



Phase 7: Integration & External Access – CampusConnect

Goal: Connect CampusConnect with external systems for automated student verification, course sync, at-risk notifications, and secure API access.

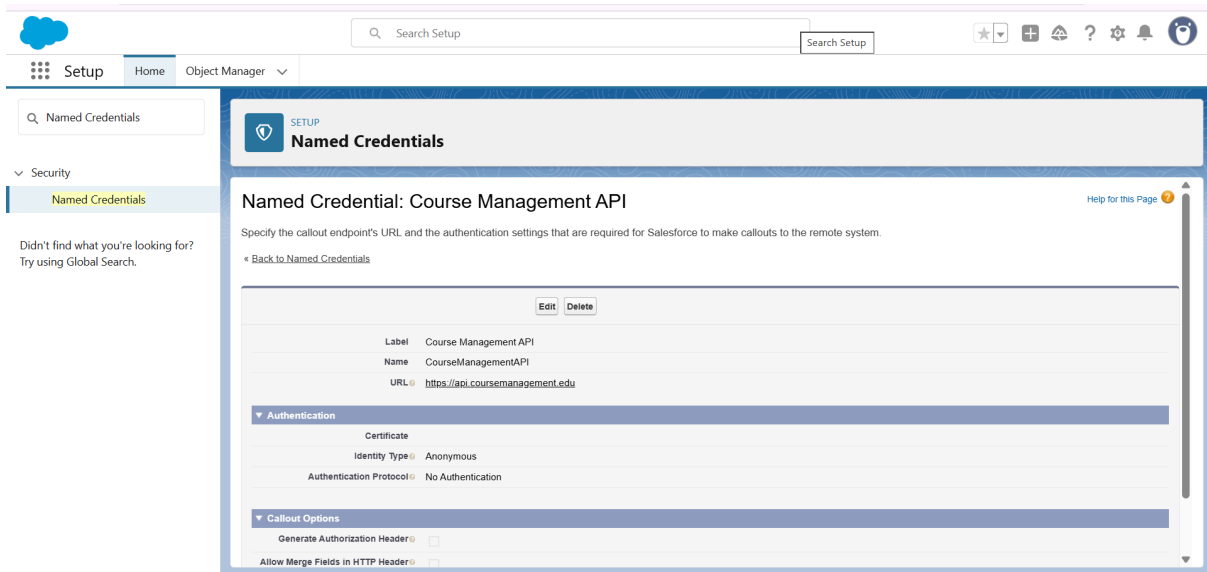
1 Named Credentials & Security

Purpose: Store external API credentials securely for REST/SOAP callouts.

Named Credential	Purpose	Setup Location	Notes / Verification
StudentVerification API	Verify student identity	Setup → Named Credentials	Check endpoint, authentication type, and test callout.
CourseManagementAPI	Sync course data	Setup → Named Credentials	Verify authentication and endpoint.
CampusConnect_External_API	OAuth for external portal	Setup → App Manager → Connected Apps	Verify OAuth scopes, callback URL, Consumer Key & Secret.

Visual Reference: Screenshot of **Named Credentials** page showing StudentVerificationAPI and CourseManagementAPI.

The screenshot displays the Salesforce Setup interface for Named Credentials. The left sidebar shows the navigation menu with 'Setup' selected. The main content area is titled 'Named Credentials' and shows the configuration for a specific Named Credential named 'Student Verification API'. The configuration includes fields for Label, Name, and URL. The Authentication section is expanded, showing Certificate as the authentication type, Per User as the identity type, and No Authentication as the authentication protocol. The Callout Options section is also expanded, showing checkboxes for Generate Authorization Header and Allow Merge Fields in HTTP Header.

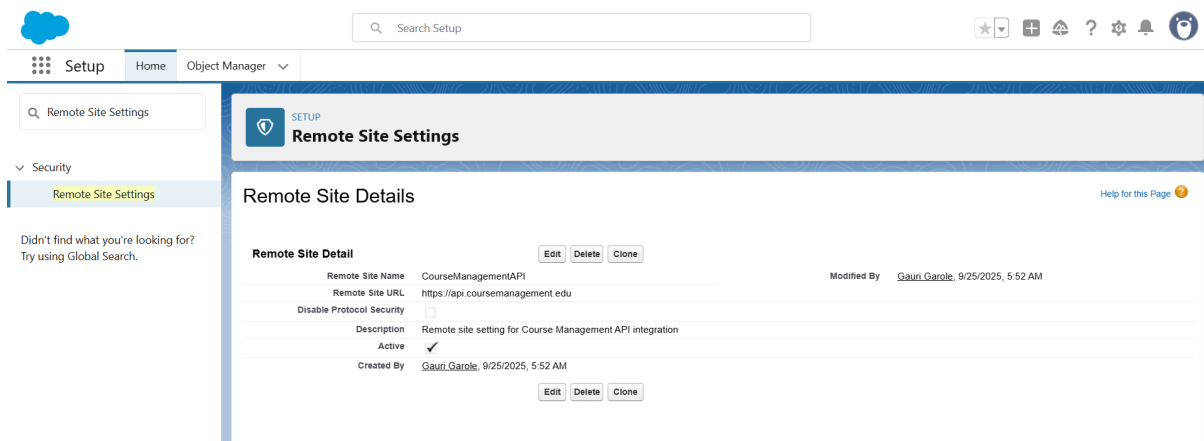


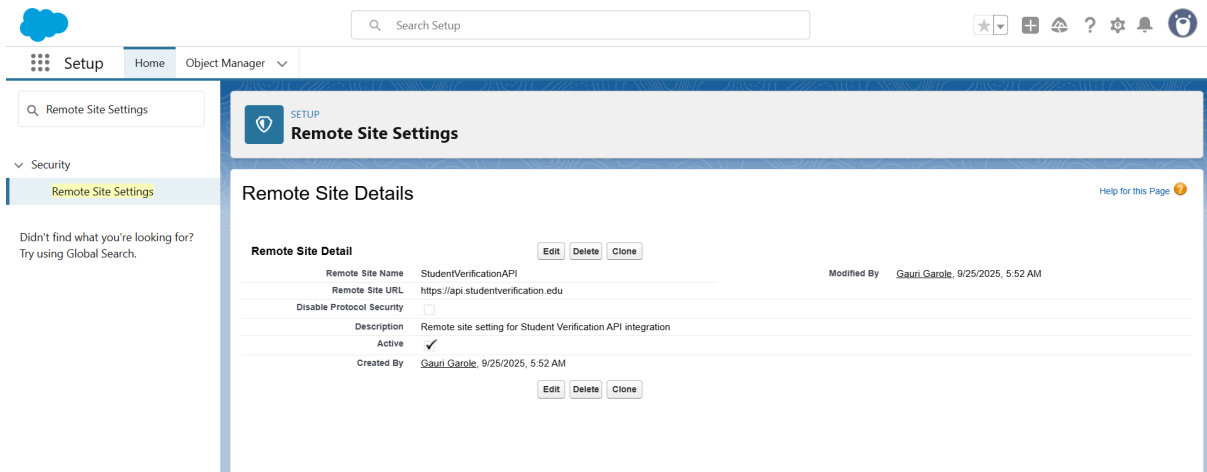
2 Remote Site Settings

Purpose: Authorize Salesforce to make callouts to external domains.

Remote Site	Purpose	Setup Location	Notes / Verification
StudentVerificationAPI	Student verification endpoint	Setup → Remote Site Settings	Active, URL matches Named Credential.
CourseManagementAPI	Course API endpoint	Setup → Remote Site Settings	Active, URL matches Named Credential.

Visual Reference: Screenshot of Remote Site Settings with domains active.



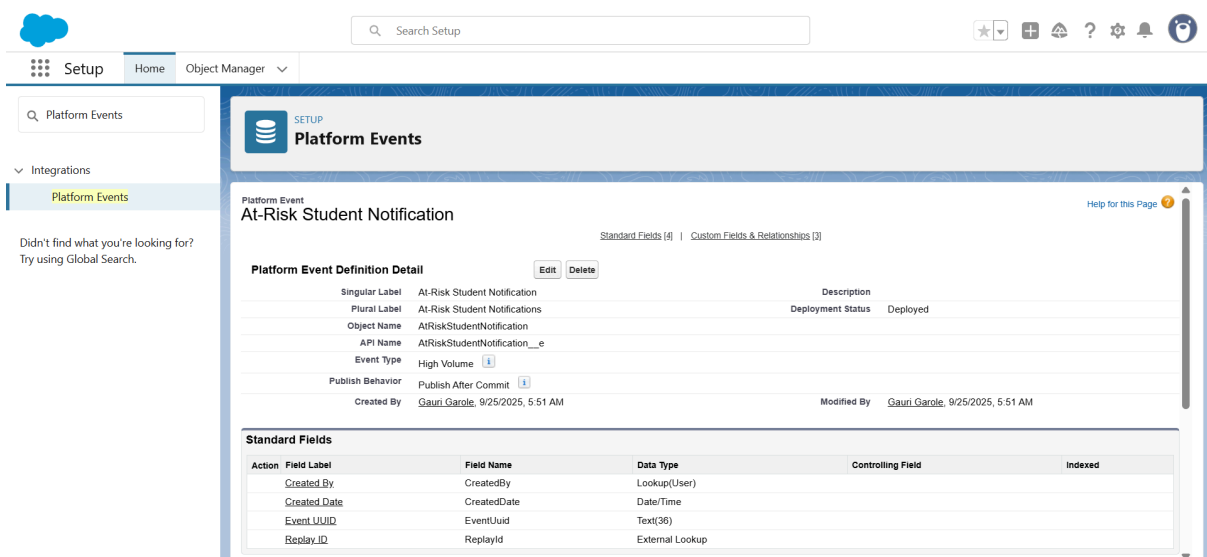


3 Platform Events

Purpose: Notify external systems or internal subscribers about at-risk students.

Platform Event	Fields	Setup Location	Notes / Verification
AtRiskStudentNotification__e	StudentId__c, RiskLevel__c, AttendancePercentage__c	Setup → Platform Events	Test event publishing via Developer Console.

Visual Reference: Screenshot of AtRiskStudentNotification__e in Setup.



4 REST Callout Services

Purpose: Handle async communication with external systems.

Apex Class	Purpose	Notes / Verification
<code>StudentVerificationService.cls</code>	Async student verification & course sync	Test with new Student record → External_Verification_Status__c updates.
<code>AtRiskStudentEventPublisher.cls</code>	Publish Platform Events	Verify events published when attendance changes trigger at-risk evaluation.
<code>ExternalSystemNotifier.cls</code>	Handle Change Data Capture events	Update Student or Event record → verify notifications are processed.

Visual Reference: Screenshot of Apex Classes in Setup → StudentVerificationService.cls, AtRiskStudentEventPublisher.cls.

The screenshot displays the Salesforce Setup interface. The left sidebar shows the navigation menu with 'Setup' selected. The main content area is titled 'Apex Classes' and shows the details for the class 'AtRiskStudentEventPublisher'. The class is in the 'AtRiskStudentEventPublisher' namespace, created by 'Gauri Garole' on 9/25/2025 at 5:52 AM. The class is active and has 0% code coverage. The 'Class Body' tab is selected, showing the following code:

```
1 public with sharing class AtRiskStudentEventPublisher {
2
3     public static void publishAtRiskNotification(String studentId, String riskLevel, Decimal attendancePercentage) {
4         AtRiskStudentNotification__e event = new AtRiskStudentNotification__e(
5             StudentId__c = studentId,
6             RiskLevel__c = riskLevel,
7             AttendancePercentage__c = attendancePercentage
8         );
9     }
10
11     Database.SaveResult result = EventBus.publish(event);
12
13     if (result.isSuccess()) {
14         System.debug('Failed to publish at-risk student event: ' + result.getErrors());
15     } else {
16         System.debug('Successfully published at-risk student event for: ' + studentId);
17     }
18 }
```

The screenshot shows the Salesforce Setup interface. In the left sidebar, 'Apex Classes' is selected under 'Custom Code'. The main content area displays the 'Apex Class Detail' for 'StudentVerificationService'. The class is in the 'StudentVerificationService' namespace, created by 'Gauri.Garole' on 9/25/2025 at 5:52 AM. The status is 'Active' with 0% code coverage. The 'Class Body' tab is active, showing the following code:

```

1 public with sharing class StudentVerificationService {
2
3     @future(callout=true)
4     public static void verifyStudentAsync(String studentId, String email, String studentNumber) {
5         try {
6             HttpRequest req = new HttpRequest();
7             req.setEndpoint('callout:StudentVerificationAPI/verify');
8             req.setMethod('POST');
9             req.setHeader('Content-Type', 'application/json');
10
11             Map<String, Object> requestBody = new Map<String, Object>{
12                 'studentId' => studentId,
13                 'email' => email,
14                 'studentNumber' => studentNumber,
15                 'source' => 'CampusConnect'
16             };
17         }
18     }
19 }

```

5 Integration Triggers

Purpose: Automate API calls and Platform Event publishing.

Trigger	Purpose	Notes / Verification
<code>StudentIntegrationTrigger.trigger</code>	Auto-verify new students	Create new Student record → verify External_Verification fields updated.
<code>AttendanceIntegrationTrigger.trigger</code>	Risk evaluation on attendance	Update Attendance__c → Platform Event triggered.

Visual Reference: Screenshot of Triggers in Setup → StudentIntegrationTrigger.trigger.

6 API Monitoring

Purpose: Track API usage and prevent overages.

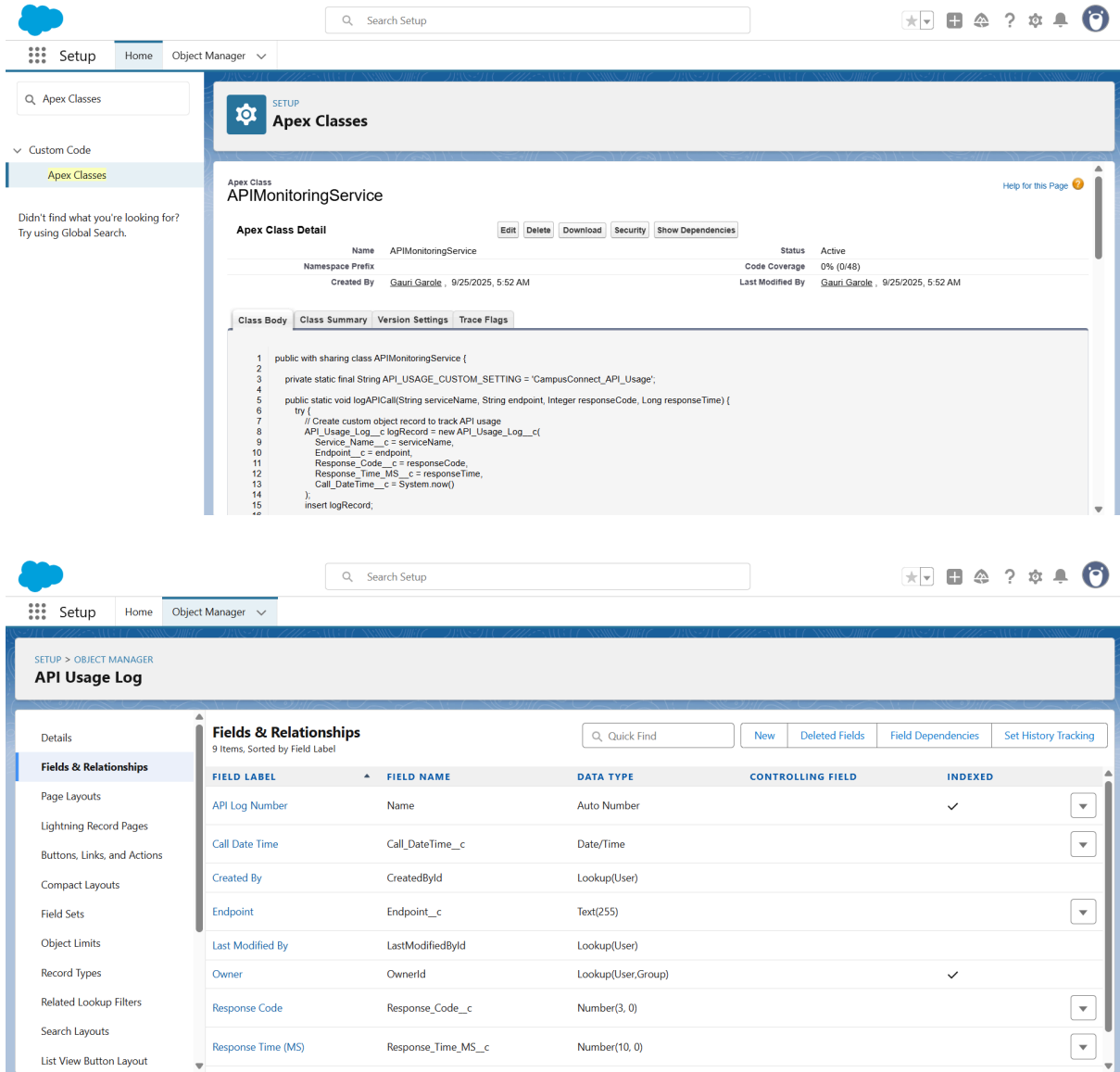
Object / Class	Purpose	Setup Location / Notes
<code>APIMonitoringService.cls</code>	Tracks usage, limits, warnings	Apex class verifies call counts and thresholds.

API_Usage_Log_c

Logs all API calls

Fields: Service Name, Endpoint, Response Code, Response Time, Call DateTime. Test by making callouts.

Visual Reference: Screenshot of API_Usage_Log__c records showing logged API calls.



7 Change Data Capture (CDC)

Purpose: Notify external systems of real-time record changes.

CDC Event

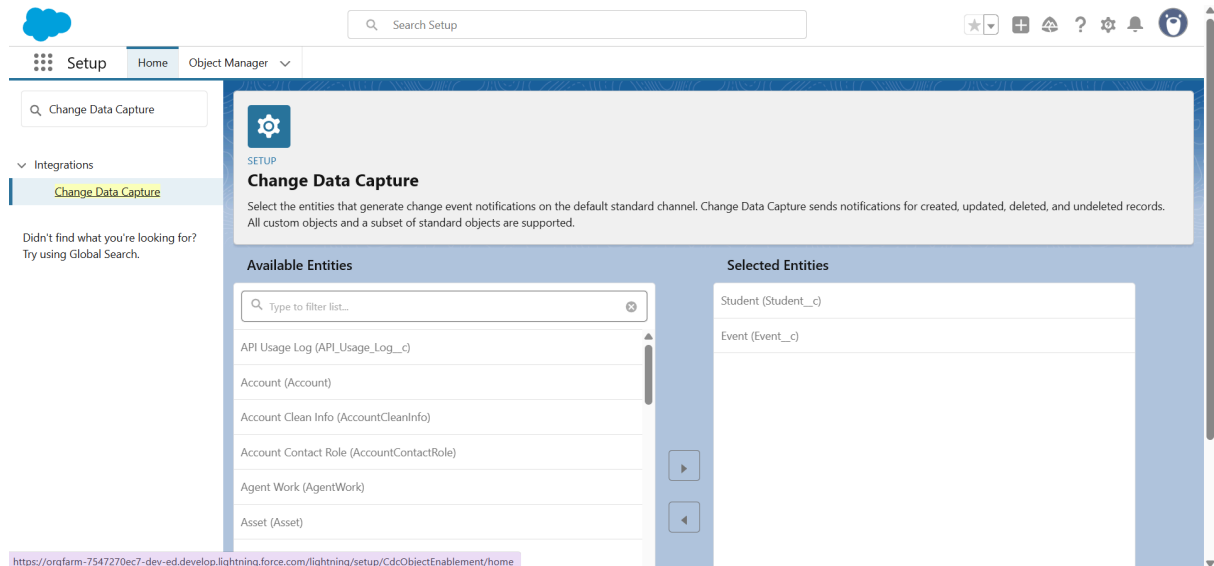
Object

Setup Location

Notes / Verification

StudentChangeEvent	Student__c	Setup → Change Data Capture	Update student → verify subscriber processes event.
EventChangeEvent	Event__c	Setup → Change Data Capture	Update event → external system notified.

Visual Reference: Screenshot of CDC setup for StudentChangeEvent.



8 Enhanced Object Fields

Object	Field	Purpose	Notes / Verification
Student__c	External_Verification_Status__c	Shows verification result	Updated via API callout
Student__c	External_Verification_Date__c	Last verification date	Updated automatically
Course__c	External_Course_Code__c	Sync with external course ID	Updated via API callout
Course__c	External_Credits__c	External course credits	Verified via sync
Course__c	External_Sync_Date__c	Last sync date	Updated automatically

SETUP > OBJECT MANAGER

Student

Details

Fields & Relationships
11 Items, Sorted by Field Label

Q Quick Find New Deleted Fields Field Dependencies Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Attendance %	Attendance_Percentage__c	Percent(3, 2)		
Created By	CreatedById	Lookup(User)		
External Verification Date	External_Verification_Date__c	Date/Time		
External Verification Status	External_Verification_Status__c	Picklist		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Roll No	Roll_No__c	Text(20)		
Status	Status__c	Picklist		

SETUP > OBJECT MANAGER

Course

Details

Fields & Relationships
12 Items, Sorted by Field Label

Q Quick Find New Deleted Fields Field Dependencies Set History Tracking

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedById	Lookup(User)		
Credits	Credits__c	Number(2, 0)		
External Course Code	External_Course_Code__c	Text(50) (External ID)		✓
External Credits	External_Credits__c	Number(2, 1)		
External Sync Date	External_Sync_Date__c	Date/Time		
Faculty	Faculty__c	Lookup(Faculty)		✓
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓

Phase 7 Conclusion – Integration & External Access

Phase 7 of CampusConnect successfully established secure, real-time integration with external systems. All components—including Named Credentials, Remote Site Settings, Connected Apps, Platform Events, REST Callouts, Integration Triggers, API Monitoring, Change Data Capture, and enhanced object fields—are deployed and fully functional.

The system now supports:

- **Automated student verification** via external APIs
- **Attendance-based at-risk detection** with real-time notifications

- **Course data synchronization** with external management systems
- **API usage monitoring** with limits and logging
- **Secure OAuth access** for external portals

This phase ensures that CampusConnect can interact reliably and securely with outside systems while maintaining full visibility, traceability, and compliance with Salesforce best practices.