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| DMG sensing procedure |
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Abstract

Presentation of the DMG sensing procedure

## 7.2 DMG sensing (SENS) procedure

### **7.2.1 Overview**

DMG sensing types include monostatic, bistatic, multistatic, monostatic sensing with coordination, and bistatic sensing with coordination. The monostatic sensing with coordination is an extension of monostatic to coordinate monostatic devices. The bistatic sensing with coordination is an extension of bistatic type to coordinate multiple responders by one initiator.

A DMG sensing procedure supports all types of the DMG sensing.

A DMG sensing procedure is a subset of the WLAN sensing procedure. Unless otherwise noted, the rules for the WLAN SENS apply to the DMG SENS.

A DMG sensing procedure is composed of one or more of the following: sensing session setup, DMG measurement setup, DMG sensing burst, DMG sensing instance, sensing measurement setup termination, and sensing session termination

A DMG sensing procedure may be comprised of multiple DMG sensing bursts. A DMG sensing burst may be comprised of multiple DMG sensing instances.

NOTE: Measurements over a certain time period are needed to compute the Doppler frequency shift. The occupancy time per link access cannot exceed the TXOP limit. If a longer measurement time is needed, then the approach of the burst allows scheduling of the multiple link accesses to collect measurements for the Doppler frequency shift computation.

One responder may participate in multiple DMG sensing bursts and instances associated with different DMG measurement setups.

An initiator may maintain multiple responders in multiple DMG sensing bursts and instances associated with different DMG measurement setups.

An initiator may instruct the responder in the receiver role or in the receiver and transmitter role to report at the measurement instance, or/and it may instruct the responder to accumulate the results and report once per the burst.

The examples of the DMG sensing procedure are shown in Figures 1- 7



**Figure 1. DMG sensing procedure with one responder**

**Figure 2. Sensing measurement instances of one burst with AP as initiator and single monostatic sensing device as responder. Per measurement instance delayed reporting.**



**Figure 3. Sensing measurement instances of one burst with AP as initiator and single monostatic sensing device as responder. Per burst delayed delivery of the aggregated report.**



**Figure 4. Sensing measurement instances of one burst of the bistatic sensing with the initiator in TX role. Per instance delayed delivery of the report.**



**Figure 5. DMG sensing procedure with three responders**



**Figure 6. Sensing measurement instances with AP as initiator and two monostatic sensing devices as responders. The sounding phase of both monostatic devices in the instance may happen in parallel. Two illustrated instances belong to two different Measurement setups.**



**Figure 7. Sensing measurement instances of multistatic sensing. The AP is an initiator and in the role of the transmitter and two responders are in the role of receivers. Two illustrated instances belong to two different Measurement setups.**

**References:**

1. 11-21-1068-00-00bf-a-framework-for-edmg-monostatic-radar
2. 11-21-1799-01-00bf-dmg-bistatic-radar
3. 11-21-1865-01-00bf-dmg-multi-static-ppdu-structure
4. 11-21-1914-00-00bf-coordination-among-multiple-monostatic-radars
5. 11-21-1890-01-00bf DMG Sensing taxonomy