



# Cisco Crosswork Telemetry – Traffic Collector Functional Pack

## Installation Guide

Version 1.0.0

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# 1 Preface

## Abstract

This **Crosswork Telemetry – Traffic Collector (TM-TC) Functional Pack Installation Guide** includes information to help you install and configure. This document is applicable to Crosswork Change Automation and Health Insights 3.2.2 and Crosswork Optimization Engine 1.2.1.

## Audience

This document describes how to install and configure Crosswork TM-TC FP. This document is intended for Cisco Advanced Services developers, network engineers, and system engineers to install, configure, and deliver the FP functionalities to Cisco customers.

## Additional Documentation

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

Sl. No.	Documentation
1.	NSO Installation Guide
2.	NSO User Guide

## 2 Before You Begin

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

### 2.1 Preparing to Install Crosswork TM-TC FP

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

1. Obtain NSO 5.2.0.3 installation bin file and follow the steps described in the **NSO Installation Guide – System Installation** to install NSO 5.2.0.3.

```
$ sudo sh nso-5.2.0.3.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 5.2.0.3.
4. Verify the NSO version.

```
$ ncs --version  
5.2.0.3
```

5. Make sure to have:
  - **sudo** user privileges to perform the installation. This user must also be part of the **ncsadmin** group.
  - OpenJDK 11 or higher is installed.
  - Python 3.8 or higher is installed. The default Python should point to Python 3.

### 3 Performing TM-TC Installation

The 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 **crosswork-322-ncs-5.2.0.3-tm-tc-1.0.0.tar.gz** package from Cisco website and copy it to the host server. This is the file for Crosswork TM-TC FP.
3. Untar the TM-TC 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 crosswork-322-ncs-5.2.0.3-tm-tc-1.0.0.tar.gz
```

Extract tm-tc-fp package from the build tar package.

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

Group	Package Category	Packages
Function Pack Packages	TM-TC FP Common Packages	packages/ncs-5.2.0.3-custom-template-utils-1.2.tar.gz
		packages/ncs-5.2.0.3-cisco-tm-tc-fp-1.0.0.tar.gz
		packages/ncs-5.2.0.3-tm-tc-multi-vendors-1.0.0.tar.gz
NEDs	CLI NED	packages/ncs-5.2.0.3-cisco-iosxr-7.18.3.tar.gz ncs-5.2.0.3-cisco-iosxr-7.21.tar.gz
	NETCONF NED	packages/ncs-5.2.0.3-cisco-iosxr-nc-6.5.3.tar.gz packages/ncs-5.2.0.3-cisco-iosxr-nc-6.6.3.tar.gz

4. Sub section a explains the steps to install functional pack on NSO system installation. For local installation, refer to sub section b. All the NED

packages mentioned in above table are mandatory for TM TC functional pack.

a) System installation:

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

Copying the functional pack packages to NSO installation directory

```
[nso@localhost 008]$ ls
crosswork-322-ncs-5.2.0.3-tm-tc-1.0.0.tar.gz  install.py  nct.config  nct.py
packages  set-nacm.sh  tm-tc-cfp-configurations.sh  utils.py
[nso@localhost 008]$
[nso@localhost 008]$
[nso@localhost 008]$ cd packages/
[nso@localhost packages]$
[nso@localhost packages]$
[nso@localhost packages]$ SWITCHING TO ROOT USER AS NCS USER DOESN'T HAVE
PERMISSION FOR DESTINATION DIRECTORY ^C
[nso@localhost packages]$
[nso@localhost packages]$ sudo su
[sudo] password for nso:
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-cisco-tm-tc-fp-1.0.0.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-tm-tc-multi-vendors-1.0.0.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-custom-template-utils-1.2.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-cisco-iosxr-nc-6.5.3.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-cisco-iosxr-nc-6.6.3.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-cisco-iosxr-7.18.3.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
[root@localhost packages]# cp ncs-5.2.0.3-cisco-iosxr-7.21.tar.gz
/var/opt/ncs/packages/
[root@localhost packages]#
```

b) Local installation:

copy the functional pack packages and NED packages to “packages” folder under “ncs-run directory”. User would have created this directory at the time of NCS installation. Make sure there are no duplicate packages. If the ned packages already exist with different name, user can skip copying those packages.

5. Login to ncs console and run "*packages reload force*" command to install the newly added packages.

```
[nso@localhost packages]$ ncs_cli -u admin -C

admin connected from 10.65.57.19 using ssh on localhost.localdomain
admin@ncs#
admin@ncs# packages reload force

>>> System upgrade is starting.
>>> Sessions in configure mode must exit to operational mode.
>>> No configuration changes can be performed until upgrade has completed.
>>> System upgrade has completed successfully.
reload-result {
  package cisco-iosxr-cli-7.18
  result true
}
reload-result {
  package cisco-iosxr-cli-7.21
  result true
}
reload-result {
  package cisco-iosxr-nc-6.5
  result true
}
reload-result {
  package cisco-iosxr-nc-6.6
  result true
}
reload-result {
  package cisco-tm-tc-fp
  result true
}
reload-result {
  package custom-template-utils
  result true
}
reload-result {
  package tm-tc-multi-vendors
  result true
}
admin@ncs#
```

6. Verify the installation and make sure the packages are up and running. For more information, see **Verifying TM-TC System Installation** in this documentation.
7. Perform post installation tasks for TM-TC FP. For more information, see **Performing Post Installation Tasks** in this documentation.



## 4 Verifying the Installation

This section discusses how to verify the TM-TC 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 Verifying TM-TC System Installation

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

1. Verify all the packages are up and running. X indicate that package is up.

```
admin@ncs# show packages package oper-status
```

PACKAGE			PROGRAM						
META	FILE		CODE	JAVA	BAD NCS	PACKAGE	PACKAGE	CIRCULAR	
DATA	LOAD	ERROR	UP	ERROR	UNINITIALIZED	VERSION	NAME	VERSION	DEPENDENCY
NAME	ERROR	INFO							
cisco-iosxr-cli-7.18	X	-	-	-	-	-	-	-	-
cisco-iosxr-cli-7.21	X	-	-	-	-	-	-	-	-
cisco-iosxr-nc-6.5	X	-	-	-	-	-	-	-	-
cisco-iosxr-nc-6.6	X	-	-	-	-	-	-	-	-
cisco-tm-tc-fp	X	-	-	-	-	-	-	-	-
custom-template-utils	X	-	-	-	-	-	-	-	-
tm-tc-multi-vendors	X	-	-	-	-	-	-	-	-

```
admin@ncs#
```

2. Verify the package versions and the build information.

```
admin@ncs# show packages package package-version
```

NAME	PACKAGE VERSION
cisco-iosxr-cli-7.18	7.18.3
cisco-iosxr-cli-7.21	7.21
cisco-iosxr-nc-6.5	6.5.3
cisco-iosxr-nc-6.6	6.6.3
cisco-tm-tc-fp	1.0.0
custom-template-utils	1.2.0
tm-tc-multi-vendors	1.0.0

```
admin@ncs#
```

## 5 Performing Post Installation Tasks

There are two types of post installation configuration that are required for tm-tc fp to work with cli NED devices and Crosswork.

### 1. Configure tm-tc cfp configurations

```
[nso@localhost packages]$ ncs_cli -u admin
admin connected from 10.65.57.19 using ssh on
localhost.localdomain
admin@ncs>
admin@ncs> configure
Entering configuration mode private
[ok][2020-06-25 02:17:51]

[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations dynamic-
device-mapping cisco-iosxr-cli-7.18:cisco-iosxr-cli-7.18
python-impl-class-name tm_tc_multi_vendors.IosXR
[ok][2020-06-25 02:18:05]

[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations dynamic-
device-mapping cisco-iosxr-cli-7.21:cisco-iosxr-cli-7.21
python-impl-class-name tm_tc_multi_vendors.IosXR
[ok][2020-06-25 02:18:06]

[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations stacked-
service-enabled
[ok][2020-06-25 02:18:07]

[edit]
admin@ncs% commit
Commit complete.
[ok][2020-06-25 02:18:09]

[edit]
admin@ncs%
```

### 1. Configure NACM rules

```
[nso@localhost 004]$
[nso@localhost 004]$ ncs_cli -u admin
```

```
admin connected from 10.65.62.106 using ssh on
localhost.localdomain
admin@ncs> configure
Entering configuration mode private
[ok] [2020-05-07 12:06:18]

[edit]
admin@ncs% set nacm read-default permit
[ok] [2020-05-07 12:06:20]

[edit]
admin@ncs% set nacm write-default permit
[ok] [2020-05-07 12:06:25]

[edit]
admin@ncs%

[edit]
admin@ncs% set nacm exec-default
[deny,permit] (permit): permit
[ok] [2020-05-07 12:06:33]

[edit]
admin@ncs%

[edit]
admin@ncs% set nacm cmd-exec-default permit
[ok] [2020-05-07 12:06:38]

[edit]
admin@ncs% set nacm cmd-read-default permit
[ok] [2020-05-07 12:06:42]

[edit]
admin@ncs%

[edit]
admin@ncs% commit
```

## 5.1 Uninstalling TM-TC FP

- To uninstall TM-TC fp on NSO system installation instance, remove the packages that were copied over to *“NSO installation folder”* during installation and run the command *“packages reload force”*.
- To uninstall functional pack on NSO local installation, remove the packages that were copied over to *“ncs-run directory”* during installation and run the command *“packages reload force”*.

```
[nso@localhost packages]$ ncs_cli -u admin -C

admin connected from 10.65.57.19 using ssh on
localhost.localdomain
admin@ncs#
admin@ncs#
admin@ncs#
admin@ncs# packages reload force

>>> System upgrade is starting.
>>> Sessions in configure mode must exit to operational mode.
>>> No configuration changes can be performed until upgrade
has completed.
>>> System upgrade has completed successfully.
reload-result {
  package cisco-iosxr-cli-7.18
  result true
}
reload-result {
  package cisco-iosxr-cli-7.21
  result true
}
reload-result {
  package cisco-iosxr-nc-6.5
  result true
}
reload-result {
  package cisco-iosxr-nc-6.6
  result true
}
admin@ncs#
```

- It is advised to remove only functional pack packages mentioned in the table under installation section. Removing the NED packages might interrupt other operations on NSO. User must be aware of NED usage on NSO if he decides to remove NED packages.

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