Using Deterministic Networks for Industry Operations and Control

draft-km-detnet-for-ocn-02

Authors

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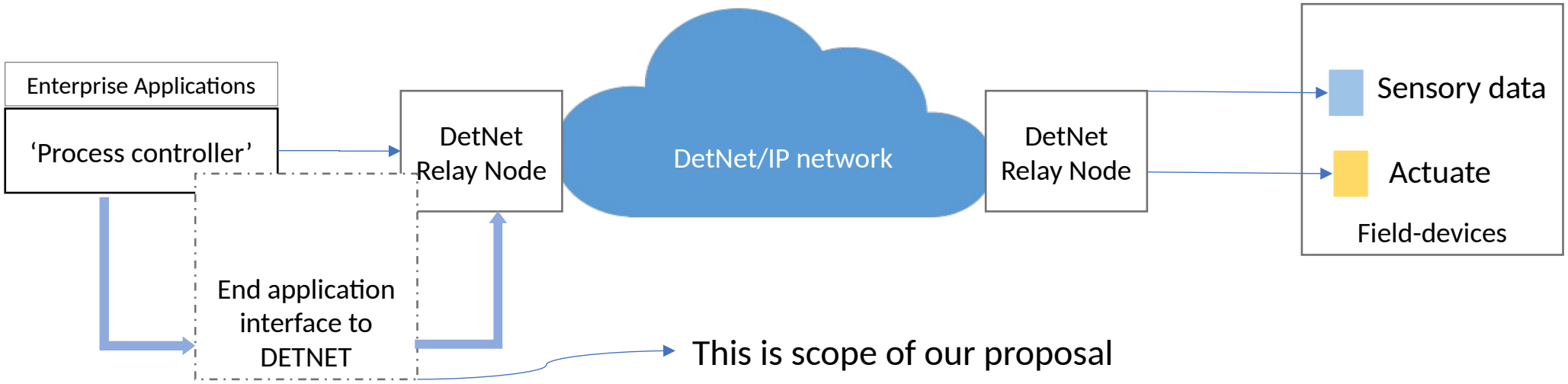
IETF 117 DetNet WG Meeting

Recap of the problem space - Application Interface to Deterministic Networks is underspecified



- **Towards Remote process Automation**
  - Softwarization and programmability helps with simplifying process automation infrastructure.
  - Interface to a Deterministic network may be under specified.
  - Application specific DetNet requirements will be dynamic and vary

OCN Option (OCNO) as an EH option

- Motivated by HBH enhancements [draft-ietf-6man-hbh-processing-06] Nodes should not drop HBH packets if they don't process them.
- Forward looking modern application stacks systems will support IPv6

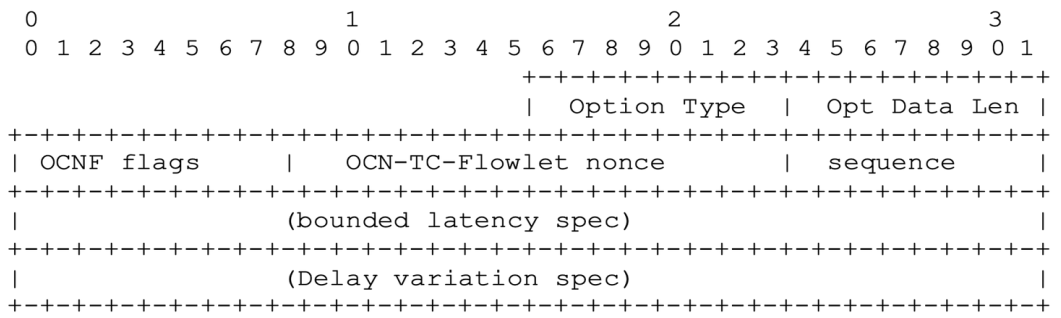


Figure 4: Explicit Traffic Control HBH Options

Identified Traffic Patterns and map to HBH

- Control Loops (latency bounds)
- Periodicity
- Ordering
- Urgency

Flag	Description
U	send message immediately. its an alarm
P	periodic packet (intervals in ~ms)
F	part of flowlet. see Nonce and seq
L	bounded latency spec provided
R	Reliability with no packet loss tolerance
V	Delay variation with no packet loss tolerance

Updates since 116 (March'23)

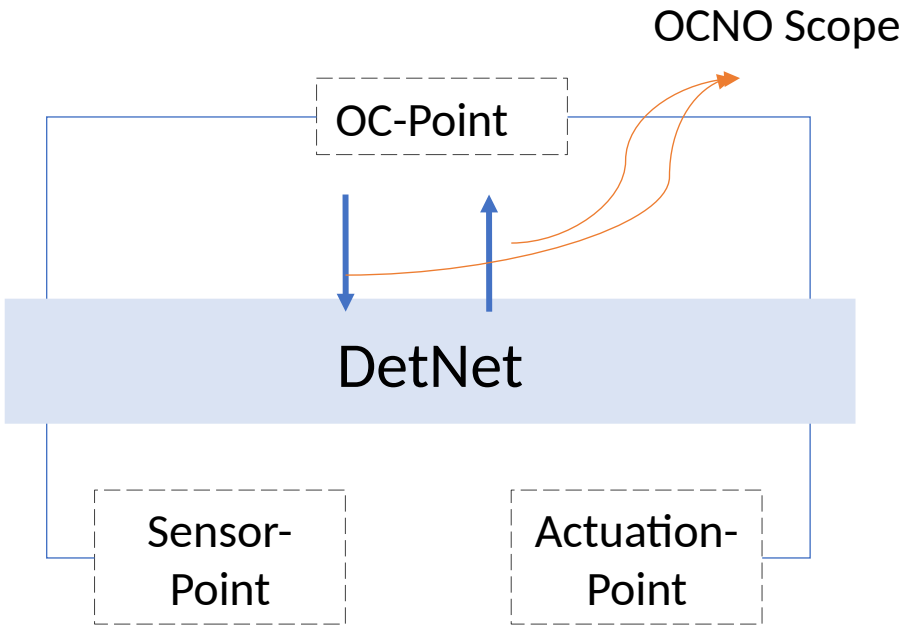
- Luis C. (Telefonica) joined as co-author.
  - The interest is to align this effort with PREDICT-6G (https://predict-6g.eu/) and DESIRE-6G (https://desire6g.eu/) projects,
  - Expect to relevant information can be leveraged (e.g., traffic profiles of industrial/critical applications)
- Informally cross-checked with V6OPS expert if HBH IPv6 approach is concerning (ans: NO)
- Received thorough review from Florian
  - Some clarifying, other improvements. Addressed some in -02 revision. But replies are posted here: https://docs.google.com/document/d/15MtFAbKQkrFwTHBiOLl_yYHG9ToqkHyBc5_LI6-Fr98/edit?usp=sharing

Major Changes in draft-km-detnet-for-ocn-02

1. Terminology
    1. Controller is now ‘process controller’:
        - term was confusing with network-controllers.
    2. Readers assumed that ‘cloud’ is a public cloud.
        - Addressed this by reducing occurrences of term cloud.
2. Where is ‘process controller’ with respect to applications?
        - Co-resident or separate?
3. Section 3.2 **Generalized Communication Model t**o address above work
4. Since we discussed traffic patterns - there is text on choice of transport protocols.
    - This should be removed as it is not in the scope of work here.
5. Editorial set of changes as pointed by Florian.

Generalized Communication Model for OCNO

- What if we simply communication model and only concern with functions necessary for interface to DetNet?
- OC-Point: Operation & Control Logical point
  - Function that interfaces with DetNet relay node.
- Sensor point:
  - Performs functions of a sensor device
- Actuation point:
  - Performs functions of an actuator



Next Steps

1. Request to make OCN option more comprehensive to add additional information – perhaps errors, service violations.
2. This raises an opportunity if we can comprehensively specify Service-sublayer.
3. How DetNet relay node will do mapping from OCN-O to DetNet is not covered in this document.

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- We would like more comments and feedback
- Formal request for WG adoption so that members can participate in making these decisions.

Thank you!