ITS323 – Performance Notes

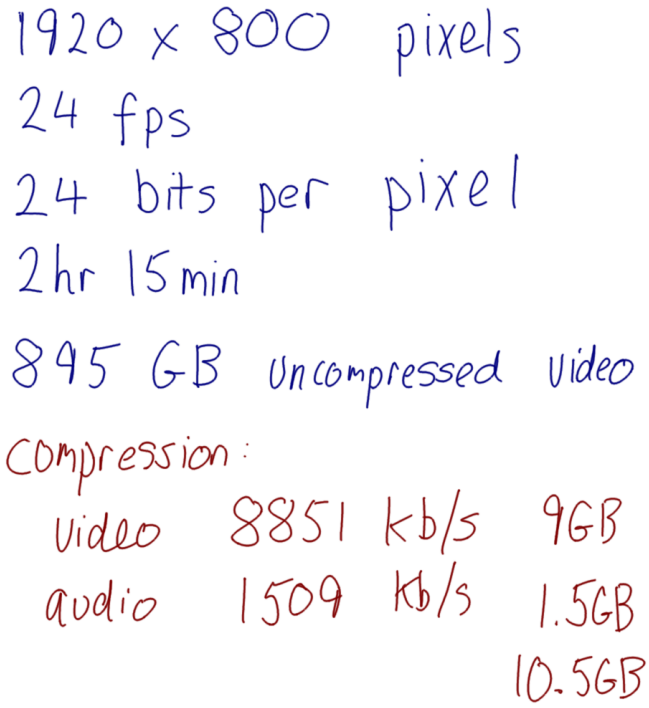

Figure 1: Calculation of raw and compressed video size; Lecture 02

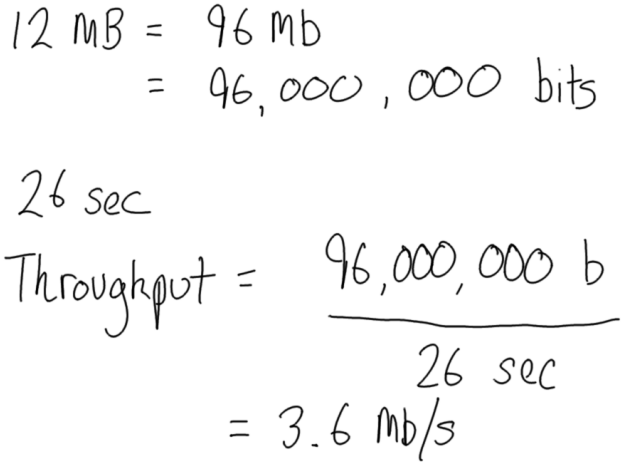

Figure 2: File download throughput calculation; Lecture 03

Figure 3: Experimental setup of client and server with HTTP; Lecture 04

Data rate : 100 Mb/s

1 bit : $\frac{1}{100\,M} = 10\,ns$

$= 0.01\,\mu s$

File 1MB : 8 Mb = 8,000,000 b

Time to transmit = $\frac{8,000,000}{100,000,000}$

$= 0.08\,s$

$= 80\,ms$

File 50 MB : Time = 4000 ms

$= 4\,s$

(transmit)

Throughput : 50MB in 4.3 s

$= \frac{50 \times 10^6 \times 8}{4.3}$

$= 93$ Mb/s =

Data rate = 100 Mb/s

Efficiency = $\frac{93}{100} = 93\%$

Figure 4: Data rate, throughput and efficiency calculations; Lecture 04

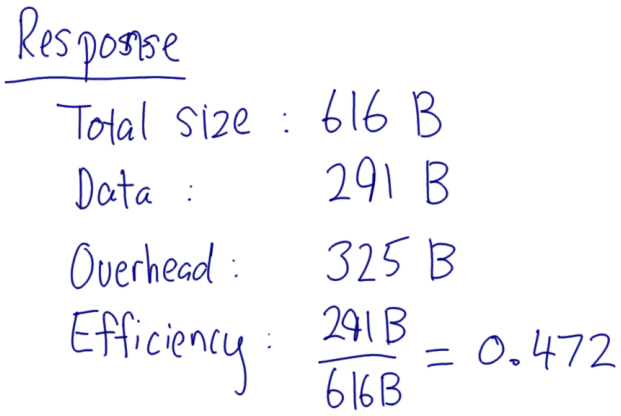

Figure 5: HTTP response overhead; Lecture 04

100 B : 0.602 ms ≈ 600 us

500 B : 0.898 ms ≈ 900 us

1000 B : 0.982 ms ≈ 1000 us

Transmission delay:

$$\frac{\text{data size}}{\text{data rate}}$$

100B @ 100 Mb/s : trans = $\frac{100 \times 8}{100 \times 10^6}$

= 8 us

Propagation delay

$$\frac{\text{distance}}{\text{speed}}$$

1m @ 300,000,000 m/s

prop = $\frac{1}{3 \times 10^8}$ = 0.003 us

Processing delay

Figure 6: Ping delay for different packet sizes; Lecture 04

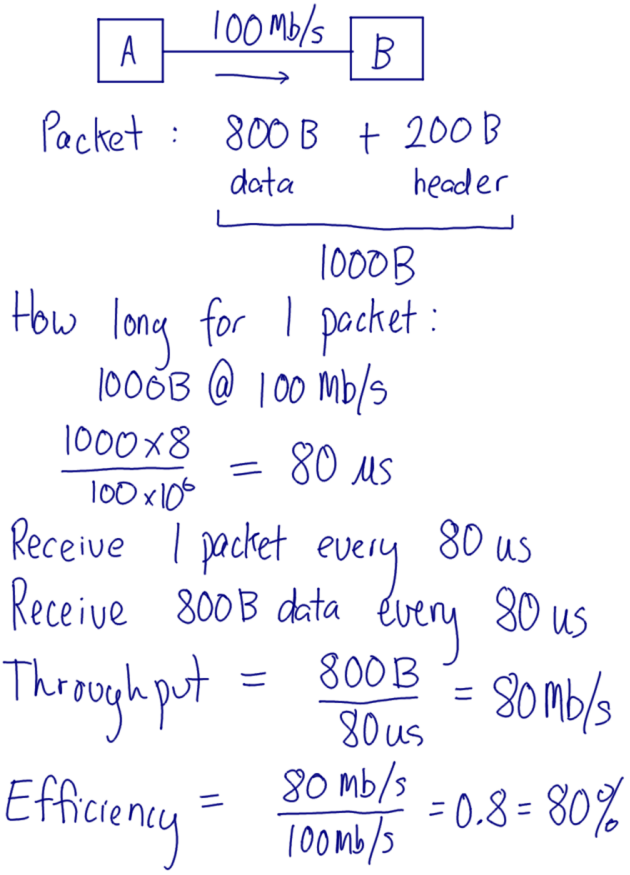

Figure 7: Data rate, throughput and efficiency calculation (2); Lecture 04

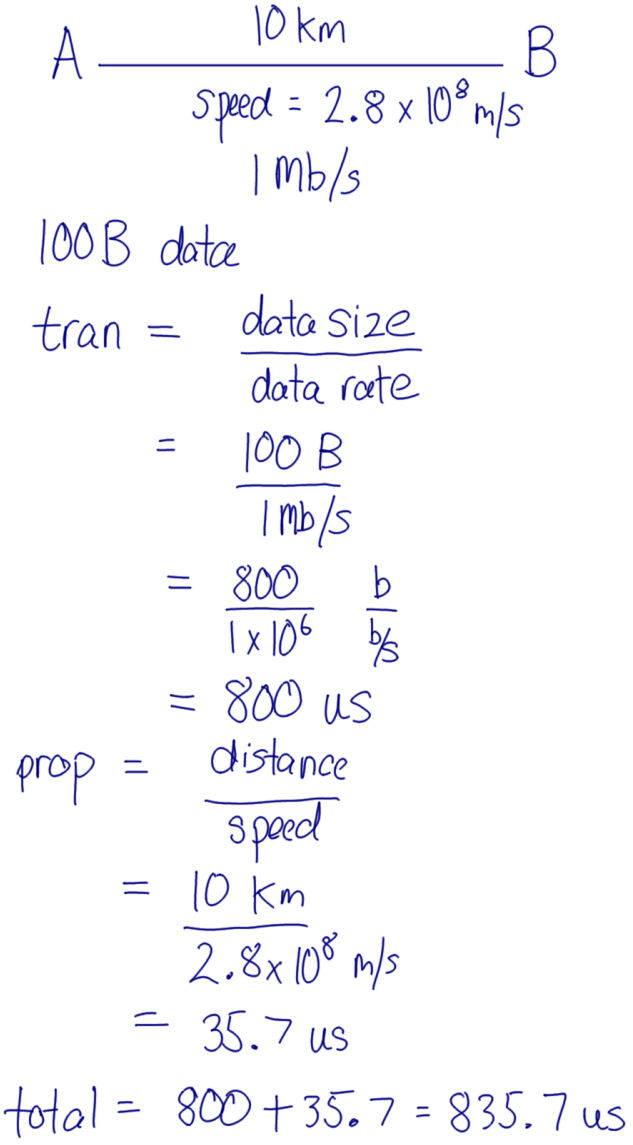

Figure 8: Example of link delay; Lecture 05

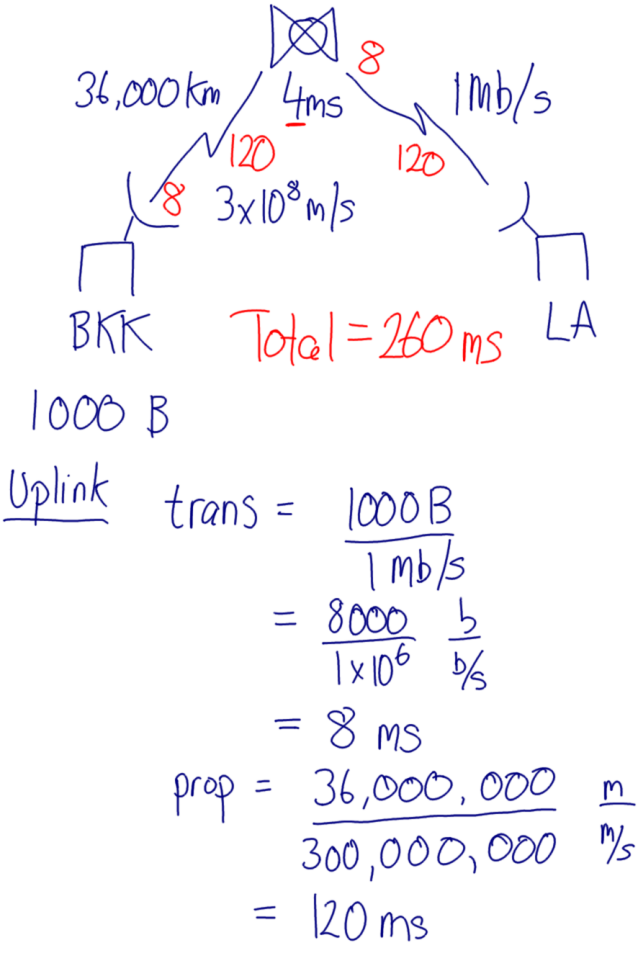

Figure 9: Example of satellite network delay; Lecture 05