

Preface

Through the eyes of billions of Internet users, we have learned how the ease of communication can ignite phenomenal innovation. It is fascinating to witness the new habits and social phenomena created by the Web. However, what happens behind the scenes of our digital ecosystem? It is the network that moves our data around, handles the peak-hour traffic and strives to smoothly deliver the audio-video streams. Networks play a vital role in sustaining the unrelenting evolution of the most demanding Web systems.

Networks have to keep up with unprecedented data volumes while adapting to new communication patterns or, rather, new kinds of traffic. Most applications are now *pervasive*. We expect them to be accessible everywhere, without compromise. We expect the same “look and feel,” and the same quality and functionality, irrespective of any other technological constraints. Hence, many fear that the emerging breed of *pervasive applications* will soon render the Internet obsolete. As a matter of fact, a worldwide effort to reinvent the Internet is well underway by the “Future Internet” research community.

Through our active involvement in the investigation and teaching of network protocols, we have come to realize how difficult it is to grasp networking concepts that exceed the horizon of TCP/IP (i.e., the Internet protocol). When it comes to *advanced network protocols*, specialist literature abounds with creative proposals. Yet, very few protocols manage to step out of the laboratory and into the commercial world.

Perhaps our most ambitious task in writing this book was to extract a selection of remarkable ideas from the scientific literature and make them accessible to the non-specialist reader. Our book does not have the objective of embracing the *Future Internet*, though it does introduce a series of *network mechanisms* that will certainly find a place in the next-generation network. We propose six ways to upgrade the Internet and make it more *ubiquitous*, *reactive*, *proactive*, *information-driven*, *distribution-efficient* and *searchable*. In the final chapter, we offer some considerations about the Future Internet, though we have resisted the temptation to give any specific technical solutions.



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