



Tech Webinar

G-SDK Introduction and Demonstration

Speaker

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Date | May 17, 2022

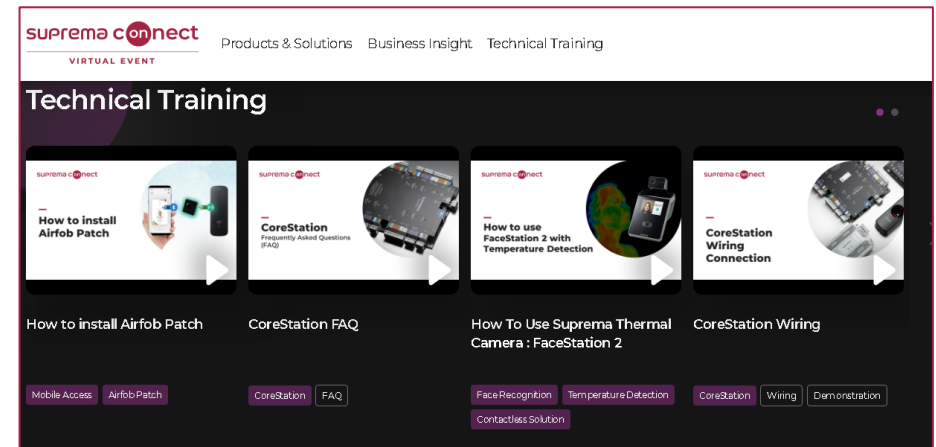
How can you find Webinar Contents?

1) Email

- ✓ Suprema Team will provide the presentation and the recorded video link to the registered emails.
- ✓ It will take about 7 days after reviewing the files with Q&A list.

2) Suprema Connect Website

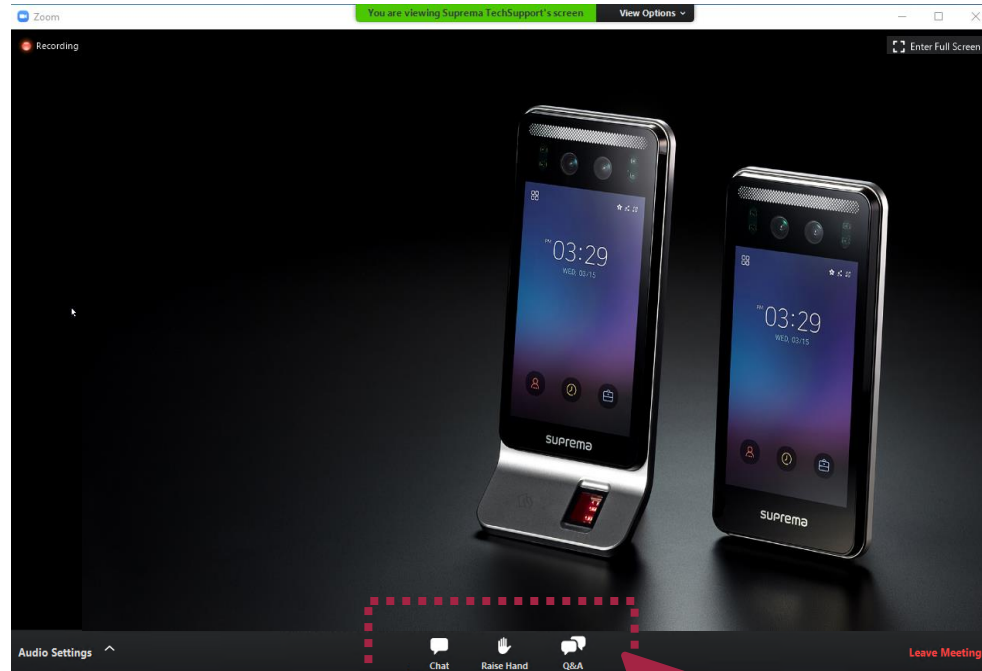
- ✓ We will post the recorded video to the site.
- ✓ <https://www.supremainc.com/connect/index.asp>
- ✓ Please google **Suprema Connect**.



3) Suprema Technical Support Site

- ✓ You can find the information with Q&A list on the website below.
- ✓ Please search **Suprema Webinar** in the support page, or simply google it.
- ✓ <https://support.supremainc.com>

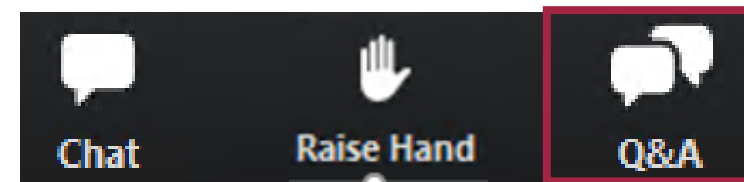
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[Q&A] box



- ✓ During the webinar, you can leave your questions in the Q&A box anytime. Suprema Panels will answer in real time.

Contents

- 01 | What is Suprema G-SDK?
- 02 | G-SDK VS BioStar 2 Device SDK
- 03 | Overview
- 04 | Getting Started
- 05 | FAQ

01

What Is Suprema G-SDK

Suprema G-SDK is a new way of communicating with BioStar 2 devices.



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- G-SDK is a new way of communicating with BioStar 2 devices.
- It is a lightweight, scalable, and cross-platform solution which will expedite your development. Based on gRPC, it supports many programming
- languages such as Java, C#, Python, Node.js, Go, and C++.
- Scalable and extensible
 - Handle thousands of devices
 - Easy to maintain and customize
- Multi-language support
 - Language-neutral IDL
 - Native client libraries
- Well-defined API
 - Easy to understand and use
- Mobile/cloud ready
 - Easily deployable on Cloud
 - Accessible from mobile devices directly

02

BioStar 2 Device SDK vs G-SDK



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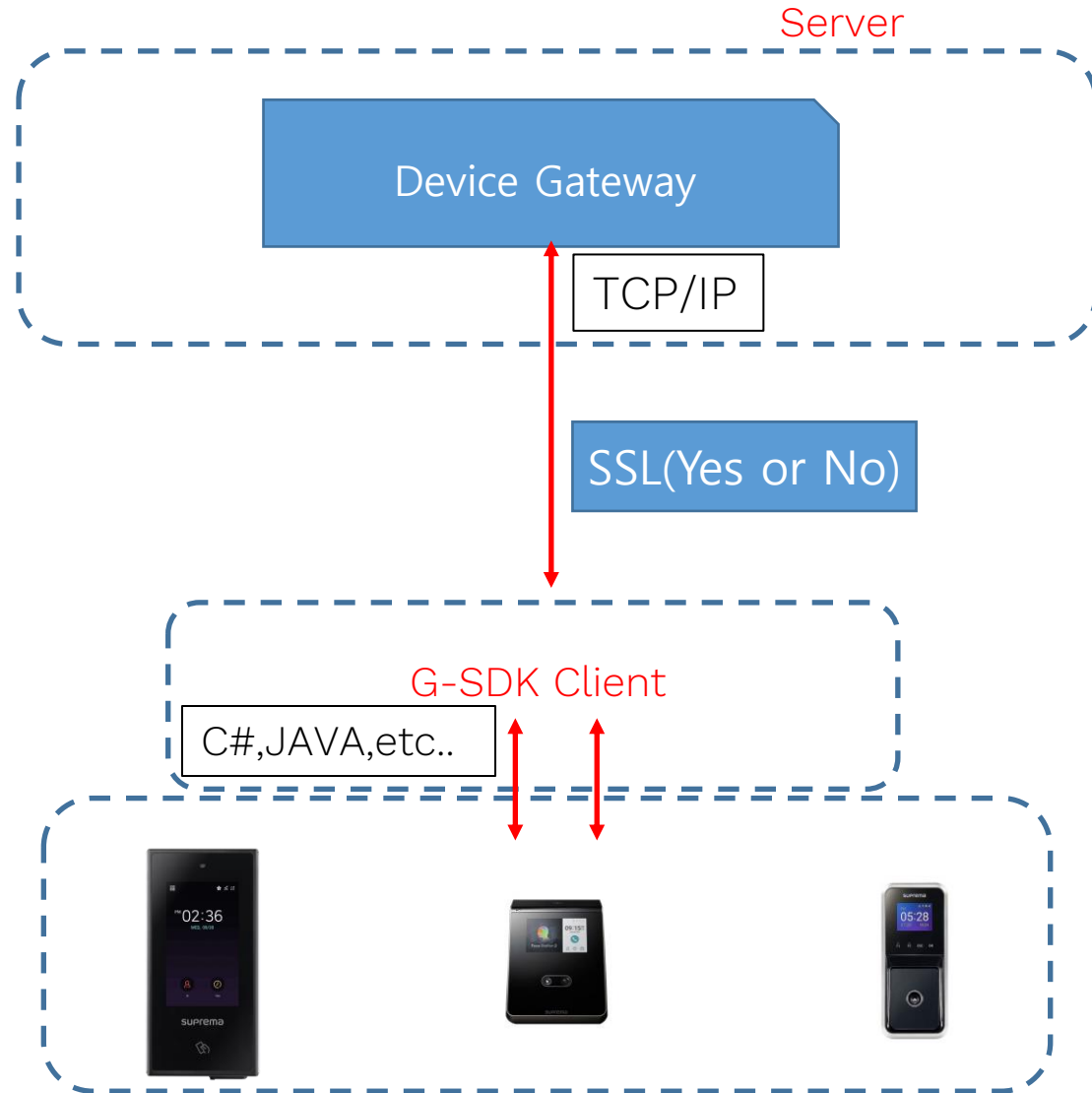
	 Device SDK	 G-SDK
Deployment	<ul style="list-style-type: none">• Shared library	<ul style="list-style-type: none">• Client libraries• Device Gateway• (Master Gateway)
OS	<ul style="list-style-type: none">• Windows• x86 Linux	<ul style="list-style-type: none">• Windows• x86/Arm Linux• MacOS
Supported Language	<ul style="list-style-type: none">• C++• C# example	<ul style="list-style-type: none">• C++, Java, Python, Go, Ruby, C#, Node.js, Android Java, Objective-C, PHP, Web• Beta support for Kotlin and Swift
Max. Devices	<ul style="list-style-type: none">• 1,000	<ul style="list-style-type: none">• 1, 000 (Device Gateway)• 100, 000 (Master Gateway)

03

Overview

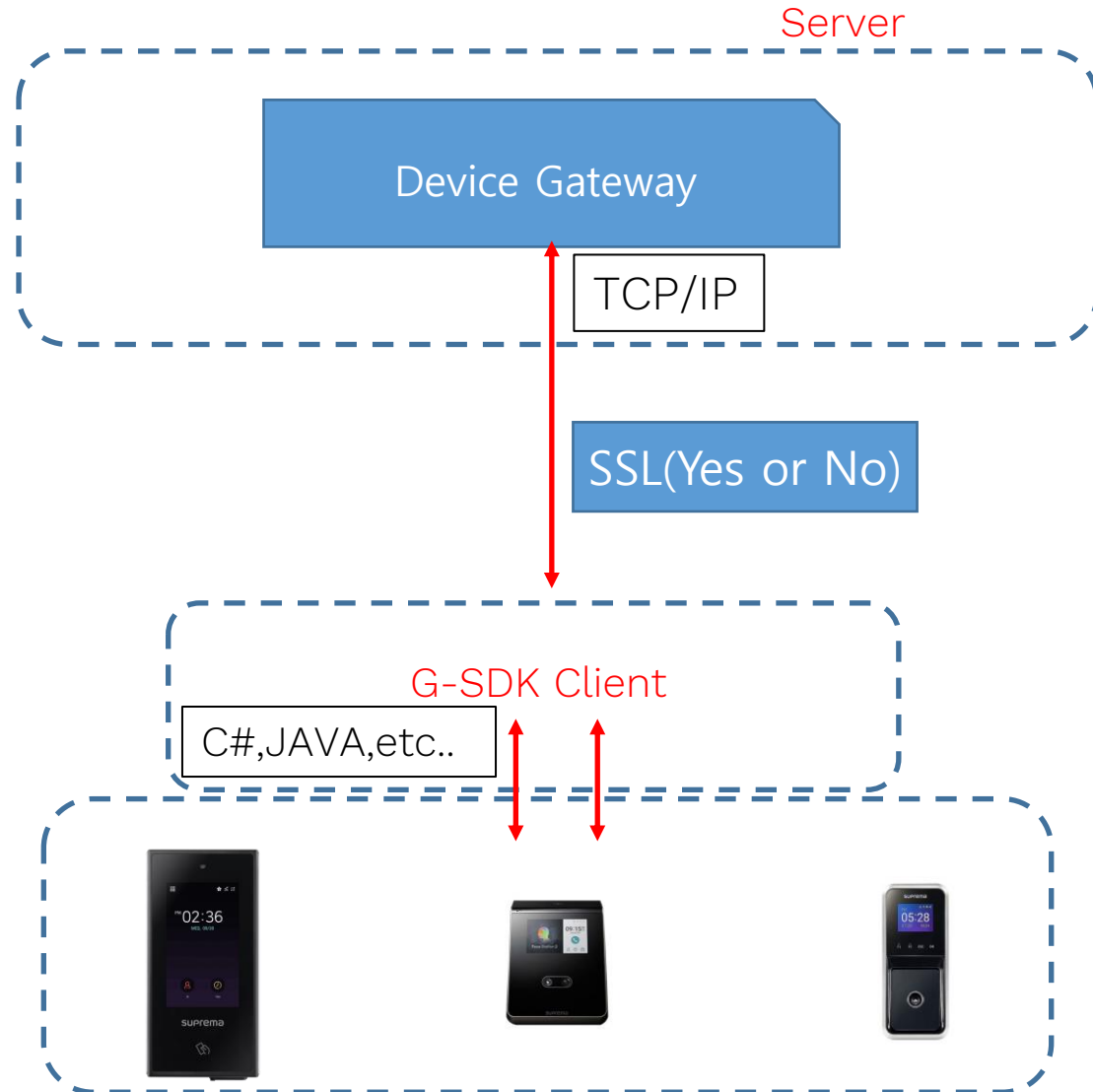



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- gRPC can be thought of as one of the ways to exchange data between clients ↔ servers and servers ↔ servers.
- G-SDK consists of the device gateway and the client libraries. The device gateway handles the communication with the devices and you can connect to it using one of the client libraries
- The protocol buffer is an open-source data structure developed by Google.
- Install the certificate when installing device gateway(when it comes to security of the server, authenticated server communicating with physical devices, because we need a certificate to communicate with physical device)

Architecture



- gRPC can be thought of as one of the ways to communicate between servers and clients.
 

```
message UserInfo {  
    UserHdr hdr = 1;  
    UserSetting setting = 2;  
    string name = 3;  
    repeated card.CSNCardData cards = 4;  
    repeated finger.FingerData fingers = 5;  
    repeated face.FaceData faces = 6;  
    repeated uint32 accessGroupIDs = 7;  
    repeated tna.JobCode jobCodes = 8;  
    bytes PIN = 9;  
    bytes photo = 10;  
}
```
- The protocol buffer is an open-source data structure developed by Google.
- Install the certificate when installing device gateway(when it comes to security of the server, authenticated server communicating with physical devices, because we need a certificate to communicate with physical device)

04

Getting Started



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Getting Started(download)

G-SDK GitHub Link

<https://github.com/biostar-dev/g-sdk/releases/tag/V1.4.0>

G-SDK Manual Link

<https://biostar-dev.github.io/g-sdk/overview/>

Getting Started(Setting)

-C#

A. NET Core SDK 2.2.0 Required

1. download and installation : <https://aka.ms/dotnet-download>

B. dotnet-grpc installation

1. Included in path : C:\Program Files\dotnet\

2. dotnet tool install -g dotnet-grpc

C. client project debugging

1.Certificates location (Place it at the location below or modify the code directly)

-+- cert

+ - client_project

Detail info:

<https://biostar-dev.github.io/g-sdk/csharp/install/>

Getting Started(Setting)

-JAVA

A. JDK needs 1.7 or higher.

1. JDK download and installation.
2. JAVA_HOME setting
3. PATH += %JAVA_HOME%\bin

B. gradle installation

1. gradle download and unzip : <https://gradle.org/releases/>
2. copy : c:\gradle-6.3
3. GRADLE = c:\gradle-6.3
4. PATH += %GRADLE%\bin
5. "gradle -v" confirm
6. gradlew wrapper --gradle-version=6.3 --distribution-type=bin

C. gradle command set

gradlew build
gradlew clean
gradlew installDist
gradlew installZip
gradlew tasks
gradlew run [--debug]

D. client project debugging

1. Copy the ca.crt file to the project path root.
2. build.gradle modify
3. QuickStart.java IP, Port modify

Getting Started(Setting)

-Python

A. Python needs 3.5 or higher

1. Python download and Add path check and installation: <https://www.python.org/>
2. PATH to the python, python\script check the inclusion

B. package management pip (Python package index) require

. Python 2.7.9, 3.4 or later, it's included as default, so skip.

C. pip set

```
pip list or pip show pip : version check
pip install xxxx : installation
pip install --upgrade xxxx : upgrade
pip uninstall xxxx : delete
pip help
```

D. module installation

```
pip list (try "pip list"and if there's no result below, install it)
pip install google
pip install protobuf
pip install grpcio
```

E. Add environmental variables.

1. PYTHONPATH = client_project_dir
2. PYTHONPATH += client_project_dir\biostar\service
3. if it use relative path , setup.py use

F. client project debugging

1. certificates location

- Modify code to execute in client_project directory (../cert/ca.crt < this location)

Getting Started(Setting)

-NodeJS

A. Need Node.js 4.0 version

1. Node.js download and installation : <https://nodejs.org/ko/>
2. node -v
3. npm -v

B. package installation

```
npm install grpc  
npm ls
```

C. client project debugging

1. certification location
- node.js quick execution

Getting Started(Setting)

-Go

A. go 1.6 installation

1. download and installaion : <https://golang.org/dl/>
2. 1.10.3 was installed, but it needs to be 1.12.0 or higher to actually debug.

B. project environmental variables

1. GOPATH = client_project
2. PATH += %GOPATH%\bin

C. package installation

1. go install -u google.golang.org/grpc
2. dotnet tool install -g dotnet-grpc

C. client project debugging

1. certification location (.././../././cert/)
 - +- cert
 - + - client_project

04

Getting Started (run the example)

Getting Started(run the example)

Example Steps

01 | Create new self-signed certificates

02 | Setting & Run the Example

03 | Basic Test – User Enrollment ,Finger Test, Card Test , Face , Auth Mode

Create new self-signed certificates

The screenshot shows a Windows File Explorer window with the address bar set to `device_gateway_x64_v1.4.0_20210623`. The left sidebar shows the 'Local Disk (C:)' with various folders like 'Quick access', 'OneDrive - Suprema Inc', 'This PC', '3D Objects', 'Desktop', 'Documents', 'Downloads', 'Music', 'Pictures', 'Videos', and 'Local Disk (C:)'.

The main pane displays a list of files and folders:

Name	Date modified	Type	Size
backup		Folder	
cert		Folder	
logs		Folder	
config.json		File	
device_gateway_x64.exe		File	

Overlaid on the File Explorer is a 'Command Prompt' window titled 'Administrator: Command Prompt'. It shows the execution of a script to create self-signed certificates:

```
ut:32us} (config.go:119)
(1) Create the Root CA
>>> Country Name (2 letter code) [US]: KR
>>> State or Province Name (full name) []: SP
>>> Locality Name (eg, city) []: Seoul
>>> Organization Name (eg, company) []: ON
>>> Organizational Unit Name (eg, section) []: OUN
>>> CA certificate will expire after n years [10]: 10
(2) Create the server certificate
>>> Do you want to use the same information as root CA? [Y/n]: N
>>> Country Name (2 letter code) [US]: CN
>>> State or Province Name (full name) []: SPN
>>> Locality Name (eg, city) []: LN
>>> Organization Name (eg, company) []: ON
>>> Organizational Unit Name (eg, section) []: OUN
>>> Common Name (e.g. server FQDN or YOUR name) []: CN
>>> More DNS names? [y/N]: N
>>> More IPv4 address? [y/N]: 192.168.13.37
Error: it should be 'y' or 'n': 192.168.13.37
>>> Please input again
Y
>>> IPv4 Address (eg, 8.8.8.8) []:
>>> Certificate will expire after n years [5]: 5

C:\Users\mark.SUPREMA\Downloads\device_gateway_x64_v1.4.0_20210623>
```

Setting

1. Copy the address in git

biostar-dev / g-sdkPublic

<> CodeIssues3Pull requests2ActionsProjectsWikiSecurityInsights

V1.4.03 branches6 tagsGo to fileCode

Lee Seongjik and Lee Seongjik V1.4 Documentation

.vscode	Clean up documentation
client	Modify the documentation for C#,
docs	V1.4 Documentation

README.md

G-SDK

G-SDK is a new way of communicating with BioStar devices. It is a lightweight, scalable, and cross-platform solution which will expedite your development. Based on gRPC, it supports many programming languages such as Java, C#, Python, Node.js, Go, etc.

Clone

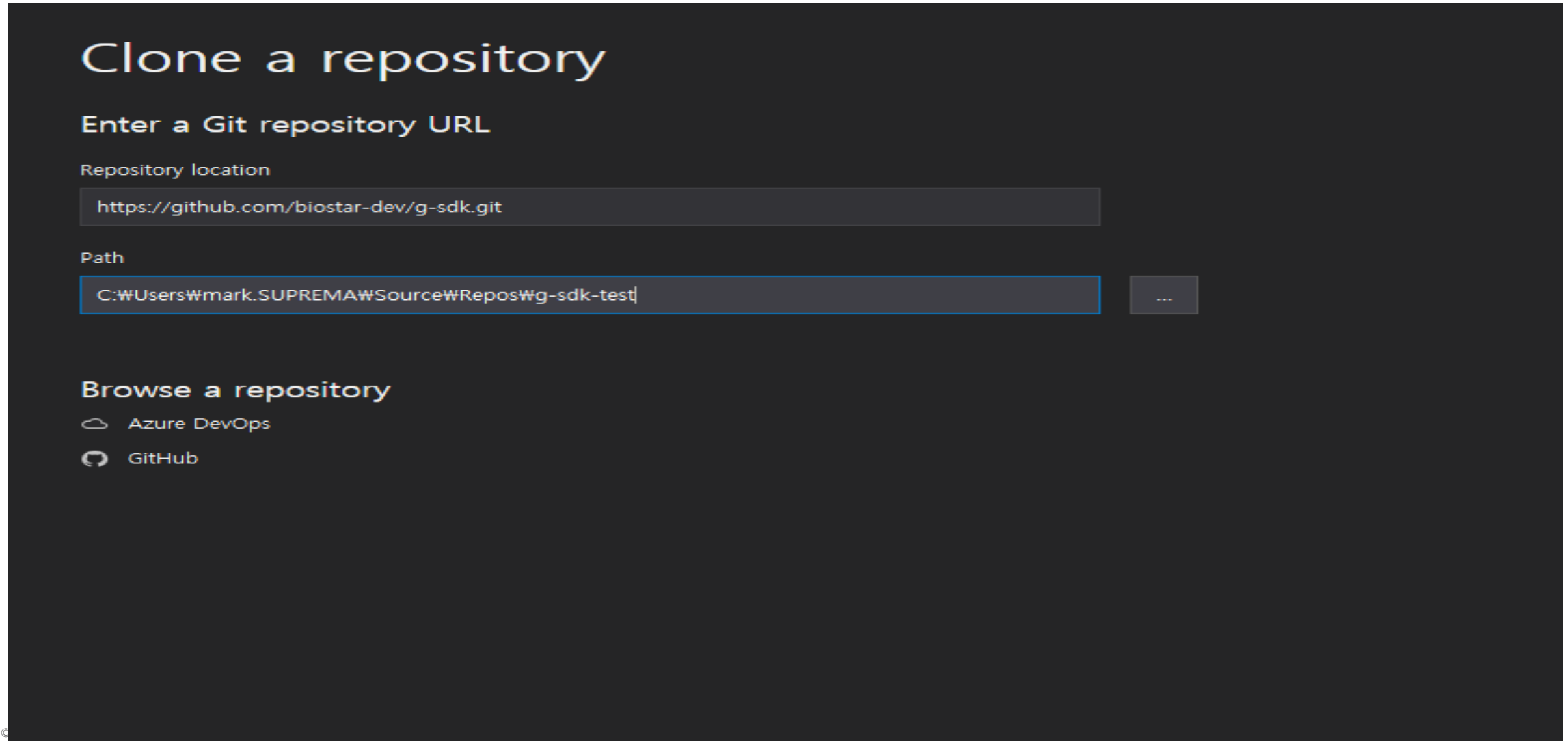
HTTPSGitHub CLIText input: https://github.com/biostar-dev/g-sdk.gitCopy icon

Use Git or checkout with SVN using the web URL.

Open with GitHub Desktop

Download ZIP

2. Paste the address after repository open as below.



Setting

1. Choose your preferred program-language folder
2. Modify the CA path directly and set the current gateway

```
class ConnectTest
{
    private const string CA_FILE = "C:\\Users\\mark.SUPREMA\\Downloads\\device_gateway_x64_v1.4.0_20210623\\cert\\ca.crt";
    private const string SERVER_ADDR = "192.168.13.37";
    private const int SERVER_PORT = 4000;
    private const int STATUS_QUEUE_SIZE = 16;

    private GrpcClient grpcClient;
    private ConnectSvc connectSvc;

    public ConnectSvc GetConnectSvc() {
        return connectSvc;
    }

    public ConnectTest(GrpcClient client) {
        grpcClient = client;

        connectSvc = new ConnectSvc(grpcClient.GetChannel());
    }

    public CancellationTokenSource SubscribeDeviceStatus() {
        var devStatusStream = connectSvc.Subscribe(STATUS_QUEUE_SIZE);

        CancellationTokenSource cancellationTokenSource = new CancellationTokenSource();

        ReceiveStatus(devStatusStream, cancellationTokenSource.Token);

        return cancellationTokenSource;
    }

    public static void Main(string[] args)
    {
        var grpcClient = new GrpcClient();
        grpcClient.Connect(CA_FILE, SERVER_ADDR, SERVER_PORT);

        var connectTest = new ConnectTest(grpcClient);

        var tokenSource = connectTest.SubscribeDeviceStatus();
    }
}
```

Basic Test

1. Stop the BioStar 2 Services to avoid port conflict.
(G-SDK uses "51212" port as default.).



2. Put the command “dotnet run”(C#)

```
cd example/quick
dotnet run
```

3. Connect a device

```
>>>>> Select a menu: 2
>> Enter the IP address of the device: 192.168.13.200
>> Enter the port of the device (default: 51211):
>> Use SSL y/n (default: n): n
Connecting to the device...
Connected to 939271697

===== Main Menu =====

(1) Search devices
(2) Connect to a device synchronously
(3) Manage asynchronous connections
(4) Accept devices
(5) Device menu
(q) Quit

>>>>> Select a menu:

Status: { "deviceId": 939271697, "status": "TCP_CONNECTED", "timestamp": 1631163171 }
```

Basic Test(Device Connect-Search)

FileEditViewGitProjectBuildDebugTestAnalyzeToolsExtensionsWindowHelp

Search (Ctrl+Q)

csharp_clie...0210623 (7)경림ADMIN

testImageUser.csProgram.csProgram.csProgram.csUserSvc.cs

testImageUser.csProgram.cs

example.ConnectTestgatewayClient

1using System;

2using System.Threading;

3using Connect;

4using Grpc.Core;

5

6namespace example

7{

8class ConnectTest

9{

10private const string GATEWAY_CA_FILE = "C:\\Users\\mark.SUPREMA\\Downloads\\device_gateway_x64_v1.4.0_20210623\\cert\\ca.crt";

11//C:\\Users\\mark.SUPREMA\\Downloads\\device_gateway_V1.4.3B_20220428\\device_gateway_V1.4.3B_20220428\\device_gateway_x64_V1.4.3B_20220428\\cert

12private const string GATEWAY_ADDR = "192.168.13.37";

13private const int GATEWAY_PORT = 4000;

14

15private const int STATUS_QUEUE_SIZE = 16;

16

17private GatewayClient gatewayClient;

18private ConnectSvc connectSvc;

19

20public ConnectSvc GetConnectSvc() {

69 %No issues foundLn: 16Ch: 9SPCCRLF

Developer PowerShell

+ Developer PowerShell

** Visual Studio 2019 Developer PowerShell v16.11.1

** Copyright (c) 2021 Microsoft Corporation

Developer PowerShellOutput

Solution Explorer - Folder View

Search Solution Explorer - Folder View (Ctrl+;)

csharp_client_sdk_v1.4.0_20210623 (7) (C:\\Users\\mark.SUPREMA\\Downloads\\device_gateway_x64_v1.4.0_20210623)

biostar

example

access

action

apb

auth

card

cli

client

connect

test

bin

cli

obj

C# Program.cs

C# test.csproj

C# ConnectSvc.cs

connectMaster

device

door

err

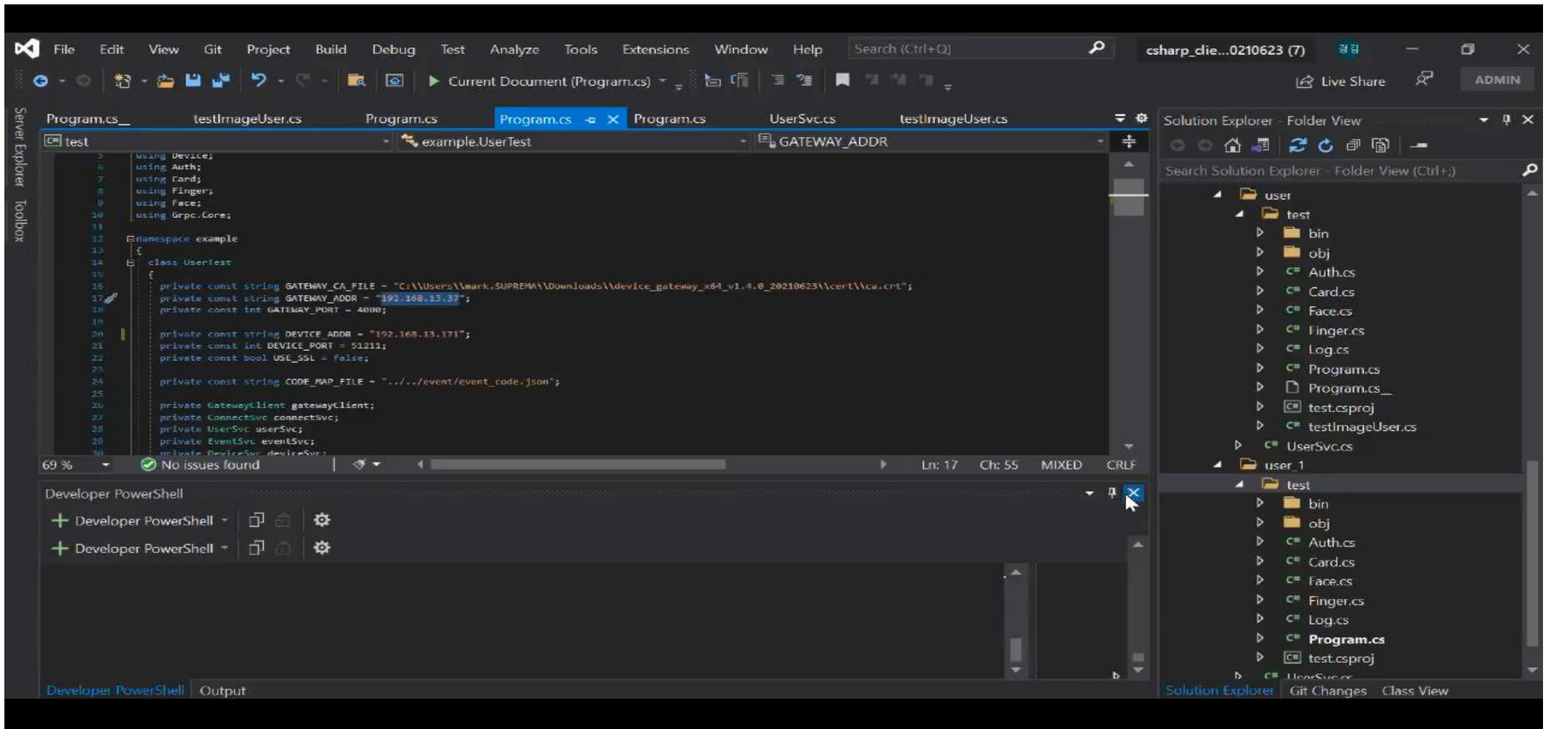
event

face

face_1

finder

Basic Test(Add User- User Enrollment)-Finger, Card, Auth



05

FAQ

Question #1

Could you confirm the below message? I cannot run the G-SDK example.

Cannot connect to the device: Grpc.Core.RpcException: Status(StatusCode=Unavailable, Detail="Cannot handshake the direct connection: Cannot handshake: Cannot receive the sync packet: Cannot receive packet: Cannot find the start code: read tcp 192.168.13.37:64990->192.168.13.171:51211: i/o timeout")

Answer

1. Check if the BioStar 2 service is running.

-> If that is running, please stop the service.

2. It may not start the service intermittently when modifying the sample code.

-> Please restart the device gate way's application.



Question #2

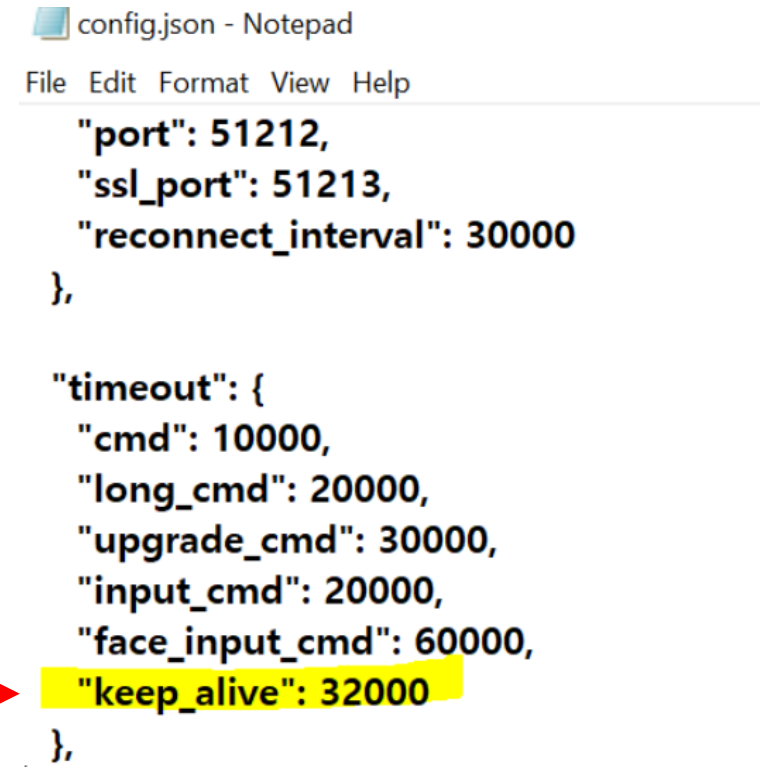
Cannot send the status change: rpc error: code = Unavailable desc = transport is closing
Cannot send the status change: rpc error: code = Unavailable desc = transport is closing

Answer

The failed with error "code = Unavailable desc = transport is closing"
This error means the connection the gRPC is using was closed, and there are many possible reasons, including:

1. misconfigured transport credentials, connection failed on handshaking
2. bytes disrupted, possibly by a proxy in between server shutdown

Please expand the value of the "keep_alive" more.
(Config.json In the Device_Gate_way)



```
config.json - Notepad
File Edit Format View Help

{"port": 51212,
"ssl_port": 51213,
"reconnect_interval": 30000
},

"timeout": {
"cmd": 10000,
"long_cmd": 20000,
"upgrade_cmd": 30000,
"input_cmd": 20000,
"face_input_cmd": 60000,
"keep_alive": 32000
},
}
```

Question #3

I cannot connect the device and cannot add user. How can I solve this issue?

Answer

If the different certificate for the secure communication is in the device, the G-SDK cannot connect the device. You need to make the device to factory default.

```
Searching devices in the subnet...
```

```
***** Found Devices: 1
```

```
{ "deviceId": 543717791, "type": "FACESTATION_F2", "IPAddr": "192.168.1.67", "port": 51211, "useSSL": true }
```

Question #4

I want to use Face Access On Card with FaceStation F2. Can I use G-SDK for this?



Answer

G-SDK does not have the API to support the Face Access On Card.

This feature would be added to the next version of G-SDK and the estimated schedule is in 2022 Q4.

Question #5

How can we update the user profile image?

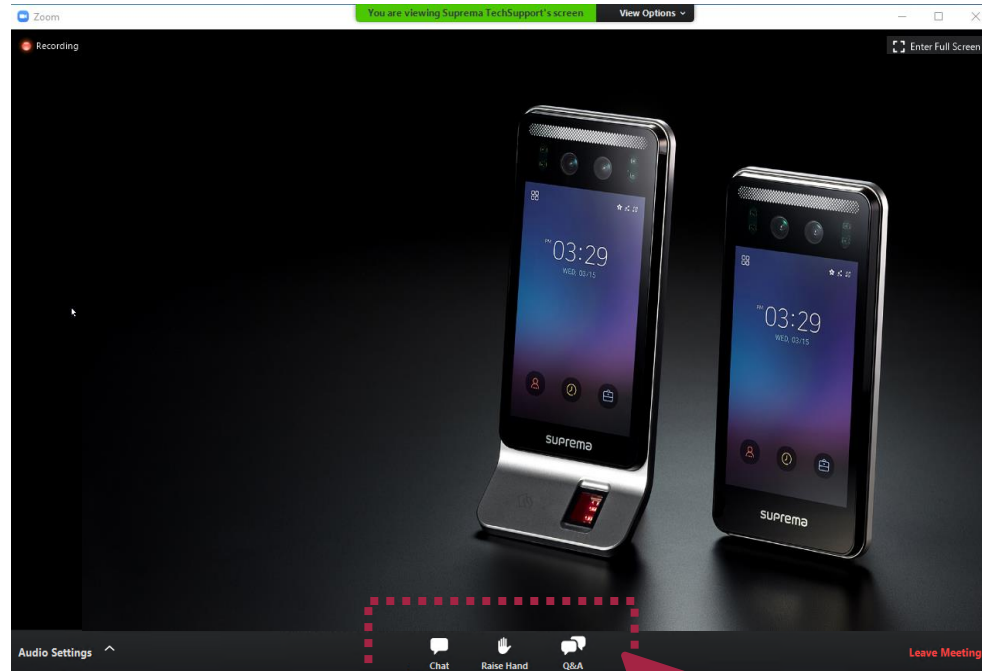
Answer

This would be updated to the next version of G-SDK and we can provide a beta example code to you if you need. Please contact Suprema Tech Team.

06

Q&A

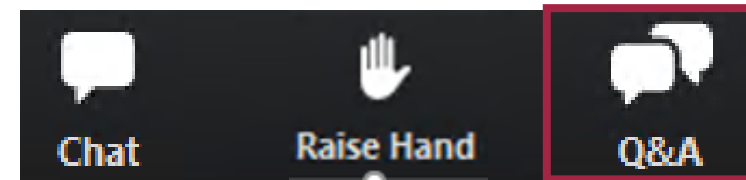
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