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Special Report

**Working in ETSI within an OSS context:
Guidance and recommendations,
including usage of OSS within ETSI Secretariat,
adoption/usage of elements of OSS in the elaboration
of ETSI Standards and adoption of ETSI Standards
within the OSS communities**

Reference

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Keywords

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Contents

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Foreword

This Special Report (SR) has been produced by the ETSI Board OPEN SOURCE group in the frame of the Strategic Topics for 2011 with the intention to come to a conclusion. Approval was given by ETSI Board#81 on the defined scope, reference was made to the ITEMS International study [i.1] commissioned by ETSI in 2006 and OCG has contributed by reviewing the proposed scenarios.

Introduction

ICT is a fast growing industry involving global and local players from the IT, Telecommunications and Multimedia sectors. The convergence factor is inducing changes in the business processes and models that impact strategies and methods of industrial players and standards-makers as well.

One of the key elements in convergence is the growing role of software, in particular in the telecommunication sector and in consumer electronics. Today, interfaces and components developments are mainly software-based.

Another major change is occurring in the software sector with the advent of Open Source Software. Originally initiated by Internet R&D communities, Open Source now seems to pervade the whole ICT market and does benefit from the support of major industrial/commercial players. Open Source Software is a different approach, which raises the question of its use in conjuction with standards.

1 Scope

The present document describes high level guidance and recommendations for working in ETSI within an Open Source Software (OSS) context, including usage of OSS within ETSI Secretariat, adoption/usage of elements of OSS in the elaboration of ETSI Standards and adoption of ETSI Standards within the OSS communities.

Annex A provides additional information on supporting material.

2 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 reference 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.

2.1 Normative references

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

Not applicable.

2.2 Informative references

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] Open Source impact on ICT Standardisation (ITEMS International study report).

NOTE: Available at http://www.etsi.org/website/document/workshop/sosinterop/sosinteropiiibackground01.pdf.

[i.2] Open Source Initiative: "This is a non-profit corporation with global scope formed to educate about and advocate for the benefits of open source and to build bridges among different constituencies in the open source community".

NOTE: Available at http://opensource.org/.

[i.3] OSMOCOM OpenBSC: "This is a project aiming to create a Free Software, (A)GPL-licensed software implementations for the GSM/3GPP protocol stacks and elements".

NOTE: Available at http://openbsc.osmocom.org/trac/.

[i.4] Open IMS Core: "This is an Open Source implementation of IMS Call Session Control Functions (CSCFs) and a lightweight Home Subscriber Server (HSS), which together form the core elements of all IMS/NGN architectures as specified today within 3GPP, 3GPP2, ETSI TISPAN and the PacketCable initiative".

NOTE: Available at http://openimscore.org/.

[i.5] ETSI Intellectual Property Rights Policy.

NOTE: Available at http://www.etsi.org/WebSite/document/Legal/ETSI IPR Policy November 2011.pdf.

[i.6]   ETSI Guide on Intellectual Property Rights.

NOTE: Available at http://www.etsi.org/WebSite/document/Legal/ETSI Guide on IPRs November 2011.pdf.

[i.7]   Free Software Foundation: This is a "non-profit with a worldwide mission to promote computer user freedom and to defend the rights of all free software users".

NOTE: Available at http://www.fsf.org/.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in the ETSI IPR policy [i.5], clause 15 (i.e. affiliate, equipment, essential, IPR, member, methods, standard) and the following apply:

Application Programming Interface (API): specification intended to be used as an interface by software components to communicate with each other

   NOTE: An API may include specifications for routines, data structures, object classes, and variables.

compiler: computer program (or set of programs) that transforms source code written in a programming language (the source language) into another computer language (the target language, often having a binary form known as object code)

   NOTE: The most common reason for wanting to transform source code is to create an executable program.

GNU: Unix-like computer operating system developed by the GNU Project, ultimately aiming to be a "complete Unix-compatible software system" composed wholly of free software

interpreter: computer program that executes, i.e. performs, instructions written in a programming language

   NOTE: An interpreter may be a program that either executes the source code directly, translates source code into some efficient intermediate representation (code) and immediately executes this or explicitly executes stored precompiled code made by a compiler which is part of the interpreter system.

machine code: (or machine language) system of impartible instructions executed directly by a computer's central processing unit (CPU)

open source license: copyright license for open source software

Open Source Software (OSS): computer software that is available in source code form

   NOTE: The source code and certain other rights normally reserved for copyright holders are provided under an open-source license that permits users to study, change, improve and at times also to distribute the software.

source code: any collection of computer instructions written using some human-readable computer language, usually as text

Um interface: air interface for the GSM mobile telephone standard

   NOTE: It is the interface between the mobile station and the Base Transceiver Station (BTS).

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3GPP	3rd Generation Partnership Project
API	Application Programming Interface
BTS	Base Transceiver Station
CODEC	Coder-DECoder
CPU	Central Process Unit
CSCF	Call Session Control Function
DECT	Digital Enhanced Cordless Telephone
DMR	Digital Mobile Radio
DVB	Digital Video Broadcasting
ETSI	European Telecommunications Standards Institute
FRAND	Fair, Reasonable, And Non-Discriminatory
GNU	GNU's Not Unix
GPL	GNU Public License
GSC	Global Standards Collaboration
GSM	Global System for Mobile communications
HSS	Home Subscriber Server
ICT	Information
IETF	Internet Engineering Task Force
IMS	Ip Multimedia Sub-system
INRIA	National Institute for Research in Computer Science and Control (Institut National de Recherche en Informatique et en Automatique)
IPR	Intellectual Property Rights
IT	Information Technology
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
LGPL	Library General Public License
M2M	Machine-to-Machine
MHP	Multimedia Home Platform
NC	Non-Commercial
NGN	Next Generation Network
OCG	Operational Co-ordination Group
OSS	Open Source Software
RAND	Reasonable, And Non-Discriminatory
SR	Special Report
TC	Technical Committee
TETRA	TErrestrial Trunked RAdio
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networking
TS	Technical Specification
TTCN	Testing and Test Control Notation
TTCN-3	Testing and Test Control Notation version 3
XML	Extensible Markup Language

4 The essence of Open Source Software (OSS)

4.1 Description

NOTE: This is taken from the Open Source impact on ICT Standardisation [i.1].

First of all, it should be underlined that Open Source does not mean free to use. Actually, Open Source is a complex world with many kinds of licenses that can be free of charge but that always include complex provisions for both parties.

Generally speaking, a license allows a holder of Intellectual Property on a technology to grant a second party the right to use it. The license usually specifies the conditions under which the technology can be used or disseminated to third parties, payments to the licensor, whether modifications are allowed, the risk and liability each party assumes, representations and warranties, as well as provisions for support and maintenance.

The various kinds of Open Source Software licenses are not all interchangeable and they can be clearly identified according to the following:

- **Freeware** involves no payment and allows the user to replicate and distribute the software freely.

- **Shareware** is provided free, but a voluntary payment is requested if the user puts the software to productive use.

A source code license grants access to source code for the licensee. **Open Source licenses** can be defined as a specific set of terms and conditions that meet the requirements summarized by the Open Source Initiative [i.2].

Similarly, **Free Software licenses** were defined by the Free Software Foundation [i.7] and they essentially include four requirements:

- The **right to access** the source code - the right to get the source code and to read it. This right is the main component of any Open Source Software since it is a necessary preliminary step to all of them. All Open Source licenses grant access to the source code of the software.

- The **right to modify** - the right to change the source code in order to correct it or to adapt it. Most Open Source licenses recognize this right but not all of them. For example the Perl Artistic license states that if a package is modified in a way that it changes from a "Standard Version", then these changes must be posted in a very specific and detailed way described in the license.

- The **right to redistribute** - the right to copy and distribute the software. Licensors often modify this right in many ways. For example, the Sun Community License allows licensees to distribute software only as long as they make no commercial gain directly from it.

- The **right to use** - the right to compile the source code and execute it. Licensors can adapt this clause as per the redistribution clause.

Each Open Source license is a different combination of these four elements according to specific legal provisions and industrial objectives.

The primary issues in choosing license terms and conditions are whether the licensor wants revenues, whether it allows modifications to the source code and whether it allows the source code to be "forked" in different versions.

Free Software can be defined as software distributed with a license that will implement these four rights. For example, the IBM Public License and the Mozilla Public License are Free Software licenses.

Copyleft is a concept drawn by Richard Stallman and the Free Software Foundation [i.7] as a license that reiterates the four freedoms described above and that must be reproduced in identical terms in the case of redistribution. This avoids the distribution of the modified software restricting the initial rights.

Copyleft Software can then be defined as software distributed with a license that will mandate licensees to publish derivative works under the same terms. For example, the GPL and the LGPL Licenses are Copyleft Software Licenses. The Free Software Foundation [i.7] is the strongest advocate of Copyleft and assumes intellectual leadership over this movement.

Copyleft licenses essentially preclude the ability to draw revenues from the code itself but admit other business models. **Community Licenses** and **Examination Licenses** are interesting for paid software licenses as a way of garnering customer or community assistance in improving software and encouraging complementary research activity.

At the end of the day, most licenses are a complex mix of Open Source, Copyleft and Free Software.

Furthermore, most licenses also allow for a variety of additional obligations. For example, the Creative Commons NC License only authorizes non-commercial uses of the work.

Finally, an Open Source Software can be represented as follows. The right to access its Source Code could be seen as its central core and all other rights granted by the licensor are optional and can be modified. The licensor can also add some other obligations that will add up to the classical rights defining Open Source and Free Software.
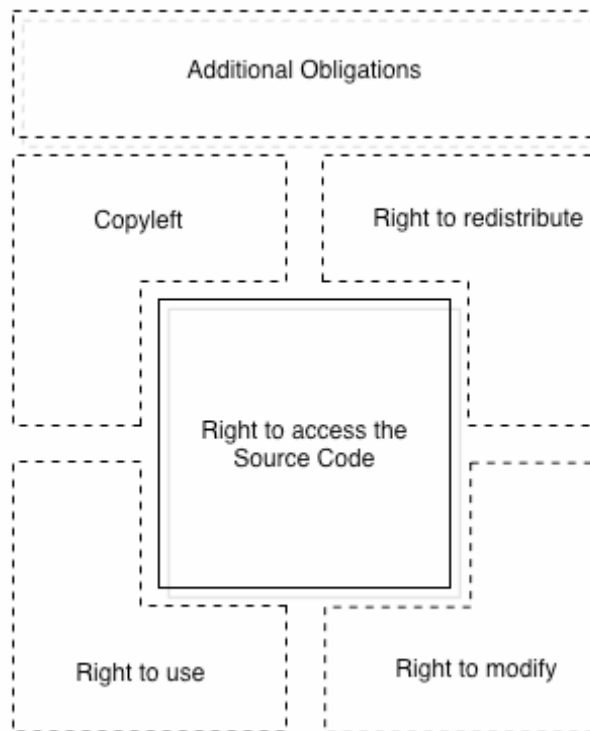
Figure 1: Open Source Software

4.2   The OSS definition (taken from the Open Source Initiative)

The distribution terms of Open Source Software must comply with the following criteria:

Free redistribution

The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.

Source code

The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost preferably, downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.

Derived works

The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

Integrity of the author's source code

The license may restrict source-code from being distributed in modified form *only* if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

No discrimination against persons or groups

The license must not discriminate against any person or group of persons.

No discrimination against fields of endeavor

The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

Distribution of license

The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.

License must not be specific to a product

The rights attached to the program must not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

License must not restrict other software

The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be open-source software.

License must be technology-neutral

No provision of the license may be predicated on any individual technology or style of interface.

4.3   The "OSS molecule"

Open Source Software is a software definition mechanism. The outcome of an OSS teamwork is OSS source code. This outcome can only be available through a License agreement. This agreement can come under a very large number of License variants.

Other material (than source code) can also be distributed under an Open Source license.

Open Source in Standards is about dealing with the "OSS Molecule", ie the association of Open Source Software and of the license agreement it is available under.

5   The relationship between Standards and OSS

5.1   Three major relationships to be analyzed

NOTE: It is hoped that this study can bring the two communities closer, i.e. Telecoms Standards developers and Open Source contributors, and can encourage their collaboration.
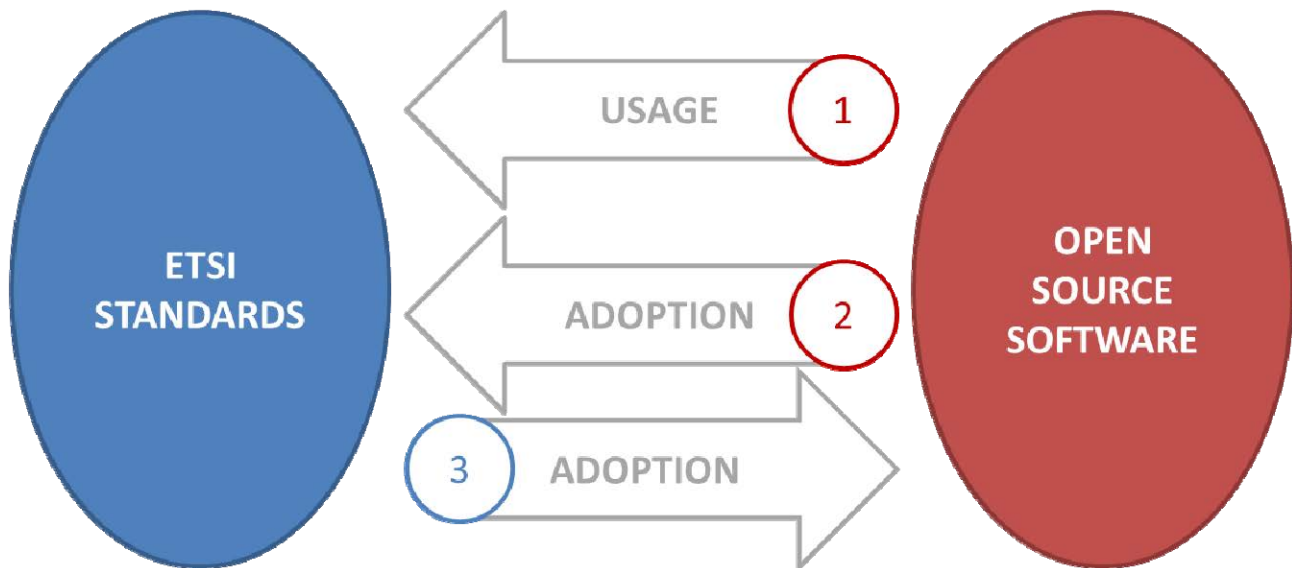
① Usage of Open Source in ETSI (TCs, Secretariat, etc.)

② Adoption of elements of OSS in the elaboration of ETSI Standards

③ Adoption of ETSI Standards within the OSS communities

Figure 2: Standards/OSS Relationships

5.2   Relationship #1: usage of OSS in ETSI Secretariat

OSS is already in use in ETSI Secretariat in various domains:

- TTCN-3 tools i.e. TRex, T3DevLib and T3Q,T3D (testing)

- APACHE (http server)

- LINUX (server operating system)

- FIREFOX (web browser)

- MYSQL (database)

- JOOMLA (content management server)

- SPIP (content management server)

Recommendation #1
Make use of OSS within ETSI Secretariat as appropriate; ETSI is in the ICT sector and open to all its products and usages.

5.3   Relationship #2: adoption/usage of elements of OSS in the elaboration of ETSI Standards

The most likely scenarios have been identified, based on potential requirements of ETSI TCs, and the opportunities and associated risks have been analysed:

- Reference material from an OSS source

- Adoption of a set of interfaces coming from an OSS source

- Inclusion of OSS source code in an ETSI Technical Specification (TS)

5.3.1 Scenario 1: consideration of reference material coming from an OSS-producing organization (requirements, architecture, etc.) in the context of the elaboration of a Technical Specification

EXAMPLE: An OSS team has identified a specific M2M gateway architecture.

What is adopted

A promising set of ideas, no specific "OSS Molecule", no copyrighted material.

Main Challenge

Work in a collaborative mode with the OSS community (e.g. INRIA is already contributing to the TC Cloud).

5.3.2 Scenario 2: adoption of a set of interfaces (Open APIs) to become prescribed within an ETSI Standard because of their particular relevance

EXAMPLE: An OSS team has developed a Home Automation product.

What is adopted

Material, other than code, and an OSS license (for example XML definitions) can be contributed to or referenced by ETSI Standards.

Main Challenge

Ensure that the OSS license applying to the material (for example interfaces) is not going to prevent licensing of essential patents on FRAND terms or otherwise be incompatible with the ETSI IPR policy [i.5] or ETSI Guide on IPRs [i.6].

The ETSI Software Copyright Policy included in the ETSI IPR policy [i.5] and the ETSI Guide on IPRs [i.6] applies to "formal (description) languages" as well as to "formal (programming) languages".

5.3.3 Scenario 3: inclusion of OSS source code in a Technical Specification

EXAMPLE: Inclusion of a CODEC description with source code developed under OSS license (an "OSS molecule", i.e. code + OSS license).

Main Challenge

Ensure that the OSS license applying to the material (for example interfaces) and to any derivative work is not going to prevent licensing of essential patents on FRAND terms or otherwise be incompatible with the ETSI IPR policy [i.5] or ETSI Guide on IPRs [i.6].

Recommendation #2
The ETSI IPR Policy [i.5] and the ETSI Guide on IPRs [i.6] apply and may allow this case depending upon the terms of the OSS license and other circumstances.

5.4 Relationship #3: adoption of ETSI Standards within the OSS communities

The adoption of ETSI Standards within the OSS communities is governed by the ETSI IPR Policy [i.5].

Recommendation #3
The OSS community is one of the potential adopters of ETSI Standards.

The ETSI IPR Policy [i.5] applies, irrespective of whether the implementation is Open Source (various license types) or not.

Some examples of Open Source implementations of ETSI Standards exist (see details in the Supporting Material in Annex A):

- **OpenBSC [i.3]**

  Note the patent-related information at http://openbsc.osmocom.org/trac/wiki/LegalNotes.

- **Open IMS Core [i.4]**

  Note the "Mandatory Disclaimer (before any usage)" regarding patents and the "General Public License v.2" at http://openimscore.org.

6 Guidance and Conclusions

6.1 General Principles

ETSI Members obligations to comply with the ETSI IPR Policy [i.5] and in particular make timely IPR Declarations are fundamental for the wide implementation of ETSI standards.

ETSI has formally adopted the GSC definition of Open Standard which includes the following fundamental elements:

- the standard is developed and/or approved, and maintained by a collaborative consensus-based process;

- such process is transparent;

- materially affected and interested parties are not excluded from such process;

- the standard is subject to RAND/FRAND Intellectual Property Right (IPR) policies which do not mandate, but may permit, at the option of the IPR holder, licensing essential intellectual property without compensation; and

- the standard is published and made available to the general public under reasonable terms(including for reasonable fee or for free).

6.2 Working in ETSI within an OSS context

In the context of Open Source Software, ETSI and its members should pay attention to the following points:

- The ETSI IPR Policy [i.5] and the ETSI Guide on IPRs [i.6] apply to any ETSI member making a contribution. Non-members have no such obligations and hence ETSI members should be careful in introducing materials of "unclear" origin into ETSI standards.

- ETSI standards should not knowingly be associated, e.g. by adopting or referencing OSS material, with any OSS licensing restrictions that would limit the ability to implement the standards for various purposes in various ways, except the need to provide a reasonable compensation (and agree to other traditional RAND licensing terms) to holders of patented technology which would be necessarily infringed without a license.

  - Care should be taken that Cooperation Agreements with external organizations do not result in adoption or referencing of such material.

- In order to enable a wide implementation of ETSI standards, they should not be approved if known to be associated with any implementation or use restrictions contained in an open source license:

  - that may prevent any patent holder to seek RAND-based patent licenses in accordance with the ETSI IPR policy [i.5]; and

  - that may prevent any implementer of the standard, having provided an agreed reasonable compensation (and agreed to other traditional RAND licensing terms) to holders of essential patented technology, to develop or acquire the software and hardware necessary for making its own products and services compliant with the ETSI standard, and market and distribute such commercial products and services in the adequate way.

NOTE: This case is already covered by the application of the ETSI Software Copyright Policy included in the ETSI IPR policy [i.5] and the ETSI Guide on IPRs [i.6] and therefore should not happen.

Annex A:
Supporting material

A.1   OpenBSC

Quote: GSM Related Patents

OpenBSC is Open Source Software for research purpose, not a product that is used commercially. The development is done by volunteers who want to learn more about GSM and who want to encourage others to experiment with it.

As such, OpenBSC does not come with patent licenses of any sort. It is well known that mobile telephony and GSM specifically is a patent minefield. Some of those patents relating to voice codecs and the Um air interface are already licensed by the BTS manufacturer. Other patents might apply directly to what OpenBSC is doing.

If you are using OpenBSC in a commercial setting, it is your responsibility to properly license all applicable patents from their respective holders. The ETSI maintains a list of essential patents that apply to GSM.

A.2   Open IMS Core

Mandatory disclaimer, before any usage

It has to be noted that this Open Source IMS Core System is not intended to become or act as a product in a commercial context! Its sole purpose is to provide an IMS core reference implementation for IMS technology testing and IMS application prototyping for research purposes, typically performed in IMS test-beds.
Users of the Open Source IMS Core System have to be aware that IMS technology may be subject of patents and license terms, as being specified within the various IMS-related IETF, ITU-T, ETSI, and 3GPP standards. Thus all Open IMS Core users have to take notice of this fact and have to agree to check out carefully before installing, using and extending the Open Source IMS Core System, if related patents and licenses may become applicable to the intended usage context.

General Public License v2, Copyright (C) 2004-2008 FhG Fokus

The Open IMS Core is an open source IMS CSCFs & HSS implementation.
Open IMS Core is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.
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For the full text of the GPLv2 license please click http://www.gnu.org/licenses/old-licenses/gpl-2.0.html.

Annex B:
Bibliography

ETSI is the Custodian of Security algorithms: "ETSI issues different type of Security Codes to manufacturers (DECT, TETRA, DMR). Codes are only delivered under a Confidentiality & Restricted Usage Undertaking procedure between the Beneficiary and the Provider".

NOTE: Available at http://www.etsi.org/WebSite/OurServices/SecurityCodes.aspx.

ETSI is the Custodian of the DVB Project Multimedia Home Platform (MHP) Test Suites.

NOTE: Available at http://www.etsi.org/WebSite/OurServices/algorithms/MHPconformance.aspx.

History

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