

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

Kenneth Birman



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

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

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

Reliable Distributed Systems Kenneth Birman, 2006-07-02 An understanding of the techniques used to make distributed computing systems and networks reliable fault tolerant and secure will be crucial

to those involved in designing and deploying the next generation of mission critical applications and Web Services Reliable Distributed Systems reviews and describes the key concepts principles and applications of modern distributed computing systems and architectures This self contained book consists of five parts The first covers introductory material including the basic architecture of the Internet simple protocols such as RPC and TCP object oriented architectures operating systems enhancements for high performance and reliability issues The second covers the Web with a focus on Web Services technologies Microsoft s NET and the Java Enterprise Edition The remaining three parts look at a number of reliability and fault tolerance issues and techniques with an emphasis on replication applied in Web Services settings With its well focused approach and clarity of presentation this book is an excellent resource for both advanced students and practitioners in computer science computer networks and distributed systems Anyone seeking to develop a solid grounding in distributed computing and Web Services architectures will find the book an essential and practical learning tool

Advanced Network Technologies and Intelligent Computing Anshul Verma,Pradeepika Verma,Kiran Kumar Pattanaik,Sanjay Kumar Dhurandher,Isaac Woungang,2024-08-07 The 4 volume proceedings set CCIS 2090 2091 2092 and 2093 constitute the refereed post conference proceedings of the Third International Conference on Advanced Network Technologies and Intelligent Computing ANTIC 2023 held in Varanasi India during December 20 22 2023 The 87 full papers and 11 short papers included in this book were carefully reviewed and selected from 487 submissions The conference papers are organized in topical sections on Part I Advanced Network Technologies Part II Advanced Network Technologies Intelligent Computing Part III IV Intelligent Computing *IEEE International Computer Performance and Dependability Symposium*,1996

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

Proceedings Euromicro. Conference,1998

Deep Learning and Edge Computing Solutions for High Performance Computing A. Suresh,Sara Paiva,2021-01-27 This book provides an insight into ways of inculcating the need for applying mobile edge data analytics in bioinformatics and medicine The book is a comprehensive reference that provides an overview of the current state of medical treatments and systems and offers emerging solutions for a more personalized approach to the healthcare field Topics include deep learning methods for applications in object detection and identification object tracking human action recognition and cross modal and multimodal data analysis High performance computing systems for applications in healthcare are also discussed The contributors also

include information on microarray data analysis sequence analysis genomics based analytics disease network analysis and techniques for big data Analytics and health information technology **Euromicro Conference** ,1998 This text on the subject of software quality and management covers such topics as digital systems design combinational logic design high level synthesis custom computing machines system level design real time embedded systems sequential logic synthesis and dependable computing systems

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