IEEE P802.11
Wireless LANs

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| TGaz telecon minutes May-July 2020 |
| Date: 2020-01-29 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Assaf Kasher | Qualcomm |  |  | akasher@qti.qualcomm.com |
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Abstract

This document contains telecon minutes from TGaz Telecons between the cancelled May 2020 Interim and the (cancelled) July 2020 Plenary

1. **TGaz – 20th May 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r1 (in progress - slide 77)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform, the guideline for IEEE WG meetings and logistics – no clarifications requested.
		2. Chair called for any potentially essential patents, no one stepped forward.
		3. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional and anti-trust requirements – no clarification requested.
		4. Recorded Participation requirement
			1. Headcount: ~15 present
	4. Review Agenda
		1. Agenda review and setting: reviewed submission list for the meeting
			1. 11-19-1011 SIG-A Changes for Ranging NDP (Christian Berger)
			2. CR for some PHY related CIDs on LB249 (Feng Jiang) – 20min (as time permits)
			3. 11-20-0788 CR for control frames related CIDs (as time permits).
	5. Feng Jiang presented 11-20-759
		1. Title CR for some PHY related CIDs
		2. CID 3128: Revised
			1. Q: Does the text change force option 1 or option 2 or are both allowed
			2. R: I prefer option 1
			3. Q: The Receiver should know which option is being used. I’d like to use option 2.
			4. R: there is an issue of the Secure Mode
			5. Strawpoll:
			11-20-0759, options from the submission
			Option 1: The transmitter can use spatial expansion matrix Q to map the Ntx antennas to Nsts spatial streams. The definition of spatial expansion matrix is in 19.3.11.11.2 Spatial mapping. For this case Nsts<=Ntx.
			(Note: This option aligns with the NDP design in 11ax. )Option 2: The transmitter always uses Nsts antennas for NDP transmission and for this case Nsts=Ntx and Q matrix is identity matrix. (Note: This option needs some change compared with 11ax spec.)
			**Results (O1) 6 (O2) 8 (A) 5**
			6. CID 3129: Revised
			7. CID 3892: Revised
			8. CID 3892: Reject – will be continued
			9. **Starwpoll –** We Agree to the CID resolution for CID 3129 depicted in document 11-20-0759r1
			**Results: (Y/N/A):** 14/0/4
	6. Christian Berger presented – 11-19-1011
		1. **Strawpoll:** Do you agree to Modify HE-SIG-A field to convey Ranging NDP indication (where data field length equal zero)
		**Results:** (6/6/6)
	7. Attendance:

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| Breakout | Timestamp | Name | Affiliation |
| TGaz | 5/20 | Berger, Christian | NXP Semiconductors |
| TGaz | 5/20 | Bhandaru, Nehru | Broadcom Corporation |
| TGaz | 5/20 | Chen, Xiaogang | Intel Corporation |
| TGaz | 5/20 | Das, Dibakar | Intel Corporation |
| TGaz | 5/20 | Grandhe, Niranjan | NXP Semiconductors |
| TGaz | 5/20 | Henry, Jerome | Cisco Systems, Inc. |
| TGaz | 5/20 | jiang, feng | Intel Corporation |
| TGaz | 5/20 | Kasher, Assaf | Qualcomm Incorporated |
| TGaz | 5/20 | Li, Qinghua | Intel Corporation |
| TGaz | 5/20 | Lindskog, Erik | SAMSUNG |
| TGaz | 5/20 | Nguyen, An | DHS/CISA |
| TGaz | 5/20 | Raissinia, Alireza | Qualcomm Incorporated |
| TGaz | 5/20 | Rosdahl, Jon | Qualcomm Technologies, Inc. |
| TGaz | 5/20 | Segev, Jonathan | Intel Corporation |
| TGaz | 5/20 | SURACI, FRANK | 101 Consulting Corporation |
| TGaz | 5/20 | Venkatesan, Ganesh | Intel Corporation |
| TGaz | 5/20 | Wang, Qi | Apple, Inc. |
| TGaz | 5/20 | Wang, Yi-Hsiu | Innopeak |
| TGaz | 5/20 | Want, Roy | Google |
| TGaz | 5/20 | Yee, Peter | NSA-CSD |

1. **TGaz – 27th May 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r1 (in progress - slide 88)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		3. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional and anti-trust requirements – no clarification requested.
		4. Recorded Participation requirement
		Headcount: ~15 present
	4. Agenda Setting
		1. Presentations:
			1. 11-20-0759 CR for some PHY related CIDs on LB249 (Feng Jiang) – for completion (40 minutes)
			2. 11-20-0788 CR for control frames related CIDs (Dibakar Das) – (45 minutes)
			3. 11-20-0806 lb249-cids (Nehru Bhandaru) – as time permits.
	5. Feng Jinag continued presentation of 11-20-0759
		1. CID 3892 – rejected
		2. CID 3692 – accepted
		3. CID 3271 – Revise
		4. Strawpoll: We agree to the resolution of CID 3692, 3271 as depicted in document 11-20-759r1
		5. Results (Y/N/A) (13/0/3)
		6. Strawpoll: we agree to the CID resolution 3892 depicted in document 11-20-759r3
		7. Results (Y/N/A): (5/3/8)
	6. Dibakar Das presented 11-20-0788
		1. CID 3013 – reject
		2. CID 3014 – Reject - will be reviewed
		3. CID 3015 –
		4. CID 3102 – Reject
	7. Review of submission pipeline (slide 94)
	8. Review of Telecons
	9. AOB?
	10. Chair adjourned in 11:32PDT
2. **TGaz – June 3rd, 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r1 (in progress - slide 88)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair remined participants to use imat for attendance
		3. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		4. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional and anti-trust requirements – no clarification requested.
		5. Recorded Participation requirement
		Headcount: ~15 present
	4. Agenda Setting
		1. Presentation:
		2. 11-20-0788 CR for control frames related CIDs (Dibakar Das)
		3. 11-20-0797 LMR/FTM Replay Counter (Ali Raissinia)
		4. 11-20-0806 lb249-cids (Nehru Bhandaru) – as time permits
	5. Dibakar Das continued presentation of 11-20-0788
		1. CID 3108: Reject
		2. CID 3283: Reject
		3. CID 3355: Revise
		4. CID 3389: Revise
		5. CID 3016: Reject
		6. CID 3017: Reject
		7. CID 3827: Accept
		8. CID 3888: Revised
		9. CID 3324: Revised
		10. CID 3434: Revised
		11. CID 3962: Revised
		12. CID 3287: Reject
		13. CID 3435: Revised – already fixed in Draft 2.2
		14. CID 4004: Reject
		15. CID 4005: Reject
		16. Strawpoll: We agree to the CID resolution 3013, 3104, 3015, …
		as depicted in document 11-20-788r2:
		17. Results (Y/N/A) (12/0/1)
	6. Attendance:

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| --- | --- | --- | --- |
| TGaz | 6/3 | Berger, Christian | NXP Semiconductors |
| TGaz | 6/3 | Bhandaru, Nehru | Broadcom Corporation |
| TGaz | 6/3 | Grandhe, Niranjan | NXP Semiconductors |
| TGaz | 6/3 | Kasher, Assaf | Qualcomm Incorporated |
| TGaz | 6/3 | Lindskog, Erik | SAMSUNG |
| TGaz | 6/3 | NANDAGOPALAN, SAI SHANKAR | Cypress Semiconductor Corporation |
| TGaz | 6/3 | Raissinia, Alireza | Qualcomm Incorporated |
| TGaz | 6/3 | Rosdahl, Jon | Qualcomm Technologies, Inc. |
| TGaz | 6/3 | Segev, Jonathan | Intel Corporation |
| TGaz | 6/3 | Seok, Yongho | MediaTek Inc. |
| TGaz | 6/3 | Venkatesan, Ganesh | Intel Corporation |
| TGaz | 6/3 | Wang, Qi | Apple, Inc. |
| TGaz | 6/3 | Wang, Yi-Hsiu | Innopeak |
| TGaz | 6/3 | Want, Roy | Google |
| TGaz | 6/3 | Wu, Tianyu | Apple, Inc. |
| TGaz | 6/3 | Yee, Peter | NSA-CSD |
| TGaz  |  | 6/3 Das Dibakar | Intel |

1. **TGaz – June 10th, 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r22 (in progress - slide 88)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair remined participants to use imat for attendance
		3. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		4. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional and anti-trust requirements – no clarification requested.
		5. Recorded Participation requirement
		Headcount: ~15 present
	4. Agenda Setting
		1. Presentation:
			1. 11-20-0797 LMR/FTM Replay Counter (Ali Raissinia) – 30 min
			2. 11-20-0806 lb249-cids (Nehru Bhandaru) – as time permits
			3. 11-20-0799 Resolutions to a few LB249 CIDs-part-4 (Ganesh Venkatesan)
	5. Ali Raissinia presented 11-20-0797-LMR/FTM Replay Counter
		1. Q: One option is to force all devices to use the unassociated mode
		2. R: would the device have two keys PN spaces
		3. Q: This is too complex however it is possible
		4. Q: The advantage of unassociated is that it has no other management frames
		5. Q: That may change, if PASN is used for other application
		6. R: would a single PASN will be used in other application
		7. Q: it would introduce a new interface.
		8. Q: the proposed solution is the most cost-effective solution
		9. Starwpoll:
		 Do you agree to add an LMR/FTM Replace counter to the 11az
		10. Results: 10/0/4
	6. Nehru Bandahru presented 11-20-806
		1. Title: LB249-cids
		2. CID 3357: Revise
		3. CID 3523: Revise
		4. Strawpoll: We Agree to the CID resolutions 3357, 3523 depicted in 11-20-806r1
		5. Results 14/0/0
	7. Ganesh Venkatesan (Intel) presented document **20-11/799r1**
		1. **Title**: Resolutions to a few LB249 CIDs-part-4
		2. **Summary**: This submission proposes resolutions to the following LB249 CIDs: 3134, 3611, 3442.
		3. C. General discussion about improving clarity of ToA type field and description.
		4. C. Please clarify text as the Phase Shift estimation does not yield ToA, but can be used to estimate ToA, which is different from a first path estimation.
		5. R. This will be clarified and brought back for a strawpoll vote during the next telecom.
	8. **Submission Pipeline for next meeting**
		1. - Doc **20-11/799**[for completion]  (Ganesh Venkatesan)
		2. - Doc. **20-11/800** Resolutions to a few LB249 CIDs-part-5 (Ganesh Venkatesan)
		3. - Doc. **20-11/836** 11az Secure LTF design (Bin Tian)
	9. **Future Meetings**
		1. - Next Telecon: June 17th
		2. - Next Plenary Meetings: June 25th, July 30th
		     - Note: Motion text must be sent to Jonathan ahead of time for review.
	10. **AOB**: None
	11. **Adjourn at 11.30am**
		1. Attendance:

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| --- | --- |
| **Name** | **Affiliation** |
| Berger, Christian | NXP Semiconductors |
| Bhandaru, Nehru | Broadcom Corporation |
| Grandhe, Niranjan | NXP Semiconductors |
| Henry, Jerome | Cisco Systems, Inc. |
| Kasher, Assaf | Qualcomm Incorporated |
| Lindskog, Erik | SAMSUNG |
| NANDAGOPALAN, SAI SHANKAR | Cypress Semiconductor Corporation |
| Raissinia, Alireza | Qualcomm Incorporated |
| Segev, Jonathan | Intel Corporation |
| Venkatesan, Ganesh | Intel Corporation |
| Wang, Qi | Apple, Inc. |
| Wang, Yi-Hsiu | Innopeak |
| Want, Roy | Google |
| Yee, Peter | NSA-CSD |

1. **TGaz – June 17th, 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r22 (in progress - slide 88)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair remined participants to use imat for attendance
		3. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		4. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional, and anti-trust requirements – no clarification requested.
		5. Recorded Participation requirement
		Headcount: ~15 present
	4. Agenda Setting
		1. Presentation:
			1. 11-20-0799 resolutions to a few LB249 CIDs-part-4 (Ganesh Venkatesan) – for completion
			2. 11-20-0800 resolutions to a few LB249 CIDs-part-5 (Ganesh Venkatesan)
			3. 11-20-0836 Secure LTF Design (Bin Tian) – a time permits.
	5. Ganesh Venkatesan presented 11-20-0799
		1. Title: resolution to a few LB249 comments (part -4)
		2. CID 3134
			1. Discussion of the text that describes “phase shift reporting” – more work on this is needed – definition needs to be aligned throughout the draft.
		3. CID 3611
			1. More work is also needed.
	6. Ganesh Venkatesan presented 11-20-800
		1. Title Resolution to a few LB249 CIDs-part-5
		2. CID 3232 – reject
		3. CID 3440 – Revise – text was modified on the fly
		4. CID 3565 – requires more work
		5. Strawpoll – we agree to the CID resolutions 3232 and 3440 depicted in document 11-20-0800r1
		6. Results: (15/0/3)
	7. Submission pipeline
		1. 11-20-0836 LMR replay counter Nehru Bhandaru
		2. 11-20-0889 11az Secure LTF design (Bin Tian)
	8. Attendance:

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| TGaz | 6/17 | Berger, Christian | NXP Semiconductors |
| TGaz | 6/17 | Bhandaru, Nehru | Broadcom Corporation |
| TGaz | 6/17 | Grandhe, Niranjan | NXP Semiconductors |
| TGaz | 6/17 | Henry, Jerome | Cisco Systems, Inc. |
| TGaz | 6/17 | Kasher, Assaf | Qualcomm Incorporated |
| TGaz | 6/17 | Li, Qinghua | Intel Corporation |
| TGaz | 6/17 | Lindskog, Erik | SAMSUNG |
| TGaz | 6/17 | Raissinia, Alireza | Qualcomm Incorporated |
| TGaz | 6/17 | Rosdahl, Jon | Qualcomm Technologies, Inc. |
| TGaz | 6/17 | Shellhammer, Stephen | Qualcomm Incorporated |
| TGaz | 6/17 | Tian, Bin | Qualcomm Incorporated |
| TGaz | 6/17 | Venkatesan, Ganesh | Intel Corporation |
| TGaz | 6/17 | Wang, Qi | Apple, Inc. |
| TGaz | 6/17 | Wang, Yi-Hsiu | Innopeak |
| TGaz | 6/17 | Want, Roy | Google |
| TGaz | 6/17 | Yee, Peter | NSA-CSD |

1. **TGaz – June 24th, 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r26 (in progress - slide 88)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair remined participants to use imat for attendance
		3. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		4. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional, and anti-trust requirements – no clarification requested.
		5. Recorded Participation requirement
		Headcount: ~15 present
	4. Agenda Setting
		1. Presentation:
			1. 11-20-0836 Secure LTF Design (Bin Tian) – 1h.
	5. Bin Tian Presented 1-20-0836 Secure LTF Design
		1. Q: Did you think of another method of attack rather than Viterbi decoder
		2. R: Response, yes, we did check, but we think the is physical limitation is when you have a limited observation window you need a lot of taps and large computational power and ICI becomes larger
		3. Q: There is no need of the 10dB down limit, any valid tap can be interpreted as a first tap
		4. R: If the SINR is low enough, a lower peak may be used. The 10dB is an implementation choice.
		5. Q: Does your presentation lead to a solution to the entropy problem in the current implementation
		6. Y: we propose to use 64QAM
		7. Q: Use of a shorter learn period introduces new noise
		8. R: do you think we a method to detect an attack
	6. Submission Pipeline:
		1. 11-20-0889
		2. 11-20-0698
		3. 11-200-836 (continue with strawpoll)
	7. Attendance:
2. **TGaz – July 1st , 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:02am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r26 (in progress - slide 88)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair remined participants to use imat for attendance
		3. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		4. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional, fair consideration of all viewpoints, and anti-trust requirements – no clarification requested.
		5. Recorded Participation requirement
		Headcount: ~17 present
	4. Agenda Setting
		1. Presentation:
			1. 11-20-0889 LMR replay counter (Nehru Bhandaru)
			2. 11-20-0698 LB 249 CID 3940 resolution (Assaf Kasher)
			3. 11-20-0963 cid-3880-kdk-hltk (Nehru Bhandaru) - as time permits
	5. Nehru Bhandaru presented 11-20-889
		1. Title: Protected LMR/FMT Replay Counter
		2. Q: How the SN plays here
		3. R: Similar to PMF we have a requirement to use a special space
		4. Q: Having a different SN space is simpler in the receiver
		5. R:yes
		6. Q: replay counter is only for protected frames
		7. Q: The counter for the security how does that work with MPDU
		8. R: each MPDU has its own replay counter. The ordering happens before decoding
		9. Strawpoll: We agree to the proposed changes as depicted in 11-20-889r3
		10. Result (Y/N/A) (12/1/3)
	6. Assaf Kasher presenting 698r0 resolution CID 3940.
		1. C: MFPR might not be set all the time. Not tightly related to MFPR. MFPR will imply protection. moving to rsnxe is okay.
		2. R: agree
		3. C: does this apply to both EDMG or non-EDMG ?
		4. R: yes.
		5. C: if RSN says MFP required and the "Protection of range..." says it’s not. Is that a valid combination ?
		6. R: If MFP is required, you have to set it. The "Protection of range..." is mainly for unassociated STAs.
		7. C: 12.6.19 reference seems to be wrong. MFPC and MFPR don’t define security context in the note.
		8. R: agree to revise the text.
		9. C: if the MIB is false, and you have a security context, ..
		10. R: Assaf to note it.
3. Attendance:

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| TGaz | 7/1 | Batra, Anuj | Apple, Inc. |
| TGaz | 7/1 | Berger, Christian | NXP Semiconductors |
| TGaz | 7/1 | Bhandaru, Nehru | Broadcom Corporation |
| TGaz | 7/1 | Bims, Harry | Bims Laboratories, Inc. |
| TGaz | 7/1 | Chen, Xiaogang | Intel Corporation |
| TGaz | 7/1 | Grandhe, Niranjan | NXP Semiconductors |
| TGaz | 7/1 | Henry, Jerome | Cisco Systems, Inc. |
| TGaz | 7/1 | Huang, Po-Kai | Intel Corporation |
| TGaz | 7/1 | Kasher, Assaf | Qualcomm Incorporated |
| TGaz | 7/1 | Li, Qinghua | Intel Corporation |
| TGaz | 7/1 | Lindskog, Erik | SAMSUNG |
| TGaz | 7/1 | NANDAGOPALAN, SAI SHANKAR | Cypress Semiconductor Corporation |
| TGaz | 7/1 | Raissinia, Alireza | Qualcomm Incorporated |
| TGaz | 7/1 | Rosdahl, Jon | Qualcomm Technologies, Inc. |
| TGaz | 7/1 | Segev, Jonathan | Intel Corporation |
| TGaz | 7/1 | Shellhammer, Stephen | Qualcomm Incorporated |
| TGaz | 7/1 | Tian, Bin | Qualcomm Incorporated |
| TGaz | 7/1 | Venkatesan, Ganesh | Intel Corporation |
| TGaz | 7/1 | Wang, Qi | Apple, Inc. |
| TGaz | 7/1 | Wang, Yi-Hsiu | Innopeak |
| TGaz | 7/1 | Wu, Tianyu | Apple, Inc. |
| TGaz | 7/1 | Yee, Peter | NSA-CSD |

1. **TGaz – July 8th , 2020**
	1. Called to order by TGaz Chair, Jonathan Segev (Intel Corporation) and Vice Chair and secretary (active), Assaf Kasher (Qualcomm), at **10:01am PDT,**
	2. Agenda Doc. **IEEE 802.11-20/0537r29 (in progress - slide 145)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patent Policy, duty to inform. Chair called for any potentially essential patents, no one stepped forward.
		2. Chair remined participants to use imat for attendance
		3. Chair reviewed the guideline for IEEE WG meetings and logistics – no clarifications requested.
		4. Chair reviewed IEEE copyright policy, code of ethics, WG participation as an individual professional, fair consideration of all viewpoints, and anti-trust requirements – no clarification requested.
		5. Recorded Participation requirement
		Headcount: ~17 present
	4. Agenda Setting
		1. Presentation:
			1. 11-20-0964 Attacks to Fully Random 64QM Sounding Signal (Qinghua Li) (60Minutes)
			2. 11-20-0836 Secure LT design(Bin Tian)
	5. Qinghua Li Presented 11-20-0964
		1. Q: Can you define the x-axis (is over the whole symbol)
		2. R: Horizontal is cross correlation over the attack window.
		3. Q: the one with freq-corr
		4. R: it is over the whole window
		5. Q: is it correlation only on the attack window. Why is not limited to ¼.
		6. R: it is over only the attack window
		7. Q: have used other windows.
		8. R:
		9. Do you think 45dB transmit EVM and SNR is realistic?
		10. Yes, although only for short range. The EVN is achievable
		11. Q: In some cases, sphere decoding the whole tree is traversed – it will take too long
		12. R: If the radius is chosen correctly the probability is low.
		13. Q: The numbers of the correlation don’t look correct. It does look like a realistic attack. No computation time was considered
		14. R:
		15. Q: The presentation should have been uploaded earlies
		16. R: it took a lot of time; It was not ready at the date printed on it.
		17. Q: if you ¾ of the observation time and computation time is taken into account, there is not enough time and SNR for the attack signal
		18. R: The attacker has a long time to prepare for the attack.
		19. Q: can you present results for shorter window
		20. R: we can
		21. Q: do you think this is an upper bound on the attack
		22. R: 20% is the best an attacker can do
		23. Q: you present a trade-off between observation window, complexity and attack SNR.
		24. R: The success rate of the attacker. If the sphere is too small. There are cases that will be missed. We agree that there some cases in which failure is the result of no convergence of the sphere decoder.
		25. Q: the CP is ¼ of the window. The attack time is smaller than ¼ symbol. Can you provide gate count?
		26. R: 8k multiplication for the sphere decoded.
		27. Q: The result of the attack was shown late in Jan. We should be thorough when review this,
		28. Q: If the LMR is not received the measurement it will be considered non-valid
	6. Chair reviewed submission pipeline.
	7. Chair reviewed scheduled telecons.
	8. AOB?
	9. Chair adjourned at 11:28 PDT
	10. Attendance:

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| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| TGaz | 7/8 | Abdelaal, Rana | Broadcom Corporation |
| TGaz | 7/8 | Adhikari, Shubhodeep | Broadcom Corporation |
| TGaz | 7/8 | Awater, Geert | Qualcomm Incorporated |
| TGaz | 7/8 | Batra, Anuj | Apple, Inc. |
| TGaz | 7/8 | Berger, Christian | NXP Semiconductors |
| TGaz | 7/8 | Bhandaru, Nehru | Broadcom Corporation |
| TGaz | 7/8 | Boldy, David | Broadcom Corporation |
| TGaz | 7/8 | Bredewoud, Albert | Broadcom Corporation |
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| TGaz | 7/8 | Sirivinas Kandala                | Samsung |

**References:**