

Advanced Acceleration Solutions for Next Generation Datacenter Servers

ABSTRACT

Acceleration techniques for TCP/IP packet processing have been studied on various forms of dedicated hardware – ASICs, programmable engines, co-processors and dedicated general-purpose cores. It is also reasonably well understood that the latter two solutions are more desirable since it provides more flexibility. In this project, we recognize that as hardware resources are dedicated to TCP/IP packet processing, there is a significant opportunity for employing these dedicated resources for other important processing layers ranging from more network processing layers (e.g. SSL/TLS, RDMA/DDP, IPv6 to IPv4 translation, etc) to frequently occurring application-level components (e.g. firewall services, XML parsing, compression, garbage collection, etc). The goals of this research are (1) to identify and define advanced acceleration solutions that attempt to encompass many of these commonly occurring processing components and (2) evaluate their benefits in terms of improved efficiency and performance for datacenter servers.