IEEE P802.19
Wireless Coexistence

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| Sept 2010 TG1 Minutes |
|  Date: 13th to 17th Sept. 2010  |
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The document records the IEEE 802.19 TG1 minutes of 802 Wireless Interim Session in Big Island, HI, USA during September 13-17, 2010

IEEE 802.19 TG1 Chair: Tuncer Baykas
IEEE 802.19 TG1 Vice Chair: Mika Kasslin
IEEE 802.19 TG1 Secretary: Junyi Wang

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# MEETING MINUTES

First session of the meeting was called to order on Monday 13 Sept. 2010 at 10.35 AM.

### APPROVE AGENDA

The Chairman opened the meeting and presented the agenda in Document 802.19-10-0122.

The agenda was approved by unanimous consensus. 10:37 AM

### APPROVAL OF JULY MINUTES

**IEEE 802.19-10/0120r0**

The minutes were approved by unanimous consensus. 10 39 AM

### IEEE IPR STATEMENT

The TG Chair informed the TAG about the IEEE patent policy and showed the set of 5 slides identified as “Highlights of the *IEEE-SA Standards Board Bylaws* on Patents in Standards” available at the IEEE PATCOM web site (<http://standards.ieee.org/board/pat/pat-slideset.ppt>). He directed the secretary to record the fact that this presentation was made in the minutes for the meeting.

* 10:40 AM - The WG Chair made a call for essential patterns: none made.

# Main Body

Note: The italic indented text is copied directly from the presented documents.

### Monday AM2

**IEEE 802.19-10/0123r0 TG 1 Sept Meeting Opening Report**

Presented by Tuncer Baykas

*This document gives an outline of the work carried out since the last 802.19 plenary meeting.*

* **Motion**

To add reference model and system description related proposals with late notification of intent until September 12th and proposals with uploads/updates to be included in the official proposal list of the September meeting proposals.

By Alex Reznik

Seconded by Mika Kasslin

YES 13, NO 0, Abstain: 1

Motion passed.

Discussion on the motion

Mika Kasslin: How many proposals was late?

The chair indicated that Joe uploaded the proposal late while Stanislav Filin updated the proposal.

Padam Kafle suggested fixing the document number in the motion.

Ivan Reede was in favour of updating the proposal but did not support for late uploading. Alex Reznik was opposed to it and claimed that someone may upload an empty proposal then updated it.

Joe Kwak clarified that, no matter when the proposal comes in, the group need to consider all contributions if agenda time is available. The motion is not needed. Mika Kasslin amended that we should treat all proposal the same. Paivi Ruuska agreed.

Steve Shellhammer clarified that there is no objection to present the contribution; procedurally we shall have a motion to approve that.

Ivan Reede suggested to Joe Kwak bringing the proposal as contributions, and so it did not break any rule.

Joe Kwak opposed to it and expressed that if the group thinks motion is necessary, we can do it. He also indicated again that it makes no sense if we do not consider the proposal just because it is late.

Padam Kafle questioned on the reason to have a deadline. Tuncer Baykas explained that if there is no deadline, one may check the submitted contributions, and prepares a new proposal. The chair can also see the possible agenda.

Ivan Reede called the question.

* The TG Chair made a call for new technical contributions 11:10 AM
1. Alex Reznik: device security overview 10/118r0
2. Paivi Russka: Resource Allocation principle for802.19.1 system 10/128r0
3. Ryo Sawai: Categorization of coexistence network 10/130r0

11:05 AM - Assign time slot for full and technical proposals. Document 10/122

* **Approval of agenda** IEEE 802.19-10/0122

**Strawpoll** on the options on the agenda

1. Have Thursday AM1 session and cancel PM2 session (YES 1)
2. Have Thursday PM2 session and cancel AM1 session (YES 9)
3. Start AM1 session from 9am and keep PM2 session (YES 2)

Time slot was assigned for each of full proposals and technical contributions

The TG closing report moves to Thursday PM1 performing together with WG closing report.

* **Motion** to approve agenda with above modification Document 10/122

By Ivan Reede

Seconded by Junyi Wang

Motion passed.

Session Recessed 11:41 AM

### Monday PM1

Meeting called to order 1:30 PM

The chair made an announcement that although IEEE template can be used in the proposals, everything like “draft standard” and the “copyright” part shall be removed. The chair requests contributors to do so and upload their proposals again.

 **IEEE 802.19-10/0127r0: Proposal on system description, reference model and draft outline**

Presentation by Mika Kasslin, Nokia Research Center

*This is a presentation of the System Description and Reference Model proposal for IEEE 802.19.1 draft standard provided in document 19-10/0110r0.*

Mika Kasslin clarified that in each network, from coexistence management point of view, it has only one interface, there is only one CE connecting with 802.19 systems.

Joe Kwak suggested that one network has at least one CE. Mika Kasslin explained that from coexistence management prospective, it is no reason to have multiple CEs in one network.

Alex Reznik gave an example in 802.11af where there may be several CEs in one network; Mika Kasslin agreed and explained that they will not prevent this to happen. However he still believes there is not too much reason for several CEs in one network.

Yongsun Kim questioned on the meaning of the term “ neighbours”? “Neighbour of TVBDs” Mika Kasslin answered.

Ivan Reede: “network interfere each other” is not a good expression since interference level shall be calculated for any transmitter inside the network to the receivers in any other network. Joe Kwak agreed.

Joe Kwak: why channel state is a vector? “Channel status parameter set for each channel of one frequency band” Mika Kasslin answered.

Joe Kwak: Does channel state mean channel measurement. Mika Kasslin: Yes but it is not limited only in measurement.

Joe Kwak: what is spectrum map?

Mika Kasslin: Map represents all information CM may sent to CE: spectrum usage within specific location.

Joe Kwak: what is coexistence value?

Mika Kasslin: Natural of the networks to show how long the resource is available, for example.

Padam Kafle: what is independent media?

Mika Kasslin:Basic transmission over any media.

Session recessed 3:10 PM

### Monday PM2

Meeting called to order 3:30 PM

**IEEE 802.19-10/111r2: Draft Wireless coexistence using a Geographic Electromagnetic Radiation Domain Control System in the IEEE 802.19.1 Systems**

Presented by Ivan Reede, AmeriSys Inc.

Interface E and G will be specified very clearly in the proposal.

The interface between TVWS enabler and CDIS is interface B4.

If two entities are not in one device, you do not have to specify the interface. The defined interface may be used if two entities are separated.

The number of interference level in coexistence example is taken from really measurement in 802.11b and 802.11g systems

 Stanislav Filin indicated that there might be some confusion between interface and access point.

 Ivan Reede: Interface B shall be standardized; transport decision about this inner interface should be done in bit level.

The session recessed at 5:15 PM

### Tuesday AM2

Meeting called to order 10:35 AM

**IEEE 802.19-10/115r1: System Description**

Presented by Stanislav Filin, NICT

This is the powerpoint version of Document 10/114r1

Padam Kafle: what is information requested for coexistence? Stanislav Filin : Available channels

Ivan Reede: TVDB tells you incumbent priority right and channels (people you have to protect, not people you have to coexistent), TVDB does not provide information to share the band?

Stanislav Filin : YES, TVBD provide list of available channels, no user information for coexistence.

**IEEE 802.19-10/116r0: Reference Model**

Presented by Stanislav Filin, NICT

Steve Shellhammer: What is media SAP and transport SAP, which one connect to which entity.

Stanislav Filin: Media SAP is for TVWS devices, Transport SAP is for transport service, it is the SAP between 802.19 entities and external entities (refer to the reference model of CE). It is better to draw the figure upside-down

It is questioned on the reason why there is only one SAP for CM or CDIS?

Stanislav Filin: CE has to communicate with TVWS device through Media SAP, we use transport SAP for communication with both CDIS and CM.

Mika Kasslin: Why do you separate reference model into two entities not having only one reference model?

Stanislav Filin: We have different entities, so we should have different reference model.

**IEEE 802.19-10/125r0: Coexistence Transport SAP Description**

Presented by Junyi Wang, NICT

Ivan Reede: Why do you define “confirm” primitive, in TCP they have already had ACK definition.

Junyi Wang: The TCP ACK is from one TCP port to another TCP port, while the “confirm” primitive is an acknowledge from a TCP port to the port of a 802.19 system entity. The “confirm” primitive is to confirm whether a PDU is successfully delivered or not, it is not the confirm whether the PDU is received.

Prabodh Varshney: It is better to upload the backup pages as revision 1. Junyi Wang agreed.

Joe Kwak: Why do we need to define the primitive for interface B1, B2, B3 and C, we just need to define the message over these interface. The protocol is defined in application layer; the message shall be transmitted as a PDU of this message.

Junyi Wang: It is true; we will define protocols in November.

**IEEE 802.19-10/125r0: Coexistence Media Service Access Point**

Presented by Ha Nguyen Tran, NICT

Hyunduk Kang: Can the predefined events be modified during operation?

Ha Nguyen Tran: No, it cannot. But you can extend the event set to add new events.

Ha Nguyen Tran: By using sharing primitive and provision primitive, you can share information with neighbours. There shall be an address to indicate who you are going to share the information.

It is questioned on what information is in the CDIS database. Ha Nguyen Tran explained that it has information about the address of CM and CE.

It is questioned on where to do measurement?

It is explained that the TVWS devices do the measurement and report to CM through CE.

**IEEE 802.19-10/124r0: Data types and information elements**

Presented by Chen Sun, NICT

It is commented that the proposal defines details which may be changed with other standard. Chen Sun explained that the information inside the structure may be changed with other standardized system, while the defined structures will not change, they can be put in the draft.

Ivan Reede: The information you show here may be difficult for 802.22.

Chen Sun: We may negotiate with 802.22.

Paivi Ruuska: It is a great work, we really concern whether this is able to be standardized, and it could be achieved in the annex as an example.

Chen Sun: The data type would be in normative text, the details are to be discussed.

Mika Kasslin: Which service will be used for information delivering to TVBD?

Chen Sun: Information sharing or reconfiguration services.

Session recessed 12:33 PM

### Tuesday PM2

Meeting opened 4:05 PM

**IEEE 802.19-10/124r0: IEEE 802.19.1 System description**

Presented by Junho Jo, from LGE

Paivi Ruuska: CDIS is playing as a coexistence management, what are CM functions?

Junho Jo: CM gets information from CDIS and may also make decision.

Joe Kwak: What is the function of master CM, why do you need master CM?

Junho Jo: We are suggesting a centralized system.

Ivan Reede: The master CM is similar with Pass-through protocol in my protocol; this is to provide smart way in the future, for example to shut down CM.

**There were some discussions on ASN.1**

Mika Kasslin: it is beneficial to use ASN.1 to present the data type.

Joe Kwak: ASN.1 has some limitations and I prefer TLB.

Mika Kasslin: We need a presentation to make difference from each other. TLB is equal to ASN.1 if you want to do so. ASN.1 does not do encoding, it stands for the TLB.

Joe Kwak: ASN.1 is very old, RDF is a good choice.

Ivan Reede: It is very useful to use ASN.1, but we are lack of knowledge.

Alex Reznik suggested having a presentation to introduce ASN.1. Mika Kasslin: agreed to prepare for it.

Steve Shellhammer asked Joe Kwak to prepare something for RDF, Joe Kwak agreed.

The chair will arrange two presentations in November meeting: one from Joe Kwak for RDF, one from Mika Kasslin for ASN.1.

**4: 30 PM -A discussion about protocol was initialled by the WG chair.**

Steve Shellhammer: How many details do we need to describe SAP including internal and external ones?

Steve Shellhammer: Do you ever write a SAP for something to connect with something physically externally or it only provide internal between entities within the same physical device.

Joe Kwak: NICT’s SAP proposal is completing the general proposals, while it is more efficient to define a protocol for each interface rather than primitive definitions for a SAP.

Mika Kasslin: We support NICT proposal. We have the same SAP proposal, which is also quite similar with other proposals.

Stanislav Filin: All SAPs are internal. Transport SAP is generic definition on how one application is able to communication to the other applications.

Stanislav Filin: In application layer, All SAPs are exposed and testable.

Joe Kwak: We are basically proposing two SAPs. One is transport SAP, which is media independent; we should focus on message definition for this SAP. And another SAP has no external transport element, which is media dependent on other system, such as .11, .22. and .16. etc. We may provide a generic description for this SAP and map the details to each system or we can specify them just in generic level and provide example in the annex for particular implementations. We should avoid changing our draft when other standard changes.

The SAP is a communication point between layers. It is internal interface.

Steve Shellhammer: Translation into another SAP is not specified in other system.

Stanislav Filin: we have one SAP for interface A, in genetic format, we need to define many primitives, for other interface, we need to define protocol and message. He asked for a strawpoll.

* **Strawpoll:**

Do you agree that 802.19.1 model should have two service access points? First one between Coexistence Enabler and a TVBD, second one between an 802.19.1 entity and a layer providing transport services.

YES: NO: Abstain:

The strawpoll is postponed until all presentations are heard.

Discussion on the strawpoll:

Ivan Reede: What is the SAP between CE and a network? A device is always talking to a device not a network.

Stanislav Filin: It is ok to remove the network.

Stanislav Filin: The first SAP is between CE and TVBD, and the second one is between 802.19 entities.

Ivan Reede requests the explanation of the question.

Steve Shellhammer: Do you believe there are two SAPs, one is between CE and TVBD, and one is between all the other entities.

Stanislav Filin: I do not want to put a name for each SAP but try to name them in a generic format since in each proposal, they have different names.

Steve Shellhammer: The transport SAP is very generic, it transmits and receives message. The actual protocol is different for different entities, but they are using the same generic SAP to capture information.

Ivan Reede: The CE may also have transport SAP. Steve Shellhammer: It is true.

Ivan Reede: we want our staff which does not depends on regulations.

It is commented that we shall clarify that SAP is within the same entities

Alex Reznik presented his reference model, and suggested using his reference model figure in the strawpoll.

Stanislav Filin objected to make a strawpoll based on a particular contribution on this point of time.

Ivan Reede suggested using “at least two service access points”

Stanislav Filin: The second SAP (Transport SAP) is definitely within the same device.

It is suggested postponing this strawpoll.

* **Motion**

To change agenda Document 10/122 to use the remained time for Alex’ presentation 10/118r0 in

By Ivan Reede

Seconded by Alex Reznik

Motion passed with unanimous consensus.

**IEEE 802.19-10/118r0: Device security overview**

Presented by Alex Reznik, InterDigital

Ivan Reede indicated that FCC regulation required all TVBD shall be trusted.

Joe Kwak : Do you know there is any consensus to use this?

Alex Reznik: UICC has.

Ivan Reede indicated that 802.22 uses some compromised algorithm for device security.

Steve Shellhammer: if 802.11 and 80.22 do it, we may mind it.

Alex Reznik: we should not verity only in 80.11 and 802.22.

Session recessed 6:03 PM

### Wednesday AM2

Called to order 10:35 AM

**IEEE 802.19-10/131r0: Reference Use Cases**

Presented by Hyunduk Kang, ETRI

This is powerpoint version of full proposal in Document 113r1.

Joe Kwak: Geolocation information is more important, we do not have to differential the sharing or non –sharing. The term sharing is misleading, interfered or non-interfered would be better terms.

Mika Kasslin: It may be possible that they may select the same default channels.

Steve Shellhammer: if the device has directional feature, they may coexistent.

Stanislav Filin: What does the term “sharing” mean? We have “Sharing mechanism” which describes how to allocate resource, while it should not be used to describe channel.

Steve Shellhammer: how to manage channel is a good discussion topic

**IEEE 802.19-10/132r0: 802.19.1 Logical Entities**

Presented by Hyunduk Kang, ETRI.

Ivan Reede: There are two types of coexistence, they may not sharing channel but they can survival on the loss of their throughput (survival model), another is to negotiate together to avoid interference (organized sharing), which model are you assuming. Kang: Survival model. The organized sharing is not decided yet.

Mika Kasslin: “Share channel” is the better term than “Coexistent channel” and so as follows Disallow -> unavailable; Allowed-> available for consistence.

Joe Kwak: Protection channel is defined by FCC, it is for the incumbent protection.

Mika Kasslin: If a device senses the signal on a channel, the channel becomes protection channel

Joe Kwak: There is no fixed set of channels; it changes with respect to location and environment. It is confusing to say channel is available or unavailable.

Hyunduk Kang: We need to know that at a given location, where the white space is. If we know the channel status, we may adopt different mechanism for coexistence solution.

Yohannes Demessie: Protection channel is impossible to be maintained by 802.19 systems. It is good to solve the problem when licence microphone uses some channel.

Ivan Reede: discovering other CM is the function of CDIS.

Mika Kasslin: We do not mandate the CM to use any service.

**IEEE 802.19-10/133r0: 802.19.1 interfaces**

Presented by Hyunduk Kang, ETRI.

Yohannes Demessie: why do you have “waiting engagement ” in CE but not in CM .

Hyunduk Kang: In centralized mode, only slave CM connects with master CM.

Alex Reznik: When does a CM become master CM?

Hyunduk Kang: When a CM is going to control the other CMs

Alex Reznik: Can master and slave CM relation be updated.

Hyunduk Kang: It can be changed at different locations.

**IEEE 802.19-10/134r0: 802.19.1 reference model**

Presented by Hyunduk Kang, ETRI.

**IEEE 802.19-10/135r0: 802.19.1 CX\_DME\_SAP Primitives**

Presented by Kyu-Min Kang, ETRI

Prabodh Varshney: There is no statement in FCC rule that TVWS devices is not allowed moving. As long as you match the regulation, you can move.

Mika Kasslin: With which primitive a CE can get information for required resource.

Kyu-Min Kang: “coexistence map”

**IEEE 802.19-10/136r0: CX\_NET\_SAP Primitives**

Presented by Hyunduk Kang, ETRI.

Session recessed 0:23 PM

### Wednesday PM2

Called to order 4:05 PM

**IEEE 802.19-10/117r1: System description and reference model proposal**

Presented by Joe Kwak, InterDigital Communications, LLC.

Mika Kasslin: Can this be realized in the devices who is not connected with internet?

Joe Kwak: For the discovery function, you have to have DNS.

Mika Kasslin: you should allow other kind of network.

Joe Kwak: This is allowed.

It is questioned on the meaning of the term “Attachment”.

Joe Kwak explained that it can be understood as the first point to connect with other network.

TVBD-C, TVBD-M and Cserv are actual realization of architecture inside devices; they can also be separated in different devices.

Stanislav Filin: There should be a system manage entity between CSS and PHY/MAC parts.

Joe Kwak: We need to map the link\_SAP to the real SAP in the system, for example, in 802.11, it would be MLME SAP. In P802.22, we need to have convergence sub-layer to MAP link\_SAP .

Ivan Reede: MLME may not be exposed; we need to descript a generic one. Joe Kwak agreed.

Stanislav Filin: What is media access function?

Joe Kwak: for example, frequency selection.

Naotaka Sato: TVBD-C, TVBD-M and Cserv look like implementation example, it should not be in normative text.

Ivan Reede: Is a reference point a SAP? Joe Kwak: YES, it can be

Joe Kwak: We do not care about the protocol to exchange the message.

Joe Kwak: interface C is missing between MICM and TVWS database in Figure 7.

Hyunduk Kang: Do we need to change draft when other standard change.

Joe Kwak: No, we do not need, the only thing we may change would be just in annex.

Ivan Reede: We may even have no such annex.

Joe Kwak: we may need some information to clarify what are missing in other system.

Hyunduk Kang: Can TVWS device take advantage of coexistence information. How can they make modification to support 19 standards?

Joe Kwak: Then they cannot use it. That is why we are looking at what they already have.

Session recessed 6:02 PM

### Thursday AM1

Called to order 8:06 PM

* **Motion**

To change agenda in Document 10/122

By Ivan Reede

Seconded by Alex Reznik

Motion passed with unanimous consensus.

**IEEE 802.22-10/121r2: 802.22 Coexistence Aspect**

Presented by Gerald Chouinard, Communication Research centre, Canada

Steve Shellhammer: BSs are synchronized?

Gerald Chouinard : YES

It is clarified that the minimum frame length is 3ms.

What happens if the traffic load is not 100%? Frame will be shortened.

The downlink transmission delay is absorbed by TTG in PHY layer if the BS is located in up to 30km.

For the downlink, the data is schedule in advance and arranged vertically in order to abort the transmission delay if BS is located from 30km -100km.

For the uplink, the data is arranged horizontally to use less subcarrier so that each subcarrier has more transmission power

Except Mode II devices, all devices shall connect to database without intermediate.

Joe Kwak questioned on the coordination of quiet period using command service of 802.19.1

**IEEE 802.22-10/128r0: Resource allocation principles for 802.19.1 coexistence system**

By Paivi Ruuska, Nokia Corporation

Hyunduk Kang: What is definition of fairness? It is difficult to define. Coexistence value is one of solution.

There may be some neighbours in different networks, you may not schedule them in the same time.

Joe Kwak: Two ways to solve resource contention issue, (1) general approach, solve the problem over entire set (2) to only fix the problem network, which is more feasible.

Reinhard Gloger: What is the reaction time? Mika Kasslin: several minutes.

Session recessed 10:07 PM

### Thursday AM2

Called to order 10:37 PM

**IEEE 802.22-10/130r0: Categorization of coexistence network configuration**

By Ryo Sawai, Sony corporation

Paivi Ruuska: who is doing this coverage estimation?

Ryo Sawai: 802.19 coexistence system.

It is clarified that slide 9 is not the case of coexistence, but this is one of category. During discovery, device in two networks may use the same channel.

Ivan Reede: Two networks may not communicate but they may interference each other, there should be a big circle showing interference range

Ivan Reede: In slide 20, the small coverage network may only connect with larger coverage network by using backhaul

It is indicated that the case 1 and case 4 may be the same.

Ryo Sawai: the coexistence solution may be different for these two cases.

* **Motion**

To remove from draft development process “After all presentations of a given clause, a straw poll is taken in the task group on all the proposals to facilitate merging of the proposals.”

By Alex Reznik

Seconded by Mika Kasslin

Motion passed.

* **Motion**

To change agenda 10/122 to remove the time slot for strawpoll

By Alex Reznik

Seconded by Mika Kasslin

Motion passed.

* **The postponed strawpoll on Tuesday PM2 was withdrawn by Stanislav Filin**

**There were some discussions on how we should consider these 6 proposals?**

It is suggested by Steve Shellhammer to compare the 6 proposals, and find the similarity/difference.

Mika Kasslin suggested that we do not discuss here, the authors of each proposal will discuss offline before November meeting.

Steve Shellhammer asked the group whether we discuss proposal now or let authors find consensus by themselves.

TG Chair called for the questions on any of proposals

Joe Kwak: by November, will proposers have complete proposal

Stanislav Filin: I planned by November.

Mika Kasslin: We are late and I do not expect others may have complete proposal. By November we may have general messages. And In January we may have details.

It is announced that In January, we will have technical editor.

Steve Shellhammer: It may proposed message and their description in PowerPoint vision without document text. Ivan Reede: It should be full text. Steven Shellhammer agreed finally.

Stanislav Filin: it is good to have parameters in the messages to help understand what is behind messages.

Mika Kasslin: General parameters may be proposed, we cannot list everything.

Ivan Reede: Before we process, we may focus on the clarification of current drafts.

Alex Reznik: It is better to unify the description language.

TG chair: it is hard to merge proposals at this time. We can work on this from January.

* **Strawpoll :**

Would you like to have conference call in order to promote convergence?

Yes 13/ No 0/ Abstain: 3

* **Strawpoll :**

Would you like to process to a review to a closing report and adjourn the task?

Yes : 13 No: 0 Abstain: 0

Session recessed 11:57

### Thursday AM2

Called to order 1:35 PM

**IEEE 802.22-10/137r0:TG1 September Closing Report**

By Tuncer Baykas, NICT

* **Motion**

To adjourn the TG meeting

By Alex Reznik

Seconded by Mika Kasslin

Motion passed.

TG meeting adjourned 1:38 PM.