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Standards Quarterly Update:

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

Welcome to the twentieth 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 third 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).

65th ISO/IEC JTC1/SC25 WG3 Meeting, 24-27 September 2018: Falls Church, VA USA

1. Development of generic single pair cabling specifications

- The draft amendment to ISO/IEC 11801-1 showing all the changes to accommodate generic single pair cabling was reviewed and endorsed by WG3. The working group agreed to focus on the following generic channels:
 - 100 m channel specified up to 600 MHz
 - 1000 m channel specified up to 20 MHz
 - Short reach channel (ffs) specified up to ffs MHz
- The group agreed this will encompass all existing single pair applications and allow study of future higher data rate applications.

2. Single pair connector selection process

- The single connector selection process reached an unambiguous result with the IEC 63171-1 copper LC style connector selected for MICE1 commercial office environments and the IEC 61076-3-125 selected for the MICE2/3 industrial environments. WG3 instructed all adhoc task groups working on single pair cabling to insert these two connectors into the respective documents with “shall” statements.

3. Application-specific Technical Report for IEEE 802.3bp, IEEE 802.3bw and IEEE 802.3cg

- The applications specific technical report supporting IEEE 802.3 single pair applications resolved all comments and will be re-circulated as a Working Draft.

4. ISO/IEC TS 29125 Remote Powering

- The adhoc task group reviewed a modelling contribution that was verified with a 37 cable single pair bundle made up of 5 mm diameter single pair cables. A second contribution showing the effect of separation of 28 AWG (0.32 mm) cordage bundles was also reviewed. More work is needed in the area to develop maximum bundle size and separation between bundles.

5. PoE Amendment to ISO/IEC 18598 Automated Infrastructure Management

- Comments to the first working draft of the amendment to add PoE functionality were reviewed and resolved. A normative Annex will be added with the requirements for remote power

identifiers, records, and the contents of records that shall be followed when PoE functionality is implemented.

6. Direct Attach Cabling

- The Working Draft on direct attach cabling had several comments that were resolved, and the document approved to be recirculated as another WD. The test procedures in ISO 14763-4 need to be updated to support the direct attach document, and WG3 approved a project to revise ISO 14763-4 to accommodate this update.

7. MPTL

- The Modular Plug Terminated Link (MPTL) adhoc task group agreed to start the definition and scope of the project and will generate a Working Draft by December 2018. This configuration would cover links terminated in modular plugs in the field, with the resultant link tested against the permanent link requirements of ISO/IEC 11801-1.

8. Physical Network Security

- The Physical network security adhoc task group reviewed TIA 5017 and agreed to create a Working Draft based on the TIA document.

9. ISO/IEC 30129 Telecommunications Bonding Networks

- All comments to the Proposed Draft Amendment (PDAM) were resolved. A DAM will be circulated.

10. ISO/IEC TR 11801-9907: Guidelines for High-speed Applications over multimode fibre

- The comments to the first Working Draft were resolved. There was discussion regarding the list of applications to be covered in addition to those in ISO/IEC 11801-1, and there was agreement to include applications with published MSAs and multiple sources. A new working draft will be circulated.

11. ISO/IEC 14763-3 Testing of Optical Fiber

- A revision of the testing document has been started with the discussion of previously pending comments and change requests.

12. ISO/IEC 11801-6 Amendment 1 inclusion of 1 pair cabling

- A Strawman document was reviewed, and comments resolved resulting in the circulation of a first working draft (WD).

13. ISO/IEC 11801-3 Amendment 1 inclusion of 1 pair cabling

- Comments to the WD were resolved resulting in the re-circulation of a second WD.

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

IEC SC48B: 17-21 September 2018 Milan, Italy

- Ballot comments on the IEC 63171-1 copper LC connector CD were discussed and resolved satisfactorily.
- The document was approved to advance to a CDV (Committee Draft Voting) where countries are requested to vote on the document in addition to providing technical and editorial comments. The document may be published at the next meeting in April 2019, or may be re-circulated again as a second CDV or a DIS (Draft International Standard) with ratification likely by the end of 2019.

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

IEC SC 46C WG7: 3-7 September 2018 in Nürnberg, Germany

- Four one-pair standards are currently progressing in IEC TC46 (61156-11, -12, -13, and -14). Two are targeted for enterprise (61156-11, -12) while the other two are targeted for industrial applications (61156-13, -14).

The next IEC 46C WG7 meeting will be held during the week of 1st April 2019 in Arlington, VA USA

TIA TR-42: no meetings were held during Q3 2018

1. TR-42.12

- Published ANSI/TIA 598-D-1 Optical Fiber Color Coding in Cable – Addendum 1, Additional Colors for Elements 13-16.

The next TIA TR-42 meeting will be held 1-5 October 2018 in Phoenix, AZ USA

INCITS T11.2 Fibre Channel: No meetings were held during Q3 2018

The next meeting of INCITS/T11 will be held 1-4 October 2018 in New Orleans, LA USA

CENELEC TC215 WG2: no meetings were held during Q3 2018

The next meeting of CENELEC TC215 WG2 will be held 29-30 October in Paris, France.

CENELEC TC215 WG1: no meetings were held during Q3 2018

The next meeting of CENELEC TC215 WG1 will be held 31 October 2018 in Paris, France.

IEEE 802.3 Ethernet Meetings: San Diego, CA USA 9-12 July 2018 (IEEE 802.3 plenary) Spokane, WA USA 10-14 September 2018 (IEEE 802.3 interim)

1. IEEE 802.3bt 4 pair Power over Ethernet

- The IEEE-SA approved IEEE Std 802.3bt-2018, 4 pair Power over Ethernet at the September Standards meeting, completing work on this long anticipated new standard. IEEE 802.3bt draft contains two new "Types" of PoE, Type 3 (up to 60W on 4 pairs) and Type 4 (up to 90W at the PSE) as well as updates to the existing specifications for PoE (802.3af and 802.3at are "Type 1" and "Type 2") to support new Ethernet rates of 2.5, 5 and 10Gbps, and currently references TIA TSB-184-A and ISO/IEC TR 29125 for cabling requirements.

Single Twisted Pair Copper Standards

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

- The 10 Mbps/ Single Pair Ethernet project completed the first phase of the process of drafting a specification and entered

Working Group ballot with a complete technical draft in July 2018, and issued a recirculation ballot during the 3rd quarter. The project is on track to conclude in the 2nd half of 2019.

- During comment resolution at the September meeting, the Task Force agreed to specifically reference, but not require, the LC-style copper connector for use as an equipment interface (called an MDI) in 10BASE-T1L applications in M111C1E1 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:

1. Up to 1km single-pair (aka 10BASE-T1L): The project adopted baseline specifications for the up-to 1km process control and building automation application.
2. 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.
3. An optional improvement collision performance on multidrop networks (known as PLCA within the Task Force).
4. 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 group continued its work on the draft specification and 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 Working Group is writing a standard for 25G and 50G EPON
- 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 1.2.

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

- The Working Group resolved comments on their fourth recirculation Sponsor ballot, with a fifth re-circulation ballot issued to close on October 4.

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

- Baseline content for the first objective was adopted at the May meeting.
- Baseline content for the second objective was adopted at the July meeting by accepting a proposal for a bi-directional transmission solution that is essentially a parallel fiber version of Cisco's 100G-BiDi. The specifications are intended to support 70/100/150m over OM3/4/5 and be the first standard to leverage the WDM support capabilities of OM5.
- Comments were resolved on two early drafts and will be incorporated into the first complete draft 1.0 for Task Force review and comment resolution at the upcoming November meeting.

7. IEEE 802.3cn 50 Gb/s, 100 Gb/s, 200 Gb/s, and 400 Gb/s Operation over Single-Mode Fiber and DWDM Task Force (formerly called Beyond 10km Study Group)

- The Study Group successfully transitioned to a Task Force
- The main objectives are delineated by data rate and reach as follows:
 - 50 Gb/s operation over at least 40 km of SMF
 - 100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system.
 - 200 Gb/s operation over four wavelengths capable of at least 40 km of SMF
 - 400 Gb/s operation over eight wavelengths capable of at least 40 km of SMF
 - 400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system.

8. IEEE P802.3 10G and 25G bidirectional access optical PHYs Study Group

- This Study Group was recently formed to investigate bidirectional 10G, 25G, and 50G over 10, 20, and 40 km over a single strand of single mode fiber.
- The PAR, CSD, and Objectives documents were approved by the Study Group and were submitted in preparation for Task Force creation.

9. IEEE P802.3 Central office consolidation (super PON) Call for Interest

- This Study Group was recently formed to investigate Physical Layers for increased-reach Ethernet optical subscriber access.
- 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

The next meeting of IEEE 802.3 will be held 12-15 November 2018 in Bangkok, Thailand

MSAs:

1. 400G-BiDi

- The 400G Bidirectional (BiDi) Multi-Source Agreement (MSA) Group announced formation on 9 July 2018 to promote adoption of interoperable 400 Gb/s optical transceivers for multimode fiber referred to as 400G-BD4.2. The specification is expected to mimic that of IEEE 802.3cm's 400GBASE-SR4.2.

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