

Network Topology

Normal topology

Problem Description

Replacing network card, board network card on motherboard and motherboard are the routine operation of server hardware maintenance.

Process Analysis

Generally, the MAC address of the new (on board) network card will change, and some servers will change the motherboard, which will also cause the MAC address change of the onboard network card. Since CAS system will treat the network card with new MAC address as a new device, it will add new device name in the original network card configuration file (70-persistent-net.rules). So network failure may occur after replacing network card and motherboard. I will introduce the method of recovering network after the hardware operation and maintenance of server network card.

Solution

1. Environmental inspection

Do environmental inspection and preparation. Make sure the network environment is healthy before replacing the network card / motherboard (on-board network card). If the network card can work normally, it is recommended to use Ping to check the network connectivity. Record the corresponding relationship between each network cable, optical fiber and network card interface.

Check whether the host system and hardware time are correct and recorded, and whether the NTP server service is normal.

2. CVM stateful failover

If it is a CVM stateful failover system environment, you can switch between the master and the standby, and replace them one by one.

If it is a CVM server only for management, it can be shut down directly to replace the network card. If it is used for cvk, the method is the same as that for cvk host.

3. License change and activation

If you want to replace the CVM node network card, the original license cannot be used in the new CVM directly due to the change of hardware information. Please contact the H3C office engineer or call H3C hotline to obtain the "H3C CAS cloud computing management platform license exception application and letter of commitment" to go through the H3C license change / unbind process, and obtain a new activation code file according to the process.

Note: the application process will involve the collection of host.id information, if it is a CVM stateful failover system environment, two host.id information needs to be collected.

4. Back up the network card configuration file

Backup the network card configuration file (70-persistent-net.rules) on the host computer.

```
root@cvk01:~# cd /etc/udev/rules.d/
root@cvk01:/etc/udev/rules.d# cp 70-persistent-net.rules 70-persistent-net.rules.bak
root@cvk01:/etc/udev/rules.d# ll
total 32
drwxr-xr-x 2 root root 4096 May  9 15:17 ./
drwxr-xr-x 3 root root 4096 Apr 30 17:34 ../
-rw-r--r-- 1 root root  541 Apr 30 17:37 70-custom-net.rules
-rw-r--r-- 1 root root  536 Apr 30 17:33 70-persistent-cd.rules
-rw-r--r-- 1 root root  683 May  9 01:46 70-persistent-net.rules
-rw-r--r-- 1 root root  683 May  9 15:35 70-persistent-net.rules.bak
-rw-r--r-- 1 root root  496 Oct 24 2018 71-persistent-fcoe.rules
-rw-r--r-- 1 root root 1157 Apr  6 2012 README
```

5. Replace network card

If there is a virtual machine running on this host, first migrate the virtual machine to other hosts, and then put the host into maintenance mode.

Turn off the host and replace the network card / motherboard (on-board network card). After hardware replacement, the physical link is restored according to the corresponding relationship between network cable, optical fiber and network card interface recorded during environmental inspection.

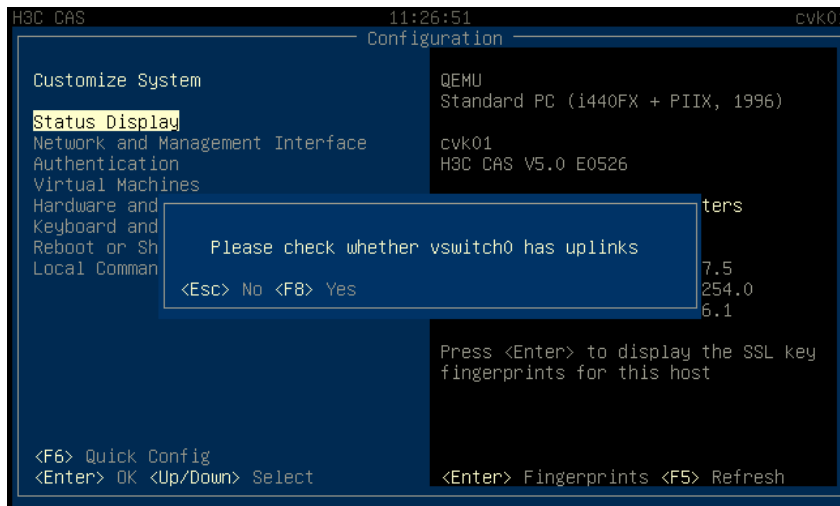
Tips:

After the physical host carries out hardware maintenance, it is necessary to ensure that the server hardware clock is synchronized with that before the maintenance, otherwise the CAS system business function will be abnormal.

Please contact the server hardware service provider for server hardware clock synchronization method.

6. Restore network card number

After replacing (on board) network card, motherboard or network card, the network card configuration file (70 persistent- net.rules) will be updated, so the network will be blocked. You need to manually modify the network card configuration file to restore the network.



After the network card is replaced, CAS xconsole prompts to check the uplink link of vswitch0

After the network card is replaced, the operating system will automatically update the network card configuration file (70 persistent- net.rules) , the eth number of the new network card will be assigned continuously with the original eth number. To recover the network , the eth number entry in the network card configuration file needs to be updated to the new MAC address.

First, we need to find out the MAC address after the network port is changed. Suppose that the physical state of the link is up after the mainboard and network card are replaced, the following provides a physical judgment method (if you need to disconnect the network of the host network card, please operate without affecting the service)

a) Open the xconsole console of the server and enter the local command shell, execute `IP a | grep down` and record the results. As shown in the figure below:

```
root@cvk01:~# ip a | grep DOWN
6: ovs-system: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
```

b) After the mainboard and physical network card are replaced, route the physical link of the original eth0 network port to down (you can pull the network cable or shut down the network port corresponding to the switch). Execute `IP a | grep down` and record the results.

```
root@cvk01:~# ip a | grep DOWN
4: eth4: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast state DOWN group default qlen 1000
6: ovs-system: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
root@cvk01:~#
```

c) Comparing the results of the above two steps, we can know that after the MAC address of the original eth0 network port is changed, it is regarded as a new network card by the system and numbered as eth4. Record the corresponding relationship of eth number to table 1

d) Repeat steps a,b,c until you find and record the relationship between the old and new eth numbers of all the network cards replaced. Execute `/opt/bin/OVS_dbg_List ports` to view the MAC address of eth4-eth7 (as shown in the figure below). Record the MAC address corresponding to the new eth number into the column of "new MAC address" in Table 1 (pay attention to supplement the semicolon " :").

```

root@cvk01:~# /opt/bin/ovs_dbg_listports
PCI   NAME  LW  IO  NU  SRIO  MTU  A/L  SPEED  MAC  IP  VEN:DEV  DESC
SUBSYS DRIVER FIRMWARE
00:03.0 eth6          1500 u/u -1 0cda411db26e          1af4:1000 virtio
0001 virtio-pci
00:04.0 eth5          1500 u/u -1 0cda411d9cfa          1af4:1000 virtio
0001 virtio-pci
00:05.0 eth4          1500 u/u -1 0cda411d2c23          1af4:1000 virtio
0001 virtio-pci
00:06.0 eth7          1500 u/u -1 0cda411dada8          1af4:1000 virtio
0001 virtio-pci
=====
Type      Name  MAC      IPv4      OffPort      MTU
vswitch0 ----- (vrb ) -----
int      vswitch0 6a195f9eca4a 10.125.27.5 65534/2      1500
eth0
stor ----- (vrb ) -----
int      stor      c6f91f69e241 1.1.1.1      65534/1      1500
stor_bond
eth2
eth3

```

Table 1

	Original eth number	New eth number	New MAC address
NIC1	eth0	eth4	0c:da:41:1d:2c:23
NIC2	eth1	eth5	0c:da:41:1d:9c:fa
NIC3	eth2	eth6	0c:da:41:1d:b2:6e
NIC4	eth3	eth7	0c:da:41:1d:ad:a8

Modified 70 persistent- net.rules File, the value of ATTR {address} in the original eth number entry is modified to the new MAC address.

In this operation guide, it is necessary to update the replaced network card NIC1 to eth0, the replaced network card NIC2 to eth1, the replaced network card NIC3 to eth2, and the replaced network card NIC4 to eth3.

After backup new 70-persistent-net.rules file, use vim command to modify the 70 persistent- net.rules document:

```

root@cvk01:~# cd /etc/udev/rules.d/
root@cvk01:/etc/udev/rules.d# cp 70-persistent-net.rules 70-persistent-net.rules.bak.nwe
root@cvk01:/etc/udev/rules.d# vim 70-persistent-net.rules

```

```

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:03.0/virtio0 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:2c:23", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth0"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:04.0/virtio1 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:9c:fa", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth1"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:05.0/virtio2 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:b2:6e", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth2"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:06.0/virtio3 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:ad:a8", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth3"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:05.0/virtio2 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:2c:23", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth4"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:04.0/virtio1 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:9c:fa", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth5"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:03.0/virtio0 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:b2:6e", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth6"

# PCI device 0x1af4:/sys/devices/pci0000:00/0000:00:06.0/virtio3 (virtio-pci)
SUBSYSTEM=="net", ACTION=="add", DRIVERS=="*", ATTR{address}=="0c:da:41:1d:ad:a8", ATTR{dev_id}=="0x0", ATTR{type}=="1", KERNEL=="eth*", NAME="eth7"
"/etc/udev/rules.d/70-persistent-net.rules" 29L, 2061C written

```

Update MAC address corresponding to eth number:

According to the relationship between the old eth number and the new MAC address recorded in Table 1, update the content.

Locate the line name = eth0, and update the corresponding MAC address, such as: ATTR{address}="0c:da:41:1d:2c:23"

Locate the line name = eth1, and update the corresponding MAC address, such as attr {address} = = 0C: Da: 41:1d: 9C: Fa "

Locate the line name = eth2, and update the corresponding MAC address, such as attr {address} = = 0C: Da: 41:1d: b2:6e "

Locate the line name = eth3, and update the corresponding MAC address, such as attr {address} = = 0C: Da: 41:1d: AD: A8 "

At the beginning of each line, annotate the entry corresponding to eth4-eth7 with #.

After updating the content, confirm that the configuration is correct, then press ESC, enter: WQ to save and exit the VIM editor.

7. Configuration verification and operation completion

After the modification, execute the reboot command to restart the host. Log in to the background of the host and check the relationship between eth number and MAC address with IP a command.

```
valid_lft forever preferred_lft forever
2: eth2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc htb master ovs-system state UP group defau
lt qlen 1000
    link/ether 0c:da:41:d:b2:6e brd ff:ff:ff:ff:ff:ff
    inet6 fe80::eda:41ff:fe1d:b26e/64 scope link
        valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 100
0
    link/ether 0c:da:41:d:9c:fa brd ff:ff:ff:ff:ff:ff
    inet6 fe80::eda:41ff:fe1d:9cfa/64 scope link
        valid_lft forever preferred_lft forever
4: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc htb master ovs-system state UP group defau
lt qlen 1000
    link/ether 0c:da:41:d:2c:23 brd ff:ff:ff:ff:ff:ff
    inet6 fe80::eda:41ff:fe1d:2c23/64 scope link
        valid_lft forever preferred_lft forever
5: eth3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc htb master ovs-system state UP group defau
lt qlen 1000
    link/ether 0c:da:41:d:ad:a8 brd ff:ff:ff:ff:ff:ff
    inet6 fe80::eda:41ff:fe1d:ada8/64 scope link
        valid_lft forever preferred_lft forever
6: ovs-system: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default qlen 1000
    link/ether 5a:b9:9e:4c:aa:ca brd ff:ff:ff:ff:ff:ff
```

Use Ping to verify that the network connectivity after the replacement of the maintenance network card is correct.

If the corresponding relationship between eth number and MAC address is correct, but Ping verification fails, please check the corresponding relationship of network cable, optical fiber and network card in interface, and check whether the corresponding relationship between network card port and MAC address is correct.

If there is no problem, exit the host from maintenance mode in CVM interface.