Cognitive Radio Standardization Activities in IEEE 802 and IETF PAWS

Workshop on Cognitive Radio and Software Defined Radio: Policy and Regulations, organised jointly by ECC/ETSI/COST-TERRA

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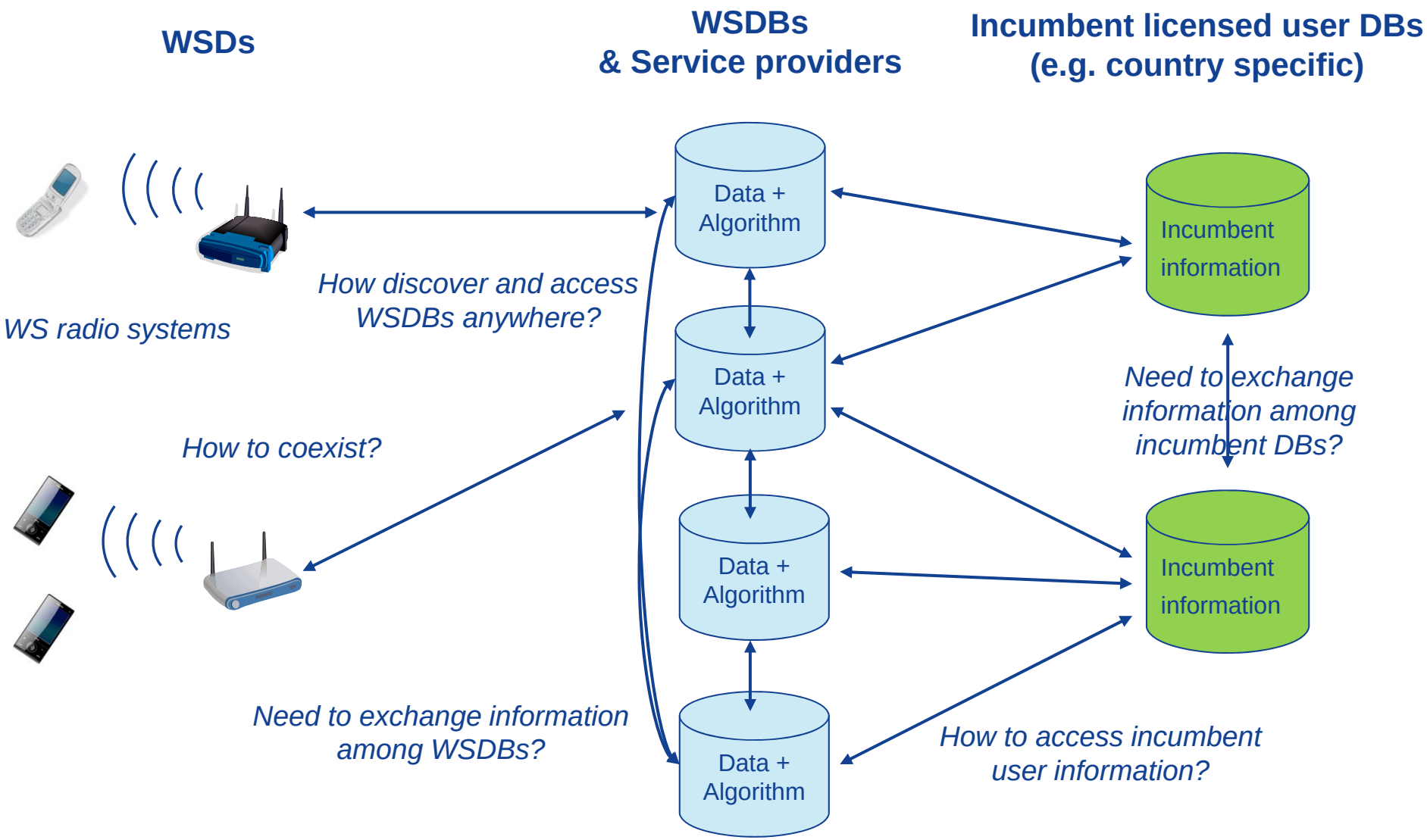
Overview of TVWS/CR framework



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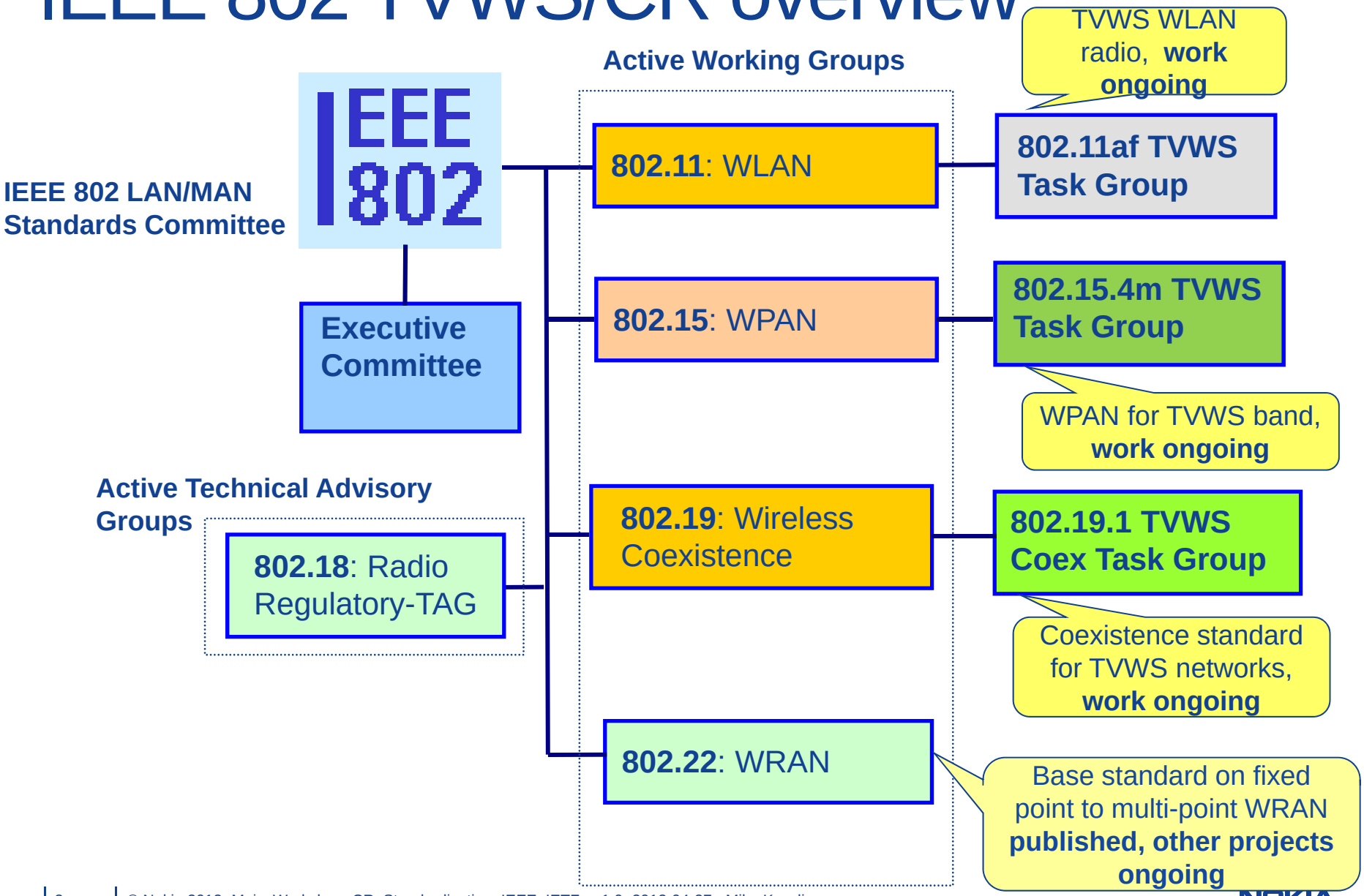
IEEE 802 TVWS/CR overview



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IETF PAWS

Charter

- Available at http://datatracker.ietf.org/wg/paws/charter/
- Two clear deliverables
  1. A description of the relevant use cases and requirements (Informational)
  2. A specification of the mechanism for discovering a white space database, the method for accessing a white space database, and the query/response formats for interacting with a white space database (Standards Track)

Current Status

- PAWS BOF held at IETF80 in Prague on March 2011, WG approved on June 2011
- The group has been reviewing proposals since late 2011 and work is ongoing on the solution documents, data model has been one of the recent discussion topics
- Very recently an updated charter was drafted to capture the Ofcom requirements

Timeline

- Submit the proposed standard for *Accessing Radio White Space Database* to the IESG for publication by Dec. 2012

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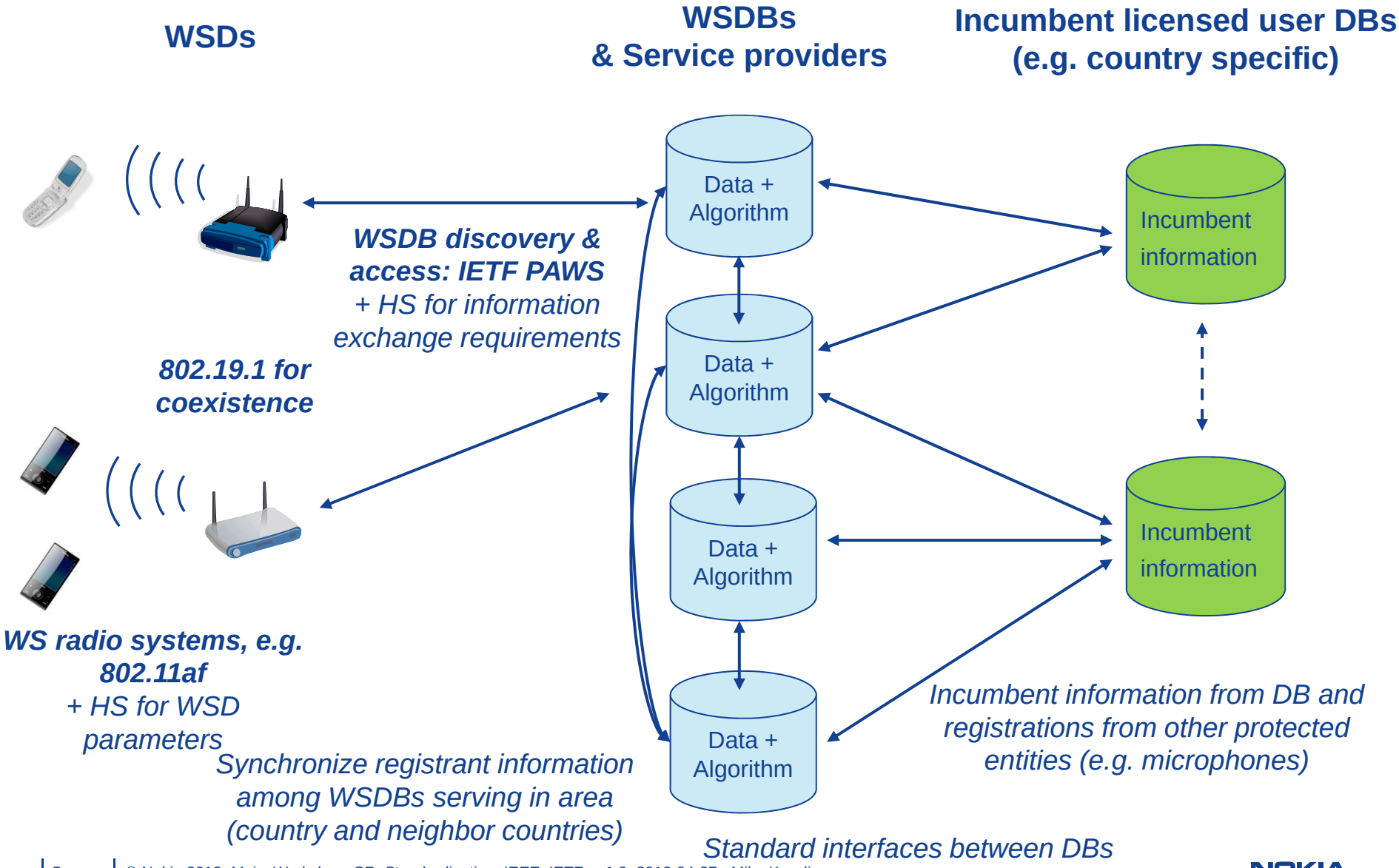
Summary



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Background Information

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Overview of CR/TVWS Activities in IEEE 802and IETF

- IEEE 802 LMSC (LAN/MAN Standards Committee): major work with broad industry participation ongoing on the following new standards or amendments:
  - 802.11af - WLAN PHY/MAC amendment for TVWS
  - 802.22 - WRAN PHY/MAC standard
  - 802.15.4m - WPAN PHY/MAC amendment for TVWS
  - 802.19.1 - Coexistence standard for TVWS

- The IETF (Internet Engineering Task Force) has started a new working group PAWS (Protocol to Access White Space Databases) in June 2011. This group will develop WS device to database interface protocol

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IEEE 802.11af

Project	Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - **Amendment: TV White Spaces Operation**
PAR Scope and Purpose	**Scope:** An amendment that defines modifications to both the 802.11 physical layers (PHY) and the 802.11 Medium Access Control Layer (MAC), to meet the legal requirements for channel access and coexistence in the TV White Space **Purpose:** The purpose of this amendment is to allow 802.11 wireless networks to be used in the TV white space
Current Status	• The first WG letter ballot (Jan-Feb 2011) failed. The TG received 1304 comments. The group has been busy with comment resolutions. • The current .11af spec mainly covers the FCC rules (10-174, Sept 23rd, 2010). However, the TG is open to include requirements from other regulations as they become available
Timeline	SASB expected in Mar 13, Final 802.11 WG approval in Mar 14

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IEEE 802.22

Project	Part 22: **Cognitive Wireless RAN Medium Access Control (MAC) and Physical Layer (PHY) specifications**: Policies and procedures for operation in the TV Bands
PAR Scope	**Scope:** This standard specifies the air interface, including the cognitive MAC PHY layer, of point-to-multipoint wireless regional area networks comprised of a professional fixed base station with fixed and portable user terminals operating in the VHF/UHF TV broadcast bands between 54 MHz and 862 MHz
Current Status	• The base **standard 802.22 published in July 2011**, • The 802.22.1 standard for the Enhanced Interference Protection of the Licensed Devices was published in Nov. 2010 • 802.22.2 Recommended Practice for Installation and Deployment of 802.22.2 Systems – in re-circ SB • 802.22a amendment for Management Information Base and Management Plane procedures- first WG LB completed • 802.22b enhancements for Broadband Applications and Monitoring Service – in call for proposals

IEEE 802.15.4m

Project	Part 15.4: Low Rate Wireless Personal Area Networks (LR-WPANs) **Amendment: TV White Space Between 54 MHz and 862 MHz Physical Layer**
PAR Scope	**Scope:** This amendment specifies a physical layer for 802.15.4 meeting TV white space regulatory requirements in as many regulatory domains as practical and also any necessary Media Access Control changes needed to support this physical layer. The amendment enables operation in the VHF/UHF TV broadcast bands between 54 MHz and 862 MHz, supporting typical data rates in the 40 – 2000 kbits per second range, to realize optimal and power efficient device command and control applications.
Current Status	• First set of proposals expected in early May

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IEEE 802.19.1

Project	Part 19: **TV White Space Coexistence Methods**
PAR Scope and Purpose	**Scope:** The standard specifies radio technology independent methods for coexistence among dissimilar or independently operated TV Band Device (TVBD) networks and dissimilar TV Band Devices **Purpose:** The purpose of the standard is to enable the family of IEEE 802 Wireless Standards to effectively use TV White Space by providing standard coexistence methods among dissimilar or independently operated TVBD networks and dissimilar TVBDs. It addresses coexistence for IEEE 802 networks and devices and will also be useful for non IEEE 802 networks.
Current Status	• First WG letter ballot on draft completed on April 23 and failed • The draft has a complete description of the system architecture and set of algorithms and related protocol messages defined

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