Considerations on P802.19.1 Architecture

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Abstract

This contribution proposes some architectural options for P802.19.1
Background

- **P802.19.1 system shall support the following functionality**
  - Discovery of P802.19.1-compliant TVBD networks
  - Obtaining and exchanging information required to make TVWS coexistence decisions
  - Centralized and distributed decision making for TVWS coexistence
  - Reconfiguration commands to implement TVWS coexistence decisions
Deployment option 1: Distributed decision making 1/4

Wired network, e.g. IP-based network

E.g., IP

Coexistence Database

E.g., IP

Coexistence Enabler

TVBD network

E.g., IP

Coexistence Enabler

TVBD network
Deployment option 1: Distributed decision making 2/4

• Coexistence Enablers of different TVBD networks register in Coexistence Database

• Coexistence Enablers request registration information of other TVBD networks from Coexistence Database
  – Coexistence Database may indicate new registration to already registered Coexistence Enablers

• Using the registration information, Coexistence Enablers of co-located TVBD networks establish connection with each other
Deployment option 1: Distributed decision making 3/4

- Coexistence Enablers exchange information required for TVWS coexistence, for example
  - TVBD network location
  - TV channels currently used by this TVBD network
  - Number of TV channels required for this TVBD network
  - Spectrum sensing results
  - Spectrum sharing capabilities (e.g. whether this TVBD network can share the same channel with other network or not and corresponding protocol, power control capability, etc.)

- Also, Coexistence Enablers are aware of the available TV channels, e.g. by communicating with TVWS DB
Deployment option 1: Distributed decision making 4/4

- Coexistence Enablers analyze received information and decide alternatives of TVWS usage
- Coexistence Enablers negotiate acceptable configuration of TVBD networks by exchanging TVWS coexistence protocol messages
- Once acceptable configuration has been found, Coexistence Enablers implement such configuration in their TVBD networks
Deployment option 2: Centralized decision making 1/3

Wired network, e.g., IP-based network

Centralized Management

Coexistence Database

E.g., IP

Coexistence Enabler

TVBD network 1

E.g., IP

Coexistence Enabler

TVBD network 2

E.g., IP
Deployment option 2: Centralized decision making 2/3

- Coexistence Enablers of different TVBD networks register in Coexistence Database
- Coexistence Enablers provide information required for TVWS coexistence to Coexistence Database
- Coexistence Management Server can obtain this information from Coexistence Database
- Coexistence Management Server is aware of available TV channels, e.g. by communicating with TVWS DB, e.g. via Coexistence Database
Deployment option 2: Centralized decision making 3/3

- Coexistence Management Server analyzes available information, decides TVWS usage, and generates corresponding reconfiguration guidelines
- Coexistence Management Server provides reconfiguration guidelines to Coexistence Enablers
- Coexistence Enablers make coexistence decisions within the received guidelines and implement these decisions by reconfiguring their TVBD networks
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