

# 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

The screenshot shows the ServiceNow Creator Studio interface. The top navigation bar includes 'All', 'Favorites', 'History', 'Workspaces', and 'Admin'. A search bar is present on the right. A sidebar on the left displays a 'service catalog' menu with options like 'My Catalogs', 'My Categories', 'My Items', 'Maintain Catalogs', 'Maintain Categories', 'Renderers', 'Maintain Dynamic Categories', 'Maintain Items', 'My Content Items', and 'Content Items'. The main area features a 'Creator Studio' header with the text 'Create request-based apps quickly' and 'A guided and curated environment for creating forms and assigning automations to them. No-code required.' Below this is a blue button labeled 'Open Creator Studio'. At the bottom, a section titled 'GO FURTHER' is followed by the text 'Power your workflow applications'.

The screenshot displays the 'Catalog Item - Network Request' form in ServiceNow. The top navigation bar shows 'Catalog Item - Network Request' and a search bar. The form includes a description of catalog items and a list of fields for configuration. The 'Name' field is set to 'Network Request'. The 'Application' is 'Global'. The 'Active' checkbox is checked. The 'Fulfillment automation level' is set to 'Unspecified'. The 'State' is 'None'. The 'Checked out' status is 'None'. The 'Owner' is 'System Administrator'. The 'Short description' is 'Network request Management'. The 'Description' field is empty. The form also includes a 'Process Engine' tab and a 'Pricing' tab. The bottom of the form shows a rich text editor with a toolbar and a text area.

ServiceNow Catalogue

dev319057.service-now.com/now/nav/ui/classic/params/target/ui\_page.do%3Fsys\_id%3D407b03483d72210eb5fa4d0deaad3f8

service catalog

Creator Studio

Create request-based apps quickly

A guided and curated environment for creating forms and assigning automations to them. No-code required.

Open Creator Studio

GO FURTHER

Power your workflow applications

https://dev319057.service-now.com/sc\_cat\_item\_list.do?sysparm\_userpref\_module=d420ccf0c611227a006d23ea39bc4207&sysparm\_query=type%21%3Dbundle%5Esys\_class\_name%21%3Dsc\_cat\_item\_guide%5Etype%21%3Dpackage%5Esys\_class\_name%21%3Dsc\_cat\_item\_content...

dev319057.service-now.com/now/nav/ui/classic/params/target/sc\_cat\_item.do%3Fsys\_id%3D23b4da30839f2210eb5fa4d0deaad35b%26sysparm\_view%3D%26sysparm\_domain%3D...

Network Request

Copy Try It Update Edit in Catalog Builder Delete

Catalog items are goods or services available to order from the service catalog. Items can be anything from hardware, like tablets and phones, to software applications, to furniture and office supplies.

- Enter a Name and Short description to display for the item.
- Enter a Price, approvals, variables, and other information as needed.

Name: Network Request

Application: Global

Catalogs: Service Catalog

Category: Network Standard Changes

State: -- None --

Checked out: -- None --

Owner: System Administrator

Active: ☒

Fulfillment automation level: Unspecified

Item Details Process Engine Picture Pricing Portal Settings

Short description: Network request Management

Description:

Rich text editor toolbar: Bold, Italic, Underline, Link, Unlink, Text color, Background color, Bulleted list, Numbered list, Indent, Outdent, Undo, Redo, Source code, Full screen, Print, Help.



## Creation of Table

A table is a collection of records in the database. Each record corresponds to a row in a table, and each field on a record corresponds to a column on that table. Applications use tables and records to manage data and processes. [More Info](#)

\* Label: Network Database Table  
\* Name: u\_network\_database\_table  
Extends table:

Application: Global  
Create module: ☒  
Create mobile module: ☒  
Add module to menu: -- Create new --  
New menu name: Network Database Table  
Remote Table: ☐

Columns Controls Application Access

Table Columns for Text Search

Dictionary Entries

| Column label        | Type | Reference | Max length | Default value | Display |
|---------------------|------|-----------|------------|---------------|---------|
| Insert a new row... |      |           |            |               |         |

## Creation of fields

Table - Network Database Table

Dictionary Entries

| Column label        | Column name         | Type          | Reference | Max length | Default value | Display |
|---------------------|---------------------|---------------|-----------|------------|---------------|---------|
| Work Status         | u_work_status       | String        | (empty)   | 40         | false         | false   |
| Assignment Group    | u_assignment_group  | Reference     | Group     | 32         | false         | false   |
| Assigned to         | u_assigned_to       | Reference     | User      | 32         | false         | false   |
| Device Details      | u_device_details    | String        | (empty)   | 40         | false         | false   |
| Request Number      | u_request_number    | String        | (empty)   | 40         | false         | false   |
| Requested For       | u_requested_for     | String        | (empty)   | 40         | false         | false   |
| Date Of Enquiry     | u_date_of_enquiry   | Date          | (empty)   | 40         | false         | false   |
| Updated             | sys_updated_on      | Date/Time     | (empty)   | 40         | false         | false   |
| Sys ID              | sys_id              | Sys ID (GUID) | (empty)   | 32         | false         | false   |
| Created by          | sys_created_by      | String        | (empty)   | 40         | false         | false   |
| Created             | sys_created_on      | Date/Time     | (empty)   | 40         | false         | false   |
| Updated by          | sys_updated_by      | String        | (empty)   | 40         | false         | false   |
| Updates             | sys_mod_count       | Integer       | (empty)   | 40         | false         | false   |
| Customer Document   | u_customer_document | String        | (empty)   | 40         | false         | false   |
| Customer Address    | u_customer_address  | String        | (empty)   | 40         | false         | false   |
| Insert a new row... |                     |               |           |            |               |         |

Show hidden icons

# Variables Configuration

The screenshot shows the ServiceNow interface for configuring a Catalog Item named "Network Request". The "Variables" tab is selected, displaying a table of variables assigned to the item.

| Type                  | Question                    | Order |
|-----------------------|-----------------------------|-------|
| Single Line Text      | provide the variable label  | 100   |
| Multi Line Text       | provide the variable labels | 200   |
| Multiple Choice       | please provide address      | 300   |
| Container Start       | service details             | 400   |
| Select Box            | type of devices             | 487   |
| Wide Single Line Text | manages item                | 549   |

# Variable Set Configuration

The screenshot shows the ServiceNow interface for configuring a Variable Set named "request information". The "Variables" tab is selected, displaying a table of variables assigned to the set.

| Name                | Type             | Question            | Order |
|---------------------|------------------|---------------------|-------|
| opened_on_behalf_of | Reference        | Opened on behalf of | 100   |
| email_id            | Single Line Text | Email Id            | 100   |
| phone_number        | Single Line Text | Phone Number        | 200   |
| user_name           | Single Line Text | User name           | 300   |
| proof_of_document   | Attachment       | Proof of Document   | 400   |

# Catalog UI Policy Configuration

**servicenow** All Favorites History Workspaces Catalog UI Policy - types of devices is others

Search

**Catalog UI Policy**  
types of devices is others

1. The catalog UI policy is Active  
2. The items in the Conditions field evaluate to true  
3. The field specified in the catalog UI policy is present on the specified catalog item

Catalog Conditions [Add Filter Condition](#) [Add OR Clause](#)

types\_of\_devices is other AND OR X

Applies on a Catalog Item view ☒  
Applies on Catalog Tasks ☐  
Applies on Requested Items ☐

Apply the catalog UI policy actions when the form is loaded or when the user changes values on the form  
On load ☒  
Reverse the effects of the catalog UI policy actions when the Conditions evaluate to false  
Reverse if false ☒

[Update](#) [Delete](#)

**Related Links**  
[Run Point Scan](#)

**Catalog UI Policy Actions** Order Search

UI policy = types of devices is others

| Name                   | Read only   | Mandatory   | Visible | Order |
|------------------------|-------------|-------------|---------|-------|
| provide_device_details | Leave alone | Leave alone | True    | 100   |

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# Request Approvals Creation(Related List)

**servicenow** All Favorites History Workspaces Admin Table - Network Database

Search

**Table**  
Network Database

A table is a collection of records in the database. Each record corresponds to a record in the database. Applications use tables and records to manage data and processes. [More Info](#)

\* Label Network Database  
\* Name u\_network\_database

Application Global  
Remote Table

[Save](#)  
[Analyze Access](#)  
[Show File Properties](#)  
[Move to Application...](#)  
[Show Latest Update](#)  
[Show Dictionary Record](#)  
[Configure](#)  
[Export](#)  
[View](#)  
[Create Favorite](#)  
[Copy URL](#)  
[Copy sys\\_id](#)  
[Show XML](#)  
[History](#)  
[Reload form](#)  
[Form Builder](#)  
[Form Design](#)  
[Form Layout](#)  
[Related Lists](#)  
[All](#)  
[Table](#)  
[Security Rules](#)  
[Business Rules](#)  
[Client Scripts](#)  
[UI Policies](#)  
[Data Policies](#)  
[UI Actions](#)  
[Notifications](#)  
[Dictionary](#)

**Table Columns** for text Search

Dictionary Entries

| Column label      | Type      | Reference | Max length | Default value | Display |
|-------------------|-----------|-----------|------------|---------------|---------|
| Work status       | String    | (empty)   | 40         | 40            | false   |
| Request for       | String    | (empty)   | 40         | 40            | false   |
| Updated by        | String    | (empty)   | 40         | 40            | false   |
| Assignment group  | Reference | Group     | 32         | 40            | false   |
| Updates           | Integer   | (empty)   | 40         | 40            | false   |
| Assigned to       | Reference | User      | 32         | 40            | false   |
| Request number    | String    | (empty)   | 40         | 40            | false   |
| Updated           | Date/Time | (empty)   | 40         | 40            | false   |
| Customer document | String    | (empty)   | 40         | 40            | false   |
| Customer Address  | String    | (empty)   | 40         | 40            | false   |

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## Overview of flows , Actions in Flow Designer

The screenshot displays the ServiceNow Flow Designer interface for a flow named 'Network Request'. The flow is currently 'Inactive'. The main workspace shows a sequence of actions:

1. Get Catalog Variables from Network Request
2. Create Network Database Record
3. Send Email
4. Ask For Approval
5. If Requested is Approved (Decision node)
  - then (Path)
6. Update Network Database Record

Below the actions, there is an 'ERROR HANDLER' section with a toggle switch and the text: 'If an error occurs in your flow, the actions you add here will run.'

On the right side, the 'Data' pane is visible, showing variables and their types:

- Flow Variables
  - Trigger - Service Catalog
    - Requested Item Record (Record)
    - Run Start Time UTC (Date/Time)
    - Table Name (Table Name)
    - Run Start Date/Time (Date/Time)
  - 1 - Get Catalog Variables
    - opened\_on\_behalf\_of (Reference)
    - please\_provide\_address\_h... (String)
    - if\_this\_is\_a\_new\_request\_o... (Choice)
    - if\_this\_is\_a\_relocation\_pleas... (String)
    - if\_this\_is\_a\_relocation\_ple... (String)
    - types\_of\_devices (Choice)
    - provide\_device\_details (String)
    - additional\_information (String)
    - if\_any\_please\_write\_here (String)

At the bottom, the status is 'Published' and the application is 'Global'.

## Testing in Service Portal(End User)

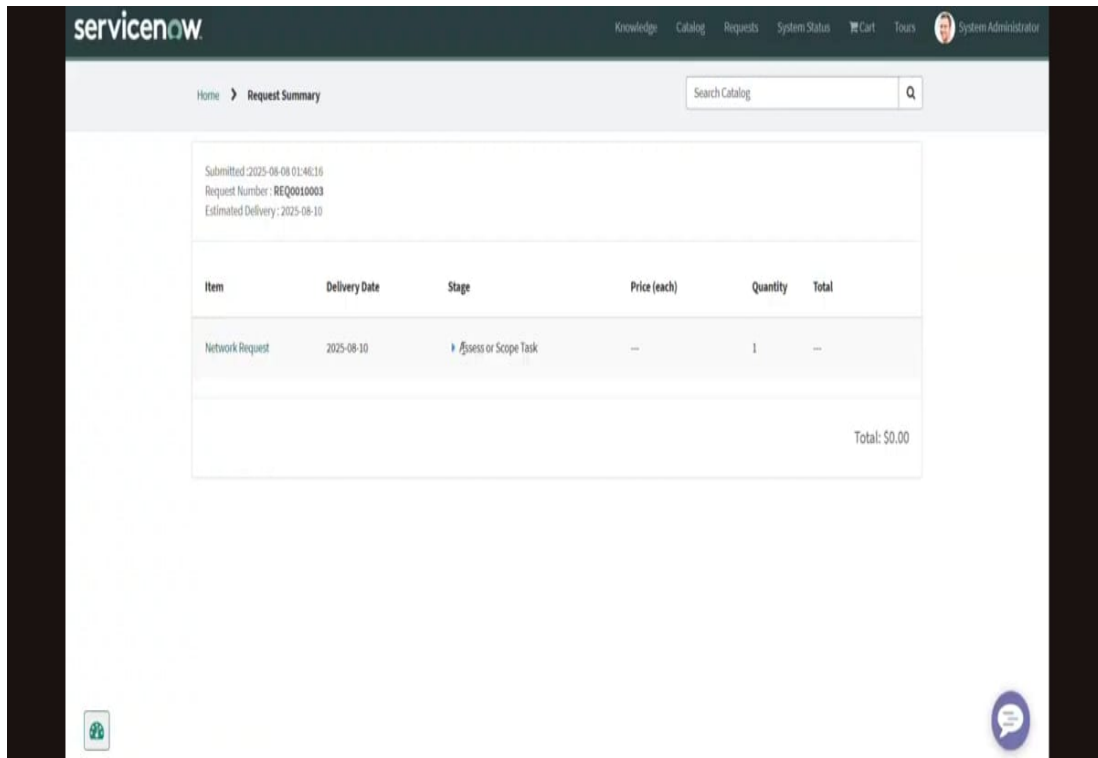
The screenshot shows the ServiceNow Service Portal interface. A modal window titled 'Order Confirmation' is displayed over the main form. The modal contains the following fields and options:

- Request for: System Administrator (dropdown menu)
- ☐ Delivery Information (Optional)
- ☐ Special Instructions (Optional)
- Buttons: Cancel, CheckOut

The background form is partially visible and includes fields for:

- Location: USA
- Device Type: Mobile (selected)
- Device Details: NA
- Email Address: LUK@MAIL.com
- Additional Information: NA
- Special Instructions: NA

The top navigation bar shows 'Home > Service Catalog > Network Request'. The bottom right corner has a 'Submitting...' status and a chat icon.



## 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         |
|-----------------------------------|---|----------------------|
| <b>1. Requirement Gathering</b>   | Meet stakeholders, identify request types, approval chains. | Requirement Document |
| <b>2. Design</b>                  | Create catalog forms, workflows, integration plans.         | Design Document      |
| <b>3. Development</b>             | Configure ServiceNow catalog items, workflows, APIs.        | Configured Instance  |
| <b>4. Testing</b>                 | Unit testing, UAT with network team.                        | Test Report          |
| <b>5. Deployment</b>              | Move configuration to production.                           | Go-Live Checklist    |
| <b>6. Training &amp; Handover</b> | 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.

## 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.

## **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>

