PCI-SIG CODE OR ID ASSIGNMENT REQUEST

Title:	PCI Programming Interface for Oasis IDPF
Date Introduced:	May 10, 2023
Date Last Updated:	May 10, 2023
Date Approved:	TBD (PCISIG assigned)
Sponsor:	Google, Dell, Intel

Section 1 Purpose of the Form

Please check the appropriate boxes below and fill in the corresponding sections of this form.

_X_ **Assign a value for a new Class, Sub-Class or Programming Interface (Section 2)**

__ **Assign a value for a new Capability ID (Section 3)**

__ **Assign a value for a new Extended Capability ID (Section 3)**

__ **Editorial or administrative changes to existing text (Section 4)**

Section 2 Request to assign a new Class, Sub-Class or Programming Interface

1. Is this a request for:

_X_ **A new Programming Interface to an existing Sub-Class.**

___ **A new Sub-Class and one or more Programing Interface(s)**

___ **A new Class, Sub-Class and one or more Programing Interface(s)**

2. What is the wording of the proposed entry?

For the existing Base Class 02h, Sub-Class 00h (Ethernet Controller), a new programming interface (01h) is requested with the wording "IDPF interface".

Base Class 02h

This base class is defined for all types of network controllers. Several sub-class values are defined.

Base Class	Sub-Class	Programming Interface	Meaning
02h	00h	00h	Ethernet Controller
		01h	Ethernet Controller with IDPF compliant Interface

Notes:

1. The IDPF interface is available at https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=idpf

3. What similar Programming Interfaces exist? Do they have Class Code assignments? If so, why is a distinct Programming Interface needed?

   Current Ethernet Controllers have vendor defined interfaces, they all use programming interface 00h. Oasis's IDPF proposes to create an industry wide interface that may be identified independent of the Device ID and Vendor ID of the function.

4. Is a new Sub-Class being requested? If so, what similar Sub-Classes exist and why is a new Sub-Class needed?

   No new sub class is required. The sub class stays Ethernet Controller (00h)

5. What use cases apply to justify this assignment?
   Check the appropriate box(s) and fill in the corresponding subsection(s) below.

   _x_ **Device driver binding purposes (Section 2.1)**

   _x_ **Device identification in a user interface (Section 2.2)**

   _x_ **Device usage policy determination (Section 2.3)**

   ___ **Resource management purposes (Section 2.4)**

   ___ **Other purpose (Section 2.5)**

2.1 Device Driver Binding Purposes

1. Describe the Programming Interface Specification.

   Existing Ethernet Controllers all have unique and proprietary programming models and capabilities. The IDPF specification defines a new industry standard programming model for Ethernet Controllers based around a PCIe device model that can be supported by multiple HW and SW vendors. It utilizes a descriptor-based programming model and have the ability to negotiate and expose specific hardware capabilities

A dedicated Class Code would allow for the construction of a class driver that would support multiple hardware implementations like other class device types (USB, NVMe, HD Audio etc).

2. Is the Programming Interface Specification publicly available? If so, where?

   The programming interface is available at https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=idpf

3. What version(s) of the specification are associated with the proposed assignment?

   Infrastructure Data-Plane Function (IDPF) version 0.9 or higher.

4. Do multiple Independent Hardware Vendors implement this Programming Interface?

   There are multiple hardware vendors within the Oasis IDPF Technical Work Group involved in developing the specification.

2.2 Device identification strings in a user interface

5. What is an example device identification string that justifies this assignment?

   IDPF Compliant Ethernet Controller

2.3 Device usage policy determination

6. What is an example device usage policy that justifies this assignment?

   An IDPF compliant device will provide Ethernet (LAN) and RDMA connectivity to a Virtual Machine, a container, an application, or a Host server in a Vendor agnostic way.

2.4 Resource management purposes

7. What is an example resource management policy that justifies this assignment?

   n/a

2.5 Other Purpose

8. What is the proposed justification?

   n/a

Section 3 Capability ID or Extended Capability ID Request

1. What kind of ID is being requested (check one)?

   __ **Capability ID**

   __ **Extended Capability ID**

2. What is the proposed wording of the new entry

ID	**(Extended) Capability**
(assigned by PCISIG)	

3. Is the proposed capability associated with an ECN to a PCISIG specification? If so, which specification(s) are affected and what is the status of the ECN?

   n/a

4. If the proposed capability is not associated with an ECN, is there a publicly available specification for it? If so, where? What is the specification's status?

   n/a

5. What similar capabilities exist? Do they have ID assignments? If so, why is a distinct capability needed?

   n/a

6. Why a distinct capability ID needed instead of using the existing Vendor Specific Capability (ID 09h) or Vendor-Specific Extended Capability (ID 000Bh) mechanisms?

   n/a

7. If the proposed capability is a conventional Capability, why? Extended Capabilities are preferable since configuration space below 256 bytes is limited.

   n/a

8. What is the size range (in bytes) of the proposed capability (including header)? How does this affect the consumption of address space in configuration space?

   n/a

9. What Function types are permitted to contain this Capability (check all that apply)?

__ **PCIe Endpoint**	__ **Legacy PCIe Endpoint**
__ **PCIe Root Port**	__ **Root Complex Register Block**
__ **PCIe: Switch: Upstream Port**	__ **PCIe Switch: Downstream Port**
__ **Bridge: PCIe to PCI/PCI-X**	__ **Bridge: PCI/PCI-X to PCIe**
__ **Root Complex Integrated Endpoint**	__ **Root Complex Event Collector**
__ **PCI-X Endpoint**	__ **PCI-X Bridge**
__ **PCI Endpoint**	__ **PCI Bridge**
__ **Other (explain ____)**	

10. Within an Upstream Port, what Functions are required have this Capability? What Functions are permitted to have this Capability? For example, the capability might be permitted in all Functions of the Port and required in none of them. It might be permitted only in Function 0. It might be permitted only in Functions with a Type 0 (or Type 1) config header, etc.

    n/a

Section 4 Editorial or administrative change to existing text

1. Specify below the precise changes requested. If this needs more than a few lines, indicate “see attached” below and include PDF or Word files with the request showing the existing text and clearly indicating the changes requested.

   n/a

2. Explain why this change should be made. If updates to external document references are involved, provide evidence that the new text is accurate (e.g. excerpt from web site or document, announcement email, press release …).

   n/a

Explanation of Form

Section 1 Purpose of the Form

This form is used to request certain types of changes to the *PCI Code and ID Assignment Specification.*

Requests using this form are processed using a light-weight change notification process. This is a simplified version of the ECN process and provides faster visibility to the membership. There is less review involved, thus only certain types of changes are permitted.

Changes that are not supported by this process must use the formal ECN process. This includes requests for technical changes to existing text or for the assignment of a new Base Class.

Justification must be provided that the proposed assignment is for the good of the industry. For requests associated with an ECN, the Working Group that owns the associated specification uses this form to formally request the necessary assignment(s). This occurs after an ECN completes its 30-day Member Review and before final approval (attach the ECN and refer to it where appropriate).

Section 2 Request to assign a new Sub-Class or Programming Interface

In order to assign a new Programming Interface (or Sub-Class), justification must be provided that doing so is for the good of the industry.

Class Codes values are a limited resource. Assignments are associated with all PCI implementations. Class Code values are sometimes used in tables that may be space constrained.

Systems use Class Code values for a variety of purposes. Industry practice has defined a number of use cases for some or all of the Class Code fields. A new assignment must address one or more of these use cases, or must propose a new use case.

New Sub-Class and Programming Interface assignments can be justified when it is needed to identify a distinct category of devices.

2.1 Device Driver Binding Purposes

Operating Systems have mechanisms they use to determine the device driver associated with a specific hardware device. This typically involves either the complete class code (Class Code, Sub-Class and Programming Interface) or some combination of device identification fields (Vendor ID, Device ID, Subsystem Vendor ID, Subsystem Device ID, and Revision).

It is often preferable to use the device identification fields for this purpose. Doing so does not require any changes to the PCI Codes and ID Specification.

For device categories that are implemented by multiple Independent Hardware Vendors and use a common device driver, this may not be practical. In such situations a new Programming Interface assignment can be requested.

Programming Interfaces should be associated with publicly available specifications. Otherwise, it becomes unclear who “owns” them and is permitted to use them.

2.2 Device identification strings in a user interface

A user interface can display a “user-friendly” descriptive string for a device, to aid in identification by the user, e.g.:

- “Floppy disk controller”
- “RAID controller”
- “PCI-to-PCI bridge”
- “Mouse controller”
- “USB controller”
- “FireWire controller”
- “InfiniBand controller”
- “Processing accelerator”

2.3 Device usage policy determination

Software or Firmware can base certain device usage policies on Class Codes. For Example:

- Selection of the keyboard/display/mouse for BIOS or SFW
- Candidates for booting, including order of preference
- Security policies
- Device usage policy determination was the key motivation for the Changing Class code for InfiniBand Adapter ECN.
- Device usage policy determination was one motivation for assigning the Accelerator Class Code

2.4 Resource management purposes

Software or Firmware can base the allocation of resources to a device using its Class Code. For example:

- Priority in resource allocation, e.g. boot devices & keyboard/display/mouse for BIOS/SFW
- Resource allocation was part of the rationale for the Accelerator Class Code ECN.
- Resource allocation was one motivation for assigning the Accelerator Class Code

2.5 Other Purpose

There may be additional valid justifications for defining a new Class Code / Programming Interface. Use this section for those use cases.

Section 3 Capability ID or Extended Capability ID Request

This section applies to Requests for a new Capability ID or Extended Capability ID.

Capability IDs identify structures compatible with all PCI implementations (Conventional PCI, PCI-X and PCI Express). They are located at byte offsets 64 through 255 in configuration space.

Extended Capability IDs identify structures compatible with most PCI Express implementations. They are located at byte offsets 256 through 4095 in configuration space. Extended Capabilities are also compatible with some PCI-X implementations.

Section 4 Editorial or administrative change to existing text

Use this section to request editorial or administrative changes to existing text in the *PCI Code and ID Assignment Specification*.

These changes must not alter the intent or common interpretation of the existing text and can include:

- Editorial changes to correct spelling, capitalization, punctuation, grammar, etc.
- Updates to external document references in this specification. For example, changes to the document name, document publishing authority, document location (web site or other contact information), etc.
- Updates in conjunction with a new assignment. For example, if a new assignment is similar to an existing listing, the existing text should be modified to clearly define intended usage.