Understanding Aggregated Ethernet Interfaces and LACP

IEEE 802.3ad link aggregation enables you to group Ethernet interfaces to form a single link layer interface, also known as a *link aggregation group (LAG)* or *bundle*.

Aggregating multiple links between physical interfaces creates a single logical point-to-point trunk link or a LAG. The LAG balances traffic across the member links within an aggregated Ethernet bundle and effectively increases the uplink bandwidth. Another advantage of link aggregation is increased availability, because the LAG is composed of multiple member links. If one member link fails, the LAG continues to carry traffic over the remaining links.

Link Aggregation Group (LAG)

You configure a LAG by specifying the link number as a physical device and then associating a set of ports with the link. All the ports must have the same speed and be in full-duplex mode. Juniper Networks JUNOS Software for EX Series Ethernet Switches assigns a unique ID and port priority to each port. The ID and priority are not configurable. When configuring LAGs, consider the following guidelines:

- Up to 12 Ethernet interfaces can be added to a LAG.
- Up to 64 LAGs are supported in a Virtual Chassis configuration.
- Up to 256 LAGs are supported on Juniper Networks EX8200 Ethernet Switches.
- The LAG must be configured on both sides of the link.
- The interfaces on either side of the link must be set to the same speed.
- You can configure and apply firewall filters on a LAG.
- Link Aggregation Control Protocol (LACP) can optionally be configured for link negotiation.

In a Virtual Chassis you can configure settings and connections so that LAGs are formed over uplink Virtual Chassis ports (VCPs). See Understanding Virtual Chassis Configurations and Link Aggregation.

NOTE: The interfaces that are included within a bundle or LAG are sometimes referred to as *member interfaces*. Do not confuse this term with *member switches*, which refers to Juniper Networks EX4200 Ethernet Switches that are interconnected as a Virtual Chassis. It is possible to create a LAG that is composed of member interfaces that are located in different member switches of a Virtual Chassis.

A LAG creates a single logical point-to-point connection. A typical deployment for a LAG would be to aggregate trunk links between an access switch and a distribution switch or customer edge (CE) router.

If you connect more than one uplink VCP of two member switches and those VCPs are running at the same link speed, a single, logical trunk link forms automatically. See Understanding Virtual Chassis Configurations and Link Aggregation.

Link Aggregation Control Protocol (LACP)

LACP, a subcomponent of IEEE 802.3ad, provides additional functionality for LAGs. When LACP is configured, it detects misconfigurations on the local end or the remote end of the link.

About enabling LACP:

- When LACP is not enabled, a local LAG might attempt to transmit packets to a remote single interface, which causes the communication to fail.
- When LACP is enabled, a local LAG cannot transmit packets unless a LAG with LACP is also configured on the remote end of the link.

By default, Ethernet links do not exchange protocol data units (PDUs), which contain information about the state of the link. You can configure Ethernet links to actively transmit PDUs, or you can configure the links to passively transmit them, sending out LACP PDUs only when they receive them from another link. The transmitting link is known as the *actor* and the receiving link is known as the *partner*.

If the remote end of the LAG link is a security device, LACP might not be supported because security devices require a deterministic configuration. In this case, do not configure LACP. All links in the LAG are permanently operational unless the switch detects a link failure within the Ethernet physical layer or data link layer.

Related Topics

- Understanding Virtual Chassis Configurations and Link Aggregation
- Understanding Redundant Trunk Links on EX Series Switches
- Example: Configuring Aggregated Ethernet High-Speed Uplinks Between a Virtual Chassis Access Switch and a Virtual Chassis Distribution Switch
- Example: Configuring Aggregated Ethernet High-Speed Uplinks with LACP Between a Virtual Chassis Access Switch and a Virtual Chassis Distribution Switch
- *JUNOS Network Interfaces Configuration Guide* at http://www.juniper.net/techpubs/software/junos/junos96/index.html

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