Internet Broadband and WiFi- Enabling Better Connectivity

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Article published on May 28th 2012 | Internet

The term broadband includes a broad range of technologies, all of which provide higher data rate access to the Internet. These technologies use wires or fiber optic cables in contrast to wireless broadband described later. Internet access is the means by which individual terminals, computers, mobile devices, and local area networks are connected to the global Internet. Internet Service Providers (ISPs) that use many different technologies offering a wide range of data rates to the end user usually sell it. Most Internet access products are being marketed using the term "broadband", and broadband penetration is being treated as a key economic indicator.

One of the great challenges for Internet access in general and for broadband access in particular is to provide service to potential customers in areas of low population density, such as in Alberta in Canada etc. In cities where the population density is high, it is easier for a service provider to recover equipment costs, but each rural customer may require expensive equipment to get connected.

Wireless Internet Service Provider is rapidly becoming a popular broadband option for rural areas. The technology's line-of-sight requirements may hamper connectivity in some areas with hilly and heavily foliated terrain.

Wi-Fi is a popular technology that allows an electronic device to exchange data wirelessly over a computer network, including high-speed Internet connections. A device that can use Wi-Fi can connect to a network resource such as the Internet via a wireless network access point. Such an access point has a range of about 20 meters indoors and a greater range outdoors. Its coverage can comprise an area as small as a single room with walls that block radio waves or as large as many square miles â€” this is achieved by using multiple overlapping access points.

To connect to a Wi-Fi LAN, a computer has to be equipped with a wireless network interface controller. The combination of computer and interface controller is called a station. All stations share a single radio frequency communication channel. Transmissions on this channel are received by all stations within range. The hardware does not signal the user that the transmission was delivered and is therefore called a best-effort delivery mechanism. A carrier wave is used to transmit the data in packets, referred to as "Ethernet frames". Each station is constantly tuned in on the radio frequency communication channel to pick up available transmissions.

Advantages

Wi-Fi allows cheaper deployment of local area networks (LANs). Also spaces where cables cannot be run, such as outdoor areas and historical buildings, can host wireless LANs.

Manufacturers are building wireless network adapters into most laptops. The price of chipsets for Wi-Fi continues to drop, making it an economical networking option included in even more devices.

Different competitive brands of access points and client network-interfaces can inter-operate at a basic level of service. Products designated as "Wi-Fi Certified" by the Wi-Fi Alliance are backwards compatible. Unlike mobile phones, any standard Wi-Fi device will work anywhere in the world.

Wi-Fi Protected Access encryption is considered secure, provided a strong passphrase is used. New protocols for quality-of-service make Wi-Fi more suitable for latency-sensitive application. Power saving mechanisms helps in extending battery life.

Multiple access points

Increasing the number of Wi-Fi access points provides network redundancy, support for fast roaming and increased overall network-capacity by using more channels or by defining smaller cells. Wi-Fi implementations have moved toward "thin" access points, with more of the network intelligence housed in a centralized network appliance, relegating individual access points to the role of "dumb" transceivers. Outdoor applications may use mesh topologies.

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Article Keywords:
Broadband internet Alberta, Wireless Internet Alberta

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