RELY-RB
Time-aware Redbox Switch

Critical systems demand time-aware high-availability networking. Moreover, the complexity of the modern network infrastructures in these premises overcomes the traditional concept of a "managed" device.

RELY-RB is a new concept of an intelligent device that integrates advanced field-proven technology for non-packet-loss redundant Ethernet, sub-microsecond synchronization, and cybersecurity.

The device can merge the whole LAN with redundant networks to interconnect PRP and HSR networks and to extend HSR rings via QuadBox operation.

HSR provides redundancy by sending packets through a ring network in both directions. A simple HSR network consists of Doubly Attached Bridging Nodes, each with two Ethernet ports. An HSR node sends the same frame over both ports.

PRP redundancy is implemented in the nodes rather than in the network. Especially adapted nodes (Dual Attached Nodes – DANs) are connected to two independent Ethernet networks (LAN A and LAN B) and send the same frames over both networks.

RELY-RB implements a similar accuracy level of synchronization that provides a GPS receiver in a device connected to an Ethernet network. The technology required to benefit from this innovation is based on Precise Time Protocol (PTP). This timer can be used for Data timestamping, distributed control, and even operating system synchronization.

These key features make RELY-RB the most suitable time-aware Redbox switch.

Specifications

Communication interfaces

- 1x 10/100/1000Base-TX Ethernet Service copper port
- 4x SFP Cages for 10/100/1000Base-TX Ethernet copper or 100Base-FX/1000Base-X fiber
- Multiple PTP Tri-speed Ethernet ports
- Zero-Packet-Loss redundancy modes:
  - » IEC 62439-3 v3 Clause 5 "High-availability Seamless Redundancy (HSR)"

    Modes: H, N, T, U, HSR-SAN, PRP-HSR, HSR-HSR
  - » EC 62439-3 v3 Clause 4 "Parallel Redundancy Protocol (PRP)"

    Modes: Duplicate discard, duplicate accept
- VLAN support
- Cut-through and Store&Forward switching capability
- Port mirroring

Synchronization

- IEEE 1588-2008 PTPv2.
- Modes: Transparent Clock, Ordinary Clock, Boundary Clock
- IEEE 1588 Stateless Transparent Clock P2P mode to support

Other interfaces

- 1x Pulse-Per-Second (PPS) SMA output

Processing performance

- Xilinx Zynq FPGA with embedded dual-core ARM9 processor
- 1GB DDR3 RAM Memory
- Linux Operating System

Security

- Optional support for IEC 62351-6 wire-speed cryptography
- Security infrastructure for IEC 62351-9 Key Exchange facilities
- AES 256, HMAC, and RSA hardware engines for software and firmware encryption, authentication, and signature
- System Level audited security (OS & Applications)
- Ethernet port isolated from switching infrastructure to implement security-oriented services (NAT, Firewall, VPN, etc.)
- IEEE 802.1X access control for port-based and MAC-based authentication, MAC-Port binding and authentication for login security

Rugged devices

- IEC 61850-3 based design
- Fanless design and full metal enclosure
- Redundant Power Supply: 9VDC to 30 VDC
- Optional PS: 48VDC / 125VDC
- Operating. temperature.: -40°C to +70°C
- Storage temperature.: -40°C to +85°C
- Optional mounting: DIN rail

Configuration and management

- SNMPv3, SSH
- Web-based HTML5-GUI access/configuration
  - » Accessible through HTTP(S)
  - » Configuration profiles and Firmware updates
  - » Real-time network monitoring

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