IEEE P802.11
Wireless LANs

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| TGaz Meeting MinutesMarch 6th-8th, 2018Chicago, Illinois, USA |
| Date: 2018-03-06 |
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Abstract

Minutes for the TGaz meeting beginning on March 6th, 2018.

**IEEE 802.11 Task Group AZ**

**March 6th – 8th, 2018**

1. **TGaz – March 6th, 2018 – Slot #1**
	1. Called to order by TGaz chair, Jonathan Segev (Intel Corporation) at **4.00pm CST**, Vice Chair Carlos Aldana (Intel Corporation), Roy Want (Google) Secretary.
	2. Agenda Doc. **IEEE 802.11-18/0276r3 (in progress)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patency Policy, additional guidelines about IEEE-SA meeting and logistics – no clarifications requested.
		2. Chair called for any potentially essential patent, no one stepped up.
		3. Chair reviewed IEEE 802 WG participation as individual professional – no clarification requested.
		4. Chair reminded all to record their attendance
		5. Recorded Participation requirement
			1. Headcount: ~35 present
	4. Review Agenda
		1. Called for any additional submissions for the week.
		2. Reviewed and agreed the agenda with 5 session slots.
		3. Chair called for any additional feedback and changes to agenda.
		4. **Motion: We approve the agenda for document 11-18/0276r3**
			1. **Approved** by unanimous consent
	5. Approve previous meeting minutes (posted Nov 17th, 2017 updated Jan 1st, 2018)
		1. Roy Want (Google) reviewed November Meeting Minutes **11-18/0221r0**
			1. **Motion: Move to approve document 11-18-0221r0 as TG meeting minutes for the Jan meeting**
			2. Mover: Erik Lindskog, Seconder: Assaf Kasher.
			3. Discussion of the motion: none
			4. **Results:** Y: 14, N: 0, A: 1; **motion passes**
		2. There was no material for teleconferences, and as a result, the two previous events were cancelled Jan – Mar, 2018
	6. Chao-Chun (MediaTek) reviewed draft of amendment text **P802.11az\_D0.1.pdf**
		1. Reminder to submit section heading for any additions to ensure they go in the correct palace.
		2. Main technical material starts at clause 4: General description.
		3. Might be worth changing NGP to something else that could be extended rather than NNGP, NNNGP …
		4. New: security section 11.22.6.4 (Chi/Sk) names added for attention of
		5. Also new: Pre-association security 12:12 (Nehru)
		6. Document is uploaded to the members area as a pdf.
		7. **Motion:
		Move to adopt P802.11az D0.1 as the TGaz initial working draft.**
		8. Mover: Alecsander Eitan, Seconder Erik Lindskog
		9. **Results**: Y: 15, N: 0, A: 2; **motion passes**
		10. **Motion
		Move to empower the editor to incorporate changes approved by TGaz into the draft and issue working drafts without further instruction from the TG.**
		11. Mover: Assaf Kasher, Seconder: Erik Lindskog
		12. **Results**: Y: 18, N: 0, A: 0; **motion passes**.
		13. **Motion**

**Move to empower the editor to make editorial changes to the draft**

* + 1. Mover: Assaf Kasher, Seconder: Chitto Ghosh
		2. Y: 16, N: 0, A: 0, **motion passes**
		3. C. Is there a more efficient process? I don’t want to write lots of amendment text pages that are not agreed by the majority.
		4. C. Will the SFD will be incomplete in some areas?
		5. R. Yes – The outcome of this group is ultimately just the amendment text.
		6. R. TGaz can consider freezing the SFD earlier, or in sections.
		7. R. Amendment text is only open to submissions in particular sections.
	1. Chao-Chun (MediaTek) presented SFD status **11-17/0462r13**
		1. Dates are used to make it easy to find when certain document text is inserted into sections of the SFD.
		2. New sections were reviewed (Jan dates can be used to find recent changes)
		3. **Motion
		Move to adopt document 11-17-462r13 as TGaz Spec Framework working draft document**
		4. Mover: SK Yong, Seconder: Ganesh Venkatesan
		5. **Results**: Y: 15, N: 0, A: 2; **motion passes**
	2. Christian Berger (Marvell) presented document **11-18/0461r0**
		1. Title: **VHTz Sounding: MinToAReady**
		2. Summary: addresses some deficiencies in the description of the protocol to handle variable processing time during the VHT sounding protocol. It Proposes the format and range of the MinToaReady and MaxToaAvailable parameters and their timing definition (to, from).
		3. C. Why do we need two time-parameters?
		4. R. We need t1i, t2r, t3r, t4i; but the computation of the sounding results may take a while, so we have delayed feedback. These times define a window when the responder can respond.
		5. C. Why is specifically the Min time part of this? Might be over complicated.
		6. R. The SFD shows the definition (section 4.6.2)

MaxToAAvailable – the time state is kept around for the session

MinToaReady – set by the responder to tell the initiator the fastest it can

return.

* + 1. C. We had a similar parameter in 11mc (beginning of one frame to beginning of next).
		2. Any further discussion? Any alternative proposals: None
		3. **Strawpoll**

**We agree to measure MinToaReady and MaxToaAvailable starting from t4/t3 in the preceding sounding sequence to t1/t2 when receiving the new sounding sequence 11-18-161**

* + 1. **Results**: Y: 13, N: 0, A: 4.
		2. **Motion
		Move to adopt the following spec framework text and instruct the SFD editor to include it in the TGaz SFD under the sub-section  3.2.2 VHTz Measurement Exchange for the .11az protocol:**

**“The MinToaReady and MaxToaAvailable are measured starting from t4/t3 in the preceding sounding sequence to t1/t2 when receiving the new sounding sequence, refer to slide 10 of submission 11-18-461.”**

* + 1. Mover: Ganesh Venkatesan, Seconder: Feng Jiang
		2. **Results**: Y: 10, N: 0, A: 5; **motion passes**
	1. Feng Jiang (Intel Corp) presented document **11-18/539r0**
		1. Title: **Existence Indication of Attacker or Jammer in LMR**
		2. Summary: This submission proposes to define a parameter field in the LMR frame to indicate the existence of the attacker or jammer.
		3. Discussion:
		4. C. We agree to include an invalid measurement indication in the LMR.
		5. C. When do you actually detect the jamming signal?
		6. R. Detection is at the end of the UL NDP
		7. C. What is the time to get the indication (you don’t get it immediately)
		8. R. Two types 1) Immediate. 2) Previous in sequence.
		9. **Strawpoll
		Do you support to indicate an invalid measurement in LMR frame?**
		10. **Results**: Y: 13, N: 0, A: 2
		11. Will continue this submission in the next slot.
	2. Attendance reminder
	3. Recess at 5:58pm.
1. **TGaz – 7th Mar, 2018 – Slot #2**
	1. Called to order by TGaz chair, Jonathan Segev (Intel Corporation) at **08.00am CST**; Vice Chair, Carlos Aldana (Intel Corporation); Roy Want (Google) Secretary.
	2. Agenda Doc. **Now working with revision 11-18/0276r4 (in progress)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patency Policy, additional guidelines about IEEE-SA meeting and logistics – no clarifications requested.
		2. Chair called for any potentially essential patent, no one stepped up.
		3. Chair reviewed IEEE 802 WG participation as individual professional – no clarification requested.
		4. Chair reminded all to record their attendance
		5. Recorded Participation requirement
			1. Headcount: ~29 present
	4. Reviewed submission order and updated agenda
		1. Updated agenda presentation order and feedback requested: none received
		2. Agenda agreed.
	5. Feng Jiang (Intel Corp) continued to present document **11-18/539r0**
		1. **Motion:
		Move to adopt the following spec framework text and instruct the SFD editor to include it in the TGaz SFD under the sub-section 6 Security:**

**“The LMR frame shall include an indication of invalid measurement.”**

* + 1. Mover: Nehru Bhandaru, Seconder: Assaf Kasher
		2. **Results**: Y: 10, N: 0, A: 3; **motion passes**
		3. C. Do you want the field to be used for the first LMR
		4. R. You can put zeros in this field for the first LMR (similar to FTM).
	1. Nehru Bhandaru (Broadcom) presented document **11-18/350r0**
		1. Title: **Pre-association Security Negotiation (PASN) for 11az**
		2. Summary: This submission contains an authentication protocol, termed **PASN**, that allows a PTKSA to be established before 802.11 association exchange. The motivation for such a protocol originates from TGaz functional requirements [2] (see TGaz R38), and a high-level scheme outlined in TGaz SFD [3] (see Security section 6, item 13). Such a protocol can be used to derive protection for 11az Negotiation and Measurement exchanges, leveraging Protected Management Frames (PMF) and other mechanisms much like the case where there is an 802.11 association followed by a PTKSA derivation. Once PTKSA is available, how it is applied to achieve protection of 11az specific exchanges is not the subject of this proposal.
		3. Discussion
		4. C The PTKSA acronym is confusing in pre-association, because it’s used in post association too.
		5. R. The same name was used, because it’s the same basic mechanism. However, we can update/improve its name in a future version of the text.
		6. C. Might be useful to negotiate a valid lifetime for the keys
		7. R. Its straightforward to add this.
		8. C. We have a context timeout for ranging – we could use that.
		9. R. This is not tied to ranging, so it would be a new timeout variable.
		10. C. Next steps?
		11. R. Will revise the text according to comments
	2. Yongho Seok (MediaTek) presented document 11-18/0458r
		1. Title: **802.11az VHTz Secure Measurement Protocol**
		2. Summary: This submission proposes P802.11az draft amendment text for the P802.11az VHT secure range measurement protocol. This submission addresses SFD (document 17/0462r13) requirements 6 (Security) (14), (15) and (16**).**
		3. Discussion: None.
		4. **Strawpoll**
		5. **Do you support to incorporate amendment text of submission 11-18-458 into the 11az draft text document?**
		6. **Results**: Y: 14, N: 0, A: 3Discussion:
		7. C. You use the word “is present” 9.6.8.33, but in 11.22.6.3 may is used
		8. R. It’s a conditional inclusion – If it’s enabled, it shall be included. So, it’s okay as it stands.
		9.
		10. **Motion**
		11. **Move to adopt document 11-18-458r0 to the 802.11az draft and instruct the technical editor to incorporate it in the 802.11az draft amendment text.**
		12. Moved: Yongho Seok, Seconder: Qinghua Li
		13. **Results**: Y: 11, N: 3, A: 3, **motion passes**
	3. Yongho Seok (MediaTek) presents document **11-18/0555r0**
		1. Title: **Revised VHTz Specific Parameters**
		2. Summary: This submission proposes the revised VHTz Specific Parameters sub-element format of TGaz D0.1 to clean-up the field format.
		3. C. In text, is the Response immediate or delayed? – its unclear. Field value 0 indicates immediate.
		4. R. Its defined later – this is copied from the SFD text, so okay.
		5. C. The information is correct, but let me think about an improvement.
		6. **Strawpoll
		Do you support to incorporate amendment text of submission 11-18-555r0 into the 11az draft text document?**
		7. **Results**: Y:17, N: 0, A: 6
		8. **Motion**
		9. **Move to adopt document 11-18-555r0 to the 802.11az draft and instruct the technical editor to incorporate it in the 802.11az draft amendment text.**
		10. Discussion. None
		11. Mover: Yongho Seok, Seconder Qinghua Li
		12. **Results**: Y: 13, N: 0, A: 5; **motion passes**
	4. Chitto Ghosh (Intel Corp) presented document **11-18/0534r0**
		1. Title: **802.11az Trigger Frame Format – relative to REVmd D0.5**
		2. Summary: This submission proposes P802.11az draft amendment text for the P802.11az Negotiation Protocol.
		3. Continue discussion of submission at next time slot
	5. Reminder to do attendance.
	6. Now at recess 10am CST.

1. **TGaz – 7th Mar, 2018 – Slot #3**
	1. Called to order by TGaz chair, Jonathan Segev (Intel Corporation) at **01.30pm CT**; Vice Chair, Carlos Aldana (Intel Corporation); Roy Want (Google) Secretary.
	2. Agenda Doc. **Now working with revision 11-18/0276r5 (in progress)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patency Policy, additional guidelines about IEEE-SA meeting and logistics – no clarifications requested.
		2. Chair called for any potentially essential patent, no one stepped up.
		3. Chair reviewed IEEE 802 WG participation as individual professional – no clarification requested.
		4. Chair reminded all to record their attendance
		5. Recorded Participation requirement
			1. Headcount: ~26 present
	4. Reviewed submission order and updated agenda
		1. Updated agenda presentation order agreed.
	5. Chitto Ghosh (Intel Corp) continued to present document **11-18/0534r0**
		1. Updated document based on discussion in the break, now at **11-18**/**0534r1**
		2. **Strawpoll:
		Do you support to incorporate amendment text of submission 11-18-534r1 into the 11az draft text document?**
		3. **Results**: Y: 13, N: 0, A: 3.
		4. **Motion:
		Move to adopt document 11-18-534r1 to the 802.11az draft and instruct the technical editor to incorporate it in the 802.11az draft amendment text.**
		5. Mover: Chitto Ghosh, Seconder: Yongho Seok
		6. Discussion: None
		7. **Results**: Y: 8, N: 0, A: 2, **motion passes**
	6. Assaf Kasher (Qualcomm) presented document **11-18/494r0**
		1. Title: **60GHz Direction Measurement Draft Text**
		2. Summary: This document proposes the changes to the TGaz Draft for allowing 60GHz Direction Measurement. The changes are in reference to TGaz Draft 0.1
		3. Note by author: Direction Measurement (name of behaviour: should it be capitalized?)
		4. Discussion
		5. C. RE: 9.4.2.nnn direction element in the LMR. The DMG Capability element in 11ay needs to make the relevant update in the DMG Direction Measurement information. We should make it clear to the Editor that this section is 11ay, not baseline spec.
		6. R. It was intended to be, but needs to be updated.
		7. C. A value of 1 in the I2R AOD Request subfield indicates a request for the FTM initiator to FTM responder Angle of Departure measurement. Does it mean that the Initiator sends a request to the Responder to measure the Initiator’s AoD, and feedback the measurement?
		8. R. Yes, if the Initiator needs AoD, the responder needs to send something back to the Initiator.
		9. C. Is the L-RX field description consistent?
		10. C. When the initiator sets the LR-x to non-zero is it a request?
		11. R. Yes. This document is based on prior sections of 11ay.
		12. C. Make it clear by saying it is based on 11ay.
		13. C. Table: Text says it cannot do both AoA and AoD. Required capabilities on right side are what are exchanged in the request. So, at this point in the protocol they are known.
		14. R. Agreed.
		15. C. What does scheduling look like?
		16. R. Capabilities are exchanged in advance, then in the 10ms exchange the requested parameters can be sent.
		17. C. Explain packet type 0, and 1.
		18. R. 0,1 are parameters in the header of the DMG parameters received
		19. C. This text needs to be aligned with 11ay terminology
		20. C. This implies all the measurement frames are using FTM frames. Better to have a description of the sequence of packets exchanged.
		21. R. This was in the slides in document 11-18/0552r0. The parameters are appended to FTM frames.
		22. C. For VHT and HEz, very different packet frames are used, so we should have a clear understanding of the differences.
		23. R. I believe, in the SFD there was a clear understanding; we can check.
		24. C. Next steps – discussion in later submission
	7. Erik Lindskog (Qualcomm) presented document **11-18/0521r1**
		1. Title: **HEz Ranging for Passive Location Support.**
		2. Summary: Re-use the HEz Ranging exchanges to support passive location

Client to be located listens to transmitted NDPs and reported time-stamps and computes its location.

* + 1. Discussion: None.
		2. **Strawpoll**
		**Do you support the following attributes for the HEz Ranging for passive location support:**

**The Polling part is the same as the HEz Ranging polling part.**

**The measurement part shall be based on the HEz Ranging measurement part with the following attributes:**

* **Each TF Sounding solicits a single user ASTA NDP (a subset behavior of the Ranging HEz).**
* **The measurements frames are full BW.**
* **The ASTA measures the TOA of the NDP transmitted by RSTA and optionally by other ASTAs of the same sequence only.**
* **The listening client measures the differential time of flight of pairs of RSTA and/or ASTAs.**
* **The measurement sequence (UL and DL) completes in a single TxOP.**
* **The indication of ‘Passive Location HEz Ranging type’ within the TF of the sequence is TBD.**
	+ 1. Discussion
		2. C. Clarify if the PDU is the same for VHTz and HEz ranging.
		3. R. Not decided yet.
		4. C. Then change to ‘shall be part’ for HEz ranging measurement (Done)
		5. C. Is Listening client, the correct description?
		6. R. A client can listen, and then record the timestamp, if not, it doesn’t
		7. **Results**: Y: 15, N: 0 A: 6.
		8. **Motion
		Move to adopt the requirements depicted in slide 53 of submission 11-18-0276r5 for Passive Location operation, instruct the SFD editor to incorporate it in the SFD and empower the editor to perform editorial changes**.
		9. Mover: Assaf Kasher, Seconder: Yongho Seok
		10. **Results**: Y: 10, N: 1, A: 4, **motion passes**
		11. C. (last line) Need to be clear about which Trigger Frame (TF) it is
		12. C. We can write “within a TBD sub variant”
		13. C. If we need a new sub variant it’s okay.
		14. R. Prefer to stay with “… TFs of the sequence is TBD.”
		15. **Strawpoll:
		Do you support that HEz Ranging for Passive Location shall define:**

**1. Reporting of all TOA measurements by ASTA of the same ranging opportunity (delayed or immediate),**

**2. Method of conveying LMR to passively locating STA,**

**3. Negotiation for Passive Location sessions establishment between RSTA and ASTA,**

**4. Schedule advertisement of HEz Ranging for Passive Location support, and**

**5. LCI announcement.**

* + 1. Discussion
		2. C. Minor edits (reflected in the text above).
		3. **Results**: Y: 14 N: 0, A: 1
		4. **Motion:
		Move to adopt the following requirements for Passive Location operation, instruct the SFD editor to incorporate it in the SFD and empower the editor to perform editorial changes.**

**“The HEz Ranging for Passive Location protocol shall define:**

**1. Reporting of all TOA measurements by ASTA of the same ranging opportunity (delayed or immediate).**

**2. Method of conveying LMR to passively locating STA.**

**3. Negotiation for Passive Location session establishment between RSTA and an ASTA.**

**4. Schedule advertisement of HEz Ranging for Passive Location support.**

**5. LCI announcement.”**

* + 1. Discussion: None.
		2. Mover: Yongho Seok, Seconder: Assaf Kasher
		3. **Results**: Y: 9, N: 0, A: 0, **motion passes**
	1. Assaf Kasher (Qualcomm) presents document **11-18/552r0**
		1. Title: **60GHz AOD-Messaging**
		2. Summary: This presentation describes the protocol and message changes needed to enable use of Angle of Departure (AOD) in 60GHz Direction measurement protocol
		3. Presentation will continue in slot 4.
		4. Reminder to do attendance
		5. Recess at 3.26pm

1. **TGaz – 8th Mar, 2018 – Slot #4**
	1. Called to order by TGaz chair, Jonathan Segev (Intel Corporation) at **01.30pm CT**; Vice Chair, Carlos Aldana (Intel Corporation); Roy Want (Google) Secretary.
	2. Agenda Doc. **Now working on revision 11-18/0276r5 (in progress)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patency Policy, additional guidelines about IEEE-SA meeting and logistics – no clarifications requested.
		2. Chair called for any potentially essential patent, no one stepped up.
		3. Chair reviewed IEEE 802 WG participation as individual professional – no clarification requested.
		4. Chair reminded all to record their attendance
		5. Recorded Participation requirement
			1. Headcount: ~41 present
	4. Reviewed submission order and updated agenda
		1. Updated agenda presentation order and feedback requested: none received
		2. Agenda agreed.
	5. Yongho Seok (MediaTek) presented document **11-18/0457r0**
		1. Title: **NDP Bandwidth Selection in Range Measurement**
		2. Summary: The document proposes the mechanisms by which the channel bandwidth is selected in the ranging protocol.
		3. Discussion: None
		4. **Strawpoll #1**
		**Do you support the following NDP bandwidth selection rule in VHTz sounding?**

**• The bandwidth of the transmitted NDPA shall be no larger than the negotiated bandwidth.**

**• The bandwidth of the transmitted NDPA sets the bandwidth of the UL and DL sounding NDP frames.**

**• This bandwidth also corresponds to the bandwidth set by the bandwidth signaling TA field within the NDPA frame.**

* + 1. Discussion
		2. C. The channel actually used may have a smaller bandwidth.
		3. R. Yes.
		4. C. Need to clarify the text in the strawpoll (not in SFD text now)
		5. R. Added above: “The bandwidth of the NDPA should be no larger than the negotiated bandwidth”
		6. C. Why is the text in bullet two included? Would the bandwidth be limited?
		7. R. The response frame cannot be a greater bandwidth than the initiator frame.
		8. **Results**: Y: 23, N: 0, A: 0.
		9. **Motion
		Move to adopt the following requirements for VHTz operation, instruct the SFD editor to incorporate it in the SFD and empower the editor to perform editorial changes:**
			- **The bandwidth of the transmitted NDPA shall be no larger than the negotiated bandwidth.**
			- **The bandwidth of the transmitted NDPA sets the bandwidth of the UL and DL sounding NDP frames.**
			- **This bandwidth also corresponds to the bandwidth set by the bandwidth signalling TA field within the NDPA frame.**
		10. Mover: Yongho Seok, Seconder: SK Yong.
		11. **Results**: Y: 20, N: 0, A: 0; **motion passes**
		12. **Strawpoll**

**Do you support the following NDP bandwidth selection rule in HEz sounding?**

* + - * **The bandwidth of the transmitted TF of type Location and subtype Sounding shall be no larger than the negotiated bandwidth.**
			* **The TF of type Location and subtype Sounding is used for bandwidth selection and channel reservation of the UL and DL sounding.**
			* **The BW of the TF Location Sounding is the same bandwidth of the solicited UL and DL sounding NDP frames and the NDPA of the same measurement sequence.**
			* **This bandwidth is also indicated by BW field in the TF Common Info field of the TF frame.**
		1. Discussion
		2. C. I think this is just part of a sequence of proposals.
		3. R. Yes, this is the sounding part, and therefore its only for NDP and NDPA
		4. C. The polling bandwidth would need to be the smaller BW. But there could be several different negotiated bandwidths
		5. R. The bandwidth used is the minimum common denominator.
		6. **Results**: Y: 22, N: 0, A: 0.
		7. **Motion
		Move to adopt the following requirements for HEz operation, instruct the SFD editor to incorporate it under section 3.2.3 in the SFD and empower the editor to perform editorial changes:**
			- **The bandwidth of the transmitted TF of type Location and subtype Sounding shall be no larger than the negotiated bandwidth.**
			- **The TF of type Location and subtype Sounding is used for bandwidth selection and channel reservation of the UL and DL sounding.**
			- **The BW of the TF Location Sounding is the same bandwidth of the solicited UL and DL sounding NDP frames and the NDPA of the same measurement sequence.**
			- **This bandwidth is also indicated by BW field in the TF Common Info field of the TF frame.**
		8. Mover: Yongho Seok, Seconder: Qinghua Li
		9. Discussion: none
		10. **Results**: Y: 20, N: 0, A: 0, **motion passes**
	1. Feng Jiang (Intel Corporation) presented document **11-17/1701r2**
		1. Title: **Two-sided LMR Feedback between AP and STA**
		2. Summary: This submission proposes a detailed design for two-sided LMR feedback regarding the negotiation indication, measurement resource allocation and LMR exchange sequence.
		3. **Strawpoll
		Do you support the following SU ranging sequence for RSTA2ISTA and ISTA2RSTA LMR feedback?

		

		         Please note: the LMR could be either immediate (for round N) or delayed (for round N-1) and the error recovery rule is TBD.**
		4. Discussion:
		5. C. This is an optional sequence – so we need to clarify that.
		6. R. Yes – we can include this in a motion
		7. **Results:** Y: 16 N. 0 A: 1
		8. **Motion
		Move to adopt the requirements depicted by slide 67 of submission 11-18-276r6 for VHTz operation, instruct the SFD editor to incorporate it under section 3.2.2 in the SFD and empower the editor to perform editorial changes.**
		9. Mover: Feng Jiang, Seconder: Qinghua Li.
		10. **Results:** Y: 13, N: 0, A: 1; **motion passes**
		11. **Strawpoll #2
		Do you support the following NDP bandwidth selection rule in HEz sounding?
		The TF of type Location and subtype Sounding is used for bandwidth selection and channel reservation of the UL and DL sounding.
		The BW of the TF Location Sounding is the same bandwidth of the solicited UL and DL sounding NDP frames.
		This bandwidth is also indicated by BW field in the TF Common Info field of the TF frame.**
		12. **Results**: Y: 16 N: 0 A: 1
		13. **Motion**
		**Move to adopt the set of requirements depicted by slide 69 of submission 11-18-276r6 for HEz and VHTz operation, instruct the SFD editor to incorporate it under section 3.2 in the SFD and empower the editor to perform editorial changes.**
		14. Discussion: a few comments to hone the text above.
		15. Mover: Feng Jiang, Seconder: Ganesh Venkatesan
		16. **Results**: Y: 10, N: 0, A: 0; **motion passes**
		17. **Strawpoll
		Do you agree to define an LMR feedback type (immediate or delayed) parameter field in NGP parameters subelement of IFTMR frame for VHTz and HEz ranging sequence:
		This parameter field is used by ISTA to indicate the ISTA2RSTA LMR feedback type during FTM negotiation.
		Immediate feedback type ‒ ISTA2RSTA LMR delivers measurement performed at the same TxOP or availability window.
		Delayed feedback type ‒ ISTA2RSTA LMR delivers measurement performed at the previous TxOP or availability window.**
		18. **Discussion of strawpoll: typos fixed.**
		19. **Results Y: 14, N 0, A: 0**
		20. **Motion**
		21. **Move to adopt the set of requirements depicted by slide 72 of submission 11-18-276r6 for HEz and VHTz operation, instruct the SFD editor to incorporate it under section 3.2 in the SFD and empower the editor to perform editorial changes.**
		22. Mover: Erik Lindskog, Seconder: Qinghua Li
		23. **Results:** Y: 12, N: 1, A: 0**, motion passes**
		24. Discussion: Clarifications. No further discussion
		25. **Strawpoll**
		26. **A** **Do you agree that once consent is set and ISTA2RSTA LMR reporting was agreed on, during the HEz sequence the ISTA will only respond to a poll once the delayed ISTA2RSTA LMR results are available at ISTA?**
		27. **Results:** Y: 16, N: 1, A: 1
		28. **Motion**
		**Move to adopt the following requirements for HEz operation, instruct the SFD editor to incorporate it under section 3.2.3 in the SFD and empower the editor to perform editorial changes:

		“Once consent is set and ISTA2RSTA LMR reporting was agreed on, during the HEz sequence the ISTA shall only respond to a poll once the delayed ISTA2RSTA LMR results are available at ISTA”.**
		29. Mover: Qinghua Li, Seconder: SK Yong
		30. **Results:** Y: 13, N: 1, A: 1**; motion passes**
	2. Christian Berger for Liwen Chu (Marvell) presented document **11-18/0553r1**
		1. Title: **NDP Ranging Error Recovery**
		2. Summary: In the 802.11baseline, the Access Category (AC) used for the control frame transmission is related to the QoS Data/Management frame. In 11ax, the AP can use any AC for Trigger frame transmission where the Trigger is not combined with other frames. For VHTz NDP sounding, this contribution proposes a similar rule as the Trigger in 11ax for AC selection for NDPA transmission: any AC can be used for VHTz ranging.
		3. Discussion of proposal
		4. C. For the recovery, does the second NDPA use the same token or different token?
		5. R. Initiator will assume the transmission is lost
		6. R. The counter is incremented, but the responder only stores one value, and then the process will have to start again.
		7. **Strawpoll
		Do you support that the LMR feedback frame includes a reference to the associated NDP exchange?**
		8. Discussion
		C. For the secured version we already have SEC. Are you saying this mechanism is more generic?
		9. R. This solution is part of the LMR. But the functionality can also be achieved by the SEC. If the SEC is not used, this can be used instead.
		10. **Strawpoll** **Do you support that:
		Any Access Category (AC) can be used for the transmission of the NDPA frame within the VHTz ranging.**
		11. **Results**: Y: 13, N: 0, A: 1
		12. **Motion
		Move to adopt the following requirements for HEz and VHTz operation, instruct the SFD editor to incorporate it under section 3.2 in the SFD and empower the editor to perform editorial changes:
		“The LMR feedback frame shall include a reference to the associated NDP exchange.”**
		13. Mover Erik Lindskog. Seconder Quinhua Li
		14. **Results**: Y: 10, N: 0, A: 2; **motion passes**
		15. **Strawpoll
		Do you support that:
		Any Access Category (AC) can be used for the transmission of the NDPA frame within the VHTz ranging.**
		16. **Results**: Y: 13, N: 0, A: 1.
		17. Discussion:
		C. Does it also say it could be used for error recover, e.g. if it fails, are you going to cause a back-off? Do you update the back-off counter?
		18. R. I would assume so.
		19. C. Any action you would like to see here?
		20. R. No – just clarification. Wondered if there were other comments.
		21. C. (my understanding) The AC does not change as a result of this kind of error.
		22. C. You could use a different AC, depending on the type of error.
		23. R. This text leaves it open, and if useful, it can be adapted.
		24. Out of time – so defer motion to next slot, and continue with 11-18/0553r1
	3. Reminder to do attendance
	4. Recess at 12:27pm
1. **TGaz – 8th Mar, 2018 – Slot #5**
	1. Called to order by TGaz chair, Jonathan Segev (Intel Corporation) at **04.00pm CT**; Vice Chair, Carlos Aldana (Intel Corporation); Roy Want (Google) Secretary.
	2. Agenda Doc. **Now working revision with 11-18/0276r6 (in progress)**
	3. Review Patent Policy and logistics
		1. Chair reviewed the IEEE-SA Patency Policy, additional guidelines about IEEE-SA meeting and logistics – no clarifications requested.
		2. Chair called for any potentially essential patent, no one stepped up.
		3. Chair reviewed IEEE 802 WG participation as individual professional – no clarification requested.
		4. Chair reminded all to record their attendance
		5. Recorded Participation requirement
			1. Headcount: ~21 present
	4. Reviewed submission order and updated agenda
		1. Updated agenda presentation order and feedback requested: none received
		2. 60GHz agenda – recommended to discuss in goals for May meeting.
		3. Agenda agreed.
	5. Christian Berger for Liwen Chu (Marvell) **continued** presentation of document **11-18/0553r1**
		1. **Motion**
		**Move to adopt the following requirements for HEz and VHTz operation, instruct the SFD editor to incorporate it under section 3.2 in the SFD and empower the editor to perform editorial changes:
		“The LMR feedback frame shall include a reference to the associated NDP exchange.”**
		2. Discussion: none
		3. Mover: Christian Berger, Seconder: Niranjan Grandhe
		4. **Results**: Y: 10, N: 0, A: 2; **motion passes**
	6. Jonathan Segev (Chair) reviewed general progress
		1. Current Timelines – improvements in brackets.
			1. Range and Accuracy Coverage (~complete)
			2. 60GHz 25% complete
			3. Scalability 25% complete
			4. Security (minor progress)
			5. Amendment text – milestone draft D0.1
			6. Group is meeting its timeline and closing the gap.
			7. D1.0 target is November
		2. Reviewed March Meeting achievements
			1. Approve P802.11az D0.1 which includes TF (Trigger Frame) and None-TF based operation.
			2. Approve new working draft SFD revision (R13).
			3. Define and approve draft revisions publication process.
			4. Reviewed and adopted amendment text submissions on TF (Trigger Frame) formats, MAC signaling support for PHY secured operation and negotiation.
			5. Issue call for submissions for all sections of Draft P802.11az.
			6. Total of 36 new SFD entries on various protocol aspects (e.g. passive, secured, error recovery).
		3. Call for submissions
			1. Call for all amendment text for all sections of the amendment text
		4. **Motion**

**Move to instruct the TG Chair to issue a call for submissions for amendment text for all sections of the 802.11az SFD for Draft P802.11az.**

* + 1. Mover: Erik Lindskog, Seconder: Chao-Chun Wang
		2. **Results**: Y: 11, N: 0, A: 0; **motion passes**
		3. May Meeting Goals
			1. Continue development of amendment text.
			2. Approve initial amendment text submissions on PHY security, 60Ghz positioning and passive location.
			3. Continue SFD development.
			4. Review technical proposals.
		4. **Motion**

**We commit for the May meeting goals as the TGaz Plan of Record**

* + 1. Mover: Christian Berger; Seconder: Nehru Bhandru
		2. **Results**: Y: 10 N: 0, A: 1; **motion passes**
		3. Teleconference schedule proposed
			1. Apr 11, Wed 11am ET for 1 hr.
			2. Request for more calls: None
		4. AoB: None
		5. Reminder to do attendance.
		6. Adjourn at 4.34pm CST.

**References:**

1. <https://mentor.ieee.org/802.11/dcn/18/11-18-0276-06-00az-tgaz-march-agenda.pptx>
2. <https://mentor.ieee.org/802.11/dcn/18/11-18-0221-00-00az-meeting-minutes-january-2018-session.docx>
3. <http://www.ieee802.org/11/private/Draft_Standards/11az/Draft%20P802.11az_D0.1.pdf>
4. <https://mentor.ieee.org/802.11/dcn/17/11-17-0462-13-00az-11-az-tg-sfd.doc>
5. <https://mentor.ieee.org/802.11/dcn/18/11-18-0461-00-00az-vhtz-sounding-mintoaready.pptx>
6. <https://mentor.ieee.org/802.11/dcn/18/11-18-0539-00-00az-existence-indication-of-attacker-or-jammer-in-lmr.pptx>
7. <https://mentor.ieee.org/802.11/dcn/18/11-18-0350-03-00az-pre-association-security-negotiation-for-11az.docx>
8. <https://mentor.ieee.org/802.11/dcn/18/11-18-0458-00-00az-vhtz-secure-measurement-protocol-amendment-text.doc>
9. <https://mentor.ieee.org/802.11/dcn/18/11-18-0555-00-00az-revised-vhtz-specific-parameters.doc>
10. <https://mentor.ieee.org/802.11/dcn/18/11-18-0534-01-00az-draft-text-on-trigger-frame-format-for-11az.doc>
11. <https://mentor.ieee.org/802.11/dcn/18/11-18-0494-00-00az-60ghz-direction-measurement-sfd-text.docx>
12. <https://mentor.ieee.org/802.11/dcn/18/11-18-0521-01-00az-scalable-hez-ranging.pptx>
13. <https://mentor.ieee.org/802.11/dcn/18/11-18-0552-00-00az-60ghz-aod-messaging.pptx>
14. <https://mentor.ieee.org/802.11/dcn/18/11-18-0457-00-00az-ndp-bandwidth-selection-in-range-measurement.pptx>
15. <https://mentor.ieee.org/802.11/dcn/17/11-17-1701-02-00az-two-sided-lmr-feedback-between-ap-and-sta.pptx>
16. <https://mentor.ieee.org/802.11/dcn/18/11-18-0553-01-00az-ndp-ranging-error-recovery.pptx>