IEEE P802.11
Wireless LANs

|  |
| --- |
| TGay Functional Requirements |
| Date: 2015-09-13 |
| Author(s): |
| Name | Company | Address | Phone | email |
| Rob Sun  | Huawei  |  |  |  |
| Yan Xin | Huawei  |  |  |  |
| Osama Aboul-Magd | Huawei  |  |  |  |
| George Calcev | Huawei  |  |  |  |
| Lei Wang | Marvell |  |  |  |
| Edward Au | Marvell |  |  |  |
| Laurent Cariou | Intel |  |  |  |
| Carlos Cordeiro | Intel |  |  |  |
| Shadi Abu-Surra | Samsung |  |  |  |
| Sanghyun Chang | Samsung |  |  |  |
| Rakesh Taori | Samsung |  |  |  |
| TaeYoung Kim | Samsung |  |  |  |
| Jongho Oh | Samsung |  |  |  |
| HanGyu Cho | LG Electronics |  |  |  |
| Hiroyuki Motozuka | Panasonic |  |  |  |
| Gaius Wee | Panasonic |  |  |  |

Abstract

These are the functional and system performance requirements for TGay. The functional requirements must be addressed by the amendment.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Overview

This document includes functional requirements that address system performance metrics as specified in the PAR [1], CSD [2] and usage models [3] requirements. The PAR, CSD, and usage models requirements include bands of operation, maximum throughput, backward compatibility and coexistence, system performance, outdoor and mobility supports. Additional performance metrics include requirements for lightly compressed and uncompressed 4K or 8K video streaming and fast link setup. Functional requirements are identified by the notation [Req X.Y.Z] where X and Y reprsent the section and sub-section the requirements belongs to, and Z represents the numerical sequence of the requirements.

The phrase “The TGay amendment provides a means” indicates that at least an optional feature must be incorporated into the TGay amendment addressing this requirement.

The phrase “The TGay devices are required to support” indicates that a mandatory feature must be incorporated into the TGay amendment addressing this requirement.

## Summary of Functional Requirements

*-add summary list for convenience when Functional Requirements are complete*

# Functional Requirements

## Scope

### Bands of Operation

[Req 2.1.1] The TGay devices are required to support operations within 57 GHz and 64GHz frequency band.

[Req 2.1.2]  The TGay devices provide a means of supporting above 64 GHz frequence bands if such bands are opened for unlicensed operation in at least one regulatory domain

###  Maximum throughput

[Req 2.1.3] The TGay amendment provides a means of achieving a maximum throughput of at least 20 Gbps, as measured at the MAC data service access point (SAP).

### Backward Compatibility and Coexistence

It is in the best interest of users and the industry to strive for a level of coexistence between wireless systems. TGay is required to create a Coexistence Assurance document demonstrating coexistence with other systems in a shared 60 GHz band .

Backward compatibility below means that an implementation of TGay amendment shall support all mandatory modes of TGad amendment.

[Req 2.1.3] The TGay devices are required to support backward compatibility with legacy directional multigigabit (DMG) devices (IEEE 802.11ad) operating in the same band.

[Req 2.1.4] The TGay devices are required to support coexistence with legacy devices operating in the same band.

## System Performance

### Range

[Req 2.2.1] The TGay amendment provides a means of achieving a range of at least 10 meters in an indoor environment and at least 100 meters in an outdoor environment in LOS PHY channel condition.

### Power efficiency

[Req 2.2.2] The TGay devices are required to support at least the same power efficiency per station as legacy DMG devices.

### Video Requirements

The TGay devices are required to support lightly compressed 4K and 8K UHD video requirements for data rate, packet loss rate and delay, as measured at the MAC data SAP.

|  |  |  |  |
| --- | --- | --- | --- |
| Req number | Parameter | Value | Description |
| Req 2.2.3 | Data rate |  1.5 Gbps (Peak) [4] | 4K UHD, 2160p(RGB): 3840x2160 pixels, 24bits/pixels,60frames/s, 8 bit per color |
| Req 2.2.4 | Packet loss rate  | 1e-8 |
| Req 2.2.5 | Delay | 10 ms |

|  |  |  |  |
| --- | --- | --- | --- |
| Req number | Parameter | Value | Description |
| Req 2.2.6 | Data rate | 8.0 Gbps (Peak) [4] | 8K UHD, 4320p(RGB): 7680x4320 pixels, 24bits/pixels,60frames/s8 bit per color |
| Req 2.2.7 | Packet loss rate  | 1e-8 |
| Req 2.2.8 | Delay | 10 ms |

The TGay amendment may provide a means of supporting uncompressed 4K and 8K UHD video requirements for data rate, packet loss rate and delay, as measured at the MAC data SAP.

|  |  |  |  |
| --- | --- | --- | --- |
| Req number | Parameter | Value | Description |
| Req 2.2.9 | Data rate |  18.0 Gbps [5] | 4K UHD uncompressed3840x2160 pixels, 30bits/pixels,60frames/s, 8 bit per colorChroma sampling (4:4:4) |
| Req 2.2.10 | Packet loss rate  | 1e-8 |
| Req 2.2.11 | Delay | 10 ms |

|  |  |  |  |
| --- | --- | --- | --- |
| Req number | Parameter | Value | Description |
| Req 2.2.12 | Data rate | 28.0 Gbps [5] | 8K UHD uncompressed7680x4320 pixels, 24bits/pixels,60frames/s8 bit per colorChroma sampling (4:2:0) |
| Req 2.2.13 | Packet loss rate  | 1e-8 |
| Req 2.2.13 | Delay | 10 ms |

## Fast Link Setup

[Req 2.3.1] The TGay amendment provides a means of providing secure fast link setup.

## Outdoor Support

[Req 2. 4.1] The TGay amendment provides a means of supporting outdoor operations.

## Mobility Support

[Req 2.5.1] The TGay amendment provides a means of supporting mobility operations at a pedestrian speed (e.g., 3Km/h,) or body movements (i.e neck roll, neck pitch)

# Compliance to PAR and CSD

[Req 4.1] The TGay devices are required to support a means of complying with the PAR and the CSD.

# References

1. 11-14-1151-08-ng60-ng60-proposed-par.docx
2. 11-14-1152-08-ng60-ng60-proposed-csd.docx
3. 11-15-0328-04-ng60-ng-60-usage-models.ppt
4. 11-015-0830-00-00ay-docking-usage-model.ppt
5. 11-15-0345-01-ng60-8K UHD Wireless Transfer Usage Model for NG 60.ppt