# Simple parity

- In the Simple parity concept one extra bit ( parity bit ) is added to each dataword.
- Simple parity check can detect all single bit error .
- Simple parity check can not detect an even number of errors.
- Simple parity check can detect an odd number of errors .

# 2D parity

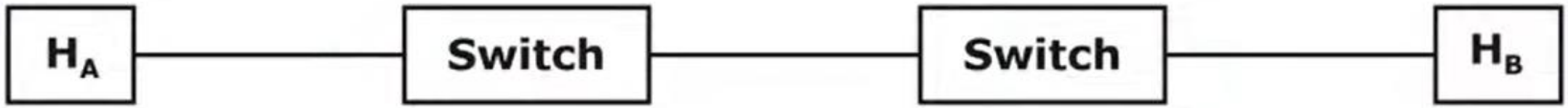
- Two dimensional parity check can detect and correct all single bit error and detect two or three bit error that occur any where in the matrix
- However only some pattern with four or more Error can be detected.
- In a 2D-parity check code, the information bits are organized in a matrix consisting of row and columns.
- For each row and each column one parity check bits is calculated.

| CIRUCUIT SWITCHING | PACKET SWITCHING |
| --- | --- |
| 1. It has three phases-connection establishment, Data transfer and Connection termination. | It has only one phase-Data transfer. |
| 2. Physical path between source and destination. | No physical path. |
| 3. All packets use same path. | Packet may follow different path (travel independently). |
| 4. Reserves the entire bandwidth in advance. | Does not reserve. |
| 5. Bandwidth wastage. | No Bandwidth wastage. |
| 6. No store and forward transmission. | Supports store and forward transmission. |
| 7. Congestion can happen during connection establishment phase. | Congestion can happen during data transfer phase. |
| 8. Circuit switching is implemented at physical layer. | Packet switching is implemented at network layer |

1. Consider a source computer (S) transmitting a file of size $10^6$ bits to a destination computer (D) over a network of two routers ($R_1$ and $R_2$) and three links ($L_1$, $L_2$ and $L_3$). $L_1$ connects S to $R_1$, $L_2$ connects $R_1$ to $R_2$ and $L_3$ connects $R_2$ to D. Let each link be of length 100 km. Assume signals travel over each link at a speed of $10^8$ meters per second. Assume that the link bandwidth on each link is 1 Mbps. Let the file be broken down into 1000 packets each of size 1000 bits. Find the total sum of transmission and propagation delays in transmitting the file from S to D?

Two hosts are connected via a packet switch with $10^7$ bits per second links. Each link has a propagation delay of 20 microseconds. The switch begins forwarding a packet 35 microseconds after it receives the same. If 10000 bits of data are to be transmitted between the two hosts using a packet size of 5000 bits, the time elapsed between the transmission of the first bit of data and the reception of the last bit of the data in microseconds is _____ .

3. Suppose two hosts are connected through two intermediate switches.




Suppose each link (one way) propagation delay is 20 ms and each link data transfer rate is 1 Mbps. If packet size is 1000 Bytes then the amount of time required to send one file of size 5000 Bytes from sender to receiver (Consider for processing overhead at switch is negligible) is _____ .