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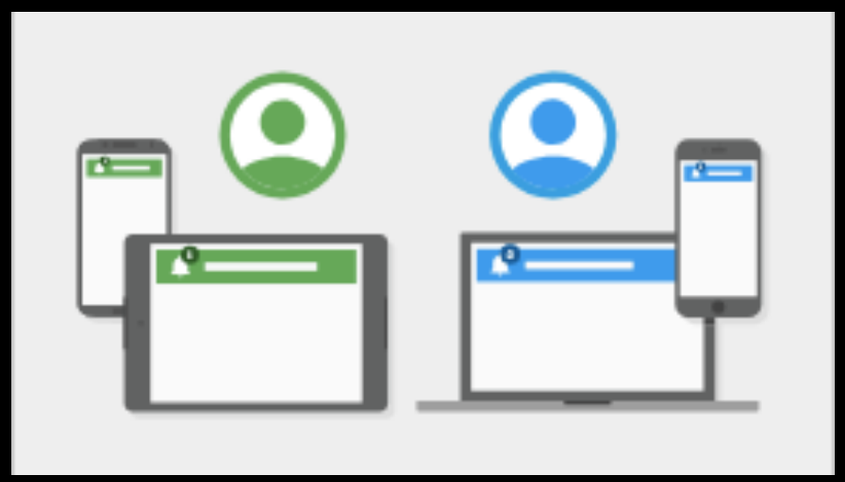
NOTIFICATIONS ARCHITECTURES

NOTIFICATION/ MESSAGING GOALS

PUSH NOTIFICATIONS TO A DEVICE (DOWN STREAM)

PUSH NOTIFICATIONS FROM DEVICE TO SERVER (UPSTREAM)



SEND TARGET MESSAGES

CHALLENGE DOWNSTREAM MESSAGING

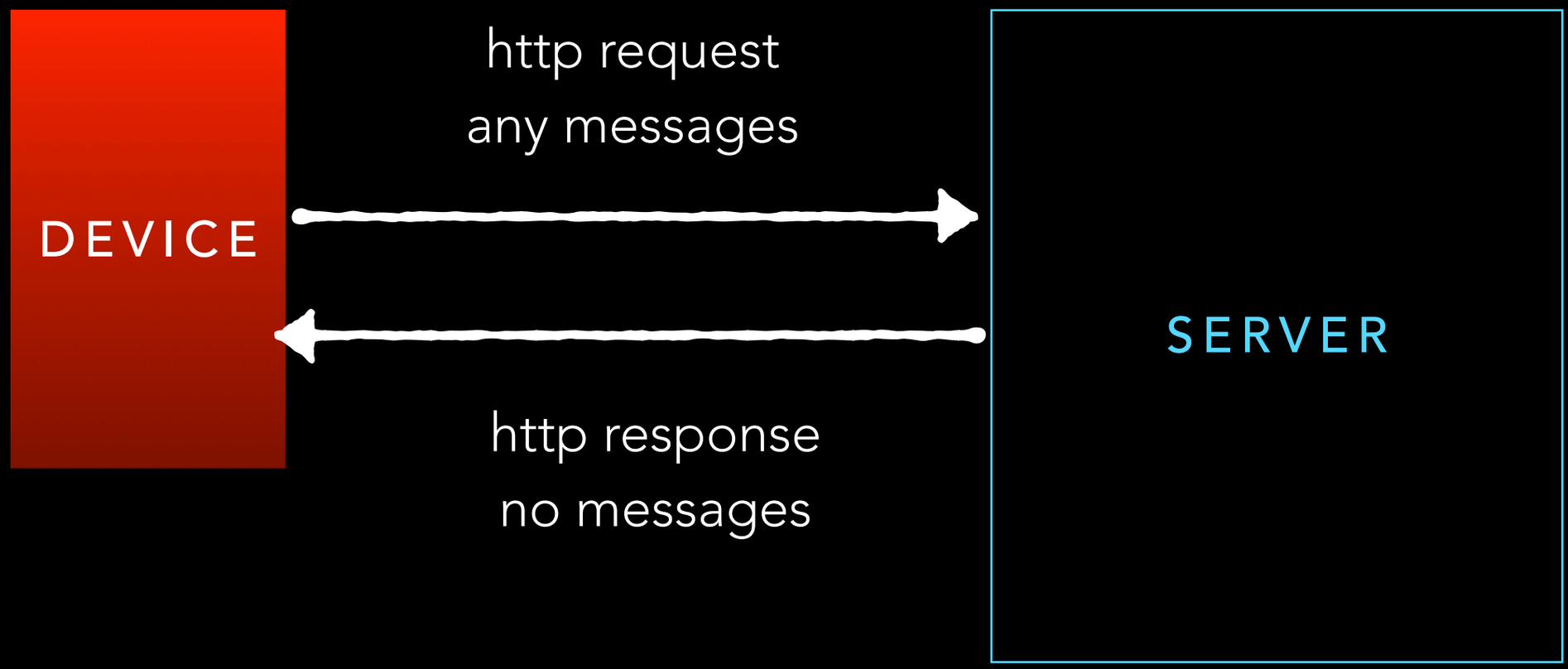
- How ensure that the message a delivered with low latency without polling? (Hundreds on milli seconds)
- How do we deliver target messages?
- How do we deliver message across platforms: Targeting users on both Android and IOS devices.

LET CONSIDER THE CASE OF DOWNSTREAM MESSAGES

HOW DO WE CHECK IF THE SERVER HAS NEED MESSAGES?

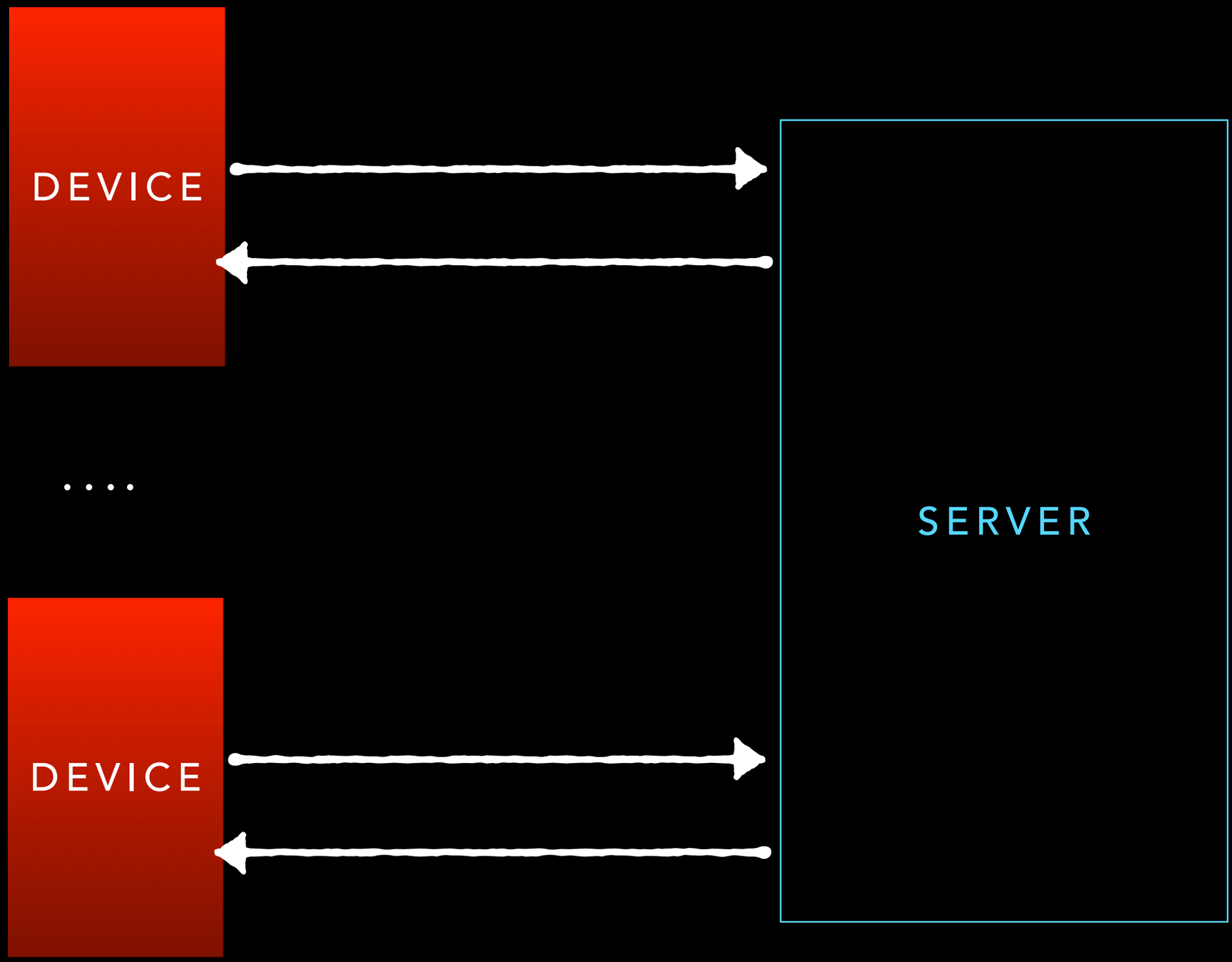
BAD CASE

THINK OF THE FETCH REQUEST IN JAVASCRIPT



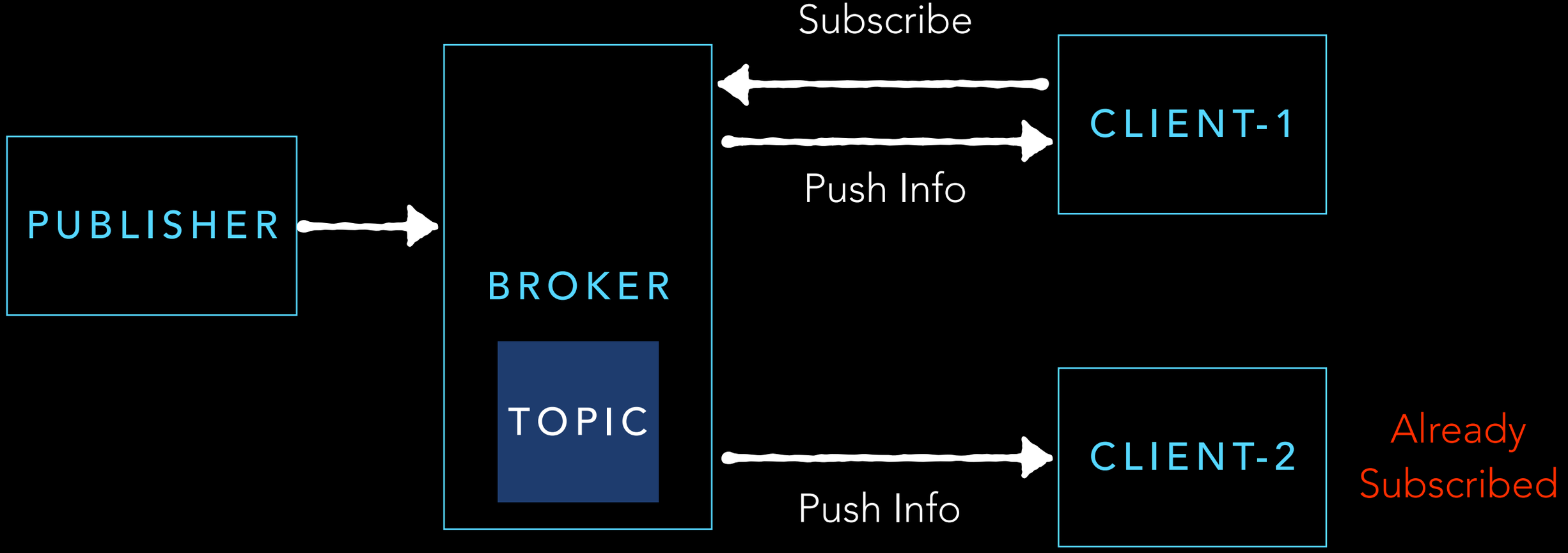
HOW OFTEN DO WE POLL THE SERVER?
EVERY 200 MILLISECONDS

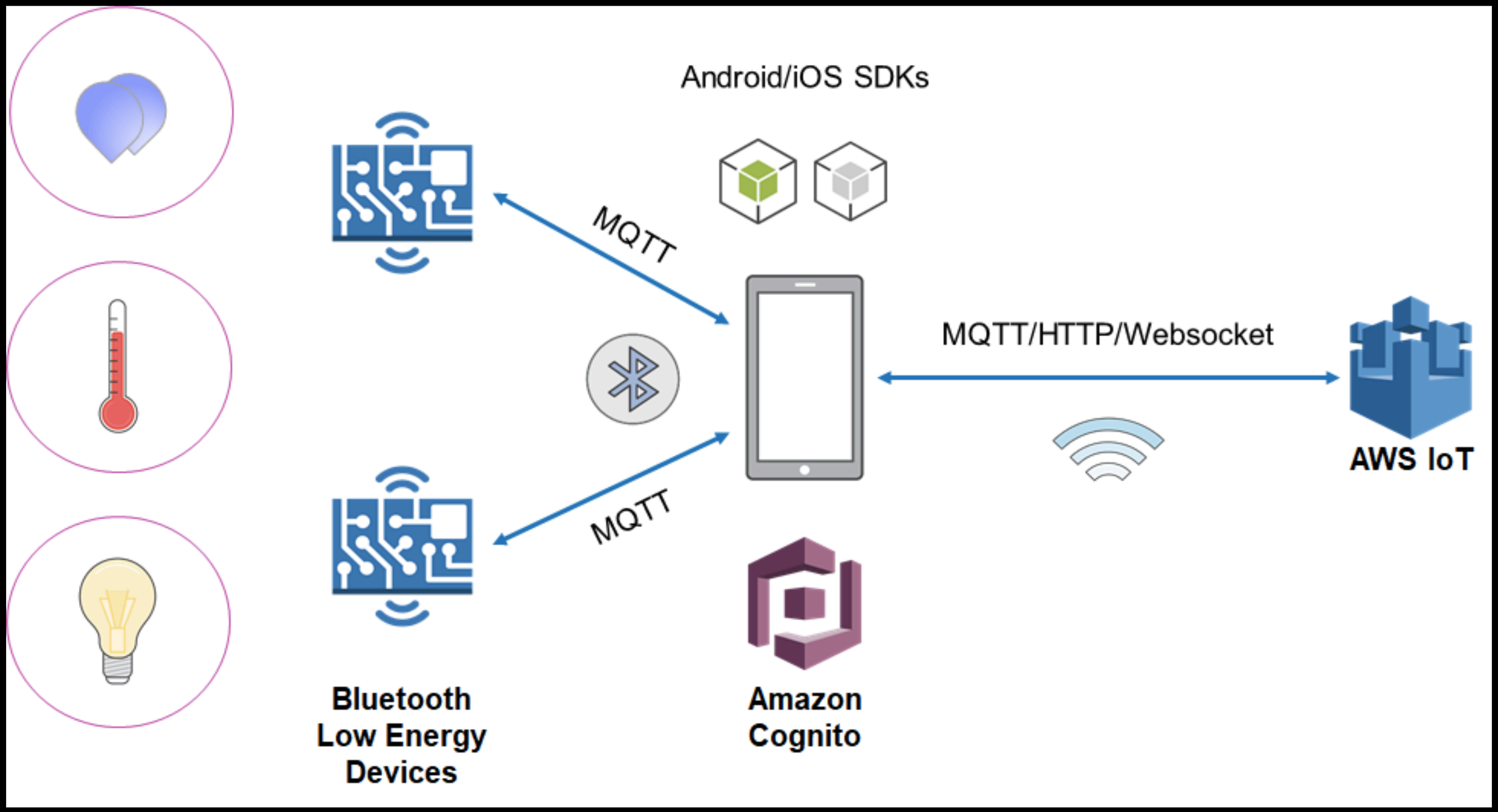
BAD CASE DOES NOT SCALE (DOS)



ARCHITECTURE SOLUTION

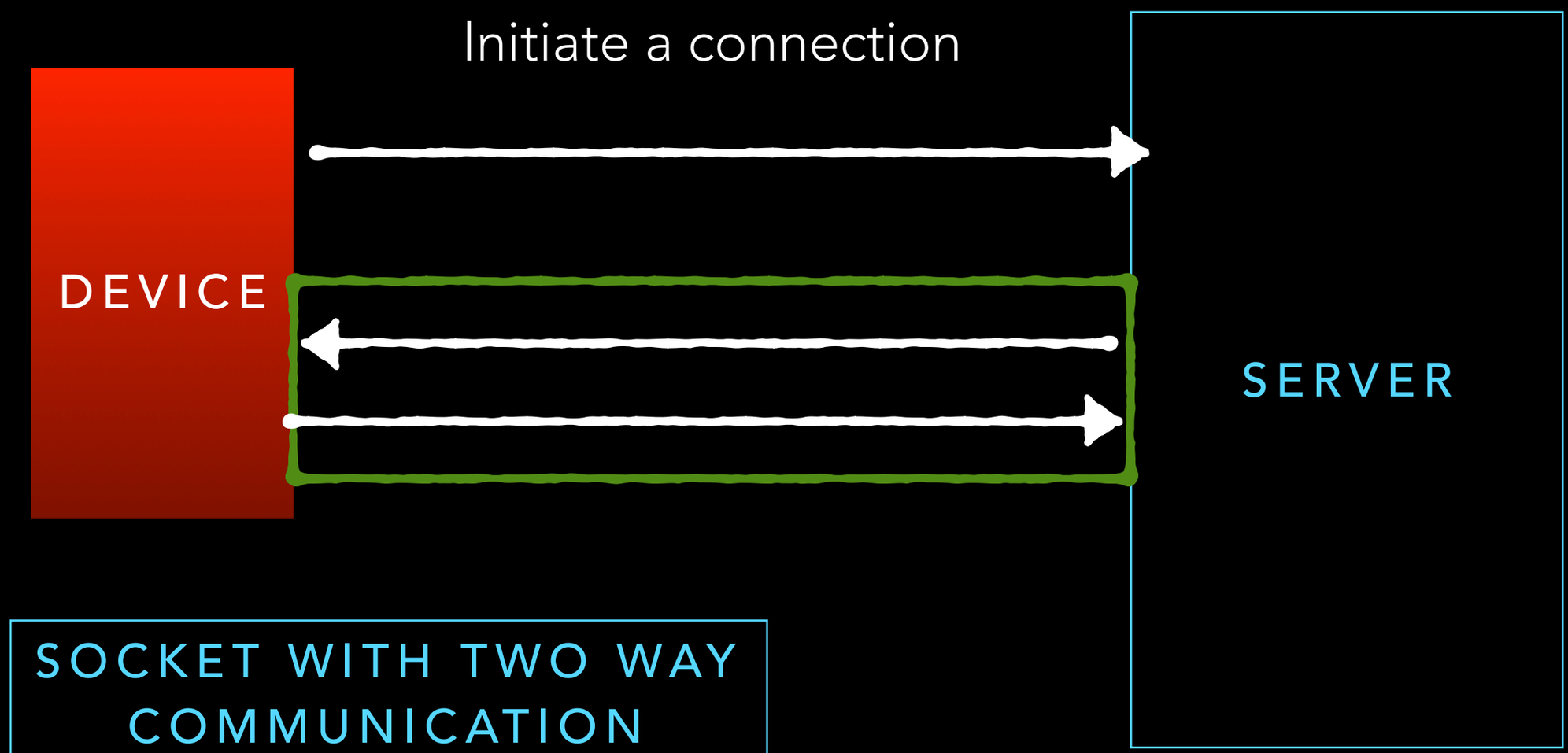
- Publish/ Subscribe architecture
  - Need way for the server to send messages to client without the client requesting




Android/iOS SDKs
MQTT
MQTT/HTTP/Websocket
AWS IoT
MQTT
Bluetooth
Low Energy
Devices
Amazon
Cognito

SOCKET ALLOW FOR TWO WAY COMMUNICATION

- Need way for the server to send messages to client without the client requesting



SOCKET WITH TWO WAY COMMUNICATION

BUT SOCKETS ARE ONLY AVAILABLE AND OS LEVEL

THERE ARE WEB SOCKETS

ADD DEEP DIVE INTO SOCKETS:

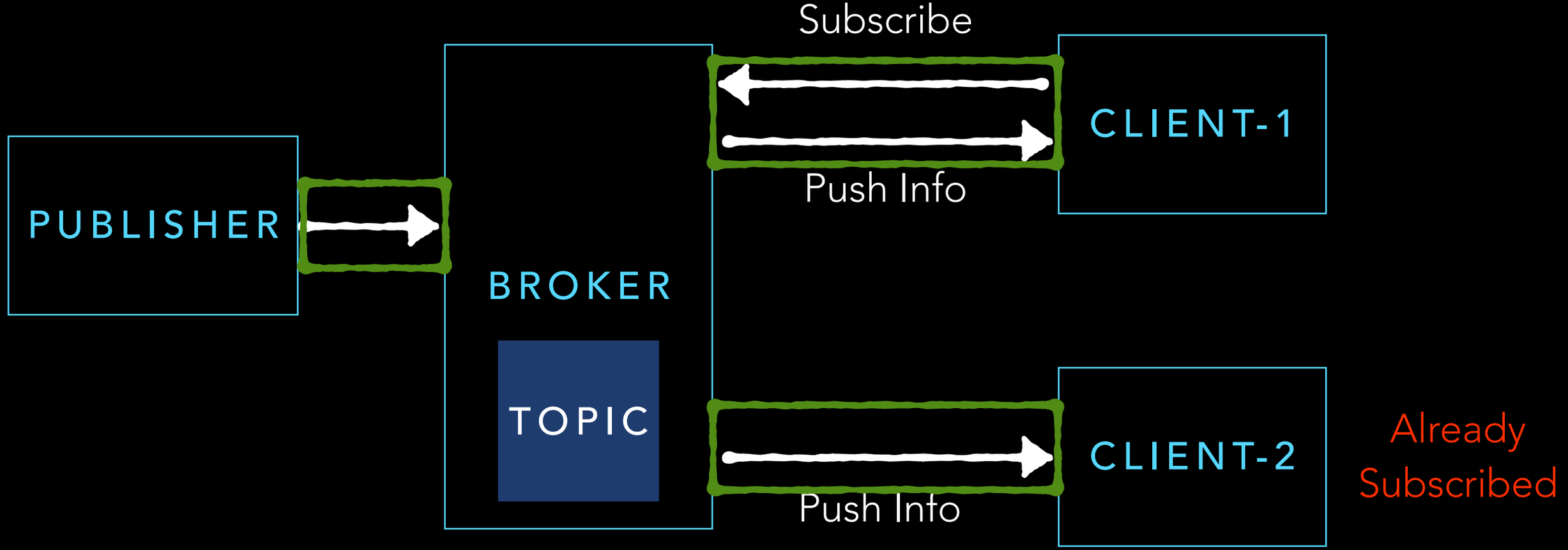
WEB SOCKETS

NO HTTP
BUT WS

why?

```
var ws = new WebSocket('ws://host.com/path');

ws.onopen = () => {
  // connection opened
  ws.send('something'); // send a message
};

ws.onmessage = (e) => {
  // a message was received
  console.log(e.data);
};

ws.onerror = (e) => {
  // an error occurred
  console.log(e.message);
};

ws.onclose = (e) => {
  // connection closed
  console.log(e.code, e.reason);
};
```

PUBLISHER SUBSCRIBER WITH SOCKETS



MAIN MESSAGING/ NOTIFICATION SERVICES

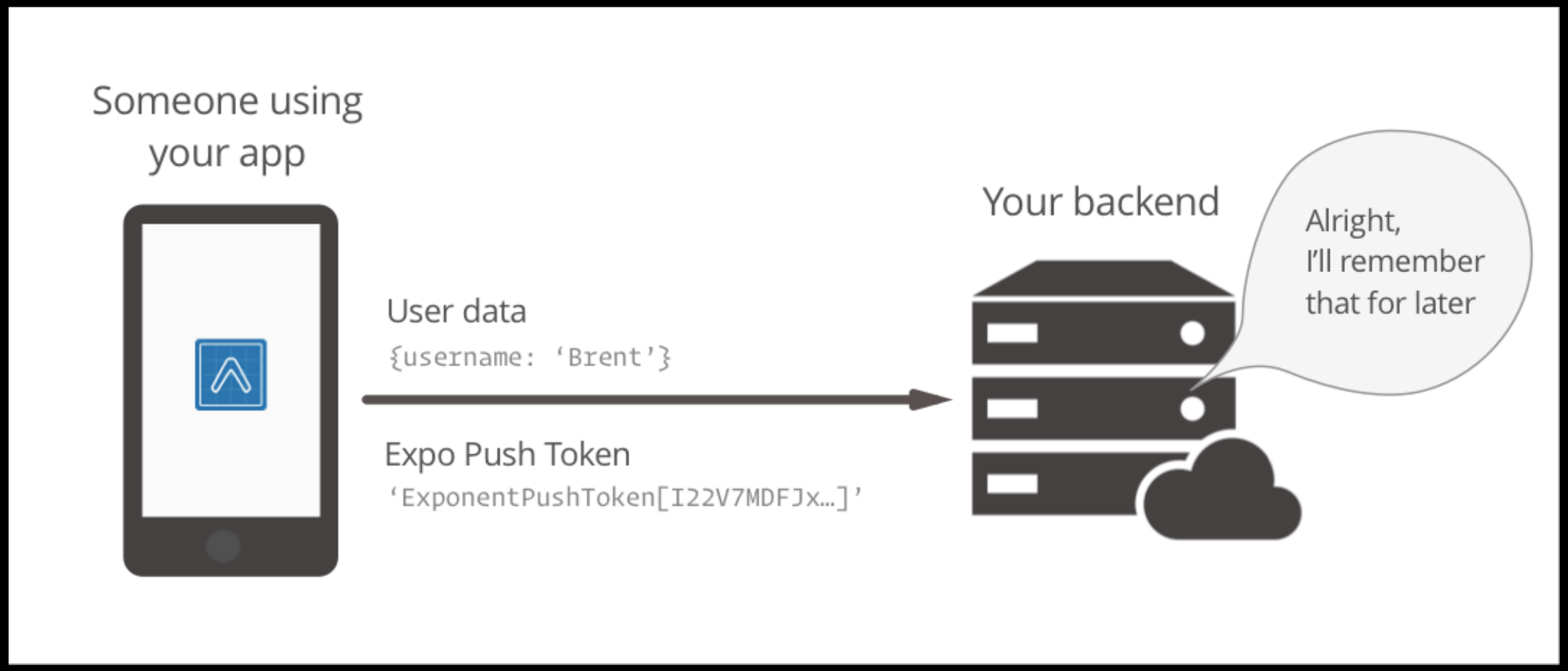
Google Cloud Messaging Service (Depreciated)

Firebase Cloud Messaging Service

Apple Push Notification Service

Expo Push Notification Service ←

DEEP DIVE EXPO NOTIFICATION ARCHITECTURE



SAVING USERS PUSH TOKEN

```
import { Permissions, Notifications } from 'expo';

export default async function registerForPushNotificationsAsync() {
  const { status: existingStatus } = await Permissions.getAsync(
    Permissions.NOTIFICATIONS
  );
  let finalStatus = existingStatus;
  if (existingStatus !== 'granted') {
    const { status } = await Permissions.askAsync(Permissions.NOTIFICATIONS);
    finalStatus = status;
  }

  if (finalStatus !== 'granted') {
    return;
  }

  let token = await Notifications.getExpoPushTokenAsync();
  return token
  }
```

STILL NOT GRANTED RETURN

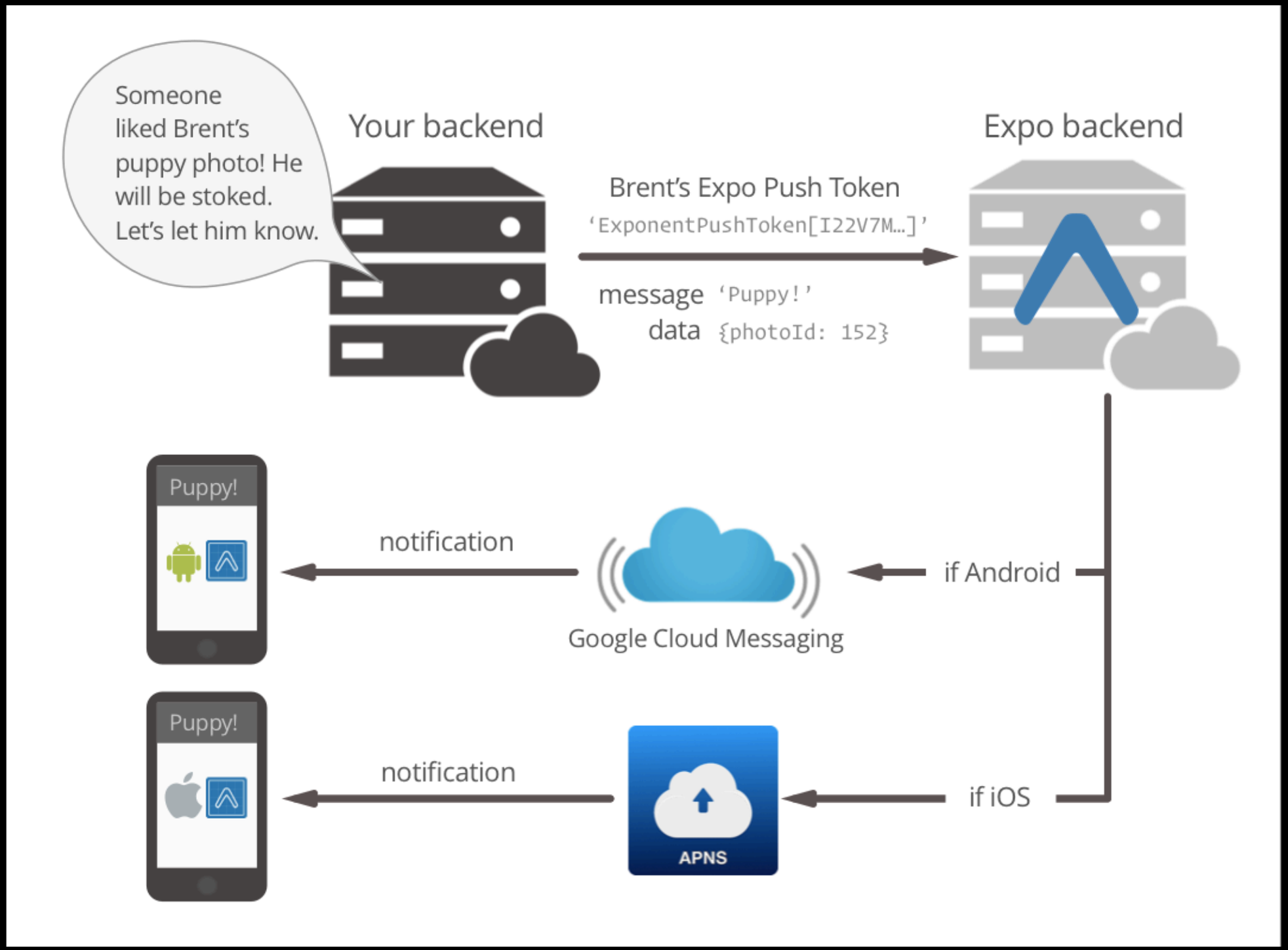
ADD CODE FOR HANDLING NOTIFICATION

- Handling Notification went the application is open

```
    componentDidMount(){
    this._notificationSubscription = Notifications.addListener(this._handleNotification);
    }

    _handleNotification = (notification) => {
      this.setState({notification: notification})
      console.log("got Notification")

    };
```

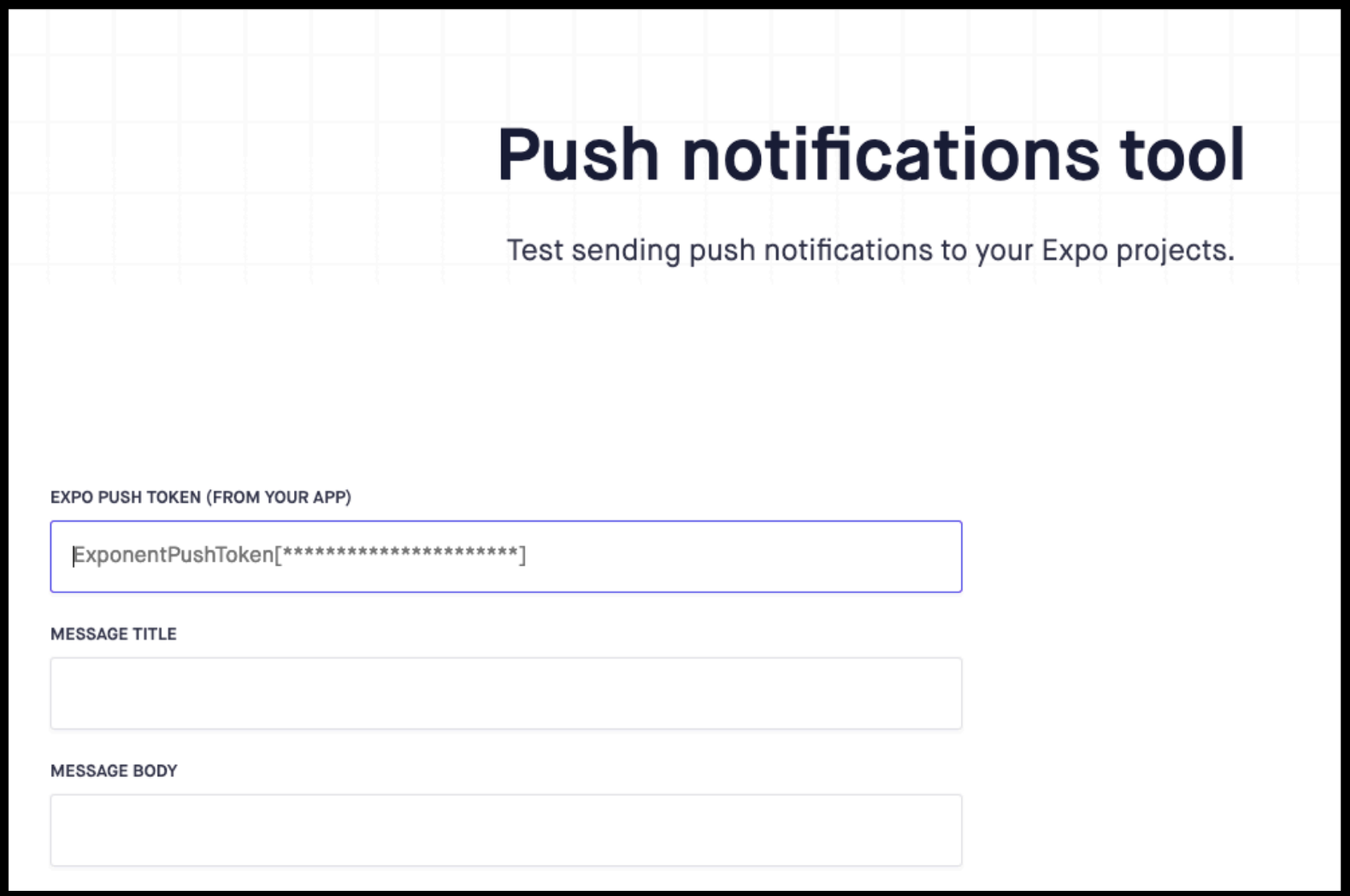
Modify the home screen to look
Handling notifications while app is open

DEEP DIVE EXPO NOTIFICATION ARCHITECTURE



DEMO TIME

https://expo.io/dashboard/notifications



REFERENCES

- https://docs.expo.io/versions/latest/guides/push-notifications/

Cloud Pub/Sub triggers

Send feedback

Google Cloud Pub/Sub is a globally distributed message bus that automatically scales as you need it. You can create a function that handles Google Cloud Pub/Sub events by using `functions.pubsub`.

Trigger a pub/sub function

You can trigger a function whenever a new Pub/Sub message is sent to a specific topic. You must specify the Pub/Sub topic name that you want to trigger your function, and set the event within the `onPublish()` event handler:

```
exports.helloPubSub = functions.pubsub.topic('topic-name').onPublish((message) => {
  // ...
});
```

☆ ☆ ☆ ☆ ☆

Firebase Cloud Messaging

iOS C++

Send feedback

Firebase Cloud Messaging (FCM) is a cross-platform messaging solution that lets you reliably send messages at no cost.

Using FCM, you can notify a client app that new email or other data is available to sync. You can send notification messages to drive user re-engagement and retention. For use cases such as instant messaging, a message can transfer a payload of up to 4KB to a client app.

Using deprecated Google Cloud Messaging APIs? Learn more about how to migrate to FCM.

iOS setup Android setup Web setup C++ setup

Unity setup