SDWAN Cisco IOS XE TLS Syslog Configuration on syslog-ng Server

Contents

Introduction

This document describes a comprehensive guide to configuring a TLS Syslog server on SD-WAN Cisco IOS® XE devices.

Prerequisites

Before proceeding with the configuration of a TLS Syslog server on SD-WAN Cisco IOS XE devices, ensure that you meet the requirements:

Requirements

Cisco recommends that you have knowledge of these topics:

- SD-WAN Controllers - Ensure your network includes properly configured SD-WAN controllers.
- Cisco IOS XE SD-WAN Router - A compatible router running the Cisco IOS XE SD-WAN image.

- Syslog Server - An Ubuntu-based Syslog server, such as syslog-ng, in order to collect and manage log data.

Components Used

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

- vManage: Version 20.9.4
- Cisco IOS XE SD-WAN: Version 17.9.4
- Ubuntu: Version 22.04
- syslog-ng: Version 3.27

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.

Configuration

1. Installation of syslog-ng on Ubuntu Machine

In order to set up syslog-ng on your Ubuntu server, pursue these steps to ensure proper installation and configuration.

Step 1. Configure Network Settings

After installing Ubuntu Server, configure a static IP address and DNS server in order to ensure the machine can access the internet. This is crucial for downloading packages and updates.

Step 2. Install syslog-ng

Open a terminal on your Ubuntu machine and run:

```
sudo apt-get install syslog-ng
sudo apt-get install syslog-ng openssl
```

2. Install Root Certificate Authority on Syslog Server for Server Authentication

Create Directories and Generate Keys

```
cd /etc/syslog-ng
mkdir cert.d key.d ca.d
cd cert.d
openssl genrsa -out ca.key 2048
openssl req -new -x509 -key ca.key -out PROXY-SIGNING-CA.ca -days 730

# Copy key to the key.d folder
```

```
cp ca.key ../key.d
```

Calculate Fingerprint

Run the command and copy the output:

openssl x509 -in PROXY-SIGNING-CA.ca -fingerprint -noout | awk -F "=" '{print $2}' | sed 's/://g' | tee fingerprint.txt
 # Example output: 54F371C8EE2BFB06E2C2D0944245C288FBB07163

3. Configure syslog-ng Server Configuration File

Edit the syslog-ng configuration file:

```
sudo nano /etc/syslog-ng/syslog-ng.conf
```

Add the configuration:

```
source s_src {
    network(
        ip(0.0.0.0) port(6514)
        transport("tls")
        tls(
            key-file("/etc/syslog-ng/key.d/ca.key")
            cert-file("/etc/syslog-ng/cert.d/PROXY-SIGNING-CA.ca")
            peer-verify(optional-untrusted)
        )
    );
};

destination remote {
    file("/var/log/syslog");
};

log { source(s_src); destination(remote); };
```

4. Install Root Certificate Authority on Cisco IOS XE SD-WAN Device for Server Authentication

Configure from CLI

1. Enter configuration mode:

```
config-t
```

2. Configure the trustpoint:

<#root>

```
crypto pki trustpoint PROXY-SIGNING-CA
  enrollment url bootflash:
  revocation-check none
  rsakeypair PROXY-SIGNING-CA 2048
  subject-name cn=proxy-signing-cert
  fqdn none
  fingerprint 54F371C8EE2BFB06E2C2D0944245C288FBB07163
```

>> The fingerprint configured was obtained from the fingerprint.txt file above

```
commit
```

3. Copy the **PROXY-SIGNING-CA.ca** file from your syslog server to the router bootflash using the same name.

4. Authenticate the trustpoint:

<#root>

```
crypto pki authenticate PROXY-SIGNING-CA
```

example:

Router#crypto pki authenticate PROXY-SIGNING-CA

```
Reading file from bootflash:PROXY-SIGNING-CA.ca
Certificate has the  attributes:
Fingerprint MD5: 7A97B30B 2AE458FF D9E7D91F 66488DCF
Fingerprint SHA1: 21E0F09B B67B2E9D 706DBE69 856E5AA3 D39A268A
Trustpoint Fingerprint: 21E0F09B B67B2E9D 706DBE69 856E5AA3 D39A268A
Certificate validated - fingerprints matched.
Trustpoint CA certificate accepted.
```

5. Enroll the trustpoint:

<#root>

```
crypto pki enroll PROXY-SIGNING-CA
```

example:

vm32#crypto pki enroll PROXY-SIGNING-CA

```
Start certificate enrollment ..
The subject name in the certificate will include: cn=proxy-signing-cert
The fully-qualified domain name will not be included in the certificate
Certificate request sent to file system
The 'show crypto pki certificate verbose PROXY-SIGNING-CA' commandwill show the fingerprint.
```

6. Copy the **PROXY-SIGNING-CA.req** file from the router to the syslog server.

Sign the Certificate on the Syslog Server

```
openssl x509 -in PROXY-SIGNING-CA.req -req -CA PROXY-SIGNING-CA.ca -CAkey ca.key -out PROXY-SIGNING-CA.
```

7. Copy the generated file (**PROXY-SIGNING-CA.crt**) to the router bootflash. copy scp: bootflash:

8. Import the certificate:

<#root>

```
crypto pki import PROXY-SIGNING-CA certificate
example:
```

Router# crypto pki import PROXY-SIGNING-CA certificate

```
% The fully-qualified domain name will not be included in the certificate
% Request to retrieve Certificate queued
```

Validate the Configuration

<#root>

```
show crypto pki trustpoint PROXY-SIGNING-CA status
```

```
example:
```

Router#show crypto pki trustpoint PROXY-SIGNING-CA status

```
Trustpoint PROXY-SIGNING-CA:
Issuing CA certificate configured:
Subject Name:
o=Internet Widgits Pty Ltd,st=Some-State,c=AU
Fingerprint MD5: 7A97B30B 2AE458FF D9E7D91F 66488DCF
Fingerprint SHA1: 21E0F09B B67B2E9D 706DBE69 856E5AA3 D39A268A
Router General Purpose certificate configured:
Subject Name:
cn=proxy-signing-cert
Fingerprint MD5: 140A1EAB FE945D56 D1A53855 FF361F3F
Fingerprint SHA1: ECA67413 9C102869 69F582A4 73E2B98C 80EFD6D5
Last enrollment status: Granted
State:
Keys generated ..... Yes (General Purpose, non-exportable)
Issuing CA authenticated ..... Yes
Certificate request(s) ..... Yes
```

5. Configure TLS Syslog Server on Cisco IOS XE SD-WAN Router

Configure the syslog server using the commands:

```
logging trap syslog-format rfc5424
logging source-interface GigabitEthernet0/0/0
logging tls-profile tls-profile
logging host X.X.X.X transport tls profile tls-profile
tls-version TLSv1.2
```

6. Verifications

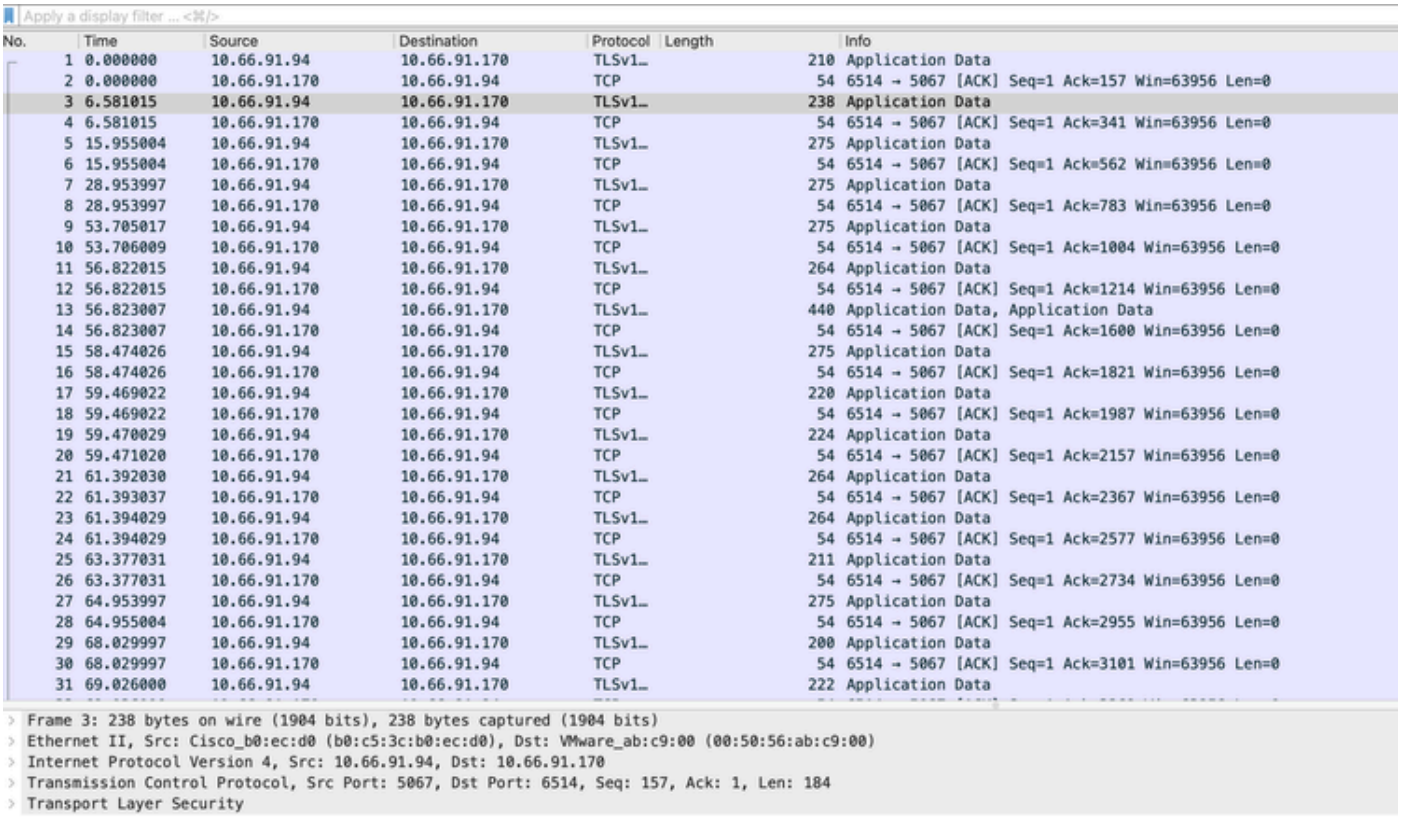
Check Logs on the Router

```
show logging

Showing last 10 lines
Log Buffer (512000 bytes):
Apr 9 05:59:48.025: %DMI-5-CONFIG_I: R0/0: dmiauthd: Configured from NETCONF/RESTCONF by admin, transac
Apr 9 05:59:48.709: %DMI-5-AUTH_PASSED: R0/0: dmiauthd: User 'vmanage-admin' authenticated successfully
Apr 9 05:59:50.015: %LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to administratively
Apr 9 05:59:51.016: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state
Apr 9 05:59:52.242: %SYS-5-CONFIG_P: Configured programmatically by process iosp_dmiauthd_conn_100001_v
```

Check Logs on the Syslog Server

```
tail -f /var/log/syslog

root@server1:/etc/syslog-ng# tail -f /var/log/syslog
Apr 9 15:51:14 10.66.91.94 188 <189>1 2024-04-09T05:51:51.037Z - - - - - BOM%DMI-5-AUTH_PASSED: R0/0: dm
Apr 9 15:59:10 10.66.91.94 177 <189>1 2024-04-09T05:59:47.463Z - - - - - BOM%SYS-5-CONFIG_P: Configured
Apr 9 15:59:10 10.66.91.94 177 <189>1 2024-04-09T05:59:47.463Z - - - - - BOM%SYS-5-CONFIG_P: Configured
Apr 9 15:59:10 10.66.91.94 143 <189>1 2024-04-09T05:59:47.463Z - - - - - BOM%DMI-5-CONFIG_I: R0/0: dmiau
Apr 9 15:59:11 10.66.91.94 188 <189>1 2024-04-09T05:59:48.711Z - - - - - BOM%DMI-5-AUTH_PASSED: R0/0: dm
Apr 9 15:59:13 10.66.91.94 133 <189>1 2024-04-09T05:59:50.016Z - - - - - BOM%LINK-5-CHANGED: Interface
Apr 9 15:59:13 10.66.91.94 137 <189>1 2024-04-09T05:59:50.016Z - - - - - BOM%LINEPROTO-5-UPDOWN: Line p
Apr 9 15:59:15 10.66.91.94 177 <189>1 2024-04-09T05:59:52.242Z - - - - - BOM%SYS-5-CONFIG_P: Configured
Apr 9 15:59:15 10.66.91.94 177 <189>1 2024-04-09T05:59:52.242Z - - - - - BOM%SYS-5-CONFIG_P: Configured
Apr 9 15:59:18 10.66.91.94 188 <189>1 2024-04-09T05:59:55.286Z - - - - - BOM%DMI-5-AUTH_PASSED: R0/0: dm
Apr 9 15:59:21 10.66.91.94 113 <187>1 2024-04-09T05:59:58.882Z - - - - - BOM%LINK-3-UPDOWN: Interface G
Apr 9 15:59:21 10.66.91.94 135 <189>1 2024-04-09T05:59:59.882Z - - - - - BOM%LINEPROTO-5-UPDOWN: Line p
Apr 9 15:59:28 10.66.91.94 177 <189>1 2024-04-09T06:00:05.536Z - - - - - BOM%SYS-5-CONFIG_P: Configured
Apr 9 15:59:43 10.66.91.94 188 <189>1 2024-04-09T06:00:20.537Z - - - - - BOM%DMI-5-AUTH_PASSED: R0/0: dm
```

Packet capture screenshot and you can see encrypted communications happening:



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.66.91.94	10.66.91.170	TLSv1…	210	Application Data
2	0.000000	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=157 Win=63956 Len=0
3	6.581015	10.66.91.94	10.66.91.170	TLSv1…	238	Application Data
4	6.581015	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=341 Win=63956 Len=0
5	15.955004	10.66.91.94	10.66.91.170	TLSv1…	275	Application Data
6	15.955004	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=562 Win=63956 Len=0
7	28.953997	10.66.91.94	10.66.91.170	TLSv1…	275	Application Data
8	28.953997	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=783 Win=63956 Len=0
9	53.705017	10.66.91.94	10.66.91.170	TLSv1…	275	Application Data
10	53.706009	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=1004 Win=63956 Len=0
11	56.822015	10.66.91.94	10.66.91.170	TLSv1…	264	Application Data
12	56.822015	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=1214 Win=63956 Len=0
13	56.823007	10.66.91.94	10.66.91.170	TLSv1…	440	Application Data, Application Data
14	56.823007	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=1600 Win=63956 Len=0
15	58.474026	10.66.91.94	10.66.91.170	TLSv1…	275	Application Data
16	58.474026	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=1821 Win=63956 Len=0
17	59.469022	10.66.91.94	10.66.91.170	TLSv1…	220	Application Data
18	59.469022	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=1987 Win=63956 Len=0
19	59.470029	10.66.91.94	10.66.91.170	TLSv1…	224	Application Data
20	59.471020	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=2157 Win=63956 Len=0
21	61.392030	10.66.91.94	10.66.91.170	TLSv1…	264	Application Data
22	61.393037	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=2367 Win=63956 Len=0
23	61.394029	10.66.91.94	10.66.91.170	TLSv1…	264	Application Data
24	61.394029	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=2577 Win=63956 Len=0
25	63.377031	10.66.91.94	10.66.91.170	TLSv1…	211	Application Data
26	63.377031	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=2734 Win=63956 Len=0
27	64.953997	10.66.91.94	10.66.91.170	TLSv1…	275	Application Data
28	64.955004	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=2955 Win=63956 Len=0
29	68.029997	10.66.91.94	10.66.91.170	TLSv1…	200	Application Data
30	68.029997	10.66.91.170	10.66.91.94	TCP	54	6514 → 5067 [ACK] Seq=1 Ack=3101 Win=63956 Len=0
31	69.026000	10.66.91.94	10.66.91.170	TLSv1…	222	Application Data

ISR4331-branch-NEW_Branch#show logging

```
Trap logging: level informational, 6284 message lines logged
    Logging to 10.66.91.170  (tls port 6514, audit disabled,
          link up),
          131 message lines logged,
          0 message lines rate-limited,
          0 message lines dropped-by-MD,
          xml disabled, sequence number disabled
          filtering disabled
          tls-profile: tls-proile
    Logging Source-Interface:       VRF Name:
    GigabitEthernet0/0/0
TLS Profiles:
    Profile Name: tls-proile
          Ciphersuites: Default
          Trustpoint: Default
          TLS version: TLSv1.2
```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.