

MeshPlanner

Design Outdoor Mesh Networks



MOTOwi⁴

MeshPlanner automates the design of outdoor mesh networks to provide superior coverage, capacity and overall quality of service.

The promise of widespread coverage, mobility and high data throughput makes wireless mesh networks an attractive alternative for those seeking to provide outdoor Internet access. In particular, government organizations that want to implement municipal applications such as meter reading or utility management are finding wireless mesh networks to be a viable, cost effective solution. However, for a wireless mesh network to meet the quality of service expected by its users, the network design must consider and plan for all of the operational and environmental factors which impact the installation and ongoing performance.

Motorola MeshPlanner™ is a software solution that enables network designers to quickly and efficiently create a reliable outdoor wireless mesh network design that delivers superior coverage, capacity and optimum performance. Optimized for planning networks with Motorola's HotZone Duo™ Solution for Municipal Wi-Fi, MeshPlanner is a component of Motorola's MOTOwi4™ portfolio of wireless broadband solutions and services.

Predictive Design and Site Survey

The traditional site survey method for designing mesh networks involves mounting access points (APs) in a small portion of the area to be covered, exhaustively driving through the area collecting signal strength measurements to identify coverage and then repeating the exercise again and again until you have covered the entire region. Given the large geographic area involved with most outdoor wireless mesh networks, the requirement to send teams to the deployment site for an extended period of time to perform multiple drive tests makes this technique quite costly and time consuming. Plus, a site survey only enables planning for wireless signal coverage and interference; it does not consider how the network will be used, how the mesh nodes will communicate with one another and what applications will be operating. In other words, a site survey is not effective in helping design a wireless mesh network that will be used for bandwidth intensive or mission critical applications.

The better design approach is to use predictive design software such as Motorola MeshPlanner combined with a verification site survey using Motorola InFielder®. With MeshPlanner, network designers are able to place mesh networking equipment on a map of the area requiring service. The MeshPlanner software simulates network activity while taking into consideration such environmental factors as terrain, clutter and potential equipment mounting points, allowing users to test the viability of their equipment placement plan and evaluate the communication capabilities among the deployed mesh points.

Enabling Mesh Specific Wireless Network Design

A core component of Motorola's RF Design and Management solutions is the creation of an RF-intelligent map that considers all of the known deployment parameters and their impact on wireless signals.

The impact that buildings, foliage and terrain have on the propagation of the wireless signal must be and are accounted for by MeshPlanner. Understanding where equipment can and cannot be installed is also important, and MeshPlanner enables automatic import and editing of possible mounting locations. Once the RF-intelligent map is completed, the designer can begin placing APs and simulating network performance.

Two other key elements of wireless mesh network planning are ensuring that a sufficient number of APs have physical network connections to form backhaul nodes and that the number of "hops" between any mesh AP and one of the backhaul nodes is optimized to ensure the desired level of coverage and capacity. MeshPlanner allows the designer to specify the parameters for mesh links among the APs plotted on the map. A user can easily move, remove or add APs to ensure that all required mesh links will be successful. The designer then designates which APs will have a physical connection to the network via Ethernet. To complete the design, the user runs various simulations to check coverage areas, redundancy, links between APs and AP connections. If any design factors are not met, MeshPlanner highlights which areas need to be adjusted and corrections can be made. To enable ease of installation, the software offers a full report detailing all network equipment and their locations in latitude/longitude.

During and following implementation of the network, abbreviated site surveys can be conducted to help verify that the mesh network is operating as expected. With MeshPlanner, users also have the flexibility to adapt the network as requirements change. With the RF-intelligent map of the deployment environment in MeshPlanner, expansions to existing coverage, changes to the physical environment or adjustments to user requirements can be easily visualized, tested and deployed.

Using MeshPlanner to design wireless mesh networks reduces labor and planning costs and enables faster implementation of a network that delivers superior resiliency, capacity and superb performance.

Features and Benefits:

- Creates an RF-intelligent map which includes import of: a digital elevation model in GeoTIFF format; deployment environment drawing via satellite image, AutoCAD drawing, scanned image, digital photograph or PDF file; buildings, structures or foliage in shapefile format; and possible equipment mounting locations in a text file
- Enables users to quickly and efficiently model wireless mesh networks in various deployment environments and sizes
- Provides intuitive and precise predictive RF planning capabilities
- Enables planning for sufficient signal coverage and network capacity
- Displays 3D visualization of the deployment environment and simulation of wireless mesh coverage
- Offers flexibility for users to adapt, visualize and test deployment models in real time based on changes in network requirements, expansions to existing coverage, physical environment or user requirements
- Delivers reduced labor and planning costs and fast implementation of wireless mesh networks

The Motorola Advantage

An innovator of indoor and outdoor wireless communications technology, Motorola provides the network performance needed to boost productivity and increase operational efficiency across your business enterprise.



Import terrain, clutter data and hardware mounting points



Place access points and simulate connectivity



Visualize impact on network coverage and capacity



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