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Software Product Line Engineering

Foundations, Principles, and Techniques

 Springer

Software Product Line Engineering Foundations Principles And Techniques

Jan Bosch, Jaejoon Lee



Software Product Line Engineering Foundations Principles And Techniques:

Software Product Line Engineering Klaus Pohl, Günter Böckle, Frank J. van der Linden, 2005-11-28 I Software Product Line Engineering Are you interested in producing software products or software intensive systems at lower costs in shorter time and with higher quality If so you are holding the right book in your hands Software product line engineering has proven to be the methodology for Higher quality lower developing a diversity of software products and software intensive systems cost and shorter at lower costs in shorter time and with higher quality Numerous reports development times document the significant achievements and experience gained by introducing software product lines in the software industry Chapter 21 of this book summarises several cases Concerning the terminology there is an almost synonymous use of the terms Software product line software product family and software product line Whereas in Europe vs software product the term software product family is used more often in North America the family term software product line is used more frequently This is among other things reflected in the names of the two former conference series the software product line conference series started in 2000 in the USA and the product family engineering PFE workshop series started in 1996 in Europe which were merged in 2004 to form the leading software product line conference SPLC series In this book we use the term software product line

Software Product Line Engineering Klaus Pohl, Günter Böckle, Frank J. van der Linden, 2009-09-02

Software product line engineering has proven to be the methodology for developing a diversity of software products and software intensive systems at lower costs in shorter time and with higher quality In this book Pohl and his co authors present a framework for software product line engineering which they have developed based on their academic as well as industrial experience gained in projects over the last eight years They do not only detail the technical aspect of the development but also an integrated view of the business organisation and process aspects are given In addition they explicitly point out the key differences of software product line engineering compared to traditional single software system development as the need for two distinct development processes for domain and application engineering respectively or the need to define and manage variability

Software Product Lines: Going Beyond Jan Bosch, Jaejoon Lee, 2010 This volume constitutes the refereed proceedings of the 14th International Software Product Line Conference SPLC 2010 held on Jeju Island South Korea in September 2010

Software Product Line Abdelrahman Elfaki, 2012-04-04 The Software Product Line SPL is an emerging methodology for developing software products Currently there are two hot issues in the SPL modelling and the analysis of the SPL Variability modelling techniques have been developed to assist engineers in dealing with the complications of variability management The principal goal of modelling variability techniques is to configure a successful software product by managing variability in domain engineering In other words a good method for modelling variability is a prerequisite for a successful SPL On the other hand analysis of the SPL aids the extraction of useful information from the SPL and provides a control and planning strategy mechanism for engineers or experts In addition the analysis of the SPL provides

a clear view for users Moreover it ensures the accuracy of the SPL This book presents new techniques for modelling and new methods for SPL analysis **UML-Based Software Product Line Engineering with SMarty** Edson Oliveira Jr, 2023-02-06

This book is about software product lines SPLs designed and developed taking UML diagrams as the primary basis modeled according to a rigorous approach composed of an UML profile and a systematic process for variability management activities forming the Stereotype based Management of Variability SMarty approach The book consists of five parts Part I provides essential concepts on SPL in terms of the first development methodologies It also introduces variability concepts and discusses SPL architectures finishing with the SMarty approach Part II is focused on the design verification and validation of SMarty SPLs and Part III concentrates on the SPL architecture evolution based on ISO IEC metrics the System PLA method optimization with the MOA4PLA method and feature interaction prevention Next Part IV presents SMarty as a basis for SPL development such as the M SPLearning SPL for mobile learning applications the PLeTs SPL for testing tools the PlugSPL plugin environment for supporting the SPL life cycle the SyMPLES approach for designing embedded systems with SysML the SMartySPeM approach for software process lines SPeL and re engineering of class diagrams into an SPL Eventually Part V promotes controlled experimentation in UML based SPLs presenting essential concepts on how to plan conduct and document experiments as well as showing several experiments carried out with SMarty This book aims at lecturers graduate students and experienced practitioners Lecturers might use the book for graduate level courses about SPL fundamentals and tools students will learn about the SPL engineering process variability management and mass customization and practitioners will see how to plan the transition from single product development to an SPL based process how to document inherent variability in a given domain or how to apply controlled experiments to SPLs *Applied Software Product Line*

Engineering Kyo C. Kang, Vijayan Sugumaran, Sooyong Park, 2009-12-22 Over the last decade software product line engineering SPLE has emerged as one of the most promising software development paradigms for increasing productivity in IT related industries Detailing the various aspects of SPLE implementation in different domains *Applied Software Product Line Engineering* documents best practices with regard to syst Software Product Lines Timo Käkölä, Juan Carlos Dueñas, 2007-02-07 Between July 1999 and June 2005 a group of European companies research institutes and universities executed the EUREKA ITEA projects ESAPS CAF and FAMILIES on the topic of product line engineering The projects originated from the need of the industry to improve software engineering performance by organizing product development in product lines The results obtained within the projects have been implemented in several large industries e g automotive e business medical systems and mobile phones They involve a radical shift in software construction and production The most important research results of the projects are collected in this book Product line engineering was already applied within industry in the 1980s and presumably earlier In the 1980s good architects in many telecommunications companies based their architectures on the ideas of David Parnas who published on the subject of program families They were facilitated by the

CHILL language widely used by the telecommunications companies This language deploys the same modularity principles as the Modula programming language family Modularity is a crucial ingredient for implementing systems with a component based architecture Being able to compose the products of components is an important mechanism in all product line architectures In the 1990s the product line ideas started to gain ground in other industries Around 1995 the company experiences reached the academia and since then people in companies and academia have collaborated widely on this subject The ESAPS CAF and FAMILIES projects manifest an institutionalized form of this collaboration

Handbook of Re-Engineering Software Intensive Systems into Software Product Lines Roberto E. Lopez-Herrejon, Jabier Martinez, Wesley Klewerton Guez Assunção, Tewfik Ziadi, Mathieu Acher, Silvia Vergilio, 2022-11-22 This handbook distils the wealth of expertise and knowledge from a large community of researchers and industrial practitioners in Software Product Lines SPLs gained through extensive and rigorous theoretical empirical and applied research It is a timely compilation of well established and cutting edge approaches that can be leveraged by those facing the prevailing and daunting challenge of re engineering their systems into SPLs The selection of chapters provides readers with a wide and diverse perspective that reflects the complementary and varied expertise of the chapter authors This perspective covers the re engineering processes from planning to execution SPLs are families of systems that share common assets allowing a disciplined software reuse The adoption of SPL practices has shown to enable significant technical and economic benefits for the companies that employ them However successful SPLs rarely start from scratch but instead they usually start from a set of existing systems that must undergo well defined re engineering processes to unleash new levels of productivity and competitiveness Practitioners will benefit from the lessons learned by the community captured in the array of methodological and technological alternatives presented in the chapters of the handbook and will gain the confidence for undertaking their own re engineering challenges Researchers and educators will find a valuable single entry point to quickly become familiar with the state of the art on the topic and the open research opportunities including undergraduate graduate students and R D engineers who want to have a comprehensive understanding of techniques in reverse engineering and re engineering of variability rich software systems

Requirements Engineering: Foundation for Software Quality Barbara Paech, Colette Rolland, 2008-05-30 This book constitutes the refereed proceedings of the 14th International Working Conference on Requirements Engineering Foundation for Software Quality REFSQ 2008 held in Montpellier France in June 2008 The 17 revised full papers presented together with an introduction of the editors and the keynote lecture were carefully reviewed and selected from 50 submissions The papers are organized in thematic sections on fitness of RE requirements elicitation industrial experience of RE innovative systems maturing research and empirical studies

Software Product Lines in Action Frank J. van der Linden, Klaus Schmid, Eelco Rommes, 2007-06-10 Software product lines represent perhaps the most exciting paradigm shift in software development since the advent of high level programming languages Nowhere else in software engineering have

we seen such breathtaking improvements in cost quality time to market and developer productivity often registering in the order of magnitude range While the underlying concepts are straightforward enough building a family of related products or systems by planned and careful reuse of a base of generalized software development assets the devil can be in the details as successful product line practice can involve organizational change business process change and technology change The authors ideally combine academic research results with industrial real world experiences thus presenting a broad view on product line engineering so that both managers and technical specialists will benefit from reading it After presenting a common framework for the description of the industrial case studies they capture the wealth of knowledge that eight companies have gathered during the introduction of the software product line engineering approach in their daily practice After reading this book you will understand all the relevant aspects regarding business architecture process and organizational issues of applying software product line engineering If you consider using a product line approach in your organization or if you want to improve your current practices you will find a rich set of useful information at your fingertips from practitioners to practitioners

Requirements Engineering: Foundation for Software Quality Björn Regnell, Daniela Damian, 2012-03-05 This book constitutes the refereed proceedings of the 18th International Working Conference on Requirements Engineering Foundation for Software Quality REFSQ 2012 held in Essen Germany in March 2012 The papers are organized in 10 topical sections on contractual requirements quality requirements collaboration complexity and creativity requirements analysis templates and heuristics requirements traceability tools and quality services and clouds self adaptivity and industrial case studies

Requirements Engineering: Foundation for Software Quality Pete Sawyer, Barbara Paech, Patrick Heymans, 2007-06-28 This book constitutes the refereed proceedings of the 13th International Working Conference on Requirements Engineering Foundation for Software Quality REFSQ 2007 held in Trondheim Norway It covers goal driven requirements engineering RE products and product lines value based RE and the value of RE requirements elicitation requirements specification industrial experience of RE and requirements quality and quality requirements

Handbook of Research on Estimation and Control Techniques in E-Learning Systems Mkrttchian, Vardan, 2015-12-22 Improvements in the application of online learning technologies are continually on the rise as the expectation for individuals to obtain a higher education grows and more people are seeking alternative modes of education As more institutions implement e learning systems it has become increasingly important to explore the advancements and obstacles of these technologies The Handbook of Research on Estimation and Control Techniques in E Learning Systems presents the latest research in online learning and educational technologies for a diverse range of students and educational environments Featuring comprehensive coverage on the implementation and usage of e education systems this publication explores a variety of pertinent topics including but not limited to ubiquitous computer technology e learning environments and challenges in implementing these technologies serving as a crucial reference source for researchers professionals

academicians students government officials and technology developers interested in the adoption and implementation of e learning systems **On the Move to Meaningful Internet Systems: OTM 2011 Workshops** Robert Meersman, Tharam Dillon, Pilar Herrero, 2011-10-30 This volume constitutes the refereed proceedings of nine international workshops EI2N NSF ICE ICSP INBAST ISDE MONET ORM SeDeS SWWS and VADER 2011 held as part of OTM 2011 in Hersonissos on the island of Crete Greece in October 2011 The 64 revised full papers presented were carefully reviewed and selected from a total of 104 submissions The volume also includes three papers from the On the Move Academy OTMA 2011 and five ODBASE 2011 poster papers Topics of the workshop papers are enterprise integration and semantics information centric engineering interoperability industrial and business applications of semantic Web applications information systems in distributed environments process management in distributed information system development distributed information systems implementation issues and applications industrial applications of fact oriented modeling data warehouse modeling extensions to fact oriented modeling model validation procedures schema transformations and mapping semantic Web and Web semantics ontology development deployment and interoperability data access and efficient computation efficient information processing exchange and knowledge synthesis algorithms mobile and networking technologies for social applications semantic and decision support variability in software architecture and dynamic and adaptive architectures **Software**

Reuse for Dynamic Systems in the Cloud and Beyond Ina Schaefer, Ioannis Stamelos, 2014-12-22 This book constitutes the refereed proceedings of the 14th International Conference on Software Reuse for Dynamic Systems in the Cloud and Beyond ICSR 2015 held in Miami FL USA in January 2015 The 21 revised full papers presented together with 3 revised short papers were carefully reviewed and selected from 60 submissions The papers cover several software engineering areas where software reuse is important such as software product lines domain analysis open source components cloud quality

Requirements Engineering: Foundation for Software Quality Roel Wieringa, Anne Persson, 2010-06-17 This volume constitutes the refereed proceedings of the International Working Conference REFSQ 2010 held in Essen Germany in June July 2010 **Software Architecture** Muhammad Ali Babar, Ian Gorton, 2010-08-11 Welcome to the European Conference on Software Architecture ECSA which is the premier European software engineering conference ECSA provides researchers and practitioners with a platform to present and discuss the most recent innovative and significant findings and experiences in the field of software architecture research and practice The fourth edition of ECSA was built upon a history of a successful series of European workshops on software architecture held from 2004 through 2006 and a series of European software architecture conferences from 2007 through 2009 The last ECSA was merged with the 8th Working IEEE IFIP Conference on Software Architecture WICSA Apart from the traditional technical program consisting of keynote talks a main search track and a poster session the scope of the ECSA 2010 was broadened to incorporate other tracks such as an industry track doctoral symposium track and a tool demonstration track In addition we also offered several workshops and tutorials on

diverse topics related to software architecture We received more than 100 submissions in the three main categories full research and experience papers emerging research papers and research challenges papers The conference attracted papers co authored by researchers practitioners and academics from 30 countries Algeria Australia Austria Belgium Brazil Canada Chile China Colombia Czech Republic Denmark Finland France Germany Hong Kong I land India Ireland Israel Italy The Netherlands Poland Portugal Romania Spain Sweden Switzerland Tunisia United Kingdom United States

Relating System Quality and Software Architecture Ivan Mistrik,Rami Bahsoon,Peter Eeles,Roshanak Roshandel,Michael Stal,2014-07-30 System Quality and Software Architecture collects state of the art knowledge on how to intertwine software quality requirements with software architecture and how quality attributes are exhibited by the architecture of the system Contributions from leading researchers and industry evangelists detail the techniques required to achieve quality management in software architecting and the best way to apply these techniques effectively in various application domains especially in cloud mobile and ultra large scale internet scale architecture Taken together these approaches show how to assess the value of total quality management in a software development process with an emphasis on architecture The book explains how to improve system quality with focus on attributes such as usability maintainability flexibility reliability reusability agility interoperability performance and more It discusses the importance of clear requirements describes patterns and tradeoffs that can influence quality and metrics for quality assessment and overall system analysis The last section of the book leverages practical experience and evidence to look ahead at the challenges faced by organizations in capturing and realizing quality requirements and explores the basis of future work in this area Explains how design decisions and method selection influence overall system quality and lessons learned from theories and frameworks on architectural quality Shows how to align enterprise system and software architecture for total quality Includes case studies experiments empirical validation and systematic comparisons with other approaches already in practice

New Trends in Software Methodologies, Tools and Techniques A. Selamat,H. Fujita,H. Haron,2014-08-29 Software is the essential enabling means for science and the new economy It helps us to create a more reliable flexible and robust society But software often falls short of our expectations Current methodologies tools and techniques remain expensive and are not yet sufficiently reliable while many promising approaches have proved to be no more than case by case oriented methods This book contains extensively reviewed papers from the thirteenth International Conference on New Trends in software Methodology Tools and Techniques SoMeT_14 held in Langkawi Malaysia in September 2014 The conference provides an opportunity for scholars from the international research community to discuss and share research experiences of new software methodologies and techniques and the contributions presented here address issues ranging from research practices and techniques and methodologies to proposing and reporting solutions for global world business The emphasis has been on human centric software methodologies end user development techniques and emotional reasoning for an optimally harmonized performance

between the design tool and the user Topics covered include the handling of cognitive issues in software development to adapt it to the user's mental state and intelligent software design in software utilizing new aspects on conceptual ontology and semantics reflected on knowledge base system models This book provides an opportunity for the software science community to show where we are today and where the future may take us Leveraging Applications of Formal Methods, Verification and Validation Tiziana Margaria, Bernhard Steffen, 2012-09-26 The two volume set LNCS 7609 and 7610 constitutes the thoroughly refereed proceedings of the 5th International Symposium on Leveraging Applications of Formal Methods Verification and Validation held in Heraklion Crete Greece in October 2012 The two volumes contain papers presented in the topical sections on adaptable and evolving software for eternal systems approaches for mastering change runtime verification the application perspective model based testing and model inference learning techniques for software verification and validation LearnLib tutorial from finite automata to register interface programs RERS grey box challenge 2012 Linux driver verification bioscientific data processing and modeling process and data integration in the networked healthcare timing constraints theory meets practice formal methods for the development and certification of X by wire control systems quantitative modelling and analysis software aspects of robotic systems process oriented geoinformation systems and applications handling heterogeneity in formal development of HW and SW Systems

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