High-Level Design Document: Teams Bot - ServiceNow - Rundeck Integration

# 1. Overview

This document describes the high-level design (HLD) for a Microsoft Teams Bot that handles software installation requests, integrates with ServiceNow via an MCP Server, automates installations using Rundeck, and logs all activities in a MySQL database. The bot interacts with users and supervisors through Teams, using Adaptive Cards for selections, approvals, and feedback.

# 2. Goals & Objectives

- Provide an automated workflow for software installation requests via Microsoft Teams.

- Ensure all activities are logged in MySQL for auditing and tracking.

- Use Adaptive Cards to present available software, approval requests, and feedback forms in Teams.

- Integrate with ServiceNow for ticket creation and status updates via MCP Server.

- Automate installations through Rundeck with secure privileged access.

# 3. High-Level Architecture

The architecture involves the following components:  
1. User (Microsoft Teams Client) – Initiates requests and receives updates.  
2. Microsoft Teams – Communication platform hosting the bot.  
3. Teams Bot – Core logic for interpreting requests, interacting with databases, and calling external systems.  
4. MySQL Database – Stores software catalog, request logs, approvals, job status, and feedback.  
5. MCP Server – Middleware that handles communication with ServiceNow.  
6. ServiceNow – Ticketing system for request tracking and approvals.  
7. Supervisor – Approves or rejects installation requests.  
8. Rundeck – Automation server that executes installation scripts.  
9. User's Laptop – Target system for software installation.

# 4. Sequence Diagram

The sequence diagram illustrates the end-to-end workflow:  
1. The user requests software installation in Teams.  
2. The bot queries MySQL for available software and presents options via Adaptive Cards.  
3. The user selects the desired software/version.  
4. The bot logs the request in MySQL, creates a ServiceNow ticket via MCP Server, and stores ticket details.  
5. The bot sends an approval request to the supervisor in Teams.  
6. Once approved, the bot updates the ticket status in ServiceNow and logs the approval.  
7. The bot notifies the user that the software is ready to install.  
8. Upon user acceptance, the bot logs the trigger and instructs Rundeck to execute the installation.  
9. Rundeck connects to the laptop over SSH and runs the installation silently using privileged credentials.  
10. The completion status is logged in MySQL, and ServiceNow is updated.  
11. The bot requests user feedback and updates the ticket based on the response.

A screenshot of a computer

AI-generated content may be incorrect.   
  
 [Sequence Diagram: Software Installation Workflow]

A diagram of a computer system

AI-generated content may be incorrect.

Flow Diagram

# 5. Key Considerations

- All sensitive credentials for SSH and ServiceNow access must be securely stored (e.g., Azure Key Vault).

- MySQL must be optimized for frequent writes and quick reads of the software catalog.

- Adaptive Cards should be dynamically generated based on the software catalog in MySQL.

- The bot must handle failure cases gracefully, including ticket creation failures, approval rejections, or installation errors.

- Rundeck scripts should support idempotent execution to avoid partial installations.