

Graduate School of Science and Technology Master's Thesis Abstract

Laboratory name (Supervisor)	Software Design and Analysis (Hajimu Iida (Professor))		
Student ID	2211422	Submission date	2024 / 7 / 17
Name	WEI ZHEYUAN		
Thesis title	An Efficient Path Selection by SRv6 for Optimizing Multipath QUIC Performance		
Abstract			
<p>In an era dominated by diverse networking environments that range from traditional WiFi to advanced cellular networks and innovative satellite communications like Starlink, optimizing data transmission paths has become a critical challenge. The Multipath QUIC (MP-QUIC) protocol, which utilizes multiple network paths for data transmission, often struggles with efficiently selecting the most effective paths, leading to suboptimal performance. This research introduces the integration of Segment Routing over IPv6 (SRv6) with MP-QUIC, aiming to enhance path selection and ensure efficient and reliable data flow across complex network topologies. SRv6 allows explicit routing control by embedding path information directly into IPv6 headers, facilitating dynamic adaptation to varying network conditions and helping to avoid congested and low-quality routes. Comprehensive performance evaluations of SRv6-enhanced MP-QUIC through detailed simulations and real-world testing highlight significant improvements in throughput, latency, and overall network resilience. This integration not only promises to advance the capabilities of multipath transport protocols but also optimizes internet communications across heterogeneous networks, paving the way for more robust and efficient digital communications infrastructures.</p>			