NetViews: Dual Plane Internet Monitoring in Real Time.
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Introduction

• Goal
  - Give network operators the ability to monitor multiple prefixes and networks on multiple planes.

• Approach
  - Leverage real time BGP update information to visualize AS-Level paths on a geographical map.
  - Utilize active measurements to obtain forwarding paths back to the subscribed source.
Dual Plane Motivation

- AS connectivity graphs may not tell the whole picture.
  - Loops on the forwarding path
  - Border routers hiding intra network problems.
- Router level graphs can be tricky to maintain.
  - How often do you probe?
Data Sources

- Colorado State’s experimental BGP collection system **BGPMon**.
- Looking Glass servers located within peer networks.
- Route Registries (ARIN, RIPE, etc.)
- Geolocation Services (DigitalEnvoy NetAcuity)
Architecture
AS Origin Tracking

1. Peer sends BGP update to BGPMon

2. Forwarded to NetViews

3a. Data Broker forwards to client through Overlay

3b. Origin Tracker connects to LG server for probing.

4b. LG Server initiates traceroute

5b. Traceroute results returned to Origin Tracker

6b. Traceroute results forwarded to client

NetViews Server

Overlay

Client

3303

14041

Data Broker

Probe Manager
Demo
Addressing Scalability Issues

- Possibly thousands of BGP updates per minute may need to be forwarded to hundreds or even thousands of clients.
  - Clients subscribing to BGP updates from specific prefixes or networks use normal TCP connections.
  - Clients wishing to subscribe to all prefixes (ie “/0”) join an overlay network to distribute load between clients.
  - In future, we will have overlay networks form dynamically when the number of client subscribed to a prefix grows beyond an arbitrary threshold.
Challenges and Future Work

• Find a scalable platform for running traceroute measurements other than legacy looking glass servers.
• Improve graphical presentation to make the interface convey information easier and be more intuitive.
• Stress test Databroker to determine bounds on performance.
• Integrate our active measurement module and its user interface.
People

- Primary Researcher - Dr. Lan Wang
- Lead Developer - Ernest McCracken
- Supporting Developers - Roman Birg, Gus Sanders.
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