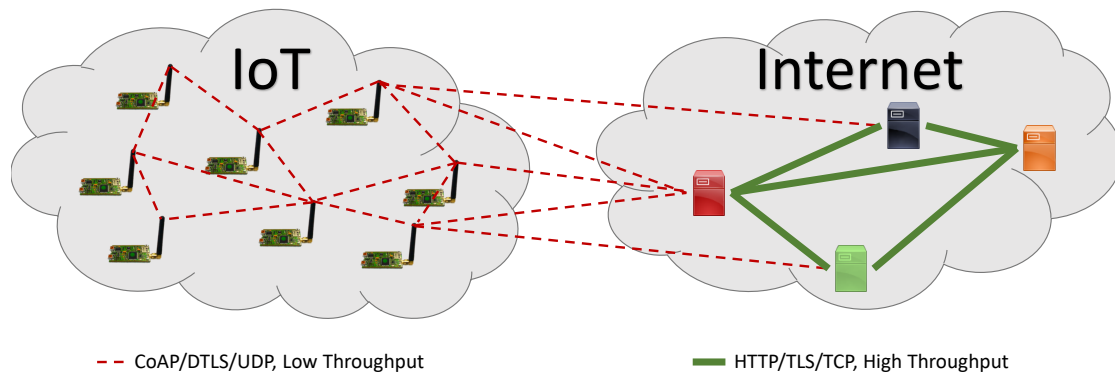


Master Thesis

High Performance Connections for the IoT: Optimizing CoAP's Congestion Control for High Throughput



While HTTP is the dominant protocol in the Internet, CoAP is the best choice for the IoT

Motivation

The Constrained Application Protocol (CoAP) [1] brings the core concepts of the Web to the IoT: Features like the proven Request/Response Model used in HTTP as well as URIs, methods and status codes are adopted. This allows transparent communication between web services and IoT devices by employing cross protocol proxies. Alternatively native CoAP support can easily be provided by using the HTTP and CoAP implementations with a compatible API.

While the HTTP/TCP [2, 3, 4] stack has been optimized for low latency and high throughput, CoAP has been optimized for constrained devices. As a result the CoAP's congestion control prefers simplicity over performance. However, with onward technical progress high performance applications in the IoT become more likely. This brings the need for congestion control mechanisms in CoAP optimized for performance. Additionally, state of the art distributed cloud services for IoT applications could be provided: While as of now inter-server communication relies on the HTTP/TCP stack to satisfy the performance requirements, CoAP is used to communicate with the IoT devices. By optimizing CoAP for high performance communication, the HTTP/TCP stack could be replaced by CoAP.

Required Skills

- C99 programming experience
- Network programming experience
- Ideally having attended one of the ComSys software projects

Project type Master Thesis
Duration 1 Semester

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