WiFi Network Guide for Schools

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Introduction

As schools have introduced increasing numbers of devices, the school's WiFi network has become a key component of the ICT infrastructure in schools. Using WiFi enabled mobile devices with a "fit for purpose" WiFi network enhances collaboration, teamwork and inclusivity among staff and students and is critical in facilitating a range of teaching and learning approaches. As schools generally have a higher density of WiFi users compared to other environments, it is important when upgrading or procuring a new WiFi network, that the WiFi system and specification is suitable for their current user demand, but also scalable for future and more demanding user demands.

Causes of Wifi problems and possible solutions

- When a suitable WiFi system is in place and working well, teachers and students should not experience any ad-hoc or intermittent drops in connectivity due to WiFi.
- Good WiFi should be able to support a full classroom of students in each classroom. If some students are having difficulty getting reliable connectivity then there may be a problem with the WiFi system itself or with how it is configured.
- WiFi may be working well in certain parts of the school but not in other areas. This could be due to problems with individual access points (APs) in certain areas within the school.
- When a very large number of WiFi enabled devices, such as tablets, laptops, chromebooks or mobile phones, are being used in a particular area, the WiFi access points (APs) covering that area may not have the capacity to support this large number of devices.
- Sometimes when schools think that their school WiFi system is having problems, it may be something else, such as the school broadband connection or other IT equipment within the school. In order to find the root cause of the issue we recommend requesting your IT support company to check both your WiFi, your school broadband connection and other possible causes.

NOTE

- To check their school broadband connection schools should contact our Broadband Service Desk at broadbandservicedesk@oide.ie or at 1800 33 44 66.

If schools experience these type of problems they should contact their WiFi support provider, who should generally resolve the problem by taking one of the following approaches:

a) Making configuration changes to fix existing WiFi problems
b) Adding additional WiFi access points (WAPs) to improve coverage in certain areas
c) By recommending other related upgrades or
d) If the system is old, recommending that a new WiFi system is required.

WiFi connectivity factors

High quality school WiFi depends on a number of factors such as:

- Having broadband provision you have.
- The network configuration you have e.g. is the cabling okay in the network, the type of switches you have.
- How the WiFi access points (WAP's) are connected back to the broadband router.
- The type of WiFi access point (eg., manufacturer and model), the amount of WiFi access points and their locations throughout the school.
- The number of devices that are concurrently trying to connect to the WiFi network.

There can be some other factors such as thick walls, interference but for the most part the above is what would be central for consistent WiFi. Also it would depend on how devices are used i.e. browsing, opening, saving files, upload versus downloading, video streaming etc., as some of these activities are more demanding than others.

School self-review – checklist for WiFi

- Is the WiFi system working well, and meeting school needs?
- Are staff happy that it is supporting teaching and learning in their classrooms and not causing problems?
- How old is the school WiFi system?
- WiFi systems suitable for home i.e. domestic use, are <u>not suitable</u> for schools
- Suitable WiFi providers need to have a good track record with schools, and be able to supply references from other schools where they've successfully installed similar systems.
- For example, if you have a third party provider that installed your school WiFi network, the following are some questions to ask, to have a better understanding of your existing WiFi network:-
    - Was a WiFi 'heat map' of the school completed to ensure high quality WiFi coverage throughout the school.
    - How many WiFi access points (WAP's) are in the school?
    - Are all WAP's from the same manufacturer, the same make and model, if not what are they?
    - Is there an admin console that the ICT co-ordinator in the school can access to see the WAP's are all up and running/functioning or is it the sole responsibility of the third party to maintain the WiFi network (including software updates)?
    - Is the WiFi system currently under warranty?
    - How many SSID's (Service Set Identifier or Network Names) are on the WiFi network e.g. is the WiFi segregated for Teacher, Student and Guest/Visitor so respective users connect to their respective network?
    - Is there only one SSID (school name for example) why is that? It is advisable to have a separate SSID (Network Name) for Teachers, Students and Visitors, for security of your network and data as well as optimising the functionality of the WiFi network.

- If the school is planning to significantly increase the number of mobile student devices in the next year or two, for example by adding Chromebooks, iPads, Laptops etc., or if the school is planning that students have their own devices i.e. either a 1:1/BYOD model, has the school checked with the WiFi provider if the current system will handle the increased load/demand.

If considering a new WiFi system, it needs to meet the relevant standards and specifications. To seek guidance on these areas schools can contact Oide-TiE at ictadvice@oide.ie

Oide-TIE Website Link:

https://www.oidetechnologyineducation.ie/technology-infrastructure/wifi/

Reviewing if school Wifi needs to be upgraded
If your school WiFi system is a number of years old, or if there has been a significant increase in devices and demand, then your WiFi network may no longer be able to support this increased demand or be fit for purpose. The WiFi may need to be upgraded or in some instances be replaced with a new system. In this scenario we recommend requesting that your IT support company conduct an audit/check of your WiFi system and provide you with a recommendation.

If their recommendation is that new WiFi system is required, they should provide your school with a proposal and quote for such a system. It is recommended to seek other quotes to ensure good value for money.

Procuring a new WiFi network
The WiFi procurement framework that had previously been in place for schools for a number of years, and which many schools and ETBs successfully used to procure 'fit for purpose' Wi-Fi has expired and is longer active. However schools can still contact Oide-TiE for guidance at ictadvice@oide.ie

Schools vary in terms of location, building size and shape, number of students/pupils/staff/devices and therefore their needs differ for their WiFi network. We will be happy to provide guidance along with specifications around your school's particular needs.

If/when seeking quotes the following is an example of the "process" that should occur:-

1. The supplier should seek a copy of the floor plans of the school.
2. The supplier should conduct a site survey.
3. They should ask you how and for what purpose you require your WiFi network.
4. They should ask how many devices at a given time (running concurrently) in a single area and the types of devices needing to access the WiFi network (e.g. different WAP's support different densities of devices).
5. What applications that will be used via Wi-Fi i.e. simple web browsing? video streaming? Voice over Wi-Fi?
6. Where do you want coverage e.g. total school grounds i.e. to cover courtyard areas / caretaker or outbuildings, car park or just specific areas like classrooms, meeting rooms etc?
7. How you want your devices configured – WAP's should support multiple SSID's i.e. this allows for example Admin / Teachers / Students / visitor – separate WiFi network names.
8. You will require switches that are POE managed switches. These power the WAP's as well as being used to patch them in and allow for multiple SSID's.
9. Finally when the supplier gathers this information they typically use software and their expertise to generate a report outlining the number of WAP's etc. required.
10. When the installation is complete the supplier should do a "walk through" of the school and "test" to confirm WiFi connectivity throughout the school.
11. The total cost will depend on the number and type of WAP's required. Typically a WAP can cost anything from €200 upwards and the cost breakdown would typically be

a) Number of WAP's @ €x amount each
b) POE switch(s) @x€ amount each
c) Installation of WAP's – number hours @x€/hour
d) Configuration of WiFi networks i.e. Teachers / students / admins 1-2 days senior engineer x€rate/hr
e) Training. ½ -1 day
f) Warranty and support – may be included / additional

Acronyms

AP's / WAP's	WiFi Access Points
POE	Power over Ethernet
SSID	(A service set identifier (SSID) is a sequence of characters that uniquely names a WiFi local area network (WLAN). An SSID is sometimes referred to as a "network name." This name allows stations to connect to the desired network when multiple independent networks operate in the same physical area. e.g. Teachers / Students / Visitor

Checklist for procuring suitable WiFi

- Selecting quality suppliers with a track record is very important, we recommend seeking references from other and similar sized schools.
- Select quality products e.g. recently the newer standard of WiFi, "WiFi 7" was released, so it may be prudent to consider access points with this standard for some future proofing if procuring a new WiFi network. WiFi 7 offers considerable improvements over previous WiFi standards under dense environments like schools and is deemed very efficient.
- Take into account security elements e.g. Separate SSID for Admin staff, Teachers, Students, Guests, etc.
- Technical Support – what is included, NBD, hours, how to log a support issue.
- Warranty – how long is it for and what does it include?
- Training/Documentation – will this be provided to the school?
- What are the ongoing support costs?
- When schools receive proposals/quotes for WiFi from IT companies, and if they need some objective advice and support, they can contact Oide-TiE at ictadvice@oide.ie .
- For schools involved in New Builds and/or refurbishments the link below to our website contains Technical Guidance documents for both Primary and Post Primary for the Provision of WiFi Network installations and will assist schools in working with their schools builders in helping to understand the WiFi building specification.

This document is located at the following Oide-TiE link:
https://www.oidetechnologyineducation.ie/technology-infrastructure/wifi/

For additional queries on WiFi schools can email ictadvice@oide.ie