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## Possible Integration Option 3 : G-SDK

In addition to the integration method using BioStar2 SW API or BioStar2 Device SDK, G-SDK is recently released as a new integration option for device management, user management, and log management.

## What is G-SDK?

G-SDK is one of the integration options for communicating with BioStar 2 devices. It is a lightweight, scalable, and cross-platform solution which will expedite your development.

## How G-SDK works?
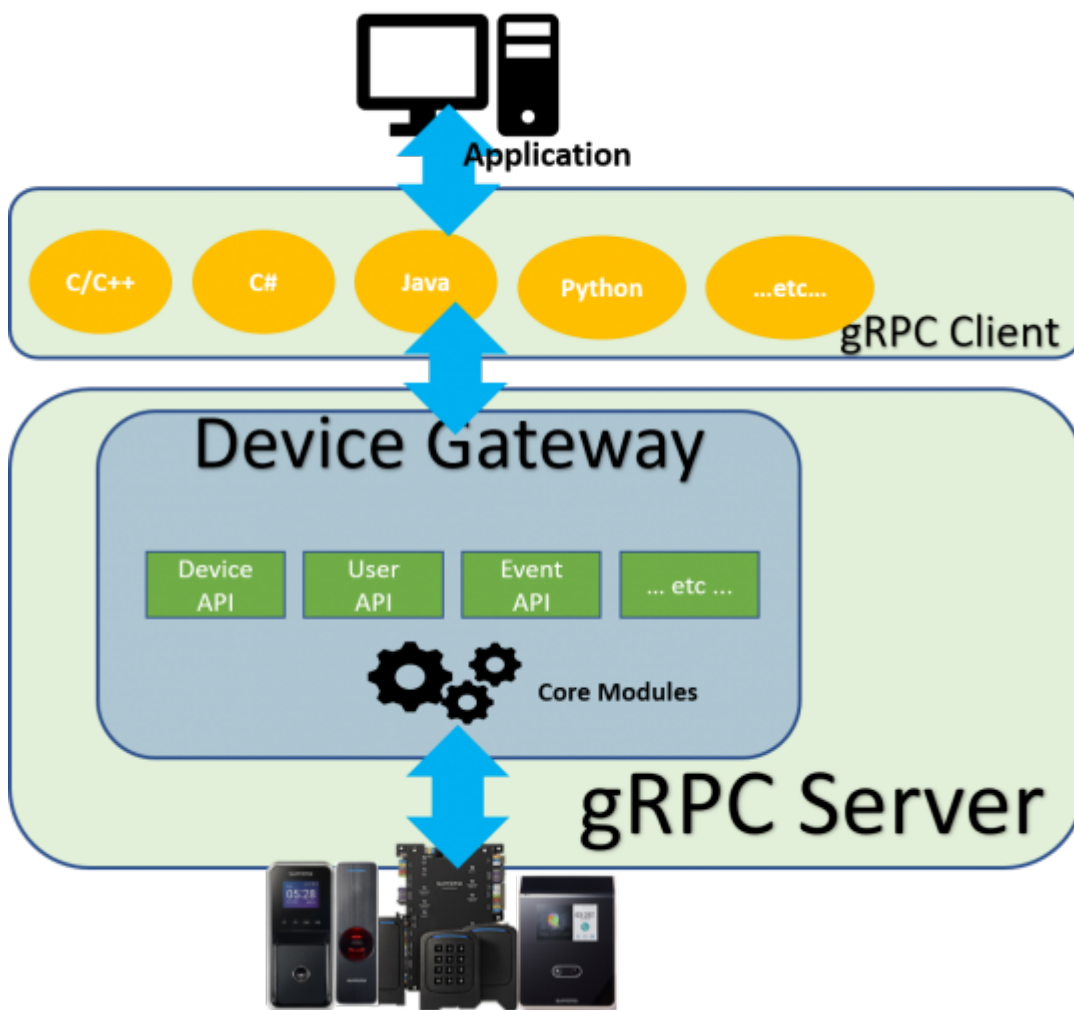


**[Figure 1. G-SDK architecture]**

G-SDK consists of Device Gateway in gRPC Server and gRPC Client Libraries.
Based on gRPC, it supports many programming languages such as Java, C#, Python, Node.js, Go, etc.

(gRPC (gRPC Remote Procedure Calls) is an open source remote procedure call (RPC) system initially developed at Google in 2015.)

### Multi-language support

- Language-neutral IDL
- Native client libraries

**Device Gateway** that communicates with BioStar 2 device can be run on a server or cloud. **Core modules** use BioStar 2 protocols and written by GO language.
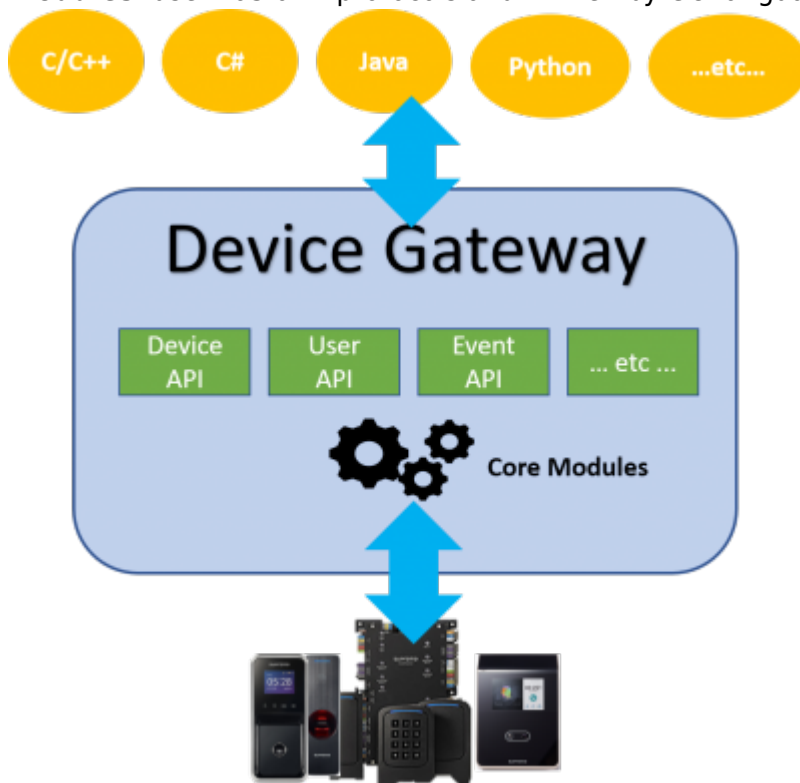


**[Figure 2. Device Gateway Structure]**

## What is different from BioStar 2 Device SDK?

Existing BioStar 2 Device SDK provides C++ library with C#. G-SDK is released to provide flexible development for those who would like to meet the requirements below.

Let's take a look for an easy comparison between BioStar 2 Device SDK and G-SDK.

| | BioStar 2 Device SDK | G-SDK |
|---|---|---|
| Deployment | • Shared library | • Client libraries<br>• Device Gateway |
| Supported OS | • Windows<br>• X86 Linux | • Windows<br>• X86/Arm Linux<br>• Mac OS |
| Supported Language | • C++<br>• C# sample | • C++, Java, Python, Go, Ruby, C#, Node.js, Android Java, Objective-C, PHP, Web<br>• C#, Java, Python, GO, node samples |

**[Figure 3. BioStar 2 Device SDK vs G-SDK]**

One of the biggest advantages of G-SDK compare to Device SDK is that it supports various languages. For the last years, Device SDK users have had difficulty using development language other than C++ or C# which is in the sample code.
Since BioStar 2 Device SDK can communicate with C++ library, you have to use C++ language or need to marshall all the APIs and structures in the library into other languages. Currently BioStar 2 Device SDK provides only C# marshalling sample.
This is a limitation of BioStar 2 Device SDK due to the structure.



**[Figure 4. BioStar 2 Device SDK structure]**

How G-SDK can support so many languages?
It is because G-SDK is based on gRPC. gRPC is an open RPC framework that supports many languages developed by Google.
Basically, the device gateway is the one that communicates with BioStar 2 device. Your client applications can connect to it using gRPC client libraries.
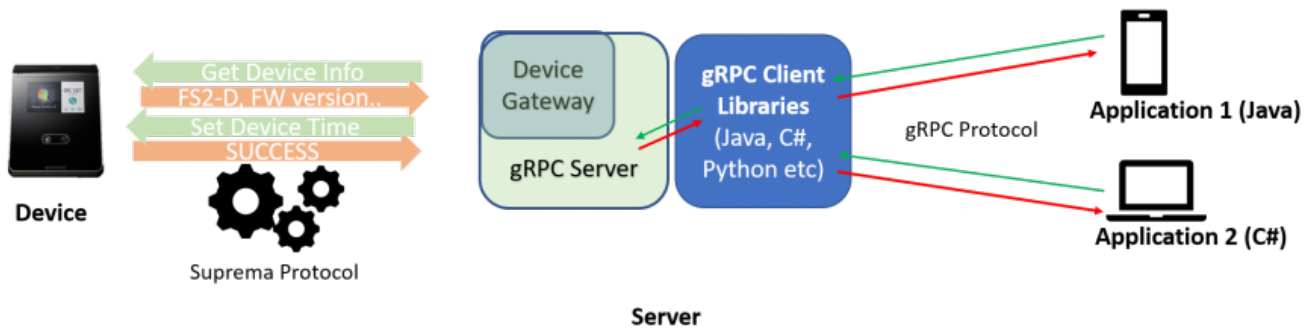
**[Figure 5. G-SDK structure]**

## What are the next features?

### 1. Master Gateway

G-SDK can support up to 1000 device connections with a Device gateway.
Currently, Master gateway that will support up to 100,000 device connections is under development.
Master Gateway helps you handle multiple Device gateways and it can be deployed on a cloud server or provide mobile direct accessibility too.

| | Device Gateway | Master Gateway |
|---|---|---|
| Role | • Manage devices | • Manage devices through gateways<br>• Manage gateways<br>• Provide additional services such as authentication, rate limit, user synchronization, etc. |
| Deployment | • Single binary | • Single binary<br>• Docker |
| Target Applications | • Desktop<br>• Single site | • Mobile<br>• Cloud<br>• Multi sites |
| Max. Devices | • 1,000 | • 100,000 |
| Design Goals | • Performance<br>• Stability | • Scalability<br>• Extensibility |

**[Figure 6. Device Gateway vs Master Gateway]**

### 2. Advanced AC API

G-SDK doesn't support advanced AC such as Zone, Wiegand or RS485 but it supports only simple configurations & features.
In the future, G-SDK will support all the APIs that are supported in the BioStar 2 Device SDK : Zone, Wiegand, RS485, etc.

### 3. More language support samples

G-SDK provides C#, Java, Python, Go and Node samples. Furthermore, G-SDK is planning to support Android, iOS, Ruby samples.

## Summary of G-SDK

### Supported OS
Windows, x86/Arm Linux, Mac OS

### Recommended Requirements
2.0GHz CPU, 4GB(32bit) or 8GB(64bit) RAM

### Minimum Requirements
1.0GHz CPU, 1GB(32bit) or 2GB(64bit) RAM

### Maximum number of devices
Up to 1,000

### Supported Language
C++, Java, Python, Go, Ruby, C#, Node.js, Android Java, Objective-C, PHP, Web

### Supported API
The basic AC APIs(Access control, User management, Event log etc) except advanced features such as Zone, Wiegand, RS485 features.

### Supported Device
All BioStar 2 devices

### Download
https://github.com/biostar-dev/g-sdk/

### Manual
https://biostar-dev.github.io/g-sdk/

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