

## Creating NIC Bonding:

- Add a new NIC if it does not exist
- Install bonding driver = **modprobe bonding**
- To list the bonding module info = **modinfo bonding**

*You will see the driver version as seen below if the driver is installed and loaded*

```
iafzal@MyFirstLinuxOS:~  
File Edit View Search Terminal Help  
filename: /lib/modules/3.10.0-693.21.1.el7.x86_64/kernel/drivers/net/bonding/bonding.ko.xz  
author: Thomas Davis, tadavis@lbl.gov and many others  
description: Ethernet Channel Bonding Driver, v3.7.1  
version: 3.7.1  
license: GPL  
alias: rtnl-link-bond  
retpoline: Y  
rhelversion: 7.4  
srcversion: 33C47E3D00DF16A17A5AB9C  
depends:  
intree: Y  
vermagic: 3.10.0-693.21.1.el7.x86_64 SMP mod_unload modversions  
signer: CentOS Linux kernel signing key  
sig_key: 03:DA:60:92:F6:71:13:21:B5:AC:E1:2E:84:5D:A9:73:36:F7:67:4D  
sig_hashalgo: sha256  
parm: max_bonds:Max number of bonded devices (int)  
parm: tx_queues:Max number of transmit queues (default = 16) (int)  
parm: num_grat_arp:Number of peer notifications to send on failover event (alias of num_unsol_na) (int)  
parm: num_unsol_na:Number of peer notifications to send on failover event (alias of num_grat_arp) (int)  
parm: miimon:Link check interval in milliseconds (int)  
parm: updelay:Delay before considering link up, in milliseconds (int)  
parm: downdelay:Delay before considering link down, in milliseconds (int)  
parm: use_carrier:Use netif_carrier_ok (vs MII ioctls) in miimon; 0 for off, 1 for on (default) (int)  
parm: mode:Mode of operation; 0 for balance-rr, 1 for active-backup, 2 for balance-xor, 3 for broadcast, 4 for 802.3ad, 5 for balance-tlb, 6 for balance-alb (charp)  
--More--
```

## Create Bond Interface File

- vi /etc/sysconfig/network-scripts/ifcfg-bond0
- Add the following parameters

```
DEVICE=bond0  
TYPE=Bond  
NAME=bond0  
BONDING_MASTER=yes  
BOOTPROTO=none  
ONBOOT=yes  
IPADDR=192.168.1.80  
NETMASK=255.255.255.0  
GATEWAY=192.168.1.1  
BONDING_OPTS="mode=5 miimon=100"
```

- Save and exit the file
- The bonding options details are can be found on the following table

| Mode | Policy                        | How it works                                                                                                                                                                                                                                   | Fault Tolerance | Load balancing |
|------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|
| 0    | Round Robin                   | packets are sequentially transmitted/received through each interfaces one by one.                                                                                                                                                              | No              | Yes            |
| 1    | Active Backup                 | one NIC active while another NIC is asleep. If the active NIC goes down, another NIC becomes active. only supported in x86 environments.                                                                                                       | Yes             | No             |
| 2    | XOR [exclusive OR]            | In this mode the, the MAC address of the slave NIC is matched up against the incoming request's MAC and once this connection is established same NIC is used to transmit/receive for the destination MAC.                                      | Yes             | Yes            |
| 3    | Broadcast                     | All transmissions are sent on all slaves                                                                                                                                                                                                       | Yes             | No             |
| 4    | Dynamic Link Aggregation      | aggregated NICs act as one NIC which results in a higher throughput, but also provides failover in the case that a NIC fails. Dynamic Link Aggregation requires a switch that supports IEEE 802.3ad.                                           | Yes             | Yes            |
| 5    | Transmit Load Balancing (TLB) | The outgoing traffic is distributed depending on the current load on each slave interface. Incoming traffic is received by the current slave. If the receiving slave fails, another slave takes over the MAC address of the failed slave.      | Yes             | Yes            |
| 6    | Adaptive Load Balancing (ALB) | Unlike Dynamic Link Aggregation, Adaptive Load Balancing does not require any particular switch configuration. Adaptive Load Balancing is only supported in x86 environments. The receiving packets are load balanced through ARP negotiation. | Yes             | Yes            |

### miimon

Specifies the MII link monitoring frequency in milliseconds. This determines how often the link state of each slave is inspected for link failures

Edit the First NIC File (enp0s3)

- vi /etc/sysconfig/network-scripts/ifcfg-enp0s3
- Delete the entire content
- Add the following parameters
 

```
TYPE=Ethernet
BOOTPROTO=none
DEVICE=enp0s3
ONBOOT=yes
HWADDR="MAC from the ifconfig command"
MASTER=bond0
SLAVE=yes
```
- Save and exit the file

Create the Second NIC File (enp0s8) or Copy enp0s3

- `vi /etc/sysconfig/network-scripts/ifcfg-enp0s8`
- Add the following parameters

```
TYPE=Ethernet
BOOTPROTO=none
DEVICE=enp0s8
ONBOOT=yes
HWADDR="MAC from the ifconfig command"
MASTER=bond0
SLAVE=yes
```
- Save and exit the file

Restart the Network Service

- `systemctl restart network`

Test and verify the configuration

- `ifconfig` or `ifconfig | more`

Use following command to view bond interface settings like bonding mode & slave interface

- `cat /proc/net/bonding/bond0`