

# A MERU CASE STUDY IN ARCHITECTURE

European architects BDP



## Summary

BDP, one of the largest interdisciplinary design practices in Europe, wanted a wireless LAN for its stunning new 33,000 square foot northern England headquarters overlooking the Piccadilly Canal Basin in Manchester. Having been disappointed with the limited capacity and inflexibility of traditional micro-cell Wi-Fi architecture, BDP sought a solution which would support more flexible work patterns throughout the building, have the capacity to support significant growth in users and in network demand, support voice over wireless IP, and be ready for full migration to high-speed 802.11n wireless.

Wireless networking with Meru using 802.11n for data and voice is better by design for leading European architects BDP

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## Background – BDP and Its New Headquarters

Since its founding in 1961, BDP has become one of the largest interdisciplinary design practices in Europe, and fifth largest in the world. Known for many innovative and award winning projects such as refurbishing the Royal Albert Hall and the Royal Opera House in London, the expansion of the All-England Lawn Tennis Club at Wimbledon, the Chunnel train station, and Aintree racecourse, BDP employs more than 1,200 architects, designers, engineers and other professionals working out of a dozen offices situated throughout the UK, Ireland, France, and Holland.

When it embarked on design of a new northern England headquarters, on Ducie Street overlooking the Piccadilly Canal Basin in Manchester, the company wanted a workspace which would be emblematic of its leadership in design and functionality.

The building was to provide a nurturing workspace, without physical barriers to

creativity, and a wireless network that could put employees online anywhere, so they can convene project meetings and collaborate wherever it best suits them.

The result is both practical and environmentally friendly. The dramatic 33,000 square foot, six-storey building features natural ventilation and overnight cooling which have earned an "Excellent" rating from the BRE environmental assessment method for mitigating the environmental impacts of new buildings and set new standards for energy efficiency in the North West of England. Since its August 2008 opening, the building had been recognized as one of the best new buildings in the city.

It also hosts Manchester's first "living roof", which provides habitat to help protect and preserve England's most endangered bird species, the Black Redstart. The roof uses recycled rubble and gravel taken from the building's own construction site, which has been seeded with the redstarts' favoured vegetation.



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### The Goal – Wireless Innovation to Match the Innovation of the Building Design

Many of BDP professionals are mobile, moving from place to place as they collaborate on projects. Over a third have laptops, and need to access their work and the firm's network from many locations within the building.

"Directors go into the boardroom and expect to get straight onto the LAN," says Paul Davies, IT manager for BDP. Easy network connections boosts productivity, so staff can be more creative: connected laptops mean they have all the information they need right away, and can carry out work items as soon as the meeting closes. BDP also wants the wireless network to support land-line quality voice over IP when deployed.

In its previous headquarters, BDP achieved wireless network connectivity using standalone Cisco access points throughout its studio and boardrooms. As wireless working became more popular, these "hotspots" became congested, overloaded, and unreliable. "There was congestion when fifteen or twenty people were online," says Davies. Productivity was compromised.

BDP wanted a work environment that was as innovative in its use of technology as in its deployment of light, space, and supportive work areas. Through its work with wireless working experts Building Zones - a specialist in the impact of emerging technologies on the work environment and a subsidiary of the Cordless Group – BDP found the technology that delivered the wireless experience they wanted – trouble-free, ubiquitous problem-free connectivity with the ability to stay connected while roaming throughout the building, plus the capability to support high-speed 802.11n wireless and voice over wireless IP.

The answer was Meru's Virtual Cell wireless LAN, the only wireless network architecture which delivers a future-proof and reliable Wi-Fi network with the quality, reliability, low cost, and ease of management which BDP demanded.

### The Challenge – Make it Simple, Reliable, and Future-Proof

Deploying Wi-Fi correctly in a large multi-floor building is not easy. Once access points are in place and operational, radio signals can be muffled, deflected, and blocked by building materials, office machines, and even people. Micro-cell wireless LANs cannot be planned without a detailed on-site survey - walking around each floor of the building with scanners to measure signal strength, broadcast reach and coverage throughout so that access points can be installed to provide complete coverage.

Covering a building with Wi-Fi can take many access points, which causes problems when wireless LANs are based on the standard multi-cell architecture predominantly in use today. With micro-cell, any access point's radio signal can interfere with any other access point if they are both on the same wireless channel and in broadcast range of each other. As there are a limited number of channels, making sure no two overlapping AP radios are on the same frequency is difficult, requiring detailed planning and measurement and operational monitoring.

It's a design approach similar to that used by the cell phone networks and it is prone to the same kind of dead spots and coverage gaps common to cell phone networks.

"We wanted a wireless LAN for data and the possibility of running telephony over it as well," says Davies. "We approached the fit-out with a view to achieving what was possible." At the time, the building was not built, and so while BDP could plan a robust and powerful wired network backbone delivering Gigabit Ethernet to each desktop location, it could not conduct the detailed site-surveys required if it were to choose the micro-cell architecture.

### ❖ The Solution

A Meru MC1030 controller, twenty-five Meru AP311 access points, deployed as a single channel Virtual Cell, giving seamless wireless access throughout the six-story building. The Meru AP311 access points are 1- 802.11 a/b/g and are ready to be upgraded to 802.11n when the customer is ready with only a software upgrade.



*“Meru solves a lot of the issues swirling around providing reliable, robust radio coverage everywhere,” says Jason Green*

### Benefits to BDP and its IT Group

- Increased productivity and efficiency: Project meetings can take place anywhere in the building, with guaranteed access to the network. Productivity is never compromised or constrained by wireless access or bandwidth
- Easier, less expensive deployment: Meru Virtual Cell architecture needed no channel planning or detailed site-survey prior to deployment as all access points are placed on a single channel, which greatly simplified planning and installation
- Voice over WLAN Ready: The Meru wireless LAN is able to deliver quality voice over the wireless IP, plus reliable coverage and seamless roaming
- 802.11n-Ready: While ample for BDP's current needs, Meru's 802.11n-ready access points will support high speed wireless with only a software upgrade
- Lower operating and support cost: The superior design of Meru's Virtual Cell architecture lowers the cost and time required to monitor AP performance and end-user connectivity, troubleshoot connection problems, and maintain network uptime.

### The solution: Meru's Wireless LAN that worked from day one

Building Zones recommended wireless LAN technology from Meru Networks that is designed to eliminate poor connections and interference between access points, load-balance client demand across the virtual cell, and eliminate conflicts caused by client radio differences.

Meru's Virtual Cell architecture puts all the access points on the same wireless channel, using a central controller to manage connections and avoid channel conflicts. While the hardware used in micro-cell and Virtual Cell architectures looks the same at first glance – “thin” APs connected to a central managing controller – the networks they deliver are very different.

- The micro-cell architecture requires a mosaic of small coverage “tiles” fit carefully and painstakingly together to provide complete coverage, and requiring extensive monitoring and support, as well as the use of multiple radio channels. It also requires extensive monitoring because the size and shape of the coverage “tiles” changes constantly.

- With Virtual Cell architecture, all the APs are set to the same radio channel, co-channel interference issues do not occur, and the end-user never experiences the dread of wondering whether moving from one AP's coverage to another will disrupt or unplug his connection.

“Meru solves a lot of the issues swirling around providing reliable, robust radio coverage everywhere,” says Jason Green, chief technology officer of Building Zones. “You would be mad to install any other vendor in an enterprise.”

Once the basic building frame was done, the fit-out began, in March 2008. The wired network was deployed, and wireless access points installed in the ceilings. “It took about a day to put up the access points, and a couple of days for Building Zones to configure them,” Davies recalls.

Move-in happened over the weekend 29 to 30 August and was the wireless LAN working from Day One? “It was working on Day Minus Twenty!” says Davies. “I was working here on the visitor network long before everyone moved in.”





## ■ About Meru

Founded in 2002, Meru Networks develops and markets wireless LAN infrastructure solutions that use virtualization to deliver pervasive, high-fidelity wireless service for business-critical voice, video and data applications. The company first introduced its award-winning virtual cell wireless architecture in 2003, and Meru products embody a complete departure from typical hub-based WLAN approaches, offering a wireless solution with levels of performance, reliability, security and cost-effectiveness previously found only in wired networking environments. Meru's solutions have been adopted in all major industry vertical markets, including Fortune 500 enterprises, healthcare, education, retail, manufacturing, hospitality and government. Meru is headquartered in Sunnyvale, Calif., and has operations in the Americas, Europe, the Middle East and Asia Pacific. For more information, visit [www.merunetworks.com](http://www.merunetworks.com)

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## The Benefits: Flexible working and future expansion

The wireless LAN has so far exceeded all BDP's objectives, supporting boardroom meetings and wireless use about the building, with less demand for support from BDP's support team.

The wireless LAN also allows secure, instant access for visitors thanks to Digital Concierge, a product from Building Zones: "It pushes out a password to the visitor, and runs a managed service," says Davies. Visitors from outside the company get access to the Internet, while staff can see company resources.

Davies' next step/project is to add voice over IP to the wireless LAN. That involves adding fixed-mobile convergence (FMC) features to their new Nortel IP/PBX switch that BDP installed into the new/moved from its old Manchester office.

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Building Zone's Green is confident it will work, "Meru has over-the-air quality of service (QoS)," he explains. "We would certainly replace our Cisco Wireless equipment, assuming Meru carries voice as well as it's predicted to do," says Davies.

BDP has already repeated the Meru deployment in its smaller studios in Sheffield and Edinburgh in September.

Is there a danger the system will be a victim of its own success and get overloaded and congested as in the past? Davies and Green have that answer ready: basically, the network is future proof.

If the current wireless LAN becomes congested, the existing access points, each with 1-802.11abgn radio and 1-802.11abg radio, can be upgraded to 802.11n high-speed high wireless with a simple software change which will more than double their capacity. "We didn't have to implement 802.11n immediately, because the upgrade will be easy," says Davies.

## About BDP

BDP is the largest interdisciplinary architect in Europe. It employs more than 1200 architects, designers, engineers, urbanists, sustainability experts, lighting designers and acoustics specialists in 15 studios across the UK, France, Ireland and Netherlands.

BDP works across disciplines, in all locations, sectors and building types, to deliver high quality, effective and inspiring built spaces.

The company has a long history of innovations. It was founded in 1961, as Building Design Partnership, by Professor Sir George Grenfell Baines, whose earlier projects included a building for the 1951 Festival of Britain.

The new Ducie Street building is the first naturally ventilated (and night time cooled) office building in Manchester to achieve an excellent rating on the BREEAM environmental assessment method.