IEEE P802.11
Wireless LANs

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| Detailed text proposal on Seamless Roaming |
| Date: December, 2024 |
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# Introduction

The authors prepared this document to further clarify our proposals related to Seamless Roaming in text format. The authors look forward to working with all interested participants to prepare an official proposal for specification text on Seamless Roaming.

This document is based on the following IEEE contributions on Seamless Roaming:

[1] 11-23-1884-00-00bn-seamless-roaming

[2] 11-24-1883-00-00bn-seamless-roaming

[3] 11-23-1937-01-00bn-smooth-roaming-follow-up-1

[4] 11-23-1996-00-00bn-improve-roaming-between-mlds

[5] 11-24-0679-00-00bn-thoughts-on-functionality-and-security-architecture-for-uhr-seamless-roaming

[6] 11-24-0101-00-00bn-mld-roaming

[7] 11-24-1425-00-00bn-considerations-for-context-transfer-in-11bn

**Revision information**

The following is a summary of the important changes that occurred within each revision of this document:

|  |  |
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| **Revision** | **Major changes** |
| 0 | Initial revision |
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**Proposed detailed text**

## 37.x Seamless Roaming

### 37.x.1 General

Seamless Roaming only applies to non-AP MLD transitions between AP MLDs within the same TBD seamless mobility domain within the same ESS. Seamless Roaming comprises of a set of procedures that reduces the time during which connectivity is lost between a non-AP MLD and the DS during a transition between a current AP MLD and a target AP MLD. With these procedures, the non-AP MLD continues to remain in state 4 preserving the context for data transmission for a seamless experience.

[TBD Association in UHR, and impact on context transfer]

### 37.x.2 Roaming preparation procedure

Before performing the roaming procedure as described in 37.x.3 (Roaming procedure), a roaming preparation procedure can be performed. The roaming preparation procedure includes:

• Transfer or renegotiation of the context (see 37.x.4 (Contexts)) to a target AP MLD, and

• Setting up the link(s) with a target AP MLD.

• Details on what context can be transferred or renegotiated is TBD

### 37.x.3 Roaming procedure

When a non-AP MLD, that is in state 4, intends to roam using the Seamless Roaming to a target AP MLD via the current AP MLD, the non-AP MLD shall send a TBD Request frame to the current AP MLD and the current AP MLD shall respond with a TBD response frame. The non-AP MLD shall stop sending any uplink data frame to the AP MLD once the non-AP MLD sends the TBD Request frame. The current AP MLD may continue to deliver downlink data frames to the non-AP MLD for a TBD period of time. The non-AP MLD may choose to continue to receive downlink data frames from the current AP MLD.

Upon reception of the TBD Request frame, the current AP MLD shall:

* + Transfer the context that is required for resuming operations with the target AP MLD (implementation-specific). The context that can be transferred is described in 37.x.4 (Contexts).
	+ [TBD The current AP MLD shall pass up any user data in the received reordering buffer collected before the DS mapping change is notified.]
	+ The current AP MLD may forward any downlink data that is buffered to the target AP MLD [Actual mechanism TBD].

At the time the TBD response frame is sent, the transfer of the context that is required for resuming operation to the target AP MLD shall be completed.

Upon reception of the TBD Response frame, the non-AP MLD may send class 3 frames to the target AP MLD.

After the TBD request and response frame exchange, if DS is not already notified about the update of the destination mapping for the non-AP MLD, DS is notified about the update of the destination mapping for the non-AP MLD

The current AP MLD shall not pass up any user data in the received reordering buffer to the next MAC process after the DS mapping change has been notified.

When a non-AP MLD is in the process of roaming from the current AP MLD to the target AP MLD, the same PTKSA shall be used to communicate with the current AP MLD and the target AP MLD.

### 37.x.4 Contexts

The following contexts can be transferred [TBD how to determine which parts of the context is transferred] to the target AP MLD to preserve the data exchange context for the non-AP MLD:

* Block Ack Parameters and Block Ack Timeout Value for existing BA agreement of a TID.
* Next SN to be assigned for DL individually addressed data frame of each TID.
* Latest duplicate receiver cache for TID without BA agreement.
* latest SN that has been passed up for TID with UL BA agreement.
* [TBD other contexts].
* Note – TBD on the agreed buffer size with the target AP MLD.