Cisco Crosswork NSO Telemetry Traffic Collector Function Pack 2.0.0

Installation Guide
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1 Introduction

This document describes how to install and configure the Cisco Crosswork - NSO Telemetry Traffic Collector Function Pack (Crosswork TM-TC FP). This document is applicable to Cisco Crosswork version 4.0.

Audience
This document is intended for Cisco Advanced Services developers, network engineers, and system engineers to install, configure, and deliver FP functionalities.

Additional Documentation
This documentation requires the reader to have a good understanding of NSO and its usage as described in the NSO documentation.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NSO Installation Guide</td>
</tr>
<tr>
<td>2.</td>
<td>NSO User Guide</td>
</tr>
</tbody>
</table>
2 Before You Begin

This section outlines the software requirements and platform dependencies to install the Crosswork TM-TC FP.

2.1 Prepare to Install Crosswork TM-TC FP

Install the following on your system before installing the Crosswork TM-TC FP:

1. Obtain NSO 5.4.2 installation bin file and follow the steps described in the NSO Installation Guide – System Installation to install NSO 5.4.2.

   $ sudo sh nso-5.4.2.linux.x86_64.installer.bin --system-install --non-interactive

2. If you are running an earlier instance of NSO, make sure to stop the NSO instance.

3. If an older NSO version is installed, uninstall the older version of the NSO and install NSO 5.4.2.

4. Verify the NSO version.

   $ ncs --version
   5.4.2

5. Make sure to have:

   o **sudo** user privileges to perform the installation. This user must also be part of the **ncadmin** group.

   o OpenJDK 11 or higher is installed.

   o Python 3.8 or higher is installed. The default Python should point to Python 3.
3 Install Crosswork TM-TC FP

The Crosswork TM-TC FP can be installed on NSO system installation and local installation. System installation is for a real time production environment and the preferred method of installation.

You must have **sudo** user privileges to perform the installation and run the installation commands.

**To perform the TM-TC installation:**

1. Log in to the host machine as the **ncs** user, who is also part of the **ncsadmin** user group and also has sudo access.

2. Obtain and download the **ncs-5.4.2-tm-tc-2.0.0.tar.gz** package from the Cisco website and copy it to the host server. This is the Crosswork TM-TC FP file.

3. Untar the Crosswork TM-TC FP package (**tar.gz**) file to the current directory. If the folder already exists, be sure to create a backup of the existing folder.

   ```
   $ tar -xvf ncs-5.4.2-tm-tc-2.0.0.tar.gz
   ```

The following table lists the packages and files that are extracted during the installation.

<table>
<thead>
<tr>
<th>Group</th>
<th>Package Category</th>
<th>Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Function Pack</strong></td>
<td>Crosswork TM-TC FP</td>
<td>TM-TC-2.0.0/ncs-5.4.2-cisco-tm-tp-2.0.0.tar.gz</td>
</tr>
<tr>
<td><strong>Common Packages</strong></td>
<td></td>
<td>TM-TC-2.0.0/ncs-5.4.2-tm-tp-multi-vendors-2.0.0.tar.gz</td>
</tr>
<tr>
<td><strong>Custom Template</strong></td>
<td>Custom template utils</td>
<td>TM-TC-2.0.0/ncs-5.4.2-custom-template-utils-2.0.5-d0e53d5-2021-02-16.tar.gz</td>
</tr>
<tr>
<td><strong>NEDs</strong></td>
<td>CLI NED</td>
<td>TM-TC-2.0.0/ncs-5.4.2-cisco-iosxr-7.33.1.tar.gz</td>
</tr>
</tbody>
</table>
4. Install the Crosswork TM-TC FP on the NSO and local systems. All the NED packages mentioned in above table are mandatory for TM TC functional pack.

**System installation:**

Copy the functional pack packages and NED packages to "packages" folder under "NSO running directory". Make sure there are no duplicate packages. If the NED packages already exist with different name, user can skip copying those packages.

**Download the Crosswork TM-TC FP 2.0.0 from cisco.com:**

```
[root@localhost 2.0.0]# ls
ncs-5.4.2-tm-tc-2.0.0.tar.gz
```

**Untar the package:**

```
[root@localhost 2.0.0]# tar -xvzf ncs-5.4.2-tm-tc-2.0.0.tar.gz
```

**List the packages of TM TC 2.0.0**

```
[root@localhost 2.0.0]# cd TM-TC-2.0.0/
[root@localhost TM-TC-2.0.0]# ls -l
manifest.json
ncs-5.4-cisco-iosxr-nc-6.6.3-3178944-2020-07-07.tar.gz
ncs-5.4.2-cisco-iosxr-7.33.1.tar.gz
ncs-5.4.2-cisco-iosxr-nc-7.3.1.tar.gz
ncs-5.4.2-cisco-tm-tc-fp-2.0.0.tar.gz
ncs-5.4.2-custom-template-utils-2.0.5-d0e53d5-2021-02-16.tar.gz
ncs-5.4.2-tm-tc-multi-vendors-2.0.0.tar.gz
[root@localhost TM-TC-2.0.0]#
```
Stop NSO
[root@localhost TM-TC-2.0.0]# /etc/init.d/ncs stop
Stopping ncs (via systemctl):      [  OK  ]

Copy the functional pack packages to NSO packages running directory

[root@localhost TM-TC-2.0.0]# cp *.tar.gz /var/opt/ncs/packages/

Restart NSO
[root@localhost TM-TC-2.0.0]# /etc/init.d/ncs restart-with-package-reload-force
Restarting ncs (via systemctl):  [  OK  ]

Local installation:

Copy the functional pack packages and NED packages to "packages" folder under "NSO running directory". Make sure there are no duplicate packages. If the NED packages already exist with different name, user can skip copying those packages.

Download TM TC 2.0.0 from cisco.com
[root@localhost 2.0.0]# ls
ncs-5.4.2-tm-tc-2.0.0.tar.gz

Untar TM TC 2.0.0
[root@localhost 2.0.0]# tar -xvzf ncs-5.4.2-tm-tc-2.0.0.tar.gz

List the packages of TM TC 2.0.0
[root@localhost 2.0.0]# cd TM-TC-2.0.0/
[root@localhost TM-TC-2.0.0]# ls -l
manifest.json
ncs-5.4-cisco-iosxr-nc-6.6.3-3178944-2020-07-07.tar.gz
ncs-5.4-cisco-iosxr-nc-7.3.1.tar.gz
ncs-5.4-cisco-iosxr-nc-7.3.1.tar.gz
Stop NSO

[root@bg12-sp-esxi-017 ncs-run]# ncs --stop

Copy the functional pack packages to NSO packages running directory

[root@bg12-sp-esxi-017 TM-TC-2.0.0]# cp *.tar.gz //home/nso/ncs-run/packages/

Restart NSO
[root@bg12-sp-esxi-017 ncs-run]# ncs --with-package-reload-force

5. Verify the installation and make sure the packages are up and running. For more information, see **Verify the Installation**.

6. Perform post installation tasks for Crosswork TM-TC FP. For more information, see **Perform Post Installation Tasks**.
4 Verify the Installation

This section discusses how to verify the Crosswork TM-TC FP system installation. As part of the verification process, user must verify if the packages are up and package versions are set as expected.

4.1 Verify Crosswork TM-TC FP System Installation

Verify the build number, Crosswork TM-TC FP release information, and package versions to verify the Crosswork TM-TC FP installation.

1. Verify all the packages are up and running. An “X” indicates that the package is up.

   [nso@localhost ->]$ ncs_cli -u admin -c

   admin connected from 10.65.34.37 using ssh on localhost.localdomain

   admin@ncs# show packages package oper-status

<table>
<thead>
<tr>
<th>NAME</th>
<th>PROGRAM</th>
<th>JAVA</th>
<th>BAD</th>
<th>NCS</th>
<th>PACKAGE</th>
<th>PACKAGE CIRCULAR</th>
<th>DATA</th>
<th>LOAD</th>
<th>ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>cisco-iosxr-cli-7.33</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>cisco-iosxr-nc-6.6</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>cisco-iosxr-nc-7.3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>cisco-tm-tc-fp</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>custom-template-utils</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>tm-tc-multi-vendors</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

2. Verify the package versions and the build information.

   admin@ncs# show packages package package-version

<table>
<thead>
<tr>
<th>NAME</th>
<th>PACKAGE VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>cisco-iosxr-c3i-7.33</td>
<td>7.33.1</td>
</tr>
<tr>
<td>cisco-iosxr-nc-6.6</td>
<td>6.6.3</td>
</tr>
<tr>
<td>cisco-iosxr-nc-7.3</td>
<td>7.3.1</td>
</tr>
<tr>
<td>cisco-tm-tc-fp</td>
<td>2.0.0</td>
</tr>
<tr>
<td>custom-template-utils</td>
<td>2.0.5</td>
</tr>
<tr>
<td>tm-tc-multi-vendors</td>
<td>2.0.0</td>
</tr>
</tbody>
</table>

admin@ncs#
5 Perform Post Installation Tasks

There are two types of post installation configuration that are required for the Crosswork TM-TC FP to work with CLI NED devices and Crosswork.

1. Configure tm-tc cfp configurations

   [nso@localhost ~]$ ncs_cli -u admin -J

   User admin last logged in 2021-04-01T02:59:08.023099-04:00, to localhost, from 10.65.34.37 using cli-ssh
   admin connected from 10.65.34.37 using ssh on localhost.localdomain
   admin@ncs> config
   Entering configuration mode private
   [ok][2021-04-01 03:10:21]

   [edit]
   admin@ncs%

   admin@ncs% set cisco-tm-tc-fp:cfp-configurations dynamic-device-mapping cisco-iosxr-cli-7.33:cisco-iosxr-cli-7.33 python-impl-class-name tm_tc_multi_vendors.IosXR
   [ok][2021-04-01 03:11:05]

   [edit]
   admin@ncs% set cisco-tm-tc-fp:cfp-configurations stacked-service-enabled
   [ok][2021-04-01 03:11:12]

   [edit]
   admin@ncs% commit
   Commit complete.

1. Configure NACM rules

   [nso@localhost ~]$ ncs_cli -u admin -J
5.1 Uninstall Crosswork TM-TC FP

- To uninstall Crosswork TM-TC FP on NSO system installation instance, stop NSO and then remove the packages that were copied over to “NSO package running directory” during installation and restart NSO.

**System installation:**

Stop NSO

```
[root@localhost TM-TC-2.0.0]# /etc/init.d/ncs stop
Stopping ncs (via systemctl): [ OK ]
```

Remove the functional pack packages to NSO installation directory

```
[root@localhost nso]# cd /var/opt/ncs/packages/
```
Perform Post Installation Tasks

[root@localhost packages]# ls -l
-dlm-service-pack-5.4.2-latest.tar.gz
ncs-5.4-cisco-iosxr-nc-6.6.3-3178944-2020-07-07.tar.gz
ncs-5.4.2-cisco-iosxr-7.33.1.tar.gz
ncs-5.4.2-cisco-iosxr-nc-7.3.1.tar.gz
ncs-5.4.2-cisco-tm-tc-fp-2.0.0.tar.gz
ncs-5.4.2-custom-template-utils-2.0.5-d0e53d5-2021-02-16.tar.gz
ncs-5.4.2-tm-tc-multi-vendors-2.0.0.tar.gz

[root@localhost packages]#

[root@localhost packages]# rm -rf ncs-5.4.2-cisco-tm-tc-fp-2.0.0.tar.gz
[root@localhost packages]# rm -rf ncs-5.4.2-tm-tc-multi-vendors-2.0.0.tar.gz
[root@localhost packages]#

Restart NSO

[root@localhost TM-TC-2.0.0]# /etc/init.d/ncs restart

Restarting ncs (via systemctl): [ OK ]

Local installation:

Stop NSO

[root@bg112-sp-esxi-017 ncs-run]# ncs --stop

Remove the functional pack packages to NSO packages running directory

[root@bg112-sp-esxi-017 packages]# pwd
/home/nso/ncs-run/packages

[root@bg112-sp-esxi-017 packages]# ls -l
ncs-5.4-cisco-iosxr-nc-6.6.3-3178944-2020-07-07.tar.gz
ncs-5.4.2-cisco-iosxr-7.33.1.tar.gz
ncs-5.4.2-cisco-iosxr-nc-7.3.1.tar.gz
ncs-5.4.2-cisco-tm-tc-fp-2.0.0.tar.gz
ncs-5.4.2-custom-template-utils-2.0.5-d0e53d5-2021-02-16.tar.gz
ncs-5.4.2-tm-tc-multi-vendors-2.0.0.tar.gz

[root@bg112-sp-esxi-017 packages]#
[root@bg112-sp-esxi-017 packages]# rm -rf ncs-5.4.2-cisco-tm-tc-fp-2.0.0.tar.gz
[root@bg112-sp-esxi-017 packages]# rm -rf ncs-5.4.2-tm-tc-multi-vendors-2.0.0.tar.gz
[root@bg112-sp-esxi-017 packages]#

Restart NSO

[root@bg112-sp-esxi-017 ncs-run]# ncs --with-package-reload-force

- It is advised to remove only functional pack packages mentioned in
  the table under installation section. Removing the other packages
  might interrupt other operations on NSO.
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