IEEE P802.11
Wireless LANs

Minutes of 802.11 Task Group E
Interim Teleconference

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The subject for today's teleconference is EDCF comments.

Agenda for Portland meeting – how do we address all these comments in an expeditious manner.

Roll Call:

Duncan Kitchin, Intel (Acting Chair)
Tim Godfrey, Intersil
Keith Amman, Spectralink
Sunghyun Choi, Philips
Mathilde Benveniste, AT&T
Greg Chesson, Atheros
Michael Fischer, Intersil
Sri Kandala, Sharp
Raju Gubbi, Broadcom
John Kowalski, Sharp Labs
Sid Schrum, TI
Aman Singla, Atheros
Javier Del Bravo, Philips
Greg Parks, Sharewave
Javad Razadilar, Magis Networks
Khaled Turki, TI
Jin Meng Ho, TI
Matt Sherman, AT&T

Agenda Review

Backward compatibility,
Autonomous burst
CF Multipoll
Bridge portal
Remote PC/HC election
clarification

General issues on EDCF:

maxMSDUlifetime

What is the advantage of having maxMSDUlifetime per traffic class?
How would this be verified for compliance?
Persistence factors should also be removed.

Is anyone in support of maxMSDUlifetime?

We're never going to have the perfect standard. EDCF alone didn't have enough support alone. Some may believe that particular capabilities are not valuable, but represent a critical base of support.

Propose taking discussion of this off-line. It may be more of a political issue.

But are there any implementation requirements?

The chair asks not to take offline. There are specific issues that need to be addressed here.

There are conceptual differences between the two concepts: maxMSDUlifetime is removed from persistence factor, since persistence factor is related to channel access. Lifetime reached back into the implementation of queues, etc. However, this may be necessary for certain applications – eg "circuit breaker".

The point being missed is that the global lifetime is not what we are discussing. A total time circuit breaker is needed, but the maxMSDUlifetime value added in EDCF is a "head of queue time", not time from the MAC SAP. It is intended to deal with head of queue blocking. A different problem.
What happens if the maxMSDUlifetime is not in the spec? The concern is that bandwidth would be wasted transmitting already dead packets.

Why is this a complex problem? It seems to be simple – you look at the timer for the packet at the head of queue, and throw away if expired.

Different implementations have different notions of when a packet enters the MAC SAP.

But how would that cause an interoperability problem?

Not interoperability, but predictability of operation between implementations.

You can't define timing from an abstract interface. This is a real issue. Leaving this undefined could cause interoperability problems.

The existing standard's value is a "head of queue" time, not from entry.

It is testable at the air interface, by looking for a retransmission after the interval expires to indicate non-conformance. However the absence doesn't prove it is conformant.

To sum up:

We need more quantification of the benefit. This is in documents, and will be sent to reflector.

Concern with conformance testing: any information should be presented.

Benefits should be clarified to specify whether they apply to all devices, or just a certain class of application – scope of benefit.

Other comments:

We have an existing draft, we are trying to improve. We need justification of what the benefit is for removing this maxMDSUlifetime.

We need comparative information on the complexity

This is in the draft as an optional MIB variable. The argument is whether to make it mandatory.

This value should apply to HCF as well as EDCF. (that is how it is specified now, but may need editorial clarification)

Persistence Factor

For the applications where real QoS matters, parameterized QoS is necessary.
The HCF will be needed, so anything not needed for HCF is only seen as extra complexity and should be removed.
Based on that argument, you would remove the whole EDCF? Yes, but not politically feasible. Thus Persistence factor, which is a core component of TCMA, is also there as a result of compromise on EDCF
What is the benefit of persistence factor for multimedia? A number of members feel that HCF/PCF is necessary, but it was realized that EDCF was needed as a compromise.
The persistence factor solves a problem that we have another mechanism for. It is a matter of redundancy. The problem solved is : a high priority traffic class gets backed off and increases latency. One solution is to scale backoff at a lower rate than binary exponential. The way to solve the problem is to use cwmin and cwmax per traffic category. Instead of PF, adjust both cwmin and cwmax. It results in the same effect as smoothing out the latency. PF is not needed if you use CWmax as intended.

The proposal is to remove PF, and introduce a new feature? Differentiating by cwmax is not part of the current draft. PF is a part of the draft. There is no simulation to show that cwmax is superior to PF, but simulations do show that PF is beneficial.

request to send documents with simulation results to the reflector., including simulations for using cwmax without PF.

Discussion:

If you use cwmax in a reasonable way, it is easy to implement, and works as well as PF. Not suggesting PF is useless, but cwmax is an easier way to do the same thing.
What is the real application space for this, especially in the HCF? How would it be optimized in a real world setting? If cwmax is easier to implement, would be in favor.
Points out that the 75% approval of the draft doesn't mean that each feature was adopted with 75% votes. It is fair to examine features to see if they are what we want.
The PF would be given out by the AP, but the algorithm is not standardized. Also, how is PF going to be tested for conformance?
No algorithm is really necessary – just use something between 1 and 2, which is better than the default of 2 we have now.
Differentiated class by cwmax is in the draft in 9.2.4. Also it is not necessary true you drop the packet at cwmax, but at the lifetime.
Larger issues – we need to re-examine our approach with conformance testing. We have WiFi to insure interoperability. They don't test for conformance on every issue. We don't specify every detail in standards. Much is up to the implementer. We need to discuss the role of the PICS in this.
We need to gain consensus – we won't finish if we try to eliminate every feature again.
Disagree – every line is being written again. We should examine the draft and discuss and decide these things.

We have a list of the data we need to close on this issue at the next meeting. Presentation of algorithms, complexity, and performance simulation data will be evaluated. Also, the relative merits of the application space.

Other points on EDCF

AIFS should be PIFS in the draft : this has been addressed.
Default values of AIFS and DIFS
Usefulness of EDCF –

There needs to be a document or presentation to explain this concern. It would be easier to discuss with a document in hand.
An email or document will be sent to reflector. Discussion deferred for later teleconference.

There is confusion about arbitration time (UAT). Concern that EDCF will collide with PCF or HCF. The language is not clear on the way TCMA works.

Backward Compatibility

Comments that suggest backward compatibility be removed.
The issue is outside the scope of the PAR . Technically, it is not in the PAR, but is in the requirements document that was adopted.
We have a small number of voters that want to drop compatibility. We would have a reduction of market acceptance if we didn't provide backward compatibility.
Is there anyone who feels there would be a net reduction of No votes if we removed backward compatibility? None.
We do need to think of how to respond to these comments.
Suggestions to be put on the reflector.

Autonomous Bursting

The editor believes that it is not work the complexity.
Does anyone on this call believe autonomous bursting is valuable and necessary?

There was one, but they have reconsidered, and think it can go away.
There might be a use in the IBSS.

Conclusion – there is no known use in BSS, but will address later in QIBSS discussion

CF MultiPoll

This is another case of complexity vs performance.

There are two aspects to support retaining MP. It is related to efficient use of the channel, and scaling with higher rates.

Could we see a submission on this?

Possible approach: Rather than trying to convince everyone it is a good thing, why not make it optional?

There is also deep seated opposition to options. as well.

We need to consider this and put it in front of the group – looking for a net reduction in No votes.

Bridge Portal

The concept is separating the infrastructure access function from the HC function. The need is real, but there may be better ways to meet the need.

The legacy standard specifies backbone traffic must go through the AP. Allowing other paths is what we are trying to do. But there are necessary aspects that are not specified in the draft – signaling related.

The scope issue can be dealt with – the existing standard allows WDS, but not efficiently. The TGe PAR specifies efficiency improvements, so this is in the scope.

We need to specify how to invoke the use of WDS. We need to address issues of mobility and signaling, and higher layers.

Remote PC

If the HC is simple enough, there isn't a necessity it is co-located with an AP.

However the spec assumes they are tied together. For example – sending beacons.

If you separate the EAP from the HC, then the you have the bridge portal problems.

The bridge portal is the AP without the HC and beacon functions.

We have an architectural concept of the AP as both infrastructure access and BSS control/coordination. It would be feasible to break the link between infrastructure access. We would still need a clear definition of how the transfer of coordinator takes place, separate from the infrastructure access.

We need to show there exist higher layer methods that solve this. With a workable signaling proposal, we could accomplish this.

Is it legal for a station to be associated and operating in ad-hoc mode? It is not addressed in the standard – it could be implemented.

Is it legal for a station to be associated in more than one BSS? An implementation could have two logical "stations" in one device. One MAC address in two BSSs would be non-conformant.

Perhaps there is a different approach here, we need to follow up these concepts. Will discuss off line.

Was the original intent to address something that does relaying?

There is a concept of an alternate coordinator as a backup. The other concept is spatial coverage extension (relay). If these are equivalent, they could be handled by one mechanism.

The signaling need to support this.

What do we need to resolve this?

This follows from the bridge portal – can we combine them?

Bridge portal is needed for home networking.

There is broad agreement we need to support Bridge Portal. We need an outline of how higher level protocols work with this.

Once we find the solution, the Remote PC issues go away.

Table until we have more info on BP and higher layer protocols.

This may have impacts on mobility.

Election of HC

Table discussion.

Closing Discussion

Refer to document 243r2 from Mathilde.

< John Kowalski takes over as Secretary>

Michael Fischer: Terminology issues would like to be discussed?

Sid: How do we avoid transmitting on a PIFS?

Mathilde: Wait till you see my presentation!

Sid: So we can defer the discussion?

Duncan: It's going to be difficult to discuss the details of the text on this, so let's defer it.

John Kowalski: HCF election issue:

1. Dynamic election of the HC, is complex.

Michael F. Can you dynamically generate a coordinator?

Can you Hand off streams.

The first question is easier to do than the latter.

John K. : the 2 things are related.

Michael: Run a QBSS w/o an infrastructure attachment.

You can dynamically create a HC when you start the network up, or if it gets forced.

Greg C. Failover is a separate issue, HC in an IBSS is very useful, esp. for 1394 apps.

Michael: Other systems do this, too. We don't have to deal w/ failover at all.

Duncan: Is there anyone who thinks it's a good idea to include fail-over in the MAC?

(nobody answered.)

Michael F. It could be in TGF. Why do you need periodic updates of candidates?

John : what if there were a sidestream ? If an HC changed without frequent communication, then you run the risk of never restarting the sidestream.

Greg: In such a case, w/o overlapping BSSs, EDCF would work - they could default to EDCF.

The reason for periodic updates is if you want to be able to "fail back" (re-establish streams).

Michael: it could be done when the HC is reestablished.

Duncan: There's no proposal to discuss.

Michael: what's the scope of the concept?

John K. we will make a proposal for a graceful shutdown of an HC that eliminates the need for frequent updating.

Michael F. Signalling issue is still there for Bridge portals, but it's not one in the same issue.
Next week's agenda:
Signalling
CC/RR/ beacon/probe response
Anything for higher layers is good (Michael F.)
Srini Kandala: Filtspec for signalling discussion next week?
Michael F. It's a valid issue for next week's discussion.
Keith: I'm trying to format that so it makes sense.