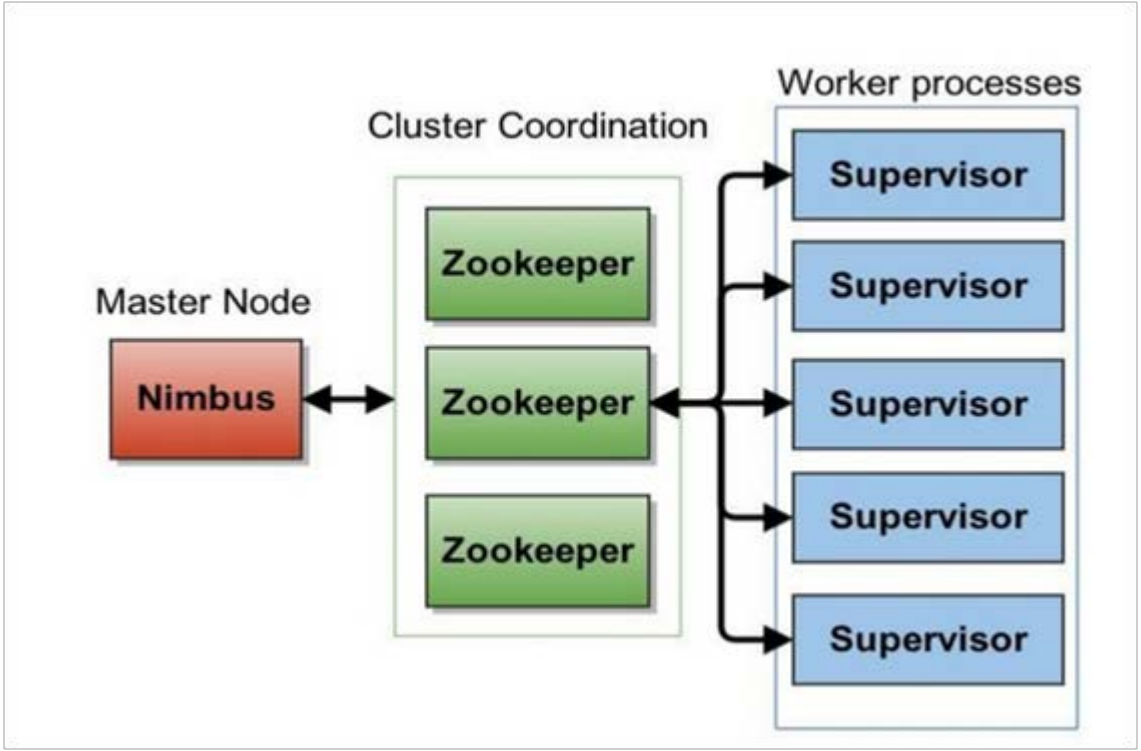
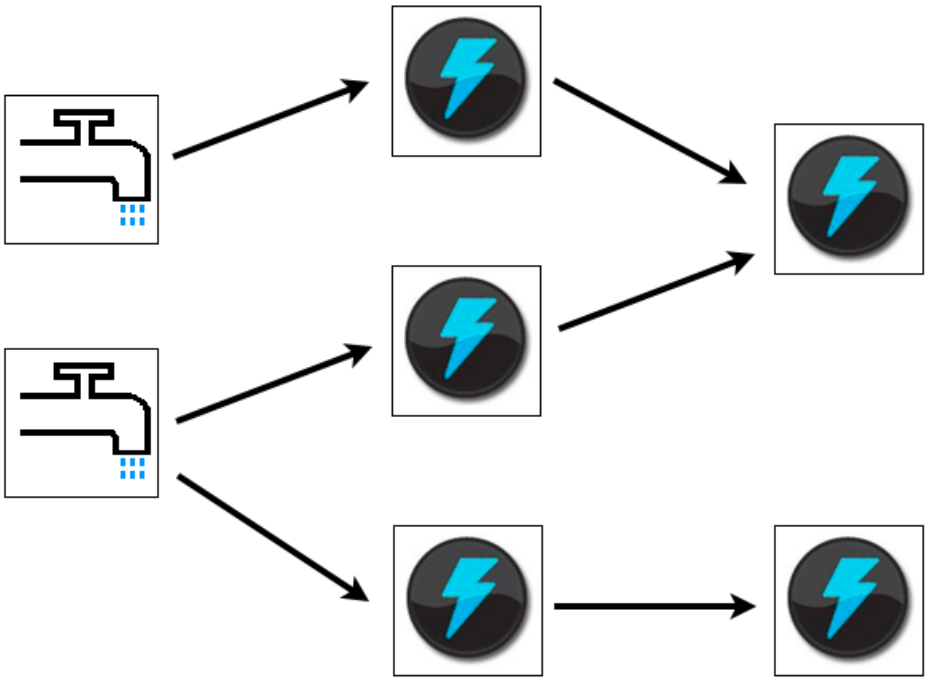
Real Time Adaptive Profiling in Storm Topologies

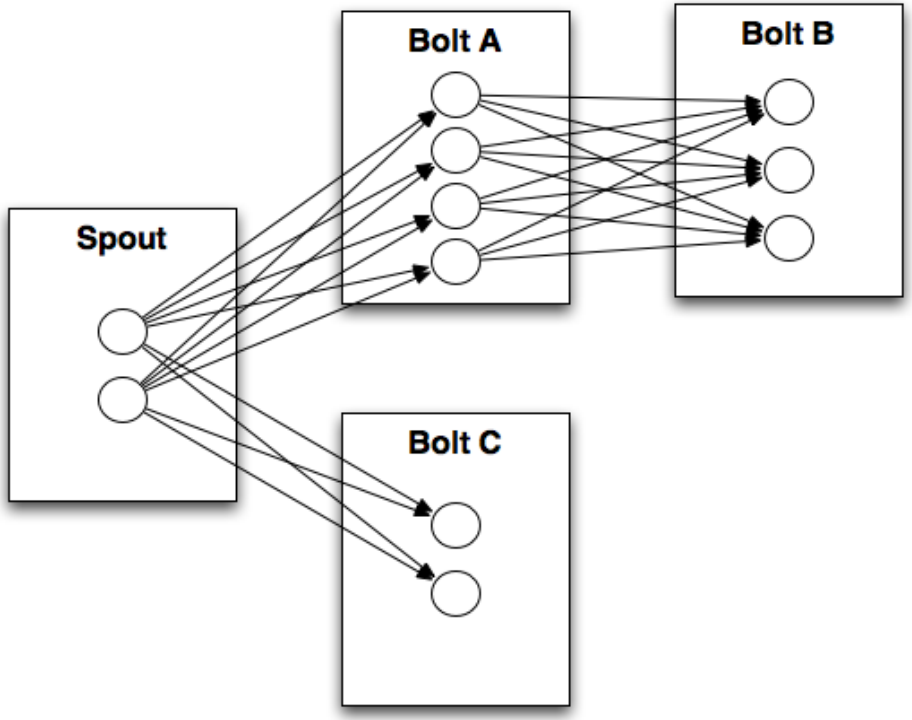
Storm Architecture



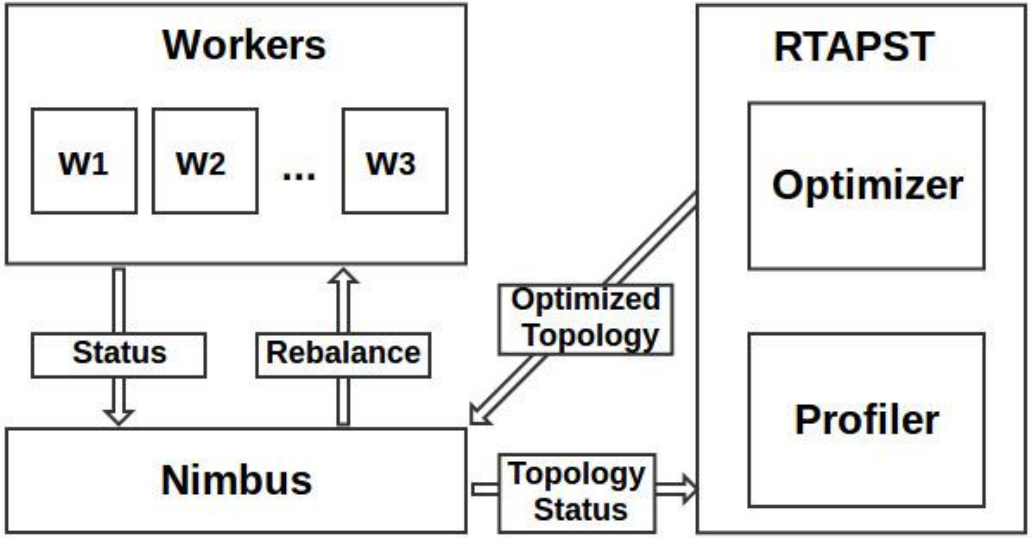
Storm Topology



Storm Topology



RTAPTS Architecture

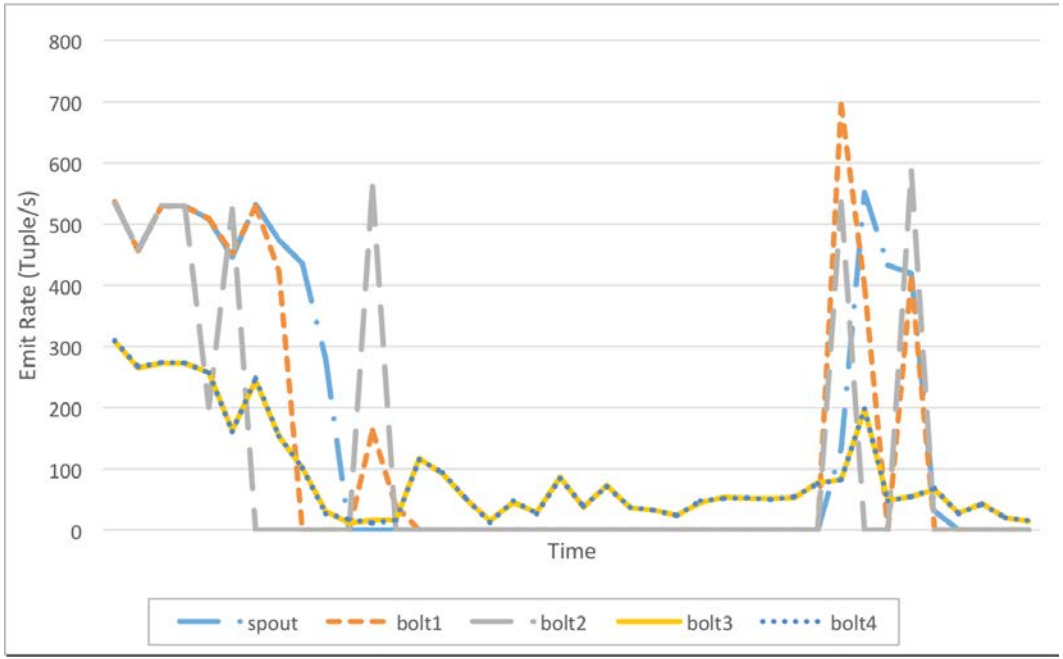


Optimization by Queuing Theory

- We can get the emit rate per component (μ in Queuing theory)
- Thus, we can get the input rate per component (λ in Queuing theory)
- We assume a Poisson distribution for the arrival rates, and model the system as a M/M/1 Queue.
- In order to have a stable queue we want $\lambda/\mu < 1$.
- We choose $\lambda/\mu = 0.75$ as the optimal value
- scale up/down to get the optimal value

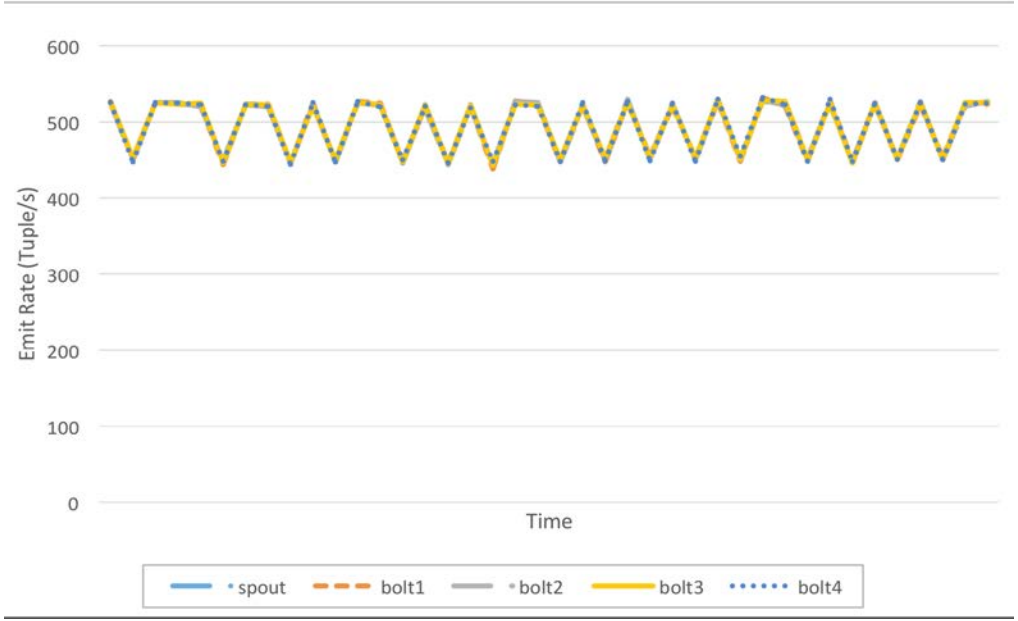
Emit rate with no optimization

linear topology spout -> bolt1 -> bolt2 -> bolt3 -> bolt4, with bottleneck in bolt3

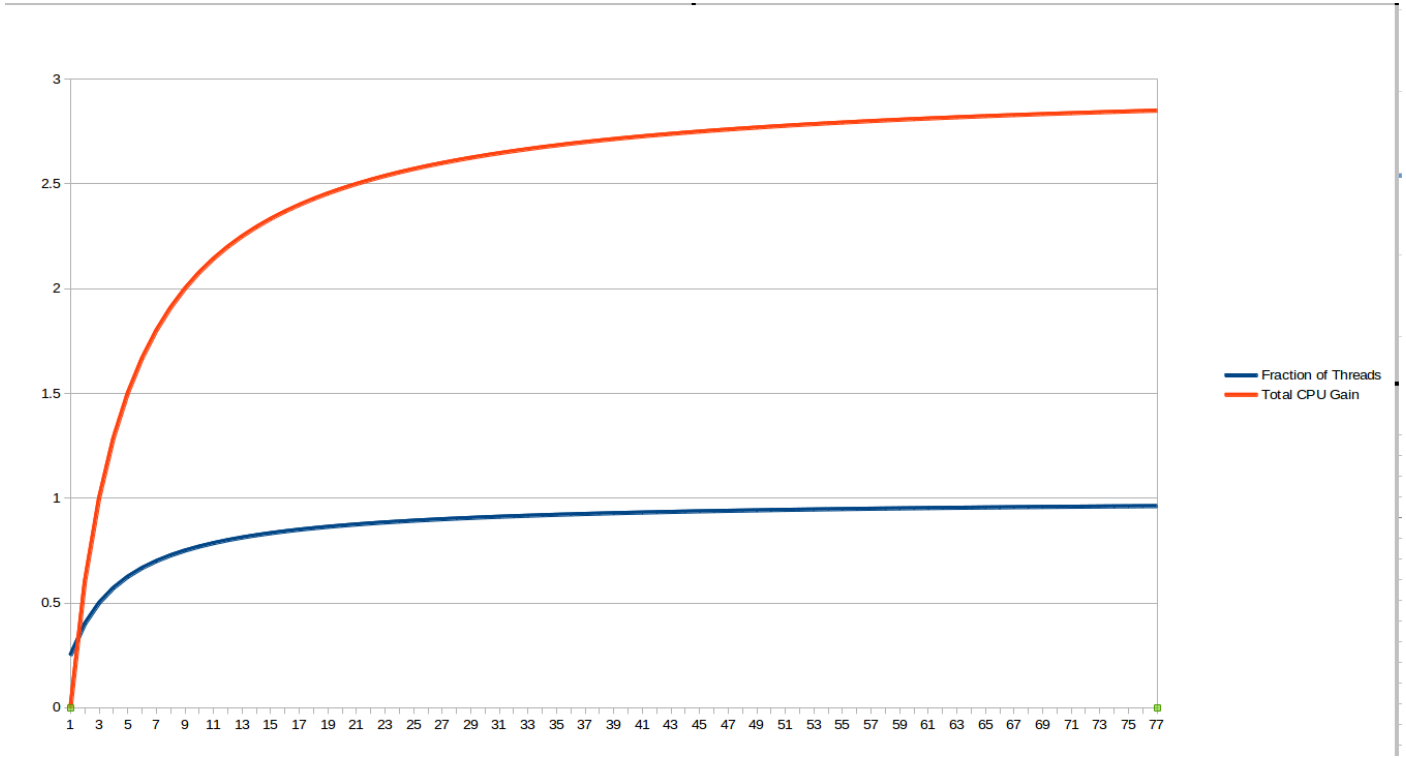


Emit rate with RTAPTS optimization

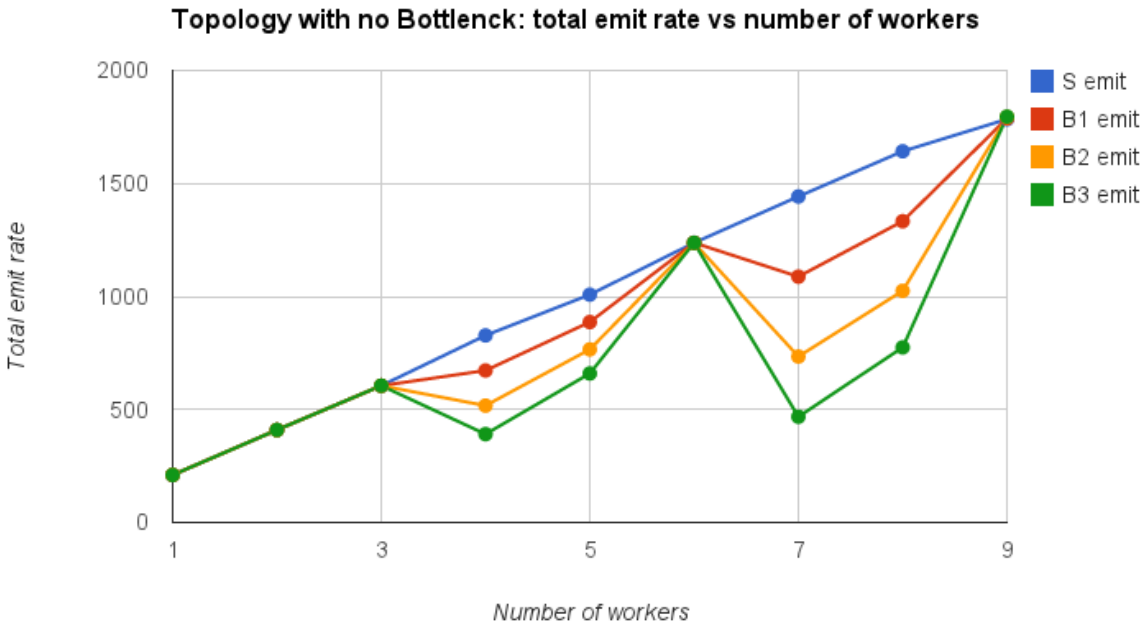
linear topology spout -> bolt1 -> bolt2 -> bolt3 -> bolt4, with bottleneck in bolt3



Cpu Gain vs number of Threads



Scalability Test



Bottleneck Behavior