

AutoPerformance

Network Benchmarking for Power Users

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The Problem

- Internet Service Providers often don't provide the speeds that they advertise to residential clients.
- How can we find out?
- Speedtest.net, speakeasy.net, ISP provided tests.
 - Can they be trusted?
 - On demand testing only
 - Don't provide rich test data

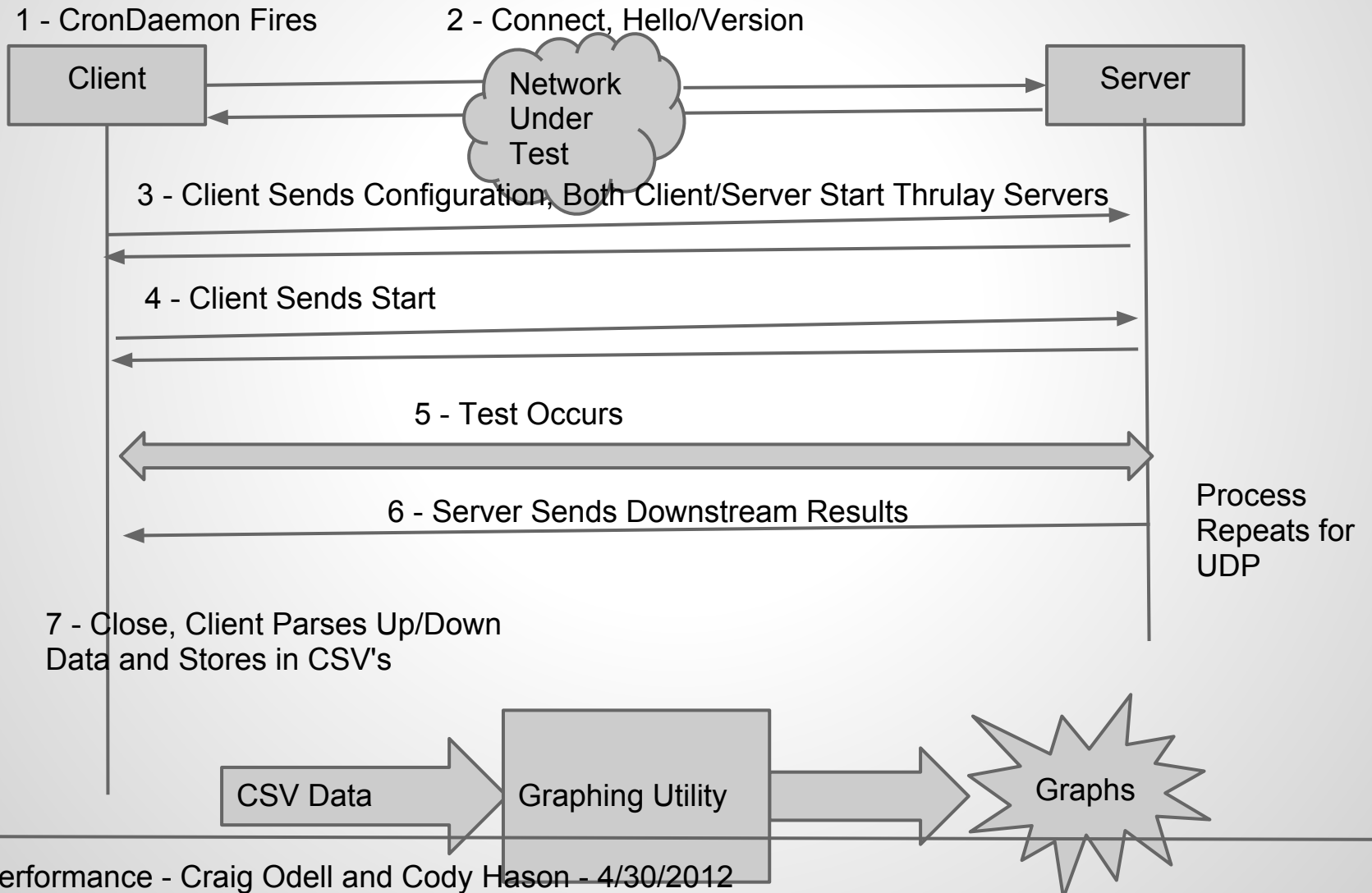
AutoPerformance Overview

- Linux software deployable on commodity hardware endpoints.
- Precision network performance measurements for UDP and TCP.
- Bi-directional testing.
- Automated graph and report generation.

Software and Methodology

- Software
 - C
 - Thrulay - Similar to iPerf (a network performance tool)
 - Python
 - Client:
 - Daemon running in cron-like fashion connects to server and performs tests
 - Server:
 - Daemon running threaded TCP server
 - Matplotlib graphing library (Python Graphing Library)
- Collected data between two linux machines at our houses.
 - Each house has the same level of service from the same ISP (should be most ideal case for achieving max throughput)

Flow



Measurements and Metrics - TCP

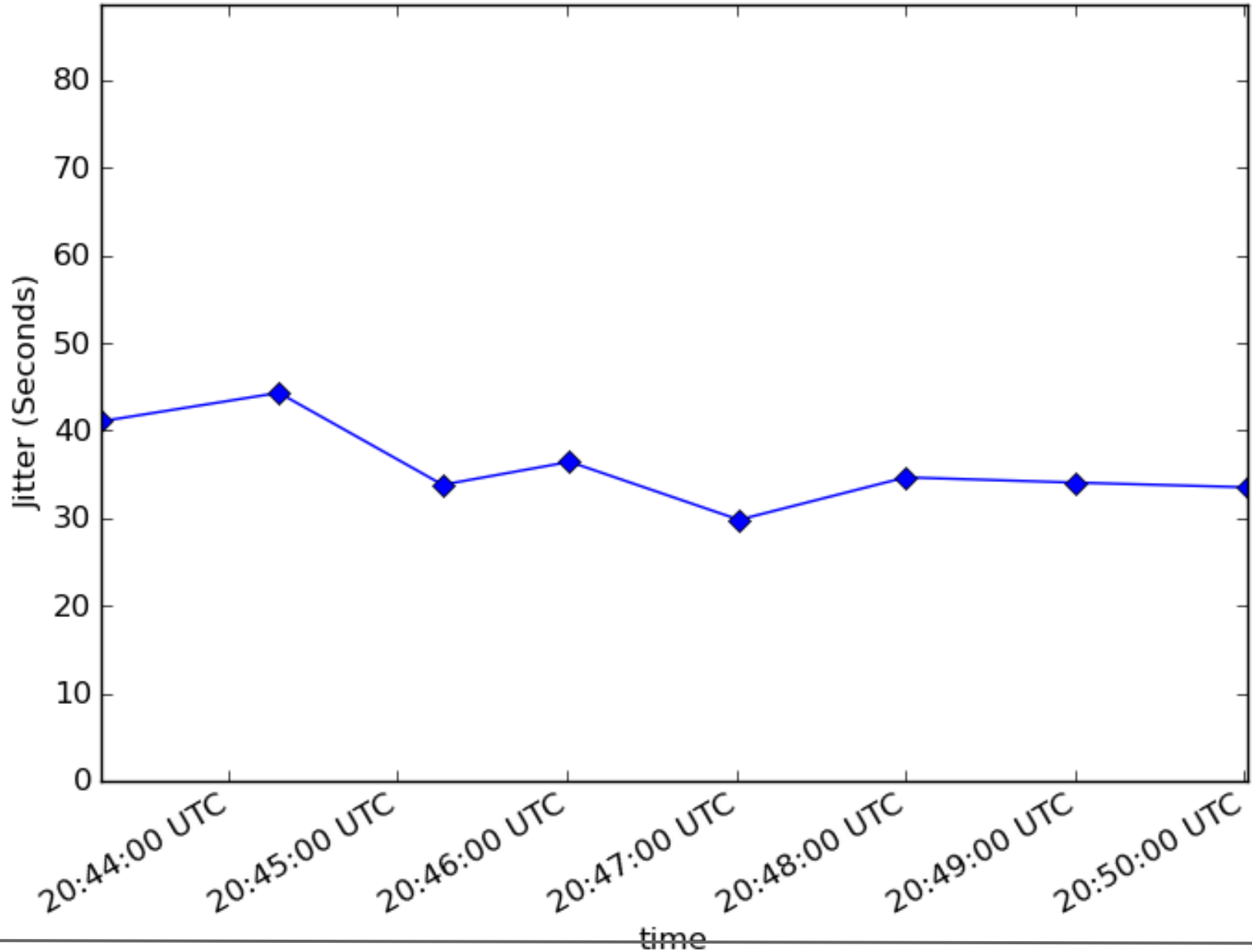
- Throughput
- Round Trip Time
- Jitter - Delay Variation

Measurements and Metrics - UDP

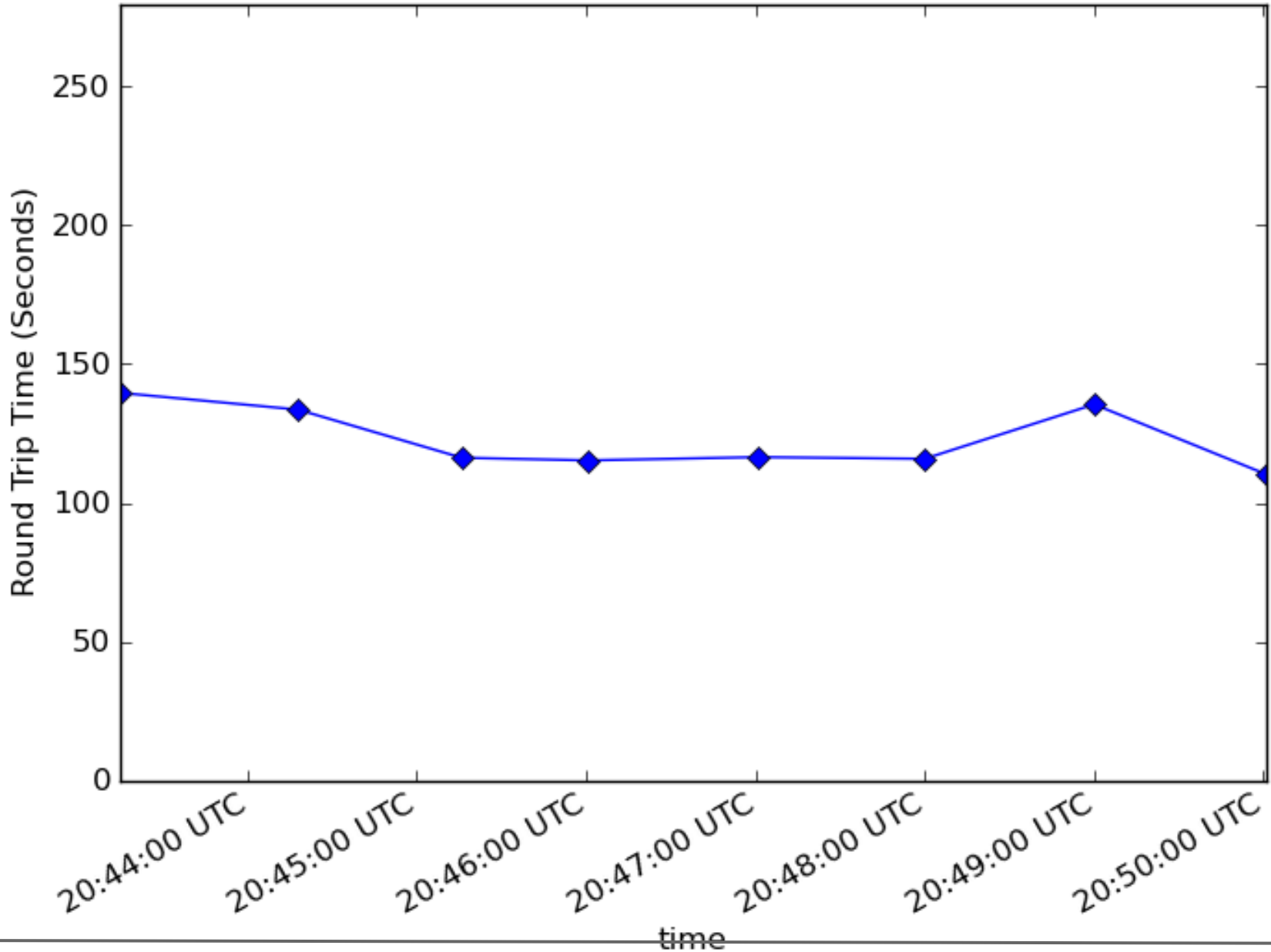
- Throughput
- Loss percentage
- Jitter - Delay Variation
- Duplication percentage
- Reorder percentage

Some Results

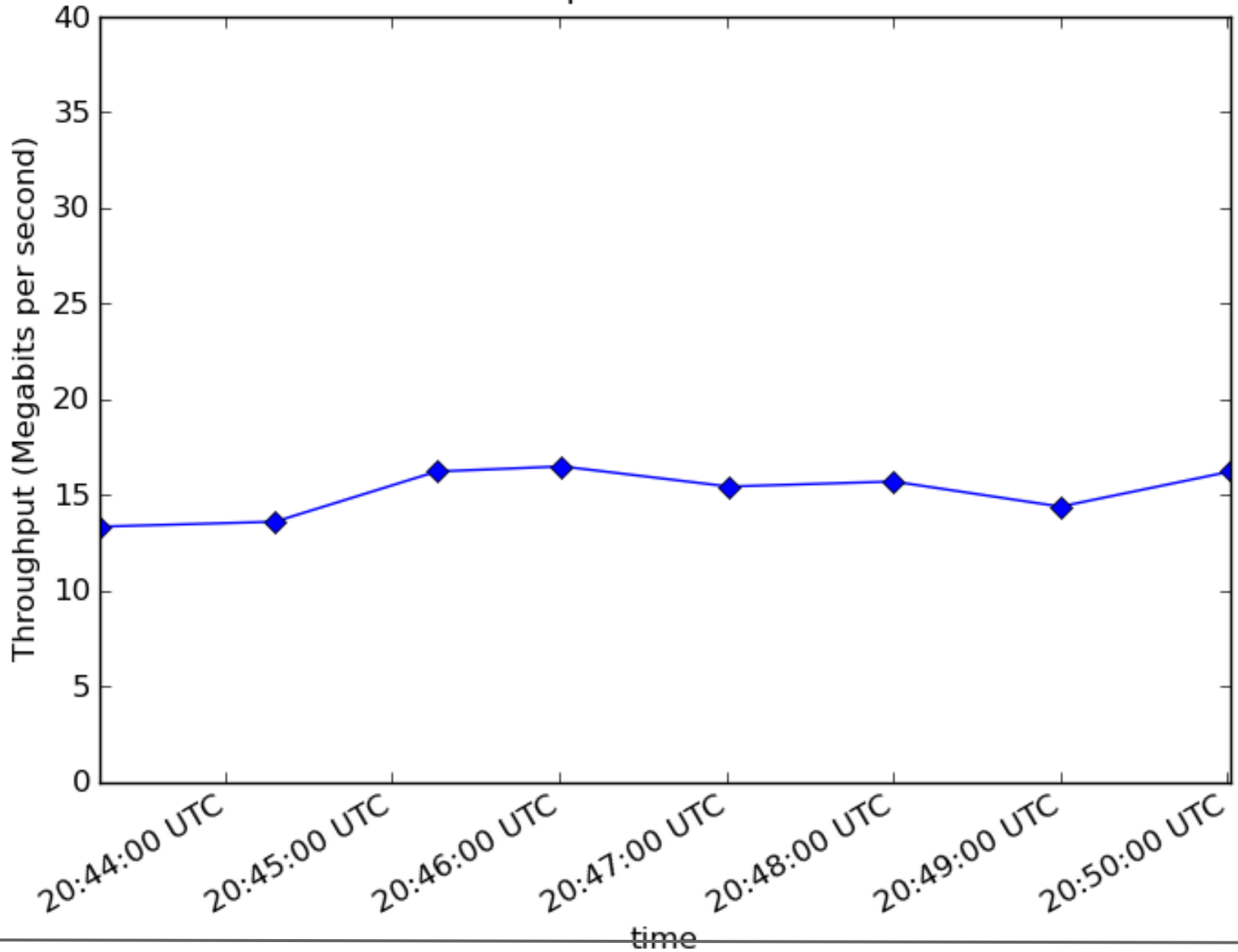
TCP Jitter



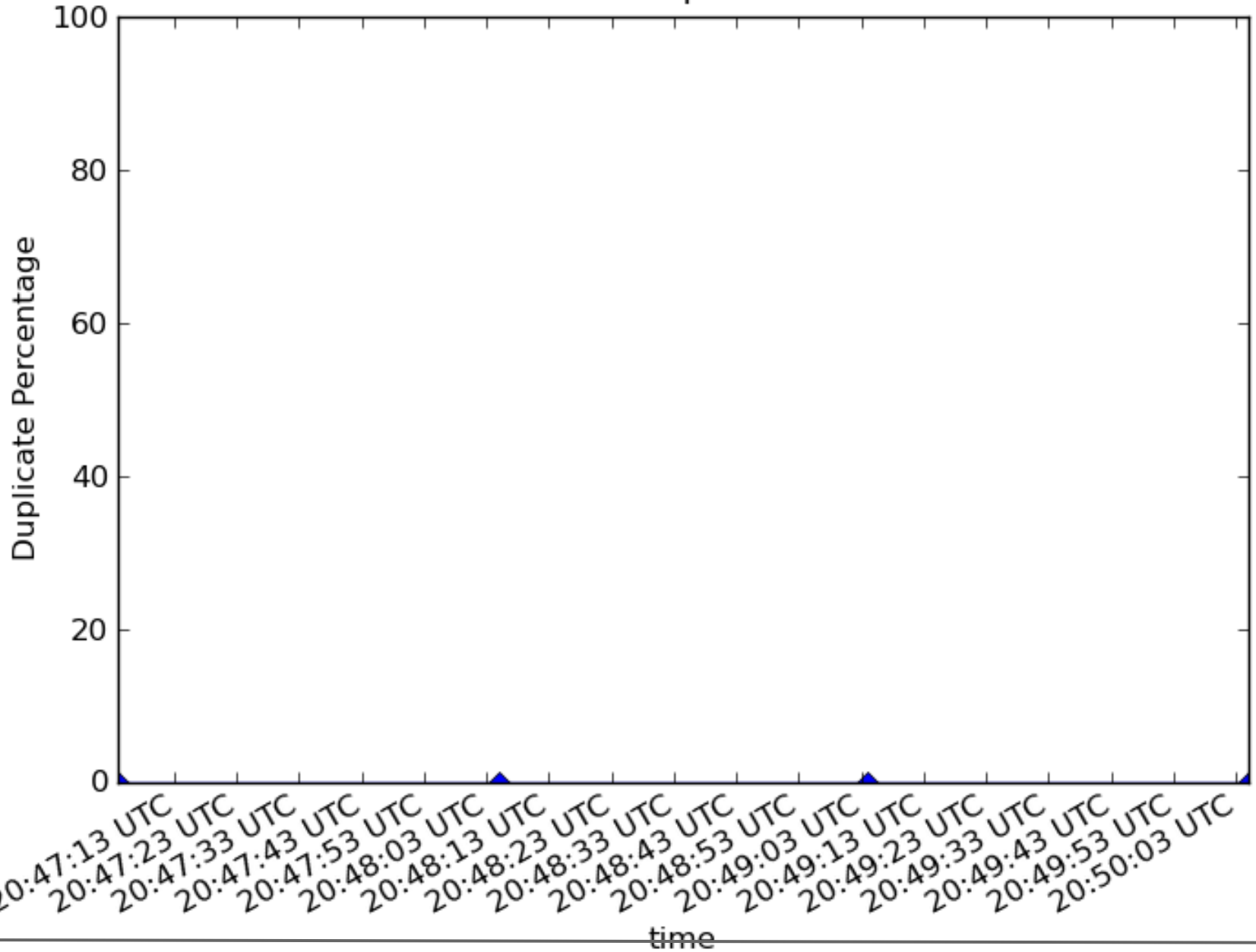
TCP Round Trip Time



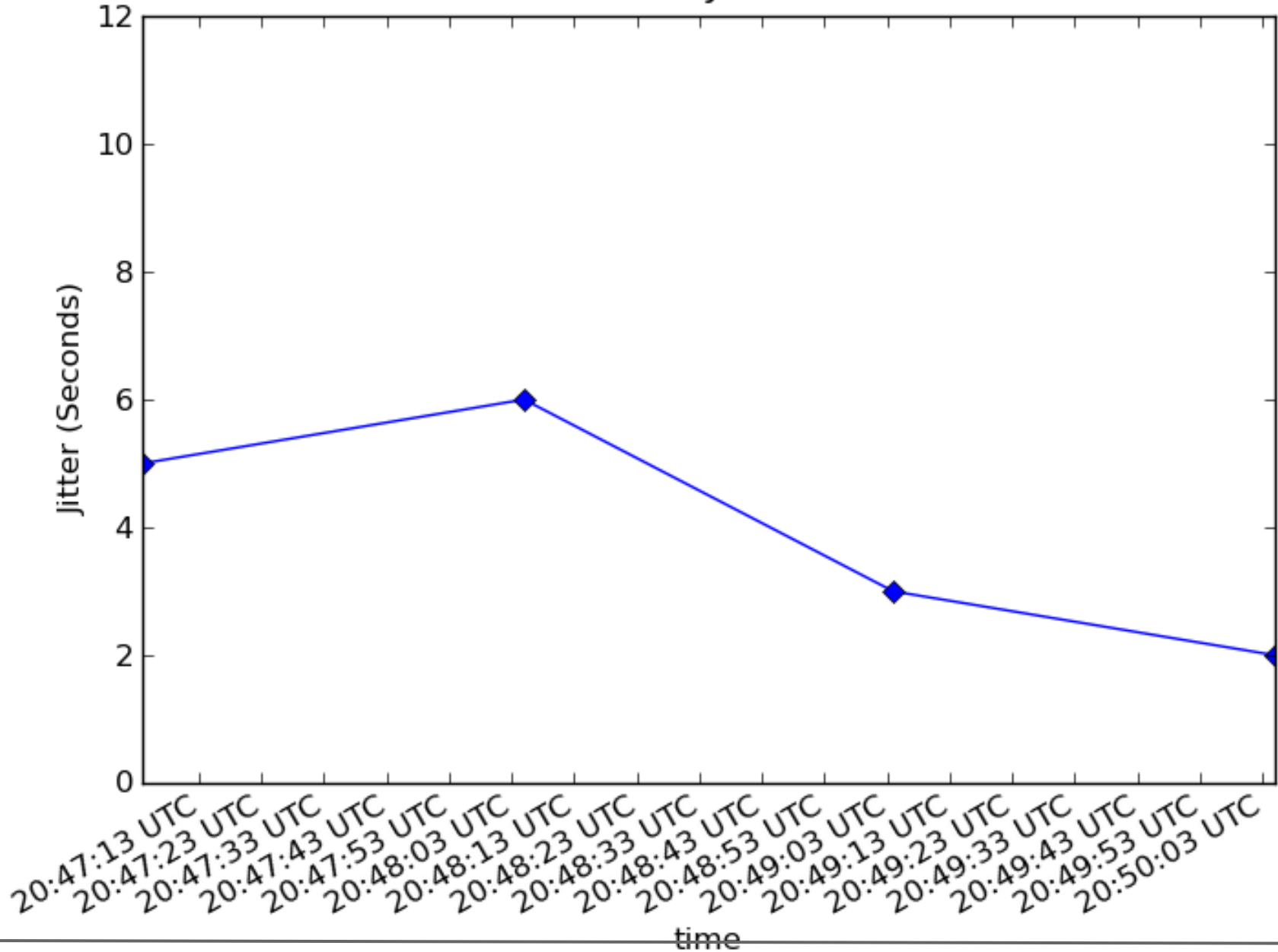
TCP bits per second VS time



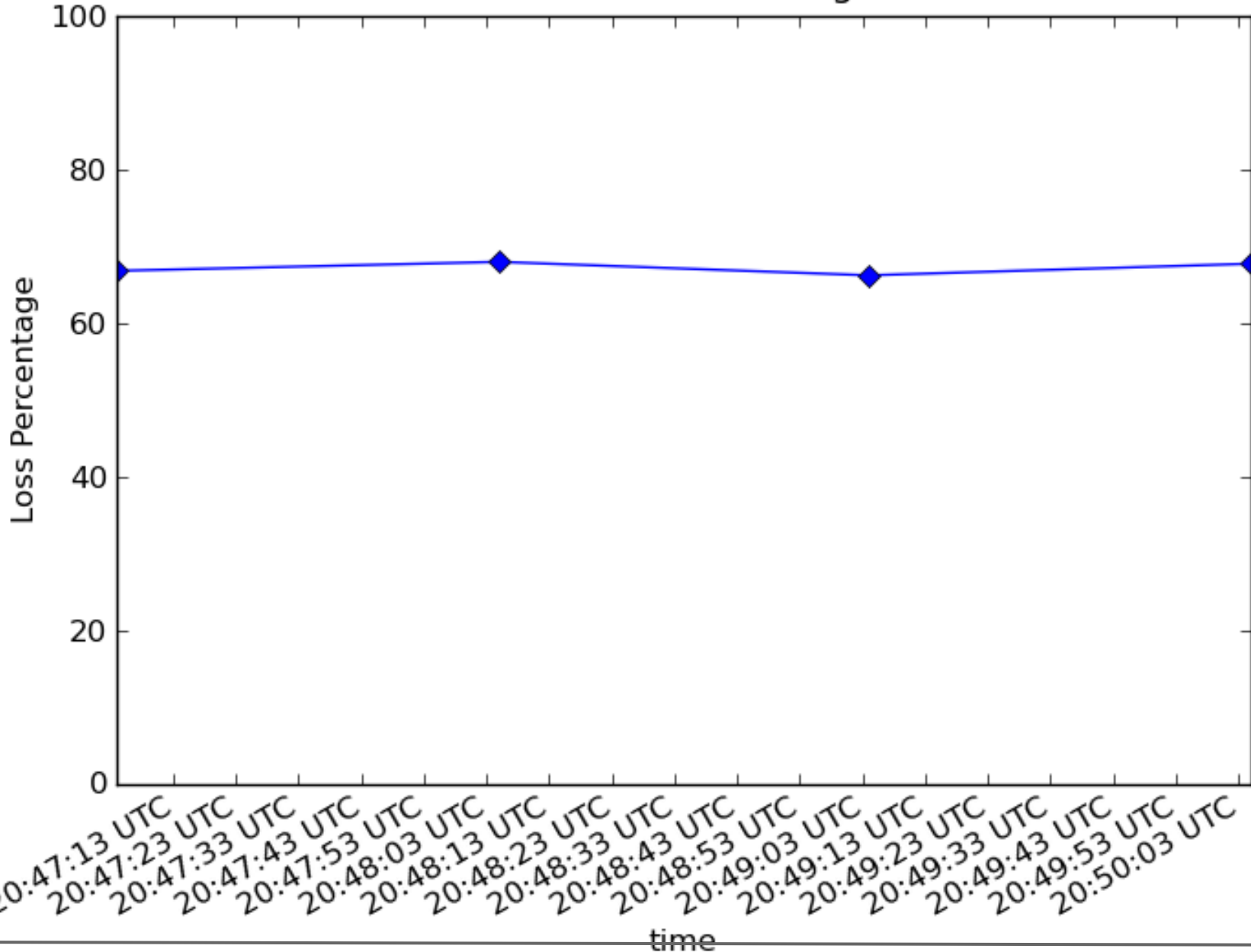
UDP Duplicates



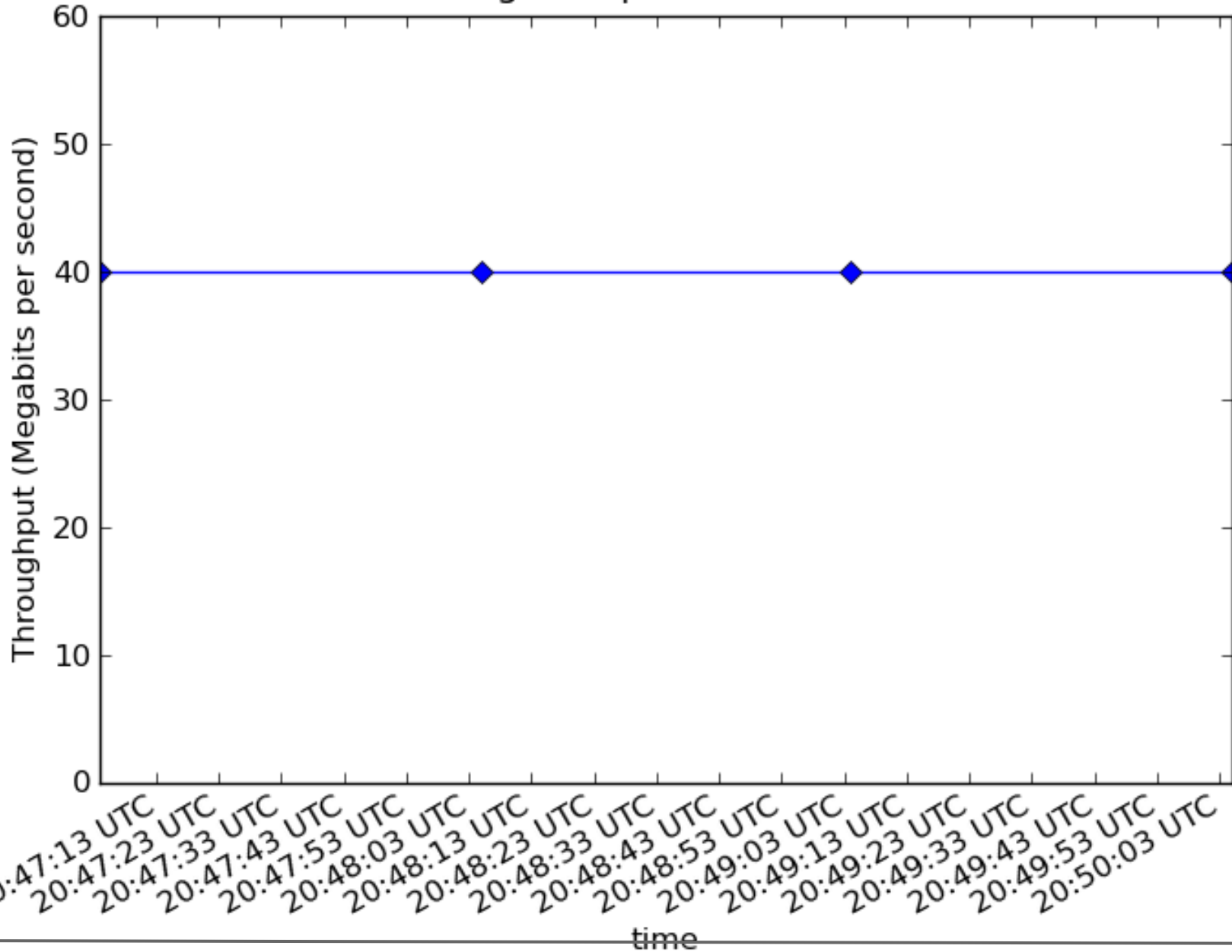
UDP Jitter



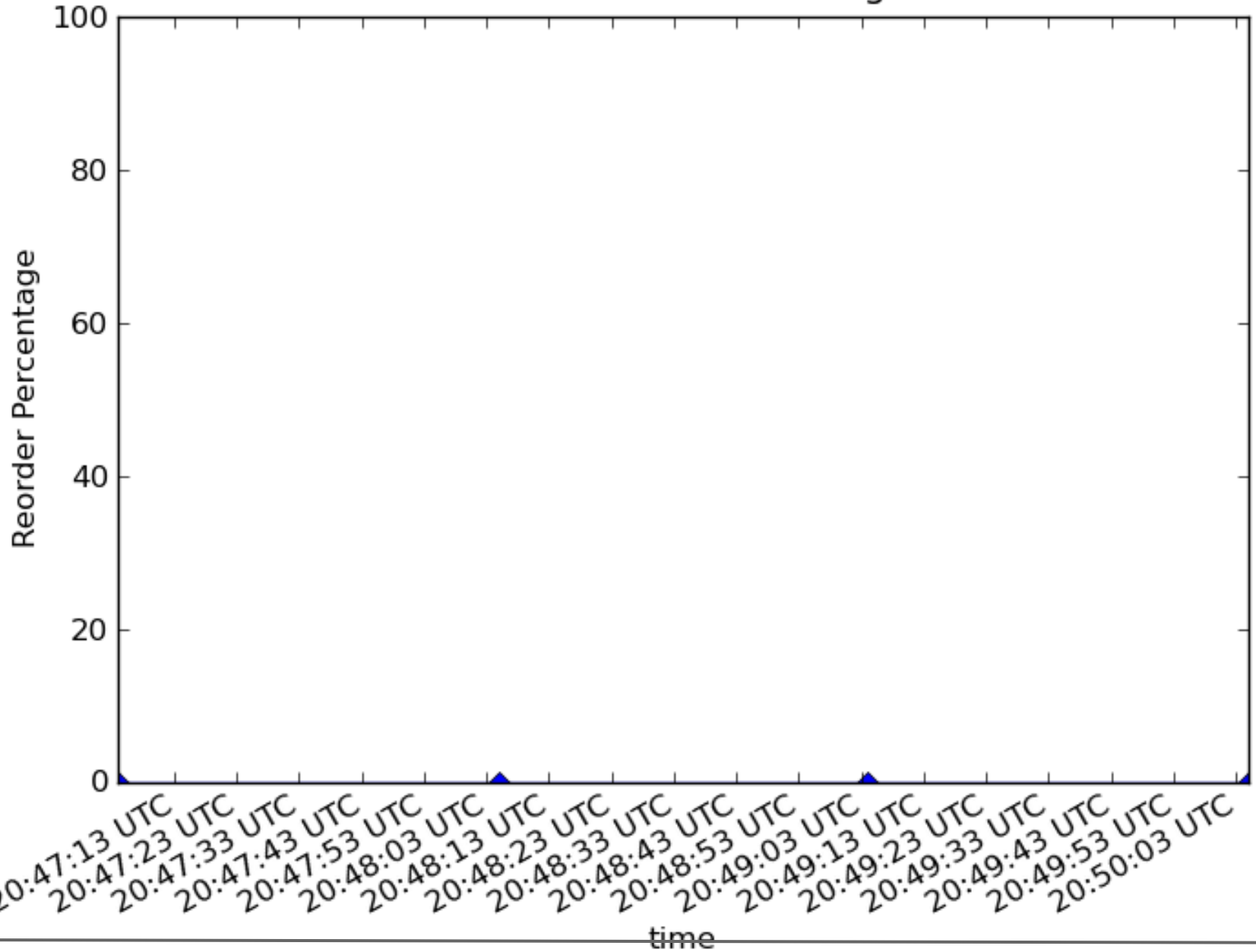
UDP Loss Percentage



UDP Megabits per second VS time



UDP Reorder Percentage



Conclusion

Accomplishments:

- Successfully created a daemonized client-server tool that trends a rich set of metrics.
- This tool can be used to help quantify the service level agreement dilemma.

Observations:

- While the metrics we've gathered thus far are aligned with our expectations, some of the latest data collected suggests consumer-grade service declines during high-use time periods.
- If this tool were to be widely used it could provide great visibility into the status of service provided over time.

References

- Thrulay Homepage <http://thrulay-hd.sourceforge.net/>
- Matplotlib Homepage <http://matplotlib.sourceforge.net/>
- Autoperformance on Github
 - <https://github.com/codyhanson50/AutoPerformance>