

***PRIoTP: A Partially Reliable and RL-based Context-Aware Transport Protocol for the IoT Network Driven by Edge Intelligence***

**Abstract**

The rapid growth of IoT networks necessitates efficient protocols for constrained environments. Traditional application-layer protocols like CoAP, MQTT, and MQTT-SN often incur significant overhead, leading to trade-offs between speed and reliability. As IoT networks expand, static scheduling becomes ineffective. Reinforcement Learning (RL) enables devices to independently optimize transmission strategies and adapt to conditions such as congestion and mobility. This proposal introduces PRIoTP, a Partially Reliable IoT Protocol that employs RL and uses UDP as its transport layer to minimize overhead and latency while navigating firewall constraints. While UDP prioritizes speed over delivery guarantees, PRIoTP addresses this with user-centric acknowledgments (UACK) and dynamic decision-making driven by Edge Intelligence. The system architecture will be developed using the low-level Socket API to build a solution for edge computing applications while balancing network efficiency and throughput. In addition, this implementation will be made open-source within the IoT research community under the EWU policy license. Moreover, it adheres strictly to the guidelines and design principles of the Internet Engineering Task Force (IETF) to ensure interoperability among various systems, devices, and networks.