

PRESENTING:

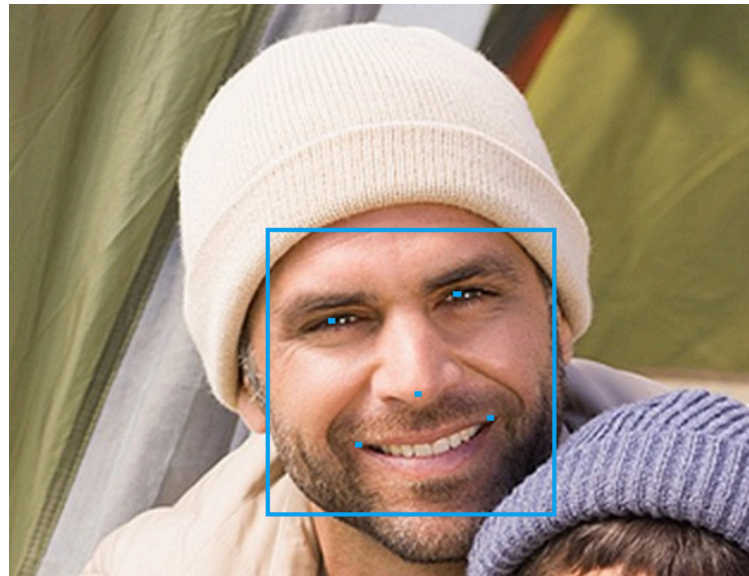
SPIDER LOCK

THE TEAM

Chelini Lorenzo
Palmiero Christian

THE SYSTEM: WHAT IS IT?

Facial recognition system



THE SYSTEM: WHAT DOES IT DO?

The admin of the system register a user by setting up:

username

password

image path representing the template

cell phone number

Username	Password	Image Path	Cell Phone Number
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THE SYSTEM: WHAT DOES IT DO?

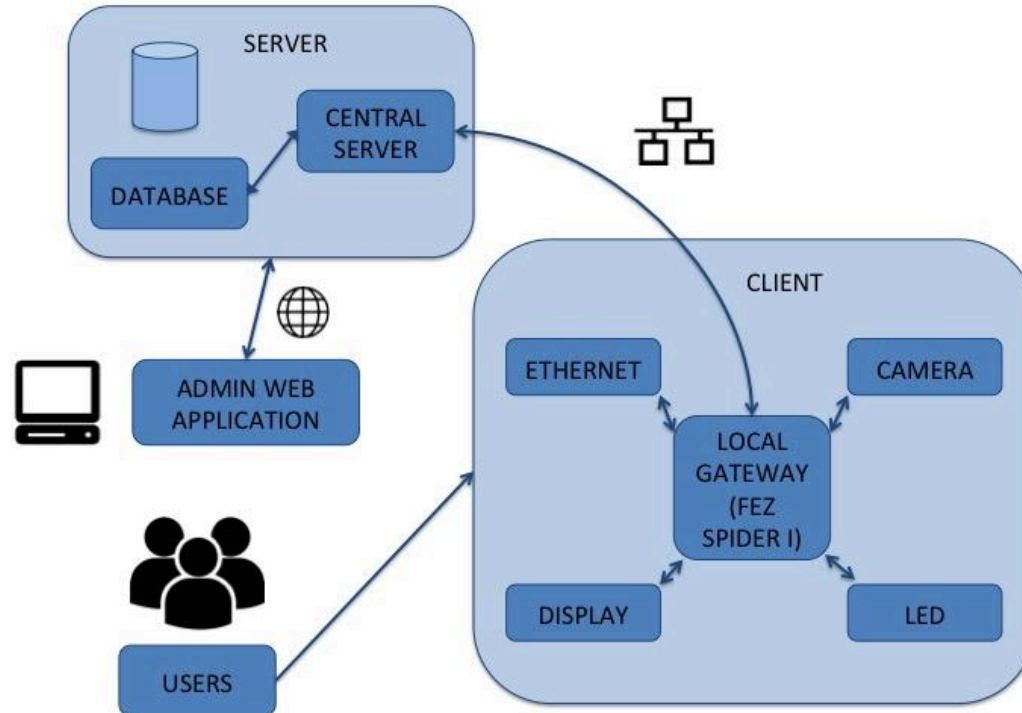
- The end user interacts with the system as follows:
 - first, he inserts his credentials
 - then, he takes a photo of his face with a camera in order to be recognised
 - if the matching with the template is successful, the user is authorized, otherwise he has three attempts to insert a one-time password sent by the system to his personal cell phone via SMS

THE SYSTEM: WHO IS IT FOR?

- How many companies want all employees to follow an authentication procedure to access locations storing classified information?
- How many owners of a building desire to have a reliable and safe system that allows to grant access only to registered people?

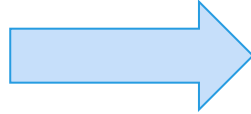


THE SYSTEM ARCHITECTURE



ADMIN WEB APPLICATION

Microsoft®
ASP.net™



Spider Lock Admin Web Application

About

This application has been designed by Lorenzo Chelini and Christian Palmiero for the course "Projects and laboratory on communication systems", taught by Prof. Albertengo and Prof. Casetti at the Polytechnic University of Turin



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HOW THE APP WORKS: HOME

Spider Lock Admin Web Application

[Home](#) [About](#) [Log in](#)

Home Page

This web application provides to the administrator of the system a compact, fast and easy way to handle the users database

The administrator is recommended to perform the following actions:

- 1 Log in**
The administrator must insert his credentials in order to access the database driven web page
- 2 Handle the database**
The administrator is able to manage the application database: he can create, read, update and delete users
- 3 Verify the status of the system**
The administrator can verify that the system works properly, according to the identity of the registered users

HOW THE APP WORKS: LOG IN

The first time, the admin must insert the following credentials:

username -> "Admin"
password -> "admin"

Then, he can modify the password as he prefers

Spider Lock Admin Web Application

Log in

Use an administrator account to log in

User name

Password

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HOW THE APP WORKS: DATABASE

The admin is able to:

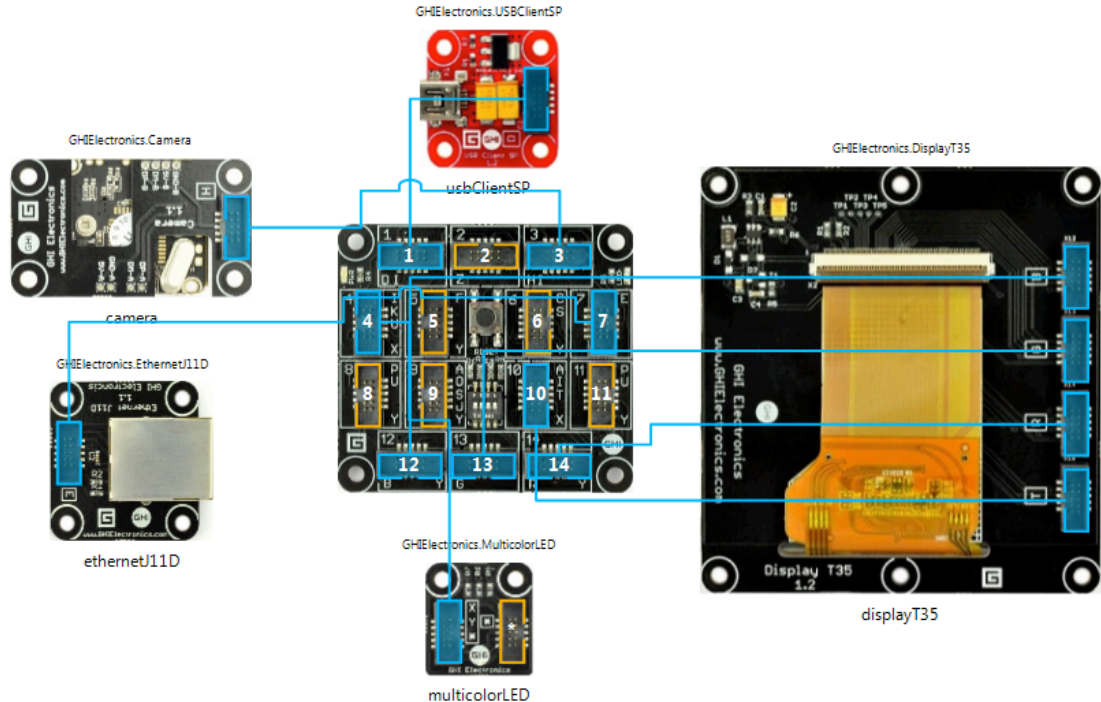
- Insert a new user
- Delete an existing user
- Update an existing user



	Username	Password	Image Path	Cellphone Number
Edit Delete	Admin	*****		
Edit Delete	Christian	*****	C:\Users\Public\Pictures\Sample Pictures\Chris.jpg	+393334556569
Edit Delete	Lorenzo	*****	C:\Users\Public\Pictures\Sample Pictures\Lorenzo.jpg	+393347055531

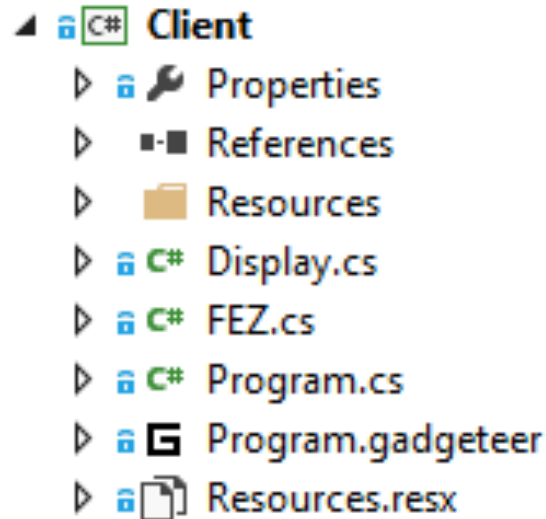
CLIENT: HARDWARE COMPONENTS

- FEZ Spider I Mainboard
- Display T35
- Ethernet J11D
- Camera
- Usb Client SP
- Multicolor LED

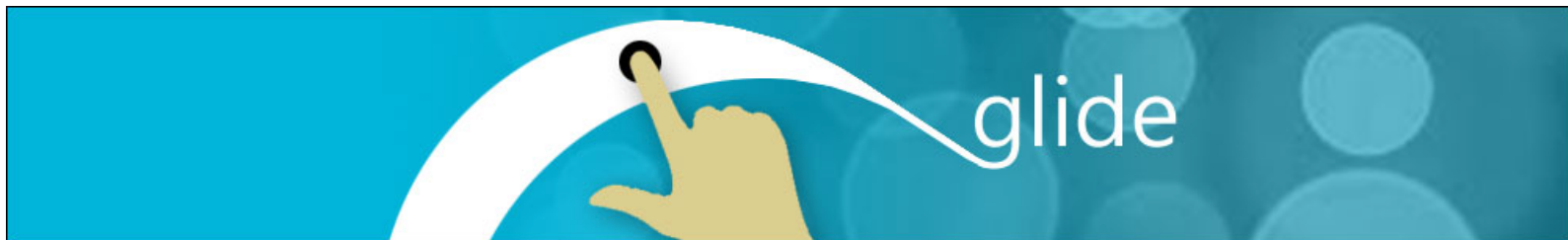


CLIENT: SOFTWARE ARCHITECTURE

The software architecture is the following one:



CLIENT: DISPLAY.CS



CLIENT: DISPLAY.CS

This class manages the user interactions: it collects and reacts to the user inputs

The XML string, created by the Glide Designer tool, is loaded

Depending on the current view, several event handlers are created and implemented

CLIENT: DISPLAY.CS

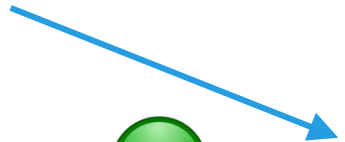
Insert credentials

Username

Password



Wrong credentials!



Take a picture

CLIENT: FEZ.CS

Static configuration of the ethernet interface:

IP: "192.168.100.2"

Subnet mask: "255.255.255.0"

Default gateway: "192.168.100.1"

Synchronous stream socket (based on TCP/
IP) creation

Connection to IP "192.168.100.4", port 8080

CLIENT: FEZ.CS

Send the credentials with the format of
“username@password”

Wait for an ACK from the server

Take the picture and send it to the server as a
byte array

Wait for an ACK/NACK

CLIENT: FEZ.CS

Depending on the face matching result:

- ACK: turn on the LED and set it to green

- NACK: send the nonce, that the user has received via sms, as a string

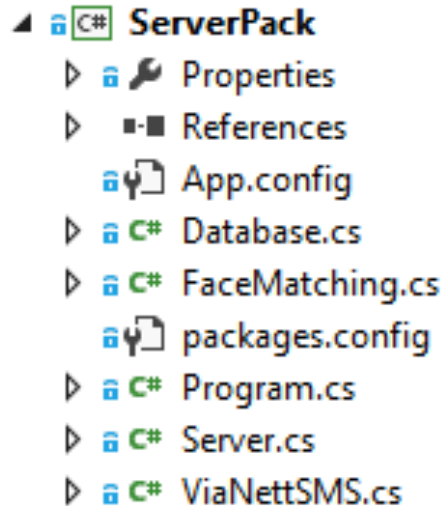
Depending on the nonce check:

- ACK: turn on the LED and set it to green

- NACK: turn on the LED and set it to red

SERVER: SOFTWARE ARCHITECTURE

The software architecture is the following one:



SERVER: SOCKET CREATION

Creation of a listening socket on port 8080

Whenever a client connects to the server,
creation of a working socket and of a
StateObject containing the connection
parameters associated to a specific client

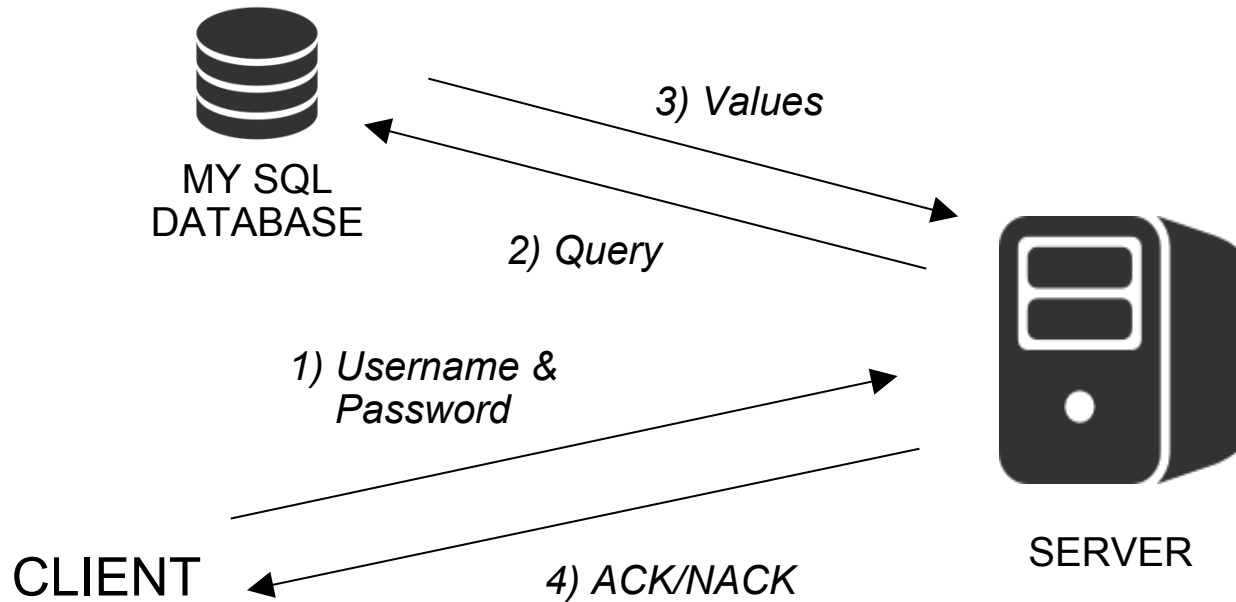
IP, port, receiving buffer, receiving buffer size,
connection stage

SERVER: CONNECTION STAGES

1. Credentials

- a. Receive username and password
- b. Query the database
- c. If the credentials exist, send an ACK; else, send a NACK

SERVER: CONNECTION STAGES (1)

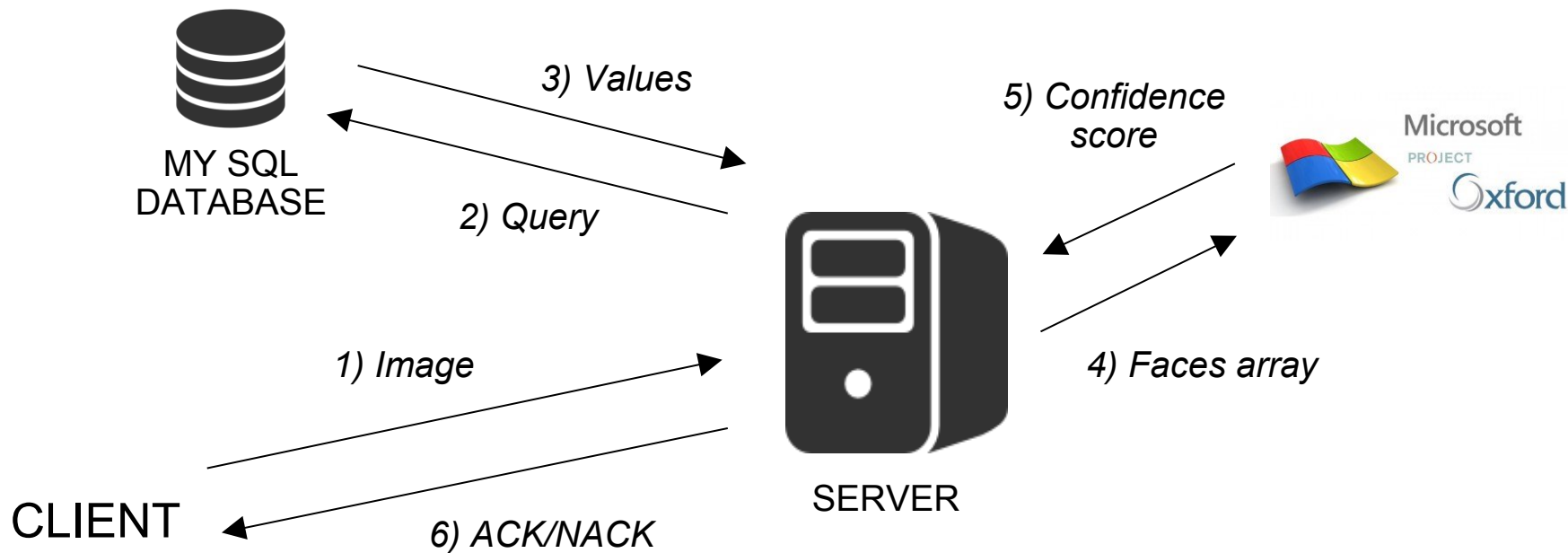


SERVER: CONNECTION STAGES

2.Image

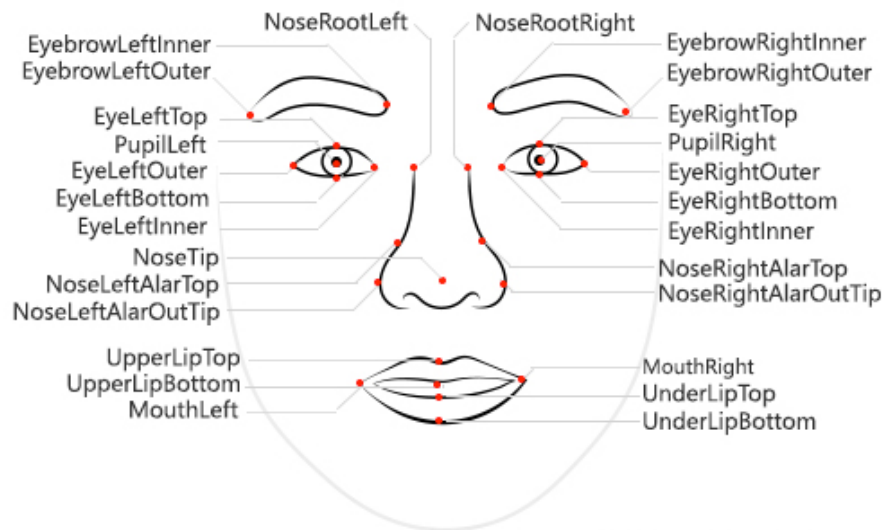
- a.Receive image
- b.Query the database for retrieving the template path
- c.Connect to Microsoft Project Oxford gateway and execute the face verification algorithm based on Face API 1.0
- d.If the returned confidence score is greater equal than 0.5, send an ACK; else, send a NACK

SERVER: CONNECTION STAGES (2)



SERVER: CONFIDENCE SCORE

It is calculated according to 27 predefined landmark points

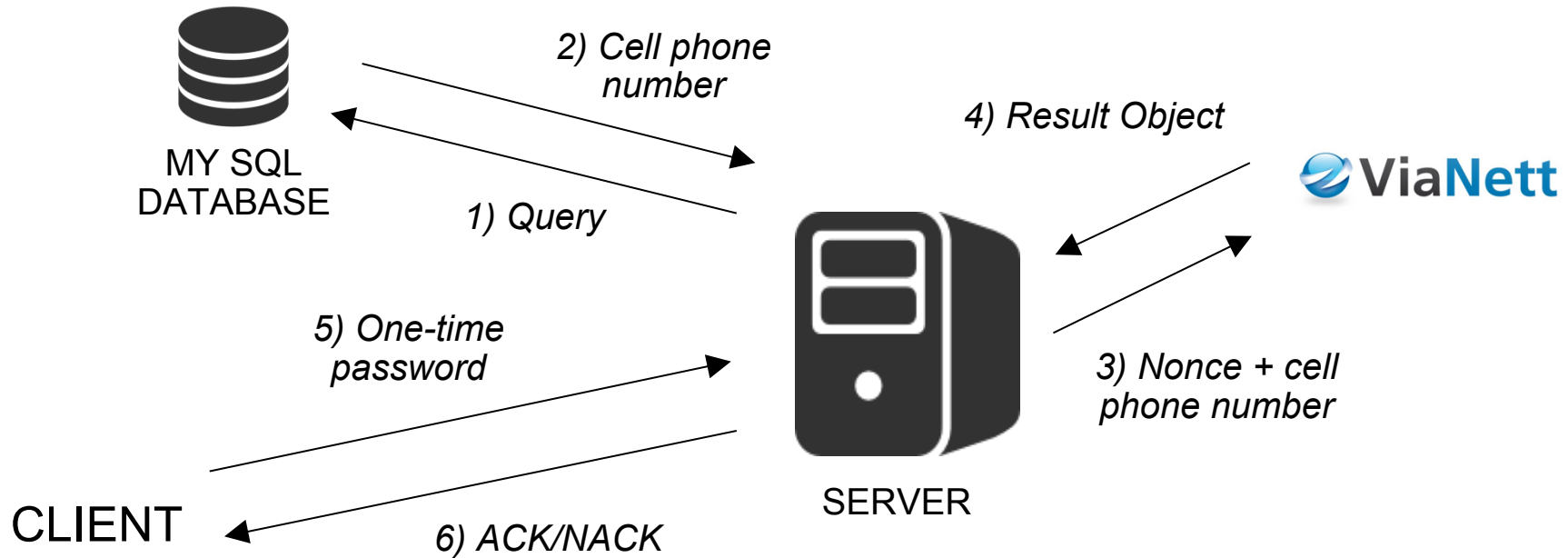


SERVER: CONNECTION STAGES

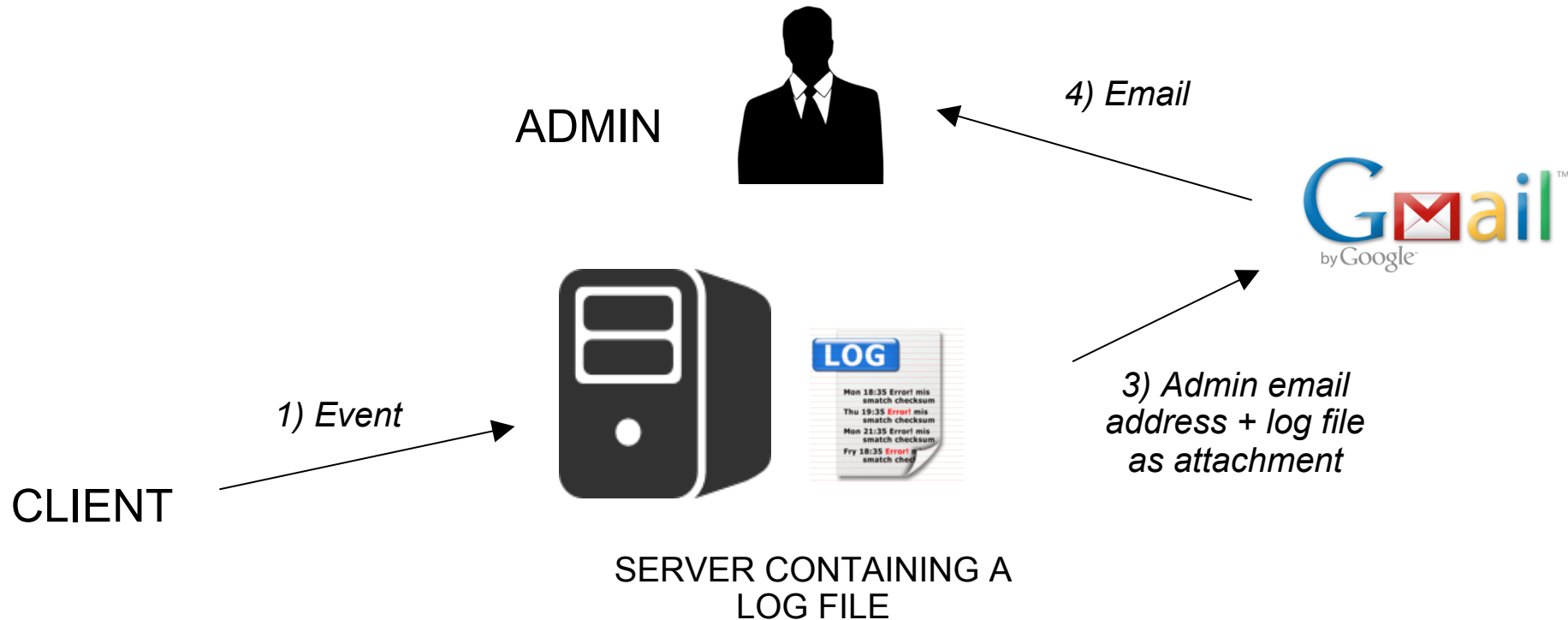
3. One-time password

- a. Generate the one-time password
- b. Query the database for retrieving the user cell phone number
- c. Send the one-time password via SMS using ViaNettSMS gateway
- d. If the one-time password inserted by the user is correct, send a ACK; else, send a NACK

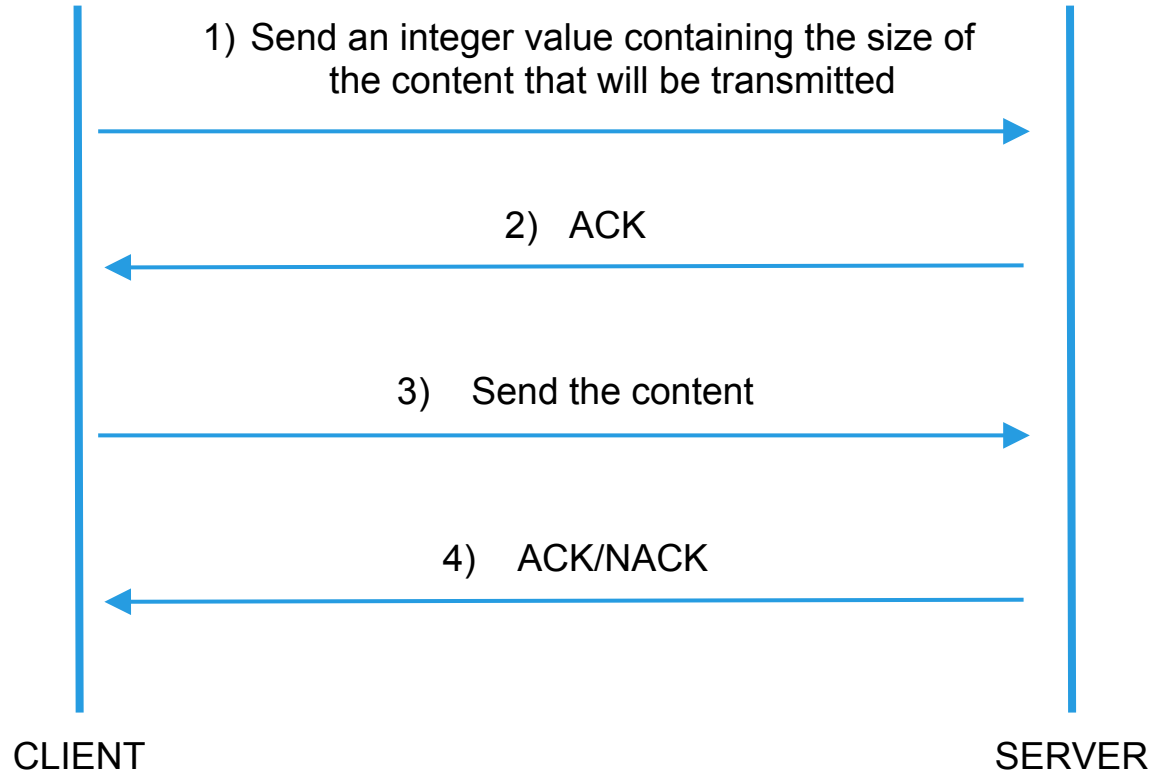
SERVER: CONNECTION STAGES (3)



SERVER: LOG FILE



SERVER-CLIENT PROTOCOL



Now let's see it in action...