IEEE P802.11
Wireless LANs

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| Resolution of CIDs on EPCS and Fast Transition (LB266) |
| Date: November 2022 |
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 Abstract

This submission proposes resolutions for the following 5 CIDs received for TGbe LB266:

10212, 11790, 11798, 10080, 11964

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revisions based on off-line comments

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbe Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 10080 | 35.17 | 538. 55 | In public area or enterprise scenario, a STA may need to handover among APs. Fast BSS Transition (FT) procedure can be used to transfer the EPCS authorization information and EPCS EDCA parameters from current AP to target AP, in order to avoid requesting authorization from NSEP service provider via interworking procedures. | As in comment. | RevisedAgree in principle with the comment. Added text in clause 35.16 to describe this procedure and updated Fast Transition tables to allow EPCS to be included as FT Resource**TGbe editor please implement changes labelled as #10080 in document 802.11-22-2164r0.** |
| 10212 | 13.1 | 368. 28 | When a non-AP MLD has EPCS enabled, it would be desirable to retain that state across a BSS transition. The BSS Fast transition supports a FT resource request protocol that could be used to facilitate that. | Update Clause 13 to specify EPCS-enabled as a resource that can be requested during a FT. | RevisedAgree in principle with the comment. Added text in clause 35.16 to describe this procedure and updated Fast Transition tables to allow EPCS to be included as FT Resource**TGbe editor please implement changes labelled as #10212 in document 802.11-22-2164r0.** |
| 11790 | 4.5.13 | 61.14 | The AP MLD should also be able to use the cached information for BSS transition | Update the sentence accordingly: 'The AP MLD might cache authorization information locally to enable subsequent verification and use it to confirm authority during (re)association and BSS transition'. | RevisedAgree in principle with the comment. Revised text to include (Fast) BSS transition.**TGbe editor please implement changes labelled as #11790 in document 802.11-22-2164r0.** |
| 11798 | 35.17.1 | 534. 03 | The AP MLD should also be able to use the cached information for fast BSS transition | "Update the text as: The authorization information included in the dot11InterworkingEntry is passed from the prior AP MLD to the new AP MLD in the same ESS during reassociation and as described in 11.22.5.3 | RevisedAgree in principle with the comment. Revised text to include (Fast) BSS transition.**TGbe editor please implement changes labelled as #11798 in document 802.11-22-2164r0.** |
| 11964 | 4.5.13 | 60.64 | The EPCS and NSEP are limited to offer fixed planned and managed WLAN networks. The use cases for this access should be included to the feature description. | Please add to note 2 clarifications that networks that implement these services are fixed, installed and managed by network operators, i.e. Mobile APs and ad hoc networks do not support EPCS. | RejectedThere are use cases where managed Mobile APs may need to support EPCS (e.g. Mobile AP mounted in emergency vehicle responding to a disaster).The text in Clause 4.5.13 clearly describes the role played by the AP MLD in EPCS, which rules out use of EPCS in an IBSS. No further clarification of that restriction is required. |

**Discussion**

Use of EPCS is limited to authorized non-AP MLDs and therefore the target AP needs to have the information necessary to confirm authorization as part of the fast transition (FT) process. While the existing FT process transfers the security association from the current AP to the target AP, it does not include the transfer of other details, such as this type of authorization information. The goal here is to provide means so that the target AP can acquire information about an FT originator’s (FTO’s) authority to use EPCS.

The proposed approach is to have an FTO use the over-the-DS method of FT when including EPCS in its resource request, so that the frames used to prepare for the FT pass through the current AP MLD. When an FTO sends an FT Confirm frame that includes EPCS as a requested resource to its current AP MLD, the current AP MLD verifies the authority of the FTO to use EPCS using the same method it employs when it receives an EPCS Enable Request frame. Then the current AP MLD includes that authorization information in the FT Confirm frame that it forwards to the target AP MLD via the DS. In addition to providing a means to transfer the authorization information, this approach has the added advantage of ensuring that the FTO can use EPCS priority access during the FT preparation process because it only exchanges frames with the current AP MLD.

**Editor: Please add the following text in a new clause immediately after 35.16.3.2 (EDCA operation using EPCS EDCA parameters)**

**35.16.4 Fast Transition of EPCS Resource [10080]**

**35.16.4.1: EPCS Fast Transition: Behavior of the FTO**

An EPCS non-AP MLD functioning as a Fast Transition Originator (FTO) attempting to transition from a current EPCS AP MLD to a target EPCS AP MLD shall use the over-the-DS FT resource request protocol in an RSN as described in 13.6.3 (Over-the-DS fast BSS transition with resource request) subject to the additional conditions described here.

An EPCS non-AP MLD functioning as an FTO shall use the over-the-DS fast BSS transition method when including EPCS in its resource request. The EPCS non-AP MLD shall use the following procedures only if both the current AP MLD and the target AP MLD are EPCS AP MLDs. The EPCS non-AP MLD functioning as an FTO shall include a Resource Request within the Resource Information Container (RIC) element with a Resource Descriptor that includes a Resource Type with a value of 2 (EPCS) in the FT Confirm frame that it sends to the current EPCS AP MLD. [10212] If the EPCS non-AP MLD has EPCS in the enabled state, it shall set the Enabled parameter in the Resource Descriptor to a value of 1. If the EPCS non-AP MLD has EPCS in the torn-down state, it shall set the Enabled parameter in the Resource Descriptor to a value of 0. Regardless of whether the EPCS resource request is accepted or denied, after transition the EPCS non-AP MLD shall initially set EPCS to the torn-down state.

Note: If the FTO set the Enabled parameter to 1 in its request and the request was accepted, the Target AP MLD will enable EPCS after transition.

**35.16.4.2: EPCS Fast Transition: Behavior of the Current AP MLD**

A current EPCS AP MLD that receives an FT Confirm frame from the FTO containing a Resource Request within the Resource Information Container (RIC) element whose Resource Descriptor includes a Resource Type with a value of 2 (EPCS) shall verify that the FTO is authorized for EPCS priority access (e.g., by checking the value of dot11EPCSPriorityAccessAuthorized in the dot11InterworkingEntry for the requesting non-AP MLD). If the FTO is authorized for EPCS priority access, the current EPCS AP MLD shall set the Authorized parameter in the Resource Descriptor to a value of 1 using the Resource Request as shown in Figure 35-XX (EPCS Resource Request Example) prior to using the Remote Request procedure described in 13.10.3 (Remote Request/Response frame definition) to forward the FT Confirm frame to the target EPCS AP MLD via the DS. If the FTO is not authorized for EPCS priority access, the current EPCS AP MLD shall set the Authorized parameter in the Resource Descriptor to a value of 0 prior to using the Remote Request procedure described in 13.10.3 (Remote Request/Response frame definition) to forward the FT Confirm frame to the target EPCS AP MLD via the DS.

**Figure 35-XX—EPCS Resource Request Example**

|  |  |
| --- | --- |
| RDE | RIC Descriptor (EPCS) |

Note: EPCS Fast Transition is applicable within mobility domains in which all the AP MLDs support EPCS.

**35.16.4.3: EPCS Fast Transition: Behavior of the Target AP MLD**

A target EPCS AP MLD that receives an FT Confirm frame via the Remote Request procedure described in 13.10.3 (Remote Request/Response frame definition) containing a Resource Request with a RIC Descriptor element including a Resource Type with a value of 2 (EPCS) that contains an Authorized parameter set to 1 shall:

* accept the EPCS resource request by including a Status Code field with a value of 0 (SUCCESS) in the RIC Data element (RDE) if it is able to provide EPCS priority access for the initiating non-AP MLD or
* deny the EPCS resource request by including a Status Code field with a value of 132 (EPCS\_DENIED\_OTHER\_REASON) in the RIC Data element (RDE) in the FT ACK frame otherwise.

A target EPCS AP MLD that receives an FT Confirm frame via the Remote Request procedure described in 13.10.3 (Remote Request/Response frame definition) containing a Resource Request within the Resource Information Container (RIC) element whose Resource Descriptor includes a Resource Type with a value of 2 (EPCS) and the Authorized parameter set to 0 shall:

* Reject the EPCS resource request by including a Status Code field with a value of 131 (EPCS\_DENIED\_UNAUTHORIZED) in the RIC Data element (RDE) in the FT ACK frame.
* Set the value of dot11EPCSPriorityAccessAuthorized for the non-AP MLD in the dot11InterworkingEntry to false if the FTO subsequently transitions to the target AP.

[10212] If the FT Confirm frame includes an Enabled parameter set to 1, a target EPCS AP MLD that included a Status Code field with a value of 0 (SUCCESS) in the RDE in the FT ACK frame shall send an EPCS Enable Request frame to the EPCS non-AP MLD functioning as an FTO following the procedures described in 35.16.2.2.3 (Procedures at the initiating AP MLD) as soon as practically possible after the FTO reassociates with the target EPCS AP MLD (within the reassociation deadline).

**9.4.2.50 RIC Descriptor element**

**Editor: Please add the row and update Table 9-183 as shown:**

**Table 9-183 – Resource type code in RIC Descriptor element**

|  |  |  |
| --- | --- | --- |
| **Resource type value** | **Meaning** | **Variable parameters** |
| 2 [10080] | EPCS | [10212] Enabled: set to 1 by the FTO to request that EPCS be enabled after transition; set to 0 by the FTO to leave EPCS in the torn-down state after transitionAuthorized: set to 1 by the current AP MLD if authority of FTO to use EPCS has been verified, otherwise, set to 0 |
| 0, ~~2~~ 3-255 | Reserved |  |

**13.11.2 Resource information container (RIC)**

**Editor: Please add the following row to Table 13-3:**

**Table 13-3 – Resource types and resource descriptor definitions**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Resource Descriptor definition** | **Notes** |
| EPCS [10080] | In a request: RIC Descriptor (see 9.4.2.50 (RIC Descriptor element)) containing a Resource Type field identifying EPCS.In a response: RIC Descriptor (see 9.4.2.50 (RIC Descriptor element)) containing a Resource Type field identifying EPCS. | May be sent by an FTO that is a non-AP MLD that has a value of true for dot11EHTEPCSPriorityAccessActivated. EPCS procedures shall be as specified in 35.16.4 (Fast Transition of EPCS Resource) |

**4.5.13 EPCS priority access**

**Editor: Please edit the following paragraph is clause 4.5.13 as shown:**

(#12037)An AP MLD that has EPCS priority access activated advertises this capability in Beacon and Probe Response frames. The AP MLD authorizes a non-AP MLD to use EPCS priority access based on locally available information (#11789)(which can be obtained a priori from an NS/EP service provider) or using online information obtained through a service provider’s authorization infrastructure, which might be accessed via an SSPN interface (see 11.22.5 (Interworking procedures: interaction with SSPN)). The AP MLD might cache authorization information locally to enable subsequent verification and use it to confirm authority during (#12258)(#10270)(re)association [11790] and (Fast) BSS transition.

**35.16.1 General**

**Editor: Please edit the following paragraph is clause 35.16.1 as shown:**

An AP MLD that successfully obtains permission for a non-AP MLD to use EPCS priority access shall update the dot11EPCSPriorityAccessAuthorized for the non-AP MLD in the dot11InterworkingEntry. The authorization information included in the dot11InterworkingEntry is passed from the prior AP MLD to the new AP MLD in the same ESS during reassociation as described in 11.22.5.3 (Reporting and session control with SSPN) [11798] and during Fast Transition as described in 35.16.4 (Fast Transition of EPCS Resource).