

A Primary School ICT Project Case Study.
How we successfully delivered a Wireless Network Upgrade Project on-time and within budget.





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About the school.

Our client is a Primary School that is located in the East of England. As part of a charitable trust, the school currently has approximately 500 pupils and shares a site with an Infant School and Children's Centre.

The school initially approached Our ICT to investigate a number of ongoing wireless connectivity challenges they were facing.

The challenge.

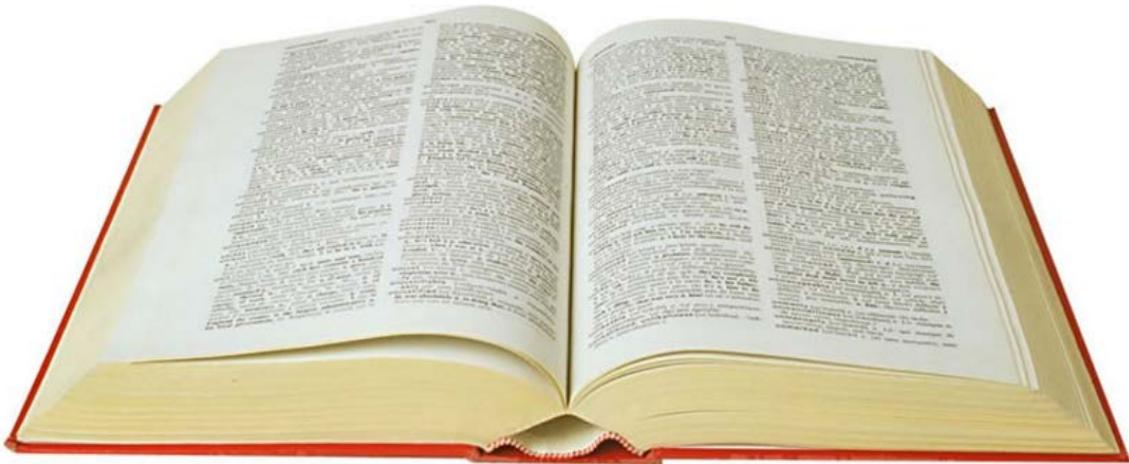
- The school wanted to increase the number of wireless devices being used onsite, but they were concerned that the existing entry level wireless system wouldn't be able to cope with the proposed number of clients.
- There were numerous 'dead spots' throughout the school where wireless connectivity was limited or unavailable.
- The school was using a single static WPA key for guests, staff, and students which was a major network security concern.
- ICT lessons were restricted to desktop PCs on the LAN and a small number of mobile devices due to the inconsistent wireless connectivity in the ICT suite.

The Solution.

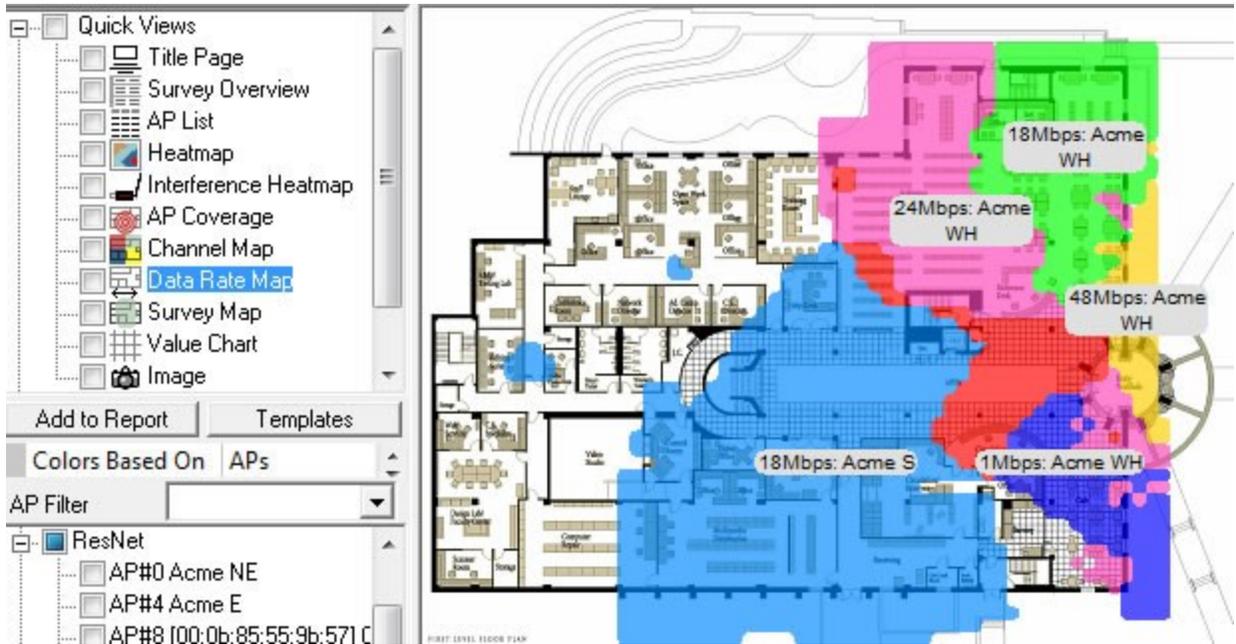
- Replace the school's aging entry level Ubiquiti Wireless system with a fully managed ZoneFlex solution from Ruckus.
- Deploy additional wireless access points in low and zero wireless coverage areas of the school.
- Scalability - Ensure that new access points can be added to the new wireless system within minutes for future expansion.
- Redesign the Authentication System to improve security by changing the way that the school uses its wireless network.
- Setup an isolated Guest Access Network that features a simple password-based login that can be created by a member of staff onsite via a web portal.

The Outcome.

- Students and staff alike now enjoy a consistent and reliable Wi-Fi service that provides a dependable strong signal that can support all the existing wireless devices throughout the entire school grounds.
- The new Ruckus Wireless system is designed to support all future growth of the school's mobile environment.
- Teachers and support staff now have the ability to conduct ICT lessons without interruptions because the children can browse the internet using iPads and laptops without suffering any connectivity or speed issues.
- The school's wireless network security has been greatly improved thanks to the highly-advanced Ruckus authentication system and an isolated guest access network.



**Continue reading to find out how we delivered this
Wireless Infrastructure Upgrade Project.**



The Wireless Site Survey.

The first task for our team was to conduct a fully comprehensive wireless site survey to ascertain if their existing wireless system could be fixed, or if a replacement wireless solution was required.

How we used GPS-based surveying technology.

The wireless site survey was conducted using the latest GPS-based wireless surveying technology that is used in conjunction with the school's original blueprints. This helped us to create a detailed visual wireless network map. The map is constructed by physically walking around the school premises with a laptop that uses a GPS adapter to coordinate the data gathered to map the school's blueprint.

Conducting a wireless site survey can take up to 3 working days depending on the size of your school.

What problems did we find?

The results of our wireless site survey highlighted numerous areas of low or zero coverage throughout the school grounds.

The survey also revealed numerous signal leaks and interferences from neighbouring devices such as microwaves and alarm systems. These issues were affecting wireless connectivity in high usage areas of the school, especially in and around the ICT suite.

Additionally.

The school was using a single static WPA key for guests, staff and students. This was a major network security problem that needed to be addressed ASAP.

What was our professional opinion?

The existing entry level wireless solution wasn't fit for purpose. Therefore, it was more cost-effective to replace this system entirely with a fully managed Wi-Fi solution from Ruckus.

What happened next?

We presented a detailed report to the school and recommended that the existing wireless system be replaced with a fully managed Ruckus Wireless solution.

The Wi-Fi service provides a consistently strong signal that will support all the existing wireless devices onsite. This system is fully scalable to accommodate the future growth of the school's mobile environment.



6 reasons why we recommend replacing the schools existing wireless system with a Ruckus solution.

1. Improve Administration.

General administration tasks are much quicker for the ICT Manager to achieve with a fully managed wireless solution. These include changes such as encryption, admin passwords, and IP's or location updates. Due to the nature of a centralised managed system, all changes can be made from a single dashboard.

2. Access Point Handovers.

With the existing wireless configuration, the decision to move between access points lies with the wireless device (e.g. the laptop, tablet etc.) This is called 'roaming.' When faced with two equal quality signal zones, wireless devices struggle to decide which access point to use. Thus, the devices end up jumping from one access point to the other which affects the consistency of the wireless connection. With a Ruckus managed system, the controller manages the school's wireless reception and will not allow a device to roam unless its 100% sure the signal is better. Clever stuff!

3. Scalability.

With a fully managed Ruckus Wireless solution, additional access points can be added to the network within minutes with zero downtime.

4. Load Sharing.

Standalone access points do not have the capacity to understand how many clients a neighbouring access point is servicing. If one access point reaches capacity, it will reject further requests. Fully managed wireless systems will automatically switch other devices to neighbouring access points if the existing connection is running at capacity.

5. Advanced Authentication Options.

A managed wireless system can be linked with the school's servers to facilitate a single sign on to the network. This allows users to authenticate to the wireless connection using their PC username and password which is much more secure than a traditional never changing password.

6. Guest Segregation.

The school will be able to isolate guests and provide a segregated web portal for them to sign into. Keeping guest users on a separate network mitigates the chances of a security breach.

Our proposed solution.

The leading ICT technician that was in charge of this project proposed the following wireless solution:

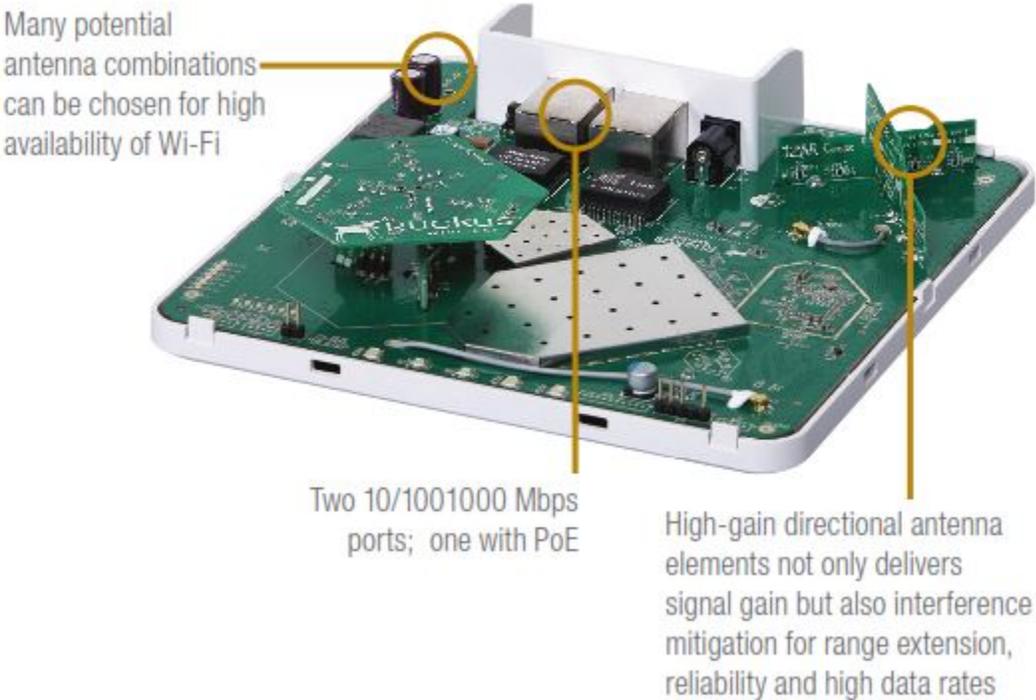
20 x Ruckus ZoneFlex R510 dual-band 802.11 a/b/g/n/ac access points.

The existing Ubiquiti Access points will be replaced with highly advanced Ruckus ZoneFlex R510 access points, with an additional three access points that will be deployed in shared locations that have low coverage such as the school reception area and the library.

A fourth access point will be deployed in the school’s ICT suite, allowing teachers to conduct their ICT lessons without interruption caused by wireless connectivity issues.

Keeping costs down.

We were able to save the school a significant amount of money on engineering time and infrastructure changes by using the existing wireless locations.



Why use Ruckus 510 access points?

The ZoneFlex R510 wireless access point is the ideal wireless solution for school wireless networks that are servicing a high number of mobile devices.

ZoneFlex R510 features:

- The dual-polarised antennas adapt in real time to handheld device movement and rotation.
- Each access point features a high gain antenna array that continually forms and directs each Wi-Fi packet over the best performing signal path.
- The ZoneFlex R510 automatically selects channels for highest throughput potential using Ruckus ChannelFly dynamic channel management which adapts to environmental changes.



1 x Ruckus Zone Director Wi-Fi controller.

We will install a Ruckus ZoneDirector wireless controller to centrally manage all the Ruckus Wireless access points.

The ZoneDirector is a physical Wi-Fi controller that allows the school's ICT manager to manage every wireless access point in the school from a browser-based user-friendly dashboard. The ZoneDirector has several features that make it easier to support and maintain the wireless network throughout the school. These features include:

- Adaptive wireless meshing which links access points wirelessly and removes the need to run additional cables throughout the premises.
- Sophisticated user access controls.
- Automatic traffic re-direction.
- Integrated Wi-Fi client performance tools.
- Elegant and simple guest networking functions.
- Rogue AP detection and advanced Wi-Fi security features.
- Flexible WLAN groups.
- Extensive authentication support.
- Robust network management.

There's another advantage...

Once this fully managed solution is deployed, the school will never have to worry about constant site surveys as the environment changes. This is because the ZoneFlex R510 was purposely built for establishments that require a reliable high speed internet connection across a large network area.





Project Implementation.

The following wireless replacement project was completed on time and within budget over 6 working days. The project was conducted outside of term in order to ensure there was no disruption to curricular activities. Here's a breakdown of the project deliverables.

Configuration of Zone controller and WAP setup – 4 days.

- All controllers and access points to be preconfigured by the ICT project team to make them ready for installation, including testing and sign-off by the project lead.
- Complete redesign of the Authentication System to improve security by changing the way that the school uses its wireless network through the implementation of RADIUS*
- Setup an isolated Guest Access Network that features a simple password-based login that can be created by a member of staff onsite via a web portal**

Physical installation of wireless access points and wireless controller – 2 days.

- Decommission the existing Ubiquiti Wireless access points.
- Wall mount and install the new Ruckus Wireless Access Points on walls and ceilings including four new additional wireless access points in areas of low or zero coverage.
- Network reconfiguration of all PCs, tablets and all other devices that are using the wireless network.
- Asset tag and inventory all the hardware for the school.



How we changed the schools wireless security culture.

*With the school sharing a single static WPA key for guests, staff, and students, changing the way the school uses wireless was essential for improving security.

With the school combining Admin and Curriculum networks we decided that the best course of action was to implement RADIUS, a Ruckus authentication system that is deployed through the Ruckus ZoneDirector.

With RADIUS enabled, the school will enjoy the following network security features:

- Each user will use their own personal username and password. In the case of staff, this would be their LGFL username and password. In the case of students, this maybe a class account or individual account.
- The encryption key will be dynamically negotiated so if a key is compromised, it's likely to have been changed before security is breached.
- When changing the authentication and encryption on a network, all existing devices will be rejected and will need to reconnect.

**To segregate guest users, we decided to setup an isolated guest network. This was achieved by setting a guest network SSID and adding the guest clients to a separate switching system using VLANs (Virtual Local Area Networks).

The Project Outcome.

The project was a complete success.

Through the implementation of a fully managed Ruckus Wireless system, students and staff alike are enjoying a consistent and reliable Wi-Fi service that can support all the existing wireless devices throughout the school grounds.

How we improved the schools teaching and learning environment.

- The numerous 'dead spots' throughout the school where wireless connectivity was limited or unavailable have been eradicated and replaced with a consistently strong and dependable wireless signal.
- Thanks to the additional wireless coverage, students are enjoying their ICT lessons without interruption because they can browse the internet using their iPads and laptops without suffering any connectivity or speed issues.
- The school now has a fully scalable wireless system that will support all future growth for the school's mobile environment. Adding a new access point takes minutes with zero downtime.
- The school's wireless network security has been greatly enhanced thanks to the implementation of a highly-advanced Ruckus authentication system and a dedicated isolated guest access network.
- Although BYOD isn't part of the school's immediate plans, the new Ruckus Wireless system will be able to cope with the implementation of a small scale Bring Your Own Device network in the future if required.





About Our ICT

Our ICT is a Professional ICT outsourcing organisation that provides a comprehensive range of ICT support services and technology solutions exclusively to the UK education sector.

We specialise in delivering Complex ICT projects to a diverse range of schools on time and within budget, including the delivery of Fully Managed Wireless Network solutions. We are happy to deliver ICT projects both inside and outside of school term time.

We're an Official Ruckus Wireless Partner.

Our ICT is an Official Partner of Ruckus Wireless Solutions. Ruckus technology is our wireless solution of choice because it offers numerous performance enhancements over conventional wireless technologies.

This includes clever administration features and unrivalled network coverage that combines to provide a seamless and secure connectivity experience in the classroom and the admin department.

Why Ruckus?

A Ruckus wireless solution will add value to your school by improving the teaching and learning experience through the delivery of a strong and consistent wireless network connection.



OurICT

Quotes from some of our many happy partners.

“The new Ruckus wireless system is now offering us new opportunities to explore and develop the technologies that support innovative teaching and learning.” – Ian Ilett | Business Manager of Hurlingham & Chelsea Secondary School.

“Our ICT have provided a fantastic service to our school. They are very meticulous and have overhauled ICT at Chapel End Academy. Problems with our system have been eradicated and any old infrastructure issues are dealt with promptly. I would recommend their services highly.” - Michael Tofi, ICT Coordinator. Chapel End Primary School.

“It’s great having Darren come in. He knows all the staff and more importantly, he gets everything sorted quickly. They were really helpful and flexible when we needed additional support at the beginning of term” – Mrs. Gaudencio, Head teacher. Freezywater Primary School.

Contact us to discuss your Wireless Connectivity requirements.

If you’re unhappy with your school’s existing wireless network and you’d like to introduce a fully managed wireless solution, then we’d love to hear from you. Call 020 8501 7670 to speak with a member of our friendly Business Development team today.

