



Cisco Crosswork Network Controller – TM-TC Function Pack

Installation Guide

Version 1.0.0

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1 Preface

Abstract

This **Crosswork Network Controller – TM-TC Function Pack (FP) Installation Guide** includes information to help you install and configure Crosswork Network Controller TM-TC FP version 1.0.0.

Audience

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

Additional Documentation

This documentation requires the reader to have a good understanding of Cisco Network Services Orchestrator (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 for installing the Crosswork Network Controller TM-TC FP.

2.1 Preparing to Install the Crosswork Network Controller TM-TC FP

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

1. Obtain the NSO 5.2.2 installation bin file and follow the steps described in the **NSO Installation Guide – System Installation** to install NSO 5.2.2.

```
$ sudo sh nso-5.2.2.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 NSO and install NSO 5.2.2.
4. Verify the NSO version.

```
$ ncs --version  
5.2.2
```

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

3 Install Crosswork Network Controller TM-TC FP on the NSO System

The Crosswork Network Controller TM-TC FP can be installed only on an NSO system installation for a realtime production environment, which is the preferred method of installation.

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

The Crosswork Network Controller TM-TC FP system installation allows you to install the TM-TC FP service.

To perform the Crosswork Network Controller TM-TC FP system installation:

1. Log into the host machine as the **ncs** user, who is also part of the **ncsadmin** user group and also has sudo access.
2. Download the **ncs-5.2.2-tm-tc-1.0.0.tar.gz** package from Cisco.com and copy it to the host server. This is the file for the TM-TC FP installation.
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 ncs-5.2.2-tm-tc-1.0.0.tar.gz
```

Extract the 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-5.2.2-custom-template-utils-1.2.tar.gz
		packages/ncs-5.2.2-cisco-tm-tc-fp-1.0.0.tar.gz
		packages/ncs-5.2.2-tm-tc-multi-vendors-1.0.0.tar.gz
NEDs	CLI NED	packages/ncs-5.2.2-cisco-iosxr-7.24.tar.gz
		packages/ncs-5.2.2-cisco-iosxr-7.18.3.tar.gz

Group	Package Category	Packages
	NETCONF NED	packages/ncs-5.2.2-cisco-iosxr-nc-6.5.3.tar.gz packages/ncs-5.2.2-cisco-iosxr-nc-6.6.3.tar.gz
Installer	Scripts that are used to install TM-TC FP	Install.py Nct.py utils.py nct.config
Post-installation configuration	Scripts to configure on NSO after TM-TC FP installation	tm-tc-cfp-configurations.sh set-nacm.sh

4. Edit the nct.config file with appropriate details. You can leave out the REST credentials if they are not available as the installer does not require REST to be configured.

Note: Please ignore any error message regarding incorrect REST credentials in the installation logs.

Variable	Description
ip_value	IP address of the NSO instance
name	Hostname of the NSO instance
ssh_user	SSH user name to log into the NSO instance
ssh_pass	SSH password to log into the NSO instance
sudo_pass	Sudo password, which will be used to copy installation packages to the runtime directory
ncs_user_name	Ncs user name
install_dir	NSO installation directory
run_dir	NSO runtime directory

Variable	Description
<code>config_dir</code>	NSO configuration directory
<code>log_dir</code>	NSO log directory

5. In the same directory, run the following command to start the installation:

```
$python3 install.py
```

The above script also supports option `-b`, which when enabled takes a backup of ncs before starting the installation. The log generated by the script can be viewed under same directory in the file `tmtc.log`.

6. The installation script checks if the necessary prerequisites are met.
If so, it will check if dependent packages are already installed. If not, all the required packages are copied to the NSO runtime directory and a package reload is triggered to install the newly added packages.
During the installation, the ncs cli is not operational
7. Verify the installation and make sure the packages are up and running. For more information, see **Verifying TM-TC System Installation** in this document.
8. Perform post-installation tasks for TM-TC FP. For more information, see **Performing Post-installation Tasks** in this document. The installation script expects the cli mode to be `'J'`. The script cannot perform the post-installation tasks if the cli mode is set to `'C'` by default. Please verify that all the post-installation tasks are performed.

4 Verifying the Installation

This section discusses how to verify the TM-TC system installation. As part of the verification process, you must verify that the packages are up and running, the package versions, and the NACM rules.

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 that all the packages are up and running.

```
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	ERROR	INFO						
cisco-iosxr-cli-7.18	X	-	-	-	-	-	-	-	-
cisco-iosxr-cli-7.24	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	-	-	-	-	-	-	-	-

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-7.24	7.24
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

3. Verify the NACM rules.

```
admin@nacs% show nacm read-default
read-default permit;

admin@nacs% show nacm write-default
write-default permit;

admin@nacs% show nacm exec-default
exec-default permit;

admin@nacs% show nacm cmd-exec-default
cmd-exec-default permit;

admin@nacs% show nacm cmd-read-default
cmd-read-default permit;
```

4. Verify dynamic mapping and stack service enabled status

```
admin@nacs> configure
Entering configuration mode private
[ok][2020-05-25 11:25:00]

[edit]
admin@nacs%

[edit]
admin@nacs% show cisco-tm-tc-fp:cfp-configurations dynamic-device-
mapping
dynamic-device-mapping cisco-iosxr-cli-7.18:cisco-iosxr-cli-7.18 {
    python-impl-class-name tm_tc_multi_vendors.IosXR;
}
dynamic-device-mapping cisco-iosxr-cli-7.24:cisco-iosxr-cli-7.24 {
    python-impl-class-name tm_tc_multi_vendors.IosXR;
}
[ok][2020-05-25 11:25:01]

admin@nacs>
admin@nacs> show cisco-tm-tc-fp:cfp-configurations stacked-service-
enabled
cfp-configurations stacked-service-enabled
[ok][2020-05-25 11:27:11]
```

5 Performing Post-Installation Tasks

There are two types of post-installation configurations that are required for TM-TC FP to work with cli ned devices and Crosswork.

These configurations are set by the installer script. Irrespective of success or failure of the installation script, please make sure that these configurations are set.

1. Configure TM-TC FP configurations

```
[nso@bgl12-sp-cimc-024-mgmt ~]$ ncs_cli -u admin -J
admin connected from 10.65.35.63 using ssh on bgl12-sp-cimc-
024-mgmt.cisco.com
admin@ncs> configure
Entering configuration mode private
[ok] [2020-12-17 03:48:23]

[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations dynamic-
device-mapping cisco-iosxr-cli-7.24:cisco-iosxr-cli-7.24
python-impl-class-name tm_tc_multi_vendors.IosXR
[ok] [2020-12-17 03:48:29]

[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] [2020-12-17 03:48:33]

[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations stacked-
service-enabled
[ok] [2020-12-17 03:48:38]

[edit]
admin@ncs% commit
```

2. Configure the required NACM rules

```
[nso@bgl12-sp-cimc-024-mgmt ~]$ ncs_cli -u admin -J
admin connected from 10.65.35.63 using ssh on bgl12-sp-cimc-
024-mgmt.cisco.com
admin@ncs> configure
Entering configuration mode private
[ok] [2020-12-17 03:49:59]

[edit]
```

```
admin@ncs% set nacm read-default permit
[ok] [2020-12-17 03:50:06]

[edit]
admin@ncs% set nacm write-default permit
[ok] [2020-12-17 03:50:10]

[edit]
admin@ncs% set nacm exec-default permit
[ok] [2020-12-17 03:50:14]

[edit]
admin@ncs% set nacm cmd-exec-default permit
[ok] [2020-12-17 03:50:21]

[edit]
admin@ncs% set nacm cmd-read-default permit
[ok] [2020-12-17 03:50:25]

[edit]
admin@ncs% commit
```

5.1 Uninstalling the Crosswork Network Controller TM-TC FP

Uninstalling the TM-TC FP only removes the function pack from the NSO instance.

The dependent packages must be removed manually if required. This is to make sure that there is no interruption to other existing packages on NSO.

Before executing the uninstall script for the TM-TC FP, you must first remove the TM-TC FP services and any devices from the system. Make sure no zombie services are running for the services.

To uninstall the TM-TC FP:

```
[nso@localhost 006]$ python3 install.py -u
2020-05-19 06:58:36,178 - tmtc - INFO - Creating the nct host
file from the input given
2020-05-19 06:58:36,179 - tmtc - INFO - Opening the file
/home/nso/006/nct.config
```

```
2020-05-19 06:58:36,179 - tmtc - INFO - Creation completed,
verifying the inputs
2020-05-19 06:58:36,179 - tmtc - INFO - Checking if IP given is
valid
2020-05-19 06:58:36,179 - tmtc - INFO - Checking SSH sudo
access
2020-05-19 06:58:38,712 - tmtc - INFO - Checking the REST
connectivity
2020-05-19 06:58:39,810 - tmtc - INFO - Verification completed
2020-05-19 06:58:40,770 - tmtc - INFO - Verifying if ncs
version 5.2.2 is latest to 5.2.2
2020-05-19 06:58:43,783 - tmtc - INFO - Beginning
Uninstallation of TM-TC functional pack. Ned and utils packages
won't be removed
2020-05-19 06:58:43,783 - tmtc - INFO - Please cleanup all the
existing services to avoid services going to zombie state after
re-installation. continue (yes/no)
enter yes to continue: yes
2020-05-19 06:58:48,210 - tmtc - INFO - Removing the cisco-tm-
tc-fp package installation file from run time directory
/var/opt/ncs/packages
2020-05-19 06:58:49,973 - tmtc - INFO - Removing the tm-tc-
multi-vendors package installation file from run time directory
/var/opt/ncs/packages
2020-05-19 06:58:50,842 - tmtc - INFO - Skipping removal of
custom-template-utils as it is not a fp package
2020-05-19 06:58:50,842 - tmtc - INFO - Skipping removal of
cisco-iosxr-nc-6.6 as it is not a fp package
2020-05-19 06:58:50,843 - tmtc - INFO - Skipping removal of
cisco-iosxr-nc-6.5 as it is not a fp package
2020-05-19 06:58:50,843 - tmtc - INFO - Skipping removal of
cisco-iosxr-cli-7.24 as it is not a fp package
2020-05-19 06:58:50,843 - tmtc - INFO - Skipping removal of
cisco-iosxr-cli-7.18 as it is not a fp package
2020-05-19 06:58:50,843 - tmtc - INFO - Restarting ncs after
removing packages
2020-05-19 07:00:03,921 - tmtc - INFO - NCS is up
2020-05-19 07:00:06,838 - tmtc - INFO - TM-TC FP uninstallation
is successful
[nso@localhost 006]$
```

