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Wireless LANs

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| Problems to be solved by 802.11ak/802.1Qbz |
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Abstract

This document is a start on the effort to enumerate and perhaps prioritize the problems to be solved by 802.11ak in conjunction, as necessary, with 802.1Qbz.

# Problems to be solved by 802.11ak/802.1Qbz

1. Addressing problem: There needs to be enough information included in frames to that two 802 stations behind non-AP STAs or behind an AP and a non-AP STA can communicate.
2. Reflection problem: A non-AP STA must be able to correctly discard or accept a multi-destination frame (broadcast, multi-cast, or flooded unicast) from its associated AP depending on whether or not that non-AP STA sent that frame to the AP.
3. Blocked AP port problem: How to assure that a non-AP STA will not accept a multi-destination frame from the AP if bridge protocols at the AP say the frame should not be sent to that non-AP STA.
4. Per port VLAN mapping: How is per port VLAN mapping supported?
5. Ethertyping versus LLC: 802.3 frames are Ethertype encoded and 802.11 frames are LLC encoded. It may be impossible to do a perfect job of translating from one to the other. Adequate mechanisms to handle this in the real world are required.
6. How are QoS and queueing handled, particularly at the AP?
7. How is the internal connectivity/cost of the AP and associated non-AP STAs reported to the rest of the network? Relates to
	1. Link Metrics.
	2. Unreliable links.
	3. “Direct Link” between non-AP STAs.

Note: Problems 2, 3, and 4 could be solved with a general capapbility for an AP to send to a subset of associsated non-AP STAs or could be solved in other ways.

# Issues suggested by Norm Finn:

1. AP architecture issue: What does the "baggy pants" look like for an AP?

2. Station architecture issue: What interface does the station present to the bridge?

3. Station subletting issue: How does the AP make one transmission and have the frame reach an arbitrary subset of the other stations on the medium?  This subsumes three sub-issues:

   a. The reflection problem.

   b. The blocked AP port problem.

   C. The different tags for different stations problem.

4. 802.1Q model for queuing in an AP/bridge:  How do we adapt this model to a situation where many ports (one port per non-AP station) have a single set of queues?

5. QoS in an AP:  How do we adapt 802.1Q queue draining models (Quality of Service models) to the reality of an 802.11 AP or non-AP station?  What QoS can we realistically offer?

6. VLAN tags, in particular, and other tags, in general.  How are multiple-tagged frames represented on 802.11 and 802.3 media, and how are they transformed when passing between these media?

7. Unreliable links: How do we present wireless connections to the topology control protocols, when the reality of wireless connections differs from the current expectations of the protocols?

8. AP-AP communications:  How are AP-to-AP data links for bridges set up

and utilized?

# Philippe Klein suggested additions:

Direct Link Management: Direct Link between two non-AP devices should be supported as a Direct Link could significantly improve the performance between 2 non-AP bridges.  The setting and tearing down of a Direct Link between to non-AP more dynamic that the association of a non-AP to an AP BSS and in a P2P link model, this is a change of topology. Therefore some rules should apply.

Link Metrics: the wireless link metrics that should be exported to the bridge must be specified (together with their computation details if these metrics are not already specified in a 802.11 REV or amendment).

**References:**