Indio Networks

Connected Campuses

Empowering education by building Wireless Networks

Introduction

Education has always been a key driver of development & collective growth; people have stressed on the need for good education for quite some time now. However, the modes of educating people have kept on evolving. Universities, colleges and schools, all educational establishments have adopted the internet as a very useful tool to educate students and collaborate between the stakeholders. Schools, Colleges and Universities have adopted wireless technology to bring reliable and affordable Internet access. WiFi penetration in the US peaks with almost 3 of out 4 schools offering 100% WiFi coverage in their campuses [1], campuses in European countries remain on a similar footing. However, WiFi penetration in developing geographies remains relatively low. Developing countries are adopting this wireless campuses to drive transformation and enable next-generation learning environments. Wireless Internet is changing the way students and teachers interact and collaborate. It creates an easy channel for students to connect to the Internet and use the resources to further their knowledge in their respective domains. Connected campuses enable growth by empowering students to rise above their comfort zones and explore new avenues of learning. WiFi accessibility can lead innovation by facilitating easy access to information.

WiFi can drive growth in ways we cannot comprehend. Research suggests that the indirect benefits of WiFi penetration to Gross Domestic Product can be as high as $10 Billion per annum. Connected campuses encourage development. Education is the most important factor that drives the socio-economic structure of society. WiFi on campus creates an inclusive space that allows everyone, irrespective of economic background to learn and grow, it brings opportunities and innovation to students.

Key Requirements for Education WiFi

In a nutshell, the key requirements to keep in mind while deploying a wireless network in the hospitality industry are:

• Fast and reliable WiFi

• WiFi Coverage across Campus

• Multiple VLANs and Network Slicing

• Network Security

• Data Privacy

• Seamless Onboarding

• Student/Staff authentication using LDAP / AP / GSuite

• Web Filtering and Activity Monitoring

• Enforcing Access Policies

• Reduce TCO

• Network Visibility & Monitoring

• Analytics & Reports

Connected Campuses, the key requirements.

Pervasive WiFi Coverage

College Campuses can stretch across vast areas of land, all at least in a few acres. They need solutions that cover all of the campus with reliable WiFi coverage so students and faculty can access Internet from any place at any time. The WiFi devices need to provide good coverage both indoor and outdoor environment.

Fast Connectivity

Students are very aggressive users of internet. They are speed hungry and need connectivity 24x7. Educational campus and hostels need to offer high-speed Internet connectivity to ensure that all the students get fast and reliable connectivity for college assignments or examinations. Many campus deploy multiple ISP connection to ensure load balancing and failover. The system should be able to aggregate the bandwidth and provide seamless failover when there is an ISP outage.

LDAP Integration

Student onboarding is one of the key challenges for any campus network, IT administrators spend a lot of time in adding and removing students from the campus network. Many educational campus use directory services like LDAP/AD or Google GSuite to centrally maintain student database. Student onboarding needs to integrate with these directory services so IT administrators can offer centralised authentication scheme for all network resources including the Internet.

Policy Management Function

Enforcing consistent Internet access policies is one of the important functions of campus networks. IT administrators need to ensure that campus networks are not misused and all stakeholders get reliable and consistent Internet access. They need tools to centrally manage and configure access policies and monitor all the user activity.

Web Logging and URL filtering

Web logging is necessary to store records of what websites the user has accessed in their connected time. Sensitive URLs should be blocked through URL filtering. URLs banned by the regulatory authorities should not be available for access to the students.

Bandwidth Management

Campuses have a very high usage of WiFi, around 500-1000 concurrent users in a smaller campus to around 5000-10000 concurrent users in a larger campus. In such cases, it is imperative that the bandwidth is controlled and managed correctly to ensure all students get consistent user experience.

Staff WiFi

Hotels need to offer Internet access to their staff and employees. However, hotel IT admins need to ensure that only legitimate users get access to their networks and prevent outsiders from hacking into their networks. Moreover, IT admin need to segment the users and define policies for each group of users. This bifurcation is necessary for the privacy of users as well as the staff. We can create these segments through logical networks based on the same physical network.

Hotspot Billing

It is true that not all WiFi users require extremely fast WiFi speed. Users who use WiFi merely for messaging or emailing would not require high speeds. However, people who need to attend video conferences or watch movies, for example, require higher bandwidth. Hotels can offer freemium services that combines free and paid options to the users. They can bill users for a higher speed through a premium service and cover their own costs.

Deployment Challenges

Campuses require complex network planning that ensures good connectivity across all

levels. A few challenges that we are presented with when designing campus networks are:

- Network planning

- Good RF Design

- Ensuring maximum WiFi coverage

- Securing the network

- Managing high concurrency of users

- Segmentation of users

How we help Education for securing better futures.

Indio offers a single vendor, end-to-end Campus WiFi solution that fulfils all of your wireless requirements. With UniBox hotspot controller, UniMax Access Points and our managed switches, the solution offers the all the active components needed to build a reliable and scalable campus network. Some of the highlights of our solution are as follows:

- All in one, On-premise Network Controller

- Multiple Student Provisioning Options

- Seamless Internet onboarding experience

- Multiple SSIDs managed from single controller

- Enterprise-grade WiFi Access Points

- Superior WiFi Coverage and Range

- Plug-n-Play Deployment

- Single Dashboard

- Student Access Policies

- Group-based Content Filtering

- Web Filtering Rules

- Real-time Analytics and Network Monitoring

Implementation

The UniBox is an integrated hotspot controller & management system that can manage the entire network from a single console. UniMax Access Points when integrated with UniBox network controller makes the network very easy to deploy and manage.

Each switch supports VLAN tagging allowing the admin to set-up VLAN enabled networking.Since every UniMax AP can be controlled through UniBox, one single configuration file can push changes on to every UniMax AP connected to the network. UniBox is vendor-agnostic and work seamlessly with third party APs. However, for third party vendor APs to work with UniBox, they must be configured to work in bridge mode. UniBox and UniMax Access Points come in different models to support different use-cases.

A complete UniBox and UniMax AP solution allows you complete control over the network through single console management. Administrators can set up policies relating to bandwidth and compliance as mandated by their regulatory policies. UniBox comes with a loading balancing mechanism that utilises all available bandwidth effectively by aggregating it between connected ISPs. If in case the primary connection fails, then UniBox smoothly transitions on to the secondary or standby connection with a responsive failover mechanism. This ensures that downtimes are kept as low as possible at all times.The solution can help the administrator to manage WLANs and VLANs through the UniBox.

The IT administrator can divide the network into VLANs and configure group-based policies that apply selectively to those groups.

Solution Benefits

Our solutions have been adopted by several educational establishments across the world. We have helped educational establishments empower students through our WiFi solutions. The results of our solution are:

- Management of up to 25,000 concurrent student users

- Improved WiFi coverage across campus

- Improved network performance

- Easy student onboarding reduced administrator workload

- Maintaining access logs and browsing history of students

- Increased average browsing speed by 60%

- Easy integration of third party APs

- Seamless failover mechanism for smooth transition

- Improved diagnostics and usage analytics

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REFERENCES
[1] https://campustechnology.com/articles/2019/07/03/3-in-4-schools-approaching-100-wifi-coverage-on-campus.aspx

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