

## Routing in IP/LEO Satellite Communication Systems: Past, Present and Future

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**Abstract :** In Low Earth Orbit (LEO) satellite constellation system, routing data from the source all the way to the destination constitutes a daunting challenge because LEO satellite constellation resources are spare and the high speed movement of LEO satellites results in a highly dynamic network topology. This situation limits the applicability of traditional routing approaches that rely on exchanging topology information upon change or setup of a connection. Consequently, in recent years, many routing algorithms and implementation strategies for satellite constellation networks with Inter Satellite Links (ISLs) have been proposed. In this article, we summarize and classify some of the most representative solutions according to their objectives, and discuss their advantages and disadvantages. Finally, with a look into the future, we present some of the new challenges and opportunities for LEO satellite constellations in general and routing protocols in particular.

**Keywords :** LEO satellite constellations, dynamic topology, IP routing, inter-satellite-links

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