

2015.

c) i GB gigabyte \rightarrow 1024×10^9 bit

$$\begin{array}{ll} \text{GB} \rightarrow 8 \text{Gb} = & 1 \text{Gb} = 10^3 \text{MB} \\ 1 \text{Gb} = 10^3 \text{Mb} & 1 \text{Mb} = 10^3 \text{KB} \\ 1 \text{Mb} = 10^3 \text{Kb} & 1 \text{KB} = 10^3 \text{B} \\ 1 \text{Kb} = 10^3 \text{bit} & 1 \text{B} = 8 \text{bit} \end{array}$$

$$u = 20 \text{ MB/s} = 20 \times 8 \times 10^3 \times 10^3 \text{ bit/s}$$

$$d = 50 \text{ MB/s} = 50 \times 8 \times 10^3 \times 10^3 \text{ bit/s}$$

$$f = 80 \text{ km/h}, d = 13600 \text{ km}$$

$$t_1 = 13600 \text{ km} / 80 \text{ km/h} = 170 \text{ h} = 612000 \text{ s}$$

$$t_2 = 4 \times 10^9 \text{ bit} / 20 \times 8 \times 10^6 \text{ bit/s} = 25 \text{ s}$$

$$t_3 = 4 \times 10^9 \text{ bit} / 50 \times 8 \times 10^6 \text{ bit/s} = 10 \text{ s}$$

$$t = t_1 + t_2 + t_3 = 612035 \text{ s}$$

ii for propagation delay = there is no chance for a pigeon to beat signal speed

for transmission delay = when the bandwidth of Internet is smaller than the speed writing into flash drive and the speed reading from flash.

(In this condition, the transmission delay of IP over air is lower).