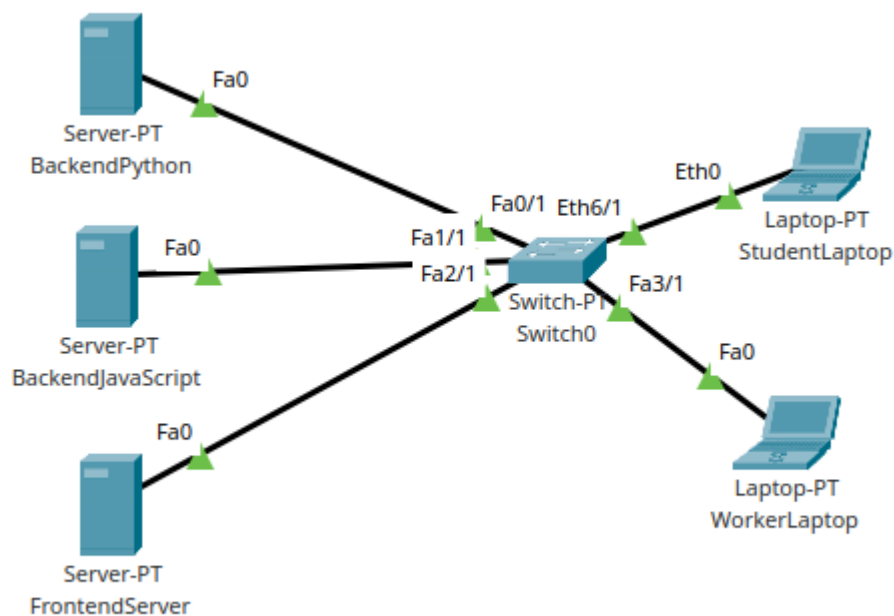


## Workshop Development

- **Network Design**

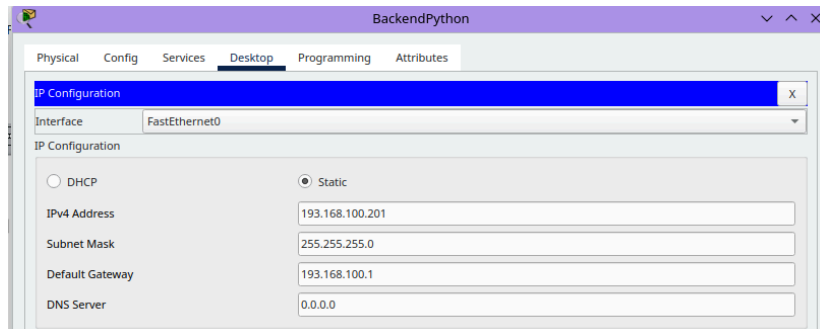


**Figure 1.** *Network design.*

This network design was chosen because it was required to add a Switch-PT to connect the 3 servers and the 2 laptops. The 3 servers (BackendPython, BackendJavaScript and FrontendServer) were configured as follows:

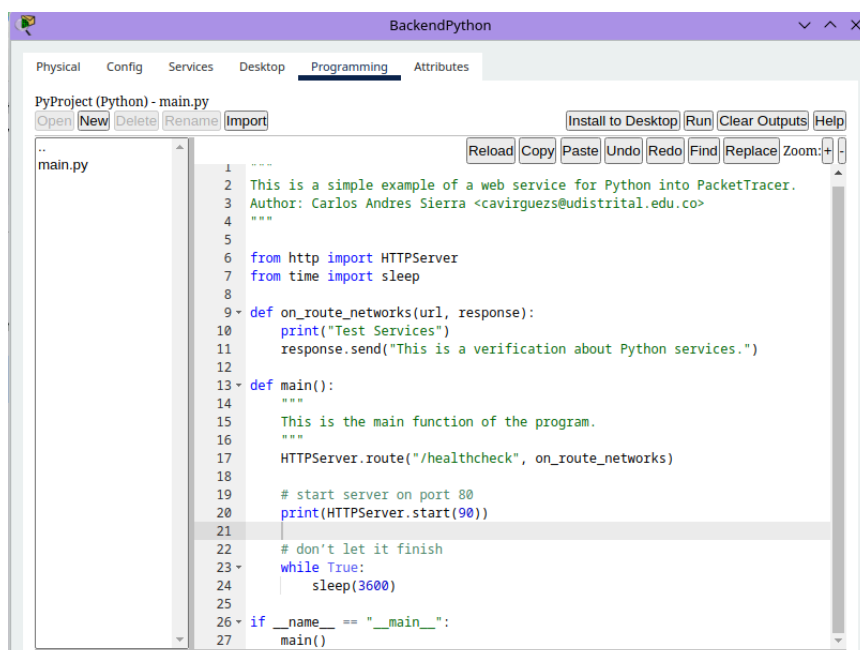
- **BackendPython Server:**

First, the IP, subnet mask and default gateway addresses were added:



**Figure 2.** *IP Configuration for BackendPython Server*

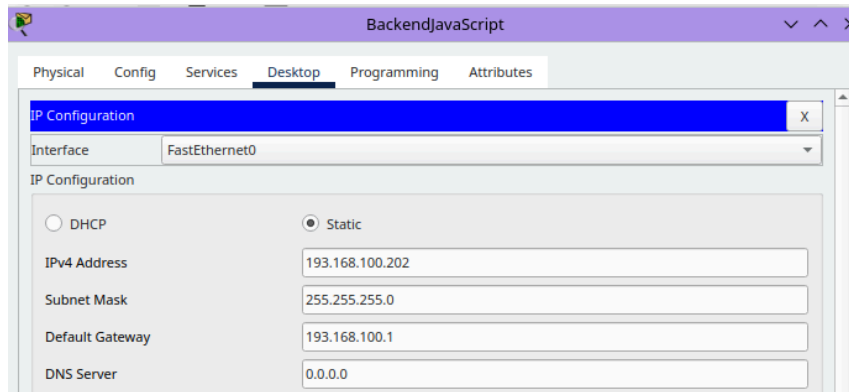
Then, in the programming section, a Python Project called PyProject was created, with its main file called main.py as shown below:



**Figure 3.** *Python project created*

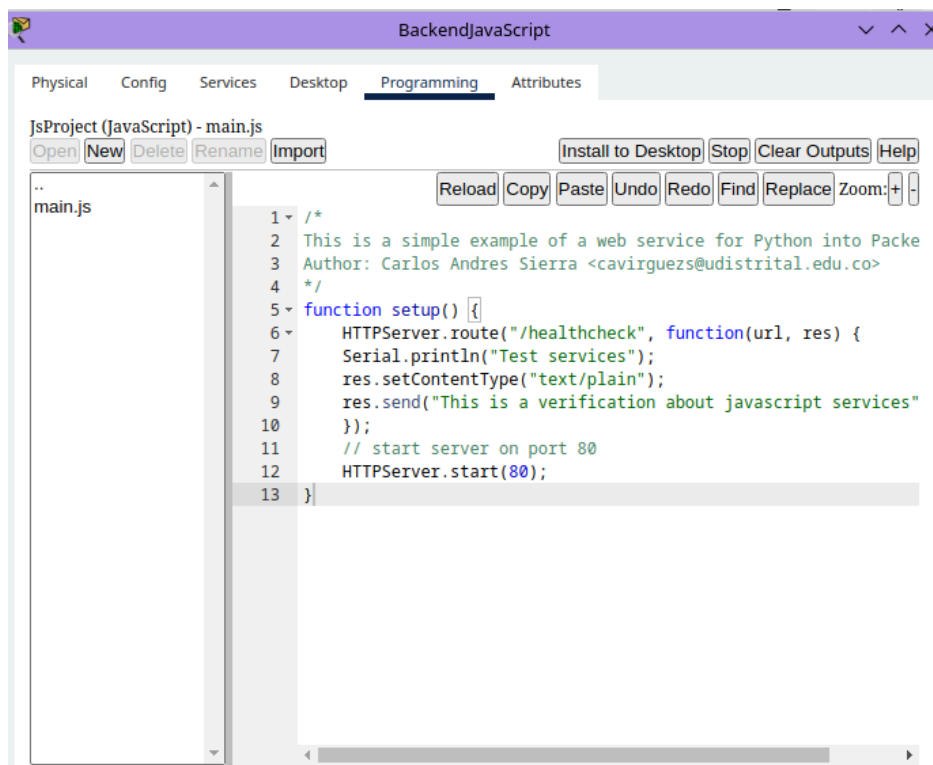
- **BackendJavaScript Server:**

Once this was done, the configuration of the BackendJavaScript Server started. First, the IP, subnet mask and default gateway addresses were added:



**Figure 4.** *IP Configuration for BackendJavaScript Server*

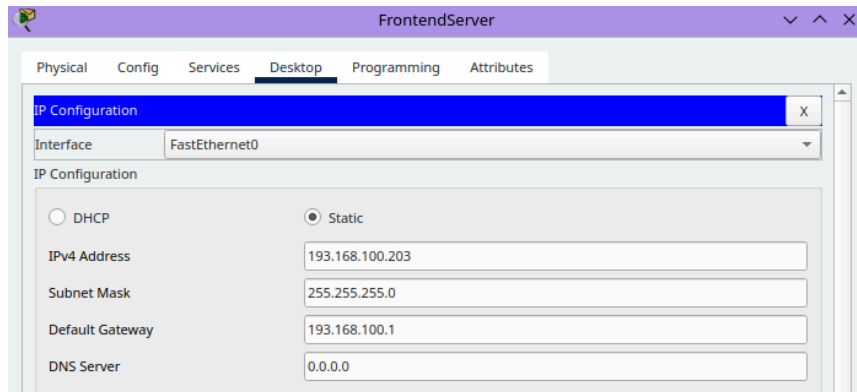
Then, in the programming section, a JavaScript Project called JsProject was created, with its main file called main.js as shown below:



**Figure 5.** *JavaScript project created*

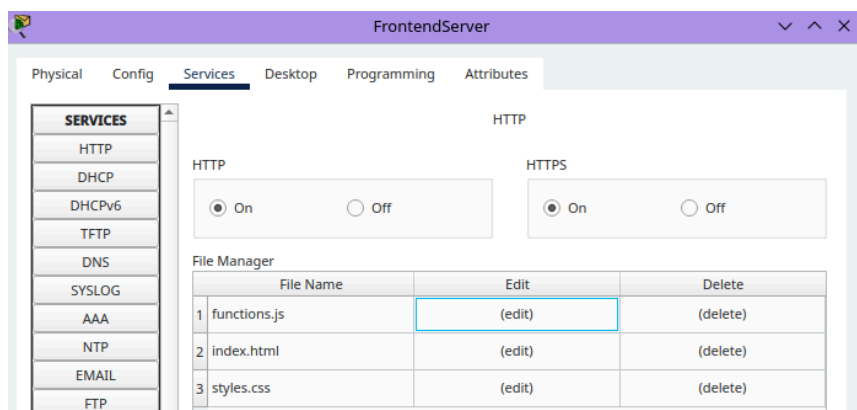
- **FrontendServer Server:**

Once this was done, the configuration of the FrontendServer Server started. First, the IP, subnet mask and default gateway addresses were added:



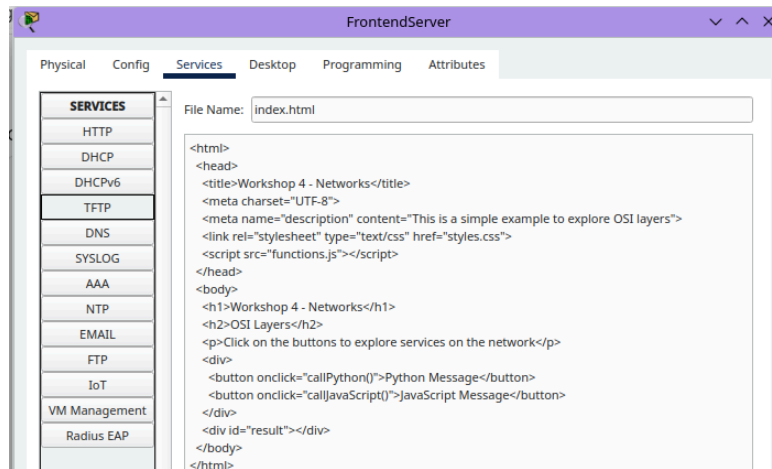
**Figure 6.** *FrontendServer IP configuration*

Then, it was time to configure the HTTP Service for the FrontendServer. For this, 3 files were created: index.html, styles.css and functions.js as shown below:

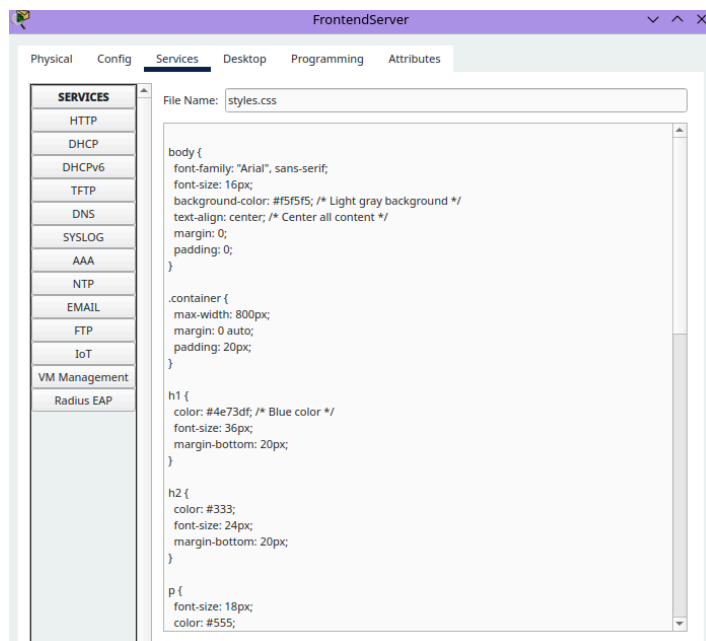


**Figure 7.** *HTTP Service configuration*

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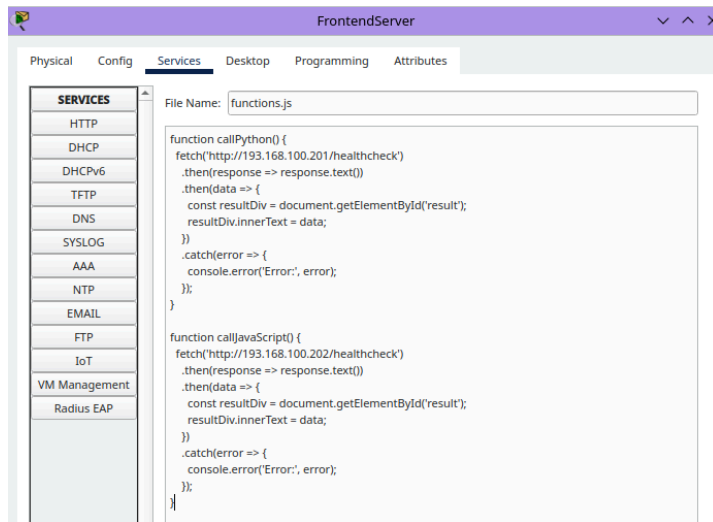


**Figure 8.** *Creation of the index.html file*



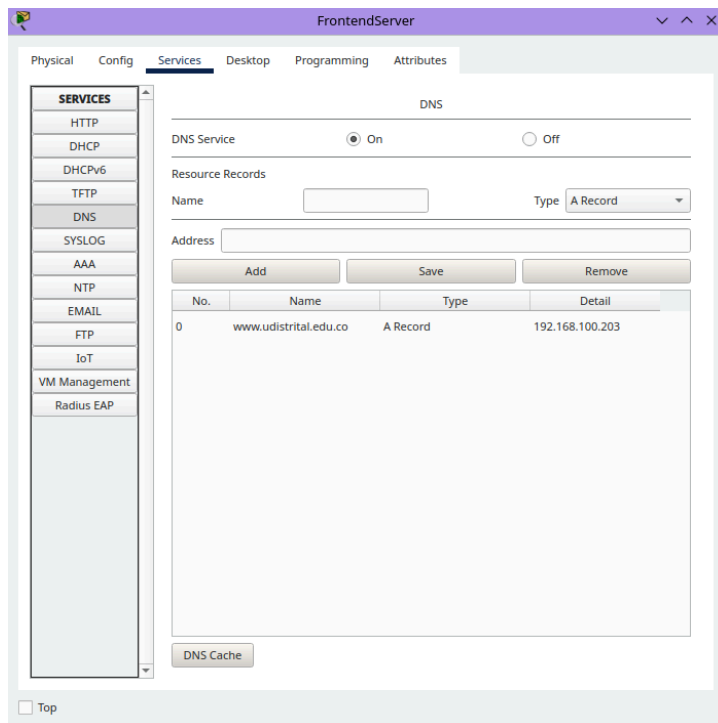
**Figure 9.** *Creation of the styles.css file*

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**Figure 10.** *Creation of the functions.js file*

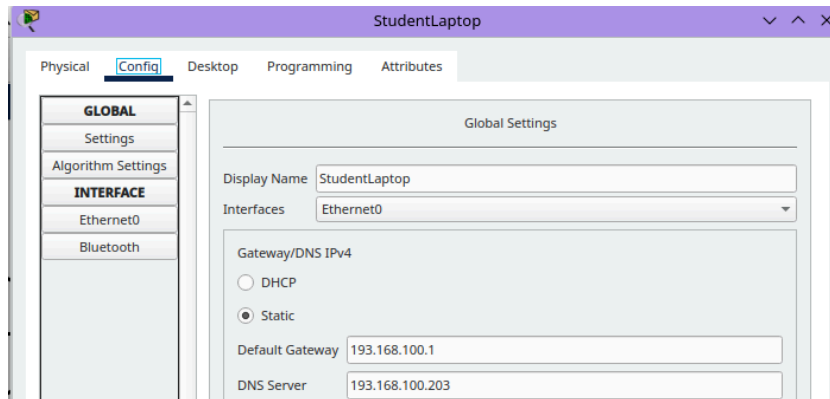
Then, it was time to configure the DNS of the FrontendServer. For this, all that as needed was to add the URL to access the web server on the IP address 193.168.100.203:



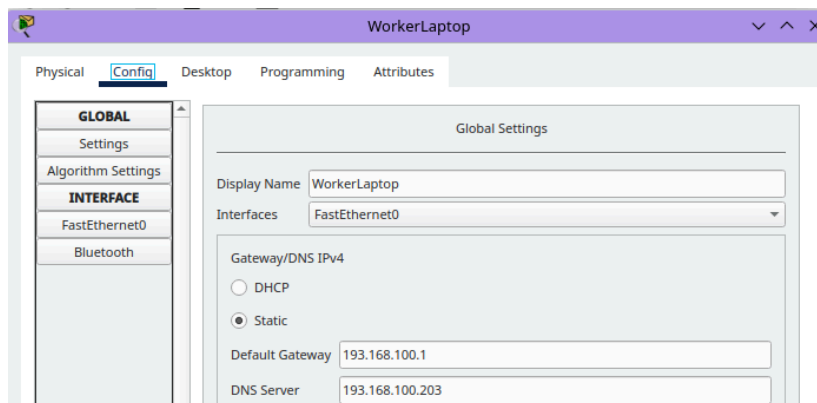
**Figure 11.** *Configuration of the DNS for the FrontendServer*

- **StudentLaptop and WorkerLaptop Configuration:**

Once this was done, it was time to configure the computers. For this, it was only needed to configure its IP addresses and their DNS Server as shown below:



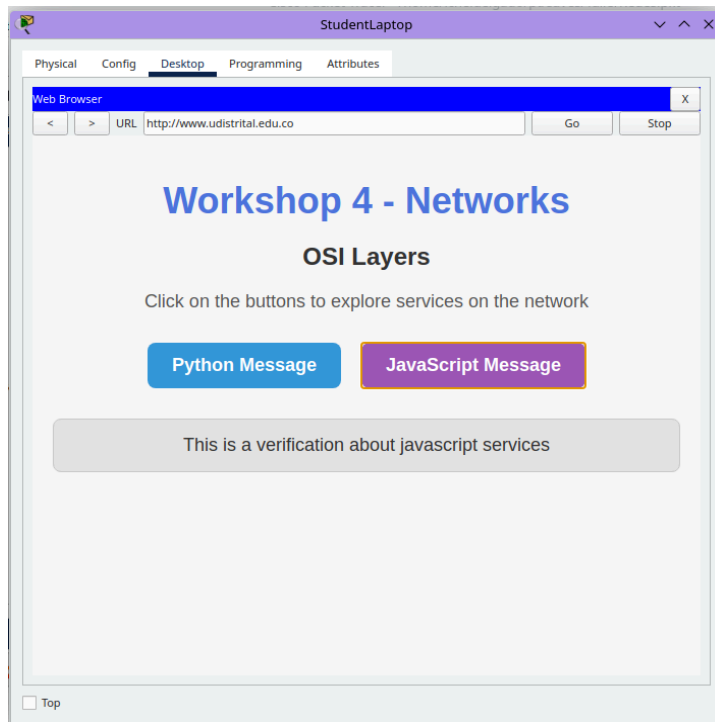
**Figure 12.** *IP Configuration of StudentLaptop*



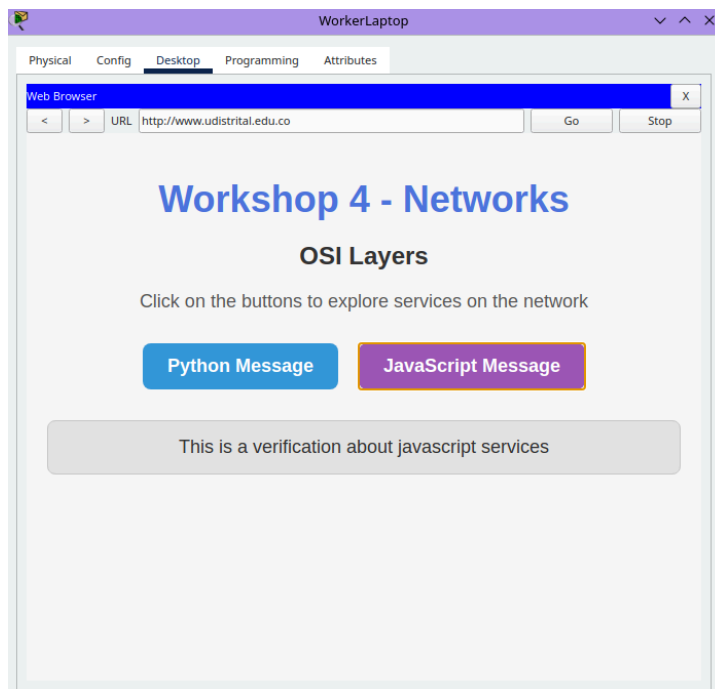
**Figure 13.** *IP Configuration of WorkerLaptop*

- **Accessing [www.udistrital.edu.co](http://www.udistrital.edu.co):**

With all of these configurations done, the Packet Tracer design was done: the computers were ready to access the FrontendServer and the FrontendServer was able to communicate with the BackendPython and BackendJavaScript:



**Figure 14.** Accessing [www.udistrital.edu.co](http://www.udistrital.edu.co) from StudentLaptop

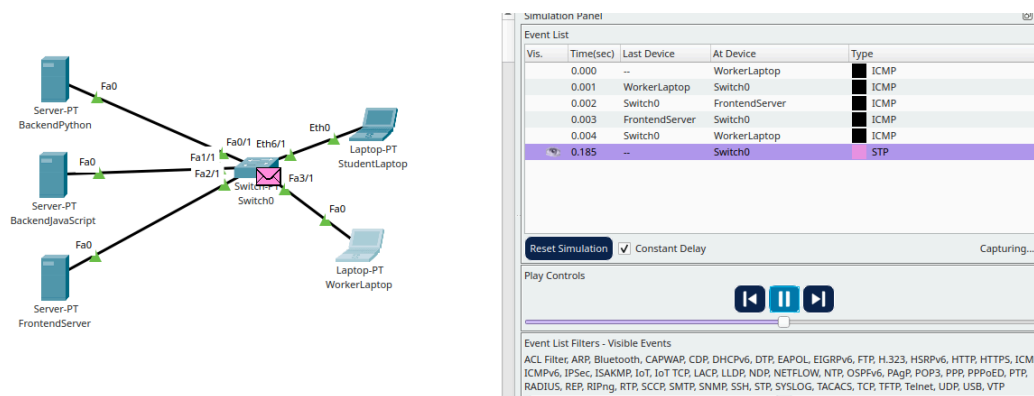


**Figure 15.** Accessing [www.udistrital.edu.co](http://www.udistrital.edu.co) from StudentLaptop



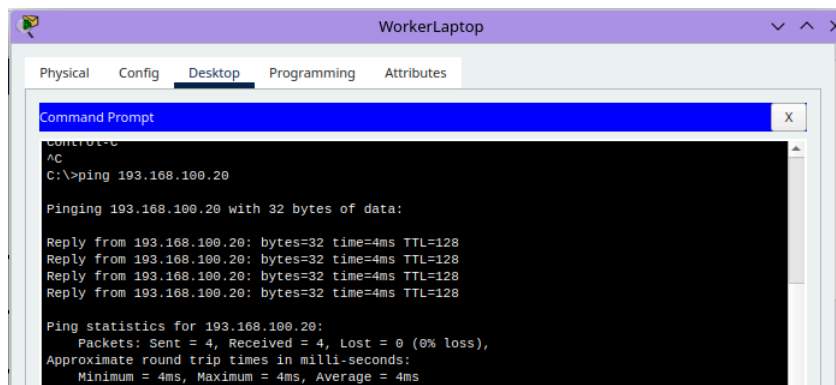
- **Usage of the simulation option:**

The simulation option allows the user to observe, analyse and debug the network while the processes are taking place but in a controlled and detailed way. With this in mind, the simulation tool was used to observe the behaviour of the network while sending a ping from WorkerLaptop to FrontendServer. This time, the simulation is only showing the ICMP protocol because the test was made with sending a ping from a device to another:



**Figure 16.** *Usage of the simulation option*

With this option, the user is able to see the detailed router that every packet travels from WorkerLaptop to FrontendServer in a didactic and animated way, different from the device terminal, which shows less information:



Looking at the simulation detail, it is possible to see the application layer through the ping (the user access [www.udistrital.edu.co](http://www.udistrital.edu.co)). It is also possible to locate the network layer as the IP routes the packets through the red with IPv4 and also the physical layer because the packets travel from WorkerLaptop to the Switch and then to the FrontendServer and back.