

Phase 7: Integration & External Access – Student Management System

Goal of This Phase

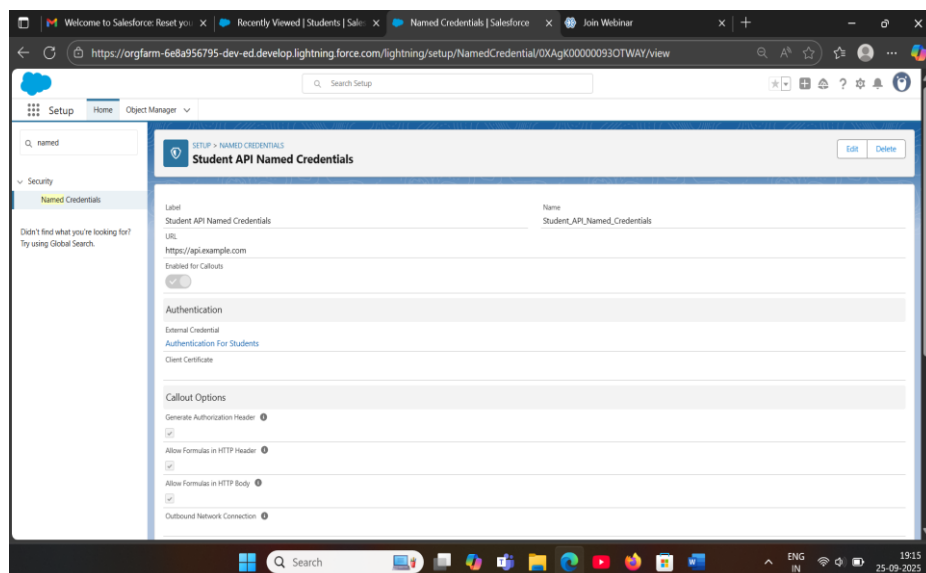
The primary goal of this phase was to enable **seamless data exchange and interaction** between Salesforce and external systems.

This ensures that the Student Management System can:

- Synchronize student data with other platforms (ERP, Learning Systems, etc.)
- Trigger real-time updates when changes happen inside Salesforce.
- Provide secure and reliable API endpoints for external applications.
- Enforce best practices for authentication, callouts, and integration limits.

1. Named Credentials

- **Created Named Credential:** Student_API_Named_Credential
- Configured with:
 - Base URL of the external Student API.
 - Authentication type (if required – basic or OAuth).
- Purpose: Simplified authentication and callout management without exposing credentials in Apex code.



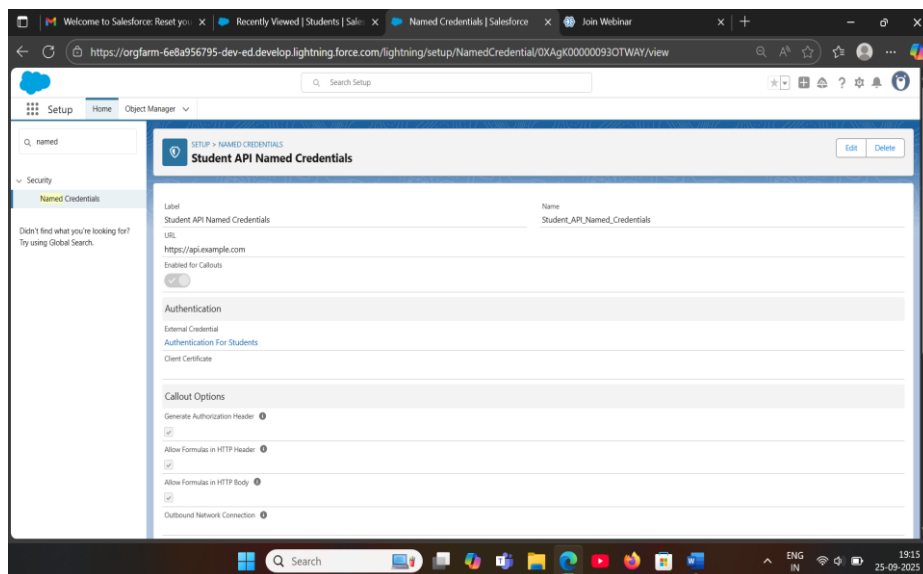
2. External Services

- **Registered External Schema:** Connected to the external Student REST API using the schema definition.

- Auto-generated Apex classes for:
 - Fetching student details.
 - Creating or updating student records externally.
- Purpose: Allow declarative integration (Flow & Apex) without manually writing callout code.

3. Web Services (REST/SOAP)

- **Developed REST Apex Class:** StudentRESTService
- Exposed endpoints:
 - /students → Create or update student records.
 - /students/{id} → Fetch student details by Student_ID__c.
- Added proper authentication and exception handling.
- Purpose: Allow external systems to push and pull student data securely.

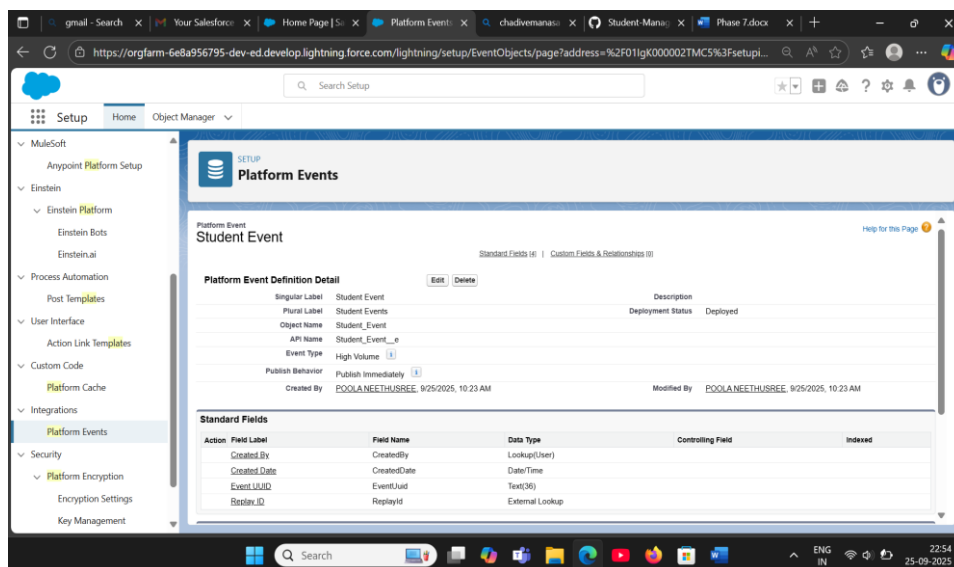


4. Callouts

- **Created Apex Callout Class:** CalloutExample
- Added test class with HttpCalloutMock to enable test coverage.
- Verified callout works with Remote Site Settings and Named Credentials.
- Purpose: Send student updates from Salesforce to external systems when a record is created or updated.

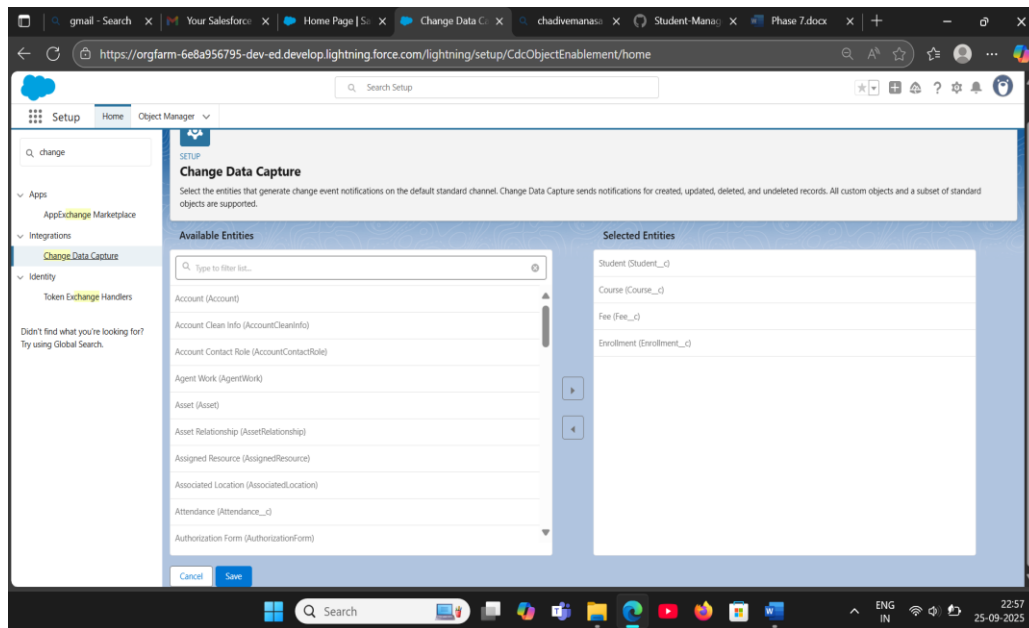
5. Platform Events

- **Created Platform Event:** Student_Event__e
- Custom Fields:
 - Student_ID__c (Text)
 - First_Name__c (Text)
 - Last_Name__c (Text)
 - Course_Program__c (Text)
 - Grade_Marks__c (Text)
 - Semester__c (Number)
 - Status__c (Checkbox)
 - Timestamp__c (Date/Time)
- Purpose: Publish student data changes to subscribers (internal or external) in real time.



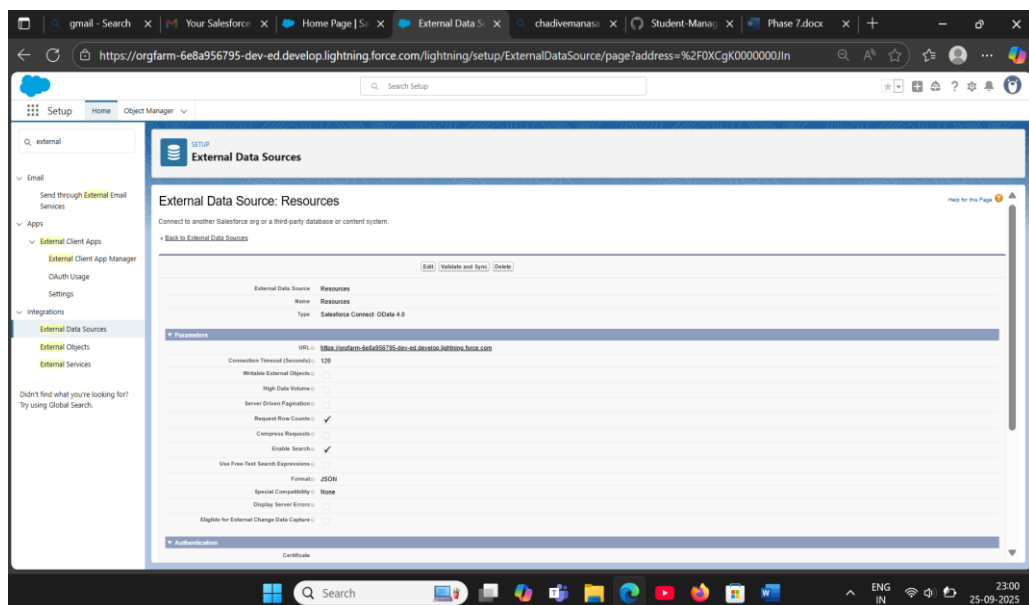
6. Change Data Capture (CDC)

- **Enabled CDC for Student__c object**
- **Created Apex Trigger:** StudentChangeTrigger
 - Logs change type, changed fields, and commit timestamp.
 - Takes action when Grade_Marks__c is updated.
- Purpose: Monitor and respond to changes in real time without writing complex logic.



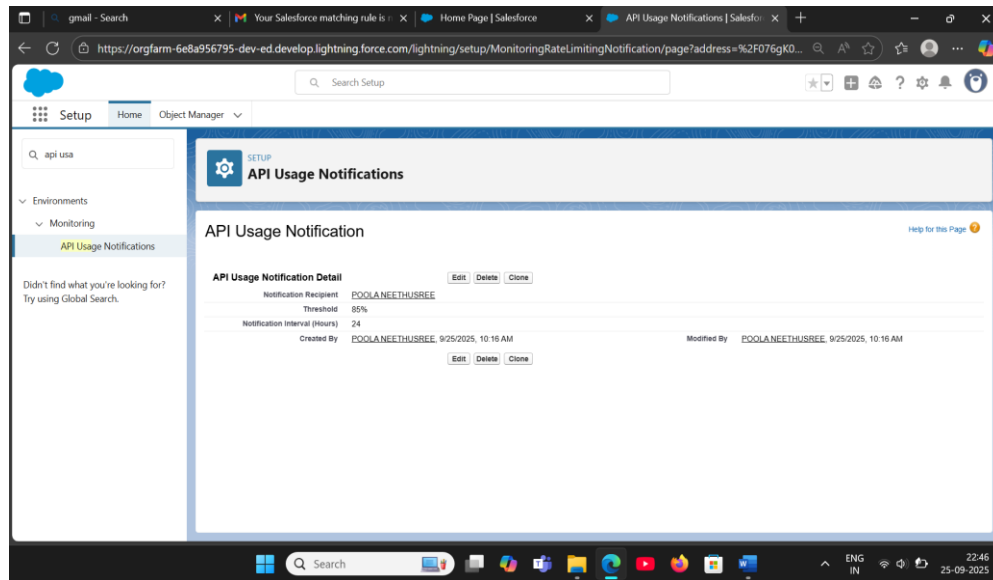
7. Salesforce Connect

- Configured **External Object** (Student_External__x) to display external student data within Salesforce.
- Verified CRUD operations (read-only or writable depending on requirement).
- Purpose: Provide a unified view of external student records directly in Salesforce UI.



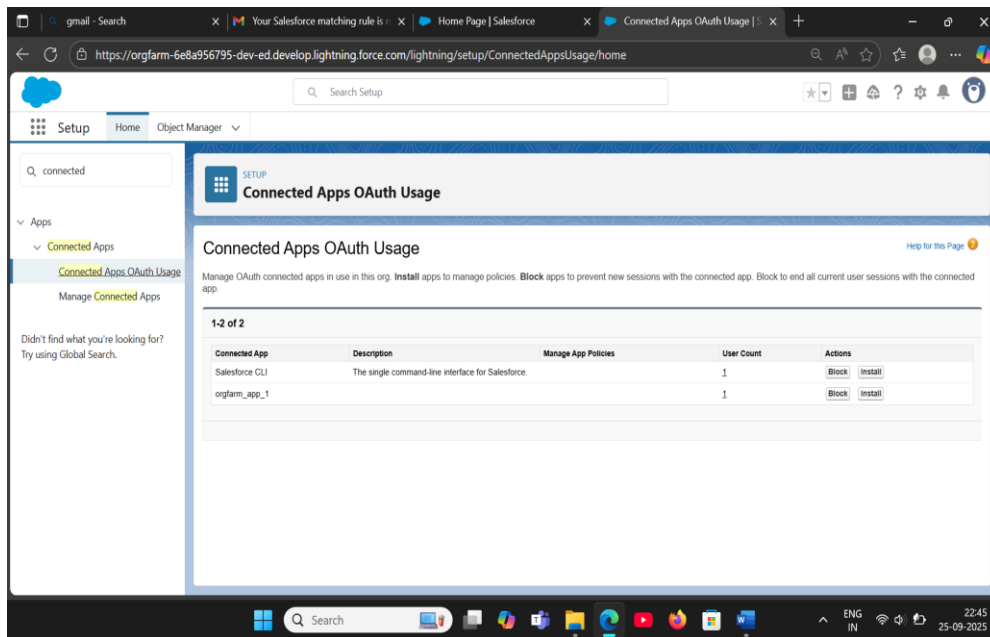
8. API Limits

- Enabled **API Usage Notifications** to alert when API usage reaches 75% and 90%.
- Monitored API calls through **System Overview** and **Reports**.
- Purpose: Prevent API over-consumption and avoid service interruptions.



9. OAuth & Authentication

- **Created Connected App:** StudentManagementIntegration
- Configured OAuth scopes:
 - Full Access (full)
 - Perform requests on your behalf at any time (refresh_token, offline_access)
- Assigned profiles/permission sets.
- Tested authentication using Postman and verified in **Connected Apps OAuth Usage**.
- Purpose: Securely allow external applications to authenticate and integrate.



10. Remote Site Settings

- **Created Remote Site:** Student_API_Remote_Site
- Added base URL of external API to allow callouts.
- Purpose: Ensure Salesforce can make HTTPS callouts to the external Student API.

