SWIFT Integration and Monitoring System

Phase 1:

Phase 1.1: Requirements and Design (11 Points)

1. **System Goal:** The goal of this project is to create a reliable and all-inclusive system for integrating, verifying, and tracking SWIFT (Society for Worldwide Interbank Financial Telecommunication) transactions and associated system operations. The system will offer a **centralized platform** for data integrity, security policy enforcement, SWIFT message processing management, and the creation of thorough audit trails for compliance.
2. **Users:** System administrators, financial analysts, security auditors.
3. **Purpose:** To provide a comprehensive audit trail, ensure data integrity, and facilitate efficient transaction processing and reporting.

Phase 1.2. Functional Requirements (7-10 Points)

1. **Transaction Processing:** The system must record and track financial transactions, including message type, amount, status, and associated details.
2. **Message Validation:** The system must validate messages against predefined rules (schema, MFVR, BIC, currency) and log validation results.
3. **User Activity Logging:** The system must log all user activities, including logins, logouts, and resource access.

4. **Component Tracking:** The system must track system components (software, hardware), their configurations, and statuses.
5. **Alerting:** The system must generate alerts for validation failures and other critical events.
6. **Reporting:** The system must provide reporting capabilities for transactions, validation logs, and user activities.
7. **Access Control:** The system must manage user access to resources based on defined permissions.
8. **Error Handling:** The system must log errors and provide detailed error messages.
9. **Correlation:** The system must correlate transactions with their message validation logs.
10. **Currency and BIC Directory:** The system must store information about currencies and BIC codes.

Phase 1.3. Entity Relationship Diagram (ERD) (Minimum 6 Entities)

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Phase 2:

Phase 2.1: Database Implementation and Queries (19 Points)

Data Definition Language | Data Manipulation Language

Phase 2.2. DQL Instructions (10 Queries, 17 Points):

Instructions

Entity-Relationship Diagram (database schema)

DomainName
- id — integer — PK
- DomainNa — varchar2(255)

ColorCode
- id — integer — PK
- ColorCod — varchar2(10)

Note: Red, Green, Yellow

Direction
- id — integer — PK
- Directio — varchar2(8)

Note: Inbound, Outbound

Status
- id — integer — PK
- Statu — varchar2(20)

Note: Processing, Completed, Error

Correlation_Repository
- id — integer — PK
- Transaction_id — integer — FK
- Timestamp — timestamp
- MessageDeta — varchar2(255)
- DomainName_id — integer — FK
- Direction_id — integer — FK
- ColorCode_id — integer — FK
- Status_id — integer — FK

EventType_Transaction
- id — integer — PK
- EventTy — varchar2(255)

Transaction_Alert
- id — integer — PK
- Type — varchar2(255)
- Timestamp — timestamp
- Resolved — integer
- System_Log_ — integer
- EventType_Transaction_id — integer — FK

Note: Resolved: 0 - yes; 1 - no

Transaction_Status
- id — integer — PK
- TransactionStat — varchar2(20)

Currency
- id — integer — PK
- Currenc — varchar2(3)

Transaction_Log
- id — integer — PK
- Timestamp — timestamp
- Error_Message_Code — integer — FK
- Transaction_id — integer — FK
- EventType_Transaction_id — integer — FK

Transaction
- id — integer — PK
- Timestamp — timestamp
- Amount — number(20,2)
- Message_Types_id — integer — FK
- Currency_id — integer — FK
- Transaction_Status_id — integer — FK
- Details — varchar2(255)

Message_Type
- id — integer — PK
- MessageType_id — integer — FK
- IsMX — integer

Note: IsMX: 0 - yes; 1 - no

Role
- id — integer — PK
- RuleType — varchar2(50)
- RuleDescripti — varchar2(255)
- RuleExpressi — varchar2(255)

Note: RuleType -- e.g., MFVR, Custom, BICPlusIBAN; RuleExpression -- e.g., Regular expression, SQL

XSD_Schemas
- id — integer — PK
- SchemaName — varchar2(255)
- TargetNamesp — varchar2(255)
- FilePath — varchar2(255)
- Description — varchar2(255)
- Version — varchar2(20)
- Message_Type_ — integer — FK

Note: SchemaName -- e.g., swift.if.ia_setr.001.001.02; TargetNamespace -- e.g., urn:swift:xsd:swift.if.iaSsetr.001.001.02; FilePath -- Path to the XSD file

Category
- id — integer — PK
- Catego — varchar2(18)

All_MessageType
- id — integer — PK
- MessageType — varchar2(10)
- Category_id — integer — FK
- Description — varchar2(255)
- StandardVersion — varchar2(20)
- DocumentationL — varchar2(255)

Message_Validation_Rule
- id — integer — PK
- Message_Types_id — integer — FK
- Role_id — integer — FK

ReceiverBIC
- BIC_Directory_BIC — varchar2(11) — PK FK
- SWIFT_Transactions_ — integer — PK FK

SenderBIC
- BIC_Directory_BIC — varchar2(11) — PK FK
- Transactions_id — integer — PK FK

Message_Validation_Log
- id — integer — PK
- Timestamp — timestamp
- Error_Message_Code — integer — FK
- Message_Validation_Rule_id — integer — FK
- EventType_Massage_id — integer — FK

EventType_Massage
- id — integer — PK
- EventTy — varchar2(255)

Message_Validation_Alert
- id — integer — PK
- Type — varchar2(255)
- Timestamp — timestamp
- Resolved — integer
- Message_Validation_Log_id — integer — FK

Note: Resolved: 0 - yes; 1 - no

BIC_Directory
- BIC — varchar2(11) — PK
- InstitutionName — varchar2(255) — N
- Country — varchar2(2) — N

User_BIC
- BIC_Directory_BI — varchar2(11) — PK FK
- Users_id — int — PK FK

User_Log
- id — integer — PK
- Timestamp — timestamp
- EventType — varchar2(255)
- Error_Message_Co — integer — FK
- User_id — int — FK
- EventType_User_id — integer — FK

User
- id — int — PK
- Userna — varchar2(255)
- Role — varchar2(255)

Error_Message
- Code — integer — PK
- Message — varchar2(255)
- Severity_id — integer
- Description — varchar2(255)
- Source_Component — integer — FK
- Component_id — integer — FK

Component
- id — integer — PK
- Name — varchar2(255)
- Type — varchar2(255)
- Description — varchar2(255)
- Version — varchar2(150)
- Vendor — varchar2(255)
- InstallationD — date
- LastUpdated — date
- Configuratio — xmltype

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