

TRANSFORMING THE FAN EXPERIENCE WITH NEXT-GENERATION 5G CONNECTIVITY

Sunderland Stadium of Light case study





Summary

The Stadium of Light is the home of Sunderland AFC (Association Football Club), regularly attracting tens of thousands of fans to matches, concerts and other events. We've worked with Sunderland AFC and Virgin Media O2 to transform 5G connectivity at the stadium under the ground-breaking Sunderland Open Network EcosysTem (SONET) smart city initiative.

Using our Connectivity-as-a-Service solution, we deployed the UK's first full neutral host RAN managed service in a high-density demand venue. The result: a seamless digital experience for fans—whether they're sharing live video, viewing AR overlays, or ordering food from their seat.

Combining a small-footprint distributed antenna system (DAS) with an Open RAN tech stack and Boldyn's Network Management System (NMS), the solution optimises costs for the stadium and mobile operators, while creating a foundation for the delivery of new digital experiences.

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The launch of an enhanced 5G network at the Stadium of Light marks an exciting step forward, not just for Sunderland AFC, but for the entire city. This technology will unlock incredible opportunities to enhance the matchday experience for our supporters through faster connectivity, richer content, and more immersive engagement than ever before.”

David Bruce, Chief Business Officer,
Sunderland Association Football Club

Bringing state-of-the-art connectivity to an iconic football stadium

The Stadium of Light is the home of Sunderland AFC, and something of a spiritual home for Sunderland residents. Its 48,707 capacity makes it the sixth-largest football stadium in the UK, but elite football is only one of many experiences on offer. As one of north-east England's destination venues, the stadium also hosts a wide array of events, from concerts and rugby matches to Sunderland University graduation ceremonies.

Built in 1997 on the site of Sunderland's Wearmouth Colliery, the stadium simultaneously looks back to the city's coal-mining past and forward to its technological future. It's a partner in the Sunderland Open Network Ecosystem (SONET) project, a smart city initiative that aims to transform connectivity for visitors to the Stadium of Light and the new British Esports Arena.

A major element of that transformation has been the implementation of a new 5G neutral host network at the Stadium of Light. Built by Boldyn Networks in partnership with Sunderland AFC and Virgin Media O2, the new system enables mobile operators to ensure a seamless digital experience for fans at even the most packed matches and events.



The scenario



48,707
seat capacity



48,353
record attendance at a football match



60,000
record attendance at a non-football event

The challenge

The Stadium of Light wanted to ensure every mobile operator can deliver enough signal capacity and coverage at the stadium to support high-bandwidth use cases like livestreaming and augmented reality overlays.



The challenges we encountered included:

High-capacity crowds

The stadium welcomes up to 48,000 fans, and sometimes more, for home matches, with concert attendance often even higher—including 60,000 for an Ed Sheeran concert in 2022. The incumbent, decade-old wireless infrastructure was capable of supporting thousands of voice calls and texts at times of peak capacity, but struggled with more data-intensive activities.



Solution:

We deployed our Connectivity-as-a-Service (CaaS) managed service to significantly enhance 5G connectivity at the stadium. Built on a neutral host model, it combines an evolved distributed antenna system (DAS) with Open RAN fronthaul interface standard, JMA X-RAN—a pioneering 5G technology stack—and Boldyn's NMS. With much of the infrastructure virtualised, the solution optimises physical footprint, power consumption and CO₂ emissions, while ensuring high-speed 5G coverage in every corner of the stadium.

Multi-carrier support

Fans and stadium visitors subscribe to different operators' networks, but the Stadium of Light wanted to deliver a seamless digital experience to every visitor equipped with a 5G device.



Solution:

Boldyn's neutral host solution can connect subscribers from any carrier on a single, multi-tenant CaaS platform. Costs for operators are kept low with a monthly subscription fee covering design, installation, operations, maintenance and upgrades. Our 24x7 network operations centre and dedicated support team maximise uptime for every carrier that uses the platform.



Future-readiness

The stadium wanted to ensure that fans and visitors can continue to enjoy a seamless digital experience as new technologies emerge and customer expectations evolve.



Solution:

The enhanced 5G connectivity enables fans to engage in a whole gamut of digital experiences at the stadium—from uploading video, to ordering food and drinks from their seat, to viewing real-time augmented reality (AR) overlays with information about a game or concert. As mixed-reality and immersive experiences continue to evolve, fans will be able to enjoy them without a hitch.

The result

Enhancing the fan experience with next-generation 5G connectivity

Working with Sunderland AFC and other SONET stakeholders, as well as Virgin Media O2 as the anchor tenant, Boldyn Networks have transformed 5G mobile connectivity at the Stadium of Light.

Our stadium-wide, neutral host 5G network delivers numerous immediate and ongoing benefits to stadium-goers, mobile network operators (MNOs) and the Stadium of Light itself, including:



60% lower space and power utilisation

The fully virtualised Open RAN based platform reduces space and power requirements by up to 60% compared to traditional indoor architectures, delivering cost savings and sustainability gains to Sunderland AFC.



New revenue generation opportunities

Ubiquitous 5G connectivity enables Sunderland AFC and its stadium partners to capitalise on new revenue streams, such as at-seat food and drinks ordering, push notifications of personalised offers, and new digital experiences.



Improved service assurance at lower cost

Boldyn's innovative CaaS reduces operational costs for MNOs with dedicated network monitoring and management, improving service assurance with less input and resources required from operators.



High-speed 5G connectivity for all

Fans and visitors benefit from high-speed 5G connectivity, resulting in richer connectivity experiences for everyone. This represents a significantly enhanced experience from the legacy infrastructure previously in place at the Stadium of Light.



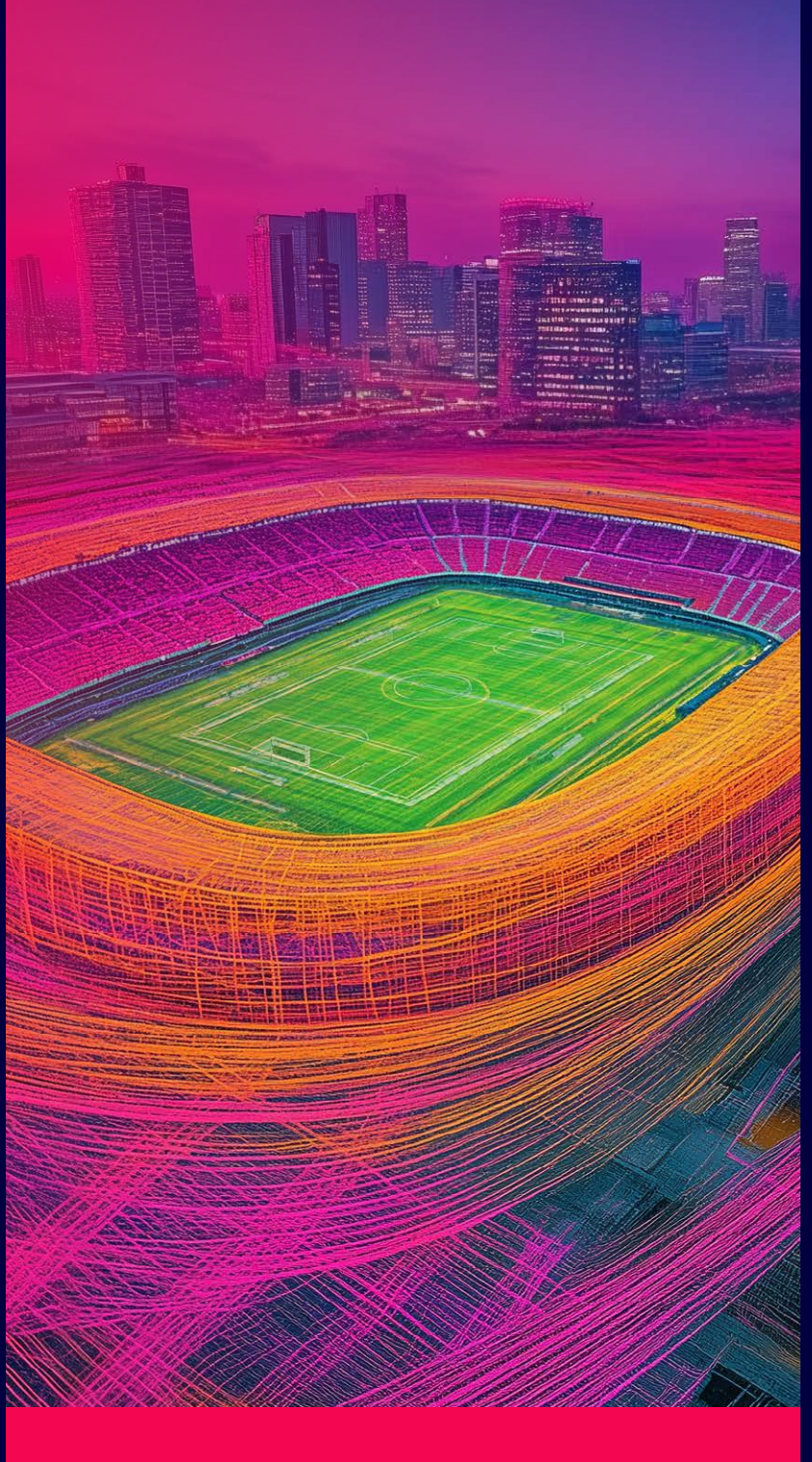
Seamless digital experiences

The new network supports the rollout of more interactive, digitally-enabled services, including seamless uploads and downloads of videos and social media, increased safety, and personalised experiences during events.

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We have a long history of giving our customers access to the best live entertainment, so it's only natural that they will be the first to benefit from the next generation 5G network at the iconic Stadium of Light. Our Mobile Transformation Plan is focused on improving the connectivity experience for our customers no matter where they are and this work with Boldyn Networks is ensuring match going fans can experience a seamless connectivity experience.”

Dr Rob Joyce, Director of Mobile Access Engineering at Virgin Media



We can help with your connectivity needs

Boldyn Networks delivers the advanced shared network infrastructure needed for a smart, inclusive, and sustainable future. We enable connected transit, venues, enterprises, heavy industry, college campuses and smart cities to create new possibilities in the way people live, work and play.

We don't just talk about the future. We exist to help build it. Creating the foundation from which a better collective future can be imagined.

To learn more visit **boldyn.com**