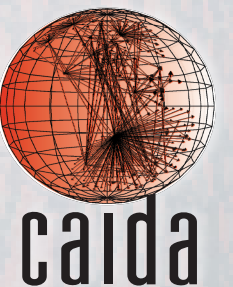


# INTERNET INTERDOMAIN CONGESTION

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Pls - **KC Claffy** (CAIDA)  
David Clark (MIT)



# BACKGROUND

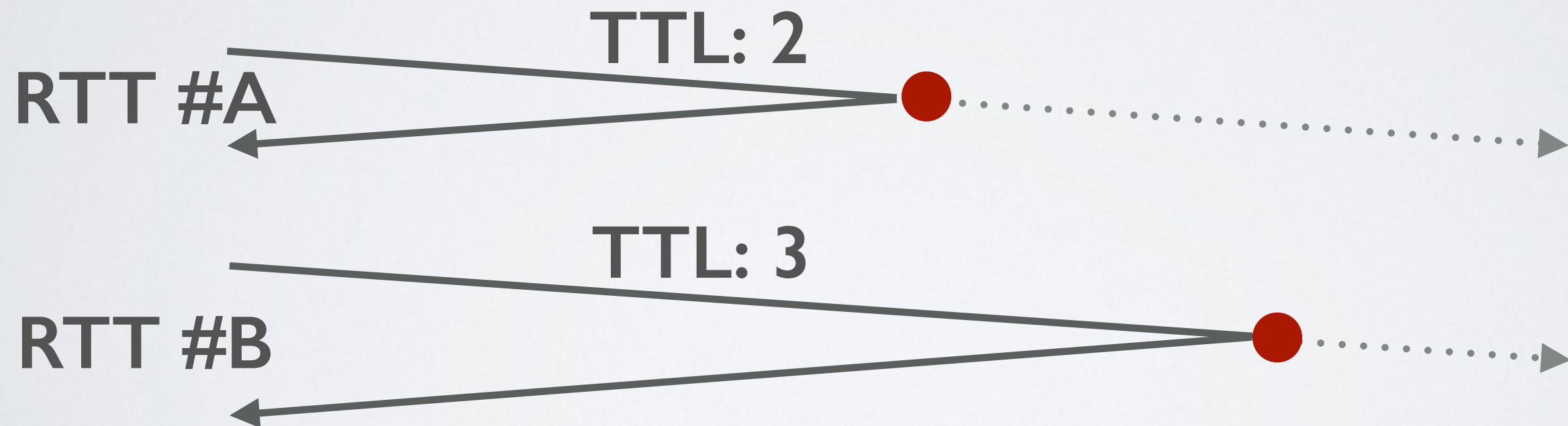
- Modern peering disputes manifest as congested links
- Disputes among access, content, and transit providers
- Some content is carried over inadequate links between access and transit networks
- **Congestion on transit links affects everybody**, not just parties to the peering dispute

# METHOD: TIME SERIES PING



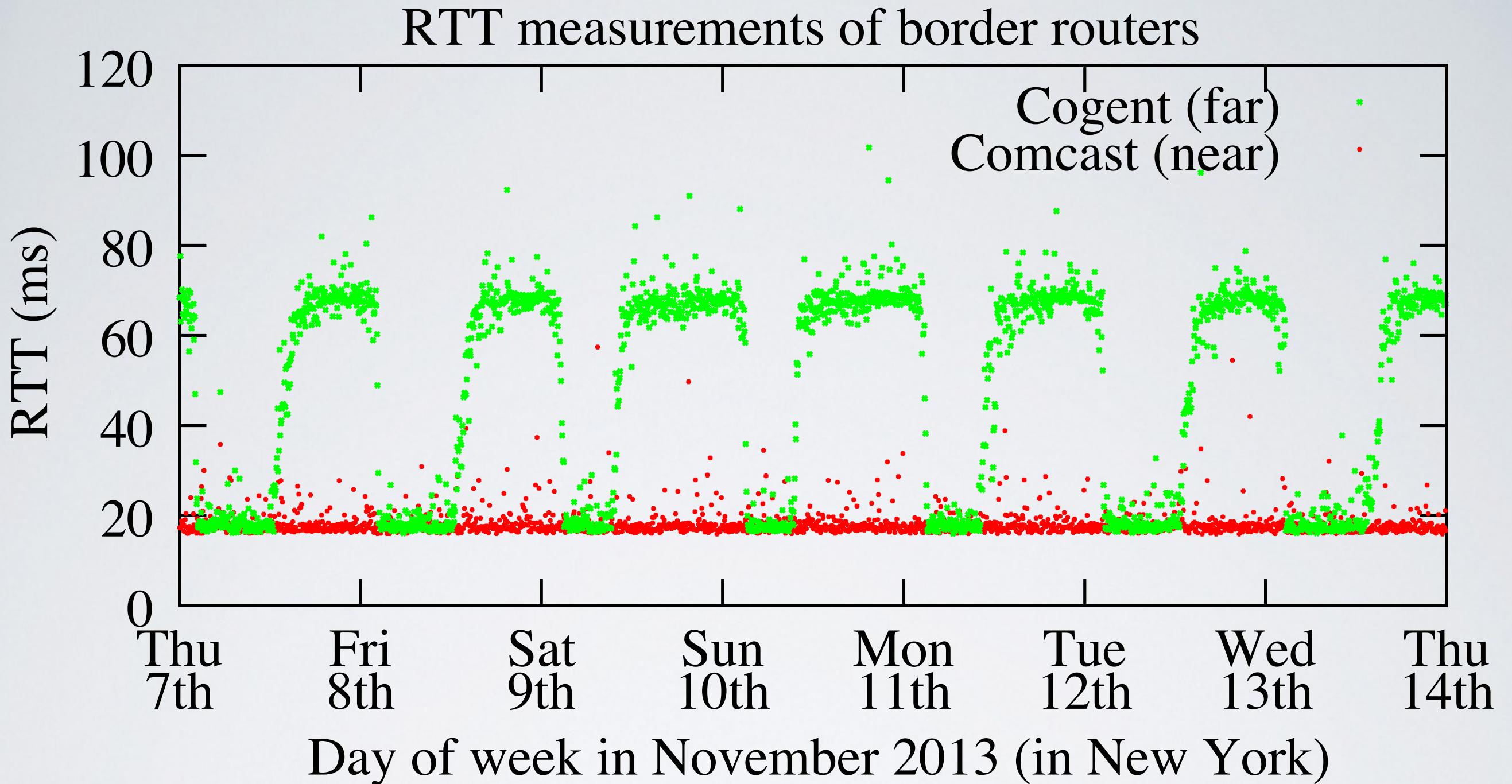
Vantage Point

Border Routers on Interesting Link



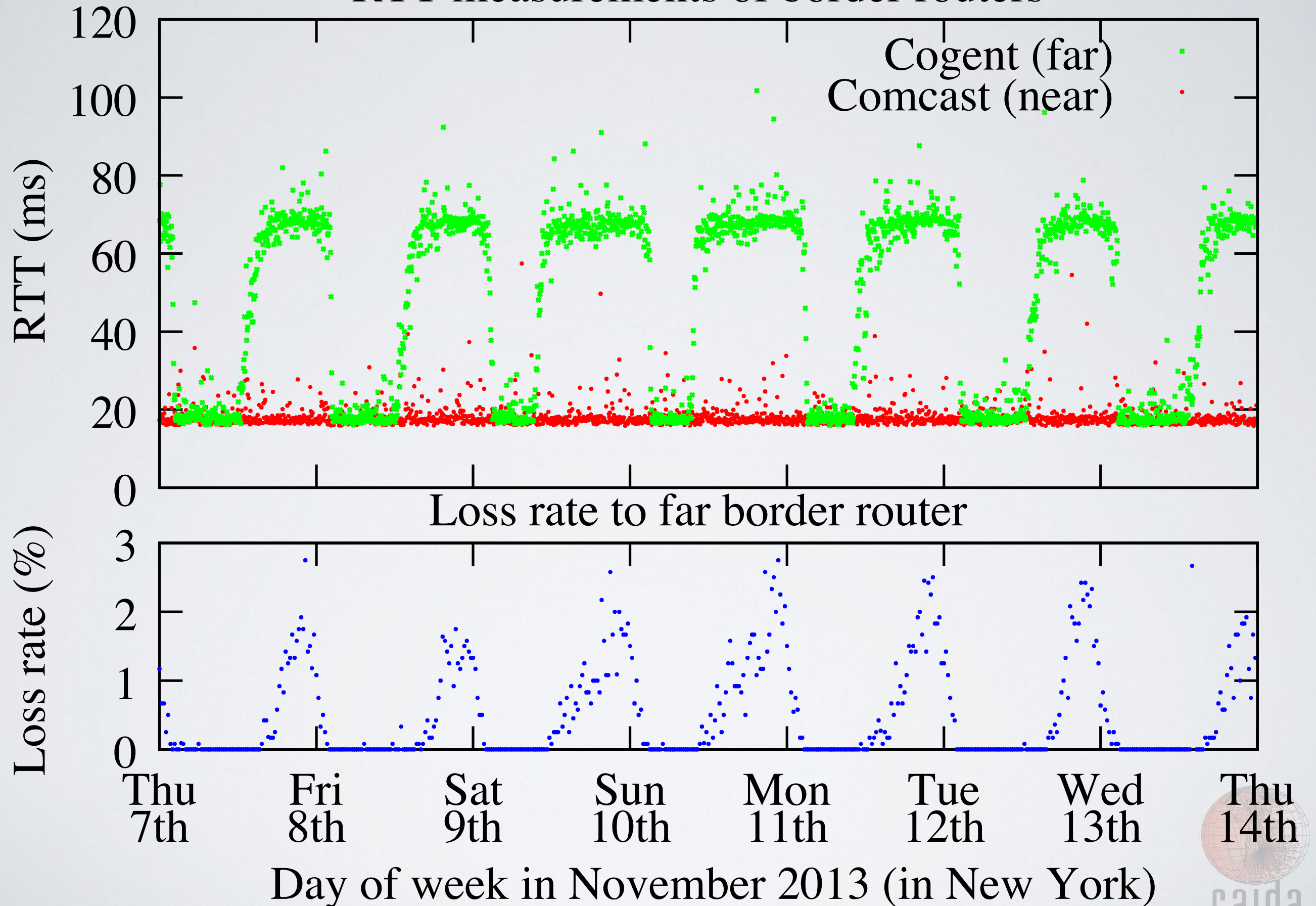
*(repeat to obtain a time series)*





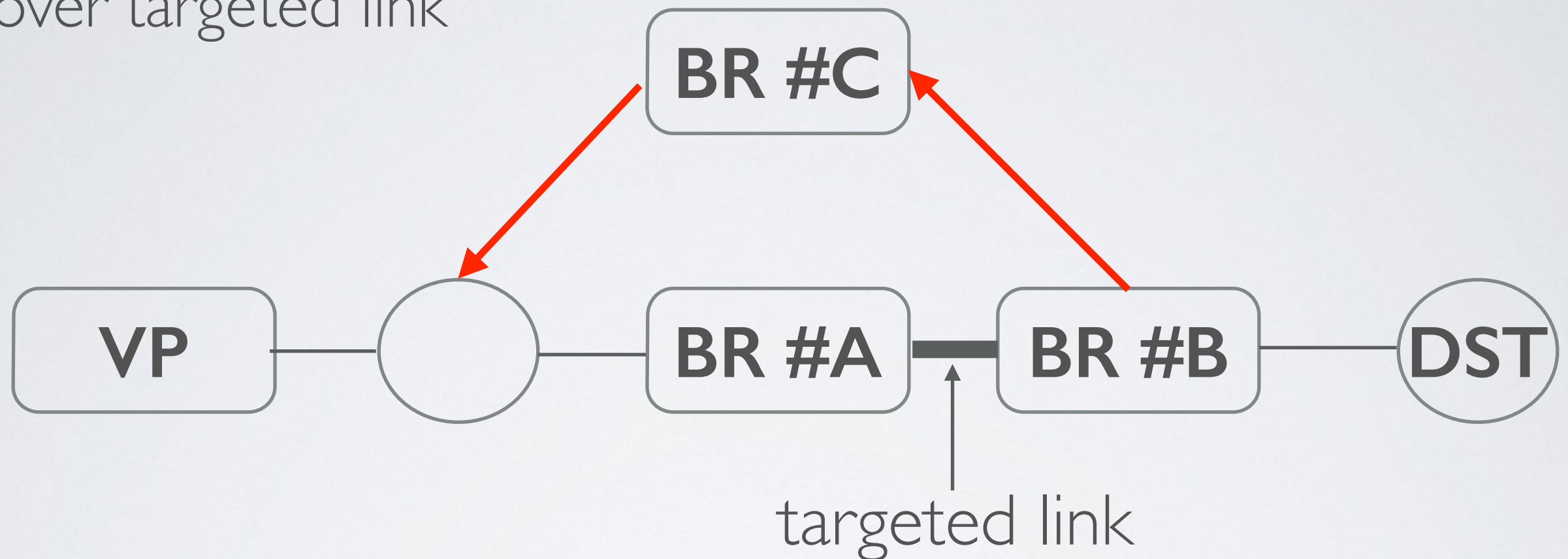
**More congestion on weekend than weekdays. Monday 11th was Veterans Day**

# RTT measurements of border routers



# CHALLENGE: REVERSE PATH

- Difficult to know that the response from far router returns over targeted link

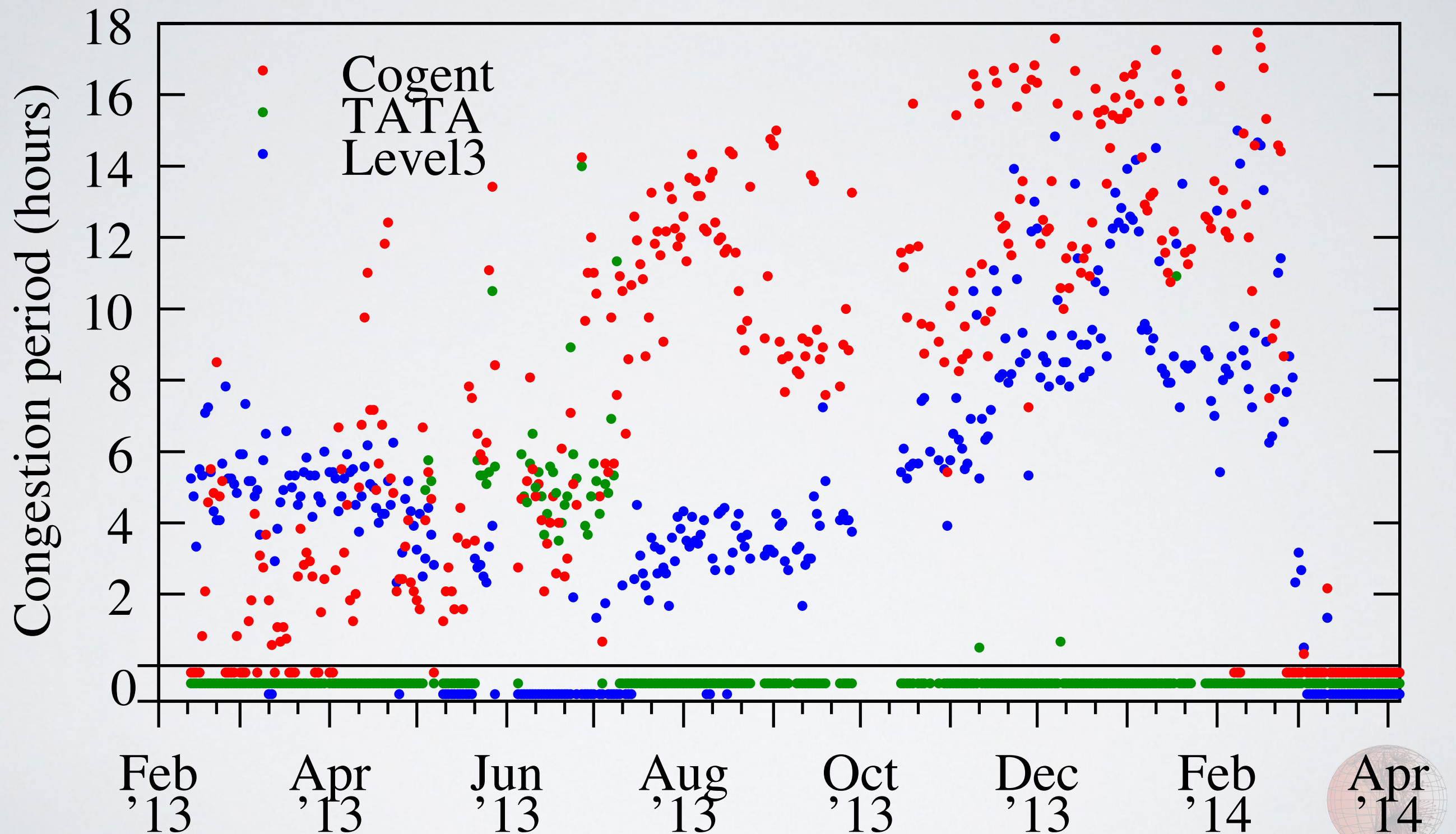


**Methods that support inference:**  
**Reverse path traceroute, IP record route,**  
**IP timestamp option, tomography**



# CONGESTION TRENDS

*(three transit links of Comcast in Bay Area over time)*



# CONGESTION TRENDS

- Two interpretations
  - ability of content providers to shift traffic “firehose” (from Level3 to TATA in June 2013)
  - demonstrates year-long, worsening, congestion patterns until Netflix / Comcast peering agreement)

