

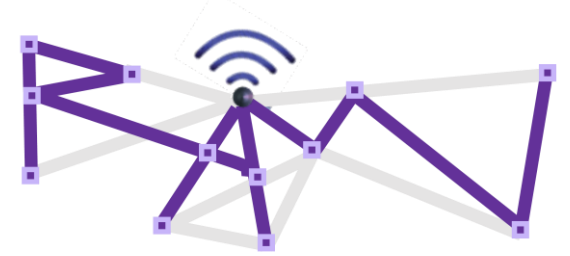


Reliable and Available Wireless Framework

Presenter: Pascal Thubert

Authors: P. Thubert, Lou Berger, (+ contributors)

RAW Architecture / Framework Split



- Architecture: what we will do, the broad picture before the work

Terminology

Reliability and availability in the context of the IETF

Conceptual Model with OODA Loop,

Introducing the Path Selection Engine (PSE)

- **Framework:** How we did it, selected building blocks and their interaction

Use cases and requirements served

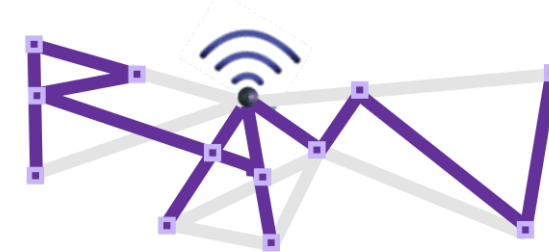
Scope of the work / applicability

Identifying Tracks, Paths, and Flows

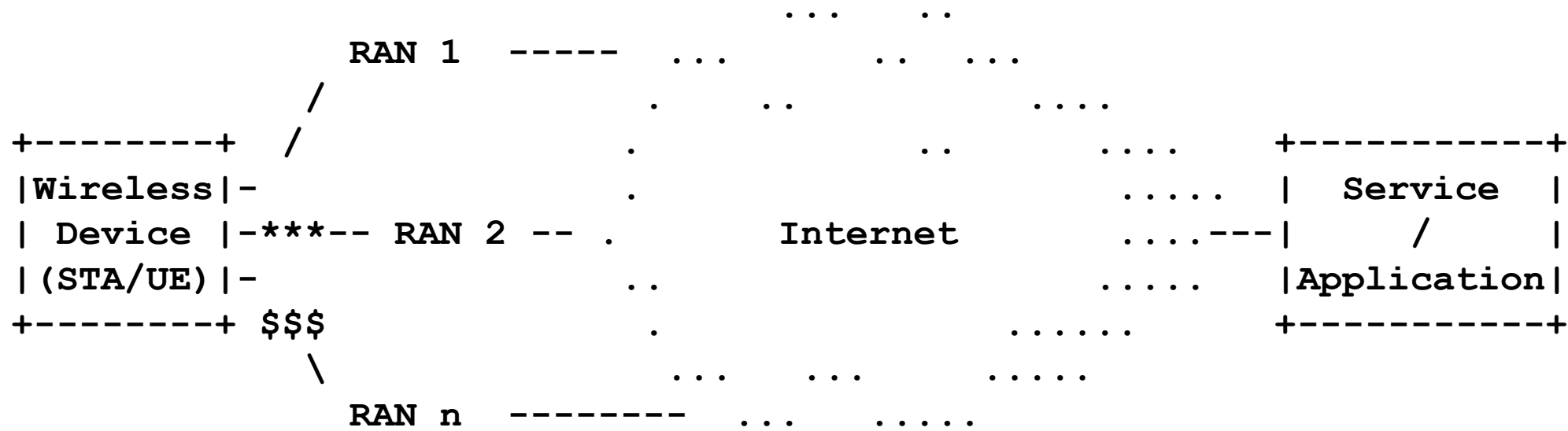
Source Routing vs distributed PSE

OAM and metrics

Use case: Wireless Access Diversity

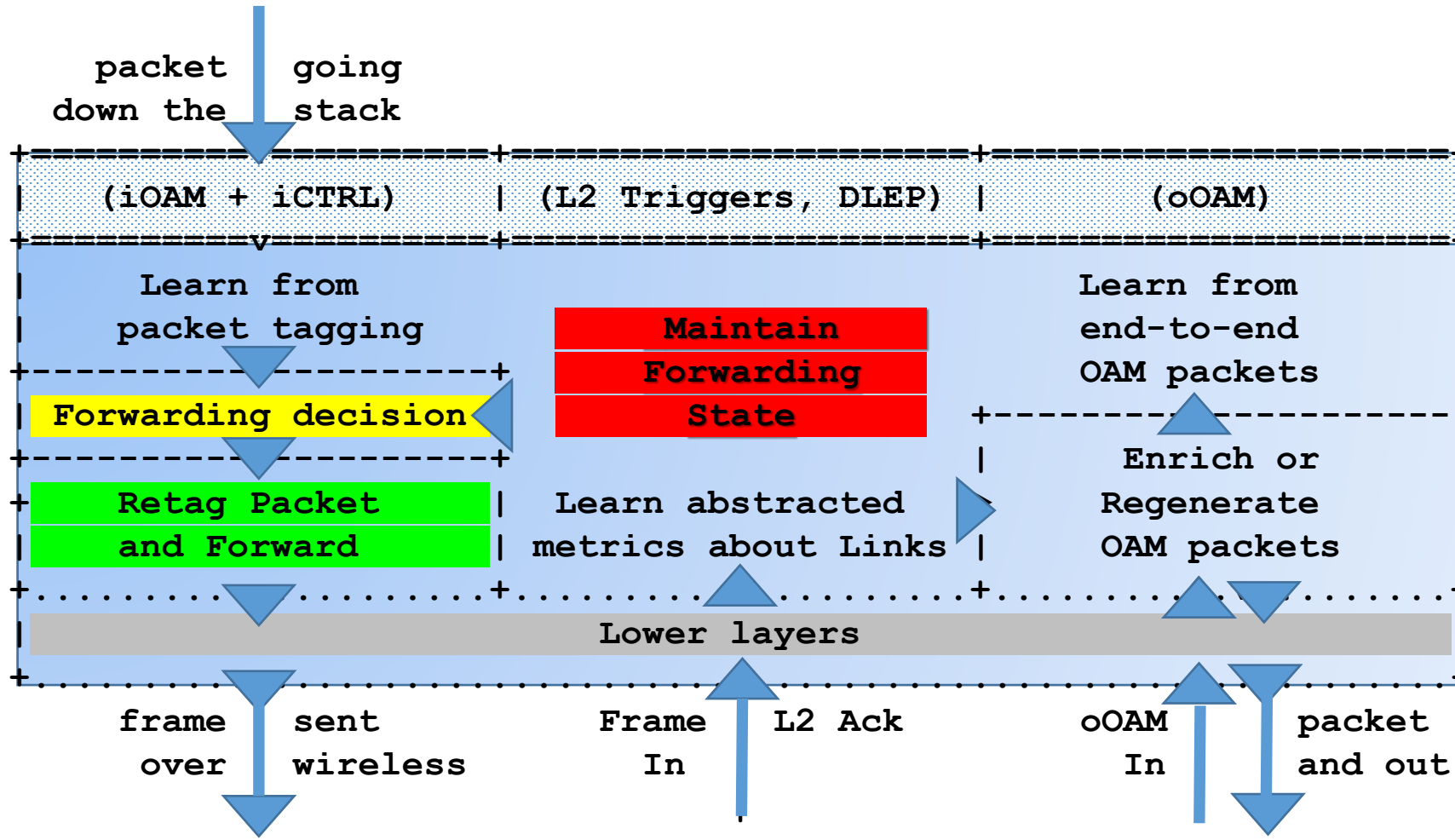
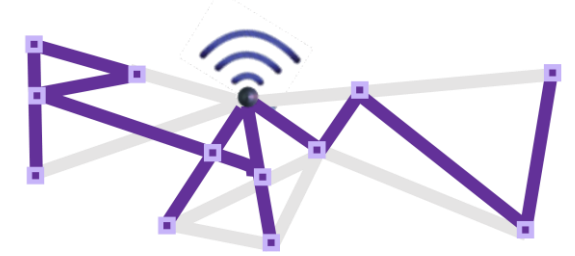


RAW OAM operation in the Network Plane observes either a full Track or subTracks that are being used at this time. In the case of Radio Access Protection, the Track is Loose and only the first hop is observed:



*** = flapping at this time \$\$\$ expensive

Implementing the PSE "Stack"

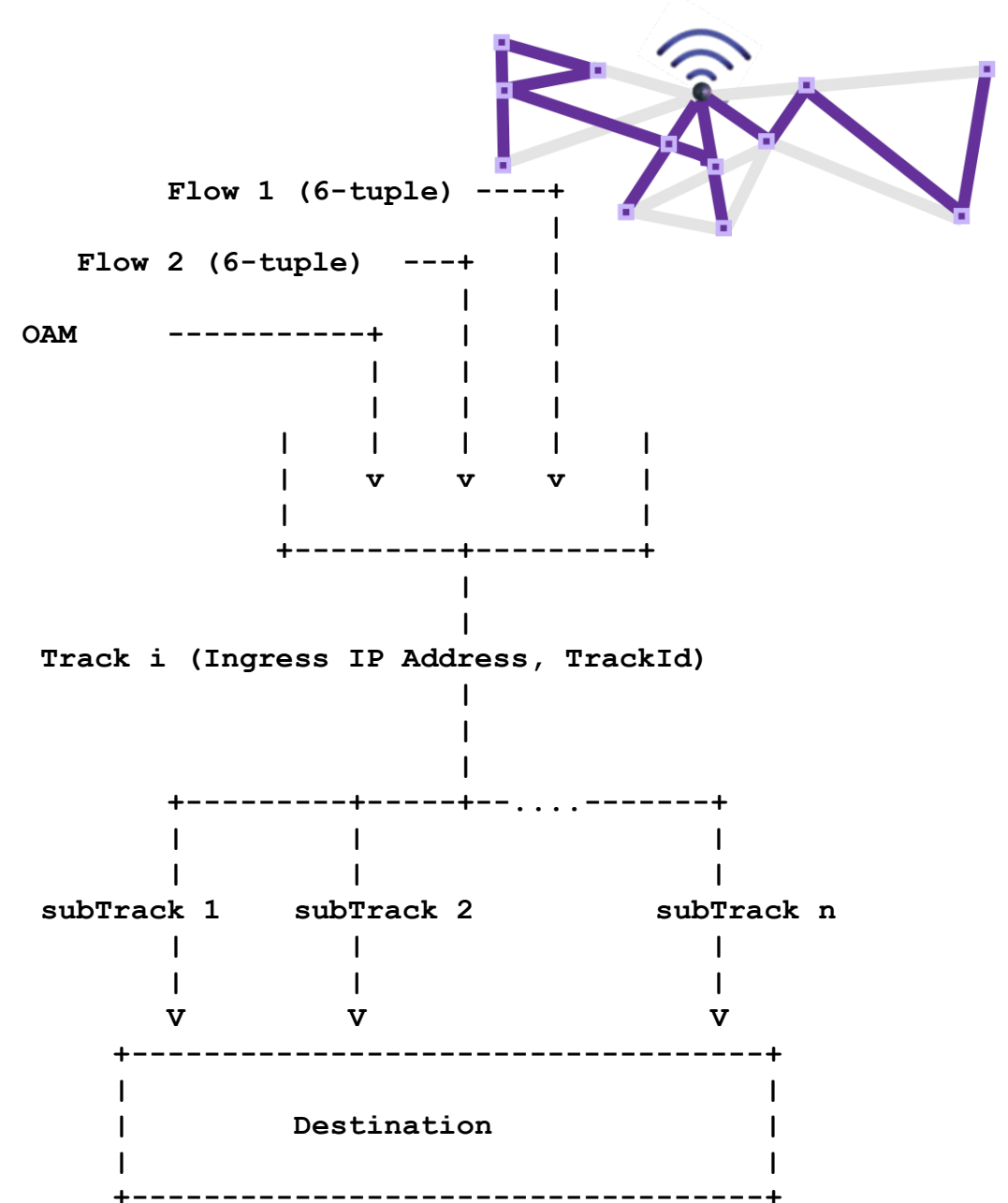


Flow and Tracks

The RAW service includes forwarding over a subset of the Links that form the Track (a subTrack). Packets from the same or a different flow that are routed through the same Track will not necessarily traverse the same Links.

The PSE selects a subTrack for a packet based on the links that are preferred and those that should be avoided at this time.

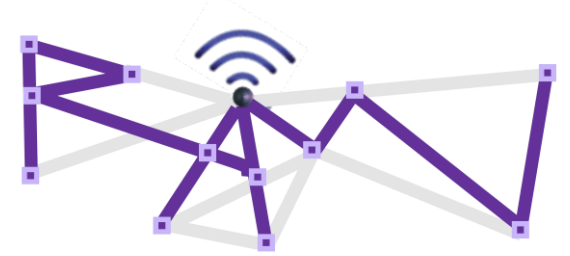
Each packet is forwarded within the subTrack that provides the best adequation with the SLA of the flow and the energy and bandwidth constraints of the network.



What do we need to do?

Select Appropriate Radios and Effective Use Cases

- ⇒ Req: Capability to schedule resources
- ⇒ Opt: Diversity capabilities (frequency, beam, ...)



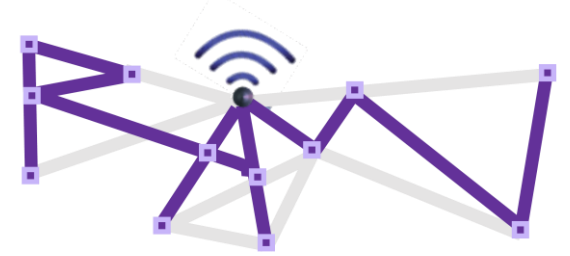
Adapt per-packet activity of a RAW flow along a diverse path

- ⇒ Determine Specific Data Models to match radio properties (for CCAMP and IPPM?)
- ⇒ Signal forwarding properties in packets (e.g., BIER-TE)
- ⇒ Source routed and Distributed forwarding decision (use of PARETO functions)
- ⇒ In-band control of resource Usage to optimize energy and bandwidth

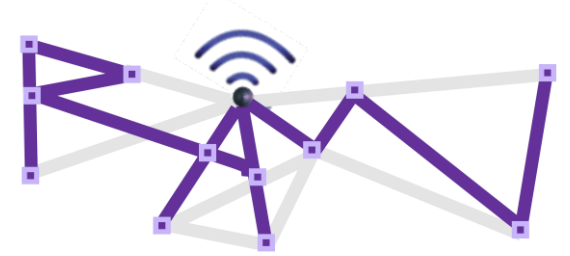
Enable i/oOAM (in and out-of-band)

- ⇒ Forward packets or generated placebo packets to measure LQI
- ⇒ In-band forward and out-of-band backward gathering of metrics across NECM

RAW interactions with other IETF WGs



- DetNet: RAW is mostly a focused Subset
 - Radio specialists, different interests
 - Unstable links (bandwidth, flapping), not ‘deterministic’
 - OAM is a common interest – cross participation
- MANET: Non-Congruent domains
 - Non-Mobile & not Ad-Hoc (antagonistic to DetNet)
 - Centralized routing
 - DLEP a relevant tool but need multihop view (OAM)
- CCAMP: May need work from CCAMP for data models
- IPPM can be leveraged for in-band OAM, direct export,
- and BIER for path selection & control



Questions ?