E-Lighthouse Network Planner

Product Overview

V.1.4.24

System Overview: E-Lighthouse Network Planner

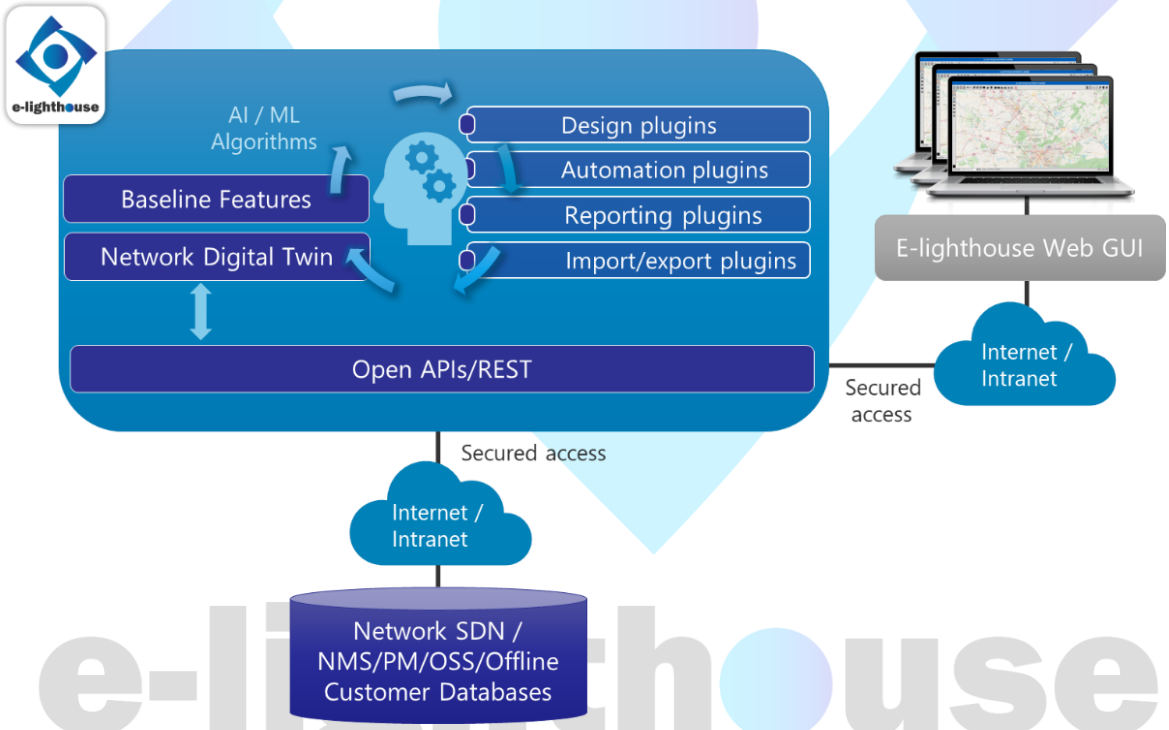
Introduction

The E-lighthouse Network Planner (ENP) is an advanced tool designed for planning and analysis of IP/MPLS/SR and transport multivendor networks. Grounded on an extensive R&D experience, it is developed to meet the needs of network planners and designers, facilitating the network analysis, simulation, optimization and seamlessly integrating with client databases through open RESTful APIs and an intuitive web user interface.

System Architecture

The architecture is designed to ensure high availability, robust security, and scalability. It consists of:

- ✓ Local or cloud servers that host the application.
- ✓ RESTful application programming interfaces (APIs) for integration with external systems.
- ✓ A web interface that provides easy and configurable access to the users.
- ✓ Plugin modules that extend functionalities according to the specific customer requirements.



System Features

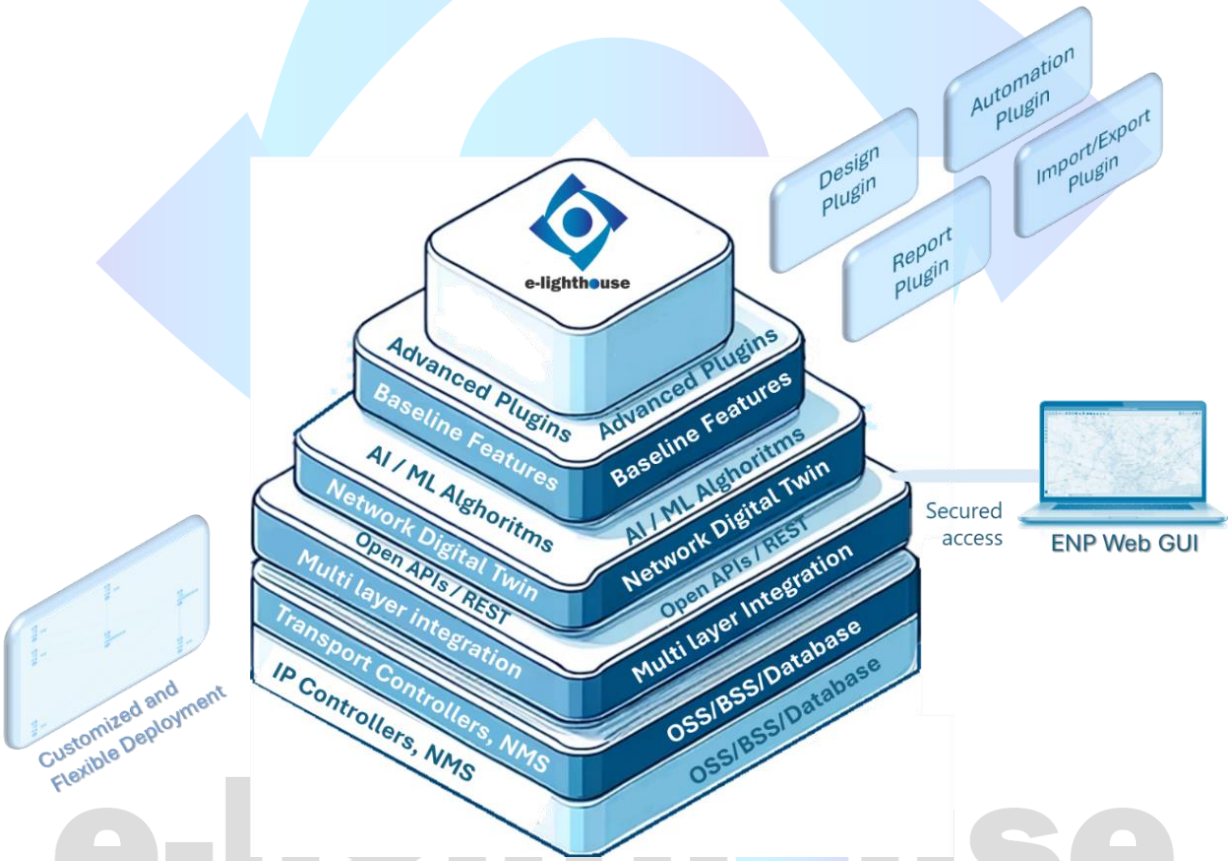
ENP offers a comprehensive range of functionalities for network design and simulation, including:

- ✓ Planning and simulation of IP/MPLS/SR networks including QoS configurations and traffic engineering for MPLS-TE and SR-TE.

- ✓ Planning and simulation of optical transport networks (OTN/DWDM) supporting multi-modulation and flexi-grid configurations.
- ✓ Multi-layer visualization of multivendor network topologies and elements analysis enabling the joint visualization of IP, optical and microwave networks, facilitating integrated analysis and optimization.
- ✓ Extensibility through plugins that add specific functionalities such as smart provisioning, failure analysis, and optimized network dimensioning.

The ENP modular approach allows for the installation of features tailored to each customer needs, being possible to add IP features and transport features in an independent deployment set according to the characteristics of the customer's network.

This high adaptability also facilitates fast and seamless integration with customer databases and platforms, enabling customized reporting solutions, such as network expansion recommendations with integrated Bills of Materials (BOMs).



ENP IP Network Capabilities

ENP offers several IP functions through its main software core and plugins.

❖ IP/MPLS Network simulation

As baseline, ENP offers multi-AS IGP/BGP simulation with user-configurable traffic injection policies, MPLS-TE tunnels, user-defined QoS and link scheduling policies, L2/L3VPNs, IP multicast, Link aggregations,

allowing comprehensive simulation capabilities to forecast network performance and behaviour under various conditions for current or forecasted traffic demand projections.

❖ L2-L3 VPN Simulation

Through this plugin, ENP integrates data from the IP layer VPNs defined within the system. This module can simulate specific features per VPN for various L3VPN and L2VPN types, as well as assess the impact of what-if analyses at the VPN level, presenting Key Performance Indicators (KPIs) for each VPN in the graphical interface. When supplemented with the 'Fault Tolerance Analysis' plugin, it can provide further insights into VPN fault tolerance.

❖ IP Traffic Demand Forecasting

Utilizing innovative Artificial Intelligence (AI) techniques, this plugin forecasts network traffic based on monitoring data, including the derivation of the network's origin-destination IP traffic matrix. By importing traffic information by interface and/or flow from Performance Monitoring (PM) systems, ENP employs robust predictive algorithms to forecast future traffic at scales relevant for network sizing (e.g., hours, days, months, years), estimating when and where traffic bottlenecks will occur. In cases where no previous traffic measures exist, ENP employs advanced mechanisms to synthetically generate realistic traffic demands.

❖ IP Network Risk Analysis

Evaluating the fault tolerance of the network at the service level, this plugin considers the different recovery systems defined at IP and transport layers based on user defined parameters. Able to implement *What if* analysis and provide reports with before and after network scenarios.

ENP Transport Network Capabilities

For transport networks, ENP has an outstanding set of features both in software core and in the plugins.

❖ OTN/DWDM Simulation

G.709 compliant, flex-grid, multi-modulation, multi-vendor. State-of-the-art optical impairments, routing, and spectrum assignments reports.

❖ Smart Provisioning OTN

Offering optical connection (OTU) and optical service (ODU/DSR) provisioning recommendations with user defined requirements. It is possible to get recommendations in terms of routes, assigned spectrum, service and routes KPIs, highlighting the cost/benefits of different options, resulting in a faster provisioning time and an efficient use of resources.

❖ Transport Network Risk Analysis

Evaluating the fault tolerance of the network at the service level, considering the different recovery systems defined at transport layer based on using user defined parameters. Able to implement *What if* analysis and provide reports with before and after network scenarios.

ENP Multilayer Capabilities

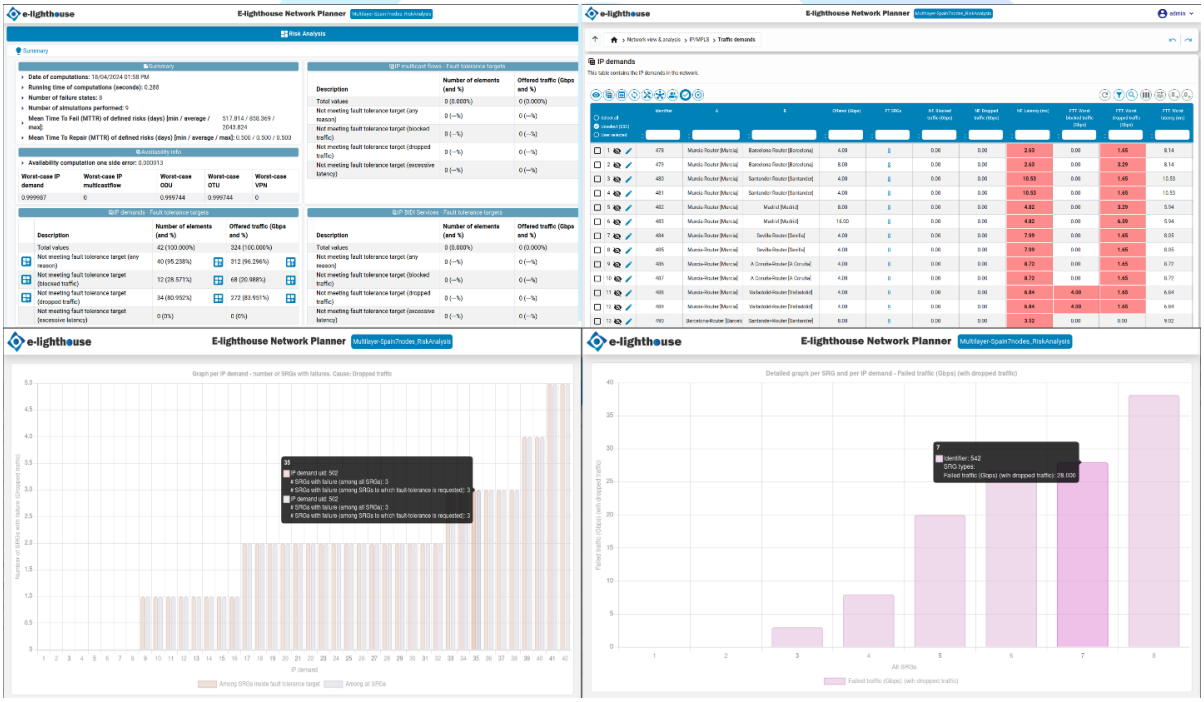
ENP can provide multilayer capabilities based on a multilayer controller / orchestrator or directly using IP and Transport network topologies from network controllers or NMS. Some multilayer features are:

❖ Multilayer IP & Transport Configuration and Simulation

Allowing a holistic analysis and optimization of IP & OTN networks with their related correlations. It is possible to analyse the impact in both the IP and transport networks, of e.g. new IP adjacencies, network reconfigurations, traffic changes, or updated network recovery policies.

❖ Multilayer Fault Tolerance Analysis

Evaluating the fault tolerance of the network at the service level, considering the different recovery systems defined at each layer (IP and Transport) and using user defined SRGs (Shared Risk Groups). Able to implement *What if* analysis and provide reports with before and after network scenarios.



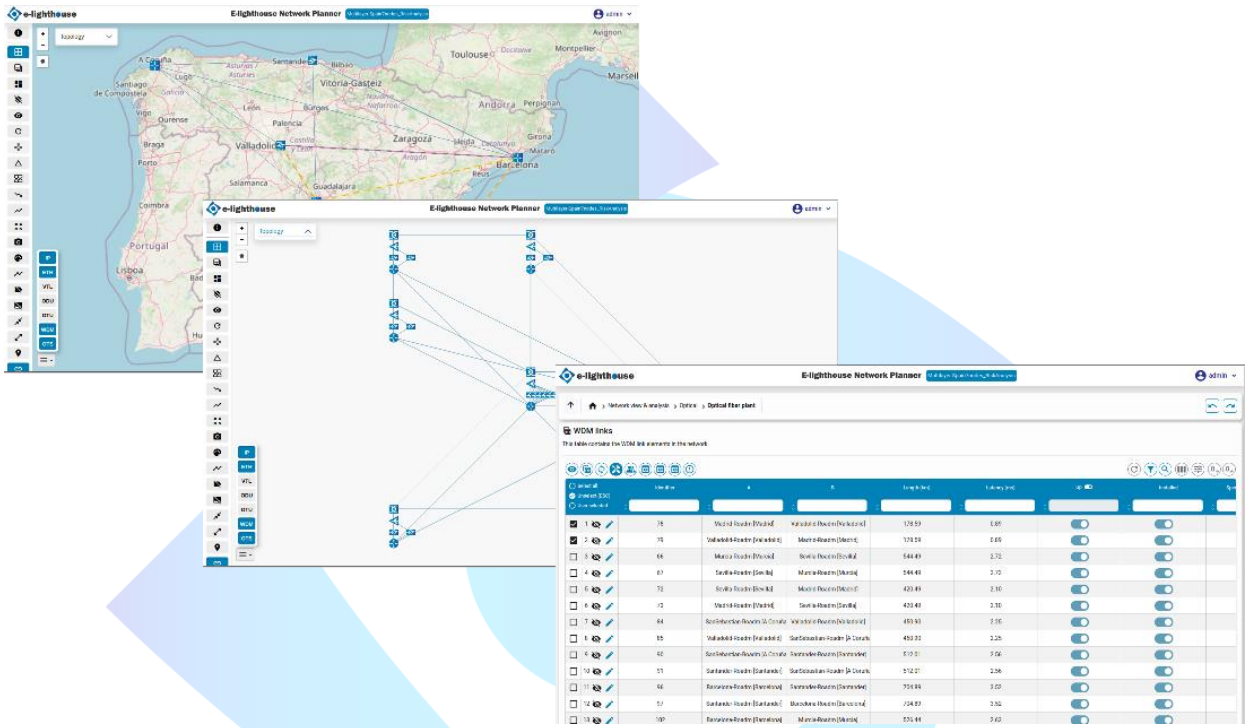
❖ Smart Import & Export

Available in both IP, transport, and multilayer networks, enables tailor made import and export modules for integration with customer systems platform as well as network controllers (including SDN), NMSs, orchestrators, OSSs and BSSs.

Network View GUI

The ENP smart multilayer visualization tool utilizes a sophisticated Graphical User Interface (GUI) that offers both geographical and logical views of the network, thereby enhancing network management and optimization with detailed performance metrics and multilayer interaction analyses. Its user-friendly design ensures effective visualization and comprehensive functionality, improving network operations.

The tool is structured around two main components: the Topology window and the Control window. The Topology window provides an interactive representation of network topology on a canvas, equipped with functional buttons for manipulation. The Control window features tables and panels for advanced visualization and analysis, as well as tools for network design and reporting. This dual-window setup delivers efficient and thorough network management capabilities.



Security and Access Control

Security and access control are priorities within the ENP, ensuring that only authorized users have access to sensitive functionalities and important data:

- ✓ Robust user authentication through integration with existing access control systems or configurable proprietary schemes.
- ✓ Rigorous security policies applied to the data infrastructure to protect against unauthorized access and ensure data confidentiality and integrity.
- ✓ Data encryption in transit and at rest using industry standards to safeguard against interceptions and leaks.

You can find more information about E-lighthouse products at:

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https://www.linkedin.com/company/e-lighthouse-network-solutions/
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