

Question 5/9 – Software components, application programming interfaces (APIs), frameworks and overall software architecture for advanced content distribution services within the scope of Study Group 9

(Continuation of Question 5/9)

1 Motivation

The design of the next generation set-top boxes and/or digital receivers for advanced content¹ distribution services for consumer use will require the smooth integration of many hardware and software components.

NOTE – The ITU Terminology database defines "content" as "program material and related information of any variety".

Particularly, these software components will have to be built following proven architectural practices, will have to communicate with each other through clearly defined application programming interfaces (APIs) and will have to be integrated as much as possible in a reusable form. A set of portable, interoperable, and properly abstracted functional components for a specific scope, which is sometimes called "framework", is a useful tool to develop an advanced system. Integrated APIs play an important role in frameworks to facilitate faster development of products, solutions or projects within the specified scope. These frameworks should also follow precise rules and definitions that would enable their reusability and hence reduce the overall cost of such advanced systems.

Today, software components usage is not limited only to content distribution services. There are many types of services such as integrated broadcast-broadband services, multiple device presentation and synchronization services, user-generated content services, social TV, etc. These services will enable better interactivity, accessibility and usability. This in turn leads to the same need for well-defined and well-organized software architecture.

The software architecture described above stands on the fact that a detailed knowledge and ability to control each API is of great importance; indeed, since some APIs can grow to take control of and supersede other APIs, and since even only one of such closed APIs in an otherwise open set-top box and/or digital receiver makes the entire box a closed environment, the control of practically all of the key APIs is of paramount importance. It is of course also highly desirable that the specified APIs should conform to accessible published standards, e.g. ITU-T Recommendations, rather than to proprietary standards, and that they should incorporate well-defined mechanisms for adding extensions.

A further purpose of defining these software architectures, frameworks and APIs is to enable service operators to deploy advanced set-top boxes and/or digital receivers, while ensuring their ability to keep costs low, choose among flexible architectures, maintain a multi-vendor modular environment, and obviate the need to compromise on features and functionality.

It is thus important and urgent that APIs, frameworks and the overall software architecture used in the advanced content distribution services and next generation set-top boxes and/or digital receivers, be studied and specified to conform to the operating requirements delineated above.

2 Question

Study items to be considered include, but are not limited to:

- What are the relevant requirements for the APIs (e.g. APIs for the set-top-boxes or digital receivers) to support the required advanced content distribution and functionalities?
- What are the specifications of the APIs that can be recommended for use in applications, paying attention to their desirable interoperability with other APIs used in other services

and next generation set-top boxes for the reception of advanced content distribution services via interactive systems?

- What are the specification of APIs that can be recommended for use in multiple devices, such as multiple STBs or mobile devices, to provide a service, paying attention to the desirable interoperability with other APIs used in each device, to enable advanced content distribution services via interactive systems?
- What are the appropriate Operating Systems architectures and frameworks that can be recommended to enable advanced content distribution services via interactive systems?
- What are the specifications of the APIs that can be recommended to provide the mechanisms to allow its future extension to further functionalities?
- What are the specifications of APIs to support accessibility requirements?

3 Tasks

Tasks include, but are not limited to:

- The preparation of new Recommendation(s) to address the study items under "Question" above, that will eventually fully specify all the APIs, frameworks and overall software architecture recommended for use in the advanced content distribution services via interactive access networks.

An up-to-date status of work under this Question is contained in the Study Group 9 work programme (https://www.itu.int/ITU-T/workprog/wp_search.aspx?sp=17&sg=9).

4 Relationships

Recommendations

- APIs: J.200-series
- TVOS: J.1200-series
- IBB: ITU-R BT.1699, BT.1722, BT.1889, BT.2037, BT.2053 and BT.2075

Questions

- 3/9, 6/9, 7/9, 8/9, 9/9 and 11/9

Study groups

- ITU-T SG16 (especially Q13/16)
- ITU-R SG6

Standardization bodies

- ISO/IEC JTC 1
- DVB
- ETSI
- W3C

WSIS action lines

- C2, C3, C5, C6, C9, C11

SDGs

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