ICT-318784 STP TROPIC
Distributed computing, storage and radio resource allocation over cooperative femtocells

D71

Dissemination report

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Participant(s): All
Workpackage: WP7
Est. person months: 10
Security: Public
Dissemination Level: PU
Version: f
Total number of pages: 38

Abstract:
This document reports the dissemination activities of the TROPIC project. It includes the publications on journals, conferences, book chapters, and the media. Presentations and demos are included as well as the Master and PhD thesis completed during the TROPIC project. In addition, the document provides information regarding the dissemination done through the web site by including access reports to web site. Collaborations with other projects and organizations are described. Finally, the document reports about the technical workshops organized by the TROPIC project with the participation of other projects in the areas of small cells and cloud computing.

Keyword list: Dissemination, publications, website, technical workshops
Document Revision History

<table>
<thead>
<tr>
<th>DATE</th>
<th>ISSUE</th>
<th>EDITOR</th>
<th>SUMMARY OF MAIN CHANGES</th>
</tr>
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<tbody>
<tr>
<td>16 March 2015</td>
<td>a</td>
<td>S. Lagen</td>
<td>First version</td>
</tr>
<tr>
<td>26 March 2015</td>
<td>b</td>
<td>S. Lagen</td>
<td>Contributions from partners</td>
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<td>27 April 2015</td>
<td>e</td>
<td>S. Lagen</td>
<td>Updated contributions in last quarter</td>
</tr>
<tr>
<td>29 April 2014</td>
<td>f</td>
<td>L. Simamora</td>
<td>New presentations included</td>
</tr>
</tbody>
</table>
Executive Summary

The success of research and development in FP7 projects -such as TROPIC- on new ICT technologies is highly dependent on the acquisition and dissemination of valuable know-how in highly relevant topics.

This document describes the dissemination activities done during the whole TROPIC project. First, publications on journal, conferences, books chapters, and media are presented. Second, presentations to forums, technical platforms and events are included. Third, Master and PhD thesis completed during the project are detailed. Fourth, statistics regarding to the dissemination through the web site are presented. Five, collaboration activities with other EC projects and organizations are described. Finally, the organization of technical workshops is detailed.
DISCLAIMER

The work associated with this report has been carried out in accordance with the highest technical standards and the TROPIC partners have endeavoured to achieve the degree of accuracy and reliability appropriate to the work in question. However since the partners have no control over the use to which the information contained within the report is to be put by any other party, any other such party shall be deemed to have satisfied itself as to the suitability and reliability of the information in relation to any particular use, purpose or application.

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<table>
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<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3GPP</td>
<td>3rd Generation Partnership Project</td>
</tr>
<tr>
<td>BTW</td>
<td>Broadband Wireless Access Workshop</td>
</tr>
<tr>
<td>CLEEN</td>
<td>Cloud Technologies and Energy Efficiency in Mobile Communication Networks</td>
</tr>
<tr>
<td>C-RAN</td>
<td>Cloud/Centralized Radio Access Networks</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EUSIPCO</td>
<td>European Signal Processing Conference</td>
</tr>
<tr>
<td>FP7</td>
<td>Seventh Framework Programme</td>
</tr>
<tr>
<td>EuCNC</td>
<td>European Conference on Networks and Communications</td>
</tr>
<tr>
<td>FuNeMS</td>
<td>Future Network and Mobile Summit</td>
</tr>
<tr>
<td>GLOBECOM</td>
<td>Global Communications Conference</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>INFOCOM</td>
<td>International Conference on Computer Communications</td>
</tr>
<tr>
<td>ICASSP</td>
<td>International Conference on Acoustics, Speech, and Signal Processing</td>
</tr>
<tr>
<td>ICC</td>
<td>International Conference on Communications</td>
</tr>
<tr>
<td>IWPC</td>
<td>International Wireless Industry Consortium</td>
</tr>
<tr>
<td>ITW</td>
<td>Information Theory Workshop</td>
</tr>
<tr>
<td>LTE</td>
<td>Long Term Evolution</td>
</tr>
<tr>
<td>MobiCASE</td>
<td>Mobile Computing, Application and Services</td>
</tr>
<tr>
<td>PIMRC</td>
<td>Annual International Symposium on Personal, Indoor, and Mobile Radio Communications</td>
</tr>
<tr>
<td>RAN</td>
<td>Radio Access Network</td>
</tr>
<tr>
<td>RSS</td>
<td>Rich Site Summary</td>
</tr>
<tr>
<td>SECON</td>
<td>Sensing, Communication, and Networking</td>
</tr>
<tr>
<td>SPAWC</td>
<td>Signal Processing Advances in Wireless Communications</td>
</tr>
<tr>
<td>VTC</td>
<td>Vehicular Technology Conference</td>
</tr>
<tr>
<td>WCNC</td>
<td>Wireless Communications and Networking Conference</td>
</tr>
<tr>
<td>WDN-CN</td>
<td>Wireless Distributed Network Workshop on Cooperative and Heterogeneous Cellular Network</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

It is clearly stated as major objective of FP7 that the activities and challenges in ICT implemented as research and development projects such as TROPIC should aim to strengthen the scientific and technology European knowledge base in order to meet the socio-economical demands and ensure rapid benefits of ICT progress. In order to accomplish a prominent and durable impact of the outcomes of the project to societies and ICT markets, the effective distribution to various technological communities of the TROPIC results is crucial.

The general dissemination strategy of the TROPIC outcomes was provided in M712, where activities aiming at promoting the work of the project to academic communities and organizations were described. The dissemination plan involves:

i) publication of results to relevant conferences and journals with relevant impact factor,

ii) participation to forums, technical platforms and events,

iii) collaboration with other EC and National projects,

iv) web site maintenance, and

v) technical workshop organization.

All of previous stated fields are tools for TROPIC to achieve visibility and a high number of quality contacts. The fields from i) to v) were already partially included in the milestone M713 that reports the dissemination activities carried out during the first period, and on the subsequent milestone M714 that reports the dissemination activities during the second period. The last field vi), was reported in milestone M715 that describes the organization of technical workshops on behalf of TROPIC. This deliverable D71 compiles and completes all previous fields that form part of the dissemination plans.
# PUBLICATIONS

All publications are available at the TROPIC website (www.ict-tropic.eu).

## 2.1 Journal papers

**Table 1: Publications in journals**

<table>
<thead>
<tr>
<th>#</th>
<th>References</th>
<th>Partner</th>
<th>Related to activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>S. Lagen, A. Agustin, and J. Vidal, “Coexisting Linear and Widely Linear Transceivers in the MIMO Interference Channel”, on the second stage of review in <em>IEEE Trans. on Signal Processing</em>, April 2015.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 2.2 Conference papers

### Table 2: Publications in conferences

<table>
<thead>
<tr>
<th>#</th>
<th>Reference</th>
<th>Partner</th>
<th>Related to activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. Carfagna, S. Barbarossa, “Distributed Bayesian Pricing for Sum-Rate Maximization in Small-Cell Networks,” <em>IEEE Global Communications Conference</em> (GLOBECOM 2012), Anaheim, CA; USA, 3-7 December 2012, doi: 10.1109/GLOCOMW.2012.6477641.</td>
<td>SAP</td>
<td>WP3</td>
</tr>
<tr>
<td>#</td>
<td>Reference</td>
<td>Partner</td>
<td>Related to activity</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>11</td>
<td>O. Muñoz, A. Pascual-Iserte, J. Vidal, “Joint Allocation of Radio and Computational Resources in Wireless Application Offloading,”, in Proc. of the <em>Future Network &amp; Mobile Summit</em> (FuNeMS), Lisbon, Portugal, 03-05 July 2013.</td>
<td>UPC</td>
<td>WP3, WP5</td>
</tr>
<tr>
<td>12</td>
<td>S. Barbarossa, S. Sardellitti, P. Di Lorenzo, “Computation Offloading for Mobile Cloud Computing Based on Wide Cross-Layer Optimization,” in Proc. of the <em>Future Network &amp; Mobile Summit</em> (FuNeMS), Lisbon, Portugal, 03-05 July 2013.</td>
<td>SAP</td>
<td>WP3, WP5</td>
</tr>
<tr>
<td>17</td>
<td>M. Goldhamer, “Technical solution for LTE operation in 5GHz and its compatibility with the EC Decisions and ETSI regulations”, <em>Workshop on LTE in Unlicensed Bands</em>, from 21st to 22nd of January 2014 in Paris, France.</td>
<td>4GC</td>
<td>WP3</td>
</tr>
<tr>
<td>#</td>
<td>Reference</td>
<td>Partner</td>
<td>Related to activity</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>19</td>
<td>S. Mekki, M. Kamoun and M. Sarkiss, &quot;Device-to-Device communications for capacity enhancement in cellular networks&quot;, <em>IEEE Wireless Communications and Networking Conference (WCNC)</em>, Istanbul, Turkey, 6-9 April 2014.</td>
<td>CEA</td>
<td>WP3</td>
</tr>
<tr>
<td>#</td>
<td>Reference</td>
<td>Partner</td>
<td>Related to activity</td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>34</td>
<td>M. Kamoun, “False positive Acknowledgement for cooperative small cell assisted Hybrid ARQ”, <em>IEEE ICC 2014 Workshop on Small Cell and 5G Networks (SmallNets)</em>, Sydney, Australia, 10-14 June 2014.</td>
<td>CEA</td>
<td>WP3</td>
</tr>
<tr>
<td>35</td>
<td>M. Torrellas, A. Agustin, J. Vidal, “Performance Analysis of Inter-cell Interference Coordination in Small Cell Networks with long feedback delays”, <em>European Conference on Networks and Communications</em>, Bologna, Italy, June 2014.</td>
<td>UPC</td>
<td>WP3</td>
</tr>
<tr>
<td>#</td>
<td>Reference</td>
<td>Partner</td>
<td>Related to activity</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------------------------</td>
<td>----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>48</td>
<td>Miguel A. Puente, Zdenek Becvar, Matej Rohlik, Felicia Lobillo, Emilio Calvanese Strinati, “A Seamless Integration of Computationally-Enhanced Base Stations into Mobile Networks towards 5G”, in <em>Proc. of the</em></td>
<td>ATOS, CTU, CEA</td>
<td>WP2, WP5</td>
</tr>
<tr>
<td>#</td>
<td>Reference</td>
<td>Partner</td>
<td>Related to activity</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<td>---------------------</td>
</tr>
<tr>
<td>50</td>
<td>M. Torrellas, A. Agustin, and J. Vidal, “Retrospective Interference Alignment for the MIMO Interference Broadcast Channel”, <em>IEEE International Symposium on Information Theory (ISIT)</em>, Hong Kong, June 2015.</td>
<td>UPC</td>
<td>WP3</td>
</tr>
<tr>
<td>51</td>
<td>M. Torrellas, A. Agustin, and J. Vidal, “Net DoF analysis for the K-user MISO IC with outdated and imperfect channel feedback”, <em>European Conference on Networks and Communications (EuCNC)</em>, Paris, June 2015.</td>
<td>UPC</td>
<td>WP3</td>
</tr>
<tr>
<td>52</td>
<td>S. Lagen, A. Agustin, J. Vidal, B. Soret, K. I. Pedersen, “Distributed User-Centric Clustering and Precoding for CoMP Joint Transmission”, submitted to <em>IEEE Global Communications Conference (GLOBECOM)</em>, San Diego, USA, December 2015.</td>
<td>UPC</td>
<td>WP3</td>
</tr>
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</table>
### 2.3 Book chapters

Table 3: Publication in books

<table>
<thead>
<tr>
<th>Reference</th>
<th>Partner</th>
<th>Related to activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>TROPIC publication in Atos Research and Innovation Booklet as a key project.</td>
<td>ATOS</td>
<td>WP7</td>
</tr>
</tbody>
</table>

### 2.4 Publications in the media

Table 4: Publications in the media

<table>
<thead>
<tr>
<th>Event</th>
<th>Publication title / Programme</th>
<th>Dates</th>
<th>Topic Addressed</th>
<th>Relation to WP</th>
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<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Media name</strong></td>
<td><strong>Submission</strong></td>
<td><strong>Acceptance</strong></td>
<td><strong>General purpose of TROPIC.</strong></td>
</tr>
<tr>
<td>Magazine</td>
<td>Capital</td>
<td>Nov-2012</td>
<td>Dec 2012</td>
<td></td>
</tr>
<tr>
<td>Internal Newspaper</td>
<td>eboletin</td>
<td>The Atos Research &amp; Innovation group aims to combine the fields of femtocells and cloud to build an innovative tool for improving the services offered by mobile devices.</td>
<td>Oct 2014</td>
<td>Awareness of TROPIC in internal bulletin n°87, accessible to Atos Iberia staff.</td>
</tr>
</tbody>
</table>

---

1. Newspaper, magazine, conference, radio, TV
### 3 PRESENTATIONS

Table 5 includes the participation to forums, technical platforms and events. Also, all the papers listed in Table 2 have been presented in the corresponding conferences but they are not included in Table 5 to avoid repetitions.

**Table 5: Presentations**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Related to activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project presentation at the 10th FP7 concertation meeting during the RAS cluster meetings of 10 Oct 2012 in Brussels.</td>
<td>WP7</td>
</tr>
<tr>
<td>Project presentation at the 11th FP7 concertation meeting during the RAS cluster meetings of 27 Feb 2013 in Brussels.</td>
<td>WP7</td>
</tr>
<tr>
<td>Mariana Goldhamer, 4GCellX, “Standardisation path towards 5G: LTE Release 12 and integration of FP7 projects into 3GPP process”, presentation to 5G Panel, Future Networks 11th Concertation meeting, 28 February 2013, Brussels.</td>
<td>WP7</td>
</tr>
<tr>
<td>Sergio Barbarossa, SAP, as invited plenary speaker at PIMRC 2013 – International WDN Workshop on Cooperative and Heterogeneous Cellular Networks Program (WDN-CN), “Femtocloud: Jointly optimal allocation of communication/computation resources for mobile cloud computing”, London, September 2013.</td>
<td>WP7</td>
</tr>
<tr>
<td>Sokol Kosta, CINI, at the FIA Event in Athens, Greece presented the TROPIC project and a demo related to the project, Athens, March 2014.</td>
<td>WP7</td>
</tr>
<tr>
<td>Sergio Barbarossa, SAP, invited lecture at the School of ICASSP 2015, “Joint optimization of radio and computational resources in mobile-edge computing”, Brisbane, Australia, April 2015.</td>
<td>WP7</td>
</tr>
<tr>
<td>Franciscus X.A. Wibowo, TELK, “Small Cell Cloud”, 17th Asia Pacific Telecommunity Wireless Group Meeting (AWG-17), Macao, September 2014</td>
<td>WP6, WP7</td>
</tr>
<tr>
<td>Mariana Goldhamer, 4GC, “TROPIC project: standardization status with a focus on 3GPP”, invited speaker at RAS Cluster meeting, Brussels, 23 Oct. 2014.</td>
<td>WP7</td>
</tr>
<tr>
<td>Reference</td>
<td>Related to activity</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Josep Vidal, UPC, “Welcome Introduction and TROPIC overview”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP1</td>
</tr>
<tr>
<td>Zdenek Becvar, CTU, “An architecture for mobile computation offloading on cloud-enabled LTE small cells” at Edge cloud-empowered 5G network workshop, Rome, February 2014.</td>
<td>WP2</td>
</tr>
<tr>
<td>Sandra Lagen, UPC, “PHY layer enablers to Edge cloud assisted application offloading”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP3</td>
</tr>
<tr>
<td>Miguel Angel Puente, ATOS, “The Local Cloud Management of Virtual Machines”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP4</td>
</tr>
<tr>
<td>Josep Martrat, ATOS, “The ‘Big Five’ in 5G”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP4</td>
</tr>
<tr>
<td>Sergio Barbarossa, SAP, “Communicating while computing: Joint optimization of radio/computing resources for distributed mobile cloud computing”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP5</td>
</tr>
<tr>
<td>Alessandro Mei, CINI, “TROPIC Practical Results”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP6</td>
</tr>
<tr>
<td>Josep Vidal, UPC, and Mariana Goldhamer, 4GCellEx, “LTE/MEC related standardization topics”, Edge Cloud at Empowered 5G Networks workshop, Rome, Feb 2015.</td>
<td>WP7</td>
</tr>
<tr>
<td>Z. Becvar, CTU, invited speech at Workshop on Advanced Communication Technologies, &quot;Evolution towards 5G mobile networks: Overview and key enablers,&quot; Ostrava, Czech Republic, April 2015.</td>
<td>WP2, WP5, WP6</td>
</tr>
<tr>
<td>All conference papers in section 2.2 have been orally presented.</td>
<td></td>
</tr>
</tbody>
</table>
THESES COMPLETION

Table 6 includes the Bachelor, Master or PhD theses presented during the development of the project.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Related to activity</th>
</tr>
</thead>
</table>
5 COLLABORATION WITH OTHER EC AND NATIONAL PROJECTS

- UPC and ATOS regularly attended meetings of Net!Works platform.

- Seven workshops have been organized by the TROPIC project, including one TROPIC training workshop (see details in Section 7).

- UPC attended the MWC 2014 in Barcelona, February 2014, where TROPIC flyers were distributed.

- 4GC has attended the Workshop on LTE-Unlicensed in Paris, January 2014, where has provided a well appreciated presentation addressing some operational aspects and regulatory challenges in Europe.

- ATOS has led the participation of several TROPIC partners (F. Lobillo - ATOS, A. Pascual Iserte - UPC, A. Agustín - UPC, O. Muñoz - UPC and M. Goldhamer – 4GC) in a white paper produced by the RAS cluster on 5G challenges and technologies entitled “5G radio network architecture” and issued in February 2014. Please refer to


- CTU has participated on NetFutures 2015 in Brussels, March 2015, with a TROPIC demo of augmented reality application with offloading.
6 REPORTS ON THE WEB-SITE ACCESSES

The project website (www.ict-tropic.eu) was setup in Sep 2012 and has been continuously updated since then. Also an RSS channel for news has been included. Figure 1 and Table 7 provide information about the number of accesses to the web-site of TROPIC. Four different types of visits are considered:

- **Returning Visits** - Based purely on a cookie, if this person is returning to your website for another visit an hour or more later.
- **First Time Visits** - Based purely on a cookie, if this person has no cookie then this is considered their first time at your website.
- **Unique Visitor** - Based purely on a cookie, this is the total of the returning visits and first time visits - all your visitors.
- **Page Load** - The number of times your page has been visited.

![Figure 1: Visits to the TROPIC website during the project lifetime](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Page Views</th>
<th>Unique Visits</th>
<th>First Time Visits</th>
<th>Returning Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>1,9k</td>
<td>157</td>
<td>295</td>
<td>28k</td>
</tr>
<tr>
<td>2013</td>
<td>2.8k</td>
<td>483</td>
<td>291</td>
<td>2.9k</td>
</tr>
<tr>
<td>2014</td>
<td>3.5k</td>
<td>614</td>
<td>220</td>
<td>2.9k</td>
</tr>
<tr>
<td>2015</td>
<td>4.4k</td>
<td>614</td>
<td>220</td>
<td>2.9k</td>
</tr>
</tbody>
</table>

![Table 7: Statistics for the visits to the TROPIC website during the project lifetime](image)
7 TECHNICAL WORKSHOPS

The technical workshops that have been organized by the TROPIC project in collaboration with other projects are:

1) The 1st International Workshop on Cloud Technologies and Energy Efficiency in Mobile Communication Networks (CLEEN 2013), held in conjunction with IEEE VTC 2013 fall.

2) The 6th International WDN Workshop on Cooperative and Heterogeneous Cellular Network (WDN-CN 2013), held in conjunction with IEEE PIMRC 2013.


4) The 7th International WDN Workshop on Cooperative and Heterogeneous Cellular Network (WDN-CN 2014), held in conjunction with IEEE PIMRC 2014.


6) The 8th International WDN Workshop on Cooperative and Heterogeneous Cellular Network (WDN-CN 2015), held in conjunction with IEEE WCNC 2015.

Further, the TROPIC project has organized a two full-day training workshop:

7) Edge Cloud Empowered 5G Networks, held in University of Rome “La Sapienza”, Rome on 18-19 February 2015.

For each technical workshop, the workshop setup and organization is detailed, including web page construction and call for papers, and the measurable achieved impact is evaluated in terms of attendees, presence of industrial organisation and academia.


7.1 CLEEN 2013

The 1st International Workshop on Cloud Technologies and Energy Efficiency in Mobile Communication Networks (CLEEN 2013) was held in conjunction with IEEE VTC 2013 fall and took place on 2-5 September 2013, Las Vegas, USA.

The CLEEN technical workshop is a joint initiative organized in collaboration with the ICT projects: iJOIN (www.ict-ijoin.eu) and Mobile Cloud Networking (www.mobile-cloud-networking.eu), also funded by the EC under the FP7. The technical workshop covers common aspects of interest in order meet the need to study new technological trends in mobile communications.


The call for papers is included in Figure 2.

TROPIC led the panel discussion: “Cloud-based flexible green heterogeneous wireless networks”. The invited panellists were: Carlos Bernardos (iJOIN project), Emilio Calvanese Strinati (TROPIC project), Thomas M. Bohnert (MCN project), and Artur Hecker (Huawei).

1 paper was presented on behalf of TROPIC project, whose title and authors are given next:

- **Title:** Overview of the EU FP7 TROPIC project
  - **Authors:** Emilio Calvanese Strinati (CEA LETI).

The technical workshop had an attendance of more than 30 attendees. Table 1 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organisation</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 30</td>
<td>30%</td>
<td>70%</td>
</tr>
</tbody>
</table>


Presence of academia: Technische Universität Dresden, Universidad Carlos III de Madrid, University of Bremen, University of Pisa, Beijing University of Posts and Telecommunications, Zurich University of Applied Sciences.
Call for Papers
First International Workshop on
Cloud Technologies and Energy Efficiency
in Mobile Communication Networks
(CLEEN 2013)

How cloudy and green will mobile networks and services be?

In conjunction with VTC 2013 Fall, 2-5 September 2013, Las Vegas, USA
http://www.lct-loin.eu/cleen2013/

Scope and Objectives:
This workshop explores novel concepts to allow for flexibly centralised radio access networks using cloud-processing based on open IT platforms, to achieve a high quality of experience for mobile access to cloud-processing resources and services, and to allow a future network evolution focused on energy efficiency and cost-effectiveness. In fact, all future innovative network solutions will be conceived and deployed with a long-term perspective of sustainability, both in terms of energy consumption of mobile network (and related interoperability with terminals) and cost efficiency of the different deployment and management options. This requires new concepts for the design, operation, and optimization of radio access networks, backhaul networks, operators and management algorithms, and architectural elements, tightly integrating mobile networks and cloud-processing. This workshop will cover technologies across PHY, MAC, and network layer, it covers technologies which translate the cloud-paradigm to the radio access and backhaul network, and analyse all the network evolutions from the energy efficiency perspective. It will study the requirements, constraints, and implications for mobile communication networks, and also potential relationship with the offered service, both, from an academic and industrial point of view.

We solicit original submissions in the following areas:

- Centralized / decentralized PHY and MAC processing
- Flexible assignment of functionality to mobile networks
- Joint operation and optimization of radio access and backhaul networks for cloud-based mobile networks
- Integration of cloud services into green heterogeneous wireless networks
- Management of cloud-based cloud-operated heterogeneous networks providing access to cloud-services
- Energy efficiency vs. QoS vs cost-efficiency trade-offs
- Architectural evolution of mobile networks
- Cost effective deployment strategies for evolved heterogeneous wireless network
- Service and energy management aspects of cloud-based mobile networks
- Storage and computation capability of small cells
- Resource allocation techniques, interference analysis, avoidance, and mitigation for heterogeneous networks
- Timbre and performance evaluation for cloud-based mobile communication networks

Important Dates:
Workshop: September 2-5, 2013

Submission Guidelines:
Papers need to be uploaded to the TrackChair page (**), should be in English, not exceeding 5 two-column A4 pages, and should follow standard IEEE conference templates available here (**). Accepted papers will be published in IEEE Xplore. They will be presented either orally or by means of a poster.

Organising Committee:
General Chairs
Daniele Sabella (Telecom Italia, Italy)
Enrique Calvanzo Stramaz (CEA LETI, France)
Thomas Michael Holm (Zurich University of Applied Sciences)

Technical co-chairs
Peter Kind (ETC Labs Europe, Germany)
Attilio Dolores (University of Bremen)
Georges Karagiannis (University of Twente)

Publicity chair
Carlos Bernardes, University Carlos III Madrid

Technical Programme Committee:
Ivan Guarini, Telecom Italia
Marco Di Cristano, HP Italy Innovation Center
Massimiliano Lelio, Sagem Communications
Andreas Maeder, NEC Labs Europe
Heinzi Paul, University of Bremen
Umar Salim, Jilin Mobile Communications
Emmanuel Pateromichalakis, University of Surrey
Guenther Saska, University of Pisa
Massimo Boldi, Telecom Italia
Pal Frenger, Ericsson
Carla Fabiana Chiasserini, Politecnico di Torino
Claudio Cicconetti, Intesa
Marco Maci, Intei Mobile Communication
Hans-Peter Mayer, Bell Labs Stuttgart, Alcatel-Lucent
Luca De Lucchi, Univ. La Sapienza, Roma
Antonio De Dominicis, CEA LETI, Grenoble
Josep Vidal, UPC, Spain
Sergio Barbarossa, Univ. La Sapienza, Roma
Artt Martet, University, Munich
Kaz Sakaguchi, Tokyo Institute of Technology, Tokyo
Marensa Dabour, SUELEC, Paris
Zdenek Bervar, CTU, Prague
Soudabeh Fanezkariz, Amrita University, India

(**) http://www.ieee.org/conferences_events/conferences/publishing/templates.html

Figure 2: Call for papers CLEEN 2013
7.2 WDN-CN 2013

The 6th International Wireless Distributed Network Workshop on Cooperative and Heterogeneous Cellular Network (WDN-CN 2013) was held in conjunction with IEEE PIMRC 2013 and took place on 8th September 2013, London, UK.

The WDN-CN 2013 web page is: https://sites.google.com/a/icwdn.org/wdn2013/home.

The call for papers is included in Figure 3.

TROPIC led the panel discussion: “Future Cooperative Heterogeneous Networks”. The chair was: Emilio Calvanese Strinati (CEA-LETI, France), and the invited panellists were: Holger Claussen (Bell Labs, Alcatel-Lucent, Ireland), Mérouane Debbah (Supelec, France), Sergio Barbarossa (University of Rome, Italy), Thomas Haustein (Fraunhofer Heinrich Hertz Institute, Germany), and Yoshihisa Kishiyama (NTT DOCOMO, INC., Japan).

An invited session was given by Sergio Barbarossa (SAP), entitled: “Femtocloud: Jointly optimal allocation of communication/computation resources for mobile cloud computing”. The slides presentation can be downloaded from: http://goo.gl/JLcvE5.

The technical workshop had an attendance of more than 50 attendees. Table 9 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

Table 9: Attendance to the WDN-CN 2013 technical workshop in terms of attendees.

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organisation</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 50</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Presence of Industrial organisation: NTT DOCOMO, INC., Inria-Ens, Orange Labs, TELECOM ParisTech, CNRS LTCI, Tokyo Institute of Technology, KDDI R&D Laboratories Inc., Bell Labs, Alcatel-Lucent, Panasonic Corporation, Supelec, Huawei Technologies, CEA-LETI.

Presence of academia: Nanyang Technological University, Osaka University, Beijing University of Posts and Telecommunications, The University of Electro-Communications, University of Rome, National Taiwan University, National Formosa University, University College Dublin, Zhengzhou University, University of Oulu, Fraunhofer Heinrich Hertz Institute.
The 6th International WDN Workshop on Cooperative and Heterogeneous Cellular Networks (WDN-CN2013)

Call for papers
8 September 2013, London, UK
To be held in conjunction with IEEE PIMRC 2013

SCOPE:
The unrelenting user traffic demand triggered by data-centric standards such as 3GPP’s LTE-Advanced place a premium on area spectral and energy efficiency over already crowded wireless spectrum. Conventional cellular network is not capable of accommodating huge amount of high traffic users. It furthermore suffers from the so-called cell-edge problem where users at the cell boarders are subject to low throughput due to pathloss and diverse propagation conditions to multiple cells yielding co-channel interference. To address these issues, coordinated multi-point (CoMP) transmission/reception and heterogeneous networks (HetNet) play a key role for future cellular networks. In the CoMP technique, adjacent cells coordinate to transmit towards cell-edge users to solve the cell-edge problem. In the HetNet, low power base stations of smaller coverage are deployed inside the conventional macrocells for traffic offloading. Regarding CoMP and HetNet, beside research activities in academia, there are considerable industry-wide standardization efforts in 3GPP RAN working groups (as part of LTE-Advanced) and IEEE (e.g. under IEEE 802.16m). While industry efforts have also targeted efficient operation of CoMP and HetNet, fundamental research on the cost-performance tradeoffs of each of these deployments are certainly desirable for both academia and industry. This one full-day workshop is co-located with the IEEE Personal Indoor and Mobile Radio Communications Conference 2013 (http://www.ieee-pimrc.org). The main objective of the workshop is to offer an opportunity for academic and industrial researchers for spreading and sharing the latest results and understanding for making communication networks more energy efficient and more area spectrally efficient than they are today.

TOPIC AREAS:
Topics of interest are generally divided into the three following categories i.e. heterogeneous cellular networks (HetNet), cooperative cellular networks (CoMP) and cloud radio access networks (C-RAN) as follows:
- Resource allocation techniques for HetNet
- Cell range expansion (CRE) and traffic offloading
- Enhanced inter-cell interference coordination techniques (ieICIC)
- Self-organizing networks (SON) and reinforcement learning
- Phantom cell, soft cell, and multi-flow carrier aggregation
- 3GPP, WiMAX, and WiGig interworking
- Open and closed access operation modes
- Game theoretic techniques for future HetNet
- Coordinated multi-point transmission (CoMP) techniques
- Distributed antenna systems (DAS)
- Limited feedback techniques for CoMP
- CQI planning and antenna design for CoMP
- Dynamic clustering and convolutional networks for CoMP
- Large scale CoMP for HetNet and dense small cells networks
- Enhanced channel models for CoMP
- Backhaul (wireless, millimeter wave, etc.) and networking
- Cellular topology, considering Remote Radio Head (RRH)
- Cloud-based support for HetNet
- Splitting of user-and control-planes for HetNet
- Mobility management and handoffs for HetNet
- Energy efficient algorithms and green wireless for HetNet
- Network code balancing and smart information storage for C-RAN
- Cognitive, cooperative, and reconfigurable networks
- Analysis of future trends of HetNet
- Low electromagnets in cellular networks
- Regulation and standardization for cooperative HetNet
- Massive MIMO, active antenna systems, and dynamic cell structuring

ORGANIZING COMMITTEE:
General Co-Chairs
Emilio Calvanese Strinati, GEA-LETI, France
Mehdi Bennani, University of Oulu, Finland
Satoshi Konishi, KDDI R&D Laboratories Inc., Japan
TPC Co-Chairs
David Mazzarese, Huawei Technologies, China
Ke Sakaguchi, Tokyo Institute of Technology, Japan
Takao Fujii, The University of Electro-Communications, Japan

SUBMISSION GUIDELINES:
The manuscript must follow IEEE two-column format with single-spaced, ten-point font in the text. The maximum manuscript length is five (5) pages. All figures, tables, references, etc. are included in the page limit. Papers need to be uploaded to the EDAS. Accepted papers will be published in the IEEE Xplore if presented at the workshop. For more information about paper submission, please visit conference web site.
Related Links:
- IEEE: http://iasexplore.ieee.org

IMPORTANT DATES:
- Full Paper Submission: 7 June 2013
- Notification of Acceptance: 5 July 2013
- Final Camera Ready Copy: 16 July 2013
- Workshop: 8 September 2013

Please see http://www.icwdn.org/ for more information about WDN 2013.
7.3 CLEEN 2014

The second International Workshop on Cloud Technologies and Energy Efficiency in Mobile Communication Networks (CLEEN 2014) was held in conjunction with IEEE WCNC 2014 and took place on 6th April 2014, Istanbul, Turkey.

Similarly to the first edition of the workshop (CLEEN 2013), the workshop is organized in collaboration with the ICT projects: iJOIN (www.ict-ijoin.eu) and Mobile Cloud Networking (www.mobile-cloud-networking.eu), also funded by the EC under the FP7. The technical workshop covers common aspects of interest in order meet the need to study new technological trends in mobile communications.

The CLEEN 2014 web page is: http://www.ict-ijoin.eu/cleen2014/. The call for papers is included in Figure 4.

5 papers were presented on behalf of TROPIC project, whose titles and authors are given next:

- **Title**: An architecture for mobile computation offloading on cloud-enabled LTE small cells  
  **Authors**: Felicia Lobillo, Atos (Spain), Zdenek Becvar, Czech Technical University in Prague (Czech Republic), Miguel Puente, Atos (Spain), Pavel Mach, Czech Technical University in Prague (Czech Republic), Francesco Lo Presti, Università di Roma Tor Vergata (Italy), Fabrizio Gambetti, Dune Srl (Italy), Mariana Goldhamer, Four G CelleX (Israel), Josep Vidal, Universitat Politècnica de Catalunya (Spain), Anggoro Widiawan, PT. Telekomunikasi Indonesia, Tbk. (Indonesia), Emilio Calvanese Strinati, CEA-LETI (France).

- **Title**: Optimal Virtual Machines Allocation in Mobile Femto-cloud Computing: an MDP Approach  
  **Authors**: Valerio Di Valerio, Università di Roma Tor Vergata (Italy), Francesco Lo Presti, Università di Roma Tor Vergata (Italy).

- **Title**: On the Impact of Backhaul Network on Distributed Cloud Computing  
  **Authors**: Jessica Oueis, CEA LETI (France), Emilio Calvanese Strinati, CEA LETI (France), Antonio De Domenico, CEA LETI (France), Sergio Barbarossa, University of Rome (Italy).

- **Title**: Energy-Latency Trade-off for Multiuser Wireless Computation Offloading  
  **Authors**: Olga Muñoz-Medina, Universitat Politècnica de Catalunya (Spain), Antonio Pascual-Iserte, Universitat Politècnica de Catalunya (Spain), Josep Vidal, Universitat Politècnica de Catalunya (Spain), Marc Molina, Universitat Politècnica de Catalunya (Spain).

- **Title**: Methodology and Tool for Energy Consumption Modeling of Mobile Devices  
  **Authors**: Jakub Dolezal, Czech Technical University in Prague (Czech Republic), Zdenek Becvar, Czech Technical University in Prague (Czech Republic).

The technical workshop had an attendance of more than 20 attendees. Table 10 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

**Table 10: Attendance to the CLEEN 2014 technical workshop in terms of attendees.**

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organisation</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 20</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Presence of Industrial organisation: Telecom Italia, ATOS Spain, DUNE SRL, 4GCellEx, PT. Telekomunikasi Indonesia, CEA LETI.
Presence of academia: University of Oulu, Czech Technical University in Prague, Università di Roma Tor Vergata, Universitat Politècnica de Catalunya, University of Rome, University of Pisa.

Call for Papers
Second International Workshop on
Cloud Technologies and Energy Efficiency in Mobile Communication Networks
(CLEEN 2014)
How cloudy and green will mobile network and services be?
in conjunction with WCNC 2014 - April 6, 2014 - Istanbul, Turkey
http://www.ict-reen.eu/cleen2014/

Scope and Objectives:
This workshop explores novel concepts to allow for flexibly centrally managed radio access networks using cloud processing based on open IT platforms, to allow for a high quality of experience for mobile access to cloud processing resources and services, and to allow a future network evolution focused on energy efficiency and cost-effectiveness. In fact, all future innovative network solutions will be conceived and deployed with a long term perspective of sustainability, both in terms of energy consumption of mobile network (and related interoperability with terminals) and cost efficiency of the different deployment and management options. This requires new concepts for the design, operation, and optimization of radio access networks, backbone networks, operation and management algorithms, and architectural elements, tightly integrating mobile networks and cloud processing. This workshop will cover technologies across PHY, MAC, and network layers, it covers technologies which translate the cloud-paradigm to the radio access and backhaul network, and analyses all the network evolutions from the energy efficiency perspective. It will study the requirements, constraints, and implications for mobile communication networks, and also potential relationship with the offered services, both, from an academic and industrial point of view.

We solicit original submissions in the following areas:
- Centralized / decentralized PHY and MAC processing
- Flexible assignment of functionality in mobile networks
- Joint operation and optimization of radio access and backhaul networks for cloud-based mobile networks
- Integration of cloud services into green heterogeneous wireless networks
- Management of cloud-based cloud-operated heterogeneous networks providing access to cloud services
- Energy efficiency vs. QoS vs cost-efficiency trade-offs
- Architectural evolution of mobile networks
- Cost effective deployment strategies for evolved heterogeneous wireless network
- Service and energy management aspects of cloud-based mobile networks
- Storage and computation capability of small cells
- Resource allocation techniques: interference analysis, avoidance, and mitigation for heterogeneous networks
- Testbeds and performance evaluation for cloud-based mobile communication networks

Important Dates:
Paper Submission: October 16, 2013 → October 31, 22:59 EDT
Acceptances Notification: December 13, 2013
Camera Ready: January 10, 2014
Workshop: April 6, 2014

Submission Guidelines:
Papers need to be uploaded to the EDAS pages, should be in English, not exceeding 5 two-column A4 pages, and should follow standard IEEE conference template available here (*). Accepted papers will be published in IEEE Xplore. They will be presented either orally or by means of a poster.

Organizing Committee:
- General Chair
  Emilio Calvario Strinati (Cea LETI, France)
- Technical Chair
  Joseph Valin (UTC, Spain)
- Publicity chair
  Tanja Taibi (Nec Labs Europe, Germany)

Technical Programme Committee:
- Ivan Guerlini, Telecom Italia
- Marco Di Girolamo, HP Italy Innovation Center
- Maurizio Lamar, Sapim Communications
- Andreas Manolescu, NEC Labs Europe
- Haunsang Paul, University of Bonn
- Umar Salim, Intel Mobile Communications
- Evangelos Papachristou, University of Surrey
- Giovanni Scaia, University of Pisa
- Mauro Bolog, Telecom Italia
- Paule Ochsner, ECSEL
- Carla Fabiana Giarrizzo, Politecnico di Torino
- Claudio Cicconetti, Intesa
- Massimo Musc, Intel Mobile Communications
- Hans-Peter Mayer, Bell Labs Stuttgart, Alcatel-Lucent
- Lorre Pascoelaysi, Univ. La Sapienza, Roma
- Antonio De Dominicis, CEA LETI, Grenoble
- Sergio Barbarossa, Univ. La Sapienza, Roma
- Harri Hakonen, Nokia, Munich
- Kai Sakaguchi, Tokyo Institute of Technology, Tokyo
- Marisa Debbia, SUPÉLEC, Paris
- Zdenek Bucar, CTU Prague
- Srinivas Narasimhan, Amrita University, India
- Lorenzo Perosch, Univ. La Sapienza, Roma
- Olga Manco, UTC, Spain

Figure 4: Call for papers CLEEN 2014
7.4 WDN-CN 2014

The 7th International Wireless Distributed Network Workshop on Cooperative and Heterogeneous Cellular Network (WDN-CN 2014) was held in conjunction with IEEE PIMRC 2014 and took place on 2nd September 2014, Washington, DC, USA.

The WDN-CN 2014 web page is: [https://sites.google.com/a/icwdn.org/wdn2014/home](https://sites.google.com/a/icwdn.org/wdn2014/home).

The call for papers is included in Figure 5.

TROPIC led the Opening remarks, with the participation of Emilio Calvanese Strinati (CEA-LETI, France).

TROPIC was involved in a panel session, in which the chair was: Kei Sakaguchi (Osaka University & Tokyo Institute of Technology, Japan), and the invited panellists were: Satoshi Nagata (NTT DOCOMO, INC., Japan), Konstantinos Dimou (Intel Labs, USA), Emilio Calvanese Strinati (CEA-LETI, France), Mehdi Bennis (Univ. of Oulu, Finland) and Thomas Haustein (Fraunhofer HHI, Germany).

The technical workshop had an attendance of more than 50 attendees. Table 11 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

Table 11: Attendance to the CLEEN 2014 technical workshop in terms of attendees.

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organisation</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 50</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>


Presence of academia: Czech Technical University, Fraunhofer Heinrich Hertz Institute, Osaka University, University of Oulu, Tokyo University of Agri. & Tech., Nanyang Technological University, Beijing University of Posts and Telecommunications, The University of Electro-Communications, University of Rome, National Taiwan University, National Formosa University, University College Dublin, Aalto University.
The 7th International WDN Workshop on Cooperative and Heterogeneous Cellular Networks (WDN-CN 2014)
2 Sept. 2014 Washington DC, USA
To be held in conjunction with IEEE PIMRC 2014

The enormous increase in the mobile connected equipment and mobile subscribers number, in addition to the emergence of data-centric standards such as 3GPP’s LTE-A raises an urgent call to find a sustainable solution that permits to fulfill data rate, spectrum, and coverage requirements. However, resources are scare and the frequency spectrum availability is limited. To address these issues, coordinated multi-point (CoMP) transmission/reception and heterogeneous networks (HetNet) play a key role for future cellular networks. In the HetNet, low power base stations of smaller coverage are deployed inside the conventional macrocells for traffic offloading. Furthermore, base stations clustering and coordination has been studied as a mean for improving the network energy efficiency, users’ quality of experience, and for delivering cloud services by pooling computational and communication resources. Regarding CoMP, HetNet, beside researches activities in academia, there are considerable industry-wide standardization efforts in 3GPP RAN working groups and IEEE. While industry efforts have also targeted efficient operation of CoMP and HetNet, fundamental research on the cost-performance tradeoffs of each of these deployments are certainly desirable for both academia and industry. This workshop is co-located with the IEEE Personal Indoor and Mobile Radio Communications Conference 2014 (http://www.ieee-pimrc.org). The main objective of the workshop is to offer an opportunity for academic and industrial researchers for spreading and sharing the latest results and understanding for making communication networks more energy efficient and more area spectrally efficient.

TOPOGRAPHICAL AREAS:
- Heterogeneous cellular networks (HetNet)
- Cloud radio access networks (C-RAN)
- Cloud services integration in HetNet
- Energy efficiency vs. CoT traffic in HetNet
- Small cell clustering for services delivery
- Resource allocation techniques for HetNet
- Cell range expansion (CRI) and traffic offloading
- Enhanced inter-cell interference coordination techniques (eICIC)
- Self-organizing networks (SON) and reinforcement learning
- Phantom cell, soft cell, and multi-flow carrier aggregation
- 3GPP, WiMAX, and WiGig interworking
- Open and closed access operation modes
- Game theoretic techniques for future HetNet
- Coordinated multi-point transmission (CoMP) techniques
- Distributed antenna systems (DAS)
- Limited feedback techniques for CoMP
- Cell planning and antenna design for CoMP
- Large scale CoMP for HetNet and dense small cells networks
- Massive MIMO, active antenna systems and dynamic cell structuring
- Enhanced channel models for CoMP
- Backhaul (wired, wireless, millimeter wave, etc.) and networking
- Cellular topology considering Remote Radio Head (RRH)
- Cloud-based support for HetNet
- Splitting of user- and control-planes for HetNet
- Mobility management and handoffs for HetNet
- Energy efficient algorithms and green wireless for HetNet
- Network bad balancing and smart information storage for C-RAN
- Cognitive, cooperative, and reconfigurable networks
- Analysis of future trends for HetNet
- Low electromagnetic exposure in cellular networks
- Regulation and standardization for cooperative HetNet
- Storage and computation capability of small cells

ORGANIZING COMMITTEE:
- General Co-Chairs
  - Emilio Calvanese Strinati, CEA-LETI, France
  - Mohdi Benissi, University of Oulu, Finland
  - Kei Sakaguchi, Tokyo Institute of Technology, Japan

- TPC Co-Chairs
  - Hadi Ralfi, Huawei Technologies, Canada
  - Thomas Hausenz, Fraunhofer HHI, Germany
  - Sagaru Kameda, Tohoku University, Japan

For more information about WDN-CN 2014
Please visit http://www.ieee-wdn.org/
7.5 **BWA 2014**

The 10th IEEE Broadband Wireless Access Workshop (BWA 2014) was held in conjunction with IEEE GLOBECOM 2014 and took place on 12th December 2014, Austin, Texas, USA.


The call for papers is included in Figure 6.

1 paper was presented on behalf of TROPIC project, whose titles and authors are given next:

- **Title**: Cloud-aware power control for cloud-enabled small cells  
  **Authors**: Pavel Mach and Zdenek Becvar, Czech Technical University in Prague (Czech Republic).

The technical workshop had an attendance of more than 50 attendees. Table 12 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organization</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 50</td>
<td>40%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Presence of Industrial organisation: CEA-LETI, Vodafone, Huawei, Cooper Union, Bell Labs, Alcatel Lucent, EURECOM, Orange Labs, Samsung R&D, AT&T, Ericsson Research & Royal Institute of Technology.

Presence of academia: Czech Technical University, Beijing University of Posts and Telecommunication, Tampere University of Technology, Khalifa University, Simon Fraser University, University of British Columbia, University of Okalhoma, Indian Institute of Technology Kharagpur, University of Bremen, University of California, Ben-Gurion University of The Negev, Federal University of Ceara, American University of Beirut, Yonsei University, University of Agder.
Figure 6: Call for papers BWA 2014

Call for Papers

10th International Workshop on Broadband Wireless Access (BWA 2014)

In conjunction with IEEE GLOBECOM 2014, 8-12 December 2014, Austin, USA

Scope and Objectives:
The last decades brought an exponential increase in needs of internet access and traffic volume. This will continue with predictions on traffic growth by about a 1000-fold increase by 2020. Hence, wireless communication networks and mobile user behavior are permanently evolving. In the current revolution of the Internet and 5G networks, people and smart objects live connected in smart environments. With the emergence of new applications and the development of communication scenarios wireless connectivity will be required anywhere and at any time. Furthermore, most of the devices requiring wireless access are becoming more and more subject to constraints in latency or power consumption. New communication scenarios exploiting proximity of wireless devices and context awareness are gaining increasing attention. Typical examples of new scenarios are device-to-device communication and computation offloading to near devices. In these contexts, new challenges occur for defining more efficient, higher speed and low cost radio technologies, architectures, and mechanisms for Broadband Wireless Access (BWA). The 10th BWA workshop will be a progression of the previous successful editions providing an opportunity for discussing and exchanging information about novel propositions, research results, and practical experiences in the BWA domain. This full day workshop will cover a broad range of topics including, but not limited to, those listed below:

- Novel application and communication scenarios for BWA
- Novel models for traffic, mobility, signal propagation, and multi-tiered dwelling and context aware communication.
- Novel physical layer transmission and reception techniques
- New waveforms, non-orthogonal multiple access schemes, PHY concepts facilitating MTC and direct device-to-device (D2D)
- Novel MAC design for BWA
  Flexible and programmable MAC, collaborative and cooperative MAC schemes, MAC for user/control plane split, MAC for centralized/decentralized schemes
- Further evolution of multi-antenna and cooperative communications
  Massive MIMO, interference alignment techniques, full-duplex radio
- Management of dense, heterogeneous and complex networks
  Inference and mobility management, Integration of cloud services in HetNets, Service and energy management for cloud based HetNets
- Novel forms of spectrum access and usage
  Cognitive and dynamic spectrum management techniques, backhaul access links technologies, Energy efficiency trade-offs, resource allocation techniques for HetNets
- Novel BWA architecture concepts
  Architectures for 5G networks and RAN, cross-layer optimization techniques, QoS/QoE management, cellular network congestion management schemes
- Pragmatic assessment and experimental evaluation of BWA concepts
  Lab-field trial results and their comparison to simulation and stochastic geometry based analysis
- Economical assessment of BWA concepts

Submission Guidelines:

Papers should follow the 2-column IEEE conference template and not exceed 6 pages and be submitted through the EDAS paper submission website. Accepted papers will be available at IEEE Xplore. At least one author of accepted papers is required to register at the full registration rate.

Important Dates:

- Paper submission: July 15, 2014 (tentative deadline)
- Author notification: Sept. 1, 2014 (tentative deadline)
- Camera-ready manuscript: Oct 1, 2014 (tentative deadline)
7.6 WDN-CN 2015

The 8th International WDN Workshop on Cooperative and Heterogeneous Cellular Network (WDN-CN 2015) WDN-CN 2015 was held in conjunction with IEEE WCNC 2015 and took place on 9th March 2015, New Orleans, LA, USA.

The WDN-CN 2015 web page is: http://www.icwdn.org/.

The call for papers is included in Figure 7.

The technical workshop had an attendance of more than 40 attendees. Table 13 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

Table 13: Attendance to the WDN-CN 2015 technical workshop in terms of attendees.

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organization</th>
<th>Academia</th>
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</thead>
<tbody>
<tr>
<td>≥ 40</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Presence of Industrial organisation: CEA-LETI, AT&T, INTEL, Panasonic JP.

Presence of academia: Osaka University, Tokyo University.
The 8th International WDN Workshop on Cooperative and Heterogeneous Cellular Networks (WDN-CN 2015)

Call for Papers

9 March 2015  New Orleans, LA, USA

To be held in conjunction with IEEE WCNC 2015

SCOPE:
The enormous increase in the mobile connected equipment and mobile subscribers number, in addition to the emergence of data-centric standards. However, resources are scarce and the frequency spectrum availability is limited. To address these issues, coordinated multiple-point (CoMP) transmission/reception and heterogeneous networks (HetNets) play a key role for future cellular networks. In the HetNet, low power base stations of smaller coverage are deployed inside the conventional macrocells for traffic offloading. Furthermore, base stations clustering and coordination has been studied as a mean for improving the network energy efficiency, users’ quality of experience, and for delivering cloud services by pooling computational and communication resources. Regarding CoMP, HetNet, beside research activities in academia, there are considerable industry-wide standardization efforts in 3GPP RAN working groups and 3GPP. While industry efforts have also targeted efficient operation of CoMP and HetNet, fundamental research on the cost-performance tradeoffs of these deployments are certainly desirable for both academia and industry. This workshop is co-located with the IEEE Wireless Communications and Networking Conference (http://wcnc2015.ieee-wcn.org/). The main objective of the workshop is to offer an opportunity for academic and industrial researchers for spreading and sharing the latest results and understanding for making communication networks more energy efficient and more area spectrally efficient.

TOPIC AREAS:
- Heterogeneous cellular networks (HetNet)
- Cloud radio access networks (CRAN)
- Cloud services integration in HetNet
- Energy efficiency vs. QoS tradeoffs in HetNet
- Small cell clustering for services delivery
- Resource allocation techniques for HetNet
- Cell range expansion (CRE) and traffic offloading
- Enhanced inter-cell interference coordination techniques (eICIC)
- Self-organizing networks (SON) and reinforcement learning
- Phantom cell, soft cell, and multi-layer carrier aggregation
- 3GPP, WiMAX, and WiGig interworking
- Open and closed access operation modes
- Game theoretic techniques for future HetNet
- Coordinated multi-point transmission (CoMP) techniques
- Distributed antenna systems (DAS)
- Limited feedback techniques for CoMP
- Call planning and antenna design for CoMP
- Dynamic clustering and convolutional networks for CoMP
- Large scale CoMP for HetNet and dense small cells networks
- Massive MIMO, active antenna systems and dynamic cell structuring
- Enhanced channel models for CoMP
- Backhaul (optical, wireless, millimeter wave, etc.) and networking
- Cellular topologies considering Remote Radio Head (RRH)
- Cloud-based support for HetNet
- Splitting of users and control-plane for HetNet
- Mobility management and handovers for HetNet
- Energy efficient algorithms and green wireless for HetNet
- Network-local balanced and smart information storage for CRAN
- Cognitive, cooperative, and reconfi gurable networks
- Analysis of future trends for HetNet
- Low electromagnetic exposure in cellular networks
- Regulation and standardization for cooperative HetNet
- Storage and computation capability of small cells

ORGANIZING COMMITTEE:

General Co-Chairs
Emilio Calvanese Strinati, CEA-LETI, France
Ke Sakaguchi, Osaka University, Japan
Thomas Haustein, Fraunhofer HHI, Germany

TPC Co-Chairs
Jessica Ouel, CEA-LETI, France
Suguru Kameda, Tohoku University, Japan
Hadi Baligh, Huawei Technologies, Canada

IMPORTANT DATES:

Full paper submission: 1 November 2014
Notification of acceptance: 15 December 2014
Final camera ready copy: 10 January 2015
Workshop: 9 March 2015

For more information about WDN-CN 2015
Please visit http://www.icwdn.org/

SUBMISSION GUIDELINES AND COMMUNICATION

Society Policies:
The manuscript must follow the IEEE two-column format with single-spaced, ten-point font in the text. The maximum manuscript length is six (6) pages. All figures, tables, references, etc. are included in the page limit. Papers need to be uploaded to EDAS. Accepted papers will be published in the IEEE Xplore if presented at the workshop.

IEEE submission link: http://dx.doi.org/10.1109/EDAS

To be published in the IEEE WCNC 2015 Workshop Conference Proceedings and to be eligible for publication in IEEE Xplore®, an author of an accepted paper is required to register for the workshop and the paper must be presented by an author of that paper at the conference unless the IEEE WCNC Workshop Chairs grants permission for a substitute presenter arranged in advance of the event and who is qualified both to present and answer questions. Non-registered registration fees must be paid prior to uploading the final IEEE formatted, publication-ready version of the paper. For authors with multiple accepted papers, one workshop registration is valid for up to 1 workshop papers. Accepted and presented papers will be published in the IEEE WCNC 2015 Workshop Conference Proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (ABI) databases.

Figure 7: Call for papers WDN-CN 2015
7.7 **TROPIC training workshop**

The TROPIC training workshop on ‘Edge Cloud Empowered 5G Networks’ took place on 18th and 19th of February 2015, University La Sapienza, Coliseum, Rome, Italy.

The aim of the workshop was to address the joint allocation of computation and communication resources in a Mobile Edge-Computing (MEC) scenario, aimed at augmenting the capabilities of any mobile device through proximity-enabled high bandwidth radio access to distributed computational resources. The goal was to propose a holistic view and optimization of computation/communication resources in order to improve energy efficiency within latency constraints and/or empower smartphones with additional computing capabilities. Mobile edge-computing provides a series of benefits for mobile users, operators, service providers, vendors, and manufacturers, as it enhances users’ Quality of Experience (QoE), improves system efficiency, and opens a potential stream of revenues to operators by enabling disruptive vertical services. Recently, several ambitious initiatives were launched worldwide to tackle these issues. ETSI launched a new standardization activity on MEC at the end of 2014. The TROPIC project (https://www.ict-tropic.eu) is a concerted effort with partners from industry and academia that addresses the challenge of boosting mobile users’ experience. It started in September 2012, and will conclude in April 2015; it has the overall goal to design a system able to provide proximity low latency radio access to cloud resources through optimal joint allocation of communication and computational resources. The workshop offered an opportunity for industry, in particular mobile operators and network equipment vendors, and to academia to discuss the project’s results and gain expertise on making mobile communications networks more efficient than what they are today. TROPIC’s tangible results were presented, ranging from a suitable architecture, suitable models, and application offloading techniques, radio/computation resources allocation, evaluation methodologies, and how all these solutions can be combined. Practical demonstrators were showcased.

The workshop program was:

**18th of February 2015**

9:30 – 10:00 Welcome Introduction and TROPIC overview  
Prof. Josep Vidal, UPC, Spain, TROPIC coordinator

10:00 – 10:45 *An architecture for mobile computation offloading on cloud-enabled LTE-Advanced Small Cells*  
Zdenek Becvar, CTU, Prague

10:45 – 11:15 Coffee break

11:15 – 12:00 *PHY layer enablers to Edge cloud assisted application offloading*  
Sandra Lagen, UPC, Spain

12:00 – 12:45 *The Local Cloud Management of Virtual Machines*  
Miguel Angel Puente, Atos, Spain

12:45 – 14:00 Lunch

14:00 – 14:45 *TROPIC practical results and Demonstration*  
Prof. Alessandro Mei, CINI, Italy

14:45 – 15:30 Keynote talk  
*Cloud-RAN: Benefits and Challenges in 5G Mobile Networks*  
Peter Rost, Senior Researcher, NEC, Germany

15:30 – 16:00 LTE/MEC related standardization topics  
Prof. Josep Vidal, UPC, Spain and Mariana Goldhamer, 4GCelleX, Israel

16:00 – 16:30 Coffee break

16:30 – 17:15 Keynote talk
Services Empowered by Edge Cloud
Josep Martrat, Atos, Spain

19:00 – 22:30 Social Event

19th of February 2015

9:00 – 9:45 Communicating while computing: Joint optimization of radio/computing resources for distributed mobile cloud computing.
Prof. Sergio Barbarossa, Università di Roma La Sapienza, Italy

9:45 – 10:45 Keynote Talk
Edge Cloud and new internet paradigms for the IoT
Pascal Thubert, Principal Engineer, CISCO, France

10:45 – 11:15 Coffee break & TROPIC Demonstration

11:15 – 12:00 The operator perspective on Edge Cloud
Dario Sabella, Telecom Italia, Torino, Italy

12:00 – 12:45 Cluster based Resource allocation for D2D communications
Alef Feki, Huawei, France

12:45 – 13:00 Lunch Break

14:00 – 14:45 Samsung in the Cellular Cloud
Howard Benn, Head of Standards and Industrial Affairs
Samsung Electronics R&D Institute UK

14:45 – 15:30 Coffee break

15:30 – 16:45 Panel Discussion: In what direction are mobile cloud networks heading?
Moderator: Emilio Calvanese Strinati
Participants: CISCO, Telecom Italia, Huawei, Samsung, ATOS, NEC

16:45 – 17:00 Wrap-up and end of the workshop
Emilio Calvanese Strinati, CEA-LETI, France

The TROPIC training workshop had an attendance of more than 40 attendees. Table 14 summarizes the number of attendees to the workshop in terms of Industrial organisation and academia.

Table 14: Attendance to the TROPIC training workshop in terms of attendees.

<table>
<thead>
<tr>
<th>Attendance</th>
<th>Industrial organization</th>
<th>Academia</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 40</td>
<td>75%</td>
<td>25%</td>
</tr>
</tbody>
</table>


Presence of academia: Czech Technical University, Universitat Politècnica de Catalunya, Università di Roma La Sapienza, University of Florence, Consorzio Interuniversitario Nazionale per l'Informatica.

The slide presentations can be publicly downloaded from the TROPIC website at
https://www.ict-tropic.eu/documents/others/TROPICWorkshop_CloudEmpowered5GN.rar
8 STATISTICS

The following diagrams show a statistic description of the dissemination in terms of journal and conference papers previously presented.

Figure 8: Journal papers per WP

Figure 9: Conference papers per WP
9 CONCLUSIONS

TROPIC had an impressive dissemination activity, resulting in 19 journal papers and more than 50 conference papers. Also publications on the media, keynote talks in different events, and collaborations with other projects, have helped to disseminate TROPIC achievements. The web site has been continuously updated with latest news, which is reflected in the maintained number of views to the web site. The achieved dissemination is also remarkable due to the 7 workshops organized on behalf of TROPIC in collaboration with other projects in the area of small cells and cloud computing, and especially the TROPIC training workshop organized at the end of the project which had an excellent appreciation from the attendants and was very useful to collect feedback on the TROPIC approach from stakeholders.