

# **Managed Wi-Fi deployments in Schools**

## The Unwired Classroom

There has been a phenomenal increase in the usage of Wi-Fi clients in today's classrooms. This is both with school provided devices as well as students bringing in their own laptops and tablets from home. From online course materials, to interactive study tools and video tutorials there are several applications that require reliable, fast, wireless network access from portable devices. While these educational tools benefit teachers and students alike, they also bring up some new challenges for the typical school IT department.

In this paper we'll go over some of these challenges and how a network administrator can use the features of Cambium Networks cnPilot Wi-Fi solutions to resolve them.

## Multiple WLANs: Secure, Guest

There are various types of users on a school campus, and to meet their distinct needs, the administrator would typically configure at least two WLANs:

- A secure Wi-Fi SSID for students and faculty: Using a WPA2-Enterprise WLAN, the cnPilot access points can authenticate users across a pool of RADIUS authentication servers. This way the administrator can ensure that only users authenticated against a central database are able to gain network access, and their connection remains secure.
- A guest network SSID for visitors and visiting faculty: Using an open WLAN, and enforcing either login through a temporary password, or just through terms and conditions on a splash-page.

While the cnPilot access points serve up these multiple WLANs on their radios, traffic separation must also be maintained on the wired network by mapping each WLAN to a unique VLAN.

## Fine-tune Network Access

In addition to serving up the separate SSIDs cnPilot access points also provide various tools for the administrator to fine-tune network access by the users. Using features such as ACLs and client-isolation, the administrator can control user access to other devices, servers, services and protocols.

The DNS-ACL feature allows the administrator to control access based on the URL of the website the user is connecting to. This is useful for instance to disable access to video streaming websites, or social media sites during school hours.

Using the Rate-Limiting features, the administrator can ensure that one client does not monopolize the bandwidth of the access point, and also ensure that the traffic from the guest-SSID does not overwhelm traffic from the main WLAN meant for faculty and students.

cnPilot access points also support a Scheduled WLAN feature using which an administrator can choose to have a WLAN available only during certain times of the day (Eg: automatically disable access overnight or after school hours).

## Pervasive Campus-wide Connectivity

Users now expect Wi-Fi access not just inside classrooms, but campus-wide. Hence the deployment should consider a mix of indoor and outdoor access points, providing connectivity all across a campus.

For buildings that are spread out, Cambium Networks has products that can help provide wireless Point-to-Point as well as Point-to-Multi-Point connectivity. These PTP and PMP devices can be managed together with the Wi-Fi access points, all from a single management console providing an integrated, single-pane of glass view.

## Deployment Strategy

While a general site-survey for signal strength and quality is recommended for all deployments, administrators should also take into account locations where students tend to congregate and account for that increased client count in deciding the access point density to be deployed.

The number of access points for a given area in a deployment would depend on the building materials, the types of clients, where the access points are installed, the applications being used (VOIP for instance would need higher density).

As part of the site-survey general RF and network performance criteria should be tested (good Signal to Noise Ratio, low round-trip times, good throughput values) as well as the ability for the clients to seamlessly roam from one access point to another. This means at the point where a client connection is starting to deteriorate and it is looking for another access point to connect with, there should ideally always be at least two candidate access points of which it can pick one to roam to.

## Scalable Management

As the number of wireless users, as well as the number of devices that each of those users brings on the network increase, it is very important that the network management system handling the wireless access point also scales. With Cambium Networks cloud based management system, administrators can be assured of the elastic storage and computing power easily growing and keeping up with their needs.