

河南联通 IOC 生产环境部署操作手册

文档信息

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|-------|-----|------|------------|
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版本修订历史记录

| 版本号 | 作者 | 参与者 | 起止日期 | 备注 |
|------|----|-----|------|----|
| V1.0 | | | | |
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内容修订历史记录

| 章节 | 修改内容 | 修订人 | 修订日期 | 修订原因 |
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一、环境准备

1、打通外网

更新每一台主机 `resovl.conf` 配置文件，添加外网配置。

```
nameserver 8.8.8.8
nameserver 114.114.114.114
```

2、更新 jdk 版本

更新每一台主机 `jdk`，升级为 1.8 版本。

```
[root@localhost Downloads]# wget --no-check-certificate --no-cookies --header "Cookie: oraclelicense=accept-securebackup-cookie" http://download.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm
--2018-03-07 11:09:44-- http://download.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm
Resolving download.oracle.com... 23.0.142.203
Connecting to download.oracle.com[23.0.142.203]:80... connected.
HTTP request sent, awaiting response... 302 Moved Temporarily
Location: https://edelivery.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm [following]
--2018-03-07 11:09:44-- https://edelivery.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm
Resolving edelivery.oracle.com... 96.16.169.83, 2600:1417:e:28e::2d3e, 2600:1417:e:28b::2d3e
Connecting to edelivery.oracle.com[96.16.169.83]:443... connected.
HTTP request sent, awaiting response... 302 Moved Temporarily
Location: http://download.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm?AuthParam=1520420964_a6b1244fbbcd99bfcd97a0e4e9d65b [following]
--2018-03-07 11:09:44-- http://download.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm?AuthParam=1520420964_a6b1244fbbcd99bfcd97a0e4e9d65b
Connecting to download.oracle.com[23.0.142.203]:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 169983496 (162M) [application/x-redhat-package-manager]
Saving to: ? . dk-8u131-linux-x64.rpm?

100%[=====] 169,983,496 645K/s in 2m 7s

2018-03-07 11:11:52 (1.28 MB/s) - ? . dk-8u131-linux-x64.rpm? . saved [169983496/169983496]
```

命令：`wget --no-check-certificate --no-cookies --header "Cookie: oraclelicense=accept-securebackup-cookie" http://download.oracle.com/otn-pub/java/jdk/8u131-b11/d54c1d3a095b4ff2b6607d096fa80163/jdk-8u131-linux-x64.rpm`

`rpm -ivh jdk-8u131-linux-x64.rpm`

```
[root@localhost Downloads]# vim /etc/resolv.conf
[root@localhost Downloads]# rpm -ivh jdk-8u131-linux-x64.rpm
Preparing...
1:jdk1.8.0_131
Unpacking JAR files...
  tools.jar...
  plugin.jar...
  javaws.jar...
  deploy.jar...
  rt.jar...
  java.jar...
  charsets.jar...
  localedata.jar...
[root@localhost Downloads]# java -version
java version "1.8.0_131"
Java(TM) SE Runtime Environment (build 1.8.0_131-b11)
Java HotSpot(TM) 64-Bit Server VM (build 25.131-b11, mixed mode)
```

3、安装 szrz

`wget http://www.ohse.de/uwe/releases/lrzs-0.12.20.tar.gz`

`tar zxvf lrzs-0.12.20.tar.gz && cd lrzs-0.12.20`

`./configure && make && make install`

`cd /usr/local/bin`

`ln -s /usr/local/bin/lrz rz`

`ln -s /usr/local/bin/lrz sz`

二、安装 ES

1、获取 es 版本

`wget https://artifacts.elastic.co/downloads/elasticsearch/elasticsearch-5.5.2.tar.gz`

2、创建用户组及用户

`groupadd elasticsearch`

`useradd -g elasticsearch elasticsearch -m`

```
[root@localhost Downloads]# groupadd elasticsearch
[root@localhost Downloads]# useradd -g elasticsearch elasticsearch -m
[elasticsearch@localhost ~]$ su - elasticsearch
[elasticsearch@localhost ~]$ ls
[elasticsearch@localhost ~]$ pwd
/home/elasticsearch
```

3、解压至用户目录

`tar -zxvf elasticsearch-5.5.2.tar.gz -C /home/elasticsearch/`

```
cd /home/elasticsearch/  
mv elasticsearch-5.5.2/ elasticsearch
```

4、修改权限及创建数据文件目录

```
chown -R elasticsearch. /home/elasticsearch/elasticsearch/  
mkdir -p /data/elasticsearch
```

5、修改 elasticsearch.yml，目前已经测试环境的配置，可根据生产环境实际情况修改，若无更新则替换 ip 地址为本机地址。



elasticsearch.yml

6、修改主机环境参数

(1)、打开/etc/security/limits.conf 文件，添加以下参数

| | | | |
|---|------|--------|-------|
| * | soft | nproc | 2048 |
| * | hard | nproc | 16384 |
| * | soft | nofile | 65536 |
| * | hard | nofile | 65536 |

```
* soft nproc 2048  
* hard nproc 16384  
* soft nofile 65536  
* hard nofile 65536
```

(2)、修改/etc/sysctl.conf，添加以下参数

```
vm.max_map_count=262144  
sysctl -p 刷新
```

(3)、修改/etc/security/limits.d/90-nproc.conf

| | | | |
|---|------|-------|------|
| * | soft | nproc | 1024 |
| * | soft | nproc | 2048 |

7、启动

```
Su - elasticsearch  
./elasticsearch/bin/elasticsearch &
```

```

elasticsearch@localhost bin$ ./elasticsearch e
1] 27851
elasticsearch@localhost bin$ [2018-03-07T12:13:14.720][INFO ][o.e.n.Node               ] [] initializing ...
2018-03-07T12:13:14.802][INFO ][o.e.e.NodeEnvironment     ] [0-kfCnj] using [1] data paths, mounts [/ /dev/mapper/VolGroup-LogVol00], net usable_space [73.6gb], net total_space [81.5gb], spins? [pos
sibly], types [ext4]
2018-03-07T12:13:14.803][INFO ][o.e.e.NodeEnvironment     ] [0-kfCnj] heap size [1.9gb], compressed ordinary object pointers [true]
2018-03-07T12:13:14.804][INFO ][o.e.n.Node               ] node name [0-kfCnj] derived from node ID [0-kfCnjvRumxaulmN8CkQ]; set [node.name] to override
2018-03-07T12:13:14.804][INFO ][o.e.n.Node               ] version[5.5.2], pid[27851], build[p2f0c09/2017-08-14T12:33:14.154Z], OS[linux/2.6.32-573.el6.x86_64/amd64], JVM[Oracle Corporation/Java HotSpot
(TM) 64-Bit Server VM/1.8.0_101/25.131-b11]
2018-03-07T12:13:14.805][INFO ][o.e.n.Node               ] JVM arguments [-Xms2g, -Xmx2g, -XX:+UseConcMarkSweepGC, -XX:CMSInitiatingOccupancyFraction=75, -XX:+UseCMSInitiatingOccupancyOnly, -XX:+Always
PreTouch, -Xmx1m, -Djava.awt.headless=true, -Dfile.encoding=UTF-8, -Djna.nosys=true, -Djdk.io.permissionsUseCanonicalPath=true, -Dio.netty.noUnsafe=true, -Dio.netty.noKeySetOptimization=true, -Dio.netty
recycler.maxCapacityPerThread=0, -Dlog4j.shutdownHookEnabled=false, -Dlog4j2.disable.jmx=true, -Dlog4j.skipJansi=true, -XX:+HeapDumpOnOutOfMemoryError, -Des.path.home=/home/elasticsearch/elasticsearch]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [agg-matrix-stats]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [lang-common]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [lang-expression]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [lang-groovy]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [lang-mustache]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [lang-painless]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [parent-join]
2018-03-07T12:13:15.521][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [percolator]
2018-03-07T12:13:15.522][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [reindex]
2018-03-07T12:13:15.522][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [transport-netty3]
2018-03-07T12:13:15.522][INFO ][o.e.p.PluginsService       ] [0-kfCnj] loaded module [transport-netty4]
2018-03-07T12:13:15.522][INFO ][o.e.p.PluginsService       ] [0-kfCnj] no plugins loaded
2018-03-07T12:13:16.969][INFO ][o.e.d.DiscoveryModule     ] [0-kfCnj] using discovery type [zen]
2018-03-07T12:13:17.440][INFO ][o.e.n.Node               ] initialized
2018-03-07T12:13:17.440][INFO ][o.e.n.Node               ] [0-kfCnj] starting ...
2018-03-07T12:13:17.441][INFO ][o.e.t.TransportService   ] [0-kfCnj] publish_address [10.36.32.40:9300], bound_addresses [10.36.32.40:9300]
2018-03-07T12:13:17.626][INFO ][o.e.b.BootstrapChecks    ] [0-kfCnj] bound or publishing to a non-loopback or non-link-local address, enforcing bootstrap checks
2018-03-07T12:13:20.669][INFO ][o.e.c.s.ClusterService     ] [0-kfCnj] new_master [0-kfCnj](0-kfCnjvRumxaulmN8CkQ)[3Nakm4dQc2SCXAdtqezsA](10.36.32.40)(10.36.32.40:9300), reason: zen-disco-elected-as-ma
ster ([0] nodes joined)
2018-03-07T12:13:20.689][INFO ][o.e.h.n.Netty4HttpServerTransport] [0-kfCnj] publish_address [10.36.32.40:9200], bound_addresses [10.36.32.40:9200]
2018-03-07T12:13:20.690][INFO ][o.e.n.Node               ] [0-kfCnj] started
2018-03-07T12:13:20.709][INFO ][o.e.g.GatewayService      ] [0-kfCnj] recovered [0] indices into cluster_state

```

8、验证服务状态

curl http://10.36.32.40:9200

```

[root@localhost ~]# curl http://10.36.32.40:9200
{
  "name" : "0-kfCnj",
  "cluster_name" : "loopt",
  "cluster_uuid" : "6iM4fnF8Rq83fdq6p1cvg",
  "version" : {
    "number" : "5.5.2",
    "build_hash" : "b2f0c09",
    "build_date" : "2017-08-14T12:33:14.154Z",
    "build_snapshot" : false,
    "lucene_version" : "6.6.0"
  },
  "tagline" : "You Know, for Search"
}

```

三、安装 collectd(每个节点安装 collectd)

1、获取 collectd 版本

wget https://collectd.org/files/collectd-5.5.0.tar.gz

2、创建用户组及用户

groupadd collectd

useradd -g collectd collectd -m

3、解压到指定目录

tar -zxf collectd-5.5.0.tar.gz -C /home/collectd/

cd /home/collectd

mv collectd-5.5.0 collectd

4、修改权限

chown -R collectd. /home/collectd/collectd/

1、编译

./configure --prefix=/usr --sysconfdir=/etc --localstatedir=/var --libdir=/usr/lib --mandir=/usr/share/man --enable-all-plugins

make && make install

2、建立 service

find / -name init.d-collectd

cp /home/collectd/collectd/contrib/redhat/init.d-collectd

/etc/init.d/collectd

chmod +x /etc/init.d/collectd

3、修改配置文件，启动 service

[illegible]

```
vim /etc/rsyslog.conf
```

```
root@localhost etc# vim /etc/rsyslog.conf
root@localhost etc# service rsyslog restart
Shutting down system logger: [ OK ]
Starting system logger: [ OK ]
```

1、获取 logstash 版本

-5.5.2. tar.gz

groupadd logstash

```
useradd -g logstash logstash -m
```

3、解压到指定目录

```
tar -zxf logstash-5.5.2.tar.gz -C /home/logstash/
```

```
cd /home/logstah
```

```
mv logstash-5.5.2/ logstash
```

4、修改权限

```
chown -R logstash. /home/ logstash / logstash /
```

5、新建配置文件



logstash.conf 根据实际情况修改，指定 es 服务集群地址

6、启动

```
./logstash -f logstash.conf &
```

```
[root@localhost bin]# ./logstash -f logstash.conf
[!] 15444
[root@localhost bin]# ERROR StatusLogger No log4j2 configuration file found. Using default configuration: logging only errors to the console.
Loading Logstash's logs to /home/logstash/.logstash/logs which is now configured via log4j2.properties
2018-03-07T13:07:51.910 [INFO] [Logstash.setting.watchable] Creating directory [/setting=>path.queue], {path=>/home/logstash/.logstash/data/queue}
2018-03-07T13:07:51.296 [INFO] [Logstash.setting.watchable] Creating directory [/setting=>path.data_letter_queue], {path=>/home/logstash/.logstash/data/dead_letter_queue}
2018-03-07T13:07:51.313 [INFO] [Logstash.agent] [No persistent UID file found. Generating new UID [uid=>dc0c5d00-33bc-40c1-9e60-a49558a5795], {path=>/home/logstash/.logstash/data/uid}]
2018-03-07T13:07:51.824 [INFO] [Logstash.outputs.elasticsearch] Elasticsearch pool URLs updated! changes=[removed=1], added=[http://10.36.32.40:9200/]
2018-03-07T13:07:51.824 [WARN] [Logstash.outputs.elasticsearch] Running health check to see if an Elasticsearch connection is working [healthcheck_url=>http://10.36.32.40:9200/, {path=>"/"}]
2018-03-07T13:07:51.919 [WARN] [Logstash.outputs.elasticsearch] Restored connection to ES instance [url=>http://10.36.32.40:9200/]
2018-03-07T13:07:51.920 [INFO] [Logstash.outputs.elasticsearch] Using mapping template from {path=>nil}
2018-03-07T13:07:51.978 [INFO] [Logstash.outputs.elasticsearch] Attempting to install template [{name=>"template", "version">50001, "settings">{"index.refresh_interval">"5m"}, "mappings">{"default">{"_all">{"enabled">true, "norm">false}, "dynamic_templates">{"message_field">{"path_match">"message", "match_mapping_type">"string", "mapping">{"type">"text", "analyzer">"standard"}, "keyword">{"path_match">"name", "match_mapping_type">"string", "mapping">{"type">"keyword", "norm">true, "ignore_above">256}}, "geoip">{"_source">{"location">{"type">"geo_point", "latitude">{"type">"half_float", "longitude">{"type">"half_float"}}}}]}]}]
2018-03-07T13:07:51.987 [INFO] [Logstash.outputs.elasticsearch] Installing elasticsearch template to _template/logstash
2018-03-07T13:07:51.997 [INFO] [Logstash.outputs.elasticsearch] Successfully installed template [_template/logstash]
2018-03-07T13:07:52.002 [INFO] [Logstash.pipeline] Starting pipeline [{class=>Logstash::Elasticsearch, :hostname=>"/10.36.32.40:9200/}]
2018-03-07T13:07:52.062 [INFO] [Logstash.pipeline] Pipeline workers=>main, "pipeline.workers">0, "pipeline.batch.size">125, "pipeline.batch.delay">0, "pipeline.max_inflight">1000)
2018-03-07T13:07:52.268 [INFO] [Logstash.inputs.udp] Pipeline main started
2018-03-07T13:07:52.268 [INFO] [Logstash.inputs.udp] Starting UDP listener [address=>"0.0.0.0:0:25826"]
2018-03-07T13:07:52.269 [INFO] [Logstash.inputs.syslog] Starting syslog tcp listener [address=>"0.0.0.0:514"]
2018-03-07T13:07:52.269 [INFO] [Logstash.inputs.syslog] Creating syslog listener [address=>"0.0.0.0:514"]
2018-03-07T13:07:52.269 [INFO] [Logstash.inputs.udp] UDP listener started [address=>"0.0.0.0:0:25826", receive_buffer_bytes=>"626464", iqueue_size=>"2000"]
2018-03-07T13:07:52.295 [INFO] [Logstash.agent] Successfully started Logstash API endpoint [:port=>9600]
```

```

"@timestamp" => 2018-03-07T05:08:17.291Z,
"type_instance" => "iface",
"plugin_instance" => "1",
  "plugin" => "cpu",
  "host" => "10.36.32.42",
  "@version" => "1",
"collectd_type" => "cpu",
  "type" => "collectd",
  "value" => 995

"@timestamp" => 2018-03-07T05:08:17.291Z,
"plugin_instance" => "eth0",
  "plugin" => "interface",
  "rx" => 101851,
  "tx" => 894849,
  "host" => "10.36.32.42",
  "@version" => "1",
"collectd_type" => "if_packets",
  "type" => "collectd"

"@timestamp" => 2018-03-07T05:08:17.291Z,
"plugin_instance" => "eth0",
  "plugin" => "interface",
  "rx" => 0,
  "tx" => 0,
  "host" => "10.36.32.42",
  "@version" => "1",
"collectd_type" => "if_errors",
  "type" => "collectd"

```

六、安装 kibana

1、获取版本

```
wget https://artifacts.elastic.co/downloads/kibana/kibana-5.5.2-linux-x86_64.tar.gz
```

2、建立用户及用户组

Groupadd kibana

Useradd -g kibana kibana -m

3、解压到指定目录

```
tar -zxvf kibana-5.5.2-linux-x86_64.tar.gz -C /home/kibana/
```

```

[root@localhost Downloads]# tar -zxvf kibana-5.5.2-linux-x86_64.tar.gz -C /home/kibana/
[root@localhost Downloads]# cd /home/kibana/
[root@localhost kibana]# ls
kibana-5.5.2-linux-x86_64
[root@localhost kibana]# mv kibana-5.5.2-linux-x86_64/ kibana

```

4、修改权限

```
chown -R kibana. /home/kibana /kibana /
```

5、修改配置 kibana.yml

```
server.port: 5601
```

```
server.host: "10.36.32.43"
```

```
elasticsearch.url: "http://10.36.32.40:9200"
```

```

server.port: 5601
server.host: "10.36.32.43"
elasticsearch.url: "http://10.36.32.42:9200"

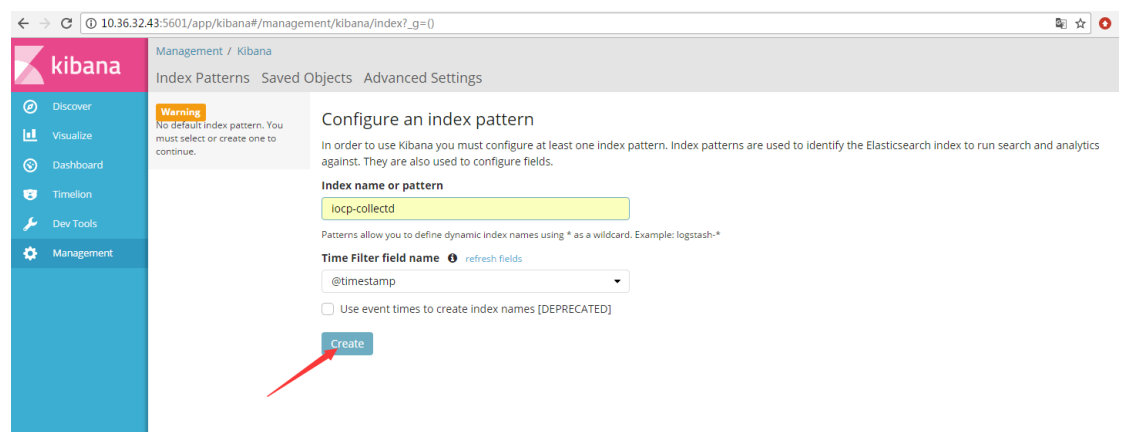
```

6、启动

```
./bin/kibana &
```

7、验证

<http://10.36.32.43:5601>



七、安装 ha(haproxy)

1、版本获取

```
wget http://www.haproxy.org/download/1.7/src/haproxy-1.7.3.tar.gz
```

2、查看内核版本

```
uname -r
```

```
[root@localhost ~]# uname -r
```

根据内核版本选择编译参数：关于编译参数更详细的参见：

<https://github.com/haproxy/haproxy>

3、解压编译安装

```
tar xf haproxy-1.7.3.tar.gz
```

```
cd haproxy-1.7.3
```

```
make TARGET=linux2628 PREFIX=/usr/local/haproxy
```

```
make install PREFIX=/usr/local/haproxy
```

安装成功查看版本

```
/usr/local/haproxy/sbin/haproxy -v
```

```
[root@localhost haproxy-1.7.3]# /usr/local/haproxy/sbin/haproxy -v
```

```
HA-Proxy version 1.7.3 2017/02/26
```

```
Copyright 2000-2017 Willy Tarreau <willy@haproxy.org>
```

4、设置 service 服务

```
cp /usr/local/haproxy/sbin/haproxy /usr/sbin/
```

```
cp /root/Downloads/haproxy-1.7.3/examples/haproxy.init
```

```
/etc/init.d/haproxy
```

```
chmod 755 /etc/init.d/haproxy
```

5、创建账号及配置

```
groupadd haproxy
```

```
useradd -g haproxy haproxy -s /sbin/nologin
```

```
mkdir /etc/haproxy
```

```
vi /etc/haproxy/haproxy.cfg
```



haproxy.cfg

根据实际情况修改，网上可查询参数定义

```
chown -R haproxy:haproxy /usr/local/haproxy/
```

```
ln -s /usr/local/haproxy/etc/haproxy.cfg /etc/haproxy/
```

```
chown -R haproxy:haproxy /etc/haproxy
```

复制错误文件

```
cp -r /root/Downloads/haproxy-1.7.3/examples/errorfiles /usr/local/haproxy/
```

6、设置日志文件

```
mkdir -p /usr/local/haproxy/log
```

```
touch /usr/local/haproxy/log/haproxy.log
```

```
ln -s /usr/local/haproxy/log/haproxy.log /var/log/
```

chown haproxy:haproxy /var/log/haproxy.log

加入 rsyslog

vim /etc/sysconfig/rsyslog

SYSLOGD_OPTIONS="-c 2 -r -m 0"

#修改"SYSLOGD_OPTIONS"参数，-c 2 使用兼容模式，默认是 -c 5；-r 开启远程日志；-m 0 标记时间戳，单位是分钟，0 表示禁用该功能。

cd /etc/rsyslog.d/

vim haproxy.conf

加入以下内容：

local0.* /usr/local/haproxy/log/haproxy.log

#local1.* /usr/local/haproxy/log/haproxy.log

local2.* /usr/local/haproxy/log/haproxy.log

&~

7、启动

service rsyslog restart

service haproxy start

8、验证

验证端口 netstat -tunlp

```
root@localhost haproxy# netstat -tunlp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:1111            0.0.0.0:*               LISTEN      1656/rpobind
tcp        0      0 0.0.0.0:8080            0.0.0.0:*               LISTEN      15421/haproxy
tcp        0      0 0.0.0.0:53109           0.0.0.0:*               LISTEN      1698/rpc.statd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1974/sshd
tcp        0      0 0.0.0.0:1631            0.0.0.0:*               LISTEN      1733/cupad
tcp        0      0 0.0.0.0:8088            0.0.0.0:*               LISTEN      15421/haproxy
tcp        0      0 0.0.0.0:1125            0.0.0.0:*               LISTEN      2060/master
tcp        0      0 0.0.0.0:16011           0.0.0.0:*               LISTEN      15038/sshd
tcp        0      0 0.0.0.0:1111            0.0.0.0:*               LISTEN      1656/rpobind
```

登陆控制台验证 <http://10.36.32.23:8088/stats>

10.36.32.23:8088/stats

HAProxy version 1.7.3, released 2017/02/28

Statistics Report for pid 15677

General process information

pid = 15677 (process #1, nproc = 1)
uptime = 0d 0h 0m 0s
system limits: memmax = unlimited; ulimit-n = 8014
maxsock = 8014; maxconn = 4000; maxpipes = 0
current conns = 1; current pipes = 0; conn rate = 1/sec
Running tasks: 1/6; idle = 100 %

active UP
active UP going down
active DOWN, going up
active or backup DOWN
active or backup DOWN for maintenance (MAINT)
active or backup SOFT STOPPED for maintenance

backup UP
backup UP going down
backup DOWN, going up
not checked

Display option:
Scope: []
Hide DOWN servers
Disable refresh
Refresh now
CSV export

External resources:
Primary site
Updates (v1.7)
Online manual
CSV export

Note: "NOLE" "DRAIN" = UP with load-balancing disabled.

| admin_stats | | Queue | | Session rate | | Sessions | | Bytes | | Denied | | Errors | | Warnings | | Status | | Server | | | | | | | | |
|-------------|-----|-------|-------|--------------|-----|----------|-------|-------|------|--------|-----|--------|------|----------|------|--------|------|--------|---------|------|-----|-----|-----|-----|----------|--------|
| | Cur | Max | Limit | Cur | Max | Limit | Total | LbTot | Last | In | Out | Req | Resp | Req | Conn | Resp | Retr | Redis | LastChk | Wght | Act | Bck | Chk | Dwn | Downtime | Thrtle |
| Frontend | 1 | 1 | - | 1 | 1 | 3000 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | OPEN | | | | | | | |
| Backend | 0 | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 0s | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4s UP | | | | | | | |

| ioc-web | | Queue | | Session rate | | Sessions | | Bytes | | Denied | | Errors | | Warnings | | Status | | Server | | | | | | | | | |
|------------------|-----|-------|-------|--------------|-----|----------|-----|-------|---|--------|---|--------|---|----------|---|--------|---|--------|---------|--------------|-----|-----|-----|-----|----------|--------|---|
| | Cur | Max | Limit | Cur | Max | Limit | | | | | | | | | | | | | LastChk | Wght | Act | Bck | Chk | Dwn | Downtime | Thrtle | |
| Frontend | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4s UP | L4OK in 0ms | 1 | Y | - | 0 | 0 | 0s | - |
| ioc-webserver-01 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4s UP | L4OK in 0ms | 1 | Y | - | 0 | 0 | 0s | - |
| ioc-webserver-02 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3s DOWN | L4CON in 0ms | 1 | Y | - | 1 | 1 | 3s | - |
| Backend | 0 | 0 | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4s UP | | | | | | 0s | | |

八、安装 ha(keepalived)

1、准备 VIP ， 用该工具计算 VIP 适用范围，非适用范围内的 VIP 无法访问。



算子网掩码.exe



如上图，遇设定 VIP 10.36.32.100 掩码 16 位，子网可用 IP 地址为 10.36.0.1 到 10.36.255.254，覆盖了 ha 主备主机地址，可以作为 VIP 使用。

2、获取安装包

```
wget http://www.keepalived.org/software/keepalived-1.4.0.tar.gz
```

3、解压并检测安装环境

```
tar -zxvf keepalived-1.4.0.tar.gz
```

```
./configure --prefix=/usr/local/keepalived
```

检测当前系统是否依赖环境都已经具备，若不具备则检测给出提示，需要按照提示信息进行依赖安装。

```
checking for strerror... yes
checking for strtoul... yes
checking for strtoul... yes
checking for strtoul... yes
checking for strtoul... yes
checking for strtoul... yes
checking for strtoul... yes
checking whether ETHERTYPE_IPV6 is declared... yes
checking openssl/ssl.h usability... no
checking openssl/ssl.h presence... no
checking for openssl/ssl.h... no
configure: error:
!!! OpenSSL is not properly installed on your system. !!!
!!! Can not include OpenSSL headers files. !!!
```

根据错误提示安装最新版本 **openssl openssl-dev**（提示：若连通外网环境并且 **linux** 版本支持 **yum** 源更新，则可以通过 **yum** 源安装，简便准确。建议按此方式安装，但是目前本次安装 **linux** 版本较低，支持 **yum** 源有限，无法更新较为新的 **yum** 源，所以下载依赖包安装）



下载依赖包 `openssl-devel-packages.zip`

将该包解压后上传至服务器，并严格按照以下顺序执行安装，若不按照顺序安装则会产生互相依赖无法安装的情况。

```
rpm -e --nodeps keyutils-libs-1.4-4.el6.x86_64
rpm -ivh keyutils-libs-1.4-5.el6.x86_64.rpm
rpm -ivh keyutils-libs-devel-1.4-5.el6.x86_64.rpm
rpm -ivh libsepol-devel-2.0.41-4.el6.x86_64.rpm
rpm -e --nodeps libselinux-utils-2.0.94-5.3.el6_4.1.x86_64
rpm -Uvh libselinux-2.0.94-5.8.el6.x86_64.rpm
rpm -ivh libselinux-devel-2.0.94-5.8.el6.x86_64.rpm
rpm -e --nodeps krb5-libs-1.10.3-10.el6_4.6.x86_64
rpm -ivh krb5-libs-1.10.3-42.el6.x86_64.rpm
rpm -e --nodeps libcom_err-1.41.12-18.el6.x86_64
rpm -ivh libcom_err-1.41.12-22.el6.x86_64.rpm
rpm -ivh libcom_err-devel-1.41.12-22.el6.x86_64.rpm
rpm -ivh krb5-devel-1.10.3-42.el6.x86_64.rpm
rpm -ivh zlib-devel-1.2.3-29.el6.x86_64.rpm
rpm -e --nodeps openssl-1.0.1e-15.el6.x86_64
rpm -ivh openssl-1.0.1e-42.el6.x86_64.rpm
rpm -ivh openssl-devel-1.0.1e-42.el6.x86_64.rpm
```

4、安装成功后，再次执行 keepalived 检测，通过后编译安装

```
cd /root/Downloads/keepalived-1.4.0
./configure --prefix=/usr/local/keepalived
```

```
checking for strerror... yes
checking for strptime... yes
checking for strcasecmp... yes
checking for strtoul... yes
checking for strtoul... yes
checking for uname... yes
checking for pipe2... yes
checking whether ETHERTYPE_IPV6 is declared... yes
checking openssl/ssl.h usability... yes
checking openssl/ssl.h presence... yes
checking for openssl/ssl.h... yes
checking openssl/err.h usability... yes
checking openssl/err.h presence... yes
checking for openssl/err.h... yes
checking openssl/md5.h usability... yes
checking openssl/md5.h presence... yes
checking for openssl/md5.h... yes
checking for MD5_Init in -lcrypto... yes
checking for SSL_CTX_new in -lssl... yes
checking for nl_socket_fill in -lnl... no
checking for nl_socket_modify_cb in -lnl... yes
checking for linux/rtnetlink.h... yes
checking libnfnetwork/libnfnetwork.h usability... no
checking libnfnetwork/libnfnetwork.h presence... no
checking for libnfnetwork/libnfnetwork.h... no
```

再次检查发现 libnfnetwork headers missing 错误，需要安装该依赖。

下载安装

```
wget ftp://mirror.switch.ch/mirror/centos/6/os/x86_64/Packages/l
ibnfnetwork-1.0.0-1.el6.x86_64.rpm
wget ftp://mirror.switch.ch/mirror/centos/6/os/x86_64/Packages/l
ibnfnetwork-devel-1.0.0-1.el6.x86_64.rpm
rpm -ivh libnfnetwork-1.0.0-1.el6.x86_64.rpm
rpm -ivh libnfnetwork-devel-1.0.0-1.el6.x86_64.rpm
```

```

root@localhost Downloads# wget ftp://mirror.switch.ch/mirror/centos/6/os/x86_64/Packages/libnftnl-1.0.0-1.el6.x86_64.rpm
--2018-03-09 05:10:43-- ftp://mirror.switch.ch/mirror/centos/6/os/x86_64/Packages/libnftnl-1.0.0-1.el6.x86_64.rpm
=> 7 . libnftnl-1.0.0-1.el6.x86_64.rpm
Resolving mirror.switch.ch... 130.59.113.36, 2001:620:0:1002::20
Connecting to mirror.switch.ch[130.59.113.36]:21... connected.
Logging in as anonymous ... Logged in!
=> SYST ... done. => PWD ... done.
=> TYPE I ... done. => CWD (1) /mirror/centos/6/os/x86_64/Packages ... done.
=> SIZE libnftnl-1.0.0-1.el6.x86_64.rpm ... 24256
=> PASV ... done. => RETR libnftnl-1.0.0-1.el6.x86_64.rpm ... done.
length: 24256 (24K) (unauthoritative)

100[=====>] 24,256 17.0K/s in 1.4s

2018-03-09 05:10:48 (17.0 KB/s) - 7 . libnftnl-1.0.0-1.el6.x86_64.rpm? . saved [24256]

root@localhost Downloads# wget ftp://mirror.switch.ch/mirror/centos/6/os/x86_64/Packages/libnftnl-devel-1.0.0-1.el6.x86_64.rpm
--2018-03-09 05:10:56-- ftp://mirror.switch.ch/mirror/centos/6/os/x86_64/Packages/libnftnl-devel-1.0.0-1.el6.x86_64.rpm
=> 7 . libnftnl-devel-1.0.0-1.el6.x86_64.rpm
Resolving mirror.switch.ch... 130.59.113.36, 2001:620:0:1002::20
Connecting to mirror.switch.ch[130.59.113.36]:21... connected.
Logging in as anonymous ... Logged in!
=> SYST ... done. => PWD ... done.
=> TYPE I ... done. => CWD (1) /mirror/centos/6/os/x86_64/Packages ... done.
=> SIZE libnftnl-devel-1.0.0-1.el6.x86_64.rpm ... 8676
=> PASV ... done. => RETR libnftnl-devel-1.0.0-1.el6.x86_64.rpm ... done.
length: 8676 (8.5K) (unauthoritative)

100[=====>] 8,676 32.9K/s in 0.3s

2018-03-09 05:11:02 (32.9 KB/s) - 7 . libnftnl-devel-1.0.0-1.el6.x86_64.rpm? . saved [8676]

root@localhost Downloads# ls
download glibc-2.17-329.el6.x86_64.rpm keepalived-1.4.0.tar.gz libnl-devel-1.4.0-2.el6.x86_64.rpm openssl-1.0.2n zlib-1.2.11
glibc-2.17-329.el6.x86_64.rpm keepalived-1.2.23.tar.gz libnftnl-1.0.0-1.el6.x86_64.rpm openssl-1.0.2n.tar.gz zlib-1.2.11.tar.gz
glibc-2.17-329.el6.x86_64.rpm keepalived-1.4.0 libnftnl-devel-1.0.0-1.el6.x86_64.rpm openssl-1.0.2n.tar.gz zlib-1.2.11.tar.gz
root@localhost Downloads# rpm -ivh libnftnl-1.0.0-1.el6.x86_64.rpm
warning: libnftnl-1.0.0-1.el6.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID c105b9de: NOKEY
Preparing... ##### [100%]
1:libnftnl
root@localhost Downloads# rpm -ivh libnftnl-devel-1.0.0-1.el6.x86_64.rpm
warning: libnftnl-devel-1.0.0-1.el6.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID c105b9de: NOKEY
Preparing... ##### [100%]
1:libnftnl-devel
root@localhost Downloads#

```

5、安装成功后，再次执行 keepalived 检测，通过后编译安装启动

```

cd /root/Downloads/keepalived-1.4.0
./configure --prefix=/usr/local/keepalived
检测成功

```

```

Keepalived configuration
-----
Keepalived version      : 1.4.0
Compiler                : gcc
Preprocessor flags      :
Compiler flags          : -Wall -Wunused -Wstrict-prototypes -Wextra -g -O2 -fPIE
Linker flags            : -pie
Extra libs               : -lcrypt -lssl -lnl
Use IPV6 Framework      : Yes
IPVS use libnl           : Yes
IPVS syncd attributes   : No
IPVS 64 bit stats       : No
L2mark socket support   : Yes
Use VRRP Framework      : Yes
Use VRRP VMAC           : Yes
Use VRRP authentication : Yes
With ip rules/routes     : Yes
SNMP vrrp support       : No
SNMP checker support    : No
SNMP RFCv2 support      : No
SNMP RFCv3 support      : No
SMD support             : No
SHA1 support            : No
Use Debug flags         : No
Use Json output         : No
Stacktrace support      : No
Memory alloc check      : No
libnl version           : 1
Use IPv4 devconf        : No
Use libiptc             : No
Use libipset            : No
Init type               : upstart
Build genhash           : Yes
Build documentation     : No

```

make && make install

编译安装成功

```

make[2]: Leaving directory /root/Downloads/keepalived-1.4.0/doc
make[1]: Leaving directory /root/Downloads/keepalived-1.4.0/doc
Making install in genhash
make[1]: Entering directory /root/Downloads/keepalived-1.4.0/genhash
make[2]: Entering directory /root/Downloads/keepalived-1.4.0/genhash
  /bin/mkdir -p /usr/local/keepalived/bin
  /usr/bin/install -c genhash /usr/local/keepalived/bin
make[2]: Nothing to be done for 'install-data-am'.
make[2]: Leaving directory /root/Downloads/keepalived-1.4.0/genhash
make[1]: Leaving directory /root/Downloads/keepalived-1.4.0/genhash
Making install in bin_install
make[1]: Entering directory /root/Downloads/keepalived-1.4.0/bin_install
make[2]: Entering directory /root/Downloads/keepalived-1.4.0/bin_install
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Leaving directory /root/Downloads/keepalived-1.4.0/bin_install
make[1]: Leaving directory /root/Downloads/keepalived-1.4.0/bin_install
make[1]: Leaving directory /root/Downloads/keepalived-1.4.0
make[2]: Entering directory /root/Downloads/keepalived-1.4.0
make[2]: Nothing to be done for 'install-exec-am'.
  /bin/mkdir -p /usr/local/keepalived/share/doc/keepalived
  /usr/bin/install -c -m 644 README /usr/local/keepalived/share/doc/keepalived
make[2]: Leaving directory /root/Downloads/keepalived-1.4.0
make[1]: Leaving directory /root/Downloads/keepalived-1.4.0

```

设置 service

cp /root/Downloads/keepalived-1.4.0/keepalived/etc/init.d/keepalived /etc/init.d/

mkdir /etc/keepalived

cp /usr/local/keepalived/etc/keepalived/keepalived.conf /etc/keepalived/

```
cp /root/Downloads/keepalived-1.4.0/keepalived/etc/sysconfig/keepalived
/etc/sysconfig/
cp /usr/local/keepalived/sbin/keepalived /usr/sbin/
启动 keepalived
service keepalived start
ps -aux |grep keepalived
```

```
[root@localhost keepalived-1.4.0]# service keepalived start
Starting keepalived: [ OK ]
[root@localhost keepalived-1.4.0]# ps -aux |grep keepalived
Warning: bad syntax, perhaps a bogus '-'? See /usr/share/doc/procps-3.2.8/FAQ
root 23296 0.0 0.0 40240 1028 ? Ss 05:21 0:00 keepalived -D
root 23298 0.0 0.0 42344 1648 ? S 05:21 0:00 keepalived -D
root 23938 0.0 0.0 103308 568 pts/1 S+ 05:21 0:00 grep keepalived
```

6、修改配置文件，重新启动运行，检查日志



keepalived.conf



check_haproxy.sh

根据实际情况修改，master/backup 模式，分别于两台主备主机上部署，相应的更新配置文件参数。

tail -f /usr/local/haproxy/log/haproxy.log 检查之前配置成功的 haproxy 日志

tail -f /var/log/messages 检查 keepalived 运行日志

```
[root@localhost keepalived]# tail -f /var/log/messages
Mar 9 05:30:20 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:20 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:20 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:20 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: VRRP_Instance(VIP_1) Sending/queueing gratuitous ARPs on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 05:30:25 localhost Keepalived_vrrp[31952]: Sending gratuitous ARP on eth0 for 10.36.32.100
```

ip addr 检查网卡绑定情况

```
[root@localhost keepalived]# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 52:54:00:49:35:68 brd ff:ff:ff:ff:ff:ff
    inet 10.36.32.23/24 brd 10.36.32.255 scope global eth0
    inet 10.36.32.100/32 scope global eth0
    inet6 fe80::5054:ff:fe49:3568/64 scope link
        valid_lft forever preferred_lft forever
```

测试:

在 master 主机

service keepalived stop 执行停止 keepalived 后， 执行

ip addr 此时 vip 地址消失，同时查看 backup 主机 ip addr 此时 vip 产生，证明 vip 及故障切换都正常。此时不回复启动 master keepalived 后，由于 master 优先级，vip 切换回 master 主机。测试正常。测试日志如下：

```
Mar 9 06:28:02 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Entering BACKUP STATE
Mar 9 06:28:02 localhost Keepalived_vrrp[4748]: VRRP sockpool: [ifindex(2), proto(112), unicast(0), fd(10,11)]
Mar 9 06:28:03 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Changing effective priority from 99 to 101
Mar 9 06:28:05 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Transition to MASTER STATE
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Entering MASTER STATE
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) setting protocol VIPs.
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Sending/queuing gratuitous ARPs on eth0 for 10.36.32.100
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:06 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:11 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:11 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Sending/queuing gratuitous ARPs on eth0 for 10.36.32.100
Mar 9 06:29:11 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:11 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:11 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:29:11 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Received advert with lower priority 100, ours 101, forcing new election
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Sending/queuing gratuitous ARPs on eth0 for 10.36.32.100
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:32:26 localhost Keepalived_vrrp[4748]: Sending gratuitous ARP on eth0 for 10.36.32.100
Mar 9 06:32:27 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Received advert with higher priority 102, ours 101
Mar 9 06:32:27 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Entering BACKUP STATE
Mar 9 06:32:27 localhost Keepalived_vrrp[4748]: VRRP_Instance(VIP_1) Removing protocol VIPs.
```

以上安装高可用 HA（haproxy-keepalived）单机版完成，BACKUP 副本按照上述步骤操作安装即可。Haproxy.conf Keepalived.conf 配置文件按照 backup 方式调整参数更新。