





## 2 802.1 Officers and Management

<b>Glenn Parsons</b>	Working Group Chair
<b>John Messenger</b>	Working Group Vice-Chair and acting Chair
<b>Jessy Rouyer</b>	Working Group Secretary and acting Vice-Chair
<b>Paul Congdon</b>	Maintenance Task Group Chair
<b>Max Riegel</b>	OmniRAN Task Group Chair
<b>Mick Seaman</b>	Security Task Group Chair
<b>János Farkas</b>	Time-Sensitive Networking Task Group Chair
<b>Craig Gunther</b>	Time-Sensitive Networking Task Group Vice-Chair
<b>Marina Gutiérrez</b>	Time-Sensitive Networking Task Group Secretary
<b>Ludwig Winkel</b>	IEC/IEEE 60802 Joint Project Chair
<b>Josef Dorr</b>	IEC/IEEE 60802 Joint Project Secretary
<b>Roger Marks</b>	Nendica Chair
<b>Scott Mansfield</b>	YANGsters Chair
<b>Stephan Kehrer</b>	YANGsters acting Chair
<b>Mark Hantel</b>	Email Maintenance and IEC/IEEE 60802 Joint Project Website Maintenance
<b>Paul Unbehagen</b>	Website Maintenance
<b>Hal Keen</b>	Email Maintenance

## 3 Maintenance Task Group

Minutes of the TG conference calls held since the last plenary session are available at <https://1.ieee802.org/maintenance/>.

**Tuesday 21 May 2019**

**8:00 AM call to order by the TG Chair**

The Maintenance Task Group Chair, Paul Congdon, presided and wrote the minutes.

At the beginning of the meeting the TG Chair presented the IEEE-SA PatCom Patent Slides for Standards Development Meetings <https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf>, the IEEE 802 Participation slide <https://mentor.ieee.org/802-ec/dcn/17/ec-17-0093-05-0PNP-ieee-802-participation-slide-ppt.ppt>, and made the Call for Potentially Essential Patents. There were no responses to the call prior to the end of the meeting.

The TG Chair:

- Introduced the agenda per *Maintenance Task Group Meeting May 21, 2019 Agenda* in <http://www.ieee802.org/1/files/public/docs2019/maint-congdon-session-0519-v01.pdf> that was approved.
- Presented *Document Vehicles -Status Update* in <http://www.ieee802.org/1/files/public/docs2019/maint-congdon-session-0519-v01.pdf>.
- Led the discussion of open and new maintenance items.
  - 0205 - Include regional Navigation satellite systems into IEEE Std 802.1CM
  - 0223 - Maintenance Request: IEEE8021-SRP-MIB inappropriate SYNTAX for ieee8021SrpStreamDataFramePriority
  - 0224 - Clarify whether frame ends on last bit or after the inter-packet gap and preamble
  - 0225 - Addendum to Maintenance Request 0223: IEEE8021-SRP-MIB inappropriate SYNTAX for ieee8021SrpStreamDataFramePriority
  - 0226 - 802.1CB Active Destination MAC and VLAN Stream identification
  - 0227 - 802.1CB Required stream identification methods
  - 0228 - 802.1AE-2018 incorrect text in Figure 9-4
  - 0229 - 802.1CB IP Stream identification
  - **Disposition:** Details for discussion on all new items were logged in the IEEE 802.1 Maintenance database at <https://www.802-1.org/home> where items progressed at the meeting can be reviewed by selecting 'Meetings'.
- Led a review of the JTC1/SC6 pre-ballot results for IEEE 802.1AE and IEEE 802.1Xck
  - The current status of work that started in March 2019 on responding to pre-ballot comments was discussed. The most recent contribution is available at <http://www.ieee802.org/1/files/public/docs2019/maint-randall-SC6comments1Q1XckAE-0319-v1.pdf>
  - **Disposition:** The Security TG will continue draft responses to the comments. The formal responses will be reviewed and motioned in July 2019.
- Led the review of the status of standards in the SC6 engagement and PSDO process
  - The current status of 802.1 documents using the PSDO process for international standardization was reviewed. The status slides are part of the maintenance meeting material at <http://www.ieee802.org/1/files/public/docs2019/maint-congdon-session-0519-v01.pdf>.

### **Future meetings/teleconferences**

The next teleconferences, if needed, will be held on Tuesday July 9, 2019 at 8:00 AM Pacific, unless cancelled prior to the call.

The TG meets face-to-face next at the July 2019 IEEE 802 Plenary session in Vienna, Austria.

### **Any Other Business**

No further business was discussed in this session.

### **9:50 AM adjournment**

Post-meeting, the TG Chair provided session slides updated based on discussion in <http://www.ieee802.org/1/files/public/docs2019/maint-congdon-session-0519-v02.pdf>. The TG website at <http://www.ieee802.org/1/maint.html> provides further details and discussion.

## 4 Security Task Group

The Security Task Group Chair, Mick Seaman, presided and wrote the minutes.

Minutes of the TG conference calls held since the last plenary session are available at <https://1.ieee802.org/security/security-task-group-minutes/>.

At the beginning of the TG meetings on Monday, Tuesday, and Wednesday, the TG Chair presented the IEEE-SA PatCom Patent Slides for Standards Development Meetings <https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf>, the IEEE 802 Participation slide <https://mentor.ieee.org/802-ec/dcn/17/ec-17-0093-05-0PNP-ieee-802-participation-slide-ppt.ppt>, and made the “Call for Potentially Essential Patents”. There were no responses to the calls prior to the end of the week’s meetings.

Additionally to the participants listed in section 1 who registered in IMAT, the following individuals also participated:

- John Messenger, Adva [Monday AM]
- Mick Seaman, Independent [Monday AM]

The draft agenda posted on the 802.1 website prior to the meeting was reviewed by the TG Chair at the beginning of the TG meeting on Monday AM.

1. Traffic flow privacy
2. A.O.B
3. Future meetings/teleconferences

### Monday 20 May 2019

**9:10 AM call to order by the TG Chair, 10:00 – 10:30 AM recess**

#### **A.O.B**

The TG Chair reported that he had received, as P802.1X-Rev editor, RAC review comments on the WG balloted draft. These will be addressed in the TG teleconference to be held June 4, 2019 (details previously announced to the 802.1 email reflector).

The TG Chair reported that work on P802.1AE-Cor1 will begin once the PAR is approved. (The PAR was approved May 21, 2019.)

#### **Traffic flow privacy**

Mick Seaman presented *Individual contribution - Media Access Control (MAC) Security - Amendment: MAC Privacy protection* <http://www.ieee802.org/1/files/public/docs2019/new-seaman-mac-privacy-0519-v00.pdf>.

- The purpose of this document was to see how the proposed work (see March 2019 minutes) could fit as an 802.1AE amendment, teasing out the potential scope of the work to assist PAR development. It necessarily mimics the formalism of an amendment, but is an individual contribution, not agreed text. The related work is not, and may not become, an approved project.
- Pages in the document are labelled as copyright IEEE not to indicate status, but because it includes text from IEEE Std 802.1AE-2018 to facilitate discussion.

- The title "MAC Privacy protection" is suggested, as better conveying the relationship between the proposed work and MAC Security. Privacy protection is described as implemented by an ISS shim that can be positioned directly over MACsec, or in an adjacent system, supporting the use of existing MACsec implementations and EDEs under a privacy protecting sublayer.
- The suggested Clause 17 attempts to cover issues (as applicable to privacy protection) similar to those in Clause 6 of 802.1AE, with Clauses 18, 19, and 20 corresponding to 802.1AE Clauses 8, 9, and 10.
- The contribution does not include material corresponding to 802.1AE Clause 11 (MAC Security in Systems) or Clause 15 (EDEs), though the intent of defining privacy support as a shim was to avoid redefining functionality available from existing bridge components (e.g. tagging, sorting into flows based on address lookup) as was done for EDEs, though details have not yet been examined.

The WG Chair had provisionally assigned 'dk' to identify the proposed 802.1AE amendment.

The TG Chair led a discussion of the interaction between MAC Privacy protection and Quality of Service in general, and TSN capabilities in particular.

- Reducing an adversary's ability to draw conclusions from frame sizes and timing necessarily impacts Quality of Service. A transmitter protecting privacy has to balance that impact against the degree of privacy protection provided (a receiver is expected to be able to decapsulate all legally encoded/encapsulated/padded privacy protected frames).
- A transmitter might have some knowledge of the receiver's characteristics, in as much as decapsulation performance might guide encapsulation choices, but any controls must avoid the possibility of fall back to transmission without privacy protection where the network administrator expects it to be applied.
- Privacy protection can be expected to be desired most on links that are most exposed, including links carried by service providers where the end-to-end delay is a significant multiple of the 'on the wire' frame time. Frame delays resulting from a (near-)fixed transmission schedule can be expected to be less significant in those cases, although there will always be some (not necessarily easily calculable) reduction in available bandwidth from padding.
- Other uses cases could include data center-to-data center backup, and backhauling of telephone traffic.
- Privacy protection padding and transmission scheduling are expected to occur independently of existing and under development bridge traffic shaping and transmission selection algorithms, such as ATS and PSFP. Combining their description would be a major complication, and not warranted for use cases where privacy is most desired.

**12:35 – 1:45 PM and 3:00 – 3:30 PM recesses**

### **Traffic flow privacy**

The TG Chair led a discussion of a PAR for the proposed work.

**Disposition:** the objective for this week was to develop information for the whole of 802.1 to facilitate 802.1 approval of a July 2019 motion authorizing the drafting of an 802.1AE MAC Privacy protection amendment PAR in the September 2019 interim, and authorizing pre-circulation of that draft PAR to 802.0 prior to the November plenary. PAR text discussion continued on Tuesday. Discussion of background information continued on Wednesday.

**4:15 PM recess**

**Tuesday 21 May 2019**

**10.35 AM call to order by the TG Chair**

**Traffic flow privacy**

The TG Chair led a discussion on MACsec implementation styles, and the way that they could affect MAC Privacy protection padding and encapsulation.

- Need to be aware of the different approaches as they could strongly influence what project participants would deem feasible or obvious. Could be difficult to close on acceptable approaches without explicit discussion of assumptions.
- MACsec is often implemented as part of streaming packet in and out of memory, with parallel operations on the packet stream. An early option to offset confidentiality, allowing the exposed data to determine where each received packet is placed in memory prior to cryptographic processing, is believed never to have been used and was deliberately omitted from later Cipher Suites.
- MAC Privacy protection padding could also be added/removed in stream, facilitating octet-level timing support with individual pad octets. The padding could be removed on reception, without requiring any supporting memory accesses. Such padding could reduce the difficulty of receiving back-to-back minimum sized frames.
- However, an implementation adding packet descriptors to a DMA structure would be more efficient if it did not have to read through each octet of a pad. An encapsulated structure using larger pad fragments could reduce that burden.
- Agreement on detailed project objectives prior to PAR approval is premature; however, efficient implementation across a variety of platforms/implementation styles is a common security objective (e.g. in Cipher Suite selection).

The TG chair led a discussion of text for a draft PAR Scope and Need, to facilitate further 802.1 discussion in July 2019 and to help in soliciting input from other MACsec implementers.

**Disposition:** Draft PAR text for *Amendment to IEEE Standard 802.1AE-2018 Media Access Control (MAC) Security - Amendment 4: Media Access Control (MAC) Privacy protection*  
<http://www.ieee802.org/1/files/public/docs2019/dk-seaman-mac-privacy-protection-draft-par-0519-v00.pdf>

**12:30 – 1:35 PM and 3:05 – 3:30 PM recesses**

**Traffic flow privacy**

The TG Chair led a discussion of the structure of the 802.1X and 802.1AE UML management models (Figure 12-3 of IEEE Std 802.1X-2010 and P802.1X-Rev, and Figure 10-5 of IEEE Std 802.1AE-2018) and its relationship to a YANG model for MACsec.

- An interface has a single ifType, which seems an inadequate description of an interface stack when augmentation is being used. If the ifType is updated automatically by an augmentation, it might reflect the order of application of multiple augmentations rather than the resulting stack. The working assumption was that the administrator would choose its value, as described in the NOTE in 14.4.4 of P802.1X-Rev/D1.0: "In Figure 14-6, it is assumed that the network manager has overwritten the ifType to reflect the service provided by the augmented interface, i.e., that of a Bridge Port."
- YANG appears to offer only primitive support for simple mapping tables, such as those required for mapping userPriority to trafficClass.
- An open question was to what degree YANG specifies or controls the resulting of applying a configuration and to what degree it relies on separate target device code taking note of a configuration change and applying processing specified outside YANG



to implement the desired configuration.

**Disposition:** YANGsters and other 802.1 YANG experts to be consulted on outstanding modeling issues.

#### 4:40 PM recess

### Wednesday 21 May 2019

#### 9:15 AM call to order by the TG Chair, 10:00 – 10:45 AM recess

#### Traffic flow privacy

The TG chair led a discussion of FrameMaker use in IEEE Std 802.1AE and amendments.

The TG Chair led a discussion on the information needed for presentation to the rest of 802.1 and to others potentially interested in MAC Privacy protection.

Don Fedyk presented *Ethernet - Traffic Flow Security*

<http://www.ieee802.org/1/files/public/docs2019/new-fedyk-traffic-flow-security-slides-0519-v00.pdf>

**Disposition:** A summary of *MAC Privacy protection* and a plan for PAR production for 802.1 and other potential participants are in <http://www.ieee802.org/1/files/public/docs2019/new-seaman-mac-privacy-summary-0519-v00.txt>.

#### Future meetings/teleconferences

Agreed (informally, none dissenting) to hold teleconferences for progression of work as identified during this session and to address TG matters arising, subject to the usual required notice.

The TG will meet during the July 2019 IEEE 802 session in Vienna, Austria.

#### Any Other Business

No further business was discussed in this session.

#### 12:00 PM adjournment

## 5 Time-Sensitive Networking Task Group

The Time-Sensitive Networking (TSN) Task Group Chair, János Farkas, presided. The TG Secretary, Marina Gutiérrez, wrote the minutes.

Minutes of the TG conference calls held since the last plenary session are available at <https://1.ieee802.org/tsn-calls/>.

At the beginning of the meetings on Monday, Tuesday, Wednesday, Thursday, and Friday the TG Chair or Vice-Chair presented the IEEE-SA PatCom Patent Slides for Standards Development Meetings

<https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf>, the IEEE 802 Participation slide <https://mentor.ieee.org/802-ec/dcn/17/ec-17-0093-05-0PNP-ieee-802-participation-slide-ppt.ppt>, and made the Call for Potentially Essential Patents. There were no responses to the calls prior to the end of the week's session.



**Monday 20 May 2019**

**8:32 AM call to order by the TG Chair**

The TG Chair presented the agenda in <https://1.ieee802.org/may-2019-interim-meeting-in-salt-lake-city-ut-usa-tsn-tg-agenda/>

**Disposition:** The agenda was reviewed, discussed and approved.

The TG Chair presented:

- Liaised *P1588/D1.4V4\_04, September 2018 Draft Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems*  
[http://www.ieee802.org/1/files/private/1588-drafts/IEEE%201588-2018%20Draft%20Standard-D1.4V4\\_04.pdf](http://www.ieee802.org/1/files/private/1588-drafts/IEEE%201588-2018%20Draft%20Standard-D1.4V4_04.pdf)
- 3GPP TSG-RAN WG2's *LS on RoHC utilization for Ethernet header compression*  
[http://ieee802.org/3/minutes/may19/incoming/3GPP\\_R2-1902372\\_to\\_IEEE\\_802\\_Mar\\_2019.pdf](http://ieee802.org/3/minutes/may19/incoming/3GPP_R2-1902372_to_IEEE_802_Mar_2019.pdf)
- 3GPP TSG-RAN WG2's *Update to LS on RoHC utilization for Ethernet header compression*  
[http://ieee802.org/3/minutes/may19/incoming/3GPP\\_R2-1908152\\_to\\_IEEE\\_802\\_May\\_2019.pdf](http://ieee802.org/3/minutes/may19/incoming/3GPP_R2-1908152_to_IEEE_802_May_2019.pdf)
- ITU-T SG15's *LS179 Reply to liaison statement regarding G.8273.2 "Class C"*  
<http://www.ieee802.org/1/files/public/docs2019/liaison-SG15-LS179-G8273-2-Class-C-clock-0319.pdf>

**Disposition:** The liaisons were discussed; more discussion needed.

Geoff Garner, P802.1AS-Rev editor, presented *P802.1AS-Rev/D8.0 Editor's Report Proposed Comment Resolution for Sponsor Ballot* <http://www.ieee802.org/1/files/public/docs2019/as-garner-802-1AS-Rev-d8-0-sponsor-ballot-editors-report-0319-v06.pdf> and led the resolution of comments received on <http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Continued later.

**10:08 – 10:38 AM recess**

Geoff Garner, P802.1AS-Rev editor, continued the resolution of comments received on <http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Continued later.

**12:00 – 1:25 PM recess**

Norman Finn, P802.1CS editor, led the resolution of comments received on <http://www.ieee802.org/1/files/private/cs-drafts/d2/802-1CS-d2-1.pdf>.

**Disposition:** Continued later.

Paul Congdon presented *Updated LLDPv2 proposal*  
<http://www.ieee802.org/1/files/public/docs2019/new-congdon-LLDPv2-0419.pdf>.

**Disposition:** Related to proposed project; the presentation was discussed.

**3:17 – 3:30 PM recess**

Paul Congdon presented and led the review of the draft PAR <http://www.ieee802.org/1/files/public/docs2019/new-congdon-LLDP-multiframe-PAR-0519-v01.pdf> and CSD <http://www.ieee802.org/1/files/public/docs2019/new-congdon-LLDP-multiframe-CSD-0519-v01.pdf> for a proposed *Standard for Local and metropolitan area*

*networks - Station and Media Access Control Connectivity Discovery Amendment: Support for Multiframe Protocol Data Units.*

**Disposition:** New PAR targeted for pre-circulation for consideration for approval at the July 2019 plenary session.

Geoff Garner, P802.1AS-Rev editor, continued the resolution of comments received on <http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Continued later.

#### 6:41 PM recess

### Tuesday 21 May 2019

#### 10:32 AM call to order by the TG Chair

Johannes Specht, P802.1Qcr editor, led the resolution of comments received on <http://www.ieee802.org/1/files/private/cr-drafts/d1/802-1Qcr-d1-0.pdf>.

**Disposition:** Continued later.

#### 12:00 – 1:34 PM recess

Additionally to the participants listed in section 1 who registered in IMAT, the following individuals also participated to this 1:34 – 6:02 PM meeting:

- David Brandt, Rockwell Automation
- Choi Eunmin, DGIST
- Robert Grow, RMG Consulting
- Toshihisa Hyakudai, Sony Electronics Inc.
- Woojin Jeong, DGIST
- Hamid Reza Salehi, Marvell
- Masato Shiino, FURUKAWA ELECTRIC
- Tom Souvignier, Broadcom
- Richard Tse, Microchip
- Peter Un, Marvell
- Dong Wei, Futurewei Technologies

Craig Gunther, P802.1DG editor, showed the web page of the project and presented the editor's draft in <http://www.ieee802.org/1/files/private/dg-drafts/d0/802-1DG-d0-1.pdf>.

**Disposition:** For information only.

Don Panell presented *Automotive Presentations to IEEE Standard Work Flow* <http://www.ieee802.org/1/files/private/dg-drafts/d0/802-1DG-d0-1.pdf>.

**Disposition:** For information only.

Craig Gunther, P802.1DG editor, presented *How to make Progress on P802.1DG* <http://www.ieee802.org/1/private/contrib/dg-cgunther-how-to-progress-0519-v01.pdf>.

**Disposition:** The presentation was discussed.

Don Panell presented *Use Cases – IEEE P802.1DG* <http://www.ieee802.org/1/private/contrib/dg-pannell-automotive-use-cases-0519-v01.pdf>.

**Disposition:** The presentation was discussed.

Rodney Cummings presented *AUTOSAR Time Sync over Ethernet* <http://www.ieee802.org/1/private/contrib/dg-cummings-autosar-time-sync-0519-v01.pdf>.

**Disposition:** Continued after the break.

**3:00 – 3:36 PM recess**

Rodney Cummings continued the presentation *AUTOSAR Time Sync over Ethernet*  
<http://www.ieee802.org/1/private/contrib/dg-cummings-autosar-time-sync-0519-v01.pdf>.

**Disposition:** Presentation was discussed.

Geoff Garner, P802.1AS-Rev editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Continued later.

**6:02 PM recess**

**Wednesday 22 May 2019**

**8:00 AM call to order by the TG Chair and the IEC/IEEE 60802 Joint Project Chair**

Minutes of this meeting, a joint meeting of the TSN TG and IEC/IEEE 60802 Joint Project, are provided in section 6.

**12:00 PM recess**

**1:32 PM call to order by the TG Vice Chair**

Norman Finn, P802.1CS editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/cs-drafts/d2/802-1CS-d2-1.pdf>.

**Disposition:** Continued later.

**3:00 – 3:30 PM recess**

Norman Finn, P802.1CS editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/cs-drafts/d2/802-1CS-d2-1.pdf>.

**Disposition:** Continued later.

The TG Chair presented and led the review of a proposed draft PAR P802.1Qcj PAR extension  
<http://www.ieee802.org/1/files/public/docs2019/cj-PAR-extension-0519-v01.pdf>.

**Disposition:** Continued later.

Paul Unbehagen, P802.1Qcj editor, presented *802.1Qcj D1.0 Status*  
<http://www.ieee802.org/1/files/public/docs2019/cj-unbehagen-editors-report-d1-0-0519-v01.pptx> and led the resolution of comments received on <http://www.ieee802.org/1/files/private/cj-drafts/d1/802-1Qcj-d1-0.pdf>.

**Disposition:** Ballot comments discussed. Disposition recorded in  
<http://www.ieee802.org/1/files/private/cj-drafts/d1/802-1Qcj-d1-0-pdis-v01.pdf>.

The TG Chair continued leading the review of a proposed draft PAR P802.1Qcj PAR extension  
<http://www.ieee802.org/1/files/public/docs2019/cj-PAR-extension-0519-v01.pdf>.

**Disposition:** PAR extension targeted for pre-circulation for consideration for approval at the July 2019 plenary session.

**6:05 PM recess**

**Thursday 23 May 2019**

### 8:00 AM call to order by the TG Vice Chair

The TG Vice Chair presented the agenda in <https://1.ieee802.org/may-2019-interim-meeting-in-salt-lake-city-ut-usa-tsn-tg-agenda/>

**Disposition:** The agenda was reviewed, discussed and approved.

Stephen Haddock, P802.1AX-Rev editor, led the resolution of comments received on <http://www.ieee802.org/1/files/private/ax-rev-drafts/d1/802-1AX-Rev-d1-2.pdf>.

**Disposition:** Ballot comments discussed. Disposition recorded in <http://www.ieee802.org/1/files/private/ax-rev-drafts/d1/802-1AX-Rev-d1-2-dis-v01.pdf>.

Norman Finn, P802.1CS editor, continued the resolution of comments received on <http://www.ieee802.org/1/files/private/cs-drafts/d2/802-1CS-d2-1.pdf>.

**Disposition:** Ballot comments discussed. Disposition recorded in <http://www.ieee802.org/1/files/private/cs-drafts/d2/802-1CS-d2-1-dis.pdf>.

Janos Farkas, P802.1CMde editor, presented the editor's draft in <http://www.ieee802.org/1/files/private/de-drafts/d0/802-1CMde-d0-0.pdf>.

**Disposition:** Draft was discussed.

Paul Congdon, P802.1Qcz editor, presented the editor's draft in <http://www.ieee802.org/1/files/private/cz-drafts/d0/802-1Qcz-d0-0.pdf>.

**Disposition:** Presentation was discussed.

### 10:10 – 10:32 AM recess

Marina Gutiérrez, P802.1Qcw editor, led the resolution of comments received on <http://www.ieee802.org/1/files/private/cw-drafts/d0/802-1Qcw-d0-3.pdf>.

**Disposition:** Ballot comments discussed. Disposition recorded in <http://www.ieee802.org/1/files/private/cw-drafts/d0/802-1Qcw-d0-3-dis-v00.pdf>.

Christophe Mangin, P802.1CBdb editor, presented *802.1CBdb How to spot untagged frames in EISS indications* <http://www.ieee802.org/1/private/contrib/db-mangin-tagged-untagged-stream-id-0519-v01.pptx> and the editor's draft <http://www.ieee802.org/1/files/private/db-drafts/d0/802-1CBdb-d0-0.pdf>.

**Disposition:** The presentation was discussed.

Tongtong Wang presented *Suggestions for Service Provider Profile outline* <http://www.ieee802.org/1/private/contrib/df-wangtt-SP-prof-outline-0519.pdf>.

**Disposition:** The presentation was discussed.

### 12:00 – 1:34 PM recess

Johannes Specht, P802.1Qcr editor, continued the resolution of comments received on <http://www.ieee802.org/1/files/private/cr-drafts/d1/802-1Qcr-d1-0.pdf> and showed *Synthesis of Queue and Priority Assignment for Asynchronous Traffic Shaping in Switched Ethernet* <https://ieeexplore.ieee.org/document/8277291> during the resolution.

**Disposition:** Continued later.

### 3:02 – 3:30 PM recess

Johannes Specht, P802.1Qcr editor, continued the resolution of comments received on <http://www.ieee802.org/1/files/private/cr-drafts/d1/802-1Qcr-d1-0.pdf>.

**Disposition:** Continued later.

Mick Seaman presented *Contribution to P802.1Qcr: organization of 8.6.5*  
<http://www.ieee802.org/1/files/public/docs2019/cr-seaman-8-6-5-organization-0519-v00.pdf>.

**Disposition:** Related to ballot comments. The presentation was discussed.

Johannes Specht, P802.1Qcr editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/cr-drafts/d1/802-1Qcr-d1-0.pdf>.

**Disposition:** Ballot comments discussed. Disposition recorded in  
<http://www.ieee802.org/1/files/private/cr-drafts/d1/802-1Qcr-d1-0-pdis-v03.pdf>.

Geoff Garner, P802.1AS-Rev editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Continued later.

### 6:30 PM recess

## Friday 24 May 2019

### 8:00 AM call to order by the TG Chair and the IEC/IEEE 60802 Joint Project Chair

Minutes of this meeting, a joint meeting of the TSN TG and IEC/IEEE 60802 Joint Project, are provided in section 6.

### 12:00 PM recess

### 1:15 PM call to order by the TG Vice Chair

Geoff Garner, P802.1AS-Rev editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Continued later.

### 3:00 – 3:30 PM recess

Geoff Garner, P802.1AS-Rev editor, continued the resolution of comments received on  
<http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-rev-d8-0.pdf>.

**Disposition:** Ballot comments discussed. Disposition recorded in  
<http://www.ieee802.org/1/files/private/as-rev-drafts/d8/802-1AS-Rev-d8-0-pdis-v08.pdf>.

### Any Other Business

No further business was discussed in this session.

### 6:03 PM adjournment

## 6 IEC/IEEE 60802 Joint Project

Ludwig Winkel, IEC WG9/PT60802 Convenor and IEC/IEEE 60802 Joint Project Chair (60802 Chair), and János Farkas, IEEE 802.1 TSN Task Group Chair (TG Chair), presided. Josef Dorr, IEC/IEEE 60802 Joint Project Secretary (60802 Secretary) wrote the minutes.

At the beginning of the meetings on each day:



- The IEEE-SA PatCom Patent Slides for Standards Development Meetings and the IEEE 802 Participation slide were presented (<http://standards.ieee.org/about/sasb/patcom/materials.html>).
- The Call for Potentially Essential Patents was made. There were no responses to the calls prior to the end of the week's session.
- The IEC WG9/PT60802 Convenor reminded the IEC participants that patent rules similar to those of IEEE-SA apply in IEC, reminded all that patents required for use of the IEC/IEEE 60802 profile must be announced to IEC and IEEE and made available using the IEC licensing form, and reminded that presentations shall not have copyright marks or confidentiality information.
- The agenda and the expected results of the day were reviewed and approved. The final agenda is in <http://www.ieee802.org/1/files/public/docs2019/admin-60802-agenda-0519-v01.pdf> and also available at <https://1.ieee802.org/may-2019-interim-meeting-in-salt-lake-city-ut-tsn-tg-agenda/>.

Draft minutes were reviewed at the end of the week's session under the lead of the 60802 Secretary.

### Wednesday 22 May 2019

#### 8:00 AM call to order by the TG Chair and the 60802 Chair

The TSN TG and IEC/IEEE 60802 Joint Project had a joint meeting.

The TG Chair and the 60802 Chair:

- Welcomed the participants of the IEC/IEEE 60802 Joint Project, a joint effort of the:
  - IEC 65C WG9/PT 60802 (TSN) Project Team, led by Ludwig Winkel; and
  - IEEE 802.1 Time-Sensitive Networking Task Group, led by the TG Chair.
- Provided information about internet access, lunch, attendance log to the IEC/IEEE 60802 Joint Project.

The 60802 Chair reported on the Conformity Assessment (CA) activities. There was a face-to-face meeting in Frankfurt and a follow-up conference call. The IEC/IEEE CA activity will be continued with a face-to-face meeting in Vienna, Austria following the July 22-24 plenary meeting.

Jordon Woods, 60802 editor, presented *Editor's Report 60802 Draft 1.0* <http://www.ieee802.org/1/files/public/docs2019/60802-woods-D10-update-0519-v00.pdf>.

Jordon Woods, 60802 editor, started resolving comments received in the TG ballot and 1<sup>st</sup> IEC Committee Draft (CD) on <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0.pdf>.

**Disposition:** Ballot comments 86, 88, 89, 130, 165, 190-193, 288, 293-297, 299, 301, 302, 499, 500, 523, 524, 537 and 647 resolved as documented in <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0-pdis-v08.pdf>.

#### 10:00 – 10:30 AM recess

Mark Hantel presented *TSN Interdomain Communications* <http://www.ieee802.org/1/files/public/docs2018/60802-Hantel-TSN-Interdomain-Communications-0718.pdf> then *TSN-IA Domains & Constructability* <http://www.ieee802.org/1/files/public/docs2019/60802-Hantel-TSN-IA-Domains-Constructability-0519-v01.pdf> and led a discussion on the definition of a "TSN Domain".

**Disposition:** A common definition applicable to all TSN profiles was considered reasonable.

**12:00 recess**

**1:30 PM call to order by the 60802 Chair**

The IEC/IEEE 60802 Joint Project met separately from the TSN TG until Friday.

Stephan Kehrer and Günter Steindl led a discussion on interoperability issues and how to deal with quantity statements in the 60802 profile. Günter Steindl presented *Quantity Figures* <http://www.ieee802.org/1/files/public/docs2019/60802-Steindl-QuantityFigures-0519-v01.pdf> which were extracted from *Use Cases IEC/IEEE 60802 V1.3* <http://www.ieee802.org/1/files/public/docs2018/60802-industrial-use-cases-0918-v13.pdf>.

**Disposition:** Further discussion needed.

**3:00 – 3:30 PM recess**

Jordon Woods, 60802 editor, continued resolving comments received in the TG ballot and 1<sup>st</sup> IEC CD on <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0.pdf>.

**Disposition:** Ballot comments 289, 291, 495, 87, 504, 312-314, 95, 253, 50, 92-94, 525, 315 and 318 resolved as documented in <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0-pdis-v08.pdf>.

**6:00 PM recess**

**Thursday 14 March 2019**

**8:00 AM call to order by the TG Chair and the 60802 Chair, 10:00 – 10:30 AM recess**

Jordon Woods, 60802 editor, continued resolving comments received in the TG ballot and 1<sup>st</sup> IEC CD on <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0.pdf>.

**Disposition:** Ballot comments 529, 600, 99, 72, 246, 411, 412, 413, 159, 414, 611, 415, 416, 35, 417-421, 461, 247, 73, 462, 463, 601, 507, 19, 402, 245, 403 and 98 resolved as documented in <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0-pdis-v08.pdf>.

A contribution is expected to be provided covering the subject of Quantity Parameters and Values; volunteers to provide the contribution include Mark Hantel, Günter Steindl, Stephan Kehrer, Thomas Enzinger, Astrit Ademaj, Maik Seewald and Josef Dorr.

**12:00 PM recess**

**1:30 PM call to order by the 60802 Chair with 15:00 – 15:30 PM recess**

Jordon Woods, 60802 editor, continued resolving comments received in the TG ballot and 1<sup>st</sup> IEC CD on <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0.pdf>.

**Disposition:** Ballot comments 4, 408, 407, 402, 405, 134, 528, 251, 252, 34, 319, 250, 316, 317, 505, 320, 51, 3, 7, 8, 609, 315, 189, 292, 522, 188, 48, 304, 500, 306, 501, 131, 307, 502, 309, 310, 321, 6, 194, 195, 530, 248, 166, 468, 595, 36, 56, 469, 100, 614, 615, 20, 466, 465, 464, 226, 136, 27, 571, 148, 344, 422, 423, 622, 431, 438, 431, 443 and 457 resolved as documented in <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0-pdis-v08.pdf>.



**6:00 PM recess**

**Friday 15 March 2019**

**8:00 AM call to order by the TG Chair and the 60802 Chair, 10:00 – 10:30 AM recess**

The TSN TG and IEC/IEEE 60802 Joint Project had a joint meeting.

The TG Chair and the 60802 Chair summarized the work performed so far in this session.

Stephan Kehrer presented *TSN Configuration Enhancements PAR and CSD Discussion Material* <http://www.ieee802.org/1/files/public/docs2019/new-kehrer-config-enhance-PAR-CSD-discussion-v01.pdf> and led the review of the draft PAR <http://www.ieee802.org/1/files/public/docs2019/dj-draft-PAR-0519-v01.pdf> and CSD <http://www.ieee802.org/1/files/public/docs2019/dj-draft-CSD-0519-v01.pdf> for a proposed *Standard for Local and Metropolitan Area Networks--Bridges and Bridged Networks Amendment: Configuration Enhancements*.

**Disposition:** New PAR and CSD targeted for pre-circulation for consideration for approval at the July 2019 IEEE 802.1 plenary session.

**12:00 PM recess**

**1:15 PM call to order by the 60802 Chair**

The IEC/IEEE 60802 Joint Project met separately from the TSN TG until adjournment.

Josef Dorr presented *Distributed Stream Configuration in Industrial Automation* <http://www.ieee802.org/1/files/public/docs2019/60802-dorr-distributedConfiguration-0319-v01.pdf>.

**Disposition:** Further discussion needed.

Jordon Woods, 60802 editor, continued resolving comments received in the TG ballot and 1<sup>st</sup> IEC CD on <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0.pdf>.

**Disposition:**

- Ballot comments 430, 376, 606, 393, 185, 45, 69, 242, 626, 636, 627, 128, 277, 628, 187, 521, 85, 423, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 644, 646, 645, 90, 91, 196, 132, 197, 198, 527, 96, 17, 9, 10, 642, 200, 401, 97, 18, 225, 467, 227, 167, 508, 531, 616, 249, 610, 536, 75, 168, 74, 617, 176 and 184 resolved as documented in <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0-pdis-v08.pdf>.
- Final disposition (updated with ballot statistics including comments received from IEC) made available post-meeting and to be circulated to IEC National Committees: <http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-0-dis-v01.pdf>

**Next steps**

Further contributions are welcome to be made and presented by their contributors at the July 2019 plenary session in Vienna, Austria for potential incorporation into the next balloted draft. The next TG ballot and 2<sup>nd</sup> IEC CD circulation on draft 1.1 of IEC/IEEE 60802 are expected after the July 2019 IEEE 802.1 plenary session.

**3:00 - 3:30 PM recess**

## Future meetings/teleconferences

The IEC/IEEE 60802 Joint Project meets next July 17-19 during the July 2019 IEEE 802.1 plenary session in Vienna, Austria: if the dates need to be changed due to meeting room unavailability, the change would be announced to the IEC/IEEE 60802 Joint Project.

The next teleconference will take place on June 24, 2019.

## Any Other Business

No other IEC/IEEE 60802 Joint Project business was discussed in this session.

## 5:00 PM adjournment

# 7 Nendica

The IEEE 802 Network Enhancements for the Next Decade Industry Connections Activity (Nendica) Chair, Roger Marks, presided and wrote the minutes.

Minutes of the Nendica conference calls held since the last plenary session are available at <https://1.ieee802.org/802-nendica/>.

In addition to the participants listed in section 1 who registered in IMAT, the following individuals also participated:

- Matthias Fritsche, HARTING Electronics GmbH (second meeting)
- Dave Hess, CORD DATA (first meeting)
- Larry McMillan, Western Digital (first meeting)
- Hans Lackner, QoSCom GmbH (second meeting)
- Masood Shariff, CommScope (second meeting)

## Monday 20 May 2019

### 1:30 PM call to order by the Nendica Chair

The Nendica Chair presented the IEEE-SA Guidelines for IEEE-SA Meetings <https://development.standards.ieee.org/myproject/Public/mytools/mob/preparslides.pdf>, the IEEE 802 Participation slide <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0180.pdf>, and IEEE ICCOM requirements <https://1.ieee802.org/802-nendica/ieee-iccom-requirements/>.

### Agenda Approval

The Nendica Chair presented a proposed agenda.

**Disposition:** The agenda was reviewed, discussed and approved (at 1:39 PM), as recorded in *Approved Nendica Agenda: 2019-05-20/21* <https://mentor.ieee.org/802.1/dcn/19/1-19-0042-00-ICne.pdf>.

### Update

The Nendica Chair showed the Nendica webpage <https://1.ieee802.org/802-nendica/>, the documents on the Mentor server to be discussed, and how to record attendance on IMAT.

The Nendica Chair presented *IEEE 802 Network Enhancements for the Next Decade” Industry Connections Activity (Nendica): Status Report* <https://mentor.ieee.org/802.1/dcn/19/1-19-0038->

[00-ICne.pptx](#) (subsequently updated as <https://mentor.ieee.org/802.1/dcn/19/1-19-0038-01-ICne.pptx>).

## Review of Minutes

The Nendica Chair reviewed draft minutes of the prior Nendica conference call and of the May 14, 2019 Nendica meeting in Atlanta, GA, USA. A motion was made to approve those documents, along with the minutes of three prior teleconferences that had previously been reviewed in earlier meetings.

**Disposition:** No comments were raised. The following motion was presented:

- **Motion:**
  - To approve the following minutes documents: 802.1-19-0028-00 (2019-04-10), 802.1-19-0034-00 (2019-04-18), 802.1-19-0036-00 (2019-04-24), 802.1-19-0037-00 (2019-05-07), 802.1-19-0040-00 (2019-05-14).
  - Moved by Zein, seconded by Maruhashi
  - Approved by unanimous consent (1:53 PM)

## Future Directions

A solicitation for potential new work items was noted by the Nendica Chair. No comments were raised.

## Flexible Factory IoT: Use Cases and Communication Requirements for Wired and Wireless Bridged Networks (FFIoT)

Beginning at 1:55 PM, Nader Zein, FFIoT draft report editor, presented *FFIoT Status report - May 2019* <https://mentor.ieee.org/802.1/dcn/19/1-19-0039-00-ICne.pptx>.

At 2:00 PM, Nader Zein, FFIoT draft report editor, began leading the comment resolution based on the database in *Consolidated FFIOT Comments* <https://mentor.ieee.org/802.1/dcn/19/1-19-0033-03-ICne.xlsx>.

## 3:30 PM recess

**Tuesday 21 May 2019**

## 1:31 PM call to order by the Nendica Chair

The Nendica Chair reconvened the meeting and reminded the group of the IEEE-SA Guidelines for IEEE-SA Meetings, the IEEE 802 Participation slide, and the IEEE ICCOM requirements. He noted that the meeting would proceed with the agenda item on FFIoT comment resolution, from the prior meeting.

Nader Zein, FFIoT draft report editor, continued to lead the comment resolution based on the database in *Consolidated FFIOT Comments* <https://mentor.ieee.org/802.1/dcn/19/1-19-0033-03-ICne.xlsx>, beginning with a status update.

## 3:30 – 7:31 PM recess

The Nendica Chair reconvened the meeting and reminded the group of the IEEE-SA Guidelines for IEEE-SA Meetings, the IEEE 802 Participation slide, and the IEEE ICCOM requirements. He noted that the meeting would proceed with the agenda item on FFIoT comment resolution, from the prior meeting.

Nader Zein, FFloT draft report editor, continued to lead the comment resolution based on the database in *Consolidated FFloT Comments* <https://mentor.ieee.org/802.1/dcn/19/1-19-0033-03-ICne.xlsx>, until 9:20 PM.

### **Lossless Data Center Networks (LLDCN)**

The Nendica Chair noted his submission of a proposed speaking track at NANOG 76 related to LLDCN.

### **Future meetings/teleconferences**

The next Nendica face-to-face meeting will be during the July 2019 IEEE 802 plenary session in Vienna, Austria. The plan is to request a two-hour slot on Tuesday July 16, 2019, 7:30 PM, with an additional meeting request for Thursday July 18, 2019, 8:00 AM.

Two teleconferences were agreed, using <https://join.me/Nendica802>:

- June 5, 2019 2:00 PM ET
- June 17, 2019 9:00 AM ET

### **Any Other Business**

No further business was discussed in this session.

### **9:27 PM adjournment**

## **8 YANGsters**

The acting YANGsters Chair, Stephan Kehrer, presided and wrote the minutes.

Minutes of the TG conference calls held since the last plenary session are available at <https://1.ieee802.org/yangsters/>.

Additionally to the participants listed in section **Error! Reference source not found.** who registered in IMAT, the following individuals also participated:

- Weiyang Cheng, Infinera
- Rodney Cummings, National Instruments
- Marina Gutiérrez, TTTech Computer AG
- Scott Mansfield, Ericsson, YANGsters Chair (remotely)

### **Tuesday 21 May 2019**

#### **6:05 PM call to order by the YANGsters Chair**

The acting YANGsters Chair presented the IEEE-SA PatCom Patent Slides for Standards Development Meetings <https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf>, the IEEE 802 Participation slide <https://mentor.ieee.org/802-ec/dcn/17/ec-17-0093-05-OPNP-ieee-802-participation-slide-ppt.ppt>, and made the “Call for Potentially Essential Patents”. There were no responses to the call prior to the end of the week’s meeting.

The acting YANGsters Chair presented the agenda in

<http://www.ieee802.org/1/files/public/docs2019/yangsters-smansfield-slc-agenda-0519.pdf>.

**Disposition:** The agenda was reviewed, discussed and approved.

The acting YANGsters Chair summarized information about *IETF EtherTypes*.

**Disposition:** YANGsters needs to bring this topic up with 802.1 leadership.

The acting YANGsters Chair summarized information about, then led a discussion on the *IEEE Lifecycle* topic as well as the short-term and long-term plans to move this topic forward.

**Disposition:** Move forward with a short-term plan for now so editors get guidance, and work on the long-term plan to provide as much automation as possible for the process to be easily manageable.

The acting YANGsters Chair introduced the *IEEE GitLab Information* topic. The YANGsters Chair elaborated on the topic.

**Disposition:** More discussion on this topic is needed and the discussion will continue on the May 2019 teleconference as well as at the July 2019 802.1 Plenary session.

The YANGsters Chair summarized the *BBF YANG Development* topic.

**Disposition:** More discussion and further evaluation on this topic are needed to see how the information can be leveraged by YANGsters. Discussion will continue at the July 2019 802.1 Plenary session.

#### **Future meetings/teleconferences**

The acting YANGsters Chair provided information on upcoming May and June 2019 monthly calls.

#### **Any Other Business**

No further business was discussed in this session.

**7:20 PM adjournment**

## **9 Next Session**

July 15-19, 2019, Vienna, Austria