COMPUTER NETWORKS

CO-1 Home Assignment

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Integrated Services Digital Network (ISDN):-

ISDN is a set of communication standards that enable simultaneous digital transmission of voice, video, data and other network services over the circuits of the public switched telephone network. ISDN was designed to replace the traditional telephone system, which primarily transmitted voice by integrating both speech and data on the same lines.

Key Features of ISDN:-

- **Basic Rate Interface (BRI):-** Consists of two 64 Kbps 'B' channels for data and one 16 Kbps 'D' channel for signaling. BRI is suitable for home and small enterprise applications.
- **Primary Rate Interface (PRI):-** offers a greater number of 'B' channels for data and one 64 Kbps 'D' channel for signaling. PRI is used by larger organizations.
- **BroadBand-ISDN (B-ISDN):-** utilizes fiber optics and supports transmission rates higher than the primary rate, making it suitable for services requiring higher bandwidths, such as video.
- ISDN is characterized to integrate multiple digital channels which allows for better voice and data quality compared to analog phone systems. ISDN plays a crucial role in evolution of digital transmission providing integrated services and improved data transmission quality.

Asynchronous Transfer Mode (ATM):-

ATM is a network technology designed to enable the transmission of data, video, or voice information using a fixed-size packet called a cell. This technology is characterized by its ability to handle a variety of service qualities at reasonable cost, aiming to subsume both telephone networks and the internet.

ATM Cell Format:-

There are two types of ATM cell formats

- UNI Header:- Used within private ATM networks for communication between ATM endpoints and ATM switches, including a Generic Flow Control (GFC) field
- NHI Header:- Utilized for communication between ATM Switches, replacing the GFC fields with a Virtual Path Identifier (VPI) that occupies the first 12 bits

ATM operation:-

ATM employs Virtual path connections (VPCs) and Virtual channel connections (VCCs) which are bundled together to carry a single stream of cells from user to user. The network uses Virtual path Identifiers (VPIs) and Virtual channel Identifiers (VCIs) to route cells through the network, allowing for efficient switching and recovery in case of failures