

## PRODUCTION (GCP + Firebase)

### Firebase Hosting (Global CDN)

<https://ai-pictionary-4f8f2.web.app>

CDN

- React SPA (80.29 KB gzipped)
- Cache: 1 year for static assets

HTTPS

### Google Cloud Run (europe-west1)

[https://ai-pictionary-backend-\\*.run.app](https://ai-pictionary-backend-*.run.app)

Docker

- FastAPI in Docker (Python 3.11-slim)
- TensorFlow 2.16.2 + Model (500MB image)
- Resources: 1GB RAM, 1 CPU
- Scaling: 0-10 instances (scale-to-zero)
- Cold start: 2-5s, Warm: <100ms

### Firebase Services

#### Auth

Google OAuth  
Email/Password  
JWT Tokens  
User Sessions

#### Firestore

NoSQL DB  
Real-time Sync  
Games/Scores  
Corrections

#### Storage

Object Storage  
ML Models  
Drawings  
Assets