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MULTIMEDIA SIGNALS

Smart TV operating system

Smart television operating system – Architecture

Recommendation ITU-T J.1202

ITU-T

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Smart television operating system – Architecture

Summary

Recommendation ITU-T J.1202 specifies the architecture of a smart television operating system (TVOS) over integrated broadcast and broadband (IBB) cable networks. A smart TVOS is intended to be installed in an IBB-capable cable set top box (STB) and television (TV) to apply to broadcasting services and interactive services based on the Internet protocol provided by cable TV operators and third-parties. By running a smart TVOS, the IBB-capable STB and TV are able to intelligently provide subscribers with advanced and personalized services by downloading and installing advanced and personalized apps from the platforms of cable operators and third-parties, which are interconnected with them.

History

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Architecture, smart TV operating system, TVOS.

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Introduction

This Recommendation is one of a series on a smart television operating system (TVOS). The Recommendations for this smart TVOS cover functional requirements, architecture, and security and application programming interfaces (APIs):

Smart television operating system – Functional requirements [b-ITU-T J.1201]

Smart television operating system – Architecture (ITU-T J.1202)

Smart television operating system – Specification [b-ITU-T J.1203]

Smart television operating system – Security framework [b-ITU-T J.1204]

Smart television operating system – Hardware abstract layer application programming interface [b-ITU-T J.1205]

Recommendation ITU-T J.1202

Smart television operating system – Architecture

1 Scope

This Recommendation specifies the architecture of a smart television operating system (TVOS) over integrated broadcast and broadband (IBB) cable networks. The smart TVOS is intended to enable an IBB-capable cable set top box (STB) and television (TV) to apply to broadcasting services and interactive services based on the Internet protocol provided by cable TV operators and third parties. By running the smart TVOS, the IBB capable STB and TV are able to intelligently provide subscribers with advanced and personalized services by downloading and installing advanced and personalized apps from the platforms of cable operators and third parties that are interconnected with them.

In this Recommendation, software components, frameworks, overall software architecture and security capabilities are also required by the smart TVOS.

The smart TVOS is not intended to support functionalities of the head-end systems of cable TV operators.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

None.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 integrated broadcast and broadband (IBB) DTV service [b-ITU-T J.205]: A service that simultaneously provides an integrated experience of broadcasting and interactivity relating to media content, data and applications from multiple sources, where the interactivity is sometimes associated with broadcasting programmes.

3.1.2 rich execution environment (REE) [b-ITU-T J.1201]: An extensible and versatile operating environment that brings flexibility and capability.

3.1.3 smart television operating system (TVOS) [b-ITU-T J.1201]: A system software running on integrated broadcast and broadband-capable (IBB-capable) cable set top box (STB) and television (TV) that are capable of managing hardware, software and data resources of the IBB-capable cable STB and TV, supporting and controlling the application software execution.

3.1.4 trusted execution environment (TEE) [b-ITU-T J.1201]: A secure area of the main processor in an integrated broadcast and broadband -capable cable set top box and television to ensure that sensitive data is stored, processed and protected in an isolated and trusted environment. It offers isolated safe execution of authorized security software providing end-to-end security by

enforcement of protected execution of authenticated code, confidentiality, authenticity, privacy, system integrity and data access rights.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 device tree source (DTS): A textual representation of a device tree in a form that can be processed and compiled into a binary device tree in the form expected by the operating system (OS). A device tree is a tree data structure with nodes that describe the physical devices in a hardware system. The tree data structure allows a runtime OS to run on top of the respective hardware system without hard-coding hardware information of the related devices included in the hardware system.

3.2.2 secure operating system: An operating system running in a trusted execution environment (TEE) which is used to trigger secure execution of applications within the TEE.

3.2.3 television operating system application framework: The software module of a smart television operating system that consists of application programming interface (API) units for constructing APIs with the computer programming language used by the respective applications and works along with the corresponding execution environment for the execution of respective applications.

3.2.4 television operating system execution environment (runtime): A software module in a smart television operating system (TVOS) that evaluates and executes applications consisting of computer language instructions, associated data and media content. An execution environment is implemented right above the component layer in a TVOS, and may be implemented along with computer language interpreters or language compilers, which an application may use to present audiovisual content, interact with a user or execute other tasks that are not evident to the user. A common example of an execution environment is that of Java software, using the Java programming language byte code interpreter and a Java virtual machine for program execution.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

API	Application Programming Interface
AV	Audio Video
DCAS	Downloadable Conditional Access System
DRM	Digital Rights Management
DTS	Device Tree Source
DTV	Digital Television
HAL	Hardware Abstraction Layer
HCI	Human-Computer Interaction
IBB	Integrated Broadcast and Broadband
ID	Identifier
IPC	Inter-Process Communication
OS	Operating System
OTT	Over The Top
REE	Rich Execution Environment