Enhanced Beacon

Metrics and Values

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https://www.sandelman.ca/SSW/ietf/meeting/ietf101/ietf101_6tisch_roll_beacon_info

Overview

- What’s the problem?
- What’s the 6tisch part?
- What’s the ROLL part?
- What’s the problem?
- Discussion and Questions.

Same slides for 6tisch and for ROLL, but different discussion!

What's the problem? Network Selection

- A (new!) device (pledge!) will not know which network it should enroll in.
- A single network will be visible multiple times.

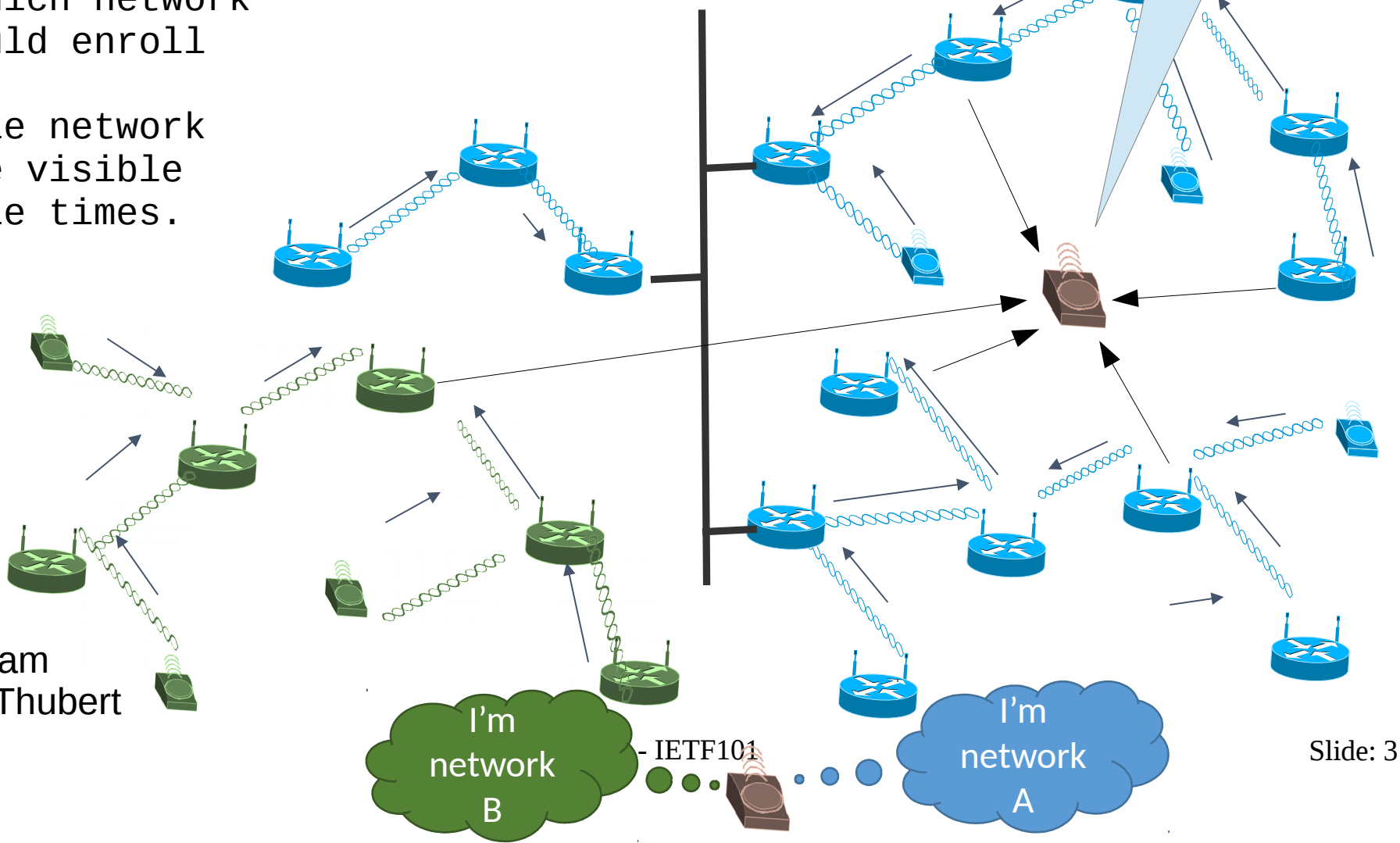


Diagram
By P.Thubert

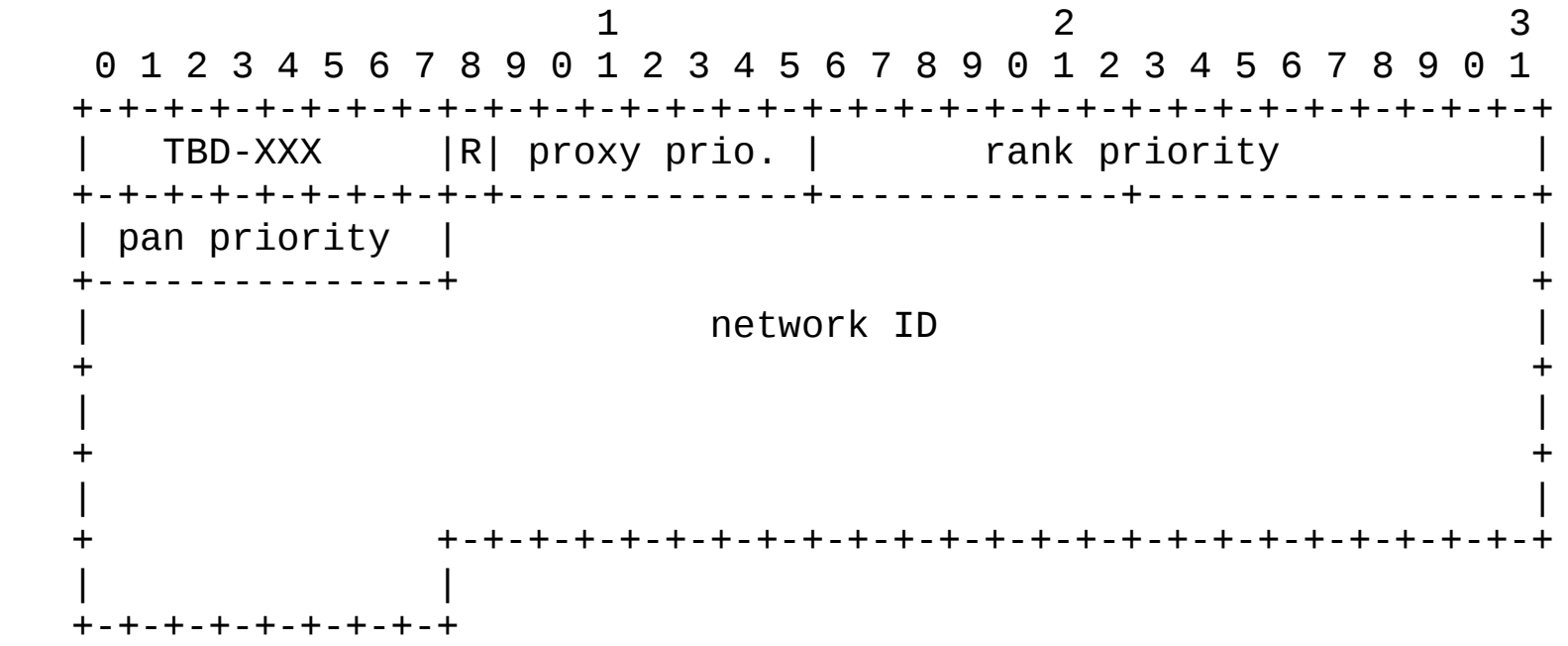
What do I mean by “JOIN”?

- Some confusion about JOINing an LLN → means getting the network keys/credentials
  - Calling this:
    - ENROLLMENT
- Vs JOINing a DODAG → which means selecting a Parent and sending a DAO to it.
  - Parent Selection

What's the 6tisch part?

IEEE802.15.4 Informational Element encapsulation of 6tisch Join and Enrollment Information
draft-richardson-6tisch-enrollment-enhanced-beacon-00

Creates a new 802.15.4 **Informational Element**, using the IETF allocation in rfc8137

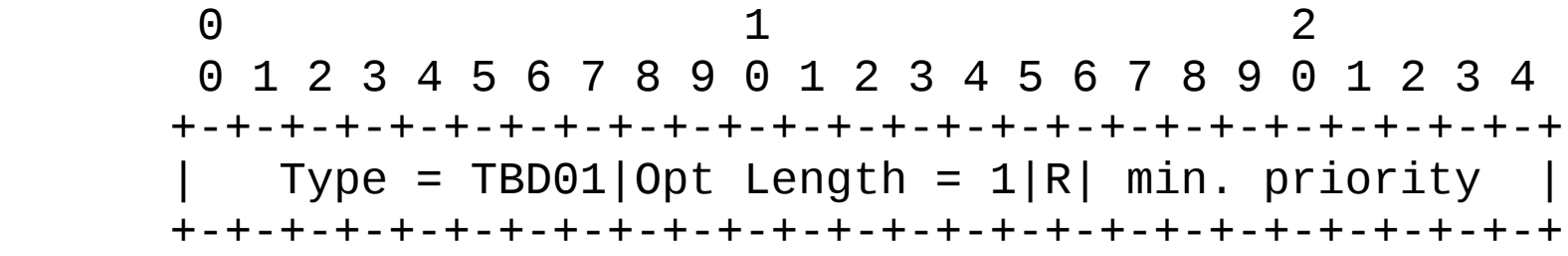


- R a flag to indicate device will answer unicast Router Solicitations
- network ID is truncated SHA256 of stable value (IPv6 DODAGID)
- Proxy prio: relative importance of each Join Proxy
- Rank Priority: something for **Parent Selection**
- Pan Priority: something for **Parent Selection**

What's the ROLL part?

Enabling secure network join in RPL networks
draft-richardson-6tisch-roll-join-priority-02

Defines a new DIO Option.



min.priority a 7 bit field which provides a base value for the Enhanced Beacon Join priority. A value of 0x7f (127) disables the Join Proxy function entirely.

R a reserved bit that SHOULD be set to 0 by senders, and MUST be ignored by receivers. The reserved bit SHOULD be copied to options created.

The Minimum Priority influences the Proxy Priority that is announced in the Enhanced Beacon. The local node will apply additional criteria (such as number of neighbor cache entries it can allocate for untrusted nodes).

What's the problem?

- There is some desire to base which network to ENROLL on, based upon the **Parent Selection** Criteria.
  - (RPL) DIOs can not be seen until node joins network, as they are encrypted.
  - Untrusted nodes can only see Enhanced Beacons.
- A long sleeping node needs the (signed) Enhanced Beacons in order to resynchronize. Such nodes will have ALREADY enrolled, so in fact, having the **Parent Selection** info in the Beacon is a great saving.

Goals in 6tisch

- Decide what set of things we want in the Enhanced Beacon.
  - Write this down somewhere, and ask ROLL to document how those numbers are derived, creating any new metrics or configuration containers needed.
- Document the security risk of exposure of these values.

ADOPT
richardson-6tisch-enrollment-enhanced-beacon

Goals in ROLL

- Determine how the newly exposed metrics interact with or are derived from DIO things.
  - A value in an enhanced beacon vs a value in a subsequent DIO.
- There are two additional things related to Enrollment Priority and also the Parent Selection:
  - Number of children
    - Multiple drafts about balancing children
      - Children require (priviledged) neighbour cache entries.
      - Enrollment requires unpriviledged neighbor cache entries
  - Availability of bandwidth for Enrollment
    - Turn off enrollment when there are issues.

Questions/Discussion

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