实验一 搭建lvs-dr集群

实验环境：rhel7.3虚拟机3台，关闭防火墙、SELinux、搭建好yum

Lvs调度器地址192.168.4.21/24

Web服务器地址1291.68.4.22/24;192.168.4.23/24

Vip地址192.168.4.60

客户端地址192.168.4.254

Web服务器 操作

#nmcli connection modify eth0 ipv4.method manual ipv4.addresses 192.168.4.22/24 autoconnect yes

#nmcli connection up eth0

##配置IP地址

#cd /etc/sysconfig/network-scripts

#cp ifcfg-lo ifcfg-lo:0

#vim ifcfg-lo:0

# cat ifcfg-lo:0

DEVICE=lo:0

IPADDR=192.168.4.60

NETMASK=255.255.255.255

NETWORK=192.168.4.60

# If you're having problems with gated making 127.0.0.0/8 a martian,

# you can change this to something else (255.255.255.255, for example)

BROADCAST=192.168.4.60

ONBOOT=yes

NAME=loopback

##修改回环接口

#systemctl restart NetworkManager

#systemctl restart network

#ifconfig

eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

inet 192.168.4.23 netmask 255.255.255.0 broadcast 192.168.4.255

inet6 fe80::5054:ff:febe:aa23 prefixlen 64 scopeid 0x20<link>

ether 52:54:00:be:aa:23 txqueuelen 1000 (Ethernet)

RX packets 19686 bytes 6870813 (6.5 MiB)

RX errors 0 dropped 16564 overruns 0 frame 0

TX packets 1898 bytes 309954 (302.6 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

ether 52:54:00:31:bb:23 txqueuelen 1000 (Ethernet)

RX packets 16572 bytes 861976 (841.7 KiB)

RX errors 0 dropped 16564 overruns 0 frame 0

TX packets 0 bytes 0 (0.0 B)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth2: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

ether 52:54:00:b9:cc:23 txqueuelen 1000 (Ethernet)

RX packets 16572 bytes 861976 (841.7 KiB)

RX errors 0 dropped 16564 overruns 0 frame 0

TX packets 0 bytes 0 (0.0 B)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

ether 52:54:00:4c:dd:23 txqueuelen 1000 (Ethernet)

RX packets 16572 bytes 861976 (841.7 KiB)

RX errors 0 dropped 16564 overruns 0 frame 0

TX packets 0 bytes 0 (0.0 B)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536

inet 127.0.0.1 netmask 255.0.0.0

inet6 ::1 prefixlen 128 scopeid 0x10<host>

loop txqueuelen 1 (Local Loopback)

RX packets 1042 bytes 88600 (86.5 KiB)

RX errors 0 dropped 0 overruns 0 frame 0

TX packets 1042 bytes 88600 (86.5 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo:0: flags=73<UP,LOOPBACK,RUNNING> mtu 65536

inet 192.168.4.60 netmask 255.255.255.255

loop txqueuelen 1 (Local Loopback)

##确认lo：0获取到IP地址

#yum -y install httpd

#echo 22 > /var/www/html/index.html

#systemctl start httpd

#curl 192.168.4.22

##测试httpd服务

#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

##修改内核参数

##4.23同步操作，注意IP地址

Lvs调用器操作

#nmcli connection modify eth0 ipv4.method manual ipv4.addresses 192.168.4.22/24 autoconnect yes

#nmcli connection up eth0

##配置IP地址

#cd /etc/sysconfig/network-scripts

#cp ifcfg-eth0 ifcfg-eth0:0

#vim ifcfg-eth0:0

TYPE=Ethernet

BOOTPROTO=none

IPADDR=192.168.4.60

PREFIX=24

DEFROUTE=yes

NAME=eth0:0

DEVICE=eth0:0

ONBOOT=yes

#systemctl restart NetworkManager

#systemctl restart network

#ifconfig

eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

inet 192.168.4.21 netmask 255.255.255.0 broadcast 192.168.4.255

inet6 fe80::f130:42ab:518e:77ef prefixlen 64 scopeid 0x20<link>

ether 52:54:00:be:aa:21 txqueuelen 1000 (Ethernet)

RX packets 20718 bytes 5420459 (5.1 MiB)

RX errors 0 dropped 16726 overruns 0 frame 0

TX packets 2815 bytes 266699 (260.4 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth0:0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

inet 192.168.4.60 netmask 255.255.255.0 broadcast 192.168.4.255

ether 52:54:00:be:aa:21 txqueuelen 1000 (Ethernet)

eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

ether 52:54:00:31:bb:21 txqueuelen 1000 (Ethernet)

RX packets 16734 bytes 870400 (850.0 KiB)

RX errors 0 dropped 16726 overruns 0 frame 0

TX packets 0 bytes 0 (0.0 B)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth2: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

ether 52:54:00:b9:cc:21 txqueuelen 1000 (Ethernet)

RX packets 16734 bytes 870400 (850.0 KiB)

RX errors 0 dropped 16726 overruns 0 frame 0

TX packets 0 bytes 0 (0.0 B)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500

ether 52:54:00:4c:dd:21 txqueuelen 1000 (Ethernet)

RX packets 16734 bytes 870400 (850.0 KiB)

RX errors 0 dropped 16726 overruns 0 frame 0

TX packets 0 bytes 0 (0.0 B)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536

inet 127.0.0.1 netmask 255.0.0.0

inet6 ::1 prefixlen 128 scopeid 0x10<host>

loop txqueuelen 1 (Local Loopback)

RX packets 1076 bytes 91468 (89.3 KiB)

RX errors 0 dropped 0 overruns 0 frame 0

TX packets 1076 bytes 91468 (89.3 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

##配置虚拟ip

#yum -y install ipvsadm

#ipvsadm -A -t 192.168.4.60:80 -s rr

#ipvsadm -a -t 192.168.4.60:80 -r 192.168.4.22:80 -g

#ipvsadm -a -t 192.168.4.60:80 -r 192.168.4.23:80 -g

#ipvsadmin -Ln

IP Virtual Server version 1.2.1 (size=4096)

Prot LocalAddress:Port Scheduler Flags

-> RemoteAddress:Port Forward Weight ActiveConn InActConn

TCP 192.168.4.60:80 rr

-> 192.168.4.22:80 Route 1 0 0

-> 192.168.4.23:80 Route 1 0 0

#ipvsadm-save

客户端测试

Lvs状态：

[root@localhost network-scripts]# ipvsadm -Ln --stats

IP Virtual Server version 1.2.1 (size=4096)

Prot LocalAddress:Port Conns InPkts OutPkts InBytes OutBytes

-> RemoteAddress:Port

TCP 192.168.4.60:80 0 0 0 0 0

-> 192.168.4.22:80 0 0 0 0 0

-> 192.168.4.23:80 0 0 0 0 0

客户端测试：

[root@localhost ~]# curl 192.168.4.60

23

[root@localhost ~]# curl 192.168.4.60

22

[root@localhost ~]# curl 192.168.4.60

23

[root@localhost ~]# curl 192.168.4.60

22

##轮询状态

[root@localhost network-scripts]# ipvsadm -Ln --stats

IP Virtual Server version 1.2.1 (size=4096)

Prot LocalAddress:Port Conns InPkts OutPkts InBytes OutBytes

-> RemoteAddress:Port

TCP 192.168.4.60:80 4 24 0 1584 0

-> 192.168.4.22:80 2 12 0 792 0

-> 192.168.4.23:80 2 12 0 792 0

##lvs调度器状态

实验二 搭建lvs-nat集群

实验环境：rhel7.3虚拟机3台，关闭防火墙、SELinux、搭建好yum

lvs调度器：eth0--192.168.4.1 eth2--202.204.48.1

web1：eth0--192.168.4.2

web2：eth0--192.168.4.3

#配置后台web服务器

[root@web1 ~]# nmcli connection modify eth0 ipv4.method manual ipv4.addresses 192.168.4.2/24 autoconnect yes

[root@web1 ~]# nmcli connection up eth0

成功激活的连接（D-Bus 激活路径：/org/freedesktop/NetworkManager/ActiveConnection/31）

[root@web1 ~]# yum clean all; yum repolist

已加载插件：langpacks, product-id, search-disabled-repos, subscription-manager

This system is not registered to Red Hat Subscription Management. You can use subscription-manager to register.

Repodata is over 2 weeks old. Install yum-cron? Or run: yum makecache fast

正在清理软件源： development

Cleaning up everything

已加载插件：langpacks, product-id, search-disabled-repos, subscription-manager

This system is not registered to Red Hat Subscription Management. You can use subscription-manager to register.

development | 4.1 kB 00:00:00

(1/2): development/group\_gz | 136 kB 00:00:00

(2/2): development/primary\_db | 3.9 MB 00:00:00

源标识 源名称 状态

development rhel7 4,751

repolist: 4,751

[root@web1 ~]# yum -y install httpd

[root@web1 ~]# systemctl start httpd; systemctl enable httpd

Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.

[root@web1 ~]# echo 192.168.4.2 > /var/www/html/index.html

[root@web1 ~]# curl http://192.168.4.2

192.168.4.2

[root@web1 ~]# route add default gw 192.168.4.1

[root@web1 ~]# route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 192.168.4.1 0.0.0.0 UG 0 0 0 eth0

192.168.4.0 0.0.0.0 255.255.255.0 U 100 0 0 eth0

##web2同步操作

####重点注意把后台web服务器的默认网关指向lvs调度器

#配置lvs调度器

[root@lvs ~]# nmcli connection modify eth0 ipv4.method manual ipv4.addresses 192.168.4.1/24 autoconnect yes

[root@lvs ~]# nmcli connection modify eth2 ipv4.method manual ipv4.addresses 202.204.48.1/24 autoconnect yes

[root@lvs ~]# nmcli connection up eth0

成功激活的连接（D-Bus 激活路径：/org/freedesktop/NetworkManager/ActiveConnection/69）

[root@lvs ~]# nmcli connection up eth2

成功激活的连接（D-Bus 激活路径：/org/freedesktop/NetworkManager/ActiveConnection/70）

[root@lvs ~]# yum -y install ipvsadm

已加载插件：langpacks, product-id, search-disabled-repos, subscription-manager

This system is not registered to Red Hat Subscription Management. You can use subscription-manager to register.

Repodata is over 2 weeks old. Install yum-cron? Or run: yum makecache fast

development | 4.1 kB 00:00

(1/2): development/group\_gz | 136 kB 00:00

(2/2): development/primary\_db | 3.9 MB 00:00

正在解决依赖关系

--> 正在检查事务

---> 软件包 ipvsadm.x86\_64.0.1.27-7.el7 将被 安装

--> 解决依赖关系完成

依赖关系解决

=========================================================================

Package 架构 版本 源 大小

=========================================================================

正在安装:

ipvsadm x86\_64 1.27-7.el7 development 45 k

事务概要

=========================================================================

安装 1 软件包

总下载量：45 k

安装大小：75 k

Downloading packages:

ipvsadm-1.27-7.el7.x86\_64.rpm | 45 kB 00:00

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

正在安装 : ipvsadm-1.27-7.el7.x86\_64 1/1

development/productid | 1.6 kB 00:00

验证中 : ipvsadm-1.27-7.el7.x86\_64 1/1

已安装:

ipvsadm.x86\_64 0:1.27-7.el7

#安装lvs

[root@lvs ~]# tail -1 /etc/sysctl.conf

net.ipv4.ip\_forward=1

[root@lvs ~]# sysctl -p

net.ipv4.ip\_forward = 1

#修改内核参数

#配置lvs规则

[root@lvs ~]# ipvsadm -C

[root@lvs ~]# ipvsadm -A -t 202.204.48.1:80 -s rr

[root@lvs ~]# ipvsadm -a -t 202.204.48.1:80 -r 192.168.4.2:80 -m

[root@lvs ~]# ipvsadm -a -t 202.204.48.1:80 -r 192.168.4.3:80 -m

[root@lvs ~]# ipvsadm -Ln

IP Virtual Server version 1.2.1 (size=4096)

Prot LocalAddress:Port Scheduler Flags

-> RemoteAddress:Port Forward Weight ActiveConn InActConn

TCP 202.204.48.1:80 rr

-> 192.168.4.2:80 Masq 1 0 2

-> 192.168.4.3:80 Masq 1 0 2

[root@lvs ~]# ipvsadm-save

-A -t lvs.tedu.cn:http -s rr

-a -t lvs.tedu.cn:http -r 192.168.4.2:http -m -w 1

-a -t lvs.tedu.cn:http -r 192.168.4.3:http -m -w 1

#客户端测试

[root@localhost ~]# curl 202.204.48.1

192.168.4.3

[root@localhost ~]# curl 202.204.48.1

192.168.4.2

[root@localhost ~]# curl 202.204.48.1

192.168.4.3

[root@localhost ~]# curl 202.204.48.1

192.168.4.2

#验证调度器状态

[root@lvs ~]# ipvsadm -Ln

IP Virtual Server version 1.2.1 (size=4096)

Prot LocalAddress:Port Scheduler Flags

-> RemoteAddress:Port Forward Weight ActiveConn InActConn

TCP 202.204.48.1:80 rr

-> 192.168.4.2:80 Masq 1 0 2

-> 192.168.4.3:80 Masq 1 0 2

[root@lvs ~]# ipvsadm -Ln --stats

IP Virtual Server version 1.2.1 (size=4096)

Prot LocalAddress:Port Conns InPkts OutPkts InBytes OutBytes

-> RemoteAddress:Port

TCP 202.204.48.1:80 4 24 16 1584 1944

-> 192.168.4.2:80 2 12 8 792 972

-> 192.168.4.3:80 2 12 8 792 972