

caida

visualizing the Mbone

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Overview

- motivation
- visualization goals
- feature overview
- real world applications
- future work
- conclusion

motivation

- map of Mbone (multicast backbone)
 - analyze/debug parameters

‘multicast backbone’:

virtual network that can send and receive traffic destined for multiple IP addresses

one-to-many

visualization goals

- data collection
- storage
- efficient parsing
- digestable image

data collection tools

mrinfo

- queries mboned nodes about:
 - connectivity to other nodes
 - known attributes of tunnels

mwatch (UCL-supported till 1998)

- calls mrinfo recursively
- maintained current daily mbone state

crawl (caida tool, 1998)

- calls mrinfo recursively
- good for single crawl across network
- no state maintained across runs

data visualization

manta

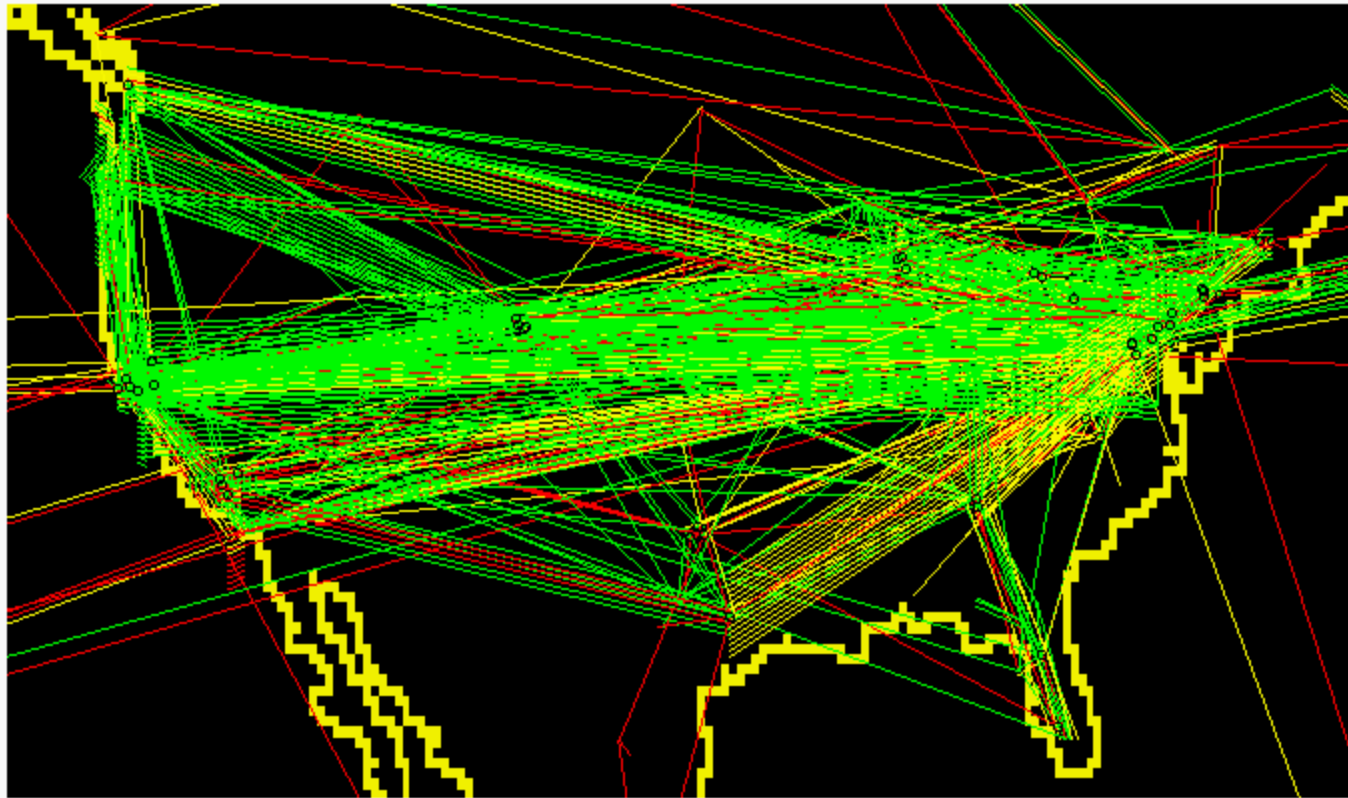
- geographical placement
- method to view complete mbone trace

otter (see today's 16:00 talk)

- topological placement
- better view for small parts of network

Manta: status (tunnel, native, down)

Mbone infrastructure of US ISPs

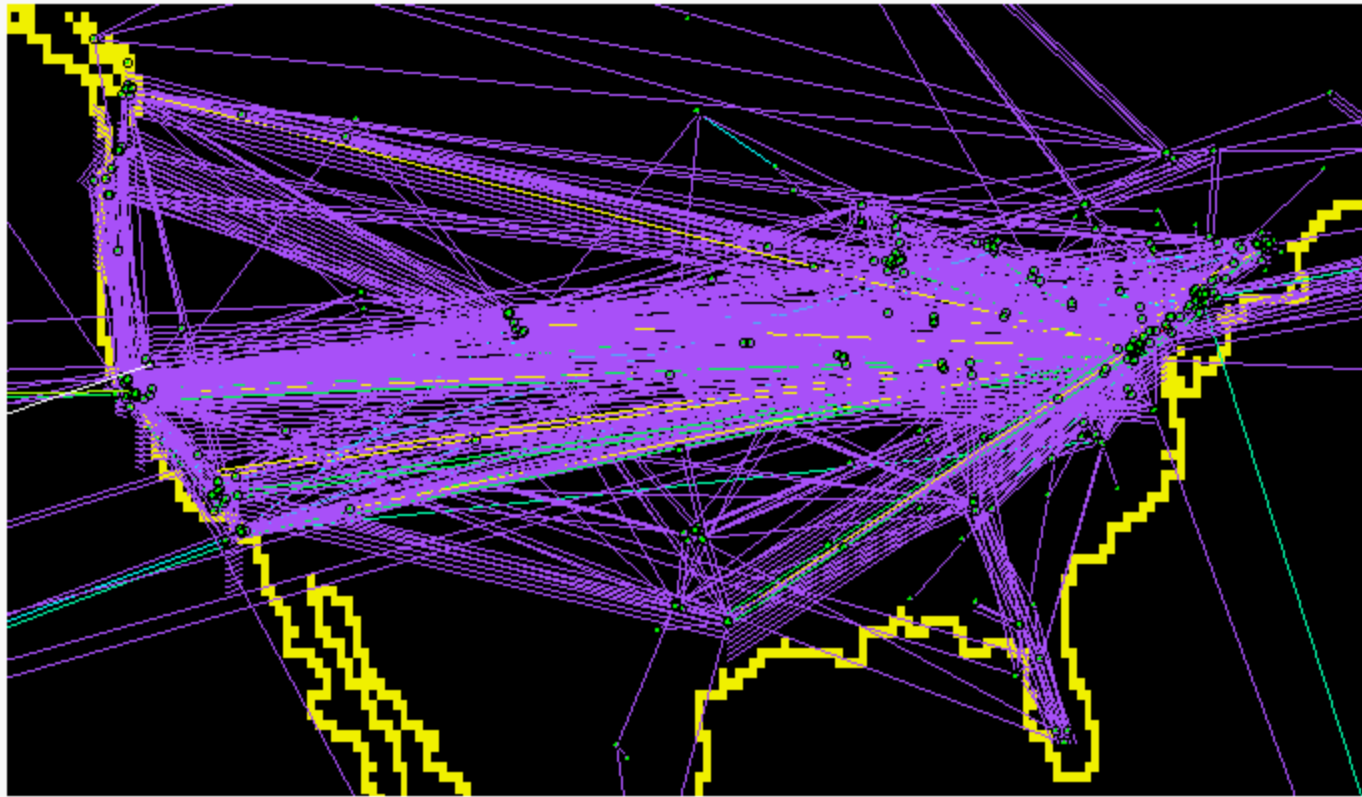


mrinfo indications:

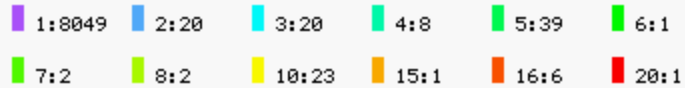
- yellow – tunnel
- green – native (not tunnel)
- red – down

Manta: metric – ‘routing cost’

Mbone infrastructure of US ISPs

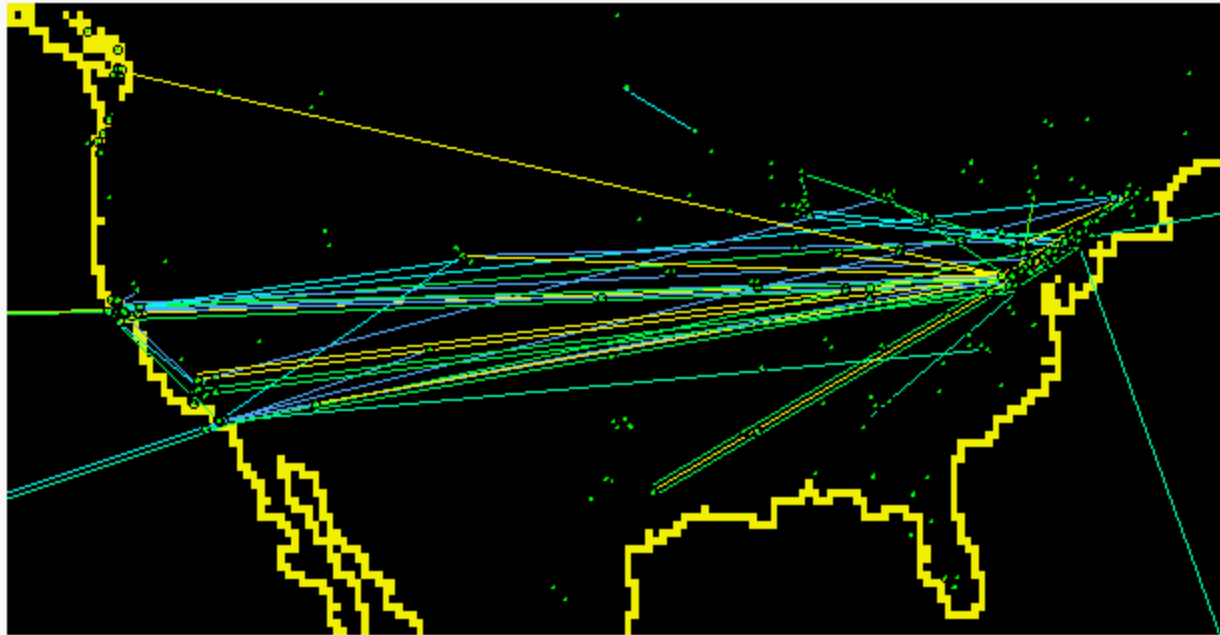


color metric: number of tunnels with that metric

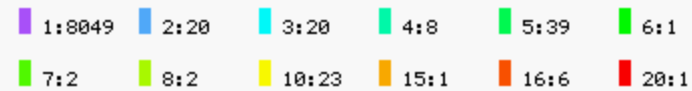


Manta: metric – ‘routing cost’

Mbone infrastructure of US ISPs (tunnels with metric > 1)

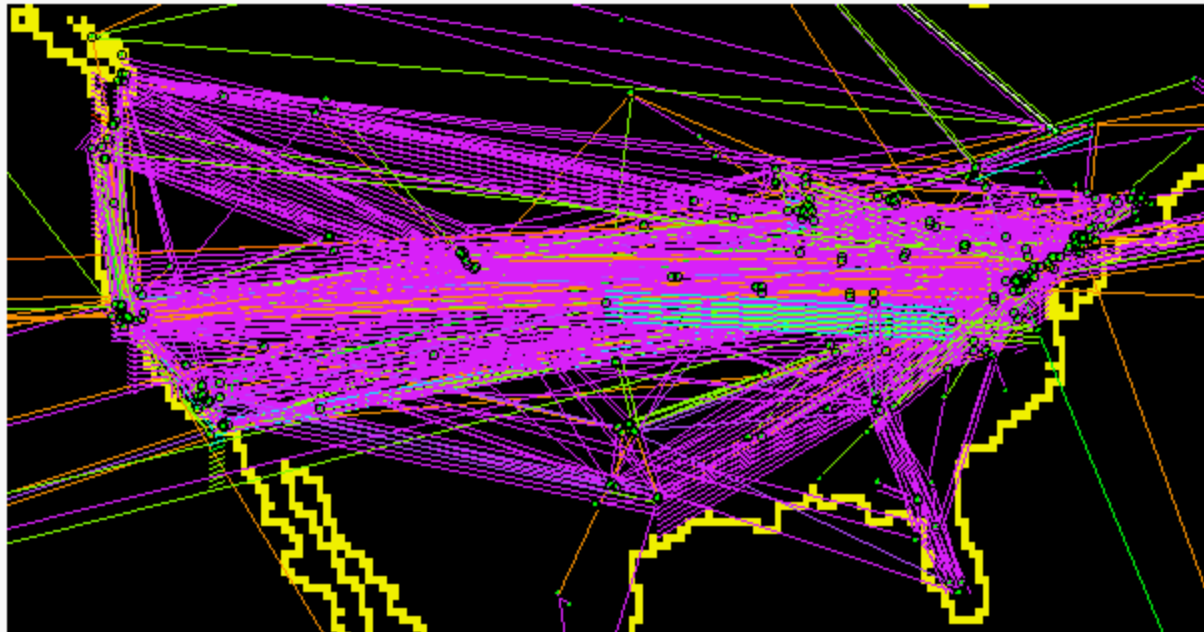


color metric: number of tunnels with that metric



Manta: threshold (topology scoping)

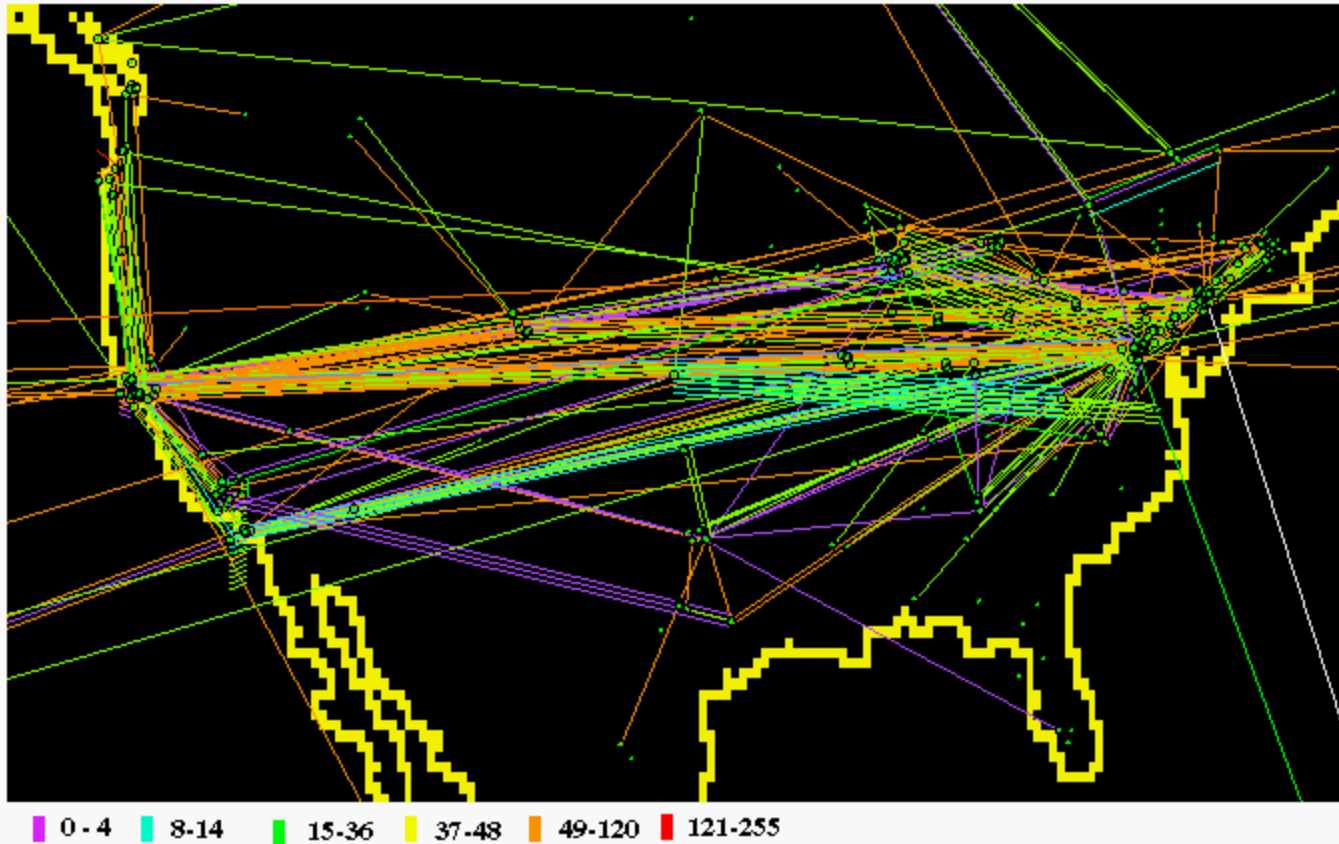
Mbone infrastructure of US ISPs



0-4 8-14 15-36 37-48 49-120 121-255

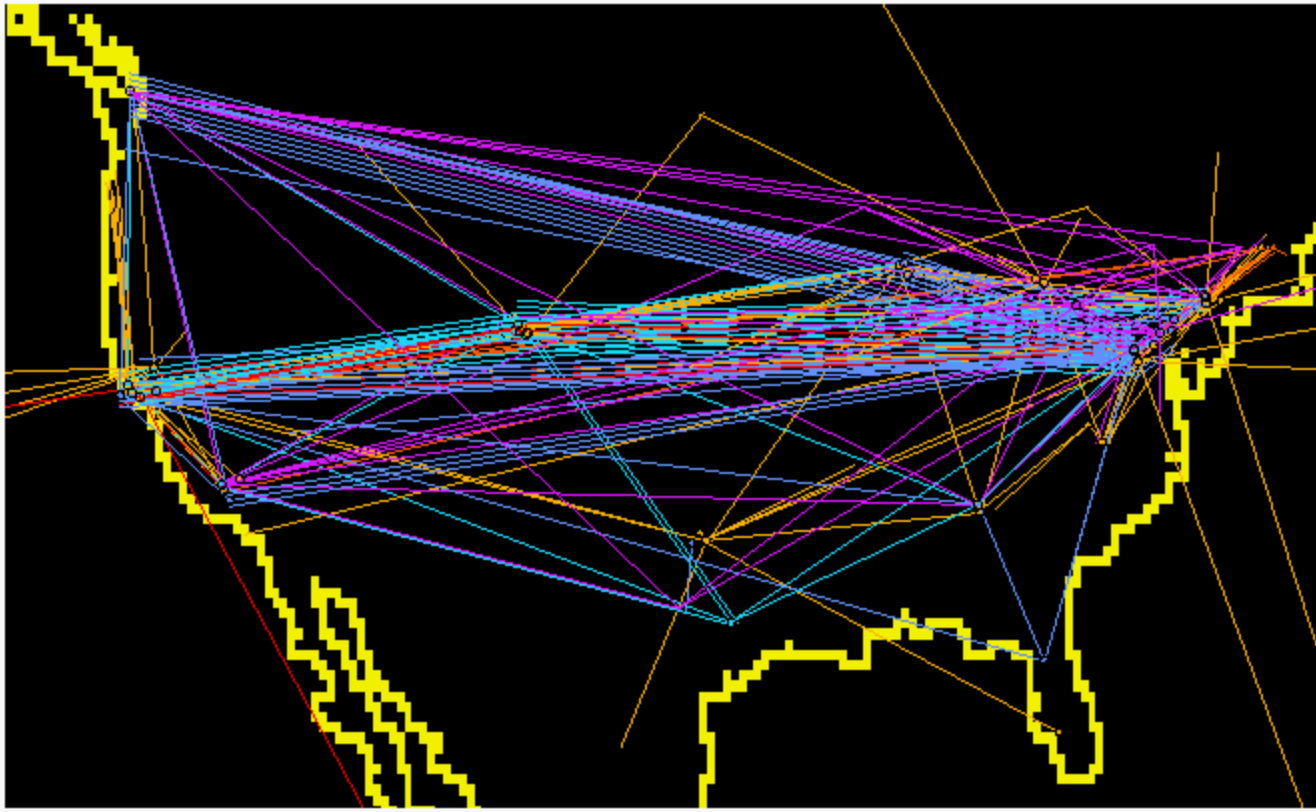
Manta: threshold (topology scoping)

Mbone infrastructure of US ISPs



Manta: by ISP

Mbone infrastructure of US ISPs

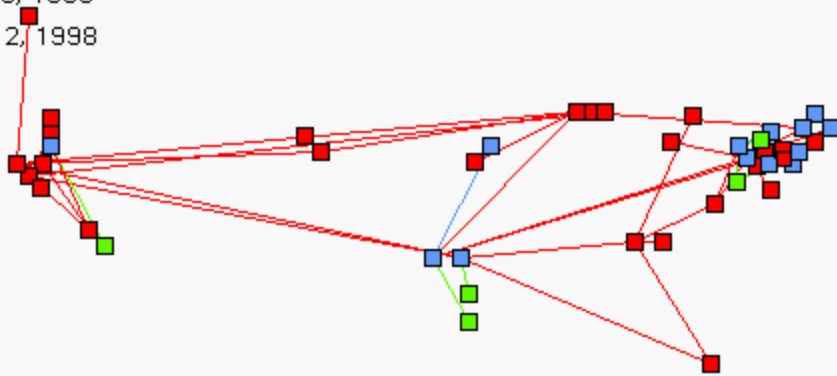


■ above ■ bbnplanet ■ cw ■ quest ■ sprintlink ■ vbns

Manta: firewall blocking topology

Otter: MCI outside (May 12) vs inside (July 26) firewall

Which: when it was found
■ July 26, 1998
■ May 12, 1998
■ both



Conclusion & Futures

Mbone visualizations

- geographic display
- analyze based on Mbone semantics
 - metric
 - threshold
 - degree

- Still want to enhance with
 - gather more geographic data
 - support for live data feed
 - integration with other mbone diagnostic tools

Availability

■ <http://www.caida.org/Tools/Manta>

- Java-based
- interested in feedback/contributions

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