



SMART MONITORING DEVICE

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ABSTRACT

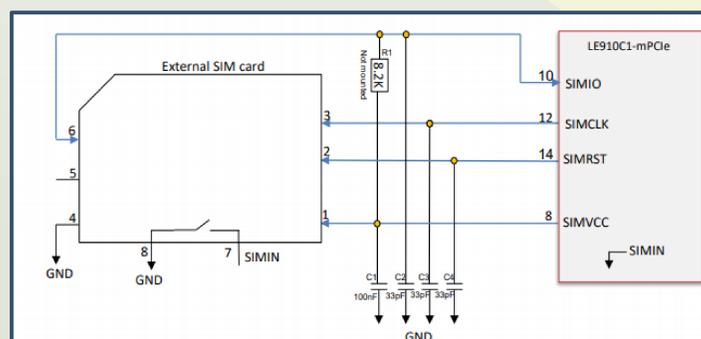
Along with advancements in technologies, the number of users using them is also increasing at a faster rate, leading us to think about backup options. Our project focuses on such additional backup connectivity options to ensure the designed system's proper working in any undesired behavior. A mini-computer is the primary basis for the project, and other components interface with the computer for providing desired results. Ethernet is the main form of connectivity for the system, and whenever ethernet goes down, designing a backup connectivity circuit is the main motive of this project.

OBJECTIVE

Smart Monitoring Device is an IoT and connectivity backup-based system, where the mini-computer actively interacts with the connected nodes as the sensors like temperature, humidity, weather, power relay, etc. This system access internet via the ethernet connection, but the stability of the connection might not be assured. Therefore, this project aims to give additional backup connectivity to the system with the attached LTE support. Hence, whenever the Internet via ethernet disconnects, the system can still be accessed using the Internet via LTE based sim connectivity

DESIGN AND DEVELOPMENT

The basic block diagram provides an overview of the whole project. An LTE Module compatible with mini-computer is used for this purpose. This mini-computer is connected to Ethernet to access the Internet. Whenever the Ethernet goes down, a backup connectivity option of the LTE Module is chosen. The module gets activated automatically, keeping the Banana Pi online by using data from the SIM. Internet Connectivity is tested using Python Code.



EXPLANATION AND RESULTS

The above-shown circuit is designed for sim card detection using 0786463001 Sim Card Holder and DALC208 diode array. Sim card holder has six pins, out of which VDD, GND, CLK, RST are input pins, and I/O is the input-output pin used for data transfer. These pins are connected to the LTE module to their respective pins. This LTE module is then connected to Banana Pi using UART Tx and Rx pins. These Tx and Rx pins are used to interface LTE module using PPP connection

```
# Importing socket library
import socket

# Function to display hostname and
# IP address
def get_Host_name_IP():
    try:
        host_name = socket.gethostname()
        host_ip = socket.gethostbyname(host_name)
        print("Hostname : ",host_name)
        print("IP : ",host_ip)
    except:
        print("Unable to get Hostname and IP")

# Driver code
get_Host_name_IP() #Function call

IPAddress=socket.gethostbyname(socket.gethostname())
if IPAddress=="127.0.0.1":
    print("No internet, your localhost is "+ IPAddress)
else:
    print("Connected, with the IP address: "+ IPAddress )
```

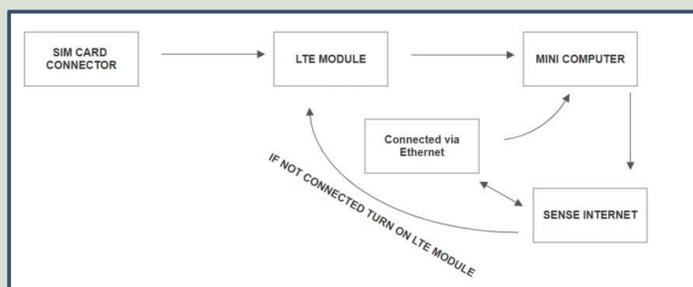
```
Python 3.7.8

Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: =====
Hostname : Yoganand
IP : 192.168.1.13
Connected, with the IP address: 192.168.1.13
>>>
===== RESTART: =====
Hostname : Yoganand
IP : 127.0.0.1
No internet, your localhost is 127.0.0.1
>>>
===== RESTART: =====
Hostname : Yoganand
IP : 127.0.0.1
No internet, your localhost is 127.0.0.1
>>>
===== RESTART: =====
Hostname : Yoganand
IP : 127.0.0.1
No internet, your localhost is 127.0.0.1
>>> |
```

CONCLUSIONS

Most of the systems have their source of internet connection either through Ethernet or WIFI. If the internet server gets down due to some reasons, both of these options might not work and especially for real-time updating systems, it is mandatory to keep track of data without loss of connectivity. In such cases having a back-up internet connectivity option provides additional benefits. Our project is based on such systems where internet connection is the first priority.

This project can be further extended by using better LTE Modules to support higher speeds and smooth switching between the frequency bands of different carriers.



REFERENCES

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