

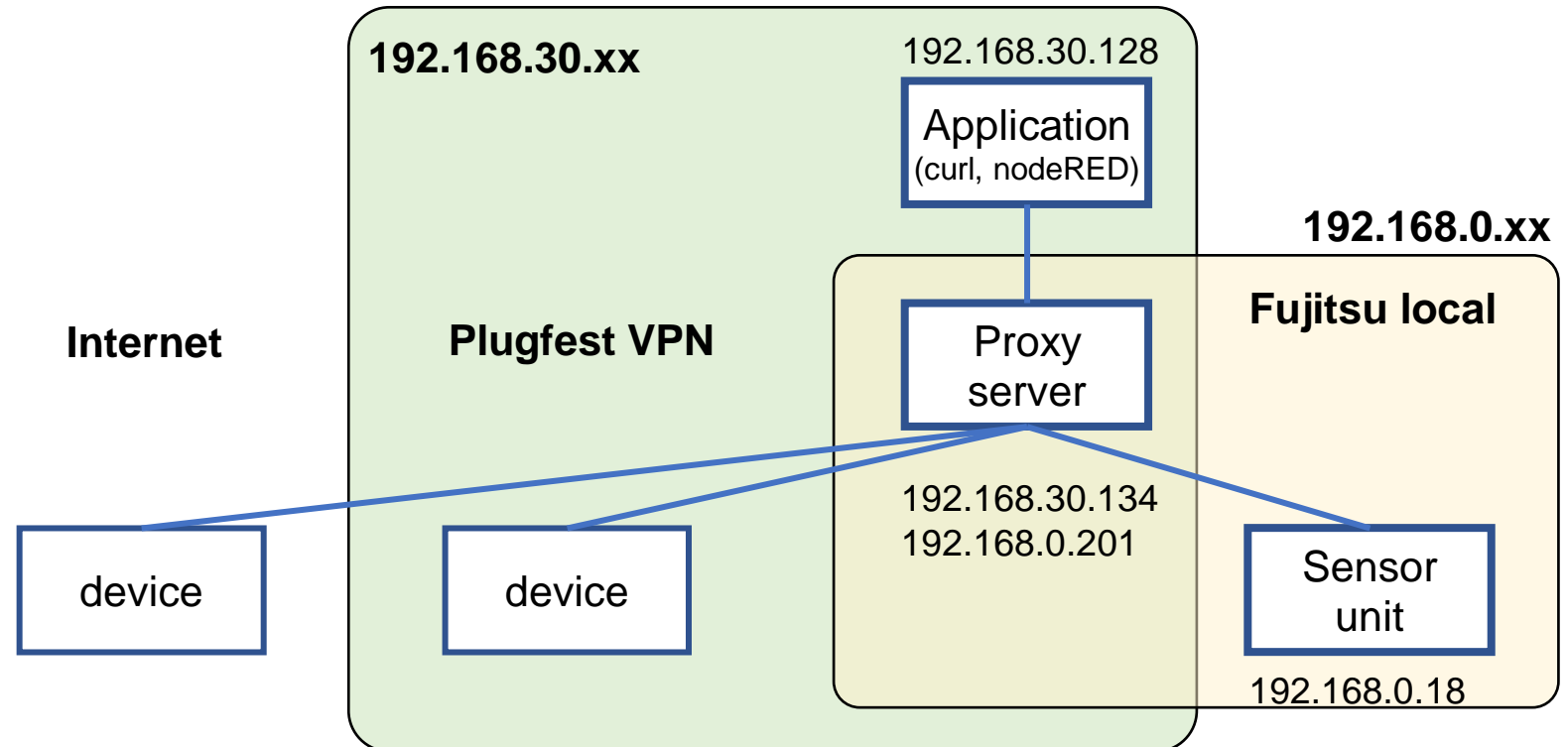
Plugfest project – Shadow Proxy

Presenter

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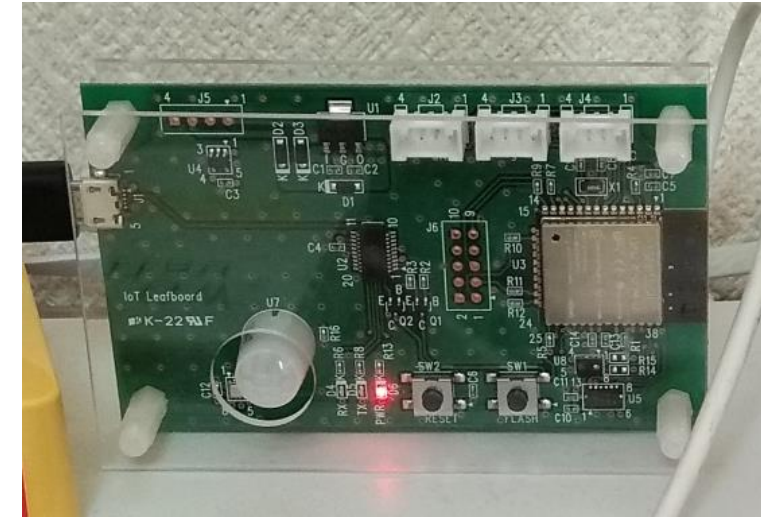
Diagram in this plugfest

- Fujitsu provides three services
 - Sensor unit (temperature, humidity and air pressure)
 - Proxy server
 - Application



Sensor unit

- 3 sensors: temperature, humidity and air pressure
- ESP32 with Wi-Fi
- Developed in C++ using Arduino
- mDNS support



```
% avahi-browse -r _wot._tcp
+ eth0 IPv4 fjsensor-esp32                _wot._tcp                local
= eth0 IPv4 fjsensor-esp32                _wot._tcp                local
  hostname = [fjsensor-esp32.local]
  address = [192.168.0.18]
  port = [80]
  txt = ["type=Thing" "td=/.well-known/wot-thing-description"]
```

Proxy server

- Objectives
 - prevent direct access to real devices.
 - allow multiple devices connected with different protocols and authentication methods to connect using one protocol and one authentication method.
- Shadow device
 - are created on request from real device
 - exposes the endpoint to applications instead of real device
- Developed in JAVA on RaspberryPi (Linux)
- Advertising the proxy address to real devices and applications with mDNS

APIs of Proxy server

- Registration and unregistration of shadow devices

```
curl -X POST -H 'content-type: application/json' -d @tdfile http://192.168.30.134/Things
```

```
curl -X DELETE http://192.168.30.134/Things/urn:com:fujitsu:sensor
```

- Getting a list of registered shadows

```
curl http://192.168.30.134/Things
```

```
(response) ["urn:dev:mac:b827ebfffe4b6d0b","echonet:temperatureSensor:19216815001101","urn:com:fujitsu:sensor"]
```

- Retrieving shadow TDs and real TDs

```
curl http://192.168.30.134/Things/urn:com:fujitsu:sensor
```

- Search APIs are NOT implemented.
 - APIs to search for devices with their description and attributes as a key

Results: checked devices

- 4 devices are connected (Internet, VPN and local)
 - Fujitsu sensor can find the proxy and register own TD to it automatically
 - Others are register manually
 - All devices can be controlled from the application on the VPN via the proxy

