

COSE242 : Data Communication

Attendance Verification System Using Wi-Fi Access Points

Absent Catcher

Team Leader

2020170393 Junhwan Choi
2020190633 Youmin Kim
2021320016 Geon Woo Lim
2021320030 Chanwoo Park

2020130885 Dohun Kim
2020320008 Tae Geon Um
2021320018 Taehee Jeong
2024952875 Tommy Tran



Problem

#Attendance



Hard to check

Attendance is important,
But it spends class time



Self-check

Attendance check is
recommended to self-check



Limitation

Attendance system has
many limitations



Goal

'Liberal Attendance'
System improvement

Current Limitations



Limitations of the current Liberal Attendance system

1. Do not check the location → Possible to check attendance anywhere
2. Cannot find out the student who run away **during** class



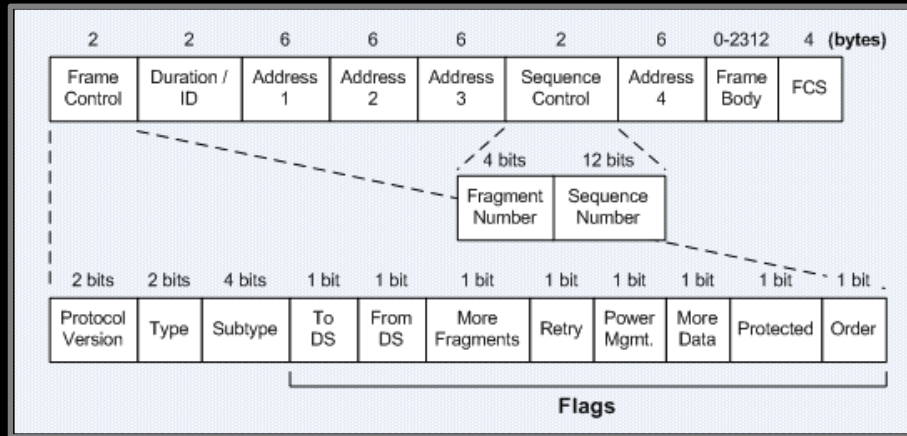
Overcome the limitations

1. Location Checking
2. Multiple Checking



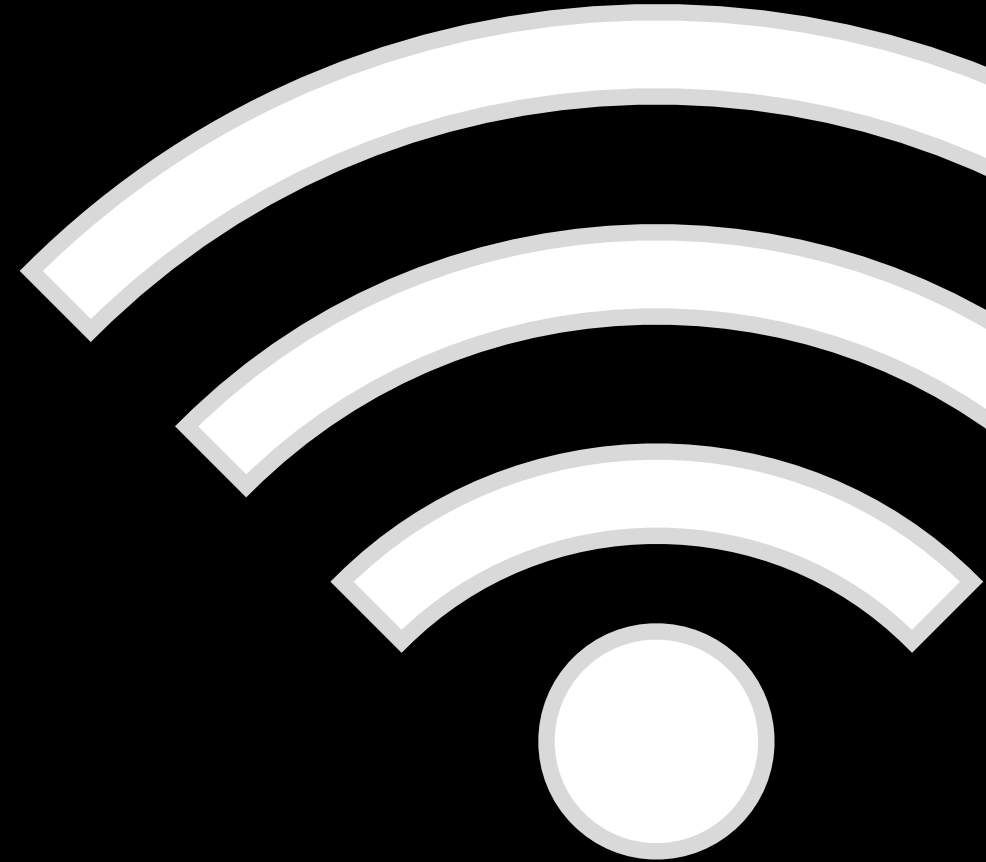
Approach

#Location #Wi-Fi Access Point



- 1) Each Classroom has a Wi-Fi Access Point(AP)
- 2) Each Wi-Fi AP has unique MAC address
- 3) Mobile devices can receive Wi-Fi protocol packets

→ Wi-Fi AP can be used to check the location



Client

Server

```
def main():
    print("=== Attendance Verification System ===")
    print("Enter the wanted process:")
    print("1. Verify attendance")
    print("2. Check attendance list")
    process = input(": ")

    if process == "1":
        student_id = input("Enter student ID: ")
        response = requests.get(url=SERVER_URL + "/valid-macs",
                                headers={'Content-Type': 'application/json'})
        result = response.json()
        print("\nClassrooms:")
        for idx, classroom in enumerate(result['classrooms'].keys(), 1):
            print(f"- {classroom}")
            print() # 가독성을 위한 빈 줄 추가
            classroom_id = input("Enter classroom ID (e.g., classroom_1): ")
            submit_attendance(student_id, classroom_id)
        elif process == "2":
            check_attendance_list()

    if __name__ == "__main__":
        main()
```

Attendance attempt
(Student ID)

Capture packets
Send to the server

Attendance Verification
(Find valid MAC address)

Send the result
(Success / Failure)

GET /attendance Get Attendance

POST /verify-attendance Verify Attendance

POST /clear-attendance Clear Attendance

POST /register-mac Register Mac

GET /valid-macs Get Valid Macs

POST /clear-mac-addresses Clear Mac Addresses

Demo Video

```
geon@Geonui-MacBookAir:~/Desktop/Absent_Catcher
(base) geon ~/Desktop/Absent_Catcher main
```

~/D/Absent_Catcher 38% 6.9 GB 12/02, 3:26 PM

```
=== Attendance Verification System ===
Enter the wanted process:
1. Verify attendance
2. Check attendance list
: 2
Printing attendance list:
Student ID: data      Timestamp: 2024-12-02T06:01:42.140
Student ID: 123456    Timestamp: 2024-12-02T06:02:10.699
Student ID: 1         Timestamp: 2024-12-02T06:02:47.999
Student ID: asvcsbdfh Timestamp: 2024-12-02T06:03:10.784
Student ID: 1         Timestamp: 2024-12-02T06:08:37.740
Student ID: 2         Timestamp: 2024-12-02T06:09:58.683
Student ID: 2021320016 Timestamp: 2024-12-02T06:21:49.280
Student ID: 2021320000 Timestamp: 2024-12-02T06:22:44.648
Student ID: 2021320001 Timestamp: 2024-12-02T06:23:42.317
Student ID: 2021320002 Timestamp: 2024-12-02T06:24:54.714
```

```
=== Attendance Verification System ===
Enter the wanted process:
1. Verify attendance
2. Check attendance list
: 1
Enter student ID: 2021320003

Classrooms:
- data communication
- test

Enter classroom ID (e.g., classroom_1): data communica
Starting attendance submission process...
Scanning network interfaces...
```

```
=== Attendance Verification System ===
Enter the wanted process:
1. Verify attendance
2. Check attendance list
: 2
Printing attendance list:
Student ID: data      Timestamp: 2024-12-02T06:01:42.140537
Student ID: 123456    Timestamp: 2024-12-02T06:02:10.699710
Student ID: 1         Timestamp: 2024-12-02T06:02:47.999294
Student ID: asvcsbdfh Timestamp: 2024-12-02T06:03:10.784889
Student ID: 1         Timestamp: 2024-12-02T06:08:37.740845
Student ID: 2         Timestamp: 2024-12-02T06:09:58.683495
Student ID: 2021320016 Timestamp: 2024-12-02T06:21:49.286731
Student ID: 2021320000 Timestamp: 2024-12-02T06:22:44.648854
Student ID: 2021320001 Timestamp: 2024-12-02T06:23:42.312689
Student ID: 2021320002 Timestamp: 2024-12-02T06:24:54.714553
Student ID: 2021320003 Timestamp: 2024-12-02T06:26:40.412761
```

Accuracy of the Location Check

Problem Packet can be captured
'near' the classroom

Approach Use multiple Aps
Strength of the signals



Persistent Presence Check

Problem Student can leave the classroom
during the class

Approach Capture the packets again

- 1) First check is directly sent to the server and verified
- 2) The application checks twice more, once every 30 minutes for the remaining hour (in background)
- 3) Send the captured packets at the next attendance check

Thank You

#Question #Answer

Role Allocation



Presentation

Junhwan Choi
Youmin Kim
Taehee Jeong



Front-end

Geon Woo Lim
Chanwoo Park

Client



Back-end

Dohun Kim
Tae Geon Um
Tommy Tran

Server

