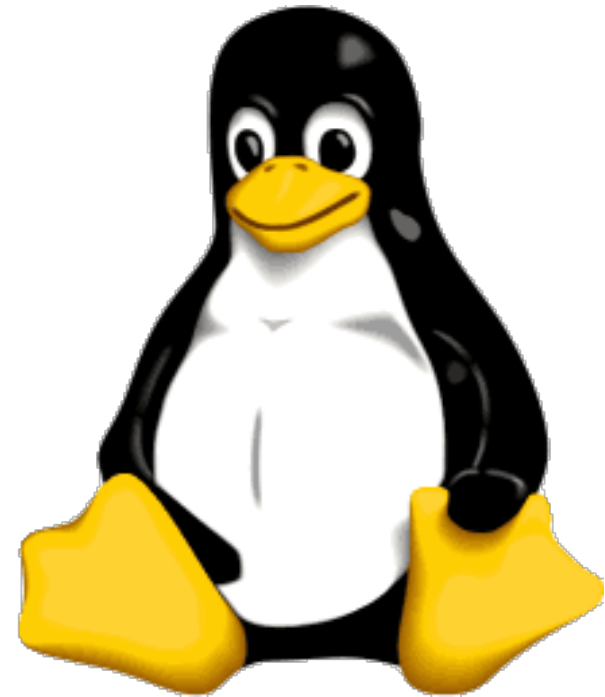# 10 minutes about my MLE experience

netdev 2.1

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What's MLE?

Mesh Link Establishment

- Currently IETF Draft for 802.15.4 only
  - Developed by ZigBee IP
  - UDP Protocol
  - Marked as "dead"
  - Moved to 6lo WG → no activity yet

- Used in Thread Specification
  - They name it MLE
  - But it is NOT MLE (a fork)

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What does MLE?

Three Major Tasks

- Link Establishment (Security)
- Link Quality Detection
- Network Parameter Distribution (not interested)

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Link Establishment

- Blocks all non-MLE Traffic until Link Establishment to Neighs

- Security Parameter exchange
  - For Peer To Peer not solved by IEEE
  - Handshake: Response & Challenge
  - "Frame Counter" for Replayed Message Protection

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Link Quality Distribution

- ## Periodic Messages
  - ### Getting better Link Quality Values
  - ### For Bidirectional Link Quality Measurements (asymmetric links)

Point of View

Unidirectional
Link Quality Measurement

MLE
Node

MLE
Neigh

Link Quality Advertisement
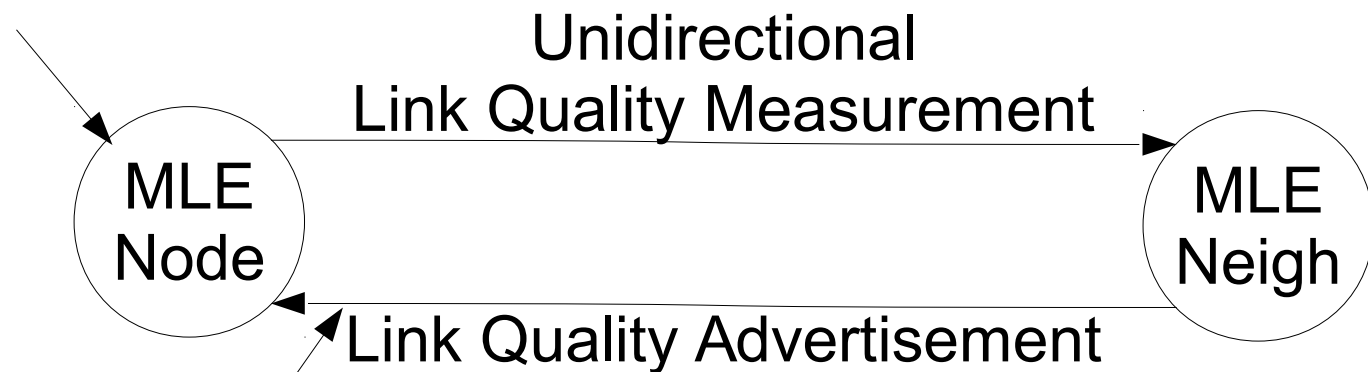
Difficult to measure

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Solved issues

MLE Messages needs read/set MAC Header Information on UDP
(common issue in 6LoWPAN)

- CMSG Data recvmsg/sendmsg
- IPV6_RECVPKTINFO_L2
- Link Layer specific Attribute

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Final Opinion

Big challenge
Link Establishment

- # Without it?
  - ## Nothing work
  - ## Solve IEEE 802.15.4 Issues
  - ## Get new issue: Key Distribution
- # Thread MLE (closed Spec.)
  - ## Provided by OpenThread?
  - ## IPv6 Neighbor Discovery Handling?

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