

### 1. Introduction:

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

### 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\_UDP/Multiuser

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

**Dependent file:** UDP\_Data\_Connct\_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\_UDP/Multiuser”
- To run the program type:  
“python3 UDP\_Data\_Store\_DB\_v3.py”

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

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

**Name of the file:** UDP\_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\_UDP/”
- To run the program type:  
“python3 UDP\_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 `UDP_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 `UDP_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 `UDP_Data_Connect_Cent_Serv.py`:  
In the function `client_program ()`:

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

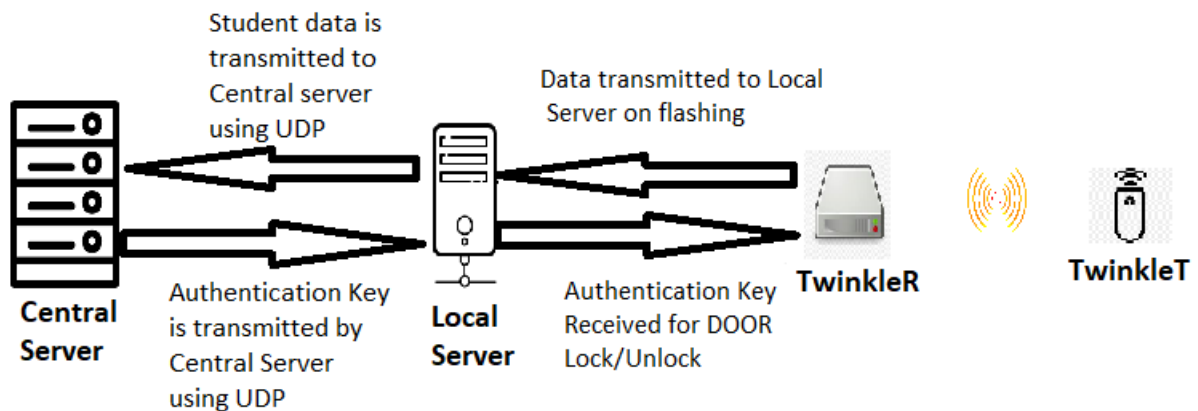
**NOTE: The port number in “UDP\_Data\_Store\_DB\_v3.py” of Central Server and port number in “UDP\_Data\_Connect\_Cent\_Serv.py” of Local Server has to be same.**

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:



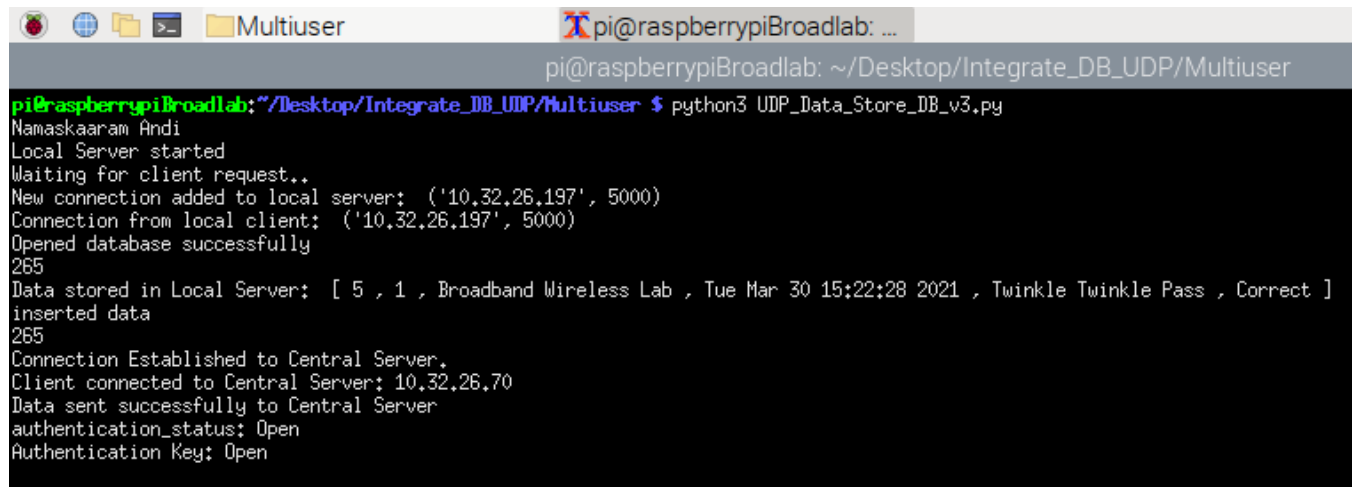
- On student flashing the device (TwinkleT) to the TwinkleR, the data is transmitted to the Local Server.
- Local Server in turn transmits this data to the Central Server.
- On receiving this data, the Central Server reviews the TwinkleT ID and if the ID is included in the valid list of TwinkleT's, an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

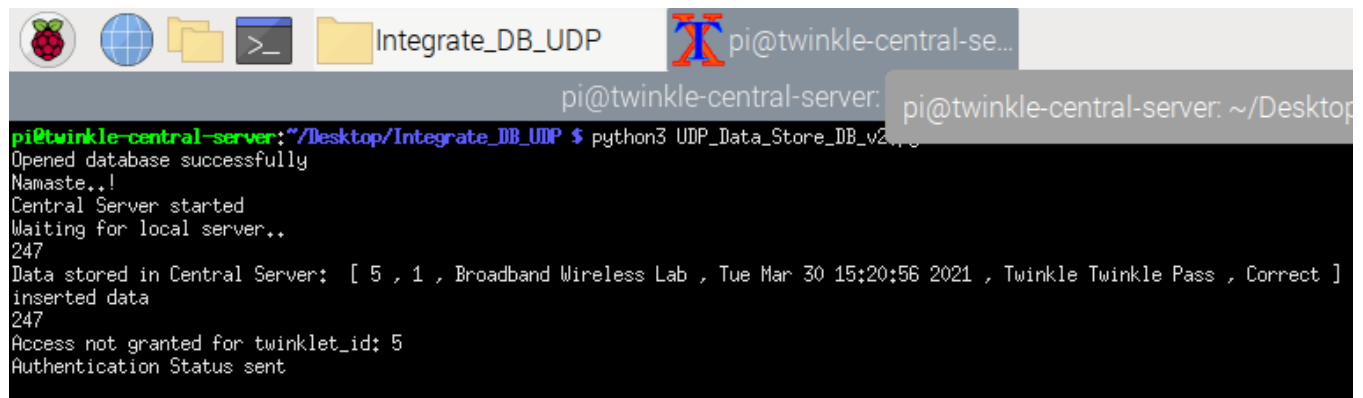
```
pi@twinkle-central-server: ~/Desktop/Integrate_DB_UDP
pi@twinkle-central-server:~/Desktop/Integrate_DB_UDP $ python3 UDP_Data_Store_DB_v2.py
Opened database successfully
Namaste..!
Central Server started
Waiting for local server..
248
Data stored in Central Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 15:22:17 2021 , Twinkle Twinkle Pass , Correct ]
inserted data
248
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\_UDP/Multiuser'. The user has run 'python3 UDP\_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: '[ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 15:22:28 2021 , Twinkle Twinkle Pass , Correct ]'. It then establishes a connection to a central server at '10.32.26.70' and sends the data successfully, with authentication status 'Open' and key 'Open'.

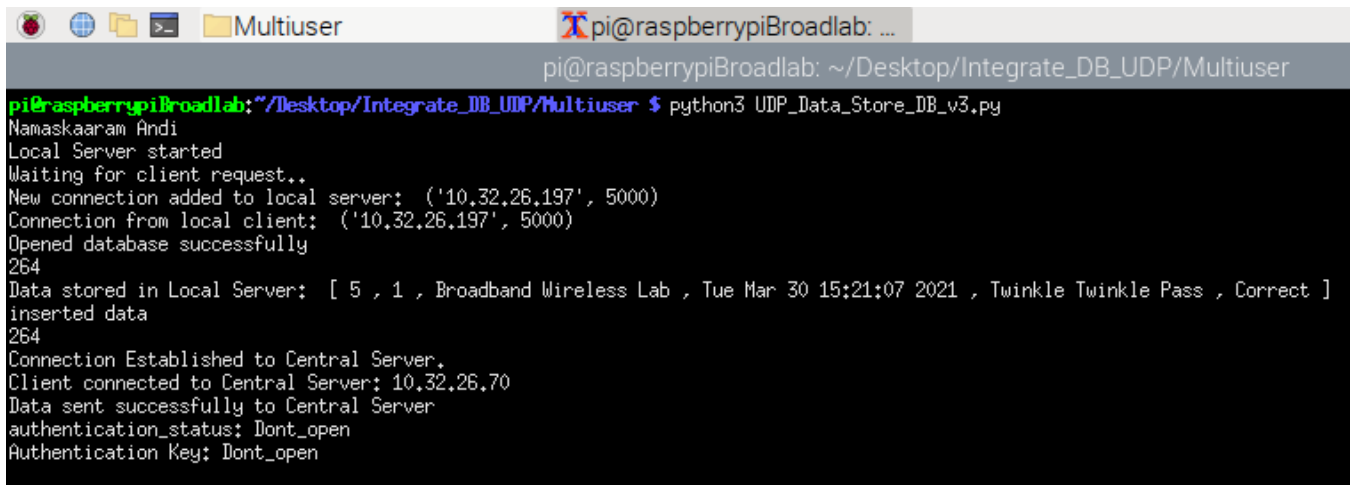
```
pi@raspberrypiBroadlab: ~/Desktop/Integrate_DB_UDP/Multiuser
pi@raspberrypiBroadlab:~/Desktop/Integrate_DB_UDP/Multiuser $ python3 UDP_Data_Store_DB_v3.py
Namaskaaram Andi
Local Server started
Waiting for client request..
New connection added to local server: ('10.32.26.197', 5000)
Connection from local client: ('10.32.26.197', 5000)
Opened database successfully
265
Data stored in Local Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 15:22:28 2021 , Twinkle Twinkle Pass , Correct ]
inserted data
265
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\_UDP' with a Raspberry Pi icon in the title bar. The prompt is 'pi@twinkle-central-server: ~/Desktop/Integrate\_DB\_UDP'. The user has run 'python3 UDP\_Data\_Store\_DB\_v2.py'. The output shows the central server starting, waiting for a local server, receiving data from the local server, and attempting to store it. It then sends an 'Access not granted for twinklet\_id: 5' message and 'Authentication Status sent'.

```
pi@twinkle-central-server:~/Desktop/Integrate_DB_UDP $ python3 UDP_Data_Store_DB_v2.py
Opened database successfully
Namaste..!
Central Server started
Waiting for local server..
247
Data stored in Central Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 15:20:56 2021 , Twinkle Twinkle Pass , Correct ]
inserted data
247
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_UDP/Multiuser
pi@raspberrypiBroadlab:~/Desktop/Integrate_DB_UDP/Multiuser $ python3 UDP_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
264
Data stored in Local Server: [ 5 , 1 , Broadband Wireless Lab , Tue Mar 30 15:21:07 2021 , Twinkle Twinkle Pass , Correct ]
inserted data
264
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.