Unconfirmed Minutes - Multiple MCS IEEE 802.3bn EPoC Ad Hoc – 0030513

Attendance

Attendee	Present
Alan Brown – Aurora	x
Andrea Garavaglia – Qualcomm	x
Avi Kliger – Broadcom	
Bill Keasler – Ikanos	
Bill Powell – ALU	x
Charaf Hanna – ST Micro	x
Christian Pietsch – Qualcomm	
Curtis Knittle – CableLabs	x
Dave Barr – Entropic	
Dave Urban – Comcast	
David Law – HP	
Duane Remein – Huawei	x
Dylan Ko – Qualcomm	
Ed Boyd – Broadcom	
Ed Mallette – Brighthouse	
Eugene Dai – Cox	
George Hart – Rogers	x
Guansheng Lu – Huawei	
Hesham ElBakoury – Huawei	
Jim Farmer – Aurora	
Joe Solomon – Comcast	x
John Dickinson – Brighthouse	
John Ulm – Motorola	
Jorge Salinger – Comcast	x
Juergen Seidenberg – BK Tel	
Juan Montojo – Qualcomm	
Leo Montreuil – Broadcom	
Liuming Lu – B-Star	
Lup Ng – Cortina	
Marc Werner - Qualcomm	
Marek Hajduczenia – ZTE	x
Mark Laubach – Broadcom	
Matt Schmitt – CableLabs	
Michael Peters – Sumitomo	
Michel Allard – Cogeco	x
Mike Darling – Shaw	
Mike Emmendorfer – Arris	
Nicola Varanese – Qualcomm	
Ony Anglade – Cox	x

Patrick Stupar – Qualcomm	
Peter Wolff – Titan Photonics	
Raanan Ivry – Wide Pass	x
Ramdane Krikeb – Videotron	
Ron Wolfe – Aurora	
Saif Rahman – Comcast	x
Sanjay Kasturia – Qualcomm	
Satish Mudugere – Intel	x
Steve Shellhammer – Qualcomm	
Thushara Hewavithana – Intel	
Tim Brophy – Cisco	
Tom Staniec – Cohere	x
Tom Williams –Cablelabs	
Venkat Arunarthi – Cortina	
Victor Hou – Broadcom	
Volker Leisse - CEL	
Yitshak Ohana - Broadcom	

Agenda

- Attendance
- Review IEEE Patent Policy
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Patents Policy

- Everyone familiar with the policy; no response to call for patents

Undecided Voters – What do you need?

A previous undecided voter would change his vote to no at this point.

- Ed's presentation doesn't show a need for MMP

Is FDD US being presented as mandatory? What if we made FDD US optional?

- Making it optional is much more problematic; then you have to know whether or not the CNU supports it
- Not sure it's worth it; does the gain in complexity give us the gain in performance?

Concerns about increasing the complexity; not sure we will see the value from it.

- An additional undecided voter is leaning toward no

Because of the issues with whether or not FDD would have a mandatory, another undecided voter is leaning toward no.

We haven't established the value of MMP in FDD upstream

- There is only 1 upstream receiver, so it sees it all as the same
    - We could compensate in other ways
- While we could compensate, that compensation is limited and wouldn't give us as much gain as MMP
- When you force everyone to transmit with the same MP, everyone transmits at the worst

Since we use OFDMA, each user gets a time and frequency grant. If we use a single MP, then all transmitters will get the same MP as the worst performer.

- Transmitters can adjust their power, but only so high

Aren't we trying to compensate for the plant with electronics? Why not just fix the plant, change the split?

- Agree that there are ways to fix in the plant, but there are economic/logistical reasons that make another method more desirable
- If this could be addressed with TDD, why also burden the FDD?
    - Not all operators see TDD as their solution and would like to have in FDD as well.

Should we do a straw poll to see if we only support MMP in TDD mode?

- If we do in TDD, then we get it in FDD US for free – no additional work is needed; it's not different
- The TDD timeline is the same as the FDD timeline, so this shouldn't slow down the overall timeline

We should decide on the TDD; we can add FDD US later.

Not sure why having a MMP receiver increases the complexity of the CLT.

One voter is still undecided; need a traffic study to show that we would get a significant advantage without wasting bandwidth

- Not sure how efficiently it uses a single pipe; could be wasting bandwidth if the pipe is not filled.
- All of the LLIDs of a CNU use that same profile; there are no sorting issues.
- Even issues in the bursting downstream; would need multiple pipes and increase the likelihood of wasting bandwidth
- Still need more information to decide for the US; for DS, is skeptical that we could make it work without waste of bandwidth/lost packets

For the next meeting, lets see if we can get some answers to the questions made today:

Performance: What are the gains as compared to the complexity for the FDD/TDD bursting upstream?

- The tool shared by John Ulm addresses this, doesn't it?

Complexity: How does it increase the hardware design time? From a hardware point of view, what is the estimated increase, if any, in silicon area/gate count to implement MMP?

- Can a participant from Qualcomm/Broadcom address?

TDD DS pipes: How do we manage bandwidth in the pipes that will be needed? Assume that multiple pipes will be needed; how do we make sure that bandwidth is not wasted?

- Can a participant from Qualcomm address?