Linux Network Bonding - fail_over_mac

: https://twpower.github.io/207-network-bonding-active-backup-fail-over-mac-option
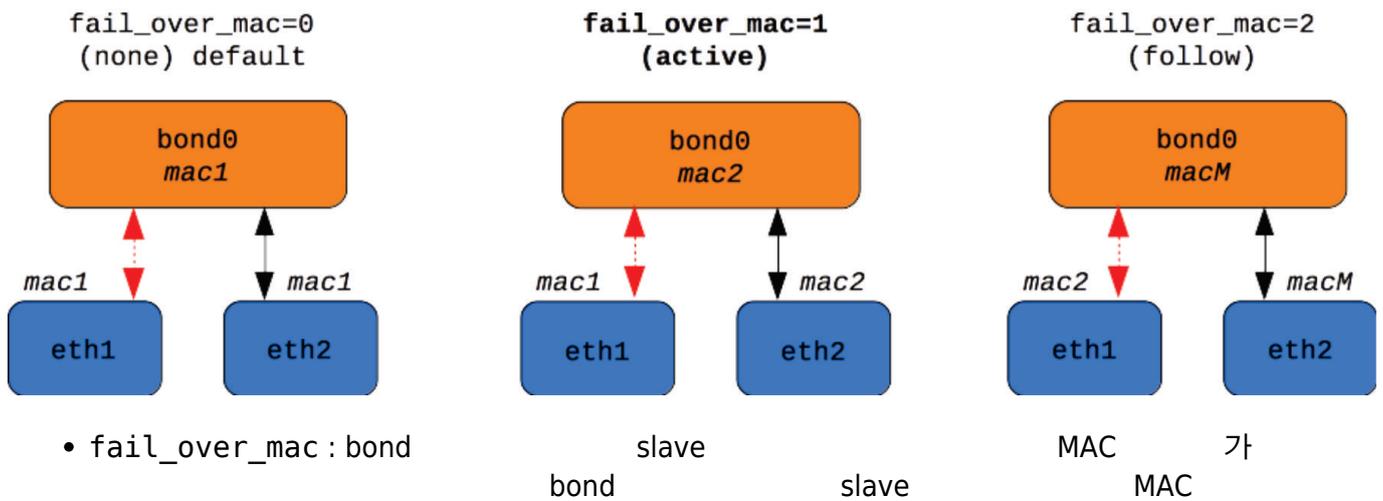
(Network Bonding)　　　`active-backup`　　　`fail_over_mac`

- CentOS 7.7.1908
- Bash shell(/bin/bash)
- Network bonding

fail_over_mac

fail_over_mac

- `fail_over_mac` : bond　　　　　　　　slave　　　　　　　MAC
  bond　　　　　slave　　　　MAC
  .
- 　　　　　bonding mode　active-backup　　　　　　　　　　　.
- 　　　　　:
  https://www.ibm.com/support/knowledgecenter/en/linuxonibm/com.ibm.linux.z.l0wlcb00/l0wlcb00_optionfailovermac.html

fail_over_mac

- `none or 0` : (Default) bond　　　　　　　　slave　　　　　　MAC
  　　　　　　slave　　　slave　MAC　　bond
  slave　　　　　　.
- `active or 1` : active　　slave　　　MAC　bond　　　　MAC
  　　　failover　　active　slave　bond　　　　MAC
  .
- `follow or 2` : bond　　　MAC　　　(　　　slave　　MAC

.) active   slave   MAC   MAC
. failover   active   MAC   active
bond   MAC   .

fail_over_mac

- Bonding   (   ) Bonding   .
- Host OS : Mac OS
- Guest OS : CentOS 7.7.1908
- Hypervisor : VirtualBox

none or 0

- Default option
- fail_over_mac=0
- VirtualBox   active-backup   .

```
[root@centos-client ~]# cat /etc/sysconfig/network-scripts/ifcfg-bond0 |
grep fail_over_mac
BONDING_OPTS="mode=1 miimon=100 fail_over_mac=0"
```

- bond0   slave (enp0s8   enp0s9)   MAC

```
[root@centos-client ~]# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:2b:04:6e brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
4: enp0s9: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
8: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue
state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
```

active or 1

- fail_over_mac=1

```
[root@centos-client ~]# cat /etc/sysconfig/network-scripts/ifcfg-bond0 |
grep fail_over_mac
BONDING_OPTS="mode=1 miimon=100 fail_over_mac=1"
bond0   MAC           slave   enp0s8   MAC
[root@centos-client ~]# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:2b:04:6e brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
4: enp0s9: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:27:a9:2d brd ff:ff:ff:ff:ff:ff
9: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue
state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
```

- enp0s8   Down

```
ip link set dev enp0s8 down
```

- bond0   MAC   enp0s9   MAC

```
[root@centos-client ~]# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:2b:04:6e brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,SLAVE> mtu 1500 qdisc pfifo_fast master
bond0 state DOWN mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
4: enp0s9: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:27:a9:2d brd ff:ff:ff:ff:ff:ff
9: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue
state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:27:a9:2d brd ff:ff:ff:ff:ff:ff
```

follow or 2

- fail_over_mac=2

- VirtualBox   active-backup   .

```
[root@centos-client ~]# cat /etc/sysconfig/network-scripts/ifcfg-bond0 |
grep fail_over_mac
BONDING_OPTS="mode=1 miimon=100 fail_over_mac=2"
bond0   MAC              slave   enp0s8   MAC
[root@centos-client ~]# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:2b:04:6e brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
4: enp0s9: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:27:a9:2d brd ff:ff:ff:ff:ff:ff
10: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue
state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
```

- enp0s8   Down

```
ip link set dev enp0s8 down
```

- bond0   MAC
-       active   enp0s9   bond0   MAC
- fail   enp0s8   active   enp0s9   MAC

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:2b:04:6e brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,SLAVE> mtu 1500 qdisc pfifo_fast master
bond0 state DOWN mode DEFAULT group default qlen 1000
    link/ether 08:00:27:27:a9:2d brd ff:ff:ff:ff:ff:ff
4: enp0s9: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
master bond0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
10: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue
state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e8:26:58 brd ff:ff:ff:ff:ff:ff
```

Bonding

.

Interfaces

- Bonding Interface : bond0
- Slave Interfaces : enp0s8, enp0s9

bond0

- /etc/sysconfig/network-scripts/ifcfg-bond0
- IPADDR   PREFIX   .
- fail_over_mac $0 \sim 2$.

```
TYPE=Bond
BOOTPROTO=static
DEFROUTE=no
NAME=bond0
DEVICE=bond0
ONBOOT=yes
PREFIX=24
IPADDR=192.168.99.101
BONDING_OPTS="mode=1 miimon=100 fail_over_mac=1"
```

enp0s8, enp0s9

- /etc/sysconfig/network-scripts/ifcfg-enp0s8

```
NAME=enp0s8
DEVICE=enp0s8
TYPE=Ethernet
BOOTPROTO=none
ONBOOT=yes
MASTER=bond0
SLAVE=yes
```

- /etc/sysconfig/network-scripts/ifcfg-enp0s9

```
NAME=enp0s9
DEVICE=enp0s9
TYPE=Ethernet
BOOTPROTO=none
```

```
ONBOOT=yes
MASTER=bond0
SLAVE=yes
```

- https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/7/html-single/networking_guide/index
- https://www.ibm.com/support/knowledgecenter/en/linuxonibm/com.ibm.linux.z.l0wlcb00/l0wlcb00_optionfailovermac.html
- https://november11tech.tistory.com/128