

P802.22.3

Submitter Email: apurva_mody@yahoo.com

Type of Project: New IEEE Standard

PAR Request Date: 09-Jun-2014

PAR Approval Date:

PAR Expiration Date:

Status: Unapproved PAR, PAR for a New IEEE Standard

1.1 Project Number: P802.22.3

1.2 Type of Document: Standard

1.3 Life Cycle: Full Use

2.1 Title: Part 22.3: Standard Specifying Spectrum Occupancy Sensing (SOS) Measurement Devices and Means that Enable Coalescing the Results from Multiple Such Devices

3.1 Working Group: Wireless Regional Area Networks Working Group (C/LM/WG802.22)

Contact Information for Working Group Chair

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3.2 Sponsoring Society and Committee: IEEE Computer Society/LAN/MAN Standards Committee (C/LM)

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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: 11/2016

4.3 Projected Completion Date for Submittal to RevCom: 10/2017

5.1 Approximate number of people expected to be actively involved in the development of this project: 30

5.2 Scope: The Spectrum Occupancy Sensing (SOS) Project creates a stand-alone system specifying measurement devices and means that enable coalescing the results from multiple such devices. The aim is to use messaging structures, interfaces and primitives that are derived from IEEE Std. 802.22-2011, and to use any on-line transport mechanism to achieve the control and management of the SOS system. This standard initially specifies a device operating in the bands below 1 GHz and a second device operating from 2.7 GHz to 3.7 GHz. This standard may specify interfaces and primitives to provide value added sensing information to various spectrum sharing database services.

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

5.4 Purpose: The purpose is to specify operating characteristics of the spectrum sensing devices.

5.5 Need for the Project: This project will enable creation of low cost sensors for improved spectrum utilization and other shared spectrum applications.

5.6 Stakeholders for the Standard: Manufacturers and users of semiconductor, personal computer, wireless devices and sensors, consumer electronic devices, mobile devices, wireless internet service providers etc.

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

If Yes please explain: There are no completed or on-going activities that are similar to the proposed SOS project within the IEEE 802 community. However, there are a few other similar standards in this space which are listed below.

a. IEEE Std. 1900.6-2011: IEEE Standard for Spectrum Sensing, Interfaces and Data Structures for Dynamic Spectrum Access and other Advanced Radio Communications Systems

b. IEEE P1900.6a: IEEE Draft Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and other Advanced Radio Communication Systems Amendment: Procedures, Protocols and Data Archive Enhanced Interfaces

It is to be noted that although these P1900 standards describe communication protocols, they do not specify the operating characteristics for the sensor.

and answer the following

Sponsor Organization: IEEE P1900 Dynamic Spectrum Access Networks Standards Committee

Project/Standard Number: IEEE Std. 1900.6-2011

Project/Standard Date: 22-Apr-2011

Project/Standard Title: a. IEEE Std. 1900.6-2011: IEEE Standard for Spectrum Sensing, Interfaces and Data Structures for Dynamic Spectrum Access and other Advanced Radio Communications Systems

b. IEEE P1900.6a: IEEE Draft Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and other Advanced Radio Communication Systems Amendment: Procedures, Protocols and Data Archive Enhanced Interfaces

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): Recently, Federal Communications Commission (FCC), National Telecommunications and Information Administration (NTIA) in the United States and other regulators such as OfCom UK, have broadened their horizons for cooperative spectrum sharing approaches in order to optimize spectrum utilization. For example see the PCAST Report [1] - Realizing Full Potential of Government Held Spectrum. FCC/ NTIA are in the process of opening new spectrum bands which specifically require multi-levels of regulated users to share the spectrum utilizing cognitive radio behavior. For our purposes, we define spectrum sharing as a mechanism which ensures that primary services are protected from interference while allowing other opportunistic devices to share the spectrum.

This emphasis on greater spectrum efficiencies, spectrum sharing and spectrum utilization requires not only database driven configuration of the radios, but systems that can provide spectrum occupancy at a particular location and at a particular time. Regulators all over the world have realized the importance of better spectrum utilization.

Since 2005, the IEEE 802.22 Working Group has been developing cognitive radio technologies which include spectrum sensing, cognitive radio messaging and control as well as spectrum management. The Spectrum Occupancy Sensing (SOS) Project plans to extract and re-structure these functions, in order to create a stand-alone system.

SOS has many applications which include:

1. On-demand spectrum survey and report
2. Collaborative spectrum measurement and calibration
3. Labeling of systems using the spectrum
4. Spectrum planning
5. Spectrum mapping
6. Coverage analysis for wireless deployment
7. Terrain and topology - shadowing and fading analysis
8. Quantification of the available spectrum through spectrum observatories
9. Complement the database access for spectrum sharing by adding in-situ awareness and faster decision making.
10. Space-Time-Frequency spectrum hole identification and prediction where non-time-sensitive tasks can be performed at certain times and at certain locations, when the spectrum use is sparse or non-existent

11. Identification and geolocation of interference sources, etc.

[1] President' s Council of Advisors on Science and Technology Report - Realizing Full Potential of the Government Held Spectrum to Spur Economic Growth. http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf