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| Minutes of the IEEE 802 5G SC meeting |
| **Date: March, 17th, 2016** |
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## Abstract:

Minutes of the IEEE 802 5G SC meeting at the March 2016 plenary in Macau

# Monday, March 14th, 2016

Chair: Glenn Parsons

Recording secretary: Max Riegel

Abbreviations used:

Q: Question raised by participant

A: Answer provided to question

## Call to order

* Chair called meeting to order at 19:32
* Guiding slides by EC doc#17r1
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0017-01-5GSG-5g-sc-agenda-march-2016.pdf>

## IEEE SC Guidelines

* Chair showed mandatory slide for IEEE standing committee meetings and explained duties of participants

## Agenda

* Chair brought up agenda proposal contained in guiding slides
* First evening focused on overview and background
* Dedicated WG presentations scheduled for Tuesday
* Roger will provide intro into IMT-2020 and an update on recent 5D meeting
* Glenn providing ITU-T introduction standing in for ITU-T liaison
* Patrick providing an overview about IEEE 5G program
* No request for agenda modifications brought up.

## Introduction of 5G SC

* Chair explained role of 5G committee
* Initiated in the Jan 16 EC workshop
* Established as standing committee (EC SC) to find out about interest and potential stakeholders in 802
* C: Paul mentioned that other intention for SC is to have single point of communication on 5G
* Approved Scope of SC was presented by slide
* Chartered for 6 months
* Type 2 SC for assisting the sponsor by drafting documents, statements but making no decisions
* Any 802 WG voting member may participate as voting member
* Monthly f2f meetings and weekly conference call schedules
* C: A. expressed that much too many f2f meetings are scheduled and he proposes to mainly run the meetings as weekly conference calls with video.
* Chair went through the slides providing further details on the task of the SC.
* C: A. bringing up concerns that creating a new 5G standard would require huge efforts exceeding timelines and capabilities of IEEE 802. He proposed seeking for a simpler way to justify need for more spectrum by bringing up available IEEE 802 technologies
* Glenn responding that the thinking is to create a profile document making references to existing specifications to keep efforts low
* C: A. confirms that he would look for best output with least amount of efforts
* C: S. asking for simple slide, showing that cellular networks are generating only small portion of all Internet traffic.
* IMT would work for 6 times more spectrum to deliver wireless communication to a level done by 802 technologies today;
* Cellular already having 85% of available spectrum;
* Spectrum usage investigations is currently done by different group than IMT-2020,
* Would propose to force IMT to take approaches used by 802 like coexistence with RADAR
* Q: D. asking whether all 802 technologies would need to provide same functionality as existing cellular technologies
* A: Glenn responding that options 2,3,4 listed on the slide would allow to cover most of the capabilities.
* Q: B. asking whether single hub wireless link to aggregation would really fit the complete scope of IMT-2020
* A: Glenn clarifying the different approaches to really address the IMT-2020 requirements, simplified architecture was brought up by him mainly for illustration

## 802 project analysis

* Glenn presented spreadsheet posted on EC reflector and filled with potential 5G related projects
* C: A. stating that 4 PHY developments in 802.11 are not the only ones, making 802.11u and ANQP are 5G technologies as well; additional technologies should be mentioned as well
* A: Glenn would like to avoid to include everything but focus on the most essential specifications
* Q: P. asked why 802.3 is missing
* A: Missing input from 802.3 chair)
* C: P. brought up that there are plenty of technologies above MAC and PHY which would go in as well
* Glenn agreed that such functions would belong to scope as well.

## IMT-2020

* Roger Marks presenting EC doc# 10r0
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0010-00-00EC-5g-and-imt-2020.pdf>

## Report of ITU-R WP5D Meeting #23

* Roger reporting about ITU-R WP5D Meeting #23
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0034-00-5GSG-summary-of-itu-r-wp-5d-meeting-23.pdf>
* Roger’s concluding recommendation
* Bring IEEE into the IMT by an update of an earlier IMT version
* Start contributing on the current work items
* Test environments
* Technical performance
* Evaluation
* When Glenn asked for questions on Roger’s report:
* no questions were raised

## ITU-T FG IMT-2020

* Update on ITU-T FG IMT-2020 by Glenn (EC doc #37)
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0037-00-5GSG-itu-t-fg-imt-2020-summary.pptx>
* Q&A:
* Q: R. wondering why these draft recommendations are becoming standards
* Glenn explaining that focus group does not have the power to approve standards but it can create input to groups to accelerate process.
* Glenn continuing that there was discussion about usage of IMT-2020 term by ITU-T FG; took time to enable usage of ‘IMT-2020’ by ITU-T group

## IEEE 5G

* Patrick Slaats (IEEE SA) about IEEE 5G (EC doc #35)
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0035-01-5GSG-ieee-5g-steering-committee-update-march-2016.pptx>
* Q&A:
* Q: A. asking about definition of 5G in the IEEE discussion
* Patrick explained that 5G is not defined yet but IEEE likes to receive input from its groups and committees. For this reason IEEE staff participates in standardization meetings
* Glenn made short outlook on Tuesday evening’s meeting pointing out the need for conclusion on ‘next steps’ at the end of the tomorrow’s meetings
* Paul asked presenters for structuring cost and benefits for the 4 options under considerations; He proposed to provide input according to structure given in Glenn’s slides.
* Meeting recessed at 21:30

# Tuesday, March 15th, 2016

* Chair called meeting to order at 19:32

## IEEE SC Guidelines

* Chair reminded that IEEE SC guidelines apply for the meeting.

## Agenda

* Presentation of agenda by EC doc #17r2
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0017-02-5GSG-5g-sc-agenda-march-2016.pdf>
* Glenn announces that meeting has to end with conclusion on next steps
* Asking for further contributions beyond what is listed.
* Nothing additional requested

## 5G SC mailing list

* Chair announced mailing list STDS-802-5G@listserv.ieee.org
* Details captured in agenda deck slides

## 802.1CM

* Janos (802.1CM editor) made introduction by EC doc #38r1
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0038-01-5GSG-802-1cm-for-5g.pdf>
* Q&A:
* Q: R. highlighted importance of fronthaul for future wireless communication network and asked whether there is participation from unlicensed proponents on Cloud RAN deployments
* A: None so far
* Q: Y. asked what data rates can be expected; would the performance be sufficient for Wi-Fi?
* A: May fit to Wi-Fi, but current work is focused on CPRI. Quite high requirements have to be met for cellular.

## 802.1CF

* Max presenting P802.1CF by EC doc #39r1
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0039-01-5GSG-p802-1cf-in-the-scope-of-5g-sc.pptx>
* Last slide shows evaluation of different options
* 5G IEEE would cause high efforts for specification of complete RAN and core network for IEEE technologies
* for comparison: standardization efforts for similar activities for WiMAX: > 200 SY
* IMT-2020 application would cause much less efforts as profiling the 802.1CF specification may be sufficient.
* Q&A:
* Q: A. asking about the need to define own access network for IEEE 802 technologies
* Max responding that many advanced features of IEEE 802 are not supported/leveraged by other organizations’ specs
* Q: A. wondering about the need to comply with ITU-R requirements; why not just only pointing to Wi-Fi carrying the huge majority of Internet traffic
* Max responding that addressing the ITU-R requirements is expected for the IMT-2020 process; own network specification would allow IEEE 802 to operate its technologies the way they are designed for, e.g. without central RAN based control but by efficient control out of the STAs

## 802.3

* Marek Hajduczenia showing 5G related technologies of 802.3
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0040-01-5GSG-802-3-for-5g.pdf>
* Q&A:
* Paul asking for efforts according profiles
* No additional efforts would be required as all will be done anyhow

## 802.11

* 5G related topics of 802.11 were presented by Joe Levy by EC doc #41r1
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0041-01-5GSG-802-11-5g-technologies-for-5g-sc.pptx>
* Q&A
* Paul: asking about efforts necessary to create specifications
* Not known yet, as details are still to be defined
* Q: R. asked about evaluation and verification done by 802.11 that requirements are met by 802.11 specs
* Joe explained that as far as detailed requirements are available, the figures used in the standardization projects well fit the expectations. For the various use cases 802.11 would deliver the best technology currently available. 11ax for hotspot operation, 11p for car2car communication
* Q: A. asked whether OmniRAN is a must have
* Joe stated that he does not have the insights to provide a conclusive answer.
* Q: R. explained that wide area mobility is missing and wondering whether 802.16 may be used to fill the functional gap regards wide area mobile
* Joe expressing that this would have to evaluated, in particular as 802.16 is currently not working on a new version of radio interface; He would not be sure whether missing wide area support would be a real problem.

## 802.15

* Bob Heile introduced 5G related projects of 802.15 by EC doc #42
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0042-00-00EC-802-15-projects-with-5g-potential.ppt>
* Q&A:
* Q: Paul wonders on cost and benefits
* Not done yet, as there is no obvious demand doing it, but if necessary 802.15 can deliver information

## 3GPP activities on 5G and relationship with non-3GPP technologies

* Richard and Philippe created EC doc #43 for presentation to 5G SC
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0043-00-5GSG-3gpp-5g-activities.pptx>
* 3GPP on 5G
* study item since Dec 2015 on Scenarios and Requirements for Next Generation Access Technologies
* to be completed until June 2016 in TR 38.913
* study item since May 2016 on Next Generation New Radio Access Technology
* RAN WGs to start next quarter on technology candidates
* Relationship to non-3GPP technologies
* Requirement says that there shall be interworking with WLAN
* Q&A:
* Paul: no question but a comment: thanks Richard for coming and making the presentation

## Next steps

* Glenn explained on next steps
* Glenn explained what should go into the report
* Providing a list of candidate technologies
* Show diagrams and explain what would be the results
* Requests further contributions to the SC in the upcoming months
* First options on the table, later the cost benefits analysis
* Q&A on the way forward
* Paul: in addition to cost/benefit a potential starting point would be a description of 5G in the perspective of IEEE
* Glenn responds that such effort would be needed anyhow for 5G IEEE but for IMT-2020 the ITU-R will bring up the requirements
* Paul: asking for specific 802 view on 5G taking into account what was shown
* Glenn explaining that in addition to IEEE 5G an IEEE 802 5G may be defined if appropriate contributions are available
* Q: J asked about the concreate goal for 5G SC effort; more spectrum may be of bigger importance than branding as 5G; asking whether efforts should be more shifted towards spectrum questions
* Glenn showing that SC has got goals to evaluate benefits of 5G; spectrum would be one of the potential benefits; that may be achieved without going the 5G/IMT-2020 path
It would be out of scope for the SC, but it may become part of the investigations regards the IEEE 5G option.
* Q: S. explained that spectrum has been already assigned to mobile communication and can be taken away from potential 802.11 usage. Asking whether we should continue to play Wi-Fi game and protect sufficient spectrum availability
* Glenn explaining that SC is not striving for 5G branding but for evaluation of cost and benefits of various options to go forward; will help EC to make decision
* Q: R. wondered why no starting into ITU-R discussions without wasting time for comprehensive analysis. Are there activities which can be started right now bringing in our views and getting engaged in the ITU-R process. Final decision by EC may even take another 4-5 months after submitting report.
* Paul responding that stepping ahead could be dangerous as we don’t know about the cost; that is the reason to come to a conclusion fast.
* Glenn asking whether we should have another meeting this week to speed process up.
* J. spoke up to slightly modify scope to put more focus on the 802.11 spectrum topic.
* Glenn considering another meeting to re-consider scope with bigger focus on regulatory and spectrum issues.
* R. stating that scope discussions should be entertained from outside, but as IEEE 802 is creating standards the SC should continue to focus on the question to create a specification for a complete 5G network.
IMT-2020 is more about playing the spectrum game but spectrum assignment is for 24 GHz and above
Also highlighting that whole is discussion about mobile, but going forward without mobile may not be well received.
* J. explained that several people with strong background in spectrum and 3GPP are at the meeting; the lucky condition should be leveraged to evaluate alternative approaches.
* Glenn run a number of straw polls:
* Should we meet again this week to discuss scope?
* Y 14, N 11, rest abstains
* Glenn will try to find time and location, and will ask for participation
* Will you participate in conference calls
* Y 34, N 2
* Will you participate in face2face meetings; every meeting will last for 0.5-1 day
* Tokyo: Y3,
* Waikoloa: Y31
* Budapest: Y14
* Ottawa: Y12
* Tokyo will be removed due to missing participation,
* May 20 is challenging for Glenn
* Conference calls:
* 42 people intend participation, potential times
* 10AM ET: 22 people
* 6PM ET: 20 people
* majority is for 10AM ET, even when majority is small
* proposed day of week is Wednesday, but it may become likely Thursday evening.
* compromise to do alternate meeting times on Wednesday every other week was not discussed further
* 6 people indicated to make contributions to the 5G SC
* Meeting recessed at 21:30

# Wednesday, March 16th, 2016

* Chair called meeting to order at 12:37

## Agenda

* Chair brought up agenda in revision of meeting slides (EC doc #17r3)
* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0017-03-5GSG-5g-sc-agenda-march-2016.pdf>
* Glenn explaining that session is only on talking about scope of SC

## Scope discussions

* Glenn started with presentation of his scope thoughts
* Revised scope would be to focus
* IEEE 5G specification, using unlicensed spectrum
* IMT (removed -2020)
* Single technology
* Multiple technologies
* Part of other proposal
* R. supports proposal because focus is on spectrum avoiding explicitly stating 2020
* A. believes that modifications are not sufficient, because main goal is to get sufficient spectrum for Wi-Fi in future, proposing to avoid labeling it either IMT or 5G. There may be other ways to claim spectrum for IEEE 802 technologies in ITU-R than going IMT.
* P. speaks against usage of term ‚unlicensed spectrum’, because unlicensed spectrum is not adding any benefits to scope reminding that WP 5D does not support unlicensed spectrum
* Glenn remarked that WP5D is not mentioned on the screen
* S. proposes to call spectrum ‚non IMT’ spectrum to show the distinction to the IMT world
* A. amending previous proposal avoiding ‘IMT’ as it is tightly bound to the 3GPP eco-system; proposing use of ‘identifying appropriate spectrum’, or ‘including according spectrum needs’ because it would fit better to the vendors usage of IEEE technologies.
* J. reconfirming that ‘appropriate spectrum needs’ would have to be added to the first item.
* S. supporting the observation that 5G is very closely related with GSMA, and that term 5G should be avoided for labeling the IEEE activities
* A. proposes text to replace the complete statement: “consider mechanisms to ensure that IEEE 802 technologies have access to sufficient spectrum to allow these technologies to be used as part of the next generation networks”
* Glenn: what is ‘mechanisms’
* A. explaining Glenn’s request for clarification of ‘mechanisms’: either contribute to IMT or contribute to the work about spectrum needs or working together with ITU-R on spectrum identification
* S. supports the statement of A. but has problems with second half ‘to allow … as part of NGN’
* J. highlighting that A.’s mission statement under the first bullet is clearly a mission statement, but SC has to work out which methods to be used for achieving the mission; EC may have missed to list really all options; would like to see the addition of WP-5A (RLAN) and ITU-R Task Group 1 (analysis) investigating future spectrum needs
* S. mentioning that TG 1 has already done most of the work
* S. supports A.’s first statement, but brings back the need to highlight ‘unlicensed spectrum’ potentially by some other terms mentioning the nature of the spectrum
* R. expressing that he is not comfortable with the direction that spectrum would be the only issue of this SC because this SC is established to deal with topics which can’t be addressed by other groups in IEEE 802
* Glenn responding to R. that this may be taken into account by avoiding that spectrum issues are becoming the main topics of the report
* G. also brings up similar concerns like R. requesting that the original scope should be kept and the direction should be to define IEEE 5G and derive from such understanding the spectrum needs;
* S. bringing up that by the proposed changes to the mission statement the SC would interfere with 802.18 activities;
* Glenn explaining that goal of SC is to understand whether there is need for additional activities in addition what is already in place in 802
* Paul making executive interrupt, to explain intention of EC: it is desired to understand what other options would exist.
* A. making clear that the SC is addressing the process to address the topic, not the topic itself; still first sub bullet making reference to IEEE 5G worries as it comes out of some IEEE staff activity which is valid but has a far longer perspective into the future
* P. speaking in favor of keeping the initial scope and not derailing to spectrum as only activity
* S. rephrasing that all is about spectrum for IEEE 802 technologies
* J. introducing alternative text proposal keeping the term NGN and extending the list of options by other ways to be included
* P. proposes to remove a couple of the options to focus on really achievable goals; three are too much; instead consider only the one with best perspective to succeed; nobody in industry wants to waste engineering resources.
* W. outlining that staff is not the driver of 5G activities and first statement should be removed as it would be outcome of activity
* Paul summaries that the SC would proceed with the text on the screen for proposing an update to the scope in the Friday EC meeting. The SC should come up with proposal to EC how to refine goals of SC and EC will decide whether refining scope or maintaining previous scope.
* S. bringing up to note that there was no consensus on text on screen.

## Meeting adjourned by chair at 13:28

Revised meeting slides containing the edits discussed during the session were uploaded to mentor:

* <https://mentor.ieee.org/802-ec/dcn/16/ec-16-0017-04-5GSG-5g-sc-agenda-march-2016.pdf>