IEEE P802.15

**Wireless Personal Area Networks**

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| --- | --- |
| Project | SC Maintenance |
| Title | **Resolutions to SB comments on categories RIT** |
| Date Submitted | July 15, 2015 |
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| Re: | Sponsor Ballot Comment resolution |
| Abstract |  |
| Purpose | Comment resolution |
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**i-37**

Kumar, Amarjeet

Page 41 Clause 6.3.1 Line 45

Comment:

Sentence: As we know Passive or Active Scan is necessary to resolve PAN ID confliction. Coordinators operated in RIT mode don't send (enhanced) beacon frame because RIT mode is one of the non-beacon-enabled PAN. Coordinators operated in RIT mode can't receive (enhanced) beacon request frame because those coordinators wake up intermittently and the reception time is very short ( 1 or 2 ms per 5 seconds).

Proposed change:

Introduction of a new type Scan Type

 RIT Passive Scan

Once the Upper Layer sends a MLME-Scan.request with ScanType as "RIT Passive Scan", the MAC Layer should turn ON its receiver in each channel request for scan and wait for the duration configured. It should receive the RIT-Data.request and send it to the upper layer as MLME-Scan.confirm once the Scan is completed.

The device initiating the RIT Passive scan should set the PAN ID as broadcast PAN ID and receive all RIT data request sent by neighboring nodes. Device supporting RIT Passive scan should send the RIT Data request as a broadcast packet, so that it can be received by all devices in neighborhood.

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Revise**

**Proposed Resolution:**

**Add below as section 6.3.1.4**

**6.3.1.4 RIT Passive Channel scan**

The RIT passive scan is essentially the passive scan as described 6.3.1.2 but rather than discarding all frames that are not Beacon frames, the RIT passive scan discards all frames that are not RIT Data Request command frames.

A RIT passive scan over a specified set of channels is requested using the MLME-SCAN.request primitive with the Valid Range of the ScanType parameter set to indicate RIT\_PASSIVE. For each channel, the device shall set phyCurrentChannel and phyCurrentPage as per the MLME-SCAN.request primitive. After switching to the channel for a RIT passive scan, the device shall enable its receiver for at most *macRITPeriod*. During this time, the device shall reject all frames that are not RIT Data Request command frames and record the information contained in all unique RIT Data Request command frames in a PAN descriptor structure, as described in Table 68 including the channel information. A RIT Data Request command frame shall be assumed to be unique if it contains both a PAN ID and a source address that has not been seen before during the scan of the current channel.

If an RIT Data Request command frame is received when macAutoRequest is set to TRUE, the list of PAN descriptor structures shall be stored by the MAC sublayer until the scan is complete; at this time, the list shall be sent to the next higher layer in the PANDescriptorList parameter of the MLME-SCAN.confirm primitive.

If a RIT Data Request command frame is received when macAutoRequest is set to FALSE, each recorded PAN descriptor is sent to the next higher layer in a separate MLME-BEACON-NOTIFY.indication primitive as described in 8.2.5.1. A received RIT Data Request Command frame containing a non-zero length payload shall also cause the PAN descriptor to be sent to the next higher layer via the MLME-BEACON-NOTIFY.indication primitive. Once the scan with macAutoRequest set to FALSE is complete, the MLME-SCAN.confirm shall be issued to the next higher layer with a null PANDescriptorList.

****

**update Figure 31 as indicated**

**Update Table 82 by adding RIT\_PASSIVE to the Valid Range for ScanType**



**Update Table 83 by adding RIT\_PASSIVE to the Valid Range for ScanType**

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**i-40**

Kumar, Amarjeet

Page 102 Clause 6.12.3 Line 19

Comment:

Sentence: When two nodes have data to send to each other at same time, both will stop sending RIT Data request at same time and wait for other to send the RIT Data request. In this case both node will be in waiting mode and eventually not be able to send any data to each other.

Proposed change:

Enable the transmission of RIT data request intermittently when it is waiting for an RIT Data Request at arbitrary timing, this will allow each device to send RIT Data request during it is waiting for one. This will make sure that both nodes can fetch data from each other."

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Revise**

**Proposed Resolution:**

***Change the below text:***

**6.12.3.3 RIT Transmission**

In order to transmit a frame in RIT mode, the device shall ~~at first stop its periodic transmission of RIT Data Request commands,~~ enable its receiver, and wait at most macRitTxWaitDuration for reception of an RIT Data Request command from another device.

**i-392**

KINNEY, PATRICK

Page 102 Clause 6.12.3 Line 19

Comment:

Sentence: When two nodes have data to send to each other at same time, both will stop sending RIT Data request at same time and wait for other to send the RIT Data request. In this case both node will be in waiting mode and eventually not be able to send any data to each other.

Proposed change:

Enable the transmission of RIT data request intermittently when it is waiting for an RIT Data Request at arbitrary timing, this will allow each device to send RIT Data request during it is waiting for one. This will make sure that both nodes can fetch data from each other."

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Revise**

**Proposed Resolution:**

**Same as per comment i-40.**

***Change the below text:***

**6.12.3.3 RIT Transmission**

In order to transmit a frame in RIT mode, the device shall ~~at first stop its periodic transmission of RIT Data Request commands,~~ enable its receiver, and wait at most macRitTxWaitDuration for reception of an RIT Data Request command from another device.

**i-42**

Kumar, Amarjeet

Page 218 Clause 8.2.5.2 Line 38

Comment:

Currently there is no way to indicate the FCS error to the upper layer.

Proposed change:

Addition of new status "FCS\_ERROR" in MLME-COMM-STATUS.indication.

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Reject**

**Proposed Resolution:**

**Behavior is already described in MAC Metrics IE.**

**i-394**

KINNEY, PATRICK

Page 218 Clause 8.2.5.2 Line 38

Comment:

Currently there is no way to indicate the FCS error to the upper layer.

Proposed change:

Addition of new status "FCS\_ERROR" in MLME-COMM-STATUS.indication.

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Revise**

**Proposed Resolution:**

**Same as resolution to comment i-42.**

**Behavior is already described in MAC Metrics IE.**

**i-38**

Kumar, Amarjeet

Page 103 Clause 6.12.3.3 Line 42

Comment:

Current specification requires CSMA-CA to be performed during sending of data in response to RIT Data Request. However, in low power devices using RIT feature, device sending data in response to RIT data req. can be avoid CSMA-CA.

Proposed change:

"Current Text in Specification:

 Upon reception of RIT Data Request command, the MAC sublayer sends the pending data using unslotted CSMA-CA.

Change it to:

 Upon reception of RIT Data Request command, the MAC sublayer sends the pending data without using unslotted CSMA-CA."

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Reject**

**Proposed Resolution:**

**No change required, use CSMA with CCA mode =4**

**i-390**

KINNEY, PATRICK

Page 103 Clause 6.12.3.3 Line 42

Comment:

Current specification requires CSMA-CA to be performed during sending of data in response to RIT Data Request. However, in low power devices using RIT feature, device sending data in response to RIT data req. can be avoid CSMA-CA.

Proposed change:

"Current Text in Specification:

 Upon reception of RIT Data Request command, the MAC sublayer sends the pending data using unslotted CSMA-CA.

Change it to:

 Upon reception of RIT Data Request command, the MAC sublayer sends the pending data without using unslotted CSMA-CA."

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Reject**

**Proposed Resolution:**

**No change required, use CSMA with CCA mode = 4**

**i-41**

Kumar, Amarjeet

Page 102 Clause 6.12.3.2 Line 19

Comment:

Current specification does not give flexibility to the Node requesting for data to request any specific data. Node cannot request for any specific data from the sending node.

Proposed change:

Addition of Enhanced RIT Data Request

Here the node sending RIT data request to add an upper layer defined payload to it. The received node upper layer can receive the payload and send back the response required.

For additional detail, please refer the mentor document "15-15-0335-00-0mag-ieee802-15-4-mac-rit-change-proposal.ppt".

Type T

Must be Satisfied Yes

**Resolution: Reject**

**Proposed Resolution:**

**After the changes done as part of comment i-68, this is not required.**

**i-393**

KINNEY, PATRICK

Page 102 Clause 6.12.3.3 Line 42

Comment:

Current specification does not give flexibility to the Node requesting for data to request any specific data. Node cannot request for any specific data from the sending node.

Proposed change:

Proposed change:

Addition of Enhanced RIT Data Request

Here the node sending RIT data request to add an upper layer defined payload to it. The received node upper layer can receive the payload and send back the response required.

Type T

Must be Satisfied Yes

**Resolution: Reject**

**Proposed Resolution:**

**After the changes done as part of comment i-68, this is not required.**

**i-68**

Kumar, Amarjeet

Page 102 Clause 6.12.3.2 Line 19

Comment:

Current specification does not give flexibility to the Node requesting for data to request any specific data. Node cannot request for any specific data from the sending node.

Proposed change:

Addition of arbitrary payload to RIT Data Request. Here the node sending RIT data request to add an upper layer defined payload to it. The received node upper layer can receive the payload and send back the response required.

Type T

Must be Satisfied Yes

**Resolution: Revise**

**Proposed Resolution:**

**Update the “Figure 109-RIT IE Content field format” as indicated below**

|  |  |  |
| --- | --- | --- |
| Octet: 1 | 1 | 2 |
| Time To First Listen(≠ 0xFF) | Number of Repeat Listen |  Repeat Listen Interval  |

|  |  |
| --- | --- |
| Octet: 1 | Variable |
| 0xFF | Payload |

**Add below text as the 1st paragraph in the Section “7.4.2.4 RIT IE”**

The first Octet of the RIT-IE content indicates if it includes vendor specific data or the timing information. If the first Octet value is 0xFF it indicates that the following data is a vendor specific data else it contains the timing information.

**Add below text as the last paragraph in the Section “7.4.2.4 RIT IE”**

If the First Octet of the RIT-IE content is set as 0xFF, it encapsulates a higher layer payload that is carried in the Payload field. Content is sent as received, i.e., no octet ordering changes shall be made.

**Update the “Figure 210—RIT Data Request command Content field format” as shown below**

|  |
| --- |
| **Octets: 0/4 Variable** |
| Listen information/Vendor Specific Payload |

**Update the 3rd paragraph of “7.5.22 RIT Data Request Command” as shown below**

The Listen Information field or Vendor specific Payload may be omitted. If the List Information field is present, it shall be formatted as illustrated in Figure211.

**Update the “Figure 211—Format of the Listen Information field” as indicated below**

|  |  |  |
| --- | --- | --- |
| Octet: 1 | 1 | 2 |
| Time To First Listen(≠ 0xFF) | Number of Repeat Listen |  Repeat Listen Interval  |

|  |  |
| --- | --- |
| Octet: 1 | Variable |
| 0xFF | Payload |

**Update the “Table 133 – MAC PIB Attribute” as shown below**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute | Type | Range | Description | Default |
| *macRITPayload* | Set of octets | \_ | A sequence of zero or more octets to be transmitted in the RIT Data Req Payload field. | NULL |
| *macRITPayloadLength* | Integer | 0x00 - 0x7FF | Length of the *macRITPayload. The max length of macRITPayloadLength will depends on the* aMaxPhyPacketSize *value set.* | 0 |

**Update the 4th sentence of 2nd paragraph in section “6.12.3.2 Periodic RIT data request transmission and reception” as shown below**

When the RIT Data Request command carries a the timing information as payload, the device goes back to sleep after the transmission of the RIT Data Request command until the end of the Time to First Listen (T0) period of time.

**Insert the below text as last paragraph in section** **“6.12.3.2 Periodic RIT data request transmission and reception”**

Upon reception of RIT Data Request command with Vendor specific payload as the RIT-IE content, the device shall notifies it to the next higher layer by initiating corresponding indication primitive.

**i-36**

Kumar, Amarjeet

Page 112 Clause 7.2 Line 16

Comment:

A new device creating a Network does a scan of the environment and get to know about the existing PAN in the network. Based on the scan results the new device selects a Unique PAN ID to create a new Personal Area Network. In case of an existing network which is using RIT, will not be able to communicate any information about its PAN as the receiver will be OFF most of the time. In such case there is a possibility that the new device may create the new Personal Area Network using a pre-existing PAN ID.

Proposed change:

Introduction of a new type of PAN ID

 Extended PAN ID (64 bit)

If the extended PAN ID is selected, the PAN ID field will be of 64 bit length and it will contain the Extended address of the PAN coordinator. This will make sure that no two PAN in the network have same PAN ID even if we have a PAN with sleeping devices.

 0xFFFFFFFFFFFFFFFF: Broadcast extended PAN Identifier in case the extended PAN ID Mode is selected.

Will need to change:

 - 7.2 General MAC frame format

 - 7.2.1 Frame Control field

 - Enhanced Ack Frame Format

 - All API which has PAN ID as parameter will need to have an additional parameter of PAN ID Mode

Will need to add the definition of "7.2.1.6 PAN ID Mode"

additional details can be found in mentor document "15-15-0336-00-0mag-ieee802-15-4-mac-panid-change-proposal.ppt"

Type T

Must be Satisfied Yes

**Resolution: Rejected**

**Proposed Resolution:**

MAC Layer already have mechanism in place to handle the PAN ID conflict, so it is not required to add Extended PAN ID.

**i-389**

KINNEY, PATRICK

Page 112 Clause 7.2 Line 16

Comment:

A new device creating a Network does a scan of the environment and get to know about the existing PAN in the network. Based on the scan results the new device selects a Unique PAN ID to create a new Personal Area Network. In case of an existing network which is using RIT, will not be able to communicate any information about its PAN as the receiver will be OFF most of the time. In such case there is a possibility that the new device may create the new Personal Area Network using a pre-existing PAN ID.

Proposed change:

Introduction of a new type of PAN ID

 Extended PAN ID (64 bit)

If the extended PAN ID is selected, the PAN ID field will be of 64 bit length and it will contain the Extended address of the PAN coordinator. This will make sure that no two PAN in the network have same PAN ID even if we have a PAN with sleeping devices.

 0xFFFFFFFFFFFFFFFF: Broadcast extended PAN Identifier in case the extended PAN ID Mode is selected.

Will need to change:

 - 7.2 General MAC frame format

 - 7.2.1 Frame Control field

 - Enhanced Ack Frame Format

 - All API which has PAN ID as parameter will need to have an additional parameter of PAN ID Mode

Will need to add the definition of "7.2.1.6 PAN ID Mode"

additional details can be found in mentor document "15-15-0336-00-0mag-ieee802-15-4-mac-panid-change-proposal.ppt"

Type T

Must be Satisfied Yes

**Resolution: Rejected**

**Proposed Resolution:**

MAC Layer already have mechanism in place to handle the PAN ID conflict, so it is not required to add Extended PAN ID.