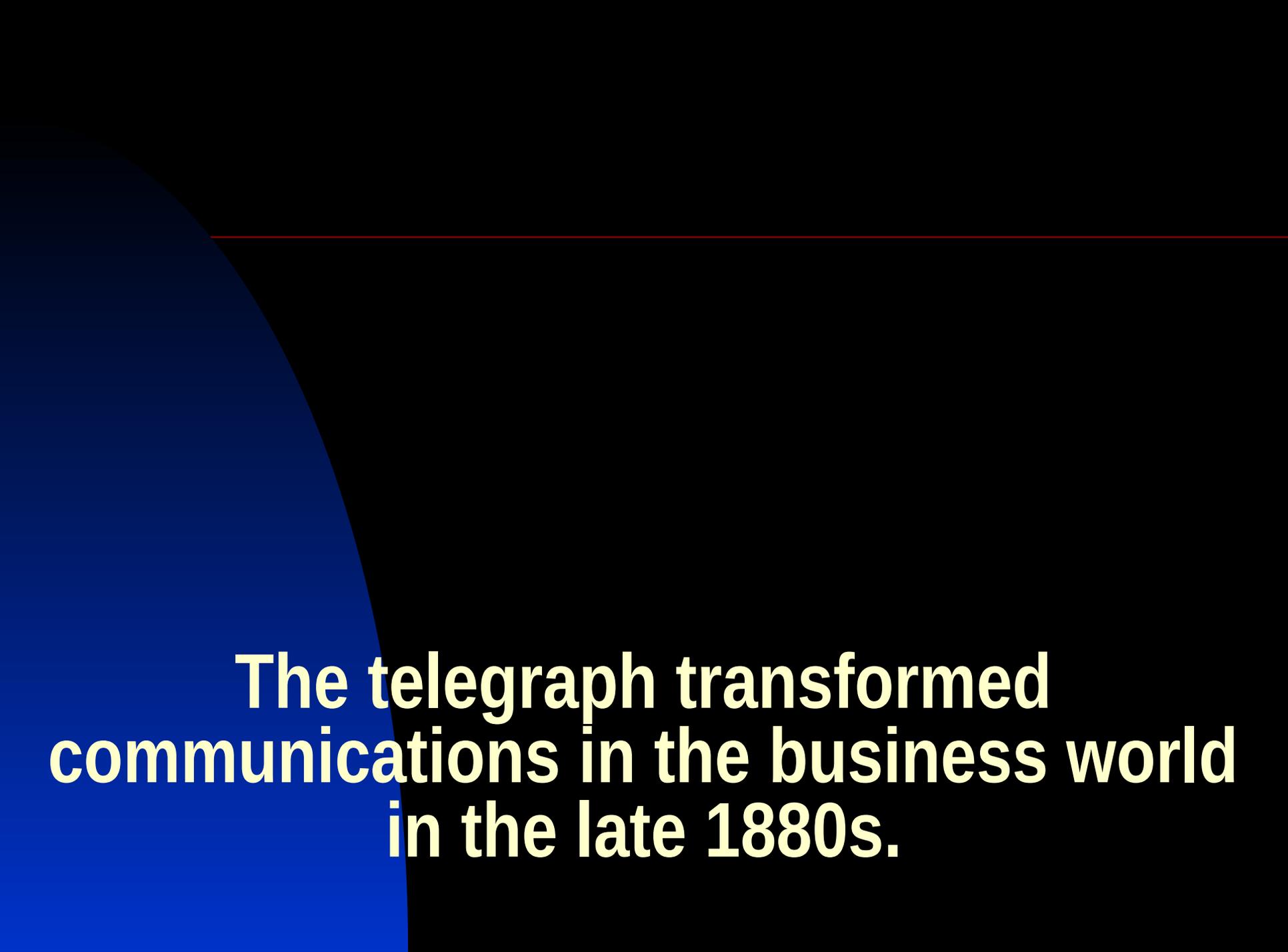




PART FIVE



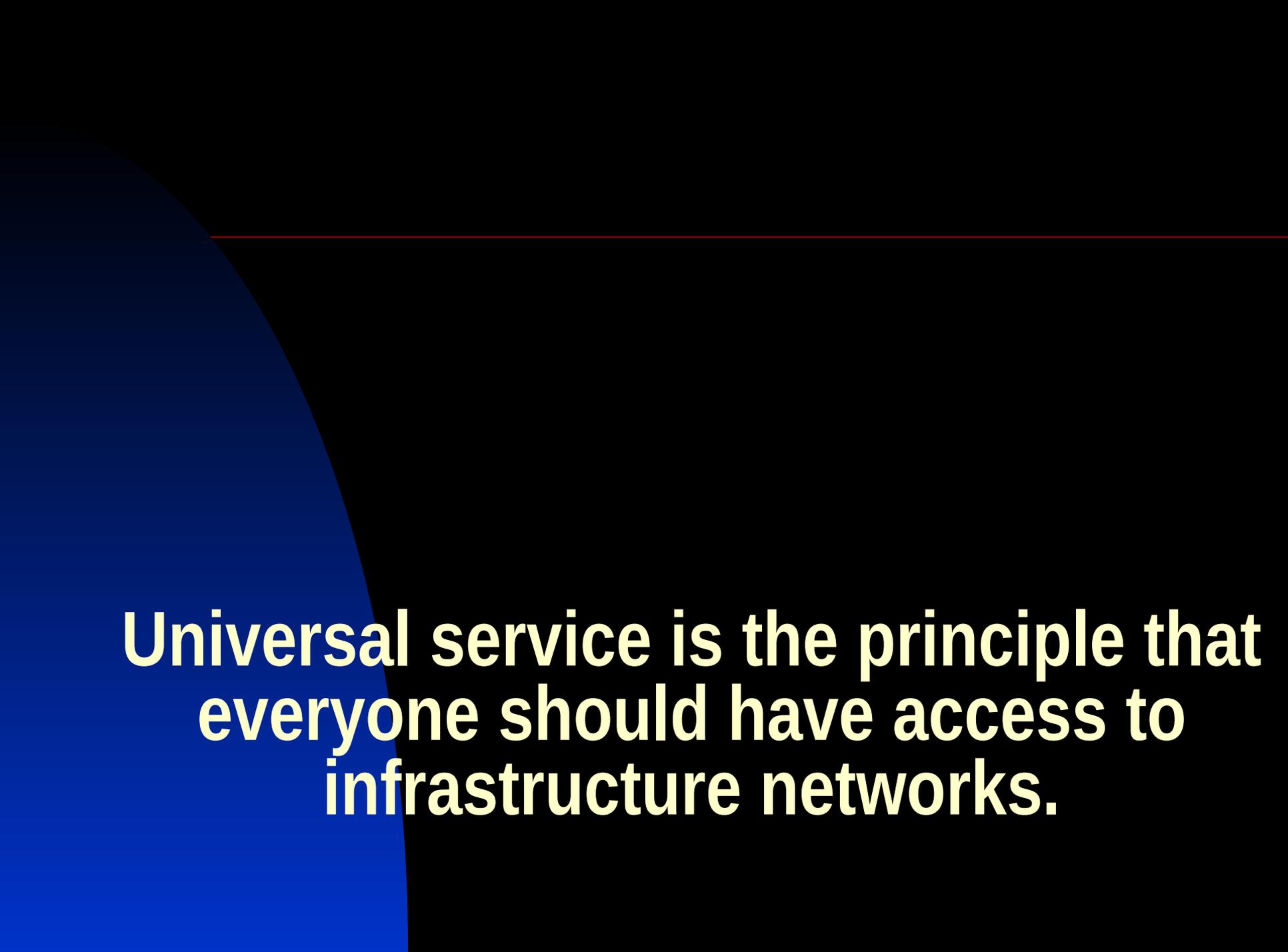
Infrastructure is the underlying physical structure of communication networks.



**The telegraph transformed
communications in the business world
in the late 1880s.**

**Telegraph service began in 1844.
A.G. Bell invents the telephone in
1876. Communications Act regulates
telecommunications in 1934. The
first cable systems began in 1948.
The first communications satellite,
pagers, and digital phone network
began in 1962.**

Vertical integration occurs when a company owns related businesses in the same industry.



Universal service is the principle that everyone should have access to infrastructure networks.

Common carriers provide service to all on an equal basis. The Federal Communications Commission (FCC) regulates communication in the United States.

After WWII, wireless microwave systems replace telephone cables on highly trafficked routes between major cities. Microwave systems transmit information between relay towers on highly focused beams of radio waves.

Satellite systems are essentially microwave transmitters launched into space that send information back-and-forth to relays in orbit around the earth. The first began with AT&T's Telstar satellite in 1962.

Number portability makes it possible for consumers to switch from wire-line to cell phone service while retaining their old telephone numbers.

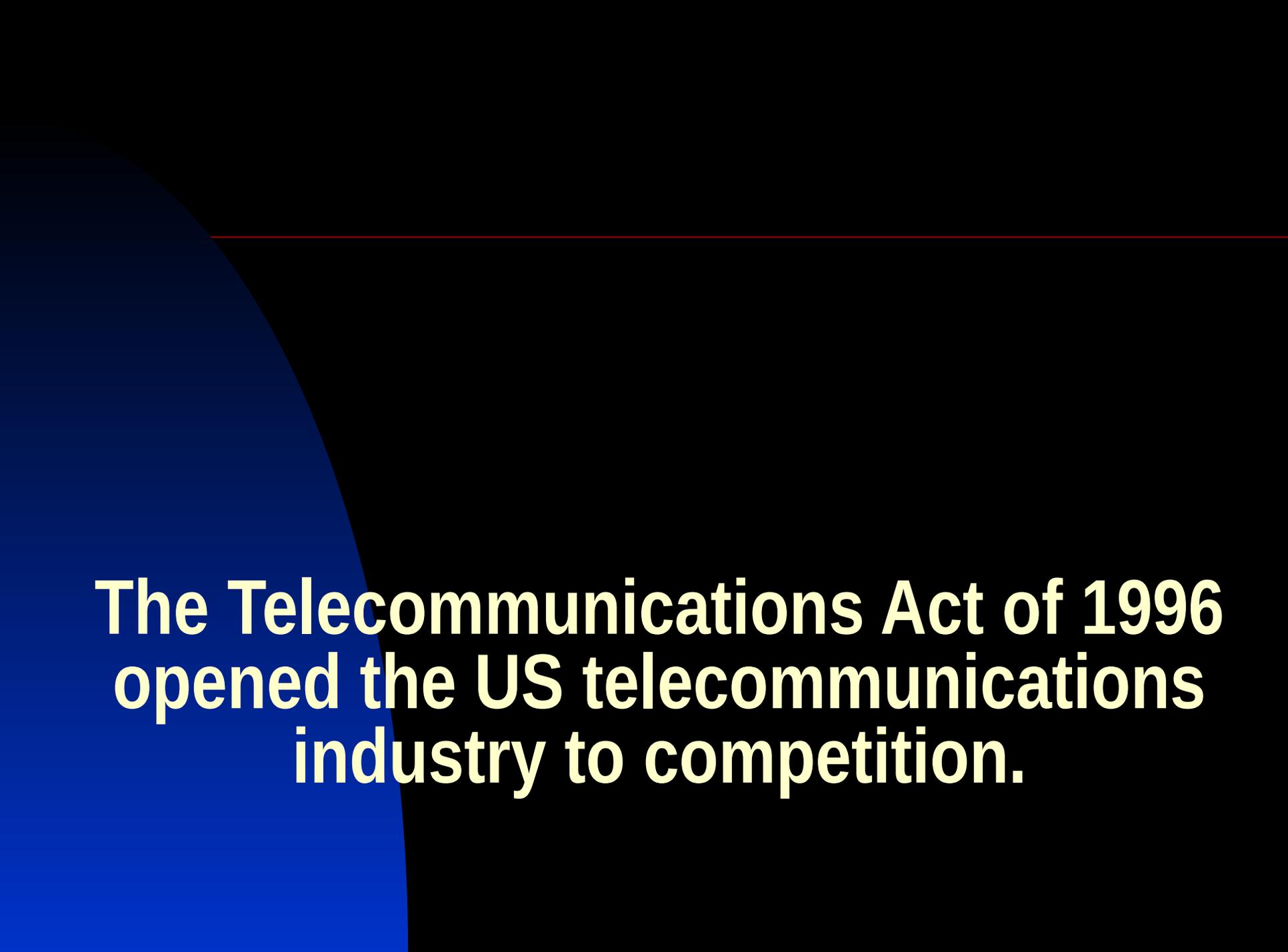


Broadband systems carry multiple channels of video, audio, and computer data simultaneously.

**Direct broadcast satellites (DBSs)
transmit television signals from
satellites to compact home receivers.**

**Multiple system operators (MSOs)
operate cable TV systems in two or
more communities.**

Fiber-optic systems use light instead of electricity. Headends occur where signals are fed into the local cable network.



**The Telecommunications Act of 1996
opened the US telecommunications
industry to competition.**

One of the first inventions to emerge from AT&T was the repeater amplifier that used the audion tube, a 1906 invention by Lee DeForest that was also a key development utilized in radio broadcasting.

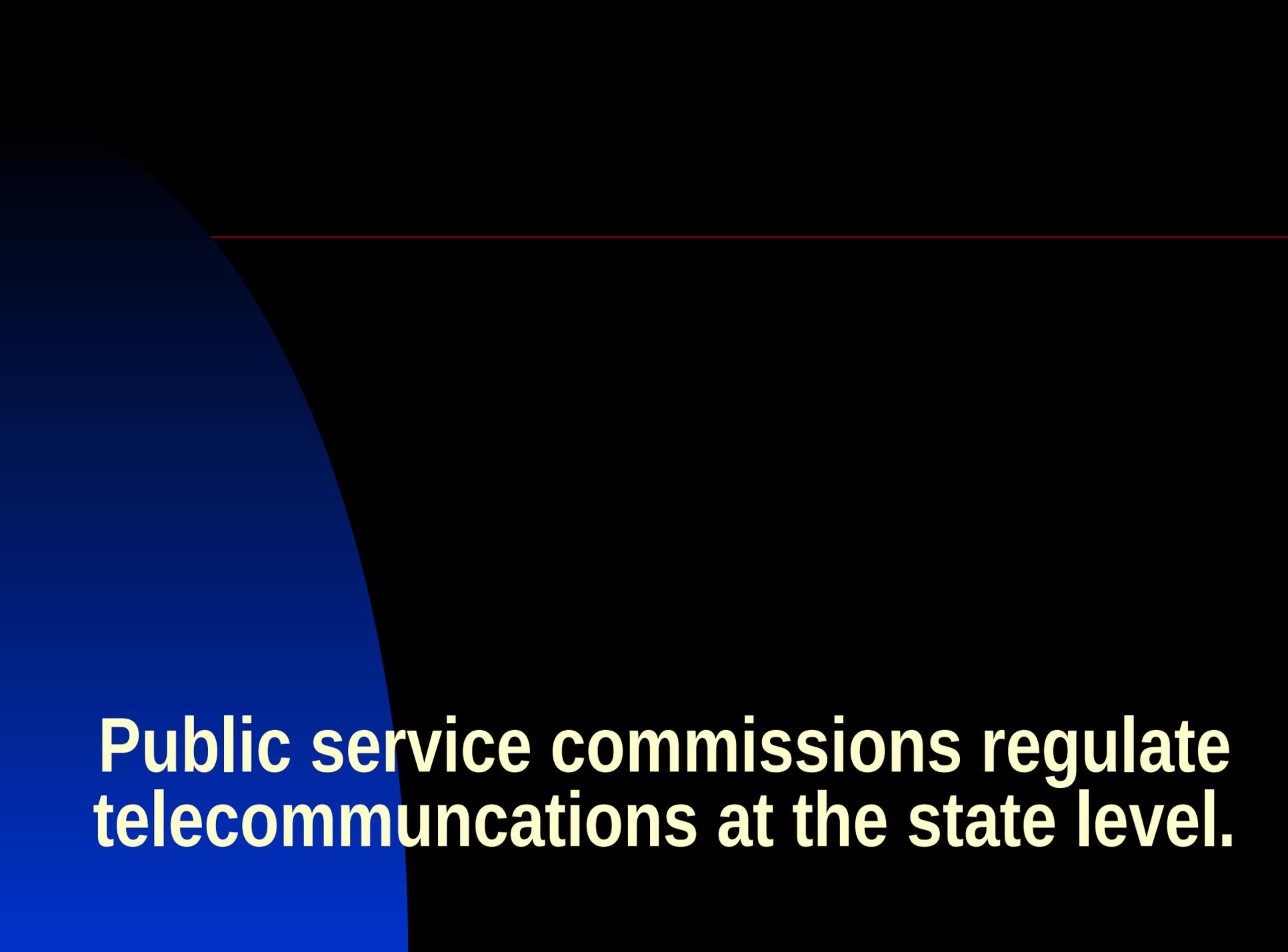
Multiplexing systems introduced in 1948 combined telephone conversations with high-frequency carrier waves to be sent over telephone wires, just as multiple radio channels are transmitted simultaneously through the air.

The cable headend feeds broadcast, satellite microwave, and local origination signals into a coaxial cable distribution networks of trunks, feeders, and drops to individual homes.

**Internet service providers (ISPs)
provide connections to the internet.
Modems covert digital data to analog
systems and vice versa.**

Cable modems connect personal computer to cable TV systems, and (DSL) digital subscriber lines send high-speed data over existing phone lines.

The communications spectrum includes the range of electromagnetic radiation frequencies that are used in wireless communication systems.



Public service commissions regulate telecommunications at the state level.

Most of the leading broadcast and cable networks are distributed by two dominant carriers, Pan Am Sat and GE Americom. They build, launch, and maintain the satellites and lease transponders to networks.

Many large organizations operate their own private networks. These include connections between their own internal local area networks, phone networks, public networks, and high-capacity links between their major locations.