Anycast Enumeration and Geolocation

Geolocation techniques fail with anycast IPs!
- Where is Google’s 8.8.8.8?
  - **Mountain View** (IP2Location).
  - **New York, New York** (Geobytes).
  - **United States** (Maxmind).
- Our methodology
  - Determines if a service uses IP anycast.
  - Enumerates replicas sharing the same IP address.
  - Geolocates those replicas.

Methodology Workflow

**Measure**
- **Latency**
  - Planetlab, Ripe

**Detect**
- **Speed of light violations**

**Enumerate**
- **Solve MIS**
  - 5-approximation (Greedy)

**Geolocate**
- **Classification**
  - Maximum likelihood

**Anycast Detection**
- Anycast instance within the DP disk centered at p, having radius \( d(p, t) \),
- Candidate locations for anycast instance
- Probes

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**Web demo of anycast census IPs** [1]

**Validation results at a glance**
- Flexible: Protocol agnostic unlike DNS-based state of the art.
- Lightweight: 1000x fewer vantage points than state of the art.
- Validation (over DNS for comparison):
  - Over 50% recall.
  - Correct geolocation in 80% of cases.
  - 361km mean error for remaining case.