Policy Based TCP Parameter Tuning

M.Sc. Thesis

Background

The modern TCP protocol stack includes a large number of tunable parameters. Basically parameters that effect the performance can be split between host specific parameters and network parameters. The host specific parameters alone form a fairly large and complex set of parameters that can be manipulated in modern operating systems. While it is relatively well understood what each of the parameters will do if individually changes, it is there is considerably less quantitative understanding on collective effects of parameters changes in different operating environments and conditions.

Tasks

In this thesis you would build a real protocol stack testing environment using ns-3 network simulator. Your work would be most likely based on the Direct Code Execution (DCE) capability and multi-core simulation capabilities. You will then implement a set of typical network architectures and application traffic conditions, such as *video streaming data centre* scenario using the developed architecture. The research part of the work is to generate a large performance data set and explore algorithmic possibilities to enable *automated parameter* tuning for a given traffic mix and network architecture. The aim is to have a learning environment that automatically adjusts parameters under predefined **policy based constraints**.

Other Information

The network simulator is based on C/C++ and programming skills are highly desirable, although one does not need to be an expert – a willingness to learn is the most important. The topic is a change to learn more about TCP protocol than covered in the basic courses, combined with a lot of fun on developing policy based networking and data driven optimization.

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