Next Generation Communication Processor

Evean Chuan Qin

Abstract

Dedicated hardware called communication processor has been designed to perform the network applications including security operation, and content inspections in the network, since late 1990. After serial generations of evolution, the communication processors have been becoming more and more mature, and took over the market from the simple software-base system. With the increase of the bandwidth of the network, and complexity of the traffic, the engineers are facing the challenges of finding the solutions for both higher performance and more functions.

This report introduces the history of the communication processor developments and overviews six of the communication processor companies including Broadcom, Cavium, Freescale, NetLogic, P.A. Semi and Sensory Network. Case studies will be done on Cavium and Freescale focusing on the technologies and architectures they use. In the studies, comparison and discussion will be made for the components in the architecture. The core of the report is the analysis of the next generation communication processors, from talking about the requirements to the solutions. According to the network security trends in the next 3 to 5 years, discussions will be made in the need of the requirements, and the choices of the selections according to the current or coming technologies. The solution section will compare different architectures and suggest the better options for the design.

In the end, conclusions will be drawn from the technical analysis on the architectures and supports. The trend of the developments will be predicted as well.