

# **OPTIMIZING USER, GROUP, AND ROLE MANAGEMENT WITH ACCESS CONTROL AND WORKFLOWS**

Submitted by

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In partial fulfilment for the award of the degree

**BACHELOR OF ENGINEERING**

**in**

**COMPUTER SCIENCE AND ENGINEERING**

NAAN MUDHALVAN LAB

ANNA UNIVERSITY REGIONAL CAMPUS MADURAI-625-019



**ANNA UNIVERSITY: CHENNAI 600 025**

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Supervised by

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# BONAFIDE CERTIFICATE

This is to certify that the project report titled " **OPTIMIZING USER, GROUP, AND ROLE MANAGEMENT WITH ACCESS CONTROL AND WORKFLOWS** " is the Bonafide work of **Kapil Navajan V C (910022104301), Viknesh Kumar S (910022104046), Ajay S (910022104001)** who carried out the project work under my supervision in the Naan Mudhalvan Lab.

V. Q. 111  
30/10/25

**SIGNATURE**

**HEAD OF THE DEPARTMENT**

Latihan 1

**SIGNATURE**

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## **ACKNOWLEDGEMENT**

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## ABSTRACT

Efficient management of users, groups, and roles is crucial for maintaining security, productivity, and accountability within any organizational system. This project, “*Optimizing User, Group, and Role Management with Access Control and Workflows*,” focuses on designing an automated framework to streamline the assignment of user privileges, enforce role-based access policies, and simplify administrative operations. By integrating access control mechanisms with intelligent workflows, the system ensures that each user receives appropriate permissions based on their role and responsibilities, minimizing the risk of unauthorized access. Automated workflows handle user creation, modification, approval, and deactivation processes, reducing manual effort and human error. The project enhances transparency and traceability through activity logs and approval histories. Overall, the proposed solution provides a secure, scalable, and efficient model for managing identity and access across enterprise environments.

**Problem Statement:**

In many organizations, managing users, groups, and roles manually often leads to inconsistencies, security vulnerabilities, and administrative overhead. Lack of centralized access control can result in unauthorized permissions, delayed approvals, and difficulties in tracking user activities. As systems grow in complexity, ensuring that every user has the right level of access while maintaining operational efficiency becomes a major challenge. There is a need for an automated, workflow-based solution that can optimize user management, enforce access control policies, and streamline the approval process while maintaining security, accountability, and compliance.

**Objectives:**

1. To design and implement a system that automates user, group, and role management within an organization.
2. To integrate workflow automation for handling user access requests, approvals, and modifications.
3. To establish a secure access control mechanism based on user roles and responsibilities.
4. To reduce administrative effort and human error through centralized management and automation.
5. To ensure transparency and traceability by maintaining detailed activity logs and audit trails.
6. To enhance overall system security, scalability, and compliance with organizational policies.

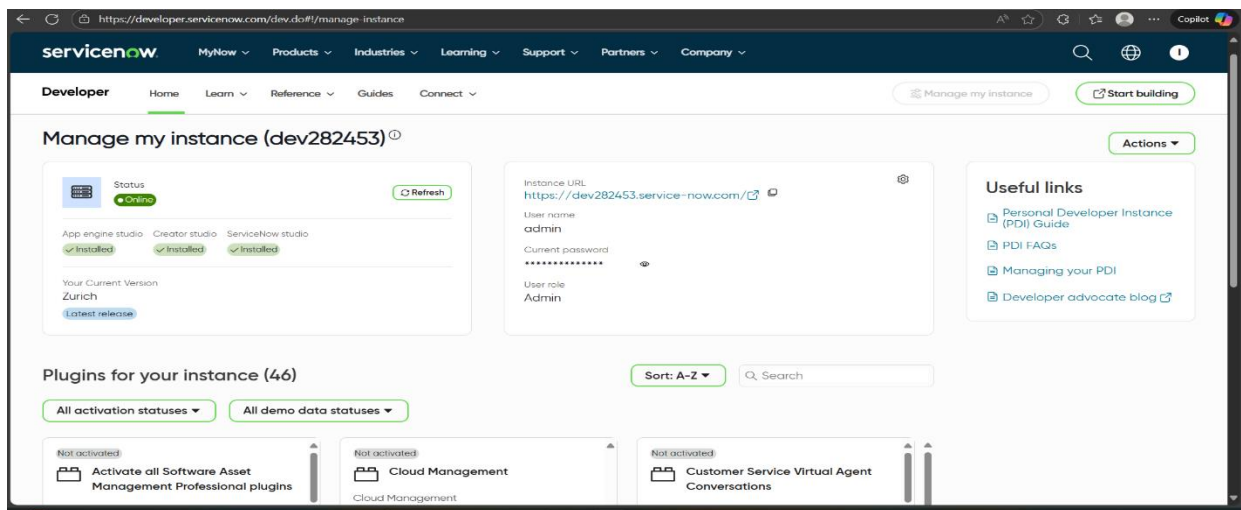
## Skills:

### TASK INITIATION

#### Milestone 1: Setting up ServiceNow Instance

##### Activity: Setting up ServiceNow Instance

1. Sign up for a developer account on the ServiceNow Developer site  
“https://developer.servicenow.com”.
2. Once logged in, navigate to the "Personal Developer Instance" section.
3. Click on "Request Instance" to create a new ServiceNow instance.
4. Fill out the required information and submit the request.
5. You'll receive an email with the instance details once it's ready.
6. Log in to your ServiceNow instance using the provided credentials.

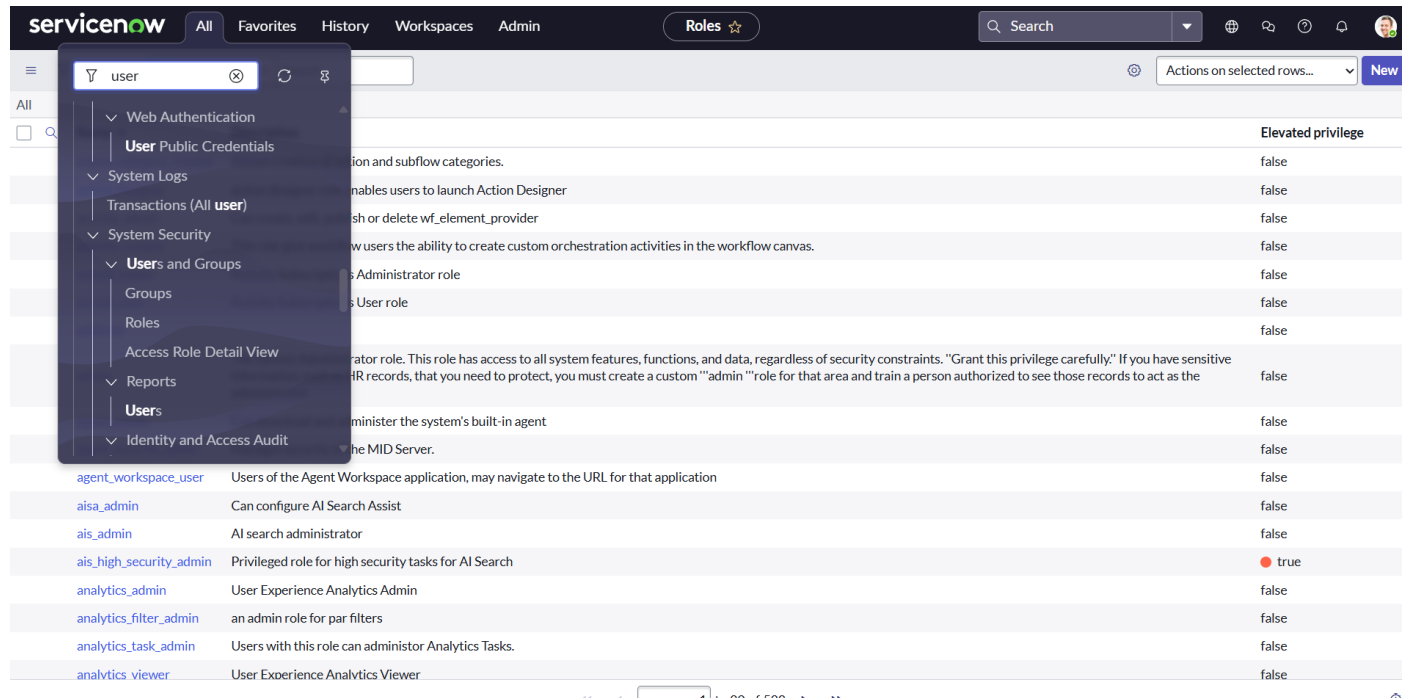


7. Now you will navigate to the ServiceNow.

## Milestone 2: Creation of New User

### Activity: Creation of New User

#### 1. Open service now



#### 2. Click on All >> search for users

#### 3. Select Users under system security

#### 4. Click on new

#### 5. Fill the following details to create a new user

User : alice,bob

#### 6. Click on submit

## Milestone 3: Creation of Group

### Activity: Creation of New Group

#### 1. Go to All >> In the filter search for Group > click on New

servicenow All Favorites History Workspaces Admin Group - New Record

Group New record

Name group name

Group email

Manager

Parent

Description

Submit

servicenow All Favorites History Workspaces Admin Roles

group

Actions on selected rows... New

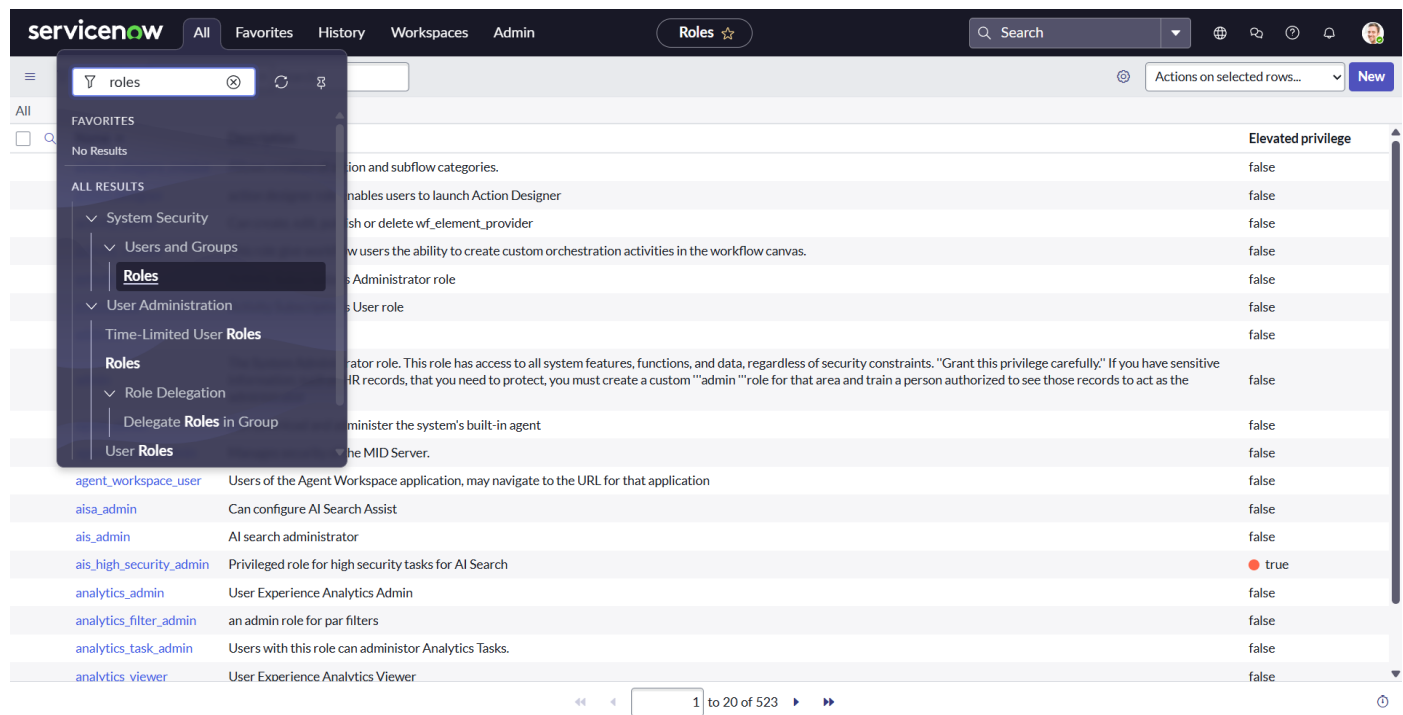
Name	Description	Elevated privilege
Administration	Administration and subflow categories.	false
Email Account Groups	Enables users to launch Action Designer	false
System Security	Enables users to launch Action Designer	false
Users and Groups	Enables users to launch Action Designer	false
Groups	Enables users to launch Action Designer	false
Roles	Enables users to launch Action Designer	false
Access Role Detail View	Enables users to launch Action Designer	false
Reports	Enables users to launch Action Designer	false
Groups Membership	Enables users to launch Action Designer	false
User Administration	Enables users to launch Action Designer	false
Groups	Enables users to launch Action Designer	false
Workspace Experience	Enables users to launch Action Designer	false
agent_workspace_user	Users of the Agent Workspace application, may navigate to the URL for that application	false
aisa_admin	Can configure AI Search Assist.	false
ais_admin	AI search administrator	false
ais_high_security_admin	Privileged role for high security tasks for AI Search	true
analytics_admin	User Experience Analytics Admin	false
analytics_filter_admin	an admin role for par filters	false
analytics_task_admin	Users with this role can administrator Analytics Tasks.	false
analytics_viewer	User Experience Analytics Viewer	false

1 to 20 of 523

1. Select groups under system security
2. Click on new
3. Fill the following details to create a new group
  - Group Name: project team
4. Click on submit



## Milestone 4: Creation of Roles



1. Go to All > In the filter search for Roles> click on New.
2. Select roles under system security
3. Click on new
4. Fill the following details to create a new role  
Name of Role: project member
5. Click on submit
6. Go to the Header and right click there >> click on Save.

servicenow All Favorites History Workspaces Admin Role - New Record ☆ Search

< Role New record

\* Name project team Application Global ⓘ

Elevated privilege ☐

Description

Submit

## Milestone 5: Assign the Roles to Users

### Activity 1: Assign Role to alice

1. Log in to your ServiceNow instance.
2. In the left navigation pane, click on All and search for User.
3. Under System Definition, select the Tables module.
4. Locate and open the record for the Project Manager user.
5. Within the user record, click Edit in the Groups related list.
6. Add the Project Member group to associate the user with project-related activities, then click Save.
7. Next, click Edit in the Roles related list.
8. Add the following roles to the user:
  - u\_project\_table
  - u\_task\_table
9. Click Save to apply the changes and then click Update to finalize the record.

User ID	Name	Email	Active	Created	Updated
Bob	Bob	Bob@gmail.com	true	2025-10-30 02:22:42	2025-10-30 02:22:42
Alice	Alice	Alice@gmail.com	true	2025-10-30 02:22:12	2025-10-30 02:22:12
kapil	kapil vc	kapil@gmail.com	true	2025-10-30 02:13:00	2025-10-30 02:13:00
aes.creator	Creator User		true	2025-10-29 23:58:19	2025-10-30 01:32:56
admin	System Administrator	admin@example.com	true	2007-07-03 11:48:47	2025-10-30 01:32:55
mariano.maury	Mariano Maury	mariano.maury@example.com	true	2012-02-17 19:04:52	2025-10-29 23:27:53
roman.simone	Roman Simone	roman.simone@example.com	true	2012-02-17 19:04:52	2025-10-29 23:27:53
marion.gaulden	Marion Gaulden	marion.gaulden@example.com	true	2012-02-17 19:04:52	2025-10-29 23:27:53
sheila.holloran	Sheila Holloran	sheila.holloran@example.com	true	2012-02-17 19:04:53	2025-10-29 23:27:53
winnie.reich	Winnie Reich	winnie.reich@example.com	true	2012-02-17 19:04:53	2025-10-29 23:27:53
cristina.sharper	Cristina Sharper	cristina.sharper@example.com	true	2012-02-17 19:04:53	2025-10-29 23:27:53
lucius.winchester	Lucius Winchester	lucius.winchester@example.com	true	2012-02-17 19:04:53	2025-10-29 23:27:53
johnie.minaai	Johnie Minaai	johnie.minaai@example.com	true	2012-02-17 19:04:53	2025-10-29 23:27:53
arron.ubhi	Arron Ubhi	arron.ubhi@example.com	true	2021-03-19 08:42:30	2025-10-29 23:27:53
Change.Manager	Change Manager	change.manager@example.com	true	2015-06-23 22:19:00	2025-10-29 23:27:53
ione.kucera	Ione Kucera	ione.kucera@example.com	true	2012-02-17 19:04:49	2025-10-29 23:27:53

## Activity 2: Assign Role to alice

1. Log in to your ServiceNow instance.
2. In the left navigation pane, click on All, then search for User.
3. Under System Definition, select Tables.
4. Locate and open the user record for Bob P.
5. In the Team Member section, click Edit to modify group membership.
6. Add Team Member to the user and assign the necessary table roles.
7. Click Save to apply the changes.
8. To test access, click on the Profile icon (top-right corner) and choose Impersonate User → Bob P.
9. Once impersonated, verify that the Task Table 2 is visible, confirming the role assignment and access control functionality.

← → ↻ https://dev272015.service-now.com/now/nav/ui/classic/params/target/sys\_user.do%3Fsys\_id%3Da223291fc3b432103503d5fc050131a6%26sysparm\_record\_target%3Dsys\_u... Import favorites McAfee Security Dell Academic Gateway Other favorites

**servicenow** All Favorites History Workspaces Admin User - Alice ☆ Search

User Alice

Password needs reset ☐ Locked out ☐ Active ☒ Internal Integration User ☐

Date format System (yyyy-MM-dd) Business phone Mobile phone Photo [Click to add...](#)

Update Set Password Delete

Related Links  
[View linked accounts](#)  
[View Subscriptions](#)  
[Reset a password](#)

Entitled Custom Tables Roles (44) **Groups (1)** Delegates Subscriptions User Client Certificates

Group Search

User = Alice

Group
project team

1 to 1 of 1

## Milestone 6:Application Access

Copy of template - Google Doc... project on users,groups,roles,t... ServiceNow Developers project table | Application Menu

← → ↻ dev196626.service-now.com/now/nav/ui/classic/params/target/sys\_app\_application.do%3Fsys\_id%3D9705334f831152108663ffd6feaad362

**servicenow** All Favorites History Admin Application Menu - project table ☆ Search

Application Menu project table Update Delete

An application menu is a group of modules in the application navigator. Choose the roles that are required to access the application and add or remove modules in the related list below. [More Info](#)

\* Title project table Application Global Active ☒

Restricts access to the specified roles. Otherwise, all users can view the application menu when it is active.

Roles project member

Specifies the [menu category](#), which defines the navigation menu style. The default value is Custom Applications.

Category Custom Applications

The text that appears in a tooltip when a user points to this application menu

Hint Description

Update Delete

Activate Windows  
Go to Settings to activate Windows.

1. When a new table is created in ServiceNow, an application and module are automatically generated for it.

2. In the Application Navigator, search for the Project Table application.
3. Click on Edit Module to modify its access settings.
4. Assign the Project Member role to this application to control access.
5. Next, search for the Task Table 2 application in the Application Navigator.
6. Open the Edit Application option for Task Table 2.
7. Assign both the Project Member and Team Member roles to ensure appropriate permissions.
8. Click Save to apply and update the access settings for both applications.

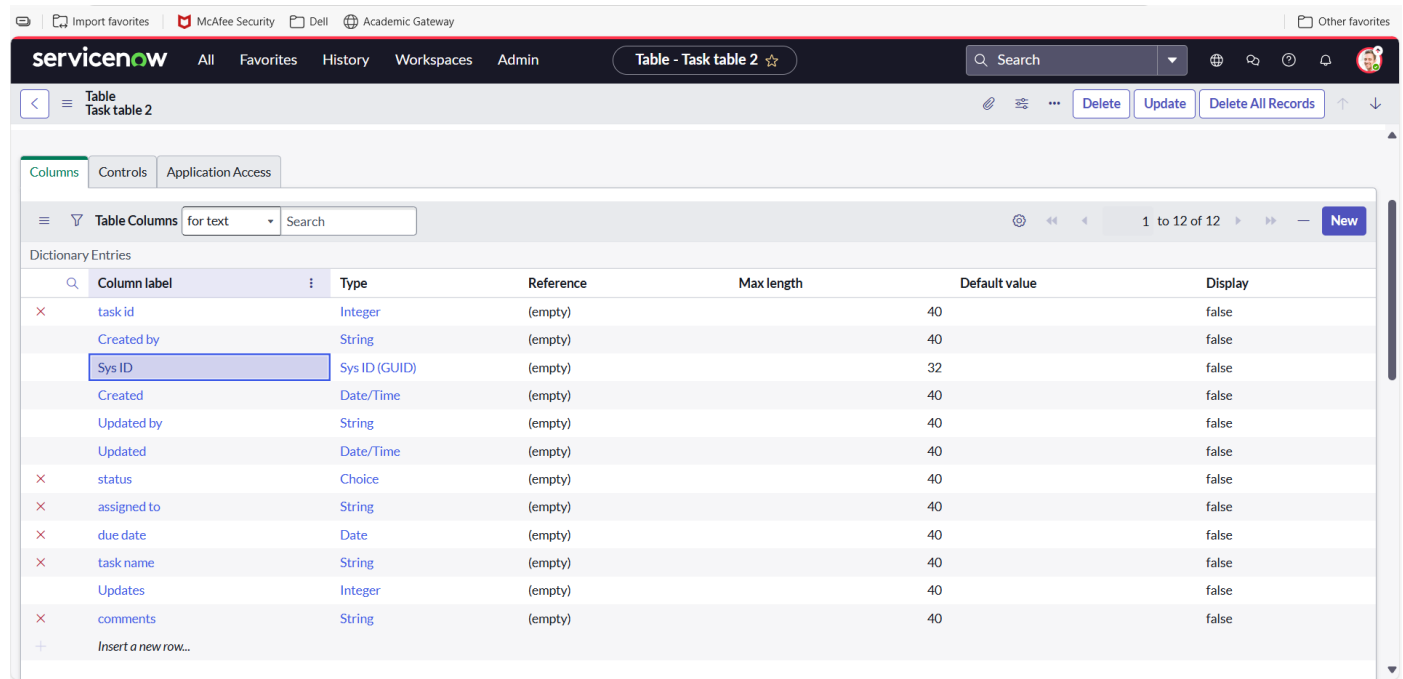
The screenshot shows the ServiceNow web interface for configuring an Access Control rule. The browser tabs include 'servicenow developer - Search', 'ServiceNow Developers', '(5) WhatsApp', and 'Access Controls | ServiceNow'. The URL is 'https://dev272015.servicenow.com/now/nav/ui/classic/params/target/sys\_security\_ad\_list.do?%3Fsysparm\_userpref\_module%3D4ec206740a0a0aa700b850e0337b2f00%26sysparm...'. The page title is 'Access Control New record'. A warning message at the top states: 'Warning: A role, security attribute, data condition, or script is required to properly secure access with this ACL.' The configuration form includes the following fields and options:

- \* Type: record
- \* Operation: create
- Decision Type: Allow If
- Admin overrides: ☒
- Protection policy: -- None --
- \* Name: (empty field)
- Description: (empty text area)
- Applies To: (empty field with buttons 'Add Filter Condition' and 'Add "OR" Clause')
- Application: Global
- Active: ☒
- Advanced: ☐

At the bottom, there are sections for 'Conditions' and 'Requires role'.

## Milestone 7: Access Control List

### Activity 2: Create ACL



The screenshot shows the ServiceNow interface for 'Table - Task table 2'. The 'Columns' tab is active, displaying a list of dictionary entries. The table has columns for Column label, Type, Reference, Max length, Default value, and Display. The 'Sys ID' row is highlighted.

Column label	Type	Reference	Max length	Default value	Display
task id	Integer	(empty)	40		false
Created by	String	(empty)	40		false
Sys ID	Sys ID (GUID)	(empty)	32		false
Created	Date/Time	(empty)	40		false
Updated by	String	(empty)	40		false
Updated	Date/Time	(empty)	40		false
status	Choice	(empty)	40		false
assigned to	String	(empty)	40		false
due date	Date	(empty)	40		false
task name	String	(empty)	40		false
Updates	Integer	(empty)	40		false
comments	String	(empty)	40		false
Insert a new row...					

In the Application Navigator, type Access Control (ACL) and select System Security → Access Control (ACL).

1. Select Access Control (ACL) under system security
2. Click on elevate role
3. Click on new
4. Click New to create a new Access Control Rule.
5. Select the table or field you want to secure.

- u\_project\_table.name
- u\_project\_table

10. Use the Condition Builder to specify access logic.

- Active is true

11. In the Requires Role field, enter the roles that should have access to this table or field.

Example:

- project\_member
- team\_member

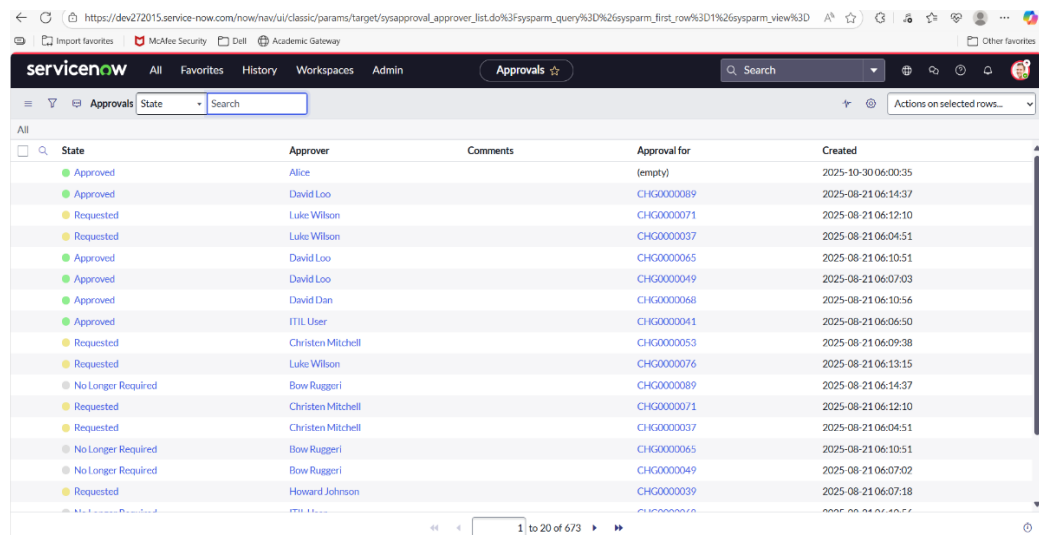
12. Add Optional Script Logic

13. The script returns true to grant access or false to deny it.

14. Click Submit to save the ACL rule.

15. Use the Test Security option (shield icon) to check which roles have access.

16. Try impersonating a user (e.g., Bob P) to verify that access behaves as expected.



State	Approver	Comments	Approval for	Created
Approved	Alice		(empty)	2025-10-30 06:00:35
Approved	David Loo		CHG0000089	2025-08-21 06:14:37
Requested	Luke Wilson		CHG0000071	2025-08-21 06:12:10
Requested	Luke Wilson		CHG0000097	2025-08-21 06:04:51
Approved	David Loo		CHG0000065	2025-08-21 06:10:51
Approved	David Loo		CHG0000049	2025-08-21 06:07:03
Approved	David Dan		CHG0000068	2025-08-21 06:10:56
Approved	ITIL User		CHG0000041	2025-08-21 06:06:50
Requested	Christen Mitchell		CHG0000053	2025-08-21 06:09:38
Requested	Luke Wilson		CHG0000076	2025-08-21 06:13:15
No Longer Required	Bow Ruggeri		CHG0000089	2025-08-21 06:14:37
Requested	Christen Mitchell		CHG0000071	2025-08-21 06:12:10
Requested	Christen Mitchell		CHG0000097	2025-08-21 06:04:51
No Longer Required	Bow Ruggeri		CHG0000065	2025-08-21 06:10:51
No Longer Required	Bow Ruggeri		CHG0000049	2025-08-21 06:07:02
Requested	Howard Johnson		CHG0000039	2025-08-21 06:07:18

## Milestone 7: Access Control List

### Activity 1: Create Flow

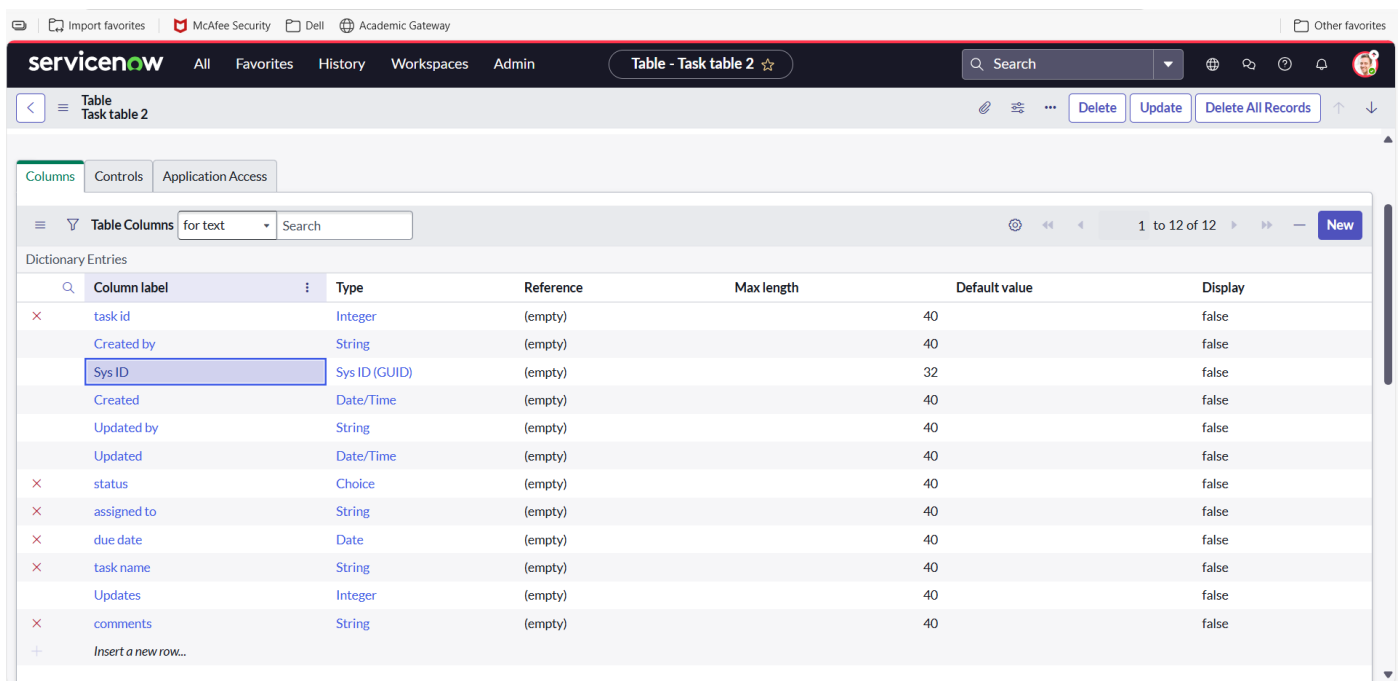
1. Log in to your ServiceNow instance.
2. In the Application Navigator, click on All and search for Flow Designer.
3. Under Process Automation, select Flow Designer.

4 .Once the Flow Designer interface opens, click on New and choose Flow.

4. In the Flow Properties window:

- Flow Name: Enter “Task Table Flow”.
- Application: Select Global.
- Description (optional): Automates record creation and updates for task management.

5. Click Submit or Build Flow to start designing your flow.



Column label	Type	Reference	Max length	Default value	Display
task id	Integer	(empty)	40		false
Created by	String	(empty)	40		false
Sys ID	Sys ID (GUID)	(empty)	32		false
Created	Date/Time	(empty)	40		false
Updated by	String	(empty)	40		false
Updated	Date/Time	(empty)	40		false
status	Choice	(empty)	40		false
assigned to	String	(empty)	40		false
due date	Date	(empty)	40		false
task name	String	(empty)	40		false
Updates	Integer	(empty)	40		false
comments	String	(empty)	40		false
Insert a new row...					

## Activity 2: Adding a Trigger to the Flow

6. In the Flow Designer, click on Add a Trigger.

7. In the Trigger Selection window, search for Create Record and select it.

8. In the Table field, enter Task Table (for example: u\_task\_table).

9. Under Conditions, define the following criteria to determine when the flow will run:

- Field: Status Operator: is Value: In Progress
- Field: Comments Operator: is Value: Feedback
- Field: Assigned To Operator: is Value: Bob

10. Once all conditions are added, click Done to save the trigger configuration.



State	Approver	Comments	Approval for	Created
Approved	Alice		(empty)	2025-10-30 06:00:35
Approved	David Loo		CHG0000089	2025-08-21 06:14:37
Requested	Luke Wilson		CHG0000071	2025-08-21 06:12:10
Requested	Luke Wilson		CHG0000037	2025-08-21 06:04:51
Approved	David Loo		CHG0000065	2025-08-21 06:10:51
Approved	David Loo		CHG0000049	2025-08-21 06:07:03
Approved	David Dan		CHG0000068	2025-08-21 06:10:56
Approved	ITIL User		CHG0000041	2025-08-21 06:06:50
Requested	Christen Mitchell		CHG0000053	2025-08-21 06:09:38
Requested	Luke Wilson		CHG0000076	2025-08-21 06:13:15
No Longer Required	Bow Ruggeri		CHG0000089	2025-08-21 06:14:37
Requested	Christen Mitchell		CHG0000071	2025-08-21 06:12:10
Requested	Christen Mitchell		CHG0000037	2025-08-21 06:04:51
No Longer Required	Bow Ruggeri		CHG0000065	2025-08-21 06:10:51
No Longer Required	Bow Ruggeri		CHG0000049	2025-08-21 06:07:02
Requested	Howard Johnson		CHG0000039	2025-08-21 06:07:18

### Activity 3: Adding an Action to Update Records

11. In the Flow Designer, click on Add an Action.

12. From the action options, select Action, then search for Update Record and choose it.

13. In the Record field, drag the appropriate data pill from the Data Panel on the right-hand side to link the record from the trigger.

14. The Table name will be automatically populated based on the record data.

15. Under the Fields section, add the field to be updated:

- Field: Status
- Value: Completed

16. Once the field and value are set, click Done to save the action configuration.

The screenshot shows the ServiceNow 'Group - New Record' form. The top navigation bar includes the ServiceNow logo, links for All, Favorites, History, Workspaces, and Admin, and a 'Group - New Record' button. A search bar is also present. The form itself has a breadcrumb 'Group New record' and a 'Submit' button. The main form fields are: 'Name' (with 'group name' entered), 'Group email' (with an email icon), 'Manager' (with a search icon), 'Parent' (with a search icon), and 'Description' (a large text area). A 'Submit' button is located at the bottom left of the form area.

#### Activity 4: Adding an Approval Action in the Flow

17. In the Flow Designer, navigate to the Actions section.
18. Click on Add an Action.
19. From the list of available actions, select Action, then search for Ask for Approval and choose it.
20. In the Record field, drag and drop the corresponding record from the Data Panel on the right side.
21. The Table field will be automatically populated once the record is linked.
22. Under the Approval Configuration section:
23. Approve Field: Status
24. Approver: Alice P
25. Review the configuration, then click Done to save the approval step.
26. Click on Save

## Activity 5: Testing the Flow and Approval Process

1. In the Application Navigator, search for Task Table and open it.
2. Verify that the Status field of the created task record has been automatically updated to Completed, as defined in the flow action.
3. Next, go back to the Application Navigator and search for My Approvals.
4. Under the Service Desk module, click on My Approvals to view pending approval requests.
5. Log in or impersonate user “Alice P”, who was assigned as the approver in the flow.
6. Locate the approval request generated for the task record.
7. Right-click on the request and select Approve to complete the approval process.

The screenshot shows the ServiceNow web interface for configuring an application menu. The browser tabs include 'Copy of template - Google Do...', 'project on users,groups,roles,t...', 'ServiceNow Developers', and 'project table | Application Men...'. The URL is 'dev196626.service-now.com/now/nav/ui/classic/params/target/sys\_app\_application.do%3Fsys\_id%3D9705334f831152108663ffd6feaad362'. The page title is 'Application Menu - project table'. The configuration form includes the following fields and sections:

- Title:** project table
- Application:** Global
- Active:** ☒
- Roles:** project member
- Category:** Custom Applications
- Hint:** (empty text box)
- Description:** (empty text box)

Buttons for 'Update' and 'Delete' are located at the bottom left. A 'More Info' link is present in the top right of the form area. A Windows activation watermark is visible in the bottom right corner.

**Conclusion:**

This scenario highlights a structured approach to project management, showcasing the roles of Alice and Bob within a defined workflow. With Alice's oversight and Bob's execution, the team effectively collaborates to ensure project success. The use of tables organizes key information, facilitating easy tracking of projects, tasks, and progress updates. Overall, this system promotes accountability, enhances communication, and leads to the successful completion of projects.