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ZebOS®
Network Platform

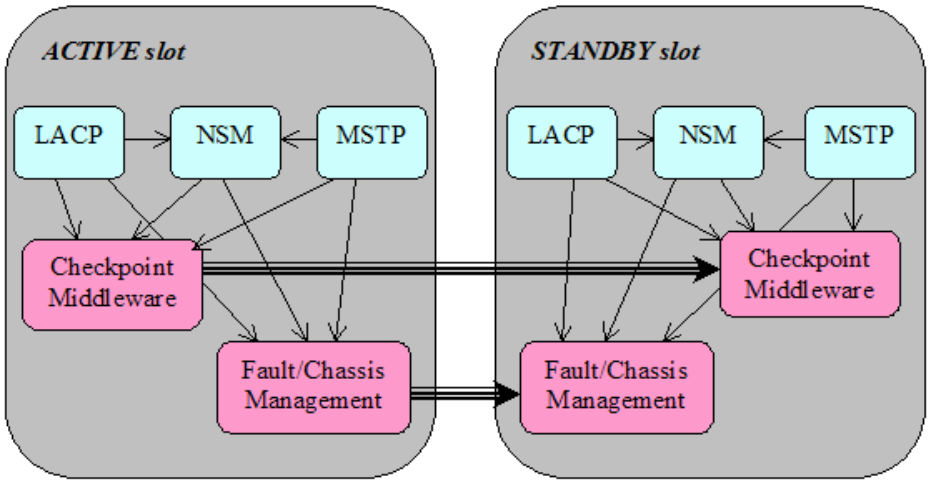
High Availability

Overview

High Availability (HA) ZebOS® Network Platform allows for Simplex-Active or Active-Standby (1+1) control plane CPU redundancy. The ZebOS HA solution includes two types of protocol recovery after a redundancy switchover:

- Immediate Recovery: The system performs immediate recovery of protocols for which complete checkpointing of all protocol states. Link Aggregation Control Protocol (LACP), Multiple Spanning Tree Protocol (MSTP), and the Network Services Manager (NSM) hosting the Routing Information Base (RIB) and Interface Manager are checkpointed between the Active and the Standby controllers.
- Graceful Restart: Gracefully restarts all remaining protocol modules. This allows the rebuilding of both the routing database and the protocol states of any Layer 3 routing protocol, without withdrawing its routes from the ZebOS global Routing Information Base (RIB).

During the post-switchover recovery process, the Layer 2 and Layer 3 forwarding planes continue uninterrupted forwarding of data packets, while the control plane switches to the new Active controller. The following diagram presents the major components participating in the ZebOS HA data checkpoint mechanism.



ZebOS HA Data Checkpointing Mechanism

Fault Management

The latest release of the ZebOS HA solution supports uniform fault error codes, registrations, and notifications that adhere to the Service Availability Forum's (SAF) fault management requirements. ZebOS HA includes a Fault Management library that links to every protocol module to provide a standardized mechanism for fault reporting, report distribution, and tracking fault triggering events and the recovery actions taken.

Features

- Checkpoint Abstraction Layer (CAL)
- Stateful Switchover Operation (SSO) for different HA configurations
- In-Service Software Upgrades (ISSU) capability

Note: This does not include upgrades to the checkpoint schema.

- Transaction-based checkpointing and global post-switchover audits
- Asynchronous completion
- Ability to track occurrences, status, location (in code tree), and recovery actions for PM faults

Benefits

- Internal audit functions reconcile protocol module states providing greater database consistency, and reconcile states between protocol module pairs if data loss occurs.
- External audit process to reconcile global system states
- Consistent states with the standby application during switchover
- Isolation of the ZebOS application from in-house or third-party developed middleware, to provide generic checkpoint supporting functionality from the middleware perspective
- Protocols perform at full speed while submitted checkpoints await asynchronous confirmation

Requirements

- ZebOS Network Services Module

Standards Support

- IEEE 802.3-2002 — MIB Medium Attachment Unites (MAU); Standard for LACP, Section 43.4
- IEEE 802.1D-2004 — MAC Bridging
- IEEE 802.1Q-2003 — Virtual LANs
- SAF-AIS-NTF-A.02.01 — Notification Service
- SAF-AIS-AMF-B.02.01 — Availability Management Framework

Standard Deliverables

- Source Code (written in ANSI-compliant C)
- Installation Guide
- Configuration Guide
- Command Reference Guide
- Developer Guide