**OBFUSCATION
CIRCUMVENTION
COMMUNITY TECH
SOLIDARITY**

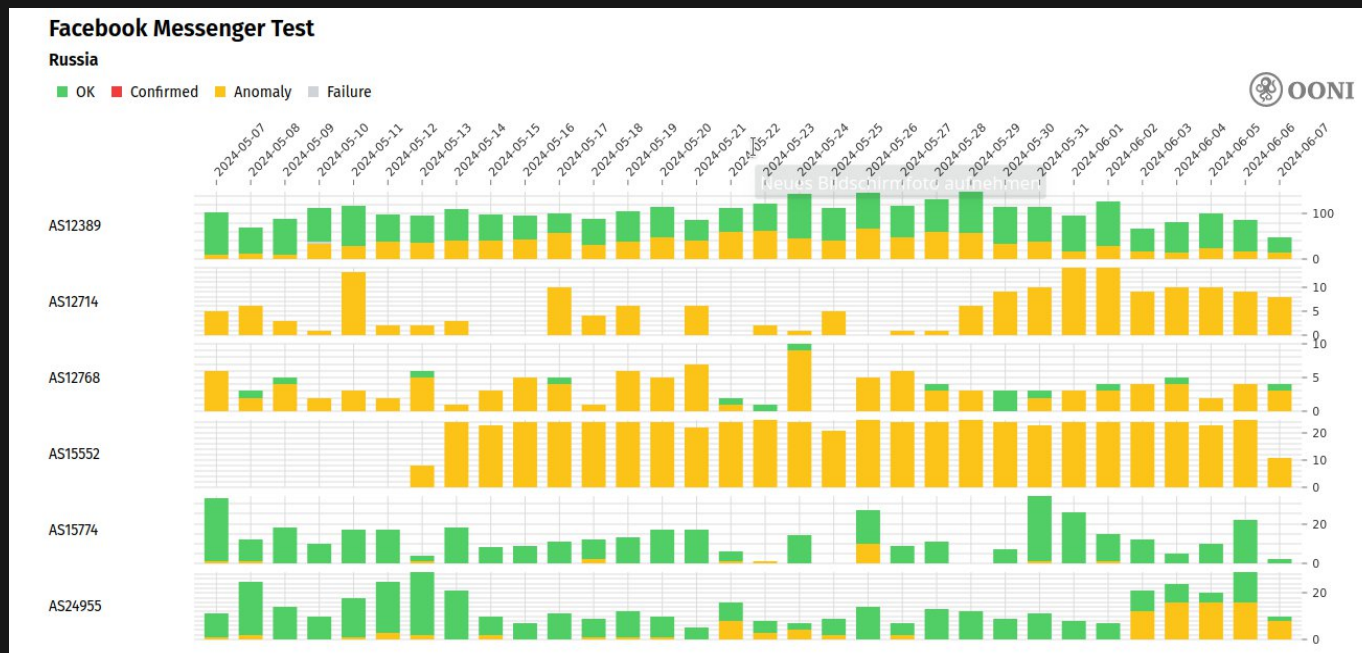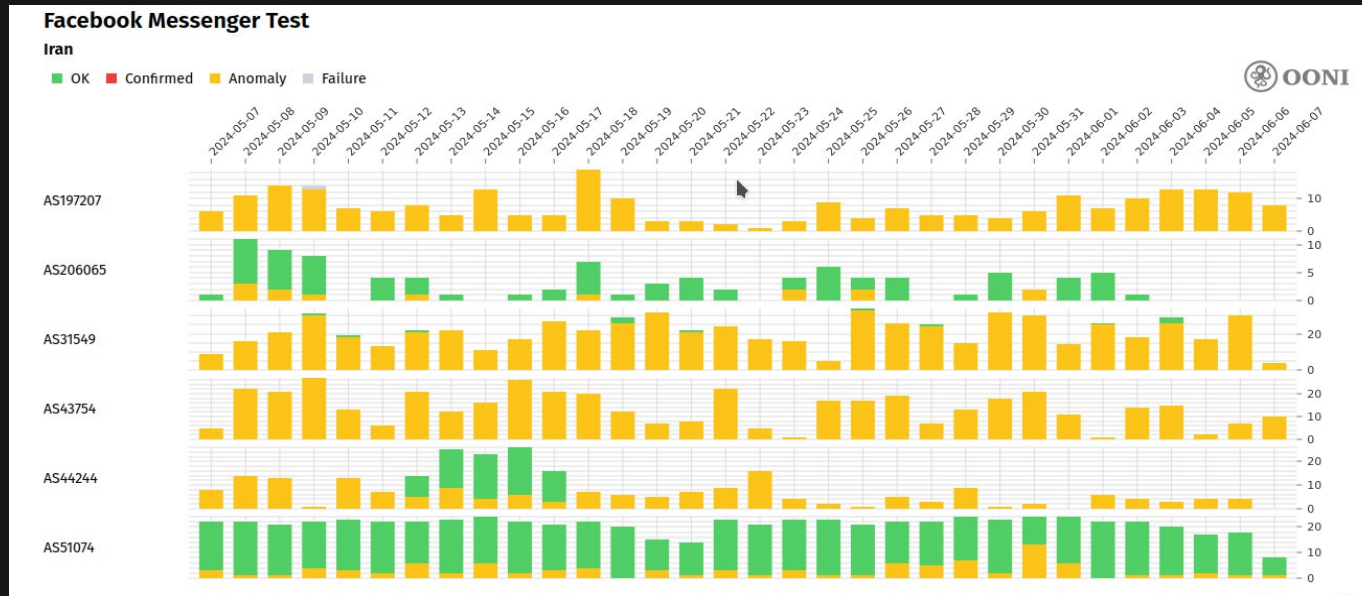**SOLITECH**

Non-commercial

Political

Fostering tech diversity

Internet censorship in Russia: Silencing opposition, suppressing resistance

Rally against Internet censorship, Moscow 2019

Fragmented censorship

Facebook Messenger Test

Iran

OK   Confirmed   Anomaly   Failure

Facebook Messenger Test

Russia

OK   Confirmed   Anomaly   Failure

Prove and provision

Measure censorship and circumvention protocols

Provide VPN service

Field tests

Small number of field testers in different regions in Russia

Simple, docker-based test client

Survey user experiences

Hi! This is a form to collect feedback and impressions of our VPN prototype.

1. Your user ID?

2. What date was the test done?

3. How would you rate the connection when accessing blocked sites? (1=extremely slow, impossible to use; 4=excellent)
- ⚪ It didn't work at all.
- ⚪ 1
- ⚪ 2
- ⚪ 3
- ⚪ 4

**4.** How would you rate the connection when using social media? (1=extremely slow, impossible to use; 4=excellent)
- ⚪ It didn't work at all.
- ⚪ 1
- ⚪ 2
- ⚪ 3
- ⚪ 4

5. Please describe your overall browsing experience with our VPN

Automated network tests

```
2024-06-10T21:21:16.399014410Z    "ServerFQDN": "ndt.vikagusieva.site",
2024-06-10T21:21:16.399066409Z    "ServerIP": "172.17.0.2",
2024-06-10T21:21:16.399085436Z    "ClientIP": "an.on.y.mi.ze.d",
2024-06-10T21:21:16.399101115Z    "Download": {
2024-06-10T21:21:16.399117137Z      "UUID": "fa179f9347cd_1710506650_unsafe_0000000000000122",
2024-06-10T21:21:16.399133875Z      "Throughput": {
2024-06-10T21:21:16.399147377Z        "Value": 3.062453249498618,
2024-06-10T21:21:16.399161693Z        "Unit": "Mbit/s"
2024-06-10T21:21:16.399175847Z      },
2024-06-10T21:21:16.399190186Z      "Latency": {
2024-06-10T21:21:16.399204728Z        "Value": 98.172,
2024-06-10T21:21:16.399219153Z        "Unit": "ms"
2024-06-10T21:21:16.399233183Z      },
2024-06-10T21:21:16.399247662Z      "Retransmission": {
2024-06-10T21:21:16.399262099Z        "Value": 7.395912395362565,
2024-06-10T21:21:16.399274835Z        "Unit": "%"
2024-06-10T21:21:16.399287089Z      }
2024-06-10T21:21:16.399337825Z    },
```
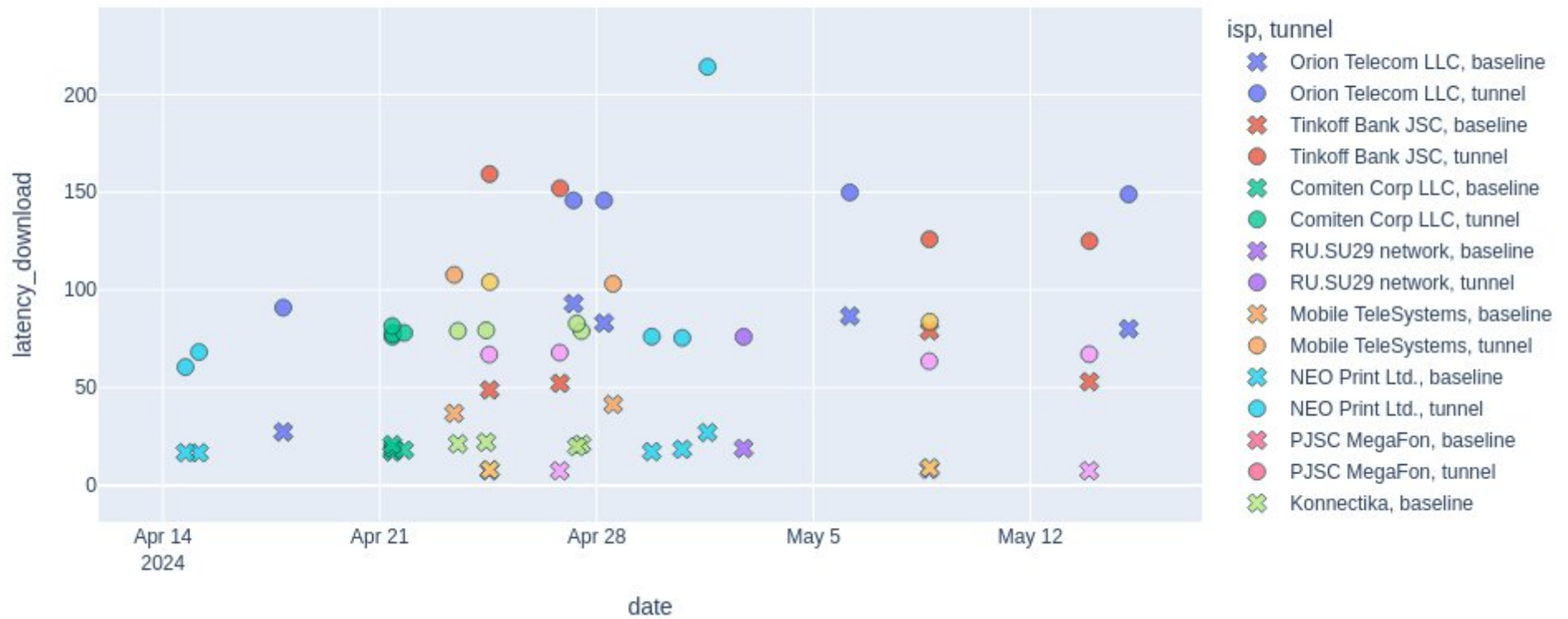
DPI-resistant protocols
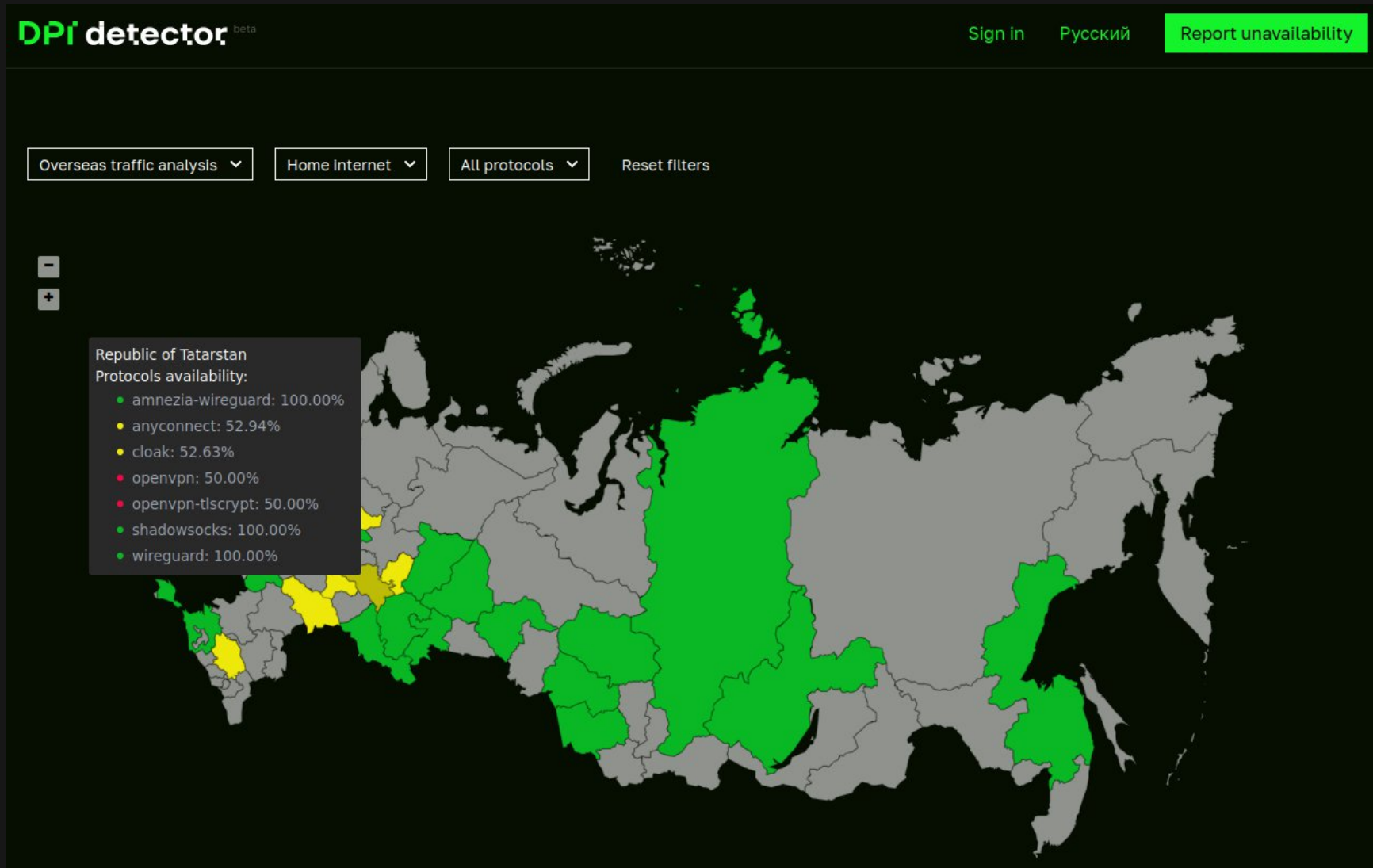
Screenshot of dpidetector.org, 10.6.24

A look at the dashboard

Throughput on download
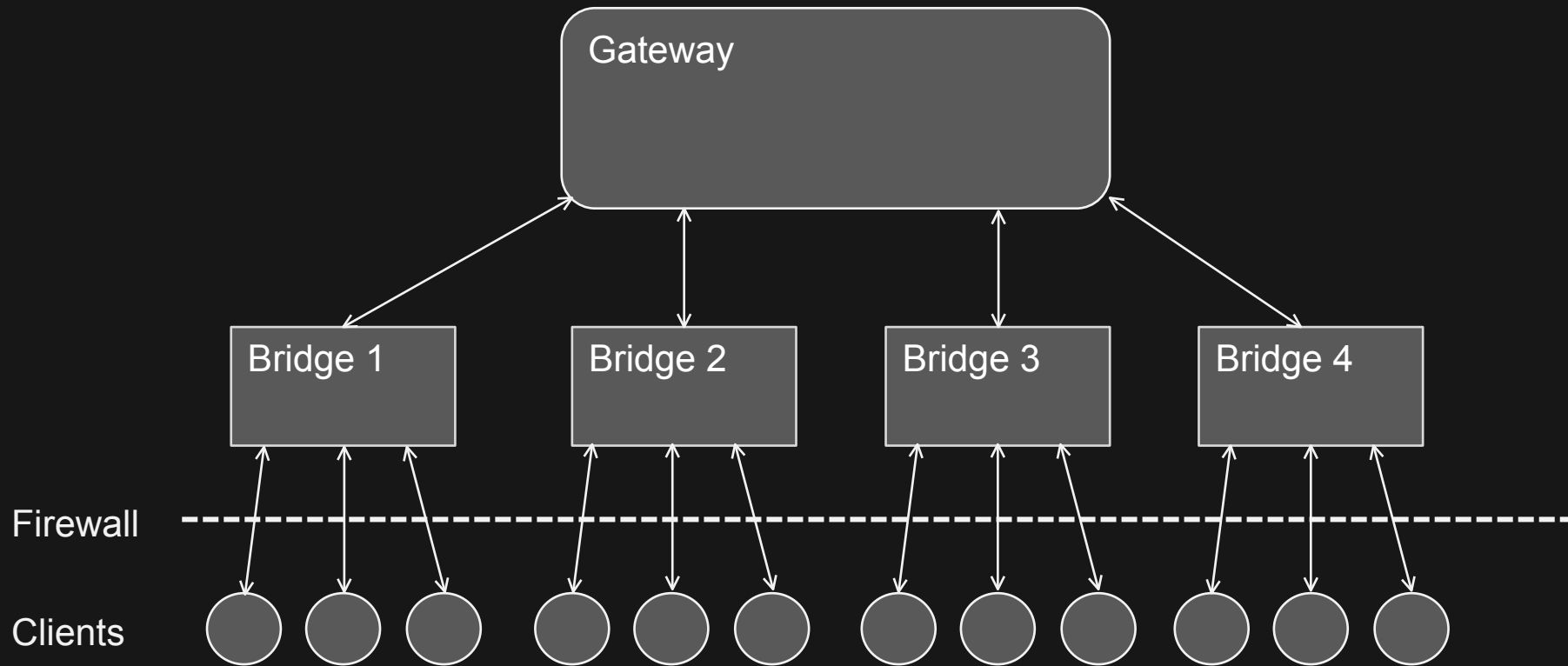
Latency on upload

VPN provider

Danja Vasiliev, Julian Oliver (2018)
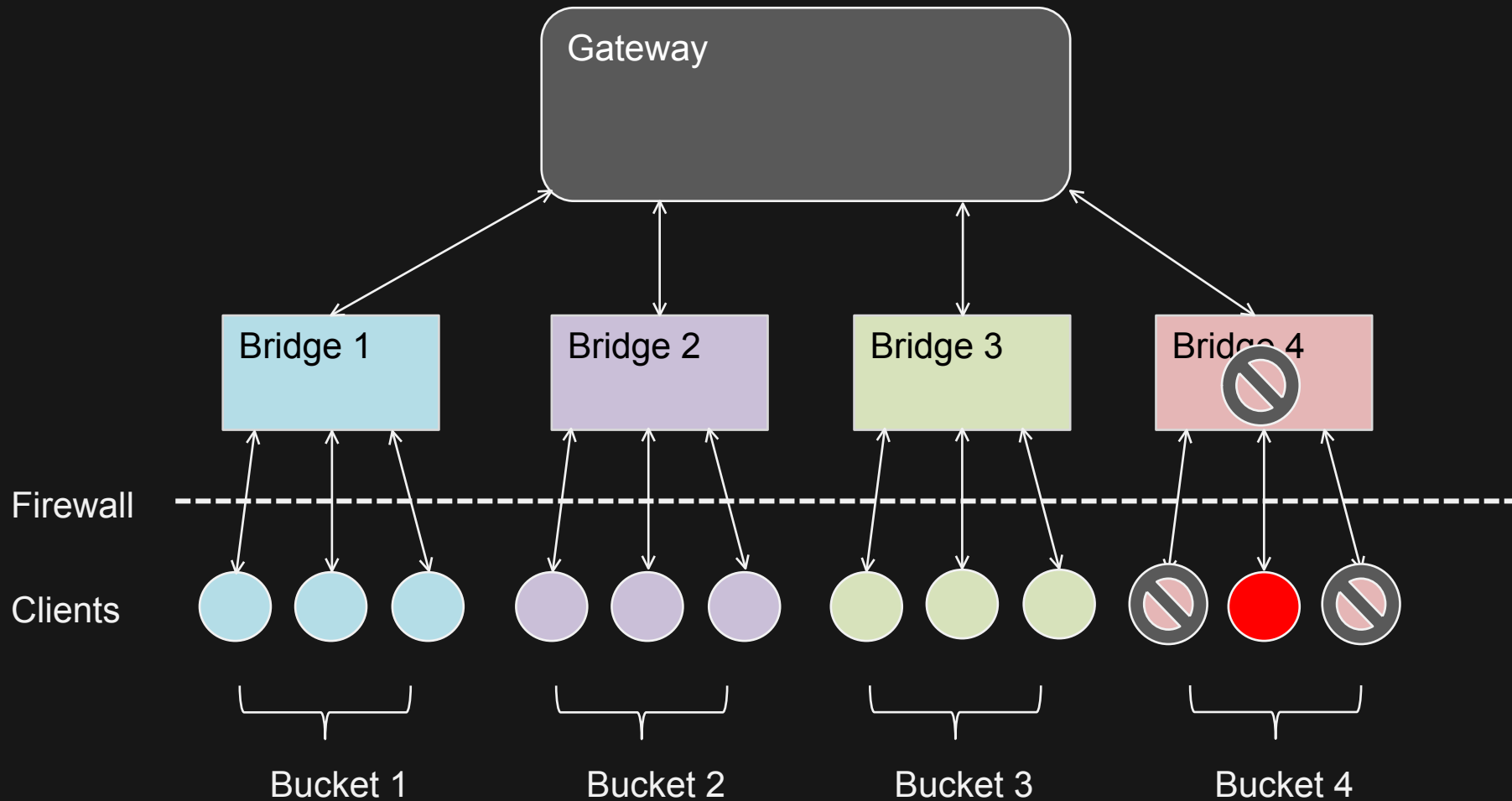
Regional and small-scale user pools

Semi-public invite system

{ URI scheme } { IP address } { port } { obfuscation type } { credentials } { invite token }

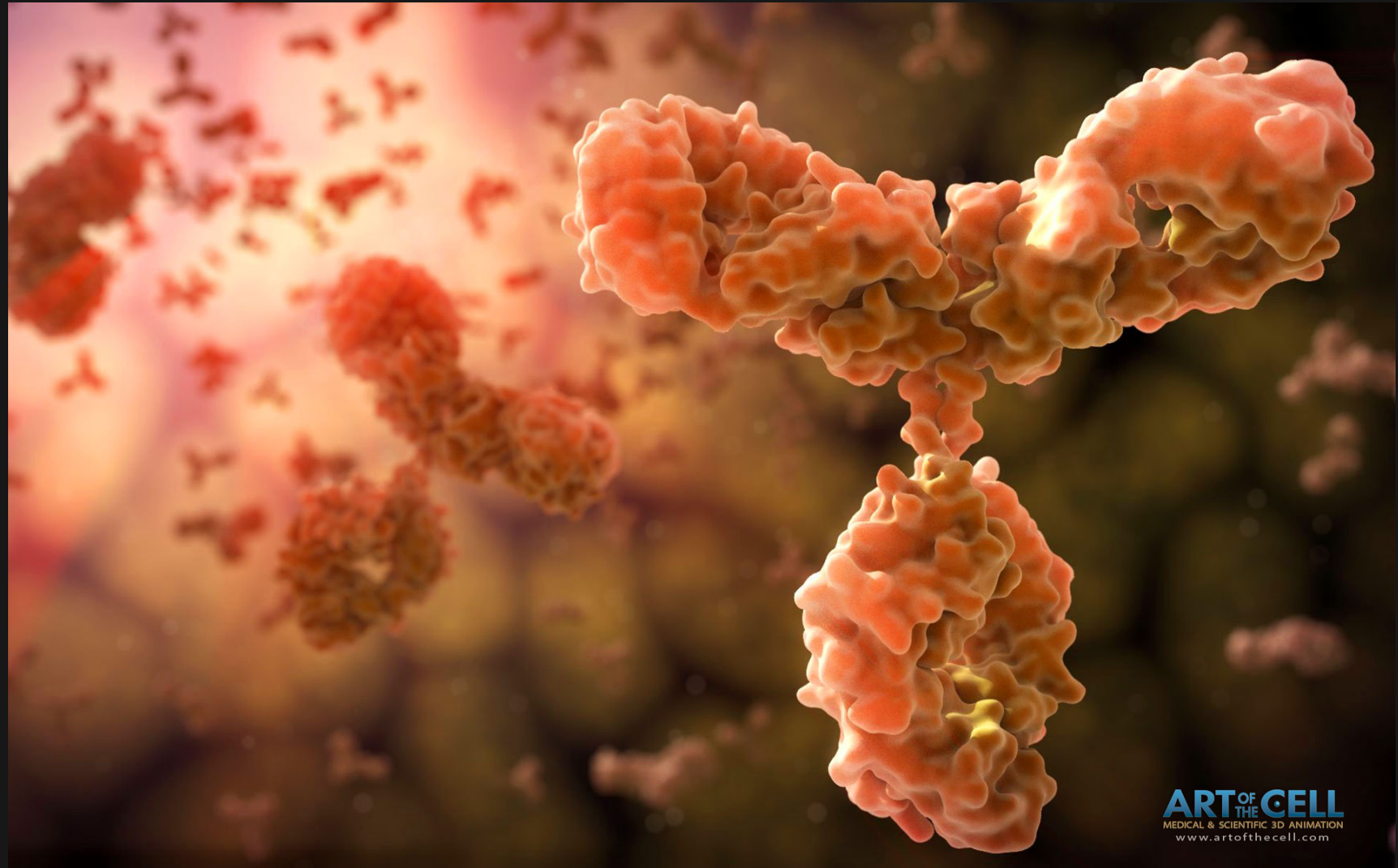**xyz://95.161.23.12:4430?type=obfs4&cert=asdf1234&token=secret_token**

Restricted view on infrastructure

Inspired by ...

"The immune system of the net"

OONI engine integration

"report_id" : string "20240606T090648Z_openvpn_IT_1267_n1_nGkibVFvyMM6ZZpK"

"resolver_asn" : string "AS13335"

"resolver_ip" : string "162.158.196.124"

"resolver_network_name" : string "Cloudflare Inc"

"software_name" : string "miniooni"

"software_version" : string "3.23.0-alpha"

▼ "test_keys" : { 3 items
  "success" : bool true
  ▼ "network_events" : [19 items
    ▼ 0 : { 6 items
      "operation" : string "state"
      "stage" : string "PRE_START"
      "t" : float 0.001035583
      ▶ "tags" : [] 0 items
      "packet" : NULL
      "transaction_id" : int 1
    }
    ▼ 1 : { 6 items
      "operation" : string "packet_out"

OONI engine: what to measure?

"data_format_version" : string "0.2.0"

"input" : NULL

"measurement_start_time" : string "2024-06-07 21:11:37"

▼ "options" : [10 items
  0 : string "Jc=4"
  1 : string "H2=1534389133"
  2 : string "H4=954146736"
  3 : string "Verbose=true"
  4 : string "S2=25"
  5 : string "H1=609718897"
  6 : string "Jmin=50"
  7 : string "H3=1358042617"
  8 : string "Jmax=1000"
  9 : string "S1=109"
]

"probe_asn" : string "AS202125"

Open Tunnel Telemetry

```
$ cat report.json
{
  "report-type": "tunnel-telemetry",
  "time": "2024-04-12T00:00:00Z",
  "endpoint": "ss://1.1.1.1:443",
  "config": {"prefix": "xx"}
}

$ curl -X POST \
    -H 'Content-Type: application/json' \
    -H 'X-Forwarded-For: 2.3.4.5' \
    -d @report.json \
    http://localhost:8080/report
```

OONI

Scrubbed meta data & aggregates

```
{
  "report-type": "tunnel-telemetry",
  "uuid": "fbf902ee-5d78-43cd-af39-b9b297a0d2f7",
  "ooni-measurement-id": "20240422144155.458035_IT_tunneltelemetry_84954cf1a5baeb91",
  "ooni-measurement-link": "https://explorer.ooni.org/m/20240422144155.458035_IT_tunn
  "time": "2024-04-18T00:00:00Z",
  "collector_id": "uenohphi7oqueiZohl2V",
  "endpoint_port": 443,
  "endpoint_asn": "AS13335",
  "endpoint_cc": "AU",
  "proto": "ss",
  "config": {
    "prefix": "xx"
  },
  "client_asn": "AS50304",
  "client_cc": "NO",
  "sampling_rate": 1
}
```

Research questions

- – How do classifiers work?

- – Can we automate detection of simplistic fingerprints?

- – Is there a traffic threshold?

- – How long can we push the allow-list prefix game?

- – When are censors willing to switch to blanket blocks (entropy-based)?

How to share?
please join the collaborative spec!

ainghazal / **tunnel-telemetry** (Public)

<> **Code**   ⊙ Issues   �⑂ Pull requests   ⊙ Actions   ⊞ Projects

⑂ **no-masters** ▾   ⑂ **2 Branches**   ◌ **0 Tags**

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