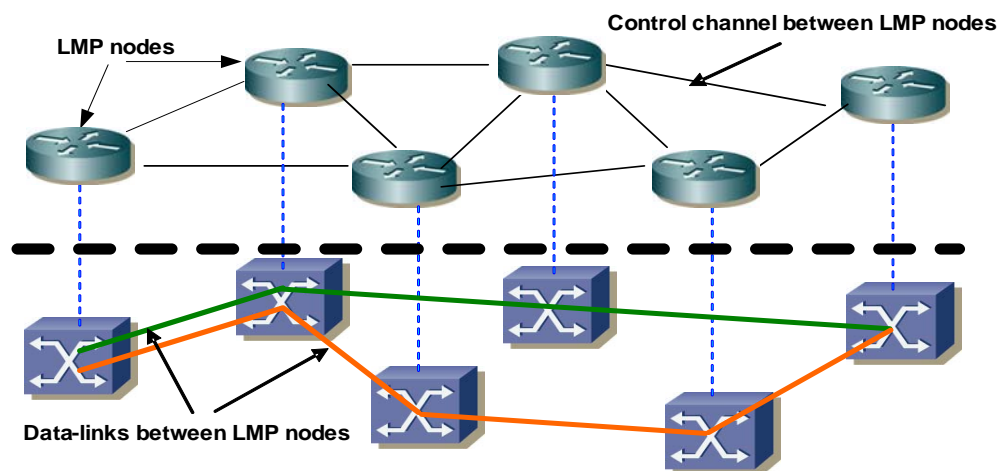


ZebOS®
Network Platform

Link Management Protocol

Overview

IP Infusion's Link Management Protocol (LMP) is an essential member of the ZebOS Network Platform Generalized Multi-Protocol Label Switching (GMPLS) protocol family. GMPLS enhances MPLS architecture by separating the control and data planes of various networking layers. GMPLS enables seamless interconnection and convergence of new and legacy networks by allowing end-to-end provisioning, control, and traffic engineering, even when start and end nodes belong to heterogeneous networks.



GMPLS Control and Data Plane Separation

The Link Management Protocol helps manage links in the control-plane (control channels) and in the data-plane (data links), which may exist separately in a GMPLS network. LMP is an important protocol designed to ease the configuration and management of next-generation optical network devices. Such devices may interconnect with thousands of data-bearing links, and may aggregate into a smaller number of traffic engineering (TE) links.

LMP Modules

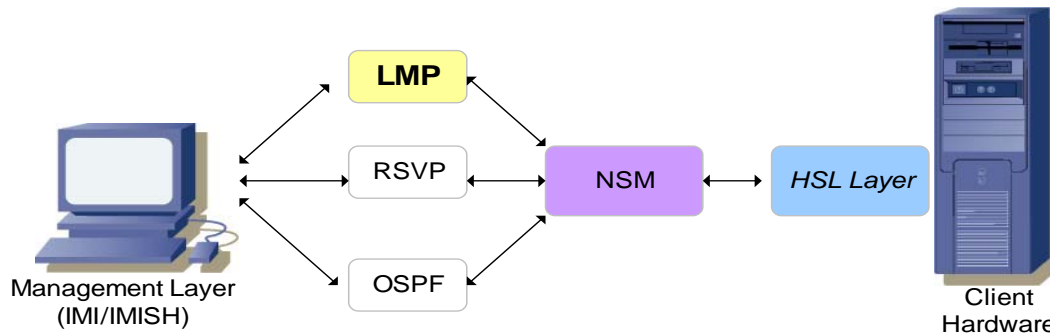
LMP comprises the following key modules:

- **LMP-NSM-Client** The LMP-NSM client interacts with the NSM server.
- **Configuration Manager** The configuration manager interacts with IMI and IMISH for LMP configuration.
- **Control Channel Management Module** The control channel management module establishes and maintains LMP adjacencies.
- **Link Property Correlation Module** The link property correlation module detects inconsistencies between local and remote link mappings.

- **Link Connectivity Verification Module** The link connectivity verification module verifies the physical connectivity of data links and exchanges their identifiers.
- **Fault Localization Module** The fault localization module localizes faults in data links between adjacent LMP nodes.
- **LMP Message Handler** The LMP message handler encodes and decodes LMP messages.

Architecture

In the ZebOS Network Platform architecture, the LMP module is initiated as a separate process running in tight connection with the Network Services Manager (NSM). Most functionality for GMPLS infrastructure and provisioning resides with the NSM module.



LMP Module Interaction in ZebOS

The LMP module decodes GMPLS infrastructure configuration messages from the NSM server, and based on this information, establishes and manages control channel adjacencies. The LMP retrieves the configuration of control-channels, TE-links, and data-links from NSM and performs LMP procedures.

Features

LMP is a control-plane component of GMPLS that supports:

- GMPLS routing (OSPF-TE) and signaling (RSVP-TE) protocols
- Link connectivity verification and validation, and link correlation
- Fault localization management for multiple links in GMPLS networks
- Automatic configuration of devices
- Control channel management
- Capabilities negotiation

Requirements

- ZebOS Network Services Module
- ZebOS RSVP-TE
- ZebOS OSPFv2
- ZebOS LDP
- ZebOS OSPF-CSPF
- ZebOS IS-IS

Standards Supported

- RFC 3945 — Generalized Multi-Protocol Label Switching (GMPLS) Architecture
- RFC 4204 — Link Management Protocol

Standard Deliverables

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