



# Configure NIC Teaming for Business Edition 6000H/M

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- [NIC Teaming, page 1](#)
- [Configure NIC Teaming in ESXi, page 2](#)
- [Configure NIC Teaming on Switch, page 2](#)

## NIC Teaming

The Hypervisor NIC teaming feature allows multiple physical adapters to be associated with a vSwitch to provide load sharing and failover connectivity to the external network.

### Failover and Load Balancing

When additional physical adapters are assigned to a vSwitch, they may be assigned as either active or standby. Depending on the way in which the appliance is connected to the physical network, traffic from virtual machines may be load balanced across active connections and, in the event of a link failure, a standby adapter will be made active to take over.

### Switched Network Topologies

To maximize resiliency to failure, teamed interfaces are typically connected to different switching equipment. This might involve connecting to separate line cards in a chassis, switches in a stack, or to completely independent devices.

Where independent physical switches are used, teamed interfaces should be set to active, allowing the Ethernet Spanning Tree protocol to block connections that create a loop. In the event of a link or switch failure, the Spanning Tree protocol will reconverge to use a serviceable connection to the appliance. Where VLAN trunking is used, the Spanning Tree protocol can typically be configured per VLAN to prefer different connections for DMZ and internal network traffic under normal operation.

If connections are made to a common logical switch (i.e. chassis or cluster) that supports IEEE 802.3ad link aggregation, it is possible to load balance traffic across all active members of the link group under normal operation. Link aggregation can accommodate link failures more quickly than Spanning Tree and is transparent to VLANs, so may be used with either dedicated network, or VLAN trunk connections.

The following table illustrates how Business Edition appliances may accommodate network separation and NIC teaming.

## Configure NIC Teaming in ESXi

### Procedure

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- Step 1** Log in to vSphere Client.
- Step 2** In the left inventory panel, click the host icon.
- Step 3** From the **Configuration** tab, select **Networking**.
- Step 4** Click **Properties** to access the switch configuration.
- Step 5** Select the **Physical Adapters** that should be added to the switch and click **Next**.
- Note** We recommend that you team a mix of motherboard and PCI card network adapters.
- Step 6** Use the **Move Up** and **Move Down** buttons to adjust the failover policy for the added ports. If you want to use an adapter for failover, move the adapter from the **Active Adapter** list to the **Standby Adapter** list.
- Step 7** Click **Next**.
- Step 8** Click **Finish**.  
If you don't need to configure IEEE 802.3ad link aggregation, you can close the vSwitch properties page and skip the remaining steps.
- Step 9** Configure IEEE 802.3 link aggregation:
- From the **vSwitch0 Properties** page, Select the **Ports** tab and **Edit** the vSwitch object.
  - Select the **NIC Teaming** tab.
  - From the **Load Balancing** drop-down menu, select **Route based on IP hash**.
  - Click **OK**.
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## Configure NIC Teaming on Switch

When aggregating appliance interfaces, the switch ports to which they are connected must be configured to use 802.3ad link aggregation. The following example illustrates how this may be configured using VLAN trunking to a Cisco Catalyst switch:

```
vlan 1
 name default
!
vlan 30
 name DMZ
!
interface GigabitEthernet1/1
 description BE Server Network Interface 1 (Internal/DMZ trunk group)
 switchport trunk allowed vlan 1,30
 switchport mode trunk
 spanning-tree portfast trunk
 channel-group 1 mode passive
!
interface GigabitEthernet1/5
 description BE Server Network Interface 2 (Internal/DMZ trunk group)
```

```
switchport trunk allowed vlan 1,30
switchport mode trunk
spanning-tree portfast trunk
channel-group 1 mode passive
!
```

When connecting appliance interfaces to separate switches, use standard trunk port configuration (no channel-group). Do not use Spanning-Tree Portfast.

```
vlan 1
 name default
!
vlan 30
 name DMZ
!
interface GigabitEthernet1/1
 description BE Server Network Interface 1 (Internal/DMZ trunk)
 switchport trunk allowed vlan 1,30
 switchport mode trunk
!
```

The Spanning Tree VLAN cost command may be used balance traffic between links, if required.

