

P1914.1

Submitter Email: m.ulema@ieee.org

Type of Project: New IEEE Standard

PAR Request Date: 14-Oct-2015

PAR Approval Date:

PAR Expiration Date:

Status: Unapproved PAR, PAR for a New IEEE Standard

1.1 Project Number: P1914.1

1.2 Type of Document: Standard

1.3 Life Cycle: Full Use

2.1 Title: Standard for Packet-based Fronthaul Transport Networks

3.1 Working Group: Next Generation Fronthaul Interface (COM/SDB/NGFI)

Contact Information for Working Group Chair

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Contact Information for Working Group Vice-Chair

None

3.2 Sponsoring Society and Committee: IEEE Communications Society/Standards Development Board (COM/SDB)

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4.1 Type of Ballot: Individual

4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 12/2017

4.3 Projected Completion Date for Submittal to RevCom: 08/2018

5.1 Approximate number of people expected to be actively involved in the development of this project: 40

5.2 Scope: This standard specifies:

- 1) Architecture for the transport of mobile fronthaul traffic (e.g., Ethernet-based), including user data traffic, and management and control plane traffic.
- 2) Requirements and definitions for the fronthaul networks, including data rates, timing and synchronization, and quality of service.

The standard also analyzes functional partitioning schemes between Remote Radio Units (RRUs) and Base-Band Units (BBUs) that improve fronthaul link efficiency and interoperability on the transport level, and that facilitate the realization of cooperative radio functions, such as massive Multiple-Input-Multiple-Output (massive MIMO) operational modes, Coordinated Multi-Point (CoMP) transmission and reception.

5.3 Is the completion of this standard dependent upon the completion of another standard: No

5.4 Purpose: The Fronthaul Packet Transport standard enables the implementation of critical 5G technologies, such as massive Multiple-Input-Multiple-Output (massive MIMO), Coordinated Multi-Point (CoMP) transmission and reception, and scalable Centralized/Virtual Radio Access Network (C-RAN/V-RAN) functions.

This standard simplifies network design and operation, increases network flexibility and resource utilization, and lowers cost by leveraging existing, mature Ethernet-based solutions for vital functions, such as quality of service, synchronization, and data security.

The fronthaul architecture provides unified management and control solution, common networking protocols, and universal network elements, thus facilitating migration to future C-RAN/V-RAN mobile networks.

This standard improves bandwidth efficiency, network scalability, timing and synchronization performance, and preserves and enhances the

ability to deploy cooperative radio modes.

5.5 Need for the Project: On the road towards future 5G networks, it is clear that an efficient transport network is necessary and traditional fronthaul solutions are not suitable for 5G evolution. The current mobile networks are comprised of multiple separate network domains. This creates serious challenges for network operators, such as low scalability, inflexible management and control solutions, slow and difficult upgrades, poor resource utilization, and high cost. This project is needed to facilitate the implementation of key 5G technologies especially Cloud-RAN and Massive multiple-input-multiple-output (MIMO) from fronthaul networking perspective, and describe the required networking architecture to enable migration to 5G and C-RAN/V-RAN solutions.

5.6 Stakeholders for the Standard: Telecom operators, telecom system infrastructure providers, chipset vendors as well as Standardization Development Organizations such as the 3rd Generation Partner Project (3GPP).

Intellectual Property

6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?: No

6.1.b. Is the Sponsor aware of possible registration activity related to this project?: No

7.1 Are there other standards or projects with a similar scope?: Yes

- P802.1CM will develop a profile for Fronthaul over Ethernet bridged networks. P1914.1 will develop an architecture and requirements for the transport of mobile fronthaul traffic (e.g., Ethernet-based), including user data traffic, and management and control plane traffic for the mobile wireless networks.

7.2 Joint Development

Is it the intent to develop this document jointly with another organization?: No

8.1 Additional Explanatory Notes (Item Number and Explanation): Regarding the item 7.1, it is worth pointing out that ITU-T recently formed a Focus Group on IMT-2020 which working scope also includes the fronthaul topic, although their target is only to make the gap analysis instead of specifying standards.

Referencing Section 7.1, while the P1914.1 Working Group focuses on the fronthaul network architecture and requirements, it would liaise closely with IEEE 802.1cm which is developing the specified solutions for fronthaul transportation.