

Visualizing RIPE data: Caidagram, VisualK, BGPlay

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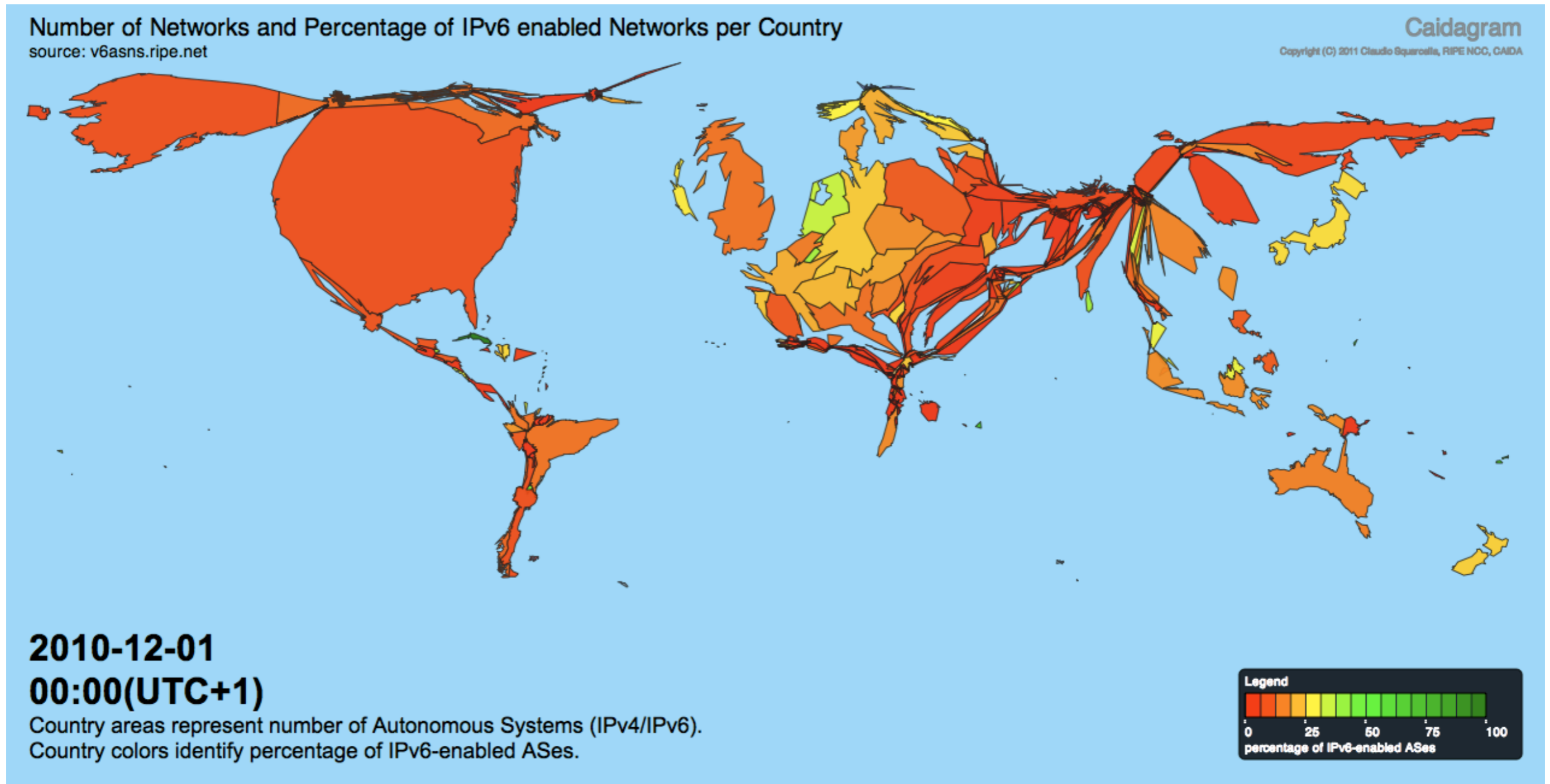
Introduction

- CV – in less than 140 characters
 - PhD student at Roma Tre University
 - (twice) at the RIPE NCC for some months
 - Visiting scholar at CAIDA in 2010
- What I do – in less than 140 characters
 - Research on Graph Drawing and Information Visualization
 - Tools and prototypes with special focus on Computer Networks

Caidagram – geolocation of Internet data

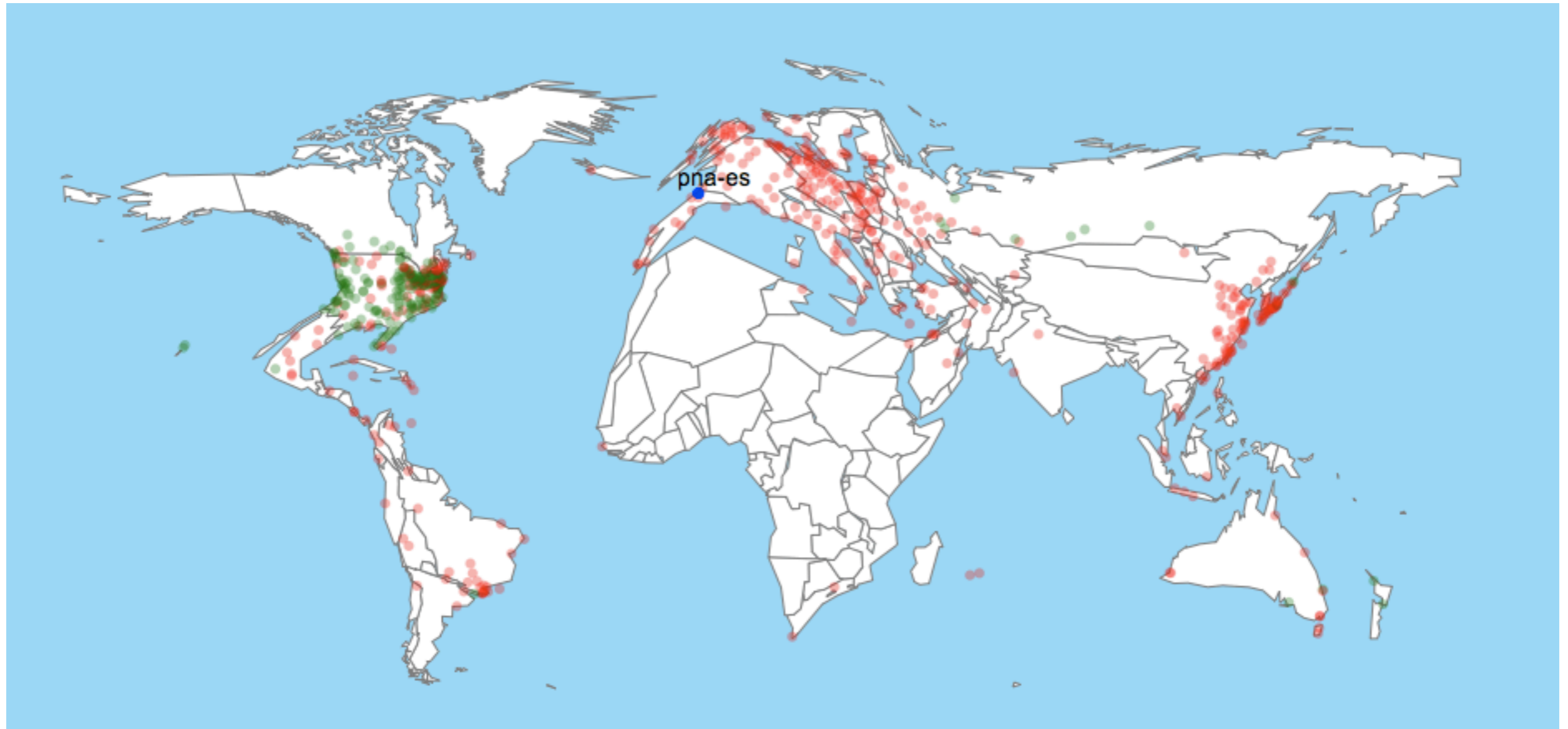
- Many Internet measurements are based on a high number of distributed nodes
 - e.g. RIPE Atlas
- Geographical distribution often implies geolocation of measurements
 - e.g. RIPE Atlas users provide lat/lon
- Therefore geography is a good candidate metaphor to understand collected data

Caidagram – area cartograms



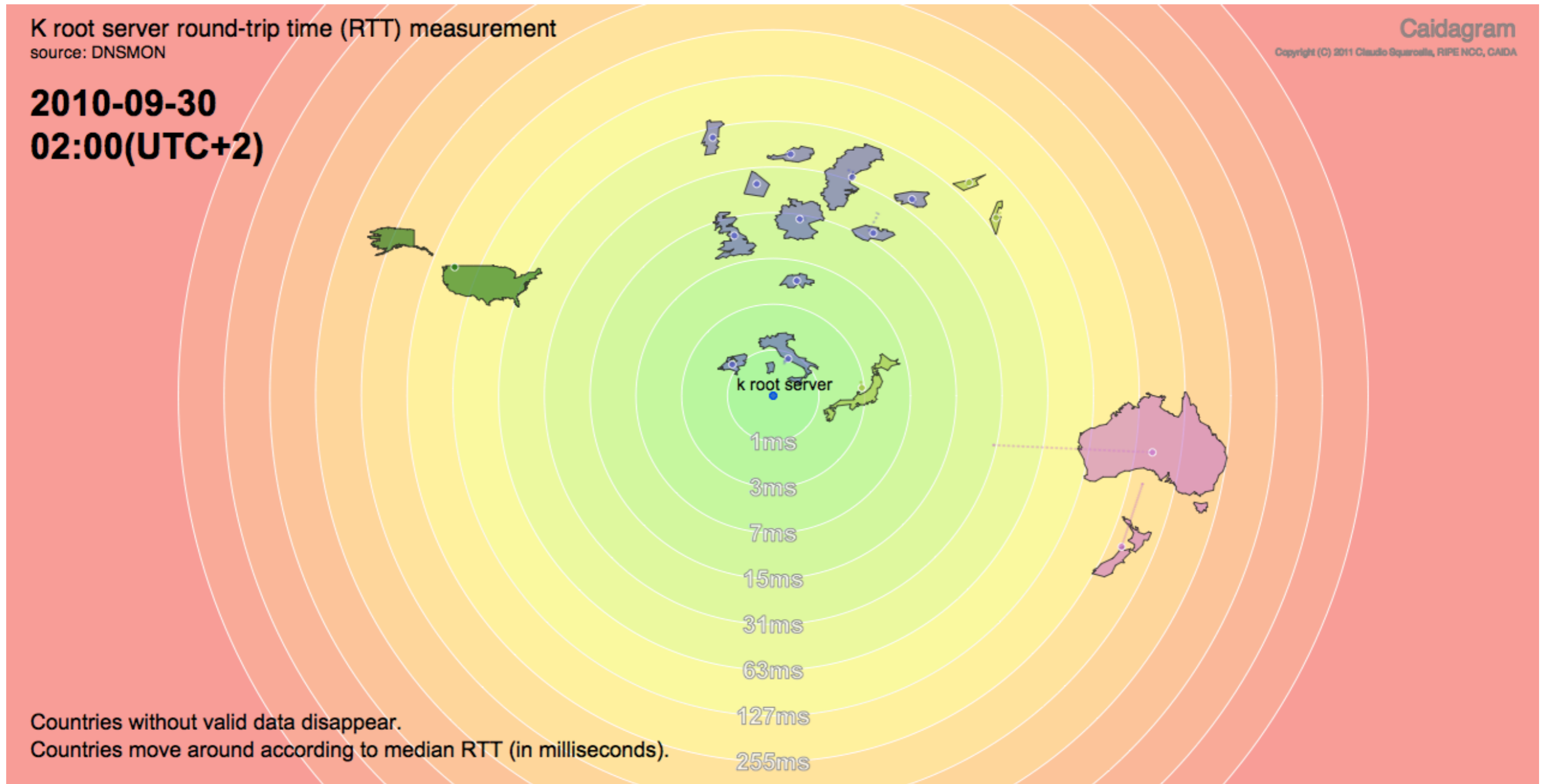
<http://v6asns.ripe.net/>

Caidagram – distance cartograms



<http://www.caida.org/projects/ark/>

Caidagram – concentric distance map



<http://dnsmon.ripe.net/>

VisualK – K-root as an anycast service

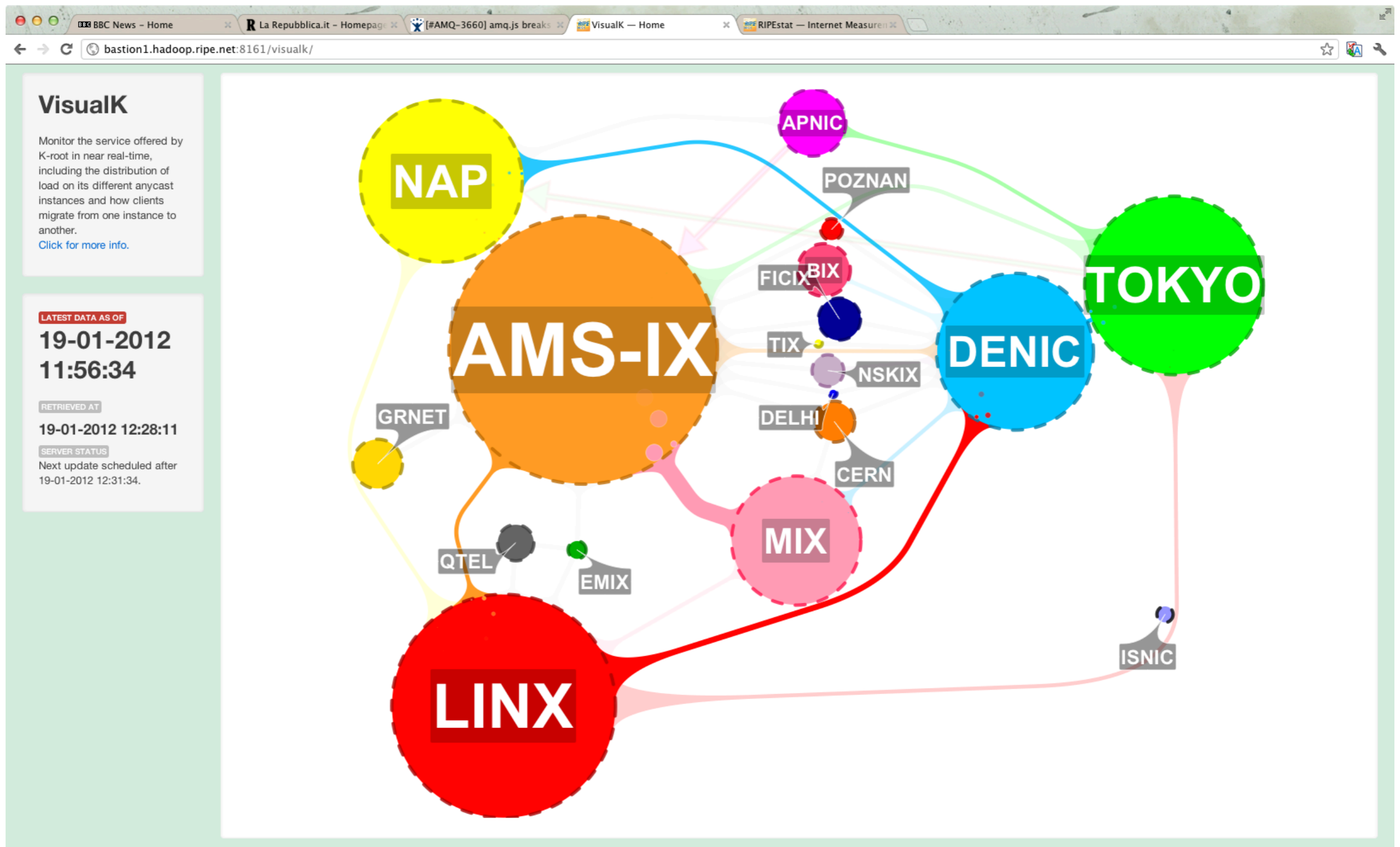
- based on 18 anycast instances in the world



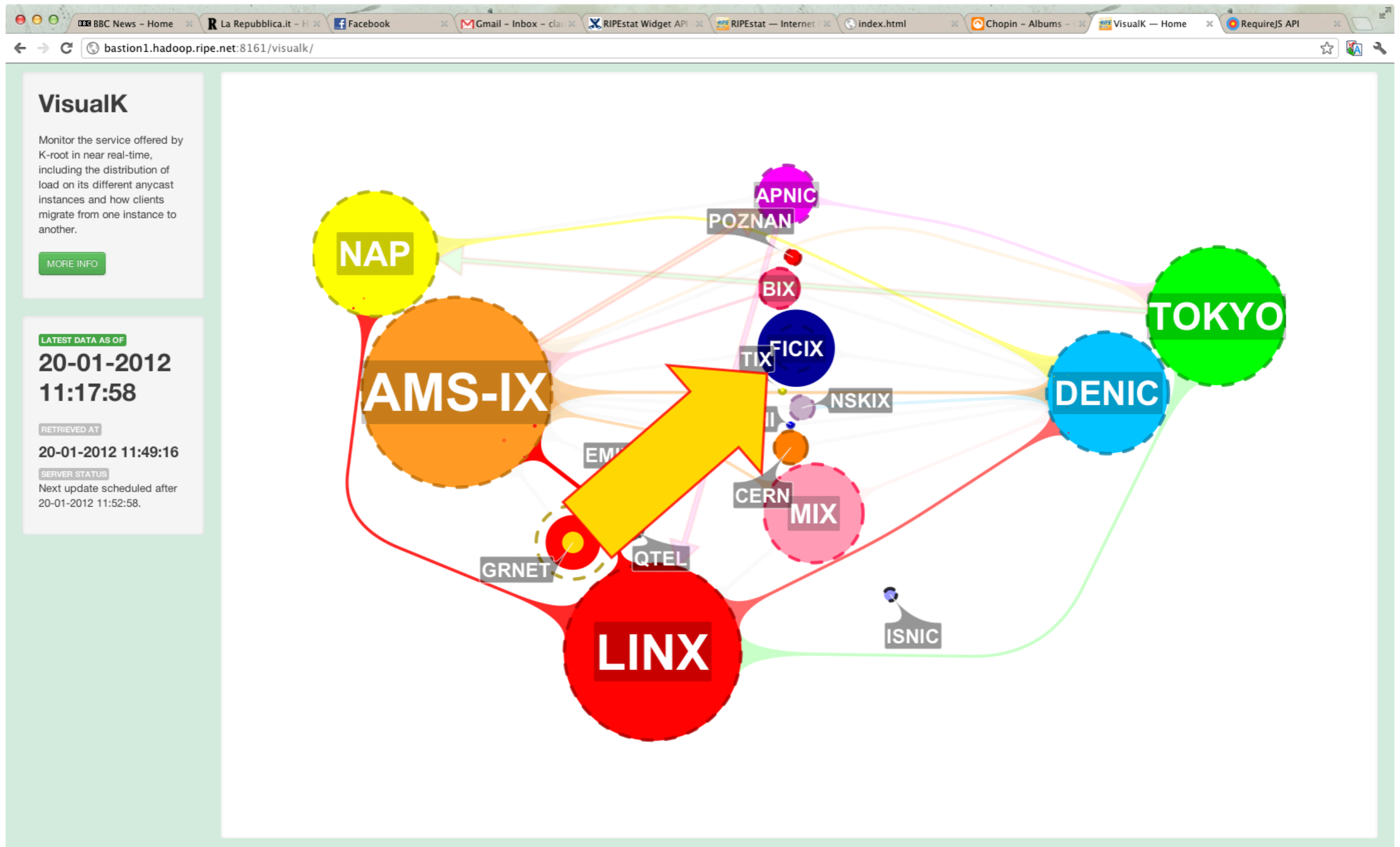
VisualK – monitoring K-root in real-time

- What?
 - Queries per second (qps) served by each instance
 - Traffic migration between instances
 - Unexpected changes (e.g. sudden increase of qps)
- Why?
 - Detection of failures and attacks
 - Performance tuning
 - Indirect analysis of the state of interdomain routing

VisualK – migration graph

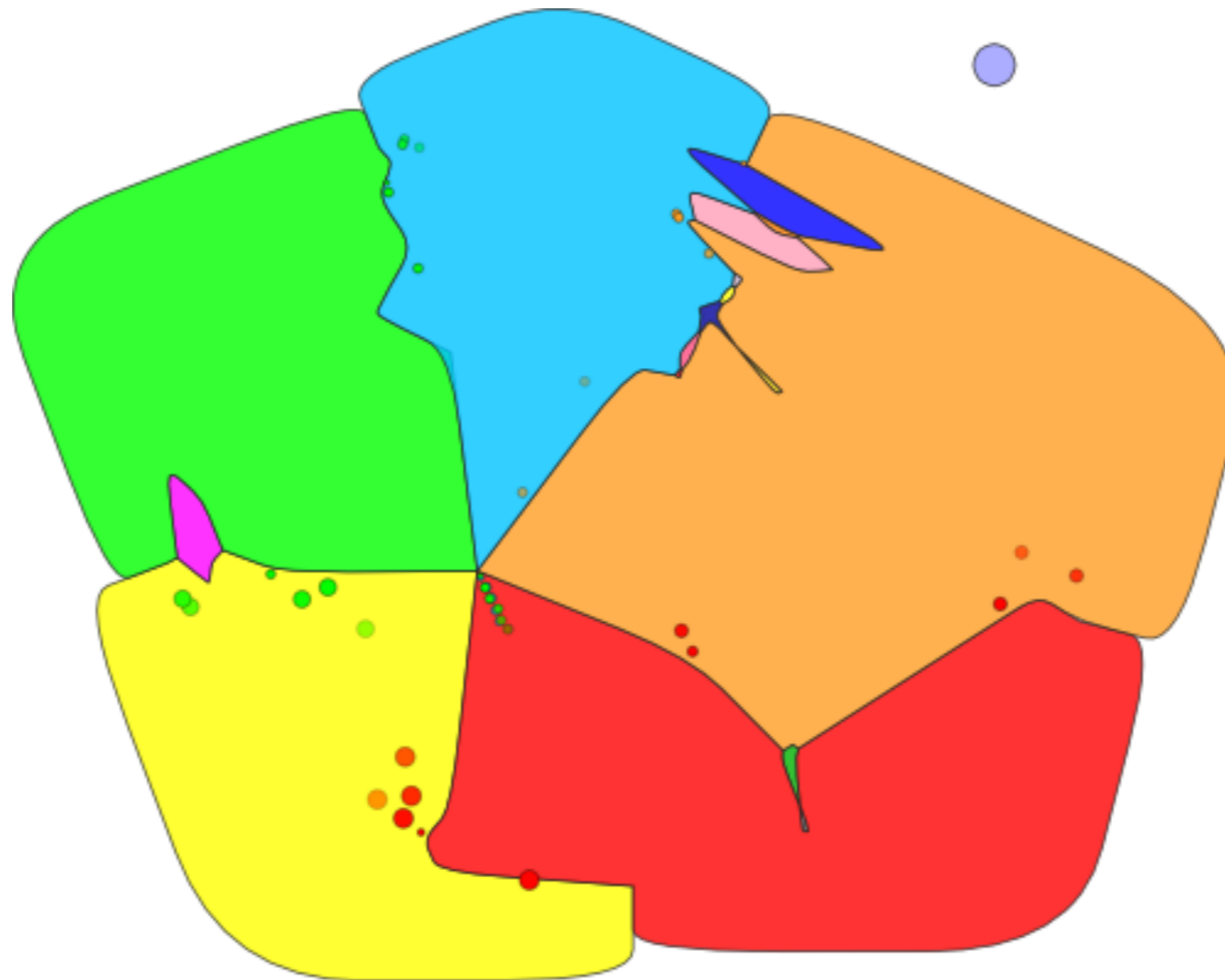


VisualK – usual vs unusual patterns



VisualK – alternative visualization

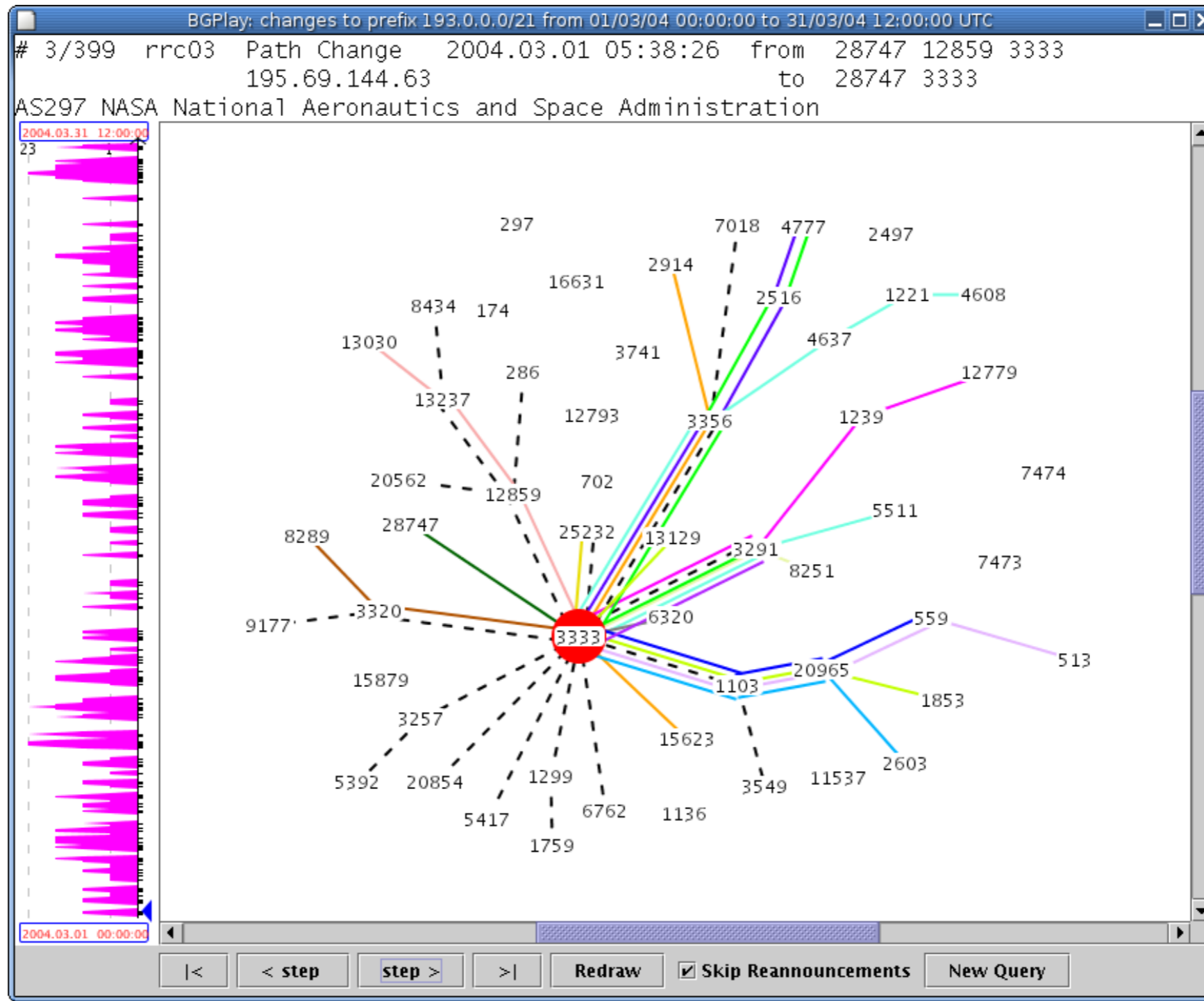
- Instances as adjacent countries (cartogram-like)



BGPlay – visualizing interdomain routing

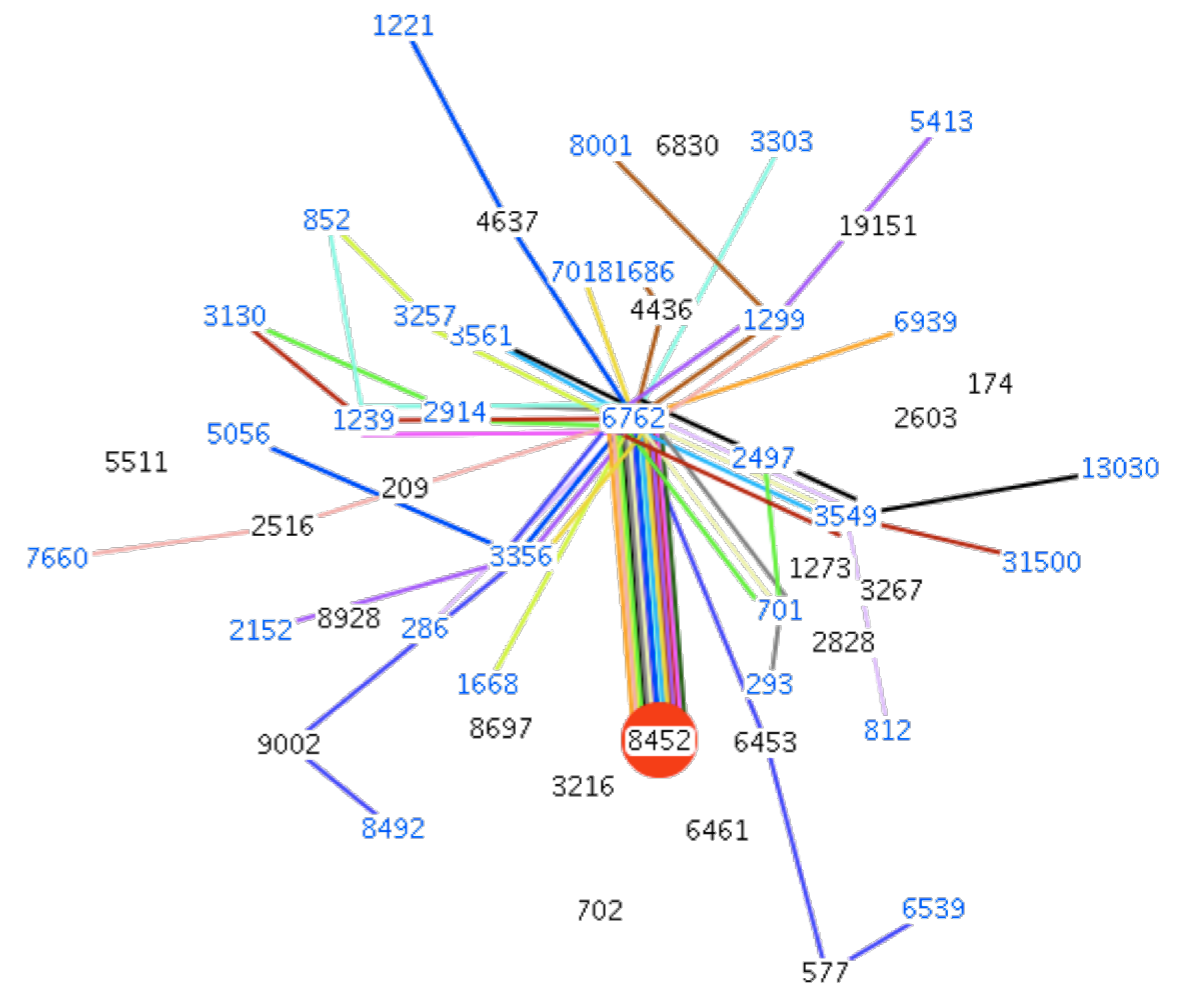
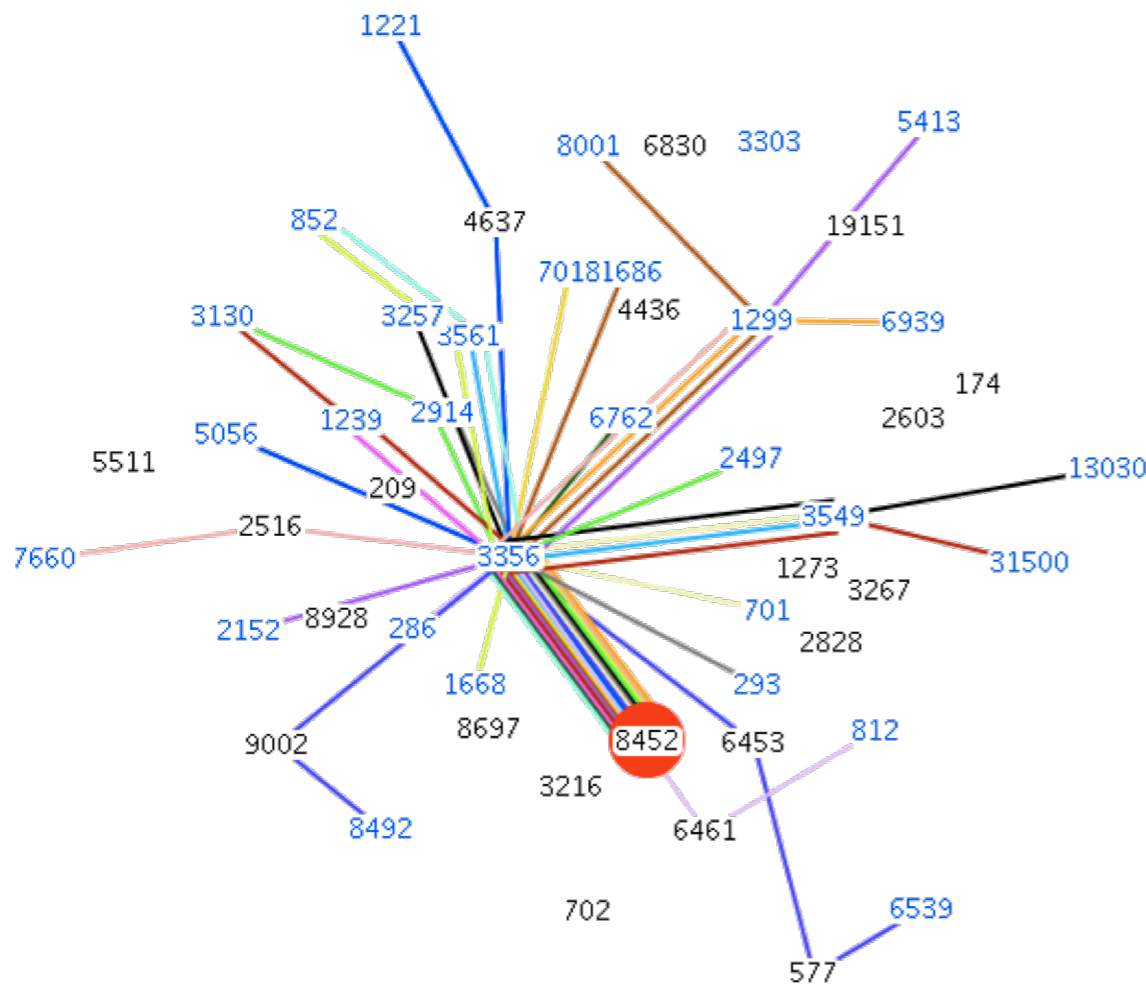
- BGPlay displays animated, interactive graphs of the routing activity related to an Internet prefix
 - The user specifies a prefix and a time interval of interest
 - The tool shows the related “BGP history”
- Different instances for different data sets
 - RIPE RIS data (<http://www.ripe.net/ris>)
 - RouteViews (University of Oregon)
 - RIPE INRDB (historical data)

BGPlay – routing graph and timeline

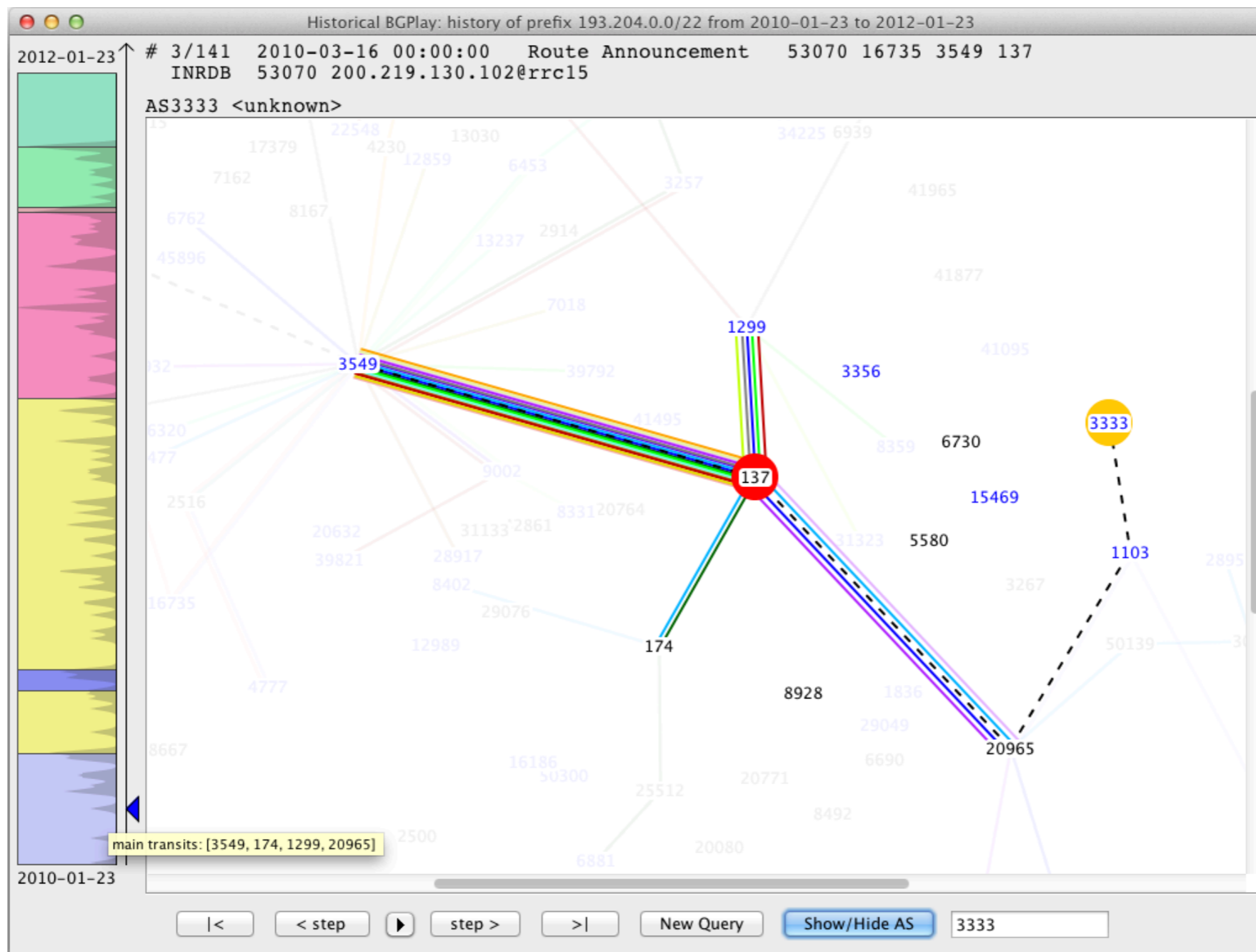


BGPlay – what happened in Egypt?

- Interdomain routing change after the massive disconnection imposed by authorities



Historical BGPlay – more data, less detail



<http://sga.ripe.net/hbgplay/>

Technologies

- JavaScript web applications
 - Vector images (SVG): Raphaël.js
 - HTML5 canvas: Paper.js
 - Google Web Toolkit
- Java applets
 - Vintage stuff 😊

What's next?

- BGPlay++
 - Integration with RIPEstat
 - New features (e.g. visualize IPv4 vs IPv6)
- Atlas visualizations
 - Geographical maps
 - Flow, traceroute, etc
- ...

Contact info

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Questions?

