

Cisco Crosswork Network Services Orchestrator

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A proven multivendor, cross-domain automation platform for service providers and large enterprises, Cisco Crosswork Network Services Orchestrator (NSO) is the bridge that links business intent to your organization’s underlying physical and virtual infrastructure.

Product overview

The ultimate success of your automation and orchestration strategy hinges on your ability to link high-level intent to changes in your organization’s physical and virtual infrastructure. Any weakness in the speed, dependability, and capabilities of this connection can undermine your entire strategy.

NSO provides a robust and sophisticated bridge between automation and orchestration frameworks and the underlying physical and virtual infrastructure. A rich set of northbound software interfaces and allow NSO to easily integrate with any number of tools and systems. An extensible southbound architecture means NSO works across different vendors and multiple domains.

NSO loosely couples the top and bottom of the service stack: freeing application and service owners to focus on innovation and customer experience (without worrying about infrastructure deployment details), while allowing operations to focus on optimizing their infrastructure without having to worry about breaking the application and service environments.

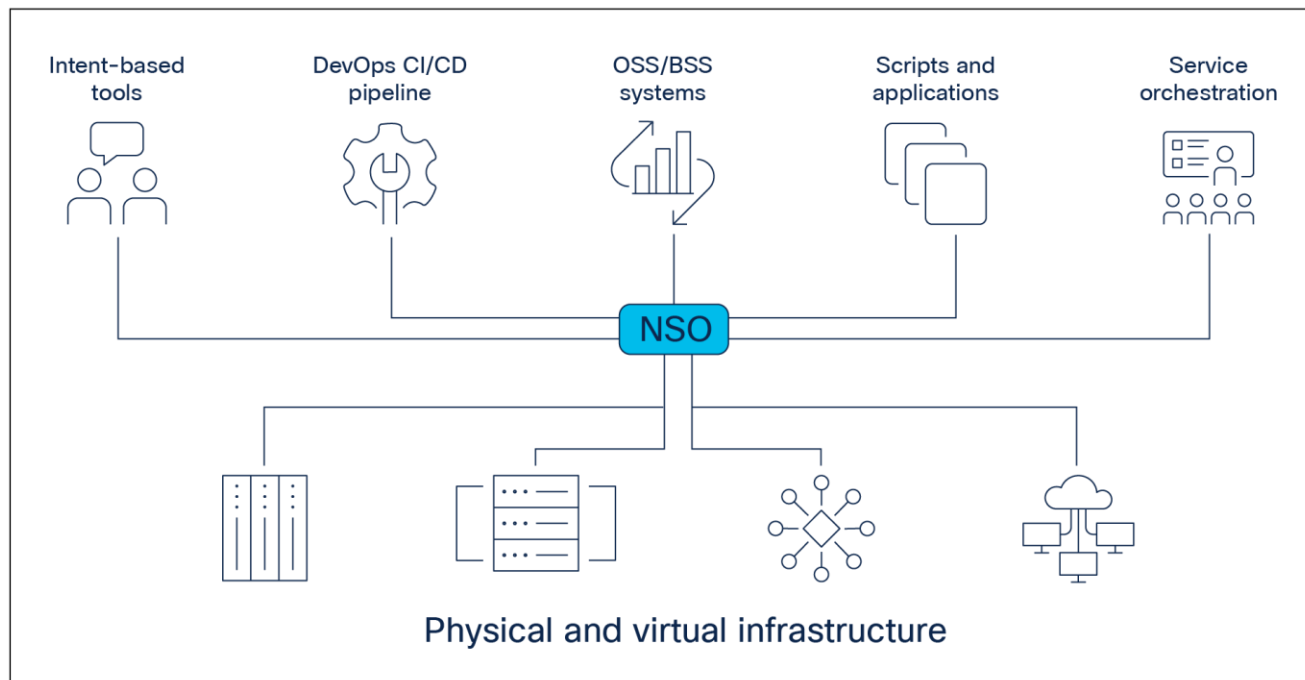


Figure 1.
Crosswork NSO as a bridge

Crosswork NSO has been shaped by nearly a decade of helping large, complex tier-1 service provider and enterprise customers automate everything from simple device turn-up, to cross-domain automation, to sophisticated full lifecycle service management. The real world success of NSO stems from a series of unique capabilities:

- A rich and diverse set of **northbound APIs and software interfaces** that allow straightforward integration into existing business systems and operational tool chains. NSO Developer Studio provides an Integrated Design Environment (IDE) to enable fast development of new network services
- A **multivendor device abstraction** layer that uses Network Element Drivers (NEDs) to mediate access to both Cisco and more than 1000 other-party physical and virtual device types
- **Globally scalable**, highly available data store for both configuration and state information
- Sophisticated integrated tools for maintaining state **integrity**, troubleshooting, and auditing

Taken together, these features deliver a fast, dependable, scalable, cross-domain, multivendor automation solution with a rich set of functionality and unmatched flexibility.

Features and benefits

Table 1. NSO offers a rich set of features with real world benefits

Feature	Benefit
Comprehensive software interfaces	<ul style="list-style-type: none"> • Easily integrated into northbound systems with a wide variety of APIs, SW interfaces, and language bindings ranging from programmatic or RPC-based protocols (such as NETCONF/RESTCONF) to language bindings like Java and Python, NSO also provides human-to-machine interfaces, such as a web UI and a set of CLIs.
Multivendor	<ul style="list-style-type: none"> • Supports Cisco infrastructure and over 1000 third-party device types and cloud services through Network Element Drivers
Cross-domain	<ul style="list-style-type: none"> • Single tool to automate cross-domain services
Loosely coupled service stack	<ul style="list-style-type: none"> • Speeds apps/service development and simplifies deployment and infrastructure operations
Extensible	<ul style="list-style-type: none"> • Functionality can be extended through APIs, • Add-on function packs include Cloud-Native Network Function Orchestrator (CNFO) for container orchestration and Network Function Virtualization Orchestrator (NFVO) for virtual machine orchestration.
Highly scalable	<ul style="list-style-type: none"> • Nearly unlimited horizontal scalability
Model-based	<ul style="list-style-type: none"> • Increases agility by simplifying additions and changes to devices and services
Development IDE	<ul style="list-style-type: none"> • NSO developer studio gives the service developer an extensive set of development tools in a familiar environment in Microsoft Visual Studio Code
Trusted transactions	<ul style="list-style-type: none"> • Database-style commitment of configuration changes • Pre-implementation checks and configuration rollbacks • Bidirectional synchronization to ensure consistent state
Highly available common data store	<ul style="list-style-type: none"> • Globally scalable, highly available data store • Definitive source for state and operational data
Network-wide CLI	<ul style="list-style-type: none"> • Config commands automatically translated to device specific commands

Feature	Benefit
Precise control	<ul style="list-style-type: none"> • Real-time, fine grained, deep control of devices and services
Visibility	<ul style="list-style-type: none"> • Detailed logging and audit trails • Ability to correlate services and resources consumed by them
Intelligent service lifecycle management	<ul style="list-style-type: none"> • Shortens service development by deducing modify and delete operations from create operation
Flexible consumption	<ul style="list-style-type: none"> • 1-year and 3-year licenses and Smart Licensing

Product architecture

Cisco NSO has three architectural components:

1. A model-based programmatic interface that allows for control of everything from simple device turn-up and configuration management to sophisticated, full lifecycle service management
2. A fast, highly scalable, highly available configuration data store that serves as a single source of truth
3. A device abstraction layer that uses Network Element Drivers (NEDs) to mediate access to both Cisco and more than 1000 non-Cisco physical and virtual devices

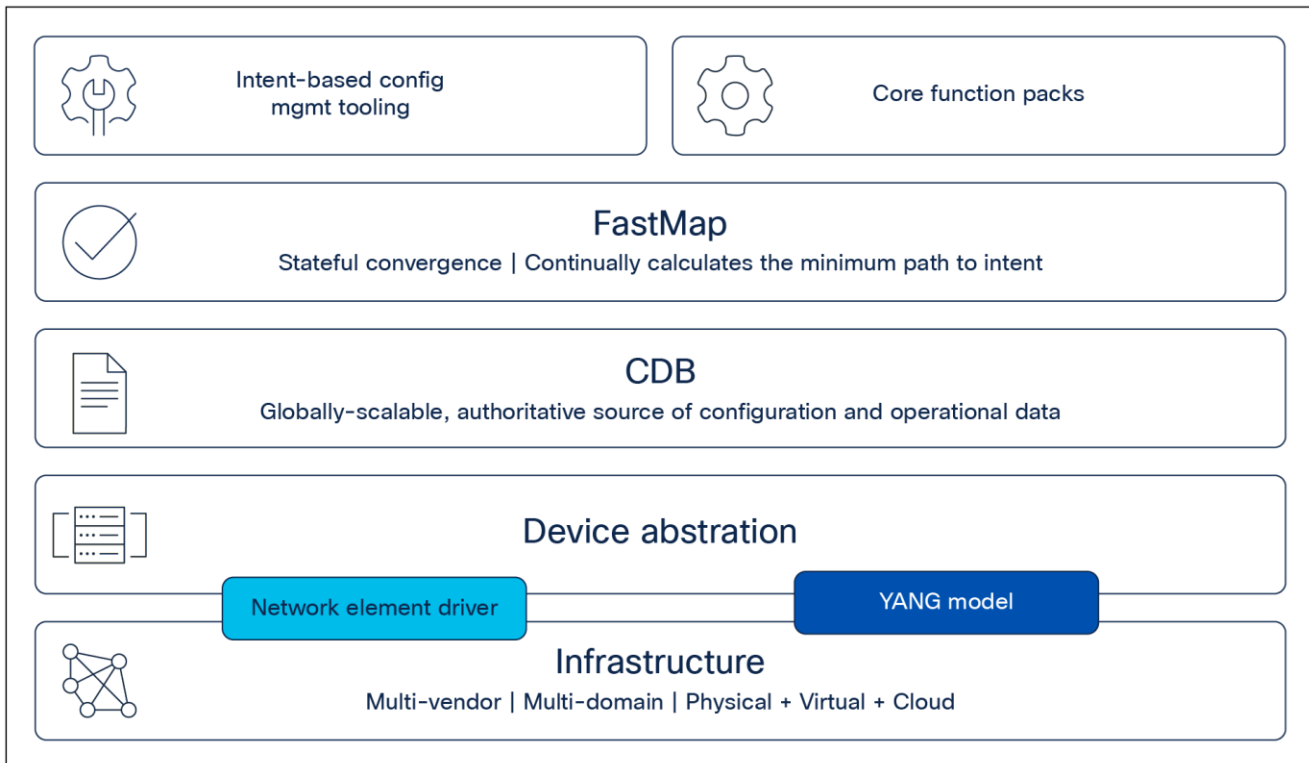


Figure 2. Crosswork NSO has a modular and flexible architecture

Ordering information

Cisco NSO has three elements, each of which is licensed separately:

1. A software license for each NSO server that runs the actual NSO services, maintains the datastore, interfaces with northbound software among other things. For each primary server, you can also license a special High Availability (HA) license for a backup server
2. A Network Element Driver (NED) license for the software that allows a particular network device like a router or firewall to be automated by the NSO server
3. A Right to Manage (RTM) license that allows a network device to be managed by NSO

Cisco Services

Successful execution of an automation strategy is as much about people and process as it about tools such as NSO. You may find you need to augment your capabilities in these areas as you embark on your automation journey. In support of that, Cisco Services offers a full portfolio of services across the project lifecycle, from advisory services, to implementation and support, to customization. In addition, our Cisco Solution Plus partners also offer professional services related to their offers.

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Sustainability topic	Reference
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Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

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Document history

New or revised topic	Described in	Date
Edited “Extensible” Section in Table 1 to include CNFO	Page 4, Table 1 , “Extensible”	10/13/22
Removed reference to ESC (no longer shown in figure 2)	Page 5, Figure 2	10/13/22

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