IEEE 1904 Access Networks Working Group

Opening report

Glen Kramer, glen.kramer@ieee.org

❑ Please, state

- – Your name
- – Your affiliation

IEEE SA Standards Board Operations manual
5.3.3.1 Disclosure of affiliation

Each participant's affiliation shall be disclosed at any working group or project meeting. The chair or the chair's delegate shall inform the meeting of the requirement for disclosure of affiliation (see 5.2.1.5 of the *IEEE-SA Standards Board Bylaws*). This shall be via a sign-in (e.g., sign-in sheet, electronic sign-in, verbal disclosure, or electronic communication) that provides for disclosure of employer and any other affiliation, a reminder of the definition of affiliation, and possible penalties for non-compliance.

...

The minutes of each working group or project meeting shall record a list of attendees and the disclosed affiliation of each attendee.

Executive Secretary Report

❑ Posted at
http://www.ieee1904.org/meeting_archive/2020/02/anwg_2002_exec_report.pdf

❑ Membership Updates
❑ Establishment of Quorum

Discussion items

1. Administrative matters

    a) P&P and OpMan refresh

    b) Re-election of chair and WG officers

2. Current/ongoing projects

    a) 1904.2 TF

    b) 1904.1 Maintenance

3. Proposed/potential new work

    a) IEEE1904.1-2017 -- Revision 2021

    b) 25G-EPON and 50G-EPON System-level specifications

    c) EPON architecture supporting mobile fronthaul/backhaul (Co-DBA, etc.)

       • Review of IEEE 1914 work

    d) YANG models for EPON

Motion to Approve the Agenda

Motion #1

❑ **Approve the agenda for the February 2020 meeting as presented in anwg_2002_agenda.pdf**

– Moved: Marek Hajduczenia
– Seconded: Kevin Noll

(Procedural, required > 50%)

Motion passed by voice vote without opposition

IEEE Guidelines

- **Patent Policy and Call for Patents**
- **Participant behavior in IEEE-SA activities**

Instructions for the WG Chair

The IEEE-SA strongly recommends that at each WG meeting the chair or a designee:

- **Show slides #1 through #4 of this presentation**
- **Advise the WG attendees that:**
  - IEEE's patent policy is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*;
  - Early identification of patent claims which may be essential for the use of standards under development is strongly encouraged;
  - There may be Essential Patent Claims of which IEEE is not aware. Additionally, neither IEEE, the WG, nor the WG Chair can ensure the accuracy or completeness of any assurance or whether any such assurance is, in fact, of a Patent Claim that is essential for the use of the standard under development.

- **Instruct the WG Secretary to record in the minutes of the relevant WG meeting:**
  - That the foregoing information was provided and that slides 1 through 4 (and this slide 0, if applicable) were shown;
  - That the chair or designee provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) of which the participant is personally aware and that may be essential for the use of that standard
  - Any responses that were given, specifically the patent claim(s)/patent application claim(s) and/or the holder of the patent claim(s)/patent application claim(s) that were identified (if any) and by whom.

- The WG Chair shall ensure that a request is made to any identified holders of potential essential patent claim(s) to complete and submit a Letter of Assurance.
- It is recommended that the WG Chair review the guidance in *IEEE-SA Standards Board Operations Manual* 6.3.5 and in FAQs 14 and 15 on inclusion of potential Essential Patent Claims by incorporation or by reference.

  Note: **WG** includes Working Groups, Task Groups, and other standards-developing committees with a PAR approved by the IEEE-SA Standards Board.

(Optional to be shown)

Participants have a duty to inform the IEEE

- Participants <u>shall</u> inform the IEEE (or cause the IEEE to be informed) of the identity of each holder of any potential Essential Patent Claims of which they are personally aware if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents

- Participants <u>should</u> inform the IEEE (or cause the IEEE to be informed) of the identity of any other holders of potential Essential Patent Claims

Early identification of holders of potential Essential Patent Claims is encouraged

IEEE

Ways to inform IEEE

- **Cause an LOA to be submitted to the IEEE-SA (patcom@ieee.org); or**

- **Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or**

- **Speak up now and respond to this Call for Potentially Essential Patents**

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the WG Chair

Other guidelines for IEEE WG meetings

- **All IEEE-SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.**

  - **Don't discuss the interpretation, validity, or essentiality of patents/patent claims.**

  - **Don't discuss specific license rates, terms, or conditions.**

    - Relative costs of different technical approaches that include relative costs of patent licensing terms may be discussed in standards development meetings.

      - **Technical considerations remain the primary focus**

  - **Don't discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.**

  - **Don't discuss the status or substance of ongoing or threatened litigation.**

  - **Don't be silent if inappropriate topics are discussed … do formally object.**

  For more details, see *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and *Antitrust and Competition Policy: What You Need to Know* at http://standards.ieee.org/develop/policies/antitrust.pdf

Patent-related information

The patent policy and the procedures used to execute that policy are documented in the:

- *IEEE-SA Standards Board Bylaws*
  (http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6)
- *IEEE-SA Standards Board Operations Manual*
  (http://standards.ieee.org/develop/policies/opman/sect6.html#6.3)

Material about the patent policy is available at http://standards.ieee.org/about/sasb/patcom/materials.html

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org

Participant behavior in IEEE-SA activities is guided by the IEEE Codes of Ethics & Conduct

- All participants in IEEE-SA activities are expected to adhere to the core principles underlying the:
  - IEEE Code of Ethics
  - IEEE Code of Conduct

- The core principles of the IEEE Codes of Ethics & Conduct are to:
  - *Uphold the highest standards of integrity, responsible behavior, and ethical and professional conduct*
  - *Treat people fairly and with respect, to not engage in harassment, discrimination, or retaliation, and to protect people's privacy.*
  - *Avoid injuring others, their property, reputation, or employment by false or malicious action*

- The most recent versions of these Codes are available at http://www.ieee.org/about/corporate/governance

Participants in the IEEE-SA "*individual process*" shall act independently of others, including employers

- The IEEE-SA Standards Board Bylaws require that "*participants in the IEEE standards development individual process shall act based on their qualifications and experience*"

- This means participants:
  - **Shall act & vote** based on their personal & independent opinions derived from their expertise, knowledge, and qualifications
  - **Shall not act or vote** based on any obligation to or any direction from any other person or organization, including an employer or client, regardless of any external commitments, agreements, contracts, or orders
  - **Shall not direct** the actions or votes of other participants or retaliate against other participants for fulfilling their responsibility to act & vote based on their personal & independently developed opinions

- By participating in standards activities using the "*individual process*", you are deemed to accept these requirements; if you are unable to satisfy these requirements then you shall immediately cease any participation

IEEE-SA standards activities shall allow the fair & equitable consideration of all viewpoints

- The IEEE-SA Standards Board Bylaws (clause 5.2.1.3) specifies that *"the standards development process shall not be dominated by any single interest category, individual, or organization"*

  – This means no participant may exercise *"authority, leadership, or influence by reason of superior leverage, strength, or representation to the exclusion of fair and equitable consideration of other viewpoints"* or *"to hinder the progress of the standards development activity"*

- This rule applies equally to those participating in a standards development project and to that project's leadership group

- Any person who reasonably suspects that dominance is occurring in a standards development project is encouraged to bring the issue to the attention of the Standards Committee or the project's IEEE-SA Program Manager

Ground Rules

❑ No audio or video recording

❑ No photography

❑ No job recruiting

❑ No product pitches

❑ No corporate pitches

❑ No prices

  – This includes costs, ASPs, etc. no matter what the currency

❑ No restrictive notices

❑ Attendance of the press should be announced

Links to Guiding Documents

- **IEEE Standards Association Operations Manual**
  https://standards.ieee.org/about/policies/sa-opman/index.html

- **IEEE-SA Standards Board Bylaws**
  https://standards.ieee.org/about/policies/bylaws/index.html

- **IEEE-SA Standards Board Operations Manual**
  https://standards.ieee.org/about/policies/opman/index.html

- **Antitrust and Competition Policy**
  https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/antitrust.pdf

- **IEEE Code of Conduct**
  https://www.ieee.org/content/dam/ieee-org/ieee/web/org/about/ieee_code_of_conduct.pdf

- **IEEE Code of Ethics**
  https://www.ieee.org/about/corporate/governance/p7-8.html

Approval of Last Meeting's Minutes

Motion #2

❑ Approve minutes of April 2019 meeting as recorded in **anwg_1904_minutes_unapproved.pdf.**

❑ Post the approved minutes on the WG website as **anwg_1904_minutes_approved.pdf**

– Moved: Zhou Zhen
– Seconded: Curtis Knittle

(Procedural, required > 50%)

Motion passed by voice vote without opposition

Treasurer's Report

❑ Posted at
http://www.ieee1904.org/meeting_archive/ 2020/02/anwg_2002_treasurer_report.pdf

P1904 Website

- ❏ Located at http://www.ieee1904.org/

  – Archived technical contributions and reflector messages are public

- ❏ ANWG Password-protected area

  – Standard drafts are password-protected (IEEE SA rules)

  – All online submission forms are password-protected to avoid spam.

    - TF2: http://www.ieee1904.org/private/2/tf2_presentproc.shtml

    - RMTF: http://www.ieee1904.org/private/revision/rmtf_maint_request.shtml

  – The same username/password for all task forces under 1904 WG

    - Username: * * * *

    - Password: * * * *

Email Reflectors

❑ **1904 WG Reflector**

– Used for general discussions/announcements. Everyone MUST subscribe!!!

– Archive is public: http://www.ieee1904.org/wg_pub_archive.shtml

– Subscription instructions: http://www.ieee1904.org/wg_reflector.shtml

❑ **1904.2 TF Reflector**

– Used for 1904.2 (Universal Management Tunnel) technical discussions

– Archive is public: http://www.ieee1904.org/2/email/index.html

– Subscription instructions: http://www.ieee1904.org/2/tf2_reflector.shtml

❑ **RMTF Reflector**

– Used for Revision & Maintenance technical discussions

– Archive is public: http://www.ieee1904.org/3/email/index.html

– Subscription instructions: http://www.ieee1904.org/revision/rmtf_reflector.shtml

IEEE 1904 P&P

❑ IEEE 1904 Policies and Procedures were approved in July 2014
❑ Posted here: http://www.ieee1904.org/documents/operations/ anwg_PnP_approved.pdf

❑ Changes needed:
  – Update IEEE 1904 Sponsor
  – Update Clause 3.1 Election of Officers
  – Other changes?

New Sponsor

- ❑ ComSoc Standards Development Board (COM/SDB) had too many projects to manage (22 WGs, 33 active projects)

- ❑ In 2017, COM/SDB created 7 Standards Committees (SC)

- ❑ IEEE 1904 ANWG is under **Access and Core Networks Standards Committee (COM/AccessCore-SC)**

Election of Officers
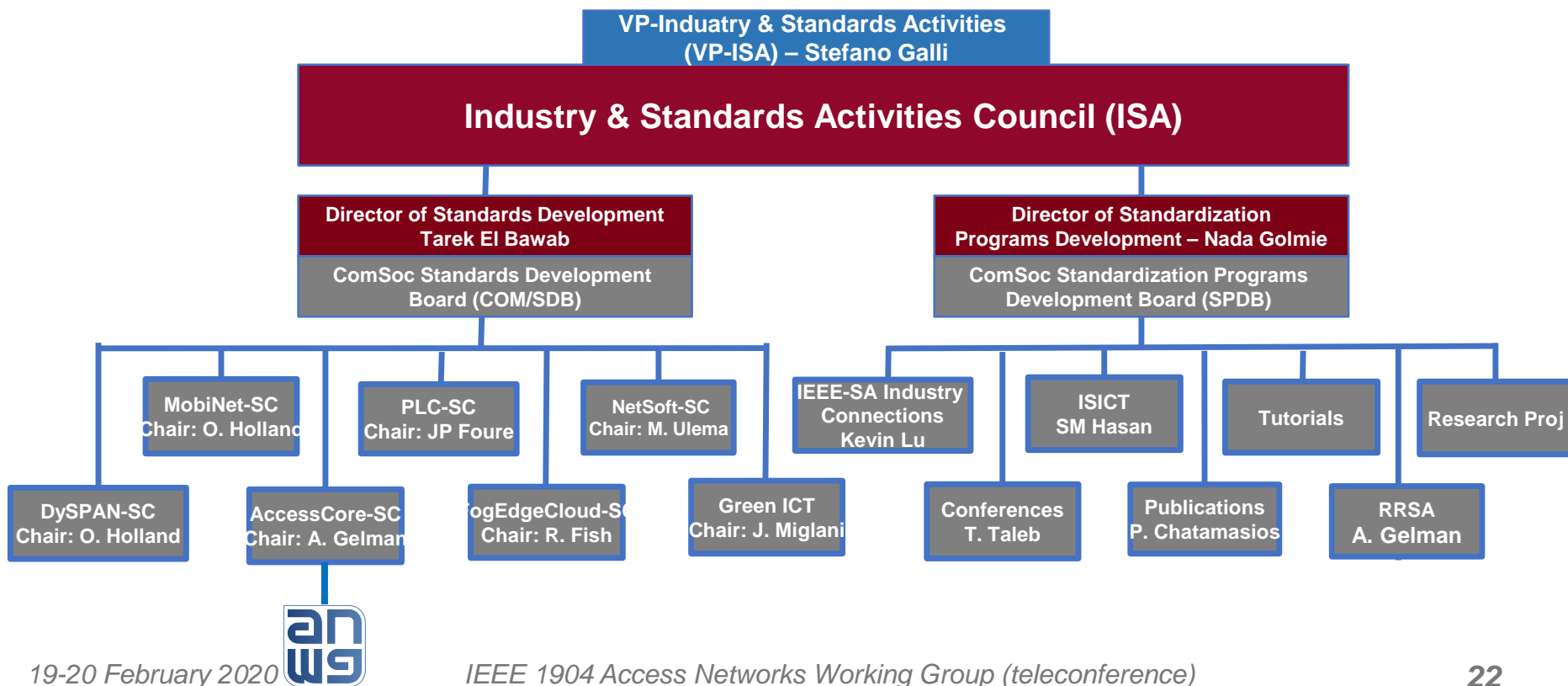
❑ Current PnP state that all the WG Chair is appointed by the Sponsor, and the WG chair appoints the rest of officers. However, traditionally in ComSoc that is only done when a new working group is formed (as was the case for this PnP). After that, elections should be held every two years.

> ## 3.1 Election or Appointment of Officers
>
> The Working Group Chair shall be appointed in accordance with the Sponsor's procedures, with input from the Working Group. After appointment of the Working Group Chair by the entity that established this Working Group, the Working Group Chair shall appoint a Vice Chair, Chief Editor, Treasurer, and Secretary, with input from the Working Group. A person may simultaneously hold the positions of Secretary and Treasurer.
>
> The appointment of officers shall be for a term of two years, but an officer may serve until a successor is appointed.

❑ We need to
1. Update PnP to reflect the desired procedures
2. After new PnP is approved, hold elections of officers

Election Clause in Sponsor PnP

We can use text similar to what was adopted for AccessCore-SC PnP →

3.1 Election of officers

There shall be elections to elect the Chair, Vice-Chair, Treasurer, and Secretary. However, the IEEE ComSoc Standards Development Board (COM/SDB) appoints the initial Chair for a term of two calendar years. The initial chair, in turn, appoints Vice-Chair, Treasurer, and Secretary for a term of two calendar years.

For next terms, the Chair, Vice-Chair, Treasurer, and Secretary are elected by the voting members of the Sponsor.

The Sponsor Chair or the COM/SDB shall appoint an Elections Officer whose function is to gather nominations and conduct an election. The Elections Officer shall not be a nominee in the election.

Voting members shall nominate to the Elections Officer one or more voting members for the Chair, Vice-Chair, Treasurer, and Secretary Offices to be filled at the election. Nominees shall be eligible to hold the office for which they are elected. A person shall be nominated for no more than one office. Upon written notification, the nominee shall, within 14 calendar days, indicate acceptance or rejection of the nomination. If no nomination is received or accepted for an office other than the Chair, a temporary appointment shall be made in accordance with Clause 3.2. If no nomination is received or accepted for Chair, the current Sponsor Chair or, if none, the COM/SDB may appoint a voting member for the office.

The Elections Officer shall prepare and conduct the election by letter or electronic ballot. Voting will conclude in a time determined by the Sponsor, but no less than 14 calendar days. Each voting member may cast one approval vote for each of as many nominees for an office as the voting member chooses. The nominee with the greatest number of approval votes shall win the election, provided ballots are returned by a majority of the eligible voters for that election.
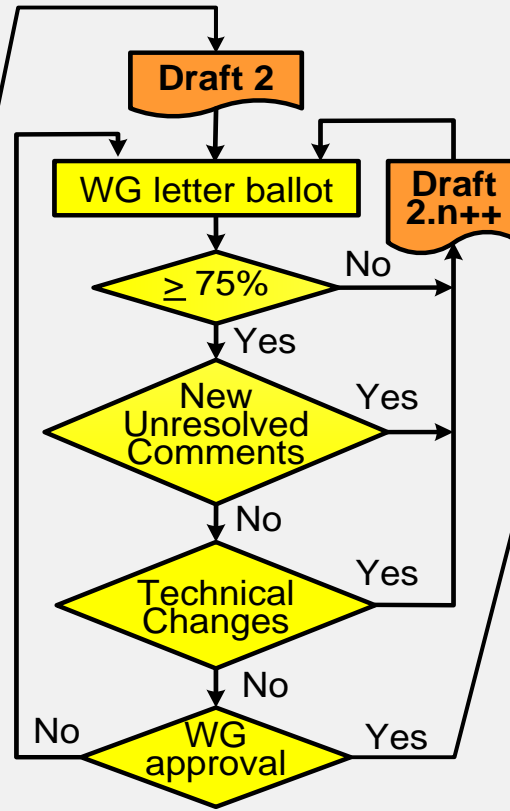
The term of office for each officer shall be two years, but an officer may serve until a successor is appointed.
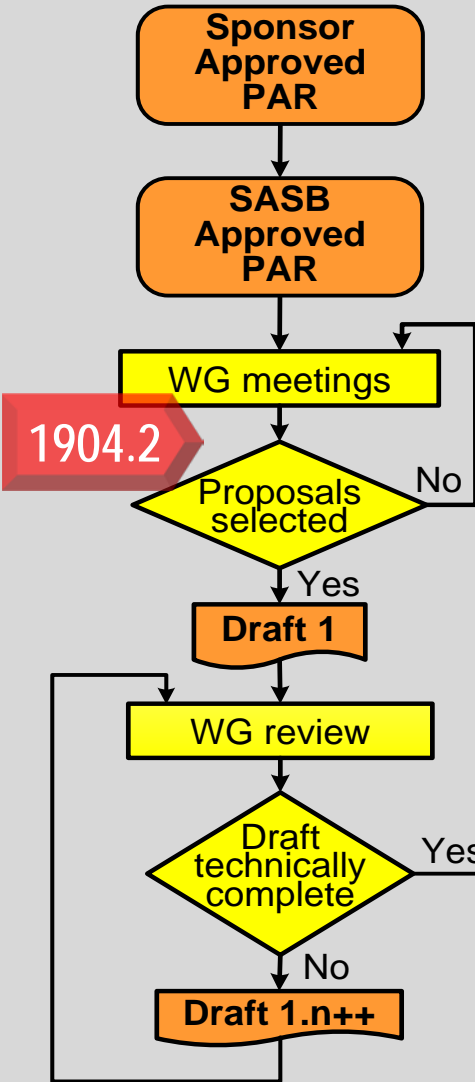
Working Group Review

Working Group Ballot

Sponsor Ballot

1904.2 history
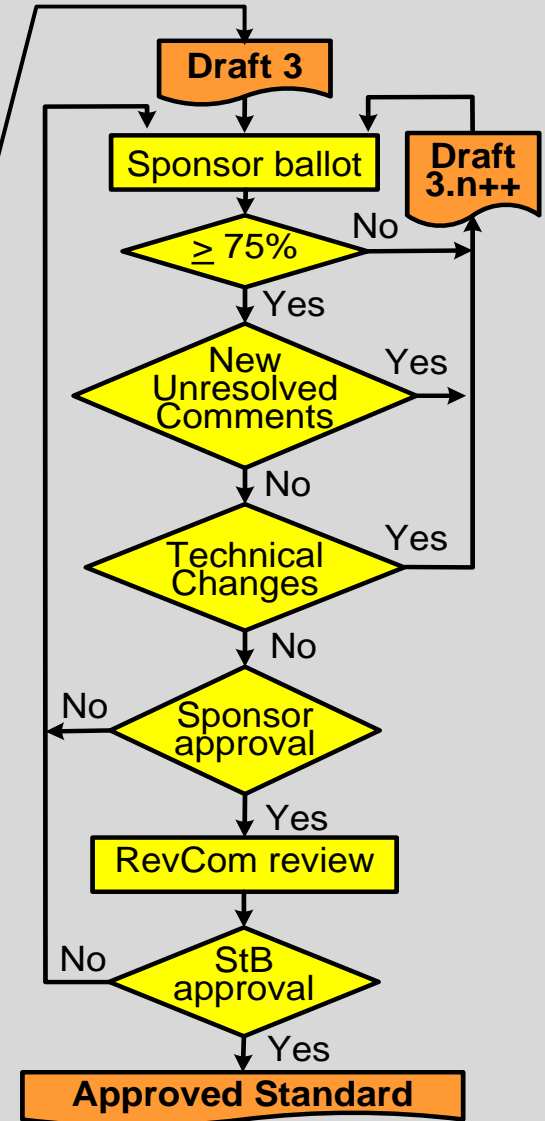
- **The original PAR**
  - PAR Request Date: 26-Dec-2013
  - PAR Approval Date: 27-Mar-2014
  - PAR Expiration Date: 31-Dec-2018

- **The original PAR had a very ambitious scope**
  - Included discovery, encryption, ONF/OpenFlow

- **Many of original participants moved on to other jobs, lost interest, and stopped contributing**

- **As we approached the PAR expiration date, we needed to decide whether to extend it or abandon the project.**
  - In August 2018, the WG approved motions for PAR extension (+2 yrs) and PAR modification (to narrow the scope). See http://www.ieee1904.org/meeting_archive/2018/10/anwg_1808_minutes_approved.pdf

- **Current PAR**
  - PAR Ext/Mod Request Date: 24 Sep 2018
  - PAR Approval Date: 05 Dec 2018
  - PAR Expiration Date: 31 Dec 2020

1904.2 activities since last mtg

- ❑ Last WG meeting in April 2019, Glen submitted an updated layering diagram. There was much discussion and Glen agreed to update the diagram and submit new draft text.

- ❑ No formal meetings have been held, but several informal discussions have occurred to bring forth the draft to be presented at this meeting.

1904.2 draft proposal

❑ Motion

– Accept the proposal presented in tf2_2002_proposal_rev07.pdf as a 1904.2 TF draft D0.4, a complete replacement of D0.3

– Moved: Kevin Noll
– Seconded: Glen Kramer

(Technical, required ≥ 75%)

Y:5   N:0   A:0

Potential New Projects

EPON Standards Family

❑ A complete EPON specification consists of two IEEE standards: **802.3** and **1904.1**
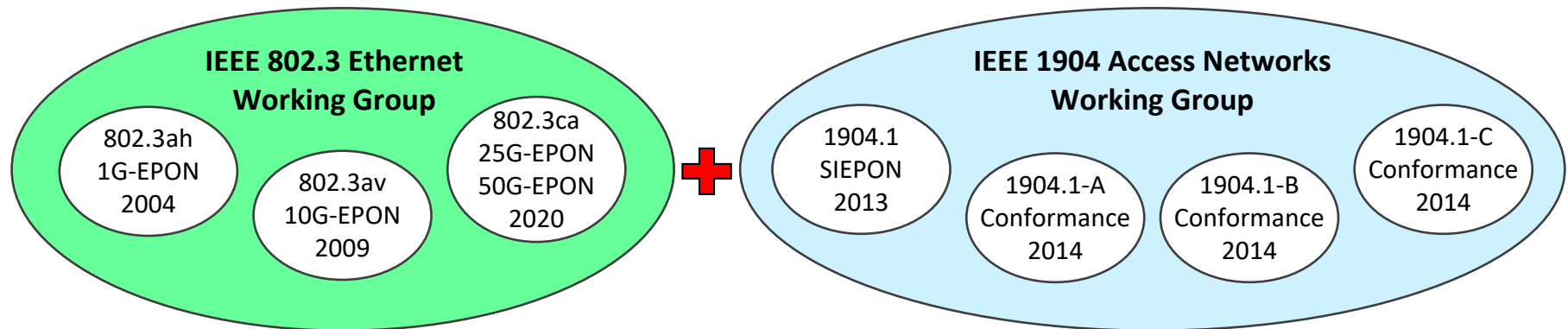
- IEEE 802.3ah – 1G-EPON (2004)
- IEEE 802.3av – 10G-EPON (2009)
- IEEE 802.3ac – 25G-EPON & 50G-EPON (2020)

- IEEE 1904.1 – SIEPON (2013, revised in 2017)
- IEEE 1904.1 Pkg. A Conformance Testing (2014)
- IEEE 1904.1 Pkg. B Conformance Testing (2014)
- IEEE 1904.1 Pkg. C Conformance Testing (2014)

802.3 and 1904.1 have different scopes

Scope of IEEE 802.3 is PHY and MAC layers	Scope of IEEE 1904.1 is system-level functions

➢ **Covers only the Physical Layer…**
 	
 ■ *PMD, Optics*
 ■ *64b/66b or 256b/257b Line coding*
 ■ *FEC (RS or LDPC)*
 ■ *Burst framing*
 ■ *Fragmentation (802.3ca only)*
 ■ *Channel bonding (802.3ca only)*
 ■ *Logical topology emulation (LLID mapping)*
 	
 ➢ **… and a portion of the Data Link Layer**
 	
 ■ *MAC*
  – *Ethernet framing*
  – *Frame integrity check*
 ■ *MPCP Protocol*
  – *ONU Discovery and Registration*
  – *GATE and REPORT messages*
 	
 ➢ **IEEE 802.3 focuses on transport channels, not on the complete system**
	➢ **Covers**
	
	 ■ *VLAN/Tunneling modes*
	 ■ *MAC learning / MAC ageing*
	 ■ *Multicast provisioning / operation*
	 ■ *Scheduling / Queue Service Discipline*
	 ■ *Queue and port provisioning*
	 ■ *Performance monitoring*
	 ■ *Optical link protection*
	 ■ *Power Saving, Sleep mode*
	 ■ *Encryption, Authentication*
	 ■ *Extended OAM Management*
	 ■ *Software/Firmware update*
	
	 ➢ **IEEE 1904.1 complements the existing IEEE 802.3.ah and 802.3av standards**
	
	 ➢ **The work on system-level specification for 25G-EPON and 50G-EPON has not started yet.**

What about Nx25G-EPON?

❑ **Why a system-level spec for Nx25G-EPON is needed?**

❑ The 802.3ca has introduced multiple channels, fragmentation, new reporting method, multiple LLID classes, etc.

❑ This affected the behavior (operation and/or provisioning) of many features:

  – Multicast provisioning / operation

  – Scheduling / Queue Service Discipline

  – Queue and port provisioning

  – Performance monitoring

  – Optical link protection

  – Power Saving, Sleep mode

  – Extended OAM Management

System-level spec for Nx25G-EPON

❑ **How to structure?**

- Amendment to P1904.1

  - 1904.1-2017 is too large (~900 pages) – already at the limit of MS Word capabilities

  - Structurally, not very convenient for amendments. Adding Nx25G-EPON spec will require modifications to almost every clause.

- A new P1904.3 standard project

  - Create a new document. (We can start with 1904.1 as a base)

  - Easy to cross-reference back to 1904.1, if needed.

❑ **When to start?**

- NesCom deadlines this year:

  - 13 March

  - 23 April

  - 14 August

  - 13 October

- Can we make April 23rd deadline? (AccessCore-SC may approve after NesCom submission, but before NesCom mtg on June 1-3)

IEEE P1904.3 PAR Draft

Title

- Standard for Service Interoperability in 25Gb/s and 50Gb/s Ethernet Passive Optical Networks

This standard describes the system-level requirements needed to provide service-level, multi-vendor interoperability of Ethernet Passive Optical Network (EPON) equipment. The specifications complement the existing IEEE 802.3$^{(TM)}$ and IEEE 802.1$^{(TM)}$ standards, which enable the interoperability at the Physical Layer and Data Link Layer. Specifically included in this specification are:

- 25G-EPON and 50G-EPON system-level interoperability specifications covering equipment functionality, traffic engineering, and service-level quality of service/class of service (QoS/CoS) mechanisms;

- Management specifications covering equipment management, service management, and power utilization.

Purpose

The purpose of this standard is to build upon the IEEE 802.3ca (25G-EPON and 50G-EPON) Physical Layer and Data Link Layer standards and create a system-level and network-level standard, thus allowing full "plug-and-play" interoperability of the transport, service, and control planes in a multi-vendor environment.

Need for the project

There are no open, international, system-level specifications describing how to achieve multi-vendor interoperability for the 25G-EPON and 50G-EPON technologies.

A detailed system-level standard for 25G-EPON and 50G-EPON technologies, developed in an open fashion by the IEEE, will eliminate the need for service providers and national bodies to create unique interoperability specifications that needlessly fragment the market. This will serve a number of important purposes:

- Devices will follow a common specification for the world-wide market, resulting in larger volumes and reduced costs;

- Operators will not face the challenge of developing system-level specifications and interoperability testing procedures before they can deploy EPON;

- Vendors will not need to implement multiple options to comply with multiple proprietary/national specifications. Reduced device complexity will further reduce costs;

- Competition among equipment and component suppliers will increase, thus driving further innovation and cost reductions.

Stakeholders

The stakeholders include telecom system and component vendors, telecommunications carriers, and multiple system operators (MSOs)

Revision of IEEE 1904.1-2017

❑ Last revision was approved on February 14th, 2017

❑ WG received 3 new maintenance requests

– See
http://www.ieee1904.org/revision/meeting_archive/2018/08/rmtf_1808_mrdb_1904_1_20180824.pdf

– All three were reviewed, resolved, and are ready for ballot
(see item 8 in Minutes for October 2018 meeting,
http://www.ieee1904.org/meeting_archive/2019/04/anwg_1810_minutes_approved.pdf)

❑ Should we start a revision project now or wait until later?

– Workload and resource allocation

– Anticipated additional changes due to other projects

Other potential projects

- ❑ What other projects are worth studying:
  - a) EPON architecture supporting mobile fronthaul/backhaul (Co-DBA, etc.)
    - a) Aim to reduce us latency
    - b) Include 10G, 25G, 50G
    - c) Coordination with O-RAN, Q2, BBF
  - b) YANG models for EPON
    - a) Look at BBF for info on what we want to do, but do it here
  - c) Network Slicing

- ❑ A project needs to have
  - – Sufficient industry interest / a need for a solution to a real problem
  - – Committed participants to serve as TF leadership
  - – Active experts to make technical contributions

2020 Meeting Calendar

January

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September

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December

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ANWG window	IEEE 802.3	BBF	CableLabs	IETF	ITU-T Q2/15	Conferences
2/19-2/20	2/25	3/2-3/5	?? – Winter Conf.		3/3, 3/24	3/8-3/12 - OFC
3/31-4/2	3/16-3/20	6/15-6/18	?? – Summer Conf.		4/21-4/23	4/18-4/22 – NAB Show
6/23-6/25	5/18-5/22	8/31-9/3			5/12	
8/25-8/27	7/13-7/16	12/7-12/10			6/9	9/21-9/23 - ECOC
10/20-10/22	9/21-9/25				7/7-7/9	10/13-10/16- SCTE Expo
12/15-12/17	11/9-11/12				8/4	

Holidays	
China	2/1-2/10,
Israel	
Japan	
US	2/17, 4/10, 5/25, 7/3, 9/7, 11/26-11/27, 12/24-12/31

- March 25, 4PM Pacific – **Teleconference**
- June – **TBD**
- August – **TBD**
- October – **TBD**
- December– **TBD**

Thank You