Planning Guide:

Maximising your School Wi-Fi

EnGenius®

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These days, paper and pencils have been substituted by tablets, Laptops and Smart boards. Add on video streaming and BYOD and you have the digital classroom fueled by the rapid advancement of education technology and the growth of innovative digital tools and resources

Internet Access for Every Student

Two main initiatives, 1 :1 computing and BYOD, are designed to maximise students' learning experience by giving each student access to network resources in the classroom.

The challenges that schools face when implementing BYOD or 1 :1 computing go well beyond the simple question of how to put iPads or Chromebooks into the hands of students. The addition of hundreds of devices to the school Wi-Fi network also creates a number of issues that need to be addressed to ensure performance.

EnGenius Classroom WiFi solutions use a management solution that are intuitive to configure, monitor and manage. The EnGenius WiFi Solutions are affordable and feature rich Enterprise level WiFi, offering WiFi that consistently works for both teaching staff and students to deliver a high quality teaching tool

EnGenius makes WiFi easy and affordable and makes the digital classroom designed to meet the connectivity needs for todays classrooms for the lowest cost of ownership

1)Zero touch configuration – Pre-configure before you get to site
2)Simply plug in the access points and switches and they will automatically Configure
3)Monitor and manage a single site or multiple locations at a glance

The Need to Scale: Exponentially increasing the number of mobile devices that can access the school network requires a variety of managed options particularly across multiple sites. Having the facility of Zero Touch Configuration, automatic RF and Channel optimization, seamless roaming and a dashboard for comprehensive analytical statistics is a must.

EnGenius can scale their WiFi coverage across High Density environments such as large venues (sports arenas, auditoriums and campuses

EnGenius enables digital learning affordable and simple

- Robust and reliable indoor & outdoor WiFi infrastructure
- Simple technology, easy to manage
- Product range covers both WiFi 5 and 6
- EnGenius ensures the lowest Total Cost of Ownership

EnGenius small and large Campus solutions are designed to meet the expanding needs of modern Education, that is truly scaleable and gives the lowest cost of total ownership. All this with no "on" costs make it the product of choice

A managed WLAN, which allows the school's IT administrator to easily add access points, as needed, and to centrally manage and monitor them through a central software dashboard.

By placing all campus access points into a managed network, IT administrators can conduct maintenance and management tasks such as configuring, provisioning, monitoring and updating firmware in bulk, saving time and providing complete visibility into the status of the network. In addition, managed networks can provide rich analytic capabilities for IT administrators to analyse network performance and maximise usage and experience for all connected devices.

Security Issues: Providing network connectivity to students and staff via mobile devices, particularly through a wireless network, opens up a host of security concerns that can include network misuse, unauthorised changes to network infrastructures, and even fraudulent use of the network.

A managed WLAN enables the IT administrator to implement and manage blanket security policies from a single dashboard that protects the entire network. Security features that can be implemented across the network include guest networks, which ensures that only authorised individuals can access the network,
802.1 x RADIUS for user authentication, email alerts to instantly notify the IT administrator of security issues, and rogue AP detection, and real-time wireless invasion monitoring to detect unauthorised attempts to enter the wireless network.

Establishing a secure virtual network for student access ensures that they can get connected to the resources they need, while blocking main school computers and network resources from unauthorised access.

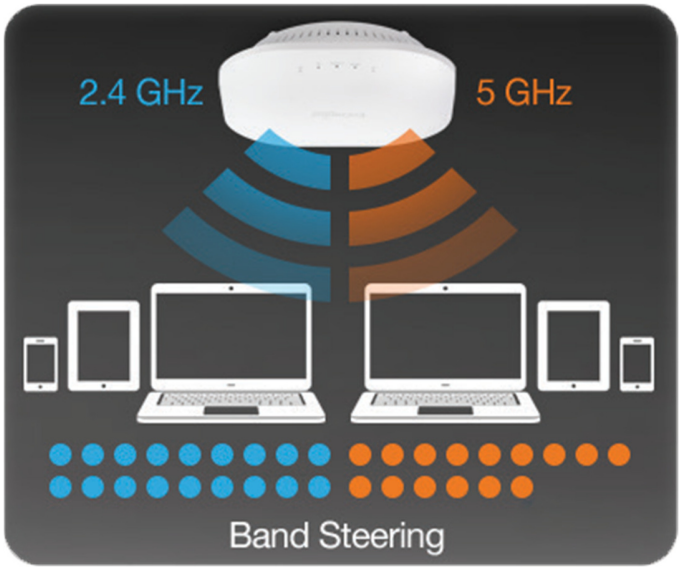
Impact to Network Performance and Reliability

Inadequate network infrastructure is one of the greatest challenges to providing access to education technology in school. Technology initiatives are largely focused on giving students and teachers access to the vast educational digital resources available on the network and from the Internet. Whether streaming video content from a school's network storage device or directly from the Internet, the network must deliver fast, reliable connectivity to support these high bandwidth applications. Technical issues like buffering videos or the inability to retrieve on line content such as electronic books and tests can significantly reduce the impact of a classroom lesson.

Diminished Network Performance: As an increasing number of devices connect to the limited amount of available bandwidth, the network's performance suffers negatively impacting the operation of critical classroom applications such as live or on-demand video streaming, cloud-based applications and interactive classroom tools.

While inadequate bandwidth coming into the school is the primary reason for network performance issues, a managed WLAN can help to greatly minimise issues caused by a large number of devices on the network.

Dual-band mobile devices support both new and legacy wireless technology and utilise band steering, which automatically places dual-band-capable devices on the less-congested 5 GHz band to reduce network traffic on the 2.4 GHz band. Band balancing manages the number of devices served by each dual-band access point to balance the client load and improve network performance for all connected devices. Transmit power and channel allocation controls ensure optimized RF coverage and wireless efficiency across the network.



Wi-Fi 6 to Solve Interference and Congestion

The major issue with Wi-Fi is the bandwidth is shared among the client devices. When you factor in problems with overlapping access points coverage and clients moving between access points then there can be very high levels of congestion resulting in poor performance. Where you have a high number of clients or traffic density then traditional Wi-Fi, for example 11 n or Wave5-11 ac, can become very slow for two key reasons: First of all, the ICSMACA protocol used for spectrum allocation means that endpoints need to listen for a period of clear radio spectrum before transmitting.

If there is interference that results in a Wi-Fi collision then the client device has to wait for the all-clear before retrying. Secondly, even when the client manages to find a clear time period to talk to the Access Point then 100% of the available bandwidth is allocated to the client. This happens even if the client's hardware doesn't support the full transfer capabilities of the Access Point or the communication doesn't demand this level of data speed.

For example, you don't need an 867Mbps Wi-Fi band to send a 256K mp3 file! The newer 11ax (Wi-Fi 6) protocol attempts to address these issues by firstly packing the data in even tighter, so less time is taken to transfer the data, and also using a system called MU-MiMo which means that the data streams can be simultaneously allocated between multiple clients. As an example, if your Access Point supports 2 Wi-Fi-streams then you can split the Wi-Fi so each client simultaneously gets a single stream. So, at a stroke, you've doubled the number of clients your system can support.

11 ax Wi-Fi systems build on the features of Wave2 11 ac with even higher data compression tools and added MU-MIMO capabilities. For example, with Wave2 11 ac MU-MIMO is limited to downlink transmissions only. The new 802.11 ax creates MU-MIMO connections so that with downlink an access point may transmit concurrently to multiple receivers and with uplink an endpoint may simultaneously receive from multiple transmitters. So, the 802.11 ax Access Point can handle multiple symmetric MU-MIMO communications. In addition, 802.11 ax supports up to eight MU-MIMO transmissions at a time, up from four with 802.11 ac, and also OFDMA which allows communication to different clients over the same transmission stream. With all of these features, the result is a dramatic increase in client count and density capabilities compared to 802.11 ac. These are features which make 11 ax a protocol eminently suitable for school or campus applications.

Network Prioritisation: Not all access requirements are created equal. The ability for a teacher to stream a video or conduct a video conference during a classroom session should take precedence over the desire for students to send email or surf the web from their devices. With each device that connects to the school network, bandwidth allocations shift, potentially taking valuable bandwidth away from teachers and impacting the delivery of their lessons.

ECW Series Access Points
ECS Series Switches

EnGenius Cloud Management

Optimal Performance, Enterprise Features, & Cloud Management

The AI-Driven Cloud for Smart Networking

EnGenius Cloud is built on top of the most advanced cloud computing technology. Scalable and AI-ready, the robust and dynamic cloud computing infrastructure helps you work intelligently on your network with important analytics and visualization tools. Artificial intelligence (AI) enables EnGenius Cloud to predict issues before they occur and provide accurate recommendations to proactively improve performance.

- Stability and scalability by the most a serverless Cloud infrastructure
- Secured Cloud deployment for user data
- Plug & Play without complex configuration
- Hierarchy view and multi-user privileges
- Real-time analytics for wired & wireless devices
- Oversee your network in a single glance
- Expert advice from EnGenius' AI-driven advisory board
- Network and monitoring on the go

Key Benefits for Your Business

Easy Deployment

With quick registration and group device configuration available on your network, EnGenius Cloud makes it easy to deploy multiple sites without the need for costly site visits or onsite support.

Smart Networking

EnGenius Cloud makes it easy to manage and monitor multiple sites. Hierarchy view provides a big-picture overview of your network, and real-time and historical device data allows for granular control over your hardware. Remotely manage and update firmware for distributed devices with scheduled maintenance.

Visualized Insight

EnGenius Cloud empowers you to perform precise troubleshooting with graphical tools, and its machine-learning component offers accurate and actionable recommendations tailored to your specific infrastructure.

Smart Management with EnGenius Cloud

EnGenius Cloud organizes your network workload to make your workflow more efficient, pinpoints network issues quickly even when you're on the go, and increases upt ime for greater customer satisfaction.

Manage Your Network with Hierarchy View

EnGenius Cloud removes the complication of tagging and allows you to create and organize networks, add managed access points & switches, and assign team members all in one place. You can manage and monitor company networks with a hierarchy view based on different locations or business setups.

Quick Access to Access Point Status

Manage all access points in one place and get quick access to current configuration and traffic usage data.

User Authentication for Wi-Fi Access per SSID

EnGenius Cloud offers various authentication methods for different business requirements. You can configure the AAA authentication on the Cloud or by a customer's RADIUS server, create a guest Wi-Fi network with preset access, or let users login by linking to their social account.

Scheduled Firmware Upgrades for Multiple Sites and Networks

Create firmware upgrade tasks for different groups of devices based on region, local time zone, or other parameter.

Detailed Switch Port View and PoE Status

Check real-time information of port connection states and PoE utilization and make port configurations for individual switches.

Managed WLANs not only allow IT administrators to implement traffic prioritisation across the network, but they can allow the allocation of specific amounts of bandwidth for different users (i.e. staff, teachers and students) and different network segments (i.e. computer labs and libraries). This can ensure that adequate bandwidth is reserved for teachers use in the classroom, and for those segments requiring more, while providing the maximum performance of education technology resources and applications.

Connectivity Everywhere

No two schools are built the same. Floor plans, construction materials, and campus layouts are just a few of the elements that make the wireless network connectivity challenges unique to each school. In addition to providing connections within school buildings, some have even begun to deploy wireless beyond classrooms and hallways to support students with Internet access during breaks and even after school hours.

Providing Network Access Everywhere: Along with the 1:1 computing and BYOD initiatives, students are beginning to expect network access for completing classwork and homework wherever they are on campus. These locations can include common and outdoor areas, portable classrooms and athletic fields. The challenges of providing this level of access may mean supporting Wi-Fi in harsh outdoor environments or in buildings that are built of materials such as concrete block, through which RF signals have difficulty penetrating.

While there are specialised wireless access points designed to provide connectivity in these environments, simply connecting them to the network does not guarantee performance and reliability.

Managed WLANs can tie these "specialized" access points from around the campus into a single managed network through which all access, bandwidth and security policies can be enforced. Deploying a managed wireless network infrastructure ensures that students and faculty experience the same network quality throughout the campus regardless of where they are using their mobile devices.

5 Key Best Practices to Consider when Planning Your Campus Wi-Fi Network Upgrades

1 Number of Access Points (Indoors & Outdoors):

Balance Coverage & Capacity: Due to the high mobile device density found in schools, often a 1:3 ratio, i.e. student mobile phone, student tablet and school Chromebook, having the right balance of coverage and capacity is critical. Access points must be powerful enough to provide complete Wi-Fi coverage, and offer enough bandwidth to handle multiple devices without compromising quality.

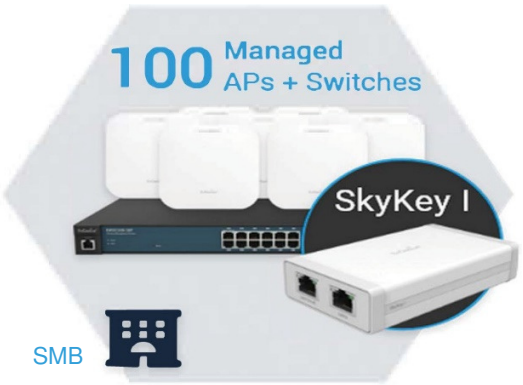
Install Only What You Need: Some wireless integrators suggest installing one (1) access point per classroom; however, your real world needs can vary, so it's important not to install more access points than you'll really need. How will you really know what you need?

Do A Site Survey: A professionally detailed site survey will allow you to assess the unique needs of your specific campus to determine the right number of access points needed.

Know Your School's Building Materials & Structure: Having an understanding of your school's structure and wall materials will help ensure proper signal transmission. Structural components to be aware of include:

- Exterior Wall Materials: Brick, Concrete, Metal Siding or other?
- Interior Wall Materials: Plaster, Concrete, Glass or other?
- Roof Type: Flat or Sloped
- Ceiling Type: Hard or Drop
- Number of Floors
- Number of Buildings

SkyKey



Hardware Controller with ezMaster preinstalled

SkyKey cross network Management

2 802.11 AX

Use Leading Wireless Technology: 802.11 ax access points offer faster wireless speeds and greater device capacity than previous wireless standards such as 802.11 n. 11 ax access points operating at their maximum data rates can existing theoretical speeds that are more than double that of existing 802.11n access points. In addition to the increase in speeds, the biggest benefit of using 11ac technology is its ability to handle the high density requirements driven by the growing number of mobile devices in schools.

11ax access points make up the majority of available 802.11ac access points currently on the market and provide a marked increase in speed and capacity handling than previous technology. Wave 1 APs generally won't require IT administrators to make widespread network infrastructure changes, making network planning fairly straightforward. Yet, due to Wave 2's additional features networks, RF design adjustments may be needed.

Future-Proofing for the Next 5 Years: Upgrading school Wi-Fi networks from older, slower technology to 11 ax provides a level of future-proofing that won't need to be upgraded again for another 5 years, maximizing your budget allocations.

3 Managed WLAN is a Requirement (onsite or cloud-based)

A Managed WLAN Provides Visibility & Awareness of the Network: Using networking hardware that supports management capabilities is essential. Access points, switches and controllers that are manageable provide network visibility and awareness that's invaluable when it comes to monitoring network traffic, applying security and access policies network wide, and troubleshooting and firmware updates.

Look for WLAN Management that Can Scale: The scalability of a WLAN management system also provides a future-proof way to manage and expand your network as you choose. Look for a system that allows you to manage the network onsite and/or remotely, either through a cloud-based service or through remote access. This gives you the flexibility to decide who will handle this important task and whether they must be on campus to do it or if it can be done from a central location, such as from the school directly or via a managed service provider.

Make Sure It's Easy to Deploy & Configure: With the abundance of wireless and network management tools available, it's important to select a vendor application that's easy to deploy and configure. Network management can be complex, so choose a solution that's intuitive with a relatively low learning curve, yet one that's robust enough to meet the varying needs and complexities of a growing distributed network.

4 Security Measures

Secure & Control Network Access: Protect and block school assets and sensitive student information located on the network from unauthorised access, while allowing students and teachers to get connected with the resources they need.

Utilise Networking Industry Standards & Protocols: Use hardware and management software that adheres to industry security standards and accepted network security protocols such as Wi-Fi Protected Access Encryption (WPA Personal & WPA2-Enterprise) and 802.1X with RADIUS for user authentication. Wireless standards and protocols protect and encrypt data as it moves across the network.

Segment Network Access: Establish a secure network segment that blocks access to administrative computers and servers while allowing teachers and administrators to collaborate and students to access study resources. Create and utilise separate, secure virtual network segments and assign them to single or multiple access points while regulating network bandwidth based on the needs of specific virtual network segments; and isolate student to keep them secure from other student's devices on the network.

5 Consult with Experts

Expert Site Survey: School Wi-Fi network design by nature is complicated due to its high-density needs, varying building structures and outdoor considerations. Be sure to work with wireless experts to perform a school site survey. A qualified expert will ask a series of questions designed to gain a deeper understanding of your existing network and any issues you have, any future technology and building expansion plans, student capacities and projected enrolment information, as well as areas for coverage expansion.

Network Design: Once your survey is complete, a network design and deployment plan will spell out the hardware and deployment locations for access points and other needed hardware in order to achieve the best wireless coverage and network connectivity.

Technology is now embedded into everyday life and is fast becoming an essential teaching aid in to days class rooms. EnGenius can make the digital transformation taking the classroom away from standard 4 wall learning, to smarter ways of imparting the learning process with universal access for students and staff.

School's new WiFi solution up and running in one day!

Bishop David Brown School, part of the Unity Schools trust, is a mixed secondary school on the outskirts of Woking and with 575 students it is rapidly expanding. A refurbishment project was completed in August 2016. The refurbishment included an extension to provide two new classrooms, four new Science laboratories, two ICT room, a Textiles classroom as well as the refurbishment of ten English and Maths classrooms.

At the heart of the refurbishment was the requirement for a new WiFi system to replace an existing solution that was poorly performing and not meeting the teaching requirements for an ever expanding number of pupils whose IT requirements were becoming more intensive with new client devices being added to the network on a monthly basis. In addition to that there was also a requirement for outdoor WiFi to cover the external playing fields and gardens for Sports Days and other potential learning activities.

Several manufacturers were invited to tender including Ruckus, Meru and EnGenius. The criteria were for site wide coverage with fast hand over to ensure seamless roaming, with the ability to handle intensive usage by multiple classrooms. Full site surveys were conducted across the site by the various manufacturers and the proposals presented to the Board of Governors.

The EnGenius WLAN Solution offered the best price and performance and with its full feature set of Management controls and statistic gathering, such as Client finger printing, captive portal, network trouble shooting and its inbuilt roaming protocols ensured it met all the needs of Bishop David Brown School to carry the teaching needs into the future.

The EnGenius Managed Solution included the EWS360AP which is a 3 stream ac indoor access point with the ac radio offering 1.3Gbps throughput. For the outdoor requirement the EWS660AP was selected, this unit also offers ac WiFi at 1.3Gbps. Both the indoor and outdoor access points can be managed either by a controller or the free ezMaster VMware management software which is able to control in excess of 10,000 concurrent users and 1000 access points. Ongoing Firmware upgrades are free for life, including a Limited Lifetime warranty and there are no licensing fees, saving valuable IT spend for other projects .

The installation by Cavendish Communications was rolled out over the half term holiday with a total of thirty eight access points installed. All the access points were pre-configured off-site, saving valuable time once the installation was underway. The full EnGenius Managed Solution was up and running the same day!

"The EnGenius WiFi was up and running in just one day. There were no problems and it has performed exactly as we were told. There has been a good cost saving to the school enabling us to buy more tablets for students"

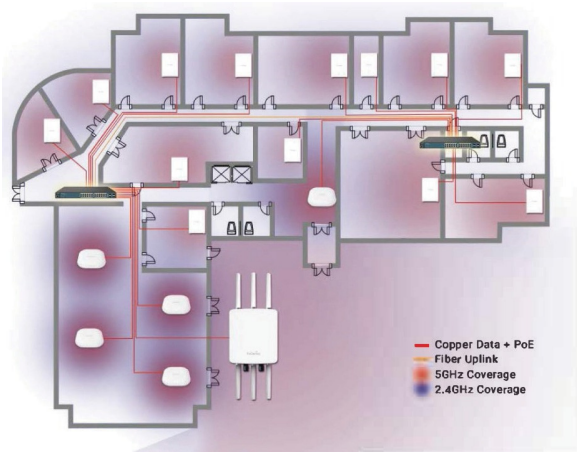
Bishop David Brown's ICT Technician John Dickinson commented

Introduction

In the educational sector, fast and reliable access to wired and wireless networks are essential to students' educational needs and learning processes.

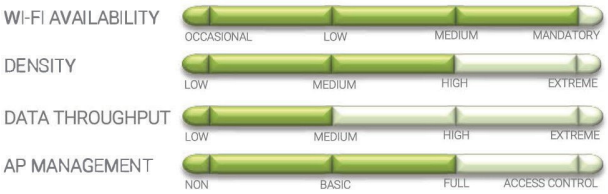
Situation

Below is a graphic representing the first floor of a small school with a central space and a small number of staff/classrooms. The construction of the building is made up of indoor walls that have low wireless penetration possibilities and with classrooms that can contain 30+ students with one or two Wi-Fi devices and some peripheral wired clients including Digi-Board and VoIP Telephone.



Requirement

To secure and fulfil high-end wireless and wired solutions to all students and staff throughout the school.



Solution

The EWS650AP omni-directional managed device as endpoint APs are selected for both wireless and wired connectivity in the staff/ classrooms.

Additionally, one EWS660AP outdoor AP will provide wireless coverage outside. The APs are wired to guarantee maximum throughput and management capabilities. The backbone is based on PoE switches.

EWS357AP with 11ax and dual band capabilities, have two radios available to accept multiple users plus additional wired connection availability. 11ax secures the lifespan of the solution. The strategic placement, careful channel selection and fine tuning of the radio transmission power are needed to create a stable and balanced network environment. In general, lower power is advised to try to isolate the wireless coverage in one classroom. With background scanning enabled, the EnGenius solution can continously optimise the network with auto power and auto channel select functions. The Fast Roaming function will improve the wireless stability. The EnGenius Cloud management is a completely scaleable management tool taking the AP count for the EnGenius solution for any individual account to thousands of APs and client devices. The standard EnSky APs and Controller switches are also manageable through the cloud portal using the SkyKey.

Device	Model	Radio	Operation Mode	Remarks
AP 1 -15	EWS360AP	2.4GHz 5GHz	Managed Access Point Managed Access Point	Use Band steering, Traffic shaping, client Limitation
AP 16-18	EWS550AP	2.4GHz 5GHz	Managed Access Point Managed Access Point	LAN ports available for stationary PC, Digi-board Network Printer, VoIP phones etc.
AP 19	EWS660AP	2.4GHz 5GHz	Managed Access Point for Outdoor Managed Access Point for Outdoor	Use Band steering, traffic shaping, client limitation
SW-1	EWS1200-28TFP		Controller+ Power Source Equipment	In WLAN Controller mode using one of the four SFP module slots for the Fibre backbone
SW-2	EWS1200-28TFP		Power Source Equipment	Using one of the four SFP module slots for the Fibre backbone

Result

With the managed solution you have centralised and easy management of your network where one time investment and no additional license fees apply. The deployment is easily scalable and/or extendable. You can have the same setup in multiple floors and also add outdoor APs for the school's courtyard. In a simple setup only an EnGenius controller switch is needed to have a managed wireless network. Optionally, you can also use ezMaster software.

Alternative Setup

Instead of using 11 ac APs, also 11 ax APs can be used. It is not recommended to use single band access points in the classrooms, since you will have less concurrent user capability.

This solution is a basic example how to use EnGenius APs in a school situation. EnGenius can offer you a wireless solution in any deployment.

Deployment Characteristics:

- *In excess of 10,000 Cloud Access Points*
- *In excess of 100,000 users*
- *Cloud management or PoE Controller switch*
- *Licence Free Cloud & EzMaster network management software*

EnGenius

Case Study

EnSky Access Points & Switch

Cardinal Newman prides itself on its teaching facilities and its Wi-Fi provision is no different

Cardinal Newman Catholic School | Hove, UK

The Site

Cardinal Newman Catholic School is a large mixed comprehensive school for pupils (ranging from 11-18 years old) with approximately 2,500 pupils and staff. The large site has Victorian origins and has its own sixth form College.

The Situation

Over the past years, more Wi-Fi teaching aids have been added to the network and the existing network solution has struggled to cope with the increased demand placed upon it. Not allowing staff and pupils to take full advantage of the expensive networking devices the school invested in nor meeting the requirement to add more in the future. Outdoor Wi-Fi needed to be added to cover the extensive grounds with some areas used for teaching.

The Benefits

- Affordable and Enterprise level WiFi solution
- Easy installation and set up
- Concise analytics
- Superior signal strength
- Free Lifetime Warranty*
- Free Firmware upgrades for Life
- Free Technical Support

Several Manufacturers were Invited to Tender

The criteria were for site wide coverage with fast hand over to ensure seamless roaming, with the ability to handle intensive usage by multiple classrooms. The EnGenius WLAN Solution offered the best price and performance and met all the needs of Cardinal Newman Catholic School to carry the teaching needs into the future.

The EnGenius Managed Solution

The EWS360AP 11ac indoor AP and EWS660AP outdoor 11ac AP were used. The EnGenius WLAN Controller Switches and free ezMaster™ network management software were used to remotely monitor, manage and troubleshoot making centralised network management easy.

The installation was rolled out over the half term holiday with a total of 93 APs installed

All the APs were pre-configured off-site, saving valuable time once the installation was underway and the full EnGenius Managed Solution was up and running the same day!

Mike Smith ICT Manager commented "The EnGenius WiFi was up and running in just one day. There were no problems and it has performed exactly as we were told. There has been a good cost saving to the school enabling us to buy more devices for students and staff."

About EnGenius Networks Europe B.V.

EnGenius' mission is to provide best-in-class data solutions that promote mobility, increase productivity and are easy to use. We believe that connectivity should go hand in hand with reliability, rich features and personalized service, while remaining affordable.

About Us

EnGenius is an industry expert in wireless communications and radio frequency (RF) technology for businesses, service providers and consumers. Our mission is to deliver best-in-class data solutions that enhance productivity and embrace simplicity. We believe connectivity should come with a promise of reliability, rich features and personalised service while maintaining affordability.

Why EnGenius?

- Award-Winning Industry Expert
- Comprehensive Line of Business-Class Solutions
- Reliable, High-Quality Hardware & Free Utility Software
- Lower Total Cost of Ownership & Maximum Return on Investment
- No Annual License or Subscription Fees
- Free System Design Services & Technical Support

EnSky Series Distributed Network Management Solution

EnGenius' EnSky Series offers fully integrated, simplified network configuration and management for both large and small campus networks. The EnSky Series is flexible and scales to meet the needs of a single campus network or that of distributed networks. EnSky's hardware and management software offers network features found in more costly solutions providing schools with a reliable, high-performing network at a fraction of the cm without compromising quality.

EnSky Solution					
Management Platform			Managed Devices		
					
SkyKey - Controller	ezMaster - Software	EnWiFi - Mobile app	Indoor wireless	Outdoor Wireless	PoE Switches

EnSky Series Offers:

Unlimited Flexibility

- Operate EnSky APs Alone or
- Manage up to 50 APs per Controller/Switch
- Centrally Manage Unlimited APs & Switches with ezMaster
- Deploy ezMaster Software on a Local or Remote Server, or via the Cloud

Complete Scalability

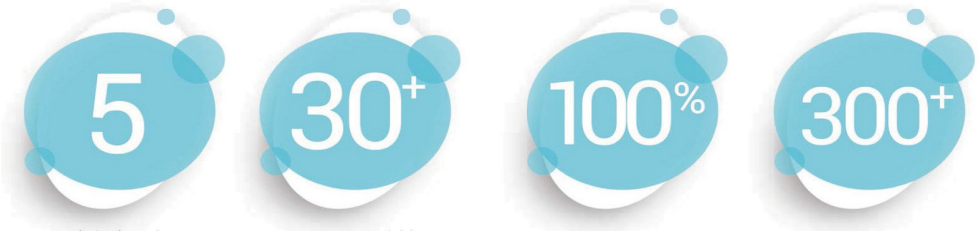
- Manage 1,000+ APs & Controller/Switches
- 10,000+ Users
- Unlimited Number of Distributed Networks
- Managed across Cities or Regions, Regardless of Size

Unmatched Affordability

- No AP Licensing, Annual Subscriptions or Technical Support Fees
- Affordable Hardware & Free ezMaster Management Software
- Saves Time & Resources, Lowers TCO per Deployment
- Best Price/Performance Ratio in the Industry

EnSky Series Includes:

- Full-Featured, Power-over-Ethernet Controller/Switches
- Dual-Band, 11 ac Indoor/Outdoor & Classroom Wall-Mount Access Points
- ezMaster Network ManagementSoftware



Global Offices | Years Reliability | Manufactured in Taiwan | In-house Engineers

EnGenius End-To-End Solution

EnGenius not only offers high quality hardware but provides an End-to-End Solution. From Planning with the ezWiFi Planner, Deployment of our AP's up to Management of your network with ezMaster or EnGenius Cloud, EnGenius works with you to Visualize your network.

Cloud Solution	ezWiFi planner: Planning Software (Partner Portal)	ECW AP ECS switch	EnGenius Cloud Platform Cloud app
EnSky Solution	ezWiFi planner: Planning Software (Partner Portal)	EWS AP / Switch EAP / ENS / ENH	EWS Controller Switch ezMaster VM / AMI / SkyKey

EnGenius Cloud Solution: Cloud Managed WiFi Solution

- includes the EnGenius Cloud Platform, Indoor AP's, outdoor AP's and the EnGenius cloud app
- is currently available for free to manage the EnGenius Cloud AP's and Switches on http://cloud.engenius.ai
- is a cloud platform based on FaaS technology and with almost limitless capacity ; fully owned and maintained by EnGenius
- typically designed for Wi-Fi access to client devices. In Hospitality / Education / Office

[! The EnGenius Cloud Solution can only Manage Cloud AP's (ECW) and Cloud Switches (ECS) !]

Cloud Hybrid switches:

Can be managed by the EnGenius Cloud (or managed by ezMaster):

EnGenius Model	Description	LAN	PoE Budget	PoE standard	SFP	Deployment / TIP
ECS2512FP	Cloud Managed PoE Switch	8-port 2.5GbE	240W	8x af/at/bt	4x 10Gb SFP+	Select switches based on the required ports and the required power budget
ECS1552FP	Cloud Managed PoE Switch	48-port GbE	740W	48x af/at	4x 10Gb SFP+	
ECS1528FP	Cloud Managed PoE Switch	24-port GbE	410W	24x af/at	4x 10Gb SFP+	
ECS1112FP	Cloud Managed PoE Switch	10-port GbE	130W	8x af/at	2x SFP	
ECS1008P	Cloud Managed PoE Switch	8-port GbE	55W	8x af	3 x 3	This Switch only supports 802.2af
ECS2512	Cloud Managed Switch	8-port 2.5GbE	-	-	4x 10Gb SFP+	
ECS1552	Cloud Managed Switch	48-port GbE	-	-	4x 10Gb SFP+	
ECS1528	Cloud Managed Switch	24-port GbE	-	-	4x 10Gb SFP+	

Indoor Cloud AP's:

Can be managed by the EnGenius Cloud. AP's are standard PoE and DC powered - optional AC-DC adapter is available. Wall/ceiling mount accessories are included.

EnGenius Model	Description	Band and Standard	Streams	PoE standard	Deployment / TIP
ECW230	Cloud Managed Ceiling Mount Access Point	Dual Band 11ax	4 x 4	at	Suitable for High density deployments: latest 11ax technology: future proof
ECW220	Cloud Managed Ceiling Mount Access Point	Dual Band 11ax	2 x 2	af	medium density deployments: latest 11ax technology: future proof
 ECW120	Cloud Managed Ceiling Mount Access Point	Dual Band 11ac Wave 2	2 x 2	af	Main stream Cloud Managed AP
ECW115	Cloud Managed Ceiling Mount Access Point	Dual Band 11ac Wave 2	2 x 2	at-in / af-out	In Room AP for Classroom/ Hotel Room

Outdoor Cloud AP's:

- Can be managed by the EnGenius Cloud
- AP is standard PoE powered; optional PoE adapter (EPA5006GAT/EPA5006GP) is available.
- Mounting accessories (wall/pole) are included in the standard packaging

EnGenius Model	Description	Band and Standard	Streams	PoE standard	Users Per Radio(1)	Deployment / TIP
 ECW160	Cloud Managed Omni Directional Access Point	Dual Band 11ac Wave 2	2 x 2	af	≤100 users	Cloud Managed outdoor AP for client access

EnSky Solution: On Premises Managed WiFi Solution

- includes various controllers, switches, indoor/outdoor Access Points
- typically designed for Wi-Fi access to client devices. In Hospitality / Education / Office
- [! You Can only Manage EnSky AP's and switches (not cloud devices) !]
- important for the On-Premises product line is that the network owner also owns the controller and is responsible for the installation and maintenance of thecontroller.
- Manage AP's and switches Local (and remotely) by:

EnSky Controller:	Management	Access	Managed devices	license	cost	
EnSky Switch	local	local and remote	50	FREE	included in the switch	The switches can function as a local controller for management up to 50AP's: in bigger deployments a SkyKey or ezMaster is recommended: you can turn of the internal controller of the switch
SkyKey I	local and remote	local and remote	100	FREE	cost of the SkyKey	The SkyKey is a Hardware ezMaster Controller at the size of a cigarette box, that works OUT-OF-THE-BOX; without any installation: you can use it to manage 100 EnSky Devices Locally or Remotely. Micro SD card slot is to store config files.
ezMaster VM (Virtual Machine)	local and remote	local and remote	≤1,000	FREE	FREE: need to be installed on PC	The ezMaster Virtual Machine version needs to be installed on a PC on a virtual machine. .ova image file is available to download. (you can use Virtual box / VMware Player)
ezMaster AMI (image on AWS)	remote	remote	≤10,000	FREE	FREE image but needs AWS cloud account	The ezMaster AMI (Amazon Machine Image) is uploaded and available on the global Amazon servers and can be selected to be loaded on your Amazon server. The Amazon web services will be under your responsibility and management

EnSky Switches:

- PoE Switch with built-in controller for 50 AP's local Management / or can be managed by SkyKey / ezMaster
- Switches Support 802.3af/at (except EWS2908P: af only))

EnGenius Model	Type	LAN	PoE Budget	PoE standard	SFP	Deployment / TIP
EWS7952FP	AP Management PoE Switch	48-port GbE	740W	48x af/at	4x SFP	Select switches based on the required ports and the required power budget
EWS7952P	AP Management PoE Switch	48-port GbE	410W	48x af/at	4x SFP	
EWS7926EFP	AP Management PoE Switch	24-port GbE	410W	24x af/at	2x 10Gb SFP+	
EWS1200-28TFP	AP Management PoE Switch	24-port GbE	410W	24x af/at	4x SFP	
EWS7928P	AP Management PoE Switch	24-port GbE	185W	24x af/at	4x SFP	
EWS5912FP	AP Management PoE Switch	10-port GbE	130W	8x af/at	2x SFP	
EWS2908P	AP Management PoE Switch	8-port GbE	55W	8x af	0	This Switch only supports 802.2af

EnSky Indoor AP's:

- To be Managed by EnSky Switch or ezMaster VM / AMI / SkyKey. (The AP's can also work in Standalone mode.)
- AP's are standard PoE and DC powered - optional AC-DC adapter is available. Wall/ceiling mount is included.
- EnGenius AP's Outperform competition on stability and multi-user capacity.

EnGenius Model	Description	Band and Standard	Streams	PoE standard	Deployment / TIP
EWS377AP	Managed Ceiling Mount Access Point	Dual Band 11ax	4 x 4	at	Suitable for High density deployments: latest 11ax technology: future proof
EWS357AP	Managed Ceiling Mount Access Point	Dual Band 11ax	2 x 2	af	medium density deployments: latest 11ax technology: future proof
EWS385AP	Managed Ceiling Mount Access Point	Tri-Band 11ac Wave 2	2 x 2	af	Medium-high Density deployments: Triband; Extra radio for more user capacity
EWS360AP	Managed (Mesh) Ceiling Mount Access Point	Dual Band 11ac		at	legacy AP: best coverage
EWS330AP	Managed (Mesh) Ceiling Mount Access Point	Dual Band 11ac Wave 2	2 x 2	af	main stream AP [Bestseller]
EWS550AP	Managed Wallplate Access point	Dual Band 11ac Wave 2	2 x 2	at-in / af-out	ideal for classroom or hotel room

EnSky Outdoor AP's:

- To be Managed by EnSky Switch or ezMaster VM / AMI / SkyKey. (The AP's can also work in Standalone mode.)
- PoE Adapters and mounting accessories (wall/pole) are included in the standard packaging

EnGenius Model	Description	Band and Standard	Streams	PoE Standard	Deployment / TIP
EWS850AP	Managed Omni-Directional Access point	Dual Band 11ax	2 x 2	at	AP for Outdoor client access: with replaceable antennes IP67 802.3at PoE
EWS860AP	Managed (Mesh) Omni-Directional Access point	Dual Band 11ac	3 x 3	at	AP for Outdoor client access: with replaceable antennes IP68
EWS660AP	Managed (Mesh) Omni-Directional Access point	Dual Band 11ac	3 x 3	at	AP for Outdoor client access: with Internal antennes (Omni-Directional)
ENH1350EXT	Standalone Omni-Directional Access point	Dual Band 11ac Wave 2	2 x 2	af	AP for Outdoor client access: with replaceable antennes IP67 802.3af PoE
ENS620EXT	Standalone Omni-Directional Access point	Dual Band 11ac Wave 2	2 x 2	24V pPoE	AP for Outdoor client access: with replaceable antennes: 2xGb LAN

EnSky Outdoor CPE/AP with EnJet: Point-to-(multi)point Solution Featuring EnJet

- EnGenius Outdoor CPE's are able to be used in multiple operating modes including Access Point / Client Bridge / WDS AP / WDS Bridge / WDS Station.
- The CPE's are specialy designed to be used in Video Surveillance / Multi building Bridging / WISP etc.
- PoE Adapters and mounting accessories (wall/pole) are included in the standard packaging.
- "EnWiFI" app (for Android and iOS) is available for easy configuration

EnJet is a technology that maintain the throughput when using Point-to-MultiPoint Solutions and In Point-to-Point Solutions, it will help to maintain stabile throughput in even after more than 3km.

EnGenius Model	Type	Band and Standard	Streams	PoE Standard	Antenna Angle	Deployment / TIP
 EnstationAC(EnJet)	EnJet CPE Access point	5GHz 11ac Wave 2	2 x 2	at-in / af-out	30°	This model has .at PoE-in and .af PoE out to supply PoE and data to next device like AP/ camera
 Enstation5-AC(EnJet)	EnJet CPE Access point	5GHz 11ac Wave 2	2 x 2	24V pPoE	30°	Smaller antenna angle give a more focused beam: longer range; Omni / wide angle devices more suitable for multi-point deployments
 ENS500EXT-AC(EnJet)	EnJet CPE Access point	5GHz 11ac Wave 2	2 x 2	24V pPoE	360°	
 ENS500-AC(EnJet)	EnJet CPE Access point	5GHz 11ac Wave 2	2 x 2	24V pPoE	90°	

[8] Legenda: (1): Realistic Number - (2):Typical deployment - AP: Access Point - CB: Client Bridge - CPE: customer premises equipment - GbE: Gigabit ethernet - FE: Fast ethernet - pPoE: proprietary power over ethernet - DP: dual polarisation - ia: internal antenna - iPOA: internal patch omni antenna - 13i: 13inch - scan: scanning radio

Have Questions? Need More Info?

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