

# Abstract

An important aspect of development and research in the field of computer networking systems is evaluation. Through evaluation, performance and behavior of software and protocols over a network can be determined. A network emulator is one of several tools available to accomplish this.

In this thesis, the network emulator Dummynet is described, as well as its extension KauNet. KauNet extends Dummynet by introducing pattern-driven emulation. A pattern defines specific points at which to apply a certain computer network characteristic or behavior. The use of patterns allow an increased control and repeatability of an emulation. Repeating a test with an identical configuration and the same pattern will yield identical results.

The goal of the project was to add a new functionality to KauNet. The new functionality consists of a notification system capable of passing information from KauNet to external observers. By adding this new functionality, emulation statistics can be available for the observers immediately when occurring. Another example of information that can be forwarded, is simulated cross-layer information. For KauNet to know when and what information to send, a new type of pattern has been created, called trigger pattern. Trigger patterns behave similarly to the existing patterns, sharing the same structure and processing in KauNet. Through the use of trigger patterns, events may be raised at specific points. The notification system may then be used to pass the event information.

This thesis describes the evaluation, design and implementation of the trigger patterns

and notification system in KauNet. Finally, it concludes with a verification of the new trigger functionality in a usage example.