



NOM POUPA
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 Promo M1 2018
 Date 12/01/17



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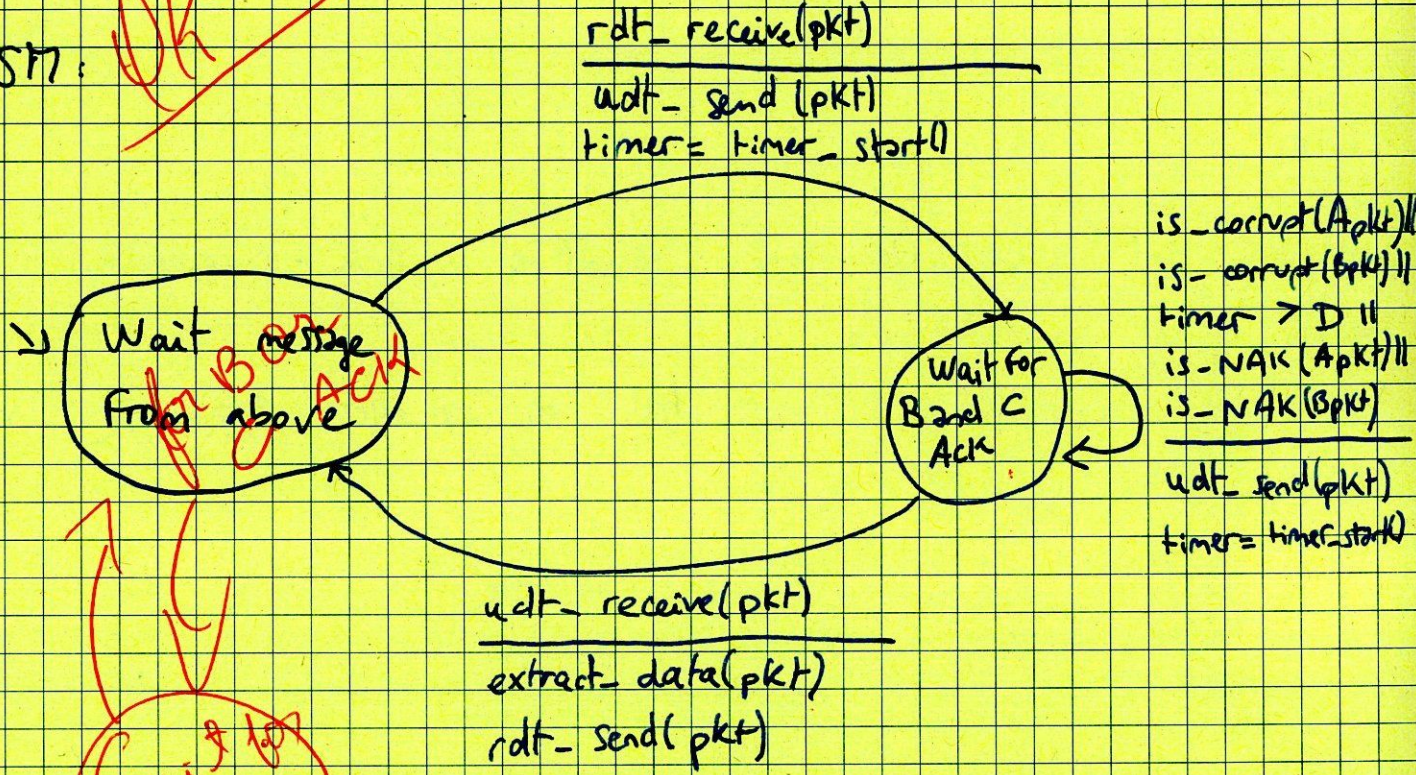
POUPA Adrien
M1 - 2016

MATIÈRE Programmation Système

Exercice 1 :

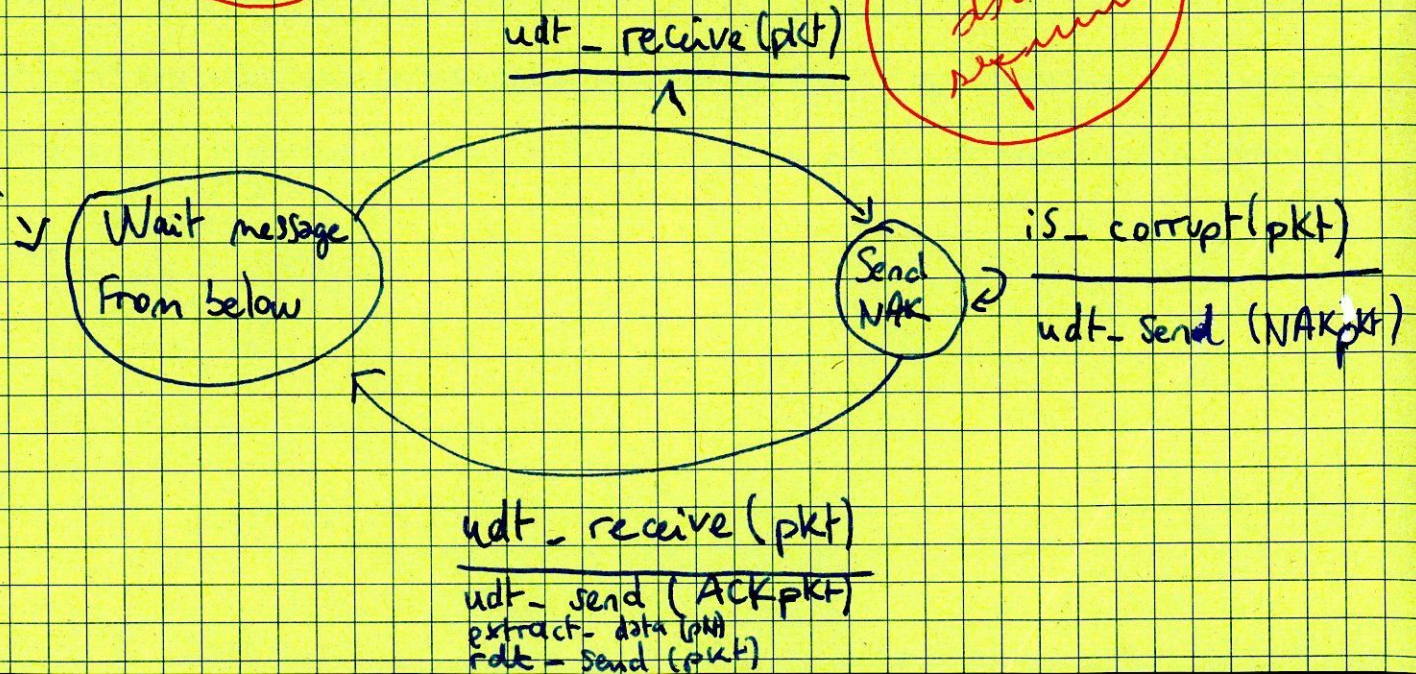
A FSM:

~~OK~~



C FSM, B is similar:

~~Wait for B Ack~~



We can use a TCP packet containing a sequence number (from which memory stream byte we start to send) and an ACK (from which memory stream byte we expect the next packet).

Exercise 2

It is not possible since $\text{SendBase} = \text{Ack} + \text{sequenceNumber}$.

Both will only grow with time so the receiver cannot receive a packet that has a smaller sequence number than the first sent.

Exercise 3

After all the layers, the headers represent h_n bytes.

The total message is Message + headers

$$\Rightarrow M + h_n$$

So the fraction of the network bandwidth that is filled with headers is

$$\frac{h_n}{M + h_n}$$

Exercise 4

OK

It makes sense to limit the number of threads in a server process because sometimes each thread will consume a lot of memory so to keep the process and system it runs on stable we can limit it.

It prevents from using the whole CPU and RAM memory, prevents swapping and makes sure the system is always responsive for other processes.

That is, of course, if the hardware is limited and/or each thread consumes a lot of resources.

If it is not, then there is no reason to limit it.

Exercise 5

OK

Connectionless communication such as the UDP protocol is not reliable unlike TCP, a connection-oriented communication protocol which is reliable.

When we need reliability, we use TCP for SSH for example.

When we need speed over reliability for games or video chat, we use UDP which is faster and best-effort: some packets can be lost on the way, but we can tolerate it.

TCP works like a telephone communication, UDP like mail. UDP can be made reliable, but that is by using the application layer.

