#08 Web Infrastructure

CLIENT/SERVER COMPUTING AND WEB TECHNOLOGIES

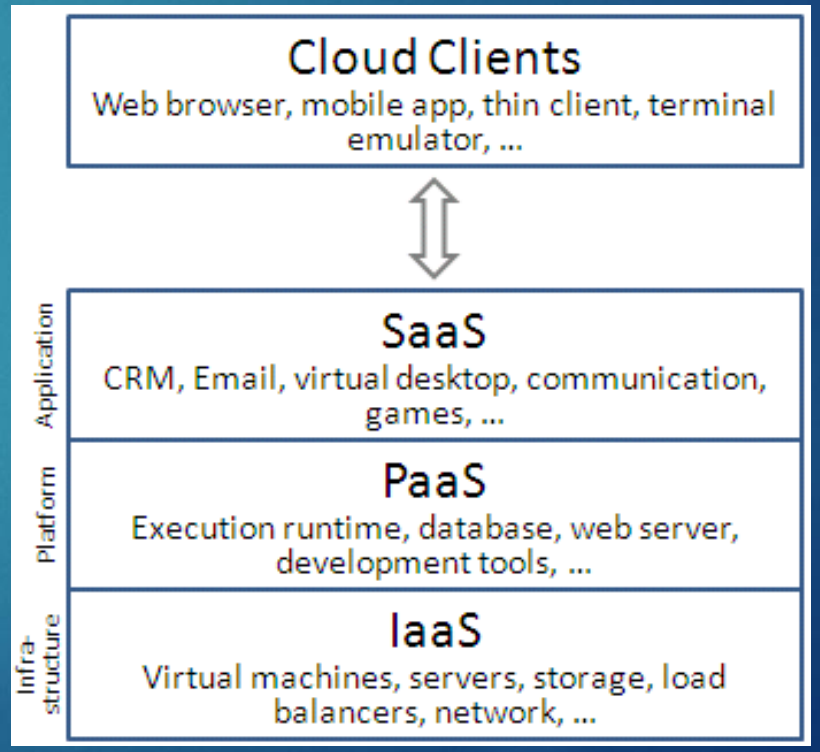
Web Infrastructure

Cloud Computing

Serverless (Firebase & Cloud Functions)

Cloud Computing

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)



IaaS: NIST's Definition

"where the consumer is able to deploy and run arbitrary software, which can **include operating systems and applications**. The consumer does not manage or control the underlying cloud infrastructure but has **control over operating systems, storage, and deployed applications**; and possibly limited control of select networking components (e.g., host firewalls)."

Infrastructure as a service (IaaS)

- Dereference low-level details of underlying network infrastructure
  - like physical computing resources, location, data partitioning, scaling, security, backup etc.
- Pools of hypervisors within the cloud operational system
  - support large numbers of virtual machines and the ability to scale services up and down according to customers' varying requirements.
- Often offer additional resources such as
  - virtual-machine disk-image library, raw block storage, file or object storage, firewalls, load balancers, IP addresses, virtual local area networks (VLANs), and software bundles.

PaaS: NIST's definition

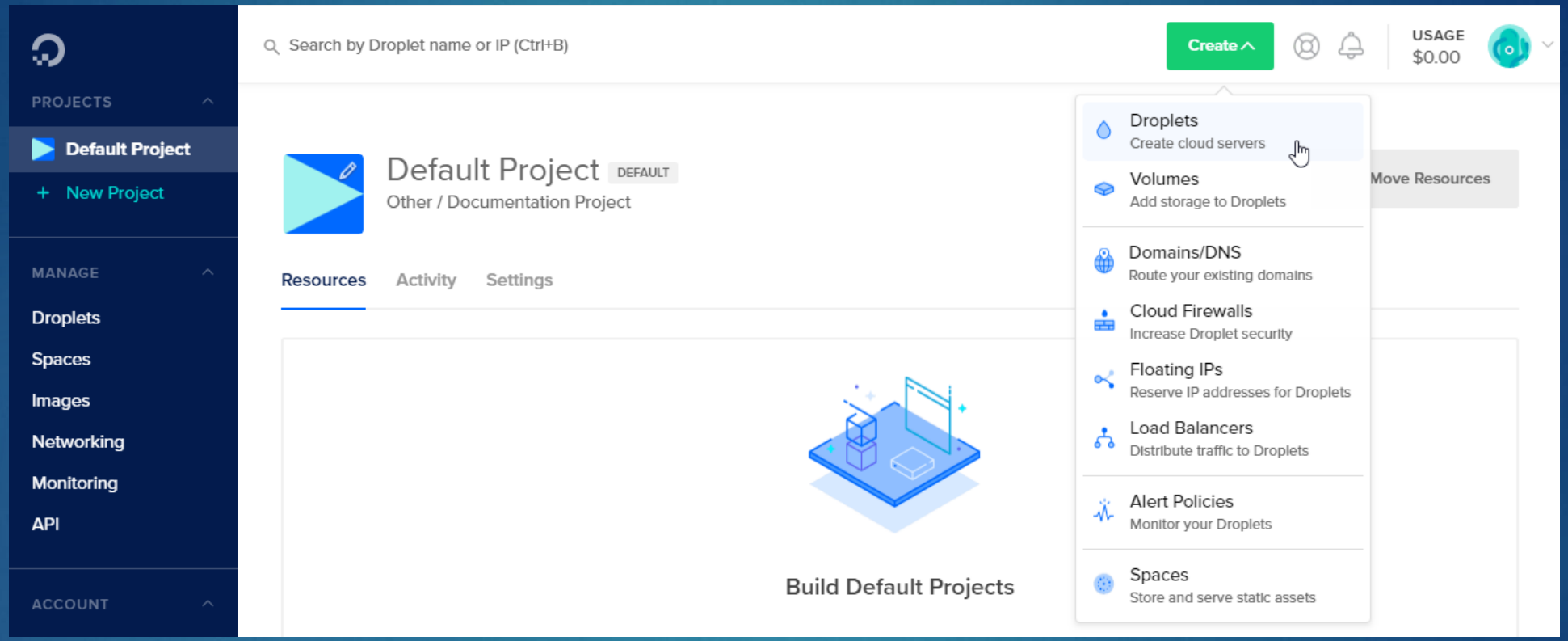
The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications **created using programming languages, libraries, services, and tools supported by the provider**. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has **control over the deployed applications and possibly configuration settings for the application-hosting environment**.

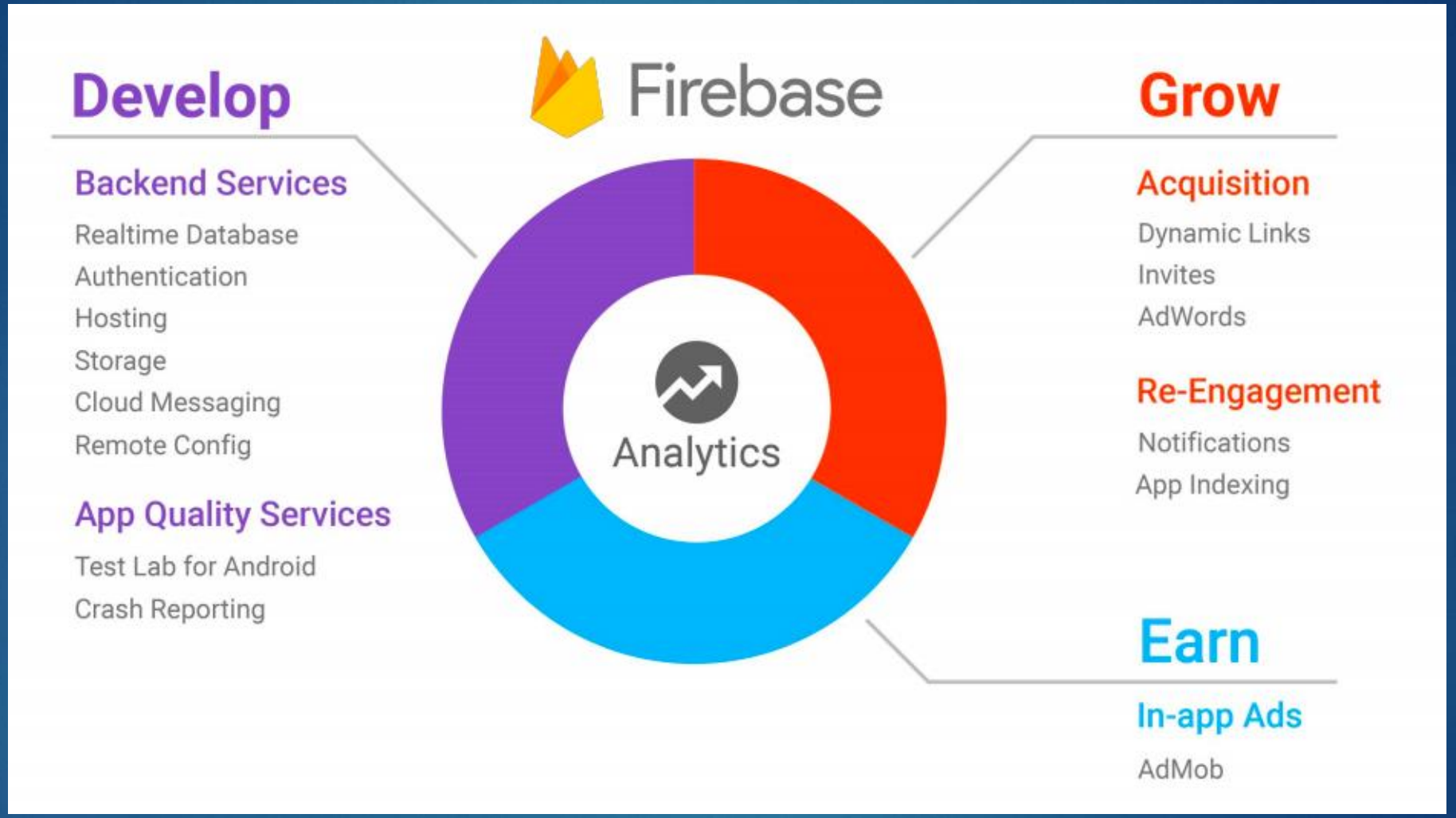
SaSS: NIST's definition

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The **applications are accessible from various client devices** through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The **consumer does not manage or control the underlying cloud infrastructure** including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

Case Study: Digital Ocean Droplet

1. From the Create menu in the top right of the control panel, click Droplets.
2. Choose an image, which can be a Linux distribution, container distribution, one-click app, snapshot, or backup.
3. Choose a size for your Droplet, which determines its RAM, disk space, and vCPUs as well as its price. You can choose to double the SSD on a plan as well.
4. Choose a datacenter region.
5. Choose an SSH key, if you've added one. If you choose not to use SSH keys, your Droplet's password will be emailed to you after creation.
6. Enter a name and click Create.


Search by Droplet name or IP (Ctrl+B)
Create
USAGE
$0.00
PROJECTS
Default Project
New Project
MANAGE
Droplets
Spaces
Images
Networking
Monitoring
API
ACCOUNT
Default Project
DEFAULT
Other / Documentation Project
Move Resources
Resources
Activity
Settings
Build Default Projects
Droplets
Create cloud servers
Volumes
Add storage to Droplets
Domains/DNS
Route your existing domains
Cloud Firewalls
Increase Droplet security
Floating IPs
Reserve IP addresses for Droplets
Load Balancers
Distribute traffic to Droplets
Alert Policies
Monitor your Droplets
Spaces
Store and serve static assets


Develop
Backend Services
Realtime Database
Authentication
Hosting
Storage
Cloud Messaging
Remote Config
App Quality Services
Test Lab for Android
Crash Reporting
Firebase
Analytics
Grow
Acquisition
Dynamic Links
Invites
AdWords
Re-Engagement
Notifications
App Indexing
Earn
In-app Ads
AdMob

Analytics

- Determine the effectiveness of notifications and update your re-engagement strategy.
- Discover what in-app activities trigger in-app purchases and surface these appropriately; improve your user's experience to increase engagement and monetization.
- Remote Config can target custom app experiences at members of different
- Analytics will provide campaign attribution reporting for AdWords, App Indexing, App Invites, Dynamic Links, and Notifications.

Authentication

- Authentication & account management

- Supports:
  - Email & password
  - Social providers
  - Existing auth systems

Hosting

- Serve static assets (images too)

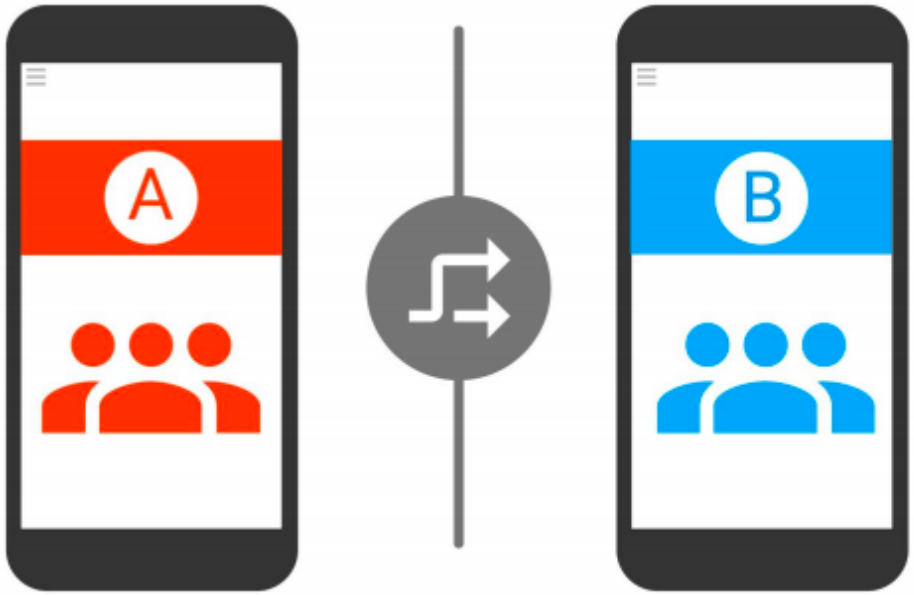
- SSL by default
- **New**: free custom domains

Storage

- Easy file storage
- Handles poor connectivity
- Backed by & accessible from Google Cloud Storage

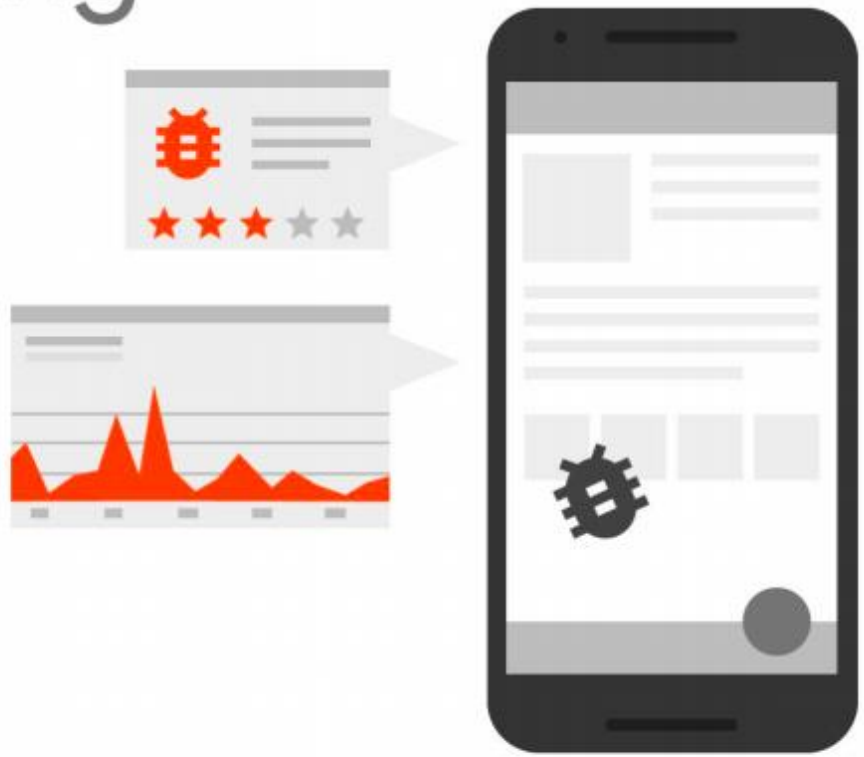
Remote Config

- Run A/B experiments or change app behavior
- Control custom key-value pairs from the Console
- Changes propagate instantly



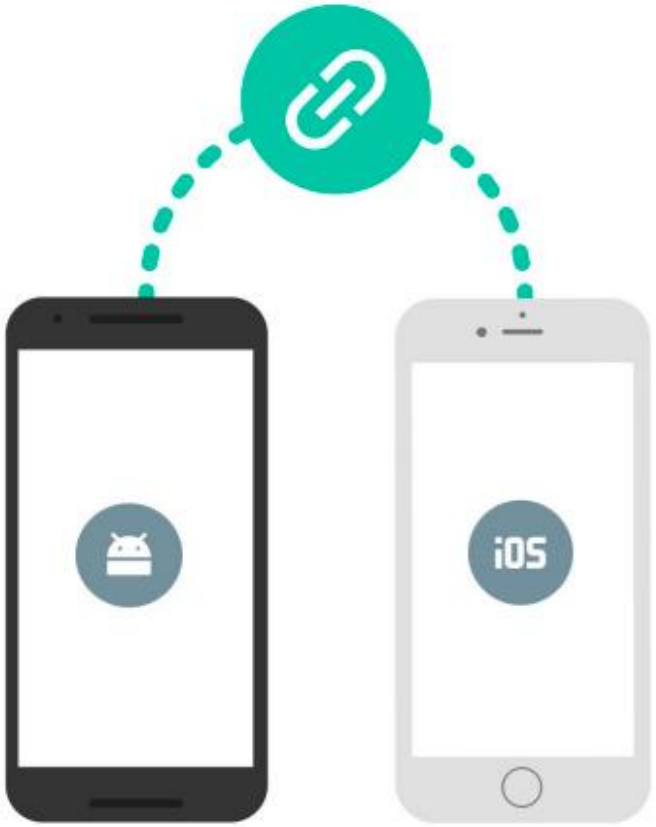
Crash Reporting

- See crashes & impact
- Version & OS drill-down
- Integrated with Analytics



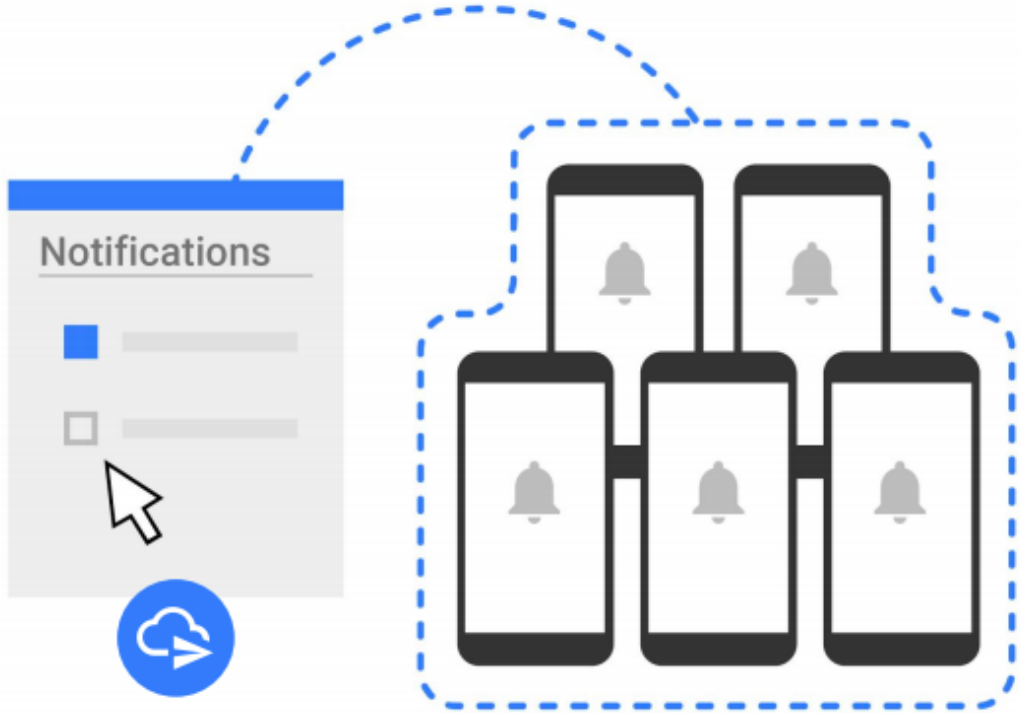
Dynamic Links

- Customize different user experiences via a single URL
- Works across platforms
- Preserves URL state, even through app install flow
- Analytics insights



Notifications

- Simple UI, with no coding
- Built on Cloud Messaging
- Audience targeting
- Conversion funnel insights



Case Study

React and Firebase Realtime Database

https://medium.com/equinox-blog/%E0%B8%A5%E0%B8%AD%E0%B8%87%E0%B9%83%E0%B8%8A%E0%B9%89-react-firebase-realtime-database-%E0%B8%81%E0%B8%B1%E0%B8%99%E0%B9%80%E0%B8%96%E0%B8%AD%E0%B8%B0-30b134b905a8

Case Study

Deploy React App to Firebase Hosting

https://medium.com/@julienrioux/deploy-react-js-app-on-firebase-c7fa6ddc153f

Cloud Function

Cloud Functions gives developers access to **Firebase and Google Cloud events**, along with scalable computing power to run code in response to those events.

Typical use cases might fall into these areas:

- Notify users when something interesting happens.
- Perform Realtime Database sanitization and maintenance.
- Execute intensive tasks in the cloud instead of in your app.
- Integrate with third-party services and APIs.

No Backend

- Backendless
- deployd
- Firebase
- Hoodie
- Kinvey
- remoteStorage
- Sockethub
- Stamplay

List from nobackend.org/solutions