**IEEE P802.15**

**Wireless Personal Area Networks**

|  |  |  |
| --- | --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title |  | |
| Date Submitted | September 2, 2014 | |
| Source | Sangjae Lee, Jaehwan Kim, Sangsung Choi (ETRI), Jae-Beom Kim, Young-Bae Ko (Ajou Univ.), and Soo-Young Chang (SYCA) | Voice: [+82-42-860-1572]  Fax: [+82-42-860-5218]  E-mail: [leestrike@etri.re.kr] |
| Re: |  | |
| Abstract | Comments on list of functionalities extracted from the TGD and from the proposals in the document,15-14-0520-00 | |
| Purpose | This document is to suggest some comments on functionalities listed in 15-14-0520-00 to be used to compare the proposals | |
| Notice | This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. | |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15. | |

**Introduction**

This document is prepared to suggest some comments on the functionalities listed in 15-14-0520-00. Red parts in the following tables are the comments and/or possible modifications to be suggested in this document.

1. **Functionalities from the TGD**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Functionality** | **NICT** | **OKI** | **ETRI 1(Hybrid L2R)** | **ETRI 2 (TCT)** |
| Mesh topology discovery | Yes  (enhanced beacons)  Topology: Hierarchical mesh tree | Yes  (Hello frames)  Topology: Tree | Yes  (PANN and PANN RP)  Topology: Tree, **mesh (Inter PAN routing)** | Yes  (Link setup request/response)  Tiered cluster tree |
| Mesh Routing | Yes  -US: Hop-by-hop from child to parent or brother using neighbor table  -DS:  \* Hop-by-hop parent to child or brother using neighbor table,  \* Proactive source routing  -P2P: Combination of US and DS | Yes  -US: Hop-by-hop child to parent using neighbor table  -DS: source routing  -P2P: Combination of US and DS | Yes  -US, DS: Hop-by-hop using routing table  -P2P: route establishment with PREQ and PREQ RP, then Hop by hop using routing table | Yes  -US, DS, P2P: using cluster table and route table |
| Extensible mesh routing architecture (metric alternative, selection, notification, new metrics) | Using the Link quality metric field in EB for 1 or more metrics | Using the Neighbor metric container in Hello frames for 1 or more metrics | Using the Metric field in PANN and PREQ for 1 metric |  |
| Unicast | Yes | Yes | Yes | Yes |
| Broadcast | Yes: packet forwarded once if at least 1 child exists | Flooding with random jitter | Flooding based. |  |
| Route discovery | Proactive | Proactive | US/DS: Proactive  P2P: reactive | Proactive |
| Low power operation | To see from the simulations results | | | |
| Mesh Security | Only devices from the same PAN sharing the same security credentials can belong to a routing tree | KMP | **Associated device only (for Beacon enabled PAN)**  **Only devices from the same PAN (for non-beacon mode)** |  |
| **Multi-channel aware** | **No** | **No** | **YES (TMCTP)** | **NO** |
| Routing metrics | Any metric.  SINR used in simulation | Any metric.  Hop count used in simulation | **Any metric.**  Inactive Overhead Aware Link Metric **in simulation** | -Link cost: Function of link type, link quality, load balance  -Route cost: number of hops |
| Discovery and association | EBR/EB | Hello request/Hello | PANN/PANN RP | Link setup request/ link setup response |
| Network acknowledgement | Not specified | E2E-ACK | Not specified | Not specified |
| Addressing modes | 16/64 bits | 16/64 bits | 16/64 bits | 16 bits (c-skip) |
| Changes to the MAC and PHY | New IEs  -HMT construction IE  -L2R routing IE  -Data aggregation IE  -Destination announcement IE | New IE with nested IEs  -L2R IE  \*Address list IE  \*Hello Param IE  \*Routing Instance IE  \*Hello request parameter IE  \*Route record parameter IE  \*MGT request parameter IE  \*MGT response parameter IE  \*KMP relay parameter IE  \*FA notification parameter IE  \*FA channel update IE  \*MC request parameter IE  \*MC response parameter IE  \*Neighbor metrics container IE  \*PIB ID list IE  \*KMP content IE | New IEs  - PANN  - PANN-RP  - PREQ  - PREQ-RP | New IEs  -L2R IE  \*setup req  \*release req  \*Hello req  \*setup resp  \*release resp  \*hello resp  -L2R payload IE  \*Cluster req  \*Update req  \*Leave req  \*flow req  \*cluster resp  \*Update resp  \*leave resp  \*flow\_resp |
| Multiple entry and exit points | Yes  Using the service/gateway, Tree root IDs fields |  | **Yes**  **Using the multiple PANN messages from multiple gateways** |  |

1. **Other functionalities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Functionality** | **NICT** | **OKI** | **ETRI 1(Hybrid L2R)** | **ETRI 2 (TCT)** |
| Cross PAN routing | n/a | n/a | Yes | n/a |
| Data aggregation | Yes | n/a | n/a | n/a |
| High reliability (retransmission to alternative neighbor) | Yes | n/a | n/a | n/a |
| Multicast routing | Yes  Using multicast subscription IE |  | **Yes**  **Using multicast option field in routing table and control messages** |  |