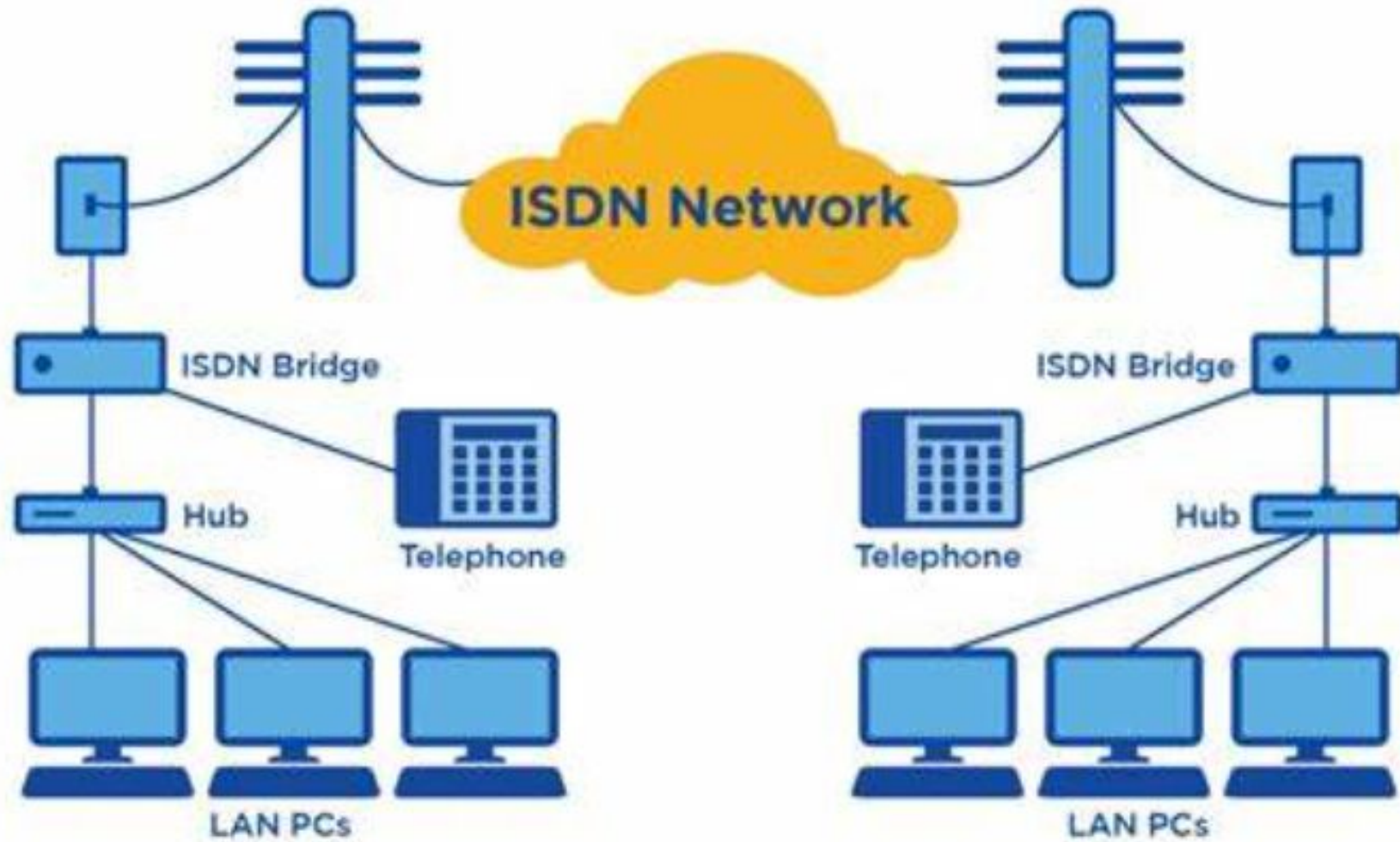


ISDN



Introduction

- ISDN stands for Integrated Services Digital Network. It is a circuit-switched telephone network system that sends voice, data, and video over regular telephone lines but in a digital format. ISDN divides the telephone line into different digital channels so that it can perform various functionalities at the same time. For instance, it allows one channel to handle a phone call while another to send a fax or connect to the internet. It makes ISDN a much more versatile telecommunication solution than traditional phone lines.

Working Modality

- ISDN takes a regular telephone line and turns it into a channel for digital data. It means everything sent over the ISDN connection is in digital format instead of old analog signals, whether a phone call or a video.
- The ISDN networking splits the telephone line into separate channels to function. The most common setup uses two types of channels: B (Bearer) channels and D (Delta) channels. The B channels carry the primary data, such as your voice in a phone call or the video in a conference call. Each B channel provides a certain amount of bandwidth for a separate phone call or data transmission.
- Meanwhile, the D channel is used for setting up and managing the calls and data transfers on the B channels. It carries information about who's calling who and sets up the connections.

Types

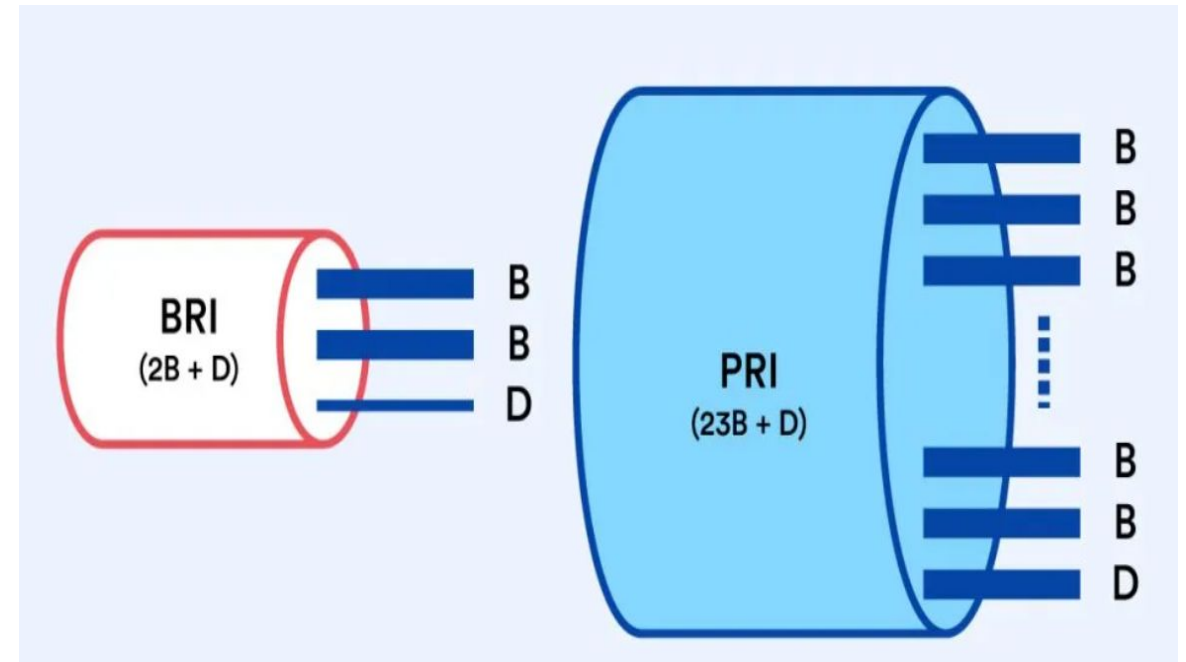
- The ISDN is primarily categorized into PRI (Primary Rate Interface) and BRI (Basic Rate Interface). Each type serves different user needs, from home users to large-scale businesses.

Primary Rate Interface

- Primary Rate Interface is a high-capacity service that's primarily used by larger organizations and businesses. A standard PRI line in the US provides 23B channels and one D channel for signaling. The setup allows for many simultaneous transmissions, making it a perfect setup for businesses with high communication demands. Moreover, each B channel in a PRI line operates at 64 kbps. It is the perfect ISDN speed for simultaneously handling multiple phone calls, internet sessions, and data transfers.

Basic Rate Interface

- ISDN BRI suits smaller businesses and home users. It typically consists of two B channels and one D channel. Each B channel in a BRI setup also operates at 64 kbps. ISDN BRI provides enough bandwidth for basic communication like standard telephone calls, internet browsing, and fax transmissions. The D channel operates at 16 kbps and is used for control and signaling rather than for carrying data.



Principle of ISDN

- The ISDN works based on the standards defined by ITU-T. The Telecommunication Standardization Sector (ITU-T) coordinates standards for telecommunications on behalf of the International Telecommunication Union (ITU) and is based in Geneva, Switzerland. The various principles of ISDN as per ITU-T recommendation are:
- To support switched and non-switched applications
- To support voice and non-voice applications
- Intelligence in the network
- Layered protocol architecture
- Variety of configurations

ISDN Services

- ISDN provides a fully integrated digital service to users. These services fall into 3 categories- bearer services, teleservices, and supplementary services.

1. Bearer Services –

Transfer of information (voice, data, and video) between users without the network manipulating the content of that information is provided by the bearer network. There is no need for the network to process the information and therefore does not change the content. Bearer services belong to the first three layers of the OSI model. They are well defined in the ISDN standard. They can be provided using circuit-switched, packet-switched, frame-switched, or cell-switched networks.

2. Teleservices –

In this, the network may change or process the contents of the data. These services correspond to layers 4-7 of the OSI model. Teleservices rely on the facilities of the bearer services and are designed to accommodate complex user needs. The user need not be aware of the details of the process. Teleservices include telephony, teletex, telefax, videotex, telex, and teleconferencing. Though the ISDN defines these services by name yet they have not yet become standards.

3. Supplementary Service –

Additional functionality to the bearer services and teleservices are provided by supplementary services. Reverse charging, call waiting, and message handling are examples of supplementary services which are all familiar with today's telephone company services.

Advantages of ISDN:

- ISDN channels have a reliable connection.
- ISDN is used to facilitate the user with multiple digital channels.
- It has faster data transfer rate.
- Efficient use of bandwidth
- Improved call quality
- Greater flexibility
- Integrated services

Disadvantages of ISDN:

- ISDN lines costlier than the other telephone system.
- It requires specialized digital devices.
- It is less flexible.
- Limited coverage
- High installation and maintenance costs
- Obsolescence
- Limited features