Using ***Reverse*** *IP Geolocation* to Identify Institutional Networks

Alexander Gamero-Garrido, Elizabeth Belding*, David Choffnes

Northeastern University *UC Santa Barbara

Motivation

Challenges in Identifying Anchor-Institutional Networks (AINs)

- Anchor institutions are "place-based, mission-driven entities such as hospitals, universities, and government agencies" [anchor.ucsf.edu]
- AINs are smaller than residential providers, and often have tight budgetary constraints, which also limits their operators' technical sophistication.
- Existing approaches to classify networks at the AS level are too coarse to identify most AINs: they purchase connectivity and lease IP addresses from an ISP.

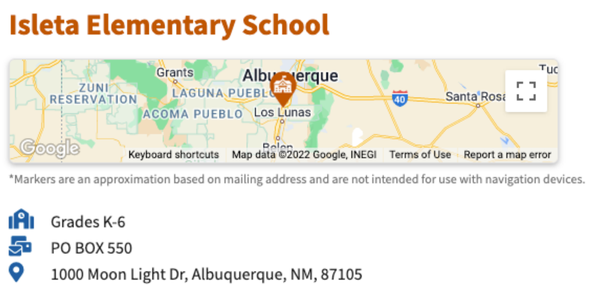
Measuring Connection Reliability at AINs

Identify (Where are these networks?) → **Measure** (Are these networks reliable?) → **Improve** (How to upgrade unreliable networks?)

Reverse *IP Geolocation*

Identifying Anchor Institutional Networks: Where To Start?

- We **do not know** which **networks** serve anchor institutions
- We usually **know** where anchor institutions are **physically** located



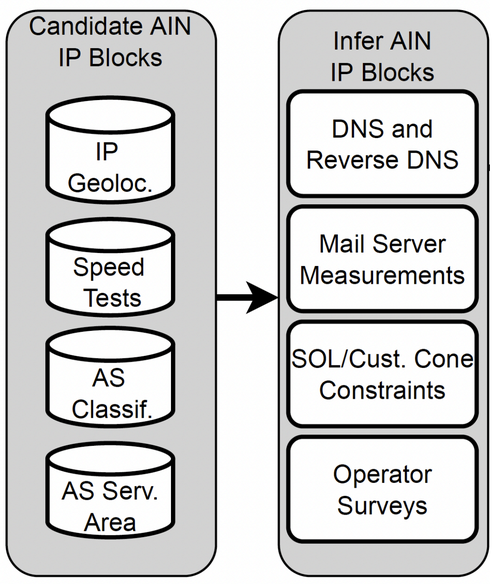
Conventional IP Geolocation

IP Address → Physical Location

Reverse *IP Geolocation*

IP Address ← Physical Location

Reverse *IP Geolocation*: Building Blocks



- Several databases can help us identify institutional networks
- They are all prone to inaccuracies (treat as candidates)
- Collect additional data for each candidate to confirm AIN status

Initial Findings: 100 Anchor Institutions In or Near Tribal Areas

U.S. anchor institutional networks identified with our Reverse IP Geolocation technique

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