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Author: Mr. John Heskett
Kongsberg Satellite Services AS, Norway

VIRTUALIZED SATELLITE GROUND STATIONS ENABLE NEW USE CASES FOR SATELLITE
OPERATORS**Abstract**

Satellite Ground Station virtualization is an exciting and important industry trend. This virtualization consists of the use of several technologies including Digital-IF, Cloud Computing and Software Defined Radios coming together to achieve a modern software-defined ground station architecture. The ground station can now use commodity IT infrastructure including IP LAN networks and general-purpose compute platforms to host the functions required for L0 and L1 processing. These functions once required proprietary hardware solutions interconnected with analog and digital interfaces. The virtualized ground station solutions continue to provide the same functions as the legacy designs. However, as with most useful technology advances, additional use cases beyond the traditional functions of the ground station are now presenting themselves. KSAT is proud of its industry leadership in driving these advancements in virtualization over the past several years. As such, we have worked to develop several use cases which add value to the ground stations while also providing benefits for the satellite operators. Two of the most critical performance metrics for today's commercial EO satellite operators are processing latency and network backhaul efficiency. The optimal locations for satellite ground stations often mean remote geographic locations. The optimization of latency and backhaul is critical to take full advantage of these satellite ground station locations. The virtualized ground station architecture has opened use cases to optimize these design parameters while still allowing the ground stations to continue to operate in the optimal geographic locations. In addition to latency and backhaul, the commercial NewSpace market has seen an exponential increase in the number of operational satellites through the constellation model. This drives an equally proportional increase in the number of ground stations or more generally ground station capacity. The virtualized architecture enables an efficient multi-mission Ground Station as a Service model allowing for quicker scaling of capacity to meet today's industry growth. This paper explains how true virtualization of the ground station provides real performance and capacity improvements for satellite operators while also increasing efficiency for ground station network operators.