IEEE P802.19
Wireless Coexistence

|  |
| --- |
|  Mobility information in update registration primitive  |
| Date: 2012-11-13 |
| Author(s): |
| Name | Company | Address | Phone | email |
| Golnaz Farhadi | Fujitsu Labs of America  | 1240 E. Arques Avenue M/S 345, Sunnyvale, CA 94085, USA  | 1-408-530-4510 | gfarhadi@us.fujitsu.com  |
| Tsuyoshi Shimomura | Fujitsu Labs Limited  |  |  |  |

Abstract

This document is a submission to IEEE 802.19 TG1 proposing resolution to comments CID # 38 and 39 of the Letter Ballot IEEE 802.19-12-0204r0 to clause 5.2.2.3.4 on including mobility information during registration updates. Such mobility information enables coexistence decisions that reduce reconfiguration signaling overhead and avoid spectrum handoffs and hence providing seamless connectivity.

**Notice:** This document has been prepared to assist IEEE 802.19. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

# 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 during registration update.

# Comment 1 (CID #38)

WSO shall be able to inform its mobility information or status to the CE during registration update.

# Proposed resolution 1

*It is proposed to include WSO mobility information parameter in "NewRegInfo.indication" primitive as follows:*

NewRegInfo.indication (

networkID,

networkTechnology,

networkType,

availableChannelsInfo,

constOfChUses,

mobilityInformation

discoveryInformation,

ACLR,

ACS,

guranteedQoSOfBackhaulConnection,

listOfSupportedResources,

minTxPower,

txScheduleSupported,

networkTechnologyReconfigurationSupported,

addNetworkTechnology,

listOfOperatingResources,

radioEnvironmentInformation,

measurementCapability,

requiredResource

)

# Comment 2 (CID#39)

The mobility information parameter data type and description should be included in Table 17.

# Proposed resolution 2

*It is proposed to modify Table 17 as follows:*

**Table 17 — NewRegInfo.indication primitive parameters**

|  |  |  |
| --- | --- | --- |
| **Name**  | **Data type**  | **Description**  |
| networkID  | OCTET STRING  | Identifier of the network which the WSO represents. As an example, in case of IEEE 802.11, this parameter contains the BSSID used by the WSO.  |
| networkTechnology  | NetworkTechnology  | Indicates the radio access technology which the WSO uses.  |
| networkType  | NetworkType  | Indicates network type as specified in regulations.  |
| availableChannelsInfo  | AvailableChannelsInformation  | Information about available white space channels  |
| constOfChUses  | ConstOfChUses OPTIONAL  | Channel user constraint  |
| mobilityInformation | MobilityInformation | WSO mobility information e.g. speed and direction or mobility state (no mobility, low, moderate, high mobility) |
| discoveryInformation  | DiscoveryInformation  | Information for coexistence discovery, e.g., location information, maximum transmission power, receiver sensitivity, antenna gain, minimum SINR required for system operation, other information needed to calculate coverage and interference areas  |
| ACLR  | REAL  | Adjacent channel leakage ratio of the TVBD device  |
| ACS  | REAL  | Adjacent channel selectivity of the receiver  |
| guaranteedQoSOfBackhaulConnection  | GuaranteedQoSOfBackhaulConnection  | Guaranteed QoS of backhaul connection in the TVBD device  |
| listOfSupportedResources  | CHOICE{ listOfSupportedFrequencies ListOfSupportedFrequencies, listOfSupportedChNumber SEQUENCE OF INTEGER}  | List of supported resources: list of supported operating frequencies or list of supported channel numbers.  |
| minTxPower  | REAL  | Minimum transmission power  |
| txScheduleSupported  | BOOLEAN  | Indicates whether scheduled transmission is supported or not  |
| networkTechnologyReconfigurationSupported  | BOOLEAN  | Indicates whether network technology reconfiguration can be requested by CM  |
| addNetworkTechnology  | SEQUENCE of NetworkTechnology  | Additional supported network technologies  |
| listOfOperatingResources  | CHOICE{ listOfOperatingFrequencies ListOfOperatingFrequencies, listOfOperatingChNumber SEQUENCE OF INTEGER}  | List of operating resources: list of operating frequencies including occupancy of each operating frequency or list of operating channel numbers. The occupancy is indicated as percentage of time the WSO radiates in the indicated operating frequency. Total occupancy may be estimated, as an example, in cases in which WSOs of the same type share a channel and communicate with each other.  |
| radioEnvironmentInformation  | RadioEnvironmentInformation OPTIONAL  | Information on radio environment as observed by this WSO  |
| measurementCapability  | MeasurementCapability  | Measurement capability of this WSO  |
| requiredResource  | RequiredResource  | Information on resource required for operation of this WSO  |