

Implementing Enterprise Wi-Fi and it's challenges

Today, it is imperative for companies to be equipped with high-performance enterprise Wi-Fi to achieve optimum productivity. With all the advancements in deploying a Wi-Fi network in an enterprise environment, however, IT professionals still find it challenging at times to implement a solution which will cater for and support a wider range of business applications.



"With the ever growing demand and evolution of Wi-Fi, it can be expected that Wi-Fi nodes, Wi-Fi calling, social media focused free Wi-Fi and a much wider deployment of public Wi-Fi hotspots will become more and more of a reality," says Kim Greyling, business analyst for EES Africa (Pty) Ltd.

EES is an ISO 9001:2008 certified company providing management, engineering and auditing services to a range of industries throughout Africa. It specialises in the integration of multiple system infrastructure including ICT, data centres, audio-visual, life safety, security and building automation systems.

Greyling continues: "However, traditional Wi-Fi solutions rarely provide the performance required to drive today's enterprise applications, to provide users with the flexibility to seamlessly access their mission-critical applications, and keep the enterprise network robust and secure."

The following items need to be considered in a new deployment:

- **Dense AP deployment**
- **Multi-site management**
- **SSIDs**
- **Dashboards for visibility**

Dense AP deployment

"In most common cases of Wi-Fi deployment, the number of users active on the network is greater than the access points (AP). This poses a performance challenge, especially when working with voice applications that require a seamless handoff from AP to AP. If APs are densely deployed, each client has more than a single AP to choose from," says Greyling.

Any high-density design should determine and document the key functions, which are:

- Type of applications that will be supported
- Minimum bandwidth required to satisfy supported applications
- Minimum, maximum and average number of Wi-Fi enabled devices
- Maximum latency tolerated

Dense AP deployment will provide adequate radio frequency (RF) coverage across the organisation to support applications such as Voice over Internet Protocol (VoIP) calls.

Multi-site management

"Once APs are deployed, they need to be managed for the sake of efficiency and security. Wi-Fi controllers centralise the administration and management of the Wi-Fi network. The most commonly deployed Wi-Fi systems are controller-based to meet a variety of enterprise mobility needs."

The requirements of each enterprise and site may differ, but the following factors, capabilities and requirements should be considered when purchasing any enterprise Wi-Fi controller:

- AP discovery and provisioning,
- Authentication,
- Encryption and roaming,
- Integrated network hardware
- Firewall and virtual local area network (VLAN),
- Quality of service and
- Radio resource management

In a multi-site environment the controller and management software can be an on-premise deployment or in the Cloud. Multi-site management involves the separation of the wireless local area networks (WLANs), but within the same controller. This is useful for keeping a single point of contact where all the APs to different sites are configured and managed separately while still belonging to the same controller.

SSIDs

There are numerous Wi-Fi networks which the Wi-Fi user can pick up. Sending and receiving data in a location with multiple wireless networks would be volatile. "To overcome this challenge a Service Set Identifier (SSID) needs to be set up," Greyling advises. "A SSID is a unique ID that consists of 32 characters and is used for naming wireless networks making sure that data is sent to the correct destination."

Dashboards for visibility

Dashboards provide visibility into the network giving the administrator views into network users, their devices and applications. They are empowered to quickly create access control and application usage policies, optimising the end-user experience and network security.

The challenge of Wi-Fi mobility

Mobility is one of the most important aspects of Wi-Fi networks. One of the challenges most enterprise Wi-Fi networks are faced with is having the capability to allow a user who is, for example, downloading a file from a server or having a conversation over the Wi-Fi network, to automatically move from one access point to the next as needed without losing connectivity.

"When it comes to roaming, a wireless client device (i.e. VoIP phone) moves outside the usable range of one wireless AP and connects to another AP. The challenge is not within the AP itself, it comes during the hand-off process. The hand-off process is the process which takes place when the client device is associating itself with the next AP which has a stronger signal. This process needs to happen without the user losing his call or his download progress," says Greyling.

There are three steps in the hand-off process, which are:

- **Scanning:** As the device moves away from the AP to which it is connected, the client device sends out probe packets to identify which other AP is available for it to connect to. On discovery of the accessible APs, the device then selects its next AP based on criteria defined by the device itself
- **Authentication:** An authentication request to the new AP is sent by the client device, which then waits for an acknowledgement response from the AP.
- **Reassociation:** Upon approval by the new AP, the client sends a reassociation request and waits for a response. Once the reassociation is complete, the new AP sends out a disassociation packet to the old AP so that the routing tables can be updated.

This handoff process typically takes less than half a second with the scanning phase contributing to the majority of the delay. The client decides when it is time to drop one AP and move to another. It is important to understand that the roam trigger is completely client dependent.

Collaboration is required

For the best Enterprise Wi-Fi solution tailored to suit a company's unique needs, it is important to engage a team of highly skilled engineers to design the network layout and a team of highly skilled IT professionals to implement the design. A combination of these two teams will ensure that an organisation will fully benefit from all that Enterprise Wi-Fi has to offer.