

ADVANCE NETWORK CONFIGURATION

BONDIG TYPE:

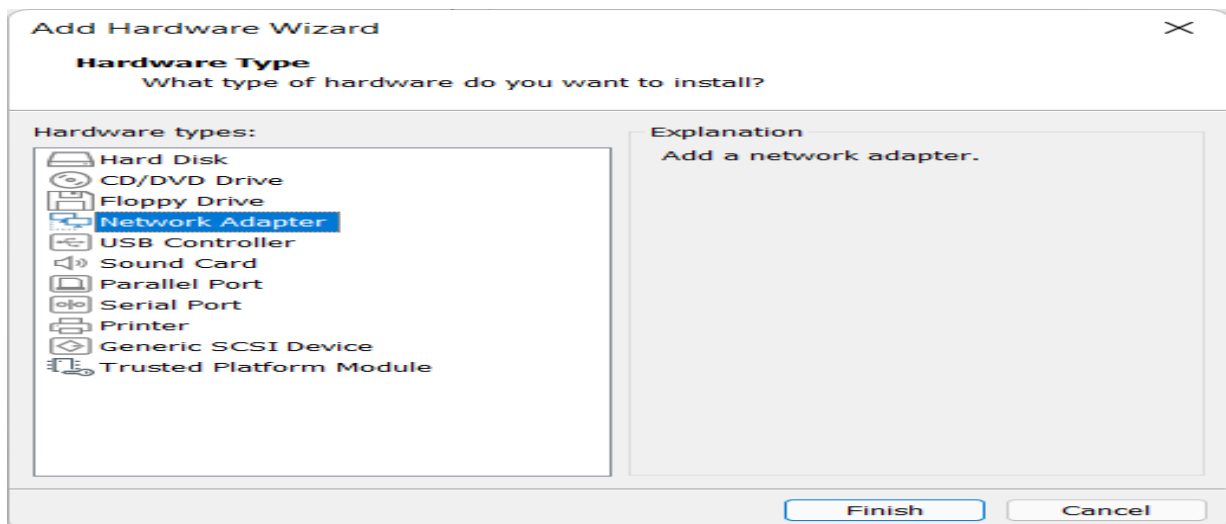
Round-robin: This mode moves network traffic serially starting with the first slave and going to the last, and then back to the first. This mode supports both load balancing and fault tolerance. It is specified as balance-rr.

Active-backup: Only one slave is active at a time, and all others are available but in passive mode. In the event that the active slave fails, one of the passive slaves takes over and becomes active. This mode of operation does not provide load balancing; however, it does support fault tolerance. It is specified as active-backup.

Steps to Configure Interface Bonding by Editing Files

Log on to server and run the ip command to check the available interfaces

CONNECT ONE NIC PORT



CHECK NIC PORT ON

```
[root@vivek p]# ip a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
    inet 192.168.10.2/24 brd 192.168.10.255 scope global noprefixroute ens160
        valid_lft forever preferred_lft forever
    inet 255.255.255.0/32 scope global noprefixroute ens160
        valid_lft forever preferred_lft forever
    inet6 fe80::4b9:cea9:aab8:d94d/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
3: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:9c:47:de brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
        valid_lft forever preferred_lft forever
4: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN group default qlen 1000
    link/ether 52:54:00:9c:47:de brd ff:ff:ff:ff:ff:ff
5: ens224: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:0c:29:01:90:50 brd ff:ff:ff:ff:ff:ff
```

Log on to server and run the ip command to check the available interfaces

```
[root@vivek p]# modprobe bonding
```

ADVANCE NETWORK CONFIGURATION

INFORMATION OF BONDING

```
[root@vivek p]# modinfo bonding
filename:      /lib/modules/4.18.0-193.el8.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
rhelversion:  8.2
srcversion:   7EED712D71D5A2D957F7D97
depends:
intree:      Y
name:         bonding
vermagic:     4.18.0-193.el8.x86_64 SMP mod_unload modversions
sig_id:       PKCS#7
signer:       Red Hat Enterprise Linux kernel signing key
sig_key:      42:A4:B8:EB:D4:F1:21:1D:CA:0B:B6:66:62:38:61:FA:0B:90:31:59
sig_hashalgo: sha256
```

Log on to server and run the ip command to check the available interfaces

```
[root@vivek p]# lsmod | grep bonding
bonding      188416  0
[root@vivek p]#
```

Generate UUIDs for interfaces using the uuidgen command

```
[root@vivek p]# uuidgen ens224
a7baff98-03e2-4386-b731-2f4e33ff2cb1
```

vi editor to create a file called ifcfg-bond0 in the /etc/sysconfig/network-scripts

```
[root@vivek p]# cd /etc/sysconfig/network-scripts
[root@vivek network-scripts]# vi ifcfg-bond0
```

```
DEVICE=bond0
NAME=bond0
TYPE=Bond
BONDING_MASTER=yes
BONDING_OPTS="mode=balance-rr"
ONBOOT=yes
BOOTPROTO=none
IPADDR=192.168.10.2
NETMASK=255.255.255.0
GATEWAY=192.168.0.0
IPV4_FAILURE_FATAL=no
IPV6INIT=no
```

vi editor to create ifcfg-eth2 and ifcfg-eth3

```
[root@vivek network-scripts]# vim ifcfg-ens160
```

```
NAME=ens160
UUID=96936179-64c0-427e-936c-52b77060eadc
DEVICE=ens160
ONBOOT=yes
MASTER=bond0
SLAVE=yes
```

```
[root@vivek network-scripts]# vim ifcfg-ens224
```

```
NAME=ens224
UUID= a7baff98-03e2-4386-b731-2f4e33ff2cb1
DEVICE=ens224
ONBOOT=yes
MASTER=bond0
SLAVE=yes
```

ADVANCE NETWORK CONFIGURATION

REBOOT SYSTEM

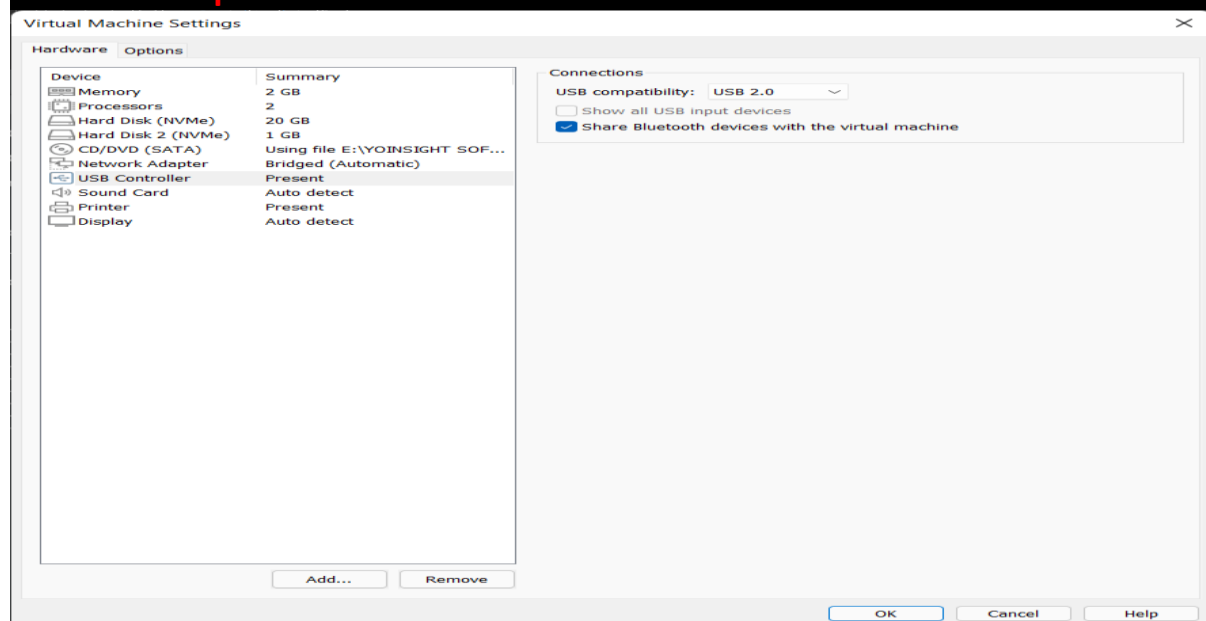
Deactivate and reactivate bond0 with the ifdown and ifup commands

ifdown bond0 ifup bond0

Check the status of bond0

```
[root@vivek p]# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc mq master bond0 state UP group default qlen 1000
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
3: ens224: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc mq master bond0 state UP group default qlen 1000
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
4: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
    inet 192.168.10.2/24 brd 192.168.10.255 scope global noprefixroute bond0
        valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fe01:9046/64 scope link
```

Remove nic port



Ping check after remove nic

```
[root@vivek p]# ping 192.168.10.2
PING 192.168.10.2 (192.168.10.2) 56(84) bytes of data.
64 bytes from 192.168.10.2: icmp_seq=1 ttl=64 time=0.085 ms
64 bytes from 192.168.10.2: icmp_seq=2 ttl=64 time=0.086 ms
64 bytes from 192.168.10.2: icmp_seq=3 ttl=64 time=0.124 ms
64 bytes from 192.168.10.2: icmp_seq=4 ttl=64 time=0.084 ms
64 bytes from 192.168.10.2: icmp_seq=5 ttl=64 time=0.100 ms
64 bytes from 192.168.10.2: icmp_seq=6 ttl=64 time=0.065 ms
64 bytes from 192.168.10.2: icmp_seq=7 ttl=64 time=0.126 ms
64 bytes from 192.168.10.2: icmp_seq=8 ttl=64 time=0.125 ms
64 bytes from 192.168.10.2: icmp_seq=9 ttl=64 time=0.090 ms
64 bytes from 192.168.10.2: icmp_seq=10 ttl=64 time=0.121 ms
64 bytes from 192.168.10.2: icmp_seq=11 ttl=64 time=0.067 ms
64 bytes from 192.168.10.2: icmp_seq=12 ttl=64 time=0.069 ms
```

ADVANCE NETWORK CONFIGURATION

Mac changes manually

```
root@client ~# ip a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:1c:34:34:45:67 brd ff:ff:ff:ff:ff:ff
    inet 192.168.254.151/24 brd 192.168.254.255 scope global dynamic noprefixroute ens160
        valid_lft 1796sec preferred_lft 1796sec
3: virbr0: <BROADCAST,MULTICAST> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:ea:b1:ef brd ff:ff:ff:ff:ff:ff
4: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN group default qlen 1000
    link/ether 52:54:00:ea:b1:ef brd ff:ff:ff:ff:ff:ff
root@client ~# ifconfig ens160 down
root@client ~# ifconfig ens160 hw ether 00:0c:29:98:57:24
root@client ~# ifconfig ens160 up
root@client ~# ip a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:98:57:24 brd ff:ff:ff:ff:ff:ff
    inet 192.168.254.149/24 brd 192.168.254.255 scope global dynamic noprefixroute ens160
        valid_lft 1797sec preferred_lft 1797sec
3: virbr0: <BROADCAST,MULTICAST> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:ea:b1:ef brd ff:ff:ff:ff:ff:ff
```



ADVANCE NETWORK CONFIGURATION

Check status in nmtui

The screenshot shows the nmtui window for editing the 'bond0' connection. The 'Profile name' and 'Device' are both set to 'bond0'. Under the 'BOND' section, 'Slaves' are listed as 'ens224' (highlighted in red) and 'ens160'. The 'Mode' is set to '<Round-robin>' and 'Link monitoring' is set to '<MII (recommended)>'. 'Monitoring frequency' is set to 'ms', 'Link up delay' is 'ms', and 'Link down delay' is 'ms'. The 'Cloned MAC address' field is empty. Under the 'IPv4 CONFIGURATION' section, the 'Mode' is set to '<Manual>'. The 'Addresses' field contains '192.168.10.2/24'. The 'Gateway' is set to '192.168.0.0'. The 'DNS servers' and 'Search domains' fields are empty. Under the 'IPv6 CONFIGURATION' section, the mode is set to '<Ignore>'. The 'Routing' section shows several options: 'Never use this network for default route' (unchecked), 'Ignore automatically obtained routes' (unchecked), 'Ignore automatically obtained DNS parameters' (unchecked), and 'Require IPv4 addressing for this connection' (unchecked).

Profile name: bond0
Device: bond0

BOND
Slaves: ens224, ens160
Mode: <Round-robin>
Link monitoring: <MII (recommended)>
Monitoring frequency: ms
Link up delay: ms
Link down delay: ms
Cloned MAC address:

IPv4 CONFIGURATION: <Manual>
Addresses: 192.168.10.2/24
Gateway: 192.168.0.0
DNS servers: <Add...>
Search domains: <Add...>
Routing (No custom routes): <Edit...>
[] Never use this network for default route
[] Ignore automatically obtained routes
[] Ignore automatically obtained DNS parameters
[] Require IPv4 addressing for this connection

IPv6 CONFIGURATION: <Ignore>

To show a list of all devices

```
[root@vivek network-scripts]# nmcli dev status
DEVICE    TYPE      STATE      CONNECTION
bond0     bond      connected  bond0
virbr0    bridge    connected  virbr0
ens160     ethernet  connected  ens160
ens224     ethernet  connected  ens224
lo         loopback  unmanaged  --
virbr0-nic tun       unmanaged  --
[root@vivek network-scripts]#
```

ADVANCE NETWORK CONFIGURATION

CHECK ACTIVE Backup DETAILS

```
DEVICE=bond0
NAME=bond0
TYPE=Bond
BONDING_MASTER=yes
BONDING_OPTS="mode=active-backup"
ONBOOT=yes
BOOTPROTO=none
IPADDR=192.168.10.2
NETMASK=255.255.255.0
GATEWAY=192.168.0.0
IPV4_FAILURE_FATAL=no
IPV6INIT=no
```

```
[root@vivek network-scripts]# cat /var/log/messages
```

```
Feb 14 03:54:06 vivek kernel: bond0: (slave ens224): Releasing backup interface
Feb 14 03:54:06 vivek NetworkManager[1178]: <info> [1644828846.4248] device (ens224): state change: activated -> unmanaged (reason 'removed', sys-iface-state: 'removed')
Feb 14 03:54:06 vivek NetworkManager[1178]: <info> [1644828846.4248] device (bond0): bond slave ens224 was released
Feb 14 03:54:06 vivek NetworkManager[1178]: <info> [1644828846.4248] device (ens224): released from master device bond0
Feb 14 03:54:06 vivek dbus-daemon[1024]: [system] Activating via systemd: service name='org.freedesktop.nm_dispatcher' unit='dbus-org.freedesktop.nm_dispatcher.service' requested by '/usr/sbin/NetworkManager --no-daemon' label='system_u:system_r:NetworkManager_t:s0'
```

The image shows a NetworkManager configuration window for a network profile named 'bond0'. The window is divided into several sections:

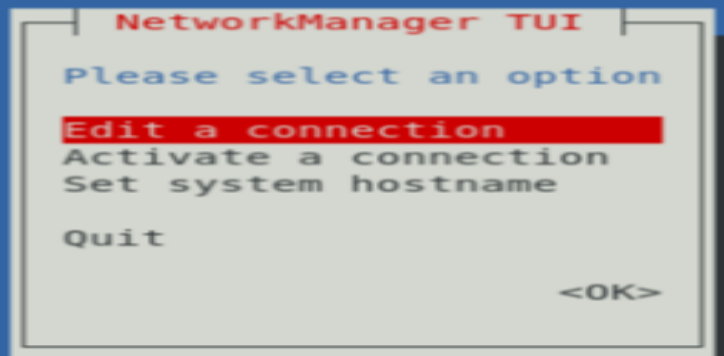
- Profile name:** bond0
- Device:** bond0
- BOND Slaves:** A list of slave interfaces. 'ens224' is currently selected, and 'ens160' is also listed. To the right of the list are buttons for '<Add>', '<Edit...>', and '<Delete>'. A '<Hide>' button is also present.
- Mode:** <Active Backup> (highlighted in red)
- Primary:** A button to set the primary slave.
- Link monitoring:** <MII (recommended)>
- Monitoring frequency:** ms
- Link up delay:** ms
- Link down delay:** ms
- Cloned MAC address:** A text field for cloning the MAC address.
- IPv4 CONFIGURATION:** A section with a '<Manual>' dropdown and a '<Hide>' button.
 - Addresses:** 192.168.10.2/24 (with a '<Remove>' button) and a '<Add...>' button.
 - Gateway:** 192.168.0.0
 - DNS servers:** <Add...>
 - Search domains:** <Add...>
 - Routing:** (No custom routes) <Edit...>
 - ☐ Never use this network for default route
 - ☐ Ignore automatically obtained routes
 - ☐ Ignore automatically obtained DNS parameters
 - ☐ Require IPv4 addressing for this connection

ADVANCE NETWORK CONFIGURATION

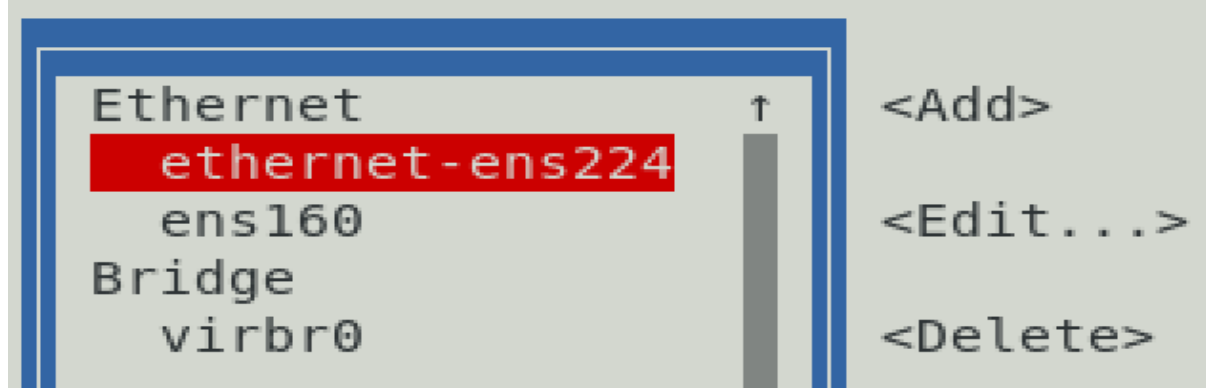
Nmtui to used round -rr

```
[root@localhost ~]# nmcli con up ens160
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/3)
[root@localhost ~]# nmcli con up ens224
Error: unknown connection 'ens224'.
[root@localhost ~]# nmcli con add type Ethernet autoconnect yes ifname ens224
Connection 'ethernet-ens224' (7f3e9284-ba6d-43db-980d-ed23c42150f3) successfully added.
[root@localhost ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.142/24 brd 192.168.238.255 scope global dynamic noprefixroute ens160
        valid_lft 1744sec preferred_lft 1744sec
    inet6 fe80::8fd2:f358:747c:dc70/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
3: ens224: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:1f brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.143/24 brd 192.168.238.255 scope global dynamic noprefixroute ens224
        valid_lft 1782sec preferred_lft 1782sec
    inet6 fe80::ee27:a049:cd5:980e/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
        valid_lft forever preferred_lft forever
5: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
```

Click edit connection



Click ethernet



ADVANCE NETWORK CONFIGURATION

Add to ethernet

Ethernet	↑	<Add>
ethernet-ens224		
ens160		<Edit...>
Bridge		
virbr0		<Delete>

Select bond option

New Connection

Select the type of connection you wish to create.

DSL	↑
Ethernet	
InfiniBand	
Wi-Fi	
Bond	↓

<Cancel> <Create>

Create bond file

Edit Connection

Profile name bond0
Device bond0

BOND Slaves <Hide>

ens224	↑	<Add>
ens160		<Edit...>
	↓	<Delete>

Mode <Round-robin>
Link monitoring <MII (recommended)>
Monitoring frequency 100 ms
Link up delay 0 ms
Link down delay 0 ms
Cloned MAC address

IPv4 CONFIGURATION <Manual> <Hide>

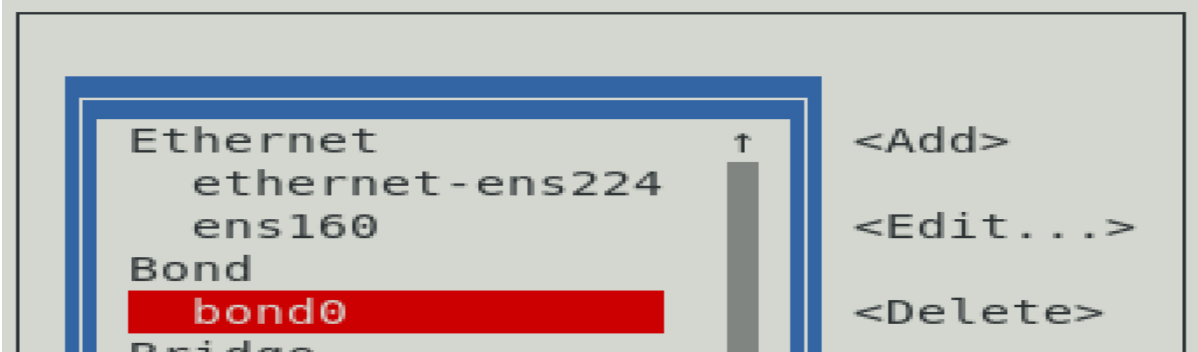
Addresses 192.168.238.150 <Remove>
<Add...>
Gateway 192.168.238.1
DNS servers <Add...>
Search domains <Add...>

Routing (No custom routes) <Edit...>
[] Never use this network for default route
[] Ignore automatically obtained routes
[] Ignore automatically obtained DNS parameters
[] Require IPv4 addressing for this connection

= IPv6 CONFIGURATION <Automatic> <Show>

ADVANCE NETWORK CONFIGURATION

Create bond0



Services restart

```
[root@localhost ~]# systemctl restart NetworkManager
[root@localhost ~]# cd /etc/sysconfig/network-scripts/
[root@localhost network-scripts]# ls
ifcfg-bond0 ifcfg-ens160 ifcfg-ens160-1 ifcfg-ens224 ifcfg-ethernet-ens224
```

Move to old ens to new ens

```
[root@localhost network-scripts]# ls
ifcfg-bond0 ifcfg-ens160 ifcfg-ens160-1 ifcfg-ens224 ifcfg-ethernet-ens224
[root@localhost network-scripts]# mv ifcfg-ens224 ifcfg-ethernet-ens224
mv: overwrite 'ifcfg-ethernet-ens224'? y
[root@localhost network-scripts]# mv ifcfg-ens160-1 ifcfg-ens160
mv: overwrite 'ifcfg-ens160'? y
[root@localhost network-scripts]#
```

Check ip

```
[root@localhost network-scripts]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.142/24 brd 192.168.238.255 scope global dynamic noprefixroute ens160
        valid_lft 1542sec preferred_lft 1542sec
    inet6 fe80::8fd2:f358:747c:dc70/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
3: ens224: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:1f brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.143/24 brd 192.168.238.255 scope global dynamic noprefixroute ens224
        valid_lft 1542sec preferred_lft 1542sec
    inet6 fe80::ee27:a049:cd5:980e/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
        valid_lft forever preferred_lft forever
5: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
6: bond0: <NO-CARRIER,BROADCAST,MULTICAST,MASTER,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 16:88:02:bf:1e:66 brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.150/24 brd 192.168.238.255 scope global noprefixroute bond0
        valid_lft forever preferred_lft forever
```

all network adapter one time restart

```
[root@localhost network-scripts]# nmcli con down ens224 && nmcli con up ens224
Connection 'ens224' successfully deactivated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/3)
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/6)
[root@localhost network-scripts]# nmcli con down ens160 && nmcli con up ens160
Connection 'ens160' successfully deactivated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/2)
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/8)
[root@localhost network-scripts]# nmcli con down bond0 && nmcli con up bond0
Connection 'bond0' successfully deactivated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/1)
Connection successfully activated (master waiting for slaves) (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/9)
```

ADVANCE NETWORK CONFIGURATION

Check only one bond ip is available

```
[root@localhost network-scripts]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc fq_codel master bond0 state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
3: ens224: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc fq_codel master bond0 state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
        valid_lft forever preferred_lft forever
5: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
7: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.150/24 brd 192.168.238.255 scope global noprefixroute bond0
        valid_lft forever preferred_lft forever
    inet6 fe80::2de5:1bad:e68f:348c/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
```

Check bonding status

```
[root@localhost network-scripts]# cat /proc/net/bonding/bond0
Ethernet Channel Bonding Driver: v3.7.1 (April 27, 2011)

Bonding Mode: load balancing (round-robin)
MII Status: up
MII Polling Interval (ms): 100
Up Delay (ms): 0
Down Delay (ms): 0
Peer Notification Delay (ms): 0

Slave Interface: ens160
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 0
Permanent HW addr: 00:0c:29:d5:2a:15
Slave queue ID: 0

Slave Interface: ens224
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 0
Permanent HW addr: 00:0c:29:d5:2a:1f
Slave queue ID: 0
```

Check ping

```
[root@localhost ~]# ping c
PING client.l.org (192.168.238.138) 56(84) bytes of data:
64 bytes from client.l.org (192.168.238.138): icmp_seq=1 ttl=64 time=1.27 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=2 ttl=64 time=1.08 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=3 ttl=64 time=1.08 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=4 ttl=64 time=1.83 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=5 ttl=64 time=1.12 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=6 ttl=64 time=1.03 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=7 ttl=64 time=1.56 ms
64 bytes from client.l.org (192.168.238.138): icmp_seq=8 ttl=64 time=1.06 ms
^C
```

ADVANCE NETWORK CONFIGURATION

```
[root@server ~]# ping s
PING server.l.org (192.168.238.150) 56(84) bytes of data.
64 bytes from server.l.org (192.168.238.150): icmp_seq=1 ttl=64 time=0.741 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=2 ttl=64 time=1.07 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=3 ttl=64 time=0.542 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=4 ttl=64 time=1.12 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=5 ttl=64 time=1.18 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=6 ttl=64 time=0.938 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=7 ttl=64 time=0.973 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=8 ttl=64 time=1.31 ms
```

```
64 bytes from server.l.org (192.168.238.150): icmp_seq=22 ttl=64 time=0.682 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=23 ttl=64 time=1.03 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=24 ttl=64 time=0.657 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=25 ttl=64 time=0.777 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=26 ttl=64 time=1.02 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=27 ttl=64 time=1.29 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=28 ttl=64 time=1.17 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=29 ttl=64 time=0.815 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=30 ttl=64 time=1.25 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=31 ttl=64 time=1.02 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=32 ttl=64 time=1.11 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=33 ttl=64 time=1.07 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=34 ttl=64 time=1.06 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=35 ttl=64 time=1.10 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=36 ttl=64 time=1.48 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=37 ttl=64 time=0.997 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=38 ttl=64 time=1.05 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=39 ttl=64 time=1.13 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=40 ttl=64 time=1.07 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=41 ttl=64 time=1.09 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=42 ttl=64 time=0.757 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=43 ttl=64 time=0.784 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=44 ttl=64 time=0.863 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=45 ttl=64 time=1.02 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=46 ttl=64 time=1.22 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=47 ttl=64 time=1.05 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=48 ttl=64 time=0.868 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=49 ttl=64 time=1.04 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=50 ttl=64 time=0.778 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=51 ttl=64 time=1.11 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=52 ttl=64 time=0.731 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=53 ttl=64 time=0.348 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=54 ttl=64 time=1.21 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=55 ttl=64 time=1.24 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=56 ttl=64 time=2.07 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=57 ttl=64 time=1.09 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=58 ttl=64 time=1.17 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=59 ttl=64 time=1.15 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=60 ttl=64 time=1.06 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=61 ttl=64 time=1.18 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=62 ttl=64 time=2.22 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=63 ttl=64 time=0.564 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=64 ttl=64 time=0.626 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=65 ttl=64 time=1.23 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=66 ttl=64 time=1.12 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=67 ttl=64 time=1.03 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=68 ttl=64 time=1.06 ms
```

```
[root@server ~]# ping s
PING server.l.org (192.168.238.150) 56(84) bytes of data.
From client.l.org (192.168.238.138) icmp_seq=1 Destination Host Unreachable
From client.l.org (192.168.238.138) icmp_seq=2 Destination Host Unreachable
From client.l.org (192.168.238.138) icmp_seq=3 Destination Host Unreachable
From client.l.org (192.168.238.138) icmp_seq=4 Destination Host Unreachable
^C
--- server.l.org ping statistics ---
6 packets transmitted, 0 received, +4 errors, 100% packet loss, time 5003ms
pipe 4
```

```
PING server.l.org (192.168.238.150) 56(84) bytes of data.
64 bytes from server.l.org (192.168.238.150): icmp_seq=1 ttl=64 time=1.48 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=2 ttl=64 time=1.08 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=3 ttl=64 time=1.03 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=4 ttl=64 time=1.05 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=5 ttl=64 time=1.08 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=6 ttl=64 time=1.05 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=7 ttl=64 time=1.00 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=8 ttl=64 time=1.02 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=9 ttl=64 time=0.989 ms
```


ADVANCE NETWORK CONFIGURATION

```
[root@server ~]# ping s
PING server.l.org (192.168.238.150) 56(84) bytes of data:
64 bytes from server.l.org (192.168.238.150): icmp_seq=1 ttl=64 time=1.48 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=2 ttl=64 time=1.08 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=3 ttl=64 time=1.03 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=4 ttl=64 time=1.05 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=5 ttl=64 time=1.08 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=6 ttl=64 time=1.05 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=7 ttl=64 time=1.00 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=8 ttl=64 time=1.02 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=9 ttl=64 time=0.989 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=10 ttl=64 time=0.509 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=11 ttl=64 time=0.804 ms
64 bytes from server.l.org (192.168.238.150): icmp_seq=12 ttl=64 time=0.677 ms
^C
--- server.l.org ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11022ms
rtt min/avg/max/mdev = 0.509/0.983/1.484/0.233 ms
```

```
[root@localhost ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc fq_codel master bond0 state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
3: ens224: <NO-CARRIER,BROADCAST,MULTICAST,SLAVE,UP> mtu 1500 qdisc fq_codel master bond0 state DOWN group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
        valid_lft forever preferred_lft forever
5: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN group default qlen 1000
    link/ether 52:54:00:72:3e:2b brd ff:ff:ff:ff:ff:ff
7: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 00:0c:29:d5:2a:15 brd ff:ff:ff:ff:ff:ff
    inet 192.168.238.150/24 brd 192.168.238.255 scope global noprefixroute bond0
        valid_lft forever preferred_lft forever
    inet6 fe80::2de5:1bad:e68f:348c/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
```

ADVANCE NETWORK CONFIGURATION

Active – backup

Edit Connection

Profile name: **bond0**
Device: **bond0**

BOND Slaves <Hide>

ens224
ens160

<Add>
<Edit...>
<Delete>

Mode: **<Active Backup>**

Primary: **<MII (recommended)>**

Link monitoring: **100** ms

Monitoring frequency: **0** ms

Link up delay: **0** ms

Link down delay: **0** ms

Cloned MAC address: **<Add...>**

IPv4 CONFIGURATION <Manual> <Hide>

Addresses: **192.168.238.150/24** <Remove>
<Add...>

Gateway: **192.168.238.1**

DNS servers: <Add...>

Search domains: <Add...>

Routing (No custom routes) <Edit...>

☐ Never use this network for default route

☐ Ignore automatically obtained routes

☐ Ignore automatically obtained DNS parameters

☐ Require IPv4 addressing for this connection

IPv6 CONFIGURATION <Automatic> <Show>

```
[root@server ~]# ping 192.168.238.150
PING 192.168.238.150 (192.168.238.150) 56(84) bytes of data:
64 bytes from 192.168.238.150: icmp_seq=1 ttl=64 time=1.64 ms
64 bytes from 192.168.238.150: icmp_seq=2 ttl=64 time=0.512 ms
64 bytes from 192.168.238.150: icmp_seq=3 ttl=64 time=0.992 ms
64 bytes from 192.168.238.150: icmp_seq=4 ttl=64 time=1.12 ms
64 bytes from 192.168.238.150: icmp_seq=5 ttl=64 time=1.09 ms
64 bytes from 192.168.238.150: icmp_seq=6 ttl=64 time=1.18 ms
64 bytes from 192.168.238.150: icmp_seq=7 ttl=64 time=1.07 ms
64 bytes from 192.168.238.150: icmp_seq=8 ttl=64 time=0.942 ms
64 bytes from 192.168.238.150: icmp_seq=9 ttl=64 time=0.934 ms
64 bytes from 192.168.238.150: icmp_seq=10 ttl=64 time=1.11 ms
64 bytes from 192.168.238.150: icmp_seq=11 ttl=64 time=0.836 ms
64 bytes from 192.168.238.150: icmp_seq=12 ttl=64 time=0.858 ms
64 bytes from 192.168.238.150: icmp_seq=13 ttl=64 time=0.528 ms
64 bytes from 192.168.238.150: icmp_seq=14 ttl=64 time=0.749 ms
64 bytes from 192.168.238.150: icmp_seq=15 ttl=64 time=10.3 ms
64 bytes from 192.168.238.150: icmp_seq=16 ttl=64 time=0.556 ms
64 bytes from 192.168.238.150: icmp_seq=17 ttl=64 time=0.842 ms
64 bytes from 192.168.238.150: icmp_seq=18 ttl=64 time=1.07 ms
^C
--- 192.168.238.150 ping statistics ---
18 packets transmitted, 18 received, 0% packet loss, time 17037ms
rtt min/avg/max/mdev = 0.512/1.465/10.316/2.163 ms
```

ADVANCE NETWORK CONFIGURATION

```
[root@server ~]# cat /proc/net/bonding/bond0
Ethernet Channel Bonding Driver: v3.7.1 (April 27, 2011)

Bonding Mode: fault-tolerance (active-backup)
Primary Slave: None
Currently Active Slave: ens160
MII Status: up
MII Polling Interval (ms): 100
Up Delay (ms): 0
Down Delay (ms): 0
Peer Notification Delay (ms): 0

Slave Interface: ens160
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 0
Permanent HW addr: 00:0c:29:d5:2a:15
Slave queue ID: 0

Slave Interface: ens224
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 0
Permanent HW addr: 00:0c:29:d5:2a:1f
Slave queue ID: 0
```