

QAT: Evaluation of a Dedicated Hardware Accelerator for High Performance Web Service

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Abstract—Security is increasingly becoming a vital necessity for web service. Secure Sockets Layer (SSL) and Transport Layer Security (TLS) are cryptographic protocols that are used to provide confidentiality and data integrity between two applications. SSL/TLS has been widely integrated into web service applications. However, the heavy overhead that is brought by frequent encryption and decryption operations in SSL/TLS has terribly burden the CPU. To address this issue, various vendors and researchers focused on developing new alternatives, such as GPU-based and FPGA-based accelerators. Unfortunately, expensive development cost and time cost seriously restrict their deployment in web servers. In this paper, we present and evaluate an emerging dedicated hardware accelerator named Quick Assist Technology(QAT). We analyse and explain the QAT's asynchronous working mode and how it cooperates with OpenSSL and Nginx server. The experimental results show that the dedicated hardware accelerator can speed up the number of connections by 10x comparing to the traditional software ways.

Keyword— Cryptography, Hardware Accelerator, Nginx, QAT, Web Service



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