SPACEX STARLINK SOLUTIONS

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Abstract. This is an outline of possible solutions and novel approaches towards SpaceX's Starlink, a network of satellites.

1. Introduction

A casual conversation with Anthony Rose (SpaceX) about the challenges facing SpaceX's Starlink prompted further private discussions amongst the two authors about possible solutions and novel approaches.

Part 1. Outline of Solutions

2. Watchdog Timer

Let $i = 0, 1, \dots N_{\text{WD}} - 1$, where N_{WD} = total number of Starlink satellites with a Watchdog (WD) timer.

Let $t_{0,i} \equiv t_{0i}$ be the time each Watchdog Timer i gets initialized. This is when the internal watchdog timer begins counting.

Suppose the time duration for a WD timer to "expire" or "timeout" (i.e. once t_{WD} time elapses, the WD rests to either indicate something went wrong, or on purpose) is chosen to be same $\forall\, i = 0, 1, \dots N_{\text{WD}} - 1$.

either / or

Because it's not safety critical, but mission assurance.

Let T_{WD}

3. Network Map

"Ping loops"

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Key words and phrases. satellites, satellite networks, network topology, topological graph theory, graph theory, algebraic topology.

4. Orbital Parameters

References

[1] **Watchdog timer circuit**. Datasheet - production data. STMicroelectronics