### ****Tables:****

### ****1. Core Account Management****

1. **Accounts** – Stores account details (ID, type, balance, status).
2. **Account\_Types** – Defines account types (Savings, Checking, Loan, etc.).
3. **Account\_History** – Tracks changes to account details (modifications, upgrades).
4. **Account\_Status** – Stores account statuses (Active, Blocked, Closed).

### ****2. Transactions & Ledger****

1. **Transactions** – Stores transaction details (debit, credit, amount, status).
2. **Transaction\_Types** – Defines transaction categories (Transfer, Payment, Deposit, etc.).
3. **Transaction\_Limits** – Stores user-specific or account-specific transaction limits.
4. **Ledger** – Stores financial records for compliance and reconciliation.
5. **Transaction\_Status** – Tracks transaction progress (Pending, Success, Failed).

### ****3. Beneficiaries & External Links****

1. **Beneficiaries** – Stores trusted payees for quick transfers.
2. **Linked\_Accounts** – Stores linked external bank accounts.

### ****4. Security & Compliance****

1. **Fraud\_Detection** – Logs suspicious transactions for risk analysis.
2. **Account\_Logs** – Stores account activity logs.
3. **Fraud\_Status** – Stores fraud investigation statuses.
4. **Account\_Freeze** – Tracks frozen accounts.
5. **KYC\_Status** – Stores KYC verification status for accounts.
6. **Audit\_Logs** – Stores logs for all critical actions on accounts.

### ****5. Account Services & Preferences****

1. **Account\_Notifications** – Stores notification preferences (SMS, email, etc.).
2. **Auto\_Debit** – Stores auto-debit settings for bills, loans, etc.

### ****6. Interest Management****

1. **Interest\_Rates** – Stores rates for different accounts (savings, loans).
2. **Interest\_Calculations** – Tracks interest earned.

### ****7. Enterprise & Multi-Tenancy Tables****

1. **Account\_Access** – Allows multi-user access for enterprises.
2. **Account\_Roles** – Stores roles for account access (Owner, Manager, Employee).
3. **Business\_Accounts** – Stores business-specific banking details.
4. **Business\_Types** – Stores types of businesses (LLC, Partnership, etc.).

## ****Structures:****

## ****1. Core Account Management****

### ****1.1 Accounts****

Stores account details.

* account\_id **(UUID, PK)** – Unique account identifier.
* account\_number **(VARCHAR(20), UNIQUE, NOT NULL)** – Account number.
* account\_type\_id **(UUID, FK -> Account\_Types)** – Type of account.
* balance **(DECIMAL(15,2), NOT NULL, DEFAULT 0.00)** – Account balance.
* status\_id **(UUID, FK -> Account\_Status)** – Account status.
* created\_at **(TIMESTAMP, DEFAULT NOW())** – Account creation date.
* updated\_at **(TIMESTAMP, DEFAULT NOW())** – Last updated time.

### ****1.2 Account\_Types****

Defines types of accounts.

* type\_id **(UUID, PK)** – Unique identifier.
* type\_name **(VARCHAR(50), UNIQUE, NOT NULL)** – Account type (Savings, Checking, etc.).
* description **(TEXT)** – Type description.

### ****1.3 Account\_History****

Tracks changes in account details.

* history\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Reference to the account.
* change\_type **(VARCHAR(50), NOT NULL)** – Type of change (Upgrade, Status Change, etc.).
* previous\_value **(TEXT)** – Old value.
* new\_value **(TEXT)** – New value.
* changed\_at **(TIMESTAMP, DEFAULT NOW())** – When the change was made.

### ****1.4 Account\_Status****

Stores possible account statuses.

* status\_id **(UUID, PK)** – Unique status ID.
* status\_name **(VARCHAR(50), UNIQUE, NOT NULL)** – Status (Active, Blocked, Closed).

## ****2. Transactions & Ledger****

### ****2.1 Transactions****

Stores transaction details.

* transaction\_id **(UUID, PK)** – Unique transaction ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Account involved.
* transaction\_type\_id **(UUID, FK -> Transaction\_Types, NOT NULL)** – Type of transaction.
* amount **(DECIMAL(15,2), NOT NULL)** – Amount involved.
* status\_id **(UUID, FK -> Transaction\_Status)** – Transaction status.
* timestamp **(TIMESTAMP, DEFAULT NOW())** – Transaction time.

### ****2.2 Transaction\_Types****

Defines transaction categories.

* type\_id **(UUID, PK)** – Unique type ID.
* type\_name **(VARCHAR(50), UNIQUE, NOT NULL)** – Type of transaction (Deposit, Withdrawal, etc.).

### ****2.3 Transaction\_Limits****

Stores account-specific transaction limits.

* limit\_id **(UUID, PK)** – Unique limit ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Account reference.
* max\_limit **(DECIMAL(15,2), NOT NULL)** – Maximum allowed transaction limit.

### ****2.4 Ledger****

Stores financial records for compliance.

* ledger\_id **(UUID, PK)** – Unique ledger ID.
* transaction\_id **(UUID, FK -> Transactions, NOT NULL)** – Related transaction.
* ledger\_entry **(TEXT, NOT NULL)** – Description of transaction.

### ****2.5 Transaction\_Status****

Tracks transaction progress.

* status\_id **(UUID, PK)** – Unique status ID.
* status\_name **(VARCHAR(50), UNIQUE, NOT NULL)** – Status (Pending, Success, Failed).

## ****3. Beneficiaries & External Links****

### ****3.1 Beneficiaries****

Stores trusted payees for quick transfers.

* beneficiary\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Owning account.
* beneficiary\_account\_number **(VARCHAR(20), NOT NULL)** – Beneficiary's account number.

### ****3.2 Linked\_Accounts****

Stores linked external bank accounts.

* link\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Owning account.
* external\_bank\_name **(VARCHAR(100), NOT NULL)** – Name of external bank.

## ****4. Security & Compliance****

### ****4.1 Fraud\_Detection****

Logs suspicious transactions.

* fraud\_id **(UUID, PK)** – Unique fraud ID.
* transaction\_id **(UUID, FK -> Transactions, NOT NULL)** – Related transaction.
* fraud\_flag **(BOOLEAN, DEFAULT FALSE)** – Suspicious flag.

### ****4.2 Account\_Logs****

Stores account activity logs.

* log\_id **(UUID, PK)** – Unique log ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Related account.
* log\_detail **(TEXT, NOT NULL)** – Log description.

## ****5. Account Services & Preferences****

### ****5.1 Account\_Notifications****

Stores notification preferences.

* notification\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Related account.
* preference **(VARCHAR(50), NOT NULL)** – Notification type (SMS, Email).

### ****5.2 Auto\_Debit****

Stores auto-debit settings.

* auto\_debit\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Related account.
* debit\_amount **(DECIMAL(15,2), NOT NULL)** – Auto-debit amount.

## ****6. Interest Management****

### ****6.1 Interest\_Rates****

Stores interest rates for different accounts.

* rate\_id **(UUID, PK)** – Unique ID.
* account\_type\_id **(UUID, FK -> Account\_Types, NOT NULL)** – Account type.
* interest\_rate **(DECIMAL(5,2), NOT NULL)** – Interest percentage.

### ****6.2 Interest\_Calculations****

Tracks interest earned.

* calculation\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Related account.
* interest\_earned **(DECIMAL(15,2), NOT NULL)** – Interest amount.

## ****7. Enterprise & Multi-Tenancy****

### ****7.1 Account\_Access****

Allows multi-user access for enterprises.

* access\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Related account.
* user\_id **(UUID, NOT NULL)** – User reference.

### ****7.2 Account\_Roles****

Stores roles for enterprise accounts.

* role\_id **(UUID, PK)** – Unique ID.
* role\_name **(VARCHAR(50), UNIQUE, NOT NULL)** – Role (Owner, Manager, Employee).

### ****7.3 Business\_Accounts****

Stores business-specific banking details.

* business\_id **(UUID, PK)** – Unique ID.
* account\_id **(UUID, FK -> Accounts, NOT NULL)** – Related account.

API

### ****API Endpoints for AccountService (Banking & Payment System)****

I’ll break down the API endpoints per category and also include **API Gateway considerations** at the end.

## ****1️⃣ Core Account Management****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Create Account | POST | /accounts | Create a new account |
| Get Account by ID | GET | /accounts/{id} | Fetch a single account |
| Get All Accounts | GET | /accounts | Fetch all accounts |
| Update Account | PUT | /accounts/{id} | Update account details |
| Delete Account | DELETE | /accounts/{id} | Soft delete an account |
| Deposit Money | POST | /accounts/{id}/deposit | Add money to an account |
| Withdraw Money | POST | /accounts/{id}/withdraw | Withdraw money from an account |
| Transfer Money | POST | /accounts/transfer | Transfer funds between accounts |
| Get Account Balance | GET | /accounts/{id}/balance | Check account balance |
| Get Account History | GET | /accounts/{id}/history | Fetch account history |
| Get All Account Types | GET | /account-types | Fetch all account types |
| Get Account Type by ID | GET | /account-types/{id} | Fetch a specific account type |

✅ **Total APIs: 12**

## ****2️⃣ Transactions & Ledger****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Initiate Transaction | POST | /transactions | Create a new transaction |
| Get Transaction by ID | GET | /transactions/{id} | Fetch transaction details |
| Get All Transactions | GET | /transactions | Fetch all transactions |
| Update Transaction | PUT | /transactions/{id} | Update transaction status |
| Cancel Transaction | DELETE | /transactions/{id} | Cancel a pending transaction |
| Get Transaction Status | GET | /transactions/{id}/status | Get status of a transaction |
| Get All Transaction Types | GET | /transaction-types | Fetch all transaction types |
| Get Transaction Limits | GET | /transaction-limits/{accountId} | Fetch limits for an account |
| Get Ledger Records | GET | /ledger | Fetch all ledger entries |

✅ **Total APIs: 9**

## ****3️⃣ Beneficiaries & External Links****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Add Beneficiary | POST | /beneficiaries | Add a new payee |
| Get Beneficiaries | GET | /beneficiaries/{accountId} | Fetch payees for an account |
| Remove Beneficiary | DELETE | /beneficiaries/{id} | Remove a payee |
| Link External Account | POST | /linked-accounts | Link an external bank account |
| Get Linked Accounts | GET | /linked-accounts/{accountId} | Fetch linked accounts |

✅ **Total APIs: 5**

## ****4️⃣ Security & Compliance****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Report Fraud | POST | /fraud-detection | Log suspicious activity |
| Get Fraud Cases | GET | /fraud-detection | Fetch all fraud cases |
| Freeze Account | POST | /accounts/{id}/freeze | Freeze an account |
| Unfreeze Account | POST | /accounts/{id}/unfreeze | Unfreeze an account |
| Get Frozen Accounts | GET | /accounts/frozen | Fetch frozen accounts |
| Get Audit Logs | GET | /audit-logs | Fetch audit logs |

✅ **Total APIs: 6**

## ****5️⃣ Account Services & Preferences****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Set Notification Prefs | POST | /notifications | Set notification settings |
| Get Notification Prefs | GET | /notifications/{accountId} | Get account notifications |
| Enable Auto Debit | POST | /auto-debit | Enable auto debit for bills |
| Get Auto Debit Settings | GET | /auto-debit/{accountId} | Fetch auto debit settings |

✅ **Total APIs: 4**

## ****6️⃣ Interest Management****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Get Interest Rates | GET | /interest-rates | Fetch interest rates |
| Get Interest by Account | GET | /interest-calculations/{accountId} | Fetch interest earned |

✅ **Total APIs: 2**

## ****7️⃣ Enterprise & Multi-Tenancy****

| **API Name** | **Method** | **Endpoint** | **Description** |
| --- | --- | --- | --- |
| Assign Role | POST | /account-access | Assign role to a user |
| Get User Roles | GET | /account-access/{accountId} | Fetch roles assigned to an account |
| Get All Business Types | GET | /business-types | Fetch all business categories |

✅ **Total APIs: 3**

# ****🚀 API Gateway Considerations****

Since this system follows a **microservices architecture**, an **API Gateway** is needed to:

* Route requests to the appropriate microservices.
* Implement authentication & authorization (e.g., JWT, OAuth).
* Perform rate limiting and security checks.
* Aggregate responses from multiple services.

### ****Gateway Routes****

| **Microservice** | **Mapped Prefix** |
| --- | --- |
| **Account Service** | /api/accounts/\*\* |
| **Transaction Service** | /api/transactions/\*\* |
| **Security Service** | /api/security/\*\* |
| **Enterprise Service** | /api/enterprise/\*\* |

# ****📌 Summary of API Count****

| **Category** | **Total APIs** |
| --- | --- |
| Core Account Management | **12** |
| Transactions & Ledger | **9** |
| Beneficiaries & External Links | **5** |
| Security & Compliance | **6** |
| Account Services & Preferences | **4** |
| Interest Management | **2** |
| Enterprise & Multi-Tenancy | **3** |

✅ **Grand Total: ~41 APIs** (Can extend based on business logic)

# ****Next Steps****

1. **Do you need API security details (OAuth2, JWT, API keys)?**
2. **Would you like me to provide a sample application.yml for API Gateway configuration?**
3. **Do you need detailed API request/response structures?** 🚀