Gilat

Case Study: UK is rolling out the world's largest 4G emergency service network (ESN)

ESN will keep UK residents safe in the most challenging operational circumstances

Executive Summary

The Challenge
- Provide secure and resilient public safety services
- Reliable 4G voice and data communication for police, fire and rescue, and ambulance services

The Solution
- EE, part of the BT Group, to deliver ESN coverage for the whole of the UK over its 4G nationwide network
- About 1,000 LTE satellite backhaul sites provided by Gilat will ensure a wide variety of solutions for fixed and portable communication in times of emergency

Benefits of Gilat
- Gilat's patented acceleration technology enables true LTE speeds for cellular handheld devices
- Highest data and encryption rates on the market
- Wide portfolio of emergency solutions

UK's Home Office requires a secure and resilient communication network, reaching to the most sparsely populated areas.

" Gilat's world-class cellular-backhaul-over-satellite solution will play a key part in enhancing our 4G network resilience and helping us to extend the network even further into rural areas as we carry on our journey to cover 95% of the UK landmass "

Mansoor Hanif,
Director of Radio Access Networks at EE

The Challenge:

UK's Home Office requires a secure and resilient communication network to support emergency services and public safety throughout the UK, reaching the most sparsely populated areas and providing backup to terrestrial networks.

The new Emergency Services Network (ESN) benefits from EE's nationwide 4G voice and data services. These enhanced network communications capabilities will allows police, fire and rescue, and ambulance services to keep pace with the latest technological developments rather than being locked into using legacy equipment. The new service will allow the emergency response team to connect to the LTE network from their own smart handheld devices. The existing radio-based network technology will be gradually phased out.

ESN's goal is to keep people safe in the most challenging operational circumstances. ESN will provide priority to emergency services and will deliver a wide geographical coverage along major and minor roads, in both rural and special coverage locations. The Government's £1 billion Emergency Services Mobile Communications Programme (ESMCP) is aimed at making the UK a world leader in Emergency Services communications, and the first to provide nationwide emergency services over a resilient commercial 4G network.

The Solution:

The Home Office has commissioned the mobile network operator EE, part of the BT Group, to deliver emergency service coverage for the whole of the UK over its 4G network. EE operates the UK's largest LTE network, now being expanded to rural areas with Gilat's satellite backhauling for commercial services. This expansion is planned to cover 95% of the British landmass by 2020. EE's terrestrial network was extended to remote locations, enabling emergency services to operate seamlessly in any location, including those that did not have coverage initially. ESN will replace the existing Tetra system, soon to become obsolete, and allow 300,000 critical emergency workers and 50,000 vehicles access to 4G voice and data services for the first time.

The dedicated ESN will use Gilat's field-proven satellite-based cellular backhaul solution over Avanti's Ka-band Hyals-fleet satellites, which cover 100% of the UK and will connect all EE LTE sites across the country. The enhanced resilience of Gilat's solution meets the Emergency Services' critical communications requirements with a wide variety of solutions for fixed and portable communication. Gilat is in the process of deploying about 1,000 LTE satellite backhaul sites supporting multiple use cases.

The Satellite Advantage

In emergency situations, the terrestrial infrastructure is often destroyed by a sudden disaster. This means that precisely when communication is most important for saving lives, it is all-too-often non-existent due to network breakdown. To enhance resiliency, MNOs are increasingly using satellite backhaul to back up or replace their terrestrial backhaul infrastructure.

Satellite backhauling is commonly the only connectivity solution in areas where the terrestrial infrastructure is destroyed, insufficient or overloaded. With satellite communication, MNOs can depend on reliable and resilient service when it is needed most.

A network backhauled by satellite can be deployed rapidly and easily in both fixed sites and ad-hoc locations as dictated by the ongoing crisis situation. On-the-pause communication can be quickly set-up and deployed by vehicles to provide first responders in any location with secure and reliable voice and data communications.

As climate change brings about more floods, earthquakes,

hurricanes and forest fires, and as our reliance on voice and data communication continues to increase, there is a growing interest in broadband communication that is not dependent on the terrestrial infrastructure. That is why we are seeing more local governments, MNOs and emergency organizations adopting satellite communication for emergency response and disaster recovery.
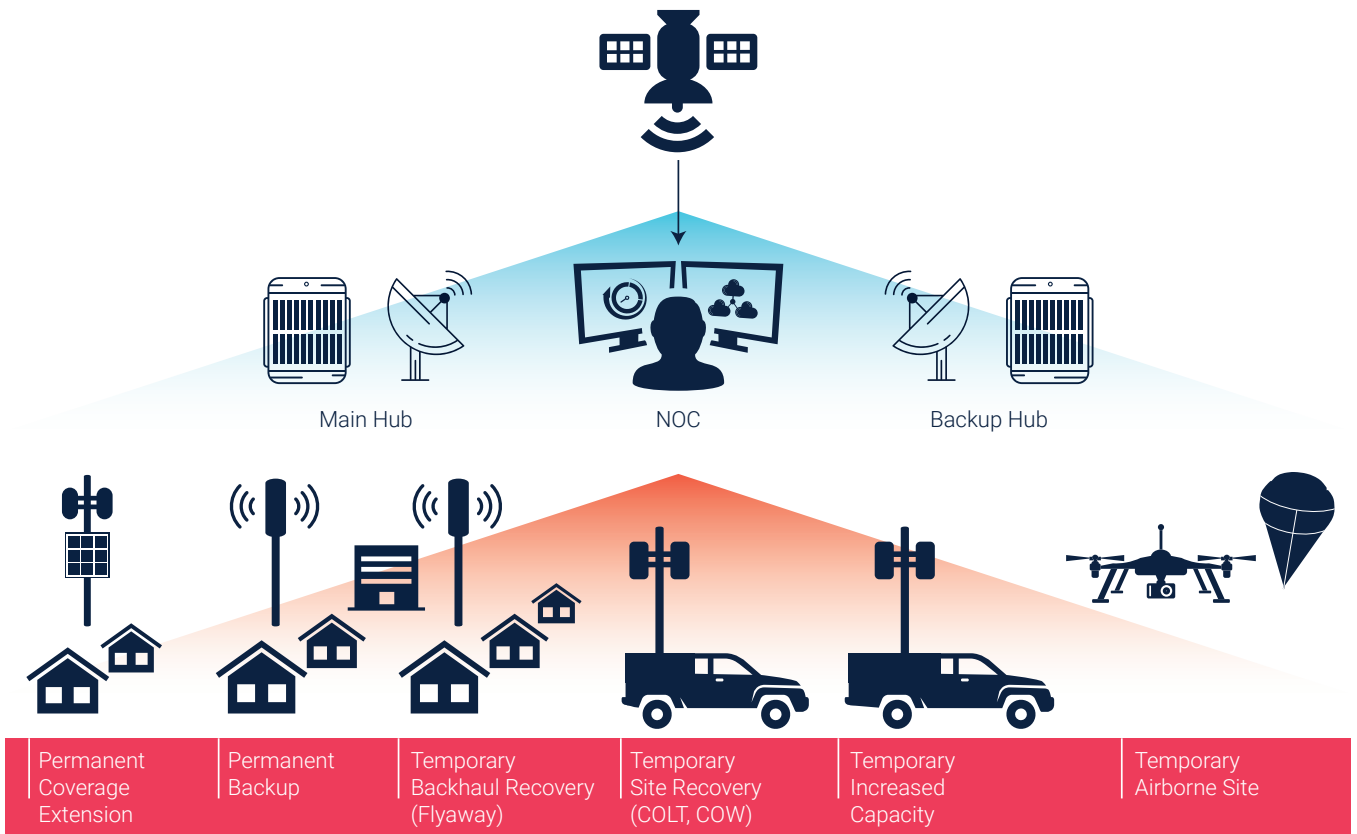
The Gilat Advantage

Gilat's SkyEdge II-c platform with the MEC-enabled Capricorn VSAT provides the highest data and encryption rates on the market, maintaining IPSec data security at unprecedented speeds without packet loss under fade conditions. Download speeds of 150Mbps, including acceleration and encryption, are achieved with Gilat's patented acceleration technology. This enables true LTE speeds for cellular handheld devices.

Complete software integration of Gilat's acceleration technology and QoS within the Capricorn VSAT results in the highest service quality and performance. Dynamic switchover to SCPC return enables the VSAT to achieve very high data rate performance, as required for applications such as mission-critical live video. In addition, Gilat's X-Architecture allows baseband resources to be shifted to the area in need via a software-defined RF matrix, facilitating the prioritization of emergency services.

EE's Emergency Service Network Use Cases

Main Hub   NOC   Backup Hub

| Permanent Coverage Extension | Permanent Backup | Temporary Backhaul Recovery (Flyaway) | Temporary Site Recovery (COLT, COW) | Temporary Increased Capacity | Temporary Airborne Site |

Multiple Emergency Response Use Cases

- **Permanent Coverage Extension** — Satellite backhaul provides primary connection to reach remote locations not covered by terrestrial network. Remote locations therefore enjoy continuous coverage when terrestrial network fails

- **Permanent Backup** — Critical BTS sites in network use satellite connection to backup the terrestrial backhaul. This solution is in stand-by mode until emergency strikes

- **Temporary Backhaul Recovery** — When terrestrial backhaul link fails due to any type of disaster, a quick temporary solution is provided using Flyaway. This portable lightweight suitcase includes the full terminal and tripod for easy and fast mounting of the antenna for restoring communication

- **Temporary Site Recovery** — When the permanent BTS site fails, a fully mounted vehicle including a cellular on wheels BTS and VSAT terminal is driven to the required location to provide very fast on-the-pause communication recovery. Cellular on Wheels (COW)/ Cellular on Light Truck (CoLT)

- **Temporary Increased Capacity (for large events)** — A vehicle-based terminal with satellite backhauling can be rolled-in temporarily to provide additional coverage over the terrestrial link for both planned and unplanned events

- **Temporary Airborne Site – Balloons and Drones** — A successful proof-of-concept was conducted with balloons and drones to temporarily fill coverage gaps. The POC used a satellite backhaul link for the 4G small cell on board