



# NSO 5.x Migration

Don't worry

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## < NSO 5.x

- Only a single version of a YANG module loaded into the system
- No support for YANG module that NSO implements itself, such as ietf-netconf-acm

# Yang Schema mount

- The CDM solution solves these problems by using a technique called *YANG Schema Mount*, where all the data models from a device are mounted into the /devices/device/config tree in NSO.
  - RFC 8528
- This makes it possible to load different versions of the same YANG module for different devices.

# NSO 5.x

- Ability to support concurrent versions of multiple namespaces and NED versions
- Tooling for low-impact introduction of new services and devices
- Allows services and infrastructure to evolve at their own rate

“AAARARRRGWWWH.”

Chewbacca – Return of the Jedi

# Should I migrate to NSO 5.x?

- NSO 5.x is all about more complex NED deployment scenarios, e.g. support multiple versions of NEDs in a single NSO installation.
- Not only about CDM
  - Secure Call Home – RFC 8071
  - Audit Trails
  - Service Progress Monitoring
  - LSA
  - NANO Services
  - NETCONF NED Builder
  - ...and many, many more enhancements and features

# Migration process



# CDM Migration

- Backup
- Update service code to make it CDM compliant
- Migrate
- Check data
- Enjoy

# CDM Migration- Prepare NEDs/Packages

- Update NSO with CDM compliant NEDs
  - NEDs needs to be updated to a version that supports new ned-id
  - Depending on the type of NED and version, your NED might already be prepared for this.
  - [nso5-upgrade-support@cisco.com](mailto:nso5-upgrade-support@cisco.com)
- Update service code to make it CDM Compliant
  - In general the Java/C/Python APIs are kept intact. Still under the hood they have undergone major changes

# CDM Migration- Prepare non-Cisco provided NEDs

- NEDs needs to be migrated to use the new ned-id. This requires some changes to Makefiles and java build.xml
  - This is described in **nso\_cdm\_migration.pdf** which is part of NSO 5.x distribution
  - Only necessary to manually do this if you have your own NEDs not supported by Cisco
- Re-compile NEDs with 5.x
  - The NED directory should also be renamed to a unique name like: cisco-ios-cli-6.xx
- [nso5-upgrade-support@cisco.com](mailto:nso5-upgrade-support@cisco.com)

# Service Packages

In Java and Python services, the service code must handle the ambiguities by code where the devices ned-id is tested before setting the nodes and values for the diverging paths.

```
/* Java */

String ipStr = ipv4Str;
String nedIdStr = context.getNEDIdByDeviceName(elemName.valueAsString());
if ("webserver-nc-1.0:webserver-nc-1.0".equals(nedIdStr))
{
    ipStr = ipv4Str;
}
else if ("webserver2-nc-1.0:webserver2-nc-1.0".equals(nedIdStr))
{
    ipStr = ipv6Str;
}

#Python

dev = _get_device(service, name)
if 'ap-nc-1.0:ap-nc-1.0' == ncs.application.get_ned_id(dev):
    self.create_apache1_device(dev)
elif 'ap-nc-1.1:ap-nc-1.1' == ncs.application.get_ned_id(dev):
    self.create_apache2_device(dev)
```

# Migration procedure CDB migration

- Compact

```
> ncs --cdb-compact ./ncs-cdb/  
Loaded configuration from ./ncs-cdb/A.cdb (5.64 MiB data, 55 transactions in 0.500s)  
Saving... done.
```

- Run the migration

```
(system install)  
> NCS_RELOAD_PACKAGES=true /etc/init.d/ncs start
```

# CDM Migration- Post checks

- After the migration is done it is a good idea to check the logfile **logs/cdm-migration.log**
- This log will tell you
  - Devices set to netconf (correct ned-id not found)
  - Data lost in the migration

# CDM Migration- Post checks

- Look in cdm-migration.log

*<ERR> 5-Jun-2019::15:14:04.299 MAKERSTR-M-P2Q7 confd[87151]: cdm\_migration*

*The following data has been deleted due to ambiguity,*

*changed name space or missing name space*

*=====  
/services/makerstr/mpls/PEService: PEService/{MYCUST1, IOS01}/private::undefined  
/services/makerstr/mpls/PEService: PEService/{MYCUST1, IOS01}::undefined  
...snip*

# CDM Migration- Post checks

- Look in cdm-migration.log

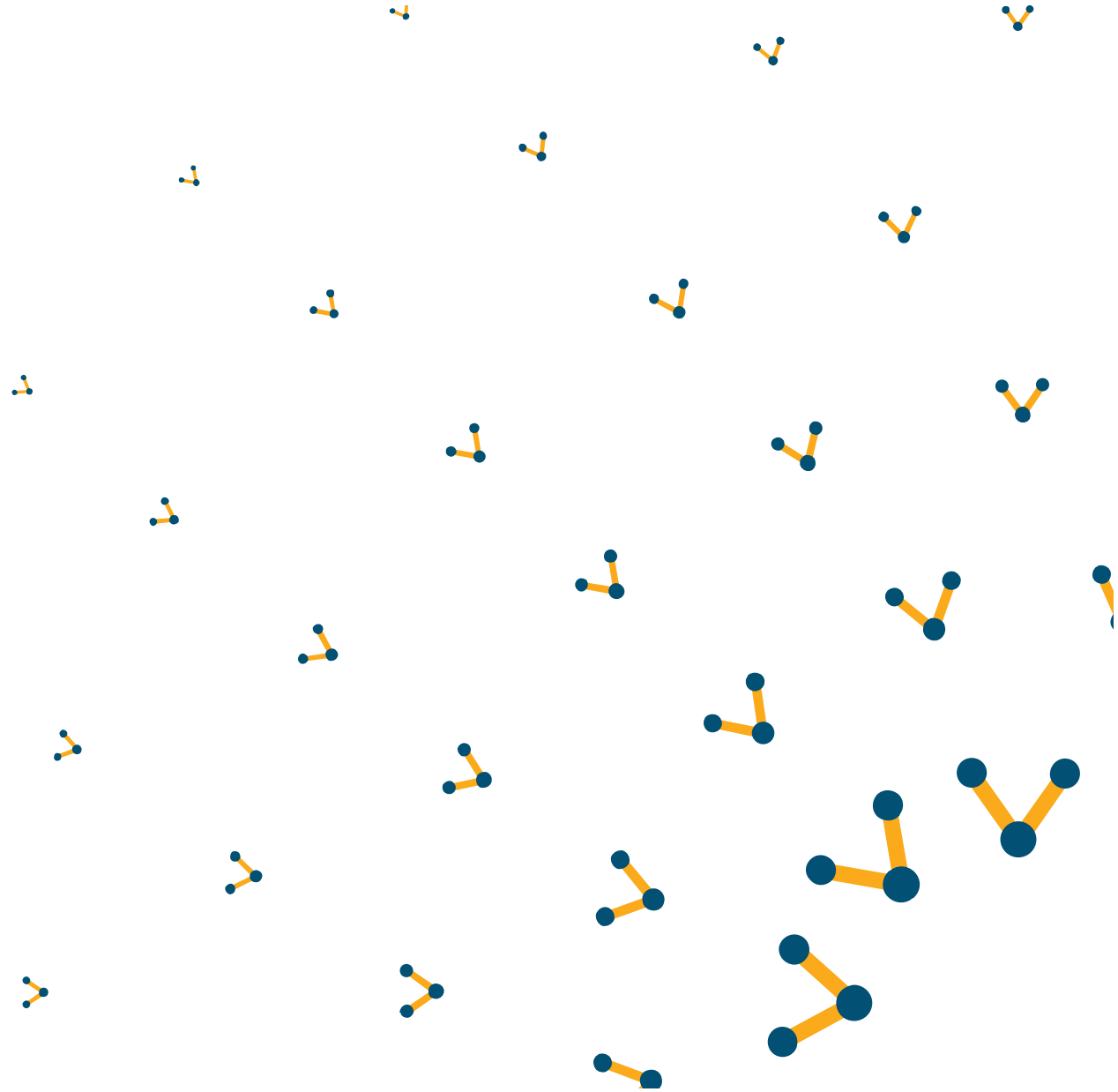
```
<ERR> 5-Jun-2019::15:14:04.313 MAKERSTR-M-P2Q7 confd[87151]: cdm_migration
The ned-id for the following devices has been set to netconf,
    because no unique data was found:
=====Device =====
IOS01
IOSXR003
IOSXR004
```



# CDM Migration help

- nso\_cdm\_migration.pdf – included with NSO 5
- [nso5-upgrade-support@cisco.com](mailto:nso5-upgrade-support@cisco.com)

Use this  
slide for  
transitions





# CDM Migration- Python (optional)

- Install Python 3
- Modify/Verify service code with python3
  - <https://github.com/hniska/nso-python2to3>
  - 2to3