

RMI-IIOP Load Balancing and Failover

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Agenda

- Overview
- What problem/use cases this feature is solving?
- Details
- Client Configuration
- Support for hw load balancers
- Open issues

Overview

- LB definition :

Load Balancing refers to the process of distributing requests from "Clients" to different server replicas or Name Servers. The goal is to spread the load evenly across the cluster, thus ensuring higher scalability.

- Failover definition :

Failover refers to the process of sending the request to the next alive server instance in the event of the chosen server instance going down.

Why was RMI-IIOP FOLB introduced

- High availability of EJBs motivated this feature work.
- The client should be able to experience high availability when accessing network services. Availability should be transparent and not require altering programs.
- Support for new feature in glassfish : The cluster shape can change dynamically. (i.e. instances can be added or deleted dynamically, instances could fail, online upgrades).

Details

- The server side ORB (GroupInfoService) registers with Shoal GMS (Group Membership Service) to receive updates on the cluster shape changes.
- The client side ORB gets notification from the GroupInfoService as and when there is a dynamic reconfiguration of the cluster.

What the user needs to do

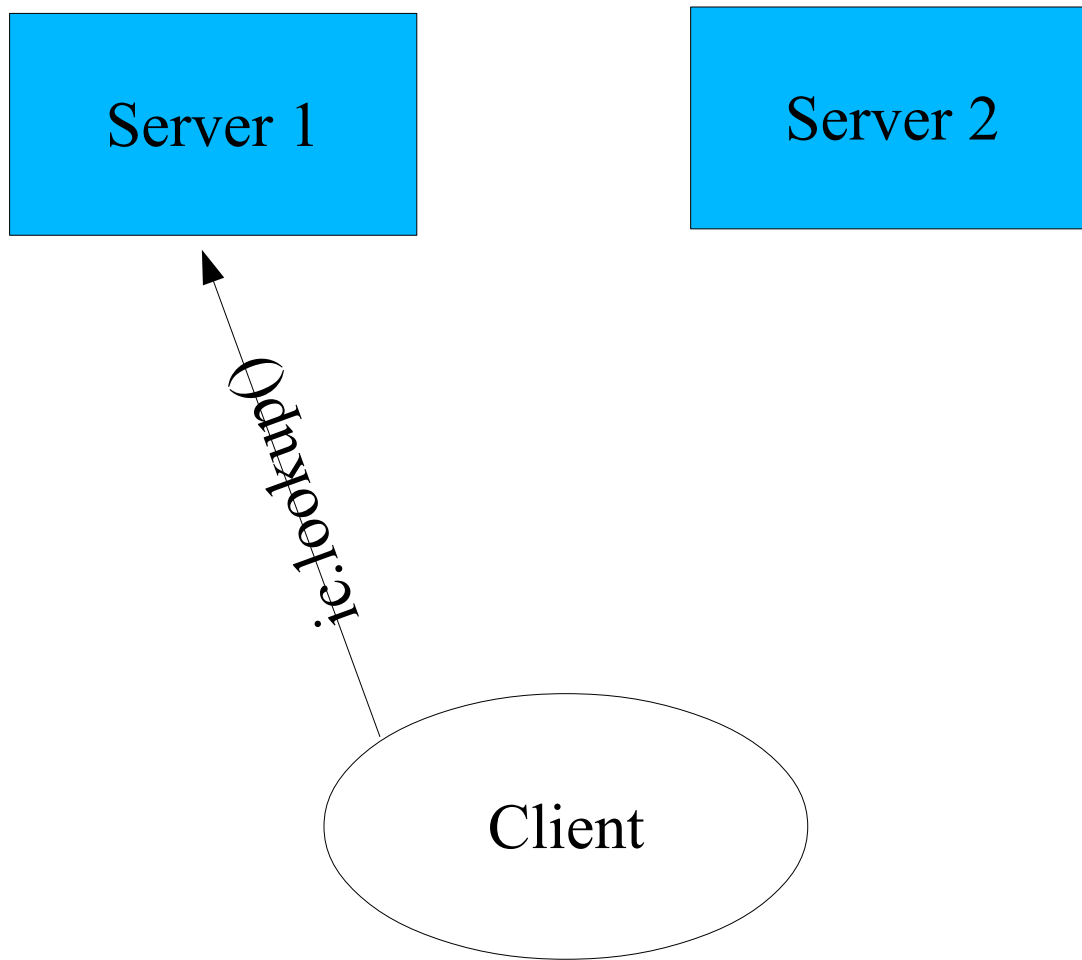
- IIOP FOLB can be configured for app clients as well as standalone clients.
- The client needs to specify the following properties:
 - > `com.sun.appserv.iiop.endpoints`
 - > `com.sun.appserv.iiop.loadbalancingpolicy`

These properties can be system properties or be specified in the `sun-acc.xml` for app clients.
- The client does not need to know the cluster shape for specifying the endpoints. It only needs to specify 2 or more endpoints (for bootstrapping purposes). The value of this property should be a comma-separated string of `<host>:<port>` values.
- The load Balancing policy can take 2 values:
 - > `ic-based` (plain Round Robin algo)
 - > `ic-based-weighted` (Weighted Round Robin algo)

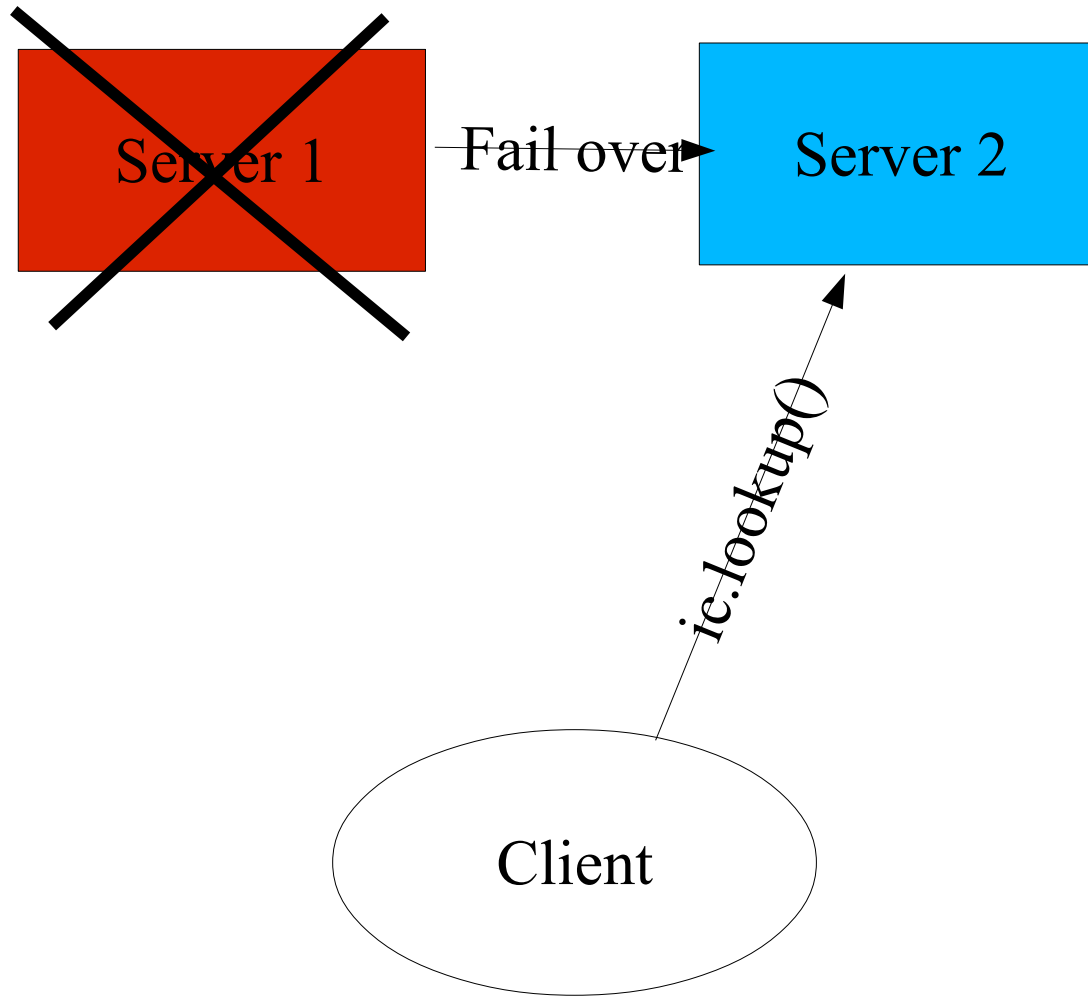
User config conti...

- No need to set any other JNDI related property for e.g. InitialContextFactory. The app server's JNDI implementation handles the rest.

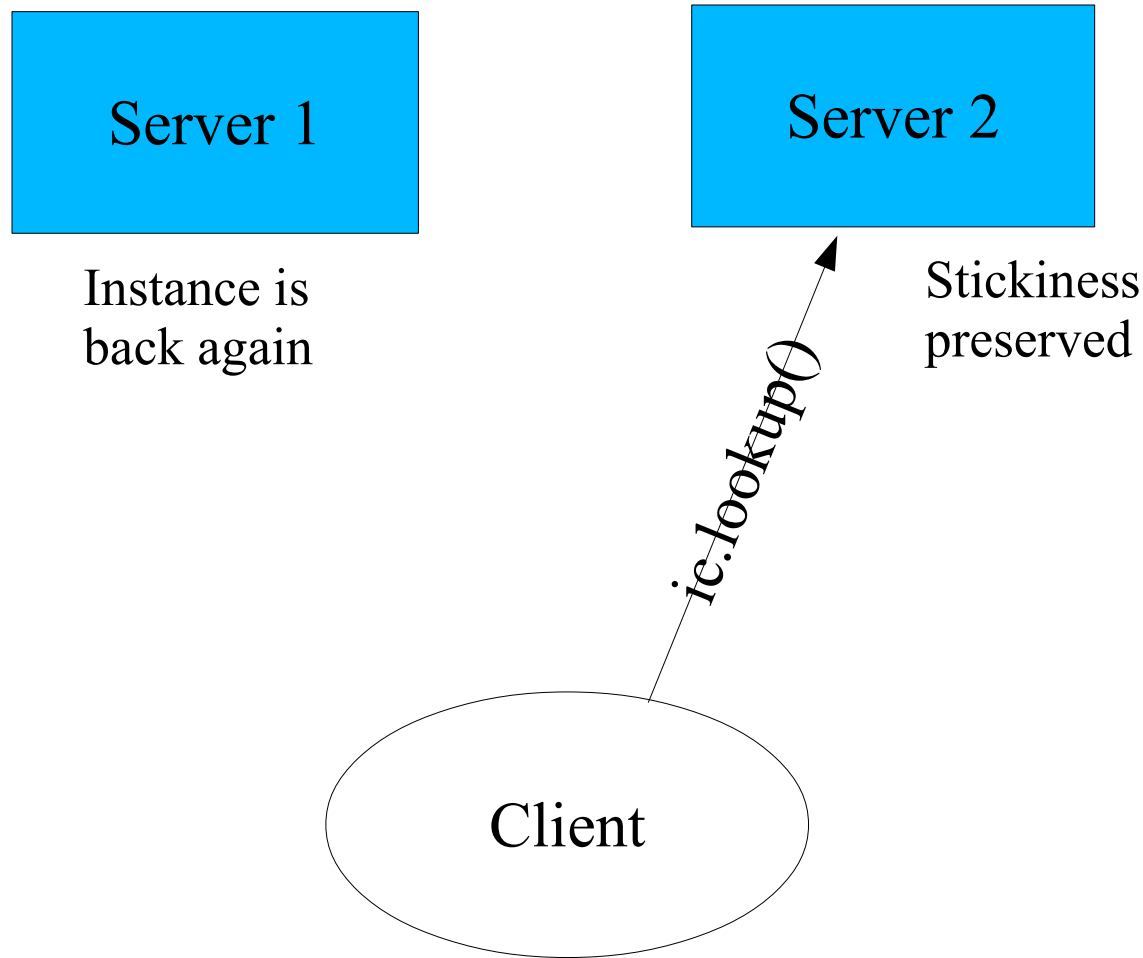
Sticky IC



Sticky IC conti...



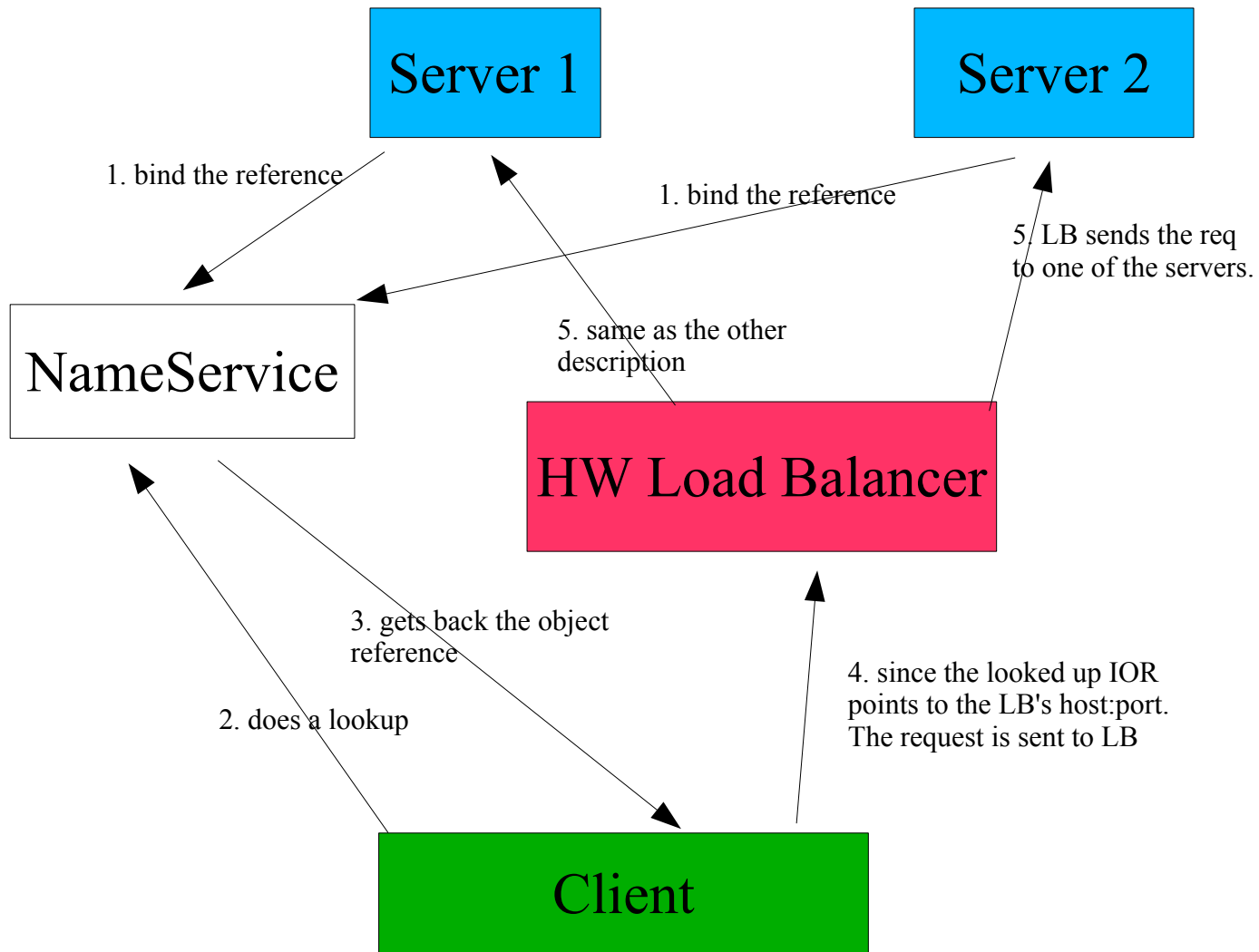
Sticky IC conti...



APIs

- glassfish/appserv-core
 - > com.sun.appserv.naming
 - > RoundRobinPolicy
 - > S1ASCtxFactory
 - > com.sun.enterprise.appclient
 - > Main
 - > com.sun.enterprise.naming
 - > SerialContext
 - > SerialInitContextFactory
 - > com.sun.enterprise.iiop
 - > FailoverInterceptor
 - > IIOPEndpointsInfo

Support for HW LB



Support for Hardware Load Balancers

- Server side config in domain.xml (<jvm-options>) :
 - Dcom.sun.corba.ee.ORBUserConfigurators.com.sun.corba.ee.impl.plugin.hwlb.VirtualAddressAgentImpl=dummy
 - Dcom.sun.CORBA.ORBVAAGHost=host where the HW LB is running
 - Dcom.sun.CORBA.ORBVAAGPort=port where the HW LB is running
- Client side config in JAVA_CMD :
 - Dorg.omg.CORBA.ORBInitialHost=host where the HW LB is running
 - Dorg.omg.CORBA.ORBInitialPort=port where the HW LB is running
 - Dcom.sun.corba.ee.ORBUserConfigurators.com.sun.corba.ee.impl.plugin.hwlb.NoConnectionCacheImpl=dummy

Open Issues

- 6328358 <BLOCKING>Loadbalancing on IIOp Over SSL
Not working
- 6331551 Loadbalancing on IIOp Over
SSL_MUTUALAUTH tests failed
- No admin configuration support
- Find out more about what kind of HW LB support matters
to the customer.

Related Specifications

- RMI-IIOP Load Balancing and Failover functional specification GlassFish v1 :

<http://www.glassfishwiki.org/gfwiki/attach/OnePagersOrFunctionalSpecs/AS9.0-RMI-IIOP-FOLB-FS.sxw>

- OMG CORBA specification 3.02 :

http://www.omg.org/technology/documents/formal/corba_iiop.htm

- IIOP LB/FO design document :

<http://www.glassfishwiki.org/gfwiki/attach/OnePagersOrFunctionalSpecs/FODynamicCluster.pdf>