Supporting Document
Mandatory Technical Document

PP-Module for Bluetooths
Version: 1.0
2021-04-15
National Information Assurance Partnership

Foreword

This is a Supporting Document (SD), intended to complement the Common Criteria version 3 and the associated Common Evaluation Methodology for Information Technology Security Evaluation.

SDs may be “Guidance Documents”, that highlight specific approaches and application of the standard to areas where no mutual recognition of its application is required, and as such, are not of normative nature, or “Mandatory Technical Documents”, whose application is mandatory for evaluations whose scope is covered by that of the SD. The usage of the latter class is not only mandatory, but certificates issued as a result of their application are recognized under the CCRA.

Technical Editor:
National Information Assurance Partnership (NIAP)

Document history:

Version	Date	Comment
1.0	2021-04-15	Initial Release

General Purpose:
The purpose of this SD is to define evaluation methods for the functional behavior of Bluetooth products.

Acknowledgments:
This SD was developed with support from NIAP Bluetooths Technical Community members, with representatives from industry, government agencies, Common Criteria Test Laboratories, and members of academia.

Table of Contents

1 Introduction

1.1 Technology Area and Scope of Supporting Document

The scope of the PP-Module for Bluetooths is to describe the security functionality of Bluetooths products in terms of [CC] and to define functional and assurance requirements for them. The PP-Module is intended for use with the following Base-PPs:

- Mobile Device Fundamentals, version 3.3
- Protection Profile for General Purpose Operating Systems, version 4.3

This SD is mandatory for evaluations of TOEs that claim conformance to a PP-Configuration that includes the PP-Module for :

- Bluetooths, Version 1.0

As such it defines Evaluation Activities for the functionality described in the PP-Module as well as any impacts to the Evaluation Activities to the Base-PP(s) it modifies.

Although Evaluation Activities are defined mainly for the evaluators to follow, in general they also help developers to prepare for evaluation by identifying specific requirements for their TOE. The specific requirements in Evaluation Activities may in some cases clarify the meaning of Security Functional Requirements (SFR), and may identify particular requirements for the content of Security Targets (ST) (especially the TOE Summary Specification), user guidance documentation, and possibly supplementary information (e.g. for entropy analysis or cryptographic key management architecture).

1.2 Structure of the Document

Evaluation Activities can be defined for both SFRs and Security Assurance Requirements (SAR), which are themselves defined in separate sections of the SD.

If any Evaluation Activity cannot be successfully completed in an evaluation, then the overall verdict for the evaluation is a 'fail'. In rare cases there may be acceptable reasons why an Evaluation Activity may be modified or deemed not applicable for a particular TOE, but this must be approved by the Certification Body for the evaluation.

In general, if all Evaluation Activities (for both SFRs and SARs) are successfully completed in an evaluation then it would be expected that the overall verdict for the evaluation is a ‘pass’. To reach a ‘fail’ verdict when the Evaluation Activities have been successfully completed would require a specific justification from the evaluator as to why the Evaluation Activities were not sufficient for that TOE.

Similarly, at the more granular level of assurance components, if the Evaluation Activities for an assurance component and all of its related SFR Evaluation Activities are successfully completed in an evaluation then it would be expected that the verdict for the assurance component is a ‘pass’. To reach a ‘fail’ verdict for the assurance component when these Evaluation Activities have been successfully completed would require a specific justification from the evaluator as to why the Evaluation Activities were not sufficient for that TOE.

1.3 Terms

The following sections list Common Criteria and technology terms used in this document.

1.3.1 Common Criteria Terms

Assurance	Grounds for confidence that a TOE meets the SFRs [CC].
Base Protection Profile (Base-PP)	Protection Profile used as a basis to build a PP-Configuration.
Collaborative Protection Profile (cPP)	A Protection Profile developed by international technical communities and approved by multiple schemes.
Common Criteria (CC)	Common Criteria for Information Technology Security Evaluation (International Standard ISO/IEC 15408).
Common	Within the context of the Common Criteria Evaluation and Validation Scheme (CCEVS), an

Criteria Testing Laboratory	IT security evaluation facility accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) and approved by the NIAP Validation Body to conduct Common Criteria-based evaluations.
Common Evaluation Methodology (CEM)	Common Evaluation Methodology for Information Technology Security Evaluation.
Distributed TOE	A TOE composed of multiple components operating as a logical whole.
Extended Package (EP)	A deprecated document form for collecting SFRs that implement a particular protocol, technology, or functionality. See Functional Packages.
Functional Package (FP)	A document that collects SFRs for a particular protocol, technology, or functionality.
Operational Environment (OE)	Hardware and software that are outside the TOE boundary that support the TOE functionality and security policy.
Protection Profile (PP)	An implementation-independent set of security requirements for a category of products.
Protection Profile Configuration (PP-Configuration)	A comprehensive set of security requirements for a product type that consists of at least one Base-PP and at least one PP-Module.
Protection Profile Module (PP-Module)	An implementation-independent statement of security needs for a TOE type complementary to one or more Base-PPs.
Security Assurance Requirement (SAR)	A requirement to assure the security of the TOE.
Security Functional Requirement (SFR)	A requirement for security enforcement by the TOE.
Security Target (ST)	A set of implementation-dependent security requirements for a specific product.
Target of Evaluation (TOE)	The product under evaluation.
TOE Security Functionality (TSF)	The security functionality of the product under evaluation.
TOE Summary Specification (TSS)	A description of how a TOE satisfies the SFRs in an ST.

1.3.2 Technical Terms

Authentication	Verifying the identity of communicating devices based on their Bluetooth address. Bluetooth does not provide native user authentication.
Authorization	Allowing the control of resources by ensuring that a device is authorized to use a service before permitting it to do so.
BD_ADDR	The Bluetooth device Address, which is used to identify a Bluetooth device.
BR/EDR	Bluetooth basic rate (BR) and enhanced data rate (EDR).
BR/EDR Controller	A term referring to the Bluetooth Radio, Baseband, Link Manager, and HCI layers.
BR/EDR	A Channel that is divided into time slots in which each slot is related to an RF hop frequency. Consecutive hops normally correspond to different RF hop frequencies and

Piconet Physical Channel	occur at a standard hop rate of 1600 hops per second. These consecutive hops follow a pseudo-random hopping sequence, hopping through a 79 RF channel set, or optionally fewer channels when Adaptive Frequency Hopping (AFH) is in use. BR/EDR/LE Bluetooth basic rate (BR), enhanced data rate (EDR) and low energy (LE).
Bluetooth	A wireless communication link operating in the unlicensed ISM band at 2.4 GHz using a frequency hopping transceiver. It allows real-time AV and data communications between Bluetooth Hosts. The link protocol is based on time slots.
Bluetooth Baseband	The part of the Bluetooth system that specifies or implements the medium access and physical layer procedures to support the exchange of real-time voice, data information streams, and ad hoc networking between Bluetooth devices.
Bluetooth Controller	A generic term referring to a Primary Controller with or without a Secondary Controller.
Bluetooth Device	A device that is capable of short-range wireless communications using the Bluetooth system.
Bluetooth Device Address	A 48 bit address used to identify each Bluetooth device.
Connect (to service)	The establishment of a connection to a service. If not already done, this also includes establishment of a physical link, logical transport, logical link and L2CAP channel.
Connectable device	A BR/EDR device in range that periodically listens on its page scan physical channel and will respond to a page on that channel. An LE device that is advertising using a connectable advertising event.
Connected devices	Two BR/EDR devices and with a physical link between them. Connecting A phase in the communication between devices when a connection between the devices is being established. The connecting phase follows after the link establishment phase is completed.
Connection	An interaction between two peer applications or higher layer protocols mapped onto an L2CAP channel.
Connection establishment	A procedure for creating a connection mapped onto a channel.
Connection event	A series of one or more pairs of interleaving data packets sent between a master and a slave on the same physical channel.
Creation of a secure connection	A procedure of establishing a connection, including authentication and encryption.
Creation of a trusted relationship	A procedure where the remote device is marked as a trusted device. This includes storing a common link key for future authentication, or pairing, when a link key is not available.
Device discovery	A procedure for retrieving the Bluetooth device address, clock, class-of-device field and used page scan mode from discoverable devices.
Discoverable Mode	A Bluetooth device that is performing inquiry scans in BR/EDR or advertising with a discoverable or connectable advertising event with a discoverable flag set in LE.
Discoverable device	A BR/EDR device in range that periodically listens on an inquiry scan physical channel and will respond to an inquiry on that channel. An LE device in range that is advertising with a connectable or scannable advertising event with a discoverable flag set in the advertising data. This device is in the discoverable mode.
Discovery procedure	A Bluetooth device that is carrying out the inquiry procedure in BR/EDR or scanning for advertisers using a discoverable or connectable advertising event with a discoverable flag set in LE.
Host	A logical entity defined as all of the layers below the non-core profiles and above the Host Controller interface (HCI); i.e. Bluetooth Host attached to a Bluetooth Controller may communicate with other Bluetooth Hosts attached to their Controllers as well.
L2CAP Channel	A logical connection on L2CAP level between two devices serving a single application or higher layer protocol.
L2CAP Channel establishment	A procedure for establishing a logical connection on L2CAP level.
LMP	

authentication	An LMP level procedure for verifying the identity of a remote device.
LMP pairing	A procedure that authenticates two devices and creates a common link key that can be used as a basis for a trusted relationship or a (single) secure connection.
Link	Shorthand for a logical link.
Link establishment	A procedure for establishing the default ACL link and hierarchy of links and channels between devices.
Link key	A secret that is known by two devices and is used to authenticate the link.
Logical Link Control and Adaptation Protocol (L2CAP)	A data link protocol used in the Bluetooth protocol stack.
Logical link	The lowest architectural level used to offer independent data transport services to clients of the Bluetooth system.
Name discovery	A procedure for retrieving the user-friendly name (the Bluetooth device name) of a connectable device.
OBEX Push	A method of Bluetooth one-way file transfer that is initiated by the entity that is providing the file.
PIN	A user-friendly value that can be used to authenticate connections to a device before pairing has taken place.
Paired device	A Bluetooth device for which a link key has been created (either before connection establishment was requested or during connecting phase).
Piconet	A collection of devices occupying a shared physical channel where one of the devices is the Piconet Master and the remaining devices are connected to it.
Piconet Master	The BR/EDR device in a piconet whose Bluetooth Clock and Bluetooth Device Address are used to define the piconet physical channel characteristics.
Piconet Slave	Any BR/EDR device in a piconet that is not the Piconet Master, but is connected to the Piconet Master.
RFCOMM	A transport protocol used in the Bluetooth protocol stack that emulates RS-232 serial port connections.
Trusted Device	A device that has a fixed relationship with another device and has full access to all services.
Unknown device	A Bluetooth device for which no information (Bluetooth Device Address, link key or other) is stored.
Untrusted Device	A device that does not have an established relationship with another Bluetooth device, which results in the untrusted device receiving restricted access to services.

2 Evaluation Activities for SFRs

The EAs presented in this section capture the actions the evaluator performs to address technology specific aspects covering specific SARs (e.g. ASE_TSS.1, ADV_FSP.1, AGD_OPE.1, and ATE_IND.1) – this is in addition to the CEM workunits that are performed in Section 3 Evaluation Activities for SARs.

Regarding design descriptions (designated by the subsections labeled TSS, as well as any required supplementary material that may be treated as proprietary), the evaluator must ensure there is specific information that satisfies the EA. For findings regarding the TSS section, the evaluator's verdicts will be associated with the CEM workunit ASE_TSS.1-1. Evaluator verdicts associated with the supplementary evidence will also be associated with ASE_TSS.1-1, since the requirement to provide such evidence is specified in ASE in the PP.

For ensuring the guidance documentation provides sufficient information for the administrators/users as it pertains to SFRs, the evaluator's verdicts will be associated with CEM workunits ADV_FSP.1-7, AGD_OPE.1-4, and AGD_OPE.1-5.

Finally, the subsection labeled Tests is where the authors have determined that testing of the product in the context of the associated SFR is necessary. While the evaluator is expected to develop tests, there may be instances where it is more practical for the developer to construct tests, or where the developer may have existing tests. Therefore, it is acceptable for the evaluator to witness developer-generated tests in lieu of

executing the tests. In this case, the evaluator must ensure the developer's tests are executing both in the manner declared by the developer and as mandated by the EA. The CEM workunits that are associated with the EAs specified in this section are: ATE_IND.1-3, ATE_IND.1-4, ATE_IND.1-5, ATE_IND.1-6, and ATE_IND.1-7.

2.1 Protection Profile for Bluetooths

The EAs defined in this section are only applicable in cases where the TOE claims conformance to a PP-Configuration that includes the Mobile Devices PP.

2.1.1 Modified SFRs

The PP-Module does not modify any requirements when the Mobile Devices PP is the base.

2.2 Protection Profile for Bluetooths

The EAs defined in this section are only applicable in cases where the TOE claims conformance to a PP-Configuration that includes the General Purpose Operating Systems PP.

2.2.1 Modified SFRs

The PP-Module does not modify any requirements when the General Purpose Operating Systems PP is the base.

2.3 TOE SFR Evaluation Activities

The PP-Module does not define any mandatory requirements (i.e. Requirements that are included in every configuration regardless of the PP-Bases selected).

2.4 Evaluation Activities for Optional SFRs

The PP-Module does not define any optional requirements.

2.5 Evaluation Activities for Selection-Based SFRs

The PP-Module does not define any selection-based requirements.

2.6 Evaluation Activities for Objective SFRs

3 Evaluation Activities for SARs

The PP-Module does not define any SARs beyond those defined within the base-PP to which it must claim conformance. It is important to note that a TOE that is evaluated against the PP-Module is inherently evaluated against the Base-PP as well. The Base-PP includes a number of Evaluation Activities associated with both SFRs and SARs. Additionally, the PP-Module includes a number of SFR-based Evaluation Activities that similarly refine the SARs of the Base-PPs. The evaluation laboratory will evaluate the TOE against the chosen Base-PP and supplement that evaluation with the necessary SFRs that are taken from the PP-Module.

4 Required Supplementary Information

This Supporting Document has no required supplementary information beyond the ST, operational guidance, and testing.

Appendix A - References

Identifier	Title
[Bluetooth]	Bluetooth Core Specifications, version 5.2; December 2019,
[CC]	Common Criteria for Information Technology Security Evaluation - • Part 1: Introduction and General Model, CCMB-2017-04-001, Version 3.1 Revision 5, April 2017. • Part 2: Security Functional Components, CCMB-2017-04-002, Version 3.1 Revision 5, April 2017. • Part 3: Security Assurance Components, CCMB-2017-04-003, Version 3.1 Revision 5, April

2017.

[CEM]	Common Evaluation Methodology for Information Technology Security - Evaluation Methodology, CCMB-2017-04-004, Version 3.1, Revision 5, April 2017.
[GPOS]	Protection Profile for General Purpose Operating Systems, Version 4.2.1, April 22, 2019
[MDF]	Protection Profile for Mobile Device Fundamentals, Version 3.2, April 15, 2021