IEEE P802.11
Wireless LANs

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| A CSD Proposal for Enhanced Broadcast Services (EBS) |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Hitoshi Morioka | SRC Software | 2-14-38 Tenjin, Chuo-ku, Fukuoka 810-0001 JAPAN |  | hmorioka@src-soft.com |
| Bahar Sadeghi | Intel |  |  | bahareh.sadeghi@intel.com |
| Xiaofei Wang | InterDigital |  |  | Xiaofei.Wang@InterDigital.com |
| Yasuhiko Inoue | NTT |  |  | inoue.yasuhiko@lab.ntt.co.jp |
| Marc Emmelmann | Koden TI | Berlin, Germany |  | emmelmann@ieee.org |
| Stephen McCann | BlackBerry | The Pearce Building, West Street, Maidenhead, SL6 1RL, UK |  | smccann@blackberry.com  |
| Hiroshi Mano | Koden TI | Tokyo, Japan |  | mano@koden-ti.com |

# 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:

1. The definitions will be part of this project. **YES**
2. The definitions will be part of a different project and provide the plan for that project or anticipated future project.
3. 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.

1. Will the WG create a CA document as part of the WG balloting process as described in Clause 13? **No**
2. If not, explain why the CA document is not applicable.

A CA document is not necessary for this amendment. It will change neither the IEEE 802.11 channel access mechanism nor physical layer operation in such a fashion to impact coexistence with other IEEE 802 standards specifying unlicensed operation.

## 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.

The number of IEEE 802.11 enabled end-consumer mobile devices is continuously increasing and the demand for WLAN mobile communications is expected to increase at nearly 50% per year according to the Cisco Visual Networking Index [1]. The outdoor WLAN market is expected to grow 14% according to the Mordor Intelligence report [2] and broadcast traffic, such as video dissemination, has a major share of this market. In line with that, a recent Gartner Report states that the “proliferation of smartphones and increasing availability of high-speed … networks … are driving increased usage of video and other applications. CSPs are looking to improve the customer experience … [including] ... Wi-Fi equipment to improve ... network capacity” [3].

Several intelligent transport system (ITS) use cases either require that the sender of MAC frames containing broadcast information is authenticated, and that the integrity of the contents is assured. These ITS use cases may not be able to accommodate authentication and association phases prior to receiving broadcast information.

In addition, the reception of data coming from sensors, which mainly reside without association in their deployments, requires that other IEEE 802.11 enabled end-consumer mobile devices receive unsolicited data at the MAC level and then decide to accept the incoming frames, possibly based on an authenticated source. For similar use cases, a Gartner Report predicts 20.4 billion connected devices with an associated “spending on end points services [reaching] almost $2 trillion” [4]. Furthermore, these use cases, for example live stream video distribution from sensors may require link level encryption.

Broadcasting to IEEE 802.11 mobile devices entails resolving outstanding privacy issues, such as the ability of end-user devices to choose if or how alerts, warnings, advertisements or other broadcast streams are received. Resolving these issues has an impact on energy efficiency and autonomy of IEEE 802.11 technology end-consumers. Increasing regulatory attention to security and privacy around the world, calls for efforts robust authentication and encryption mechanisms for broadcast frames, but also for assistance to broadcasters in ensuring that they are compliant with marketing, privacy and security expectations.

Broadcast providers (i.e. public providers) are evaluating current technologies operating in the unlicensed band to provide a low cost means for broadcasting public TV and especially radio channels. When DVB technologies are replaced with alternative low-cost technologies, such as WLAN, receiving stations may not be capable of establishing bidirectional association and authentication with the sender.

The increasing number of IEEE 802.11 mobile devices cause channel congestion, especially in high-density areas. An enhanced broadcast service (EBS) is expected to provide benefit for all IEEE 802.11 mobile devices, as it can reduce traffic on a channel by replacing frequently accessed unicast traffic with broadcast traffic.

b) Multiple vendors and numerous users.

A wide variety of chipset vendors currently build various IEEE 802.11 chipsets. A significant variety of set makers also build various IEEE 802.11 enabled end-consumer mobile devices, such as APs, smartphones, tablets and PCs. They are expected to implement the IEEE 802.11 EBS.

Stakeholders include chip makers, set makers, system integrators, end-consumers, telecom operators, public broadcasters, transportation industries and store operators.

## 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.

1. Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q? **YES**
2. 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 describes why the proposed project is substantially different.

The proposed amendment is an amendment to the IEEE 802.11 specifications. There are no approved IEEE 802 projects addressing enhanced broadcast services for IEEE 802.11 mobile devices.

## 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.

Hardware components, such as IEEE 802.11 chipsets, are available today. Modifications to the existing IEEE 802.11 MAC are implemented by modifying driver software. Possible solutions on how to achieve the envisioned functionality have been presented in IEEE 802.11 BCS SG. [5, 6, 7, 8, 9]

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

The main components of the technology and signaling are in use today. Hence, the involved testing overhead associated with a commercial development undertaken by manufacturers is reasonable.

The amendment will use modeling and simulation as tools for evaluating performance metrics as necessary.

**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).

The amendment will not change the existing balance with infrastructure versus attached station, with the exception of opening up a new class of cheap receiver only IEEE 802.11 mobile devices. Receiver only IEEE 802.11 mobile devices may apparently reduce their average energy consumption as they do not need transmit frames.

1. b) Known cost factors.

It does not significantly change the existing IEEE 802.11 known cost factors except receiver only IEEE 802.11 mobile devices. The receiver only IEEE 802.11 mobile devices may reduce their cost by removing the transmitter.

c) Consideration of installation costs.

Installation costs are unchanged from those for existing IEEE 802.11 mobile devices.

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

Operation cost is expected to be the same as existing IEEE 802.11 mobile devices. In addition, using EBS may reduce energy consumption at both IEEE 802.11 access points and mobile devices.

1. Other areas, as appropriate.

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