PlannerPlus

Automated capacity management for
optimized network designs

Faced with the need to build out optical network
capacity in a world of ever-increasing demand for
bandwidth? That is a good challenge to have. Ciena's
PlannerPlus network planning and design tool makes
network builds and augmentations quick and easy.

PlannerPlus is fully integrated with Ciena's Manage, Control and Plan (MCP) domain
controller, which provides comprehensive visibility and software control of Ciena-
based optical networks. MCP's live view of the network state provides an accurate
starting point for laying out and connecting new sites—as well as overlaying
services—to meet future bandwidth, performance, and reliability requirements.
Visualization and viability modeling of foreign wavelengths is also supported.
The PlannerPlus user-friendly interface facilitates analysis of what-if scenarios to
determine optimal equipment configurations and placement of services. Once the
network design is finalized, a bill of materials (BOM) is created, and commissioning
scripts are generated automatically so that MCP can enact the plan as soon as the
equipment is in place. With PlannerPlus, network designs optimize utilization of
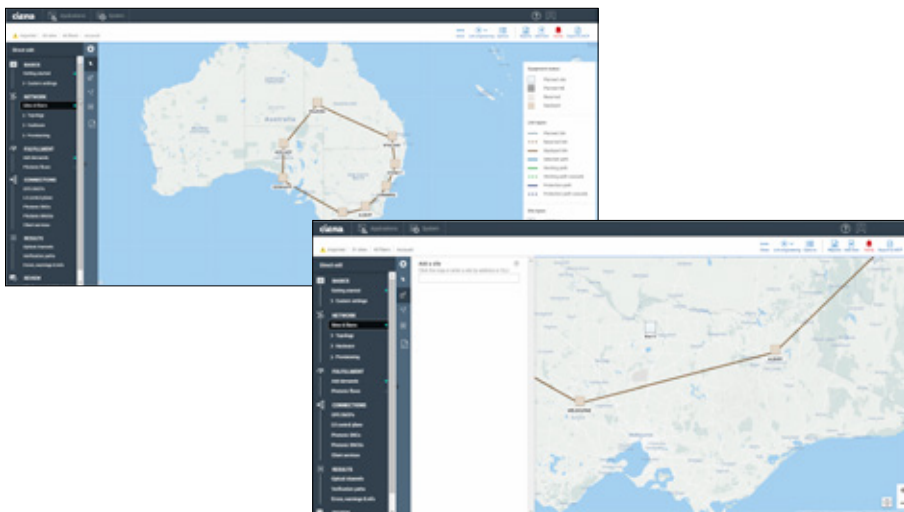optical network assets, maximizing return on investment (ROI).

Figure 1. The PlannerPlus easy-to-use GUI facilitates network buildouts

Features and Benefits

- **Accelerates capacity
  management workflow** from
  network utilization monitoring,
  equipment and service planning,
  device commissioning, and service
  activation via tight integration
  with the MCP domain controller

- **Offers on-line planning** based
  on live network topology, fiber
  characterization, and utilization
  data for accurate designs, which
  consolidates planning inputs in
  one place and eliminates the need
  to refer to out-of-date records

- **Facilitates what-if failure
  scenario simulations** to ensure
  validation of network survivability
  under multiple simultaneous
  failures

- **Enables easy visualization of
  network layout and design** with
  planned, reserved, and deployed
  views via an intuituive Graphical
  User Interface (GUI)

- **Optimizes utilization of optical
  network assets with forecast-
  tolerant designs**, ready for
  future growth

- **Saves time and manual effort,**
  reducing the planning horizon and
  enabling dynamic planning to adapt
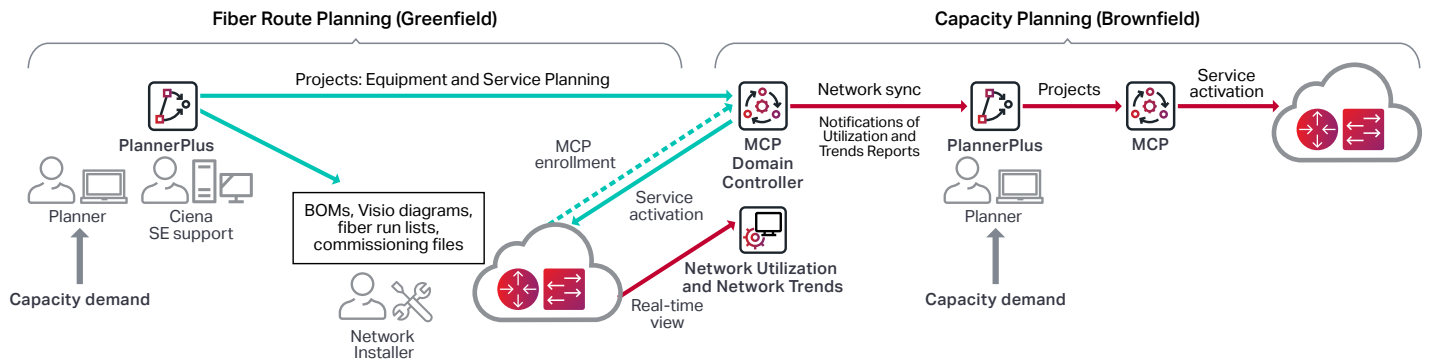 to changing market conditions

Figure 2. PlannerPlus capabilities are fully integrated with Ciena's MCP domain controller, accelerating equipment turn-up and capacity management

Integrated on-line planning

Typically, fiber route planning and services capacity planning are time-consuming tasks that require a lot number crunching and manual effort due to off-line stale data, and hence are performed infrequently for a long-range time horizon. With PlannerPlus, time and effort are greatly reduced to enable incremental network build outs and to avoid spending capital dollars today for capacity that will be underutilized for months to come.

PlannerPlus software works seamlessly with MCP so that new network designs are easily deployable via pre-generated commissioning files, and network buildouts are accurately based on live network topology and utilization data of fiber, spectrum, and Ethernet client services. An MCP network capture includes all the photonic components, their position in shelves, their part codes, and their serial numbers. The capture also includes various fiber parameters such as per-span fiber loss and fiber type, wavelength-specific parameters such as frequency, Polarization Mode Dispersion (PMD), and modulation class. This provides an accurate view of the as-built network for the basis of network augments and service expansion, taking the guesswork out of capacity management, reducing errors and manual rework.

When a network design is completed in PlannerPlus, it is imported into MCP as a project, and new equipment appears in a planned state until it is commissioned, turned up, and enrolled in MCP. MCP offers centralized, comprehensive visibility of network elements and services across multiple views: deployed, planned, and scheduled (for services with a future activation date).
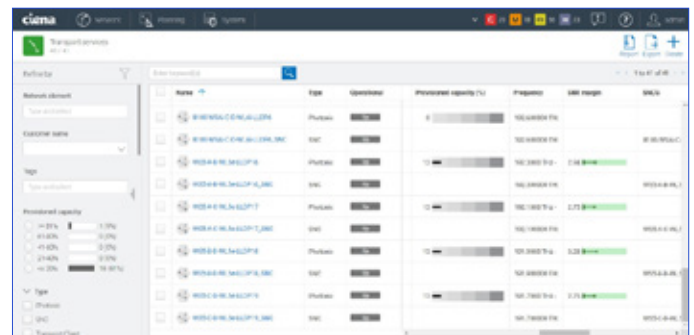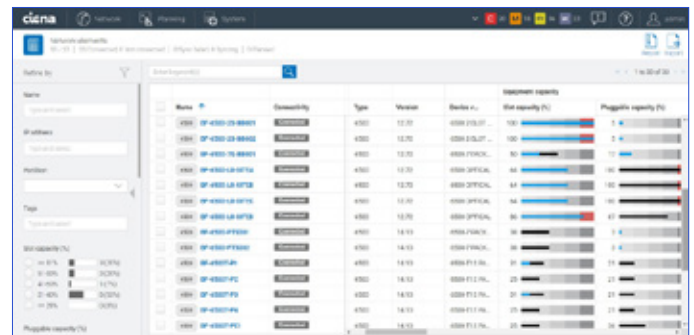
Ciena's MCP domain controller
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Figure 3. Network utilization of equipment and services is clearly visualized on MCP GUI

Photonic layer planning made simple

With PlannerPlus, network operators can design and validate Dense Wavelength Division Multiplexing (DWDM) photonic networks using sophisticated link engineering—resulting in designs that are guaranteed over the life of the system. PlannerPlus offers a wide range of configurations for the planning of photonic lines over fiber routes, supporting 10G and 800G wavelengths, as well as the planning of client services over those wavelengths.

PlannerPlus simplifies the essential steps of network design, whether starting greenfield or augmenting an existing network:

1. Set up profiles initially

2. Optionally, import MCP network capture, then enter topology information including sites and fibers

3. Enter capacity demands on wavelengths and/or client services

4. Run link engineering for fiber route planning, and path viability for services capacity planning

5. Review the BOM

6. Create a quote

7. Generate deployment packages, including pre-generated commissioning files

8. Complete the project for upload to MCP for network lifecycle management

Feature breadth enables customized designs

Flexible user workflows – Users can define customized Shelf, Node, Site, and Design Settings profiles to bring consistency across multiple planning cycles. PlannerPlus offers a choice of workflows:

• Guided workflow for auto-placement of photonic components and automatic link engineering, with the ability to review multiple scenarios prior to accepting the design and creating the BOM.

• Direct edit workflow for full user control at every step of the planning process, including manual placement of photonic components and selection of photonic degrees, which is especially useful for brownfield network planning.

Fiber types – A wide variety of fiber types are supported and can be selected during the fiber route design process, such as Non-Dispersion Shifted Fiber (NDSF), Enhanced Large Effective Area Fiber (ELEAF), and TrueWave Reduced Slope (TWRS) fiber types. Spans and domains can contain mixes of the supported fiber types. Additionally, TrueWave Classic (TWC), DSF, LS, Tera, and TW Reach are also supported for specific applications.

Automatic Link Engineering (ALE) – Using sophisticated design algorithms, photonic components such as Wavelength Selective Switch (WSS), Channel Mux/Demux (CMD), pads, and amplifiers can be optimized to meet end-of-life performance targets based on predefined aging margins. Components are selectively placed and configured, and paths are validated for forecast tolerance prior to creating optical channels.

Spectrum viewer – PlannerPlus provides the user with an intuitive graphical representation of how spectrum is utilized and planned for optical channels as wavelengths with center frequencies, along with associated channel guard-bands and including add and drop structures. Users gain a clear picture of what frequencies remain available.

Optical path protection – PlannerPlus supports mesh-restorable network designs via photonic control plane or explicit Designated Transit List (DTL) sets. Additionally, Optical Protection Switch (OPS) placement is a critical part of the planning process and is incorporated into the workflow.

Photonic flows – Users can simulate client traffic demands by creating photonic flows to ensure the network will support future growth. Foreign wavelengths are supported for viability simulations, based on user specified input parameters. PlannerPlus can analyze and validate photonic flow viability of selected DWDM interfaces across paths based on shortest path, five shortest paths, or explicit selection.

Wavelength and client services routing – PlannerPlus routes wavelengths and client services in the most efficient way, dimensions the links required to support the forecast traffic demands, and identifies the equipment required to terminate these links. Restoration routes are also computed for optical survivability. When imported into MCP, the necessary spectrum for the planned wavelengths is reserved, eliminating the need for any manual tracking methods.

Automated failure analysis – PlannerPlus can simulate simultaneous failure scenarios, predict restoration times, optimize the network for low latency, and identify additional bandwidth required to support various restoration scenarios. A simulation of possible points of failure can be executed automatically. A detailed report is generated that shows the effects of a simulated failure of each node, line, protection bundle, or line module on the network.

Planning Tool Calibrator – Fiber loss estimates are critical for optical planning. The Planning Tool Calibrator Liquid Spectrum™ app is embedded within MCP and collects, consolidates, and displays the actual fiber loss measurements for every fiber in comparison to the initial planned loss from PlannerPlus. The planned loss can be reconciled with the actual measurements in order to refine fiber loss margins for the next planning cycle and optimize asset utilization.

Optical parameters reports – Reports include information on the wavelength route, Optical Signal Noise Ratio (OSNR), OSNR margin, power margin, dispersion, and calculation of latency for each optical path present in the analyzed design. Information is available as on-screen summaries as well as exportable reports.

APIs for automated operations – PlannerPlus capabilities are also available via open APIs for automated retrieval of relevant planning data by back-end Operational Support Systems (OSS).

Quick time-to-value with Ciena's MCP Applications Services

Ciena's MCP Applications Services deliver single-point-of-service management for ease of deployment of the PlannerPlus solution. Services help bridge gaps in technical or resource availability—enabling the realization of the benefits of the solution as quickly as possible. With deep expertise and domain knowledge in management and operations systems, Ciena's Services team can help throughout all stages of the rollout: consulting, implementation, systems integration, maintenance, optimization, and learning. Managed Services are also available, to turn over full management of the solution.

Ciena's MCP Services
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Technical specifications

PlannerPlus supports network designs for the following Ciena products. For planning of other products not on this list, or more details, please contact your Ciena Account Manager:

- 6500 Family
- 6500 Reconfigurable Line System (RLS)
- WaveLogic™ 5 Extreme support and all WaveLogic modems
- Waveserver® Family

Full PlannerPlus functionality is available through the MCP Plus license.

PlannerPlus is deployable on premises in a private network alongside MCP or is accessible via the Cloud as Software as a Service (SaaS). PlannerPlus software is supported on Red Hat Enterprise Linux (RHEL) 7.x, Oracle Linux 7.x, or CentOS 7.x servers, and accessible via HTML 5 web client using a Chrome Web browser.

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