

NSO 4.6 Highlights



This documents and highlights the main efforts of the NSO 4.6 release and other development that has a direct or indirect interface towards NSO.

With orderability now confirmed, we'd like to welcome you to the NSO 4.6 release – a release that includes an exciting list of new features from the roadmap (see table below); approximately 50 new smaller features, and 100 enhancements to existing features.

The focus of the release is on improving the environment for service developers as well as bringing results from our continuous efforts to improve the usability and performance of NSO as a whole.

User Interface (UI)

Most updates to webui-one are to be found in the **Model browser** which previously was a plain listing of the loaded models, categorized by module. Now you can see both modules and packages, and each one of them can be expanded to see the containing models.

The packages have status as well as version indicators, meaning if a package fails to load, you will immediately find out the reason why it didn't work. There is also an option to reload packages directly into the model browser for when packages are added or updated.

In the **configuration editor**, we have added support to navigate the configuration model using the keyboard. The breadcrumbs indicator has an input field which allows you to type the names of containers and list elements, use tab-completion or a drop down menu to select from the available options. This feature will hopefully be helpful for users that are used to using a command line interface to navigate models.

Presence containers can now be created and deleted individually.

Network Element Drivers (NEDs)

New Production NEDs

NED Name	Vendor	Platform	API
adv-a-fspnh	ADVA optical networking	ADVA FSP Network Hypervisor	RESTConf
arris-cmts	Arris	E6000 Converged Edge Router	CLI
coriant-smartrouter	Coriant	8600 Smart Router Series	CLI
infinera-emxp	Infinera	Ethernet Muxponder II	CLI
radware-alteonos	Radware	Alteon OS Application Switch 5208, 5224 and Virtual Appliances	CLI

New POC NEDs

NED Name	Vendor	Platform	API
ericsson-efn324	Ericsson	EFN324	CLI

New NSO Features

Activity	High level description	What problem(s) gets solved
Templatize	Templatize is a new operational mode command that is used to extract certain patterns from configuration, and presents them as templates to use in service implementation	It helps solve the problem of designing templates for a new service and for finding templates on a device that has a number of service instances already configured.
Progress Trace	When a transaction or action is applied, NSO emits progress events. These events can be displayed and recorded in a number of different ways.	The progress trace provides developers with useful information or debugging, diagnostics and profiling. This information can be used both during development cycles and after release of the software.
Template Language Enhancements	Enhance the template language with more powerful control statements, such as for-loops and if-then-else.	<p>Make it simpler to create services, by moving more logic from Java/Python to templates.</p> <p>This also addresses a performance problem; if the Java/Python code has to invoke the same template multiple times (due to lack of iteration), there will be lots of IPCs. Moving the iteration to the template means that the number of IPCs can be drastically reduced.</p>
Scheduler	NSO now includes a native time-based job scheduler suitable or scheduling background work. Tasks can be scheduled to run at particular times or periodically at Fixed times, dates, or intervals. It can typically be used to automate system maintenance or administration-through tasks	The NSO scheduler can typically be used to automate system maintenance or administration-through tasks
RESTCONF items	<p>A "YANG Patch" is an ordered list of edits that are applied to the target data store by the RESTCONF server.</p> <p>Add support for Token based authentication.</p> <p>Implements the RESTCONF event notification streams described in Section 6 and 9.2 in RFC 8040. The design of RESTCONF event notification is inspired by how event notifications is designed in the NETCONF RFC 5277.</p>	<p>Make it possible to perform an ordered list of edits as one atomic operation.</p> <p>Authentication solutions based upon Tokens is now supported by the RESTCONF server via the external authentication mechanism. This makes it possible to avoid sending User/Password information to the RESTCONF server.</p> <p>The RESTCONF event notification streams support makes it possible for subscribers to subscribe to event streams using RESTCONF as channel.</p>

Core Function Packs

TAILF NFVO

There have been two minor releases of NFVO since the 4.5 release of NSO, and a major release is right around the corner.

The feature growth during this period:

- The Image and Flavor services now have a plan component as well as an image/flavor-result list
- Images and Flavors can now be onboarded as part of the ns-info/vnf-info with the new vdu onboard-image and onboard-flavor flags
- A new service has been added to the NFVO tree for the creation of Volumes
- The Resource Orchestrator can now allocate resources for an NSD/VNFD over a zone
- Added support for creating authgroups as part of the VNF instantiation
- Merged the core packages (tailf-etsi-rel2-nfvo, tailf-etsi-rel2-nfvo-esc, tailf-etsi-rel2-nfvo-ro and tailf-etsi-rel2-nfvo-ro-os) into a single package: tailf-etsi-rel2-nfvo (no model changes just a packaging change)

TAILF-HCC

There have been a number of patch releases and one minor release of tailf-hcc since the 4.5 release of NSO. The feature growth during this period:

- Multiple VIP support, from 1 to N Virtual IPs, can now be created by the tailf-hcc FP

PNP

There has been one minor release of PNP since the 4.5 release of NSO. The feature growth during this period:

- Enhanced support for creating snmp authgroups for onboarded devices: in addition to the snmp-community-ro parameter it is now possible to add SNMPv3 parameters
- Configurable support of X-Forwarded-For - the IP address gets forwarded if HTTP-proxy is used
- Added support for specifying a day-1 file per CPE in the PnP map
- Added support for URIs in config restore (day-1)

Resource Manager

There has only been patch releases of the Resource Manager since the 4.5 release of NSO.

For any questions and/or feedback, please reach out to Fredrik Swahn, NSO Product Owner.

