

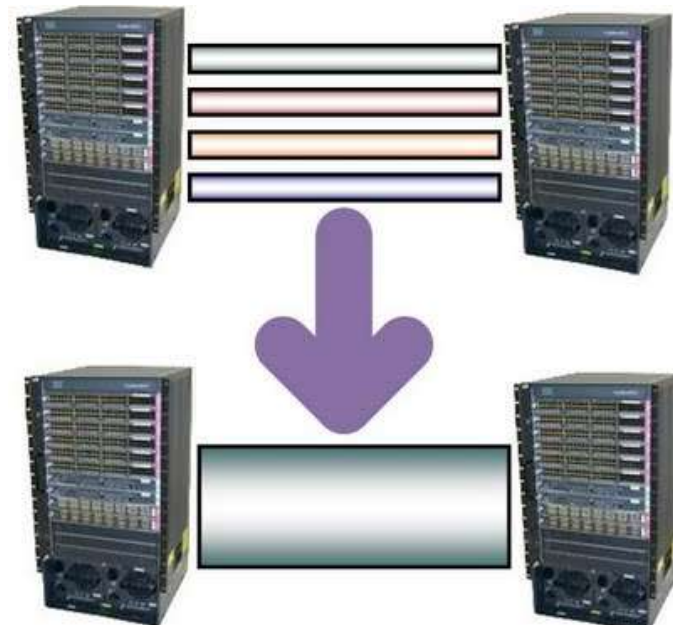


LPIC-1 TRAINING COURSE

Advanced Topic 1: Linux Network Bonding

What is Bonding

- ❖ Two or more network interface on a host computer are combined
 - For redundancy
 - And/or for increased throughput
- ❖ So-called *Link Aggregation*, *Port Aggregation*, *Etherchannel*, *NIC teaming*...



Linux Bonding Modes

- ❖ **mode=1** (active-backup): only one slave in the bond is active
 - provide fault tolerance
- ❖ **mode=2** (balance-xor): transmits based on XOR policy
 - provide load balancing and fault tolerance
- ❖ **mode=3** (broadcast): transmits everything on all slave interface
 - provide fault tolerance
- ❖ **mode=4** (802.3ad): Utilizes all slaves in the active aggregator according to the 802.3ad specification
 - provide load balancing and fault tolerance
 - Prerequisites: **ethtool** support in the base driver, a switch that supports IEEE802.3ad
- ❖ **mode=5** (balance-tlb): Adaptive transmit load balancing. Outgoing traffic is distributed, incoming traffic is received by the current slave
 - provide load balancing and fault tolerance
- ❖ **mode=6** (balance-alb): transmit load balancing + receive load balancing
 - provide load balancing and fault tolerance

Linux Bonding Configuration: Step 1

- ❖ Add the following to */etc/modprobe.conf*:
alias bond0 bonding
options bond0 miimon=80 mode=5

Linux Bonding Configuration: Step 2

- ❖ Create the *ifcfg-bond0* in the */etc/sysconfig/network-scripts* directory:

DEVICE=bond0

IPADDR=<ip address>

NETMASK=<netmask>

GATEWAY=<gateway>

ONBOOT=yes

BOOTPROTO=none

USERCTL=no

Linux Bonding Configuration: Step 3

- ❖ Change the *ifcfg-ethX* in the */etc/sysconfig/network-scripts* for all interfaces belong to the bond:

DEVICE=ethX

ONBOOT=yes

BOOTPROTO=none

USERCTL=no

MASTER=bond0

SLAVE=yes

Linux Bonding Configuration: Step 3

- ❖ Change the *ifcfg-ethX* in the */etc/sysconfig/network-scripts* for all interfaces belong to the bond:

DEVICE=ethX

ONBOOT=yes

BOOTPROTO=none

USERCTL=no

MASTER=bond0

SLAVE=yes

Linux Bonding Configuration: Step 4

- ❖ Restart networking service in order to bring up **bond0** interface:
service network restart

Querying Bonding Configuration

- ❖ `ifconfig`
- ❖ `less /proc/net/bonding/bond0`
- ❖ `cat /sys/class/net/bonding_masters`
(*RHEL5 or CentOS5*)

Configure bonding via sysfs

❖ Available in RHEL5 or CentOS 5

❖ Creating and Destroying Bonds:

- Add a new bond **bond0**:
`echo +bond0 > /sys/class/net/bonding_masters`
- Remove an existing bond **bond1**:
`echo -bond1 > /sys/class/net/bonding_masters`
- Show all existing bonds:
`cat /sys/class/net/bonding_masters`

❖ Adding and Removing Slaves:

- Enslave interface **eth0** to bond **bond0**:
`echo +eth0 > /sys/class/net/bond0/bonding/slaves`
- Free slave **eth0** from bond **bond0**:
`echo -eth0 > /sys/class/net/bond0/bonding/slaves`



Thank You !