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# Exploring Back-Pressure Based Routing

## Motivation

Routing algorithms decide on routes based on metrics determined by the algorithm itself or given by network operators. Different commonly known protocols are used in large scale networks such as RIP, OSPF, or BGP. Dynamic routing protocols can use metrics to determine a path including for example path length, reliability, bandwidth, policies, ...

Back-Pressure routing (BPR) [3] aims to optimize network throughput by considering the occupancy of network interface queues. Reducing the queue backlog often comes with a lower packet delay and an overall increased throughput. One drawback of BPR is, that only considering queue occupancy values can lead to unnecessary long paths and therefore increased resource use leading to lower throughput. Different approaches exist that address this drawback such as [4].

## Your Task

BPR is often considered in wireless environments. However, we are interested in analysing its behaviour in wired scenarios.

Your task is to design a suitable test setup, analyze existing approaches, and implement a back-pressure based routing algorithm based on previous work (e.g. [1, 2]). Moreover, your task will be to measure the behavior of the developed solution and compare it to simulations of the implemented algorithm to evaluate the performance compared to simulated scenarios.

## Literature

### References

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