Deploy the Cisco Optical Automation Solution in Seven Steps

Optical Automation Solution

An Optical Automation Solution (OAS) provides a unified approach for planning, deploying, and operating optical networks while keeping design intent consistent across tools and teams. It connects the planning, installation, and controller stages to ensure that data, configurations, and validations remain aligned from day-0 through day-2 operations. OAS also standardizes prerequisites and access controls to reduce deployment variance across sites.

The solution offers several key functions.

- It streamlines deployment and lifecycle management of optical networks through repeatable workflows.
- It enables collaboration among planners, site engineers, and automation administrators with shared artifacts and checkpoints.
- It integrates Cisco Optical Network Planner, Cisco Optical Site Manager, and Cisco Optical Network Controller for end-to-end orchestration.
- It preserves configuration intent from initial design through service provisioning and operational assurance.

Key components and roles in OAS

OAS relies on a structured approach involving specific Cisco platforms and dedicated roles to achieve end-to-end automation:

This table lists the primary solution components for the OAS workflow and describes the function of each.

Table 1: Components

Component	Description
Cisco Optical Network Planner	Design and validate networks for the NCS 1000 series platforms.
NCS 1010, NCS 1014, NCS 1004	Provide hardware platforms for optical transport and connectivity within the solution.
Cisco Optical Site Manager	Serves as the software platform for site configuration import, management, and automation tasks.

Component	Description
Cisco Optical Network Controller	Delivers centralized control and monitoring across the optical network infrastructure.

This table outlines the primary roles and the responsibilities required to maintain alignment from planning through operations.

Table 2: Roles

Role	Responsibilities
Planner	Maintains topology fidelity in Cisco Optical Network Planner, aligns fiber parameters, and generates Cisco Optical Site Manager Netconf XML exports.
Site engineer	Handles the physical installation and powering of Cisco hardware, confirms day-0 configurations, and reports site readiness.
Automation administrator	Operates Cisco Optical Site Manager and Cisco Optical Network Controller, manages authentication, imports configurations, and validates telemetry data.

Interconnected stages

The fundamental principle of OAS is to ensure that the configuration intent defined during the planning phase is accurately translated, applied, and monitored across the entire optical network infrastructure.

The deployment of an Optical Automation Solution typically involves these stages:

Stage	Focus
Model preparation	Validate the network design in Cisco Optical Network Planner by confirming the site inventory, fiber types, connector loss values, and service cards. Resolve any design errors. Capture reports, including the bill of materials, layout, NFV, and cabling details. Generate the site configuration in Netconf XML format for consumption by Cisco Optical Site Manager.
Hardware installation	Deploy optical platforms (NCS 1010, NCS 1014, NCS 1004), rack equipment, install components, connect power, boot devices, configure root credentials and management addresses, and verify interface status.
Cabling validation	Verify that all fiber and cabling work are completed accurately, according to the planned design standards.
Cisco Optical Site Manager activation	Install and configure Cisco Optical Site Manager, including TACACS, authentication groups, and smart licensing. Import Netconf XML bundles, synchronize devices, and push ANS parameters.
Cisco Optical Network Controller onboarding	Install Cisco Optical Network Controller, set up users, import Cisco Optical Site Manager nodes, and verify topology, alarms, performance monitoring, and circuits.

Advantages of OAS

Implementing an Optical Automation Solution offers significant advantages:

- **Repeatable and Consistent Deployments:** Provides a standardized, evidence-backed playbook for deploying optical networks, reducing errors and increasing efficiency.

- **Enhanced Planning and Design:** Facilitates continuous planning by enabling the re-import of live topology data into Cisco Optical Network Planner and supporting proactive upgrade analyses for new network configurations.
- **Operational Assurance:** Ensures reliable service provisioning with comprehensive assurance capabilities and continuous monitoring within Cisco Optical Network Controller.
- **Streamlined Workflow:** Integrates various tools and roles into a cohesive workflow, from initial design to active network management.

- Optical Automation Solution, on page 3
- Deploy the Optical Automation Solution in seven steps, on page 5

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Key components and roles in OAS

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Component	Description
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This table outlines the primary roles and the responsibilities required to maintain alignment from planning through operations.

Table 4: Roles

Role	Responsibilities
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Interconnected stages

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Advantages of OAS

Implementing an Optical Automation Solution offers significant advantages:

- **Repeatable and Consistent Deployments:** Provides a standardized, evidence-backed playbook for deploying optical networks, reducing errors and increasing efficiency.
- **Enhanced Planning and Design:** Facilitates continuous planning by enabling the re-import of live topology data into Cisco Optical Network Planner and supporting proactive upgrade analyses for new network configurations.

- **Operational Assurance:** Ensures reliable service provisioning with comprehensive assurance capabilities and continuous monitoring within Cisco Optical Network Controller.
- **Streamlined Workflow:** Integrates various tools and roles into a cohesive workflow, from initial design to active network management.

Deploy the Optical Automation Solution in seven steps

Use this task to move a planned optical network from design to an operational state with continuous planning enabled.

The OAS deployment workflow coordinates Cisco Optical Network Planner, Cisco Optical Site Manager, and Cisco Optical Network Controller for design, configuration, onboarding, and circuit provisioning.

Before you begin

- Confirm access to Cisco Optical Network Planner and Cisco Optical Network Controller, and ensure devices are installed and cabled at the site.

  Ensue that day-0 parameters are available, including IP address assignments, DCN plans, and access to servers such as NTP, TACACS, and Smart Licensing for software downloads.

Follow these steps to deploy the Optical Automation Solution.

Procedure

Step 1 Plan and design the network in Cisco Optical Network Planner.

Define topology and circuit requirements, then generate planning reports including the Cisco Optical Site Manager configuration file.

For details, see Design the topology in Cisco Optical Network Planner and Generate Cisco Optical Site Manager Netconf XML Files.

Design artifacts are ready for device initialization.

Step 2 Perform device turn-up (Day-0) at the site.

Power on devices and initialize Day-0 parameters such as IP address assignments, DCN plans, and access to servers such as NTP, TACACS, and Smart Licensing for software downloads.

For day-0 procedures, see Configure NCS 1010 day-0 settings.

Devices are powered on and visible in Cisco Optical Site Manager.

Step 3 Apply Day-1 configuration and validate in Cisco Optical Site Manager.

Push the Day-1 configuration generated by Cisco Optical Network Planner to devices via Cisco Optical Site Manager and validate the configuration on all devices.

For details, see Import a Cisco Optical Network Planner configuration file and Synchronize devices in Cisco Optical Site Manager.

Devices are validated and ready for onboarding.

Step 4 Onboard nodes to Cisco Optical Network Controller.

Add validated nodes to Cisco Optical Network Controller and confirm they appear in inventory.

For details, see Onboard Cisco Optical Site Manager nodes in Cisco Optical Network Controller.

Nodes are managed by Cisco Optical Network Controller.

Step 5 Provision circuits in Cisco Optical Network Controller based on the Cisco Optical Network Planner plan.

Review planned paths in Cisco Optical Network Planner and provision circuits in Cisco Optical Network Controller according to the planned design.

For details, see Provision CPCE services.

Circuits are provisioned according to the approved plan.

Step 6 Monitor the live network and synchronize data with Cisco Optical Network Planner.

Use Cisco Optical Network Controller to monitor network status and import live network details into Cisco Optical Network Planner with one click.

For details, see Perform live network import.

Planning data reflects the live network state.

Step 7 Perform continuous planning and upgrades.

Use live network information in Cisco Optical Network Planner, generate new ANS parameters after upgrade analysis, and push updates via Cisco Optical Site Manager.

For details, see Analyze the network.

The network evolves through continuous planning and upgrades.

OAS deployment is complete and the network enters a continuous planning loop supported by Cisco Optical Network Planner, Cisco Optical Site Manager, and Cisco Optical Network Controller.