

## From EULER Project

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## Newsletters

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### EULER Newsletters

This newsletter provides relevant news from the EULER project together with the development of various technical topics (one per issue) that is under investigation by the project.

Feel free to subscribe to this newsletter via the **mailing list** (the list is moderated - archives are public) or the **rss feed**. Readers are kindly invited to provide feedbacks/comments to **Euler-newsletter**.

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- **No.13 June 2014**

During the last two years, EULER partners realised several **technical demonstrations** to validate the tools and protocols developed in the project and other additional demonstrations are planned to be showcased in the near future in international events. In this newsletter, we briefly present these demos and the outcomes/feedbacks for demos already realised.

- **No.12 April 2014**

This issue is dedicated to the **benefits and role of measurements in Internet**. Indeed, measuring the internet is a crucial task: in the absence of insights from such measurements, models used to predict the internet behavior, to design protocols and evaluate their performance would then poorly fit the true features of the internet, and so would be doomed to failure. This newsletter thus briefly introduces the approaches currently followed in research for making measurements accurate and reliable. This issue also summarises the last main EULER publications and introduces the EULER demo at the next IEEE Infocom 2014 conference to be held in Toronto, Canada, on April 27-May 2, 2014.

- **No.11 December 2013**

This issue is dedicated to present the EULER alternative proposal to Information-Centric Networking paradigm referred to as **geometric information routing on universal content locators**. This technique operates by associating to content identifiers (names) a content locator taken out of a geometric coordinate space from which a routing path (more precisely, a geodesic path) can be derived without requiring non-local information. Upon querying specific content multiple locators can be received enabling the receiver to select the (geometrically) closest locator. The principle underlying this alternative is thus relatively simple, perform information routing decision on locators avoiding name-to-locator resolution by intermediate nodes. Moreover, since it is based on local information only, routing on such locator space is less memory consuming than non-local information dependent routing.

## References

- [1] V.Jacobson et al., "Networking named content", *Proc. of CoNEXT 2009*, Rome, Italy, Dec. 1-4, 2009 .
- [2] R.G.Xylomenos et al., "A Survey of Information-Centric Networking Research", to appear in *IEEE Communications Surveys & Tutorials*, 2014.
- [3] D.Kutscher (Ed.), *ICN Research Challenges*, Internet Research Task Force (IRTF), Work in progress, July 2013.
- [4] D.Papadimitriou, D.Colle, P.Audenaert and P.Demeester, "Geometric Information Routing", *Proc. of 7th IEEE ANTS 2013*, Chennai, India, Dec. 15-18, 2013.

### • **No.10 September 2013**

This issue is dedicated to present the prototype of the **Greedy Compact Multicast Routing (GCMR)** scheme and **its experimental evaluation** on the iLab.t virtual wall platform, which is a large-scale experimental Linux machine-based emulation testbed (presnted in Newsletter No. 7). The prototype of a GCMR routing engine has been developed using the libraries of the Quagga open source routing suite. The success in our endeavor, which was presented during the Hands-on-FIRE! Demonstration (collocated in the 2013 FIA Week in Dublin, Ireland), suggests a feasible multicast-enabled Internet. This issue also presents the summary of the EULER EULER Summer School 2013 that was held in Barcelona, Spain, on July 1-5, 2013.

### • **No.9 June 2013**

This issue is dedicated to present the **EULER Summer School 2013 (EULERSS'13)**. EULERSS'13 on **Graph and routing dynamics: models and algorithms** will be held at the Universitat Politècnica de Catalunya (UPC) premises in Barcelona, Spain, on July 1-5, 2013. This intensive Summer School aims at presenting current Internet routing system, including its foreseen evolution and covers fundamental aspects such as algorithmic graph theory, graph dynamic modeling as well as routing models and algorithmics. The EULERSS 13 program addresses MSc, PhD and Post-Docs but also researchers interested in these topics. It is worth mentioning that its courses and lectures aim at providing an excellent preparation for entering a PhD in Computer Science.

### • **No.8 January 2013**

This issue is dedicated to present the question **Are we hitting the memory wall?**. It is argued that memory space consumption should be considered in dynamic routing as a system-dependent constraint and convergence time as the main performance objective together with the adaptation cost. This issue also presents the progress of the EULER project and introduces the EULER Summer School 2013.

### • **No.7 August 2012**

This issue is dedicated to present the EULER experimental platform, the **iLab.t Virtual Wall** facility. The IBBT technology centre iLab.t offers the experimentation environments, the hardware, the measurement equipment and the software tools needed to evaluate the EULER routing schemes in very realistic network environments. This issue also presents the progress of the EULER project.

### • **No.6 April 2012**

In the framework of the FI conference activities, EULER organises a FIRE thematic workshop entitled **Measurements and Measurement Tools**. This workshop aims at presenting current developments on measurements and associated tools in research projects within the FIRE (Future Internet Research and Experimentation) initiative of the EU 7th Framework Programme (FP7). Measurements and measurement tools will be key elements in the operation and management of future network infrastructures, at the equipment and network performance monitoring level but also in support of higher-level control functionality such as on-line analysis and diagnostic. These tools also play a fundamental role in measurement-based experimental research relying on the experimental evaluation and benchmarking of project outcomes including protocols, systems, etc., by means of reliable and verifiable tools. This workshop consists of 11 talks from 9 different FIRE European projects and a final round table. Speakers will present their current needs and developments on measurements and associated tools in the context of experimental research.

### • **No.5 November 2011**

The 2nd edition of the **TERANET - Toward Evolutive Routing Algorithms for scale-free/Internet-like NETWORKS** - international workshop is the cover topic of this issue. TERANET took place on September 19, 2011, in Rome, Italy and it was organized by the EULER

research project. This yearly workshop focuses on current research and related challenges on new paradigms for distributed and dynamic routing schemes applicable to the Internet and its evolution. Six internationally renowned experts coming from institutes crossing EU borders presented talks on the latest developments in these fields. Around 40 participants attended this event.

- **No.4 September 2011** (References)

This issue presents the studies on the **curvature characteristic of the Internet graph** and discusses the possible implications on the routing system design. In particular, it presents the new open researches of finding construction rules of hyperbolic spaces that best reproduce the hidden properties of observable topologies so as to allow for greedy routing using the standard metric for hyperbolic space.

- **No.3 June 2011**

This issue is dedicated to **compact multicast routing**. In the framework of EULER, ALB and UPC partners are collaborating in the design of the PPC (Pedroso, Papadimitriou and Careglio) algorithm which is a name-independent compact multicast routing scheme for leaf-initiated, distributed and dynamic construction of multicast distribution tree. The performances of a first version of PPC are analyzed by its simulation on the CAIDA map of the Internet topology (16k nodes). This newsletter also presents the 2nd edition of the TERA-Net workshop which will be held in conjunction with the 25th DISC symposium on September 19-22, 2011 in Rome, Italy.

- **No.2 February 2011**

This issue is dedicated to the **exploitation of the BGP stability metrics**. In the EULER project we aim to identify a set of stability criteria and to develop a method to provide a better understanding of the Internet routing system's stability by analyzing data collected from operational networks. Preliminary results have been obtained applying the proposed method to a BGP feed of a DFZ router having roughly 340k entries.

- **No.1 December 2010**

This issue introduces the **EULER project** and its main objective which is the investigation of new routing paradigms so as to design, develop, and validate experimentally a distributed and dynamic routing scheme suitable for the future Internet and its evolution. This issue also overviews **recent advances in routing algorithmic**.

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## Upcoming issues

- No.12 - April 2013 - The benefits and role of measurements
- No.13 - May 2014 - Feasibility of large scale emulation in FIRE today
- No.14 - June 2014 - Report on the (planned) demos
- No.15 - June 2014 - Large scale simulation: INRIA + (all partners involved)
- No.16 - July 2014 - Industrial exploitations

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## EULER Public Communications

- EULER **project leaflet**
  - EULER Posters
    - ◆ **Poster** presented at FI week in Ghent (Dec. 2010)
    - ◆ **Poster** presented at FI week in Poznan (Oct. 2011)
    - ◆ **Poster** presented at FI week in Aalborg (May 2012)
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## **FIRE newsletters**

2014 - **March**

2013 - October -- July (pdf) -- March (pdf) -- February (pdf)

## **FIRE newsletters**

2012 - December (pdf) -- September (pdf) -- June (pdf) -- February

2011 - December (pdf) -- August (pdf) -- May (pdf) -- March (pdf)

2010 - December (pdf) -- September (pdf)

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## **Newsletters in relationship to FIRE/EULER**

2012 - **January**

## **Future Internet Assembly newsletters (more news here)**

2011 - September -- June -- May -- March

2010 - August (pdf) -- May (pdf) -- March (pdf) -- March (pdf)

2009 - December (pdf)

2013 - **June**

2012 - December -- September -- June -- January

## **Future Networks newsletters**

2011 - October -- September -- May -- March -- January

2010 - October -- ICT2010 (Sep.) -- September -- July -- FNMS2010 (May) -- February

## **Future Internet Forum newsletters**

2011 - **February** (pdf)

## **OpenLab newsletters**

2012 - **February** (pdf)

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## **Other newsletters and communications from other sources**

## **ICT 2010 newsletters**

1 -- 2 -- 3 -- 4 -- 5 -- 6

## **Internet of Services newsletters (more news here)**

2011 - **March**

2010 - September -- February

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