Nendica Status Report, March 2022

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ICA Overview

- IEEE 802 "*Network Enhancements for the Next Decade*" Industry Connections Activity (ICA)
  - ICA: Industry Connections Activity
  - Authorized by IEEE SA
    - Through "Industry Connections Committee (ICCom)"
    - via an "Industry Connections Activity Initiation Document (ICAID)", parallel to a PAR
    - "Industry Connections activities provide an efficient environment for building consensus and developing many different types of shared results. Such activities may complement, supplement, or be precursors of IEEE Standards projects, but they do not themselves develop IEEE standards."

Nendica History

- Outgrowth of a recommendation of IEEE 802 5G Standing Committee of 2016
  - Seeking "an external view into general 802 access network" to "support many 802 MACs and PHYs"
  - that view evolved during ICAID development
- ICAID
  - March 2017 - March 2019: original ICAID IC17-001-01
  - March 2019 - March 2021: renewed ICAID IC17-001-02
  - Sept 2021 - Sept 2022: renewed ICAID IC17-001-03

Nendica "Motivation and Goal"

- The goal of this activity is to document emerging requirements and directions for IEEE 802 networks, identify commonalities, gaps, and trends not currently addressed by IEEE 802 standards and projects, and facilitate building industry consensus towards proposals to initiate new standards development efforts. Encouraged topics include enhancements of IEEE 802 communication networks and vertical networks as well as enhanced cooperative functionality among existing IEEE standards in support of network integration. Topics concerning higher-layer applications related to new standards development in the IEEE 802.1 Working Group are also specifically expected and encouraged. Findings related to existing IEEE 802 standards and projects are forwarded to the responsible working groups for further considerations.
  - https://standards.ieee.org/content/dam/ieee-standards/standards/web/governance/iccom/IC17-001-IE.pdf

Nendica Overview

- Web site
  - https://1.ieee802.org/802-nendica/
- Voting
  - organized under 802.1 WG
  - no members; anyone attending may vote on all motions
- Document storage –mentor
  - https://mentor.ieee.org/802.1/documents?is_group=ICne
- Mailing List
  - STDS-802-NEND@LISTSERV.IEEE.ORG
- Organization
  - Work Items to develop Nendica Reports for publication
  - Study Items for less formal activity, or for proposing a Work Item
  - Vetting activities

Published Nendica Reports

- *IEEE 802 Nendica Report: The Lossless Network for Data Centers* (ISBN 978-1-5044-5102-4)
  - Editor: Paul Congdon
  - Published 2018-08-17
- *IEEE 802 Nendica Report: Flexible Factory IoT — Use Cases and Communication Requirements for Wired and Wireless Bridged Networks* (ISBN 978-1-5044-6229-7)
  - Editor: Nader Zein
  - Published 2020-04-17
- *IEEE 802 Nendica Report: Intelligent Lossless Data Center Networks* (ISBN 978-1-5044-7741-3)
  - Editor: Liang Guo and Paul Congdon
  - Published 2021-06-22

Nendica Meetings

- Have been meeting Thursdays (09:00-11:00 ET)
- Authorized to add ad hocs if necessary

Date	Attendance
2021-11-18	19
2021-12-02	17
2021-12-09	19
2021-12-16	18
2021-12-23	11
2022-01-06*	8

*16:00 ET

Date	Attendance
2022-01-20	30
2022-01-27	19
2022-02-03	21
2022-02-10	22
2022-02-17	15
2022-02-24	15

Nendica Activity

- Study Item: "Evolved Link Layer Architecture [ELLA]"
  - https://1.ieee802.org/nendica-ella/
  - Initiated 22 July 2021
- Study Item: "Cut-Through Forwarding in Bridges and Bridged Networks"
  - https://1.ieee802.org/nendica-ctf/
  - Initiated March 2021
- Vetting Topics
  - ICAID renewal proposal says "Topics concerning higher-layer applications related to new standards development in the IEEE 802.1 Working Group are also specifically expected and encouraged."
  - on July 20, 2021, the IEEE 802.1 WG Chair notified the 802.1 WG Opening Plenary Meeting of
    - "Migration towards vetting all new work in Nendica"
    - "Strong proposals can be directed to the TG/WG to initiate a PAR; Proposals needing more consensus can be further developed."
  - Completed topics:
    - PFC headroom (led to PAR P802.1Qdt for March consideration)
    - Pulsed Queuing: vetted and transitioned to TSN
  - Recent topics reported below.

ELLA

- Support IEEE 802 activities toward the revision of IEEE Std 802
- Decided to pursue two PAR directions:

1. ## Maintenance Revision

   - Draft ELLA Report finalized 2022-01-27
   - Report and Proposed PAR content passed to Technical Plenary & Maintenance TG
   - PAR forwarded to 802 EC & NesCom
   - Anticipating project authorization in March (Maintenance TG)

2. ## Comprehensive amendment(s)

   - Expect to extend ELLA Report by May 2022
   - Recommend that Maintenance TG brings a motion at 802.1 Closing Plenary (March 2022):
     - *802.1 authorizes pre-circulation to the July IEEE 802 Plenary Session of one or more PARs/CSDs to amend IEEE Std 802, as reviewed in the Maintenance Task Group, based a Nendica report on the topic and considering information from the 802 Technical Plenary.*

CTF

- Study Item: "Cut-Through Forwarding in Bridges and Bridged Networks"
- Tentative goals
  - Develop IEEE 802 Plenary tutorial on Cut-Through Forwarding (CTF)
  - Identify and analyze relevant technical elements in IEEE Std 802.3
  - Discuss administrative and technical aspects of potential lower layer modelling across IEEE 802.3 and IEEE 802.1 with support for CTF
  - Discuss contributions with input for PAR&CSD of a potential IEEE 802.1 project for standardizing CTF (standalone standard):
    - With support for *IEEE 802.3 compatible real implementations*
    - Incorporate lower layer model with support for CTF, if such a model becomes available during such a project.
- Consensus-building report (September 2021)
  - *Nendica consensus is that further discussion should be brought to the 802.1 WG or a Task Group.*
- Led to PAR P802.1DU for March consideration
- Study Item remains on weekly agenda, 0 minutes allocated
- Has been following up to make video of July tutorial widely available
  - https://1.ieee802.org/july-2021-plenary-session-electronic/

Recent Vetting Topics

- Low Latency Ethernet
  - 1-21-0072-00 (Huajie Bao, 2021-11-17)
- Open, Softwarized, Data-Driven 802 Networks
  - 1-21-0078-02 (Francesco Restuccia, 2021-12-21)
  - 1-21-0078-03 (Francesco Restuccia, 2022-01-06)
  - 1-21-0078-04 (Francesco Restuccia, 2022-02-10)
- Source Flow Control
  - See following slide

Vetting Topic: Source Flow Control

- Contributions
  - 1-21-0055-00 (JK Lee, 2021-09-15)
  - 1-21-0061-00 (Lily Lv, 2021-10-12)
  - 1-21-0067-00 (Lily Lv, 2021-11-04)
  - 1-21-0068-01 (Paul Congdon, 2021-11-11)
  - 1-21-0077-00 (Lily Lv, 2021-12-13)
  - 1-21-0079-00 (Paul Congdon, 2021-12-22)
  - 1-22-0001-00 (Paul Congdon, 2022-01-19)
  - 1-22-0001-01 (Paul Congdon, 2022-01-27)
  - 1-22-0005-00 (Paul Bottorff, 2022-02-18)
- Goals/Objectives
  - Remotely invoke Flow Control at the Source (Server Attachment) in data center
  - Proposed amendment to 802.1Q
  - Leverage mechanisms from Congestion Isolation
- Introduced to TSN Jan 2022
  - https://ieee802.org/1/files/public/docs2022/new-congdon-SFC-overview-0122-v01.pdf
- *Nendica consensus is that further discussion of this topic should proceed to the 802.1 TSN Task Group for PAR/CSD development.*