

Recommendation

ITU-T J.1306 (07/2023)

SERIES J: Cable networks and transmission of television, sound programme and other multimedia signals

Cloud-based converged media services for IP and broadcast cable television

Specification of microservices architecture for audiovisual media in the converged media cloud

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Recommendation ITU-T J.1306

Specification of microservices architecture for audiovisual media in the converged media cloud

Summary

Recommendation ITU-T J.1306 specifies the architecture and related components of audiovisual media based on microservice technologies. Recommendation ITU-T J.1306 fulfils the requirements in Recommendation ITU-T J.1305. This Recommendation applies to the design, development, construction, operation and maintenance of audiovisual media systems based on microservices. Recommendation ITU-T J.1306 is based on the characteristics of microservice technology and audiovisual media business, combines the requirements of technology and business, and devises an audiovisual media microservice architecture (MMA) that meets the needs of rapid iteration and diversified services of the audiovisual media business. MMA follows the layered architectural methodology specified in Recommendation ITU-T J.1302. Mainly from the perspective of cloud platform, Recommendation ITU-T J.1302 stipulates the system architecture of cloud-based converged media services (CBCMSs) to support Internet protocol and broadcast cable television services. From the perspective of microservice, Recommendation ITU-T J.1306 specifies the microservices architecture of integrated media based on container, virtual machine, cloud and other infrastructures to support the audiovisual media business carried out by microservices on a variety of infrastructures. From the perspective of microservice governance, Recommendation ITU-T J.1306 realizes the compatibility of various current mainstream microservice frameworks and stipulates the management capabilities of distributed systems. From the media business perspective, it specifies the microservice components that support production, broadcasting, transmission, distribution, interaction and other audiovisual media business. From the perspective of application integration, it stipulates the service orchestration capabilities and the means of application assembly.

History *

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Introduction

This Recommendation is part 2 of a multi-part deliverable covering microservices architecture for audiovisual media in converged media cloud, identified as follows:

Part 1: [ITU-T J.1305] – Requirements

Part 2: ITU-T J.1306 – Specification

Recommendation ITU-T J.1306

Specification of microservices architecture for audiovisual media in the converged media cloud

1 Scope

This Recommendation specifies the architecture and related components of audiovisual media based on microservice technologies. This Recommendation fulfils the requirements of [ITU-T J.1305].

This Recommendation applies to the design, development, construction, operation and maintenance of audiovisual media systems based on microservices.

This Recommendation bears the characteristics of microservice technology and audiovisual media business, combines the requirements of technology and business, and comes up with an audiovisual media microservice architecture (MMA) that meets the needs of rapid iteration and diversified services of the audiovisual media business. An MMA follows the layered architectural methodology as specified in [ITU-T J.1302].

Mainly from the perspective of cloud platform, [ITU-T J.1302] stipulates the system architecture of cloud-based converged media services (CBCMSs) to support Internet protocol (IP) and broadcast cable television services. From the perspective of microservice, this Recommendation specifies the microservices architecture of integrated media based on container, virtual machine, cloud and other infrastructures to support the audiovisual media business carried out by microservices on a variety of infrastructures.

From the perspective of microservice governance, this Recommendation realizes the compatibility of various current mainstream microservice frameworks and stipulates the management capabilities of distributed systems. From the media business perspective, it specifies the microservice components that support the production, broadcasting, transmission, distribution, interaction and other audiovisual media business. From the perspective of application integration, it stipulates the service orchestration capabilities and the means of application assembly.

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.

- | | |
|----------------|---|
| [ITU-T J.1302] | Recommendation ITU-T J.1302 (2022), <i>Specification of cloud-based converged media service to support Internet protocol and broadcast cable television – System architecture</i> . |
| [ITU-T J.1305] | Recommendation ITU-T J.1305 (2023), <i>Requirements of microservice architecture for audiovisual media in the converged media cloud</i> . |

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 API gateway [ITU-T J.1302]: In microservices architecture, applications and services are composed of smaller, exchangeable components, and these components need a way to find and communicate with one another. This is where API gateways come in. An API gateway sits between clients and services. It acts as a reverse proxy, routing requests from clients to services. It may also perform various cross-cutting tasks such as authentication, transport layer security (TLS) termination, and rate limiting.

3.1.2 audiovisual media [b-ISO/TR 11219]: Documents in which sound and/or pictures are prominent, and which require the use of special equipment to be viewed and/or heard.

NOTE – This includes audio documents, pictures and films on different physical carriers.

3.1.3 cloud-based converged media service (CBCMS) [b-ITU-T J.1301]: A service intended for deployment by cable television operators and to support the requirements of rapid service innovation and deployment, which enables media services to be developed by separate vendors according to standard application programming interfaces, where appropriate.

3.1.4 container [b-ITU-T Y.3535]: A set of software to provide isolation, resource control and portability for virtualization processing of an application.

3.1.5 converged media [ITU-T J.1305]: New type of media that effectively combines the information technology of radio, television, newspapers and periodicals, network audiovisual and other aspects, with the help of diversified communication channels and forms.

3.1.6 data warehouse [b-ISO 19297-1]: Special kind of database system built upon existing operational databases that plays a key role in building a decision support system for an organization or an enterprise.

3.1.7 digital rights management [b-ITU-T X.1193]: A synonym for service and content protection or content protection, depending upon the context of use.

3.1.8 edge cloud [b-ITU-T J.1303]: The cloud that is deployed close to users' locations and has a limited set of services compared to the central cloud.

3.1.9 media microservice architecture (MMA) [ITU-T J.1305]: A system construction method oriented to audiovisual media based on microservice technologies. Its core idea is to adopt miniaturized and distributed methodologies to provide services to users in system development, deployment and maintenance for complex application scenarios related to audiovisual media, to avoid the problem that the system is difficult to maintain and upgrade with the increasing number of business scenarios.

3.1.10 microservice [b-ITU-T J.1301]: An architectural and organizational approach to software development where software is composed of small independent microservices that communicate over well-defined application programming interfaces. Microservice architecture makes applications easier to scale and faster to develop, enabling innovation and accelerating time-to-market for new features.

3.1.11 microservices architecture [b-ISO/IEC TS 23167]: Design approach that divides an application into a set of microservices.

3.1.12 process engine; workflow engine [ITU-T J.1305]: Software service or "engine" that provides the run time execution environment for a process instance.

NOTE – Adopted from the definition of "workflow engine" in [b-ISO 12651-2].