

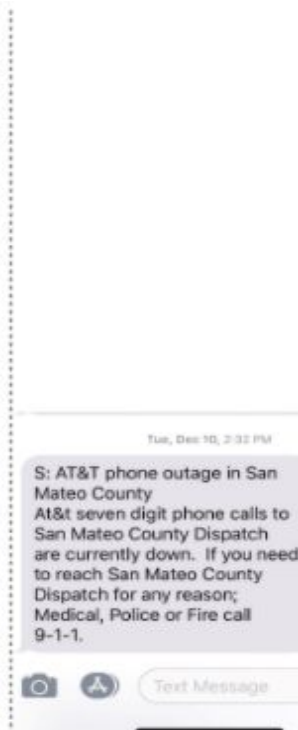
Notification System

Notification 种类

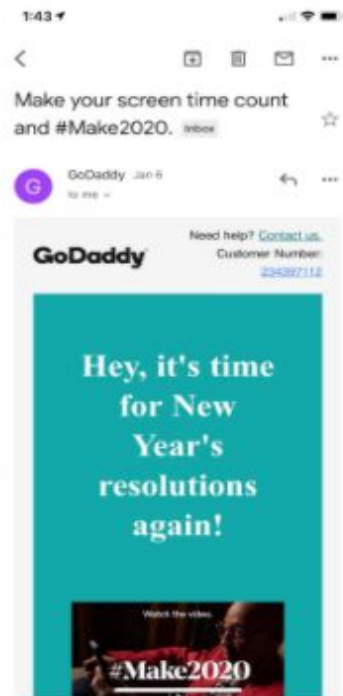
- Mobile push notification
- SMS message
- Email



Push notification



SMS

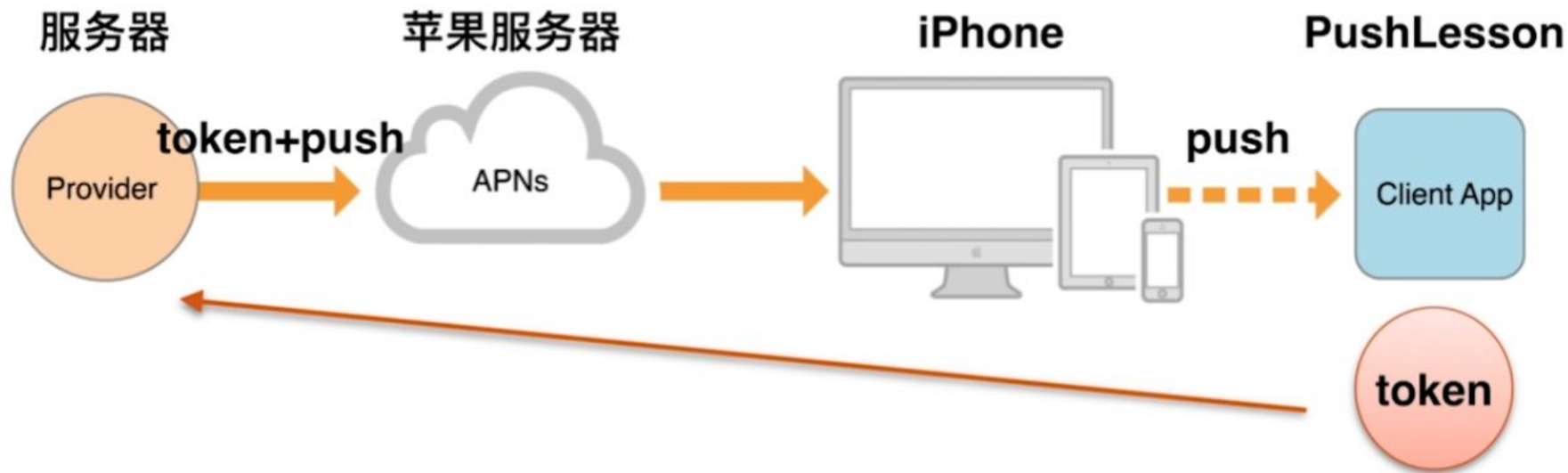


Email

Requirements

- Real time - soft
- Supported device - IOS/Android, Web
- Triggers - Server side scheduled, client apps
- User opt out option
- Traffic - Daily, 10M mobile push notifications, 1M SMS messages, 5M Emails

IOS PUSH工作原理



Components

- **Provider:** A provider builds and sends notification requests to Apple Push Notification Service (APNS). To construct a push notification, the provider provides the following data:
 - **Device token:** This is a unique identifier used for sending push notifications.
 - **Payload:** This is a JSON dictionary that contains a notification's payload. Here is an example:

```
{
  "aps" : {
    "alert" : {
      "title" : "Game Request",
      "body" : "Bob wants to play chess",
      "action-loc-key" : "PLAY"
    },
    "badge" : 5
  }
}
```

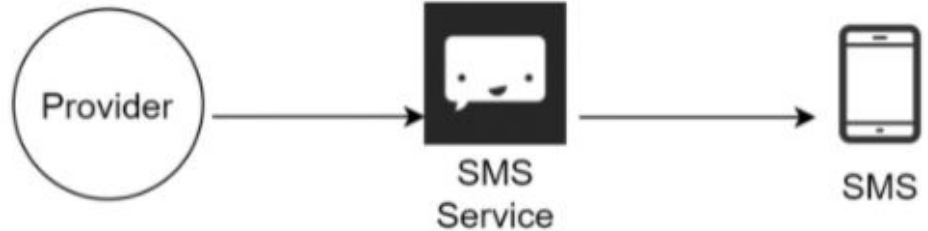
- **APNS:** This is a remote service provided by Apple to propagate push notifications to iOS devices.
- **iOS Device:** It is the end client, which receives push notifications.

Android/SMS Message/Email

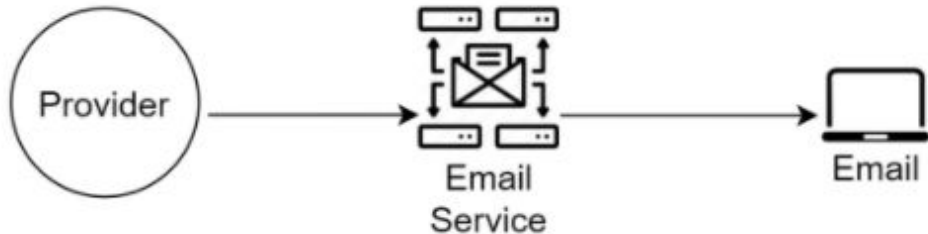
Firestore Messaging
(GCM)



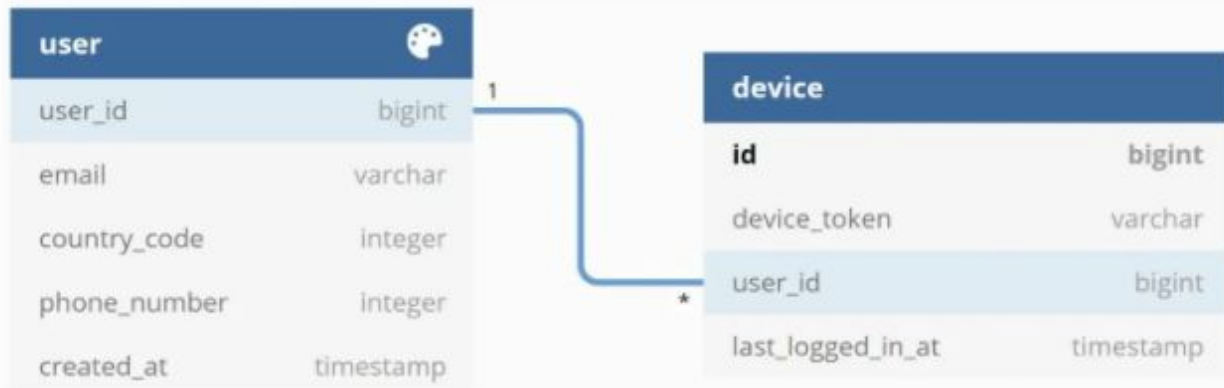
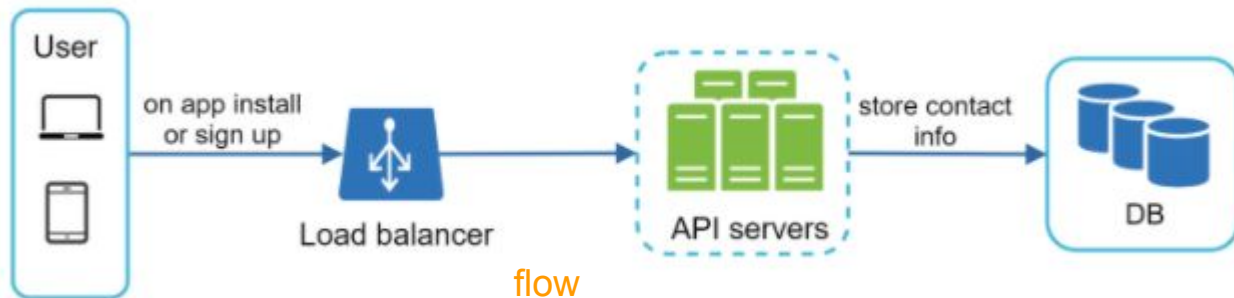
Twilio, Nexmo



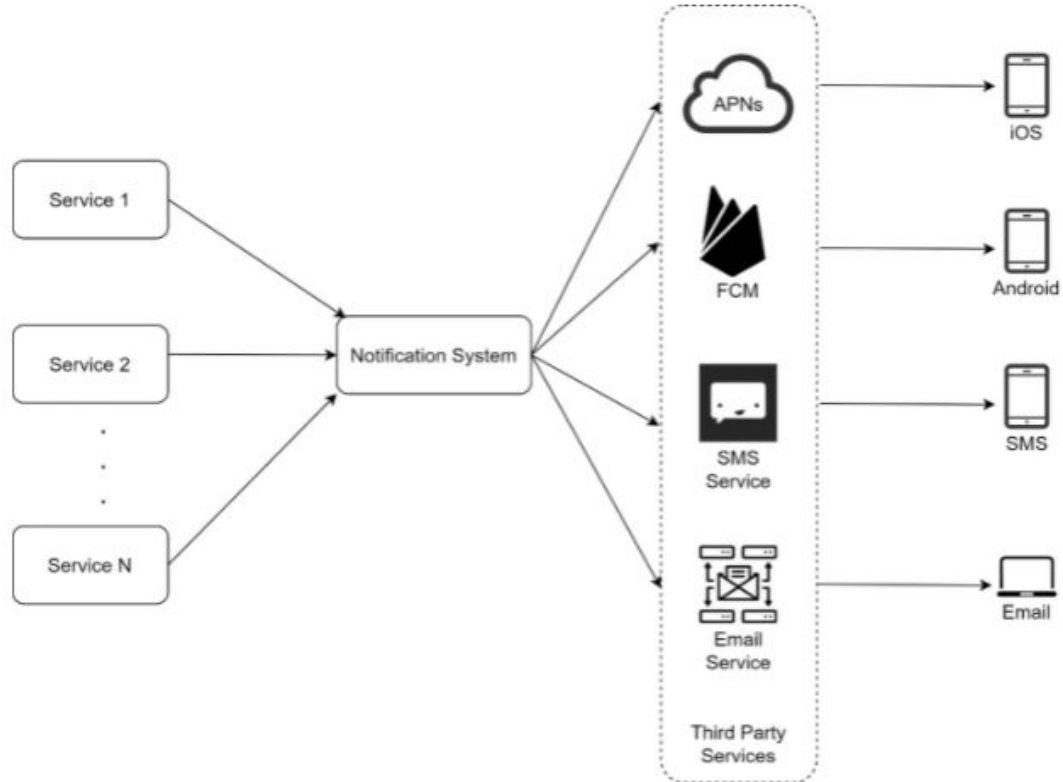
Sendgrid, Mailchimp



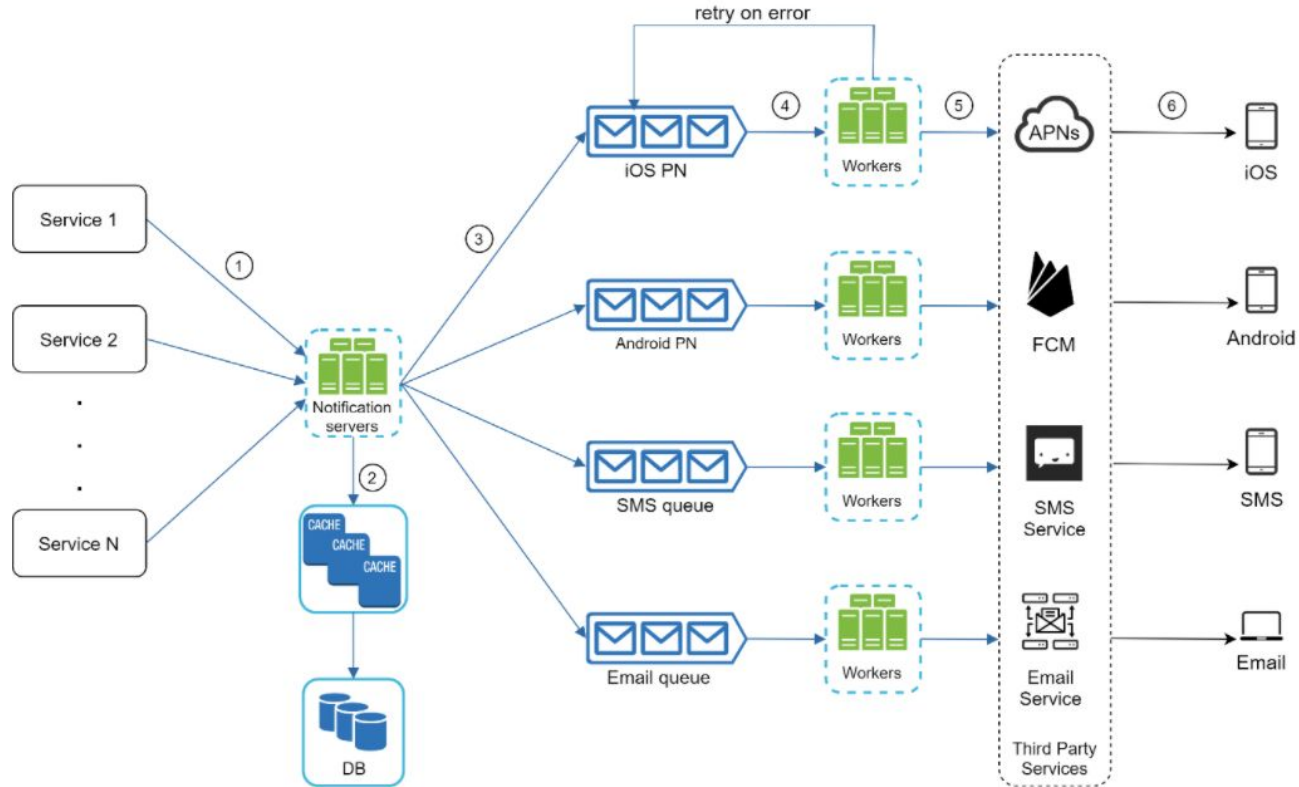
信息收集



Intuitive High Level Design



Enhanced High Level Design



组件解释

- Service 1 to N
- Notification Servers
- Cache
- MQ
- Workers
- Third Party Services
- IOS/Android/SMS/Email

Additional - Reliability

Data Loss



Exact once

Additional - Notification Template

BODY:

You dreamed of it. We dared it. [ITEM NAME] is back — only until [DATE].

CTA:

Order Now. Or, Save My [ITEM NAME]

Additional - Users Opt-in/Opt-out

user_id bigint

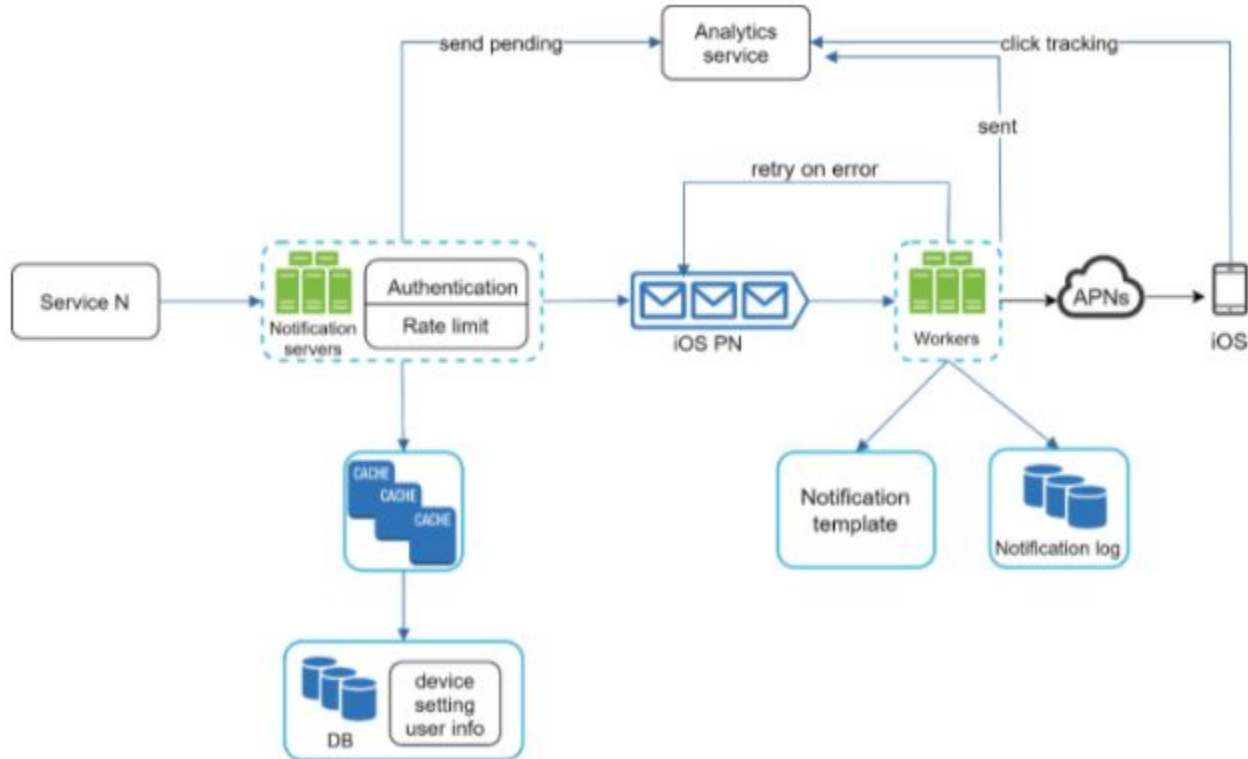
channel varchar # push notification, email or SMS

opt_in boolean # opt-in to receive notification

Additional - others

- Rate limiting
- Retry
- Security
- Monitor mq
- Event tracking

Updated Design



Reference

- [1] Twilio SMS: <https://www.twilio.com/sms>
- [2] Nexmo SMS: <https://www.nexmo.com/products/sms>
- [3] Sendgrid: <https://sendgrid.com/>
- [4] Mailchimp: <https://mailchimp.com/>
- [5] You Cannot Have Exactly-Once Delivery: <https://bravenewgeek.com/you-cannot-have-exactly-once-delivery/>
- [6] Security in Push Notifications:
<https://cloud.ibm.com/docs/services/mobilepush?topic=mobile-pushnotification-security-in-push-notifications>
- [7] RadditMQ: <https://bit.ly/2sotla6>