Mobile Private Network as a Service – Service Definition Document

G-Cloud 14

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1. Introduction

We bring you mobile private network, a secure, dedicated network designed for innovation or critical communication.

[Freshwave](#) are one of the longest-serving, market-establishing, suppliers of neutral host indoor small cell, DAS and Wi-Fi based mobile solutions in the UK. Working with us gives you access to industry-leading solutions, which we've delivered in many of the most complex and demanding connectivity settings in the world.

To date, we have designed, deployed, and upgraded over 2,000 in-building systems nationwide, manage, 200 multi-operator outdoor networks for our customers, and look after over 5,000 mast locations across the UK. We have strong relationships with the leading technology providers, meaning that we're at the forefront of delivering the latest technologies.

Our team collaborates with the you and mobile network operators to give you a dedicated network which is:

- **Reliable**: Uninterrupted quality of service and resilience, get gigabit speeds and support thousands of devices.

- **Secure**: Carrier-grade, end-to-end encryption and localised data management, so it's well suited for critical IT systems.

- **Simple**: Triple the range of a traditional Wi-Fi network and unrestricted device choice, along with industry standard infrastructure. Flexibility to reconfigure without re-cabling.

"We're committed to rolling out high-speed mobile to rural communities, and sharing spectrum with Freshwave complements our efforts. We'll continue to endorse novel approaches that help bridge the digital divide and connect more people and businesses."

**Chief Network Officer
Vodafone UK**

"High capacity, super-fast connectivity is essential for consumers and businesses today, with demand for data and low-latency networks continuing to rise. We're pleased to be the first operator live on this pilot with Freshwave helping to deliver the best possible 4G and 5G services to our City of London customers, even at the busiest times. The project is a further demonstration of how we're enhancing our networks to help both digitise and deliver economic prosperity to the UK, and we look forward to extending it in the future."

**Director of Mobile Radio Access Networks
EE**

"Outdoor small cells provide a flexible solution for boosting network connectivity, and adding extra capacity to our existing legacy solution of over 200 small cells in the City of London will provide further benefit to the ever-increasing data demands of its users."

**Outdoor Small Cell and Microcell Delivery Lead
VMO2**

"We are investing more than ever in enhancing connectivity and coverage, and already have the UK's Fastest 5G Network, according to Ookla. Indoor focus has been a major priority of ours with the acquisition of additional low frequency spectrum in 2020 and our agreement with Freshwave will further enhance indoor coverage, particularly for business customers."
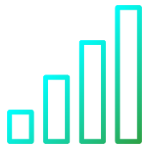
**Chief Network Officer
Three UK**

We take the complexity out of mobile connectivity through:

Combined real estate and telecoms know-how

Collaborative commercial models

Global best practice

2.   The service

Your mobile signal service is:

Carrier-grade secure network

The best available, and upgradeable technology

Resilient connectivity layer

24/7 connectivity

Our approach

Our ISO accredited standard delivery process for installing and commission wireless systems is based on an in-depth understanding of mobile private network technology and our proven experience with similar wireless network solution design and deployment.

The end-to-end process includes:

- Requirement capture
- High level design report and review
- Low level design report
- Build and delivery
- Setup and commissioning
- Acceptance test and handover
- Training

High level design

We'll provide a high-level design to show the fit for purpose mobile private network architecture and outline the scope to meet customer requirements.

It will include:

- System architecture
- RF Design & coverage predictions
- Antenna / AP locations
- Network components
- Main equipment room layout

Figure 1: Example mobile private network architecture
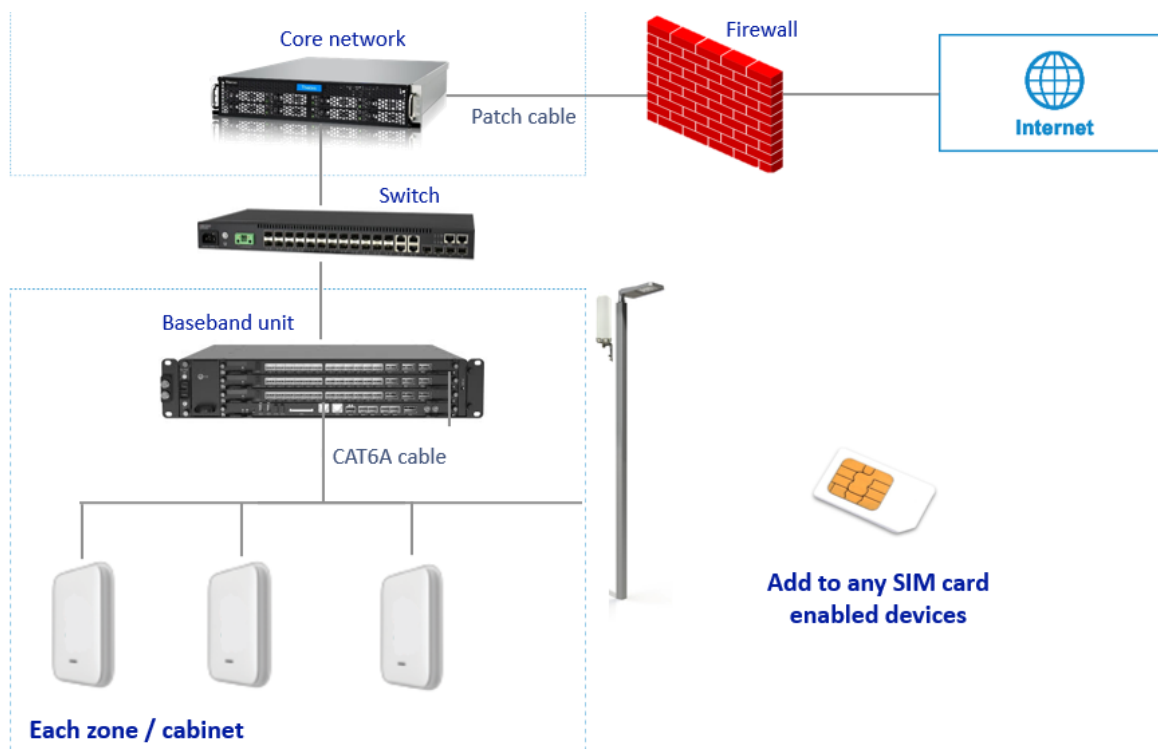
Our approach to design uses both mobile network operator and Ofcom licenced spectrum. Provides the right level of power (low, mid or high) depending on need and supports unlimited devices, SIM cards and applications.

Low level design

Our low level designs incorporate a full and detailed design report and appendices covering all aspects of the proposed solution. This is so you and any stakeholders can review, feedback and approve before we move to the build stage.

Table 1: All services included in the low level design phase

Document title	Summary of contents
Design report	Overview of key design elements
Design requirements	Detailed requirements for the proposed design
RF coverage design	RF predictions and CW test results
GA drawings and schematics	Detailed drawings of RF infrastructure
Equipment room layout and M&E	Detailed equipment room layout and mechanical and electrical details

Fibre and Cat6A layout	Detailed drawings of brackets and fixings for all antennas and remote locations
Point of interconnect	Operator and technology specific attenuation and connectivity of technology mapping
IP Network Configuration	Showing all IP addresses and ports allocation
ICNIRP compliance statement	ICNIRP compliance of all proposed antennas
Photo pack	Photographs indicating location of equipment
Equipment specifications	Detailing all equipment specifications
Access details	Access routes to main equipment and remote locations
Planning drawings, as applicable	To enable planning consent if required
Stakeholder pack	Cut down version of the design pack including all relevant information for the stakeholders
Site provider scope of works	Details of works required to be carried out by the site provider such as power provision and possibly fibre

Build and delivery

We will assign a dedicated project manager to oversee successful and on-time delivery who will liaise with you to ensure the full scope and requirements capture is transferred into the delivery plan. The project manager carries out numerous pre-build activities including programme and risk management, organising resource and materials, H&S construction pack and communication with site contacts and third-party contractors to ensure a smooth transition into the delivery phase.

We employ a team of in-house engineers covering Fibre, Electrical, Rigging and Commissioning skill sets with comprehensive experience in delivering into sensitive and/or critical environments and can factor delivery to meet specific needs such a SC cleared resource where requested.

All personnel have the relevant qualifications to deliver their aspect of the service. Freshwave will be constantly open to collaborating with the you to explore new ways of working that continuously improve efficiency of implementation.

Set up and commissioning

Our previous experience working with vendors on private networks shows that vendor support is essential to the success of the project, especially when the RAN equipment and Core come from different vendors. Our approach has therefore been to setup the Core and RAN at our Reading

Lab with the appropriate switches, firewalls etc. for configuration before shipping the equipment to site ready for installation. We will engage with the vendors for support if required.

Once the cabling and installation work is completed and the cabling is tested then integration work can proceed. System components are connected and configured as per the low level design, including firewalls, switches, routers, radio units, hubs, servers and Core equipment. Post integration testing is then carried out to confirm end to end system performance re. signal levels, data throughput etc. This approach has worked successfully for other projects. It allows us test and rectify any faults or incompatibilities in a controlled lab environment, with access to the full set of diagnostic tools.

Acceptance and handover

Upon completion of the build works, a post-build Quality Inspection is carried out to ensure that the final system is ready for handover to the client. The CDM H&S file will be updated and closed. As-Built documents are produced to detail any changes to the design, including configuration details and a maintenance and operational manual. The following are the deliverables of the project:

- Low level design report
- As built drawings
- As-built documentation including the configuration and maintenance and operational manual.

3. Summary

As well as a robust, future proofed and secure mobile private network, with us you'll get a:

Pioneering service. One of our founding innovations as a business was delivering multi-operator in-building mobile signal as a service. We brokered unparalleled relationships with the UK MNOs to develop the solution alongside them. And we're continuing to develop our in-building service through the combination of technical and commercial innovations for our customers' benefit.

Principled partner. We've built our business on being a trusted and neutral partner to our customers and by extension their customers. We're proud to be the network service provider bringing together mobile operators, local and central government, and real estate providers to work together in new ways and ensure everyone's on.

Versatile advisor. Telecommunications is constantly evolving, and our in-house technical teams are at the forefront of many industry innovations. Being one of our customers will give you access to a level of specialist know-how as well as a collaborative commercial approach that makes what's cutting edge even more accessible.

Here's a reminder of our customers, alongside some recent testimonials:

"When moving to a new building, the ICT infrastructure fitout is a huge challenge on its own. But, from a mobile signal perspective, we needed to ensure seamless 4G service across all networks – with future support for 5G – for the thousands of employees and customers that come through our offices at One Bank Street each day. Otherwise the connected experiences within the building would simply be a non-starter."

Andrew Sharp
ICT Project Director

SOCIETE GENERALE

"Workspace Group has worked with Freshwave since 2016. We've formed a successful relationship in the design, deployment and management of our In-Building Mobile Coverage (IMBC) implementations across our robust portfolio (totally 65 properties and 16 live sites). The team are friendly, knowledgeable and always there to assist (no matter how trivial the problem is). As a third party supplier, they're a joy to work with."

Richard Monk
Head of Digital Infrastructure

WORKSPACE®

"It has never been so important for our patients to be able to stay in contact with their families, so I'm pleased that we're working with Freshwave to provide a robust, multi-operator in-building solution. No matter what network people are on, they'll be able to access secure, reliable mobile coverage so they can always get in touch with people when they need to. It's great being able to give that peace of mind to our patients and those that care about them."

Matthew Mahoney
Head of ICT

GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Aneurin Bevan University Health Board

"Outernet London will be an iconic entertainment district, where digital technology and the physical world come together to create unique immersive experiences. The district will be using some of the most impressive audio-visual technology available and we know that for people to have the best experience of it, they need reliable mobile coverage. I'm pleased to be working with Freshwave to ensure all out visitors will stay connected, whether they're marvelling at our four-storey 360-degree LED screens, or rocking out to a live gig in our underground venue."

Mike Whittaker
CTO at Outernet Global

And here are our Freshwave Services Limited accreditations, ensuring compliant, carrier-grade network for our customers:

FreshWave
You're on