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| MCCAOP advertisement Clause 9.9a.3.8 | | | | |
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Text to replace Clause 9.9a.3.8 of Draft 8.01. Jointly with documents 11-11/216 and 11-11/217 this document addresses the MCCA comments raised during the first Sponsor Recirculation of 802.11s Draft 8.0, as identified by label 2011-02-09-MCCA-ad-hoc in Column Y of 11-11/0027r7.

* MCCAOP advertisements

A mesh STA with dot11MCCAActivated equal to true tracks MCCAOP reservations. The tracked MCCAOP reservations contain the neighborhood MCCAOP times and optionally other periodic transmission of itself or of neighboring STAs.

The MCCAOP advertisement set contains all MCCAOP reservations tracked by the mesh STA. The MCCAOP advertisement set is represented by an MCCAOP Advertisement Overview element and zero (if the MCCAOP advertisement set is empty) or more (if the MCCAOP advertisement set is non-empty) MCCAOP Advertisement elements. An MCCAOP Advertisement element contains one or more tracked MCCAOP reservations.

The mesh STA advertises its MCCAOP advertisement set to its neighbor mesh STAs.

This subclause describes how the mesh STA constructs the MCCAOP Advertisement Overview element and the MCCAOP Advertisement elements. Further, this subclause describes the procedure to advertise an MCCAOP advertisement set, the procedure to request an MCCAOP advertisement from a neighboring mesh STA, and the procedure to process a received MCCAOP advertisement.

**9.9a.3.8.1 Construction of an MCCAOP advertisement set**

Each MCCAOP reservation tracked by a mesh STA is one of the following types:

* MCCAOP TX-RX time:
* An MCCAOP reservation for individually addressed frames for which the mesh STA is the MCCAOP owner or the MCCAOP responder.
* MCCAOP broadcast time:
* An MCCAOP reservation for group addressed frames for which the mesh STA is the MCCAOP owner or the MCCAOP responder.

1. Optionally, a known Target Beacon Transmission Time of Beacon frames for which the mesh STA is either the transmitter or the receiver.

* Optionally, a transmission or reception time of a STA that is collocated with the mesh STA, for example, Beacon or HCCA times of a collocated AP.
* MCCAOP interfering time:
* A TX-RX or a broadcast reservation reported by a neighbor peer mesh STAs of the mesh STA excluding those times for which this mesh STA is either the MCCAOP owner or the MCCAOP responder.

1. Optionally, a TX-RX or a broadcast time reported by neighbor non-peer mesh STAs of the mesh STA.

The MCCAOP reservations are grouped into the following sets:

1. the MCCAOP TX-RX advertisement set,
2. the MCCAOP broadcast advertisement set, and
3. the MCCAOP interfering advertisement set.

These three sets constitute the MCCAOP advertisement set. The mesh STA uses the MCCAOP Overview element and MCCAOP Advertisement elements to advertise its MCCAOP advertisement set to its neighbor mesh STAs.

The mesh STA acts as follows to construct the representation of its MCCAOP advertisement set:

1. If the MCCAOP advertisement set is non-empty, the mesh STA constructs one or more MCCA reports according to the format described in Clause 7.3.2.106.3 as follows
   1. If the MCCAOP TX-RX advertisement set is non-empty, the mesh STA constructs one or more TX-RX reports according to the format described in Clause 7.3.2.106.3 such that each reservation in the MCCAOP TX-RX advertisement set occurs exactly in one TX-RX report.
   2. If the MCCAOP broadcast advertisement set is non-empty, the mesh STA constructs one or more broadcast reports according to the format described in Clause 7.3.2.106.3 such that each reservation in the MCCAOP Broadcast advertisement set occurs exactly in one Broadcast report.
   3. If the MCCAOP Interfering advertisement set is non-empty, the mesh STA constructs one or more interfering reports according to the format described in Clause 7.3.2.106.3 such that each reservation in the MCCAOP interfering advertisement set occurs exactly in one interfering report.
2. If the MCCAOP advertisement set is non-empty, the mesh STA constructs one or more MCCAOP Advertisement elements as follows
   1. The MCCAOP Advertisement Set Sequence Number field is set to the MCCAOP advertisement set sequence number as explained in 9.9a.3.8.2.
   2. The MCCAOP Advertisement Element Index subfield is set to a unique identifier as explained in 9.9a.3.8.2.
   3. Each MCCAOP Advertisement element includes at least one of the TX-RX reports, broadcast reports, or interfering reports. Moreover, it includes at most one of the TX-RX reports, at most one of the broadcast reports, and at most one of the interfering reports. In case the MCCAOP Advertisement element contains a TX-RX report, the TX-RX Report Present subfield of the MCCAOP Advertisement Element Information field is set to 1, otherwise this subfield is set to 0. In case the MCCAOP Advertisement element contains a broadcast report, the Broadcast Report Present subfield of the MCCAOP Advertisement Element Information field is set to 1, otherwise this subfield is set to 0. In case the MCCAOP Advertisement element contains an interfering report, the Interfering Report Present subfield of the MCCAOP Advertisement Element Information field is set to 1, otherwise this subfield is set to 0.
   4. Each report as constructed in step 1) is present in exactly one MCCAOP Advertisement element.
3. The mesh STA constructs one MCCAOP Advertisement Overview element such that
   1. The MCCAOP Advertisement Set Sequence Number field is set to the advertisement set sequence number as explained in 9.9a.3.8.2.
   2. The Medium Access Fraction field is set to the medium access fraction.
   3. The MAF limit field is set to the value of dot11MAFlimit.
   4. The Accept Reservations field is set to 1 if the number of tracked reservations of this mesh STA is less than dot11MCCAMaxTrackStates, and set to 0 otherwise.
   5. Bit *i* of the Advertisement Elements Bitmap field is set to 1 if an MCCAOP Advertisement element with the MCCAOP Advertisement Element Index subfield equal to *i* is part of the representation of this MCCAOP advertisement set, and set to 0 otherwise.

**9.9a.3.8.2 Setting the MCCAOP advertisement set sequence number**

The MCCAOP advertisement set sequence number identifies an MCCAOP advertisement set. Mesh STAs with dot11MCCAActivated equal to true assign MCCAOP advertisement set sequence numbers from a single modulo-256 counter. The MCCAOP advertisement set sequence number is initialized to 0. The MCCAOP advertisement set sequence number shall be incremented by 1 if one of the following conditions holds

1. The mesh STA sets the bit for an MCCAOP Advertisement element in the Advertisement Elements Bitmap from 0 to 1 and this bit has been set to 1 under the same MCCAOP Advertisement Sequence Number before.
2. The bit of the Advertisement Elements Bitmap corresponding to an MCCAOP Advertisement element is equal to 1 and the content of this MCCAOP Advertisement element changes.

However, the MCCAOP advertisement set sequence number may remain unchanged if

1. The mesh STA changes a bit in the Advertisement Element Bitmap from 0 to 1 and this bit has not been set to 1 under the same MCCAOP Advertisement Sequence Number before, or
2. The mesh STA changes a bit in the Advertisement Elements Bitmap from 1 to 0.

**NOTE --- The Advertisement Set Sequence Number identifies the current distribution of the MCCAOP advertisement set over the MCCAOP Advertisement elements. Using a new MCCAOP advertisement set sequence number signals a new, (possibly) completely different distribution of the MCCAOP advertisement set over the MCCAOP Advertisement elements, and requires an advertisement of all reservations of the MCCAOP advertisement set. Leaving the MCCAOP advertisement set sequence number unchanged as in the previous MCCAOP Advertisement Overview element indicates MCCAOP Advertisement elements that have previously been advertised are not changed and retain their validity. This enables a limited advertisement procedure in which only new MCCAOP Advertisement elements are advertised. Additionally, this enables mesh STAs that operate in power save mode in requesting a limited update of the MCCAOP advertisement set of a neighboring mesh STA in which only new MCCAOP Advertisement elements are included.**

**9.9a.3.8.3 Advertisement procedure**

To advertise its MCCAOP advertisement set, the mesh STA constructs a representation of the MCCAOP advertisement set as described in Clause 9.9a.3.8.1. The MCCAOP advertisement set is advertised by transmitting an MCCAOP Advertisement Overview element and zero or more MCCAOP Advertisement elements (see 9.9a.3.8.1) to neighbor peer mesh STAs. The MCCAOP Advertisement Overview element and the MCCAOP Advertisement elements are transmitted in Beacon frames, Probe Response frames, or MCCAOP Advertisement frames.

The mesh STA shall advertise its MCCAOP advertisement set according to the following rules:

1. The mesh STA shall advertise at least one MCCAOP Advertisement Overview element in every dot11MCCAAdvertPeriodMax DTIM intervals.
2. The mesh STA shall advertise its MCCAOP Advertisement Overview element and any new MCCAOP Advertisement elements at the latest with the transmission of its next Beacon frame after its MCCAOP advertisement set has changed.
3. The mesh STA shall advertise the requested MCCAOP Advertisement elements as described in Clause 9.9a.3.8.4 if the mesh STA receives an MCCAOP Advertisement Request frame.

**9.9a.3.8.4 Receipt of an MCCAOP advertisement**

Upon receipt of an MCCAOP advertisement a mesh STA with dot11MCCAActivated shall compare the Advertisement Set Sequence Number contained in the MCCAOP Advertisement Overview element of the received MCCAOP advertisement with the last advertisement set sequence number that this mesh STA tracked for the sender of the received MCCAOP advertisement according to the following decision tree:

**If** the tracked advertisement set sequence number does not equal the Advertisement Set Sequence Number of the received MCCAOP advertisement, **then**

the mesh STA shall perform the procedure described in 9.9a.3.8.4.1 (Complete update of the tracked MCCAOP reservations of a neighbor mesh STA).

**else**

the mesh STA shall compare the Advertisement Elements Bitmap contained in the received MCCAOP Advertisement Overview element with the last Advertisement Elements Bitmap that this mesh STA tracked for the sender of the received MCCAOP advertisement.

**If** the tracked Advertisement Elements Bitmap does not equal the Advertisement Elements Bitmap of the received MCCAOP advertisement, **then**

the mesh STA shall perform the procedure described in 9.9a.3.8.4.2 (Partial update of the tracked MCCAOP reservations of a neighbor mesh STA).

**endif**

**endif**

**9.9a.3.8.4.1 Complete update of the tracked MCCAOP reservations of a neighbor mesh STA**

The mesh STA performed the decision tree in 9.9a.3.8.4 and detected that the MCCAOP advertisement set sequence number has been updated. Consequently, the mesh STA performs the following procedure.

The mesh STA shall discard all MCCAOP reservations that it tracked for the sender of the received MCCAOP advertisement. The mesh STA shall record the Advertisement Set Sequence Number and the source address (SA) of the received MCCAOP advertisement. The mesh STA shall record all reservations in the MCCAOP Advertisement elements of the received MCCAOP advertisement.

If the mesh STA does not receive all MCCAOP Advertisement elements of the sender of the MCCAOP advertisement before a frame exchange sequence on the wireless medium causes the mesh STA to set its NAV, the mesh STA shall perform the MCCAOP advertisement request procedure as described in 9.9a.3.8.5.

**9.9a.3.8.4.2 Partial update of the tracked MCCAOP reservations of a neighbor mesh STA**

The mesh STA performed the decision tree in 9.9a.3.8.4 and detected that part of the MCCAOP advertisement set of the sender of the MCCAOP advertisement has been updated. Consequently, the mesh STA performs the following procedure.

For each bit in the Advertisement Elements Bitmap contained in the MCCAOP Advertisement Overview element of the received MCCAOP advertisement, the mesh STA shall operate according to the following decision tree:

**if** the bit in position *n* of the received Advertisement Elements Bitmap contained in the received MCCAOP Advertisement is equal to 0 **then**

**if** the bit in position *n* of the Advertisement Elements Bitmap tracked for sender of the received MCCAOP advertisement is equal to 1 **then**

the mesh STA shall delete the reservations contained in a previously received MCCAOP Advertisement element with the same Advertisement Sequence Number and with the MCCAOP Advertisement Element Index set to *n* received from the same sender from its tracked reservations

**endif**

**else**

**if** the bit in position *n* of the Advertisement Elements Bitmap tracked for the sender of the received MCCAOP advertisement is equal to 0 **then**

the mesh STA shall add the reservations of the received MCCAOP Advertisement element with the MCCAOP Advertisement Element Index set to *n* to its tracked reservations.

If the mesh STA does not receive the MCCAOP Advertisement element of the sender of the MCCAOP Advertisement before a frame exchange sequence on the wireless medium causes the mesh STA to set its NAV, the mesh STA shall perform the MCCAOP Advertisement request procedure as described in 9.9a.3.8.5.

**endif**

**endif**

**9.9a.3.8.5 MCCAOP advertisement request procedure**

To request all MCCAOP Advertisement elements from a neighbor peer mesh STA, the mesh STA transmits an MCCAOP Advertisement Request frame without an MCCAOP Advertisement Overview element.

To request a subset of the MCCAOP Advertisement elements of a neighbor peer mesh STA, the mesh STA transmits an MCCAOP Advertisement Request frame including an MCCAOP Advertisement Overview element. The mesh STA shall set the contents of the MCCAOP Advertisement Overview element as follows. The mesh STA sets

1. the Advertisement Set Sequence Number field to the Advertisement Sequence Number that it tracks for the recipient of this frame,
2. in the Advertisement Element Bitmap, the bit to 1 for each MCCAOP Advertisement Element that the mesh STA requests from the recipient of this frame,
3. the Flags field, the MCCA Access Fraction field, and the MAF Limit field to zero.

The mesh STA shall discard the MCCAOP Advertisement Request frame from its frame queue if it receives all of the MCCAOP Advertisement elements that it requests in the MCCAOP Advertisement Request.