

Design and Implementation of ARUBA External Access Point Installation in BCBC Comprehensive Schools

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Abstract

The increasing reliance on digital technology in education calls for a robust and expansive network infrastructure within schools. This report examines the design and implementation of External ARUBA Access Points (APs) across Bridgend County Borough Council (BCBC) comprehensive schools; a project funded by the Welsh Government to enhance outdoor Wi-Fi connections. The primary objective of the project is to provide high quality and secure wireless access to outdoor workspaces and classrooms, ensuring seamless access and connectivity for staff and students.

Aims & Objectives

- Aim:**
- To implement an outdoor Wi-Fi solution using ARUBA External APs that extends secure, high-performance connections to outdoor school spaces.
- Objectives:**
- Strategic AP Placement
 - Network Integration and Performance
 - Enhanced Security Measures
 - User Experience and Satisfaction
 - Scalability and Futureproofing

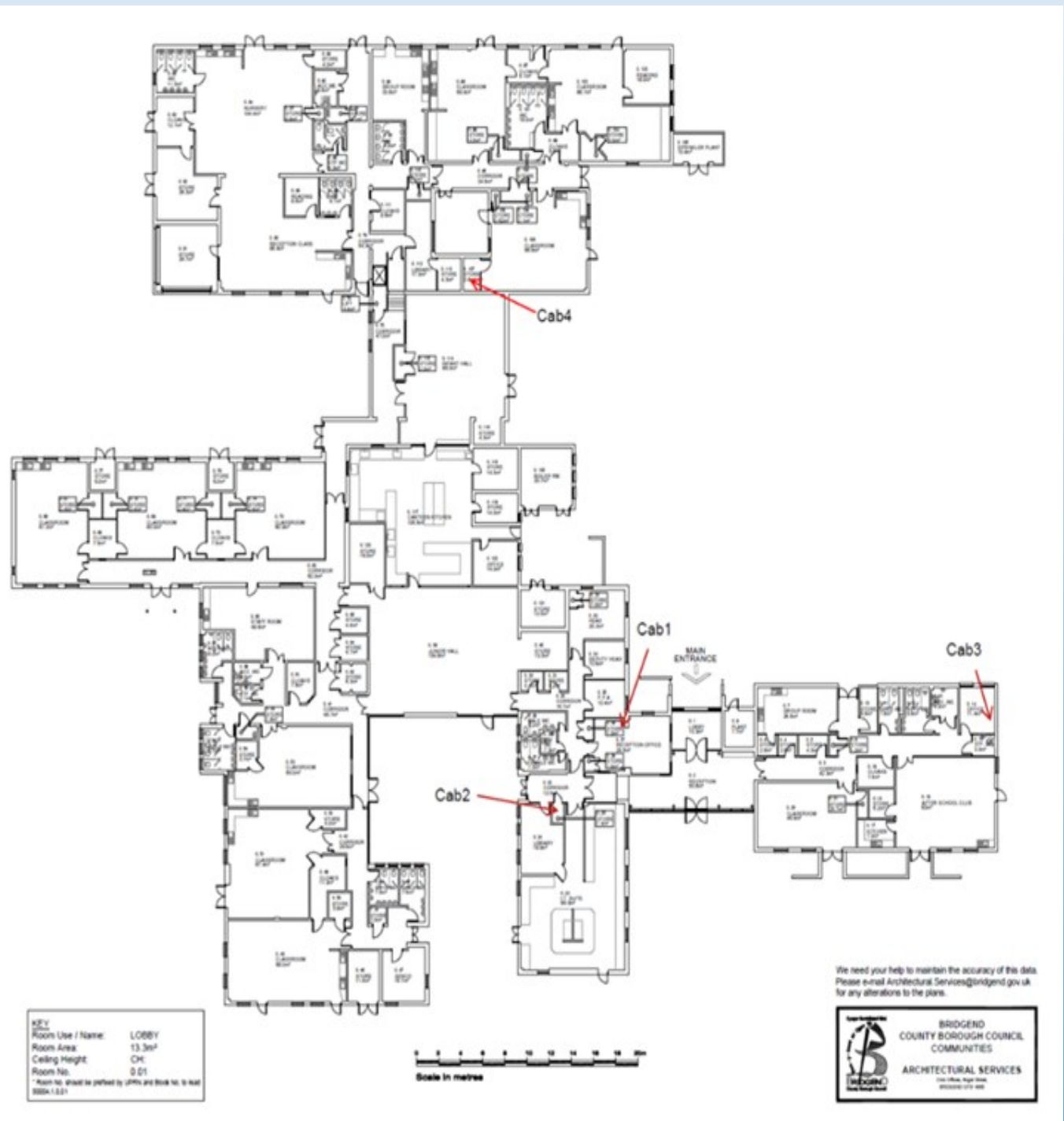


Figure 3: Network cabinet locations (Cab1-Cab4) used to integrate the ARUBA External APs into the school's existing wired network infrastructure. These cabinets served as the central connection points for Ethernet and power delivery.

Research

There is a growing importance of outdoor Wi-Fi in educational settings, particularly in the context of hybrid learning and flexible spaces. ARUBA APs were identified as a suitable solution due to their dual-band capabilities, WPA3 security features, and environmental resilience. Case studies from a number of other UK schools demonstrated tangible benefits, such as increased digital engagement and operational efficiency. Stanley Park High school allowed for cloud based learning throughout the school grounds. Leading to increased pupil engagement and an increase in work productivity. By adopting a structured and forward-thinking approach that involves site surveys, network segmentation, predictive tools and ongoing security management, schools can ensure the successful installation of outdoor Wi-Fi

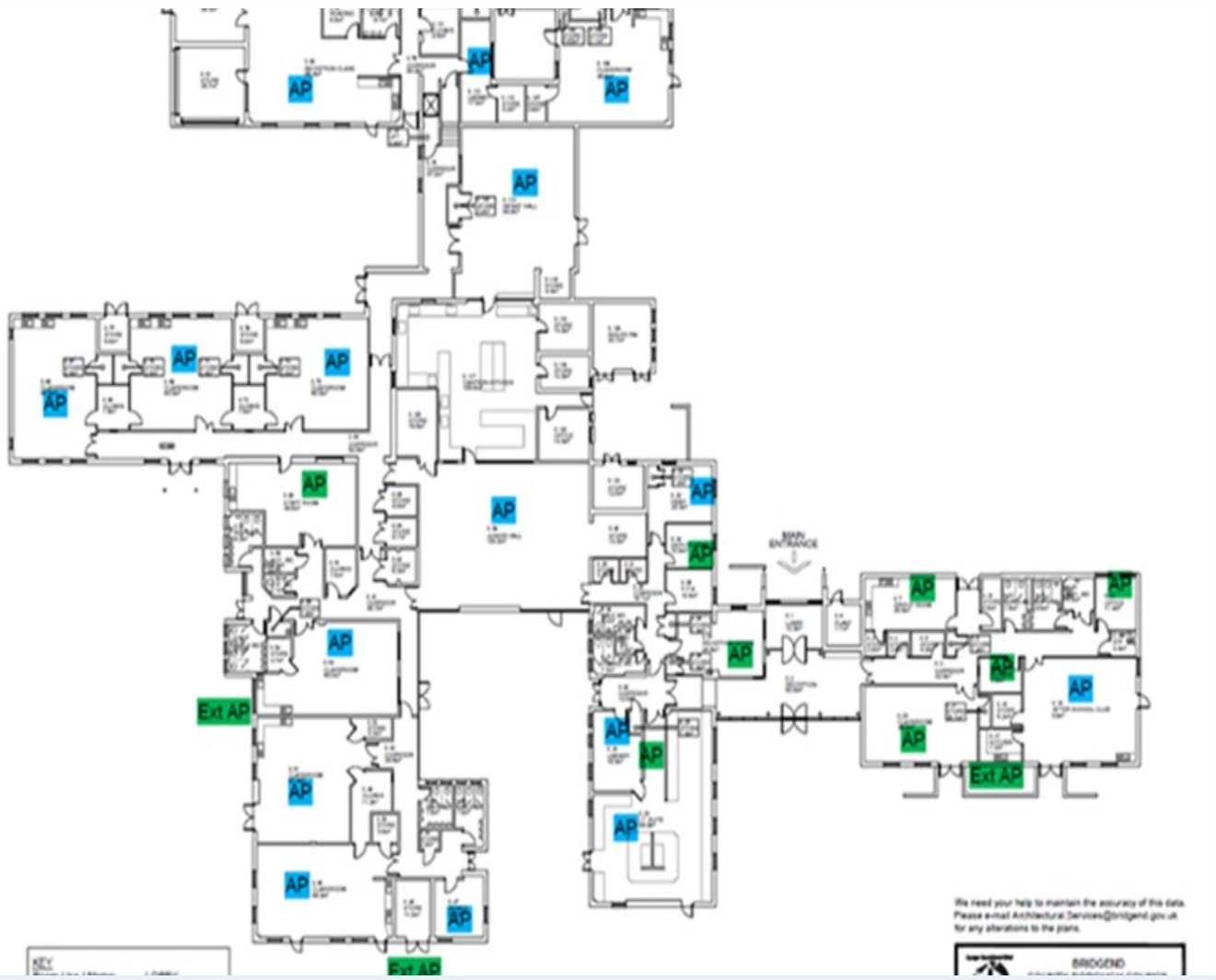


Figure 2: Floor plan highlighting the placement of internal and external ARUBA Access Points (APs) across a BCBC comprehensive school. Green icons represent External APs, while blue icons denote internal APs.

Design and Implementation

The design and implementation of ARUBA External APs across BCBC Comprehensive Schools were thoroughly planned to meet educational needs and technical standards. Collaborative site assessments and tailored infrastructure planning ensured the project delivered an outdoor Wi-Fi solution that enhances digital teaching and learning and lays the foundation for future expansion.

- Stage 1 – Pre-Installation Preparation
- Stage 2 – Physical Installation
- Stage 3 – Testing and Optimisation

Analysis

A high percentage of respondents (84%) reported that outdoor wireless connectivity had either “significantly improved” or “somewhat improved” since the installation. This aligns directly with the hypothesis and supports literature suggesting the need for extended connectivity in outdoor learning environments. Some staff indicated that outdoor lessons, particularly in lessons such as Physical Education and Sustainable Sciences became more feasible and resourceful due to the stronger signal and wider coverage.

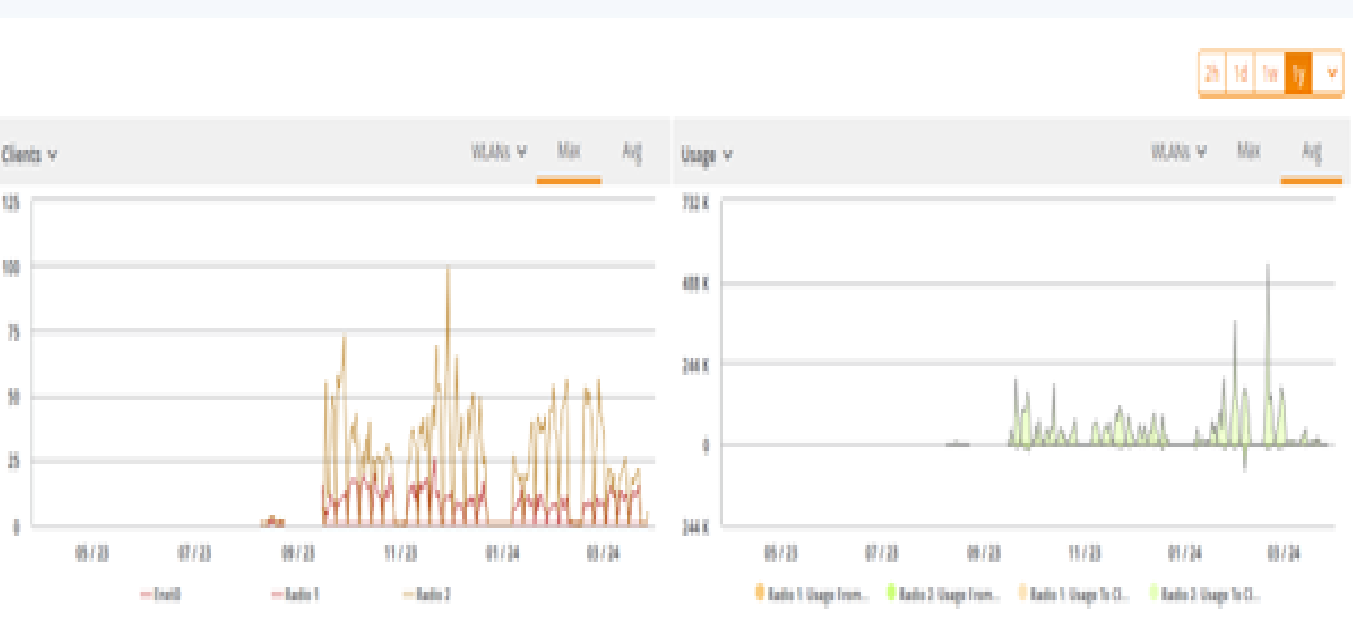


Figure 4: Network usage and client connection statistics post-ARUBA AP installation.

ARUBA External APs have made a significant positive impact on outdoor connectivity and user satisfaction within BCBC schools. However, limitations related to site-specific coverage and technical training were highlighted. This provides valuable input for future implementations. The insights gathered from both quantitative and qualitative data provide a well-rounded picture of the real-world outcomes following the installations.

Conclusion

- Connectivity** - Wireless coverage and reliability outdoors improved significantly, enabling digital activities beyond classrooms.
- User Satisfaction** - High satisfaction, especially among teachers and digital leads, due to greater flexibility for mobile learning.
- Security & Usability** - Most users noted better security and ease of use, though some were confused by SSID and authentication options.
- Training** - Some staff, particularly those less tech-savvy, felt post-installation training was insufficient.
- Scalability** - Leadership and IT staff viewed the outdoor AP model as viable for expansion to other schools.