

VOQ Simulator v2.0-Software Tool for Performance Analysis of VOQ Switches

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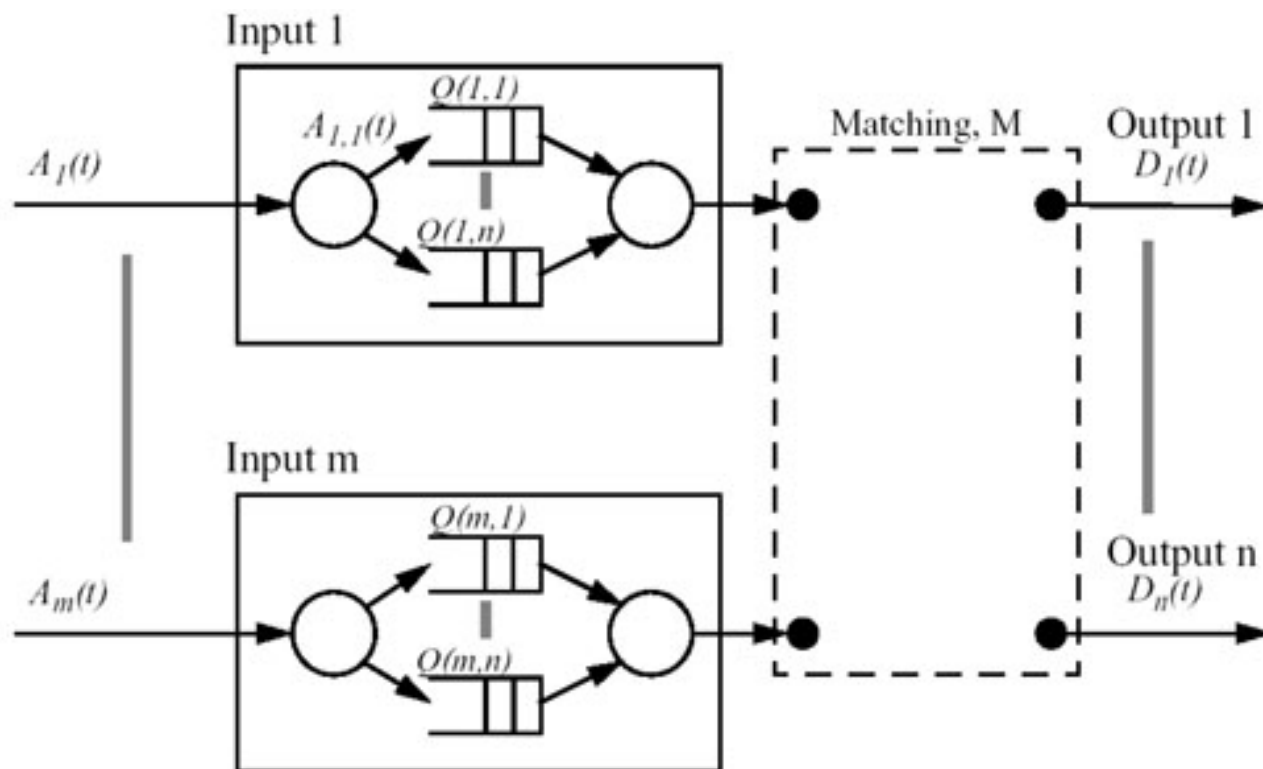
Introduction

- Rapid growth of Internet traffic last few years
- An advance in data transmission technology
- High speed packet switch design:
 - high throughput (more than 1Tb/s)
 - low delay
 - stability for all traffic loads and requirements

High speed packet switch design

- Crossbar switching fabric
- Switching of fixed length packets
- IQ and HOL blocking effect
- VOQ solution
- Scheduling algorithms

VOQ solution



Scheduling algorithms

- weighted (LQF, OCF, LPF, iLQF, iOCF and iLPF)
- non-weighted (MSM, iSLIP, DRRM, EDRRM and uFORM)
- weighted algorithms give good performance but too complex to be implemented
- non-weighted algorithms give not so good performance like weighted but can be practically implemented

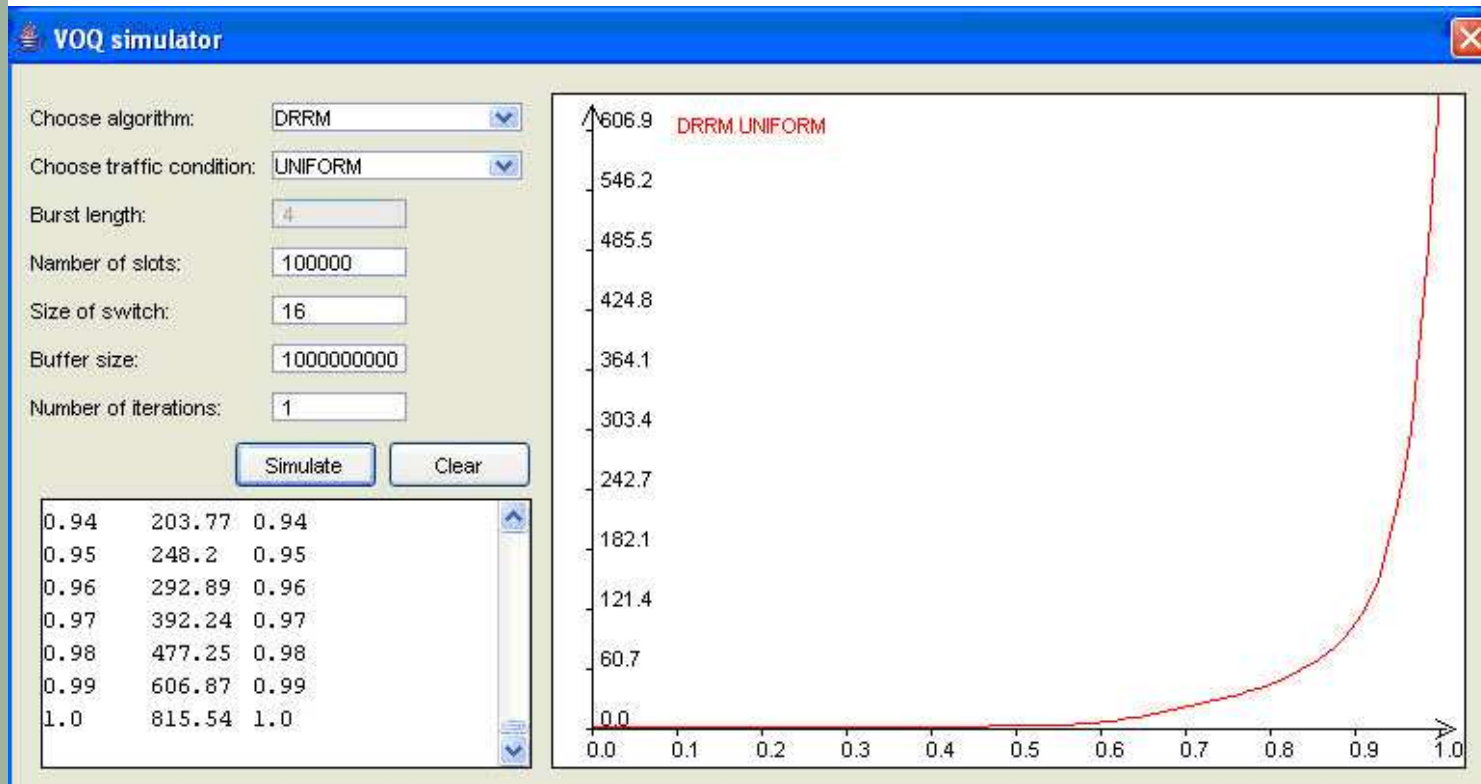
VOQ simulator

- written in Java programming language
- works regardless of operating system
- own visualization tool
- include new scheduling schemes
- simple user interface
- modular structure
- extending to CICQ switches

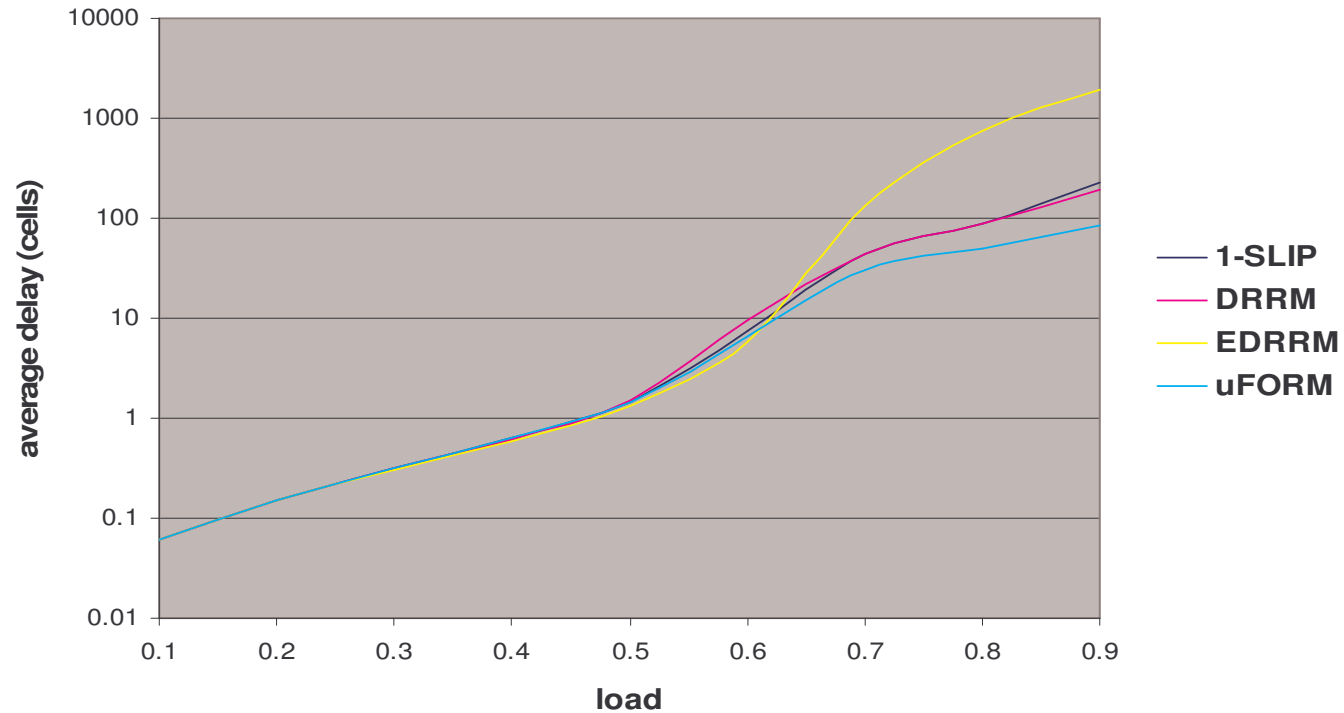
Modular structure

- traffic source
- queueing policy
- switching fabric
- scheduling algorithm

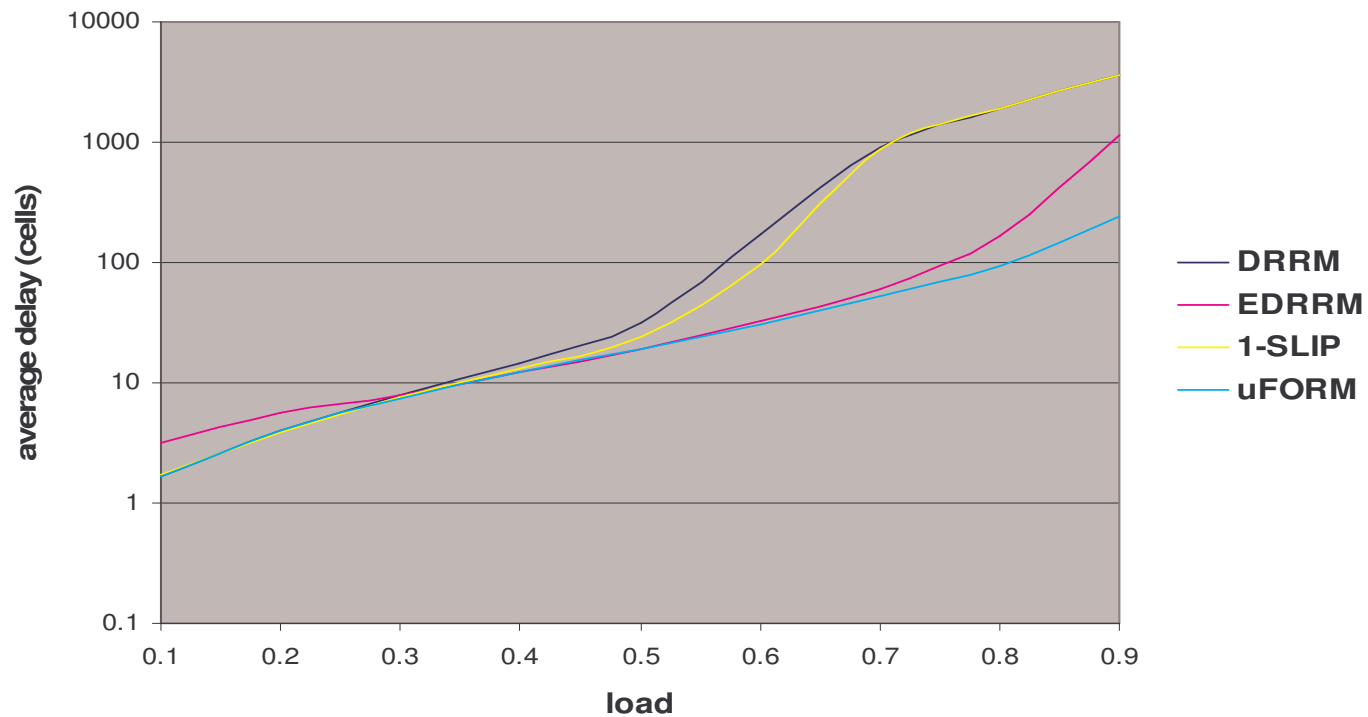
Application form



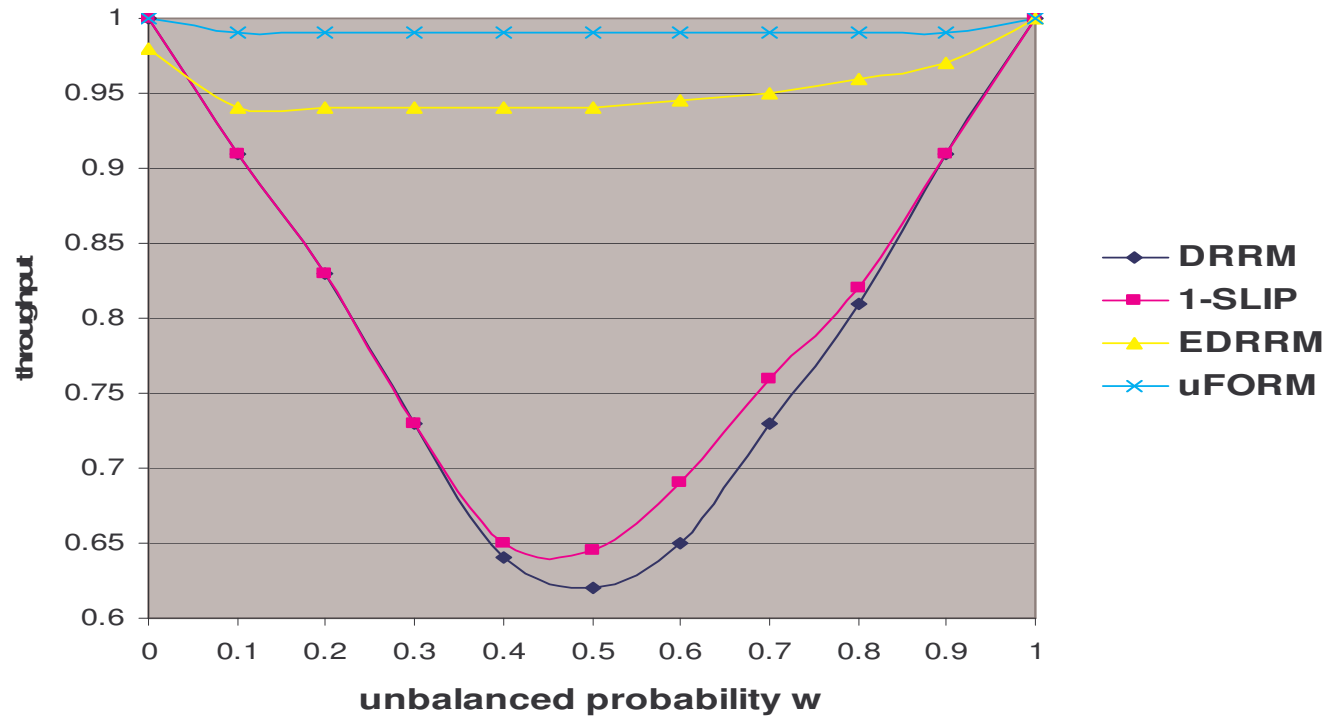
Bernoulli uniform traffic



Markov ON-OFF traffic



Unbalanced non-uniform traffic



Conclusion and Future Work

- results which we get with this software are compatible with results we find in literature
- packet switch simulators, however, have their limitations
- simulation results are not as convincing as those produced by real hardware, but software tools play one of the most important roles in preliminary phase of researching in this area
- using simulation techniques as a tool in this area of research is a key point and because of that further development of this software is very important