Peer Review: Traffic Classification by Hardware-accelerated Machine Learning

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As these technologies have already been mentioned in the expose, all topics covered in this work are set in relation to and discussed with previous work. In each section, previously conducted research is referred to by technology and its development status is mentioned. The common features and differences depending on the specific application scenario are then named and justified. This structure of the chapter enables the reader to immediately put this into context. Thus, it becomes clear that the content of this thesis is based on a combination of network traffic classification using neural networks, hardware accelerated SIMD instructions and supportive preprocessing in the data plane.

Therefore, it is immediately obvious why the paper by Tom Auld, et al [1] was used as one of the first sources. The researchers developed one of the cornerstones of today's network traffic classification tools when they decided to support the use of neural networks for network classification. In addition, the shortcomings of this one implementation are explained, which are due to its complexity. However, further research in this area is also discussed in the case of [5] where the researchers present a more advanced version of such a tool, which is good enough in terms of performance since it takes into account the complexity of the classifier by reducing the number of features.

It is again made clear where the differences of this bachelor thesis to previous work lie, in the case that already special hardware accelerated instructions can be used in neural networks which is explained in more detail in [3]. The linking of the domains of network technologies and neural networks has already taken place, but there is limited preliminary work on the use of SIMD instructions within neural networks in the context of network traffic classification on which the focus lies.

However, reference will of course be made to the previous use of SIMD technologies in the context of acceleration of network applications. Here [4] is referenced and also the focus of this research. However, it may not be entirely clear to the reader in what way software influences memory latency as this may be confused with CAS latency, which is a physical limit of individual memory modules. However, it is well pointed out that the use of SIMD instructions requires special care and consideration beyond the network domain in order to avoid possible

inefficiencies.

Furthermore, related literature in the area of outsourcing the computations to data plane [2] is mentioned, as this allows to compute features needed later in advance in a much more efficient way, where similar preliminary work already exists [6]. Finally, it is again stated that there is already a lot of preliminary work in the various areas that now make it possible to put together a completely new system in the course of the bachelor thesis.

In general, the related work part gives a well-structured overview of the work as I already got to know it from the expose. For all topics covered in this work, the state of research to date has been identified and discussed where similarities and differences lie. However, I believe that there is an opportunity to go a little deeper into the area of preprocessing using P4 in the data plane. Regardless, the reader is well guided through the various topics and it is good that immediately afterwards there is a discussion in the context of this work.

PS: Referring to the sources of the related work part