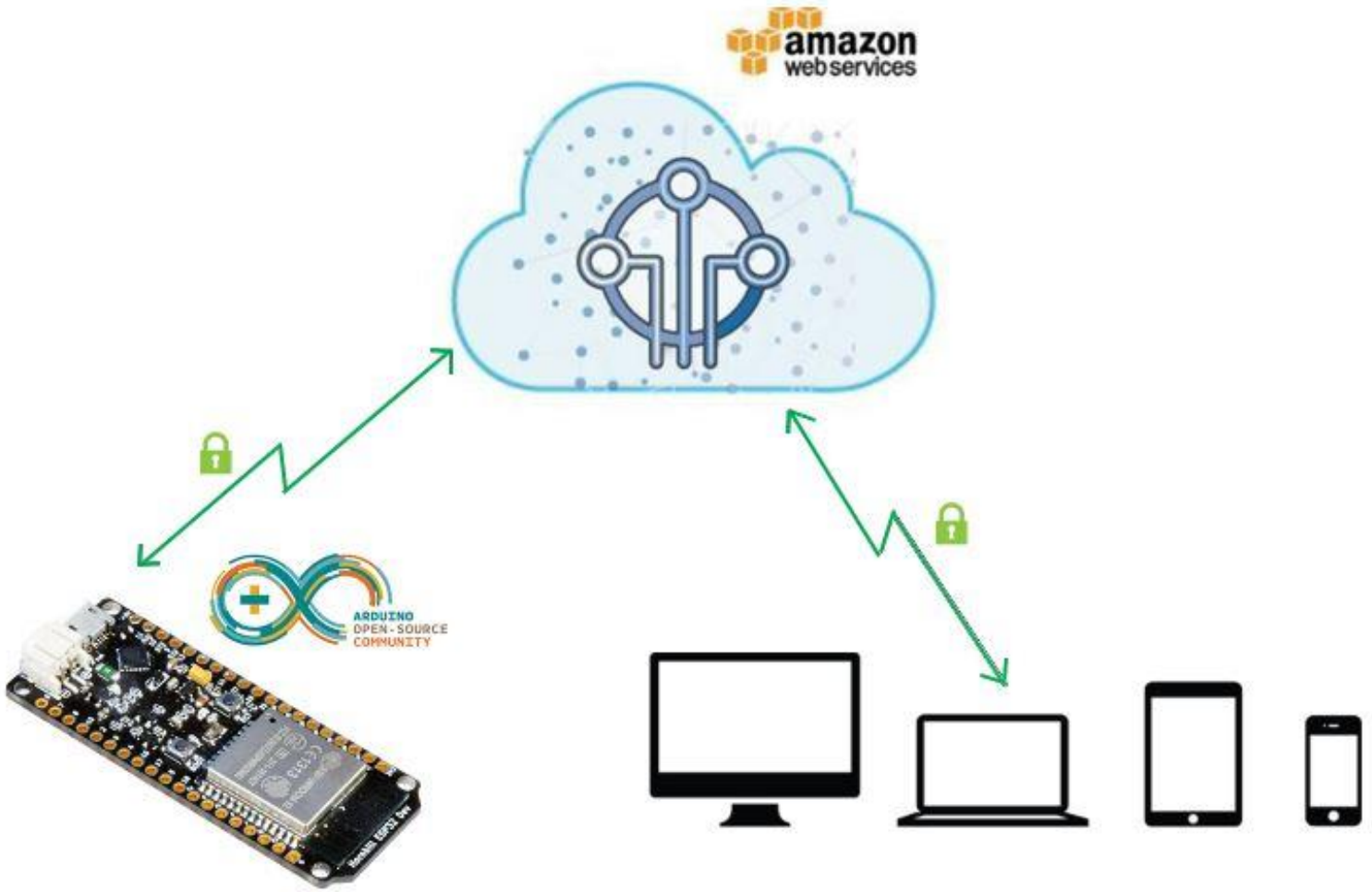
TAPIT PROJECT :

MQTT Protocol Application using AWS IoT-Core Management & control devices

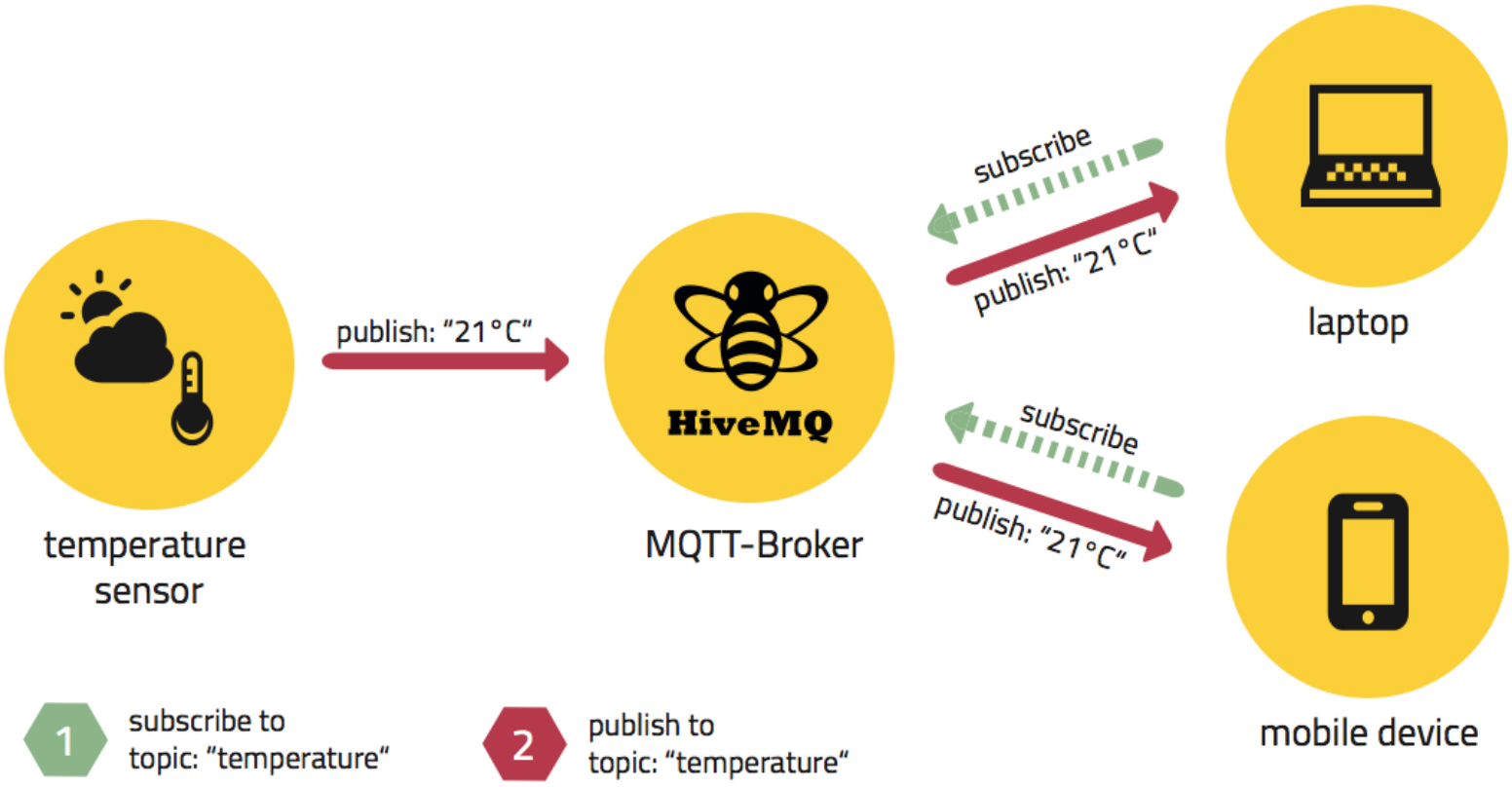


Reporter: Nguyễn Võ Khánh Toàn
Hoàng Nhật Linh

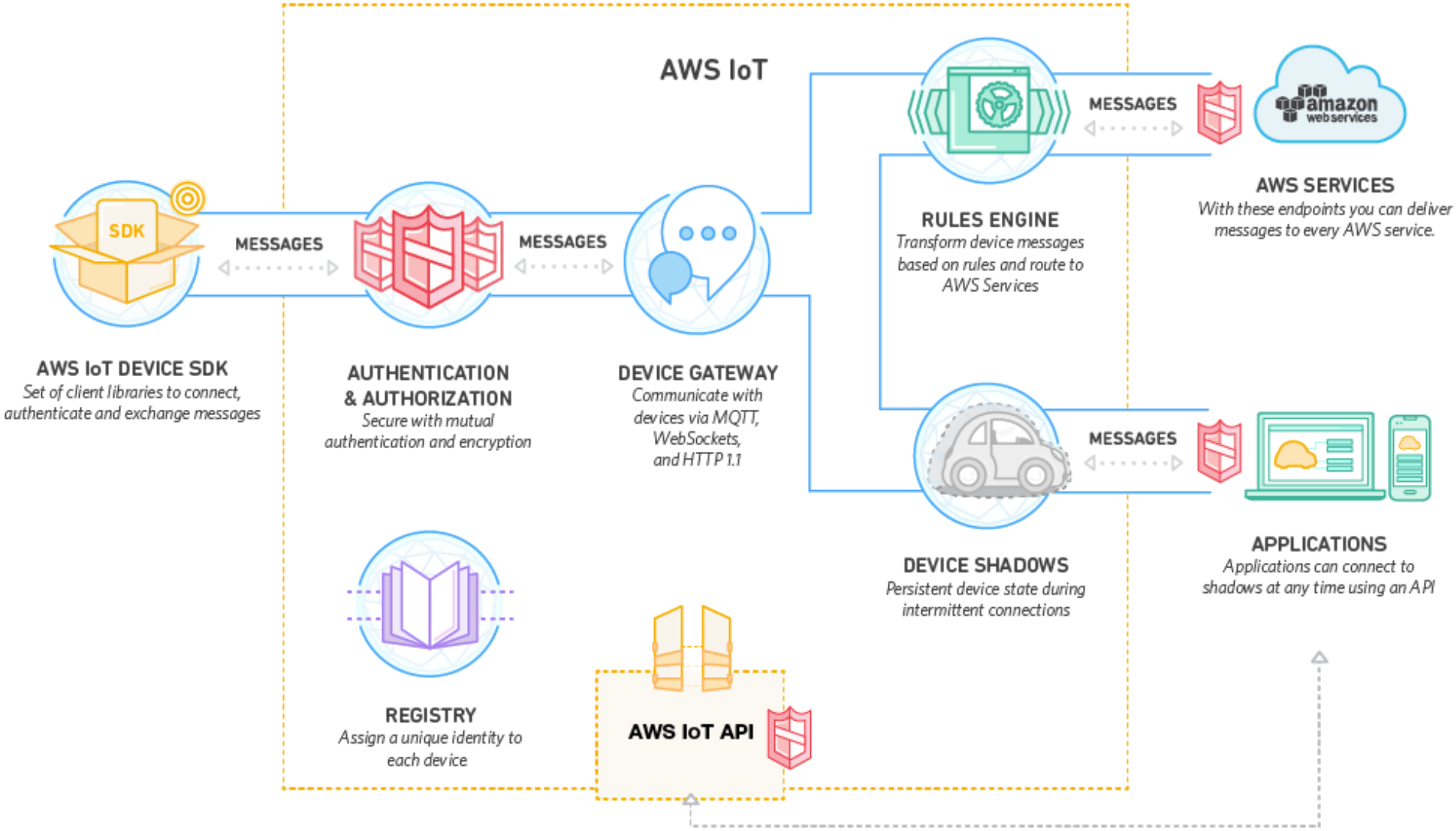
Target:

+ MQTT Application via Amazon Web Services:
    - Temperature, humidity monitoring and control I/O test.
    - Thing Shadow cloud storage service.
    - Query, import and export principles with ThingShadow to manage data, state, devices...etc.
+ User interact through Website interface model.

MQTT Architecture:

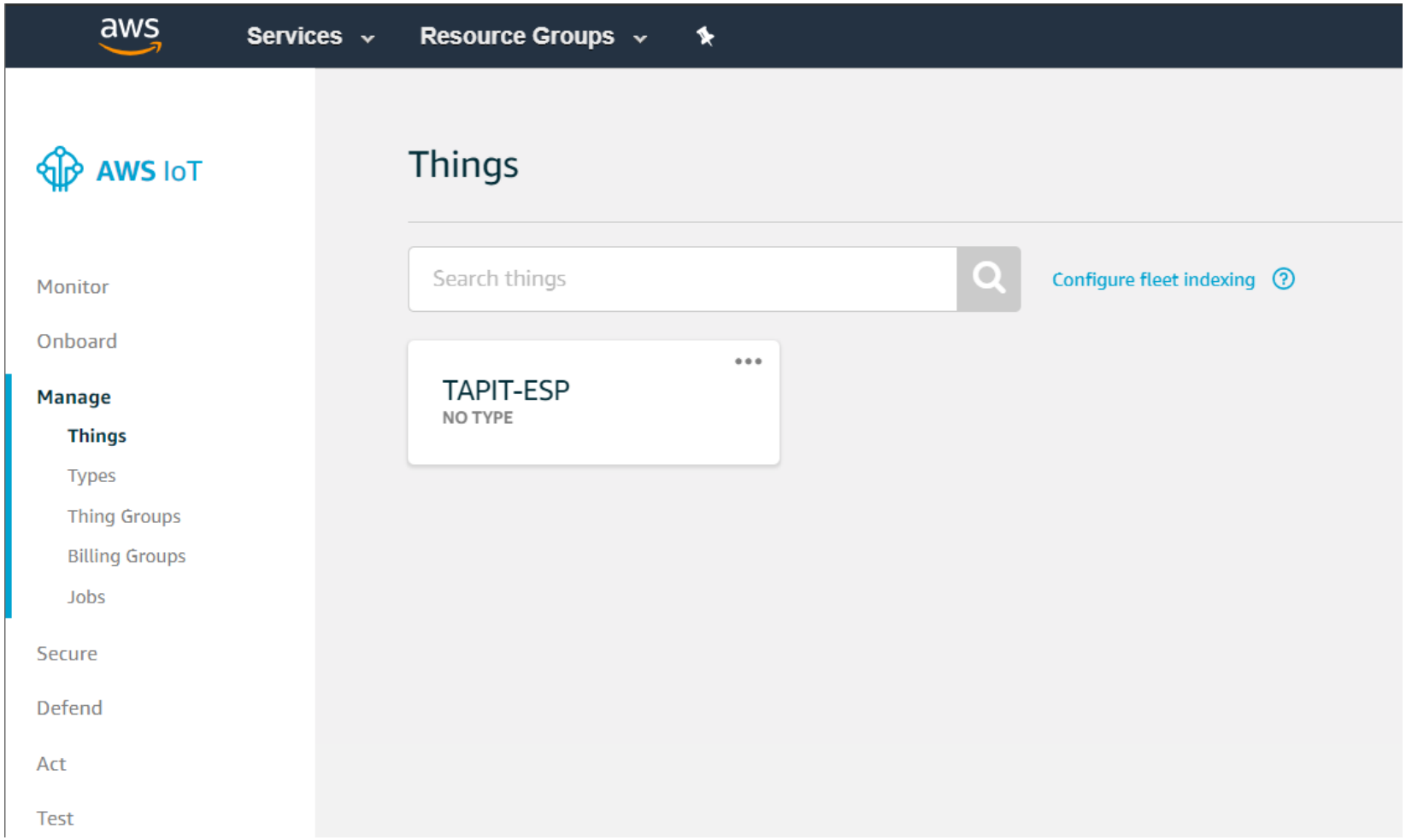


Amazon Web Services IoT-Core platform:



ThingShadow:

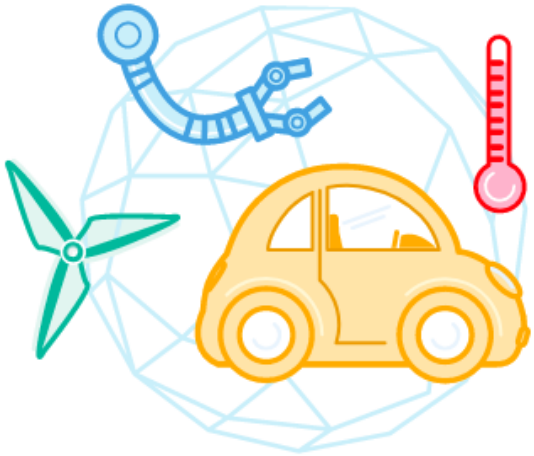
- Each device that is able to connect to the internet and connect to AWS – IoT Core can be defined as a “**Things**”, and could be managed, displayed via **Thing Shadow**.
- These device’s data are stored in **Registry**



Security:

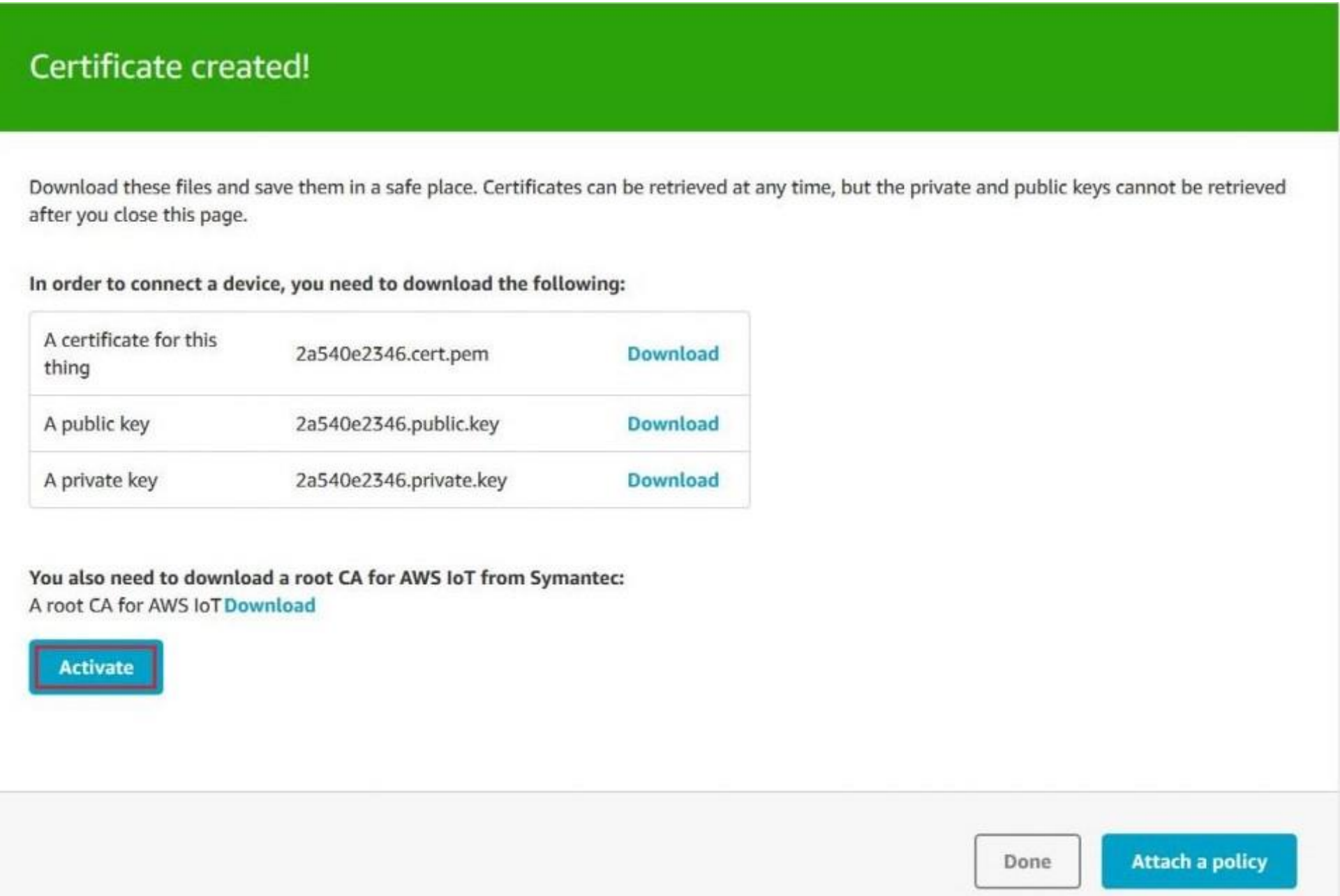
Policies

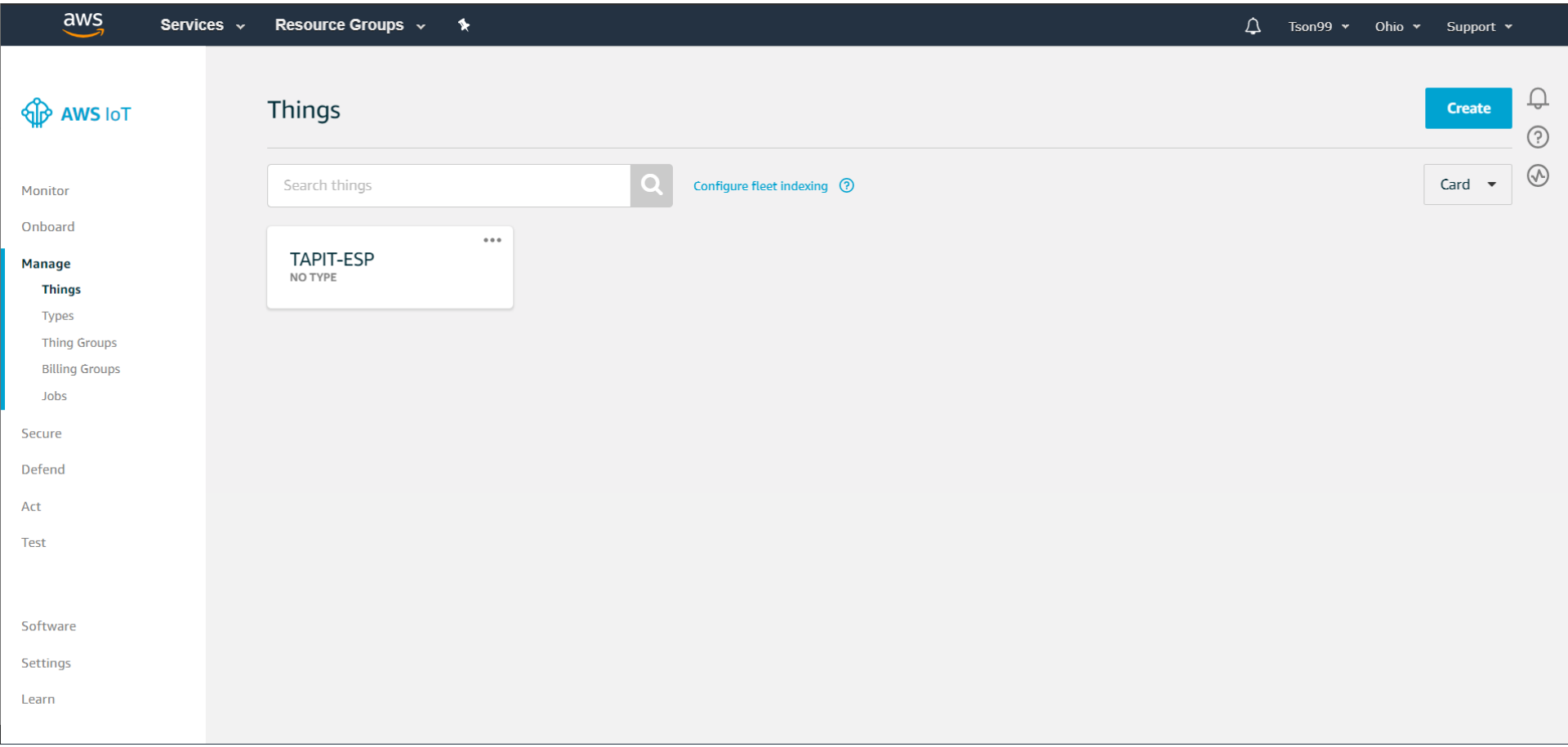
Certifications



The connection between devices and AWS IoT-Core will be protected through **Certifications** and **Identity verification**

Security:


Certificate created!
Download these files and save them in a safe place. Certificates can be retrieved at any time, but the private and public keys cannot be retrieved after you close this page.
In order to connect a device, you need to download the following:
A certificate for this thing
2a540e2346.cert.pem
Download
A public key
2a540e2346.public.key
Download
A private key
2a540e2346.private.key
Download
You also need to download a root CA for AWS IoT from Symantec:
A root CA for AWS IoT Download
Activate
Done
Attach a policy


aws
Services
Resource Groups
Tson99
Ohio
Support
AWS IoT
Monitor
Onboard
Manage
Things
Types
Thing Groups
Billing Groups
Jobs
Secure
Defend
Act
Test
Software
Settings
Learn
Things
Create
Search things
Configure fleet indexing
Card
TAPIT-ESP
NO TYPE

Thing Shadow interaction model:

MQTT

Use topics to enable applications and things to get, update, or delete the state information for a Thing (Thing Shadow)

Learn more

Update to this thing shadow

```
$aws/things/TAPIT-ESP/shadow/update
```

Update to this thing shadow was accepted

```
$aws/things/TAPIT-ESP/shadow/update/accepted
```

Update this thing shadow documents

```
$aws/things/TAPIT-ESP/shadow/update/documents
```

Update to this thing shadow was rejected

```
$aws/things/TAPIT-ESP/shadow/update/rejected
```

Get this thing shadow

```
$aws/things/TAPIT-ESP/shadow/get
```

Get this thing shadow accepted

```
$aws/things/TAPIT-ESP/shadow/get/accepted
```

Getting this thing shadow was rejected

```
$aws/things/TAPIT-ESP/shadow/get/rejected
```

Delete this thing shadow

```
$aws/things/TAPIT-ESP/shadow/delete
```

Deleting this thing shadow was accepted

```
$aws/things/TAPIT-ESP/shadow/delete/accepted
```

Deleting this thing shadow was rejected

```
$aws/things/TAPIT-ESP/shadow/delete/rejected
```

ThingShadow uses predefined Topics

AWS IoT-Core MQTT Topic:

$aws/things/thingName/shadow/queryType

There are 3 form ways to **Publish** or **Subcribe** to these **Topics** including :

+ $aws/things/TAPIT-ESP/shadow/update

+ $aws/things/TAPIT-ESP/shadow/get

+ $aws/things/TAPIT-ESP/shadow/delete

When the packet is successfully Published, the **Topic** will automatically generate the corresponding response Topics of the form:

$aws/things/TAPIT-ESP/shadow/update/accepted

$aws/things/TAPIT-ESP/shadow/update/delta

$aws/things/TAPIT-ESP/shadow/update/documents

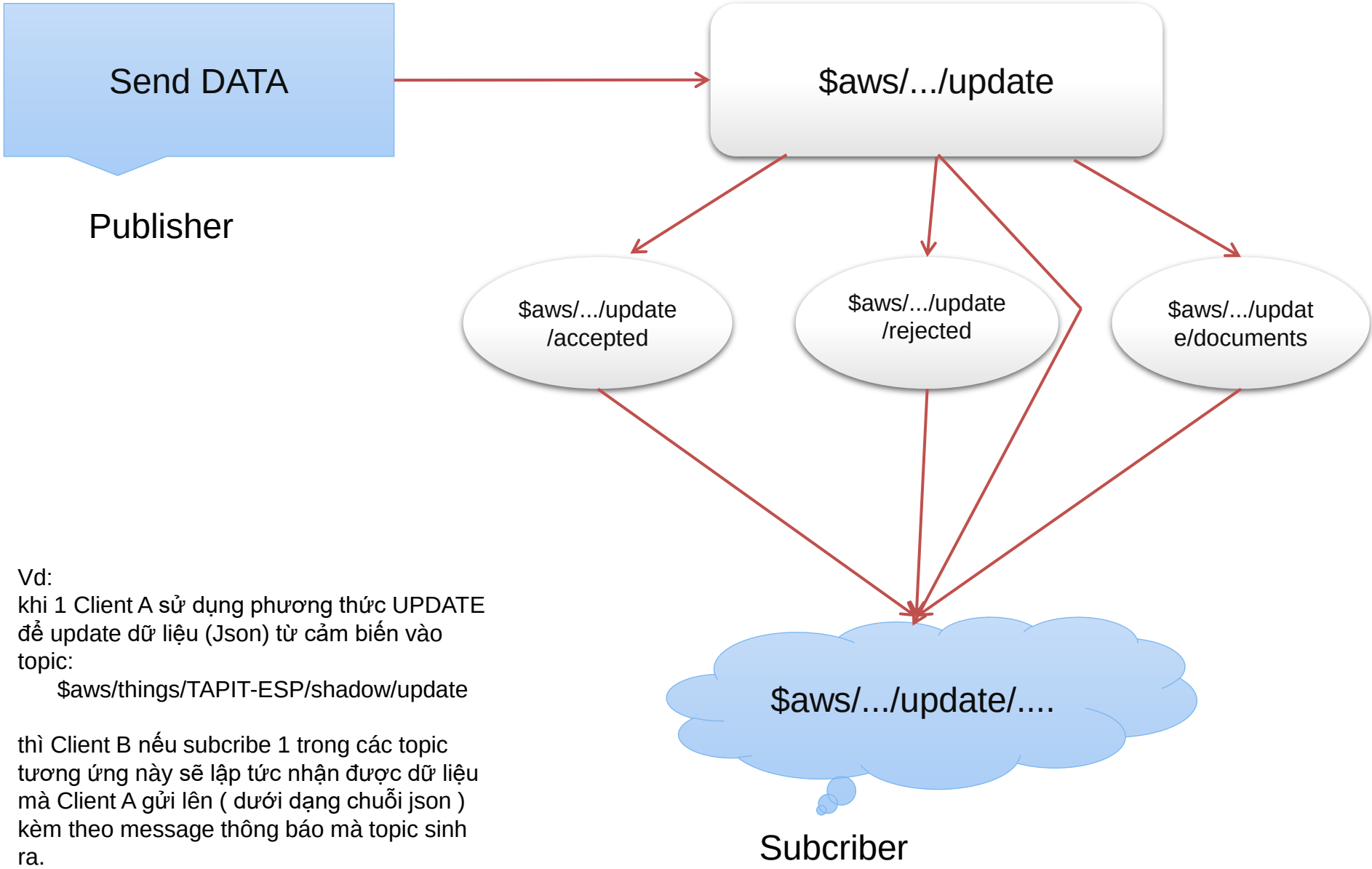
$aws/things/TAPIT-ESP/shadow/update/rejected

$aws/things/TAPIT-ESP/shadow/get/accepted

$aws/things/TAPIT-ESP/shadow/get/rejected

$aws/things/TAPIT-ESP/shadow/delete/accepted

Operating model:



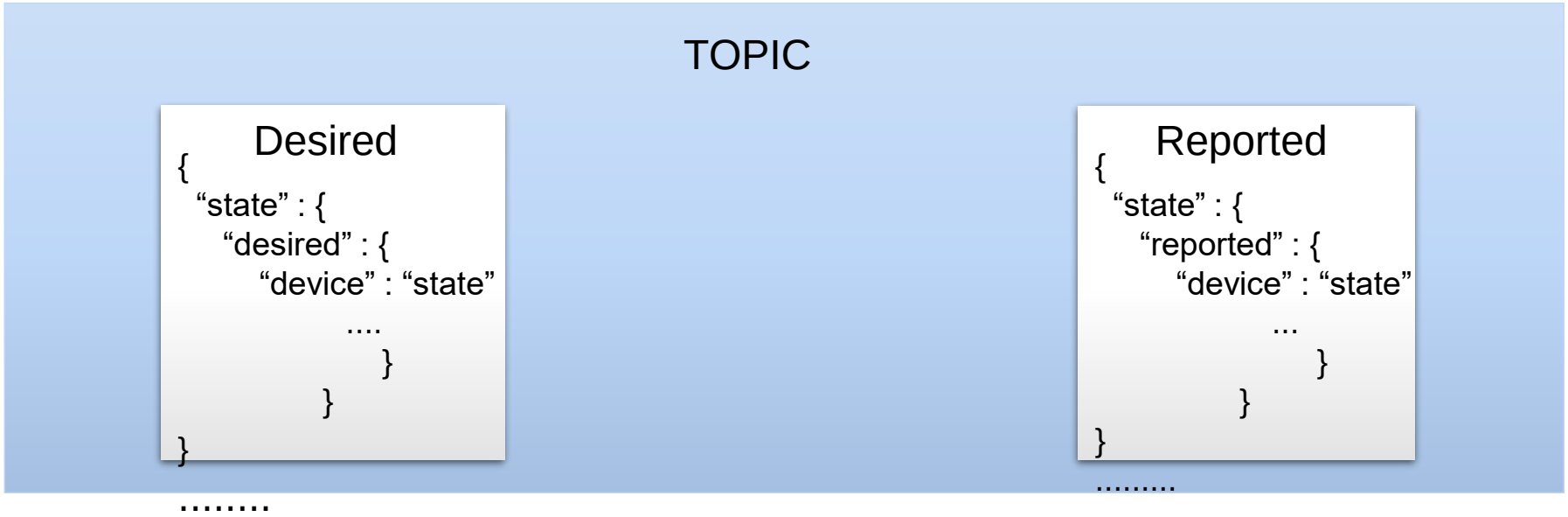
Vd:
khi 1 Client A sử dụng phương thức UPDATE để update dữ liệu (Json) từ cảm biến vào topic:

$aws/things/TAPIT-ESP/shadow/update

thì Client B nếu subcribe 1 trong các topic tương ứng này sẽ lập tức nhận được dữ liệu mà Client A gửi lên (dưới dạng chuỗi json) kèm theo message thông báo mà topic sinh ra.

*ThingShadow interaction model:

Data in Topic will be stored in 2 main Forms (called “Fields”) :

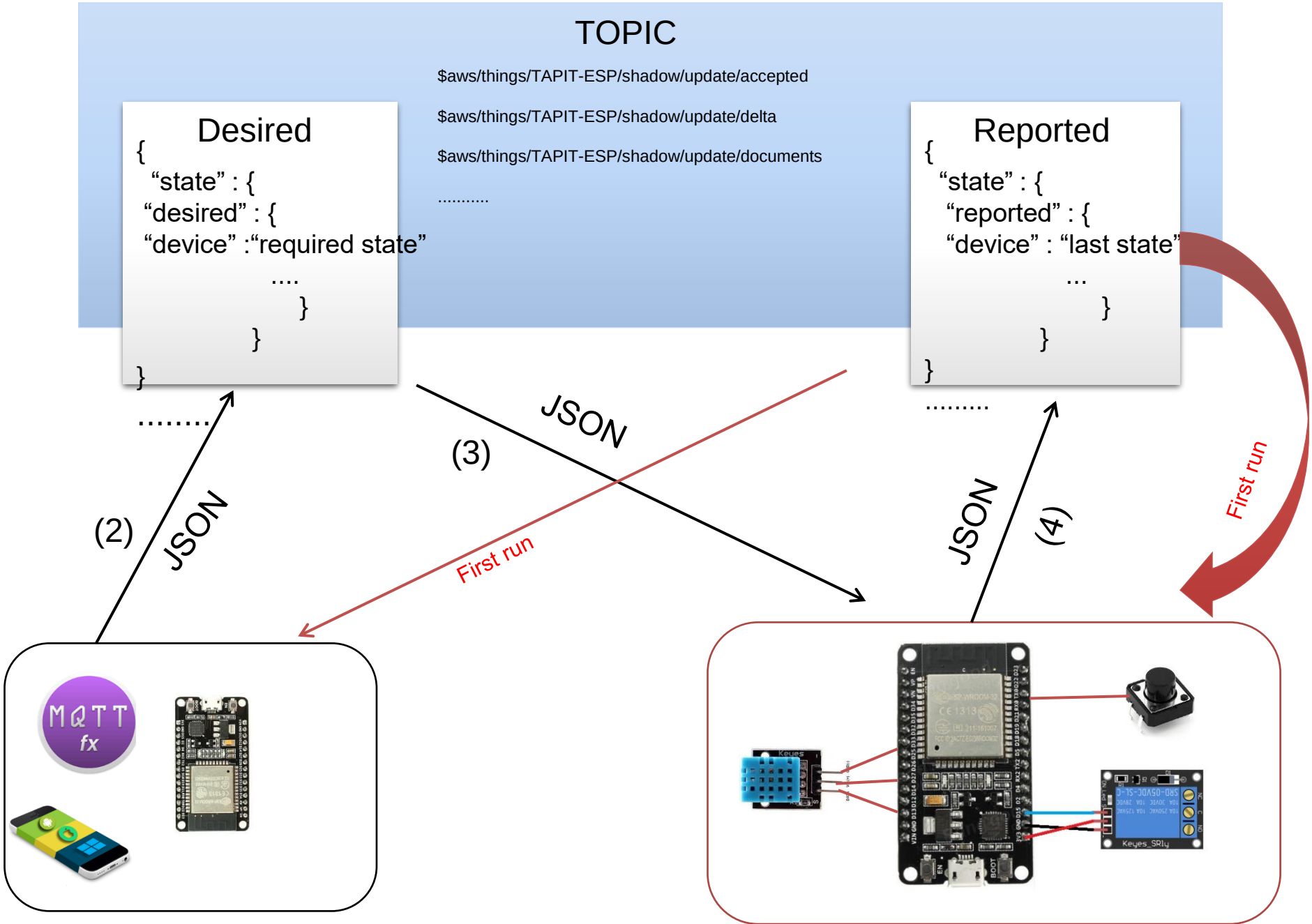


+ *Reported* : the present status of devices that ThingShadow are describing

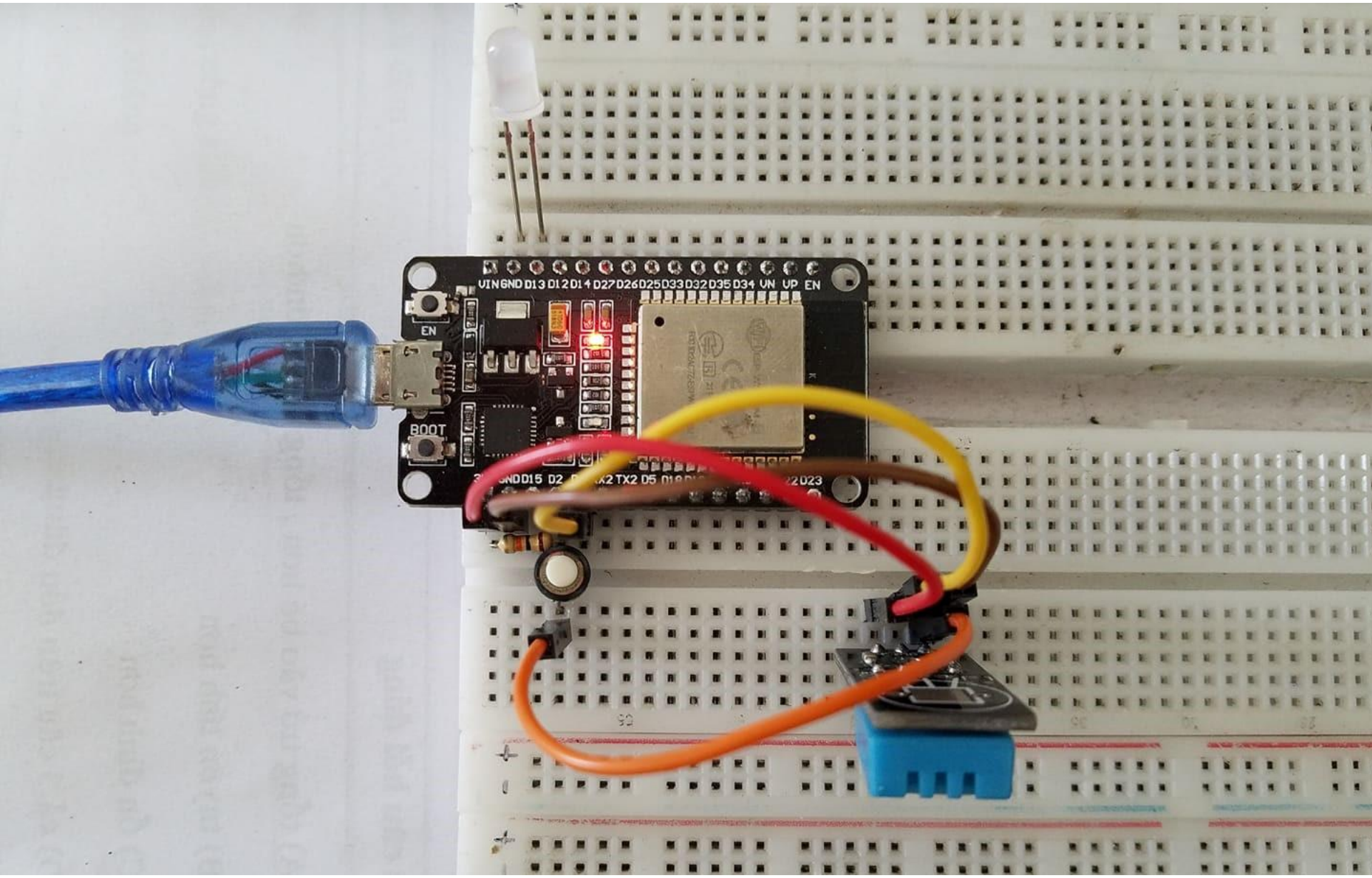
+ *Desired* : the status that other application are expecting to contact the device.

=> Each Client that would like to Publish or Subscribe the Topic must through these 2 Fields

Operating model:



DEMO


VIN GND D13 D12 D14 D27 D26 D25 D33 D32 D35 D34 VN VP EN
EN
BOOT