IXmaps or CHmaps

Rendering visible the ‘interesting’ features of internet backbones, especially sites of surveillance

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http://iprp.ischool.utoronto.ca/

Background

- Much is going on ‘inside’ the internet, but out of sight, that should concern users and policy advocates:
  - Surveillance (e.g eavesdropping by the NSA and other security agencies)
  - Deep packet inspection (DPI) by ISPs/carriers
  - Discriminatory traffic management and blockage
  - Excessive energy consumption
  - Oligopolistic and anti competitive business practices
  - …
- There is relatively little critical research into, or public understanding of, internet backbone structure and operation
- Prevailing metaphors, such as ‘dumb core/ intelligent edges’ and ‘cloud computing’, obscure important insights and possibilities for action

Research ambitions

- Make visible to users interesting internet backbone/core phenomena related to everyday usage
  - e.g. NSA surveillance, DPI, Carrier Hotel ownership, energy (in)efficiency, …
- Promote an understanding of the internet core amenable to public policy engagement
- Develop a research tool for conducting critical internet backbone investigations, and for presenting findings publically
- Enroll others (users, activists, researchers) in building the database of internet sites of interest

Welcome screen (mock up)

Welcome to IXmaps

This tool allows you to trace the route your packets take across the internet when you visit a web site

Please enter a destination URL _____ or select a start and destination node from the map on the right.

Please select the types of site along the route you are interested in learning about:

- NSA eavesdropping
- ISPs
- DPI routers
- Energy efficiency
- …

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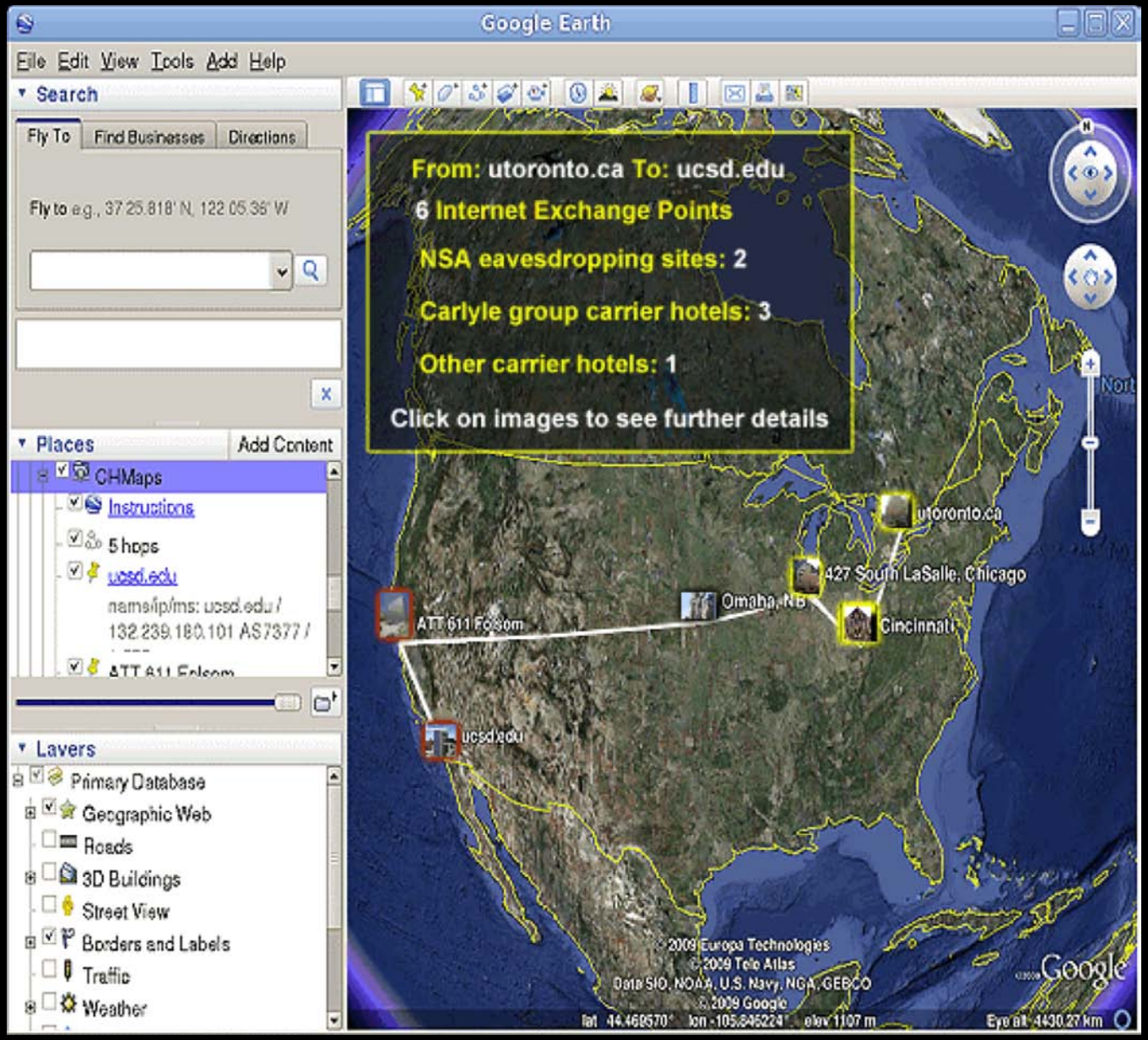
Summary screen

Summary screen (Google Earth)



TR details screen

Hop#	IP#	Delay	Lat	Long	AS#	DPI#	CH#	ISP	NSA
1	192.168.1.1								
2	206.248.154	10	42.4	-82.183	12345			TekSav	
3	69.196.136.	8	43.667	-79.417	12345		151	TekSav	
4	65.39.198.2	8	43.667	-79.417	24680	198	151	Peer 1 I	
5	216.187.114	69	40.689	-74.02	24680	198	232	Peer 1 I	11
6	216.187.88.	73	40.689	-74.02	24680	198	232	Peer 1 I	11
7	216.187.88.	91	40.689	-74.02	24680	198	232	Peer 1 I	11
8	198.32.176.	82	33.978	-118.44	43210		323	EP.NET,	
9	137.164.47.	84	33.819	-118.04	76859	357	444	CENIC	22
10	137.164.46.	85	33.819	-118.04	76859	357	444	CENIC	22
11	137.164.46.	97	33.819	-118.04	76859	357	444	CENIC	22
12	137.164.47.	98	33.819	-118.04	76859	357	444	CENIC	22
13	137.164.24.	98	33.819	-118.04	76859	357	444	CENIC	22
14	132.239.255	98	32.881	-117.24	97531			UCSD	
15	132.239.254	98	32.881	-117.24	97531			UCSD	
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Carrier hotel - 151 Front St. Toronto

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NSA warrantless wiretapping sites (suspected – see Marcus deposition, 2006)

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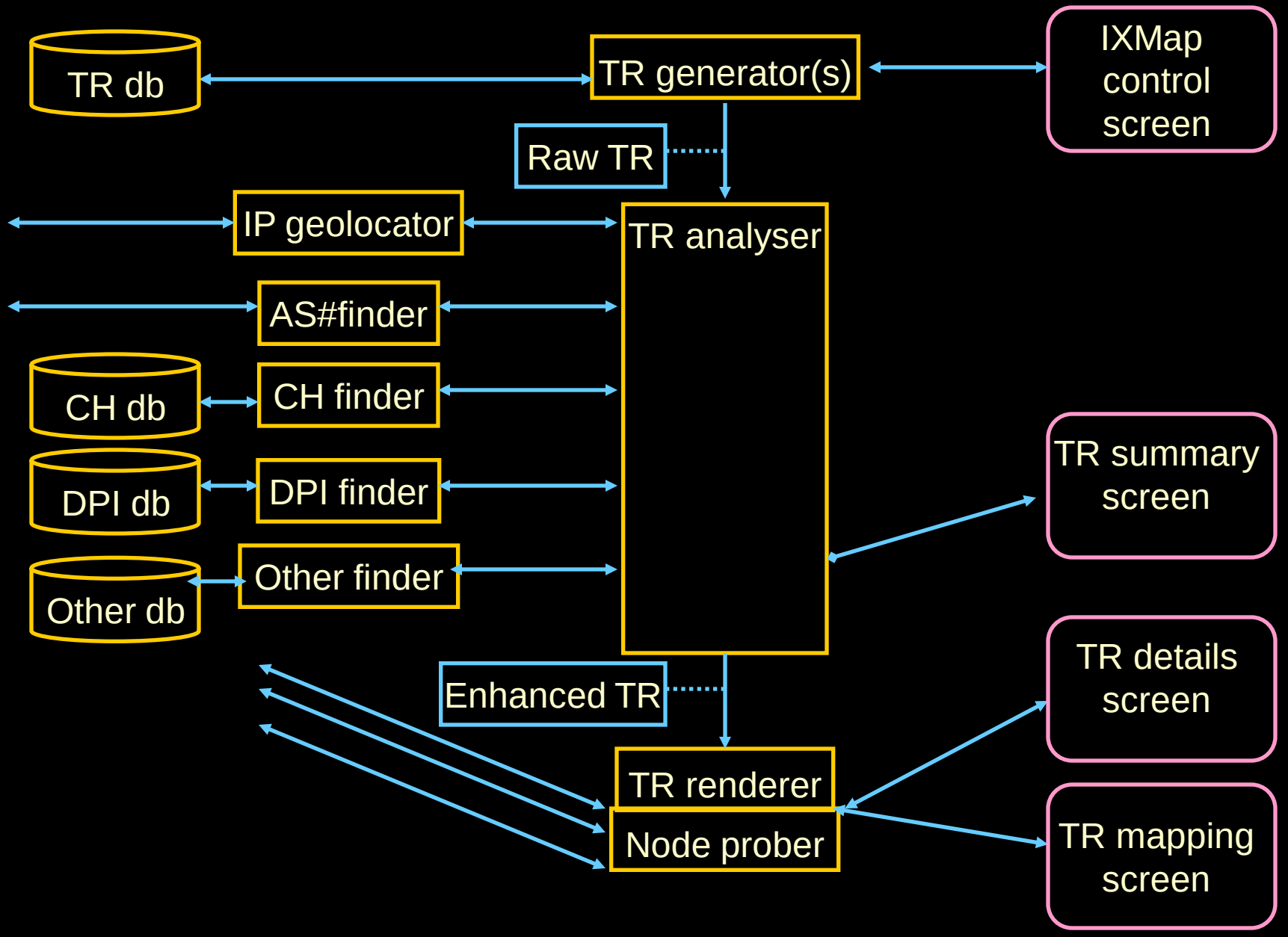
Peer 1 Networks operates Narus 1234 Semantic Traffic Analyzer, for unknown purposes

IXMap system overview

System side

User side



Future work

- Working prototype as proof of concept
- Build data base of:
  - Trace routes
  - NSA sites
  - DPI sites and policies
  - Energy consumers
- Art gallery installation?
- Cyber-surveillance international research workshop, May 2011, Toronto

> Looking for research assistant(s)