IETF Deterministic Networking (DetNet) Working Group Overview

Guaranteed* delivery of a data packet within a guaranteed time window

*Guaranteed ≈ zero loss or delay due to congestion

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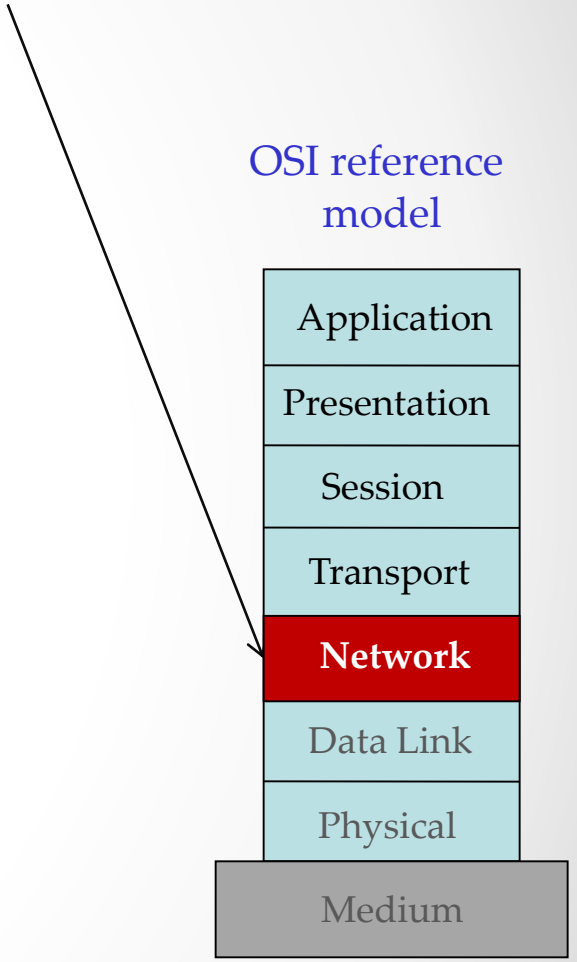
DetNet WG Chartered Scope

- Chartered to do work in the following areas:
  - See https://datatracker.ietf.org/doc/charter-ietf-detnet/
- Overall architecture:
  - encompasses the data plane, OAM, time synchronization, management, control, and security aspects.
- Data plane:
  - document how to use IP and/or MPLS to support a data plane of flow identification and packet forwarding over Layer 3.
- Data flow information model:
  - identify the information needed for flow establishment and control and be used by reservation protocols and YANG data models. The work will be independent from the protocol(s) used to control the flows
    - (e.g. YANG+NETCONF/RESTCONF, PCEP or GMPLS).
- YANG models:
  - This work will document device and link capabilities (feature support) and resources (e.g. buffers, bandwidth) for use in device configuration and status reporting.
- Problem statement: (as needed)
  - This effort will establish the deployment environment and deterministic network requirements.
- Vertical requirements:(as needed)
  - This effort will detail the requirements for deterministic networks in various industries, for example, professional audio, electrical utilities, building automation systems, wireless for industrial applications.
- Encryption:
  - To investigate whether existing data plane encryption mechanisms can be applied, possibly opportunistically, to improve security and privacy

DetNet Responsibilities

- The **DetNet WG** is responsible to provide the **overall IETF solution** for deterministic networking
  - The WG coordinates with other relevant IETF WGs
  - As the work progresses, requirements may be provided to the responsible WG, with
  - **DetNet** acting as a **focal point to maintain the consistency of the overall DetNet solution**
  - Relevant WGs: CCAMP, PCE, PALS, TEAS, LSR, TSVWG, 6TisSCH
  - DetNet use cases include both wireline and wireless
    - Current focuses on IP, MPLS, IEEE 802.1 TSN
    - WG is contribution driven
- Transport protocol work, e.g., DetNet integration, is **out of scope**



Coordination Topics with Other WGs

- TSVWG
  - Consistency with IP architecture and support for congestion controlled and non-congestion controlled traffic, particularly in support of DetNet IP data plane definition
- MPLS
  - Proper use of MPLS in DetNet MPLS data plane definition
- PALS/BESS
  - Definition of the DetNet Control Word (largely complete)
- TEAS
  - Consistency with and impact on IETF TE Architecture, use of TE-LSPs, possible future signaling extensions
- CCAMP
  - Sub-IP control plane topics, including DetNet over TSN
- PCE
  - Requirements for support of centralized and hybrid DetNet service provisioning
- LSR
  - Possible routing protocol extensions
- 6TisSCH
  - Possible future operation of DetNet data plane over 6TisSCH
- SPRING
  - Possible future usage of SR-MPLS and SR-IPv6

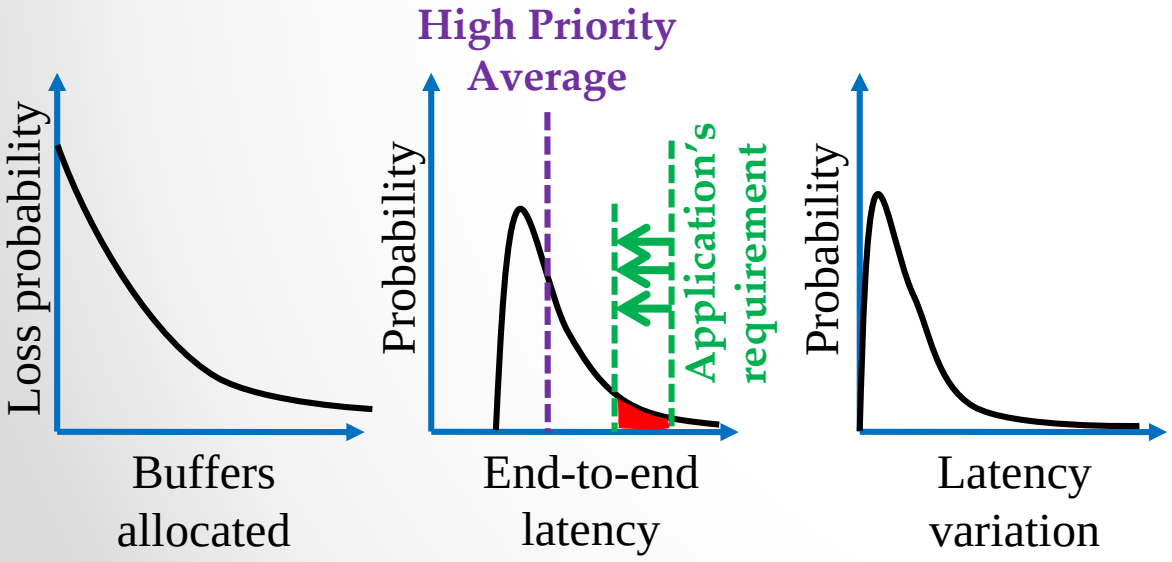
Unknowns

- Deconflicting/coordinating a PAW/SPAWN WG with existing WGs
  - Perhaps too early to discuss in a non-WG forming BoF

Thank you!

Deterministic Service

- Traditional Service
  - Curves have long tail
  - Average latency is good
  - **Lowering the latency** means **losing packets** (or overprovisioning)



- Deterministic Service
  - Packet loss is at most due to equipment failure (zero congestion loss)
  - Bounded latency, no tails
  - **The right packet at the right time**