



## Managing Large Wireless Networks

- **VLAN to Each Access Point**

One of the biggest challenges with large networks is keeping it small. Small networks just work better. You have less of a problem with the spreading of viruses and broadcast storms. When you have a separate VLAN for each Access Point you in effect create many small networks.

- **Packet Rate Limiting on Client Radio**

When a customer's computer has a virus, it often sends out many small packets. These small packets hit the access point so fast that they affect network performance. Controlling the packet rate only works if it is done at the client radio, otherwise it is too late and will be affecting other customers.

- **Equipment Monitoring**

On any large network you will have many points of failure. If an access point fails, you drop customers. If a back haul fails, you drop customers. You must have a system that is constantly checking your equipment. If it finds something down, it will send out a notification.

- **Central Control of Customers and Equipment**

As you grow, at some point you will need to get multiple connections to the Internet. You will have many gateway routers. Managing and keeping track of who is where can become very hard if you do not have a central control point. This central control point should also have a GUI (Graphical User Interface) type interface. It should be able to remotely configure your routers. This GUI, and remote control of each router is important. You will not always be able to hire network experts. Employees without technical experience will need to turn customer accounts off, change customers' speed and more.

- **Web Redirect Pages**

There are many things that you may need to notify a customer about. Two main ones are; 1) when a customer has a virus, or 2) if a customer is not paying their bill. You need a way to redirect the customer's web traffic to a notification page.

- **Bandwidth Management**

Without bandwidth management a small number of customers can hog the Internet, thus making the Internet slow for everyone else.

- **Automatic Bandwidth Choking**

When a customer starts using a large constant stream of bandwidth, they can affect the overall speed and performance for other customers. An automatic bandwidth choker will monitor bandwidth usage for each customer and slow down abusive users.

- **Searchable Database of Equipment**

When you have thousands of radios and networking equipment, you do not want to keep track of it in a spread sheet. You must have a way to search and find equipment. You need to find equipment not only by IP or MAC , but also by customer name, equipment location and more. You need to also be able to quickly find out which equipment points to which equipment.

- **Graphs That Keep a History**

On a large network, many things can affect it's ongoing performance. Things like: network changes, increased bandwidth usage and outside interference. Having a graphical history will help you identify the cause of the change in performance. Some of the important items to graph are RSSI, packet loss, latency, usage and packet rate.

- **RTS if 802.11b/g Network**

RTS stands for "Request to Send". It is an industry standard, but is not always implemented. When a wireless client talks to the access point, the access point hears the client, but the other clients do not. Because the clients are hidden from each other this is commonly called "Hidden Node". Due to this, clients will unknowingly interrupt each others' transmissions to the access point. With RTS set, the client will request and wait to receive a "Clear to Send" acknowledgment from the access point. This keeps the clients from interrupting each other.