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Services Management in Intelligent Networks - Reports on DSOM 2000

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Services Management in Intelligent Networks -
Report on DSOM 2000

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Introduction

DSOM 2000, the Eleventh IFIP/IEEE International Workshop on "Distributed Systems: Operations and Management" followed a series of annual meetings, the latest of which took place in Zurich, Switzerland (DSOM'99) [1], Delaware, USA (DSOM'98) [2], and Sydney, Australia (DSOM'97) [3]. DSOM is a single-track workshop of the management research community. The workshop traditionally stresses interaction and encourages active participation.

DSOM 2000 was held at the Thompson Conference Center, the University of Texas at Austin, Austin, Texas, USA from December 4 to 6, 2000. Seventy (70) participants attended the event. It was sponsored by the IEEE Communications Society with technical co-sponsorship by IFIP Working Group 6.6, and was supported by IBM Research and Tivoli Systems.

For technical paper sessions, 65 submissions had been received, out of which 21 were selected for presentation, and are published in the workshop proceedings [4]. In addition, 19 short papers on work-in-progress had been received, of which 12 were selected for presentation in two special sessions. The submissions were from 14 countries, and the participants were from both industry and academia. The program was structured into an opening keynote session, 7 technical paper sessions, 2 work-in-progress sessions, and a closing panel.

The DSOM 2000 Theme – Services Management in Intelligent Networks

The theme of DSOM 2000 was "Services Management in Intelligent Networks", reflecting the current interest and development in the field of distributed, networked application services, their definition, operation and management. Most of the papers presented at the workshop addressed some important aspect of this broad problem area. The topics ranged from those in the more traditional management disciplines, like fault management and event handling, to those concerned with end-to-end, cross system management issues, like Quality of Service (QoS) and inter-domain management.

The workshop demonstrated that management technologies continue to evolve to address more global technical concerns in distributed networked systems. The industry trend is to

move away from traditional telecommunication environments towards an Internet-based infrastructure that can provide programmable and dynamic service creation, network and management mechanisms that scale to very large systems, and end-to-end perspectives of networked application services. In order to make progress in this direction, the emphasis is on technologies for software integration and interoperation, since it is unlikely that any single monolithic architecture can be effectively deployed.

The Keynote – Distributed Systems, Connected People

Laszlo A. (Les) Belady gave the keynote entitled "Distributed Systems, Connected People." Based upon his wide experience in both systems and software research and technical management, Les discussed his perceptions of the technology transfer gap. He noted that while the technical community tends to focus on narrow, deep research results, product development teams must necessarily deal with compositions of components, and problems of integration of technologies. He described his view of the innovation process, and the importance of connecting people together in multidisciplinary teams that can have much greater and more direct impact on the advancement of technology.

Closing Panel

The closing panel was chaired by Prof. Dewayne Perry of the University of Texas at Austin. He, along with the panelists, Prof. Morris Sloman, Imperial College, UK and PhD student Anuj Goel of the Laboratory of Intelligent Processes and Systems at the University of Texas at Austin, conducted a very lively discussion on the research issues related to the management of pervasive systems and mobility. The computing environment they addressed would offer universal connectivity with an ubiquitous Internet environment, embedded webservers everywhere and context independent access to services with context dependent information presentation. The problem of management would be a challenging one in such an environment. Some of the key problems identified were: a) how to integrate millions of pervasive devices into the complex information infrastructure; and, b) how to develop and manage context aware software systems for such an infrastructure.

Highlights from Paper Sessions

Internet management: The operation and management of evolving Internet technologies continues to be an important theme. The monitoring and visualization of network-layer (routing and topology) data about a global multicast infrastructure was discussed (Rajvaidya, Almeroth, and Claffy, University of California, USA), as was the provisioning of multicast sessions with Quality of Service (QoS) guarantees (Wu and Katzela, University of Toronto, Canada) .

Services management: Managing services on the Internet is becoming more complex, as the services themselves become more sophisticated and the number of users per service increases. One proposal that was made was to allow the users themselves to partly manage the services that they use, and a Customer Service Management Architecture was described (Sprenkels, Pras, van Beijnum, and de Goede, University of Twente, The

Netherlands). Along more traditional lines, an architecture to allow Service Providers to deploy and manage Internet services more effectively was also presented (Vanet, Suzuki, Egashira, and Kiriha, NEC Corporation, Japan).

Inter-domain management: With the proliferation of computing resources, and the increased connectivity provided by advanced networking technologies, distributed processing in various forms is already firmly established. A number of different problems dealing with distribution and the relationships between separate entities in distributed systems were topics of technical presentations. One way of dealing with distribution is to provide middleware that minimizes its impact on application development. This tends, however, to mask critical configuration and performance information. An approach for instrumenting object middleware so that system managers can get necessary data on the operation of the system without burdening application designers with the requirement to understand and support management functionality was proposed (Kath, et al, Europe). With different entities providing different aspects of an overall distributed service, the duties and responsibilities of each of the participants need to be established. One approach is to use service contracts. A customer-oriented methodology for specifying service contracts based upon workflow modeling was the topic of another study (Schmidt, University of Munich, Germany).

QoS management: Support for Quality of Service (QoS) guarantees has become a key issue in network and systems management. Users of networked information processing systems increasingly demand more reliable and predictable performance. A number of mechanisms for providing negotiated levels of performance have been proposed and are being implemented in different ways for different type of systems. There were thus presentations on: (a) the management of concurrent multicast sessions with security and QoS guarantees using programmable and active network mechanisms (State, Nataf, and Festor, LORIA-INRIA, France); b) a function-oriented approach to ATM network management designed for QoS monitoring (Thurm and Wiltfang, Germany); and, c) a distributed network management system for information delivery and planning with QoS guarantees (Natarajan, et al, Telcordia Technologies, USA).

Work-in-progress sessions: Two sessions of the workshop were dedicated to short papers describing work-in-progress. This was a new element for DSOM, and seems to have been well received. Many of the attendees requested copies of the presentations, and we intend to make them available on the DSOM 2000 web-site (http://dpnm.postech.ac.kr/conf/dsom2k/). The papers presented covered a wide variety of topics including: (a) dynamic resource allocation and monitoring using Service Level Agreements (SLAs) (Appleby, et al, IBM Research, USA) , (b) mobile agent based management (Simoes, et al, University of Coimbra, Portugal) , (c) enabling small computing devices as network management consoles (Hoertnagl, IBM Research, Switzerland) , (d) management of embedded distributed computing (Jaiko, et al, University of Delaware, USA) , and (e) managing digital television in home networks (Meandzija, Motorola, USA).

More information

The proceedings of DSOM 2000 are available from the publisher or scientific bookstores [4]. DSOM 2001 will be hosted by the "Lorraine Laboratory for Research into Information Technology and its Applications" (LORIA) and the "French National Institute for Research in Computer Science and Control (INRIA), and will be held in Nancy, France from October 15 – 17, 2001. For further information, please refer to the workshop web-site (`http://www.dsom2001.org/`) or contact Olivier Festor (Olivier.Festor@loria.fr).

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