

AT&T MetroCell 9962 Technical Requirements



For the Alcatel-Lucent 9962 Multi-standard Enterprise Cell v1



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Purpose of this document

In order to ensure successful operation of an AT&T MetroCell, there are a number of technical requirements which must be met. It is the customer's responsibility to understand these requirements and ensure that they can be met.

These requirements are described in this document.

Local transport requirements

Confirm the following router/switch settings prior to activating your AT&T MetroCell:

- 1. DHCP is ON**
[Note: For installations where static assignment of an IP address is desired the use of MAC Binding and static DHCP Reservation is suggested. Static IP is not supported]
- 2. MTU size is set to 1492 or higher**
- 3. MAC address filtering** is either **turned off** or allows the MAC address of the MetroCell
- 4. IPSec Pass-Through is Enabled**
- 5. Block Fragmented Packets is Disabled**

If using multiple routers, the MetroCell must be connected to the first router connected to the broadband modem.

If the MetroCell is connected to a router that is connected to a modem and both the router and the modem have NAT (Network Address Translation) enabled, disable NAT either in the router or in the modem.

Because of the wide variety of network configurations, AT&T recommends consultation with a network specialist, router manufacturer, and/or Internet Service Provider to answer specific network setup questions.

TCP/UDP Ports

All ports listed need to be Open for inbound and outbound connections:

- **UDP Ports 123, 500, 4500, 33434, 33435, 33436**
- **TCP Ports 443, 7004, 7014**

IP Address Pass-Through

If the local network has a firewall with specific IP addresses allowed to pass through, traffic to and from the following addresses must be allowed to pass:

Fully Qualified Domain Name (FQDN)	IP address	Port
fileserver.metro.wireless.att.com	166.147.105.25	tcp 443
hnm.metro.wireless.att.com	166.147.105.25	tcp 443, tcp 7014
N/A	166.147.105.25	tcp 443, tcp 7004
N/A	12.230.208.133	udp 123
N/A	12.230.209.5	
N/A	12.230.208.48	
N/A	12.230.209.133	
bootstrap-ipsecrouter1.metro.wireless.att.com	12.230.211.36	udp 500, 4500, 33434 thru 33450
initial-ipsecrouter.metro.wireless.att.com	12.230.211.12	udp 500, 4500
alumsmci-crtn-3gb.metro.wireless.att.com	12.230.209.17	udp 500, 4500, 33434, 33435, 33436
alumsmci-crtn-4gb.metro.wireless.att.com	12.230.211.44	
alumsmci-crtn-oam.metro.wireless.att.com	12.230.211.4	
alumsmci-hzwd-3gb.metro.wireless.att.com	12.230.209.81	
alumsmci-hzwd-4gb.metro.wireless.att.com	12.230.211.76	
alumsmci-hzwd-oam.metro.wireless.att.com	12.230.211.68	
alumsmci-clmb-3gb.metro.wireless.att.com	12.230.208.209	
alumsmci-clmb-4gb.metro.wireless.att.com	12.230.210.204	
alumsmci-clmb-oam.metro.wireless.att.com	12.230.210.196	
alumsmci-rcpk-3gb.metro.wireless.att.com	12.230.208.145	
alumsmci-rcpk-4gb.metro.wireless.att.com	12.230.210.140	
alumsmci-rcpk-oam.metro.wireless.att.com	12.230.210.132	
alumsmci-dctr-3gb.metro.wireless.att.com	12.230.208.25	
alumsmci-dctr-4gb.metro.wireless.att.com	12.230.210.36	
alumsmci-dctr-oam.metro.wireless.att.com	12.230.210.4	
alumsmci-lkmr-3gb.metro.wireless.att.com	12.230.208.81	
alumsmci-lkmr-4gb.metro.wireless.att.com	12.230.210.100	
alumsmci-lkmr-oam.metro.wireless.att.com	12.230.210.68	
alumsmci-snap-3gb.metro.wireless.att.com	12.230.209.225	
alumsmci-snap-4gb.metro.wireless.att.com	12.230.211.204	
alumsmci-snap-oam.metro.wireless.att.com	12.230.211.196	
alumsmci-sntd-3gb.metro.wireless.att.com	12.230.209.161	
alumsmci-sntd-4gb.metro.wireless.att.com	12.230.211.140	
alumsmci-sntd-oam.metro.wireless.att.com	12.230.211.132	

In the event that a MetroCell does not successfully activate, it may be useful to perform a packet trace of the messaging between the MetroCell and the AT&T network to aid in troubleshooting.

Internet access

Customer is responsible for providing connectivity to the Internet.

The required bandwidth will depend on the number of simultaneous users you want to be able to support and whether data-intensive applications are being used.

The maximum total traffic that can be carried by a MetroCell 9962 across all simultaneous users, based on its radio interface, is up to 100 Mbps. Lesser Internet access bandwidth may limit overall throughput

The following table shows the minimum bandwidth required for the MetroCell 9962 to operate properly, depending on whether there is 1, 2, or 3 MetroCells sharing the same access circuit:

Number of MetroCells Supported	Minimum Downlink Bandwidth	Minimum Uplink Bandwidth
1	25 Mbps	5 Mbps
2	30 Mbps	7 Mbps
3	35 Mbps	9 Mbps

Placement of the MetroCell

At its heart, the MetroCell is a cellular radio transmitter and receiver. Its performance is affected by physical obstructions, by other devices which emit radio signals, and by potential interference between the MetroCell signals and those of the public or “macro” cellular network.

The following guidelines will help ensure strong and clear performance in your environment:

- The MetroCell should be installed in a central location, relative to the desired coverage area.
 - The MetroCell should be installed on an interior wall or column, near the ceiling.
 - Placement must be within 100 feet of an exterior window, glass wall or door (to receive GPS signals), and preferably at least 15 feet from such a window to reduce interference from external cellular signals. Note that “Low-E” glass windows may interfere with the reception of GPS signals and should be avoided.
 - In order to avoid interference with the radio signal, the MetroCell should be placed at least 2 feet away from metal obstructions, microwave ovens, cordless phones, fans, motors, heating and air-conditioning ducts, large roof or ceiling trusses, and major power cables and fluorescent lighting.
 - In order to avoid excessive exposure to radio frequency emissions, the MetroCell must be installed at least 1 foot away from any work station or site where people may gather. The MetroCell should not be mounted where any person will spend more than a minute within a 12-inch radius of the device when it is active.
- Walls between the MetroCell and users will reduce signal strength. Solid metal or metal mesh can block a radio signal entirely. Signals can typically penetrate one or two solid concrete walls, three or four cinder block walls, five or six drywall or wood walls.
 - Installation of more than one small cell (MetroCell, MicroCell, or repeater) in a single location can result in interference between the radios. In such a case, the devices must be placed sufficiently far apart to minimize interference, possibly 50 to 100 feet. The distance varies based on the existence of intervening walls, building construction, and other factors. See the section on Multiple MetroCells in this document.
 - The MetroCell kit includes 150 ft. of shielded Cat5e Ethernet cable. AT&T Metrocell may not be used as an RF source for a Distributed Antenna System. Select a location for the MetroCell that is within 150 ft. of the router or switch port to which it will be connected. If necessary, the MetroCell can be as far away from the router or switch as 300 ft. If a cable longer than 150 ft. is required, either the customer or the party performing the installation must provide this cable, which must be shielded Cat5e with metallic “boots”.
 - The area to be served by the MetroCell should have no more than 2 “bars” of signal strength from the macro network. If it has more than 2 bars, there is a strong possibility that performance will be degraded with the MetroCell installed due to signal interference.

Multiple MetroCells

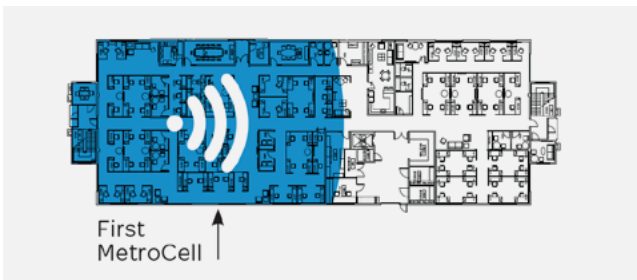
A single MetroCell can cover up to 15,000 square feet, depending on the building layout and construction material. If the area to be served is larger than this, a 2nd or 3rd MetroCell may be required. However, be aware of the following considerations:

- If the MetroCells are too close to each other (or to a MicroCell, repeater, or Distributed Antenna System (DAS)), their signals may interfere with each other, resulting in poor performance.
- If the MetroCells are too far away from each other, a call in progress may drop where there is no signal coverage.

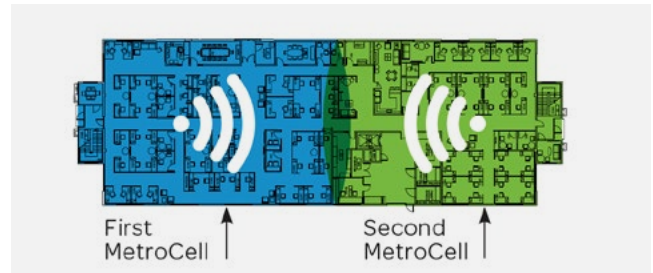
If optimal performance is desired, a custom Radio Frequency (RF) design is required, performed by a qualified RF engineer using sophisticated equipment, followed by optimization of the antennas, power, and other settings. This level of customization is NOT included in the standard installation option offered by AT&T.

In the absence of such a custom design, the following guidelines are provided.

1. Install the first MetroCell and activate it. If possible, allow some flexibility to be able to move it to adjust the coverage area in step 5.



2. Map out the effective coverage area of the first MetroCell by walking around while looking at the number of “bars” of signal strength on a handset. Identify the edge of the area covered by the 1st MetroCell where signal strength is between 1 and 2 bars. This is as far away from the first MetroCell as a user could be and still be properly served by that MetroCell.



3. Find a site for the 2nd MetroCell that is as far away from the edge of the coverage area identified in step 2 as that edge is away from the first MetroCell. Map the coverage area as in step 2.
4. Install and activate the 2nd MetroCell. If possible, allow some flexibility to move it to adjust the coverage area in the next step.
5. Place test calls from points throughout the combined coverage area, especially in the overlap area, where interference between the two may adversely affect call quality. Test for the ability to place calls, the ability to maintain calls without dropping, and voice quality. Adjust the locations of the MetroCells if necessary to achieve the best performance.

Environmental Requirements

The following are the environmental requirements for the MetroCell device:

Parameter	Value
Temperature range	0°C to +50°C [32°F to 122°F]
Relative humidity	Up to 93%