

Smart Mesh Networking

High Performance, Reliable and Easy Wi-Fi Mesh



The First Intelligent Indoor 802.11 Meshing for Building Low Cost, High Performance, and Ultra-Reliable Wireless LANs

Ruckus Wireless Smart Mesh Networking is a unique, new approach to building high-performance wireless LANs (WLANs). It reduces cumbersome RF planning and costly cable backhaul by lowering the need to run Ethernet wiring to individual ZoneFlex Smart Wi-Fi access points.

Smart Mesh dramatically simplifies, speeds and reduces the cost of WLAN deployment. With Smart Mesh, enterprises now simply plug ZoneFlex access points into any convenient power source, and walk away. No extensive RF site surveys, cable runs, configuration, or optimization adjustments are required.

Smart Mesh delivers three key ingredients that have previously hindered the use of indoor meshing:

- 1) high performance**
by combining 802.11n with Smart Wi-Fi technology
- 2) reliable connectivity**
between mesh nodes, using best path selection and interference avoidance techniques
- 3) ultra-simple deployment**
through the automation of AP and mesh provisioning

SmartMesh extends Ruckus-patented Smart Wi-Fi technology to create a new class of reliable and high-performance wireless LANs that are self-organizing, self-optimizing and self-healing. It is the first Wi-Fi meshing approach that combines high-gain smart antenna arrays, sophisticated RF routing and centralized management with a single WLAN system.

BENEFITS

Smart Mesh dramatically lowers deployment costs

Smart Mesh eliminates costly Ethernet cabling to every Wi-Fi access point. Extended signal range from high-gain directional antenna array reduces the number of mesh APs typically required.

No RF experts required

Smart Mesh automatically determines the optimal network topology and maintains the best connections between APs.

Extended range minimizes mesh hops for high performance

A high-gain directional antenna array in every Smart Mesh access point enables signals to reach farther to eliminate needless mesh hops that degrade performance.

Deploys in half the time of conventional 802.11 WLANs

Smart Mesh automates configuration, reducing Ethernet cabling and eliminating extensive RF planning, enabling Smart Mesh WLANs to be deployed and operational in half the time of conventional WLANs.

Integrated interference avoidance ensures high reliability

An intelligent antenna array in each ZoneFlex AP picks the best signal path for traffic at any given time and automatically steers signals around interference to ensure high availability of mesh links.

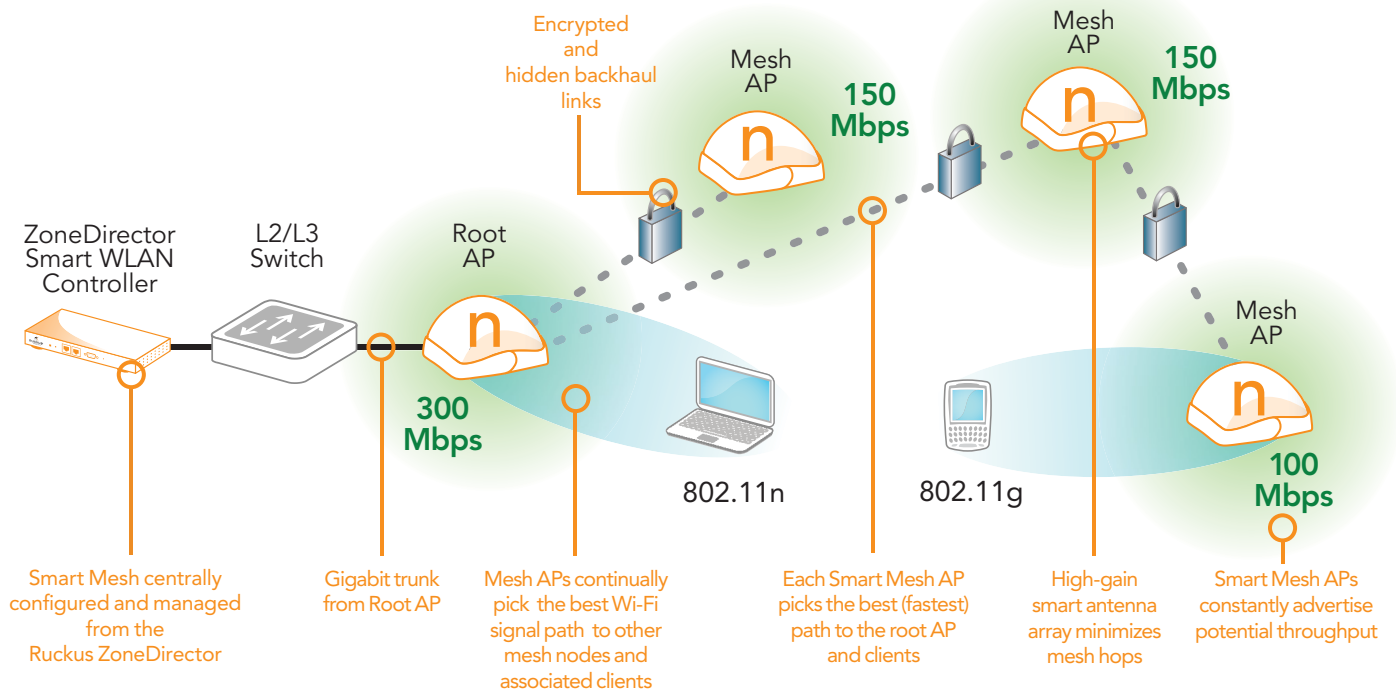
Automated deployment keeps things simple

Configure the entire Smart Mesh in minutes from a central management system. Plug mesh APs into the network and the ZoneDirector automatically provisions all nodes.

Highly secure

All mesh backhaul links between nodes are encrypted and hidden to ensure safe and secure operation.





Smart Wi-Fi Makes all the Difference

Ruckus Smart Wi-Fi technology is used by the Smart Mesh to form, direct and steer Wi-Fi signals over the best performing paths between mesh nodes, as well as to associated clients. This enables the Smart Mesh to adapt in real time to environmental changes, ensuring highly reliable and available wireless trunk links.

Each ZoneFlex AP within the Smart Mesh integrates an intelligent, high-gain antenna array that provides diversity and extended signal range. This ensures high performance by minimizing the number of mesh hops and reducing the number of mesh APs required.

Additionally, this same smart antenna array allows the Smart Mesh to continuously choose from thousands of antenna patterns, to avoid or reject interference, and to maintain high performance connections between mesh nodes.

How Ruckus Smart Mesh Works

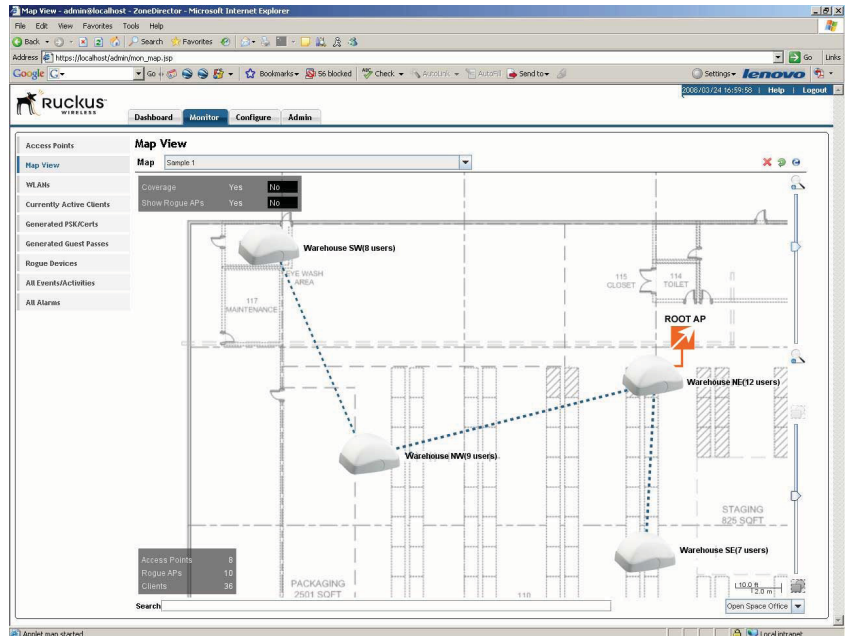
With Smart Mesh, each ZoneFlex AP functions as a wireless node within the mesh. Smart Mesh uses antenna-ranking techniques to determine the best upstream path through the RF to the backhaul AP.

Smart Mesh topology is automatically determined based on the potential throughput of each node. Potential throughput is the actual throughput of its uplink (i.e., how fast the uplink AP can get a packet to the wired network) as well as the potential throughput to the uplink AP. This is based on the actual throughput to the uplink AP, signal strength, and other considerations such as AP load and hop count.

FEATURES

- Built on patented Ruckus BeamFlex directional smart Wi-Fi antenna array technology
- Centrally managed by Ruckus ZoneDirector Smart WLAN controller
- Self-forming network topology
- Automatic access point provisioning
- Secure encrypted backhaul links
- Self-healing around mesh AP failures and environmental problems
- Supported on all Ruckus ZoneFlex 802.11g and 802.11n Smart Wi-Fi access points
- Real-time interference avoidance and automatic interference rejection
- Best path signal selection to clients
- High quality of service and rate limiting throughout the mesh

Ruckus Smart Mesh is managed centrally from the Ruckus ZoneDirector Smart WLAN controller. Powerful mapping and management tools allow a complete view of the entire Smart Mesh, including connections within the mesh, associated mesh clients and other unique controls.



Each AP in the mesh determines the best mesh node with which to associate. Each upstream ZoneFlex AP continually advertises its Smart Mesh characteristics including its own potential throughput and the path through which it is connected to the wired network. This allows other APs to make real-time topology decisions, reacting to any changes in the environment.

In the event of an AP failure or if an upstream path drops below a set performance threshold due to overloading or interference, a new path to the best performing AP is selected. This efficient "tree" topology minimizes convergence risks and latency while maximizing performance.

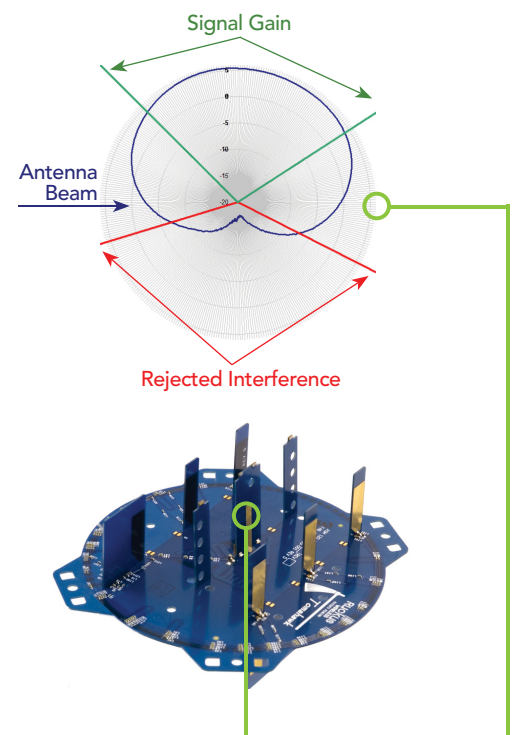
Simple to Deploy

To enable Smart Mesh, administrators simply click a check box within the ZoneFlex Setup Wizard. Once the WLAN is configured, the administrator attaches the Smart Mesh access points to the ZoneDirector for auto-provisioning. After provisioning is complete, the administrator can place the ZoneFlex APs virtually anywhere.

Once plugged into any power source, Ruckus Smart Mesh determines the optimal network topology and each ZoneFlex AP chooses the best mesh path back to a root AP.

Simple to Manage

All management of the Smart Mesh is performed from the ZoneDirector. There, administrators can view a topology map of the mesh, see associated clients and make any desired changes.



Each Smart Mesh AP integrates a patented smart antenna array with six high-gain vertically-polarized, and six horizontally-polarized antenna elements. This enables up to 4096 potential antenna combinations and up to 9 dBi gain and 18 dB interference rejection, thereby delivering unprecedented range extension and signal reliability.

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