Technology

Technology, Information Technology

Fiber Optic Cable VS Coaxial Cable A myriad of ways to convey information exist with the aid of modern information networks. Information is conveyed from one point to another, between computers and servers, telephones and television through the use of transmission media which can be widely grouped into guided and unguided. Both fiber optic cable and coaxial cable falls under guided transmission media which provide a physical path for the propagation of the signal. Twisted pair was majorly used for all sorts of communication until the development of the coaxial cable which provided higher data rates over long distance (Nellist, John and Ellit, 12). Optical fiber has taken over much of the market given its tremendous capacity for high speed and long distance application. Both fiber optic cable and coaxial cable have their distinct benefits and pitfalls as far as their role in conveying information in the form of data video or audio is concerned. The paper highlights both the advantages and disadvantages of fiber optic cables and coaxial cables as used in transmission. Fiber optic cable Fiber optic cables are thin , usually between 2 to 125 micrometers , flexible transmission media used to guide optical rays from information source to the information source. Fiber optic cables are cylindrical in shape and are made up of three concentric sections including the cladding, the core and the jacket. The core consists of one or more glass fibers with each fiber surrounded by individual cladding. The outer layer called the jacket is made up of plastic and is used to protect against crushing, moisture and abrasion (Nellist, John and Ellit, 12). Fiber optic cables have greater capacity, that is, it has potential bandwidth hence the immense data rate. Large amount of data can be transmitted data high speed over long distances as compared to coaxial

cables. In addition, fiber optic cables are small in size and light in weight as compared to most of the transmission media such as coaxial cables. This in turn is an advantage especially in reducing the structural support requirement given the light weight of the cable. Fiber optic cables have reduced attenuation as compared to coaxial cables. The attenuation is significantly lower and is constant over a wide range. Electromagnetic isolation is another key advantage of fiber optic cables. Fiber optic cables do not suffer from electromagnetic interference caused by external electromagnetic fields. The system is therefore not vulnerable to such interferences as crosstalk and impulse noise. Fiber optic cables do not radiate energy and therefore does not interfere with other equipments. It also has a high security degree that eliminates eavesdropping besides the fact that it's inherently hard to tap (Nellist, John and Ellit, 37). Great repeater spacing associated with fiber optic reduces the cost and ensures minimum errors. Fiber optic cables can transmit information for greater distances without the need of repeaters as opposed tom coaxial cables which required a considerable number of repeaters before the information can reach its destination. Fiber optic cables have pitfalls among which include high investment and installation cost; more expensive optical receivers and transmitters. Susceptibility to physical damage; fiber optic cables is fragile are easily broken. Even though the installation costs of fiber optic is dropping, it is still high. Coaxial cable Coaxial cable is made up of two conductors which allows it to operate over wide frequency ranges; inner wire core which is surrounded by a hollow outer cylindrical conductor. Between the inner core and the outer cylindrical conductor there is a dielectric

material that separates the two. A shield covers the outer conductor. Coaxial cable has a wide range of applications including television distribution, LAN, telephone transmission and short run computer links (Nellist, John and Ellit, 34). As compared to fiber optic cables, coaxial cable is relatively cheaper and convenient to install. Coaxial cables have greater throughput given that their sufficient frequency which support multiple channels. Coaxial cables have improved noise immunity thereby minimizing the error rate. This is due to fact that it has Faraday shielding providing noise immunity. Coaxial cables have great channel capacity allowing them the ability to transmit various frequencies at the same time. The cables also have a high capacity to transmit large amount of data at very high speed given that it consist of a large number of copper wires banded together. Unlike fiber optic cables, coaxial cables are not fragile and can be easily twisted and turned without breaking. The major pitfalls of coaxial cables include great noise, bidirectional upgrade is required, problems associated with deployment architecture. Additional cables have to be installed when transmitting audio, data and video signals at the same time unlike fiber optic cables. Climate change greatly affects the quality of data transmitted by coaxial cables as opposed to fiber optic cables which do not suffer from external interference (Nellist, John and Ellit, 42). Work Cited Nellist, John G., and Elliot M. Gilbert. Understanding modern telecommunications and the information superhighway. Boston, Mass.: Artech House, 2009. Print. Top of Form Bottom of Form