



S E R V I C E

now

tutorialspoint

SIMPLY EASY LEARNING

www.tutorialspoint.com



<https://www.facebook.com/tutorialspointindia>



<https://twitter.com/tutorialspoint>

About the Tutorial

ServiceNow is a cloud solution company which is used for process automation, IT service management, IT operation management and IT business management. At the end of this tutorial, you should have gained good knowledge in ServiceNow administration and development.

Audience

This tutorial is designed for readers who are interested in understanding the concepts of ServiceNow. The tutorial also covers the basics of IT service management (ITSM) and Cloud computing. It is mainly targeted for software professionals who are involved in ServiceNow administration and its development.

Prerequisites

This is an elementary tutorial which will help you to understand the concepts of ServiceNow from scratch. There is no prior knowledge required to learn ServiceNow administration, but for ServiceNow development, knowledge of Javascript is mandatory. It will be good to have some basic understanding of ITSM, however, not mandatory.

Copyright & Disclaimer

© Copyright 2020 by Tutorials Point (I) Pvt. Ltd.

All the content and graphics published in this e-book are the property of Tutorials Point (I) Pvt. Ltd. The user of this e-book is prohibited to reuse, retain, copy, distribute or republish any contents or a part of contents of this e-book in any manner without written consent of the publisher.

We strive to update the contents of our website and tutorials as timely and as precisely as possible, however, the contents may contain inaccuracies or errors. Tutorials Point (I) Pvt. Ltd. provides no guarantee regarding the accuracy, timeliness or completeness of our website or its contents including this tutorial. If you discover any errors on our website or in this tutorial, please notify us at contact@tutorialspoint.com

Table of Contents

About the Tutorial	ii
Audience.....	ii
Prerequisites.....	ii
Copyright & Disclaimer	ii
Table of Contents	iii
1. ServiceNow — Introduction	1
Services of ServiceNow.....	1
ServiceNow Instance	2
Generating Developer Instance.....	2
ServiceNow User Interface (UI)	7
2. ServiceNow — Fundamentals	10
Applications and Modules	10
Lists and Forms	11
Users, Roles and Groups.....	13
Tables, Columns and Fields	19
3. ServiceNow — ITIL	22
Stages of ITIL.....	22
Processes in ITIL.....	23
Example of entire ITIL process.....	23
Change, Incident and Problem Management.....	24
4. ServiceNow — Cloud Services	26
Types of deployment models	27
Cloud Service Models	27
5. ServiceNow — Administration	29
ServiceNow Configuration	29
Import sets	31

Scheduled Data Import.....	35
SLAs Configuration.....	38
Workflows	41
Notifications	46
Reporting and Scheduled Jobs	47
Service Catalogs.....	51
Diagnostics and Troubleshooting	55
6. ServiceNow — Development	58
Application Creation Overview.....	58
UI Policy and Actions	61
ServiceNow Scripting.....	63
Server Side Scripting.....	68
Script Include	70
Debugging.....	72
7. ServiceNow — Mastering and Certification.....	74

1. ServiceNow — Introduction

ServiceNow is a cloud based platform, which was mainly developed for workflow and process automation as per the ITIL principles. However, it is highly customisable and also can be used for other purposes. ServiceNow is an American based company and was founded in 2004 by Fred Luddy. It has a unique way for naming its versions. They name the versions based on the major cities of the world. The latest version of ServiceNow is Orlando.

ServiceNow offers many ready to use solutions, workflows and products for an organisation. The organisation can develop the customised applications and modules as per the business requirement using the ServiceNow scripting and existing tools.

Services of ServiceNow

Some of the important offerings and most widely used services of ServiceNow are explained below:

IT Service management

ServiceNow is mainly used as a ticketing tool to manage incidents, problems and changes. It has many advanced features, analytics and insights that impacts the speed and delivery of IT.

HR management

ServiceNow can be used for almost all HR delivery services like leave management, timesheet management, employee document management, new onboarding management, performance management, etc.

IT Asset management

With ServiceNow, we can manage our hardware and software assets to optimise cost and increase efficiency. ServiceNow has features such as licence management, warranty management, CI management, advanced reporting and insights, etc.

Finance operation management

ServiceNow manages all the activities related to finance close and automates the financial processes.

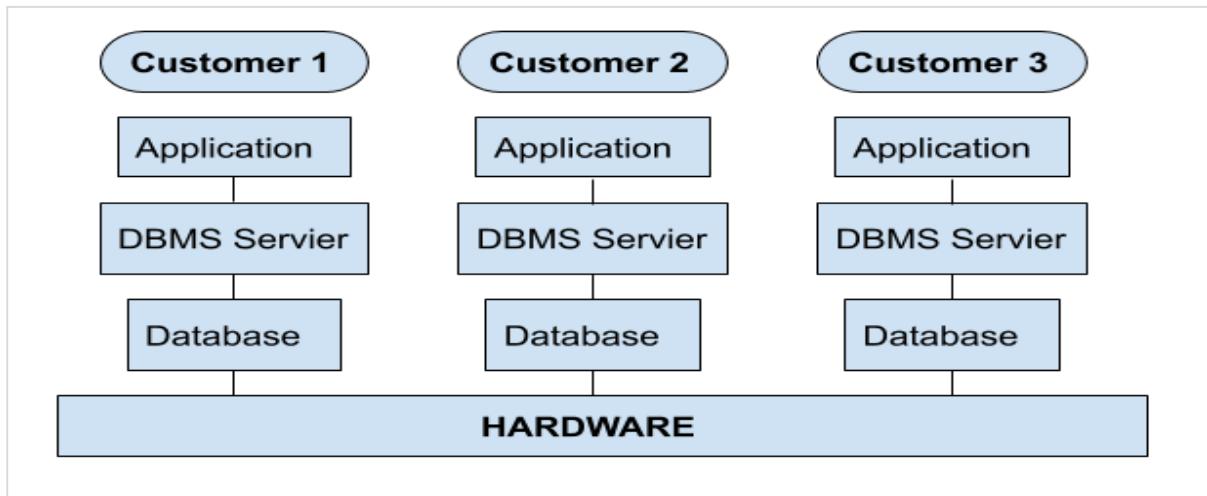
Apart from offerings mentioned above, ServiceNow also offers services for IT business management, security operations, virtual chatbots, etc.

ServiceNow is built using Java and Tomcat web server running on Linux. Although to develop new modules and applications in ServiceNow the JavaScript knowledge is sufficient.

ServiceNow Instance

A ServiceNow instance is a set of databases, applications, virtual machines, libraries grouped together to provide the required services to a specific customer. ServiceNow customer instance is built on multi-instance architecture.

The figure given below shows multi-instance architecture:



The important point to note here is that, each customer has a separate customised application(s) along with separate database(s) running on shared hardware resources. The customer data is encrypted and therefore, is completely secure. The deployment of ServiceNow is very flexible and it can also be implemented in a private cloud.

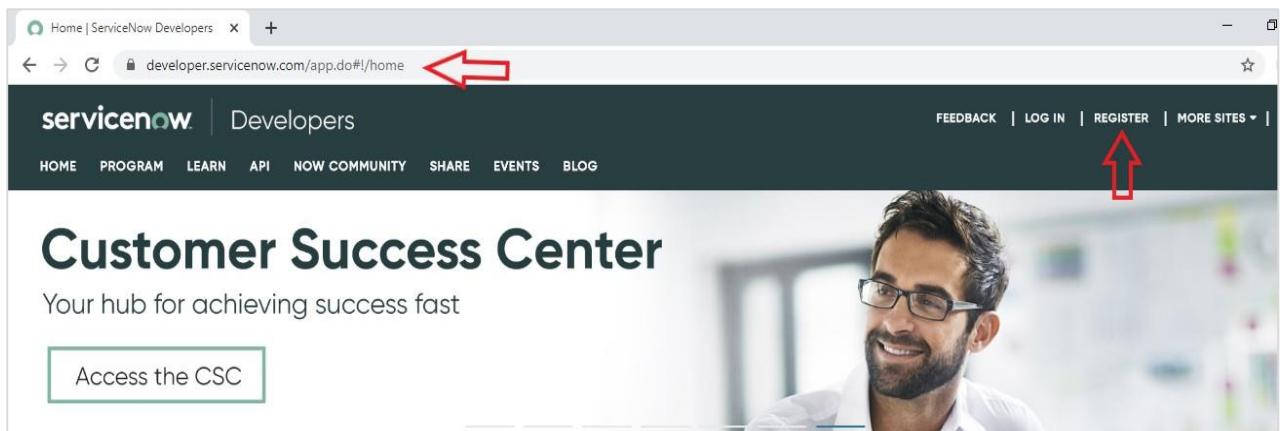
ServiceNow also offers developer instance, which is a community edition free of cost. ServiceNow developer instance was launched, to promote the use of ServiceNow and to provide the resources, so that the developers/administrators can learn, build, enhance and customise the applications in ServiceNow.

Generating Developer Instance

In this tutorial, we will use the ServiceNow developer instance and we also recommend you to generate a developer instance using the steps below:

Step 1

Go to the URL <https://developer.servicenow.com/> and click on register. You will see a screen like the one shown below.



Step 2

ServiceNow registration form will open. Give your details and click submit, as given below.

Welcome to ServiceNow Registration

Sign up for a ServiceNow ID

First name

Last name

Email

Password

Confirm password

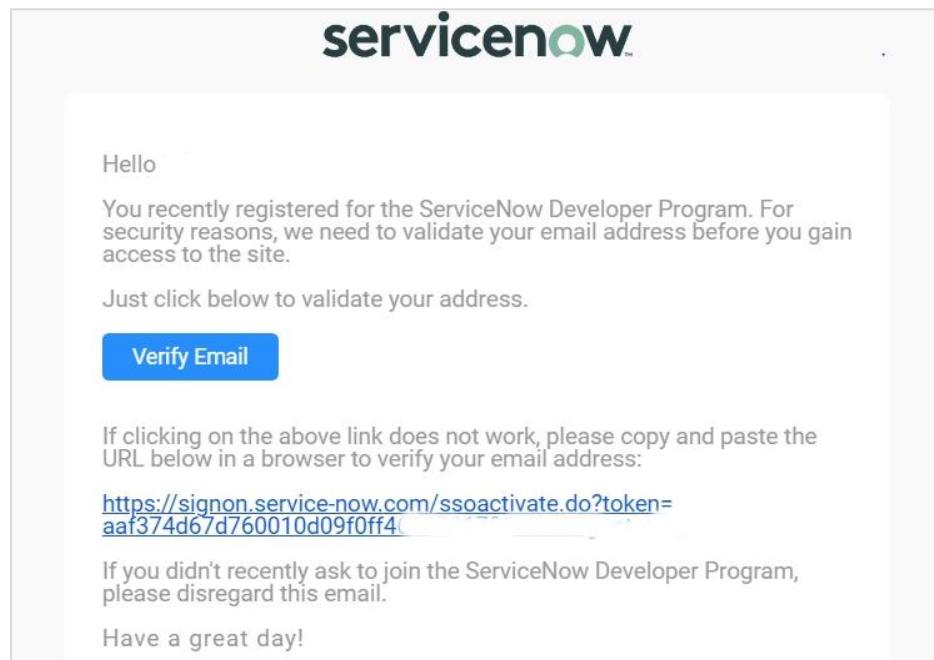
Enter the text from image below

I have read and agree to the [terms of use](#) and understand that my personal information is processed in accordance with ServiceNow's [privacy statement](#).

Sign Up

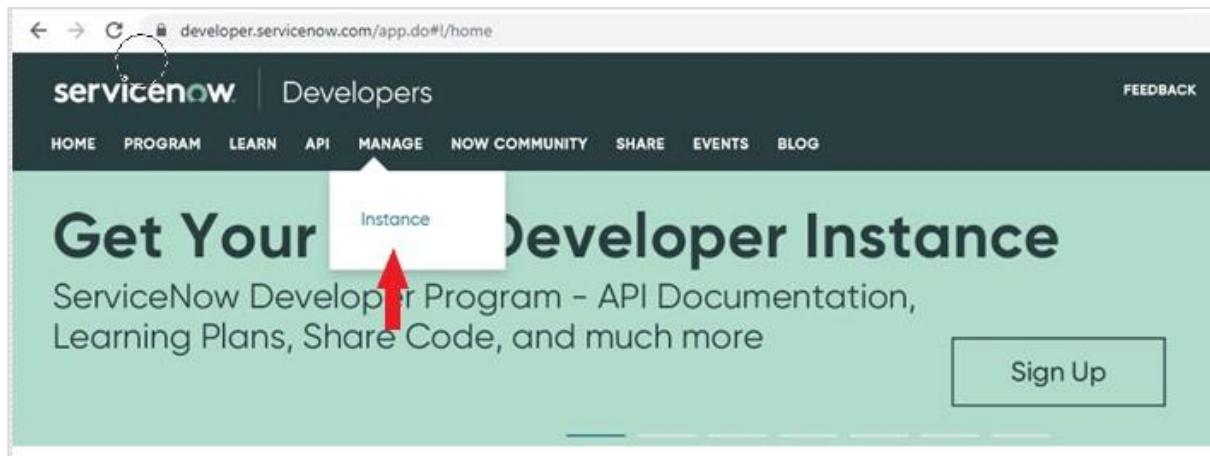
Step 3

ServiceNow will send the confirmation email. Click on the link in email to confirm the registration. Kindly refer the screen given below.



Step 4

Now, login to your ServiceNow account. You will see the dashboard below. Go to Manage → Instance.



Step 5

Now, click on request instance.

servicenow | Developers

HOME PROGRAM LEARN API MANAGE NOW COMMUNITY SHARE EVENTS BLOG

My Instance

You can request an instance of ServiceNow free of charge. In order to retain the instance, you must have it returned to the pool.

Request Instance **Restore Instance**

Step 6

Click on the latest release of ServiceNow and click on Request Instance. At the time of writing this tutorial, the latest version is Orlando.

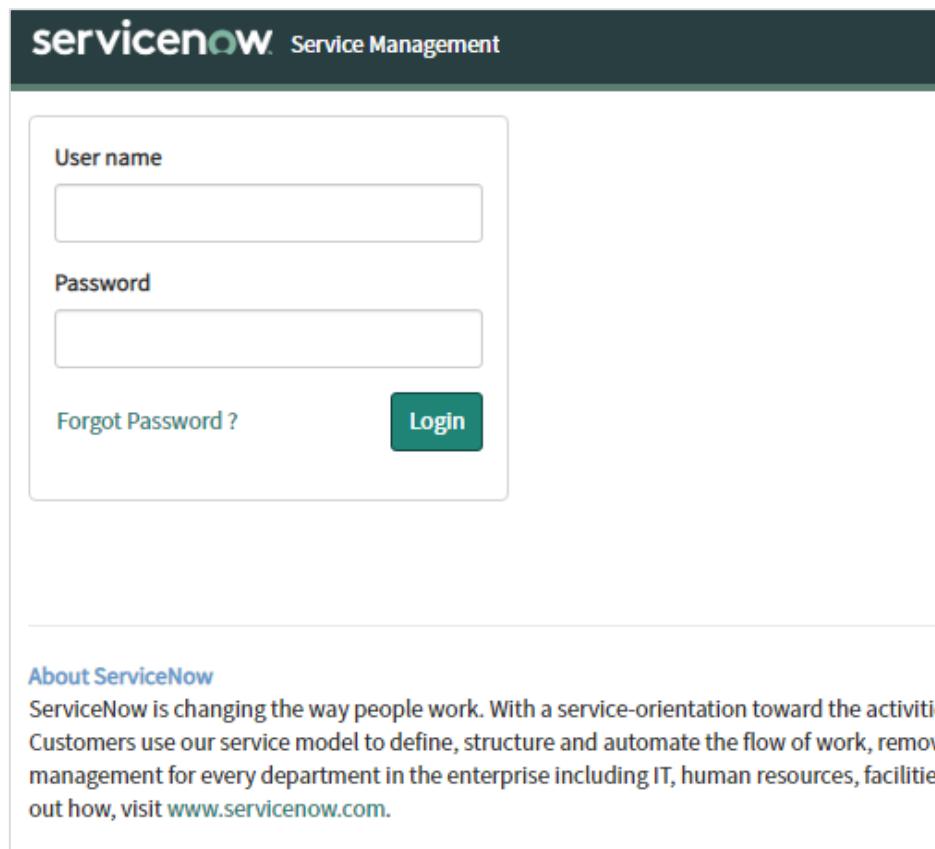
Which version of ServiceNow would you like?

London Release Notes London <small>Currently Unavailable</small>	Madrid Release Notes Madrid	New York Release Notes New York	Orlando Release Notes Orlando ↑
--	--------------------------------	------------------------------------	---

If you aren't sure which version to choose, start with Orlando. It's our latest available release and we have an instance ready for you to get started.

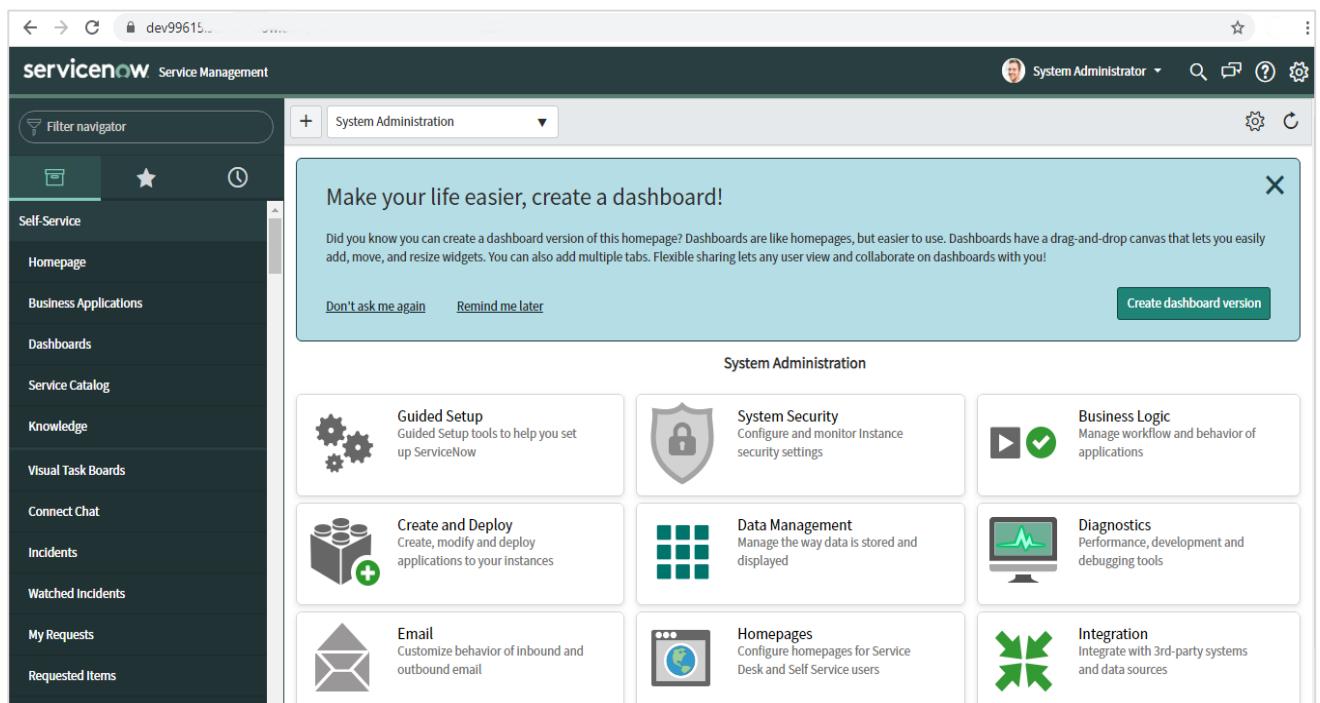
Request Instance **Cancel**

It will take around 20 minutes and your instance will get ready. On the following page, you will get the link for your instance, the admin username and password. Click on the instance link and give your username and password. After Login, you will be required to change the default password given by ServiceNow.



The screenshot shows the ServiceNow login page. At the top, it says "servicenow Service Management". Below that is a form with fields for "User name" and "Password", a "Forgot Password ?" link, and a green "Login" button. Below the form is a section titled "About ServiceNow" with a brief description: "ServiceNow is changing the way people work. With a service-orientation toward the activities of business, customers and employees, ServiceNow helps organizations manage their business processes and IT management for every department in the enterprise including IT, human resources, facilities, procurement, sales, marketing, and finance. To learn more about how ServiceNow can help your organization, visit www.servicenow.com".

Please keep in mind that, if you do not use your developer instance for 10 consecutive days then, it will become inactive and you have to reclaim that instance back. After logging into your instance, you will get the first look of the ServiceNow portal.

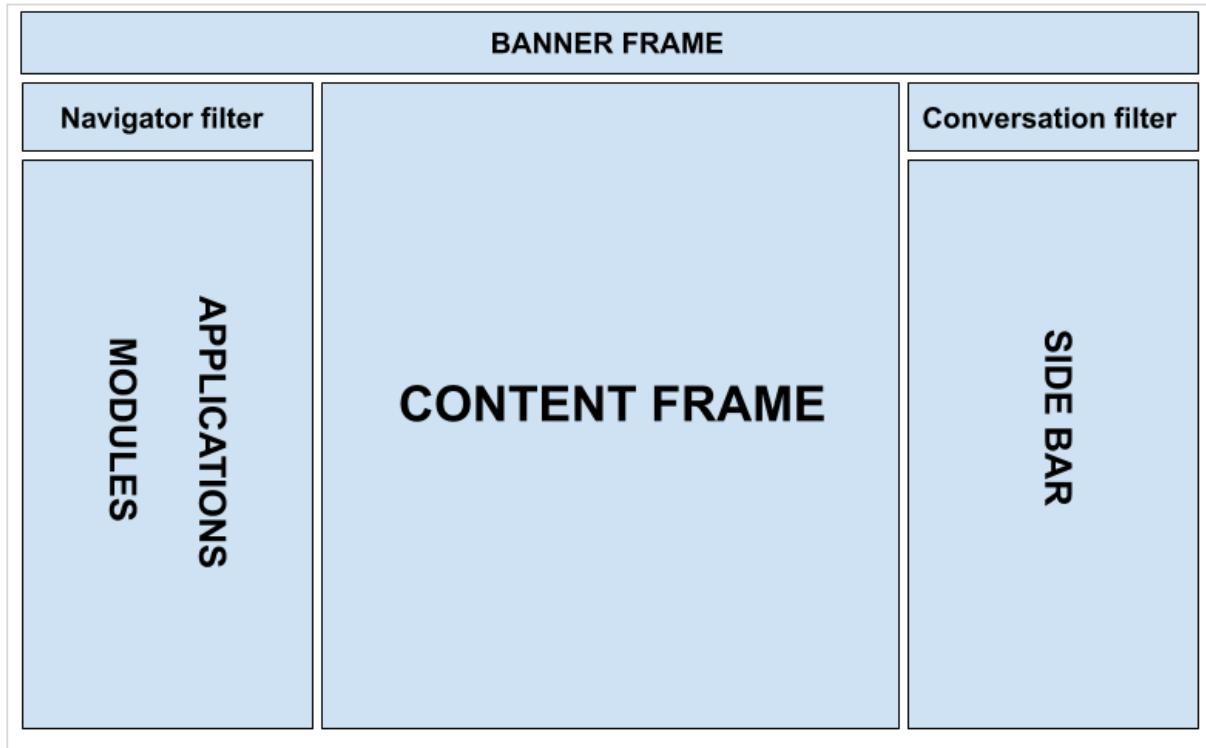


The screenshot shows the ServiceNow dashboard for a user named "System Administrator". The left sidebar lists various navigation options: Self-Service, Homepage, Business Applications, Dashboards, Service Catalog, Knowledge, Visual Task Boards, Connect Chat, Incidents, Watched Incidents, My Requests, and Requested Items. A central callout box says "Make your life easier, create a dashboard!" with links to "Don't ask me again" and "Remind me later", and a "Create dashboard version" button. Below this is a "System Administration" section with tiles for Guided Setup, System Security, Business Logic, Create and Deploy, Data Management, Diagnostics, Email, Homepages, and Integration.

Now that, you have your ServiceNow instance, you can explore various applications and features along with this tutorial.

ServiceNow User Interface (UI)

ServiceNow user interface (UI) is made up of default elements. The interface is highly flexible and can be customised as per the business requirements. An overview of ServiceNow UI is mentioned below:



All the components in the UI are explained below.

Banner frame

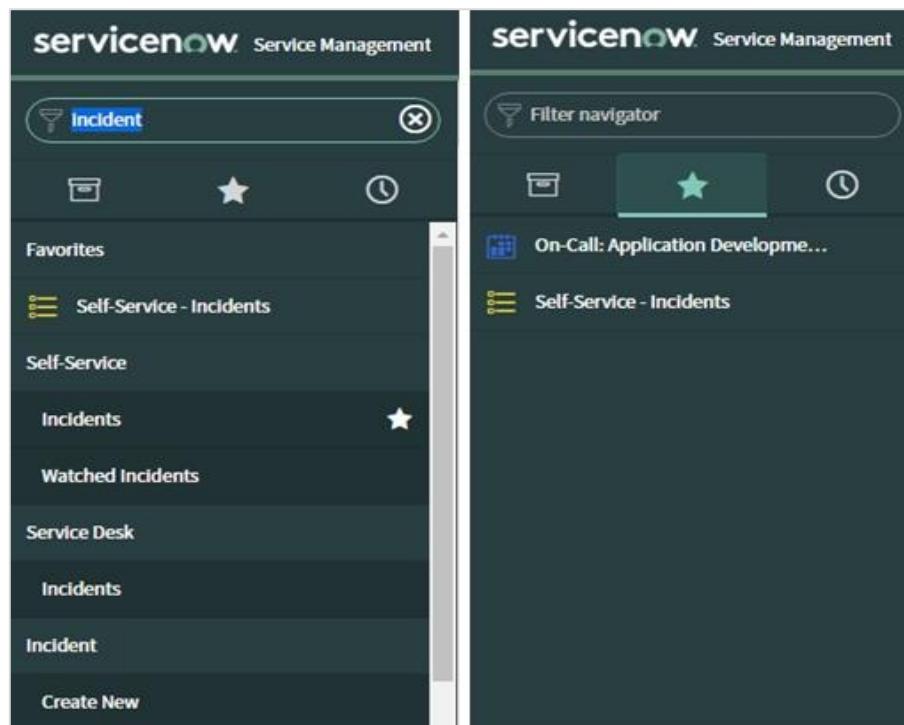
The banner frame has a logo, setting options, user profile, global search bar, and option to toggle between conversation and help in the right side bar.

Application navigator

The Application navigator allows us to browse through all the applications and modules under the applications. We can give the name of application or module in the navigation filter and ServiceNow will automatically show us all the matching applications and modules.

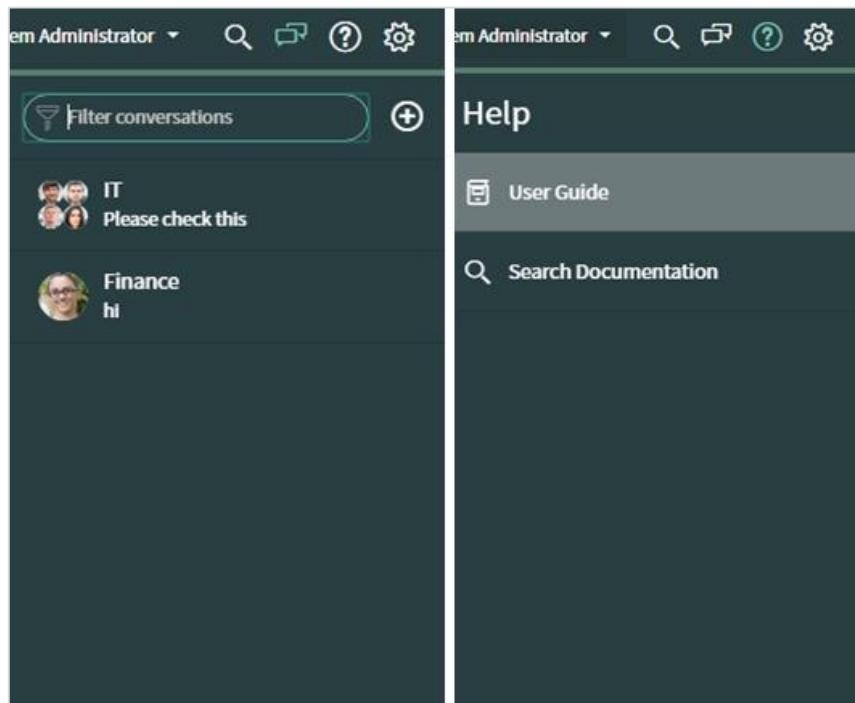
For example, "Incident" is an application in service now and "Create new" is a module under it, using which, we can create a new incident. Similarly, "Open" is another module inside incident application, which will list all the open incidents.

ServiceNow provides an option to add applications or modules as favourite by clicking in the star at the side. This is very helpful in navigating our favourite applications or modules easily.



Sidebar

The sidebar is not provided by default. The user has to activate it from the banner frame. The sidebar can either display the conversations or the help options. Using the conversation feature, we can chat with fellow colleagues and browse through chat history. The Help option allows us, to refer to the support articles which are added by administrators.



Content frame

The content frame is the centre part of ServiceNow portal, which lists the entire content of applications and modules. This also contains the centralised menu of the applications, which are important from the administration point of view. Below, are the samples of content frame displaying centralised menu and displaying content of the open module in incident application.

Guided Setup	System Security	Business Logic
Guided Setup tools to help you set up ServiceNow	Configure and monitor Instance security settings	Manage workflow and behavior of applications
Create and Deploy	Data Management	Diagnostics
Create, modify and deploy applications to your instances	Manage the way data is stored and displayed	Performance, development and debugging tools
Email	Homepages	Integration
Customize behavior of inbound and outbound email	Configure homepages for Service Desk and Self Service users	Integrate with 3rd-party systems and data sources
Reporting and Analytics	User Administration	User Interface
Create visual representations of your data	Manage users, groups and their roles	Control the look and feel of applications

<input type="checkbox"/> Incidents <input type="button" value="New"/> Search Number ▾ Search										1 to 20 of 65 ▶▶▶
<input type="checkbox"/> All <input type="checkbox"/>										
	#	Number	Opened	Short description	Caller	Priority	State	Category	Assignment group	Assigned to
<input type="checkbox"/>	<input type="checkbox"/>	INC0010112	2019-07-29 11:48:43	Assessment : ATF Assessor	survey_user	5 - Planning	New	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0010111	2019-07-22 14:04:57	ATF : Test1	System Administrator	5 - Planning	New	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0009009	2018-08-30 01:06:16	Unable to access the shared folder.	David Miller	4 - Low	New	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0009005	2018-08-31 21:35:21	Email server is down.	David Miller	● 1 - Critical	New	Software	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0009004	2018-09-01 06:13:30	Defect tracking tool is down.	David Miller	3 - Moderate	Closed	Software	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0009003	2018-08-30 02:17:32	Cannot sign into the company portal app	David Miller	3 - Moderate	Closed	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0009002	2018-09-16 05:49:23	My computer is not detecting the headphone device	David Miller	3 - Moderate	Closed	Hardware	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0009001	2018-09-11 20:56:26	Unable to post content on a Wiki page	David Miller	3 - Moderate	New	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	<input type="checkbox"/>	INC0007002	2018-10-16 22:47:51	Need access to the common drive.	David Miller	4 - Low	New	Inquiry / Help	(empty)	(empty)

2. ServiceNow — Fundamentals

Let's move a step ahead and learn some basics of ServiceNow. In this chapter, we will go through users/groups/roles, lists, forms, applications, modules and a few more concepts.

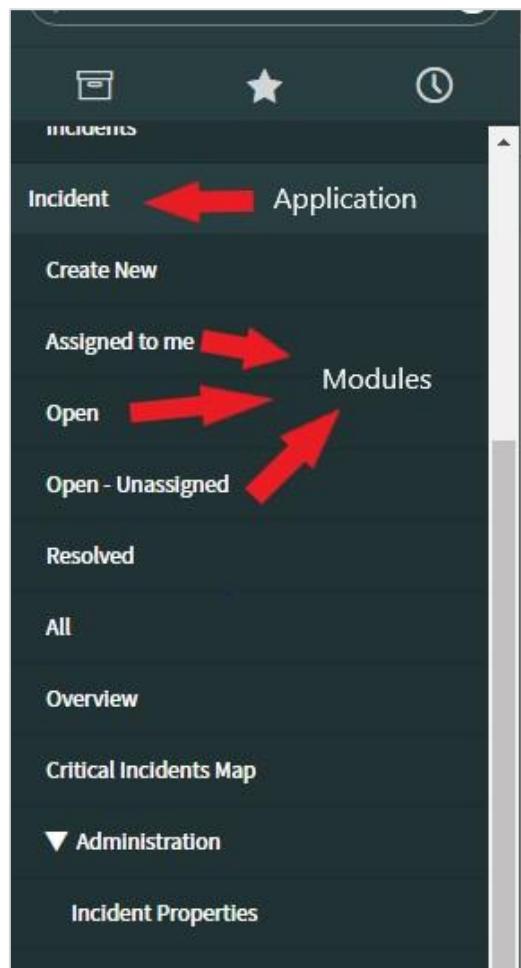
The ServiceNow developer instance has ample of dummy data like users, incidents, groups etc., which we can refer to gain good understanding about the concept. Throughout the remaining chapter, we will take our old example of BookWorm Ltd. and try to understand where, ServiceNow fits in the internal functioning of the organisation.

Applications and Modules

ServiceNow defines **Application** as, a collection of files and data that deliver a service and manage business processes and **Modules** are, children of application linking to other pages or records in the platform.

For example, we have an "Incident" application, which has modules like "Create new" to create a new incident for any department in BookWorm Ltd. "Open" module lists all the open incidents within BookWorm Ltd. (This module may only be visible to system administrators).

Similarly, there are other important applications like Problem, Change, Workflows, etc. and its respective modules like "Create New", "Open", "WorkFlow editor", etc.



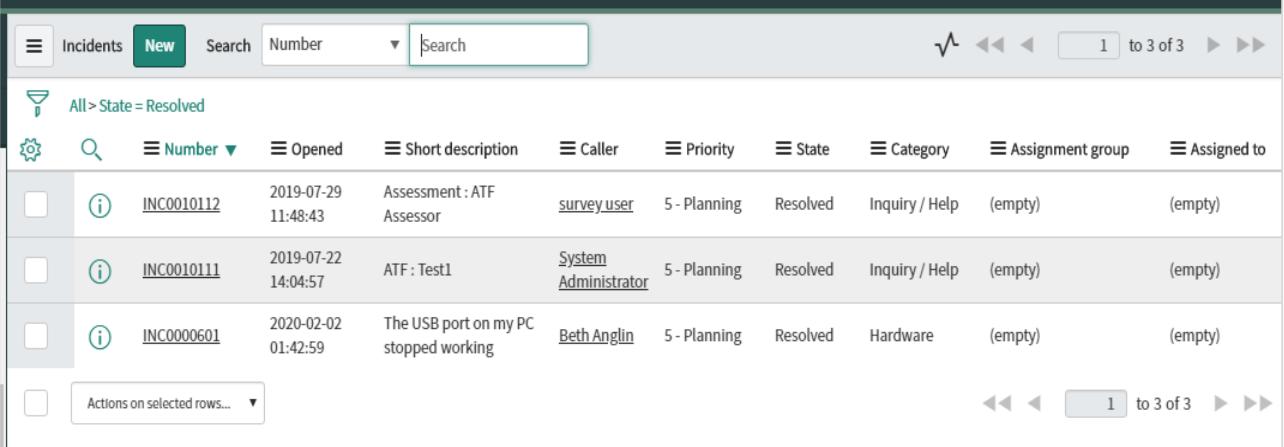
Lists and Forms

Here, you will understand what are the lists and forms in ServiceNow.

Lists

It displays the set of records (based on certain conditions) from the data table. It could be a list of incidents assigned to a certain group, from the incident table or list of problems not assigned to any group from problem table, etc.

Below is an example, of the Incident list having incidents, which are resolved from the incident table.



The screenshot shows a list of resolved incidents in the ServiceNow interface. The top navigation bar includes 'Incidents' (selected), 'New', 'Search' (with fields for 'Number' and 'Search'), and navigation icons. A search bar at the top right shows '1 to 3 of 3'. The main area displays three resolved incidents:

	Number	Opened	Short description	Caller	Priority	State	Category	Assignment group	Assigned to
<input type="checkbox"/>	INC0010112	2019-07-29 11:48:43	Assessment : ATF Assessor	survey_user	5 - Planning	Resolved	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	INC0010111	2019-07-22 14:04:57	ATF : Test1	System Administrator	5 - Planning	Resolved	Inquiry / Help	(empty)	(empty)
<input type="checkbox"/>	INC0000601	2020-02-02 01:42:59	The USB port on my PC stopped working	Beth Anglin	5 - Planning	Resolved	Hardware	(empty)	(empty)

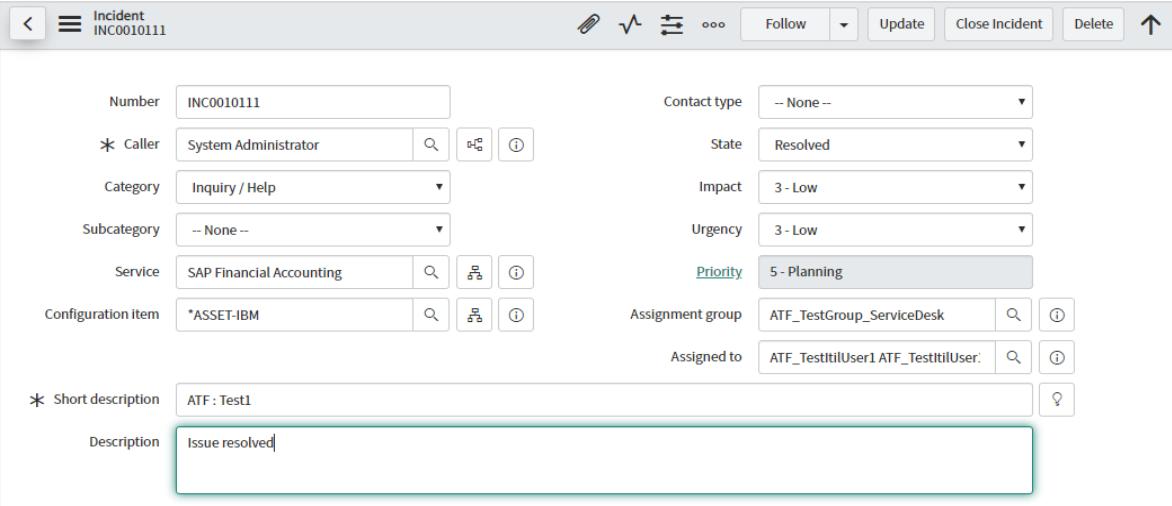
Actions on selected rows... ▾

This List is generated via the “Resolved” module of “Incident” application. This is a default module provided with ServiceNow. To open this module and explore this list, search “Incident” in application navigator and inside the Incident application find “Resolved” module.

Forms

It displays one record from the data table or it can be used to enter/update a record in a data table. For example, an incident form will display details related to a single selected incident or it can also be used to enter details of a new incident in an incident table.

The form which have details of existing incident record and form to enter the details of the new incident record are given below respectively.



The screenshot shows a detailed form for an incident record (INC0010111). The form fields include:

- Number: INC0010111
- Contact type: -- None --
- * Caller: System Administrator
- State: Resolved
- Category: Inquiry / Help
- Impact: 3 - Low
- Subcategory: -- None --
- Urgency: 3 - Low
- Service: SAP Financial Accounting
- Priority: 5 - Planning
- Configuration item: *ASSET-IBM
- Assignment group: ATF_TestGroup_ServiceDesk
- Assigned to: ATF_TestUser1 ATF_TestUser2
- * Short description: ATF : Test1
- Description: Issue resolved

The screenshot shows the ServiceNow Incident application interface. At the top, the incident number is displayed as INC0010112. Below the header, there are several input fields and dropdown menus for incident details. The 'Number' field contains 'INC0010112'. The 'Caller' field is set to 'survey user'. The 'Category' is 'Inquiry / Help'. The 'Subcategory' is '-- None --'. The 'Service' and 'Configuration item' fields are empty. The 'Contact type' is '-- None --', 'State' is 'Resolved', 'Impact' is '3 - Low', 'Urgency' is '3 - Low', 'Priority' is '5 - Planning', and 'Assignment group' and 'Assigned to' fields are also empty. A note in the 'Short description' field states 'Assessment : ATF Assessor'. The 'Description' field is a large text area. At the bottom right, there is a link to 'Related Search Results'.

To access the first form in the above example, go to “Resolved” module inside Incident application. A list of resolved incidents will appear. Click on any incident number, to open the form. The second screen in the above example, having a form to enter new incident details, can be accessed via “Create New” module of Incident application.

Users, Roles and Groups

The users, roles and groups in ServiceNow are explained below in detail.

Users

are the individuals who use the ServiceNow within an organisation. The system administrator has the authority to create a new user, browse through the list of existing users, delete a user and impersonate a user.

To open the list of existing user, go to “Users” module inside User administration application.

(Search user in application navigator and click on “Users” under User Administration)

The screenshot shows the ServiceNow User list page. At the top, there is a search bar and a 'New' button, which is circled in red. Below the search bar, there are filters for 'All' and 'User ID'. The main table lists seven users with the following data:

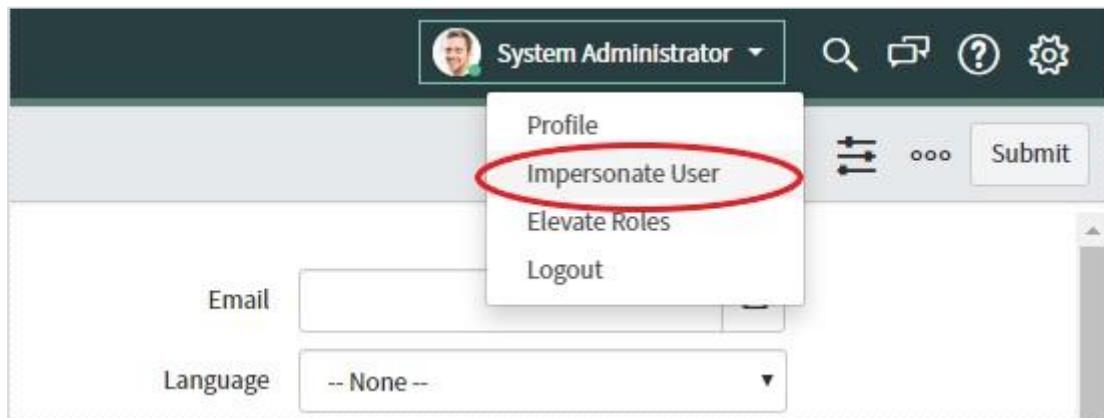
	User ID	Name	Email	Active	Created	Updated
<input type="checkbox"/>	abel.tuter	Abel Tuter	abel.tuter@example.com	true	2012-02-17 19:04:52	2020-02-07 15:46:45
<input type="checkbox"/>	abraham.lincoln	Abraham Lincoln	abraham.lincoln@example.com	true	2013-07-23 17:15:54	2020-02-07 15:46:49
<input type="checkbox"/>	adela.cervantsz	Adela Cervantsz	adela.cervantsz@example.com	true	2012-02-17 19:04:50	2020-02-07 15:46:40
<input type="checkbox"/>	aileen.mottern	Aileen Mottern	aileen.mottern@example.com	true	2012-02-17 19:04:49	2020-02-07 15:46:46
<input type="checkbox"/>	alejandra.prenatt	Alejandra Prenatt	alejandra.prenatt@example.com	true	2012-02-17 19:04:52	2020-02-07 15:46:41
<input type="checkbox"/>	alejandro.mascall	Alejandro Mascall	alejandro.mascall@example.com	true	2012-02-17 19:04:52	2020-02-07 15:46:49
<input type="checkbox"/>	alene.rabeck	Alene Rabeck	alene.rabeck@example.com	true	2012-02-17 19:04:53	2020-02-07 15:46:50

To create a new user, click on the New button in top left of the content frame. Following form will open to enter a new data record for the user table.

User New record

User ID	<input type="text"/>	Email	<input type="text"/>
First name	<input type="text"/>	Language	-- None --
Last name	<input type="text"/>	Calendar integration	Outlook
Title	<input type="text"/>	Time zone	System (America/Los_Angeles)
Department	<input type="text"/>	Date format	System (yyyy-MM-dd)
Password	<input type="password"/>	Business phone	<input type="text"/>
Password needs reset	<input type="checkbox"/>	Mobile phone	<input type="text"/>
Locked out	<input type="checkbox"/>	Photo Click to add...	
Active	<input checked="" type="checkbox"/>		
Web service access only	<input type="checkbox"/>		
Internal Integration	<input type="checkbox"/>		
User			
<input type="button" value="Submit"/>			

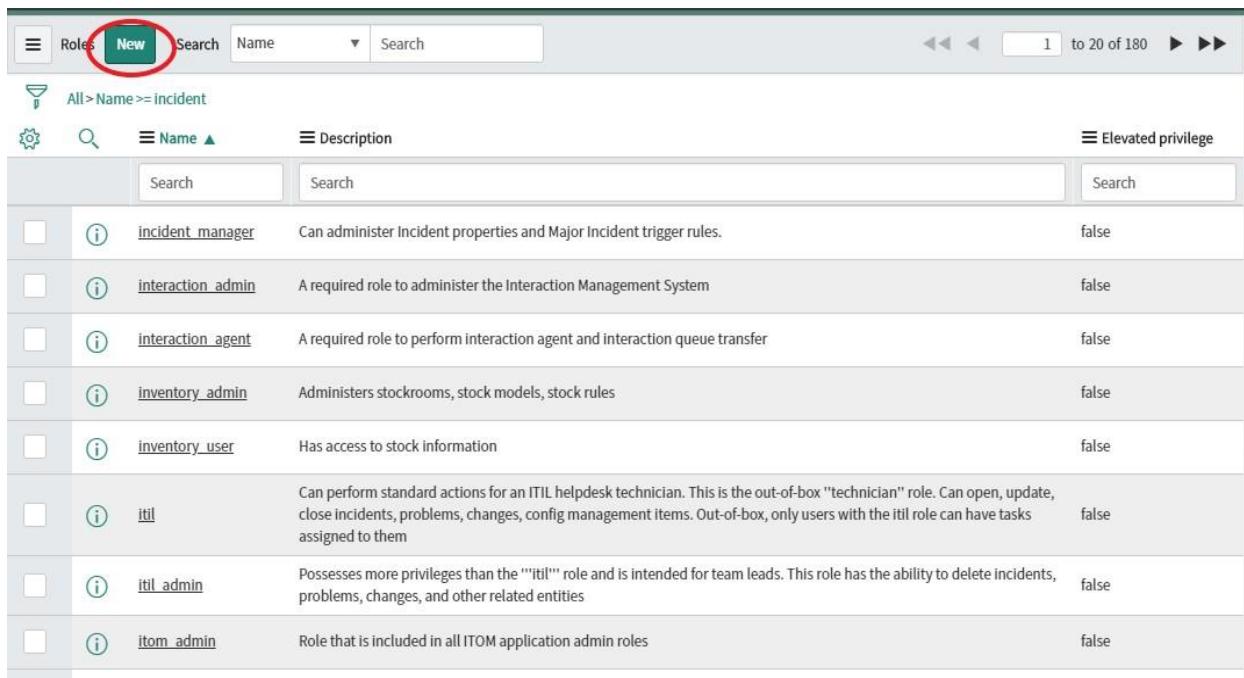
A system administrator can also impersonate a user, which means that system administrator can login to ServiceNow as another user. There is an option in the banner frame, to impersonate as any other user.



Roles

are associated with the task that a user performs within an organisation. The role is assigned based on the work profile. For example, there can be an incident manager role, application developer role, incident analyst role, etc.

The roles control the access to the features and capabilities in applications and modules. So, a system administrator role may have access to a few applications which incident manager role may not have. The list of roles and form to add a new role can be found in System security application under Users and Groups.



The screenshot shows a ServiceNow interface for managing roles. At the top, there's a navigation bar with 'Roles' and a 'New' button highlighted with a red circle. Below the navigation is a search bar with 'Name' and a dropdown. The main area displays a table of roles with columns for Name, Description, and Elevated privilege. The 'Elevated privilege' column contains the value 'false' for all listed roles.

	Name	Description	Elevated privilege
<input type="checkbox"/>	incident_manager	Can administer Incident properties and Major Incident trigger rules.	false
<input type="checkbox"/>	interaction_admin	A required role to administer the Interaction Management System	false
<input type="checkbox"/>	interaction_agent	A required role to perform interaction agent and interaction queue transfer	false
<input type="checkbox"/>	inventory_admin	Administers stockrooms, stock models, stock rules	false
<input type="checkbox"/>	inventory_user	Has access to stock information	false
<input type="checkbox"/>	itil	Can perform standard actions for an ITIL helpdesk technician. This is the out-of-box "technician" role. Can open, update, close incidents, problems, changes, config management items. Out-of-box, only users with the itil role can have tasks assigned to them	false
<input type="checkbox"/>	itil_admin	Possesses more privileges than the "itil" role and is intended for team leads. This role has the ability to delete incidents, problems, changes, and other related entities	false
<input type="checkbox"/>	itom_admin	Role that is included in all ITOM application admin roles	false

Groups

Groups are the collection of users, which perform a similar task. For example, there can be a group of change managers, who can approve the changes in production, or there can be a procurement group, who have the access to raise the purchase order, etc. The group can be accessed via System security → Users and groups → Groups.

It is always best practise to assign users to groups or vice versa, and further assign roles to groups. Generally, it is not recommended to assign users directly to the roles. The reason is explained using the below example:

Suppose among many groups in BookWorm Ltd. (in ServiceNow), there is one group for the IT team and under the IT team there is a child group for 'Full stack engineers'. In addition to this, there are a couple of roles i.e., 'Backend IT services' and 'Frontend IT services'. The Full stack engineers need to be assigned to both the roles so that they have accesses and licence privileges meant for both, Frontend and Backend IT services.

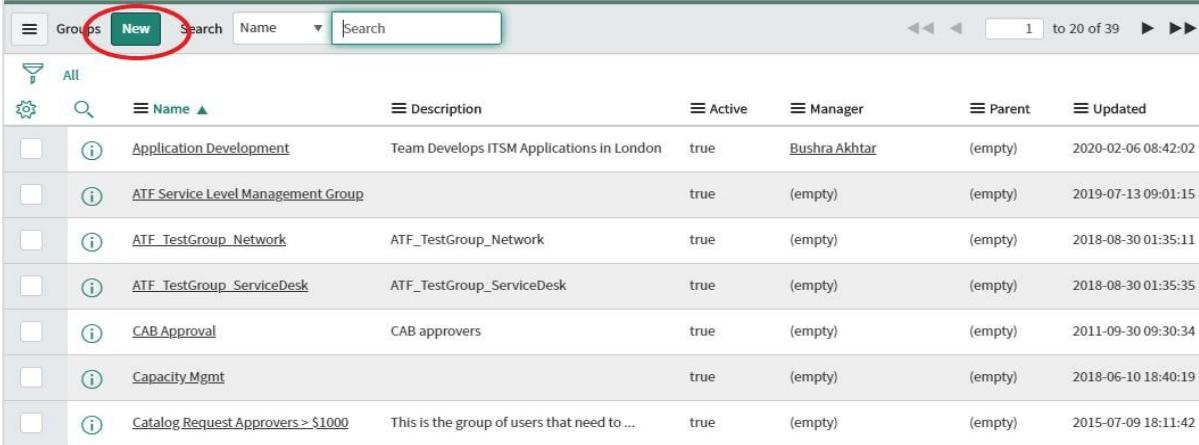
A full stack engineer joined BookWorm Ltd. who is expert in both backend technologies and frontend technologies. Therefore, instead of assigning this user to two roles (Backend IT services and Frontend IT services) separately, it would be a good idea to create a group of full stack engineer and assign this group to two roles, i.e., Backend IT services and Frontend IT services.

Now, for all the full stack engineers joining the BookWorm Ltd., the administrator only has to assign that full stack engineer user to the full stack engineer group, which is a child group of the IT team.

Let's implement the example mentioned above practically in ServiceNow, to understand this concept better.

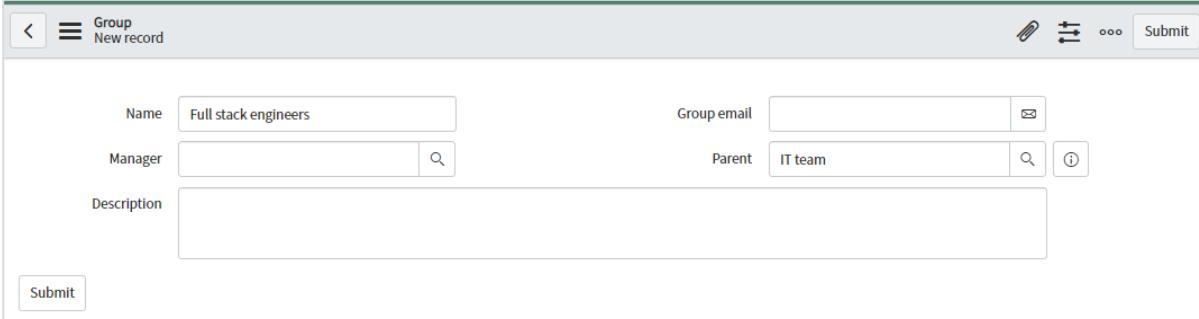
Practical

First, we will create a group, i.e. IT team and its child group Full stack engineers. In the navigation filter, search “User administration” and select “Group” modules under user administration. The following screen will open in the content frame.



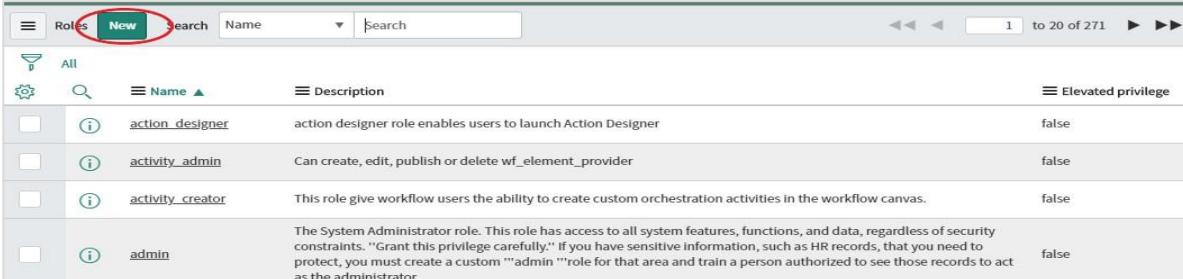
<input type="checkbox"/>	Name	Description	Active	Manager	Parent	Updated
<input type="checkbox"/>	Application Development	Team Develops ITSM Applications in London	true	Bushra Akhtar	(empty)	2020-02-06 08:42:02
<input type="checkbox"/>	ATF Service Level Management Group		true	(empty)	(empty)	2019-07-13 09:01:15
<input type="checkbox"/>	ATF_TestGroup_Network	ATF_TestGroup_Network	true	(empty)	(empty)	2018-08-30 01:35:11
<input type="checkbox"/>	ATF_TestGroup_ServiceDesk	ATF_TestGroup_ServiceDesk	true	(empty)	(empty)	2018-08-30 01:35:35
<input type="checkbox"/>	CAB Approval	CAB approvers	true	(empty)	(empty)	2011-09-30 09:30:34
<input type="checkbox"/>	Capacity Mgmt		true	(empty)	(empty)	2018-06-10 18:40:19
<input type="checkbox"/>	Catalog Request Approvers > \$1000	This is the group of users that need to ...	true	(empty)	(empty)	2015-07-09 18:11:42

Click on the New button and give the details. Only Name is sufficient to identify the Group. You can also give Group email and select the manager from the list of users. The parent tag is used to create a hierarchical structure in the group, so for the IT team group, we can leave it blank and for Full stack engineers group, we can give IT team group as the parent.



Group New record			
Name	Full stack engineers	Group email	<input type="text"/>
Manager	<input type="text"/>	Parent	IT team
Description	<input type="text"/>		
<input type="button" value="Submit"/>			

Now that we have created the groups, let's move ahead and create two roles - Backend IT services and Frontend IT services, which will be assigned to the group Full stack engineers. Inside “User administration”, go to “Roles” module.



<input type="checkbox"/>	Name	Description	Elevated privilege
<input type="checkbox"/>	action_designer	action designer role enables users to launch Action Designer	false
<input type="checkbox"/>	activity_admin	Can create, edit, publish or delete wf_element_provider	false
<input type="checkbox"/>	activity_creator	This role gives workflow users the ability to create custom orchestration activities in the workflow canvas.	false
<input type="checkbox"/>	admin	The System Administrator role. This role has access to all system features, functions, and data, regardless of security constraints. "Grant this privilege carefully." If you have sensitive information, such as HR records, that you need to protect, you must create a custom "admin" role for that area and train a person authorized to see those records to act as the administrator.	false

Click on the New button and give the name of the role. Keep the application as Global to allow this role to be implemented for every application in your ServiceNow. Granting “elevated privilege” means that, the user assigned to this role, will be given accesses/privileges more than a standard user. They may require administering certain functionality.

Now, we have to assign these roles to our group. Go to “Groups” module again and search our group “Full stack engineers” at the top of content frame beside New button.

	Name	Description	Active	Manager	Parent	Roles
<input type="checkbox"/>	Application Development	Team Develops ITSM Applications in London	true	Bushra Akhtar	(empty)	
<input type="checkbox"/>	ATF Service Level Management Group		true	(empty)	(empty)	
<input type="checkbox"/>	ATF TestGroup_Network	ATF_TestGroup_Network	true	(empty)	(empty)	

Open group “Full stack engineers” and now you will see, a new section to add roles or Group members. In the roles tab, click edit button and below screen will appear.

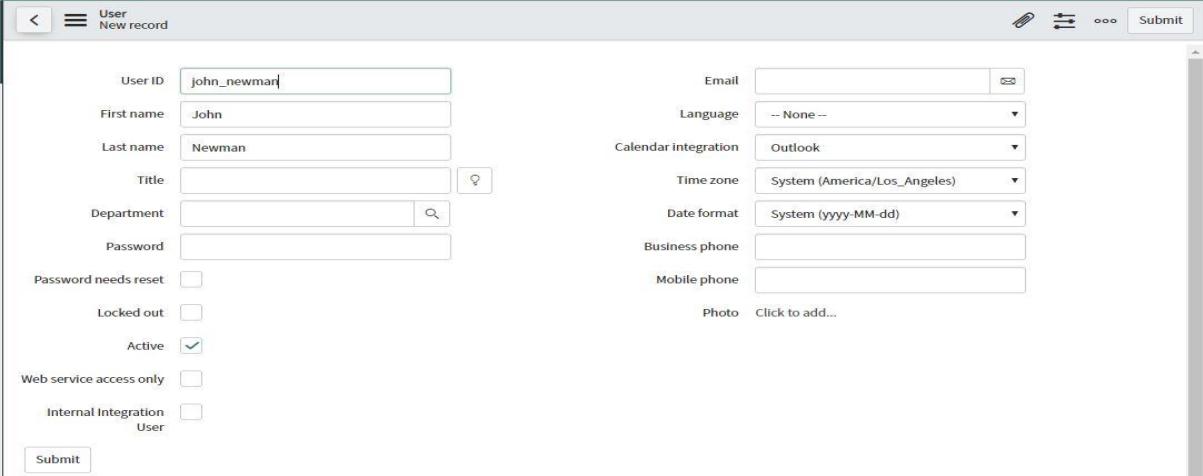
Search the role, we have just created “Frontend IT services” in the collection box. Select the role and click on the arrow button to add the role in this group. Finally, press the Save button. You will be taken back to the main screen of the Group module. Update the record, using the update button in the top right corner. Similarly, repeat the process for Backend IT team services.

Let's move ahead and add some users in ServiceNow. Navigate to "users" module in "user administration" application and click on New button.

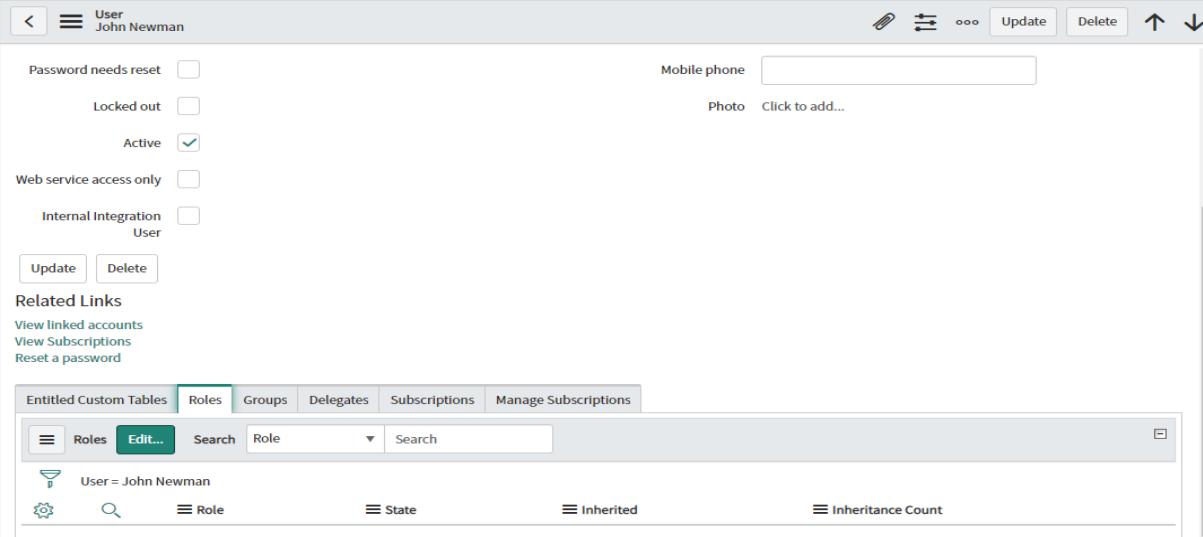


	User ID	Name	Email	Active	Created	Updated
<input type="checkbox"/>	abel.tuter	Abel Tuter	abel.tuter@example.com	true	2012-02-17 19:04:52	2020-02-07 15:46:45
<input type="checkbox"/>	abraham.lincoln	Abraham Lincoln	abraham.lincoln@example.com	true	2013-07-23 17:15:54	2020-02-07 15:46:49
<input type="checkbox"/>	adela.cervantsz	Adela Cervantsz	adela.cervantsz@example.com	true	2012-02-17 19:04:50	2020-02-07 15:46:40

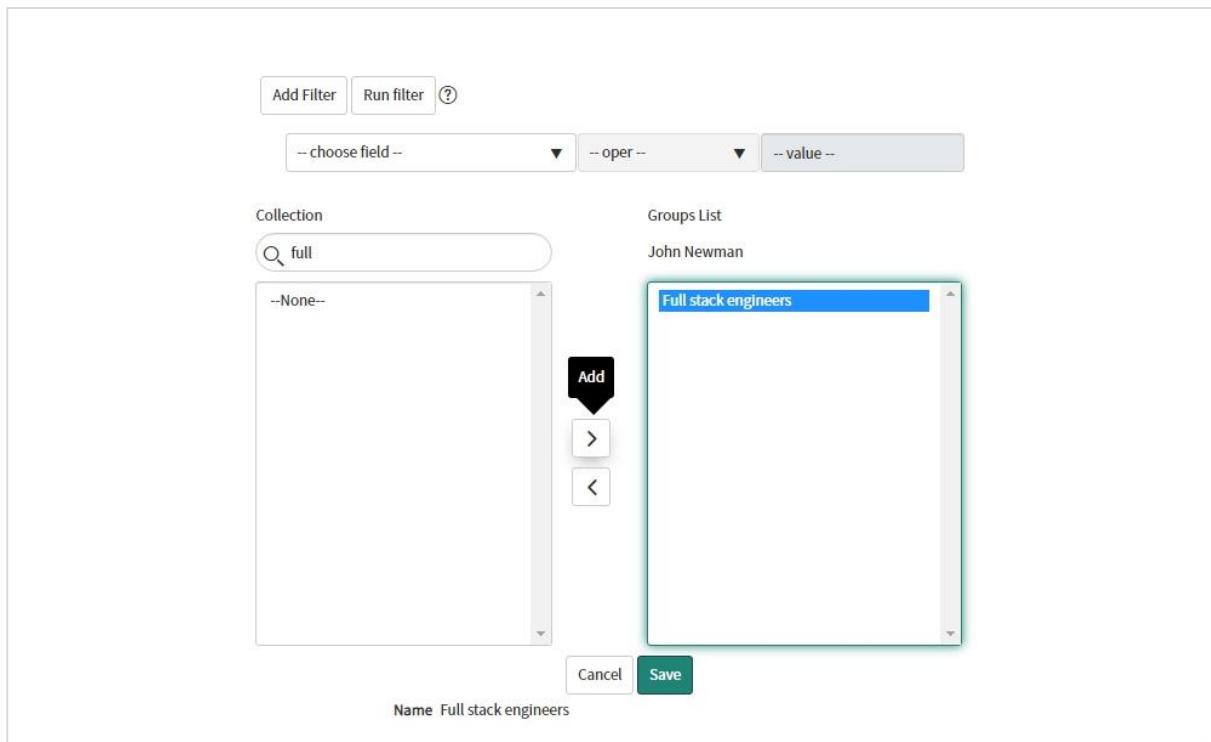
Enter the details of the new user and press submit button. Similarly, you can add a few more users. We have added two new users here, John Newman and Cindy Davis.



To assign the group "full stack engineer" to these users, open the newly created users again and scroll at the bottom of the user. You will see a new section to add roles or groups to this user.



Go to Groups tab and click on edit button. Following screen will appear:



Search the group “full stack engineers” in the collection box, select the group and click on the arrow button to add this group to the user John Newman. Repeat the similar process for Cindy Davis. So, finally we have created users, groups and roles. We have then added the roles to the group and group to the user.

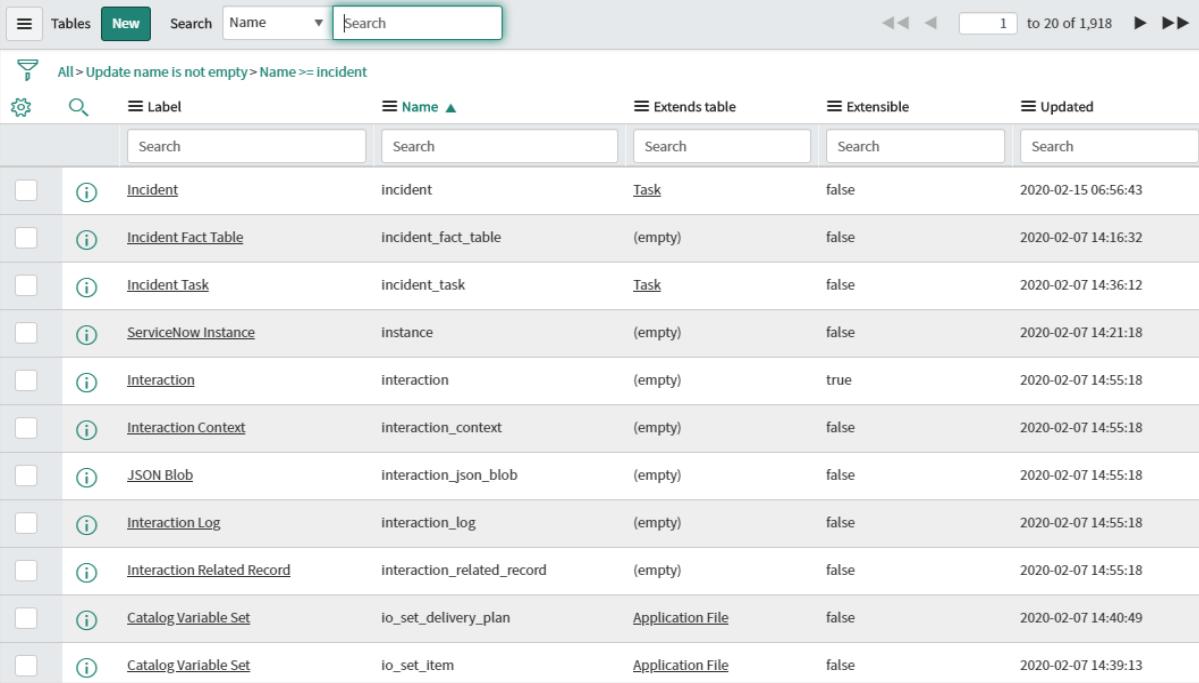
Tables, Columns and Fields

Let us learn, what are tables, columns and fields in ServiceNow. We will begin by understanding about the tables.

Tables

Tables are the collection of data in ServiceNow. The applications and modules use tables to store, display and process the data. For example, the “Incident” application has an incident table. Similarly, there is a user table, change request table, etc.

To check the structure or update the structure of any table make use of the “Tables” module of “System Definition” application.

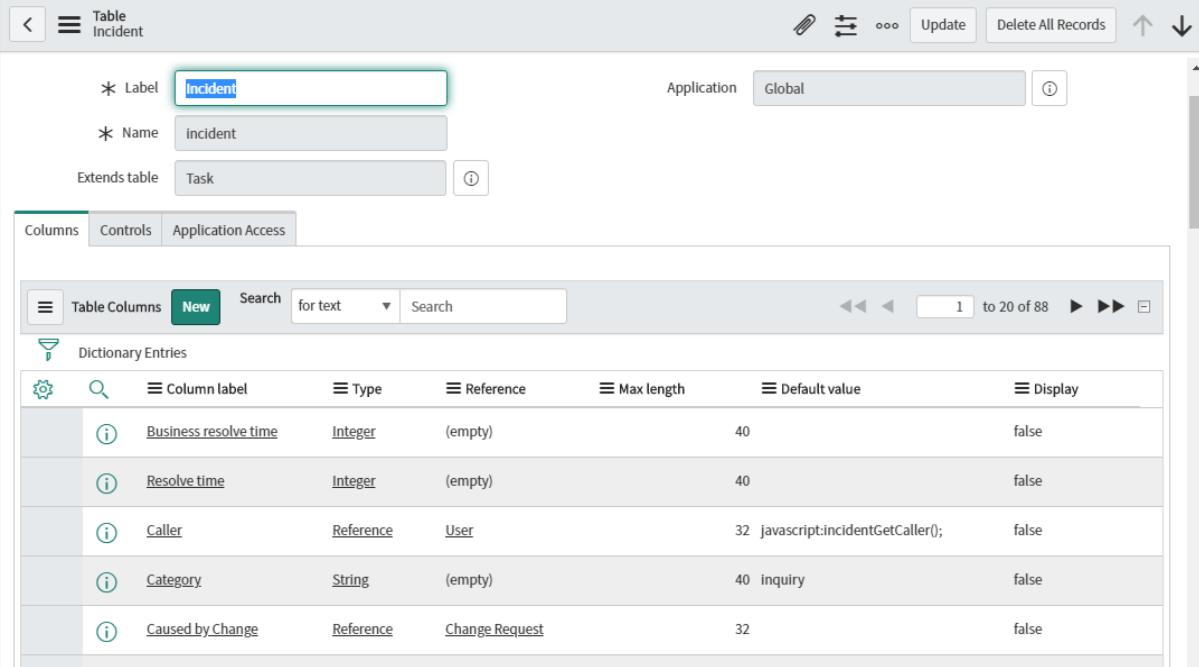


The screenshot shows a search results page for 'All' in ServiceNow. The search bar at the top contains 'Search'. Below the search bar is a table header with columns: Label, Name, Extends table, Extensible, and Updated. The table body lists various tables with their details:

	Label	Name	Extends table	Extensible	Updated
<input type="checkbox"/>	Incident	incident	Task	false	2020-02-15 06:56:43
<input type="checkbox"/>	Incident Fact Table	incident_fact_table	(empty)	false	2020-02-07 14:16:32
<input type="checkbox"/>	Incident Task	incident_task	Task	false	2020-02-07 14:36:12
<input type="checkbox"/>	ServiceNow Instance	instance	(empty)	false	2020-02-07 14:21:18
<input type="checkbox"/>	Interaction	interaction	(empty)	true	2020-02-07 14:55:18
<input type="checkbox"/>	Interaction Context	interaction_context	(empty)	false	2020-02-07 14:55:18
<input type="checkbox"/>	JSON Blob	interaction_json_blob	(empty)	false	2020-02-07 14:55:18
<input type="checkbox"/>	Interaction Log	interaction_log	(empty)	false	2020-02-07 14:55:18
<input type="checkbox"/>	Interaction Related Record	interaction_related_record	(empty)	false	2020-02-07 14:55:18
<input type="checkbox"/>	Catalog Variable Set	io_set_delivery_plan	Application File	false	2020-02-07 14:40:49
<input type="checkbox"/>	Catalog Variable Set	io_set_item	Application File	false	2020-02-07 14:39:13

The table name can be searched in the top section of the content screen.

Let's explore the incident table. Once, we click the desired table, we can find all the columns in the table, column type (integer, string, etc.), maximum length, etc. The new column can be added to the table, using the New button.

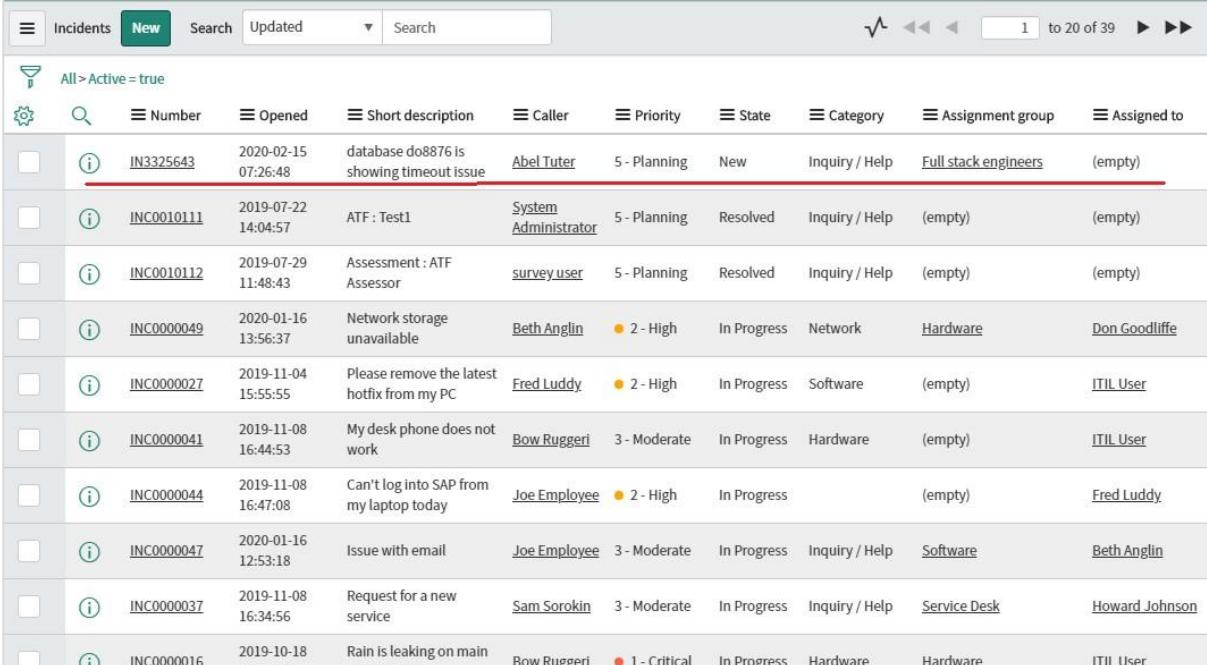


The screenshot shows the configuration of the 'Incident' table. At the top, there are fields for Label (set to 'Incident'), Application (set to 'Global'), and Extends table (set to 'Task'). Below this, there are tabs for Columns, Controls, and Application Access. The Columns tab is selected, showing a table of columns with their labels, types, references, max lengths, default values, and displays:

	Column label	Type	Reference	Max length	Default value	Display
<input type="checkbox"/>	Business resolve_time	Integer	(empty)	40	false	
<input type="checkbox"/>	Resolve_time	Integer	(empty)	40	false	
<input type="checkbox"/>	Caller	Reference	User	32	<code>javascript:incidentGetCaller();</code>	false
<input type="checkbox"/>	Category	String	(empty)	40	inquiry	false
<input type="checkbox"/>	Caused_by_Change	Reference	Change_Request	32		false

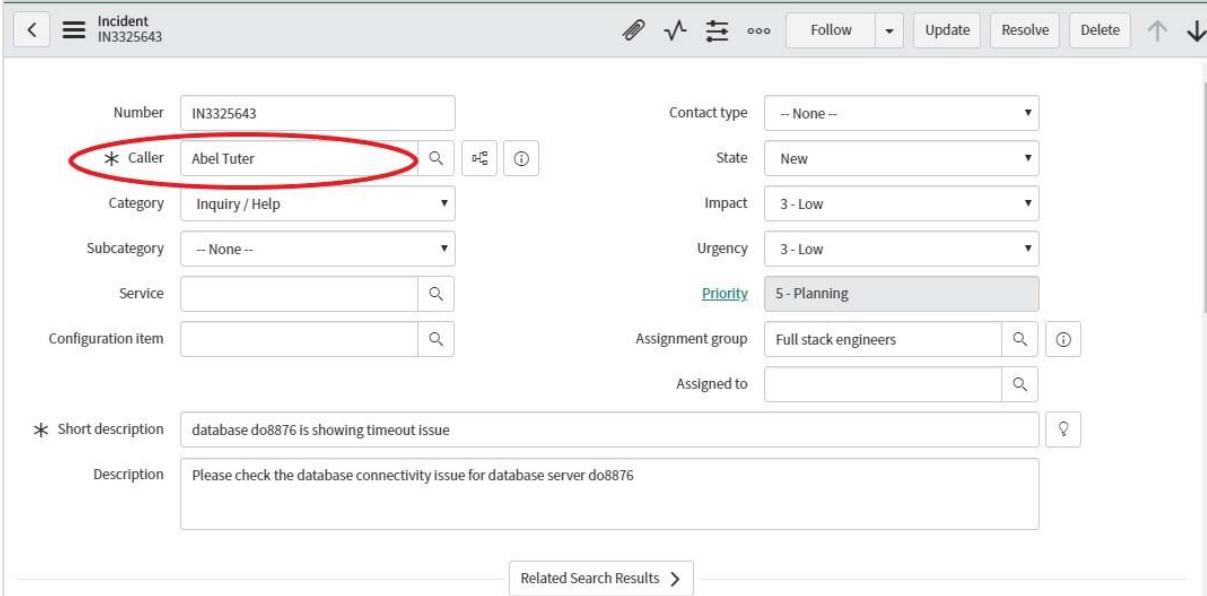
The important point to note here is that, every row in the table points to the unique record. So, for example, if an incident **IN3325643** is raised in BookWorm Ltd., for the full stack engineers group reporting the database connectivity issue. There will be a new row added in the incident table, which is specific for the incident record **IN3325643**.

To browse the data, in the table search “<tablename>.list” in the navigation bar (incident.list in this case).



	Incidents	New	Search	Updated	▼	Search	✓	◀◀	◀	▶	▶▶	1	to 20 of 39	► ►►
All > Active = true														
	Number	Opened	Short description	Caller	Priority	State	Category	Assignment group	Assigned to					
<input type="checkbox"/>	IN3325643	2020-02-15 07:26:48	database do8876 is showing timeout issue	Abel Tuter	5 - Planning	New	Inquiry / Help	Full stack engineers	(empty)					
<input type="checkbox"/>	INC0010111	2019-07-22 14:04:57	ATF : Test1	System Administrator	5 - Planning	Resolved	Inquiry / Help	(empty)	(empty)					
<input type="checkbox"/>	INC0010112	2019-07-29 11:48:43	Assessment : ATF Assessor	survey user	5 - Planning	Resolved	Inquiry / Help	(empty)	(empty)					
<input type="checkbox"/>	INC0000049	2020-01-16 13:56:37	Network storage unavailable	Beth Anglin	● 2 - High	In Progress	Network	Hardware	Don Goodliffe					
<input type="checkbox"/>	INC0000027	2019-11-04 15:55:55	Please remove the latest hotfix from my PC	Fred Luddy	● 2 - High	In Progress	Software	(empty)	ITIL User					
<input type="checkbox"/>	INC0000041	2019-11-08 16:44:53	My desk phone does not work	Bow Ruggeri	3 - Moderate	In Progress	Hardware	(empty)	ITIL User					
<input type="checkbox"/>	INC0000044	2019-11-08 16:47:08	Can't log into SAP from my laptop today	Joe Employee	● 2 - High	In Progress	(empty)	(empty)	Fred Luddy					
<input type="checkbox"/>	INC0000047	2020-01-16 12:53:18	Issue with email	Joe Employee	3 - Moderate	In Progress	Inquiry / Help	Software	Beth Anglin					
<input type="checkbox"/>	INC0000037	2019-11-08 16:34:56	Request for a new service	Sam Sorokin	3 - Moderate	In Progress	Inquiry / Help	Service Desk	Howard Johnson					
<input type="checkbox"/>	INC0000016	2019-10-18 16:40:22	Rain is leaking on main door	Bow Ruggeri	● 1 - Critical	In Progress	Hardware	Hardware	ITIL User					

If we focus on this incident record, every column in this record represents the field having a specific value. For example, this incident record **IN3325643** is having column “Caller” as Abel Tuter, this is one of the fields of this record. To open any record, click on the incident number from the list.



Number	IN3325643	Contact type	— None —
* Caller	Abel Tuter	State	New
Category	Inquiry / Help	Impact	3 - Low
Subcategory	— None —	Urgency	3 - Low
Service		Priority	5 - Planning
Configuration item		Assignment group	Full stack engineers
		Assigned to	
* Short description	database do8876 is showing timeout issue		
Description	Please check the database connectivity issue for database server do8876		
Related Search Results >			

Similarly, you can explore other tables like users, problem, change, etc. We can even create a new table, for our custom applications as per the business requirements. The new table can be created from the Table module → New button in the top section of the content frame.

3. ServiceNow — ITIL

ITIL stands for **Information Technology Infrastructure Library**. It was introduced by the UK government's Central Computer and Telecommunications Agency (CCTA) during the 1980s.

ITIL is a collection of books having processes and best practises laid down in order to achieve efficient **IT (Information Technology) Service Management (ITSM)** and elaborating all the activities required for delivering end to end IT services in any organisation.

ITIL defines service as "means of delivering value to customers by facilitating outcomes customers want to achieve, but without the ownership of specific costs and risks." ITSM states the systematic approach to design, deliver and manage IT services within the organization.

Stages of ITIL

ITIL is divided into five main stages. Every stage has a specific role to play in a service life cycle and form the skeleton of ITIL. Let's look into each stage briefly.

Service Strategy

It is the first stage of ITIL, which lays down the blueprint of a new service (or changes in an existing service). The proper plan and roadmap of the service is prepared in this stage. All the aspects of services like value creation, resources, capabilities, investment, portfolio, etc. are discussed in this phase.

Service Design

This is the next phase of ITIL, wherein, architecture of the new or changed service takes place, as per the service strategy. It also lays down the processes, policies and solutions as per the business requirements.

Service Transition

This is the third stage of ITIL and the main objective of this stage is plan, manage, build and deploy the new or changed IT service in the production (real world). This stage also drafts the risk management and back out plans. Change management is one of the important processes which comes under service transition, which is explained later.

Service Operation

This stage of ITIL focuses on the day to day IT services, which are delivered to the customers. It makes sure that; every IT service is delivered efficiently without any (or at minimum possible) disruption. This stage introduces various processes, which need to be carried out in case of service disruption, incident management and problem management being important among them.

Continual Service Improvement (CSI)

This stage highlights the steps that could be taken, to increase the overall efficiency and performance of the service. The CSI works closely with all the other stages and identifies improvement opportunities with metrics driven approach.

Processes in ITIL

Now let's look into the three main processes in ITIL. The **Change Management** comes under Service Transition and **Incident Management** and **Problem Management** comes under Service operation.

Change Management

It is an approach which guides on how to prepare, manage and support transition in the service. It deals with any kind of change within the organisation. May it be technological change, process change, organisational restructuring, physical datacenter related changes, software related changes, server related changes, etc.

A specific change request is raised in any ITIL tools like ServiceNow, Remedy, etc. to track the change. The change request undergoes several stages like review, approval, budgeting, documentations, etc. which may vary as per the organisation's policies.

Incident Management

It is an approach to identify, analyse, manage and restore any disruption caused in the service. Incident management ensures that the performance of the service is up to the mark and any interruption in the quality of the service is restored as soon as possible.

A specific incident record with unique ticket number is raised in ITIL tool, by support/service desk executive for each and every disruption reported. The corresponding team further analyses and restores the service and updates the Incident ticket accordingly in ITIL tool.

Problem Management

The purpose of problem management is to find a permanent root cause for the recurring incidents. Problem management mitigates the impact of the recurring incidents in the services. As per the ITIL practice, a problem record is raised for recurring types of incidents.

The corresponding team finds the exact root cause and proposes change or fix in the service for the permanent resolution of the incident. A change request is raised for the proposed fix/change and it is implemented in production through change management process.

Example of entire ITIL process

Let us take an example of a startup BookWorm Ltd., which sells books online through their website. The company is planning to launch a book rental service in selected cities. This service provides facility for doorstep delivery and return of the rented books. The company has adopted an ITIL framework, since its establishment and since, this is a new service, it should undergo various stages of ITIL.

Service strategy

The service proposal is first presented to the stakeholders. The discussions on customer base, return on investment (ROI), prices, market research, competitors and business model takes place in this phase.

Service design

The blueprint of the service is prepared by the experts in the respective fields. The technology that will be used to deliver the service to the customer, subscription plans, payment method, online portal design, delivery and return model and charges are finalised in this stage.

Service transition

At this point of time, scope and design of the service is already defined. In service transition, the preparation to implement the service starts. The change request is raised for the new service and activities like software development, budgeting, approval, acquisitions, inventory management is undertaken by the respective teams. The roadmap for the service is finalised and milestone dates are set for the service to go live.

Service operation

The service is now in production and each and every issue (whether one time or recurring) reported during the service delivery by the customers, users or internal team is tracked and managed by the Service operation.

Continual Service Improvement

In this continuous process, the opportunities are identified to make service better, for example, internal IT team suggests a new CMS (content management system) tool for their website, which provides improved metrics, easy access and enhanced features.

Change, Incident and Problem Management

An example of BookWorm Ltd. with respect to change management, incident management and problem management is discussed below:

The BookWorm Ltd. has taken forward the idea to implement the new CMS as a part of continual service improvement. The service improvement plan undergoes various stages of ITIL - Service strategy, Service design, Service transition and finally the new CMS is implemented in production and is being monitored as part of Service operation. The new CMS is performing as expected and is providing enhanced features.

One fine day a customer using book rental service calls up the customer care and reports that, he had opted for the monthly subscription of their basic plan, but he was billed as per the premium plan. The customer care executive creates an Incident ticket for the issue in ITIL tool and forwards it to the respective team. This is the **Incident management phase**. The IT team checks the issue and corrects the bill amount and plan from the backend (database) directly and marks the incident as resolved.

With time, several similar incidents got reported by multiple customers. After resolving the issue by manual adjustment from the backend, the IT team decides to find a permanent root cause and fix this issue. They open a problem record for this recurring

incident in an ITIL tool and start the investigation. This is a **problem management phase**. After an investigation, the team spots a bug in their script and identifies the changes required in the script as a part of fix.

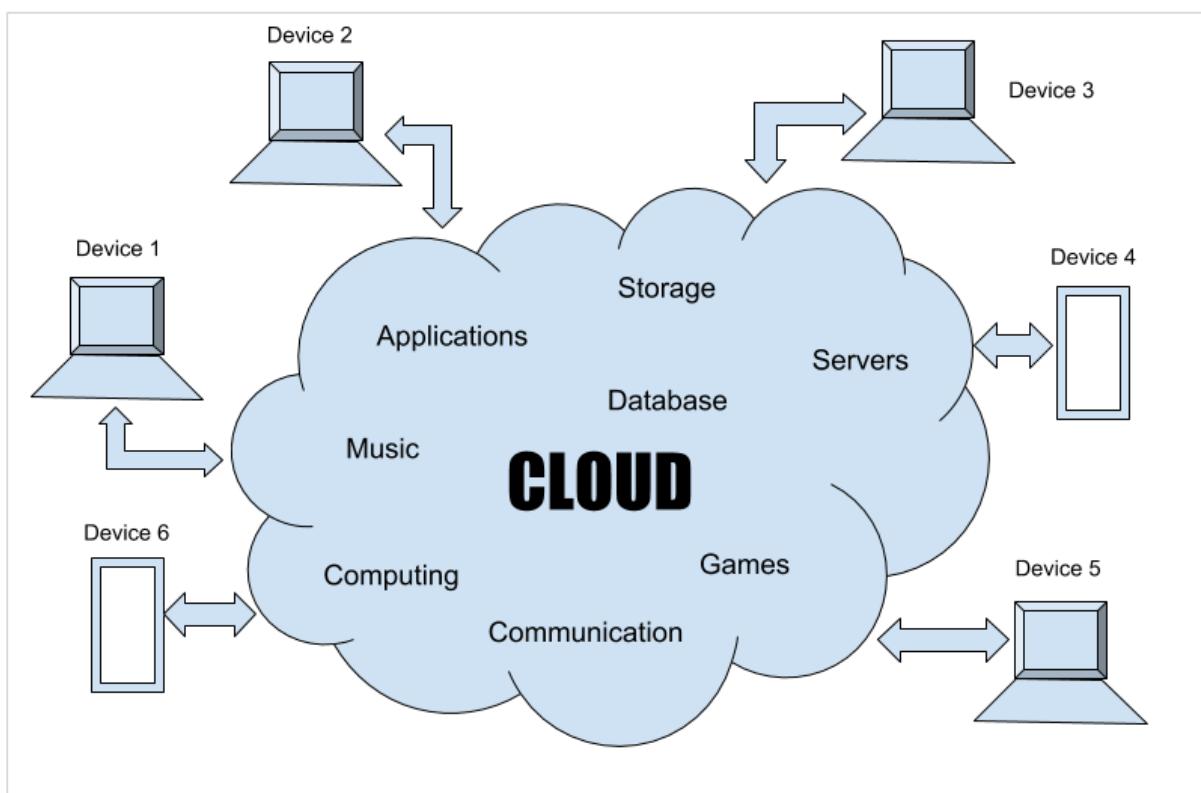
The IT team now raises a change request in ITIL tool to fix the script of the new CMS and starts working in the code changes. This is the **change management phase**. The change request goes through various approval, prioritisation and budgeting phase and finally, gets implemented in production as per the agreed date.

4. ServiceNow — Cloud Services

The vendors providing Cloud computing are called Cloud services. The “cloud” in cloud computing refers to the internet. Therefore, **cloud computing refers to providing computing services like storage, CPU, networking, RAM, servers, etc. over the Internet.** However, cloud computing has evolved over the years and thereby, providing a range of services like software development platforms, tools, enhanced infrastructure management, etc.

The major cloud service providers in the market include Google, Amazon, IBM, Oracle, SAP, etc. A perfect example of cloud computing is Google docs. All your documents are stored in Google cloud and you can access your documents from anywhere, anytime and from any device without having any specific software (Document viewer/editor) installed in your system. Your documents and application through which you can access your documents, both are available in the cloud.

The below figure gives an overall view of cloud computing.



Cloud computing can be implemented in a number of ways based on the organisation's or individual's requirement and business needs. Cloud infrastructure can be setup in a number of ways, which are referred to as cloud deployment models.

Types of deployment models

The types of deployment models are as follows:

Public cloud

This type of cloud is freely available for public use. It can be owned by big companies or government organisations providing free of cost services. For Example - Gmail, Dropbox, Microsoft Azure, etc.

Private cloud

Private cloud is used exclusively by a single organisation for their internal purposes. They are generally, accompanied by firewalls restricting the general public from using the cloud. For example, a big MNC operating private cloud for its multiple subsidiaries or business unit for their internal computing/sharing resources.

Community cloud

It is a model between public and private cloud. Only selected organisations or communities of users having the same line of business or same agenda have access to this type of cloud. For example, all the banks maintaining a common cloud having the database of loan defaulters, which is shared among the banks to refer while issuing a fresh loan.

Hybrid cloud

This type of cloud infrastructure is a mixture of any of the deployment models discussed above (Public, Private and Community). For example, a large company maintaining a hybrid cloud of public and private. All the sensitive information of the companies like future strategies, internal policies, etc. are stored and processed in private cloud while public information such as product details, prices, orders are processed and stored in a public cloud.

Cloud Service Models

There are also cloud service models, which are categorised based on the services offered by the cloud service providers. We have discussed the three service models of cloud below:

Infrastructure as a service (IaaS)

This is the most fundamental level of cloud service, where in customer only takes computing resources or virtual hardware like storage, CPU, RAM, etc. from the cloud service providers. The customer takes complete ownership of managing applications, operating systems, software, databases, etc. in the cloud. For example: Rackspace, Digital ocean, etc.

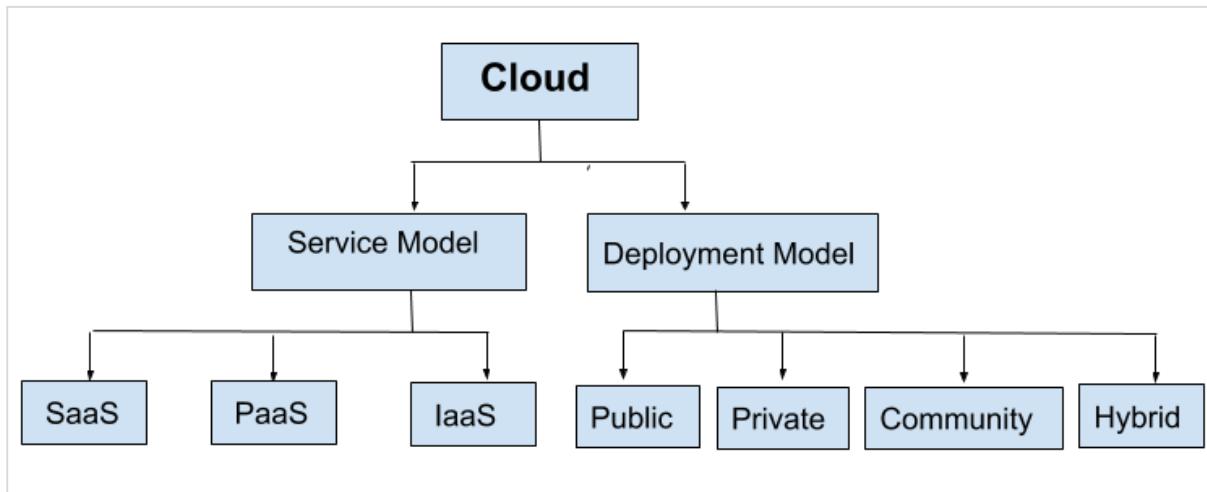
Platform as a service (PaaS)

This is one level further to IaaS. Here, along with the computing resources/virtual hardware, operating system, some software service and tools are also provided by the cloud service providers. The customer takes ownership of developing application using those software services/tools and maintaining it. For example: Google App Engine, Apache Stratos, ServiceNow, etc.

Software as a service (SaaS)

This service model offers fully functional, ready to use software over the internet. The service provider takes the complete ownership of managing the software, servers, database, infrastructure, etc. The SaaS services can be free or available at monthly/yearly prices. For example: Salesforce, Google Apps, ServiceNow, etc.

We can summarise the deployment model and service model of the cloud based on the below figure.



ServiceNow is a highly flexible application which provides the option of PaaS as well as SaaS. Its SaaS offering provides fully functional workflow automation and ITSM tools, while its PaaS offering, allows the user to develop a custom application on the top of existing suite, as per the business requirement. We will study more about this in later sections.

5. ServiceNow — Administration

ServiceNow administration deals with general support, administration and maintenance of the ServiceNow platform for the organisation.

It also includes customising user interface, keeping versions up to date, configuration of applications and modules, managing security and user access, monitoring the system performance and doing regular health checks, managing workflows, UI policies, UI actions, etc.

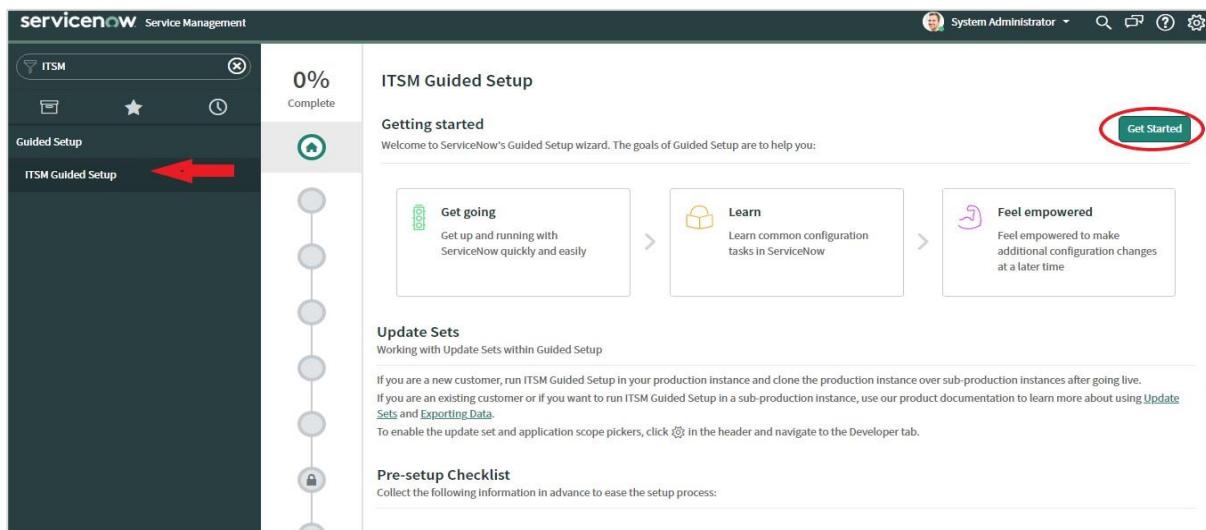
ServiceNow administrators are also responsible for setting up the ServiceNow, loading ServiceNow with the initial data, setting up groups, roles, users, SLAs, etc.

ServiceNow Configuration

The best way for the initial configuration of the ServiceNow is to use the "ITSM guided setup" application. Generally, only system administrators have access to ITSM guided setup application.

ITSM guided setup provides a sequence of tasks that help you configure IT Service Management (ITSM) applications on your ServiceNow instance from scratch including company name, logo, colour combinations, fonts, banner, form layout, fields to be displayed in forms, lists, etc.

Moreover, the ITSM guided setup also assists in configuring the major applications like Incident, Change, Problem, etc. To open ITSM guided setup, search ITSM in the navigation bar and open the first search result "ITSM guided setup" and click on the Get started button, as shown below.



The screenshot shows the ITSM Guided Setup interface. On the left, there is a vertical progress bar with 10 steps, the first one being 'Complete'. At the top, it says '0% Complete'. The main area is titled 'ITSM Guided Setup' and contains two sections:

- Company**: Status: Not Started. Progress: 0%. Description: Transform the ServiceNow instance by configuring your company name, logo, and color theme to reflect your corporate brand. Configure the default system settings such as the time zone and the date and time formats. Buttons: 'Get Started' (green), 'Skip' (blue).
- Connectivity**: Status: Not Started. Progress: 0%. Description: Configure the ServiceNow instance to support inbound and outbound email notification. Integrate it with your existing LDAP and single sign-on (SSO) solutions. Buttons: 'Get Started' (green), 'Skip' (blue).

On the right, there are summary boxes for each section:

- Company**: 0 / 2 Tasks completed. Tasks: System Configuration, Welcome Page.
- Connectivity**: 0 / 3 Tasks completed. Tasks: Email Properties, LDAP Integration, SSO Integration.

The entire setup is organised into categories like Company, Connectivity, Foundational data, CMDB, etc. We have to configure each category one by one using an interactive and guided menu. The completion progress for each category is displayed, beside the content frame and also, the overall completion status is displayed at the top of content frame.

We can configure the category in any order and we can skip the configuration of any specific category as well. The task for the configuration of the ServiceNow from scratch is very big and, therefore, we can assign the task to configure each category to the individual admin user.

The screenshot shows the ITSM Guided Setup interface for the 'Connectivity' category. The left sidebar shows the overall progress as 0% complete. The main content area shows the 'Connectivity' section with a 0% progress bar. Below it, a table shows completed tasks:

0 / 3 Tasks completed		
●	Email Properties	Skip View Notes Last visited just now by System Administrator Assigned to David Loo
●	LDAP Integration	
●	SSO Integration	

The right side of the screen shows a detailed view of the 'Email Properties' task, which is currently assigned to 'David Loo'. A modal window titled 'Assign Tasks' is open, showing a list of users:

- Carol Coughlin
- Christen Mitchell
- David Loo** (highlighted in green)
- Deepa Shah
- Eric Schroeder
- Fred Luddy

At the bottom of the modal, there are buttons for 'Mark as Complete' and 'Configure'.

The steps in guided setup are very detailed and self-explanatory. You can play around with the guided setup and try to configure the various categories. There are instructions and help available in every category for the reference.

Import sets

The import sets are used to import the data in ServiceNow from external sources like excel, JDBC, etc. The data is imported in the ServiceNow and then, mapped in the relevant ServiceNow tables. The data can be imported manually one time, or we can schedule the periodic import to happen automatically. Let's discuss, both the imports one by one with the help of an example.

Manual Import

The data can be imported manually using the "Load data" module of "System import set" application. Let's take an example, we have to import 5 groups in ServiceNow. The table, which stores the group in the ServiceNow is sys_user_group. To browse the data in this table, simply type "sys_user_group.list" in the navigation bar.

Groups						<input type="button" value="New"/>	Search	Name	▼	\$Search	◀◀	◀	▶	▶▶	1	to 20 of 42	► ►►
		All			Name ▲		Description		Active		Manager		Parent		Roles		
<input type="checkbox"/>		<input type="button" value="i"/>	Application Development				Team Develops ITSM Applications in London		true		Bushra Akhtar		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	ATF Service Level Management Group						true		(empty)		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	ATF TestGroup_Network		ATF_TestGroup_Network				true		(empty)		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	ATF_TestGroup_ServiceDesk		ATF_TestGroup_ServiceDesk				true		(empty)		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	CAB Approval		CAB approvers				true		(empty)		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	Capacity Mgmt						true		(empty)		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	Catalog Request Approvers > \$1000		This is the group of users that need to ...				true		(empty)		(empty)		catalog_itil		
<input type="checkbox"/>		<input type="button" value="i"/>	Catalog Request Approvers for Sales		This is a group of users that need to ap...				true		(empty)		(empty)		catalog_itil		
<input type="checkbox"/>		<input type="button" value="i"/>	Change Management		Change Management Group				true		(empty)		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	Database						true		Don Goodliffe		(empty)				
<input type="checkbox"/>		<input type="button" value="i"/>	Database Atlanta		Manages databases hosted in Atlanta				true		(empty)		Database				

Suppose, we have data of five groups in the excel, which we want to upload in the ServiceNow.

	A	B	C
1	Name	Description	Active
2	Oracle DBA	ITSM group for Oracle DBAs	TRUE
3	Middleware	ITSM group for Middleware team	TRUE
4	File transfer	ITSM group for file transfer team	TRUE
5	MQ	ITSM group for MQ team	TRUE
6	Performance testing	ITSM group for performance testing team	TRUE
7			

Open the "Load data" module for "System import set" application. In the import set table, click on the "Create table", as we do not have any existing import table for importing user groups. The import tables are basically the intermediate tables or the staging table.

As we import the file, the data is first loaded in this table and then, we can load the data from this import table to the actual target table in the ServiceNow (sys_user_group in this case).

Then, give the name of the new table in the Label field. The important point to note here, is all the tables, which are created by the user, have the prefix of "u_" in the name and all the system tables of ServiceNow have prefix "sys_" in the name.

Select the file from the explorer. Additionally, you can give the sheet number, which corresponds to the tab in the excel and header row (column name) in the excel. Both of them are "1" in our case. Finally, click on submit.

The screenshot shows the 'Load Data' configuration screen. The 'Import set table' section has 'Create table' selected. The 'Label' field contains 'user_group_import'. The 'Name' field contains 'u_user_group_import'. Under 'Source of the import', 'File' is selected, and the file 'user_group_load.xlsx' is chosen. The 'Sheet number' and 'Header row' both have the value '1'. A green 'Submit' button is at the bottom.

The screenshot shows the 'Progress' screen. It displays the following information:
Name: ImportProcessor
State: Complete
Completion code: Success
Message: Processed: 5, inserts 5, updates 0, errors 0, empty and ignored 0, ignored errors 0 (0:00:01.175)

Next steps...

- [Import sets](#) Go to the import sets for this data load
- [Loaded data](#) Go to the newly imported data inside the staging table: u_user_group_import
- [Create transform map](#) Create a transform map for the newly staged data
- [Import log](#) View the import log

Once the process is complete, you will see the above screen with state as complete and the next steps which have to be followed. First, let us go to the Import Sets under Next steps.

Import Sets	Search	Created	Search	Actions
All > Data source Import set table name = u_user_group_import	ISET0010001	Type: File Format: Excel	Loaded	user_group_import [u_user_group_import] user_group_load.xlsx (Uploaded) 2020-02-16 06:39:00 2020-02-16 06:39:00 0 Seconds

You can see that the import set has been created with the state as "Loaded", which means that the data in our excel file, has been loaded in our intermediate table

"u_user_group_import". You can check the data in this intermediate table, by searching u_user_group_import.list in the navigation bar.

Now let's move ahead and create a transform map for this imported data. In the transform map, basically, we create the mapping between intermediate table and target table (sys_user_group system table), that means which column of intermediate table corresponds to which column of target table, so that data can be loaded in target table accordingly.

Go to the "Create transform map" module under the "System import set" application and give any name for the transform map. Select the source table, which is u_user_group_import in our case and the target table, which is sys_user_group. Since, we have to keep this transform map active, check the active box and check "Run business rule" as well. The business rules are a set of rules, which runs when any insert or update is made on the table.

For example, if a user does not enter any data in a field, the default values are set automatically. You can even give your own script, if you want to process the data before inserting it to target table, for this check the Run script box.

Name	user group import transform map	Application	Global
Source table	user_group_import [u_user_group_...]	Created	2020-02-16 07:07:58
Active	<input checked="" type="checkbox"/>	Target table	Group [sys_user_group]
Run business rules	<input checked="" type="checkbox"/>	Order	100
Enforce mandatory fields	No	Run script	<input type="checkbox"/>
Copy empty fields	<input type="checkbox"/>		
Create new record on empty coalesce fields	<input type="checkbox"/>		

Now, that we have created a transform map, either we can map the column of source table to target table, or allow ServiceNow to do the auto mapping for us. Go to "Transform maps" module under System import sets → Administrations → Transform maps.

Select the transform map, which we have just created and check for the section "Related links". There are two options, auto mapping and mapping assist. Click on Auto map matching fields and you will find all the mapping done automatically in the Field map tab.

Table Transform Map
user group import transform map

Enforce mandatory fields: No

Run script:

Copy empty fields:

Create new record on empty coalesce fields:

Related Links: Auto Map Matching Fields, Mapping Assist, Transform, Index Coalesce Fields

Field Maps (3)

Source field	Target field	Coalesce
<u>u_description</u>	description	false
<u>u_name</u>	name	false

You can also try to do the mapping manually, by clicking on Mapping assist.

Mapping Assist

Source: user_group_import

- Active
- Comment
- Created
- Created by
- Description
- Error
- Import set run
- Name

Field Map

Description	Description
Name	Name
Active	Active

Target: Group

- Cost center
- Default assignee
- Exclude manager
- Group email
- Include members
- Manager
- Parent
- Roles

Let us run this transform map to load the data in our target table. This is our final step. Go to “Run transform” module inside “System import set”. Select the transform map, we have just created and click Transform.

Specify Import set and Transform map

Import set: ISET0010001 - u_user_group_import (2020-02-16...)

Available maps:

Selected maps, run in order:

- user group import transform map - sys_user_group

Transform

We will get the below screen showing the final status of the transformation.

Progress

Name	Transforming: ISET0010001
State	Complete
Completion code	Success
Message	Transformation complete

Next steps...

- [ISET0010001](#) Go to the import sets for this data load
- [Transform history](#) Show the transform history, related errors and log
- [Import log](#) View the import log

Now, we will go to sys_user_group table and check that our groups are imported successfully.

	Name	Description	Active	Manager	Parent	Updated
<input type="checkbox"/>	Oracle DBA	ITSM group for Oracle DBAs	true	(empty)	(empty)	2020-02-16 07:28:47
<input type="checkbox"/>	Middleware	ITSM group for Middleware team	true	(empty)	(empty)	2020-02-16 07:28:47
<input type="checkbox"/>	Performance testing	ITSM group for performance testing team	true	(empty)	(empty)	2020-02-16 07:28:47
<input type="checkbox"/>	MQ	ITSM group for MQ team	true	(empty)	(empty)	2020-02-16 07:28:47
<input type="checkbox"/>	File transfer	ITSM group for file transfer team	true	(empty)	(empty)	2020-02-16 07:28:47

Since, we were importing the user groups for the first time, we were required to create an import table, transform map, etc. These efforts will be reduced in all the subsequent imports of the user groups, as we already have an import table and transform map.

Scheduled Data Import

Scheduled data import is very useful if, our ServiceNow is receiving data from some external system. ServiceNow can be connected to other systems via FTP, HTTP, SCP, etc. We can also upload the file periodically in ServiceNow, so that, it can be picked up by the scheduled import process.

Let us take an example, wherein, we have some external system based on UNIX, which will daily generate a file (in the fixed path), having details of the new employee joining the BookWorm Ltd.

The ServiceNow is supposed to pull this file from the external system, process this file and finally, import the data in the sys_user table. Let's implement this step by step. First of all, we have to create a data source, navigate to the "Data source" module under "System import set" application.

Give the name of data source, import set table (new table will be created), format of the file which ServiceNow will pull (CSV, XML, Excel, Jason, Etc). Here, we are taking the example of **csv**, so we have to give **csv delimiter** as well, which would be "," (comma) in our case. Now select the file retrieval method, here we are using FTP and we have to give the server, pathname where, file will be available for pull, FTP username and password.

The screenshot shows the 'Data Source' configuration page. The 'Name' field is set to 'user group data source'. The 'Import set table label' is 'user group scheduled import'. The 'Import set table name' is 'u_user_group_scheduled_import'. The 'Type' is 'File' and 'Format' is 'CSV'. The 'Zipped' checkbox is unchecked. Under 'Application', it's set to 'Global'. The 'File retrieval method' is 'FTP'. The 'Server' is '124.98.143.22'. The 'File path' is '/home/employee/record/new/import'. The 'Username' is 'servicenow@4431'. The 'Password' is masked as '*****'. The 'CSV delimiter' is ','. A 'Submit' button is visible at the bottom.

After clicking the submit button, open the Data source again and click on "Test load 20 records" in the Related link section. ServiceNow will now try to test load the records via FTP, so make sure that, the file is present in the mentioned location.

The screenshot shows the 'Data Source' configuration page again. In the 'Related Links' section, there is a link 'Test Load 20 Records' which has a red arrow pointing to it. Below this, there is a 'Transforms' list view. The 'New' button in the top navigation bar of the transforms view is highlighted. The transforms list view shows a table with columns: Name, Source table, Target table, Run business rules, Order, Active, and Updated. The message 'No records to display' is shown at the bottom of the list view.

Now, after the test load, we have to create the transform map. Navigate to Transform map and click on new, to create a new transform map. Give the name of the source table, which we created during data source definition and target table as sys_user.

Table Transform Map
New record

Name: schedule import user group table
Application: Global
Source table: user group scheduled import 2 [u_us...]
Target table: User [sys_user]
Order: 100
Active:
Run business rules:
Enforce mandatory fields: No
Copy empty fields:
Create new record on empty coalesce fields:

Submit

After submitting, open the newly created transformed map and go to Related links sections. Here, you can use auto mapping or use mapping assist (for manual mapping), if auto mapping is unable to detect the fields properly.

Related Links

- Auto Map Matching Fields
- Mapping Assist
- Transform
- Index Coalesce Fields

Field Maps (4) Transform Scripts

	Source field	Target field	Coalesce
<input type="checkbox"/>	u_email	email	false
<input type="checkbox"/>	u_user_id	user_name	false
<input type="checkbox"/>	u_name	name	false
<input type="checkbox"/>	u_active	active	false

New

Actions on selected rows...

Click on the update to confirm the mapping.

Now, it's time to create the scheduled import. Navigate to "Scheduled import" module inside "System import set" application and click on new to create a new scheduled import. Select the data source, which we have created and select the frequency of running this scheduled import. It can be daily, weekly, monthly or periodically. Let us make it run daily at 08:00 hrs.

The screenshot shows the 'Scheduled Data Import' configuration page. The 'Name' field is set to 'user scheduled import'. The 'Application' is 'Global'. The 'Run' frequency is 'Daily' at 'Hours 08 00 00'. The 'Active' checkbox is checked. There are also options for 'Concurrent Import', 'Execute pre-import script', and 'Execute post-import script', all of which are unchecked. A 'Submit' button is visible at the bottom.

Click on submit and check the user table after the scheduled import run. The data should be imported into the sys_user table.

	User ID	Name	Email	Active
<input type="checkbox"/>	(i) atlee.roy	Atlee Roy	atlee.roy@example.com	true
<input type="checkbox"/>	(i) francis.xavier	Francis Xavier	francis.xavier@example.com	true

SLAs Configuration

SLA stands for **Service Level Agreement**, which is a commitment or contract between the service provider and the service consumer (customer), or it can also be commitment between various departments within an organisation. This contract clearly states the level of service that, the provider should give, the response time, the resolution time of incidents, penalties (if any), uptime, system performance, etc.

For example: BookWorm Ltd. has implemented ITIL within its organisation, in such a way that, each incident reported within an organisation should be recorded in ServiceNow and categorised in any of the following four categories - Critical, High, Medium and Low.

A SLA is signed between the IT and business of BookWorm Ltd., which clearly defines the time limit to resolve incidents in each category:

Critical - 6 hrs, High - 24 hrs, Medium - 48 hrs and Low - 72 hrs

This is called as resolution time. In a similar manner, there is a response time SLA, which defines time limit to acknowledge the incident (or assign the incident to respective group) in ServiceNow system.

Critical - 30 mins, High - 60 mins, Medium - 5 hrs and Low - 8 hrs.

For defining the SLA, we have a module called "SLA definition" inside "SLA application". To define a new SLA, open SLA definition module and click on New button.

Let's create a SLA in the incident table. We can also choose to create SLA in any other table like change, problem, etc. First, start with Response time for critical incidents. Give the name of SLA, select type as SLA, select Target as Response and Table as Incident. Workflow is used for escalation purposes.

For example, if 50% of SLA time is over and the incident is not resolved/acknowledged, we can choose to send an alert email to the leader of that team. Then, if 75% of SLA time is over, we can choose to send email to manager of that team and so on. We will take a look at workflow in more detail in the next section.

Now, select duration as User defined and give duration as 30 minutes, as it is for Critical incident. Then select the schedule, which means, if we want to calculate the SLA time 24 X 7, exclude weekends, exclude only Sundays, etc.

Now let's put the conditions, so that this SLA gets attached to every new critical incident. Scroll down to the next section and there, you can give the Start conditions, as given herewith,

- Incident is active.
- Incident is new.
- Priority of incident is critical.

Further, for the Stop condition we choose to stop the SLA, once the incident is assigned and moved to "in progress" status.

[Start condition](#) [Pause condition](#) [Stop condition](#) [Reset condition](#)

The conditions under which the new SLA will be attached and canceled

[Start condition](#) [Add Filter Condition](#) [Add "OR" Clause](#)

All of these conditions must be met

Active	is	true	AND	OR	X
Priority	is	1 - Critical	AND	OR	X
State	is	New	AND	OR	X

Retroactive start

When to cancel [Cancel conditions are met](#)

[Cancel condition](#) [Add Filter Condition](#) [Add "OR" Clause](#)

-- choose field -- [-- oper --](#) [-- value --](#)

[Start condition](#) [Pause condition](#) [Stop condition](#) [Reset condition](#)

The condition under which the SLA will complete

[Stop condition](#) [Add Filter Condition](#) [Add "OR" Clause](#)

State	is	In Progress	AND	OR	X
-------	----	-------------	-----	----	---

Finally, click submit. Now, we will create one new critical incident and check if, this SLA gets attached to the incident.

[Incident](#) [New record](#)

[Submit](#) [Resolve](#)

Number	INC0010007	Contact type	-- None --
* Caller	Bow Ruggeri	State	New
Category	Inquiry / Help	Impact	1 - High
Subcategory	-- None --	Urgency	1 - High
Service	IT Services	Priority	1 - Critical
Configuration item		Assignment group	Frontend IT team
* Short description	The server d009Y776 is giving timeout error		
Description			

Open the incident again from the incident list and scroll down to the “Tasks SLA” section. You can see that, our new SLA is attached and showing the time left to breach the response SLA.

	Task SLAs	Search	SLA definition	▼	Search						
	Task = INC0010007		SLA definition	Type	Target	Stage	Business time left	Business elapsed time	Business elapsed percentage	Business elapsed percentage	Business elapsed percentage
						In progress	0 Seconds	4 Minutes	8.78%	2021-08-08 08:30	
			Incident Response SLA - Critical	SLA	Response	In progress	1 Minute	4 Minutes	67.08%	2021-08-08 08:30	
						In progress	0 Seconds	4 Minutes	2.19%	2021-08-08 08:30	

Actions on selected rows... ▾

Similarly, Resolution SLA can also be created, post which, you can see two separate SLAs namely Response and Resolution, attached to the incidents in Task SLA section.

Workflows

The ServiceNow defines workflow as sequence of activities to automate processes in applications. It is basically a flowchart, which records all the activities to be triggered step by step, once the desired event has occurred. Let us try to understand this, with an example of BookWorm Ltd.

We have to add a new workflow to every change request, that is assigned to the Frontend IT team, the workflow includes two activities:

- If the Assignment group is selected as "Frontend IT team" in the change request, then, the value in the Service field should be automatically set to "IT Services".
- Each change request for the Frontend IT team required approval from its Manager Cristina Sharper.

For Workflows we have a module called "Workflow editor". Search in the navigation bar and click on the Workflow editor. Click on new to create a new Workflow. In this screen, we can also see the existing workflows and we can edit them as well. You can see the screen below:

Published	Checked Out	Help		New Workflow
All > Published = true				
Name	Table	Updated by	Updated	Published
Service Catalog Item Request	Requested Item [sc_req_item]	glide.maint	2009-01-14 09:46:52	true
Knowledge - Instant Publish	Knowledge [kb_knowledge]	admin	2014-11-05 01:52:29	true
Grant role_delegator role to user in group	Change Request [change_request]	james.capaldo	2010-02-25 13:32:49	true
Knowledge - Approval Publish	Knowledge [kb_knowledge]	admin	2019-03-08 01:45:36	true
Service Task Processing	Service Task [service_task]	admin	2018-07-25 01:44:04	true
Item Designer - Approvals	Requested Item [sc_req_item]	nigel.bell	2014-02-24 16:53:13	true
Pwd Reset - Master	Global [global]	admin	2019-03-27	true

Filter workflows ? +

- Change Request - Emergency
- Change Request - Emergency change tasks
- Change Request - Normal
- Change Request - Normal change tasks
- Change Request - Standard
- Change Request - Standard change tasks
- Comprehensive Change
- Contract Approval
- Default SLA Repair workflow
- Default SLA workflow
- Delegate roles to group member
- Emergency Change
- Grant role_delegator role to user in group
- Item Designer - Approvals
- Item Designer - Fulfilment

Give the name of the Workflow and table for which, we have to create the workflow. We can also give, the conditions for workflow at this point of time, but we can also give the conditions later.

New Workflow (?)

Workflow Version
New record
[New Workflow view*]

A workflow automates and visualizes a multi-step process as a sequence of activities. Give your new workflow a unique Name and select the Table on which it runs. [More Info](#)

* Name: Change_Workflow_Frontend_Team

* Table: Change Request [change_req...]

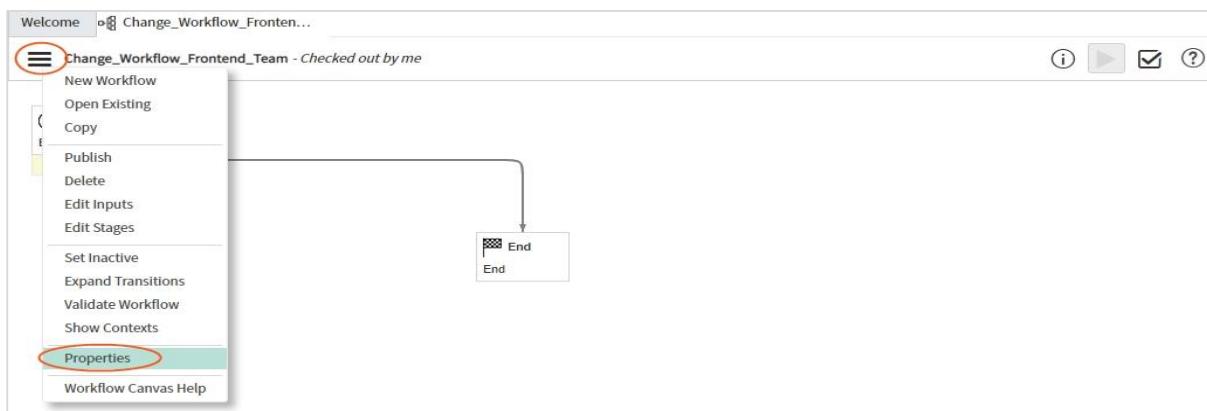
Description:

Conditions

Specify at least one Condition to trigger the workflow. Select one of the following options to determine what happens when a record inserted on the selected table matches the condition:

- Run the workflow: Workflow(s) start in succession according to the Order column each time an inserted record matches the condition.
- Run if no other workflows matched yet: The workflow starts when a record matches the condition, only if no other workflows are running on the record.
- None: The workflow does not start unless it is triggered by a subflow or script.

Now that, the workflow is created, let us add conditions and activities in this workflow. Click on the top left menu bar and go to properties.



From the properties, go to Conditions tab to give the condition for the workflow to be triggered. Here, we will select "If assignment group is Frontend IT team". We can add multiple conditions combined with AND/OR. Then, click on Update.

Specify at least one Condition to trigger the workflow. Select one of the following options to determine what happens when a record inserted on the selected table matches the condition:

- Run the workflow: Workflow(s) start in succession according to the Order column each time an inserted record matches the condition.
- Run if no other workflows matched yet: The workflow starts when a record matches the condition, only if no other workflows are running on the record.
- None: The workflow does not start unless it is triggered by a subflow or script.

If condition matches: Run the workflow always Order: 100

Condition: Assignment group is Frontend IT team AND OR X

Update Delete

In the right frame, go to "Core" tab. Here, you will see a list of activities, which we can add in our workflow, like approval, conditions, tasks, etc. You can go ahead and try them. For this example, we will use "Approval user" under Approval main activity and "Set values" under Utilities main activity.

Workflows Core

Filter core activities

Core Activities

- Approvals
- Change Policy
- Conditions
- Notifications
- Service Catalog
- Subflows
- Tasks
- Timers
- Utilities

First, let's drag Set values in our workflow. Once you drag the "Set values" activity, a popup will open and we have to mention, the fields for which we need to set the value. We will select the "Services" field and set value as IT services.

New Activity: Set Values [?](#)

Workflow Activity
New record [Diagrammer view]

Name: Set services value

Stage:

Values

The Set Values activity sets the value of the fields specified below into the current record. [More Info](#)

Set these values: Service: IT Services

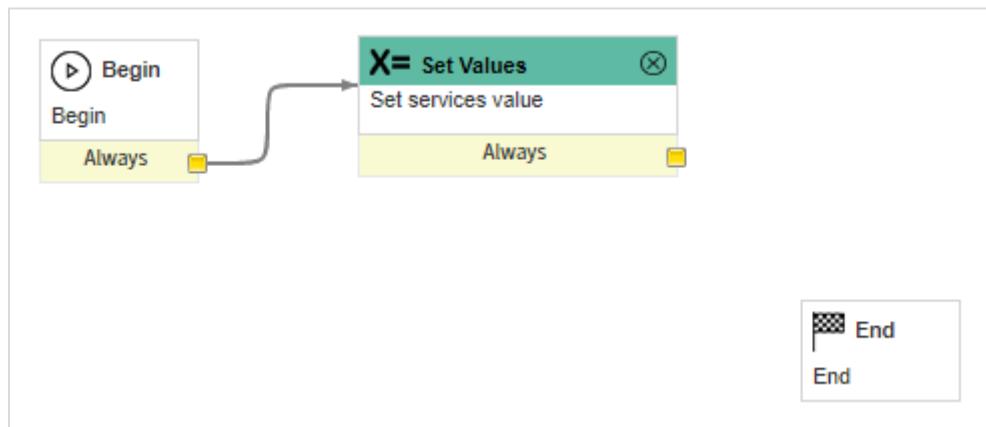
-- choose field -- -- value --

Submit

Related Links
[Conditions](#)

Now, you will see our activity in the workflow but, it is not connected as of now by any arrow. So first, we have to delete the existing arrow between Begin and End activity and insert our Set values activity between Begin and End.

Select the existing arrow between Begin and End and click delete button from the keyboard. Then drag an arrow, from the yellow dot of Begin activity to the Set value activity. A new arrow will be generated.



Now, we have to add another activity for the approval-user. Drag the approval-user activity and perform the same as above.

New Activity: Approval - User [?](#)

Workflow Activity New record [Diagrammer view]

-- choose field -- ▾ -- open -- -- value --

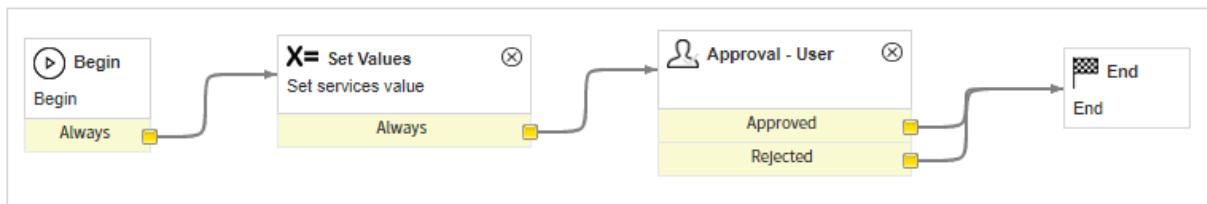
Approvers

Specify the users whose approval will be requested. To edit this field, click the lock icon. To select specific users by name, use the lookup list. To select users from field values on the current record at runtime, click the tree icon. Each user will be assigned an individual approval record.

Users Cristina Sharper Groups

Check 'Advanced' to use a script for creating additional user approvals. When you check Advanced, a text box appears where you can enter your script. In the script, set the variable 'answer' to a comma-separated list or an array of user and/or group ids.

This is how our final workflow looks like:



Now, click on the top left menu bar and click on Publish to make our workflow live.

Welcome [Change_Workflow_Fronten...](#)

Change_Workflow_Frontend_Team - Checked out by me

- New Workflow
- Open Existing
- Copy
- Publish**
- Delete
- Edit Inputs
- Edit Stages
- Set Inactive
- Expand Transitions
- Validate Workflow
- Show Contexts
- Properties
- Workflow Canvas Help

After publishing, our workflow will become active and when any change request will be assigned to the Frontend IT team, our new workflow will get triggered.

Notifications

Notifications are used to notify or send an alert to the user on the occurrence of certain events, like change in the priority of incident, change in the state of incident, etc. Notifications are generally sent via emails.

First of all, to start setting up the notification, check whether the email settings are configured in the ServiceNow. Go to "Email properties" module of System mailboxes and check on "Email sending enabled" box and "Email receiving enabled" box. Click Save.

The screenshot shows the 'Email Properties' page. At the top right is a 'Save' button. Below it, a note says: 'Email accounts can be created or modified in the Email Accounts table. Email account connection status and diagnostics information can be found on the Email Diagnostics page.' The 'Outbound Email Configuration' section contains a 'Email sending enabled' checkbox (checked) and a 'Send all email to this test email address (non-production testing)' input field. The 'Inbound Email Configuration' section contains an 'Email receiving enabled' checkbox (checked) and an 'Identify email as a reply by these subject prefixes' input field containing 're:,aw:,r:,Accepted:,Tentative:,Declined:'.

Now, let's create a notification that whenever, any Critical incident is assigned to the 'Frontend IT team' group, an email will be sent to the manager of the team Cristina Sharper. Go to "Notification" module under "System notification" application.

Now, give the name of the notification, followed by the table for which this notification is created and then under the "When to send" tab set the conditions.

The screenshot shows the 'Notification' creation screen. It includes fields for Name ('Notification_Priority_Critical_Frontend'), Application ('Global'), Active status (checked), and Category ('Uncategorized'). Below these are tabs for 'When to send', 'Who will receive', and 'What it will contain'. The 'When to send' tab shows conditions: 'Record Inserted or updated' (selected), 'Updated' (checked), and 'Inserted' (unchecked). It also includes a 'Conditions' section with 'Add Filter Condition' and 'Add "OR" Clause' buttons, and a 'Priority' condition set to '1 - Critical'.

Now, go to "Who will receive" tab and set the users who will receive the email.

The screenshot shows the 'Who will receive' tab of a notification configuration. At the top, there are dropdowns for 'Table' (set to 'Incident [Incident]') and 'Category' (set to 'Uncategorized'). Below these are checkboxes for 'Active' (checked) and 'Allow Digest' (unchecked). The tabs at the bottom are 'When to send', 'Who will receive' (selected), and 'What it will contain'. A note below the tabs states: 'Notifications can be sent to specific Users and Groups or to User/Groups in fields on the record that generated this notification.' The main area contains sections for 'Users' (listing 'Cristina Sharper'), 'Groups' (with a lock icon), and 'Subscribable' (unchecked). There is also a search bar for entering email addresses and a section for 'Users/Groups in fields' with a lock icon. A 'Submit' button is at the bottom.

Finally, in the "What it will contain" tab, we can give the body/text of the email.

The screenshot shows the 'What it will contain' tab of the notification configuration. The tabs at the top are 'When to send', 'Who will receive', and 'What it will contain' (selected). A note below the tabs states: 'If using an Email Template then Subject and Message will be used from the template unless overridden with a Subject and Message on this form.' The main area includes fields for 'Email template' (set to 'Unsubscribe and Preferences'), 'Subject' (set to 'Critical incident assigned to your group'), and a 'Message HTML' editor. The message content is: 'Dear Manager,
A critical incident has been assigned to your group. Please align the resources and make sure to resolve the incident within SLA.
Regards,'. To the right of the editor is a 'Select variables:' panel with a 'Fields' folder icon. A 'Submit' button is at the bottom.

Now, once any critical incident is assigned to the Frontend IT team, its manager will receive an email notification regarding the same.

Reporting and Scheduled Jobs

Reporting is used to create a report based on the data available in the ServiceNow. The report can give information related to incident, user, change, problem, etc. We can generate the report in bar chart, pie chart, graphical format or as per the business requirement. The reports can also be generated automatically by the scheduled jobs based on the defined frequency.

Let us create a report for BookWorm Ltd. wherein, the manager of the Frontend IT team will receive the weekly report (via scheduled job) having a number of Critical, High, Medium and Low priority incidents open and assigned to the Frontend IT team.

Let's start by creating the report. Navigate to "Create new" module under "Report" application. Give the report name. In the Source type, select table, as we have to extract data from the incident table. Finally, click Run. You will see entire data from the table.

The screenshot shows the 'Create a report' interface. On the left, there are fields for Report name ('Frontend_IT_team_weekly_incident_count'), Source type ('Table'), and Table ('Incident [incident]'). The main area displays a table titled 'Frontend_IT_team_weekly_incident_count' with three rows of incident data:

Number	Opened	Short description	Caller	Priority	State	Category	Assignment group
INC0010007	2020-02-21 08:31:30	The server d009Y776 is giving timeout error	Bow Ruggeri	● 1 - Critical	New	Inquiry / Help	Frontend IT team
INC0010008	2020-02-21 22:45:33	Please check server D5698967, it is giving timeout error	Pilar Suddeh	● 1 - Critical	New	Inquiry / Help	Frontend IT team
INC0010111	2019-07-22 14:04:57	ATF : Test1	System Administrator	5 - Planning	Closed	Inquiry / Help	(empty)

Now, we can add the filters to add the conditions so that only specific data, based on our requirements should be extracted.

The screenshot shows the 'Create a report' interface with filters applied. The 'CONDITIONS' section contains the following filter: 'Assignment group is Frontend IT team AND Active is true'. The main table now only displays the second incident from the previous screenshot, which matches the filter criteria.

Number	Opened	Short description	Caller	Priority	State	Category	Assignment group
INC0010008	2020-02-21 22:45:33	Please check server D5698967, it is giving timeout error	Pilar Suddeh	● 1 - Critical	New	Inquiry / Help	Frontend IT team

Click next and select the type of report you need, like - bars, pie chart, time series, etc. We will use bars here. Select bar and click Next.

Create a report

Data > Type > Configure > Style

Frontend_IT_team_weekly_incident_count

Table: Incident [incident]

All > Assignment group = Frontend IT team > Active = true

Add Sort | Clear All | X

CONDITIONS

All of these conditions must be met

Assignment gro... is Frontend IT te... AND
AND Active is true OR AND

or

New Criteria | RELATED LIST CONDITIONS ?

Click on next, you will now be able to configure the report. In the 'group by' option, we will select 'priority' and in the 'aggregation by', we will select 'count'.

Create a report

Data > Type > Configure > Style

Frontend_IT_team_weekly_incident_count

Table: Incident [incident]

All > Assignment group = Frontend IT team > Active = true

Add Sort | Clear All | X

CONDITIONS

All of these conditions must be met

Assignment gro... is Frontend IT te... AND
AND Active is true OR AND

or

New Criteria | RELATED LIST CONDITIONS ?

Click next and you will be asked to customise the style for your report. You can change the colour of bars, fonts of heading, location on heading, etc.

Create a report

Data > Type > Configure > Style

Frontend_IT_team_weekly_incident_count

Table: Incident [incident]

All > Assignment group = Frontend IT team > Active = true

Add Sort | Clear All | X

CONDITIONS

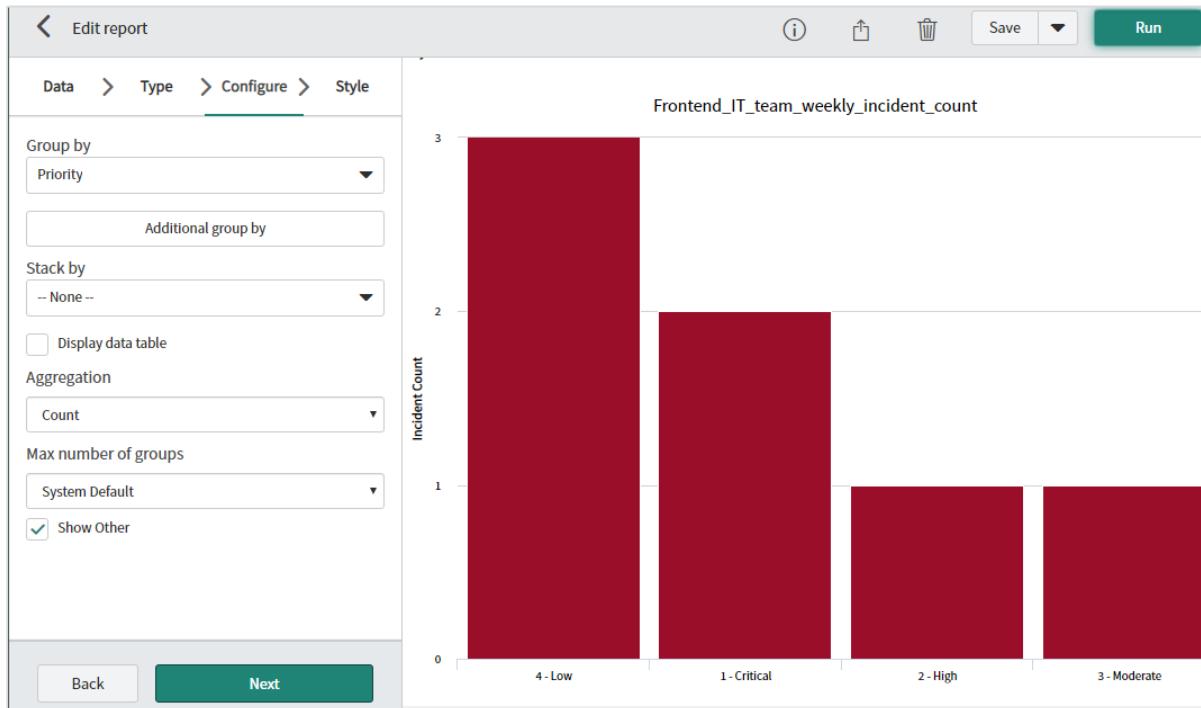
All of these conditions must be met

Assignment gro... is Frontend IT te... AND
AND Active is true OR AND

or

New Criteria | RELATED LIST CONDITIONS ?

Finally, click on Save to save this report. You can Run your report by using, the button at the top right to see the result.



Next, we have to schedule this report weekly using the scheduled jobs. Go to 'scheduled jobs' module under 'System definition' application and click on New.

Name	Active	Class	Updated
Add checkpoint descriptions	false	Scheduled Script Execution	2015-08-11 15:18:01
Add Identifier Fields In Recommended Rules	false	Scheduled Script Execution	2019-04-17 17:30:37
Analyze PA scores and PA snapshot tables	true	Scheduled Script Execution	2018-10-01 00:28:40
API Monthly Requestor Stats	true	API Stats Scheduled Script Execution	2020-02-21 07:57:50
API Monthly Stats	true	API Stats Scheduled Script Execution	2015-12-29 22:45:40
AppSec - Clear Domain Monitoring	true	Scheduled Script Execution	2018-10-04 15:52:06
AppSec - Clear Security Dashboard Events	true	Scheduled Script Execution	2018-02-26 14:06:52
Asynchronous Import Set Transformer	false	Scheduled Script Execution	2019-04-29 14:29:34

On the next screen, select "Automate the generation and distribution of a report". Then give the name of the scheduled job, select the report which, we have just created and add the user receiving the report. Change the "Run" field to make it run weekly. We can also give the introductory message about the report. Finally, click on submit.

The screenshot shows the 'Scheduled Email of Report' configuration screen in ServiceNow. The 'Name' field is set to 'Frontend_IT_Team_incident_report_job'. The 'Application' is 'Global'. The 'Active' checkbox is checked. The 'Run' frequency is set to 'Weekly' on 'Friday' at 'Hours 08 00 00'. The 'Users' field contains 'Cristina Sharper'. There is a 'Conditional' checkbox and an 'Omit if no records' checkbox. Below these are fields for 'Groups', 'Email addresses', and 'Subject'. At the bottom is an 'Introductory message' section with a rich text editor toolbar.

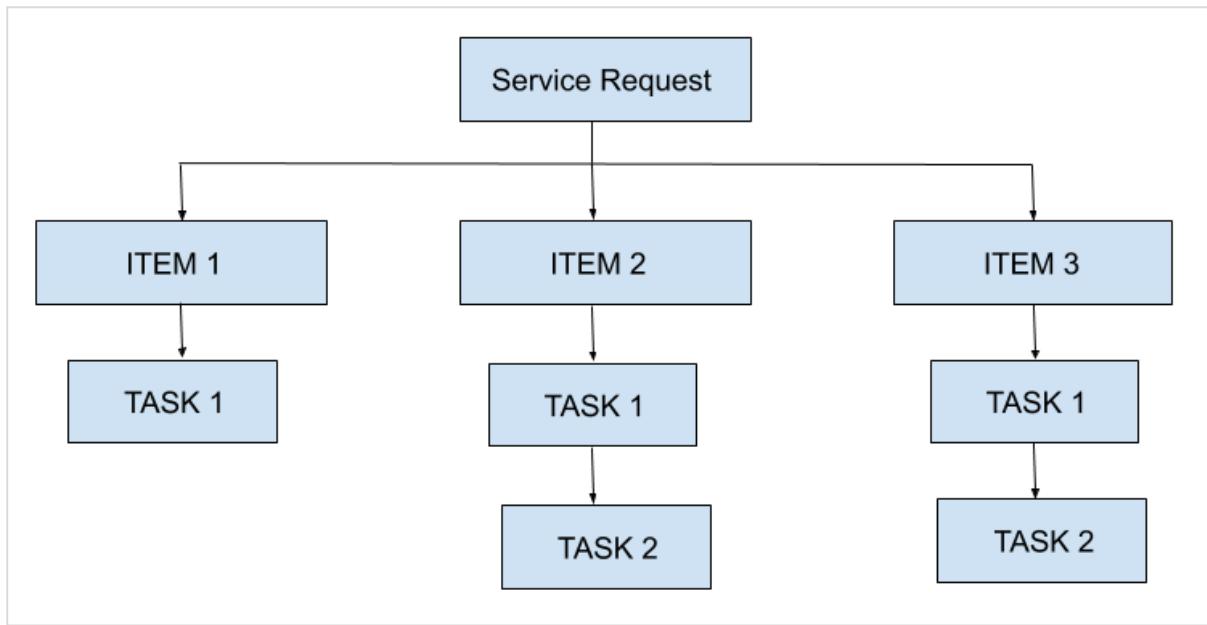
You can find this new report in the list of reports inside the scheduled jobs module.

Service Catalogs

Service catalogs provide self-service opportunities to the users. The users can select the desired services from the list (catalog) and submit the request. It has look and feel like online shopping, wherein, users can add the services (hardware, software or any other listed services) in the cart and finally order them.

We can also bundle the items under the package and order the package directly. For example, in BookWorm Ltd., if a new member joins the Frontend IT team, he/she can simply order a package "Frontend IT kit", which has software used within the team like Rational developer, Notepad ++, Winscp and Sql developer.

So, the user will be raising one request, which has four items in it (Rational developer, Notepad ++, Winscp and Sql developer). For each item, there may be different tasks like, there can be task for procurement team to get the new license of the software, then a task for the IT team to install the software in the machine or a task for additional approval for some software, etc.



Accordingly, there are three tables in ServiceNow service catalog for this:

- The Requests table
- The Items table
- The tasks table

All these tables are co-related and you can find these tables in the Service catalog application → Open records module.

Requests					
	New	Search	Number	Search	1 to 1 of 1
	All > Active = true				
		≡ Number ▾	≡ Requested for	≡ Opened by	≡ Request state
<input type="checkbox"/>		REQ00000001	System Administrator	System Administrator	Approved
<input type="checkbox"/>	Actions on selected rows...				
					1 to 1 of 1

Requested Items							
	New	Search	Number	Search	1 to 1 of 1		
	All > Active = true						
		≡ Number ▾	≡ Item	≡ Stage	≡ Request	≡ Requested for	≡ Opened by
<input type="checkbox"/>		RITM00000001	Apple iPad 3			REQ00000001	System Administrator
<input type="checkbox"/>	Actions on selected rows...						1 to 1 of 1

Catalog Tasks						
	New	Search	Number	Search	1 to 1 of 1	
	All > Active = true					
		≡ Number ▾	≡ Priority	≡ State	≡ Short description	≡ Assignment group
<input type="checkbox"/>		TASK00000001	4 - Low	Open	Order from vendor or move from in-stock inventory	Procurement (empty)
<input type="checkbox"/>	Actions on selected rows...					1 to 1 of 1

ServiceNow has provided some default categories and items. Go to Service catalog module of Self-service application. You can find the homepage of service catalog in content frame.

The screenshot shows the Service Catalog homepage with a search bar at the top right. On the left, there's a section titled 'Can We Help You?' with a question mark icon. The main area is divided into several categories:

- Services**: Document production services. Create and produce high-quality, professional documents.
- Hardware**: Order from a variety of hardware to meet your business needs, including phones, tablets and laptops.
- Software**: A range of software products available for installation on your corporate laptop or desktop computer.
- Office**: Office services such as printing, supplies requisition and document shipping and delivery.
- Desktops**: Desktop computers for your work area.
- Peripherals**: End user peripherals such as mobile phone cases, dongles, and cables.
- Mobiles**: Cell phones to meet your business needs.

On the right side, there are sections for **Top Requests** and **Shopping Cart**.

Let's place a sample request for Microsoft access and Cisco jabber. Go to Software and click on Microsoft access. You can add to the cart or directly order the item.

The screenshot shows the Microsoft Access product page within the Service Catalog. The product image is a red cube with a white 'A' on it, representing Access databases. The product name 'Microsoft Access' is displayed above the description. The description includes a bulleted list of features:

- Publish, update, manage, and share data with others via the web.
- Analyze your information from multiple sources and gain more insights by bringing together all of your data, from spreadsheets to server databases.
- Keep your data secure and compliant with easy data backup and auditing.
- Simplified Expression Builder makes it faster and easier for you to build out logic and expressions in your database.
- Data caching helps ensure that changes made to applications and data while you're offline—including line-of-business information—are automatically synchronized when a connection is restored.

On the right, there's a sidebar for 'Order this Item' with fields for Price (\$139.99), Quantity (1), Subtotal (\$139.99), and Delivery time (2 Days). Buttons for 'Order Now' and 'Add to Cart' are present, along with a 'Shopping Cart' section.

Here, we have to add Cisco jabber as well, so we will choose 'Add to cart' and continue shopping. Follow similar steps to add Cisco jabber and finally, click on 'Proceed to check out'. After submitting a request, you will see the following page and entries in the three tables.

Order Status

Thank you, your request has been submitted X

Order Placed: 2020-02-22 21:04:30
 Request Number: [REQ0010002](#)

Estimated Delivery Date of 2020-02-24
 Complete Order:

Description	Delivery Date	Stage	Price (ea.)	Quantity	Total
Microsoft Access	2020-02-24	▶	\$139.99	1	\$139.99
Collaborate Anywhere on Any Device with Cisco Jabber	2020-02-24	▶		1	
				Total	\$139.99

[Back to Catalog](#) [Continue Shopping](#) [Home](#)

Open the request table and select your request. You will see the items attached to this request. Click on the items and you will see the tasks associated with the item.

Request
REQ0010002

Short description

Special instructions

[Update](#) [Cancel Request](#) [Copy](#) [Delete](#)

Related Links

[Show Workflow](#) [Workflow Context](#)

Requested Items (2) [Approvers](#) [Group approvals](#)

Requested Items	Search	Number	Search	Actions		
Request = REQ0010002		1	to 2 of 2			
RITM0010003		1 (empty)	Cisco Jabber 10.5	2020-02-24 21:04:30	\$0.00 (empty)	▶
RITM0010002		1 (empty)	Access	2020-02-24 21:04:30	\$139.99 (empty)	▶
Actions on selected rows...						

The screenshot shows a ServiceNow interface for a 'Requested Item' (RITM0010003). At the top, there's a toolbar with icons for edit, search, and navigation, followed by buttons for 'Follow', 'Update', 'Delete', and arrows. Below the toolbar, detailed information about the item is displayed: Impact (3 - Low), Opened by (System Administrator), Priority (4 - Low), and State (Open). A large central area contains a table titled 'Catalog Tasks (1)'. The table has columns for Number, Assignment group, Assigned to, Short description, Actual start, Actual end, and Order. One row is shown, with the number 'SCTASK0010002' and the assignment group 'Procurement'. The short description is 'Order from vendor or move from in-stock inventory'. The table includes search and pagination controls at the bottom.

You can also create your own service catalog and items in ServiceNow using "Catalog definition" application inside My catalogs, My categories and My items modules.

Diagnostics and Troubleshooting

The responsibility of system administrator is not limited to the setup and configuration of applications and modules. The system administrator is also responsible for the performance and response time of the system by referring to the logs, stats, memory utilization, CPU consumption, etc.

ServiceNow has provided an application called System diagnostics which is a collection of many useful modules for the system administrators. A module called "Diagnostics page" lists the entire configuration of server, database, stats, etc. The diagnostics page is divided in four main parts:

- Cluster node status
- System overview
- Database overview
- Database connections

The cluster is a collection of nodes and node is a single system, which is responsible to store and process the data. In the cluster node status section, you will find the details of memory utilisation, number of transactions hit, logged in users, JVM uptime, etc. The system overview section lists the details related to events, POP3, SMTP, etc.

The database overview section gives the details related to the database version, driver, type, etc. and finally, the database connections give the logs of the queries executed in ServiceNow, connection details, etc.

Cluster Nodes Status

Name	app132034.ycg3.service-now.com:dev99615001
Status	online
Logged in users	1
Last reported	0 seconds
Last reported (seconds ago)	0
JVM UP time	1 day 13 hours 35 minutes
JVM CPU time	7 hours 16 minutes
Scheduler running	true
Scheduler queue length	0
Memory (MB)	270.0 of 1980.0
JVM Classes	27687.0 loaded, 649.0 unloaded
Transactions	138353
Errors	4574
GC.ParNew.Count	22652 (50 per 5 minutes)
GC.ParNew.TotalTime	292213 (4 minutes)
GC.ParNew.AvgTime	0.012900097
GC.ConcurrentMarkSweep.Count	323 (0 per 5 minutes)
GC.ConcurrentMarkSweep.TotalTime	308222 (5 minutes)
GC.ConcurrentMarkSweep.AvgTime	0.95424765

System overview

Emails (recv) last 60 minutes 0
 Emails (sent) last 60 minutes 2
 Events pending 10
 Log entries last 60 minutes 1604
POP3 Status Processed 0 emails
SMTP Status Connected to: relaydev, as: dev99615

Database overview

Type	mysql
Version	5.7.17-2-MariaDB-enterprise-log
Driver	MariaDB connector/J
JDBC	2.3.0

Database connections

0	free	glide.scheduler:SELECT RELEASE_LOCK('dev99615_1.schedule') /* dev99615001 */
1	free	glide.scheduler:SELECT RELEASE_LOCK('dev99615_1.schedule') /* dev99615001 */
2	free	"unknown"
3	free	"unknown"
4	free	glide.amb.cluster.synchronizer:SELECT sys_amb_message0040.`to_user`, sys_amb_message0040.`channel`, sys_amb_message0040.`sys_mod_count`, sys_amb_message0040.`serialized_cometd_message`, sys_amb_message0040.`sys_updated_on`, sys_amb_message0040.`from_user`, sys_amb_message0040.`number`, sys_amb_message0040.`sys_id`, sys_amb_message0040.`sys_updated_by`, sys_amb_message0040.`sys_created_on`, sys_amb_message0040.`from_node`, sys_amb_message0040.`sys_created_by` FROM sys_amb_message004 sys_amb_message0040 WHERE sys_amb_message0040.`number` > 0 /* dev99615001 */ Default-thread-35.0 (/home/do):SELECT ecc_agent0.`public_key`, ecc_agent0.`mid_java_command_dir`, ecc_agent0.`host_os_distribution`, ecc_agent0.`user_name`, ecc_agent0.`host_os_address_width`, ecc_agent0.`sys_updated_on`, ecc_agent0.`host_type`, ecc_agent0.`jvm_version`, ecc_agent0.`network`, ecc_agent0.`sys_id`, ecc_agent0.`router`, ecc_agent0.`sys_updated_by`, ecc_agent0.`validated`, ecc_agent0.`host_os_version`, ecc_agent0.`sys_created_on`, ecc_agent0.`sys_domain`, ecc_agent0.`host_glibc_version`, ecc_agent0.`win_domain`, ecc_agent0.`sys_created_by`, ecc_agent0.`stopped`, ecc_agent0.`is_running_using_system`, ecc_agent0.`application_experience_status`, ecc_agent0.`application_experience`, ecc_agent0.`home_dir`, ecc_agent0.`sys_mod_count`, ecc_agent0.`started`, ecc_agent0.`ip_address`, ecc_agent0.`host_cpu_speed`, ecc_agent0.`sys_domain_path`, ecc_agent0.`version`, ecc_agent0.`last_refreshed`, ecc_agent0.`host_disk_size_bytes`, ecc_agent0.`host_disk_size`, ecc_agent0.`unresolved_issues`, ecc_agent0.`mid_maximum_ram`, ecc_agent0.`name`, ecc_agent0.`host_cpu_core_count`, ecc_agent0.`host_total_ram`, ecc_agent0.`max_heap_size`, ecc_agent0.`host_maxheapsize`, ecc_agent0.`host_name`, ecc_agent0.`host_maxmemalloc_size`
5	free	

Another important application is “Performance analytics”. Its “Diagnostics” module under the troubleshooting lists down each and every error and exception received in ServiceNow.

Diagnostics					
		Name	Description	Severity	Active
<input type="checkbox"/>		(i) Active automated indicator not used in...	An automated indicator is associated wit...	Information	true
<input type="checkbox"/>		(i) Active daily jobs with Relative Start/En...	An active daily job with the Operator se...	Warning	true
<input type="checkbox"/>		(i) Automated indicator with invalid fields ...	A condition used in an automated indicat...	Error	true
<input type="checkbox"/>		(i) Automated indicators not associated with...	An automated indicator is not associated...	Warning	true
<input type="checkbox"/>		(i) Breakdown element filter with invalid co...	A condition used in a breakdown element ...	Error	true
<input type="checkbox"/>		(i) Breakdown Source with invalid Conditions	A condition used in a Breakdown Source i...	Error	true

Click on any error to find the underlying script which caused the error.

The screenshot shows a ServiceNow diagnostic record for a 'pa_diagnostic' entry. The record title is 'Diagnostic' and the description is 'Active automated indicator not used in any widgets or formula indicators'. A note indicates that the record is in the 'Performance Analytics - Diagnostics' application but is currently being edited in the 'Global' application. The script tab contains the following code:

```
1 v function executeDiagnostic(id) {  
2     var result = [];  
3     var job = new GlideAggregate('pa_job_indicators');  
4     job.addEncodedQuery('job.active=true&job.run_typeNOT INonce,on_demand');
```

Execute Diagnostic

6. ServiceNow — Development

ServiceNow provides a lot of inbuilt features and applications, which we can easily use to implement ITSM in any organisation. At the same time, there are business requirements to set up different processes and features. ServiceNow is highly customisable and developers can easily create applications and modules based on customer's requirements using principles of Javascript.

Javascript is mandatory for ServiceNow scripting. In this section, we will give you an overview of ServiceNow development.

Application Creation Overview

ServiceNow provides an application called "Studio", where you can create your new applications, give the source codes, create new tables for your applications, etc. The Studio provides guided and easy to use interface for creating new applications. Let's create a new application for the following case of BookWorm Ltd.

The Frontend IT team needs an application in ServiceNow wherein the Manager can publish the shift ROTA (shift rotation). There would be a 6 hrs shift for each employee and the team has to support 24 X 7.

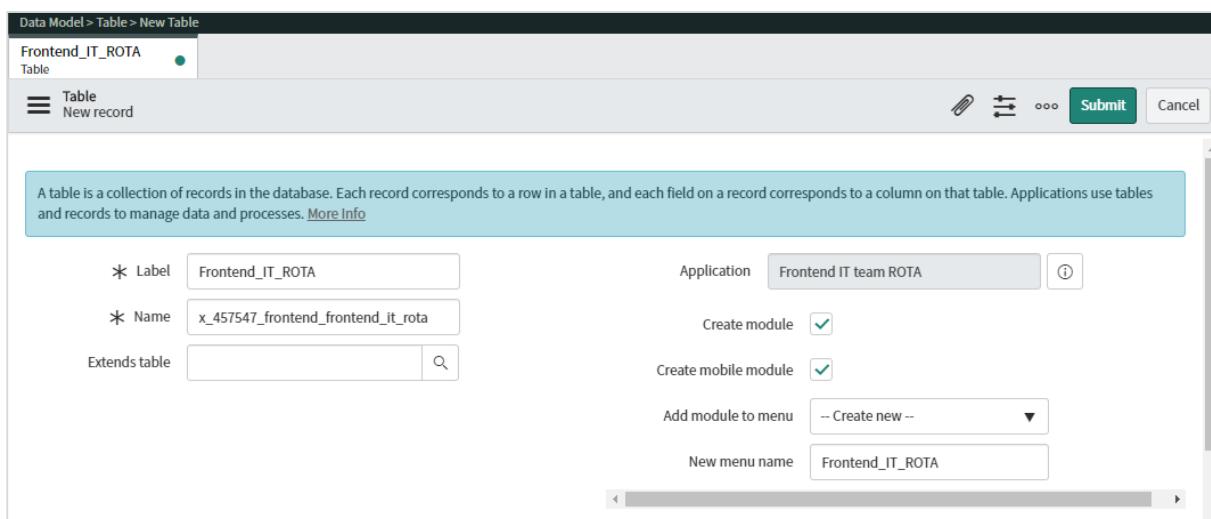
From the navigator goto Studio, a new window will open. Click on Create application. You will be prompted to enter the application name and description. Finally, click Create.

The screenshot shows the 'Create application' dialog box in ServiceNow Studio. At the top, there are three tabs: 'General Info' (selected), 'Data', and 'Design'. Below the tabs, a message says 'OK. Let's get started on your new app'. A note below it states: 'This app needs a name, description, and logo (optional). If you want to create more than one app, we'll build them one at a time.' The 'Name' field contains 'Frontend IT team ROTA'. The 'Description' field contains 'This application is for logging ROTA of Fr...'. To the right, there is a dashed box for uploading a logo with the placeholder text 'Drag and drop or browse to upload logo' and file types '.bmp, .gif, .ico, .jpeg, .jpg, .png, .svg'. At the bottom, there are 'Advanced settings' and 'Scope' dropdowns, both set to 'x_457547_frontend'. On the far right, there are 'Cancel' and 'Create' buttons, with 'Create' being green.

You will find the application page below. Now, it is time to create a table for our application. Go to "Create application file".



Click on Table under Data model and click create. You will be prompted to enter the details for the new table. Give the name of the table and keep remaining details as default.



Now scroll down and start defining the columns for these tables. We have below column definition, the important point to note here is that, we have selected reference of sys_user in Member column.

The screenshot shows the 'Table Columns' configuration screen. At the top, there are tabs for 'Columns', 'Controls', and 'Application Access'. The 'Columns' tab is active. Below the tabs is a search bar with 'Table Columns' and 'Search for text'. Underneath is a section for 'Dictionary Entries'. The main table lists columns with the following details:

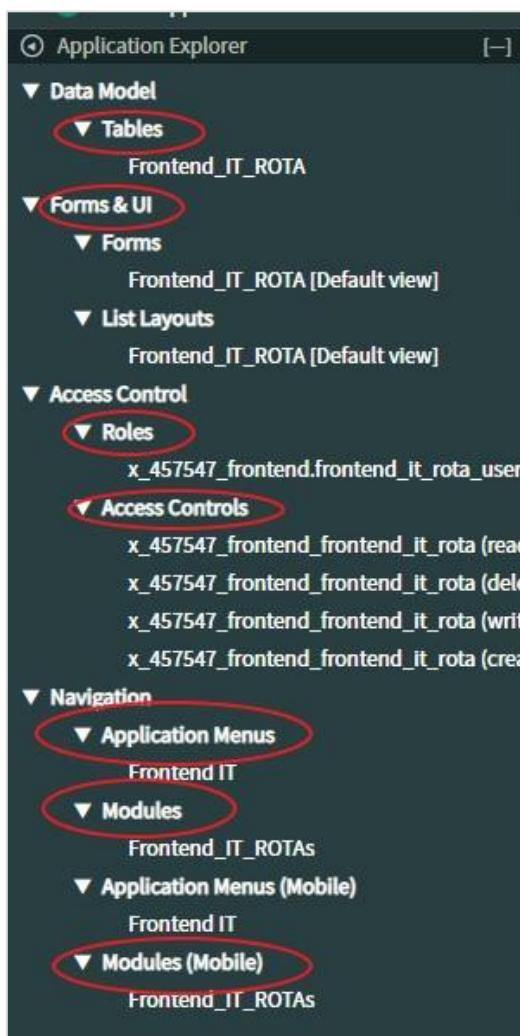
	Column label	Type	Reference	Max length	Default value	Display
<input type="button" value="X"/>	Date	Date			true	
<input type="button" value="X"/>	Shift	Choice			true	
<input type="button" value="X"/>	Member	String	User		true	
<input type="button" value="X"/>	Remarks	Translated Text			true	
<input type="button" value="+"/>	Insert a new row...					

At the bottom, there are 'Submit' and 'Cancel' buttons.

Now, click on the Shift column and select "Create choice list" as here, we will create choices of shift like 6am-12pm, 12pm-6pm, 6pm-12am and 12am-6am.

Access Controls						
	Choices	New	Search	Label	Value	Language
					Sequence	Inactive
<input type="checkbox"/>	<i>(i)</i> 6am-12pm	6am-12pm	en		false	2020-02-23 06:52:43
<input type="checkbox"/>	<i>(i)</i> 12pm-6pm	12pm-6pm	en		false	2020-02-23 06:58:15
<input type="checkbox"/>	<i>(i)</i> 6pm-12am	6pm-12am	en		false	2020-02-23 06:58:48
<input type="checkbox"/>	<i>(i)</i> 12am-6am	12am-6am	en		false	2020-02-23 06:59:10

So, now that we have created the table our application in the studio looks like this.



The studio has automatically created Form, list, module, application menu for us. We can create additional modules, tables, UI etc. from the create application file option, as we did for creating the ROTA table.

Now let's see how our application looks in service now. Search Frontend_IT_ROTA in the navigation bar and go to our new module.

Let's go ahead and add some new ROTA records in our application. Click on the New button.

Date	Shift	Member	Remarks
2020-02-24	12am-6am	Sameer	Please check all schedulers active
2020-02-24	6pm-12am	Zaid	Please monitor all the batch run
2020-02-24	6am-12pm	Atul	Please work on hot fixes
2020-02-24	12pm-6pm	John	Please complete daily ATR patching

UI Policy and Actions

ServiceNow defines UI policies as a tool through which, we can dynamically change the behaviour of information on a form and control custom process flows for tasks. UI action on the other hand is used to make the UI more interactive, customised, and specific to user activities. Let's understand this with the help of an example.

Suppose, we have to configure the Incident form in such a way that, if any incident is assigned to the Frontend IT team assignment group then, the Services field should become invisible and Configuration items should get disabled. The UI policy here is, "if assignment group is selected as frontend IT team" and UI actions here, is "Services field should become invisible and Configuration item field should get disabled".

The UI action can be implemented through, an easy way to use interface and also through the client script. Writing client script will help us, to do advanced operations in the fields. We will also demonstrate the client scripting later in this section.

The important point to note over here is that, UI actions are faster and executed first, followed by client scripts. Let's create an UI policy and action for our use case. From the navigation bar, open "UI policy" module under "System UI" application and click on New

button.

Short description	Table	Conditions	Reverse if false	On load	Updated
Always Hide Read-only Related List Field	Relationship [sys_relationship]	sys_id!SNOTEMPTY^EQ	false	true	2015-08-21 17:28:31

Give the name of the table, it is Incident in our case. Keep application as Global. If you can't find the option of global, navigate to the cog wheel in the top right corner and from developer tab select application as global.

Now, start giving the conditions in the next section. It would be "Assignment group is Frontend IT team" in our case. Next, there are some checkboxes, which are as follows:

- Global** - tick if you want, your UI policies to be implemented globally.
- On load** - tick if you want, to run your UI policy every time the page is refreshed.
- Reverse if false** - tick if you want, to reverse all the actions which we created if the conditions are changed.
- Inherit** - tick if you want, the table (in which UI policy is created) that extend the specified table inherit this UI Policy.

Fill all the required details and press submit.

Now, open the UI policy again and you will find the option to enter the UI actions. Let's give the UI actions as per our use case. Click on the New button in the UI action section.

The screenshot shows the 'UI Policy Actions' screen. At the top, there are two tabs: 'UI Policy Actions' and 'UI Policy Related List Actions'. Below the tabs is a search bar with a placeholder 'Search for text' and a 'Search' button. A red circle highlights the 'New' button, which is located next to the search bar. The main area displays a UI policy configuration for a 'UI policy for frontend IT team assignment'. It includes fields for 'Field name' (set to 'Service'), 'Table' (set to 'Incident [incident]'), 'Application' (set to 'Global'), 'Mandatory' (set to 'Leave alone'), 'Visible' (set to 'False'), and 'Read only' (set to 'Leave alone'). There is also a 'Clear the field value' checkbox. At the bottom left is a 'Submit' button.

We will select the following actions for Services and Configuration items fields.

This screenshot shows the same 'UI Policy Actions' screen as above, but for a different field. The 'Field name' is now set to 'Service'. The other settings remain the same: 'Table' is 'Incident [incident]', 'Application' is 'Global', 'Mandatory' is 'Leave alone', 'Visible' is 'False', and 'Read only' is 'Leave alone'. The 'Clear the field value' checkbox is unchecked. A 'Submit' button is at the bottom.

This screenshot shows the 'UI Policy Actions' screen again, but for a 'Configuration item' field. The 'Field name' is now set to 'Configuration item'. The 'Table' is still 'Incident [incident]'. The 'Application' is 'Global', 'Mandatory' is 'Leave alone', 'Visible' is 'Leave alone', and 'Read only' is 'True'. The 'Clear the field value' checkbox is checked. A 'Submit' button is at the bottom.

Click submit to confirm your UI actions and finally, click 'Update' to save the changes in UI policy. You can now go, to incident forms and verify your UI policy and actions.

ServiceNow Scripting

There are two types of scripting in ServiceNow, which are Client side and Server side. The server side scripting means that, processing takes place at the web server, while client scripting means, processing takes place at the user's machine. There are specific tasks, which could be accomplished by each type of script. Let's discuss, examples of both the scripts:

Client side scripting

The client side scripting can be used in various scenarios like populating some default values in the field of form, displaying some alert message, setting value in one field based on the response by the user in another field in a form, altering the choice list, etc. There are three main types of client scripts:

- Onload() - This gets executed, when the form is loaded.
- Onchange() - This gets executed, when particular field in the form is changed.

- **Onsubmit()** - This gets executed, when form is submitted.

Let's create a client script for two use cases. In our new application, "Frontend IT team ROTA", we will implement an alert "Please use this application once a week, to set shift rotation", once the application is loaded. Then, we will display an alert "The Member is entitled for shift allowance", if the shift timing is selected as 12am-6am.

Navigate to Studio module, open the application and click 'Create application' file. Then, select client script under client development option and give the required details as below:

Frontend_ROTA_On... Client Script

Client Script New record

Name: Frontend_ROTA_Onload_alert

Application: Frontend IT team ROTA

Type: onLoad

Active:

Inherited:

Global:

Description: (empty)

Messages: (empty)

Scroll down and give the script. We will give an alert as below.

Script

```

1+ function onLoad() {
2
3     alert("Please use this application once a week to set the shift rotation")
4
5 }
```

Submit

```

Function onLoad() {
    alert ("Please use this application once a week to set the shift rotation");
}
```

Click submit and load your new application to see the result.

Now, let us implement the next use case. Here, we will use onChange. The onChange Function is automatically passed with 5 arguments by ServiceNow.

- **Control** - It is the field for which the Client Script is configured.
- **OldValue** - It is the value of the field, when the form is loaded (prior to the change).

- **newValue** - It is the value of the field after the change.
- **isLoading** - It is the boolean value indicating whether, the change is occurring as part of a form load. Value is true if, change is due to a form load. When form loads, all the field values on the form changes.
- **isTemplate** - It is the boolean value indicating whether, the change that occurred, is due to the population of the field by a template. Value is true if, change is due to population by a template.

New client-scripts are run in strict mode, with direct DOM access disabled. Access to jQuery, prototype and the window object are likewise disabled. To disable this on a per-script basis, configure this form and add the "Isolate script" field. To disable this feature for all new globally-scoped client-side scripts set the system property "glide.script.block.client.globals" to false.

Name	onChange_Frontend_IT_ROTA	Application	Frontend IT team ROTA
Table	Frontend_IT_ROTA [x_457547_fron...	Active	<input checked="" type="checkbox"/>
UI Type	Desktop	Inherited	<input type="checkbox"/>
Type	onChange	Global	<input checked="" type="checkbox"/>
Field name	Shift		
Description			
Messages			

```
function onChange(control, oldValue, newValue, isLoading, isTemplate) {
    if (isLoading || newValue === '12am-6pm') {
        alert("The member is entitled for shift allowance");
        return;
    }
}
```

Script

```
1 v
2 v
3 v
4 v
5 v
6 v
7 v
8 v
9 v
function onChange(control, oldValue, newValue, isLoading, isTemplate) {
    if (isLoading || newValue === '12am-6pm') {
        alert("The member is entitled for shift allowance");
        return;
    }
}
//Type appropriate comment here, and begin script below
```

Submit

Glideform (g_form) class

The glideform is the class which is used to control the forms and the fields of the forms. We can perform tasks such as Hide a value of field, set the value of field based on the response on the other fields, add fields to choice list, etc.

The glide form class comes with many methods. A few important methods are addOption(), clearOptions(), showFieldMsg(), clearMessages(), clearValue(), setValue(), etc.

Let's create a client script in incident form to populate some message in the description field, if the assignment group is selected as the Frontend IT team. Go to UI policies and create a new policy. Give the condition in the "Where to apply" section as "Assignment group is Frontend IT team".

UI Policy
New record
[Advanced view*]

Table: Incident [Incident] Application: Global Active:

* Short description: UI policy to populate message in description field if assignment group is selected as Frontend IT team

Order: 100

When to Apply Script

Conditions: Add Filter Condition, Add "OR" Clause

All of these conditions must be met:

- Assignment group is Frontend IT team

Submit the UI policy, open it again and then, click on the advanced view. Later, you will find the option to give the script.

When to Apply

Conditions: Add Filter Condition, Add "OR" Clause

Assignment group is Frontend IT team

Update Delete

Related Links

Convert this to Data Policy

[Advanced view](#)

The script is automatically populated with function onCondition(). The onCondition function will be executed automatically once, the condition we have given in UI policy is met. Another point to note is that there are two scripts, "Execute if true" and "Execute if false".

The 'execute if true' script will execute once the condition is matched and if, we change the values in the fields such that, condition we have mentioned is no longer met, then the script in 'execute if false' will execute.

Let's write a script for both. Here, we will use setValue and clearValue methods. To get the field name, which needs to be mentioned in the script, open the incident form and right click on the desired field, you can find the field name in format "Show - <fieldname>"



On true script

```
function onCondition() {
    g_form.clearValue('description');
    g_form.setValue('description', '**Please mention server name, instance name and error code**');
}
```

On false script

```
function onCondition() {
    g_form.clearValue('description');
}
```

```
Run scripts 
Run scripts in UI type: Desktop
Execute if true
1 v  function onCondition() {
2
3      g_form.clearValue('description');
4      g_form.setValue('**Please mention server name, instance name and error code**');
5
6  }
7

Execute if false
1 v  function onCondition() {
2
3      g_form.clearValue('description');
4
5  }
```

Now, open the incident form and check the result.

The screenshot shows a ServiceNow incident creation form. The fields are as follows:

- Number: INC0010022
- Contact type: -- None --
- State: New
- Impact: 3 - Low
- Urgency: 3 - Low
- Priority: 5 - Planning
- Assignment group: Frontend IT team (circled in red)
- Assigned to: (empty)
- Short description: (empty)
- Description: Please mention server name, instance name and error code (circled in red)

Server Side Scripting

Server-side scripts execute on the ServiceNow server or database. Server side scripting has two categories:

- Business rules
- Script include

Let us take a look into each category one by one.

Business rules

The business rules module can be found in System definition application. To create a business rule, click on new. We can create a simple business rule using business rule actions, which have a simple dropdown interface.

You can use business rule action to set the values of the field or to add a message in the form. We can choose, when to run the business rule as below:

- **Before** - The logic in business rule executes before the database operation
- **After** - The logic in the business rule executes after the database operation
- **Async** - Async Business Rules executes their logic after a database operation occurs but the scheduler queues the task to be run as soon as possible but not necessarily immediately after the database operation.
- **Display** - Display Business Rules executes their logic, when a form loads and a record is loaded from the database.

We can also choose the database operation, at which the business rule should execute. Let us create a business rule action, in the Frontend IT team ROTA application, we created in the last section.

We have to set the value in the Remark field as "Monitor XO887 batch jobs" if the shift timing is 12am to 6am. Give the name and table frontend_it_rota. Inside, when to run tab give the condition, as shift is 12am to 6am and check 'insert' and 'update' box.

A business rule is a server-side script that runs when a record is displayed, inserted, deleted, or when a table is queried. Use business rules to automatically change values in form fields when the specified conditions are met. [More Info](#)

Name	Frontend it rota business rule	Application	Global	<input type="button" value="i"/>
Table	frontend_it_ROTA [x_457547_fro...]	Active	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Advanced				

When to run **Actions**

Specify whether the business rule should run on Insert or Update. Use Filter Conditions to specify under which conditions the business rule should run.

Insert	<input checked="" type="checkbox"/>
Update	<input checked="" type="checkbox"/>
Filter Conditions	<input type="button" value="Add Filter Condition"/> <input clause"="" or"="" type="button" value="Add "/>
Shift	<input type="button" value="is"/> <input type="button" value="12am-6am"/> <input type="button" value="AND"/> <input type="button" value="OR"/> <input type="button" value="X"/>
Role conditions	<input type="button" value="edit"/>

Submit

Inside Action tab give your condition for the remark field.

When to run **Actions**

Specify field values using the Set field values choice lists:

- To: a value determined by the options available for that field.
- Same as: a value taken from another field.
- To (dynamic): A value relative to the user configuring the business rule, or a user with a specific role.

Set field values	<input type="button" value="Remarks"/> To <input type="text" value="Monitor X0887 batch jobs"/> <input type="button" value="X"/>
	<input type="button" value="-- choose field --"/> To <input type="button" value="-- value --"/>
Add message	<input type="checkbox"/>
Abort action	<input type="checkbox"/>

Submit

We can also give our custom script in this business rule. To start writing the custom script, check the Advanced checkbox and you will see, the new Advanced tab to write the script.

Let us write a script, to abort the insert transaction when the member, time or date field is not given. We will use 'current' and 'previous' objects for this purpose.

```
(function executeRule(current, previous /*null when async*/){  
    if((current.member = ' ') || (current.date = ' ') || (current.shift  
= ' '))  
    {  
        current.setAbortAction(true);  
    }  
}
```

The screenshot shows the ServiceNow Business Rule Scripting interface. At the top, there are tabs: 'When to run', 'Actions', and 'Advanced'. The 'Advanced' tab is selected. Below it, there's a 'Condition' section with a toolbar containing various icons. Underneath is a 'Script' section with a toolbar and a code editor containing the following JavaScript:

```

1+ (function executeRule(current, previous /*null when async*/) {
2
3     if((current.member == '') || (current.date == '') || (current.shift == '')) {
4         current.setAbortAction(true);
5
6     }
7
8 })(current, previous);

```

At the bottom of the screen are 'Update' and 'Delete' buttons.

Script Include

Using script includes, we can write custom functions or classes and then, use them in other scripts as many times we need. They are sort of reusable scripts; we can use in other client-side or server side scripts. However, they get executed only, when called by the other scripts explicitly. To create a new script include, we have a module "**Script include**" under the "System definition" application. Click on new to create a new script include.

In the script include form, give the name of the script include. The API name field is the internal name of the script include and it is used, when this script include is called from other applications. Check the client callable checkbox, if you want to use this script include in client-side scripts. In the application, give the application for which this script is used. In the 'accessible from' field, give the application scope.

Let us write a script for the following case in Frontend IT team ROTA application. First, we will write a script include, which will check an invalid character in any field. We will define a function, which will take the argument as a string and return true or false, based on the characters in the string.

We will use this function in our business rule scripting to validate, if the value given in the Member (Name) field (in frontend IT team ROTA app), does not have any invalid character while submitting the form.

Open the script include module, below is the script which we will use.

```

function validatefieldcharacters(fieldinput) {
    var validcharacters = /^[a-zA-Z]+$/;
    if(fieldinput.value.match(validcharacters)) {
        return true;
    }
    else {
        return false;
    }
}

```

The screenshot shows the 'Script Include' configuration page. The 'Name' is 'Frontend IT team field check', 'Application' is 'Global', 'Accessible from' is 'This application scope only', 'Client callable' is checked, and 'Active' is checked. The 'Description' and 'Protection policy' fields are empty. The 'Script' section contains the following code:

```

1 function validatefieldcharacters(fieldinput) {
2     var validcharacters = /^[a-zA-Z]+$/;
3     if(fieldinput.value.match(validcharacters)) {
4         return true;
5     }
6     else {
7         return false;
8     }
9 }

```

The 'Submit' button is at the bottom left.

Now, let us write down the Business rule script to validate the Member field. Open business rule module and create a new business rule for our application Frontend IT team ROTA.

```

var memberfieldstatus = validatefieldcharacters(current.member)
if(memberfieldstatus == false) {
    gs.addErrorMessage(" Special characters not allowed in member
field");
    current.setAbortAction(true);
}

```

The screenshot shows the 'Business Rule' configuration page. The 'Name' is 'Frontend IT team ROTA field check', 'Table' is 'Frontend_IT_ROTA [x_457547_fro...', 'Application' is 'Global', 'Active' is checked, and 'Advanced' is checked. The 'When to run' tab is selected. The 'Condition' field is empty. The 'Script' section contains the same validation code as above:

```

1 var memberfieldstatus = validatefieldcharacters(current.member)
2 if(memberfieldstatus == false) {
3     gs.addErrorMessage(" Special characters not allowed in member field");
4     current.setAbortAction(true);
5 }

```

The 'Submit' button is at the bottom left.

Debugging

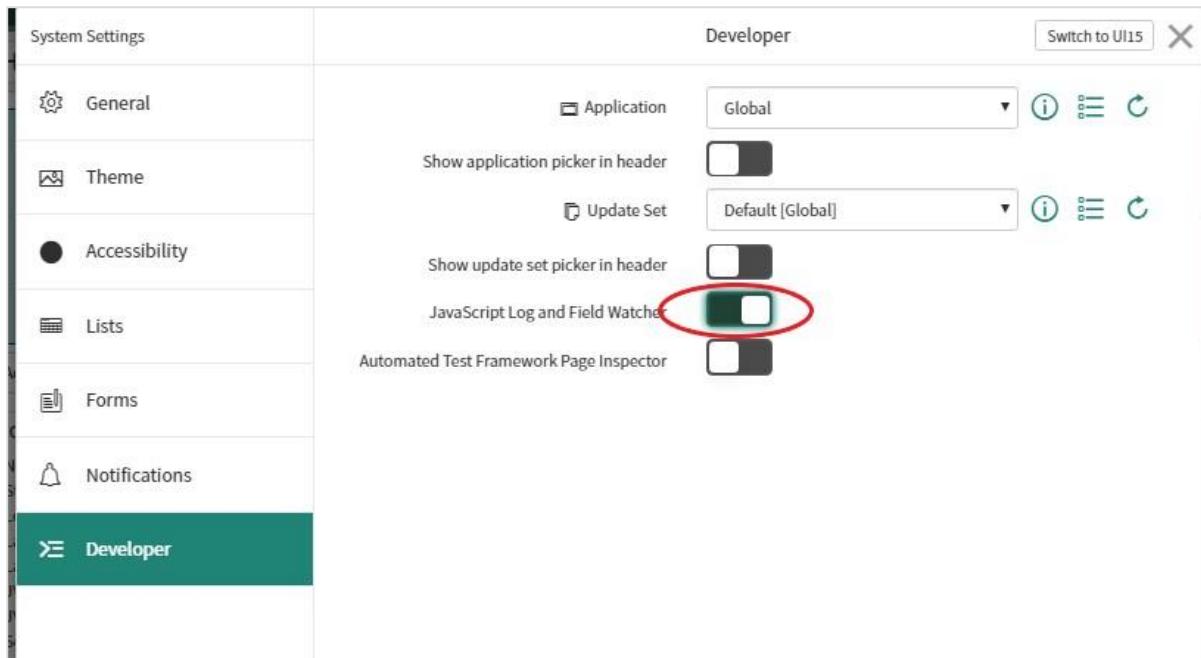
We can use various debugging techniques, if our script is not performing as per the expectations, or if we are getting some error. Let's discuss various ways in which, we can debug client side and server side script.

Debugging client scripts

The best way to debug the client script is referring to logs. The Javascript provides jslog() method to write messages in Javascript logs. The jslog() method accepts messages, which we want in the logs in the argument. Below is an example on, how we can implement the jslog(). You can use the below script in the business rule script.

```
function onLoad(){
    jslog("This log is displayed from jslog().");
    jslog("The value of Member field is = " + g_form.getValue('Member'));
}
```

This will give the value given in the member field in the logs. In this case, we have used the getvalue method, to retrieve the value of the member field. Now, the next step is to turn the logs on. Go to setting option on the top right corner and click on developer tab. Turn on the “Javascript log and Field watcher” option.



The JavaScript Logs will open in a new section at the bottom of the main ServiceNow browser window.

JavaScript Log	Field Watcher	Small	Medium	Large	\emptyset	C
21:04:08 (954) concourseJsDebug.do running inline scripts, count: 0						
21:04:08 (959) concourseJsDebug.do runBeforeRender						
21:04:08 (968) concourseJsDebug.do runAfterAllLoaded, functions: 7						
21:04:08 (972) concourseJsDebug.do fireAllChangeHandlers start						
21:04:08 (973) concourseJsDebug.do fireAllChangeHandlers end						

Apart from jslog() we can also use try/catch statements which we generally use in Javascript to debug the scripts.

Debugging server side script

The most common way of debugging server side script is using "Script debugger" module. The script debugger can be used to place breakpoints, traverse the code step by step, view value of variables, etc. To access script debugger, find "script debugger" in the navigation bar. It is present inside "System Diagnostics" application.

Apart from this, we can also refer to "Application logs" module, which is present inside "System log application".

7. ServiceNow — Mastering and Certification

ServiceNow is an enterprise cloud ecosystem, which has revolutionised the way ITSM is implemented within the organisation. Due to its flexibility, better quality, improved productivity and easy integration, it is in very much demand.

Our ServiceNow tutorial, should have given you a strong base and sufficient knowledge to start your journey as a ServiceNow professional. You can start creating new applications in your developer instances, for hypothetical use cases, because hands on is very necessary, to grasp each and every topic and to build good understanding on each topic.

You have two career options in the field of ServiceNow, which are as follows:

- ServiceNow developer
- ServiceNow administrators

Although having a specialisation in administration or development is very beneficial. Many organisations prefer to hire resources having knowledge of both fields. We have tried to cover the important concepts of both administration and development in this tutorial.

However, you can gain more proficiency by going through ServiceNow documentations. ServiceNow has organised the documentation of their products very systematically and you can refer to it, using this link <https://docs.servicenow.com/> .

Next thing, we want to highlight is that, you can showcase your ServiceNow skills through ServiceNow certification. To earn a ServiceNow certification, it is mandatory to complete the ServiceNow paid training first and post which, you will receive a free certification voucher.

ServiceNow have divided the certifications in four main categories, which are as follows:

- Certified implementation specialist (CIS)
- Certified application developer (CAD)
- Certified application specialist (CAS)
- Certified system administrator (CSA)

You can find more details on ServiceNow certifications and ServiceNow authorised training partners on this URL, <https://www.servicenow.com/services/training-and-certification.html>