

## P802.22.3

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**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

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

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**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)

**Contact Information for Sponsor Chair**

**Name:** Paul Nikolich

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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

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

**5.2 Scope:** ~~This~~ Standard defines a Spectrum Occupancy Sensing ~~Project System. It creates a stand-alone system specifying measurement parameters and device behaviors. It includes measurement devices and protocols for reporting measurement information means~~ that enable coalescing the results from multiple such devices. The ~~aim is to use messaging structures standard leverages,~~ interfaces and primitives that are derived from IEEE Std. 802.22-2011, and ~~uses to use~~ any on-line transport mechanism ~~available~~ to achieve the control and management of the ~~SOS~~ system. ~~Interfaces and primitives are provided for conveying value added sensing information to various spectrum sharing database services.~~ 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 components of the Spectrum Occupancy Sensing System-sensing devices.

**5.5 Need for the Project:**

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 (See §8.1). FCC/ NTIA are in the process of opening new spectrum bands which specifically require multi-levels of regulated users (e. g. primary, opportunistic etc.) to share the spectrum. There is emphasis on greater spectrum efficiencies, spectrum sharing and spectrum utilization, which 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.

This standard will help fulfil this need by creating a Spectrum Occupancy Sensing System. This will enable creation of low-cost sensors for improved spectrum utilization and support for other shared spectrum applications, hence-benefitting the regulators and users alike.

**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.

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**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

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**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 Standard 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 Std. 1900.6a-2014~~IEEE P1900.6a~~: IEEE Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and Other Advanced Radio Communication Systems - Amendment 1: Procedures, Protocols, and Data Archive Enhanced Interfaces  
~~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 IEEE P1900 standards describe communication protocols, they do not specify the operating characteristics for the sensor devices.

**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 Std. 1900.6a-2014~~~~IEEE P1900.6a~~: [IEEE Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and Other Advanced Radio Communication Systems - Amendment 1: Procedures, Protocols, and Data Archive Enhanced Interfaces](#)

## 7.2 Joint Development

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

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### 8.1 Additional Explanatory Notes (Item Number and Explanation):

~~This provides further explanation to Item 5.5 on the Need the Spectrum Occupancy Sensing System. 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. Regualtors 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](http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf)