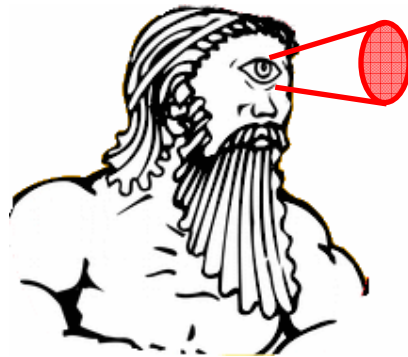


Visualizing Internet Topology Dynamics with *Cyclops*



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Why Visualizing Topology Dynamics?

“Can someone tell me if there are any tools on the net we can use to evaluate ISP X as a possible Tier 1 peer?”

Post @ Nanog mailing list, 5/14/2007

- One approach is to understand how connectivity of an ISP is changing over time
 - E.g. has ISP X been losing customers recently?
- helps in making intelligent choices about who to connect to

What to visualize

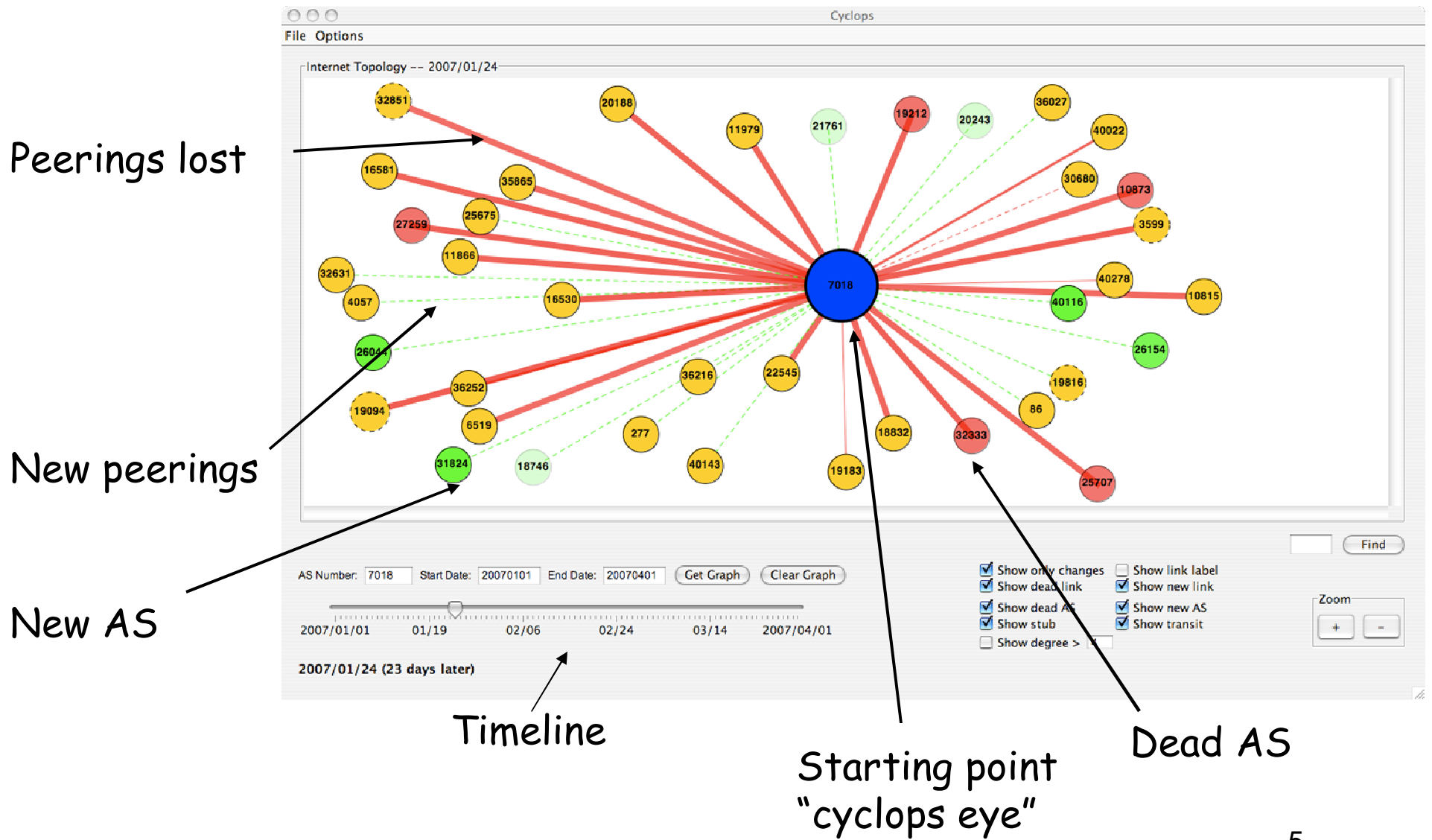
- Changes in AS nodes and AS-links
 - When
 - Where
- Challenge: scaling the visualization
- We developed Cyclops
 - Starting with a specific AS and its neighbors
 - Display connectivity changes over time
 - Selectively display connectivity of other ASes

Our data sources

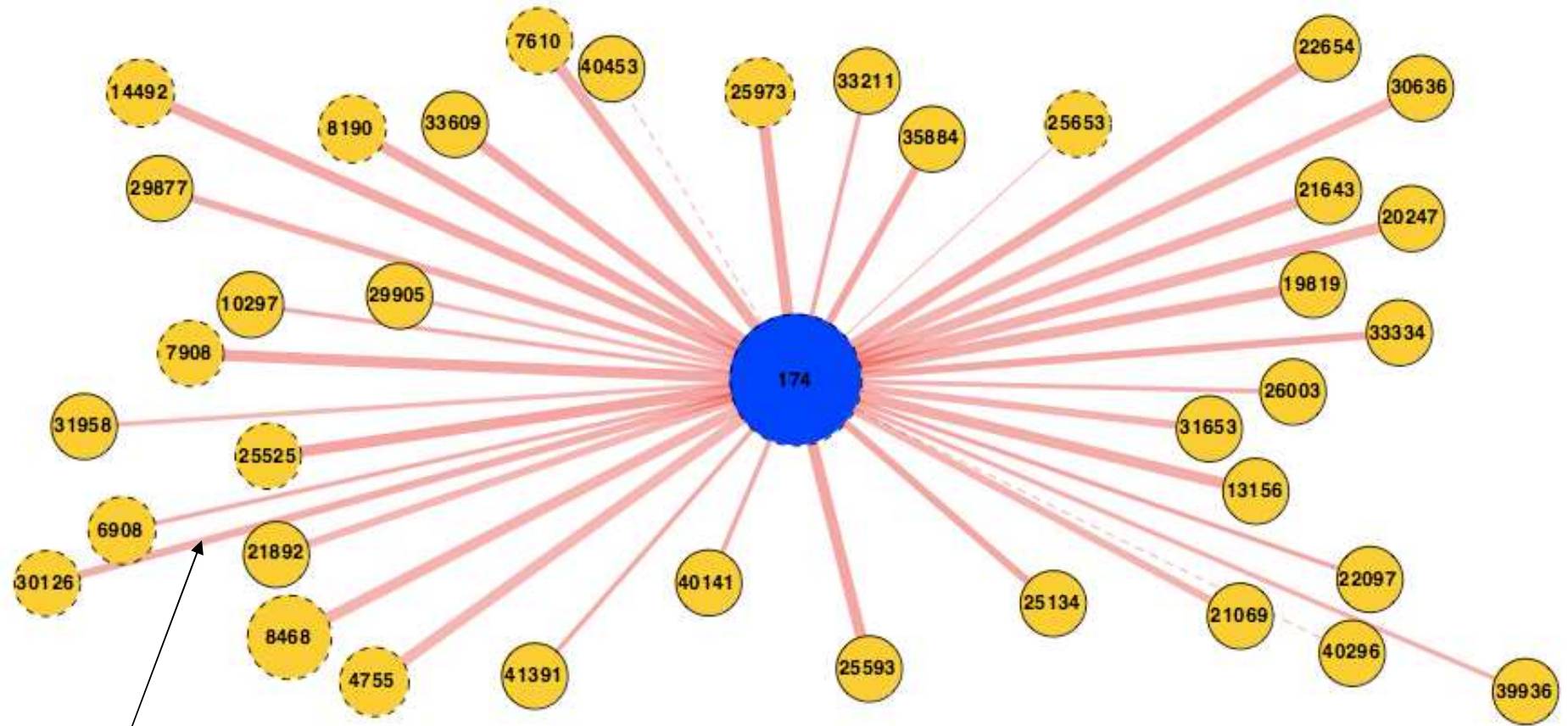
- **BGP routing tables + updates:** Route Views, RIPE, Abilene, CERNET
- **Route Servers:** Packet Clearing House, UC Riverside, traceroute.org, Route Server Wiki
- **Looking Glasses:** traceroute.org, Looking Glass Wiki

The more the better: if you store your BGP feeds and make them available please let me know!

Cyclops user interface



Case #1: Cogent depeerings

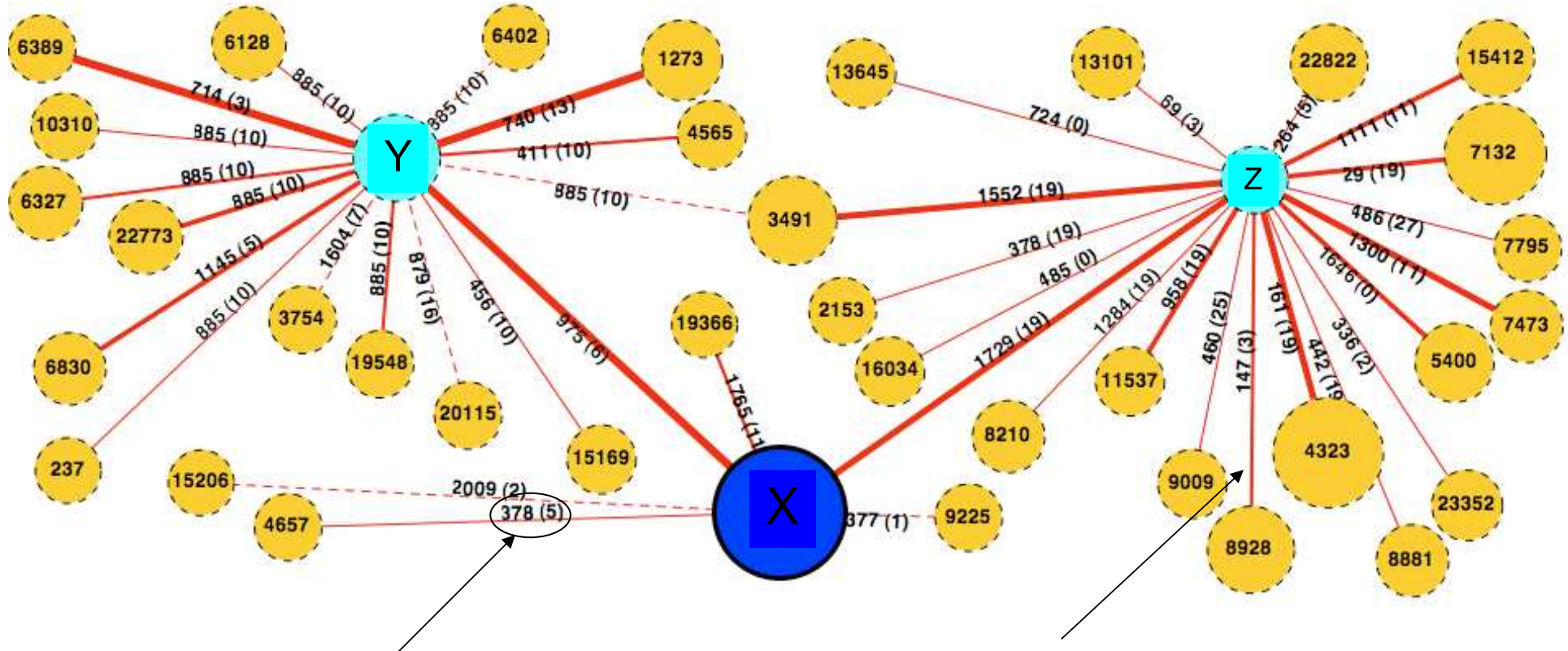


thickness ~ link age

April 2007

Cyclops shows how connectivity is changing over **time**

Case #2: Correlating changes



Link age and relative age

thickness ~ # routes carried

Cyclops enables visual correlation of events across space

Your input is most appreciated!

- Grab me afterwards
 - Play with our prototype
 - Tell me what features you like, what you don't, what you want to see added
- Planning on a beta release of the tool by **September 2007**

Send all questions and
comments to
rveloso@cs.ucla.edu
Thanks!

