Energy Efficient Implementation Guidance (Link Layer Impact to Upper Layers w.r.t E.E)

draft-hex-lwig-energy-efficient-01.txt

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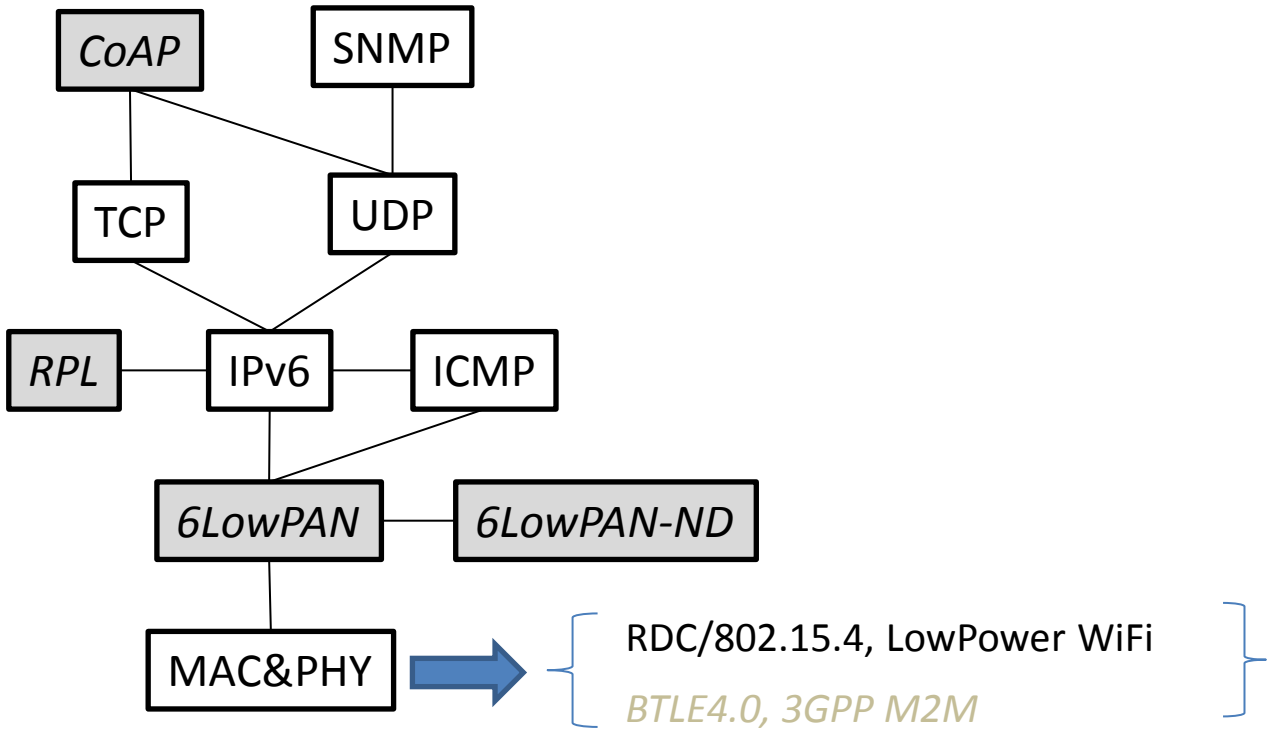
Background

- This document summarizes the impact of link layer protocol power saving behaviors to the upper layer protocols, so that they can coordinately make the system energy efficient.



History

- 00version presented in IETF 86, well received
  - Inverse way of RFC3819
  - Interesting and useful to gain knowledge of lower layers

- Update since IETF 86
  - Merge with draft-kovatsch-lwig-class1-coap-00
  - Add section 3.1 about IEEE 802.11v Power Save Model
  - Diff:

  http://tools.ietf.org/rfcdiff?url2=draft-hex-lwig-energy-efficient-01.txt

802.11v Power Save Model

- Power save services provided by 11v
  - Proxy ARP – delegation for someone sleeping
  - FMS (Flexible Multicast Service): non-AP node can request a longer multicast delivery interval
  - Extended sleep mode (MaxIdlePeriod): enables an AP to indicate a time period during which the AP does not disassociate a node due to non-receipt of frames from the node.
  - Traffic filtering: non AP informs the AP about which traffic should be filtered out
- Impact to upper layer protocol design
  - FMS has much impact to upper layer protocols that use multicast service. RDC protocols can make use of it to save energy
  - Max Idle Period, reduce cost of keep alive consumption
  - Traffic filtering: for service layer optimization / IPS services

BTLE4.0

Version	Feature	Released	RF	Data Rate
Bluetooth v1.1	IEEE 802.15.1	2001	2.4GHz	1Mbps
Bluetooth v1.2	Personal Area Network	2003	2.4GHz	1Mbps
Bluetooth v2.0 + EDR	Enhanced Data Rate	2004	2.4GHz	3Mbps
Bluetooth v2.1 + EDR	Simple Secure Pairing	2007	2.4GHz	3Mbps
Bluetooth v3.0 + HS	High Speed	2009	~5GHz	24Mbps
Bluetooth v4.0	Ultra-Low Power	2010	2.4GHz	1Mbps

- Principles of Power Save, with goal of coin-cell battery
  - Short packets , High data rate
  - Low duty cycle, Lower standby time

Canfeng Chen, Bluetooth Low Energy and its Convergence with Lightweight IPv6,
http://www.esbf.org.cn/img/1205ccf.pdf

Next Step

- Questions for group
  - We do have a mile stone for this topic
  - WG adoption?