



MOBILE NETWORK CONNECTIVITY AT A GLANCE

With so many possibilities for getting and staying connected while on the go, how do you choose a specific connectivity option? This Q & A introduces basic connectivity concepts to help you make informed network choices.

WHAT IS WIRED ETHERNET?

Ethernet is a local area network technology specified by the IEEE 802.3 standard. A wired Ethernet uses cables or wires to transmit data from one device to another. There are three types of Ethernet most commonly installed today: 10BASE-T, 100BASE-T and Gigabit Ethernet. 10BASE-T transmits data at speeds up to 10 Megabits per second (Mbps). 100BASE-T is a fast Ethernet capable of transmitting data at 100 Mbps, and is typically used to support the back-end LAN infrastructure in most small to medium-sized companies. Gigabit Ethernet can transmit data at up to 1000 megabits per second, and is used in larger networks for back-end support.

Devices connected to a wired Ethernet compete with each other to gain access to the wire for data transmission. If many devices are transmitting at the same time, data transfer may slow down significantly. Many organizations chose a combination of wired and wireless Ethernet to provide anytime, anywhere access for their employees.

WHAT IS WIRELESS?

Wireless LAN and Bluetooth refer to a radio-based system that transmits information from one device to another without a physical wired connection. Infrared waves carry a signal through space rather than along a cable, also providing wireless connectivity. Wireless devices conforming to 802.11 standards can achieve a data transfer speed of up to 108 megabits per second.

Wireless connectivity is widely used by mobile computing professionals who perform their work in transit or in multiple locations. For example, wireless LAN access points are now available in public spaces such as airports, cafés, and modern hotels. Users with a notebook computer can connect to the internet from these locations just as easily as connecting from the office or at home. Wireless networking solutions are also employed in cases where a physical limitation such as the architecture of an old building prevents a hard-wired Ethernet.

WHAT IS DIAL-UP?

Dial-up communication requires a modem and a telephone network to establish connections with other devices. The modem converts a digital computer signal to an analogue signal before the data is sent along telephone lines. The data throughput rate in a dial-up transfer is significantly lower than when using wired or wireless network connections.



Although still used in some hotels and by consumers for home use, dial-up data transfer rates are significantly slower than WLAN. In the past, the maximum data transfer speed was 56 Kilobits (Kbps) per second, but more recent standards such as Integrated Services Digital Network (ISDN) have increased the maximum rate to 128 Kbps per second.

WHAT IS BROADBAND?

Broadband refers to telecommunication in which a wide band of frequencies is available so that information can be multiplexed (i.e. sent across multiple frequencies/channels concurrently). The result is that more information can be sent at the same time.

Increasingly, users are turning to xDSL or Cable Modem for broadband connectivity. Bandwidth (the speed achieved in usage as opposed to theoretical speeds) varies, depending on the type of connection employed, the amount of unused bandwidth and the host provider services.

Here is an overview of common broadband connection types:

- **ADSL** (Asymmetric Digital Subscriber Line), commonly used in Europe: download and upload speeds differ. Higher bandwidth for downloads than for uploads is supported as most home users spend more time downloading data or files. Theoretically, rates of 1.5 to 8 Mbps downstream and up to 1.544 Mbps upstream are possible. Typically, individual subscriber connections will provide from 1.544 Mbps to 512 Kbps downstream and about 128 Kbps upstream.
- **SDSL** (Symmetric Digital Subscriber Line), commonly used in Europe, offers the same download and upload speeds. This may be a more practical alternative for businesses where an equal amount of time is spent on downloading and uploading files or data. Typical individual connections will provide up to 2.048 Mbps.
- **HDSL** (High Bit-Rate Digital Subscriber Line), used for wideband digital transmission within a corporate site and between the telephone company and a customer. HDSL, like SDSL, is symmetrical. HDSL speeds are comparable to T1 or E1 speeds. In Europe, this means that E1 connectivity of up to 2.048 Mbps is possible.
- **CABLE MODEM** takes advantage of unused bandwidth on a cable television network. Theoretically, a rate of 10 to 30 Mbps downstream and 128 Kbps to 10 Mbps upstream are possible. Typical individual subscriber connections of about 1.5 Mbps are likely when receiving data.

WHAT IS WWAN?

A wireless wide area network (WWAN) uses radio, satellite, and mobile phone technology to transfer data between devices. Many manufacturers now install a cellular radio into computing devices, which allows the device to send and receive digital data along cellular radio frequencies and to transmit voice communications from the same device.



Currently, WWANs can send and receive data at rates ranging from 384 Kbps up to 2.4 Mbps per second even when beyond corporate or hotspot areas. Thus, WWAN provides a broader range of connectivity support than WLAN.

WHAT IS THE DIFFERENCE BETWEEN WLAN AND WWAN?

A wireless local area network (WLAN) is usually privately owned by an individual or corporation where significant amounts of data are passed quickly and continuously. A wireless wide area network (WWAN), on the other hand, is generally a publicly shared data network that provides maximum coverage in public areas and along traffic corridors. A WWAN is typically owned by a service provider or carrier who charges others to use the connection. Whereas WLAN data transfer speeds are relatively high, WWAN data rates are much lower and support mainly short bursts of data messaging.

HOW DO I CONFIGURE THESE CONNECTIONS ON MY TOSHIBA NOTEBOOK?

Toshiba notebook owners benefit from ConfigFree, a set of connectivity utilities that make it easy to connect to one or more networks. From re-usable network profiles to point and draw connectivity using the Wireless Radar Screen, ConfigFree simplifies many different types of connection tasks, including WWAN connections. For example, Connectivity Doctor now detects and troubleshoots WWAN connection problems in addition to WLAN, dial-up, and wired Ethernet.

HOW DO I KNOW WHAT CONNECTIVITY OPTIONS ARE INTEGRATED IN MY NOTEBOOK?

For a complete list of options installed in any Toshiba notebook computer, see the relevant product page for your notebook. More information is available at the following address: http://eu.computers.toshiba-europe.com/cgi-bin/ToshibaCSG/notebooks_desktops_servers_family_page.jsp?service=EU

WHERE DO I PURCHASE CONNECTIVITY OPTIONS?

The Toshiba website provides a search function to locate devices compatible with your existing Toshiba hardware, and also provides a list of vendors where you can purchase network cards. See the Toshiba website for more information: http://eu.computers.toshiba-europe.com/cgi-bin/ToshibaCSG/options_and_accessories_search.jsp?service=EU&oldOptionCategory=4697&selOptionCategory=4696