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# World University of Bangladesh

## Computer Science and Engineering (CSE)

### Welcome To Presentation On

# Design and Implementation of a Lightweight Encryption Algorithm for IoT Devices

**Presented By…**

| | | | | | |
|---|---|---|---|---|---|
| **Name** | **: Arif Hussain** | **Name** | **: Harun Ur Rashid** | **Name** | **: Md. Riaz Rahman** |
| Roll | : 1463 | Roll | : 1453 | Roll | : 1458 |
| Batch | : 33D | Batch | : 33D | Batch | : 33D |

**Supervised By…**

**Md. Ashraf Kamal**
Sr. Lecturer in Computer Science & Engineering
World University Of Bangladesh

# Introduction

- Data Security is an important issue now a days. It is a digital privacy which is prevent unauthorized access to computer, database and websites.
- Billions of IoT devices that have sensing or actuation capabilities and are connected to each other via the Internet.
- Security has not been a high priority for these devices until enough now. It is now time to establish The Internet of Secure Things.
- By this project we want to develop an encryption algorithm for IoT devices.

# IOT devices

Example :

- Smart watches
- Smart Glasses
- Smart fabrics
- E-textiles etc

## Objectives

- To reduce processing complexity and provide powerful data security for wearable devices.
- To develop a lightweight encryption algorithm with small size of keys.

## Methodology


Figure: Methodology

# Our proposed model

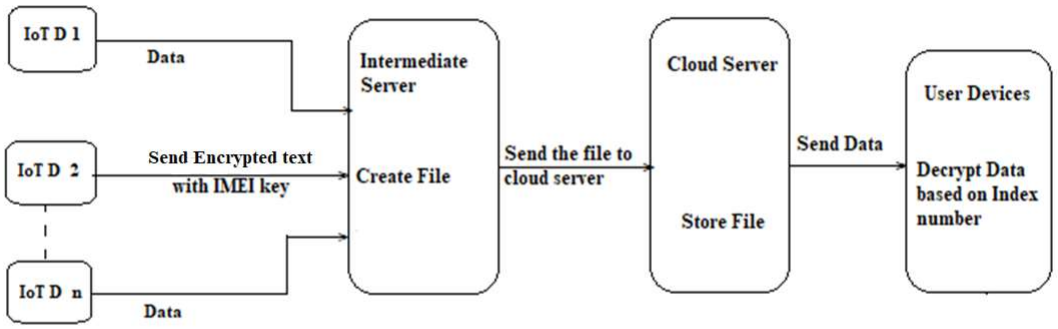



**Figure: Proposed Model Block Diagram**

# Our proposed model Algorithm

The algorithm has the following features…

Step-1: Collect 128 bit data from IoT devices.

Step-2: Jumble 128 bit data and get key (index number).

Step-3: Get ASCII value of the jumble data.

Step-4: Add the ASCII value and key.

Step-5: Send the encrypted data to the Intermediate Server.

Step-3: Create a File of the encrypted data in Intermediate Server.

Step-4: Send the File to Final Server.

Step-5: Again, Final Server split the file into small file and send to the receivers.

# Project Flowchart

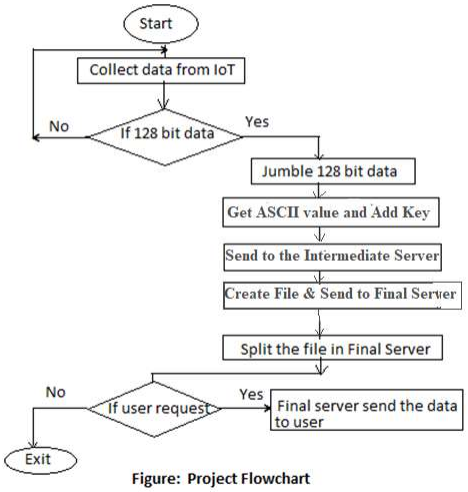



Figure: Project Flowchart

# Key Generate

| Index number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Data | H | o | w | | a | r | e | | y | o | u | ? |

| Index number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jumble Data | e | ? | y | o | r | | o | H | u | w | | a |

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Key → | 7 | 6 | 9 | 10 | 11 | 4 | 0 | 5 | 2 | 3 | 8 | 1 |

# How to Get Chipper Text/ Encrypted Data

| Index number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jumble Data | e | ? | y | o | r | | o | H | u | w | | a |

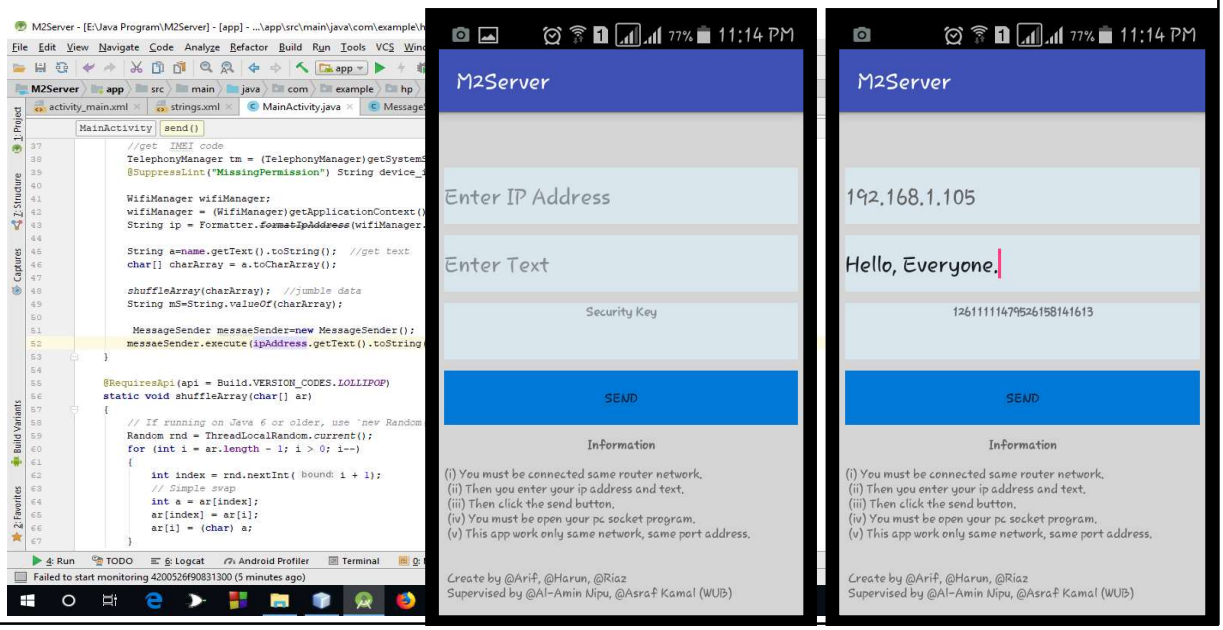
| Index number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASCII value | 101 | 63 | 121 | 111 | 114 | 32 | 111 | 72 | 117 | 119 | 32 | 97 |

| Index number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASCII value + Key | 101+7 =108 | 63+6 =69 | 130 | 121 | 125 | 36 | 111 | 77 | 119 | 122 | 40 | 98 |

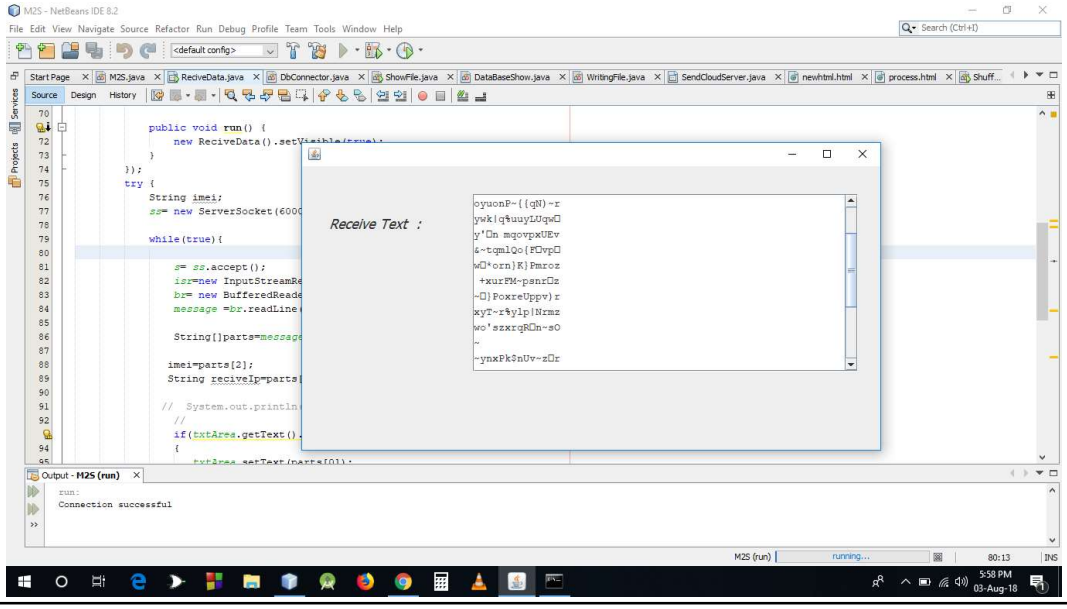
| Index number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Character Value | 1 | E | g | y | } | $ | o | M | w | z | ( | b |

| Original Text/Plain Text | Chipper Text/Encrypted Text |
|---|---|
| How are you? | 1Egy}$oMwz(b |

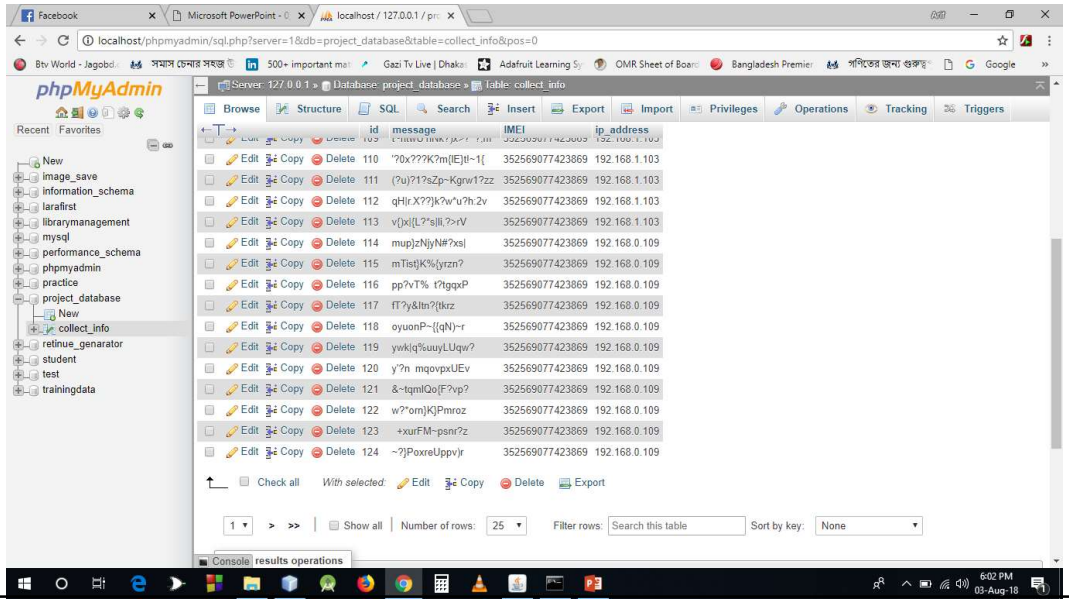
# Design, Development and Testing (Get Encrypted Data and Send To the Intermediate Server)



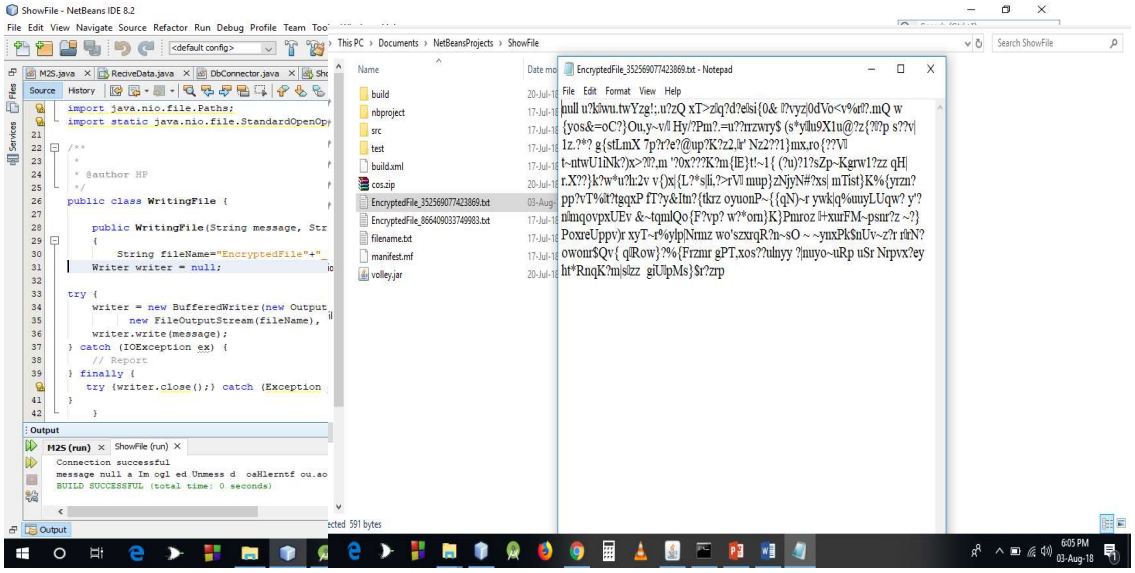
# Development and Testing
# (Receiving Text by Intermediate Server)



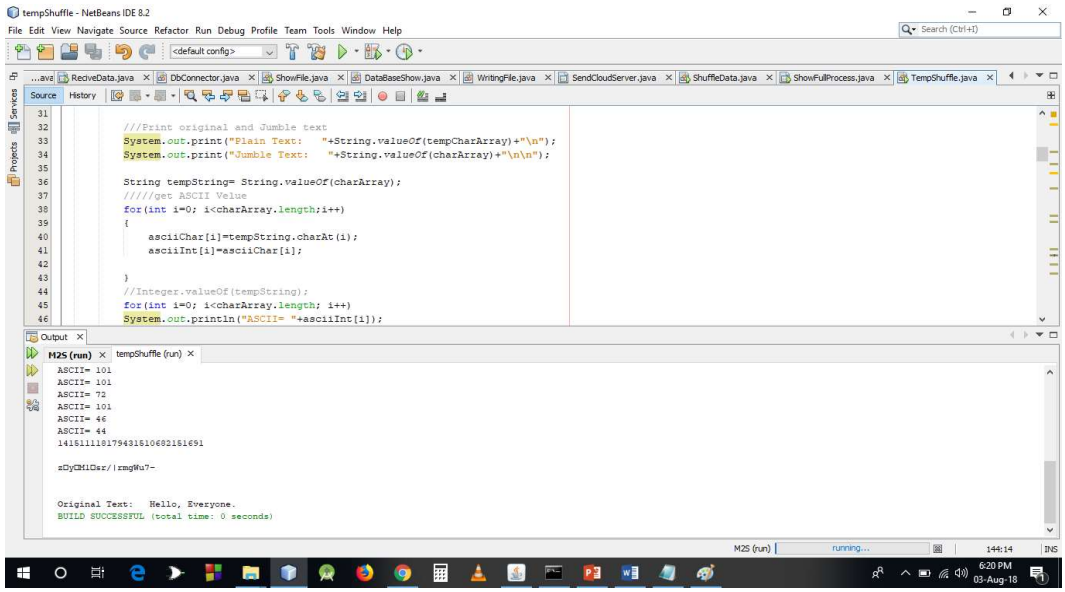

# Development and Testing
# (Store the data by Intermediate Server)



# Development and Testing
# (Create File by Intermediate Server)




# Development and Testing
# (Decrypt Process)



## Conclusion

- We understood that IoT based devices faces that number of challenges like power, bandwidth, scalability, heterogeneity, security and privacy.
- Now Security and Privacy is the most imperative challenge to solve to maintain the trust of users in IoT.
- So if we develop an encryption algorithm, we hope it will be so helpful for IoT based devices security. Though it is a small contribution.

***Thank You All***