Personal Area Networking (PAN)

***Bluetooth*® Implementation Conformance Statement (ICS) Proforma**

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1 General principles

1.1 Implementation Under Test (IUT) identification

Using the Bluetooth SIG qualification tool, the implementer is expected to declare details about what will be implemented.

1.2 Enforcement of inter-layer dependencies

This ICS includes one or more tables with inter-layer dependencies (ILDs). ILDs are used for specification requirements that are dependent on other supporting specifications. ILDs can refer to an individual ICS item in a separate layer (individual ILD), or it can refer to the full layer (full-layer ILD).

ILDs residing in an X2Core layer will be enforced from the Bluetooth SIG qualification tool in the following conditions, depending on where the referred ILD is residing:

Referred ILD resides in	Individual ILD	Full-layer ILD
Controller layer	Core-Complete configuration, or Referred layer is supported	N/A
Lower HCI layer	HCI is supported	N/A
Upper HCI layer	Core-Host configuration, or UHCI is supported	N/A
Host layer	Core-Host configuration, or Core-Complete configuration, or Referred layer is supported	N/A
X2Core layer	Core-Host configuration, or Core-Complete configuration, or Referred layer is supported	Core-Host configuration, or Core-Complete configuration

Table 1.1: Enforcement of an ILD within the Bluetooth SIG qualification tool

2 ICS declarations

2.1 Versions

Table 0: X.Y Versions

Item	Version	Reference	Status
1	PAN v1.0	[1]	M

2.2 Core Configuration

Table 0a: Core Configuration Requirements

Item	Core Configuration	Reference	Status
1	Profile supported over BR/EDR	[1] 2.3	C.1, C.3
2	Profile supported over LE	[1] 2.3	C.2

C.1: Excluded for this Profile IF CORE 41/2 “LE Core Configuration”.

C.2: Excluded for this Profile.

C.3: Mandatory for this Profile.

2.3 Roles

Table 1: Role Requirements

Item	Role	Reference	Status
1	Network Access Point	[1] 2.4	C.1
2	Group Ad-hoc Network	[1] 2.4	C.1
3	PAN User	[1] 2.4	C.1

C.1: Mandatory to support at least one.

2.4 Network Access Point Role

Network Access Point Application Features

Table 2: NAP Application Features

Prerequisite: PAN 1/1 “Network Access Point”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Bluetooth Network Encapsulation Protocol	[1] 1, 2.3	M	[2] BNEP
2	Support BNEP Forwarding	[1] 5.4	M	N/A
3	Support Layer 2-Bridging between PAN and External Network	[1] 5.4	C.1	N/A
4	Support IP Forwarding between PAN and External Network	[1] 5.4	C.1	N/A
5	Support BNEP Packet Filtering	[1] 5.1, 5.2, 5.4	O	N/A
6	Support IPv4	[1] 6.1.1	C.2	N/A

Item	Capability	Reference	Status	Inter-Layer Dependency
6a	Supports operable routable IPv4 address	[1] 6.3.1	O	N/A
6b	Support link-local address configuration for IPv4	[1] 6.3.1	C.4	N/A
7	Support ping client for IPv4	[1] 6.1.1	O	N/A
8	Support DHCP Server for IPv4	[1] 6.2.1	O	N/A
9	Support DNS Resolver for IPv4	[1] 6.2.1	O	N/A
9a	Support LLMNR Sender for IPv4	[1] 6.4	C.5	N/A
9b	Support LLMNR Responder for IPv4	[1] 6.4	O	N/A
10	Support HTTP Client for IPv4	[1] N/A	O	N/A
11	Support WAP Client for IPv4	[1] N/A	O	N/A
12	Support IPv6	[1] 6.1.2	C.3	N/A
13	Support ping client for IPv6	[1] 6.1.2	O	N/A
14	Support DNS Resolver for IPv6	[1] 6.2.2	O	N/A
14a	Support LLMNR Sender for IPv6	[1] 6.4	C.6	N/A
14b	Support LLMNR Responder for IPv6	[1] 6.4	O	N/A
15	Support HTTP Client for IPv6	[1] N/A	O	N/A
16	Support WAP Client for IPv6	[1] N/A	O	N/A
17	Supports Connectable Mode	[1] 11.4	M	N/A
18	NAP Service Record	[1] 8.1.1	M	N/A
19	Support at least three PANUs	[1] 12.2	O	N/A
20	Support at least two PANUs	[1] 12.2	O	N/A

C.1: Mandatory to support at least one.

C.2: Mandatory IF PAN 2/7 “Support ping client for IPv4” OR PAN 2/8 “Support DHCP Server for IPv4” OR PAN 2/9 “Support DNS Resolver for IPv4” OR PAN 2/9a “Support LLMNR Sender for IPv4” OR PAN 2/9b “Support LLMNR Responder for IPv4” OR PAN 2/10 “Support HTTP Client for IPv4” OR PAN 2/11 “Support WAP Client for IPv4”, otherwise Optional.

C.3: Mandatory IF PAN 2/13 “Support ping client for IPv6” OR PAN 2/14 “Support DNS Resolver for IPv6” OR PAN 2/14a “Support LLMNR Sender for IPv6” OR PAN 2/14b “Support LLMNR Responder for IPv6” OR PAN 2/15 “Support HTTP Client for IPv6” OR PAN 2/16 “Support WAP Client for IPv6”, otherwise Optional.

C.4: Mandatory IF PAN 2/6 “Support IPv4” AND NOT PAN 2/6a “Supports operable routable IPv4 address”, otherwise Optional.

C.5: Optional IF PAN 2/6 “Support IPv4”, otherwise Excluded.

C.6: Optional IF PAN 2/12 “Support IPv6”, otherwise Excluded.

2.5 Group Ad-Hoc network Role

2.5.1 Group Ad-Hoc Network Application Features

Table 3: GN Application Features

Prerequisite: PAN 1/2 "Group Ad-hoc Network"

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Bluetooth Network Encapsulation Protocol	[1] 1, 2.3	M	[2] BNEP
2	Support BNEP Forwarding	[1] 5.4	M	N/A
3	Support BNEP Packet Filtering	[1] 5.1, 5.2, 5.4	O	N/A
4	Support IPv4	[1] 6.1.1	C.1	N/A
5	Support ping client for IPv4	[1] 6.1.1	O	N/A
6–7	No longer used	N/A	N/A	N/A
7a	Support LLMNR Sender for IPv4	[1] 6.4	C.3	N/A
7b	Support LLMNR Responder for IPv4	[1] 6.4	O	N/A
8	Support HTTP Client for IPv4	[1] N/A	O	N/A
9	Support WAP Client for IPv4	[1] N/A	O	N/A
10	Support IPv6	[1] 6.1.2	C.2	N/A
11	Support ping client for IPv6	[1] 6.1.2	O	N/A
12	No longer used	N/A	N/A	N/A
12a	Support LLMNR Sender for IPv6	[1] 6.4	C.4	N/A
12b	Support LLMNR Responder for IPv6	[1] 6.4	O	N/A
13	Support HTTP Client for IPv6	[1] N/A	O	N/A
14	Support WAP Client for IPv6	[1] N/A	O	N/A
15	Supports Connectable Mode	[1] 11.4	M	N/A
16	GN Service Record	[1] 8.1.1	M	N/A
17	Support at least three PANUs	[1] 12.2	O	N/A
18	Support at least two PANUs	[1] 12.2	O	N/A

C.1: Mandatory IF PAN 3/5 "Support ping client for IPv4" OR PAN 3/7a "Support LLMNR Sender for IPv4" OR PAN 3/7b "Support LLMNR Responder for IPv4" OR PAN 3/8 "Support HTTP Client for IPv4" OR PAN 3/9 "Support WAP Client for IPv4", otherwise Optional.

C.2: Mandatory IF PAN 3/11 "Support ping client for IPv6" OR PAN 3/12a "Support LLMNR Sender for IPv6" OR PAN 3/12b "Support LLMNR Responder for IPv6" OR PAN 3/13 "Support HTTP Client for IPv6" OR PAN 3/14 "Support WAP Client for IPv6", otherwise Optional.

C.3: Optional IF PAN 3/4 "Support IPv4", otherwise Excluded.

C.4: Optional IF PAN 3/10 "Support IPv6", otherwise Excluded.

2.6 PAN User Role

2.6.1 PAN User Application Features

Table 4: PANU Application Features

Prerequisite: PAN 1/3 "PAN User"

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Bluetooth Network Encapsulation Protocol	[1] 1, 2.3	M	[2] BNEP
2	Support IPv4	[1] 6.1.1	C.1	N/A
3	Support ping client for IPv4	[1] 6.1.1	O	N/A
4	Support DHCP Client for IPv4	[1] 6.2.1	O	N/A
5	Support DNS Requester for IPv4	[1] 6.2.1	O	N/A
5a	Support LLMNR Sender for IPv4	[1] 6.4	C.2	N/A
5b	Support LLMNR Responder for IPv4	[1] 6.4	O	N/A
6	Support HTTP Client for IPv4	[1] N/A	O	N/A
7	Support WAP Client for IPv4	[1] N/A	O	N/A
8	Support IPv6	[1] 6.1.2	C.1	N/A
9	Support ping client for IPv6	[1] 6.1.2	O	N/A
10	Support DNS Requester for IPv6	[1] 6.2.2	O	N/A
10a	Support LLMNR Sender for IPv6	[1] 6.4	C.3	N/A
10b	Support LLMNR Responder for IPv6	[1] 6.4	O	N/A
11	Support HTTP Client for IPv6	[1] N/A	O	N/A
12	Support WAP Client for IPv6	[1] N/A	O	N/A
13	Support connections to multi-user NAPs/GNs	[1] 10.3	O	N/A
14	Supports Connectable Mode	[1] 11.4	O	N/A
15	PANU Service Record	[1] 8.1.1	O	N/A

C.1: Mandatory to support at least one.

C.2: Optional IF PAN 4/2 "Support IPv4", otherwise Excluded.

C.3: Optional IF PAN 4/8 "Support IPv6", otherwise Excluded.

2.7 GAP requirements

Table 5: GAP Requirements

Item	Capability	Reference	Status	Inter-Layer Dependency
1	General discoverable mode	[1] 3.2	C.1	[3] GAP 1/3

C.1: Mandatory IF PAN 1/1 "Network Access Point" OR PAN 1/2 "Group Ad-hoc Network", otherwise Optional.

2.8 SDP requirements

Table 6: SDP Requirements

Item	Capability	Reference	Status	Inter-Layer Dependency
1	SDP record present for PAN	[1] 8.1	C.1	N/A
2	Server	[1] 8.1	C.2	[4] SDP 1b/1
3	ProtocolDescriptorList	[1] 8.1	C.2	[4] SDP 9/2
4	LanguageBaseAttributeIdList	[1] 8.1	C.2	[4] SDP 9/6
5	BluetoothProfileDescriptorList	[1] 8.1	C.2	[4] SDP 9/14
6	ServiceName	[1] 8.1	C.2	[4] SDP 9/9
7	ServiceDescription	[1] 8.1	C.2	[4] SDP 9/10

C.1: Mandatory IF PAN 1/1 “Network Access Point” OR PAN 1/2 “Group Ad-hoc Network”, otherwise Optional.

C.2: Mandatory IF PAN 6/1 “SDP record present for PAN”, otherwise not defined.

3 References

[1] Personal Area Networking (PAN) Profile Specification, Version 1.0

[2] ICS Proforma for Bluetooth Network Encapsulation Protocol (BNEP)

[3] ICS Proforma for Generic Access Profile (GAP)

[4] ICS Proforma for Service Discovery Protocol (SDP)

4 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.0	2003-02-14	ICS Adopted
	1.0.1r1	2005-02-11	Editorial and format changes. Change document numbering.
1	1.0.1	2005-02-18	Prepare for publication.
	1.0.2r0	2005-09-29	TSE 823: Tables 2&3 to optionally support > 1 PANU
2	1.0.2	2005-10-12	Prepare for publication.
	1.0.3r0-2	2006-11-16-2007-01-08	TSE 1796: Table 2: Add 2 rows 6a and 6b, and footnote C4 for 6b. TSE 1894: Changes Tables 2, 3, and 4 to show LLMNR Sender and Responder support for IPv4 for IPv6 Changed adopted spec version from 1.1 to 1.0 Removed redundant reference section (MS)
3	1.0.3	2007-01-08	Prepare for publication.
	1.0.4r0	2008-02-01	TSE 2159: Table 3, 4, 5: Support for LLMNR Sender conditional
4	1.0.4	2008-04-01	Prepare for publication.
5	1.0.4a	2008-07-01	TSE 2632: Removed table number from first table introduced in v1.0.3
	1.0.5r0-1	2008-09-01 – 2008-12-01	TSE 2637; Table 2/9a, 14a: change footnotes, re-implement TSE 2632 with correct table numbering.
6	1.0.5	2008-12-01	Prepare for publication.
	1.0.6r0-1	2009-04-29 – 2009-06-04	TSE 2722: Clarification to TSE 2159 Tables 2, 3, 4 Correction to Table 4, C.2
7	1.0.6	2009-08-10	Prepare for publication.
	1.0.7r0	2011-11-10	TSE 4473: Table 1a; Add rows 3a, 3b TSE 4519: Table 2/8: modify, Table 3/6: remove
8	1.0.7	2012-03-30	Prepare for publication.
	1.0.8r01	2015-01-26	Update to current ICS template and conventions. TSE 6196: Add pre-requisites to tables.
	1.0.8r02	2015-06-01	Updated terminology from “PICS” to “ICS”
9	1.0.8	2015-07-14	Prepared for TCRL 2015-1 publication
	1.0.9r00	2015-10-05	TSE 6489: Added new item 1a/3c (BNEP Compressed Packet Transmission Destination Only); updated conditionals for items 1/3 and 1/3a.
10	1.0.9	2015-12-22	Prepared for TCRL 2015-2 publication.
	1.0.10r00	2018-04-04	TSE 10573 (rating 1): Template Conversion.
11	1.0.10	2018-07-01	Approved by BTI. Prepared for TCRL 2018-1 publication.

Publication Number	Revision Number	Date	Comments
	1.0.11r00	2018-10-03	TSE 10899 (rating 4): ICS: Revised Capability for Items 2/9, 2/14, 4/5, and 4/10. Deleted Items 3/7 and 3/12.
12	1.0.11	2018-11-21	Approved by BTI. Prepared for TCRL 2018-2 publication.
	1.0.12r00	2019-09-16	TSE 4382 (rating 2): Updated items in Tables 2, 3, and 4 to reflect that LLMNR is only an informational RFC. Updated template and copyright/legal info.
13	1.0.12	2020-01-07	Approved by BTI on 2019-11-17. Prepared for TCRL 2019-2 publication.
	p14r00–r01	2021-08-10 – 2021-12-06	TSE 17303 (rating 1): Split the BNEP ICS (Table 1a) from the PAN ICS into a separate document. Performed template-related editorials and formatting fixes. Performed consistency checker editorials. Updated copyright page to align with v2 of the DNMD.
14	p14	2022-01-25	Approved by BTI on 2021-12-19. Prepared for TCRL 2021-2 publication.
	p15r00	2023-10-19	TSE 23952 (rating 2): To address missing GAP and SDP ILDs, added the GAP and SDP ICSs to and removed the BNEP spec from the References section and updated the cross-refs throughout the doc. Removed “note” text at the beginning of the Network Access Point Role section. Updated conditional language throughout to current conventions. Added new Table 5 with new item 5/1, and new Table 6 with new items 6/1–6/7.
15	p15	2024-07-01	Approved by BTI on 2024-05-22. Prepared for TCRL 2024-1 publication.
	p16r00–r01	2025-02-27 – 2025-04-28	TSE 27012 (rating 2): Added “Versions” and “Core Configuration” sections and Tables 0 and 0a. Updated phrasing and formatting for 3/6, 3/7,and 3/12. Updated “References” section for PAN version number. Applied current ICS template. Deleted draft revision history comments prior to p0.
16	p16	2025-07-08	Approved by BTI on 2025-05-30. Prepared for TCRL pkg100 publication.

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