Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	Solutions for some AIs in last meeting.	
Date Submitted	**2007-03-15**	
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Re:	IEEE 802.16-07/010：IEEE 802.16 Working Group Letter Ballot Recirc #24a: Announcement (2007-02-01)	
Abstract	Following AIs assigned in last meeting.	
Purpose	To consolidate the 16h draft.	
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Solutions for some AIs in last meeting.

Wu Xuyong Huawei

Overview

I was responsible for solving several AIs listed in C802.16h-07_020.xls, by these contribution, we will discussion on the solution.

Here is the list:

303	Shawn	AI: clean-up the 2 paragraphs from p.58L31
531	Shawn	AI: check the definition of the CX community - are only 3 systems there?
366, 368, 369	Shawn, Mariana	AI: Energy keying in time and freq
405, 407, 408, 424, 425, 1019, 1020, 1022, 1023,1025,	Shawn	AI: simplify the tables in 15.3.3
498, 499	Shawn	AI: move the text in 15.7 to proper place
1049	Shawn	AI: fix the text to up-date with the sub-frames

Reference:

[1] *IEEE 802.16-06/068r5: comment database of IEEE 802.16 LB24 (2007-01-31)*

[2] *IEEE P802.16h/D2: Working Document for P802.16h (2007-01-31)*

[3] *IEEE 802.16-07/010：IEEE 802.16 Working Group Letter Ballot Recirc #24a: Announcement (2007-02-01)*

[4] *IEEE 802.16-2004: IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems (2004-10-01)*

[5] *IEEE 802.16e-2005: IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands and Corrigendum 1 (2006-02-28)*

[6] *IEEE C802.16-07/020:* Action Items from Session #47 (Mariana Goldhamer; 2007-01-18)

Proposed Changes accordingly (Discussion in blue & Proposal in Red):

1) Comment 303 AI: clean-up the 2 paragraphs from p.58L31

Comment: [303] By Kenneth Stanwood

The coexistence proxy concept is not solid. It needs to be more completely specified to be useable.

Suggest Remedy:

Finish specifying the coexistence proxy or delete the concept from the document.

Resolution: AI: cleaning up the two paragraphs from P58L31 to the level of necessary functionality.

Taken by Xuyong.

Discussion: *The coexistence proxy is just being described here to show the mechanism of the information exchange between systems, the coexistence proxy may be a separate device or a part of the BS device in deployment, just act as an agent for the BS to exchange CXP message and present only the proxy's IP address instead of the IP address of the BS's data link. It will provide some level of security for the BS to prevent everyone in the internet from easy attacking the data service of the BS.*

Although it seems to be an IETF topic, the proxy IP address is part of the content to be sent out in the MAC layer message in air link. So we since we should clarify the method here to show how it works. We may need some associated detail within IETF entity afterward.

Proposal: refine the paragraph as following:

Between systems not unsuspicious with each other, ~~Every~~ BS shall use its coexistence proxy as CXP agent to exchange CXP messages and use the proxy IP and the BSID as its contact information within air signaling/messaging between systems.~~while it sends/receives signaling containing the IP contact information over the air, so that~~ It can prevent malevolent interceptors ~~will not~~ from knowing the real IP address of the BSs ~~from~~ by the signaling/messaging over the air, while it enables the neighbor system to negotiate with each other at the same time. ~~The coexistence proxy should have a stand alone physical port and an IP address to connect to the internet using either direct link or an internal interface.~~ The coexistence proxy could be a module of the BS or a stand alone ~~server~~ device.

~~*A coexistence proxy can also be optionally used to forward the CXP messages between BSs when the IP address of the BS is not transmitted over the air, so that the proxy will act as an agent between the BSs and other BSs and terminals in the internet. By using the coexistence proxy, all the BSs know other BSs' coexistence proxy's IP address instead of their actual IP address, and contact them only via coexistence proxy and the BSID information. In order to prevent various attacks from the internet, the proxy could utilize various approaches to protect the BSs without affecting the data services of the BSs. [The proxy could limit the forwarding bandwidth from one IP address or to one BSID. The proxy could qualify or block the messages using various approaches.]*~~

THE RESULT OF MODIFICATION IS SHOWN AS:

Between systems not unsuspicious with each other, BS shall use its coexistence proxy as CXP agent to exchange CXP messages and use the proxy IP and the BSID as its contact information within air signaling/messaging between systems. It can prevent malevolent interceptors from knowing the real IP address of the BSs by the signaling/messaging over the air, while it enables the neighbor system to negotiate with each other at the same time. The coexistence proxy could be a module of the BS or a stand alone device.

2) Comment 531 AI: check the definition of the CX community - are only 3 systems there?

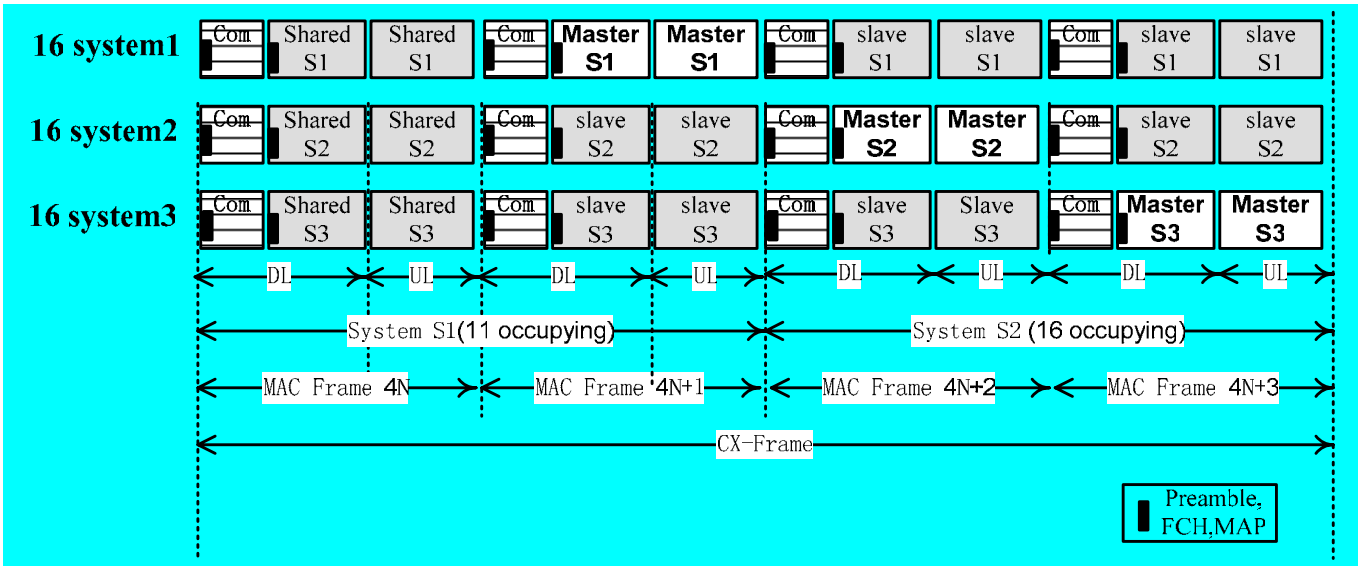
Comment: [531] By Phillip Barber

What if a BS is a part of more than one neighborhood or community? part of three neighborhoods? four? nine? How can the available solution methodologies cope with the complexity of such decision making?

Suggest Remedy:

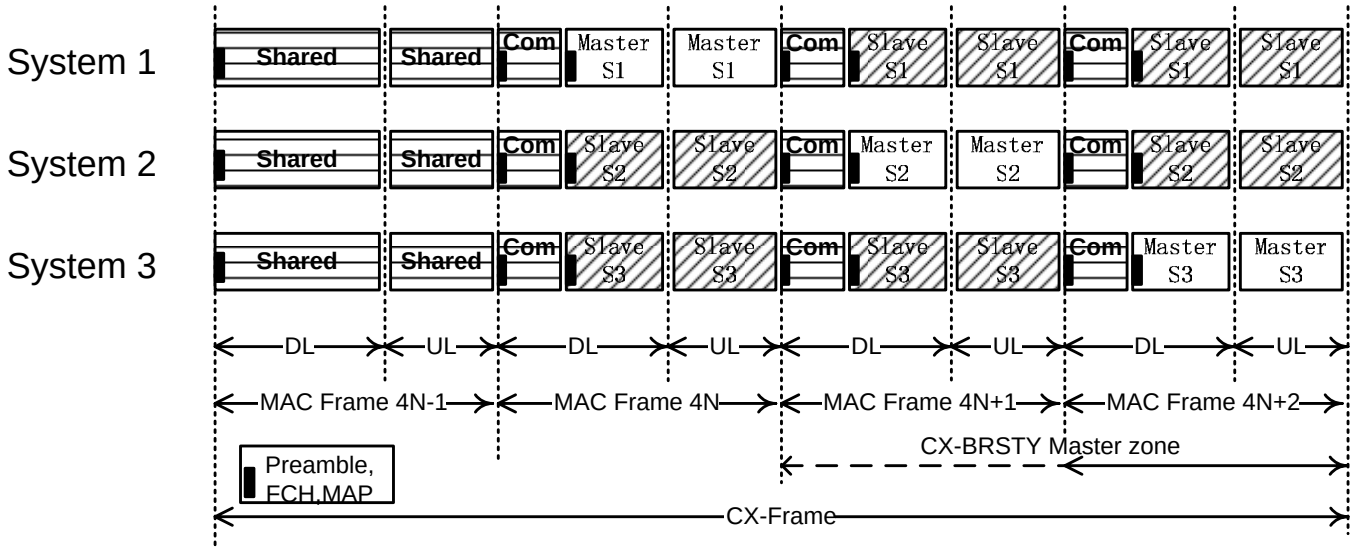
Resolution: We have limit the number of subframes to three in one working channel to allow the coexistence within neighborhood.

Discussion: *There is some discussion within Mariana's AIs, and some reply is relating to this topic, by the proposal of following frame structure, we limited only up to 3 systems within the neighborhood to share the radio resource in one channel.*

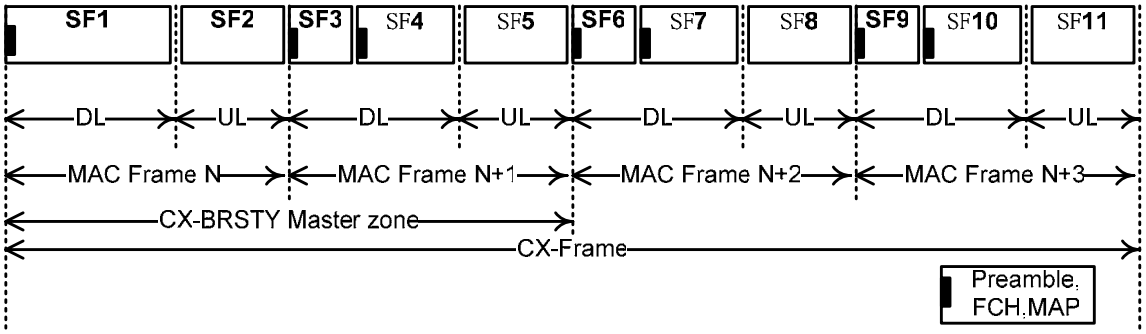


Proposal:

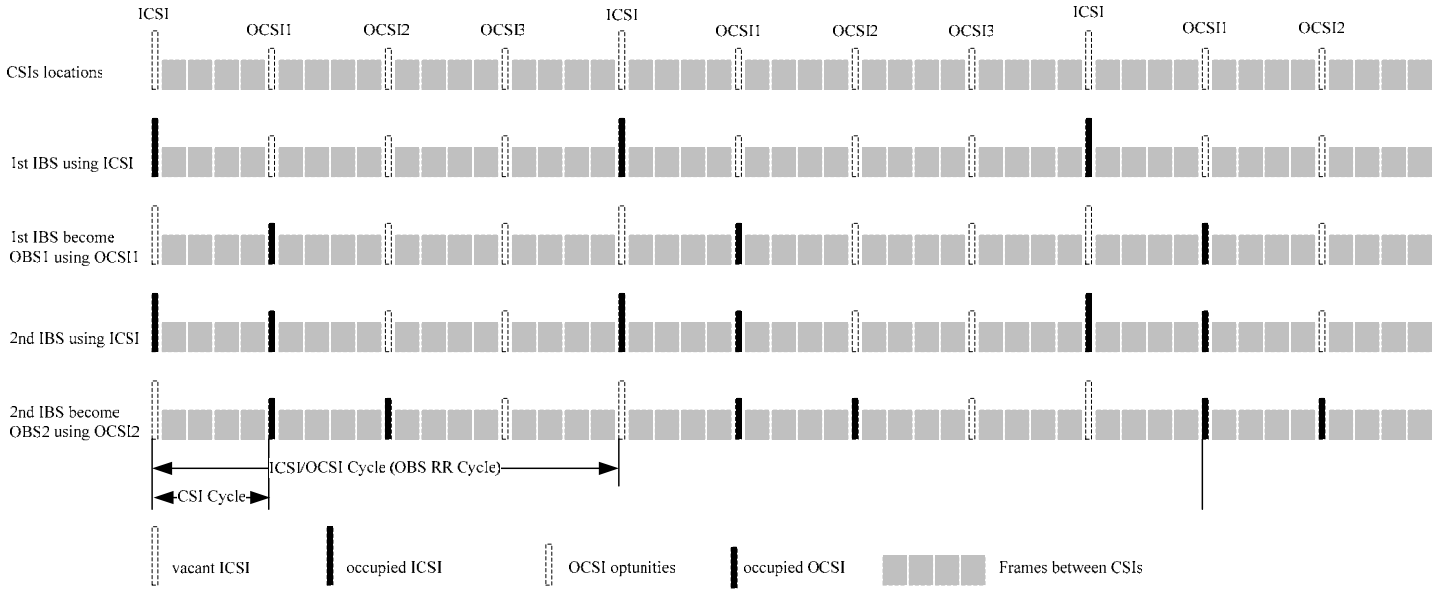
531a) change figure h46 as follows(only to move the shared part to the front of the 4 frame.):



531b) change figure h47 as follows(only to move the shared part to the front of the 4 frame.):



531c) change figure h22 as follows (to comply with the 3 system assumption.):



3) Comment 366, 368, 369 AI: Energy keying in time and freq

Comment: [366] By Avi Freedman

It seems to me that the appropriate place to describe the mechanism of frequency keyed pulses is here and not in 15.4.3. The next section (15.3.1.2.2) doesn't make any sense without it.

Suggest Remedy:

Move the text from section 15.4.3.4 to 15.3.1.2.1

Resolution: to AI taken by Xuyong and Mariana to figure the solution of energy keying in Time and Frequence.

Discussion: *the mechanism within 15.4.3.4 did only provide the functionality of the following items, such as:*

1 (Header)

2 (Tx_start)

3 (Rx_start or Rx_slot)

4 (Tx_end)

5 (Rx_end)

6 (NACK)

7 (CSI_Start)

8 (CSI_Continuation)

It doesn't conform to the description in 15.3.1.2.2 yet:

"The radio signaling described in section 15.3.1.2.1 may be also used for the transmission of the BS_NURBC message (see 15.5.5.1.1), when there is no active Base Station Identification Server."

I believe it's better to follow Avi's advice to move the content in section 15.4.3.4 to 15.3.1.2.1, but before that the author (Mariana) need to provide updated text before this content moved to 15.3.1.2.1.

Comment: [368] ByMariana GoldHamer

The Energy keying in the frequency domain is using now the CX CC, but the text in clause 15.3.1.2.2 is not reflecting this.

The transmission is done in consecutive coexistence time slots, spaced apart by Tiptx seconds. The first CSI in the series starts with CSI start signal, while the CSI in the series contains the Tx_end signal, the continuation in sequential CSI slots starts with the CSI_Continuation, as defined Table h 9. The IP identifier of the BS and an 8bit CRC, are transmitted between these signals, the L.S.B (least significant bit) for each field being transmitted first. The transmission of the above information uses only the preambles for the sub-channels 6,8,10,12,14,18,20,22,24,26 (10bits / symbol), the L.S.B. corresponding to the lowest sub-channel index.

Suggest Remedy:

Change the text between lines 44-54 to read:

The transmission is done in consecutive slots of the CC CX, named Freq_Key 1, Freq_Key 2, Freq_Key 3 and Freq_Key 4. The used slots in the above series start with CSI start signal and end with the CSI_Continuation, as defined Table h 9. The last used slot ends with Tx_end signal, defined as well in Table h9.

The message transmitted inside the above frames is BS_NURBC (see 15.5.6.2.1)

The transmission of the above information uses only the preambles for the sub-channels 6,8,10,12,14,18,20,22,24,26 (10bits / symbol), the M.S.B. corresponding to the lowest sub-channel index.

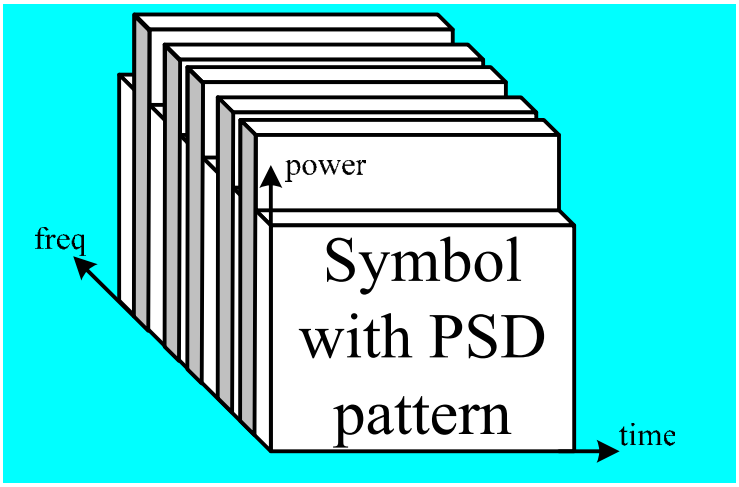
Reply By Wu Xuyong:

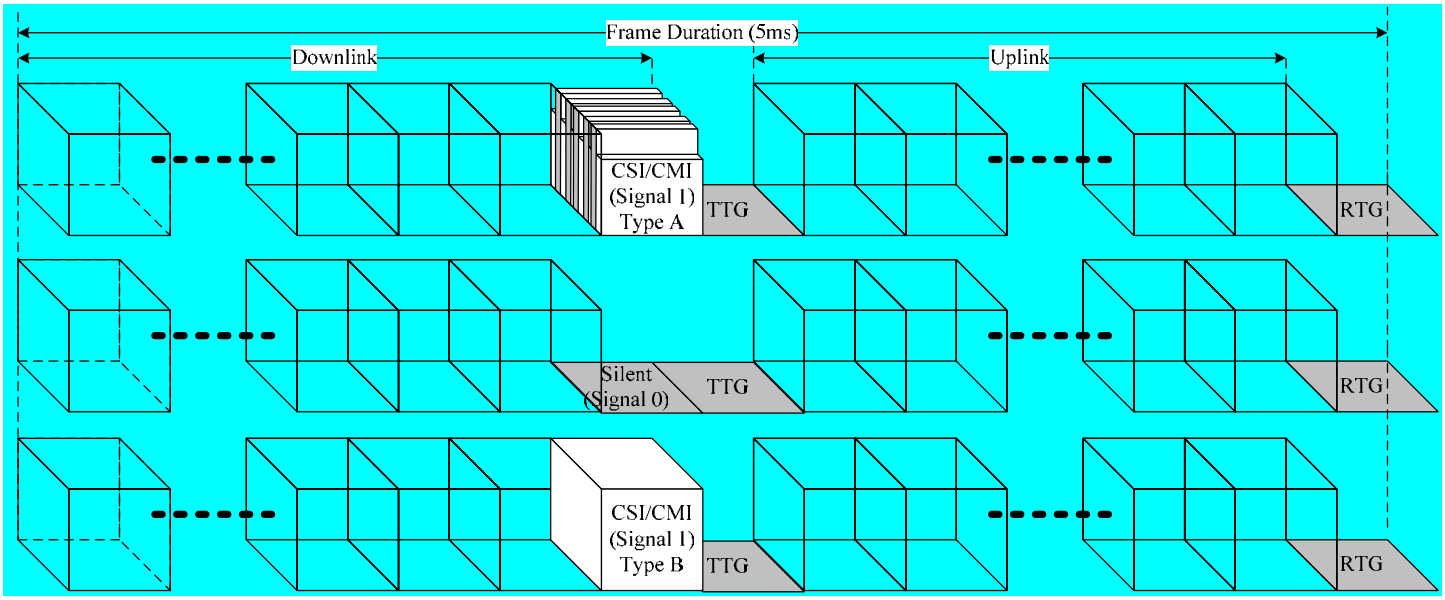
1) CSI is not within CXCC currently,

2) BS_BURBC is CSI use only. BSD is used in CMI for the same purpose in another way.

Resolution: to AI taken by Xuyong and Mariana to figure the solution of energy keying in Time and Frequence.

Discussion: We have some contribution (Consolidation proposal on CSI/CMI/CXCC.) which may harmonize those mechanisms, lets discuss during meeting and see what we can get.





Comment: ***[369] By David Grandblaise***

The subclause 15.3.1.3 "Community entry of new BS using signaling" should be added in a new subclause of 15.3.1.1 (like 15.3.1.1.4) since this section is applicable to CSI only.

Suggest Remedy:

Move the subclause 15.3.1.3 into the new subclause 15.3.1.1.4 and remove subclause 15.3.1.3.

Reply By Wu Xuyong:

Only if we don't need this section.

Some other feasible approach have been addressed now?

Resolution: to Adhoc of channel selection chaired Paul

Discussion: The approach seems to be only fit for CSI is all because it's written very early and makes it look like. I believe the basic procedure of "Community entry of new BS using signaling/messaging" is all based on similar concept. So we may change the title of 15.3.1.3 as "Community entry of new BS using signaling/messaging" and update the description to fit for it. Not so much to change, I guess.

Proposal:

366a) *Waiting for Mariana's updating of the text in 15.4.3.4 to fit for 15.3.1.2.1*

366b) *Move it to 15.3.1.2.1 after 366a).*

368) *Waiting the resolution of the contribution "Consolidation proposal on CSI/CMI/CXCC."*

369a) For 15.3.1.3, update the title to be "Community entry of new BS using signaling/messaging";

369b) Change the description accordingly afterward. E.g., change all "signaling" to "signaling/messaging", change "BS_NURBC" to "BS_NURBC or BSD" etc.

4) Comment 405, 407, 408, 424, 425, 1019, 1020, 1022, 1023,1025 AI: simplify the tables in 15.3.3

Comment: [405] By Mariana Goldhamer P78 15.3.3

The tables are too long and are not related to CX only

Suggest Remedy:

Delete the rows not relevant for CX

Resolution: AI to simplify the tables in 15.3.3 taken by Xuyong.

Discussion: tbd

Comment: [407] By Avi Freedman P82L20 in D1

The direction of the SS should also be maintained in the database. This could be given as an azimuth value in terms of the beamwidth.

Suggest Remedy:

Add a line in the table:

SS transmission direction 8 bits Azimuth as a number of beamwdiths

Resolution: AI to simplify the tables in 15.3.3 taken by Xuyong.

Discussion: tbd

Comment: [408] By Avi Freedman P83L6 in D1

BSD is not the only way an SS can learn of an interfering BS

Suggest Remedy:

Replace in all the lines "via BSD", "from its BSD" or "as per BSD" with "*"

Add a note at the end of the table, saying:

* By BSD, or as reported via CXP"

Resolution: AI to simplify the tables in 15.3.3 taken by Xuyong.

Discussion: tbd

Comment: [424] By Avi Freedman P91L27 in D1

The bullet list seems out of context

Suggest Remedy:

Move the list to section 15.3. Harmonize with tables h6, h7, h8

Resolution: goes to AI for the database simplification taken by Xuyong.

Discussion: tbd

Comment: [425] By David Grandblaise P91L27 in D1

The following list of parameters should be included in the distributed database in subclause 15.3.3.1:

— Operator ID
— Base Station ID
— MAC Frame duration (same for a community)
— Shared Tx and Rx sub-frame durations (same for a community)
— Type of sub-frame allocation (same for a community)
— MAC Frame number and sub-frame number chosen for the Master sub-frame (same for a community)
— Repetition period for Base Station radio-signature, measured in MAC-frames
— Repetition interval between two Master sub-frames, measured in MAC-frames
— List of other used sub-frames, in the interval between two Master sub-frames
— Time_shift from the Master sub-frame start, duration and the repetition information for the Base Station radio-signature transmission
— Time_shift from the Master sub-frame start, duration and the repetition information for the Subscriber Station radio-signature transmission
— Time_shift from the Master sub-frame start and duration for network entry of a new Base Station, which is evaluating the possibility of using the same Master slot.
— BS power relative to radio-signature, in the used sub-frames, in the interval between two Master subframes;
— For every active SS: SSID and its attenuation relative to radio-signature power, in the used subframes, in the interval between two Master sub-frames;
— For every coexistence neighbor BS: the BSID, the IP address of the coexistence neighbor and other profile information, and the SSs it interfered to, (and the SSs belong to it that interfered by the database owner BS. tbd.)
— For every BS in the same community: the contact IP address and the interference situation between this BS and other BS, including the interference situation with the DB owner.
— For every SS registered: the interference situation,

Suggest Remedy:

Add these data in the distributed database subclause 15.3.3.1 (Table h6, page 78)

Resolution: Superceded by 424

Discussion: tbd

Comment: [1019] By Kenneth Stanwood P79L17 in D1

The negotiation status bits have very confusing definitions.

Suggest Remedy:

Clarify the meanings of the negotiation status bits.

Reply By Wu Xuyong:

I guess it shoule be in the row below line 39.

But if this row refers to the status with BSIS, I guess it's in place, and should be named "negotiation status with BSIS"

Resolution: Goes to AI to simplify the table taken by Xuyong.

Discussion: tbd

Comment: [1020] By Kenneth Stanwood P79L42 in D1

No field size is specified for the "Band" field. It also has no definition.

Suggest Remedy:

Specify a size for the "Band" field.

Supply something in the notes section that would allow someone to create/decipher the field.

Reply By Wu Xuyong:

Make it conformity with Annex B.

Resolution: delete the row of "band"

Discussion: tbd

Comment: [1022] By Kenneth Stanwood P79L45 in D1

"Modulation" is not part of a profile. Multiple modulations can be used in the same frame. This entry doesn't make sense.

Suggest Remedy:

Delete the "modulation" entry in table h6 and table h7.

Reply: By Wu Xuyong

Just Fix the TBD and tbcs or delete the rows contain TBD/tbc.

not reason to delete the whole table.

Resolution: Goes to AI to simplify the table taken by Xuyong.

Discussion: tbd

Comment: [1023] By Kenneth Stanwood P80L41 in D1

What's the difference between "sector ID" and "BS RF antenna sector ID" (at line 59)? What if a BS has multiple sectors?

Suggest Remedy:

Delete sector ID or differentiate it from the other entry.

Reply: By Wu Xuyong

Delete "BS RF antenna sector ID"

"Sector ID" is identical to "BS RF antenna sector ID"

Resolution: Goes to AI to simplify the table taken by Xuyong.

Discussion: tbd

Comment: [1025]

What is the difference between "SS location" and "SS GPS location"?

Suggest Remedy:

specify the difference or get rid of one.

Reply: By Wu Xuyong

Another option is to delete both.

Since they are "expensive" requirements, and not so practically useful.

Resolution: Goes to AI to simplify the table taken by Xuyong.

Discussion: tbd

Proposal: Since the table related basic principle and mechanisms are within consolidation in this meeting, I suggest not to discuss the specific change of the table in parallel.

5) Comment 498, 499 AI: move the text in 15.7 to proper place

Comment: [498] By Avi Freedman

I feel that the entire section does not add any additional information to the standard.

Suggest Remedy:

Delete section 15.7

Resolution: AI to move to these text in 15.7 to proper place. Taken by Xuyong.

Discussion: since this topic is mostly for the subframe sharing and scheduling, I feel it's better to move all the content in 15.7.1 to the end of the15.4.2.1.1. And delete 15.7 afterward.

Comment: ***[499] By David Grandblaise***

The sentence "The system needs to group of interfering/not interfering units of all the systems in the community and all the SSs in the native system for various purposes." is not clear.

Suggest Remedy:

Reformulate the sentence

Resolution: Goes to AI to move to these text in 15.7 to proper place. Taken by Xuyong.

Discussion: *I agree the english is bad within this sentence☺ Is it better to say: "The system needs to group ~~of~~ all the systems in the community as interfering/not interfering units ~~of all the systems in the community~~ and all the SSs in the native system as interfered/not interfered SS for various purposes"*

Proposal:

498) To move all the content in 15.7.1 to the end of the15.4.2.1.1. And delete 15.7 afterward.

499) Change the sentence as read:

The system needs to group all the systems in the community as interfering/not interfering units and all the SSs in the native system as interfered/not interfered SSs for various purposes.

6) Comment 1049 AI: fix the text to up-date with the sub-frames

Comment: ***[1049] By Kenneth Stanwood***

This section implies a variable number of subframes. This is in contradiction with other sections of the document that imply a set number. Also, a variable number implies a variable duration (type 1 frames) or a variable periodicity (type 2 frames). Either way, a system with two neighbor systems can't know their meaning of when master subframe n occurs. Also, the ability to flexibly add subframes means there shouldn't ever be one empty so no system will ever an alternate subframe because an alternate subframe implies an unoccupied channel.

In any case, coordination of random master subframes across neighbor after neighbor is impossible since you need to coordinate with your neighbor's neighbors even if you can't hear them yourself.

Suggest Remedy:

Eliminate the variable master subframe concept:

1) rewrite the paragraph at page 95, line 43 to use a constant number of subframes.

2) delete section 15.4.2.3 on page 96

Resolution: 2) delete section 15.4.2.3 on page 96

AI for Xuyong to update the text only dealing with the remaining subframes structure.

Discussion:

Every BS maintains the status of its ALTSFs by itself. It counts up all the vacant subframes within the CX frame (see figure h46) as ALTSFs, which can be used as ~~a~~ master sub-frames ~~and have the same or larger occupation ratio of the frame~~. ~~For example, if the working master subframe is one out of 4 subframes in the current~~

~~*working channel, and there is vacant subframe out of 3 subframes in another channel in the surroundings, the second subframe will be counted as one ALTSF. Also, if the second subframe is one out of 4 subframes, it will be counted as ALTSF as well. But if the second subframe is one out of 5 subframes, it will not be counted as ALTSF, since it's it is occupied more than the current master subframe.*~~ *The BSs will count up the number of its ALTSFs by scanning and contacting with all coexistence neighbors, resource IDs for every ALTSFs are also stored in the database. All the channels which are not usable shall be ignored. This information shall be maintained in the information table in the shared database (see Table h 5).*

Proposal: Change the paragraph P115L44 as following:

Every BS maintains the status of its ALTSFs by itself. It counts up all the vacant subframes within the CX frame (see figure h46) as ALTSFs, which can be used as master sub-frames. The BSs will count up the number of its ALTSFs by scanning and contacting with all coexistence neighbors, resource IDs for every ALTSFs are also stored in the database. All the channels which are not usable shall be ignored. This information shall be maintained in the information table in the shared database (see Table h 5).