Developer Days
Network Services Orchestrator

NSO 5.2 Migration

Common Data Model

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< NSO 5.1

- 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

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 upgrade to NSO 5.2.x?

- What are your current needs?
  - NSO 5.x is all about more complex NED deployment scenarios, e.g. support multiple versions of NEDs in a single NSO installation.
  - If this sounds like what you need NSO 5.x is going to give you a lot of strong tools. You should plan to migrate soon.

No need for multiple NEDs and CDM features

- If you don’t feel limited by your current NSO, start planning but take your time
- If you don't leverage any of the new features in NSO 5.x, it is going to feel much like NSO 4.7

New project, NSO 5.2 or NSO 4.7?

- Go straight to NSO 5.2
- Not only about CDM
  - Secure Call Home – RFC 8071
  - Audit Trails
  - Service Progress Monitoring
  - LSA
  - NANO Services

Migration process

CDM Migration- Overview

- The upgrade procedure is the same as previous versions.
  - With additional pre-requisite to compact CDB journal first.
- The upgrade is triggered automatically when starting the NSO 4.x instance with the NSO 5 binary.
  - The upgrade process will automatically migrate all devices to their new crunched namespace and update the ned-ids
  - Device templates are also migrated to the new ned-id list structure.

Pre-migration activites

- Device Templates
- Validate services (Code review)
- NEDs
- Do a backup

Device Templates

- When an existing NSO installation is migrated to CDM, NSO will automatically, as part of the migration process, attempt to move existing templates in the configuration into this new form.
- However, templates stored as XML files will need to be changed manually.

Service Packages

- In general the Java/C/Python APIs are kept intact. Still under the hood they have undergone major changes.
- The notification kicker YANG module now has a new XML namespace and new prefix. Code that uses notification kickers might need to change.

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 - NEDs

- Migrate/Update the NED on your current NSO system to the latest NED, which then supports CDM and 5.x
  - Test your solution with the new NEDs
- Migrate your NSO from =>4.5 to 5.x
  - Test your solution with the new NSO

Non Cisco NEDs

- Old NEDs needs to be migrated to use the new ned-id. This requires some changes to Makefiles and java build.xml
  - Newer NEDs are already prepared for this, depending on the type of NED and version, your NED might already be prepared for this.
  - This is described in **nso-cdm.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

“AAARARRRGWWWH.”

Martin – I forgot to backup

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

```
(local install)
> ncs --with-package-reload
```

```
(system install)
> /etc/init.d/ncs start-with-package-reload
```

CDM Migration – Verify migration

- 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 due to no config
  - Data lost in the migration

CDB Migration result

- 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

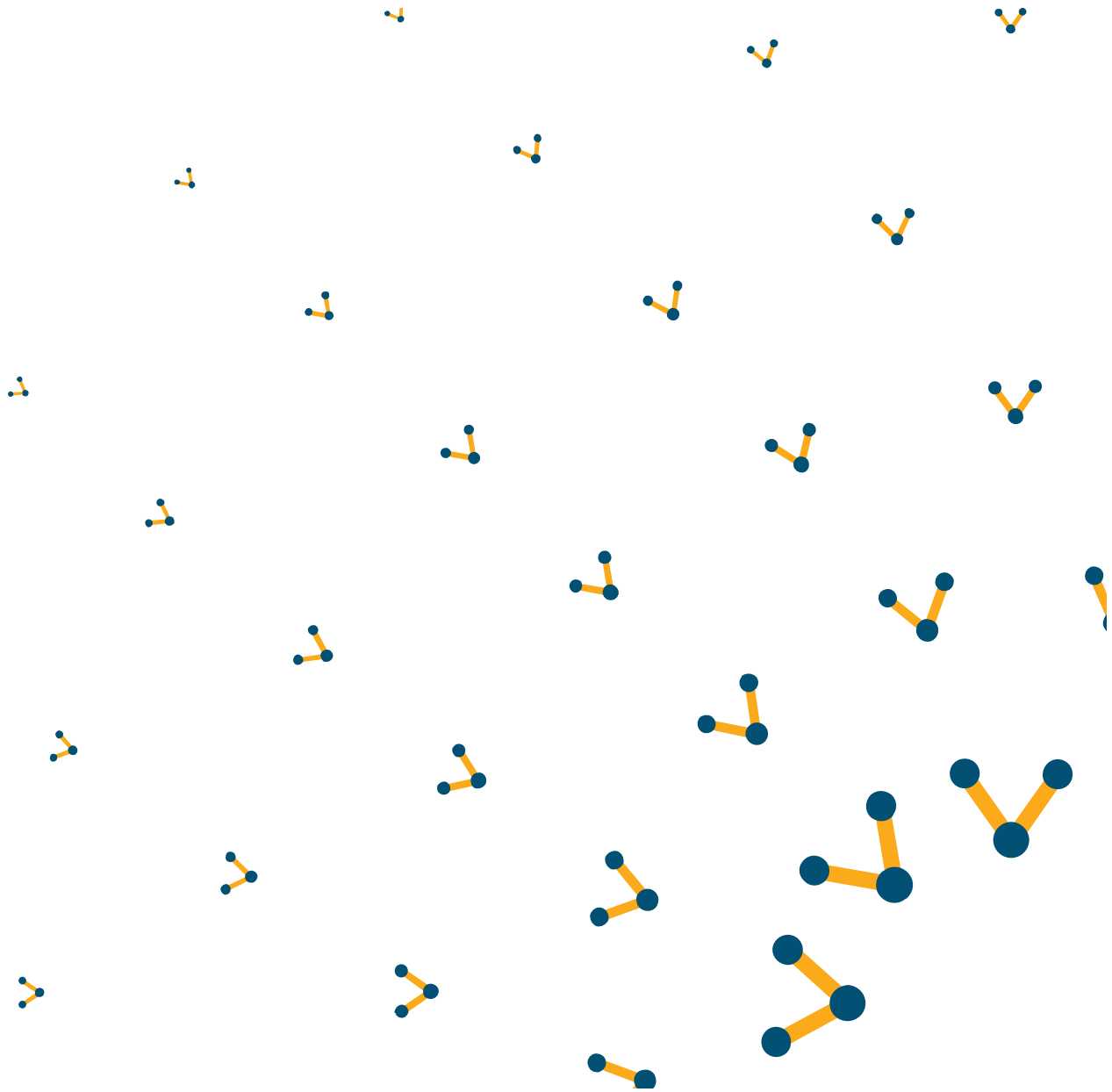
=======CDM data===
/services/makerstr/mpls/PEService: PEService/{MYCUST1, IOS01}/private::undefined
/services/makerstr/mpls/PEService: PEService/{MYCUST1, IOS01}::undefined
…snip

CDB Migration result

- 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

Use this slide for transitions

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