背景:   
随着你的网站业务量的增长你网站的服务器压力越来越大？需要负载均衡方案！商业的硬件如F5又太贵，你们又是创业型互联公司如何有效节约 成本，节省不必要的浪费？同时实现商业硬件一样的高性能高可用的功能？有什么好的负载均衡可伸张可扩展的方案吗？答案是肯定的！有！我们利用 LVS+Keepalived基于完整开源软件的架构可以为你提供一个负载均衡及高可用的服务器。   
  
LVS+Keepalived 介绍   
LVS   
LVS 是Linux Virtual Server的简写，意即Linux虚拟服务器，是一个虚拟的服务器集群系统。本项目在1998年5月由章文嵩博士成立，是中国国内最早出现的自由软件项 目之一。目前有三种IP负载均衡技术（VS/NAT、VS/TUN和VS/DR）；   
八种调度算法（rr,wrr,lc,wlc,lblc,lblcr,dh,sh）。   
  
Keepalvied   
Keepalived在这里主要用作RealServer的健康状态检查以及LoadBalance主机和BackUP主机之间failover的实现   
二. 网站负载均衡拓朴图(在做下面的附件里，有兴趣的朋友可以下载了查看)

IP信息列表：   
名称 IP   
LVS-DR-Master 192.168.81.128   
LVS-DR-BACKUP 192.168.81.129   
LVS-DR-VIP 192.168.81.130   
WEB1-Realserver 192.168.81.131   
WEB2-Realserver 192.168.81.132   
GateWay 192.168.81.1 三. 安装LVS和Keepalvied软件包   
1. 下载相关软件包 #mkdir /usr/local/src/lvs   
#cd /usr/local/src/lvs   
#wget http://www.linuxvirtualserver.org/software/kernel-2.6/ipvsadm-1.24.tar.gz   
#wget http://www.keepalived.org/software/keepalived-1.1.15.tar.gz   
2. 安装LVS和Keepalived   
  
#lsmod |grep ip\_vs   
#uname -r   
2.6.18-53.el5PAE   
#ln -s /usr/src/kernels/2.6.18-53.el5PAE-i686/ /usr/src/linux 

#tar zxvf ipvsadm-1.24.tar.gz   
#cd ipvsadm-1.24   
#make && make install   
#find / -name ipvsadm # 查看ipvsadm的位置 

#tar zxvf keepalived-1.1.15.tar.gz   
#cd keepalived-1.1.15   
#./configure && make && make install   
#find / -name keepalived # 查看keepalived位置   
  
#cp /usr/local/etc/rc.d/init.d/keepalived /etc/rc.d/init.d/   
#cp /usr/local/etc/sysconfig/keepalived /etc/sysconfig/   
#mkdir /etc/keepalived   
#cp /usr/local/etc/keepalived/keepalived.conf /etc/keepalived/   
#cp /usr/local/sbin/keepalived /usr/sbin/   
#service keepalived start|stop #做成系统启动服务方便管理.

四. 配置LVS实现负载均衡  
  1． LVS-DR，配置LVS脚本实现负载均衡

     #vi /usr/local/sbin/lvs-dr.sh  
   #!/bin/bash  
        # description: start LVS of DirectorServer     
        #Written by :NetSeek   
          
        GW=192.168.81.1  
        # website director vip.  
        SNS\_VIP=192.168.81.130  
        SNS\_RIP1=192.168.81.131  
        SNS\_RIP2=192.168.81.132  
  
     ./etc/rc.d/init.d/functions  
  
        logger $0 called with $1  
  
        case "$1" in  
  
        start)  
           # set squid vip  
           /sbin/ipvsadm --set 30 5 60  
                   /sbin/ifconfig eth0:0 $SNS\_VIP broadcast $SNS\_VIP netmask 255.255.255.255  
        broadcast $SNS\_VIP up  
           /sbin/route add -host $SNS\_VIP dev eth0:0  
           /sbin/ipvsadm -A -t $SNS\_VIP:80 -s wrr -p 3  
           /sbin/ipvsadm -a -t $SNS\_VIP:80 -r $SNS\_RIP1:80 -g -w 1  
           /sbin/ipvsadm -a -t $SNS\_VIP:80 -r $SNS\_RIP2:80 -g -w 1  
           touch /var/lock/subsys/ipvsadm >/dev/null 2>&1  
  
       ;;  
        stop)  
           /sbin/ipvsadm -C  
           /sbin/ipvsadm -Z  
           ifconfig eth0:0 down  
           ifconfig eth0:1 down  
           route del $SNS\_VIP  
           route del $SS\_VIP  
           rm -rf /var/lock/subsys/ipvsadm >/dev/null 2>&1  
           echo "ipvsadm stoped"  
           ;;  
      status)  
  
           if [ ! -e /var/lock/subsys/ipvsadm ];then  
                echo "ipvsadm stoped"  
                exit 1  
           else  
                echo "ipvsadm OK"  
           fi  
           ;;  
        \*)  
          echo "Usage: $0 {start|stop|status}"  
           exit 1  
        esac  
        exit 0

2． 配置Realserver脚本.

       #vi /usr/local/sbin/realserver.sh  
        #!/bin/bash  
        # description: Config realserver lo and apply noarp   
        #Written by :NetSeek

        SNS\_VIP=192.168.81.130  
           
        . /etc/rc.d/init.d/functions  
           
        case "$1" in  
        start)  
               ifconfig lo:0 $SNS\_VIP netmask 255.255.255.255 broadcast $SNS\_VIP  
               /sbin/route add -host $SNS\_VIP dev lo:0  
               echo "1" >/proc/sys/net/ipv4/conf/lo/arp\_ignore  
               echo "2" >/proc/sys/net/ipv4/conf/lo/arp\_announce  
               echo "1" >/proc/sys/net/ipv4/conf/all/arp\_ignore  
               echo "2" >/proc/sys/net/ipv4/conf/all/arp\_announce  
               sysctl -p >/dev/null 2>&1  
               echo "RealServer Start OK"  
                ;;  
        stop)  
               ifconfig lo:0 down  
               route del $SNS\_VIP >/dev/null 2>&1  
               echo "0" >/proc/sys/net/ipv4/conf/lo/arp\_ignore  
               echo "0" >/proc/sys/net/ipv4/conf/lo/arp\_announce  
               echo "0" >/proc/sys/net/ipv4/conf/all/arp\_ignore  
               echo "0" >/proc/sys/net/ipv4/conf/all/arp\_announce  
               echo "RealServer Stoped"  
               ;;  
        \*)  
               echo "Usage: $0 {start|stop}"  
               exit 1  
        esac  
        exit 0

或者采用secondary ip address方式配置  
          # vi /etc/sysctl.conf

          net.ipv4.conf.lo.arp\_ignore = 1  
          net.ipv4.conf.lo.arp\_announce = 2  
          net.ipv4.conf.all.arp\_ignore = 1  
          net.ipv4.conf.all.arp\_announce = 2  
          [code]  
          #sysctl –p  
          #ip addr add 192.168.81.130/32 dev lo  
          #ip add list 查看是否绑定  
  3. 启动lvs-dr脚本和realserver启本，在DR上可以查看LVS当前状态:  
        #watch ipvsadm –ln

五．利用Keepalvied实现负载均衡和和高可用性  
  1.配置在主负载均衡服务器上配置keepalived.conf  
  #vi /etc/keepalived/keepalived.conf

   ! Configuration File for keepalived  
global\_defs {  
   notification\_email {  
      [wangsong@test.com](mailto:wangsong@test.com)  
  #   [failover@firewall.loc](mailto:failover@firewall.loc)  
  #   [sysadmin@firewall.loc](mailto:sysadmin@firewall.loc)  
   }  
   notification\_email\_from [sns-lvs@gmail.com](mailto:sns-lvs@gmail.com)  
   smtp\_server 127.0.0.1  
  # smtp\_connect\_timeout 30  
   router\_id LVS\_DEVEL  
}  
# 20081013 written by :netseek  
# VIP1  
vrrp\_instance VI\_1 {  
    state MASTER             #备份服务器上将MASTER改为BACKUP     
    interface eth0  
    virtual\_router\_id 51  
    priority 100    # 备份服务上将100改为99  
    advert\_int 1  
    authentication {  
        auth\_type PASS  
        auth\_pass 1111  
    }  
    virtual\_ipaddress {  
        192.168.81.130     
        #(如果有多个VIP，继续换行填写.)  
    }  
}  
  
virtual\_server 192.168.81.130 80 {  
    delay\_loop 6                  #(每隔10秒查询realserver状态)  
    lb\_algo wrr                  #(lvs 算法)  
    lb\_kind DR                  #(Direct Route)  
    persistence\_timeout 60        #(同一IP的连接60秒内被分配到同一台realserver)  
    protocol TCP                #(用TCP协议检查realserver状态)  
  
    real\_server 192.168.81.131 80 {  
        weight 3               #(权重)  
        TCP\_CHECK {  
        connect\_timeout 10       #(10秒无响应超时)  
        nb\_get\_retry 3  
        delay\_before\_retry 3

 connect\_port 80  
        }  
    }  
    real\_server 192.168.81.132 80 {  
        weight 3  
        TCP\_CHECK {  
        connect\_timeout 10  
        nb\_get\_retry 3  
        delay\_before\_retry 3  
        connect\_port 80  
        }  
     }  
}

2. BACKUP服务器同上配置，先安装lvs再按装keepalived,仍后配置/etc/keepalived/keepalived.conf，

 把vrrp\_instance VI\_1 {  
    state MASTER             #备份服务器上将MASTER改为BACKUP     
    interface eth0  
    virtual\_router\_id 51  
    priority 100    # 备份服务上将100改为99  
    其他的跟master一样。  
  
3. vi /etc/rc.local  
   #/usr/local/sbin/lvs-dr.sh  将lvs-dr.sh这个脚本注释掉。步  
   #/usr/local/sbin/lvs-dr.sh stop 停止lvs-dr脚本  
   #/etc/init.d/keepalived start  启动keepalived 服务，keepalived就能利用keepalived.conf 配  
   置文件，实现负载均衡和高可用.

六、Lvs服务端的配置

(1).编辑/etc/sysctl.conf，添加如下内容：

net.ipv4.conf.all.send\_redirects = 1

net.ipv4.conf.default.send\_redirects = 1

net.ipv4.conf.eth0.send\_redirects = 1

然后 sysctl -p,使刚才的配置生效

(2). Ipvsadm 的配置信息

ipvsadm -A -t 192.168.1.130:http -s wlc

ipvsadm -a -t 192.168.1.130:http -r 192.168.1.128 -g

ipvsadm -a -t 192.168.1.130:http -r 192.168.1.129 -g

(3).把ipvsadm的配置写到/etc/rc.local里

ipvsadm -A -t 192.168.11.130:http -s wlc

ipvsadm -a -t 192.168.1.130:http -r 192.168.1.128 -g

ipvsadm -a -t 192.168.1.130:http -r 192.168.1.129 -g

七、lvs客户端的配置

(1).编辑/etc/sysctl.conf，添加一下内容到文件尾部

net.ipv4.conf.lo.arp\_ignore = 1

net.ipv4.conf.lo.arp\_announce = 2

net.ipv4.conf.all.arp\_ignore = 1

net.ipv4.conf.all.arp\_announce = 2

(2).添加一个监听IP地址和一条路由

ifconfig lo:0 192.168.81.130 broadcast 192.168.81.130 netmask 255.255.255.255 up

route add -host 192.168.81.130 dev lo:0

(3).把(2)的配置信息写到/etc/rc.local文件里  
  
八、查看lvs服务是否正常  
  #watch ipvsadm –ln

IP Virtual Server version 1.2.1 (size=4096)  
Prot LocalAddress:Port Scheduler Flags  
  -> RemoteAddress:Port           Forward Weight ActiveConn InActConn  
TCP  192.168.81.130:80 wrr persistent 60  
  -> 192.168.81.131:80            Route   3      0          0  
  -> 192.168.81.132:80            Route   3      0          0

#tail –f /var/log/message  监听日志，查看状态，测试LVS负载均衡及高可用性是否有效。  
  
九、停Master服务器的keepalived服务，查看BAKCUP服务器是否能正常接管服务