Phase 7: Integration & External Access – Institute Management System
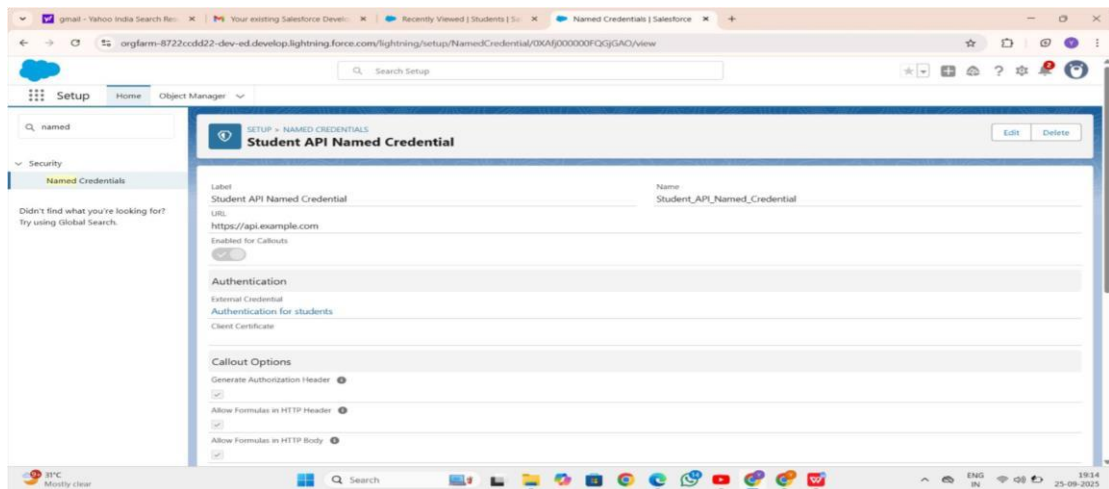
Goal of This Phase

The primary goal of this phase was to enable **seamless data exchange and interaction** between Salesforce and external systems.
This ensures that the Institute 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.
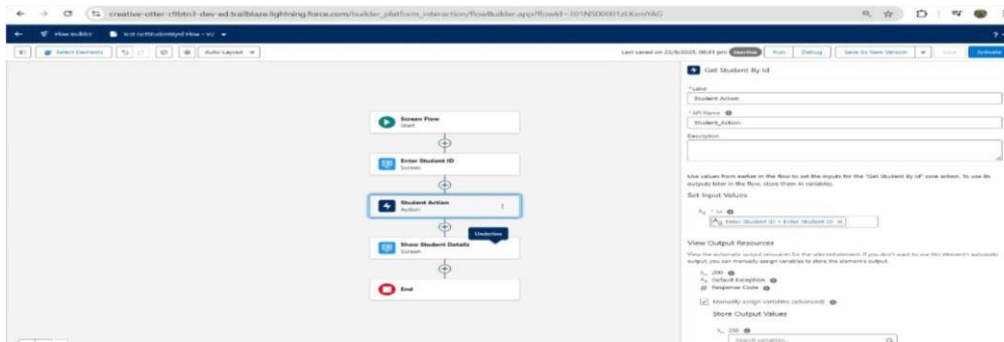
1. Named Credentials

- **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.
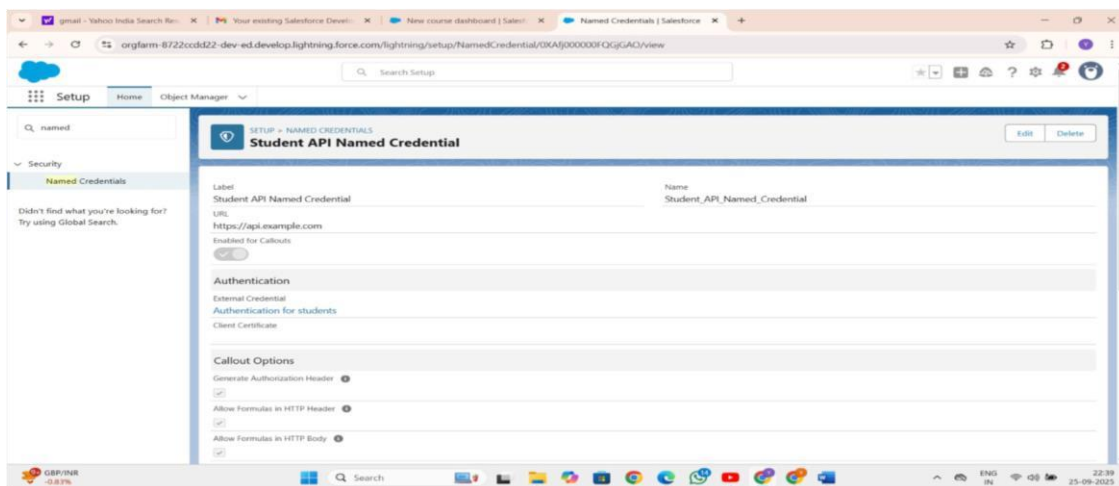

2. External Services

- **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

- Student_ID__c.

- Added proper authentication and exception handling.

- Purpose: Allow external systems to push and pull student data securely.
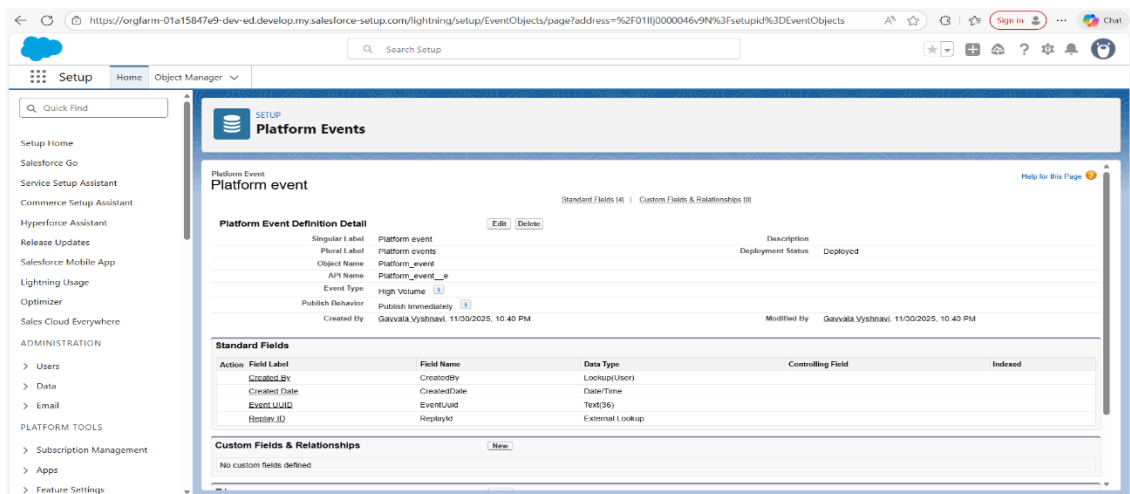
4. Callouts

- Create 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.
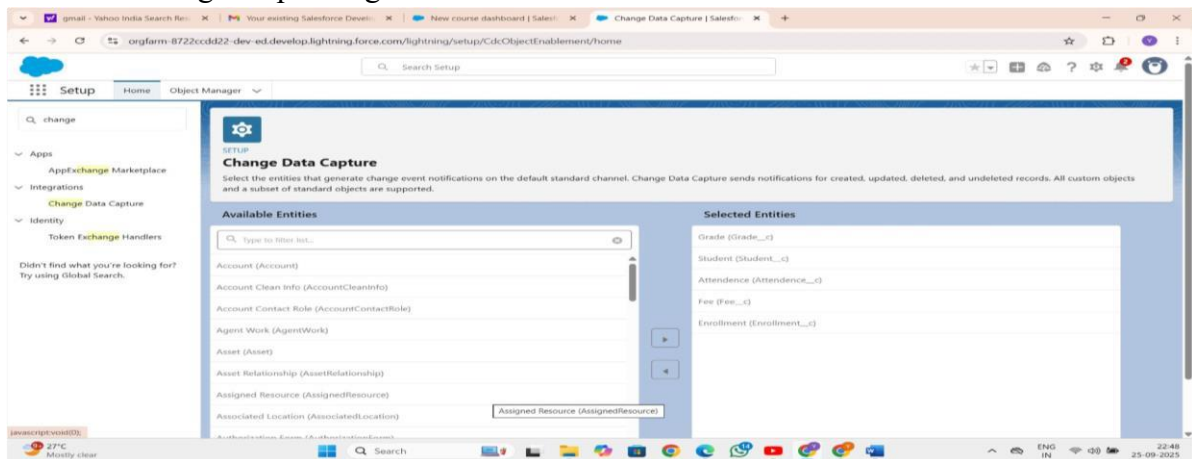
5. Platform Events

- **Created Platform Event:** Student_Event__e

- **Custom Fields:**

  o Student_ID__c (Text) o

  First_Name__c (Text) o

  Last_Name__c (Text) o

  Course_Program__c (Text) o

  Grade_Marks__c (Text) o

  Semester__c (Number) o

  Status__c (Checkbox) o

  Timestamp__c (Date/Time)

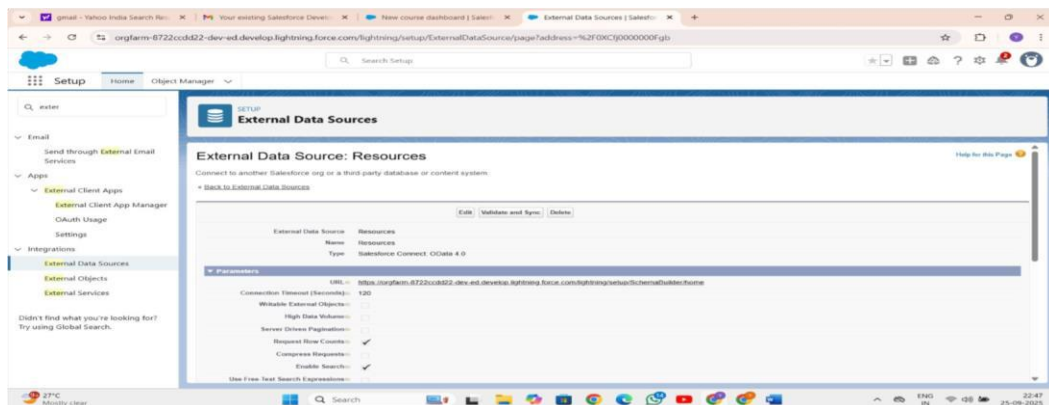- Purpose: Publish student data changes to subscribers (internal or external) in real time.

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.
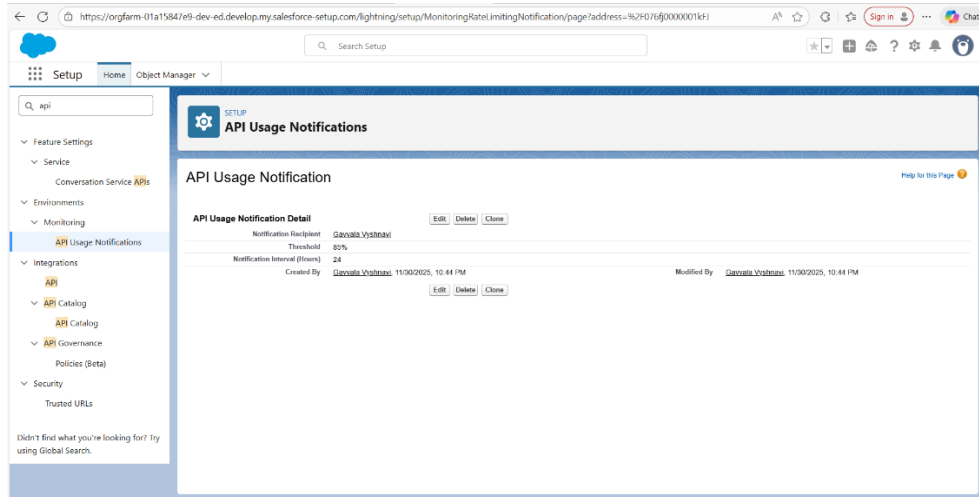

7. Salesforce Connect

- 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.
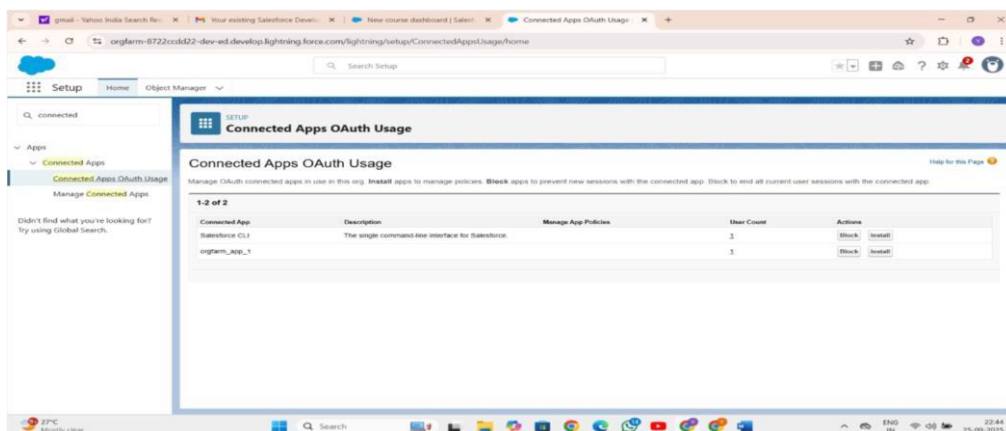
8. API Limits

- 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:** InstituteManagementIntegration
- Configured OAuth scopes: o Full Access (full) o 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.