

Project assignments 2019

Requirements

- In teams of two or three
- 10 min Presentation last week of the semester
- 2 pages report on the results
- P4 code

... no exam for teams whose results can be used...

Project 1 – Traffic management 1

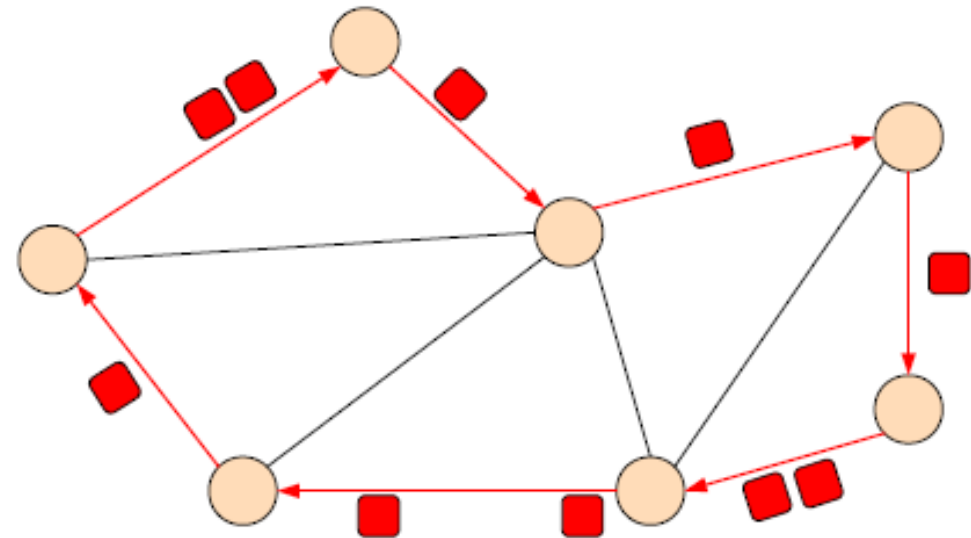
- Implementing drop policies of AQM algorithms and their evaluation in NS-3
- Evaluation framework:
 - <https://github.com/PIFO-TM/ns3-bmv2>
- Implementing the following AQM algorithms:
 - FRED: Fair RED
 - Useful Links: <https://pdos.csail.mit.edu/~rtm/papers/fred.pdf>
 - P4 implementations notes: Requires tracking queue occupancy of each flow in buffer
 - SRED: Stabilized RED
 - Useful Links: <https://ieeexplore.ieee.org/document/752153>

Project 2 – Traffic management 2

- Implementing drop policies of AQM algorithms and their evaluation in NS-3
- Evaluation framework:
 - <https://github.com/PIFO-TM/ns3-bmv2>
- Implementing the following AQM algorithms:
 - PED: Periodic Early Detection
 - Useful Links: <https://ieeexplore.ieee.org/abstract/document/5986016/>
 - Adaptive Virtual Queue (AVQ)
 - Useful Links: http://vision.gel.ulaval.ca/~klein/qos/qos_rep/avq.pdf

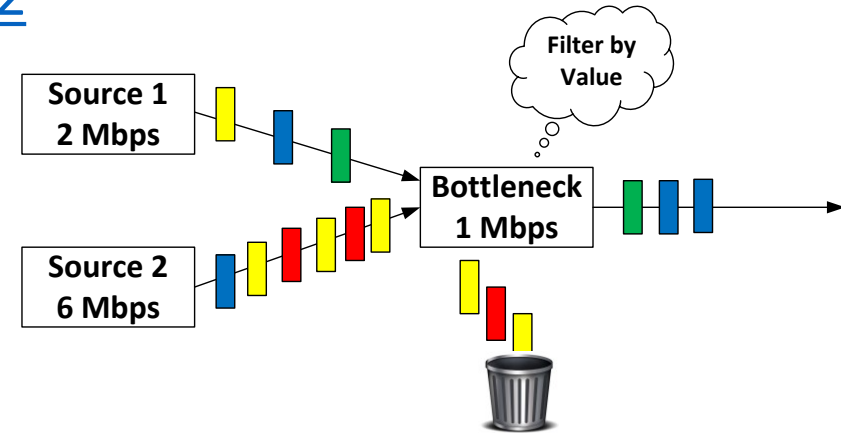
Project 3 - In-network data store

- **Store data in forwarding loops and circles in the network (circulating packets)**
- Output is a program that can interact with the controller to add, query and remove data from the network store
- Environment:
 - MININET + BMv2



Project 4 – Per Packet Value in P4

- Components in P4:
 - PPV packet marker implementation in P4
 - packet value-based scheduler/packet dropper
 - PVPIE implementation: <https://irtf.org/anrw/2017/anrw17-final8.pdf>
- Environment:
 - NS-3: <https://github.com/PIFO-TM/ns3-bmv2>
 - Or mininet



Project 5 - full 5G UPF functionality

- On separate slides