



Technical Specification

ISO/IEC TS 7339

Information technology — Cloud computing — Overview of platform capabilities type and platform as a service

*Technologies de l'information — Informatique en nuage — Vue
d'ensemble des types de ressources et des services de plateformes
à la demande*

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Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 38, *Cloud computing and distributed platforms*.

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Introduction

Many cloud services allow a cloud service customer (CSC) to develop, upload, and execute their own code, rather than uploading a complete virtual machine image, or being confined to software provided by the cloud service provider.

This ability to write and execute their own code allows CSCs and others to develop or customise their own applications without having to run their own private datacentres, and without having to install, patch and manage operating systems and other elements typically required in legacy IaaS services. This approach allows the CSC to concentrate on the code that directly meets their business need rather than having to create a lot of peripheral code just to make things work.

While some cloud services are specifically designed as Platform as a Service (PaaS) wherein the execution of CSC-provided code is the primary purpose of the cloud service, others include a greater or lesser amount of “platform capabilities type” as a feature or supplement to the main function of the cloud service. These platform capabilities can be as basic as telephone call routing scripts or database stored procedures or can be as extensive as large function libraries or microservices for use in other applications. The full range of possibilities is too extensive to list exhaustively and is constantly growing as new ideas emerge.

In addition, the world of cloud computing is seeing wholly new developments and technologies added all the time. Many of these include the execution of CSC-provided code, or its equivalent for a different paradigm. For example, Artificial Intelligence (AI) services (e.g. machine learning) can be deployed as cloud services, and in this case the “CSC-provided code” can include both training data and procedural code. As another example, the world is preparing for the availability of Quantum Computing (QC) technology which (like AI) will probably be exposed to CSCs as various forms of cloud services. Both AI and QC technologies appear as services that can be incorporated within more traditional application designs, thus contributing their specialised and unique capabilities.

It is therefore useful to describe both the purpose-built PaaS concept, and the more general “platform capabilities type” as it appears in other cloud services beyond PaaS. This document explains the differences between PaaS and other services, the types of CSC-provided code that such platforms can support, the general approaches to development of code for such services, common platform architectural approaches, and how cloud computing platforms can support new technology paradigms such as AI and QC in a consistent manner.

In particular, this document provides an introduction to the “cloud native computing” concept as a pattern of platform capabilities type, providing an architectural pattern that is focused on cloud-first development and that offers greater flexibility and modularity than many older software design patterns.

It is also important to define some general recommendations to promote good practice in the provision and use of digital technology platforms of these kinds especially with respect to transparency of platform service offerings to existing and potential CSCs.

Throughout this document, unless otherwise explicitly stated, the term “platform” is always used in the engineering sense, specifically referring to the “digital technology platform” in accordance with ISO/IEC TS 5928 as implemented in cloud services, edge services, mobile services, and other distributed platforms.

The common engineering usage of “digital technology platform” includes:

- operating systems,
- “platform as a service” cloud services in accordance with ISO/IEC 22123-1,
- other cloud services that exhibit “platform capabilities type” in accordance with ISO/IEC 22123-2.

As such, this usage of platform refers to cloud services that enable a CSC to create and maintain their own hosted application, rather than using digital technology for the creation of a multi-sided market as typically used by economists and competition regulators.

However, as described in ISO/IEC TS 5928, some types of cloud services (typically various forms of SaaS) that are implemented on top of the digital technology platform can also exhibit the characteristics of

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a digital economic platform by creating a multi-sided market. Such SaaS implementations by CSCs of the digital technology platform are generally outside the control and responsibility of the digital technology platform service operator.

The intended audience for this document is:

- businesses considering the use of technology platform capabilities for new cloud applications (both as CSDs and as purchasers of installable cloud software)
- for those seeking to understand or describe the various cloud application development options available
- for those seeking to clearly describe digital technology platform services that they offer to CSCs
- for those developing governmental or procurement policies covering CSC-provided cloud applications
- those developing other standards that need to reference cloud technology platform capabilities and approaches.

Information technology — Cloud computing — Overview of platform capabilities type and platform as a service

1 Scope

Within the context of digital technology platforms as defined in ISO/IEC TS 5928, this document provides:

- a description of the concepts of the platform capabilities type as it appears in various cloud service categories;
- a description of the specific cloud service category of platform as a service (PaaS);
- descriptions of common technology platform architectures, development approaches, and life cycles of elements of technology platform services, including a high-level description of the popular cloud native computing concept;
- recommendations for cloud services that include platform capabilities, including but not limited to PaaS.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 22123-1, *Information technology — Cloud computing — Part 1: Vocabulary*

ISO/IEC/TS 5928, *Taxonomy for digital platforms*