

Workshop on TV White Space Coexistence

IEEE 802.19.1 Overview

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IEEE-SA Standards Board Operation
Manual (subclause 5.9.3)

Outline

- Introduction
 - IEEE 802
 - Standard Development
- IEEE 802.19.1 Project
 - 802.19 WG
 - Project Scope and Purpose
 - Project Timeline
 - System Design Document
- How to assist 802.19.1

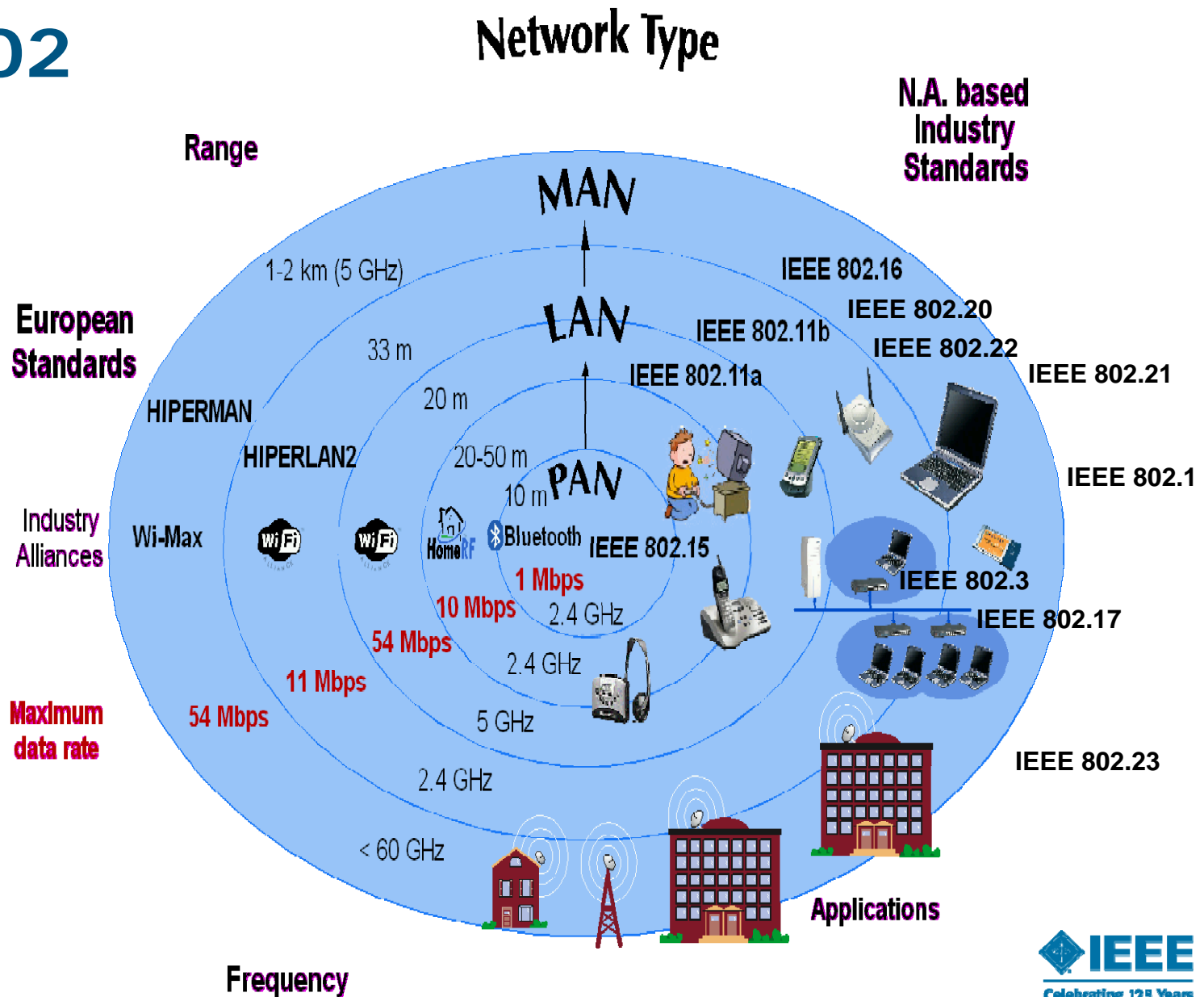
IEEE 802

~1500 members
12 Groups
(Working & TAG)

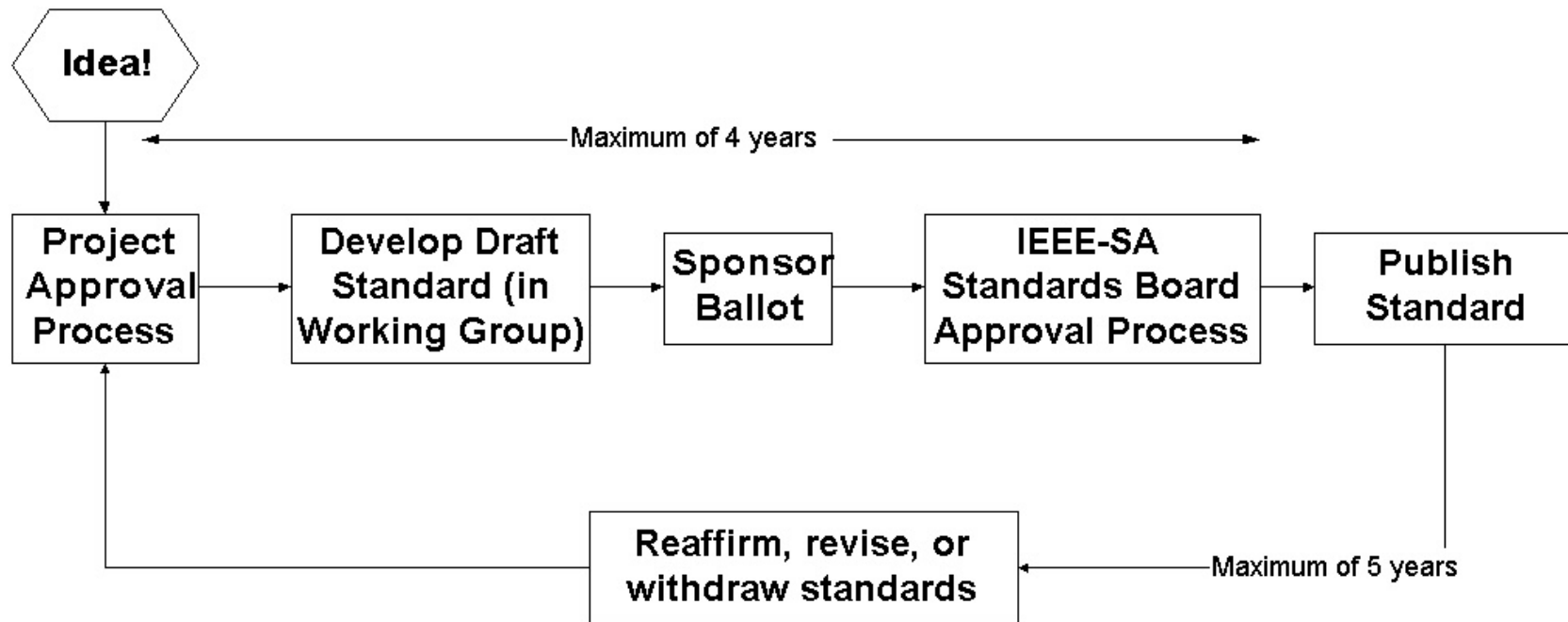
3 Plenary Sessions:
MAR, JUL, NOV
(~1000 participants)

3 Interim Sessions:
JAN, MAY, SEP

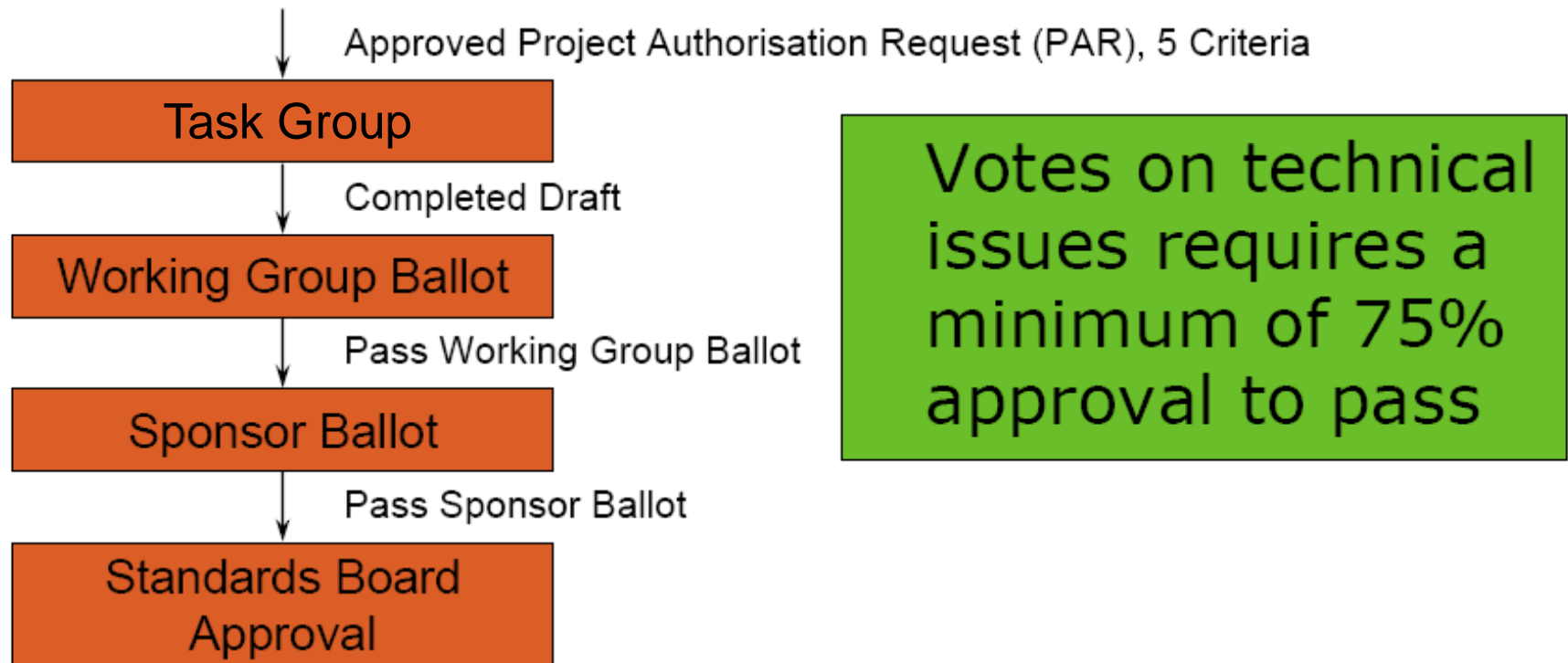
In between:
Many teleconference meetings



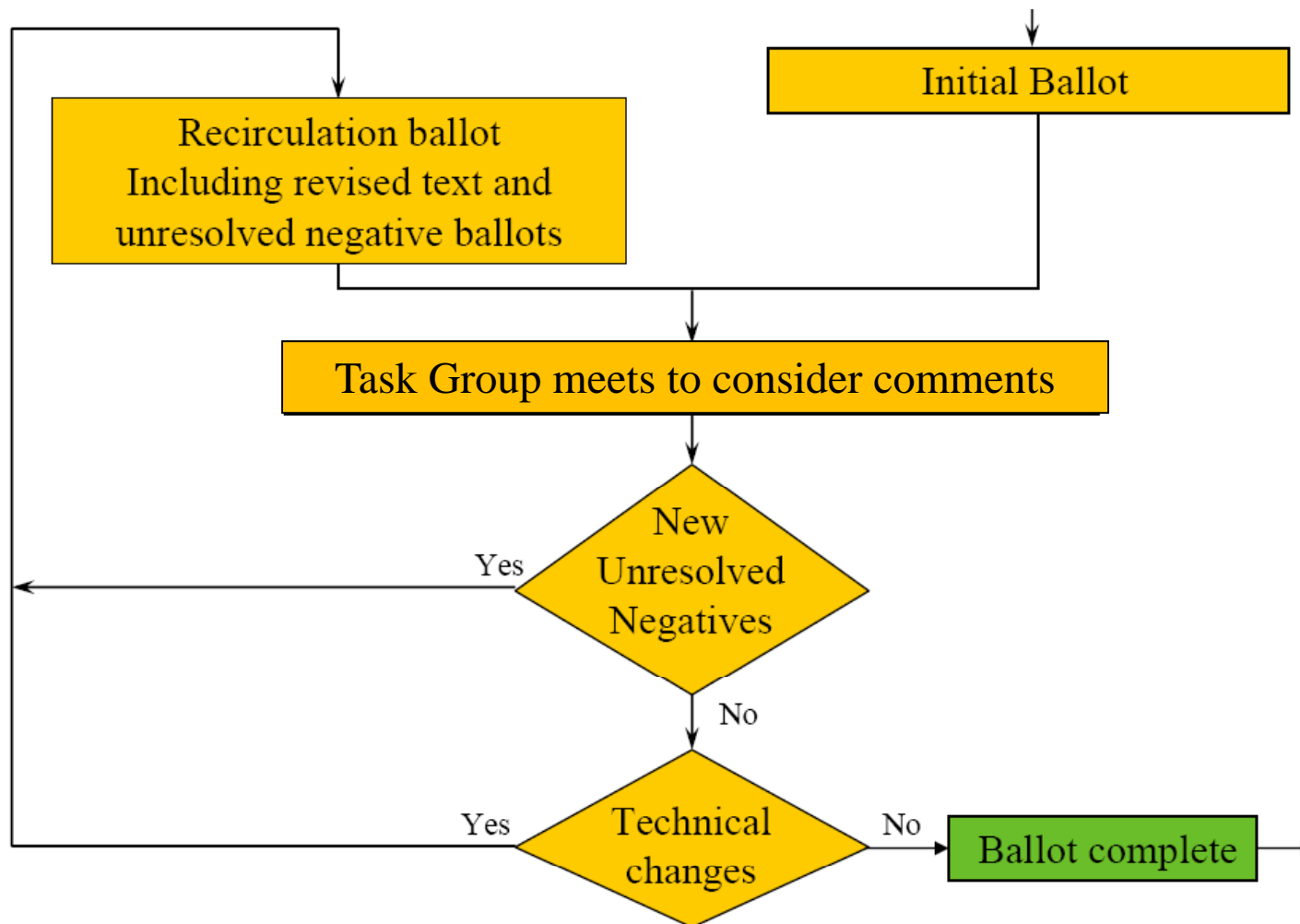
The Consensus Process



IEEE 802 Standards Development Overview



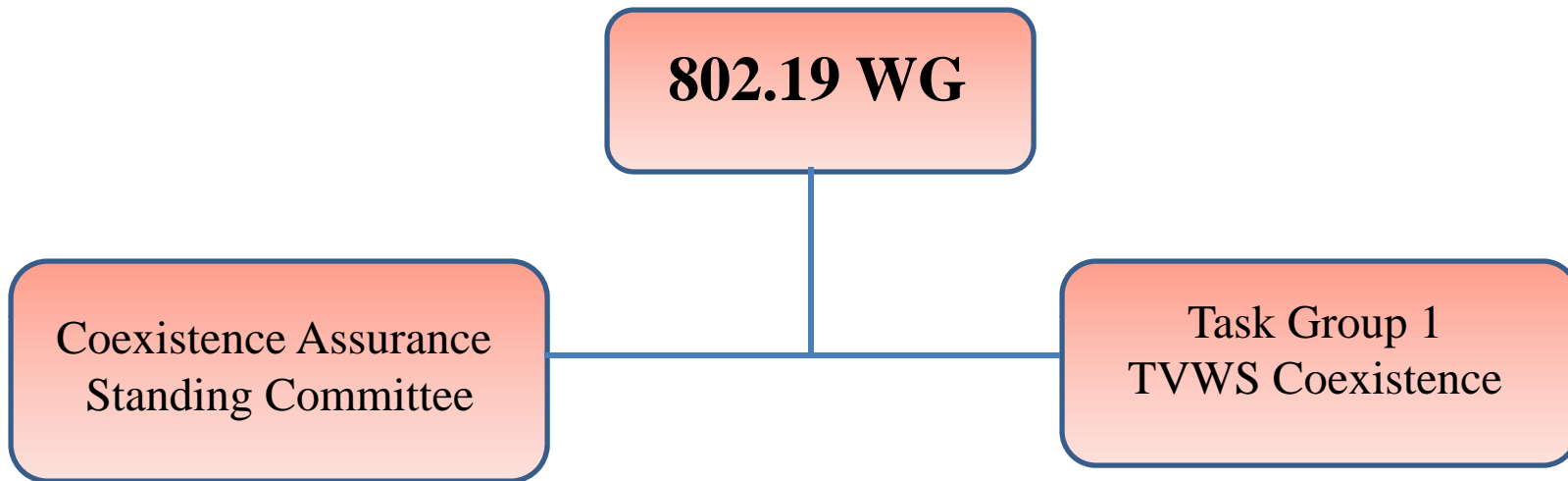
The Ballot Process



IEEE 802.19 Wireless Coexistence Working Group

- Providing technical advice to the working groups and evaluating coexistence assurance documents.
- Preparing a standard, which enables effective use of TV White Spaces by IEEE 802 algorithms via coexistence methods.
- **Website:** <http://www.ieee802.org/19/>
- **Officers**
 - Chair: Steve Shellhammer (Qualcomm) shellhammer@ieee.org
 - Vice Chair: Ivan Reede (Amerisys)
 - Editor: Mark Austin (Ofcom)
- Number of Voting Members: 46

IEEE 802.19 WG Structure



- Officers

- Chair:
Steve Shellhammer (Qualcomm)

- Officers

- Chair:
Tuncer Baykas (NICT)
- Vice Chair:
Mika Kasslin (Nokia Research)

802.19.1 History

- **March 2009:** The IEEE 802 executive committee approved formation of an 802.19 Study Group on TV white space coexistence with PAR intention.
- **December 2009:** The PAR created by the Study Group is approved by the Nescom and 802.19 Task Group 1 is formed.
- **January 2010:** IEEE 802.19 Task Group 1 had its first meeting in Los Angeles. Group decided to work on a System Design Document and prepare its call for proposals
- **March 2010:** IEEE 802.19 Task Group 1 approved system design document and call for proposals.
- **May/July 2010:** Contributions about coexistence methods and algorithms will be presented.

802.19.1 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 **most effectively use TV White Space** by providing standard **coexistence methods** among dissimilar or independently operated TVBD networks and dissimilar TVBDs. This standard addresses coexistence for IEEE 802 networks and devices and will also be useful for non IEEE 802 networks and TVBDs.

802.19 TG1 Timeline

| | 2010 | | | | | 2011 | | | | | | |
|--|------|---|---|---|---|------|---|---|---|---|---|----|
| | 1 | 3 | 5 | 7 | 9 | 11 | 1 | 3 | 5 | 7 | 9 | 11 |
| Task Group Formed | x | | | | | | | | | | | |
| SDD completed | | x | | | | | | | | | | |
| Order of Clauses determined | | x | | | | | | | | | | |
| Call for Proposals issued | | x | | | | | | | | | | |
| Contribution presentations with straw polls | | | x | x | x | x | | | | | | |
| Proposal presentations | | | | | x | x | | | | | | |
| Round of votes on proposals in clause order | | | | | | | x | | | | | |
| Create candidate draft document | | | | | | | x | | | | | |
| Comment ballot on the candidate draft | | | | | | | x | x | | | | |
| Comment resolutions on the candidate draft | | | | | | | | x | | | | |
| Adoption of draft normative text (Draft 1.0) | | | | | | | | x | | | | |

September 2010: System description

September 2010: The 802.19.1 reference model

September 2010-November 2010: Procedures and protocols

September 2010-November 2010: Coexistence mechanisms and algorithms

System Design Document

802.19.1 created system design document to assist standardization process.

It provides,

- **System Requirements (What is expected from 802.19.1 system?)**
- **802.19.1 System Architecture (How 802.19.1 will provide coexistence?)**

SDD does not put any limitation on future contributions and proposals.

<http://ieee802.org/19/pub/TG1.html>

System Requirements

Requirement 1 (Discovery)

802.19.1 system shall enable discovery for 802.19.1 compliant TVBD networks and devices.

Requirement 2 (Communication)

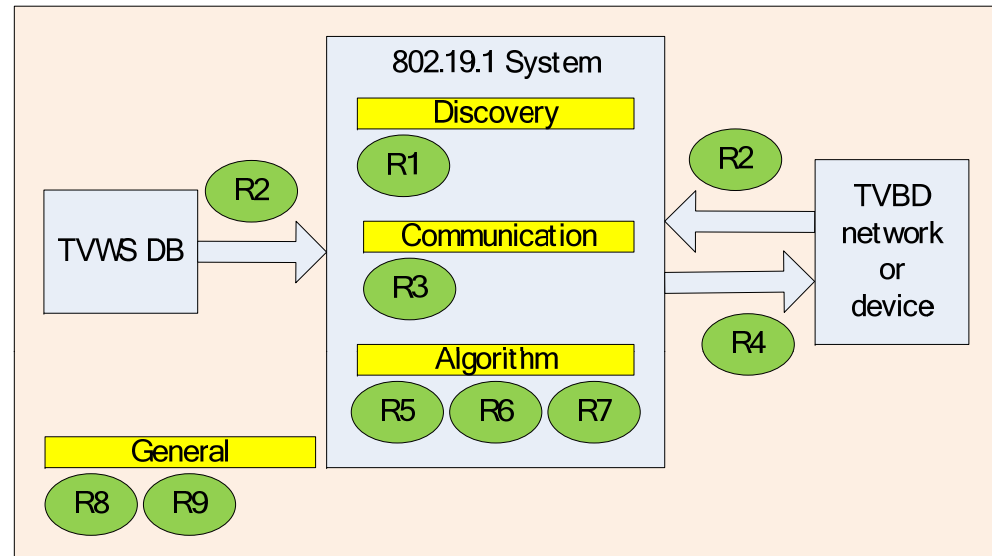
802.19.1 system shall be able to obtain and update information required for TVWS coexistence.

Requirement 3 (Communication)

802.19.1 system shall have means to exchange obtained information.

Requirement 4 (Communication)

802.19.1 system shall be able to provide reconfiguration requests and/or commands as well as corresponding control information to 802.19.1 compliant TVBD networks and devices to implement TVWS coexistence decisions.



System Requirements

Requirement 5 (Algorithm)

802.19.1 system shall analyze obtained information.

Requirement 6 (Algorithm)

802.19.1 system shall be capable of making TVWS coexistence decisions.

Requirement 7 (Algorithm)

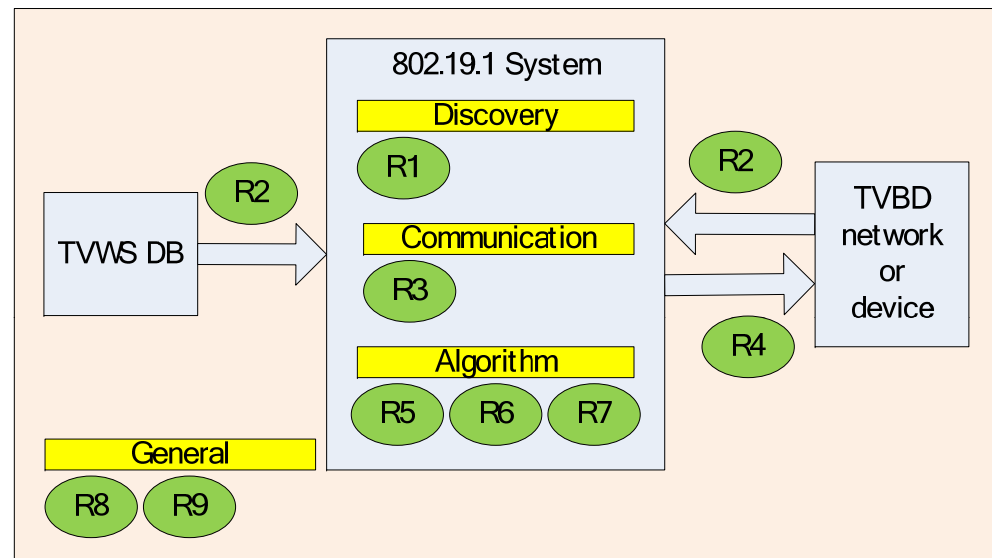
802.19.1 system shall support different topologies of decision making for TVWS coexistence (e.g. centralized, distributed and autonomous).

Requirement 8 (General)

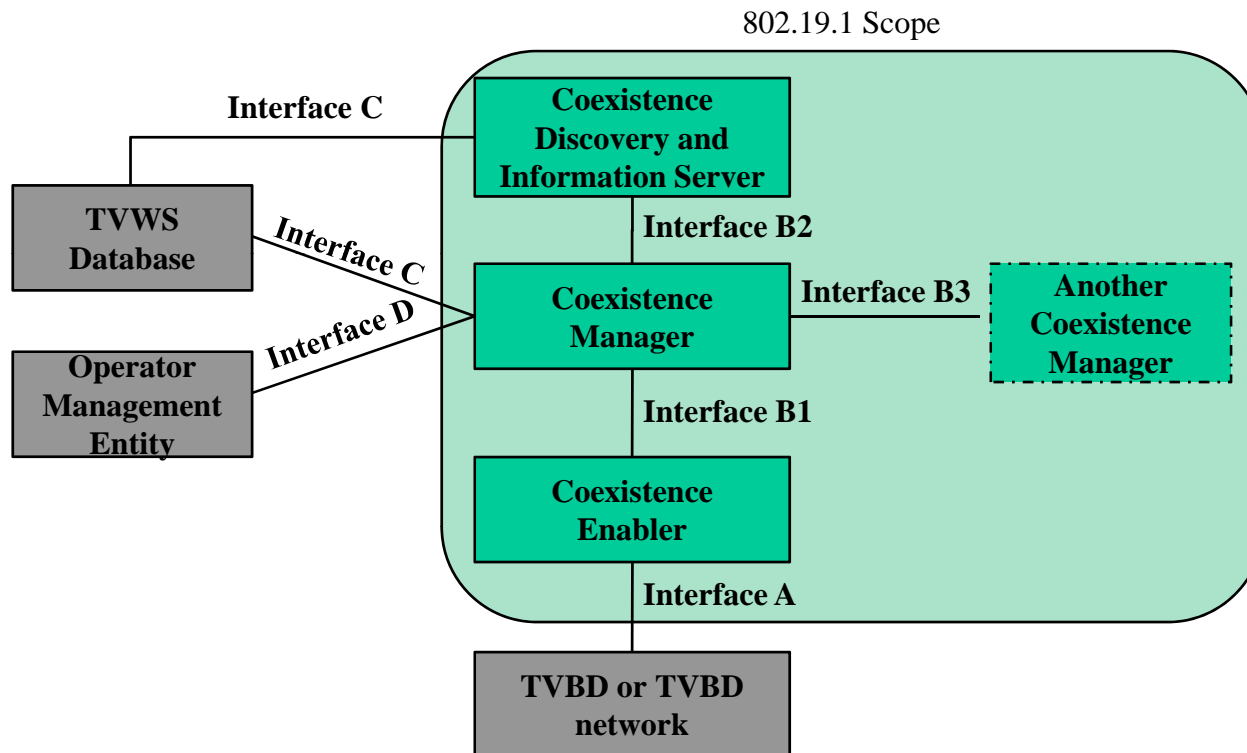
802.19.1 system shall support appropriate security mechanisms. This shall include user/device authentication, integrity and confidentiality of open exchanges, and data privacy and policy correctness attestation and enforcement.

Requirement 9 (General)

802.19.1 system shall utilize a set of mechanisms to achieve coexistence of TVBD networks and devices.



802.19.1 Architecture



Entities communicating with the 802.19.1 system

TV Band Device or Network

Operates license-exempt in the broadcast television spectrum at locations where it is allowed.

TVWS Database

Provides list of channels occupied by primary users.

Operator Management Entity

Provides operator related information such as policies/limitations.

Entities belonging to 802.19.1 System

Coexistence Manager

Coexistence decision making, which includes generating and providing corresponding coexistence requests/commands and control information to Coexistence Enabler(s)

Discovery of and communication with other Coexistence Managers

Assisting network operators in management related to TVWS coexistence

Coexistence Enabler

Communication between Coexistence Manager and TVBD network or device

Obtaining information, required for coexistence, from TVBD network or device

Translating reconfiguration requests/commands and control information received from the Coexistence Manager into TVBD-specific reconfiguration requests/ commands

Coexistence Discovery and Information Server

Providing coexistence related information to Coexistence Managers

Supporting discovery of Coexistence Managers and opening interfaces between Coexistence Managers

Collecting, aggregating information related to TVWS coexistence.

Coexistence Discovery and Information Server may connect to TVWS database to obtain primary users information.

Deployment of Entities

Coexistence Enabler (CE)

CEs can be deployed inside TV Band Device or Network.

Coexistence Manager (CM)

CMs can be deployed inside the TV Band Device or Network. Also CMs can be deployed outside TV Band Networks.

Coexistence Discovery and Information Server (CDIS)

CDISs can be deployed outside TV Band Networks.

How to assist 802.19.1?

802.19.1 is open to contributions during its meetings and teleconferences.

Interested parties may join meetings and obtain voting right to provide comments during Working group ballot.

During sponsor ballot comments can be provided by becoming member of IEEE SA.

Questions related to 802.19.1:

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