

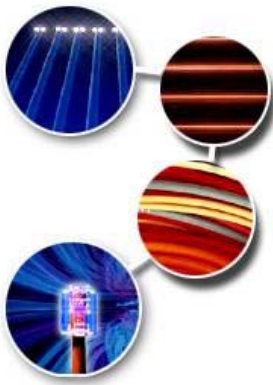
# Networks

## Local, Wide & Metropolitan Networks

Organisations need to carry data traffic seamlessly and securely, from the point of network access to the end users. There are a few broad choices available when considering network implementation :

- CAT5 structured cabling and cabinets
- WiFi 802.11B and 802.11G
- Line of sight (LOS) radio links
- Non-line of sight radio links (NLOS) and WiMax

## Structured Cabling



When installing or upgrading fixed infrastructure an audit is carried out on existing:

- Cabling
- Switches
- Routers
- Firewalls
- Protocols and procedures

For fixed infrastructure, Astutechnologies deploys CAT5E cable (EIA/TIA-568) to support 100Mbit Ethernet to 100m, or CAT6 cabling to the ANTSI /EIA 568 B-2.1 standard which supports 1000Mbit Ethernet to 100m, installed with ancillary equipment specified in accordance with client applications.

Full AT&T standard wiring diagrams are then prepared to support the installation, and maintenance or support contracts recommended to ensure continued reliability as the network grows are part of the turnkey installation.

## Wireless – Local Area Network

Where an organisation has taken offices in an older building, or where shared cable ducts make running new Ethernet cable a costly proposition, wireless (WiFi) LANs can be deployed instead.

An advantage of wireless networking is flexible desk arrangement, and the means to easily accommodate users who operate from more than one office location.

Desktop PC's can be fitted with wireless cards instead or in addition to Ethernet cards, and laptops either use external antennas, or PCMCIA cards. Laptops shipped with Centrino chips have WiFi functionality built-in by the manufacturer.

Organisations deploying wireless technology must ensure that network security is maintained. Password protection and processes to ensure that these passwords remain confidential are essential.



# Wireless – Wide Area Network

For organisations which have local offices grouped around a main location, wireless line of sight (LOS), can be used to extend the network from a principal site to others.

Higher power WiFi access points, or microwave radio links carry the data traffic either over a wide campus area, or for longer distances, point-to-point links can be used over any line-of-sight link. Typically line-of-sight (LOS) links are less than 35Km, and often limited in their range only by local restrictions on the size of antennas and towers.



Small parabolic antennas are used on the building(s) at the remote sites to receive and transmit the traffic.

LOS links multiplex all the site-to-site traffic whether data only, or a mixture of TCP/IP data and voice traffic, between the central access site and all distant offices. These links must therefore high bandwidth and equipment providing up to 34Mbits of bandwidth would typically be deployed to ensure that the end-users do not suffer from bottlenecks or congestion caused by this extension to the LAN.



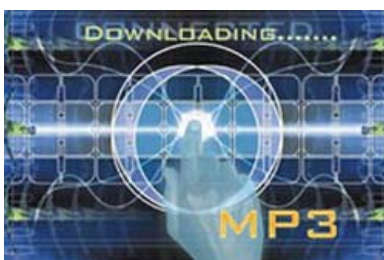
In this way organisations can minimise the number of connections which they have to external telcos and ISP's enabling them to improve security and manage costs.

## Non Line Of Sight Wireless – Metropolitan Networks

For locations where broadband IP connectivity is required by many hundreds, or even thousands of end-users, the latest non-line-of-sight (NLOS) wireless technology can be deployed.

These systems use large towers, or high buildings to provide coverage to many square kilometres of a town or city, and can provide links speeds of up to 34Mbits, although this bandwidth would normally be shared among many users.

Small customer premise equipment (CPE) is then used to achieve a public broadband wireless network. These systems are typically deployed by Internet Service Providers (ISP) to extend their coverage to areas where telephone lines and exchanges are poor.



The emerging standard of WiMax is now adding further speed and functionality to NLOS wireless networks, enabling network infrastructure providers to provide services such as on-line gaming and broadband multimedia services.