

# SCHC Convergence Profile

draft-aguilar-lpwan-schc-convergence-00

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# SCHC Convergence Profile



- Update from previous interim presentation
  - Individual Submission
  - Added motivation and use cases
  - Added comparison between SCHC over LoRaWAN and SCHC over Sigfox Uplink ACK-on-Error mode

# Motivation

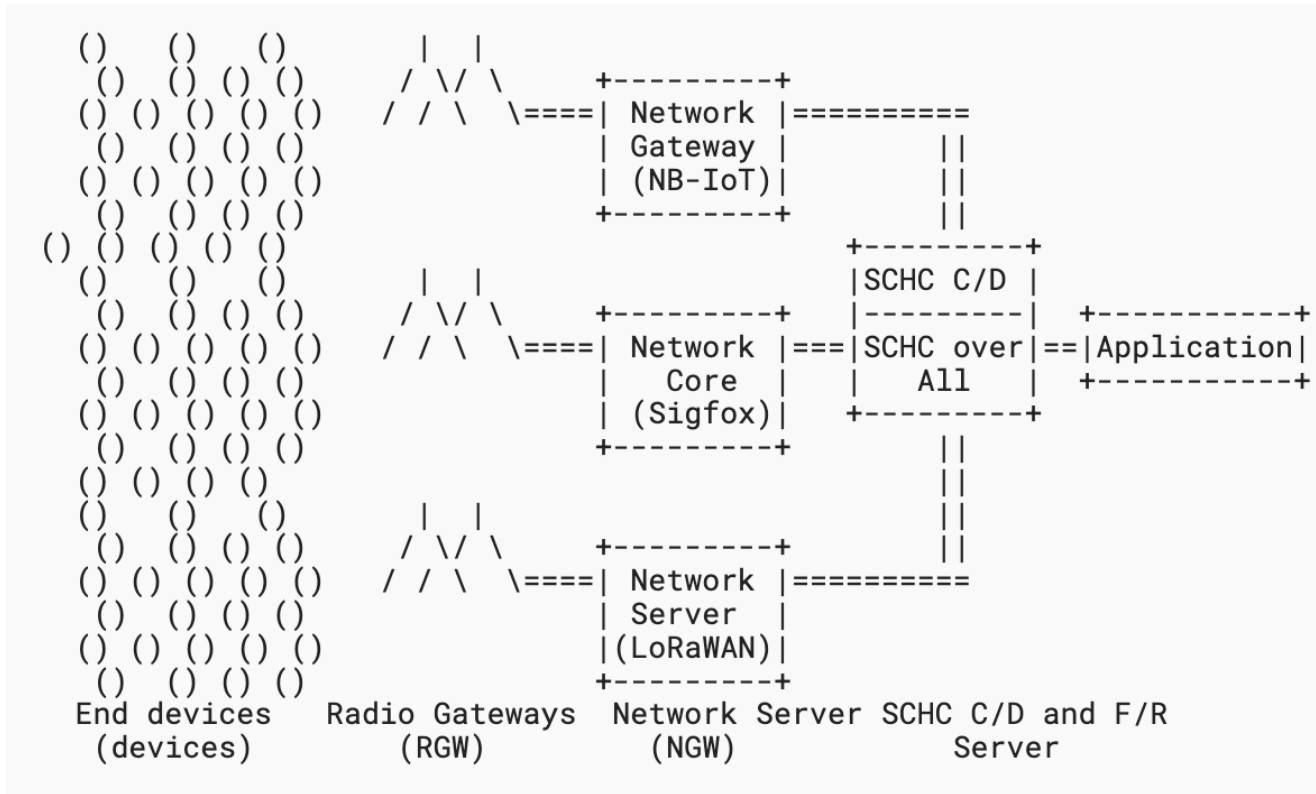
- IoT applications are tied up to the selected LPWAN technology.
- The LPWAN constraints influence the design of the IoT application itself.
- Migrating to other LPWANs implies redesigning the IoT application.
- The LPWAN, as L2, should be transparent as it is in the IP domain.

# Motivation

- Current SCHC implementation
  - Single SCHC C/D sublayer
  - Multiple SCHC F/R sublayer one per LPWAN (different but similar fragmentation modes)
- To reduce code complexity and maintenance, a single convergent SCHC F/R sublayer.



# Single SCHC Implementation



# Use cases

- **Multi-radio devices:** Devices implementing more than one LPWAN radio.
- **Multi-network applications:** Applications deployed over more than one LPWAN.
- **Generic SCHC F/R Profile** for implementation of SCHC to test over a new technology. SCHC out-of-the-box F/R modes.

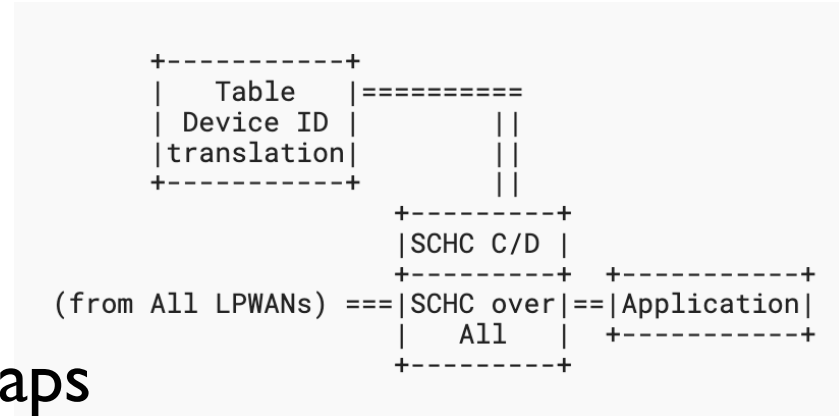
# Use Cases

- Network Redundancy:
  - Devices using another LPWAN as backup.
  - Devices sending the same or different SCHC Fragment in different networks to increase probability of success.
  - Increased device duty-cycle as more networks are available.
  - Device sending SCHC Fragments over different LPWANs to check available coverage.



# Single SCHC ID

- To simplify the access to RuleIDs and to converge the different deviceIDs provided by the networks involved.
- Rules are defined per device.
- Device ID translation table maps the network device ID to single SCHC ID to find device rules.



# Uplink fragmentation

- Comparison between SCHC over LoRaWAN and SCHC over Sigfox (option 2)
- Similarities:
  - 2-byte SCHC Fragmentation Header size.
  - 10-byte tile size.
  - 2-byte Rule ID size.
  - No DTag
- Differences:
  - WINDOW\_SIZE (tiles per window).
  - M size (maximum number of windows).
  - N size (tiles per window).
  - Different RCS size and algorithm.

# SCHC Convergence Profile



- Uplink ACK-on-Error mode
  - Rule ID size is: 8 bits
  - DTag size (T) is: 0 bits
  - Window index (W) size (M): 3 bits
  - FCN size (N): 5 bits.
  - MAX\_ACK\_REQUESTS: 5
  - WINDOW\_SIZE: 31
  - Regular tile size: 10 bytes
  - All-I tile size: 1 to 10 bytes
  - Retransmission Timer: Application-dependent.
  - Inactivity Timer: Application-dependent.
  - RCS size: 32 bits

# New Open Source Project

- SCHCduino
  - Implement SCHC for Arduino.
  - Single code base for C/D and F/R using SCHC convergence Profile.
  - Simplify application migration between LPWANs for multi-network application.
  - Allow SCHC Fragments to be sent in different LPWAN for multi-radio devices.
  - Device code, not server code (OpenSCHC as server?)

Questions and Comments?  
Thank you!