Load Balancer Administration

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Agenda

- Overview
- GlassFish Clustering
- HTTP Load balancer Plug-in
- A Simple Configuration
- Issues
- Future Improvements
- Comments & Questions

GlassFish Clustering Overview

- In production environments GlassFish can be scaled horizontally by using multiple server instances .
- Cluster – group of homogeneous server instances (typically on multiple hosts).
- Node Agent – light weight process on a machine, which is responsible for stopping, starting and creating/deleting instances.
- EE quick start guide - http://docs.sun.com/app/docs/doc/819-2553
- GlassFish V2 Architecure- http://www.glassfishwiki.org/gfwiki/Wiki.jsp?page=GlassFishV2Architecture

Documented Load balancers

- Load to these server instances can be balanced by any type load balancer.
  - Sun LB Plug-in on Sun Web Server, Apache and IIS - http://docs.sun.com/app/docs/doc/819-2555/6n4r9qo8g?a=view
  - Apache (mod_jk) - http://weblogs.java.net/blog/jfarcand/archive/2006/03/running_glassfi_1.html
  - F5 -http://blogs.sun.com/roller/page/sv96363?entry=setting_up_big_ip_v4
  - Sun Secure Application Switch- http://www.sun.com/products/networking/switches

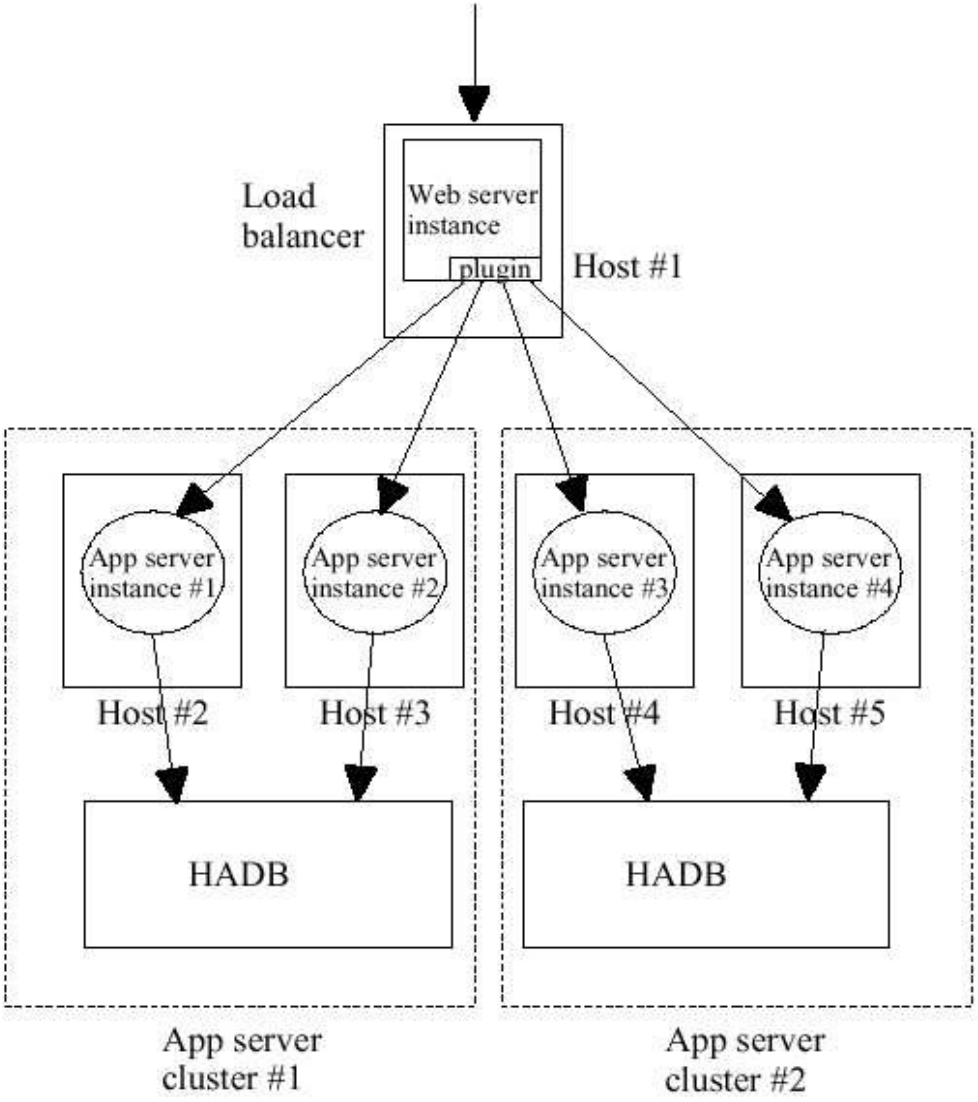
HTTP LB plug-in

- Sticky RR Load Balancing
- Can support multiple clusters
- Rapid HTTP request failover (<30ms)
- Configurable Health Checking to re-enlist server
- Check for dynamic changes to LB configuration
- Support for Quiescence
  - Enables Rolling web service upgrade
- Idempotent URLs
- Configurable error pages

HTTP LB plug-in Administration

- Improved load balancer administration
- Generated loadbalancer.xml reduces chances of manual errors
- Inbuilt XML verifier in loadbalancer points out errors if any
- Optional active health check introduced

Two Cluster configuration



A Simple Configuration

- Download Application Server 8.1 (individual component products as a Compressed Archive) and use the installer to install only the web server and Load balancing plug-in - http://www.sun.com/software/javaenterprisesystem/previous/r3/get.xml
- In these slides the following variables mean:
  - $WS-INSTALL – Web Server installation directory
  - $AS-INSTALL – Application Server installation directory
- Setup EE domain using
  - From $AS-INSTALL do, ant -f setup-cluster.xml (not setup.xml)
- Start the domain using
  - asadmin start-domain –user admin

Creating a cluster

- Download clusterjsp sample and the scripts
  - Download quickstart.jar and un-jar it in $AS-INSTALL/samples
  - http://download.java.net/javaee5/external/shared/quickstart/jars/quickstart-1.0.jar
- Setup a cluster named cluster1
  - $AS-INSTALL/bin/asant setup-one-machine-cluster. It does the following:
    - Creates a cluster with name cluster.name (cluster1)
    - Creates a node-agent with name nodeagent.name (cluster1-nodeagent)
    - Starts the node-agent (you may see a pause here, both instances are started here).
    - Creates two instances under the cluster that will use the node agent just created
- Deploy the clusterjsp application
  - $AS-INSTALL/bin/asant deploy
- Start the cluster
  - $AS-INSTALL/bin/asant start_cluster

A Simple Configuration (contd.)

- Generate load balancer configuration
  - asadmin configure-http-lb-config –target cluster1-lb-config "C:\loadbalancer.xml"
  - This command will do the following:
    - asadmin create-http-lb-config –target cluster1 cluster1-lb-config
    - asadmin enable-http-lb-server cluster1
    - asadmin enable-http-lb-application –name clusterjsp cluster1
    - asadmin export-http-lb-config –config cluster1-lb-config "C:\loadbalancer.xml"
- GUI can also be used (screen shots – slides 23 & 24)
  - Select HTTP Load Balancers -> select New -> Select name and targets of the load balancer -> (skip the step 2) and click finish.
  - To export click lb1 -> export -> export now button
  - Loadbalancer configuration is generated at $AS_INSTALL\domains\domain1\generated\loadbalancer.xml.lb1_LB_CONFIG

A Simple Configuration (Manual)

- Copy plugin files (slide 19)
- Modify magnus.conf and obj.conf (slides 20 & 21)
- Setup cluster and generate load balancer configuration (as described in the previous slides)

Rolling upgrade

- Upgrade using a single cluster - http://docs.sun.com/app/docs/doc/819-2555/6n4r9qo8i?a=view#abdim
- Upgrade in multiple clusters - http://docs.sun.com/app/docs/doc/819-2555/6n4r9qo8i?a=view#abdin
- Upgrading incompatible applications - http://docs.sun.com/app/docs/doc/819-2555/6n4r9qo8i?a=view#abdio

Issues

- Module page for LB Administration does not exist. -https://glassfish.dev.java.net/public/ServerModules.html
- Setup instructions need to be updated with the correct paths and additional trouble shooting information.
  https://glassfish.dev.java.net/javaee5/build/GlassFish_LB_Cluster.html
- GlassFish quick start guide is out of date does not talk about clustering.
  https://glassfish.dev.java.net/downloads/quickstart/index.html
- GlassFish documentation page does not talk about clustering.
  https://glassfish.dev.java.net/javaee5/docs/DocsIndex.html

Issues - GUI

- Last Exported time is not updated.
- Applications and Instances can not be enabled/disabled in LB.
- Disable “Apply changes Now” button, when Application server can not communicate with LB or when LB host information is not set.
- “Auto Apply” should not be enabled by default.

Bugs to be fixed ASAP

- Bug# 6186848 - configure-http-lb-config is not working. http://bugs.sun.com/bugdatabase/view_bug.do?bug_id=6186848
- Bug# 6347791 - lb-enable/disable of application is missing in gui. http://bugs.sun.com/bugdatabase/view_bug.do?bug_id=6347791
- Bug# 6340518 - SSL setup - loadbalaner plugin installation with Sun's Web Server. http://bugs.sun.com/bugdatabase/view_bug.do?bug_id=6340515
- Bug# 6461739 - Stickiness is not maintained in the second cluster. http://bugs.sun.com/bugdatabase/view_bug.do?bug_id=6461739

References

- Clustering and Securing Web Applications: A Tutorial- http://developers.sun.com/prodtech/appserver/reference/techart/load-balancing.html
- Load Balancing and Clustering with GlassFish V2 - https://glassfish.dev.java.net/javaee5/build/GlassFish_LB_Cluster.html
- Clusterjsp application and cluster setup ant script - http://download.java.net/javaee5/external/shared/quickstart/jars/quickstart-1.0.jar
- Configuring F5 BIG-IP with Sun Application Server - http://blogs.sun.com/roller/page/sv96363?entry=setting_up_big_ip_v4
- Application Platform Suite - http://www.sun.com/software/solaris/get.jsp

Comments/Question

- Community contribution
  - Try out setting up lb plug-in and provide feedback on issues encountered
  - Help us with bug fixes
  - Integration with popular hard-ware load balancers
  - Identify if there are other issues
- Feedback
  - dev@glassfish.dev.java.net

Load Balancer Administration

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Loadbalancer Installtion Steps

- Create the following directories
  - $WS_INSTALL/plugins/lbplugin/bin
  - $WS_INSTALL/plugins/lbplugin/resource
  - $WS_INSTALL/plugins/lbplugin/errorpages
- cp $AS_INSTALL/lib/webserver-plugin/<OS>/iws[Version]/libpassthrough.so(dll) $WS_INSTALL/plugins/lbplugin/bin/libpassthrough.so
- chmod +x plugins/lbplugin/bin/libpassthrough.so
- cp $AS_INSTALL/lib/webserver-plugin/<OS>/iws[Version]/errorpages/* $WS_INSTALL/plugins/lbplugin/errorpages/
- cp $AS_INSTALL/lib/webserver-plugin/<OS>/iws[Version]/*.res $WS_INSTALL/plugins/lbplugin/resource
- cp $AS_INSTALL/lib/lbplugin/lib/dtds/sun-loadbalancer_1_2.dtd $WS_INSTALL/config/sun-loadbalancer_1_2.dtd

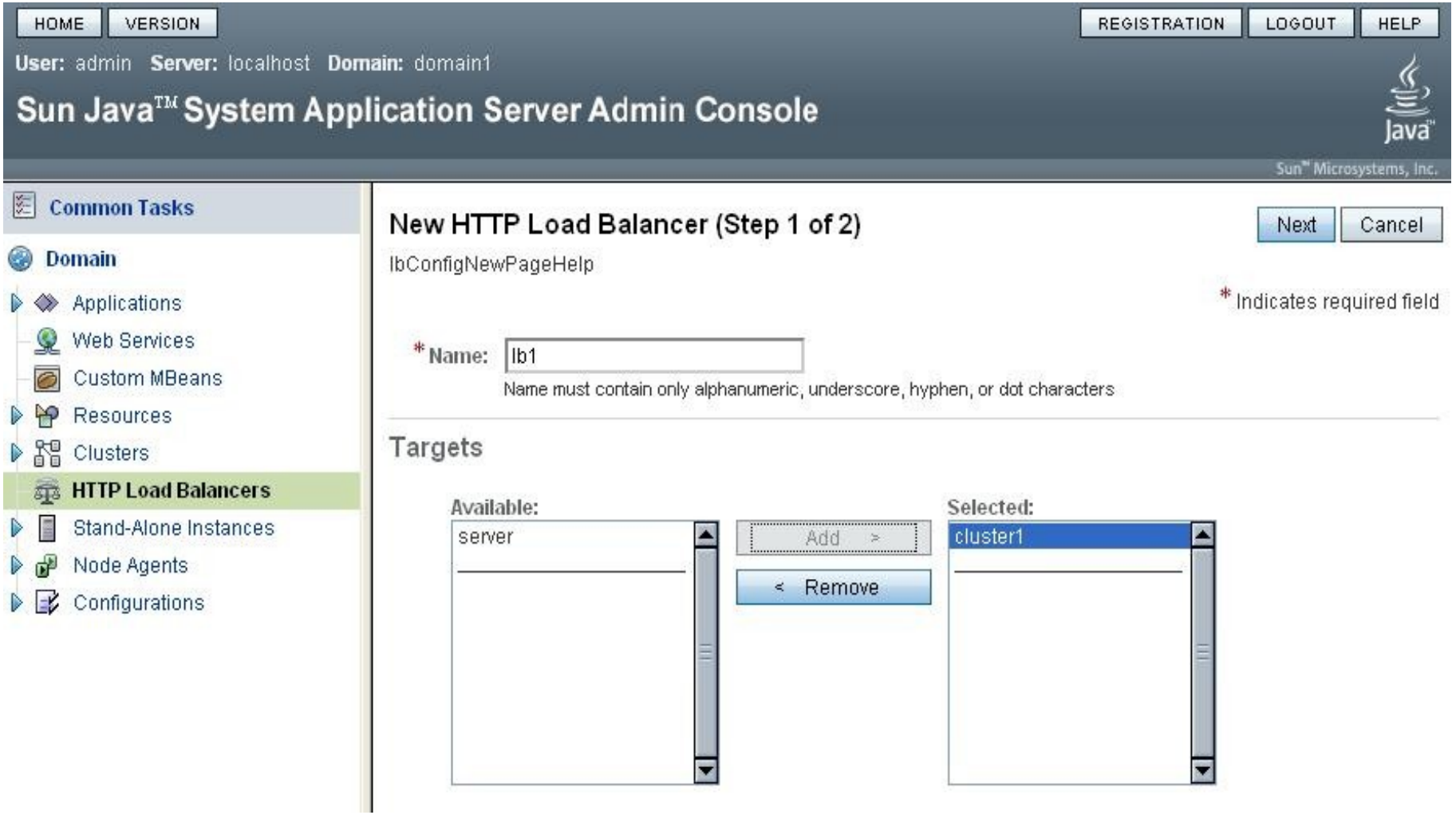
Loadbalancer Installation Steps

- # Append the following lines to $WS_INSTALL/config/magnus.conf.
  - ##BEGIN EE LB Plugin Parameters
  - Init fn="load-modules" shlib="$WS_INSTALL/plugins/lbplugin/bin/libpassthrough.so"
  - funcs="init-passthrough,service-passthrough,name-trans-passthrough" Thread="no"
  - Init fn="init-passthrough"
  - ##END EE LB Plugin Parameters
- The above lines need to be before following line. Init fn="load-modules" shlib=".../libj2eeplugin.so" shlib_flags="(global|now)"
- Insert this line before the line of the first occurence of the string "nametrans" in $WS_INSTALL/config/obj.conf nameTrans fn="name-trans-passthrough" name="lbplugin" config-file="$WS_INSTALL/config/loadbalancer.xml"

Loadbalancer Installation Steps

- Append the following lines to $WS_INSTALL/config/obj.conf
  - <Object name="lbplugin">
  - ObjectType fn="force-type" type="magnus-internal/lbplugin"
  - PathCheck fn="deny-existence" path="*/WEB-INF/*"
  - Service type="magnus-internal/lbplugin" fn="service-passthrough"
  - Error reason="Bad Gateway" fn="send-error" uri="$docroot/badgateway.html"
  - </Object>

Creating LB configuration in GUI



Exporting LB configuration in GUI