

# IEEE 802.1 Time-Sensitive Networking (TSN) Update

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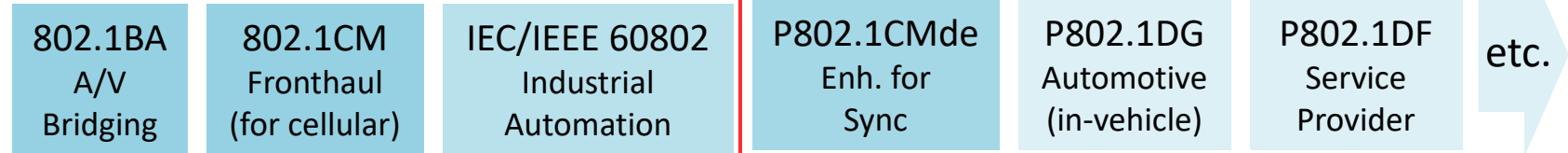
IETF 106, November 21, 2019

# Before We Start – Disclaimer

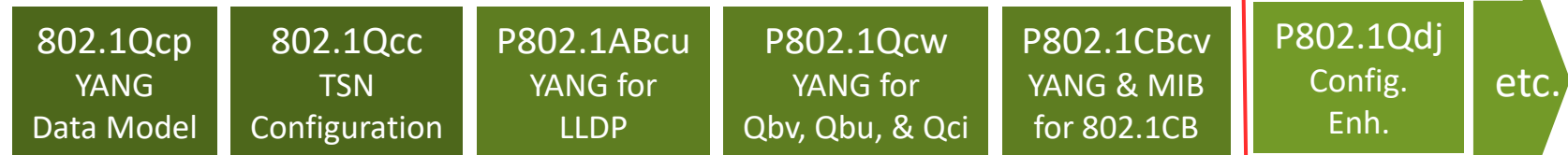
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# IEEE 802.1 TSN Progress

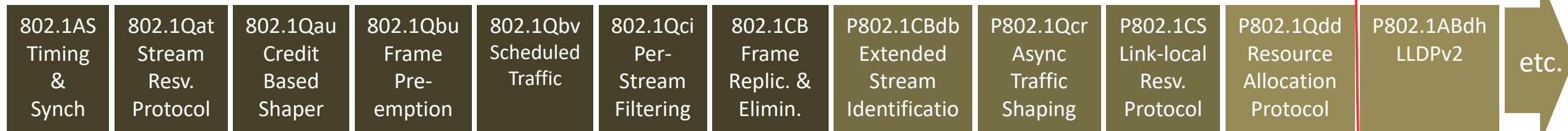
## Profiles:



## Configuration:



## Base technology:



IETF 103

time

# TSN Tools and Configuration

## Developments Since IETF 103

### TSN Components

#### Time synchronization:

Timing and Synchronization (802.1AS)  
includes a profile of IEEE 1588  
(revision: P802.1AS-Rev → 802.1AS-2020  
sent to IEEE SA RevCom approval)

Synchronization

#### High Availability / Ultra reliability:

Frame Replication and Elimination (802.1CB)  
Path Control and Reservation (802.1Qca)  
Per-Stream Filtering and Policing (802.1Qci)  
Reliability for time sync (802.1AS-2020)

Reliability

Latency

#### Dedicated resources & API

Stream Reservation Protocol (802.1Qat)  
TSN configuration (802.1Qcc)  
Basic YANG (802.1Qcp)  
YANG for CFM (P802.1Qcx)  
YANG for LLDP (P802.1ABcu)  
YANG for Qbv, Qbu, and Qci (P802.1Qcw)  
YANG & MIB for FRER (P802.1CBcv)  
Extended Stream Identification (P802.1CBdb)  
Link-local Registration Protocol (P802.1CS)  
Resource Allocation Protocol (P802.1Qdd) **new**  
Configuration Enhancements (P802.1Qdj) **new**  
LLDPv2 (P802.1ABdh) **new**

Resource Mgmt

Zero congestion loss =  
Bounded latency

#### Bounded low latency:

Credit Based Shaper (802.1Qav)  
Frame preemption (802.3br & 802.1Qbu)  
Scheduled Traffic (802.1Qbv)  
Cyclic Queuing and Forwarding (802.1Qch)  
Asynchronous Traffic Shaping (P802.1Qcr)  
QoS Provisions (P802.1DC)

Note: P upfront of an ID indicates ongoing Project

# IEEE 802.1 TSN Develops

- The TSN toolbox is being extended
  - New tools are being added as needed / gaps identified
  - Configuration capabilities are being extended
- TSN profiles specify the use of TSN
  - New profiles for new use cases
- **You are welcome to contribute!**
  - <http://ieee802.org/1>
  - <http://ieee802.org/1/tsn>
  - <http://ieee802.org/1/tsn-calls>

