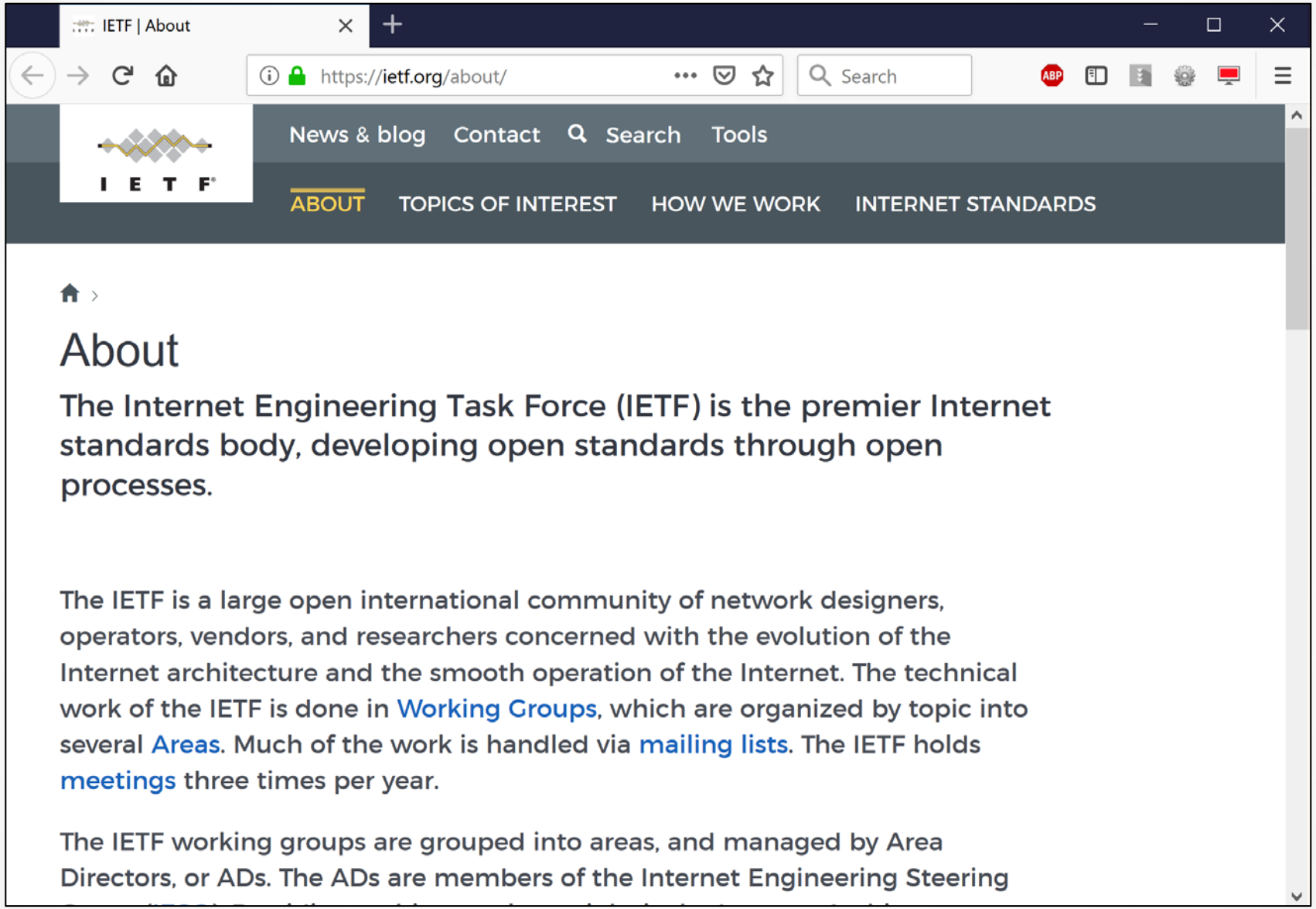
IETF DetNet Working Group Overview

November 11, 2018
Bangkok, Thailand

The IETF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About
The Internet Engineering Task Force (IETF) is the premier Internet standards body, developing open standards through open processes.
The IETF is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. The technical work of the IETF is done in Working Groups, which are organized by topic into several Areas. Much of the work is handled via mailing lists. The IETF holds meetings three times per year.
The IETF working groups are grouped into areas, and managed by Area Directors, or ADs. The ADs are members of the Internet Engineering Steering

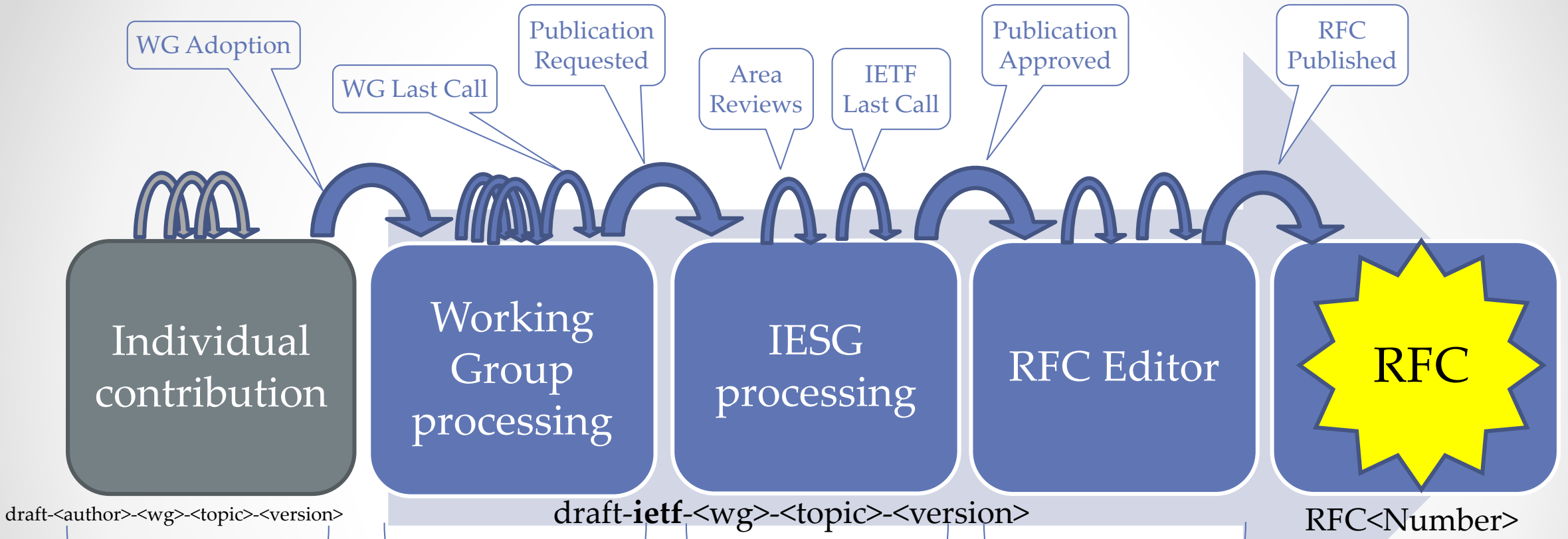
IETF Areas

Applications and Real-Time (ART)	• Application protocols and architectures • Real-time (communication) and non-real-time
Transport (TSV)	• Mechanisms related to data transport on the Internet • Includes congestion control
Routing (RTG)	• Routing and signaling protocols
Internet (INT)	• IPv4/IPv6, DNS, DHCP, VPNs, mobility
Operations and Management (OPS)	• Network management • Operations: IPv6, DNS, security, routing
Security (SEC)	• Security protocols and mechanisms, including cryptography
General (GEN)	• Activities focused on supporting and updating IETF processes

DetNet WG lives here

https://www.ietf.org/slides/slides-edu-ietf-103-newcomer-slides-00.pptx

IETF Consensus Document Process



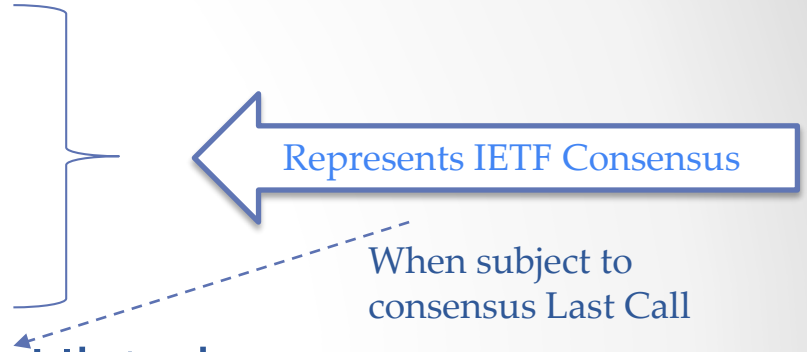
Individual Draft	Working Group Draft	Post Pub. Request	RFC Ed. Queue
Authors control content. Does not represent any IETF position	WG controls content. Starting point may be very different from end point.	Reflects WG consensus IESG controls content.	Reflects IETF consensus* Editor controls content.

See RFC2026/BCP9
RFC2418/BCP25

* -- Consensus documents only

Types of RFCs

- Defined by RFC2026/BCP9
  - Standards Track (as updated by RFC 6410):
    Proposed Standard and Internet Standard
    - (Draft Standard will no longer be used.)
  - "Almost standard": Best Current Practice
  - Non-standards track: Experimental, Informational, Historic



- Shown on RFC 1st page as "*Category*:"
  - For Standards Track, only "*Standards Track*" is shown.
  - Sometimes called "status".
- A published RFC can not change but its category can

The IETF and Consensus

- Rough consensus is achieved when all issues are addressed, but not necessarily accommodated
  - o Dissenting opinions are heard, but are not controlling
  - o Working Group document consensus responsibility: Document editors
  - o WG consensus responsibility: WG chairs
  - o IETF consensus responsibility: IESG
- Humming (Hand raising): a way of measuring consensus that is not voting
- “On Consensus and Humming in the IETF”, https://tools.ietf.org/html/rfc7282

DetNet WG Management

- Chairs:
  - Lou Berger lberger@labn.net
  - János Farkas janos.farkas@ericsson.com
- Secretary:
  - Ethan Grossman eagros@dolby.com
- 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.*

DetNet WG Scope

- Based on WG Charter
  - o https://datatracker.ietf.org/wg/detnet/about/
- Overall architecture:
  - o encompasses the data plane, OAM, time synchronization, management, control, and security aspects.
- Data plane specification:
  - o 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:
  - o 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:
  - o 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)
  - o This effort will establish the deployment environment and deterministic network requirements.
- Vertical requirements:(as needed)
  - o 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:
  - o To investigate whether existing data plane encryption mechanisms can be applied, possibly opportunistically, to improve security and privacy

WG Document Status

Document	Date	Status	IPR	AD / Shepherd
Active Internet-Drafts (8 hits)				
draft-ietf-detnet-use-cases-19 **Deterministic Networking Use Cases**	2018-10-08 87 pages	Approved-announcement to be sent::Point Raised - writeup needed **for 15 days** Submitted to IESG for Publication: Informational Reviews: genart, opsdir, secdir *Mar 2018*	1	Deborah Brungard Lou Berger
draft-ietf-detnet-dp-sol-ip-01 **DetNet IP Data Plane Encapsulation**	2018-10-21 32 pages	I-D Exists WG Document		
draft-ietf-detnet-dp-sol-mpls-01 **DetNet MPLS Data Plane Encapsulation**	2018-10-21 50 pages	I-D Exists WG Document		
draft-ietf-detnet-flow-information-model-02 **DetNet Flow Information Model**	2018-10-22 24 pages	I-D Exists WG Document		
draft-ietf-detnet-security-03 **Deterministic Networking (DetNet) Security Considerations**	2018-10-16 40 pages	I-D Exists WG Document		
draft-ietf-detnet-yang-00 **DetNet Configuration YANG Model**	2018-10-22 51 pages	I-D Exists WG Document		
draft-ietf-detnet-problem-statement-07 **Deterministic Networking Problem Statement**	2018-10-03 11 pages	Waiting for Writeup **for 37 days** Submitted to IESG for Publication: Informational Reviews: genart, opsdir, rtgdir, secdir		Deborah Brungard Janos Farkas
draft-ietf-detnet-architecture-09 **Deterministic Networking Architecture**	2018-10-22 42 pages	Waiting for Writeup **for 37 days** Submitted to IESG for Publication: Proposed Standard Reviews: genart, opsdir, rtgdir, secdir, tsvart	1	Deborah Brungard Lou Berger

WG Draft Status

- With IESG
  - o draft-ietf-detnet-use-cases
  - o draft-ietf-detnet-problem-statement
  - o draft-ietf-detnet-architecture
- Content expected to be largely finalized by IETF104
  - o draft-ietf-detnet-dp-sol-ip
  - o draft-ietf-detnet-dp-sol-mpls
  - o draft-ietf-detnet-flow-information-model
- Gated by solutions (-sol-) drafts
  - o draft-ietf-detnet-security
- Recently adopted WG document, substantive changes are expected
  - o draft-ietf-detnet-yang

Contains multiple modules and future documents

Scope of Data Plane Solutions

- Solution documents specify procedures and behaviors required of nodes supporting DetNet
  - Focus is on interoperable implementations
- Two data planes being defined
  - IP
    - Uses IP and Transport Protocol header information for flow ID
    - Specifies mapping to TSN
  - MPLS
    - Uses Labels for flow ID
    - Supports DetNet Service Layer and packet replication/ordering/elimination
    - Specifies mapping to TSN
    - Defines support for interconnected TSN domains
      - may be moved to separate document

Likely Future Work/Drafts

- OAM
- Informational document(s) on internal implementation support for DetNet service
- Control plane impacts