

ITU-T

The Leader in APIs for Worldwide Interactive TV Services

ITU-T Study Group 9 is responsible for ITU-T Recommendations on integrated broadband cable networks, television and sound transmission, including cable modems and delivery of video, voice and high-speed data. This ITU-T work has facilitated worldwide exchange of interactive TV services by publishing Recommendations for declarative and procedural content formats (presentation and execution "engines" as they are sometimes called). ITU-T Recommendation J.200 defines the high-level architecture for a harmonized set of interactive content formats and application programming interfaces (APIs) capable of providing the variety of functionalities required by advanced interactive applications to be delivered over television networks to end users' homes. This Recommendation is the result of collaboration between ITU and organizations such as Digital Video Broadcasting (DVB), Advanced Television Systems Committee (ATSC), OpenCable, Society of Motion Picture and Television Engineers (SMPTE), Association of Radio Industries and Businesses (ARIB), etc., who have contributed to the process of harmonizing the application environment for a wide range of media throughout the world; it establishes substantial common ground in the approaches used in the standards adopted in Europe, North America and Japan.

The Recommendations

- J.200 – Worldwide common core-application environment for digital interactive television services
- J.201 – Harmonization of declarative content formats for interactive TV applications
- J.202 – Harmonization of procedural content formats for interactive TV applications

Related Recommendations

- J.95 – Copy protection of intellectual property for content delivered on cable television systems
- J.112 – Transmission systems for interactive cable television services
- J.122 – Second-generation transmission systems for interactive cable television services – IP cable modems

- J.Imp122 – Implementor's guide for second-generation transmission systems for interactive cable television services – IP cable modems
- J.83 – Digital multi-programme systems for television, sound and data services for cable distribution

What is a Common API?

The ITU APIs defined within these Recommendations are designed to specify middleware software layers intended to enable providers of interactive TV services and applications to develop products that will run successfully on a wide range of devices. This includes worldwide cable television systems, independent of set-top or television receiver hardware or operating system software.

The APIs define the environment to support a variety of applications and also provide mechanisms to take into account future work. There will of course be some regional or media-specific requirements, which demand variation from the common structure recommended. However, the ITU common API concept is intended to encourage and assist continued harmonization of the work in progress in ITU and elsewhere on the application environment for digital interactive television services.

These common APIs enable manufactures of, for example, set-tops or television receivers to build devices that will support a sophisticated array of services from cable operators, including the following:

- Electronic programme guides (EPGs)
- Video-on-demand (VOD);
- Interactive personnel video recorders;
- Interactive sports and game shows;
- Impulse pay-per-view (IPPV);
- Communication applications such as e-mail, chat, and instant messaging;
- Interactive games;
- Interactive news/weather;
- Services such as shopping (television commerce, or "T-Commerce"), and home banking.

Applications that run on set-tops or television receivers to offer these services to end users may come on the fly.

APIs for Interactive TV

Application Programming Interfaces

Enabling interactive television services

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Application Environment System Architecture

Presentation Engine/Execution Engine

– These vary between the different specifications. In some cases, one or the other is optional.

Bridge Elements – This is a mechanism for applications that allows bi-directional mapping between Java APIs and DOM (document object model), ECMA (European Computer Manufacturers Association) script objects and methods.

App Lifecycle Monitor – This controlling software is expressed differently in each specification. It can appear as a fully-fledged application or just a simple operating system (OS) monitor to control the state of the software. The general functionality is to manage applications over their entire life cycle, including initiation, termination and control.

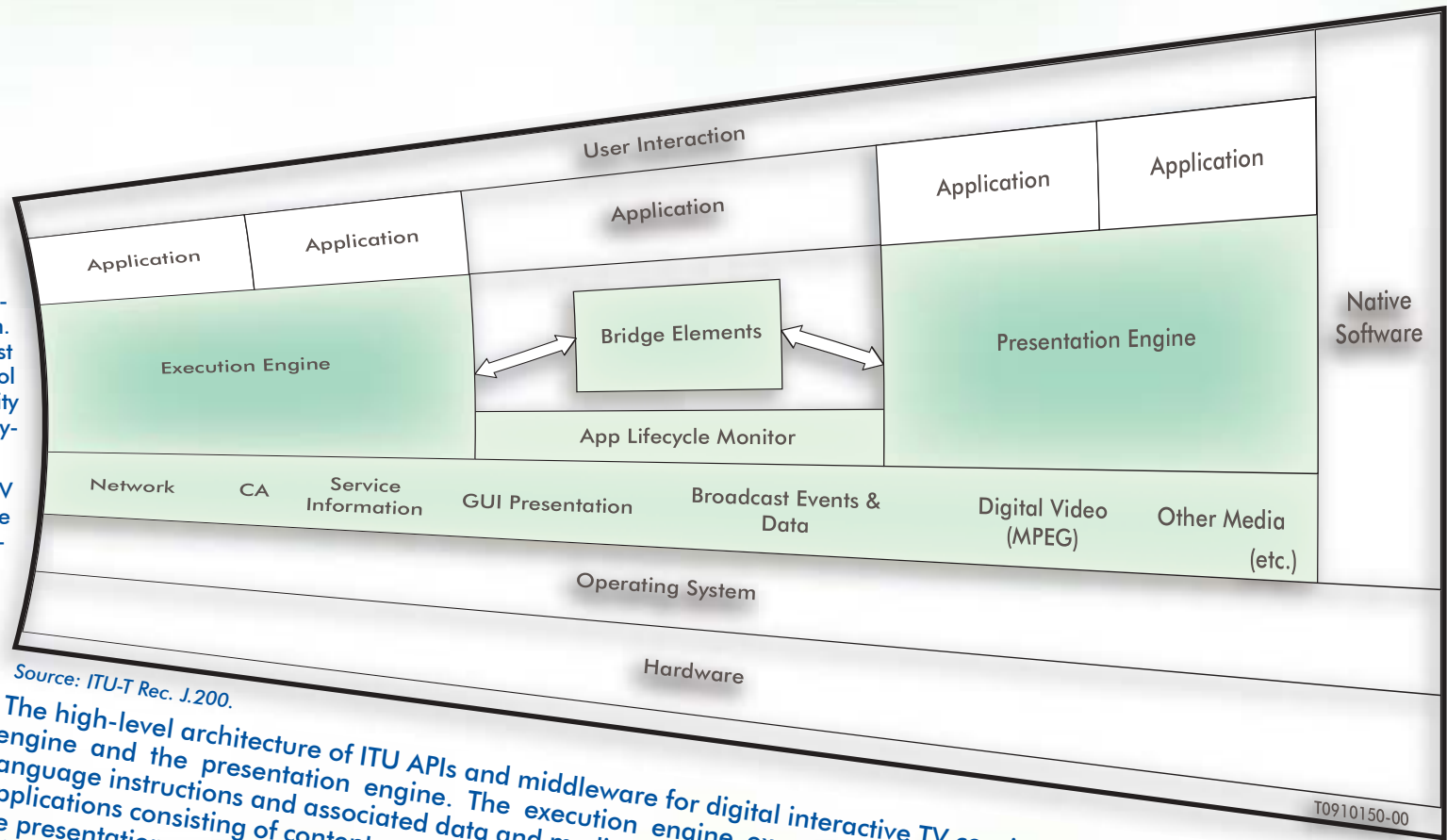
Application – This controls interactive TV programmes such as EPG, games, interactive news/weather, etc. This software may be provided on the fly.

In some systems, these applications can be limited to service-bound applications or unbounded applications. These applications can be written either to the presentation or to the execution engine, or to both.

User Interaction – This is the input layer into remote control, keyboards, and other controllers.

Other Media – This media includes streaming media such as audio and data feeds, or monomedia such as static images and text.

Native Software – This is software that is either legacy software or software written using additional APIs and functionality outside the specified application environment.



The high-level architecture of ITU APIs and middleware for digital interactive TV consist of two components: the execution engine and the presentation engine. The execution engine executes procedural applications consisting of computer language instructions and associated data and media content. The presentation engine evaluates and presents declarative applications consisting of content, such as audio, video, graphics and text primarily based on representation rules defined in the presentation engine. It also responds to formatting information, or mark-up, associated with the content, to user inputs, and to script statements.

For more information, see the ITU-T Study Group 9 at: www.itu.int/ITU-T/studygroups/com09