

Unveiling the Contrasts Between Packet Switching and Circuit Switching in Modern Communication Networks



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Introduction

Packet Switching: Divides data into small packets that are sent independently to the destination, where they are reassembled. Allows for efficient use of network resources. •**Circuit Switching:** Establishes a dedicated communication path between two devices for the entire duration of the conversation.

Characteristics

Connection Establishment

Packet Switching: No dedicated path; packets travel independently and may take different routes to reach the destination.

Circuit Switching: Requires the establishment of a dedicated path before communication begins.

Resource Usage

Packet Switching: Efficient use of bandwidth; multiple connections can share the network simultaneously. **Circuit Switching:** Resources reserved for the entire duration, even if not actively transmitting data.

Advantages and Disadvantages

Packet Switching:

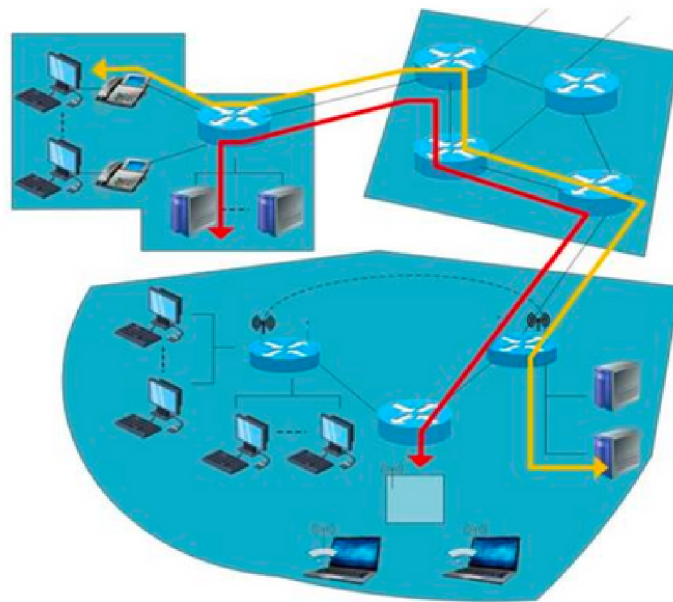
Flexibility: Adapts well to varying data transmission needs.
Scalability: Scales better with increasing network traffic.
Cost-Effectiveness: Efficient use of resources.
Low Latency: Dedicated path ensures minimal delay.
Predictable Performance: Consistent connection quality.

Disadvantages

Packet Switching

Variable Latency: Packet arrival times may differ.
Congestion Issues: High traffic can lead to packet loss.
Inefficiency: Resources reserved, even if not in active use.

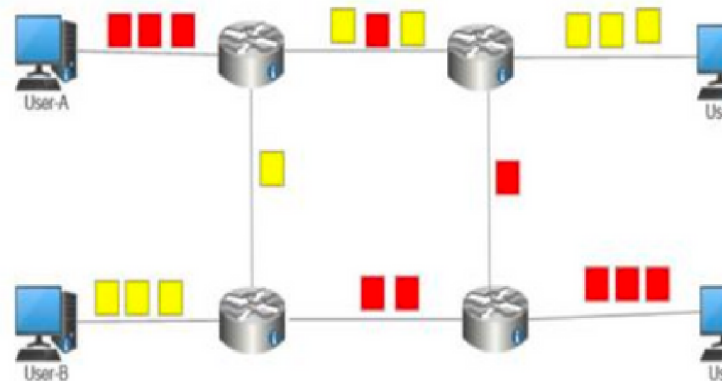
circuit Switching



Application

Use Cases Packet Switching:
Internet Communication: Dominant in modern internet communication. **Data Transmission:** Efficient for variable-sized data. **Traditional Telephony:** Common in traditional telephone networks. **Real-Time Communication:** Suitable for applications requiring constant, low-latency communication.

Packet Switching



Current Trends

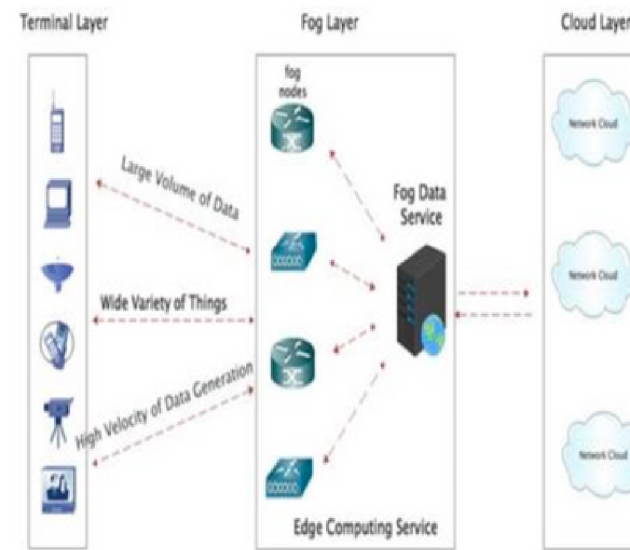
Packet Switching: Continues to dominate due to the internet's growth and diverse data types. **Circuit Switching:** Declining in use but still prevalent in specific applications.

Emerging Technologies

5G Networks: Emphasizes packet-switched architecture for higher data rates.

Software-Defined Networking (SDN): Enhances the flexibility and control of packet-switched networks.

Computing Architecture



Planing Considerations

Network Design: Consider the nature of the data and communication requirements when choosing between packet and circuit switching. **Cost-Benefit Analysis:** Evaluate the costs associated with each switching method against the specific needs of the application or network.

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