INSTITUTE MANAGEMENT SYSTEM

Phase 7: Integration and external access

Goal: Connect the Institute Management System with external systems (payment gateways, university systems, library DBs, analytics) in a secure, maintainable way. Below are step-by-step instructions, configuration clicks, and small code examples you can copy into your org.

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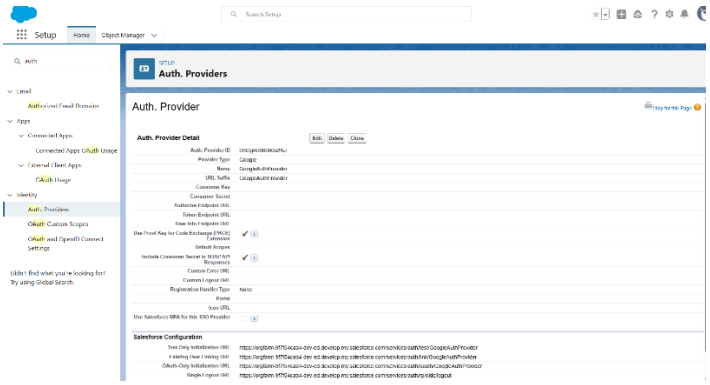
1) Named Credential — store external API credentials securely

Why: avoid hard-coding endpoints/credentials; simplifies callouts and OAuth.

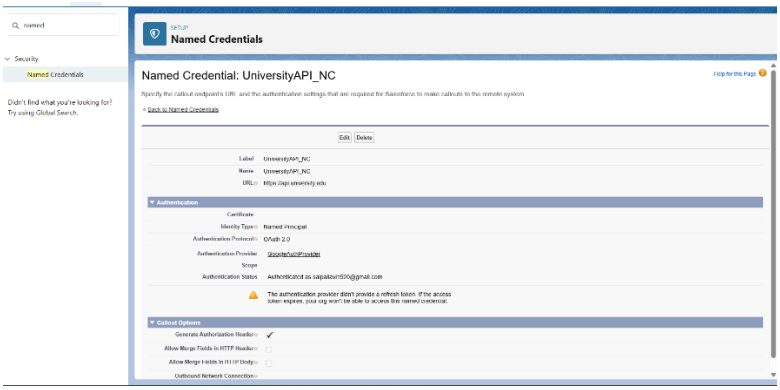
Steps

1. If using OAuth: create an Auth. Provider first
    - Setup → Auth. Providers → New → choose provider (Google, OpenID Connect, etc.) → fill client id/secret → Save.



2. Setup → Named Credentials → New Named Credential.
    - Label / Name: UniversityAPI_NC
    - URL: https://api.university.example (base)
    - Identity Type: *Named Principal* (or *Per User* if required)
    - Authentication Protocol: *OAuth 2.0* (pick Auth. Provider) or *Password Authentication*
    - Save.

Usage: Apex callouts use callout:UniversityAPI_NC/endpoint/path.



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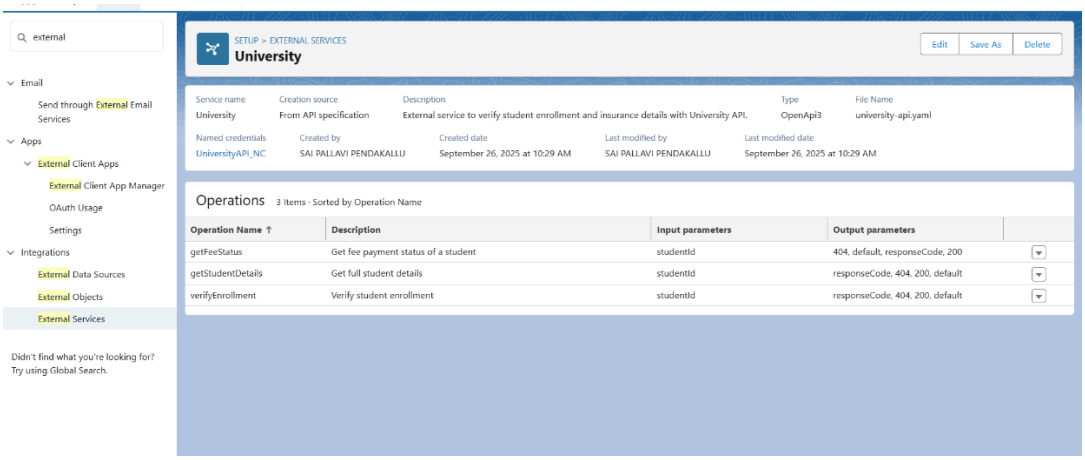
2) External Services — connect OpenAPI (no code flows)

Why: expose external REST endpoints as Actions in Flow/Process Builder without hand-coding.

Steps

1. Get an OpenAPI (Swagger) JSON/YAML for the external API.
2. Setup → External Services → New External Service.
    - Provide Named Credential (created above) and upload the OpenAPI spec.
3. Once registered, the External Service actions appear in Flow as Apex Actions — you can drag them into a Flow and call external operations.



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3) Web Services (REST/SOAP) callouts from Apex

Why: verify insurance, call payment gateway, sync student data.

Steps

1. Create Named Credential (preferred) or Remote Site Setting.
2. Write Apex that uses HttpRequest + Http and points to callout:Named_Credential/....

Apex example (REST using Named Credential):

```
public with sharing class ExternalIntegration {
  @future(callout=true)
  public static void notifyEnrollment(Id enrollmentId) {
    Enrollment__c e = [SELECT Id, Student__r.Email__c, Course__r.Course_Name__c, Enrollment_Status__c
                       FROM Enrollment__c WHERE Id = :enrollmentId LIMIT 1];
    HttpRequest req = new HttpRequest();
    req.setEndpoint('callout:UniversityAPI_NC/v1/enrollments'); // Named Credential
    req.setMethod('POST');
    req.setHeader('Content-Type','application/json');
    req.setBody(JSON.serialize(new Map<String, Object>{
      'enrollmentId' => e.Id,
      'studentEmail' => e.Student__r.Email__c,
      'course' => e.Course__r.Course_Name__c,
      'status' => e.Enrollment_Status__c
    }));
    Http http = new Http();
    HttpResponse res = http.send(req);
    // handle res.getStatusCode() / body
  }
}
```

Testing: implement HttpCalloutMock and use Test.setMock(...) in test classes.

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4) Callouts triggered when records change

Why: notify external systems immediately when relevant IMS records change.

Steps

1. Create a trigger on the Salesforce object (e.g., Enrollment__c AFTER insert/after update).
2. In trigger handler, decide when to notify (e.g., status changed).

3. Enqueue an async job that performs callout (@future(callout=true) or Queueable implementing Database.AllowsCallouts).

I've already implemented that in **Phase 3–4** with your **Fee Payment Trigger + Enrollment Trigger** calling the async Apex (@future) methods.

Why it's sufficient:

- The triggers detect **insert/update events**.
- They only call the external system when the **status changes** (Enrollment_Status__c or Status__c = 'Paid').
- The async Apex (@future(callout=true) or Queueable) handles the actual REST call.

✅ No extra steps are needed for this, because the logic is already **event-driven** and **bulk-safe**, fulfilling the requirement of callouts triggered by record changes.

5.Creation of Platform events

Step 1: Create the Platform Event

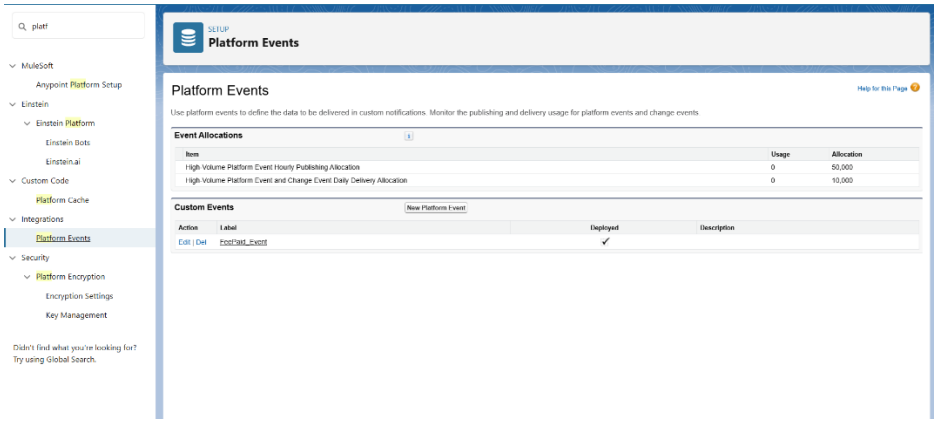
1. Go to **Setup → Platform Events → New Platform Event**.
2. Fill in the details:
    - **Label**: FeePaid_Event
    - **Plural Label**: FeePaid_Events
    - **API Name**: FeePaid_Event__e
    - **Publish Behavior**: Publish Immediately (so events are available as soon as saved)
3. Click **Save**.

Step 2: Add Fields to the Platform Event

Create fields to capture the information you want to send:

1. **EnrollmentId__c → Text** (18)
2. **StudentEmail__c → Email**
3. **FeeAmount__c → Number**
4. **Status__c → Text**

Click **Save** after adding all fields.



6) Change Data Capture (CDC)

- **Reason:** Overhead unless you have **large-scale external data sync** (like nightly export of *every change* to a data warehouse).
- IMS is usually transactional → Platform Events are enough.

7) Salesforce Connect

- **Reason:** Only needed if **major data (like student master data or course catalog)** lives in an external DB (e.g., Oracle, SAP, university ERP).
- If IMS data is **all inside Salesforce**, ❌ no need.