



Beam Me Up, Ruckus

Ruckus ZoneFlex WiFi system uses beam forming technology to deliver powerful, secure, flexible enterprise-grade WLAN

By Wayne Rash, Network World

The Ruckus Wireless ZoneFlex Smart WiFi system is designed to be a stable, easy to manage and highly secure wireless networking solution for the enterprise. The heart of the system is the ZoneDirector controller, which can communicate with up to 500 ZoneFlex access points.

The controllers and the access points are highly configurable, they can be connected directly to your wired network or they can work in a mesh configuration.

We tested the ZoneDirector 1100 (\$1,200), which will support up to 50 access points, with two ZoneFlex 7962 (\$999 each) and two ZoneFlex 7363 (\$599 each) access points. The ZoneDirector and the ZoneFlex 7962 access points were connected to the lab network via Gigabit Ethernet. The ZoneFlex 7363 access points were tested both in direct-connect and mesh modes.

One important capability of the Ruckus WiFi APs is the ability to beam the WiFi signal at clients, thus extending the range of the WiFi signal over much longer distances than standard access points.

The ZoneFlex 7962 will also adapt its RF polarization to improve reception for

portable devices, such as smartphones and tablets that may be operated in a variety of orientations. The ZoneFlex access points are able to handle extremely high speed connections on 802.11n, if they're connected to the network over Gigabit Ethernet.

Using the Ruckus System

When you unpack the Ruckus Wireless gear, the first piece of equipment that needs to be configured is the ZoneDirector. You do this by connecting a computer to the ZoneDirector using an Ethernet cable, and then running the device's setup wizard. The primary goal of the initial setup is to give the ZoneDirector a name and to assign an IP address or tell it to use DHCP. Once you've done that, you can manage the ZoneDirector from any computer on the network by browsing to the device's IP address.

Once you can reach the Web-based management interface and set your user name and password, you can configure other settings, such as whether you want the ZoneDirector to act as a DHCP server on your wireless network. You can also configure what Ruckus Wireless calls Smart Redundancy, which allows you to configure two ZoneDirectors so that one device stays in a standby state to take over if the other fails.

At this point, the ZoneDirector is set up enough that you can add access points if you wish. However there are a wide number of other features that you can turn on or configure if you choose, including the type of security you want to use, the method of finding system time, telling it the country you're in so that it uses the correct WiFi channels, and telling the

ZoneDirector whether you're going to be using mesh networking.

Note that all of these settings can be configured after the wireless network is up and operating.

The level of flexibility dictates a fairly complex management interface, but Ruckus has mitigated the potential for confusion by dividing up each of the areas into tabs, and sections within tabs. This means that if you want to configure access points, you go to the configuration page (it's a tab on top) click on Access Points on a menu on the side, and then look for the section that contains the access point you want to configure.

Adding the access points

The access points in this test were the Ruckus ZoneFlex 7962, which the company describes as its highest performance access point. It's designed to support high definition IPTV, has extended range, supports vertical and horizontal polarization, and claims to provide up to 300Mbps of user throughput. The ZoneFlex 7363 is a midrange access point and is designed for video streaming and VoIP along with general data use. Both devices are dual band and support dynamic beam forming.

Adding the access points to the network is basically a plug-and-play operation. All you do is plug in an Ethernet cable that's on the same network as the ZoneDirector, and plug in the power. The access point will find the ZoneDirector, request an IP address from the DHCP server (either the one on the ZoneDirector or your existing DHCP server depending on your network configuration) and then check for up to date firmware. If the firmware on the access

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point needs updating, the ZoneDirector will do that, and then the ZoneFlex access point will be ready to use.

About the only thing you're likely to change is to set the IP address to a fixed instead of dynamic address, and to give the access point a name so that you can tell which one you're managing and where it's physically located. If you're planning to use the access point in a mesh configuration, then you need to make sure that the "Mesh" configuration check box is checked where it says "enable."

While most of the access point settings are handled automatically to meet the needs of most users, you can set a wide variety of characteristics, ranging from adding the GPS coordinates to the access point to telling the access point how you want it to handle the mesh environment. You should note that if you plan to use the access points in a mesh network, you must first connect them to an Ethernet connection so that you can set them up. Once that's done, you can disconnect the network cable, and take the access point to its operational location, and plug it into a power outlet. The access point will locate the network and join, retaining the IP address you assigned it initially.

Access points used in the mesh network can connect directly to wired access points or they can connect through other mesh access points. Ruckus allows up to five hops in the mesh. You should note that each hop in the mesh reduces performance because the access point in the middle must handle traffic from its mesh partners, as well as any clients that are connected to it.

The mesh backhaul in this test took place on the 5GHz part of the 802.11n network, with all of the access points sharing the same channel for their internal communications. One feature of the meshed



access points is that you can connect them to a wired Ethernet device through an extra Ethernet port on the access point. This means that you can include non-wireless capable devices or computers in your wireless network. You could, for example, plug an Ethernet cable into one of the access points, attach an Ethernet switch, and to that switch attach devices such as UPS monitors that aren't available in wireless form.

Beam Forming

One of the advanced features of the Ruckus Wireless system is the ability of the access points to engage in beam forming. This means that once an access point detects a wireless client, it can direct the radio energy at the device to give it a stronger signal. I tested this with a variety of streaming media services and a variety of devices, including an Apple iPad, a Sony 102.11n equipped BluRay player, and a ThinkPad T410.

I watched the beam forming take place in real-time with a Fluke Networks AirCheck WiFi Tester set on the channel utilization mode. Once a device started the media stream, you could see the signal strength grow by as much as 10db. The result was that I could use streaming media in places where in the past I barely had a solid WiFi connection.

The beam forming process will keep track of where the device is located physically in relation to the access point, and shift the beam so that it stays focused on the device. You can also roam from one access point to another, and the beam forming will pass from one to the next.

I also found that when the access point isn't beam forming, it appears with a signal level that's little different from any other access point. This means that if you have a very weak signal, you might not be able to start the streaming media if the

device doesn't see a strong enough signal to begin with.

Also, you should note that beam forming takes a second or two to get set up, so that some services that appear to be streaming media may not take advantage of it. One example is Pandora Radio, which the Fluke AirCheck showed isn't really streaming - instead it does a series of very brief downloads from time to time, and never gives a beam a chance to form.

The final testing access points of the Ruckus Wireless system was with two 7962 APs connected to the Ethernet network, and two 7363 APs connected in a mesh network. One of the 7363 APs was then connected to a wired Ethernet device (an APC UPS) that didn't have the means to join a wireless network.

In use, the Ruckus Wireless products were impressive. They delivered solid performance under difficult conditions (including some added interference, a leaky microwave oven, and a series of non-data devices on conflicting frequencies), they identified and worked around neighboring WiFi installations, and provided solid WiFi connections. In addition, the ZoneDirector was easy to manage, it does not create a huge learning curve, and it was extremely flexible. This may be close to the ideal WiFi system for the enterprise. ■

MAC Address	Device Name	Descrip
00:13:92:EA:43:01	RuckusAP	Warehd
00:13:92:EA:43:04	RuckusAP	Warehd
00:13:92:EA:43:07	RuckusAP	Warehd
00:13:92:EA:43:0A	RuckusAP	Warehd
00:13:92:EA:43:0D		AP5
00:13:92:EA:43:10		AP6
00:13:92:EA:43:13		AP7
00:13:92:EA:43:16		AP8
00:13:92:EA:43:19		AP9
00:13:92:00:33:1C		AP0000

Member	Descrip
00:13:92:EA:43:01	Warehd
00:13:92:EA:43:04	Warehd

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