visualizing paths and PMTU

Kenjiro Cho, IIJ

visualizing paths and PMTU

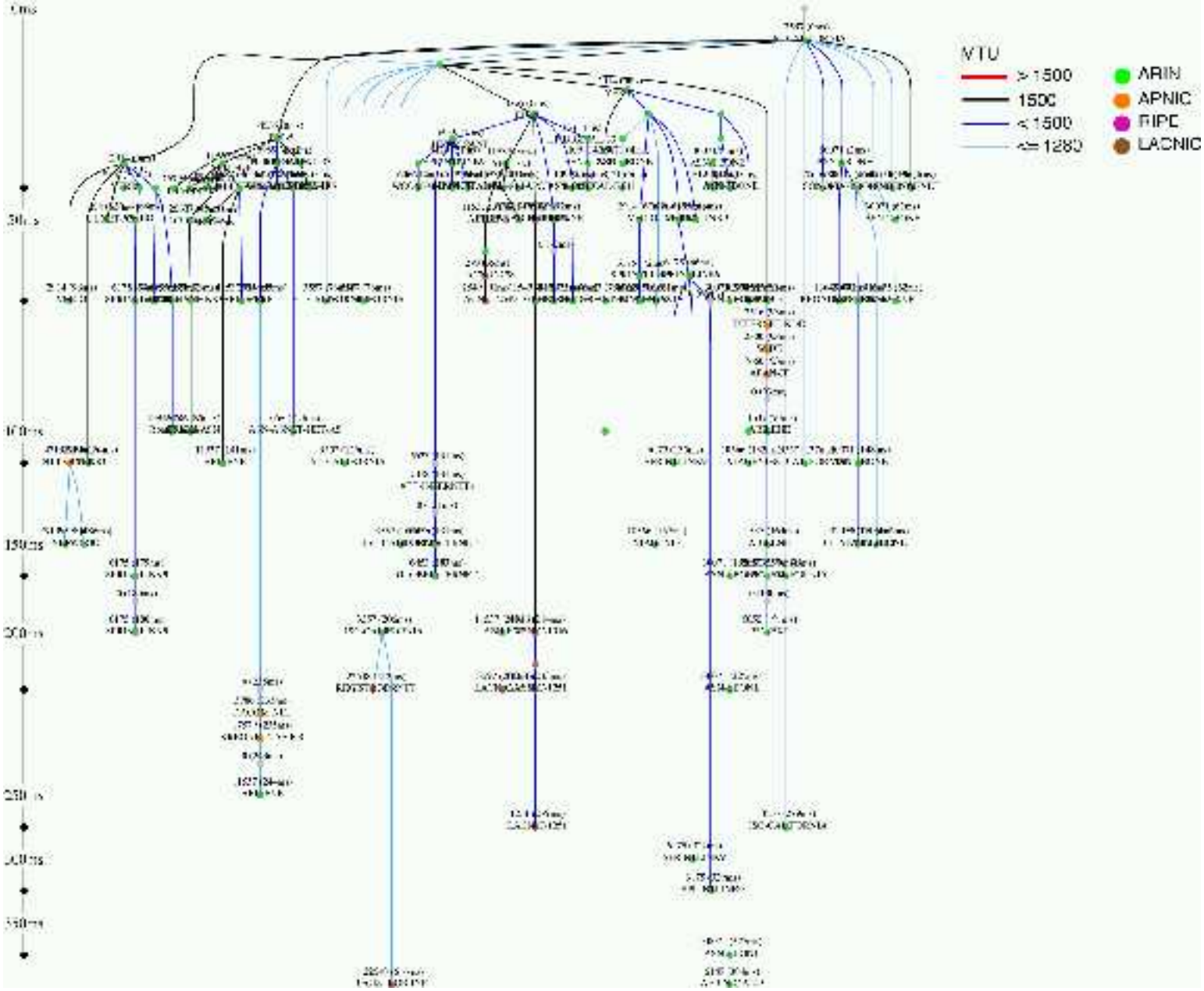
- scamper: parallel traceroute tool for topology measurement
  - outputs are too large to parse manually
- need a macro-level view of results
  - PMTU: to identify tunnels (for IPv6)
  - paths: AS level hops
  - rough RTTs: to understand topological distances

pmtuviz

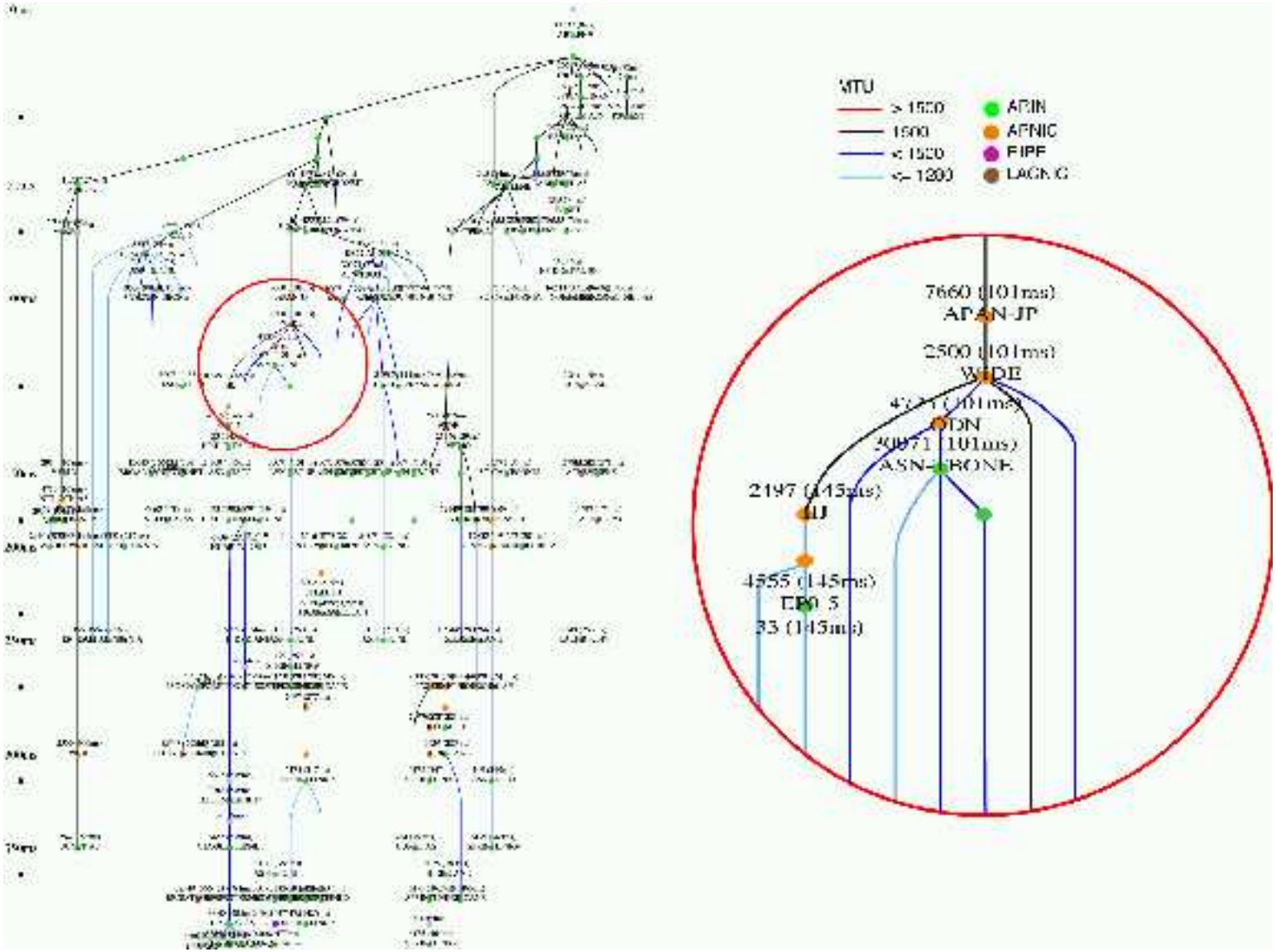
- an experiment for path visualization
  - graphviz (dot) for tree layouts
  - a perl script to produce a dot file
- algorithms
  - add ASN and AS-names to scamper’s output
  - aggregate hops if same AS, same MTU, similar RTTs (diff < 35ms)
  - make RTTs monotonic from root to leaves
  - tweak tree ranks to reflect RTTs

  - divide tree into RIRs (ARIN, APNIC, RIPE-NCC)
  - use colors to show PMTU and hops’ regions

an example graph from ISC to ARIN sites over IPv6



an example graph from NYSERNET to ARIN sites over IPv6



Abilene case: a well-known problem

- Abilene has been trying to encourage IPv6 adoption
  - NO-AUP, tunnel services for IPv6
- but ended up with horrible IPv6 paths, mostly with tunnels
  - ISPs are reluctant to move to paid IPv6 connectivity
- Alilene is thinking about suspending relaxed AUP for IPv6

discussions

- pmtuviz: a tool to visualize macro-level paths and PMTU
  - still under development
- goals
  - started to identify tunnels
  - but could be a generic tool to visualize traceroute outputs
  - or, jumbo frame debugging
- graphs are still too large and need more aggregation
  - currently show PMTUs, AS paths, RTTs
  - where to focus (what is an effective way to use this tool?)
- results from WIDE, IIJ, ConsulIntel, NYSERNET, ISC
  - larger scale measurement?