INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
TC65: Industrial-process measurement, control and automation
SC65C: Industrial communication networks
PT 60802: Time sensitive networking profile for industrial automation

Institute of Electrical and Electronics Engineers, Inc. (IEEE)

IEEE 802: LAN/MAN Standards Committee
IEEE 802.1: Higher Layer LAN Protocols Working Group
IEEE 802.1 TSN: Time-Sensitive Networking Task Group

Meeting: IEC/IEEE 60802 Joint Project
Meeting was based on the meeting announcement; see IEC collaboration tool http://collaboration.iec.ch/ and http://www.ieee802.org/1

Date: 2019-11-13 — 2019-11-15

Location: Waikoloa, HI

IEC WG9/PT 60802 Convenor and IEC/IEEE 60802 Joint Project chair: Ludwig Winkel

Daily minutes by: Josef Dorr

Minutes compiled by: Ludwig Winkel and Jessy Rouyer

Published minutes: Collaboration tool http://collaboration.iec.ch/, and IEEE 802.1 web site http://www.ieee802.org/1/files/public/60802

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 Copyright Policy slides https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/copyright-policy-WG-meetings.potx, the IEEE-SA PatCom Patent Slides for Standards Development Meetings https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf and the IEEE 802 Participation slide https://mentor.ieee.org/802-ec/dcn/17/ec-17-0093-05-0PNP-ieee-802-participation-slide-ppt.ppt were presented.
- 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 available at https://1.ieee802.org/november-2019-plenary-session-in-waikoloa-hi-usa-tsn-tg-agenda/.

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

Attendance:

Session columns (left to right):
- S1: IEC/IEEE 60802 Joint Project Ad Hoc (Monday, 11-Nov-2019, 18:00 - 20:00)
- S2: Time-Sensitive Networking TG + IEC/IEEE 60802 Joint Project (Wednesday, 13-Nov-2019, 08:00 - 10:00)
- S3: TSN Trk A: IEC/IEEE 60802 Joint Project (Wednesday, 13-Nov-2019, 10:30 - 12:30)
- S4: TSN Trk A: IEC/IEEE 60802 Joint Project (Wednesday, 13-Nov-2019, 13:30 - 18:00)
- S5: TSN Trk A: IEC/IEEE 60802 Joint Project (Thursday, 14-Nov-2019, 08:00 - 12:30)
- S6: Time-Sensitive Networking TG + IEC/IEEE 60802 Joint Project (Friday, 15-Nov-2019, 08:00 - 12:00)
- S7: Time-Sensitive Networking TG + IEC/IEEE 60802 Joint Project (Friday, 15-Nov-2019, 13:00 - 18:00)

Last name	First Name	Affiliation	S1	S2	S3	S4	S5	S6	S7
ADEMAJ	Astrit	TTTech Computertechnik AG	●	●	●	●	●	●	●
Assmann	Ralf	Marvell Semiconductor, Inc.		●				●	
Berger	Catherine	IEEE		●					
Boiger	Christian	b-plus GmbH		●		●		●	
Bottorff	Paul	Hewlett-Packard Development Company, L.P.		●					
Canchi	Radhakrishna	Kyocera International Inc		●	●	●	●		
Chen	Feng	Siemens AG		●			●		
Cheng	Weiying	Infinera Corporation		●					
Congdon	Paul	Tallac Networks; Huawei		●					
Cummings	Rodney	National Instruments Corporation		●	●	●	●		
Dorr	Josef	Siemens AG	●	●	●	●	●	●	●
Dupuis	Marc	web industries							●
Farkas	Janos	Ericsson		●				●	
Fincher	Scott	Extreme Networks		●					
Finn	Norman	Huawei Technologies Co. Ltd		●					
Garner	Geoffrey	Huawei Technologies Co. Ltd		●		●		●	●
Gravel	Mark	Hewlett Packard Enterprise		●					
Gunther	Craig	Robert Bosch GmbH		●					
Gutierrez	Marina	TTTech Computertechnik AG						●	
Haasz	Jodi	IEEE Standards Association (IEEE-SA)		●				●	●
Haddock	Stephen	Stephen Haddock Consulting, LLC		●					
Hantel	Mark	Rockwell Automation	●	●	●	●	●	●	●
Henry	Jerome	Cisco Systems, Inc.		●					
Hotta	Yoshifumi	Mitsubishi Electric Corporation	●	●	●	●	●	●	●
Itaya	Satoko	National Institute of Information and Communications Technology (NICT)		●				●	
Ito	Yoshihiro	Nagoya Institute of Technology		●					
Kehrer	Stephan	Hirschmann Automation and Control, Inc.	●	●		●	●	●	●
KONDO	Kenji	Yaskawa Electric Corp					●	●	●
Lawlis	James	Ford Motor Company		●					
Lennartsson	Kent	Kvaser AB						●	
Mangin	Christophe	Mitsubishi Electric Corporation		●			●	●	●
Maruhashi	Kenichi	NEC Corporation		●	●	●			
McCall	David	Intel	●			●	●	●	●
McMillan	Larry	Western Digital Corporation		●				●	
Mustala	Tero	Nokia		●	●	●	●	●	●
Nomura	Takumi	Honda R&D		●					

		Time-Sensitive Networking TG + IEC/IEEE 60802 Joint Project (Friday, 15-Nov-2019, 13:00 - 18:00)						
		Time-Sensitive Networking TG + IEC/IEEE 60802 Joint Project (Friday, 15-Nov-2019, 08:00 - 12:00)						
		TSN Trk A: IEC/IEEE 60802 Joint Project (Thursday, 14-Nov-2019, 08:00 - 12:30)						
		TSN Trk A: IEC/IEEE 60802 Joint Project (Wednesday, 13-Nov-2019, 13:30 - 18:00)						
		TSN Trk A: IEC/IEEE 60802 Joint Project (Wednesday, 13-Nov-2019, 10:30 - 12:30)						
		Time-Sensitive Networking TG + IEC/IEEE 60802 Joint Project (Wednesday, 13-Nov-2019, 08:00 - 10:00)						
		IEC/IEEE 60802 Joint Project Ad Hoc (Monday, 11-Nov-2019, 18:00 - 20:00)						
Last name	First Name	Affiliation						
Noseworthy	Bob	University of New Hampshire InterOperability Laboratory (UNH-IOL)		●					●
ohue	hiroshi	panasonic		●	●				
Osagawa	Daisuke	Mitsubishi Electric Corporation	●		●	●	●	●	●
Pannell	Donald	NXP Semiconductors		●	●				
Parsons	Glenn	Ericsson AB		●			●		
Petre	Razvan	Spirent Communications	●						
Potts	Michael	Molex Incorporated		●		●		●	
Proell	Dieter	Siemens AG	●	●	●	●	●	●	●
Rouyer	Jessy	Nokia		●				●	
Sato	Atsushi	Yokogawa Electric Corporation	●	●	●	●	●	●	●
Seewald	Maik	Cisco Systems, Inc.		●	●	●	●		
Sivakolundu	Ramesh	Cisco Systems, Inc.	●	●				●	
Soeda	Tatsuo	Yaskawa	●	●	●	●	●	●	●
Specht	Johannes	University of Duisburg-Essen and General Motors Company		●				●	
Stanica	Marius	ABB AB	●	●	●	●	●	●	●
Steindl	Guenter	Siemens AG	●	●	●	●	●	●	●
Takita	Daisuke	Mitsubishi Electric Corporation	●	●		●	●	●	
Tarui	Isao	Mitsubishi Electric Corporation		●	●	●	●	●	
traore	karim	Microchip/Microsemi Corporation		●				●	
Wang	Tongtong	Huawei Technologies Co. Ltd		●					
Weber	Karl	Beckhoff Automation	●	●	●	●	●	●	●
Winkel	Ludwig	PNO e.V.	●	●	●	●	●	●	●
Woods	Jordon	Analog Devices Inc.		●	●	●	●	●	
Yachera	Timothy	US Department of Defense						●	
Yamaura	Takahiro	TOSHIBA Corporation		●	●	●		●	●
YU	Yi	Rockwell Automation	●	●				●	●
Zein	Nader	NEC Europe (NLE)		●				●	
Zhang	Xingxin	Huawei Technologies Co., Ltd		●					
Zhao	William	Siemens AG	●	●				●	●
Zhu	Chunhui	Futurewei Technologies		●				●	●

Wednesday 13 November 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 proposed to continue aligning IEC/IEEE 60802 Joint Project meetings with IEEE 802.1 meetings, starting Wednesday and ending Friday during IEEE 802.1 sessions. The meeting agreed (none dissenting) to the proposal.

Mark Hantel reported on the IECEE 60802 Conformity Assessment (CA) status and activities: the next meeting will be held December 9-11, 2019 in Frankfurt, Germany.

Jordon Woods, 60802 editor, presented *Editor's Report 60802 Draft 1.1* http://www.ieee802.org/1/files/public/docs2019/60802-woods-D1-1-update-1119-v00.pdf. The comments from the IEC review were not yet included in the comment database and in the editor's report.

Jordon Woods, 60802 editor, led the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Continued later.

10:00 – 10:30 AM recess

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

Günter Steindl provided an overview of the results of the IEC/IEEE 60802 ad hoc meeting held 6:00 – 8:00 PM on November 11, 2019 to further develop *Conformance Class* http://www.ieee802.org/1/files/public/docs2019/60802-Steindl-et-al-ExampleSelection-1119-v13.pdf as a contribution to the 60802 profile.
Disposition: Contribution discussed. Further discussion needed.

Jordon Woods, 60802 editor, continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
- Radhakrishna Canchi presented *Measuring Time Error* http://www.chronos.co.uk/files/pdfs/itsf/2014/Day3/1310-tommycook_calnex.pdf as a contribution to the resolution of comment 400.
Disposition: Continued later.

11:57 – 1:00 PM recess

Jordon Woods, 60802 editor, continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Continued later.

Rodney Cummings presented *Proposal for Hot Standby in IEEE 802.1AS* http://www.ieee802.org/1/files/public/docs2019/new-cummings-hot-standby-proposal-1119-v00.pdf.
Disposition: Presentation discussed. A motion for 802.1 to authorize the January 2020 Interim to generate PAR and CSD for pre-circulation to the EC for an amendment to IEEE 802.1AS to specify hot standby redundancy will be moved at the 802.1 closing plenary.

Jordon Woods, 60802 editor, continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Continued later.

3:00 – 3:30 PM recess

Astrit Ademaj and Günter Steindl presented *Redundant Clock Synchronization* http://www.ieee802.org/1/files/public/docs2019/60802-Ademaj-et-al-Redundant-Clocks-1119-v6.pdf.
Disposition: Presentation discussed. Further discussion needed.

Jordon Woods, 60802 editor, continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Continued later.

5:36 PM recess

Thursday 14 November 2019

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

Mark Hantel presented *60802 Conformance Class B Requirements* http://www.ieee802.org/1/files/public/docs2019/60802-Hantel-Conformance-Class-B-1119-v02.pdf, which was based on his comments 267 and 275 on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Presentation discussed. Further discussion needed.

Jordon Woods, 60802 editor, continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Continued later.

The TG Chair presented a draft response finalized as http://www.ieee802.org/1/files/public/docs2019/liaison-response-LNI-4-0-draft-sharing-1119-v01.pdf to the LNI 4.0 liaison *Re: Liaison with LNI 4.0: draft sharing IEEE 802.1 WG and LNI 4.0* http://www.ieee802.org/1/files/public/docs2019/liaison-LNI-draft_sharing-1019.pdf.
Disposition: Liaison discussed and draft response reviewed for 802.1 closing plenary approval.

Jordon Woods, 60802 editor, continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.
Disposition: Continued later.

12:31 PM recess

Friday 15 November 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.

Maik Seewald presented IEC TC57 *TR IEC 61850-90-13 Deterministic Networking* http://www.ieee802.org/1/files/public/docs2019/60802-Seewald-LiaisonTC57IEC61850-1119-v00.pdf.
Disposition: None.

Mark Hantel led the discussion on *TSN Domain Proposal for 802.1Qdj* http://www.ieee802.org/1/files/public/docs2019/dj-Hantel-TSN-Domain-Proposal-1119-v03.pdf presented Tuesday in the TSN TG meeting.
Disposition: Further discussion needed.

Jordon Woods, 60802 editor, presented and updated the list of gaps in Annex Z http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf then continued the resolution of comments received on http://ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1.pdf.

- **11:51 AM – 12:50 PM recess**
- Comment resolution continued.
- **2:57 – 3:30 PM recess**
- Comment resolution continued.

Disposition: Ballot comments discussed. Disposition recorded in http://www.ieee802.org/1/files/private/60802-drafts/d1/60802-d1-1-pdis-v02.pdf.

Comment resolution will be continued in the next teleconference.

Josef Dorr presented *LNI 4.0 TSN Testbed Update of Stream Reservation Approach* http://www.ieee802.org/1/files/public/docs2019/new-Dorr-LNI40-1119-v03.pdf.
Disposition: Presentation discussed.

Future teleconferences

The next teleconferences will be held November 25, 2019 and December 9, 2019. Other teleconferences preceding the January 2019 interim session are cancelled.

Any Other Business

No further business was discussed in this session.

6:00 PM adjournment

Annex A
Final Agenda

Meeting Agenda of IEC 65C/WG9.PT 60802 and the
IEC/IEEE 60802 Joint Project of IEEE 802.1
held in Waikoloa (HI), at 2019-11-13… -15

Rev	rev03	Ludwig Winkel (Convenor IEC SC65C/WG9 and chair IEC/IEEE 60802 Joint Project); János Farkas (TG chair of IEEE 802.1 TSN)	
Key:		color means:	Common session of "IEC/IEEE 60802 Joint Project" & "TG TSN"

Wed	13-11-19	[h:min]	[min]	Topics	Responsible
	8:00 - 8:15		15	Welcome and organizational issues (IEEE intro, IEC intro)	Ludwig, János
Room	8:15 - 8:30		15	Agenda	Ludwig, János
Kohala	8:30 - 8:35		5	Next meetings	Ludwig, Mark
#3	8:35 - 8:35				
	8:35 - 8:40		5	Update on Conformity Assessment (CA)	Ludwig, Mark
	8:40 - 8:40				
	8:40 - 8:50		10	Editor's update on D1.1 TG ballot and IEC CD 2	Jordon
	8:50 - 10:05		75	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	10:05 - 10:05				
	10:05 - 10:05				
	10:05 - 10:35		30	Break	
	10:35 - 10:35				
	10:35 - 11:05		30	Ad hoc contribution group results	Günter
	11:05 - 12:00		55	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	12:00 - 12:00				
	12:00 - 13:00		60	Lunch	
	13:00 - 13:30		30	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	13:30 - 14:40		70	Amendment to IEEE 802.1AS-2020	Rodney
	14:40 - 15:00		20	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	15:00 - 15:30		30	Break	
	15:30 - 17:00		90	Redundant Clock Synchronization Contribution	Astrit
	17:00 - 17:40		40	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	17:40 - 17:40				
	17:40 - 17:40		0	Review of minutes of the day	Josef
	17:40			Recess of 60802 JP meeting	
	18:30			Social Event	

Thu	14-11-19	[h:min]	[min]	Topics	Responsible
	8:00 - 8:05		5	IEEE Intro, Review Agenda; expected results of the day	Ludwig
	8:05 - 8:05				
Room	8:05 - 8:05				
Kohala	8:05 - 8:45		40	Conformance Class B Amendments	Mark
#3	8:45 - 10:00		75	Comment resolution IEC/IEEE 60802 D1.1	Jordon

					Topics	Responsible
10:00	-	10:30		30	Break	
10:30	-	10:40		10	Liaison out letter to LNI	János
10:40	-	12:30		110	Comment resolution IEC/IEEE 60802 D1.1	Jordon
12:30	-	12:30				
12:30	-	13:30		60	Lunch	
13:30	-	13:30				
13:30	-	13:30				
13:30	-	15:30		120	IEEE 802.1 closing plenary	Glenn, John
15:30	-	16:00		30	Break	
16:00	-	18:00		120	IEEE 802.1 closing plenary	Glenn, John
18:00	-	18:00				
18:00	-	18:00				
18:00	-	18:00				
18:00	-	18:00				
18:00					Recess of 60802 JP meeting	

Fri	15-11-19		[h:min]	[min]	Topics	Responsible
	8:00	-	8:10	10	Review Agenda; expected results of the day	Ludwig, János
Room	8:10	-	8:15	5	Recap past days	Ludwig, János
Kohala	8:15	-	8:35	20	Liaison update of IEC TC57 (IEC 61850-90-13 Deterministic Networking)	Maik
#3	8:35	-	9:25	50	Discussion on TSN Domain Definition & Interdomain Communications Proposal	Mark
	9:25	-	10:00	35	Identify and discuss IEEE 802 gaps for TSN-IA profile	Jordon
	10:00	-	10:00			
	10:00	-	10:30	30	Break	
	10:30	-	10:30			
	10:30	-	11:50	80	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	11:50	-	11:50			
	11:50	-	11:50			
	11:50	-	12:50	60	Lunch	
	12:50	-	12:50			
	12:50	-	15:00	130	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	15:00	-	15:00			
	15:00	-	15:30	30	Break	
	15:30	-	17:35	125	Comment resolution IEC/IEEE 60802 D1.1	Jordon
	17:35	-	17:35			
	17:35	-	17:40	5	revised LNI presentation	Josef
	17:40	-	18:00	20	Review of the minutes	Josef
	18:00				Adjournment of IEC/IEEE 60802 JP meeting	

1st Names in the Agenda	Name		Affiliation		Position in the joint project	
Ludwig	Winkel		Siemens AG		Convenor IEC SC65C/MT9 and chair IEC/IEEE 60802 Joint Project	
János	Farkas		Ericsson		Chair IEEE 802.1 TG TSN	
Jordon	Woods		Analog Devices		Editor, IEEE 802.1 voter	
Josef	Dorr		Siemens AG		Secretary	
Mark	Hantel		Rockwell Automation		Web master, IEC/AVNU ALLIANCE Liaison officer,IEEE 802.1 voter	
Astrit	Ademaj		TTTech		IEEE 802.1 individual	
Günter	Steindl		Siemens AG		IEC expert, IEC/PI Liaison officer	
Yoshifumi	Hotta		Mitsubishi Electric		IEC expert, IEC/CC-Link Liaison officer	
Stephan	Kehrer		Hirschmann		IEC expert,	
Thomas	Enzinger		B&R Industrial Automation GmbH		IEC expert,	
Lihao	Chen		HUAWEI TECHNOLOGIES CO., LTD.		IEEE 802.1 individual	
John	Messanger		ADVA Optical Networking Ltd			
Feng	Chen		Siemens AG		IEEE 802.1Qdd Editor	
Maik	Seewald		Cisco		IEC TC57 Liaison officer	