

## Wireless in the Warehouse

### James Hall & Co. case study: design and build of a new LAN and WLAN in brand new warehouse and corporate headquarters

James Hall & Co. is a distribution business based in Preston, Lancashire. The company is the north of England distributor for the SPAR network of convenience stores, delivering a range of frozen, chilled and ambient goods to over 450 stores.

Networks First started working with James Hall in 2004 when it took charge of the company's ProCurve switching infrastructure. To boost the network's performance and resilience Networks First introduced a multi-vendor environment to the LAN Core. However expansion of James Hall's operations necessitated a move to larger custom-built premises. With such a large and complex operation pending, James Hall called on Networks First to manage the IT challenges of the move itself and the design and implementation of network infrastructure in the new premises.

James Hall & Co. had decided to build a new HQ comprising 3,000sq metres of office space, plus a large warehouse, training facility, Spar store, filling station and a crèche on the greenfield site on Preston's Bluebell Way. Dominic Hall, IT director of James Hall & Co commented: "It became clear that our existing premises were past their sell by date. We had to move to gain maximum efficiencies and continue to provide the distribution service expected by independent retailers in the UK's foremost convenience group."

Uprooting an entire business with over 500 staff and moving it into brand new



premises is a huge operation and requires careful planning particularly with regards to the IT function. Networks First was asked to design and implement a comprehensive wired and wireless connectivity solution in the new premises and manage the transition from the previous network. A smooth changeover process was essential to ensure the business continued to function during the relocation process, and to guarantee that the new network was ready to support the business in the new premises as soon as it was needed.

Networks First brought in its trusted partner Amillan to oversee cabling requirements on the project.

#### Work begins

"New build premises are something of a double-edged sword for network engineers, particularly in the case of wireless implementations," explains Paul Lewis, Network's First's lead consultant on the project. "On the one hand it can be beneficial to start from scratch with design

and implementation without any hangovers from legacy systems or older buildings which were never designed to house network infrastructure. But at the same time the building process can be unpredictable, and the lack of any physical premises to inspect can make planning and testing more difficult.”

James Hall & Co’s new distribution warehouse was planned at 385,000sq ft in size, or roughly the same area as seven football pitches. Because of the wireless voice activated picking system which would be used in the warehouse, this vast space required 100% wireless coverage so that staff could receive order information through their wireless headsets anywhere on the premises.

In addition, Networks First’s engineers would have to work largely from the architects’ blueprints to plan how the network would be designed and implemented. With building work yet to start, site visits and testing would have to wait for the time being.

The engineers were aware that there would be lots of traffic flowing across the network, and not just data. The company’s CCTV, door entry systems and VoIP would all make use of the new network, adding extra load and making a resilient and application-aware network a high priority.

### **The solution**

As a new build project, James Hall & Co. made use of Networks First’s consultancy throughout the building stages. From day one, when Networks First advised on cabling locations, At this stage the building only existed on paper, so in the absence of any onsite testing Networks First used specialist planning software to predict the wireless coverage given various

permutations of Access Point locations. Using this software the team planned the most effective positions for the WLAN Access Points, selecting the best combination of different models and antenna types to match specific requirements in different areas of the building. Such meticulous planning was necessary to achieve the 100% area coverage required throughout the warehouse.

Constant dialogue on every aspect of the marriage between the construction and IT implementation processes was required. There were further challenges to come as the building started to take shape. On one site visit to install wireless Access Points, the consultant found that the structure he was supposed to be working with had not yet been built. And sometimes new features appeared which had not been detailed on the original blueprints: another visit found a new mezzanine level had been put in place!

A further complication of working from plans arose from some of the construction materials used in the warehouse. Because James Hall and Co. deals with many frozen and perishable products, dual insulating layers of steel and foam were included in the walls to the chilled areas. The architects’ blueprints could not give any indication of how these walls would affect wireless signal, so the consultants were forced to wait until the building was nearer completion. Eventually they were able to run tests on the physical premises and they discovered that these structures were almost 100% resistant to wireless. At the eleventh hour the locations of the Access Points had to be carefully redesigned to ensure that the warehouse still had the complete WLAN coverage specified in the brief.

James Hall & Co.'s IT director, Dominic Hall, comments: "Whilst a new build location offers advantages such as being able to specify where cabling will be routed, it also presents many challenges which require experience and rigorous planning and testing processes to solve. It was vital that our partners were willing to take a flexible and collaborative approach. The adaptability of Networks First and Amillan staff was key throughout the project from an IT perspective, and helped the construction of the building to run smoothly as well."

For a network-critical business like James Hall & Co., a long period of downtime during the changeover was simply not an option. For this reason, Networks First facilitated the parallel running of the old and new networks during the changeover period so that the business could continue to function as normal.

### **The finished networks**

James Hall and Co. now has a fully-functional LAN and WLAN operating throughout its new premises. In total there are 92 wireless access points and 1,200 ports on the wired network. There have been no reports of any wireless "blackspots" where coverage has been needed and not found.

The network makes extensive use of 10Gb uplinks with multi-gigabit backup links, and is fully resilient with no single points of failure. All edge switches use stacking, ensuring better performance and making network management more efficient.

The wireless network utilises Cisco Aironet 1140 Series and 1250 Series Access Points, with Cisco 5500 Series Wireless Controllers.

The wired network uses Cisco Catalyst 4510-E chassis switches, coupled with 2960-S Series edge switches.

The network fully supports Cisco Energy Wise which enables the network manager to report on and control the power usage of kit which is attached to the network. It is also optimised to deliver Power over Ethernet (PoE) for IP telephony and Access Points, with PoE Plus capability which futureproofs the network to cover for the potential need for higher power outputs in future.

The move to the new premises was a huge operation, of which IT was a relatively small but vastly important part. In the context of the rest of the move, any delays or problems would have been catastrophic, because the IT function was the critical factor in getting the business up-and-running again in its new premises as quickly as possible. Once the building work was complete, the entire business moved into the new headquarters over the space of two weekends.

"Without a doubt, the network switchover was the smoothest part of the move. There was the absolute minimum of downtime and fuss," said Dominic Hall. "Now that we are in the new building the network is working faultlessly, and exactly as we specified."

"Throughout the project the attitude of the consultants was outstanding. When the building work got in the way or forced a change in the network design, Networks First's flexibility was a real asset. Whatever the issue throughout the project I knew they would always provide me with solutions, not problems."