Experiment Plan

Paper ID:xxx

Define the collision rate to be $\gamma = M/m$, where m is the number of packets processed by the switch and M is the number of collisions occurred during the processing of the packets.

The algorithms to be evaluated is NormalHash, HashPipe, OFD and OFD-CI. The configurable parameters are as follows:

- Synthetic traffic or real network trace
- The number of buckets in the hash table or the memory size allocated to the algorithms
- The number of packets processed by the switch (synthetic traffic)
- The number of flows (synthetic traffic)
- The skewing factor of the flow size distribution (synthetic traffic)
- The number of buckets needing to be checked for HashPipe, OFD and OFD-CI.

Note when evaluate the performance of the algorithms with the real traffic trace, each flow record in NormalHash and HashPipe occupies 17 bytes, while that of OFD occupies 18 bytes. When evaluating the performance with synthetic traffic, we won't consider the size of a single flow record.

The number of buckets needing to be checked when processing a single packet for OFD, OFD-CI and HashPipe is 4 by default.

EXPERIMENT #001

- Set the memory size to be 0.5MB.
- Using ten network traces from CAIDA: equinix-nyc.dirA.20180315-125910.UTC.anon.pcap, equinix-nyc.dirA.20180315-130000.UTC.anon.pcap, equinix-nyc.dirA.20180315-130100.UTC.anon.pcap, equinix-nyc.dirA.20180315-130200.UTC.anon.pcap, equinix-nyc.dirA.20180315-130300.UTC.anon.pcap, equinix-nyc.dirA.20180315-130400.UTC.anon.pcap, equinix-nyc.dirA.20180315-130500.UTC.anon.pcap, equinix-nyc.dirA.20180315-130600.UTC.anon.pcap, equinix-nyc.dirA.20180315-130700.UTC.anon.pcap, equinix-nyc.dirA.20180315-130800.UTC.anon.pcap.
- The number of packets to be replayed for each trace file is 5 million.
- Calculate the collision rate of NormalHash and PriMe.

EXPERIMENT #002

- Set the memory size to be 0.5MB.
- Using ten network traces from HGC: pcap002, pcap003, pcap004, pcap005, pcap006, pcap007, pcap008, pcap009, pcap010, pcap011.
- The number of packets to be replayed for each trace file is 5 million.
- Calculate the collision rate of PriMe and NormalHash.

EXPERIMENT #003

- Using the network trace from CAIDA: equinix-nyc.dirA.20180315-125910.UTC.anon.pcap.
- The number of packets to be replayed for each trace file is 5 million.
- Increase the memory size from 0.2MB to 2MB, in a step size of 0.2MB.
- Calculate the collision rate of NormalHash and PriMe.

EXPERIMENT #004

- Using the network trace from HGC: pcap002
- The number of packets to be replayed for each trace file is 5 million.
- Increase the memory size from 0.2MB to 2MB, in a step size of 0.2MB.
- Calculate the collision rate of NormalHash and PriMe.

EXPERIMENT #005

- Using the network trace from CAIDA: equinix-nyc.dirA.20180315-125910.UTC.anon.pcap.
- Set the memory size to be 2MB.
- Increase the buckets to be checked from 2 to 8.
- Calculate the collision rate of OFD, OFD-CI and HashPipe.

EXPERIMENT #006

- Using the network trace from HGC: pcap002
- Set the memory size to be 2MB.
- Increase the buckets to be checked from 2 to 8.
- Calculate the collision rate of OFD, OFD-CI and HashPipe.

EXPERIMENT #007

- Set the number of buckets in the hash table to be 1K.
- Set the number of flows to be 10K.
- Set the number of packets to be 1M.
- Increase the skewing factor from 0.1 to 2.0 by the step of 0.1.
- Calculate the collision rate of the algorithms.

EXPERIMENT #008

- Set the skewing factor to 0.6.
- Set the number of flows to be 100K.
- Set the number of packets to be 10M.
- Increase the number of buckets in the hash table from 2K to 40K with the step of 2K.
- Calculate the collision rate of the algorithms.

EXPERIMENT #009

- Set the skewing factor to 0.8.
- Set the number of flows to be 100K.
- Set the number of packets to be 10M.
- Increase the number of buckets in the hash table from 2K to 40K with the step of 2K.
- Calculate the collision rate of the algorithms.

EXPERIMENT #010

- Set the skewing factor to 1.0.
- Set the number of flows to be 100K.
- Set the number of packets to be 10M.
- Increase the number of buckets in the hash table from 2K to 40K with the step of 2K.
- Calculate the collision rate of the algorithms.

EXPERIMENT #011

- Set the skewing factor to 1.2.
- Set the number of flows to be 100K.
- Set the number of packets to be 10M.
- Increase the number of buckets in the hash table from 2K to 40K with the step of 2K.
- Calculate the collision rate of the algorithms.

EXPERIMENT #012

- Set the skewing factor to 1.4.
- Set the number of flows to be 100K.
- Set the number of packets to be 10M.
- Increase the number of buckets in the hash table from 2K to 40K with the step of 2K.
- Calculate the collision rate of the algorithms.

EXPERIMENT #013

- Set the skewing factor to 1.6.
- Set the number of flows to be 100K.
- Set the number of packets to be 10M.
- Increase the number of buckets in the hash table from 2K to 40K with the step of 2K.
- Calculate the collision rate of the algorithms.

EXPERIMENT #014

- Using the network trace from CAIDA: equinix-nyc.dirA.20180315-125910.UTC.anon.pcap.
- The number of packets to be replayed for each trace file is 5 million.
- Increase the memory size from 0.2MB to 2MB, in a step size of 0.2MB.
- Calculate the number of exports, checks and resulting flow records of PriMe.

EXPERIMENT #015

- Using the network trace from HGC: pcap002
- The number of packets to be replayed for each trace file is 5 million.
- Increase the memory size from 0.2MB to 2MB, in a step size of 0.2MB.
- Calculate the number of exports, checks and resulting flow records of PriMe.

EXPERIMENT #016

- Set the memory size to be 1.0MB.
- Using ten network traces from CAIDA: equinix-nyc.dirA.20180315-125910.UTC.anon.pcap, equinix-nyc.dirA.20180315-130000.UTC.anon.pcap, equinix-nyc.dirA.20180315-130100.UTC.anon.pcap, equinix-nyc.dirA.20180315-130200.UTC.anon.pcap, equinix-nyc.dirA.20180315-130300.UTC.anon.pcap, equinix-nyc.dirA.20180315-130400.UTC.anon.pcap, equinix-nyc.dirA.20180315-130500.UTC.anon.pcap, equinix-nyc.dirA.20180315-130600.UTC.anon.pcap, equinix-nyc.dirA.20180315-130700.UTC.anon.pcap, equinix-nyc.dirA.20180315-130800.UTC.anon.pcap.
- The number of packets to be replayed for each trace file is 5 million.
- Calculate the number of exports, checks and resulting flow records of PriMe as well as the real number of flow records in the trace file.

EXPERIMENT #017

- Set the memory size to be 1.0MB.
- Using ten network traces from HGC: pcap002, pcap003, pcap004, pcap005, pcap006, pcap007, pcap008, pcap009, pcap010, pcap011.
- The number of packets to be replayed for each trace file is 5 million.
- Calculate the number of exports, checks and resulting flow records of PriMe as well as the real number of flow records in the trace file.