Recent Advances in Distributed Systems Operations and Management: Report on DSOM ’98

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1. INTRODUCTION

DSOM ’98 was the Ninth Annual IFIP/IEEE International Workshop on Distributed Systems, Operations and Management held at the University of Delaware in Newark, Delaware, during October 26–28, 1998. This series of annual workshops is sponsored by the IFIP Working Group 6.6 on Network Management for Communication Networks with technical co-sponsorship of the IEEE Communications Society Technical Committee on Network Operations and Management (CNOM).

The general scope of the DSOM workshop series is the operations and management of application software or services within a distributed system and the impact of advanced computing and networking technologies on management. In addition, the theme topic of DSOM ’98 was Management of Mobility. The workshop attracted over 75 participants from 16 countries. The 24 technical paper presentations were divided into eight sessions with three sessions focusing on the theme topic of managing mobility. In addition, a concluding panel session explored emerging issues and problems in the theme area.

2. NEW DIRECTIONS IN DISTRIBUTED SYSTEMS MANAGEMENT

As middleware technologies mature, Distributed Management over Middleware takes on increasing importance. A session with this title examined the management of services and applications using Java, the World Wide Web, and CORBA. An important issue here is the scalability of management capability and how these middleware technologies can help in that direction. Can management of delegation be of use or are there other paradigms to be explored? In a

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middleware architecture for coordinating distributed applications, many issues of synchronization arise including allowing flexibility to applications in choosing the type and level of coordination and synchronization, and the scalability of the synchronization mechanism itself. While a quality-of-service (QoS) framework based on CORBA can be designed for distributed services and applications, more work is needed in studying QoS of “bundled” products and in issues of integrated QoS.

A session on Fault and Event Management explored the problems of integrated event management, the use of intelligent assistants in fault localization, and the automation of end-to-end system diagnosis. In spite of the considerable progress made in these fields in recent years, we still do not understand how to do event correlation in a perfect manner. A variety of techniques, such as decision trees, dependency graphs, case-based reasoning, and model-based reasoning have been applied to this problem, but how similar or different are they? Is there a method that can find a fault in a system irrespective of the kind of system it is? This capability is crucial to allowing users to directly manage the process of fault localization. Again, there are issues of scalability here; should a hierarchy of tools and systems be considered?

Data Management and Information Models continue to be at the heart of effective distributed systems management. This session presented directory based management as a way to integrate MIB information into directory services, an information model to allow the generation of computed views of management information, and an access control algorithm for OSI MIBs. An interesting issue here is the use of directories to enhance or even substitute SNMP and the progress made by WBEM and JMAPI in this direction. Is SNMP dead? In the long run, protocols do not really matter, as they keep changing and evolving. Functionality is more important, and we must standardize functionality, in addition to protocols and MIB information, to support interoperability.

Distributed Service Management is an evolving area of great importance; this session examined how services and their management can provide a greater degree of transparency to users, the support that can be provided for distributed application development, and how a universal service management architecture can be designed. If service management can be made transparent, what control will customers have over their services, and how can they verify that they are indeed getting the requested quality of service? Converting between low-level network QoS and high-level application and service QoS continue to be a difficult issue. A unified language that facilitates interaction between applications and services can help, but does the need justify a new language?

An evolution of management architectures towards Distributed Management Frameworks was discussed in the session with this title. One path in this direction is the integration of scripting frameworks with management frameworks, while another is the examination of process-centered environments which