
Link Aggregation Operations

802.3ad Task Force

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General Comments

◆ Terminology

- ❖ **Logical MAC (LMAC) is MAC functionality of *Aggregated Link Group* including *Aggregation Control* and *Data Path Mux* elements**
- ❖ **Physical MAC (PMAc) is hardware instantiated MAC (traditional 802.3 MAC)**

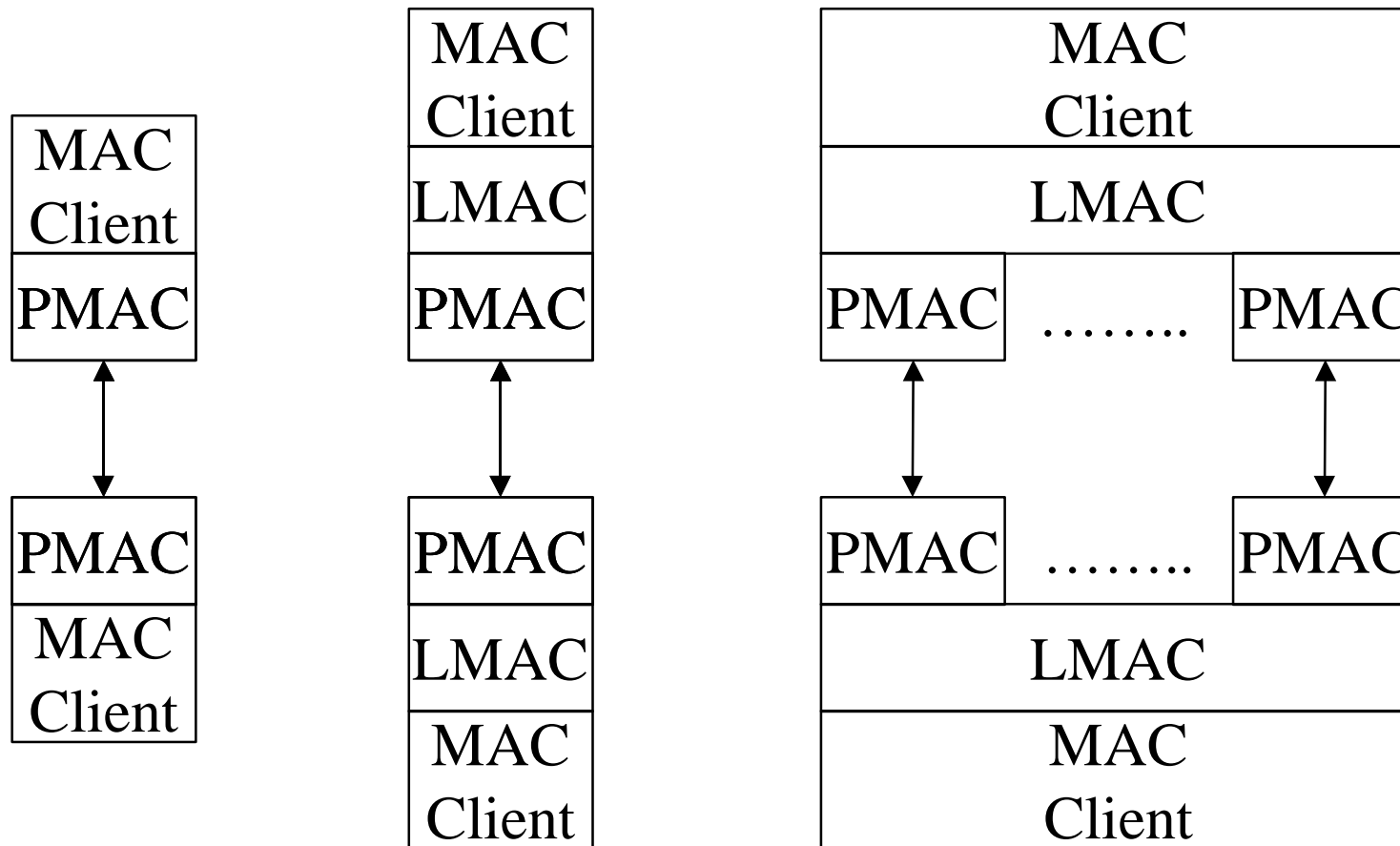
◆ Assumptions

- ❖ **Each LMAC is initially associated with at least one PMAc**
- ❖ **LMAC's address is persistent for duration of group existence**
- ❖ **Aggregation Control Sublayer (ACS) is associated with one and only one LAG**

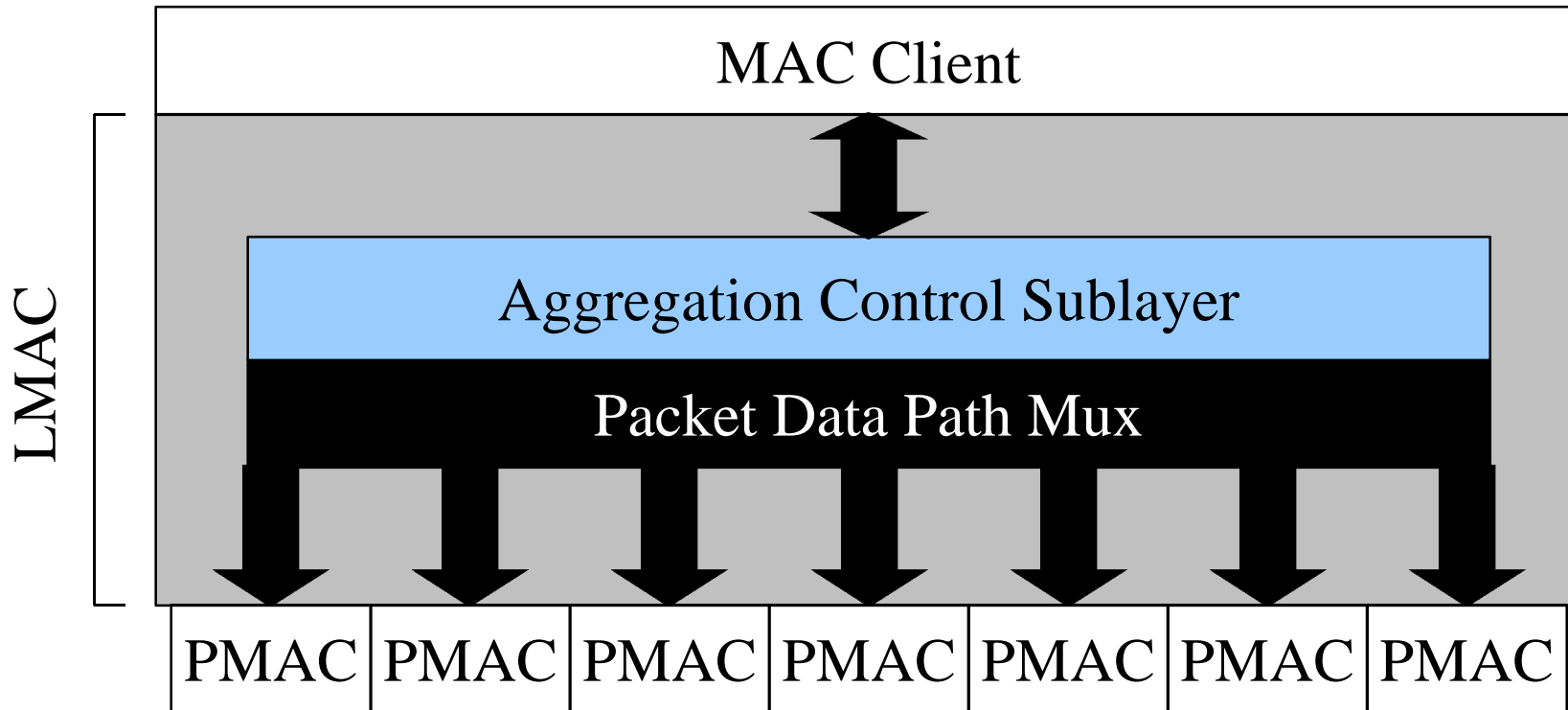
◆ Decision of when to add/delete PMAc from group is beyond the scope of the standard

◆ Moving PMAcs between groups is beyond the scope of the standard

Allowed Initial Configurations



LMAC Structure



- ❖ **ACS can source/sink packets**
- ❖ **ACS controls packet flow through the data path mux**

Standardized Operations

◆ General command operation

- ❖ **Triggered by outside entity (management, etc.)**
- ❖ **Sourced in the Aggregation Control Sublayer**
- ❖ **General Header Syntax**
 - **DA—Reserved Multicast**
 - **SA—LMAC address**
 - **Type — 802.3-AggregateControlType**

◆ Allowed Commands

- ❖ **Query for LAG partner**
- ❖ **Start Group**
- ❖ **Add PMAC to LAG**
- ❖ **Delete PMAC from LAG**
- ❖ **Check status of LAG**

Query for Aggregation Partner

◆ Purpose

- ❖ Determines if Link Partner has operational LMAC
- ❖ Determines if partner LMAC is willing to form LAG
- ❖ Identifies group capabilities

◆ Request Syntax

- ❖ DA = Res. Multicast, SA = LMAC, Type = 802.3-AggregateControlType
- ❖ Command = QUERY
- ❖ Arguments = Device ID, Group ID, Capabilities Vector

◆ Response Syntax (Time Out⇒partner LMAC not present)

- ❖ DA = Res. Multicast, SA = Responding LMAC, Type = 802.3-AggregateControlType
- ❖ Command = QUERY
- ❖ Arguments
 - partner Device ID, Group ID, Capabilities vector

Start Group

- ◆ **Purpose—To change this link to the starting link of an aggregation**
- ◆ **Request Syntax**
 - ❖ **DA = Res. Multicast, SA = LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = StartGroup**
 - ❖ **Arguments = Segment ID**
- ◆ **Response Syntax**
 - ❖ **DA = Res. Multicast, SA = Responding LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = StartGroup**
 - ❖ **Arguments**
 - **Success/Identity**
 - **Fail/Failure Code**

Add Link Segment to Group

- ◆ **Purpose—Add link to established group**
- ◆ **Request Syntax**
 - ❖ **DA = Res. Multicast, SA = LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = AddLink**
 - ❖ **Arguments**
 - **ID of link segment to be added to group**
 - **Number of links currently in group**
- ◆ **Response Syntax**
 - ❖ **DA = Res. Multicast, SA = Responding LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = AddLink**
 - ❖ **Arguments — One of:**
 - **Success/New number of segments in group**
 - **Fail/Failure Code (mismatched capabilities, out of resources, etc.)**

Delete Link Segment from Group

- ◆ **Purpose—Delete link from established group**
- ◆ **Request Syntax**
 - ❖ **DA = Res. Multicast, SA = LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = DeleteLink**
 - ❖ **Arguments**
 - **ID of link segment to be deleted from group**
 - **Number of links currently in group**
- ◆ **Response Syntax**
 - ❖ **DA = Res. Multicast, SA = Responding LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = DeleteLink**
 - ❖ **Arguments — One of:**
 - **Success/New number of segments in group**
 - **Fail/Failure Code (Link not in group, Required Link—unable to delete, etc.)**

Check Status of Group

- ◆ **Purpose—To check health of group**
- ◆ **Request Syntax**
 - ❖ **DA = Res. Multicast, SA = LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = CheckLink**
 - ❖ **Arguments**
 - **Number of links currently in group**
 - **Optional ID of specific link to be checked**
- ◆ **Response Syntax**
 - ❖ **DA = Res. Multicast, SA = Responding LMAC, Type = 802.3-AggregateControlType**
 - ❖ **Command = CheckLink**
 - ❖ **Arguments — One of:**
 - **Success/Number of segments in group**
 - **Error/MyNumber of segments in group or specific error code for designated link**