

In this paper, we present Structured Message Transport (SMT). SMT is a transport protocol coordinator designed to alleviate the head-of-line blocking problem of existing transport layer protocols, such as TCP. SMT uses explicit dependency tracking instead of assuming total ordering between messages of a communication.

Moreover, explicit dependency tracking creates the opportunity for using multiple paths. SMT can distribute messages into more than one path. However, unlike the stream-based Multi-Path-TCP, SMT is not limited to a single stream of messages. Relaxing the ordering constraints between the messages makes it possible to deliver the received messages to the application layer if they do not have any unmet dependencies.

We have designed and implemented a prototype of SMT to test our ideas. We show that SMT can achieve higher throughput and lower latency than other communication mechanisms. Moreover, we have integrated the ideas from SMT into a proprietary software system and we show that the SMT version performs better than the base version.