CAPWAP Protocol Concerns

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Agenda

- Issue #1: Changes in CAPWAP State Machine
- Issue #2: Load Balancing for WTP
- Issue #3: General Statistics for CAPWAP
- Issue #4: Firmware Trigger
Changes in CAPWAP State Machine

• State Machine specified in draft requires details.

• There is no clear indication on how the transition goes from DTLS-complete state to Configure state or Image Data state.

• There should be clear basis on how the protocol should handle the various states.
Changes in CAPWAP State Machine

• Suggestion:- To change the state machine as in the following figure.
Load Balancing for WTP

- In Section 5.2.4 and 5.2.5 WTP Manager Control, it has been stated that the message element is useful for load balancing.
- Message element only contains IP addresses and WTP count.
- Are such information sufficient to provide effective load balancing?
Load Balancing for WTP

- Suggestion:- To introduce more parameters in the message element for WTP manager.
- Other than IP addresses & WTP count, we should include
  - Traffic loading
  - Network Congestion
  - Etc.
General Statistics for CAPWAP

• The CAPWAP protocol needs regular statistics exchange.
• Statistics should be applicable for the overall network, e.g. congestion, traffic loading, channel interferences etc.
• Size of statistics element ≈ 4 – 8 bytes.
• Echo Request is regularly exchanged between WTP and AC.
General Statistics for CAPWAP

• Suggestion:- To include general statistics message elements in the Echo Request message.

• Suggestion made in CAPWAP Comparative Analysis. (Section 4.6.1)
General Statistics for CAPWAP

Simulation Results of Message Exchanges

- **Echo Request, Statistics separately**
- **Echo Request with Statistics Message Element**

Cumulative number of bytes received vs. Time(s)

Overhead Reduction
Firmware Trigger

• No clear indication of periodic firmware trigger in the State Machine
• Firmware Management optional in CAPWAP draft specification (Section 4.3)
• Firmware updates should be periodic and on a proactive basis so as to ensure consistent firmware version across the network.
Firmware Trigger

• Suggestion:- To introduce periodic firmware trigger in CAPWAP protocol.
• Firmware Management should be mandatory.
• Suggestion made in CAPWAP Comparative Analysis. (Section 4.1.5)