



# Ports and Port Channels

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## Configuring Port Channels

### Information About Port Channels

Port channels provide a mechanism for combining individual links into a group to create a single logical link that provides the aggregate bandwidth of up to eight physical links. Port channels provide increased bandwidth and redundancy and balance the traffic load between the members port. If a member port within a port channel fails, traffic previously carried over the failed port switches to the remaining member ports.

Port channels can be configured using static mode (no protocol) or the Link Access Control Protocol (LACP). Any configuration changes that you apply to the port channel are applied to each member port of the port channel. A port channel must have at least two ports. A port channel can be added to a bridge. A bond is created when a port channel has more than two members and the port channel is added to a bridge.

A port can be a member of only one port channel. All the ports in a port channel must be compatible; they must use the same speed and operate in full-duplex mode.

### Port Channels Bond Mode

A port channel can be configured for the following bond modes:

- **active-backup**: In this mode, one of the ports in the aggregated link is active and all others ports are in the standby mode.
- **balance-slb**: In this mode, load balancing of traffic is done based on the source MAC address and VLAN.
- **balance-tcp**: In this mode, 5-tuple (source and destination IP, source and destination port, protocol) is used to balance traffic across the ports in an aggregated link.

## Port Channels LACP Mode

A port channel can be configured for the following LACP modes:

- **off**: Indicates that no mode is applicable.
- **active**: Indicates that the port initiates transmission of LACP packets.
- **passive**: Indicates that the port only responds to the LACP packets that it receives but does not initiate the LACP negotiation.

## Creating a Port Channel

To create a port channel:

```
configure terminal
pnac pc type port_channel lacp_type active bond_mode balance-tcp trunks 10, 20
commit
```

### Port Channel Creation APIs and Commands

APIs	Commands
/api/config/pnics	pnac <i>name</i> type port_channel
/api/operational/pnics	show pnac

## Adding a Port to a Port Channel

A port channel must have at least two ports. A bond is created when a port channel has more than two members and the port channel is added to a bridge. You can add a port to a new port channel or a port channel that already contains ports.

To add a port to a port channel:

```
configure terminal
pnac eth1 member_of pc
commit
```

### Adding a Port to a Port Channel APIs and Commands

APIs	Commands
/api/config/pnics/pnac/ <i>name</i> /member_of	pnac <i>name</i> member_of <i>portchannel_name</i>

## Adding a Port Channel to a Bridge

You can add a port channel to a new bridge or an existing bridge. When a port channel is added to a bridge, a bond is added for the port channel.

To add a port channel to a bridge:

```
configure terminal
bridges bridge test-br port pc
commit
```

### Adding a Port Channel to a Bridge APIs and Commands

APIs	Commands
/api/config/bridges/bridge/ <i>bridgename</i>	bridges bridge <i>name</i> port <i>portchannel_name</i>

## Deleting a Port Channel

Before deleting a port channel, you must remove all members assigned to the port channel. If the port channel is configured on the bridge, you must remove the port channel from the bridge.

To delete a port channel:

```
configure terminal
no pnic pc
commit
```

### Port Channel Deletion APIs and Commands

APIs	Commands
/api/config/pnics/pnic/ <i>portchannel_name</i>	no pnic <i>portchannel_name</i>
/api/operational/pnics	show pnic

## Removing a Port from a Port Channel

To remove a port from a port channel:

```
configure terminal
no pnic eth1 member_of pc
commit
```

### Removing a Port from a Port Channel APIs and Commands

APIs	Commands
/api/config/pnics/pnic/ <i>name</i> /member_of	no pnic <i>name</i> member_of <i>portchannel_name</i>

## Removing a Port Channel from a Bridge

To remove a port channel from a bridge:

```
configure terminal
no bridges bridge test-br port pc
commit
```

**Removing a Port Channel from a Bridge APIs and Commands**

APIs	Commands
/api/config/bridges/bridge/ <i>bridgename</i>	no bridges bridge <i>bridgename</i> port <i>portname</i>

## Configuring LLDP

To enable LLDP on a port:

```
configure terminal
pnic eth0 lldp enabled
commit
```

To disable LLDP on a port:

```
configure terminal
pnic eth0 lldp disabled
commit
```

**LLDP Configuration APIs and Commands**

APIs	Commands
/api/config/pnics/pnic/ <i>portname</i> /lldp	pnic <i>name</i> lldp
/api/operational/lldp	show lldp
/api/operational/lldp?deep	

## Configuring Admin Status of a Port

To bring a port up administratively:

```
configure terminal
pnic eth5 adminstatus up
commit
```

To bring a port down administratively:

```
configure terminal
pnic eth5 adminstatus down
commit
```

**Admin Status Configuration APIs and Commands**

APIs	Commands
/api/config/pnics/pnic/ <i>portname</i> /adminstatus	pnic <i>name</i> adminstatus

# Tracking Changes for a Port



**Note** This feature is supported only on ENCS 5400.

The configured VNICs tracks the state of the ports based on the PNICs notifications. To verify the state of the port, use **show interface** or **ethtool** commands. You can also use commands specific to the VM, that displays the interface link state.

To configure track state on GE0-0 & GE0-1:

```
configure terminal
pnic GE0-0 track-state ROUTER 1
end
```

To configure track state on switch port:

```
configure terminal
switch interface gigabitEthernet 1/0 track-state ROUTER 2
end
```

# Speed, Duplex and Autonegotiation

To enable autonegotiation on a port:

```
configure terminal
pnic GE0-0 speed auto duplex auto
commit
```

To configure speed and duplex with non auto values:

```
configure terminal
pnic GE0-0 speed 100 duplex full
commit
```

Speed can be set to 10, 100, 1G, 10G, 10G\_PF, 10G\_SR, 10G\_VF and auto. Duplex values can be set at full, half and auto.

Use **show pnic GE0-0 operational-speed**, **show pnic GE0-0 operational-duplex** and **show pnic GE0-0 autoneg** to verify the configurations.



**Note** The speed and duplex configurations are dependent on the peer configuration. If the peer is set at a certain speed and duplex, NFVIS port is set to match that speed. Not all ports on ENCS 5000 series hardware devices support Automatic medium-dependent interface crossover (auto-MDIX) feature. Based on the port connected to the ENCS device, the cable type used to connect to the peer and the speed or duplex settings on the peer, you can try straight through and cross over cable.

