

Second Workshop on Proactive Failure Avoidance, Recovery, and Maintenance (PFARM)

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Abstract

Proactive approaches to failure avoidance, recovery and maintenance have recently attracted increased interest among researchers and practitioners from various areas of dependable system design and operation. This first workshop provided a stimulating, and fruitful forum to foster collaboration among researchers working on proactive fault management, to discuss ideas, exchange experiences and to find new answers to the overall challenge of significantly improving system dependability in contemporary computing and communication systems.

1. Themes, Goals and Objectives

Over the last decade, research on dependable computing has undergone a shift from reactive towards proactive-reactive and purely proactive methods: In classical fault tolerance a system reacts to errors or component failures in order to prevent them from turning into system failures, and maintenance follows fixed, time-based plans. However, due to an ever increasing system complexity, use of commercial-off-the-shelf components, virtualization, ongoing system patches and updates and dynamicity the effectiveness of such approaches has diminished and some of them have become difficult to apply. Therefore, a new area in dependability research has emerged focusing on proactive approaches that start acting before a problem arises in order to increase time-to-failure and/or reduce time-to-repair. These techniques frequently build on the anticipation of upcoming problems based on runtime monitoring. Industry and academia use several terms for such techniques, each focusing on different aspects, including self-* computing, autonomic computing, proactive fault management, trustworthy computing, failure prediction or forecasting, software rejuvenation, or preventive/proactive maintenance. It is the goal of this workshop to increase collaboration among re-

searchers from various communities all over the world working on the topic of PFARM. We want to provide a stimulating, and fruitful forum to foster collaboration among researchers working on similar topics, to discuss ideas, exchange experiences and to find new answers to the overall challenge of improving system dependability in contemporary computing and communication systems by an order of magnitude or more. More specifically, these techniques usually build on

- runtime monitoring to permanently measure the system's state
- algorithms to anticipate upcoming problems
- predictive diagnosis focused on the root cause of the upcoming problem
- decision and scheduling techniques in order to decide which method should be applied and when
- efficient and effective techniques to avoid upcoming failures, minimize their negative effects or improve system dependability by maintenance

An increased interest in proactive failure avoidance, recovery and maintenance techniques can be observed from the rising number of papers published in major general dependability conferences such as DSN, SRDS, PRDC and EDOC. It was the goal of this workshop to bring together researchers from all over the world to form a community within the community of dependable computing. In order to achieve this, the workshop provided a stimulating, and fruitful forum to foster collaboration among researchers working on similar topics, to discuss ideas, exchange experiences and to find new answers to the overall challenge of significantly improving system dependability in contemporary computing and communication systems. In fact, there is some evidence that with comprehensive use of proactive fault management methods the dependability in the server clusters environments (e.g., cloud computing) can be increased by an order of magnitude or more.

Dependable Computing With Proactive Failure Avoidance Recovery And Maintenance

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Dependable Computing With Proactive Failure Avoidance Recovery And Maintenance:

Dependable Computing with Proactive Failure Avoidance, Recovery, and Maintenance Mirosław Malek, Felix Salfner, 2015-02-05 This book presents a set of techniques for dependable computing known collectively as Proactive Failure Avoidance Recovery and Maintenance or PFARM which can have a major impact on computer systems availability and performance It focuses on runtime monitoring failure avoidance and prediction algorithms and technologies proactive recovery and preventive maintenance as the main steps in proactive fault management Coverage includes runtime monitoring techniques long term and short term prediction techniques an introduction to prediction quality measures and a demonstration of how the availability of software and hardware systems can be increased by preventive measures which are triggered by short term failure prediction mechanisms

On the Move to Meaningful Internet Systems: OTM 2009 Robert Meersman, Tharam Dillon, Pilar Herrero, 2009-10-26 This two volume set LNCS 5870 5871 constitutes the refereed proceedings of the four confederated international conferences on Cooperative Information Systems CoopIS 2009 Distributed Objects and Applications DOA 2009 Information Security IS 2009 and Ontologies Databases and Applications of Semantics ODBASE 2009 held as OTM 2009 in Vilamoura Portugal in November 2009 The 83 revised full papers presented together with 4 keynote talks were carefully reviewed and selected from a total of 234 submissions Corresponding to the four OTM 2009 main conferences CoopIS DOA IS and ODBASE the papers are organized in topical sections on workflow process models ontology challenges network complexity modeling cooperation information complexity infrastructure information aspect oriented approaches for distributed middleware distributed algorithms and communication protocols distributed infrastructures for cluster and Grid computing object based component based resource oriented event oriented and service oriented middleware peer to peer and centralized infrastructures performance analysis of distributed computing systems reliability fault tolerance quality of service and real time support self properties in distributed middleware software engineering for distributed middleware systems security and privacy in a connected world ubiquitous and pervasive computing information systems security privacy and authentication security policies and verification managing ontologies using ontologies event processing dealing with heterogeneity building knowledge bases and XML and XML schema

Self-Organizing Systems Thrasyvoulos Spyropoulos, Karin Anna Hummel, 2009-12-01 This book constitutes the refereed proceedings of the 4th International Workshop on Self Organizing Systems IWSOS 2009 held in Zurich Switzerland in December 2009 The 14 revised full papers and 13 revised short papers presented were carefully selected from the 34 full and 27 short paper submissions The papers are organized in topical sections on ad hoc and sensor networks services storage and internet routing peer to peer systems theory and general approaches overlay networks peer to peer systems and internet routing wireless networks and network topics

Reliable Distributed Systems Amy Elser, 2005-03-25 Explains fault tolerance in clear terms with concrete examples drawn from real world settings Highly practical focus aimed at building

mission critical networked applications that remain secure *Proceedings Euromicro. Conference,1998* Delay and Disruption Tolerant Networks Aloizio Pereira da Silva,Scott Burleigh,Katia Obraczka,2018-09-04 Delay and Disruption Tolerant Networks DTNs are networks subject to arbitrarily long lived disruptions in connectivity and therefore cannot guarantee end to end connectivity at all times Consequently DTNs called for novel core networking protocols since most existing Internet protocols rely on the network s ability to maintain end to end communication between participating nodes This book presents the fundamental principles that underline DTNs It explains the state of the art on DTNs their architecture protocols and applications It also explores DTN s future technological trends and applications Its main goal is to serve as a reference for researchers and practitioners **Computer Safety, Reliability, and Security** Stefano Tonetta,Erwin Schoitsch,Friedemann Bitsch,2017-09-01 This book constitutes the refereed proceedings of five workshops co located with SAFECOMP 2017 the 36th International Conference on Computer Safety Reliability and Security held in Trento Italy in September 2017 The 38 revised full papers presented together with 5 introductory papers to each workshop and three invited papers were carefully reviewed and selected from 49 submissions This year s workshops are ASSURE 2017 Assurance Cases for Software Intensive Systems DECSoS 2017 ERCIM EWICS ARTEMIS Dependable Embedded and Cyber Physical Systems and Systems of Systems SASSUR 2017 Next Generation of System Assurance Approaches for Safety Critical Systems TIPS 2017 Timing Performance in Safety Engineering TELERISE 2017 Technical and legal Aspects of Data Privacy and Security **Digital Citizenship Class 6 Level 1** Manish Soni,2024-11-13 Today s world is rapidly transforming and technology has become an inseparable part of our lives Digital tools have opened up immense opportunities from communicating with friends to accessing educational resources However with these advances it is crucial to ensure that young learners are equipped with the necessary skills to navigate this Digital landscape responsibly and safely This is the foundation upon which Digital Citizenship for Class 6 The content of this book is thoughtfully divided into several key areas 1 Introduction to Digital Citizenship In this introductory chapter students will learn about Digital Citizenship focusing on the responsible use of Digital devices and positive contributions to the online world They will be introduced to concepts like Digital Identity and Digital Footprint in a way that helps them understand the long term effects of their online actions 2 Online Safety and Security With increasing access to the internet safety and security are paramount This chapter covers essential topics such as protecting personal information understanding privacy settings recognising and avoiding online threats such as cyberbullying phishing and malware and strong passwords Students will also be introduced to safe browsing habits and how to report inappropriate or harmful content 3 Media Literacy and Critical Thinking The internet is full of information but not all of it is accurate or trustworthy In this book students will enhance their critical thinking skills to analyse and evaluate online information They will learn to differentiate between credible sources and misinformation understand the dangers of fake news and recognise the influence of advertising and social media on public opinion

empowering them to become discerning consumers of Digital content 4 Digital Footprint and Online Reputation In this chapter students will learn about Digital Footprints and their long term impact on online reputation They will understand the importance of maintaining a positive online presence and how their online activities can influence future opportunities including academic applications and career prospects 5 Cyberbullying and Online Respect With the rise of social media and online communication cyberbullying has become a serious concern This chapter addresses the various forms of cyberbullying its impact on victims and the importance of reporting and preventing such behaviour Why This Book This book aims to equip young learners with the tools necessary to thrive in the Digital age by educating them about the risks and challenges of the Digital world while empowering them to seize its opportunities Each chapter focuses on fostering critical thinking responsible decision making and ethical behaviour The book also includes engaging activities real life scenarios and thought provoking discussions to help students apply what they have learned Interactive quizzes and projects encourage students to explore these topics in depth making the learning process informative and enjoyable

Green Computing in Network Security Deepak Kumar Sharma,Koyel Datta Gupta,Rinky Dwivedi,2022-01-10 This book focuses on green computing based network security techniques and addresses the challenges involved in practical implementation It also explores the idea of energy efficient computing for network and data security and covers the security threats involved in social networks data centers IoT and biomedical applications Green Computing in Network Security Energy Efficient Solutions for Business and Home includes analysis of green security mechanisms and explores the role of green computing for secured modern internet applications It discusses green computing based distributed learning approaches for security and emphasizes the development of green computing based security systems for IoT devices Written with researchers academic libraries and professionals in mind so they can get up to speed on network security the challenges and implementation processes

CompTIA Security+ Practice Tests S. Russell Christy,Chuck Easttom,2018-04-06 1 000 Challenging practice questions for Exam SY0 501 CompTIA Security Practice Tests provides invaluable practice for candidates preparing for Exam SY0 501 Covering 100% of exam objectives this book provides 1 000 practice questions to help you test your knowledge and maximize your performance well in advance of exam day Whether used alone or as a companion to the CompTIA Security Study Guide these questions help reinforce what you know while revealing weak areas while there s still time to review Six unique practice tests plus one bonus practice exam cover threats attacks and vulnerabilities technologies and tools architecture and design identity and access management risk management and cryptography and PKI to give you a comprehensive preparation resource Receive one year of FREE access to the Sybex online interactive learning environment to help you prepare with superior study tools that allow you to gauge your readiness and avoid surprises on exam day The CompTIA Security certification is internationally recognized as validation of security knowledge and skills The exam tests your ability to install and configure secure applications networks and devices analyze respond to and mitigate threats and operate within

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Spacecraft Safety Systems: Principles, Architectures, and Applications Edenilson Brandl, Space exploration represents humanity's boldest endeavor pushing the limits of technology science and courage This work delves into the critical systems and methodologies that ensure the safety and reliability of spacecraft operating in the unforgiving environment of space By examining historical developments state of the art technologies and innovative strategies this book seeks to illuminate the intricate balance required between ambition and safety It is designed for engineers researchers and enthusiasts who aspire to understand and advance the principles that keep spacecraft operational and missions successful

Index to IEEE Publications Institute of Electrical and Electronics Engineers, 1997 Dissertation Abstracts International, 2007 *Index to Theses with Abstracts Accepted for Higher Degrees by the Universities of Great Britain and Ireland and the Council for National Academic Awards*, 2005 *Dependable Computing for Critical Applications* Algirdas Avizienis, Jean-Claude Laprie, 2012-12-06 The International Working Conference on Dependable Computing for Critical Applications was the first conference organized by IFIP Working Group 10.4 Dependable Computing and Fault Tolerance in cooperation with the Technical Committee on Fault Tolerant Computing of the IEEE Computer Society and the Technical Committee 7 on Systems Reliability Safety and Security of EWICS The rationale for the Working Conference is best expressed by the aims of WG 10.4 Increasingly individuals and organizations are developing or procuring sophisticated computing systems on whose services they need to place great reliance In differing circumstances the focus will be on differing properties of such services e.g. continuity performance real time response ability to avoid catastrophic failures prevention of deliberate privacy intrusions The notion of dependability defined as that property of a computing system which allows reliance to be justifiably placed on the service it delivers enables these various concerns to be subsumed within a single conceptual framework Dependability thus includes as special cases such attributes as reliability availability safety security The Working Group is aimed at identifying and integrating approaches methods and techniques for specifying designing building assessing validating operating and maintaining computer systems which should exhibit some or all of these attributes The concept of WG 10.4 was formulated during the IFIP Working Conference on Reliable Computing and Fault Tolerance on September 27-29 1979 in London England held in conjunction with the Europ IFIP 79 Conference Profs A. Avizienis UCLA Los Angeles USA and A. *Design of Dependable Computing Systems* J.C. Geffroy, G. Motet, 2013-03-09 This book analyzes the causes of failures in computing systems their consequences as well as the existing solutions to manage them The domain is tackled in a progressive and educational manner with two objectives 1 The mastering of the basics of dependability domain at system level that is to say independently of the technology used hardware or software and of the domain of application 2 The understanding of the fundamental techniques available to prevent to remove to tolerate and to forecast faults in hardware and software technologies The first objective leads to the presentation of the general problem the fault models and degradation mechanisms which are at the origin of the failures and finally the methods and techniques

which permit the faults to be prevented removed or tolerated This study concerns logical systems in general independently of the hardware and software technologies put in place This knowledge is indispensable for two reasons A large part of a product s development is independent of the technological means expression of requirements specification and most of the design stage Very often the development team does not possess this basic knowledge hence the dependability requirements are considered uniquely during the technological implementation Such an approach is expensive and inefficient Indeed the removal of a preliminary design fault can be very difficult if possible if this fault is detected during the product s final testing

The Evolution of Fault-Tolerant Computing A. Avizienis,H. Kopetz,J.C. Laprie,2012-12-06 For the editors of this book as well as for many other researchers in the area of fault tolerant computing Dr William Caswell Carter is one of the key figures in the formation and development of this important field We felt that the IFIP Working Group 10.4 at Baden Austria in June 1986 which coincided with an important step in Bill s career was an appropriate occasion to honor Bill s contributions and achievements by organizing a one day Symposium on the Evolution of Fault Tolerant Computing in the honor of William C Carter The Symposium held on June 30 1986 brought together a group of eminent scientists from all over the world to discuss the evolution the state of the art and the future perspectives of the field of fault tolerant computing Historic developments in academia and industry were presented by individuals who themselves have actively been involved in bringing them about The Symposium proved to be a unique historic event and these Proceedings which contain the final versions of the papers presented at Baden are an authentic reference document

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