Universiteit Antwerpen

Title: HOW THE SERVER REPLIES TO NODEMCU DATA?

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INHOUD

Intro

In this project we discuss on how to receive the data from nodeMCU and reply back back to it.

Materials and Methods

- nodeMCU
- Ubuntu Server
- Netbeans (Java IDE or integrated development environment)

DHCP server:

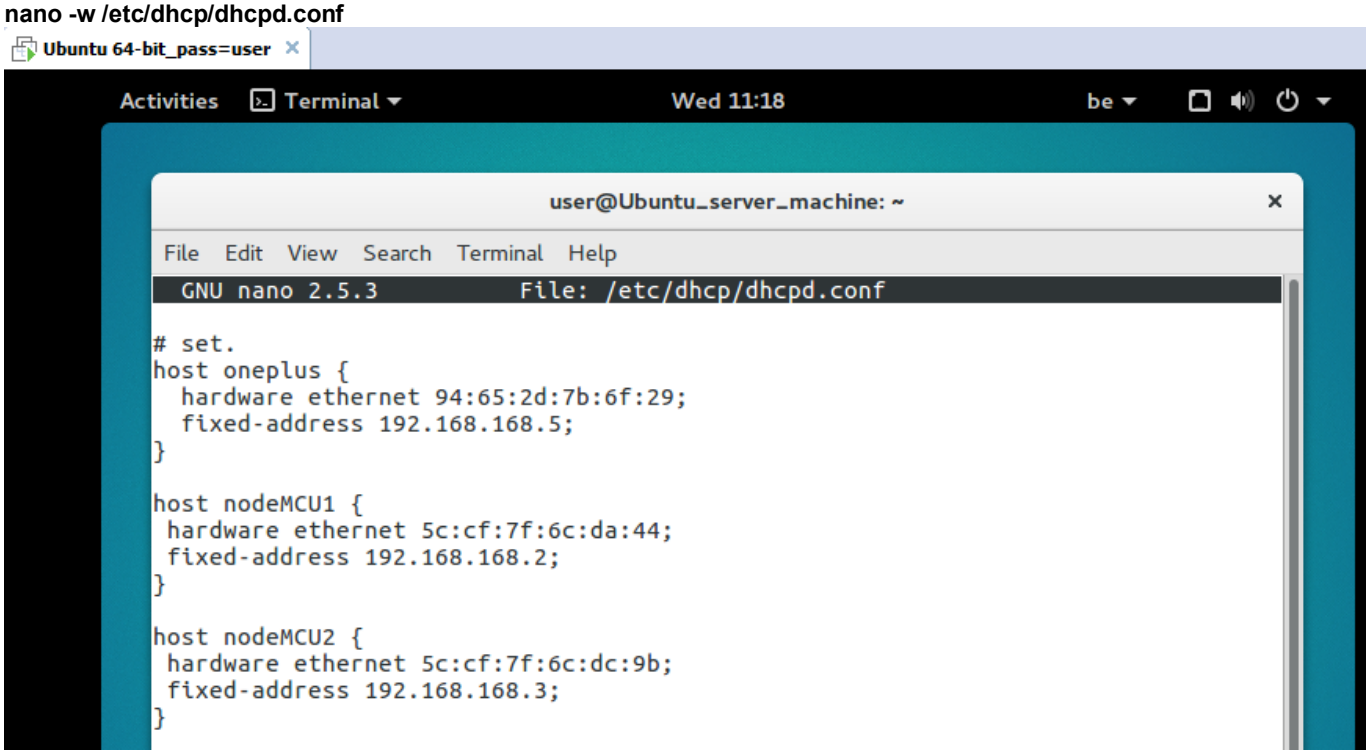
First of all we might want to give our nodeMCUs permanent IP addresses to make things easier. Whenever these chips are connected to our wireless hotspot, they always get the same IP address assigned. To configure a DHCP we do the following:

1. Installing DHCP server: we type the following command in Ubuntu terminal

sudo apt-get install isc-dhcp-server

2. Configuring DHCP server: we edit the configuration file in Ubuntu server as follows:

nano -w /etc/dhcp/dhcpd.conf



In the picture above the DHCP server is configured to assign the above IP addresses to devices which have the above MAC addresses. Please note that a MAC address is a unique address in the world which is assigned to any device which connects to a network either wired or wirelessly. It is in the form a1:b2:c3:d4:e5:f6 where the letters can be random and in any order.

3. Starting the DHCP server:

To start or stop the DHCP server, we use any of the following commands necessary.

sudo service isc-dhcp-server restart

sudo service isc-dhcp-server start

sudo service isc-dhcp-server stop

Netcat

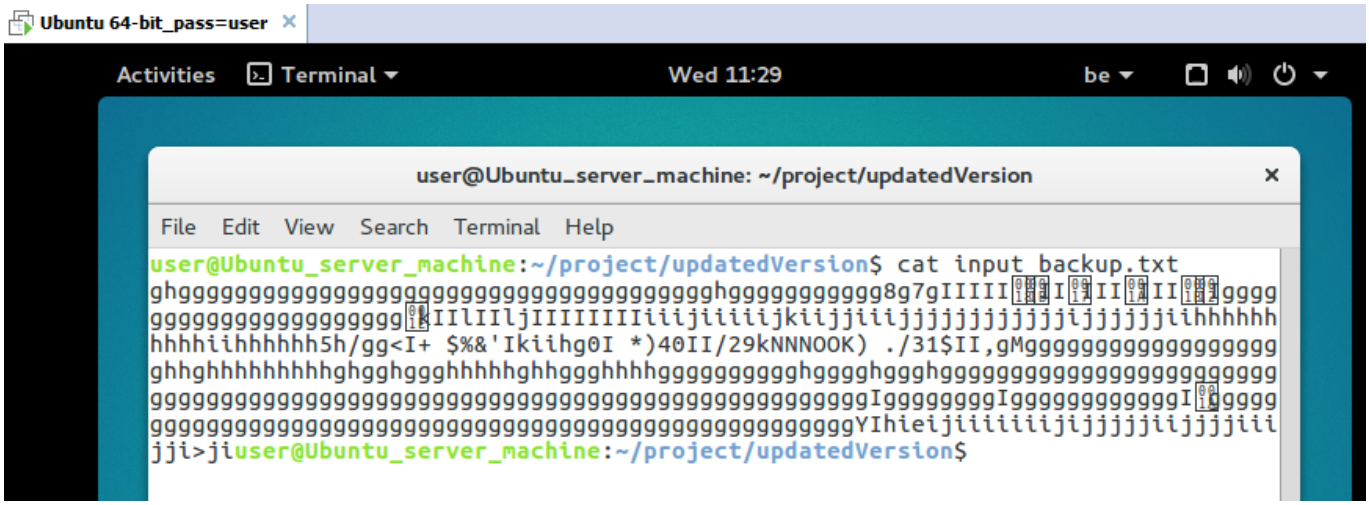
We need to find a way to receive any data from our nodeMCU to the server assuming the wireless connection has already been established. For this to work we use a Linux tool called netcat as follows:

“nc –l –u 2000 >> input.txt”

This command listens to any device sending data on port 2000 on UDP channel and appends that data in a text file called input.txt

If we have multiple devices to listen to, we might configure different UDP ports for example port 2000, 2001, etc. to distinguish between the devices. Please note that we should also store the data in different files called input.txt for example input1.txt, input2.txt etc.

In the picture below is an actual data sequence received from a nodeMCU.



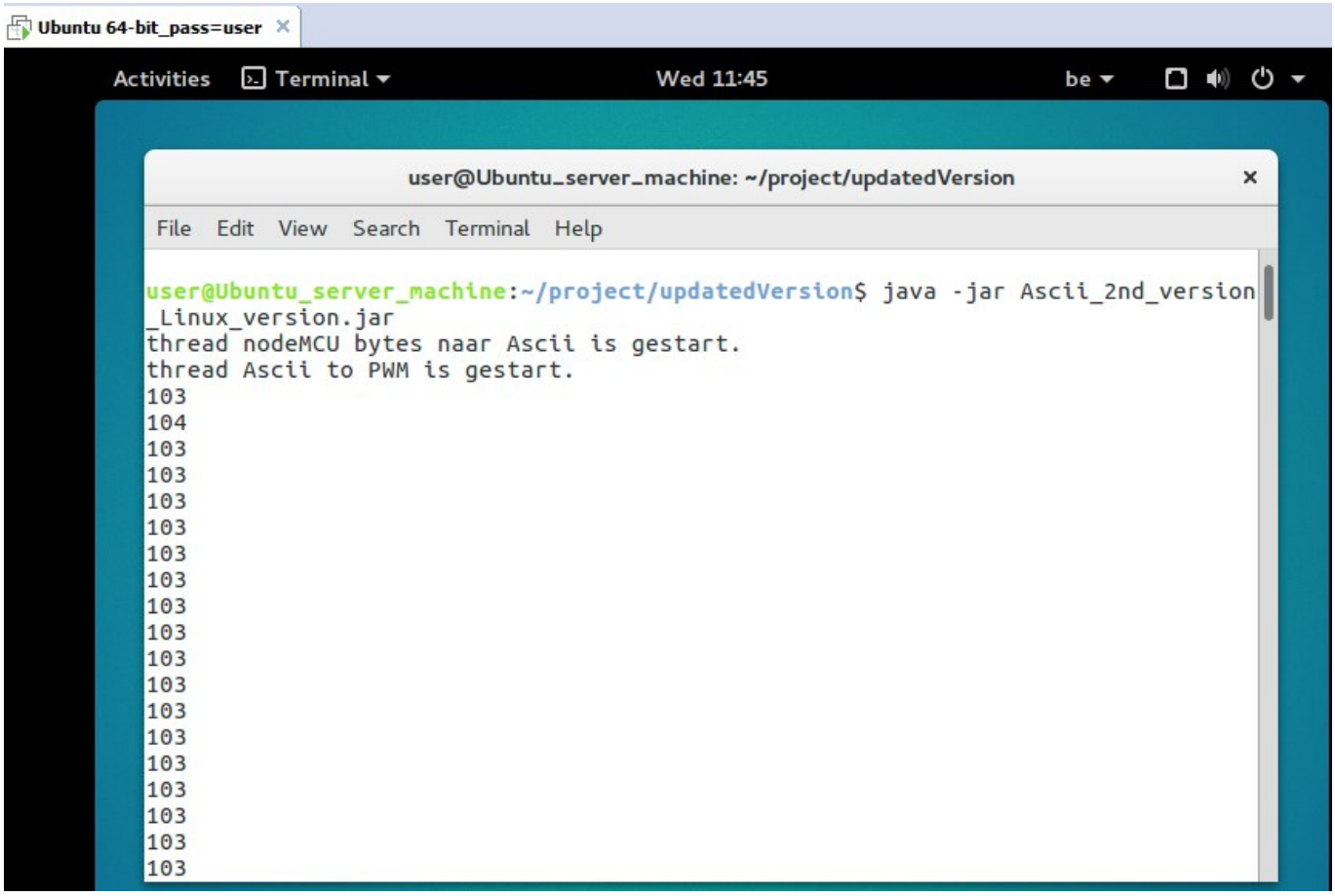
Manipulating the data

At this moment the actual bytes received from nodeMCU doesn't mean anything beneficial. Gauthier who is responsible for transmitting data from a nodeMCU noted that these bytes should be expressed as ASCII numbers. So we decided to make a script or program on the server to convert these bytes into their respective ASCII numbers in real-time. After some research I decided to make a java program to do this job. The only reason is because I am more comfortable with Java programming language than any other ones. Since the code is a bit lengthy it will be uploaded as attachments.

Beschrijft alle materialen (software, apparatuur,…) en methoden die gebruikt werden in detail.
Beschrijf de methodes voor het verzamelen en verwerken van de resultaten die je gebruikte..
Neem alle informatie op die nodig is om het werk te herhalen.
Resultaten of conclusies mogen in dit deel niet voorkomen.

Results

After running the Java code, we generated the following output which was stored in a file called output.txt.



Information & conclusion

The generated output can be manipulated in any way to send the response to the nodeMCU. For example to reply with the same bytes received from nodeMCU but in ASCII form, we have to type the following command in Ubuntu terminal.
“java –jar Ascii_2de_version_Linux_version.jar | nc –u 192.168.168.2 3000“
Assuming the nodeMCU has IP address 192.168.168.2 and is listening on port 3000 on UDP channel. It would be decided later on the specifics of which bytes to manipulate and exactly what reply to send back to the nodeMCU.

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Extra Documents

The java code as .java extension files.