Overview

This chapter contains the following sections:

Licensing Requirements

For a complete explanation of Cisco NX-OS licensing recommendations and how to obtain and apply licenses, see the *Cisco NX-OS Licensing Guide*.

Information About Fibre Channel Over Ethernet

Fibre Channel over Ethernet (FCoE) allows Fibre Channel traffic to be encapsulated over a physical Ethernet link. FCoE and FIP frames use a unique EtherType so that FCoE traffic and standard Ethernet traffic can be carried on the same link.

Classic Ethernet is a best-effort protocol, which means that in a congested network, Ethernet discards packets and relies on higher level protocols to provide retransmission and other reliability mechanisms.

Fibre Channel traffic requires a lossless transport layer; as a data storage protocol, it is unacceptable to lose a single data packet. Native Fibre Channel implements a lossless service at the transport layer using a buffer-to-buffer credit system.

Ethernet links on Cisco NX-OS switches provide two mechanisms to ensure lossless transport for FCoE traffic: link-level flow control and priority flow control.

IEEE 802.3x link-level flow control allows a congested receiver to signal the far end to pause the data transmission for a short period of time. The pause functionality is applied to all traffic on the link.

The priority flow control (PFC) feature on Cisco NX-OS platforms applies pause functionality to specific classes of traffic on the Ethernet link. For example, PFC can provide lossless service for the FCoE traffic and best-effort service for the standard Ethernet traffic using IEEE 802.1p traffic classes.

Fibre Channel Forwarder

Fibre Channel traffic requires a lossless transport layer, which means that it requires a data storage protocol that does not lose a single data packet. A FCoE Forwarder (FCF) communicates with FCoE end devices, such as converged network adapters (CNAs). The FCF accepts the Fibre Channel frame that is encapsulated in an Ethernet packet and forwards that packet over a VLAN across an Ethernet network to a remote FCoE end device. The FCF has a unique FC-MAC address in the FCoE network. An FCF can also assign FC address IDs to the CNAs. An FCF can assign Fabric Provide MAC Addresses (FPMA) to the CNAs consisting of the FC-Map Value for the Fabric and the Fibre Channel IDs (FC IDs) assigned during Fabric Login.

Fibre Channel Bridge

A Fibre Channel Bridge connects an FCoE network to a Fibre Channel network. A Fibre Channel Bridge decapsulates an FCoE frame and sends the Fibre Channel frame to the Fibre Channel network. A Fibre Channel Bridge also encapsulates FC frames from a Fibre Channel network and forwards them to the FCoE network.