



the open Net
s i n e q u a n o n

Connectivity of the Country to the Internet

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SEE5

the open Net

- engage technical Internet community
- provide technical expertise
- talk to other stakeholders

Motivation

Summer 2014: Russian Ministries of Telecommunication and Emergency with help of cctld.ru conducted training for «prevention of disconnection of Russia from Internet»
Results: successful, details classified.

Autumn 2015: Participant of training: actually it was training for disconnection Russia from Internet.
Results: unsuccessful.

Concerns

- Are we well connected?
- Are we protected from evil insider or outsider?
- How to measure?
- What to do?

Measure

Registries:

- Number of «local» prefixes and ASes

Routing info:

- ASN/prefix availability
- BGP paths
- diversity and stability

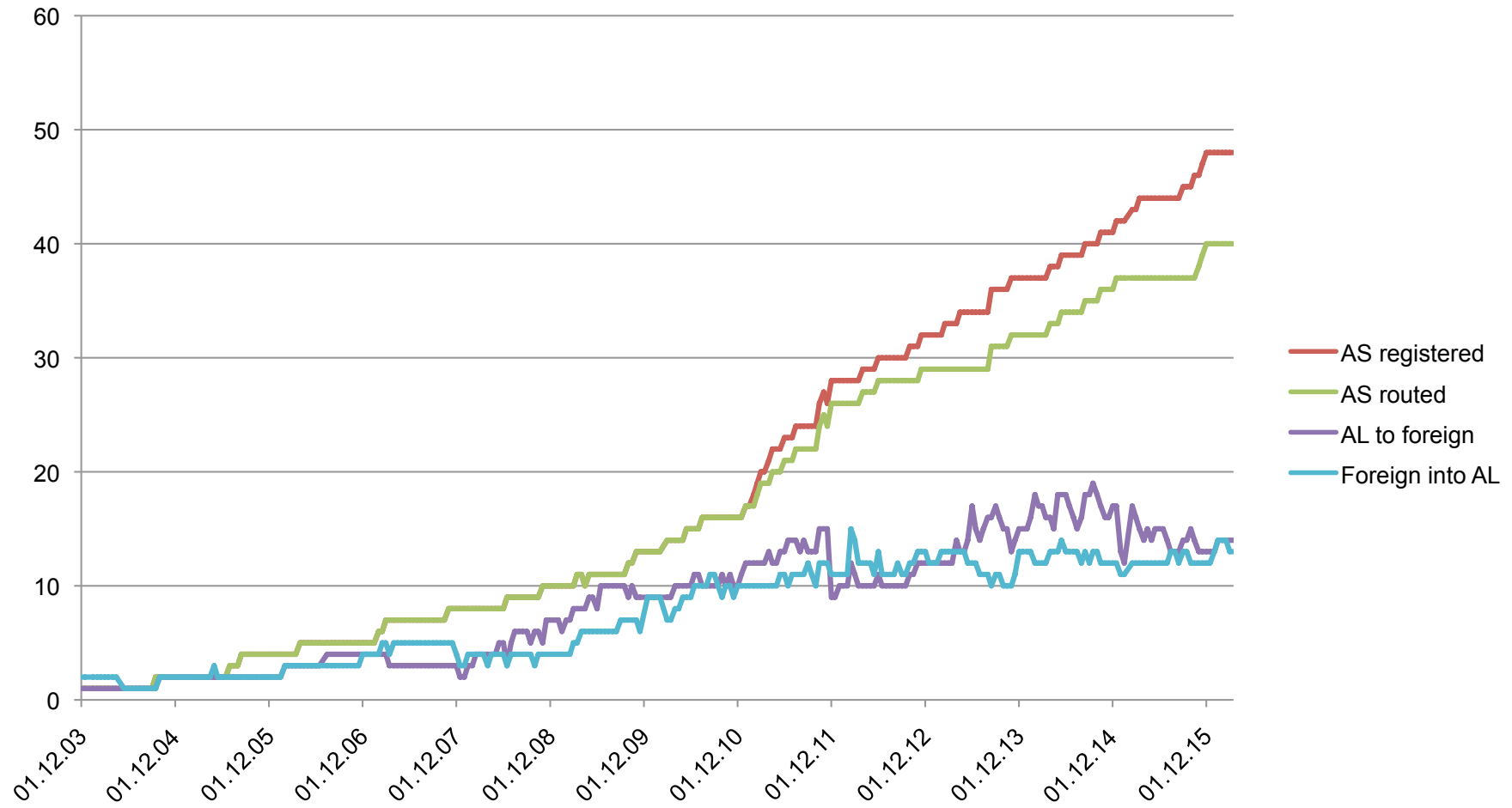
Measure (this study)

Simplified (just for start)

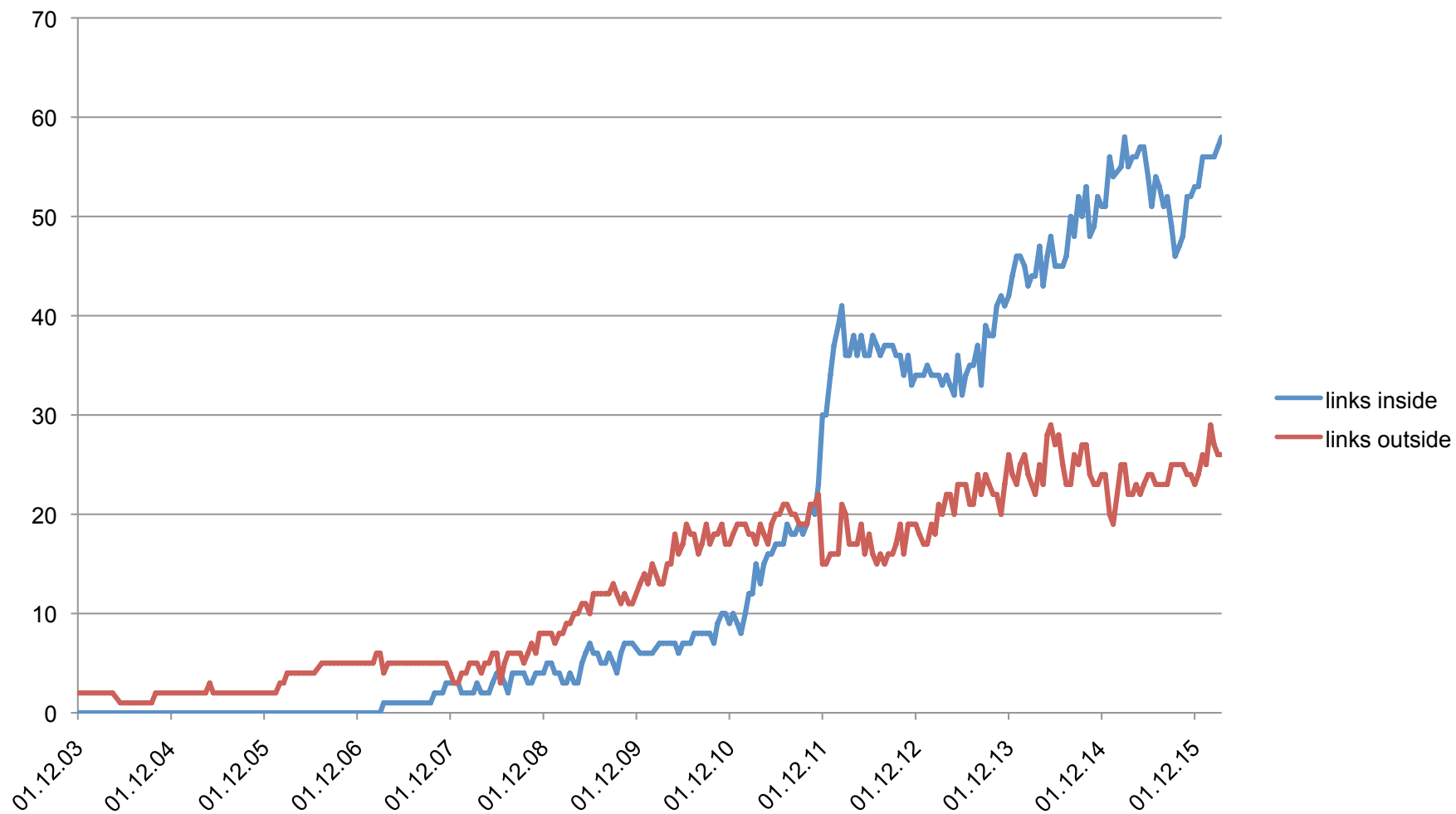
- number of ASes in selected country
- number of links between ASes (local and non-local).
- number of ASes involved in international connectivity (from both sides of border)

RIPEStat by RIPE and BGPstream by CAIDA

Albania



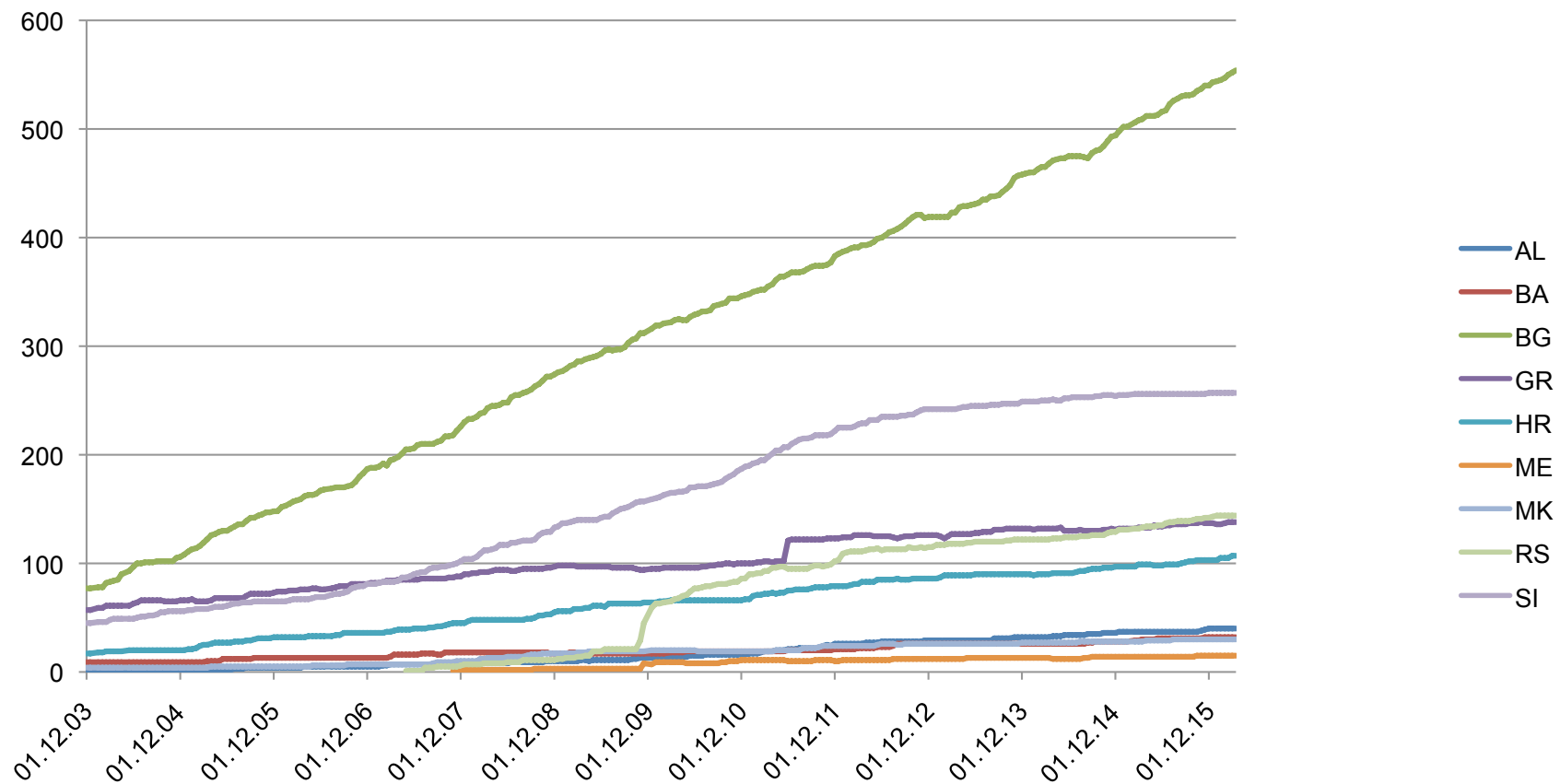
Albania – links



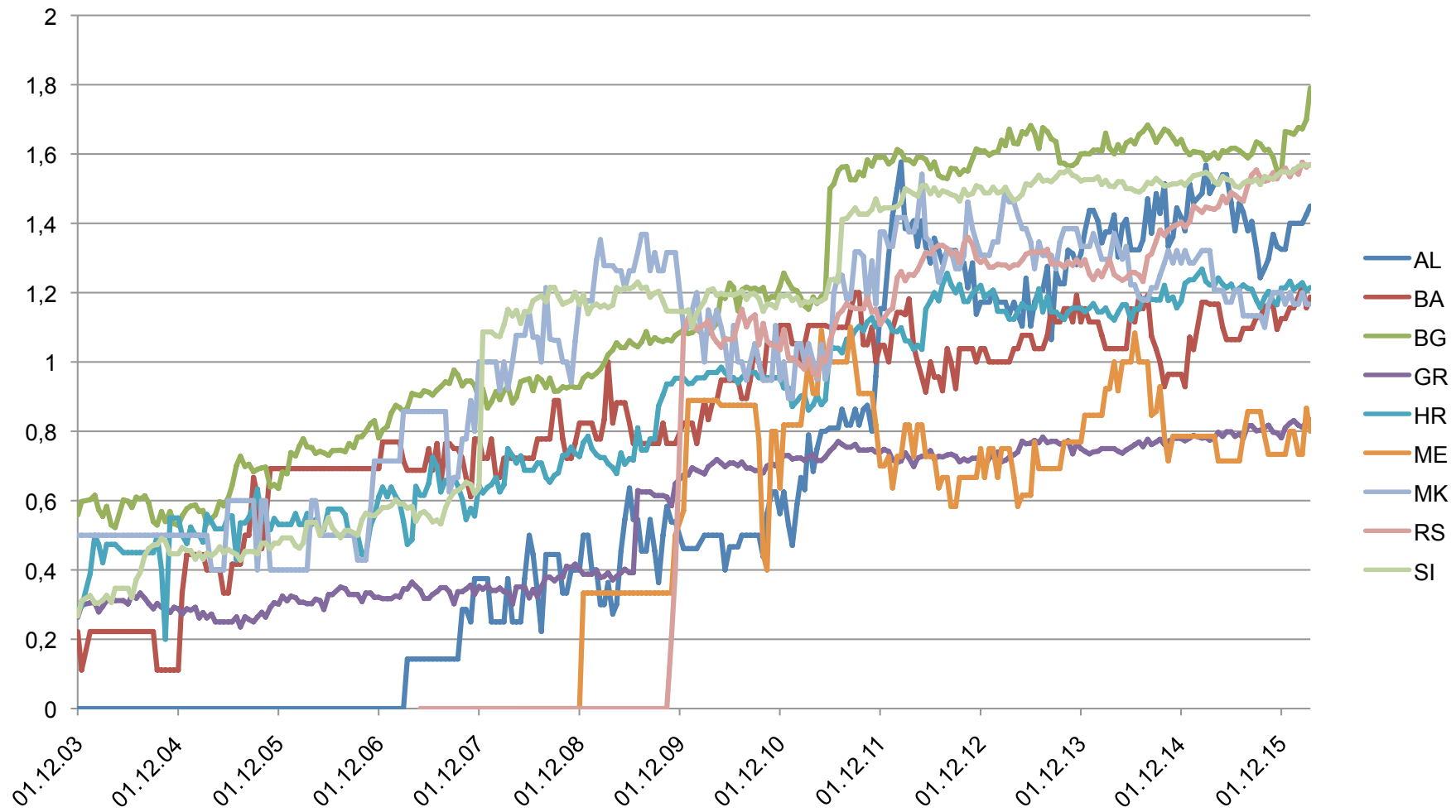
Comparison

- changes by time
- ratios – allows comparison between countries/regions
 - number of «connected» ASes normalized by overall number of ASes
 - number of links/number of ASes

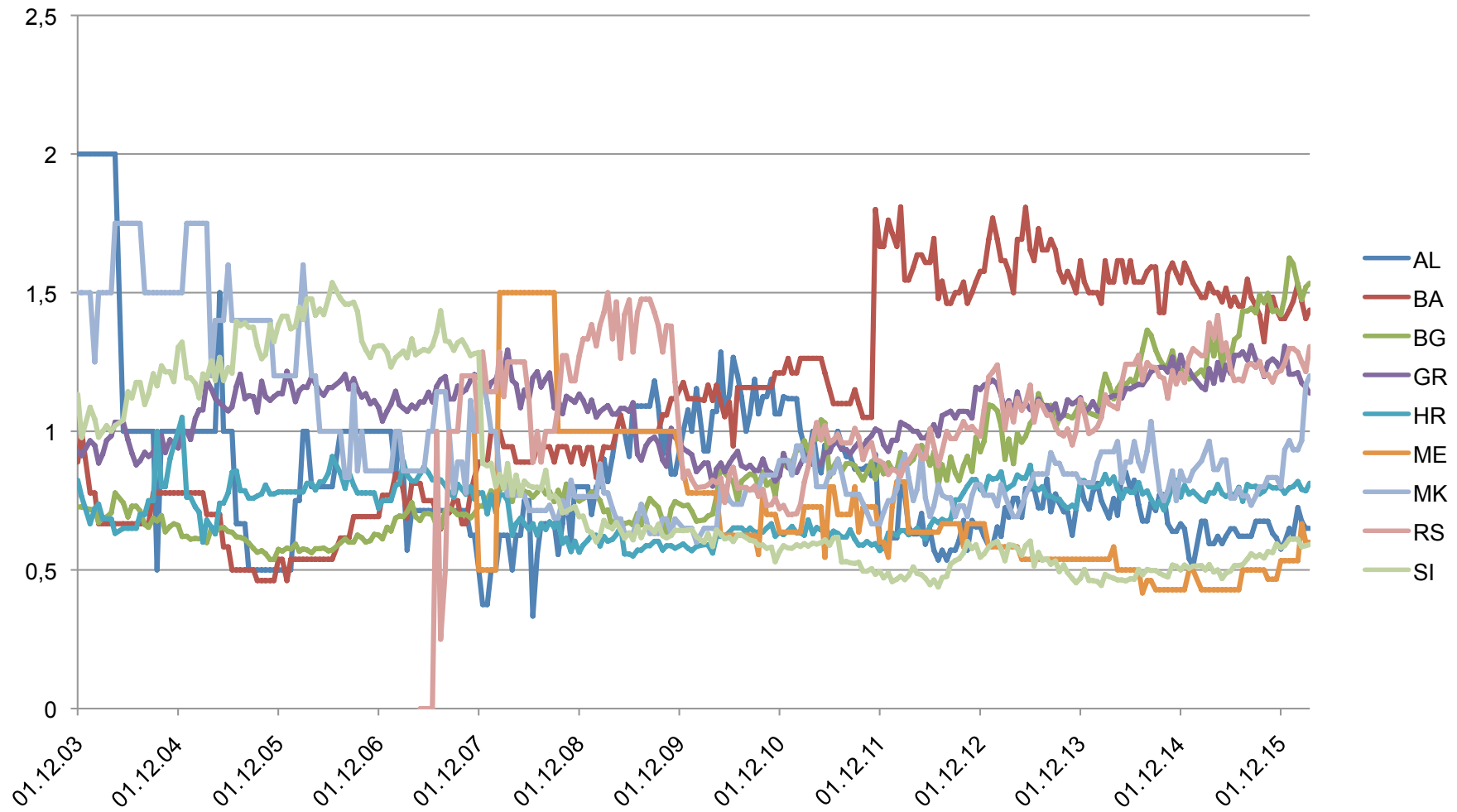
SEE – routed



links inside country / routed AS



links outside country / routed AS



Regional statistics

206 “outsiders” are involved in intrnational connectivity in region

TOP international connections

1. 156 – Hurricane Electric (AS6939)
2. 70 – Cogent (AS174)
3. 69 – InterRoute (AS8929)
4. 47 – Hibernia (AS5580)
5. 41 – Level3 (AS3356)
6. 36 – Telecom Italia (AS6762)
7. 35 – Forthnet (AS1241)
8. 34 – NTT (AS2914)
9. 32 – Portlane (AS42708) - Sweden
10. 31 – M-net (AS8767) - Germany

Real user

Russian «Internet Protection Society»

- Using number of links «outside» Russia as an «Connectivity index»
- Also have «Internet Liberty Index» for demonstrating number of censorship events.

Internet Protection Society

ДЕЯТЕЛЬНОСТЬ

ОБ ОЗИ

ПОДДЕРЖАТЬ ОЗИ

Индекс Свободы
Интернета

985

1 марта 2016

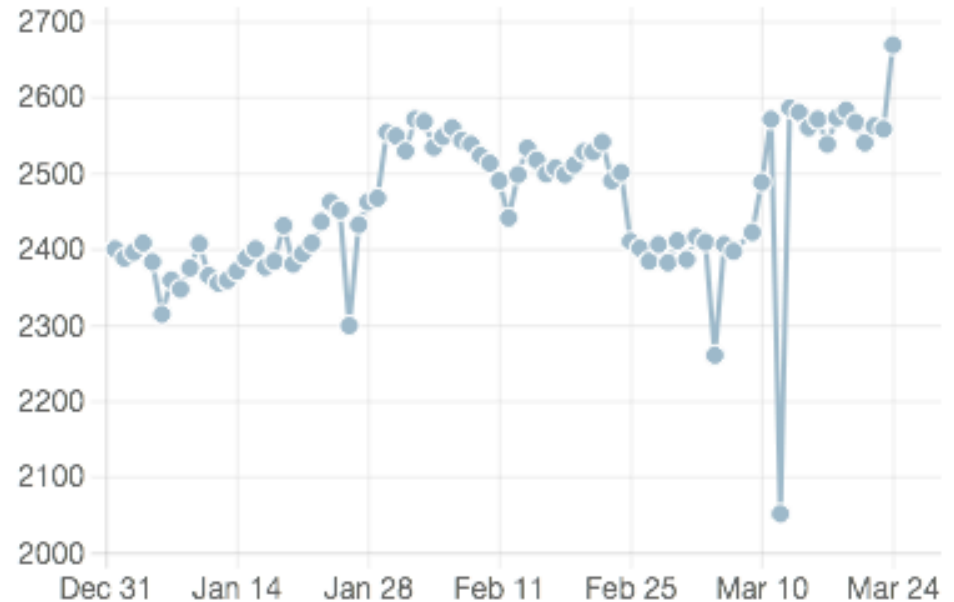
Индекс Связности

2670

24 марта 2016

Индекс Связности

График за 2016



Other projects

- The Internet Outage Detection and Analysis (IODA) by CAIDA (not publically available yet)
- “Critical infrastructure” approach NL, DE, FR

Future works

- paths
 - outside country/region
 - to specific set (Tier1s, content)
- realtime
- online tool
- real-life relations