BUSINESSCOM NETWORKS

CASE STUDY • NATIONAL TELECOMMUNICATIONS • MIDDLE EAST

CELLULAR BACKHAUL
BUILT FOR GROWTH

Cellular backhaul engineered for control, continuity and growth

A national telecommunications service provider in the Middle East needed more than satellite Internet access. They needed a robust backhaul network connecting remote mobile sites to a central MNO core. This network needed to carry both voice and data, leveraging locally available Ku-band VSAT outdoor equipment. The network had to grow with demand, and the operator needed full control over the entire ground segment. The satellite connectivity also had to be fully sovereign and independent from third-party telecommunications service providers and local gateways. As a global provider, BusinessCom Networks brought the platform, capacity, engineering and operational support together as one integrated solution.

Built around Comtech Elevate and a customer-side hub, the network began with a service design of 60 Mbps outbound and 20 Mbps inbound. Following the initial delivery, the network tripled in capacity in 2026, reaching 180 Mbps outbound and 60 Mbps inbound. This story is not simply one of higher bandwidth: it is about selecting an architecture and operating model designed to support the provider's evolving mission.



The customer's challenge

The provider wanted to support mobile services for the general population across geographically separated sites. The project required combining 2G/3G and 4G LTE traffic, including voice calls and Internet access. These services had to connect into an existing mobile-network environment.

Demand differed between sites and changed over time. The customer wanted an aggregate bandwidth pool shared according to traffic, rather than fixed bandwidth dedicated to each location. Planning therefore had to distinguish network capacity, terminal capability and actual traffic demand in both directions and rely on real-time dynamic bandwidth allocation.

Existing VSAT equipment represented an investment worth preserving, but its RF characteristics constrained the transmission plan. The challenge was to reconcile installed hardware, satellite-link margins, operating cost and future expansion without making the launch unnecessarily complex.

The requirement was for a multi-site mobile-network transport service — not just connectivity.

From traffic requirements to RF margins

BusinessCom sized the capacity, selected the topology, and tested RF assumptions against the equipment available at hard-to-reach locations.





Size the transport in both directions

Planning considered voice demand, data users, Ethernet handoffs and anticipated growth. Bidirectional voice and asymmetric Internet traffic required separate outbound and inbound link budgets, and both have very different data characteristics. To begin, a star topology matched the customer's initial preference and central-core traffic path well. The Comtech Elevate platform offered the capability to add a Mesh layer on top, featuring direct point-to-point remote site connectivity via a single satellite hop. The site-to-site mesh option can significantly reduce remote site-to-site voice delay, should that capability be required in the future.

Tune the waveform to the link budget

The original link budget was based on the 60/20 Mbps design used a 60 Mbps outbound carrier and two 10 Mbps inbound carriers, allowing efficient sharing of capacity in both directions. Link-budget revisions considered 16APSK modulation outbound and QPSK inbound. The main challenge was to support 10 Mbps inbounds with 99.5% guaranteed network availability while being limited to relatively compact 1.8 m antennas and only 6 Watts of transmit power. BusinessCom addressed this limitation by providing exclusive, very high-power EIRP satellite capacity in the standard Ku-band range. The higher satellite power signal compensated for the smaller antennas and transmitters.

Balance equipment reuse and satellite resources

The 1.8 m / 6 W VSAT hardware constraints at remotes prompted highly optimized link budgets. BusinessCom evaluated equipment modification options alongside capacity change options, balancing one-off hardware investment, transmission efficiency and operating margin against imposing a standard terminal package.

Connect commissioning to ongoing operation

The implementation scope included remote hub configuration and operator training, with a customer-provided collocated remote modem for configuration and testing. Customer engineers were responsible for physical installation and RF/IF/IP connectivity. BusinessCom's Remote Management Service (RMS) complemented Comtech Engineering Support Services (ESS), advancing and supporting everything from implementation to ongoing configuration support and fault escalation.

A star network with a redundant customer hub

Satellite transport connects remote mobile equipment to the provider's central network through an IP handoff.

MOBILE SITES	SATELLITE	CUSTOMER HUB	MOBILE CORE
2G / 3G / 4G LTE IP over Ethernet	TDM outbound TDMA returns	Comtech Elevate 1:1 redundancy	Layer 2 / Layer 3 Huawei environment

Shared TDM/TDMA transport

The solution provided an outroute controller generating the hub's forward time-division multiplexed (TDM) carrier, which combines traffic for multiple remotes. Inroute controllers at the remote sites receive the time-division multiple access (TDMA) return carriers. Scheduled return time slots allow remote sites to share capacity according to demand, rather than reserving an independent satellite circuit for each location. This added minimal bandwidth overhead of only 2% in each direction.

Integration with the mobile network

The requirement was to support IP over Ethernet, Layer 2/Layer 3 transport, Abis and S1 interfaces, and integration with the customer's Huawei environment. S1-MME signalling and S1-U user traffic were identified separately. The satellite system was therefore designed as a mobile-network transport extension, with voice, signalling and user data considered together—not merely an IP access at each site.

Resilience at the central platform

The specified 1:1 redundant hub combined licensed inroute/outroute controllers, L-band intermediate-frequency (IF) distribution, primary and secondary network-management system (NMS) servers, and paired Gigabit Ethernet switches, delivering a robust and reliable operation.

Operational control and optional evolution

BusinessCom RMS delivered monitoring, incident support and coordinated configuration/change management within the agreed scope, alongside local engineers and Comtech ESS. Mesh and Comtech WAN optimization were expansion options, not documented installed features. The proposed optimizer included GPRS Tunnelling Protocol (GTP)-aware handling of mobile user traffic.



From initial delivery to threefold growth

In 2026, the network expanded to 180 Mbps outbound and 60 Mbps inbound. Both directions reached three times the original design rates, retaining a 3:1 directional ratio.

The project achieved all agreed key performance indicators (KPIs), and the customer is fully satisfied with the delivered solution. Benefits extend beyond capacity: central mobile-core integration, shared transport, equipment-aware RF engineering and an established support relationship for operation and growth.



The BusinessCom difference

Choice guided by the mission. Platform and topology followed the traffic requirement, installed environment, and growth plan. Star connectivity provided a proportionate starting point, while mesh and hybrid topologies remain as optional add-on layers.

Control through engineering. Capacity sharing, mobile-core handoffs, hub resilience and RF margins formed one design. Waveform and equipment choices were assessed together with their satellite-resource implications.

Accountability across the lifecycle. BusinessCom combined design, capacity coordination, implementation assistance and remote management, with specialist vendor support alongside. The customer gained an engineering partner, not just a supplier of components.

Sustainable coverage depends on transport that fits the application, integrates with the operator’s infrastructure and grows with demand, enabling the transition from coverage to control.