

## Chapter 7 Object Oriented Software Engineering Addressing

Test-Driven Development (TDD) is now an established technique for delivering better software faster. TDD is based on a simple idea: Write tests for your code before you write the code itself. However, this "simple" idea takes skill and judgment to do well. Now there's a practical guide to TDD that takes you beyond the basic concepts. Drawing on a decade of experience building real-world systems, two TDD pioneers show how to let tests guide your development and "grow" software that is coherent, reliable, and maintainable. Steve Freeman and Nat Pryce describe the processes they use, the design principles they strive to achieve, and some of the tools that help them get the job done. Through an extended worked example, you'll learn how TDD works at multiple levels, using tests to drive the features and the object-oriented structure of the code, and using Mock Objects to discover and then describe relationships between objects. Along the way, the book systematically addresses challenges that development teams encounter with TDD—from integrating TDD into your processes to testing your most difficult features. Coverage includes Implementing TDD effectively: getting started, and maintaining your momentum throughout the project Creating cleaner, more expressive, more sustainable code Using tests to stay relentlessly focused on sustaining quality Understanding how TDD, Mock Objects, and Object-Oriented Design come together in the context of a real software development project Using Mock Objects to guide object-oriented designs Succeeding where TDD is difficult: managing complex test data, and testing persistence and concurrency

Nothing provided

The Pernambuco School on Software Engineering (PSSE) 2007 was the second in a series of events devoted to the study of advanced computer science and to the promotion of international scientific collaboration. The main theme in 2007 was testing. Testing is nowadays a key activity for assuring software quality. The summer school and its proceedings were intended to give a detailed tutorial introduction to the scientific basis of this activity and its state of the art. These proceedings record the contributions from the invited lecturers. Each of the chapters is the result of a thorough revision of the initial notes provided to the participants of the school. The revision was inspired by the synergy generated by the opportunity for the lecturers to present and discuss their work among themselves and with the school's attendees. The editors have tried to produce a coherent view of the topic by harmonizing these contributions, smoothing out differences in notation and approach, and providing links between the lectures. We apologize to the authors for any errors introduced by our extensive editing. Although the chapters are linked in several ways, each one is sufficiently self-contained to be read in isolation. Nevertheless, Chap. 1 should be read first by those interested in an introduction to testing. Chapter 1 introduces the terminology adopted in this book. It also provides an overview of the testing process, and of the types (functional, structural, and so on) and dimensions (unit, integration, and so on) of the testing activity. The main strategies employed in the central activity of test selection are also discussed. Most of the material presented in this introductory chapter is addressed in more depth in the following chapters.

Fundamentals of Object-Oriented Design in UML shows aspiring and experienced programmers alike how to apply design concepts, the UML, and the best practices in OO development to improve both their code and their success rates with object-based projects.

"Supply Chain Event Management (SCEM)" is one of the major topics in application-oriented Supply Chain Management. However, many solutions lack conceptual precision and currently available client-server SCEM-systems are ill-suited for complex supply networks in today's business environment. Agent-based proactive information logistics promises to overcome existing deficits by providing event-related information to all participants in the distributed environment. Hence, follow-up costs of disruptive events are significantly reduced for all network participants and performance of a supply network is increased. In this book a thorough analysis of the event management problem domain is the starting point to develop a generic agent-based approach to Supply Network Event Management. The main focus lies on practical issues of event management (e.g., semantic interoperability) and economic benefits to be achieved with agent technology in this state-of-the-art problem domain.

Addressing various aspects of object-oriented software techniques with respect to their impact on testing, this text argues that the testing of object-oriented software is not restricted to a single phase of software development. The book concentrates heavily on the testing of classes and of components or sub-systems, and a major part is devoted to this subject. C++ is used throughout this book that is intended for software practitioners, managers, researchers, students, or anyone interested in object-oriented technology and its impacts throughout the software engineering life-cycle.

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More than ever, mission-critical and business-critical applications depend on object-oriented (OO) software. Testing techniques tailored to the unique challenges of OO technology are necessary to achieve high reliability and quality. "Testing Object-Oriented Systems: Models, Patterns, and Tools" is an authoritative guide to designing and automating test suites for OO applications. This comprehensive book explains why testing must be model-based and provides in-depth coverage of techniques to develop testable models from state machines, combinational logic, and the Unified Modeling Language (UML). It introduces the test design pattern and presents 37 patterns that explain how to design responsibility-based test suites, how to tailor integration and regression testing for OO code, how to test reusable components and frameworks, and how to develop highly effective test suites from use cases. Effective testing must be automated and must leverage object technology. The author describes how to design and code specification-based assertions to offset testability losses due to inheritance and polymorphism. Fifteen micro-patterns present oracle strategies—practical solutions for one of the hardest problems in test design. Seventeen design patterns explain how to automate your test suites with a coherent OO test harness framework. The author provides thorough coverage of testing issues such as: The bug hazards of OO programming and differences from testing procedural code How to design responsibility-based tests for classes, clusters, and subsystems using class invariants, interface data flow models, hierarchic state machines, class associations, and scenario analysis How to support reuse by effective testing of abstract classes, generic classes, components, and frameworks How to choose an integration strategy that supports iterative and incremental development How to achieve comprehensive system testing with testable use cases How to choose a regression test approach How to develop expected

test results and evaluate the post-test state of an object How to automate testing with assertions, OO test drivers, stubs, and test frameworks Real-world experience, world-class best practices, and the latest research in object-oriented testing are included. Practical examples illustrate test design and test automation for Ada 95, C++, Eiffel, Java, Objective-C, and Smalltalk. The UML is used throughout, but the test design patterns apply to systems developed with any OO language or methodology. 0201809389B04062001

This textbook provides a progressive approach to the teaching of software engineering. First, readers are introduced to the core concepts of the object-oriented methodology, which is used throughout the book to act as the foundation for software engineering and programming practices, and partly for the software engineering process itself. Then, the processes involved in software engineering are explained in more detail, especially methods and their applications in design, implementation, testing, and measurement, as they relate to software engineering projects. At last, readers are given the chance to practice these concepts by applying commonly used skills and tasks to a hands-on project. The impact of such a format is the potential for quicker and deeper understanding. Readers will master concepts and skills at the most basic levels before continuing to expand on and apply these lessons in later chapters.

Object-Oriented Design and Programming with C++: Your Hands-On Guide to C++ Programming, with Special Emphasis on Design, Testing, and Reuse provides a list of software engineering principles to guide the software development process. This book presents the fundamentals of the C++ language. Organized into two parts encompassing 10 chapters, this book begins with an overview of C++ and describes object-oriented programming and the history of C++. This text then introduces classes, polymorphism, inheritance, and overloading. Other chapters consider the C++ preprocessor and organization of class libraries. This book discusses as well the scope rules, separate compilation, class libraries, and their organization, exceptions, browsers, and exception handling. The final chapter deals with the design of a moderately complex system that provides file system stimulation. This book is a valuable resource for readers who are reasonably familiar with the C programming language and want to understand the issues in object-oriented programming using C++.

This book provides the software engineering fundamentals, principles and skills needed to develop and maintain high quality software products. It covers requirements specification, design, implementation, testing and management of software projects. It is aligned with the SWEBOK, Software Engineering Undergraduate Curriculum Guidelines and ACM Joint Task Force Curricula on Computing.

In today's modernized environment, a growing number of software companies are changing their traditional engineering approaches in response to the rapid development of computing technologies. As these businesses adopt modern software engineering practices, they face various challenges including the integration of current methodologies and contemporary design models and the refactoring of existing systems using advanced approaches. Applications and Approaches to Object-Oriented Software Design: Emerging Research and Opportunities is a pivotal reference source that provides vital research on the development of modern software practices that impact maintenance, design, and developer productivity. While highlighting topics such as augmented reality, distributed computing, and big data processing, this publication explores the current infrastructure of software systems as well as future advancements. This book is ideally designed for software engineers, IT specialists, data scientists, business professionals, developers, researchers, students, and academicians seeking current research on contemporary software engineering methods.

Software architectures have gained wide popularity in the last decade. They generally play a fundamental role in coping with the inherent difficulties of the development of large-scale and complex software systems. Component-oriented and aspect-oriented programming enables software engineers to implement complex applications from a set of pre-defined components. Software Architectures and Component Technology collects excellent chapters on software architectures and component technologies from well-known authors, who not only explain the advantages, but also present the shortcomings of the current approaches while introducing novel solutions to overcome the shortcomings. The unique features of this book are: evaluates the current architecture design methods and component composition techniques and explains their shortcomings; presents three practical architecture design methods in detail; gives four industrial architecture design examples; presents conceptual models for distributed message-based architectures; explains techniques for refining architectures into components; presents the recent developments in component and aspect-oriented techniques; explains the status of research on Piccola, Hyper/J®, Pluggable Composite Adapters and Composition Filters. Software Architectures and Component Technology is a suitable text for graduate level students in computer science and engineering, and as a reference for researchers and practitioners in industry.

Object-oriented programming is a popular buzzword these days. What is the reason for this popularity? Is object-oriented programming the solution to the software crisis or is it just a fad? Is it a simple evolutionary step or a radical change in software methodology? What is the central idea behind object-oriented design? Are there special applications for which object-oriented programming is particularly suited? Which object-oriented language should be used? There is no simple answer to these questions. Although object-oriented programming was invented more than twenty years ago, we still cannot claim that we know everything about this programming technique. Many new concepts have been developed during the past decade, and new applications and implications of object-oriented programming are constantly being discovered. This book can only try to explain the nature of object-oriented programming in as much detail as possible. It should serve three purposes. First, it is intended as an introduction to the basic concepts of object-oriented programming. Second, the book describes the concept of prototypes and explains why and how they can improve the way in which object-oriented programs are developed. Third, it introduces the programming language Omega, an object oriented language that was designed with easy, safe and efficient software development in mind.

As information technologies become increasingly distributed and accessible to larger number of people and as commercial and government organizations are challenged to scale their applications and services to larger market shares, while reducing costs, there is demand for software methodologies and applications to provide the following features: Richer application end-to-end functionality; Reduction of human involvement in the design and deployment of the software; Flexibility of software behaviour; and Reuse and composition of existing software applications and systems in novel or adaptive ways. When designing new distributed software systems, the above broad requirements and their translation into implementations are typically addressed by partial complementarities and overlapping technologies and this situation gives rise to significant software engineering challenges. Some of the challenges that may arise are: determining the components that the distributed applications should contain, organizing the application components, and determining the assumptions that one needs to make in order to implement distributed scalable and flexible applications, etc.

Business Component-Based Software Engineering, an edited volume, aims to complement some other reputable books on CBSE, by stressing how components are built for large-scale applications, within dedicated development processes and for easy and direct combination. This book will emphasize these three facets and will offer a complete overview of some recent progresses. Projects and works explained herein will prompt graduate students, academics, software engineers, project managers and developers to adopt and to apply new component development methods gained from and validated by the authors. The authors of Business Component-Based Software Engineering are academic and professionals, experts in the field, who will introduce the state of the art on CBSE from their shared experience by working on the same projects. Business Component-Based Software Engineering is designed to meet the needs of practitioners and researchers in industry, and graduate-level students in Computer Science and Engineering.

To achieve consistent software project success under the pressures of today's software development environment, software organizations require achievable plans including

viable estimates of schedule, resources, and risks. To estimate realistically, you must understand how to apply sound estimation processes, tools, and data. Software Sizing While Java texts are plentiful, it's difficult to find one that takes a real-world approach, and encourages novice programmers to build on their Java skills through practical exercise. Written by an expert with 19 experience teaching computer programming, Java Programming Fundamentals presents object-oriented programming by employing examples taken Object-Oriented Software Engineering Using UML, Patterns, and Java: Pearson New International Edition Pearson Higher Ed

Addressing general readers as well as software practitioners, "Software and Mind" discusses the fallacies of the mechanistic ideology and the degradation of minds caused by these fallacies. Mechanism holds that every aspect of the world can be represented as a simple hierarchical structure of entities. But, while useful in fields like mathematics and manufacturing, this idea is generally worthless, because most aspects of the world are too complex to be reduced to simple hierarchical structures. Our software-related affairs, in particular, cannot be represented in this fashion. And yet, all programming theories and development systems, and all software applications, attempt to reduce real-world problems to neat hierarchical structures of data, operations, and features. Using Karl Popper's famous principles of demarcation between science and pseudoscience, the book shows that the mechanistic ideology has turned most of our software-related activities into pseudoscientific pursuits. Using mechanism as warrant, the software elites are promoting invalid, even fraudulent, software notions. They force us to depend on generic, inferior systems, instead of allowing us to develop software skills and to create our own systems. Software mechanism emulates the methods of manufacturing, and thereby restricts us to high levels of abstraction and simple, isolated structures. The benefits of software, however, can be attained only if we start with low-level elements and learn to create complex, interacting structures. Software, the book argues, is a non-mechanistic phenomenon. So it is akin to language, not to physical objects. Like language, it permits us to mirror the world in our minds and to communicate with it. Moreover, we increasingly depend on software in everything we do, in the same way that we depend on language. Thus, being restricted to mechanistic software is like thinking and communicating while being restricted to some ready-made sentences supplied by an elite. Ultimately, by impoverishing software, our elites are achieving what the totalitarian elite described by George Orwell in "Nineteen Eighty-Four" achieves by impoverishing language: they are degrading our minds.

This comprehensive and well-written book presents the fundamentals of object-oriented software engineering and discusses the recent technological developments in the field. It focuses on object-oriented software engineering in the context of an overall effort to present object-oriented concepts, techniques and models that can be applied in software estimation, analysis, design, testing and quality improvement. It applies unified modelling language notations to a series of examples with a real-life case study. The example-oriented approach followed in this book will help the readers in understanding and applying the concepts of object-oriented software engineering quickly and easily in various application domains. This book is designed for the undergraduate and postgraduate students of computer science and engineering, computer applications, and information technology. **KEY FEATURES :** Provides the foundation and important concepts of object-oriented paradigm. Presents traditional and object-oriented software development life cycle models with a special focus on Rational Unified Process model. Addresses important issues of improving software quality and measuring various object-oriented constructs using object-oriented metrics. Presents numerous diagrams to illustrate object-oriented software engineering models and concepts. Includes a large number of solved examples, chapter-end review questions and multiple choice questions along with their answers.

Extensively class-tested, this textbook takes an innovative approach to software testing: it defines testing as the process of applying a few well-defined, general-purpose test criteria to a structure or model of the software. It incorporates the latest innovations in testing, including techniques to test modern types of software such as OO, web applications, and embedded software. The book contains numerous examples throughout. An instructor's solution manual, PowerPoint slides, sample syllabi, additional examples and updates, testing tools for students, and example software programs in Java are available on an extensive website.

The ultimate goal of program verification is not the theory behind the tools or the tools themselves, but the application of the theory and tools in the software engineering process. Our society relies on the correctness of a vast and growing amount of software. Improving the software engineering process is an important, long-term goal with many steps. Two of those steps are the KeY tool and this KeY book.

An indispensable resource for anyone working with Eiffel, this up-to-date guide provides full coverage of the most recent version of the language, focusing on Eiffel's practical use in the development of large, mission-critical software systems. In addition to a comprehensive description of Eiffel's syntax and semantics, you will find in-depth information on style guides, analysis and design, design patterns, and validation and testing. Descriptions and comparisons of available compilers and libraries will help you decide which Eiffel tools best fit your development needs. The book even includes an Eiffel resource guide. The book's most notable feature is its three large-scale case studies that demonstrate Eiffel in action, illustrating implementation techniques and showcasing Eiffel's power and effectiveness in three different realms: the MIS world, the embedded systems/telecommunications world, and the numeric world. By reading this book, you will not only obtain a knowledge of the mechanics of Eiffel programming, but you will also come away with an understanding of Eiffel's role in the field of object-oriented technology and a sense of the language's strong potential in large software development.

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The purpose of this book is to make the reader familiar with software engineering for distributed systems. Software engineering is a valuable discipline in the development of software. The reader has surely heard of software systems completed months or years later than scheduled with huge cost overruns, systems which on completion did not provide the performance

promised, and systems so catastrophic that they had to be abandoned without ever doing any useful work. Software engineering is the discipline of creating and maintaining software; when used in conjunction with more general methods for effective management its use does reduce the incidence of horrors mentioned above. The book gives a good impression of software engineering particularly for distributed systems. It emphasises the relationship between software life cycles, methods, tools and project management, and how these constitute the framework of an open software engineering environment, especially in the development of distributed software systems. There is no closed software engineering environment which can encompass the full range of software missions, just as no single flight plan, airplane or pilot can perform all aviation missions. There are some common activities in software engineering which must be addressed independent of the applied life cycle or methodology. Different life cycles, methods, related tools and project management approaches should fit in such a software engineering framework.

Presents information on how to program software for iOS applications, covering such topics as object-oriented design principles, using Xcode, developing an Apps user interface, and harnessing iOS device capabilities.

Covers advanced features of Perl, how the Perl interpreter works, and presents areas of modern computing technology such as networking, user interfaces, persistence, and code generation. For courses in computer science and software engineering The Fundamental Practice of Software Engineering Software Engineering introduces students to the overwhelmingly important subject of software programming and development. In the past few years, computer systems have come to dominate not just our technological growth, but the foundations of our world's major industries. This text seeks to lay out the fundamental concepts of this huge and continually growing subject area in a clear and comprehensive manner. The Tenth Edition contains new information that highlights various technological updates of recent years, providing students with highly relevant and current information. Sommerville's experience in system dependability and systems engineering guides the text through a traditional plan-based approach that incorporates some novel agile methods. The text strives to teach the innovators of tomorrow how to create software that will make our world a better, safer, and more advanced place to live.

Software Engineering: A Methodical Approach (Second Edition) provides a comprehensive, but concise introduction to software engineering. It adopts a methodical approach to solving software engineering problems, proven over several years of teaching, with outstanding results. The book covers concepts, principles, design, construction, implementation, and management issues of software engineering. Each chapter is organized systematically into brief, reader-friendly sections, with itemization of the important points to be remembered. Diagrams and illustrations also sum up the salient points to enhance learning. Additionally, the book includes the author's original methodologies that add clarity and creativity to the software engineering experience. New in the Second Edition are chapters on software engineering projects, management support systems, software engineering frameworks and patterns as a significant building block for the design and construction of contemporary software systems, and emerging software engineering frontiers. The text starts with an introduction of software engineering and the role of the software engineer. The following chapters examine in-depth software analysis, design, development, implementation, and management. Covering object-oriented methodologies and the principles of object-oriented information engineering, the book reinforces an object-oriented approach to the early phases of the software development life cycle. It covers various diagramming techniques and emphasizes object classification and object behavior. The text features comprehensive treatments of: Project management aids that are commonly used in software engineering An overview of the software design phase, including a discussion of the software design process, design strategies, architectural design, interface design, database design, and design and development standards User interface design Operations design Design considerations including system catalog, product documentation, user message management, design for real-time software, design for reuse, system security, and the agile effect Human resource management from a software engineering perspective Software economics Software implementation issues that range from operating environments to the marketing of software Software maintenance, legacy systems, and re-engineering This textbook can be used as a one-semester or two-semester course in software engineering, augmented with an appropriate CASE or RAD tool. It emphasizes a practical, methodical approach to software engineering, avoiding an overkill of theoretical calculations where possible. The primary objective is to help students gain a solid grasp of the activities in the software development life cycle to be confident about taking on new software engineering projects.

Part of SoMet series, this book contains reviewed papers given at the Seventh International Conference on New Trends in Software Methodology Tools, and Techniques (SoMeT\_08) held in Sharjah, United Arab Emirates. It addresses handling of cognitive issues on software development to adapt to user mental state.

Object-oriented programming (OOP) has been the leading paradigm for developing software applications for at least 20 years. Many different methodologies, approaches, and techniques have been created for OOP, such as UML, Unified Process, design patterns, and eXtreme Programming. Yet, the actual process of building good software, particularly large, interactive, and long-lived software, is still emerging. Software engineers familiar with the current crop of methodologies are left wondering, how does all of this fit together for designing and building software in real projects? This handbook from one of the world's leading software architects and his team of software engineers presents guidelines on how to develop high-quality software in an application-oriented way. It answers questions such as: \* How do we analyze an application domain utilizing the knowledge and experience of the users? \* What is the proper software architecture for large, distributed interactive systems that can utilize UML and design patterns? \* Where and how should we utilize the techniques and methods of the Unified Process and eXtreme Programming? This book brings together the best of research, development, and day-to-day project work. "The strength of the book is that it focuses on the transition from design to implementation in addition to its overall vision about software development." -Bent Bruun Kristensen, University of Southern Denmark, Odense

An industry insider explains why there is so much bad software—and why academia doesn't teach programmers what industry wants them to know. Why is software so prone to bugs? So vulnerable to viruses? Why are software products so often delayed, or even canceled? Is software development really hard, or are software developers just not that good at it? In *The Problem with Software*, Adam Barr examines the proliferation of bad software, explains what causes it, and offers some suggestions on how to improve the situation. For one thing, Barr points out, academia doesn't teach programmers what they actually need to know to do their jobs: how to work in a team to create code that works reliably and can be maintained by somebody other

than the original authors. As the size and complexity of commercial software have grown, the gap between academic computer science and industry has widened. It's an open secret that there is little engineering in software engineering, which continues to rely not on codified scientific knowledge but on intuition and experience. Barr, who worked as a programmer for more than twenty years, describes how the industry has evolved, from the era of mainframes and Fortran to today's embrace of the cloud. He explains bugs and why software has so many of them, and why today's interconnected computers offer fertile ground for viruses and worms. The difference between good and bad software can be a single line of code, and Barr includes code to illustrate the consequences of seemingly inconsequential choices by programmers. Looking to the future, Barr writes that the best prospect for improving software engineering is the move to the cloud. When software is a service and not a product, companies will have more incentive to make it good rather than "good enough to ship."

Software Development with C++: Maximizing Reuse with Object Technology is about software development and object-oriented technology (OT), with applications implemented in C++. The basis for any software development project of complex systems is the process, rather than an individual method, which simply supports the overall process. This book is not intended as a general, all-encompassing treatise on OT. The intent is to provide practical information that is directly applicable to a development project. Explicit guidelines are offered for the infusion of OT into the various development phases. The book is divided into five major parts. Part I describes why we need a development process, the phases and steps of the software process, and how we use individual methods to support this process. Part II lays the foundation for the concepts included in OT. Part III describes how OT is used in the various phases of the software development process, including the domain analysis, system requirements analysis, system design, software requirements analysis, software design, and implementation. Part IV deals exclusively with design issues for an anticipated C++ implementation. Part V is devoted to object-oriented programming with C++. This book is intended for practicing software developers, software managers, and computer science and software engineering students. Sufficient guidelines are included to aid project leaders in establishing an overall development process for small, medium, and large system applications.

This book demonstrates the efficiency of the C++ programming language in the realm of pattern recognition and pattern analysis. For this 4th edition, new features of the C++ language were integrated and their relevance for image and speech processing is discussed.

This is a textbook for a course in object-oriented software engineering at advanced undergraduate and graduate levels, as well as for software engineers. It contains more than 120 exercises of diverse complexity. The book discusses fundamental concepts and terminology on object-oriented software development, assuming little background on software engineering, and emphasizes design and maintenance rather than programming. It also presents up-to-date and easily understood methodologies and puts forward a software life cycle model which explicitly encourages reusability during software development and maintenance.

This 1998 book presents the underlying principles associated with object-orientation and its practical application.

For courses in Software Engineering, Software Development, or Object-Oriented Design and Analysis at the Junior/Senior or Graduate level. This text can also be utilized in short technical courses or in short, intensive management courses. Shows students how to use both the principles of software engineering and the practices of various object-oriented tools, processes, and products. Using a step-by-step case study to illustrate the concepts and topics in each chapter, Bruegge and Dutoit emphasize learning object-oriented software engineer through practical experience: students can apply the techniques learned in class by implementing a real-world software project. The third edition addresses new trends, in particular agile project management (Chapter 14 Project Management) and agile methodologies (Chapter 16 Methodologies).

If you want an up-to-date, in-depth understanding of next generation intelligent networks (IN), this book is essential reading. It provides you with a comprehensive survey of current and emerging intelligent telecommunications networks, including underlying software, implementation, deployment and standards. It assesses the influence of mobile networks and IP technology on the directions that IN is taking now, and looks at the way middleware is reducing the dependence of service logic on the underlying network protocols. Moreover, it discusses the role of IN in tomorrow's network. Next Generation Intelligent Networks investigates how service creation is taking on board state-of-the-art distributed object-oriented programming techniques. The book focuses on emerging software architectures for programming and deploying value-added services, and proposes a vision of value-added services in the network of the future. Learn how new initiatives such as Soft switches, JAIN, Parlay, OSA, TINA and CAMEL help you to more effectively handle the new challenges brought on by the rapid growth of cellular mobile networks and the Internet.

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