Management Component Transport Protocol (MCTP) PCC Transport Binding Specification

Version: 1.0.0

Document Identifier: DSP0292

Date: 2025-08-21

Version History: https://www.dmtf.org/dsp/DSP0292

Supersedes: None

Document Class: Normative

Document Status: Published

Document Language: en-US

10 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems management and interoperability. Members and non-members may reproduce DMTF specifications and documents for uses consistent with this purpose, provided that correct attribution is given. As DMTF specifications may be revised from time to time, the particular version and release date should always be noted.

11 Implementation of certain elements of this standard or proposed standard may be subject to third-party patent rights, including provisional patent rights (herein “patent rights”). DMTF makes no representations to users of the standard as to the existence of such rights and is not responsible to recognize, disclose, or identify any or all such third-party patent right owners or claimants, nor for any incomplete or inaccurate identification or disclosure of such rights, owners, or claimants. DMTF shall have no liability to any party, in any manner or circumstance, under any legal theory whatsoever, for failure to recognize, disclose, or identify any such third-party patent rights, or for such party’s reliance on the standard or incorporation thereof in its products, protocols, or testing procedures. DMTF shall have no liability to any party implementing such standards, whether such implementation is foreseeable or not, nor to any patent owner or claimant, and shall have no liability or responsibility for costs or losses incurred if a standard is withdrawn or modified after publication, and shall be indemnified and held harmless by any party implementing the standard from any and all claims of infringement by a patent owner for such implementations.

12 For information about patents held by third parties which have notified DMTF that, in their opinion, such patents may relate to or impact implementations of DMTF standards, visit https://www.dmtf.org/about/policies/disclosures.

13 This document's normative language is English. Translation into other languages is permitted.

CONTENTS

1 Foreword . . . 4
1.1 Acknowledgments . . . 4
2 Introduction . . . 5
2.1 Document conventions . . . 5
2.1.1 Typographical conventions . . . 5
3 Scope . . . 6
4 Normative references . . . 7
5 Terms and definitions . . . 8
6 Symbols and abbreviated terms . . . 10
7 Conventions . . . 11
7.1 Byte ordering . . . 11
7.2 Reserved and unassigned values . . . 11
8 MCTP over PCC Transport . . . 12
8.1 Management Component Relationships . . . 12
8.2 MCTP Endpoint ID Use and MCTP Bus Owner . . . 13
8.2.1 MCTP Endpoints . . . 13
8.2.2 MCTP Bus Owner and MCTP Discovery . . . 13
8.3 PCC Structures for MCTP Packet Binding . . . 13
8.4 Packet Format Encapsulation . . . 13
8.4.1 Extended Subspace Shared Memory Region Header . . . 14
8.4.2 MCTP Transport Header . . . 15
8.4.3 MCTP Message over PCC . . . 15
8.5 Supported Media . . . 15
8.6 MCTP Over PCC - Physical Address . . . 16
8.7 MCTP Messages Timing Requirements . . . 17
9 ANNEX A (informative) Brief introduction to PCC . . . 19
10 ANNEX B (informative) Notation . . . 21
11 ANNEX C (informative) Change log . . . 22

1 Foreword

The Management Component Transport Protocol (MCTP) Platform Communications Channel (PCC) Transport Binding Specification was prepared by the PMCI Working Group of DMTF.

DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems management and interoperability. For information about DMTF, see https://www.dmtf.org.

1.1 Acknowledgments

DMTF acknowledges the following individuals for their contributions to this document:

Editor:

- John S. Howard — Ampere Computing

Contributors:

- Patrick Caporale — Lenovo
- Samer El-Haj-Mahmoud — Arm Limited
- Rob Gough — Ampere Computing
- Janusz Jurski — Intel Corporation
- Eliel Louzoun — Intel Corporation
- Jose Marinho — Arm Limited
- Patrick Schoeller — Intel Corporation
- Hemal Shah — Broadcom Inc.

21 # 2 Introduction

22 The Management Component Transport Protocol (MCTP) Platform Communications Channel (PCC) Transport Binding Specification defines a transport binding for facilitating communication between host software and on-chip embedded management controllers (i.e., Auxiliary Management Controllers) via a PCC shared-memory interface.

23 The *MCTP Base Specification* describes the protocol and commands used for communication within and initialization of an MCTP network. The MCTP over PCC transport binding definition in this specification includes a packet format, physical address format, message routing, and discovery mechanisms for MCTP over PCC communications.

24 ## 2.1 Document conventions

25 ### 2.1.1 Typographical conventions

26 The following typographical conventions are used in this document:

- Document titles are marked in *italics*.
- Important terms that are used for the first time are marked in *italics*.
- Terms include a link to the term definition in the "Terms and definitions" clause, enabling easy navigation to the term definition.

3 Scope

This document provides the specification for the Management Component Transport Protocol (MCTP) transport binding using PCC.

29

4 Normative references

30 The following referenced documents are indispensable for the application of this document. For dated or versioned references, only the edition cited (including any corrigenda or DMTF update versions) applies. For references without a date or version, the latest published edition of the referenced document (including any corrigenda or DMTF update versions) applies. Earlier versions may not provide sufficient support for this specification.

31 DMTF DSP0236, *Management Component Transport Protocol (MCTP) Base Specification* 1.3
https://www.dmtf.org/sites/default/files/standards/documents/DSP0236_1.3.pdf

32 DMTF DSP0239, *Management Component Transport Protocol (MCTP) IDs and Codes* 1.11
https://www.dmtf.org/sites/default/files/standards/documents/DSP0239_1.11.pdf

33 DMTF DSP0274, *Security Protocol and Data Model (SPDM) Specification* 1.4 or later
https://www.dmtf.org/sites/default/files/standards/documents/DSP0274_1.4.pdf

34 DMTF DSP4014, *DMTF Process for Working Bodies* 2.14
https://www.dmtf.org/sites/default/files/standards/documents/DSP4014_2.14.pdf

35 IETF RFC 4122, *A Universally Unique IDentifier (UUID) URN Namespace*, July 2005
https://www.ietf.org/rfc/rfc4122.txt

36 ISO/IEC Directives, Part 2, *Principles and rules for the structure and drafting of ISO and IEC documents*
https://www.iso.org/sites/directives/current/part2/index.xhtml

37 UEFI Forum, *Advanced Configuration and Power Interface (ACPI) Specification* 6.5 or later
https://uefi.org/specifications

5 Terms and definitions

In this document, some terms have a specific meaning beyond the normal English meaning. Those terms are defined in this clause.

The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"), "may", "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 7. The terms in parentheses are alternatives for the preceding term, for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that ISO/IEC Directives, Part 2, Clause 7 specifies additional alternatives. Occurrences of such additional alternatives shall be interpreted in their normal English meaning.

The terms "clause", "subclause", "paragraph", and "annex" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 6.

The terms "normative" and "informative" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do not contain normative content. Notes and examples are always informative elements.

Refer to DSP0236 for terms and definitions that are used across the MCTP specifications.

The following additional terms are used in this document.

Auxiliary Management Controller (AMC)

See Management Component Relationships.

Communications Subspace

The data payload region of a PCC Subspace Shared Memory Region.

MCTP PCC Endpoint

A PCC endpoint on which MCTP through PCC communication is supported.

MCTP Signature

An assigned 32-bit value required in the subspace shared memory regions' header command field for MCTP messages on a PCC shared memory subspace region.

PCC Signature

The first 32 bits of a PCC subspace is composed of the value `0x50434300` (little endian) bitwise OR with the subspace ID (8-bit value) into the least significant byte of the PCC Signature field.

Platform Communications Channel Table (PCCT)

A table structure defined in the ACPI specification (see ACPI, Chapter 14) whose entries are subspace structures, each describing a PCC Subspace Shared Memory Region.

PCC Subspace Structure

58 An entry in a PCCT. Each PCC subspace structure describes:

- the address where the associated PCC subspace shared memory region is located
- the location of the doorbell register associated with the PCC instance
- the type of PCC shared memory region

59 The type value indicates the layout of the subspace structure and the layout of the header of the PCC shared memory region. Please refer to ACPI, Chapter 14 for details.

60 **PCC Subspace Shared Memory Region**

61 Generically, the PCC subspace shared memory region is a region of memory referenced by a PCC subspace structure from within a PCCT. A PCC subspace shared memory region has a header whose layout is dictated by the type value set in the PCC subspace structure that references the PCC subspace shared memory region. The PCC subspace shared memory region is the information transport/interface between the host entity and the AMC.

62 **Platform Entity**

63 A generic term for any entity on the platform side of a PCC interface including but not limited to: a platform controller, an Auxiliary Management Controller, etc.

64 **Subspace ID**

65 The index value into a PCCT of a PCC Subspace Structure

6 Symbols and abbreviated terms

Refer to DSP0236 for terms and definitions that are used across the MCTP specifications. For the purposes of this document, the following additional symbols and abbreviated terms apply.

ACPI

Advanced Configuration and Power Interface (see ACPI)

AMC

Auxiliary Management Controller

AML

ACPI Machine Language

MC

Management Controller

MCTP

Management Component Transport Protocol

MD

Managed Device

OSPM

Operating System–directed Power Management

PCC

Platform Communications Channel (see ACPI, Chapter 14)

PCCT

Platform Communications Channel Table (see ACPI, Chapter 14)

SPDM

Security Protocol and Data Model (see SPDM)

88 # 7 Conventions

89 ## 7.1 Byte ordering

90 Unless otherwise specified, the byte ordering of multibyte numeric fields or multibyte bit fields in this specification shall be "little endian": The lowest byte offset holds the least significant byte and higher offsets hold more significant bytes.

91 ## 7.2 Reserved and unassigned values

92 Unless otherwise specified, any reserved, unspecified, or unassigned values in enumerations or other numeric ranges are reserved for future definition by DMTF.

93 Unless otherwise specified, numeric or bit fields that are designated as reserved shall be written as 0 (zero) and ignored when read.

94 # 8 MCTP over PCC Transport

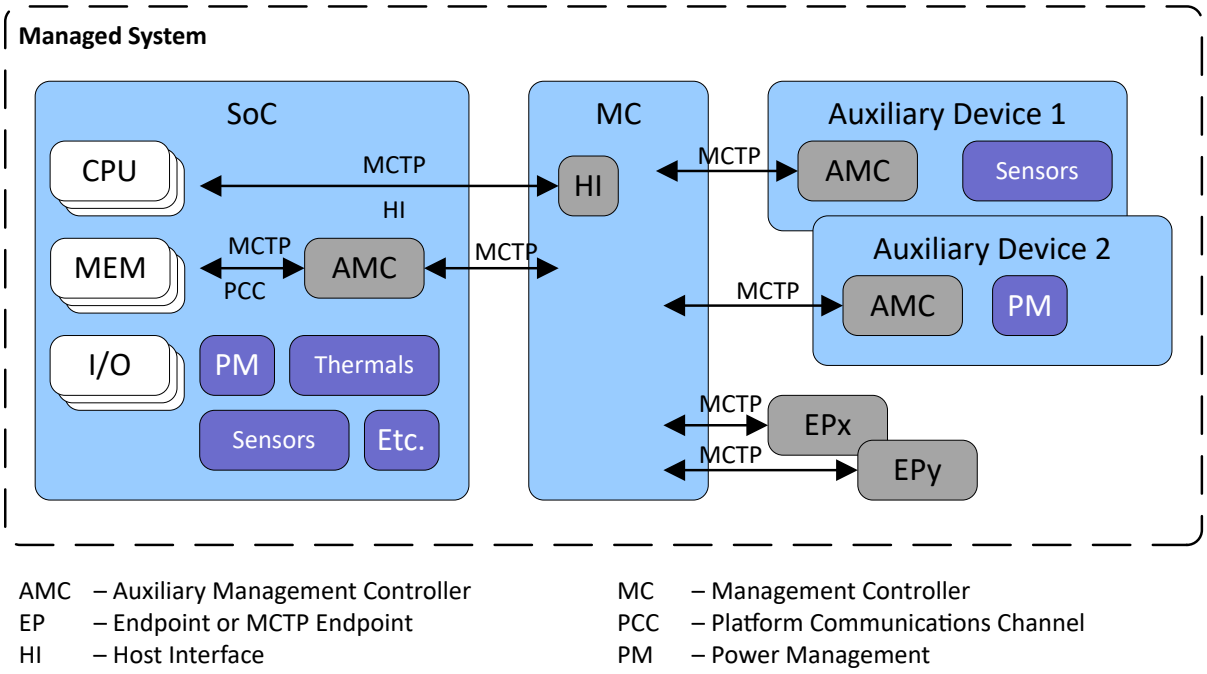
95 This document defines the medium-specific transport binding for transferring MCTP packets between endpoints using a PCC interface.

96 An MCTP over PCC compliant PCC device shall support MCTP over PCC communications on at least one PCC sideband interface.

97 ## 8.1 Management Component Relationships

98 Figure 1 illustrates the relationships between a Management Controller, SoC, Auxiliary Management Controllers, and MCTP Endpoints.

99



100 **Figure 1 — Management Component Relationships**

101 An Auxiliary Management Controller (AMC) is a microcontroller or processor in an auxiliary device (Accelerator, Storage, SoC, etc.) that interprets and processes management-related data and initiates management-related actions on managed devices (MDs). An AMC is complementary to management controllers (MC) because it feeds information to the MC.

102 ## 8.2 MCTP Endpoint ID Use and MCTP Bus Owner

103 ### 8.2.1 MCTP Endpoints

104 A single PCC instance shall serve as a communication channel between at most two MCTP capable entities, nominally host software and an embedded management controller/AMC. The AMC may provide one or more MCTP Endpoints for use over the PCC transport. An instantiation may implement statically defined EIDs or dynamically assigned EIDs. For point-to-point MCTP communications using physical addressing, only one MCTP endpoint is required and allowed on either device.

105 ### 8.2.2 MCTP Bus Owner and MCTP Discovery

106 The AMC side of a PCC channel shall implement the MCTP Bus Owner function for the PCC transport. It is responsible for distributing EIDs to Endpoints for instantiations that provide support for dynamically assigned EIDs.

107 MCTP to PCC binding is strictly a peer-to-peer, two-party network.

108 ## 8.3 PCC Structures for MCTP Packet Binding

109 MCTP binding to PCC uses the Extended PCC subspaces. The Extended PCC subspaces are composed of two subspace structures named Type 3 and Type 4. The shared memory regions associated with each Type are used for transmitting MCTP messages between the host (OSPM) and a platform entity (AMC) and together support a bidirectional message interface. The Type 3 shared memory region is used for host transmission of MCTP messages to the platform entity. The Type 4 shared memory region is used for platform entity transmission of MCTP messages to the host.

110 Either entity (host or AMC) may adopt the role of MCTP requester by transmitting an MCTP request message to the peer entity. It will always use the shared memory region designated for it when transmitting information, as defined above. When a response message is expected, it will arrive on the shared memory region designated for it to receive information, as defined above.

111 For example, the host will transmit MCTP request messages through the Type 3 shared memory region and receive MCTP response messages from the AMC through the Type 4 shared memory region. Similarly, the AMC will transmit MCTP request messages through the Type 4 shared memory region and receive MCTP response messages from the host through the Type 3 shared memory region.

112 The structure of the Extended PCC shared memory regions for Type 3 and Type 4 are identical, see Figure 2 for details.

113 ## 8.4 Packet Format Encapsulation

114 The Extended PCC Subspace is a region of shared memory that will carry the MCTP messages between entities.

Figure 2 is an illustration of how an MCTP message, including the MCTP transport header is instantiated in an Extended PCC subspace shared memory region.

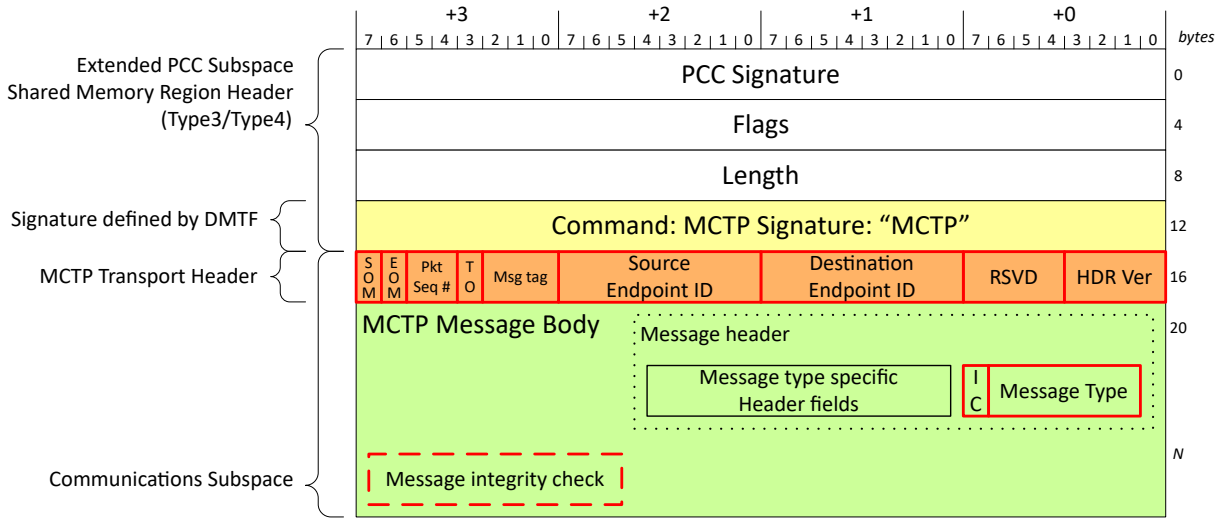


Figure 2 — MCTP binding to Extended PCC Subspace Shared Memory Region

The length of the Extended PCC subspace shared memory region is reported in the referencing Type 3 or Type 4 subspace structure in the PCCT. The shared memory region is aligned to a 4-byte boundary.

8.4.1 Extended Subspace Shared Memory Region Header

For details on most header fields, refer to ACPI, Chapter 14. The length of the header is 16 bytes.

The format of the **PCC Signature** is specified by the PCC standard. It includes the ASCII character values for `"PCC"` bitwise OR with the subspace ID of the referencing subspace structure in the PCCT in byte 0.

The **Flags** field is defined by the PCC standard.

The value of the **Length** field is defined in the PCC standard. The value in this field covers the Command field and the number of valid bytes in the Communications Subspace region. For an MCTP payload, this is the sum of:

- the Command field (4 bytes)
- the MCTP transport header (4 bytes)
- the length of the actual MCTP message body in the shared memory region

For this binding, the **Command** field shall be set to the ASCII characters `"MCTP"` (i.e., little-endian `0x5054434D`).

The **Communications Subspace** contains:

- The length of the available Communications Subspace region that was allocated by the system, which is:
  - the length of the entire subspace (as reported in the subspace structure in the PCCT)
  - minus the size of the Extended Subspace shared memory region header (16 bytes)
- The 4 bytes at offset 0 of the Communications Subspace, which shall be the standard MCTP transport header
- The MCTP message body which begins at offset 4 of the Communications Subspace (which is offset 20 of the

Extended Subspace shared memory region). The length of the MCTP message body is `PCC subspace header.length - 8`, where `8` is the combined length of the command field in the header and the MCTP transport header.

125 The system shall allocate at minimum a shared memory region sufficiently large to accommodate the MCTP baseline transmission unit size (64 bytes). For example, the minimum size for an Extended Subspace Shared Memory region supporting MCTP messaging spans the Extended Subspace memory region header (16 bytes), the MCTP transport header (4 bytes), plus 64 bytes for the MCTP baseline transmission unit, which is `16 + 4 + 64 = 84` bytes.

126 > **Note**
>
> 127 **Extended Subspace Shared Memory regions should be allocated sufficiently large so that full application layer messages can transit through the memory-based channel without requiring segmentation and reassembly. Note that 128 or 256 bytes of message size data space can be sufficient for most applications. Protocol layers, such as SPDM, have large request and response messages. However, these protocol layers may also have application protocol layer chunking mechanisms that don't require the MCTP layer to perform packetization and re-assembly.**

128 8.4.2 MCTP Transport Header

129 The MCTP Transport header fields are consistent with DSP0236.

130 8.4.3 MCTP Message over PCC

131 Table 1 summarizes the MCTP message body definitions for the MCTP to PCC binding.

132 **Table 1 — MCTP Message Body Field Encoding for PCC Transport**

Field	Description
Message Type	There are no PCC-specific MCTP message types. MCTP binding to PCC is used as a generic transport of any defined MCTP message type available in the DSP0239 specification.

133 8.5 Supported Media

134 This physical transport binding has been designed to work with the following media as defined in DSP0239 and listed

in Table 2. Use of this binding with other types of physical media is not covered by this specification. Refer to DSP0239 for all physical media supported by MCTP transport bindings.

135 An implementation that conforms to this specification shall support at least one of the PCC media listed in Table 2.

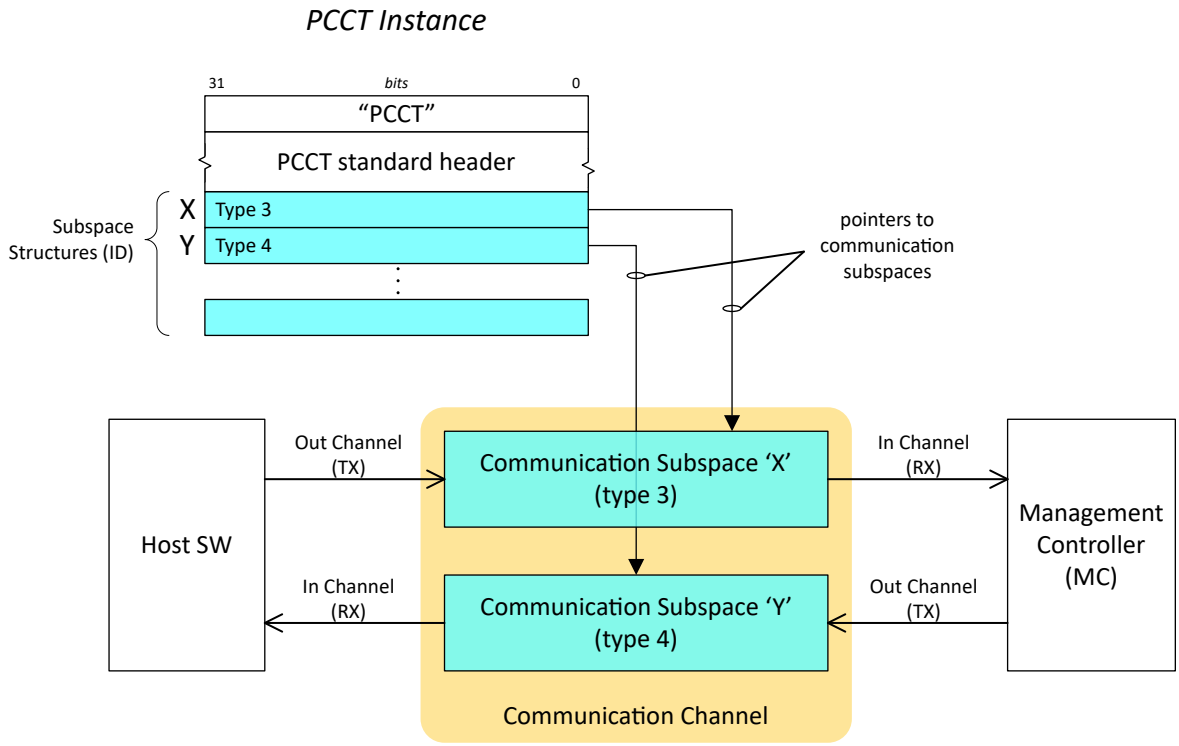
136 **Table 2 — Supported Media**

Physical Media Identifier	Description
0x1A	PCC compatible

137 ## 8.6 MCTP Over PCC - Physical Address

138 A number of standard MCTP commands include the physical address of the MCTP Endpoints in their response payload. The reference building blocks for the PCC physical address are illustrated in Figure 3.

139



140 **Figure 3 — MCTP over PCC Physical Address Components**

141 As described previously, the peer-to-peer communications channel between two PCC entities is composed of:

142 • A Platform Communications Channel Table (PCCT), which has table elements (subspace structures). Each subspace structure has an identifier (its index in the table).

143 • A pair of communications subspaces which are regions of memory referenced from the PCCT. Each communications subspace shared memory region is identified by the identifier of the PCCT subspace structure

that contains the pointer to the communications subspace shared memory instance. These communications subspaces are the communications channel for all data exchanges between the PCC entities.

144 The physical address of each PCC entity is composed as shown in Table 3.

145 **Table 3 — MCTP Endpoint Physical Address Format for MCTP over PCC**

Field Name	Size (Bytes)	Description
PCCT Parent ID	4	An identifier for the PCCT instance. An ordinal value starting at zero.
In Channel Subspace ID	2	This is the subspace ID (identifier) value of the subspace structure associated with the communications subspace that the MCTP Endpoint uses to receive information through the PCC transport.
Out Channel Subspace ID	2	This is the subspace ID (identifier) value of the subspace structure associated with the communications subspace that the MCTP Endpoint uses to transmit information through the PCC transport.

146 ## 8.7 MCTP Messages Timing Requirements

147 Table 4 lists MCTP-specific timing requirements for MCTP Control messages and operation on the PCC medium. All MCTP Control Messages over PCC shall comply with the timing specification listed in Table 4.

148 **Table 4 — Timing Specifications for MCTP Control Messages on PCC**

Timing Specification	Symbol	Min	Max	Description
Endpoint ID reclaim	$T_{RECLAIM}$	–	5 sec	Maximum interval that an endpoint is allowed to be non-responsive to MCTP control messages before its EID may be reclaimed by the bus owner. A bus owner shall wait at least for this interval before an EID of the non-responsive endpoint is reclaimed.
Number of request retries	MN1	2	See Description column	Thus, a minimum of three tries in total: the original try plus two retries. The maximum number of retries for a given request is limited by the requirement that all retries shall occur within MT4, max of the initial request.

Timing Specification	Symbol	Min	Max	Description
Request-to-response time	MT1	–	120 ms	This interval is measured at the responder from the end of the reception of an MCTP control request to the beginning of the transmission of the corresponding MCTP control response. This requirement is tested under the condition where the responder can successfully transmit the response on the first try.
Time-out waiting for a response	MT2	MT1 max[1] + 6 ms	MT4, min[1]	This interval at the requester sets the minimum amount of time that a requester shall wait before retrying an MCTP control request. This interval is measured at the requester from the end of the successful transmission of the MCTP control request to the beginning of the reception of the corresponding MCTP control response. NOTE: This specification does not preclude an implementation from adjusting the minimum time-out waiting for a response to a number smaller than MT2 based on the measured response times from responders. The mechanism for doing so is outside the scope of this specification.
Instance ID expiration interval	MT4	5 sec[2]	6 sec	Interval after which the instance ID for a given response shall expire and become reusable if a response has not been received for the request. This is also the maximum time that a responder shall track an instance ID for a given request from a given requester.

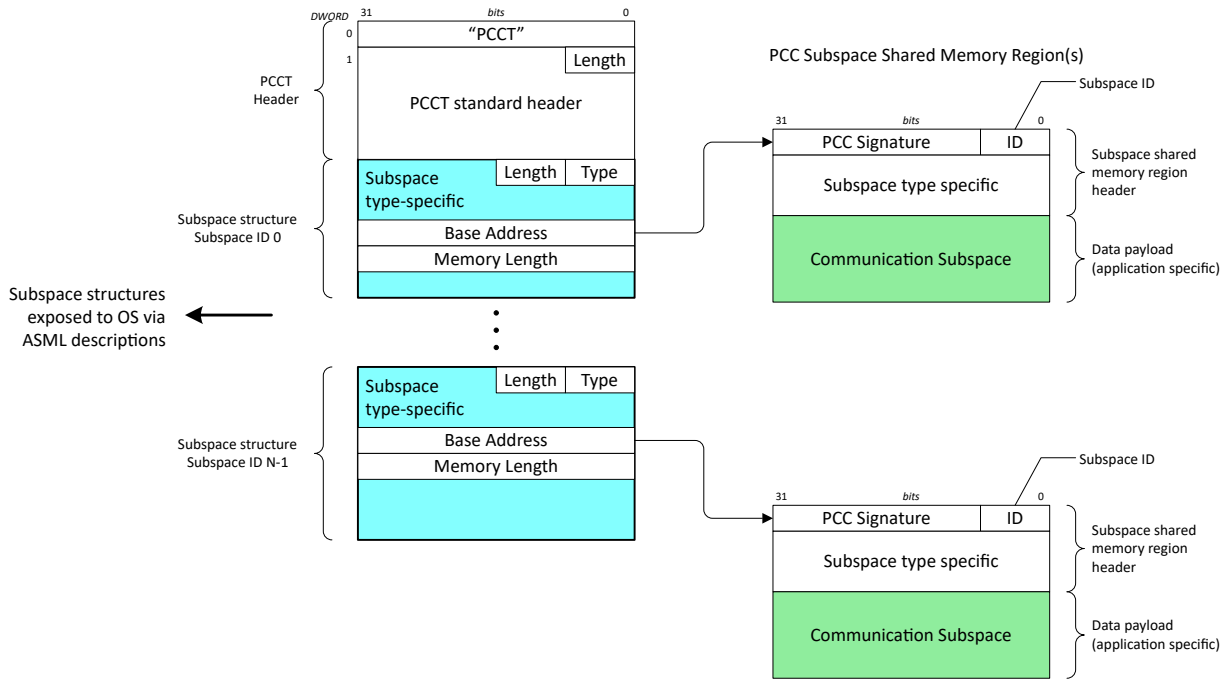
NOTE 1: Unless otherwise specified, this timing applies to the mandatory and optional MCTP commands.
NOTE 2: If a requester is reset, it may produce the same sequence number for a request as one that was previously issued. To guard against this, it is recommended that sequence number expiration be implemented. Any request from a given requester that is received more than MT4 seconds after a previous matching request should be treated as a new request, not a retry.

149 # 9 ANNEX A (informative) Brief introduction to PCC

150 This annex introduces the general architecture of the Platform Communications Channel (PCC) feature documented in the ACPI specification. The intent of this introduction is to establish a context for the binding of MCTP to a PCC interface. Because this introduction uses an abstraction of the PCC structures, please refer to ACPI, Chapter 14 for a complete description of PCC, including operational flows.

151 Figure 4 is an abstract view of the PCC entities used to implement a communications channel. These entities are in-memory data structures in little-endian format, which is consistent with the PCC specification.

152



153 **Figure 4 — PCC Interface Building Blocks (Abstracted)**

154 The Platform Communications Channel feature in ACPI is based on a structure called a PCC Table (PCCT). The PCCT is a contiguous memory structure with a table header composed of the length of the entire table and a list of subspace structures. Each subspace structure has a type and a length.

155 > NOTE: Subspace structures of different types may have different sizes.

156 Each subspace structure has an implicit ID value corresponding to its order in the PCCT: the first subspace structure has a subspace ID of 0, the second a subspace ID of 1, and so on. Each subspace structure has a memory pointer to a subspace shared memory region and a length field whose value represents the entire size of the subspace shared memory region.

157 The subspace shared memory region is composed of a header and a communications subspace, which is the memory region used to pass information between the entities using PCC to communicate.

158 The subspace type field value determines both the format of the subspace structure in the PCCT and the structure of the header of the subspace shared memory region.

159 System firmware exposes subspace structures in the PCCT to the operating system (OS) via standardized AML tables. Host software (OSPM) utilizes the fields in the subspace structure to interact with its peer and the system-specific interrupt or doorbell mechanisms to exchange data through the PCC subspace shared memory region. See ACPI, Chapter 14 for details.

160

10 ANNEX B (informative) Notation

161 Notations used in this document include the following:

2:N	In field descriptions, this will typically be used to represent a range of byte offsets starting from byte two and continuing to and including byte N. The lowest offset is on the left, and the highest is on the right.
(6)	Parentheses around a single number can be used in message field descriptions to indicate a byte field that may be present or absent.
(3:6)	Parentheses around a field consisting of a range of bytes indicate the entire range may be present or absent. The lowest offset is on the left, and the highest is on the right.
DSP0236	Underlined blue text is typically used to indicate a reference to a document or specification listed in the "Normative References" clause or to items hyperlinked within the document.
rsvd	Abbreviation for “reserved.” Case insensitive.
[4]	Square brackets around a number are typically used to indicate a bit offset. Bit offsets are given as zero-based values (that is, the least significant bit (LSb) offset = 0).
[7:5]	A range of bit offsets. The most significant bit (MSb) is on the left, and the least significant bit (LSb) is on the right.
1b	A lowercase “b” following a number consisting of 0s and 1s is used to indicate the number is being given in binary format.
0x12	A leading “0x” is used to indicate a number given in hexadecimal format.

162

11 ANNEX C (informative) Change log

Version	Date	Description
1.0.0	2025-08-21	Initial release