
IEEE P802.11
Wireless LANs

IEEE 802.11 HEW SG Proposed CSD**Date:** 2014-03-18**Author(s):**

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Abstract

This is the IEEE 802.11 High Efficiency WLAN (HEW) SG proposed CSD.

1. IEEE 802 criteria for standards development (CSD)

The CSD documents an agreement between the WG and the Sponsor that provides a description of the project and the Sponsor's requirements more detailed than required in the PAR. The CSD consists of the project process requirements, 1.1, and the 5C requirements, 1.2.

1.1 Project process requirements

1.1.1 Managed objects

Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:

- a) The definitions will be part of this project. YES
- b) The definitions will be part of a different project and provide the plan for that project or anticipated future project.
- c) The definitions will not be developed and explain why such definitions are not needed.

1.1.2 Coexistence

A WG proposing a wireless project shall demonstrate coexistence through the preparation of a Coexistence Assurance (CA) document unless it is not applicable.

- a) Will the WG create a CA document as part of the WG balloting process as described in Clause 13? YES
- b) If not, explain why the CA document is not applicable.

1.2 5C requirements

1.2.1 Broad Market Potential

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:

- a) Broad sets of applicability.

Traffic growth continues to be driven by significant growth in the video traffic. New uses such as video streaming, simultaneous transmission of multiple high rate video streams, on-line gaming, and cloud access will drive the need for improving system level performance and user experience in the home, enterprise, and outdoor environments.

Majority of connected devices are tablets and smartphones. Those consumer devices are equipped with Wi-Fi interfaces. The use of these devices for video streaming, on-line gaming, and other applications drives an increased traffic volume on Wi-Fi infrastructure.

Similar to the wired Ethernet and the related bridging technology (IEEE 802.3 and IEEE 802.1), the Wi-Fi technology is now finding its way to the carrier domain. Cellular operators are now using Wi-Fi technology for data offloading. Hotspot deployments are characterized by densely deployed APs to provide sufficient coverage to a large number of devices. Hotspot users are looking for seamless connectivity and a Wi-Fi experience similar to that they enjoy on the

Deleted: Cisco's market forecast predicts that Internet traffic will reach zettabytes by the end of 2016. By 2017 traffic of end stations that connect over wireless links will reach 51% of the total internet traffic.

Deleted: More individuals increasingly rely on Wi-Fi connections to support their connectivity needs including entertainment, web surfing, and e-commerce. Forecasts from International Data Corporation show that 87% of connected devices sales by 2017 will be

Deleted: Consequently iGR predicts that Wi-Fi usage in the US will double by 2015.

Deleted: Infonetics Research predicts that the carrier Wi-Fi market to reach \$2.8 billion by year 2017, at a 5 year compound annual growth rate (CAGR) of 40%. Unit's volume will grow from 985 thousand access points (APs) in year 2012 to 5.3 million APs in year 2017, a 40% CAGR

Deleted: Carrier hotspot deployments are expected to reach 5.8 million worldwide by year 2015

cellular networks.

Enterprises, such as small and medium businesses, are increasingly dependent on Wi-Fi technology as their main networking infrastructure. ~~Forecasts show that in the next few years an~~ Enterprise network will be composed of 80% wireless ports and 20% wired ports reversing the current ratio. Improved system performance is a main factor for enterprise to migrate to Wi-Fi technology and to achieve the expected cost savings.

Deleted: Network Barometer

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b) Multiple vendors and numerous users.

A wide variety of vendors currently build numerous products for the Wireless Local Area Network (WLAN) marketplace. According to Dell'Oro Group overall WLAN market revenues are forecast ~~have exceeded \$11 billion in 2017, nearly 50% greater than 2012 revenues. It is~~ anticipated that the majority of those vendors, and others, will participate in the standards development process and subsequent commercialization activities.

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1.2.2 Compatibility

Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.

Deleted: ABI Research estimated that for 2012 ,25% of homes around the world used Wi-Fi.. ABI Research expects that the number of devices shipped with Wi-Fi interface to reach 3 billion by year 2015.¶

- a) Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q? YES
- b) If the answer to a) is no, supply the response from the IEEE 802.1 WG.

The review and response is not required if the proposed standard is an amendment or revision to an existing standard for which it has been previously determined that compliance with the above IEEE 802 standards is not possible. In this case, the CSD statement shall state that this is the case.

1.2.3 Distinct Identity

Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describe why the proposed project is substantially different.

This project will focus on a WLAN that can efficiently support deployments with dense stations and dense access points where interference from neighboring devices is an issue affecting the perceived user experience. This project will focus on system level performance and improving the utilization of the spectrum resources as well as interference mitigation and management between neighboring overlapping basic service sets (OBSSs).

There is no other WLAN standard focusing on significantly improving WLAN efficiency and system level performance in dense deployment scenarios other than this amendment.

1.2.4 Technical Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:

a) Demonstrated system feasibility.

The IEEE 802.11 HEW SG has reviewed many presentations indicating that the proposed functions are technically feasible. Summary text is there, and the detail is in the referenced links;

https://mentor.ieee.org/802.11/documents?is_dcn=DCN%2C%20Title%2C%20Author%20or%20Affiliation&is_group=0hew

b) Proven similar technology via testing, modeling, simulation, etc.

Until the full extent of the user models referenced in the IEEE 802.11 HEW PAR is understood, the study group cannot completely assess the extent of reasonable testing for those technologies. However, IEEE 802.11 is a mature technology which has a wide variety of legacy devices and a proven track record, with several billions of devices shipping each year. The increased capabilities envisioned for the baseband and RF parts necessary to implement the proposed amendment are in line with the current progress in technology and not expected to impinge testability.

The amendment will use modeling and simulation, based on real world deployment, as a tool for evaluating performance metrics.

1.2.5 Economic Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:

a) Balanced costs (infrastructure versus attached stations).

WLAN equipment is accepted as having balanced costs. The development of Wireless capabilities to enhance the efficiency of WLAN network deployments and improve system level performance will not disrupt the established balance.

b) Known cost factors.

Support of the proposed standard will likely require a manufacturer to develop a modified radio, modem and firmware. This is similar in principle to the transition between IEEE 802.11n and IEEE 802.11ac as well as in previous iterations of IEEE 802.11 enhancements. The cost factors for these transitions are well known and the data for this is well understood.

c) Consideration of installation costs.

Deleted: This amendment will differentiate itself from other IEEE 802 wireless standards via the title which stresses the specification of high efficiency WLAN technology.

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The proposed amendment has no known impact on installation costs.

d) Consideration of operational costs (e.g., energy consumption).

There are billions of WLAN systems in operation around the world. WLAN systems are recognized to provide a total cost of ownership (TCO) that provides a significant operation cost benefits. This amendment is not expected to change today's operation costs.

This amendment is targeting improved power saving per device as specified in the PAR.

e) Other areas, as appropriate.

None.

References:

