Konfigurieren von SIP-TLS zwischen CUCM-CUBE/CUBE-SBC

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Einführung

Dieses Dokument unterstützt die Konfiguration von SIP Transport Layer Security (TLS) zwischen Cisco Unified Communication Manager (CUCM) und Cisco Unified Border Element (CUBE).

Voraussetzungen

Cisco empfiehlt, diese Themen zu kennen.

- SIP-Protokoll
- Sicherheitszertifikate

Anforderungen

- Datum und Uhrzeit müssen auf den Endpunkten übereinstimmen (es wird empfohlen, dieselbe NTP-Quelle zu verwenden).
- Der CUCM muss sich im gemischten Modus befinden.
- TCP-Konnektivität ist erforderlich (Open port 5061 on any Transit Firewall).
- Auf dem CUBE müssen die Sicherheits- und UCK9-Lizenzen installiert sein.

Verwendete Komponenten

- SIP
- Eigenständige Zertifikate

Konfigurieren

Netzwerkdiagramm



Konfigurationsschritte

Schritt 1: Erstellen Sie einen Vertrauenspunkt, um das selbst signierte CUBE-Zertifikat zu speichern.

crypto pki trustpoint CUBEtest(this can be any name)
enrollment selfsigned
serial-number none
fqdn none
ip-address none
subject-name cn= ISR4451-B.cisco.lab !(this has to match the router's host name)
revocation-check none

rsakeypair ISR4451-B.cisco.lab !(this has to match the router's host name) Schritt 2: Nachdem der Vertrauenspunkt erstellt wurde, führen Sie den Befehl **Crypto pki enroll CUBEtest aus**, um selbstsignierte Zertifikate zu erhalten.

crypto pki enroll CUBEtest

% The fully-qualified domain name will not be included in the certificate

Generate Self Signed Router Certificate? [yes/no]: yes Wenn die Registrierung korrekt war, müssen Sie diese Ausgabe erwarten

Router Self Signed Certificate successfully created Schritt 3: Nachdem Sie das Zertifikat erworben haben, müssen Sie es exportieren

crypto pki export CUBEtest pem terminal Der obige Befehl muss das unten stehende Zertifikat generieren. % Self-signed CA certificate:

----BEGIN CERTIFICATE----

MIIBgDCCASqgAwIBAgIBATANBgkqhkiG9w0BAQUFADAeMRwwGgYDVQQDExNJUlI0 NDUxLUIuY2lzY28ubGFiMB4XDTE1MTIxNTAxNTAxNVoXDTIwMDEwMTAwMDAwMFow HjEcMBoGA1UEAxMTSVNSNDQ1MS1CLmNpc2NvLmxhYjBcMA0GCSqGSIb3DQEBAQUA A0sAMEgCQQDGtZ974Tfv+pngs1+cCeLZ/e0b2zq6CrIj4T1t+NS1G5sjMJ919/ix 7Fa6DG33LmEYUM1NntkLaz+8UNDAyBZrAgMBAAGjUzBRMA8GA1UdEwEB/wQFMAMB Af8wHwYDVR0jBBgwFoAU+Yy1UqKdb+rrINc7tZcrdIRMKPowHQYDVR00BBYEFPmM tVKinW/q6yDX07WXK3SETCj6MA0GCSqGSIb3DQEBBQUAA0EADQXG2FYZ/MSewjSH T88SHXq0EVqcLrgGpScwcpbR1mKFPpIhDVaJfH/FC6jnkGW7JFWcekA5Kp0tzYx4 LDQaxQ==

----END CERTIFICATE----

% General Purpose Certificate:

----BEGIN CERTIFICATE----

MIIBgDCCASqgAwIBAgIBATANBgkqhkiG9w0BAQUFADAeMRwwGgYDVQQDExNJU110 NDUxLUIuY21zY28ubGFiMB4XDTE1MTIxNTAxNTAxNVoXDTIwMDEwMTAwMDAwMFow HjEcMBoGA1UEAxMTSVNSNDQ1MS1CLmNpc2NvLmxhYjBcMA0GCSqGSIb3DQEBAQUA A0sAMEgCQQDGtZ974Tfv+pngs1+cCeLZ/e0b2zq6CrIj4T1t+NS1G5sjMJ919/ix 7Fa6DG33LmEYUM1NntkLaz+8UNDAyBZrAgMBAAGjUzBRMA8GA1UdEwEB/wQFMAMB Af8wHwYDVR0jBBgwFoAU+Yy1UqKdb+rrINc7tZcrdIRMKPowHQYDVR00BBYEFPmM tVKinW/q6yDX07WXK3SETCj6MA0GCSqGSIb3DQEBBQUAA0EADQXG2FYZ/MSewjSH T88SHXq0EVqcLrgGpScwcpbR1mKFPpIhDVaJfH/FC6jnkGW7JFWcekA5Kp0tzYx4 LDQaxQ==

----END CERTIFICATE-----

Kopieren Sie das oben erzeugte selbst signierte Zertifikat und fügen Sie es in eine Textdatei mit Dateierweiterung .pem ein

Das nachfolgende Beispiel wird als ISR4451-B.ciscolab.pem bezeichnet.

Computer			
File name:	ISR4451-B.cisco.lab.pem		×
Save as type:	All types (*.*)		•
Hide Folders		Save	Cancel
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Schritt 4: Laden Sie das CUBE-Zertifikat in den CUCM hoch.

- CUCM-OS-Admin > Sicherheit > Zertifikatsverwaltung > Zertifikat/Zertifikatkette hochladen
- Zweck des Zertifikats = CallManager-Trust
- Laden Sie Ihre .pem-Datei hoch.

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Jpload Certificate/Certific	ate chain	
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Upload Certificate/Certific	ate chain	
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Schritt 5: Laden Sie das selbstsignierte Zertifikat des Call Managers herunter

- Suchen Sie das Zertifikat mit der Bezeichnung "Callmanager".
- Klicken Sie auf den Hostnamen.
- Klicken Sie auf PEM-Datei herunterladen.
- Speichern Sie die Datei auf Ihrem Computer

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Key value: 082010a0282010100b803883f1177dcd68431efc16d7fdb127db637091d1d8e7b5 1913a1689d2a289ea74fc1b42b5a571bc0abc1310e63b8924a84a3e7dc03e5001ac 0551b9f1569d44c1f336d5a1c2a80cbf65ebc93e2bb1619ca3d1c77984aeed1a752 1433611d85f619725c8d116a5ab399765ed0851cdd73336244a7d214091f7a92be 03d07ae913dee31954028c16a6b020737890fc3f63653da9ca6bbafbd59f3c3b77292 0d50f14b7d8d4ae303069072917f6491ba1083584cae22122bd6ed524da1598353 Regenerate Generate CSR Download .PEM File Download .DER File Close	Key: RSA (1.2.840.1135	49.1.1.1)			
Astronavzezulorodobassesiri // Accese4stercte0/10b12/0063/0910108e705 4913a1689d2a289ea74fc1b42b5a571bc0abc1310e63b8924a84a3e7dc03e5001ac b551b9f1569d44c1f336d5a1c2a80cbf65ebc93e2bb1619ca3d1c77984aeed1a752 433611d85f619725c8d116a5ab399765ed0851cdd73336244a7d214091f7a92be 8d07ae913dee31954028c16a6b020737890fc3f63653da9ca6bbafbd59f3c3b77292 8d50f14b7d8d4ae303069072917f6491ba1083584cae22122bd6ed524da1598353 Regenerate Generate CSR Download .PEM File Download .DER File Close	Key value:	288361177464684214641647645137456370014140-755			
b551b9f1569d44c1f336d5a1c2a80cbf65ebc93e2bb1619ca3d1c77984aeed1a752 c433611d85f619725c8d116a5ab399765ed0851cdd73336244a7d214091f7a92be 3d07ae913dee31954028c16a6b020737890fc3f63653da9ca6bbafbd59f3c3b77292 ad50f14b7d8d4ae303069072917f6491ba1083584cae22122bd6ed524da1598353 Regenerate Generate CSR Download .PEM File Download .DER File	8d913a1689d2a289ea746	c1b42b5a571bc0abc1310e63b8924a84a3e7dc03e5001ac			
A33611d85f619725c8d116a5ab399765ed0851cdd73336244a7d214091f7a92be 3d07ae913dee31954028c16a6b020737890fc3f63653da9ca6bbafbd59f3c3b77292 3d50f14b7d8d4ae303069072917f6491ba1083584cae22122bd6ed524da1598353 Regenerate Generate CSR Download .PEM File Download .DER File	4fb551b9f1569d44c1f336	d5a1c2a80cbf65ebc93e2bb1619ca3d1c77984aeed1a752			
3d07ae913dee31954028c16a6b020737890fc3f63653da9ca6bbafbd59f3c3b77292 3d50f14b7d8d4ae303069072917f6491ba1083584cae22122bd6ed524da1598353 Regenerate Generate CSR Download .PEM File Close	3c433611d85f619725c8d	116a5ab399765ed0851cdd73336244a7d214091f7a92be			
Regenerate Generate CSR Download .PEM File Download .DER File Close	38d07ae913dee31954028	1c16a6b020737890fc3f63653da9ca6bbafbd59f3c3b77292			
Regenerate Generate CSR Download .PEM File Download .DER File Close	8905011407d8d4ae30306	907291770491D81083584cae22122bd6ed524d81598353			
Close	(Business) (=			_	
Close	Regenerate Gener	Tate CSK Download .PEM File Download .DER File			
Close					
ciose	(lane)				
	Close				

Schritt 6: Laden Sie das Zertifikat "Callmanager.pem" in CUBE hoch.

- Öffnen Sie Callmanager.pem mit einem Text-Datei-Editor.
- Kopieren des gesamten Inhalts der Datei
- Führen Sie diese Befehle auf CUBE aus

enrollment terminal

revocation-check none

crypto pku authenticate CUCMHOSTNAME

(PASTE THE CUCM CERT HERE AND THEN PRESS ENTER TWICE)

You will then see the following:

Certificate has the following attributes:

Fingerprint MD5: B9CABE35 24B11EE3 C58C9A9F 02DB16BC

Fingerprint SHA1: EC164F6C 96CDC1C9 E7CA0933 8C7518D4 443E0E84

% Do you accept this certificate? [yes/no]: yes

If everything was correct, you should see the following:

Trustpoint CA certificate accepted.

% Certificate successfully imported

Schritt 7: Konfigurieren Sie SIP so, dass der selbst erstellte Certificate Trustpoint von CUBE verwendet wird.

sip-ua

crypto signaling default trustpoint CUBEtest Schritt 8: Konfigurieren der Dial-Peers mit TLS

dial-peer voice 9999 voip

- answer-address 35..
- destination-pattern 9999

session protocol sipv2

session target dns:cucm10-5

session transport tcp tls

voice-class sip options-keepalive

srtp

Schritt 9: Konfigurieren eines CUCM-SIP-Trunk-Sicherheitsprofils

- CUCM-Admin-Seite > System > Security > SIP-Trunk-Sicherheitsprofil
- Konfigurieren Sie das Profil wie unten gezeigt.

itatus j) Status: Ready		
IP Trunk Security Profile Informatio	n	
lame*	CUBE Secure SIP Trunk Profile	
Description	Secure SIP Trunk Profile authenticated by	null String
Device Security Mode	Encrypted	
ncoming Transport Type*	TLS	
Outgoing Transport Type	TLS	•
Enable Digest Authentication		
Ionce Validity Time (mins)*	600	
.509 Subject Name	ISR4451-B.cisco.lab	
ncoming Port*	5061	
Enable Application level authorization		
Accept presence subscription		
Accept out-of-dialog refer**		
Accept unsolicited notification		
Accept replaces header		
Transmit security status		
Allow charging header		
IP V 150 Outbound SDP Offer Filtering*	Use Default Eilter	

Hinweis: Es ist von entscheidender Bedeutung, dass das Feld X.509 mit dem zuvor beim Generieren des selbstsignierten Zertifikats konfigurierten CN-Namen übereinstimmt.

Schritt 10: Konfigurieren eines SIP-Trunks auf dem CUCM

- Stellen Sie sicher, dass das Kontrollkästchen SRTP allowed aktiviert ist.
- Konfigurieren Sie die richtige Zieladresse, und ersetzen Sie Port 5060 durch Port 5061.

 Stellen Sie sicher, dass Sie das richtige SIP-Trunk-Sicherheitsprofil auswählen (das in Schritt 9 erstellt wurde).

Destination Destination Address is an SRV Destination Address is an SRV	Idress	Destination A	Address IPv6	Destination Port
1* 10.201.160.12				5061
MTP Preferred Originating Codec*	711ulaw	•		
BLF Presence Group*	Standard Presence group	-		
SIP Trunk Security Profile*	ISR4451-B Secure SIP Trunk Profile	-		
terouting Calling Search Space	< None >	•		
Jut-Of-Dialog Refer Calling Search Space	< None >	*		
SUBSCRIBE Calling Search Space	< None >	•		
SIP Profile*	Standard SIP Profile-options	- 1	View Details	
DTMF Signaling Method*	No Preference	-		

Speichern und zur
ücksetzen Sie den Trunk.

Überprüfen

Da Sie OPTIONS PING auf dem CUCM aktiviert haben, muss der SIP-Trunk den Status "VOLLDIENST" haben.

Name *	Description	Calling Search Space	Device Pool	Route Pattern	Partition	Route Group	Priority	Trunk Type	SIP Trunk Status	SIP Trunk Duration
ISR4451-B			G711-Secure	SIP Full Service Time In Trunk minute		Time In Full Service: 0 day 0 hour 0 minute				

Der SIP-Trunk-Status zeigt den Full-Service an.

Der DFÜ-Peer-Status wird wie folgt angezeigt:

show dial-peer voice summary									
TAG KEEPALI	TYPE IVE	MIN	OPER PREFIX	DEST-PATTERN	FER	THRU	SESS-TARGET	STAT PORT	
9999	voip	up	up	9999	0	syst	dns:cucm10-5		active

Fehlerbehebung

Aktivieren und Erfassen der Ausgabe dieser Debugger

debug crypto pki api debug crypto pki callbacks debug crypto pki messages debug crypto pki transactions debug ssl openssl errors debug ssl openssl msg debug ssl openssl states debug ip tcp transactions debug ccsip verbose

WebEx Aufzeichnung Link:

https://goo.gl/QOS1iT