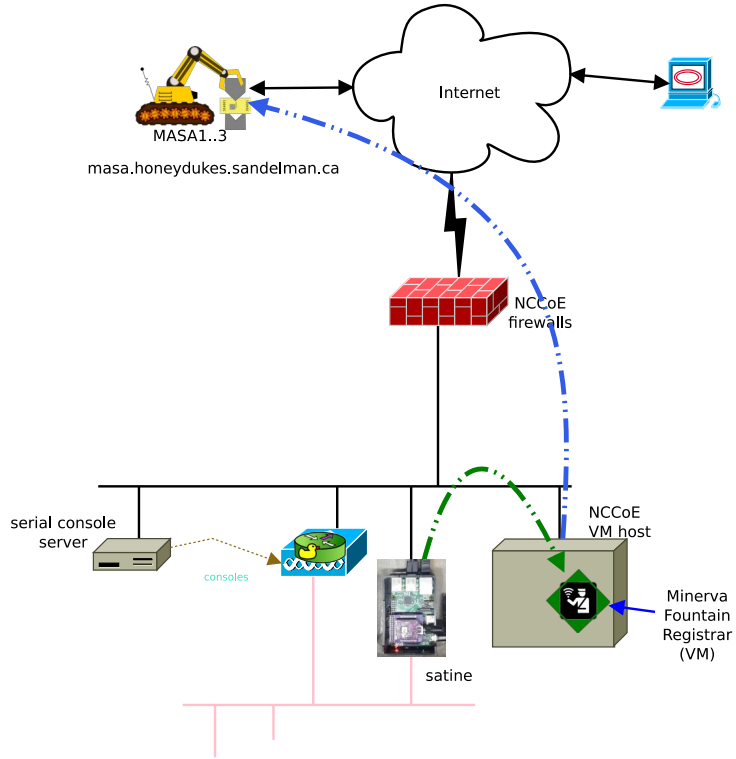
NCCoE IoT Onboarding

BRSKI – build 3 Operational Run Through

Sept 2022 - Network Diagram for Build 3

Goals of iteration 1

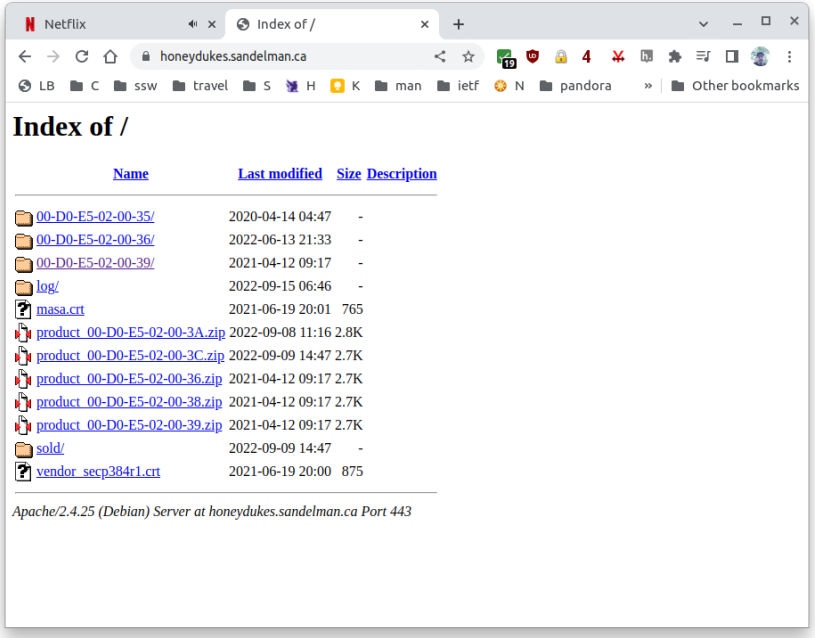
- Validation of Registrar
- Validation of MASA
- Verification of IDevID



Sept 2022 – Simulated Factory Provisioning

Provisioning of IDevID

- Factory generates private keys
- Signs IDevID certificates
- Maintains inventory of five un-owned devices

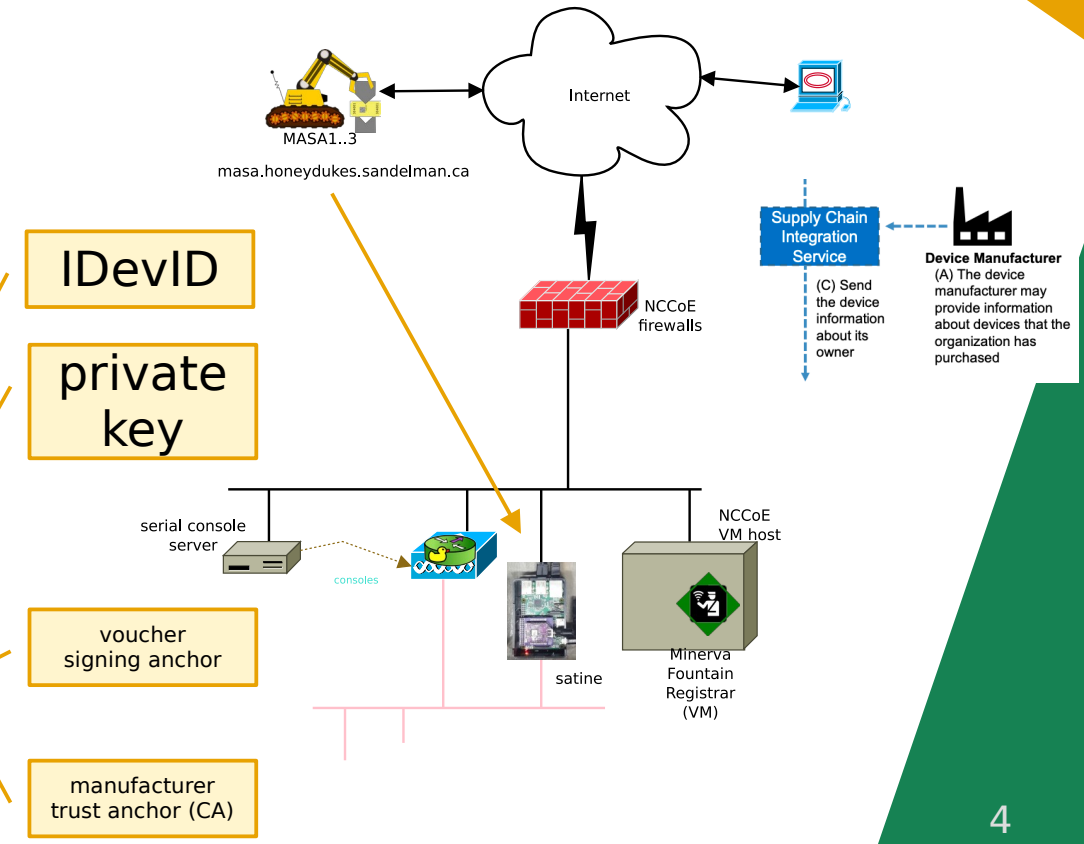


Sept 2022 – Provisioning Step

Provisioning of IDevID

- Download ZIP file to Pledge simulator
- Unzip into convenient place

```
nccoe@satine:~/reach$ ls -l 00-D0-E5-02-00-37
total 16
-rw-rw-r-- 1 nccoe nccoe 696 Apr 12  2021 device.crt
-r-------- 1 nccoe nccoe 227 Apr 12  2021 key.pem
-rw-rw-r-- 1 nccoe nccoe 733 Apr 12  2021 masa.crt
-rw-r--r-- 1 nccoe nccoe 810 Apr 12  2021 vendor.crt
```



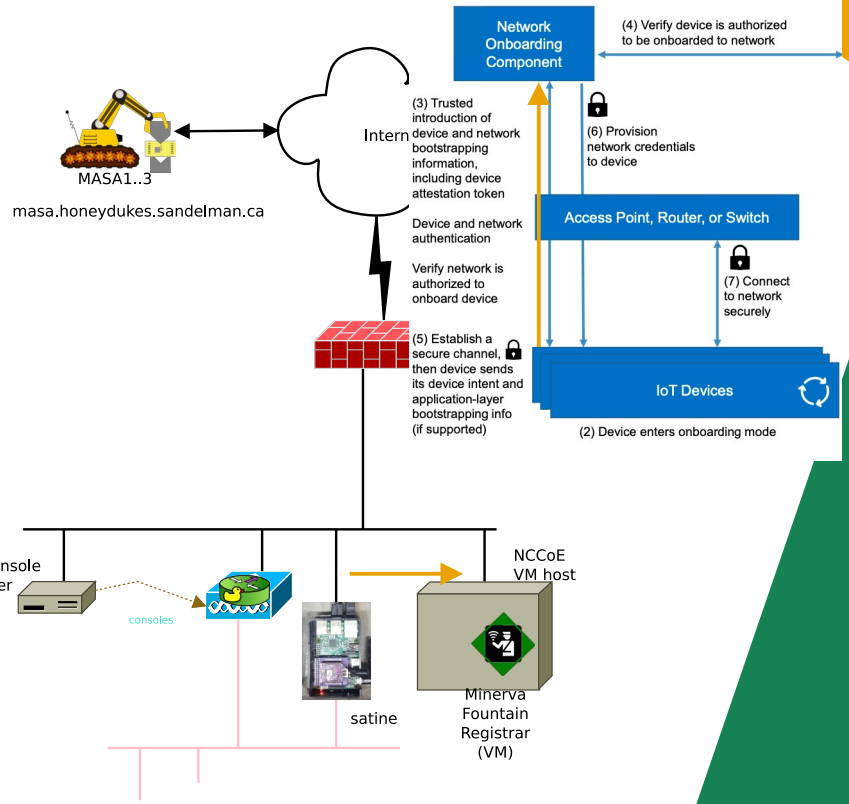
Sept 2022 – Voucher Request Step

Use IDevID to connect to Registrar

```
bundle exec rake
reach:enroll_http_pledge
PRODUCTID=00-D0-E5-02-00-3B
JRC=https://192.168.30.34:8443/
```

address/ port of Registrar

Directory in which identity files are extracted

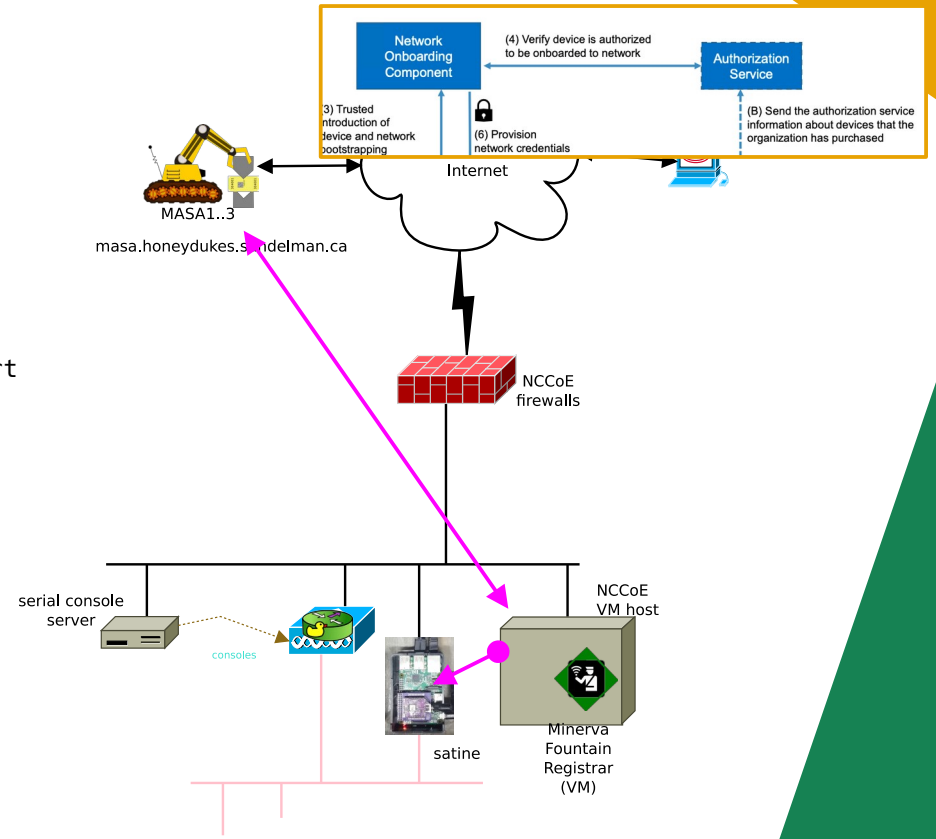


Sept 2022 – MASA Interaction

Use IDevID to find MASA

`device.crt` → `masa.honeydukes.sandelman.ca`

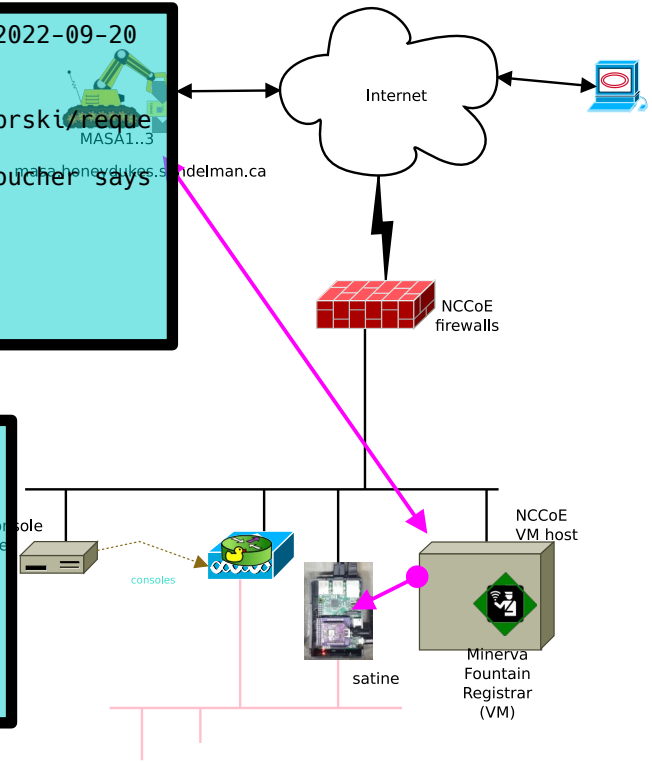
```
nccoe@satine:~/reach$ openssl x509 -noout -text -in 00-D0-E5-02-00-3B/device.crt


    Certificate:
    ...
            Issuer: DC = ca, DC = sandelman, CN = Unstrung Highway CA
            Validity
                Not Before: Sep  9 12:47:22 2022 GMT
                Not After : Dec 31 00:00:00 2999 GMT
            Subject: serialNumber = 00-d0-e5-02-00-3b
    ...
                1.3.6.1.5.5.7.1.32:
                    ..masa.honeydukes.sandelman.ca
        Signature Algorithm: ecdsa-with-SHA256
             30:65:02:30:75:15:8e:de:cd:13:58:ca:b3:1c:ef:03:9d:7c:
    ...      c9:b2:78:3d:36:29:b2:1f:85:f8:66:cd:8c
```



Sept 2022 – MASA Interaction

```
INFO -- : Started POST "/.well-known/brski/requestvoucher" for 192.168.30.103 at 2022-09-20
INFO -- : Processing by EstController#requestvoucher as HTML
INFO -- : voucher request from 192.168.30.103
INFO -- : Contacting server at: https://masa.honeydukes.sandelman.ca/.well-known/brski/reque
INFO -- : Asking for voucher of type: application/voucher-cms+json
INFO -- : MASA at https://masa.honeydukes.sandelman.ca/.well-known/brski/requestvoucher says
INFO -- : MASA provided voucher of type application/voucher-cms+json
INFO -- : device #3 (name: ) has been adopted
INFO -- : returning voucher #9 of size 1949 with ct=application/voucher-cms+json
INFO -- : Completed 200 OK in 952ms (Views: 0.5ms | ActiveRecord: 12.2ms)
```

```
nccoe@satine:~/reach$ sh er1
Writing Voucher Request to tmp/vr_00-d0-e5-02-00-3b.pkcs
MASA/JRC provided voucher of type application/voucher-cms+json; charset=utf-8
Voucher connects to /DC=ca/DC=sandelman/CN=minerva-fountain.example.com
vs:   /DC=ca/DC=sandelman/CN=minerva-fountain.example.com
Voucher authenticates this connection!
```

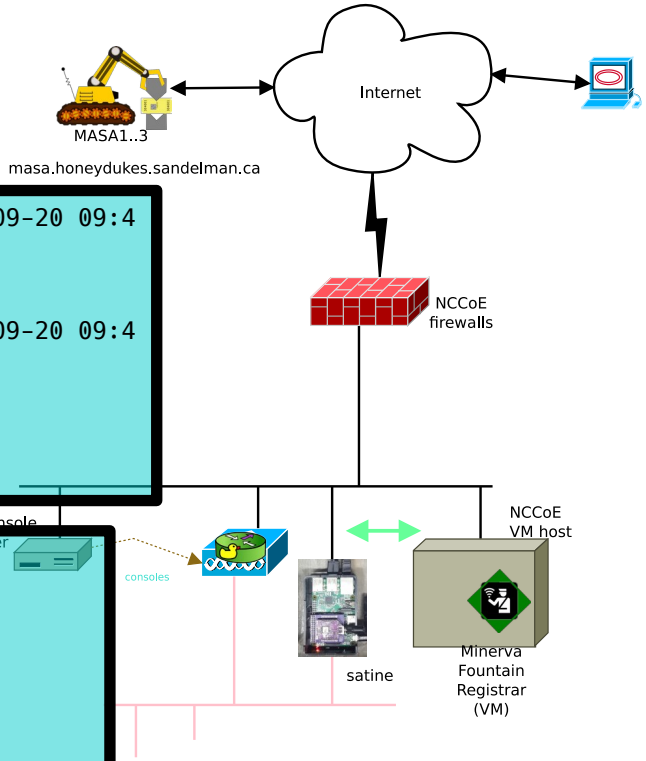


Sept 2022 – MASA Interaction

Use Resulting trust to enroll LDevID

```
INFO -- : Started GET "/.well-known/est/csrattributes" for 192.168.30.103 at 2022-09-20 09:4
INFO -- : Processing by EstController#csrattributes as */*
INFO -- : Completed 200 OK in 9ms (Views: 0.6ms | ActiveRecord: 1.3ms)

INFO -- : Started POST "/.well-known/est/simpleenroll" for 192.168.30.103 at 2022-09-20 09:4
INFO -- : Processing by EstController#simpleenroll as */*
INFO -- : Completed 200 OK in 69ms (Views: 0.7ms | ActiveRecord: 49.4ms)
```

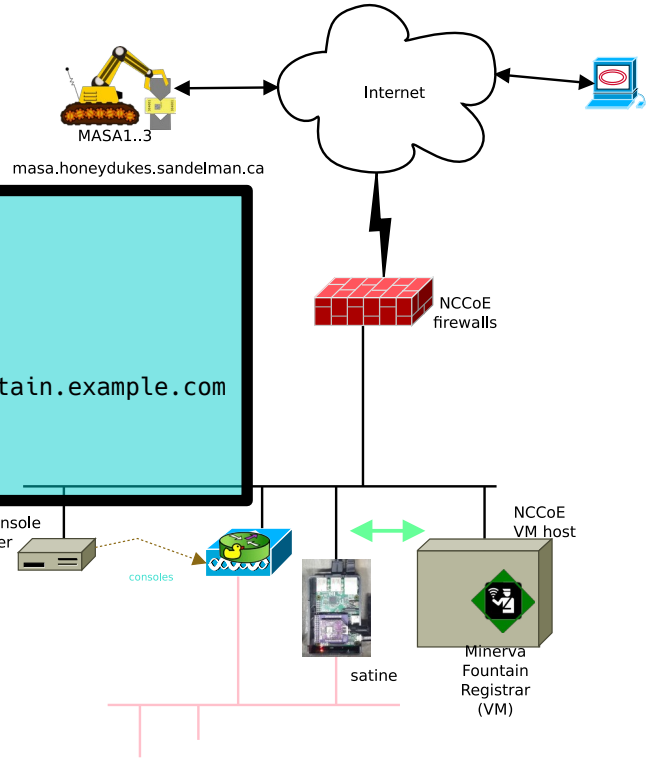
```
csrattr_uri: https://192.168.30.34:8443/.well-known/est/csrattributes
Registrar returned CSR of type application/csrattrs; charset=utf-8
new device gets rfc822Name: rfc8994+fee4e924a8be596a64257f1e00000000+@acp
Registrar returned certificate of type application/pkcs7-mime;
                        charset=utf-8 [in tmp/certificate.der]
nccoe@satine:~/reach$
```



Sept 2022 – MASA

MASA notes transfer of ownership with an email!

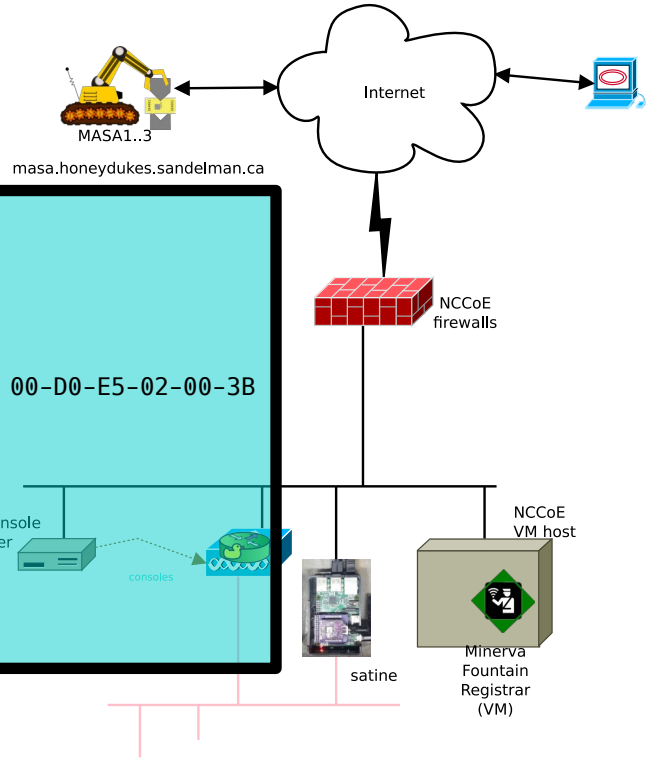
```
Subject: New cms_voucher voucher issued for Device 00-D0-E5-02-00-3B


Message from masa.honeydukes.sandelman.ca
============================

Device Device 00-D0-E5-02-00-3B was re-sold to /DC=ca/DC=sandelman/CN=minerva-fountain.example.com
to Registrar at 2610:20:60ce:230::34.
```



Sept 2022 – MASA

MASA notes depletion of inventory, creates new devices.

```
Subject: Cron <honeydukes@relay> $HOME/bin/inventory
Date: Fri,  9 Sep 2022 12:47:22 +0000 (UTC)

creating 1 devices to refill inventory to 5
Creating device 1 with mac 00-d0-e5-02-00-3b
Running: cd /honeydukes/app/highway/releases/20220603215622/db/devices &&
 zip -r /honeydukes/app/highway/current/db/inventory/product_00-D0-E5-02-00-3B.zip 00-D0-E5-02-00-3B
  adding: 00-D0-E5-02-00-3B/ (stored 0%)
  adding: 00-D0-E5-02-00-3B/device.crt (deflated 24%)
  adding: 00-D0-E5-02-00-3B/masa.crt (deflated 27%)
  adding: 00-D0-E5-02-00-3B/vendor.crt (deflated 34%)
  adding: 00-D0-E5-02-00-3B/key.pem (deflated 15%)
Marking /honeydukes/app/highway/current/db/inventory/product_00-D0-E5-02-00-37.zip
  as sold
```



Build3 – BRSKI – Network/Application Onboarding

- A credential was provisioned by the manufacturer
- (similated by download of zip file)
- The device contacted the local onboarding infrastructure and was approved to join.
- An LDevID certificate was issued for the device