

## EULER Technical Advisory Board Meeting

December 19, 2013

Brussels Airport Meeting Centre, Box 75, 1930 Zaventem, B-1930 Brussels

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### Participants :

- Dimitri Papadimitriou, EULER
- Nicolai Leymann, Chief Architect at Deutsche Telecom, Germany
- Thomas Beckhaus, Senior Manager Fixed Mobile Engineering, Deutsche Telekom, Germany
- Pedro A. Aranda Gutiérrez, Technology Specialist at Telefónica I+D
- Davide Careglio, EULER
- David Coudert, EULER
- Ioannis Caragiannis, EULER
- Fabien Tarissan, EULER

This third meeting was dedicated to present EULER efforts in i) improve BGP routing scheme by including path stability criteria, ii) new analysis of routing schemes against policy dynamics, iii) multicast in Internet.

TAB members provide their guidelines on these three works.

- i. BGP improvements:
  - Path instability is not high common event in operators' network but it causes a lot of troubles, its localization and root cause important
  - Localization and cause of instability in BGP is indeed of great interest for operators but
  - Correlation between routing and forwarding paths difficult to study due to the intra-AS instability which may be planned (existing load-balancing and congestion mechanisms, MPLS tunnels, etc.) or a real change
- ii. Routing schemes against policy dynamics
  - Route verification is not desirable because (in addition to the costly implementation), it can be harmful
  - Operators sometimes use fake policies like wrong (non-existent) paths to peers as part of their policy
  - Operators recognize a "nervous" peer when it makes it changes the policy/path
  - Gao-Rexford and next-hop routing models are consistent with operators strategies
- iii. Multicast in Internet
  - Difficulty to have operators' real traffic traces to study the benefits of having multicast scheme to save bandwidths
  - Today the configuration of IPTV multicast is semi-static or even manual
  - Operators' IPTV multicast network uses 3/4 rendezvous points with a single source (one datacenter)
    - balanced shared trees (distance between the receivers and source are almost the same), end-to-end delay not an issue
    - major time spent to the join event, due to the video encoding system

- Multicast in intra-domain environment or mobile networks have real sense, in Internet the deployment of a real fully distributed, dynamic, leaf-initiated multicast is not an objective nowadays.

#### **Presentations :**

- Dimitri Papadimitriou, Didier Colle, Pieter Audenaert and Piet Demeester (2013) Geometric Information Routing. In Proceedings of Seventh IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS) 2013 To appear. Chennai, India, December
- Davide Careglio, Dimitri Papadimitriou, Fernando Agraz, Sahel Sahhaf, Jordi Perelló, Wouter Tavernier, Salvatore Spadaro, Didier Colle, "Development and experimentation towards a multicast-enabled Internet", Research report, Jun. 2013.
- Experimental analysis of routing schemes against policy dynamics, Deliverable D2.4 (available on demand).
- Matthieu Latapy, Elie Rotenberg, Christophe Crespelle, Fabien Tarissan (2013) Measuring the Degree Distribution of Routers in the Core Internet.
- D. Papadimitriou, D. Careglio, F. Tarissan, P. Demeester, "Method of reliability and availability analysis", Proceedings 5th International Workshop on Reliable Networks Design and Modeling (RNDM), co-located with ICUMT 2013 Congress, Sep.10-12, 2013, Almaty, KZ.

#### **Informational material :**

- Cyril Gavoille, Christian Glacet, Nicolas Hanusse, David Ilcinkas, "On the Communication Complexity of Distributed Name-Independent Routing Schemes", Proc of 27th International Symposium on Distributed Computing (DISC). Oct. Springer, page 12.
- D. Papadimitriou, D. Careglio, P. Demeester, "Performance analysis of multicast routing algorithms", 2014 International Conference on Computing, Networking and Communications (ICNC), February 3-8, 2014, Honolulu (Hawaii), United States.