



**Canopy™ Wireless Internet Platform
Frequently Asked Questions**

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Technology

Q: *What is a Canopy™ system?*

A: A Canopy™ system is based on wireless broadband technology that provides for high-speed Internet access. The Canopy system was designed to provide cost-effective, “last mile” high-speed data access for residential and business customers who previously were underserved or lived in locations where infrastructure is non-existent. Canopy system is comprised of three major components: Access Point (AP), Subscriber Module (SM) and the Backhaul Unit). A Canopy system utilizes the unlicensed UNII bands (5.25 – 5.35GHz or 5.725 – 5.825GHz).

Q: *How does Canopy technology differ from other broadband services?*

A: Today, virtually every broadband service employs different technologies, e.g., phone lines, coaxial cable, large-cell wireless, satellite. The Canopy system is different from all of these solutions in that it offers affordable, high-speed Internet access to the end-user using wireless communications in the 5GHz unlicensed U-NII band. Compared to other wireless delivery technologies (namely MMDS), the Canopy technology uses a smaller community of cells and involves significantly less network investment.

Q: *Other wireless technologies such as cell phones sometimes experience inconsistent service e.g., dropped calls. How reliable is the Canopy technology? What kinds of tests/trials has Motorola conducted to ensure reliability?*

A: As opposed to the wireless technologies that support the mobility of a cell phone, the Canopy technology is a fixed wireless system that supports ranges of approximately two miles or less. The technology provides a similar user experience to other fixed wireless devices (the user’s radio experience with reception consistency of a home stereo receiver tuned to a local community radio station or home TV tuned to a local community TV station). The Canopy technology has been rigorously tested for over two years and is currently in customer service with over 40 wireless Internet service providers (and growing) around the country.

Q: *One of the biggest issues surrounding the Internet is security. The term “wireless” immediately raises questions on the security of the system. Most consumers have experienced the unintentional interception of portable phone signals and cellular phone signals and equate this to wireless. Explain, in layman’s terms, how Canopy’s wireless technology addresses these problems.*

A: First, unlike analog telephone transmissions, digital transmissions of Internet traffic are much more difficult to intercept because of the complex cryptology associated with the technology. Second, like other Internet applications such as secure email or web browsing, users can employ many security applications which prevent eavesdropping on transmissions - whether such security applications are installed on the last-mile link to the user’s house or elsewhere in the Internet. Third, a Canopy system provides an over-the-air encryption, which cryptographically scrambles the data bits, preventing anyone “listening” to the airwaves from deciphering any messages. In fact, the Canopy system’s over-the-air link may be the most secure leg of the typical user’s Internet connection.

Q: *What are the transmission speeds for Canopy systems?*

A: The raw data rate for the Canopy radios is 10 Mbps. The effective total (sum of both directions) throughput of the Canopy system, Point-to-Point Backhaul Unit (BU) is 7.5 Mbps. As shipped, this is divided equally; 3.75 Mbps in each direction; this ratio may be set from the configuration page.

Multi-point systems provide a total of 6.2 Mbps at each Access Point (AP) unit. As shipped from the factory this is divided as 4.7 Mbps on the downlink and 1.5 Mbps on the uplink; this ratio is also adjustable from the configuration page, although we recommend that all AP units at a single location be set to the same ratio.

Q: *What frequency spectrum does a Canopy system operate in?*

A: The Canopy system operates in the 5GHz-unlicensed National Information Infrastructure band, commonly called the U-NII band.

Q: *What is the maximum number of users that a six-sector system can serve?*

A: A basic six-sector Canopy system can serve approximately 1,200 users. Each Access Point (AP) is capable of supporting 200 users. A six-sector system contains six APs.

Q: *Is it possible to link together multiple systems to form a network?*

A: Yes, multiple Canopy Access Point Clusters can be combined to create a network.

Q: *Is there a limit to the number of systems that can be linked together to form a network?*

A: No, there is virtually no limit in adding capacity or coverage to the Canopy network. One of the unique characteristics of a Canopy system is the fact that it does not cause interference with any other components in the system, which is key to supporting this type of expansion.

Q: *Does a Canopy system require any system engineering or frequency planning?*

A: Simple Canopy systems that provide islands of unconnected coverage do not require significant frequency planning. Once these systems become more complex and provide contiguous coverage with greater capacity, frequency planning and RF propagation analysis are required to ensure high quality systems. Many service providers, value added resellers and distributors are capable of performing this analysis based on Motorola's prescribed deployment practices.

Q: *Is a Canopy system compatible with existing service provider systems including cable or telephony networks?*

A: Yes, the primary interface between the Canopy system and a Service provider's network is through the Canopy Backhaul Unit (BU). The BU has been designed utilizing standard interfaces for connectivity to any IP network that the service provider might have already.

Q: *Does the Canopy Subscriber Module or (Customer Premise Equipment) require any special installation knowledge/expertise?*

A: No, one of the key attributes of Canopy is the ease of installation of the Subscriber Module (SM). The SM is automatically synchronized with the system once the unit is initialized. The SM can be installed either indoors or outdoors and has an indicator light to guide the optimum location for final installation. In fact, consumers can actually self-install the Canopy product.

Q: *What are the typical configurations, deployments?*

A: The Canopy system has been developed to support the needs of residential and small/medium business. It is typically deployed in a Point to Multipoint configuration that allows a six-sector cell site to provide 360-degree coverage for multiple users within a two-mile radius. Please refer to the Motorola Canopy Installation and Canopy Configuration Guide for additional information. Canopy also is used in a point-to-point configuration to backhaul IP traffic.

Q: *Since the Canopy product is based on line-of-sight technology, have you encountered significant interference issues?*

A: Since Canopy systems were always intended to operate in an unlicensed band, they were designed from the start to work in interference-riddled environments. In fact, one of the unique characteristics of Canopy systems is their ability to tolerate interference from other sources. The Canopy technology, unlike many of its competitors, does not cause interference upon other components in a Canopy system because of its low carrier to interference ratio of two to three decibels. For example, in order for a signal to interfere with a Canopy signal, it must be at least 50 percent of the strength of the intended Canopy signal to interfere with the throughput of the Canopy system. Some competing wireless technology signals need to be 16 times stronger than the external interference to operate well.

Q: *How many new software releases will Canopy services offer each year?*

A: The Canopy system has significant software content. Motorola will continue to add new features to serve our customers needs as well as those of the existing market. There will be approximately two new software releases each calendar year.

General Information (Business/Market)

Q: *Is the Canopy systems available today?*

A: Canopy is commercially available from Motorola today. There are currently commercial installations throughout the United States. Prior to commercialization, the product underwent rigorous testing and validation.

Q: *What are the major benefits of Canopy technology for service providers?*

A: The Canopy system lowers the barriers to entry for providing broadband Internet service.

Canopy:

- Is a low-cost data infrastructure solution.
- Delivers high speed data
- Operates in the unlicensed frequency band thereby requiring no costly radio spectrum licenses.
- Employs more local, community sized cells.
- Enables simple and fast deployment & easy installation
- Requires no integration with other systems.

Q: *What are the major benefits of a Canopy system for consumers?*

A: While a Canopy system offers a wide range of benefits to consumers:

- The Canopy system is a more resistant and resilient than other wireless technologies used in similar applications.
- Low start-up costs, faster deployment and easier installation than other technologies for the new ISP to deploy.
- A Canopy system can provide high-speed service to any customer within range.
- Because of the shorter range than other wireless alternatives, the Canopy system employs a smaller customer unit, which is lower cost and easier to install.
- Works in all environments. The Canopy system has been tested in multiple environments, including extreme heat and cold and in high winds.

Q: *Why would Internet Service Providers want to purchase a Canopy system and how will they benefit from the system?*

A: A Canopy system will enable new entrants to the ISP market to offer a more economical, commercially viable wireless broadband offering where service is currently unavailable. The system's competitive pricing structure dramatically lowers the barriers to entry that new ISPs might sometimes face. The Canopy system also permits more rapid deployment of broadband service due to its simple to deploy network design.

Q: *Will Motorola assist its customers in the development of value added software features?*

A: Yes, Motorola has a well-established and experienced professional services organization that is uniquely qualified to develop specialized software applications for the Canopy product at a rapid pace. Along with Motorola, value added resellers and distributors are capable of developing customized applications for Canopy systems to serve a wide variety of needs. Having a software product family increases the value of your purchase and protects your initial investment.

Q: *Due to shrinking demand, major phone carriers are re-evaluating their aggressive broadband strategies. Would this seriously hinder the attractiveness of the Canopy system to these carriers, and possibly create another supply and demand dilemma for the industry?*

A: The Canopy wireless Internet platform is not a 3G cellular broadband architecture. It requires no costly spectrum. In fact, the barriers to entry become low enough that Canopy ISPs do not need to be a major phone carrier today. In terms of demand, the Canopy system hits the sweet spot (high-speed affordable Internet) that virtually all Internet subscribers would want - were it only available and affordable. It is also worth noting that the Canopy solution is focused on fixed, not mobile solutions.

Q: *What is the pricing strategy for Motorola's Canopy system?*

A: A detailed pricing strategy is in place to support the sale of Canopy systems. The plan takes into account the distribution channels and the ultimate markets that the product will be sold. Please refer to the Motorola Canopy Pricing Guide for more information.

Q: *What is the distribution strategy for the product?*

A: The Canopy wireless broadband solution will be sold through multiple channels. Existing Motorola customers will be served through our existing Motorola sales channels. Since the Fixed Wireless Access target market is very fragmented, most of the Canopy systems will be sold through Distributors and through Value Added Resellers (VARs).

Q: *Is there a certification process required for distributors and VARs?*

A: Yes, as part of the formalization process of contracting with Canopy Distributors and VARs, there will be specific requirements identified to ensure each Distributor and VAR is fully capable of successfully selling, installing, operating and servicing the Canopy system.

Q: *Is there any type of formal training available?*

A: Yes, Motorola has developed a comprehensive training program that addresses both pre-and post- sales training requirements. The Pre-Sales Training focuses on assisting sales representatives in understanding the product portfolio, the benefits of the product, configuring and pricing the product as well as number of other areas. The Post-Sales Training program focuses on enabling customer care agents, operations and maintenance personnel to have all of the tools necessary to perform their functions. Finally, Motorola is creating a comprehensive on-line interactive training program.

Q: *What are the key targets, markets that the Canopy wireless broadband platform satisfies?*

A: The Canopy system was designed to provide the “last mile” of high-speed data connectivity for residential and small/medium business. It is ideally suited for ISPs, Competitive Local Exchange Carriers, and any service provider who desires to provide high-speed data service to underserved or new market locations where existing infrastructure is not available. The wireless connectivity aspects of the Canopy systems are also appealing to rural and difficult terrain locations that make DSL or cable implementations cost prohibitive. The Canopy system also meets the needs of many private systems owned by enterprises and service providers.

Q: *What type of warranties are available?*

A: The Canopy system comes with a three-month software and hardware warranty against all defects.

Q: *Who will be manufacturing the CANOPY technologies? Will Motorola outsource the production?*

A: Canopy manufacturing production is outsourced, as are many wireless products today. Canopy technology is a core Motorola Labs innovation and all Canopy products are produced to meet Motorola's six-sigma quality standard.

Q: *Will the Canopy wireless Internet platform be available in the U.S. only?*

A: The Canopy system is designed for the U-NII band that is available in many countries outside the US (Canada, Mexico and many others).

Q: *What type of customer support is available for Canopy?*

A: Motorola's customer care support program has been designed to minimize the impact of potential service issues that may arise during the life of the Canopy system. The customer care program is segmented into three distinct tiers of support to ensure prompt response to technical issues encountered by subscribers. This tiered strategy of support is in place to support problems that may arise during the normal operation of the system

Q: *What if a Canopy unit is damaged during shipment, what is Motorola's repair and return policy?*

A: Motorola stands behind the quality of its products. If a product is damaged during shipping, a customer needs merely to pack the product carefully and return it to Motorola. Upon receipt, Motorola will evaluate the product and promptly either repair or return the product to the customer.

Competition

Q: *Competitive technology is already available, so what makes the Canopy solution faster and more affordable than other technologies?*

A: The Canopy system was designed from the ground up, to provide the “last mile” of high-speed data connectivity for residential and small/medium business. It is ideally suited for ISPs, Competitive Local Exchange Carriers, and any service provider who desires to provide high-speed data service to underserved or new market locations where existing infrastructure is not available. The Canopy system has an impressive C/I (Carrier to Interference) ratio on the order of 2-3 db, significantly better than that of other wireless products available today. Having a low C/I ratio equates to reduced numbers of trouble tickets, fewer calls for support, and reduced truck rolls.

Cost/Consumer

Q: *Is there any special training required for the end-user?*

A: No, the Canopy solution is very simple for the end-user to operate and requires no specialized training.

Q: Can consumers actually install the Canopy products themselves or are professional installers required for home installation?

A: One of the unique benefits the Canopy solution offers is that consumers can actually install the products at home themselves without requiring the services of specially trained installation workers. Consumers can actually control the time for installation and are not required to wait around at home for installers to schedule a home visit.

Q: *Research indicates consumers are not running out to buy broadband products and services. What makes Motorola think the Canopy technology will be any different?*

A: A Canopy system will enable new entrants to the ISP market to offer a more economical, commercially viable wireless broadband offering where service is currently unavailable.. The system's competitive pricing structure dramatically lowers the barriers to entry that new ISPs might sometimes face. . The Canopy system will also be deployed in areas where this is no broadband option other than T1 or Frame Relay solutions.

Q: *How will Motorola market the Canopy solution to consumers?*

A: The Point-to-Multi-Point Canopy technology solution will be marketed to ISPs, who in-turn will provide Canopy systems to consumers. The Point-to-Point Canopy system will be marketed to ISPs, business, & small business markets as a dedicated data link.

Q: *What is the intended target market for this product? End Users?*

A: The intended target for Canopy technology is both residential consumer Internet service and businesses with unique needs.

Q: *Is Canopy designed for rural or urban subscribers?*

A: The Canopy system is designed to provide service for both metropolitan and rural subscribers. Rural ISPs will find the system's low network cost does not require high user-densities to create a profitable business. Urban ISPs will find Canopy attractive from a speed of deployment perspective at an attractive price.

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