Telemedicine

24 Jan 2017

Module 2

Communication & networks

- Types of Communication & network:
  - PSTN, POTS, ATM, ISDN

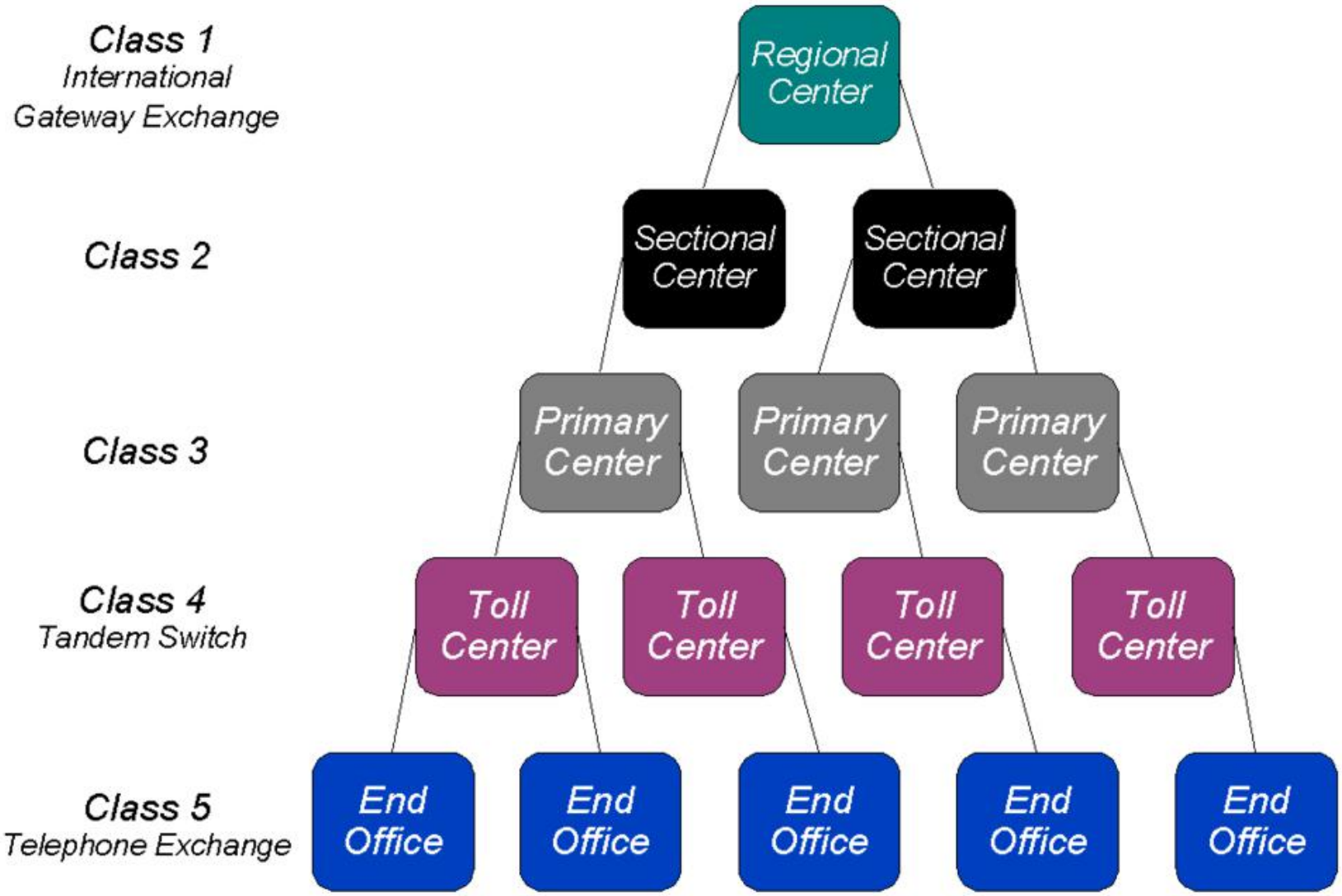
Public Switched Telephone Network (PSTN)

- Aggregate of the world's **circuit-switched** telephone networks
  - two network nodes establish a dedicated communications channel (circuit) through the network before the nodes may communicate.
  - guarantees the full bandwidth of the channel and remains connected for the duration of the communication session.

- PSTN consists of telephone lines, fiber optic cables, microwave transmission links, cellular networks, communications satellites, and undersea telephone cables
- The E.163 and E.164 standards provide a single global address space for telephone numbers.
- The first company to be incorporated to provide PSTN services was the Bell Telephone Company.

Technology

- Network topology
- Digital channels
  - To carry a typical phone call from a calling party to a called party, the analog audio signal is digitized at an 8 kHz sample rate with 8-bit resolution
  - call is carried over the PSTN using a 64 kbit/s channel, originally designed by Bell Labs


Class 1
International
Gateway Exchange
Regional Center
Class 2
Sectional Center
Sectional Center
Class 3
Primary Center
Primary Center
Primary Center
Class 4
Tandem Switch
Toll Center
Toll Center
Toll Center
Toll Center
Class 5
Telephone Exchange
End Office
End Office
End Office
End Office
End Office

Plain old telephone service (POTS)

- Voice-grade telephone service employing analog signal transmission over copper loops
- 1876 until about 1960
- Properties:
  - Bi-directional (full duplex) communications.
  - Using balanced signalling of voltage analogs of sound pressure waves on a two-wire copper loop
  - Restricted to a narrow frequency range of 300 to 3300 Hz, called the (voice band), which is much less than the human hearing range of 20 - 20,000 Hz
  - Call-progress tones, such as dial tone and ringing signal.
  - Dial pulse signalling of addresses

- limited features, low bandwidth, and no mobile capabilities, it provides greater reliability than other telephony systems

Internet protocol suite

- Abstraction layers
  - Link layer
  - Internet layer
  - Transport layer
  - Application layer