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Embedded Common Interface (ECI) for exchangeable CA/DRM solutions; Part 4: The Virtual Machine

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Foreword

This Group Specification (GS) has been produced by ETSI Industry Specification Group (ISG) Embedded Common Interface (ECI) for exchangeable CA/DRM solutions.

The present document is part 4 of a multi-part deliverable covering the Virtual Machine for the Embedded Common Interface for exchangeable CA/DRM solutions specification, as identified below:

Part 1: "Architecture, Definitions and Overview";

Part 2: "Use cases and requirements";

Part 3: "CA/DRM Container, Loader, Interfaces, Revocation";

Part 4: "The Virtual Machine";

Part 5: "The Advanced Security System";

Part 6: "Trust Environment".

Modal verbs terminology

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Introduction

The present document describes the concept of a Virtual Machine that executes in a Sandbox and offers a range of instructions and System Call functions. The VM is designed to work in a variety of environments. It interoperates with other applications that exist on the same machine using well-defined interfaces and provides a combination of support for its own instruction set and a modular mechanism for the execution of elements written in the native code of the **ECI Host** CPU and interacting with the hardware and other elements of the **ECI Host** environment. This provides the VM with the means to execute readily renewable code that can provide a wide range of potential secure applications, including the implementation of CA/DRM clients.

1 Scope

The present document specifies a Virtual Machine which is intended for inclusion in the implementation of digital television receivers and Set Top Boxes, and which is able to provide a secured environment for executing Conditional Access kernel or Digital Rights Management client applications. The intention is to provide a uniform execution environment in which such clients can operate in the knowledge that minimum **ECI Host** performance requirements are met, that a standard API is provided to be used for retrieval of essential security data from content (i.e. encapsulated with content) or via external networks (e.g. the Internet) and where resources can be accessed from the **ECI Host** environment in a standardized way.

The presence and use of the VM allows to exchange CA/DRM clients at will and to support multiple simultaneous instances of such clients in **ECI Hosts** so that users and operators are not tied in to a particular content protection provider and that they can use security solutions of different types to suit differing content types. For **Content Protection system** providers, it ensures the availability of a known execution platform that does not require specific integration with any and every vendor of **ECI Host** devices.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI GS ECI 001-3: "Embedded Common Interface (ECI) for exchangeable CA/DRM solutions; Part 3: CA/DRM Container, Loader, Interfaces, Revocation".

[2] "Tool Interface Standard (TIS) Executable and Linking Format (ELF) Specification, version 1.2", TIS Committee, 1995.

NOTE: Available at https://refspecs.linuxfoundation.org/elf/elf.pdf.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ISO/IEC 9899: "Information technology -- Programming Languages -- C", ISO/IEC JTC1/SC22 WG14.

[i.2] ETSI GR ECI 004: "Embedded Common Interface (ECI) for exchangeable CA/DRM solutions; Guidelines for the implementation of ECI".