Title
Configuring RadSec profile in EOS

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Configuring RadSec profile in EOS

Arista Switches can form a RadSec tunnel using SSL encryption with AGNI. RadSec is a protocol that supports RADIUS over TCP and TLS. For mutual authentication it is required to install a client certificate with corresponding private key as well as your AGNI CA certificate. The steps below assumes the usage of AGNIs internal PKI.

Major steps to create, upload and establish the RadSec tunnel.

1. Generate private key and CSR
2. Generate client certificate for the Switch in AGNI.
3. Upload the Certificate to the Switch.
4. Configure an SSL profile and and RadSec profile

Generate certificates

Method 1 - CSR (Certificate Signing Request)

A pair of two keys (public and private key) is generated using a public-key cryptosystem. EOS supports the RSA algorithm with key lengths of 2,048, 3,072, or 4,096 bit.

A certificate signing request (CSR) is issued specifying properties like the common name (CN) and DNS. The CSR is then submitted to the CA (AGNI). AGNI will generate a certificate that must be uploaded and installed on the switch

It is also necessary to upload AGNIs root certificate to the switch trust list.

- Generate the Key pair

```
switch01#security pki key generate rsa 2048 rit311.key
```

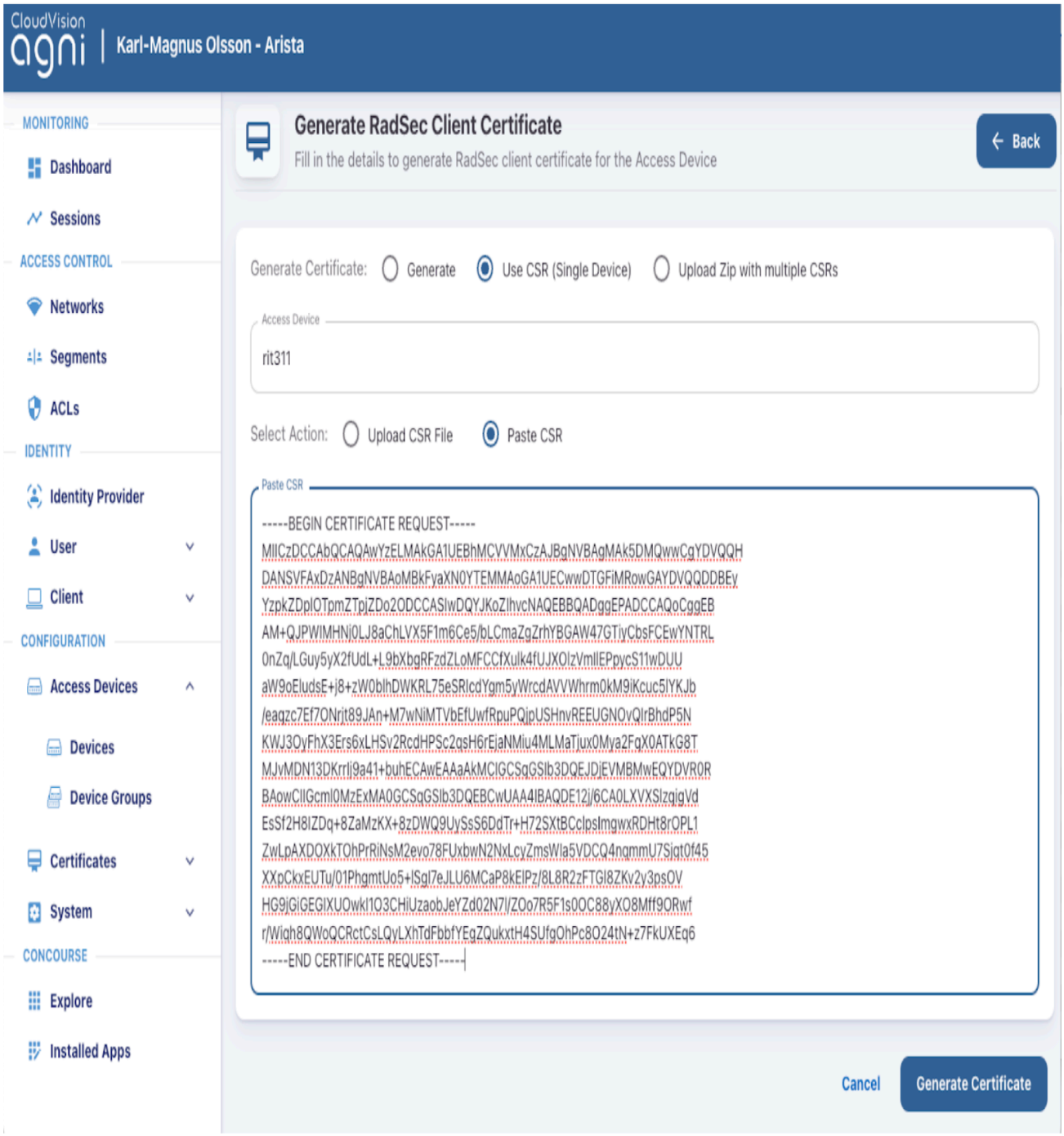
- Generate the certificate signing request using the key just created.

Note. Common Name must correspond to the Switch MAC address and the DNS needs to match the hostname of the switch

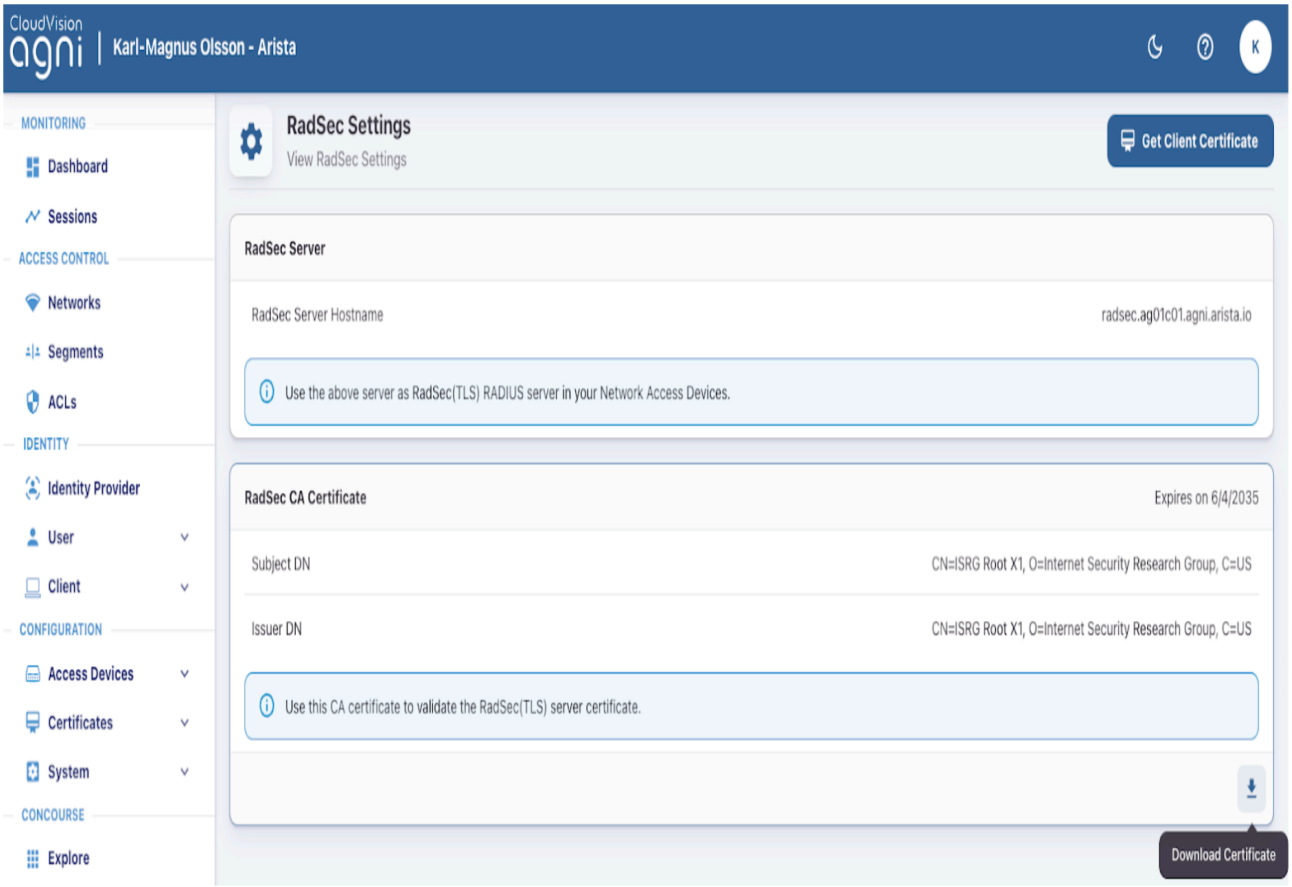
```
rit311...17:18:39(config)#security pki certificate generate si
Common Name for use in subject: 2c:dd:e9:fe:cd:68
Two-Letter Country Code for use in subject: US
State for use in subject: NC
Locality Name for use in subject: RTP
Organization Name for use in subject: Arista
Organization Unit Name for use in subject: Lab
Email address for use in subject:
IP addresses (space separated) for use in subject-alternative-
DNS names (space separated) for use in subject-alternative-nam
Email addresses (space separated) for use in subject-alternati
URIs (space separated) for use in subject-alternative-name:
-----BEGIN CERTIFICATE REQUEST-----
MIICzDCCAbQCAQAwYzELMAkGA1UEBhMCVVMxCzAJBgNVBAgMAk5DMQwwCgYDVQ
DANSVFAxDzANBgNVBAoMBkFyaXN0YTEMMAoGA1UECwwDTGFiMRowGAYDVQQDDB
YzpkZDplOTpmZTpjZDo2ODCCASIwDQYJKoZIhvcNAQEBBQADggEPADCCAQoCgg
AM+QJPWIMHNj0LJ8aChLVX5F1m6Ce5/bLCmaZgZrhYBGAW47GTiyCbsFCEwYNT
0nZq/LGuy5yX2fUdL+L9bXbgRFzdZLoMFCCfXulk4fUJXOlzVmIlEPpycS11wD
aW9oEludsE+j8+zW0blhDWKRL75eSRIcdYgm5yWrcdAVVWhrm0kM9iKcuc5lYK
/eaqzc7Ef7ONrjt89JAn+M7wNiMTVbEfUwfRpuPQjpUSHnvREEUGNOvQIrBhdP
KWJ3OyFhX3Ers6xLHSv2RcdHPSc2qsH6rEjaNMiu4MLMaTjux0Mya2FqX0ATkG
MJvMDN13DKrrIj9a41+buhECAwEAAaAkMCIGCSqGSIb3DQEJDjEVMBMwEQYDVR
BAowCIIGcml0MzExMA0GCSqGSIb3DQEBCwUAA4IBAQDE12j/6CA0LXVXSlzqig
EsSf2H8IZDq+8ZaMzKX+8zDWQ9UySsS6DdTr+H72SXtBCclpsImgwxRDHt8rOP
ZwLpAXDOXkTOhPrRiNsM2evo78FUxbwN2NxLcyZmsWIa5VDCQ4nqmmU7Sjqt0f
XXpCkxEUTu/01PhgmtUo5+lSgI7eJLU6MCaP8kElPz/8L8R2zFTGl8ZKv2y3ps
HG9jGiGEGIXUOwkI1O3CHiUzaobJeYZd02N7l/ZOo7R5F1s0OC88yXO8Mff9OR
r/Wiqh8QWoQCRctCsLQyLXhTdFbbfYEgZQukxtH4SUfgOhPc8O24tN+z7FkUXE
-----END CERTIFICATE REQUEST-----
```

- Copy the certificate including the text “-----BEGIN CERTIFICATE REQUEST-----” and “-----END CERTIFICATE REQUEST-----”
- Select your **Access Device** from the list and select **Get Client Certificate.**
- Select Use CSR (Single Device) and Past CSR.

Note 1. CSR can also be uploaded from file by selecting action **Upload CSR File**
Note 2. For singing multiple CSRs select **Upload Zip with multiple CSRs**



- Click **Generate Certificate.** A certificate [Access device].pem will be generated and downloaded.
- Go to **RadSec Setting** in the Navigator under Administration section to download the CA certificate.
- Download the RadSec CA certificate (radsec_ca_certificate.pem) by clicking **Download Certificate.**



Copy certificates to the switch

The certificate and root certificate need to be copied to the switch flash using SCP.

- Prerequisites

  Settings on switch to be able to SCP over the certs.

  ```
  #username USER privilege 15 role network-admin secret SECRET
  #aaa authentication login console local
  #aaa authorization exec default local
  ```

- Copy the certificates

  ```
  #scp rit311.pem radsec_ca_certificate.pem <user>@<switch-ip>:/
  ```

- Now you are ready to create a SSL profile

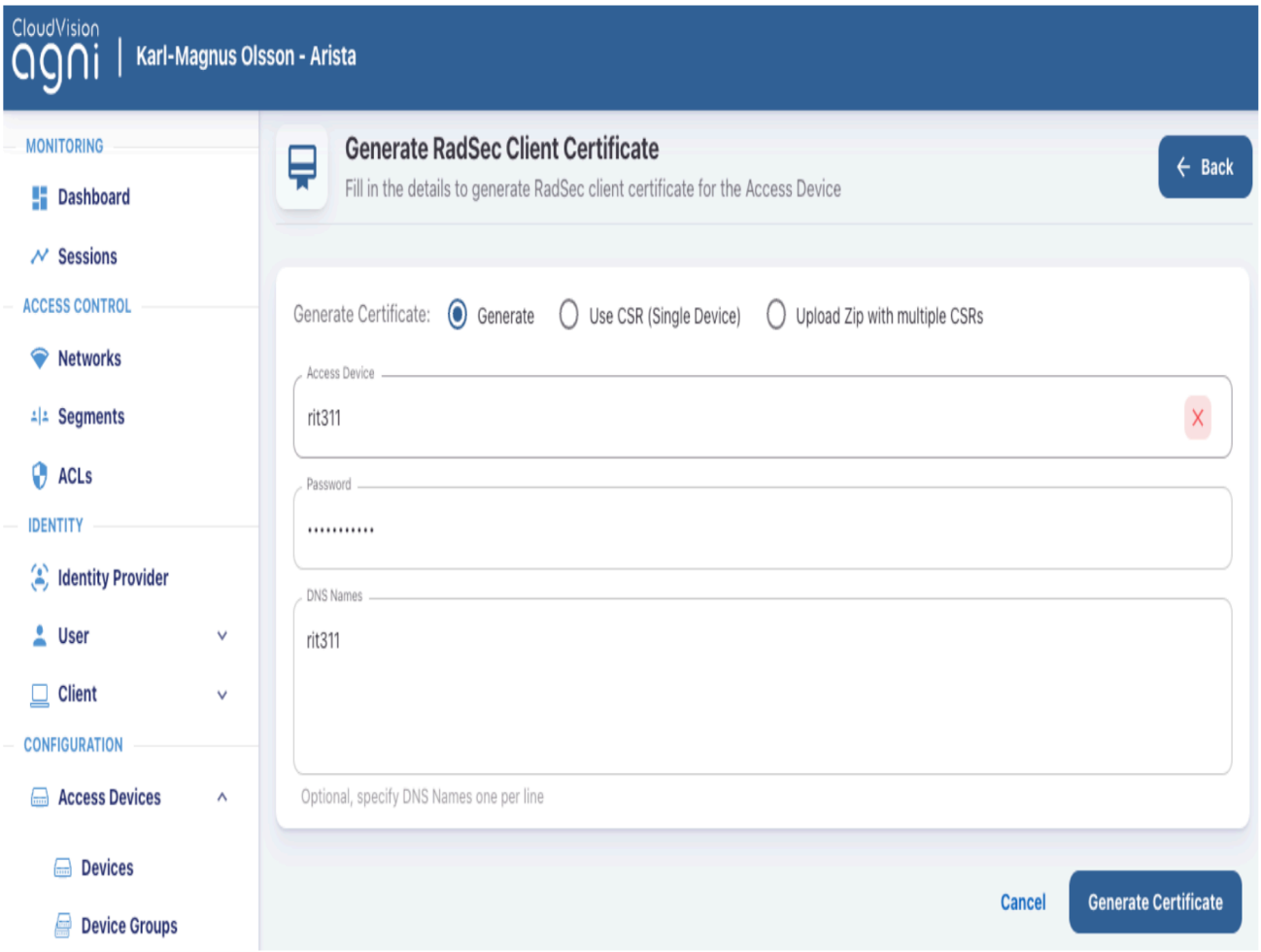
Method 2 - Direct certificate generation

Generate a RadSec client certificate for the switch from AGNI by following the procedure.

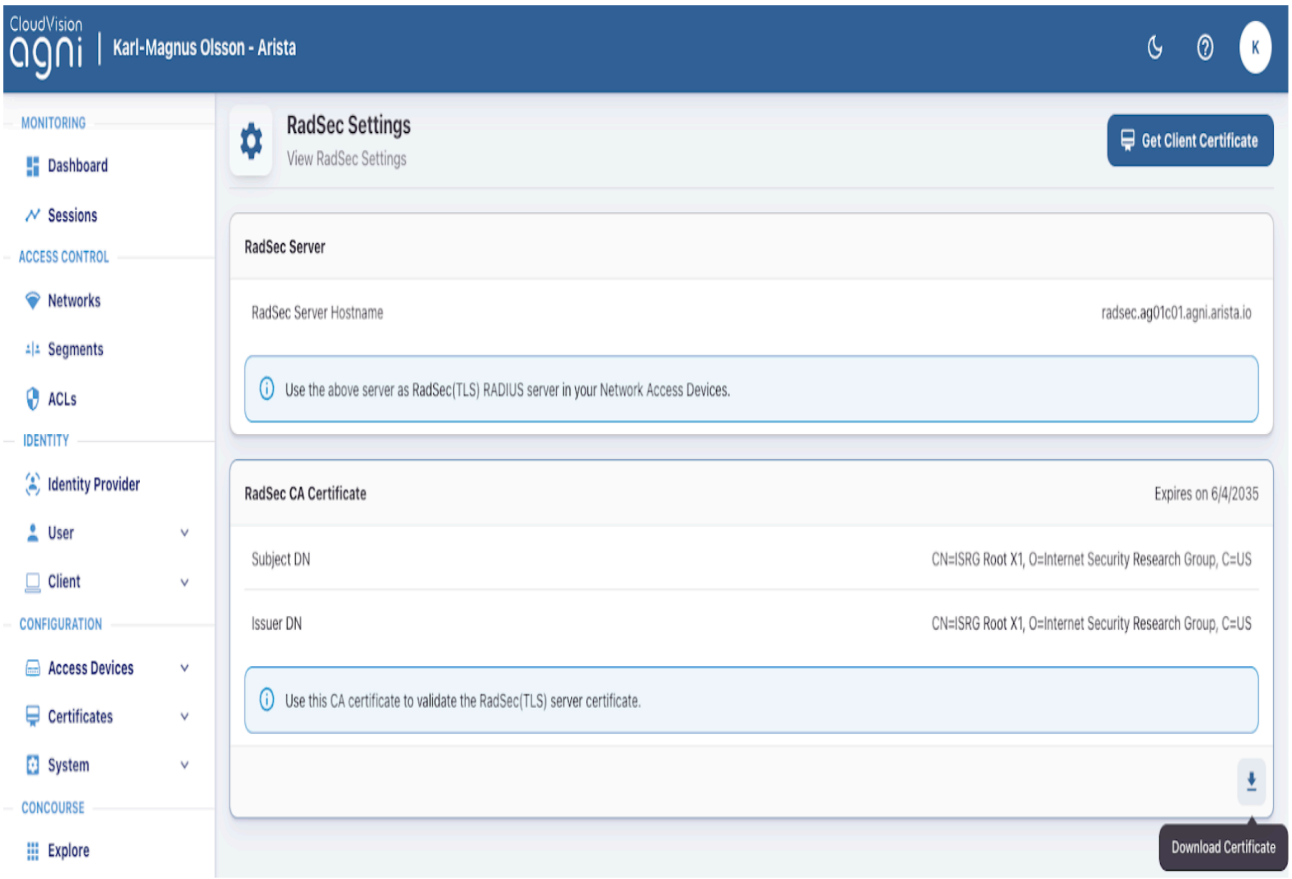
- Select your **Access Device** from the list and select **Get Client Certificate.**

- Select **Generate**. Define password and DNS name.

  Note. The DNS name needs to match the switch host name



- Click **Generate Certificate**. A certificate [Access device].pem will be generated.
- Go to **RadSec Setting** in the Navigator under Administration section to download the CA certificate.
- Download the RadSec CA certificate (radsec_ca_certificate.pem) by clicking **Download Certificate**.



- Break out the private key

  Split the certificate into switch.crt and switch.key using the openssl commands described. The following commands are run in terminal (Linux, MacOS or Windows)

```
#openssl pkcs12 -in rit311.p12 -out rit311.crt -clcerts -nokey
#openssl pkcs12 -in rit311.p12 -out rit311.key -nocerts -nodes
```

Note. Running openssl on newer MacOS release might require -legacy flag to be added to the commands above.

Copy certificates to the switch

The certificate, key and CA certificate files need to be copied to the switch flash using scp.

- Prerequisites

  Settings on switch to be able to SCP over the certs.

```
#username USER privilege 15 role network-admin secret SECRET
#aaa authentication login console local
#aaa authorization exec default local
```

- Copy the certificates.

```
#scp rit311.crt rit311.key radsec_ca_certificate.pem
<user>@<switch-ip>:/mnt/flash
```

Create a SSL profile

- SSH to the switch and create the SSL profile by executing the commands below. All steps except for copying the key to the key storage is required for both method 1 and 2.

```
rit311#copy flash:rit311.pem certificate:
rit311#copy flash:rit311.key sslkey: (Not necessary if certifi
rit311#copy flash:radsec_ca_certificate.pem certificate:
rit311#config
rit311(config)#management security
rit311(config-mgmt-security)#ssl profile agni-server
rit311(config-mgmt-sec-ssl-profile-server)#certificate rit311.
rit311(config-mgmt-sec-ssl-profile-server)#trust certificate r
```

- Test your management security profile

```
rit311#show management security ssl profile agni-server

   Profile        State

-------------- -----------

   agni-server    valid
```

RadSec profile configuration

- Configure AGNI as a RadSec server in the switch and use the above configured SSL profile.

```
rit311(config)#radius-server host radsec.ag01c01.agni.arista.i
rit311(config)#aaa group server radius agni-server-group
rit311(config-sg-radius-agni-server-group)# server radsec.ag01
rit311(config)#aaa authentication dot1x default group radius
rit311(config)#aaa accounting dot1x default start-stop group r
```

Example Configuration

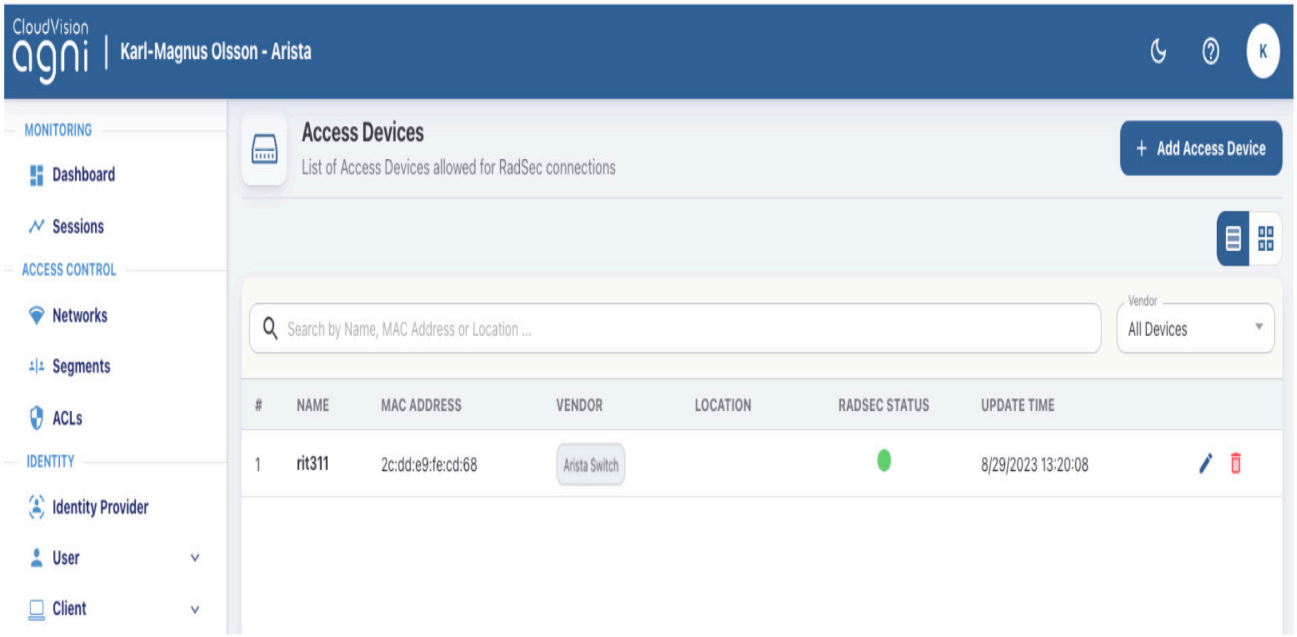
```
management security
   ssl profile agni-server
        certificate rit311.pem key rit311.key
        trust certificate radsec_ca_certificate.pem
!
radius-server host radsec.beta.agni.arista.io (http://radsec.b
!
aaa group server radius agni-server-group
   server radsec.ag01c01.agni.arista.io (http://radsec.ag01c01
!

aaa authentication dot1x default group radius
aaa accounting dot1x default start-stop group radius

!
```

Verify the RadSec connection

The status of the RadSec tunnel can be verified from: Configuration > Access Devices > Devices page in AGNI. Solid green under RadSec status means that the tunnel is UP.

The RadSec tunnel stays Down [Solid Gray], unless the Access Device is using it.

Meaning, SSIDs using RadSec should be turned ON.



Troubleshooting

- Client certificate missing or wrong.

  List available certificates.

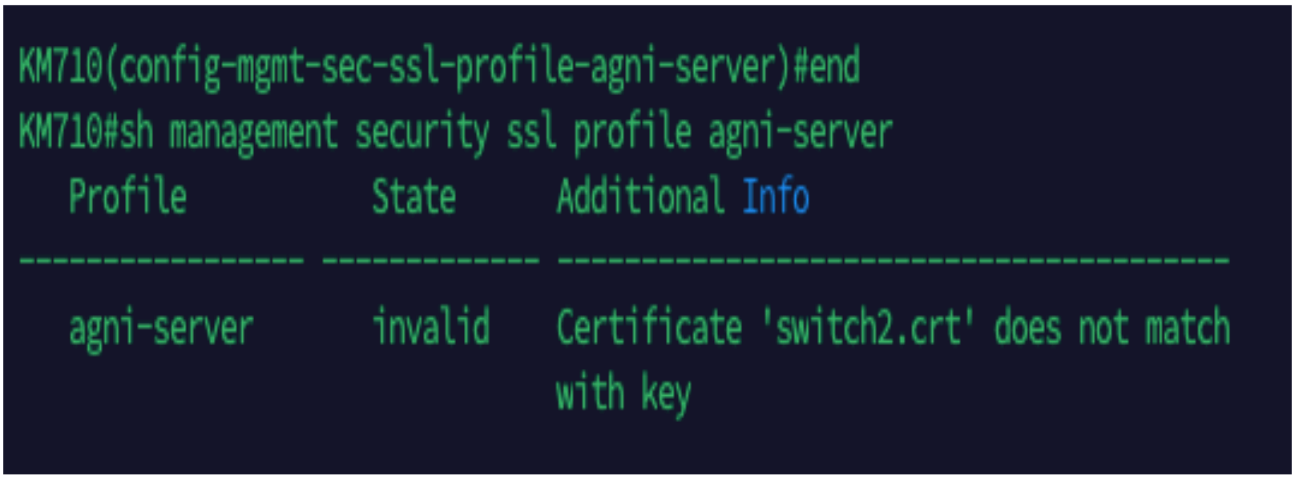
  ```
  #dir certificate:
  ```

  List available Keys.

  ```
  #dir sslkey:
  ```

  Make sure your certificate and key pair is valid.

  ```
  #sh management security ssl profile agni-server
  ```

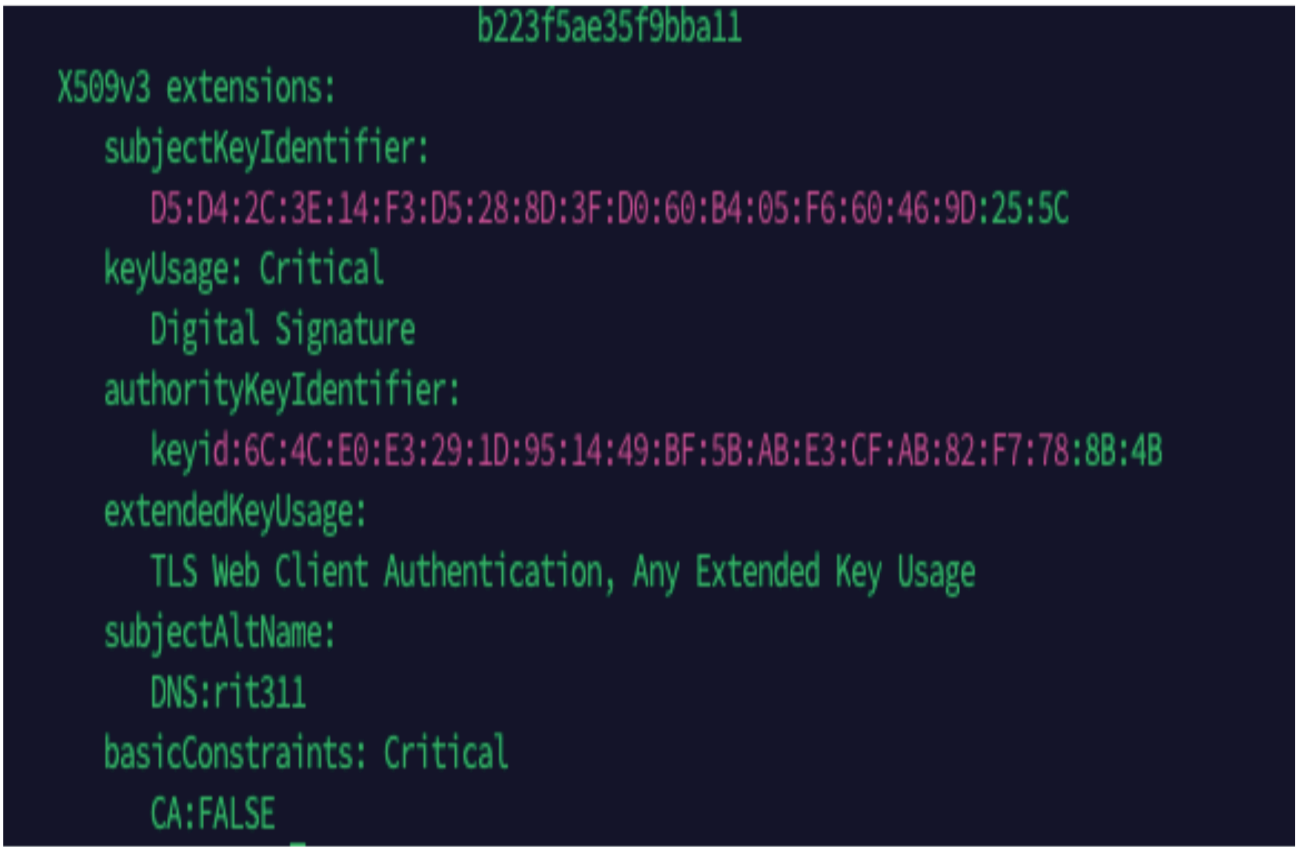


Example output of certificate and key mismatch

This command displays the status of the SSL profile server. Problems like Certificate does not exist, Certificate expired, incorrect certificate chain, Certificate is not yet valid, etc can be revealed using this command
"Certificate not yet valid" is generally a symptom of incorrect date and time on the switch.

- Make sure Switch Host name is present in client certificate.

```
#show management security ssl certificate rit311.pem
```



Snippet of client certificate showing the DNS matching switch host name (here rit311)

- Root CA certificate of Server missing on client side

  Make sure Root CA is trusted in your SSL profile

  ```
  rit311..16:36:12(config)#sh run section ssl
  management security
     ssl profile agni-server
        certificate rit311.pem key rit311.key
        trust certificate radsec_ca_certificate.pem
  ```

Further info on troubleshooting TLS

https://www.arista.com/en/um-eos/eos-control-plane-security#xx1001547
(https://www.arista.com/en/um-eos/eos-control-plane-security#xx1001547)

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