Mapping the Geography of Data in Central Asia: A View From Within

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Mapping the (geography of the) Internet at three different levels

• Research Project carried out by GEODE researchers
• Support from RIPE Project Funding

• **Broad objectives:**
  • Mapping the Internet of Central Asia at 3 different levels
  • Better understand the geopolitics behind the connectivity architecture

• Methodological question: What gaps can we fill by going on the field?
  • The choice of an “simple” case study: Central Asia/Kyrgyzstan
Mapping physical infrastructures: possible with caveats
Mapping connectivity with BGP feeds

- Relative centralization of networks
- Very limited intra-regional connectivity
The connectivity of Kyrgyzstan

- Relative centralization
- Some dependencies identifiable (RU-KZ)
- Limited view
  - BGP feeds are incomplete
  - Data paths cannot be inferred
Mapping data with the Internet geographer’s best friend

- Geolocated by design
- Can be leveraged to augment our knowledge of the geography of connectivity
Mapping latencies between Kyrgyzstan and its neighbours: more or less coherent patterns
Problem: Kyrgyzstan is a Ripe Atlas Far East
Fieldwork in Kyrgyzstan

Main goals:

• Understanding connectivity through interviews with local stakeholders (Providers, IXPs, government)

• Create on-site measurements from remote connected places to improve granularity
Interviewing local stakeholders to understand the architecture of connectivity

• Lack of a shared understanding of the region’s connectivity
  • Southern IXPs
  • Connectivity with neighboring countries
  • No regional coordination/cooperation or even contacts
Interviewing local stakeholders to understand the architecture of connectivity

• A political environment with specific views on the network: “что такое цифровой суверенитет?”
  • Strong dependency on Kazakh and Russian networks
  • Redundancy and efficiency of networks are the responsibility of private operators

• The limited paradigm shift of the Russian invasion of Ukraine: how to escape structural dependencies?
  • Dependency to Russia as an “inescapable” fact
  • Some projects welcome: Turktelecom / Chinese infrastructures?
Interviewing local stakeholders to understand the architecture of connectivity

• Improving cooperation with RIPE: potential obstacles and overcoming them
  • Lack of interest
  • Lack of competent personnel
  • Overall lack of certainty over the cost/benefit ratio
Creating “local” measurements
A visualization platform fit for Geopolitics: Amethyst
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87.245.237.13
ASN41710
MIIT Ltd.
8448 addresses announced
Rank 6123

AS cone: 3 AS
9216 addresses
18 prefixes

Degree: 152
In degree: 82
Out degree: 82

- Bishkek
- Kara-Balta
- Toktogul
- Jalal-Abad
- Cholpon-Ata
- Osh

- Kiev
- Bishkek
- Karakol
- Toktogul

Amethyst by Geoide
Potential for improvements and suggestions from WG?

- **Ripe Atlas dissemination:**
  - How to increase the spread of RIPE Atlas probes, including in strategic areas
  - Are “moving” probes efficient tools for other communities?

- **Facilitate the manipulation of measurements data**
  - Work in progress: EasymapIT
  - Geolocation data: how to prioritize the most reliable one?
  - Develop new ideas for data visualisation

- **On the replicability and reliability of fieldwork as a source of data: discussion is open**
  - 2nd Fieldwork in Ukraine (February 2023) confirms the relevance for assessing the geopolitical causes and consequences of connectivity + geographical properties of the network
Future steps

• Other fieldworks: Ukraine, Canada, Pakistan, French Guyana…
• Increase cooperation with researchers from CS, STS, Mathematics
• 5 years project starting now
Thank you!

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RIPE Labs articles


3/ Coming soon: Description and updates of the Amethyst platform

4/ The Ukrainian case: someday