

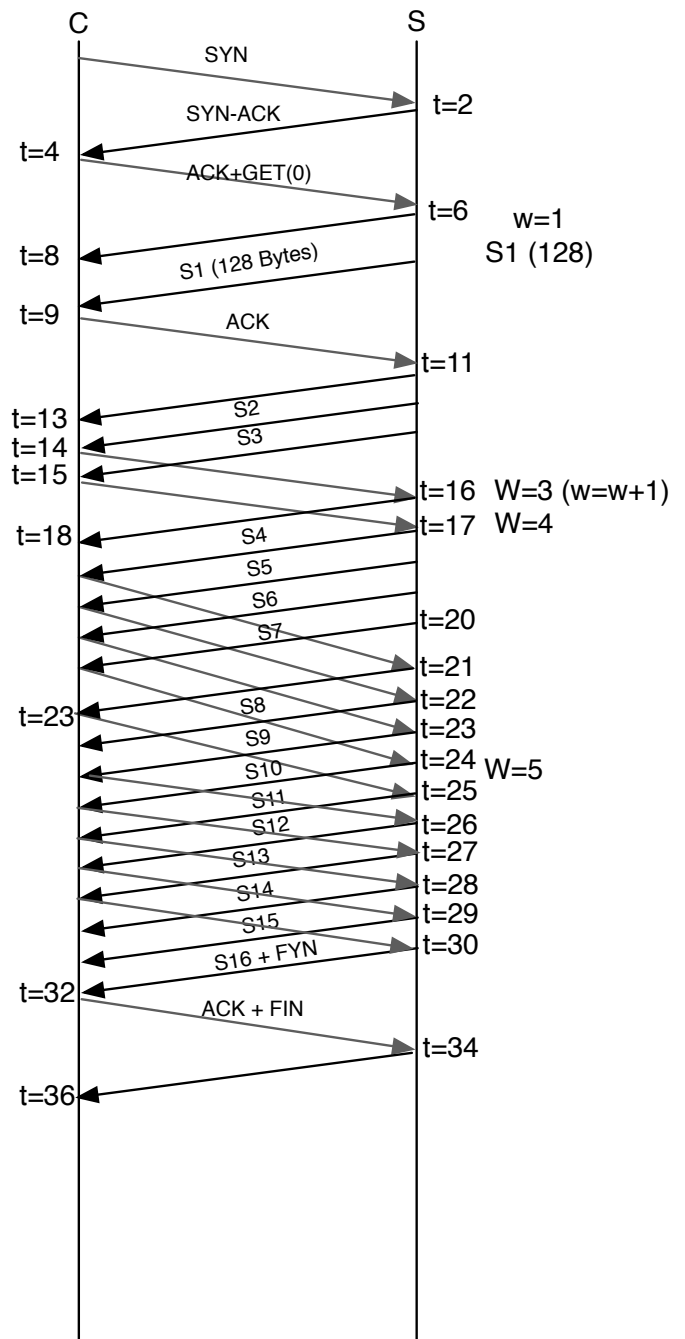
$$\begin{aligned} RTT &= 4 \text{ ms} \\ R &= 1024 \text{ Kbps} \\ S &= 128 \text{ byte} \\ N &= 16 \end{aligned}$$

TCP:

- Slow Start
- Congestion Avoidance  $W = 4$

tempo de transmissão = 1 ms

R: 32 ms



b)

$I = 1024$  bytes

$R = 1024$  kbps

2 ligações  $\begin{cases} \frac{R}{2} = 512 \text{ kbps} \\ \frac{R}{2} = 512 \text{ kbps} \end{cases}$

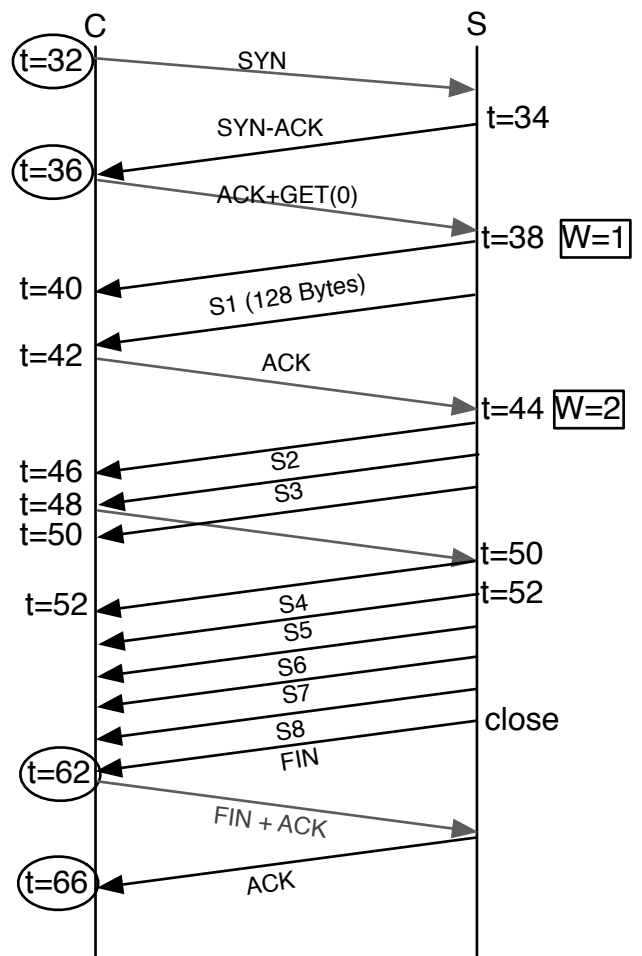
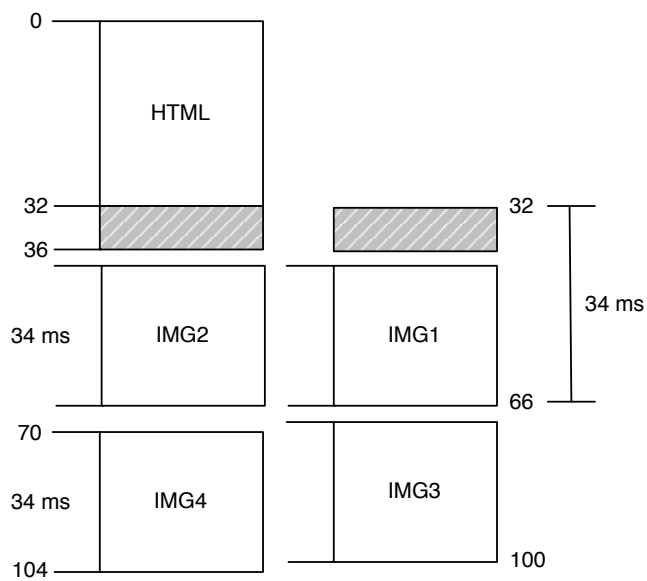
$S = 128$  bytes  $\rightarrow N = \frac{1024}{128} = 8$

1 h  $\text{---} 512 \times 10^3$  bits

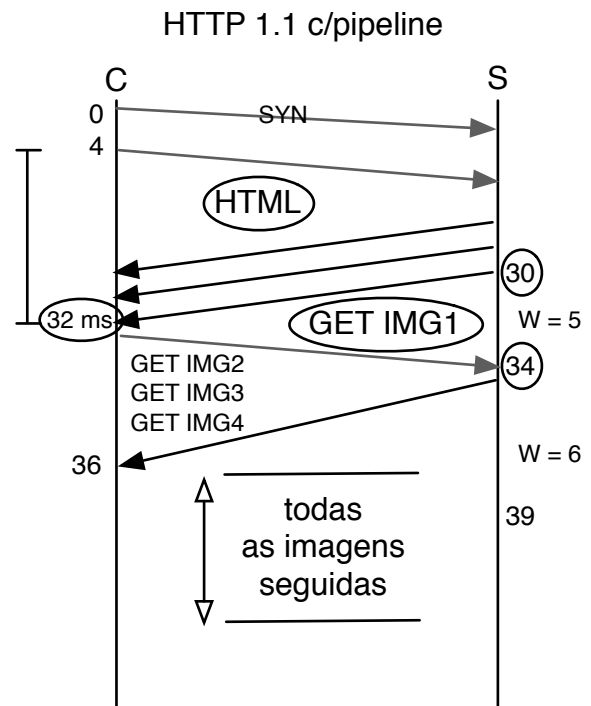
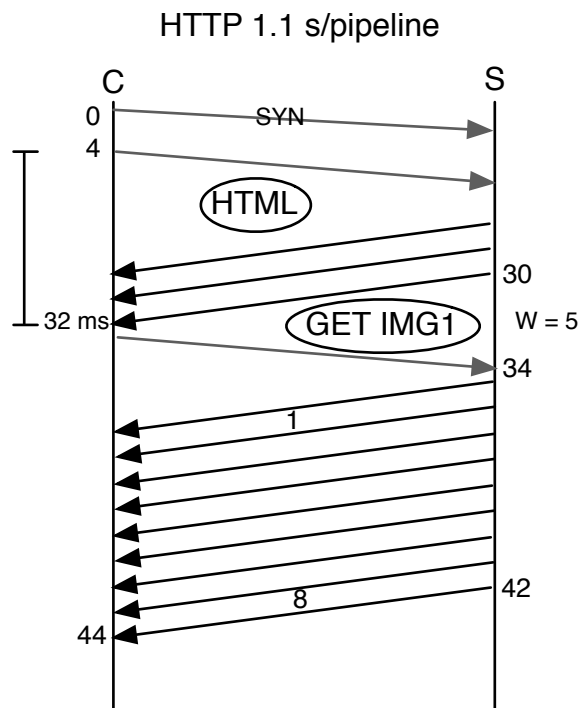
$tt$   $\text{---} 128 \times 8$  bits

$tt = \frac{1024}{512} \times 10^3 = 2$  ms

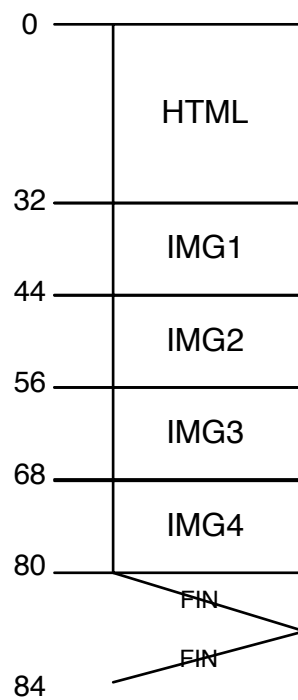
HTTP 1.0  $\rightarrow T_t = 104$



c)



HTTP 1.1 s/pipeline



HTTP 1.1 c/pipeline

