

Building a ring network using industrial switches



AI Overview

To configure a ring network for an industrial switch, you need to select appropriate switches, define the ring topology, configure IP addresses and VLANs, and implement a ring protection protocol such as RSTP, ERPS, or DLR to ensure fast recovery from link failures.

Key Steps for Configuration

- 1. Select Suitable Industrial Switches** Choose industrial-grade switches that support ring topologies and redundancy protocols. Consider factors such as the number of ports, port speed, management capabilities, and environmental tolerance for industrial conditions.
- 2. Define the Ring Topology**
 - Single Ring:** Simple and suitable for small networks. Each switch connects to two other switches forming a closed loop.
 - Multiple Rings:** More complex but provides higher redundancy. Ensure each ring is isolated to prevent protocol conflicts.
- 3. Configure Switch Parameters** Assign IP addresses to each switch for management. Configure VLANs to segment traffic if needed. Set port speeds and duplex settings according to network requirements.
- 4. Implement Ring Protection Protocols**
 - RSTP (Rapid Spanning Tree Protocol):** Provides fast convergence by blocking redundant paths and quickly switching to backup links in case of failure.
 - ERPS (Ethernet Ring Protection Switching, ITU-T G.8032):** Designed for ring topologies, ERPS isolates failed links and restores communication within sub-50ms, supporting both single and multiple ring topologies.
 - DLR (Device Level Ring):** A Layer 2 EtherNet/IP protocol for industrial networks, requiring a ring supervisor node and at least two Ethernet ports per node. DLR supports redundant gateways and fast fault detection.
 - N-Ring (N-Tron proprietary):** Uses a Ring Manager to monitor health check packets and reroutes traffic within ~30ms if a fault is detected.
- 5. Connect the Switches** Use Ethernet cables or optical fibers to connect switches according to the...

Article Content

Editorials: Industrial Ring Networks | ERPS | Antaira Technologies

ERPS Rings simplify network management by providing a vendor-neutral solution that can be used with industrial switches and ports from multiple vendors. This reduces the complexity of

How to Create a 10G Fast Ring Network?

This blog will take you through the entire process of creating a 10G Fast Ring Network. What is a Fast Ring Network (ERPS)? A Fast Ring network refers to a ring topology that leverages

Fiber Optic Ring Network Design Explained:

Learn how to design a fiber optic ring network with practical diagrams, topologies, and switch setup tips. Explore ring network switch options

Ethernet Ring Redundancy

Figure 2, shows a network with spanning tree automatically blocking one of the redundant or ring path connections. Spanning Tree will set a port on

Key Industrial Redundant Ring Protocols You Need to Know

Discover key industrial switch ring protocols, including STP, RSTP, MRP, and ERPS. Build a redundant industrial Ethernet network with fast recovery and uptime.

Industrial Ring Networks | ERPS | Antaira Technologies

Industrial Ethernet switches are critical components in network infrastructures, often used in harsh environments and mission-critical applications. The Ethernet Ring Protection Switching

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The ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) is an open-standard layer 2 Ethernet protocol designed to detect and prevent switching loops from occurring. Originally developed by the

Microsoft Word

Introduction Unlike office Ethernet "star" networks, industrial control applications tend to favour "ring" topology. The "ring" simplifies cabling and provides inherent redundancy. The basic building block for

Ring Redundancy in Industrial Networks for OT Reliability

Discover how industrial ring networks improve OT network redundancy, minimize downtime, and maintain stable communication in mission-critical environments.

Redundant Ring Technology for Industrial Ethernet Applications

Products include industrial embedded computers, industrial Ethernet switches, serial device servers, multiport serial cards, embedded device servers, and remote I/O servers. Our products are key

Best Practices for Designing Redundant Networks for

Redundancy is a crucial aspect of designing and configuring industrial control systems (ICS) to ensure high availability, fault tolerance and

Building Network Redundancy: Why Ring Topology Matters in

Learn why ring topology is vital for network redundancy in industrial Ethernet networks. Discover how it enhances reliability, minimizes downtime, and maintains stable communication in critical operations.

X-Ring Plus Ethernet Industrial Ring Technology

X-Ring Plus resilient ring technology is provided with network operating system 2.0 & is an enhanced version of Case Communications "X-Ring" technology.

Industrial Automation Ring Network Solution

This solution builds a basic two-layer ring network architecture designed to decrease complexity, enhance security, and increase efficiency and operating uptime for your industrial network.

Industrial Ring Networks | ERPS | Antaira Technologies

Antaira's industrial switches are capable of building a fault tolerant ring network with Ethernet Ring Protection Switching (ERPS). An Ethernet Ring can...

Detailed Explanation of the Ring Network Redundancy Function of ...

Behind these scenarios, a core proposition is being repeatedly validated: How can the ring network redundancy function of Ethernet switches build a "never-disconnecting" digital lifeline for industrial

X-Ring Ethernet Industrial Ring Technology

Case Communications X-Ring provides an Ethernet Ring between Industrial Ethernet switches, running at 10 Mbps, 100 Mbps or 1 Gbps. X-Ring can support

Ethernet Ring Redundancy

This document provides basic background information regarding adding ring redundancy in your wired Ethernet networks. It will explore the N-Tron proprietary protocol N-Ring and how it is a

Proprietary Ring Topologies in Automation Networks

In fact, select manufacturers claim much better recovery times for their proprietary ring networks sometimes to within 10 msec. Conclusion on

How Industrial Switches Build Industrial Ring Networks

This article aims to provide a concise yet comprehensive overview of how industrial switches contribute to the formation of industrial ring networks, catering to both traditional industry professionals looking

Fiber Optic Ring Redundancy Design for Industrial Ethernet Switches

5. Redundancy Design as the "Lifeline" of Industrial Networks Fiber optic ring redundancy design represents not just a technical choice but an industrial pursuit of "determinacy"—ensuring real-time,

Redundancy Protocol Configuration Guide, Cisco Catalyst IE3x00,

Device Level Ring (DLR) is a Layer 2 protocol that enables redundancy in a ring topology, providing fast network fault detection and reconfiguration for industrial networks.

Ethernet Ring Redundancy - HMS Support Portal

This document provides basic background information regarding adding ring redundancy in your wired Ethernet networks. It will explore the N-Tron proprietary protocol N-Ring and how it is a step up from

Perle P-Ring Protocol | Industrial Managed Switches

For these reasons, ring topology networks are popular within industrial infrastructures (Fig 1). Caution! Storm Warning: However, when using switches to set up a ring topology network, the administrator

Industrial Lan switch how to group ring network

September 19, 2024 Industrial Lan switch how to group ring network In the industrial Internet of Things, the Industrial Lan Switch group ring network is an important network architecture method that can

Building Network Resilience: Redundancy Protocols and Design in ...

Leading industrial networks often combine multiple resilience strategies for enhanced protection. Multi-ring architectures with ERPS protocols create hierarchical redundancy—a backbone

Contact Us

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