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**Tugas Akhir**

1. Sebuah proses pengguna memiliki ukuran data 120 MB, sedangkan tempat penyimpanan sementara yang berupa hardisk memiliki kecepatan transfer data sebesar 120 MB per detiknya. Maka waktu yang dibutuhkan untuk proses mentransfer data sebesar 120 MB berapa lama?

Jawab :

120 MB = 120 × 210 = 122880 KB

= 122880 KB / 122880 KB = 1 Detik

= 1 Detik dikonversi ke Milidetik = 1 × 1000 = **1000 Milidetik (ms)**

1. Diketahui data informasi 1100 0111 0010, tentukan urutan bit yang akan dikirimkan (bit informaasi + bit parity), jika menggunakan Hamming Code, tentukan juga bit ke berapa yang mengalami error/kesalahan.

Jawab :

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Posisi Bit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | Proses  Xor |
| Kategori | p1 | p2 | d1 | p3 | d2 | d3 | d4 | p4 | d5 | d6 | d7 | d8 | d9 | d10 | d11 | p5 | d12 |  |
| Bit  Informasi |  |  | 1 |  | 1 | 0 | 0 |  | 0 | 1 | 1 | 1 | 0 | 0 | 1 |  | 0 |  |
| p1 | √ |  | √ |  | √ |  | √ |  | √ |  | √ |  | √ |  | √ |  | √ | p1=1  xor 1  xor 0  xor 0  xor 1  xor 0  xor 1  xor 0  = 0 |
| p2 |  | √ | √ |  |  | √ | √ |  |  | √ | √ |  |  | √ | √ |  |  | p2=1  xor 0  xor 0  xor 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | xor 1  xor 0  xor 1  = 0 |
| p3 |  |  |  | √ | √ | √ | √ |  |  |  |  | √ | √ | √ | √ |  |  | p3=1  xor 0  xor 0  xor 1  xor 0  xor 0  xor 1  = 1 |
| p4 |  |  |  |  |  |  |  | √ | √ | √ | √ | √ | √ | √ | √ |  |  | p4=0  xor 1  xor 1  xor 1  xor 0  xor 0  xor 1  = 0 |
| p5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | √ | √ | p5=0 |

Data yang dikirim

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p1 | p2 | d1 | p3 | d2 | d3 | d4 | p4 | d5 | d6 | d7 | d8 | d9 | d10 | p11 | p5 | d12 |
| 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |

Menentukan bit yang error 0011100001110010000111100011100100

Jawab :

Masukkan data pada perumusan cek bit paritas :

C1 = 1 + 1 + 0 + 0 + 1 = 1

C2 = 1 + 0 + 0 + 1 + 1 = 1

C3 = 1 + 0 + 0 = 1

C4 = 0 + 1 + 1 = 0

Sekarang bit 12 mengalami kesalahan data menjadi : 00111100011100100 C1 = 1 + 1 + 0 + 0 + 1 = 1

C2 = 1 + 1 + 0 + 1 + 1 = 1

C3 = 1 + 1 + 0 = 0

C4 = 0 + 1 + 1 = 0

Apabila bit – bit cek dibandingkan antara yang lama dan baru maka terbentuk syndrome word :

|  |  |  |  |
| --- | --- | --- | --- |
| C4 | C3 | C2 | C1 |
| 0 | 1 | 1 | 1 |
| 0 | 0 | 0 | 1 |
|  |  |  | (EX-OR) |

0 1 1 0 = 6

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| C1 | C2 | D1 | C3 | D2 | D3 | D4 | C4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | C5 | D12 |
| 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |

Data asli yang dikirim adalah = D1 D2 D3 D4

1 1 1 0