Milton Keynes Council
A Case Study For Tallac Networks

**A Broadband-Testing Report
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BROADBAND-TESTING

Broadband-Testing is Europe's foremost independent network testing facility and consultancy organisation for broadband and network infrastructure products.

Based in Andorra, Broadband-Testing provides extensive test demo facilities. From this base, Broadband-Testing provides a range of specialist IT, networking and development services to vendors and end-user organisations throughout Europe, SEAP and the United States.

Broadband-Testing is an associate of the following:

Limbo Creatives (bespoke software development)

Broadband-Testing Laboratories are available to vendors and end-users for fully independent testing of networking, communications and security hardware and software.

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Output from the labs, including detailed research reports, articles and white papers on the latest network-related technologies, are made available free of charge on our web site at HTTP://www.broadband-testing.co.uk

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EXECUTIVE SUMMARY

- Deploying wireless networks is no longer a simple case of carrying out a site survey and deciding where to locate – and how many – Access Points and how to secure them.

- Wi-Fi is now a valuable commodity for a member of the public – some would say essential – so, in offering a service to them, as well as to internal users, that service should have value to both the provider – in this case Milton Keynes Council – and the user base.

- In order to create value in the deployment beyond Internet access, flexibility beyond the capabilities of typical WiFi solutions to date is required. These were important requirements for Milton Keynes council, when evaluating its options for a new, next-generation WiFi deployment.

- With its service-oriented approach to deployment using SDN (Software Defined Networking), based around an OpenDaylight OpenFlow controller, Tallac Networks gave Milton Keynes Council both the flexibility to create value-adds such as user Apps via the APIs (and including additional network components such as an integrated, wired infrastructure and virtual firewalls) and future-proofing it needs in order to offer both top-class wireless access *and* a means of creating multiple revenue streams going forward.

- Moreover, it did this in a way which has minimised both CapEx and OpEx, with a predictable ongoing cost, stated to be lower than traditional solutions. The Council not only benefitted from a significant saving on initial deployment costs compared with the alternatives, but equally impressive ongoing cost reductions.

MILTON KEYNES COUNCIL: THE NEED FOR A WIRELESS INFRASTRUCTURE

Milton Keynes, situated centrally in England, was formally designated as a *new town* in January 1967, with the design brief to become a "city" in scale and is located around 45 miles north-west of London.

In line with the aim of developing a "city in scale", population has risen over the years by a factor of more than double that of the national average, with well of 250,000 inhabitants now in the Milton Keynes designated area.

From a Council perspective, in terms of planning and changes, this clearly puts a lot of pressure on the IT department of Milton Keynes Council (MKC) to cope with the necessary adds and changes.

Figure 1 – MK Council Offices

In terms of actual IT locations, MKC currently has three main office sites in the town centre (one of which is being newly deployed, adding more pressure to the IT team), with over 30 remote sites, each with between 20-100 staff, being wireless-enabled over time.

So what was already in place? The answer was an ageing and largely restricted member's wireless network, with a requirement to provide corporate wireless coverage across the two main sites with the ability to scale across all the remote sites. Another factor of the incumbent wireless network was poor performance. So, another priority was to enable 802.11ac access, for higher connection speeds, while retaining compliance with earlier standards, so not restricting access for users with older technologies on their devices. At the same time, the requirement was also to increase the ability for corporate BYOD support. In line with 802.11ac was the requirement to use the 5Ghz airspace, not simply for performance benefits, but also because the 2.4Ghz space was very congested.

According to Martin Heaton, Principal Communications Engineer at MKC, the incumbent wireless system "worked ok" but was proving expensive to operate on the native corporate network, given the changes within both the MKC work codes and the wireless market itself. And, because it was relatively slow and coverage was narrow, so it proved unpopular in some aspects. Also, there was the reality of 30 remote sites with no wireless coverage whatsoever.

Alongside corporate access was the need to have secure guest access which was both easily managed and monitored with readily reportable usage statistics, as well as deploying Internet information booths. Having an "open" solution was also key, not least for the ability to integrate with other software (such as security applications) and hardware in the future, such as external APs, as the network would continue to expand across the town.

The Decision-Making Process

Gone are the days when IT was a "must have" luxury, that was brought in simply because that's what you did, regardless of cost and return.

Now IT has to pay its way – and rightly so. From a vendor perspective, then, this means they need to offer more than just connectivity, storage and application access – they need to provide a solution that adds value to the customer's own business model. Such was the case with MKC in the UK when it looked to provide its next generation Wi-Fi service both internally and to visitors.

So the requirement was to significantly upgrade the wireless offering, making it more cost effective, secure, efficient and – ideally – revenue generating – but also easy to access. The next phase of wireless deployment had therefore to be both far more extensive and offer higher performance AND offer more than just simple connectivity.

"Local government has an ever changing code of connectivity", explained Martin Heaton, so MKC needed a solution that was both extremely flexible and future-proofed in its ability to expand and diversify. There were many considerations to be taken into account: extending public network connectivity to remote sites with an MPLS-based network and, with the ability to now put in a wireless solution, what should it be? More to the point, could there be life beyond a simple wireless deployment to satisfy basic access needs? Heaton was looking at the idea of a wireless public infrastructure that is both usable and acts as a managed service layer – a means of generating revenue streams for the council.

What Does SDN (Software Defined Networking) Mean To Milton Keynes Council?

"What MKC is looking for is single pane of glass management, enabling compliance and providing real security levels. SDN has lots of smoke and mirrors, so it's a case of understanding the difference between what is genuine and what is marketing talk. For example, it was VLANs originally, but they were not as secure as it was thought they would be. Then legislation changes created issues which needed to be solved. We need a solution that can deliver a secure, segmented environment – this can be OpenSource, involve knowledge sharing and interoperability between best of breed vendors, but without compromise. A one stop shop is great but open systems provide flexibility and, especially in a council environment, change is always likely."

Martin Heaton, Principal Communications Engineer, Milton Keynes Council

While the technical elements – and benefits of contemporary wireless standards, such as the performance capabilities of the 802.11ac standard – were important, the ability to resolve classic wireless issues, such as contention in shared buildings, was a real differentiator Heaton and his team were looking for. This ability to create a managed service offering, ensure quality access with associated revenue, ease problem resolution

and provide real services, including additional apps, was what led MKC in its decision-making process.

The result was an open tender which involved most major wireless vendors being considered and several actually tested. At the recommendation of Tallac Networks a full RF site survey was completed which showed up serious interference from other tenants at the MKC Saxon Court site – one of the two primary town centre locations.

This survey was used to agree appropriate non conflicting channels and to negotiate with others to reduce various signal strengths. A proof of concept (POC) site was provided for three months, during which time Tallac worked closely with MKC staff to fully understand the technology, the benefits it could provide and to fine tune the installation.

As part of the POC, a bespoke secure access portal was developed for MKC with up to 200 users. After this a full tender process was put in place to make sure that key requirements were met and full commercials were taken in to account.

"The council completed evaluation installations of Meraki, Aruba, Ruckus and Tallac, and the result of an open tender was Tallac being selected"

Martin Heaton, Principal Communications Engineer, Milton Keynes Council

THE DEPLOYMENT

Figure 2 – MK Council Offices Deployment Overview
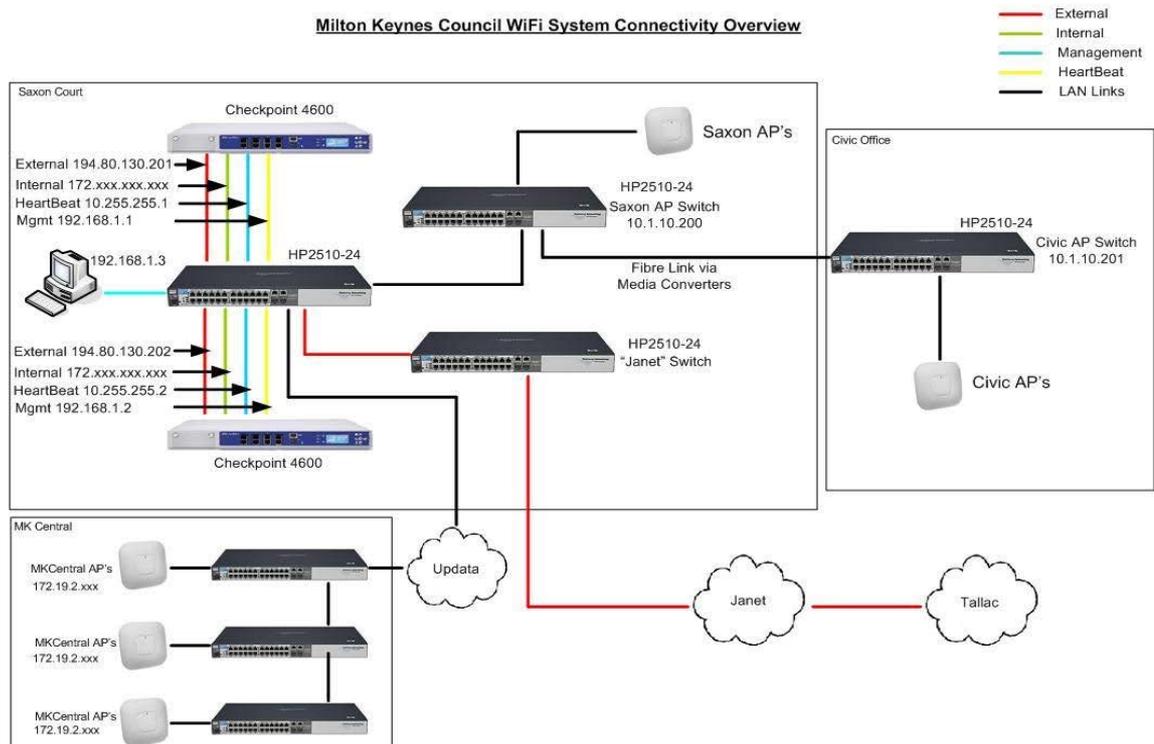
Following the evaluation process, a Tallac Networks cloud-based, open source, OpenFlow

enabled controller with initially 35 802.1x/802.11 a//b/g/n/ac Access Points (APs) was specified for the two main HQ offices, covering a total of 1400 seats. As mentioned, this is currently being extended to a third central office – MK Central, with an additional 300 seats. Each of the remote offices has between 20-100 seats.

APs were installed as per the RF Site Survey and tuned remotely by Tallac to enable the best coverage and performance combination.

OpenDaylight

Key to the deployment is the OpenDaylight controller - an open source development with a modular, pluggable, and flexible platform at its core. This controller is implemented strictly in software and is contained within its own Java Virtual Machine (JVM). As such, it can be deployed on any hardware and operating system platform that supports Java.

The controller exposes open northbound APIs which are used by any applications developed to run with the controller. The southbound interface is capable of supporting multiple protocols (as separate plugins). The business logic and algorithms reside in the applications. These applications use the controller to gather network intelligence, run algorithms to perform analytics, and then use the controller to orchestrate the new rules, if any, throughout the network.

This approach lends itself to the development of in-house and 3rd party applications capable of generating significant value-add and revenue generation for both the end user and a hosting company, a primary factor for MK Council and its deployment here.

Both secure Guest SSID and corporate SSIDs have been enabled. Onsite, Broadband-Testing actually did a live performance check, as a guest, and performance was absolutely superb, even at peak times of day.

Removing The Risk Factor

Many public bodies, such as councils, have shied away from deploying wireless networks because of what they see as the security risk to the corporate network. With the Tallac deployment, MK Council has been able to complete separate "Guest" and "Corporate" identities, yet manage the entire network as one. Other councils stand up and take note:

Steve Broadhead – Broadband-Testing

As part of the deployment, Tallac is able to control *any* authorised OpenFlow device, and external APs are already on the roadmap. Wired Ethernet controllers and virtual firewalls from Tallac are also being evaluated currently. Additionally, locally-based Comms-Solve, who has been working closely with the Council for several years, primarily over voice-related deployments, has added MKC to its MSP portal and can drill down into the SSIDs to individual APs to maintain the solution and gather required analysis and statistics, so fulfilling the management and monitoring brief. Comms-Solve also suggested a softphone app technology to use on the wireless network. Heaton describes them as

"experts in their field" and have worked with the council to challenge the cost and functionality of the voice related infrastructure.

The latest development, on the back of a successful Tallac wireless deployment, is the cloud-based softphone which is connected via a Mitel Border Gateway solution. It has since been developed and introduced.

Open, Flexible, Scalable

"The Tallac model is pragmatic; 'you don't have to buy our controller, we can provide it as part of a cloud-based service'. It removes the whole headache of unknown cost. We're paying for a service; we know how much it will cost, what it delivers in terms of SLAs, that it will get updated as required, with the latest software and firmware versions. So, over time, all the pieces come together. It's a well-considered solution."

Martin Heaton, Principal Communications Engineer, Milton Keynes Council

Again, at Broadband-Testing, we downloaded the softphone app successfully and we see it as an excellent example of the benefits of having an open framework within a wireless deployment. Tallac Networks SDM (Software Defined Mobility) solution is available on a small monthly (OpEx) managed service fee per AP or via other flexible options that can be defined to suit the client and MKC has established a three year framework agreement initially. Clearly, the options here are effectively limitless, in terms of value-add applications and services.

To date the Tallac wireless technology has been deployed in a total of 16 sites, with a view to complete per-site coverage over time. It has been recommended that because of the potential RF interference issues, it would be good practise to have the site survey audited every six months.

The Softphone Example:

"The softphone solution is part of challenging the status quo of a physical hot desk phone on a desk, considering cost, reliability and real world user requirements. Comms-Solve has been maintaining and developing the voice side of MKC for five years and are experts in their field. The latest development, on the back of a successful Tallac wireless deployment, is this cloud-based softphone which is connected via a Mitel Border Gateway solution. The deployment is based on an extension to the proof of concept, to challenge the need for desk phones as part of increased agile working.

The business is continuing to consider enhancements such as presence awareness. However, presence aware solutions currently are cost prohibitive based on the perceived business benefit."

Martin Heaton, Principal Communications Engineer, Milton Keynes Council

In Conclusion

By deploying Tallac Network's cloud-managed wireless solution and OpenFlow-enabled guest management, based on the OpenDaylight controller, Milton Keynes Council is achieving its aims in terms of revolutionising its wireless offering, both to corporate users and the general public, in a highly-performant and secure fashion.

Moreover, it has achieved this in a cost-effective way, deploying the least expensive solution evaluated, with equally significant ongoing OpEx savings – a win-win scenario.

At the same time, it has reduced dependence on incumbent, proprietary networking systems while migrating to a cloud-managed network provider to remotely manage secure guest and corporate networks, making for a far more flexible and scalable solution into the future.

Key Benefits

- Cost effective scale-out to three main offices and 30+ remote offices

- Effective guest portal

- Access portal supports any OpenFlow (wired and wireless)

- Centralised cloud-managed network service

- OpenFlow enabled 802.11ac wireless APs

- Cloud-delivered by trusted, 3rd-party MSP - Comms-Solve

- Ability to add on applications using open framework

- Ability to provide revenue-earning value-add services

- Future-proofed open environment; not tied to any single vendor or technology