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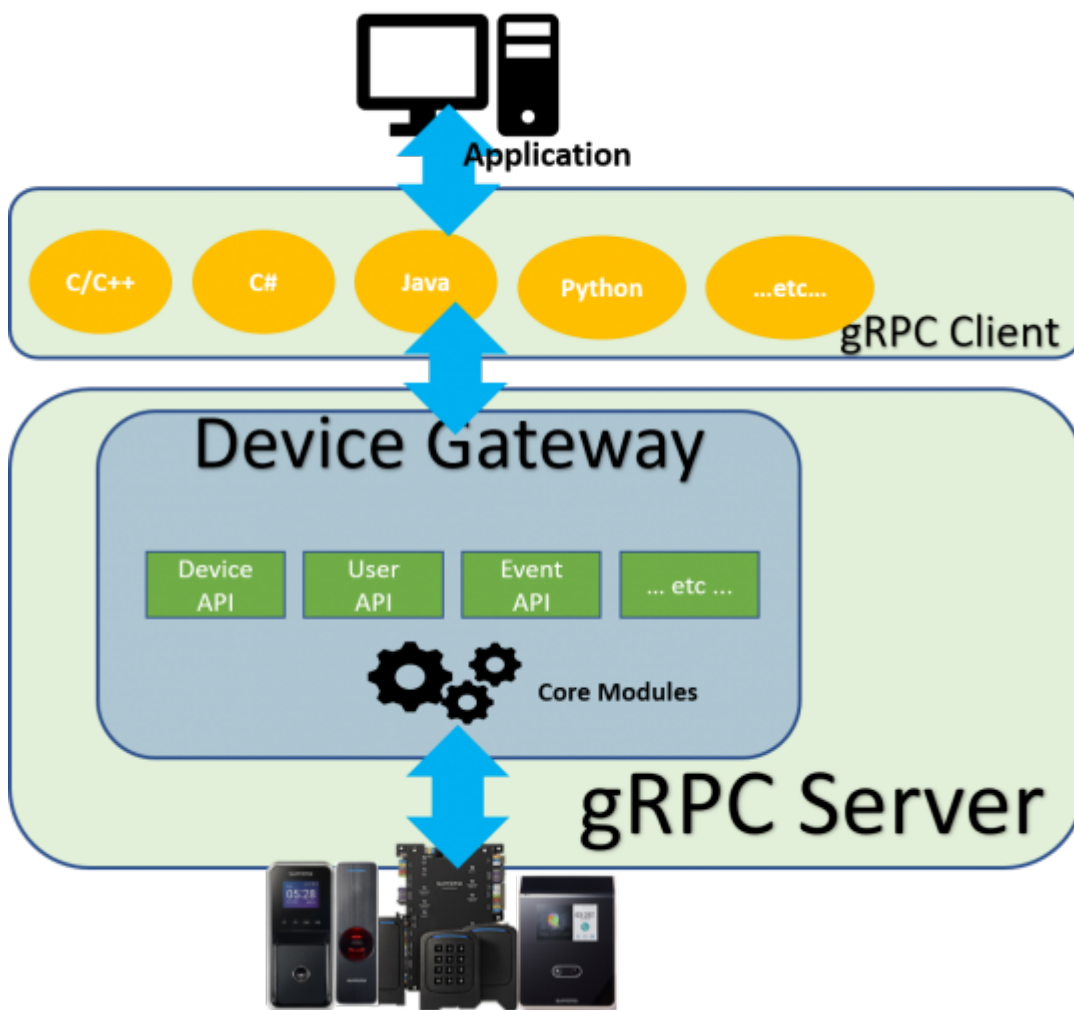
## Possible Integration Option 3 : G-SDK

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]**

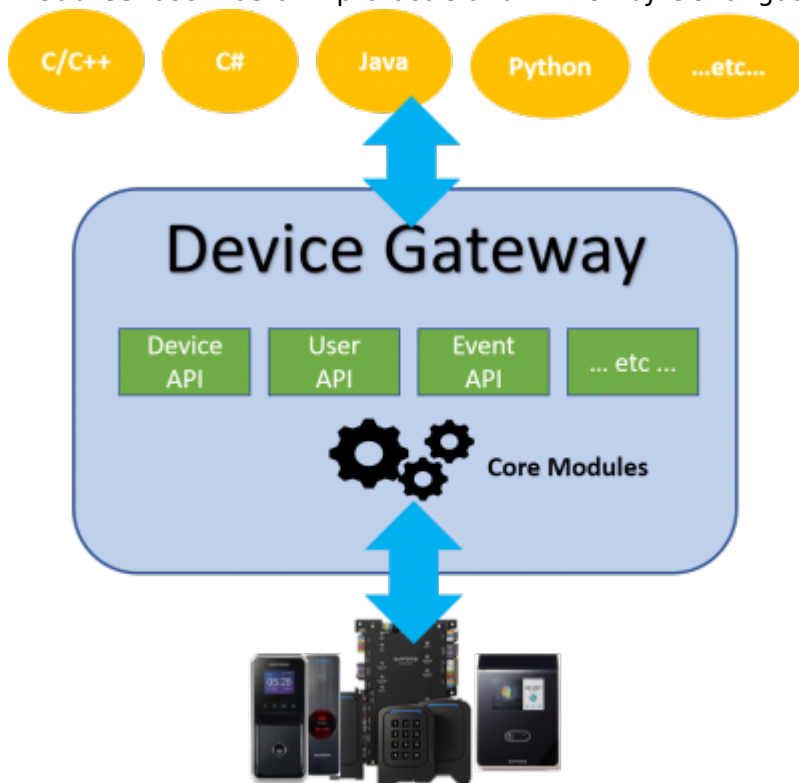
G-SDK consists of Device Gateway in gRPC Server and gRPC Client Libraries. Based on gRPC, it supports many programming languages such as Java, C#, Python, Node.js, Go, etc.

(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	<ul style="list-style-type: none"> <li>Shared library</li> </ul>	<ul style="list-style-type: none"> <li>Client libraries</li> <li>Device Gateway</li> </ul>
Supported OS	<ul style="list-style-type: none"> <li>Windows</li> <li>X86 Linux</li> </ul>	<ul style="list-style-type: none"> <li>Windows</li> <li>X86/Arm Linux</li> <li>Mac OS</li> </ul>
Supported Language	<ul style="list-style-type: none"> <li>C++</li> <li>C# sample</li> </ul>	<ul style="list-style-type: none"> <li>C++, Java, Python, Go, Ruby, C#, Node.js, Android Java, Objective-C, PHP, Web</li> <li>C#, Java, Python, GO, node samples</li> </ul>

**[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# marshall sample.

This is a limitation of BioStar 2 Device SDK due to the structure.

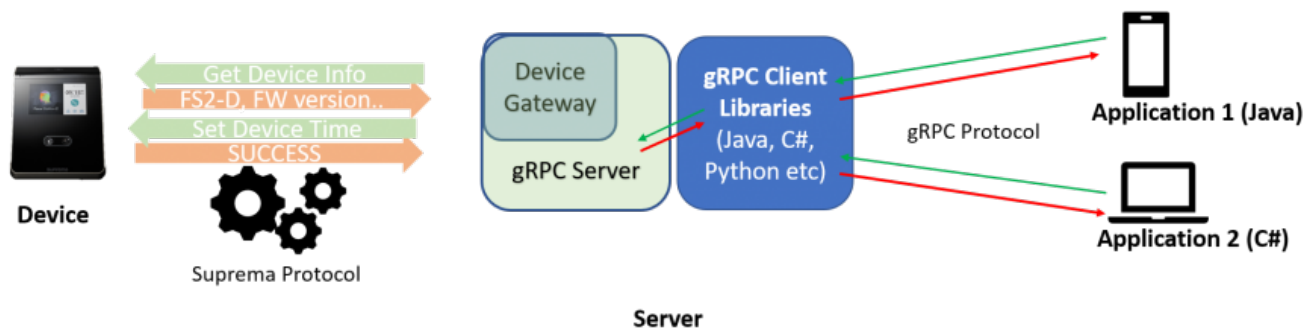


**[Figure 4. BioStar 2 Device SDK structure]**

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	<ul style="list-style-type: none"> <li>Manage devices</li> </ul>	<ul style="list-style-type: none"> <li>Manage devices through gateways</li> <li>Manage gateways</li> <li>Provide additional services such as authentication, rate limit, user synchronization, etc.</li> </ul>
Deployment	<ul style="list-style-type: none"> <li>Single binary</li> </ul>	<ul style="list-style-type: none"> <li>Single binary</li> <li>Docker</li> </ul>
Target Applications	<ul style="list-style-type: none"> <li>Desktop</li> <li>Single site</li> </ul>	<ul style="list-style-type: none"> <li>Mobile</li> <li>Cloud</li> <li>Multi sites</li> </ul>
Max. Devices	<ul style="list-style-type: none"> <li>1,000</li> </ul>	<ul style="list-style-type: none"> <li>100,000</li> </ul>
Design Goals	<ul style="list-style-type: none"> <li>Performance</li> <li>Stability</li> </ul>	<ul style="list-style-type: none"> <li>Scalability</li> <li>Extensibility</li> </ul>

[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

### 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

### Not Supported Device

All BioStar 1 Devices

(BioEntry Plus v2, BioEntry W v2, XPass v2, XPS2 v2, and BLN v2 are not supported.Gen 1 devices are not supported)

### Download

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

### Manual

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

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