Implementation Agreement (IA) Errata

Common Management Interface Specification (CMIS)

Errata and Corrigenda for CMIS 5.x

Revision 1.0

IA Identification #

OIF-CMIS-05-Errata-01.0

February 2025

Implementation Agreement created and approved
OIF
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Physical and Link Layer (PLL) Working Group

Errata and Corrigenda for the 5.x revisions of the Common Management Interface Specification (CMIS) Rev. 1.0

Source

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Abstract

This Errata document informs about significant specification or publication errors that have been detected in published revisions of the CMIS 5.x Implementation Agreement family. Recommendations of how to address practical consequences of these errors in deployed implementations are included.

Change History

Rev 1.0 February 13th, 2025

Table of Contents

1 Introduction

1.1 Purpose

This versioned document collects corrigenda and errata of published CMIS revisions [1], [2], [3], [4] in the 5.x revision family. Corrigenda and errata are expected to be corrected in the next CMIS specification revision.

1.2 Document Overview

In section 2 specification issues or errors are described, and a specification correction is provided.

In section **Error! Reference source not found.**, recommendations for addressing errata in existing and new i mplementations are provided.

1.3 Glossary

Please refer to [4] for a more complete glossary:

Application: "... a (type of) functional transmission configuration that is characterized by specific signal propagation or signal processing between one or more host lanes and one or more media lanes, overall providing a well-defined signal or data transmission function to the host."

Commissioning: The module procedures to implement the configuration described in the active control set (ACS) in module hardware. Normally, in stepwise configuration, commissioning occurs during the DPInit state of the DPSM.

Configuration: The management actions of the host to prepare a module for running a selected Application. The first action is to define a data path configuration in a staged control set (SCS), the second action is to provision a defined configuration from an SCS into the active control set (ACS), and the last step is to commission the configuration contained in the ACS to module hardware. All Applications except for the default Application need to be configured by the host. The default Application is initially pre-defined and pre-commissioned by the module and will be auto commissioned, when the DPSM control settings allow that.

Corrigendum: An author-induced error in a published specification that requires correction. Specification corrigenda may come with patch or mitigation recommendations for modules, hosts, or both, to mitigate real world consequences of the specification bug.

DP Emulation: When a nominal (i.e. advertised) NP Application can be controlled by the host as if it was a DP Application (via the DPSM) and when it behaves like a DP Application (e.g. Tx squelching), this mode of implementing a nominal NP Application is called DP Emulation.

Erratum: A document production error during publication.

NP Application: An application supporting both genuine (N:1) multiplexing and uniplexing (1:1) in so-called client encapsulation applications, where (in "transport" terminology) one or more host side "client" signals are mapped into a media side "server" signal that can (in principle) be operated independently of client signals. Client encapsulation is a classical "transport" technology that has recently found its way into the "datacom" domain, via 400ZR and similar standards that use client encapsulation albeit with reduced maintenance overhead (compared to "transport").

NP aware host: A host is NP aware if it evaluates the NP Application related advertisements. An NP aware host can at least distinguish nominal NP Applications and nominal DP Applications. Note that an NP Aware host may choose not to use (not support) NP Applications and use DP Applications only.

NP Module: A module that supports NP Applications is called an NP module in this document.

NP unaware host: A host is NP unaware when it is not NP aware. An NP unaware host assumes that every advertised Application is a DP Application that is controlled via the DPSM and behaves like a DP Application.

1.4 References

[1] CMIS 5.0, https://www.oiforum.com/wp-content/uploads/CMIS5p0_Third_Party_Spec.pdf
[2] CMIS 5.1, https://www.oiforum.com/wp-content/uploads/CMIS5p1_Third_Party_Spec.pdf
[3] OIF-CMIS-05.2, https://www.oiforum.com/wp-content/uploads/OIF-CMIS-05.2.pdf
[4] OIF-CMIS-05.3, https://www.oiforum.com/wp-content/uploads/OIF-CMIS-05.3.pdf

2 Corrigenda

2.1 Corrigendum 1 (Incompatible Network Path Application Behaviors)

2.1.1 Affected Revisions

Affected CMIS revisions: 5.1, 5.2, 5.3

Correction expected in CMIS revision 5.4.

2.1.2 Issue Summary

Problem

In CMIS 5.1 a subtle specification issue was introduced when concepts and data structures for Network Path Applications were added to support *genuine multiplex* and *uniplex* client encapsulation applications like 400ZR.

The issue is a consequence of the fact that NP Application *advertisements* usually[1] look exactly like DP Application advertisements to NP unaware hosts.

Likewise, NP Application *configurations* in a staged control set or in the active control set usually look exactly like DP Application configurations to NP unaware hosts.

Impact

NP unaware hosts will misinterpret NP Application *advertisements* or *configurations* as DP Application *advertisements* or *configurations* and may then inadvertently *commission* NP Applications.

Depending on the DP or NP nature of the default Application this may result either in unexpected rejections of configuration commands, or in problematic NP hardware configurations[2] that are neither understood nor can be managed by the NP unaware host.

Correction

The specification correction makes NP Applications useable for NP unaware hosts by building upon two elements:

1. NP modules should support so-called **DP Emulation**, both as a configuration and as a well-defined operational behavior, for advertised NP Applications, at least for uniplex applications and homogenous multiplex applications.
2. NP modules shall use DP Emulation **as default configuration** and behavior of advertised NP Applications; an NP aware host must explicitly configure NP Application behavior when desired.

A deliberately accepted consequence of this correction is that patched NP modules[3] that do not support DP Emulation of their default NP Application, will not work as expected in unpatched NP aware hosts, because such modules will reject the default DP Emulation configuration in the control set, while the host expects them to come up with their advertised default NP Application.

Recommendations

The problems caused by the specification error can be resolved by encouraging NP modules and NP aware hosts to implement the changes as described in sections 2.1.3 and 3.1.

Going forward, as NP applications become more prevalent, hosts are encouraged to fully support NP applications and not rely on DP emulation mode.

[1] Genuine multiplexing Application Descriptors (so called partial Application Descriptors) may be recognized, when the host actually checks for a match of media interface and host interface bandwidth.
[2] The most concerning effect would be that the media side transmitter may be silently enabled, contrary to the host's assumption and hidden from the host.
[3] A module or host implementation containing modifications recommended later in this document is considered "patched". As a subtle detail, please note that there is no standardized version identification scheme defined that distinguishes original and patched implementations; this is left to custom implementations.

2.1.3 Specification Correction

The following specification elements would have prevented the interworking issues described above and are expected to be incorporated into the next CMIS revision after CMIS 5.3.

The fundamental change is that the module should not run an NP Application except when the host is aware of NP Applications and has deliberately defined (programmed) NP configuration attributes in a Staged Control Set.

To honor existing practice and to maximize the usefulness of NP Applications, especially uniplex applications, NP modules should offer a so-called DP Emulation capability for NP Applications.

DP Emulation means that a nominal NP Application (i.e. an application advertised as an NP Application) actually behaves like and is managed as if it was a DP Application. DP emulation encompasses DP control via the DPSM and DP behavior (e.g., automatic squelching) for nominal NP Applications.

Default DP Emulation is achieved by the module initializing both the NPInUseLane bits in the Staged Control Set and the Active Control Set to **zero**. This initial setting will only change by action of an NP aware host.

The combination of the DP Emulation capability and a default DP Application configuration in Staged Control Set and Active Control Set provides the expected DP behavior to NP unaware CMIS 5.0+ Hosts.

2.1.3.1 DP Emulation characteristics

DP Emulation **shall** provide the following characteristics of DP Applications:

1. Dynamic control via the DPSM, using stepwise configuration only
2. Presence and validity of all uniplexed or multiplexed host side client signals is a precondition for exiting DPDeactivated state
3. Automatic squelching (if supported for DP Applications)
4. Adherence to the timing of DPSM state transitions

2.1.3.2 Default Application Configuration always represents a DP Application

Independent of the nominally advertised DP or NP type of an Application, both the default configuration of the **SCS0::NPInUseLane**<i> bits in the default NP part of the Staged Control Set (SCS) and the default configuration status of the **ACS::NPInUseLane**<i> bits in the NP part of the Active Control Set (ACS) shall be initialized as **zero** on exit from MgmtInit state of the Module State Machine (MSM).

2.1.3.3 NP module response to DP Configuration of NP applications

When a module sees a nominal NP application configured as a DP application, the module may either **implement DP emulation** of the NP Application or **reject** the DP application[1].

A module sees a nominal NP application configured as a DP application either when the host deliberately configures the NP application as a DP application or as a result of the NP module initializing the NP Staged Control Set and NP Active Control Set to maintain backwards compatibility with NP unaware CMIS 5.x hosts. (see section 2.1.3.2)

[1] When a default NP application happens not to be suitable for DP emulation, the module should reject DP initialization and write a suitable ConfigRejected* code into the relevant ConfigStatusLane<i> registers to indicate that the default DP emulation configuration cannot been commissioned into hardware.

3 Recommendations

3.1 Recommendations regarding Corrigendum 1

The corrected specification ensures that an NP Application always runs in DP Emulation mode until an NP aware host reconfigures (defines and provisions) the relevant NPInUseLane<i> bits in SCS and ACS, respectively.

NP modules that have implemented these corrections can safely be plugged into any CMIS 5.x host, because the default behavior of a corrected NP module is always that of an DP application, either native or emulated.

3.1.1 Recommendations for CMIS 5.x (x=1,2,3) NP Modules

CMIS 5.x (x=1,2,3) NP module implementations are strongly encouraged to implement the specification corrections in Section 2.1.3.

3.1.2 Recommendations for NP aware CMIS 5.x (x=1,2,3) Hosts

CMIS 5.x (x=1,2,3) NP aware hosts should not rely on a default NP Application to come up as an NP Application. NP aware hosts should explicitly provision NP Applications (including NPInUse bits).

NP aware hosts should check for commissioning rejection indicated in ConfigurationStatusLane<i> bits when DP Emulation of an advertised NP Applications is requested. This will occur when an NP Module does not support DP Emulation for that application.