Overview

This document describes how to configure unicast routing on the Cisco Industrial Ethernet 2000U Series (IE 2000U) and Connected Grid Switches, hereafter referred to as switch. To use unicast routing, the switch must be running the IP services image.

This chapter provides an overview of the following unicast routing features:

- IPv4 Unicast Routing, page 1-1
- IPv6 Unicast Routing, page 1-1
- Enhanced Object Tracking, page 1-2

IPv4 Unicast Routing

Routers and Layer 3 switches can route packets in the following ways:

- By using default routing—sending traffic with a destination unknown to the router to a default outlet or destination.
- By using preprogrammed static routes for the traffic

  Static unicast routing forwards packets from predetermined ports through a single path into and out of a network. Static routing does not automatically respond to changes in the network and therefore, might result in unreachable destinations.

- By dynamically calculating routes by using a routing protocol

  Dynamic routing protocols are used by routers to dynamically calculate the best route for forwarding traffic. Routing protocols supported by the switch are Routing Information Protocol (RIP), Border Gateway Protocol (BGP), Open Shortest Path First (OSPF) protocol, Enhanced IGRP (EIGRP), System-to-Intermediate System (IS-IS), and Bidirectional Forwarding Detection (BFD).

Related Topics

Chapter 2, "Configuring IP Unicast Routing"

IPv6 Unicast Routing

IPv4 users can move to IPv6 and receive services such as end-to-end security, quality of service (QoS), and globally unique addresses. The IPv6 address space reduces the need for private addresses and Network Address Translation (NAT) processing by border routers at network edges.

IPv6 unicast routing support on the switch includes expanded address capability, header format simplification, improved support of extensions and options, and hardware parsing of the extension header. The switch supports hop-by-hop extension header packets, which are routed or bridged in software.

The switch provides IPv6 routing capability over 802.1Q trunk ports for static routes, Routing Information Protocol (RIP) for IPv6, and Open Shortest Path First (OSPF) Version 3 Protocol. It supports up to 16 equal-cost routes and can simultaneously forward IPv4 and IPv6 frames at line rate.

Related Topics

Chapter 3, "Configuring IPv6 Unicast Routing"

Enhanced Object Tracking

Enhanced object tracking on the switch provides a more complete alternative to the Hot Standby Routing Protocol (HSRP) tracking mechanism, which allows you to track the line-protocol state of an interface. If the line protocol state of an interface goes down, the HSRP priority of the interface is reduced and another HSRP device with a higher priority becomes active. The enhanced object tracking feature separates the tracking mechanism from HSRP and creates a separate, standalone tracking process that can be used by processes other than HSRP. This allows tracking other objects in addition to the interface line-protocol state.

A client process, such as HSRP or Gateway Local Balancing Protocol (GLBP), can register an interest in tracking objects and request notification when the tracked object changes state.This feature increases the availability and speed of recovery of a routing system and decreases outages and outage duration.

Related Topics

Chapter 4, "Configuring Enhanced Object Tracking"