整体架构为apache+tomcat+mysql，共使用服务器三台，分别为10.10.67.114、10.10.67.115、10.10.67.116，其中114、115为运行apache+tomcat，116运行mysql。以下为apache+tomcat安装过程。

1. 文档中使用到的变量：

# 源码包存放位置

SOURCE\_DIR=/Data/software

#apache安装目录

APACHE\_PREFIX=/Data/app/apache2.4.9

#apache配置文件

APACHE\_CONF=$APACHE\_PREFIX/conf/httpd.conf

#tomcat 安装目录

TOMCAT1\_PREFIX=/Data/app/tomcatA

TOMCAT2\_PREFIX=/Data/app/tomcatB

#tomcat根目录

TOMCAT\_ROOT=/Data/code

1. apache安装 （版本2.4.9）

2.1 openssl 升级

cd $SOURCE\_DIR

tar zxvf openssl-1.0.1g.tar.gz && cd openssl-1.0.1g

./config shared zlib

make && maek install

mv /usr/bin/openssl /usr/bin/openssl.OFF

mv /usr/include/openssl /usr/include/openssl.OFF

ln -s /usr/local/ssl/bin/openssl /usr/bin/openssl

ln -s /usr/local/ssl/include/openssl /usr/include/openssl

echo “/usr/local/ssl/lib” >> /etc/ld.so.conf

ldconfig

2.2 apr安装

cd $ SOURCE\_DIR

tar jxvf apr-1.5.0.tar.bz2 && cd apr-1.5.0

sed -i '/$RM "$cfgfile"/ s/^/#/' configure #解决“/bin/rm: cannot remove `libtoolT’: No such file or directory

./configure --prefix=/Data/app/apr && make && make install

* 1. apr-util 安装

cd $ SOURCE\_DIR

tar jxvf apr-util-1.5.3.tar.bz2 && cd apr-util-1.5.3

./configure --prefix=/Data/app/apr-util --with-apr=/Data/app/apr/bin/apr-1-config && make && make install

* 1. pcre安装

cd $SOURCE\_DIR

tar jxvf pcre-8.34.tar.bz2 && cd pcre-8.34 && cd pcre-8.34

./configure --prefix=/Data/app/pcre && make && make install

* 1. apache 安装

cd $SOURCE\_DIR

tar jxvf httpd-2.4.9.tar.bz2 && cd httpd-2.4.9

./configure --prefix=/Data/app/apache2.4.9 --sysconfdir=/Data/app/apache2.4.9/conf --with-apr=/Data/app/apr/bin/apr-1-config --with-apr-util=/Data/app/apr-util/bin/apu-1-config --with-pcre=/Data/app/pcre/ --enable-mods-shared=most --enable-rewirte --enable-so --enable-ssl=static --with-ssl=/usr/local/ssl --enable-proxy=shared --enable-proxy-balancer=shared --enable-proxy-http=shared

make && make install

2.6 apache 启动脚本放到/etc/init.d下

cp $APACHE\_PREFIX/bin/apachectl /etc/init.d/httpd

2.7 httpd服务自启动

# 解决 “service httpd does not support chkconfig”

sed -i '2a # chkconfig: 2345 65 37\

# description: apache service manager.' /etc/init.d/httpd

chkconfig --level 3 httpd on

1. tomcat安装

cd $SOURCE\_DIR

#解压安装包

tar zxvf apache-tomcat-7.0.53.tar.gz -C /Data/app

cd /Data/app

# 复制为两个tomcat

cp -a apache-tomcat-7.0.53 apache-tomcat-7.0.53A

cp -a apache-tomcat-7.0.53 apache-tomcat-7.0.53B

1. 为tomcat添加项目，也就是配置tomcat根目录为/Data/code

在$TOMCAT1\_PREFIX/conf/server.xml的<Host></Host>段添加Context

<Host name="localhost" appBase="webapps"

unpackWARs="true" autoDeploy="true">

<Context path="" docBase="/Data/code"></Context>

……

……

</Host>

1. 安装jk （apache tomcat 连接器）

cd $SOURCE\_DIR

tar zxvf tomcat-connectors-1.2.39-src.tar.gz && cd tomcat-connectors-1.2.39-src/native

./configure --with-apxs=/Data/app/apache/bin/apxs --with-java-home=/Data/app/jdk

make # mod\_jk.so会生成在$APACHE\_PREFIX/modules目录

1. 安装tomcat native (tomcat性能优化)

cd $SOURCE\_DIR

tar zxvf tomcat-native.tar.gz && cd tomcat-native-1.1.29-src/jni/native

./configure --with-apr=/Data/app/apr/bin/apr-1-config --with-ssl=/usr/local/ssl/

make && make install

cp /usr/local/apr/lib/libtcnative\* /usr/lib

1. 启动多个tomcat，本机启动多个tomcat，要注意修改tomcat端口，server.xml的8080,8005,8009端口都要避免冲突，不然无法启动多个tomcat

$TOMCAT1\_PREFIX/bin/catalina.sh start

$TOMCAT2\_PREFIX/bin/catalina.sh start

1. 配置apache作为前端，将请求转发给后端tomcat集群

8.1 在$APACHE\_PREFIX/conf/extra目录下创建mod\_jk.conf,文件内容为：

LoadModule jk\_module modules/mod\_jk.so #加载mod\_jk模块

JkWorkersFile /etc/httpd/extra/workers.properties #这个文件里配置的是tomcat集群及负载均衡

JkMountFile /etc/httpd/extra/uriworkermap.properties # 这里配置的是转发规则，即哪些由apache自己处理，哪些交给tomcat

JkLogFile logs/mod\_jk.log

JkLogLevel info

8.2 workers.properties文件内容：

# workers.properties

#

# list the workers by name

worker.list=tomcatserver

# localhost server 1

# ------------------------

worker.s1.port=8009

worker.s1.host=localhost

worker.s1.type=ajp13

worker.s1.lbfactor = 1

# localhost server 2

# ------------------------

worker.s2.port=8010

worker.s2.host=localhost

worker.s2.type=ajp13

worker.s2.lbfactor = 1

# server 3

# ------------------------

worker.s3.port=8009

worker.s3.host=10.10.67.115

worker.s3.type=ajp13

worker.s3.lbfactor = 1

# server 4

# ------------------------

worker.s4.port=8010

worker.s4.host=10.10.67.115

worker.s4.type=ajp13

worker.s4.lbfactor = 1

#-----------------------------

worker.tomcatserver.type=lb

worker.retries=3

worker.tomcatserver.balance\_workers=s1,s2,s3,s4

worker.tomcatserver.sticky\_session=false

worker.tomcatserver.sticky\_session\_force=1

* 1. uriworkermap.properties文件的内容

!/\*.gif=tomcatserver #所有以.gif结尾的请求都不由tomcatserver这个server处理，以下几个都是一样的意思

!/\*.jpg=tomcatserver

!/\*.png=tomcatserver

!/\*.css=tomcatserver

!/\*.js=tomcatserver

!/\*.htm=tomcatserver

!/\*.html=tomcatserver

* 1. 在$APACHE\_CONF中添加Include /Data/app/apache2.4.9/conf/extra/mod\_jk.conf,使步骤8中的配置生效

1. service httpd restart

步骤1-9为10.10.67.114和10.10.66.115通用，分别在两台服务器上执行以上步骤。

1. tomcat session复制,保持客户端会话

**配置10.10.66.114**

10.1 修改$TOMCAT1\_PREFIX/conf/server.xml,添加如下内容：

<Engine name="Catalina" defaultHost="localhost" jvmRoute="s1">

<Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"

channelSendOptions="8">

<Manager className="org.apache.catalina.ha.session.DeltaManager"

expireSessionsOnShutdown="false"

notifyListenersOnReplication="true"/>

<Channel className="org.apache.catalina.tribes.group.GroupChannel">

<Membership className="org.apache.catalina.tribes.membership.McastService"

address="228.0.0.4"

port="45564"

frequency="500"

dropTime="3000"/>

<Receiver className="org.apache.catalina.tribes.transport.nio.NioReceiver"

address="10.10.67.114"

port="4000" #同一机器上两个tomcat不得使用同一端口

autoBind="100"

selectorTimeout="5000"

maxThreads="6"/>

<Sender className="org.apache.catalina.tribes.transport.ReplicationTransmitter">

<Transport className="org.apache.catalina.tribes.transport.nio.PooledParallelSender"/>

</Sender>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.TcpFailureDetector"/>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.MessageDispatch15Interceptor"/>

</Channel>

<Valve className="org.apache.catalina.ha.tcp.ReplicationValve"

filter=""/>

<Valve className="org.apache.catalina.ha.session.JvmRouteBinderValve"/>

<Deployer className="org.apache.catalina.ha.deploy.FarmWarDeployer"

tempDir="/tmp/war-temp/"

deployDir="/tmp/war-deploy/"

watchDir="/tmp/war-listen/"

watchEnabled="false"/>

<ClusterListener className="org.apache.catalina.ha.session.JvmRouteSessionIDBinderListener"/>

<ClusterListener className="org.apache.catalina.ha.session.ClusterSessionListener"/>

</Cluster>

10.2 修改$TOMCAT2\_PREFIX/conf/server.xml,添加如下内容：

<Engine name="Catalina" defaultHost="localhost" jvmRoute="s2">

<Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"

channelSendOptions="8">

<Manager className="org.apache.catalina.ha.session.DeltaManager"

expireSessionsOnShutdown="false"

notifyListenersOnReplication="true"/>

<Channel className="org.apache.catalina.tribes.group.GroupChannel">

<Membership className="org.apache.catalina.tribes.membership.McastService"

address="228.0.0.4"

port="45564"

frequency="500"

dropTime="3000"/>

<Receiver className="org.apache.catalina.tribes.transport.nio.NioReceiver"

address="10.10.67.114"

port="4001" #同一机器上两个tomcat不得使用同一端口

autoBind="100"

selectorTimeout="5000"

maxThreads="6"/>

<Sender className="org.apache.catalina.tribes.transport.ReplicationTransmitter">

<Transport className="org.apache.catalina.tribes.transport.nio.PooledParallelSender"/>

</Sender>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.TcpFailureDetector"/>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.MessageDispatch15Interceptor"/>

</Channel>

<Valve className="org.apache.catalina.ha.tcp.ReplicationValve"

filter=""/>

<Valve className="org.apache.catalina.ha.session.JvmRouteBinderValve"/>

<Deployer className="org.apache.catalina.ha.deploy.FarmWarDeployer"

tempDir="/tmp/war-temp/"

deployDir="/tmp/war-deploy/"

watchDir="/tmp/war-listen/"

watchEnabled="false"/>

<ClusterListener className="org.apache.catalina.ha.session.JvmRouteSessionIDBinderListener"/>

<ClusterListener className="org.apache.catalina.ha.session.ClusterSessionListener"/>

</Cluster>

**配置10.10.66.115**

* 1. 修改$TOMCAT1\_PREFIX/conf/server.xml,添加如下内容：

<Engine name="Catalina" defaultHost="localhost" jvmRoute="s3">

<Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"

channelSendOptions="8">

<Manager className="org.apache.catalina.ha.session.DeltaManager"

expireSessionsOnShutdown="false"

notifyListenersOnReplication="true"/>

<Channel className="org.apache.catalina.tribes.group.GroupChannel">

<Membership className="org.apache.catalina.tribes.membership.McastService"

address="228.0.0.4"

port="45564"

frequency="500"

dropTime="3000"/>

<Receiver className="org.apache.catalina.tribes.transport.nio.NioReceiver"

address="10.10.67.115"

port="4000"

autoBind="100"

selectorTimeout="5000"

maxThreads="6"/>

<Sender className="org.apache.catalina.tribes.transport.ReplicationTransmitter">

<Transport className="org.apache.catalina.tribes.transport.nio.PooledParallelSender"/>

</Sender>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.TcpFailureDetector"/>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.MessageDispatch15Interceptor"/>

</Channel>

<Valve className="org.apache.catalina.ha.tcp.ReplicationValve"

filter=""/>

<Valve className="org.apache.catalina.ha.session.JvmRouteBinderValve"/>

<Deployer className="org.apache.catalina.ha.deploy.FarmWarDeployer"

tempDir="/tmp/war-temp/"

deployDir="/tmp/war-deploy/"

watchDir="/tmp/war-listen/"

watchEnabled="false"/>

<ClusterListener className="org.apache.catalina.ha.session.JvmRouteSessionIDBinderListener"/>

<ClusterListener className="org.apache.catalina.ha.session.ClusterSessionListener"/>

</Cluster>

* 1. 修改$TOMCAT1\_PREFIX/conf/server.xml,添加如下内容：

<Engine name="Catalina" defaultHost="localhost" jvmRoute="s4">

<Cluster className="org.apache.catalina.ha.tcp.SimpleTcpCluster"

channelSendOptions="8">

<Manager className="org.apache.catalina.ha.session.DeltaManager"

expireSessionsOnShutdown="false"

notifyListenersOnReplication="true"/>

<Channel className="org.apache.catalina.tribes.group.GroupChannel">

<Membership className="org.apache.catalina.tribes.membership.McastService"

address="228.0.0.4"

port="45564"

frequency="500"

dropTime="3000"/>

<Receiver className="org.apache.catalina.tribes.transport.nio.NioReceiver"

address="10.10.67.115"

port="4001"

autoBind="100"

selectorTimeout="5000"

maxThreads="6"/>

<Sender className="org.apache.catalina.tribes.transport.ReplicationTransmitter">

<Transport className="org.apache.catalina.tribes.transport.nio.PooledParallelSender"/>

</Sender>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.TcpFailureDetector"/>

<Interceptor className="org.apache.catalina.tribes.group.interceptors.MessageDispatch15Interceptor"/>

</Channel>

<Valve className="org.apache.catalina.ha.tcp.ReplicationValve"

filter=""/>

<Valve className="org.apache.catalina.ha.session.JvmRouteBinderValve"/>

<Deployer className="org.apache.catalina.ha.deploy.FarmWarDeployer"

tempDir="/tmp/war-temp/"

deployDir="/tmp/war-deploy/"

watchDir="/tmp/war-listen/"

watchEnabled="false"/>

<ClusterListener className="org.apache.catalina.ha.session.JvmRouteSessionIDBinderListener"/>

<ClusterListener className="org.apache.catalina.ha.session.ClusterSessionListener"/>

</Cluster>

11． 分别在114和115的$TOMCAT\_ROOT下创建WEB-INF目录，WEB-INF目录下创建web.xml文件，文件内容如下：

<web-app xmlns="http://java.sun.com/xml/ns/javaee"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://java.sun.com/xml/ns/javaee

http://java.sun.com/xml/ns/javaee/web-app\_3\_0.xsd"

version="3.0"

metadata-complete="true">

<display-name>Welcome to Tomcat</display-name>

<description>

Welcome to Tomcat

</description>

<distributable/> #必须添加这个标签

</web-app>

1. 重新启动所有tomcat

附：在开启tomcat session复制情况下的iptables规则：（以10.10.66.114为例）

/etc/sysconfig/iptables内容：

# Generated by iptables-save v1.4.7 on Tue Apr 15 21:58:01 2014

\*filter

:INPUT DROP [0:0]

:FORWARD DROP [0:0]

:OUTPUT DROP [0:0]

-A INPUT -m conntrack --ctstate INVALID -j DROP

-A INPUT -m conntrack --ctstate RELATED,ESTABLISHED -j ACCEPT

-A INPUT -i lo -j ACCEPT

-A INPUT -d 224.0.0.0/8 -j ACCEPT

-A INPUT -s 10.10.67.253/32 -j ACCEPT

-A INPUT -p tcp -m tcp --dport 5122 --tcp-flags FIN,SYN,RST,ACK SYN -m state --state NEW -j ACCEPT

-A INPUT -p tcp -m tcp --dport 80 --tcp-flags FIN,SYN,RST,ACK SYN -m state --state NEW -j ACCEPT

-A INPUT -p tcp -m tcp --dport 45564 --tcp-flags FIN,SYN,RST,ACK SYN -m state --state NEW -j ACCEPT

-A INPUT -p udp -m udp --dport 45564 -j ACCEPT

-A INPUT -s 10.10.67.115/32 -p tcp -m tcp --dport 4000 -m state --state NEW -j ACCEPT

-A INPUT -s 10.10.67.115/32 -p tcp -m tcp --dport 4001 -m state --state NEW -j ACCEPT

-A INPUT -s 10.10.67.115/32 -p tcp -m tcp --dport 8009 -m state --state NEW -j ACCEPT

-A INPUT -s 10.10.67.115/32 -p tcp -m tcp --dport 8010 -m state --state NEW -j ACCEPT

-A INPUT -s 10.10.38.238/32 -p udp -m udp --dport 161 -j ACCEPT

-A INPUT -p icmp -m icmp --icmp-type 8 -j ACCEPT

-A INPUT ! -i lo -j LOG --log-prefix "DROP " --log-tcp-options --log-ip-options

-A OUTPUT -m conntrack --ctstate INVALID -j DROP

-A OUTPUT -m conntrack --ctstate RELATED,ESTABLISHED -j ACCEPT

-A OUTPUT -o lo -j ACCEPT

-A OUTPUT -d 224.0.0.0/8 -j ACCEPT

-A OUTPUT -p tcp -m tcp --dport 25 --tcp-flags FIN,SYN,RST,ACK SYN -m conntrack --ctstate NEW -j ACCEPT

-A OUTPUT -p tcp -m tcp --dport 80 --tcp-flags FIN,SYN,RST,ACK SYN -m conntrack --ctstate NEW -j ACCEPT

-A OUTPUT -p tcp -m tcp --dport 45564 -m state --state NEW -j ACCEPT

-A OUTPUT -p udp -m udp --dport 45564 -j ACCEPT

-A OUTPUT -d 10.10.67.115/32 -p tcp -m tcp --dport 4000 -m state --state NEW -j ACCEPT

-A OUTPUT -d 10.10.67.115/32 -p tcp -m tcp --dport 4001 -m state --state NEW -j ACCEPT

-A OUTPUT -d 10.10.67.0/24 -p tcp -m tcp --dport 8009 -m state --state NEW -j ACCEPT

-A OUTPUT -d 10.10.67.0/24 -p tcp -m tcp --dport 8010 -m state --state NEW -j ACCEPT

-A OUTPUT -p udp -m udp --dport 53 -j ACCEPT

-A OUTPUT -p udp -m udp --dport 123 -m conntrack --ctstate NEW -j ACCEPT

-A OUTPUT -p icmp -m icmp --icmp-type 8 -j ACCEPT

-A OUTPUT ! -o lo -j LOG --log-prefix "DROP " --log-tcp-options --log-ip-options

COMMIT

# Completed on Tue Apr 15 21:58:01 2014