LWIG guidance document
draft-bormann-lwig-guidance-01

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Scope

- **Try** doing one single document
  - "Guidance for Light-Weight Implementations of the Internet Protocol Suite"
  - Could very well "roadmap out" to specific documents
- Implementation guidance only
  - Not developing/changing any protocols or services
    - **"The techniques shall […] not affect conformance to the relevant specifications**."
  - Not software engineering best practices
- Guidance:
  - Focus on a limited number of protocols
  - Configuring a protocol for a constrained system
  - What can be left out — what's the bare minimum?

2: "Constrained"

- Distinguish 2 rough classes of constrained nodes:

- 10 KiB data/100 KiB code ("quite constrained")
- 50 KiB data/250 KiB code ("not so constrained")

- In each case, make clear which class is being targeted
- (These are a starting point for making sure we discuss from the same requirements, not exact classes.)

Focus protocols

- **The group shall focus only on techniques that have been used in actual implementations […]**

- **The topics for this working group will be chosen from these protocols: IPv4, IPv6, UDP, TCP, ICMPv4/v6, MLD/IGMP, ND, DNS, DHCPv4/v6, IPsec, 6LOWPAN, and RPL protocols.**

Data Plane protocols

- Application Layer
  - HTTP, CoAP
  - Others? (XMPP, TFTP)
- Transport Layer
  - TCP, UDP
  - Others?
- Network Layer
  - IPv4, IPv6
- Link layer support
  - 6lowpan

3: Data Plane

- 3.1 Link Adaptation Layer
  - 3.1.1: 6LoWPAN fragmentation
- 3.4
  - 3.4.1: CoAP
    - message layer processing, message parsing, storing message IDs

Control Plane protocols

- Application Layer
  - DNS, DHCP, DHCPv6
  - Others? (SIP)
- Transport Layer
  - ?
- Network Layer
  - ICMP, ICMPv6, IGMP/MLD
  - RPL, AODV/DYMO, OLSRv2
- Link Layer support
  - ARP, ND

4: Control Plane

- 4.5.1: SNMP
  - (focusing on the "strncmp" style of implementation)

Security protocols

- TLS, ciphersuites, certificates
- IPsec, IKEv2, transforms, …
- PANA, EAP, EAP methods

5: Security Protocols

- 5.4.1: PANA

"Wire-visible" constraints

- Checksum
- MTU
- Fragmentation and reassembly
- Options — implications of leaving some out
- Simplified TCP optimized for LLNs
- Out-of-order packets

"Wire-invisible" constraints

- Buffering
- Memory management
- Timers
- Energy efficiency
- API
- Data structures
- Table sizes (somewhat wire-visible)
- Improved error handling due to resource overconsumption

Next steps

- Document is still very sparse
- Looking for additional contributions
  - Input from CoAP interop likely
  - DTLS maybe?

- When are we ready for WG adoption?