

# IETF DetNet Working Group Update

July 26, 2025  
Madrid, Spain

# Objective and Topics

- Provide an update on IETF Deterministic Networks (DetNet) Working Group progress and plans
  - Since last joint session at after IETF 103, November 11, 2018, Bangkok, Thailand
- Minimal recap
  - See slides <https://1.ieee802.org/november-2018-plenary-meeting-in-bangkok-thailand-tsn-tg-agenda/>

Provide current WG status:

- Completed RFCs
- Current documents
- Expected activities

# Recap: IETF DetNet Working Group

- Chairs:

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- Secretary:

- Eve Schooler

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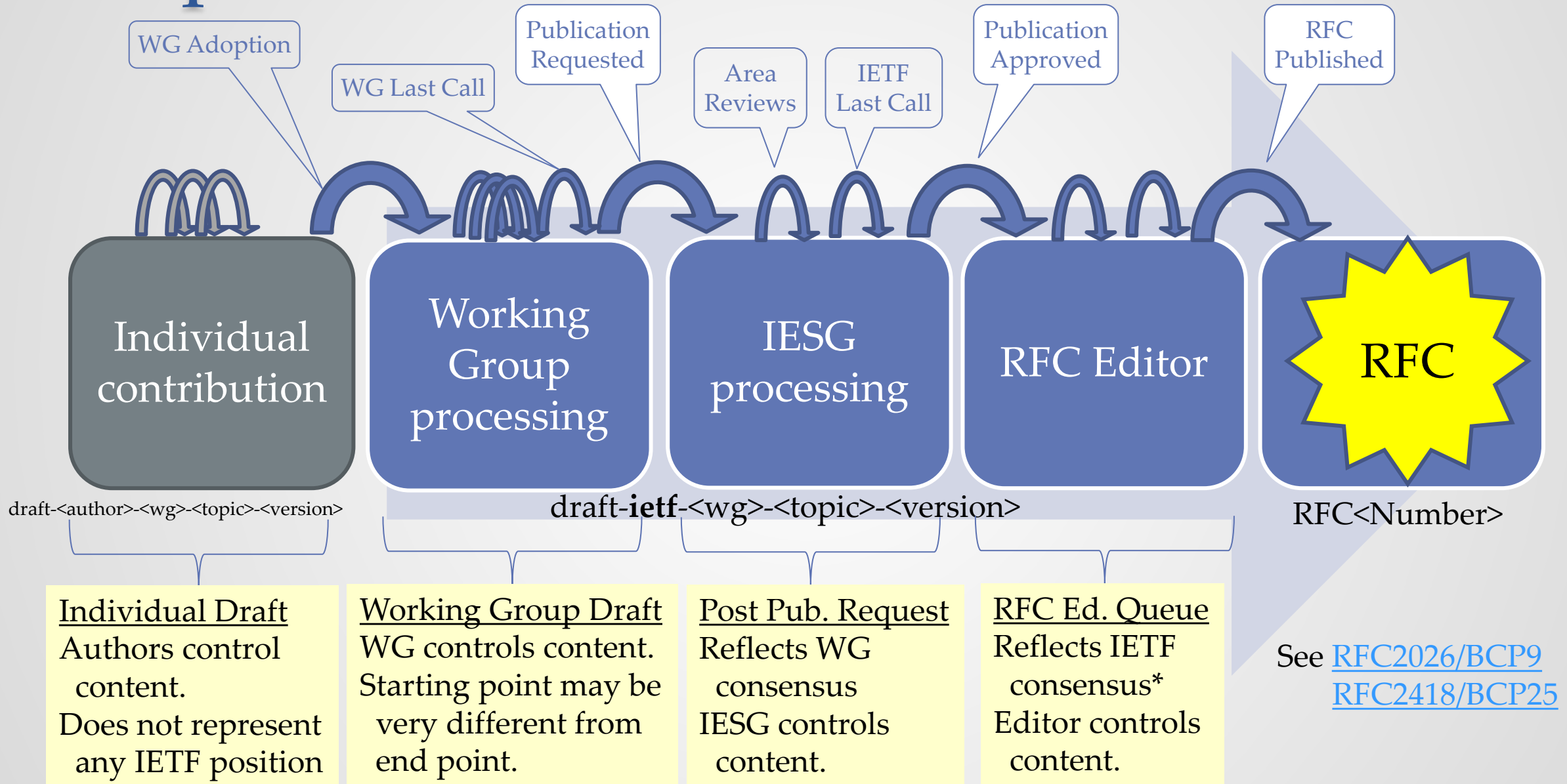
- WG Information: <https://datatracker.ietf.org/wg/detnet/>

- *The Deterministic Networking (DetNet) Working Group focuses on deterministic data paths that operate over Layer 2 bridged and Layer 3 routed segments, where such paths can provide bounds on latency, loss, and packet delay variation (jitter), and high reliability.*

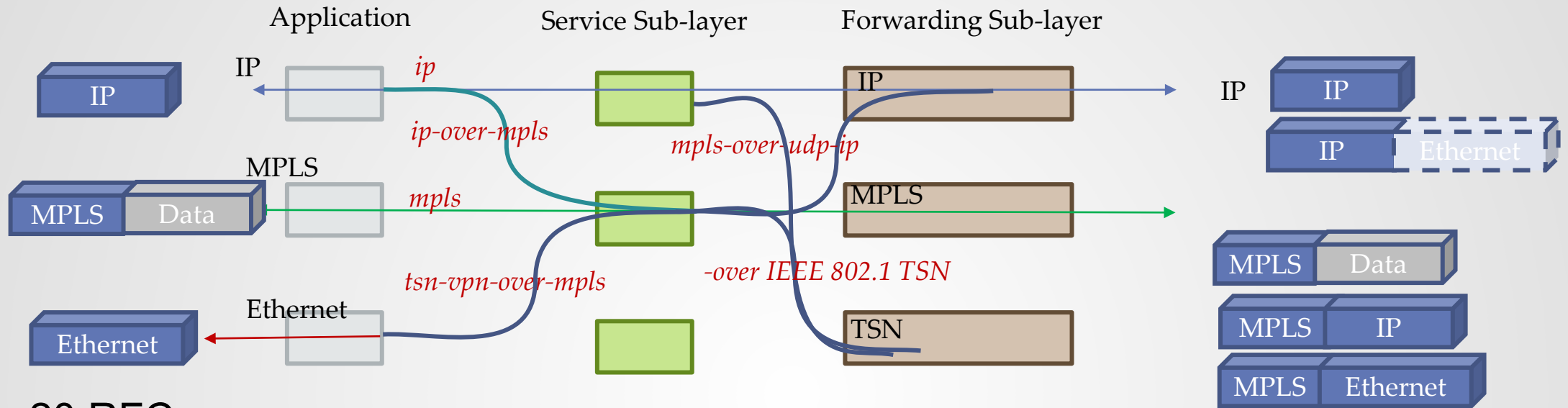
# Recap: Topics Covered in 2018

- What is the IETF?
- How is the IETF organized and managed?
- What are IETF Standards and other documents (RFCs)?
- What is the process for publishing and IETF standard?
- If interested, see
  - <http://www.ieee802.org/1/files/public/docs2018/detnet-tsn-berger-detnet-overview-1118-v03.pdf>
  - <https://www.ietf.org/about/introduction/>
  - <https://www.ietf.org/process/>

# Recap: IETF Consensus Document Process



# WG Status – Published RFCs



- 20 RFCs
- Use cases and architecture
- Data plane definitions
  - IP, MPLS, MPLS over UDP/IP, IP over MPLS
  - Operation over TSN
  - TSN over DetNet MPLS
  - Packet Ordering (POF)
  - Packet Replication, Elimination, and Ordering Functions (PREOF) via MPLS
  - Use of IETF Operations, Administration, and Maintenance (OAM)
- YANG model

# Published RFCs

| RFCs (20) | Title                                                                                                                  | Date    | Track             |
|-----------|------------------------------------------------------------------------------------------------------------------------|---------|-------------------|
| RFC 8557  | Deterministic Networking Problem Statement                                                                             | 2019-05 | Informational     |
| RFC 8578  | Deterministic Networking Use Cases                                                                                     | 2019-05 | Informational     |
| RFC 8655  | Deterministic Networking Architecture                                                                                  | 2019-10 | Proposed Standard |
| RFC 8939  | Deterministic Networking (DetNet) Data Plane: IP                                                                       | 2020-11 | Proposed Standard |
| RFC 8938  | Deterministic Networking (DetNet) Data Plane Framework                                                                 | 2020-11 | Informational     |
| RFC 8964  | Deterministic Networking (DetNet) Data Plane: MPLS                                                                     | 2021-01 | Proposed Standard |
| RFC 9016  | Flow and Service Information Model for Deterministic Networking (DetNet)                                               | 2021-03 | Informational     |
| RFC 9025  | Deterministic Networking (DetNet) Data Plane: MPLS over UDP/IP                                                         | 2021-04 | Proposed Standard |
| RFC 9023  | Deterministic Networking (DetNet) Data Plane: IP over IEEE 802.1 Time-Sensitive Networking (TSN)                       | 2021-06 | Informational     |
| RFC 9037  | Deterministic Networking (DetNet) Data Plane: MPLS over IEEE 802.1 Time-Sensitive Networking (TSN)                     | 2021-06 | Informational     |
| RFC 9024  | Deterministic Networking (DetNet) Data Plane: IEEE 802.1 Time-Sensitive Networking over MPLS                           | 2021-06 | Proposed Standard |
| RFC 9055  | Deterministic Networking (DetNet) Security Considerations                                                              | 2021-06 | Informational     |
| RFC 9056  | Deterministic Networking (DetNet) Data Plane: IP over MPLS                                                             | 2021-10 | Proposed Standard |
| RFC 9320  | Deterministic Networking (DetNet) Bounded Latency                                                                      | 2022-11 | Informational     |
| RFC 9546  | Operations, Administration, and Maintenance (OAM) for Deterministic Networking (DetNet) with the MPLS Data Plane       | 2024-02 | Proposed Standard |
| RFC 9550  | Deterministic Networking (DetNet): Packet Ordering Function                                                            | 2024-03 | Informational     |
| RFC 9551  | Framework of Operations, Administration, and Maintenance (OAM) for Deterministic Networking (DetNet)                   | 2024-03 | Informational     |
| RFC 9566  | Deterministic Networking (DetNet) Packet Replication, Elimination, and Ordering Functions (PREOF) via MPLS over UDP/IP | 2024-04 | Informational     |
| RFC 9634  | Operations, Administration, and Maintenance (OAM) for Deterministic Networking (DetNet) with the IP Data Plane         | 2024-10 | Informational     |
| RFC 9633  | Deterministic Networking (DetNet) YANG Data Model                                                                      | 2024-10 | Proposed Standard |

# WG Status – Documents Completed

- Publication Requested (technical work completed)
  - **Deterministic Networking (DetNet) Controller Plane Framework**
    - draft-ietf-detnet-controller-plane-framework-12
    - Controller plane is defined by the DetNet Architecture
      - General term that covers centralized (SDN), decentralized and hybrid control
      - DetNet Data Plane is independent of controller plane
  - **Reliable and Available Wireless (RAW) Technologies and Architecture**
    - [draft-ietf-raw-technologies-17](#)
    - [draft-ietf-raw-architecture-28](#)



# RAW: Reliable and Available Wireless

- RAW is DetNet over any wireless network technology that can provide IP connectivity
  - Challenge is to provide deterministic operation over wireless channels
- Use cases and LDACS RFCs published by RAW WG
  - <https://datatracker.ietf.org/group/raw/documents/>
- Architecture defines key considerations and related concepts
  - Allows for wireless only DetNets or mixed wired and wireless networks
  - Is agnostic of underlying wireless technology
  - Key addition is concept of provisioned protection paths and need for new protection function that can operate on a per packet basis (based on local radio channel status)
- Expected next steps:
  - Revive expired Framework document
  - Wait for contributions on solutions

# Active WG Documents

- Active documents are under development in the WG
- **Deterministic Networking (DetNet) Topology YANG Model**
  - [draft-ietf-detnet-topology-yang-02](#)
  - Adds DetNet specific link information to the IETF Traffic Engineering Topology Model
    - Includes metrics and queue related information
- Data plane enhancements
  - **Requirements for Scaling Deterministic Networks**
    - [draft-ietf-detnet-scaling-requirements-08](#)
  - **Dataplane Enhancement Taxonomy**
    - [draft-ietf-detnet-dataplane-taxonomy-04](#)



Will be presented today

# Likely Future Work/Drafts

Based on individual drafts and WG discussions:

- Data plane queueing enhancements
  - Objective is no more than one solution per category identified in taxonomy document
- DetNet for multiple domains ← related presentation on agenda
- DetNet SRv6 data plane definition
- Controller plane related definitions