Determine Correct Certificate for LDAPS

Contents

Introduction

This document describes how to determine the correct certificate(s) for secure Lightweight Directory Access Protocol (LDAP).

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

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, make sure that you understand the potential impact of any command.

Background Information

Secure LDAP requires that the Unified Computing System (UCS) domain have the correct certificate or certificate chain installed as a Trusted Point.

If an incorrect certificate (or chain) is set up, or if none exists, authentication fails.

To determine if there may be an issue with the certificate(s).

If you have problems with Secure LDAP, use LDAP debugging to check if the certificates are correct.

```
[username]
[password]
connect nxos      *(make sure we are on the primary)
debug ldap all
term mon
```

Next, open a second session and attempt to log in with your Secure LDAP credentials.

The session with debugging enabled logs the attempted login. On the logging session run the **undebug** command to halt further output.

```
undebug all
```

To determine if there is a potential issue with the certificate, look at the debugging output for these lines.

```
2018 Sep 25 10:10:29.144549 ldap: ldap_do_process_tls_resp: (user f-ucsapac-01) - ldap start TLS
sent succesfully;          Calling ldap_install_tls
2018 Sep 25 10:10:29.666311 ldap: ldap_do_process_tls_resp: (user f-ucsapac-01) - TLS START
failed
```

If TLS failed, a secure connection was unable to establish and authentication fails.

To determine which certificate/chain you should use.

Once you have determined that there was a failure to establish the secure connection, determine what the correct certificate(s) should be.

Use ethanlyzer to capture the communication and then extract the certificate (or chain) from the file.

In your debugging session run the command:

```
ethanalyzer local interface mgmt capture-filter "host <address of controller/load balancer>"
limit-captured-frames 100 write volatile:ldap.pcap
```

Next, attempt another log in via with your credentials.

Once you no longer see any new output in the debugging session, kill the capture. Use (**ctrl + c**).

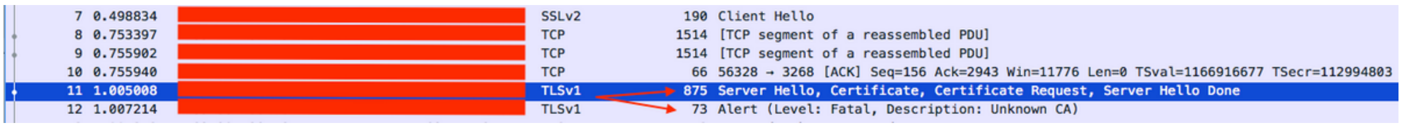
Transfer the packet capture from the Fabric Interconnect (FI) wth this command:

```
copy volatile:ldap.pcap tftp:
```

Once you have the ldap.pcap file, open the file in Wireshark and look for a packet that starts to initialize the TLS connection.

You can see a similar message in the **Info** section for the packet, as shown in the image:

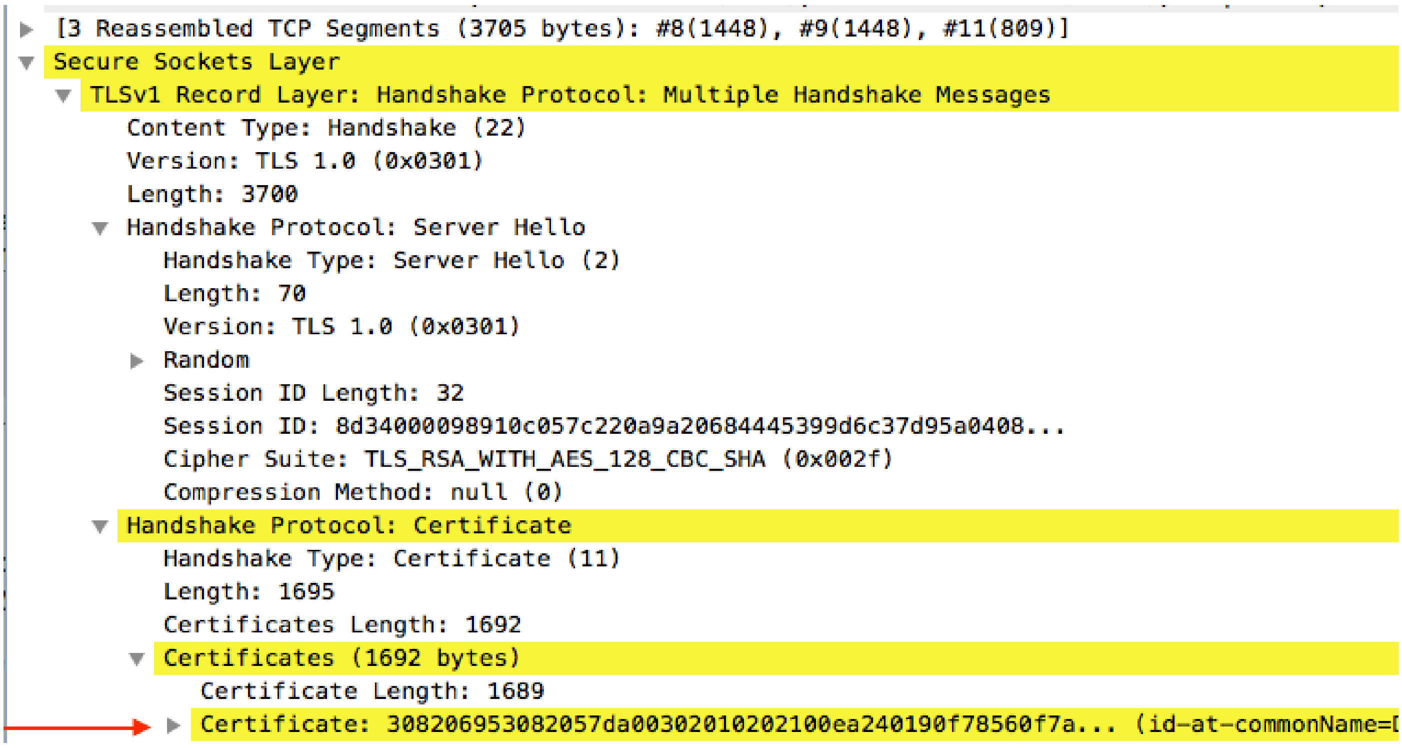
```
Server Hello, Certificate, Certificate Request, Server Hello Done
```



```
 7 0.498834 [redacted] SSLv2   190 Client Hello
 8 0.753397 [redacted] TCP    1514 [TCP segment of a reassembled PDU]
 9 0.755902 [redacted] TCP    1514 [TCP segment of a reassembled PDU]
10 0.755940 [redacted] TCP      66 56328 → 3268 [ACK] Seq=156 Ack=2943 Win=11776 Len=0 TSval=1166916677 TSecr=112994803
11 1.005008 [redacted] TLSv1   875 Server Hello, Certificate, Certificate Request, Server Hello Done
12 1.007214 [redacted] TLSv1    73 Alert (Level: Fatal, Description: Unknown CA)
```

Select this packet and expand it:

```
Secure Sockets Layer
-->TLSv? Record Layer: Handshake Protocol: Multiple Handshake Messages
---->Handshake Protocol: Certificate
------>Certificates (xxxx bytes)
```



```
▶ [3 Reassembled TCP Segments (3705 bytes): #8(1448), #9(1448), #11(809)]
▼ Secure Sockets Layer
  ▼ TLSv1 Record Layer: Handshake Protocol: Multiple Handshake Messages
      Content Type: Handshake (22)
      Version: TLS 1.0 (0x0301)
      Length: 3700
    ▼ Handshake Protocol: Server Hello
        Handshake Type: Server Hello (2)
        Length: 70
        Version: TLS 1.0 (0x0301)
      ▶ Random
        Session ID Length: 32
        Session ID: 8d34000098910c057c220a9a20684445399d6c37d95a0408...
        Cipher Suite: TLS_RSA_WITH_AES_128_CBC_SHA (0x002f)
        Compression Method: null (0)
    ▼ Handshake Protocol: Certificate
        Handshake Type: Certificate (11)
        Length: 1695
        Certificates Length: 1692
      ▼ Certificates (1692 bytes)
          Certificate Length: 1689
        ▶ Certificate: 308206953082057da00302010202100ea240190f78560f7a... (id-at-commonName=
```

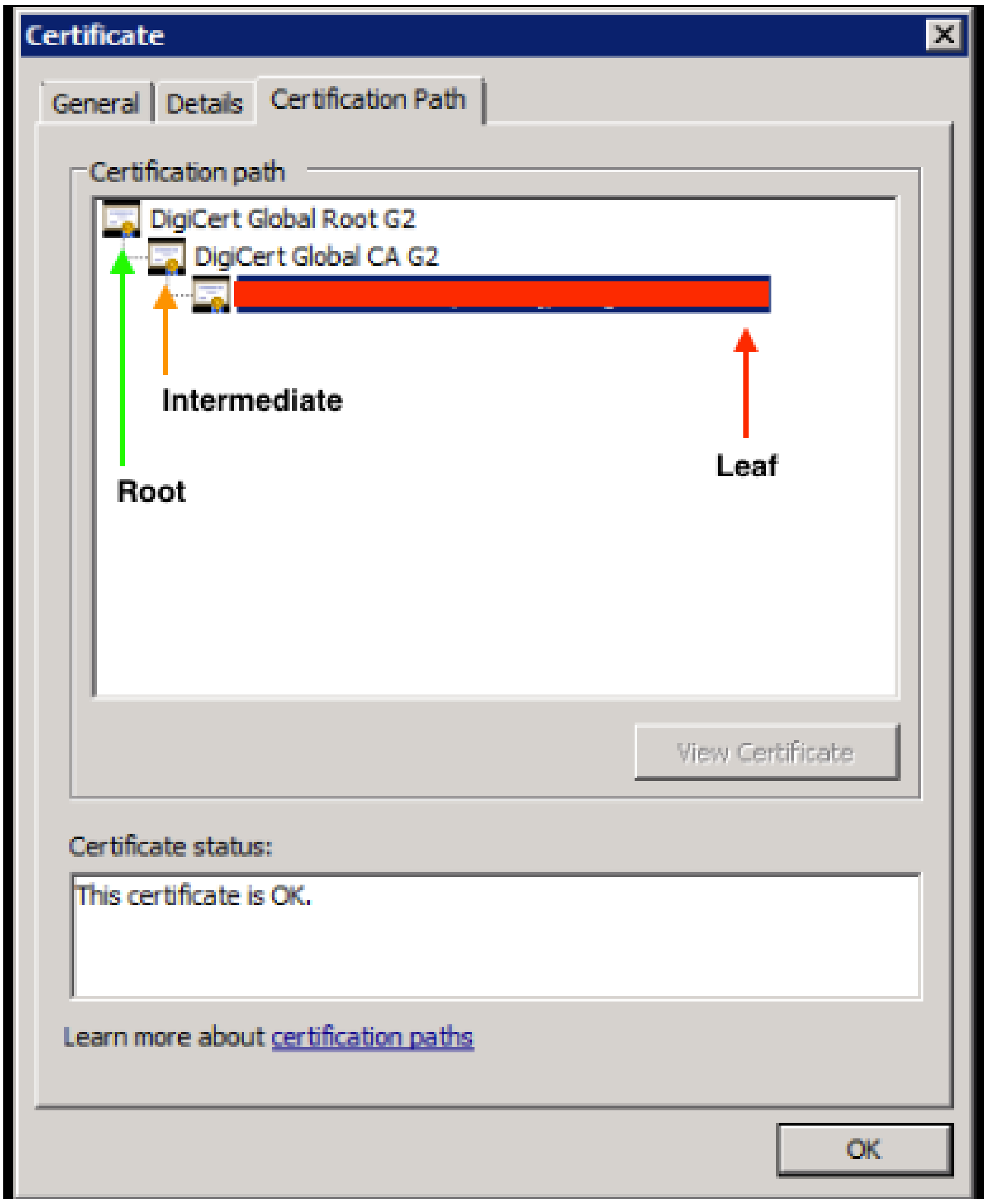
Select the line titled **Certificate**.

Right click this line and select **Export Packet Bytes** and save the file as a **.der** file.

Open the certificate in Windows and navigate to **Certificate Path** tab.

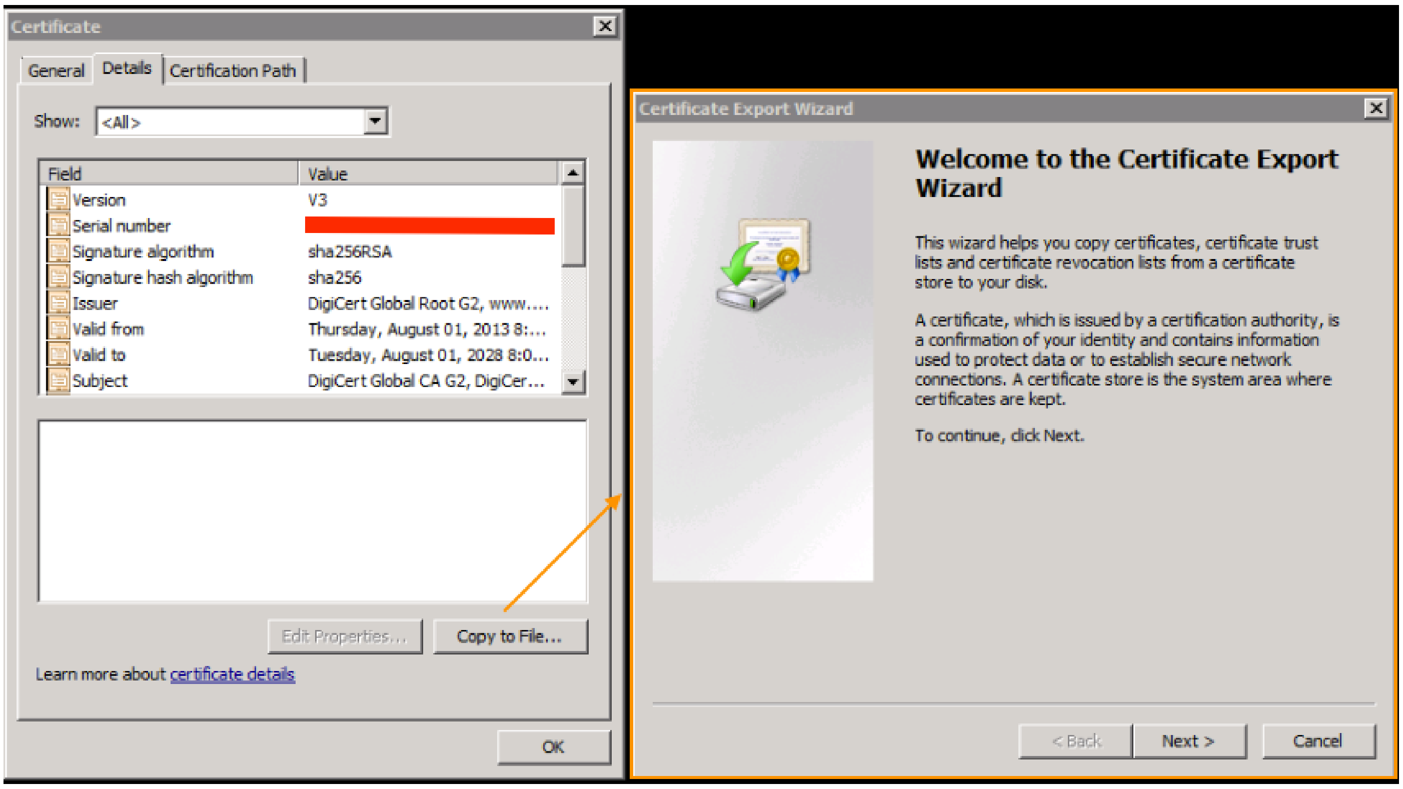
This shows you the full path from **Root** certificate to the **leaf** (end host). Do the following for all of the nodes listed except for the **leaf**.

```
Select the node
-->Select 'View Certificate'
---->Select the 'Details' tab
```



Select the **Copy to File** option and follow the **Certificate Export Wizard** (ensure to use the Base-64 encoded format).

This generates a **.cer** file for each of the nodes in the list as you complete them.


Certificate

General | Details | Certification Path

Show: <All>

Field	Value
Version	V3
Serial number	[redacted]
Signature algorithm	sha256RSA
Signature hash algorithm	sha256
Issuer	DigiCert Global Root G2, www....
Valid from	Thursday, August 01, 2013 8:...
Valid to	Tuesday, August 01, 2028 8:0...
Subject	DigiCert Global CA G2, DigiCer...

Edit Properties... | Copy to File...

Learn more about certificate details

OK

Certificate Export Wizard

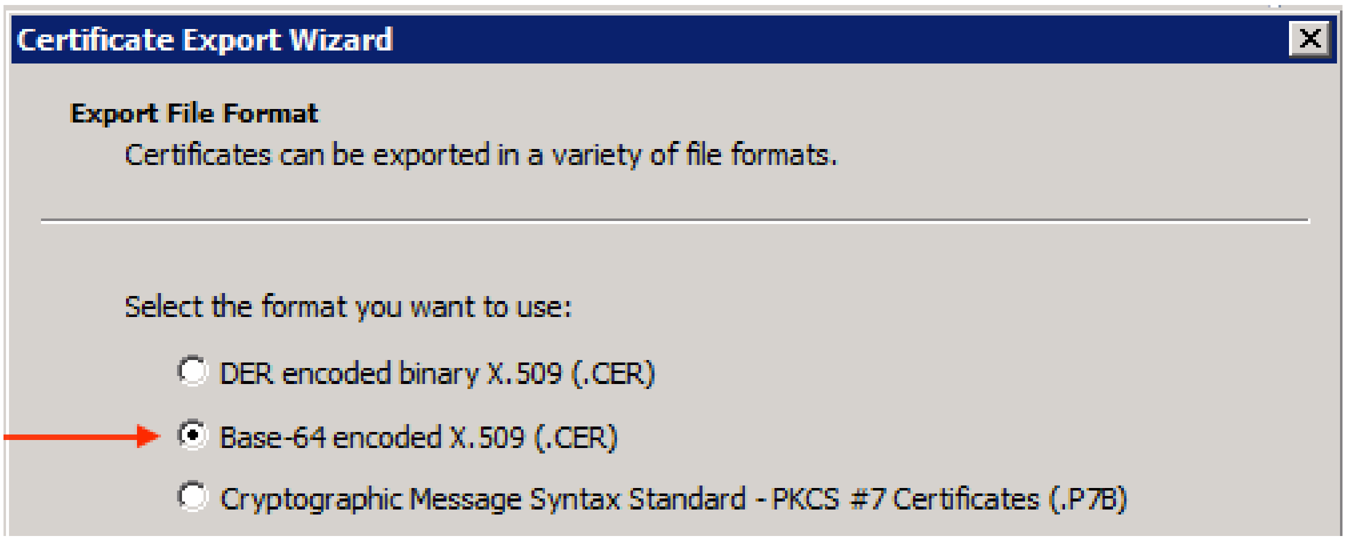
Welcome to the Certificate Export Wizard

This wizard helps you copy certificates, certificate trust lists and certificate revocation lists from a certificate store to your disk.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

To continue, click Next.

< Back | Next > | Cancel


Certificate Export Wizard

Export File Format

Certificates can be exported in a variety of file formats.

Select the format you want to use:

- ○ DER encoded binary X.509 (.CER)
- [✓ Base-64 encoded X.509 (.CER)]
- ○ Cryptographic Message Syntax Standard - PKCS #7 Certificates (.P7B)

Open these files in Notepad, Notepad++, Sublime, etc. to view the hashed certificate.

To generate the chain (if there is one), open a new document and paste in the last node's hashed certificate.

Work your way up the list pasting each hashed certificate, ending with the **Root CA**.

Paste either the **Root CA** (if there is no chain) or the entire chain that you have generated into the Trusted Point.