



OzSpots wireless hotspot hardware uses the latest generation of wireless mesh networking technology to create ultra low-cost **zero-config, plug & play** wireless mesh network solutions that spread an Internet connection throughout a hotel, apartment, neighborhood, village, coffee shop, shopping mall, campground, marina and just about anywhere else you can imagine.

"It is now easy for anyone to extend their wireless coverage throughout their home, school or share with neighbours in an apartment complex. **It should take you no more than a few minutes to do it, even if you consider the extent of your technical skills to be no more than turning on your computer and checking your email.**"

Using [google maps](#) and basic site plans that you provide we can determine and estimate where each repeater is best placed. to spread the signal evenly through your complex. Once you receive the wireless repeaters you simply plug it in - behind the TV cabinet, in a kitchen cavity, anywhere there is power and hidden from obvious view of the public. Once it is plugged in each repeater will 'check in' to your control server and alert us to signal strength and an overview of the network. We can then finalize locations or move repeaters to create a better quality network.

## Introduction

A typical network consists of 2 or more routers, one connected to your broadband modem, and others plugged into outlets around the area you'd like to cover.

The magic that makes this work is the [Mesh mini routers](#) (about the size of a pack of cards) that can spread a single DSL across multiple rooms.

Users can simply plug one router into their DSL or cable modem (the "internet") and put additional units ("repeaters") around the site BETWEEN the one plugged into the internet and where you want better coverage. By placing the repeaters half way between you and the internet, you'll make sure the repeater can see both your computer and the Mesh node plugged into the internet, which is important for it to work reliably.

If you are planning to deploy more than 3 nodes in your home, apartment, or hotel, we recommend you read the rest of this guide to so that your installation goes as smoothly as possible.

## Some basic terminology:

<b>Network:</b>	A group of computers that can talk to each other – in our case, wirelessly.
<b>Gateway:</b>	The Mesh router that is connected to the internet
<b>Repeater:</b>	An Mesh router that is <b>not connected</b> to the DSL and “repeats” the signals from local computers and other nodes to the gateway.
<b>Node:</b>	A generic name for an Mesh router which can be either a Gateway or a Repeater.

## Basic Planning:

### Selecting an internet provider

The first step is to figure out where you will get your internet connection. Usually this will be a DSL, cable or fiber-optic connection. Visit our [FAQ](#) for further details on Australian ISP's we prefer.

### Picking a location for the DSL

If you only have a single internet connection feeding your mesh network, it is desirable to have the Gateway be as central to the area you want to cover as possible. The reason for this is that for each Repeater you pass through to get to the Gateway the maximum speed is cut roughly in half. So if most of your Repeaters have a direct (or single "hop") connection to the Gateway, speed is maximized. The easiest way to accomplish this is to put your DSL connection as close to the middle of the area you want to cover (an apartment complex, for example) as possible.

Another way is to have multiple DSL's.

### How many Mesh routers do I need?

If you are using the routers in apartments or hotels, we recommend that you have one for every 4-6 units that you want to cover, on average. This will vary depending upon the type of construction used for the apartments. If concrete/brick/stone or other “dense” materials, you may need one for every 3 or 4 units. For wood frame construction, 5-6 seems about right.

If you are using the routers in a residential neighborhood, we recommend that each house have at least one node as houses are typically larger than apartments and yards separate the nodes much more than in apartments. And if the houses are especially large, you can even add multiple nodes to the house to provide excellent coverage in every room.

Also check our [network maps](#) for a comparison of other sites.

## Indoor vs Outdoor installation?

Indoor vs outdoor nodes? Some things to keep in mind:

- Outdoor nodes are a little more expensive to install
- Often require specific installation knowledge to install power (**we have great POE solutions**)
- Often involve getting up on ladders or rooftops
- Long Ethernet cables need to be installed and secured
- Lightning protection needed in some cases
- Strongest signals are outdoors - weakest are indoors, the opposite of what you want

So why are outdoor nodes used? Historically they were used as mesh repeaters were expensive so you wanted to install as few as possible. This meant big antennas to both broadcast and be able to pickup tiny incoming wireless signals. Other cases are where you want to create point-to-point connections over large distances.

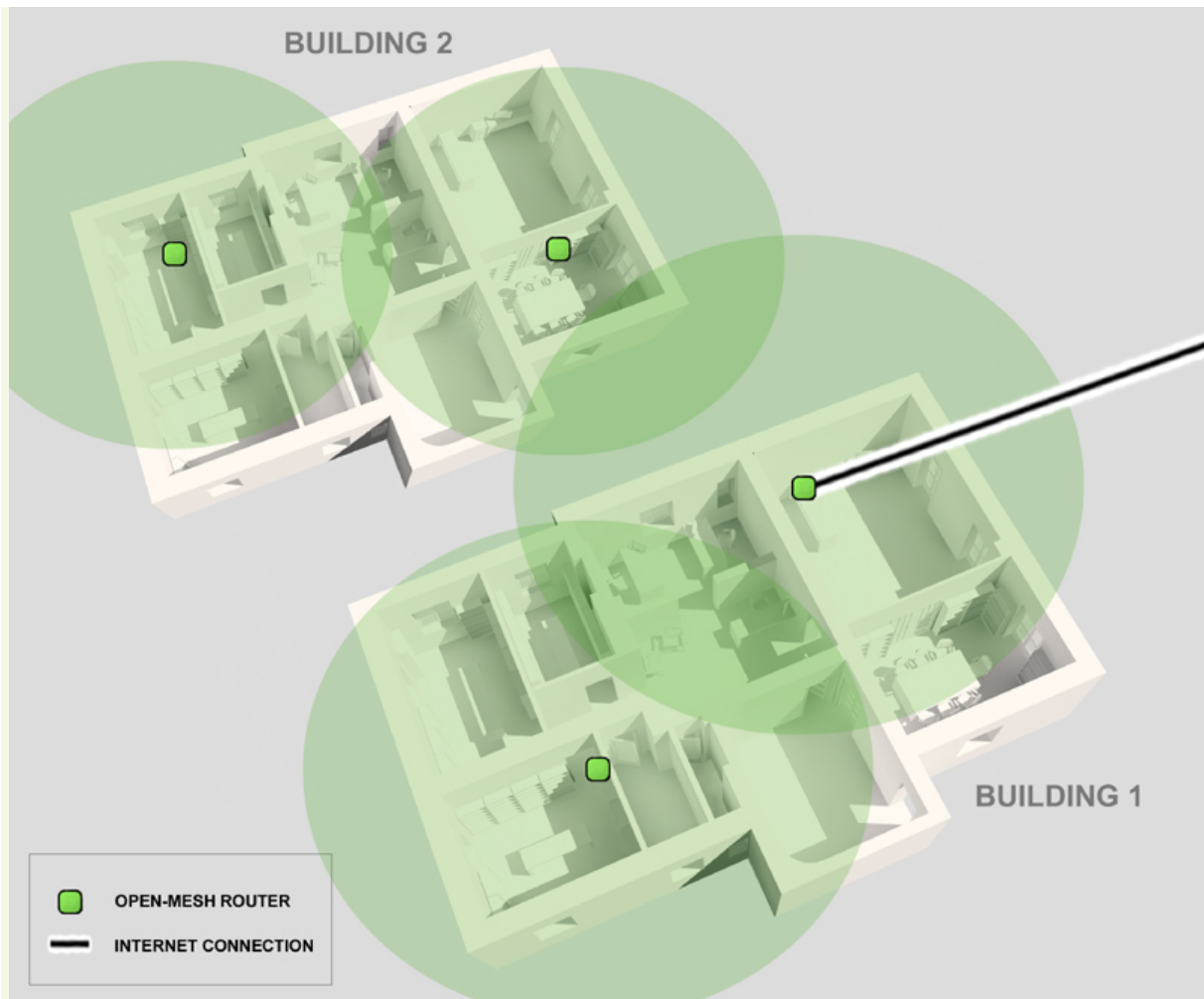
With the advent of very low cost mesh technology, this often isn't necessary any more. Let's face it - you typically don't care about outdoor wireless. You want it indoors. So we suggest turning the historical installation approach "inside out" and instead use a greater number of very low cost devices indoors (where the people and computers are) and **save money on installation** (which goes to nearly zero \$). By deploying densely indoors (eg, one indoor device for 4-6 apartments), your total cost is lower and you will have better indoor performance.

We usually don't do outdoor installations or limit the number of outdoor nodes to provide only "back-haul" connection over longer distances. In many situations they aren't needed and the \$ they consume is often better spent in more densely deploying indoor nodes. Before installing an outdoor node, **please** ask yourself if this is needed. You'll often save yourself time, money and grief by deploying indoor, where possible.

## Installation

### Where to put them?

OK, so you have your DSL and your Mesh routers. Now you just need to plug them in. It's easy! For this example, let's take two buildings and see how we might provide nearly complete coverage. We'll use 4 nodes (one Gateway and 3 Repeaters). Remember that a Gateway node is simply the one that is plugged into our DSL, and is shown with the line coming in.



In the above diagram, the green circles show the approximate coverage range of each node. As you can see, by using 4 nodes, we are able to almost completely cover both buildings.

Here are some important installation suggestions:

- First, remember that it will really help if the DSL can be central to the area being covered. If you put it on the edge, you'll likely find that users far away from the DSL will have slower speed than the users close in.
- Each node can cover an area that is roughly a 50-150 foot "sphere" indoors, depending upon the number of walls and their construction. You will want to have the edges of these spheres overlap so that each node can talk to at least one (and preferably two) other nodes, with good signal quality.
- For multi-story buildings, you'll want to think vertically as well. If you have 2-3 floors to cover, placing the nodes on the second floor is a good idea. This keeps them centered between the floors where they can provide coverage above and below. If you have more than 3 floors, then repeating the installation on every other floor will usually do the trick.
- If the building has brick, cement or stone on the outside walls (or lots of fireplaces indoors), your range will be significantly reduced. In this case, you may want to keep everything (all Repeaters and Gateways) indoors to avoid having to penetrate the stone walls.

- If you are installing in an apartment complex with internal hallways, we **HIGHLY** recommend putting the routers there. There are a few reasons for this: First, as this is common space, you'll have access to it without disturbing residents. Secondly, placing the routers down a long corridor means they can all see each other without having to go through walls. This maximizes the signal between the routers and minimizes potential "hops" that will slow down the network.

## Getting Ready

Before you install the routers in individual apartments or hallways, it is a good idea to write down where you are putting each one. This is so that later if you get notification of an outage, you'll be able to know where that particular router is!

We like to plan before we install and write (using a pen that can write on plastic) the location on each router before we go out to the installation site. This makes sure we get the right one in the right place.

## Pre-Test

The OM1P Mini repeaters have a built-in test: The WLAN light will start blinking about 5-6 minutes after you plug on each node if it can find a gateway. If after 6 minutes, you don't see the WLAN light, you'll know you are too far from a gateway or other repeater, and you should move this repeater to a closer location.

## Testing your network

The easiest way to test your network is to take a laptop into each apartment and see how well it works to browse the internet.

Now you are ready to test!

It is important that as you wander around, you turn off, then on the wireless adapter on the laptop (some laptops have a switch for this so they can be used on airplanes where wireless isn't allowed). As you enter a new apartment or room that you want to test, turn the wireless switch to the "off" position, wait a second or two, then turn it on again. It will usually take a few moments to find the network again and once it says "connected" in the taskbar (if you are using a Windows Laptop), then you are ready to test.

Why do you have to do this? Wireless adapters in computers like to stay "locked" onto the wireless access point (in our case, one of the mesh routers) unless the signal gets really bad. Since you are wandering around and mesh networks have many such access points, if you don't switch off then on your wireless adapter, you'll get false results as it may be trying to talk to a router that is now farther away than another which would have a better signal. Users typically don't wander like this, so by turning off then on your wireless you'll see what a stationary user would see.

At each location, it's a good idea to refresh a page with lots of graphics a few times. You can use <http://www.yahoo.com> as it typically has several images. You should see each page load quickly with no missing images if it is working well. Or, you can run a speed test like you would find at [www.dslreports.com/speedtest](http://www.dslreports.com/speedtest)

If you have some areas that don't work or don't work well, you can add a Repeater and retest.

Or, if you'd like to make certain your network is working well without having to manually test each location, you can use our Mesh Dashboard to gain a clear understanding of how it is working. This is the best way to make sure everything is working well.

Good Luck!



Hotspot Branding