WIRELESS LAN

The infrastructure less network where, there is not required of any physical cable for network connection. In wireless LAN each client computer is connected to the Access Point though which they can share the file and access to the Internet.

These days People are becoming more mobile and want to maintain access to their business LAN resources from locations other than their desks. Workers in the office want to take their laptops to meetings or to a co-worker's office. When using a laptop in another location, it is inconvenient to rely on a wired connection.

WLAN VS LAN:

Characteristics	802.11 Wireless LAN	802.3 Ethernet LANS
Physical Layer	Radio Frequency (RF)	Cable
Media Access	Collision Avoidance (CSMA/CA)	Collision Detection(CSMA/CD)
Availability	Anyone with a radio NIC in range of an Access point	Cable connection required
Signal interference	Yes	Inconsequential
Regulation	Additional regulation by local authorities	IEEE standard dictates

- RF does not have boundaries, such as the limits of a wire in a sheath. The lack of such a boundary allows data frames traveling over the RF media to be available to anyone that can receive the RF signal.
- RF is unprotected from outside signals, whereas cable is in an insulating sheath. Radios operating independently in the same geographic area but using the same or a similar RF can interfere with each other.
- RF transmission is subject to the same challenges inherent in any wave-based technology, such as consumer radio. For example, as you get further away from the source, you may hear stations playing over each other or hear static in the transmission. Eventually you may lose the signal all together. Wired LANs have cables that are of an appropriate length to maintain signal strength.
- RF bands are regulated differently in various countries. The use of WLANs is subject to additional regulations and sets of standards that are not applied to wired LANs.

Wireless Standards - 802.11b 802.11a 802.11g and 802.11n

Parameters	802.11a	802.11b	802.11g	802.11n
Bandwidth(BW)	11Mbps	54Mbps	54Mbps	100Mbps
Signal Frequency	2.4Ghz	Upto 5Ghz	2.4Ghz	Unconfirmed possibly 2.4 and 5Ghz.

802.11a:
- **Pros of 802.11a** - fast maximum speed; regulated frequencies prevent signal interference from other devices
- **Cons of 802.11a** - highest cost; shorter range signal that is more easily obstructed

802.11b:
- **Pros of 802.11b** - lowest cost; signal range is good and not easily obstructed
- **Cons of 802.11b** - slowest maximum speed; home appliances may interfere on the unregulated frequency band

802.11g:
- **Pros of 802.11g** - fast maximum speed; signal range is good and not easily obstructed
- **Cons of 802.11g** - costs more than 802.11b; appliances may interfere on the unregulated signal frequency.

802.11n:
- **Pros of 802.11n** - fastest maximum speed and best signal range; more resistant to signal interference from outside sources
- **Cons of 802.11n** - standard is not yet finalized; costs more than 802.11g; the use of multiple signals may greatly interfere with nearby 802.11b/g based networks.

Wireless Topologies:

1. BSS (Basic Service Set). (in the presence of a Control Module often called "Base Station" or Access points.
2. Ad-hoc or Peer-to-Peer (When there is no Control Module)
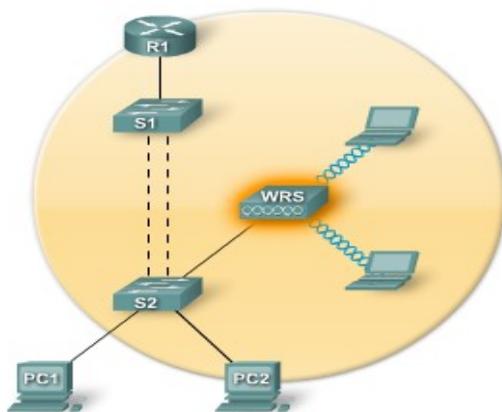
BSS Topology
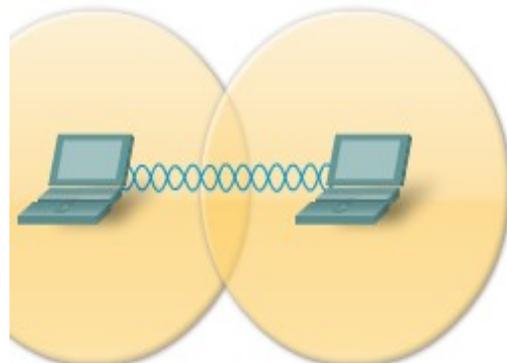
Adhoc Topology

BSS:

Access points provide an infrastructure that adds services and improves the range for clients. A single access point in infrastructure mode manages the wireless parameters and the topology is simply a BSS.

Ad-Hoc:
Wireless networks can operate without access points; this is called an ad hoc topology. Client stations which are configured to operate in ad hoc mode configure the wireless parameters between themselves. The IEEE 802.11 standard refers to an ad hoc network as an independent BSS (IBSS).

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