

Configure Thousand Eyes on SD-WAN Devices

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Introduction

This document describes how to integrate Thousand Eyes Agent (TE) on a Software-Defined Wide Area Network (SD-WAN).

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics.

- SD-WAN general overview
- Templates
- Thousand Eyes

Components Used

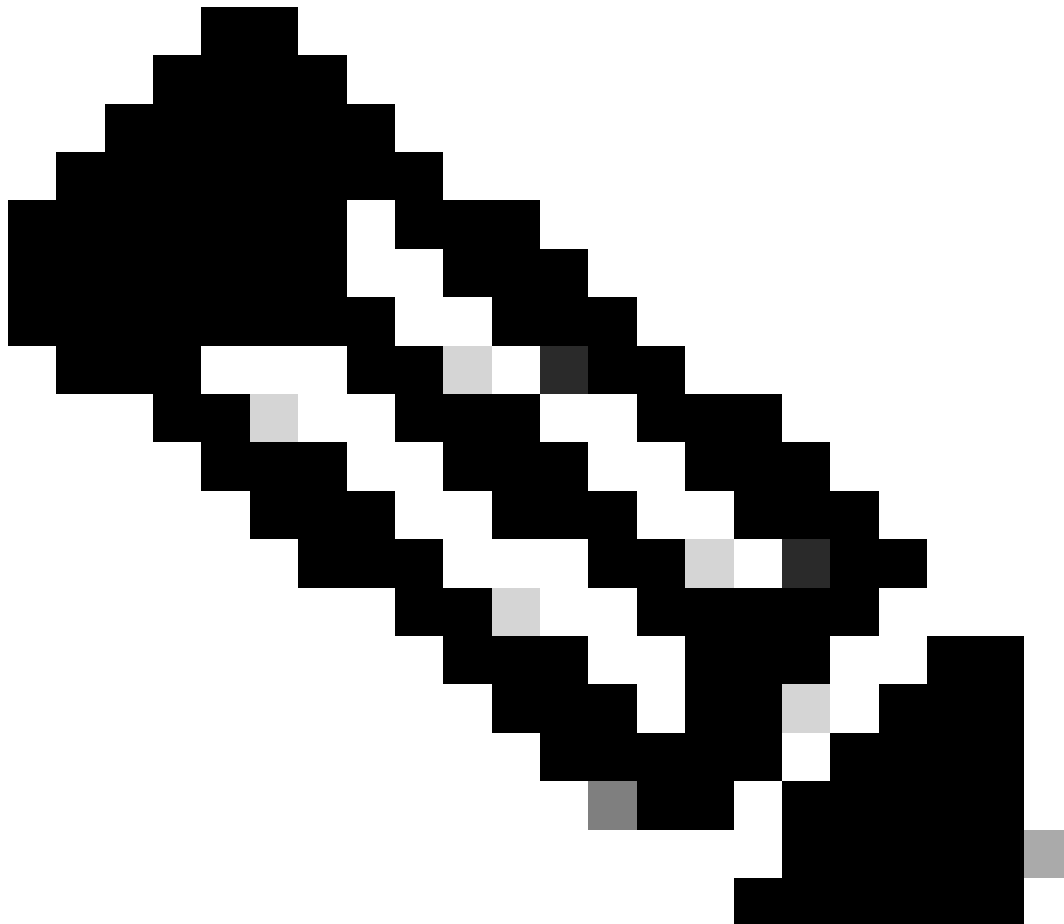
The information in this document is based on these software and hardware versions.

- Cisco vManage Version 20.6.3.1
- Cisco vBond Version 20.6.3
- Cisco vSmart Version 20.6.3
- Integrated Service Routers (ISR)4451-X/K9 Version 17.6.3a
- thousandeyes-enterprise-agent-4.3.0.cisco

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Configure

Download TE agent



Note: You must have a Thousand Eyes account to download the latest version.

-
1. Log in TE account from the [Cisco ThousandEyes Agent](#) page.
 2. Navigate to **Cloud & Enterprise Agents > Agent Settings**.

Cloud & Enterprise Agents



Views

Test Settings

Agent Settings

BGP Monitors

3. Click **Add New Enterprise Agent**.

Enterprise Agents Cloud Agents Agent Labels Proxy Settings

Agents Notifications Kerberos Settings

Assigned to Account Group ▾ ✕ Add a filter ▾

Search... 8 Enterprise Agents

Add New Enterprise Agent

4. Navigate to **Cisco Application Hosting**.

5. **Copy** and **save** your Account Group Token.

6. Choose the type of Device, in SD-WAN case. Click **Routers**.

7. Click **Download-TAR** to download the agent.

Add New Enterprise Agent



Appliance Custom Appliance **Cisco Application Hosting** Linux Package Docker Cloud Templates

Account Group Token

Catalyst Switches Nexus Switches **Routers**

Cisco IOS XE Docker Appliance

Catalyst 8000 Series Routers

* Browser tests are not currently supported. SSD not required.

Integrated Services Routers (ISR)

* Browser tests are not currently supported. SSD not required.

Aggregation Services Routers (ASR)

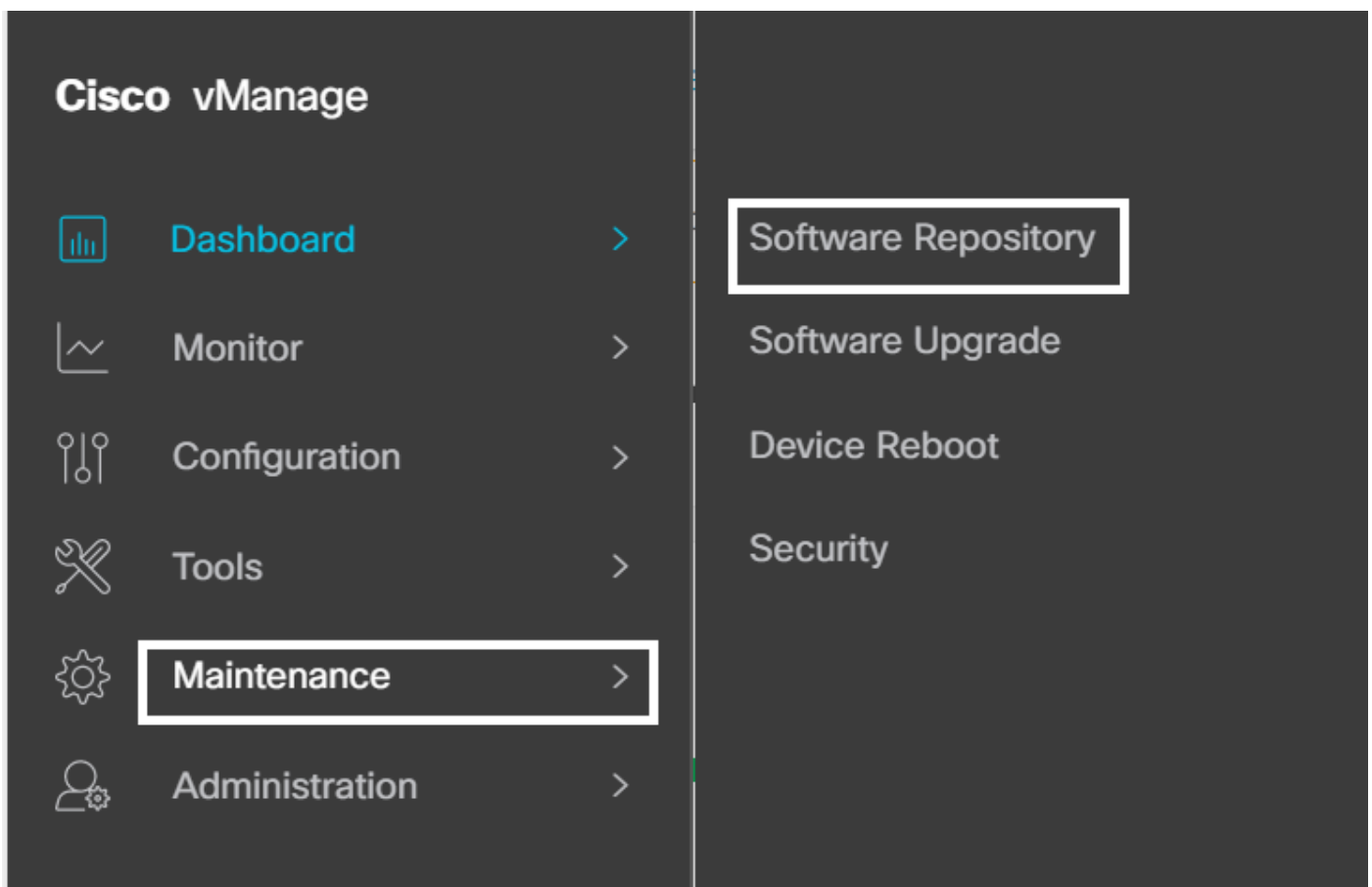
* Browser tests are not currently supported. SSD not required.

[Download - TAR](#)

[Installation Guide](#)

Upload TE Agent to Cisco vManage

1. From Cisco vManage, choose **Maintenance** > **Software Repository**.



2. Click **Virtual Images**.
3. Click **Upload Virtual Image** and click **vManage**.

Software Images

Virtual Images

Firmware

Search

Upload Virtual Image

Add Custom VNF Package

vManage

Remote Server - vManage

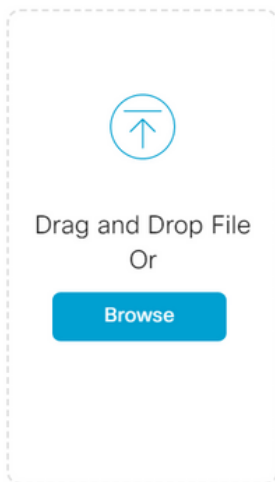
4. In the Upload VNF Package to vManage dialog box, browse to the location of the downloaded TE agent software file and choose the file.

Alternatively, drag and drop the Cisco ThousandEyes Enterprise agent software file.

5. Click **Upload**.

Upload VNF's Package to vManage

✕



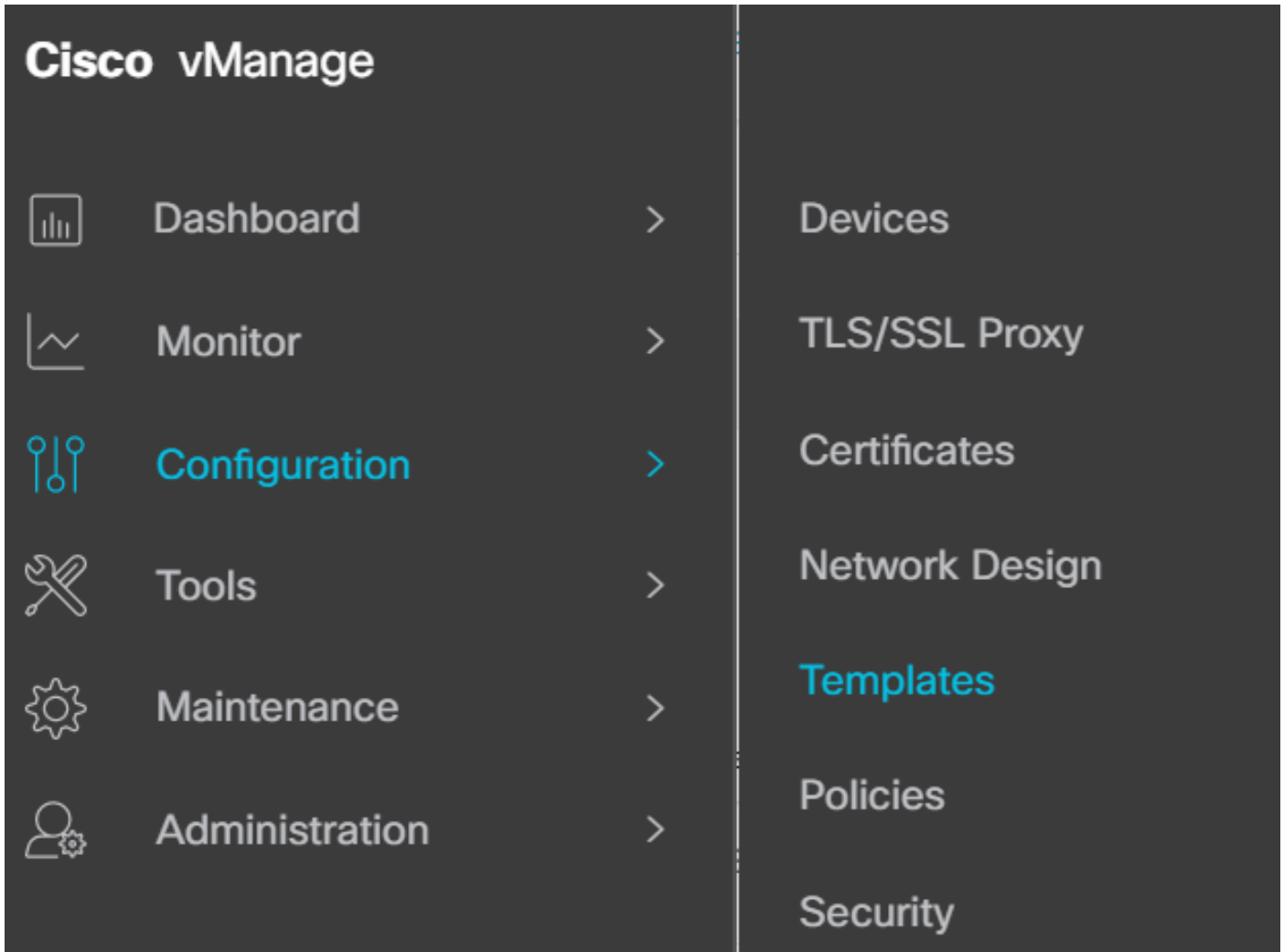
No Images Uploaded

Note : Please ensure Container images are not deleted when Container is in use

Upload

Configure TE on Transport VPN

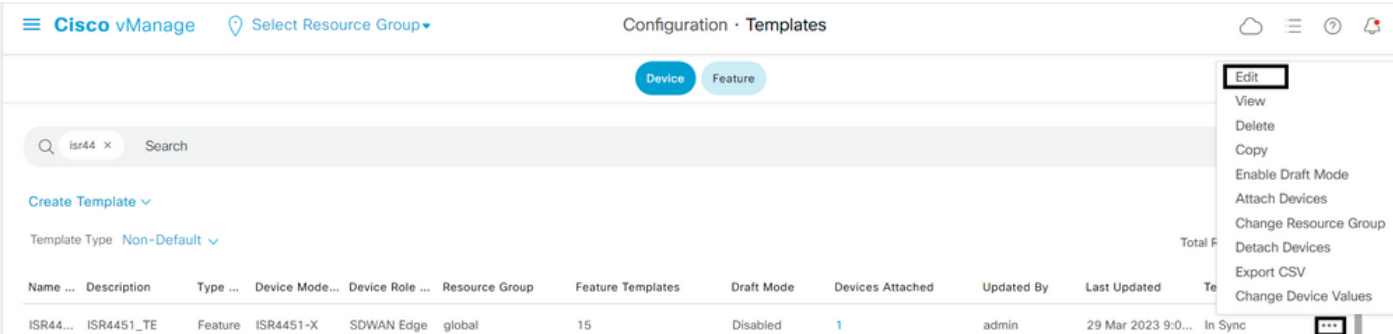
1. Navigate to **Configuration > Templates**.



2. From Device Template, choose the template you want to integrate with TE.

Note: In Cisco vManage Release 20.7.x and earlier releases, Device Templates is titled as Device.

3. Click tree dots (...) > **Edit**.



The screenshot shows the Cisco vManage interface for Configuration - Templates. The page has a search bar with 'ISR44' entered. Below the search bar, there is a 'Create Template' dropdown menu and a 'Template Type' dropdown menu set to 'Non-Default'. A table lists templates with columns: Name, Description, Type, Device Mode, Device Role, Resource Group, Feature Templates, Draft Mode, Devices Attached, Updated By, Last Updated, and Total F. The first row shows a template named 'ISR44...' with description 'ISR4451_TE', type 'Feature', device mode 'ISR4451-X', device role 'SDWAN Edge', resource group 'global', 15 feature templates, draft mode 'Disabled', and 1 device attached. A context menu is open over the table, showing options: Edit, View, Delete, Copy, Enable Draft Mode, Attach Devices, Change Resource Group, Detach Devices, Export CSV, and Change Device Values. The 'Edit' option is highlighted with a red box.

| Name | Description | Type | Device Mode | Device Role | Resource Group | Feature Templates | Draft Mode | Devices Attached | Updated By | Last Updated | Total F |
|----------|-------------|---------|-------------|-------------|----------------|-------------------|------------|------------------|------------|--------------------|---------|
| ISR44... | ISR4451_TE | Feature | ISR4451-X | SDWAN Edge | global | 15 | Disabled | 1 | admin | 29 Mar 2023 9:0... | In Sync |

4. Navigate to **Additional Templates**.

5. Choose **ThousandEyes Agent** drop down menu and click **Create Template**.

Additional Templates

| | |
|---------------------------|---|
| AppQoE | Choose... |
| Global Template * | Factory_Default_Global_CISCO_Templ... ⓘ |
| Cisco Banner | Choose... |
| Cisco SNMP | Choose... |
| ThousandEyes Agent | Choose... ISR4451_TE ISR4451_TE |
| TrustSec | |
| CLI Add-On Template | |
| Policy | |
| Probes | Create template View Template |

- Template Name: Enter a name for the template. Ensure that the template name is unique.
- Description: Enter a description for the template.
- In the Basic Configuration, enter the Account Group Token obtained from previous steps.
- VPN must remain as Default.
- In the ADVANCED section, enter the IP address of your preferred Name Server.
- Hostname is optional.
- Web Proxy Type does not apply for VPN 0 configuration.

Device Feature

Feature Template > ThousandEyes Agent > ISR4451_TE

Device Type: ISR4451-X
Template Name:
Description:

▼ BASIC CONFIGURATION

Account Group Token:
VPN: ⓘ

▼ ADVANCED

Name Server:
Hostname:
Web Proxy Type: Static PAC

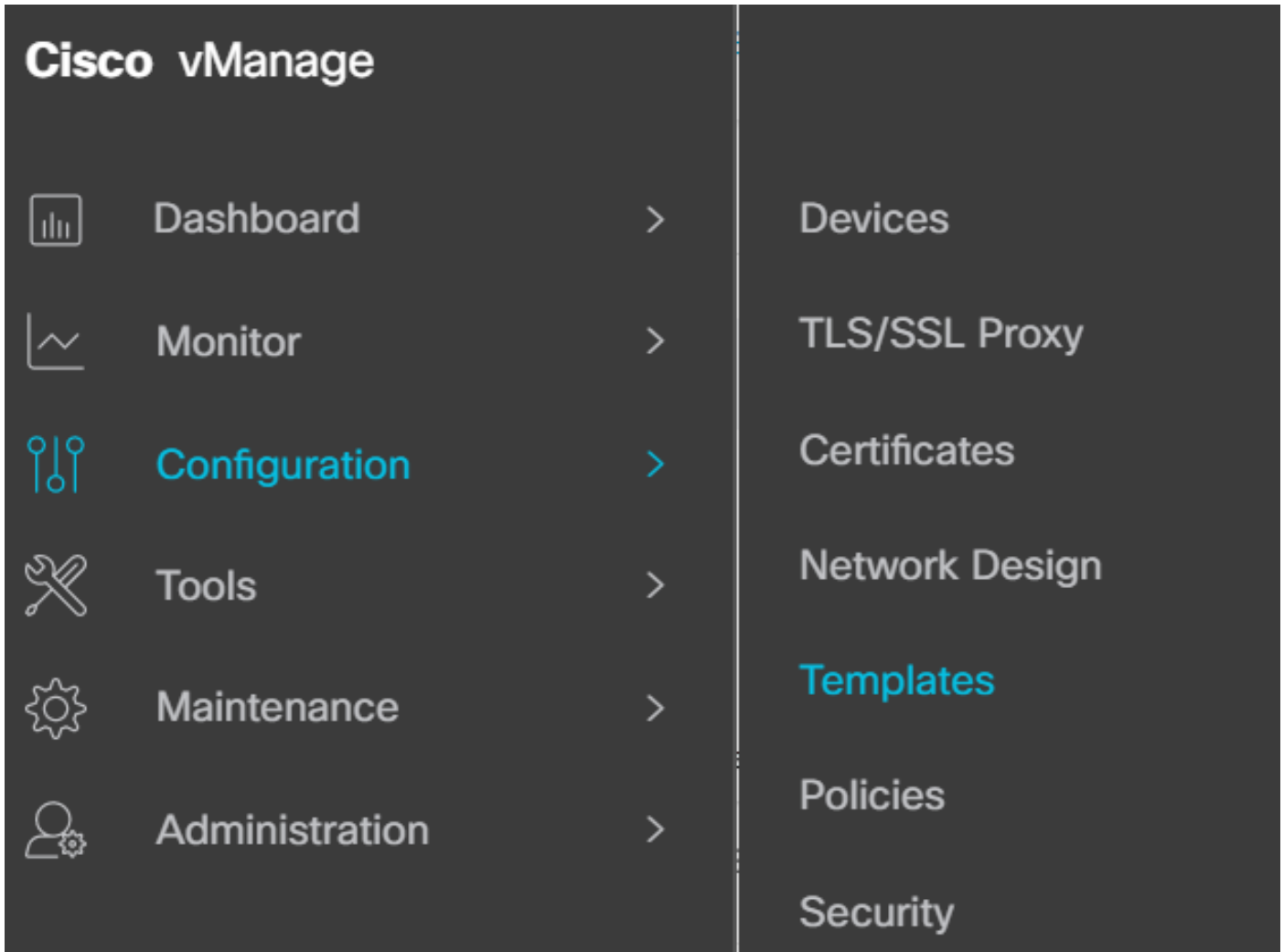
6. Click **Save**.

7. Click **Update**.

8. Push the template to your device.

Configure TE on Service VPN

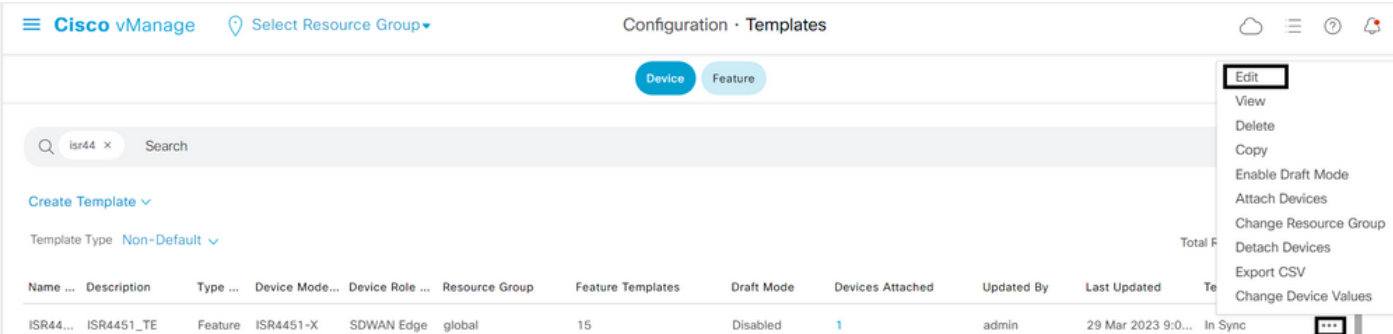
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Note: In Cisco vManage Release 20.7.x and earlier releases, Device Templates is titled as Device.

3. Click tree dots (...) > **Edit**.



The screenshot shows the Cisco vManage interface for Configuration - Templates. The page has a search bar with 'ISR44' entered. Below the search bar, there is a 'Create Template' dropdown and a 'Template Type' dropdown set to 'Non-Default'. A table lists templates with columns: Name, Description, Type, Device Mode, Device Role, Resource Group, Feature Templates, Draft Mode, Devices Attached, Updated By, Last Updated, and Total F. One template is visible: 'ISR44...' with description 'ISR4451_TE', Type 'Feature', Device Mode 'ISR4451-X', Device Role 'SDWAN Edge', Resource Group 'global', Feature Templates '15', Draft Mode 'Disabled', and Devices Attached '1'. A context menu is open over the table, listing actions: Edit, View, Delete, Copy, Enable Draft Mode, Attach Devices, Change Resource Group, Detach Devices, Export CSV, and Change Device Values. The 'Edit' option is highlighted.

| Name | Description | Type | Device Mode | Device Role | Resource Group | Feature Templates | Draft Mode | Devices Attached | Updated By | Last Updated | Total F |
|----------|-------------|---------|-------------|-------------|----------------|-------------------|------------|------------------|------------|--------------------|---------|
| ISR44... | ISR4451_TE | Feature | ISR4451-X | SDWAN Edge | global | 15 | Disabled | 1 | admin | 29 Mar 2023 9:0... | In Sync |

4. Navigate to **Additional Templates**.

5. Choose **ThousandEyes Agent** drop down menu and click **Create Template**.

Additional Templates

| | |
|---------------------------|--|
| AppQoE | <input type="text" value="Choose..."/> |
| Global Template * | <input type="text" value="Factory_Default_Global_CISCO_Templ..."/> ⓘ |
| Cisco Banner | <input type="text" value="Choose..."/> |
| Cisco SNMP | <input type="text" value="Choose..."/> |
| ThousandEyes Agent | <input type="text" value="Choose..."/> |
| TrustSec | |
| CLI Add-On Template | |
| Policy | |
| Probes | |

ISR4451_TE

ISR4451_TE

[Create template](#)

[View Template](#)

- Template Name: Enter a name for the template. Ensure that the template name is unique.
- Description: Enter a description for the template.
- In the Basic Configuration, enter the Account Group Token obtained from previous steps.
- Choose the service VPN. On this step you can use Global values or Device Specific.
- In the ADVANCED section, enter the IP address of your preferred Name Server.
- Hostname and Web Proxy Type are optional.

Device

Feature

Feature Template > ThousandEyes Agent > ISR4451_TE

Device Type: ISR4451-X

Template Name:

Description:

▼ BASIC CONFIGURATION

Account Group Token:

VPN: ⓘ

Agent IP Address:

Agent default gateway:

▼ ADVANCED

Name Server:

Hostname:

Web Proxy Type: Static PAC

6. Click **Save**.

7. Click **Update**.

8. Push the template to your device.

Verify

Router Side

```
Router#show app-hosting list
App id                               State
-----
te                                     RUNNING  >>>> verify the status of app id
```

```
Router#show app-hosting detail
App id           : te
Owner            : iox
State            : RUNNING
Application
  Type           : docker
  Name           : ThousandEyes Enterprise Agent
  Version        : 4.3.0 >>> verify latest version
  Description    :
  Author        : ThousandEyes
```

```
Path : bootflash:.TE_IMAGES/iox-te_4.3.0.tar
URL Path :
Activated profile name : custom
```

Resource reservation

```
Memory : 500 MB
Disk : 1 MB
CPU : 1500 units
CPU-percent : 3 %
VCPU : 1
```

Platform resource profiles

```
Profile Name CPU(unit) Memory(MB) Disk(MB)
-----
```

Attached devices

```
Type Name Alias
-----
serial/shell iox_console_shell serial0
serial/aux iox_console_aux serial1
serial/syslog iox_syslog serial2
serial/trace iox_trace serial3
```

Network interfaces

```
eth0:
MAC address : 52:54:dd:23:79:c4
IPv4 address : 172.16.1.2 >> verify here display the proper default gateway
IPv6 address : ::
Network name : VPG4
```

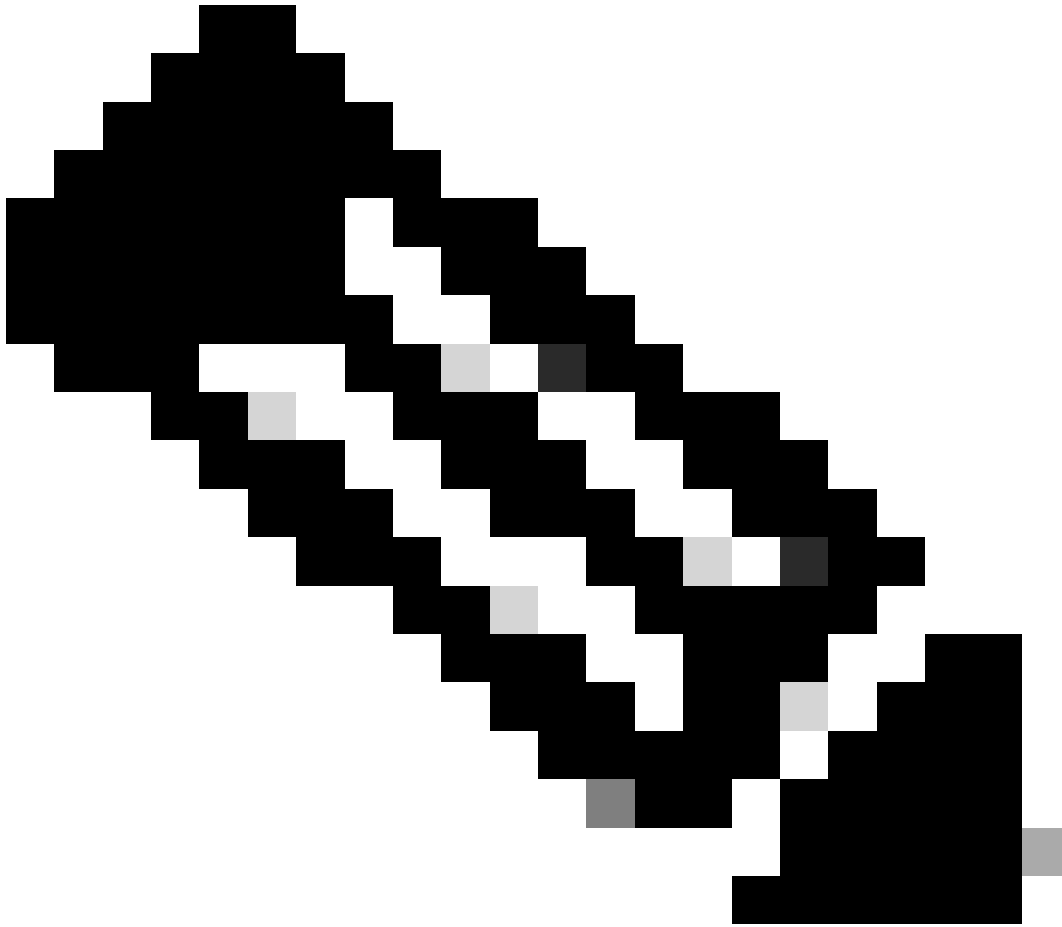
Router#show ip interface brief

```
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0/0 10.0.12.21 YES other up up
GigabitEthernet0/0/1 unassigned YES unset down down
GigabitEthernet0/0/2 unassigned YES unset down down
GigabitEthernet0/0/3 172.16.10.1 YES other down down
GigabitEthernet0 unassigned YES other administratively down down
Sdwan-system-intf 10.10.10.10 YES unset up up
Loopback65528 192.168.1.1 YES other up up
NVIO unassigned YES unset up up
Tunnel0 10.0.12.21 YES TFTP up up
VirtualPortGroup4 172.16.1.1 YES other up up >>> check virtual group int
```

- Connect to Cisco ThousandEyes Enterprise agent and check **var/log/agent/te-agent.log**.

Router#app-hosting connect appid te session

```
# cat var/log/agent/te-agent.log
2023-03-29 13:35:53.900 INFO [a273cf00] enable-iox 53.5207 seconds
2023-03-29 13:35:55.900 INFO [a273cf00] download-package-te 24.0457 seconds
2023-03-29 13:35:55.900 INFO [a273cf00] install-te 82.3967 seconds
2023-03-29 13:35:55.902 INFO [15816]: pre-config-callback 169.5950 seconds
2023-03-29 13:35:55.902 INFO [15816]: verify-install-te 58.4398 seconds
2023-03-29 13:35:55.902 INFO [15816]: post-config-callback 59.3583 seconds
2023-03-29 13:35:55.941 INFO [15816]: utdapp.py profile info
2023-03-29 13:35:55.941 INFO [15816]: is-config-interesting 0.0012 seconds
2023-03-29 13:35:55.942 INFO [15816]: TOTAL 3.96 minutes
```



Note: Check the reach ability with the internet and with Virtual Group 4 Default Gateway.

ThousandEyes Side

Verify your device shows as active(green) in the portal.

1. In TE portal, navigate to **Cloud & Enterprise Agents > Agent Settings**.

| <input type="checkbox"/> Agent Name | Hostname | ↓ Utilization | Status/Last Contact |
|-------------------------------------|--|---------------|---|
| <input type="checkbox"/> te |  te | General 0% |  1 minute ago ⋮ |

2. Click your device and check the information.

Basic Configuration

Advanced Settings

Agent Statistics

Status: ● Online

Last Contact: 1 minute ago

Labels Add Labels ▾

Agent Name

te

Video