Data Sheet
Virtuora® AX OLS Designer MicroApplication

Automated Open Line System Planning and Design for Multivendor Innovation and Flexibility

But network planning and design tools have not kept pace with this ability to mix and match line systems and transponders. This is because conventional network design depends on reliable optical transmission information. In the case of OLSs, this is particularly challenging. Operations technicians must manually compile field measurements from in-service network equipment in order to harvest this information. This reliance on labor-intensive, manual data collection carries a risk of stranded capacity and slower innovation, and results in inefficient, error-prone network planning and design.

Virtuora OLS Designer Overview

The Virtuora AX OLS Designer provides the software support needed to fully realize the potential of an OLS. This MicroApplication employs AI and Machine Learning (ML) to accurately model optical performance and continuously improve OLS network designs. Its patent-pending technology tests topologies' transponder reach and interoperability, eliminating costly and error-prone manual calculations, simulation studies, and field measurements.

Introduction

Supporting new revenue streams and protecting existing business creates an urgent need to upgrade optical infrastructure as more agile and responsive hardware becomes available. Implementing an Open Line System (OLS) can be a key initiative in this ongoing strategy, by allowing independent selection of ROADM and transponder vendors in various configurations. An OLS allows Service Providers (SPs) to introduce hardware innovations quickly and manage operational expenses at a more granular level. SPs make the most appropriate and cost-effective equipment choice for each functional block of their integrated network. Consequently providers have flexibility to upgrade the network incrementally, achieve smooth network evolution, and speed implementation while controlling costs—all without undue operational disruption.
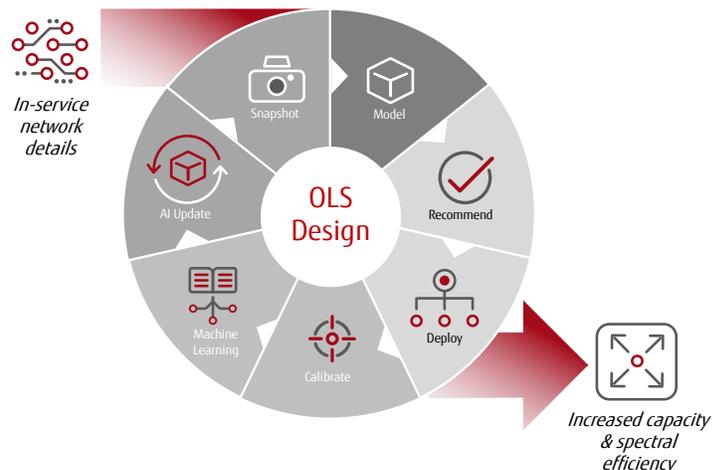
OLS Designer Process

Automation and Intelligence that Improves Customer Experience

Virtuora OLS Designer Highlights
- Harvests network data from transponders, global topologies, wavelength route, and Bit-Error Rate (BER)
- Provides an abstracted optical network model that is continuously trained and updated
- Suggests the best possible modulation (DP-16QAM, -8QAM, or -QPSK) for CD/CDC C+L ROADM and Raman architectures
- Orchestrates, controls, and manages multidomain flex-grid elastic optical networks via the Virtuora cloud solution portfolio
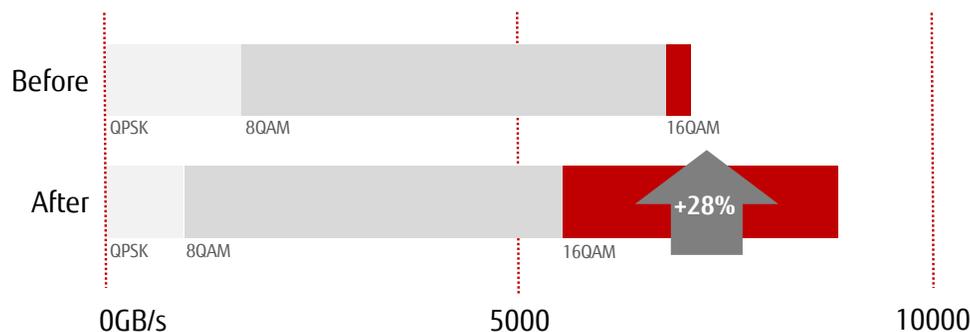
Virtuora OLS Designer maximizes network capacity per link and wavelength, mitigating issues proactively and optimizing network performance. Ultimately, this results in improved customer quality of experience.

Virtuora OLS Designer Benefits
- Preserves line system differentiation
- Takes advantage of transponder innovations from any vendor
- Validates transponder reach and interoperability
- Maximizes total network capacity of the OLS
- Eliminates costly and manual calculations, simulation studies, and field measurements
- Enables automated planning and design in the SDN-controlled optical network
- Optimizes long-term capital investments
- Reduces operational costs

Increase Fiber Capacity
The example illustrated below shows the anticipated results of using Virtuora AX OLS Designer to calculate how much additional capacity an operator's line system would gain after replacing an older transponder. The result shows a 28% increase in available optical fiber capacity—without adding fiber.

Virtuora AX Microapplications
Virtuora AX delivers explainable AI for sophisticated data sets, together with tools that enable operations, planning, engineering, and professional services teams to improve network quality of experience and service. Combinations of any or all of the Virtuora AX Network Intelligence toolset and Virtuora AX microapplications deliver specific automated network control and management across domains, layers, and systems.

Virtuora AX microapplications combine Virtuora AX network intelligence with automation to continuously evaluate and improve service delivery and the digital infrastructure that powers it. The microapplications provide network management for specific use cases, proactively applying policy-based actions and remediation using advanced analytics, AI, and automated workflows.

Virtuora AX microapplications enable a wide range of network management applications, including:

- Open line system design and planning
- Traffic predictions
- Fault predictions
- Anomaly detection
- Automated network operations management
- Data analytics and integrity

Before

QPSK   8QAM   16QAM

After

+28%

QPSK   8QAM   16QAM

0GB/s   5000   10000

This is a sample configuration. Results will vary based on network variables.

Increase optical fiber capacity—without adding fiber

Expand the Productivity and Value of the Communications Network

Total Network Automation, Powered by Virtuora

Virtuora AX microapplications are included in the Virtuora cloud solutions family of products. Virtuora cloud solutions unify orchestration, control, and management of the multilayer, multivendor network stack, unwinding complexity and enabling powerful functionality. Virtuora cloud solutions are part of the Fujitsu hybrid CT/IT infrastructure, which expands the reach, productivity, and value of the communications network within the enterprise. With Virtuora, anyone can build a network around offerings and services powered by software.

Technical Requirements

Servers

- Master (VM 1):
  - 32 Gb RAM
  - 16 vCPUs
  - 500 Gb hard disk space
- Worker 1 (VM 2):
  - 48 Gb RAM
  - 24 vCPUs
  - 400 Gb hard disk space
- Worker 2 (VM 3):
  - 48 Gb RAM
  - 24 vCPUs
  - 400 Gb hard disk space
- Worker 3 (VM 4):
  - 48 Gb RAM
  - 24 vCPUs
  - 400 Gb hard disk space

Web Browser

- Google® Chrome® Version 76.0.1 (recommended), 73.0.1, and 69.0.1
- Mozilla® Firefox® Version 77.0.3865.90, 81.0.4044.138, and 81.0.4044.129

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