Huawei OLT H901MPLA Control Board Redundancy and Database Sync Guide - Official Technical Overview & Hardware Datasheet

PRODUCT IDENTIFICATION

Huawei OLT H901MPLA Control Board Redundancy and Database Sync Guide

This document serves as the definitive technical reference for the Huawei OLT H901MPLA Main Processing and Control Board, with a dedicated focus on its advanced high-availability (HA) architecture. This guide details the hardware-level failover mechanisms, the stateful database synchronization (DB Sync) protocol, and the system-level redundancy logic that ensures carrier-grade uptime for Huawei's Optical Line Terminal (OLT) platforms. Engineered to eliminate single points of failure, this control plane solution guarantees sub-50ms switchover times, making it ideal for triple-play services, mobile backhaul, and enterprise access networks.



CORE INTERNAL TOPOLOGY & REDUNDANCY ARCHITECTURE

The H901MPLA is designed as a fully redundant control board for the Huawei MA5800 series OLT chassis. The core architecture is built around a dual-plane design: the Active/Standby control plane and the Synchronous Data Plane.

1. **Active/Standby (1+1) Protection:** In a standard deployment, two H901MPLA boards operate in a 1+1 active/standby configuration. The active board manages system control, signaling, and data forwarding for all line cards. The standby board receives continuous real-time state updates, ensuring a `Hitless` or `Warm` switchover depending on the database synchronization level.

2. **Database Synchronization Logic (DB Sync):** The H901MPLA implements a comprehensive stateful synchronization mechanism. This is divided into:

- **Bulk Sync:** Upon system initialization or board insertion, the active board pushes the full configuration database, routing table (including all dynamic routing entries), and subscriber session information to the standby board.

- **Incremental Sync:** Following the initial bulk sync, the system operates in a real-time update mode. Any modification to the configuration, MAC address table, IP routing entries, or multicast group membership triggers an immediate differential update to the standby board. This ensures data consistency with zero data loss.

3. **Forwarding Engine Redundancy:** The board carries an integrated switching fabric. In the event of an active board failure, the standby board seamlessly assumes control of the backplane, re-routing traffic without requiring the line cards to reload their forwarding tables.

SWITCHING SUBSYSTEM CAPABILITIES

- **High-Speed Fabric Interface:** The H901MPLA connects to the system's backplane via a 900 Gbps switching fabric, enabling non-blocking L2/L3 forwarding across all service ports.

- **Routing & Control Plane:** Powered by a high-performance multi-core CPU (ARM/X86-based architecture) optimized for Layer 2, Layer 3, and MPLS processing. It supports massive routing tables (up to 1M IPv4 routes and 500k

IPv6 routes).

- **Synchronization Protocol:** Utilizes a proprietary HA synchronization protocol that operates over a dedicated physical link between the dual boards. This link is designed with hardware-level redundancy to prevent split-brain scenarios.

OPERATIONAL ADVANTAGES

- **Sub-50ms Switchover:** Ensures uninterrupted service for latency-sensitive applications (VoIP, IPTV).
- **Zero Configuration Disruption:** The standby board inherits all operational parameters, ensuring line cards remain operational without software resets.
- **Predictable Recovery:** Post-switchover, the new active board restores full management functionality within seconds.

SPECIFICATION MATRIX

Parameter	Specification
Redundancy Mode	1+1 Active/Standby Hot Redundancy
Database Sync Mechanism	Stateful (Bulk & Incremental Synchronization)

| **Switchover Time** | < 50 ms (Hardware-assisted) |

| **CPU Complex** | 16-Core ARM Cortex-A72 @ 1.8 GHz |

| **Onboard Memory** | 32 GB DDR4 ECC (Error-Correcting Code) |

| **Forwarding Capacity** | 480 Gbps (Control Plane) / 900 Gbps (Fabric Interconnect) |

| **Routing Table Capacity** | 1 Million IPv4 / 500k IPv6 Routes |

| **MAC Address Capacity** | 1 Million Entries |

| **Management Interfaces** | 1 x Console (RJ45), 1 x Management Ethernet (10/100/1000Base-T) |

| **Synchronization Link** | Dedicated 10GE HA Link between dual boards |

| **Operating Temperature** | -10°C to 55°C (Long-term) |

| **MTBF (Reliability)** | > 1,200,000 Hours |

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CPU Complex	16-Core ARM Cortex-A72 @ 1.8 GHz
Onboard Memory	32 GB DDR4 ECC (Error-Correcting Code)
Forwarding Capacity (Control Plane)	480 Gbps

System Fabric Interconnect	900 Gbps
Routing Table (IPv4/IPv6)	1 Million / 500k Routes
MAC Address Table	1 Million Entries
Management Interfaces	1 x RJ45 Console, 1 x RJ45 10/100/1000Base-T
HA Sync Link	Dedicated 10GE Interface
Operating Temperature	-10°C to 55°C
MTBF (Predicted)	> 1,200,000 Hours

REGULATORY COMPLIANCE

- **EMC Standards:** Compliant with FCC Part 15 (Class A), EN 55022, and CISPR 22.
- **Safety Standards:** IEC 60950-1 / EN 60950-1 (Safety requirements for telecommunication equipment).
- **Environmental:** RoHS compliant, meeting WEEE directives.
- **Network Standards:** ITU-T G.984 (GPON), ITU-T G.987 (XG-PON), IEEE 802.3ah (EFM), and MEF (Metro Ethernet Forum) CE 2.0 standards.


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