Deployment Instructions

System Requirements

- Ubuntu Server 20.04 LTS or newer
- Minimum 4GB RAM
- 20GB available disk space

The deployment instructions provided in this document have been tested and verified on Ubuntu Server 20.04 LTS. However, please note:

- Other Ubuntu versions (18.04+) should work with minimal or no modifications
- Other Linux distributions (Debian, CentOS, etc.) should also work but may require:
  - Different package manager commands (apt → yum/dnf)
  - Slightly different Docker installation steps
  - Modified firewall configurations
  - Different service management commands

These instructions are written for deployment via direct terminal access to a Linux server. The steps assume you have root/sudo access to the server and will be managing the Docker containers directly.

While these instructions focus on direct server deployment, the Docker configuration provided should also be compatible with most cloud platforms that support Docker container management. The actual deployment steps would differ based on your chosen cloud platform's interfaces and tools, but the core Docker and application configuration would remain largely the same.

Prerequisites

1. Firewall Configuration

Ensure the following ports are open in your server firewall:

- Port 80 (HTTP): Required for web traffic
- Port 443 (HTTPS): Required if using SSL
- Port 22 (SSH): Required for server access

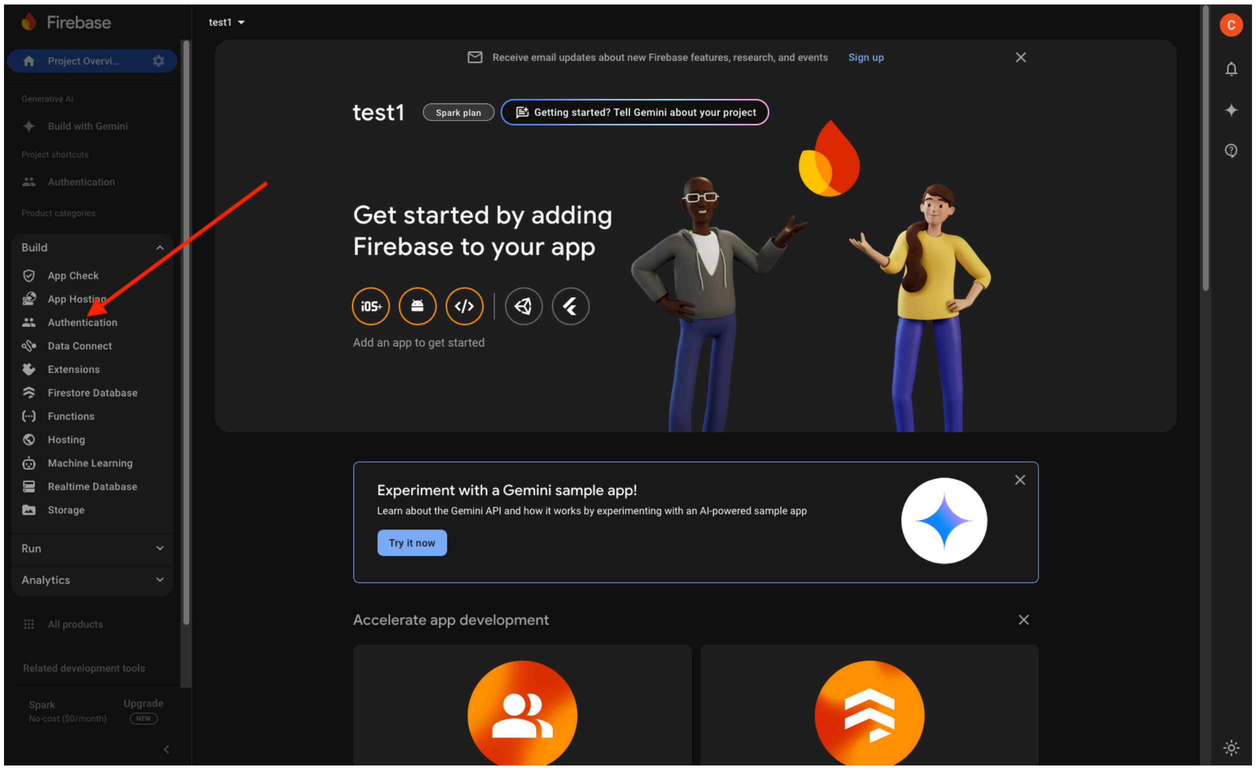
2. Firebase Authentication Setup

Step 1: Create Firebase Project

- Visit Firebase Console (https://console.firebase.google.com)
- Click "Create a project" or select existing project
- Follow the setup wizard to create your project

Step 2: Enable Authentication

- In Firebase Console, click "Authentication"



Receive email updates about new Firebase features, research, and events

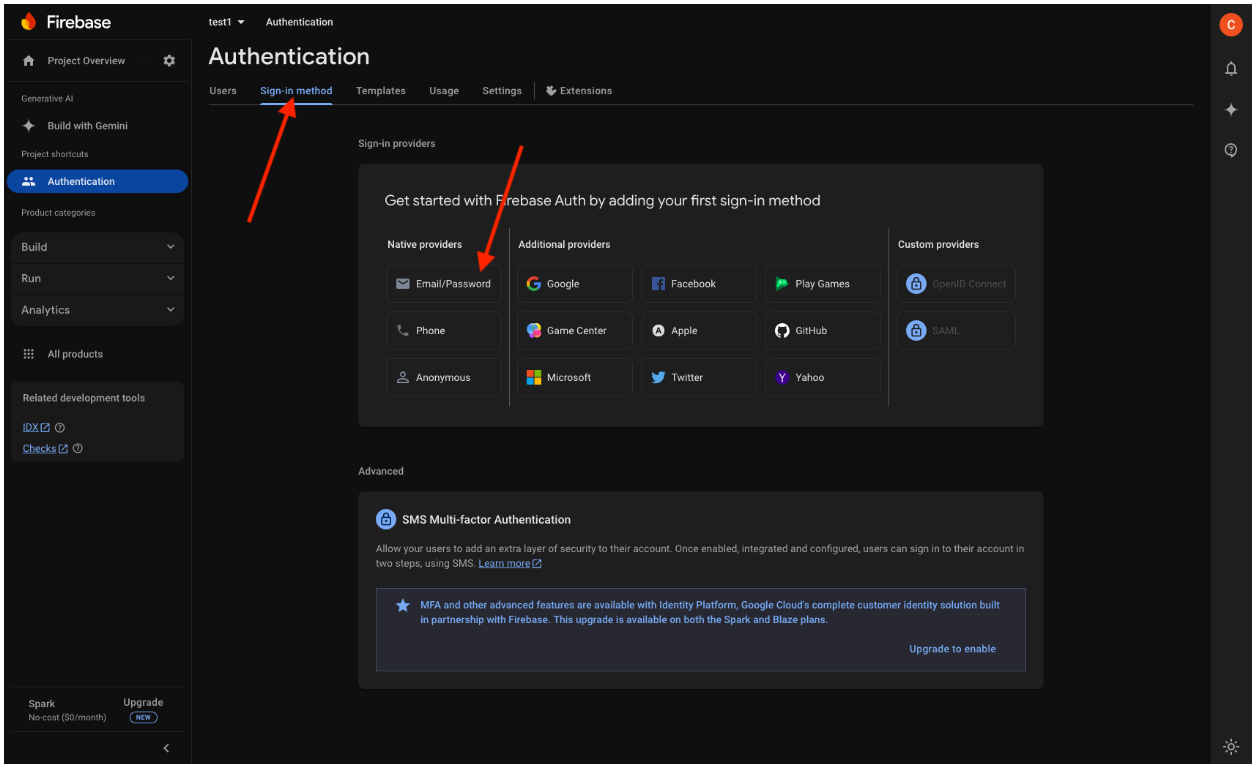
Get started by adding Firebase to your app

Add an app to get started

Experiment with a Gemini sample app!

Learn about the Gemini API and how it works by experimenting with an AI-powered sample app

- Click "Get Started"
- Enable Email/Password authentication:
  - Click "Sign-in method"
  - Click "Email/Password"
  - Toggle "Enable"
  - Save



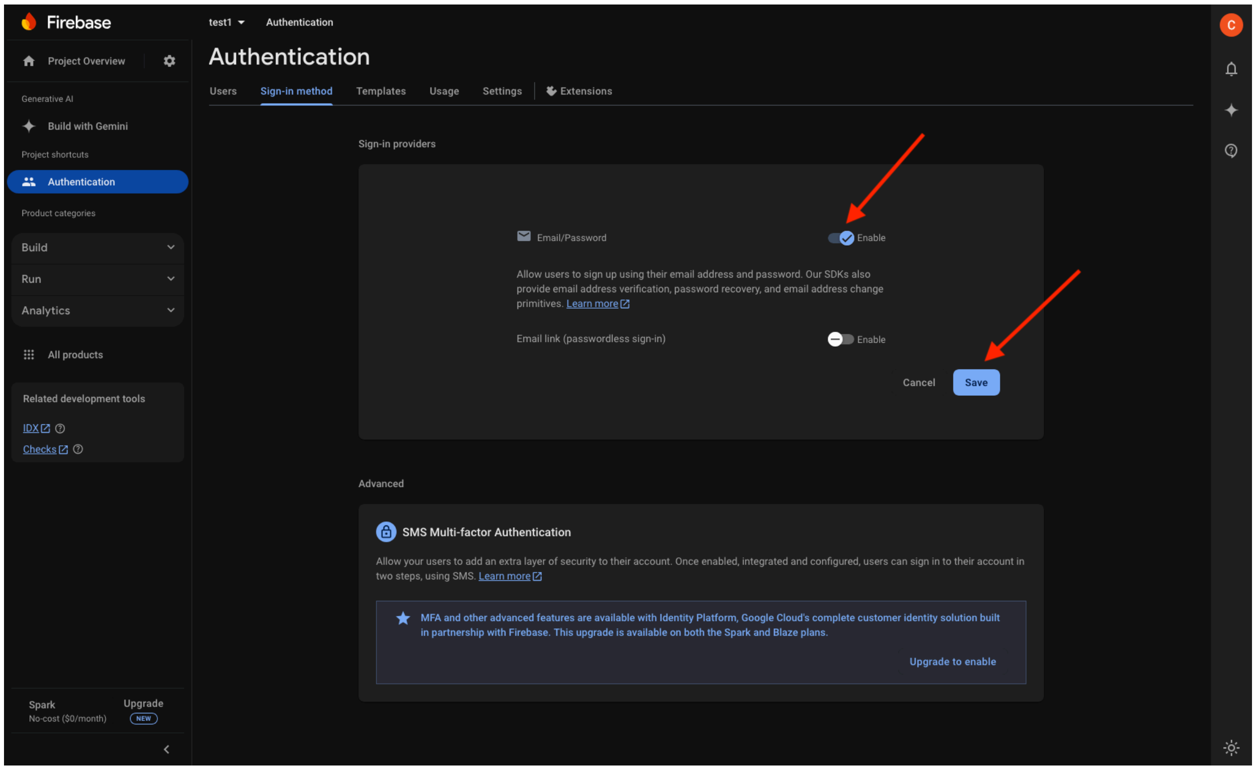
Authentication

Get started with Firebase Auth by adding your first sign-in method

SMS Multi-factor Authentication

Allow your users to add an extra layer of security to their account. Once enabled, integrated and configured, users can sign in to their account in two steps, using SMS. Learn more

MFA and other advanced features are available with Identity Platform, Google Cloud's complete customer identity solution built in partnership with Firebase. This upgrade is available on both the Spark and Blaze plans.



Authentication

Email/Password [✓ Enable]

Allow users to sign up using their email address and password. Our SDKs also provide email address verification, password recovery, and email address change primitives. Learn more

Email link (passwordless sign-in) Enable

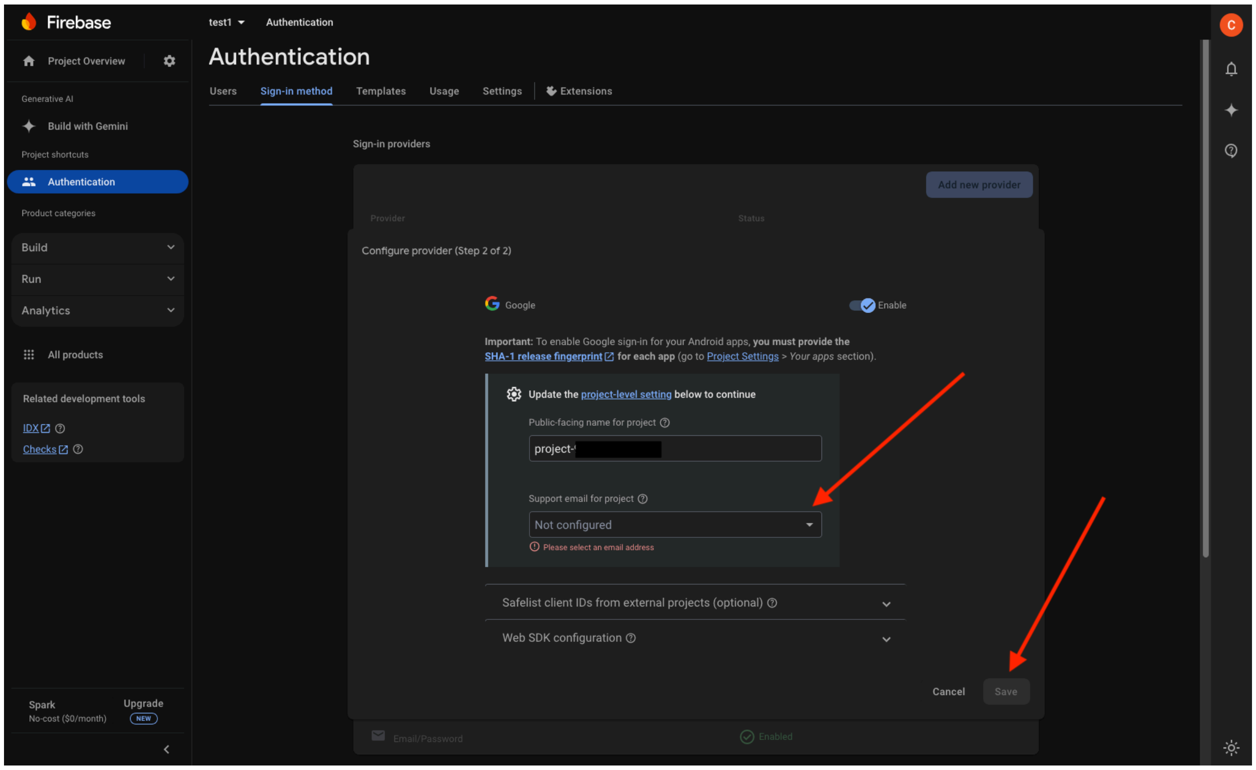
SMS Multi-factor Authentication

Allow your users to add an extra layer of security to their account. Once enabled, integrated and configured, users can sign in to their account in two steps, using SMS. Learn more

MFA and other advanced features are available with Identity Platform, Google Cloud's complete customer identity solution built in partnership with Firebase. This upgrade is available on both the Spark and Blaze plans.

- Enable Google authentication:
  - Click "Sign-in method"
  - Click “Add new provider”
  - Click "Google"

- Select support email
- Save
- Click “Settings” > “Authorized Domains” > “Add domain” and add your domain



Authentication

Sign-in providers

Configure provider (Step 2 of 2)

Google

Important: To enable Google sign-in for your Android apps, **you must provide the SHA-1 release fingerprint for each app** (go to Project Settings > *Your apps* section).

Update the project-level setting below to continue

Public-facing name for project

project-[redacted]

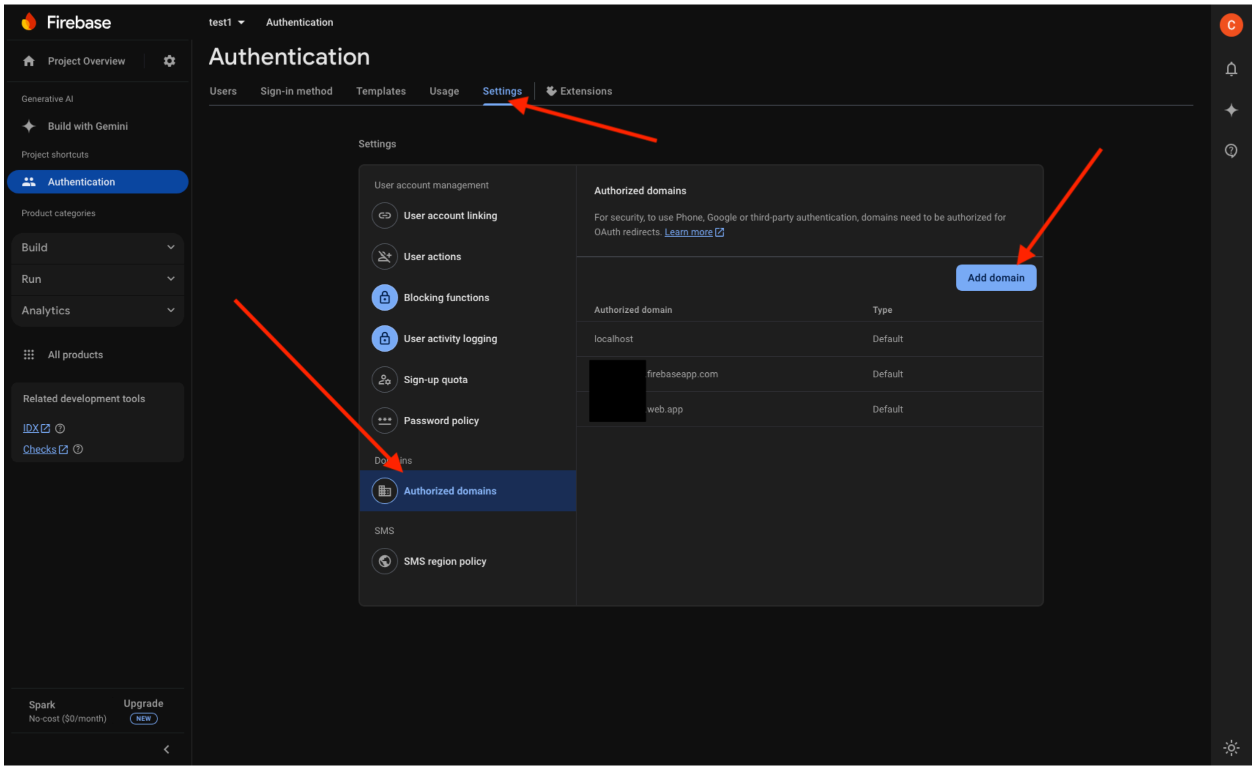
Support email for project

Not configured

Please select an email address

Safelist client IDs from external projects (optional)

Web SDK configuration



Authentication

Settings

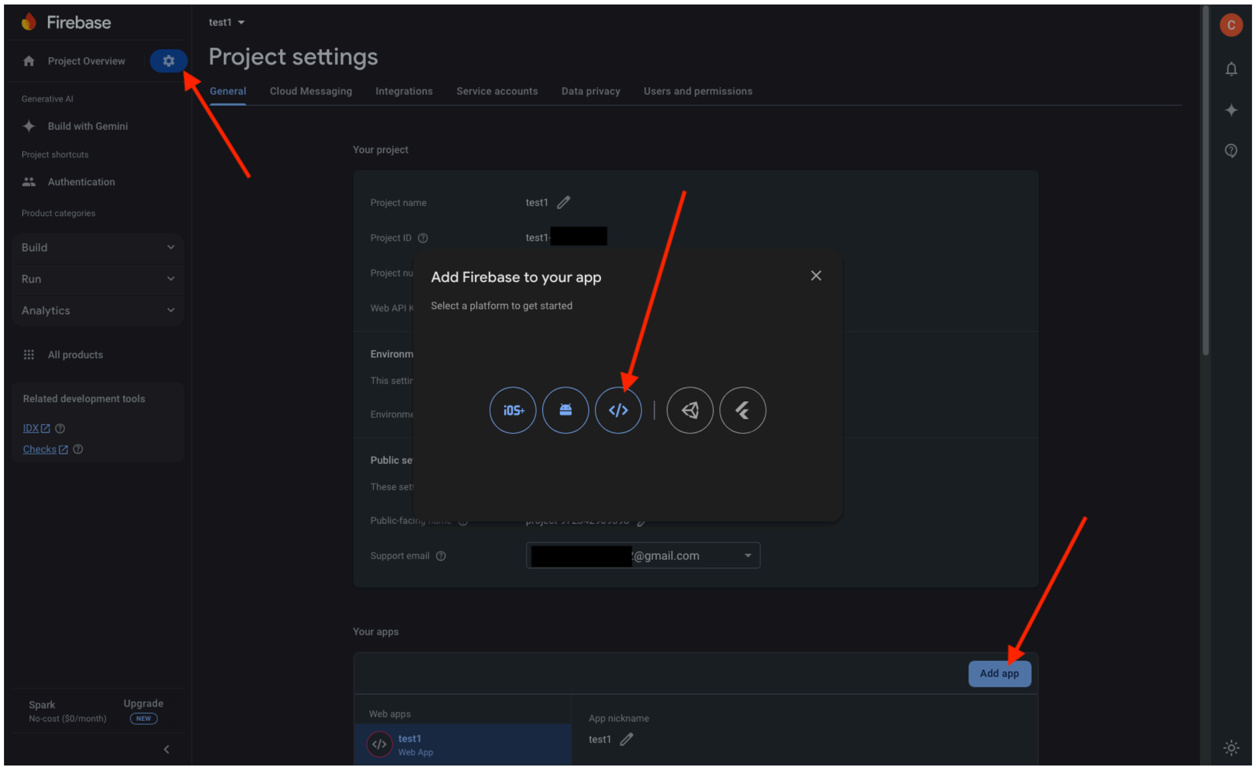
Authorized domains

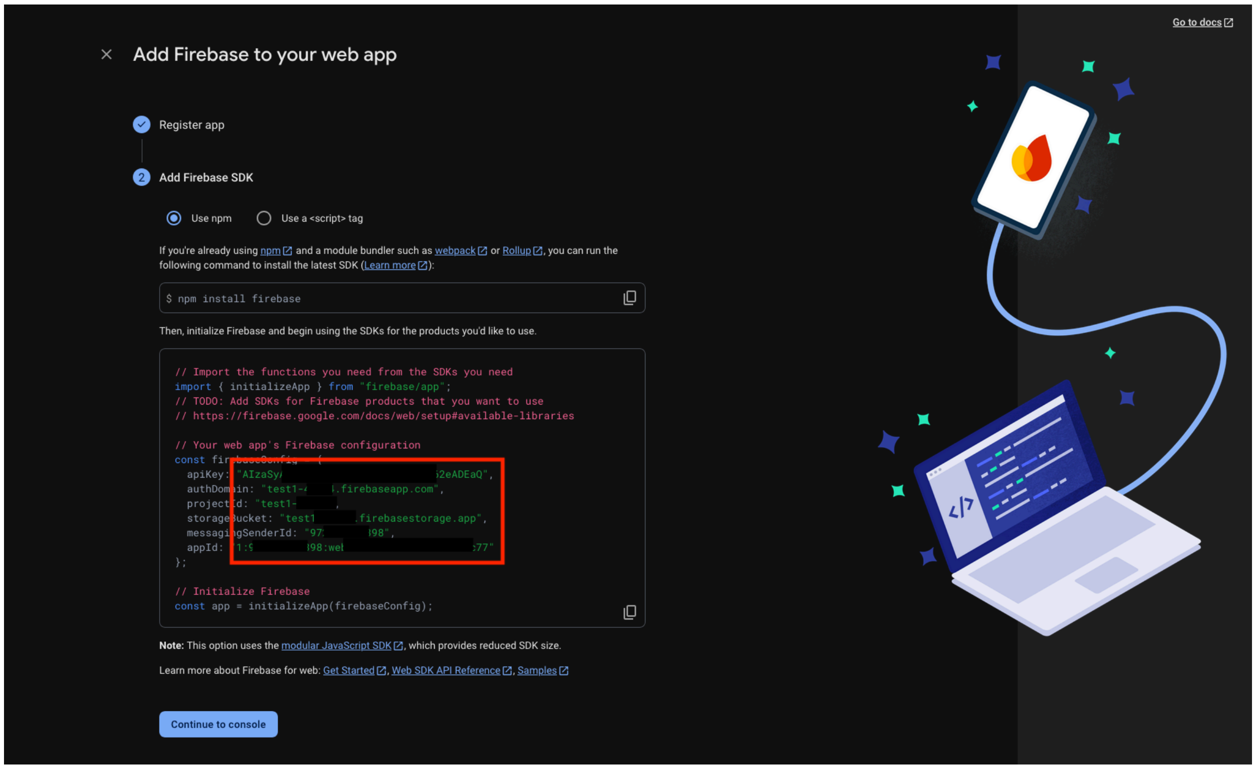
For security, to use Phone, Google or third-party authentication, domains need to be authorized for OAuth redirects. Learn more

Authorized domain	Type
localhost	Default
[redacted]firebaseapp.com	Default
web.app	Default

Step 3: Create Web App

- Click gear icon ⚙️ (Project Settings)
- Under "Your apps", click web icon (</>)
- Register app with a nickname
- Copy the provided firebaseConfig variables for the frontend environment file (described in section Configure environment variables)





If you're already using npm and a module bundler such as webpack or Rollup, you can run the following command to install the latest SDK (Learn more):

```
$ npm install firebase
```

Then, initialize Firebase and begin using the SDKs for the products you'd like to use.

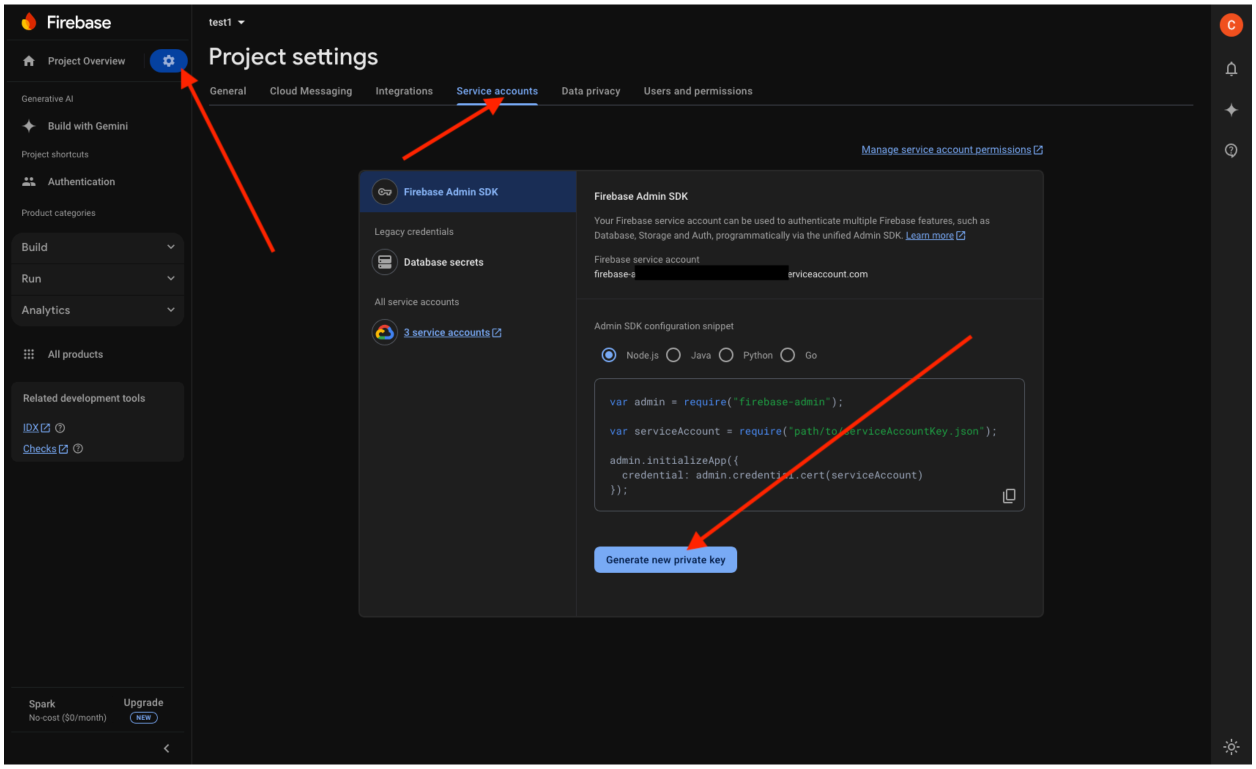
```
// Import the functions you need from the SDKs you need
import { initializeApp } from "firebase/app";
// TODO: Add SDKs for Firebase products that you want to use
// https://firebase.google.com/docs/web/setup#available-libraries

// Your web app's Firebase configuration
const firebaseConfig = {
  apiKey: "AIzaSy[redacted]2eADEaQ",
  authDomain: "test1-[redacted].firebaseapp.com",
  projectId: "test1-[redacted],
  storageBucket: "test1[redacted].firebasestorage.app",
  messagingSenderId: "97[redacted]98",
  appId: "1:9[redacted]98:web[redacted]77"
};

// Initialize Firebase
const app = initializeApp(firebaseConfig);
```

Note: This option uses the modular JavaScript SDK, which provides reduced SDK size.

Learn more about Firebase for web: Get Started, Web SDK API Reference, Samples

Step 4: Get Admin SDK Credentials

- In Project Settings, go to "Service accounts"
- Click "Generate new private key"
- Save the JSON file securely
- This file will be used for Firebase credentials JSON file used on your server `yourapplication/backend/firebase-credentials.json` (described in section Configure environment variables)



Project settings

Firebase Admin SDK

Your Firebase service account can be used to authenticate multiple Firebase features, such as Database, Storage and Auth, programmatically via the unified Admin SDK. Learn more

Firebase service account
firebase-a[redacted]erviceaccount.com

Admin SDK configuration snippet

[✓ Node.js] Java Python Go

```
var admin = require("firebase-admin");

var serviceAccount = require("path/to/serviceAccountKey.json");

admin.initializeApp({
  credential: admin.credential.cert(serviceAccount)
});
```

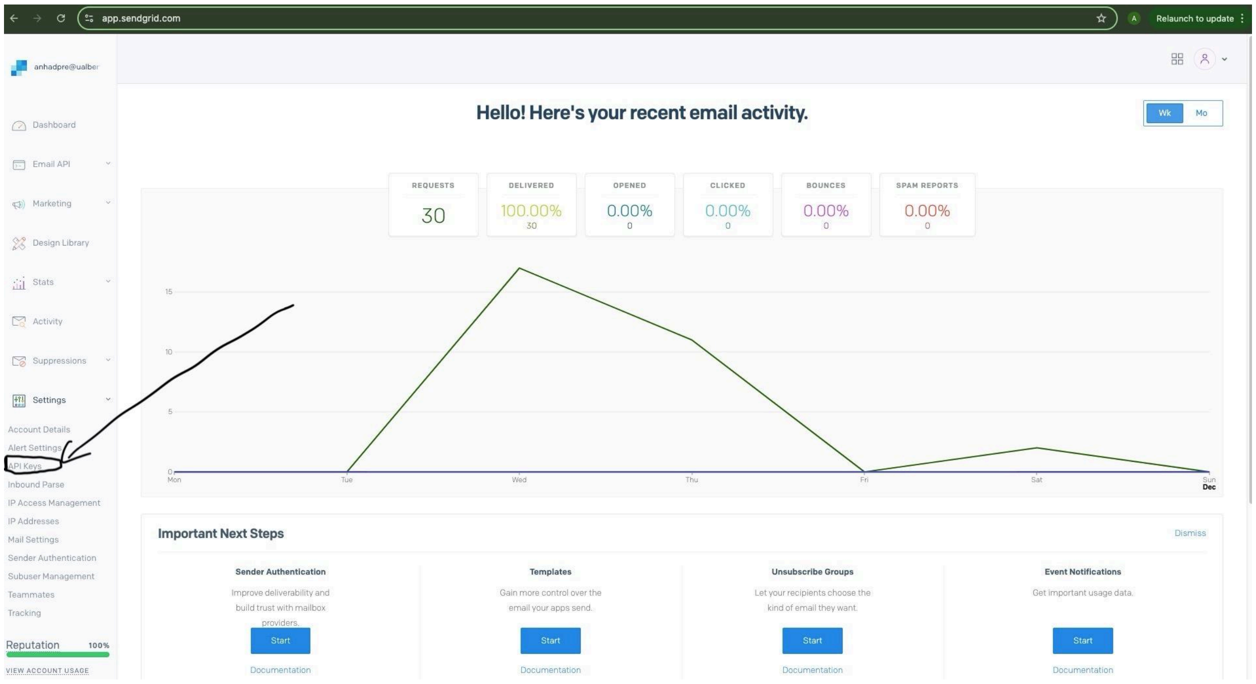
3. SendGrid Setup

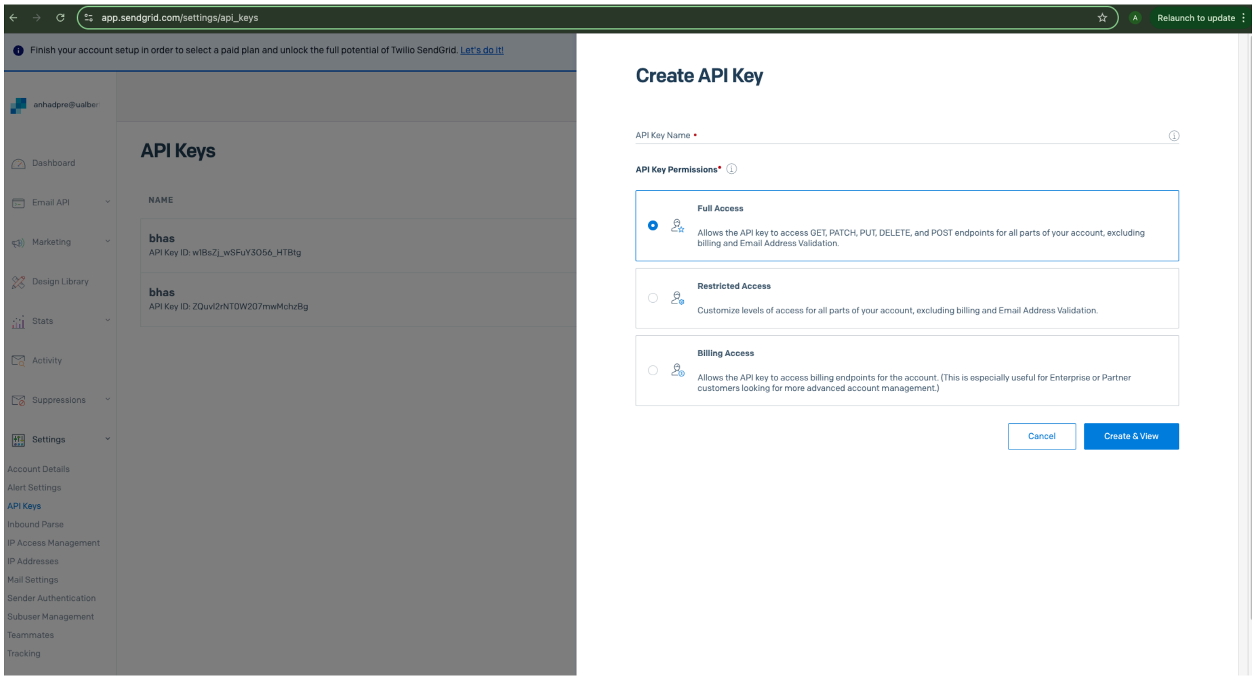
Step 1: Create a SendGrid Account

1. Go to the [SendGrid website]() and sign up for an account.
2. Verify your email address and complete the required account setup.

Step 2: Generate an API Key

1. Log in to your SendGrid dashboard.
2. Navigate to the **API Keys** section:
   - Go to **Settings** > **API Keys**.
3. Click on **Create API Key**.
4. Enter a name for the API key (e.g., `MyApp-SendGrid-API`).
5. Assign **Full Access** or **Restricted Access** permissions based on your requirements.
6. Click **Create & View** to generate the key.
7. Copy the API key and save it securely. You won't be able to view it again.




app.sendgrid.com/settings/api_keys
Relaunch to update
Finish your account setup in order to select a paid plan and unlock the full potential of Twilio SendGrid. Let's do it!
API Keys
NAME
bhas
API Key ID: wIBsZj_wSFuY3O56_HTBtg
bhas
API Key ID: ZQuvl2rNT0W207mwMchzBg
Create API Key
API Key Name *
API Key Permissions*
Full Access
Allows the API key to access GET, PATCH, PUT, DELETE, and POST endpoints for all parts of your account, excluding billing and Email Address Validation.
Restricted Access
Customize levels of access for all parts of your account, excluding billing and Email Address Validation.
Billing Access
Allows the API key to access billing endpoints for the account. (This is especially useful for Enterprise or Partner customers looking for more advanced account management.)
Cancel
Create & View

Step 3: Add SendGrid to Your Project

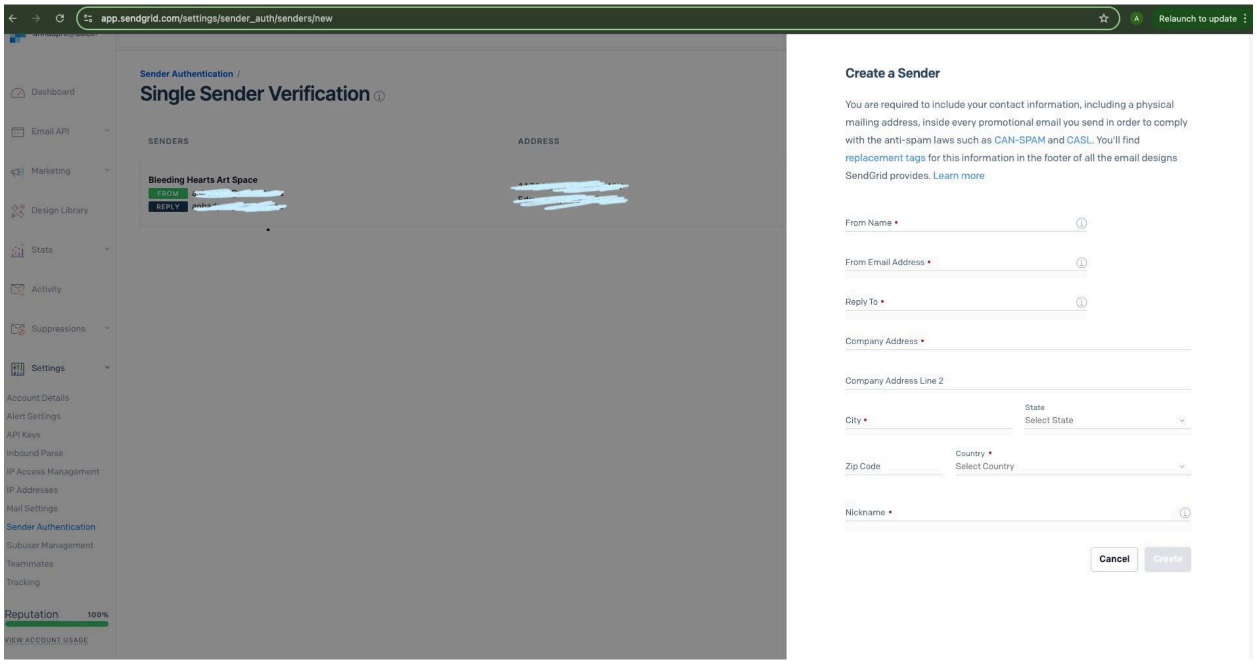
1. Install the SendGrid library for your application:
   - For Node.js: Run the command:
     npm install @sendgrid/mail

2. Set up the SendGrid API key in your environment variables (described in section [Configure environment variables](#)):

- Add the following to your `.env` file in backend:
  i. SENDGRID_API_KEY=<your-sendgrid-api-key>
  ii. SENDGRID_FROM_EMAIL=<your-verified-sender-email>
- Replace `<your-sendgrid-api-key>` with your API key.
- Replace `<your-verified-sender-email>` with the email address you'll use as the sender (this email must be verified in SendGrid).

Step 4: Verify Your Sender Identity

1. In the SendGrid dashboard, navigate to **Settings** > **Sender Authentication**.
2. Set up either:
   - **Single Sender Verification**:
     - Add your email address (e.g., `example@domain.com`) and verify it.



app.sendgrid.com/settings/sender_auth/senders/new

Sender Authentication /

Single Sender Verification

SENDERS	ADDRESS
Bleeding Hearts Art Space FROM [redacted] REPLY [redacted]	[redacted]

Create a Sender

You are required to include your contact information, including a physical mailing address, inside every promotional email you send in order to comply with the anti-spam laws such as CAN-SPAM and CASL. You'll find replacement tags for this information in the footer of all the email designs SendGrid provides. Learn more

From Name •

From Email Address •

Reply To •

Company Address •

Company Address Line 2

City •

State: Select State

Zip Code

Country •: Select Country

Nickname •

Initial Server Setup

1. Update the system packages:

```
sudo apt update
sudo apt upgrade -y
```

2. Install Docker

1. Set up Docker's `apt` repository.

```
# Add Docker's official GPG key:
sudo apt-get update
sudo apt-get install ca-certificates curl
sudo install -m 0755 -d /etc/apt/keyrings
sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg -o
/etc/apt/keyrings/docker.asc
sudo chmod a+r /etc/apt/keyrings/docker.asc

# Add the repository to Apt sources:
echo \
  "deb [arch=$(dpkg --print-architecture)
signed-by=/etc/apt/keyrings/docker.asc]
https://download.docker.com/linux/ubuntu \
  $(. /etc/os-release && echo "$VERSION_CODENAME") stable" | \
  sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
sudo apt-get update
```

2. Install the Docker packages.

```
sudo apt-get install docker-ce docker-ce-cli containerd.io
docker-buildx-plugin docker-compose-plugin
```

3. Verify that the installation is successful by running the `hello-world` image:

```
sudo docker run hello-world
```

This command downloads a test image and runs it in a container. When the container runs, it prints a confirmation message and exits.

For more info: https://docs.docker.com/engine/install/ubuntu/

Application Deployment

1. Transfer application files to server:

This step is done on your local machine:

From Linux/macOS

```
# From your local terminal
scp your-application.tar.gz user@your-server-ip:/home/user/
```

From Windows

```
# Using PowerShell/Command Prompt with OpenSSH
scp your-application.tar.gz user@your-server-ip:/home/user/

# OR if using PuTTY's pscp
pscp your-application.tar.gz user@your-server-ip:/home/user/

# Note: If using Windows Terminal or PowerShell, you might need to specify
the full path:
# C:\Users\YourUsername\path\to\your-application.tar.gz
```

2. On the server, extract the files:

```
# For .tar.gz
cd /home/user
tar -xzf your-application.tar.gz
cd your-application
```

3. Configure environment variables:

For both the frontend and backend applications, you'll need to set up environment variables using the provided example files as templates.

Frontend Configuration:

```
# Create production environment file from example
cp frontend/.env.example frontend/.env.production.local

# Edit the environment file with your production values
```

```
nano frontend/.env.production.local
```

Example:

```
# Backend site
VITE_API_URL=http://example.com/api

# Firebase Config
VITE_FB_API_KEY=aBcDeFg
VITE_FB_AUTH_DOMAIN=bleeding-heart-art-space.firebaseapp.com
VITE_FB_PROJECTID=bleeding-heart-art-space
VITE_FB_STORAGEBUCKET=bleeding-heart-art-space.appspot.com
VITE_FB_MESSAGINGSENDERID=123456789
VITE_FB_APPID=1:123456789:web:1a2b3c4d5e
```

- `VITE_API_URL`: must be `http://<domain or ip>/api`
- Copy each Firebase config variable from section Create Web App

Backend Configuration:

```
# Create production environment file from example
cp backend/.env.example backend/.env.production.local

# Edit the environment file with your production values
nano backend/.env.production.local
```

Example:

```
# port to run application on
PORT=80
# the lowest priority of logs that is displayed (usually `debug` for
development and `warn` in production)
# log levels - error: 0, warn: 1, info: 2, http: 3, verbose: 4, debug: 5,
silly: 6
LOG_LEVEL=warn
# database host name (usually `localhost` for development and `db` in
production)
DB_NAME=bhas
# postgres port (default 5432 for postgres)
DB_HOST=db
# postgres database name
DB_USER=admin
```

```
# postgres username
DB_PORT=5432
# postgres password for username
DB_PASSWORD=password
# path to firebase credentials json file
GOOGLE_APPLICATION_CREDENTIALS=./firebase-credentials.json
# sendgrid email api
SENDGRID_API_KEY=SG.aBcDeFgHiJkLmNoPqRsTuVwXyZ
SENDGRID_FROM_EMAIL=info@email.com
```

The variables that should be configured are:

- `DB_USER`: any username (or keep as `admin`).
- `DB_PASSWORD`: must be a secure password.
- `GOOGLE_APPLICATION_CREDENTIALS`: create a new Firebase credentials JSON file described in section Get Admin SDK Credentials and copy it to the server to the location `backend/firebase-credentials.json` of the application.
- `SENDGRID_API_KEY`: the api key obtained from section SendGrid Setup.
- `SENDGRID_FROM_EMAIL`: the email being used with SendGrid.

All other variables do not need modification.

4. Deploy with Docker Compose

From the application root directory, start docker:

```
sudo docker compose --env-file ./backend/.env.production.local up --build
-d
```

5. Enable SSL (Recommended)

1. Install NGINX and Certbot:

```
sudo apt update
sudo apt install nginx certbot python3-certbot-nginx
```

2. Create/edit NGINX configuration file:

```
sudo nano /etc/nginx/sites-available/your-domain.conf
```

3. Add basic NGINX configuration:

```
server {
    listen 80;
    server_name your-domain.com;

    location / {
        proxy_pass http://localhost:your_app_port;
        proxy_set_header Host $host;
        proxy_set_header X-Real-IP $remote_addr;
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto $scheme;
    }
}
```

4. Create symbolic link:

```
sudo ln -s /etc/nginx/sites-available/your-domain.conf
/etc/nginx/sites-enabled/
```

5. Test NGINX configuration:

```
sudo nginx -t
```

6. If test is successful, restart NGINX:

```
sudo systemctl restart nginx
```

7. Obtain SSL certificate:

```
sudo certbot --nginx -d your-domain.com
```

8. Certbot will automatically modify your NGINX configuration to include SSL settings. The final configuration should look something like:

```
server {
    listen 80;
    server_name your-domain.com;
    return 301 https://$server_name$request_uri;
}

server {
    listen 443 ssl;
    server_name your-domain.com;
    ssl_certificate /etc/letsencrypt/live/your-domain.com/fullchain.pem;
    ssl_certificate_key /etc/letsencrypt/live/your-domain.com/privkey.pem;

    location / {
        proxy_pass http://localhost:your_app_port;
        proxy_set_header Host $host;
        proxy_set_header X-Real-IP $remote_addr;
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto $scheme;
    }
}
```

Additional important steps:

9. Set up auto-renewal for SSL certificate:

```
sudo certbot renew --dry-run
```

For detailed NGINX configuration or alternative SSL solutions, refer to:

- NGINX documentation: https://nginx.org/en/docs/
- Let's Encrypt documentation: https://letsencrypt.org/docs/