



IMPROVING ARINC 653 SYSTEMS RELIABILITY BY USING FAULT-TOLERANT PARTITION SCHEDULING

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Introduction

The ARINC 653 specifies multiple operating system components to provide isolation between partitions in avionics. This means failure on one partition in such system does not affect any other partition. While each partition cannot affect the other partitions, the failure still happens and possibly leads to failure to the whole system. System failure on avionics often leads to significant increase of the safety risk for the people and/or environment involved. Currently, solutions for described problem already exists and implemented. Unfortunately, these solutions are proprietary, thus limiting further research for this domain. This research will propose a reliable ARINC 653 compliant system which will be provided gratis for further research.

Improving System Reliability

To improve service reliability in real-time systems, one solution is to have the scheduler to be fault-tolerant. Studies shows that a hierarchical scheduler like ARINC 653 scheduler can be made fault-tolerant by means of primary-backup scheme. Primary-backup scheme will be used when choose partition to run. If primary partition experienced a failure, a backup partition is chosen to run in place of the faulty primary partition.

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