# Periscope: Unifying Looking Glass querying

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# Traceroute has multiple operational and research use cases

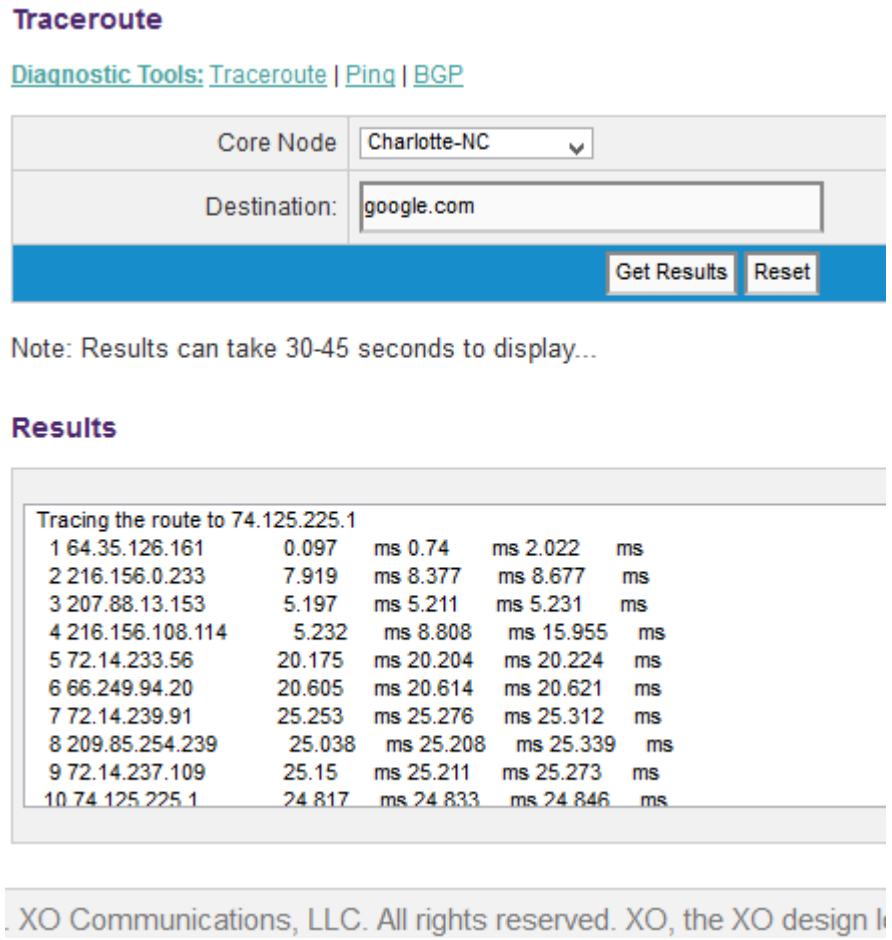
- Troubleshoot operational routing issues
- Measure and analyse performance
- Generate Internet topologies
- IP geolocation
- Detect prefix hijacks and outages
- Location of congestion
- …

# Multiple traceroute platforms offer diverse Vantage Points (VPs)

- Crowdsourced traceroute VPs:
  - CAIDA's Ark, RIPE Atlas, Dasu, …
  - Deployed over end hosts, such as home computers
- VPs deployed over the academic network:
  - iPlane
- VPs deployed by operators:
  - Looking Glasses (LGs)
  - Not an homogenous set of VPs

# What is a Looking Glass (LG)

- Web-based interface to routers that allow the execution of read-only network commands
- Each LG can offer access to multiple backbone or border routers
  - Combine data-plane and control plane routing information
- Each LG is completely independently from each other



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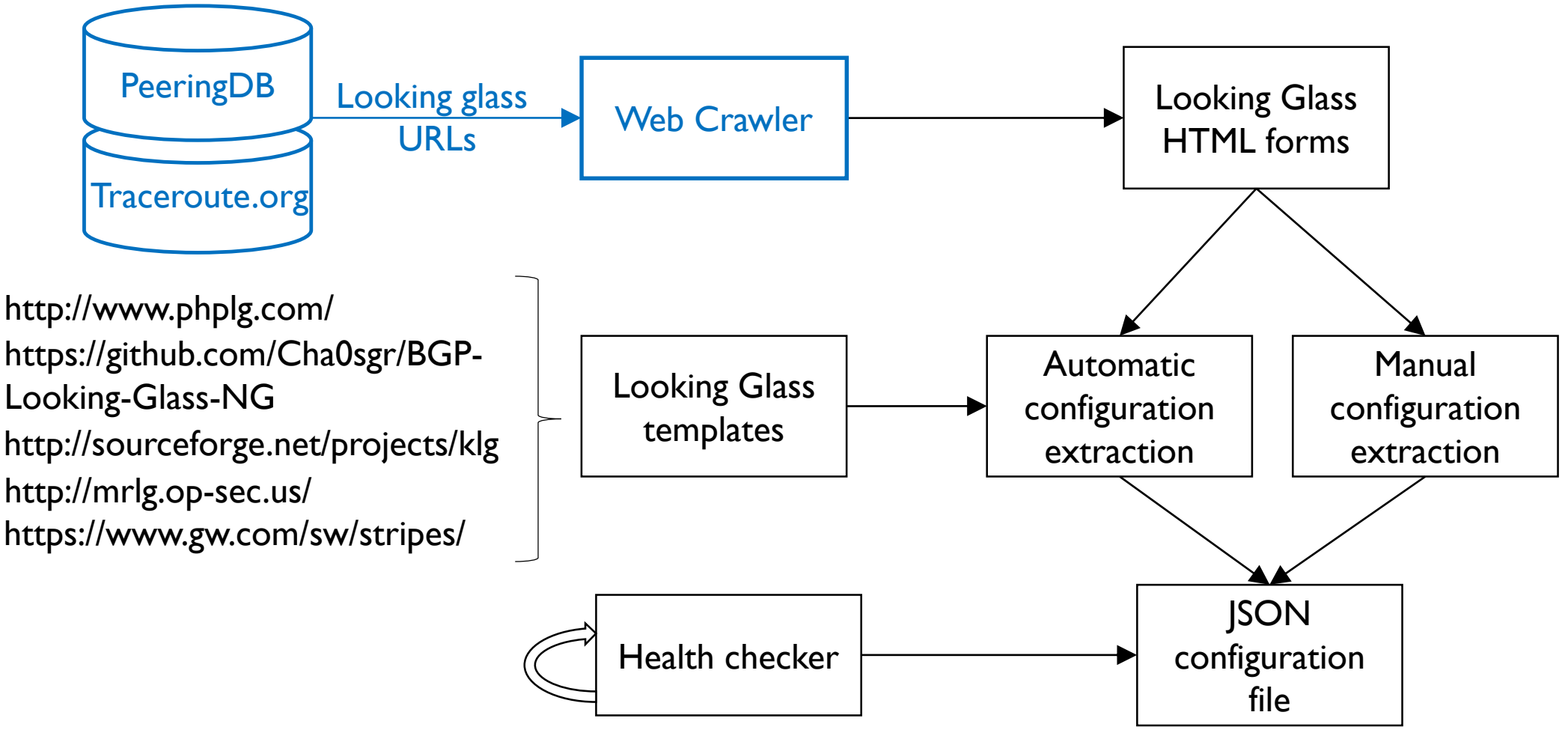
   - LGs have disparate input parameters, output formats and supported commands
3. Automatic discovery of interface changes
   - LGs are volatile in terms of availability and specifications

# Looking glass discovery methodology



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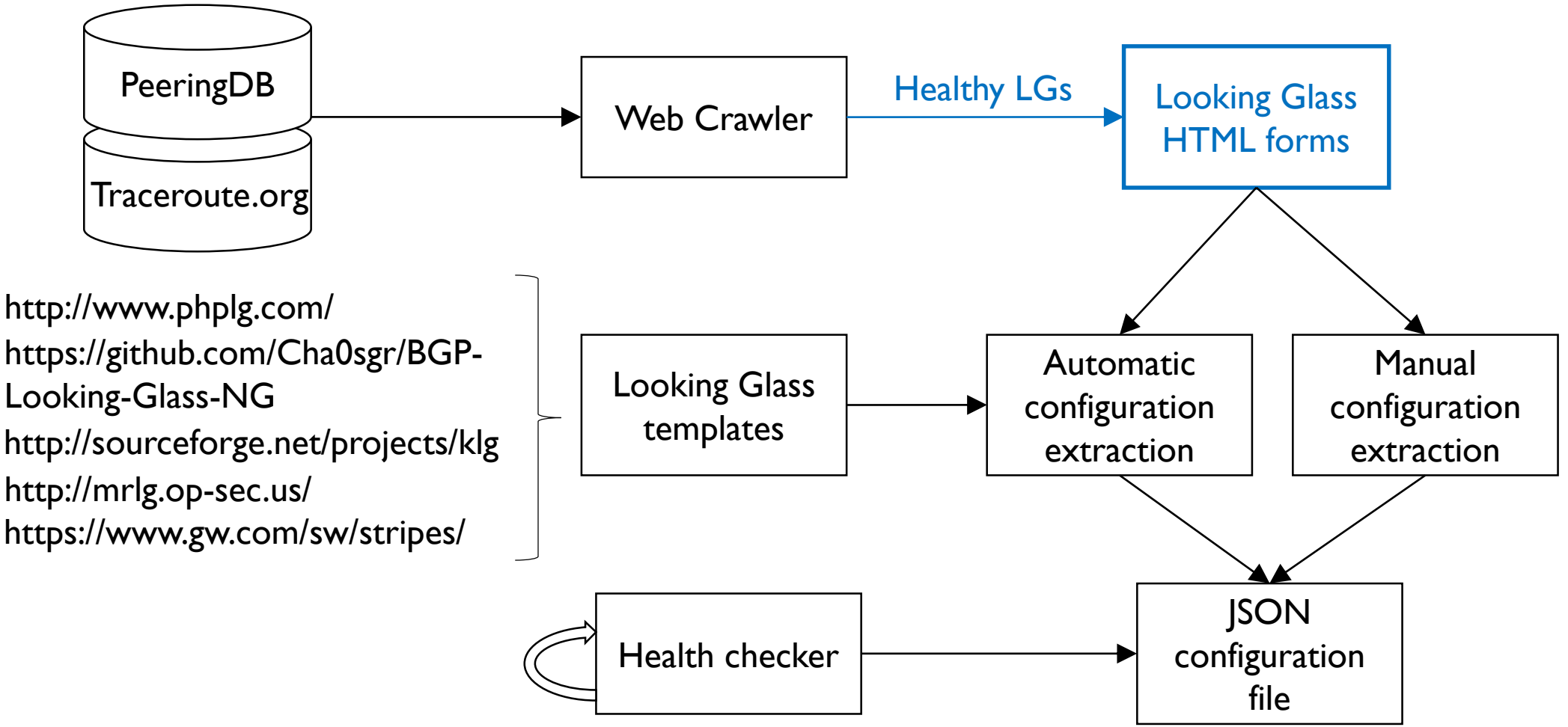

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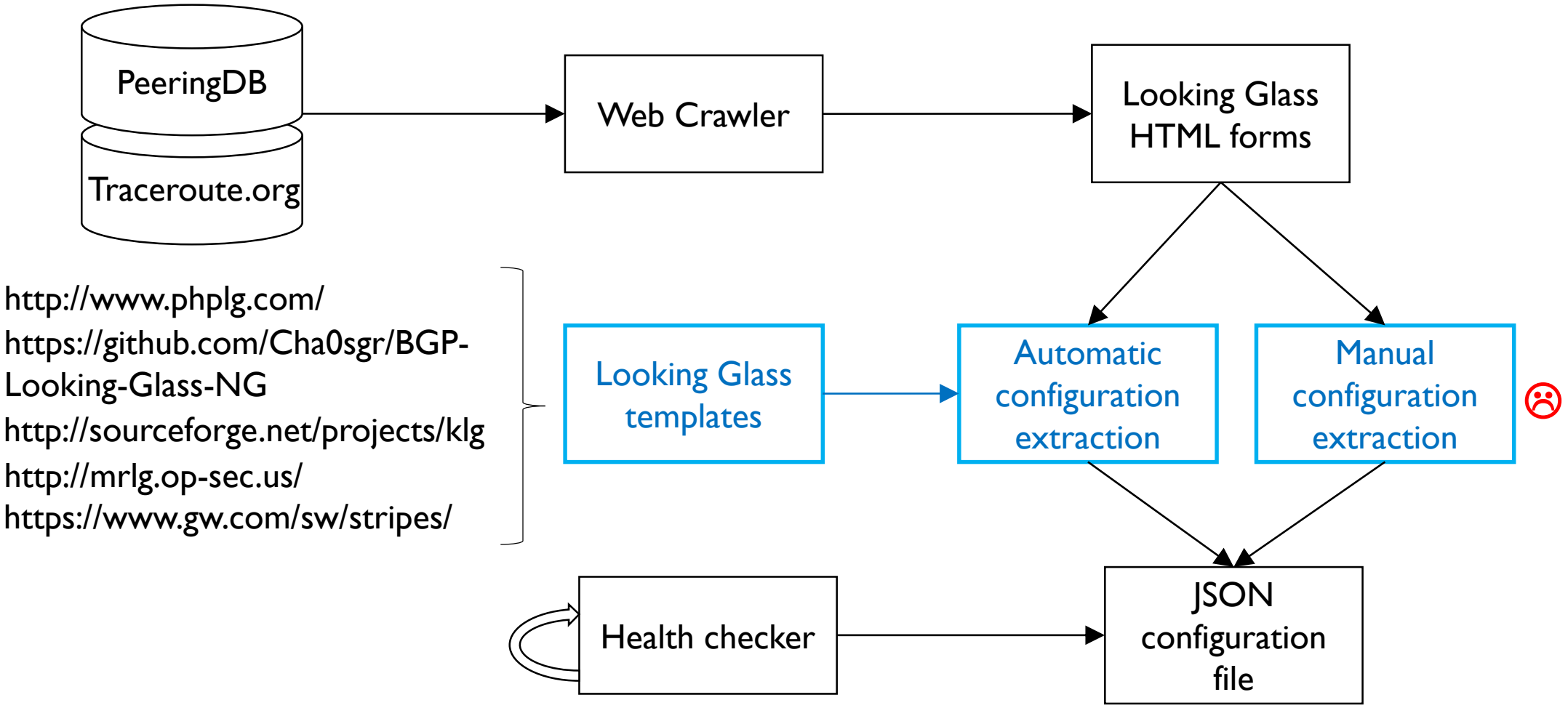

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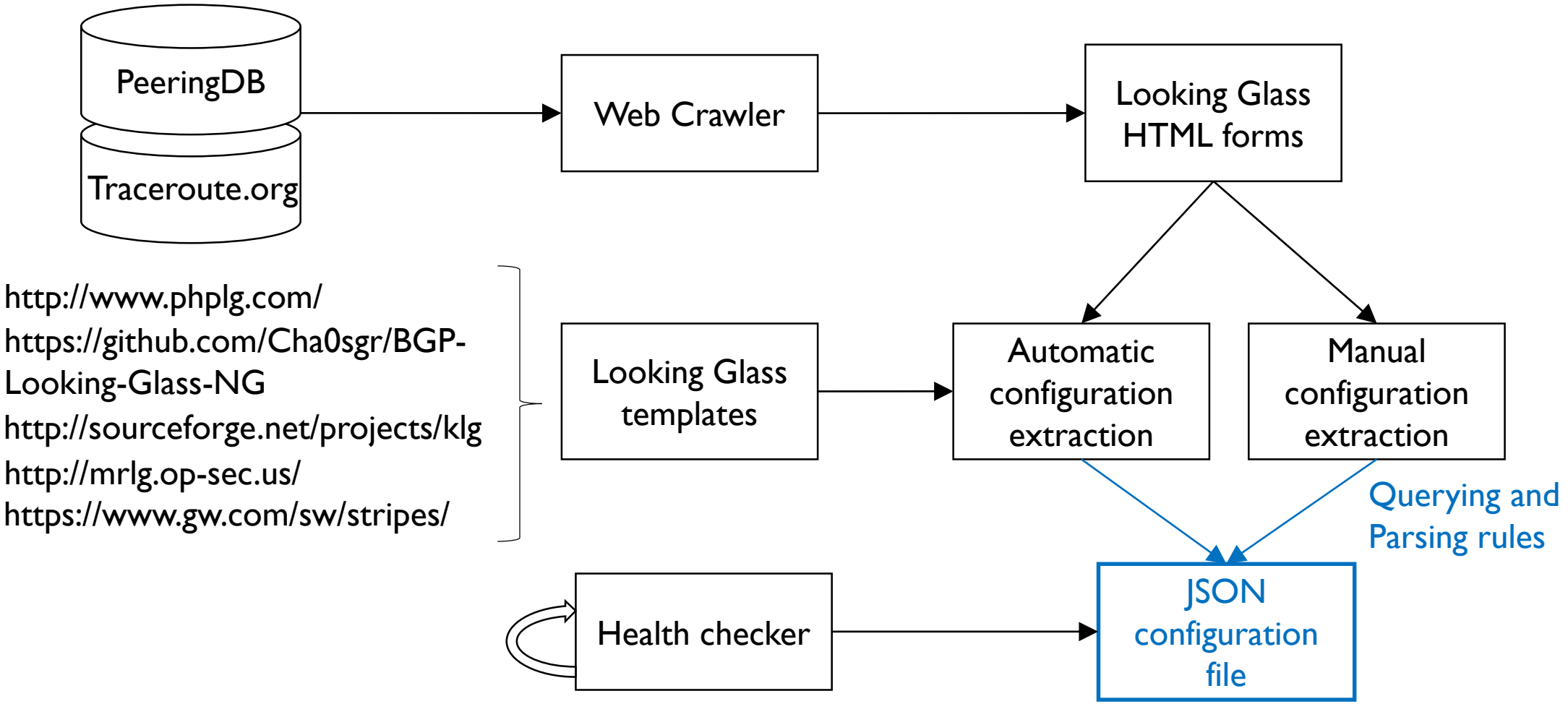

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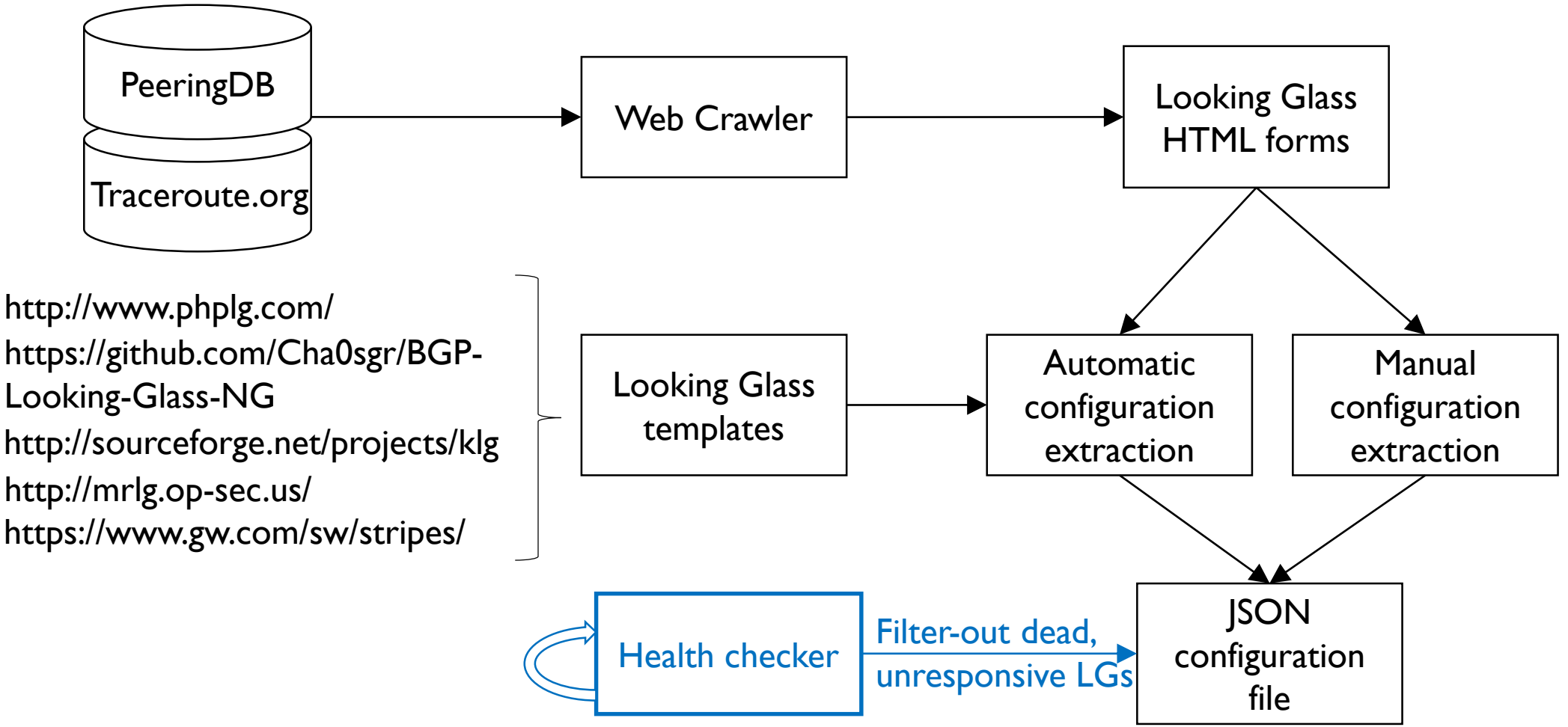

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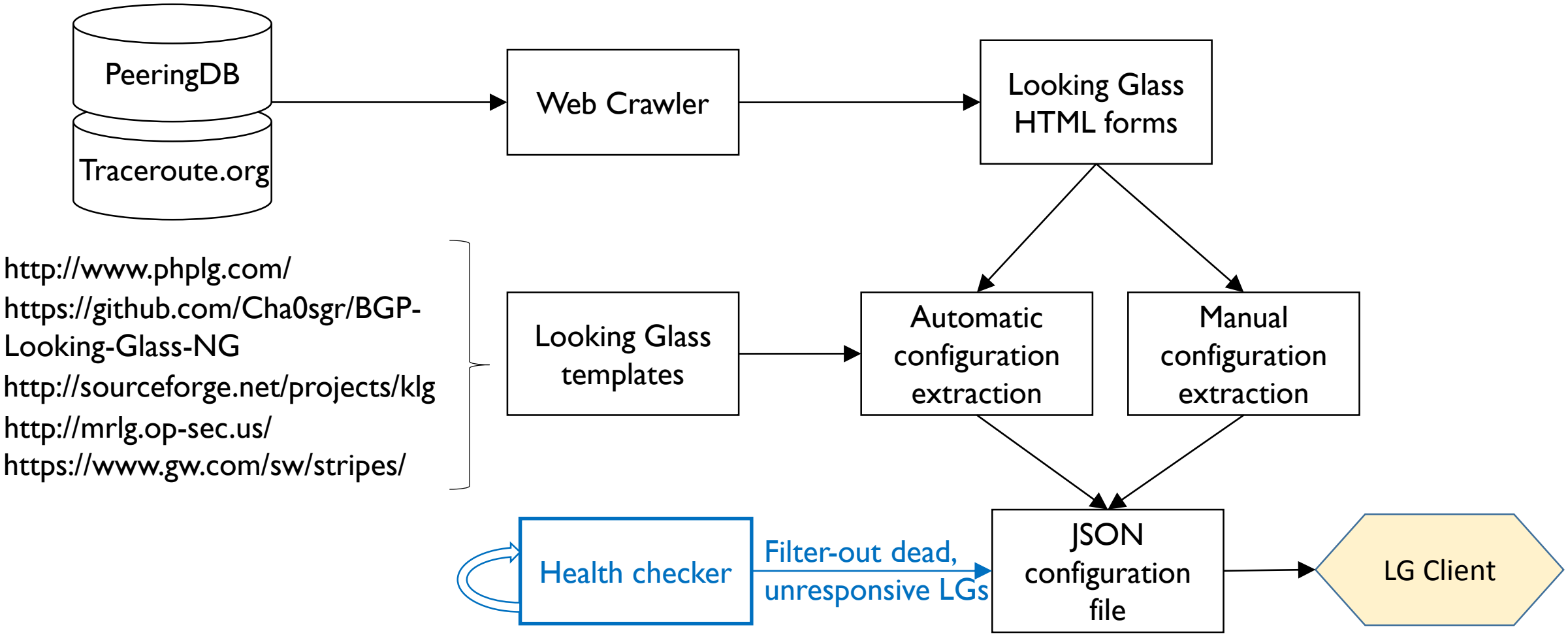
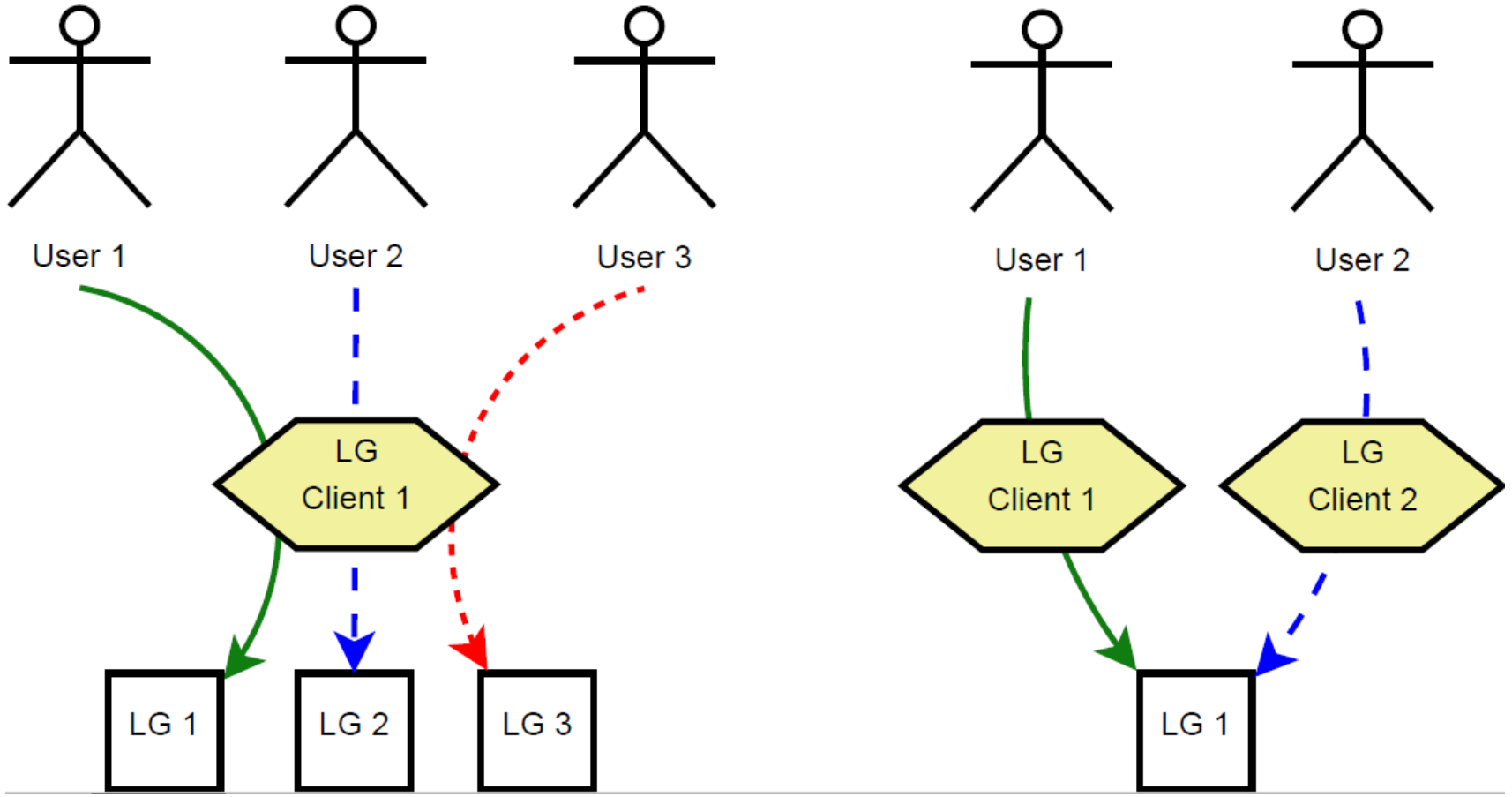
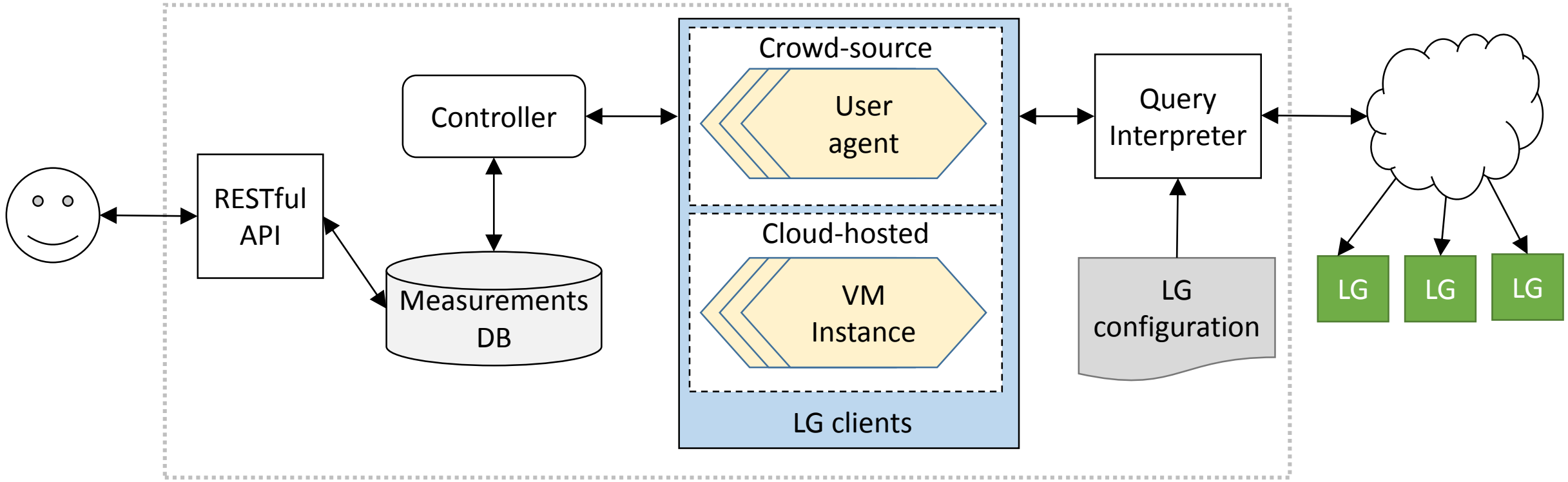


# To enable querying by multiple concurrent users we need multiple LG querying clients

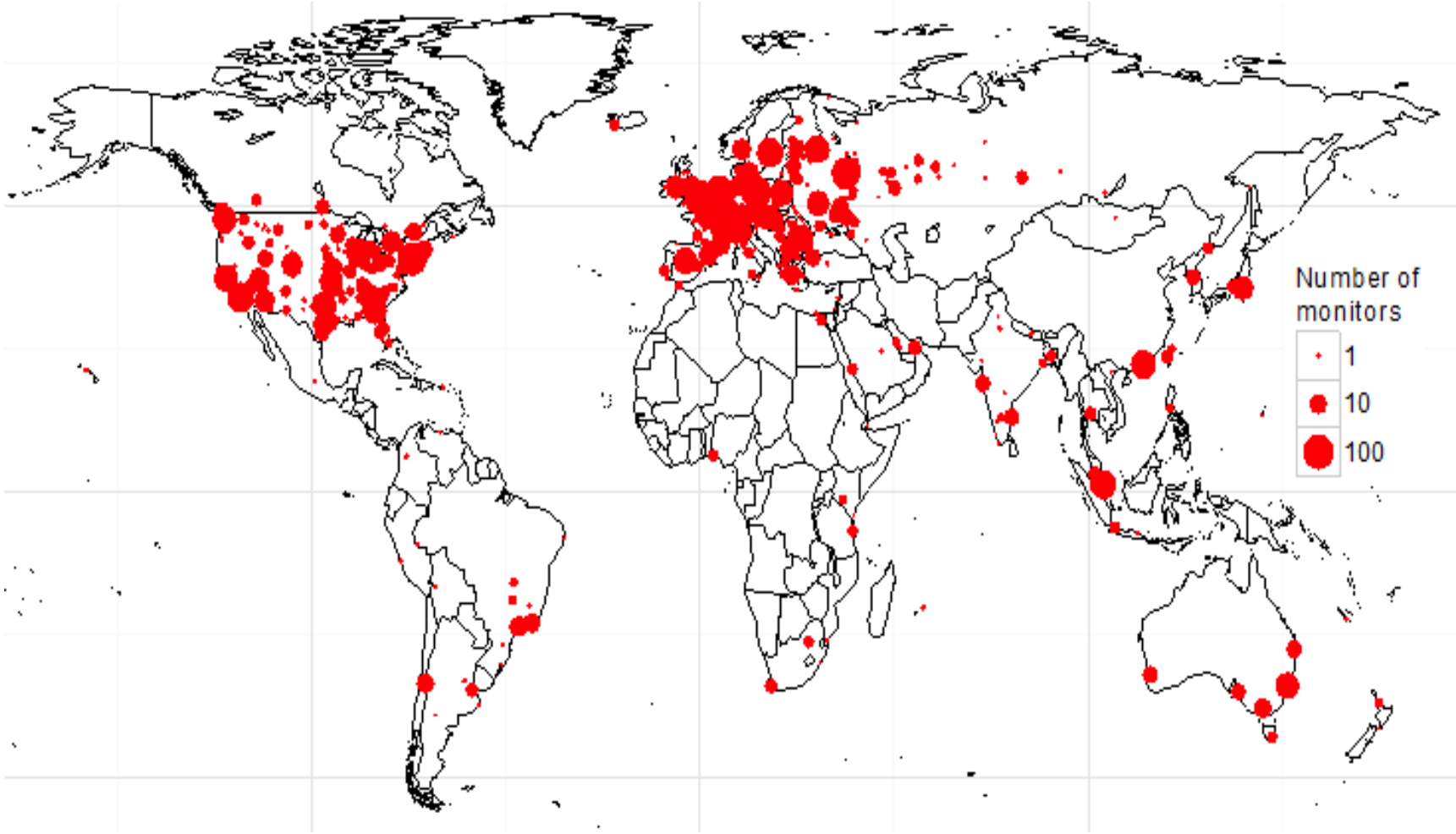


# Periscope's querying architecture

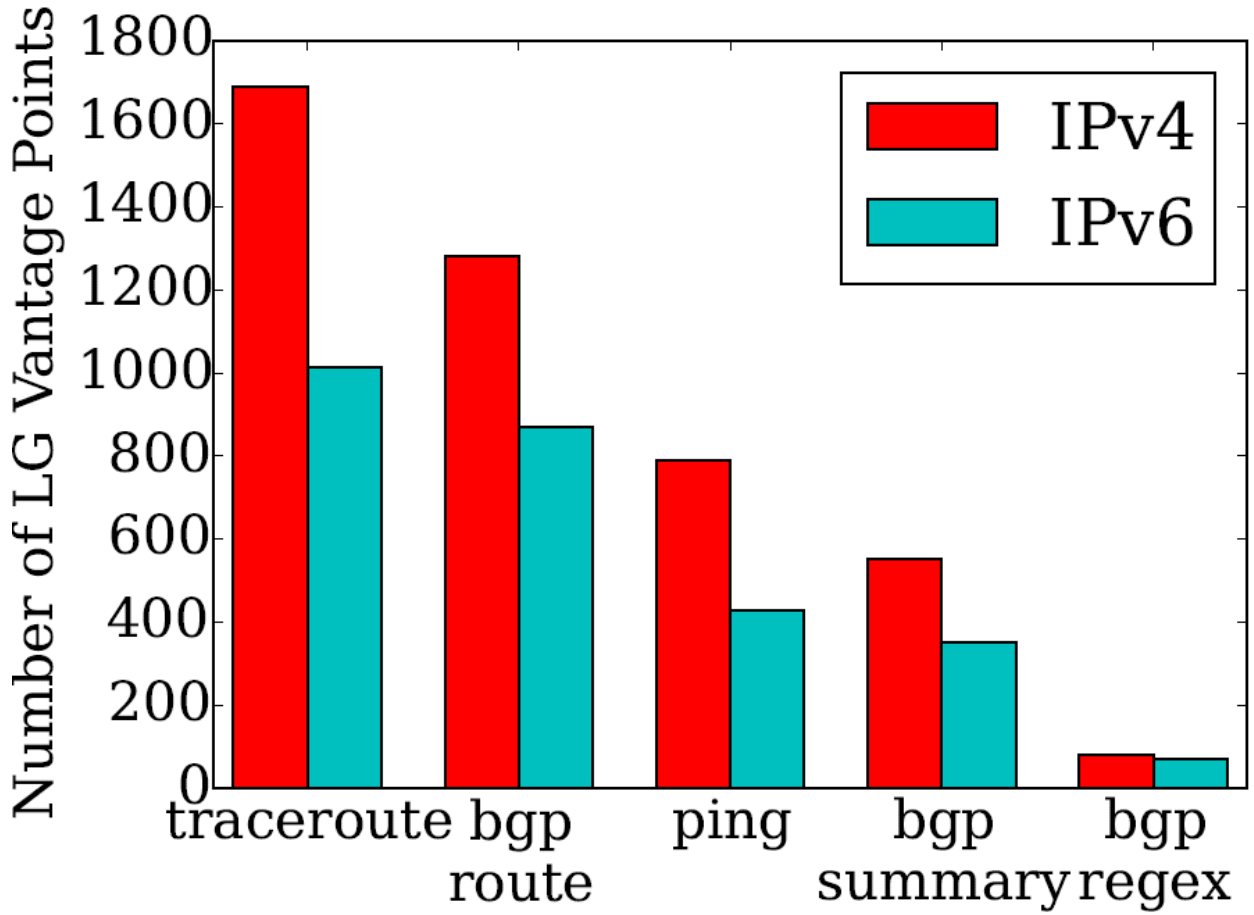


# Coverage of Looking Glasses

- **263** ASNs
- **1,640** VPs
- **77** countries



# Commands supported by Looking Glasses



# Overlap with other platforms

| Datasets | ASes | | AS links | | IXPs | |
|---|---|---|---|---|---|---|
| | Observed | Unique | Observed | Unique | Observed | Unique |
| **LG** | 3109 | 809 (17%) | 29525 | 13969 (19%) | 167 | 16 (8%) |
| **Atlas** | 3369 | 1464 (31%) | 55936 | 40620 (55%) | 171 | 21 (10.4%) |
| **Ark** | 1608 | 59 (1.2%) | 10237 | 1625 (2.2%) | 136 | 8 (4%) |
| **All** | 4657 | - | 73348 | - | 202 | - |

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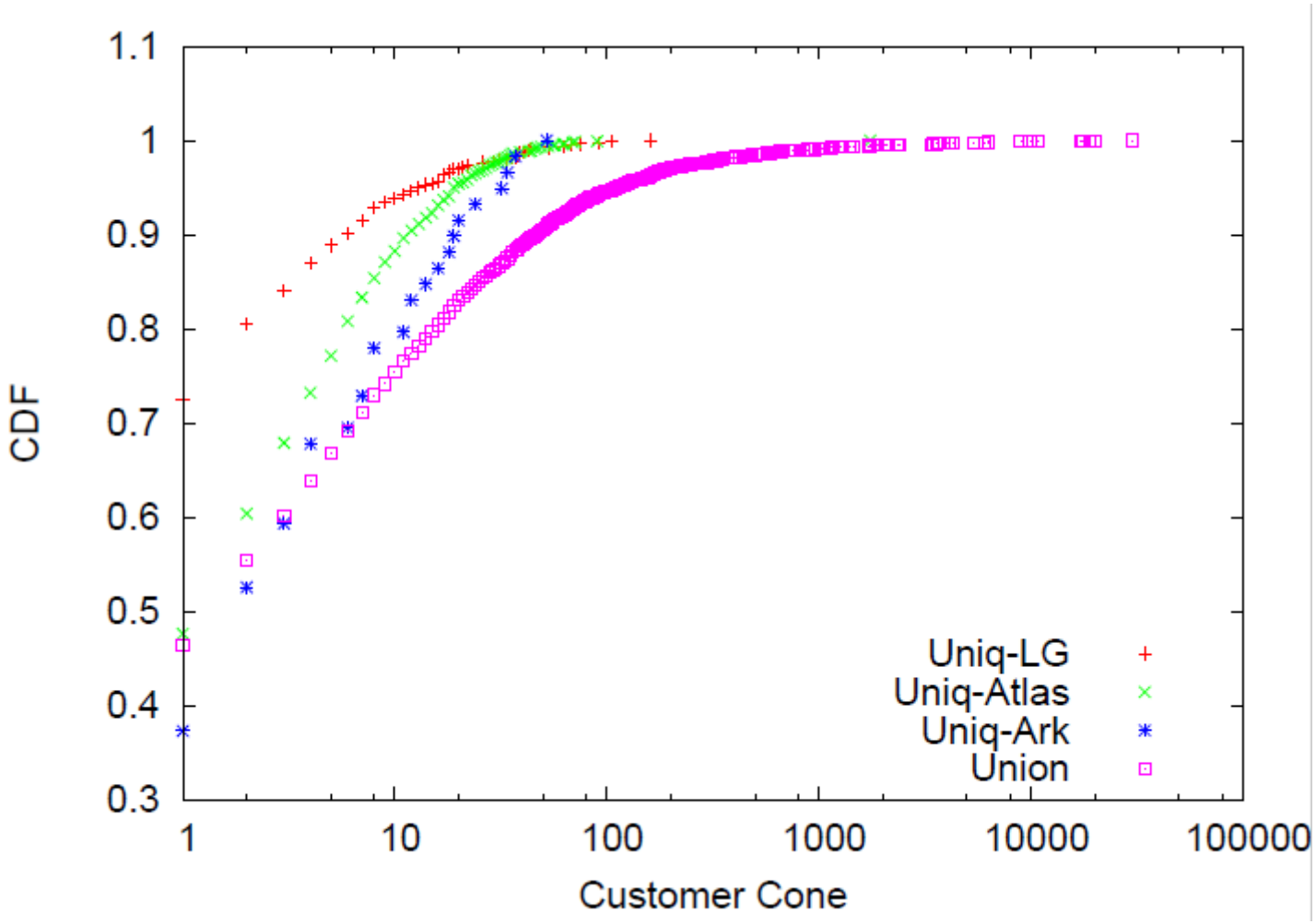

# Current status

- Periscope is publicly accessible after email request:

vgiotsas@caida.org

- API documentation:

http://www.caida.org/tools/utilities/looking-glass-api/

- Current projects:
  - Facility mapping
  - Inference of complex relationships
  - Sibyl: A Practical Internet Route Oracle
  - IP-to-ASN mapping