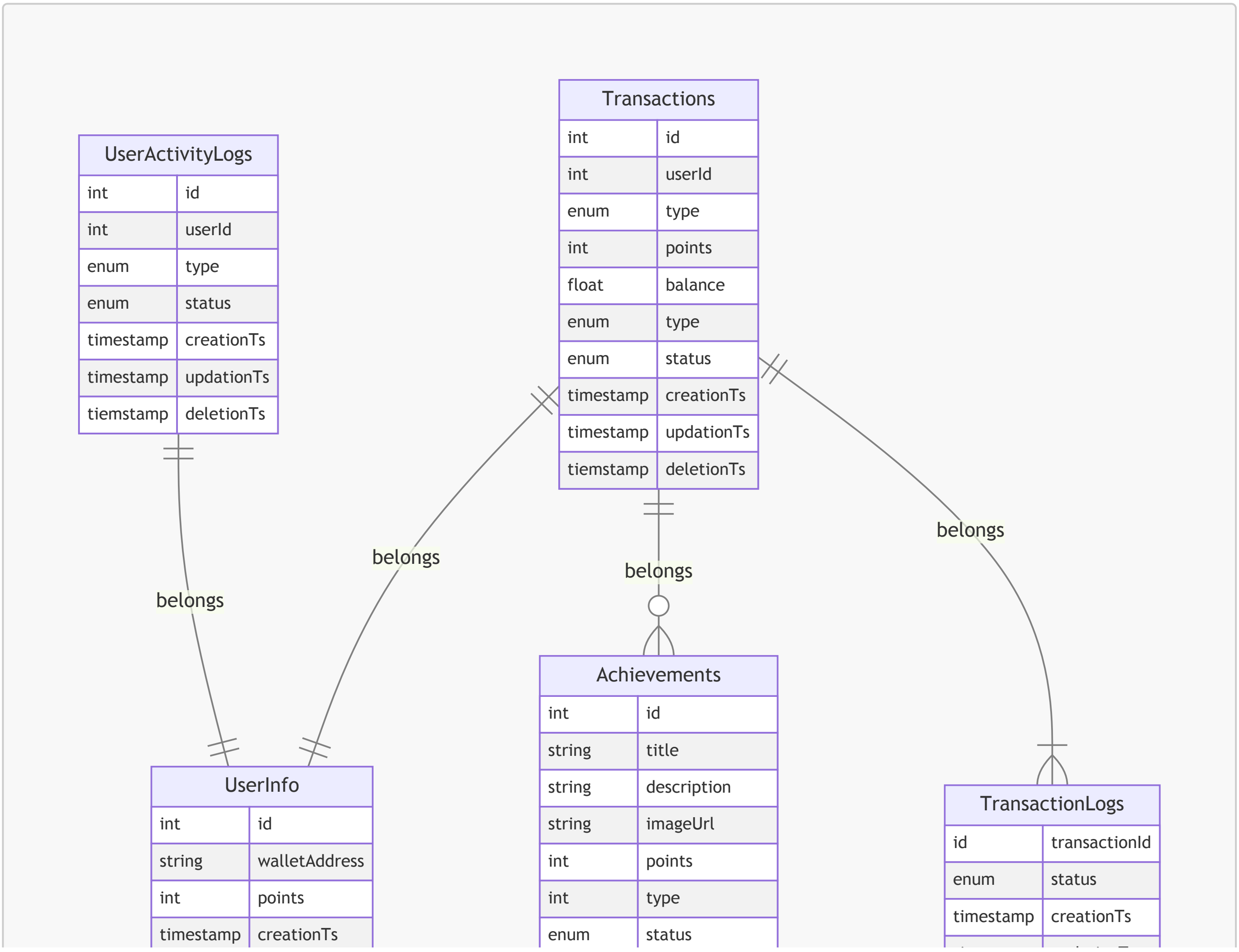
Project 2

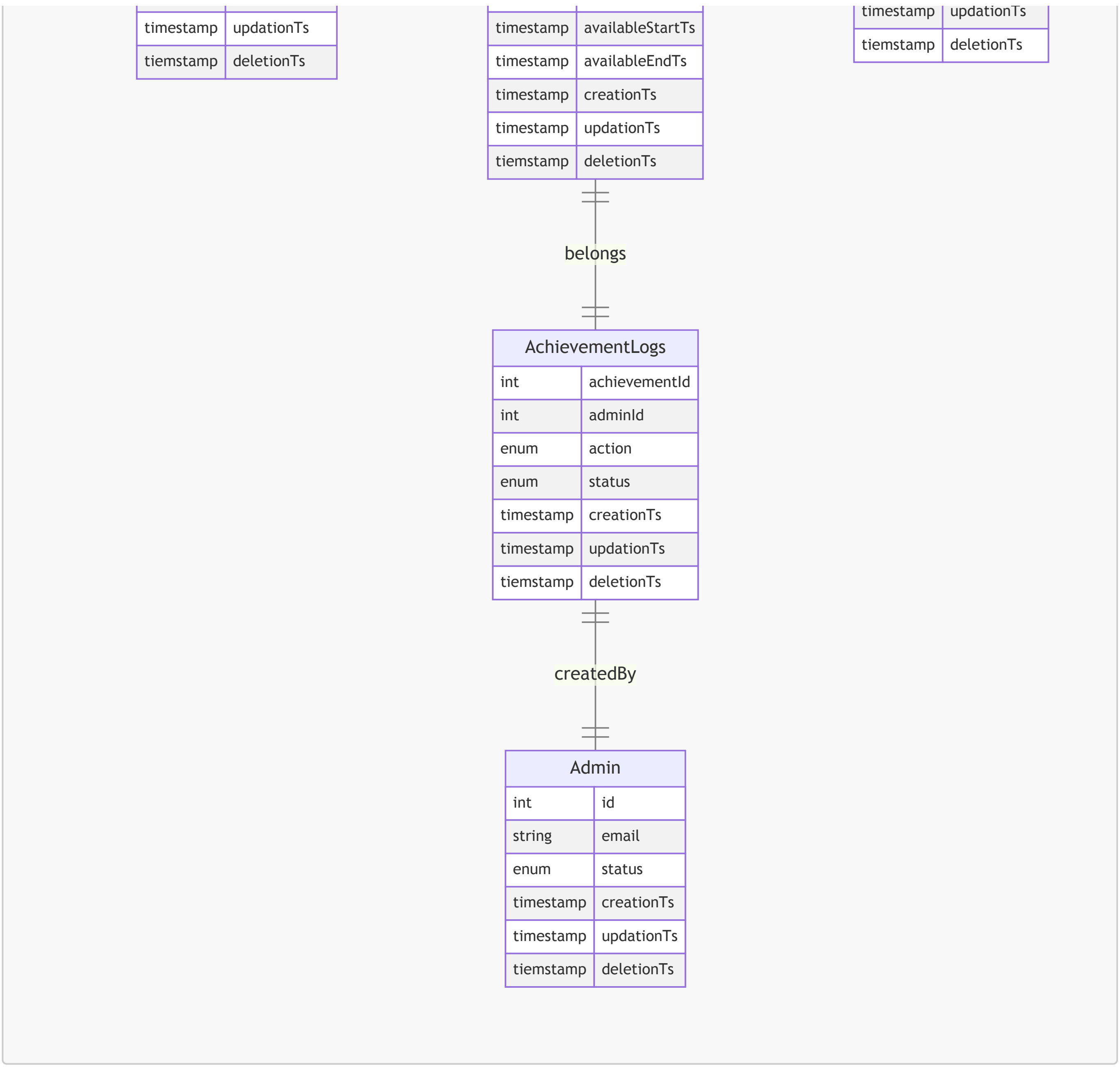
1. Design the database schema

In order to create a loyality system for **9gag** , here is the list of table going to create

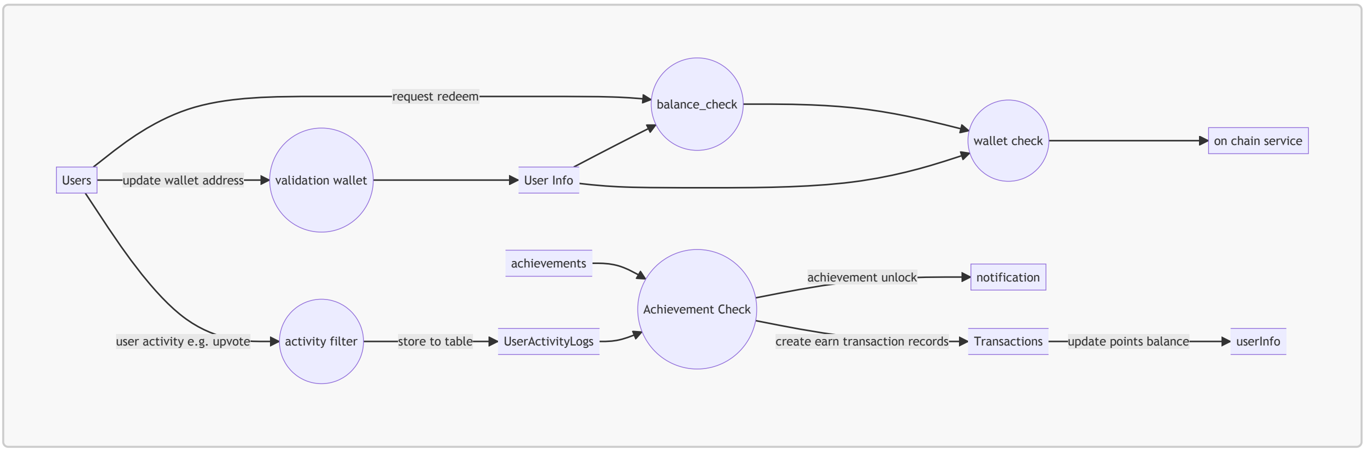
Table Name	Description
Achievements	store all achievements in loyality system
Transactions	store all user point transaction including earn and redeem
UserInfo	store user info including wallet address and point balance
UserActivityLogs	store all user activity including comment, upvote, create post, share etc
TransactionLogs	store every transaction status including transaction requested, processing status, complete status etc.
AchievementLogs	store all admin action on create / update / delete achievements for loggins purpose
Admin	store admin users information

Here is the ER diagram for different tables.





2. Illustrate the data flow



3. Design the APIs endpoints Due the the API design practise in 9gag is RESTful API, so i will have the following new endpoint design. Following API list only included external API, for those internal API (e.g. create achievemnt/ update daily achievement is not included)

Title	API Endpoint	Method	URL params	Description
Get all achieveemnts,	/achievements	GET	type: filter by type page: default 0 limit: default 20	Get all achievements, can filter by type URL params, also support pagination
Get my transactions	/my/transactions	GET	page: default 0 limit: default 20	Let all transactions for every point you earn and redeemp
get my reward point balance	/my/balance	GET	N/A	Get the total balance for reward points you have
update my MetaMask wallet	/my/wallet	PUT	N/A	Update you wallet address for redeem you point to MetaMask wallet
redeem my point	/my/point/redeem	PUT	N/A	users to redeem the points and send back MetaMask Wallet

Here is the example for API `request` and `response`

Get all achievements

```
GET /achievements?type=upvote,comment,post&page=0&limit=20
HTTP 200 OK
{
    data: {
        achievements[
            {
                id: "InM63b4gS5",
                name: "share rewards",
                type: "share",
                redeemed: true,
                creationTs: 1676109493
            },
            {
                id: "cH9J6wM5qt",
                name: "Vpvote rewards",
                type: "upvote",
                redeemed: false,
                creationTs: 1676109493
            },
            {
                id: "tRoOaRAsCk",
                name: "comment rewards",
                type: "comment",
                redeemed: false,
                creationTs: 1676109493
            }
        ]
    },
    meta: {
        sid: '9gVQ01EVjlHTUVkMMRVS4xEVFpXTn1TY',
        status: 'Success',
        timestamp: 1676109493
    }
}
```

Get point transactions history

```
GET /my/transactions?limit=25&page=0
HTTP 200 OK
{
    data: {
        transaction: [
          {
             type: 'earn',
             points: 30,
             status: 'success',
             achievement: {
                id: "cH9J6wM5qt",
                name: "Vpvote rewards",
                type: "upvote",
                redeemed: true,
                creationTs: 1676109493
             },
             creationTs: 1676109316,
          },
          {
             type: 'earn',
             points: 30,
             status: 'success',
             achievement: {
                id: "tRoOaRAsCk",
                name: "comment rewards",
                type: "comment",
                redeemed: false,
                creationTs: 1676109493
             },
             creationTs: 1676109316,
          },
          {
             type: 'redeem',
             points: 30,
             status: 'success',
             creationTs: 1676109316
          },
        ]
    },
    meta: {
        sid: '9gVQ01EVjlHTUVkMMRVS4xEVFpXTn1TY',
        status: 'Success',
        timestamp: 1676109493
    }
}
```

Get my reward point balance

```
  GET /my/balance
  HTTP 200 OK
  {
      data {
          balance: {
              points : 300,
          }
      },
      meta: {
          sid: '9gVQ01EVjlHTUVkMMRVS4xEVFpXTn1TY',
          status: 'Success',
          timestamp: 1676109493
      }
  }
```

Update my MetaMask wallet

```


  PUT /my/wallet
      -d '{"walletAddress": "0xb08B7cCB09DAc236DB60b621A0E5eAddA8191A10"}'
  HTTP 200 OK
  {
      data: {
          userInfo: {
              reqeustId: "kuWqkbm47f",
              walletAddress: "0xb08B7cCB09DAc236DB60b621A0E5eAddA8191A10"
          }
      },
      meta: {
          sid: '9gVQ01EVjlHTUVkMMRVS4xEVFpXTn1TY',
          status: 'Success',
          timestamp: 1676109493
```

```
    }
}
```

redeem my point

```
PUT /my/points/redeem
    -d '{"points": 300}'
HTTP 200 OK
{
    data: {
        redeem: {
            id: "78QFEtttlo",
            creationTs: 1676109493
        }
    },
    meta: {
        sid: '9gVQ01EVjlHTUVkMMRVS4xEVFpXTn1TY',
        status: 'Success',
        timestamp: 1676109493
    }
}
```

> **4. Any considerations you can think of**

First of all, these DB/API design and implementation is a very basic loyality system without member tier concept, so every user can earn point and redeem every rewards avaiable in that period. If we need a tier concept in this loyality system, we should have a extra column `tier` in both `UserInfos` and `Rewards` table which only same tier user can retieve that rewards.

Secondly, in API design section, you can see the update wallet API is super simple and the hacker may easily reteive the cookie from other user browser and trigger update wallet and redeem the point the hacker wallet. So we should also implement `2FA` or `MFA` protection when user try to request update wallet address and redeem to point and send back to MetaMask wallet.

Also, cause this use case invoice on-chain action, there are async operation and always have error during on-chain action (e.g. Transaction rejected, Request limit exceeded... etc.), so our on-chain module should handle the fail case, including retry logic or point refund logic when error happen.