AdOptimize - Google Ads API Design Documentation

1. Application Overview

Application Name: AdOptimize (廣告船長) **Company:** 1Way SEO **Website:** https://adoptimize.1wayseo.com **Contact Email:** acejou27@gmail.com

1.1 Purpose

AdOptimize is a **production SaaS advertising analytics platform** designed for the Taiwan market. It helps advertisers monitor and analyze their Google Ads campaign performance through a unified dashboard that aggregates data across multiple advertising platforms (Google Ads, Meta Ads, TikTok Ads, LinkedIn Ads).

The tool is **read-only** — it retrieves campaign and performance data for display and analysis. It does **not** modify campaigns, budgets, or bids.

1.2 Target Users
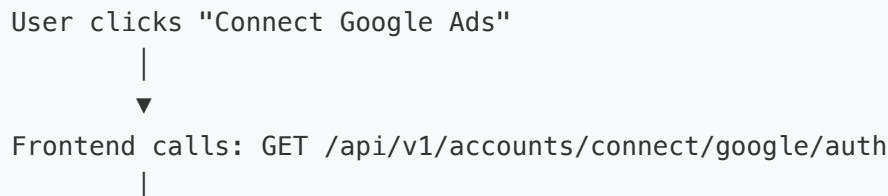
- Small to medium-sized businesses running Google Ads in Taiwan
- Digital marketing agencies managing multiple client accounts
- E-commerce businesses monitoring their advertising ROI
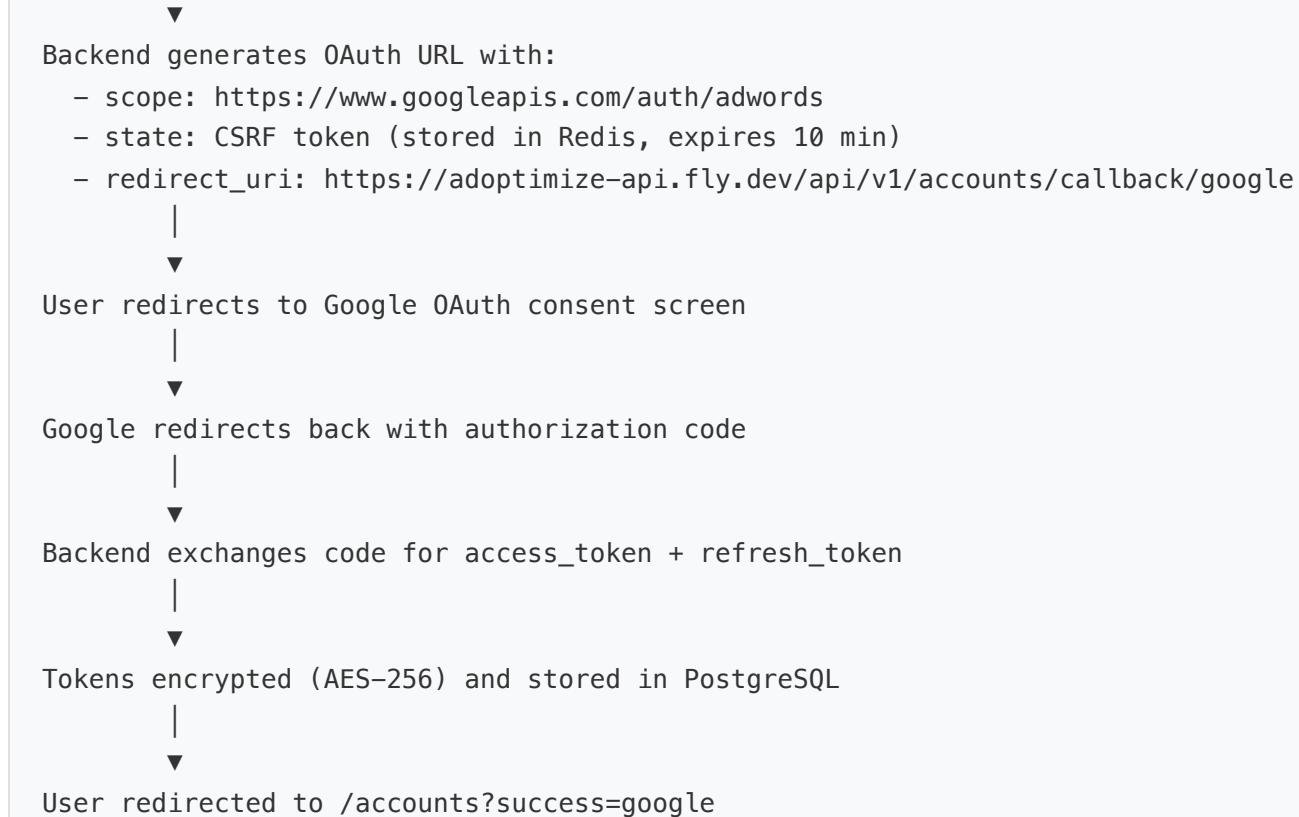
1.3 Current Status

- **Production URL:** https://adoptimize.1wayseo.com
- **Backend API:** https://adoptimize-api.fly.dev
- **User Authentication:** Google OAuth + email/password
- **Connected Platforms:** Google Ads, Meta Ads, TikTok Ads, LinkedIn Ads

2. Google Ads API Usage

2.1 Authentication Flow (OAuth 2.0)

```
User clicks "Connect Google Ads"
        |
        ▼
Frontend calls: GET /api/v1/accounts/connect/google/auth
        |
```

```
        ▼
Backend generates OAuth URL with:
  - scope: https://www.googleapis.com/auth/adwords
  - state: CSRF token (stored in Redis, expires 10 min)
  - redirect_uri: https://adoptimize-api.fly.dev/api/v1/accounts/callback/google
        |
        ▼
User redirects to Google OAuth consent screen
        |
        ▼
Google redirects back with authorization code
        |
        ▼
Backend exchanges code for access_token + refresh_token
        |
        ▼
Tokens encrypted (AES-256) and stored in PostgreSQL
        |
        ▼
User redirected to /accounts?success=google
```

OAuth Scopes: - `https://www.googleapis.com/auth/adwords` — Read access to Google Ads data

2.2 API Operations (Read-Only)

Our application performs **read-only** operations. We do not create, update, or delete any resources in the user's Google Ads account.

Operation	GAQL Query	Purpose	Frequency
List Customers	`CustomerService.ListAccessibleCustomers()`	Discover connected accounts	On connection
Get Campaigns	See Section 2.3	Retrieve campaign list and status	Every 15 min
Get Ad Groups	See Section 2.3	Retrieve ad group data	Every 15 min
Get Ads	See Section 2.3	Retrieve individual ad data	Every 15 min
Get Metrics	See Section 2.3	Retrieve performance	Every 15 min

Operation	GAQL Query	Purpose	Frequency
		metrics (7-day window)	

2.3 GAQL Queries Used

Campaign Data:

```
SELECT
    campaign.id,
    campaign.name,
    campaign.status,
    campaign.advertising_channel_type,
    campaign_budget.amount_micros
FROM campaign
WHERE campaign.status != 'REMOVED'
```

Ad Group Data:

```
SELECT
    ad_group.id,
    ad_group.name,
    ad_group.status,
    ad_group.campaign,
    ad_group.cpc_bid_micros
FROM ad_group
WHERE ad_group.status != 'REMOVED'
```

Ad Data:

```
SELECT
    ad_group_ad.ad.id,
    ad_group_ad.ad.name,
    ad_group_ad.status,
    ad_group_ad.ad_group
FROM ad_group_ad
WHERE ad_group_ad.status != 'REMOVED'
```

Performance Metrics (Last 7 Days):

```
SELECT
    campaign.id,
```
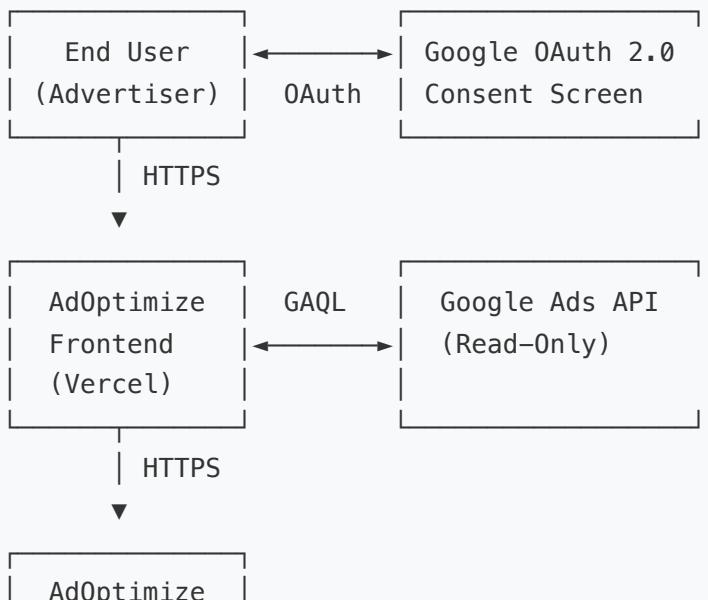
```
    campaign.name,
    metrics.impressions,
    metrics.clicks,
    metrics.cost_micros,
    metrics.conversions,
    metrics.ctr,
    metrics.average_cpc
  FROM campaign
WHERE segments.date DURING LAST_7_DAYS
    AND campaign.status != 'REMOVED'
```
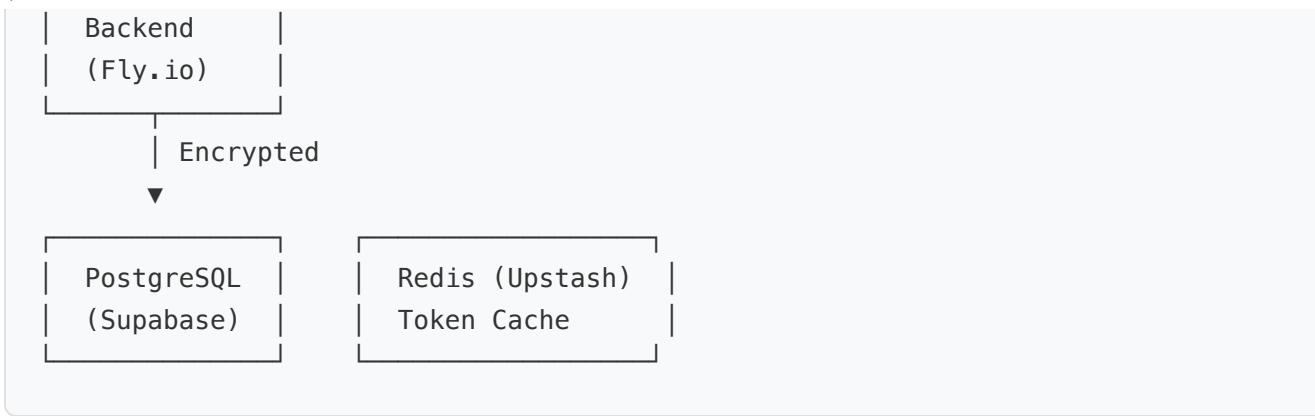
2.4 API Call Volume

Metric	Value
Sync interval	Every 15 minutes
Calls per sync per account	4 (campaigns, ad groups, ads, metrics)
Syncs per day per account	96
Calls per day per account	384
Expected accounts (Year 1)	10-50
Max daily calls (Year 1)	~19,200

3. Data Flow Architecture

```
  ┌──────────────┐                ┌──────────────┐
  │  End User    │◄──────────────►│ Google OAuth 2.0 │
  │ (Advertiser) │    OAuth       │ Consent Screen │
  └──────────────┘                └──────────────┘
         │  HTTPS
         ▼
  ┌──────────────┐    GAQL       ┌──────────────┐
  │  AdOptimize  │               │ Google Ads API │
  │   Frontend   │◄─────────────►│  (Read-Only)  │
  │   (Vercel)   │               │              │
  └──────────────┘               └──────────────┘
         │  HTTPS
         ▼
  ┌──────────────┐
  │  AdOptimize  │
```

```
│   Backend    │
│   (Fly.io)   │
└──────┬───────┘
       │ Encrypted
       ▼
┌──────────────┐      ┌──────────────────┐
│  PostgreSQL  │      │  Redis (Upstash) │
│  (Supabase)  │      │  Token Cache     │
└──────────────┘      └──────────────────┘
```

3.1 Data Storage

We store the following data from Google Ads:

Data	Storage	Retention
Campaign metadata	PostgreSQL	Until user disconnects
Ad group metadata	PostgreSQL	Until user disconnects
Ad metadata	PostgreSQL	Until user disconnects
Performance metrics	PostgreSQL	90 days rolling
OAuth tokens	PostgreSQL (AES-256 encrypted)	Until user disconnects
CSRF state	Redis	10 minutes

4. Security Measures

4.1 Token Security

- Access tokens and refresh tokens encrypted at rest with AES-256
- Tokens stored in PostgreSQL, never exposed to frontend
- Automatic token refresh before expiration
- CSRF protection via Redis-backed state parameter

4.2 Access Control

- JWT-based user authentication
- Each user can only access their own connected accounts
- All API calls authenticated with user's JWT token
- Backend validates user ownership before returning data

4.3 Data Privacy

- Only aggregated performance metrics are stored
- Personal or PII data is not retained
- Users can disconnect accounts and delete all data at any time
- Compliant with Taiwan PDPA (Personal Data Protection Act)

4.4 Infrastructure Security

- HTTPS everywhere (TLS 1.3)
- Backend hosted on Fly.io with isolated containers
- Database on Supabase with connection pooling (pgBouncer)
- Environment variables managed via Fly.io secrets

5. Rate Limiting & Error Handling

5.1 Request Management

- Exponential backoff with jitter for transient failures
- Maximum 3 retries per request
- 15-minute sync interval prevents excessive API usage
- Cached responses to minimize redundant calls

5.2 Error Handling

Error Type	Response
401 Unauthorized	Attempt token refresh, notify user if refresh fails
429 Rate Limited	Exponential backoff, skip current sync cycle
500 Server Error	Log error, retry with backoff
Network Error	Skip current sync, retry next cycle

6. User Interface

6.1 Account Connection Page (`/accounts`)

Users connect their Google Ads account via a single click: 1. Navigate to Accounts page 2. Click "Connect Google Ads" button 3. Redirected to Google OAuth consent 4. Return to AdOptimize with account connected 5. Account displays as "Connected" with last sync timestamp

6.2 Dashboard (`/dashboard`)

The unified dashboard displays: - **Total Spend** — Aggregated across all connected platforms - **Key Metrics** — Impressions, Clicks, CTR, Conversions, ROAS - **Performance Trends** — Time-series charts showing 7-day trends - **Health Score** — 5-dimension account health indicator - **Platform Breakdown** — Per-platform performance comparison

6.3 Health Audit

Automated health scoring across 5 dimensions: - Structure — Campaign organization quality - Creative — Ad creative freshness and diversity - Audience — Targeting breadth and relevance - Budget — Budget utilization and allocation - Tracking — Conversion tracking setup

7. Technical Stack

Component	Technology
Frontend	Next.js 16, React 19, TypeScript
Backend	Python 3.12, FastAPI
Database	PostgreSQL (Supabase)
Caching	Redis (Upstash)
Authentication	JWT + OAuth 2.0
Frontend Hosting	Vercel
Backend Hosting	Fly.io
Scheduler	APScheduler (in-process)

8. Compliance

8.1 Google Ads API Terms

- We comply with all Google Ads API Terms of Service
- We do not resell or redistribute Google Ads data
- We display required Google branding where applicable
- We perform read-only operations — no modifications to user accounts

8.2 User Agreement

- Users must accept Terms of Service before connecting accounts

- Users acknowledge that AdOptimize will access their Google Ads data (read-only)
- Users can revoke access and delete data at any time

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9. Contact Information

Technical Contact: Email: acejou27@gmail.com

Company: 1Way SEO Website: https://1wayseo.com

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