IEEE P802.19
Wireless Coexistence

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|  Mobility information in registration messages  |
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Abstract

This document is a submission to IEEE 802.19 TG1 proposing resolution to comments CID #48 and 49 of the Letter Ballot IEEE 802.19-12-0204r0 to clause 6.4 on including mobility information during CE and CM registrations. It is also proposed to include the mobility information data type in clause 6.5. Such mobility information enables coexistence decisions that reduce reconfiguration signaling overhead and avoid spectrum handoffs and hence providing seamless connectivity.

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# Discussion

WSOs may require switching to another spectrum band as they move. This is because the white space spectrum availability depends on the time and the location. At a given instant of time, the channel available at the current location may not be available at the next location. Hence, spectrum handoff is required to avoid interference to the primary users. This results in interruptions in communications and dropped packets and hence poor user experience.

Mobility information may lead to a better coexistence decision making so as to achieve a balance between seamless connectivity, network throughput, and signaling overhead. However, WSO mobility information parameters to the coexistence system are not supported in the draft. WSO mobility information parameters may include WSO speed, direction, or mobility state (no mobility, low/moderate/high mobility determined based on some thresholds). WSO mobility information shall be forwarded to the coexistence system during registration, resource reconfiguration, and information request. Furthermore, the coexistence system shall be able to obtain measurement from the networks under its subscription. Thus, WSO mobility measurement capability shall be supported in IEEE 802.19.1. Consequently, WSO mobility report (on speed, direction, or mobility state) shall be added to enable the coexistence system to configure reports on mobility. This document proposes modifications to include mobility information in CE and CM registration messages.

# Comment 1 (CID# 48)

WSO mobility information should be specified during the CE registration.

# Proposed resolution 1

*It is proposed to include WSO mobility information parameter in "CERegistrationRequest" message as follows:*

CERegistrationRequest ::= SEQUENCE {

-- Indicates whether this is new registration or registration update

operationCode OperationCode,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Network type, e.g., fixed, mode 2

networkType NetworkType, 3

-- Regulatory ID of the WSO, e.g. FCC ID

deviceRegulatoryID OCTET STRING,

-- Serial number of the WSO

deviceSN OCTET STRING,

-- Information about available white space resources

availableChannelsInfo AvailableChannelsInfo,

-- Information about WSO mobility

mobilityInformation MobilityInformation,

-- Information for discovery

discoveryInformation DiscoveryInformation,

-- Adjacent channel leakage ratio of the TVBD device

aCLR REAL,

-- Adjacent channel selectivity of the receiver

aCS REAL,

…

}

# Comment 2 (CID #49)

WSO mobility information should be specified during the CM registration.

# Proposed resolution 2

*It is proposed to include WSO mobility information parameter in "CMRegistrationRequest" message as follows:*

CMRegistrationRequest ::= SEQUENCE {

-- Maximum number of controllable WSOs

maximumNumberOfControlableWSO INTEGER,

-- The geo-location of the CM

geolocationCM Geolocation,

-- The coverage radius of the CM in meters

coverageRadiusCM REAL,

-- Indicates whether this is new registration, registration update,

-- or deletion of WSO

operationCode OperationCode,

-- CE identifier to which this message applies

ceID CxID,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Network type, e.g., fixed, mode 2

networkType NetworkType,

-- Information about WSO mobility

mobilityInformation MobilityInformation,

-- Information for discovery

discoveryInformation DiscoveryInformation,

-- Adjacent channel leakage ratio of the WSO device

aCLR REAL,

-- Adjacent channel selectivity of the receiver

aCS REAL,

-- Guaranteed QoS of backhaul connection in the WSO device

guarQoSOfBackhaulConnection GuaranteedQoSOfBackhaulConnection,

-- List of supported resources: channel numbers or frequencies

listOfSupportedResources CHOICE {

-- List of supported channel numbers

listOfSuppChNumber ListOfSupportedChNumber,

-- List of supported frequencies

listOfSuppFrequencies ListOfSupportedFrequencies },

-- Measurement capability of the WSO

measurementCapability MeasurementCapability

}

# Comment 3

The mobility information data type shall be listed and defined in clause 6.5.

# Proposed resolution 3

1. *It is proposed to modify the text in clause 6.5 as follows:*

*-- Data type definitions used in messages*

EXPORTS SubscribedService, OperationCode, NetworkTechnology, NetworkType, MobilityInformation, DiscoveryInformation, AvailableChannelsInformation, ListOfAvailableFrequencies, ListOfSupportedFrequencies,  *…*

1. *It is proposed to include “MobilityInformation” data type after “DatabaseInformation” as follows:*

MobilityInformation :: = CHOICE {

 mobilityInfoValue MobilityInfoValue,

 mobilityStatus MobilityStatus

}

MobilityInfoValue :: = SEQUENCE {

 WSOSpeed REAL,

 WSODirection REAL, -- radian

}

MobilityStatus :: = ENUMERATED {

 noMobility,

 lowMobility,

 moderateMobility,

 highMobility

}