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Standards Quarterly Update:

What you need to know now for the future of your network

Welcome to the twenty-first edition of the Standards Advisor. This report is issued quarterly and provides updates on the standards relevant to the structured cabling industry, and the impact they have on your network design, planning and operations.

This summary represents standards meetings held during the fourth quarter of 2018 and reports on activities from all aspects of the cabling industry. These activities range from the applications standards (IEEE 802.3 and 802.11 and T11—Fibre Channel) to the cabling standards (ANSI/TIA, ISO/IEC, CENELEC) and, finally, cover new developments in the world of multisource agreements (MSAs).

ISO/IEC JTC1/SC25 WG3: No meetings were held during Q4 2018

The 66th ISO/IEC JTC1/SC25 WG3 meeting will be held 4 - 8 March 2019 in Vienna, Austria.

IEC SC48B: No meetings were held during Q4 2018

The next IEC 46B meeting will be during the week of 18 April 2019 in London, UK

TIA TR-42: 1-5 October 2018 in Phoenix, AZ USA

1. TR-42.1 Commercial Building Cabling

- Work continues on the "C" version of ANSI/TIA-758 customer owned outside plant cabling standard. The working draft was approved for circulation as an ANSI industry ballot
- PARs were approved for the "E" versions of the TIA-568.0-D generic cabling standard and the TIA-568.1-D commercial telecommunications cabling standard, as well as for the revision of the ANSI/TIA-4966 education facilities standard

2. TR-42.3 Pathways and Space

- Reviewed the main items of ISO I8598 AIM amendment to incorporate remote powering functionality
- Reviewed and approved the PAR request for the revision of TIA-607-B and approved the draft document be circulated as an industry ballot
- Resolved all comments to TIA-569-E industry ballot and approved to re-circulate TIA-569-E for a second industry ballot

3. TR42.7 Copper Cabling Systems

- Resolved ballot comments and approved to re-circulate a third committee ballot for TIA TSB-184-A-1 guidelines for 28 AWG cords supporting remote powering
- Single pair connector updates were made, with the copper LC connector selected
- Names for four different single pair channels with four different reaches tentatively proposed, inserted into the committee draft of the single pair standard.

- As part of the single pair connector selection TR42.7 drafted a liaison letter to inform IEEE 802.3 of the connector choices made by both TR42.7 and TR42.9
- Agreed to create an addendum to 568.2-D to make normative certain requirements in TSB-184-A. This will be worked on by a task group and a PAR may be available for review at the next meeting in January 2019
- A task group was started to work on requirements for testing a field terminated plug

4. TIA TR42.9 Industrial cabling

- Resolved comments on the 1G industrial cabling addendum 2 to ANSI/TIA-1005-A-2012 for cabling supporting 1000BASE-T for E2 and E3 environments and approved re-circulation for a 4th committee ballot
- Discussed ANSI/TIA-1005-A addendum 3 on single pair cabling in support of IEEE 802.3bp type B, IEEE 802.3bw 100 BASE-T1 and IEEE 802.3cg 10 BASE-1 and committed this document to a task group to attempt to harmonize it with other documents.
- Selected the IEC 61076-3-125 connector as the single pair connector interface for ANSI/TIA 1005-A3

5. TR-42.11 Optical Fiber Systems

- ANSI/TIA-568.3-D-1
 - Resolved all comments on default ballot of addendum 1 to the optical fiber cabling and components standard.
- New Project Proposal
 - Motion passed to initiate project for TSB on Optical Fiber Channel Polarity.
 - Draft TSB was reviewed and is circulated for comments.

6. TR-42.12 Optical Fiber and Cable

- ANSI/TIA-598-D-1 colors for fibers 13 to 16 - Published.
- TIA 492 Document Series Restructuring: three projects to adapt IEC 60793 fiber specifications were approved at the June meeting
 - ANSI/TIA-4920000-C to be adaption of IEC 60793 -2 (General) Working draft shared with spec editors to help drafts of 492AAAF and 492CAAC
 - ANSI/TIA-492AAAF to be adaption of IEC 60793-2-10 (MMF family)
 - ANSI/TIA-492CAAC to be adaption of IEC 60793-2-50 (SMF family)

- ANSI/TIA-598-D-2014 - Motion approved to start project to update ANSI/TIA-598-D-2014.
- FOTP-82 Cable Fluid Penetration – Motion approved for revision to incorporate sections of IEC 60794-1-22.
- FOTP-95 Absolute Power – IEC TAG request to update document. Pending further discussion.
- FOTP-244 Temperature Cycling of Expressed Tubes – Motion approved for revision to incorporate sections of IEC 60794-1-22 Method F18

7. TR-42.13 Optical Passive Devices and Metrology

- FOTP 171B – All comments accepted and moved to publication.
- FOCIS 5F Default Ballot – All comments accepted, and three technical changes incorporated for additional connector fiber allocation configuration option of 4 and 8 number of fiber per row.

The next TIA TR-42 meeting will be 28 January – 1 February 2019 in Orlando, FL USA

INCITS T11.2 Fibre Channel: 1-4 October 2018 in New Orleans, LA USA

- FC-PI-7 [64GFC] is complete and now in review for publication.
- FC-PI-7P [256GFC] MRD reviewed regarding ability to meet the requirements in the current Marketing Requirement Document (256GFC at 100m for multimode).
 - Proposals to FCIA board to pursue one of three options: 1) Change the MRD, specifically the 100m reach requirement. 2) Delay PI-7P until studies/work can be produced that meet the MRD requirements, or 3) Cancel the project due to lack of interest/demand. The FCIA board favors option 2, delay FC-PI-7P.
- FC-PI-8 [128GFC Serial] MRD draft also reviewed and discussed. Preference to have one document for PI-8 [128GFC Serial] & PI-8P [512GFC].
 - FC-PI-8 [128GFC Serial] will be based on the direction of IEEE/OIF for 128GFC and thus lag IEEE and OIF. Discussion on changing FC-PI-8 [128GFC Serial] speeds to be the same as IEEE.
 - Plans are to proceed with project but seek guidance from FCIA on 1) Maintaining the MRD and performing the Link Budget analysis, and 2) Changing the MRD to consider new line rate, BER and Length.

The next meeting of INCITS/T11 will be held on 4-8 February 2019 in Fort Worth, TX USA

CENELEC TC215 WG2 meeting 45: 29-30 October 2018 in Paris, France

- Discussions on length-dependent electrical parameters of copper cabling and determination of NVP.
- Discussions on CPR and reaction to fire on cables and pathway systems.
- Work on CMS screening performance in relation to power separation. The work with TC213 continues in this area.
- Evaluation of 1 pair cable heating with remote powering.
 - Second draft of EN 50310 will be created after comment resolution.
 - A document that collects CPR information across countries has been created and is being updated.

Next Meeting of CENELEC TC215 WG2 will be 3 April 2019 in Milan, Italy.

CENELEC TC215 WG1 meeting 70: 31 October 2018 in Paris, France

- Work has started to amend EN 50700: Information technology - Premises distribution access network (PDAN) cabling to support deployment of optical broadband networks
- Work has started on cabling for 1 pair Ethernet.

Next Meeting of CENELEC TC215 WG1 will be 3-4 June 2019 in Athens, Greece.

1. IEEE 802.3bt 4 pair Power over Ethernet

- This work is now completed, and IEEE editorial staff is preparing the new standard, IEEE Std 802.3bt-2018, for publication. It should become available in the first quarter of 2019.

Single Twisted Pair Copper Standards

2. IEEE P802.3cg 10 Mbps Single-Twisted-Pair Ethernet

- The 10 Mbps/ Single Pair Ethernet project continued the Working Group ballot process, and the project is still on track to conclude in late 2019.
- The draft out of the November meeting now specifically references the LC-style copper connector for use as an equipment interface (called an MDI) for both 10BASE-T1L and 10BASE-T1S applications in M11C1E1 environments (similar to those found in in-building environments). Because of the varied environmental and electromagnetic conditions found in the industrial and automotive use cases envisioned for this standard, the standard allows the use of other connectors, but the LC-style connector is so far the only one directly referenced in the standard.
- The project objectives cover industrial, automotive, and building automation use cases, encompassing multiple different applications, one up to 15m, one of approximately 1km, and a new one is in formulation to reflect 25m multidrop applications. The project has organized around 2 physical layer PHYs:
 - Up to 1km single-pair (aka 10BASE-T1L): The project adopted baseline specifications for the up-to 1km process control and building automation application, adopting PAM 3 signaling and various electrical specifications.
 - Short-reach (15m+) (aka 10BASE-T1S): The project also adopted link segment specifications for 15m point-to-point links, compatible with 25m multi-drop networks as well. Short reach PHYs will optionally support multidrop.
 - An optional improvement collision performance on multidrop networks (known as PLCA within the Task Force).
 - Optional single-pair powering, based on clause 104 (IEEE Std 802.3-2016, known as PoDL) with some specification changes and additional power levels.

3. IEEE P802.3ch Multigigabit Automotive Ethernet PHY Task Force

- This task force is focused on short-reach automotive links at rates of 2.5Gbps, 5Gbps, and 10Gbps. The objectives call for up to 15m and 4 connectors, and the project has adopted transmission characteristics for shielded cabling with bandwidths up to 6 GHz to provide headroom for PHY developers to study.
- The project includes use of the 802.3bu powering, but does not expect to extend that powering specification.
- The group issued the first full draft (1.0) for Task Force review, with the major features in place. It is expecting to reach a technically complete draft in the first half of 2019.

Optical Fiber Standards

4. IEEE P802.3ca 25G and 50G EPON Task Force

- This Task Force is writing a standard for 25G and 50G EPON
- The previous objective supporting 100G EPON was removed from the scope
- The wavelength plan will allow backwards compatibility with networks supporting 10G EPON
- All upstream and downstream wavelengths will be in O-band (around 1310 nm)
- The standard will allow coexistence of:
 - 25G EPON with GPON (reduced wavelength)
 - 25G EPON and 50G EPON with 10G-EPON, XG-PON1, and XGS-PON
- The Working Group resolved comments on draft 1.3

5. IEEE P802.3cd 50G, 100G, 200G Ethernet PHYs Task Force

- Task Force has written a standard for 50G, 100G, and 200G
- Standard has been submitted to RevCom, Task Force work is complete.

6. IEEE P802.3cm Next-gen MMF PHYs (i.e. 400Gb/s over fewer pairs of MMF) Task Force

- This Task Force has two main objectives:
 - Define a physical layer specification that supports 400 Gb/s operation over 8 pairs of MMF with lengths up to at least 100m
 - Define a physical layer specification that supports 400 Gb/s operation over 4 pairs of MMF with lengths up to at least 100m
- The specifications are intended to support 70/100/150m over OM3/4/5. This will be the first standard to leverage WDM on MMF and thus the support capabilities of OM5 are now officially included in the fiber reach objectives.
- Comments were resolved on draft 1.0

7. IEEE P802.3cn 50 Gb/s, 200 Gb/s, and 400 Gb/s Operation Over Single-Mode Fiber (formerly called Beyond 10km Study Group)

- The Study Group successfully transitioned to a Task Force
- This Task Force will split into two Task Forces. 802.3cn will focus on the 40 km objectives.
- The main objectives are:
 - 50 Gb/s operation over at least 40 km of SMF (50GBASE-ER)
 - 200 Gb/s operation over four wavelengths capable of at least 40 km of SMF (200GBASE-ER4)
 - 400 Gb/s operation over eight wavelengths capable of at least 40 km of SMF (400GBASE-ER8)
- Baseline proposals for these objectives were adopted at the November meeting.

8. IEEE P802.3cp 10G, 25G, and 50G bidirectional access optical PHYs Task Force

- The Study Group successfully transitioned to a Task Force
- This Task Force is developing standards for bidirectional 10G, 25G, and 50G over 10, 20, and 40 km over a single strand of single mode fiber.

9. IEEE P802.3cs Central office consolidation (super PON) Task Force

- The Study Group successfully transitioned to a Task Force
- The main objectives of this Study Group are:
 - Support a passive point-to-multipoint ODN with a reach of at least 50 km with at least 1:64 split ratio per wavelength pair
 - Support at least 16 wavelength pairs for point-to-multipoint PON operation
 - Support the MAC data rate of 10Gb/s downstream
 - Support the MAC data rates of 2.5Gb/s and 10Gb/s upstream
 - Support tunable transmitters

10. IEEE P802.3ct 100 Gb/s and 400 Gb/s Operation over DWDM Systems Task Force (formerly called Beyond 10km Study Group)

- The Study Group successfully transitioned to a Task Force
- This Task Force was split off from 802.3cn and will focus on the 80 km objectives.
- The main objectives are delineated by data rate and reach as follows:
 - 100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system (100GBASE-ZR).
 - 400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system (400GBASE-ZR).
- These objectives will be met using DP-16QAM coherent transmission.

The next meeting of IEEE 802.3 will be an interim meeting in Long Beach, California, USA the week of January 13, 2019.



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