

Preface

The need for sophisticated network management solutions have become more and more important due to the complexity of the managed environment and the expectations of the end users. The employment of self-* properties or autonomic computing and Peer-to-Peer (P2P) for network management became promising alternatives to provide such sophisticated solutions. We observed that in general the proposed autonomic or self-* solutions for network management were designed in a very centralized fashion and focused on abstract issues of management. In contrast, P2P was being used in network management as the underlying infrastructure to enhance the connectivity capabilities of network managers, whose designs follow the traditional network management approaches, such as Management by Delegation.

Interestingly, these two trends were developed in parallel to each other, without (or with minor) direct connection between them. This situation caught our attention and we started to wonder how we could combine these two trends in order to enable a more sophisticated and truly distributed design of network management solutions able to deal with the complexity of current management. Our wonders gave space for the proposition of the Self-* P2P design for network management solutions.

Specifically, this book describes the insights, definitions, and guidelines to support the readers to understand how one should think and what one should consider when designing a Self-*P2P solution. In an incremental fashion, we move from abstract concepts into the tangible application of those concepts. In this way, the readers are presented with a description of all the steps to design a Self-* P2P solution. We start with the abstract concepts needed to change the mind-set for developing new self-managed, fully distributed, and cooperative network management solutions. In the next step, we exemplify how one should identify scenarios that can benefit from a Self-* P2P solution. Then, the readers are presented with a detailed description of self-* P2P solutions for two case studies considering distinct scenarios.

The focus of this book is not the experimental part of the developed solutions. Instead, we focus on the description of the conception phase of each solution.

Especially, we dedicate two sections and one entire chapter to analyzing the design decisions which were taken during the development of the case studies. By doing this, we expect to help the readers to deeply understand the changes in the way of thinking network management solutions by exploring the potentials of using distributed, parallel, and concurrent models which are combined in the Self-* P2P design. Particularly, readers involved with the development of dynamic, heterogeneous, large-scale network management solutions are the ones that could benefit the most from the insights and solutions described in this book.

The ideas and principles discussed in this book are in fact the result of more than 4 years of investigation. During this time, different people contributed directly and indirectly to the accomplishments described in this book. Therefore, we would like to thank all of you for the support and contributions.

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Design Principles and Case Studies

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