Bimble

Github URL

```
https://github.com/huseinnashr/bimble
```

Requirements

Functional

```
F1. User can create new account with an email (Implemented)
F2. User can verify its newly created account's email
F3.1. Existing user can login with email and password (Implemented)
F3.2. System can authenticate user on authenticated endpoint
F4. Authenticated user can customize their dating profile (OOS but MVP)
F5. Authenticated user can set their dating preferences (OOS but MVP)
F7. Authenticated user can see list of personalized dating profiles (OOS but MVP)
F8. Authenticated user can pass a dating profile
F9. Authenticated user can like a dating profile
F10. Regular User is limitted to 10 pass+like per day
F11. Authenticated user won't be able to see the same dating profile in the same day
F12.1 Regular user can purchase premium packagees which unlock one premium feature of their choosing. The features are:
- No swipe quota
- Verified label
F12.2 System can verify the purchase payment
```

System Design

Tech Stacks

```
Go
- as programming language.
- Simple, Fast, Compile time type checking. Suitable for rapid development.

Proto driven HTTP endpoint
- for defining and generating api docs
- Can generate both server stub and OpenAPI spec

Mockery
- for unit test
- Can generate mock both internal and 3rd party library. Mock with dependency injection not monkey patching

PostgreSQL
- for storing transactional data that require ACID or persistent
- Open source, community driven, and matured ecosystem.

Redis
- for storing login session and profile view
- The goto in-memory datastructure store. Great API, mature ecosystem, reliable

Kafka
- notifying when account, profile, preference changes
- persistent, ordered, scalable, and great ecosystem
- can rebuild elasticsearch index from the kafka when needed

Elasticsearch
- for storing and distributing dating profile that support personalization, re-ranking and boosting certain profile
- The goto indexing engine for content recommendation. Great API, mature ecosystem, reliable

Github Action
- CI/CD Workflow
- integrate natively with github. Many community based 'action' that we can use in our pipeline

K8s
- Deployment environment
- Cloud native, mature ecosystem, easier to setup CI/CD, as well as managing resources such as postgreSQL, redis, elastic
```

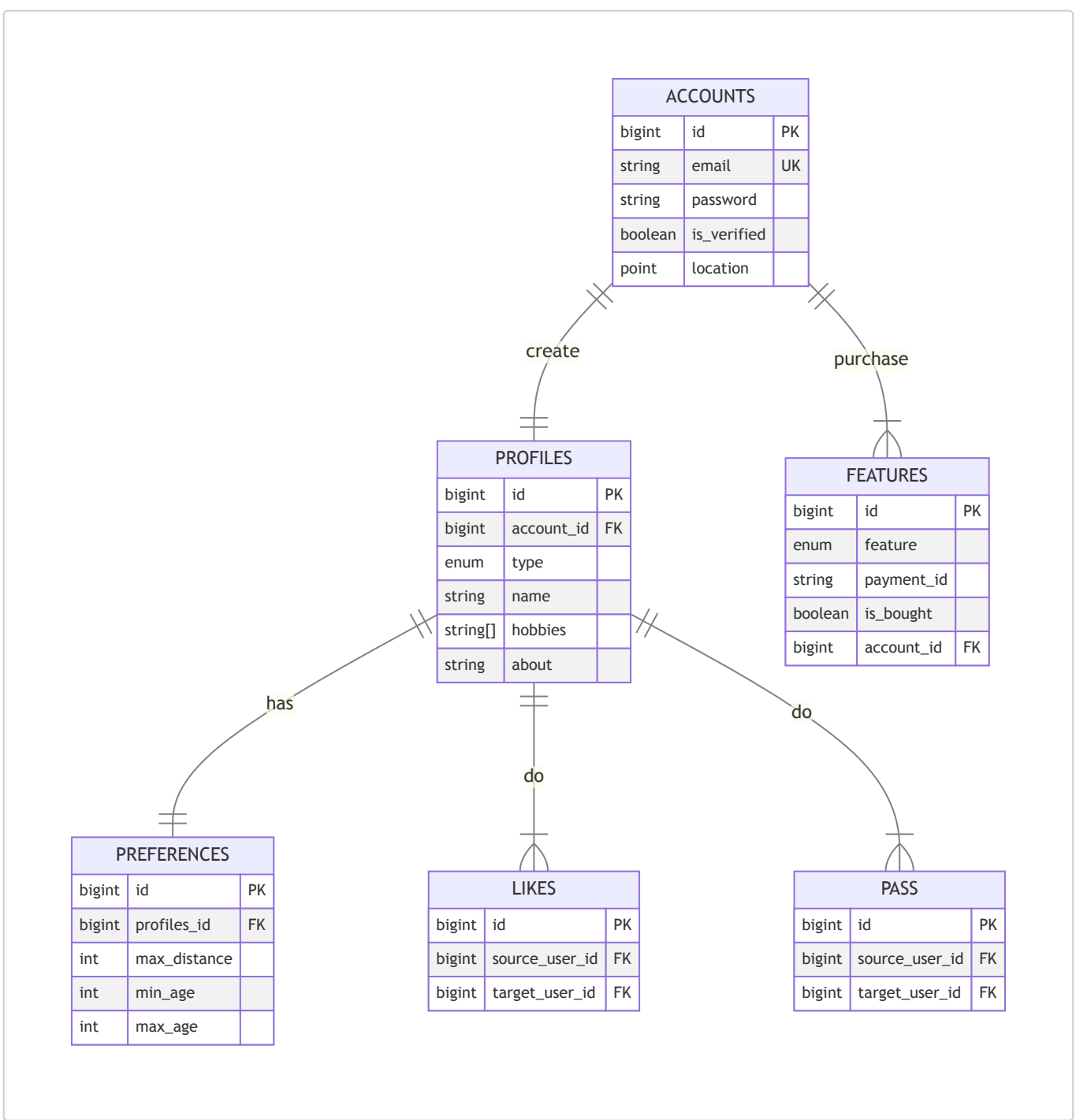
Endpoints

These endpoints loosely follow https://google.aip.dev/1 api guidelines. The endpoints numbering matches with corresponding functional requirement.

```
F1. POST /accounts:signup
- Request
    Body {email: string, password: string}
- Response OK
    Body {message: string}

F2. POST /accounts:verify
- Request
    Body {token: string}
- Response OK
    Body {message: string}

F3.1. POST /accounts:login
- Request
    Body {email: string, password: string}
- Response OK
    Body {token: string}

F4. PATCH /accounts/profiles
- Request
    Header {Authentication: Bearer $token}
    Body {Profile}
- Response OK
    Body {message: string}

F5. PATCH /account/preference
- Request
    Header {Authentication: Bearer $token}
    Body {Preference}
- Response OK {message: string}

F6. GET /profile:random
- Request
    Header {Authentication: Bearer $token}
- Response OK
    Body {array of Profile}

F7. GET /profile:personalized
- Request
    Header {Authentication: Bearer $token}
- Response OK
    Body {array of Profile}

F8. POST /profile/{profile_id}:pass
- Request
    Header {Authentication: Bearer $token}
- Response OK
    Body {message: string}

F9. POST /profile/{profile_id}:like
- Request
    Header {Authentication: Bearer $token}
- Response OK
    Body {message: string}

F11. POST /profile/{profile_id}:view
- Request
    Header {Authentication: Bearer $token}
- Response OK
    Body {message: string}

F12.1. POST /feature/{feature_id}:purchase
- Request
    Header {Authentication: Bearer $token}
- Response OK
    Body {payment_url: string}

F12.2. POST /payment:confirmation
- Request
    Header {Authentication: Bearer $token}
    Body {payment_token: string}
- Response OK
    Body {message: string}
```

Entity Relation

PostgreSQL Table



PostgreSQL query

```
PQ1. F1/F3. SELECT accounts WHERE email = {email}
PQ2. F1. UPDATE accounts SET password = {hashedPassword} WHERE email = {email}
PQ3. F2. UPDATE accounts SET is_verified = true WHERE id = {account_id}
PQ4. F3. UPDATE accounts SET location = {location} WHERE id = {account_id}
PQ5. F4. UPDATE profiles SET ...profile WHERE id = {profile_id}
```

Redis Datastructure

```
R1. Account Verification token
- type: strings
- key: account_verification:{token}
- ttl: 1 hour

R2. Login Session
- type: strings
- key: login_session:{token}
- value: {account_id, profile_id, preference_id}
- ttl: 1 day

R3. Account Viewed Profile
- type: sorted sets
- key: account:{account_id}:viewed_profiles
- value: {profile_id[]}
```

Redis Query

```
RQ1. F1. Create account
SET R1{token} {account_id} EX 3600

RQ2. F2. Account Verification token
GET R1{token}

RQ3. F3.1. User Login
SET R2{token} {account_id, profile_id, preference_id}

RQ4. F3.2 System Authenticate
GET R2{token}

RQ5. F6/F7. Exclude viewed profile
ZRANGE R3{account_id} INF (CURRENT_MS() - 1 Day) REV BYSCORE

RQ6. F11. Register profile view
ZADD R3{account_id} CURRENT_MS() profile_id
```

Elasticsearch Datastructure

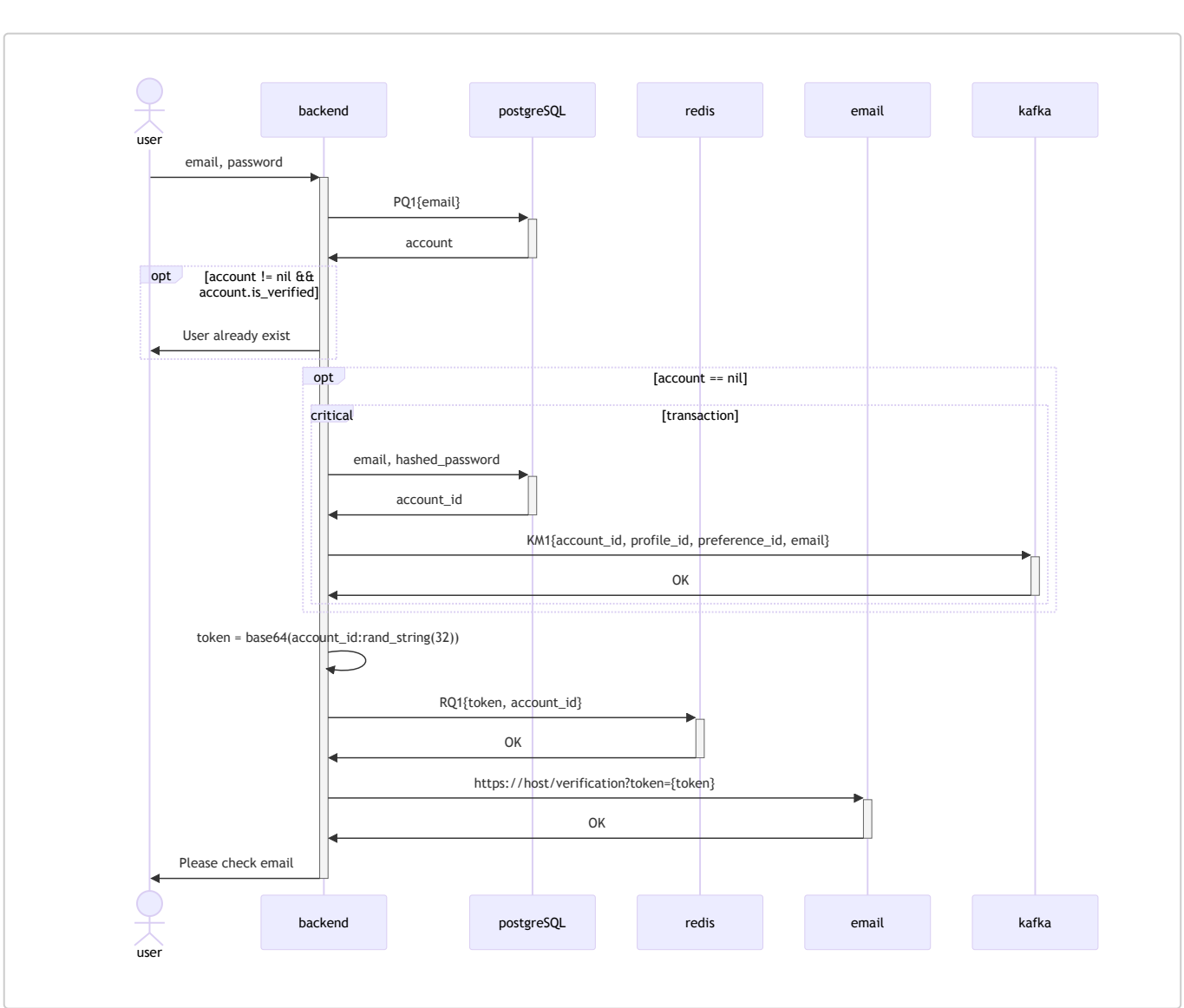
```
ED1. F7. index dating_profiles
{
    "_id": 1                    // profile.ID
    "account_id": 1             // account.ID
    "preference_id": 1          // preference.ID
    "email": "jane@test.com     // account.email
    "location": [1.23, 4.5]     // account.location
    "is_verified": true         // account.is_verified
    "name": "Jane"              // profile.name
    "hobbies": ["drawing"]      // profile.hobbies
    "about": "my-about"         // profile.about
    "max_distance": 200         // preferences.max_distance
    "min_age": 25               // preferences.min_age
    "max_age": 27               // preferences.max_age
    "verified_label: true       // features.feature = VERIFIED_LABEL
    "no_swipe_quota: true       // features.feature = NO_SWIPE_QUOTA
}
```

Kafka Messages

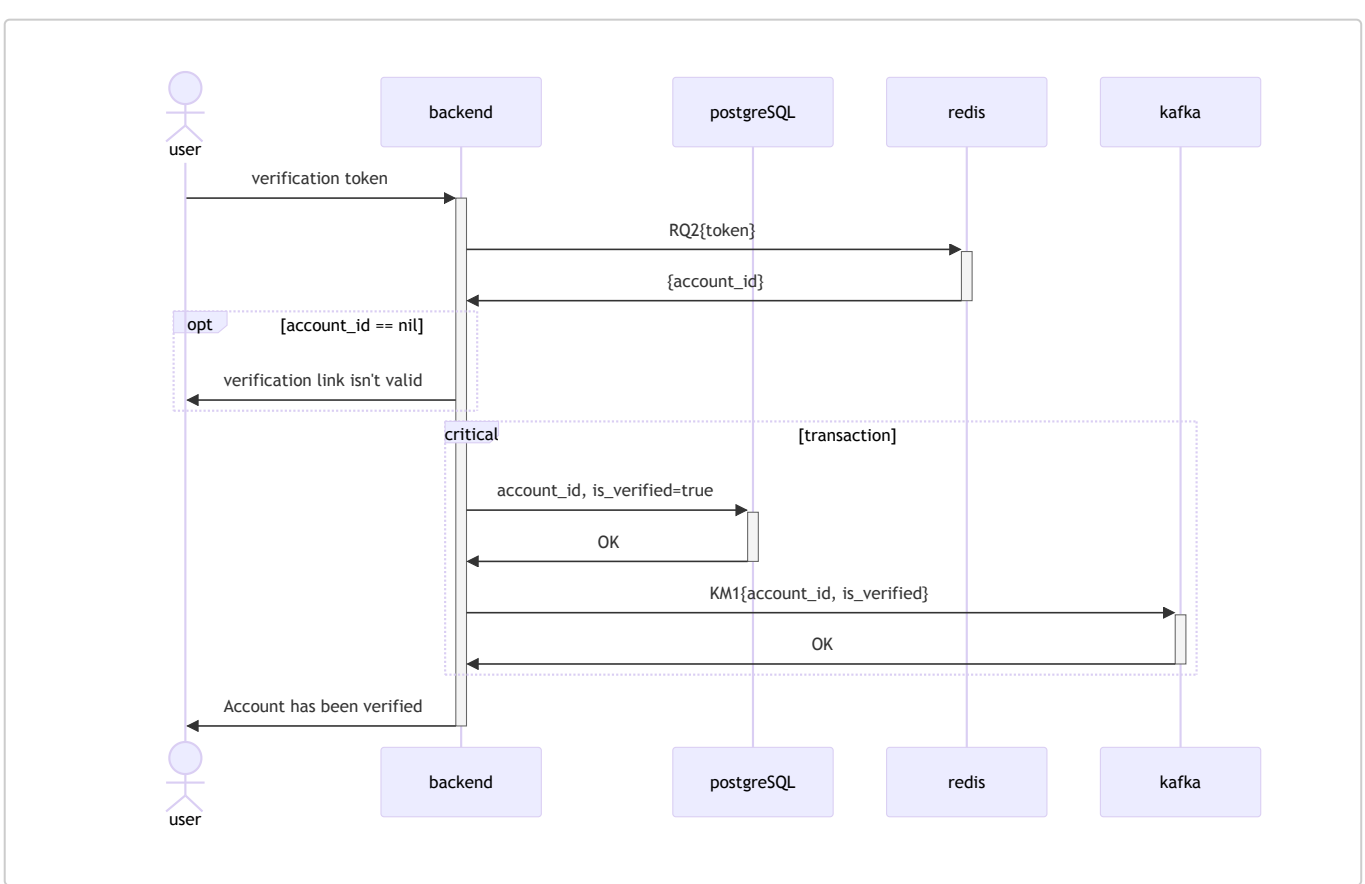
```
KM1. F7. event account_changed
account {
    ...partial,
    profile {
        ...partial,
        preference {
            ...partial
        }
    },
}
```

Sequence

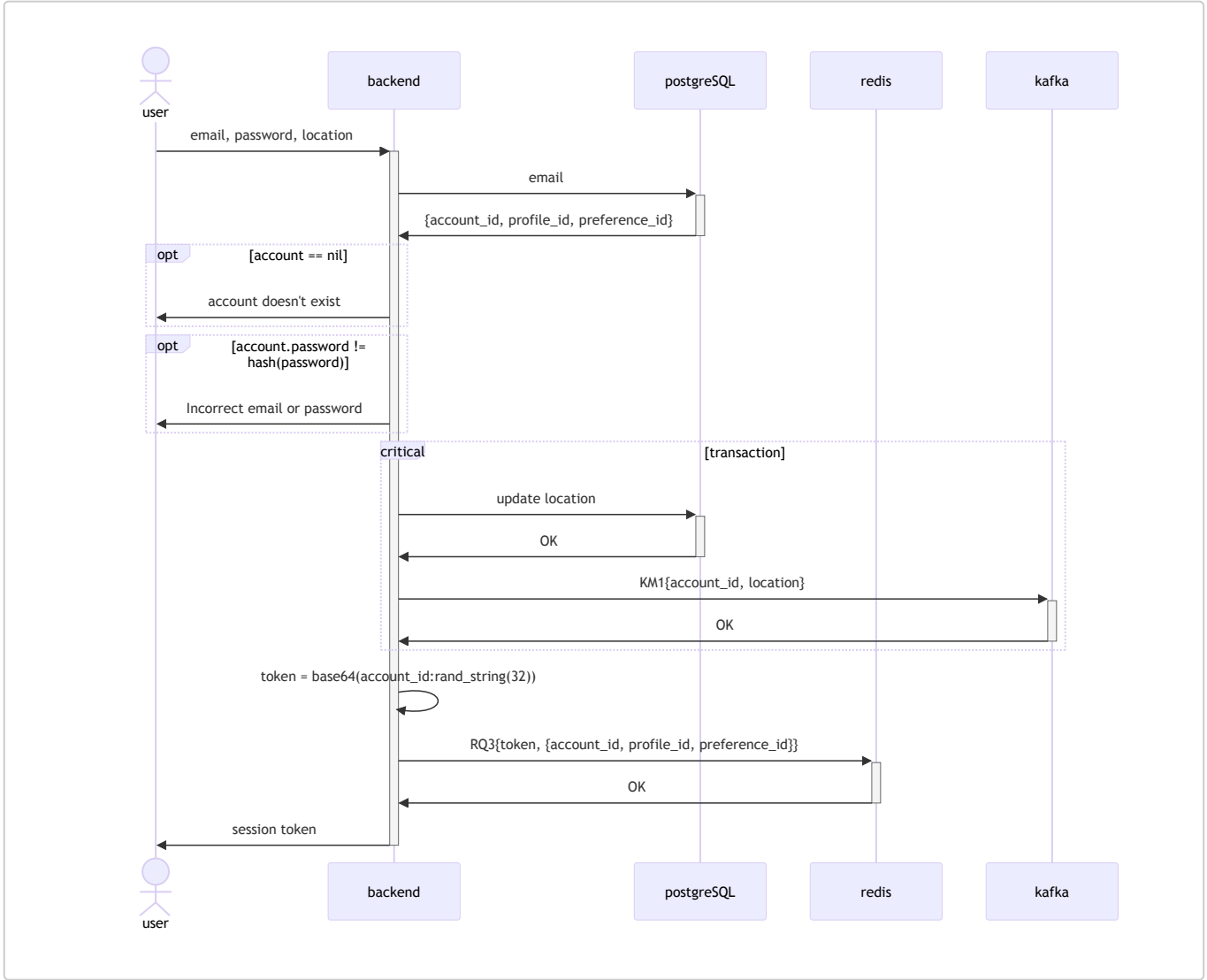
SD1. F1. POST /accounts



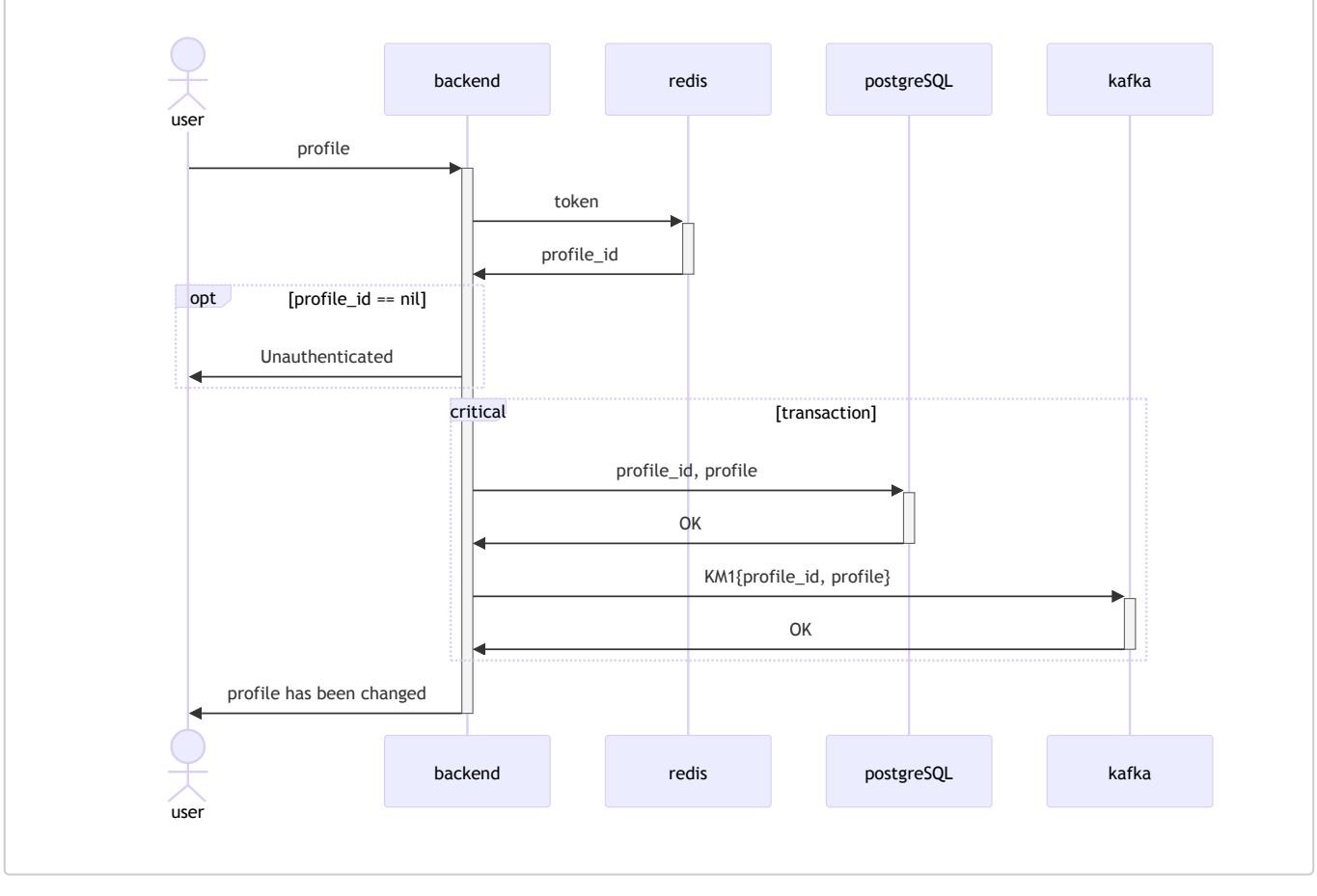
SD2. F2. POST /accounts:verify



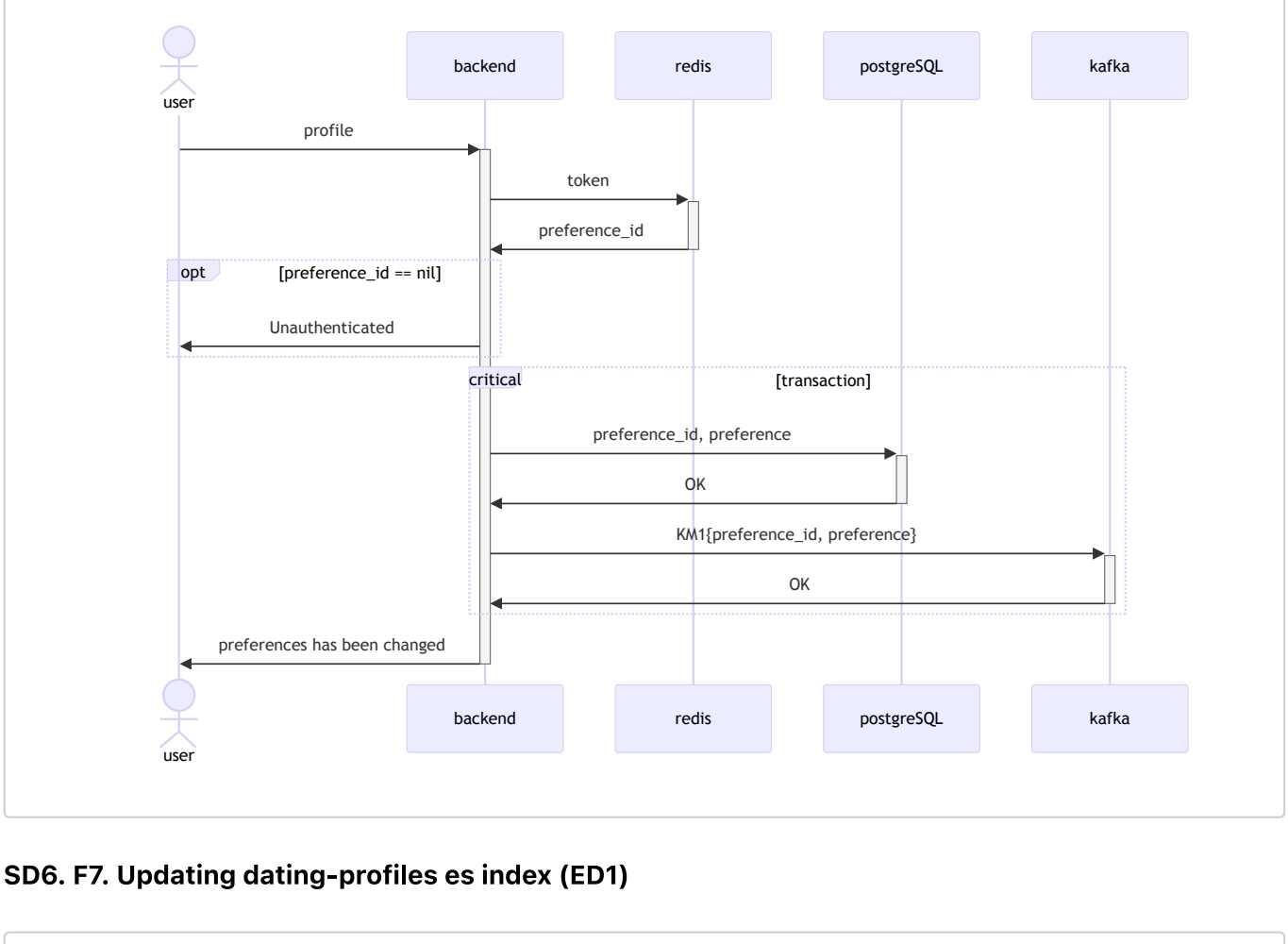
SD3. F3.1. POST /accounts:login



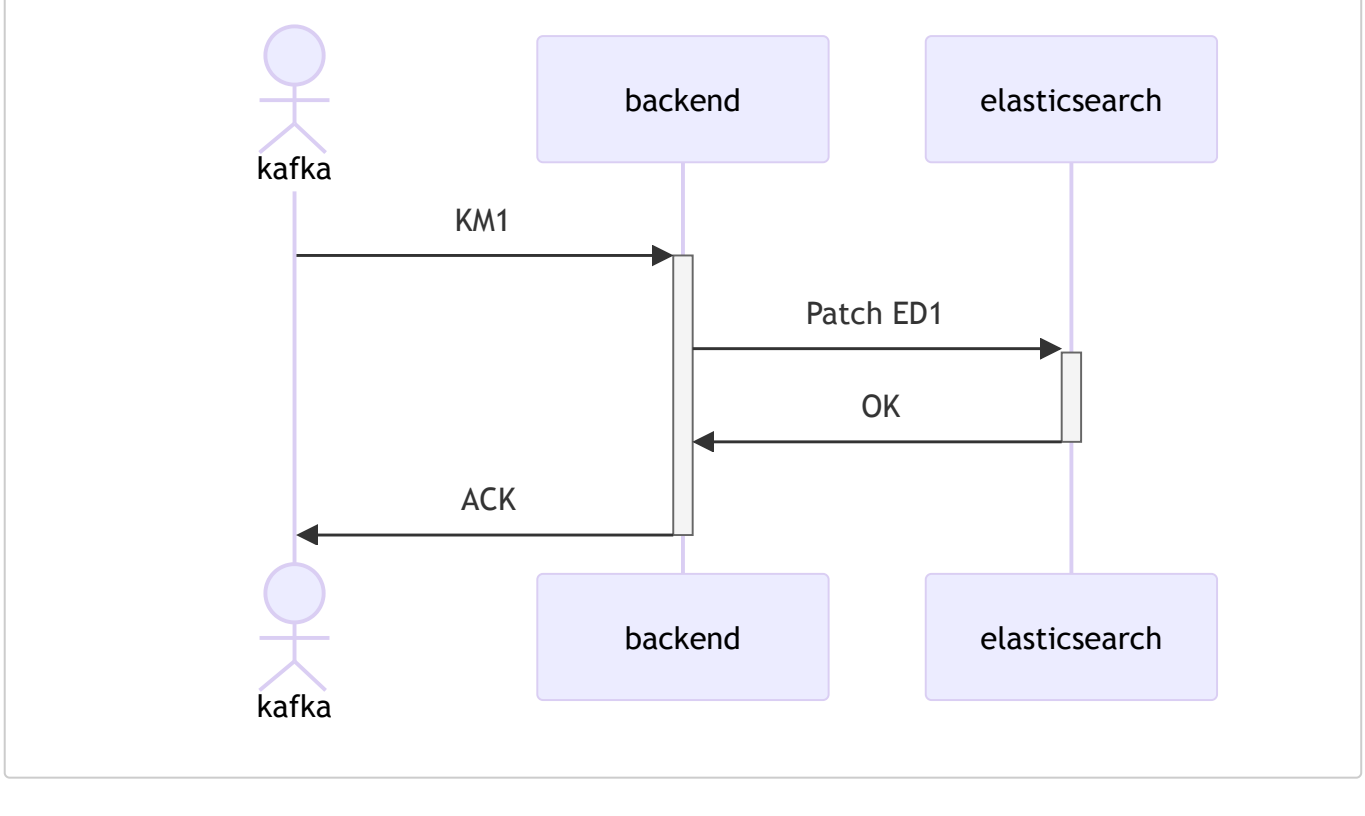
SD4. F4. PATCH /accounts/me:dating-profile



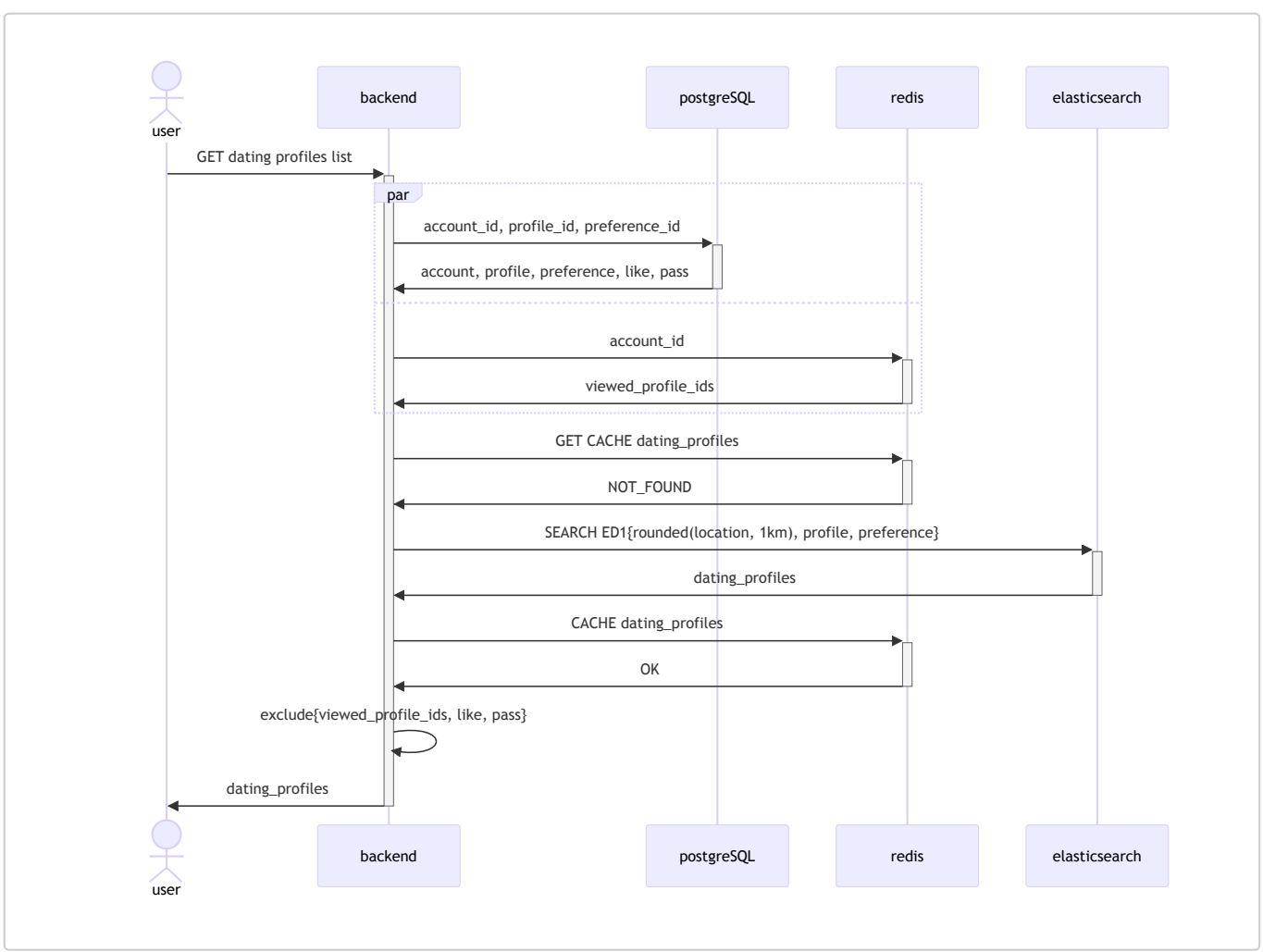
SD5. F5. PATCH /accounts/me:dating-preferences



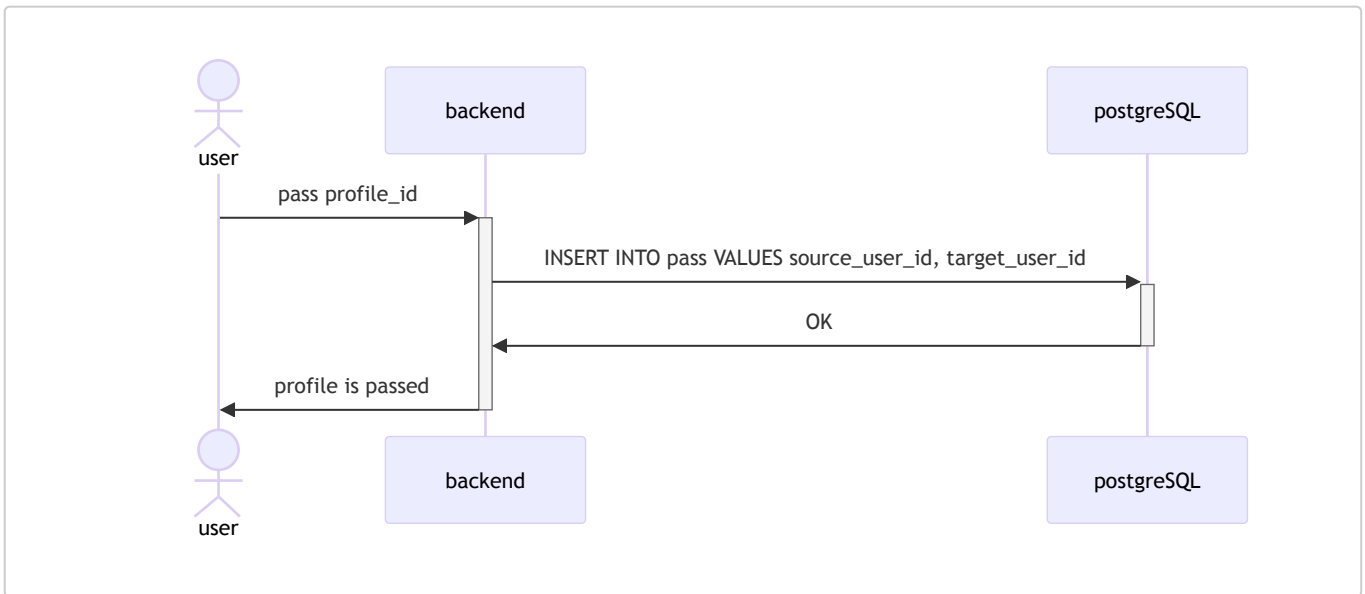
SD6. F7. Updating dating-profiles es index (ED1)



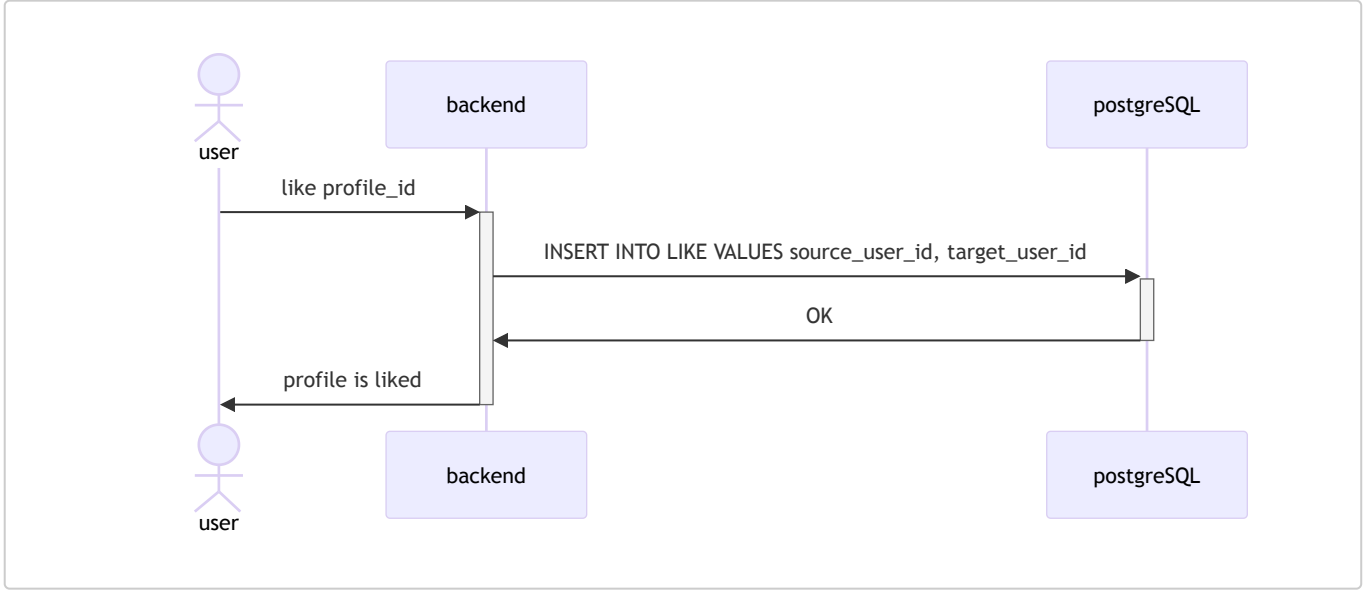
SD7. F7. GET /profiles:personalized



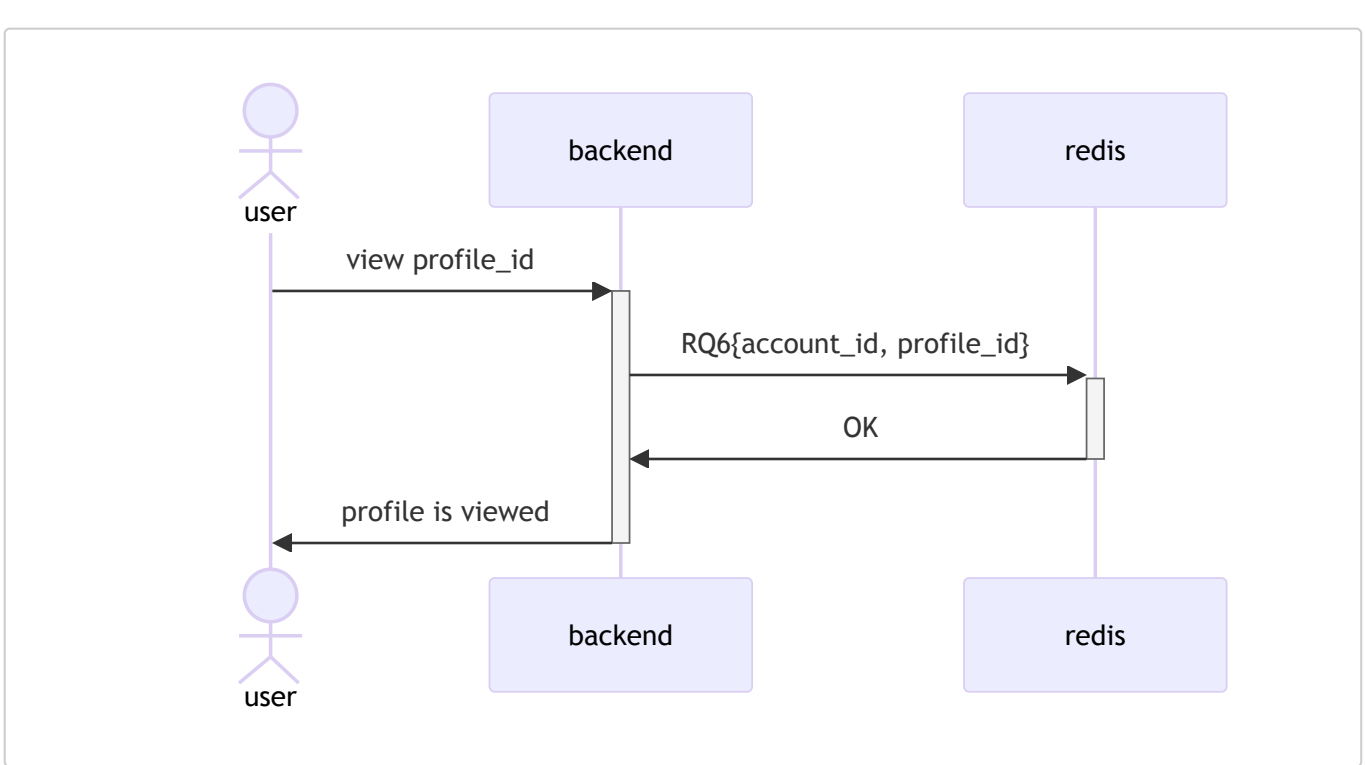
SD8. F8. POST /profiles/{profile_id}:pass



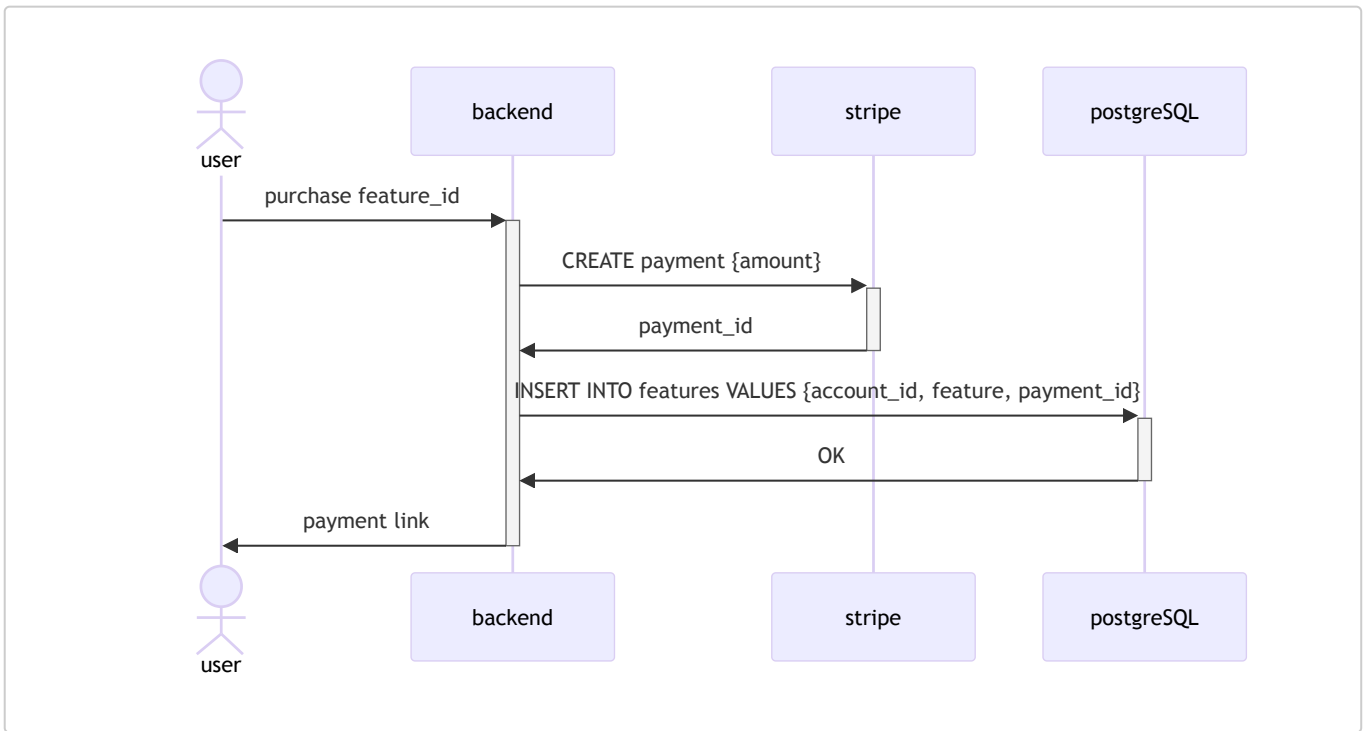
F9. POST /profiles/{profile_id}:like



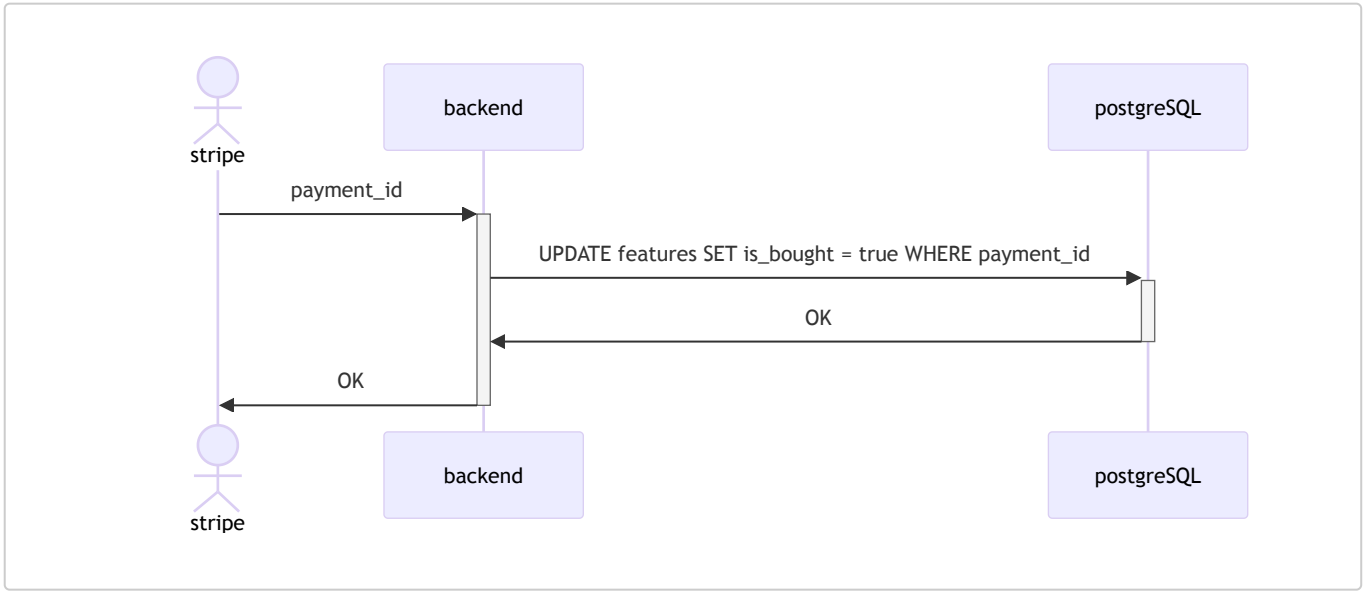
F11. POST /profiles/{profile_id}:view



F12.1. POST /features/{feature_id}:purchase



F12.2. POST /payments:confirmation

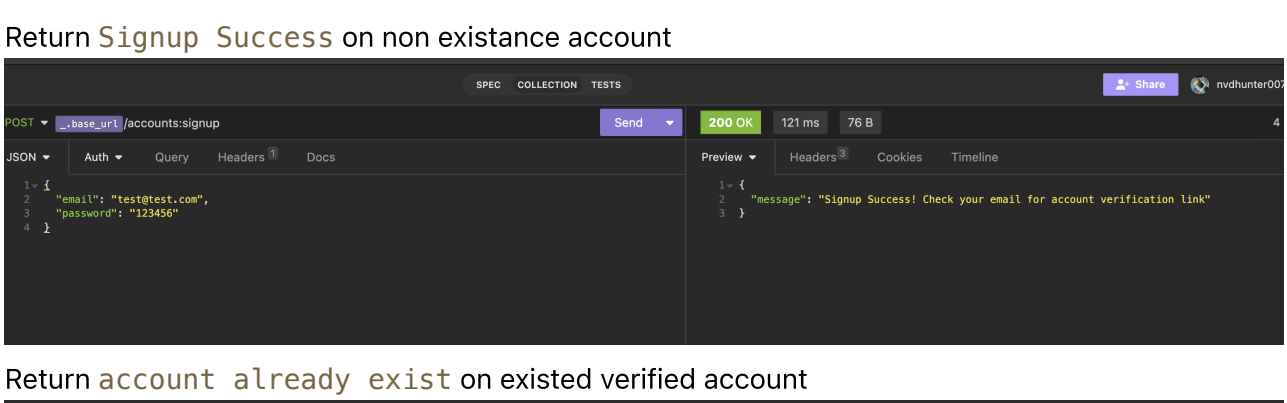


Tests

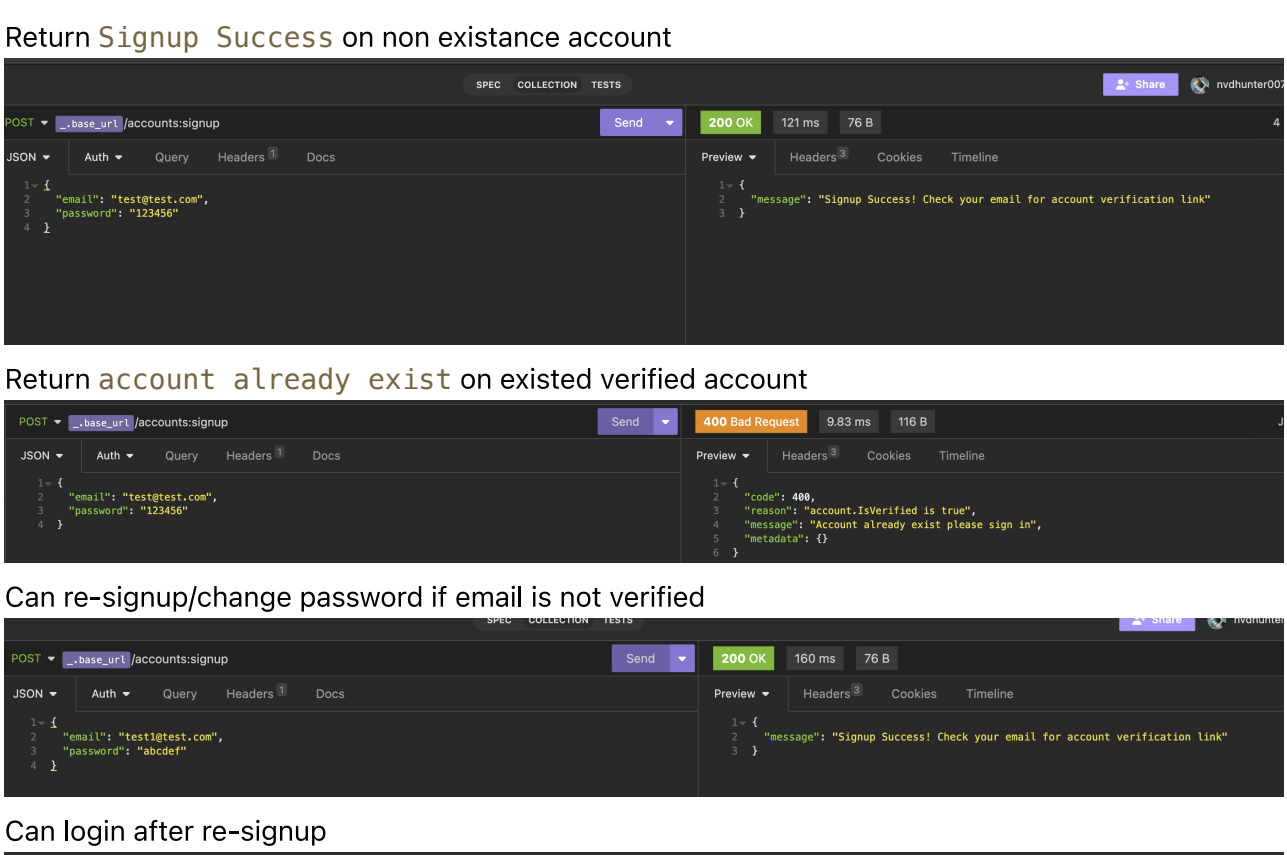
Criteria

F1. User can create new account with an email

- Return `Signup Success` on non existance account

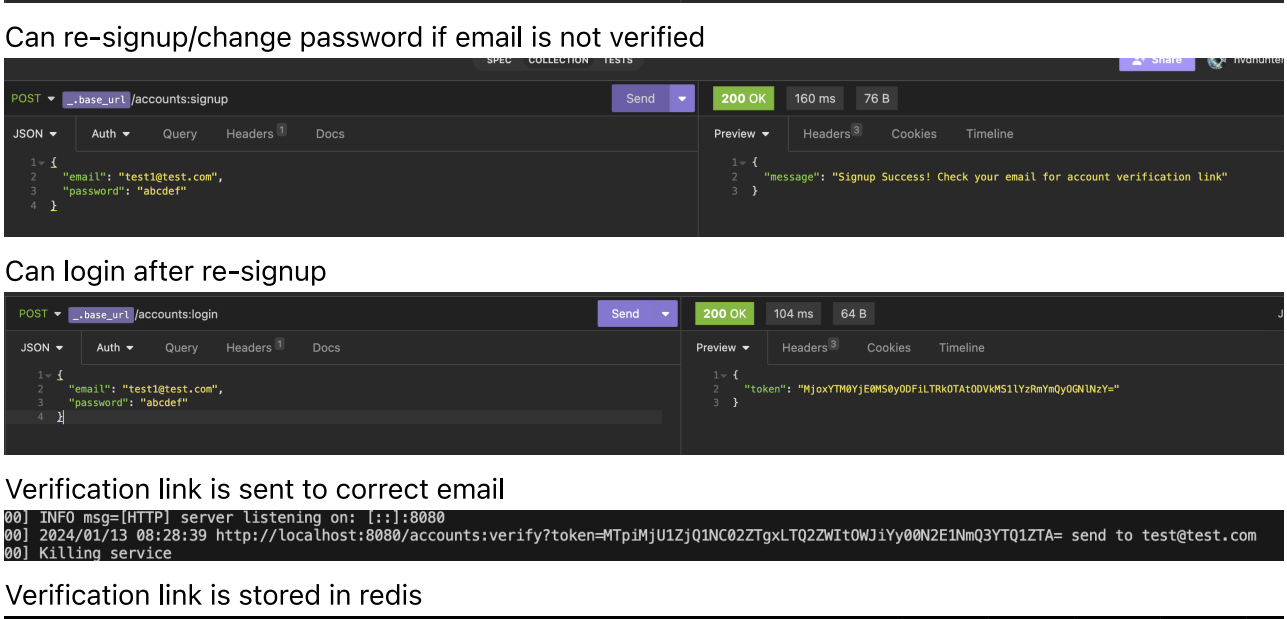


- Return `account already exist` on existed verified account



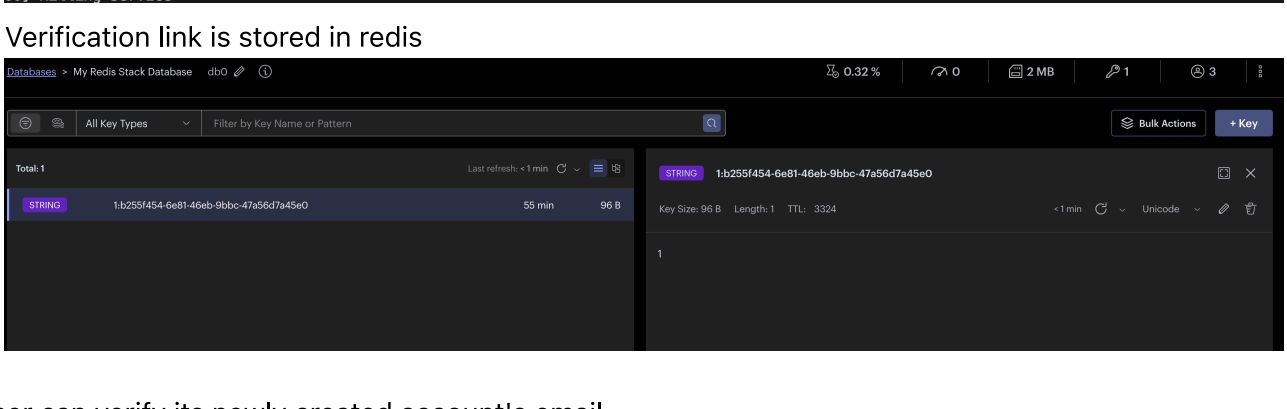
- Can re-signup/change password if email is not verified

- Can login after re-signup



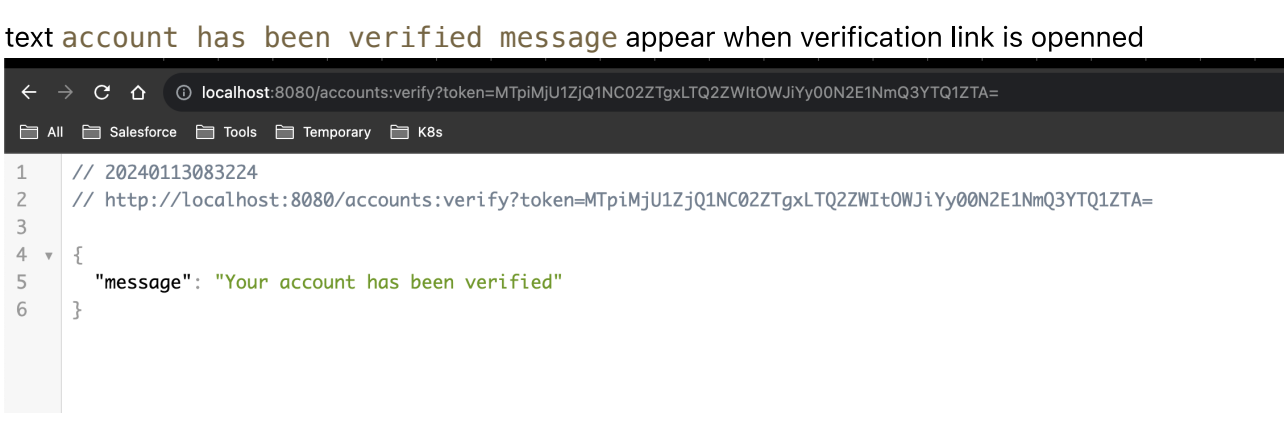
- Verification link is sent to correct email

- Verification link is stored in redis

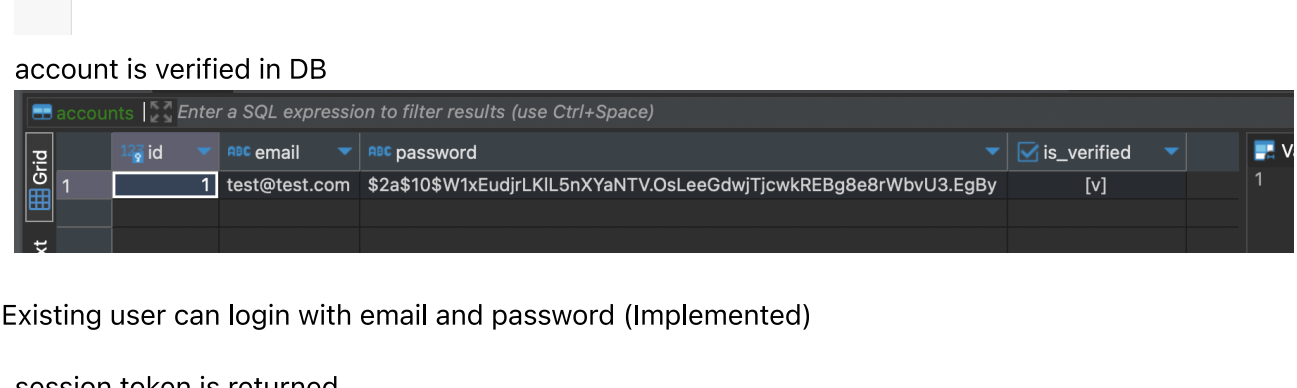


F2. User can verify its newly created account's email

- text `account has been verified message` appear when verification link is openned

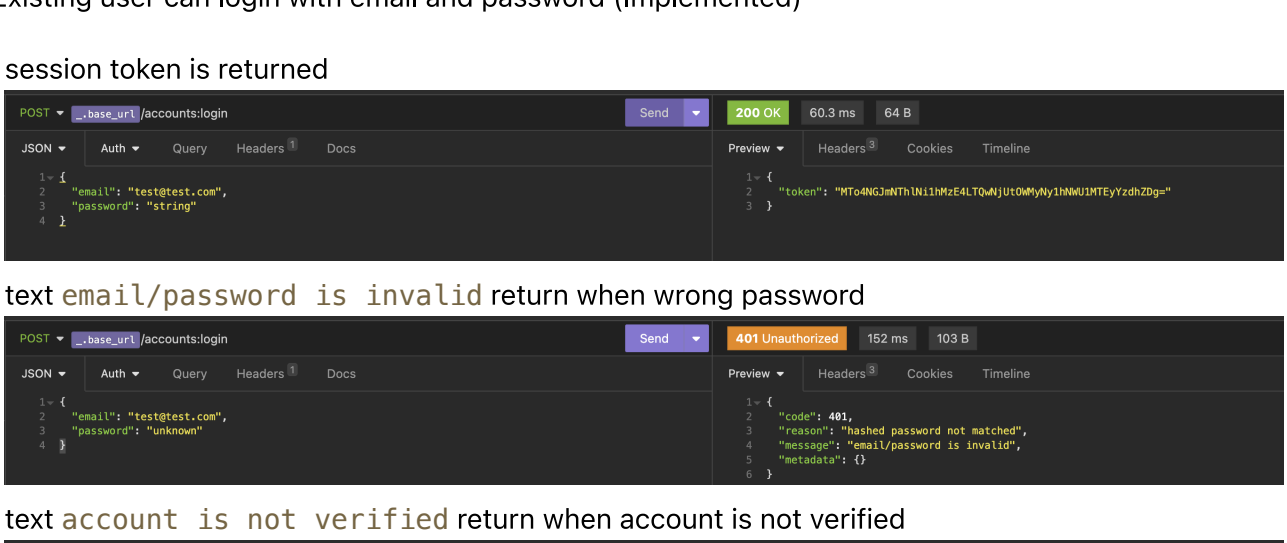


- account is verified in DB



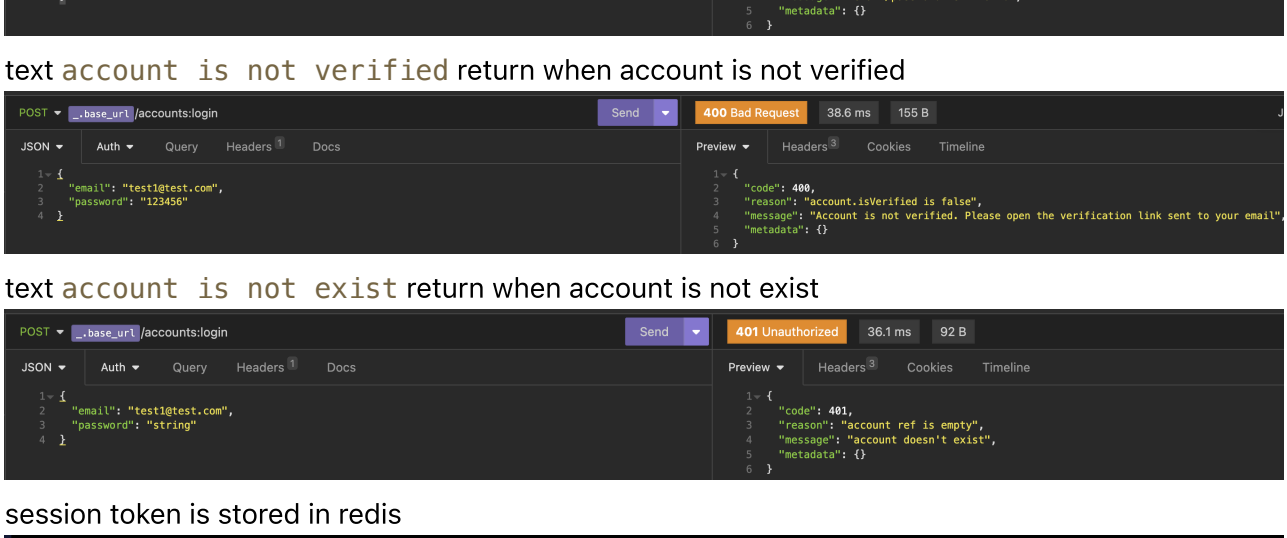
F3.1. Existing user can login with email and password (Implemented)

- session token is returned



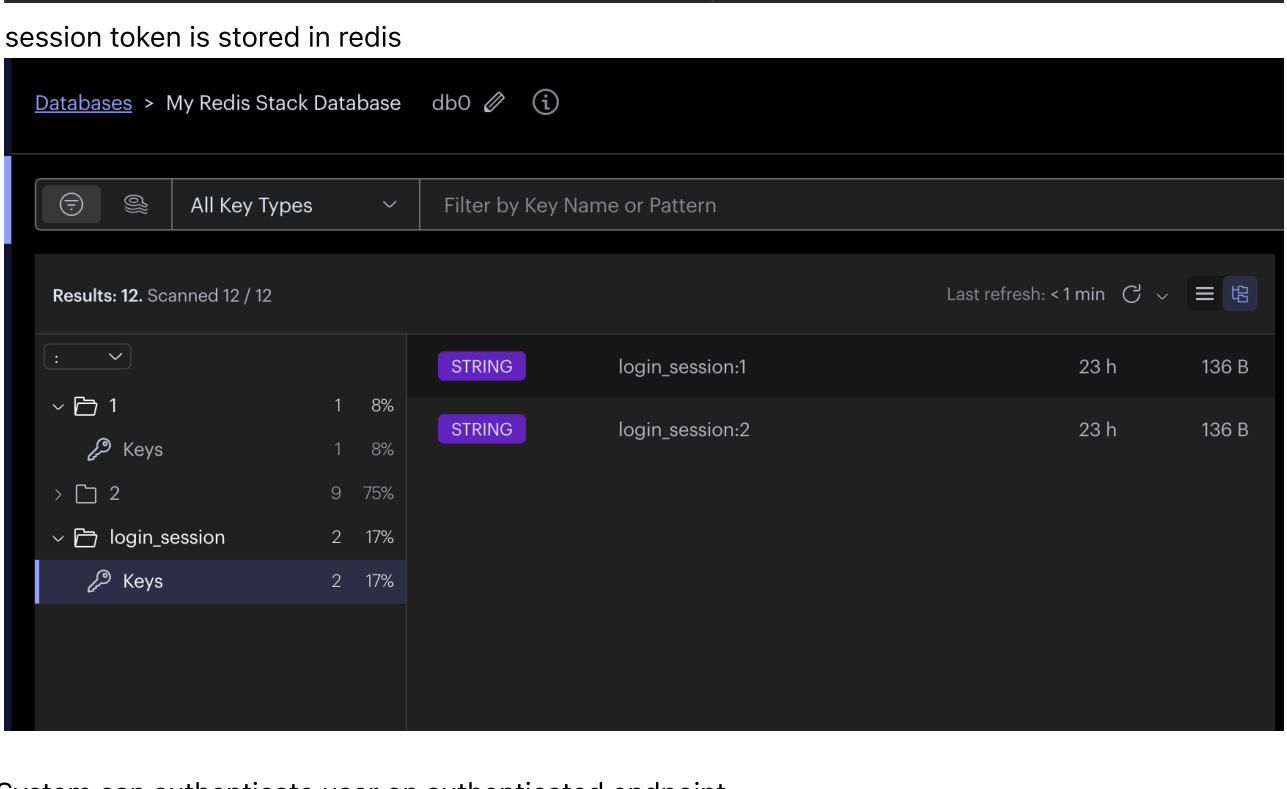
- text `email/password is invalid` return when wrong password

- text `account is not verified` return when account is not verified



- text `account is not exist` return when account is not exist

- session token is stored in redis



F3.2. System can authenticate user on authenticated endpoint

- endpoint with "Authentication" header not returning Unauthenticated status
- endpoint will return Unauthenticated status when using invalid session token

F4. Authenticated user can customize their dating profile (OOS but MVP)

- endpoint return "profile has been changed"

F5. Authenticated user can set their dating preferences (OOS but MVP)

- endpoint return "preferences has been changed"

F7. Authenticated user can see list of personalized dating profiles (OOS but MVP)

- endpoint return array of dating profile ranked approximately by distance and user profiles/preferences

F8. Authenticated user can pass a dating profile

- endpoint return "profile is passed"

F9. Authenticated user can like a dating profile

- endpoint return "profile is liked"

F10. Regular User is limitted to 10 pass+like per day

- endpoint return "cannot passed/liked, quota of 10/day is reached"

F11. Authenticated user won't be able to see the same dating profile in the same day

- endpoint exclude viewed profile that day

F12.1 Regular user can purchase premium packagees which unlock one premium feature of their choosing. The features are: No swipe quota & Verified label

- endpoint return payment link

F12.2 System can verify the purchase payment

- endpoint return OK