Randomized RPA Updates

Bluetooth® Validation Specification

- **Version:** VSr02_PR
- **Version Date:** 2024-10-29
- **Prepared By:** Core Specification Work Group

This CR proposes changes to the following specification (“Source Specification”):

- Bluetooth Core Specification Version 5.4 [1]

Abstract:

This document specifies the changes to the Core specification required to add the Randomized Resolvable Private Address (RPA) Updates feature.

Contents

1 Language

1.1 Language conventions

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

2 Conventions used in this specification

The formatting and color conventions described in Table 2.1 below are used in the CR to describe the specific changes and additions that are proposed to the Source Specification(s) identified on the cover page.

Text Color	Description
black	Text that is unmodified from the Source Specification. Note: The text of the Source Specification may not be black and may contain tracked changes or other colored text that are reflected as black text in this document.
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 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 2.1: Color key for headings, captions, and body text

3 Changes to Core Specification

This Section sets forth the specific changes and additions, using the formatting and color conventions described in Section 2, that are proposed to the Core Specification [1].

3.1 Changes to Volume 0, Part C, Section X: Acknowledgments for vTBD

3.1.1 **[New Section]** X Acknowledgments for vTBD

3.1.1.1 **[New Section]** X.1 Randomized RPA Updates

Hai Shalom	Google LLC

3.2 Changes to Volume 0, Part D, Section 4: Features and their types

3.2.1 **[Modified Section]** 4 Features and their types

[…]

Randomized RPA Updates	TBD	2

[…]

3.3 Changes to Volume 4, Part E, Section 3: Overview of commands and events

3.3.1 **[Modified Section]** 3 Overview of commands and events

[…]

LE Set Resolvable Private Address Timeout command	4.2 TBD	The HCI_LE_Set_Resolvable_Private_Address_Timeout command sets the length of time the Controller uses a random private address before a new random private address starts being used. The [v2] version enables the timeout to be randomly varied within a specified range.	E	[v1] C.9 [v2] C.10

[…]

C.10: Optional if LE Feature (LL Privacy) is supported, otherwise excluded.

[…]

3.4 Changes to Volume 4, Part E, Section 6: HCI configuration parameters

3.4.1 [Modified Section] 6.27 Supported commands

[…]

35	0	HCI_LE_Read_Local_Resolvable_Address
	1	HCI_LE_Set_Address_Resolution_Enable
	2	HCI_LE_Set_Resolvable_Private_Address_Timeout [v1]
	3	HCI_LE_Read_Maximum_Data_Length
	4	HCI_LE_Read_PHY
	5	HCI_LE_Set_Default_PHY
	6	HCI_LE_Set_PHY
	7	HCI_LE_Receiver_Test [v2]

[…]

48	2	HCI_LE_Set_Resolvable_Private_Address_Timeout [v2]

[…]

3.5 Changes to Volume 4, Part E, Section 7: HCI commands and events

3.5.1 [Modified Section] 7.8.45 LE Set Resolvable Private Address Timeout command

Command	OCF	Command Parameters	Return Parameters
HCI_LE_Set_Resolvable_Private_Address_Timeout [v2]	0x009E	RPA_Timeout_Min, RPA_Timeout_Max	Status
HCI_LE_Set_Resolvable_Private_Address_Timeout [v1]	0x002E	RPA_Timeout	Status

Description:

The HCI_LE_Set_Resolvable_Private_Address_Timeout [v1] command sets the length of time the Controller uses a Resolvable Private Address before a new ~~r~~Resolvable ~~p~~Private ~~a~~Address is generated and starts being used.

The HCI_LE_Set_Resolvable_Private_Address_Timeout [v2] command sets the range of time the Controller uses a Resolvable Private Address before a new Resolvable Private Address is generated and starts being used.

This timeout applies to all resolvable private addresses generated by the Controller.

The RPA_Timeout parameter specifies the time after which a new Resolvable Private Address shall start being used.

The RPA_Timeout_Min parameter specifies the minimum time after which a new Resolvable Private Address shall start being used.

The RPA_Timeout_Max parameter specifies the maximum time after which a new Resolvable Private Address shall start being used.

When the Controller supports the HCI_LE_Set_Resolvable_Private_Address_Timeout [v2] command and needs to set a new timeout (e.g., when the RPA is set for the first time, or when the current timeout expires), the new timeout shall be a random value between RPA_Timeout_Min and RPA_Timeout_Max generated so as to meet the requirements for random number generation defined in [Vol 2] Part H, Section 2.

If RPA_Timeout_Min is greater than RPA_Timeout_Max, then the Controller shall return the error code *Invalid HCI Command Parameters* (0x12).

Command parameters:

RPA_Timeout: Size: 2 octets

Value	Parameter Description
0xXXXX	RPA~~_T~~ timeout, ~~measured~~ in seconds Range: 0x0001 to 0x0E10 Time range: 1 s to 1 hour Default: 0x0384 (900 s or 15 minutes)

RPA_Timeout_Min: Size: 2 octets

Value	Parameter Description
0xXXXX	Minimum RPA timeout, in seconds Range: 0x0001 to 0x0E10 Time range: 1 s to 1 hour Default: 0x01E0 (480 s or 8 minutes)

RPA_Timeout_Max: Size: 2 octets

Value	Parameter Description
0xXXXX	Maximum RPA timeout, in seconds Range: 0x0001 to 0x0E10 Time range: 1 s to 1 hour Default: 0x0384 (900 s or 15 minutes)

[…]

Appendix A References

[1] Bluetooth Core Specification, Version 5.4