

A group of birds flying in a V-formation against a light blue sky, positioned above the main title.

NSO - Troubleshooting, Backup & Restore

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Agenda

- NSO Logs & Troubleshooting Tips
 - NSO Logs
 - NSO Error Log commands
 - Changing Log Level
 - Log Rotation
 - Performance Impact by each Log file
- NSO Backup & Restore
 - Backup Functionality
 - Restore Functionality
 - Alternate of ncs-backup tool

NSO Logs

- **Log File Setup & Location**

- Logging level can be set for most NSO logs via `ncs.conf`
- Located at `/var/log/ncs` (for system installs)

- **Log Files**

- `audit.log` – NB Calls including WebUI, JSON, REST API calls coming into NSO
- `ncs.log` – Logs NSO system events including issues with startup/shutdown
- `ncs-java-vm.log` – NSO's Java VM issues
- `devel.log` – capture detailed info on Java code / CBD / sync-from and other details

NSO Logs - Continued

- **Log Files**

- ned-alu-..trace – generated by setting device trace on via NSO CLI (raw vs. pretty)
- xpath-trace-log – troubleshooting Xpath in YANG must statements (use carefully)
- ncserr.log – NSO Daemon errors are logged
- snmp.log – SNMP traps info
- netconf.log – Troubleshooting NB NETCONF operations coming into NSO
- ncs-python-vm.log – NSO python VM issues
- ncs-python-vm-<package-name>.log – Troubleshooting Python package specific issues

NSO Logs - Commands

- **Commands**

- `ncs -debug-dump myncsdebug` : send this to NSO Dev Team or attach to case
- `ncs --printlog ncserr.log.1` :send this to NSO Dev Team
- `ncs_cmd -c reopen_logs` : restarting Logging without restarting NSO

Changing Log level

- Changing logging level for 'devel.log' in >> ncs.conf

```
<developer-log>
  <enabled>>true</enabled>
  <file>
    <name>${NCS_LOG_DIR}/devel.log</name>
    <enabled>>true</enabled>
  </file>
</developer-log>
<developer-log-level>info</developer-log-level>
```

- Changing device trace setting >> NSO CLI

```
root@ncs% set devices device ALUSR-0 trace
Possible completions:
false - Trace is disabled
pretty - Pretty-printed data
raw - Raw, unformatted data
root@ncs% set devices device ALUSR-0 trace raw
```

Log Rotation

- The primary agent for log rotation is the Linux logrotate utility.
- All files under `/var/log/ncs` are subject to rotation by logrotate, except `ncserr.log*`
- Rotation `ncserr.log*` files are managed by NCS itself.
- Rotation Options
 - `createolddir` :Create ARCHIVED dir if it doesn't exit.
 - `compress` :Compress rotated log files.
 - `copytruncate` :Truncate file during rotation.
 - `dateext` :Use a date as the archived file extension.
 - `dateformat` :Set the file extension format to be -YYYYmmdd
 - `maxage 90` :Delete archived log files older than 90 days
 - `maxsize 15728640` :Rotate any log file >= to 15MB
 - `missingok` :Do not issue an error if a log file is missing
 - `ifempty` :Rotate the log file even if it's empty
 - `maxage` :Maximum retention days of a rotated log file.
 - `nosharedscripts` :The "prerotate" script applies target individually.
 - `olddir` :Location of rotated files.

Log Files

Log File	Information	System Installation Enabled by Default	Local Installation Enabled by Default	
ncs.log	System events	Yes	Yes	Low Performance Impact
ncs-java-vm.log	Java VM log	Yes	Yes	High Performance Impact
audit.log	System access and actions	Yes	Yes	Low Performance Impact
devel.log	Development log (Java code)	Yes	Yes	High Performance Impact
netconf.log	NETCONF actions and results	Yes	Yes	High Performance Impact
snmp.log	SNMP requests	Yes	Yes	Medium Performance Impact
xpath.trace	XPath processing	No	Yes	High Performance Impact
ncserr.log	Internal NSO daemon log	No	Yes	High Performance Impact

Log File	Information	System Installation Enabled by Default	Local Install Enabled by Default	Impact
ncs-python-vm.log	Python VM Log	Yes	Yes	Low Impact
ncs-python-vm-<package-name>.log	Python Package Log	Yes	Yes	Medium Impact
ned-alu-..trace	NED Trace Log	No	No	High Impact

NSO Backup & Restore

Backup / Restore CDB Backup

- **Simple CDB Backup/Restore Option**

- Backup entire CDB or specific service
 - `ncs_load nso-config-backup.xml`
 - `ncs_load -P /ncs:services/l3mplsvpn:l3mplsvpn nso-l3mplsvpn.xml`
- Restore CDB or specific Service
 - `ncs_load -u admin -j -1 nso-config-backup.xml`
 - `ncs_load -u admin -j -1 -m nso-l3mplsvpn.xml`
- Use -m (merge) option instead of outright replacing configuration

Backup / Restore

- **Backup**

- Built-in functionality
- Available with 'system-install'
- Backs-up following files/components
 - CDB
 - State files
 - Rollback files
 - Configuration files

Minor Change

Service: No downtime

Management: No downtime

Risk: Low

Complexity: Low

Backup / Restore

- **Backup Process**

- No need to Stop NSO
- Run “ncs-backup” command
- Stored at /var/opt/ncs/backups/ folder
- Run it periodically using CRON job
- For disaster recovery, recommended to copy backup to remote server

Backup / Restore

- **Restore**

- Restore full running environment
- Entire configuration replaced
- Latest configuration changes may be lost
- Time consuming for very large configuration

- **Restore Process**

- Stop NSO
- `ncs-backup -restore <path-to-backup-file>`
- Start NSO

Major Change

Service: No downtime

Management: e.g. 30' downtime

Risk: Medium to High

Complexity: Low to Medium

Backup / Restore

- **Complex Backup**

- NSO in HA
- NSO with Clustering & HA
- NSO with LSA & HA

- **Solution**

- nct tool - useful for multiple NSO nodes
 - Backup & Restore
 - Upgrade
 - Install & Uninstall
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TOMORROW starts here.