



Cisco Crosswork NSO Telemetry Traffic Collector Function Pack

Installation Guide

Version 4.4.0-116



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Preface

Abstract

Function packs are installed on the Cisco Network Services Orchestrator (NSO) platform and used to push services and network configurations to devices.

The Telemetry Traffic Collector (TM-TC) function pack utilizes Cisco NSO Reactive FastMap (RFM) nano services to manage the telemetry configuration on devices.

The TM-TC function pack version 4.4.0-116 must be installed on Cisco NSO 5.7.6 and is intended for use with Cisco Crosswork 4.4.

This document describes how to install and configure the TM-TC function pack.

Audience

This document is intended for experienced network users and operators who have a good understanding of Cisco NSO and its usage.

Additional Documentation

Please refer to the [Cisco NSO documentation](#) for more information about Cisco NSO.

Before you Begin

Cisco NSO 5.7.6 must be installed on your system before installing the Crosswork TM-TC FP. This section outlines the software requirements and platform dependencies that must be met in order to install the Crosswork TM-TC function pack successfully:

- **sudo** user privileges are required to perform the installation. This user must also be part of the **ncsadmin** group.
- OpenJDK 11 or higher must be installed.
- Python 3.8 or higher must be installed. The default Python should point to Python 3.
- If you are running an older version of Cisco NSO, upgrade to Cisco NSO 5.7.6. Stop the Cisco NSO instance, uninstall the older version of the NSO then download the Cisco NSO 5.7.6 installation bin file from Cisco.com and install using the following command:

```
sudo sh nso-5.7.6.linux.x86_64.installer.bin --system-install --non-interactive
```

Note: For complete instructions on installing Cisco NSO 5.7.6, follow the steps described in the [Cisco Network Services Orchestrator Installation Guide](#).

- Verify the NSO version.

```
ncs --version
```

The result should be:

```
5.7.6
```

Installing the TM-TC Function Pack

TM-TC function pack can be installed on standalone and Layered Service Architecture (LSA) NSO installations. In case of standalone NSO installations, it can be installed on a system installation and local installation. System installation is for a real time production environment and the preferred method of installation. This document does not cover steps to setup LSA.

To access the TM-TC function pack installation file and extract its packages:

1. Log into the host machine as the **ncs** user. This user must also be part of the **ncsadmin** user group and have sudo access.
2. Download the **cw-na-fp-tmtc-4.4.0-116-nso-5.7.6.tar.gz** package from Cisco.com and copy it to the host server. This is the installation file for the TM-TC function pack.
3. Untar the TM-TC **tar.gz** file to the current directory.

```
tar -xvzf cw-na-fp-tmtc-4.4.0-116-nso-5.7.6.tar.gz
```

A new directory TM-TC-4.4.0-116 is created with all the files in the package. All the files related to standalone installation can be found in this folder and files related to LSA can be found under LSA folder.

The following packages/files are extracted:

Type of Installation	Group	Package Category	Packages
Standalone NSO	Core Packages	TM-TC Function Pack Common Packages	ncs-5.7.6-cisco-tm-tc-fp-4.4.0-116.tar.gz ncs-5.7.6-tm-tc-multi-vendors-4.4.0-116.tar.gz
	Custom Template	Utility packages	ncs-5.7.2-custom-template-utils-2.0.9.tar.gz
	NEDs	CLI NED	ncs-5.7.5-cisco-iosxr-7.40.1.tar.gz
		NETCONF NED	ncs-5.7.3-cisco-iosxr_netconf-7.5.2.tar.gz
LSA Deployment CFS	Core Packages	TM-TC Function Pack Common Packages	ncs-5.7.6-cisco-tm-tc-fp-cfs-4.4.0-116.tar.gz ncs-5.7.6-cisco-tm-tc-fp-cfs-ned-4.4.0-116.tar.gz
	Utility Packages	Utility packages (Required to run tm-tc core packages)	ncs-5.7-core-fp-common-1.30.0.tar.gz ncs-5.7.2-custom-template-utils-2.0.9.tar.gz ncs-5.7.2.1-lsa-utils-1.0.1.tar.gz ncs-5.7.6-cisco-nso-nc-5.7.tar.gz ncs-5.7.6-core-fp-common-ned-1.0.tar.gz ncs-5.7.6-custom-template-utils-ned-1.0.tar.gz ncs-5.7.6-lsa-utils-ned-1.0.tar.gz
LSA Deployment RFS	Core Packages	TM-TC Function Pack Common Packages	ncs-5.7.6-cisco-tm-tc-fp-4.4.0-116.tar.gz ncs-5.7.6-tm-tc-multi-vendors-4.4.0-116.tar.gz
	Utility Packages	Utility packages (Required to run tm-tc core packages)	ncs-5.7-core-fp-common-1.30.0.tar.gz ncs-5.7.2-custom-template-utils-2.0.9.tar.gz ncs-5.7.2.1-lsa-utils-1.0.1.tar.gz ncs-5.7.5-cisco-iosxr-7.40.1.tar.gz ncs-5.7.3-cisco-iosxr_netconf-7.5.2.tar.gz

All the NED packages mentioned in the above table are mandatory for the TM-TC function pack.

- Follow the relevant installation procedure below, depending on the type of NSO environment you are using (System, Local, and LSA deployment).

System Installation

This section provides the procedure for installing the package on a Cisco NSO instance that was installed using the “system installation” typical for production environments. **sudo** user privileges are required to perform the installation.

- Stop Cisco NSO.

```
[root@nso-vm TM-TC-4.4.0-116]# /etc/init.d/ncs stop
Stopping ncs (via systemctl): [ OK ]
```

2. Copy the function pack packages to the Cisco NSO packages running directory.
3. Make sure there are no duplicate packages. If the NED packages already exist with different names, you do not need to copy those packages.

```
[root@nso-vm TM-TC-4.4.0-116]# cp *.tar.gz /var/opt/ncs/packages/
[root@nso-vm TM-TC-4.4.0-116]#
```

4. Restart Cisco NSO.

```
[root@nso-vm TM-TC-4.4.0-116]# /etc/init.d/ncs restart-with-package-reload-force
Restarting ncs (via systemctl): [ OK ]
[root@nso-vm TM-TC-4.4.0-116]#
```

5. Verify the installation and make sure the packages are up and running. For more information, see the [Verifying the Installation](#) section.

Local Installation

This section provides the procedure for installing the package on a Cisco NSO instance that was installed using the “local installation” typical for lab and demo environments. **sudo** user privileges are required to perform the installation.

1. Stop Cisco NSO.

```
[root@nso-vm ncs-run]# ncs -stop
```

2. Copy the function pack packages to the Cisco NSO packages running directory.

```
[root@nso-vm TM-TC-4.4.0-116]# cp *.tar.gz /home/nso/ncs-run/packages/
```

3. Restart Cisco NSO.

```
[root@nso-vm packages]# cd /home/nso/ncs-run/
[root@nso-vm ncs-run]# ncs --with-package-reload-force
```

4. Verify the installation and make sure the packages are up and running. For more information, see the [Verifying the Installation](#) section.

Installation On LSA Deployments - CFS

This section provides the procedure for installing the package on a Cisco NSO instance that was installed as CFS node. **sudo** user privileges are required to perform the installation.

1. Stop Cisco NSO.

```
[root@cfs1 TM-TC-4.4.0-116]# /etc/init.d/ncs stop
Stopping ncs (via systemctl): [ OK ]
```

2. Copy the function pack packages to the Cisco NSO packages running directory. The packages relevant to CFS can be found in LSA/CFS folder.

```
[root@cfs1 TM-TC-4.4.0-116]# cd LSA/CFS/
[root@cfs1 CFS]#
[root@cfs1 CFS]# cp *tar.gz /var/opt/ncs/packages/
```

3. Restart Cisco NSO.

```
[root@cfs1 CFS]# /etc/init.d/ncs restart-with-package-reload-force
Restarting ncs (via systemctl): [ OK ]
[root@cfs1 CFS]#
```

4. Verify the installation and make sure the packages are up and running. For more information, see the [Verifying the Installation](#) section.

Installation On LSA Deployments - RFS

This section provides the procedure for installing the package on a Cisco NSO instance that was installed as RFS node. **sudo** user privileges are required to perform the installation.

1. Stop Cisco NSO.

```
[root@nso-vm TM-TC-4.4.0-116]# /etc/init.d/ncs stop
Stopping ncs (via systemctl): [ OK ]
```

2. Copy the function pack packages to the Cisco NSO packages running directory. The packages relevant to RFS can be found in LSA/RFS folder

```
[root@nso-vm TM-TC-4.4.0-116]# cd LSA/RFS/
[root@nso-vm RFS]#
[root@nso-vm RFS]# cp *tar.gz /var/opt/ncs/packages/
[root@nso-vm RFS]#
```

3. Restart Cisco NSO.

```
[root@nso-vm RFS]# /etc/init.d/ncs restart-with-package-reload-force
Restarting ncs (via systemctl): [ OK ]
[root@nso-vm RFS]#
```

4. Verify the installation and make sure the packages are up and running. For more information, see the [Verifying the Installation](#) section.

Verifying the Installation

This section discusses how to verify the TM-TC system installation by checking that the packages are up and package versions are set as expected. You need to verify the build number, TM-TC release information, and package versions.

Standalone NSO Installations

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

```
[nso@nso-vm ~]$ ncs_cli -u admin -C

User admin last logged in 2022-10-18T05:19:04.392965+00:00, to nso-vm, from 10.65.61.162
using cli-ssh

admin connected from 10.65.61.162 using ssh on nso-vm

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

```
[nso@nso-vm ~]$ ncs_cli -u admin -C

User admin last logged in 2022-10-18T05:19:04.392965+00:00, to nso-vm, from 10.65.61.162 using cli-ssh
admin connected from 10.65.61.162 using ssh on nso-vm
admin@ncs# show packages package oper-status | tab
```

NAME	UP	PROGRAM CODE ERROR	JAVA UNINITIALIZED	PYTHON UNINITIALIZED	BAD NCS VERSION	PACKAGE NAME	PACKAGE VERSION	CIRCULAR DEPENDENCY	PACKAGE META DATA ERROR	FILE LOAD ERROR	ERROR INFO
cisco-iosxr-cli-7.40	X	-	-	-	-	-	-	-	-	-	-
cisco-iosxr-nc-7.5	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
```

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

NAME	PACKAGE VERSION
cisco-iosxr-cli-7.40	7.40.1
cisco-iosxr-nc-7.5	7.5.2
cisco-tm-tc-fp	4.4.0-116
custom-template-utils	2.0.9
tm-tc-multi-vendors	4.4.0-116

```
admin@ncs#
```

LSA Installation - CFS

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

```
[nso@cfs1 TM-TC-4.4.0-116]$ ncs_cli -u admin -C
admin connected from 10.65.61.162 using ssh on cfs1
admin@ncs#
admin@ncs# show packages package oper-status
```

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

NAME	UP	PROGRAM CODE ERROR	JAVA UNINITIALIZED	PYTHON UNINITIALIZED	BAD NCS VERSION	PACKAGE NAME	PACKAGE VERSION	CIRCULAR DEPENDENCY	PACKAGE META DATA ERROR	FILE LOAD ERROR	ERROR INFO
cfs-cisco-tm-tc-fp	X	-	-	-	-	-	-	-	-	-	-
cfs-ned-tm-tc-nc-4.4.0-116	X	-	-	-	-	-	-	-	-	-	-
cisco-nso-nc-5.7	X	-	-	-	-	-	-	-	-	-	-
core-fp-common	X	-	-	-	-	-	-	-	-	-	-
core-fp-common-ned	X	-	-	-	-	-	-	-	-	-	-
custom-template-utils	X	-	-	-	-	-	-	-	-	-	-
custom-template-utils-ned	X	-	-	-	-	-	-	-	-	-	-
lsa-utils	X	-	-	-	-	-	-	-	-	-	-
lsa-utils-ned	X	-	-	-	-	-	-	-	-	-	-

```
admin@ncs# _
```

2. Verify the package versions and the build information.

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

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

NAME	PACKAGE VERSION
cfs-cisco-tm-tc-fp	4.4.0-116
cfs-ned-tm-tc-nc-4.4.0-116	4.4.0-116
cisco-nso-nc-5.7	5.7
core-fp-common	1.30.0
core-fp-common-ned	1.0
custom-template-utils	2.0.9
custom-template-utils-ned	1.0
lsa-utils	1.0.1
lsa-utils-ned	1.0

```
admin@ncs# _
```

LSA Installation - RFS

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

```
[nso@nso-vm ~]$ ncs_cli -u admin -C

User admin last logged in 2022-10-18T05:34:03.968465+00:00, to nso-vm, from
10.65.61.162 using cli-ssh

admin connected from 10.65.61.162 using ssh on nso-vm

admin@ncs#

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

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

NAME	UP	PROGRAM CODE ERROR	JAVA UNINITIALIZED	PYTHON UNINITIALIZED	BAD NCS VERSION	PACKAGE NAME	PACKAGE VERSION	CIRCULAR DEPENDENCY	PACKAGE META DATA ERROR	FILE LOAD ERROR	ERROR INFO
cisco-iosxr-cli-7.40	X	-	-	-	-	-	-	-	-	-	-
cisco-iosxr-nc-7.5	X	-	-	-	-	-	-	-	-	-	-
cisco-tm-tc-fp	X	-	-	-	-	-	-	-	-	-	-
core-fp-common	X	-	-	-	-	-	-	-	-	-	-
custom-template-utils	X	-	-	-	-	-	-	-	-	-	-
lsa-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
```

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

NAME	PACKAGE VERSION
cisco-iosxr-cli-7.40	7.40.1
cisco-iosxr-nc-7.5	7.5.2
cisco-tm-tc-fp	4.4.0-116
core-fp-common	1.30.0
custom-template-utils	2.0.9
lsa-utils	1.0.1
tm-tc-multi-vendors	4.4.0-116

```
admin@ncs# █
```

3. Perform the post-installation tasks for TM-TC FP. For more information, see the [Performing Post-Installation Tasks](#) section.

Performing Post-Installation Tasks

The following post-installation configurations are required for the TM-TC function pack to work with CLI NED devices and Cisco Crosswork.

1. Configure TM-TC CFP configurations.

```
[nso@nso-vm ~]$ ncs_cli -u admin -J
User admin last logged in 2022-10-18T05:49:41.926275+00:00, to nso-vm, from 10.65.61.162 using cli-ssh
admin connected from 10.65.61.162 using ssh on nso-vm
admin@ncs>
admin@ncs> configure
Entering configuration mode private
[ok][2022-10-18 01:50:26]
[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations dynamic-device-mapping cisco-iosxr-cli-7.40:cisco-iosxr-cli-7.40 python-impl-class-name tm_tc_multi_vendors.IosXR
[ok][2022-10-18 01:50:38]
[edit]
admin@ncs% set cisco-tm-tc-fp:cfp-configurations stacked-service-enabled
[ok][2022-10-18 01:50:38]
[edit]
admin@ncs% commit
Commit complete.
[ok][2022-10-18 01:50:40]
```

Uninstalling the TM-TC Function Pack

Uninstalling the TM-TC function pack from the NSO involves stopping NSO, removing the packages listed as “core packages” and restarting NSO. Based on the type of NSO environment you are using (System or Local) choose one of the following processes to uninstall the package. **sudo** user privileges are required to perform the uninstallation.

Uninstall the System Installation

1. Stop NSO.

```
[root@nso-vm nso]# /etc/init.d/ncs stop
Stopping ncs (via systemctl): [ OK ]
```

2. Remove the core packages from the NSO installation directory.

```
[root@nso-vm nso]# cd /var/opt/ncs/packages/
[root@nso-vm packages]#
[root@nso-vm packages]# rm -rf ncs-5.7.6-cisco-tm-tc-fp-4.4.0-116.tar.gz
[root@nso-vm packages]# rm -rf ncs-5.7.6-tm-tc-multi-vendors-4.4.0-116.tar.gz
```

3. Restart NSO.

```
[root@nso-vm packages]# /etc/init.d/ncs restart-with-package-reload-force
Restarting ncs (via systemctl): [ OK ]
[root@nso-vm packages]#
```

Uninstall the Local Installation

1. Stop NSO.

```
[root@localhost packages]# cd /home/nso/ncs-run/
[root@localhost ncs-run]# ncs --stop
```

2. Remove the core packages from the NSO packages running directory.

```
[root@localhost packages]# cd /home/nso/ncs-run/packages/
[root@localhost packages]# rm -rf ncs-5.7.6-cisco-tm-tc-fp-4.4.0-116.tar.gz
[root@localhost packages]# rm -rf ncs-5.7.6-tm-tc-multi-vendors-4.4.0-116.tar.gz
```

3. Restart NSO.

```
[root@localhost packages]# cd /home/nso/ncs-run/
[root@localhost ncs-run]# ncs --with-package-reload-force
```

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