Dev and App roles for SCHC header compression over IEEE 802.15.4 networks

Related draft:

draft-gomez-6lo-schc-15dot4-02

Authors:
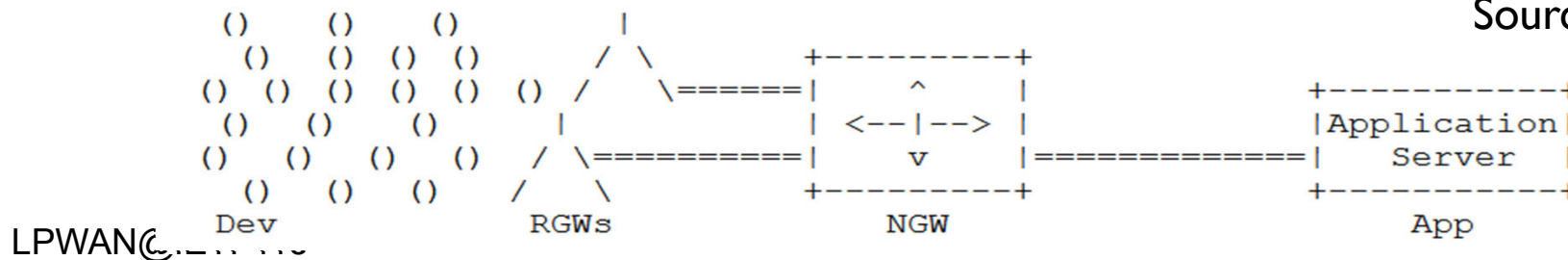
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Dev and App

- RFC 8376 defines "Dev" and "App"
  - Dev: "sensor, actuator, device, object"
  - App: "application" or "application server"
- RFC 8724 uses "Dev" and "App"
  - App: "runs an application sending/receiving packets to/from the Dev."
  - App: "is the endpoint of the application- level protocol on the Internet side"

Source: RFC 8724

```
 ()     ()      ()          |
   ()    ()  ()  ()       / \            +---------+
 ()  ()  ()  ()  ()  () /    \======|         ^        |                      +----------+
   ()    ()       ()      |           | <--|--> |                      |Application|
 ()    ()    ()    ()   / \========|         v        |=============|  Server  |
   ()    ()     ()     /   \            +---------+                      +----------+
  Dev              RGWs             NGW                         App
```

LPWAN©...   2

Uplink and Downlink

- RFC 8724 defines "Uplink" and "Downlink" based on "Dev" and "App"
  - Uplink: from Dev to App
  - Downlink: from App to Dev

Dev and App in LPWAN

- The Dev and App roles fit well the LPWAN scenario:
    - A SCHC entity knows whether it corresponds to Dev or App
    - RFC 8724: compression Rules for some IPv6 and UDP header fields (Prefix, IID, Port) are expressed in terms of Dev and App
        - NOT by the position of these fields in the headers
    - Advantage: the same Rule can be used for C/D for both directions:
        - When a Dev has to compress, a source address/port corresponds to the Dev address/port in a Rule
        - When a Dev has to decompress, a source address/port corresponds to an App address/port in a Rule

Dev/App in 802.15.4 networks? LPWAN

- Star topology networks, with the constrained devices talking to some "network side" App

  - The current Dev/App model fits well here as well…

- However, in peer-to-peer topologies:

  - There may be scenarios where two constrained devices talk to each other

    – Which is the role that corresponds to each?

    – Both are candidates to be "Dev"…

    – How do we use SCHC C/D then?
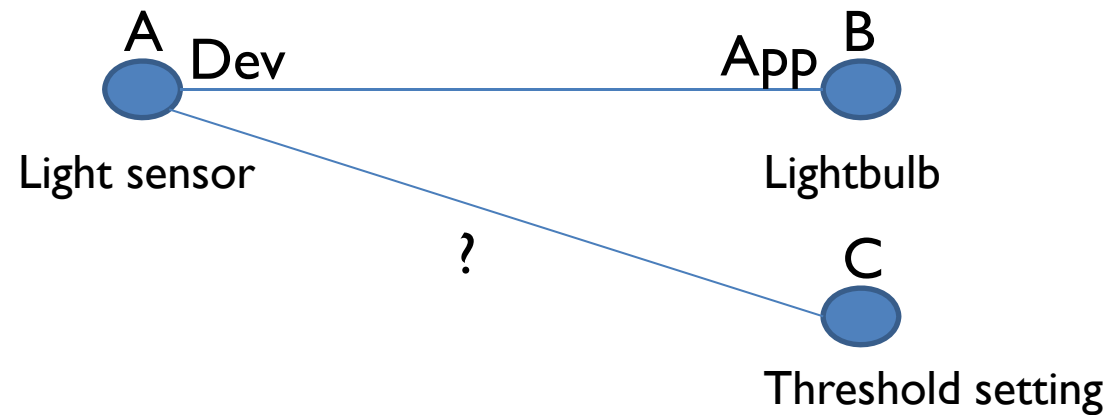
Dev/App in 802.15.4 networks?

- Examples

A   B

Light sensor   Lightbulb

Dev/App in 802.15.4 networks? LPWAN

- Examples

A Dev   App B

Light sensor   Lightbulb

Dev/App in 802.15.4 networks?

LPWAN

- Examples

```
     A Dev                      App B
      ◯────────────────────────◯
  Light sensor                  Lightbulb

                                  C
                  ?              ◯
                             Threshold setting
```

Dev/App in 802.15.4 networks?

- Examples

A
Dev
App

Light sensor

B
App

Lightbulb

?

C
Dev

Threshold control

Dev/App in 802.15.4 networks?

- Examples

A Dev —————————— App B
Light sensor   Lightbulb
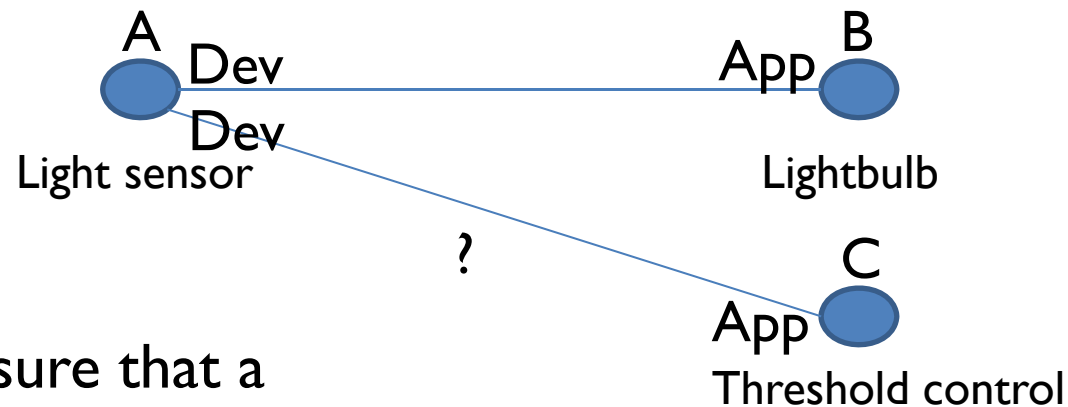
Dev
                    ?
                              App C
                              Threshold control
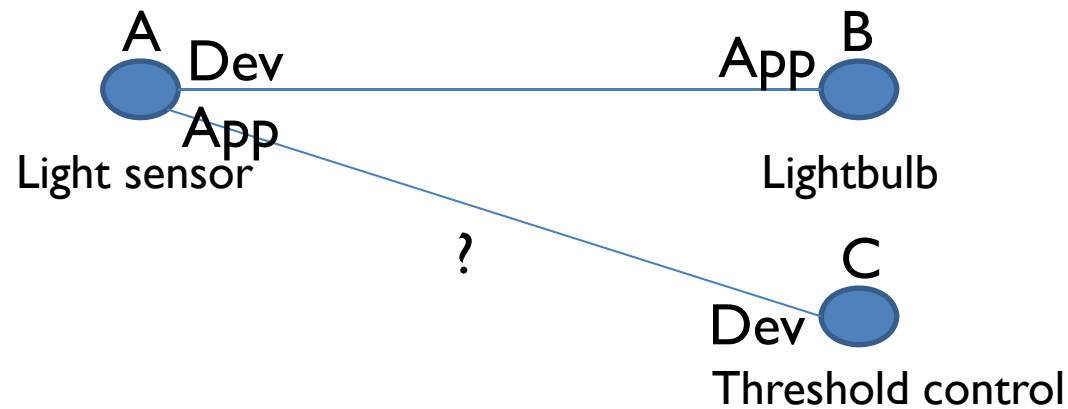
Can we ensure that a
device will only be Dev or
App for all its interactions?

Dev and App in 802.15.4 networks?

- Two options for the peer-to-peer scenario:
    - **Option 1**. If we stick to RFC 8724, each device might need to know whether it is "Dev" or "App" when talking to another device
        - A SCHC entity may need to know its role even for each possible communication endpoint
        - Uplink and Downlink would be specific to each pair of endpoints
    - **Option 2**. Use "Source" and "Destination" in the Rules, instead of "Dev" or "App"
        - It requires one Rule for each direction
        - New terms needed instead of "Uplink" and "Downlink"