

Errata Correction 25800: Expedited Fixes to Frame Space Update and Channel Sounding

Bluetooth® Errata Correction

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This Errata Correction applies to the following specification:

- Bluetooth Core Specification v6.0 (“Source Specification”) [\[1\]](#)

Abstract:

This Errata Correction makes some corrections to the Frame Space Update and Channel Sounding features of the Source Specification.



Version History

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1 Drafting conventions

1.1 Language

Refer to and follow any terminology, language conventions, and interpretation sections of the Source Specification(s).

1.2 Formatting and color

The formatting and color conventions described in [Table 1.1](#) below are used in this Errata Correction to describe the specific changes and additions to the Source Specification(s) identified on the cover page.

Text Color	Description
black	Text that is unmodified from the Source Specification.
red	Text that is added to the Source Specification.
red-strikethrough	Text that is deleted from the Source Specification.
[green bracketed text]	Comments that explain the changes to be made to the Source Specification.
[...]	Indicates the section of the Source Specification that includes additional text that is not included in black text.
blue	Default color used for section numbers and headings of this document.

Table 1.1: Color key for headings, captions, and body text

2 Changes to Bluetooth Core Specification v6.0

This Section sets forth the specific changes and additions, using the formatting and color conventions described in Section 1.2, to Bluetooth Core Specification v6.0.

2.1 Changes to Bluetooth Core Specification, v6.0, Volume 4, Part E: Host Controller Interface Functional Specification

2.1.1 [Modified Section] Section 7.8.151 LE Frame Space Update command

[The modified text with changes is shown below.]

[...]

If the Host issues this command with no bits set in the PHYS or the Spacing_Types parameter, then the Controller shall reject the command and return the error code *Invalid HCI Command Parameters* (0x12).

If the Host issues this command with a bit set in the PHYS or the Spacing_Types parameter that the Controller does not support, then the Controller shall reject the command and return the error code *Unsupported Feature or Parameter Value* (0x11) ~~*Invalid HCI Command Parameters* (0x12)~~.

If the Host issues this command with a bit set in the PHYS or the Spacing_Types parameter that the remote device does not support, then the Controller shall reject the command and return the error code *Unsupported Remote Feature* (0x1A). The Controller can determine this either because it receives a corresponding error response from the remote device or because it has checked the features supported by the remote device.

Command parameters:

[...]

2.2 Changes to Bluetooth Core Specification, v6.0, Volume 6, Part B: Link Layer Specification

2.2.1 [Modified Section] Section 2.4.2.44 LL_CS_CAPABILITIES_REQ and LL_CS_CAPABILITIES_RSP

[The modified text with changes is shown below.]

[...]

A device that supports the RTT_Capability shall support the following section of this document:

- [Vol 6] Part H, Section 3.1

The RTT_AA_Only_N, RTT_Sounding_N, and RTT_Random_Sequence_N fields shall hold the values specified by the product manufacturer to satisfy the accuracy requirements described in [Vol 6] Part H, Section 3.1.2. If an implementation supports optional transmit and receive PHYs as indicated by the CS_SYNC_PHY_Capability field, then the ~~corresponding~~**respective** field shall be set to the highest “N” value derived when tested across all mandatory and optional PHYs. ~~The value of RTT_AA_Only_N shall be non-zero.~~ If an implementation does not support ~~another~~**an** RTT type, then the ~~corresponding~~**respective** field shall be set to 0.



A device that supports any of the RTT types shall support the following sections of this document:

- [Vol 6] Part H, Section 2
- [Vol 6] Part H, Section 3.1

[...]

2.2.2 [Modified Section] Section 4.5.10 Data PDU length management

[The modified text with changes is shown below.]

[...]

- *connIntervalRequired* - the value $T_IFS_ACL_CP + T_MCES + \min (connEffectiveMaxRxTime, ((connEffectiveMaxRxOctets \times 64) + 976))$.
- *connIntervalUncodedMin* - the value *connIntervalRequired* + 328.
- *connIntervalCodedMin* - the value *connIntervalRequired* + 2704.

[...]

2.2.3 [Modified Section] Section 5.1.1 Connection Update procedure

[The modified text with changes is shown below.]

[...]

A Central shall not issue the LL_CONNECTION_UPDATE_IND PDU when a CS procedure or CS procedure instance repeats, as described in Section 4.5.18.1, are in progress.

The Link Layer of the Central shall determine the *connInterval* from the interval range given by the Host (*connIntervalmin* and *connIntervalmax*); the value chosen shall be at least *connIntervalUncodedMinRequired* μ s. However, if the current PHY is the LE Coded PHY and the Controller supports the LE Data Packet Length Extension feature, then the new connection interval shall be at least *connIntervalCodedMin* μ s.

The Link Layer shall indicate to the Host the selected interval value.

[...]

2.2.4 [Modified Section] Section 5.1.7.2 Responding to LL_CONNECTION_PARAM_REQ and LL_CONNECTION_PARAM_RSP PDUs

[The modified text with changes is shown below.]

[...]

- The Peripheral shall respond to an LL_CONNECTION_PARAM_REQ PDU with an LL_CONNECTION_PARAM_RSP PDU. The rules for filling in various fields of the LL_CONNECTION_PARAM_RSP PDU are the same as those for filling in various fields of the LL_CONNECTION_PARAM_REQ PDU, as described in Section 5.1.7.1. The rules for handling a received LL_CONNECTION_PARAM_RSP PDU on the Link Layer of the Central are identical to the

rules for handling a received LL_CONNECTION_PARAM_REQ PDU that are described earlier in this section.

- The Central shall respond to an LL_CONNECTION_PARAM_REQ PDU or an LL_CONNECTION_PARAM_RSP PDU with an LL_CONNECTION_UPDATE_IND PDU. The Central should try to choose a value of Interval that is a multiple of PreferredPeriodicity if the Peripheral has set the PreferredPeriodicity field of the LL_CONNECTION_PARAM_REQ or LL_CONNECTION_PARAM_RSP PDU. ~~and~~The chosen value shall be at least *connIntervalUncodedMinRequired* μ s. However, if the current PHY is the LE Coded PHY and the Controller supports the LE Data Packet Length Extension feature, then the new connection interval shall be at least *connIntervalCodedMin* μ s. The Central should try to pick the values of WinOffset and WinSize such that the timing of the new connection events matches one of the Offset0 to Offset5 fields of the LL_CONNECTION_PARAM_REQ PDU or the LL_CONNECTION_PARAM_RSP PDU sent by the Peripheral. The Instant field of the LL_CONNECTION_UPDATE_IND PDU is set as described in Section 5.1.1.

Once the Central issues the LL_CONNECTION_UPDATE_IND PDU, the connection parameters get updated as described in Section 5.1.1.

[...]

2.2.5 [Modified Section] Section 5.1.30 Frame Space Update procedure

[The modified text with changes is shown below.]

[...]

FS_Max shall be greater than or equal to the frame space value in use. If FS_Min and FS_Max in the LL_FRAME_SPACE_REQ PDU are both less than the frame space value in use for any of the selected frame space types and PHYs, then the responding device may reject the request by sending an LL_REJECT_EXT_IND PDU with the error code set to *Unsupported Feature or Parameter Value* (0x11).

If the resulting frame space value causes *connIntervalRequiredUncodedMin* (if the current PHY is an LE Uncoded PHY) or *connIntervalCodedMin* (if the current PHY is the LE Coded PHY) to exceed the connection interval and the change is being done on the existing ACL connection on the PHY in use, then the responding device shall reject the request by sending an LL_REJECT_EXT_IND PDU with the error code set to *Unsupported Feature or Parameter Value* (0x11).

The responding device shall set the FS field of the LL_FRAME_SPACE_RSP PDU to a value between the FS_Min and FS_Max of the LL_FRAME_SPACE_REQ PDU, and should set it to the lowest value the responding device supports within that range.

[...]

3 References

- [1] Bluetooth Core Specification, Version 6.0

