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# Towards a Service-Based Internet

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# Foreword

Today it is almost impossible to remember what life was like with no computer, no mobile phone, and no Internet for accessing information, performing transactions or exchanging emails and data. New technology is bringing wave after wave of new benefits to daily life: organisations are doing business with each other via the Internet; people are filling in tax declarations online and booking their next vacation through the Internet. In general we are all progressively using (and dependent on) software and services running on computers, connecting mobile phones and other devices, and exchanging information on the Internet.

People like to shop around and exercise choice. So do businesses and public administrations. Today they can buy a complete software package that best suits their needs, even though they may never use some of the tools it offers, or other desirable tools are not available. In the future they may no longer have to compromise on choice. Alternative approaches like "Software as a Service" and "Computing Resources as a Service" are emerging. Software is provided on-line as a service when and where it is needed, and the same for computing resources needed to run software. Such an approach allows individuals and organisations to tap into and effectively harness the immense wealth of information, knowledge and analytical resources when they need them, paying only for what they use. Customers are bound to benefit when there is a sufficiently rich choice of services.

But what does this mean when seen from the supply side? Although it may not yet be so evident to the outside world, the software industry is rapidly restructuring and changing patterns of competition and business. Relatively new internet companies are successfully providing software and computing resources as a service. They are seriously competing with established industries delivering traditional packaged software, forcing the latter to adapt their business models.

I believe that the restructuring of the market and the industry represents a tremendous opportunity for Europe and for the European software industry.

The number of companies and researchers involved in the European Technology Platforms eMobility, EPoSS, ISI, NEM and NESSI, shows that industry is also taking this opportunity seriously. These Technology Platforms are collaborating to define a strategy for addressing the challenges in delivering software and computing resources as a service, and in developing new attractive context-based, device-independent services addressing the precise needs of the user that exploit the possibilities offered by the convergence of the media, telecom and IT industries.

ServiceWave 2008 presents the main results of European industrial and academic collaboration in this field. It reflects the great potential and the continued strength of European expertise in many fields of service development. The

challenge now is to bring these advancements to the market and to ensure the European leadership in the new Internet economy.

Viviane Reding
Commissioner for Information Society and Media

# Preface

The Internet is becoming a critical infrastructure for the growth of the modern economy and society by allowing anyone to access information in a transparent way, independent of the location or computing device used. While today, users' main interactions with the Internet remain web browsing or exchange of e-mails, a revolution is on-going through the availability of software services.

The convergence of smarter networks, resource virtualization and collaborative and intelligent services will pave the way to the Future Internet with new software services which will be as revolutionary as the e-mail and the Web were when they appeared initially.

The Future Internet will enable new and unforeseen collaborative applications based on dynamic adaptation to the context and to the available services and resources. The technological and architectural advances in the Internet domain will also take economic and service-oriented facts into account.

Furthermore, the Future Internet will reinforce the need for interdisciplinary collaboration between domains such as computer science, electrical engineering and social sciences - disciplines that have already moved forward in working together but whose level of collaboration will have to increase considerably. However, before this revolution can be completed, several research challenges must be addressed and a tighter collaboration between industry and academia is of utmost importance.

The ServiceWave conference series aims to establish the premier European forum for researchers, educators and industrial practitioners to present and discuss the most recent innovations, trends, experiences and concerns in software services (or the "Future of the Internet of Services") and related underlying network technologies. ServiceWave fosters the creation of cross-community scientific excellence by gathering together industrial and academic experts from various disciplines such as business process management, distributed systems, computer networks, wireless and mobile communication networks, grid computing, embedded and smart systems, networking, service science and software engineering.

ServiceWave 2008 was organized along four tracks designed to foster the collaboration and lively exchange of ideas between industry and academia:

- ETPs Future Internet Track: dedicated to presentations on the common vision of the Future of the Internet elaborated and shared by the major European Technology Platforms active in the ICT domain—namely, eMobility, EPoSS, ISI, NEM and NESSI
- Industrial Panels Track: multidisciplinary open debate panels focusing on topics which, starting from traditional service-based systems engineering, brought the discussions toward the ambitious target of Future Internet

- Scientific Track: presentation of the papers, selected by the ServiceWave 2008 Program Committee, from research and industry, covering the state of practice and real-world experiences in service engineering
- Workshop Track: meetings organized by Working Groups active within the Future Internet activities, the intra-ETP activities or within an ETP as well as research and industrial communities wishing to present their work

These proceedings cover the peer-reviewed Scientific Track of ServiceWave 2008 for which we received 102 submissions. In an extensive and careful review process, the Scientific Program Committee of ServiceWave 2008 accepted 28 papers—an acceptance rate of 27%.

We offer our sincere thanks to the members of the ServiceWave 2008 Program Committee for devoting their time and knowledge to reviewing and discussing the submitted papers. We would especially like to thank the members of the Program Committee who attended the two-day Program Committee meeting held in Essen, Germany on September 1 and 2, 2008. Special thanks go to Andreas Gehlert and Julia Hilscher for their responsive and helpful support during the paper evaluation and selection process, as well as during the preparation of the proceedings.

We would also like to thank David Kennedy for organizing the ETP Track, Stefano De Panfilis and Wolfgang Gerteis for the Industrial Track and Frédéric Gittler for the Workshop Track.

In addition, ServiceWave 2008 would not have been possible without the efforts and expertise of a number of people who selflessly offered their time and energy to help to make this conference a success. We would like to thank Universidad Politécnica de Madrid, host of the 2008 edition of ServiceWave, for their continous support.

We would like to thank all the people on the Organizing Committee, especially Federico Alvarez, Nuria Sánchez Almodóvar, Usoa Iriberri Zubiola, Bruno François-Marsal, Véronique Pevtschin and Barbara Pirillo.

Finally, we thank the main conference sponsors and supporters: Alcatel-Lucent, Atos Origin, Engineering, Siemens, Telefónica, Thales, IBBT, HP and IBM as well as INRIA, RWTH Aachen, and University of Duisburg-Essen.

December 2008

Reinhold Achatz
Guillermo Cisneros
Petri Mähönnen
Klaus Pohl
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# Organization

ServiceWave 2008 was organized by NESSI and hosted in Madrid by UPM in cooperation with:

- The European Technology Platforms eMobility, EPoSS, ISI and NEM
- Spanish Technology Platform INES
- Networks of Excellence CoreGrid and S-Cube
- Support actions Eiffel, 4NEM and NESSI 2010
- ICSOC, the International Conference on Service-Oriented Computing

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