Project Overview – *Agentic AI DevOps Automation with ServiceNow Integration*

1. Project Overview

You are tasked with building an agentic AI system in the form of a FastAPI microservice that integrates with the ServiceNow platform via REST API. This system processes free-form IT service requests, generates incident records in ServiceNow, and executes intelligent agent flows to either remediate the problem automatically or await manual approval before execution.

Core Workflow Summary

* On receiving a request, the system creates a new ServiceNow incident via the Table API (incident table).
* If require\_approval: false:  
  → the full agentic remediation flow is triggered immediately, and the system updates the incident with results.
* If require\_approval: true:  
  → the system pauses after incident creation and responds with: "The incident has been reported. Awaiting approval before initiating automation."
* Admin can then choose to:
  + POST /plans/{id}/approve: Approve the plan and trigger agents
  + POST /plans/{id}/reject: Reject the automation and mark the incident for manual resolution

2. Technical Architecture

### API Layer (FastAPI)

| Endpoint | Functionality |
| --- | --- |
| POST /api/v1/execute | Submit a new request (create incident + trigger/await) |
| POST /api/v1/plans/{id}/approve | Approve a plan and start agentic automation |
| POST /api/v1/plans/{id}/reject | Reject the plan; no automation is performed |
| GET /api/v1/tasks/{id} | Query task (incident) status and updates |

## 3. Agent & Flow Logic

The system consists of modular AI agents coordinated via **LangGraph**, supporting approval-based workflows.

| Agent | Purpose |
| --- | --- |
| **CoordinatorAgent** | Parses user requests and orchestrates the agentic flow |
| **DiagnosticAgent** | Performs root-cause analysis using prompt-based reasoning |
| **AutomationAgent** | Generates & validates remediation scripts (PowerShell/Bash/CLI) |
| **WriterAgent** | Drafts human-readable summaries, emails, and SOPs |
| **IncidentReportAgent** | Handles ServiceNow REST API logic: create/update/query incidents |

4. Flow Logic (Approval-Driven Execution)

| Approval Required | ServiceNow Incident | Agentic Flow | System Response |
| --- | --- | --- | --- |
| false | Created immediately | Triggered | Diagnosis, script, summary, incident updated |
| true | Created immediately | Paused | "Awaiting approval" message |
| POST /approve | Updated with logs | Triggered | Results posted to incident |
| POST /reject | Marked manually | Skipped | "Incident will be handled manually" message |

5. Advanced Techniques

* ServiceNow REST API integration using the incident table
* LangGraph for execution flow orchestration
* DSPy router for prompt specialization
* MCP context pruner for compact context construction
* Incident sys\_id used as internal task\_id

6. API Flow Examples

Example A – Auto Execution (No Approval)

POST /api/v1/execute

{

"request": "Diagnose high CPU usage on VM-node1 and generate a mitigation script.",

"require\_approval": false

}

Response:

{

"incident\_sys\_id": "abc123",

"status": "resolved",

"diagnosis": "...",

"script": "...",

"email\_draft": "...",

"servicenow\_updated": true

}

Example B – With Approval

POST /api/v1/execute

{

"request": "Limit inbound RDP traffic on production VMs to 10.0.0.0/24",

"require\_approval": true

}

Response:

{

"incident\_sys\_id": "xyz456",

"status": "awaiting\_approval",

"message": "The incident has been reported. Awaiting approval before initiating automation."

}

Then:

curl -X POST /api/v1/plans/xyz456/approve

Triggers flow → updates incident

Rejection Flow:

curl -X POST /api/v1/plans/xyz456/reject

Response:

{

"status": "manual\_intervention\_required",

"message": "The incident was unable to be solved automatically. A service agent will assist you shortly."

}

7. Task Status API (GET /api/v1/tasks/{id})

Returns current status and any updates for a given task/incident.

{

"incident\_sys\_id": "xyz456",

"status": "awaiting\_approval",

"updates": [

"Incident created",

"Waiting for admin approval"

]

}

8. Deliverables

* GitHub repo with modular agent code and ServiceNow integration
* IncidentReportAgent handles all interaction with Now Platform
* FastAPI + LangGraph orchestration
* README + Mermaid diagram + architecture PNG
* Postman or curl API collection
* Screen recording of both flows (auto and approval-based)