

Measurement to support policy research on interconnection and on privacy

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Interconnection

- How should a regulatory body determine whether interconnection agreements are reasonable?
- Networking-related questions:
 - what are the routes (including IXPs) for both indirect and direct interconnection between content providers and ISPs?
 - what is the QoS associated with each route?
- Research approach:
 - analytical model
 - parameterized by measurements

Interconnection: what to measure

- performance metrics:
 - border router to border router, across an IXP:
 - utilization
 - latency
 - packet loss
- used:
 - MANIC API
- but no data on utilization

Interconnection: what to measure

- traffic matrices:
 - source IXP to destination IXP
 - content provider
 - IXP at which traffic enters transit provider's network (if any)
 - IXP at which traffic enters ISP's network
 - closest IXP to the customer
- used:
 - AS-Relationships
 - AS-Rank
 - IXPs dataset
 - AS taxonomy
 - BGPStream
- but no data on traffic ...

Interconnection: what to measure

- one-way delay matrices:
 - source IXP to destination IXP
 - border router in content provider's network
 - through transit provider (if any)
 - border router in ISP's network
- used:
 - nothing yet ...

Privacy

- What should a privacy law be?
- Networking-related questions:
 - what personal information is collected?
 - is it collected by first and/or third parties?
 - how is it used?
 - with whom is it shared?
- Research approach:
 - analysis of privacy policies
 - complemented by measurements ??
 - identification of policy problems

Privacy: what to measure

- What personal information is collected?
 - personal identifiers?
 - customer IP address, device identifier, ad identifier
 - cookie
 - behavioral information?
 - website, domain, destination IP address, URL
 - geolocation
 - devices on customer's network
 - apps on customer's device
 - app usage
 - audio, video, sensors

Privacy: what to measure

- How is personal information used?
 - what functionality breaks when specified personal information isn't collected?
 - what advertising breaks when specified personal information isn't collected?

Privacy: what to measure

- With whom is personal information shared?
 - service provider vs. advertiser?
 - what personal information?
 - where does it go after that?