


Technology

Using the Network Infrastructure Within

Multimedia over Coax (MoCA) technology enables over 175 Mbps of application bandwidth for room-to-room networking without having to install any new cables.

Do you know how flexible the technology has become?



Telco managers know that using existing coaxial cables in residential and commercial properties can provide a cost-effective and highly reliable infrastructure. This infrastructure can be used for distributing broadband services within the structure. By leveraging the same coax cable that is used for CATV service, real-estate developers can save on the expense, time and maintenance that is associated with installing cat-5 Ethernet cabling. Best of all, Multimedia over Coax Alliance, MoCA® home networks can coexist with traditional TV and data services so property owners do not have to sacrifice any other services to support room-to-room networking.

Given the rapid adoption of network capabilities on entertainment devices, real estate developers and property owners should anticipate that transferring entertainment content around the home will quickly become the predominant use of a home network. The good news is, by using MoCA, the same coax cables that are used to distribute CATV signals around the home can be used to form a high bandwidth, highly reliable home entertainment network. This eliminates the added expense and time of having to install Ethernet cables and network switches throughout the home.

By Jon Iwanaga, Entropic Communications

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The desire to stream or access entertainment media is indeed driving the needs for a second generation, “home entertainment” network. Such a network must provide greater bandwidth to handle the requirements of high-definition video with great quality-of-service assurances so that pristine high-definition programs can be streamed around the home fast enough to avoid glitches or annoying visual artifacts.

Also, network connectors can now be found on audio/video entertainment devices as well as computers. The back of the entertainment rack can look like a network IT rack, except that Ethernet connections are not yet typically found next to the television or A/V rack. But coax connections usually are.

Consider that all these devices, whose primary purpose is providing entertainment to consumers, now provide data connectivity:

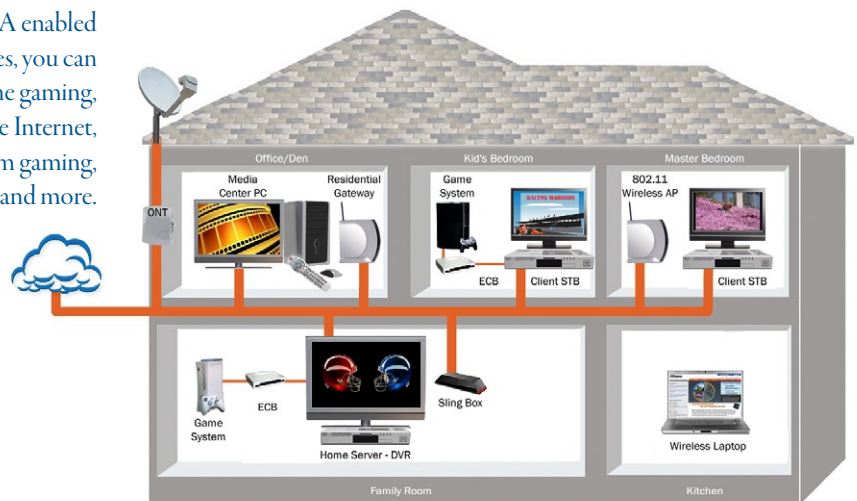
- Cable, satellite and IP set-top boxes
- Digital video recorders
- Video place-shifters like SlingBox
- Game consoles
- Blu-ray disc players
- Televisions

The list of possible entertainment equipment types outnumbers the list of different devices that connect to data-centric networks, which typically consist of PCs, storage devices, printers, modems and routers.

In addition to being able to connect computers in different rooms together for Internet access and file sharing, a MoCA enabled home network has the bandwidth capacity and reliability to stream music and high-definition video between rooms. Using MoCA, a game console like an Xbox360 or PS3 can reliably stream TV shows recorded on a PC in the office for viewing on the living room TV.

Homeowners or tenants with multiple HD digital video recorders can use a MoCA network to access a program recorded on a DVR in one room and watch it in another, eliminating family arguments about who get's to watch what on the big screen TV. AppleTV and other media boxes can use MoCA to get a reliable and fast connection to the Internet to download purchased movies or to access home pictures, music and movies already on their computers in another room.

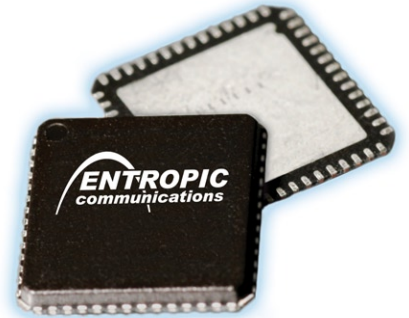
MoCA can turn the coaxial cable already installed in your house into a robust, high speed whole home entertainment network. With MoCA enabled devices and Ethernet-to-Coax (ECB) bridges, you can experience multi-room DVR, superior on-line gaming, seamless delivery of video content from the Internet, easy PC to TV content sharing, multi-room gaming, wifi extension, place shifting and more.



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Fast data transfer over MoCA also gives game enthusiasts swift response times during on-line game play. Slow connections end up handicapping a player's ability to compete effectively and ultimately spoil the experience. Blu-ray disc players rely on a fast home network to enable interactive disc features and provide the ability to upgrade the player's software. Televisions are being equipped with network connections to bring premium content like movies and personal content like home movies and pictures directly to the TV over the Internet or the in-home MoCA network. MoCA can be used in conjunction with WiFi networks to provide increased coverage throughout properties. In order to get to the far ends of a home, MDU or commercial structure, MoCA can be used as a network backbone. If there is coax wiring near to or within a WiFi dead zone, a MoCA-to-WiFi extender can be attached to the coax outlet to fill in areas that have inadequate coverage.

The high throughput and reliability of MoCA ensures the link between a router and a MoCA-to-WiFi extender is not degraded, providing the best possible WiFi performance in the new coverage area. The only worry is that over very long coax cable runs, 300 to 500 feet or more, the signal can degrade. In these rare cases, a fiber node can substitute for a stretch of coax.



MOCA NETWORKS

MoCA is a global consortium of service operators, original equipment and component manufacturers, chip providers, and test equipment vendors dedicated to enabling high-speed and robust multimedia network capability using existing coaxial cables. Designed from the ground up to support emerging uses like multiple streams of high-definition video programs, MoCA has produced a technology that provides over 250 Mbps data rate with over 175 Mbps of throughput at the application layer. These actual, field-tested throughput rates should not be confused with other network technologies that typically quote theoretical data rates with no guarantees of actual useable throughput by applications.

Extensive field trials in real homes with typical coax installations have proven MoCA can provide a minimum of 100 Mbps of throughput to over 97 percent of all coax connections. With the installation of a simple filter at the coax's point-of-entry to the home, the field trial was able to attain 100 percent coverage.

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Another key feature of MoCA is that it was designed to coexist with other services that could be using the coax cable. In order to avoid clashing with cable TV broadcasts and cable modem services, MoCA can operate over a number of different frequencies. Thus, homeowners do not have to give up any TV or data services they may already have – a MoCA network can be overlaid on the same coax cables as existing TV and data services.

MoCA products are easy to use. Typically, no user configuration is necessary and all that is needed to do is attach the coax cable, similar to hooking up a television or VCR. Optional password protection is provided (good in MDU environments), but that is about all that a user might need to configure.

When first powered up, a MoCA device starts looking for other MoCA products and if they are detected, will automatically form a network. If a MoCA device doesn't find others, it will automatically set itself up to be ready to communicate to new MoCA products as they are connected to the coax.

Because MoCA is a full mesh network, no routers or switches are needed to pass communications from one MoCA product to another – although MoCA routers are available for unusual needs. MoCA is simple enough to install that professional IT help or calling on your trusted PC expert is rarely if ever required.

MoCA is already widely used in Verizon's FiOS fiber-to-the-home deployments. MoCA is not limited to uses in just single family homes. With a point-of-entry filter installed at the coax cable's multi-taps, where the cable is split to serve the various units within an MDU, MoCA home networks can be set up within apartments or condominiums. All residents can still receive their existing television or Internet services, but now have the ability to use the coax cables in their units to connect all their computers and A/V entertainment devices onto a common high speed entertainment network.

Entropic Communications, a founder of MoCA and pioneer in developing multimedia network technology, provides the chips used in a wide variety of network-capable products. Today, Entropic's c.LINK® chipsets can be found embedded in service operator equipment such as MoCA enabled routers, HD/SD set-top boxes, HD/SD digital video recorders and optical network terminals.

Millions of subscribers already unknowingly use MoCA from their service operators. Soon, products with MoCA network technology will be available for consumers to purchase at retail. These consumer focused MoCA products will allow anyone to easily setup their own home coax networks, allowing them to connect all their computers and entertainment devices together to seamlessly blend Internet access capability with room-to-room multimedia streaming capability.

About the Author

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About Entropic Communications®

Entropic Communications, Inc. is a leading fabless semiconductor company that designs, develops and markets systems solutions to enable connected home entertainment. The company's technologies significantly change the way high-definition television-quality video and other multimedia content such as movies, music, games and photos are brought into and delivered throughout the home.

