**Proposed WARP Protocol**

The protocol below aims to support internal two way communication between WARP board and PC Engine over the Ethernet. Modification to the protocol should ensure modularity and extensibility to support future developments and additional features. Also, this design avoids fields with variable lengths.

**I) General architecture of WARP Protocol:**

A typical packet from PC Engine to WARP (and vice versa) will have the following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ethernet | WARP | | | Encapsulated dot11 data  (if applicable) |
| WARP Header | | WARP Data |
| Type | Subtype | (See below) |

**II) WARP Header:**

|  |  |  |
| --- | --- | --- |
| Type | Expected WARP Element | Expected data at the end |
| 0 (Ignore) (Default value) | None | No |
| 1 (Transmit) | Transmit Element | Yes |
| 2 (Control) | Control Element | No |

|  |  |  |
| --- | --- | --- |
| Type | Subtype | Meaning |
| 0 (Ignore) (Default value) | Any | Ignore (for testing purpose) |
| 1 (Transmit) | Any | Transmit the message (either to wifi or to hostapd) |
| 2 (Control) | 0 | Ignore |
| 1 | Transmission control (see WARP Element Transmit below) |
| 2 | MAC address control (see WARP Element MAC Address Control below) |

**III) WARP Elements:**

**1) Transmit Elements:**

a) WARP Transmit Element:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Field | Dot11 TX parameters | | | | | |
| Dot11 PHY TX parameters | | | | Dot11 MAC TX parameters | |
| Power | Rate | Channel | Flag | Max # of reTX | Reserved |
| Size (byte) | 1 | 1 | 1 | 1 | 1 | 1 |
| Default | 0 | 1 | 1 | 2 | 0 | 0 |
| Note | Not used currently | | | |  |  |

**2) Control Elements:**

a) WARP MAC Address Control Element:

|  |  |  |
| --- | --- | --- |
| Field | WARP MAC Address Control Element | |
| Operation code | MAC Address |
| Size (byte) | 1 | 6 |
| Default | 0 | 00:00:00:00:00:00 |

|  |  |
| --- | --- |
| Operation code (PC Engine to WARP) | Meaning |
| NOTHING (0) | Do nothing |
| MAC\_ADD (1) | Add |
| MAC\_REMOVE (32) | Remove |
| MAC\_REMOVE\_ALL (33) | Remove all MAC |
| MAC\_CHECK\_IF\_EXIST (64) | Check if exist (from PC Engine to WARP) |

|  |  |
| --- | --- |
| Operation code (WARP to PC Engine) | Meaning |
| MAC\_ADDED (2) | Added MAC to the bssid list |
| MAC\_LIST\_FULL (3) | Cannot add MAC since bssid list is full |
| MAC\_REMOVED (34) | Removed MAC from the bssid list |
| MAC\_EXISTED (65) | Existing (reply from WARP to PC Engine) |
| MAC\_NOT\_EXISTED (66) | Not existed (reply from WARP to PC Engine) |

b) WARP Transmission Control Element:

Not defined yet (possibly needed in the future)