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NEW SPACE MARKET SITUATION ANALYSIS FROM GSAAS BUSINESS VIEWPOINT

Abstract

Satellite operators need to access their spacecraft using ground stations. The ground stations enable a communications link between the spacecraft and the earth for monitoring and controlling the spacecraft and for retrieving the payload data such as imagery, science data, etc. Traditionally a satellite operator would build their own ground stations to support their own satellites. For Geo-synchronous satellites, this solution is acceptable because the spacecraft and the ground station are able to communicate 24x7. For Low Earth Orbit (LEO) satellite operators, this is an inefficient solution because the spacecraft is constantly orbiting the earth, and the ground station is only utilized when the spacecraft is in view of the ground station. This utilization can range from less than 1-hour up to about 2.5-hours per day per satellite, depending on the location of the site. Far North and far South sites will achieve the greatest utilization for polar orbit satellite. However, when the satellites are not in view the ground station is not being used, but the operations and maintenance (OM) costs continue to accumulate. Larger organizations that operate multiple LEO satellites may improve the efficiency of the ground station by supporting more spacecraft and using more of the ground station capacity, but the cost of the ground station remains a large capital investment with equipment that typically has a lifetime several multiples longer than the life of a satellite. For an organization that plans to operate many satellites over the course of several decades, the ground station investment may be acceptable, but empirical observations show the utilization of each antenna will rarely exceed sixty percent. It is not acceptable for satellite startup companies.

Several Ground Station (or Ground Segment) as a Service (GSaaS) companies established in the 2010s to provide cost effective ground station solutions to satellite operators. The satellite operators only pay for the access of the ground station, but avoid the capital expense of the ground station, and they avoid the costs associated with decommissioning a ground station at the end of the satellite mission(s). GSaaS business started mainly because of the increase of new satellite startup companies. However the GSaaS customers are still mostly government agencies or large commercial companies supporting government contracts. The current satellite business situation analysis results from the GSaaS business viewpoint will be discussed in this research.