

# Software Defined Privacy-Preserving Measurement Instrument and Services

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Michael McGarry, Univ. of Texas El Paso



# Overview of IRNC AMIS Project

## ► Objectives

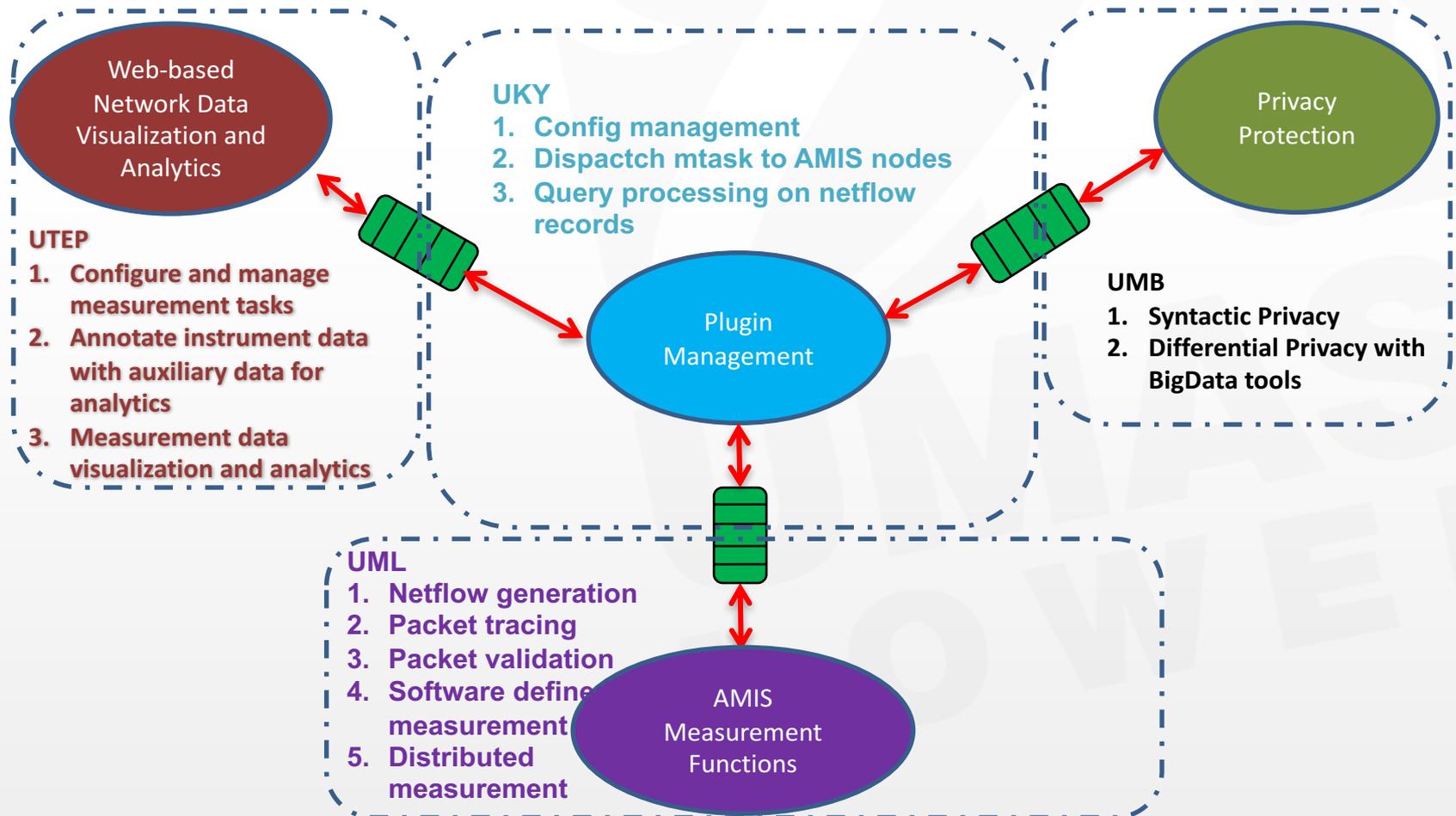
- 40+Gbps flow-granularity network measurement instrument
- Software defined measurement
- Preserving privacy of network flow info
- In-depth flow analytics

## ► NSF Funded Project Team:



- Yan Luo, PI, University of Massachusetts Lowell
- Cody Bumgardner, Co-PI, University of Kentucky
- Gabriel Ghinita, Co-PI, Univ. of Massachusetts Boston
- Michael McGarry, Co-PI, University of Texas El Paso

# Overview of IRNC AMIS Framework



# AMIS Measurement Functions

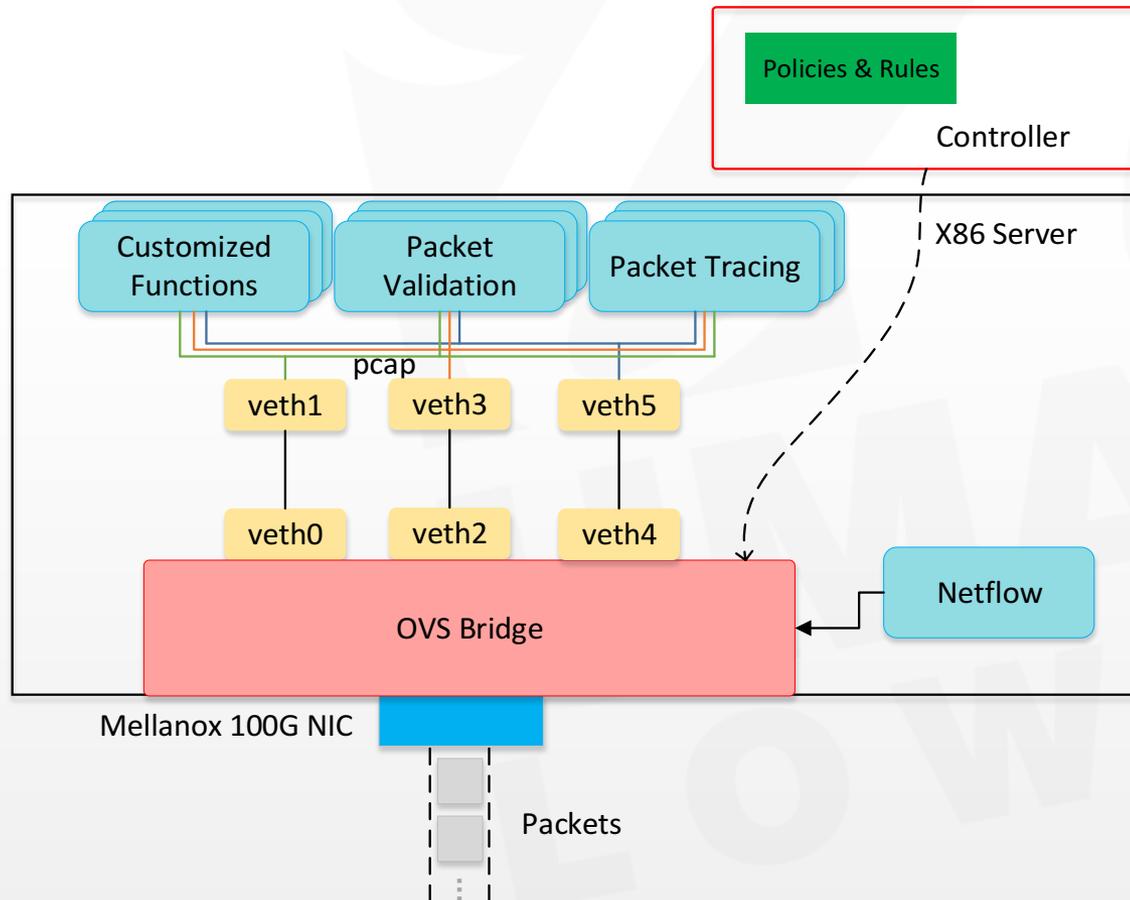
## ▶ Current functions

- Netflow
  - Generate NetFlow v5 record
- Packet Tracing
  - Trace the occurrence of flows/packets on links monitored by (distributed) AMIS instrument
- Packet Validation
  - Validate packets, report good/bad packets, OOO, etc.

## ▶ Ongoing Work

- Software Defined Measurement
  - P4 based protocol parser and matching table
  - Measurement function composition and distributed measurement
- Integrating active measurements
  - perfSONAR, test packet generation

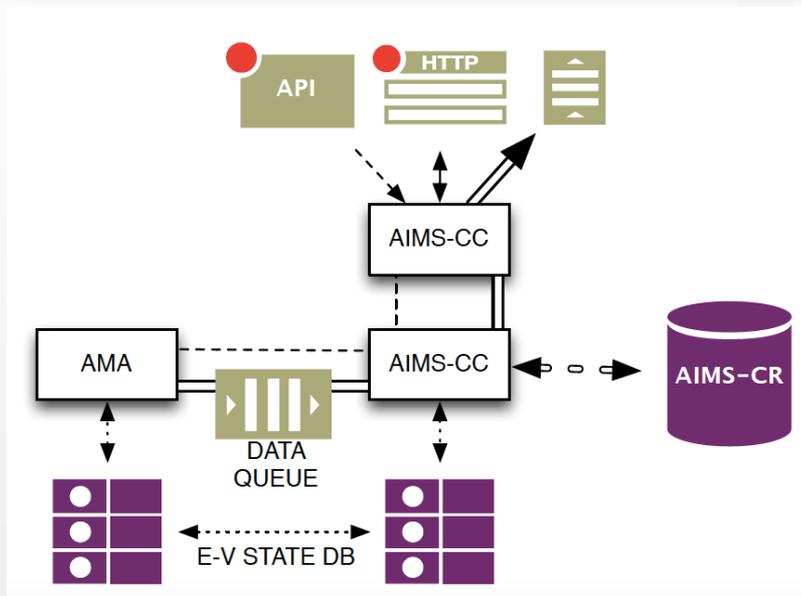
# AMIS Instrument Internal Architecture



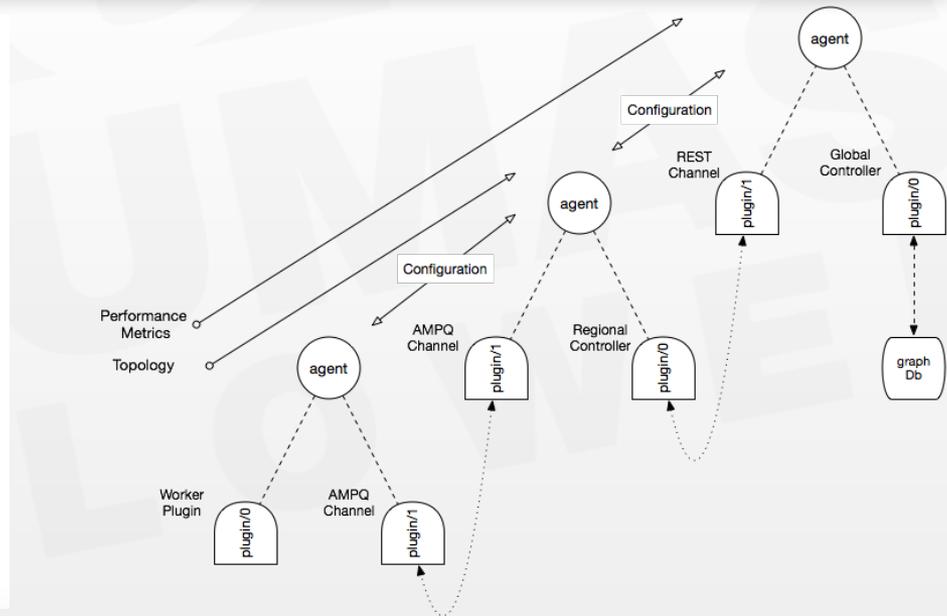
1. NetFlow: OVS
2. Packet Validation: PCAP
3. Packet Tracing: PCAP

# IRNC AMIS: Distributed Control System

- Project components managed through a distributed control system comprised of agents and plugins.
- Plugins implemented to manage control of data processing components.
- Agents allow for anonymous operation with centralized control.

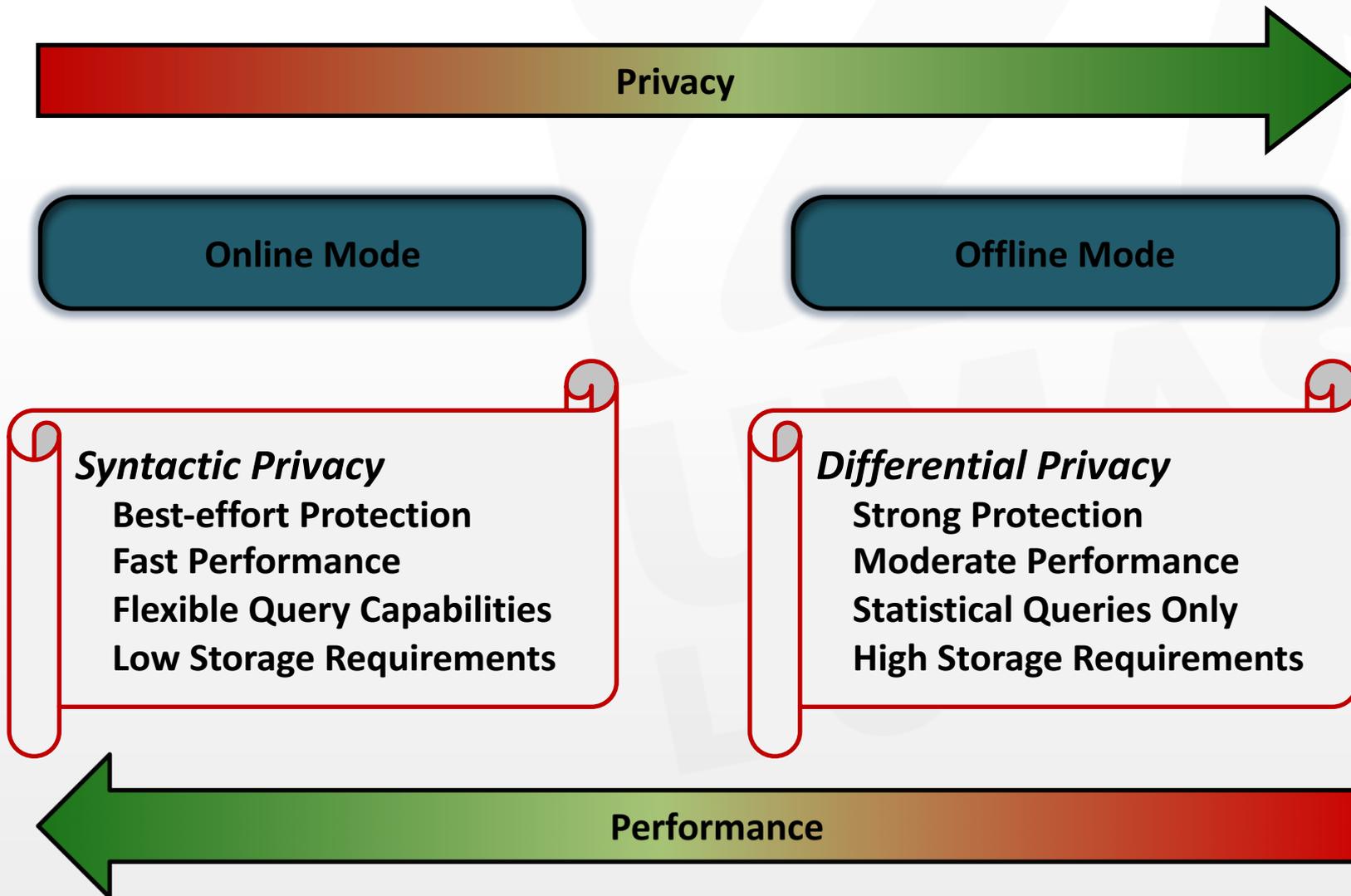


Processing - Interaction



Distributed Control System

# AMIS: Supported Privacy Modes



# Advanced Measurement Instrument and Services (AMIS)

About

Define Measurement Task

**View Measurement Data**

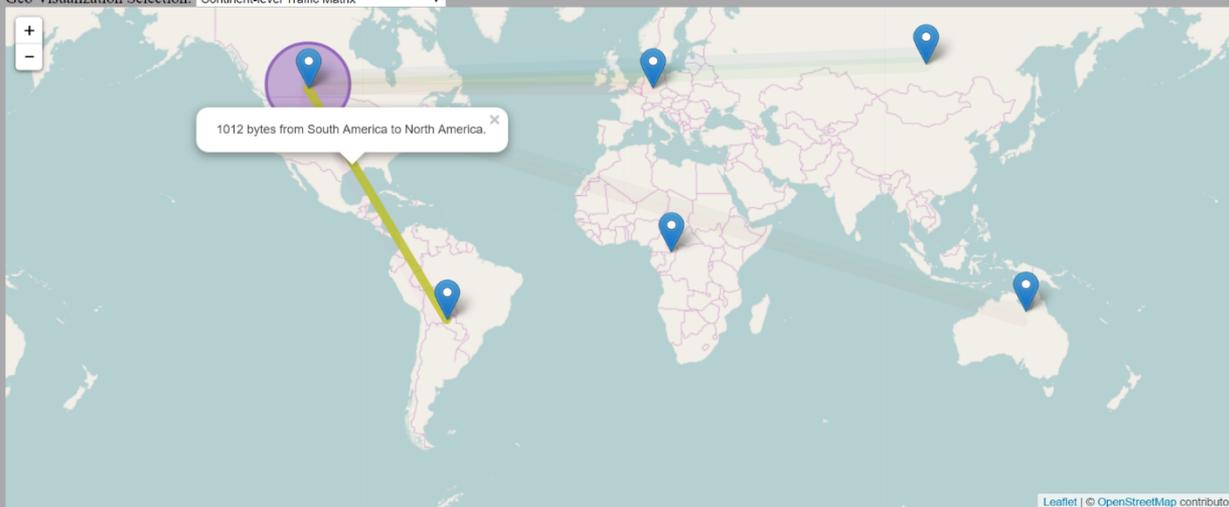
IP Address Lookup

Project Team

Training Materials

## Geo Visualizations

Geo Visualization Selection: Continent-level Traffic Matrix



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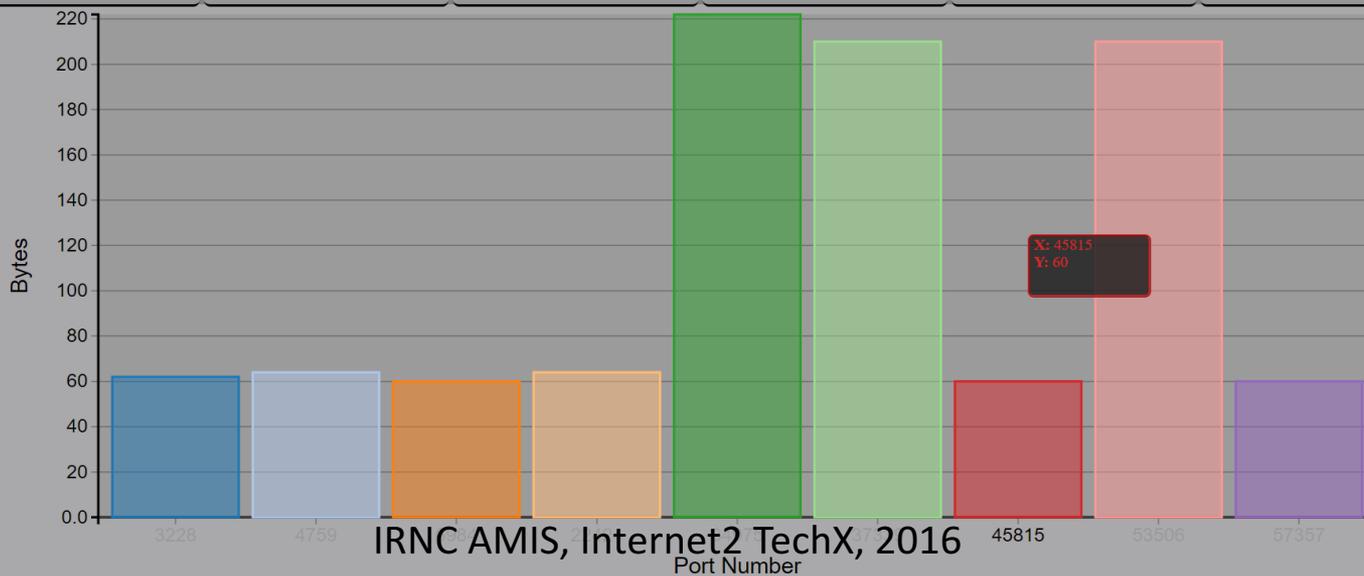
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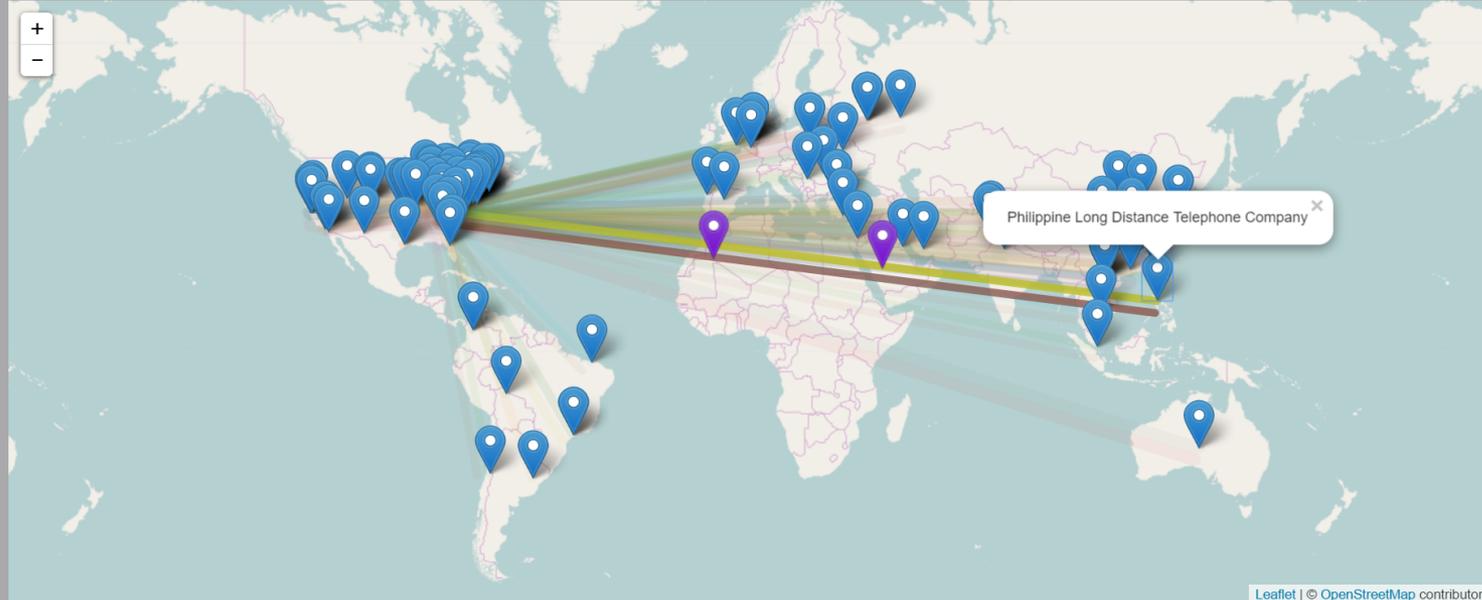
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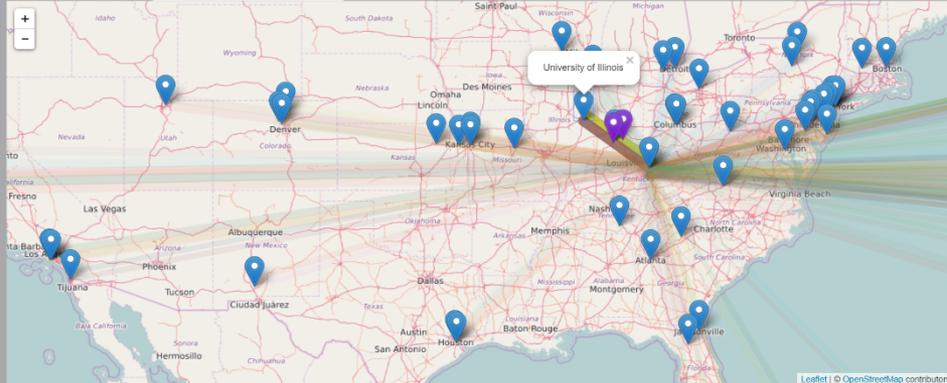
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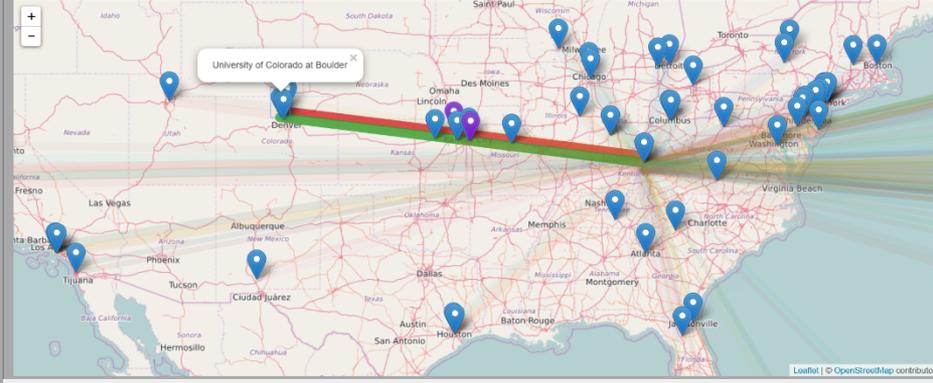
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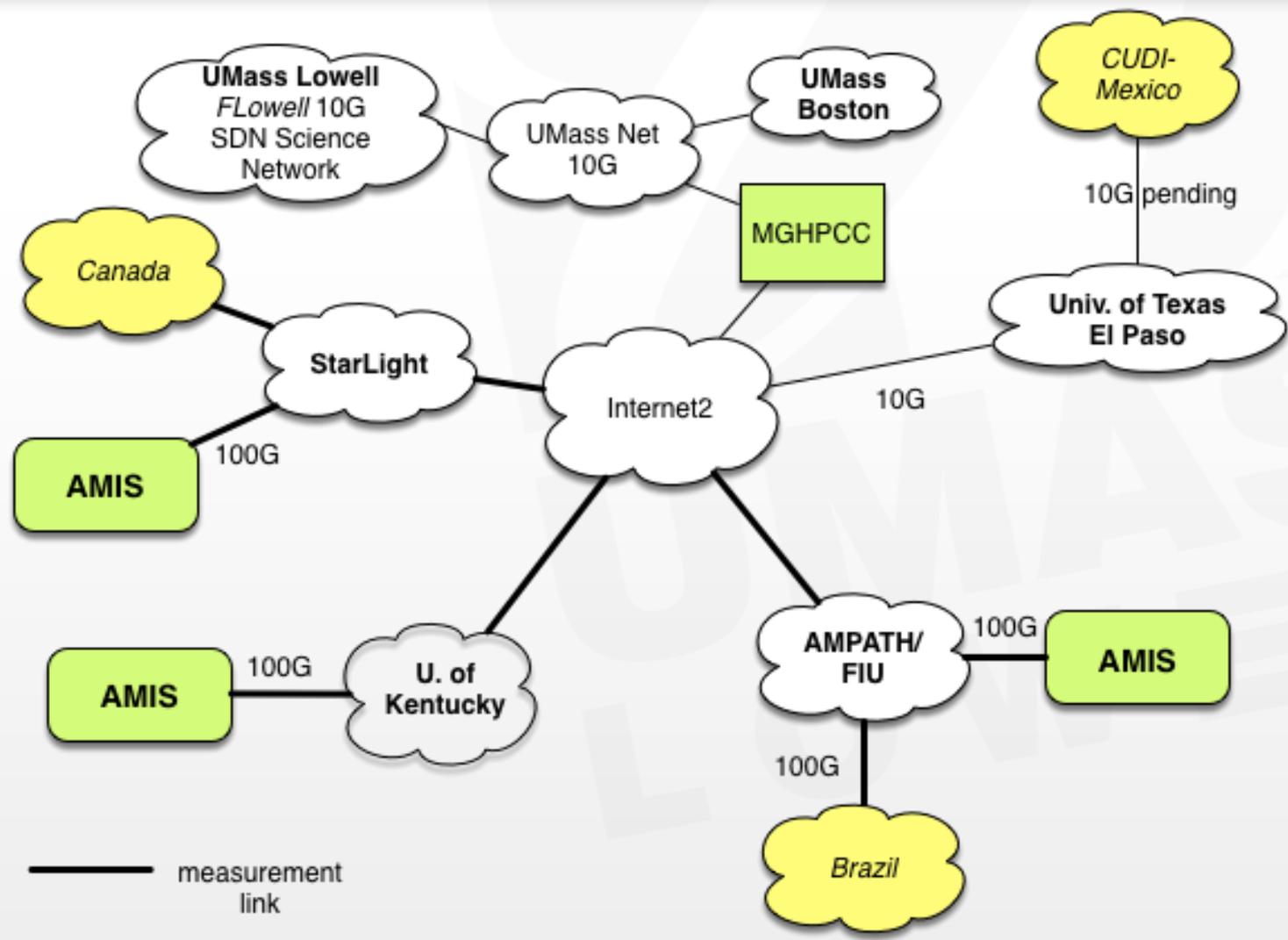
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# IRNC AMIS Test Plan



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