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First edition  
2021-04

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# Software and systems engineering — Methods and tools for the feature- based approach to software and systems product line engineering

*Ingénierie du logiciel et des systèmes — Méthodes et outils pour  
l'approche basée sur les caractéristiques dans l'ingénierie de lignes de  
produits logiciels et systèmes*



Reference number  
ISO/IEC 26580:2021(E)

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Published in Switzerland

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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*.

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## Introduction

Feature-based software and systems product line engineering (“feature-based PLE” for short) is a specialization of software and systems product line (SSPL) engineering and management that is described in ISO/IEC 26550. ISO/IEC 26550 describes a very generalized approach to SSPL, focusing on the benefits of exploiting a common platform of reusable assets for a product family. Each organization that adopts SSPL under ISO/IEC 26550 is free to do so using their preferred techniques and methods.

What is the motivation for creating a standard for a specialization of SSPL? As the SSPL field has matured and achieved widespread attention in the industry, a specific and repeatable approach to SSPL has emerged that takes advantage of commercial off-the-shelf industrial-strength tools and technology, along with robust best practices for methods and processes, that automate and formalize many of the processes in domain and application engineering. The result is that less upfront analysis, design, and implementation effort is required prior to gaining the benefits from the approach.

While SSPL in general provides significant benefits, it also requires a significant investment of time and effort to adopt and to ultimately achieve those benefits. The feature-based PLE specialization is a more narrowly defined solution that can be supported by off-the-shelf tools and methods, which has resulted in lower investments when an organization adopts SSPL. Feature-based PLE embodies lessons learned about SSPL practices that have been shown to provide some of the highest benefits and returns (see, for example, References [2] and [8]).

This document provides a reference model consisting of an abstract representation of the key technical elements, tools, and methods of feature-based PLE. The predominant specializations of general SSPL that characterize feature-based PLE are:

- a) a mapping from features to asset variation points that is sufficient to drive a fully automated configurator that produces assets specific to member products;
- b) a methodological shift of all design and implementation effort, change management, and configuration management to domain engineering, so that application engineering is reduced to automated configuration of member product instances and testing of configured member products and member-product-specific assets.

This document embodies a distinct separation of concerns between the feature-based PLE technology providers and feature-based technology users. For each of these stakeholder concerns, the scope of this document is to define only what is necessary and sufficient to enable feature-based PLE practice. For technology providers, this imparts flexibility in how the necessary and sufficient technical capabilities are provided, as well as the opportunity to offer more expansive capabilities that are possible in an ideal solution. For technology users, this provides flexibility to select among the technology providers and to apply the methods that best match their technical and business objectives for feature-based PLE.