

### 1. Introduction:

To transmit the student data to the Central Server for obtaining an authentication key to unlock the door for valid students using TCP.

### 2. Scope: Applicable for the Twinkle Door Access System

### 3. The folder where the program resides and how to execute them from the start:

In Local Server (Raspberry Pi, IP addr: 10.32.26.20):

**Location:** /home/pi/Desktop/Integrate\_DB\_TCP/Multiuser

**Name of the file:** TCP\_Data\_Store\_DB\_v3.py

**Dependent file:** TCP\_Data\_Connect\_Cent\_Serv.py

How to execute the program in Local Server:

- Open the terminal.
- Change the directory by typing:  
“cd /home/pi/Desktop/Integrate\_DB\_TCP/Multiuser”
- To run the program type:  
“python3 TCP\_Data\_Store\_DB\_v3.py”

In Central Server (Raspberry Pi, IP addr:10.32.26.70)

**Location:** /home/pi/Desktop/Integrate\_DB\_TCP/

**Name of the file:** TCP\_Data\_Store\_DB\_v2.py

How to execute the program in Central Server:

- Open the terminal.
- Change the directory by typing:  
“cd /home/pi/Desktop/Integrate\_DB\_TCP/”
- To run the program type:  
“python3 TCP\_Data\_Store\_DB\_v2.py”

4. **Guide to install the program and configure various parameters:** The program is a self-written script.

**Parameters to be configured:**

- In the Central Server:

1. In the program TCP\_Data\_Store\_DB\_v2.py, update the parameter:  
“list\_valid\_twinklet\_for\_twinkler1”,

For example: To provide the access for TwinkleT ID: 17,  
Add “list\_valid\_twinklet\_for\_twinkler1= {‘17’}”

Every student has a unique TwinkleT ID, on updating the above parameter with the TwinkleT ID, only the valid students will get the authentication.

2. In the program TCP\_Data\_Store\_DB\_v2.py, update the port number in the main function accordingly.

**Note:**

For example: Port number=5002

Make the changes in line number 107:  
“port=5002”

- In the Local Server:

1. In the program TCP\_Data\_Connect\_Cent\_Serv.py:  
In the function client\_program ():

Update the Central Server’s IP address and port number accordingly.

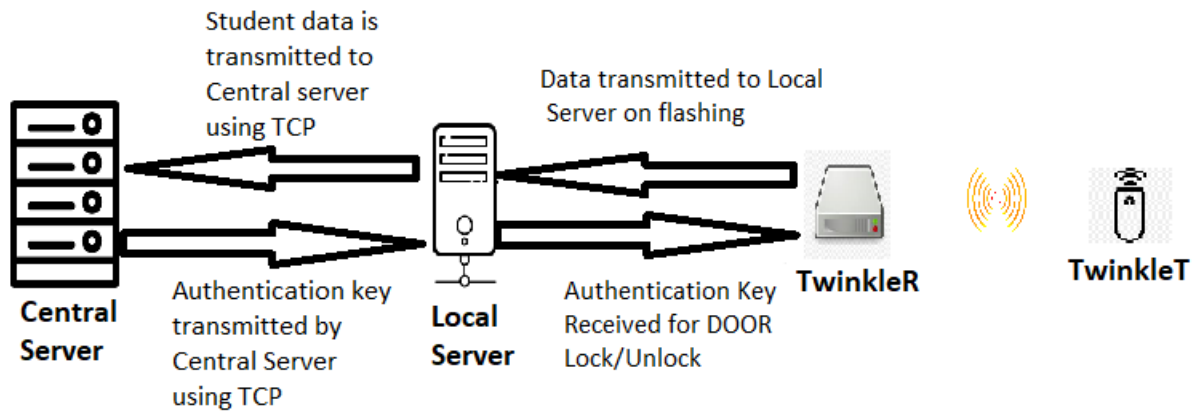
**NOTE: The port number in “TCP\_Data\_Store\_DB\_v3.py” of Central Server and port number in “TCP\_Data\_Connect\_Cent\_Serv.py” of Local Server has to be same.**

For example: If the Central Server is configured with port number=5002, then the local server should also be configured with the same port number=5002. If the Central Server’s IP address is “10.32.26.70”,

Make changes in line number: 18 and 19

“host=”10.32.26.70””  
“port=5002”

## 5. Detailed Description with diagrams:



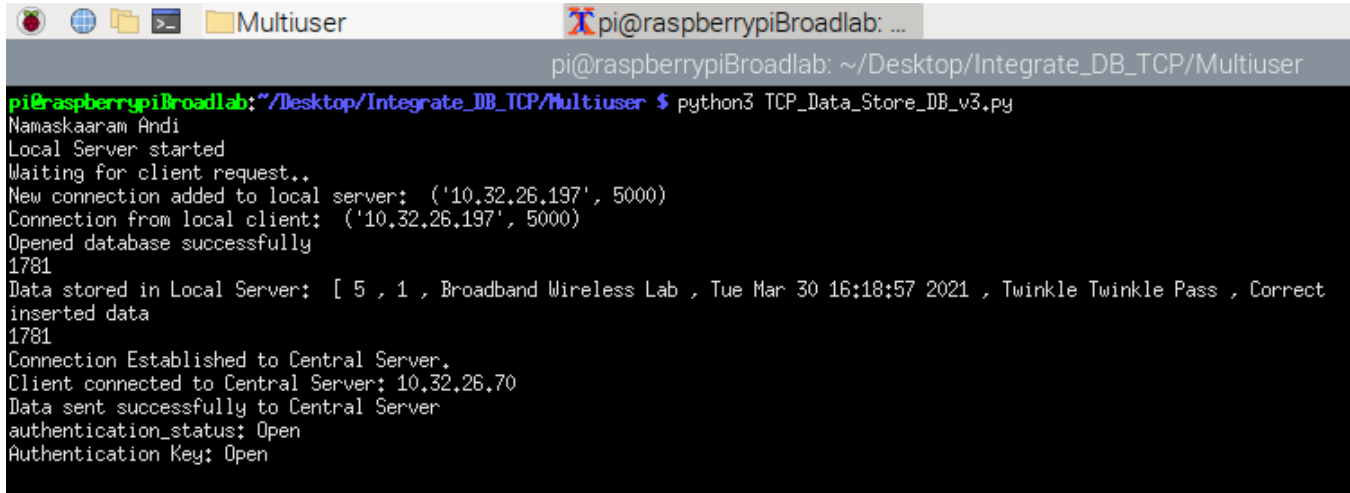
- On student flashing the device (TwinkleT) to the TwinkleR, the data is transmitted to the Local Server.
- Local Server in turn transmits this data to the Central Server.
- On receiving this data, the Central Server reviews the TwinkleT ID and if the ID is included in the valid list of TwinkleT's, an "Open" Key is transmitted to the Local Server.
- The Local Server transmits it to the TwinkleR, for unlocking the door.

## Screenshots:

**Central Server:** Terminal view on reception of valid TwinkleT ID:

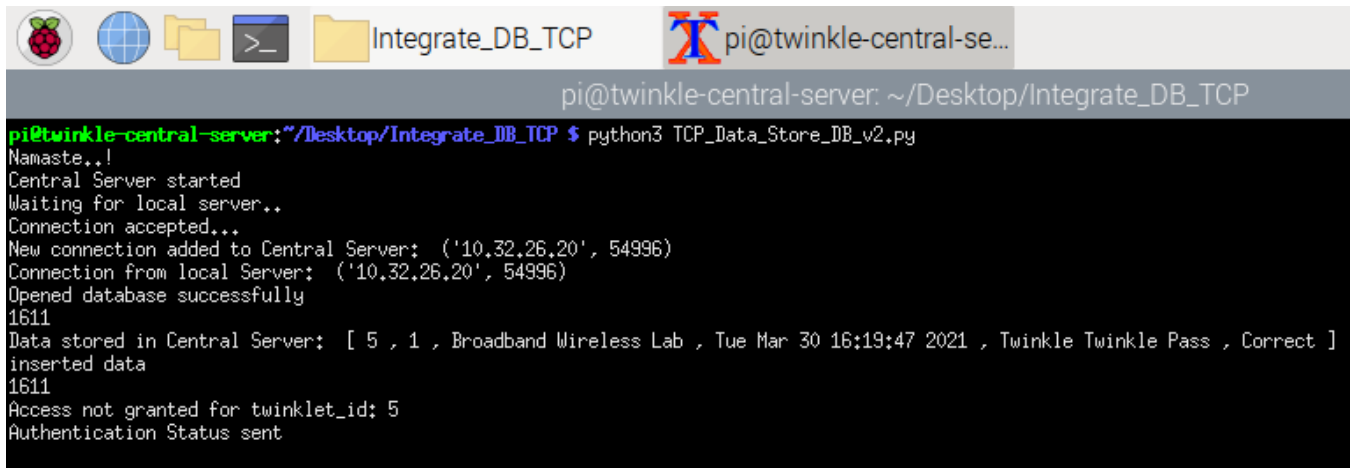
```
pi@twinkle-central-server: ~/Desktop/Integrate_DB_TCP
pi@twinkle-central-server: ~/Desktop/Integrate_DB_TCP
pi@twinkle-central-server: ~/Desktop/Integrate_DB_TCP $ python3 TCP_Data_Store_DB_v2.py
Namaste..!
Central Server started
Waiting for local server..
Connection accepted...
New connection added to Central Server: ('10.32.26.20', 54994)
Connection from local Server: ('10.32.26.20', 54994)
Opened database successfully
1610
Data stored in Central Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 16:18:46 2021 , Twinkle Twinkle Pass , Correct ]
inserted data
1610
Access granted for twinklet_id: 5
Authentication Status sent
```

**Local Server:** Terminal view when a valid student flashes the TwinkleT:

A terminal window titled 'Multiuser' with a Raspberry Pi icon in the title bar. The prompt is 'pi@raspberrypiBroadlab: ~/Desktop/Integrate\_DB\_TCP/Multiuser'. The user has run 'python3 TCP\_Data\_Store\_DB\_v3.py'. The output shows the local server starting, waiting for a client, receiving a connection from '10.32.26.197', opening a database, and storing data. It then connects to a central server at '10.32.26.70' and sends the data successfully.

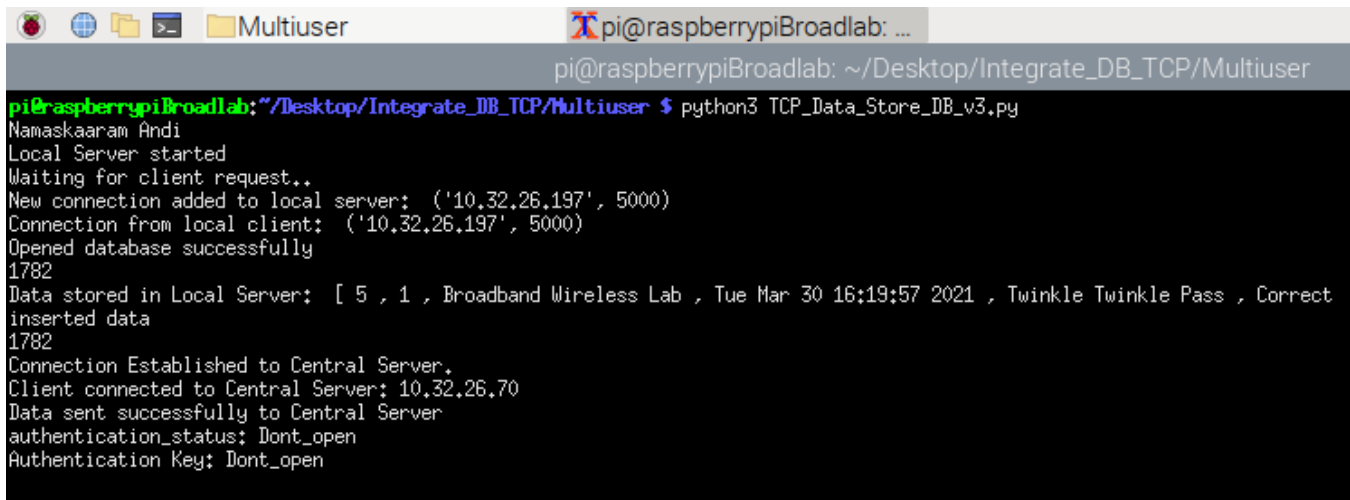
```
pi@raspberrypiBroadlab:~/Desktop/Integrate_DB_TCP/Multiuser $ python3 TCP_Data_Store_DB_v3.py
Namaskaaram Andi
Local Server started
Waiting for client request..
New connection added to local server: ('10.32.26.197', 5000)
Connection from local client: ('10.32.26.197', 5000)
Opened database successfully
1781
Data stored in Local Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 16:18:57 2021 , Twinkle Twinkle Pass , Correct
inserted data
1781
Connection Established to Central Server.
Client connected to Central Server: 10.32.26.70
Data sent successfully to Central Server
authentication_status: Open
Authentication Key: Open
```

**Central Server:** Terminal view on reception of invalid TwinkleT ID:

A terminal window titled 'Integrate\_DB\_TCP' with a Raspberry Pi icon in the title bar. The prompt is 'pi@twinkle-central-se...'. The user has run 'python3 TCP\_Data\_Store\_DB\_v2.py'. The output shows the central server starting, waiting for a local server, accepting a connection from '10.32.26.20', opening a database, and storing data. It then receives an access request for 'twinklet\_id: 5' and denies it.

```
pi@twinkle-central-server:~/Desktop/Integrate_DB_TCP $ python3 TCP_Data_Store_DB_v2.py
Namaste..!
Central Server started
Waiting for local server..
Connection accepted...
New connection added to Central Server: ('10.32.26.20', 54996)
Connection from local Server: ('10.32.26.20', 54996)
Opened database successfully
1611
Data stored in Central Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 16:19:47 2021 , Twinkle Twinkle Pass , Correct ]
inserted data
1611
Access not granted for twinklet_id: 5
Authentication Status sent
```

**Local Server:** Terminal view when a valid student flashes the TwinkleT:



```
pi@raspberrypiBroadlab: ~/Desktop/Integrate_DB_TCP/Multiuser
pi@raspberrypiBroadlab:~/Desktop/Integrate_DB_TCP/Multiuser $ python3 TCP_Data_Store_DB_v3.py
Namaskaaram Andi
Local Server started
Waiting for client request..
New connection added to local server: ('10.32.26.197', 5000)
Connection from local client: ('10.32.26.197', 5000)
Opened database successfully
1782
Data stored in Local Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 16:19:57 2021 , Twinkle Twinkle Pass , Correct
inserted data
1782
Connection Established to Central Server.
Client connected to Central Server: 10.32.26.70
Data sent successfully to Central Server
authentication_status: Dont_open
Authentication Key: Dont_open
```

**6. Details about any scripts or 3rd party programs:**

No third-party program is implemented here

**7. Platforms required for running the programs (PC/RPi ...):**

Raspberry Pi, Windows with Visual Studio, PyCharm, Linux Systems.