

## ICIN 2015: INNOVATIONS IN SERVICES, NETWORKS AND CLOUDS CONNECTING PEOPLE, THINGS, AND MACHINES

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A total of 105 delegates from 26 countries representing about 60 different organizations met in Paris, France for the 16th ICIN conference to discuss new technologies from the Internet and from the telecommunications industry. ICIN 2015 took place February 17–19, with the technical co-sponsorship of the IEEE and IEEE Communications Society, and the support of Ericsson, Nokia, BroadSoft, Orange, and Institut Mines-Telecom. ICIN has a 26-year history of anticipating the key trends in communications networks and services, showcasing technologies and architectures that become vital elements of delivering services.

The acceptance rate of the conference was 36 percent for full papers. Each paper was evaluated by at least five reviewers with an average of eight reviews per paper.

The conference was structured around four tracks: Service Webification (chaired by Roch Glitho, professor at Concordia University); Network ITzation (chaired by Bruce Maggs, professor at Duke University and VP Research of Akamai Technologies); Internet of Things (chaired by Jiangtao Wen, professor at Tsinghua University); and Social Networking and Customer Relationships (chaired by Raouf Boutaba, professor at the University of Waterloo). Thirty-three research articles were presented, plus eight poster presentations.

The conference began with a tutorial focused on the Internet of Things, delivered by Roberto Minerva, head of Innovative Architectures at Telecom Italia's Future Centre. This tutorial illustrated that, in a future where almost anything will be a potential network node, market growth will be driven by the "servitization" trend (i.e. not merely selling products, but providing services surrounding products). In this context, we should anticipate a shift from a world where devices, networks, services, and information systems are clearly distinguished, to a virtual continuum between smart objects, network, processing, and storage resources.

The conference was opened by Noël Crespi (Mines-Telecom Institute), Chair of the ICIN 2015 Technical Program Committee, and Stuart Sharrock, Chair of the ICIN International Advisory Board. A series of keynote speeches were delivered around the theme for the conference. Nicolas Demassieux, VP Research from Orange, presented insights on Orange research at the dawn of the fifth 'digital' era. Alistair Urie, Director of Architecture Strategy and 5G at Alcatel-Lucent and a Bell Labs Fellow, next gave a keynote on the whys and wherefores of 5G: why, what and when 5G is coming. He highlighted the need to design energy-aware protocols and to set up APIs between applications and networks. Henning Schulzrinne, professor at Columbia University, presented a keynote on the Internet of Things – Internet in the Small. He highlighted some lessons learned from the Internet: quality is not a substitute for quantity; data link layers come and go but IP stays; the age of application-specific is over (whether for sensors, access channels, OS or protocols); and protocols matter but programmability matters much more! In this perspective, the IoT is mostly about devices and not about chang-

ing the Internet: network parts are not really new or exciting, but designing software-defined networked devices is still a challenge. Bruce Maggs, professor at Duke University and VP Research of Akamai Technologies, explained the role of Content Delivery Networks in protecting web sites from attacks, illustrating his talk with real-life attacks. This capacity is enabled by the role of CDNs in terminating TCP connections to act as service frontends. David Soldani, VP Research of Huawei, presented the pillars of Software-Defined 5G Networks: design principles, architecture, interfaces, functions, and procedures looking at the 1ms latency requirement. Jan Holler, principal researcher at Ericsson Research, detailed the usage impacts of the Internet of Things for embedding more intelligence into our networked society.

As usual, the ICIN conference is a good indicator of the trends in academic and industry research in communication networks and services. We observed that the IMS and VoLTE completely dropped off the radar; nobody seems to be betting on their capacity to provide breakthrough innovation. The main emerging topic is the webification of communication services, enabled by the WebRTC technology along with all-web systems. This is an entirely new field, and many of the usual mechanisms from communication services need to be rethought, for example signaling, identity management, media plane, and network QoS. Another avidly discussed domain was the Internet of Things. The need for interoperability was unanimously shared, e.g. with publish/subscribe mechanisms. Concerning the ITization of networks, the need for programmability by user's applications was mentioned, as well as the importance of applying up-to-date software development paradigms to SDN/NFV, e.g. DevOps, loose coupling, Hollywood principle, etc.

Additional ICIN 2015 highlights included a closing session where all the track chairs synthesized the upcoming trends in their topic. Best paper and best presentation awards were also given at the close of the conference. Paulo Chainho (Portugal Telecom), Kay Haense and Steffen Druessedow (Deutsche Telekom), and Michael Maruschke (University of Leipzig) won the best paper award for Signalling-On-the-fly: SigOfly. Best presentation awards were given to Bichlien Hoang (IEEE Future Directions) for How Will Rebooting Computing Help IoT? and to Jiangtao Wen (University of Tsinghua) for An IoT Electric Business Model Based on the Protocol of Bitcoin. The best poster award went to Iyas Alloush, Jacques Simonin, Siegfried Rouvrais, Yvon Kermarrec (Telecom Bretagne) and Vanea Chiprianov (University of Pau) for A Model Driven Approach for Telecommunication Service Creation Environments Relying on Enterprise Architecture. Feedback on the ICIN 2015 received verbally onsite and via email after the closing ceremony was very positive.

Planning for ICIN 2016 is already underway under the leadership of Emmanuel Bertin of Orange Labs, Technical Program Chair for ICIN 2016. The conference will take place in February 2016 in Paris. For more information please visit [www.icin.co.uk](http://www.icin.co.uk)