Cisco Prime Optical

Manage your converged IP and optical networks with scale and efficiency.

Overview
The transition to packet transport networks from time-division multiplexing (TDM) networks introduces various operational challenges for service providers as they continue to manage both capital expenditures (CapEx) and operating expenses (OpEx) while adapting to changing market requirements. To help ensure profitability, business agility, and quality of service (QoS), service providers need a management system equipped to efficiently handle disparate technologies and devices that make up this complex, ever-evolving optical network.

Cisco Prime™ Optical meets these challenges, providing simplified management of the converged IP and optical network from access to core for efficient delivery of voice, video, mobile, and cloud services. Through automated and advanced mechanisms for configuration, provisioning, and troubleshooting, it reduces human errors and helps operators efficiently execute end-to-end circuit creation. It also manages every point of the converged network with unprecedented accuracy and scale. (Refer to Figure 1).

Figure 1. Cisco Prime Optical Functions

Cisco Prime Optical is available as a standalone product or as a component of the Cisco Prime Carrier Management suite, which provides comprehensive unified management and service lifecycle capabilities including design, fulfillment, assurance, and analysis.
Features and Benefits

Benefits

- **Business agility:** Accelerates time to market of value-added services including voice, video, and on-demand content delivery through operational scale and efficiency in network discovery, configuration, provisioning, troubleshooting, and change management
- **Service assurance:** Helps enable rapid resolution of network issues through advanced fault diagnostics, real-time service-level agreement (SLA) performance monitoring, and security management
- **Lower total cost of ownership (TCO):** Reduces both CapEx and OpEx through turnkey integration with the other components of the Cisco Prime Carrier Management suite and standards-based interfaces to third-party operations support system (OSS) applications

Features

- An intuitive GUI (consistent across the Cisco Prime Carrier Management suite) that promotes operator productivity and reduces training efforts
- Converged support for Cisco nLight™ technology, TDM, dense wavelength-division multiplexing (DWDM), and Synchronous Optical Networks Synchronous Digital Hierarchy (SONET/SDH)
- Standards-compliant (CORBA TMF 814 v.3) northbound interfaces (NBIs), facilitating fast and easy integration with third-party OSS software
- Topology maps that display an accurate inventory of both optical and packet network devices and allow detailed drill-down to each device
- Scalability with support for up to 5000 optical network elements (NEs)
- Support for virtual machines, Linux, and Cisco Unified Computing System™ (Cisco UCS®)

Detailed Features and Benefits

Table 1 provides details on some of the key features and benefits of Cisco Prime Optical. For further details and information on the latest enhancements to this product, please refer to the Cisco Prime Optical Release Notes.

**Table 1. Cisco Prime Optical Features and Benefits**

<table>
<thead>
<tr>
<th>Features</th>
<th>Details</th>
<th>Benefits</th>
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</thead>
<tbody>
<tr>
<td><strong>Architecture</strong></td>
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<tr>
<td>Oracle embedded database</td>
<td>Ability to store all network information in the embedded database and interoperate seamlessly with Cisco Prime Optical without a separate license.</td>
<td>Reduced CapEx and OpEx</td>
</tr>
<tr>
<td>Multitechnology management</td>
<td>One-stop management for TDM/SONET/SDH, DWDM, and IP and optical technologies.</td>
<td>Ease of use with powerful optical domain management for converged technologies in a single view</td>
</tr>
<tr>
<td>IP and optical circuit provisioning</td>
<td>Ability to configure the physical parameters of the DWDM port and maintain the same workflow of circuit provisioning when the termination point is embedded in the router.</td>
<td>Improved efficiencies through end-to-end management of optical layer</td>
</tr>
<tr>
<td><strong>Operations and Administration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Authentication Service (CAS)</td>
<td>Support for different applications to authenticate to one authoritative source of trust with a single sign-on (SSO) CAS solution.</td>
<td>Ease of operations</td>
</tr>
<tr>
<td>Network maps</td>
<td>Dockable panels displaying topology and properties</td>
<td>Enhanced customer satisfaction through efficient network diagnostics and planning</td>
</tr>
<tr>
<td></td>
<td>Notification bar that alerts users when changes are made to NE attributes and the map must be refreshed</td>
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<td></td>
<td>Map views that can be exported as snapshots</td>
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<tr>
<td></td>
<td>Ability to configure the appearance of nodes, groups, and links in a network map</td>
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<tr>
<td></td>
<td>Link utilization visual map</td>
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<tr>
<td>Features</td>
<td>Details</td>
<td>Benefits</td>
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<tr>
<td>-------------------------------</td>
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</table>
| Layer 1 circuit reports       | ● Simple and Quick Filter - Facilitates filtering of data based on commonly encountered conditions  
● Custom View - Helps enable filtering of data based on operator selected conditions  
● Save Custom View - Saves custom views for future use, either privately or publicly  
   - Public - Contains customized view reports created by a super user  
   - Private - Contains customized view reports created by other users  
● Manage Custom Views - Helps enable editing and deleting of existing customized views  
● Auto-Refresh - Allows updating of the data that has been added without a manual refresh | Improved visibility and customization of circuit management |
| Virtual appliances            | Preconfigured optical virtual appliances (OVA) available in open virtual machine format (OVF) for fast and easy deployment | Simplified installation                                 |
| Audit log                     | ● Extensive filtering options  
● Customizable views to create, filter, save, copy, and manage audit logs  
● Configurable audit log settings | Flexibility in extracting useful information from audit logs to troubleshoot and evaluate network issues |
| Network maintenance operations| Support for the link maintenance report, including the following on the optical channel (OCH), OCH client connection (OCHCC), and OCH network connection (OCHNC) trail circuits:  
   ● Display of the list of protected circuits  
   ● Display of the active path on the link  
   ● Performance of the switch operations | Reduced network maintenance complexity |
| Fault Management              | Traditionally, in networks with an Automatic Switched Optical Network (ASON) and a Generalized Multi-Protocol Label Switching Transport Profile (GMPLS) control plane, a centralized network management system is responsible for path computations and route selections, based only on topology information while photonic domain knowledge is not taken into consideration.  
In contrast, the Cisco Wavelength Switched Optical Network (WSON) control plane of Cisco Prime Optical works within a distributed architecture where intelligence is embedded in NEs. It enhances GMPLS capabilities with awareness of wavelength properties and optical impairments, offering dynamic service provisioning on a flexible DWDM network.  
Cisco Prime Optical introduces extensions to GMPLS that supply path computation with analysis of optical feasibility while providing protocol interoperability with the GMPLS suite.  
A simplified GUI as well as script-oriented Transaction Language 1 (TL1) User-Network Interface (UNI) allows users to dynamically demand wavelength services across DWDM networks.  
   ● Elimination of the need to collect large amounts of information across the network for path computation, which is a bottleneck and source of errors that are hard to troubleshoot  
   ● Rapid restoration of services and improved network robustness to failures using fast reroute (FRR)  
   ● Fewer wavelengths and transponders needed in the network through use of reconfigurable optical add-drop multiplexers (ROADMs), which directly translates into tremendous CapEx savings for operators | |
| Circuit table                 | Ability to launch circuit table from the Alarm Browser window and view the circuits affected by an alarm. | Ease of operations                                      |
| Configuration and Provisioning|                           |                                                         |
| Circuit wizard                | End-to-end circuit creation using the network maps to locate the physical endpoints. | Ease of operations                                      |
| Circuit enhancements          | ● Regenerator management of OCHCC and OCHNC circuits  
● Auto restoration  
● Link management  
● Optical Physical Section (OPS), Optical Transmission Section (OTS), Optical Multiplex Section (OMS) link inventory  
● Provisioning of new diversity parameter from WSON circuits | Improved quality of service based on comprehensive circuit information |
<p>| Performance Management        |                           |                                                         |
| Data collection and reports   | Automatic data collection and reports creation of optical performance and capacity utilization. | Improved visibility of network performance and capacity issues |
| Performance graphs            | Ability to draw graphs of performance data. | Improved visibility to visualize performance issues |</p>
<table>
<thead>
<tr>
<th>Features</th>
<th>Details</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance data monitoring</td>
<td>Near-end and far-end performance data with 10-second, 15-min and 1-day granularity.</td>
<td>Improved service assurance through performance monitoring</td>
</tr>
<tr>
<td>Real-time performance display</td>
<td>Extensive performance monitoring and statistics collection for all interfaces with 10-second polling.</td>
<td>Enhanced customer satisfaction through real-time SLA monitoring</td>
</tr>
</tbody>
</table>

### Security Management

| Administration                   | • Centralized management of user accounts  
|                                 | • Ability to upload, store, view, and filter audit logs  
|                                 | • Comprehensive audit log that tracks all user actions  
|                                 | • Enforced password complexity and password aging  
|                                 | • External authentication based on RADIUS and TACACS server | Improved operational efficiencies and enhanced security |
| Role-based access control (RBAC)| Creation of user profiles and right level of access based on roles and groups. | Enhanced security |

### High Availability

| High availability with disaster recovery configuration extended to the Linux platform | • Ability to withstanding most network disasters with minimal downtime by taking the following two steps:  
|                                                                                   | - Creation of a disaster recovery configuration, based on Red Hat Cluster Suite and Oracle Active Data Guard (ADG)  
|                                                                                   | - Failover to the standby server, which is a replica of the primary server  
|                                                                                   | • Support for local redundancy and automatic failover with the HA configuration on Linux. | Protection against most network-impacting disasters, with minimal network downtime, providing carrier-class service assurance  
|                                                                                   | • Elimination of the need for costly third-party disaster recovery software with Oracle ADG and Red Hat Cluster Suite embedded |

## Hardware Capabilities

Table 2 lists support for some of the latest platforms, devices, and technologies.

### Table 2. Cisco Prime Optical Hardware Support

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Details</th>
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</table>
| Cisco® Transport Controller-based releases    | • ONS 15216 R10.0  
|                                               | • ONS 15216 Passive DCU R10.0  
|                                               | • ONS 15454-M6 R10.0  
|                                               | • ONS 15454-M2 R10.0 |
| Cisco Network Convergence System (NCS) releases| • NCS 2002 SONET  
|                                               | • NCS 2002 SDH  
|                                               | • NCS 2006 SONET  
|                                               | • NCS 2006 SDH |
| 16-WXC-FS card                                | • Card provisioning  
|                                               | • Client connect (CC) channel and payload support  
|                                               | • Performance monitoring  
|                                               | • Threshold crossing alert (TCA) support  
|                                               | • Fault management  |
| 100G-CK-C card                                | • Card mode provisioning  
|                                               | • CC channel and payload support  
|                                               | • PPM, TTI, Payload, Inventory, and FEC provisioning  
|                                               | • GCC, Y-cable, and proactive protection support  
|                                               | • Support of new pluggables  
|                                               | - CPAK-100G-SR10 with 100GE/OTU4 and 40GE payloads  
<p>|                                               | - CPAK-100G-LR4 with 100GE/OTU4 payloads |</p>
<table>
<thead>
<tr>
<th>Hardware</th>
<th>Details</th>
</tr>
</thead>
</table>
| RAMAN amplifier cards | **EDFA+Raman Amplifiers:**  
  - EDRA-1-26  
  - EDRA-2-26  
  - EDRA-1-35  
  - EDRA-2-35  
  The EDRA cards provide the following functionalities:  
  - Inventory  
  - Installation  
  - Performance monitoring  
  - TCA support and Span Loss measure  
  - Fault management |
| Passive units |  
  - MF-4x4-COFs  
  - MF-MPO-8LC  
  - MF-DEG-5  
  - MF-UPG-4  
  - MF-16AD-CFS  
  - Y-cable protection support for these cards:  
    - 5x10G TXP  
    - 10x10G MXP  
    - 100G TXP  
  - New payloads  
  - Create and manage protection group  
  - Chromatic dispersion values  
  - Tx Shutdown and Tx Power values  
| 100G_LC_C (enhancements to **100G DWDM Trunk Card**) |  
  - Y-cable protection support for these cards:  
    - 5x10G TXP  
    - 10x10G MXP  
    - 100G TXP  
  - New payloads  
  - Create and manage protection group  
  - Chromatic dispersion values  
  - Tx Shutdown and Tx Power values  
| Wire Speed Encryption (**WSE**) card |  
  - Threshold settings  
  - GCC channel and payload support  
  - PPM, TTI, and FEC provisioning  
  - Card mode provisioning  
| 10x10G_LC, 100G_LC_C, and CFP_LC cards | Supported on ONS 15454 M2 and ONS 15454 M6 platforms  
  - ODU0 multiplexing for 1GE and 1GFC payloads  
  - ODU0 payload mapping during OCHCC circuit creation  
  - RMON thresholds for 10GE and 4GFC payloads  
  - Bandwidth utilization panel to show ODU0 slices  
  - ODUK port mapping  
| AR_XPE card (enhanced version of the AR_XP card) |  
  - GCC communication channel support  
  - Payload support for 10x10G LC  
  - OTU4 payload support for 100G LC  
  - Physical PM support on 100G LC  
  - FAN-OUT and LOW-LATENCY operating mode for 10x10G LC  
  - The following protection mechanism for the cards:  
    - Y-Cable protection for 1x100G and 2x40G clients for CFP_LC  
    - Y-Cable protection for all supported payloads in 10x10G Muxponder and TXP_10G Transponder mode for 10x10G LC  
    - Proactive Protection Regen tab for 100G LC_C card  
| 100G_LC_C, 10x10G_LC, and CFP_LC cards |  
  - GCC communication channel support  
  - Payload support for 10x10G LC  
  - OTU4 payload support for 100G LC  
  - Physical PM support on 100G LC  
  - FAN-OUT and LOW-LATENCY operating mode for 10x10G LC  
  - The following protection mechanism for the cards:  
    - Y-Cable protection for 1x100G and 2x40G clients for CFP_LC  
    - Y-Cable protection for all supported payloads in 10x10G Muxponder and TXP_10G Transponder mode for 10x10G LC  
    - Proactive Protection Regen tab for 100G LC_C card  
| 40E-MXP-C card | Supports full transparency muxponder mode |
System Requirements

Table 3 lists the system requirements for Cisco Prime Optical. For further details, please refer to the Cisco Prime Optical Quick Start Guide.

Table 3. Supported Platforms and Operating Systems

<table>
<thead>
<tr>
<th>Platform</th>
<th>Operating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco UCS B series</td>
<td>Red Hat Enterprise Linux (RHEL) 5.7, 5.8 or 6.4, (64-bit OS with or without VMware ESXi version 4.1 or 5.0)</td>
</tr>
<tr>
<td>Cisco UCS C series</td>
<td></td>
</tr>
</tbody>
</table>

About Cisco Prime

The Cisco Prime portfolio of IT and service provider management offerings empowers organizations to more effectively manage their networks and the services they deliver. Built on a service-centered foundation, the Cisco Prime supports integrated lifecycle management through an intuitive workflow-oriented user experience - providing A-to-Z management for evolved programmable networks (EPNs), mobility, video, cloud, and managed services.

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information please visit the Cisco Services page on Cisco.com.

Ordering Information

Cisco Prime Optical is available for purchase through regular Cisco sales and distribution channels worldwide. To place an order, visit the Cisco Ordering Homepage.

For More Information

For more information about Cisco Prime Optical including a complete list of features and product specifications and the latest release notes please visit www.cisco.com/go/primeoptical or contact your local account representative.