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**Software and systems
engineering — Capabilities of build
and deployment tools**

*Ingénierie du logiciel et des systèmes — Capacités des outils de
construction et de déploiement*

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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 7, *Software and systems engineering*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

Build and deployment tools and methods have long been central to software engineering, and the importance of their role continues to increase. Traditionally, build and deployment tools were simple mechanisms used to create executable code from the source code written in a programming language, typically comprising a compiler and a linker bundled with the operating system. Over time, these mechanisms have become much more complex, where application software is built using the source code and libraries distributed across multiple servers. Furthermore, the testing and operation of a system often requires deployment to a large number of servers. Increasing sophistication in software development environments is another factor in the increasing the importance of advanced build and deployment tools and methods.

Many modern build and deployment tools are now available on the market, independent of the vendor providing the operating system. These tools can be configured as independent automation on top of compilers and linkers bundled with individual operating systems, as well as repositories that manage assets. Therefore, there are multiple options available, and it is essential to choose the appropriate one for each different software engineering context. This document provides guidance in the selection of commercially available tools from different vendors as well as tools provided as open source.

This document treats tasks and tools related to change management and configuration management as out of scope. Build and deployment processes are typically initiated by modifications to the source code, indicating they are closely related to change management and configuration management. However, while change management and configuration management primarily deal with source code, build and deployment involves the transformation of source code into sophisticated operational representations and structures. Therefore, change management and configuration management are excluded to enable focus on the single build and deployment concern.

From a user's perspective, it is important to choose the right tools from the variety of available build and deployment tools, especially in large organizations. It is imperative that tool evaluation and selection be done in accordance with fair and public standards. To this end, ISO/IEC 20741 was published in 2017 as a guideline to evaluate and select software engineering tools. However, ISO/IEC 20741 does not identify the standard capabilities specific to build and deployment tools since it is generalized without regard to a specific tool category.

This document defines the requirements for capabilities of build and deployment tools and is intended to be used in conjunction with ISO/IEC 20741 to select the appropriate tool (see [Annex A](#)). The document provides a list of capabilities in build and deployment tools. The capabilities described in this document are gathered from existing tools (see [Annex B](#)).

Build, deploy, and CI/CD tools are separate and independent tools, which can logically be treated in separate standards. However, in most software engineering environments, they are applied in highly integrated, interdependent, and continuous workflows. Evaluation and selection are best conducted from this integrated viewpoint and this document functions as a single standard for this integrated collection tools.