**# Title:**

Add PCC Resource Descriptors

**# Status:**

Draft

**# Document:**

ACPI Specification Version 6.next

**# License:**

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**# Submitters:**

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**# Summary of the change**

This ECR adds the Platform Communication Channel type to the list of valid Resource Types encoded in WORD, DWORD, and QWORD Address Space resource descriptors. Additionally, Resource Macros are defined to generate Resource Buffers for PCC use of these Resources. Lastly, the Word/DWord/QWordSpace resource macro descriptions for the ResourceType argument is incorrect. This change corrects this issue as well.

**# Benefits of the change**

This means that information can be exchanged through a PCC in chunks greater than can be expressed using the Register interface, which is restricted to a width of 128 bits by the GAS encoding mechanism

**# Impact of the change**

In order to take advantage of this change, OSPM will need to add support to convey the resource information to drivers, as well as handle access to the resources per the underlying interface mechanism (PCC, PRM, etc.) similar to the address space operation region handlers. Support for the new macros needs to be added to AML interpreters and ASL compilers/disassemblers.

**# Detailed description of the change [normative updates]**

Existing text

New text

~~Deleted Text~~

Text to be discussed

Addition/Change: Initial version

*Change #1: Add missing content in Table 5.2, section 5.2.3.2:*

| *Table 5.2****Address Space Format*** | |
| --- | --- |
| **Address Space** | **Format** |
| 0-System Memory | The 64-bit physical memory address (relative to the processor) of the register. 32-bit platforms must have the high DWORD set to 0. |
| 1-System I/O | The 64-bit I/O address (relative to the processor) of the register. 32-bit platforms must have the high DWORD set to 0. |
| 2-PCI Configuration Space | PCI Configuration space addresses must be confined to devices on PCI Segment Group 0, bus 0. This restriction exists to accommodate access to fixed hardware prior to PCI bus enumeration. The format of addresses are defined as follows:  Word Location Description  Highest Word Reserved (must be 0)  — PCI Device number on bus 0  — PCI Function number  Longest Word Offset in the configuration space header  For example: Offset 23h of Function 2 on device 7 on bus 0 segment 0 would be represented as: 0x0000000700020023. |
| 6-PCI BAR Target | PciBarTarget is used to locate a MMIO register on a PCI device BAR space. PCI Configuration space addresses must be confined to devices on a host bus, i.e any bus returned by a \_BBN object. This restriction exists to accommodate access to fixed hardware prior to PCI bus enumeration. The format of the Address field for this type of address is:  Bits [63:56] – PCI Segment  Bits [55:48] – PCI Bus  Bits [47:43] – PCI Device  Bits [42:40] – PCI Function  Bits [39:37] – BAR index#  Bits [36:0] – Offset from BAR in DWORDs |
| 0x0A-PCC | ~~{Definition needed}~~  PCC is used to locate a platform communication channel resource, described by a PCC Subspace Structure entry in the PCCT.  The format for the Address field is the index into the PCCT. |
| 0x7F-Functional Fixed Hardware | Use of GAS fields other than Address\_Space\_ID is specified by the CPU manufacturer. The use of functional fixed hardware carries with it a reliance on OS specific software that must be considered. OEMs should consult OS vendors to ensure that specific functional fixed hardware interfaces are supported by specific operating systems. |

##### *Change #2, sections 6.4.5.3.1-3, corrections and updates:*

##### 6.4.3.5.1. QWord Address Space Descriptor

**Type 1, Large Item Value 0xA**

The QWORD address space descriptor is used to report resource usage in a 64-bit address space (like memory and I/O).

|  |  |  |
| --- | --- | --- |
| *Table 6.45****QWORD Address Space Descriptor Definition*** | | |
| Offset | Field Name | Definition |
| Byte 0 | QWORD Address Space Descriptor | Value = 0x8A (10001010B) - Type = 1, Large item name = 0x0A |
| Byte 1 | Length, bits[7:0] | Variable length, minimum value = 0x2B (43) |
| Byte 2 | Length, bits[15:8] | Variable length, minimum value = 0x00 |
| Byte 3 | Resource Type | Indicates which type of resource this descriptor describes. Defined values are:  0 Memory range  1 I/O range  2 Bus Number  3-9 Reserved  10 Platform Communication Channel  311-191 Reserved  192-255 Hardware Vendor Defined |

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##### 6.4.3.5.2. DWord Address Space Descriptor

**Type 1, Large Item Value 0x7**

The DWORD address space descriptor is used to report resource usage in a 32-bit address space (like memory and I/O).

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| --- | --- | --- |
| *Table 6.46****DWORD Address Space Descriptor Definition*** | | |
| Offset | Field Name | Definition |
| Byte 0 | DWORD Address Space Descriptor | Value = 0x87 (10000111B) - Type = 1, Large item name = 0x07 |
| Byte 1 | Length, bits[7:0] | Variable: Value = 23 (minimum) |
| Byte 2 | Length, bits[15:8] | Variable: Value = 0 (minimum) |
| Byte 3 | Resource Type | Indicates which type of resource this descriptor describes. Defined values are:  0 Memory range  1 I/O range  2 Bus Number  3-9 Reserved  10 Platform Communication Channel  311-191 Reserved  192-255 Hardware Vendor Defined |

…

##### 6.4.3.5.3. Word Address Space Descriptor

**Type 1, Large Item Value 0x8**

The WORD address space descriptor is used to report resource usage in a 16-bit address space (like memory and I/O).

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|  |  |  |
| --- | --- | --- |
| *Table 6.47****WORD Address Space Descriptor Definition*** | | |
| Offset | Field Name | Definition |
| Byte 0 | WORD Address Space Descriptor | Value = 0x88 (10001000B) - Type = 1, Large item name = 0x08 |
| Byte 1 | Length, bits[7:0] | Variable: Value = 0x0D (13) |
| Byte 2 | Length, bits[15:8] | Variable: Value = 0 |
| Byte 3 | Resource Type | Indicates which type of resource this descriptor describes. Defined values are:  0 Memory range  1 I/O range  2 Bus Number  3-9 Reserved  10 Platform Communication Channel  311-191 Reserved  192-255 Hardware Vendor Defined |

*Change #3: Add to section 19.6 DWordPCC Macro:.*

### 19.6.n0. DWordPCC (DWordPCC Resource Descriptor Macro)

**Syntax**:

DWordPCC (PccChannel, ResourceSourceIndex, ResourceSource,

DescriptorName)

**Arguments**

PccChannel evaluates to an 8-bit integer that specifies the PCCT Index of the PCC Subspace consumed by this Resource.

ResourceSourceIndex is an optional argument which evaluates to an 8-bit integer that specifies the resource descriptor within the object specified by ResourceSource. If this argument is specified, the ResourceSource argument must also be specified.

ResourceSource is an optional argument which evaluates to a string containing the path of a device which produces the pool of resources from which this I/O range is allocated. If this argument is specified, but the ResourceSourceIndex argument is not specified, a value of zero is assumed.

DescriptorName is an optional argument that specifies a name for an integer constant that will be created in the current scope that contains the offset of this resource descriptor within the current resource template buffer. The predefined descriptor field names may be appended to this name to access individual fields within the descriptor via the Buffer Field operators.

**Description**

The DWordPCC macro evaluates to a buffer that contains a 32-bit Address Space resource descriptor. The format of the 32-bit Address Space resource descriptor can be found in Table 6.46. This macro is designed to be used inside of a ResourceTemplate (Resource To Buffer Conversion Macro). The PccChannel field is used to populate the Address field in the resultant Resource Buffer.

*Change #4: Section 19.3.x add QWordPCC Macro:*

### 19.6.n1. QWordPCC (QWordPCC Resource Descriptor Macro)

**Syntax**:

QWordPCC (PccChannel, ResourceSourceIndex, ResourceSource,

DescriptorName)

**Arguments**

PccChannel evaluates to an 8-bit integer that specifies the PCCT Index of the PCC Subspace consumed by this Resource.

ResourceSourceIndex is an optional argument which evaluates to an 8-bit integer that specifies the resource descriptor within the object specified by ResourceSource. If this argument is specified, the ResourceSource argument must also be specified.

ResourceSource is an optional argument which evaluates to a string containing the path of a device which produces the pool of resources from which this I/O range is allocated. If this argument is specified, but the ResourceSourceIndex argument is not specified, a value of zero is assumed.

DescriptorName is an optional argument that specifies a name for an integer constant that will be created in the current scope that contains the offset of this resource descriptor within the current resource template buffer. The predefined descriptor field names may be appended to this name to access individual fields within the descriptor via the Buffer Field operators.

**Description**

The QWordPCC macro evaluates to a buffer that contains a 64-bit Address Space resource descriptor. The format of the 64-bit Address Space resource descriptor can be found in Table 6.45. This macro is designed to be used inside of a ResourceTemplate (Resource To Buffer Conversion Macro). The PccChannel field is used to populate the Address field in the resultant Resource Buffer.

*Change #5: Section 19.3.x add WordPCC Macro:*

### 19.6.n2. WordPCC (WordPCC Resource Descriptor Macro)

**Syntax**:

WordPCC (PccChannel, ResourceSourceIndex, ResourceSource,

DescriptorName)

**Arguments**

PccChannel evaluates to an 8-bit integer that specifies the PCCT Index of the PCC Subspace consumed by this Resource.

ResourceSourceIndex is an optional argument which evaluates to an 8-bit integer that specifies the resource descriptor within the object specified by ResourceSource. If this argument is specified, the ResourceSource argument must also be specified.

ResourceSource is an optional argument which evaluates to a string containing the path of a device which produces the pool of resources from which this I/O range is allocated. If this argument is specified, but the ResourceSourceIndex argument is not specified, a value of zero is assumed.

DescriptorName is an optional argument that specifies a name for an integer constant that will be created in the current scope that contains the offset of this resource descriptor within the current resource template buffer. The predefined descriptor field names may be appended to this name to access individual fields within the descriptor via the Buffer Field operators.

**Description**

The WordPCC macro evaluates to a buffer that contains a 16-bit Address Space resource descriptor. The format of the 16-bit Address Space resource descriptor can be found in Table 6.4.3.5.3. This macro is designed to be used inside of a ResourceTemplate (Resource To Buffer Conversion Macro). The PccChannel field is used to populate the Address field in the resultant Resource Buffer.