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Independent Multicasting-Dense Mode
in Low Earth Orbit Satellite Networks

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This research explored the implementation of Protocol Independent Multicasting - Dense Mode (PIM-DM) in a LEO satellite constellation. PIM-DM is a terrestrial protocol for distributing traffic efficiently between subscriber nodes by combining data streams into a tree-based structure, spreading from the root of the tree to the branches. Using this structure, a minimum number of connections are required to transfer data, decreasing the load on intermediate satellite routers. The PIM-DM protocol was developed for terrestrial systems and this research implemented an adaptation of this protocol in a satellite system. This research examined the PIM-DM performance characteristics which were compared to earlier work for On- Demand Multicast Routing Protocol (ODMRP) and Distance Vector Multicasting Routing Protocol (DVMP) - all in a LEO satellite network environment. Experimental results show that PIM-DM is extremely scalable and has equivalent performance across diverse workloads.

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