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## Information technology — Cloud computing — Interoperability and portability

*Technologies de l'information — Informatique en nuage — Interopérabilité et portabilité*



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## Foreword

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 38, *Cloud Computing and Distributed Platforms*.

## Introduction

This document is intended to establish a common understanding of cloud computing interoperability and portability. In particular, it is of interest to cloud stakeholders focusing on cloud service agreements concerning interoperability or portability between cloud services.

Cloud computing is defined as a paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand. ISO/IEC 17788 and ISO/IEC 17789 provide a starting point for understanding of different types of interoperability and portability, relationships with activities and roles and cloud capabilities types. Interoperability, data portability and application portability are essential to the use of cloud services. The goal of interoperability is to enable the interaction between non-cloud and cloud services, as well as between cloud services, in addition to enabling composition of new services from multiple services. The goal of portability is to enable cloud service customers (CSCs) to move their data or applications between non-cloud and one or more cloud services and between cloud services. The benefits of interoperability include lower costs of integration and increasing the value of services through enrichment or new functionality provided by composing cloud services. The benefits of portability include greater efficiency by lowering the costs of migration. Both interoperability and portability offer more choices to CSCs by limiting the effects of being locked in to any cloud service or cloud service provider (CSP). While there is no disagreement that interoperability and portability are advantages to cloud computing, there is no single way of handling either capability. Declaring interoperability or portability without doing a detailed analysis of what specifically is to be ported or is to be made interoperable is meaningless and does not lead to cloud solutions that meet the CSC's and CSP's business goals, which has led to significant and on-going confusion in the industry and needs to be resolved.

Interoperability is the ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged. In the context of cloud computing, interoperability should be viewed as the capability of public cloud services, private cloud services and other cloud service customer systems to understand each other's interfaces, configuration, forms of authentication and authorization, etc. in order to cooperate and work with each other.

Interoperability is a complex subject in the context of cloud computing because of the number of interactions involved and the potential variations for each interaction. While interoperability and standards add significant value and are advantageous to cloud computing, there are no comprehensive solutions. Many existing IT standards contribute to enabling interoperability between CSC applications and cloud services and between cloud services themselves. Using standards can be one way to build interoperable cloud services. Other techniques such as well-documented API specifications can also help.

Cloud computing services that enable portability using defined policies, standards or documented formats can ensure that CSCs are able to get their data into or out of cloud services in a reasonably easy and cost-effective manner, as this allows CSCs to move to a cloud service of another CSP and also to drive integration of heterogeneous cloud services.

As presented in ISO/IEC 17788, portability is the ability of a CSC to move their data or their applications between two different cloud services at a low cost and with minimal disruption. Portability is significant in cloud computing since CSCs are interested in avoiding lock-in when they choose to use cloud services. Therefore, in the context of cloud computing, portability can have multiple aspects depending on what is being ported (moved) and which cloud services are involved. For portability, there are no specific requirements for the source and target systems to be directly connected.

Portability in a cloud computing environment is not a binary concept. It would be a mistake to think of cloud services and the associated cloud applications and data as being either 100% portable or not portable at all. Almost all applications running in a cloud service can be ported to another cloud service offering equivalent capabilities if enough resources are invested. The critical considerations for portability discussions are the porting cost, the risks associated with the porting and how to control the costs and risks compared to the expected benefits.