

Metrics for the Root Servers and Root Server System Discussion

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Goals - current stage

1. Determine how many (and which ones) of the measurements proposed by the RSSAC metrics WP are already collected by the RIPE ATLAS.
2. Download and analyze a subset of the existing RIPE ATLAS measurements on the Root Server System (RSS) in the past month (every measurement from every probe for every day), apply algorithms of the work party draft metrics, and produce a graph for each of the metrics for all the root server identities and the RSS.

Goals - future stages

3. Provide an estimate of the implementation feasibility and level of effort for the measurements that are not currently collected by the RIPE Atlas project
4. Implement as many measurements as currently discussed in the RSSAC Metrics WP as possible, and collect up to 15-30 day worth of data on these measurements.
5. Analyze tradeoffs between sampling frequency and data quality, determine how many probes and how high of a sampling rate is needed to achieve a 95% and 99% confidence interval.

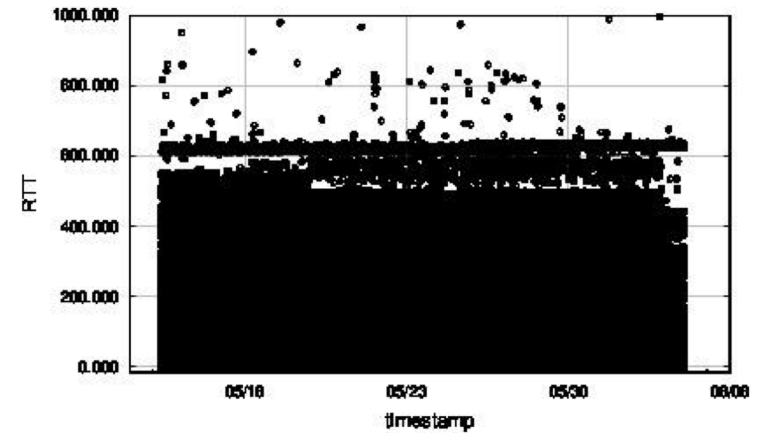
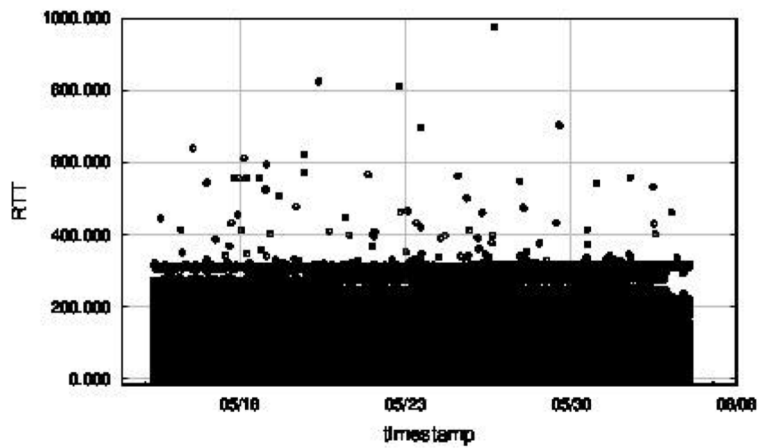
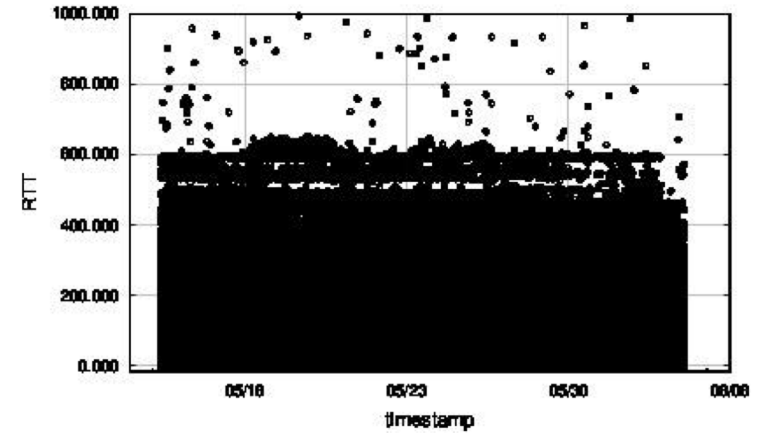
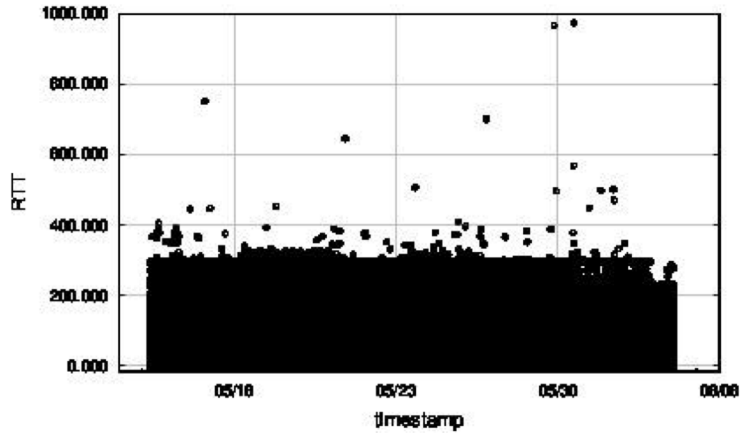
RSSMON - overview

- Python prototype code <https://github.com/jtkristoff/rssmon>
- Fetch active RIPE Atlas anchors (~500)
- For each root, daily fetch IPv4/IPv6/UDP/TCP SOA query results
- Data results per root per day: ~85,000 rows
- 3+ weeks of data total: > 25 million rows
- Anomalies (rare): empty results, outlier values, bad data
- Graphs built using Gnuplot
- TODO: parallelize RIPE Atlas data fetching
- TODO: additional tests, verification, incorporate feedback

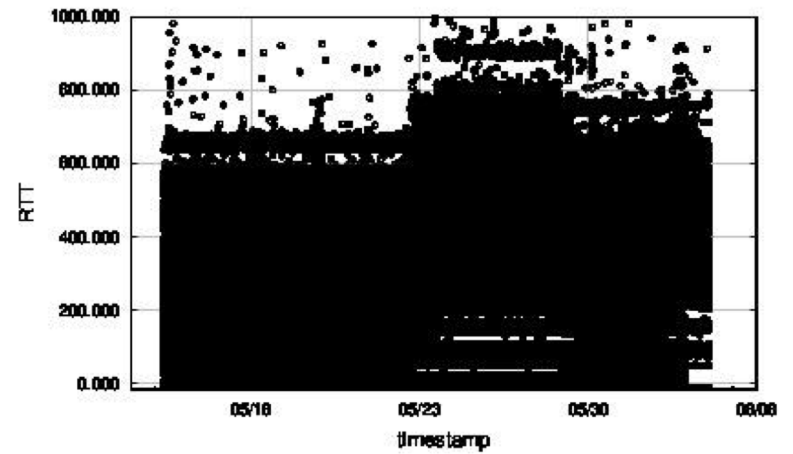
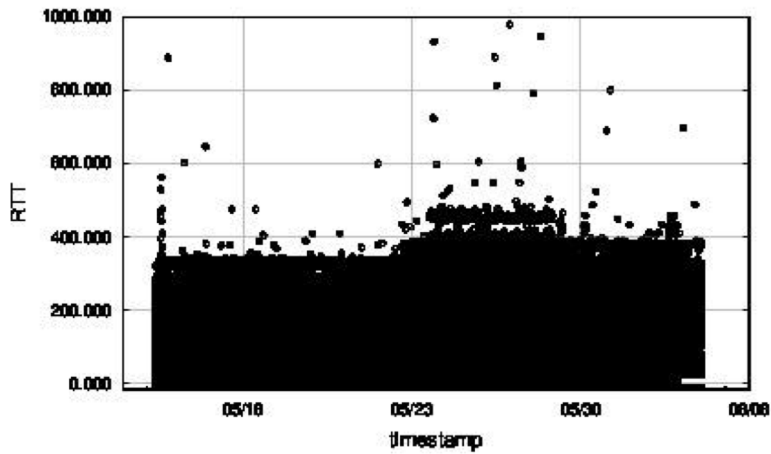
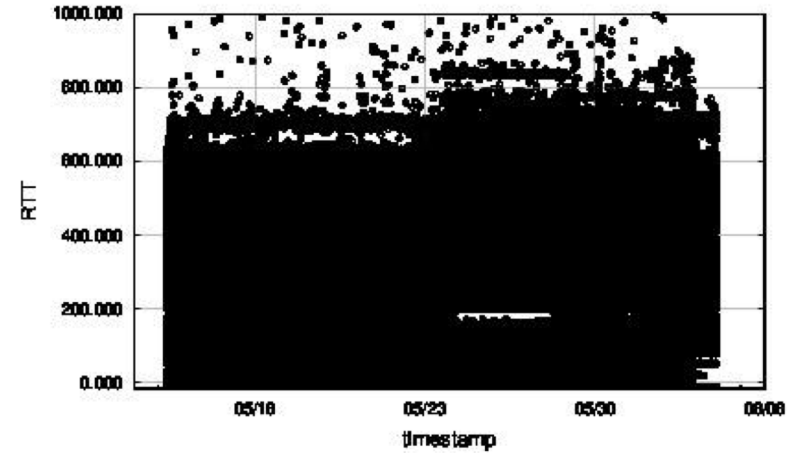
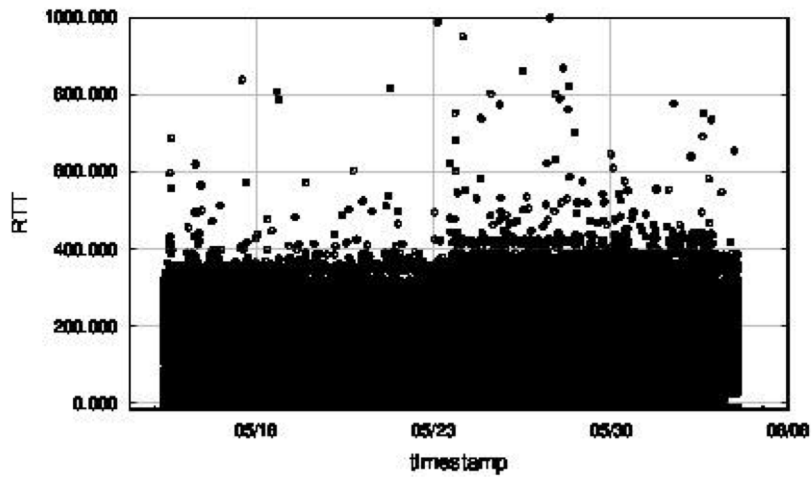
Data Points

		Root 1	Root 2	Root 3	Root 4	Root 5	Root 6	Root 7	Root 8	Root 9	Root 10	Root 11	Root 12	Root 13
V4 udp	25%	10.555	124.055	8.216	1.280	1.063	1.226	18.874	99.925	3.154	2.585	2.581	7.739	20.392
	50%	20.947	152.493	16.075	8.051	2.338	2.696	44.002	134.688	13.291	14.863	16.131	20.085	45.656
	75%	46.833	176.144	41.088	27.793	9.921	10.664	73.012	158.113	38.547	38.694	41.965	41.320	157.760
	95%	173.944	274.241	181.407	109.765	56.014	71.362	169.439	242.591	132.236	260.491	138.950	170.832	250.019
V4 tcp	25%	22.790	248.774	16.587	2.573	1.871	1.900	36.352	200.976	6.130	5.917	5.103	15.614	40.961
	50%	43.530	305.569	32.488	15.848	4.250	4.662	82.386	269.722	26.717	30.339	32.156	41.359	91.470
	75%	95.475	353.005	82.657	55.236	19.665	20.590	141.080	317.282	77.295	79.224	84.171	84.568	316.525
	95%	351.806	554.355	364.200	220.988	113.302	144.788	411.129	486.708	273.424	538.279	289.697	365.467	501.313
V6 udp	25%	9.211	107.580	7.041	1.099	1.026	1.219	31.751	92.506	2.503	2.750	2.454	8.787	14.434
	50%	19.228	124.247	13.826	6.769	2.186	2.269	101.833	128.019	11.658	16.702	15.454	23.441	29.937
	75%	41.981	167.366	37.366	20.734	10.605	10.233	125.038	146.894	34.556	40.295	45.090	47.982	83.219
	95%	171.072	270.714	174.556	105.461	125.382	92.365	237.213	226.147	153.772	197.602	154.554	174.809	207.927
V6 tcp	25%	20.079	215.387	14.320	2.270	1.805	1.880	72.231	185.756	4.658	6.511	5.190	17.784	29.177
	50%	40.072	249.044	27.955	13.832	4.061	3.922	211.040	256.378	22.992	34.300	31.097	46.976	60.314
	75%	85.865	336.431	75.326	42.040	21.053	20.186	262.676	294.835	69.222	81.007	91.520	96.426	167.333
	95%	345.425	544.279	350.449	216.958	253.332	196.329	496.356	456.245	316.806	401.756	311.340	351.791	418.441

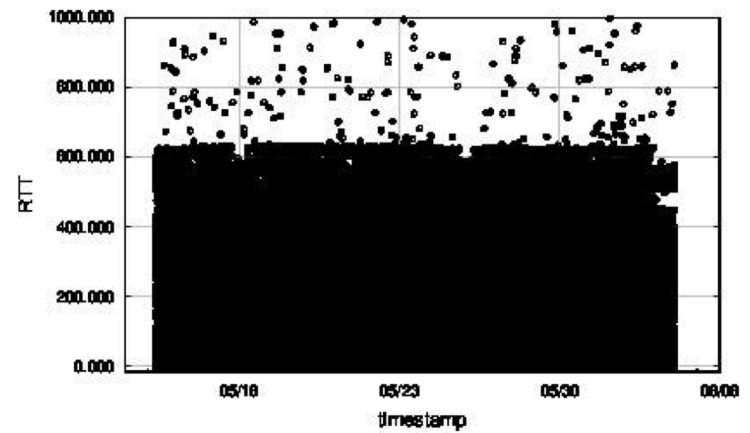
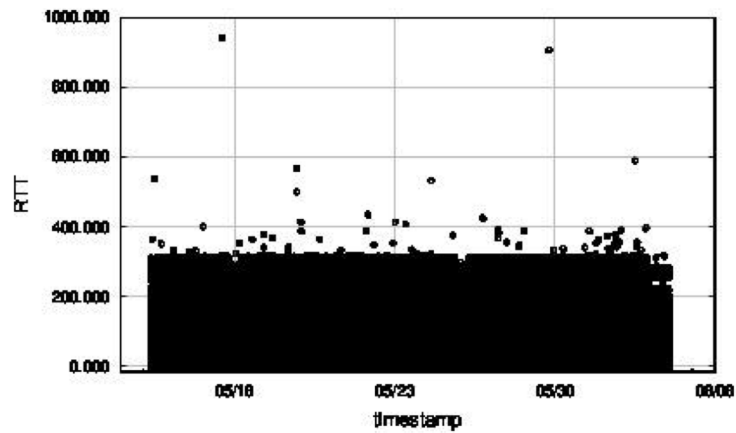
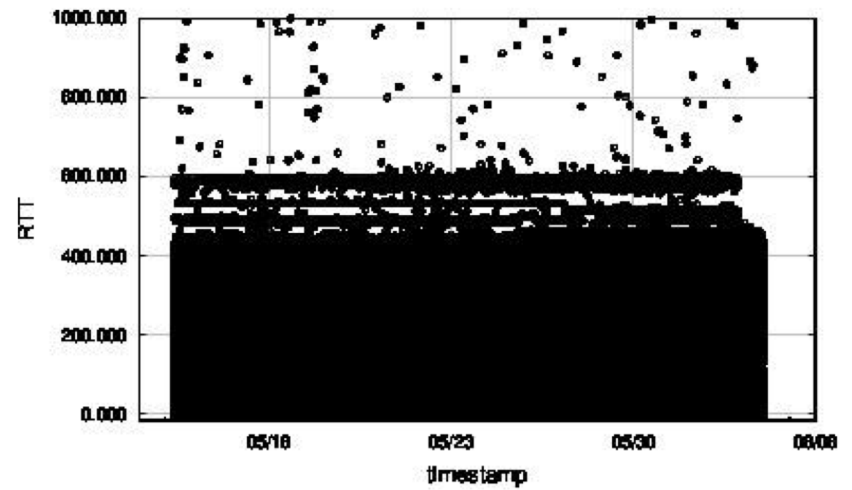
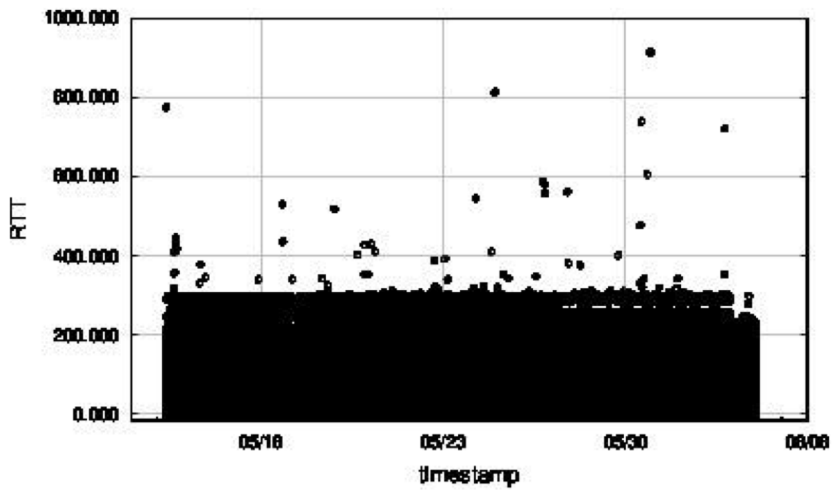
Graphs – root 1 v4udp, v4tcp v6udp, v6tcp



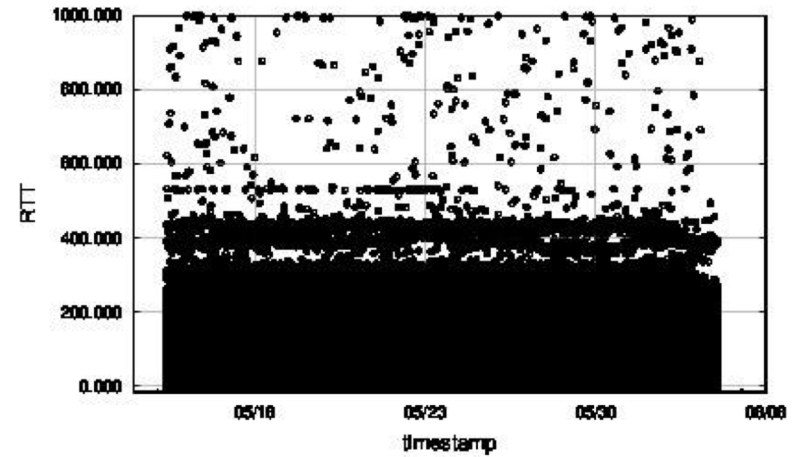
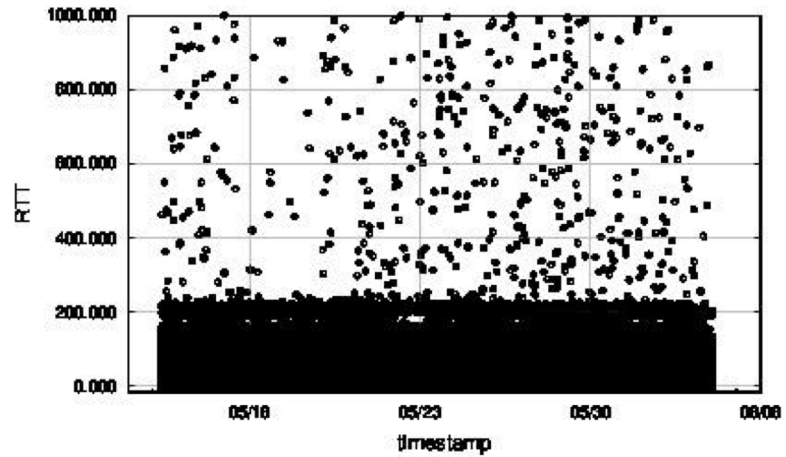
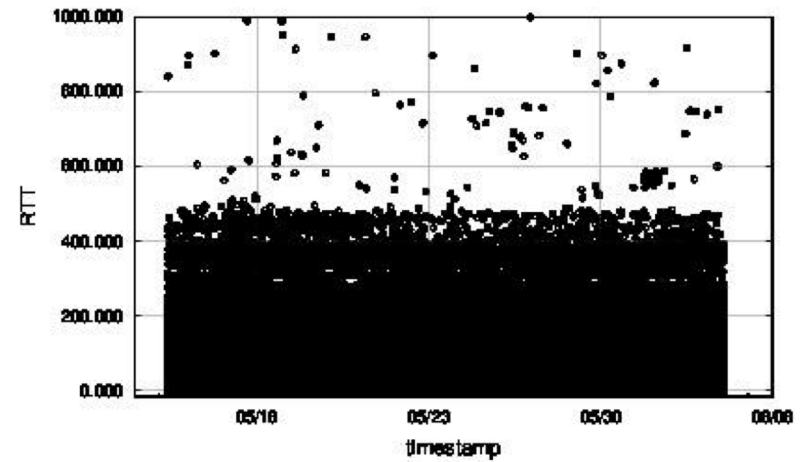
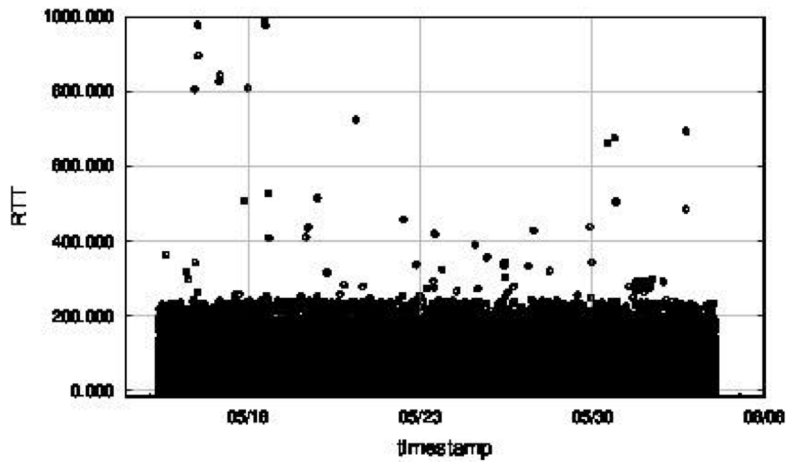
Graphs – root 2 v4udp, v4tcp v6udp, v6tcp



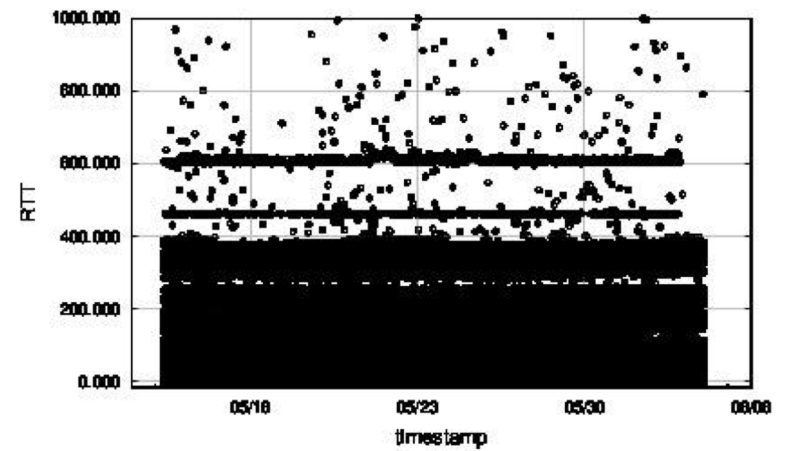
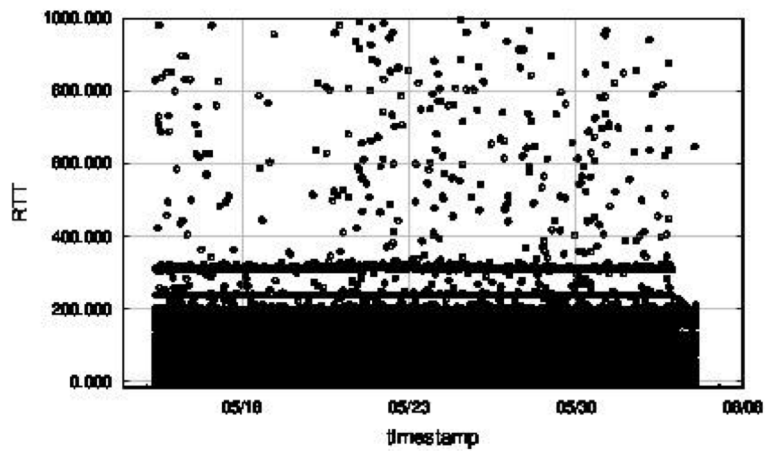
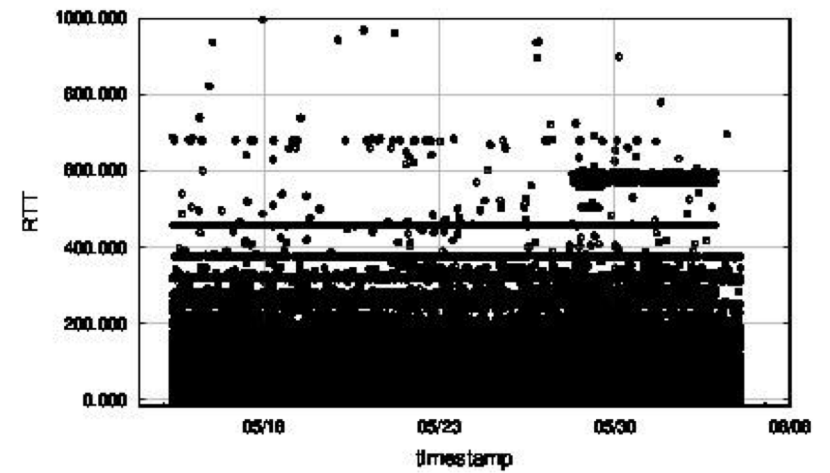
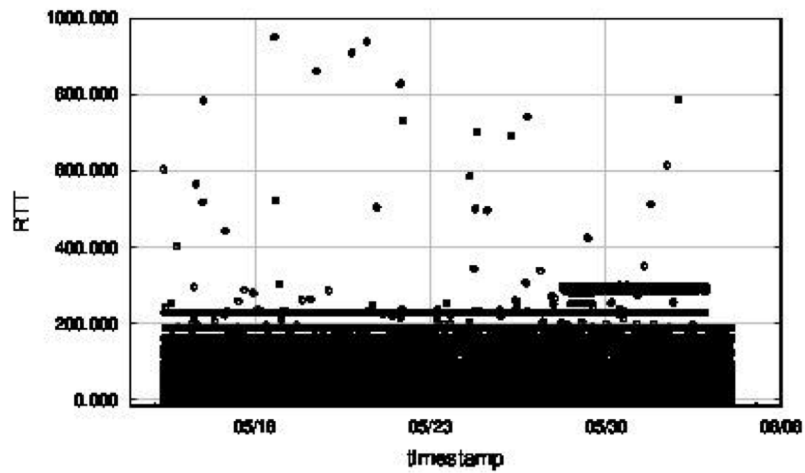
Graphs – root 3 v4udp, v4tcp v6udp, v6tcp



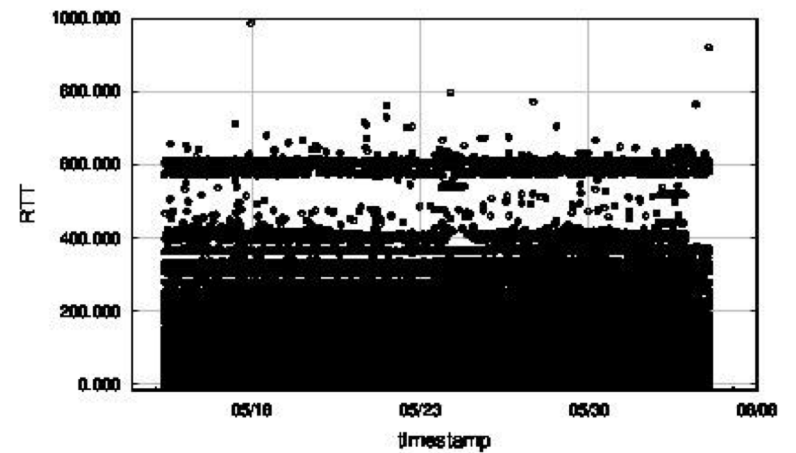
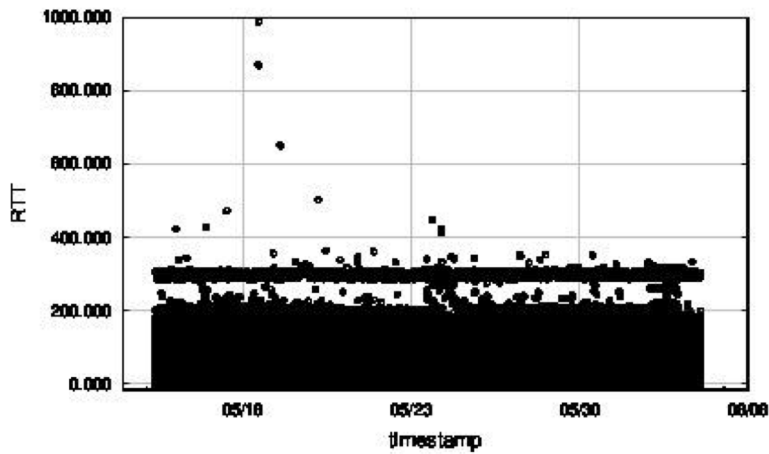
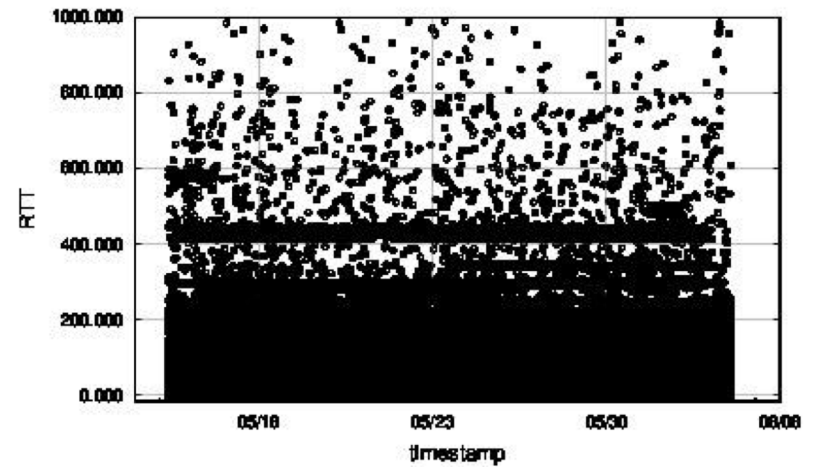
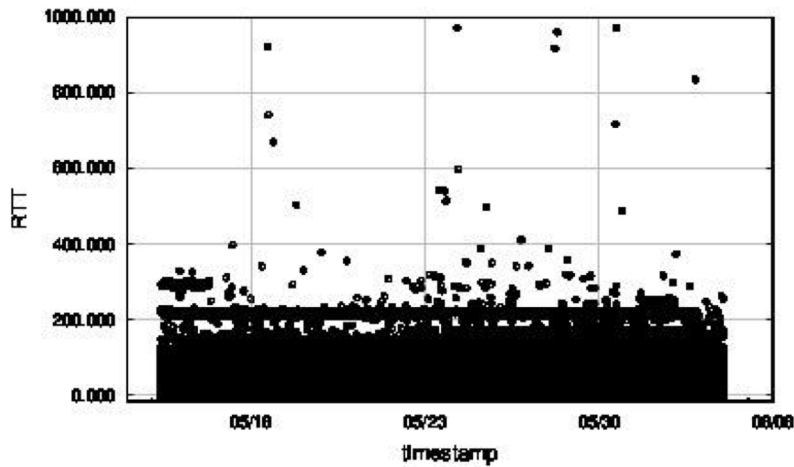
Graphs – root 4 v4udp, v4tcp v6udp, v6tcp



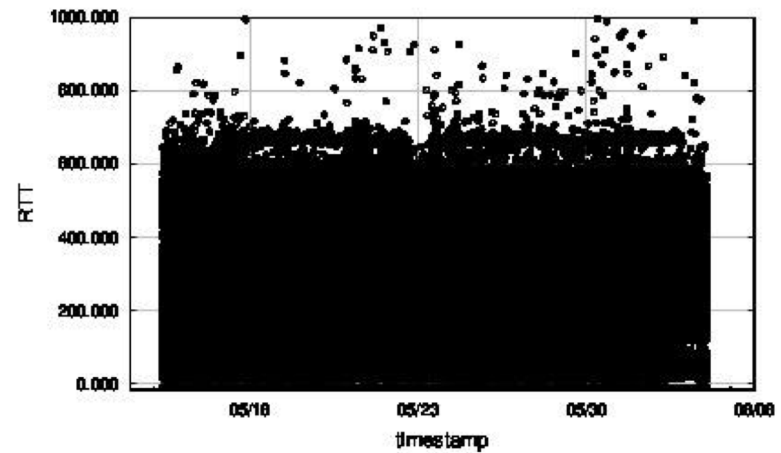
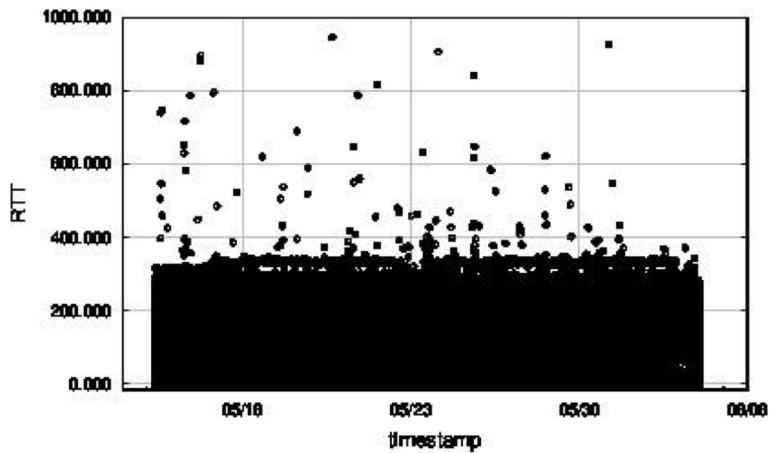
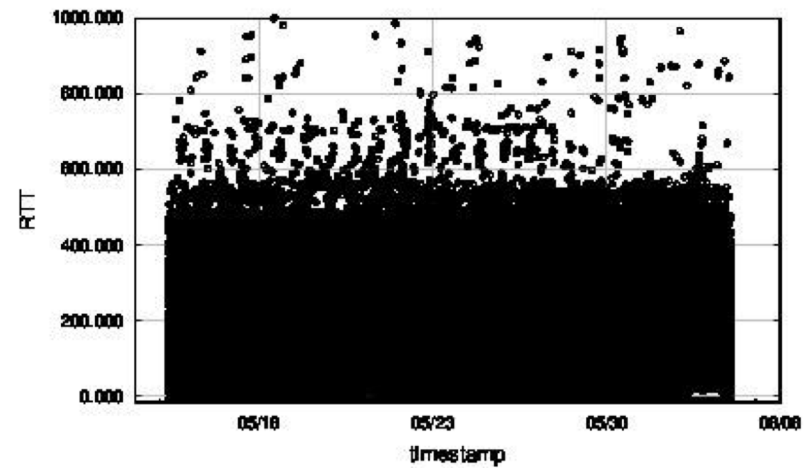
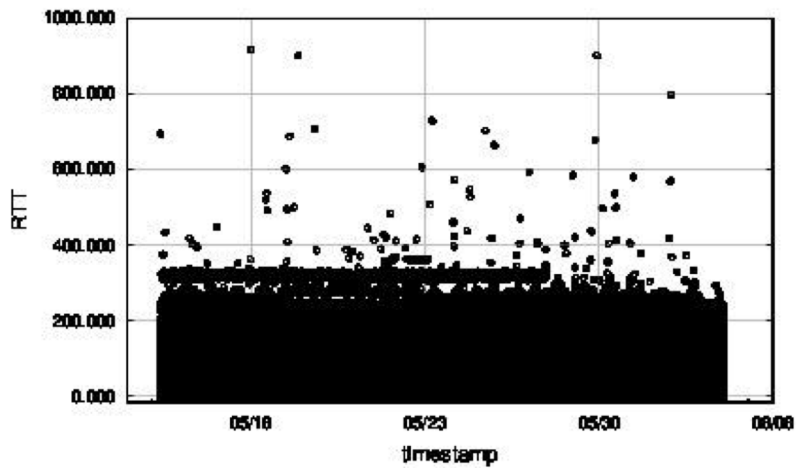
Graphs – root 5 v4udp, v4tcp v6udp, v6tcp



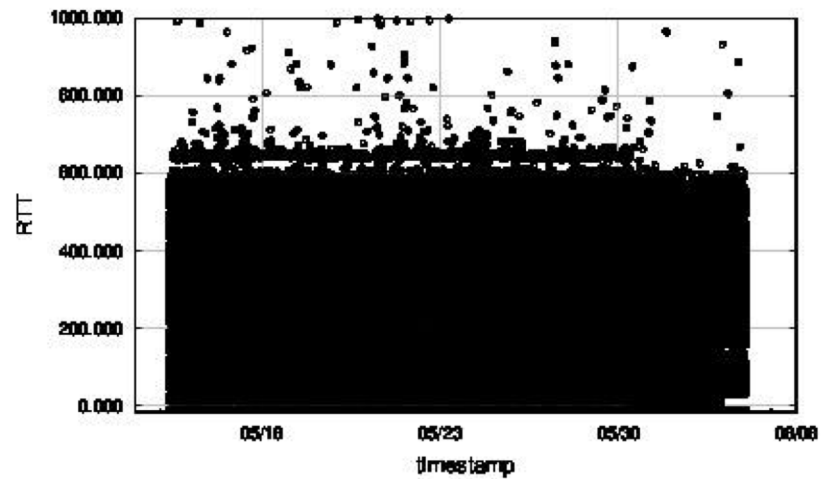
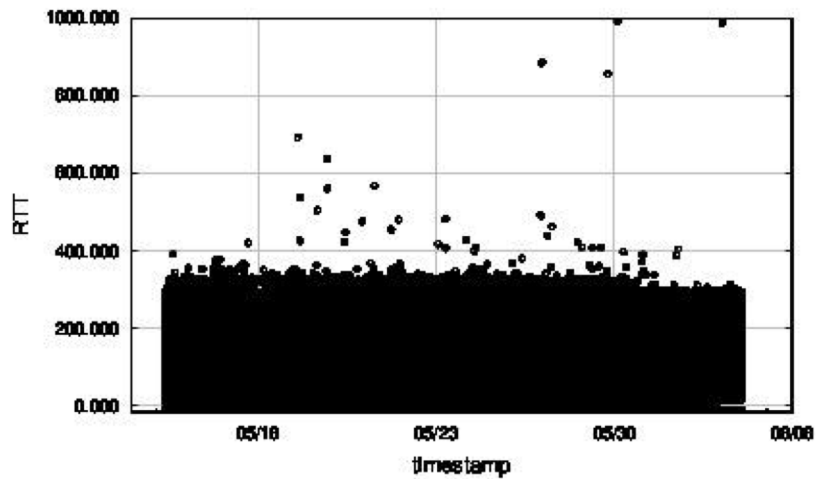
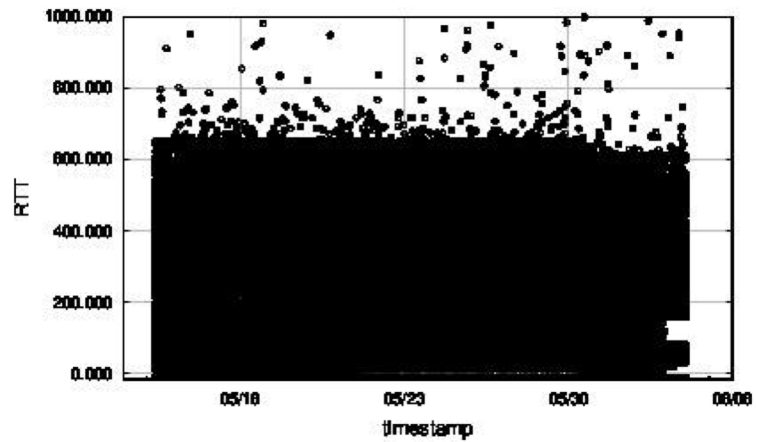
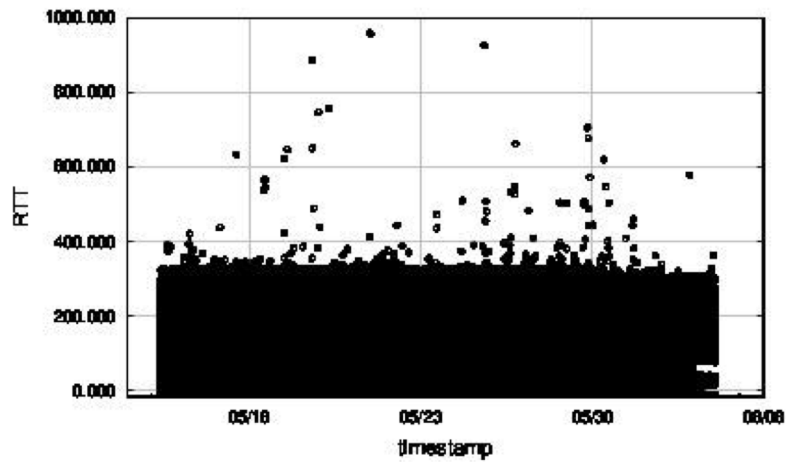
Graphs – root 6 v4udp, v4tcp v6udp, v6tcp



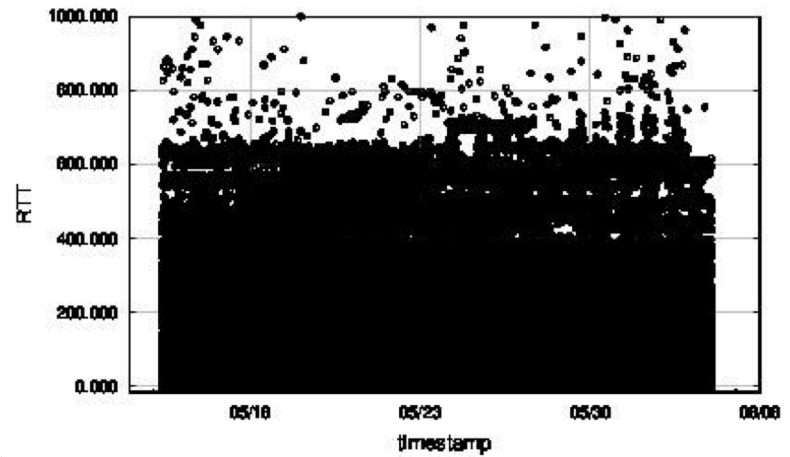
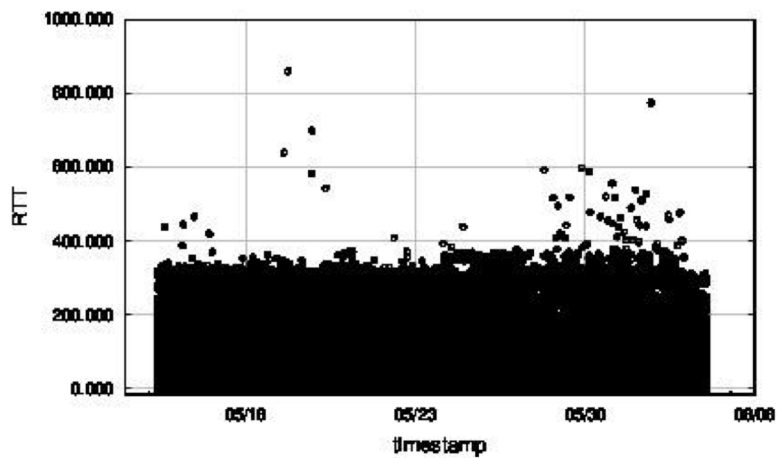
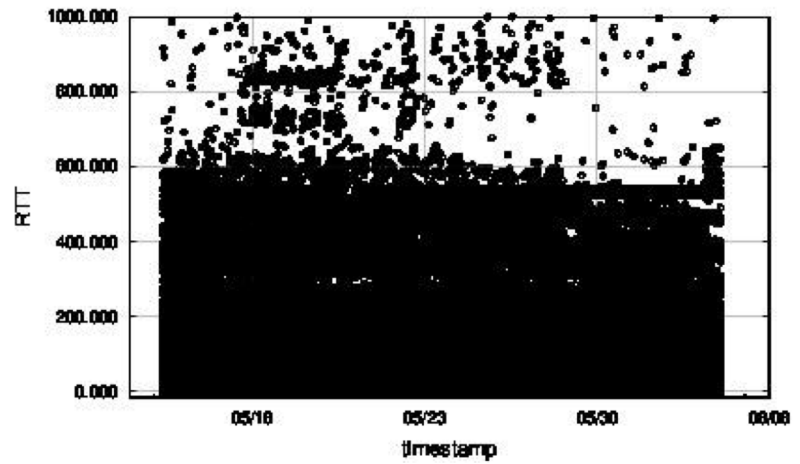
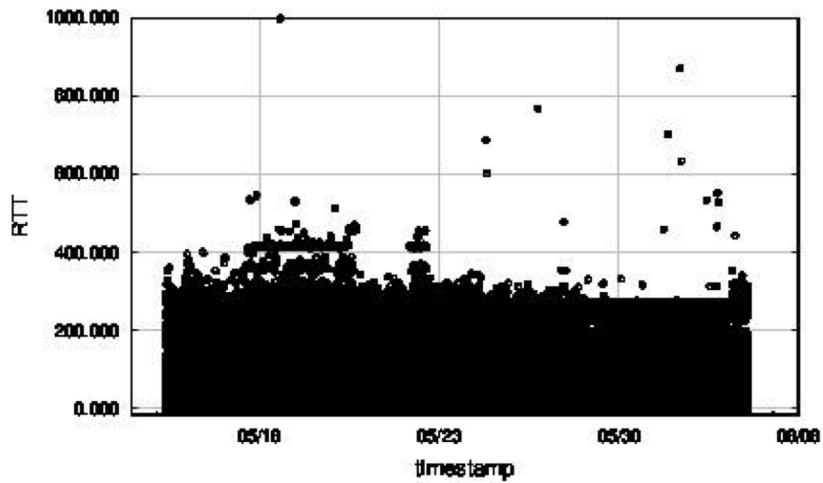
Graphs – root 7 v4udp, v4tcp v6udp, v6tcp



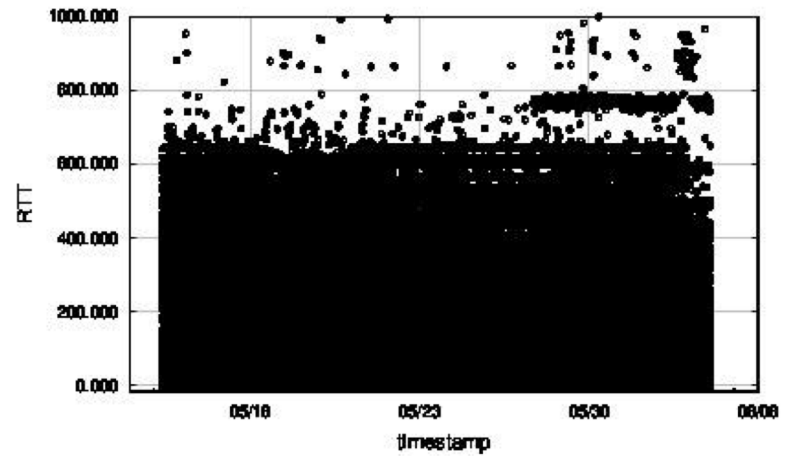
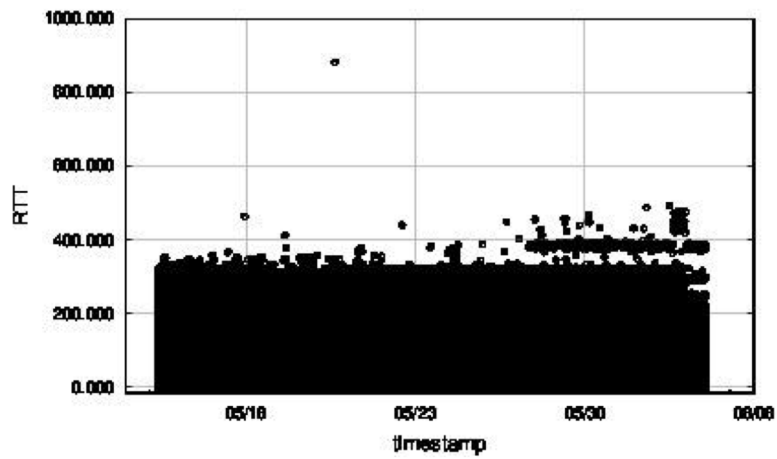
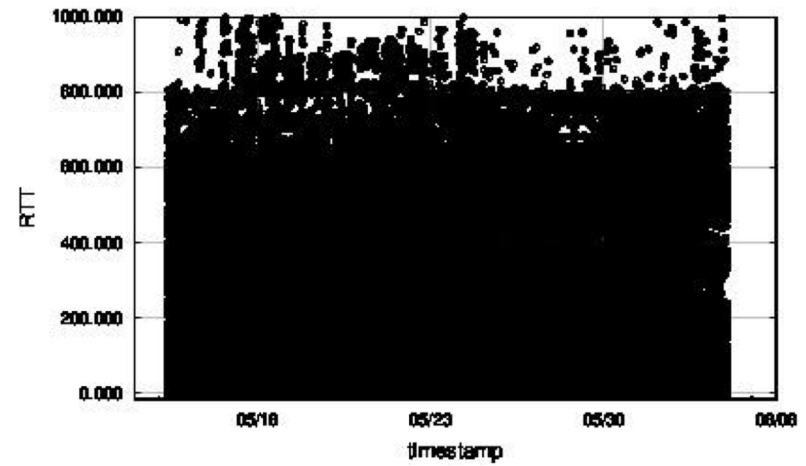
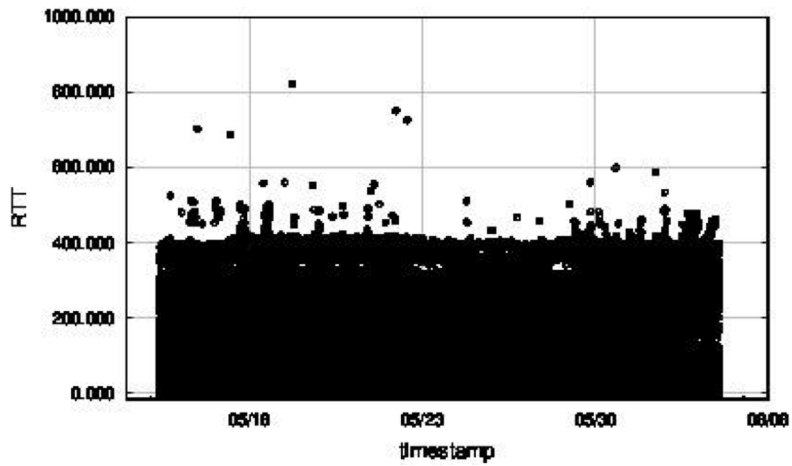
Graphs – root 8 v4udp, v4tcp v6udp, v6tcp



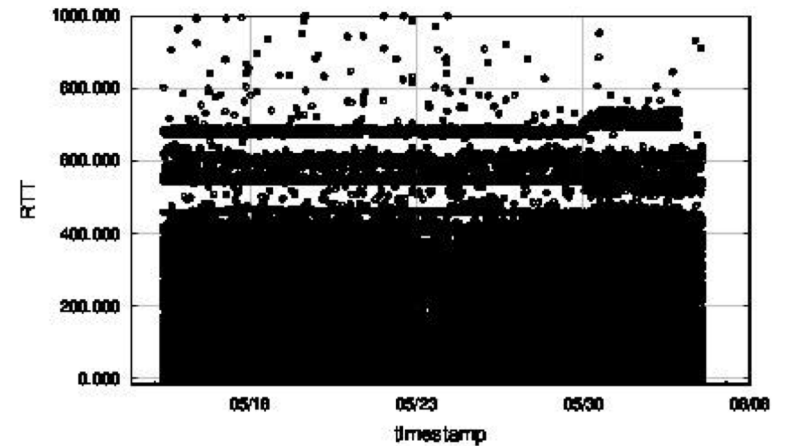
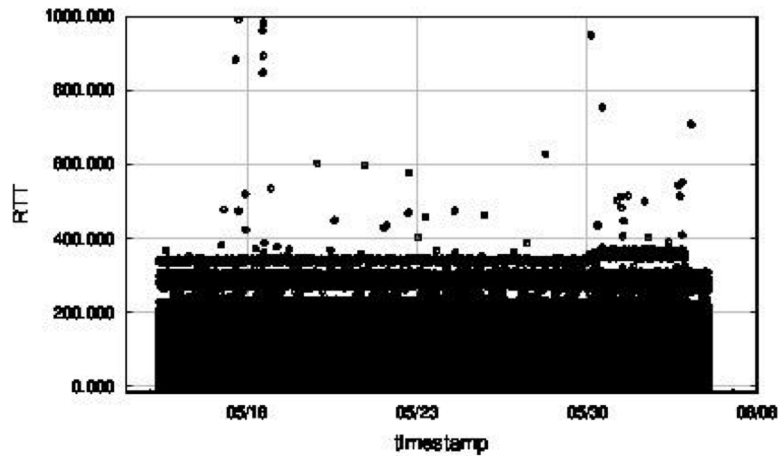
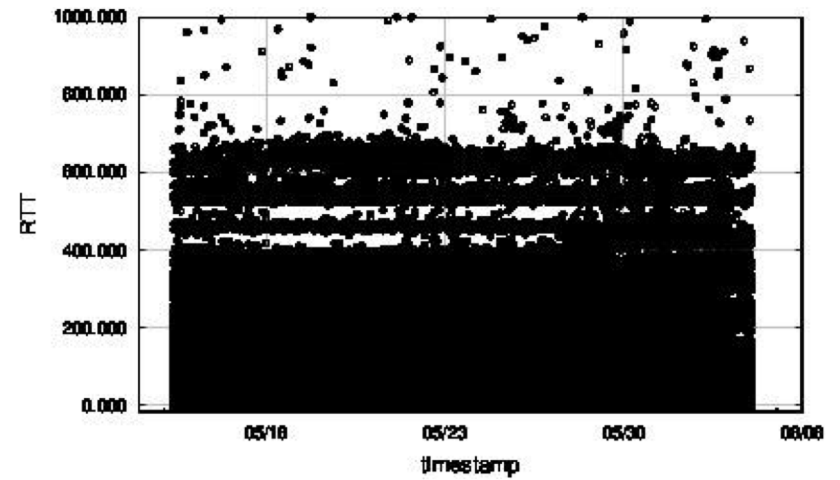
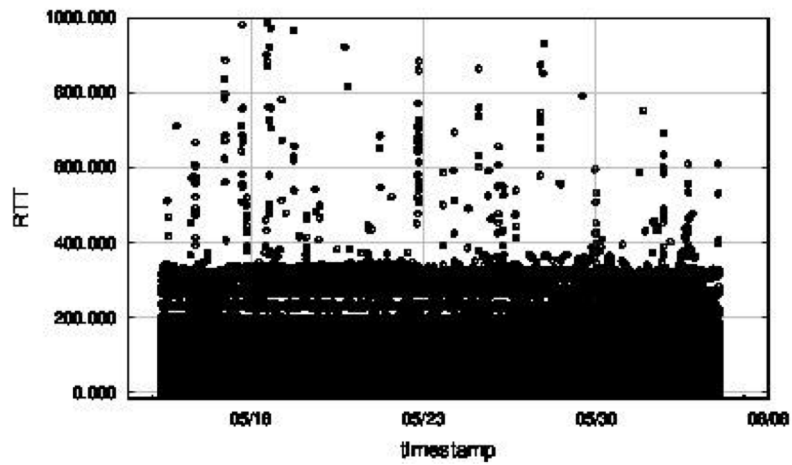
Graphs – root 9 v4udp, v4tcp v6udp, v6tcp



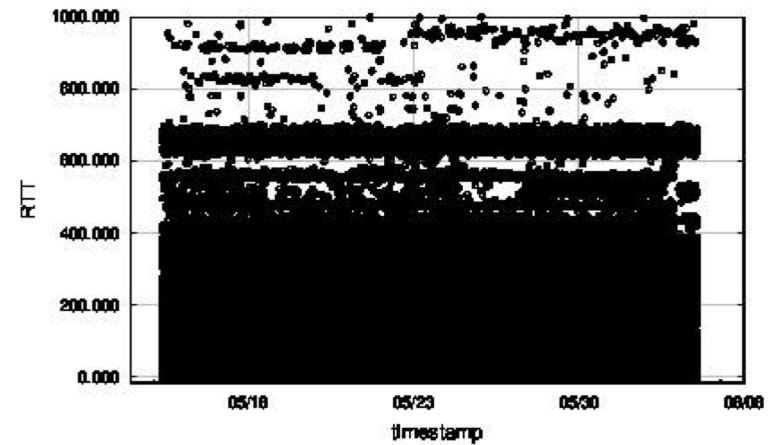
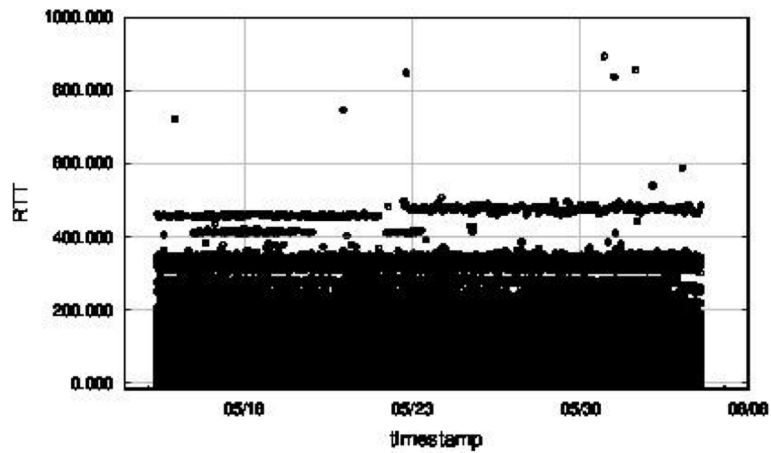
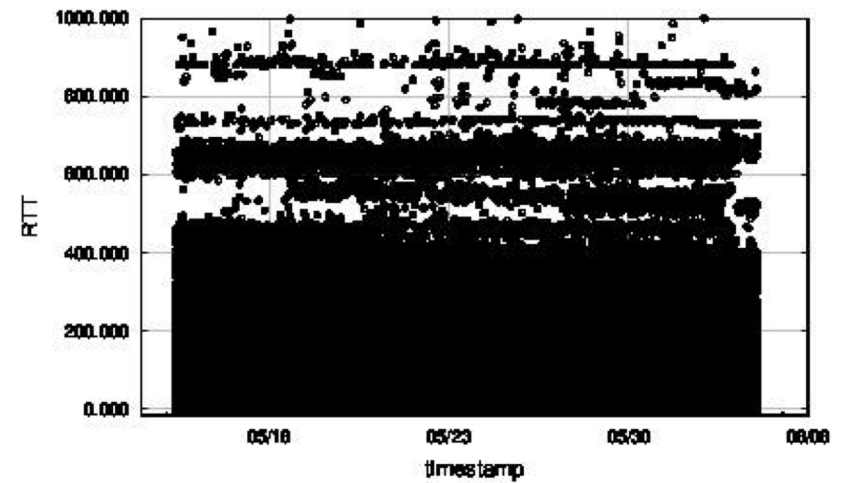
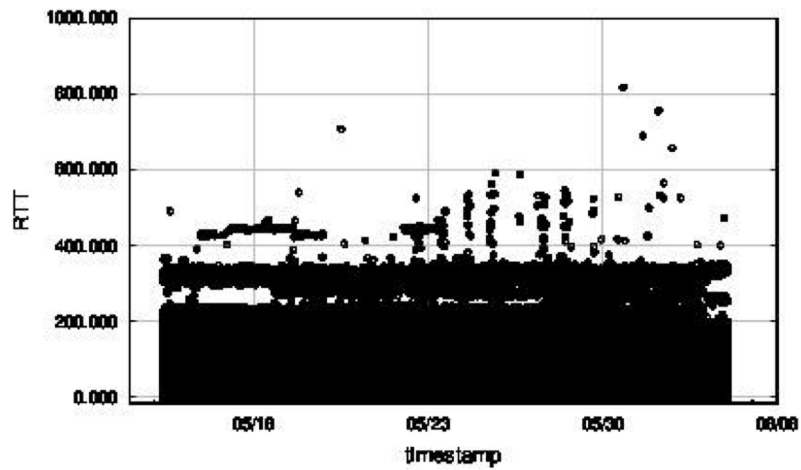
Graphs – root 10 v4udp, v4tcp v6udp, v6tcp



Graphs – root 11 v4udp, v4tcp v6udp, v6tcp



Graphs – root12 v4udp, v4tcp v6udp, v6tcp



Graphs – root 13 v4udp, v4tcp v6udp, v6tcp

