fd-protocol-timeout-in-millis changed to *failure-detection.heartbeat-frequency-in-millis*

ping-protocol-timeout-in-millis changed to *group-discovery-timeout-in-millis*

vs-protocol-timeout-in-millis changed to *failure-detection.verify-failure-waittime-in-millis*

failure-detection-tcp-retransmit-timeout changed to *failure-detection.tcp-retransmit-timeout*

In the *cluster* element, the following attribute names need to be changed:

heartbeat-address changed to *multicast-address*

heartbeat-enabled changed to *gms-enabled*

heartbeat-port changed to *multicast-port*

- backward compatibility for the property name changes

The server mbeans are auto-generated. So some amount of work needs to be manually done to make sure that the domain.xml is backward compatible.

4.6. Doc Impact:

Documentation will need to incorporate the changes suggested above.

4.7. Admin/Config Impact:

Admin gui/cli related changes :

- expose new attributes and attribute name changes
- property-modified-to-attribute change

4.8. HA Impact:

The config changes will only affect how GMS is started.

4.9. I18N/L10N Impact:

No.

4.10. Packaging & Delivery:

No impact.

4.11. Security Impact:

No impact.

4.12. Compatibility Impact

If older attribute/property names are used, then the class/interface needs to provide a solution to deal with backward compatibility.

// List any requirements on upgrade tool and migration tool.

4.13. Dependencies:

5. Reference Documents:

// List of related documents, if any (BugID's, RFP's, papers).

// Explain how/where to obtain the documents, and what each

// contains, not just their titles.

<http://appserver.sfbay.sun.com/Wiki.jsp?page=SetGMSIpAddressInAppServer>

6. Schedule:

6.1. Projected Availability:

// Dates in appropriate precision (quarters, years)