



Google Cloud Messaging

400% growth in 10 months



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Google Cloud Messaging



400% growth in 10 months



200K+ QPS



Google Cloud Messaging



400% growth in 10 months



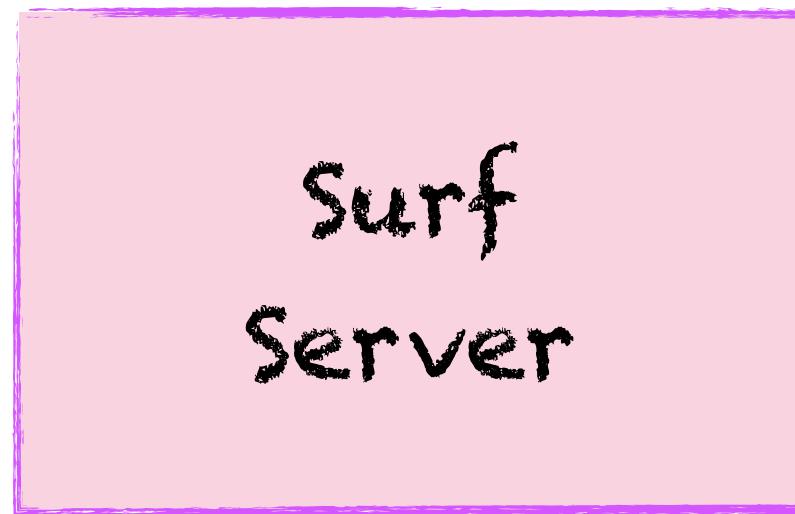
200K+ QPS



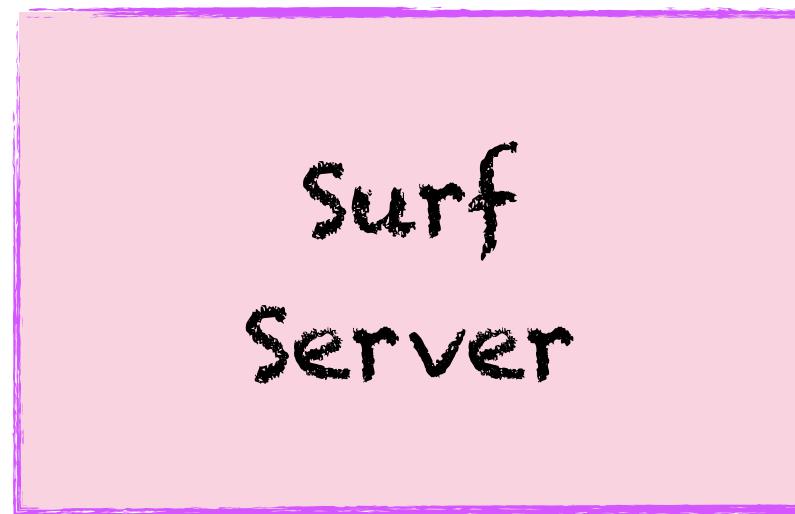
60+% of most popular apps



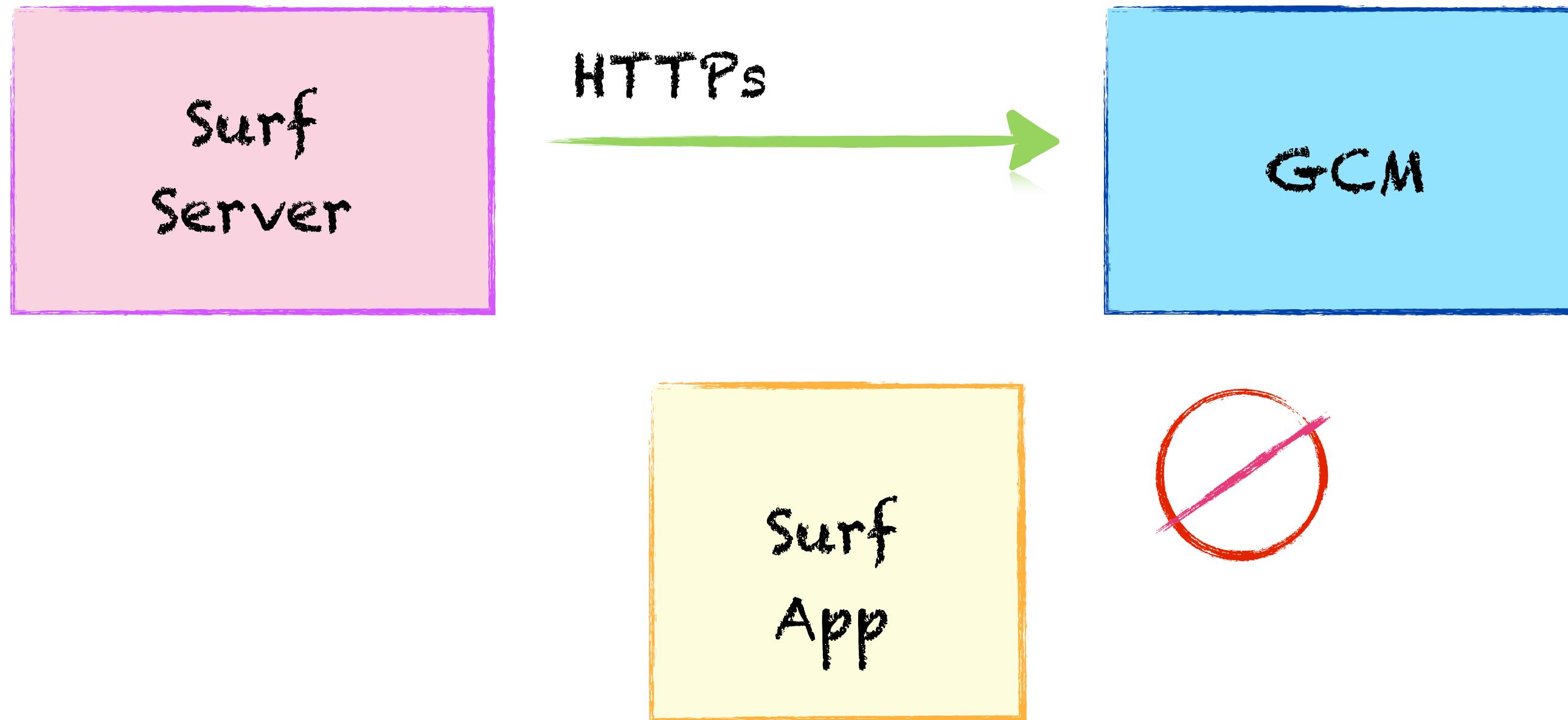
Google Cloud Messaging



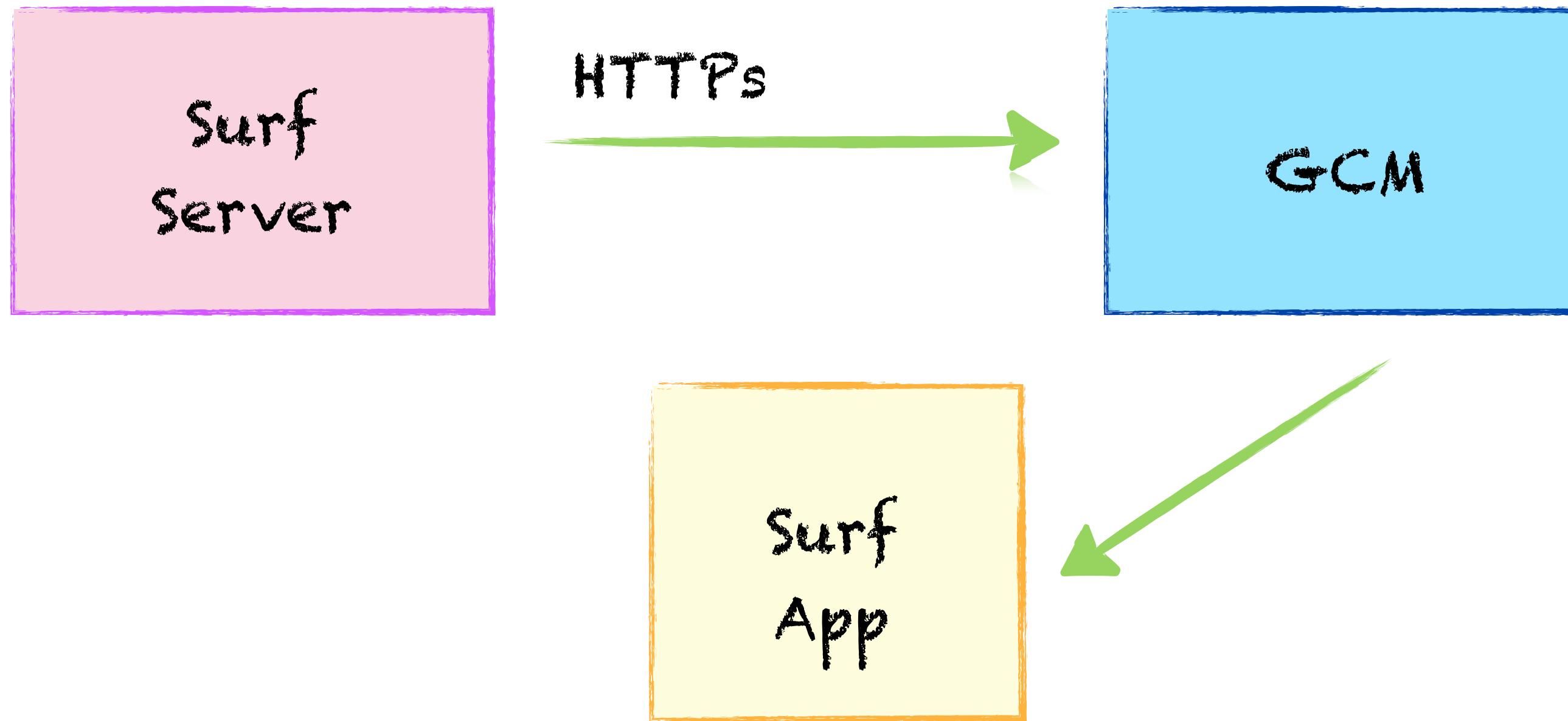
Google Cloud Messaging



Google Cloud Messaging



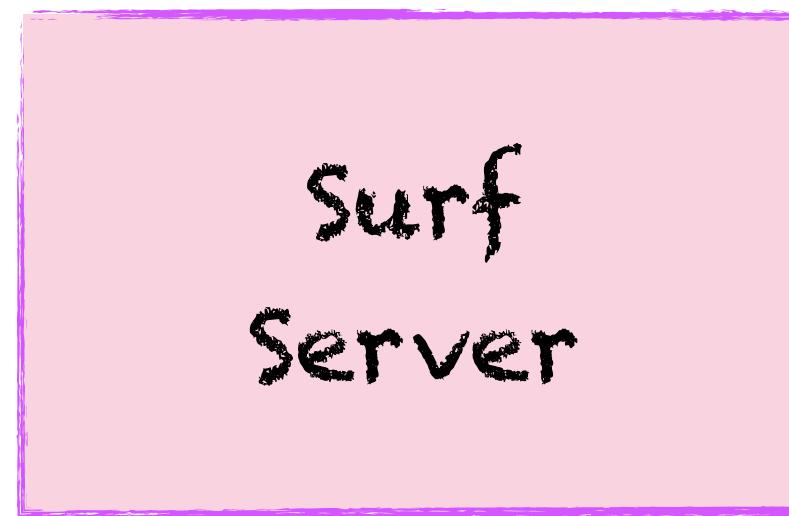
Google Cloud Messaging



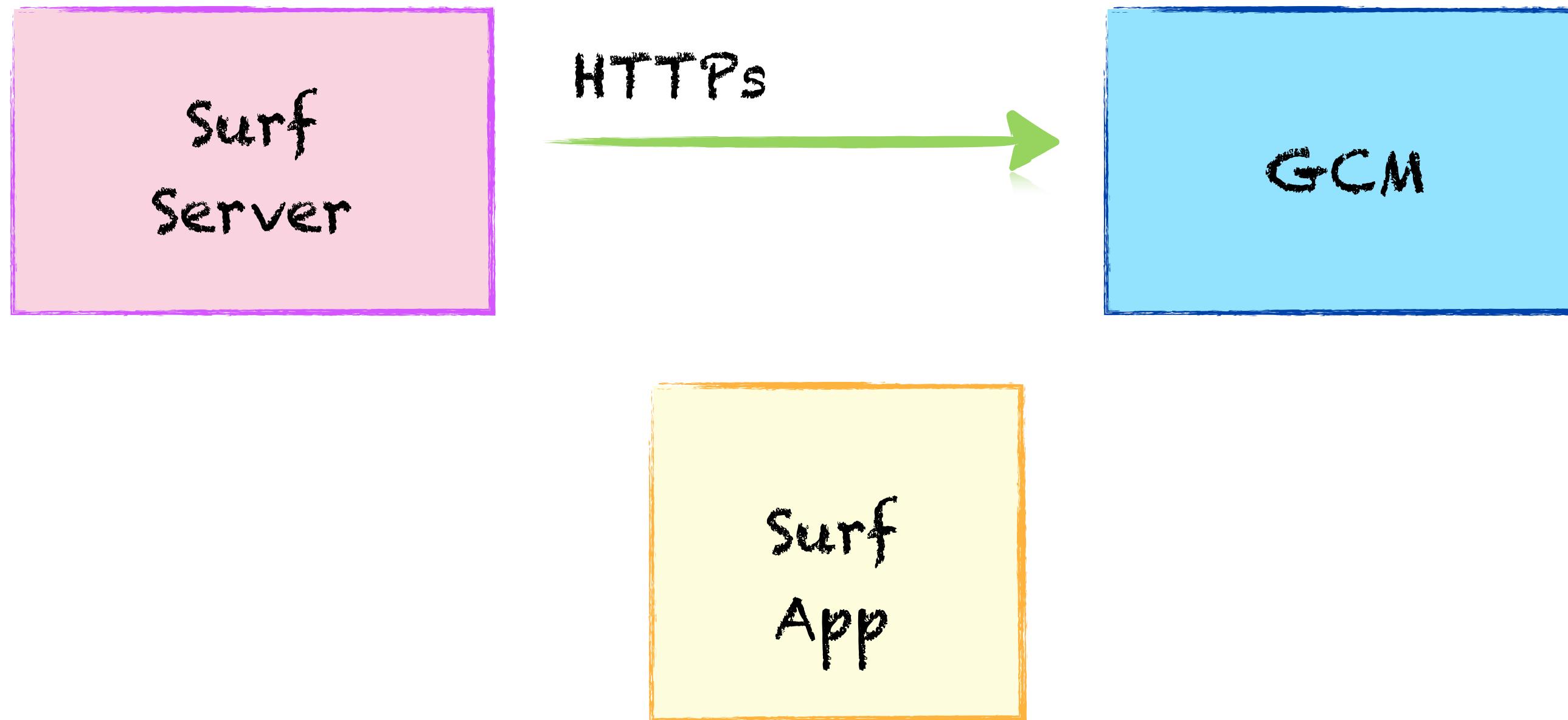
Google Cloud Messaging *Send to Sync*



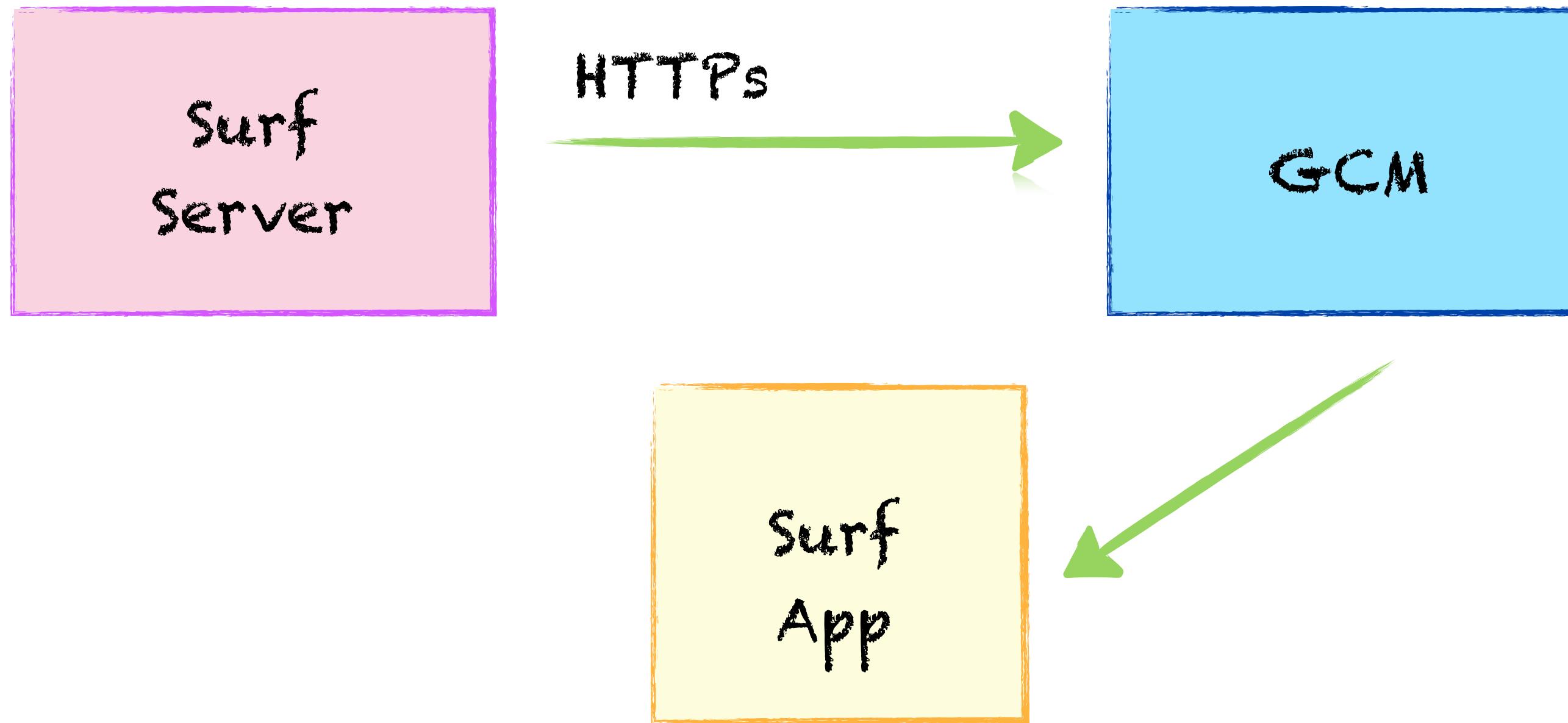
Google Cloud Messaging *Send to Sync*



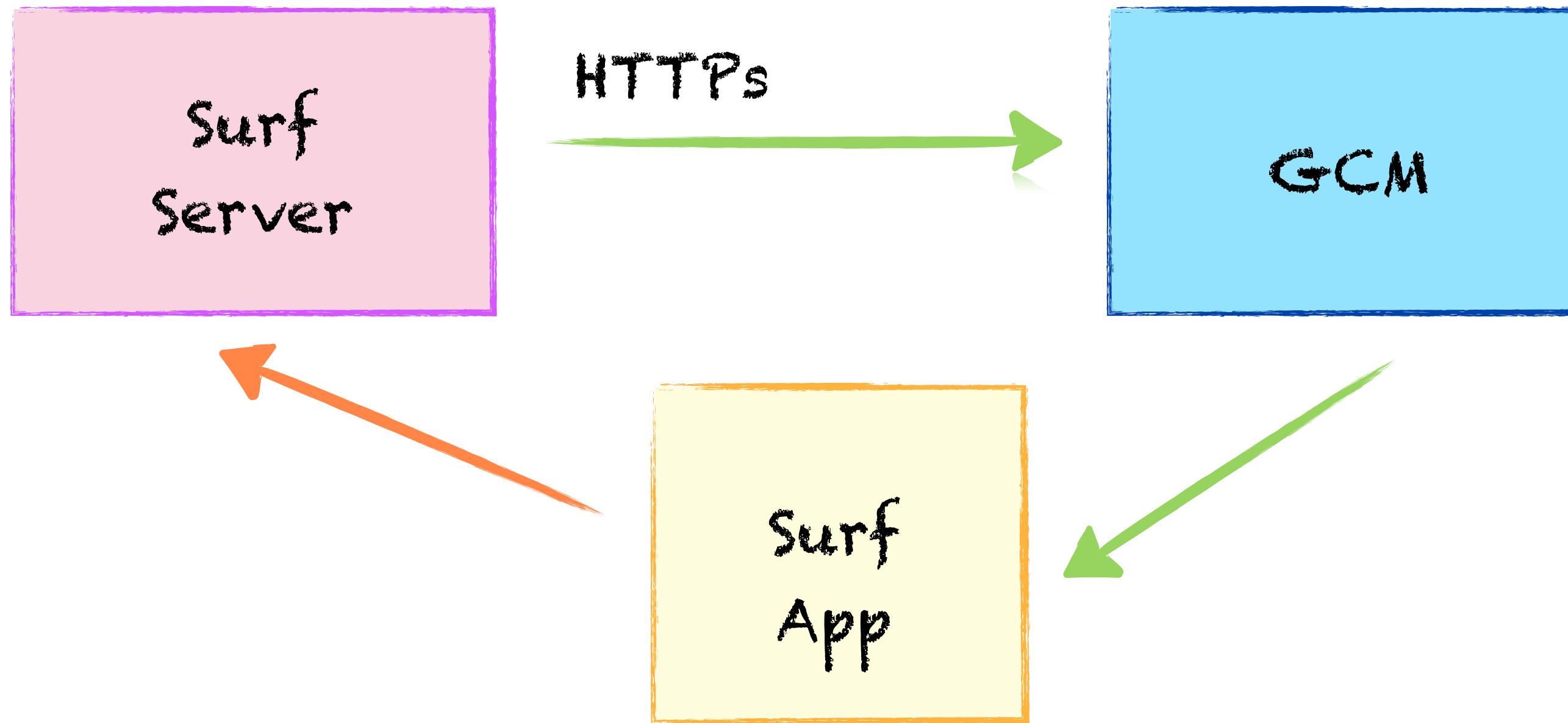
Google Cloud Messaging *Send to Sync*



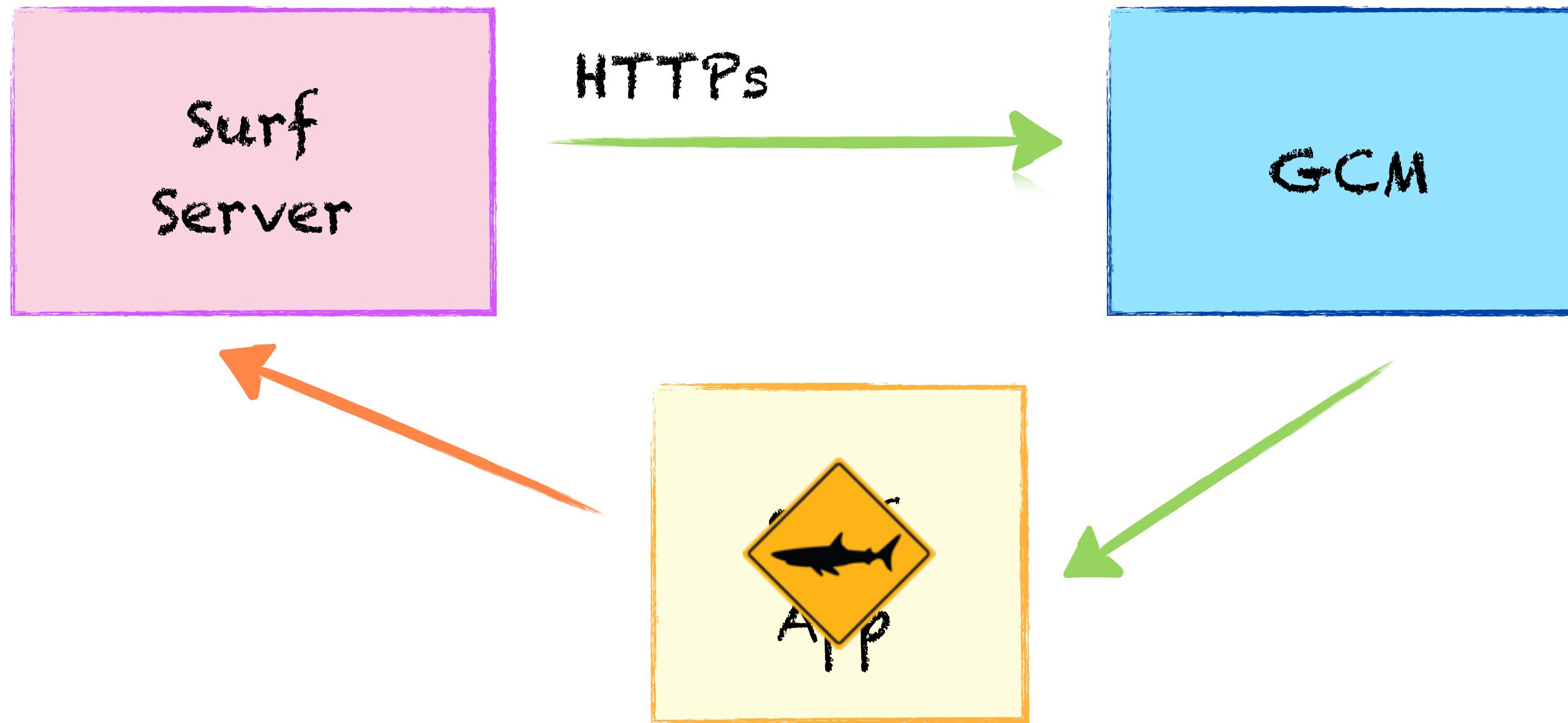
Google Cloud Messaging *Send to Sync*



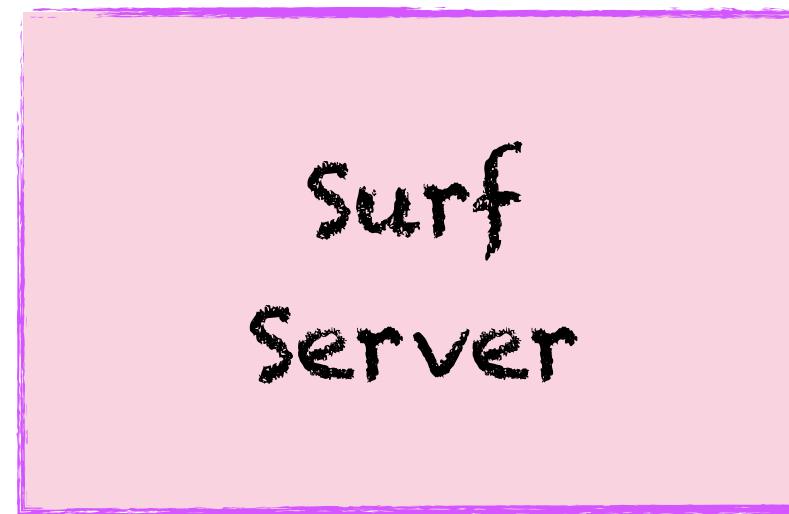
Google Cloud Messaging *Send to Sync*



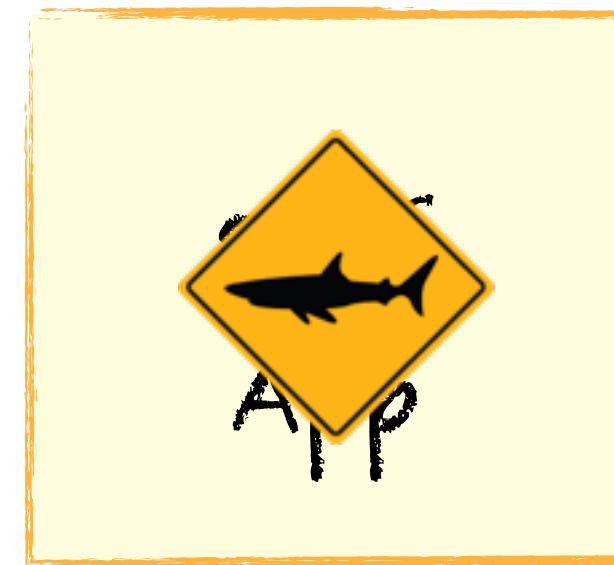
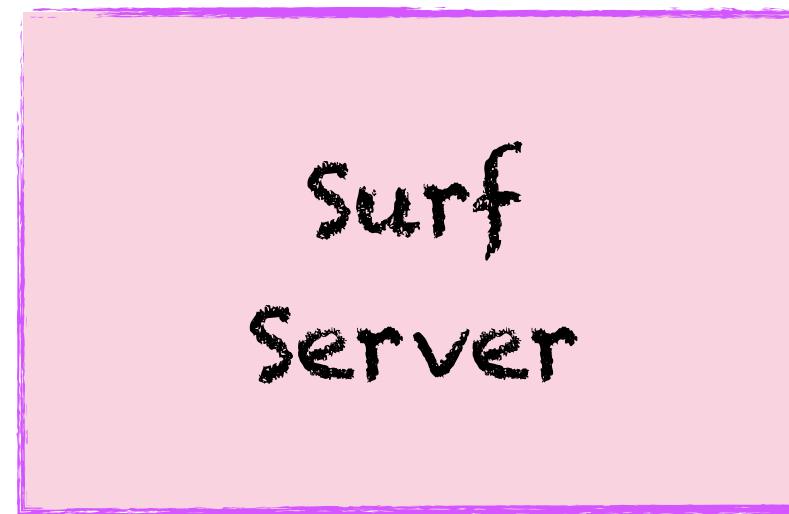
Google Cloud Messaging *Send to Sync*



Google Cloud Messaging Send Data



Google Cloud Messaging Send Data



Google Cloud Messaging APIs

Time To Live and Delay While Idle



Google Cloud Messaging APIs



Time To Live and Delay While Idle



Google Cloud Messaging APIs



Time To Live and Delay While Idle



Multiple Senders



Google Cloud Messaging APIs



Time To Live and Delay While Idle



Multiple Senders

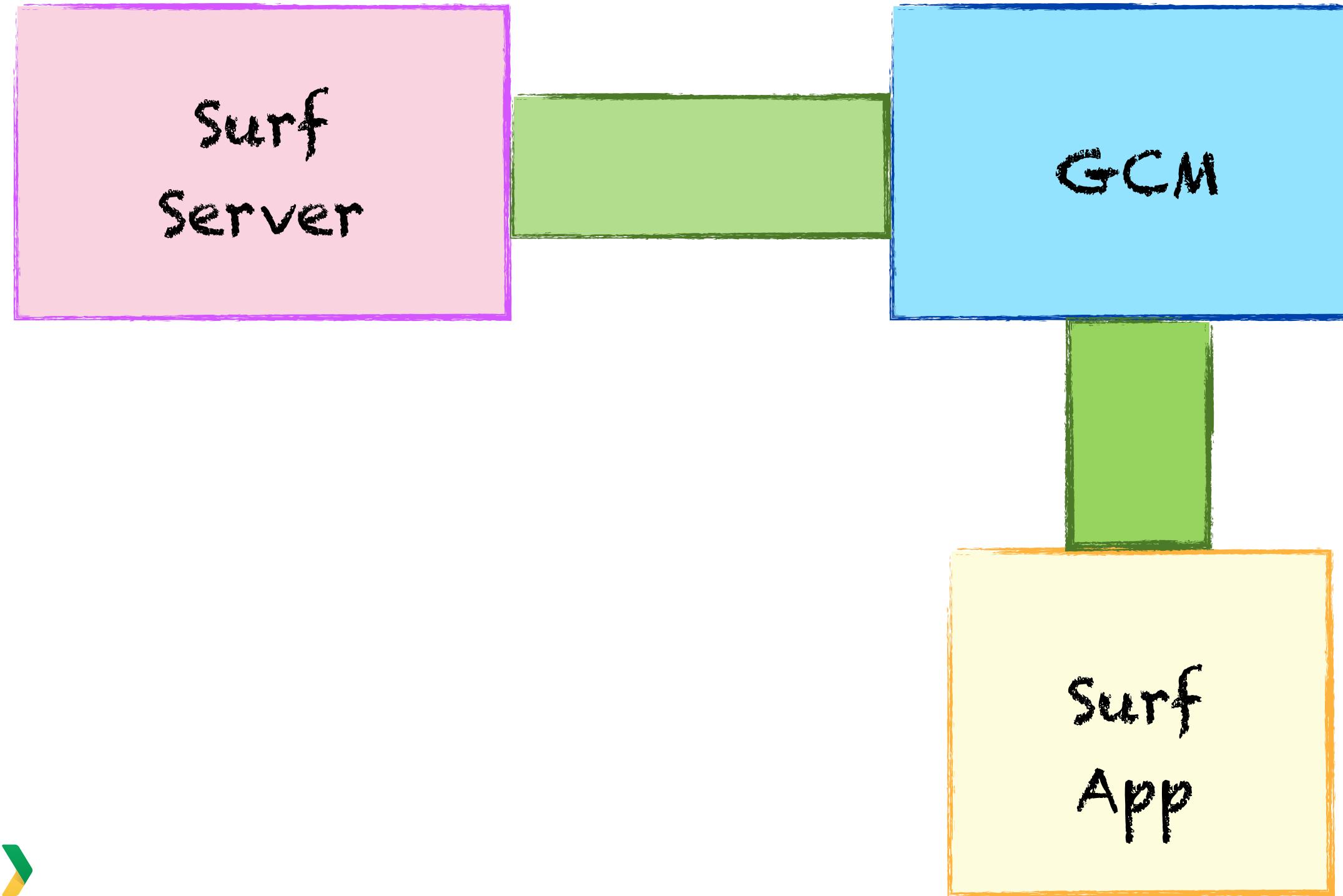


Message Multicasting

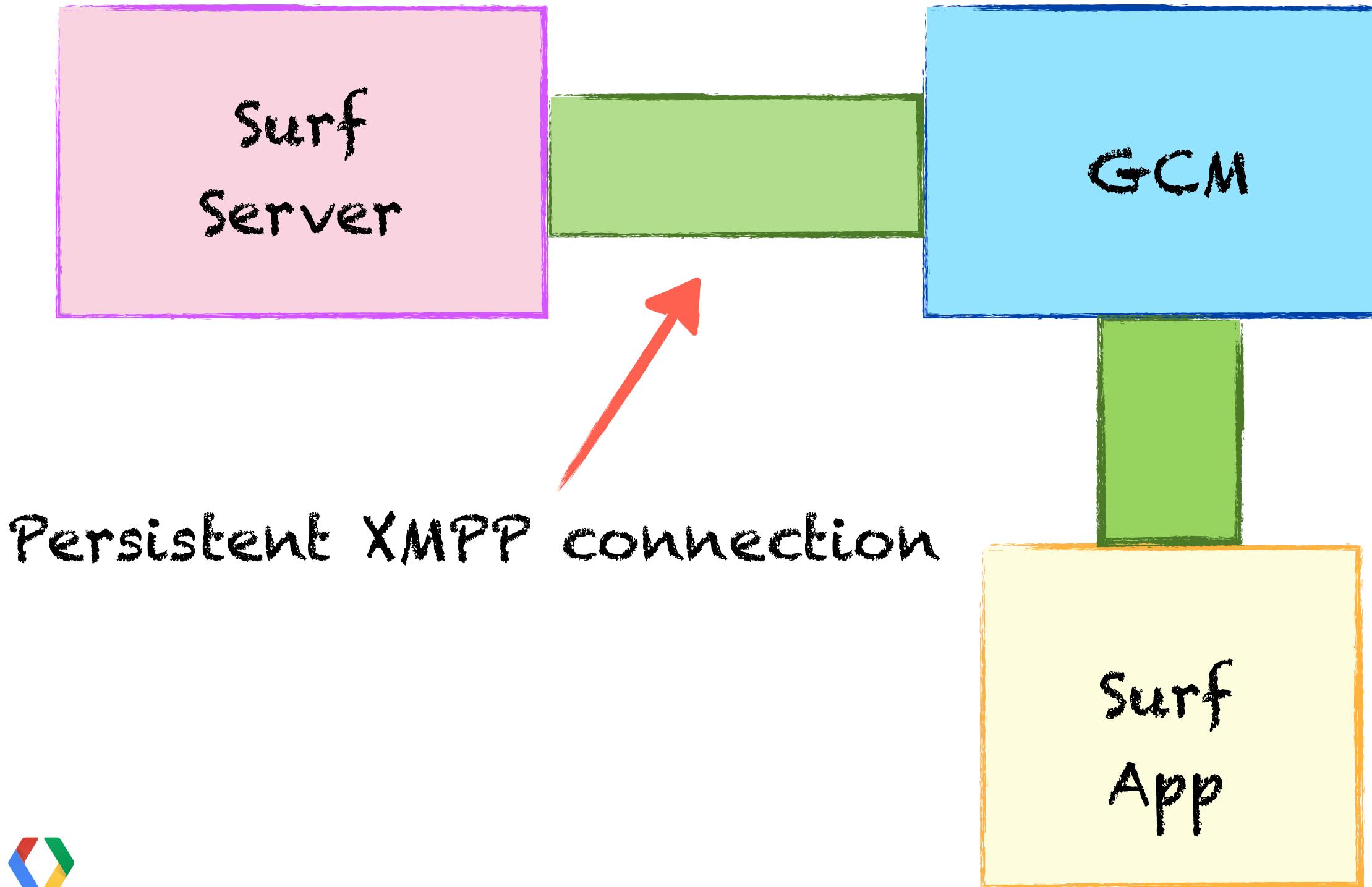




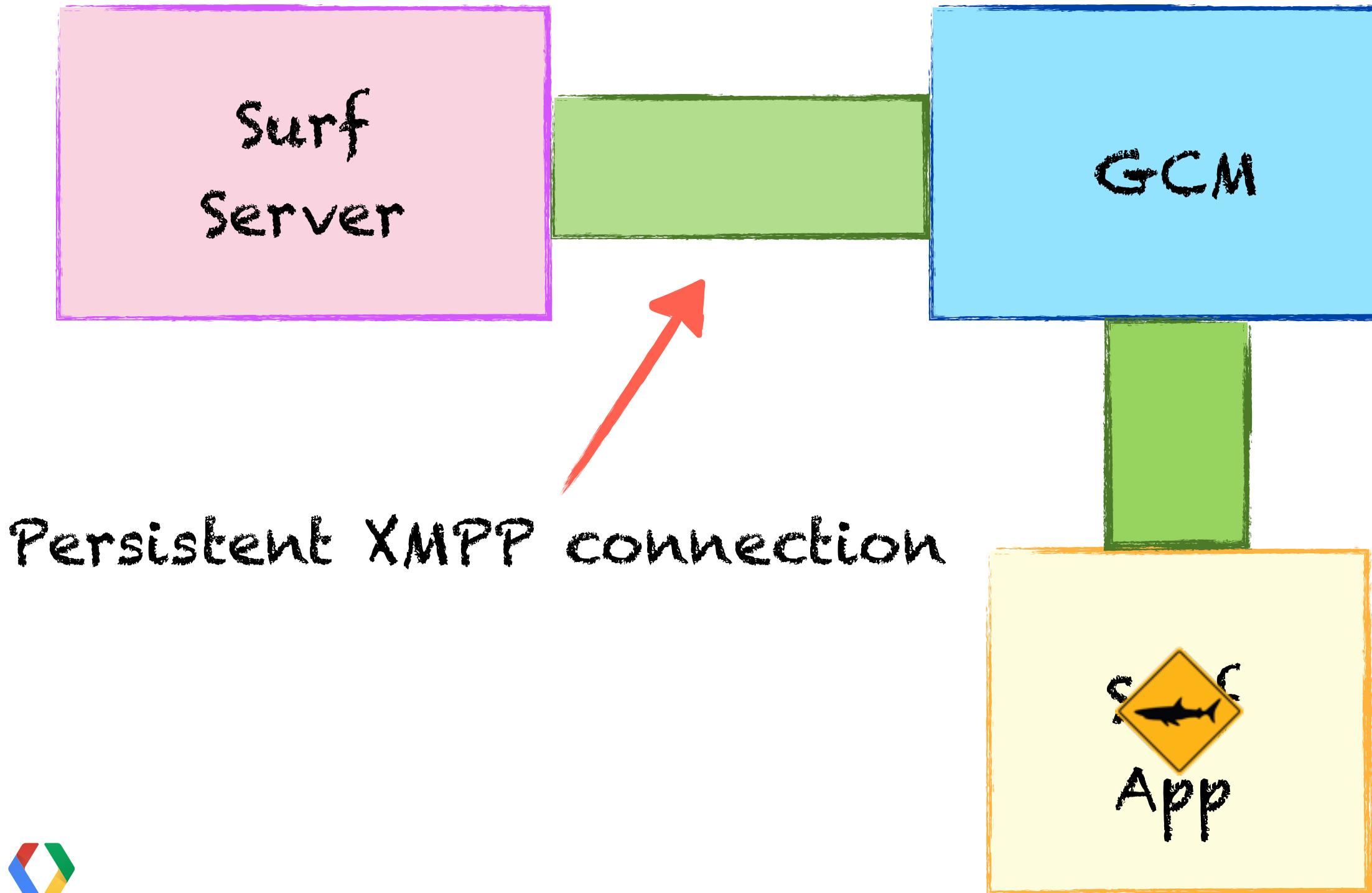
Google Cloud Messaging XMPP Endpoint



Google Cloud Messaging XMPP Endpoint



Google Cloud Messaging XMPP Endpoint



```
SERVER = ('gcm.googleapis.com', 5235)
```

```
client = xmpp.Client('gcm.googleapis.com', 5235)
```

```
client.connect(server=SERVER, secure=1, use_srv=False)
```

```
client.auth(PROJECT ID, API KEY)
```



Xmpp Client:

```
<auth mechanism="PLAIN"  
      xmlns="urn:ietf:params:xml:ns:xmpp-sasl">  
  MTI2MjAwMzQ3OTMzQHBy [...]  
</auth>
```

GCM Server:

```
<success xmlns="urn:ietf:params:xml:ns:xmpp-sasl"/>
```



```
node = "<message>
<gcm xmlns:google:mobile:data>
  JSON payload
</gcm>
</message>"
```

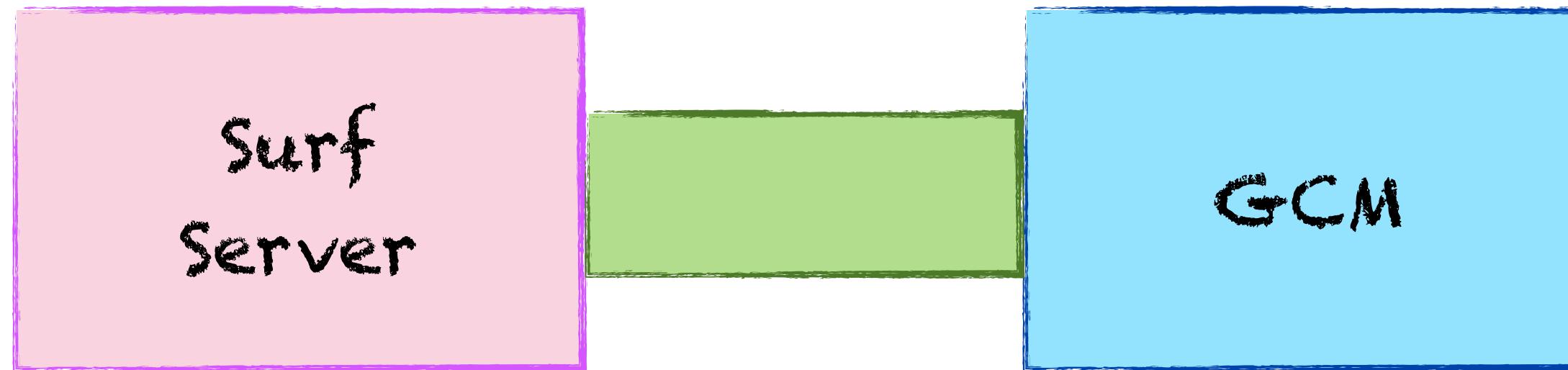
```
client.send(xmpp.protocol.Message(node))
```



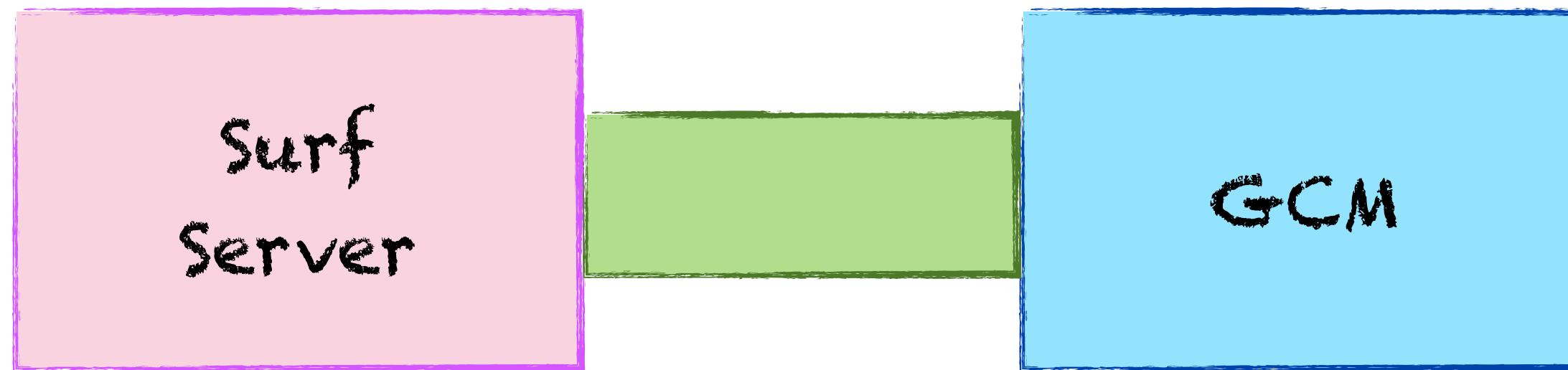
```
{  
  "to": "REGISTRATION_ID",  
  "data": {"hello": "world", }  
  "collapse_key": "collapse"  
  "time_to_live": "600",  
  "message_id": "m-1366082849205"  
  "delay_while_idle": true/false  
}
```



Message stream



Message stream



```
<gcm xmlns="google:mobile:data">  
  
{ "from":"REGISTRATION_ID",  
  "message_id":"m-1366082849205"  
  "message_type":"ack" }  
  
</gcm>
```



```
<gcm xmlns="google:mobile:data">  
  { "from": "REGID",  
    "message_id": "m-1366082849205"  
    "error": "ERROR_CODE",  
    "message_type": "nack" }  
</gcm>
```



XMPPTC Endpoint

Up to 10 connections



XMPP Endpoint



Up to 10 connections



XMPP Endpoint



Up to 10 connections



Message streaming with ACKs/NACKs



XMPPE Endpoint



Up to 10 connections



Message streaming with ACKs/NACKs



Same GCM APIs, no Multicasting





Upstream

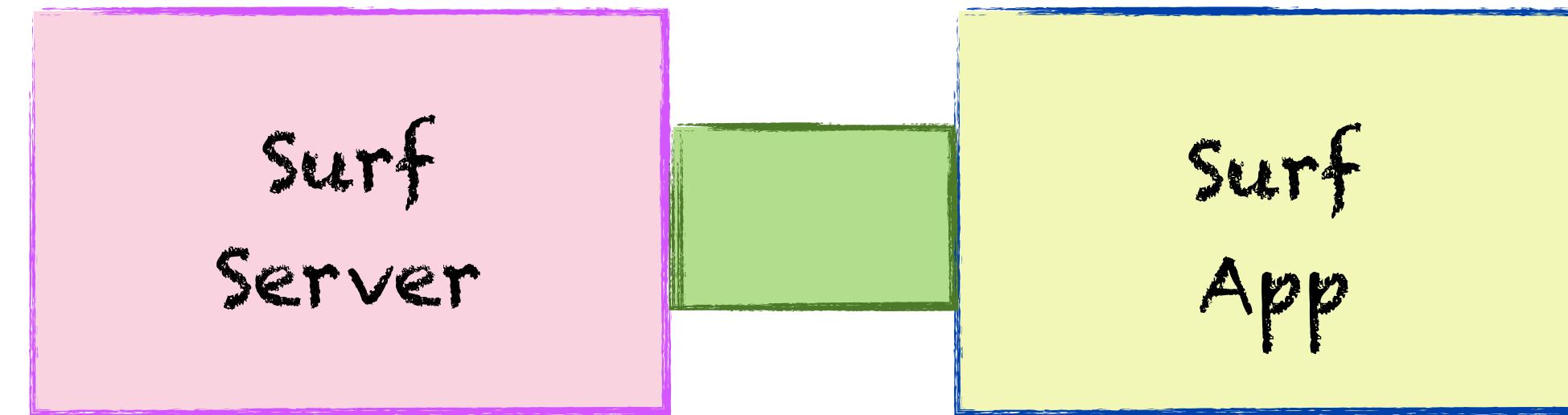
Google Cloud Messaging Upstream



Google Cloud Messaging Upstream



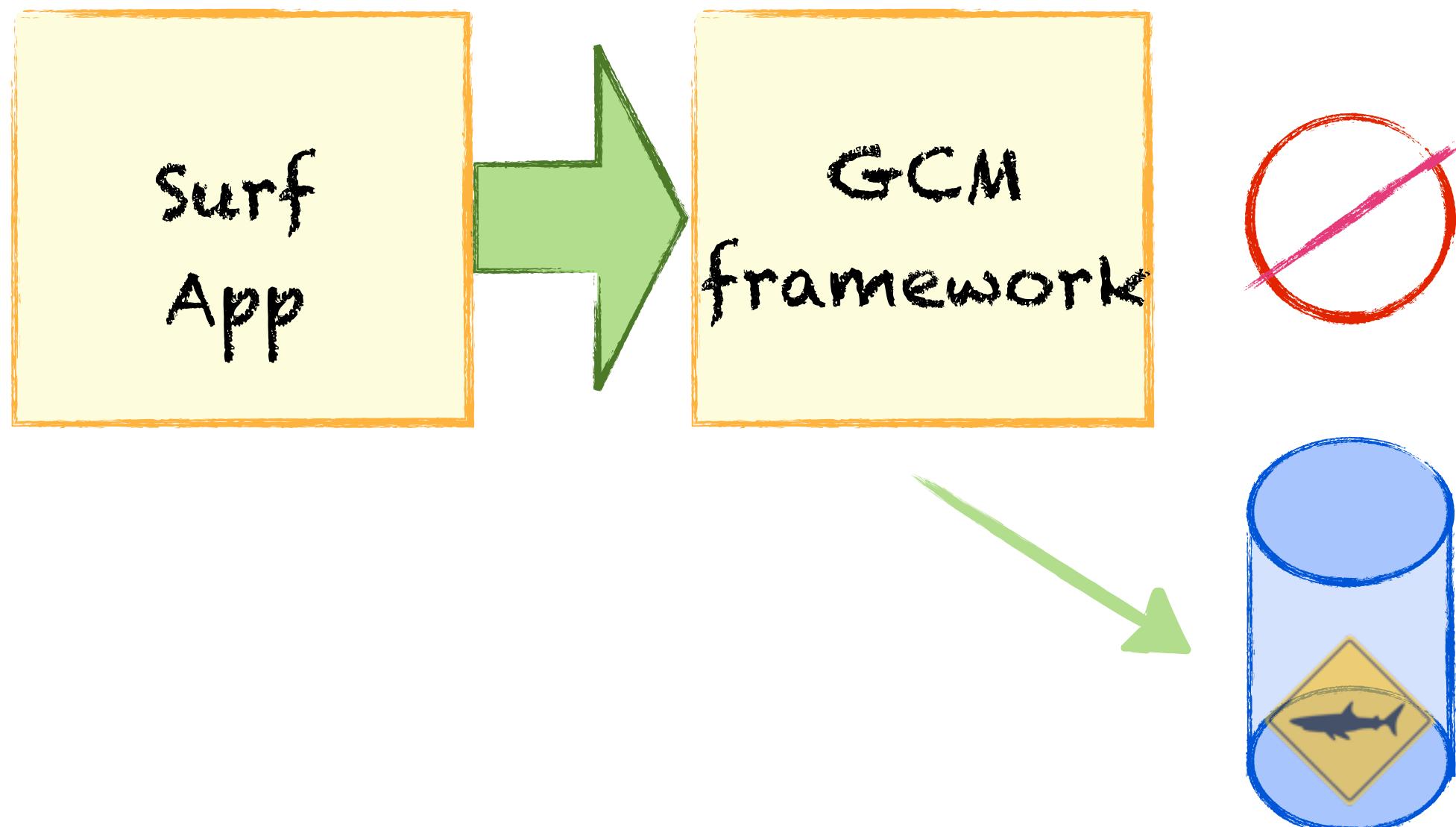
Google Cloud Messaging Upstream



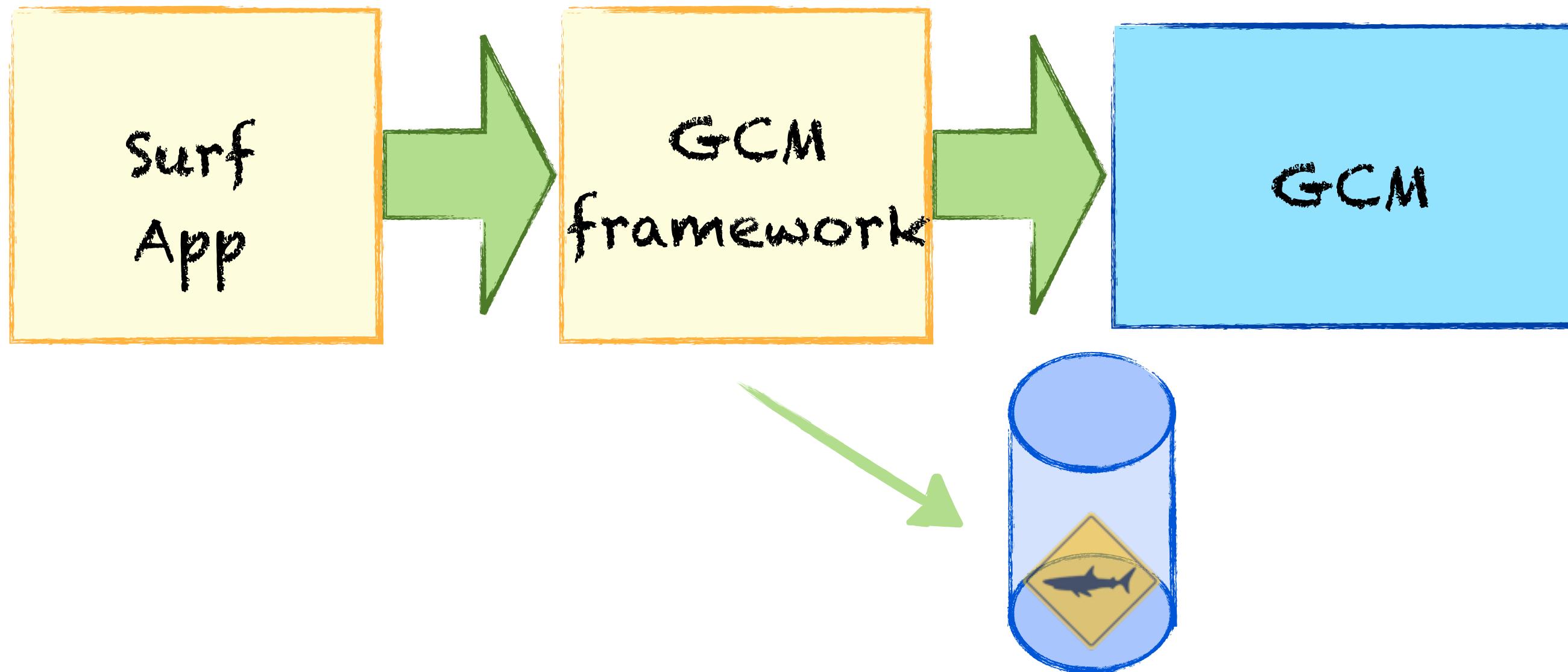
Sending an **upstream** message



Sending an **upstream** message



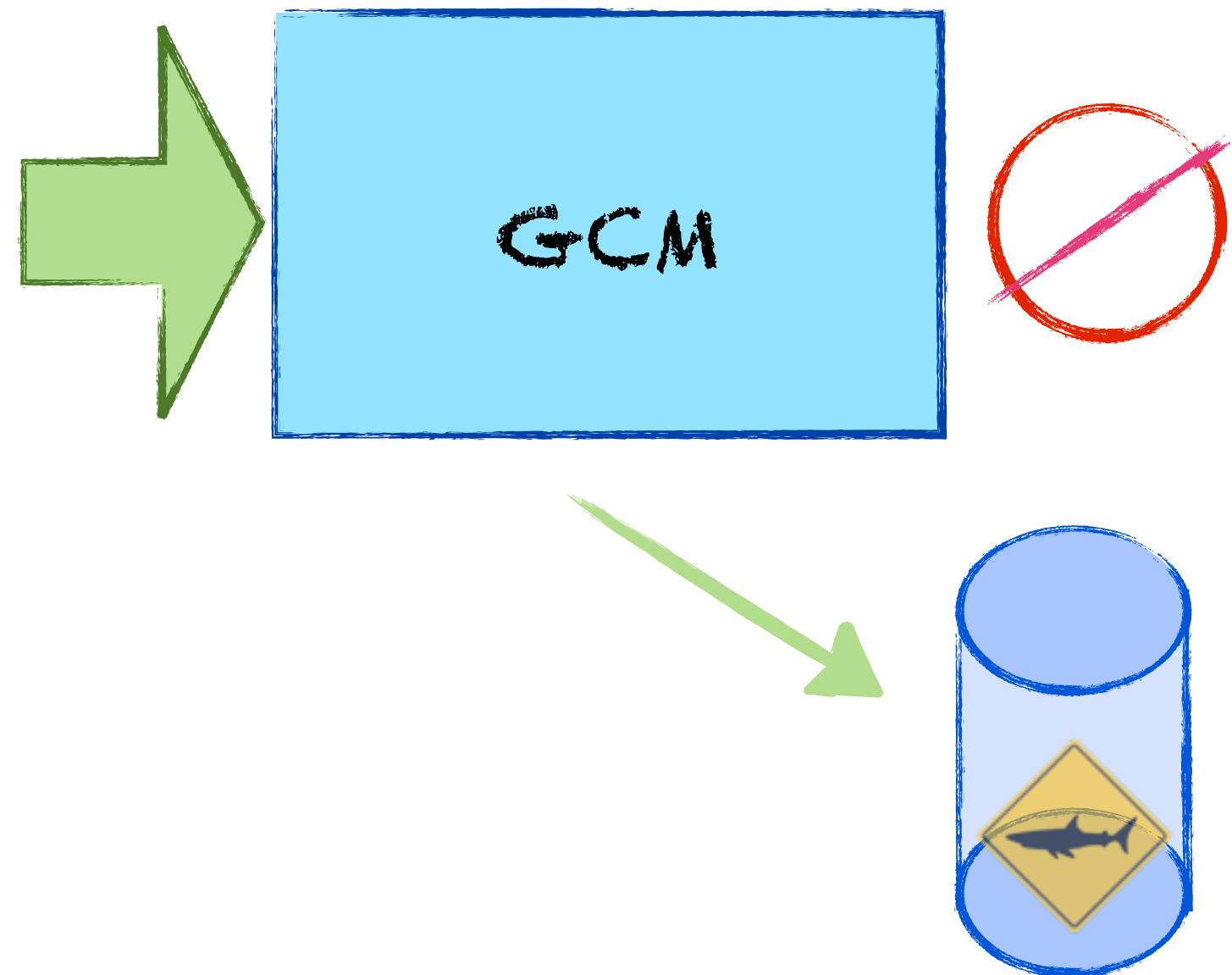
Sending an **upstream** message



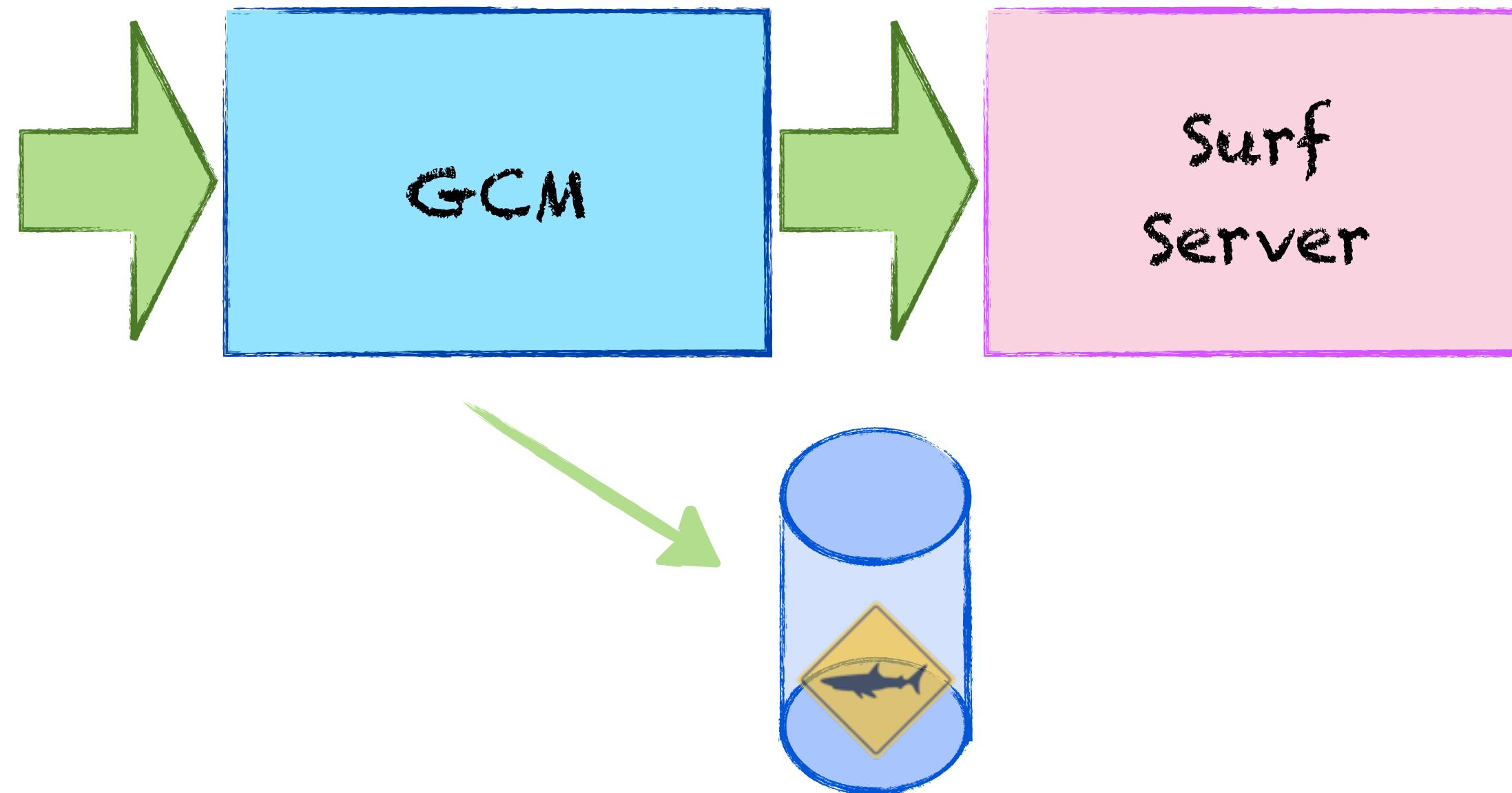
Sending an **upstream** message



Sending an *upstream* message



Sending an **upstream** message



```
GoogleCloudMessaging gcm =  
    GoogleCloudMessaging.get(context);
```

String to = PROJECT_ID

```
gcm.send(to, msgId, data);
```



Time To Live API



Time To Live API



Time To Live API



Time To Live API



```
GoogleCloudMessaging gcm =  
    GoogleCloudMessaging.get(context);
```

```
int timeToLive = [0 seconds, 4 weeks]
```

```
gcm.send(to, msgId, timeToLive, data);
```



Google Cloud Messaging Error Handling

No Connection



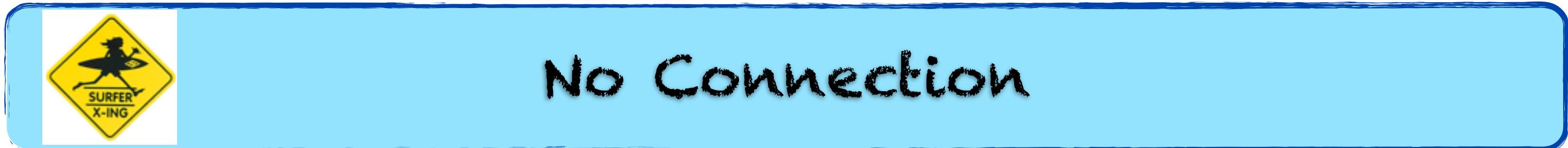
Google Cloud Messaging Error Handling



No Connection



Google Cloud Messaging Error Handling



Google Cloud Messaging Error Handling



No Connection



Message is too big



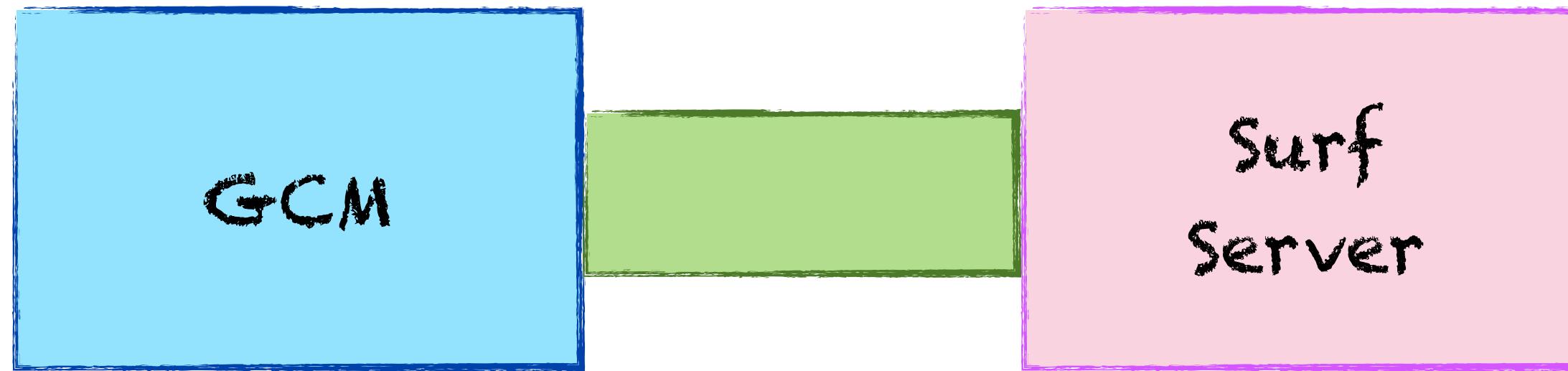
Too many outstanding messages



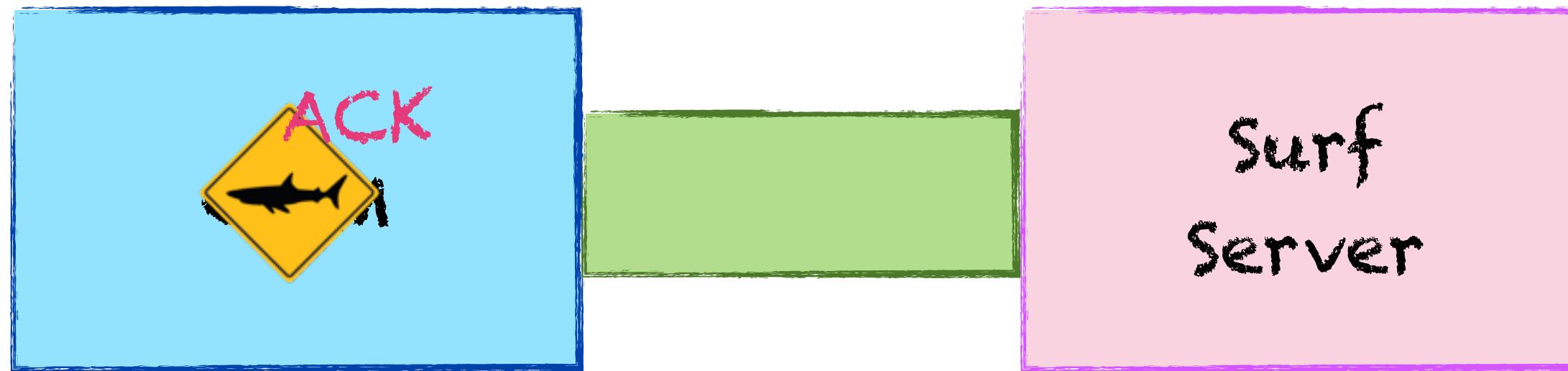
```
@Override  
public void onReceive(Context context, final Intent intent) {  
    if (MESSAGE_TYPE_SEND_ERROR.equals(messageType)) {  
        [...]  
    }  
}
```



Message stream



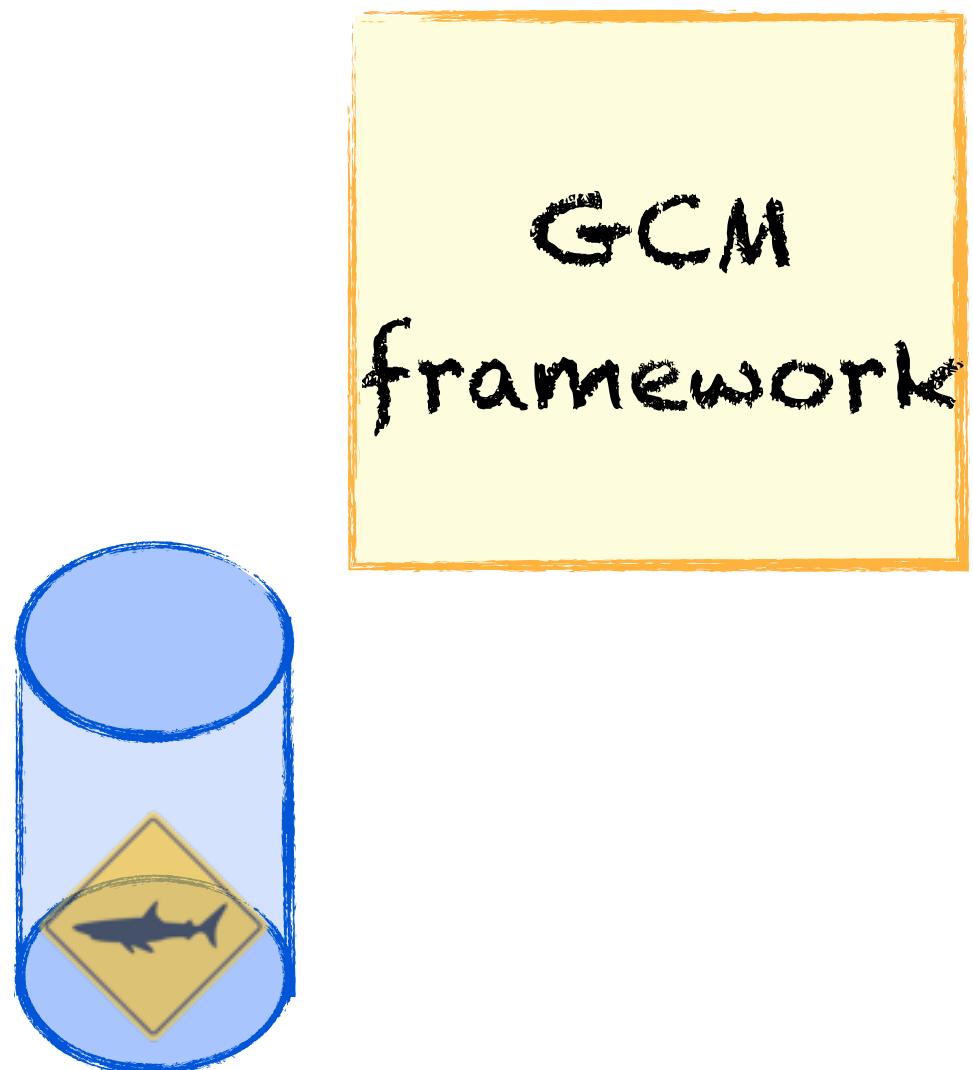
Message stream



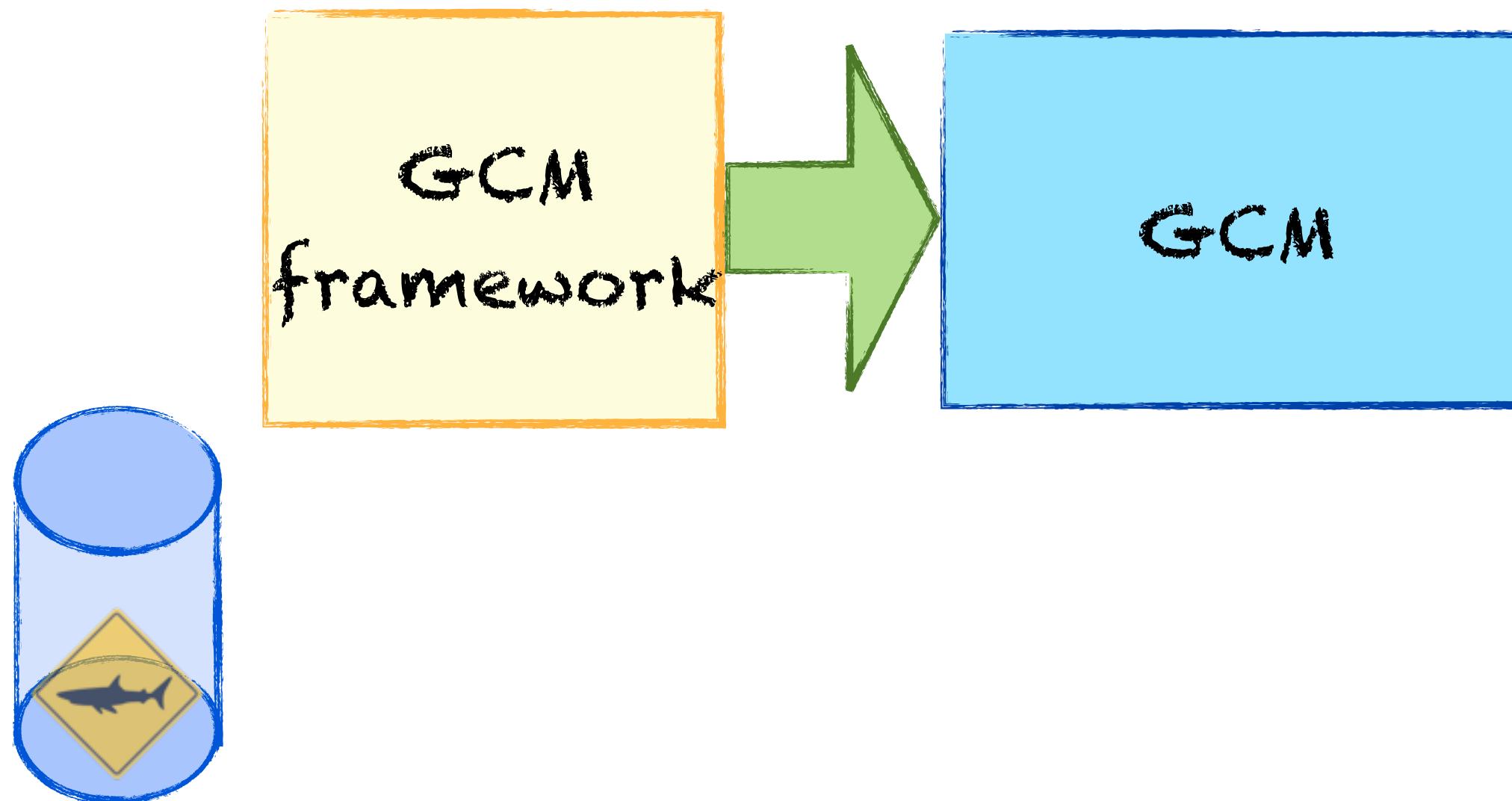
```
<gcm xmlns="google:mobile:data">  
  { "to":"REGID",  
    "message_id":"m-1366082849205"  
    "message_type":"ack" }  
</gcm>
```



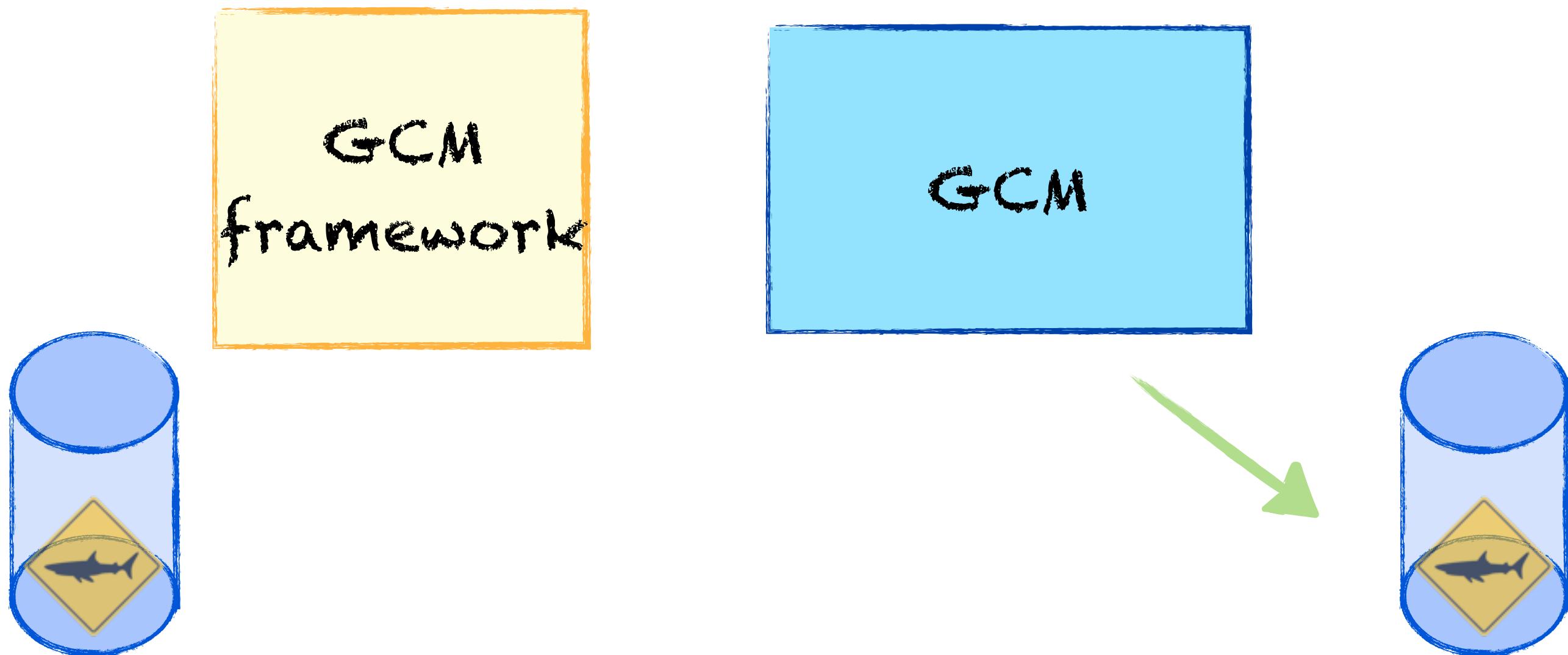
Deleting ACK'd messages



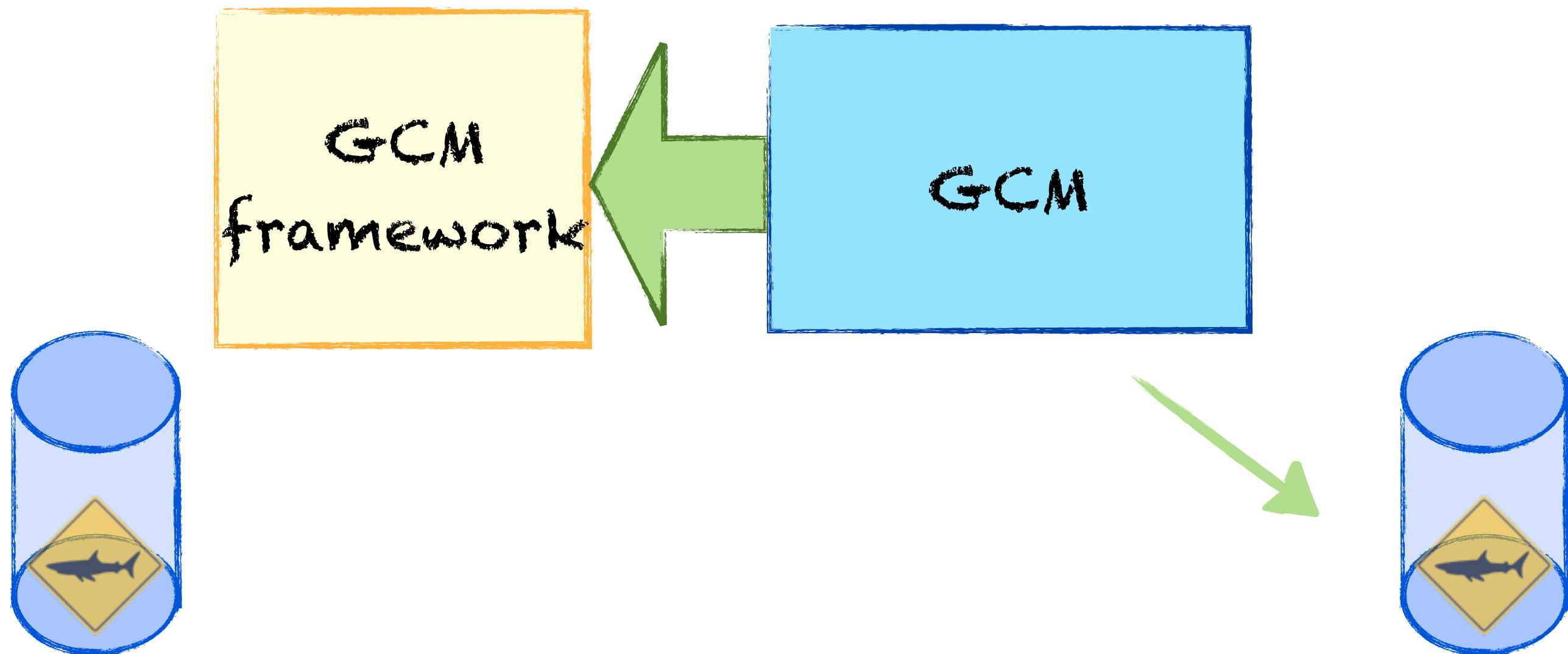
Deleting ACK'd messages



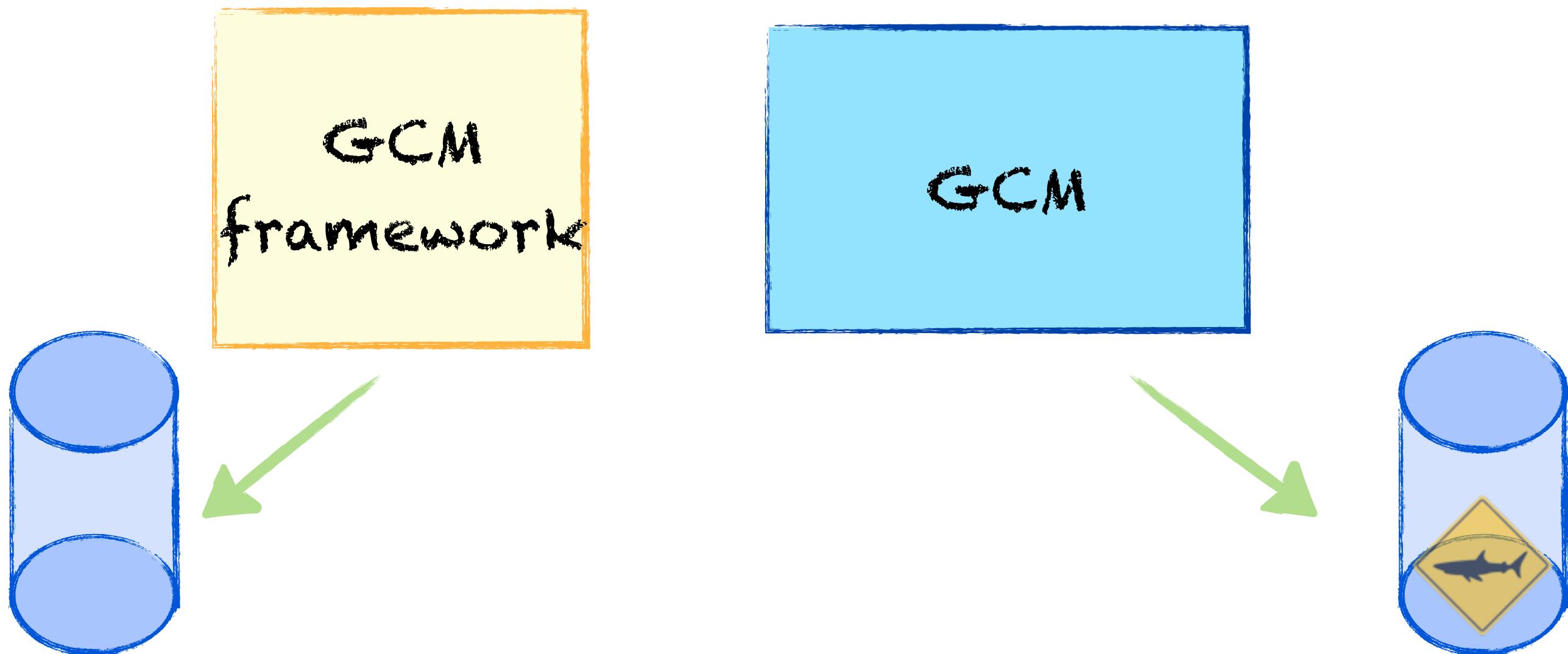
Deleting ACK'd messages



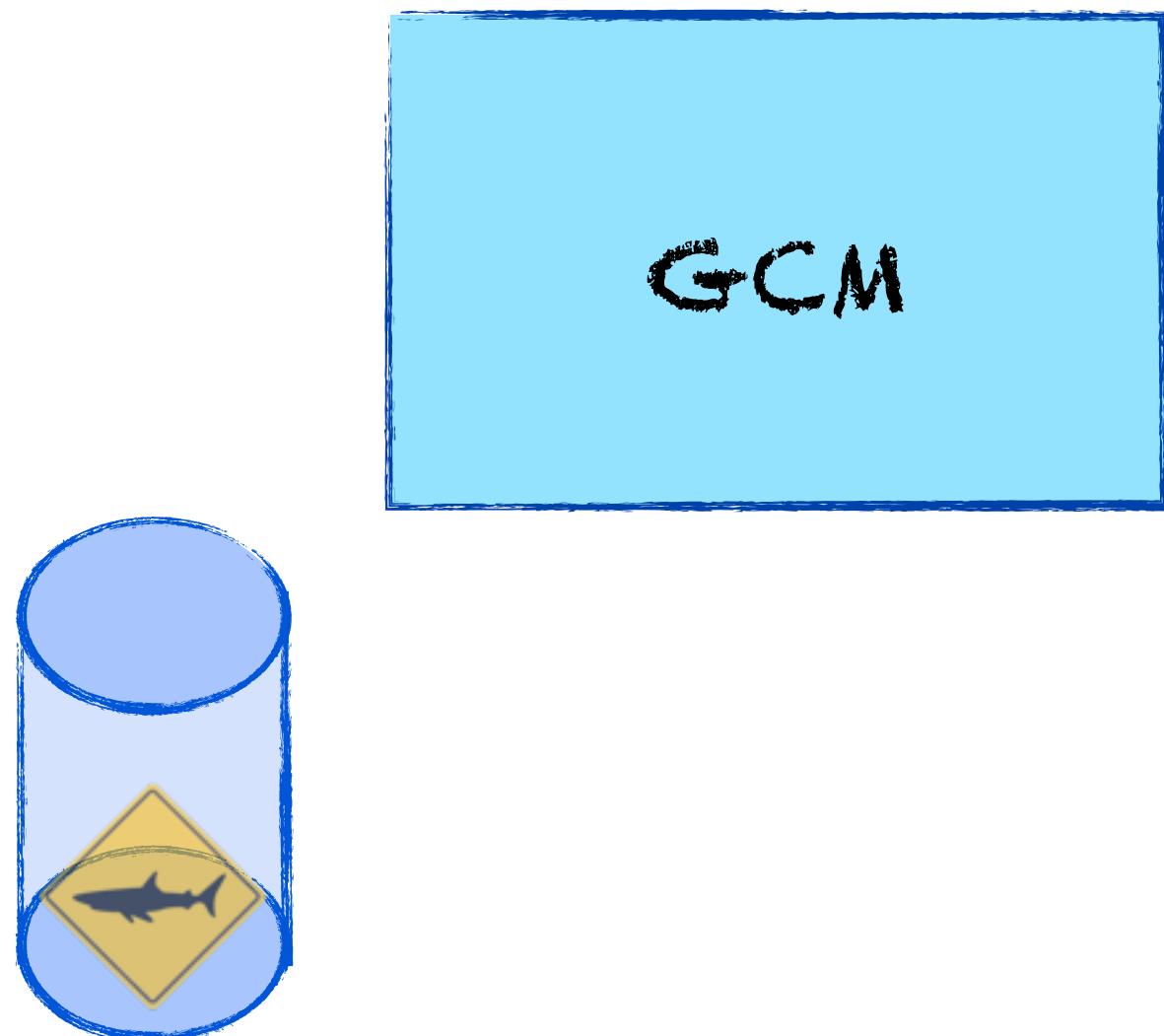
Deleting ACK'd messages



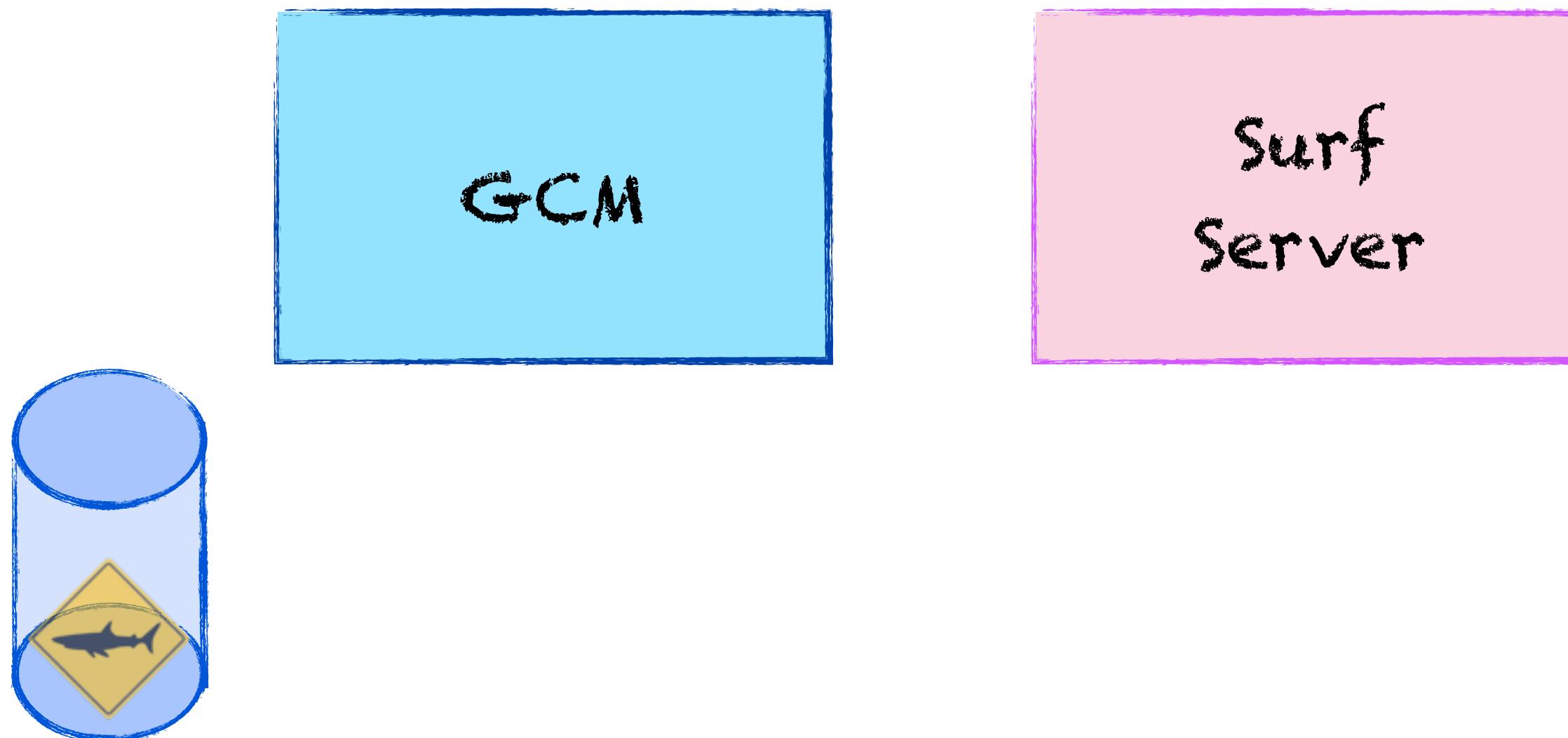
Deleting ACK'd messages



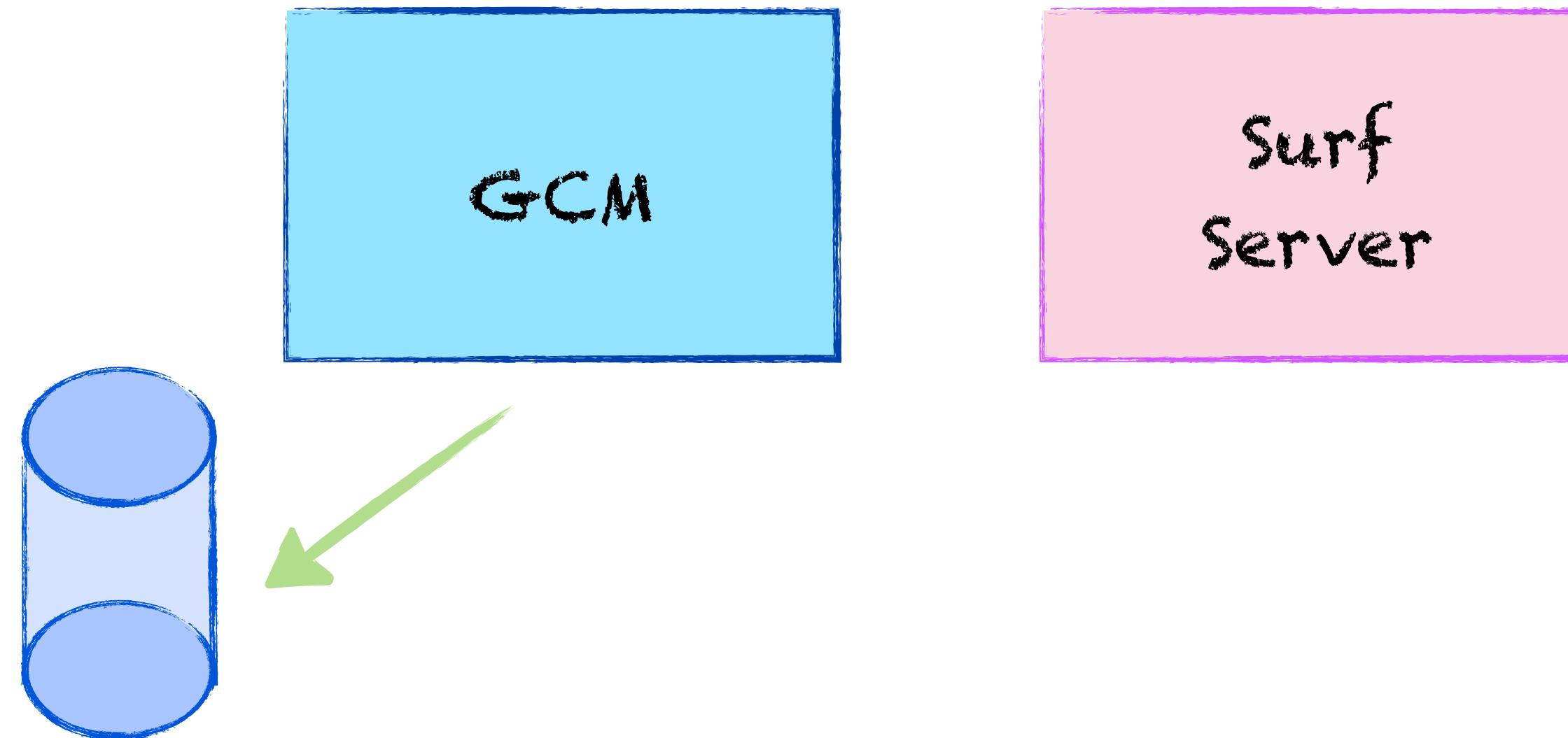
Deleting ACK'd messages



Deleting ACK'd messages



Deleting ACK'd messages



Google Cloud Messaging Upstream

ACKing is required



Google Cloud Messaging Upstream



ACKing is required



Google Cloud Messaging Upstream



ACKing is required



Maximum 100 outstanding msgs



Google Cloud Messaging Upstream



ACKing is required



Maximum 100 outstanding msgs



Maximum 1 day disconnect time



Battery and Network Optimization

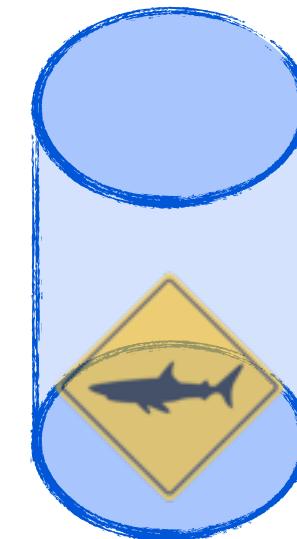
Surf
App

GCM
framework

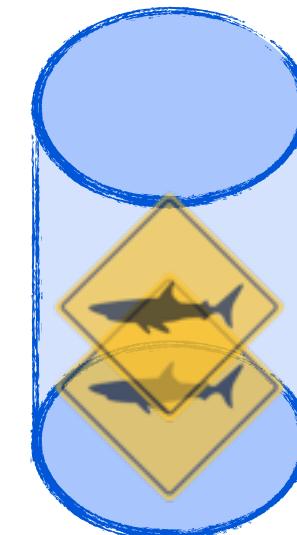
Other
App



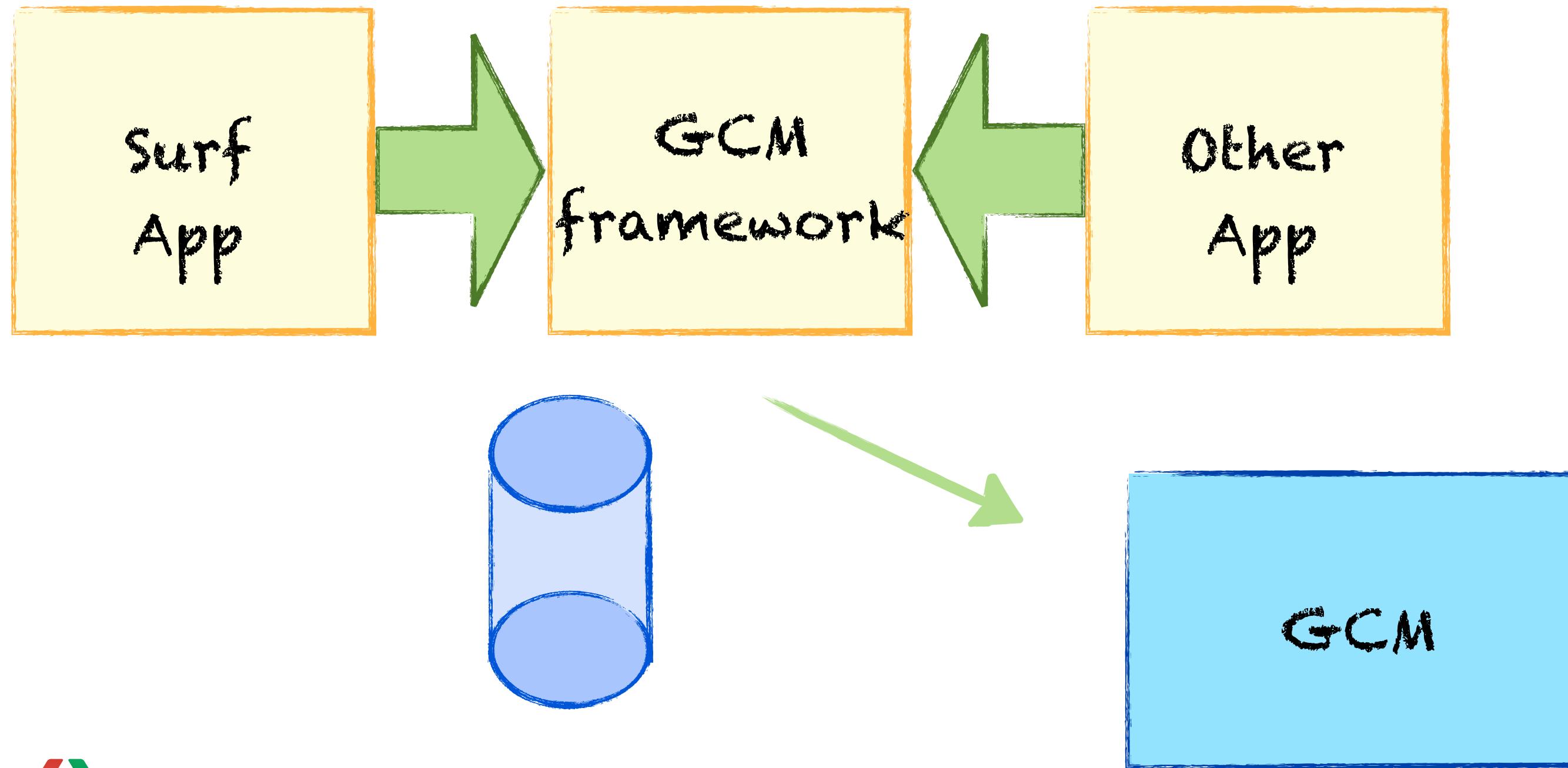
Battery and Network Optimization



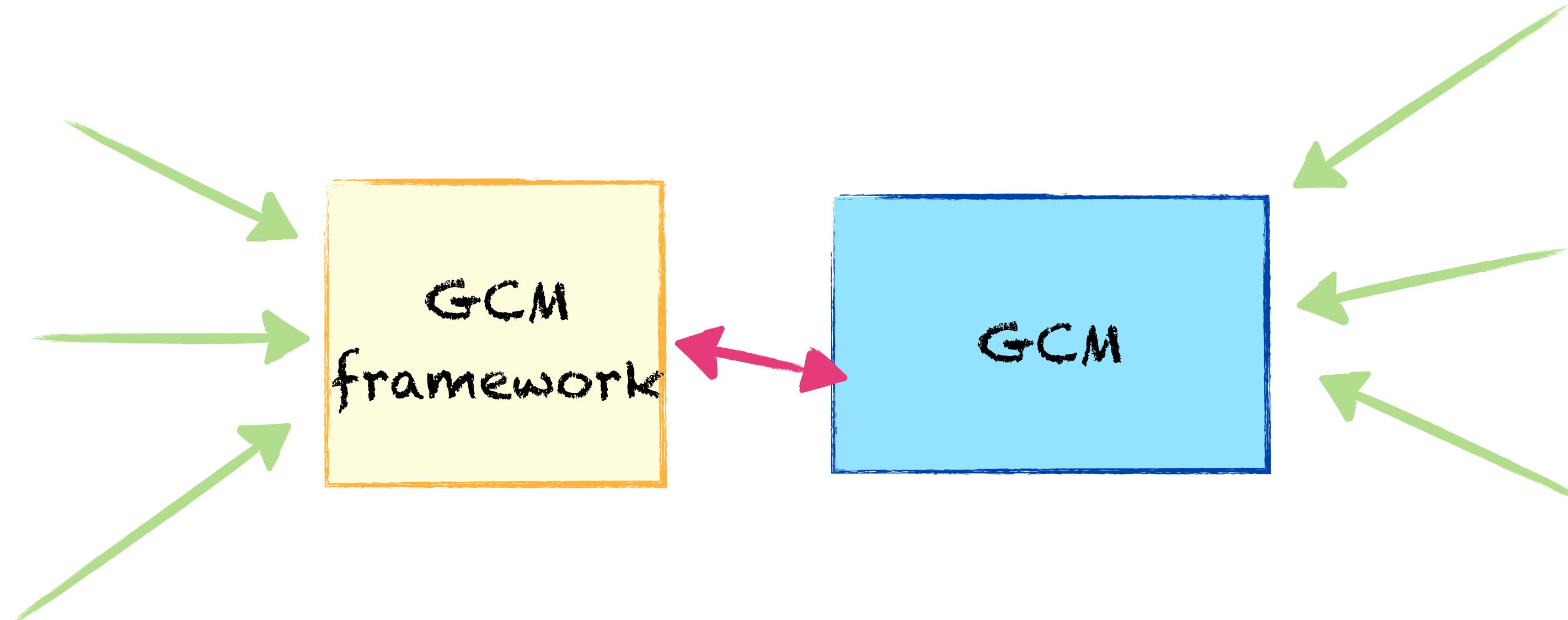
Battery and Network Optimization



Battery and Network Optimization



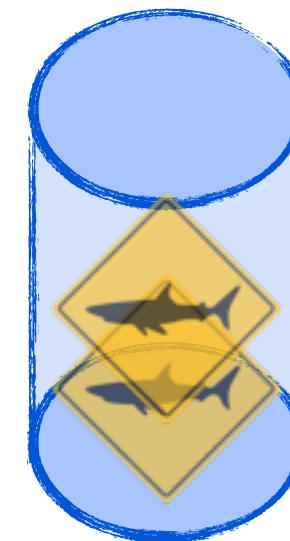
Battery and Network Optimization



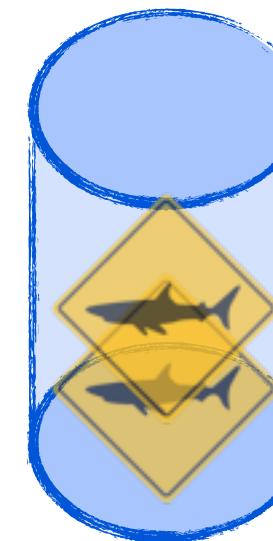
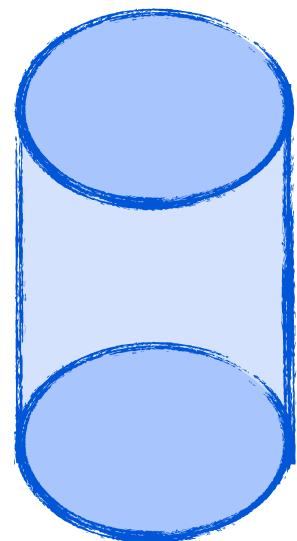
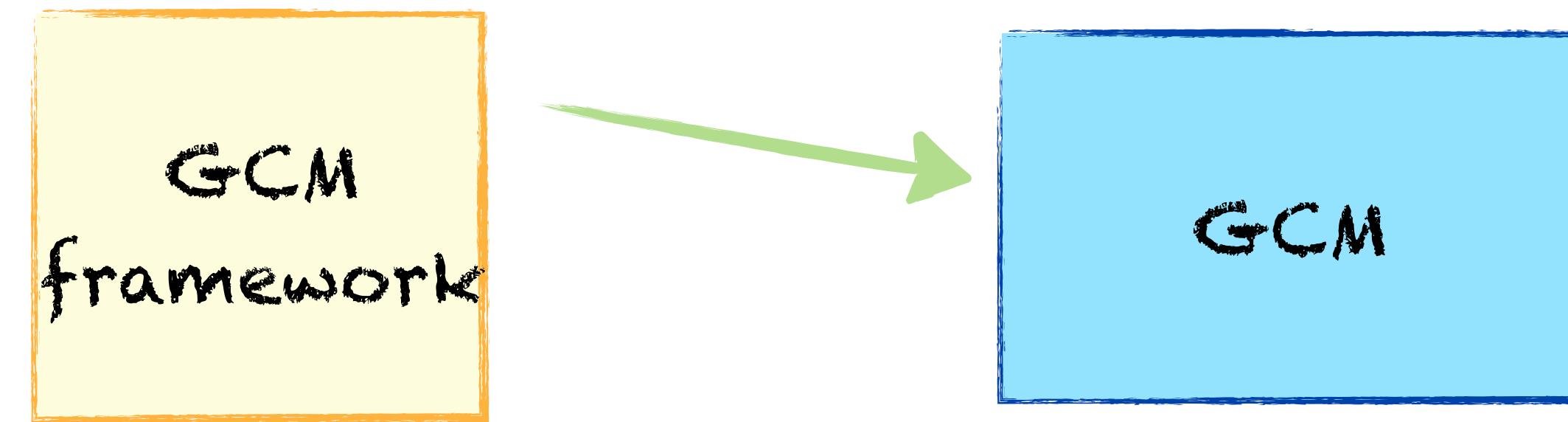
Battery and Network Optimization

GCM
framework

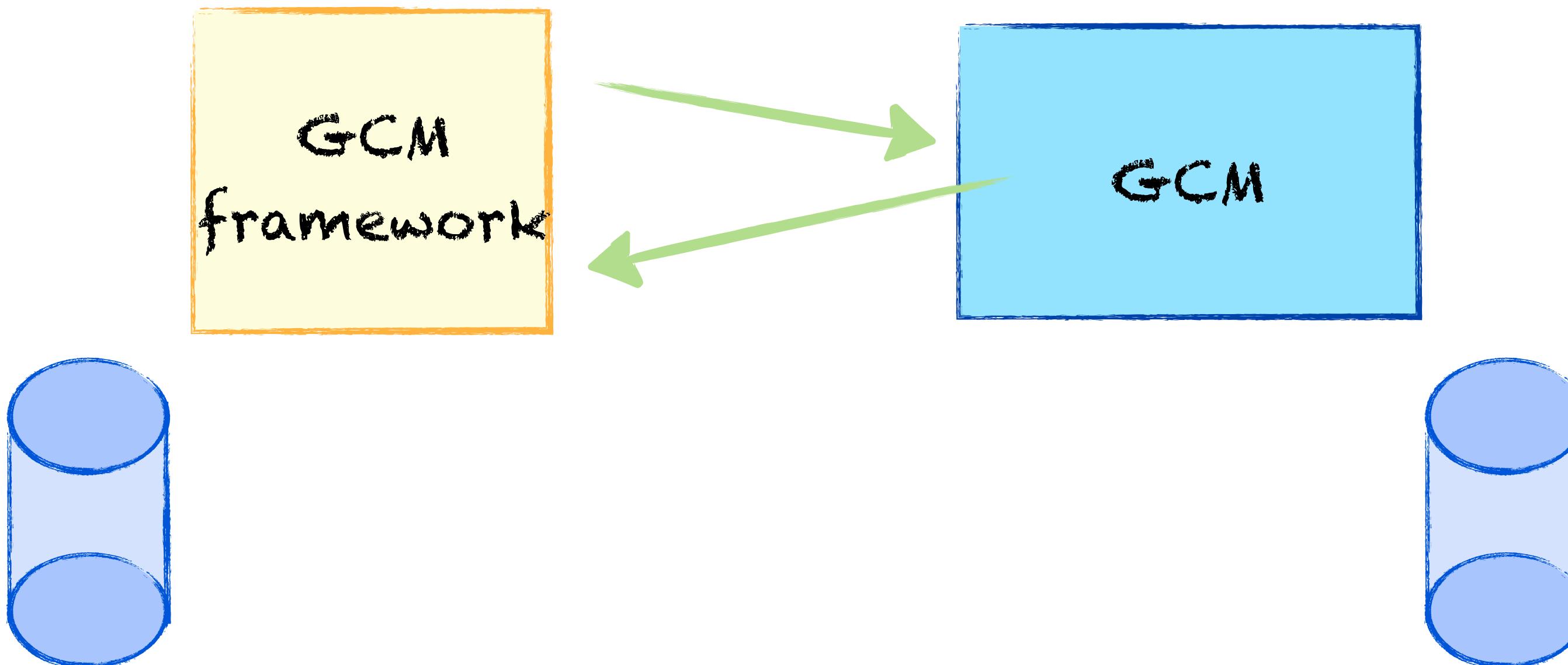
GCM



Battery and Network Optimization



Battery and Network Optimization



GCM Upstream

Send messages reliably



GCM Upstream



Send messages reliably



GCM Upstream



Send messages reliably



Send messages with low latency



GCM Upstream



Send messages reliably

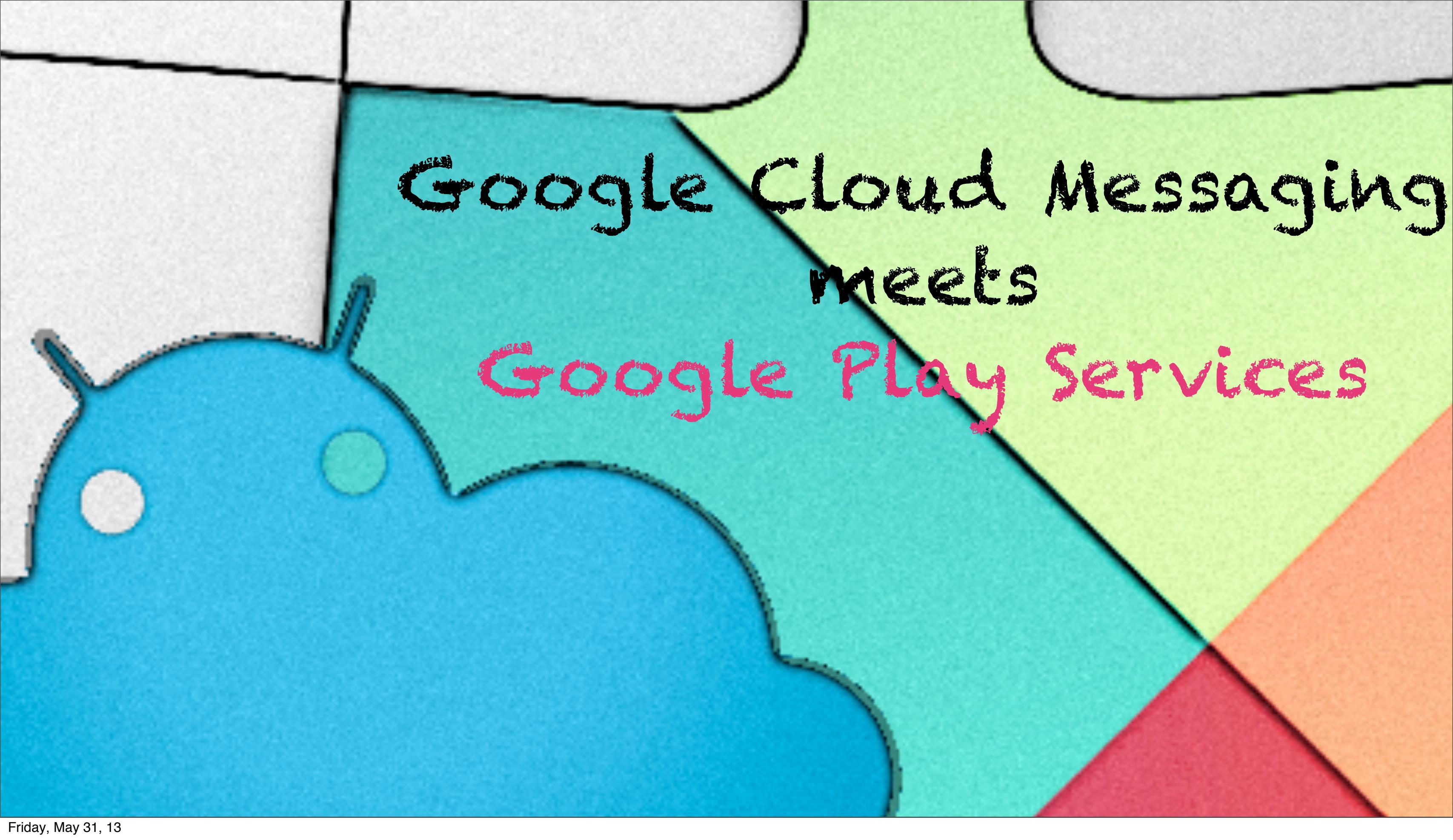


Send messages with low latency



Time To Live API





Google Cloud Messaging
meets
Google Play Services

GCM library meets Play Services

Old Library Compatible



GCM library meets Play Services



Old Library Compatible



GCM library meets Play Services



Old Library Compatible



New APIs from Froyo+



GCM library meets Play Services



Old library Compatible



New APIs from Froyo+



Upstream only on Play Services



```
GoogleCloudMessaging gcm =  
    GoogleCloudMessaging.getInstance(context);
```

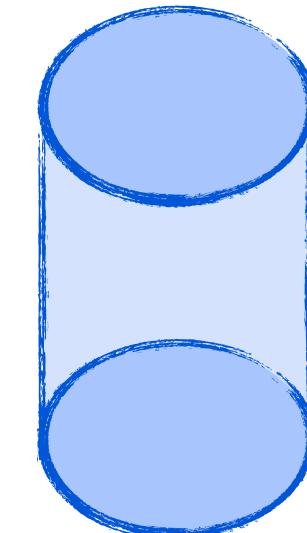
```
String registrationId = gcm.register(sender1, sender2);
```



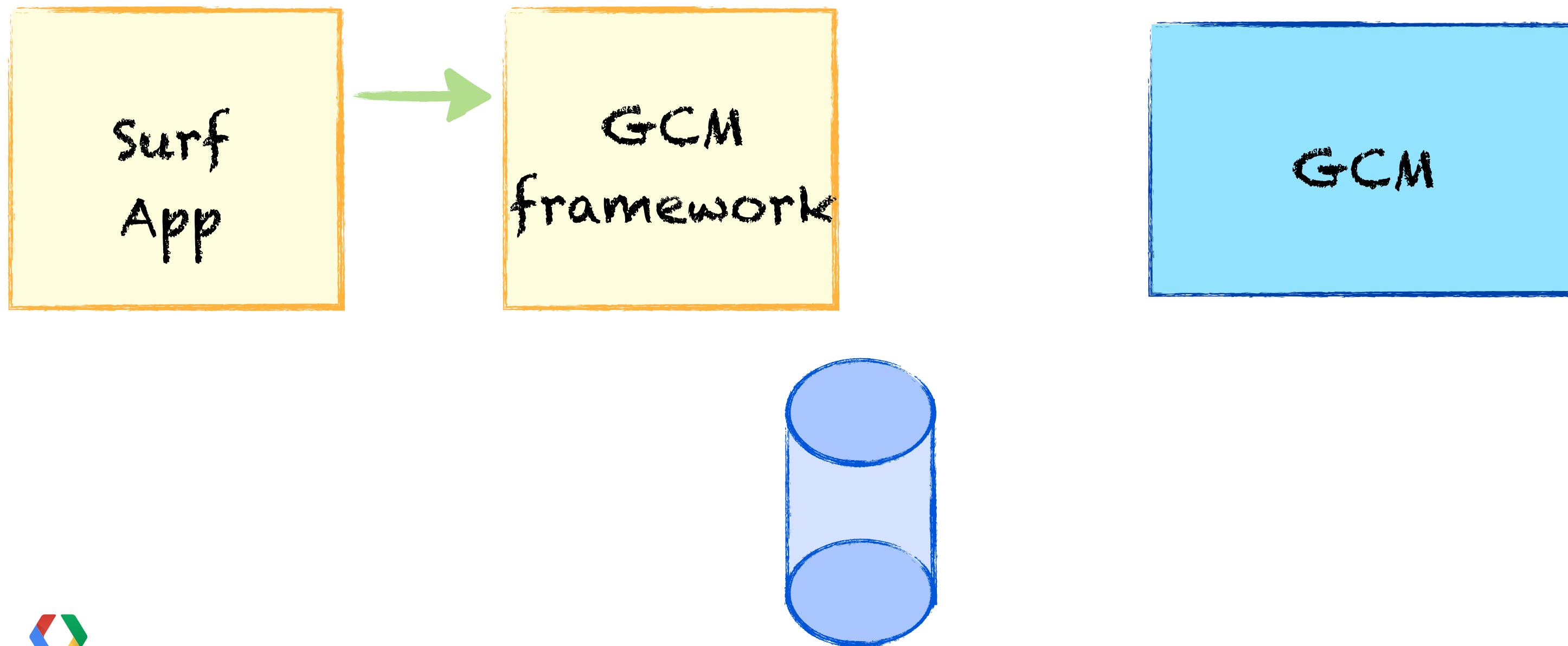
```
<uses-permission  
    android:name="com.google.android.c2dm.permission.RECEIVE" />  
  
<receiver android:name=".MyReceiver" android:exported="true"  
    android:permission="com.google.android.c2dm.permission.SEND" >  
    <intent-filter>  
        <action android:name="com.google.android.c2dm.intent.RECEIVE" />  
        <category android:name="YOUR_PACKAGE_NAME" />  
    </intent-filter>  
</receiver>
```



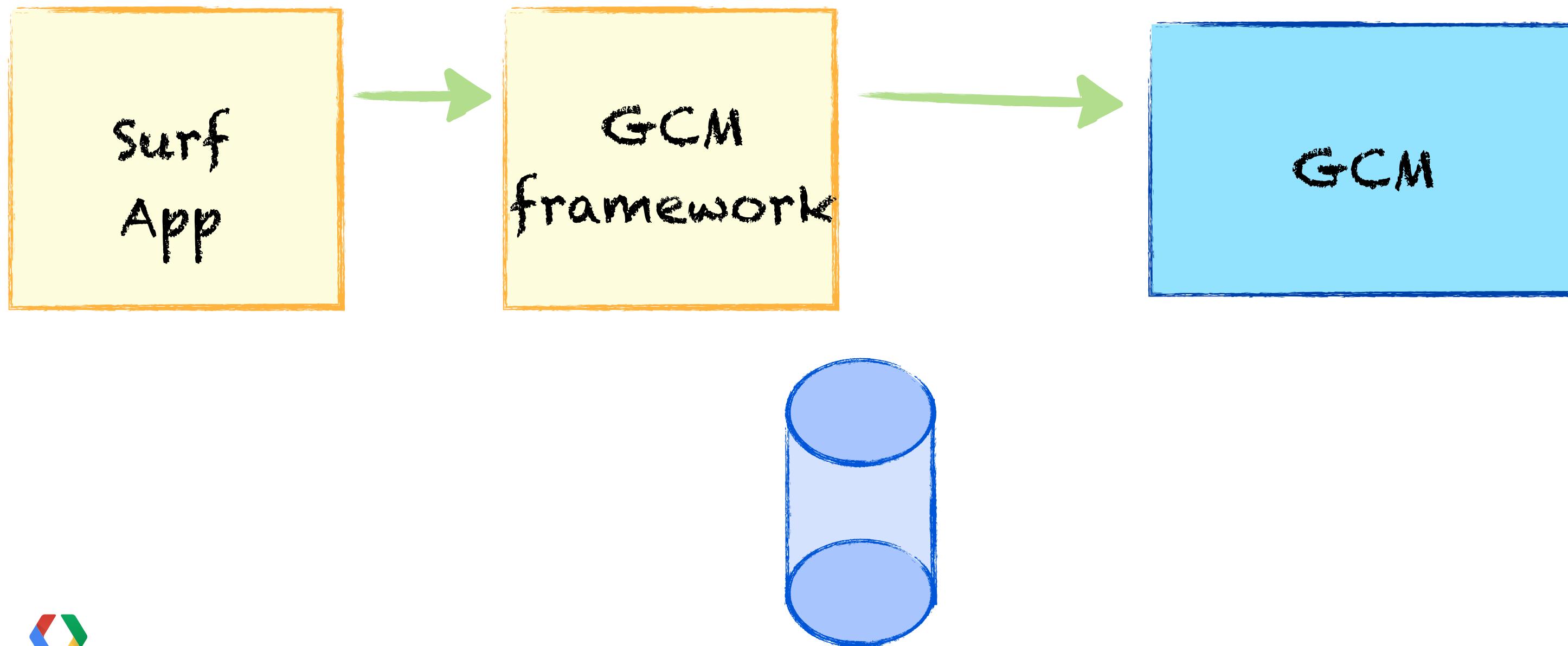
Registrations are cached on Play Services



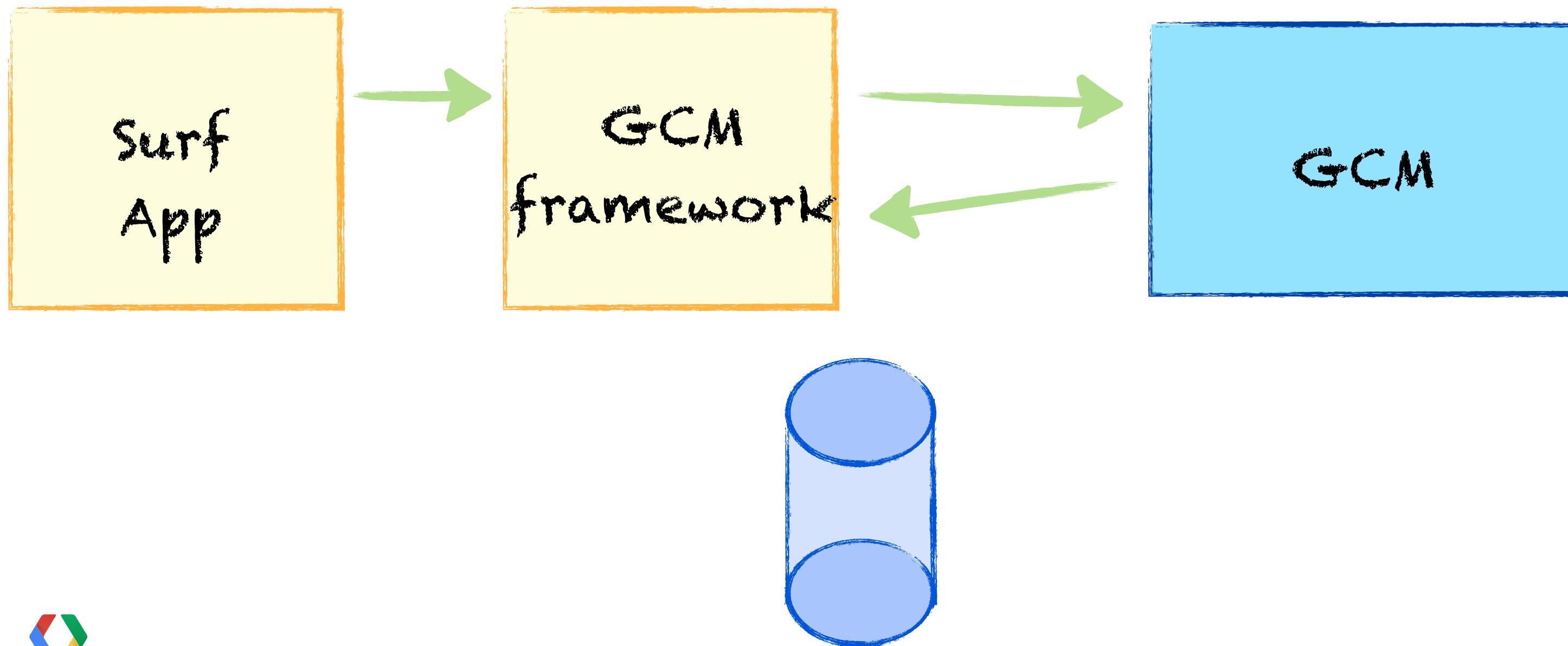
Registrations are cached on Play Services



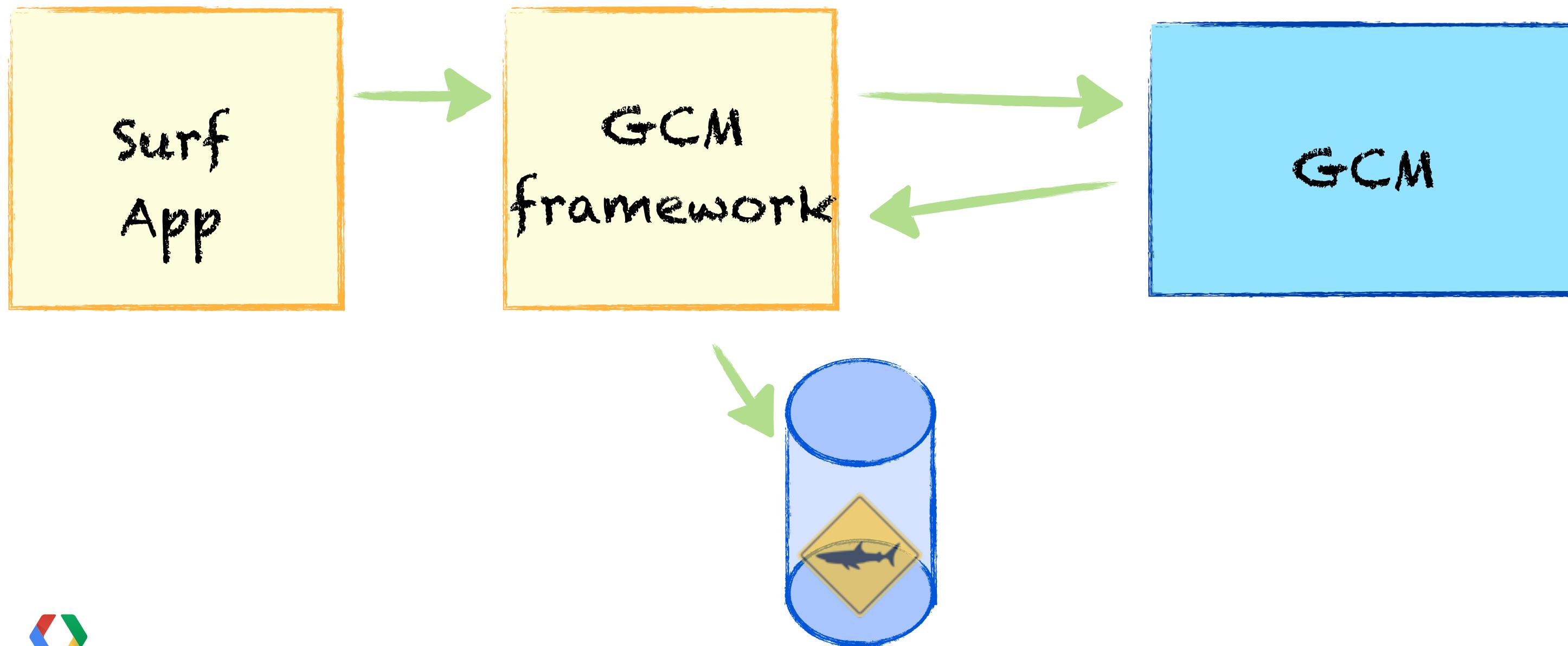
Registrations are cached on Play Services



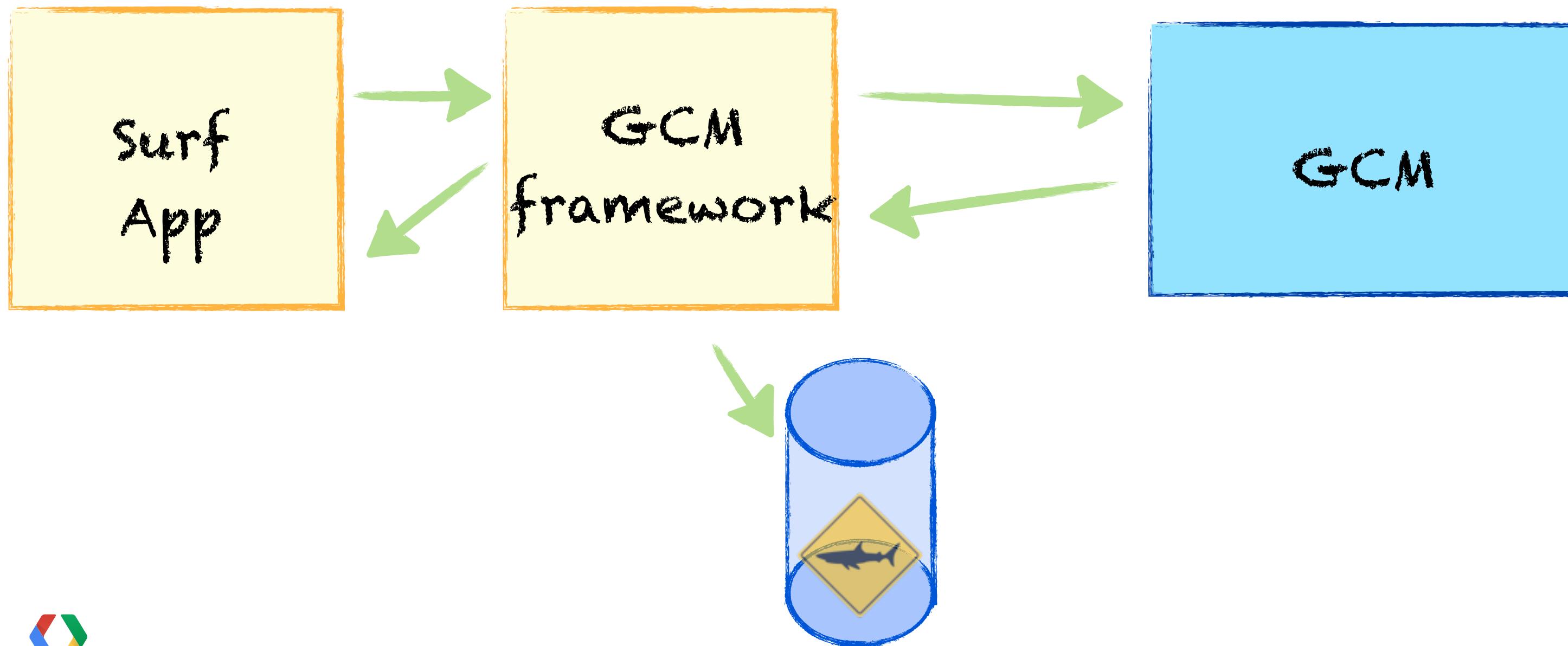
Registrations are cached on Play Services



Registrations are cached on Play Services



Registrations are cached on Play Services

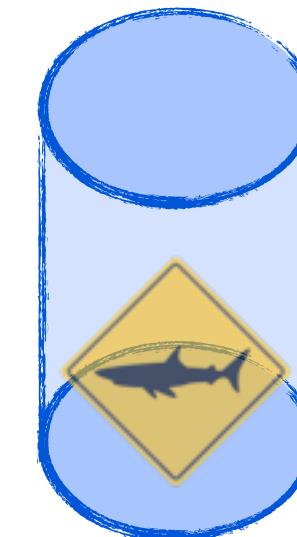


Registrations are cached on Play Services

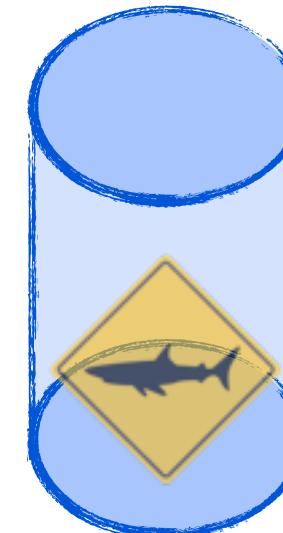
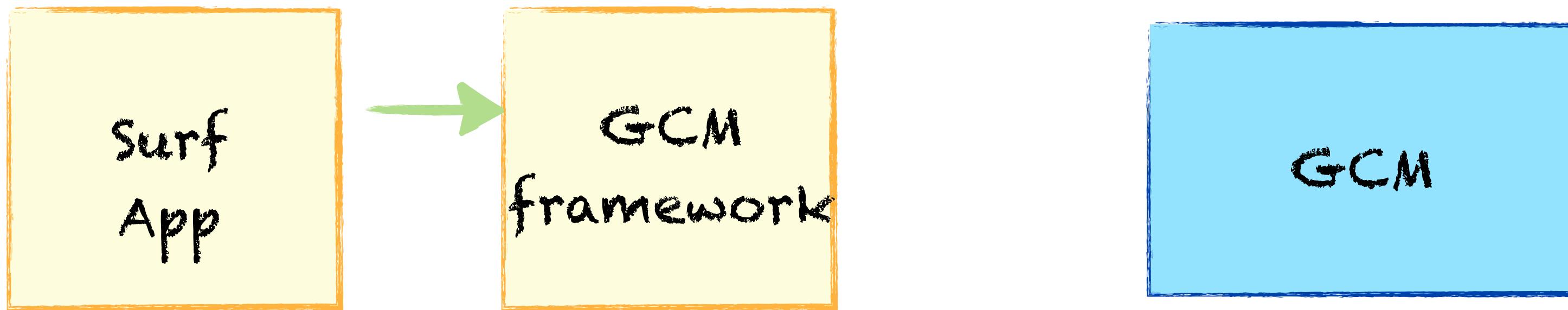
Surf
App

GCM
framework

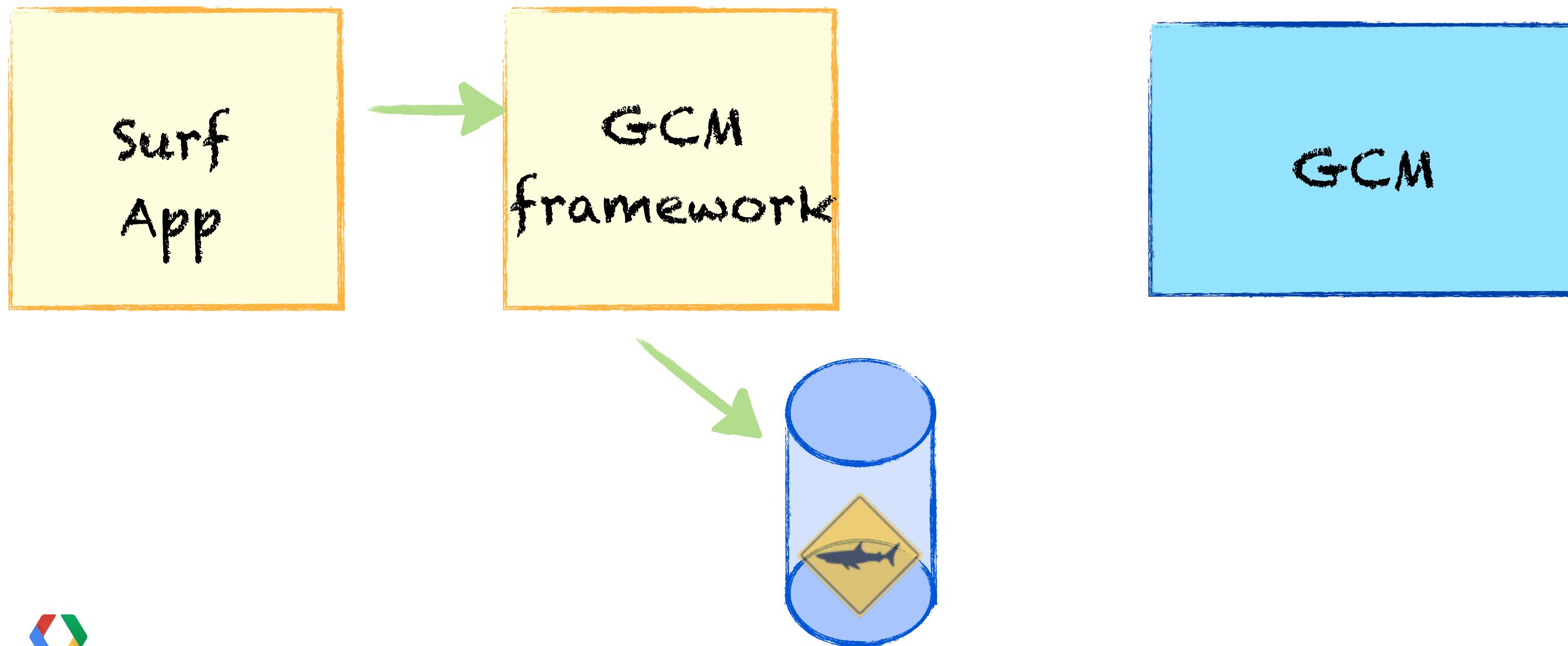
GCM



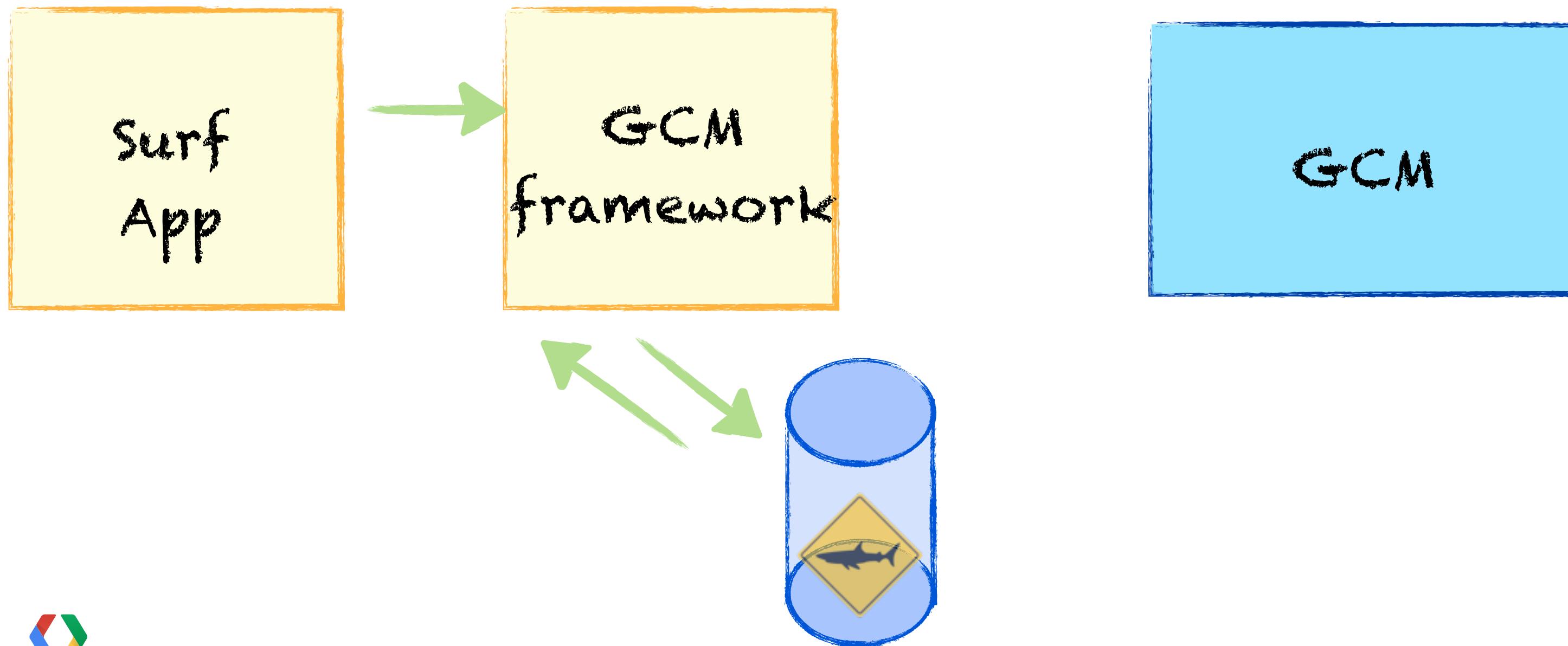
Registrations are cached on Play Services



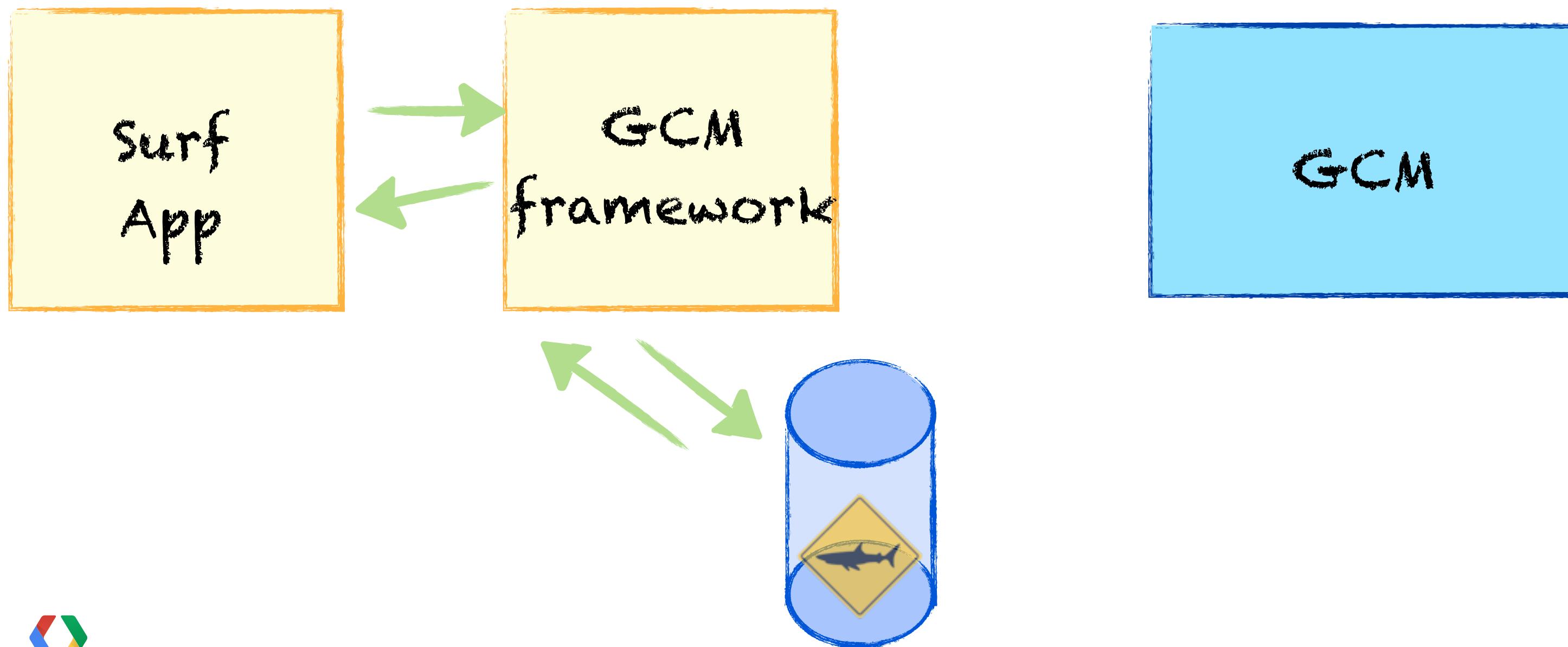
Registrations are cached on Play Services



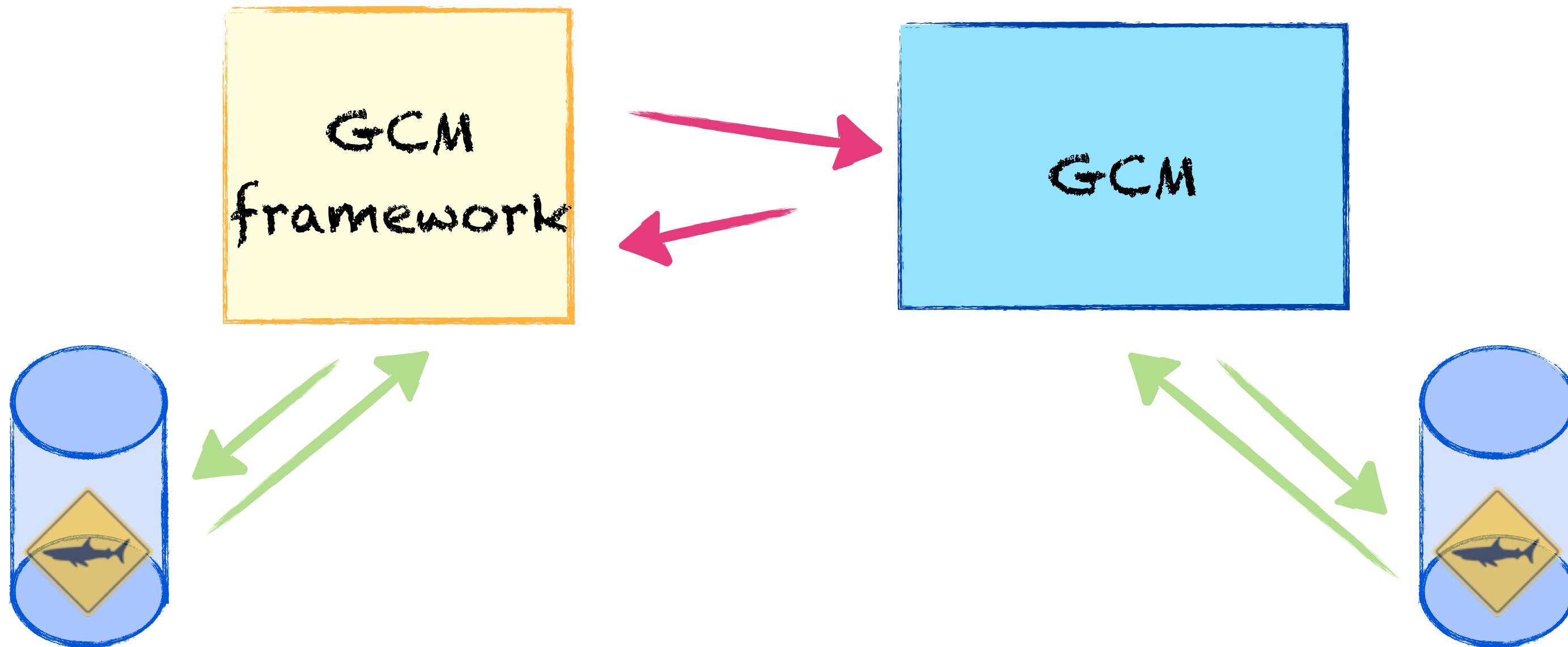
Registrations are cached on Play Services



Registrations are cached on Play Services

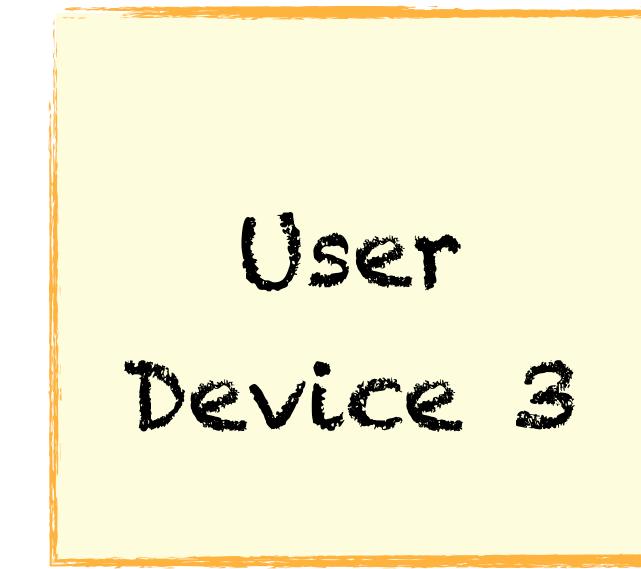
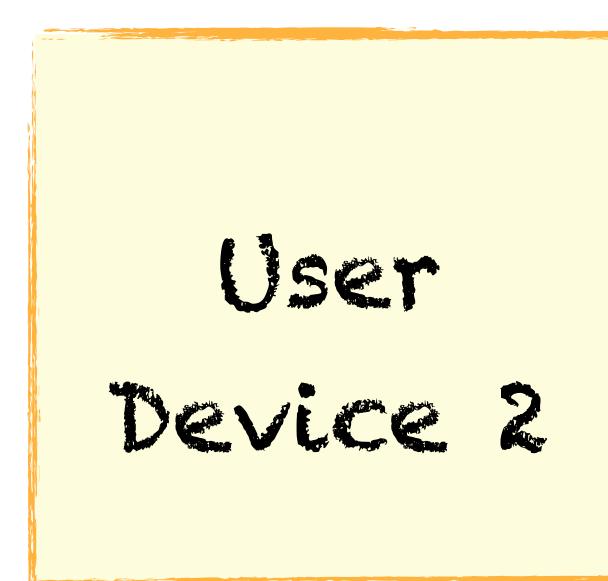


Registrations are periodically *sync'd*

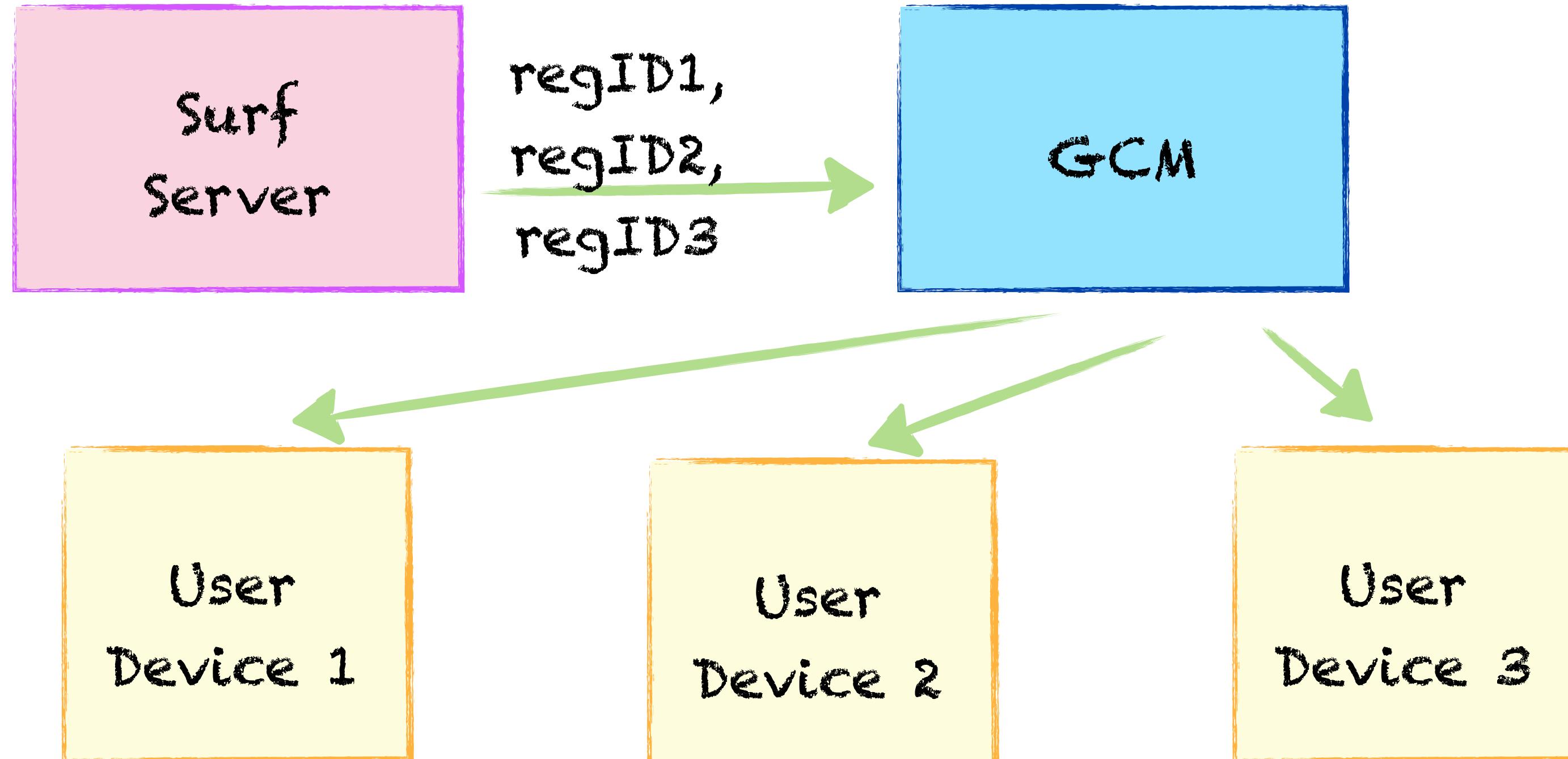




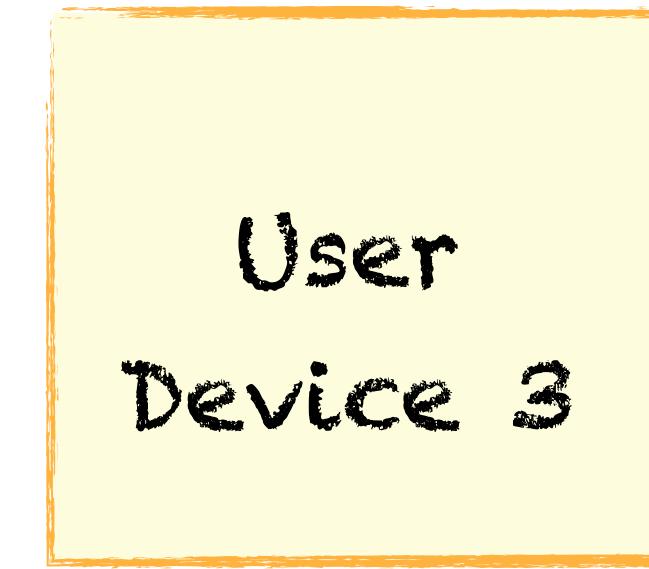
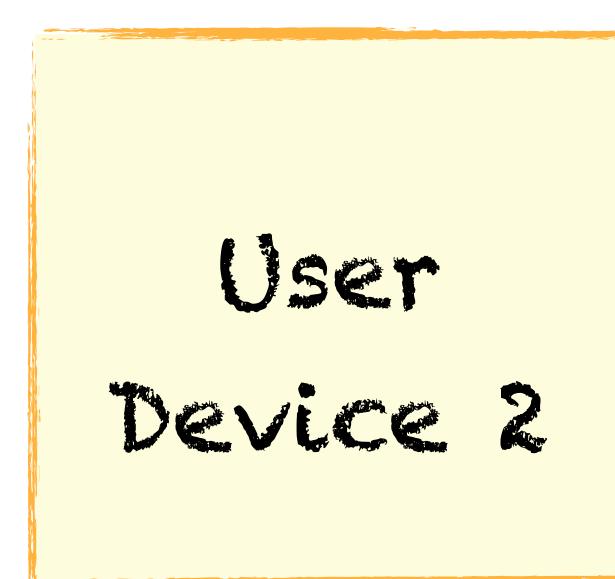
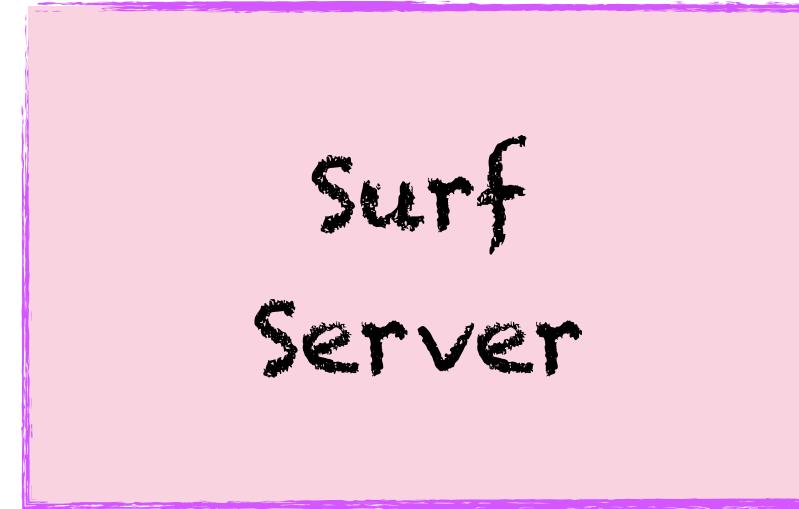
Google Cloud Messaging User Notifications



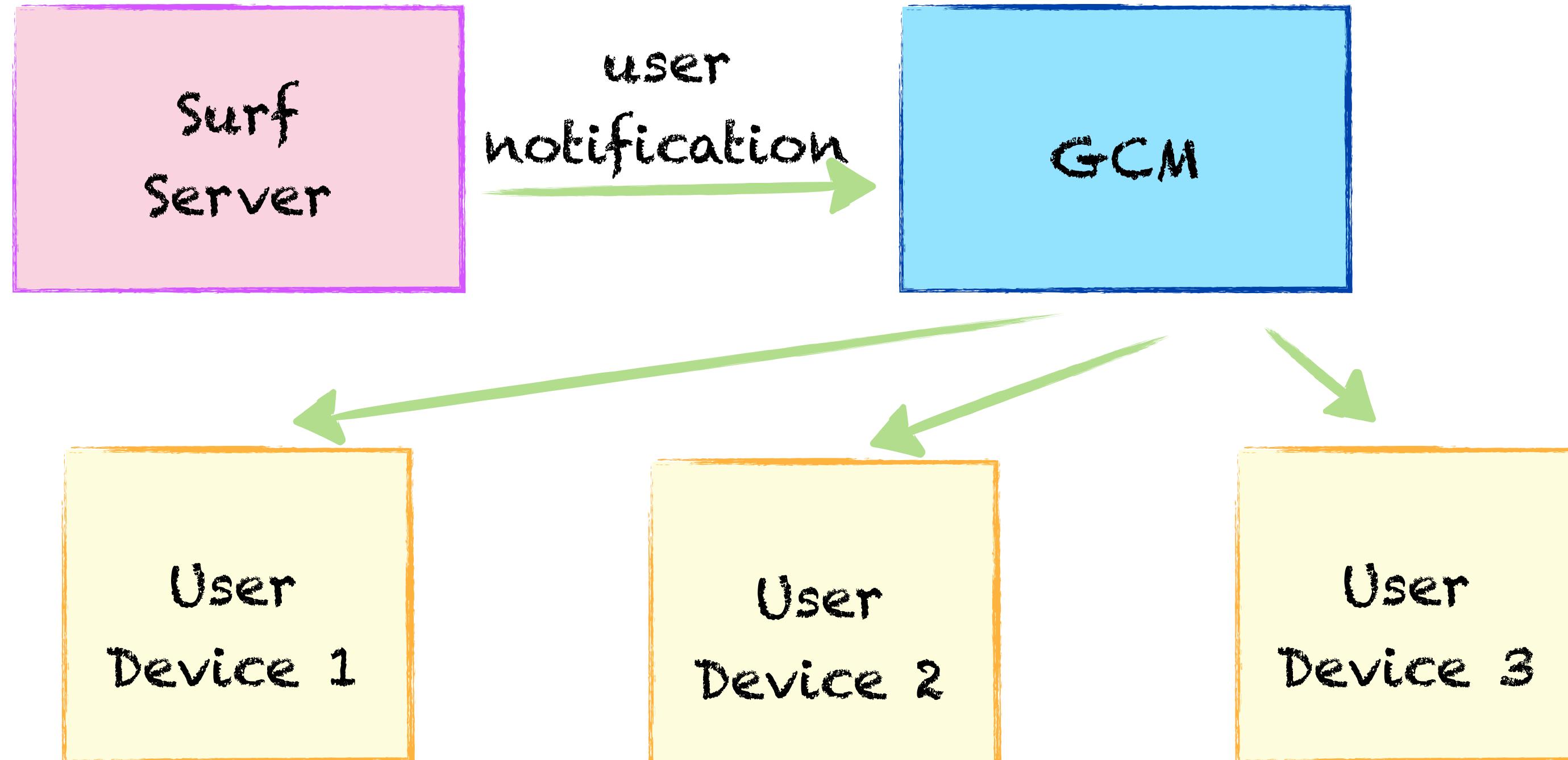
Google Cloud Messaging User Notifications



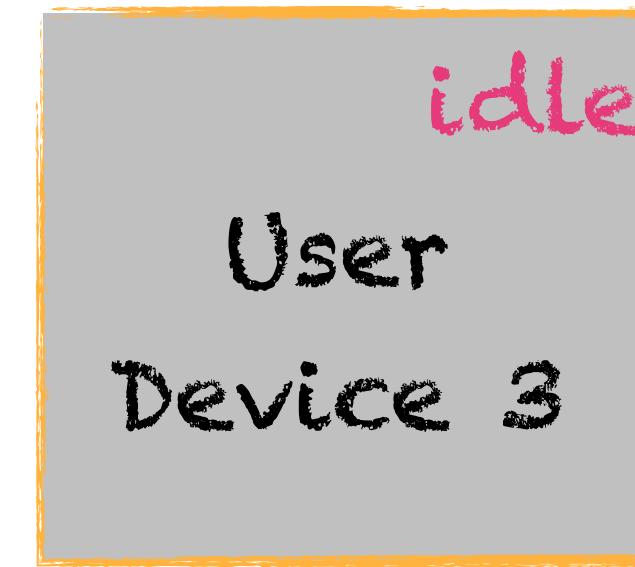
Google Cloud Messaging User Notifications



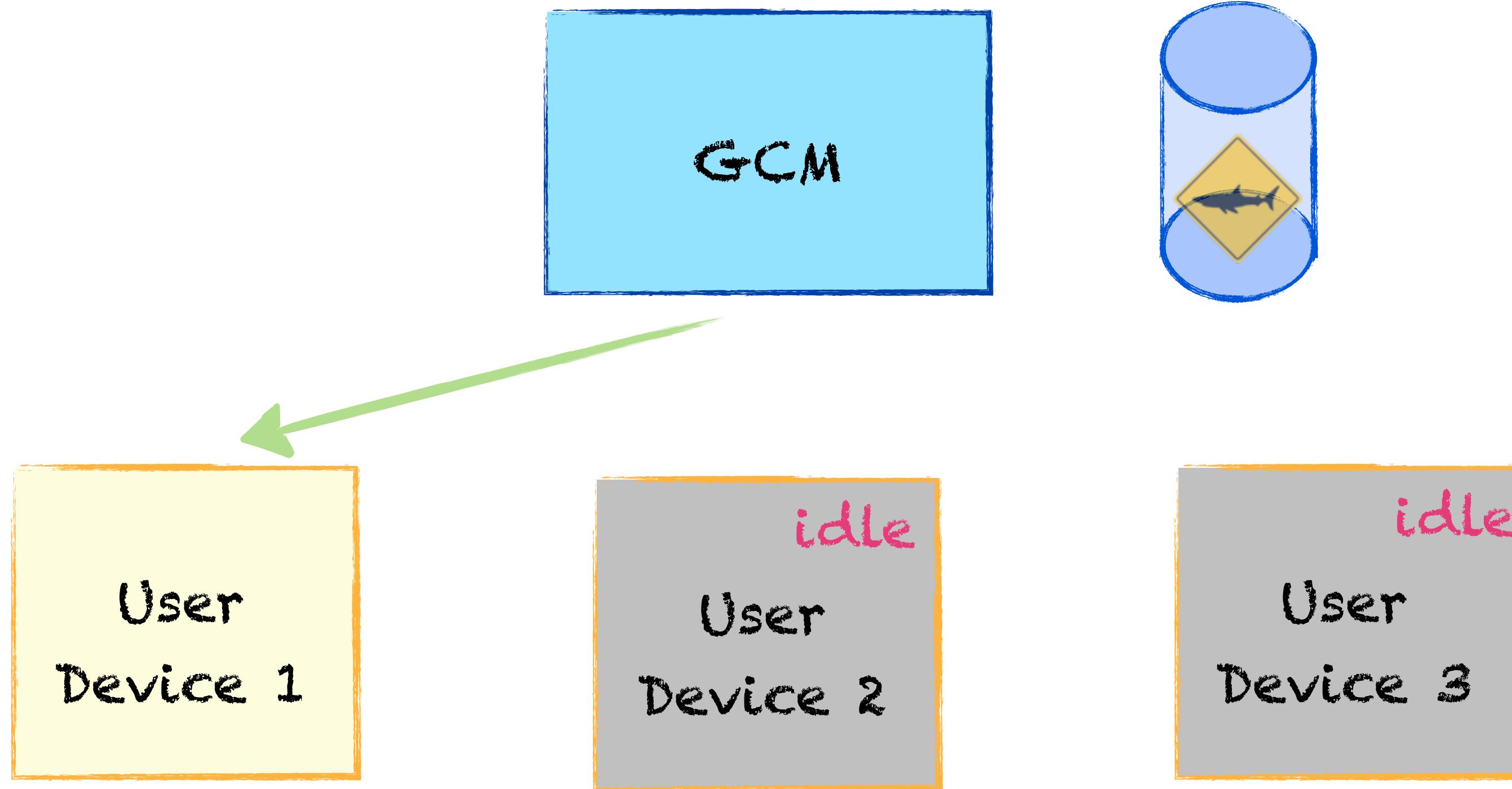
Google Cloud Messaging User Notifications



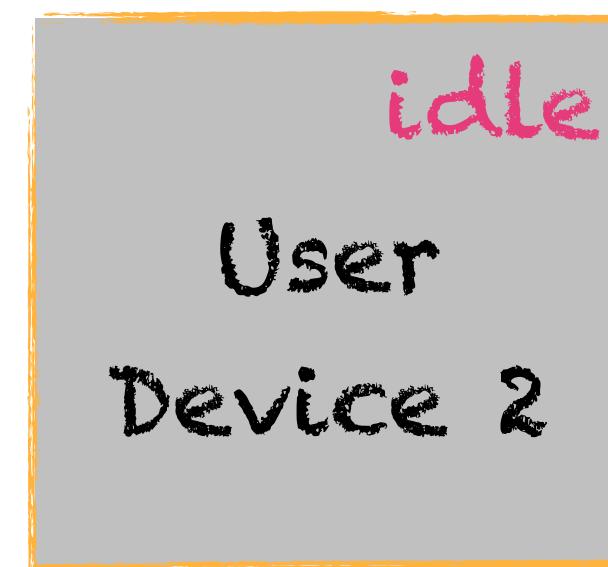
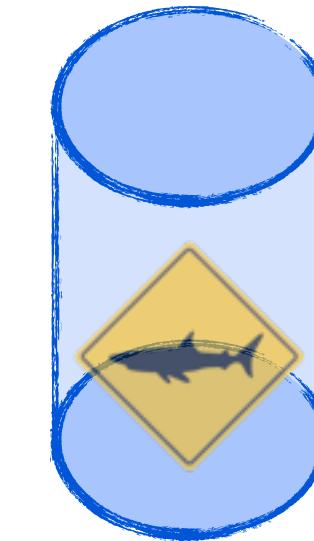
Google Cloud Messaging User Notifications



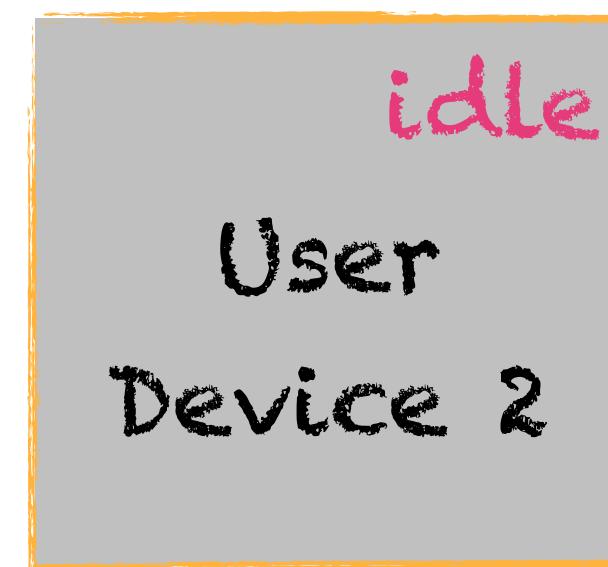
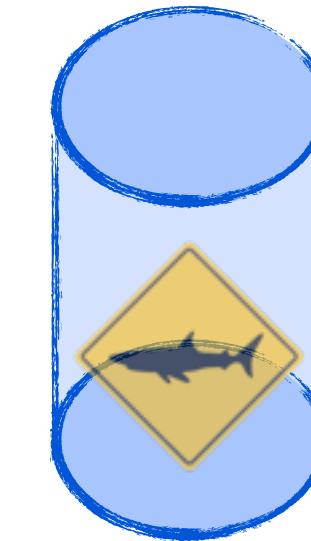
Google Cloud Messaging User Notifications



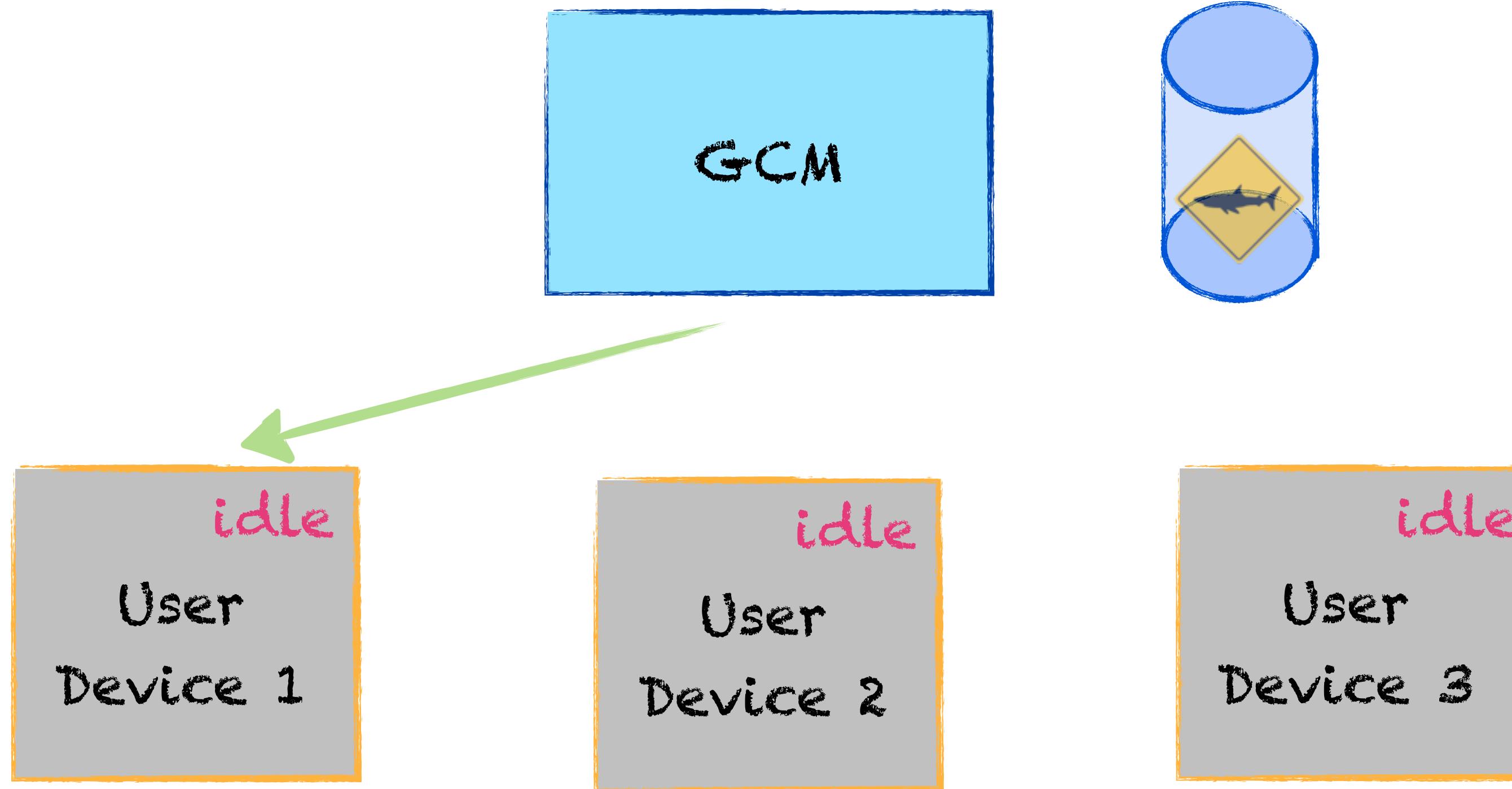
Google Cloud Messaging User Notifications



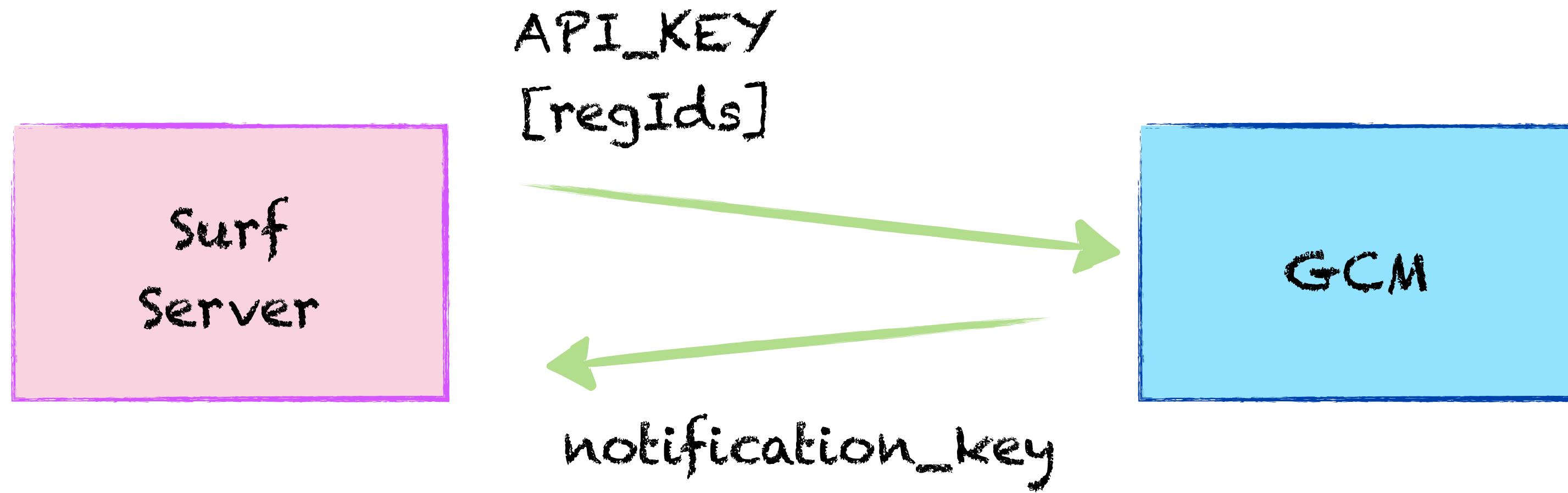
Google Cloud Messaging User Notifications



Google Cloud Messaging User Notifications



Google Cloud Messaging User Notifications



<https://android.googleapis.com/gcm/notifications>

content-type: "application/json"

Header : "project_id": <projectId>

Header: "Authorization", "key=API_KEY"



Request:

```
{  
  "operation": ["create", "add", "remove"],  
  "notification_key_name": "user1_hash",  
  "registration_ids": ["XYZ", "ABC"]  
}
```

Response:

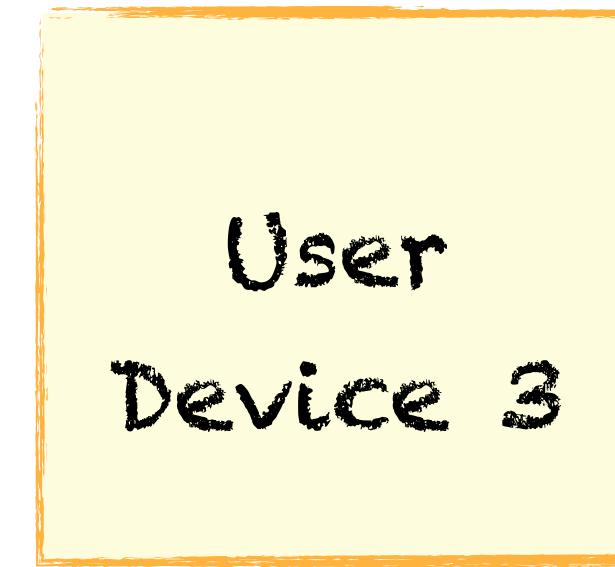
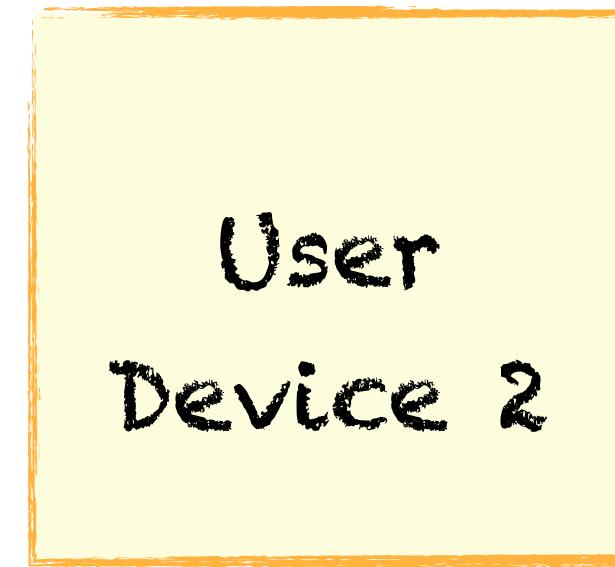
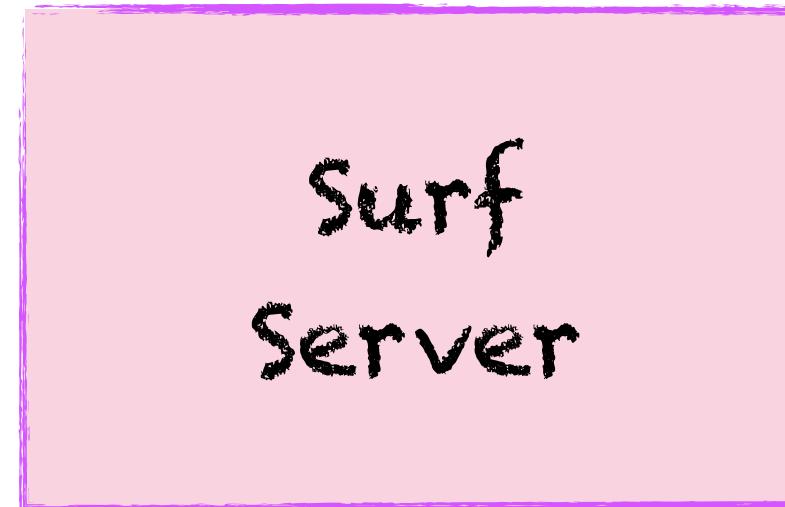
```
{  
  "notification_key": "a8YTG63hHH",  
}
```



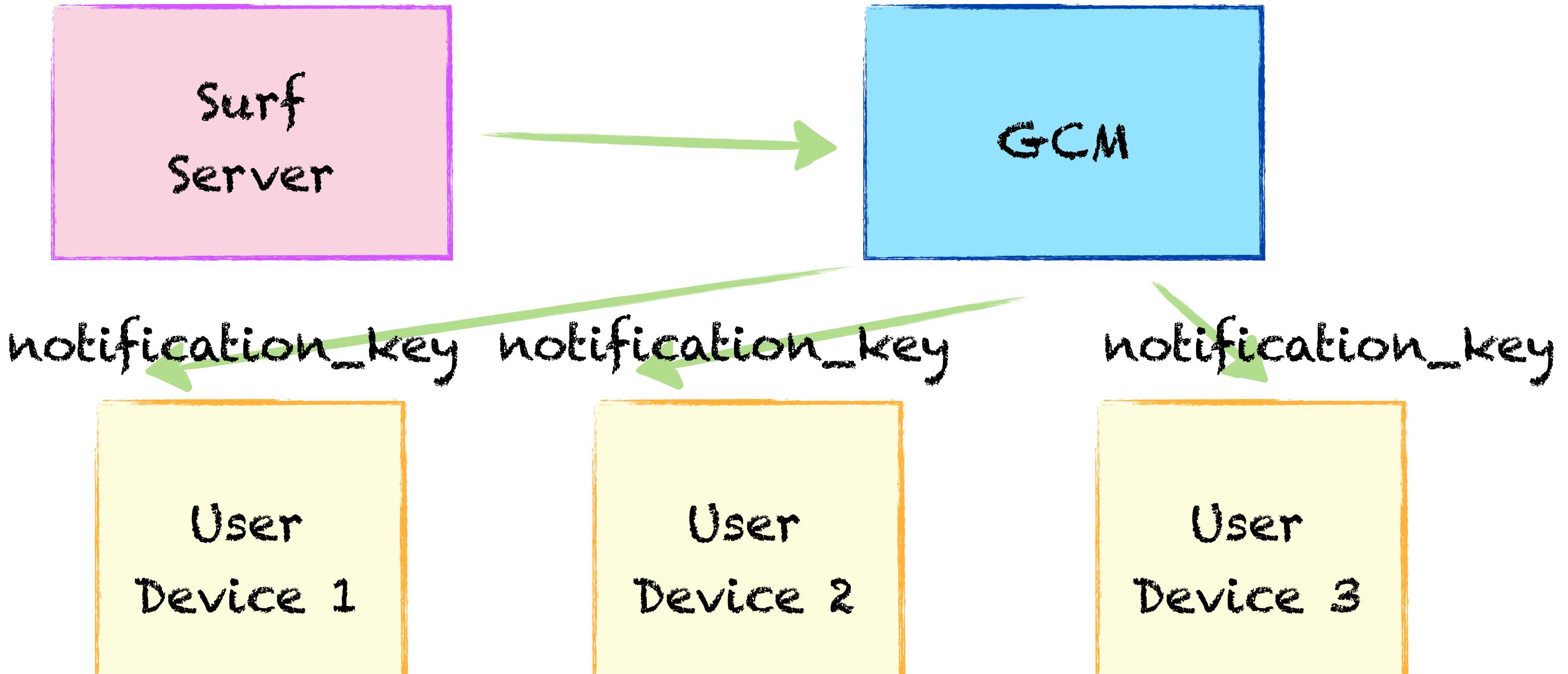
```
{  
  "to": "NOTIFICATION_KEY",  
  "data": {"hello": "world", }  
  "collapse_key": "collapse"  
  "time_to_live": "600",  
  "message_id": "m-1366082849205"  
  "delay_while_idle": true/false  
}
```



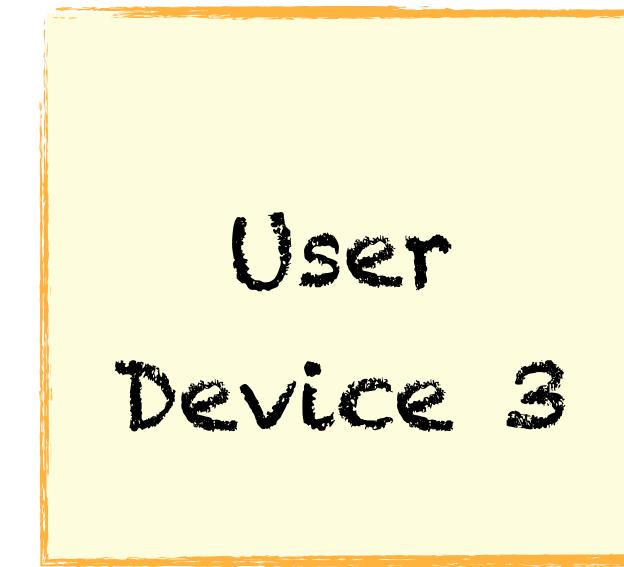
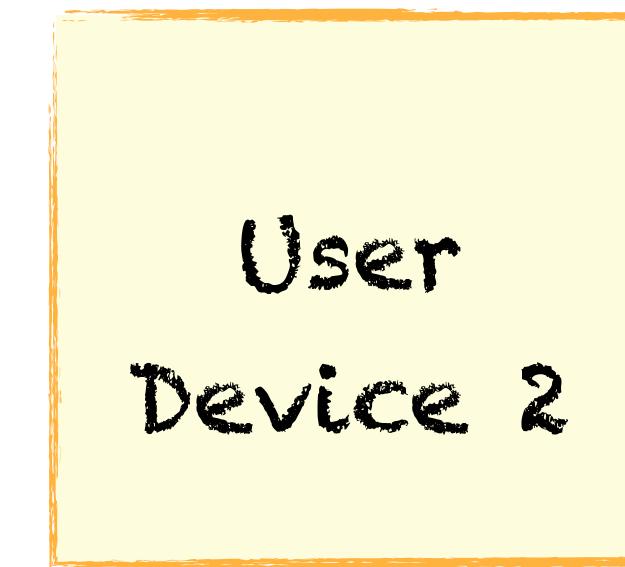
Google Cloud Messaging User Notifications



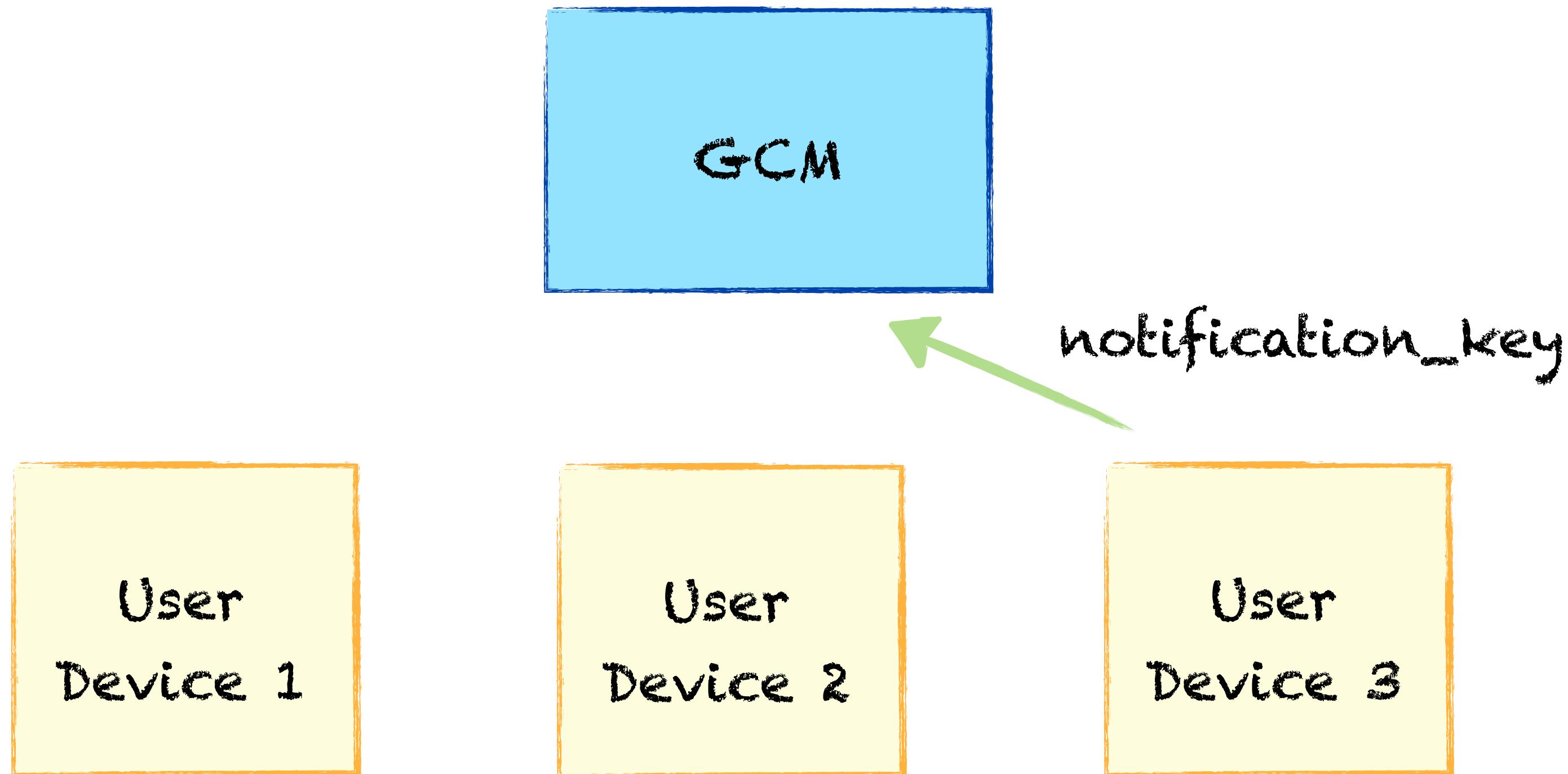
Google Cloud Messaging User Notifications



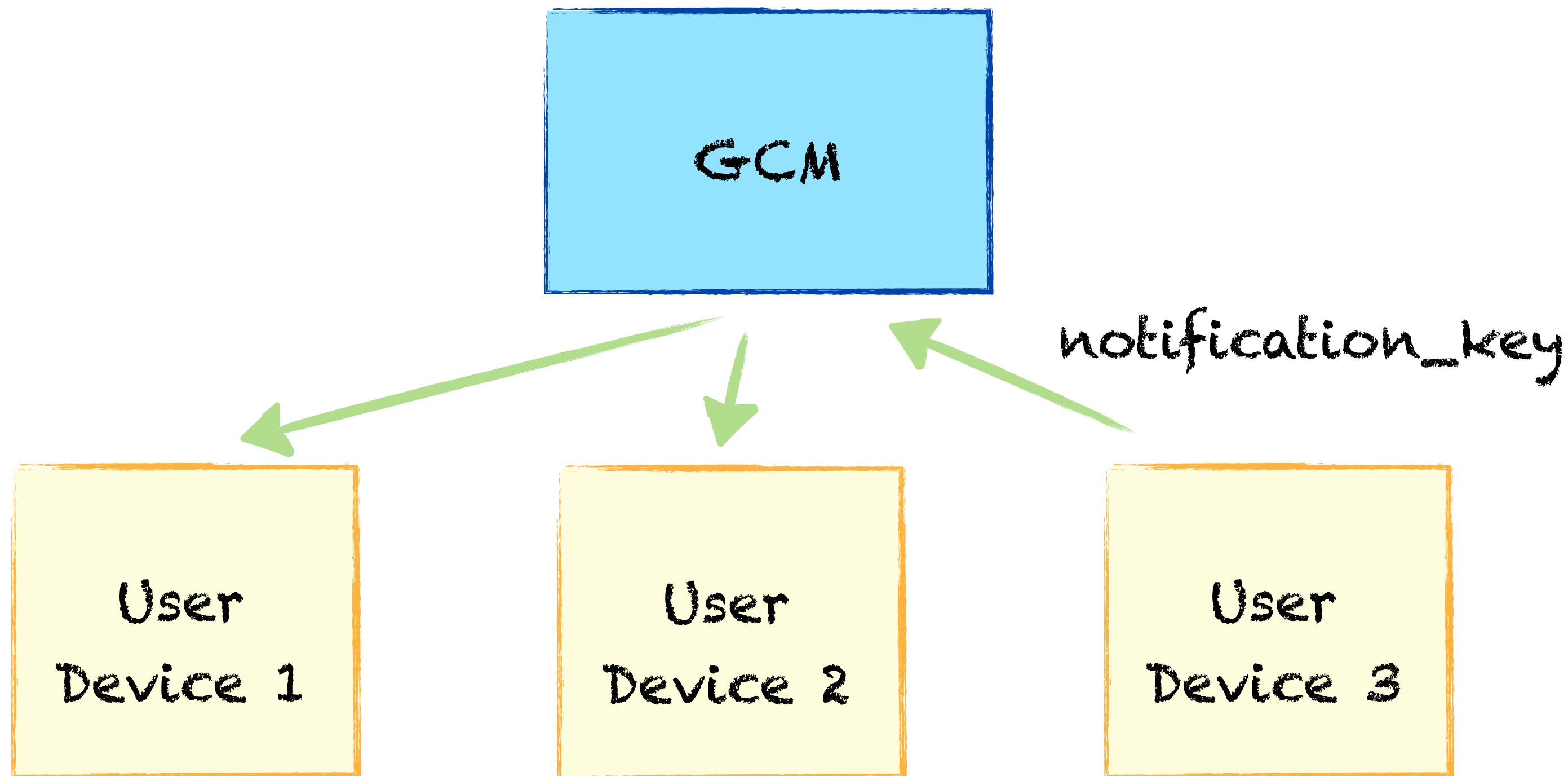
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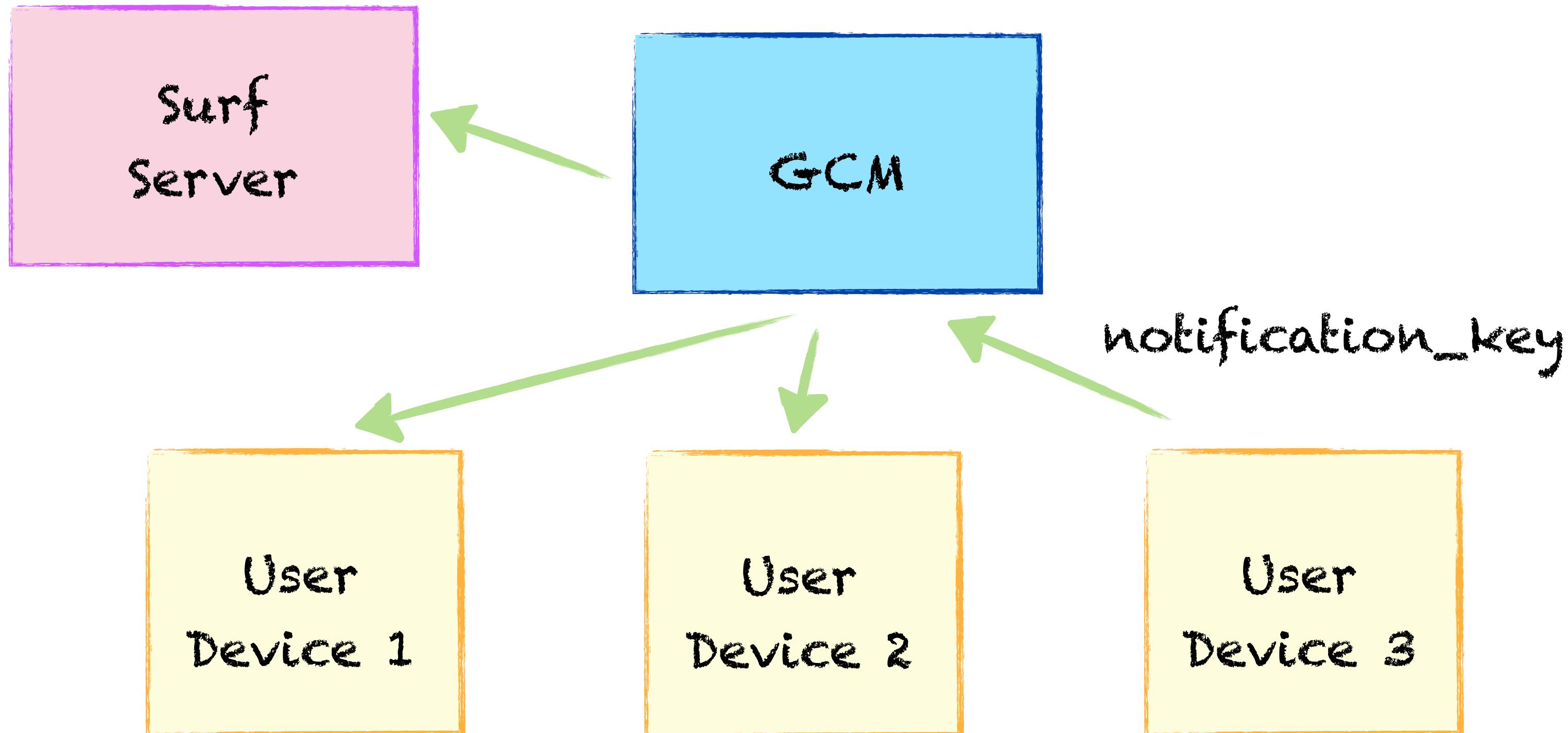
Google Cloud Messaging User Notifications



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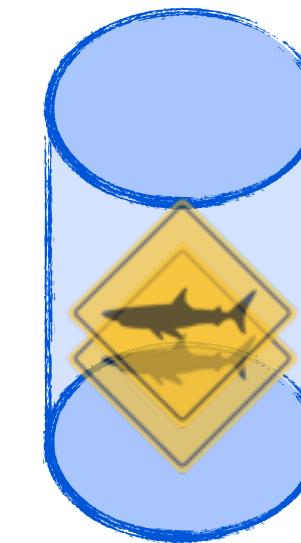
```
GoogleCloudMessaging gcm =  
    GoogleCloudMessaging.get(context);
```

String to = NOTIFICATION_KEY

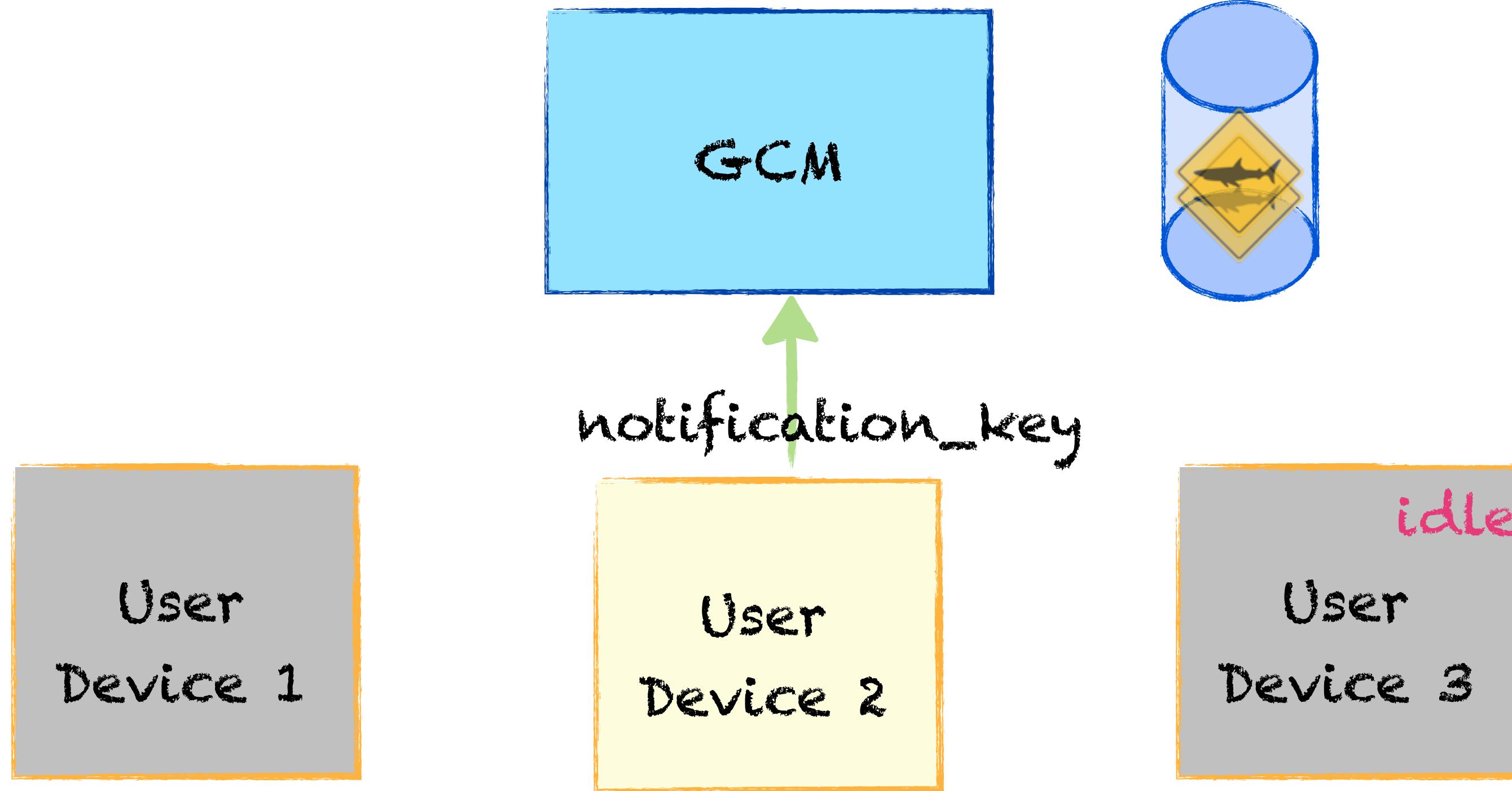
```
gcm.send(to, msgId, data);
```



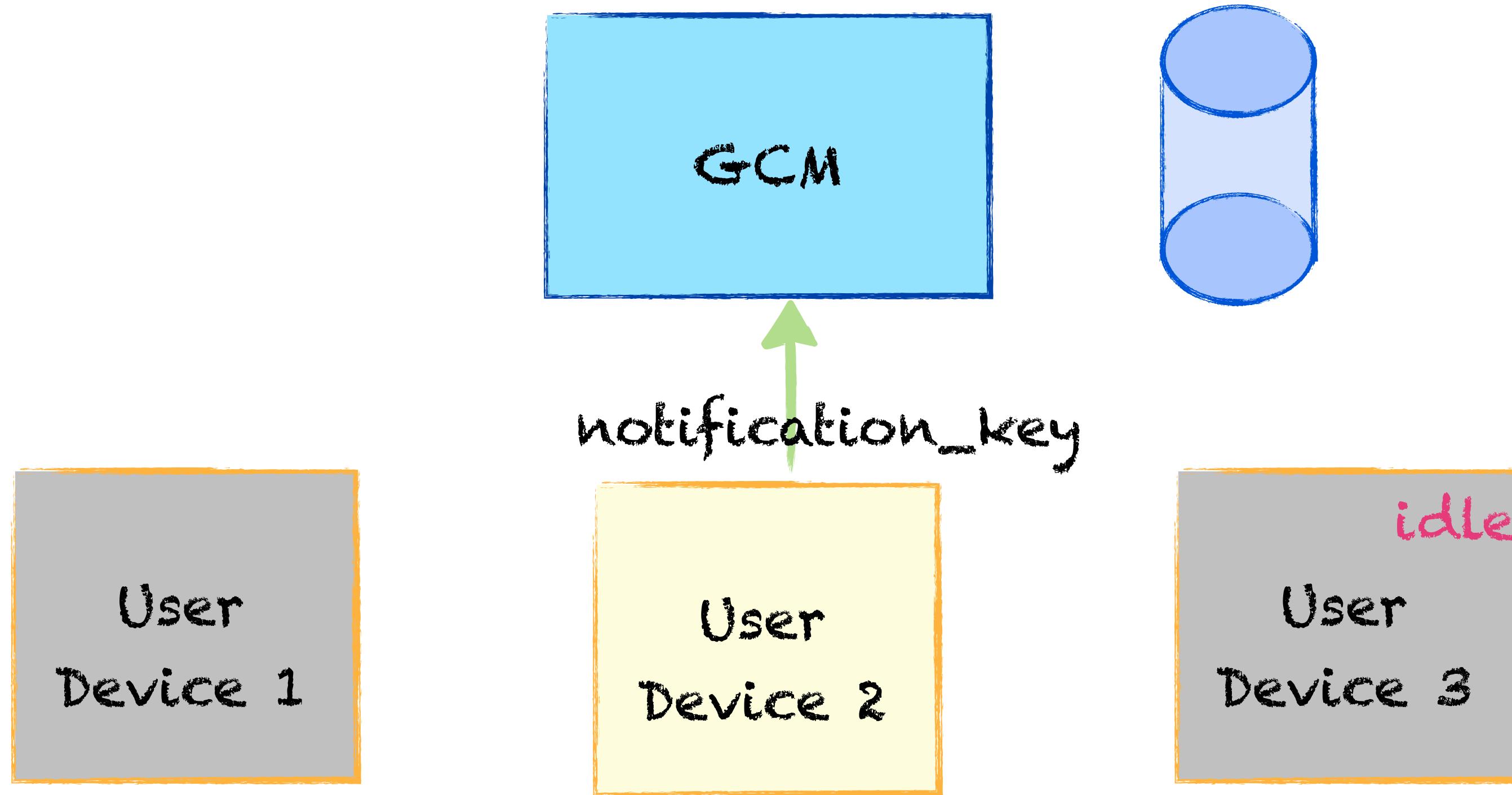
Google Cloud Messaging Optimization



Google Cloud Messaging Optimization



Google Cloud Messaging Optimization



Google Cloud Messaging **Notification Key**

Max 10 regIds per Notification Key



Google Cloud Messaging **Notification Key**



Max 10 regIds per Notification Key



Google Cloud Messaging **Notification Key**



Max 10 regIds per Notification Key



Notification Key Name is unique



Google Cloud Messaging **Notification Key**



Max 10 regIds per Notification Key



Notification Key Name is unique



Available for HTTP and XMPP





<https://developer.android.com/google/gcm>



Check out the new docs!

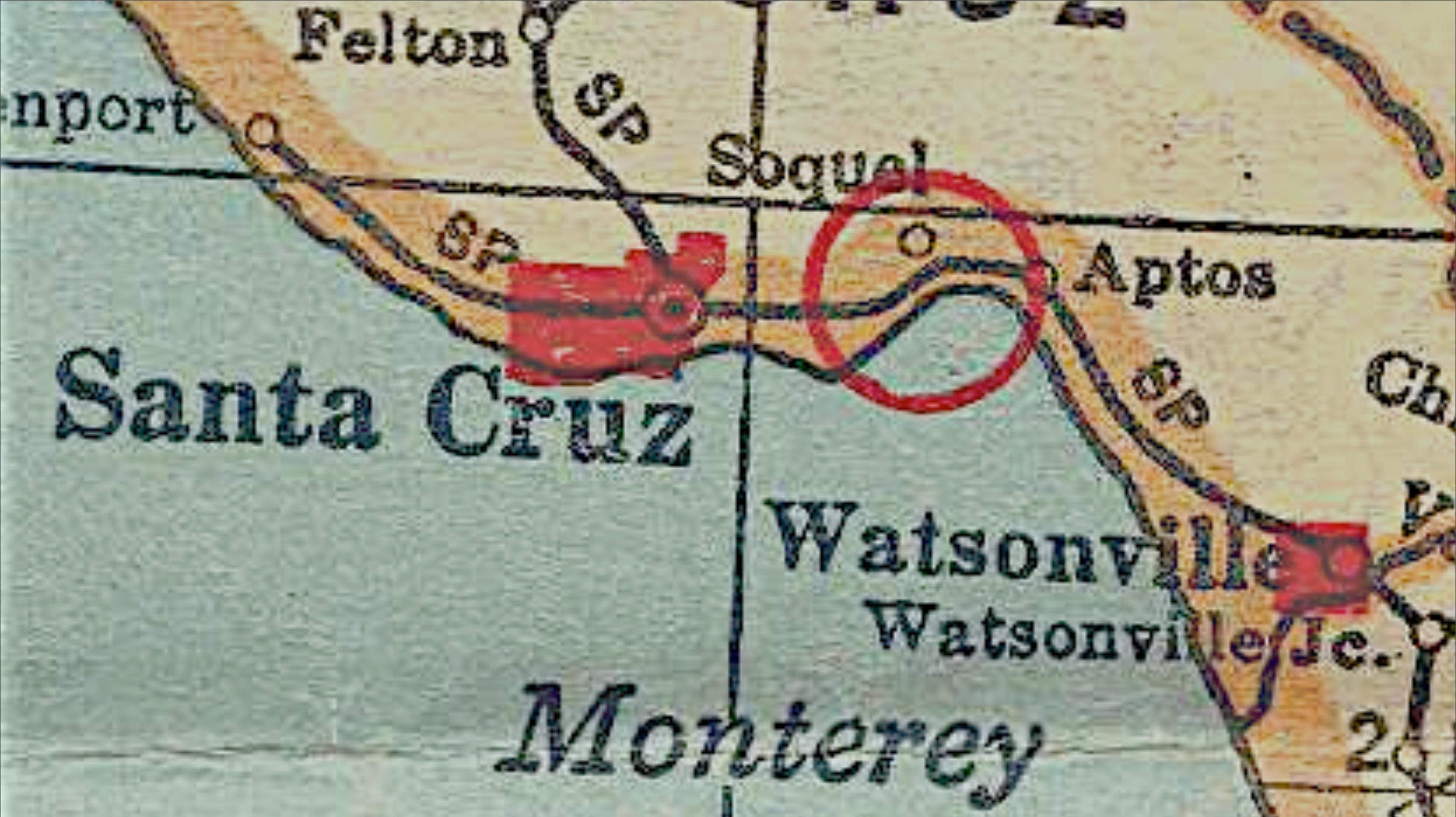


<https://services.google.com/fb/forms/gcm>



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