TD4 - Networks and protocols
TI602

In this tutorial, we are interested in IP fragmentation process.

Case study

We are interested in an online shooter video game platform where players control characters and compete in 3D space. Characters can interact with the environment and with other characters by attacking each other. This platform runs on a local network infrastructure, each player accesses the game on a machine on which his client application is running. A central server manages the synchronization of the game's views and actions: a client application sends data to the servers at a fairly high frequency on the position of the player's character, movements and the actions executed by the latter (in particular on the other players characters). The server after receiving this information, made a computation based on the actions and movements done (received) and distributes the updates to the other machines so that everyone can see everyone's state almost in real time locally on their machine. In this kind of games, the speed of the messages as well as the optimization of resources is very important in order to guarantee an optimal gaming experience (maximum data transmitted correctly and low latency for a view close to real time).

IP fragmentation

Considering the final configuration bellow (figure) from tutorial 3, the *sender (a client from room 4)* sends to the *receiver (server)* an IP packet update message of 5000 bytes including 20 bytes of header, 10 bytes of copied options and 30 bytes of uncopied options. The MTU of the network relating the two routers is set to 1500 and the MTU of the server network is set to 3000.

- Detail the fragmentation process of the IP packet:

1. Each fragment data, header and total length

2. Flags and related fields values: MF, offset

3. The reassembly of the different fragments