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

Related draft:
draft-gomez-6lo-schc-15dot4-01
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: “It 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
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?

• 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 mesh topologies:
  • There may be peer-to-peer scenarios where two constrained devices talk to each other
    – It is less clear which is the role that corresponds to each... Both are candidates to be “Dev”...
Dev/App in 802.15.4 networks?

• Examples

A

Light sensor

B

Lightbulb
Dev/App in 802.15.4 networks?

• Examples

![Diagram](image-url)

- A: Dev
- B: App
- Light sensor
- Lightbulb
Dev/App in 802.15.4 networks?

• Examples

A
Dev
Light sensor

B
App
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

Can we ensure that a device will only be Dev or App for all its interactions? As scenarios become more complex, probably not...
Dev and App in 802.15.4 networks?

• For the peer-to-peer scenario:
  • If we stick to RFC 8724, each device might need to know whether it is “Dev” or “App” when talking to another device
    – Additional complexity: a SCHC entity may need to know its role even for each possible communication endpoint
  • Another approach: use “Source” and “Destination” in the Rules, instead of “Dev” or “App”
    – Avoids the previous complexity, although it requires one Rule for each direction
    – Extends RFC 8724 for a peer-to-peer scenario
Dev and App in 802.15.4 networks?

• For the peer-to-peer scenario, another consequence:
  • If we stick to RFC 8724, each device might need to know whether it is “Dev” or “App” when talking to another device
    – “Uplink” and “Downlink” are specific to each pair of endpoints
  • Another approach: use “Transmit” and “Receive” in the Rules, instead of “Uplink” or “Downlink”