SES▲

CLOUD-ENABLED MINING OPERATIONS

Digitalisation is a key initiative for the mining sector, with industry spend on digital solutions expected to reach $9.3B in 2030[1]. New technologies such as Industrial Internet of Things (IIoT)-enabled sensors, embedded programmable logic controllers and simulation models promise improved performance across all mining functions, as well as enhanced crew safety and higher returns on exploration investment.

As the sector contends with volatile commodity prices, pressure to implement sustainability initiatives and resource depletion, cloud computing represents a path towards transforming the industry's historically siloed information and operational technology (IT/OT) systems.

The elasticity of the cloud means mine operators can access storage and compute resources as they're needed, providing a more cost-effective and efficient way to implement new digital technologies that can improve asset performance and optimise their operations:

- Remote monitoring systems that leverage advanced algorithms to predict upcoming maintenance needs and warn of possible equipment failures
- Simulation-based planning that enables them to virtually analyse their processes and execute "what-if" scenarios that can reduce time and cost during operations
- Advanced sensor technology that can enable more precise extraction, reducing waste and processing time
- Automation of mining equipment to improve worker safety and reduce labour costs
- Drones for faster site surveying and maintenance

While the shift to Mining 4.0 has the potential to improve mine profitability by up to 45% within two to three years[2], this transformation depends on the presence of cloud-optimised connectivity with ore depletion forcing mining companies to push into increasingly remote locations, the limit of terrestrial networks means access to that connectivity becomes less feasible.
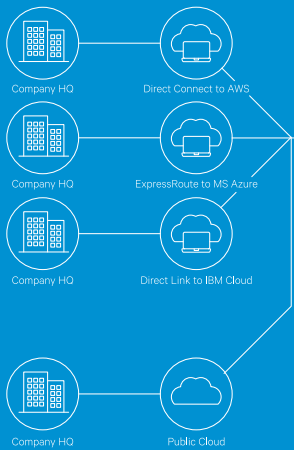
As the only satellite-enabled network services provider with a commercially proven multi-orbit fleet, SES is breaking through those limitations, bringing the power of cloud and edge technologies to even the most remote mining sites. We deliver private, dedicated connectivity via our Geostationary Earth Orbit (GEO) and Medium Earth Orbit (MEO) systems, along with a suite of managed edge and managed 5G solutions developed with our partners. Our portfolio of cloud solutions connects any user to the cloud and extend the cloud to anywhere, ensuring that mine operators can access the resources they need to execute on their digital transformations.

1   "Digital Transformation in the Mining Industry,"
    ABI Research (3Q, 2021)
2   AT Kearney analysis

Private Cloud
- Private, dedicated connection
- Performance tuned to workload demand
- E2E Managed service to the cloud

Company HQ

Direct Connect to AWS

Company HQ

ExpressRoute to MS Azure

Company HQ

Direct Link to IBM Cloud

Company HQ

Public Cloud

Router

IP Core

Router

Router

Platform

GEO/MEO/O3b mPOWER

Edge Computing

Sensor

Customer Edge Terminal

Mine Operator

Sensor

1 High-volume site
MEO

50Mbps to Multi-gigabit per second

Edge Computing

Sensor

Customer Edge Terminal

Mine Operator

Sensor

2 Low-to-medium volume site
GEO

Up to 50Mbps

Public Cloud
- VPN-to-cloud encrypted through Internet
- Public peering with major CSPs
- Robust access to cloud services

A multi-orbit fleet means more ways to connect to a multi-cloud world.
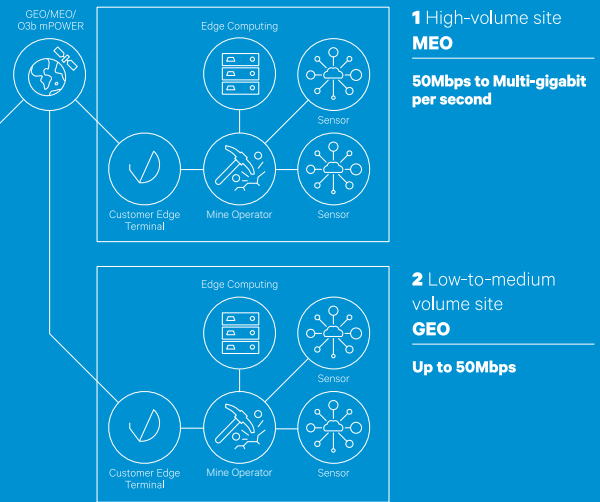
Support for terabyte-scale data volumes

While edge compute applications help gathering, transforming and consolidating data produced at the edge, deep business analytics processes hosted in main cloud regions enable mining companies to derive actionable value from the terabytes of data that a single site can generate each day. Our advanced satellite network can transfer high volumes of data from any site to the cloud, with the ability to support performance requirements for specific use cases.

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Optimised connectivity for edge workloads

Use cases such as autonomous vehicles, drone operations or thermal imaging cameras can dramatically improve mine safety and efficiency but require edge compute functionality that can process large volumes of data on real-time. Additionally, that data can be sent to powerful machine learning systems in the cloud, resulting in further insights that can be delivered back to the edge for continuous performance improvements. Our secure, dedicated links from the cloud to the edge ensures these critical edge workloads receive the connectivity they need to operate effectively, while our managed edge solutions enable new revenue-generating use cases for mining companies.

Global reach

Mine operators are expanding into previously unexplored regions, where the economics of extraction has been historically challenging – a paradigm that cloud-based digital technologies have the potential to change. Our multi-orbit, global fleet of interlinked high-throughput and widebeam satellites ensure any mining site can access reliable, cloud-native connectivity, regardless of location.

Scalability throughout a mine's lifecycle

Mine operators may opt to deploy specific digital solutions for each stage of a mining site, from exploration to reclamation, and each of these solutions may have distinct connectivity requirements. We enable a consumption-based model that lets mining companies scale up their bandwidth investments easily and cost-effectively throughout the lifecycle of a mine.

A next-generation cloud-ready network

As the mining sector adopts digitalisation, our network is evolving to meet its new requirements. Our next-generation O3b mPOWER system builds on our market-proven MEO capabilities, delivering the flexibility, performance, and scale essential for cloud services. Dedicated, private connections from remote sites to any cloud data centre ensure the performance, latency and reach that mining companies need for their cloud applications.

Learn more about our full portfolio of services and solutions at **ses.com**