# Cut-Through Forwarding (CTF) in Bridges and Bridged Network – Background and Clarifications

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# Introduction

- The discussion on June 1, 2022 based on contribution https://www.ieee802.org/3/ad_hoc/ngrates/public/calls/22_0601/dambrosia_nea_01_220601.pdf, provided a better understanding towards standardizing CTF in IEEE 802.
- This slide set provide the following contents, as a result of the aforesaid discussions:
  - Summarized background/motivation on the proposed project P802.1DU
  - Clarification on technical proposals
  - Discussing steps forward

# Background/Motivation for Standardizing CTF

- Some (but not all) technical aspects
  - Standardizing CTF becomes important on the network level, rather than on single link/port level
    - Like for many other 802.1TSN tools, consistent (and sometimes automatic) configuration via a unified management is required throughout entire networks/network segments with multi-vendor settings
    - QoS aspects (e.g., proper use of CTF in topological loops)
  - Environments where higher link speeds, different topologies and/or existing protocols (e.g., preemption) are no alternative to CTF
- Pointers
  - IEEE 802 July 2021 Plenary Tutorial (https://mentor.ieee.org/802.1/dcn/21/1-21-0037-00-ICne-ieee-802-tutorial-cut-through-forwarding-ctf-among-ethernet-networks.pdf)
  - Presentations since 2016 - please have a look at slides 3 through 5 of https://mentor.ieee.org/802.1/dcn/22/1-22-0017-02-ICne-cut-through-forwarding-ctf-in-bridges-and-bridged-network-status-update.pdf for various references

# Technical Proposals for CTF in IEEE 802 (1)

- **The author's recent technical proposal for P802.1DU (https://mentor.ieee.org/802.1/dcn/22/1-22-0021-03-ICne-ctf-considerations-on-modelling-compatibility-and-locations.pdf)**
  - Retains frame resolution interfacing between MACs and MAC client (bridge)
  - Enables CTF for MACs that support it, but does not make CTF a pre-requisite for conformance to P802.1DU (i.e., CTF as a feature, not as an obligation)
  - Opportunities w.r.t. 802.3 MAC conformance
    - With the understanding that MACs conformant to Std 802.3 cannot support transmission start before complete reception in bridges, such bridges can be conformant to P802.1DU nonetheless. In addition, there seems to be no general issue in adding associated statements in a standard.
    - As some MAC implementations otherwise conformant to Std 802.3 may support transmission start before complete reception in bridges, the proposal should not require to touch the Std 802.3 MAC Pascal models for enabling CTF.
  - Does not preclude initiation of additional MAC project(s), even if during the course of P802.1DU.

# Technical Proposals for CTF in IEEE 802 (2)

- **Alternative technical proposals welcomed by the author!**
  - Alternative technical proposals may exist, with or without additional MAC projects in WG 802.3 or another venue, and the author would welcome associated presentations.
  - In this context, some past concerns related to atomicity of frame transfers may imply underlying technical assumptions about some (new and unpresented) octet- or bit-resolution interfacing between MAC and MAC client (bridge). The author's recent technical proposal does not require to change the resolution of this interfacing, but the author would be interested in seeing associated technical presentations nonetheless.

# Discussing Steps Forward

- A good proposal for potential outcomes of this joint Nendica/NEA activity: https://www.ieee802.org/3/ad_hoc/ngrates/public/calls/22_0601/dambrosia_nea_01_220601.pdf, slide 4
- Limiting on project setups (i.e., interpretation of published Stds excluded) and taking the June 1 discussion into account, these potential outcomes may be summarized as follows:
  A. Agree that an 802.1 project and no 802.3 project is required
  B. Agree that an 802.1 project and a complementary MAC project (in WG 802.3 or another venue) are required
  C. Agree to disagree on either option A or B
- Main points
  - There seems to be no doubt that an 802.1 project is needed.
  - To the author's understanding, transitions between items (e.g., C. to B.) during subsequent joint ad hoc meetings or even during an 802.1 project would be acceptable.

# Thank You for Your Attention!

Questions,
Comments,
Opinions,
Ideas?