Unconfirmed Meeting Minutes: Meeting of the IEEE P802.3cg 10 Mbps Single-Pair Ethernet Task Force

Nov 12-15, 2018
Bangkok, Thailand

Prepared by Jon Lewis, Dell EMC

The meeting of the IEEE P802.3cg 10 Mbps Single Pair Ethernet Task Force convened at 1:09 PM, Monday, November 12, 2018 by George Zimmerman, P802.3cg Task Force chair.

Attendance for the meeting is listed in Appendix A

All presentations referenced in these minutes are located on the November 2018 802.3cg public website.

Administrative Matters

The Task Force Chair asked the participants to introduce themselves, their employer and affiliations.

Motion #1:   Move to approve the agenda as shown in agenda_3cg_01a_1118.pdf.
M: Valerie Maguire   S: Mick McCarthy
Approved by voice without opposition (Procedural > 50%)
Motion Passes

George Zimmerman displayed the agenda in agenda_3cg_01a_1118.pdf.

Motion #2:   Move to approve minutes of IEEE P802.3cg 10 Mbps Single Pair Ethernet Task Force from September 2018 as posted.
M: Brett McClellan   S: Peter Jones
Approved by voice without opposition (Procedural > 50%)
Motion Passes

- Mr. Zimmerman noted that there should be no recording or photography permitted.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

Chair reviewed the goals for the meeting, big ticket items, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Zimmerman advised the group that the attendance tool should be used each day to record attendance and that for today the only meeting that counts in IMAT is the plenary meeting held this morning. The physical attendance log was introduced and passed to the group.

IEEE Patent Policy, at **1:36 PM**, Mr. Zimmerman noted that the patent policy had been updated and then read slide 1 of the patent policy aloud. Mr. Zimmerman then made the call for potentially essential patents at **1:38 PM**, none responded. Mr. Zimmerman then read aloud slides #3 and #4.

Mr. Thompson reminded the group to review LOAs already submitted and available on the IEEE patcom website. (https://standards.ieee.org/about/sasb/patcom/)

Mr. Zimmerman noted that the slide entitled "Participation in IEEE 802 Meetings" had been shown in the opening plenary and thus would be reviewed and not read aloud completely. Mr. Zimmerman asked if there was any discussion necessary, none responded.

Chair reviewed the IEEE 802.3 Standards process and where the Task Force was in the process and the process by which we will develop the standard.

LIAISONS

No Liaisons were received.

Valerie Maguire gave a brief update from the last TIA meeting and noted that a liaison letter was approved but not yet forwarded to IEEE.

James Withey gave a brief update from ISO/IEC.

Mr. Zimmerman showed the PAR, CSD and Objectives URLs and reviewed the approved timeline for the Task Force.

Title: 802.3cg 10SPE TF Ad Hoc Report (jones_10spe_01_1118.pdf)
Presenter: Peter Jones, Cisco

Peter Jones noted that the next meeting would change, and a new invitation would be sent to the reflector.

James Withey gave a quick report on the "Comment #573" ad hoc chartered at the last interim meeting.

Title: Editor's Report: P802.3cg Draft D2.1 (maguire_3cg_01_1118.pdf)
Presenter: Valerie Maguire, Siemon; P802.3cg chief editor

The Editor reviewed the last draft balloting status, outlined the comments by topic, and reminded participants that the comments had been posted by topic on the website.

Motion #3: Move to consider 15 comments (#478 through #492) submitted after the P802.3cg draft 2.1 Working Group 1st Recirculation ballot deadline, included with Editor's proposed resolutions.
M: Valerie Maguire   S: Piergiorgio Beruto
The Task Force agreed to consider these comments with comments 1-477 and handled in the order listed in the Chief Editor's opening report.
(Technical >= 75%)
Motions Passes by Voice

The Editor asked if anyone would like more time to review the EZ bucket or needed any comments pulled from the EZ bucket list.

Motion #4: Accept the resolutions to all P802.3cg d2p1 comments marked with the Topic "EZ" and posted as, '"EZ Bucket" comments with proposed resolutions sorted by clause/subclause', excluding comment #98.
M: Valerie Maguire   S: Stefan Graber
(Technical >= 75%)
Y: 55   N: 0   A: 1
Motion Passes

Motion #5: Accept the resolutions to all P802.3cg d2p1 comments marked with the Topic "Editorial" and posted as, '"Editorial" comments with proposed resolutions sorted by clause/subclause', excluding #438.
M: Valerie Maguire   S: Gergely Huszak
(Technical >= 75%)
Y: 53   N: 0   A: 2
Motion Passes

At this time, the editor's report was concluded.

COMMENT RESOLUTION
Decisions during comment resolution were made by consensus, except where noted that motions were taken. For details on comment resolution see the posted comment database.

Presentations related to comment resolution are listed as they were presented. Details on the outcome of these presentations are contained in the comment database.

In connection with comment 279, the following presentation was given & straw poll taken:

Title: 10BASE-T1S Autoneg and Link Status Indication
(beruto_3cg_T1S_autoneg_revG.pdf)
Presenter: Piergiorgio Beruto, Canova Tech

Straw Poll #1: (Pick one)

    A) Do we feel ready to resolve this comment Today (Mon)
    B) Shall we revisit this Tomorrow (Tues AM)

    A: 26   B: 7

The group to a short break at 3:06

The meeting was called back to order at 3:31 PM

Following the break, the group resolved comment 279 and resumed general comment resolution.

The Task Force meeting recessed for the day at 6:03 PM.

The Task Force was brought to order at 8:02 AM.

Mr. Zimmerman called the meeting to order and asked if anyone new was in the room that would like a full round of introductions, none responded.

- Mr. Zimmerman noted that there should be no recording or photography.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

Chair reviewed the goals for the meeting, big ticket items, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Zimmerman advised the group that the attendance tool should be used each day to record attendance. The physical attendance log was introduced and passed to the group.

IEEE Patent Policy, at **8:14 AM**, Mr. Zimmerman asked if anyone had not seen the patent policy this week, none responded. Mr. Zimmerman then made the call for potentially essential patents at **8:16 AM**, none responded. The Chair then read aloud slide #3 and slide #4.

Mr. Zimmerman reviewed the slide entitled "Participation in IEEE 802 Meetings" and asked if there was any discussion necessary, none responded.

Chair reviewed the IEEE 802.3 Standards process and where the Task Force was in the process and the process by which we will develop the standard.

The Chief Editor displayed the comment database and continued comment resolution.

The Task Force took a short break at 10:05 AM.

The Task Force was called back to order at 10:25 AM.

The Chair called the meeting back to order.
Comment resolution continued.

The meeting recessed for lunch at 12:03 PM.

The meeting resumed at 1:30 PM.

The Chair called the meeting to order and comment resolution resumed.

**Title: Optional Cable Resistance Measurement (CRM) -Part 2
        (stewart_3cg_01e_1118.pdf)**
Presenter: Heath Stewart, Analog Devices

The Chair then moved to presentations relating to comments received on the MDI.

**Title: Industrial style Single Pair Ethernet connector acc. to IEC 61076-3-125
        (Fritsche_3cg_01_1118.pdf)**
Presenter: Matthias Fritsche, HARTING Technology Group

Title: MDI interface for 10BASE-T1L (Horrrmeyer_3cg_01_1118.pdf)
Presenter: Bernd Horrmeyer, Phoenix Contact

**Title: MDI Connector interface Considerations for IEEE 802.3cg
        (shariff_3cg_01a_1118.pdf)**
Presenter: Masood Shariff, Commscope

Title: Optional MDI Concerns (jones_3cg_02c_1118.pdf)
Presenter: Peter Jones, Cisco

The Task Force discussed the presentations.

The group to a short break at 3:17 PM

The meeting was called back to order at 3:41 PM

Comment resolution resumed starting with comments relating to MDI.

Comment resolution on the MDI concluded and moved on to other subjects as described in the editor's report.

In connection with comment #266 the following presentation was heard:
Title: 10BASE-T1L Receive State Diagram Disparity Error

(Graber_3cg_02a_1118.pdf)
Presenter: Steffen Graber, Pepperl+Fuchs

In connection with comments #180 and #441, the following presentation was heard, and Straw Poll #2 was taken.

Title: 10BASE-T1S Increased Transmit Voltage (brandt_3cg_01d_1118.pdf)
Presenter: David Brandt, Rockwell Automation
(note – this presentation was updated to revision e and presented again the next day)

Straw Poll #2:
I would support an optional 2.4 Vpp mode for 10BASE-T1S multidrop
(Pick One)
Y: 8
N: 6
A: 13

I abstained, but might support, with more information:
Y: 5

The following motion was taken:

Motion #6: Move to consider 10 comments (#493 through 502) submitted 1 week after the P802.3cg draft 2.1 Working Group 1ˢᵗ recirculation ballot deadline, after other comment resolution, time permitting.
M: Peter Jones   S: Alon Regev
(Procedural > 50%)
Y: 28   N: 0   A: 1
Motion Passes

The Chair then reviewed the remaining comments and discussed the order of comment resolution for Wednesday.

The Task Force meeting recessed for the day at 5:52 PM.

The Task Force was brought to order at 8:10 AM.

Mr. Zimmerman called the meeting to order.

- Mr. Zimmerman asked if there was anyone new in the room, none responded and the group progressed without introductions.

- Mr. Zimmerman noted that there should be no recording or photography.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

Chair reviewed the goals for the meeting, big ticket items, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Zimmerman advised the group that the attendance tool should be used each day to record attendance. The physical attendance log was introduced and passed to the group.

IEEE Patent Policy, at **8:15 AM**, Mr. Zimmerman asked if anyone had not seen the patent policy this week, none responded. Mr. Zimmerman then made the call for potentially essential patents at **8:16 AM**, none responded. The Chair then read aloud slide #3 and slide #4.

Mr. Zimmerman reviewed the slide entitled "Participation in IEEE 802 Meetings" and asked if there was any discussion necessary, none responded.

The Chair then discussed the schedule for the day and noted the order of presentations and comment resolution.

Comment resolution continued with comments related to PLCA.

Straw Poll #3: (Pick One) Related to Comment 393.
A: Accept the proposed resolution
B: Reject the proposed resolution
A: 23   B: 1

In connection with comments #497 through #502, the following presentation was heard.
Title: CL148 (PLCA) unresolved CSD related comments (Kim_3cg_01a_1118.pdf)
Presenter: Yong Kim, Nio

The meeting recessed for a short break at 10:03 AM.

The meeting resumed at 10:32 AM.

The Chair called the meeting back to order.

Discussion on the prior presentation commenced, and comment resolution continued.

In connection with comments #493 and #494 the following presentation was heard:
Title: Two proposals for priority based PLCA (Park_3cg_01c_1118.pdf)

Presenter: Sungkwon Park, Hanyang University

The Task Force discussed the presentation.

In connection with comments #324 and #329, the following two presentations were heard:

Title: PLCA Burst Mode for In-cabinet Use Case ([xu_3cg_01b_1118.pdf](xu_3cg_01b_1118.pdf))
Presenter: Dayin Xu, Rockwell Automation

Title: PLCA Burst Mode (beruto_3cg_PLCA_burst_mode_revB%20.pdf)
Presenter: Piergiorgio Beruto, Canova Tech

The meeting recessed for lunch at 12:06 PM.

The meeting resumed at 1:15 PM.

The Chair called the meeting to order and presentations continued related to PLCA.

In connection with comments #365 and #366, the following two presentations were heard:

Title: Precedence Considerations (Miller_3cg_01b_1112.pdf)
Presenter: Martin Miller, Microchip

Title: PLCA strict precedence mode
      (beruto_3cg_PLCA_strict_precedence_revB.pdf)
Presenter: Piergiorgio Beruto, Canova Tech

The Task Force discussed the presentation.

The Chair moved to comment resolution relating to the preceding presentations.

Straw Poll #4: (Choose One)
I support adding PLCA burst mode as described in:
beruto_3cg_PLCA_burst_mode_revB.pdf
Y: 19   N: 4   A: 9

Straw Poll #5: (Choose Y/N/A)
I support adding PLCA node precedence and/or priority feature(s) as described in one or more of the following:
      beruto_3cg_PLCA_strict_precedence_revB.pdf
      park_3cg_01b_1118.pdf
Y: 3   N: 9   A: 21

In connection with comment #489, the following straw poll was taken:
     Below are alternatives offered and Straw Poll #6 resulting in this resolution
     1. Change second sentence of 148.1 to:
     "PLCA provides improved performance in terms of throughput and latency for small
     multidrop networks having a limited number of nodes using the standard Clause 4
     CSMA/CD MAC."
     2. PLCA provides certain performance characteristics required for some applications.
     3. PLCA reduces collisions.

Straw Poll #6: (Vote for as many as you like)
A: REJECT the comment – no consensus for change
B: ACCEPT the comment
C: ACCEPT IN PRINCIPLE – Change 1 above
D: ACCEPT IN PRINCIPLE – Change 2 above
E: ACCEPT IN PRINCIPLE – Change 3 above
F: ACCEPT IN PRINCIPLE –delete the second sentence of 148.1
A: 7   B: 0   C: 2   D: 10 E: 0   F: 18

The meeting recessed for a short break at 3:05 PM.

The meeting resumed at 3:38 PM.

The Chair called the meeting to order and comment resolution continued.

In connection with comment #441, the following presentation was heard, and straw polls 7 through 9 were taken:

Title: 10BASE-T1S Increased Transmit Voltage (brandt_3cg_01e_1118.pdf)
Presenter: David Brandt, Rockwell Automation
This is an updated presentation from previously shown.

Discussion on the presentation was completed and comment resolution continued.

Straw Poll #7: (Comment 441)
I support the proposed remedy:
Implement changes in brandt_3cg_01d_1118.pdf slides 17-40 excluding headers slides, with editorial license to conform to IEEE 8023 style.
Y: 6
N: 4
A: 22

Straw Poll #8:
I might change my mind at a later date with more information:
Y: 6

N: 10
A: 1

Straw Poll #9:
I believe this project should consider new features and functions for incremental market:
Y: 5
N: 17
A: 6

In connection with comments 497 through 502, Straw Polls #10, #11, and Motion #7 were taken:

Straw Poll #10: (Comment 497)
ACCEPT comments 497, 498, 499, 500, 501, and 502
Suggested remedy for Comment 497:
All 802.3cg PHYs should operate with MII as defined as-is meaning that they work with MII prior to any technical changes proposed in CL22 of the 802.3cg draft.   And reflect any downstream changes to the PICS table.

Suggested remedy for All others:
Reverse the change and all 802.3cg PHYs should operate with MII as defined prior to any changes proposed by 802.3cg draft. And reflect any downstream changes to the PICS table.
Y: 2
N: 21
A: 13

Straw Poll #11: (Comment 497)
I support a resolution of REJECT – No consensus to change.
Y: 29
N: 2
A: 1

Motion #7: Reject comments 497-502 - no consensus to change.
M: Chad Jones   S: Gergely Huszak
Y: 30   N: 3   A: 4
(Technical >= 75%)
Motion Passes

The Chair asked if there were any late comments from the Task Force, David Brandt provided a late comment for the Task Force.

Comment resolution concluded.

The Chair informed the Task Force that the meeting would start Thursday at 10:30 AM.

Title: Editor's Closing Report: P802.3cg Draft D2.0 (maguire_3cg_02_1118.pdf)
Presenter: Valerie Maguire, Siemon; P802.3cg chief editor

Motion #8: Move to instruct the editors to generate draft 2.2 from draft 2.1 and the closed comments, and request that IEEE 802.3 progress the draft to a 15-day second WG Recirculation Ballot.
M: Valerie Maguire   S: Peter Jones
(Technical (>= 75%))
Y: 22   N: 0   A: 2
MOTION PASSES

The Task Force meeting recessed for the day at 5:15 PM.

The Task Force was brought to order at 10:34 AM.

Mr. Zimmerman called the meeting to order.

- Mr. Zimmerman asked if there was anyone new in the room, none responded, and the group progressed without introductions.
- Mr. Zimmerman noted that there should be no recording or photography.
- Mr. Zimmerman asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

Chair reviewed the goals for the meeting, big ticket items, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Zimmerman advised the group that the attendance tool should be used each day to record attendance. The physical attendance log was introduced and passed to the group.

IEEE Patent Policy, at **10:36 AM**, Mr. Zimmerman asked if anyone had not seen the patent policy this week, none responded. Mr. Zimmerman then made the call for potentially essential patents at **10:37 AM**, none responded. The Chair then reviewed aloud slide #3 and slide #4.

Mr. Zimmerman reviewed the slide entitled "Participation in IEEE 802 Meetings" and asked if there was any discussion necessary, none responded.

The Chair discussed the possibility of an off-cycle interim on February 19-20, 2019.

Straw Poll #12:
I am likely to attend an off-cycle 802.3cg interim February 19-20 2019 in either the Southwestern US or San Francisco Bay area (location TBD by Dec 31):
Y: 12   N: 11   M: 13

Straw Poll #13:
I am likely to attend 802.3cg at:
January 2019, Long Beach, CA, USA:
Y: 21   N: 4   M: 13

March 2019 802 Vancouver, BC Canada plenary:
Y: 31   N: 1   M: 7

The Chair then asked Peter Jones to review outgoing liaisons to ISO IEC SC25 WG3. The Task Force discussed the liaison letter. The Chair asked if there was any objection to the Chair taking the liaison letter to the Working Group, none responded.

Peter Jones then showed another liaison letter to the group that was not for Task Force approval.

The Chair then reviewed the proposed timelines and discussion was heard on the different options presented.

Motion #9: Adjourn the meeting.
M: Curtis Donahue   S: Mick McCarthy
Approved by voice without opposition (Procedural > 50%)
Motion Passes

THE MEETING ADJOURNED AT 11:17 AM

Appendix A: Attendees at the IEEE P802.3cg 10 Mb/s Single-Pair Ethernet Task Force Meeting, November 12-15, 2018.

IEEE 802.3 P802.3cg 10 Mb/s Single Pair Ethernet Task Force IEEE 802.3 November 2018				Day 1 12 Nov	Day 2 13 Nov	Day 3 14 Nov	Day 4 15 Nov
By choosing to attend and sign in to this meeting, you acknowledge and agree that your personal data will be documented for IEEE standards development purposes to comply with policies and procedures, legal and accreditation requirements, and evaluation of patent claims by patent offices. See Front Page for additional information.							
Last Name	First Name	Employer	Other Affiliations	Mon	Tues	Wed	Thurs
Abramson	David	Texas Instruments	Texas Instruments			X	
An	Hongming	Microchip	Microchip	X	X	X	X
Asmussen	Jes	Rockwell Automation	Rockwell Automation	X	X	X	X
Baggett	Tim	Microchip	Microchip	X	X	X	X
Bains	Amrik	Cisco	Cisco	X	X	X	X
Belitz	Tobias	Renesas	Renesas	X			
Beruto	Piergiorgio	Canova Tech SRL	Canova Tech SRL	X	X	X	X
Brandt	David	Rockwell Automation	Rockwell Automation	X	X	X	X
Carlson	Steve	High Speed Design	Robert Bosch/Marvell				X
Carty	Clark	Cisco	Cisco	X	X	X	
Chabot	Craig	UNH-IOL	UNH-IOL			X	
DiMinico	Christopher	MC Communications	Panduit	X	X		
Dinh	Thuyen	Pulse Electronics	Pulse Electronics		X		X

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Last Name	First Name	Employer	Other Affiliations	Mon	Tues	Wed	Thurs
Donahue	Curtis	UNH - IOL	UNH - IOL	X	X	X	X
Engels	Yuan	Leoni	Leoni	X			
Fathi Moghadam	Borhan	NVIDIA	NVIDIA	X			X
Fritsche	Matthias	Harting	Harting	X	X	X	X
Fukuoka	Takashi	Auto Networks Tech.	Auto Networks Tech.	X			
Goto	Hideki	Toyota Motor Corp.	Toyota Motor Corp.	X			
Gottron	Jens	Siemens AG	Siemens AG	X	X	X	X
Graber	Steffen	Pepperl+Fuchs	Pepperl+Fuchs	X	X	X	X
Grau	Olaf	Robert Bosch	Robert Bosch	X	X		
Grow	Robert	RMG Consulting	RMG Consulting				X
Hajduczenia	Marek	Charter	Charter				X
Horrmeyer	Bernd	Phoenix Contact	Phoenix Contact	X	X	X	X
Huszak	Gergely	Kone	Kone	X	X	X	X
Hutchinson	Guy	Drv.io	Drv.io	X			
Jimenez	Andrew	Anixter Inc.	Anixter Inc.	X	X		
Jones	Chad	Cisco	Cisco		X	X	

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Last Name	First Name	Employer	Other Affiliations	Mon	Tues	Wed	Thurs
Jones	Peter	Cisco	Cisco	X	X	X	X
Jung	Inyong	Hyundai Motors	Hyundai Motors	X	X	X	
Kabla	Lokesh	Synopsys Inc.	Synopsys Inc.	X		X	
Kanuri	Mrudula	NVIDIA	NVIDIA	X			
Kelsey	Randy	Engineering Solutions Inc.	Engineering Solutions Inc.			X	
Kim	Yong	NIO	NIO	X		X	X
Kim	Tae Hyung	Hanyang University	Hanyang University	X	X	X	
Kim	Bjung Joo	Hanyang University	Hanyang University	X			
Koczwara	Wojciech	Rockwell Automation	Rockwell Automation	X	X	X	X
Lackner	Hans	QoSCom	QoSCom	X	X	X	X
Lapak	Jeff	UNH-IOL	UNH-IOL	X	X	X	X
Law	David	Hewlett Packard Enterprise	Hewlett Packard Enterprise		X	X	
Lee	Juho	Hanyang University	Hanyang University	X	X	X	
Lewis	Jon	Dell | EMC	Dell | EMC	X	X	X	X
Lin	Allan	Marvell	Marvell	X			
Lin	Alex	Mediatek	Mediatek	X			

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Last Name	First Name	Employer	Other Affiliations	Mon	Tues	Wed	Thurs
Madgar	Tzahi	Valens Semiconductor	Valens Semiconductor				X
Maguire	Valerie	Siemon	Siemon	X	X	X	X
McCarthy	Mick	Analog Devices	Analog Devices	X	X	X	X
McClellan	Brett	Marvell	Marvell	X	X	X	
Mehta	Darshan	Tektronix	Tektronix	X			
Miller	Martin	Microchip	Microchip	X	X	X	X
Nagai	Takao	Hirose	Hirose	X	X		X
Nomura	Takumi	NEC	Jaspar	X			
Oberg	Mats	Marvell	Marvell	X			
Pannell	Don	NXP	NXP			X	
Park	Sungkwon	Hanyang University	Hanyang University	X	X	X	X
Pohl	Christopher	Beckhoff	Beckhoff	X		X	X
Ramesh	P.E.	Tektronix	Tektronix	X			
Regev	Alon	Keysight Technologies	Keysight Technologies	X	X	X	X
Renteria	Victor	Bel Fuse Inc.	Bel Fuse Inc.	X	X	X	X

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Last Name	First Name	Employer	Other Affiliations	Mon	Tues	Wed	Thurs
Schmidt	Rainer	Harting	Harting	X	X	X	
Shariff	Masood	Commscope	Commscope	X	X	X	X
Stewart	Heath	Analog Devices	Analog Devices		X	X	
Taiji	Kondo	Megachips	Megachips	X			X
Thompson	Geoff	GraCaSI SA.	Independent	X	X	X	X
Tremblay	David	HPE	HPE		X	X	
Tseng	Dachin	Realtek	Realtek	X	X		
Wang	Chao	Huawei	Huawei	X			
Withey	James	Fluke Networks	Fluke Networks	X	X	X	X
Wu	Peter	Marvell	Marvell	X			X
Wucher	Markus	Endress+Hauser	Endress+Hauser	X	X	X	X
Xu	Dayin	Rockwell Automation	Rockwell Automation	X	X	X	X
Yseboodt	Lennart	Signify	Signify		X	X	
Zhang	Xinjxin	Huawei	Huawei	X			
Zielinski	Martin	Emerson Automation Solutions	Emerson Automation Solutions	X	X	X	

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Last Name	First Name	Employer	Other Affiliations	Mon	Tues	Wed	Thurs
Zimmerman	George	CME Consulting	Commscope, Aquantia, CME Consulting, Cisco, ADI, BMW, APL Group	X	X	X	X
Zinner	Helge	Continental	Continental	X			
Zweck	Harald	Infineon Tech.	Infineon Tech.	X	X		X