

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
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DEVELOPMENT OF A NEW ALGORITHM FOR IMPLEMENTATION OF QOS ON SPACEFIBRE
BASED SPACE NETWORKS**Abstract**

SpaceFibre is a new high-speed serial data link designed specifically for spacecraft onboard data communication, which runs over both electrical and fiber optic media and supports more than 2Gbit/s transmission rate. Considering the needs of reliably transmitting lots of large real-time data streams for space onboard networks in a short time, technology of Quality of Services (QoS) is applied to guarantee the delivery of data streams. The QoS mechanism combining priority, bandwidth reservation and scheduling provides different QoS services for different data traffics, such as the command traffic with the highest priority and the video streams traffic with a large bandwidth requirement. The implementation of QoS services could be complicated and resources consuming depend on the different space mission and application. To save the hardware resources and make QoS method easy to change and universal for different space missions, a new algorithm using binary sequence is developed. With this new algorithm, the implementation of QoS will consume less system hardware resource and provide the optimal transmission throughput. The paper describes in detail how to implement the QoS service by using this algorithm under the framework of SpaceFibre protocol, and investigates characteristics of different kinds of data streams for different space missions with QoS mechanism provided, and presents the throughput performance and transmission time by using the new algorithm to an onboard space network. In the end, the analysis result for evaluating the algorithm is given. The comparisons with other existing algorithm theory prove the algorithm is effective.