# Compressed IPFIX for Smart Meters
# in
# Constrained Environments

draft-braun-core-compressed-ipfix-01

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# Agenda

▶ Motivation for Compressed IPFIX

▶ Brief presentation of the modifications to IPFIX

▶ Goals:
- Get attention to the protocol/activities
- Get feedback from the IPFIX experts
- Point to the full presentation in the CoRE-WG
  - Meeting at Thursday 9:00-11:30
  - Time slot for presenting Compressed IPFIX in more depth

# Idea: IPFIX in Constrained Environments

▶ Use IPFIX for exporting sensor data from constrained devices in 6LoWPAN networks
  - Sensors perform periodic measurements
  - Sensors aggregate several measurements into a single packet
  - Export the aggregated measurements
  - Power-off wireless transceiver in the mean time

▶ Constraints:
  - Hardware:
    - Little Memory: ~ 8 kb RAM
    - Little Energy: Battery-Powered
  - Network:
    - IEEE 802.15.4 wireless lan
    - Packet size constraint:
      - 128 Bytes frames
      - ~102 Bytes for application payload

▶ Propose modifications to IPFIX ➔ Compressed IPFIX

# Compressed IPFIX – Message Header

▶ Goal: reduce message size by „compressing" headers

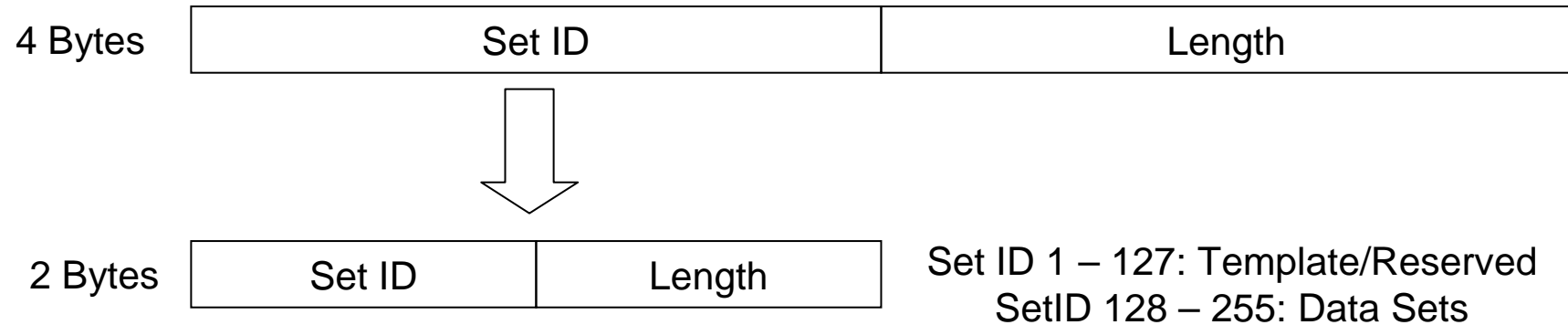| | | |
|---|---|---|
| 4 Bytes | Version | Length |
| 4 Bytes | Export Time | |
| 4 Bytes | Sequence Number | |
| 4 Bytes | Observation Domain | |

16 Bytes
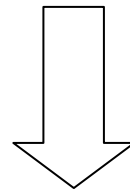
| | | |
|---|---|---|
| 2 Bytes | Version ETC SNC | Length |
| 0 – 8 Bytes | Sequence Number/Export Time | |

2 - 10 Bytes

# Compressed IPFIX – Set and Template Record Header

▶ **Modified Set Header**

| 4 Bytes | Set ID | Length |
|---|---|---|

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| 2 Bytes | Set ID | Length |
|---|---|---|

Set ID 1 – 127: Template/Reserved
SetID 128 – 255: Data Sets

▶ **Modified Template Record Header**

| 4 Bytes | Template ID | Field Count |
|---|---|---|

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| 2 Bytes | Template ID | Field Count |
|---|---|---|
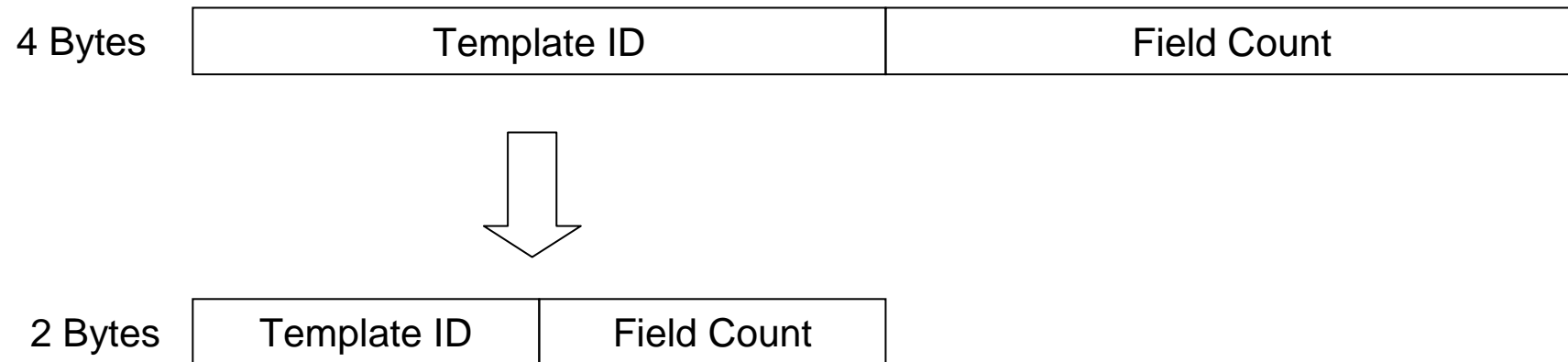
# Conclusion

▶ Changes to IPFIX as per RFC 5101
- Reduced header sizes (Message header, Set header and Template Record header)
- Changes to Template Management over UDP
  - ➡ Sensors sleep most of the time
    - Templates are not retransmitted after *N seconds*
    - But: Templates are resend after *N Data Sets*

▶ Compressed IPFIX can be translated into IPFIX (a Mediation process exists)

▶ Two existing implementations
- Enhanced our IPFIX implementation in VERMONT to include Compressed IPFIX Exporting and Collecting Processes
- Protocol implementation on TinyOS for IRIS Motes

▶ We are looking for people who are interested in Compressed IPFIX
- Protocol will also be presented in depth in CoRE