Automated Network Management Using Servicenow

Introduction

In modern enterprise environments, managing network infrastructure manually is inefficient, error-prone, and unable to scale with increasing demand. Automated Network Management (ANM) integrated with ServiceNow provides a streamlined, proactive, and data-driven approach to network operations. This solution leverages ServiceNow's IT Service Management (ITSM) and orchestration capabilities to automate common network tasks, improve incident resolution times, and enhance overall network reliability.

Project Description:

This project aims to design and implement a streamlined, automated solution for managing network-related service requests within ServiceNow. It enables end users to submit requests for network services through a user-friendly self-service portal.

The system leverages ServiceNow's workflow engine, catalog items, and approval processes to ensure requests are properly captured, validated, and routed for fulfillment. Upon submission, requests trigger automated notifications, task assignments, and—where applicable—integration with network automation tools or scripts to fulfill standard requests without manual intervention.

Project Overview

The *Automated Network Request Management* project aims to streamline and automate the handling of network-related service requests within an organization

using **ServiceNow**.

Typical network requests may include:

- New network access provisioning
- VLAN creation/modification
- IP address assignment
- Firewall rule changes
- Network equipment configuration

The project eliminates manual approvals, repetitive updates, and email-based communications by implementing a **ServiceNow-based workflow** that automates:

- Request submission
- Approval routing
- Task assignment to network teams
- Change implementation tracking
- Status notifications to requesters

Background & Problem Statement

In many organizations, network requests are handled through emails, spreadsheets, or ad-hoc ticket systems, leading to:

- Delayed responses due to manual approvals.
- Inconsistent request formats.

- Lack of visibility into request status.
- Errors in configuration changes.

Solution:

Implement a ServiceNow-based automated workflow for network requests that routes, approves, and fulfills tasks seamlessly, reducing human intervention and ensuring compliance.

Objectives

The primary objectives of implementing Automated Network Management with ServiceNow are:

Reduce Mean Time to Resolution (MTTR) for network incidents.

Automate repetitive tasks such as device configuration backups, port resets, and monitoring alerts.

Provide real-time visibility into network health and performance.

Enhance compliance with configuration and security policies.

Improve collaboration between Network Operations Center (NOC) teams and IT support.

Scope

This project covers: Automated Incident Detection – Integrating network monitoring tools (e.g., SolarWinds, Nagios, Cisco DNA Center) with ServiceNow for real-time incident creation.

Automated Remediation – Using ServiceNow workflows and orchestration to

trigger scripts or API calls for common fixes.

Change Management Automation – Auto-generating change requests for network upgrades or configuration changes.

Reporting and Analytics – Dashboards for network KPIs such as uptime, incident trends, and SLA compliance.

Self-Service Portal – End-users can request network services (e.g., VLAN changes, access point resets) via ServiceNow.

System Architecture

Technical Design

Architecture Diagram:

User → ServiceNow Service Catalog → Approval Workflow → Network Tool Integration → CMDB Update → Completion Notification

Key Components:

Network Monitoring Tools – Detect and alert network events.

ServiceNow ITSM – Centralized ticketing, workflow automation, and reporting.

Orchestration Engine – Executes automated remediation scripts via ServiceNow Orchestration or IntegrationHub.

Configuration Management Database (CMDB) – Stores network device inventory and relationships.

APIs and Webhooks – Enable real-time data exchange between monitoring tools

and ServiceNow.

Workflow Example:

Network monitoring tool detects high CPU usage on a core switch.

Alert is sent via webhook/API to ServiceNow.

ServiceNow creates an incident ticket with device details from CMDB.

Automated workflow checks for known issues and runs a remediation script.

If resolved, ticket is automatically closed and a summary is sent to NOC.

If unresolved, ticket is escalated to a network engineer.

Benefits

Proactive Issue Resolution – Problems can be fixed before users notice them.

Reduced Downtime – Faster remediation of network faults.

Operational Efficiency – NOC staff focus on complex tasks instead of repetitive work.

Improved SLA Compliance – Automated escalation ensures timely responses.

Better Data Accuracy – CMDB remains up-to-date with automated discovery.

Security and Compliance

Access Controls – Only authorized personnel can trigger automation workflows.

Audit Trails – All automated changes are logged in ServiceNow.

Policy Enforcement – Automated scripts ensure network configurations comply

with security policies.

Functional Requirements

1. **Service Catalog Forms**
    a. Custom forms for each network request type.
    b. Mandatory fields for request details (e.g., IP range, VLAN ID, rule justification).
2. **Workflow Automation**
    a. Automatic assignment to appropriate network team.
    b. Conditional approvals based on request type.
3. **Integration**
    a. API calls to network tools (e.g., Cisco DNA Center, Infoblox) for automated execution.
    b. Auto-update CMDB entries post-implementation.
4. **Notifications & SLAs**
    a. Email/SMS notifications at each stage.
    b. SLA timers for request handling.

Key Features

1. **Service Catalog Item** – Custom catalog item for “Network Request”

with dynamic fields.

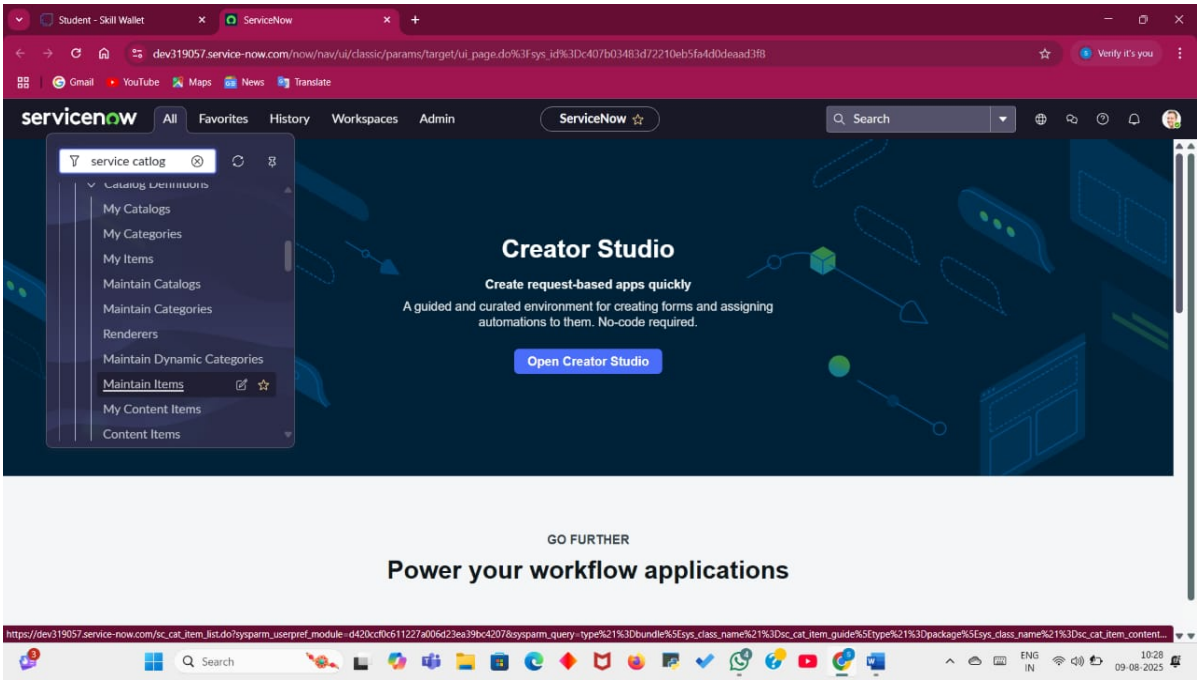
2. **Workflow Automation** – End-to-end automated workflow in ServiceNow Flow Designer.
3. **Approval Chains** – Conditional approvals based on request type, department, or cost.
4. **Integration** – API integration with network automation tools for configuration execution.
5. **Notifications** – Automated email/SMS updates for every stage.
6. **Reporting & Analytics** – SLA performance, request trends, and backlog insights.

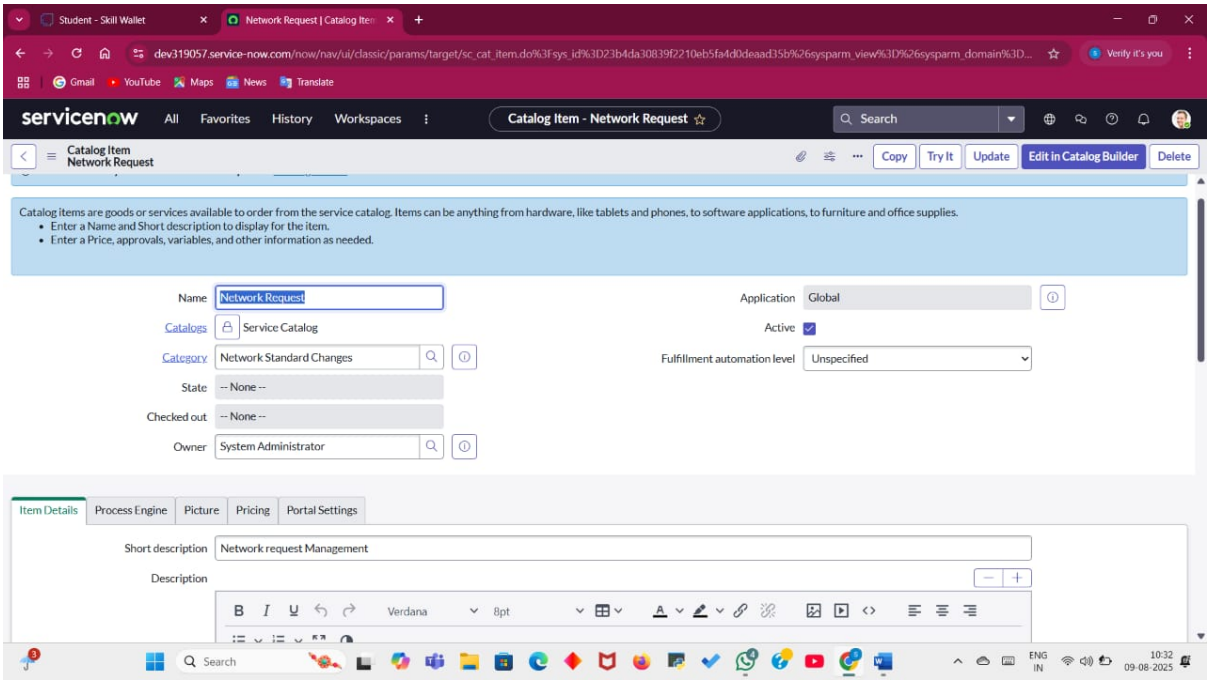
Results

Output Screenshots

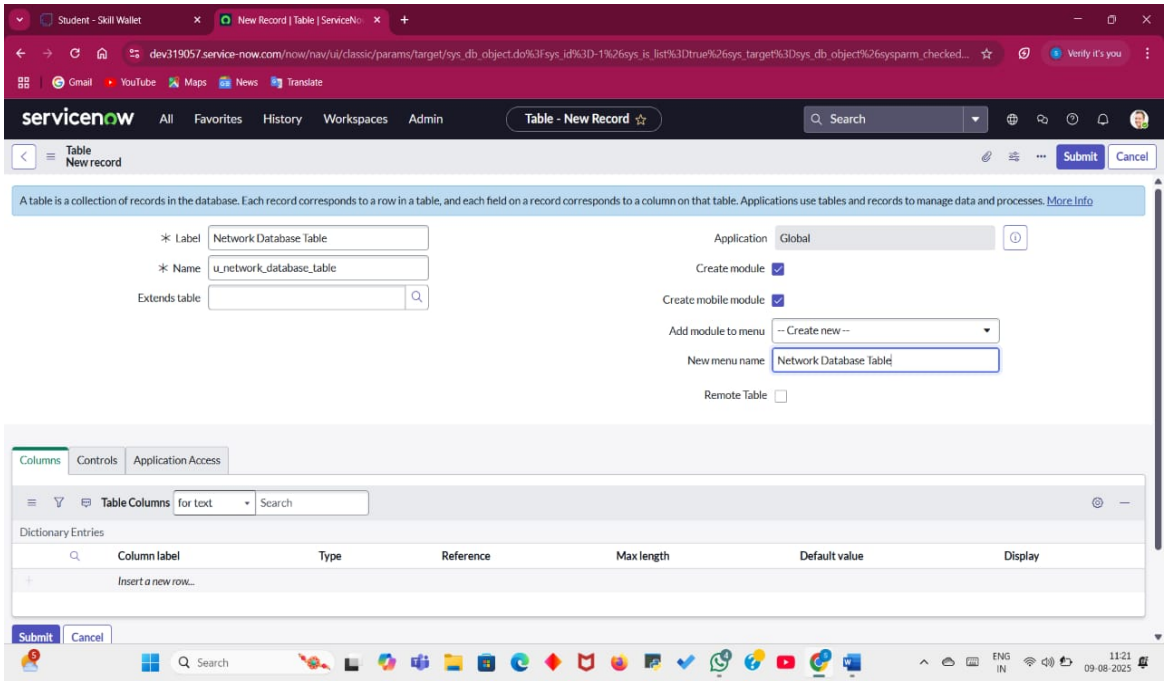
- ServiceNow Catalogue
- Creation of Table
- Request Approvals Creation(Related List)
- Overview of flows,Actions in Flow Designer
- Creation & Implementation of flows, Actions in Flow Designer
- Final Testing in End User portal & Instance

ServiceNow Catalogue

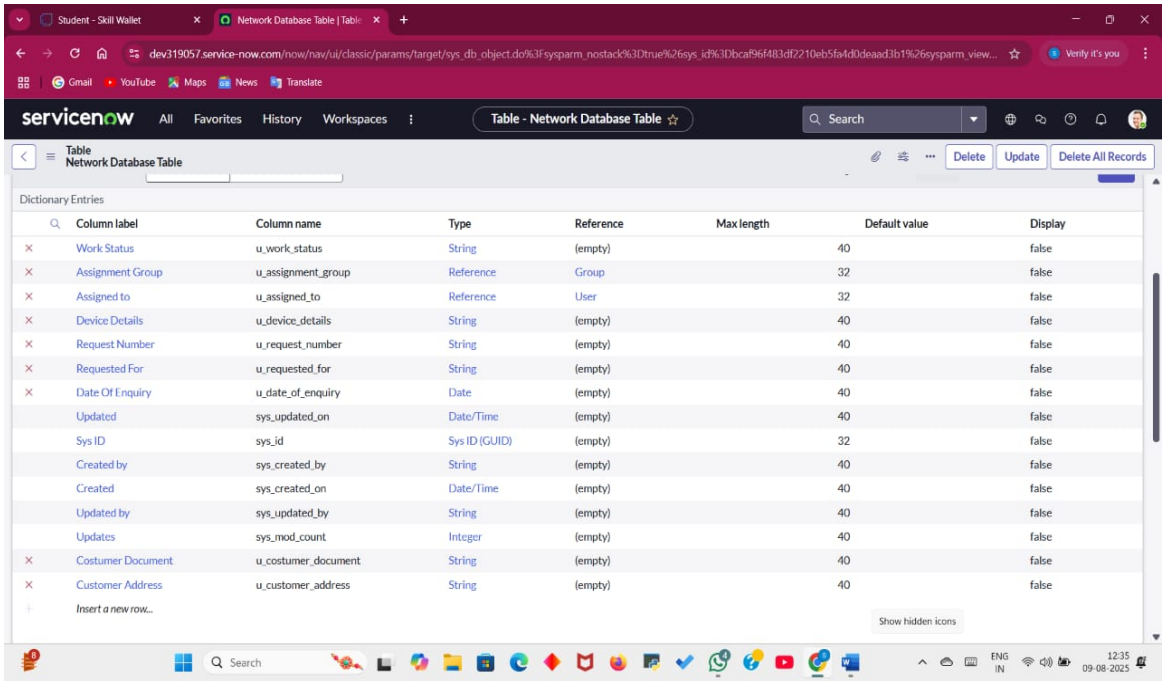




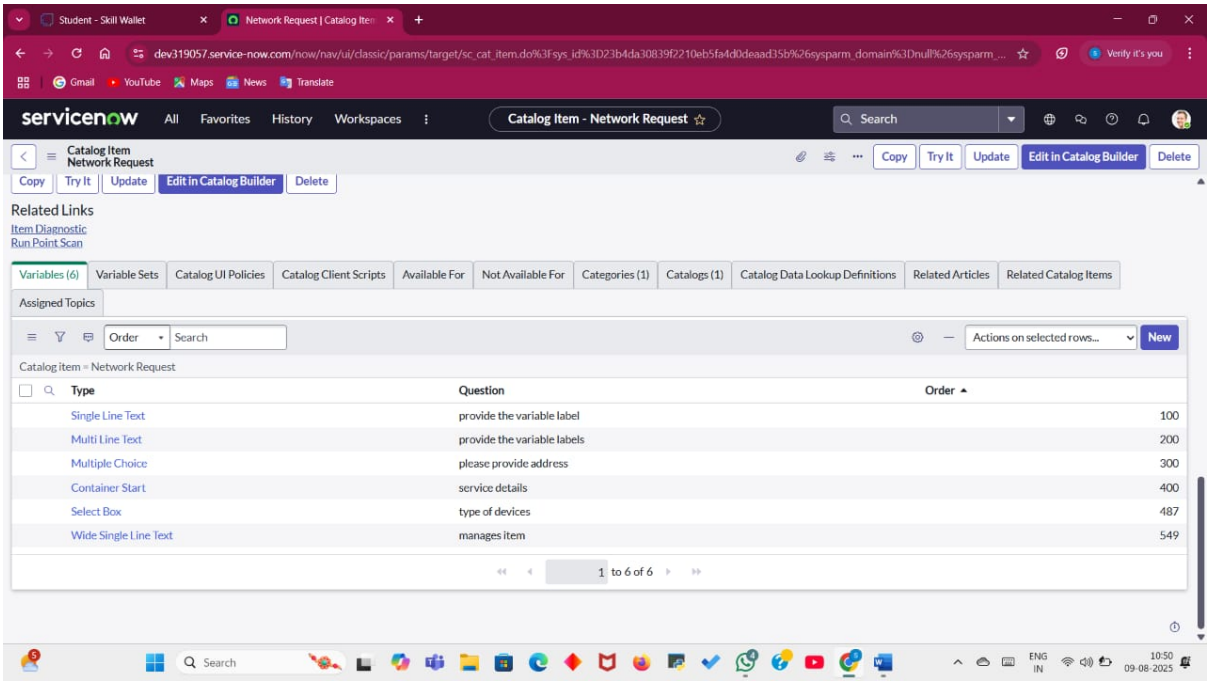
Creation of Table



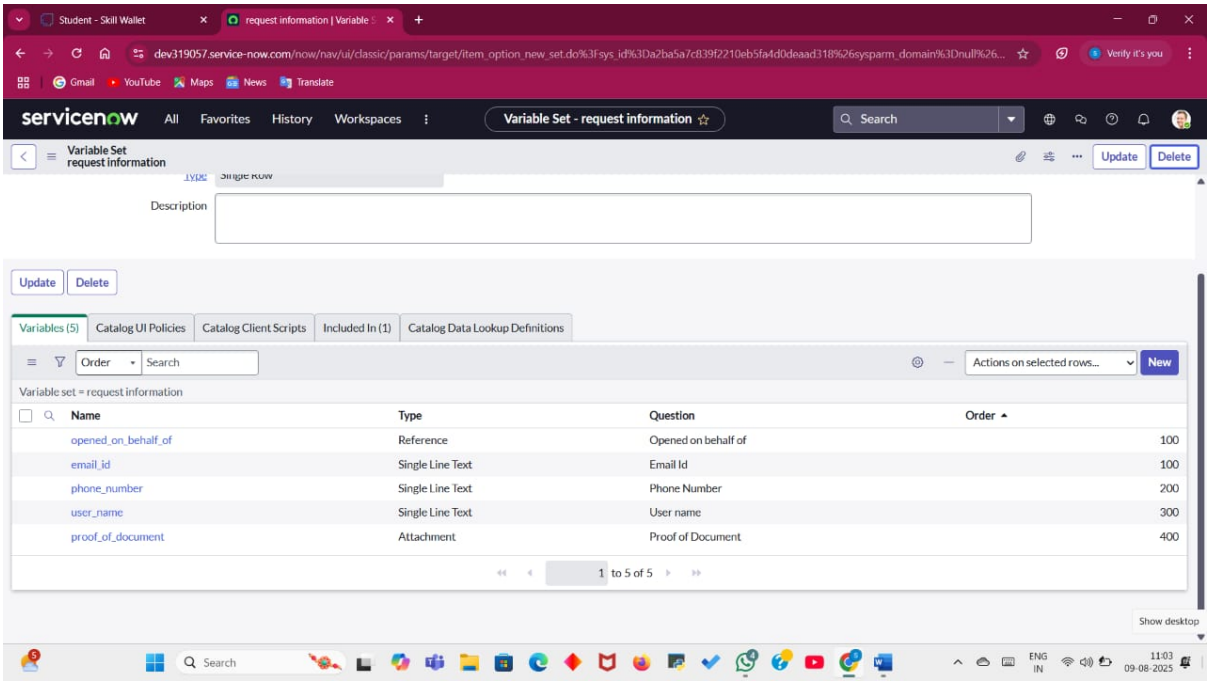
Creation of fields



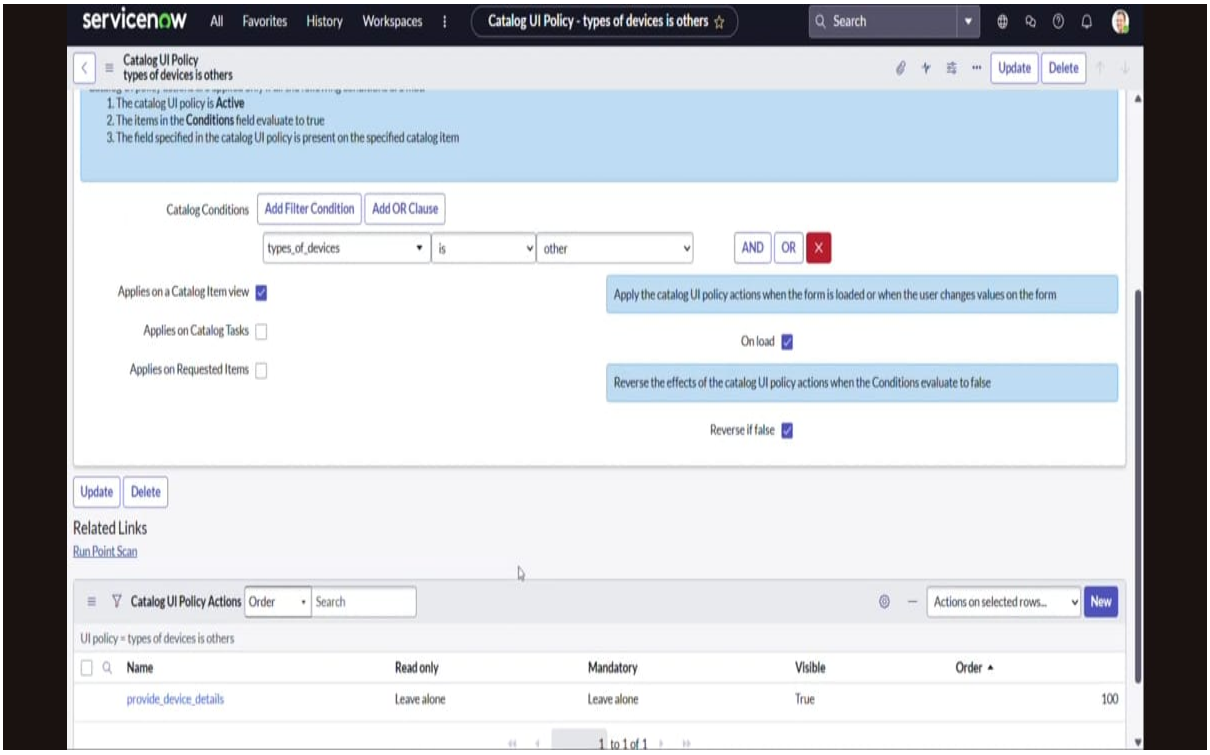
Variables Configuration



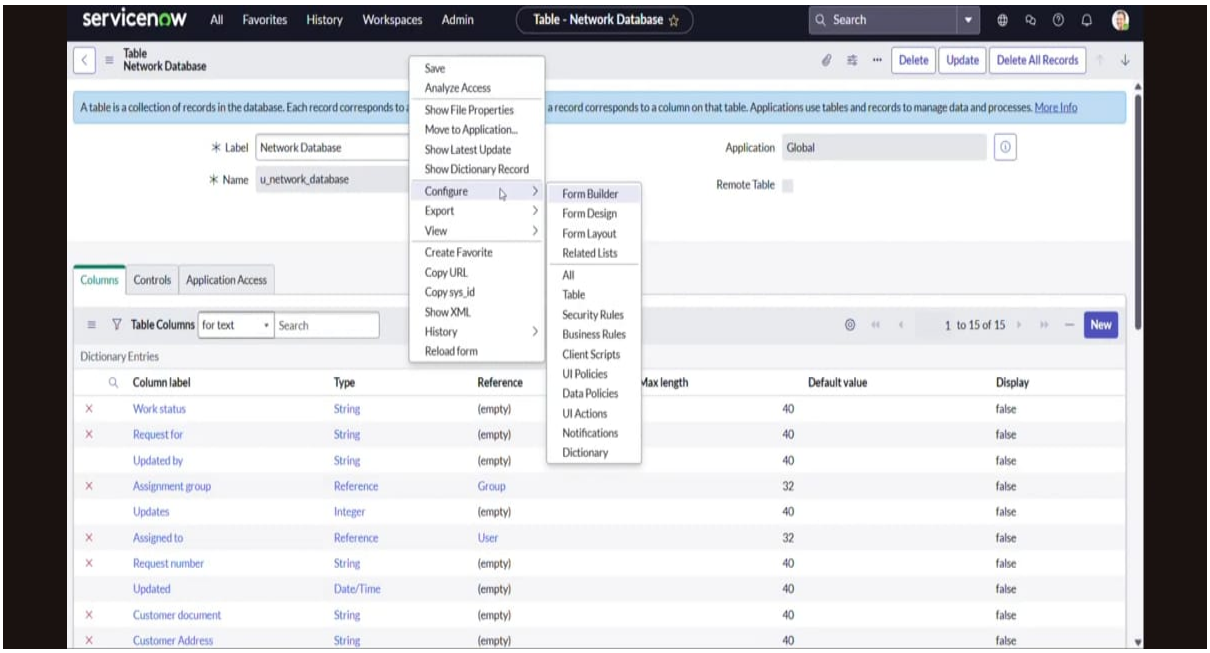
Variable Set Configuration



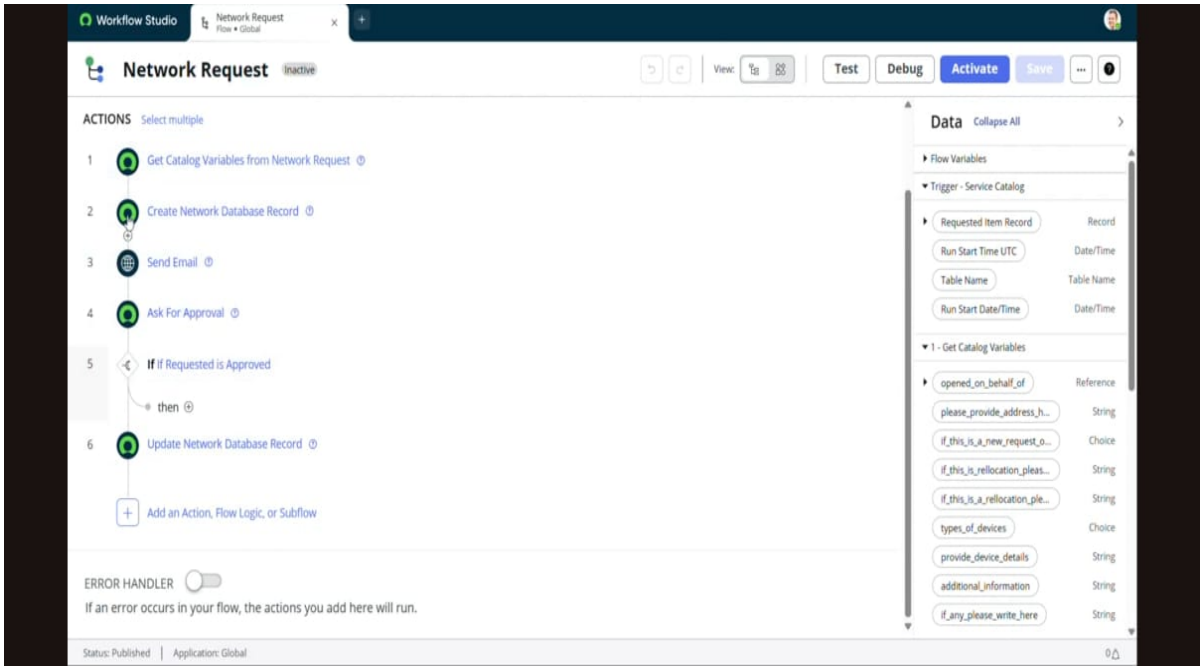
Catalog UI Policy Configuration



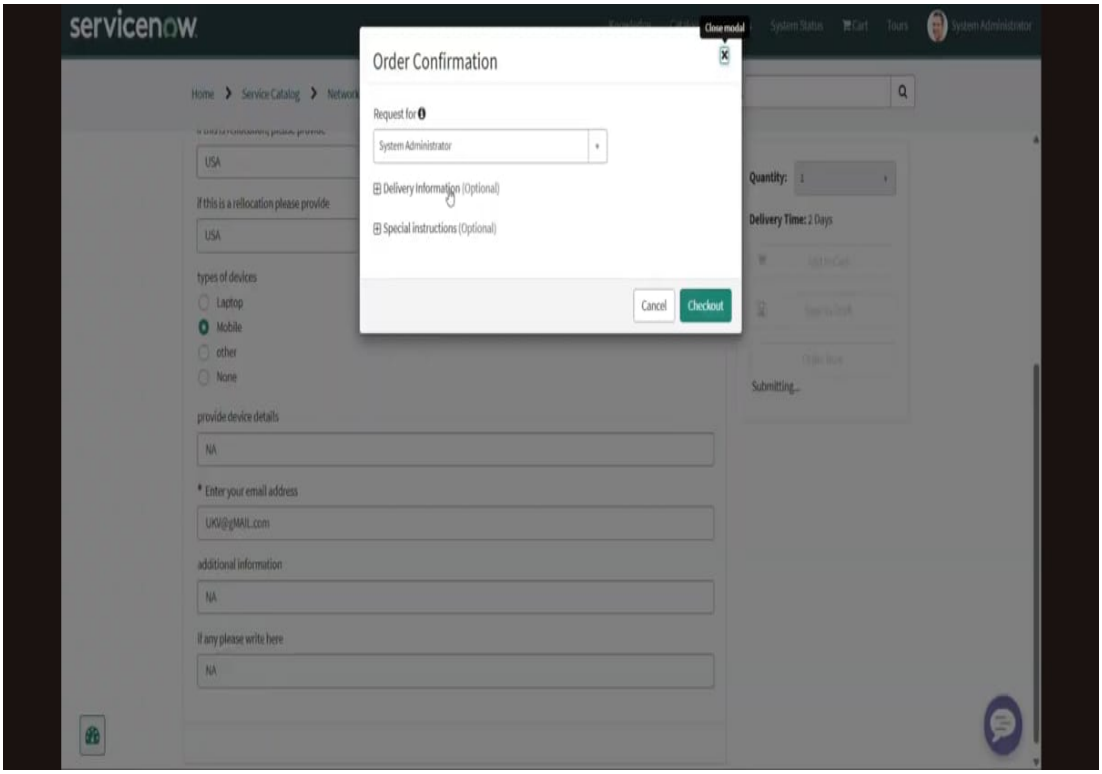
Request Approvals Creation(Related List)

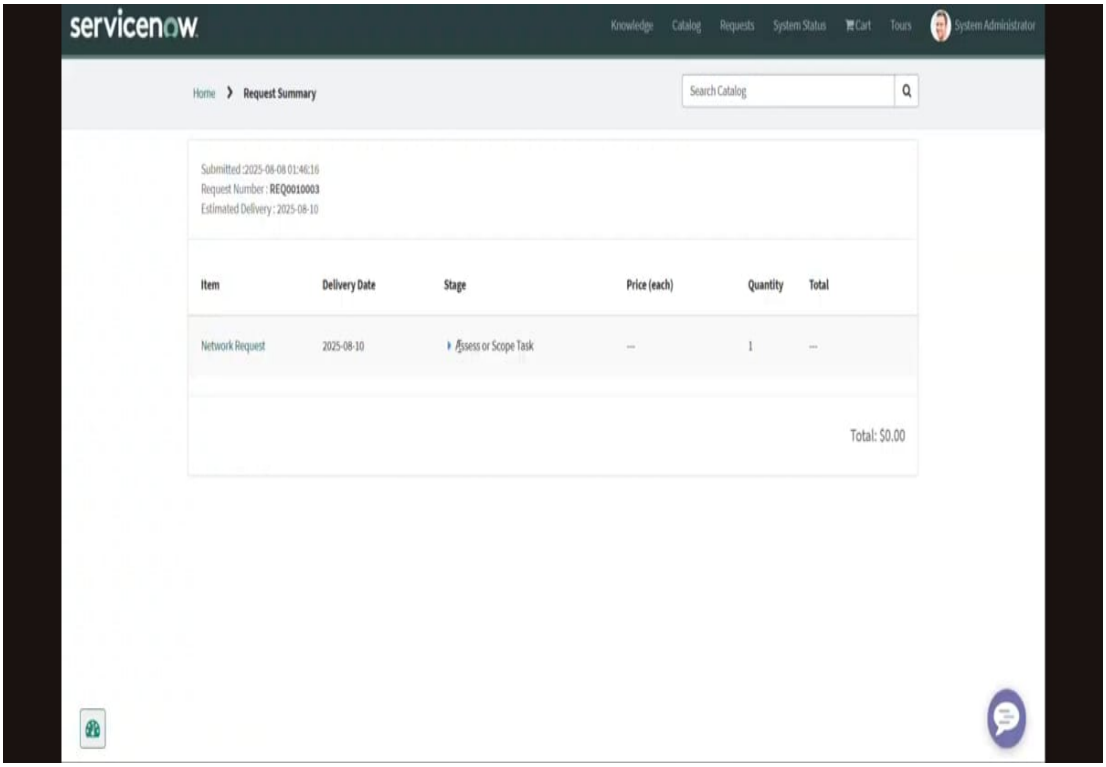


Overview of flows , Actions in Flow Designer



Testing in Service Portal(End User)





Implementation Plan

Phase Activities Duration

Phase 1: Assessment Requirements gathering, tool inventory, CMDB audit 2 weeks

Phase 2: Integration Setup API/webhook integration between monitoring tools and ServiceNow 3 weeks

Phase 3: Workflow Development Build and test automated remediation workflows 4 weeks

Phase 4: Pilot Run Deploy automation for selected network segments 2 weeks

Phase 5: Full Deployment Expand automation across all network devices 3

weeks

Phase 6: Optimization Refine workflows, add new automation use cases

Ongoing

Phase	Activities	Deliverables
1. Requirement Gathering	Meet stakeholders, identify request types, approval chains.	Requirement Document
2. Design	Create catalog forms, workflows, integration plans.	Design Document
3. Development	Configure ServiceNow catalog items, workflows, APIs.	Configured Instance
4. Testing	Unit testing, UAT with network team.	Test Report
5. Deployment	Move configuration to production.	Go-Live Checklist
6. Training & Handover	Train network team and helpdesk.	Training Materials

Risk Management

Risk	Impact	Mitigation
API failure with network tools	Medium	Retry mechanism, fallback to manual

Incorrect request data	High	Mandatory field validation
Approval delays	Medium	Auto-reminders, escalation rules

Project Scope

In Scope:

- Network service request types:
    - IP address allocation/release
    - VLAN creation/modification
    - Firewall rule creation/removal
    - Network port activation/deactivation
- Service Catalog integration.
- Automated approval workflows.
- CMDB updates for network assets.
- Integration with network management tools via API.

Out of Scope:

- Physical network hardware procurement.
- End-user device configuration.

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Example Use Cases

Automated switch port reset when a port is down.

Automatic configuration backup after a change is made.

Dynamic VLAN assignment based on ServiceNow request approvals.

Incident auto-resolution when a link recovers.

Monitoring & Maintenance

- Regular workflow audit.
- SLA performance reporting.
- Integration health checks.
- Periodic updates for catalog items.

Conclusion

Automating network management using ServiceNow transforms reactive operations into proactive, intelligent workflows. This integration not only reduces operational costs but also improves network resilience and user satisfaction.

If you want, I can also prepare a ServiceNow workflow diagram that visually shows how network events move from detection to automated remediation. That would make the document more implementation-ready.

Advantages

- **Faster processing** – Automation reduces time taken to complete requests.
- **Easy tracking** – Real-time status updates in ServiceNow.
- **Fewer errors** – Standard forms reduce mistakes.
- **Better SLA compliance** – Automatic reminders and escalations.
- **One-stop solution** – All requests handled in a single platform.
- **Can integrate** with network automation tools for quick execution.

- **Scalable** – Can handle more request types and higher volumes.

Disadvantages

- **High setup cost** – Needs investment in licenses and customization.
- **Training required** – Users and IT teams must learn the system.
- **Integration challenges** – API connections can be complex.
- **Dependent on ServiceNow** – If the platform is down, requests stop.
- **Needs regular updates** – Workflows must be maintained over time.
- **Not fully automated for all cases** – Complex changes may need manual work.

Future Scope

1. Add analytics dashboards for performance tracking
2. Send automatic notifications for admission status
3. Create a mobile-friendly version
4. Role-based permissions for teachers and students

Appendix

1. Source Code: No external code; used ServiceNow platform
2. Dataset Link: Not applicable
3. GitHub Link: https://github.com/Keerthi-28-11