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The evolution of indoor connectivity

Understanding industry standards for multi-operator indoor connectivity in the UK

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About the paper

This paper provides a high level overview of the Joint Operator Technical Specification Neutral Host In-Building (JOTS NHIB) architecture for indoor connectivity, and the benefits of this approach for building owners.

These specifications are developed by the Joint Operators Technical Specification Forum, comprising all four UK mobile operators, and specify the performance, coverage and reliability of wireless systems shared between UK mobile operators. They are referenced by providers, including Cellnex UK, when deploying shared radio solutions on behalf of mobile operators and their customers.

More information is available at www.mobileuk.org/jots

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The challenge of indoor communications

Despite the anywhere/anytime connectivity enabled by today's mobile phone networks, the majority of calls and mobile internet sessions continue to originate from inside buildings. The quality of mobile network operator coverage in offices, shopping centres, hotels, entertainment venues and so on is therefore critical to building owners, tenants and visitors.

However, the coverage and capacity available to outdoor users is not always accessible to those indoors. Thick walls, steel structures and the use of metallised-glass in building design can have a major impact on indoor mobile signals – reducing their strength or blocking them completely.

This well-recognised and ongoing problem is spurring the adoption of distributed antenna systems (DAS) that transmit mobile operator signals inside buildings, hence providing both coverage and capacity.

The Joint Operator Technical Specification for Neutral Host In-Building (JOTS NHIB) architecture framework is a new approach to indoor solutions and marks an important evolution of the standard connectivity model.

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Understanding the JOTS NHIB approach

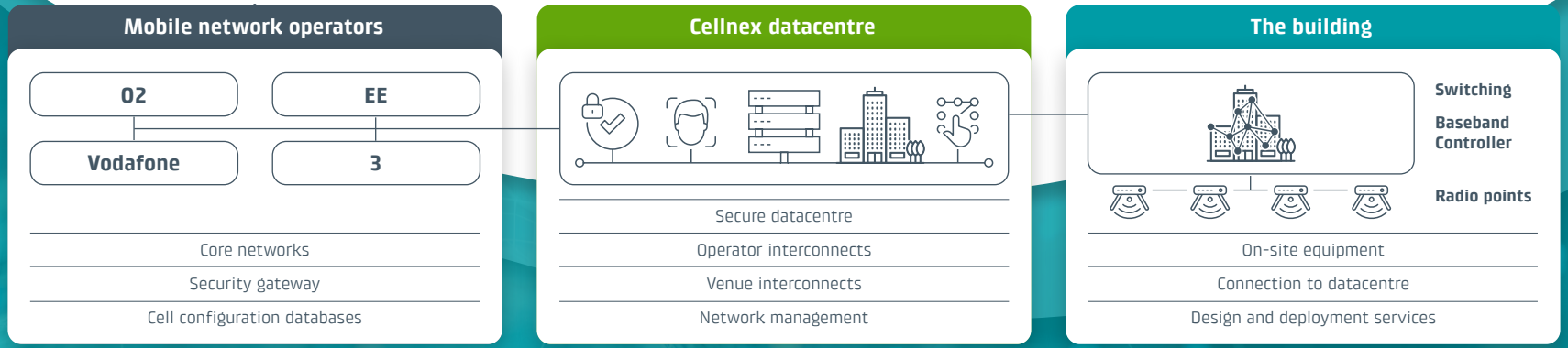
The Joint Operator Technical Specification for Neutral Host In-Building sets out the technical requirements for shared indoor connectivity solutions. This approach has been agreed by the UK's four Mobile Network Operators (MNOs) – O2, EE, Vodafone and 3.

In a conventional DAS deployment, all four MNOs install telecoms base station racks within the building to provide their signal. These signals are then distributed around the building via a network of remote units and small antennas.

The JOTS NHIB solution offers a more centralised approach, removing the MNOs' base stations from the building entirely, and providing a more energy efficient solution. Instead, the MNOs connect back to their core network through a third-party provider's datacentre, such as those operated by Cellnex UK. The mobile traffic is then carried via a fibre connection to the building, where the signals are distributed via a series of radio points.

Flexibility is key and the solution is tailored to the precise needs of the target building and its users.

Illustrating the JOTS NHIB approach



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Centralising the benefits

Offloading the direct connection between MNOs and the building makes it possible to remove the operator base stations entirely, with on-site telecoms equipment reduced to just a few units of rack space.

This dramatic reduction in equipment decreases the footprint and power consumption, and makes the installation a simpler and less disruptive process. JOTS NHIB solutions can also take advantage of existing structured cabling within the building.

Crucially, because JOTS NHIB is a multi-operator specification, the principles are agreed by all. This eliminates the requirement for the building owner or Neutral Host connectivity provider to negotiate with individual operators for every new solution.

Key features of a JOTS NHIB solution

- Dedicated coverage & capacity
- Single point of interconnection for all 4 UK MNOs
- Remote network management and monitoring
- Simple installation and on-demand scalability

Benefits in brief

- Seamless indoor voice and data communication
- Flexible coverage to single or multiple floors
- Reduced power consumption and cooling requirement
- Reduced on-site equipment footprint

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Assuring compliance

Under the specifications, the Neutral Host provider (for example, Cellnex UK), will install the indoor connectivity solution into the building or venue. The provider will be responsible for adherence to the requirements of JOTS NHIB.

The technical solutions are detailed and include: ensuring that appropriate assessments are carried out; that new deployments don't compromise existing technologies and devices; that all mobile operator spectrum requirements are met; and that the solution meets current 3GPP and ETSI standards.

Therefore, it is important for building owners and businesses to choose a certified and experienced partner with a deep understanding of the specifications together with the capability and experience to deploy and manage the solution.

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Case study:

Delivering neutral host connectivity to R+

Based in the centre of Reading, near Reading Station, R+ is a modern office complex. During its recent refurbishment, the management company had provided lightning-fast wired IT connectivity across its six floors. Mobile connectivity was a different matter though.

Indoor coverage was poor, dropped calls a problem and tenants were unable to make or take calls or access their mobile apps in many areas of the building. One floor was particularly prone to issues and the tenant business chose to invest in a JOTS NHIB solution delivered by Cellnex UK.

Developing the business case was straightforward and easy to approve; the tenant simply considered the negative impact and opportunity cost of the poor mobile experience. With the JOTS system now installed, users will be able to access ultra-fast mobile coverage across the floor, and embrace hot-desking and other modern working practices.

A complete solution from a strategic partner

As a UK Critical National Infrastructure Provider and one of Europe's leading telecommunications companies, Cellnex UK is committed to continually reducing the cost of indoor connectivity.

A pioneer in DAS with the expertise to meet JOTS NHIB requirements, Cellnex offers a robust, cost effective and fully-managed solution – funded through a range of flexible commercial models.

From design and planning to deployment, and operational support, Cellnex UK manages the entire process.

Designed to be tailored and fully scalable to suit the nature of the building, deployment is fast, straightforward and ensures minimal disruption.

Cellnex UK begins by understanding the needs of the business, conducts a detailed site survey and produces a design blueprint tailored to the specific building.

Engineering teams then deploy and commission the JOTS NHIB solution – which is fully managed and monitored 24x7x365 to ensure optimal performance.

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Get in touch

From design and planning to deployment, and operational support, Cellnex UK manages the entire process.

Find out more and book a meeting with our Indoor Connectivity experts, get in touch at: **IndoorSolutions@cellnextelecom.co.uk**

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Cellnex plays a key role within the telecoms sector enabling connectivity throughout Europe. In the UK, as the country's leading independent telecoms site partner, Cellnex UK provides critical national infrastructure & services to telecoms operators, emergency services organisations and many other enterprises.