

# IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide

Description	IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide
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# Table of Contents

## Welcome

- Prerequisite knowledge
- Lab overview
- Support
- Using the demonstration guide

## IBM Technology Zone environment

- Create a reservation request
- Extend the reservation
- Join the
- Accessing the environments
- Troubleshooting

## Creating an assistant and configuring conversational search

- Access the
- Create your Assistant
- Configure conversational search
- Complete the configuration
- Configure the base large language model
- Testing conversational search
- Troubleshooting

Bring your own search and documents

## Creating a stand-alone OpenSearch instance for document ingestion

- Install the Red Hat OpenShift command line interface utility
- Prepare to ingest documents
  - Log in to the OpenShift cluster from your local terminal
  - Create a working directory
  - Install IBM Certificate Manager on Red Hat OpenShift
  - Install the watsonx Assistant for Z Operator (for OpenSearch)
  - Deploy required secrets and the custom bring-your-own-search (BYOSearch) resources
  - Verify all the required pods are running and get the network route to your
  - Update your assistant with the new
- Troubleshooting

## Installing and using zassist to ingest client documents

- Install the zassist utility
- Ingest client documentation using zassist

- Verify that the assistant is using the ingested documents
- Adjusting the search behavior

## Skills and skill flows

### Getting started with skills and actions

- Environments
  - Watsonx Orchestrate
  - Ansible Automation Platform and Wazi as a Service

### Explore Ansible Automation Platform

- Access the

### Importing skills from Ansible Automation Platform

- Import skills into your assistant

### Connecting skills to your assistant

### Creating actions for your assistant

### Configure the number of input fields

- Create actions

### Verify the job in the Ansible Automation Platform console

- Troubleshooting

### Creating skill flows

- Add the utility skill
- Add the skills to your Personal skills
- Create the skill flow
- Enable the skill flow in your assistant

### Creating custom-built actions

### Importing pre-packaged z/

## Publishing and deploying your assistant

- Publish the assistant
- Configure the live environment
- Connect the skills to the live environment
- Deploy the assistant

## Use cases

### Use case: Retrieve

- Download and customize the watsonx Assistant for Z OpenAP JSON file
- Set the
- Import and publish the pre-packaged skills as an OpenAPI file

- Configure your appURL to connect to the WaaS server
- Test the skill
- Connect the app to your assistant
- Create an action for your assistant
- Create a custom-built action
- Test the custom-built action

#### Use case:

- Create an initial certificate authority (
- Create an
- Renew the
- Create another
- Import the Ansible automations into watsonx Orchestrate
- Verify all the skills are successfully imported and create the app connection.
- Connect the app to the assistant.
- Create a skill flow to retrieve certificate expiration dates.
- Create a skill flow for certificate renewal
- Add the skill flows to the assistant
- Create a custom-built action for
- Test the
- Complete the custom-built skill to renew the certificate
- Run the complete custom-built action

#### Use case:

## Adding other integrations

### Next steps

- Other resources
- Earn the badge

# Welcome

Welcome to the IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide (lab guide). The lab guide is part of the IBM watsonx Assistant for Z for Technical Sales Level 4 learning plan for IBM and Business Partner Technical Sales and related badge. The learning plan is intended to teach technical sellers and Business Partners how to conduct a proof of experience (PoX) for a client.



## In a fast-paced world, things change...

The products and services may appear differently than what is shown in the lab guide. This can occur if the product or service is updated with a new version.

Responses generated by IBM watsonx Assistant for Z are likely to change over time. The responses you see when you run the queries in this section may differ from the screen images captured in the lab guide.

## Prerequisite knowledge

The prerequisite requirements to complete this course are as follows:

- Basic Windows or Linux (MacOS) Operating System admin skills, including:
  - Open a command prompt or power shell on Windows, or a terminal window on Linux (MacOS)
  - Change directories, create directories, and move directories
  - Set environment variables and add directories to the default PATH
  - Create and modify plain text files with an editor and save as plain text files
  - Familiarity with a visual code editor like VS Studio Code is a plus
- The following links may help with these basic skills. This is not an endorsement of the sources. Try searching the internet for related resources.
  - [Windows tutorials](#) (and other videos in the series).
  - [Windows PowerShell](#).
  - [MacOS terminal](#).
  - [The 50 most popular Linux & terminal commands - full course for beginners](#) (based on the following book).
  - [The Linux Commands Handbook](#) (Linux/MacOS).



### Read and follow all the directions.

It is important to read and follow all the documented steps. Skipping steps or sections can cause issues with completing the lab.

Also, invest a few minutes in reading the tips in the [Using the demonstration guide](#) section. The tips will save you time and frustration in completing the lab.

## Lab overview

This lab guide covers the setup, configuration, and usage of watsonx Assistant for Z. This lab guide uses the [IBM watsonx Assistant for Z Velocity collection](#) and the three Velocity Pilot lab environments in IBM Technology Zone (ITZ).

The lab guide also enables dedicated lab environments for customized client PoXs and demonstrations. If you are preparing for an actual pilot engagement, refer to the [Pilot Scoping Guide for watsonx Assistant for Z](#) for additional information.

Using the lab guide, you learn how to:

- Provision the lab environments
- Create an assistant and configuring conversational search
- Configure assistant settings
- Test conversational search
- Deploy a dedicated instance of OpenSearch for client document ingestion (Optional)
- Import skills for z/OS automations
- Connect apps to assistants
- Create assistant actions
- Create skill flows
- Publish and deploy an assistant

In addition, you import pre-packaged z/OS skills and create custom-built skills to deliver an assistant that handles 3 use cases:

- Retrieving initial program load (IPL) information
- Managing certificates
- Resource Access Control Facility (RACF) administration support

**Not all capabilities of the offering are covered in the lab guide.**

This lab guide covers many features and capabilities of IBM Watson Assistant for Z, but not all. Some uncovered capabilities may be available in ITZ environments, while others may not, such as using skills for OMEGAMON.

## Support

Think something is down? Check the applicable status pages for any known issues such as a site or service not being available:

- [IBM Technology Zone status](#)

For issues with provisioning the ITZ environment for this lab (for example, a failed reservation request due to insufficient quota capacity), open a ticket with ITZ support:

- Web: [IBM Technology Zone ticket system](#)
- Email: [techzone.help@ibm.com](mailto:techzone.help@ibm.com)

For issues related to specific steps found in the demonstration guide after the ITZ environment is provisioned, contact the authors:

- Slack:
  - [#watsonx-assistant-z-technical](#) - IBM only
  - [#wxo-practitioners](#) - IBM only - for questions that are related to the software as a service (SaaS) instance of watsonx Orchestrate
- Email: [andrewj@us.ibm.com](mailto:andrewj@us.ibm.com) and [maxwell.g.weiss@ibm.com](mailto:maxwell.g.weiss@ibm.com)

Business Partners, use the IBM Training live Chat Support service or other support methods that are found on the IBM Training portal [here](#).

## Using the demonstration guide

Use these helpful tips to take full advantage of the IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide.



### Printing the demonstration guide

#### Printed or saved copies can be out of date

The IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide changes regularly to match the IBM watsonx Assistant for Z offering and associated ITZ environment. Printed or saved copies of the demonstration guide can become out-of-date quickly and result in failed steps.

A ready-to-print PDF version of the IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide is [here](#).



## Create a reference card for storing user IDs, passwords, and links for your ITZ environments.



You will be creating and using multiple user IDs, passwords, links, and other content throughout the lab. To save time, it is strongly suggested you create a simple text file to store this data so it is readily available and you can easily cut and paste the data when needed. Here is a template to get you started.

watsonx Assistant for Z - Level 4 shortcuts:

watsonx Orchestrate

IBM Cloud account:

IBM Cloud resources: <https://cloud.ibm.com/resources>

watsonx Orchestrate URL:

Assistant name:

Assistant description:

Assistant icon: [https://ibm.github.io/SalesEnablement-L4-watsonx-AssistantForZ/Setup/\\_attachments/Zeeves75x75.png](https://ibm.github.io/SalesEnablement-L4-watsonx-AssistantForZ/Setup/_attachments/Zeeves75x75.png)

OpenShift

Cluster Admin Username: kubeadmin

Cluster Admin Password:

OCP Console:

IBM Cloud container entitlement key:

OS-secret password:

Client ingestion AuthKey:

Wrapper password:

Cluster domain for routes:

Ingestion route (append /v1/query):

Ansible

Ansible Automation Platform URL:

AAP User Name: admin

AAP password:

Wazi User: IBMUSER

Wazi Password:

Wazi URL:

Live Embed

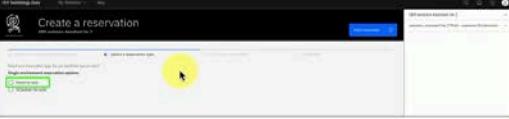
inetegrationID:

region:

serviceInstanceID:

## Viewing images

Images in the demonstration guide can be enlarged by clicking on the image. Press the  key or click the X to dismiss the enlarged image.



2. Click **Reserve now**.

The **Reserve now** option creates a reservation for immediate use. Optionally, schedule the reservation for a later date, like when you will be at your client's office.

3. Complete the reservation request and click **Submit**.

The first two reservations will be similar to the first image below and have fields **a-e** that will need to be completed.

- Optionally, change the **Name** field for the reservation.
- Select the **Education** purpose tile.
- Enter a **Purpose description**.
- Select the region nearest your physical location in the **Preferred Geography** drop-down.
- The **End date and time** will be set to 2 days after the current date and time.
- Accept the IBM Technology Zone's terms and conditions and security policies.
- When satisfied with the parameters, click **Submit**.



## Image highlighting

In some images, the following styles of highlighting are used:

- **Solid highlight box:** This style of box highlights where to click, enter, or select an item.



- **Dash highlight box:** This style of box highlights one of two things: the path to follow to get to a specific location in the user interface, or areas to explore on your own.





## Copying commands and prompts

Copying and pasting commands and prompts from this demonstration guide is easy and can eliminate typographical errors.

Click the highlighted copy icon and then use your operating system's paste function. For example, **[^ Ctrl] + [V]**, or right-click and select **Paste**.

### Prompt 1

What is the APF list in z/OS? Provide a detailed explanation.



## Acronyms and terminology

IBM employees and the tech industry in general, tend to use acronyms. In the demonstration guide, most acronyms will appear with a dashed underline. Hover over the acronym to learn its meaning. A question mark (?) icon will first appear and after a second the tool tip with the acronym's meaning is displayed. Try it here: LPAR.



### Guidance for delivering a demonstration



Search

IBM watsonx Assistant for Z

Welcome

Reserve the IBM Technology Zone environment

Guidance for delivering a demonstration

Demonstration scenarios >

Next steps

Specific guidance for IBM watsonx Assistant for Z and the ITZ environment

Following the scripts provided in the IBM watsonx Assistant for Z for Technical Sales Level 3 Demonstration Guide will help guarantee a successful demonstration. Use these tips to help insure success with IBM watsonx Assistant for Z and the ITZ environment:

- Follow the scripts in the IBM watsonx Assistant for X for Technical Sales Level 3 Demonstration Guide for the automations and skills to execute as expected.

Table of contents

General demonstration guidance

Specific guidance for IBM watsonx Assistant for Z and the ITZ environment



## The Lab Guide table of contents



This **Demonstration Guide** uses a responsive browser-based interface to ensure pages are usable on various devices with different screen sizes. The Demonstration Guide table of contents may be displayed as highlighted in the green dashed box in this image:

The screenshot shows a browser window for the "IBM watsonx Assistant for Z for Technical Sales Level 3 Demonstration Guide". The title bar includes the course name, a refresh icon, and a search bar. The main content area has a green dashed box highlighting the Table of Contents on the left and the "Welcome" section on the right.

**Table of Contents (highlighted by a green dashed box):**

- IBM watsonx Assistant for Z for Technical Sales Level 3 Demonstration Guide
- Welcome
- Guidance for delivering a demonstration
- Reserve the IBM Technology Zone environment
- Demonstration scenarios
  - Introduction to scenarios
  - Scenario 1: Authorized Program Facility
  - Scenario 2: Certificate renewal
  - Scenario 3: Db2 versioning
  - Scenario 4: Initial Program Load on Z
  - Additional IBM Z related prompts
  - Summary
  - Next steps
  - Printing the guide
  - Instructions

**Welcome Section:**

Welcome to the **IBM watsonx Assistant for Z for Technical Sales Level 3** course and demonstration guide! The goal of this course is to provide IBM and Business Partner technical sellers the knowledge and tools to demonstrate **IBM watsonx Assistant for Z**.

This course is not intended to serve as an in-depth study of IBM watsonx Assistant for Z, watsonx, or IBM Z; rather the focus is on learning how to deliver a client demonstration of IBM watsonx Assistant for Z. More specifically, the focus is on the *end-user* creating queries and by using trusted automations through skills that are suggested by IBM watsonx Assistant for Z.

Other aspects of IBM watsonx Assistant for Z including creating and configuring assistants, importing and creating new skills, and ingestion of client documentation are **not** covered in this demonstration guide. To learn more and get hands-on with these additional capabilities, check out the Velocity Pilot information in IBM Technology Zone (ITZ) [here](#).

Obtaining the IBM watsonx Assistant for Z Technical Sales Intermediate badge

However, if the browser window is sized smaller, the table of contents can be accessed by clicking the main menu icon (≡):

The screenshot shows the same browser window after the main menu icon (≡) was clicked. The menu is now expanded, covering the top portion of the page. The "Welcome" section is still visible below the menu.

**Welcome Section:**

Welcome to the **IBM watsonx Assistant for Z for Technical Sales Level 3** course and demonstration guide! The goal of this course is to provide IBM and Business Partner technical sellers the knowledge and tools to demonstrate **IBM watsonx Assistant for Z**.

Click the main menu icon (≡) to expand the table of contents.

Continue to the [Reserve the IBM Technology Zone environments](#) section to begin the journey to obtain the IBM watsonx Assistant for Z Technical Sales Advanced badge.

# IBM Technology Zone environment

To enable sellers to learn how to deliver client pilots of IBM Watsonx Assistant for Z, three environments are available in IBM Technology Zone (ITZ). The environments are part of the Watsonx Assistant for Z Velocity lab collection and can be found in the [IBM Watsonx Assistant for Z](#) collection.

- **Watsonx Assistant for Z lab – Watsonx Orchestrate:** provides a dedicated environment on IBM Cloud where you can create and configure the assistant, set up conversational search, import skills, and configure actions.
- **Ansible Automation Platform (AAP) & z/OS:** provides a pre-configured instance of AAP and Wazi z/OS. This environment includes Ansible playbooks, which you can import as skills within Watsonx Orchestrate and connect to your assistant. Preinstalled templates for various use cases are also available (covered in later sections). Learn more about AAP [here](#). Learn more about Wazi, [here](#).
- **Single Node OpenShift with NFS storage:** provisions a single-node Red Hat OpenShift cluster (SNO) on IBM Cloud. This cluster installs a dedicated instance of OpenSearch for Watson Assistant for Z, enabling ingestion of client-supplied documents.-



All activities in this lab guide are required.

To earn the IBM Watsonx Assistant for Z Technical Sales Advanced badge and complete the Level 4 learning plan, you must provision all three ITZ environments and finish every section in the lab guide. Disregard any statements in the ITZ collection that suggest optional environments or tasks.

Follow the instructions to create new reservation requests, extend the reservations, and access the ITZ demonstration environments. Provisioning the SNO environment in ITZ can take several hours, while the other two environments typically provisioning in under 30 minutes.

## Create a reservation request

1. Click each of the links that follow to open a browser to the reservation pages of the **IBM Watsonx Assistant for Z** ITZ environments.



You may be asked to authenticate to IBM Technology Zone.

The steps to authenticate to ITZ are not detailed here as they may vary between users.

[Watsonx Assistant for Z lab – Watsonx Orchestrate - reservation page](#)

[Ansible Automation Platform \(AAP\) & z/OS - reservation page](#)

[Single Node OpenShift with NFS storage - reservation page](#)



**The next two steps are for one of the three environments. Repeat for all three environments.**

Follow the steps to create a reservation in ITZ for all three environments.

## 2. Select Reserve now.

The **Reserve now** option creates a reservation for immediate use. Optionally, schedule the reservation for a later date, for example, when you are at your client's office to start a pilot.

The screenshot shows the 'Create a reservation' interface. At the top, there are tabs for 'IBM Technology Zone', 'My TechZone', and 'Help'. Below the tabs, the title 'Create a reservation' and subtitle 'IBM watsonx Assistant for Z' are displayed. On the right side, there is a sidebar with 'View collection' and a search bar. The main form has several sections: 'Select a environment/contract/zone', 'Select a reservation type', 'Fill out your reservation', and 'Complete'. Under 'Single environment reservation options', there are two radio buttons: 'Reserve now' (which is selected and highlighted with a green border) and 'Schedule for later'.

## 3. Complete the reservation request form and then click Submit.

The first two reservations are similar to the first image and have fields **a-e** that need to be completed.

- a. Name: specify a name for the reservation (optional).
- b. Purpose: select the **Education** purpose tile.



**For client pilots...**

For client pilots, set the **Purpose** field in the reservation to **Pilot** and provide an opportunity number to receive a longer reservation.

- c. Purpose description: enter a description, for example: Level 4 education.
- d. Preferred geography: select the region nearest to your physical location for improved performance and reduced network latency.
- e. End date and time: the initial maximum will be set to a specific number of days (typically two, but in some cases longer) after the current date and time. Instructions follow to extend the reservation end date.
- f. Accept the IBM Technology Zone's terms and conditions and security policies.
- g. Click **Submit**.

The screenshot shows the 'Create a reservation' form for Watson Assistant for Z Pilot. The 'Name' field (a) contains 'Watson Assistant for Z Pilot - Watson Orchestrate'. The 'Purpose' section (b) has 'Education' selected, described as 'Getting experience with specific technology, product, or solution.' The 'Pilot' section (c) has 'Data Activity Pilot' selected, described as 'Data Activity build that proves IBM technologies can utilize Watson's value to clients' while serving as a foundation to build a production solution. Automatically captures a Technical Data Activity in IBM Data Cloud on the Opportunity type provided.' The 'Test' section (d) has 'Test' selected, described as 'Used to test a specific function, configuration, or customization.' The 'Opportunity number' field (e) contains 'PRJ-A-1234567890'. The 'Preferred Geography' dropdown (f) shows 'ibp-watsonx-2 - AMERICAS - us-south-region - data00 datacenter'. The 'End date and time' field (g) shows '12/02/2024 8:07 AM America/Chicago'. The 'Notes' field (h) contains '(Note: any notes you provide will be visible to others for this reservation.)'. At the bottom right, there is a checkbox for 'I agree to IBM Technology Zone's [Terms & Conditions](#) and [Customer Security Policies](#)' and a blue 'Submit' button.

In addition to the preceding fields, the reservation for the **Single Node OpenShift with NFS storage** has these additional fields:

- h.** OCP/Kubernetes cluster network: leave the default setting of **10.128.0.0/14**.
- i.** Enable FIPS security: leave the default setting of **No**. Learn more about the Federal Information Processing Standards (FIPS) [here](#).
- j.** Master single node flavor: select **16 vCPU x 64 GB - 300 GB ephemeral storage**.
- k.** OpenShift version: select **4.14**.
- l.** OCP/Kubernetes service network: leave the default setting of **172.30.0.0/16**.
- m.** Accept the IBM Technology Zone's terms and conditions and security policies.
- n.** Click **Submit**.

IBM Technology Zone   My TechZone   Help

Select a date   Select a time   America/Chicago

Reservation policy: Recommended 2 days, but can be reserved up to 2 days on this reservation form. Extend later for 2 days increments up to 4 days total. Max time 6 days total.

OCF/Kubernetes Cluster Network: **10.128.0.0/14**

Enable FIPS Security: **No**

Master Single Node Flavor: **16 vCPU x 64 GB - 300 GB ephemeral storage**

OpenShift Version: **4.14**

OCP/Kubernetes Service Network: **172.30.0.0/16**

Notes:  
Enter any notes you would like to attach to this reservation:

**m**  I agree to IBM Technology Zone's Terms & Conditions and End User License - Policies

**n** **Submit**

IBM watsonx Assistant for Z   Single Node OpenShift (VMware on IBM Cloud) - NFS   Policy

During the provisioning process, multiple emails are sent to you from ITZ as the provisioning process runs. One email states the reservation is provisioning and the other email states that the environment is **Ready**.

In rare cases, the provisioning process can fail. If you receive an email stating the reservation failed, try again by repeating Steps 1-3 for the environment that failed to provision. In addition, review the [Troubleshooting](#) section that follows. If issues continue, open an [ITZ support ticket](#) by using the methods that are mentioned in the [Support](#) section.

## Extend the reservation

When the reservations are in the **Ready** state, you can extend each reservation beyond its original end date. The duration of the extension will vary by reservation.

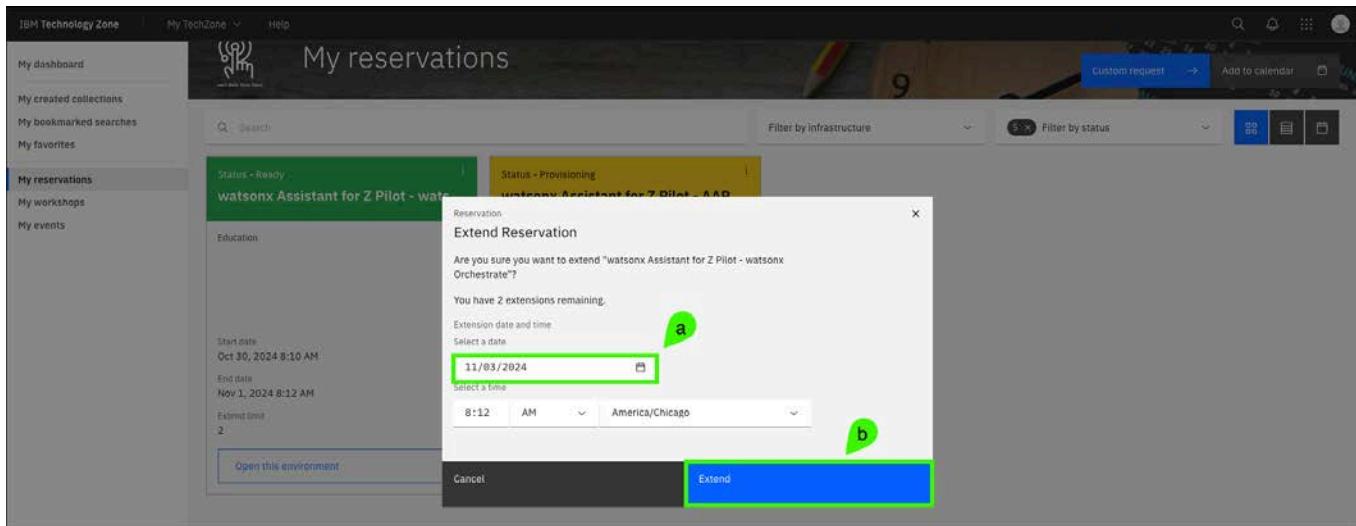
1. In the IBM Technology Zone portal, expand **My TechZone** and select **My Reservations**.

The screenshot shows the IBM Technology Zone portal interface. The top navigation bar includes 'IBM Technology Zone', 'My TechZone' (with a dropdown arrow), 'Help', and a search bar. The main content area features a welcome message for Andrew and a graphic of interconnected nodes. Below this, there's a section titled 'Certified Base Images' with a sub-section 'Best starting point to build'. On the left, a sidebar lists 'My dashboard', 'My created collections', 'My bookmarked searches', 'My favorites', **My reservations** (which is selected and highlighted in green), 'My workshops', and 'My events'. The main content area displays two reservation tiles. The first tile, for 'watsonx Assistant', has a status of 'Status - Ready' and an 'Extend' option highlighted with a green dashed box and a cursor. The second tile, for 'watsonx Assistant for Z Pilot - AAP ...', has a status of 'Status - Provisioning'. Both tiles show start and end dates, extend limits, and 'Open this environment' buttons.

2. Click the **overflow icon (≡)** on the reservation tile and select **Extend**.

This screenshot shows the 'My reservations' page within the IBM Technology Zone portal. The left sidebar is identical to the previous screenshot, with 'My reservations' selected. The main area displays two reservation cards. The first card, for 'watsonx Assistant', has a context menu open over it. The 'Extend' option in this menu is also highlighted with a green dashed box and a cursor. The second card, for 'watsonx Assistant for Z Pilot - AAP ...', is visible but lacks a context menu. The top of the page includes a search bar, filter buttons for infrastructure and status, and various navigation icons.

3. Click the **Select a date** option, (a) specify the date to extend to, and then (b) click **Extend**.



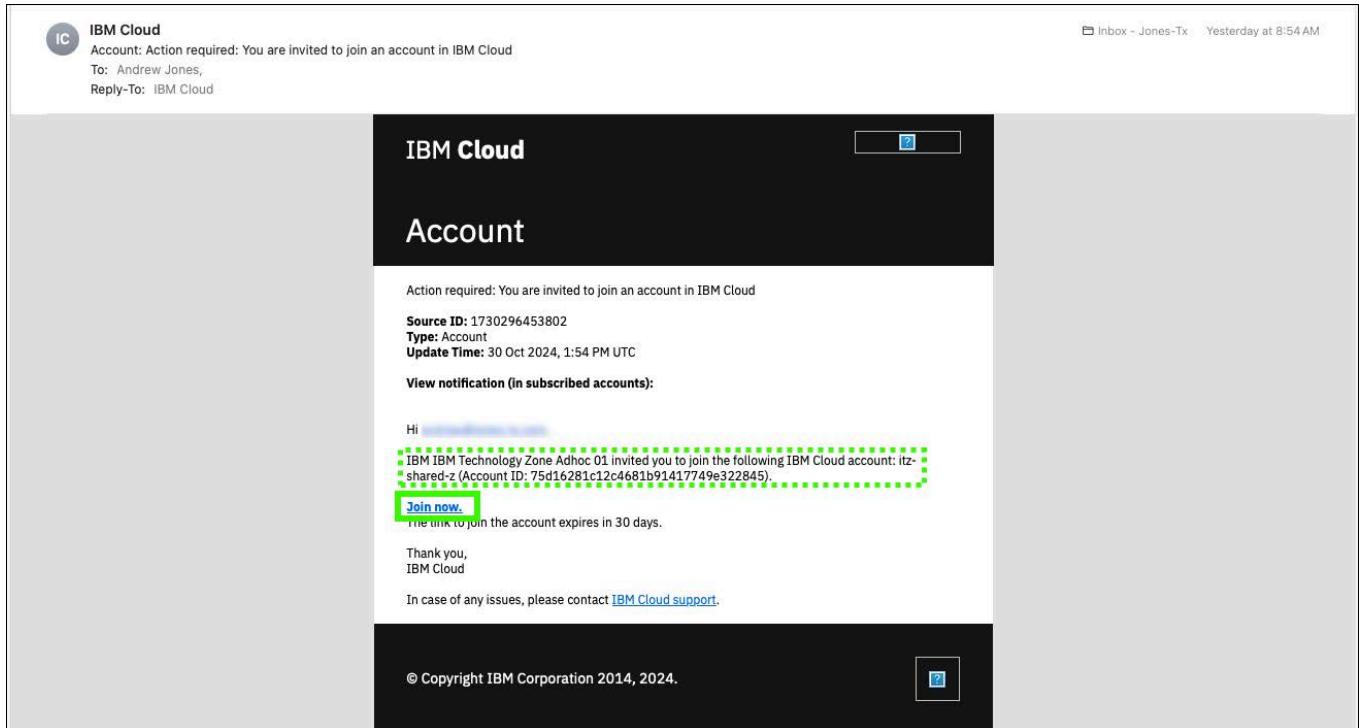
If you anticipate needing more time, repeat Steps 5-6 to extend the reservation to the maximum allowed. Repeat these steps for the other two reservations.

## Join the ITZ IBM Cloud account

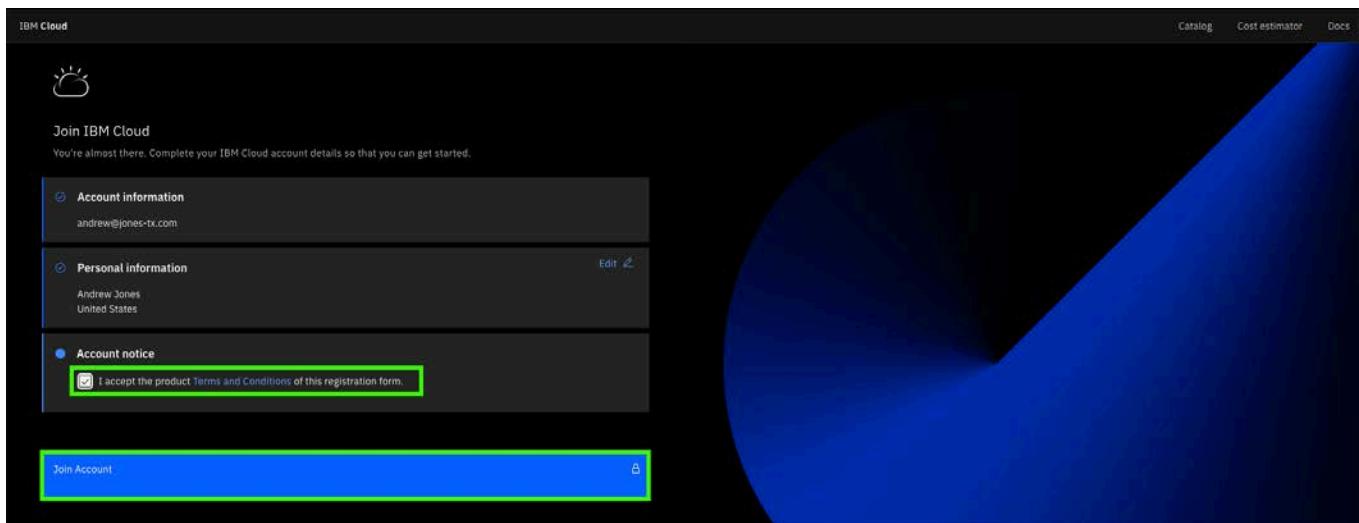
Both the **watsonx Assistant for Z lab – watsonx Orchestrate** and the **Ansible Automation Platform (AAP) & z/OS** environments add you to an IBM Cloud account while your reservation is active. During the provisioning process of these ITZ environments, you receive two emails from IBM Cloud.

You only need to accept the invitation to the **watsonx Assistant for Z lab – watsonx Orchestrate** environment.

1. Open the email from **IBM Cloud** and click the **Join now** links.



2. In the **Join IBM Cloud** browser window that opens, select the **I accept the product Terms and Conditions** of the registration form, and then click **Join Account**.

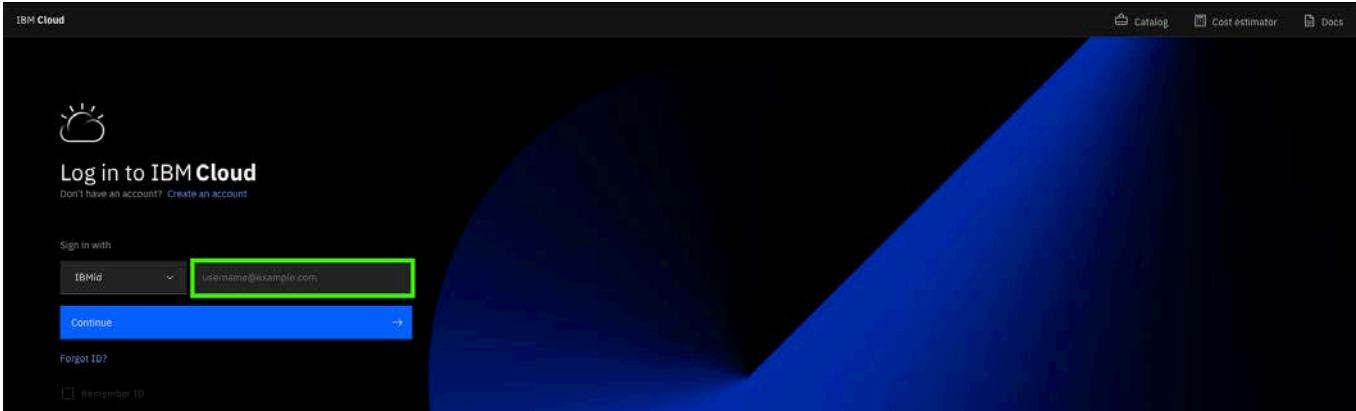


After joining the account, verify that the account appears in your available account list in the IBM Cloud portal.

- Click the following link to open a browser to the IBM Cloud portal.

### IBM Cloud portal

- Follow the directions to complete the authentication to IBM Cloud using the same email address you used to login to ITZ. The login steps vary depending on any two-factor authentication methods enabled.



- Click the **account** menu and verify access to the IBM Cloud account listed in your ITZ reservation.

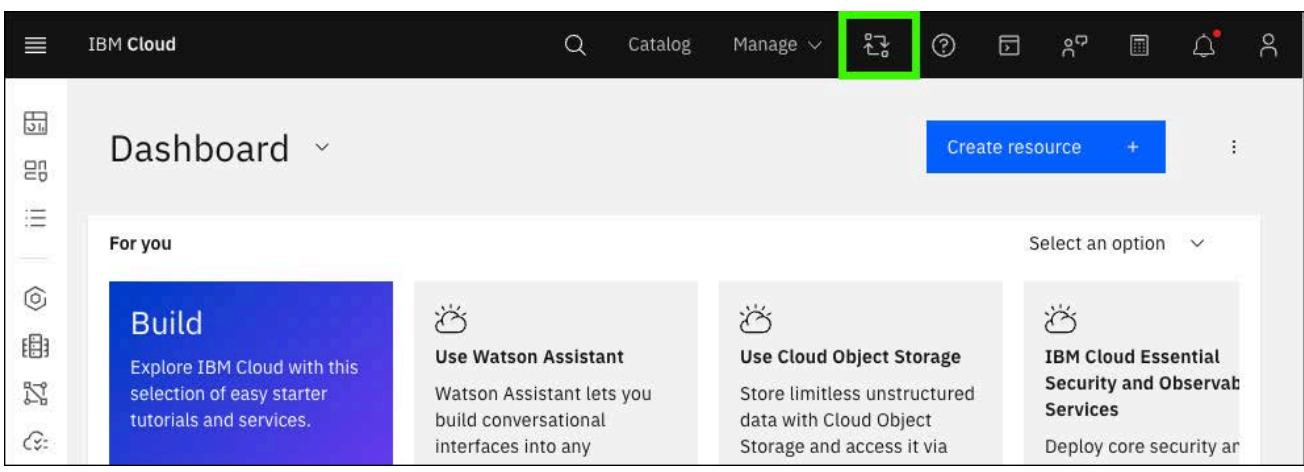


**The account may be different.**

The account name should align with the account named in the invitation email you received.

 Does your IBM Cloud portal view look different?

If your IBM Cloud portal looks different from the images above, it could be because the IBM Cloud portal has gone through a design change, or your browser window is set to smaller size. Instead of the current selected account appearing in the top menu, you may see this **change account** icon:  Click this icon to view the list of accounts you can access.



## Accessing the environments

Each reservation provides access to its respective environment. Details for accessing each environment are provided in the **Pilot setup** sections that follow in the lab guide.

After all three reservations are in the **Ready** state and you accept the invitations to the IBM Cloud accounts, proceed to the next section to complete the pilot setup.

## Troubleshooting

 If your reservation for the Single Node OpenShift environment fails...

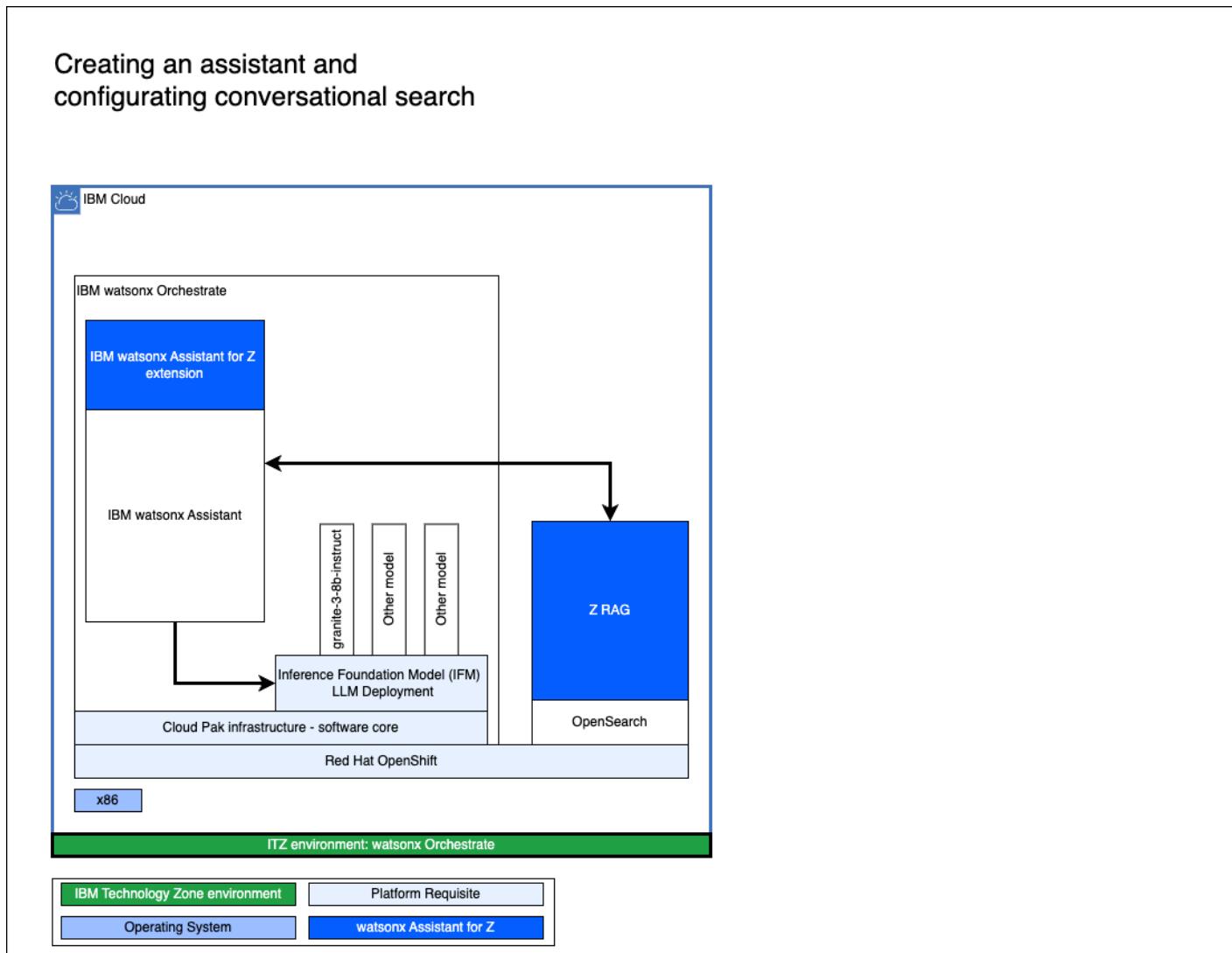
If your reservation for the Single Node OpenShift environment fails, try selecting one of the **eu-gb region** options as the **Preferred Geography**.

# Creating an assistant and configuring conversational search

Watsonx Orchestrate allows you to create and configure an assistant with conversational search capabilities.

Configure your assistant to use conversational search by using a hosted [OpenSearch](#) instance. The pre-configured instance of Watsonx Orchestrate in IBM Technology Zone (ITZ) boasts over 220 knowledge sources and supports Retrieval Augmented Generation (RAG). The large language model (LLM) providing conversational AI augments this knowledge based on IBM Z documentation, generating IBM Z context-aware responses to queries with content-grounded knowledge.

A high-level, logical architecture of the environment is illustrated in the following diagram.



Access the [ITZ IBM Cloud account](#) for the Watsonx Assistant for Z Pilot environment

1. In the IBM Technology Zone portal, expand **My TechZone** and select **My Reservations**, or click the following link.

[ITZ My reservations](#)

Welcome to Technology Zone, Andrew

Certified Base Images

Best starting point to build

These images are 'TechZone Certified' and represent the best starting point for building new content, showing clients how easy it is to deploy IBM Technology from scratch, or testing custom configurations.

## 2. Click the **watsonx Assistant for Z Pilot - watsonx Orchestrate** tile.

Status	Reservation Name	Description
Ready	watsonx Assistant for Z Pilot - AAP & z/OS	Education
Ready	watsonx Assistant for Z Pilot - watsonx O...	Education
Ready	Single Node OpenShift (VMware on IBM C...	Education

## 3. Record the ITZ IBM Cloud account name associated with the reservation.

Did you read the tip on the welcome page about creating a reference card? Check it out [here](#).

**Purpose**

- Purpose
- Education
- Opportunity Product(s)
- Customer(s)

**Environment**

Reservation ID: 672a09a1a8f85062ff91e081

Type: IBM Cloud

Request method: watsonx-orchestrate

Cloud Account: ITZ-WATSONX-036

Region: us-south

Customer data: false

Data runtime limit: 10800

Transaction ID: 115897c9-58a1-4f17-af9c-b16dc2a97590

Gen: americas

Datacenter: data0

Environment: watsonx-orchestrate-wus01

Timeout action:

**Reservation Details**

IBM Cloud Login: <https://cloud.ibm.com/resources>

## 4. Click the **IBM Cloud Login** link.

**Purpose**

- Purpose
- Education
- Opportunity Product(s)
- Opportunity description.
- Customer(s).

**Environment**

Reservation ID	Type
672ad091abf85062ff071e081	IBM Cloud
Request method	Transaction ID
watsonx-orchestrate	115897c9-58a1-4f17-a9c-b18dc2a97590
Cloud	Geo
ITZ-WATSONX-036	americas
Region	Datacenter
us-south	dal10
Customer data	Environment
false	watsonx-orchestrate-wusd1
Idle runtime limit	Timeout action
10800	

**Reservation Details**

IBM Cloud Login  
<https://cloud.ibm.com/resources>

### Steps to authenticate to IBM Cloud are not illustrated here.

You may need to authenticate to IBM Cloud after clicking the link. These steps are not shown here as they may vary by individual.

- Verify that the current IBM Cloud account is the same as the account name recorded in step 3. If the account is not the same, switch to the proper account.

**Note:** The formatting of the name can appear differently than what is shown in the ITZ reservation.

**Resource list**

Name	Group	Location	Product	Status	Tags
Filter by name or IP address...	Filter by group or org...	Filter...	Filter...	Filter...	Filter...
Compute (0)					
Containers (0)					
Networking (0)					
Storage (0)					
Converged infrastructure (0)					
Enterprise applications (0)					
AI / Machine Learning (1+)					
Analytics (0)					

If the proper account is not listed, click the account drop down and select the proper account.

**Note:** If your browser window is narrow, the account drop down can be depicted with the Switch Account icon ().

## Create your Assistant

1. Click the **Resources** icon (☰).

2. Expand the **AI / Machine Learning** section and click the **watsonx Orchestrate** instance listed (the instance name is different than shown in the following image).

3. Click **Launch watsonx Orchestrate**.

Resource list / itzwxo-2700039nft-erspw Active Add tags

**Manage**

Service credentials

Start by launching the tool

Launch Watsonx Orchestrate Getting started tutorial

Credentials

API key: [Download](#) [Show credentials](#)

URL: <https://api.us-south.assistant-builder.watson.cloud.ibm.com/instances/a7675d8e-e885-4891-93f3-1a2a2a2a2a2a>

**Plan**

Essentials Plan

4. Click the **AI assistant builder** tile to start creating a new assistant.

Welcome, Andrew Jones!

Take productivity to the next level.

Try Skills in Chat →

**Build**

Start building the skills, conversations, and automations your team needs here.

**AI assistant builder**

Boost productivity and customer care by creating conversational experiences.

**Skill studio**

Build the skills your team needs to get their work done more quickly.

**Upgrade**

Standard plan | Skill studio

Automate how your business works

Learn more →

5. Enter a name and optional description for your assistant and click **Next**.

Welcome to AI assistant builder

Create Personalize Customize Preview

**Create your first assistant**

Let's get your assistant up and running. Name your assistant, add a description, and choose a language. In following steps we'll gather more information, show you basic customizations, and give you a preview of what your assistant will look like.

Assistant name: **Zeeves**

Your assistant name will be kept internally and not visible to your customers.

Description (optional): **Zeeves, the Jeeves for everything IBM Z.**

40/128

Assistant language: **English (US)**

This is the language your assistant will speak.

**Next**

6. Complete the **Personalize your assistant** form and click **Next**.

Explore the personalization options. In creating an assistant for a client pilot, consider specifying attributes that align with the client's business.

- Select **Web**.
- Select the industry of your choice.
- Select the role of your choice.
- Select the need of your choice.

Welcome to AI assistant builder

**Personalize your assistant**

**Tell us where your assistant will live**  
You may add multiple channels from your dashboard.  
Where do you plan on deploying your assistant?  
Web (a)

**Tell us about yourself**  
This information will be used to personalize your onboarding experience.  
Which industry do you work in?  
Software (b)  
What is your role on the team building the assistant?  
Developer (c)  
Which statement describes your needs best?  
I want to automate common tasks in a natural way (d)

This is what your customers will experience

watsonx Assistant

Do you have the Speed Demons in stock?

The Speed Demons are in stock at our Downtown and Northgate locations, which are both within 5 miles of you.

What size and color do you need?

I'm looking for a size 9 in white

Great news! The Speed Demons are available in white in a size 9.

You can purchase them for curbside pickup or we can ship them to you. Which would you prefer?

I'll pick them up! Ship them to me!

Type something... ➤

## 7. Complete the **Customize your chat UI** form and click **Next**.

Explore the customization options. When creating an assistant for a client pilot, consider specifying attributes that align with the client (for example, colors and logos).

Welcome to AI assistant builder

**Customize your chat UI**

Assistant's name as known by customers  
Zeeves (highlighted with a green dashed box)

Intended purpose  
 Standard: For virtual agents and customer support experiences.  
 Carbon for AI: For use in internal IBM products.

Choose a theme  
Light (highlighted with a green dashed box) Dark

Primary color #FFFFFF Secondary color #303030

Chat header User message bubble

Accent color #0070C0

Size  
The size of the web chat on this page will not change by updating these fields.

Width 100px Height 100px

IBM Watermark Create IBM Watermark  
 On

Streaming Enable Streaming  
 Off

Zeeves

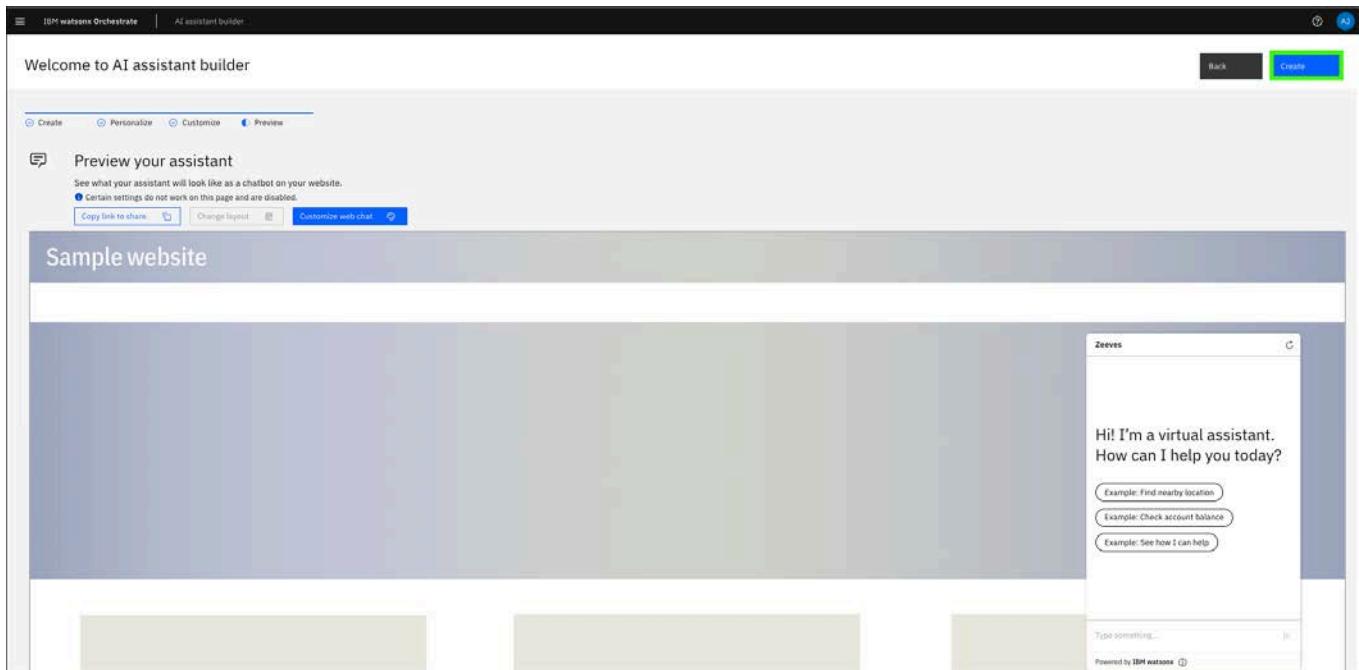
Hi! I'm a virtual assistant.  
How can I help you today?

Example: Find nearby location  
Example: Check account balance  
Example: See how I can help

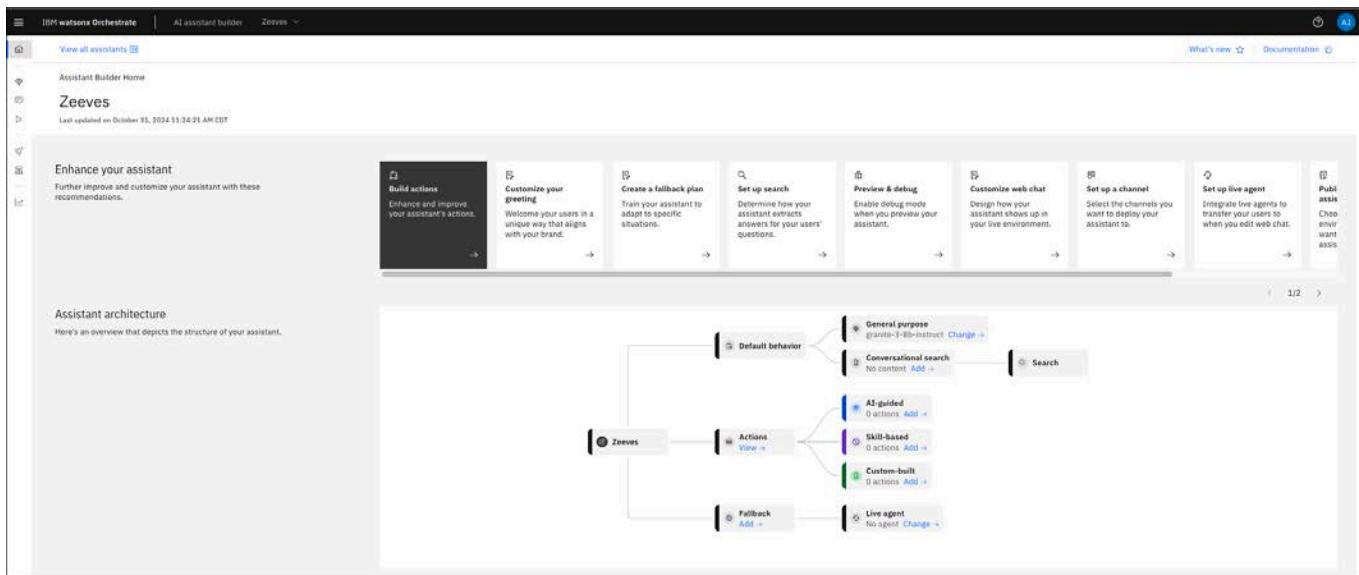
Type something... ➤

Powered by IBM Watson

## 8. Preview your assistant and then click **Create**.



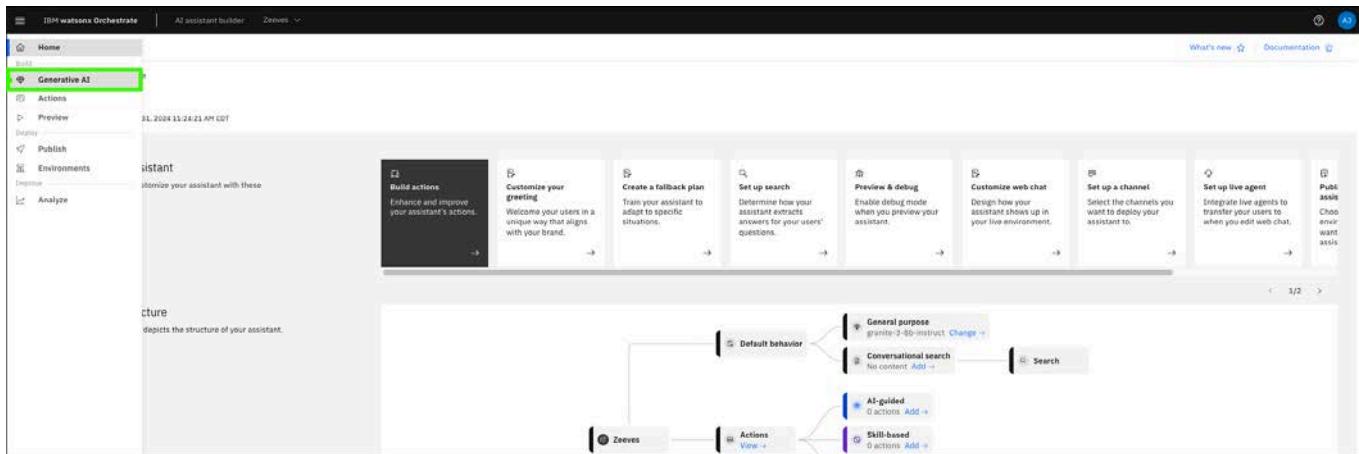
The assistant is now created.



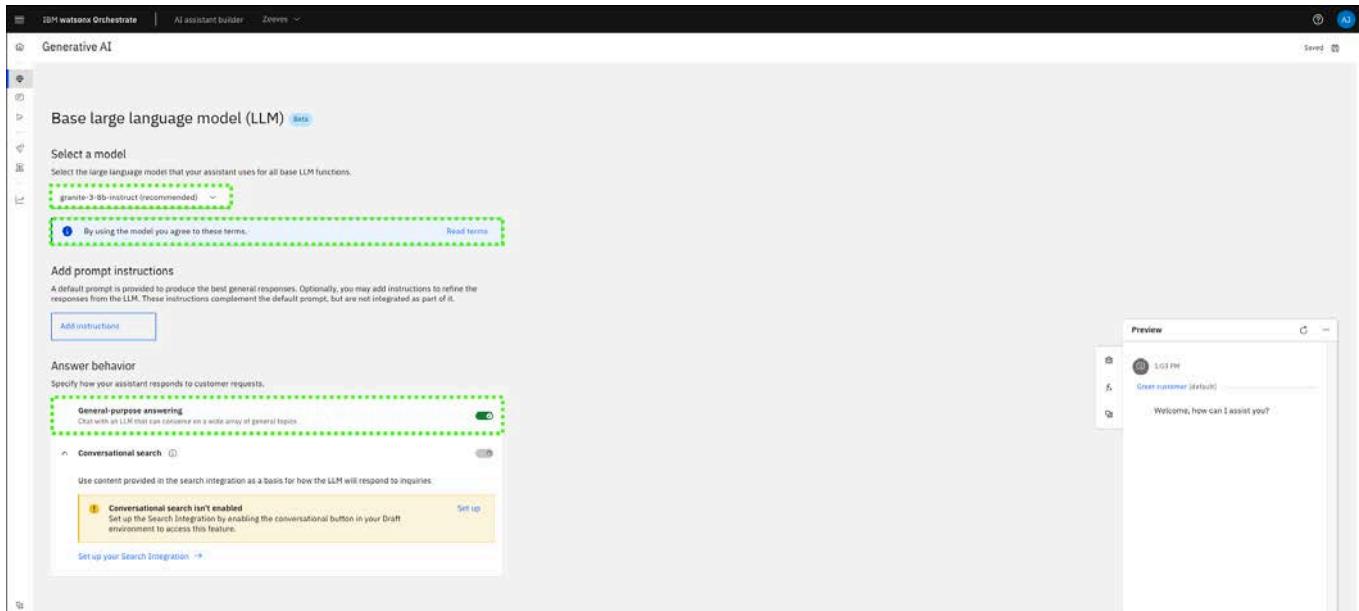
## Configure conversational search

In the next steps you will be to configure **conversational search** for your assistant that uses a hosted instance of OpenSearch.

1. Click **Generative AI** menu item (💡) in the left navigation.

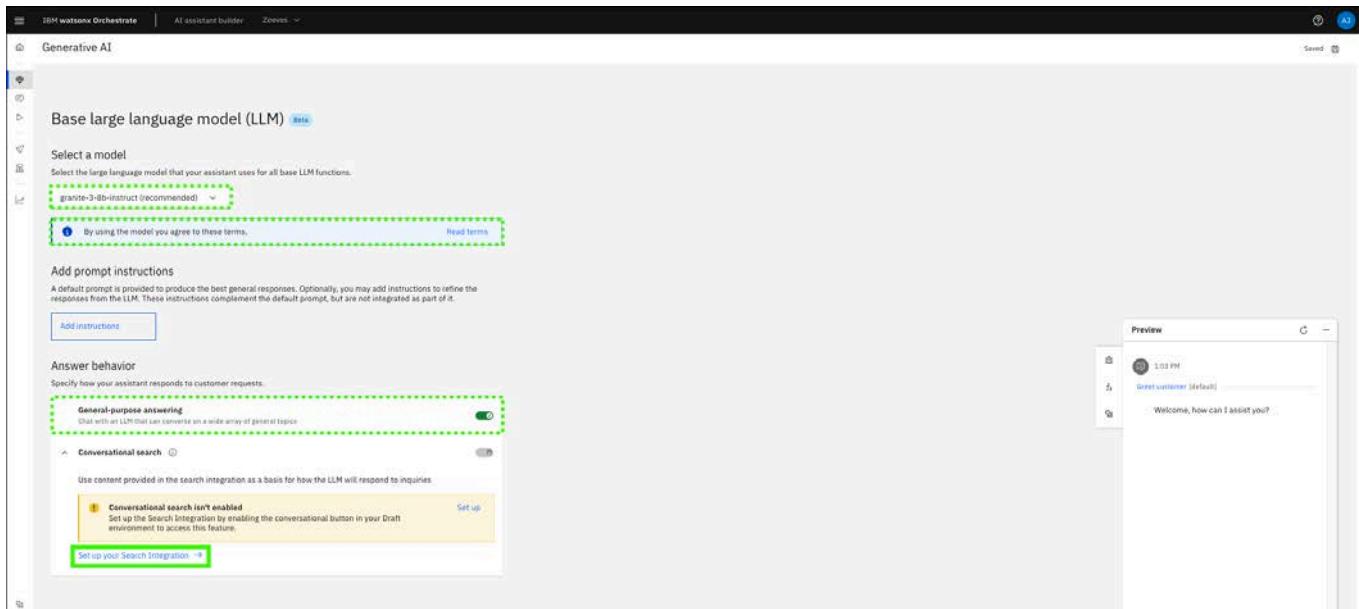


## 2. Select **granite-3-8b-instruct** for the base large language model (LLM) settings.

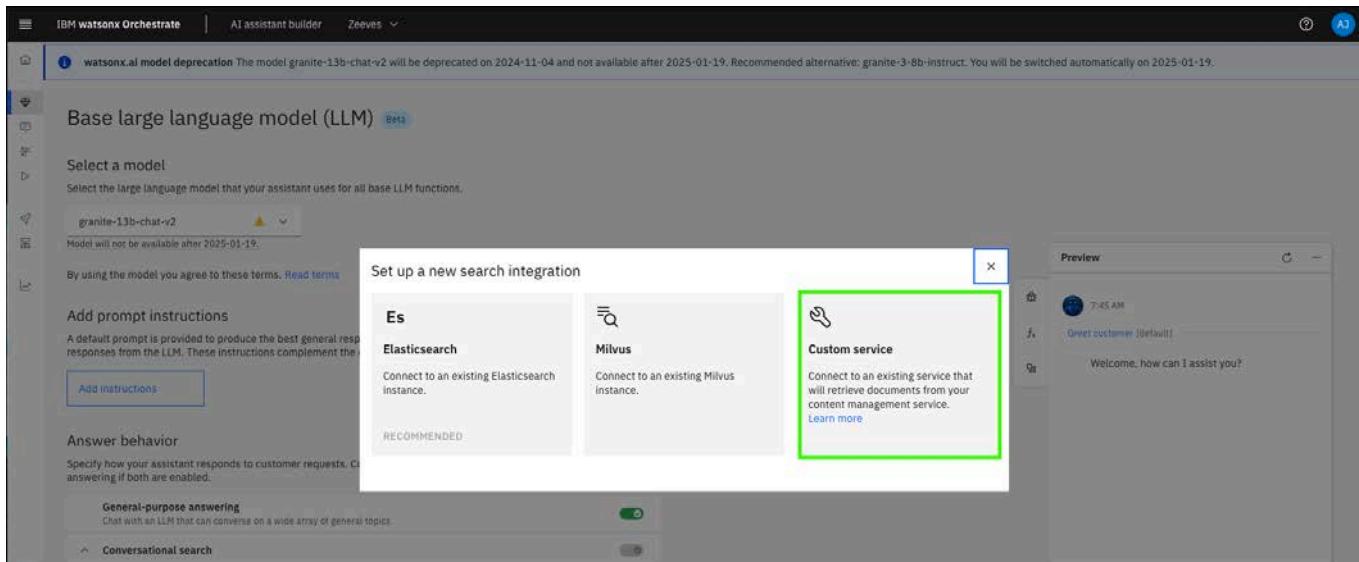


## 3. Click **Set up your Search Integration**.

By default, conversational search is not enabled when an assistant is created. Conversational search takes priority over general-purpose answering if both are enabled. Learn more about conversational search in Watsonx [here](#).



#### 4. Click Custom service.



#### 5. Complete the **Custom service (a-e)** form and then click **Next (f)**.

a. Select **By providing credentials**.

b. Enter the following value in the **URL** field (use the copy icon to avoid typographical errors). This is the **URL** for the shared **OpenSearch** instance. In later sections, you create and customize a dedicated instance.

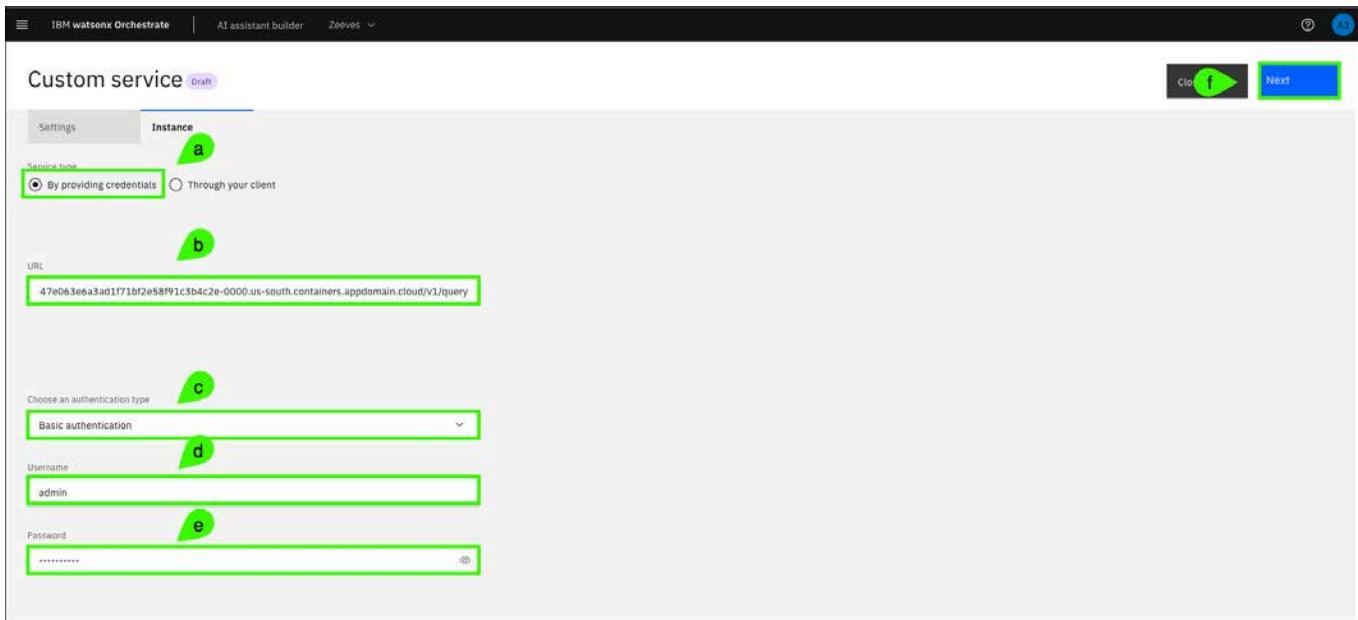
```
https://wxa4z-opensearch-wrapper-wxa4z-demo-v2-1-0.wxo4z-opc-opensearch-clus-47e063e6a3ad1f71bf2e58f91c3b4c2e-0000.us-south.containers.appdomain.cloud/v1/query
```

c. Select **Basic authentication** in the **Choose an authentication type** drop-down list.

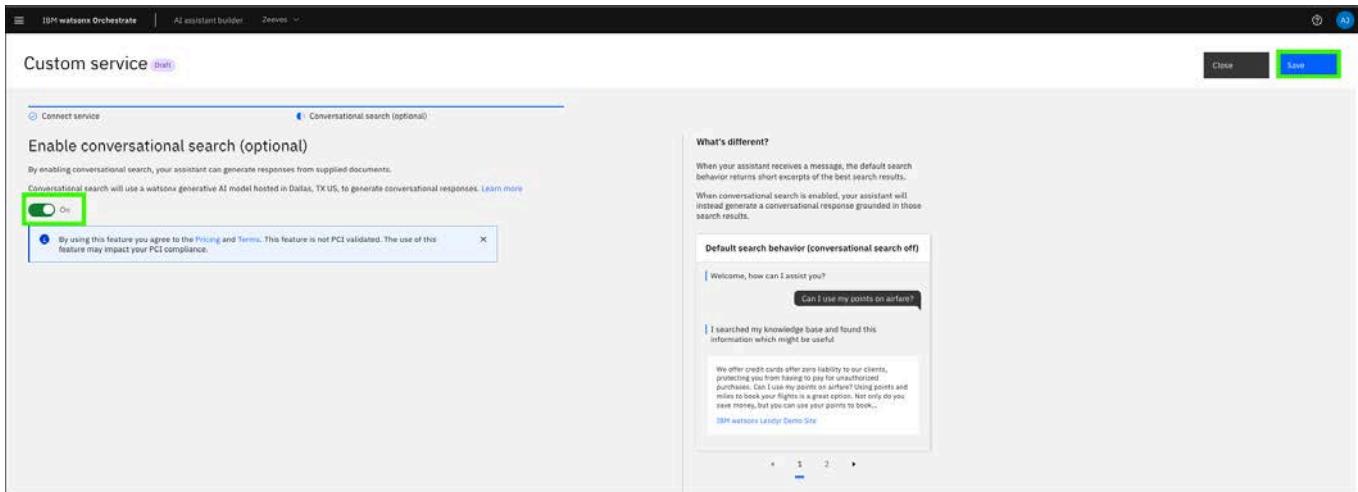
d. Enter **admin** in the **Username** field.

e. Enter **secureP@ssw0rd!** in the **Password** field.

```
secureP@ssw0rd!
```



## 6. Enable conversational search and then click Save.



## 7. Update the conversational search **custom service** settings based on your requirements.

**Note:** The **Settings** page is divided into two sections in the following images to enhance the visibility of the screen captures.

Learn more about these **custom service** settings [here](#).

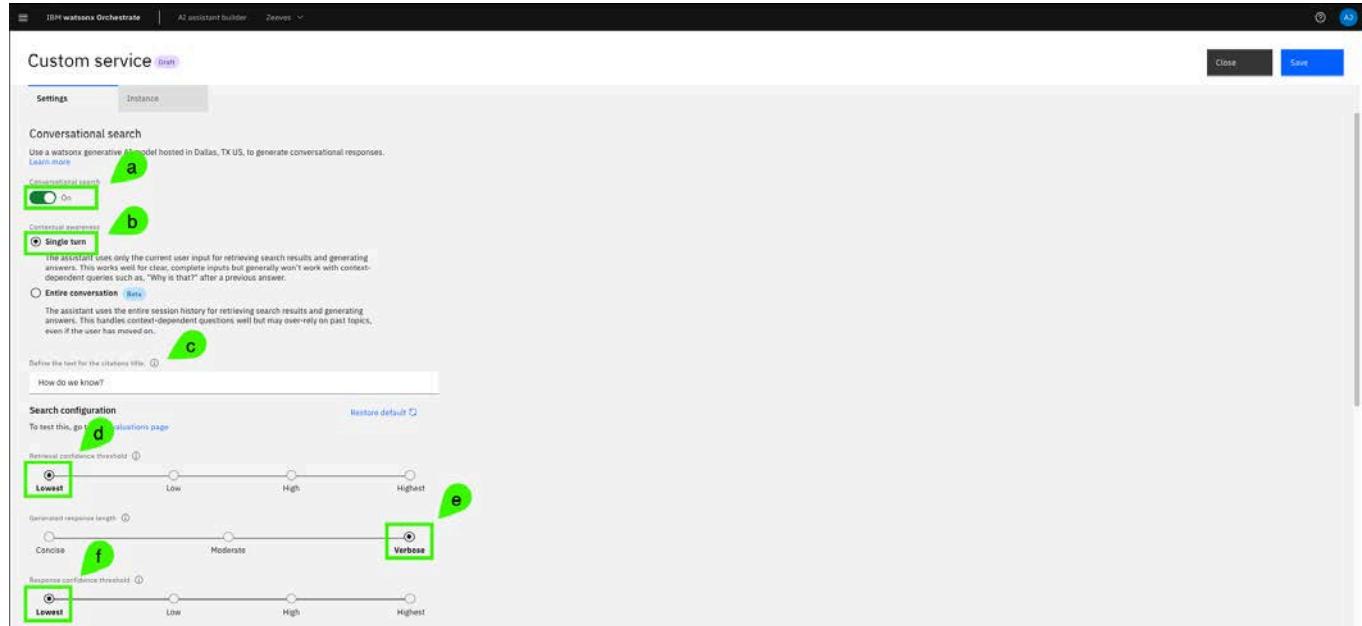
The following settings are proven to work well. You can experiment with these settings to see how they affect queries for your client's pilot.

- a. Enable **Conversational search**.
- b. Select **Single turn. Multi-turn conversation** (by selecting **Entire conversation**) is supported by the offering, but has not been fully included in the lab guide. See the callout in the [Testing conversational search](#) section below.
- c. Specify the text that appears to instruct the user to expand the list of citations in the assistant (except web chat client).
- d. Select **Lowest** for the **retrieval confidence threshold** setting. This setting checks the confidence of the retrieved citations before a response is generated.

e. Select **Verbose** for the **generated response length**. This setting affects the average response length.

Depending on user input, variations from the selected length can occur.

f. Select **Lowest** for the **response confidence threshold**. This setting checks the confidence of the generated citations after the response is generated.

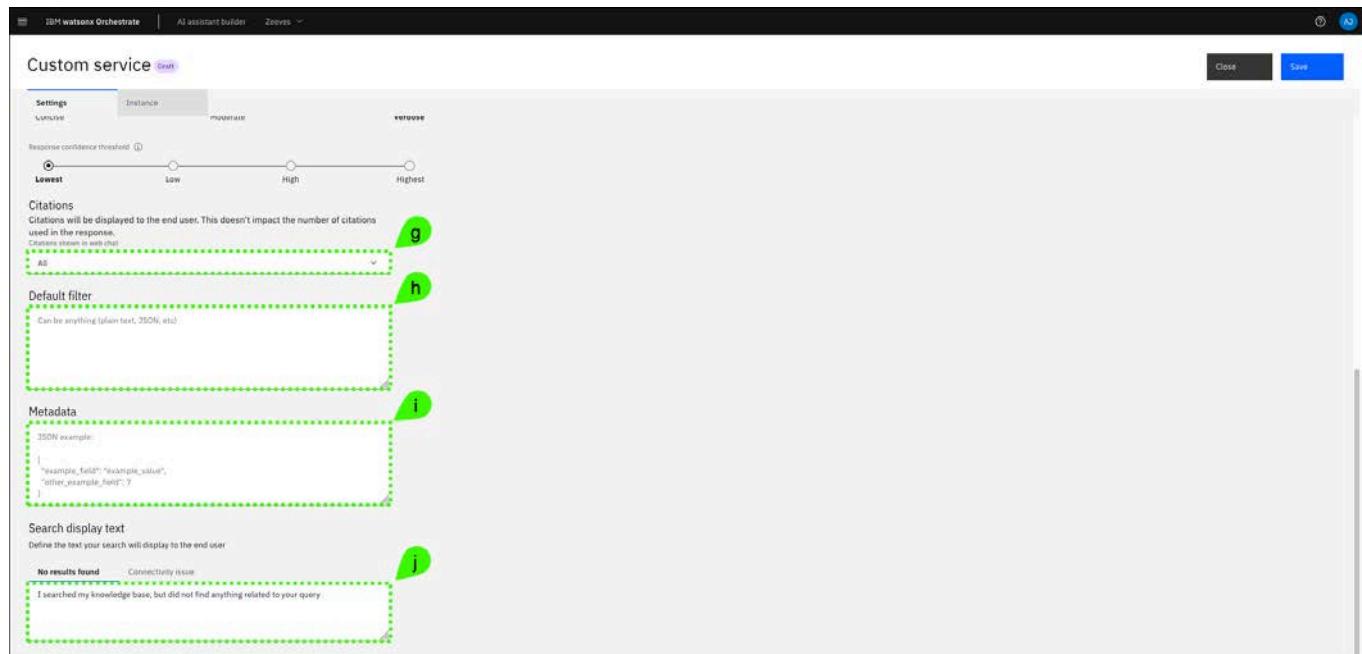


g. Keep the default setting of **All** for the listing of citations.

h. Keep the **Default filter** field empty.

i. The **Metadata** field provides a way to adjust your assistant's behavior during conversational search for your OpenSearch instance. This option is explored in detail in the [Installing and using zassist to ingest client documents](#). Leave the field empty for now.

j. The **Search display text** options specify the default text displayed when no results are found or when connectivity issues to the backend search service occur. You can keep the defaults or customize the service.



8. Click **Save** (a) and then click **Close** (b).

The screenshot shows the 'Custom service' configuration page. At the top right, there are two buttons: 'Close' and 'Save'. The 'Save' button is highlighted with a green circle labeled 'a', and the 'Close' button is highlighted with a green circle labeled 'b'.

**Custom service** (draft)

**Settings** **Instance**

**Conversational search**

Use a watsonx generative AI model hosted in Dallas, TX US, to generate conversational responses. [Learn more](#)

Conversational search  On

Contextual awareness

Single turn  
The assistant uses only the current user input for retrieving search results and generating answers. This works well for clear, concrete inputs but generally won't work with context-dependent queries such as, "Why is that?" after a previous answer.

Entire conversation Beta  
The assistant uses the entire session history for retrieving search results and generating answers. This handles context-dependent questions well but may over-rely on past topics, even if the user has moved on.

Define the text for the citations title (optional)

How do we know?

**Search configuration** Restore default

To test this, go to the [evaluations page](#)

## Complete the configuration

After you save and close the **Conversational search** configuration page, a few more configurations are needed to get the best experience from your conversational chat. Details on these settings are available [here](#).

1. Hover over the **Generative AI** icon ( ) in the left navigation and click **Actions**.

The screenshot shows the 'Actions' configuration page under the 'Generative AI' section. The 'Actions' menu item in the left sidebar is highlighted with a green box. The main area displays a language model (LLM) configuration with a 'Preview' window showing a sample interaction.

**Actions**

**Language model (LLM)** Beta

model that your assistant uses for all base LLM functions.

recommended

del you agree to these terms. [Read terms](#)

ictions

to produce the best general responses. Optionally, you may add instructions to refine the These instructions complement the default prompt, but are not integrated as part of it.

**Preview**

2:08 PM  
Great customer! (default)  
Welcome, how can I assist you?

2. Click **Set by assistant** under the **All items** menu.

The screenshot shows the 'Actions' configuration page with the 'All items' menu expanded. The 'Set by assistant' option is highlighted with a green box. The main area displays a 'Create your first action' section with a 'Create action' button.

**All items**

- Created by you
- Set by assistant**
- Variables
- Created by you
- Set by assistant
- Set by integration
- Saved responses

Create your first action

With actions, you can help your customers accomplish their goals.

**Create action** +

### 3. Click No matches.

Name	Last edited	Examples Count	Status
Greet customer	3 hours ago	0	Green
Trigger word detected	3 hours ago	0	Green
No matches	3 hours ago	0	Green
Fallback	3 hours ago	0	Green

### 4. Click Step 1 under Conversation steps.

**Action starts**  
When no action can be matched to the customer's message.  
Use the assistant's default retry message or customize your own.

**Additional training examples (optional)**  
Tip: Adding examples here is most useful for things you're certain that you don't want your assistant trying to answer. [Learn more](#)

**Enter phrases**  
Example: Can I have a sandwich? Total: 0

### 5. Select without conditions (a) in the Is taken drop-down menu and then click Clear conditions (b).

**Note:** the Is taken value does not change from with conditions after selecting without conditions.

**Step 1**

**Is taken:** with conditions

**Conditions:** If \_\_\_\_\_ of this is true:

**New condition group:** Clear conditions?

Are you sure you want this step taken without conditions? All conditions and condition groups will be deleted.

**Assistant says:**

I'm afraid I don't understand. Please rephrase your question.

**Buttons:** Cancel, Clear conditions

### 6. Delete the default text in the Assistant says entry field.

**Step 1**

**Is taken:** without conditions

**Assistant says:**

(For example: Please select from the following options:)

**Buttons:** Define customer response

**And then:**

End the action

### 7. Expand the And then drop-down menu and select Search for the answer.

The screenshot shows the AI assistant builder interface with the following configuration for Step 1:

- Customer starts with:** Example: Can I have a refund?
- Conversation steps:**
  - Step 1: This step has no content. Action complete.
  - Step 2: This step has no content. Go to subaction: Fallback.
- Step 1:**
  - Is taken: without conditions
  - Assistant says: For example: Please select from the following options.
  - And then: End the action (highlighted with a green box)

## 8. Click Edit settings.

The screenshot shows the AI assistant builder interface with the following configuration for Step 1:

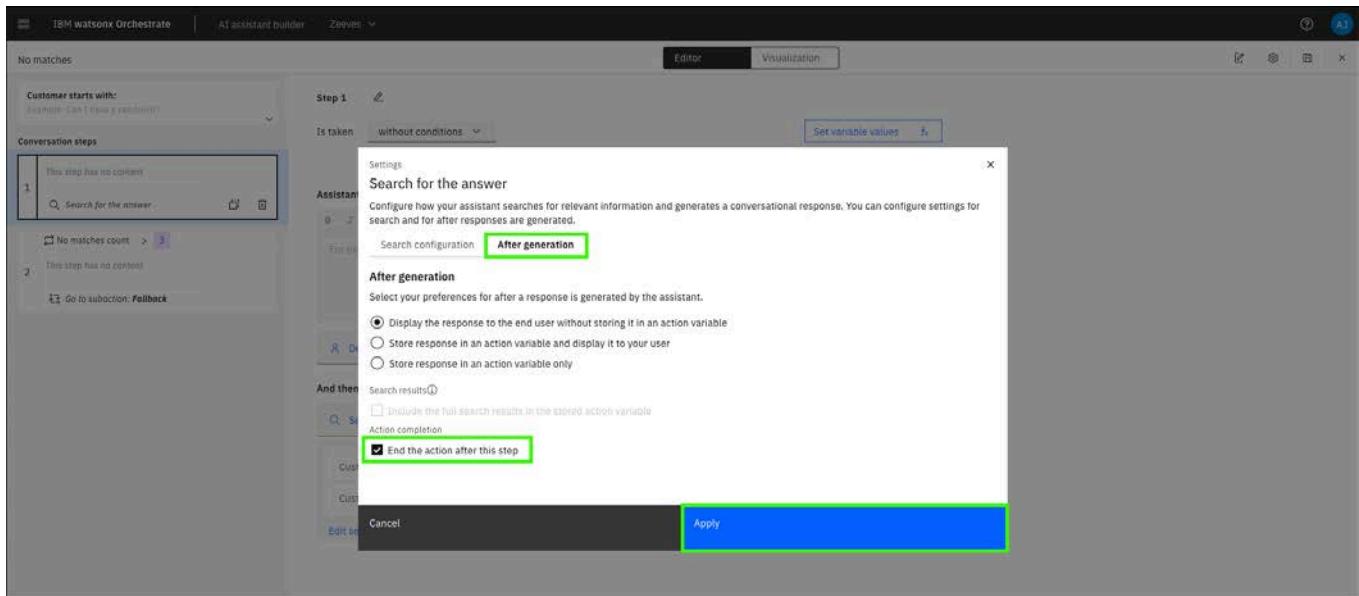
- Customer starts with:** Example: Can I have a refund?
- Conversation steps:**
  - Step 1: This step has no content. Search for the answer.
  - Step 2: This step has no content. Go to subaction: Fallback.
- Step 1:**
  - Is taken: without conditions
  - Assistant says: For example: Please select from the following options.
  - And then: Search for the answer (highlighted with a green box)
- Search for the answer settings:**
  - Custom query: None (Customer's message will be the query)
  - Custom filter: None (Optional)
  - Edit settings (highlighted with a green box)

## 9. Click After generation.

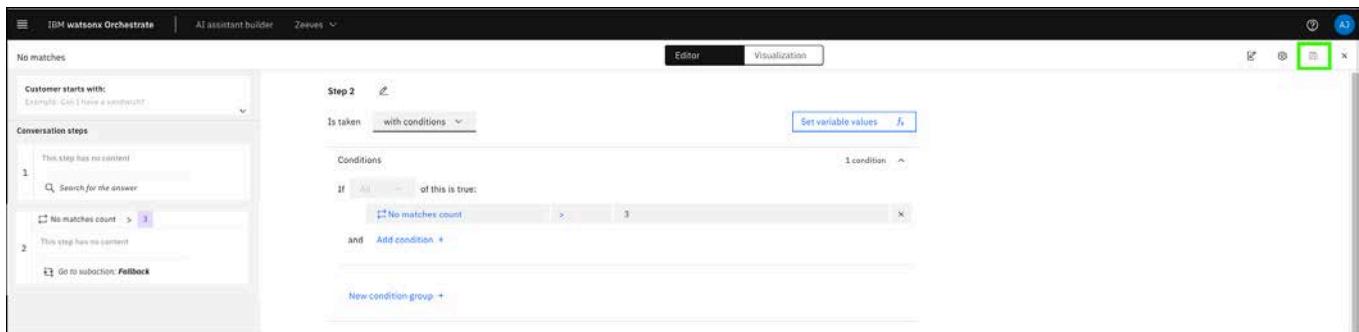
The screenshot shows the AI assistant builder interface with the following configuration for Step 1:

- Customer starts with:** Example: Can I have a refund?
- Conversation steps:**
  - Step 1: This step has no content. Search for the answer.
  - Step 2: This step has no content. Go to subaction: Fallback.
- Step 1:**
  - Is taken: without conditions
  - Assistant says: For example: Please select from the following options.
  - And then: Search for the answer
- Search configuration dialog (After generation tab):**
  - Search configuration:** Set how you want your search to perform before a response is generated.
    - Custom search query (optional): Example: Which accounts have fees?
    - Custom results filter:
      - Use default (radio button selected)
      - Set new filter: Example: enriched\_textentities.txt, "Boston, MA"

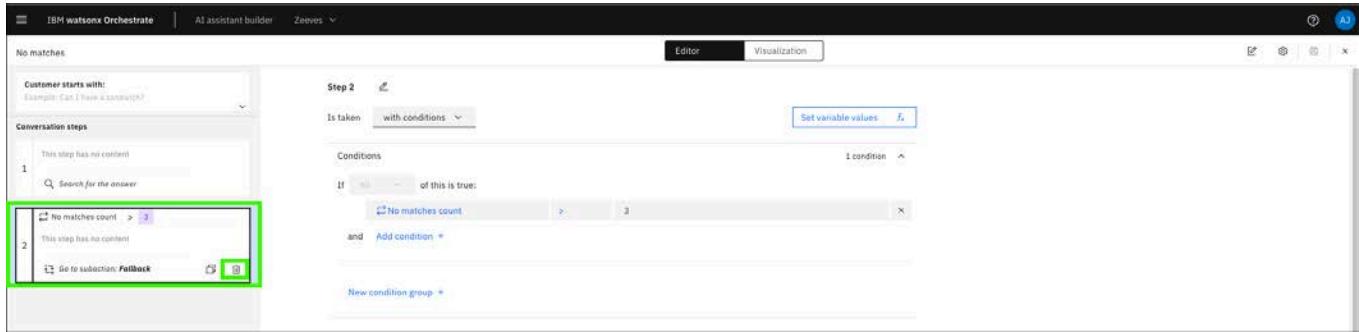
## 10. Select End the action after this step and then click Apply.



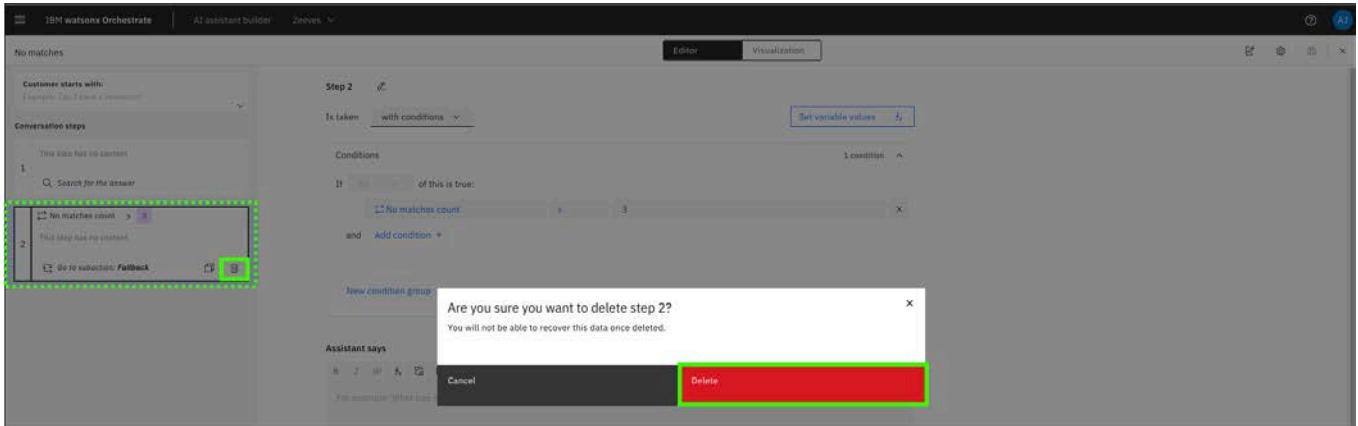
11. Click Save (💾).



12. Select Step 2 (No matches count) under Conversation steps and click delete (🗑).



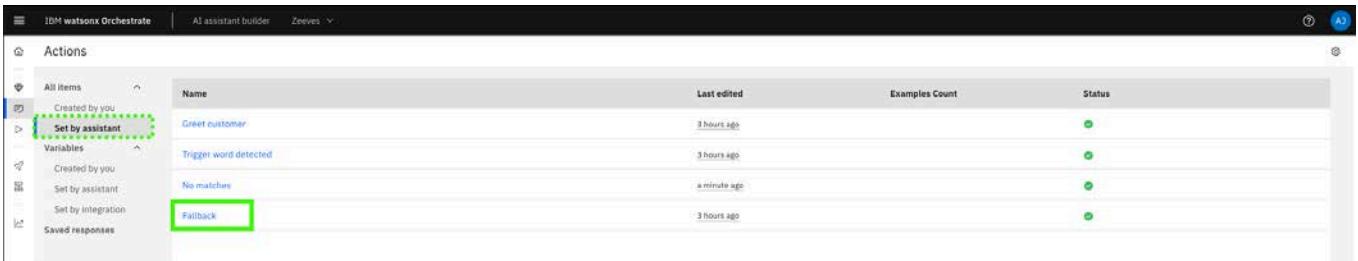
13. Click Delete in the confirmation dialog to delete Conversation step 2.



14. Click **Close** (the x icon) the **Editor** window.



15. Click **Fallback** in the **Actions** table.



16. Delete all of the **Conversation steps**.

**Note:** The following image is edited. Only five steps are shown, but all six need to be deleted. You need to select each step individually. Click **delete** (trash bin icon) and confirm the deletion.

17. Verify that all **Conversation steps** are deleted and then click the **x** to close the **Editor** window.

18. Click the **Global settings** (⚙️).

Name	Last edited	Examples Count	Status
Greet customer	4 days ago		Green
Trigger word detected	4 days ago		Green
No matches	4 days ago		Green
Fallback	4 days ago		Green

19. Click **No matches** under the **Conversation routing** tab.

**Global settings**

Conversation routing Change conversation topic Generative AI New Autocorrection Display formats Algorithm Version Upload/Download

**Ask clarifying questions**

Customize modes Beta

No matches  **Beta**

Search routing

Your assistant can show options to users when multiple actions seem to match what the customer wants. Learn more about asking a clarifying question.

Enable disambiguation  On

**Assistant says**

Introduction text before listing the options.

Did you mean:

No matches Option for when the user doesn't see relevant options. Leave blank to omit.

None of the above

**Response modes**

Off

One action matches Action for when user didn't want to start the matched action.

Something else

**Connection to support**

Can be any affiliation type, such as a live agent or contact information.

Connect to support

**Example of asking a clarifying question**

**Important** Make sure your action names are short and clear to your customers. Action names will appear in the list of choices.

**Bank Bot**

Did you mean:

open an account

Open a new savings account  
Open a new checking account  
I want to apply for a mortgage loan  
None of the above

## 20. Move the slider to **More often** (or select **More often** in the drop-down).

The setting helps ensure that actions are triggered less often unless the user's query specifically matches the action's input.

**Global settings**

Conversation routing Change conversation topic Generative AI New Autocorrection Display formats Algorithm Version Upload/Download

**Ask clarifying questions**

Customize modes Beta

No matches  **Beta**

Search routing

Unrecognized input by customers triggers the **No matches** action that can be configured to fetch answers from a search integration or trigger the **Fallback** action.

By setting this threshold, you can affect how often your assistant routes customers to the "No matches" action.

Use "No matches"

More often

## 21. Click **Autocorrection**.

**Global settings**

Conversation routing Change conversation topic Generative AI New Autocorrection Display formats Algorithm Version Upload/Download

**Ask clarifying questions**

Customize modes Beta

No matches  **Beta**

Search routing

Unrecognized input by customers triggers the **No matches** action that can be configured to fetch answers from a search integration or trigger the **Fallback** action.

By setting this threshold, you can affect how often your assistant routes customers to the "No matches" action.

Use "No matches"

More often

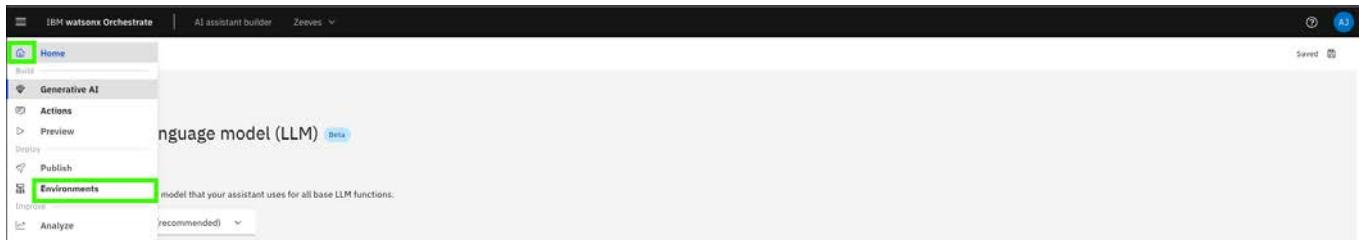
## 22. Click the autocorrection toggle to turn the feature **Off**.



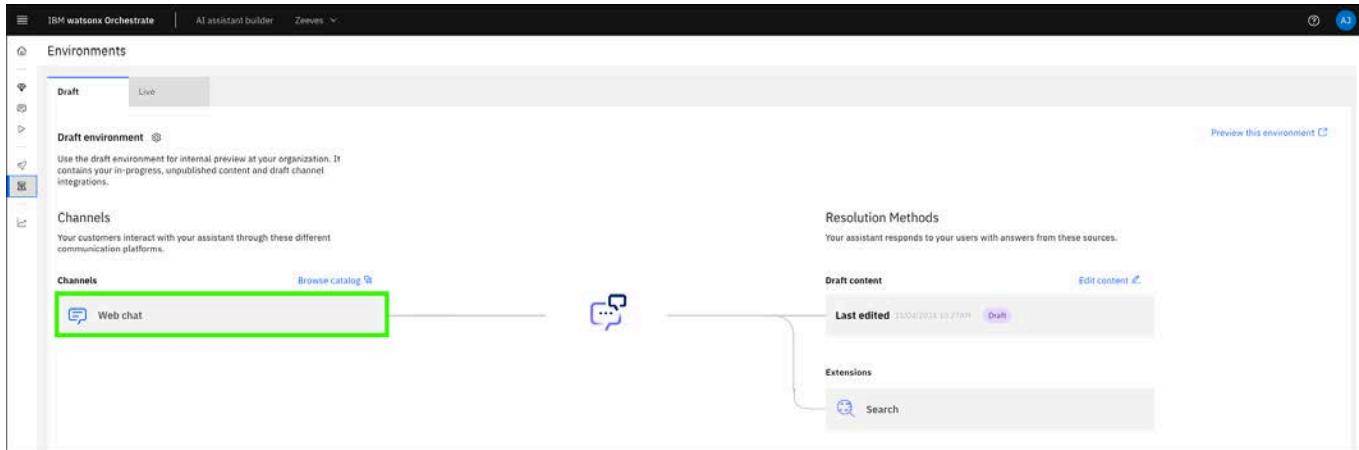
23. Click **Save** (a) and then **Close** (b).



24. Hover over the **Home** (🏠) and click **Environments**.

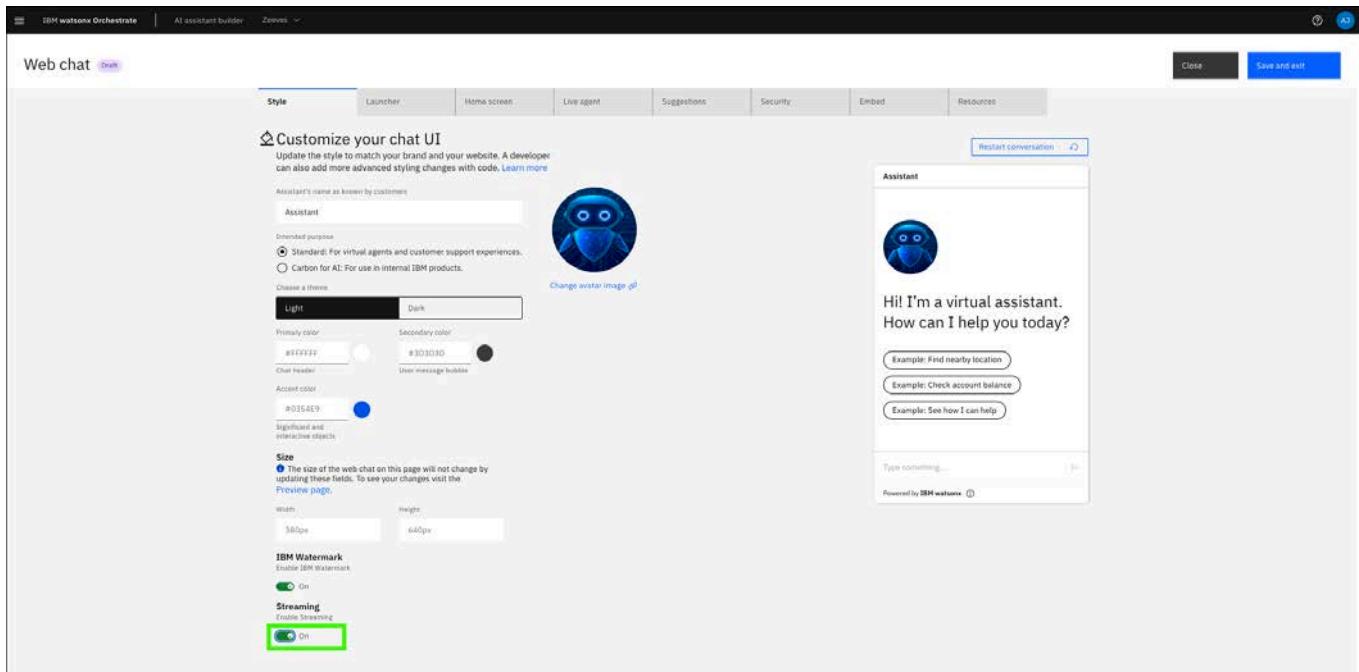


25. Click **Web chat**.

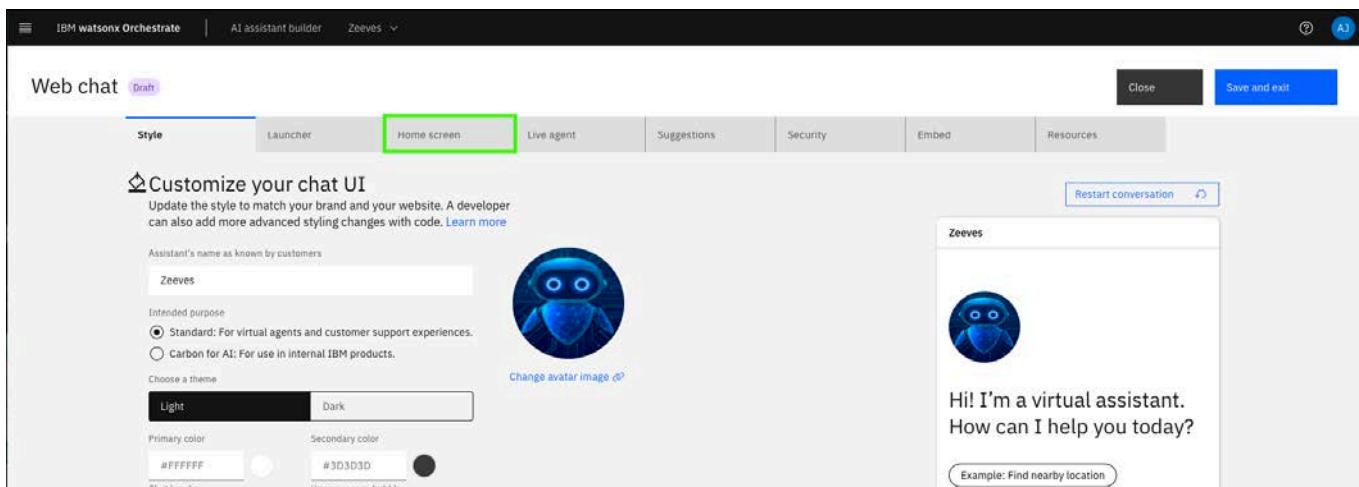


26. On the **Style** tab, click the **Streaming** toggle to enable streaming.

The streaming setting allows responses to be streamed to the assistant and displayed as they are generated versus waiting until the full response is received and then displayed.



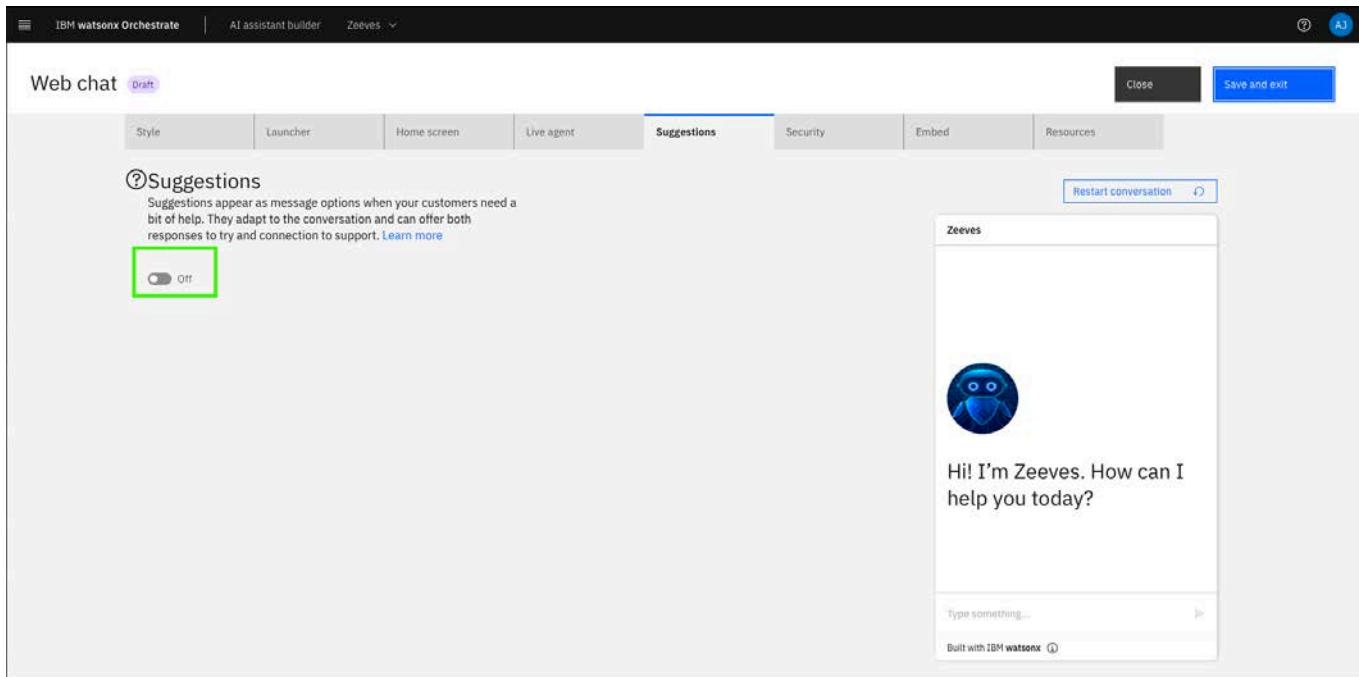
27. Click the **Home screen** tab.



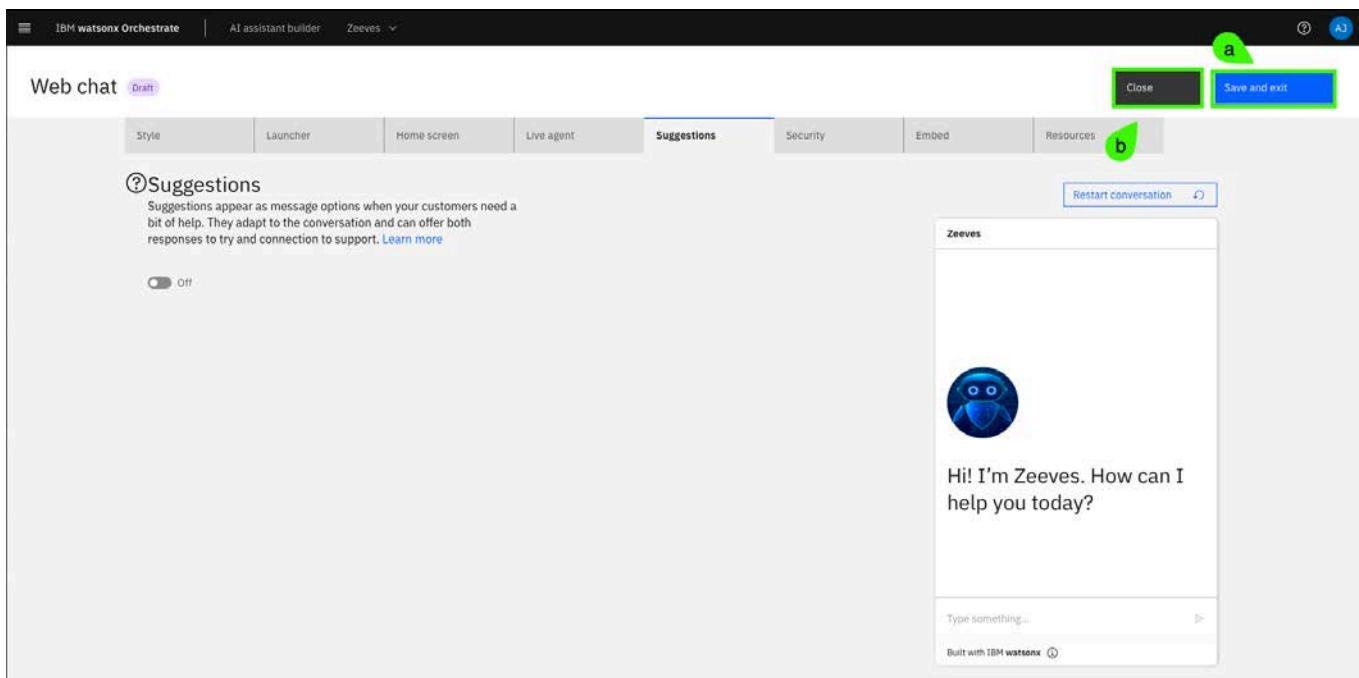
28. Customize the **Home screen** by setting a custom **Greeting message** and deleting the default **Conversation starters**. Optionally, adjust the **Background style**.

## 29. Click Suggestions.

## 30. Click the Suggestions toggle to turn this feature Off.



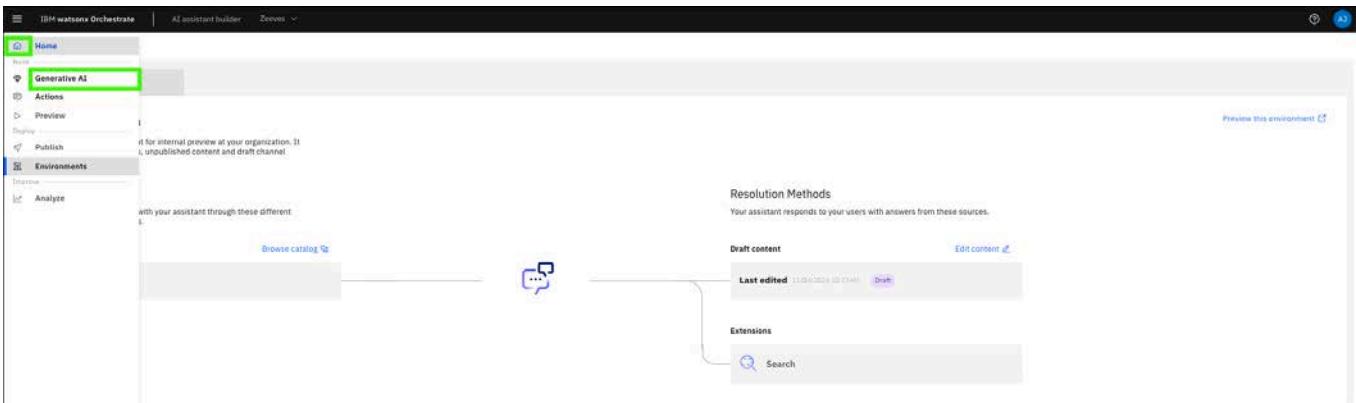
31. Click (a) **Save and exit** and then click (b) **Close**.



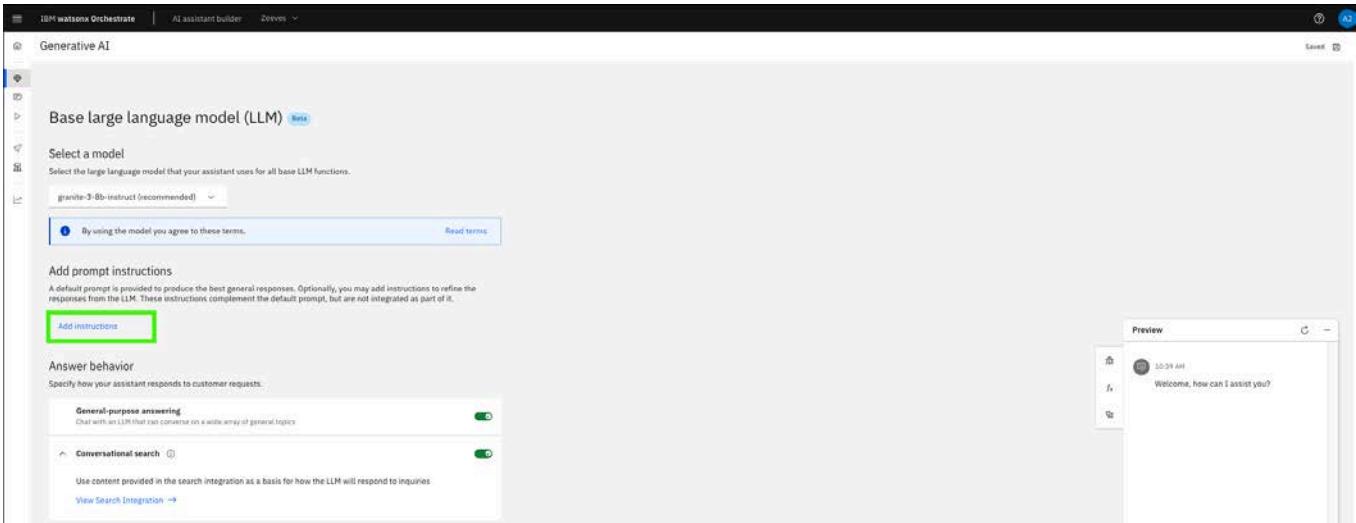
## Configure the base large language model

There are enhancements that you can make to configure how the large language model (LLM) responds to your queries, including adding prompt instructions and configuring the LLM's answer behavior. The options are summarized [here](#).

1. Hover over the **Home** ( ) and click **Generative AI**.



## 2. Click Add instructions.



## 3. Enter a prompt instruction.

Your assistant's LLM gives refined responses by following the prompt's instructions, which clarify how to achieve the end-goal of an action.

Enter prompt instructions in the field. The maximum number of characters you can enter in the prompt instruction field is 1,000.

The following is an example prompt instruction that works well. Experiment with different prompt instructions.

You are a subject matter expert on mainframe systems. Please respond to all prompts with truth and accuracy. Keep all answers short and concise, unless requested to provide details.

**Note:** When the instructions are typed in, they are automatically saved and the LLM is immediately trained on them.

The screenshot shows the 'Generative AI' configuration page in the IBM Watson Assistant interface. In the 'Answer behavior' section, the 'General-purpose answering' toggle is turned on. Below it, the 'Conversational search' toggle is also turned on. A green box highlights the 'Conversational search' section. To the right, a preview window shows a customer interaction where the assistant greets a customer at 10:47 AM.

#### 4. Toggle **General-purpose answering** to **Off** and then click **Save** (💾).

The ability exists to configure the answering behavior of your assistant to provide responses that are based on the preinstalled content or general content.

On the **Generative AI** page (under **Prompt Instructions**), you see the **Answer behavior** section. After you configure **Conversational search**, you see that it is enabled (toggled on) with the search integration added.

If you enable both general-purpose answering and conversational search, conversational search answering takes precedence over General-purpose answering.

**Recommendation:** For purposes of retrieving Z-specific answers and responses, it is recommended that you turn off general-purpose answering and leave only conversational search turned on.

The screenshot shows the 'Generative AI' configuration page. The 'General-purpose answering' toggle switch is now turned off. A green box highlights the 'Conversational search' section, which remains turned on. The 'Preview' window shows the same greeting message as before.

## Testing conversational search

Now, you can begin issuing queries to test the assistant's responses. For more detailed responses, try appending "Please provide a detailed response." to the end of your question.

**Important:** Modify settings iteratively based on your assessment of response quality. Review and change them at any time. For example, add extra prompt instructions, change response verbosity, and modify OpenSearch indexes.

1. Hover over the **Home** ( ) and click **Preview**.

2. Experiment with different prompts and validate that the answers are reasonable and related to IBM Z.

Other prompts and responses follow.

**Note:** The responses that you receive can vary from the ones shown.

**Prompt:**

What is z/OS continuous delivery?

**Example output:**

**Prompt:**

What is the APF list in z/OS?

**Example output:**

The screenshot shows the IBM Watson Assistant interface. On the left, there's a preview of a "Sample website" with a light blue header and a main content area. On the right, a "Zeeves" chat window is open, showing a conversation. The first message is from the user: "What is the APF list in z/OS? Provide a detailed explanation?" The response from Zeeves is: "The APF (Authorized Program Facility) list in z/OS is a system component that controls which libraries and data sets are authorized to run in privileged mode. This ensures system security and integrity by restricting access to sensitive system resources. The APF list is maintained in the system's memory and can be managed using various system commands and macros." Below the response, there's a note: "The APF list contains a list of libraries and data sets that are authorized to run in privileged mode. These libraries and data sets include system programs, languages, and utilities that require elevated privileges to function correctly. By authorizing these..." A "Type something..." input field is at the bottom.

**Prompt:**

Why is Db2 different than other database systems?

**Example output:**

The screenshot shows the IBM Watson Assistant interface. On the left, there's a preview of a "Sample website" with a light blue header and a main content area. On the right, a "Zeeves" chat window is open, showing a conversation. The first message is from the user: "Why is Db2 different than other database systems?" The response from Zeeves is: "Db2 is a mainframe relational database management system (DBMS) that runs under the z/OS operating system, which is specific to mainframe computers. Other database systems may run on various operating systems like Linux, Windows, or Unix. Additionally, Db2 provides a higher level of data management and security features compared to other database systems, as it manages data stored in databases and controls access to the data." A note below the response says: "Accuracy of generated answers may vary." A "Type something..." input field is at the bottom.

**Prompt:**

What happens during an IPL on IBM Z?

**Example output:**

The screenshot shows the IBM Watson Assistant for Z interface. At the top, there's a navigation bar with links like 'IBM Watson Orchestrate', 'AI assistant builder', 'Zeeves', and 'Preview assistant'. Below the navigation is a toolbar with icons for copy, share, layout, background, and web chat. The main area is titled 'Sample website' and contains a grid of colored squares. To the right, a 'Zeeves' window is open, displaying a Q&A session. The first message is from 'You' at 11:05 AM asking 'What happens during an IPL on IBM Z?'. The second message is a response from 'Zeeves' explaining the process of loading the operating system into memory and beginning execution, mentioning sources like the Support Element (SE), Hardware Management Console (HMC), and System Control Panel (SCP). A green box highlights the beginning of the response text. The bottom of the Zeeves window has a 'Get something...' input field and a 'Powered by IBM Watson' footer.



## Experiment with multi-turn (entire conversation) contextual awareness.

In the December 2024 release of IBM watsonx Assistant for Z support for multi-turn contextual awareness was added. This capability enables the assistant to use an entire session history for retrieving search results and generating answers. This handles context-dependent questions well but may over-rely on past topics, even if the user has moved on.

Experiment with this setting by changing your custom service contextual awareness setting from **Single turn** to **Entire conversation**.

The screenshot shows the 'Custom service' settings page in the IBM Watsonx Orchestrate AI assistant builder. At the top, there are tabs for 'Settings' and 'Instance'. A note about PCI compliance is displayed. Below, the 'Conversational search' section is shown, followed by 'Contextual awareness' settings. The 'Entire conversation' radio button is selected and highlighted with a green border, indicating it is the current configuration. The 'Single turn' option is also visible. At the bottom, there are sections for 'Search configuration' and 'How do we know?'

Once enabled, try sequential prompts like:

What are some features of z/OS?

Give me an itemized list?

Tell me more about item 3.

You have a working assistant that uses IBM Watson Assistant for Z. Explore different prompt instructions and settings. If you encounter issues, refer to the Troubleshooting section that follows for resolution.

Continue to the [Creating a stand-alone OpenSearch instance for document ingestion](#) to learn how to configure a dedicated OpenSearch instance for ingesting client-specific documentation into the RAG model.

## Troubleshooting

The following are issues that you may encounter. If the provided resolutions do not work, contact support by using the methods that are mentioned in the [Support](#) section.

 **Assistant responds to all prompts with, "I might have information related to your query to share, but am unable to connect to my knowledge base at the moment"** 

This Assistant is unable to connect to the custom service URL specified. This could be a network issue, the service may be down, the service may be restarting, or the service is no longer running at that URL.

Before reaching out to [Support](#), try the following:

- Wait a few minutes and try again. It may be the service was in the process of restarting.
- If you printed this demonstration guide or saved a copy, verify you are using the most current version of the [lab guide](#) and the correct service URL (<https://wxa4z-opensearch-wrapper-wxa4z-demo-v2-1-0.wxo4z-opc-opensearch-clus-47e063e6a3ad1f71bf2e58f91c3b4c2e-0000.us-south.containers.appdomain.cloud/v1/query>). The URL may have changed since you saved or printed the lab guide.

Bring your own search and documents

# Creating a stand-alone OpenSearch instance for document ingestion

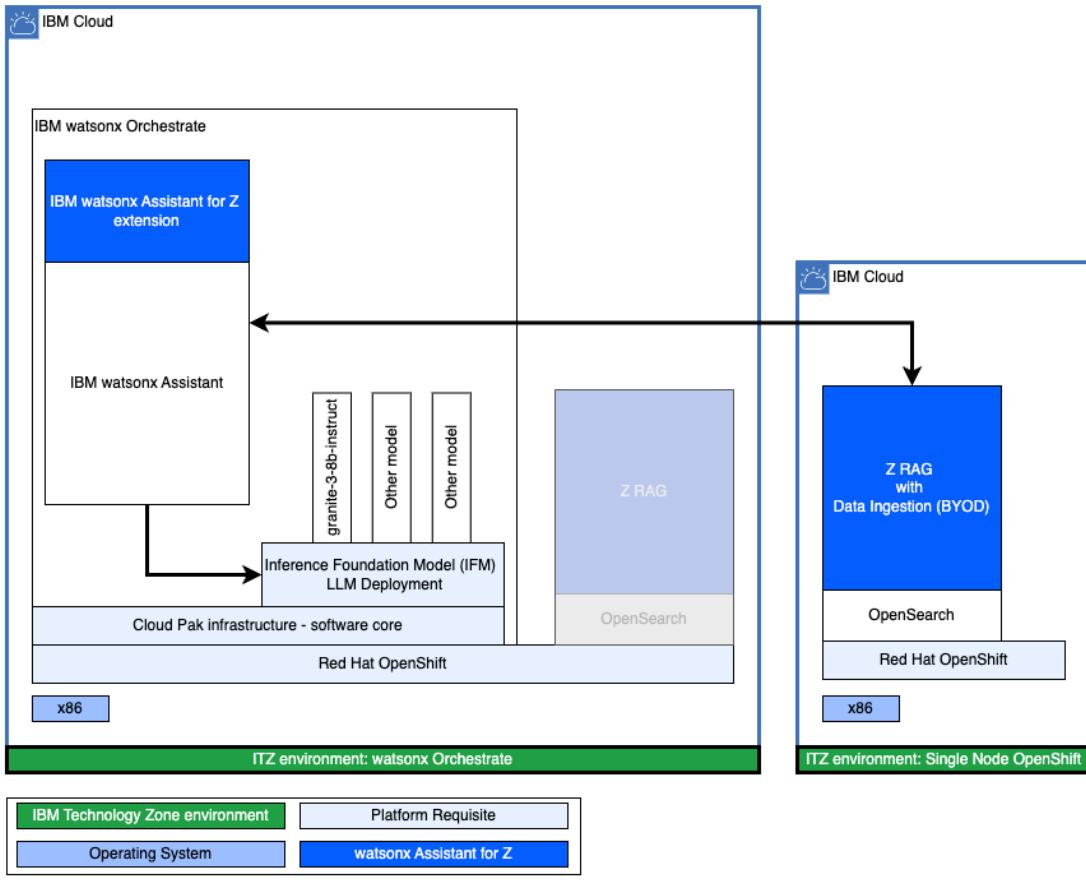
Now that you created and deployed your own assistant with conversational search capabilities, your client can understand how watsonx Assistant for Z provides its content-grounded responses to any Z-related questions. In the previous section, you configured your assistant to use a pre-configured Z RAG that has over 220 knowledge sources, and uses this knowledge to provide AI-generated responses.

Next, learn to enable clients to personalize the assistant with an internal knowledge base that contains documentation they add to the Retrieval Augmented Generation (RAG). This helps provide a level of context-awareness for their own environment when environment-specific questions are asked to the assistant.

Now, install and configure a “Z RAG” on Red Hat OpenShift enabling the bring-your-own-search (BYOS) and bring-your-own-documentation (BYOD) capability to ingest other documentation. In doing so, you deploy a dedicated OpenSearch instance (BYOS). Then, connect your assistant to the new RAG database to provide responses based on the ingested documentation (BYOD).

Below is a high-level, logical architecture of the environment deployed in this section.

## Creating a stand-alone OpenSearch instance for document ingestion



Earlier, you provisioned three IBM Technology Zone (ITZ) environments. One of which was a single-node Red Hat OpenShift (SNO) cluster. If you have not reserved this environment, or it is not in the **Ready** state, return to the [IBM Technology Zone environment](#) section to complete the reservation.

## Install the Red Hat OpenShift command line interface utility

The Red Hat OpenShift command line interface (CLI) utility, which is known as **oc**, must be installed on your local workstation. If you already installed the **oc** utility, you can proceed to [log in to the SNO cluster](#).

1. Click the following link to open a browser window to your ITZ reservations.

[ITZ My reservations](#)

2. Click the **Single Node OpenShift** tile.

The screenshot shows the 'My reservations' section of the IBM Technology Zone. It displays three reservation cards. The first card, titled 'Single Node OpenShift (VMware on IBM Cloud)', has its 'Open this environment' button highlighted with a green border. The other two cards are for 'watsonx Assistant for Z Pilot' and show similar details.

### 3. Scroll down and record the Cluster Admin Username and Cluster Admin Password.

The screenshot shows the 'Reservation Details' page for the OpenShift cluster. It includes fields for API URL, Bastion Password, Reservation RDP address, Bastion SSH connection, Bastion Username, and Bastion Password. The 'Cluster Admin Username' field is highlighted with a red box and contains 'kubeadmin'. The 'Cluster Admin Password' field is also highlighted with a red box and contains 'K8s@123'.

### 4. Click the OCP Console link.

**Note:** OCP stands for OpenShift Container Platform.

IBM Technology Zone | My TechZone | Help

---

Node ID	Node Name	OS Type	IP Address	Status	Action
672371d38376796fb96a6c4d-master-1	Red Hat Enterprise Linux 8 (64-bit)	192.168.252.11	Running	<a href="#">Console</a>	
672371d38376796fb96a6c4d-nls	Red Hat Enterprise Linux 8 (64-bit)	192.168.252.17	Running	<a href="#">Console</a>	

---

### Reservation Details

API URL:  
<https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:443>

Bootstrap Password:  
[REDACTED]

Bootstrap RDP address:  
api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:43389

Bootstrap SSH connection:  
ssh itzuser@api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com -p 40222

Bootstrap Username:  
itzuser

Cluster Admin Username:  
kubeadmin

Cluster Admin Password:  
[REDACTED]

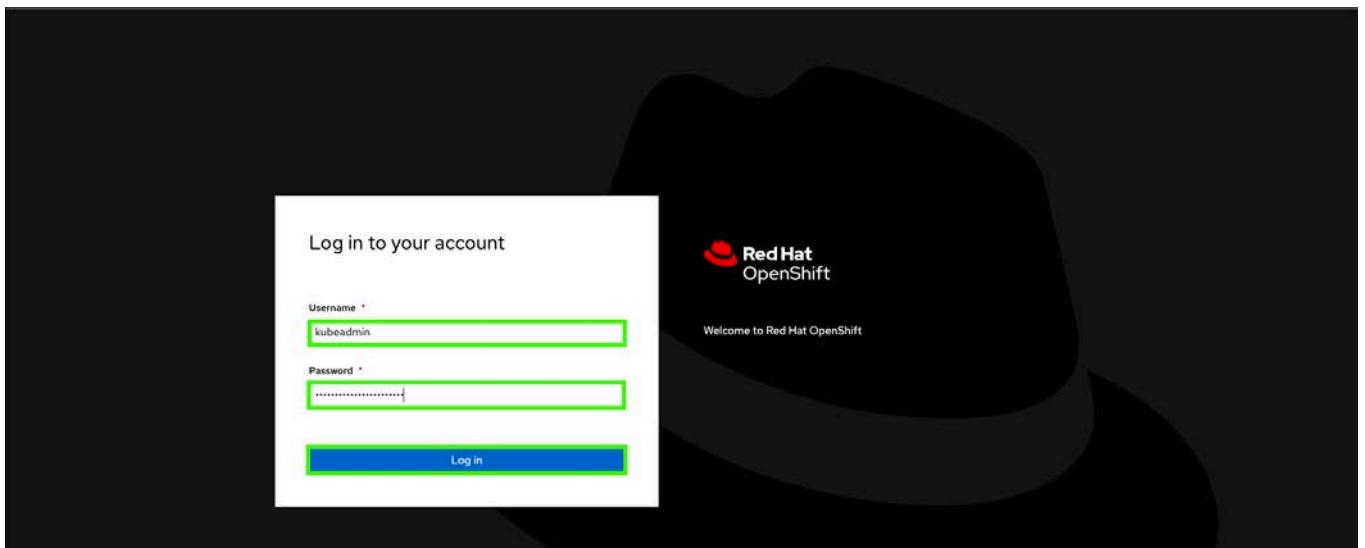
OCP Console:  
<https://ocp-console.672371d38376796fb96a6c4d.ocp.techzone.ibm.com>

OCP Version:  
4.14

vCenter:  
itzyr-vc.eu.cloud.techzone.ibm.com

[Download kubeconfig](#)

5. Enter the **Cluster Admin Username** and **Cluster Admin Password** values from step 3 and click **Log in**.



6. Click **Help** (?) and then click **Command Line Tools**.

The screenshot shows the Red Hat OpenShift on IBM Techzone interface. The top navigation bar includes the Red Hat logo, the title "Red Hat OpenShift on IBM Techzone", and a user dropdown for "kubeadmin". A green box highlights the "Command Line Tools" link in the "Quick Starts" section of the right-hand sidebar.

7. Click the link under **oc - OpenShift Command Line Interface (CLI)** for the operating system of your local machine.

The screenshot shows the Red Hat OpenShift on IBM Techzone web interface. The left sidebar has a 'Administrator' dropdown and navigation links for Home, Operators, Workloads, Networking, Storage, Builds, Observe, Compute, and User Management. The main content area is titled 'Command Line Tools'. It includes a 'Copy login command' link and a section for the 'oc' binary. This section is highlighted with a green dashed box. It describes the 'oc' binary as the OpenShift command line interface and provides download links for x86\_64, ARM, and IBM Power architectures, along with a 'LICENSE' link.

Clicking the preceding link automatically downloads either a **.zip** or **.tar** file specific to your operating system. Extract the file's content. Place the **oc** binary for your operating system (**OS**) in a directory that is in your default PATH, or set the PATH environment variable to include the location of the **oc** binary.

#### 8. Verify the installation by running the **oc** command on your local workstation.

```
oc --help
```

Sample output:

```
andrewjones@Andrews-MBP ~ % oc --help
OpenShift Client

This client helps you develop, build, deploy, and run your applications on any
OpenShift or Kubernetes cluster. It also includes the administrative
commands for managing a cluster under the 'adm' subcommand.

Basic Commands:
  login           Log in to a server
  new-project     Request a new project
  new-app          Create a new application
  status           Show an overview of the current project
  project          Switch to another project
  projects         Display existing projects
  explain          Get documentation for a resource

Build and Deploy Commands:
  rollout          Manage a Kubernetes deployment or OpenShift deployment
  config           Revert part of an application back to a previous deployment
```



**Mac/OS users may need to adjust security settings.**



The **oc** binary may cause a security exception. Adjust the security settings by opening the **System Settings** utility and clicking **Privacy & Security**. Under **Security** locate the message about the **oc** binary and click **Allow Anyway**. Return to the terminal window and try the `oc --help` command again and click **Allow Anyway** when prompted.

## Prepare to ingest documents

Before ingesting documents, complete the following setup steps.

## Log in to the OpenShift cluster from your local terminal

**Note:** If you just installed the **oc** utility, skip the next 5 steps.

1. Click the following link to open a browser window to your ITZ reservations.

[ITZ My reservations](#)

2. Click the **Single Node OpenShift** tile.

3. Scroll to the bottom of the reservation page and record the **Cluster Admin Username** and **Cluster Admin Password**.

Reservation Details	
API URL	<a href="https://api.watsonx.ibm.com:6443">https://api.watsonx.ibm.com:6443</a>
Bastion Password	[REDACTED]
Bastion RDP address	api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:43389
Bastion SSH connection	ssh ituser@api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com -p 40222
Bastion Username	ituser
Cluster Admin Username	kubeadm
Cluster Admin Password	K8s@123
OCP Console	<a href="http://ocp-console.ocp.watsonx.ibm.com:6443">http://ocp-console.ocp.watsonx.ibm.com:6443</a>
OCP Version	4.14
vCenter	itreuvc.eu.cloud.techzone.ibm.com
<a href="#">Download kubeconfig</a>	

4. Click the **OCP Console** link.

**Reservation Details**

API URL: <https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:443>

Bastion Password: [REDACTED]

Bastion RDP Address: `api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:43389`

Bastion SSH connection: `ssh itzuser@api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com -p 40222`

Bastion Username: `itzuser`

Cluster Admin Username: `kubeadmin`

Cluster Admin Password: [REDACTED]

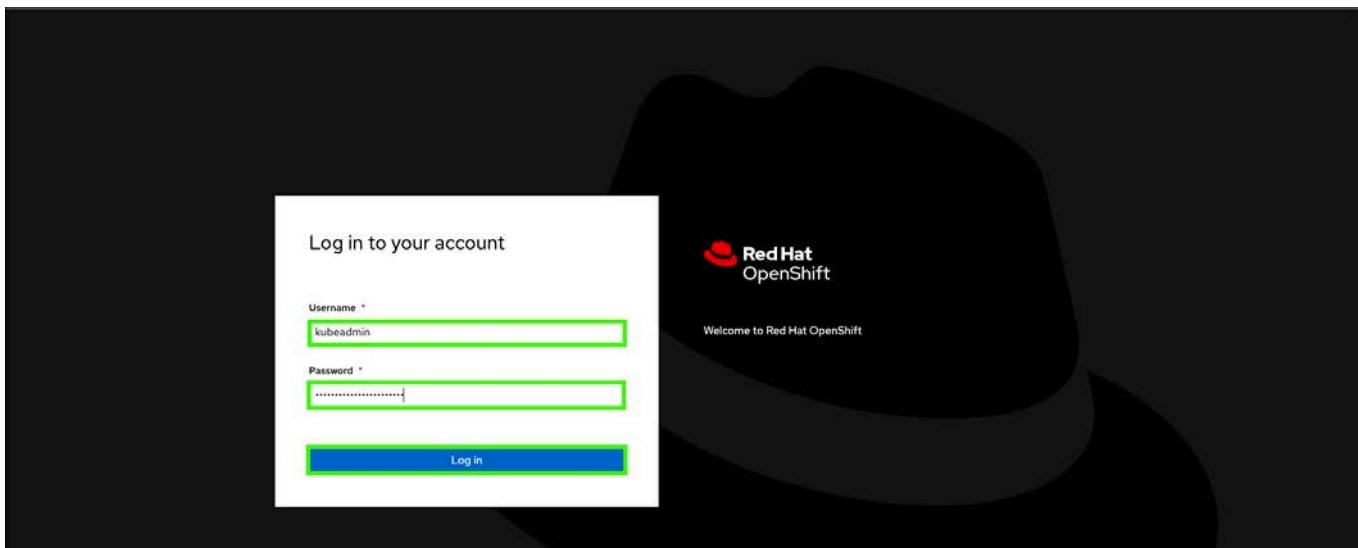
OCP Console: <http://console-openshiftnfs/api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com>

OCP Version: 4.14

vCenter: `itzeu-vc.eu.cloud.techzone.ibm.com`

[Download kubeconfig](#)

- Enter the **Cluster Admin Username** and **Cluster Admin Password** values from step 3 and click **Log in**.



- Click the **kube:admin** profile drop-down and click **Copy login command**.

**Administrator**

- Home
- Operators
- Workloads
- Networking
- Storage

**Command Line Tools**

You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.

[Copy login command](#)

**oc - OpenShift Command Line Interface (CLI)**

With the OpenShift command line interface, you can create applications and manage OpenShift projects from a terminal.

The oc binary offers the same capabilities as the kubectl binary, but it is further extended to natively support OpenShift Container Platform features.

- [Download oc for Linux for x86\\_64](#)

- Click **Display Token**.

**Display Token**

- Select and copy the **Log in with this token** string.

For most operating systems, double-click the value, then right-click and select **Copy**.

Your API token is  
sha256~zuWR0KDnkYn1IY0m8g81KoUXPdFFFmou~o4s5FsrDNA

**Log in with this token**

oc login --token=sha256~zuWR0KDnkYn1IY0m8g81KoUXPdFFFmou~o4s5FsrDNA --server=https://api.672b79320c7a71b728e523b4.ocp.techzone.ibm.com:6443

Use this token directly against the API

```
curl -H "Authorization: Bearer sha256~zuWR0KDnkYn1IY0m8g81KoUXPdFFFmou~o4s5FsrDNA" "https://api.672b79320c7a71b728e523b4.ocp.techzone.ibm.com:6443"
```

Request another token  
Logout

Look Up in Stack Overflow  
Copy  
Copy Link to Highlight  
Search Google for "oc login --token=sha256~..."  
Print...  
Open in Reading Mode  
Translate Selection to English  
Inspect  
Speech  
Services

9. Open a command prompt or terminal window on your local workstation.

10. Paste the login command and press **enter**.

```
andrewjones@Andrews-MBP ~ % oc login --token=sha256~mJ4L8K6cUMyNykZ2Z69KMm3vbP1sWc8Sw0eeOdVqtA94 --server=https://api.672371d38376796fb9.6a6c4d.ocp.techzone.ibm.com:6443
Logged into "https://api.672371d38376796fb9.6a6c4d.ocp.techzone.ibm.com:6443" as "kube:admin" using the token provided.
You have access to 70 projects, the list has been suppressed. You can list all projects with 'oc projects'
Using project "default".
andrewjones@Andrews-MBP ~ %
```

## Create a working directory

1. Create a directory to store the configuration files that you will create in the next steps.



**Instructions vary by your local workstation's operating system.**

The directions that follow may vary depending on your operating system. The examples provided are based upon MacOS.

```
mkdir watsonxAssistant
```

2. Change to the new directory.

```
cd watsonxAssistant
```

```
andrewjones@Andrews-MBP ~ % oc login --token=sha256~mJ4L8K6cUMyNykZ2Z69KMm3vbP1sWc8Sw0eeOdVqtA94 --server=https://api.672371d38376796fb9.6a6c4d.ocp.techzone.ibm.com:6443
Logged into "https://api.672371d38376796fb9.6a6c4d.ocp.techzone.ibm.com:6443" as "kube:admin" using the token provided.
You have access to 70 projects, the list has been suppressed. You can list all projects with 'oc projects'
Using project "default".
andrewjones@Andrews-MBP ~ % mkdir watsonxAssistant
andrewjones@Andrews-MBP ~ % cd watsonxAssistant
andrewjones@Andrews-MBP watsonxAssistant %
```

## Install IBM Certificate Manager on Red Hat OpenShift

1. In a text editor, create a file that is named `catalogCertManager.yaml` and paste the following text in the file.



**Formatting of the yaml file is critical!**

The content of the YAML file must be formatted exactly as shown. Use the **Copy** icon to prevent typographical errors.

File name:

```
catalogCertManager.yaml
```

File contents:

```
apiVersion: operators.coreos.com/v1alpha1
kind: CatalogSource
metadata:
  name: ibm-cert-manager-catalog
  namespace: openshift-marketplace
spec:
  displayName: ibm-cert-manager-4.2.7
  grpcPodConfig:
    securityContextConfig: restricted
    image: icr.io/cpopen/ibm-cert-manager-operator-
catalog@sha256:4dcf4ace4b5f166f83b31063f7e6404dbf78d8e98a9d4fcf52fedf576a55ca6c
  publisher: IBM
  sourceType: grpc
  updateStrategy:
    registryPoll:
      interval: 30m0s
```

2. Install the IBM Certificate Manager operator in the Red Hat OpenShift cluster.

```
oc apply -f catalogCertManager.yaml
```

The preceding command returns a message that states the **ibm-cert-manager-catalog** was created.

3. In the OpenShift web console, click **Operators** and then select **OperatorHub**.

The screenshot shows the Red Hat OpenShift web console interface. The top navigation bar includes the Red Hat logo, the text "OpenShift on IBM Techzone", and a user dropdown for "kube:admin". The main menu on the left has sections for "Administrator", "Home", "Operators", "Workloads", and "Networking". The "Operators" section is currently selected, indicated by a green highlight. Under "Operators", the "OperatorHub" option is also highlighted with a green box. The central content area is titled "Command Line Tools" and contains a sub-section for "oc - OpenShift Command Line Interface (CLI)". It provides a brief description of the CLI and links to download it for various platforms: Linux (x86\_64), Mac, Windows, and ARM 64. A note at the bottom states that the oc binary offers the same capabilities as the kubectl binary but is further extended to support OpenShift Container Platform features.

4. Click the **Project** to pull-down menu and click the **Show default projects** toggle.

The screenshot shows the Red Hat OpenShift OperatorHub interface. On the left, a sidebar menu includes 'Administrator', 'Home', 'Operators' (selected), 'OperatorHub' (selected), 'Workloads', 'Networking', and 'User Management'. The main area has a header 'Project: All Projects' with a dropdown arrow. Below it is a search bar 'Select project...'. A toggle switch labeled 'Show default projects' is turned on. A list of 'Projects' is shown, including 'All Projects' (selected), 'default', 'kube-node-lease', and 'kube-public'. At the bottom right, there are tabs for 'Community', 'Marketplace', and 'Community' again. A note at the top right says: 'partners; curated by Red Hat. You can purchase commercial software through Red Hat Marketplace. You can install Operators on your clusters to provide optional add-ons and shared services to your developers. After installation, the Operator capabilities will appear in the Developer Catalog providing a self-service experience.' A note at the bottom right says '624 items'.

## 5. Scroll down and select openshift-marketplace.

This screenshot is similar to the previous one, but the 'openshift-marketplace' option in the dropdown menu is now highlighted with a green box. The rest of the interface remains the same, showing the list of projects and the marketplace tab at the bottom.

## 6. Enter IBM Cert Manager in the search field and then click the IBM Cert Manager tile.

**Be patient.**

It may take a minute or two for the **IBM Cert Manager** tile to appear.

**Note:** The current version of the operator may differ than shown in the image below. Select the most current version.

The screenshot shows the Red Hat OpenShift OperatorHub interface with the search bar containing 'IBM Cert Manager'. The search results list a single item: 'ibm-cert-manager-4.2.7' by IBM, which is described as an 'Operator for managing deployment of cert-manager service.'. This result is highlighted with a green box.

## 7. Click Install.

The screenshot shows the Red Hat OpenShift OperatorHub interface. On the left, there's a sidebar with various categories like Home, Operators, Workloads, Networking, Storage, Builds, Observe, and Compute. Under Operators, 'OperatorHub' is selected, and 'Installed Operators' is shown. In the main content area, a search bar at the top right says 'All Items' and has 'ibm-cert-manager' typed into it. Below the search bar, a card for 'ibm-cert-manager-4.2.7' is displayed. To the right of the card, there's a detailed description of the operator, including its version (4.2.7), capability level (Basic Install, Seamless Upgrades), and source (ibm-cert-manager-4.2.7). At the bottom right of the card, there's a large green 'Install' button, which is also highlighted with a green box.

## 8. Keep the default settings and click Install.

The screenshot shows the 'Install Operator' page in the Red Hat OpenShift OperatorHub. The left sidebar is identical to the previous screenshot. The main area is titled 'Install Operator' and contains several configuration fields: 'Update channel \*' set to 'v4.2', 'Version \*' set to '4.2.7', 'Installation mode \*' with 'All namespaces on the cluster (default)' selected, 'Installed Namespace \*' with 'Operator recommended Namespace: ibm-cert-manager' selected, and 'Update approval \*' with 'Automatic' selected. On the right side, there are four cards providing details about the operator's APIs: 'Provided APIs' (IBMCertManager), 'CR CertificateRequest' (Not available), 'CMC Cert Manager Config' (Not available), and 'Challenge' (Not available). At the bottom of the page, there are two buttons: a green 'Install' button and a blue 'Cancel' button, with the 'Install' button being highlighted with a green box.



### Do not continue until...

The installation process takes a few minutes. Do not continue until you see the following message: **Installed operator: ready for use.**

## Install the watsonx Assistant for Z Operator (for OpenSearch)

1. In your command prompt or terminal window, create a new namespace called `wxa4z-byos` in the Red Hat OpenShift cluster.

```
oc create namespace wxa4z-byos
```

2. Create or obtain your IBM Container Software production entitlement key.

A production entitlement key is required to pull the container images that get deployed by the operator.

To create or retrieve your existing entitlement key, follow the instructions [here](#).

If you don't have an entitlement key at the above link, click the **Add new key** to create a new one or [visit this link to create a new one](#).

If extra assistance is needed, refer to this [site](#). Note, the process here is not

Locate your existing key or create a new one and continue to the next step.

3. Click **copy** and record your entitlement key for future use in a secure location.

The screenshot shows the IBM Container Software and Cloud Pak Access Management interface. On the left, there's a sidebar with 'My IBM', 'Profile', 'Billing', 'Container Software and Cloud Pak Access Management', and 'Entitlement keys' (which is selected and highlighted in blue). Below that is 'Container software library'. The main content area has a title 'Entitlement keys (1)'. Underneath it, a section titled 'Access your container software' explains that an entitlement key allows access to all container software in the IBM Entitled Registry. It also states that you can have a maximum of 5 entitlement keys and that once deleted, they're no longer valid. A note says 'Issue date: October 17, 2022'. At the bottom right of this section are 'Copy' and 'Delete' buttons, with 'Copy' being highlighted with a green border.

4. In your command prompt or terminal window, set an environment variable with your production entitlement key.

Substitute your production entitlement key copied in the last step for <entitlement key> .

Mac OS:

```
export IBM_CS_ENT_KEY=<entitlement key>
```

Microsoft Windows:

```
set IBM_CS_ENT_KEY=<entitlement key>
```

5. Enter the following command to create a pull secret for the **Container Registry**.

Mac OS:

```
oc -n wxa4z-byos create secret docker-registry icr-pull-secret --docker-server=cp.icr.io --  
docker-username=cp --docker-password=$IBM_CS_ENT_KEY
```

Microsoft Windows:

```
oc -n wxa4z-byos create secret docker-registry icr-pull-secret --docker-server=cp.icr.io --  
docker-username=cp --docker-password=%IBM_CS_ENT_KEY%
```

The terminal window shows the following command being run and its output:

```
andrewjones@Andrews-MBP watsonxAssistant % oc create namespace wxa4z-byos  
namespace/wxa4z-byos created  
andrewjones@Andrews-MBP watsonxAssistant % export IBM_CS_ENT_KEY=  
andrewjones@Andrews-MBP watsonxAssistant % oc -n wxa4z-byos create secret docker-registry icr-pull-secret --docker-server=cp.icr.io --  
docker-username=cp --docker-password=$IBM_CS_ENT_KEY  
secret/icr-pull-secret created  
andrewjones@Andrews-MBP watsonxAssistant %
```

6. In a text editor, create a file that is named `catalogSource.yaml` and paste the following text in the file.

**Formatting of the yaml file is critical!**

The content of YAML files must be formatted exactly as shown. Use the copy icon to prevent typographical errors.

File name:

```
catalogSource.yaml
```

File contents:

```
apiVersion: operators.coreos.com/v1alpha1
kind: CatalogSource
metadata:
  name: ibm-wxa4z-operator-catalog
  namespace: wxa4z-byos
spec:
  displayName: "IBM watsonx Assistant for Z Operator Catalog"
  image: icr.io/cpopen/ibm-wxa4z-
  catalog:v2.1.0@sha256:a085d360b6aa0e40cf86a632eb5cd190a0407d1c54ec1b2d1d2fb5507f39a524
  publisher: 'IBM'
  sourceType: grpc
  secrets:
  - icr-pull-secret
```

7. Create your document catalog in the Red Hat OpenShift operator.

```
oc apply -f catalogSource.yaml
```

andrewjones@Andrews-MBP watsonxAssistant % oc create namespace wxa4z-byos  
namespace/wxa4z-byos created  
andrewjones@Andrews-MBP watsonxAssistant % export IBM\_CS\_ENT\_KEY=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpYXQiOjE2NjYwMTk1ODAsImp0aSI6IjNkOWUyMzjZTAzMzQzMzVhNTJhYTkzMWNmOTcyMDRlIn0.4M3XRDXzkHMSOkFNJ4uKVcWZ6SnEA0Z03eL\_11A2xy  
andrewjones@Andrews-MBP watsonxAssistant % oc -n wxa4z-byos create secret docker-registry icr-pull-secret --docker-server=cp.icr.io --docker-username=cp --docker-password=\$IBM\_CS\_ENT\_KEY  
secret/icr-pull-secret created  
andrewjones@Andrews-MBP watsonxAssistant % vi catalogSource.yaml  
andrewjones@Andrews-MBP watsonxAssistant % vi catalogSource.yaml  
andrewjones@Andrews-MBP watsonxAssistant % oc apply -f catalogSource.yaml  
catalogsource.operator.coreos.com/ibm-wxa4z-operator-catalog created:  
andrewjones@Andrews-MBP watsonxAssistant %

8. In the Red Hat OpenShift web console, click **OperatorHub** and select the **wxa4z-byos** project.

The screenshot shows the Red Hat OpenShift OperatorHub interface. The left sidebar has 'OperatorHub' selected. The search bar at the top contains 'Project: openshift-marketplace'. The search results for 'ibm watsonx' are displayed in a grid. One result, 'IBM Watson Assistant for Z Operator', is highlighted with a green border.

9. Enter **ibm watsonx** in the search field and the click the **IBM watsonx Assistant for Z Operator Catalog** tile.

**Be patient.**

It may take a minute or two for the **IBM watsonx Assistant for Z Operator Catalog** tile to appear. Reload the browser page if the operator is not listed.

**Note:** The current version of the operator may differ than that shown in the image below.

The screenshot shows the Red Hat OpenShift OperatorHub interface. The search bar at the top contains 'Project: wxa4z-byos'. The search results for 'ibm watsonx' are displayed in a grid. One result, 'IBM Watson Assistant for Z Operator Catalog', is highlighted with a green border.

10. Click **Install**.

**Note:** The current version of the operator may differ than the one shown in the image after this. Select the most current version.

The screenshot shows the Red Hat OpenShift OperatorHub interface. On the left, the navigation menu includes 'Administrator', 'Home', 'Operators', 'Workloads', 'Networking', 'Storage', 'Builds', 'Observe', 'Compute', 'User Management', and 'Administration'. Under 'Operators', 'OperatorHub' is selected. In the center, a search bar shows 'ibm watsonx'. Below it, a modal window for 'IBM watsonx Assistant for Z' is displayed, providing details such as the channel (stable), version (2.0.0), capability level (Basic Install), and installation mode (A Specific namespace on the cluster).

11. Select **A specific namespace on the cluster (a)** under **Installation mode** and **wxa4z-byos (b)** for the **Installed Namespace**, then click **Install (c)**.

The screenshot shows the 'Install Operator' page. The left sidebar has the same navigation as the previous screen. The main area is titled 'Install Operator' with the sub-section 'OperatorHub > Operator Installation'. It contains fields for 'Update channel' (set to 'stable'), 'Version' (set to '2.0'), 'Installation mode' (radio button 'A Specific namespace on the cluster' is selected, highlighted with a green box and labeled 'a'), 'Installed Namespace' (dropdown set to 'wxa4z-byos', highlighted with a green box and labeled 'b'), and 'Update approval' (radio button 'Automatic' is selected). At the bottom are 'Install' and 'Cancel' buttons, with the 'Install' button highlighted with a green circle and labeled 'c'.

**Do not continue until...**

The installation process takes a few minutes. Do not continue until you see the following message: **Installed operator: ready for use.**

12. In your command prompt or terminal window, run the following commands to add the Container Registry credential to the operator's service account.

Mac OS and Microsoft Windows:

```
oc project wxa4z-byos
```

Mac OS:

```
oc patch serviceaccount ibm-wxa4z-operator-controller-manager --type merge -p
'{"imagePullSecrets": [{"name": "icr-pull-secret"}]}'
```

Microsoft Windows:

```
oc patch serviceaccount ibm-wxa4z-operator-controller-manager --type merge -p
'{"imagePullSecrets": [{"name": "icr-pull-secret"}]}'
```

```
andrewjones@Andrews-MBP watsonxAssistant % oc create namespace wxa4z-byos
namespace/wxa4z-byos created
andrewjones@Andrews-MBP watsonxAssistant % export IBM_CS_ENT_KEY=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpYXQiOjE2NjYwMTk1ODAsImp0aS16IjNkOWUyMzjZTAzMDQzMzNhNTJhYTkzMnNmOTcyMDR1In0.4M3XRD4XzkHMSOkFNJ4uKVcWZ6SnEA0Z03el_11A2xY
andrewjones@Andrews-MBP watsonxAssistant % oc -n wxa4z-byos create secret docker-registry icr-pull-secret --docker-server=cp.icr.io --docker-username=cp --docker-password=$IBM_CS_ENT_KEY
secret/icr-pull-secret created
andrewjones@Andrews-MBP watsonxAssistant % vi catalogSource.yaml
andrewjones@Andrews-MBP watsonxAssistant % vi catalogSource.yaml
andrewjones@Andrews-MBP watsonxAssistant % oc apply -f catalogSource.yaml
catalogsource.coreos.com/ibm-wxa4z-operator-catalog created
andrewjones@Andrews-MBP watsonxAssistant % oc project wxa4z-byos
Now using project "wxa4z-byos" on server "https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:6443".
andrewjones@Andrews-MBP watsonxAssistant % oc patch serviceaccount ibm-wxa4z-operator-controller-manager --type merge -p '{"imagePullSecrets": [{"name": "icr-pull-secret"}]}'
serviceaccount/ibm-wxa4z-operator-controller-manager patched
andrewjones@Andrews-MBP watsonxAssistant %
```

13. In the Red Hat OpenShift web console, under **Workloads**, click **Pods**.

14. Verify the two pods that start with **ibm-wxa4z-operator** have a status of **Running** and that all pods are **Ready**.

15. Run the following command to set the administrative policy for the workspace.

```
oc -n wxa4z-byos adm policy add-scc-to-user privileged -z byos
```

```
watsonxAssistant ~ execuser@pt1385-jvml ~ zsh ~ 138x37
andrewjones@Andrews-MBP watsonxAssistant % oc create namespace wxa4z-byos
namespace/wxa4z-byos created
andrewjones@Andrews-MBP watsonxAssistant % export IBM_CS_ENT_KEY=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpYXQiOjE2NjYwMTk1ODAsImp0aSI6IjNkOWUyMzjZTAzMDoZmZvNhTJhYTkzMWNmOTcyMDR1In0.4M3XRd4XzkHMS0kFNJ4uKvCwZ6SnEA0Z03eL_11A2xY
andrewjones@Andrews-MBP watsonxAssistant % oc -n wxa4z-byos create secret docker-registry icr-pull-secret --docker-server=cp.icr.io --docker-username=cp --docker-password=$IBM_CS_ENT_KEY
secret/icr-pull-secret created
andrewjones@Andrews-MBP watsonxAssistant % vi catalogSource.yaml
andrewjones@Andrews-MBP watsonxAssistant % vi catalogSource.yaml
andrewjones@Andrews-MBP watsonxAssistant % oc apply -f catalogSource.yaml
catalogsource.operator.coreos.com/ibm-wxa4z-operator-catalog created
andrewjones@Andrews-MBP watsonxAssistant % oc project wxa4z-byos
Now using project "wxa4z-byos" on server "https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:6443".
andrewjones@Andrews-MBP watsonxAssistant % oc patch serviceaccount ibm-wxa4z-operator-controller-manager --type merge -p '{"imagePullSecrets": [{"name": "icr-pull-secret"}]}'
serviceaccount/ibm-wxa4z-operator-controller-manager patched
andrewjones@Andrews-MBP watsonxAssistant % oc -n wxa4z-byos adm policy add-scc-to-user privileged -z byos
clusterrole.rbac.authorization.k8s.io/system:openshift:scc:privileged added: "byos".
andrewjones@Andrews-MBP watsonxAssistant %
```

## Deploy required secrets and the custom bring-your-own-search (BYOSearch) resources

- In a text editor, create a file that is named `os-secret.yaml`, paste the following text in the file, and then modify the default password.

File name:

```
os-secret.yaml
```

**Substitute a secure password of your choosing for the string <OPENSEARCH\_PASSWORD>. Record this value for later use.**

File contents:

```
apiVersion: v1
stringData:
  password: <OPENSEARCH_PASSWORD>
kind: Secret
metadata:
  name: opensearch-creds
  namespace: wxa4z-byos
type: Opaque
```

2. Create the secret by running the following command.

```
oc apply -f os-secret.yaml
```

3. In a text editor, create a file that is named `client-ingestion-secret.yaml`, paste the following text in the file, and then modify the default password.

File name:

```
client-ingestion-secret.yaml
```

**Substitute a secure authentication key of your choosing for the string <CLIENT\_INGESTION\_AUTHKEY>. The authentication key can be a random password. Record this value for later use.**

File contents:

```
apiVersion: v1
stringData:
  authkey: <CLIENT_INGESTION_AUTHKEY>
kind: Secret
metadata:
  name: client-ingestion-authkey
  namespace: wxa4z-byos
type: Opaque
```

4. Create the secret by running the following command.

```
oc apply -f client-ingestion-secret.yaml
```

5. In a text editor, create a file that is named `wrapper-creds.yaml`, paste the following text in the file, and then modify the default password.

File name:

```
wrapper-creds.yaml
```

**Substitute a secure password credential of your choosing for the string <WRAPPER\_PASSWORD> . The password can be a random password. Record this value for later use. Use this password in the following steps when you configure your BYOS connection in your assistant to connect to the network route.**

File contents:

```
apiVersion: v1
stringData:
  username: admin
  password: <WRAPPER_PASSWORD>
kind: Secret
metadata:
  name: wrapper-creds
  namespace: wxa4z-byos
type: Opaque
```

6. Create the secret by running the following command.

```
oc apply -f wrapper-creds.yaml
```

7. Obtain and record your cluster domain that is used for routes by running the following command.

```
oc -n openshift-ingress-operator get ingresscontroller default -o jsonpath=".status.domain"
```



**The output from the command does not include a newline.**

The value returned for the cluster domain does not include a newline. When copying the value do not include the character or characters used for your command line prompt. Do not include your prompt in the next step! For example, the command may return `apps.678e206af501a868a5828e4a.ocp.techzone.ibm.com%`. You do NOT want to include the `%` character which was part of the terminal command prompt.

**Note:** The output of the command will be a string similar to:

**apps.672b79320c7a71b728e523b4.ocp.techzone.ibm.com**

8. In a text editor, create a file that is named `byos.yaml` and paste the following text in the file.

File name:

```
byos.yaml
```

Substitute the domain name recorded in the previous step for the string <YOUR\_CLUSTER\_DOMAIN> .

File contents:

```

apiVersion: wxa4z.watsonx.ibm.com/v1
kind: BYOSearch
metadata:
  name: byosearch
  namespace: wxa4z-byos
spec:
  imagePullSecrets:
    - name : icr-pull-secret
  namespace: wxa4z-byos
  clusterName: wxa4z-byos-cluster
  clusterDomain: <YOUR_CLUSTER_DOMAIN>

  opensearch:
    secretName: opensearch-creds

  persistence:
    enabled: true
    storageClass: "managed-nfs-storage"
    accessModes:
      - ReadWriteOnce
    size: 24Gi

  wrapper:
    createRoute: true
    resources:
      requests:
        cpu: 2
        memory: "500Mi"
      limits:
        cpu: 2
        memory: "1Gi"

  clientIngestion:
    secretName: client-ingestion-authkey

    resources:
      limits:
        cpu: "500m"
        memory: 2Gi
        nvidia.com/gpu: "0"
      requests:
        cpu: "500m"
        memory: 1Gi
        nvidia.com/gpu: "0"
    pvc:
      storageClass: "managed-nfs-storage"
      enabled: true
      size: 24Gi

```

9. Run the following command to deploy BYOS on your cluster.

```
oc apply -f byos.yaml
```

Verify all the required pods are running and get the network route to your BYOS instance

1. In the OCP console, verify that all pods have the status of **Running** or **Completed**.

**⚠️ Do not continue until...**

The BYOS deployment can take 20 minutes or more to complete. Do not continue until all the pods have a status of "Running" or "Completed". The next step is to retrieve your BYOS endpoint URL.

Name	Status	Ready	Restarts	Owner	Memory	CPU	Created
wxa4z-byos-cluster-0	Running	1/1	0	ibm-wxa4z-operator-controller-manager-556fcf98bb-4bhvk	142.8 MiB	0.023 cores	Nov 6, 2024, 9:26 AM
wxa4z-byos-cluster-1	Running	1/1	0	ibm-wxa4z-operator-controller-manager-556fcf98bb-4bhvk	142.8 MiB	0.023 cores	Nov 6, 2024, 9:26 AM
wxa4z-byos-cluster-2	Running	1/1	0	ibm-wxa4z-operator-controller-manager-556fcf98bb-4bhvk	142.8 MiB	0.023 cores	Nov 6, 2024, 9:26 AM
wxa4z-client-ingestion-79b8d6c58-9bzh	Running	1/1	0	ibm-wxa4z-client-ingestion-79b8d6c58-9bzh	501.8 MiB	0.071 cores	Nov 6, 2024, 12:18 PM
wxa4z-opensearch-wrapper-5cb879f5fb-qw7qt	Running	1/1	0	ibm-wxa4z-opensearch-wrapper-5cb879f5fb-qw7qt	547.1 MiB	0.030 cores	Nov 6, 2024, 10:22 AM
wxa4z-snapshot-setup-job-nsqtz	Completed	0/1	0	wxa4z-snapshot-setup-job-nsqtz	-	-	Nov 6, 2024, 10:22 AM

2. Under **Networking**, click **Routes**.

Name	Status	Ready	Restarts	Owner	Memory	CPU	Created
wxa4z-client-ingestion-79b8d6c58-9bzh	Running	1/1	0	ibm-wxa4z-client-ingestion-79b8d6c58-9bzh	534.6 MiB	0.087 cores	Nov 6, 2024, 12:18 PM
wxa4z-opensearch-wrapper-5cb879f5fb-qw7qt	Running	1/1	0	ibm-wxa4z-opensearch-wrapper-5cb879f5fb-qw7qt	547.1 MiB	0.030 cores	Nov 6, 2024, 10:22 AM
wxa4z-snapshot-setup-job-nsqtz	Completed	0/1	0	wxa4z-snapshot-setup-job-nsqtz	-	-	Nov 6, 2024, 10:22 AM

3. Copy and record the location for the **wxa4z-opensearch-wrapper** route.

Name	Status	Location	Service
wxa4z-client-ingestion	Accepted	https://wxa4z-client-ingestion-wxa4z-byos.apps.672b79320c7a71b728e523b4.ocp.techzone.ibm.com	wxa4z-client-ingestion
wxa4z-opensearch-wrapper	Accepted	https://wxa4z-opensearch-wrapper-wxa4z-byos.apps.672b79320c7a71b728e523b4.ocp.techzone.ibm.com	wxa4z-opensearch-wrapper

## Update your assistant with the new BYOS instance route

You are now ready to configure your assistant with the route to your BYOS instance.

1. Using the network route for your BYOS instance, append the string **/v1/query** to complete the URL endpoint.

The URL should look similar to:

```
https://wxa4z-opensearch-wrapper-wxa4z-
byos.apps.672b79320c7a71b728e523b4.ocp.techzone.ibm.com/v1/query
```

**Important:** The above URL will not work for you. Use the value of your specific OpenSearch instance that is recorded in the previous step.

2. Update your assistant's custom search integration URL.

Next, you need to return to your assistant in the watsonx Orchestrate AI assistant builder and update the custom search integration URL. Use the URL from the network route (with **/v1/query**) appended. Use **admin** for the **Username** and the **Password** will be the password that you specified in the `wrapper-creds.yaml` file.



### Don't recall how to set the customer search URL?

Refer back to [Creating an assistant and configuring conversational search](#) if you don't remember how to specify the customer search URL.

3. Test your assistant and verify that it is still answering questions that are related to IBM Z.

Experiment with different prompts and validate that the answers provided are reasonable, and that you can view the documentation that was sourced. If responses are not received as expected, verify that the URL is formatted correctly and you specified the `wrapper-creds.yaml` password as the **admin** password.

## Troubleshooting

The following are issues that you may encounter. If the provided resolutions do not work, contact support by using the methods that are mentioned in the [Support](#) section.

### Pods have a status of ErrImagePull or ImagePullBackoff

If the pods starting with **ibm-wxa4z-operator** have a status of “ErrImagePull” or “ImagePullBackoff”, you can delete the pod and it will automatically restart and pull the image successfully. Wait until the pod is re-created successfully.

### The wxa4z-client-ingestion pod does not start

Did you include the % character in the **clusterDomain** name when creating the **byos.yaml**? To resolve, edit the **byos.yaml** file and run the following command again. The current pod will be terminated and a new one started. This will take about 20 minutes to start.

```
oc apply -f byos.yaml
```

# Installing and using zassist to ingest client documents

With bring-your-own-search (BYOS) installed and configured in your assistant, you can now prepare for document ingestion (bring-your-own-documents (BYOD)). BYOD demonstrates how clients can augment their assistant's conversational search by creating an internal knowledge base with their documentation. Using the client's documentation allows the assistant to provide valuable responses to a range of questions not possible with the default documentation available.

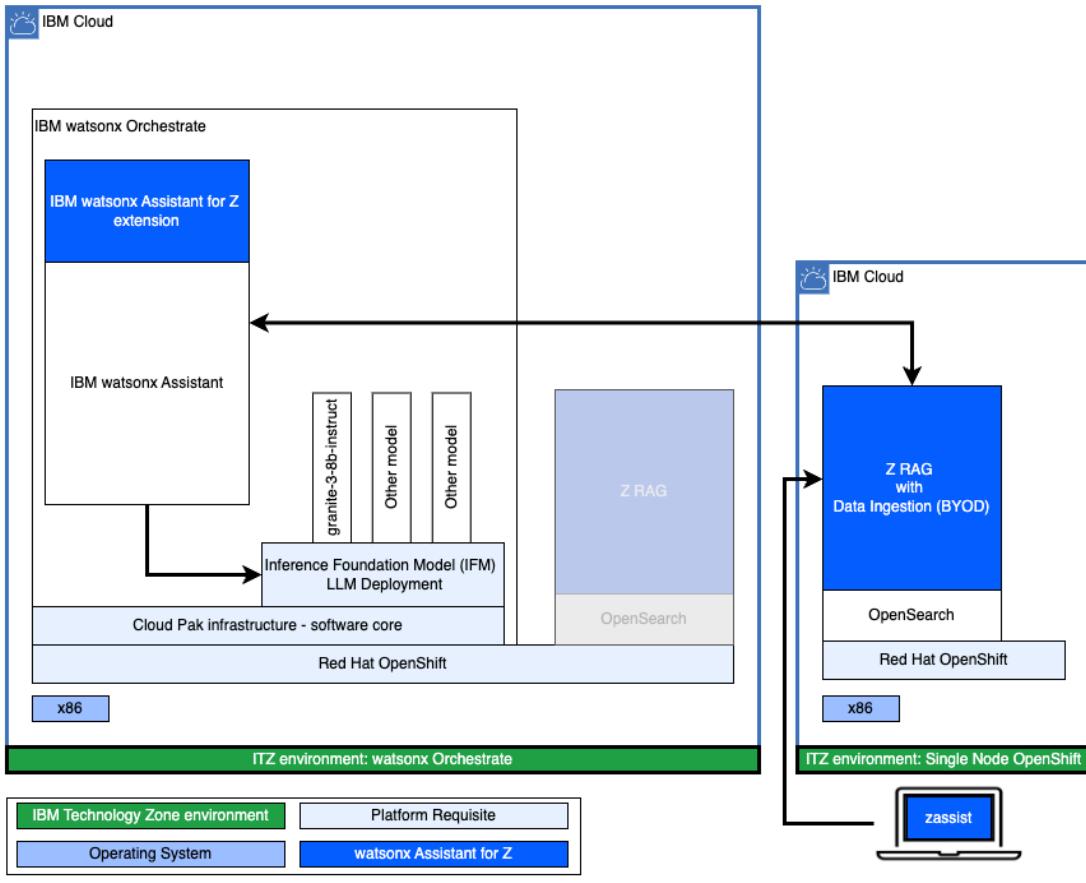
As an example, a client mentioned that their developers often need reference material on company-specific legacy code or company-specific syntax. The users must search through volumes of documentation to find it or look at old code. Also, a need for their operational support group to quickly determine how to resolve technical issues using runbooks exists.

You can show your client how watsonx Assistant for Z can assist developers and operational support personnel in finding answers about internal processes for code development and deployment.

Currently, only PDF, HTML, and DOCX file formats are supported for ingestion.

A high-level, logical architecture of the environment is illustrated in the following diagram.

## Installing and using zassist to ingest client documents



To prepare for document ingestion, you can also reference the setup instructions that are located [here](#).

## Install the zassist utility

The **zassist** utility is an executable program that automates the ingestion of client documentation into the RAG for watsonx Assistant for Z. A version of zassist is available for download for IBMers and Business Partners for conducting pilots. Follow the steps to download and install **zassist**.

### **i** How do clients get the zassist utility?

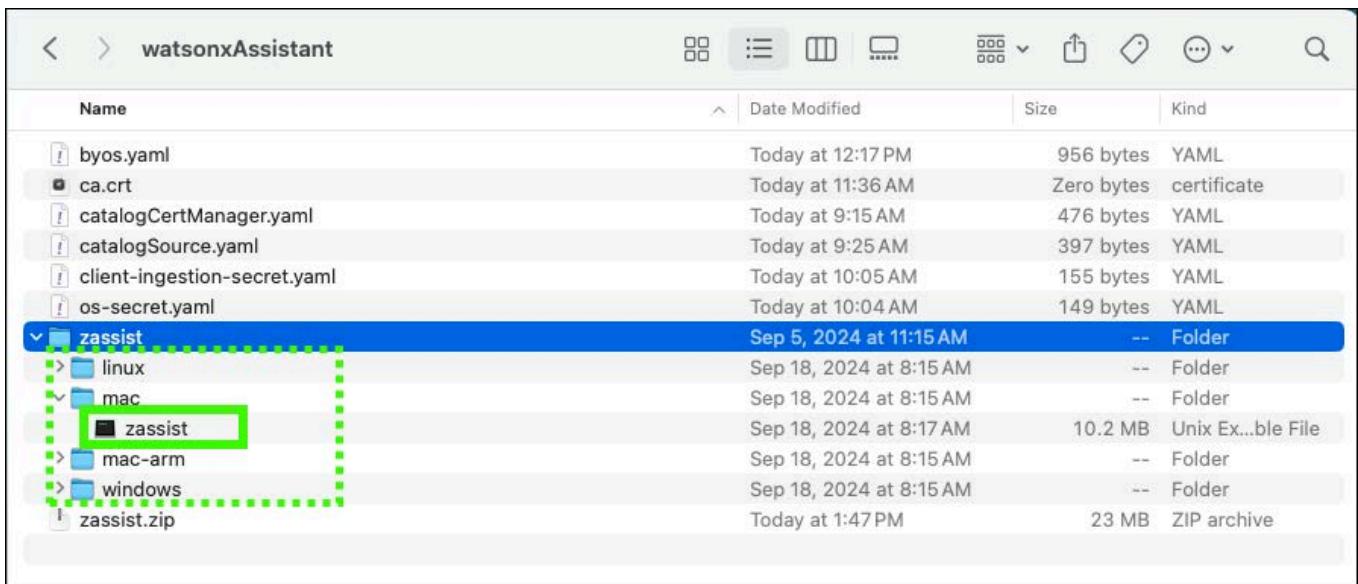
The utility is available to clients through [IBM Passport Advantage](#).

1. Click the following link and download the **zassist.zip** file.

<https://ibm.box.com/s/j3nt5iw4fqd5w2jgcqwxnjlsu8bpvl77>



2. Extract the **zassist.zip** file.
3. Locate the appropriate file for your local workstation's operating system.



4. Either copy the appropriate **zassist** file to a directory in your PATH, or add the appropriate directory to your PATH environment variable.

Additional information for running the preceding tasks can be found [here](#).



#### Windows users may need to rename the file **zassist** file!

If the **zassist** file does not execute properly, rename the file to **zassist.exe**.

5. Run the **zassist** command to verify that it is working.

```
zassist
andrewjones@Andrews-MacBook-Pro watsonxAssistant % PATH=$PATH:.
andrewjones@Andrews-MacBook-Pro watsonxAssistant % zassist
zassist: error: expected one of "version", "init", "login", "ingest", "load", ...
andrewjones@Andrews-MacBook-Pro watsonxAssistant %
```



Mac/OS users may need to adjust security settings.



The **zassist** binary may cause a security exception. Adjust the security settings by opening the **System Settings** utility and clicking **Privacy & Security**. Under **Security** locate the message about the **zassist** binary and click **Allow Anyway**. Return to the terminal window and try running the command again.

## Ingest client documentation using zassist

With the **zassist** command installed, you are now able to begin ingesting data.

Step-by-step guidance for ingesting documents using **zassist** is provided in the IBM watsonx Assistant for Z documentation.

1. Download the `BYOD.zip` file.

[BYOD.zip](#)



### What is in the sample client documentation?

Three sample documents are included:

- `Mainframe_COBOL_Error_Codes.pdf`

This is a document containing company-specific mainframe COBOL error codes for their application.

Developers within the organization typically review this document to quickly diagnose issues based on the application error codes returned.

- `Mainframe_Operational_Incidents_Log.pdf`

This document is leveraged by the organization's operational support team and contains historical records of production-level incidents that occurred. For each incident, there's a record of what the incident was, the date, how it was resolved and who was involved in resolving the incident.

- `COBOL-CICS-to-Java-Internal-Framework.pdf`

This document is leveraged by the development team and contains details about the organization's internal framework for developing applications consisting of legacy COBOL CICS interoperating with new Java code. Within the document contains company-specific coding practices and code syntax that the developers frequently reference.

2. Extract the `BYOD.zip` file.
3. Change to the `BYOD` directory.
4. Set the `TLS_VERIFY` environment variable to `false`.

Mac OS:

```
export TLS_VERIFY=false
```

Windows OS:

```
set TLS_VERIFY=false
```

Windows OS PowerShell:

```
Set-Item Env:\TLS_VERIFY "false"
```

5. Initialize the `zassist` environment.

```
zassist init
```

6. Retrieve the server URL for the client ingestion server.

Mac OS:

```
echo https://$(oc -n wxa4z-byos get route wxa4z-client-ingestion -o jsonpath=".spec.host")
```

The output of this command is your unique URL for your client ingestion server.

Windows OS (this method can also be used by Mac OS users):

You can retrieve the URL in your OCP Web console by navigating to Networking Routes and then copy the URL for the **wxa4z-client-ingestion** route.

Name	Status	Location	Service
HTTP wxa4z-client-ingestion	Accepted	https://wxa4z-client-ingestion-wxa4z-byos.apps.67850b0240c621f33ba8749.ocp.techzone.ibm.com	wxa4z-client-ingestion
HTTP wxa4z-opensearch-wrapper	Accepted	https://wxa4z-opensearch-wrapper-wxa4z-byos.apps.67850b0240c621f33ba8749.ocp.techzone.ibm.com	wxa4z-opensearch-wrapper

7. Retrieve the `client-ingestion-authkey`.

```
oc -n wxa4z-byos get secret client-ingestion-authkey -o jsonpath=".data.authkey" | base64 -d
```

The output of this command is your unique auth-key that you had previously set. You will need the output of both previous commands in the next step.

✖ If the command doesn't work for you...

You can find your `authkey` value by viewing the `client-ingestion-secret.yaml` file you created and copying the value set for the `authkey` parameter.

8. Login to your server. Replace <server url> with the value from step 6.

```
zassist login <server url>
```

9. When prompted, enter the password from step 7. Verify that a **Success** message is received.

10. Verify `zassist` is ready to ingest documents by checking the status.

```
zassist status
```

```
andrewjones@Andrews-MBP BYOD % export TLS_VERIFY=false
andrewjones@Andrews-MBP BYOD % zassist init
andrewjones@Andrews-MBP BYOD % echo https://$(oc -n wxa4z-byos get route wxa4z-client-ingestion -o jsonpath=".spec.host")
https://wxa4z-client-ingestion-wxa4z-byos.apps.67850b0240c6211133ba8749.ocp.techzone.ibm.com
andrewjones@Andrews-MBP BYOD % oc -n wxa4z-byos get secret client-ingestion-authkey -o jsonpath=".data.authkey" | base64 -d
[REDACTED]
andrewjones@Andrews-MBP BYOD % zassist login https://wxa4z-client-ingestion-wxa4z-byos.apps.67850b0240c6211133ba8749.ocp.techzone.ibm.com
Enter Password: *
Success
andrewjones@Andrews-MBP BYOD % zassist status
Gathering local files...
Local    Ingested    Loaded    Path
yes      no          no        dev/COBOL-CICS-to-Java-Internal-Framework.pdf
yes      no          no        dev/Mainframe_COBOL_Error_Codes.pdf
yes      no          no        ops/Mainframe_Operational_Incidents_Log.pdf
andrewjones@Andrews-MBP BYOD %
```

11. Ingest the documentation using the commands.

For the next steps, you must be in the root directory called BYOD.

```
zassist ingest dev
```

```
zassist ingest ops
```

12. Upload the ingested documents.

```
zassist load dev
```

```
zassist load ops
```

13. Verify that all documents were successfully ingested and loaded.

```
zassist status
```

```

andrewjones@Andrews-MBP BYOD % zassist ingest dev
Gathering local files...
Comparing uploaded files with local files...
Uploaded 2 documents
Started 2 embedding jobs
Completed 2 embedding jobs
andrewjones@Andrews-MBP BYOD % zassist ingest ops
Gathering local files...
Comparing uploaded files with local files...
Uploaded 1 documents
Started 1 embedding jobs
Completed 1 embedding jobs
andrewjones@Andrews-MBP BYOD % zassist load dev
Gathering local files...
Loaded 2 documents into Opensearch database
andrewjones@Andrews-MBP BYOD % zassist load ops
Gathering local files...
Loaded 1 documents into Opensearch database
andrewjones@Andrews-MBP BYOD % zassist status
Gathering local files...
Local Ingested Loaded Path
yes yes yes dev/COBOL-CICS-to-Java-Internal-Framework.pdf
yes yes yes dev/Mainframe_COBOL_Error_Codes.pdf
yes yes yes ops/Mainframe_Operational_Incidents_Log.pdf
andrewjones@Andrews-MBP BYOD %
andrewjones@Andrews-MBP BYOD %

```

## Verify that the assistant is using the ingested documents

Use the Watsonx Orchestrate AI assistant builder to verify your document ingestion.

1. Enter the following prompt in your assistant and **record the response** (cut and paste into a text file on your local machine).

The customer application is failing with ERR-CBL-001, what does this internal error mean?

The screenshot shows the Watsonx Orchestrate AI assistant builder interface. At the top, there are tabs for "IBM Watsonx Orchestrate", "AI assistant builder", and "Zeeves". Below the tabs, there are buttons for "Copy link to share", "Change layout", "Change background", and "Customize web chat". On the left, there is a sidebar with various icons. The main area is titled "Preview assistant" and contains the name "Zeeves". Below the name is a blue owl icon. The text "Hi! I'm Zeeves. How can I help you today?" is displayed. At the bottom, there is an input field containing the prompt "The customer application is failing with ERR-CBL-001, what does this internal error mean?". To the right of the input field is a blue arrow pointing downwards, indicating where the AI's response will appear.

2. Click the **Down arrow** to view the citations for the response.

The customer application is failing with ERR-CBL-001, what does this internal error mean?

1:57 PM

The customer application is encountering the internal error ERR-CBL-001, which means that a null value was encountered in a mandatory field. This error typically occurs when a required field in the application is left blank or contains a null value. It is important to investigate and resolve this issue as soon as possible to ensure the proper functioning of the application.

Accuracy of generated answers may vary.

Type something...

### 3. Click View source for the Mainframe\_COBOL\_Error\_Codes-... citation.

The customer application is failing with ERR-CBL-001, what does this internal error mean?

1:57 PM

The customer application is encountering the internal error ERR-CBL-001, which means that a null value was encountered in a mandatory field. This error typically occurs when a required field in the application is left blank or contains a null value. It is important to investigate and resolve this issue as soon as possible to ensure the proper functioning of the application.

**CDBL0001E**  
The z/TPF debugger works as a client in debug sessions, where TPF Toolkit is listening for the requests from the z/TPF debugger. pgmname The name of the program that the error originated...

**Mainframe\_COBOL\_Error\_Codes....**  
ERR-CBL-001: Null value encountered in mandatory field.

**View source**

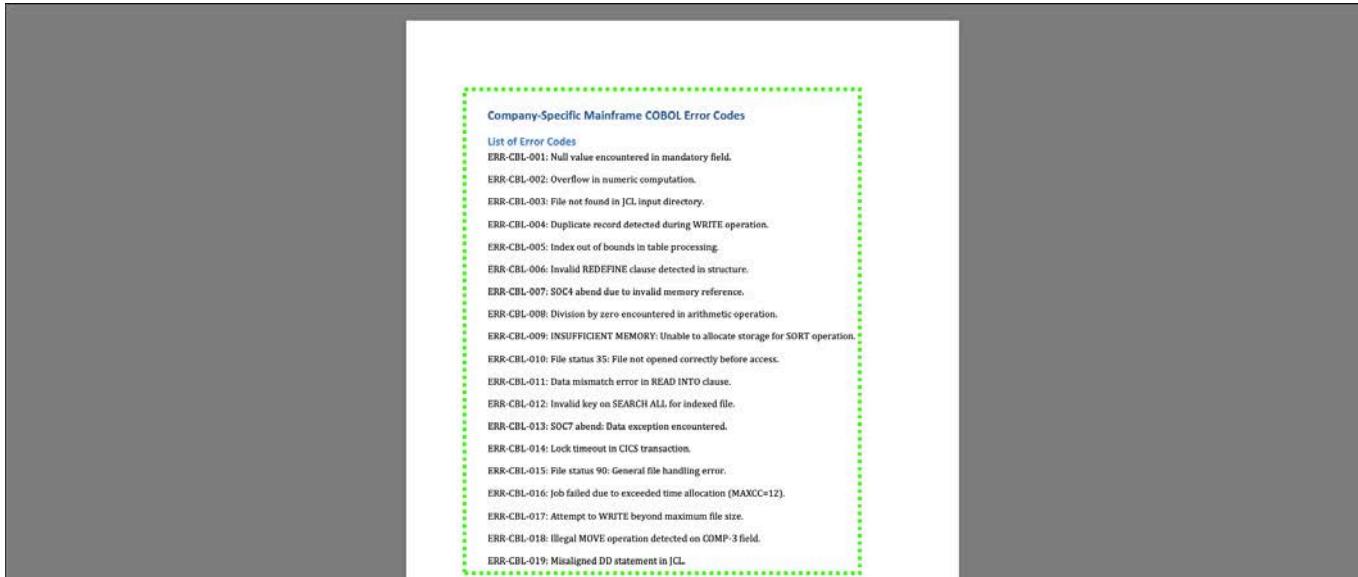
Accuracy of generated answers may vary.



**Take note of the order of the response citations!**

### 4. Accept the security risk to view the source document for any ingested document cited.

The steps to accept the security risk for the document are not shown as it varies by the browser you are using. The risk occurs because the certificate for the connection to the SNO instance is not secure. Notice that the URL contains the path to your SNO instance route.



5. Repeat the preceding steps for the following prompts in your assistant and **record the responses** (cut and paste into a text file on your local machine).

Are there any production incidents that were resolved in relation to Data corruption in the production database. If yes who can I collaborate with to resolve a similar issue today and what are their names?

What specific syntax changes do I need to make in COBOL to call Java using the internal framework? Please provide a detailed explanation.

What is the internal git lab link to execute the Java on z/OS pipeline?

## Adjusting the search behavior

Do you recall the **Metadata** field when you configured your assistant?

The screenshot shows the 'Custom service' tab in the IBM Watson Assistant AI Assistant Builder. The 'Metadata' field is highlighted with a green dashed border. The field contains a JSON example: 
 

```
{
      "example_field": "example_value",
      "other_example_field": 7
    }
```

The Metadata field provides a way to adjust your assistant's behavior during conversational search for your OpenSearch instance. Now that you have your own docs that are ingested for conversational search, you can set the metadata field for your assistant to use those documents in its content-grounded search. If you leave the metadata field empty, then it defaults to settings found to perform well but may not use the ingested documents as part of the search results.

If you leave the Metadata field empty, OpenSearch relies on the default settings, which means OpenSearch searches all the default IBM-provided documentation and all of the ingested customer documentation using the following value:

```
{"ibm_indices": "*_ibm_docs_slate, *_ibm_redbooks_slate",
 "customer_indices": "customer_*"}
```

Replacing the wildcard string with an explicit list of indices allows for personalization. The metadata setting is where you can input specific indices (pointing to the underlying documentation) that you want your assistant to use for the content-grounded search. There are over 220 products and topics that the OpenSearch instance has IBM Documentation for. You can find those indices and products [here](#).

You can input a subset of indices into the “Metadata” field in cases where you want your assistant to only gather context for specific IBM products or topics. The specific indices can be listed out in this format:

```
{"ibm_indices": "<comma separated index values>", "customer_indices": "customer_*"}
```

For example, if you want your assistant to reference only documentation for “Db2 Analytics Accelerator for z/OS” and no ingested client documentation, you can enter the following into the metadata field:

```
{"ibm_indices": "ss4lq8_ibm_docs_slate"}
```

If you have a mix of IBM Documentation and client documentation ingested, then there's an optional search string that you can use to set the "weights" used for each.

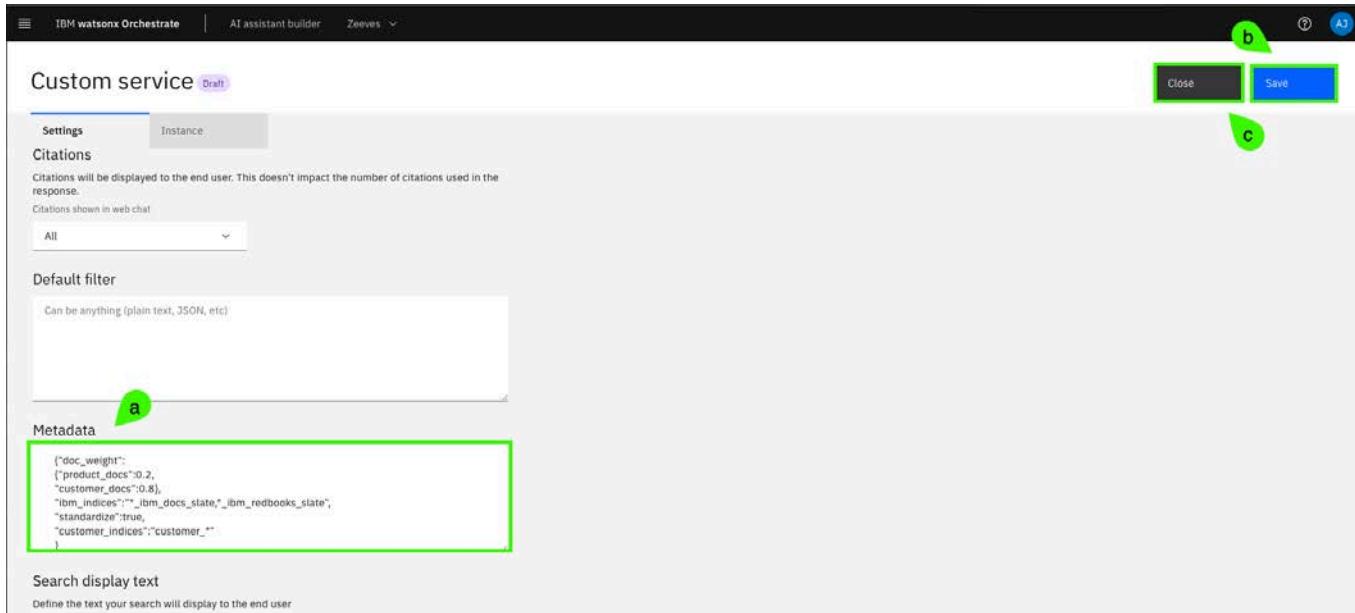
For example:

```
{"doc_weight":  
{"product_docs":0.5,  
"customer_docs":0.5},  
"ibm_indices":"*_ibm_docs_slate,*_ibm_redbooks_slate",  
"standardize":true,  
"customer_indices":"customer_*"  
}
```

In this case, "product\_docs" is the weight that is assigned to "ibm\_indices" and "customer\_docs" is the weight that is assigned to "customer\_indices". For more information on customizing the metadata field for conversational search, refer to this supplemental video found [here](#).

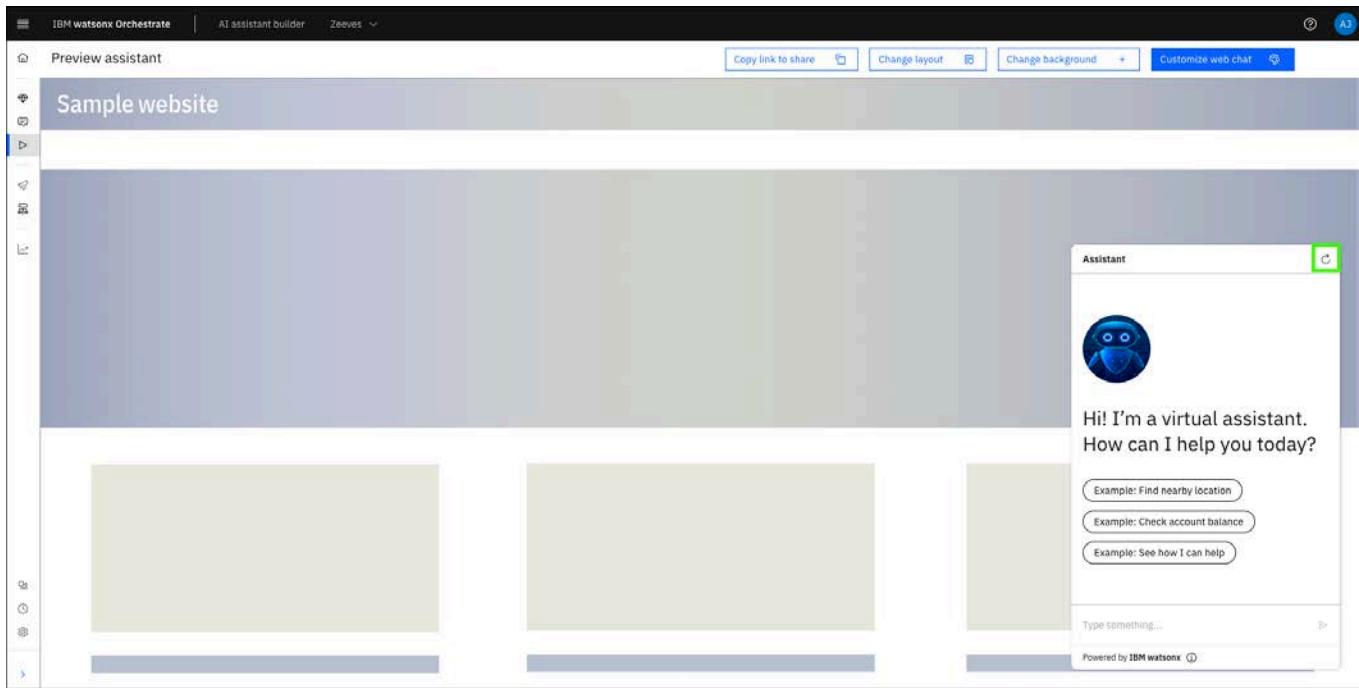
1. Set the (a) **Metadata** field for your BYOS custom search instance to the following value, click (b) **Save**, and then click (c) **Close**. Notice the weight for **customer\_docs** is heavier than the weight for **product\_docs**.

```
{"doc_weight":  
{"product_docs":0.2,  
"customer_docs":0.8},  
"ibm_indices":"*_ibm_docs_slate,*_ibm_redbooks_slate",  
"standardize":true,  
"customer_indices":"customer_*"
```



2. Hover over the **Home** (🏠) icon and click **Preview**.

3. Click the **Restart conversation** (⟳) icon.



#### 4. Repeat the queries four queries run earlier and record the results and the order of the response citations.

Compare the two sets of results. Notice how the answers changed based on the weighting of the ingested documents versus the IBM product documentation. Were the ingested documents always the first document cited? If not, why do you think that is?

Before proceeding, experiment with different metadata and other configuration settings for your custom service instance.

 **For client pilots**

If you or your client have other documents to ingest, you can do so by repeating the steps using **zassist**. The Velocity Pilot ITZ environment is limited in compute and storage capacity. The following limits should be adhered to:

- Loading documents can take a long time, especially with > 100 MB of text.
- It is recommended to run large loads late at night.
- When loading, ensure your workstations does not sleep during the process.
- If you receive a **batch time error**, set the batch size to a lower number for that command. For example:

```
zassist ingest . -s 50
```

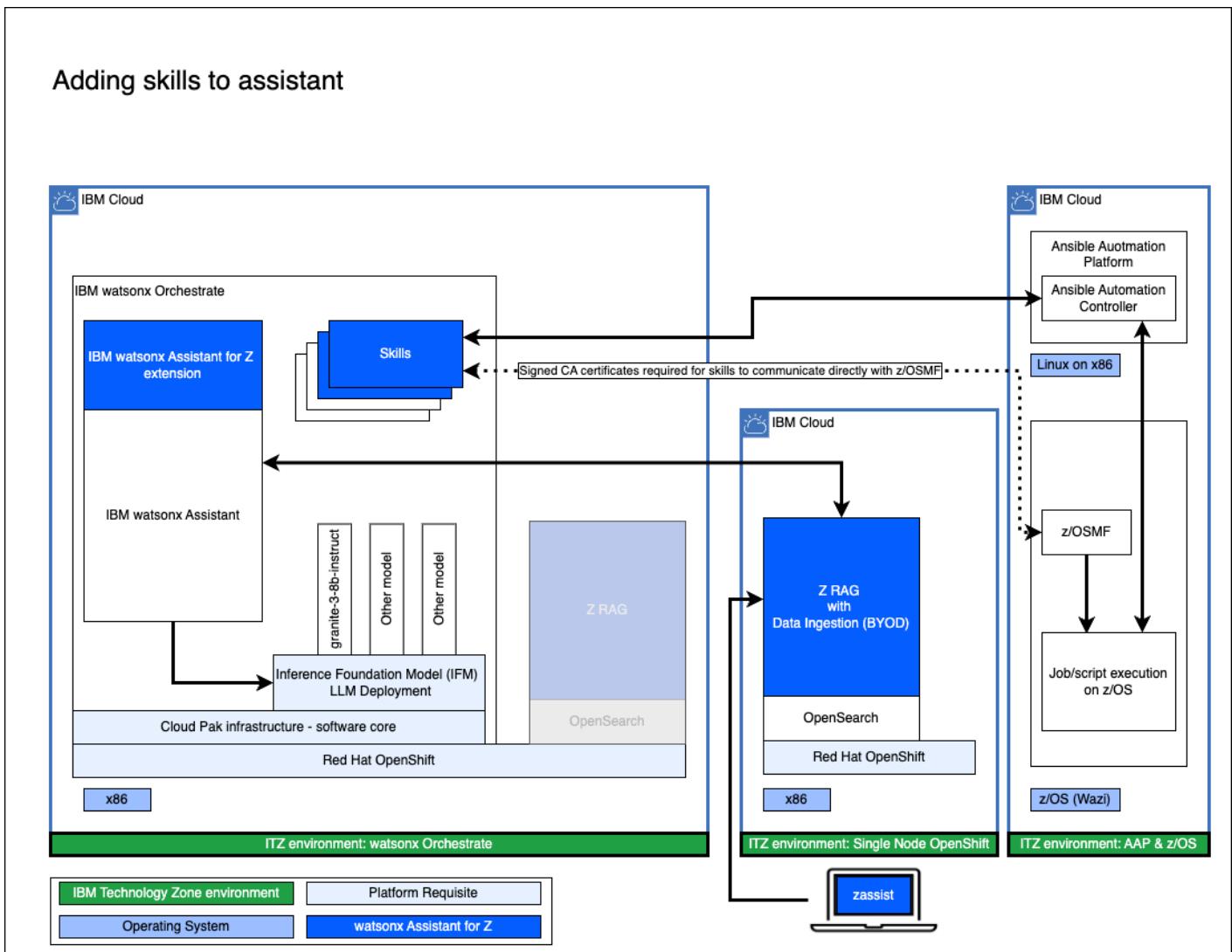
## Skills and skill flows

# Getting started with skills and actions

Watsonx Assistant for Z automates a range of IBM Z related tasks through assistant interactions by importing skills. Each skill is a pre-defined automation that accomplishes some unit or units of work by running tasks. For example, skills can view z/OS IPL information or work with z/OS datasets.

Watsonx Assistant for Z extends Watsonx Orchestrate, allowing users to build new skills from Ansible Automation platform or z/OS Management Facility (z/OSMF) through the Z Skills Accelerator extension. The Z Skills Accelerator extension connects Ansible and z/OS application programming interfaces (APIs) and imports automation as Ansible Playbooks, JCL, or REXX as skills. Learn more importing and building skills [here](#).

A high-level, logical architecture of the environment is illustrated in the figure that follows.



## Environments

### Watsonx Orchestrate

The Z Skills Accelerator extension is already configured in your watsonx Orchestrate IBM Technology Zone (ITZ) environment. You can use this component to import new skills.

## Ansible Automation Platform and Wazi as a Service

To import skills for automations, you use Ansible Automation Platform (AAP) and Wazi as a Service (Wazi aaS) to serve as the z/OS back-end. Learn more about AAP [here](#). Learn more about Wazi, [here](#).

The two resources are provisioned together in the ITZ environment that you reserved earlier. This environment enables the ability to manage and automate z/OS tasks and subsystems with various preinstalled Ansible playbooks. It includes a z/OS back-end (Wazi as a Service) with all needed prerequisites.

The playbooks provided cover various use cases for automating z/OS management. Ansible's capabilities for automating various Z-specific tasks are not limited to the use cases that are preinstalled in the AAP instance. The preinstalled playbooks are tasks from the 'IBM z/OS core collection'. Using this environment accelerates the ability to showcase the value of watsonx assistant for Z, and to get started with simple automations that can be expanded.

The ITZ environment gives you access to AAP, which is preconfigured to target the accompanying z/OS Wazi system, along with web-based access to AAP to experiment with different playbook templates. These templates are imported into watsonx Orchestrate as skills and connected to your assistant.

For more information on the AAP and Wazi z/OS environments, refer to this [document](#).

The playbook templates that are preinstalled in AAP cover various use cases, which you can explore, including:

- z/OS Certificate Management (create, delete, list, and renew certificates)
- dataset management (create, delete, fetch datasets)
- Submit JCL
- Run Operator commands
- Run TSO commands
- And more

Each of the sections that follow build upon each other. Complete each to successfully enhance your assistant by starting with [Explore Ansible Automation Platform](#).

# Explore Ansible Automation Platform

After you reserved the Ansible Automation Platform (AAP) and Wazi z/OS environment in IBM Technology Zone (ITZ) and the reservation is in the **Ready** state, follow these steps to explore AAP.

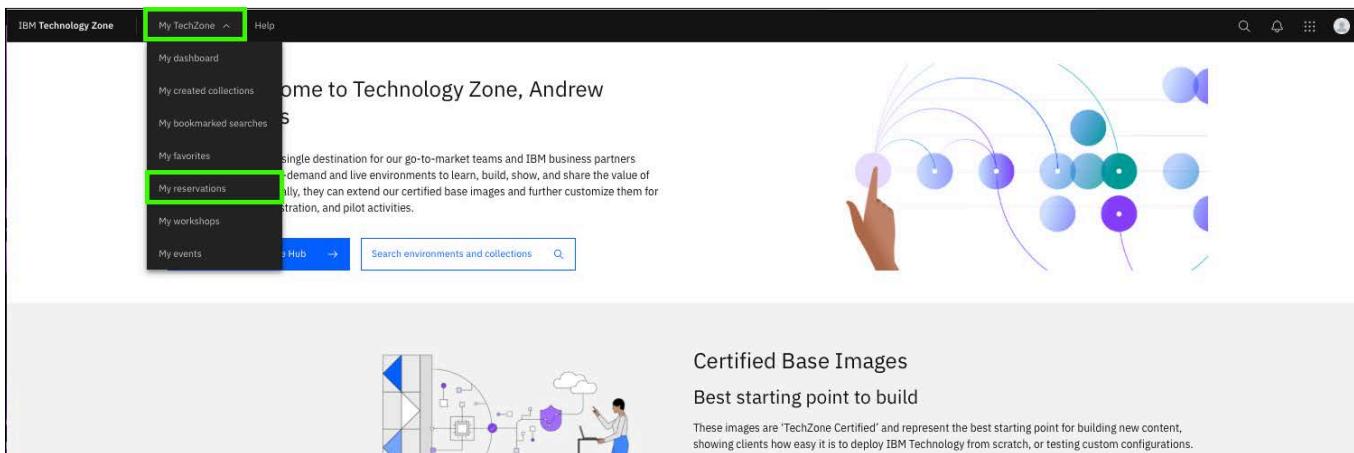
## Access the AAP and Wazi as a Service environment

### Be sure to record the information as instructed

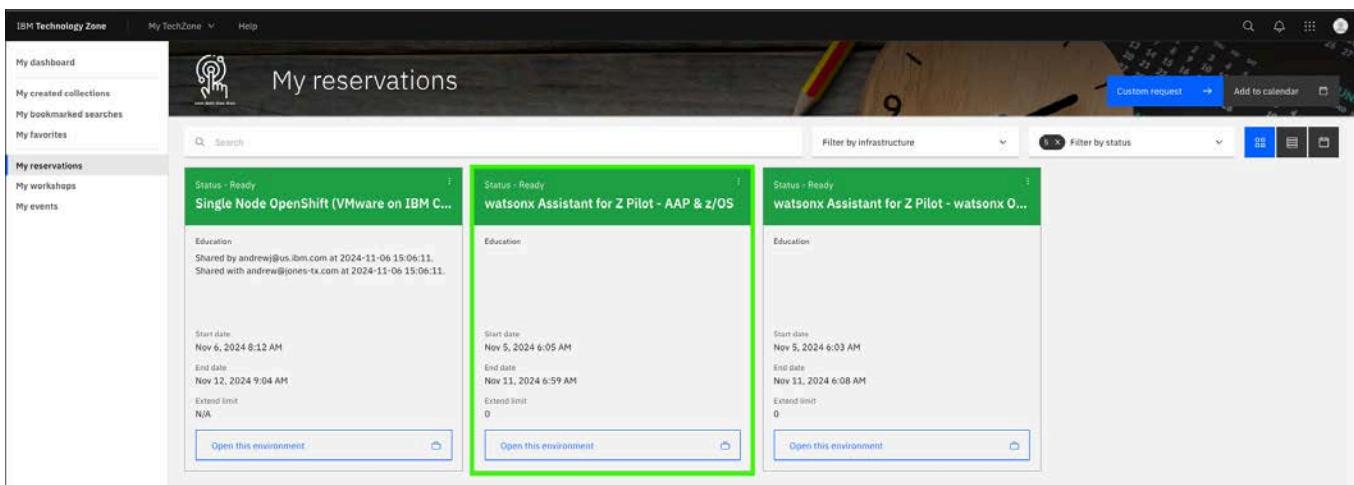
Several of the steps below instruct you to record values from your ITZ reservation. Be sure to do this as they will not only be used in this section, but also in later sections of the lab guide.

1. In the IBM Technology Zone portal, expand **My TechZone** and select **My Reservations**, or click the following link.

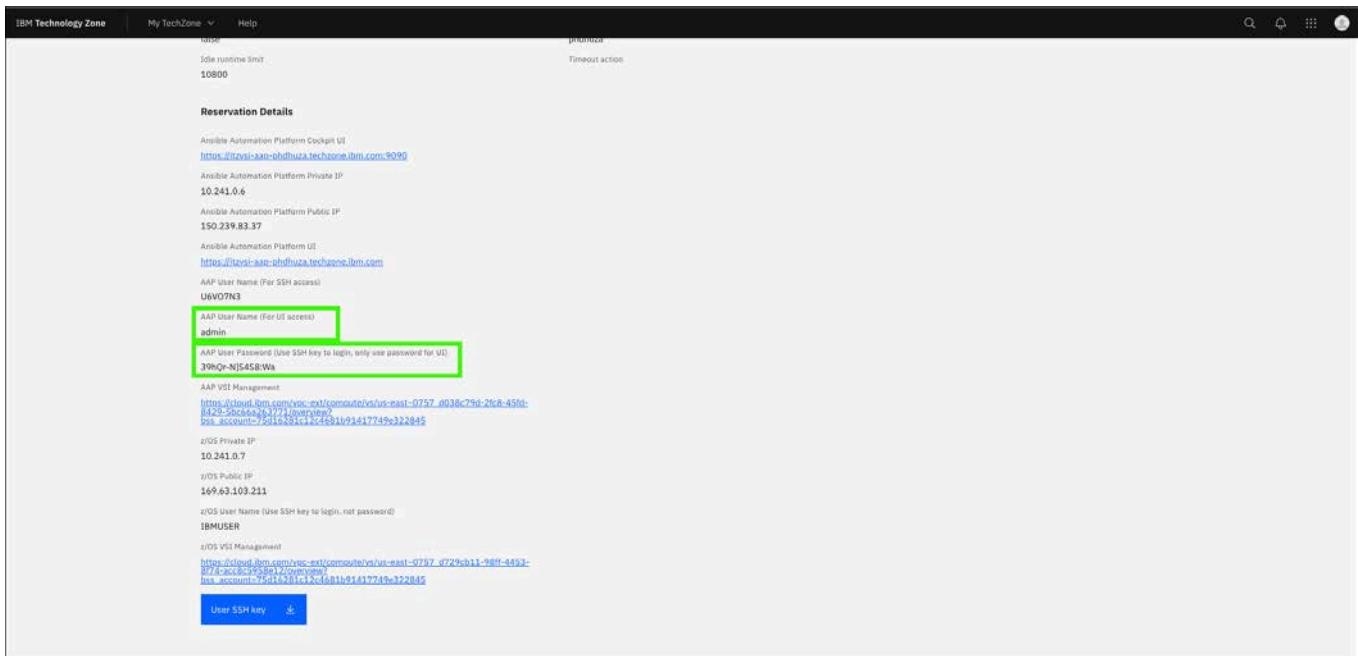
#### [ITZ My reservations](#)



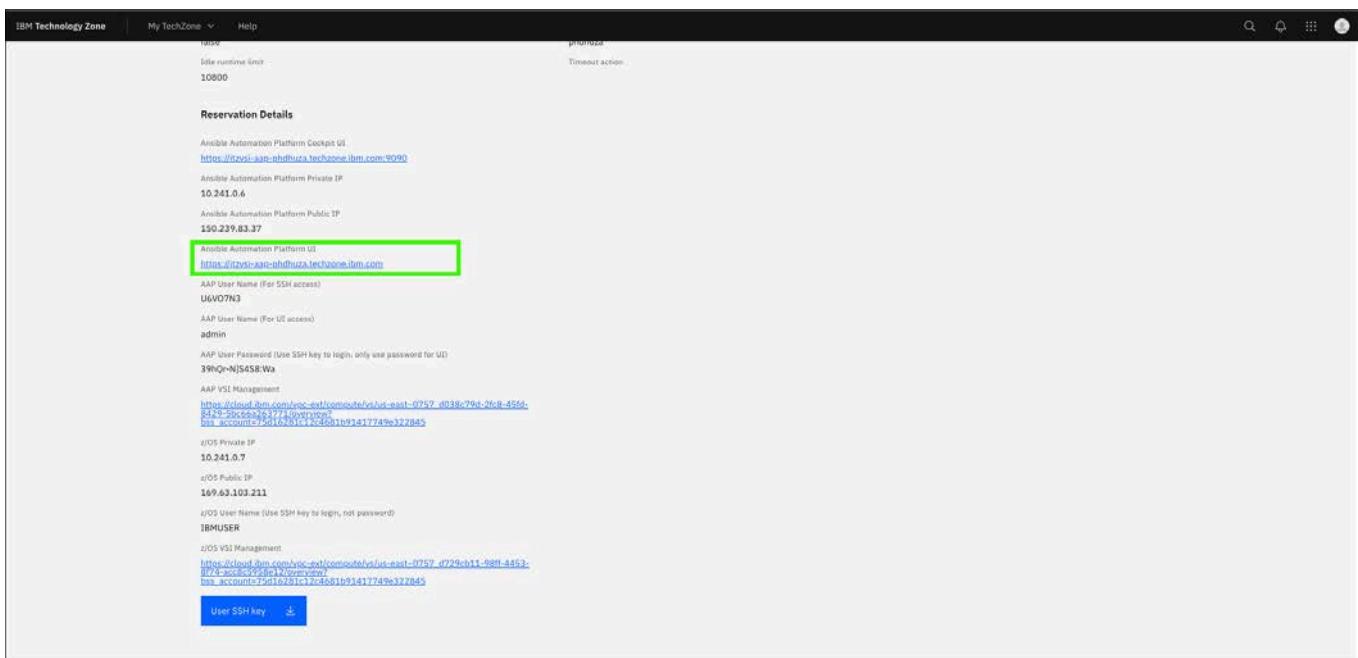
2. Click the **watsonx Assistant for Z Pilot - AAP & z/OS** tile.



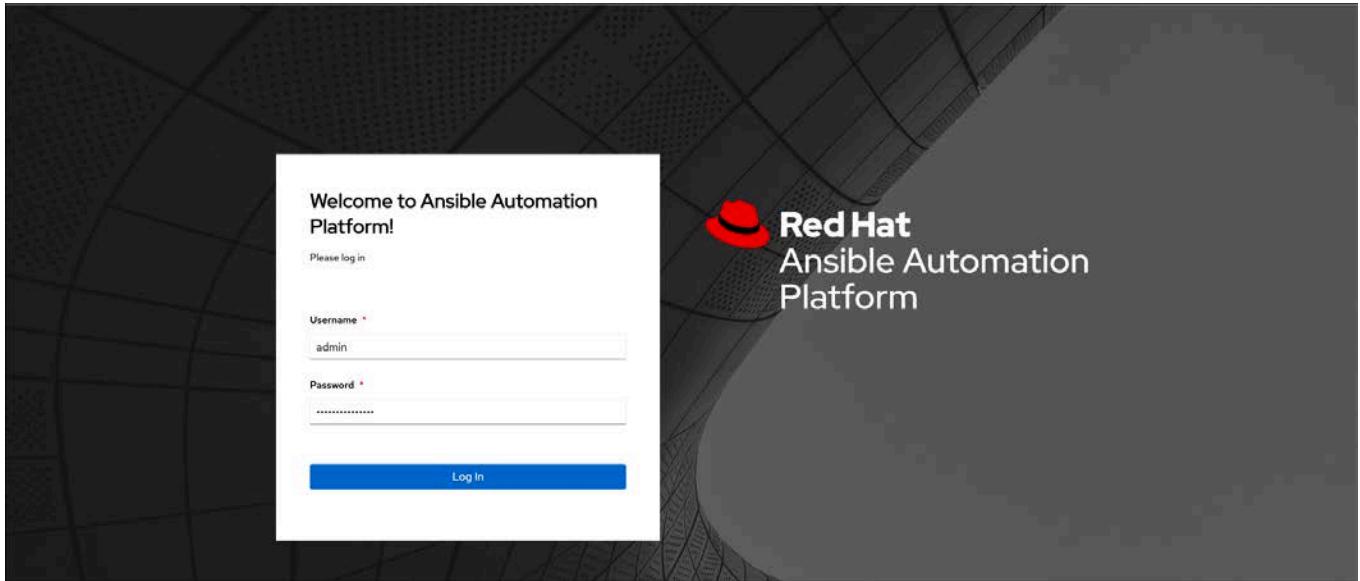
3. Locate and record the **AAP User Name (For UI access)** and **AAP User Password** fields.



#### 4. Record and then click the Ansible Automation Platform UI link.



#### 5. Enter the **Username** and **Password** that is recorded in step 3 and click **Log In**.

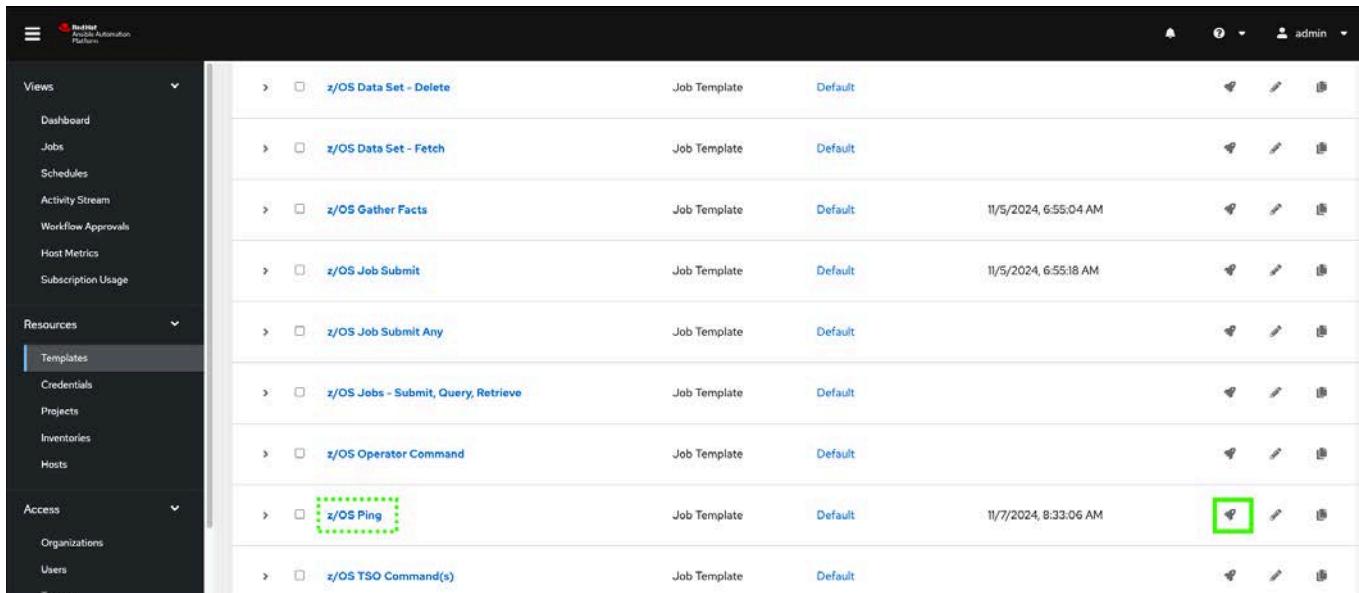


6. Click **Templates** under the **Resources** section.

**i** The AAP instance is preconfigured to the Wazi aaS instance

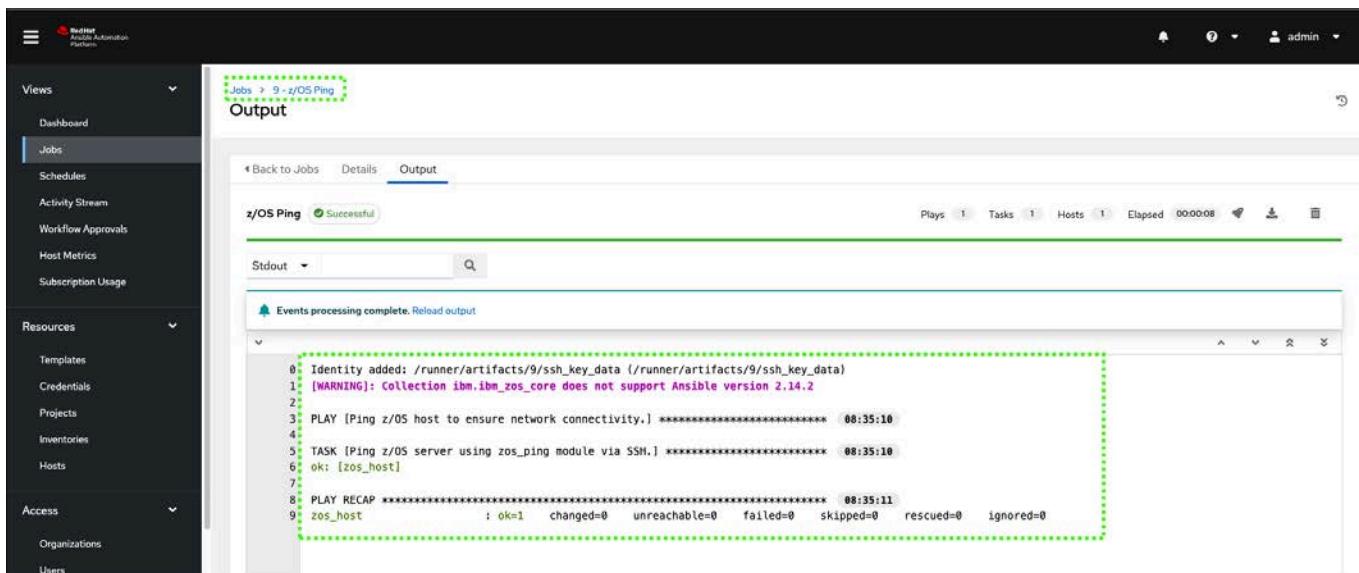
Note that because the AAP instance and the back-end z/OS system are preconfigured, no changes are needed to execute the templates and they will target your provisioned z/OS system by default.

7. Locate the **z/OS Ping** template and click the rocket (🚀) icon to start the template.



Views	<a href="#">z/OS Data Set - Delete</a>	Job Template	Default	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Dashboard	<a href="#">z/OS Data Set - Fetch</a>	Job Template	Default	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Schedules	<a href="#">z/OS Gather Facts</a>	Job Template	Default	11/5/2024, 6:55:04 AM <a href="#"></a> <a href="#"></a> <a href="#"></a>
Activity Stream	<a href="#">z/OS Job Submit</a>	Job Template	Default	11/5/2024, 6:55:18 AM <a href="#"></a> <a href="#"></a> <a href="#"></a>
Workflow Approvals	<a href="#">z/OS Job Submit Any</a>	Job Template	Default	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Host Metrics	<a href="#">z/OS Jobs - Submit, Query, Retrieve</a>	Job Template	Default	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Subscription Usage	<a href="#">z/OS Operator Command</a>	Job Template	Default	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Resources	<a href="#">z/OS Ping</a>	Job Template	Default	11/7/2024, 8:33:06 AM <a href="#"></a> <a href="#"></a> <a href="#"></a>
Access	<a href="#">z/OS TSO Command(s)</a>	Job Template	Default	<a href="#"></a> <a href="#"></a> <a href="#"></a>

## 8. Observe the z/OS Ping job run.



Jobs > 9 - z/OS Ping

Output

Events processing complete. Reload output

```

8 Identity added: /runner/artifacts/9/ssh_key_data (/runner/artifacts/9/ssh_key_data)
1 [WARNING]: Collection ibm.ibm_zos_core does not support Ansible version 2.14.2
2
3 PLAY [Ping z/OS host to ensure network connectivity.] *****
4
5 TASK [Ping z/OS server using zos_ping module via SSH.] *****
6 OK: [zos_host]
7
8 PLAY RECAP *****
9 zos_host : ok=1    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

Take time to explore the other templates that are ready to use. Learn more about the automation capabilities [here](#).

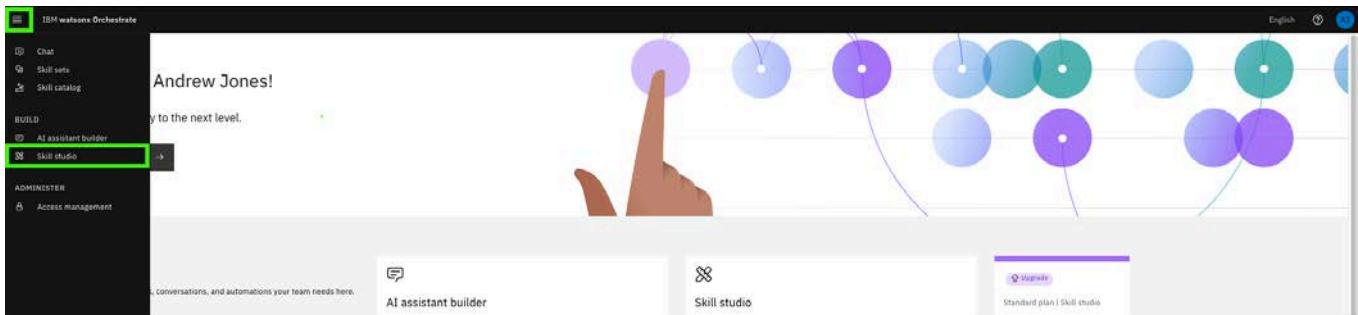
# Importing skills from Ansible Automation Platform

Now that you understand Ansible Automation Platform (AAP) and the preinstalled automations available, you can import them as skills into your watsonx Orchestrate instance, which is used for assistant guided actions.

## Import skills into your assistant

The next steps assume that you have an active browser window to the watsonx Orchestrate ITZ cloud account. If you do not, refer to the initial steps in [Creating an assistant and configuring conversational search](#).

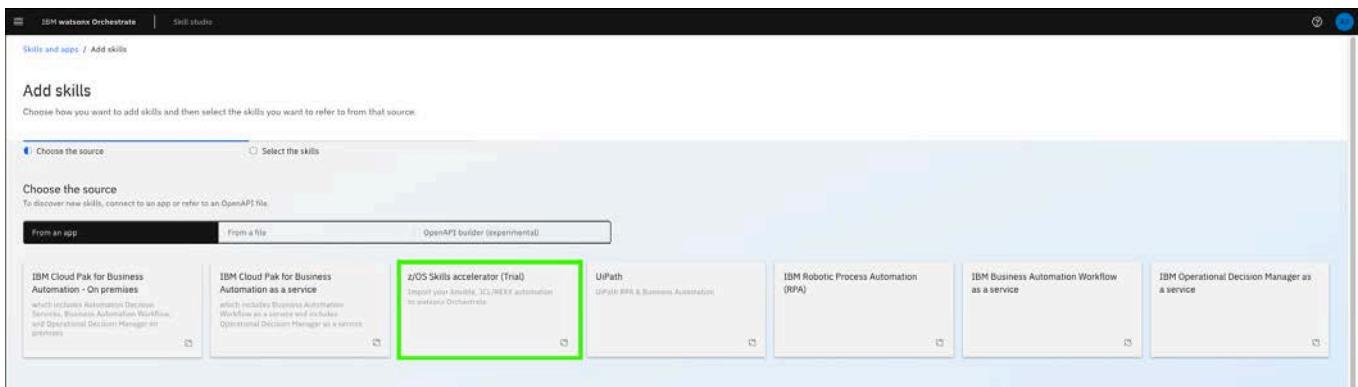
1. Return to your watsonx Orchestrate instance and expand the main menu and click **Skill studio**.



2. Expand **Create** and click **Import API**.



3. Click the **z/OS Skills accelerator (Trial)** tile.



4. Enter the following values in the **z/OS Skills accelerator** form and then click **Connect**.

Use the **URL**, **User Name**, and **Password** values recorded in the [Explore Ansible Automation Platform](#) section earlier.

**a:** Connection Type: ansible

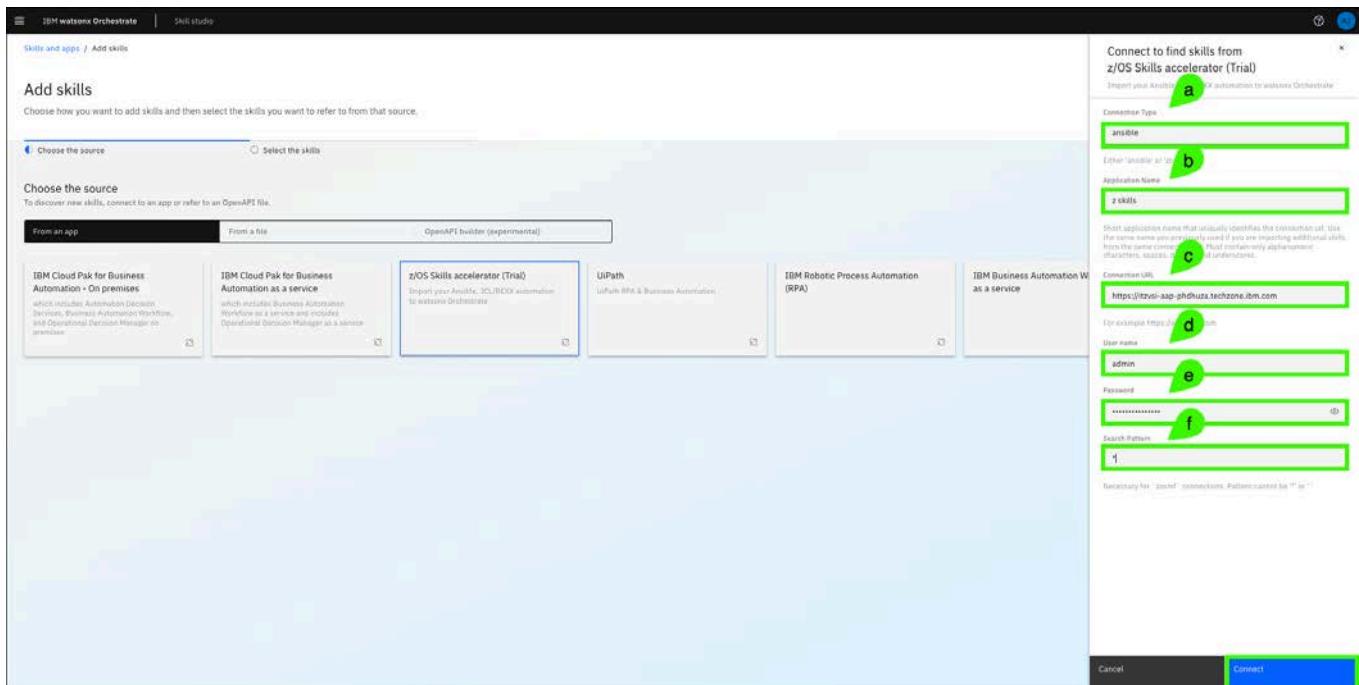
**b:** Application Name: <enter a meaningful name for the skills that you will import> - record this name, you will need in the next section

**c:** Connection URL: <enter the URL for your AAP UI>

**d:** User Name: <enter the AAP User Name (for UI access)>

**e:** Password: <enter the AAP User Password>

**f:** Search Pattern: \* (displays all skills available)

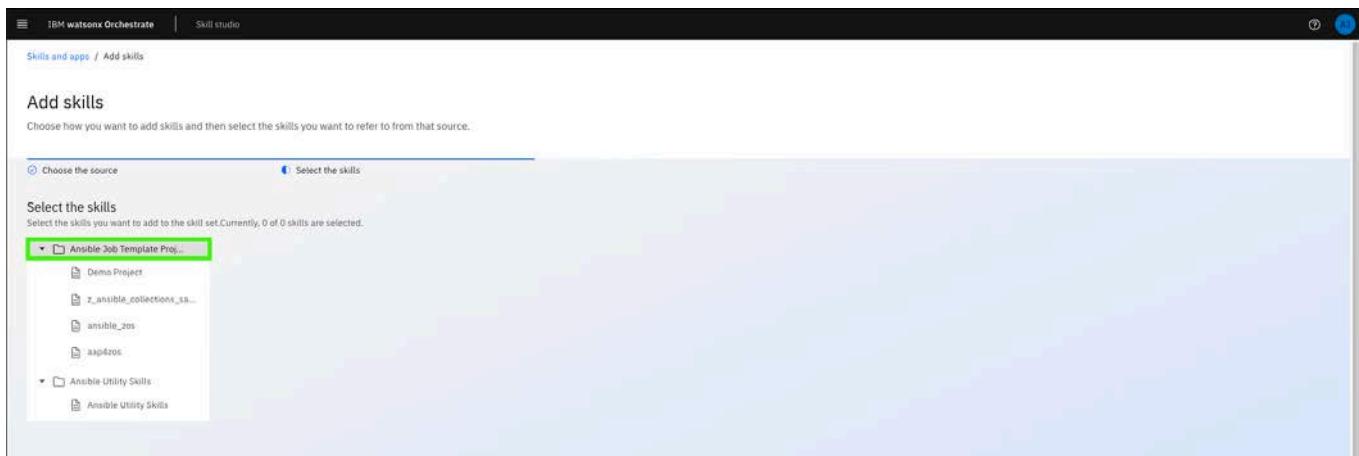


## 5. Expand the Ansible Job Template Proj... folder.



### Explore the other available skills

Take time to explore the available skills. There are many utility skills provided out of the box with the “Z Skills Accelerator” which are needed for actions such as retrieving the output of an Ansible skill. Consider importing these utility skills to enable more complete automation execution flows.



## 6. Click **aap4zos**.

Skill	Description	Status
Z/os ping	Z skills - this playbook pings...	Ready to add
Z/os gather facts	Z skills - this sample playbook...	Ready to add

## 7. Select the skills that you want to import into your application and then click **Save as draft**.

For this lab, select the **Z/os ping** and **Z/os gather facts** skills.

Skill	Description	Status
<input checked="" type="checkbox"/> Z/os ping	Z skills - this playbook pings...	Ready to add
<input checked="" type="checkbox"/> Z/os gather facts	Z skills - this sample playbook...	Ready to add

## 8. Click the ellipses (⋮) for the first skill and select **Enhance this skill**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

**Skills and apps** Projects

**Skills** Apps

Find a skill:

**Skills**

Name	Step in the process	Status	Skill type	Author	Last edited
z/OS Gather Facts	Just 1 step away to be ready	Ready to publish	Imported	andrew@jones-tx.com	November 19 2024
z/OS Ping	Just 1 step away to be ready	Ready to publish	Imported	andrew@jones-tx.com	November 19 2024

Configure prebuilt skills

Enhance this skill

Export this skill

Delete this skill

## 9. Review the skill enhancement options and then click **Publish**.

On the **Enhance this skill** page, you can specify enhancements to the default skill. Refer to this documentation for more information on enhancing skills.

Skills and apps / Enhance this skill

Enhance the "z/OS Gather Facts" skill

Add details that will make people want to use this skill.

Name: z/OS Gather Facts

Description: z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls z/OS-specific information from the z/OS host.

API version\*: 1.0

Categories: Add categories

App: Ansible Controller Skills - z skills

Preview

The skill will look like this in the catalog.

The skill will look like this in the skill set.

**Publish**

Cancel Save as draft

## 10. Repeat steps 8 and 9 for each skill you imported.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

**Skills and apps** Projects

**Skills** Apps

Find a skill:

**Skills**

Name	Step in the process	Status	Skill type	Author	Last edited
z/OS Gather Facts	Ready to use	Published	Imported	andrew@jones-tx.com	November 19 2024
z/OS Ping	Just 1 step away to be ready	Ready to publish	Imported	andrew@jones-tx.com	November 19 2024

Configure prebuilt skills

The selected skills are now ready for use and available to your assistant. In the next section, learn how to connect them to your assistant.

# Connecting skills to your assistant

Once you have a subset of skills that are published, the application you created can be connected to your assistant.

1. Expand the main menu and select **Skill sets**.

The screenshot shows the IBM Watsonx Orchestrate interface with the 'Skill studio' tab selected. On the left, the main menu is expanded, with 'Skill sets' highlighted. The central area displays a table of skills:

Step in the process	Status	Skill type	Author	Last edited
Ready to use		Imported	andrew@jones-tx.com	November 19 2024
Ready to use		Imported	andrew@jones-tx.com	November 19 2024
Ready to use		Imported	andrew@jones-tx.com	November 19 2024

2. Click the **Team Skills** drop-down and select the **Draft** of your assistant.

The screenshot shows the 'Team Skills' page. The 'Skill sets' dropdown is open, showing 'Team Skills' and 'Zeeves draft' (which is highlighted). Below the dropdown, there is a message about team skills. A table lists the skills under 'Name' and 'App' columns. At the bottom, there is a note about managing skills for the team.

3. Click the **Connections** tab.

The screenshot shows the 'Zeeves draft' skill set page. The 'Skills' tab is selected. Below it, there is a note about skills available to the team members. A table lists the skills under 'Name' and 'App' columns. At the bottom, there is a note about managing skills for the team.

4. Click the **Search (🔍)** icon.

Application	Number of skills	Credential type	Connected by ⓘ	Action
Activate or deactivate attracting candidates using ThisWay Global	4	Not specified		
Adobe Workfront	37	Not specified		
Alliance Virtual Office	2	Not specified		
Amazon S3	8	Not specified		
Amazon SES	10	Not specified		

Items per page: 5 | 1-5 of 78 items | 1 of 16 pages | ⌂ ⌃ ⌁

5. Search for the application name you specified in the previous section.

Application	Number of skills	Credential type	Connected by ⓘ	Action
Ansible Controller Skills - zskills	2	Not specified		

Items per page: 5 | 1-1 of 1 items | 1 of 1 page | ⌂ ⌃ ⌁

6. Click the ellipses (⋮) and click **Connect app**.

Application	Number of skills	Credential type	Connected by ⓘ	Action
Ansible Controller Skills - zskills	2	Not specified	⋮	Connect app

Items per page: 5 | 1-1 of 1 items | 1 of 1 page | ⌂ ⌃ ⌁

7. On the **Connect to Ansible Controller Skills** form, keep the defaults and click **Connect app**.

**Skill sets**

Zeeves draft

**Skills** **Connections**

These are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

Application	Number of skills	Credential type
Ansible Controller Skills - z skills	2	Not specified

Items per page: 5 1-1 of 1 items

**Connect to Ansible Controller Skills - z skills**

Member credentials  
Each team member uses their own credentials to connect to this app and use its skills.

Team credentials  
The admin sets the credentials each team member uses to connect to this app and use its skills.

You selected **Team credentials** for the credential type. Click **Connect app** to provide the credentials your team will use and to connect to the app.

**Connect app**

8. Enter the **username (a)** and **password (b)** using the username (admin) and password for your IBM Technology Zone (ITZ) watsonx Assistant for Z Pilot - AAP & z/OS reservation, and then click **Connect app (c)**.

**Skill sets**

Zeeves draft

**Skills** **Connections**

These are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

Application	Number of skills	Credential type
Ansible Controller Skills - z skills	2	Not specified

Items per page: 5 1-1 of 1 items

**Connect to Ansible Controller Skills - z skills**

a  
username  
admin  
b  
password  
\*\*\*\*\*

If the service instance uses legacy credentials for authentication, provide the password for the specified service.

**Connect app**

The application is now connected to the draft version of your assistant.

**Skill sets**

Zeeves draft

**Skills** **Connections**

These are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

Application	Number of skills	Credential type	Connected by	Action
Ansible Controller Skills - z skills	2	Not specified	andrew@jones-tx.com	

Items per page: 5 1-1 of 1 items

Continue to the next section to create actions for your assistant.

# Creating actions for your assistant

Now that the skills in your application are connected to your assistant, you are ready to create actions that are tied to those skills. Learn more about building actions [here](#)

## Configure the number of input fields

Before configuring actions, it is important to modify a setting within watsonx Orchestrate that allows triggered skills to display as forms (versus conversational skills).

1. Click your (a) profile icon and then click (b) **Settings**

Learn more about configuring input fields [here](#).

The screenshot shows the 'Skills' tab of the 'Zeeves draft' application in Watsonx Orchestrate. The sidebar on the left lists 'Skill sets' and 'Connections'. The main area shows a table of skills, with one row selected for 'Ansible Controller Skills - z-skills'. The right sidebar displays user information for 'Andrew Jones' (andrew@jones-tx.com), including 'Region: US-SOUTH', 'Plan: Essentials', and a 'Settings' link which is highlighted with a green box and labeled 'b'. The top right corner shows the user profile icon (highlighted with a green box and labeled 'a').

2. Click the **Skill configurations** tab.

The screenshot shows the 'Settings' page in Watsonx Orchestrate. The 'Skill configurations' tab is selected and highlighted with a green box. Other tabs include 'Data Retention' and 'Platform languages'. The 'Skill configurations' section contains a note: 'Set default for maximum number of fields to consider a skill to be conversational.' Below this is a field labeled 'Number of form fields' with a value of '0', which is also highlighted with a green box.

3. Enter 0 for the **Number of form fields**.

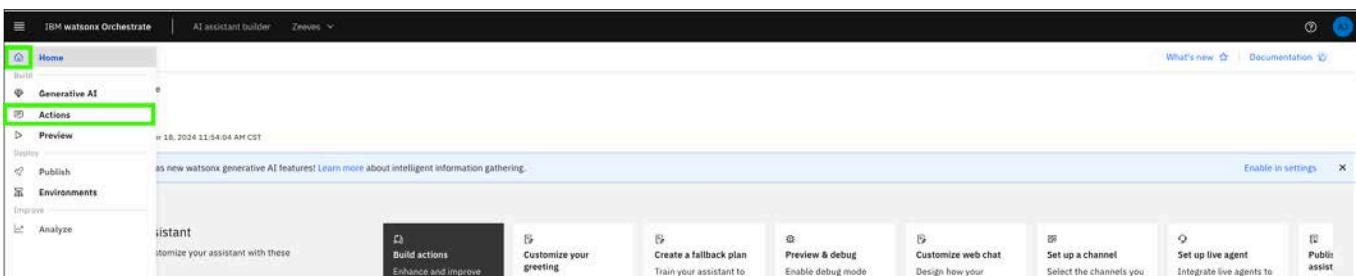
The screenshot shows the 'Settings' page in Watsonx Orchestrate, specifically the 'Skill configurations' section. The 'Number of form fields' field is highlighted with a green box and contains the value '0'. The other tabs ('Data Retention' and 'Platform languages') are visible at the top of the page.

## Create actions

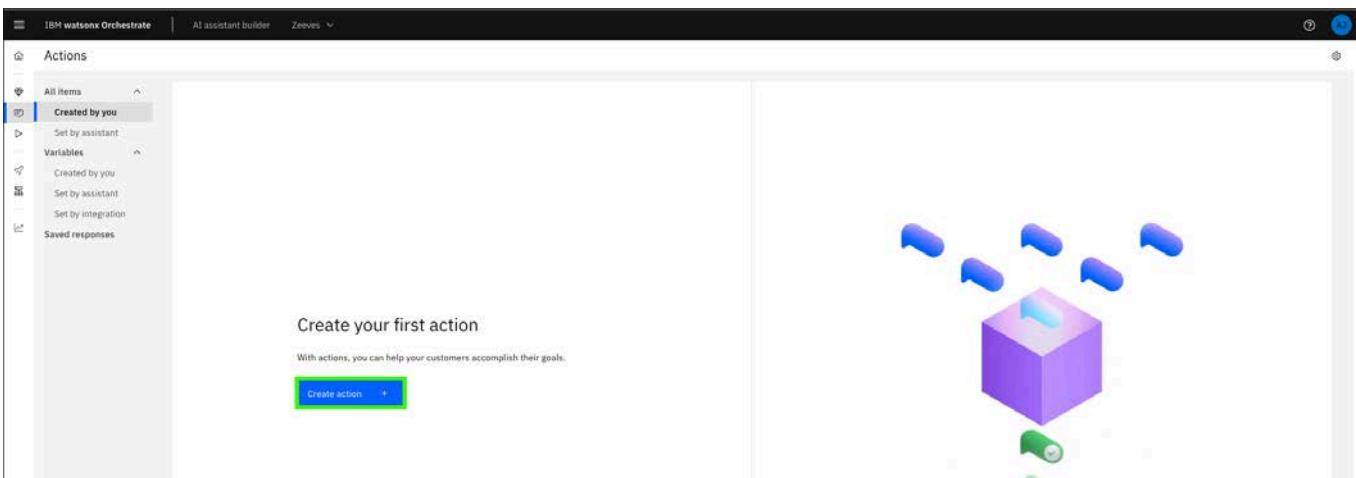
1. Click the main menu and select **AI assistant builder**.



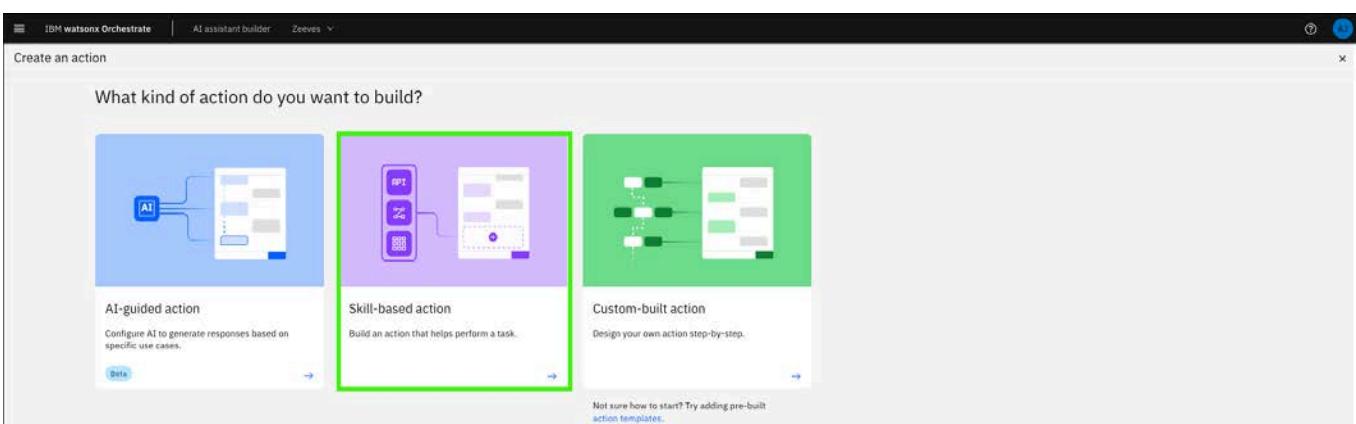
2. Hover over the **Home** icon ( ) and click **Actions**.



3. Click **Create action**.



4. Click the **Skill-based action** tile.



5. Select the **z/OS Gather Facts** tile and click **Next**.

Note, it may take a minute for the page to display the action tiles. The date that is shown in the **z/OS Gather Facts** tile reflects when you added the skill to your application.

The screenshot shows a list of actions available in the AI assistant builder. The 'z/OS Gather Facts' action is highlighted with a green border and a green callout pointing to it. The 'Next' button at the top right is also highlighted with a green border.

Action	Description	Last updated
<b>z/OS Ping</b>	z skills - This playbook pings the z/OS host to test connectivity.	2024-11-19T15:58:20.567Z
<b>z/OS Gather Facts</b>	z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls z/OS-specific information from the z/OS host.	2024-11-19T15:56:26.843Z
Summarize the Webex meeting transcript	in watsonx.ai	2024-11-04T10:49:16.502Z
Summarize the Box content	in watsonx.ai	2024-11-04T10:49:12.077Z
Summarize a Zendesk ticket	in watsonx.ai	2024-11-04T10:49:09.476Z
Summarize a ServiceNow incident	in watsonx.ai	2024-11-04T10:49:05.828Z
Summarize a Salesforce opportunity	in watsonx.ai	2024-11-04T10:49:01.769Z
Sharepoint document summary	in watsonx.ai	2024-11-04T10:48:55.707Z
Salesloft email summary	in watsonx.ai	2024-11-04T10:48:51.522Z
Salesforce case summarization	in watsonx.ai	2024-11-04T10:48:48.195Z
Salesforce case sentiment analyze	in watsonx.ai	2024-11-04T10:49:05.828Z
Outlook email summary	in watsonx.ai	2024-11-04T10:49:01.769Z
Github issue summarization	in watsonx.ai	2024-11-04T10:48:55.707Z
Github issue sentiment	in watsonx.ai	2024-11-04T10:48:51.522Z
Generate an email	in watsonx.ai	2024-11-04T10:48:48.195Z

- On the **New action** dialog, (a) enter a prompt a user of the assistant might use to initiate the action and then (b) click **Save**.

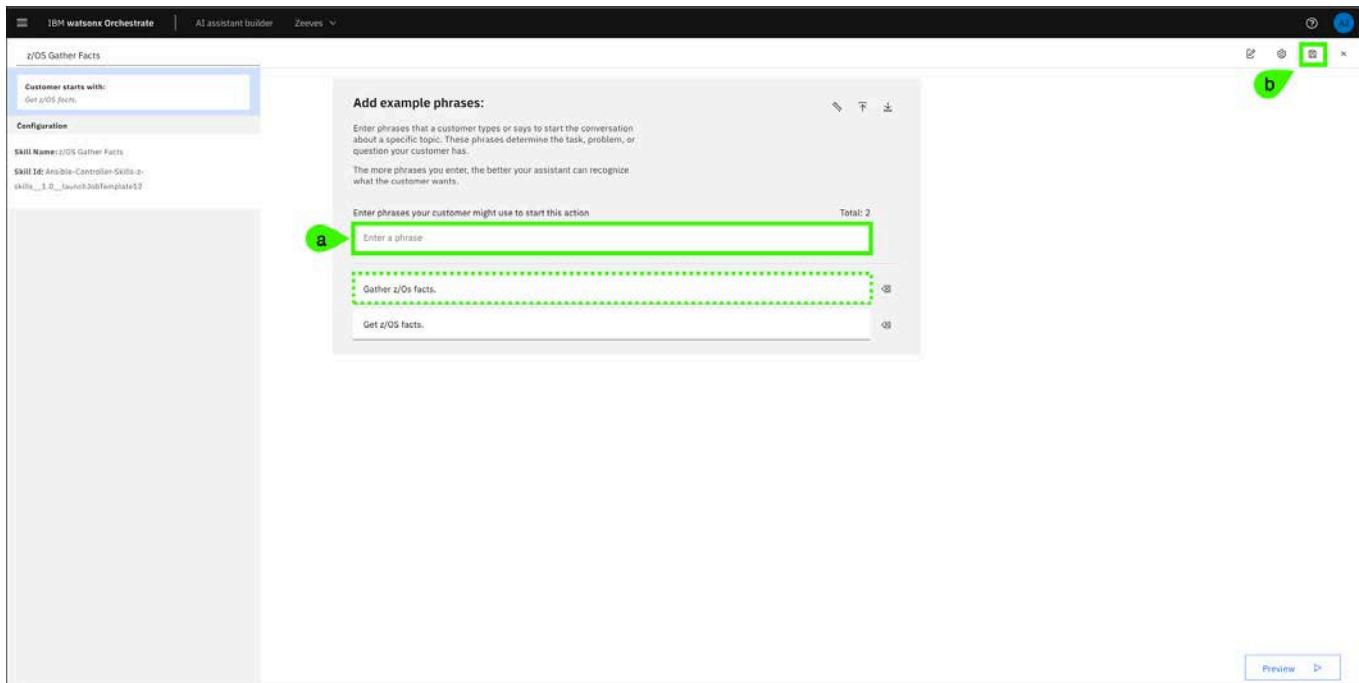
Sample prompts:

Get z/OS facts

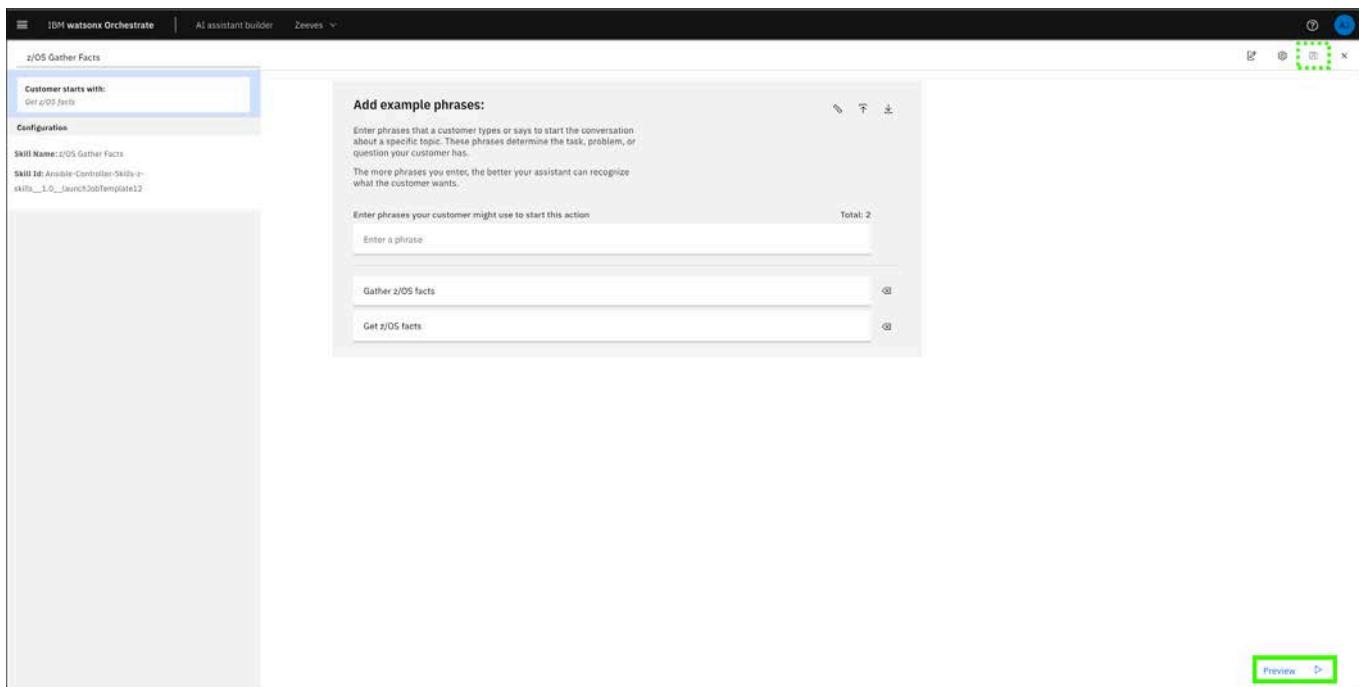
Gather z/OS facts

The screenshot shows the configuration for the 'z/OS Gather Facts' skill. A modal window titled 'New action' is open, prompting the user to enter example phrases. The input field contains the phrase 'Get z/OS facts.'.

- Add any extra prompts (a) and then click the save (b).



## 8. Click Preview.



## 9. Enter one of the prompts you specified in step 9 or 10.

**Prompt:**

Get z/OS facts

The screenshot shows the IBM Watson Assistant builder interface. On the left, there's a sidebar with 'IBM Watson Orchestrate' at the top, followed by 'AI assistant builder' and 'Zeeves'. Below that is a section titled 'z/OS Gather Facts' with a sub-section 'Customer starts with:' containing the phrase 'Get z/OS facts'. Under 'Configuration', it lists 'Skill Name: z/OS Gather Facts', 'Skill Id: Ansible-Controller-Skills-z-skills\_1.0.\_launchJobTemplate12', and two actions: 'Gather z/OS facts' and 'Get z/OS facts'. On the right, there's a 'Add example phrases:' section with instructions to enter phrases that start a conversation about a specific topic. A preview window shows a message from a user at 12:55 PM: 'Great customer [default]'. The response is 'Welcome, how can I assist you?'. The 'Get z/OS facts' action is highlighted with a green border.

10. Review the returned results and record the **job** number.

 If an error is generated or the action is not performed and only search results are returned, review the following Troubleshooting section.

The screenshot shows the IBM Watsonx Orchestrate interface with the following details:

- Skill Name:** z/OS Gather Facts
- Skill Id:** Assistant-Controller-Skills-z-  
skills\_1.0.\_LaunchJobTemplate12
- Customer starts with:** Get z/OS facts
- Add example phrases:** Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.
- Enter phrases your customer might use to start this action:** Total: 2  
- Enter a phrase: (empty)
- Example phrases:**
  - Gather z/OS facts
  - Get z/OS facts
- Preview:** A simulated conversation window showing:
  - Customer message: 12:59 PM Great customer! [default]
  - Bot response: Welcome, how can I assist you?
  - Customer message: 1:05 PM Get z/OS facts
  - Bot response: 1:05 PM Conversational skill called z/OS Gather Facts recognized job : 12 status : pendingA note at the bottom right of the preview window states: "There are no additional steps for this action. Add a new step or end the action."
- Bottom navigation:** Use the up arrow for prior messages

# Verify the job in the Ansible Automation Platform console

Return to the Ansible Automation Platform (AAP) console and review the job information.

1. Click **Jobs** and then click the **job** number that you recorded in the previous step for the **z/OS Gather Facts** skill.

Name	Status	Type	Start Time	Finish Time	Actions
12 - z/OS Gather Facts	Successful	Playbook Run	12/5/2024, 7:17:32 AM	12/5/2024, 7:17:41 AM	

2. Review both the **Details** and **Output** for the **z/OS Gather Facts** job.

Recall, that in the assistant, the contents shown in the **Output** of the Ansible job were not displayed.

```

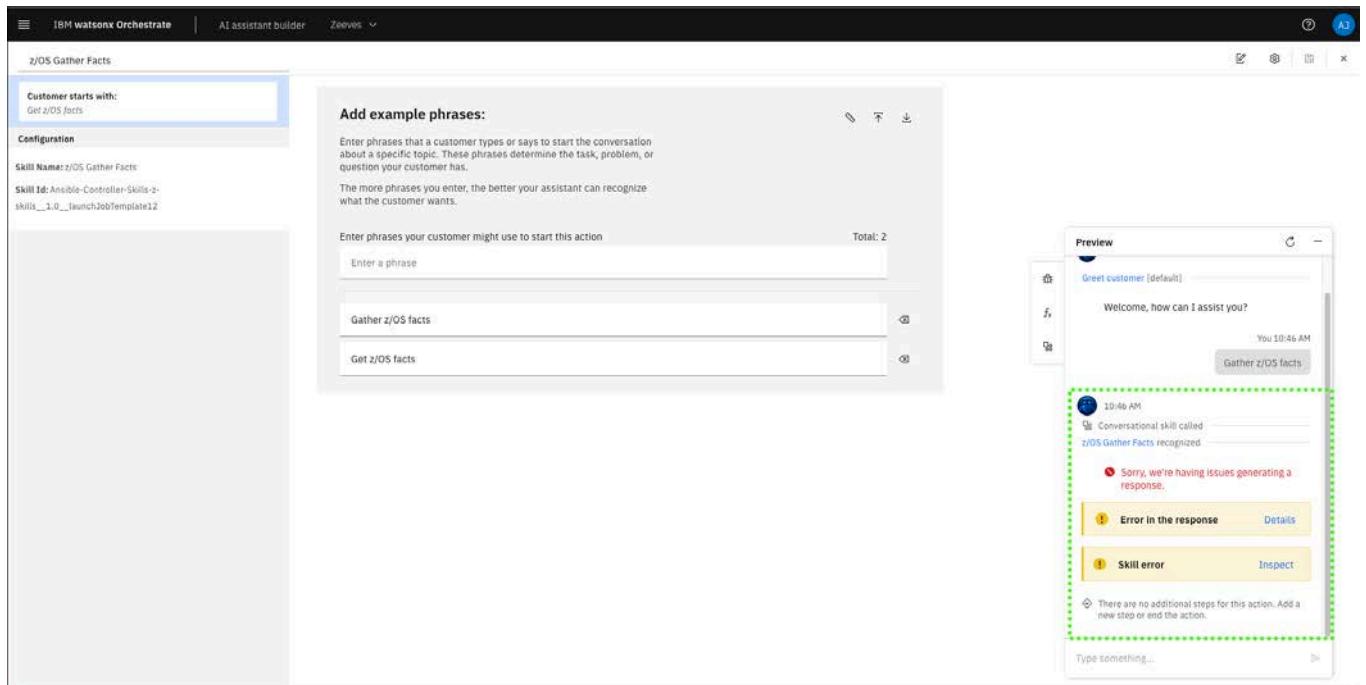
25 }
26 TASK [Print out all gathered facts about the z/OS host.] **** 07:17:38
27 ok: [zos_host] => {
28     "ansible_facts": {
29         "arch_level": "2",
30         "cpc_nd_manufacturer": "IBM",
31         "cpc_nd_model": "A08",
32         "cpc_nd_plant": "C1",
33         "cpc_nd_seqno": "237701828347",
34         "cpc_nd_type": "008562",
35         "edt": "00",
36         "hw_name": "",
37         "leasym_card": "(00,K2)",
38         "io_config_id": "00",
39         "iodate": "",
40         "iodesc": "",
41         "iodf_config": "DEFAULT",
42         "iodf_name": "PROV.IODF00",
43         "iodf_unit_addr": "DE28",
44         "ioproc": "",
45         "iotime": ""
46 }

```

IBM watsonx Assistant for Z provides utility skills to retrieve the job output. It is also possible to create a skill flow that executes the **z/OS Gather Facts** skill followed by the **Retrieve job output** utility skill in sequence; passing the job ID from the first skill to the second to view the output within the assistant. Creating a skill flow is covered in the next section.

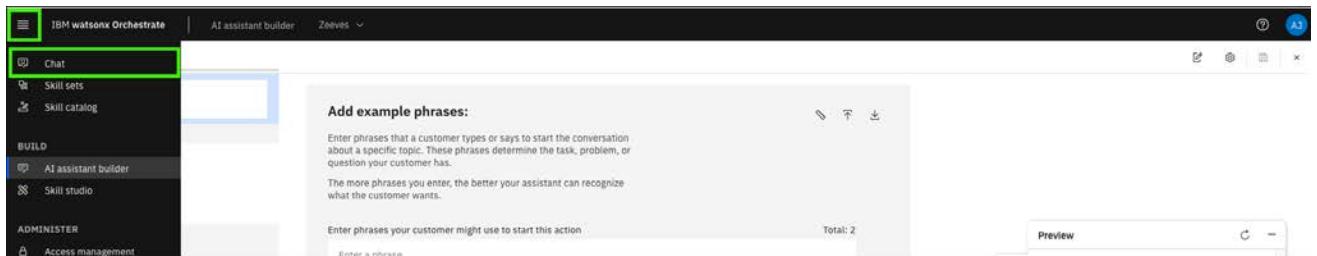
## Troubleshooting

X Skill returns "Sorry, we're having issues generating a response" or the action is not performed and only search results are returned.

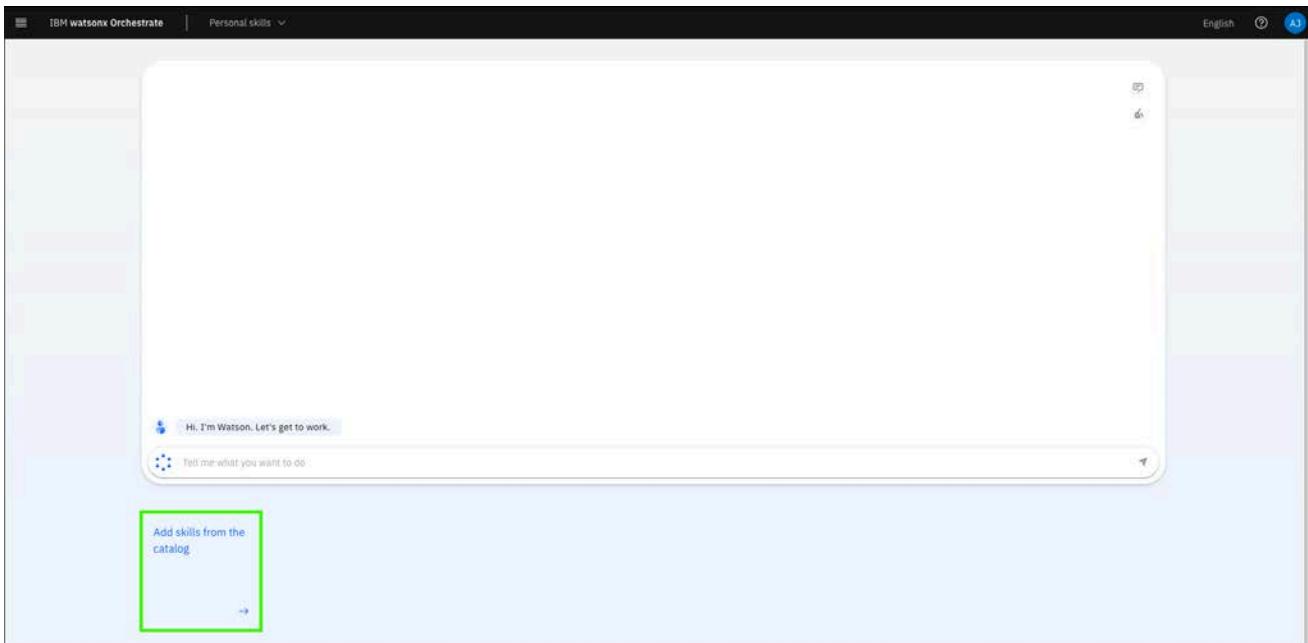


This error appears to be an intermittent issue when a skill is first added. To resolve, add the skill to your personal skills catalog using the steps that follow. If you encounter the issue, try the steps that follow:

1. Expand the main menu and select Chat.



2. Click Add skills from the catalog.



3. Search for the skill app you created earlier and click the tile for your app.

The screenshot shows the "Skill catalog" page. At the top, it says "Skill catalog" and "Skills are grouped by app. Select an app to see all the skills that use that app.". There's a search bar with "z skills" typed in. Below it, there's a grid of app tiles. One tile, "Ansible Controller Skills - z skills", is highlighted with a green box.

Apps	
Salesloft	47 skills
Cognos	8 skills
Skill flows	167 skills
Adobe Workfront	37 skills
Webex	14 skills
IBM Process Mining	2 skills
Salesforce Chatter	5 skills
Ansible Controller Skills - z skills	2 skills
Interview top candidates using ...	2 skills
Reveal your existing applicants...	7 skills
Seismic	22 skills
FreshService	25 skills
Workday HCM	36 skills
ZoomInfo	26 skills

4. Click Add skill for all the skills you want to add.

The screenshot shows the "Ansible Controller Skills - z skills" page. At the top, it says "Ansible Controller Skills - z skills (2)". There's a "Connect app" button on the right. Below it, there's a search bar with "Search skills". Underneath, there are two cards for skills: "z/OS Gather Facts" and "z/OS Ping". Both cards have a green box around their "Add skill" buttons.

5. Click Connect app.

Ansible Controller Skills - z skills (2)

**z/OS Gather Facts**  
z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls z/OS...  
**z/OS Ping**  
z skills - This playbook pings the z/OS host to test connectivity.

**Connect app**

6. Enter the (a) **username** and (b) **password** using the username (admin) and password for your IBM Technology Zone (ITZ) watsonx Assistant for Z Pilot - AAP & z/OS reservation (AAP User Password (Use SSH key to login, only use password for UI)), and then click **Connect app**.

Connect to Ansible Controller Skills - z skills

username: admin  
password: \*\*\*\*\*

Cancel Connect app

7. Expand the main menu and select **Chat**.

Skills - z skills

**z/OS Ping**  
z skills - This playbook pings the z/OS host to test connectivity.

8. Try one of the prompts you created for your skill.

Prompt:

Gather z/OS facts

The screenshot shows the IBM Watsonx Assistant interface. At the top, it says "IBM Watsonx Orchestrate" and "Personal skills". On the right, there are icons for English, a profile, and a help symbol. The main area has a blue header bar with a "Tell me what you want to do" input field. Below this, a message from Watson says: "Hi, I'm Watson. Check out the skills in the catalog to see how I can help you." A green box highlights a section titled "Gather z/OS facts". Inside this box, it says "Here are the results of the z/OS Gather Facts skill." and lists "z/OS Gather Facts", "status pending", and "job 12". At the bottom of this box is a "Tell me what you want to do" input field. To the left, another box says "Add skills from the catalog" with an arrow pointing to a section titled "Ansible Controller Skills - z skills" which contains a small square icon and "2 skills".

You should now be able to run the skill through the assistant preview.

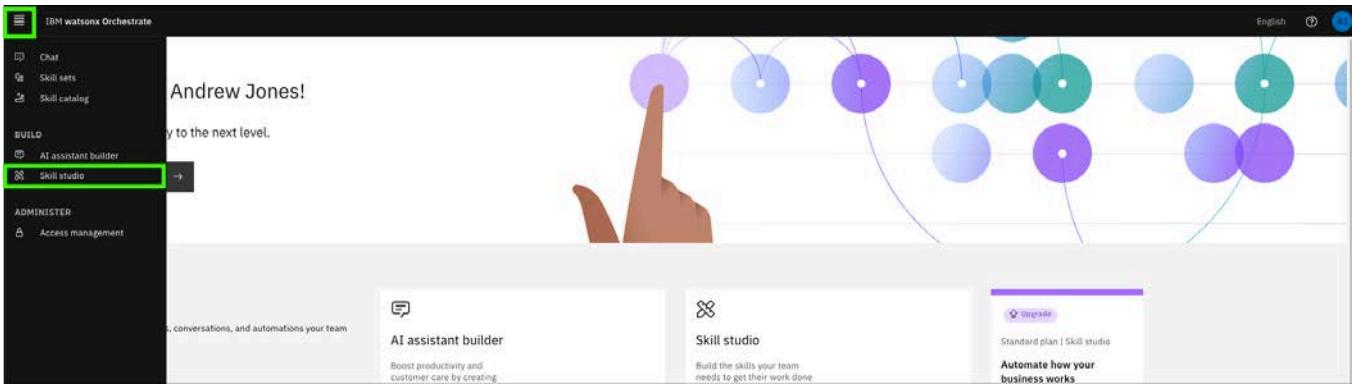
# Creating skill flows

In the previous section, you ran the **Gather z/OS facts** skill, but the output was not displayed in the assistant. To both run the action and display the results, a skill flow is needed. Skills are often more valuable when combined with other skills. You can create a skill flow to use two or more skills together to finish a task (like returning the output of a previous skill). When you create a skill flow, you map the output of one skill as the input for subsequent skills. Learn more about creating skill flows [here](#).

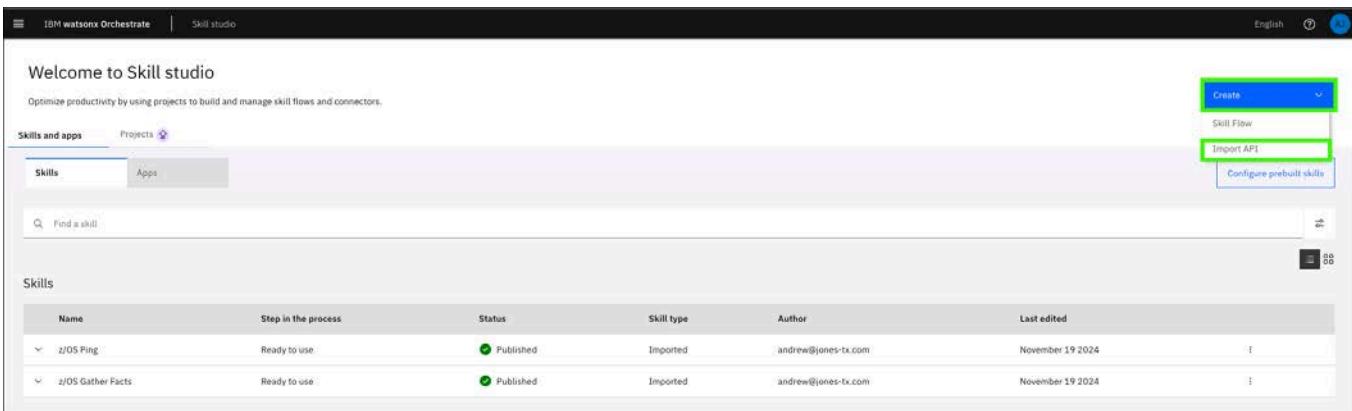
As mentioned in a previous section, default utility skills that are provided with the watsonx Assistant for Z skills collection. The **Retrieve job output** utility skill is used to return the output of a skill.

## Add the utility skill

### 1. Open IBM watsonx Orchestrate **Skill studio**.



### 2. Expand **Create** and click **Import API**.



### 3. Click the **z/OS Skills accelerator (Trial)** tile.

The screenshot shows the 'Skill studio' interface of IBM Watsonx Orchestrate. In the top left, it says 'IBM Watsonx Orchestrate' and 'Skill studio'. Below that, 'Skills and apps / Add skills' is selected. The main area is titled 'Add skills' with the sub-instruction 'Choose how you want to add skills and then select the skills you want to refer to from that source.' There are two tabs at the top: 'Choose the source' (selected) and 'Select the skills'. Under 'Choose the source', there are three options: 'From an app' (selected), 'From a file', and 'OpenAPI builder (experimental)'. A green box highlights the 'z/OS Skills accelerator (Trial)' option, which includes the sub-instruction 'Import your Ansible, z/OS/REXX automation to Watsonx Orchestrate'. Other options shown include 'IBM Cloud Pak for Business Automation - On premises', 'IBM Cloud Pak for Business Automation as a service', 'UiPath', 'IBM Robotic Process Automation (RPA)', and 'IBM Business Automation Workflow as a service'. Below these are two more options: 'IBM Operational Decision Manager as a service' and 'IBM Operational Decision Manager as a service' (repeated).

#### 4. Enter the following values in the **z/OS Skills accelerator** form and then click **Connect**.

Use the **URL**, **User Name**, and **Password** values recorded in the **Explore Ansible Automation Platform** section earlier.

**a:** Connection Type: `ansible`

**b:** Application Name: <use the same application name from the previous section>

**c:** Connection URL: <enter the URL for your AAP UI>

**d:** User Name: <enter the AAP User Name (for UI access)>

**e:** Password: <enter the AAP User Password>

**f:** Search Pattern: `*`

The screenshot shows the 'Add skills' interface with the 'z/OS Skills accelerator (Trial)' selected. The right side of the screen displays a configuration form for connecting to the skill. The fields are labeled as follows: **a** Connection Type: `ansible`; **b** Application Name: `Ansible`; **c** Connection URL: `https://azavis-aap-phd.usa.techzone.ibm.com`; **d** User name: `admin`; **e** Password: `password`; **f** Search Pattern: `*`. The 'Connect' button is highlighted with a green box.

#### 5. Expand **Ansible Utility Skills** and click **Ansible Utility Skills**.

**Add skills**

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source       Select the skills

**Select the skills**

Select the skills you want to add to the skill set. Currently, 0 of 4 skills are selected.

Skill	Description	Status
List hosts	Z skills - list hosts on this ...	Ready to add
List inventories	Z skills - list inventories on...	Ready to add
Retrieve job status	Z skills - retrieve job status...	Ready to add
Retrieve job output	Z skills - retrieve job output...	Ready to add

## 6. Select **Retrieve job output** and click **Save as draft**.

**Add skills**

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source       Select the skills

**Select the skills**

Select the skills you want to add to the skill set. Currently, 1 of 4 skills are selected.

Skill	Description	Status
List hosts	Z skills - list hosts on this ...	Ready to add
List inventories	Z skills - list inventories on...	Ready to add
Retrieve job status	Z skills - retrieve job status...	Ready to add
<input checked="" type="checkbox"/> Retrieve job output	Z skills - retrieve job output...	Ready to add

**Cancel**      **Save as draft**

## 7. Click the ellipses (...) for the **Retrieve job output** skill and select **Enhance this skill**.

**Welcome to Skill studio**

Optimize productivity by using projects to build and manage skill flows and connectors.

**Skills and apps**      **Projects**

**Skills**      **Apps**

Find a skill

**Skills**

Name	Step in the process	Status	Skill type	Author	Last edited
Retrieve job output	Just 1 step away to be ready		Imported	andrew@jones-tx.com	November 19 2024
z/OS Ping	Ready to use		Imported	andrew@jones-tx.com	November 19 2024
z/OS Gather Facts	Ready to use		Imported	andrew@jones-tx.com	November 19 2024

**1 skill successfully imported**  
success  
14:06:04

**Configure prebuilt skills**

**Enhance this skill**

**Export this skill**

**Delete this skill**

## 8. Review the skill settings and then click **Publish**.

## 9. Select Skill sets from the main menu.

## 10. Select (a) your draft assistant in the Team Skills drop-down list and (b) click the Connections tab.

11. Click the **Search (🔍)** icon.

Application	Number of skills	Credential type	Connected by	Action
Activate or deactivate attracting candidates using ThisWay Global	4	Not specified		<span>⋮</span>
Adobe Workfront	37	Not specified		<span>⋮</span>
Alliance Virtual Office	2	Not specified		<span>⋮</span>
Amazon S3	8	Not specified		<span>⋮</span>
Amazon SES	10	Not specified		<span>⋮</span>

12. Search for the application name you specified earlier.

Application	Number of skills	Credential type	Connected by	Action
Available Controller Skills - z_skills	2	Not specified		<span>⋮</span>

13. Click the (a) ellipses (⋮) for your application and (b) click **Edit connection**.

Application	Number of skills	Credential type	Connected by	Action
Available Controller Skills - z_skills	2	Not specified	andrew@jones-tx.com	<span>⋮</span> <span>Edit connection</span> <span>Delete connection</span>

14. Verify that the application is **Connected (a)** and then click **Close (b)**.



Connect the application if it is not connected.

Use the AAP user name (admin) and the AAP password for your ITZ reservation.

Zeeves draft

Skill sets

Skills Connections

Theze are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

Application	Number of skills	Credential type
Ansible Controller Skills - z skills	3	Team

Items per page: 5 | 1-1 of 1 items

Edit the Ansible Controller Skills - z skills connection

Member credentials  
Each team member uses their own credentials to connect to this app and use its skills.

Team credentials (Active)  
The admin sets the credentials each team member uses to connect to this app and use its skills.

You have an active connection set using **Team credentials**. If you wish to update connection details click on the **Edit** icon below.

Connected

## Add the skills to your Personal skills

1. Click **Skill catalog** in the main menu.

Chat

Skill sets

**Skill catalog**

BUILD

AI assistant builder

Skill studio

ADMINISTER

Access management

Number of skills	Credential type	Connected by	Action
3	Team	andrew@janes-tx.com	

1 of 1 items

2. Search for the application name you specified earlier.

Skill catalog

Skills are grouped by app. Select an app to see all the skills that use that app.

Personal skills

z skills

Most popular skills

Send an email from Gmail	Create a lead in Salesforce	Send an email using Outlook
--------------------------	-----------------------------	-----------------------------

All Apps

Coupa (23 skills)	ZoomInfo (26 skills)	HubSpot CRM (33 skills)	Appio Targetprocess (24 skills)	Salesforce (85 skills)	Zendesk Service (25 skills)
Calendly (6 skills)	Square (8 skills)	Oracle E-Business Suite (20 skills)	GitLab (40 skills)	Toggl Track (12 skills)	Microsoft Teams (35 skills)

3. Click the tile for your application.

Note, the tile name is proceeded by **Ansible Controller Skills**.

Skill catalog  
Skills are grouped by app. Select an app to see all the skills that use that app.

Personal skills

z skills

Apps

- ZoomInfo (26 skills)
- Workday HCM (36 skills)
- FreshService (25 skills)
- Seismic (22 skills)
- Reveal your existing applic... (7 skills)
- Interview top candidates u... (2 skills)
- Salesforce Chatter (5 skills)
- IBM Process Mining (2 skills)
- Webex (14 skills)
- Adobe Workfront (37 skills)
- Skill flows (167 skills)
- Ansible Controller Skills - z ... (3 skills)**
- Cognos (8 skills)
- Salessoft (47 skills)

- Click **Add skill** for each of the skills you want to add to the flow.

Skill catalog / Ansible Controller Skills - z skills (3)

Connect app

Personal skills

Search skills

Ansible Controller Skills - z skills

- Retrieve job output (3 skills) **Add skill**
- z/OS Gather Facts (2 skills) **Add skill**
- z/OS Ping (2 skills) **Add skill**

## Create the skill flow

- Click **Skill studio** in the main menu.

IBM Watsonx Orchestrate

English

Chat

Skill sets

Skill catalog

BUILD

AI assistant builder

**Skill studio**

ADMINISTER

Access management

Skills - z skills (3)

z skills

**z/OS Gather Facts** (3 skills) **Added ✓**

**z/OS Ping** (2 skills) **Added ✓**

Add skill

Connect app

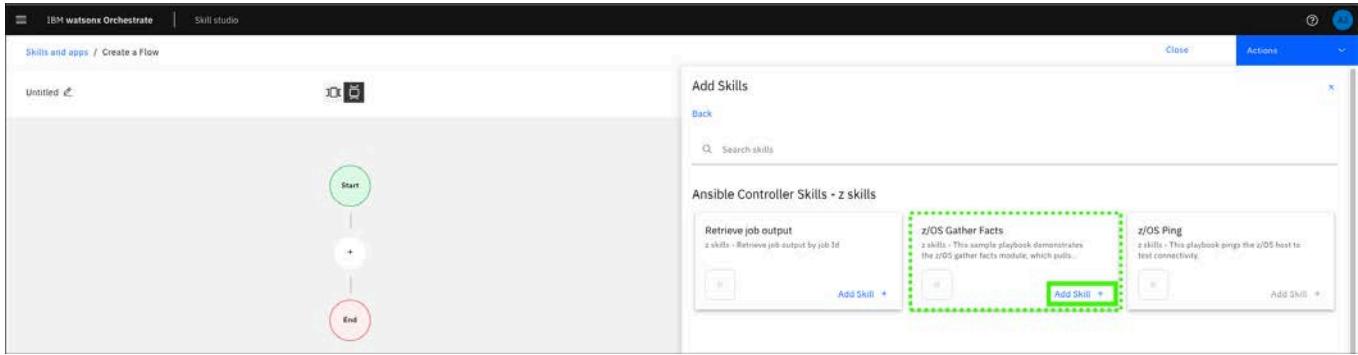
- Expand the **Create** drop-down menu and click **Skill flow**.

3. Click the + icon.

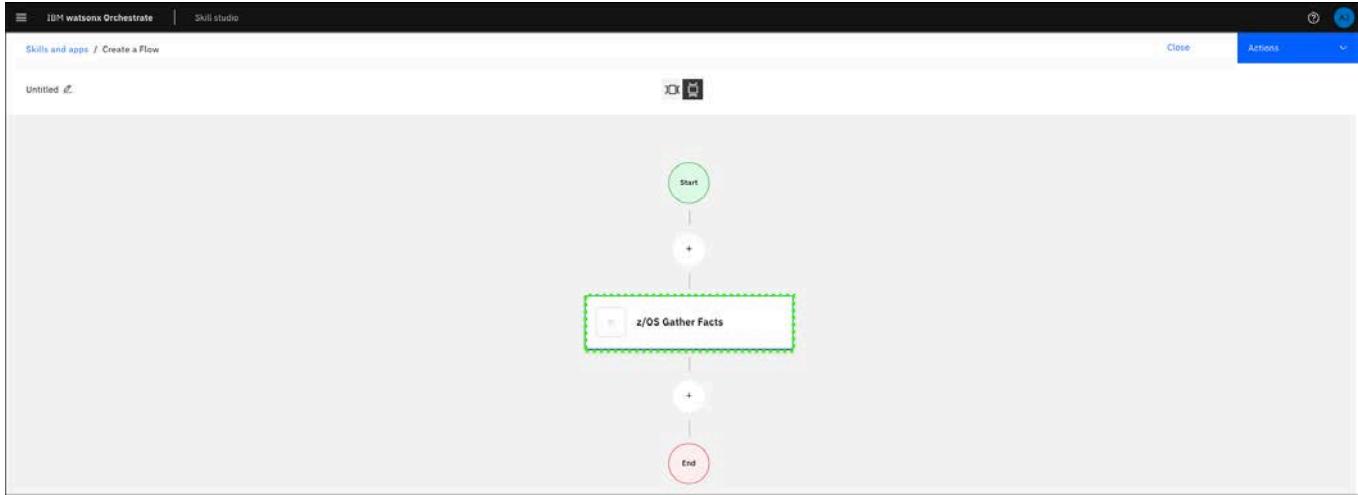
Next, you need to add the [z/OS Gather Facts](#) skill and the **Retrieve job output** skill to the skill flow. Use the **Search apps** function to locate the skills.

4. Search for the application name you specified earlier and click the tile.

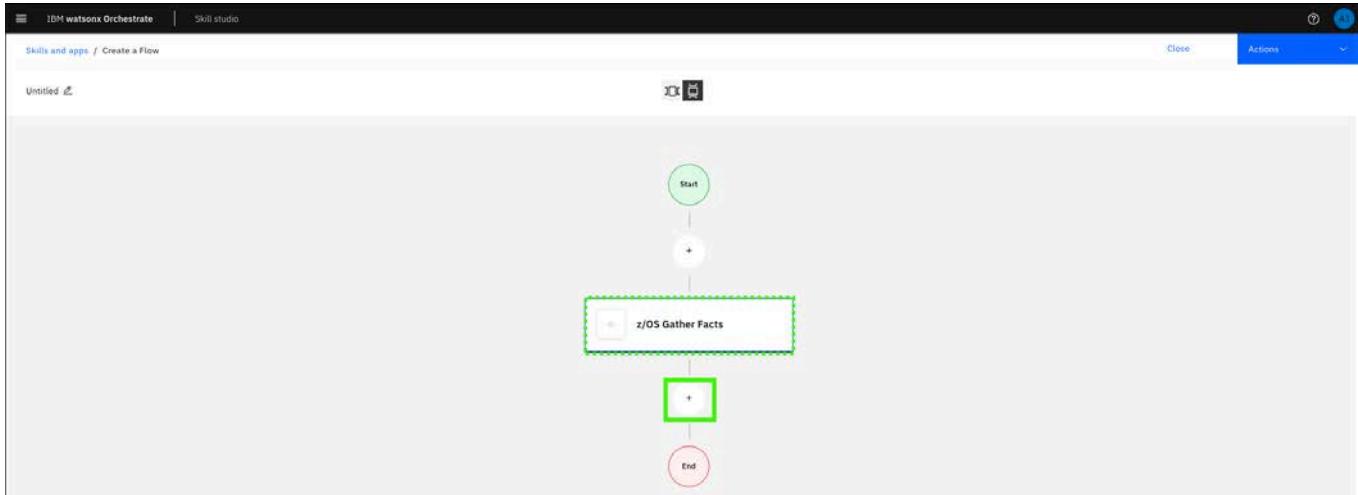
5. Click **Add Skill** in the [z/OS Gather Facts](#) tile.



6. Verify the **z/OS Gather Facts** skill is added to the skill flow.

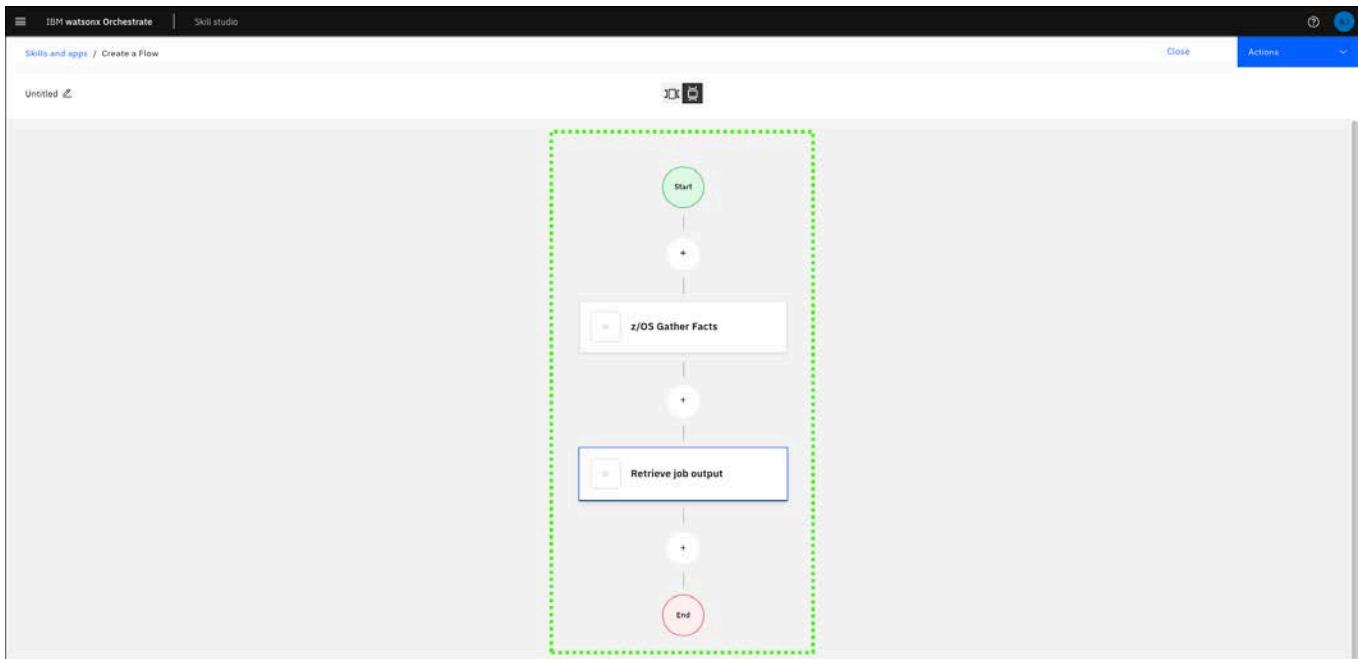


7. Click the + icon after the **z/OS Gather Facts** tile.



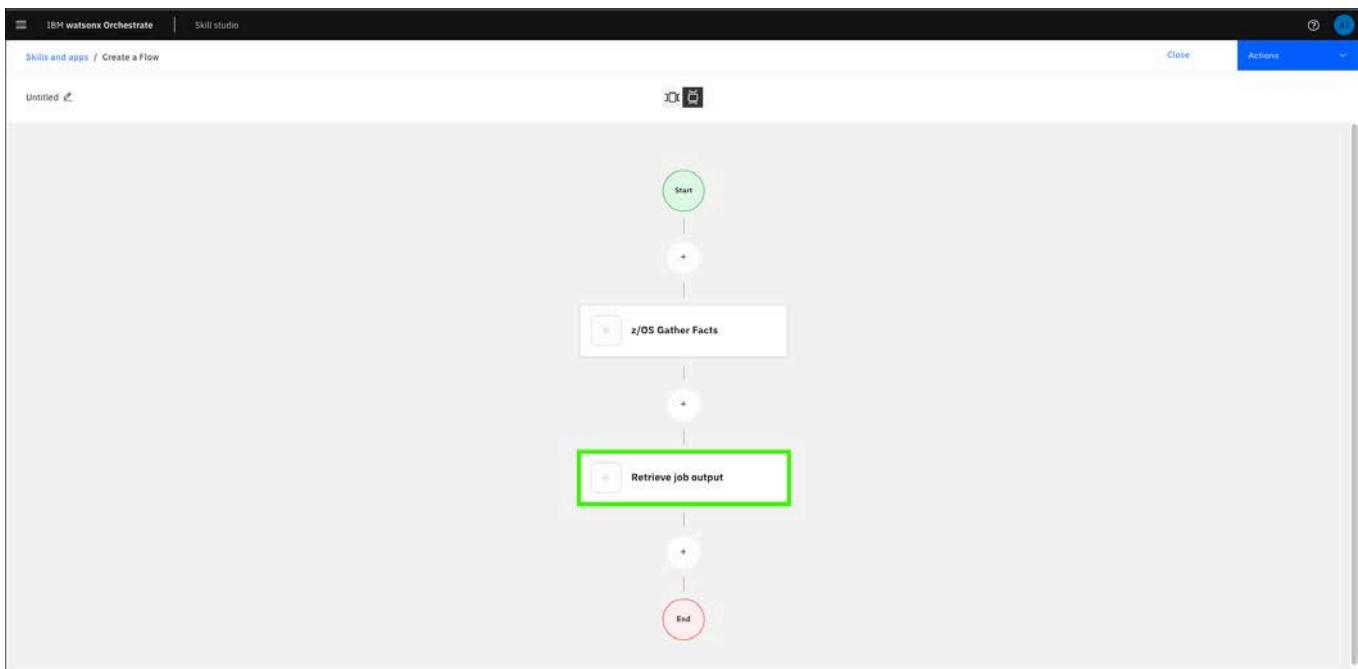
8. Repeat steps 5 and 6 for the **Retrieve job output** skill.

After adding the **Retrieve job output** skill, your skill flow should look like:

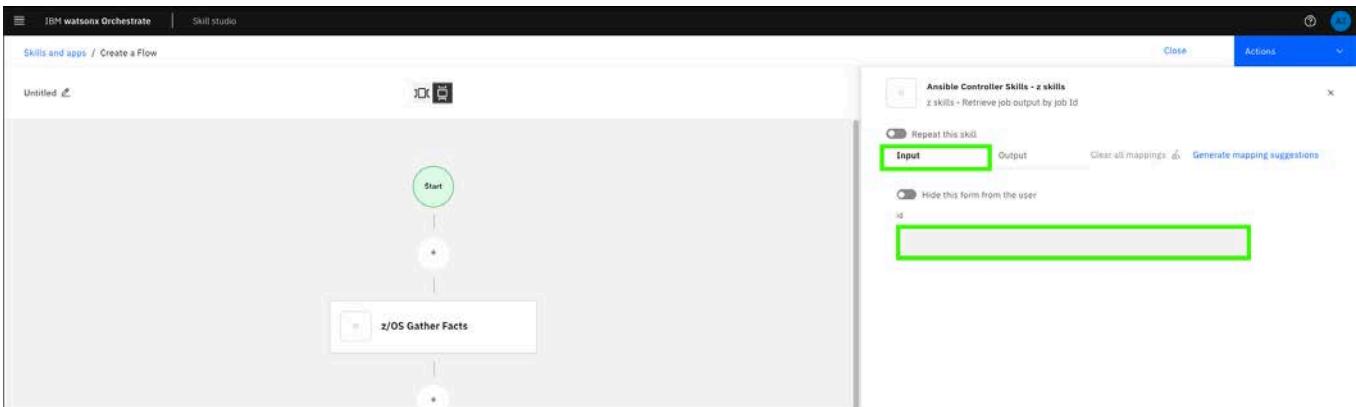


Next you must map the output values of the first skill to the input of the second skill. In this case, pass the job ID output from **z/OS Gather Facts** as an input for **Retrieve job output**.

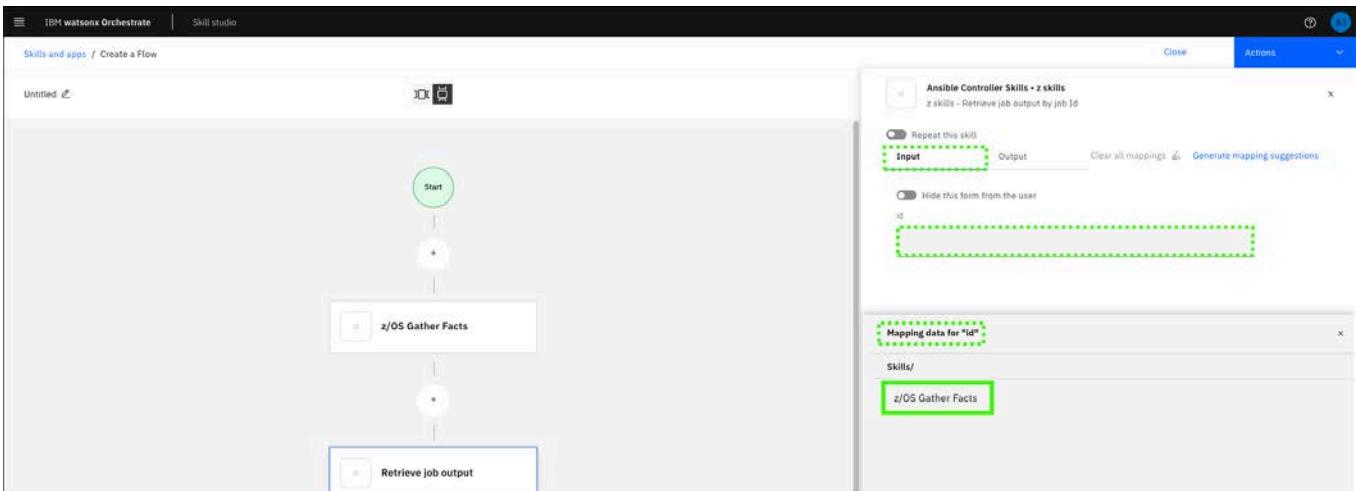
#### 9. Click the **Retrieve job output** tile.



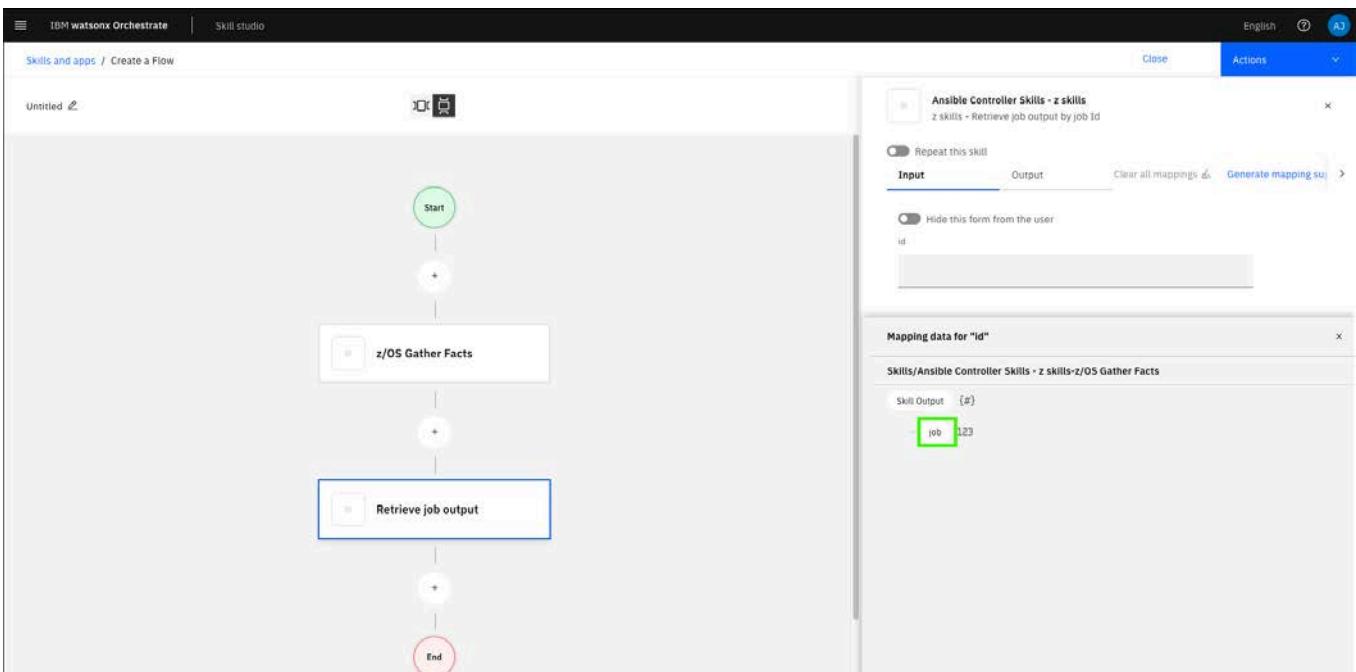
#### 10. Select the **Input** tab and click the **id** field.



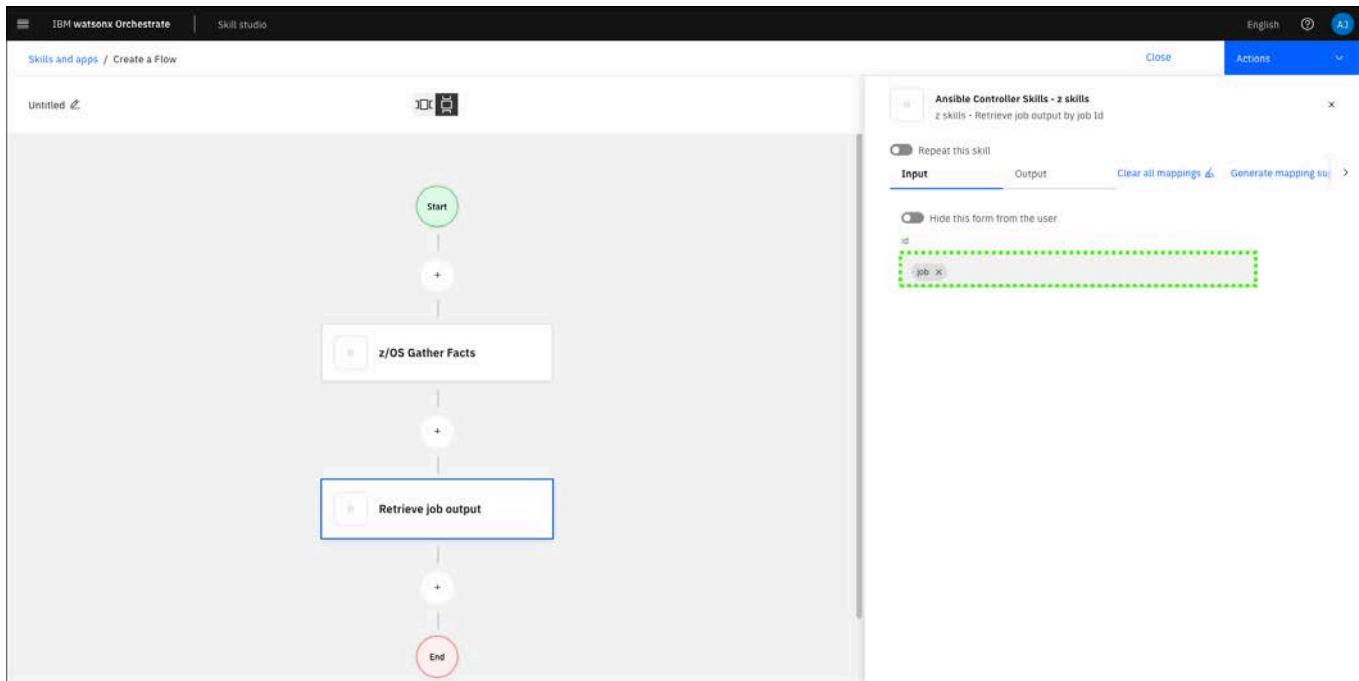
11. Click the **z/OS Gather Facts** skill in the **Mapping data for "id"** section.



12. Click the **job** icon.

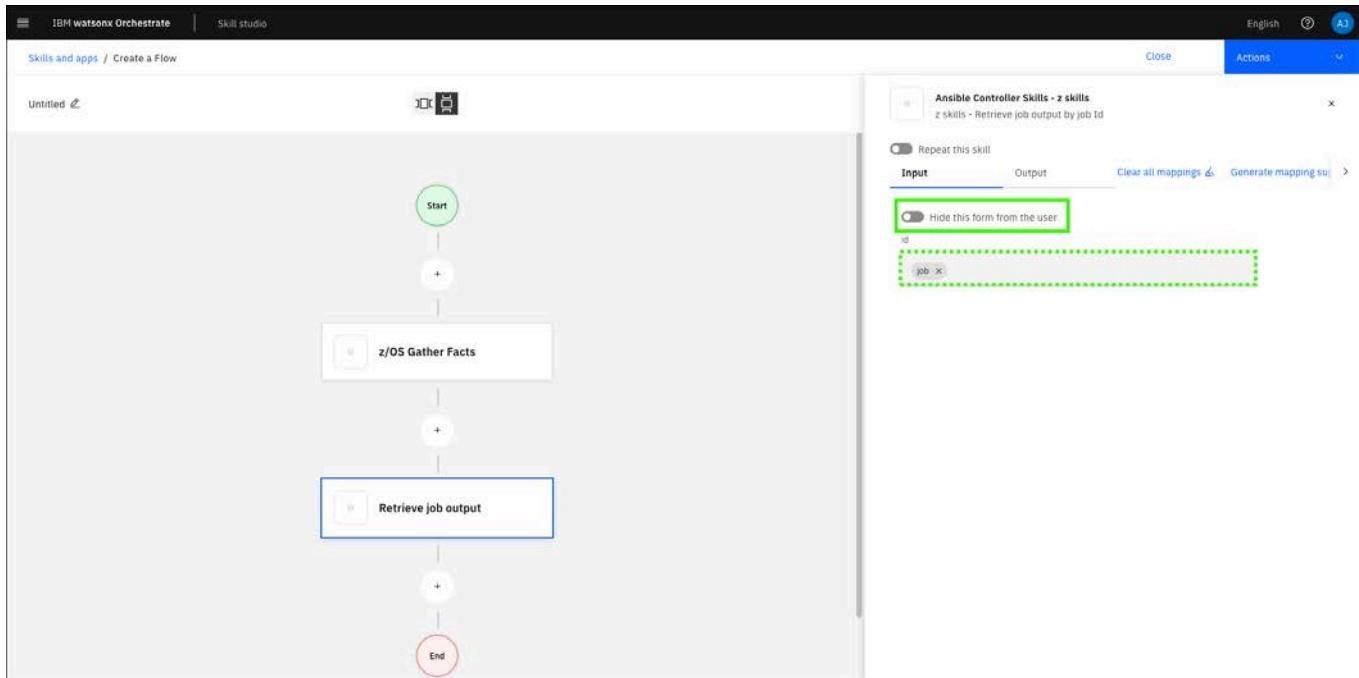


13. Verify that the **job** appears in the **id** field.

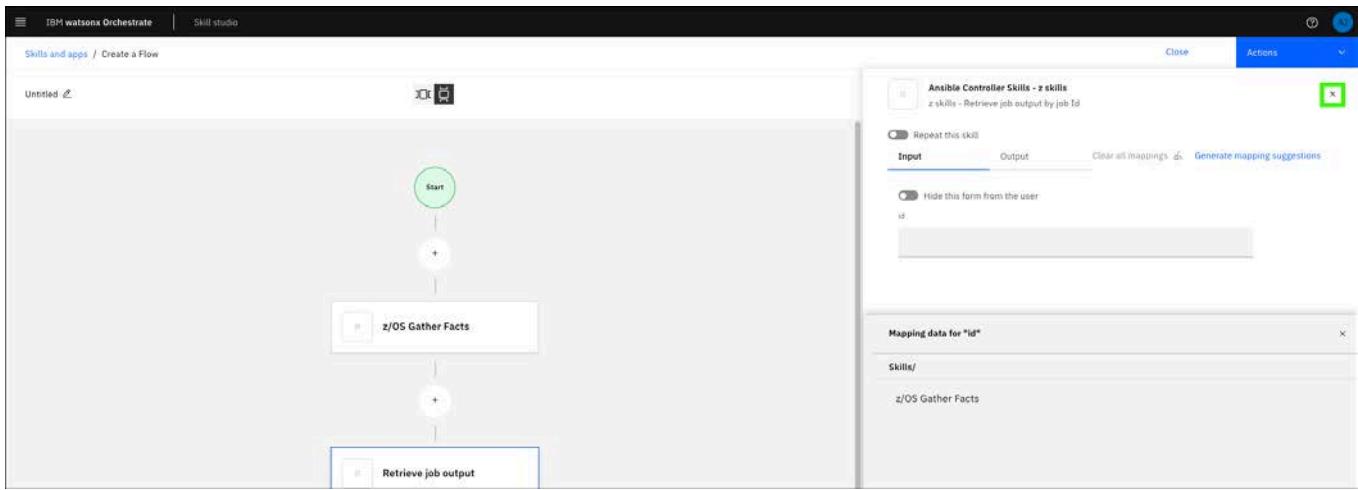


14. Do not toggle/enable the **Hide this from the user** setting as it is needed in order to display the full output of the previous skill.

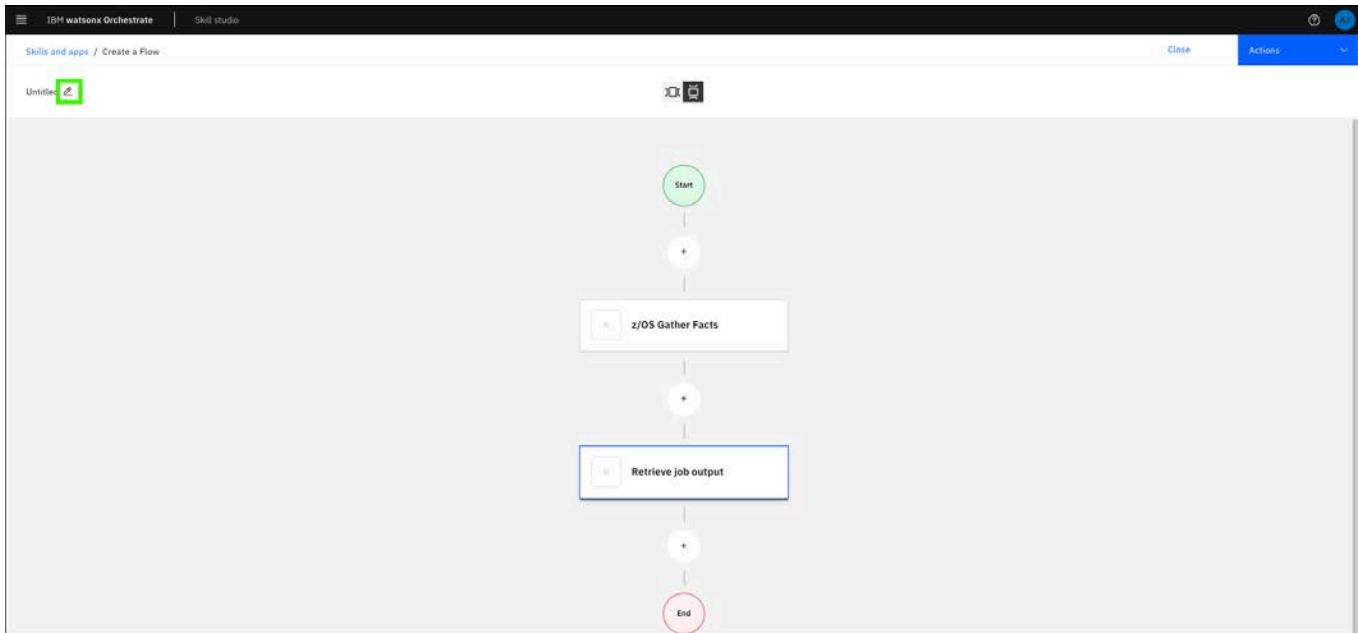
For this lab guide, this option is left disabled. Learn more about this option [here](#).



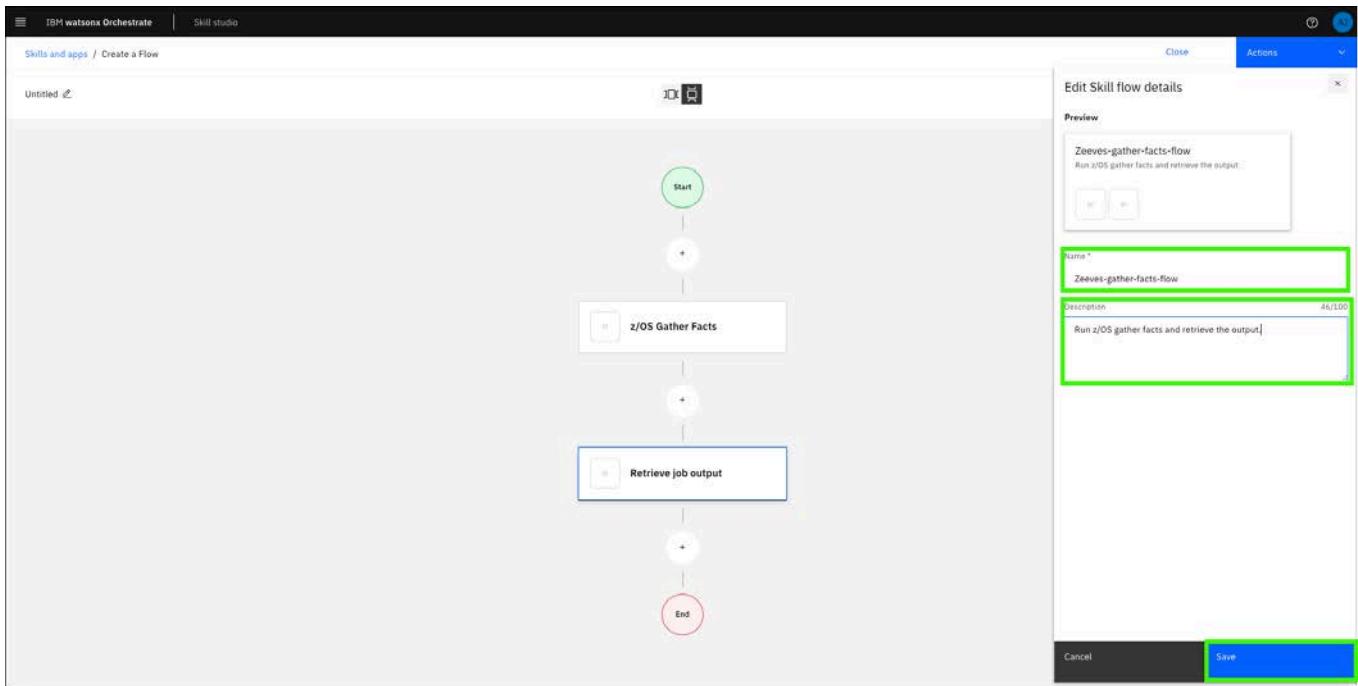
15. Click the **x** to close mapping window.



16. Click the pencil ().



17. Enter a (a) **Name** and (b) **Description** for your skill flow and then (c) click **Save**.



18. Expand the **Actions** pull-down and click **Save as draft**.



19. Expand the **Actions** pull-down and click **Enhance**.



On the **Enhancing the skill** pages, you can:

- modify the skill name, description, and version
- add phrases (prompts) that will be recognized by the assistant to call the skill flow

## 20. Click the **Phrases** tab.

## 21. Replace the existing **phrases** (prompts) and then click **Publish**.

Notice that the default prompts are either not intuitive (the skill flow name) or a bit verbose. Replace the existing phrases with phrases that you anticipate users will use.

Example prompts:

Show me z/OS facts

Gather and display z/OS facts

Enable the skill flow in your assistant

1. Click **AI assistant builder** in the main menu.

The screenshot shows the IBM Watsonx Orchestrate interface. The left sidebar has a dark theme with several sections: Chat, Skill sets, Skill catalog, BUILD (with AI assistant builder selected), Skill studio, ADMINISTER, and Access management. The main area is titled "Skill studio" and contains a message: "Objects to build and manage skill flows and connectors." Below this is a table with four rows of skill flow data:

Step in the process	Status	Skill type	Author	Last edited
Ready to use	Published	Skill flow	andrew@jones-tx.com	November 19 2024
Ready to use	Published	Imported	andrew@jones-tx.com	November 19 2024
Ready to use	Published	Imported	andrew@jones-tx.com	November 19 2024
Ready to use	Published	Imported	andrew@jones-tx.com	November 19 2024

A green notification bar at the top right says "Published successful Published skill Zeeves-gather-facts-flow. 15:18:32". A "Configure prebuilt skills" button is also visible.

2. Hover over the **Home (🏠)** and click **Actions**.

The screenshot shows the AI assistant builder Home page. The left sidebar has sections: Home (selected), Build, Generative AI, Actions (selected), Preview, Publish, Environments, and Analyze. The main content area is titled "Actions" and includes a "Welcome" message: "as new Watsonx generative AI features! Learn more about intelligent information gathering." Below this are several tiles:

- Build actions**: Enhance and improve your assistant's actions.
- Customize your greeting**: Welcome your users in a unique way that aligns with your brand.
- Create a fallback plan**: Train your assistant to adapt to specific situations.
- Preview & debug**: Enable debug mode when you preview your assistant.
- Customize web chat**: Design how your assistant shows up in your live environment.
- Set up a channel**: Select the channels you want to deploy your assistant to.
- Set up live agent**: Integrate live agents to transfer your users to when you edit web chat.

Below these tiles is a "Workflow structure" diagram showing a "Default behavior" node branching into "General purpose" and "Conversational search" nodes, which then lead to a "Search" node.

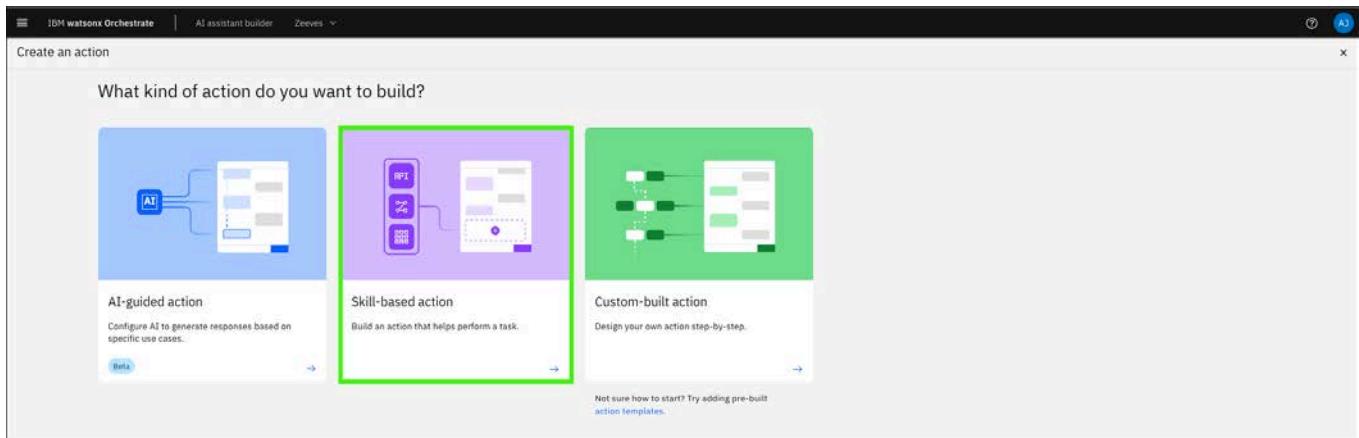
3. Click **New action**.

The screenshot shows the Actions list page. The left sidebar has sections: Actions (selected), All items, Created by you (selected), Set by assistant, Variables, Created by you, Set by assistant, Set by integration, and Saved responses. The main area lists actions:

Name	Last edited	Examples count	Steps count	Status
z/OS Gather Facts	2 hours ago	2	0	Green

A green "New action" button is located in the top right corner of the table header.

4. Click the **Skill-based action tile**.



## 5. Click the skill flow that you created earlier and then click **Next**.

**Note:** it may take a minute for the tiles to appear on the screen.

Build an action from a skill				
<b>Select a skill</b> Choose a conversational skill published as a foundation of your action. <input type="text" value="Search a skill"/>				
<b>Zeeves-gather-facts-flow</b> Run z/OS gather facts and retrieve the output.  Last updated: 2024-11-19T21:18:31.793Z	<b>Retrieve job output</b> z skills - Retrieve job output by job Id  Last updated: 2024-11-19T20:08:59.538Z	<b>z/OS Ping</b> z skills - This playbook pings the z/OS host to test connectivity.  Last updated: 2024-11-19T15:58:20.567Z	<b>z/OS Gather Facts</b> z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls z/OS-specific information from the z/OS host.  Last updated: 2024-11-19T15:56:26.843Z	<b>Summarize the Webex meeting transcript</b> in watsonx.ai  Last updated: 2024-11-04T10:49:16.502Z
<b>Summarize the Box content</b> in watsonx.ai  Last updated: 2024-11-04T10:49:12.077Z	<b>Summarize a Zendesk ticket</b> in watsonx.ai  Last updated: 2024-11-04T10:49:09.476Z	<b>Summarize a ServiceNow incident</b> in watsonx.ai  Last updated: 2024-11-04T10:49:05.828Z	<b>Summarize a Salesforce opportunity</b> in watsonx.ai  Last updated: 2024-11-04T10:49:01.769Z	<b>Sharepoint document summary</b> in watsonx.ai  Last updated: 2024-11-04T10:48:55.707Z
<b>Salesloft email summary</b>  Last updated: 2024-11-04T10:49:12.077Z	<b>Salesforce case summarization</b>  Last updated: 2024-11-04T10:49:09.476Z	<b>Salesforce case sentiment analyze</b>  Last updated: 2024-11-04T10:49:05.828Z	<b>Outlook email summary</b>  Last updated: 2024-11-04T10:49:01.769Z	<b>Github issue summarization</b>  Last updated: 2024-11-04T10:48:55.707Z

## 6. Enter an example prompt for the skill and click **Save**.

You can use one of the prompts you used earlier for the skill flow.

Show me z/OS facts

**Customer starts with:**  
Example: I want to see our inventory and sales.

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action

Example: I want to pay my credit card bill.

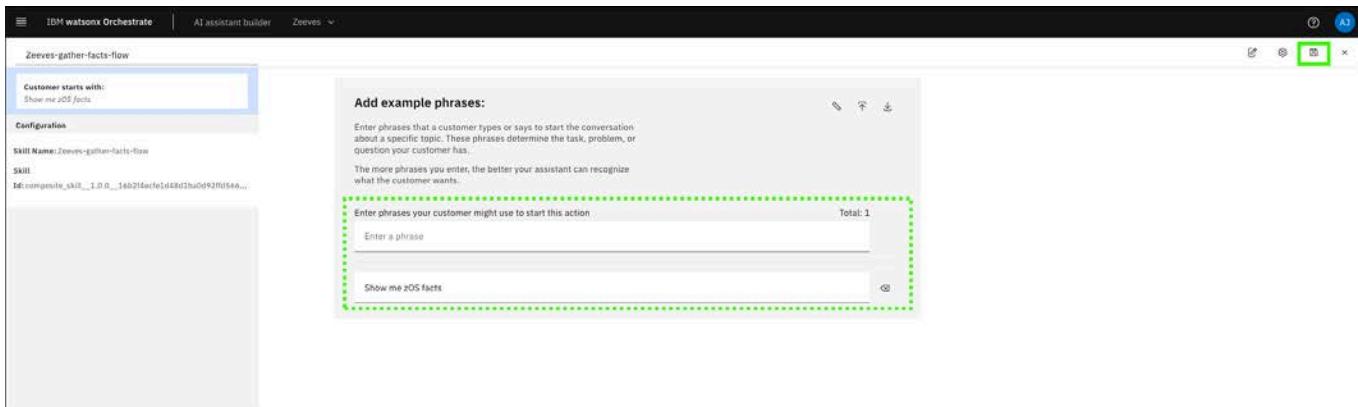
New action

What does your customer say to start this interaction?

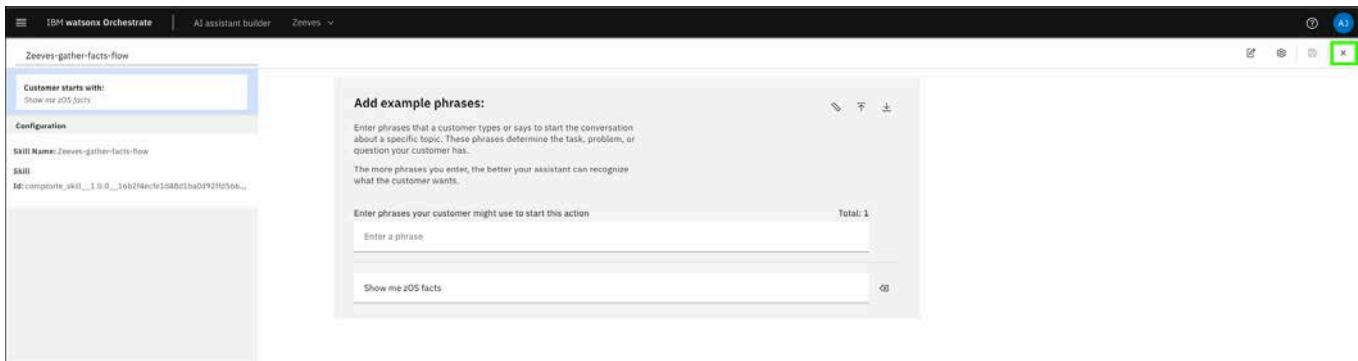
Show me z/OS facts

**Save**

## 7. Enter any additional phrases (prompts) and then click the **save** (💾).



## 8. Click close (x).

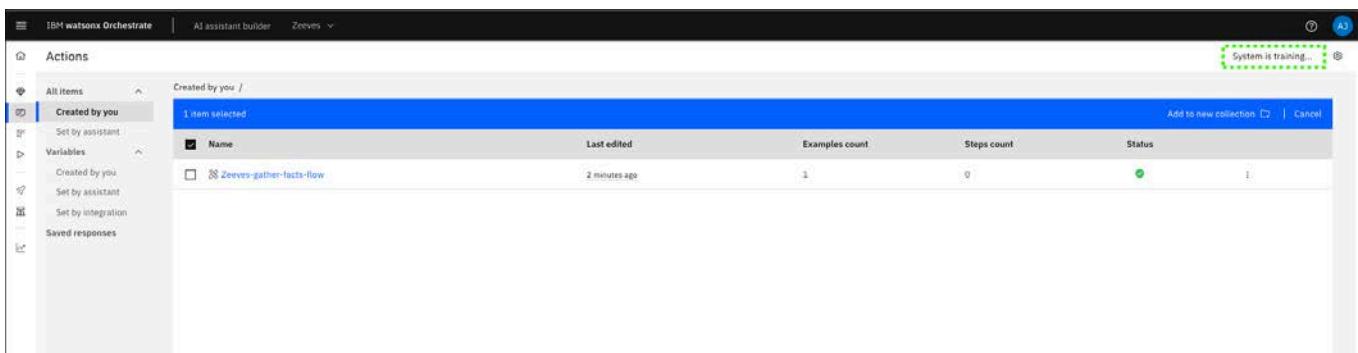


## 9. Select the *original* skill that you created (a) (not the skill flow you just created), click the ellipses (b), and then click **Delete** (c).



## 10. Wait for system training to complete.

**Note:** The message changes to "System is trained" and then disappears.



## 11. Click **Preview**.

The screenshot shows the IBM Watsonx Orchestrator interface. On the left, there's a sidebar with 'Actions' and a tree view under 'Created by you' (All Items, Set by assistant, Variables, etc.). The main area shows a table with one item selected:

Name	Last edited	Examples count	Steps count	Status
Zeeves-gather-facts-flow	3 minutes ago	1	0	<span style="color: green;">Green</span>

At the bottom right of the main area, there's a 'Preview' button with a green border.

## 12. Enter one of the prompts you specified into the assistant preview.

The screenshot shows the same interface as above, but now with a 'Preview' window open. In the preview window, a conversation is shown between a user and an AI assistant. The user has entered the message 'Show me z/OS facts'. This user input is highlighted with a green box.

## 13. Wait 10 seconds and then click Apply.

**Note:** It is important to wait for the first job to complete before submitting the second job in the flow.

The screenshot shows the IBM Watsonx Orchestrator interface. In the top navigation bar, 'IBM Watsonx Orchestrator', 'AI assistant builder', and 'Zeeves' are visible. On the left, a sidebar titled 'Actions' contains sections for 'All items', 'Created by you' (which is expanded), 'Variables', and 'Saved responses'. Under 'Created by you', there are sub-sections for 'Set by assistant', 'Variables', and 'Saved responses'. A search bar at the top right says 'Add to new collection' and 'Cancel'. Below the sidebar, a table lists one item: 'Name' (Zeeves-gather-facts-flow), 'Last edited' (11 minutes ago), 'Examples count' (1), 'Steps count' (0), and 'Status' (green). At the bottom of the table, there are 'Preview' and 'Edit' buttons. The 'Preview' window shows a conversation between a user and a bot. The user asks 'Show me zOE facts' and the bot responds with 'Zeeves-gather-facts-flow'. The status bar at the bottom right shows '9:54 AM' and 'Green customer [default]'. The footer of the page shows 'Items per page: 50' and 'Showing 1–1 of 1 items'.

#### 14. Review the results from the skill flow.

Use both scroll bars in the assistant preview to review all the returned information. The output is similar to what was seen in the AAP web console. The character strings like `[0;32m` are special characters that are not properly displayed in the assistant preview interface.

This screenshot is identical to the previous one, showing the 'AI assistant builder' section of the IBM Watsonx Orchestrator. The 'Preview' window now displays a detailed list of facts gathered by the skill. The list includes: 'ipl\_volume': 'D25VS2', 'load\_param\_device\_f', 'load\_param\_dsn', 'operator\_prompt\_flag', 'nucleus\_id': '1', and 'master\_catalog\_vols'. A green dashed box highlights this list. The status bar at the bottom right shows '9:54 AM' and 'Green customer [default]'. The footer shows 'Items per page: 50' and 'Showing 1–1 of 1 items'.



## Sample output from the Z/OS gather facts flow.



### Content

```

Identity added: /runner/artifacts/16/ssh_key_data (/runner/artifacts/16/ssh_key_data)
[1;35m[WARNING]: Collection ibm.ibm_zos_core does not support Ansible version 2.14.2[0m

PLAY [Gather z/OS-specific facts.] *****
TASK [Gather all facts about z/OS host.] *****
TASK [Print gathered facts about the master catalog.] *****
[0;32mok: [zos_host][0m
[0;32m      "master catalog dsn: CATALOG.VS01.MASTER",0m [0;32m      "master catalog volser: OPEVS1"[0m
[0;32m ][0m [0;32m}{0m

TASK [Print only CPC and IODF info from gathered z/OS facts.] *****
[0;32mok: [zos_host] => {[0m
[0;32m      "msg": {[0m [0;32m      "manufacturer: IBM",0m [0;32m      "model: A00",0m [0;32m      "plant: C1",0m
[0;32m      "iodf name: PROV.IODF00",0m [0;32m      "iodf config: DEFAULT"[0m [0;32m ][0m [0;32m}{0m

TASK [Print out all gathered facts about the z/OS host.] *****
[0;32mok: [zos_host] => {[0m
[0;32m      "ansible_facts": {[0m [0;32m      "arch_level": "2",0m [0;32m      "cpc_nd_manufacturer": "IBM",0m
[0;32m      "cpc_nd_model": "A00",0m [0;32m      "cpc_nd_plant": "C1",0m
[0;32m      "cpc_nd_seqno": "20D90792EB76",0m [0;32m      "cpc_nd_type": "008562",0m [0;32m      "edt": "00",
[0m [0;32m      "hw_name": "",0m [0;32m      "ieasym_card": "(00,K2)",0m [0;32m      "io_config_id": "00",0m
[0;32m      "iodate": "",0m [0;32m      "iodesc": "",0m [0;32m      "iodf_config": "DEFAULT",0m
[0;32m      "iodf_name": "PROV.IODF00",0m [0;32m      "iodf_unit_addr": "DE28",0m [0;32m      "ioproc": "",0m
[0;32m      "iotime": "",0m [0;32m      "ipaloadxx": "K2",0m [0;32m      "ipl_volume": "D25VS1",0m
[0;32m      "load_param_device_num": "DE28",0m [0;32m      "load_param_dsn": "SYS0.IPLPARM",0m
[0;32m      "lpar_name": "",0m [0;32m      "master_catalog_dsn": "CATALOG.VS01.MASTER",0m
[0;32m      "master_catalog_volser": "OPEVS1",0m [0;32m      "nucleus_id": "1",0m
[0;32m      "operator_prompt_flag": "M",0m [0;32m      "parmlib_dsn": "K2.PARMLIB",0m
[0;32m      "parmlib_volser": "USRVS1",0m [0;32m      "primary_jes": "JES2",0m
[0;32m      "product_mod_level": "00",0m [0;32m      "product_name": "z/OS",0m
[0;32m      "product_owner": "IBM CORP",0m [0;32m      "product_release": "05",0m
[0;32m      "product_version": "02",0m [0;32m      "smf_name": "VS01",0m [0;32m      "sys_name": "VS01",0m
[0;32m      "sysplex_name": "LOCAL",0m [0;32m      "tsoe_rel": "05",0m [0;32m      "tsoe_ver": "4",0m
[0;32m      "vm_name": ""}[0m [0;32m }{0m [0;32m}{0m

PLAY RECAP *****
[0;32mzos_host[0m          : [0; 32mok=4
[0m changed=0  unreachable=0  failed=0  skipped=0  rescued=0  ig nored=0

```

The previous scenario might or might not be relevant for your client's use case. The scenario illustrates how to sequence skills together in a skill flow to create an action that your assistant triggers based on prompts that use the pre-configured Ansible automation templates. You are encouraged to create your own skill flows and prompts that use other skills available within the AAP instance. As an example, create a skill flow for the **z/OS Ping** skill. Be sure to add the **Retrieve job output** skill to view the results.

Next, learn about custom-built actions.

# Creating custom-built actions

To this point, you learned how to:

- import skills into Watsonx Orchestrate
- add applications with those skills to your assistant
- create skill-based actions for your assistant
- combine skills in a skill flow

You can also create **custom-built** actions. Custom-built actions have actions with different steps to take in conversations and form sequences of prompts that define the conversation experience. The steps can be defined with or without conditions, which help control the custom responses. Steps within the custom action can end with routing to conversational search, triggering another existing subaction, and other actions. Custom-built actions are a powerful way of customizing the user's experience.

Learn more about creating custom-built actions [here](#).

# Importing pre-packaged z/OS skills

Provided with Version 2 of watsonx Assistant for Z is a set of pre-packaged skills. These skills are used to automate various tasks on z/OS, such as running different console commands and retrieving logs from batch jobs.

The list of pre-packaged skills available include:

- Authorized program list
- z/OS IPL Information
- Display zOS parmlib datasets
- UNIX System Services options
- Display zOS subsystems
- List spool files
- Retrieve dataset content
- Retrieve spool file content
- Retrieve z/OS Management Facility (OSMF) job status

IBM watsonx Orchestrate requires that any OSMF environment you connect to for skill execution has certificate authority (CA) signed certificates.

As an example, the following are console commands that are used in some of the pre-packaged skills:

- Authorized Program list - `operator command -> d prog,lnklist`
- z/OS IPL Information - `operator command -> d iplinfo`
- Display zOS parmlib datasets - `operator command -> d parmlib`

You can import the pre-packaged skills to your sandbox environment by downloading the compressed file [here](#) and following [these instructions](#).

Extract the embedded JSON file and modify the file for your environment by following [these instructions](#).

# Publishing and deploying your assistant

To this point, acting as an Assistant Builder, you built the assistant, configured conversational search, and added skills and automations. You tested your assistant by using the **preview** capability of AI Assistant Builder. The **preview** capability is a closed environment for experimenting with prompts.

After your assistant is finalized, you can publish it to make it available to users. Each assistant that you create comes with two **environments**: *draft* and *live*. You configured your assistant in the draft environment. Each environment has its own set of IDs, URLs, and service credentials referenced by external services.

The **Environments** page in the AI assistant builder has tabs for managing both the **Draft environment** and the **Live environment**:

This screenshot shows the 'Environments' page in the AI assistant builder. The 'Draft' tab is selected, indicated by a green dashed border. The 'Live' tab is also present but not selected. The page displays sections for 'Draft environment', 'Channels', 'Resolution Methods', and 'Extensions'. A 'Preview this environment' button is located in the top right corner.

This screenshot shows the 'Environments' page in the AI assistant builder. The 'Live' tab is selected, indicated by a green dashed border. The 'Draft' tab is also present but not selected. The page displays sections for 'Live environment', 'Channels', 'Resolution Methods', and 'Extensions'. A 'Publish version' button is located in the top right corner.

The **Draft environment** contains all your in-progress work in the Actions, Preview, and Publish pages. Use the **Draft environment** tab to build out your assistant and use for internal testing before deployment. Any integrations (channels) that you use for the **Draft environment** are unique to that environment, and changes to draft integrations don't affect the **Live environment**.

## Publish the assistant

Each time that you publish, you're creating a new version of the assistant, for example V1. When you publish your content, you're creating a snapshot of the draft content, resulting in a version.



### Versions do not contain integration configurations or environment settings

Published versions contain all of the content from actions, including settings and variables. **However, versions do not contain integration configurations or environment settings.** Integration configurations and environment settings must be configured manually in each environment.

For managing quality-control and versioning, the Live environment is the version of the assistant to give to users.

Follow these steps to publish the first version of your assistant by using Assistant Builder:

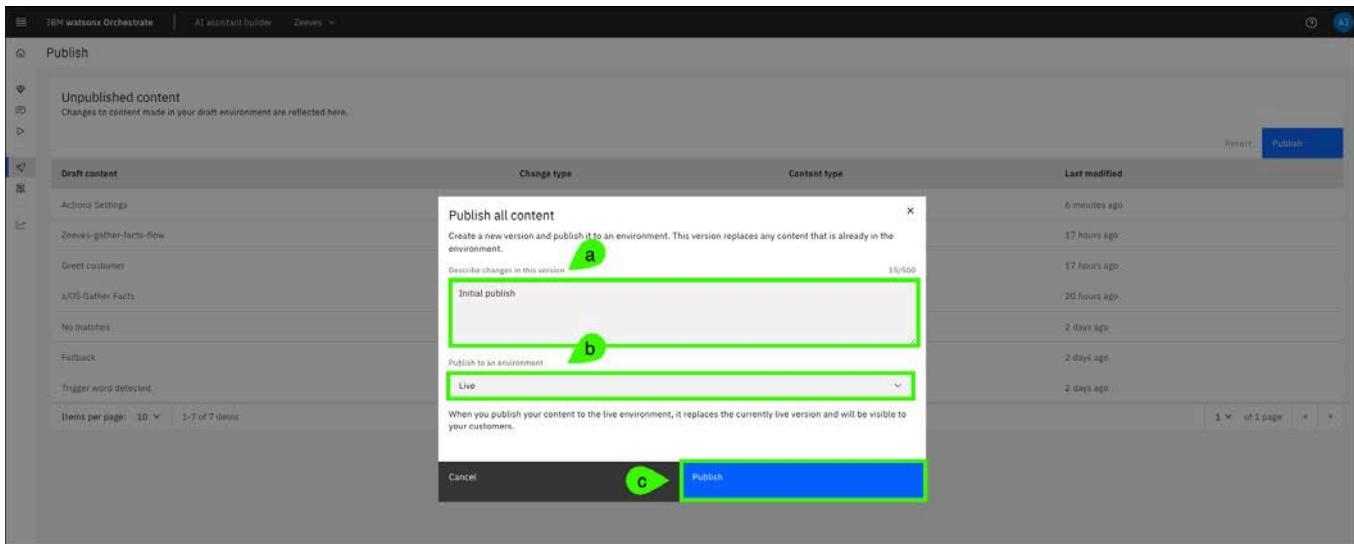
1. Hover over the **Home** icon ( ) and click **Publish**.

The screenshot shows the AI assistant builder interface. The left sidebar has a 'Publish' button highlighted with a green box. The main area displays various configuration steps: 'Build actions', 'Customize your greeting', 'Create a fallback plan', 'Preview & debug', 'Customize web chat', 'Set up a channel', 'Set up live agent', and 'Public assist'. Below these is a diagram of a flowchart with nodes like 'Default behavior', 'General purpose', 'Conversational search', and 'Search'. The top right corner shows a 'What's new' link and a 'Documentation' link.

2. Click **Publish**.

The screenshot shows the 'Publish' page. It displays a table of 'Draft content' changes with columns for 'Change type', 'Content type', and 'Last modified'. The 'Publish' button at the bottom right is highlighted with a green box. The table includes rows for 'Zeeves-gather-facts-flow', 'Greet customer', 'Actions Settings', 'Fallback', 'No matches', and 'Trigger word detected'. At the bottom, there are pagination controls for 'Items per page' (set to 10), '1-6 of 6 items', and '1 of 1 page'.

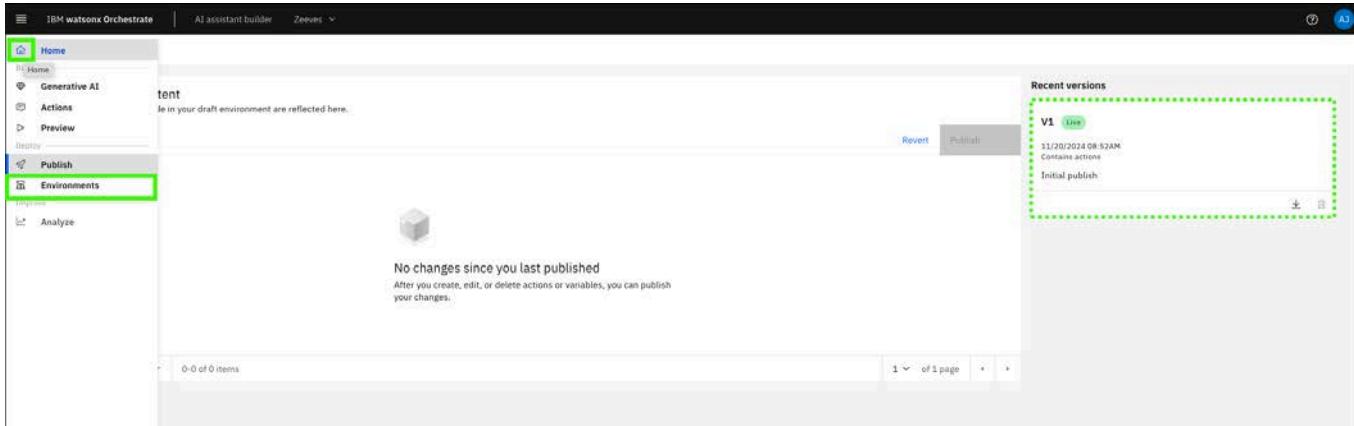
3. Enter a description of the changes (a), set the environment to **Live** (b), and then click **Publish** (c).



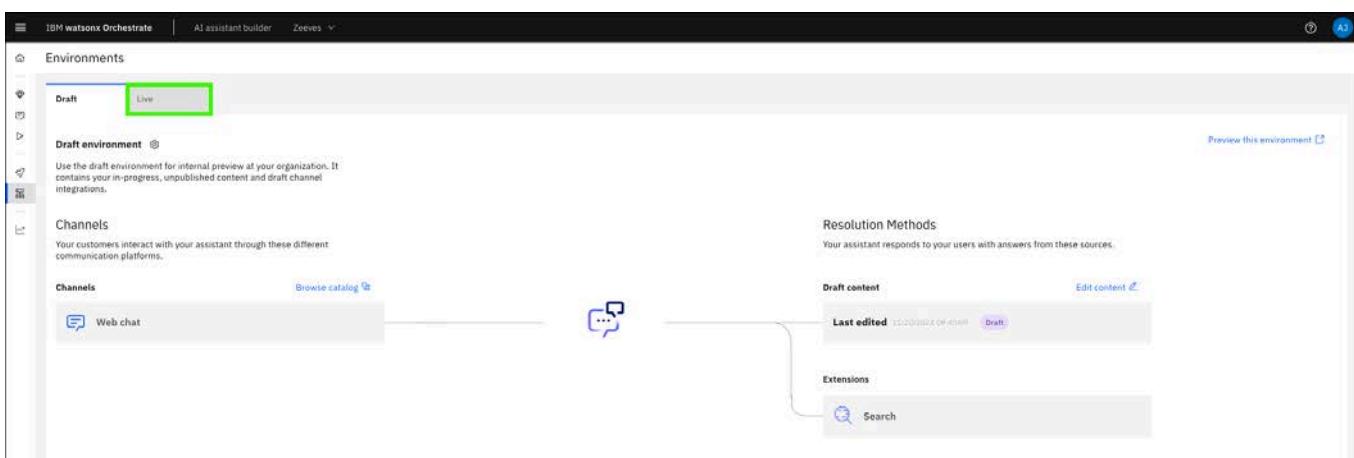
## Configure the live environment

**Important:** When the live environment is created, the settings from the draft environment are not carried over (for example, the configuration of the OpenSearch instance used for conversational search).

1. Hover over the Home icon (⌂) and click Environments.



2. Click Live.



### 3. Click Web chat.

The screenshot shows the IBM Watson Assistant interface. At the top, there are tabs for 'IBM Watson Assistant', 'AI assistant builder', and 'Zenvers'. Below this, the 'Environments' section has 'Draft' and 'Live' tabs, with 'Live' being the active tab. Under 'Live environment', there's a note about using it for deployment to customers. The 'Channels' section lists 'Web chat' (which is highlighted with a green box), 'Email', 'SMS', 'Facebook', 'Twitter', and 'LinkedIn'. To the right, under 'Resolution Methods', it says 'Your assistant responds to your users with answers from these sources.' Below that is the 'Content' section, which shows 'V1' (with a timestamp) and 'Live'. The 'Extensions' section includes a 'Search' extension with a note about extending what the assistant can answer by searching existing documents. There's also an 'Add +' button.

### 4. Customize the live assistant as you see fit.

On the **Style** tab, you're able to set the Assistant name that is displayed on the chat window when users are interacting with the assistant. For pilots or demos, consider personalizing this name for the client. Also in the **Style** tab, you can set the themes and display settings of the chat windows, including the ability to enable the IBM Watermark and enable streaming.

On the **Home** tab, you enable and customize the greeting message from the assistant when the user accesses the assistant chat. You are also able to set **Conversation starters** that are displayed in the chat window. When selected by the user, the text of the conversation starter is sent as a prompt, so it is important that your assistant is trained and tested to answer correctly. It is highly recommended to remove the default conversation starters and create your own. The ability to add a Background style for the assistant chat window is on the home screen tab.

Explore all the other tabs.



#### Customize your live environment.

For this lab, toggle **Streaming** on and turn **Suggestions** off on the **Suggestions** tab. You may also want to change the theme to **Dark** to differentiate your draft and live environments.

The screenshot shows the 'Style' tab selected in the navigation bar. The 'Suggestions' tab is also highlighted with a green border. On the right side, there is a preview window showing a dark-themed chat interface with a blue owl icon and sample messages.

## 5. Click Save and exit.

The screenshot shows the 'Save and exit' button highlighted with a blue border. The preview window on the right shows the same dark-themed chat interface with a blue owl icon and sample messages.

## 6. Click Add in the Search tile.

The screenshot shows the 'Live' environment configuration in IBM Watsonx Orchestrate. It includes sections for Channels (Web chat), Resolution Methods (Content V1, Live), and Extensions (Search). A green box highlights the 'Add +' button under Extensions.

## 7. Click Custom service.

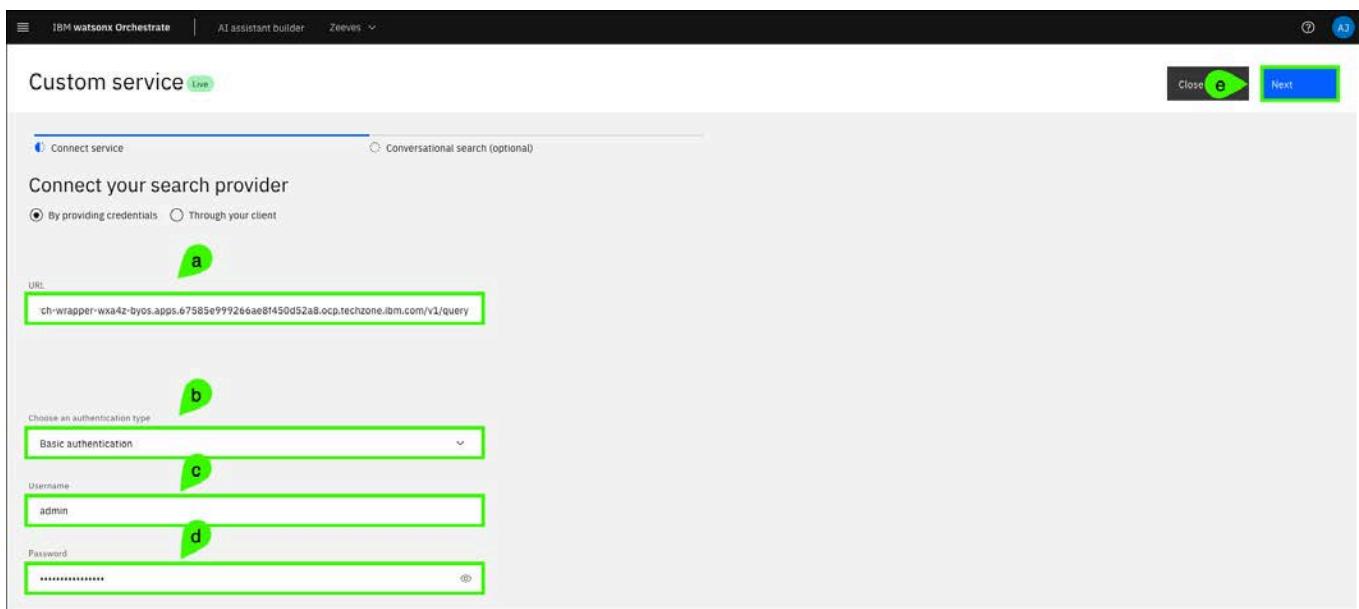
The screenshot shows the 'Set up a new search integration' dialog box. The 'Custom service' option is highlighted with a green box.

- Enter the URL for your bring-your-own-search (BYOS) engine (a), select Basic authentication for the authentication type (b), enter admin for the Username (c), enter the password that you specified in the wrapper-creds.yaml file for the Password (d), and then click Next (e).

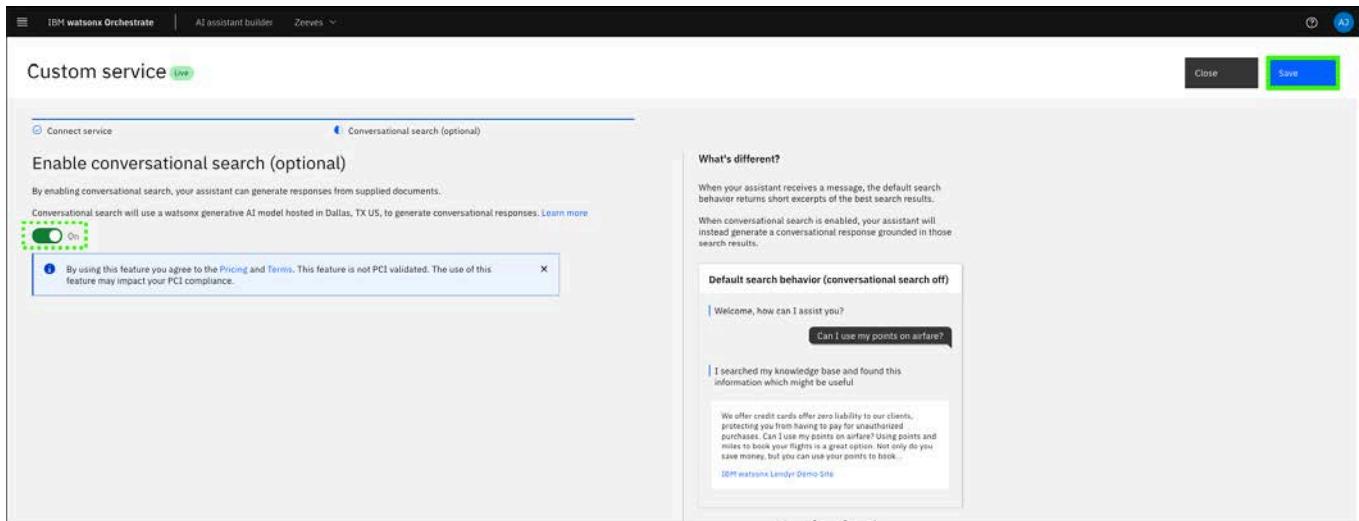


**Use the correct URL and authentication type!**

Use the URL and credentials for your BYOS OpenSearch engine created earlier [here](#).



## 9. Verify conversational search is enabled and click Save.



## 10. Update the Custom service settings (a-f), click Save (g), and then click Close (h).

### Customize the settings.

This is your assistant. Feel free to customize the settings. The settings shown below reflect the changes made earlier in the lab guide to the draft version of the assistant. This includes the **Metadata** field to weigh ingested client documents higher using:

```
{
  "doc_weight": {
    "product_docs": 0.2,
    "customer_docs": 0.8,
    "ibm_indices": "*_ibm_docs_slate, *_ibm_redbooks_slate",
    "standardize": true,
    "customer_indices": "customer_*"
  }
}
```

**Custom service** Live

**Settings** Instance

**Conversational search**

Use a watsonx generative AI model hosted in Dallas, TX US, to generate conversational responses. [Learn more](#)

**Conversational type**

**a** On

**b** Off

**Contextual responses**

**c** Single turn

The assistant uses only the current user input for retrieving search results and generating answers. This works well for clear, complete inputs but generally won't work with context-dependent queries such as, "Why is that?" after a previous answer.

**d** Entire conversation Beta

The assistant uses the entire session history for retrieving search results and generating answers. This handles context-dependent questions well but may over-rely on past topics, even if the user has moved on.

Define the text for the citations title. i1

How do we know?

**Search configuration**

To test this, go to the [evaluations page](#) Restore default

**Retrieval confidence threshold** i2

**c** Lowest

Low High Highest

**Generated response length** i3

Concise  **d** Verbose

Moderate

**Response confidence threshold** i4

**e** Lowest

Low High Highest

**Citations**

Citations will be displayed to the end user. This doesn't impact the number of citations used in the response.

Citations shown in web chat

All

**Default filter**

Can be anything (plain text, JSON, etc.)

**Metadata** f

```
{
  "doc_weight": 1.0,
  "product_docs": 0.2,
  "customer_docs": 0.8,
  "item_indices": "...",
  "item_docs": "...",
  "customer_indices": "customer_...",
  "customer_docs": "customer_..."
}
```

**Search display text**

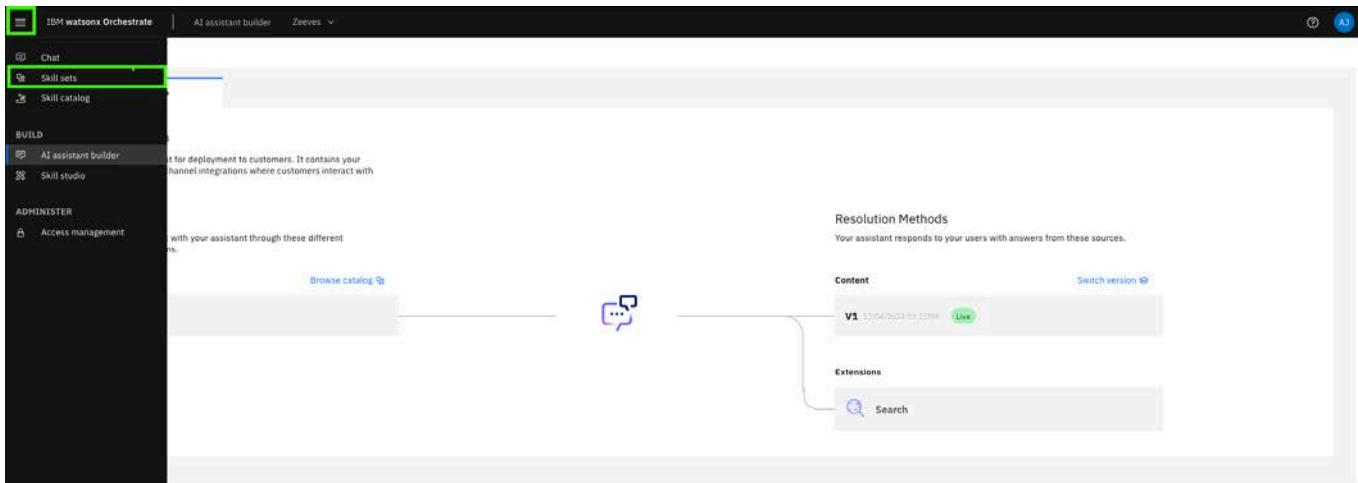
Define the text your search will display to the end user

No results found	Connectivity issue
I searched my knowledge base, but did not find anything related to your query	

**Close** g h A3

## Connect the skills to the live environment

1. Click **Skill sets** in the main menu.



## 2. Select your assistant's live instance in the Skill sets list.

Name	Type
z/OS Gather Facts	App
Zeeves-gather-facts-flow	App
Retrieve job output	App

## 3. Click Connections.

Name	Type
z/OS Gather Facts	App
Zeeves-gather-facts-flow	App
Retrieve job output	App

## 4. Search for the application name you specified earlier.

Zeeves live

Skill sets

Application	Number of skills	Credential type	Connected by	Action
Ansible Controller Skills - z skills	3	Not specified		<span style="color: green;">⋮</span>

Items per page: 5 1-1 of 1 items

5. Click the ellipses (⋮) for your app and then click **Connect app**.

Zeeves live

Skills Connections

Application	Number of skills	Credential type	Connected by	Action
Ansible Controller Skills - z skills	3	Not specified		<span style="color: green;">Connect app</span>

Items per page: 5 1-1 of 1 items

6. Click **Connect app**.

Connect to Ansible Controller Skills - z skills

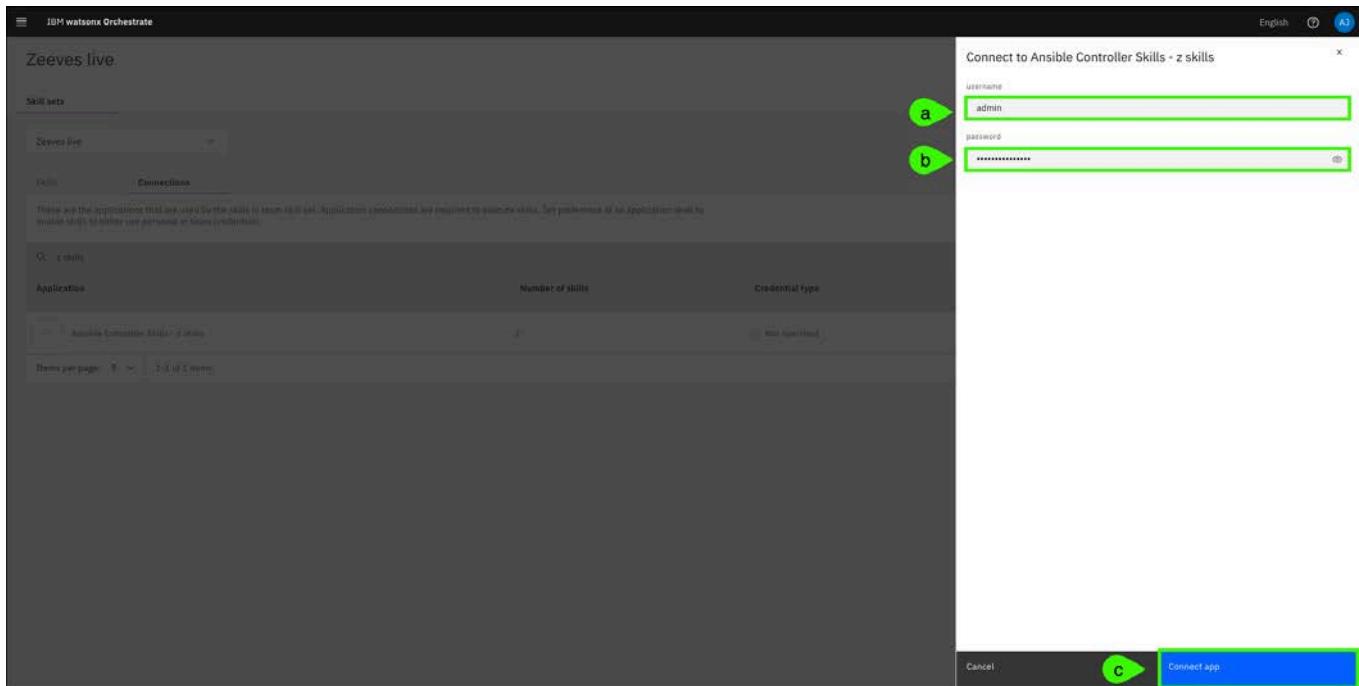
Member credentials  
Each team member uses their own credentials to connect to this app and use its skills.

Team credentials  
The admin sets the credentials each team member uses to connect to this app and use its skills.

You selected **Team credentials** for the credential type. Click **Connect app** to provide the credentials your team will use and to connect to the app.

Connect app

7. Enter the **username (a)** and **password (b)** using the username ( admin ) and password for your IBM Technology Zone (ITZ) watsonx Assistant for Z Pilot - AAP & z/OS reservation, and then click **Connect app (c)**.



Learn more about publishing your assistant and creating live environments [here](#).

## Deploy the assistant

After configuring your assistant's settings and publishing, the final step is to deploy your assistant, which can be done across various channels depending on the use case.

Several options exist for deploying your assistant through channels and integrations to satisfy the use cases that you might encounter. Learn more about all the deployment options [here](#).

For this lab, deploy the assistant by using the web chat integration. The web chat integration provides an assistant interface that can integrate with a website. Learn more about the web chat integration [here](#).

1. Open the **Environments** page in the **AI assistant builder**.

2. Click **Web chat** for the **Live** environment.



3. Click the **Embed** tab.

4. Copy and record the `integrationID`, `region`, and `serviceInstanceId` values.

```
<script>
  <!-- Integration ID -->
  integrationID: '8bad0299-e6b9-43dc-8c8c-2754d9272fe5', // The ID of this integration
  region: 'wco-us-south', // The region your integration is hosted in.
  serviceInstanceId: '21613381-8dfc-47ab-bdf2-319f531087ba', // The ID of your service instance.
  onload: async (instance) => { await instance.loadUI(); }

  </script>

```

5. In a text editor, create a file that is named `Watson Assistant Chat.html` and paste the following text in the file.

File name:

```
Watson Assistant Chat.html
```

File contents:

```
<html lang="en">
<head>
<title>Watson Assistant Chat</title>
<meta name="viewport" content="width=device-width, initial-scale=1">

<style>
.WebChatContainer {
  position: absolute;
  left: 0;
  right: 0;
  top: 0;
  bottom: 0;
}
</style>
</head>
<body>

<div class="WebChatContainer"/>

<script>
const element = document.querySelector('.WebChatContainer');

window.watsonAssistantChatOptions = {
  integrationID: "<YOUR INTEGRATION ID>", // The ID of this integration.
  region: "<YOUR REGION>", // The region your integration is hosted in.
  serviceInstanceId: "<YOUR SERVICE INSTANCE ID>", // The ID of your service instance.
  element,

  openChatByDefault: true,
  hideCloseButton: true,

  layout: {
    showFrame: false,
    hasContentMaxWidth: true,
  },
  onLoad: async (instance) => {
    window.WACInstance = instance;
    await instance.render();
  }
};

setTimeout(function() {
  const t = document.createElement('script');
  t.src = 'https://web-chat.global.assistant.test.watson.appdomain.cloud/versions/' +
  (window.watsonAssistantChatOptions.clientVersion || 'latest') +
  '/WatsonAssistantChatEntry.js';
  document.head.appendChild(t);
});
</script>

</body>
</html>
```

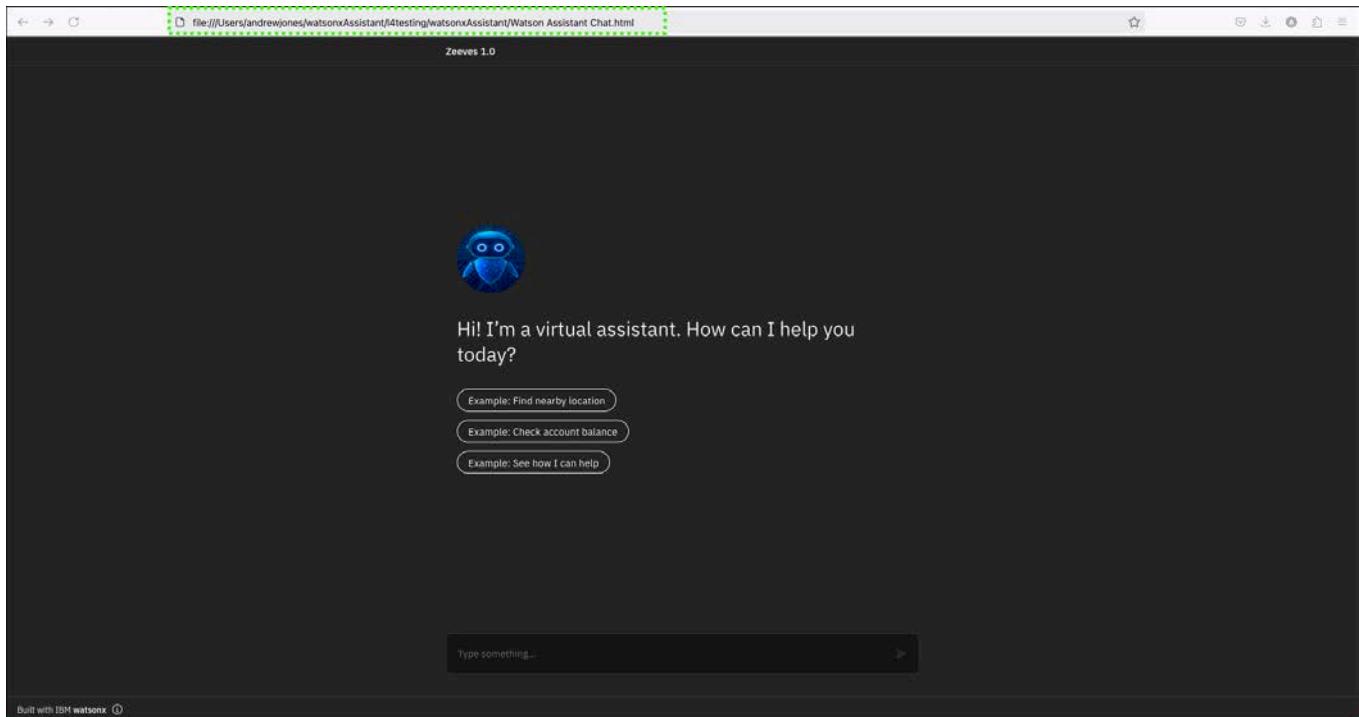
Before modification:

```
Watson Assistant Chat.html X
Users > andrewjones > Downloads > Watson Assistant Chat.html > html
1  <html lang="en">
2  <body>
3  <script>
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
</body>
</html>
```

After modification:

```
Users > andrewjones > Downloads > Watson Assistant Chat.html > html > body > script > layout
1  <html lang="en">
2  <head>
3  <style>
4    .WebChatContainer {
5      top: 0;
6      bottom: 0;
7    }
8  </style>
9  </head>
10 <body>
11 <div class="WebChatContainer">
12
13 <script>
14   const element = document.querySelector('.WebChatContainer');
15
16   window.watsonAssistantChatOptions = {
17     integrationID: "8b4ad299-e6b9-434c-8c8c-2754d9272fe5", // The ID of this integration.
18     region: "wxs-us-south", // The region your integration is hosted in.
19     serviceInstanceId: "7c163381-8dcf-476b-bdf2-319f531087be", // The ID of your service instance.
20     element,
21
22     openChatByDefault: true,
23     hideCloseButton: true,
24
25     layout: {
26       showFrame: false,
27       hasContentMaxWidth: true,
28     },
29
30     onLoad: async (instance) => {
31       window.WACInstance = instance;
32       await instance.render();
33     }
34   }
35
36
37
38
39
40
</script>
```

6. Open the `Watson Assistant Chat.html` file in a web browser.



Your assistant is now live. Explore some of the earlier prompts to verify that the assistant is accessing the ingested documents and your skills and skill flows are active.

**⚠ Wait 5-10 seconds before clicking apply on skill actions.**

Prompts to try:

What is z/OS continuous delivery?

Get z/OS facts

Show me z/OS facts

Gather and display z/OS facts

## Use cases

# Use case: Retrieve IPL information

Next, explore a use case to improve productivity for early-tenure system programmers (SysProg) who are preparing for an upcoming initial program load (IPL) for a logical partition (LPAR).

To prepare for the IPL, the SysProgs need to familiarize themselves with the process. Rather than spending time reading through the wide array of documentation available online, they would like to use watsonx Assistant for Z. The content-grounded capabilities that are provided by watsonx Assistant for Z return accurate responses to their questions quickly and uses automations to perform actions.

As part of the pilot, they already explored prompting the assistant with questions. In one example prompt, they asked the assistant is “*What information is needed to perform an IPL on a z/OS LPAR?*” In reading the response, the SysProg learns they need information about their system in preparation for the IPL. For example, the IPL Volume and the IPL LOAD PARM.

For this use case, show how a simple automation for retrieving this type of information can be infused in a natural conversation with watsonx Assistant for Z. You use pre-packaged skills to automate various tasks on z/OS. The pre-packaged skills are provided as an OpenAPI JSON file. Learn more about OpenAPI [here](#). The file includes skill definitions that can be uploaded to the Skill Studio within watsonx Orchestrate to import the pre-packaged skills. First, the file must first be customized for your z/OS server.

The list of pre-packaged skills available include:

- Authorized program list
- z/OS IPL Information
- Display zOS parmlib datasets
- Unix System services options
- Display zOS subsystems
- List spool files
- Retrieve dataset content
- Retrieve spool file content
- Retrieve z/OS Management facility (z/OSMF) job status

A great value of watsonx Orchestrate is the ability to build skills that anyone can use. You can build your own custom skills by importing an OpenAPI file into watsonx Orchestrate as a JSON or YAML file. For more information on building skills by importing OpenAPI files, refer to the documentation [here](#).

Watsonx Orchestrate also makes it possible to build, edit, and generate OpenAPI specifications by using the OpenAPI builder. With the OpenAPI Builder, you can use the AI function to simplify the process of generating these specifications. For more information on using the OpenAPI Builder, refer to the documentation [here](#).

For this use case, you are importing the skill for retrieving a z/OS server’s IPL information. The next steps walk you through the process of downloading that OpenAPI JSON file and customizing it for your environment.

## Download and customize the watsonx Assistant for Z OpenAP JSON file

1. Download the watsonx Assistant for Z OpenAP JSON file.

[wxa4z-skillpak-prepackaged-skills.json.zip](#)

2. Extract the file.

3. In a text editor, open the `wxa4z-skillpak-prepackaged-skills.json`, modify the server's url field as described, and save the file.

**File name:**

```
wxa4z-skillpak-prepackaged-skills.json
```

Substitute your Wazi as a Service (WaaS) instance URL for the string <your z/OSMF URL>. Your WaaS URL is based on your ITZ AAP URL that can be obtained from your watsonx Assistant for Z Pilot - AAP & z/OS ITZ reservation.

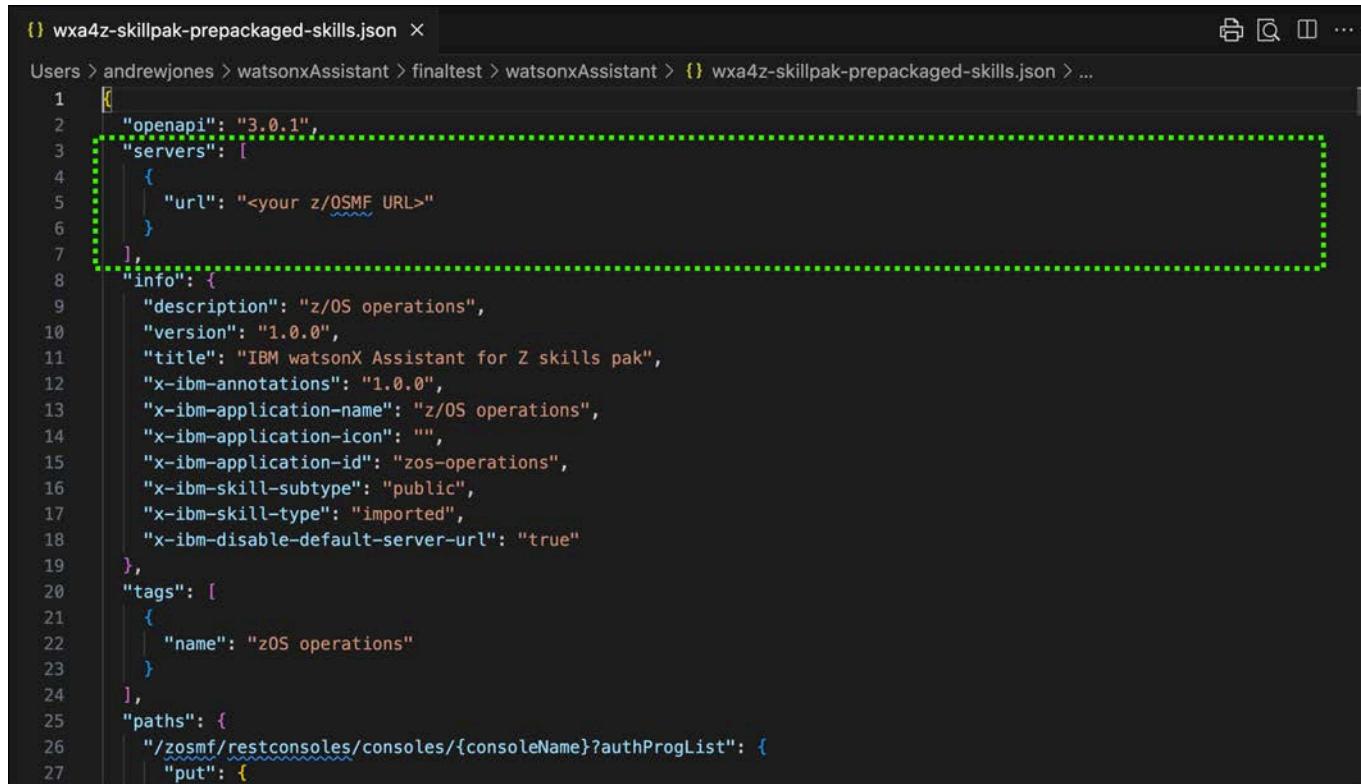
The AAP URL is similar to:

<https://itzvsi-aap-ppxbcno.techzone.ibm.com>

Change the `aap` string to `zos` and append `:10443` to the URL value. **Record this value for later use!** Your new URL is similar to:

<https://itzvsi-zos-ppxbcno.techzone.ibm.com:10443>

Before:



```
{
  "openapi": "3.0.1",
  "servers": [
    {
      "url": "<your z/OSMF URL>"
    }
  ],
  "info": {
    "description": "z/OS operations",
    "version": "1.0.0",
    "title": "IBM watsonX Assistant for Z skills pak",
    "x-ibm-annotations": "1.0.0",
    "x-ibm-application-name": "z/OS operations",
    "x-ibm-application-icon": "",
    "x-ibm-application-id": "zos-operations",
    "x-ibm-skill-subtype": "public",
    "x-ibm-skill-type": "imported",
    "x-ibm-disable-default-server-url": "true"
  },
  "tags": [
    {
      "name": "zOS operations"
    }
  ],
  "paths": {
    "/zosmf/restconsoles/consoles/{consoleName}?authProgList": {
      "put": {
        "summary": "Update authProgList for a console"
      }
    }
  }
}
```

After:

```

{} wxa4z-skillpak-prepackaged-skills.json •
Users > andrewjones > watsonxAssistant > finaltest > watsonxAssistant > {} wxa4z-skillpak-prepackaged-skills.json > {} info
1  {
2    "openapi": "3.0.1",
3    "servers": [
4      {
5        "url": "https://itzvsi-zos-pwgabob.techzone.ibm.com:10443"
6      }
7    ],
8    "info": [
9      "description": "z/OS operations",
10     "version": "1.0.0",
11     "title": "IBM watsonX Assistant for Z skills pak",
12     "x-ibm-annotations": "1.0.0",
13     "x-ibm-application-name": "z/OS operations",
14     "x-ibm-application-icon": "",
15     "x-ibm-application-id": "zos-operations",
16     "x-ibm-skill-subtype": "public",
17     "x-ibm-skill-type": "imported",
18     "x-ibm-disable-default-server-url": "true"
19   ],
20   "tags": [
21     {
22       "name": "zOS operations"
23     }
24   ],
25   "paths": {
26     "/zosmf/restconsoles/consoles/{consoleName}?authProgList": {

```



In watsonx Orchestrate, each app is associated with a single URL.

If you have not imported previous skills into an app called `z/OS operations`, the default values in the `info` section are fine. If you already have an app named "z/OS operations", modify the `info` section to meet your needs.

For more information on modifying the OpenAPI JSON file, see the instructions [here](#).

## Set the RACF passphrase for z/OSMF authentication

For your skills to run successfully on your WaaS instance, you need to ensure that you can authenticate to it from watsonx Orchestrate. To achieve successful authentication, setup a new RACF Passphrase for the `IBMUSER` ID that is a pre-defined user ID on the WaaS server. The following steps take you through the steps of setting a new passphrase for your user and verifying access.

1. Open and log in to the Ansible Automation Platform (AAP) web console.



**Don't remember how?**

Refer to the first 5 steps in [Explore Ansible Automation Platform](#).

2. Click **Templates** under the **Resources** section.

Name	Type	Organization	Last Ran	Actions
z/OS Certs - Add CA Cert	Job Template	Default	1/17/2025, 5:17:58 AM	
z/OS Certs - Create Cert	Job Template	Default		
z/OS Certs - Create Keyring	Job Template	Default		
z/OS Certs - Delete Cert	Job Template	Default		
z/OS Certs - Delete Keyring	Job Template	Default		

3. Click the launch icon () for the **z/OS TSO Command(s)** template.

Name	Type	Organization	Last Ran	Actions
z/OS TSO Command(s)	Job Template	Default		

4. Replace the default command with the text that follows and substituting a password of your choosing for the string **YOUR PASSWORD PHRASE** and then click **Next**.

```
ALTUSER IBMUSER PHRASE('YOUR PASSWORD PHRASE') NOEXPIRE RESUME
```

**Avoid typographical errors later... keep the password simple.**

If you type the command yourself, be sure to include the single quotes before and after the password. **Record the password as it will be needed later.** We will refer to this as your **WaaS password**."

**Launch | z/OS TSO Command(s)**

A playbook to execute one or multiple TSO commands on the target z/OS system.

1 Survey    2 Preview

**Command(s) (?)**

ALTUSER IBMUSER PHRASE('YOUR PASSWORD PHRASE') NOEXPIRE RESUME

**Actions**

Next Back Cancel

## 5. Click Launch.

**Launch | z/OS TSO Command(s)**

A playbook to execute one or multiple TSO commands on the target z/OS system.

1 Survey    2 Preview

Name	z/OS TSO Command(s)	Description	Type	Job Template
Timeout	0 min 0 sec	Job Type	Run	Organization Default
Inventory	AAP z/OS	Project	aap4zos	Execution Environment aap4zos EE
Playbook	zos_tso_command.yml	Forks	0	Verbosity 1 (Verbose)
Show Changes	Off	Job Slicing	1	
Credential	SSH: z/OS Host SSH ...			
Created	1/17/2025, 5:17:49 AM by admin	Last Modified	1/17/2025, 5:17:49 AM by admin	

**Actions**

Launch Back Cancel

## 6. Verify that the job is **Successful** by locating the message `"failed": false` in the job output.

The screenshot shows the Red Hat Ansible Automation Platform interface. On the left, there's a sidebar with sections like Views, Jobs, Schedules, Activity Stream, Workflow Approvals, Host Metrics, Subscription Usage, Resources, Templates, Credentials, Projects, Inventories, Hosts, Access, Organizations, Users, Teams, Administration, Credential Types, and Notifications. The main area is titled "Jobs > 13 - z/OS TSO Command(s)" and "Output". It shows a "z/OS TSO Command(s)" job with a green "Successful" status. The output tab is selected, showing "Stdout" and a search bar. A message says "Events processing complete. Reload output". The output content is a JSON array with one item, which includes a "failed" entry highlighted with a green dashed box.

```

5 TASK [Run z/OS TSO command(s).] ****
6 changed: [zos_host] => {"changed": true, "max_rc": 0, "output": [{"command": "ALTUSER IBMUSER PHRASE('YOUR PASSWORD PH RASE') NOEXPIRE RESUME", "content": "", "failed": false, "lines": 1, "rc": 0, "stderr": ""}]}
7
8 TASK [Print results from command(s). Click on the output and go to the 'JSON' tab to show more output.] *** 07:41:32
9 ok: [zos_host] => {
10     "command.output": [
11         {
12             "command": "ALTUSER IBMUSER PHRASE('YOUR PASSWORD PHRASE') NOEXPIRE RESUME",
13             "content": "",
14             "failed": false,
15             "lines": 1,
16             "rc": 0,
17             "stderr": ""
18         }
19     ]
20 }
21
22 }
23
24 ]

```

## 7. Verify that you can log in to z/OSMF in a new browser tab.

Use the WaaZ URL created earlier and append `/zosmf` to the string. The URL is similar to: <https://itzvsi-zos-pwgabob.techzone.ibm.com:10443/zosmf>.

The screenshot shows a web browser window with the URL <https://itzvsi-zos-pwgabob.techzone.ibm.com:10443/zosmf> highlighted in green. The browser tabs include "IBM Watsonx Assistant for Z", "My reservations", "IBM Watson Service Page", "IBM Watsonx Orchestrate", "Routes - Red Hat OpenShift", and "Ansible Automation Platform | 1...". A warning message box is displayed in the center of the screen, stating "This Connection Is Not Private" with a warning icon. It says: "This website may be impersonating 'itzvsi-zos-pwgabob.techzone.ibm.com' to steal your personal or financial information. You should close this page." There are "Show Details" and "Close Page" buttons at the bottom of the message box.



**Accept any connection not private messages to open the page.**

## 8. Enter (a) IBMUSER for the z/OS USER ID, (b) the password you specified in step 4 for the z/OS PASSWORD, and then (c) click LOG IN.

**Welcome to z/OS**

The highly secure, scalable and resilient enterprise operating system for the IBM z Systems mainframe.

**a** z/OS USER ID  
IBMUSER

**b** z/OS PASSWORD  
.....

**c** LOG IN

Shopz  
IBM Support

z Systems Redbooks  
z/OSMF Home Page

WSC Flashes and Techdocs  
z/OS Home Page

IBM z/OS documentation

9. Close the new browser tab after verifying a screen similar to the image that follows is displayed.



Import and publish the pre-packaged skills as an OpenAPI file

1. Open **Skills studio** in watsonx Orchestrate.

Welcome, Andrew Jones!

Take productivity to the next level.

Intuitive interaction | Natural conversations | Contextual clarity

Try Skills in Chat →

**Build**

Start building the skills, conversations, and automations your team needs here.

**AI assistant builder**

Boost productivity and customer care by creating conversational experiences.

**Skill studio**

Build the skills your team needs to get their work done more quickly.

Standard plan | Skill studio

**Automate how your business works**

Learn more →

**Explore**

2. Click **Create** and then click **Import API**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

**Skills and apps** Projects

Skills Apps

Find a skill

Skills

**Create**

Skill Flow

**Import API**

Configure prebuilt skills

3. Click **From a file**.

**Add skills**

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source     Select the skills

**Choose the source**

To discover new skills, connect to an app or refer to an OpenAPI file.

**From an app**    **From a file**    OpenAPI builder (exp...)

IBM Cloud Pak for Business Automation - On premises which includes Automation Decision Services, Business Automation Workflow, and Operational Decision Manager on-premises	IBM Cloud Pak for Business Automation as a service which includes Business Automation Workflow as a service and includes Operational Decision Manager as a service	z/OS Skills accelerator (Trial) Import your Ansible, JCL/REXX automation to Watsonx Orchestrate
--	---	--

#### 4. Click Drag and drop files here or click to upload in the Import a skill file window.

**Add skills**

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source     Select the skills

**Choose the source**

To discover new skills, connect to an app or refer to an OpenAPI file.

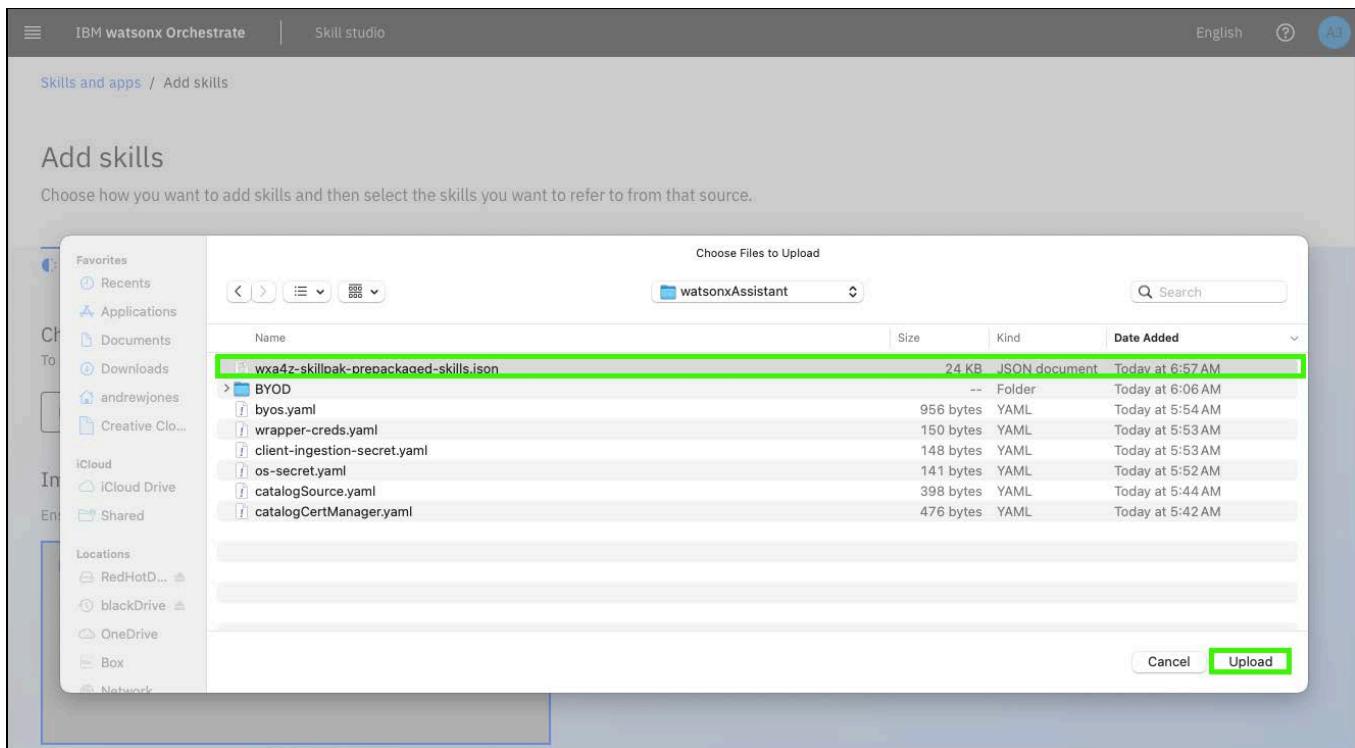
**From an app**    **From a file**    OpenAPI builder (exp...)

**Import a skill file**

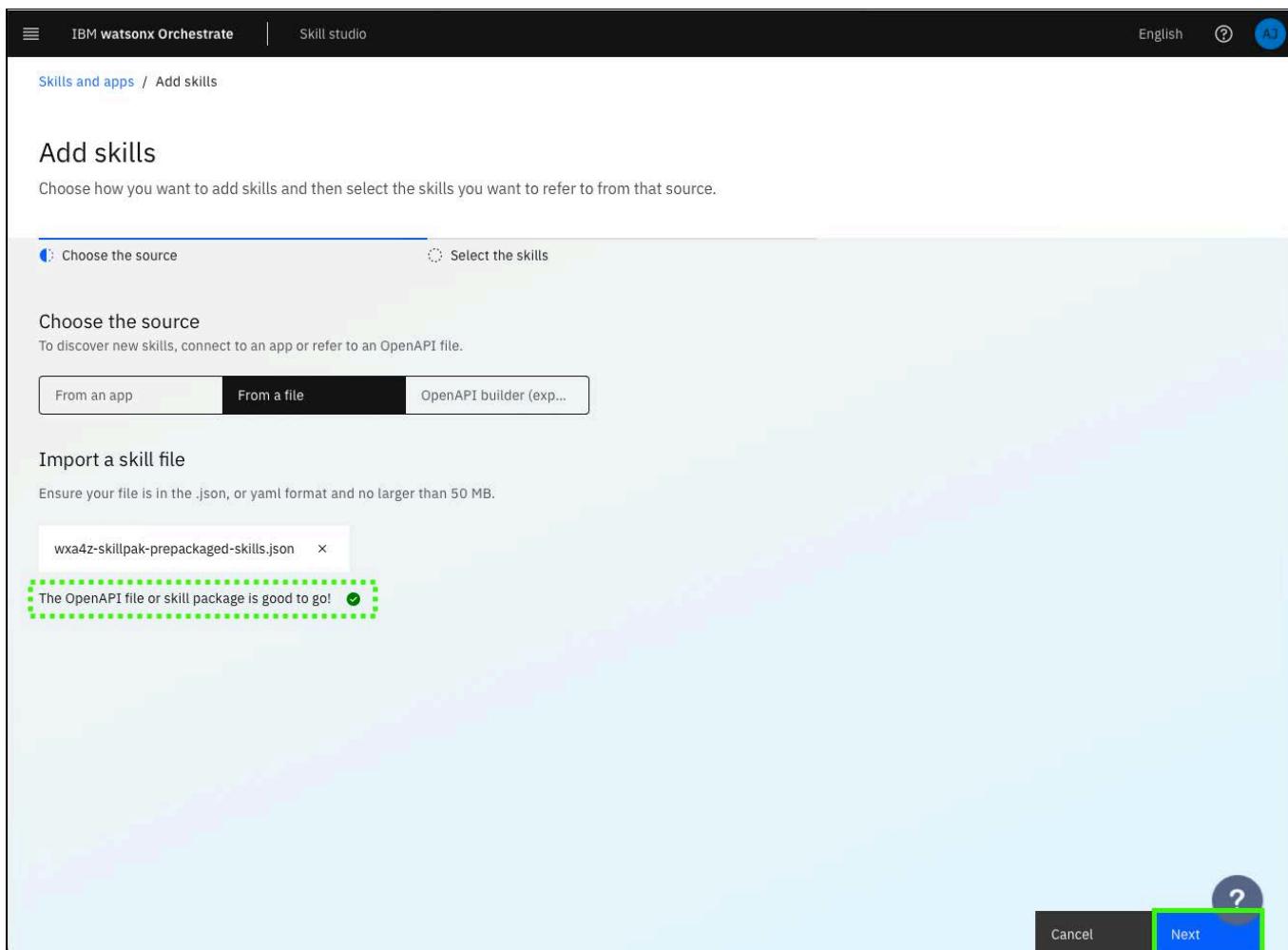
Ensure your file is in the .json, or yaml format and no larger than 50 MB.

Drag and drop files here or click to upload

#### 5. Locate and select the JSON file that you modified earlier and then click **Upload**.



6. Verify that you receive the message **The Open file or skill package is good to go!** and then click **Next**.

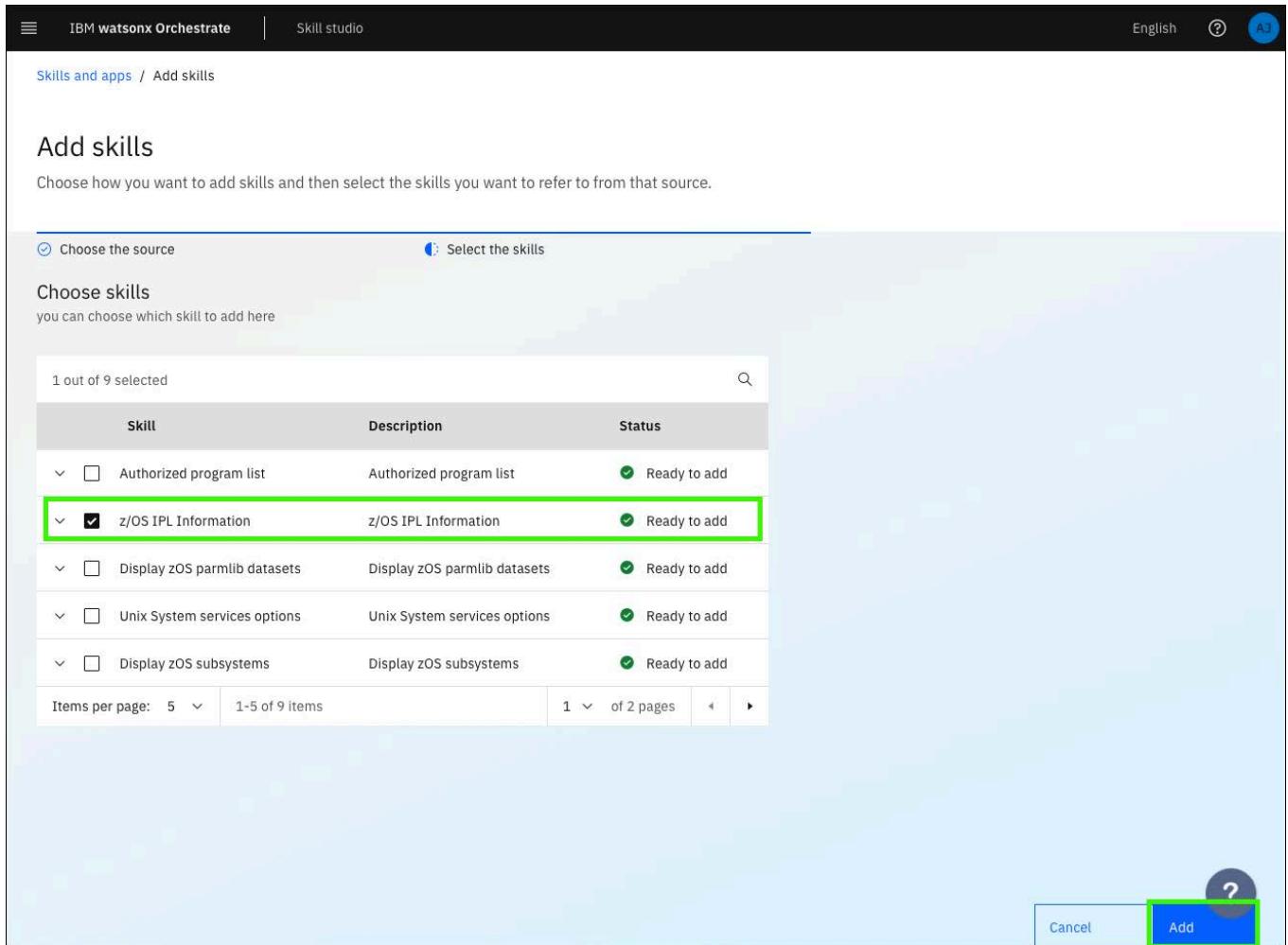


### ✖️ Not good to go?

If the file does not load properly you will need to verify not formatting or errors were made in your json file. Return to the previous section to verify the file contents and then reload the JSON file.

#### 7. Select the **z/OS IPL Information** skill and then click **Add**.

**Note:** Only the **z/OS IPL Information** skill is required for this use case, but you can add as many skills as you like for testing purposes.



The screenshot shows the 'Add skills' interface in the Skill studio. At the top, there are two tabs: 'Choose the source' (selected) and 'Select the skills'. Below this, a section titled 'Choose skills' with the sub-instruction 'you can choose which skill to add here' is visible. A search bar is at the top of the list. The list itself has a header row with columns 'Skill', 'Description', and 'Status'. There are five items listed, each with a checkbox and a status indicator (green checkmark). The second item, 'z/OS IPL Information', has its checkbox checked and is highlighted with a green border. At the bottom of the list, there are pagination controls ('Items per page: 5', '1-5 of 9 items', '1 of 2 pages', navigation arrows) and a footer with 'Cancel' and 'Add' buttons, where 'Add' is also highlighted with a green border.

Skill	Description	Status
<input type="checkbox"/> Authorized program list	Authorized program list	<span style="color: green;">✓ Ready to add</span>
<input checked="" type="checkbox"/> z/OS IPL Information	z/OS IPL Information	<span style="color: green;">✓ Ready to add</span>
<input type="checkbox"/> Display zOS parmlib datasets	Display zOS parmlib datasets	<span style="color: green;">✓ Ready to add</span>
<input type="checkbox"/> Unix System services options	Unix System services options	<span style="color: green;">✓ Ready to add</span>
<input type="checkbox"/> Display zOS subsystems	Display zOS subsystems	<span style="color: green;">✓ Ready to add</span>

#### 8. Click the ellipses icon (⋮) for the **z/OS IPL Information** skill and then click **Enhance this skill**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

Create

Skills and apps Projects

Skills Apps

Configure prebuilt skills

Find a skill

Skills

Name	Step in the process	Status	Skill type	Author	Last edited	More
z/OS IPL Information	Just 1 step away to be ready	Ready to publish	Imported	andrew@jones-tx.com	January 17 2025	<span>⋮</span>
Zeeves-gather-facts-flow	Ready to use	Published	Skill flow	andrew@jones-tx.com	January 17 2025	<span>⋮</span>
Retrieve job output	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	<span>⋮</span>
z/OS Ping	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	<span>⋮</span>
z/OS Gather Facts	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	<span>⋮</span>

## 9. Review the skill enhancements options and then click Publish.

Skills and apps / Enhance this skill

Enhance the “z/OS IPL Information” skill

Add details that will make people want to use this skill.

Name	Input	Output	Security	Phrases	Next best skills
<b>z/OS IPL Information</b>					

Name and describe this skill in a way that tells users how it's used and why they would want to use it.

**Name\***

**z/OS IPL Information**

Description 20/100

**z/OS IPL Information**

API version\*

**1.0.0**

Categories

Add categories

App

**z/OS operations**

Preview

The skill will look like this in the catalog.

**z/OS IPL Information**  
z/OS IPL Information

The skill will look like this in the skill set.

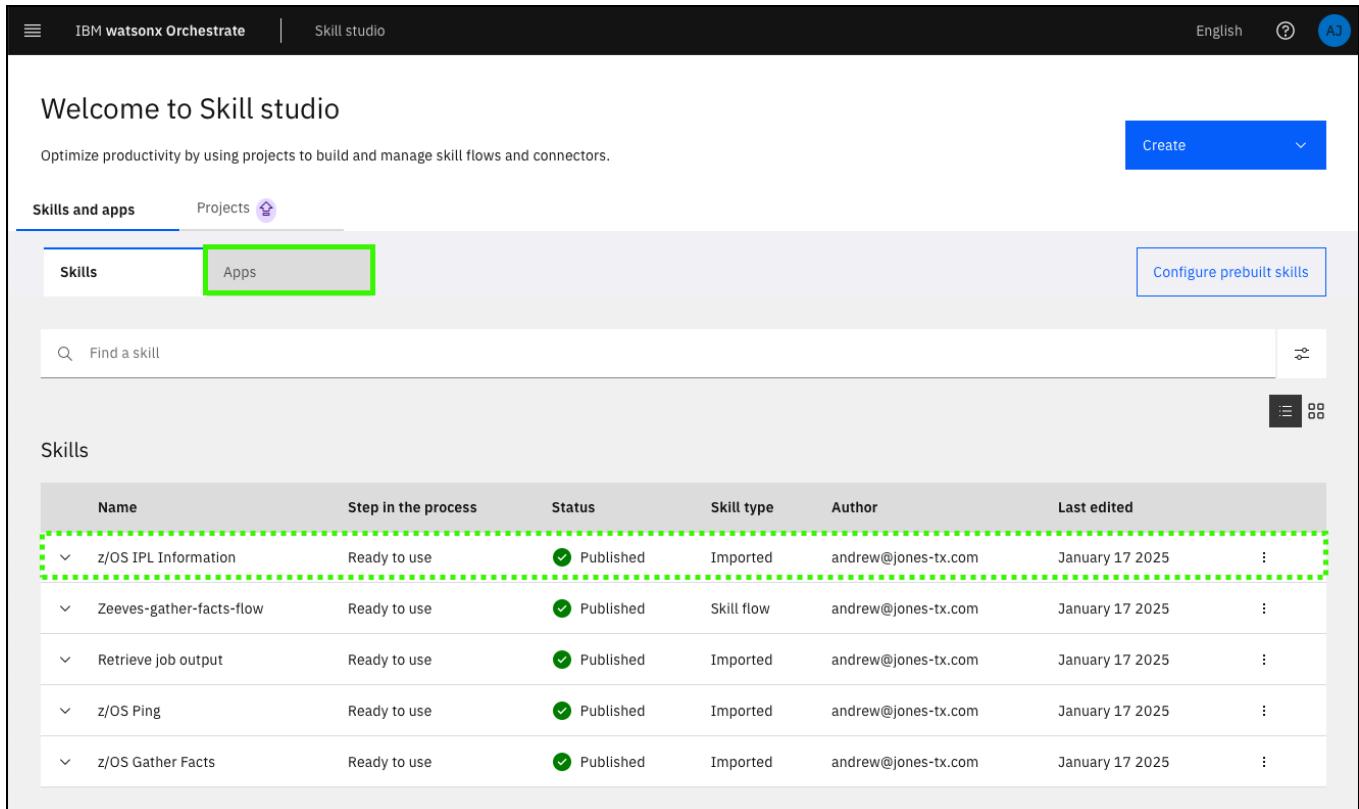
**z/OS IPL Information**

Cancel Publish Save as draft

10. If you added other skills in step 7, repeat the previous 2 steps for each skill added.

Configure your appURL to connect to the WaaS server

1. In **Skill studio**, click the **Apps** tab.



The screenshot shows the 'Skill studio' section of the IBM Watsonx Orchestrate interface. At the top, there's a navigation bar with 'IBM Watsonx Orchestrate', 'Skill studio', 'English', and a help icon. Below the navigation is a header 'Welcome to Skill studio' with a sub-instruction 'Optimize productivity by using projects to build and manage skill flows and connectors.' To the right of the header is a 'Create' button with a dropdown arrow. Below the header, there are two tabs: 'Skills' and 'Apps', with 'Skills' being the active tab. A green box highlights the 'Apps' tab. To the right of the tabs is a 'Configure prebuilt skills' button. Below the tabs is a search bar with a magnifying glass icon and the placeholder 'Find a skill'. To the right of the search bar is a filter icon. The main area is titled 'Skills' and contains a table with the following data:

Name	Step in the process	Status	Skill type	Author	Last edited
z/OS IPL Information	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025
Zeeves-gather-facts-flow	Ready to use	Published	Skill flow	andrew@jones-tx.com	January 17 2025
Retrieve job output	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025
z/OS Ping	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025
z/OS Gather Facts	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025

2. In the search field, enter the name of the application in the search field. Unless you modified the `info` section of the JSON file, the default name is **z/OS operations**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

Create

**Skills and apps** Projects

Skills Apps Configure prebuilt skills

z/OS operations

Select an app to configure the settings for all the app's skills.

Name	Description	Configuration status
Workday HCM		Not Configured
Salesloft		Not Configured
Adobe Workfront		Not Configured
Webex		Not Configured
ZoomInfo		Not Configured

- Click the ellipses icon (⋮) for the **z/OS Operations** and then click **Edit**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

Create

**Skills and apps** Projects

Skills Apps Configure prebuilt skills

z/OS operations

Select an app to configure the settings for all the app's skills.

Name	Description	Configuration status
z/OS operations	z/OS IPL Information	Not Configured

- Click the **Configuration** tab.

Change the app's name and icon to whatever makes more sense for your organization. Be sure to provide the connection information.

**Name\***

**Description** 0/100

**App icon**

**Preview**

The app will look like this in the skill set.

**z/OS operations**  
1 skill

The app will look like this in the skill set.

**z/OS operations**  
1 skill

## 5. Click **Test connection**.

**Note:** the **Server URL** field must match the URL you created for your WaaS server. It is similar to:

<https://itzvsi-zos-pwgabob.techzone.ibm.com:10443> .

**Server URL\***

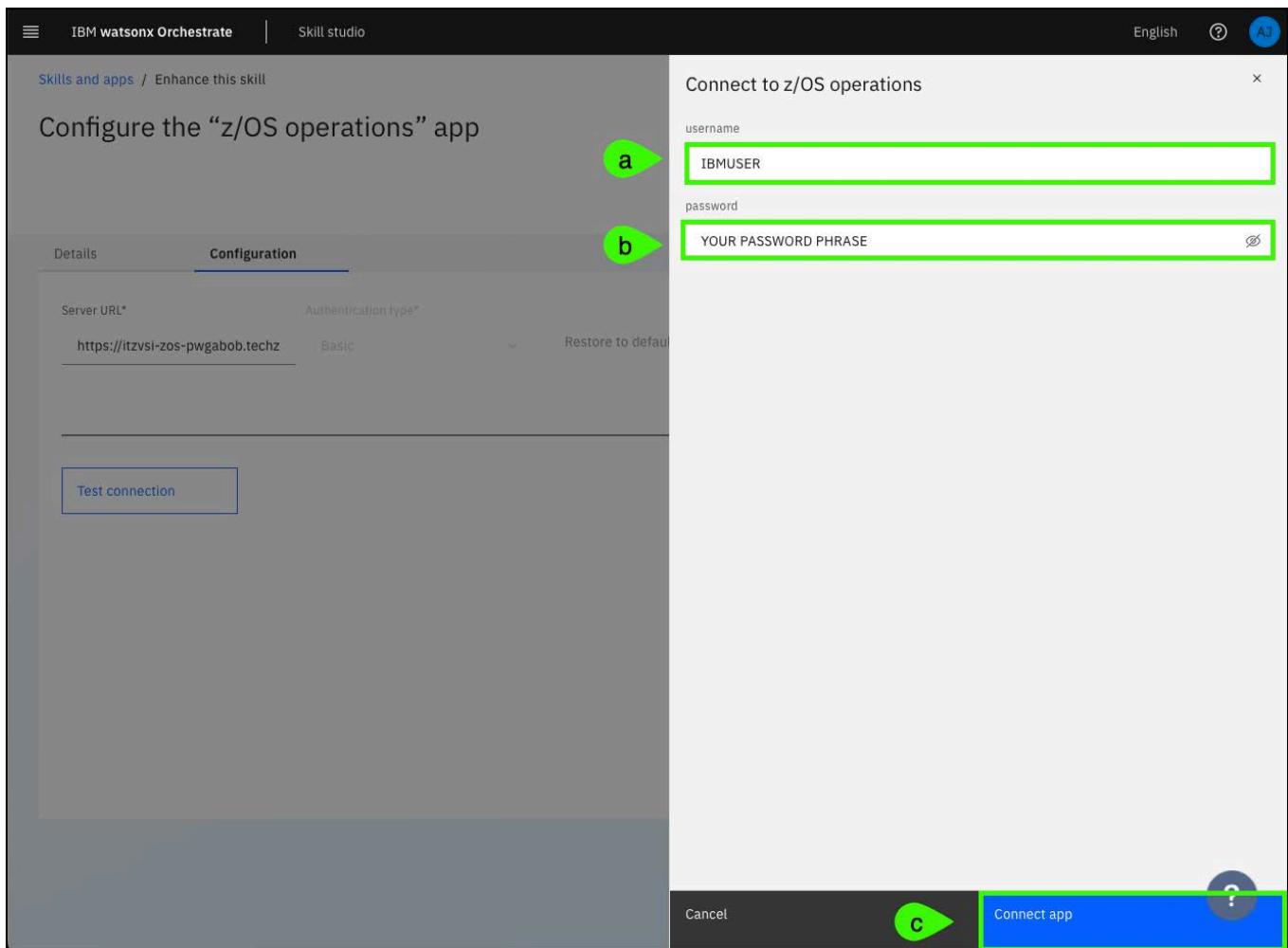
**Authentication type\***

Basic

Restore to default ↻

**Test connection**

## 6. Enter (a) **IBMUSER** in the **username** field, (b) your **WaaS password** created earlier in the **password** field, and then (c) click **Connect app**.



7. Verify that the connection is successful and then click **Save**.

Skills and apps / Enhance this skill

## Configure the “z/OS operations” app

**Configuration**

Server URL\*  Authentication type\*  Restore to default

**Test connection**

Cancel **Save** ?

8. Repeat step 2 above to verify that the **Configuration status** is **Configured**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

**Create**

**Skills and apps** **Projects**

**Skills** **Apps** **Configure prebuilt skills**

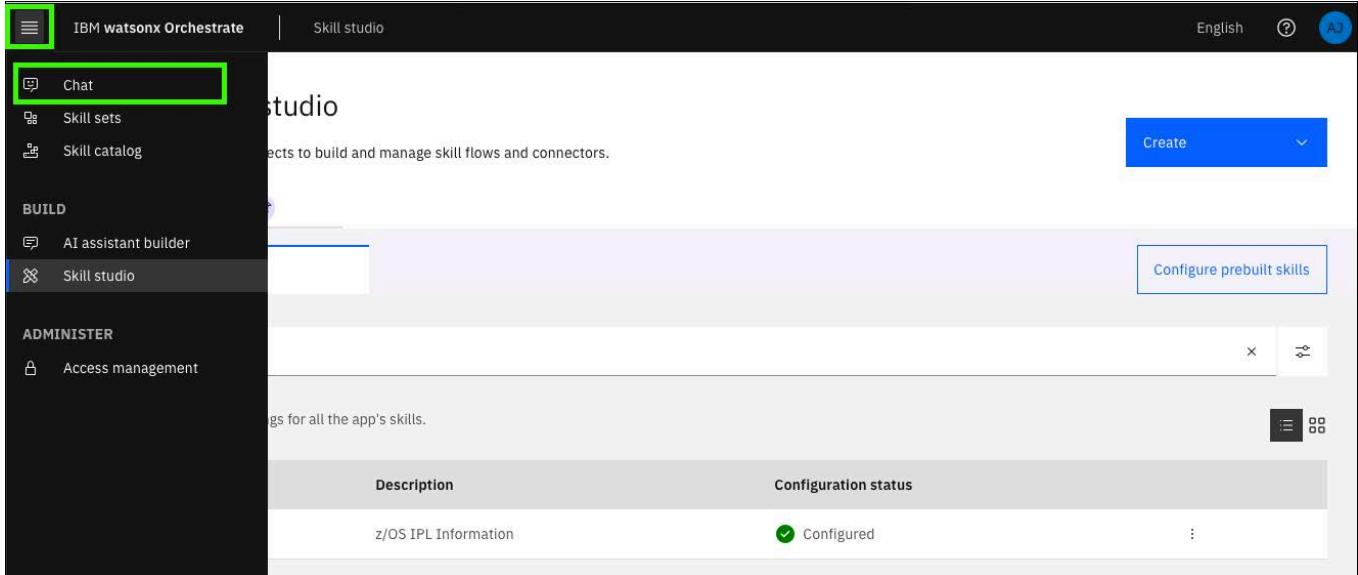
z/OS operations

Select an app to configure the settings for all the app's skills.

Name	Description	Configuration status
z/OS operations	z/OS IPL Information	Configured

Test the skill

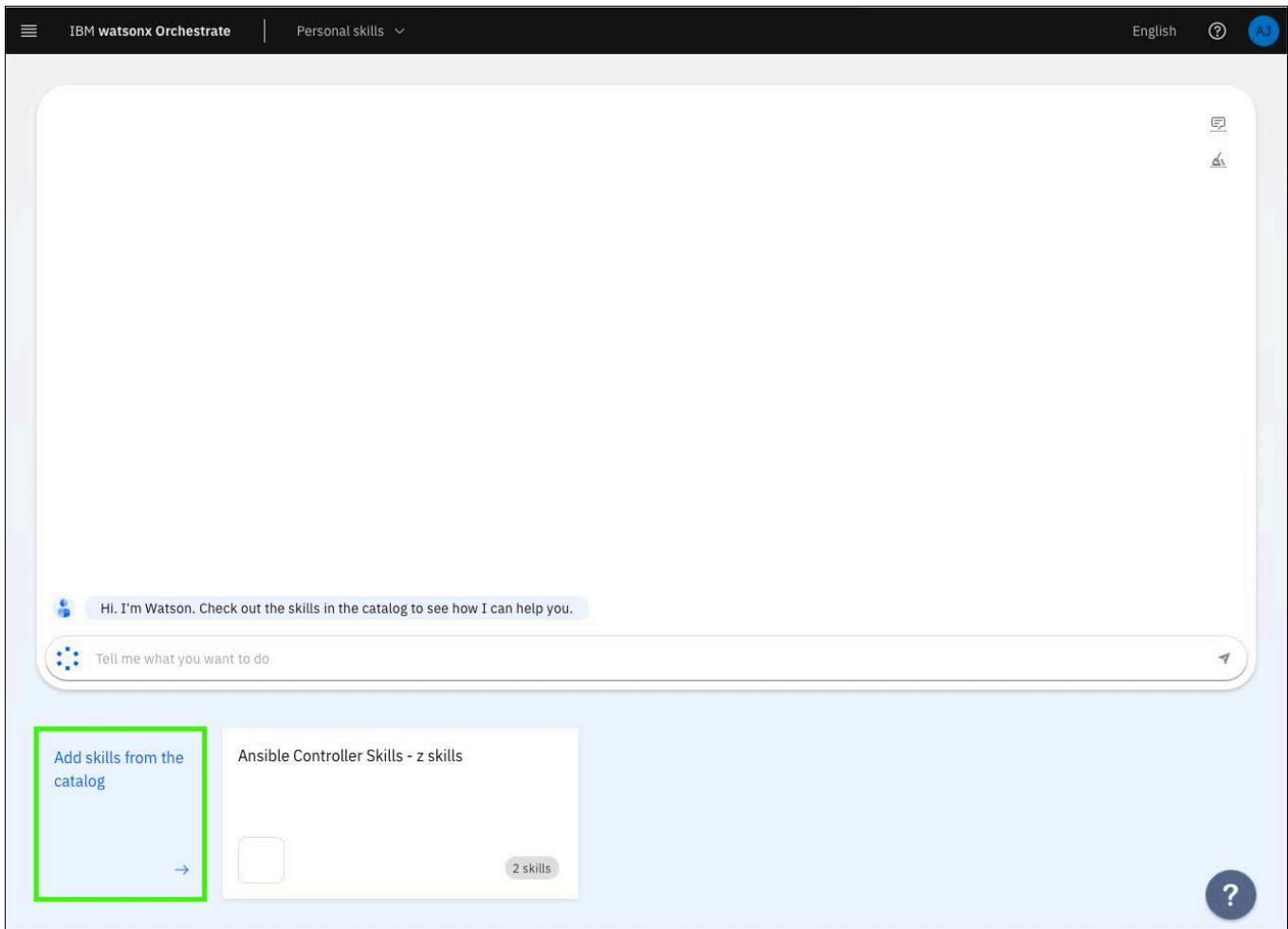
1. Open **Chat** in watsonx Orchestrate.



The screenshot shows the IBM Watsonx Orchestrate interface. The left sidebar has a dark theme with white text and icons. The 'Chat' option is highlighted with a green border. Other options like 'Skill sets' and 'Skill catalog' are also visible. The main area is titled 'Skill studio' and contains a brief description: 'Build skill flows and connectors to build and manage skill flows and connectors.' A 'Create' button is at the top right. Below it is a 'Configure prebuilt skills' button. A table lists a single skill entry:

Description	Configuration status
z/OS IPL Information	<span>✓ Configured</span>

2. Click **Add skills from the catalog**.



The screenshot shows the AI assistant builder interface. At the top, it says 'IBM Watsonx Orchestrate' and 'Personal skills'. The main area has a light blue background with a conversation-style UI. It starts with a message from Watson: 'Hi. I'm Watson. Check out the skills in the catalog to see how I can help you.' Below is a search bar with the placeholder 'Tell me what you want to do'. In the bottom left corner, there's a button with the text 'Add skills from the catalog' and an arrow icon, which is highlighted with a green box. To its right, there's a card for 'Ansible Controller Skills - z skills' with a small icon and a '2 skills' indicator. A question mark icon is in the bottom right corner.

3. In the search apps field, enter the name of the application. Unless you modified the `info` section of the JSON file, the default name is **z/OS operations**.

The screenshot shows the 'Skill catalog' page in IBM Watsonx Orchestrate. At the top, there's a search bar with the text 'z/OS operations' highlighted by a green box. Below the search bar, there's a section titled 'Most popular skills' with three cards: 'Send an email from Gmail', 'Create a lead in Salesforce', and 'Send an email using Outlook'. Underneath this, there's a section titled 'All Apps' displaying a grid of app tiles. The 'z/OS operations' tile is located in the second row, third column of this grid.

- Locate and click the tile for your app (z/OS operations).

This screenshot shows the same 'Skill catalog' page as above, but now the 'z/OS operations' tile is highlighted with a green box. This indicates it has been selected or is the current focus. The rest of the interface remains the same, with the search bar containing 'z/OS operations' and the 'All Apps' grid visible below.

5. Click **Add skill +** for the **z/OS IPL Information** skill.

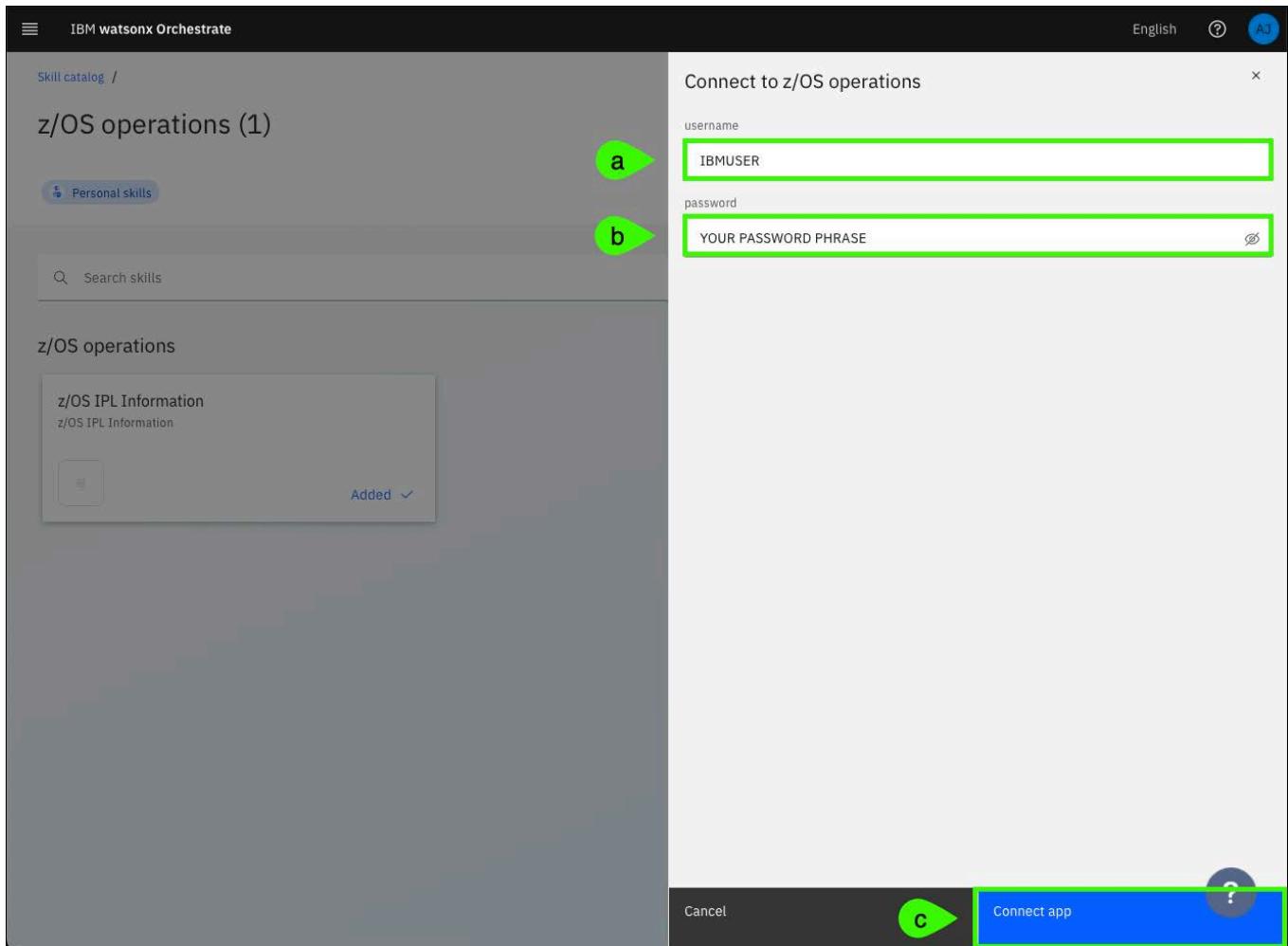
The screenshot shows the IBM Watsonx Orchestrate interface. At the top, there's a navigation bar with 'Skill catalog /' and other options like 'English', '?', and 'AJ'. Below it, the title 'z/OS operations (1)' is displayed. Underneath, there's a search bar labeled 'Search skills'. A list of skills is shown, with 'z/OS operations' expanded. Inside this list, the 'z/OS IPL Information' skill is visible. To its right is a small icon and a button labeled 'Add skill +' which is highlighted with a green box. In the top right corner of the main content area, there's a blue button labeled 'Connect app' with a gear icon.

6. Repeat step 5 for any additional skills you added to the app.

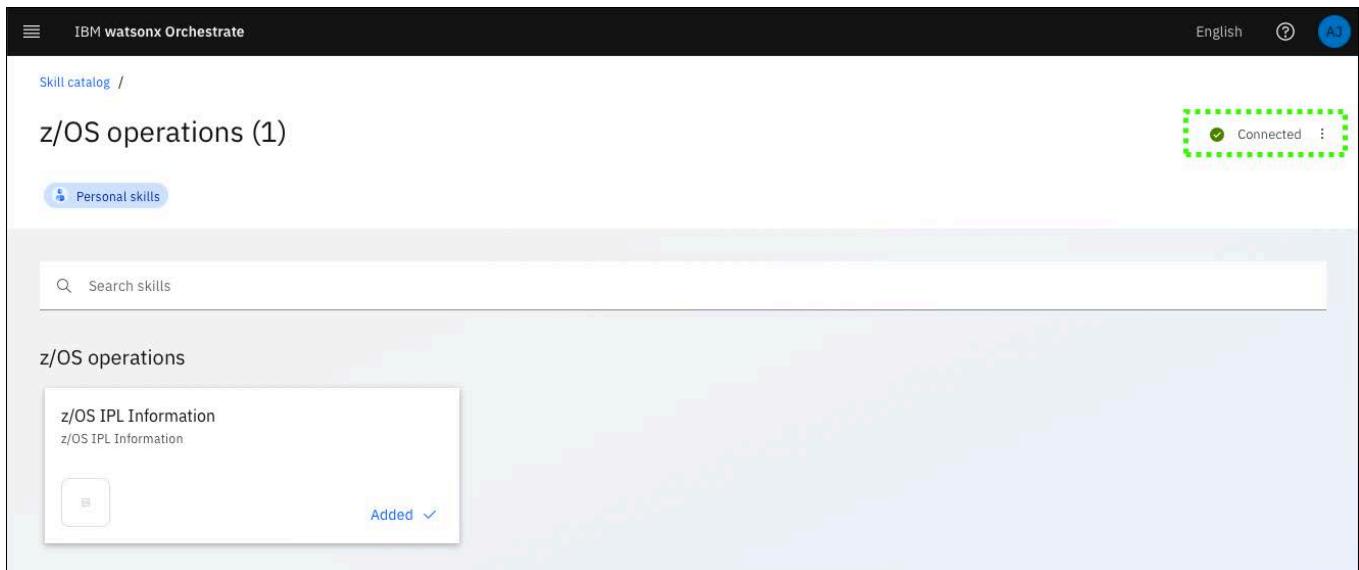
7. Click **Connect app**.

This screenshot is similar to the previous one but shows the result of adding the skill. The 'z/OS IPL Information' skill now has a green box around it with the text 'Added ✓'. The 'Connect app' button at the top right is also highlighted with a green box. The rest of the interface remains the same, including the search bar and the collapsed 'z/OS operations' section.

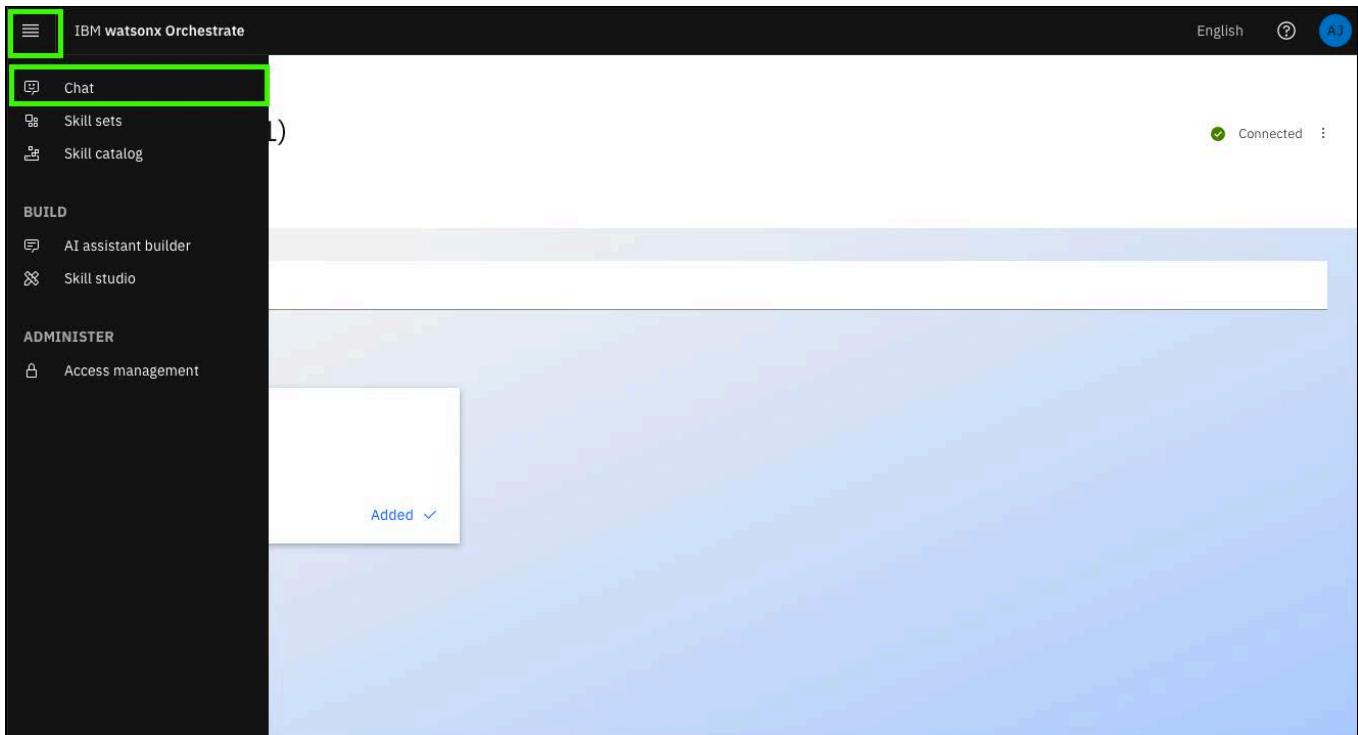
8. Enter (a) **IBMUSER** in the **username** field, (b) your **WaaS password** created earlier in the **password** field, and then (c) click **Connect app**.



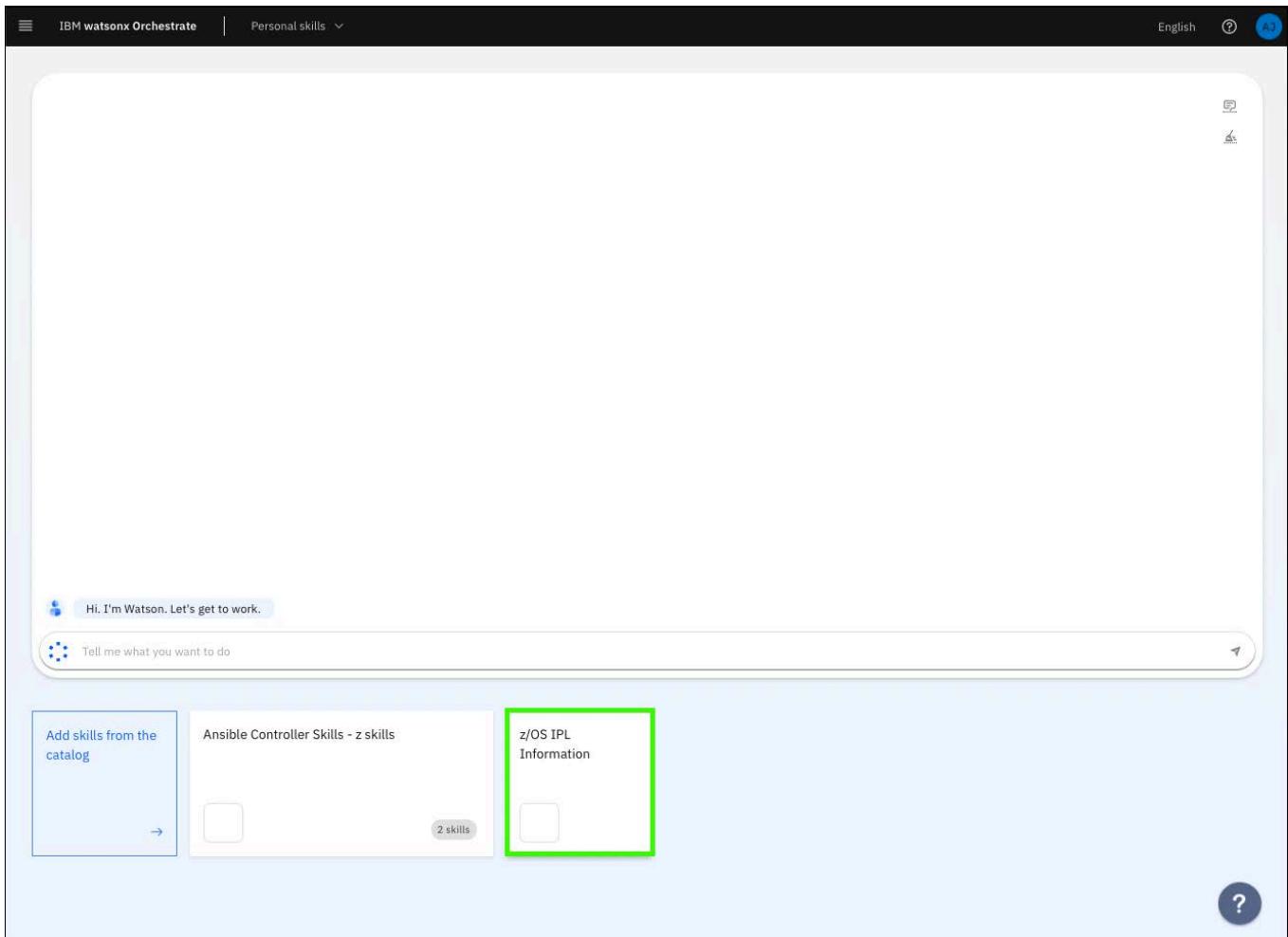
9. Verify that the skill is connected.



10. Open **Chat** in watsonx Orchestrate.



11. Click the z/OS IPL Information tile.



**The name of the tile may be different.**

If you added multiple skills to your app, the tile name may be **z/OS operations** and the number of skills included will be shown.

12. Using the defaults in the form, click **Apply**.

Hi. I'm Watson. Let's get to work.

**z/OS IPL Information**

You just need to complete this form first.

z/OS IPL Information

consoleName \*

iserVS01

cmd \*

d iplinfo

sol-key \*

JES

Cancel **Apply**

Tell me what you want to do

Add skills from the catalog →

Ansible Controller Skills - z skills

2 skills

z/OS IPL Information

?

13. Review the returned information.

The provided output shows information the early-tenure SysProg needs to prepare for an IPL on their z/OS LPAR. For example, the date and time the system was last IPL'ed, the z/OS release level, the IPL volume, the IPL LOAD PARM used during the IPL, and other details.

If you loaded other pre-packaged skills, test them now.



The screenshot shows the IBM Watsonx Orchestrate interface. In the center, there is a terminal window displaying a command-line session. A specific command, 'cmd-response-key', is highlighted with a green dashed rectangular box. The terminal output includes various system logs and configuration details related to z/OS IPL Information.

```

z/OS IPL Information

sol-key-timeout
sol-key-detected

cmd-response
IEE2541 10.14.21 IPLINFO DISPLAY 514
SYSTEM IPLLED AT 06.48.48 ON 01/17/2025
RELEASE z/OS 02.05.00 LICENSE = z/OS
USED LOADK2 IN SYS0.IPLPARM ON ODE28
ARCHLVL = 2 MTLSHARE = N
VALIDATED BOOT: NO
IEASYM LIST = (00,K2)
IEASYS LIST = (00) (OP)
IODF DEVICE: ORIGINAL(ODE28) CURRENT(ODE28)
IPL DEVICE: ORIGINAL(ODE27) CURRENT(ODE27) VOLUME(D25VS1)
VM CPID = zHYPaaS
VM UUID = 3C9BD7F3-8A47-4A47-B62C-298DA45F40EB
VM NAME = k8s_75d1
VM EXT NAME = k8s_75d16281c12c4681b91417749e322845_0727_3c9bd7f3-8a47
-4a47-b62c-298da45f40eb

cmd-response-key

```

## Connect the app to your assistant

Before configuring the **z/OS IPL Information** skill as an assistant action, the app containing the skill must first be connected to the assistant.

### 1. Open Skill sets in watsonx orchestrate.



### 2. Click the **Skill sets** drop-down list and select the **Draft** of your assistant.

The screenshot shows the 'Team Skills' section of the IBM Watsonx Orchestrate interface. At the top, there's a navigation bar with 'IBM Watsonx Orchestrate', 'English', and a help icon. Below it, the title 'Team Skills' is displayed. A sidebar on the left lists skill sets: 'Team Skills' (selected), 'Orchestrate Agent Skillset', 'Team Skills', 'Zeeves draft', and 'Zeeves live'. A note below the list states: 'The skills added to this team are available to this team's members. These skills complete related tasks for the team members so members can work more efficiently and effectively.' To the right, there's a search bar and a blue button labeled 'Manage skills'. The main area shows a table with columns 'Name' and 'App'. There is one entry: 'No skills' with a small cube icon. A note below says: 'Click **Manage skills** to give this team digest specific abilities.'

### 3. Click Connections.

This screenshot shows the 'Connections' tab for the 'Zeeves draft' skill set. The interface is similar to the previous one, with a sidebar listing skill sets and a main table showing connections. A green box highlights the skill set list in the sidebar. The table has columns 'Name' and 'App'. It lists two connections: 'Retrieve job output' and 'Zeeves-gather-facts-flow', each with a small cube icon. At the bottom, there are pagination controls: 'Items per page: 10' (with a dropdown arrow), '1-2 of 2 items', '1 of 1 page', and navigation arrows.

### 4. Enter your skill app name (z/OS operations) in the search bar.

Skill sets

Zeeves draft

Skills      Connections

These are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

Application	Number of skills	Credential type	Connected by	Action
z/OS operations	1	Not specified	-	<span>⋮</span>

Items per page: 5 | 1-1 of 1 items

5. Click the ellipses icon (⋮) for the **z/OS operations** app and then click **Connect app**.

Skill sets

Zeeves draft

Skills      Connections

These are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

Application	Number of skills	Credential type	Connected by	Action
z/OS operations	1	Not specified	-	<span>⋮</span>

Items per page: 5 | 1-1 of 1 items

6. In the dialog, click **Connect app**.

Connect to z/OS operations

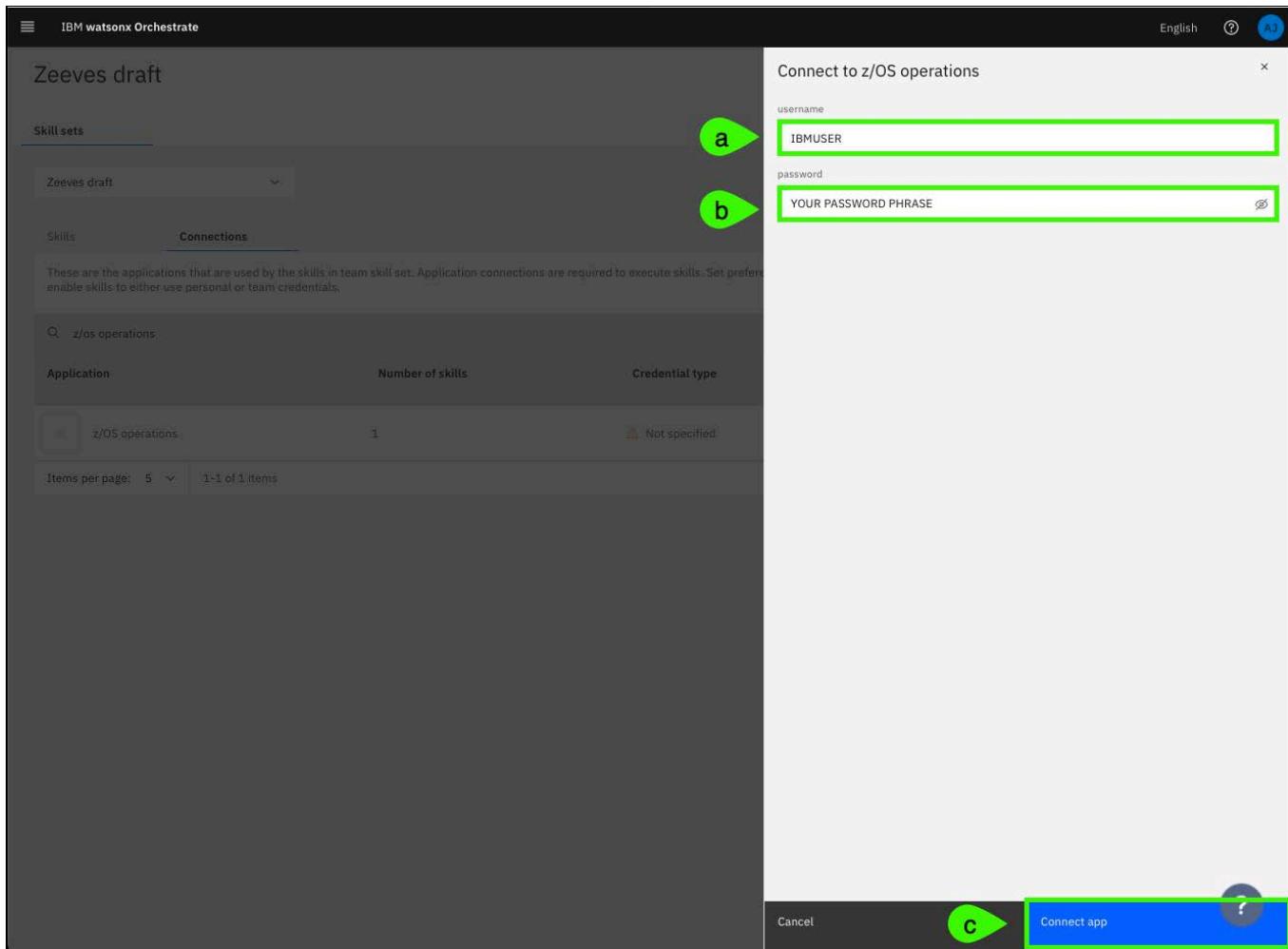
Member credentials  
Each team member uses their own credentials to connect to this app and use its skills.

Team credentials  
The admin sets the credentials each team member uses to connect to this app and use its skills.

You selected **Team credentials** for the credential type. Click **Connect app** to provide the credentials your team will use and to connect to the app.

Connect app

7. Enter (a) **IBMUSER** in the username field, (b) your **WaaS password** in the password field, and then (c) click **Connect app**.



## Create an action for your assistant

Next, create a skill-based action that uses the **z/OS IPL Information**. Recall, with the **z/OS Gather Facts** skill flow that was created earlier, adding the skill as a skill-based action allows the skill to run based on user prompts to the assistant.

Skill-based actions also serve another purpose. After creating the skill-based action, you can then call that action from a custom-built action. This is accomplished through subactions. For this use case, create an action that triggers the **z/OS IPL Information** skill on z/OS to display the LPARs IPL information. That action is integrated into another custom-built action (as a subaction) to provide a customized user experience.

1. Open [AI assistant builder](#) in watsonx Orchestrate.

The screenshot shows the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with sections like Chat, Skill sets, Skill catalog, BUILD (with AI assistant builder selected), and ADMINISTER (with Access management). The main area is titled 'Skill sets' and contains a table with one item. The table columns are Number of skills, Credential type, Connected by, and Action. The single row shows 1 skill, Team as the credential type, and andrew@jones-tx.com as the connected user. A message at the top says 'Skills are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to use your own application or team credentials.'

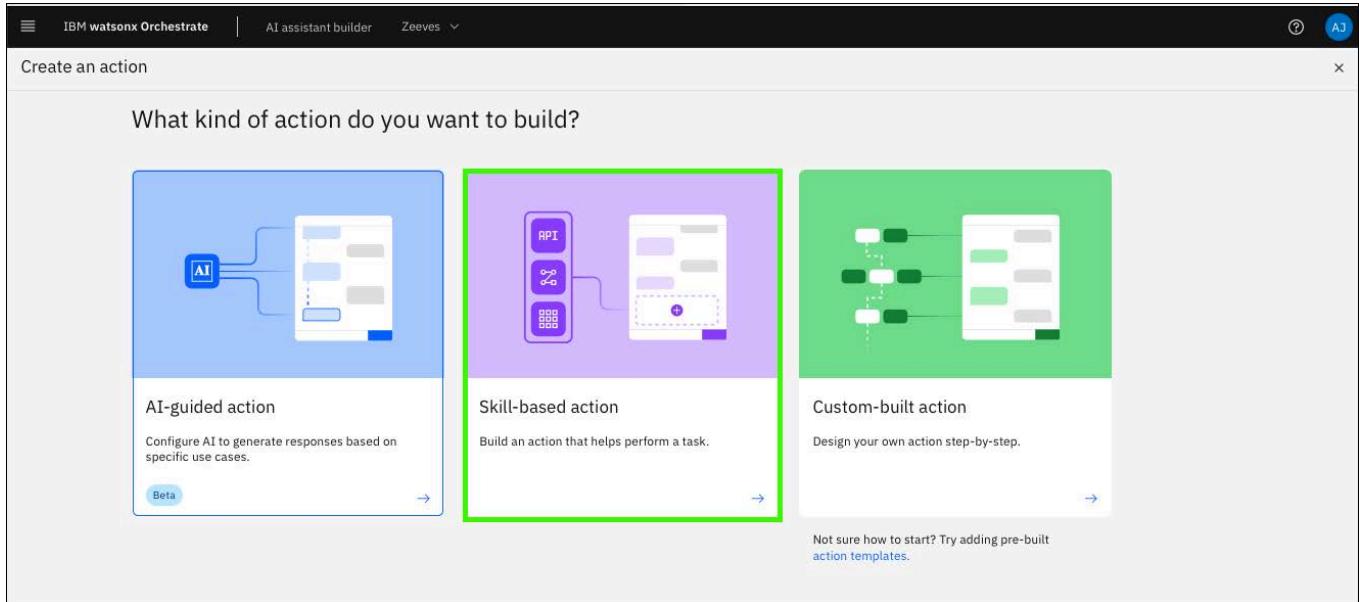
## 2. Select Actions.

The screenshot shows the 'Actions' section within the AI assistant builder. The sidebar has sections like Generative AI, Evaluate, Preview, Publish, Environments, Improve, and Analyze. The main area shows several actions: Build actions, Customize your greeting, Create a fallback plan, Preview & debug, Customize web chat, and Set. A message at the top says 'as new watsonx generative AI features! Learn more about intelligent information gathering.' There's also a link 'Enable in settings'.

## 3. Click New action +.

The screenshot shows the 'Actions' list. The sidebar has sections like All items, Created by you (selected), Set by assistant, Variables, and Saved responses. The main area lists actions: Zeeves-gather-facts-flow (created by you, last edited 2 days ago, 1 example, 0 steps, green status). A 'New action +' button is highlighted with a green box in the top right corner of the list table.

## 4. Click Skill-based action.



## 5. Click **z/OS IPL Information** and then click **Next**.

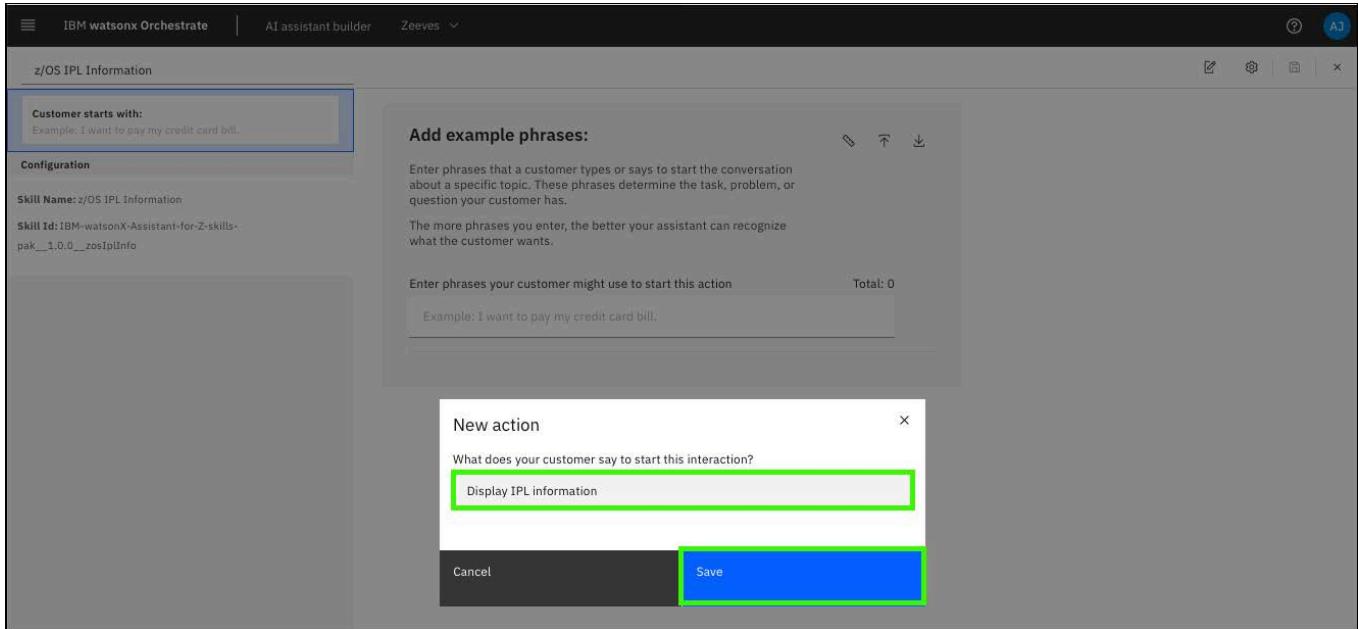
The screenshot shows the 'Build an action from a skill' screen. It lists several skills:

Skill Name	Description	Last Updated
<b>z/OS IPL Information</b>	Run z/OS gather facts and retrieve the output.	2025-01-17T14:39:36.042Z
Zeeves-gather-facts-flow	z skills - Retrieve job output by job Id	2025-01-17T12:24:16.672Z
Retrieve job output	z skills - This playbook pings the z/OS host to test connectivity.	2025-01-17T12:18:14.714Z
<b>z/OS Ping</b>	z skills - This playbook pings the z/OS host to test connectivity.	2025-01-17T12:13:33.194Z
<b>z/OS Gather Facts</b>	z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls z/OS-specific information from the z/OS host.	2025-01-17T14:39:36.042Z
Summarize the Webex meeting transcript	in watsonx.ai	
Summarize the Box content	in watsonx.ai	
Summarize a Zendesk ticket	in watsonx.ai	

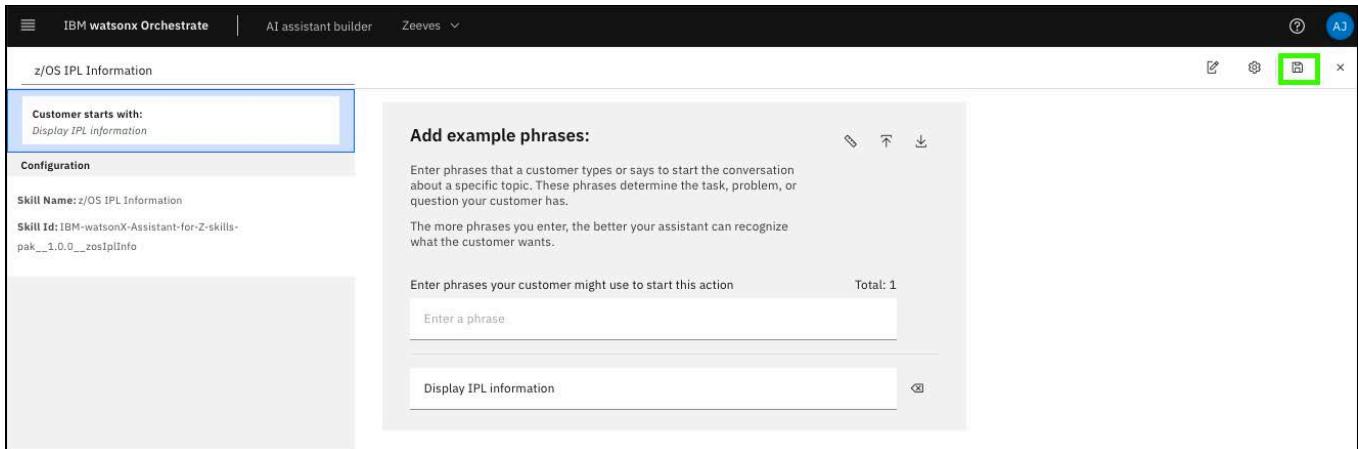
## 6. Enter a prompt like **Display IPL information** that starts the skill and then click **Save**.

Prompt:

Display IPL information



7. Click the **Save** icon (💾).



8. Click **Preview**.

z/OS IPL Information

**Customer starts with:**  
Display IPL information

**Configuration**

**Skill Name:** z/OS IPL Information

**Skill Id:** IBM-watsonX-Assistant-for-Z-skills-pak\_1.0.0\_zosIplInfo

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action      Total: 1

Enter a phrase

Display IPL information

Preview



Wait for the Your changes are being added. message to disappear before proceeding.

9. Enter the prompt (**Display IPL information**) to test the skill.

z/OS IPL Information

**Customer starts with:**  
Display IPL information

**Configuration**

**Skill Name:** z/OS IPL Information

**Skill Id:** IBM-watsonX-Assistant-for-Z-skills-pak\_1.0.0\_zosiplInfo

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action      Total: 1

Enter a phrase

Display IPL information

**Preview**

8:46 AM  
Greet customer [default]

Welcome, how can I assist you?

Display IPL information

10. Using the defaults in the form, click **Apply**.

**Customer starts with:**  
Display IPL information

**Configuration**

**Skill Name:** z/OS IPL Information

**Skill Id:** IBM-watsonX-Assistant-for-Z-skills-pak\_1.0.0\_zosIplInfo

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action Total: 1

Enter a phrase

Display IPL information

**Preview**

9:02 AM  
Conversation skill called  
z/OS IPL Information recognized

z/OS IPL Information

consoleName \*  
iserVS01

cmd \*  
d iplinfo

sol-key \*  
JES

Cancel Apply

## 11. Verify the results.

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action Total: 1

Enter a phrase

Display IPL information

**Preview**

z/OS IPL Information

cmd-response  
IEE254I 11.04.51 IPLINFO DISPLAY  
SYSTEM IPLLED AT 06.48.48 ON 01/1  
RELEASE z/OS 02.05.00 LICENSE =  
USED LOADK2 IN SYS0.IPLPARM ON  
ARCHLVL = 2 MTLSHARE = N  
VALIDATED BOOT: NO  
IEASYM LIST = (00,K2)  
IEASYS LIST = (00) (OP)  
IODF DEVICE: ORIGINAL(ODE28) CUI  
IPL DEVICE: ORIGINAL(ODE27) CURF  
VM CPID = zHYPaa5  
VM UUID = 3C9BD7F3-8A47-  
4A47-B62C-298DA45F40EB  
VM NAME = k8s\_75d1  
VM EXT NAME = k8s\_75d16281c12c  
8a47

12. Click the **delete** icon (✖) to remove the example phrase (**Display IPL information**) from the skill.

Next, you will add this skill-based action as a subaction to a custom-build action. To have the custom-built action started rather than the skill-based action, the existing *example phrases* need to be removed.

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action Total: 1

Enter a phrase

Display IPL information

**Preview**

z/OS IPL Information

13. Verify (a) all **example phrases** are deleted, (b) click the **Save** icon (💾), and then (c) click **x** to close the action.

**z/OS IPL Information**

**Customer starts with:**  
Example: I want to pay my credit card bill.

**Configuration**

**Skill Name:** z/OS IPL Information

**Skill Id:** IBM-watsonX-Assistant-for-Z-skills-pak\_1.0.0\_zosIplInfo

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action      Total: 0

Example: I want to pay my credit card bill.

## Create a custom-built action

Custom-built actions allow you to define each step of a conversation with your assistant. You can define steps with or without conditions to control the user responses. You can include your skill-based actions as sub-actions. You can pass generated values between the subactions.

Recall the use case of an early-tenure SysProg who is preparing for an upcoming IPL on one of their LPARs. After going through documentation, the SysProg found that there is information that is needed about their LPAR before they can begin the IPL process. To gather that information, the SysProg might ask the assistant "How do you retrieve the information needed to IPL a z/OS LPAR? Provide a detailed response". A response the assistant might return is shown in the following image.

**Preview assistant**

**AssistantZeeves**

You 9:28 AM

How do you retrieve the information needed to IPL a z/OS LPAR? Provide a detailed response

9:28 AM

To retrieve the necessary information for IPLing a z/OS LPAR, you would typically refer to the system's documentation or consult with the system administrators. However, generally, you'd need the following:

1. LPAR Name: The unique identifier for the Logical Partition.
2. IPL Parameters: These include the system configuration parameters, such as the load module library, parmlib, and the address space layout.
3. System Symbols: These are used to customize the IPL process according to specific requirements.
4. IPL Source: This could be a specific member in a PDS (Partitioned Data Set), or a dataset specified in the IPL JCL (Job Control Language).

The exact process might vary depending on the specific mainframe environment and its configuration. Always ensure to follow the established procedures and guidelines provided by your organization's IT department.

Note: The document provided does not contain specific details about retrieving information for IPLing a z/OS LPAR. The provided information is based on general mainframe practices.

Accuracy of generated answers may vary.

A custom-built action can help the SysProg to take the next steps that are required by adding next-step action suggestions and start skills to gather the needed information.

1. Click **New action +**.

The screenshot shows the 'Actions' section of the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with categories like 'All items', 'Created by you', 'Variables', and 'Saved responses'. The main area lists actions with columns for 'Name', 'Last edited', 'Examples count', 'Steps count', and 'Status'. Two actions are listed: 'z/OS IPL Information' (last edited 17 minutes ago) and 'Zeeves-gather-facts-flow' (last edited 2 days ago). A green box highlights the 'New action' button in the top right corner of the list area.

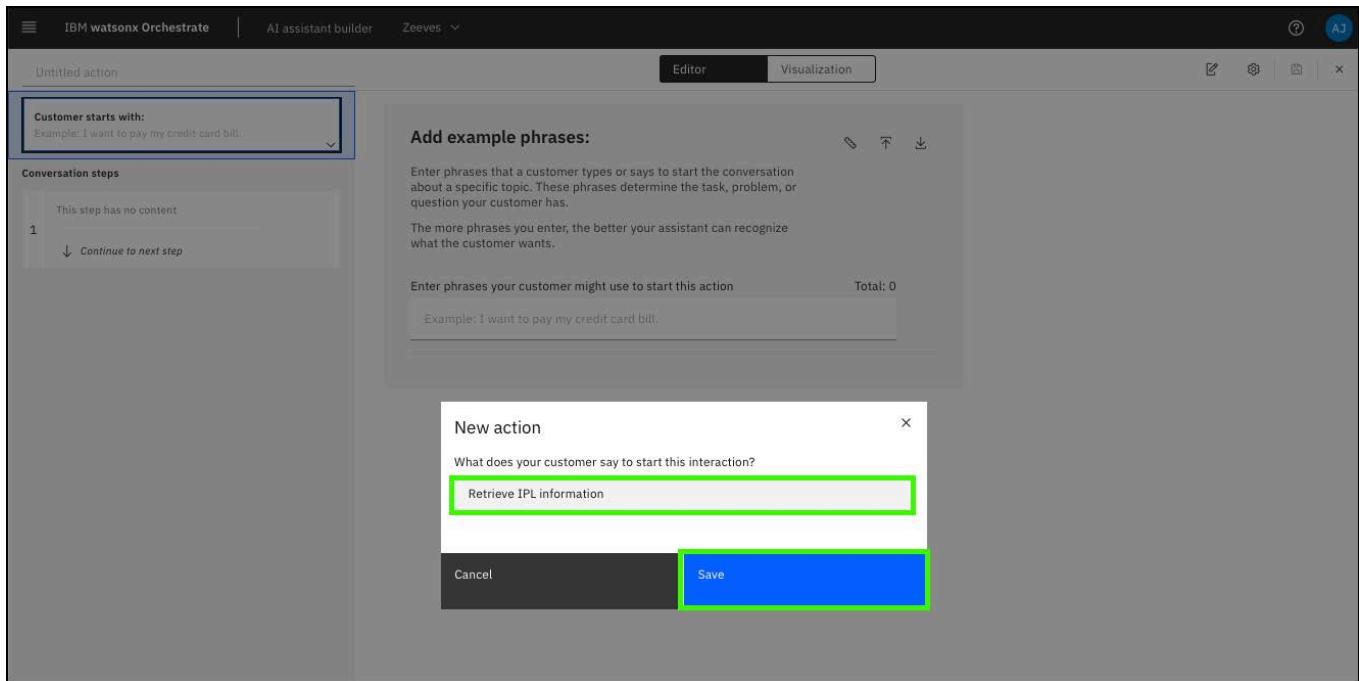
## 2. Click Custom-built action.

The screenshot shows the 'Create an action' dialog. It asks 'What kind of action do you want to build?' and lists three options: 'AI-guided action', 'Skill-based action', and 'Custom-built action'. The 'Custom-built action' option is highlighted with a green box. Below it, a note says 'Not sure how to start? Try adding pre-built action templates.' A green box also highlights the 'Custom-built action' label.

## 3. Enter an example phrase (**Retrieve IPL information**) to prompt the assistant to start the custom-built action and click **Save**.

Prompt:

Retrieve IPL information



#### 4. Review the form to create a custom-built action.

A custom-built action can consist of multiple steps with each step that is taken with or without conditions. Each step specifies the assistant's response and the next step to start.



#### For client demonstrations and pilots...

For client demonstrations and pilots, it is possible to add a custom search query such that when conversational search is executed in the 1st step, the query being used is hard-coded and isn't necessarily what the end-user inputted. This can be done by clicking on the Edit settings option under Search for the answer and specifying a custom search query that specifies the exact query to be used.

#### 5. Click the **And then** drop-down list and select **Search for the answer**.

Customer starts with:  
Retrieve IPL information

Conversation steps

Step 1

Is taken without conditions Set variable values fx

Assistant says

For example: Please select from the following options:

Define customer response

And then

Continue to next step  
Re-ask previous step(s)  
Go to a subaction  
Use an extension  
**Search for the answer**  
Connect to agent  
End the action

## 6. Click **Edit settings**.

Customer starts with:  
Retrieve IPL information

Conversation steps

Step 1

Is taken without conditions Set variable values fx

Assistant says

For example: Please select from the following options:

Search for the answer

And then

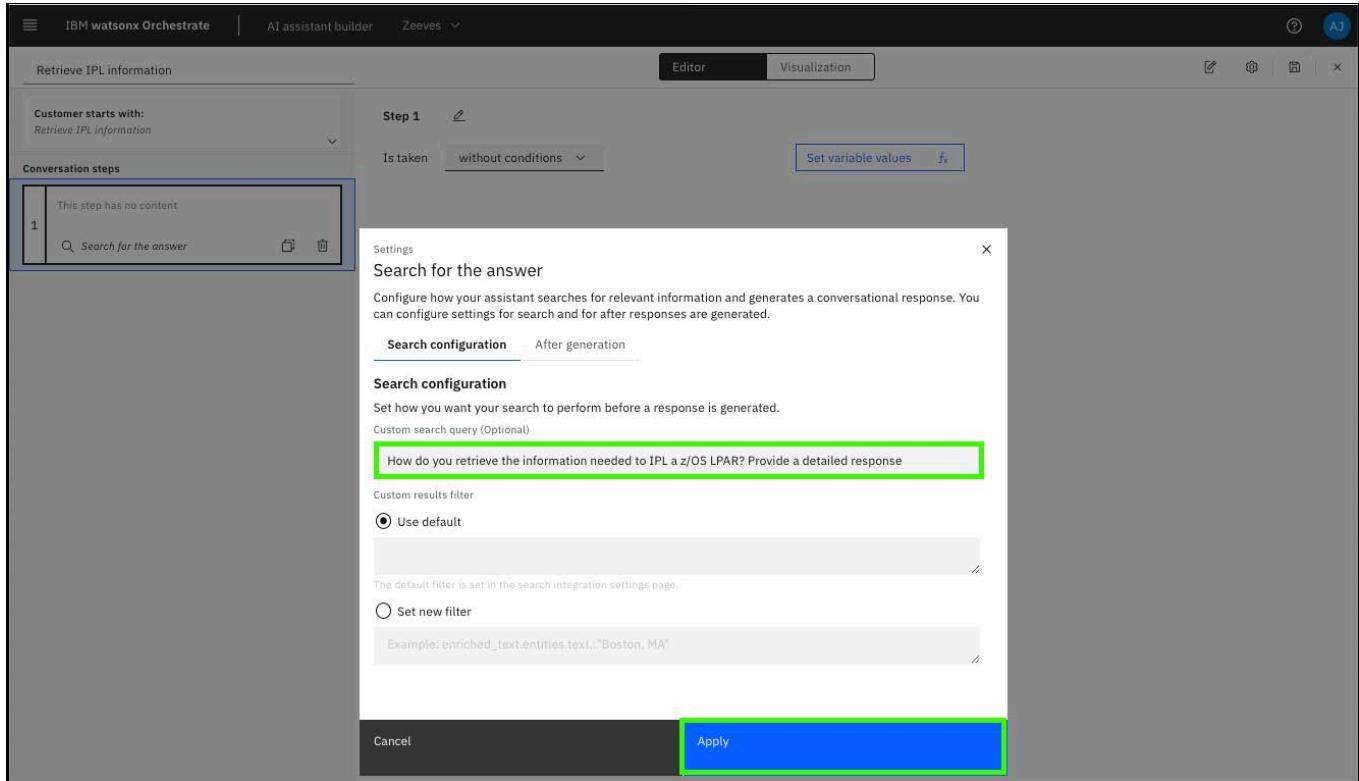
Custom query None (Customer's message will be the query)  
Custom filter None (Optional)

**Edit settings**

## 7. Enter a **Custom search query** and click **Apply**.

Custom search query:

How do you retrieve the information needed to IPL a z/OS LPAR? Provide a detailed response



#### 8. Click New step +.

The new custom-built action only responds with a description of how to retrieve the IPL information. Now, infuse automation into the conversation and ask the user if they want to perform the action.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. At the top, it says "IBM Watsonx Orchestrate" and "AI assistant builder". The title bar also includes "Zeeves" and a gear icon. The main area is titled "Retrieve IPL information". It shows a "Customer starts with" section and a "Conversation steps" section. In the "Conversation steps" section, step 1 is defined with the action "Search for the answer". The "Assistant says" field contains the placeholder text "For example: Please select from the following options:". Below this, there's a "Define customer response" dropdown. The "And then" section shows another "Search for the answer" step, with a custom query asking about retrieving IPL information for a z/OS LPAR. A green button at the bottom left says "New step +". On the right side, there are icons for help, preview, and other settings.

9. In the **Assistant says** field, enter a response asking if the user wants to display the IPL information.

Assistant says:

Would you like to display your LPARs IPL information?

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. It continues from the previous step. In the "Conversation steps" section, step 2 is defined with the action "Search for the answer". The "Assistant says" field now contains the question "Would you like to display your LPARs IPL information?". Below this, there's a "Define customer response" dropdown. The "And then" section shows another "Search for the answer" step, with a continuation action "Continue to next step". The entire "Assistant says" field for step 2 is highlighted with a green border.

10. Click the **Define customer response** drop-down and select **Confirmation**.

Now, after providing a conversational search-based response to the original question, the assistant asks the user if they want to display the IPL information and prompts the user to select **Yes** or **No**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. At the top, it says "IBM Watsonx Orchestrate" and "AI assistant builder Zeeves". Below that, there are tabs for "Editor" and "Visualization".  
  
On the left, under "Conversation steps", there are two steps:

- Step 1: "Customer starts with: Retrieve IPL information". It has a note "This step has no content".
- Step 2: "Is taken without conditions". It has a "Set variable values" button.

  
In the center, under "Assistant says", there is a message: "Would you like to display your LPARs IPL information?".  
  
On the right, a modal window titled "Define customer response" is open. It has a sidebar with "System" and "Options" sections. The "Options" section is expanded, showing "Confirmation" selected. Other options include "Free text", "Regex", "Number", "Date", "Time", and "Saved".  
The main area of the modal shows "As buttons" with four buttons: "Checking", "Savings", "401 (k)", and "Roth IRA".  
Below that, under "As a list", there is a single item: "Pay Bill".

11. Click **New step +**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'Retrieve IPL information' and shows 'Conversation steps'. Step 1 is a placeholder step with a search bar. Step 2 contains a message 'Would you like to display your LPARs IPL information?' with a 'Confirmation' button, and a 'Continue to next step' link. Step 3 is a placeholder step with a search bar. The 'Step 2' configuration panel shows 'Is taken' set to 'without conditions'. The 'Assistant says' section contains the message template and a green dashed box around the response area. Below it, there are 'Yes' and 'No' buttons, 'View response', and 'Edit validation' options. The 'And then' section has a 'Continue to next step' link.

## 12. Click the **Is taken** drop-down and select **with conditions**.

The screenshot shows the same interface after selecting 'with conditions' from the 'Is taken' dropdown. The dropdown now shows 'without conditions' (highlighted) and 'with conditions' (selected). The 'Assistant says' section now contains the message 'For example: What size do you want to order?'. The 'And then' section remains the same.

## 13. Review the **Conditions**.

Notice that the default condition is based on **Step 2** and the user clicking **Yes** when prompted.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, the 'Conversation steps' pane displays three steps: Step 1 (Search for the answer), Step 2 (Confirmation), and Step 3 (which has no content). Step 3 is currently selected. In the main panel, 'Step 3' is configured with a condition: 'If All of this is true: 2. Would you like to d... is Yes'. Below this, there is a 'Conditions' section with a 'New condition group +' button. The 'Assistant says' section contains the placeholder text 'Retrieving your system's IPL information...'. At the bottom, the 'And then' section includes a 'Continue to next step' button.

#### 14. Enter **Retrieving your system's IPL information...** in the **Assistant says** field.

Assistant says:

Retrieving your system's IPL information...

This screenshot shows the same interface as above, but the 'Assistant says' field has been updated. The placeholder text 'Retrieving your system's IPL information...' is now enclosed in a green rectangular box, indicating it has been modified. The rest of the interface remains the same, including the conversation steps and the condition setup.

#### 15. Click the **And then** drop-down and select **Go to a subaction**.

Customer starts with: Retrieve IPL information

Conversation steps

Step 3

Is taken with conditions

Conditions

If All of this is true:

2. Would you like to d... is Yes

and Add condition +

New condition group +

Assistant says

Retrieving your system's IPL information...

Define customer response

And then

- Continue to next step
- Re-ask previous step(s)
- Go to a subaction**
- Use an extension
- Search for the answer
- Connect to agent
- End the action

Preview

16. Click (a) the Go to drop-down, (b) select your skill-based action (z/OS IPL Information), and then (c) click **Apply**.

Customer starts with: Retrieve IPL information

Conversation steps

Step 3

Is taken with conditions

Conditions

If All of this is true:

2. Would you like to d... is Yes

and Add condition +

Go to a subaction

z/OS IPL Information

End this action after the b: action is completed

Privacy

Protect data returned after the subaction completes

Cancel

Apply

17. Click **Save** (💾) and then click **x**.

The screenshot shows the IBM Watsonx Orchestrate interface. In the top navigation bar, it says "IBM Watsonx Orchestrate" and "AI assistant builder". The workspace is titled "Zeeves". The main area shows a conversation flow:

- Customer starts with:** "Retrieve IPL information"
- Conversation steps:**
  - This step has no content.
  - Q: Search for the answer  
Would you like to display your LPARS IPL information?  
Confirmation
  - ↓ Continue to next step  
2 is Yes  
Retrieving your system's IPL information...  
Go to subsection: z/OS IPL Inform...
- Step 3:** Is taken with conditions
  - If All of this is true:
    2. Would you like to d... is Yes
  - and Add condition +
- Conditions:** 1 condition
  - If All of this is true:
    2. Would you like to d... is Yes
- Assistant says:** (with various icons for text, code, and media)

## Test the custom-built action

You can now practice demonstrating the flow of this use case. Recall the steps that were taken and the scenario of the early-tenure SysProg being tasked with preparing for an upcoming IPL.

### 1. Click Preview.

The screenshot shows the "Actions" section of the IBM Watsonx Orchestrate interface. The left sidebar includes options like Home, Build, Generative AI, Actions, Evaluate, Preview (which is highlighted with a green box), Deploy, Publish, Environments, Improve, and Analyze. The main area displays a table of actions:

Name	Last edited	Examples count	Steps count	Status
z/OS IPL Information	an hour ago	0	3	Green checkmark
Zeeves-gather-facts-flow	2 days ago	1	0	Green checkmark
Retrieve IPL information	15 minutes ago	1	3	Green checkmark

### 2. Enter How do you retrieve the information needed to IPL a z/OS LPAR? in the assistant prompt.

Prompt:

How do you retrieve the information needed to IPL a z/OS LPAR?



Use the Change layout option to open a full page view of the assistant.

AssistantZeeves

Hi! I'm Zeeves. How can I help you today?

How do you retrieve the information needed to IPL a z/OS LPAR?

### 3. Review the response.

By using the conversational search capability of watsonx Assistant for Z, grounded on Z-domain knowledge in the Z RAG, the user is able to quickly find an answer to their question. The assistant returns a response that shows the exact operator command they might use, and the types of details it provides which is relevant for preparing for an upcoming IPL. For example, the system's release level, the LOAD LIB information used for the IPL, the IODF device, the IPL device, and other system information.

You are also able to improve their productivity by infusing automations into the natural conversation that will provide them exactly the information they need to accomplish their task.

Preview assistant

AssistantZeeves

You 10:33 AM

How do you retrieve the information needed to IPL a z/OS LPAR?

10:33 AM

To retrieve the necessary information for IPLing a z/OS LPAR, you would typically refer to the system's documentation or consult with the system administrators. However, generally, you'd need the following:

1. LPAR Name: The unique identifier for the Logical Partition.
2. IPL Parameters: These include the system configuration parameters, such as the load module library, parmlib, and the address space layout.
3. System Symbols: These are used to customize the IPL process according to specific requirements.
4. IPL Source: This could be a specific member in a PDS (Partitioned Data Set), or a dataset specified in the IPL JCL (Job Control Language).

The exact process might vary depending on the specific mainframe environment and its configuration. Always ensure to follow the established procedures and guidelines provided by your organization's IT department.

Note: The document provided does not contain specific details about retrieving information for IPLing a z/OS LPAR. The provided information is based on general mainframe practices.

AI Accuracy of generated answers may vary.

Would you like to display your LPARs IPL information?

Type something...

#### 4. Click Yes.

Preview assistant

AssistantZeeves

You 10:33 AM

How do you retrieve the information needed to IPL a z/OS LPAR?

10:33 AM

To retrieve the necessary information for IPLing a z/OS LPAR, you would typically refer to the system's documentation or consult with the system administrators. However, generally, you'd need the following:

1. LPAR Name: The unique identifier for the Logical Partition.
2. IPL Parameters: These include the system configuration parameters, such as the load module library, parmlib, and the address space layout.
3. System Symbols: These are used to customize the IPL process according to specific requirements.
4. IPL Source: This could be a specific member in a PDS (Partitioned Data Set), or a dataset specified in the IPL JCL (Job Control Language).

The exact process might vary depending on the specific mainframe environment and its configuration. Always ensure to follow the established procedures and guidelines provided by your organization's IT department.

Note: The document provided does not contain specific details about retrieving information for IPLing a z/OS LPAR. The provided information is based on general mainframe practices.

AI Accuracy of generated answers may vary.

Would you like to display your LPARs IPL information?

#### 5. Using the defaults in the form, click Apply.

The screenshot shows the IBM Watsonx Orchestrate interface with the 'AI assistant builder' tab selected. On the left, a sidebar lists various actions: Home, Generative AI, Actions, Evaluate, Preview (which is selected), Deploy, Publish, Environments, Improve, Analyze, Integrations, and Activity log. The main content area is titled 'AssistantZeeves' and contains the following text:

specified in the IPL JCL (Job Control Language).

The exact process might vary depending on the specific mainframe environment and its configuration. Always ensure to follow the established procedures and guidelines provided by your organization's IT department.

Note: The document provided does not contain specific details about retrieving information for IPLing a z/OS LPAR. The provided information is based on general mainframe practices.

AIA Accuracy of generated answers may vary.

Would you like to display your LPARs IPL information?

Yes No

You 10:37 AM Yes

10:37 AM Retrieving your system's IPL information...

A modal window titled 'z/OS IPL Information' is displayed, containing the following form fields:

consoleName *	iserV501
cmd *	d iplinfo
sol-key *	JES

Cancel Apply

## 6. Review the response to the custom-built action.

The output provides relevant pieces of information the early-tenure SysProg needs to prepare for an IPL on their z/OS LPAR. For example, when the system was last IPLed, the z/OS release they have running (2.5), the IPL volume (D25VS1), the IPL LOAD PARM (LOADK2) used during the last IPL, and other relevant details.

The screenshot shows the IBM Watsonx Assistant interface. At the top, there are tabs for "IBM Watsonx Orchestrate", "AI assistant builder", and "Zeeves". On the right, there are buttons for "Copy link to share", "Change layout", "Change background", and "Customize web chat". The main area is titled "AssistantZeeves". A sidebar on the left contains various icons. The main content area has a green dashed box around the following text:

```
z/OS IPL Information
sol-key-timeout
sol-key-detected
cmd-response
IEE254I 12.40.03 IPLINFO DISPLAY 770
SYSTEM IPLED AT 06.48.48 ON 01/17/2025
RELEASE z/OS 02.05.00 LICENSE = z/OS
USED LOAD2 IN SYS0.IPLPARM ON ODE28
ARCHLVL = 2 MTLSHARE = N
VALIDATED BOOT: NO
IEASYM LIST = (00,K2)
IEASYS LIST = (00) (OP)
IODF DEVICE: ORIGINAL(ODE28) CURRENT(ODE28)
IPL DEVICE: ORIGINAL(ODE27) CURRENT(ODE27) VOLUME(D25VS1)
VM CPID = zHYPaaS
VM UUID = 3C9BD7F3-8A47-4A47-B62C-298DA45F40EB
VM NAME = k8s_75d16281c12c4681b91417749e322845_0727_3c9bd
8a47
-4a47-b62c-298da45f40eb

cmd-response-key
C4443879
```

At the bottom, there is a timestamp "10:39 AM" and a text input field with "Type something..." and a send icon.

The ability to infuse skills and automations into the conversation allows the user to issue the operator command on their system directly within the assistant itself. The assistant provides a single interface for retrieving details that are required for the IPL process to go smoothly and increases the user's efficiency.

# Use case: SSL Certificate renewal on z/OS

Now, shift roles to that of a mainframe Security Administrator (SA). The client want to understand how watsonx Assistant for Z can help them to verify that their critical security certificates are up to date and reduce the risk of expired certificates disrupting their organization's services.

Secure Sockets Layer (SSL) certificates, often referred to as digital certificates, are used to establish an encrypted connection between communicating parties over a network. Certificate management is crucial for maintaining the security of a company's z/OS environment. The SA has not performed the tasks to manage and renew a certificate in some time. The SA recalls that there are many steps that are required on z/OS and various RACF commands that need to be run to renew a certificate. Rather than going to their senior SA for assistance, demonstrate how using watsonx Assistant for Z can help the SA automate the certificate renewal process.

In this scenario, use the Ansible automation templates that are provided with AAP and the WAZI z/OS environment to create assistant actions. The actions guide the client through the process of identifying their SSL certificate's expiration dates, and automating the certificate renewal process for them. The assistant saves them time and improve their productivity.

## Create an initial certificate authority (CA) certificate to sign future SITE certificates

For this use case, a certificate authority (CA) certificate is needed to sign new SITE certificates.

1. Open and log in to the Ansible Automation Platform (AAP) web console.



**Don't remember how?**

Refer to the first 5 steps in [Explore Ansible Automation Platform](#).

2. Click **Templates** under the **Resources** section.

The screenshot shows the 'Jobs' section of the Red Hat Ansible Automation Platform. The left sidebar has sections like 'Views', 'Dashboard', 'Jobs' (which is selected and highlighted), 'Schedules', 'Activity Stream', 'Workflow Approvals', 'Host Metrics', and 'Subscription Usage'. Below these are 'Resources' and 'Templates' (also highlighted with a green box). The main area shows a table of jobs with columns: Name, Status, Type, Start Time, Finish Time, and Actions. Three jobs are listed:

Name	Status	Type	Start Time	Finish Time	Actions
15 – Cleanup Job Details	Successful	Management Job	1/19/2025, 5:02:46 AM	1/19/2025, 5:02:48 AM	
14 – z/OS Certs - Add CA Cert	Successful	Playbook Run	1/17/2025, 10:08:07 AM	1/17/2025, 10:09:29 AM	
13 – z/OS TSO Command(s)	Successful	Playbook Run	1/17/2025, 7:41:26 AM	1/17/2025, 7:41:35 AM	

3. Click the **launch** icon ( ) for the **z/OS Certs - Create Cert** template.

The screenshot shows the 'Templates' section of the Red Hat Ansible Automation Platform. The left sidebar has sections like 'Views', 'Dashboard', 'Jobs', 'Schedules', 'Activity Stream', 'Workflow Approvals', 'Host Metrics', and 'Subscription Usage'. Below these are 'Resources' and 'Templates' (which is selected and highlighted with a green box). The main area shows a table of templates with columns: Name, Type, Organization, Last Ran, and Actions. Three templates are listed:

Name	Type	Organization	Last Ran	Actions
z/OS Certs - Add CA Cert	Job Template	Default	1/17/2025, 10:09:29 AM	
z/OS Certs - Create Cert	Job Template	Default		
z/OS Certs - Create Keyring	Job Template	Default		

4. On the **Survey** screen, modify the **Certificate Label** and **Type** fields with the values that follow and then click **Next**.

**a: Certificate Label**

TESTCA

**b: Type**

CERTAUTH



Leave the default values for all other fields.

The screenshot shows the 'Launch | z/OS Certs - Create Cert' survey step in the Red Hat Ansible Automation Platform. The 'Survey' tab is selected. The form fields are as follows:

- Owner ID**: IBMUSER
- Certificate Label**: TESTCA
- Type**: CERTAUTH
- Sign With**: Self
- Sign Label**: (empty)
- Organizational Unit**: ANSIBLE CORE

The 'Next' button at the bottom left is highlighted with a green border, indicating it is the next step to be clicked.

5. Click **Launch**.

**Launch | z/OS Certs - Create Cert**

This playbook creates a SITE, USER or CERTAUTH certificate. Signed by local CA or self-signed.

	Name	Description	Type	Job Template
1 Survey	z/OS Certs - Create Cert	This playbook creates a SITE, USER or CERTAUTH certificate. Signed by local CA or self-signed.		
2 Preview				
	Timeout	0 min 0 sec	Job Type	Run
	Inventory	AAP z/OS	Project	aap4zos
	Playbook	zos_concepts/certificate_management/create_cert.yml	Forks	0
	Show Changes	Off	Job Slicing	1
	Credential	SSH: z/OS Host SSH ...		

**Actions**

**Launch** **Back** **Cancel**

## 6. Review the output of the job.

In the output of the playbook, notice that a new keyring is created, a certificate is created, and the certificate is connected to the key ring.

The screenshot shows the Red Hat Ansible Automation Platform interface. The left sidebar has sections for Views (Dashboard, Jobs, Schedules, Activity Stream, Workflow Approvals, Host Metrics, Subscription Usage), Resources (Templates, Credentials, Projects, Inventories, Hosts), Access (Organizations, Users, Teams), and Administration (Credential Types). The main area shows a job titled "z/OS Certs - Create Cert" with a status of "Successful". It has 1 play, 15 tasks, and 1 host, and took 00:00:20. The output tab is selected, showing the command history. A green dashed box highlights line 25, which is a task to generate a new certificate.

```
10 TASK [Get FQDN of this z/OS server from USS.] *****
11 ok: [zos_host]
12
13 TASK [Set cn fact from previous task.] *****
14 ok: [zos_host]
15
16 TASK [Check if certificate to be created already exists.] *****
17 ok: [zos_host]
18
19
20 TASK [Debug command output.] *****
21 ok: [zos_host] => {
22     "msg": "4"
23 }
24
25 TASK [Debug.] *****
26 ok: [zos_host] => {
27     "cert_not_found": true
28 }
29
```

7. Locate the line **TASK [GENERATE new certificate]**, click the **changed: [zos host]**.

Jobs > 16 - z/OS Certs - Create Cert

**Output**

z/OS Certs - Create Cert Successful

Plays 1 Tasks 15 Hosts 1 Elapsed 00:00:20

Stdout Search

Events processing complete. Reload output

```

27     "cert_not_found": true
28 }
29
30 TASK [Generate new certificate.] *****
31 changed: [zos_host] 12:58:32
32
33 TASK [List chain for new certificate.] *****
34 changed: [zos_host] 12:58:38
35
36 TASK [Connect new certificate to keyring.] *****
37 changed: [zos_host] 12:58:39
38
39 TASK [List keyring.] *****
40 changed: [zos_host] 12:58:40
41
42 TASK [Stop TN3270 server.] *****
43 skipping: [zos_host] 12:58:41
44
45 TASK [Start TN3270 server] *****
46 skipping: [zos_host] 12:58:41

```

## 8. Click JSON.

Jobs > 16 - z/OS Certs - Create Cert

**Output**

z/OS Certs - Create Cert Successful

Plays 1 Tasks 15 Hosts 1 Elapsed 00:00:20

**Host Details**

JSON

Host	zos_host	Status	Changed
Task	Generate new certificate.	Module	ibm.ibm_zos_core.zos_tso_comm and

Play

Check if SITE cert and keyring already exist. If not, create them and then run health check via TSO and operator commands.

12:58:32

12:58:38

## 9. Review the RACDCERT command that was run to generate the certificate and then click X to close the window.

Host Details

Details JSON

```

1 "changed": true,
2 "output": [
3     {
4         "command": "RACDCERT GENCERT CERTAUTH KEYUSAGE(CERTSIGN) SUBJECTSDN(CN('itzvsi-zos-pwg'))",
5         "rc": 0,
6         "content": [
7             "IRRD175I The new profile for DIGTCERT will not be in effect until a SETROPTS REFRESH is issued."
8         ],
9         "lines": 2,
10        "stderr": "",
11        "failed": false
12    }
13 ],
14 "max_rc": 0,
15 "invocation": {
16     "module_args": {
17         "commands": "RACDCERT GENCERT CERTAUTH KEYUSAGE(CERTSIGN) SUBJECTSDN(CN('itzvsi-zos-pwg'))",
18         "max_rc": 0
19     }
20 }

```

42 TASK [Stop TN3270 server] \*\*\*\* 12:58:41

## Create an expiring certificate

Now, create an expiring certificate that uses the ..... CA certificate that you just created.

1. Return to the **Templates** tab and click the **launch** icon (🔗) for the **z/OS Certs - Create Cert** template.

Name	Type	Organization	Last Ran	Actions
z/OS Certs - Add CA Cert	Job Template	Default	1/17/2025, 10:09:29 AM	
z/OS Certs - Create Cert	Job Template	Default	1/19/2025, 12:58:44 PM	
z/OS Certs - Create Keyring	Job	Default		

2. On the **Survey** screen, modify the fields that follow with the values specified and then click **Next**.

a: Type

SITE

**b: Sign with**

CERTAUTH

**c: Sign Label**

TESTCA

**d: Common Name**

company.com

**e: Expiration Date**

Enter a date that occurs within the next 30 days. The date must be in the format YYYY-MM-DD.



Leave the default values for all other fields.

Unlike the first certificate you created which was *self-signed*, this certificate will be signed by the local certificate authority that uses the CA you created.



The following image does not highlight all the fields that need to be modified!

**Views**

**Launch | z/OS Certs - Create Cert**

This playbook creates a SITE, USER or CERTAUTH certificate. Signed by local CA or self-signed.

**Survey**

**Common Name** company.com

**Country** US

**Keyring** SharedRing1

**Expiration Date** 2025-01-30

**Check Name** IBMRACF,RACF\_CERTIFICATE\_EXPIRATION

**Next** **Back** **Cancel**

3. Click Launch.

**Views**

**Launch | z/OS Certs - Create Cert**

This playbook creates a SITE, USER or CERTAUTH certificate. Signed by local CA or self-signed.

**Survey**

**Preview**

<b>Execution Environment</b>	aap4zos EE	<b>Playbook</b>	zos_concepts/certificate_management/create_cert.yml	<b>Forks</b>	0
<b>Verbosity</b>	0 (Normal)	<b>Show Changes</b>	Off	<b>Job Slicing</b>	1
<b>Credential</b>	SSH: z/OS Host SSH ...				
<b>Created</b>	1/17/2025, 5:17:37 AM by admin	<b>Last Modified</b>	1/17/2025, 5:17:37 AM by admin		

**Prompted Values**

**Variables** **YAML** **JSON**

```

2 cert_label_survey: TESTSITE
3 cert_type_survey: SITE
4 sign_with_survey: CERTAUTH
5 sign_label_survey: TESTCA

```

**Launch** **Back** **Cancel**

4. Verify that the job was successful and inspect the output of the job.

The screenshot shows the Red Hat Ansible Automation Platform interface. The left sidebar has sections for Views (Dashboard, Jobs, Schedules, Activity Stream, Workflow Approvals, Host Metrics, Subscription Usage), Resources (Templates, Credentials, Projects, Inventories, Hosts), Access (Organizations, Users, Teams), and Administration (Credential Types, Notifications). The main area shows a job titled "z/OS Certs - Create Cert". The "Output" tab is selected. The job status is "Successful". The output log shows the following tasks:

```

15 TASK [Check if certificate to be created already exists.] **** 13:16:28
16 ok: [zos_host]
17
18 TASK [Debug command output.] **** 13:16:29
19 ok: [zos_host] => {
20     "msg": "4"
21 }
22
23 TASK [Debug.] **** 13:16:29
24 ok: [zos_host] => {
25     "cert_not_found": true
26 }
27
28 TASK [Generate new certificate.] **** 13:16:29
29 changed: [zos_host]
30
31 TASK [List chain for new certificate.] **** 13:16:34
32 changed: [zos_host]
33
34
35

```

## Renew the expiring certificate

Now that you have a certificate and it is expiring within 30 days, it is time to renew the certificate.

1. Return to the **Templates** tab and click the **launch** icon ( ) for the **z/OS Certs - Search and Renew** template.

The screenshot shows the Red Hat Ansible Automation Platform interface. The left sidebar has sections for Views (Dashboard, Jobs, Schedules, Activity Stream, Workflow Approvals, Host Metrics, Subscription Usage), Resources (Templates, Credentials, Projects, Inventories, Hosts), Access (Organizations, Users, Teams), and Administration (Credential Types, Notifications). The 'Templates' section is highlighted with a green box. The main area lists job templates:

Template Name	Type	Status	Last Run	Action Icons
<a href="#">z/OS Certs - Add CA Cert</a>	Job Template	Default	1/17/2025, 10:09:29 AM	
<a href="#">z/OS Certs - Create Cert</a>	Job Template	Default	1/19/2025, 1:16:45 PM	
<a href="#">z/OS Certs - Create Keyring</a>	Job Template	Default		
<a href="#">z/OS Certs - Delete Cert</a>	Job Template	Default		
<a href="#">z/OS Certs - Delete Keyring</a>	Job Template	Default		
<a href="#">z/OS Certs - Health Checker Security</a>	Job Template	Default	1/17/2025, 5:17:58 AM	
<a href="#">z/OS Certs - List Cert</a>	Job Template	Default		
<a href="#">z/OS Certs - Search and Renew</a>	Job Template	Default		
<a href="#">z/OS Data Set - Basics</a>	Job Template	Default		

2. On the **Survey** screen, modify the fields that follow with the values specified and then click **Next**.

**a: Certificate Label**

TESTSITE

**b: Type**

SITE

**c: Sign with**

CERTAUTH

**d: Sign Label**

TESTCA

**e: Expiration Date**

Specify a new expiration date in the format YYYY-MM-DD.



The following image does not highlight all the fields that need to be modified!

Views

z/OS Certs - Add CA Cert

Job Default Template 1/17/2025, 10:09:29 AM

Launch | z/OS Certs - Search and Renew

This playbook searches for certificates with the details specified in the AAP survey and renews them.

1 Survey 2 Preview

Certificate Label \* TESTSITE

Type \* SITE

Sign With \* CERTAUTH

Sign Label TESTCA

Owner ID \* IBMUSER

Keyring \* SharedRing1

Next Back Cancel

3. Click **Launch**.

**Launch | z/OS Certs - Search and Renew**

This playbook searches for certificates with the details specified in the AAP survey and renews them.

	Name	Description	Type	Job Template
Survey	z/OS Certs - Search and Renew	This playbook searches for certificates with the details specified in the AAP survey and renews them.	Run	Default
Preview				
Timeout	0 min 0 sec	Job Type	Run	Organization
Inventory	AAP z/OS	Project	aap4zos	Execution Environment
Playbook	zos_concepts/certificate_management/search_and_renew.yml	Forks	0	Verbosity
Show Changes	Off	Job Slicing	1	
Credential	SSH: z/OS Host SSH ...			

**Buttons:** Launch (highlighted in green), Back, Cancel

4. Verify that the job was **Successful** and review the output.

**Note:** Click the **Reload Output** button to view the full output after the job completes.

Review the tasks that were run within the automation to renew the certificate. Some of the steps completed include:

- Run the RACF\_CERTIFICATE\_EXPIRATION z/OS Health Check
- Submit JCL to pull a report on the z/OS Health Check
- Search the output of the report for the given certificate label
- Print the expiring certificate, if it is found. You see: 'TESTSITE expiring – True'
- If the certificate is expiring, start a series of RACDCERT commands to do the following:
  - Backup the expiring certificate
  - Rekey the certificate and give it a new temporary label
  - Generate a CSR for the new certificate
  - Sign the new certificate with the local CA
  - Delete the old certificate
  - Relabel the new certificate to use the same label as before
  - Refresh the digital certificate list

Jobs > 18 - z/OS Certs - Search and Renew

**Output**

z/OS Certs - Search and Renew

Successful

Events processing complete. Reload output

```

16 skipping: [zos_host] => (item={'ddname': 'JESJCL', 'record_count': '8', 'id': '3', 'stepname': 'JES2', 'proctep': None, 'byte_count': '136', 'content': ['      1 //HZSPRINT JOB=RACF CERT EXPIRATION CHECK', '                                JOB00225', '      // MSGCLASS=H,MSGLEVEL=(1,1),CLASS=A,', '      // NOTIFY=SYSUID', '      IEFC653I SUBSTITUTION JCL - RACF CERT EXPIRATION CHECK', 'MSGCLASS=H,MSGLEVEL=(1,1),CLASS=A,NOTIFY=IBMUSER', '      2 //HZSPRINT EXEC PGM=HZSPRNT,TIME=100,REGION=0M,PARMDD=SYSIN', '      3 //SYSIN DD *,DLM='@'', '      4 //SYSOUT DD SYSOUT=A,DCB=(LRECL=256)', '      5 //'])}
17 skipping: [zos_host] => (item={'ddname': 'JESYSMSG', 'record_count': '18', 'id': '4', 'stepname': 'JES2', 'proctep': None, 'byte_count': '137', 'content': [' ICH70001I IBMUSER LAST ACCESS AT 15:26:46 ON SUNDAY, JANUARY 19, 2025', ' IFA111I HZSPRINT IS USING THE FOLLOWING JOB RELATED SETTINGS:', '      SWA=BELOW,TIOT SIZE=64K,DSENQSHR=DISALLOW,GDGBIAS=JOB', ' IEF236I ALLOC. FOR HZSPRINT HZSPRINT', ' IEF237I JES2 ALLOCATED TO SYSIN', ' IEF237I JES2 ALL LOCATED TO SYSOUT', ' IEF142I HZSPRINT HZSPRINT - STEP WAS EXECUTED - COND CODE 0000', ' IEF285I IBMUSER.HZSPRINT.JOB00225.D0000101.?      SYSIN', ' IEF285I IBMUSER.HZSPRINT.JOB00225.D0000102.?      SYSOUT', ' IEF373I STEP/HZSPRINT/START 2025019.1526', ' IEF032I STEP/HZSPRINT/STOP 2025019.1526', '      CPU: 0 HR 00 MIN 00.00 SEC SRB: 0 HR 00 MIN 00.00 SEC', '      VIRT: 12K SYS: 304K EXT: 24K SYS: 9748K', 'ATB- REAL: 228K SLOTS: 0K', '      VIRT- ALLOC: C: 13M SHRD: 0M'. ' IEF375I JOB/HZSPRINT/START 2025019.1526'. ' IEF033I JOB/HZSPRINT/STOP 2025019.1526'])

```

## Create another expiring certificate

Create one more expiring certificate to use with the assistant and the new skills you will create.

1. Return to the **Templates** tab and click the **launch** icon (💡) for the **z/OS Certs - Create Cert** template.

Name	Type	Organization	Last Ran	Actions
z/OS Certs - Add CA Cert	Job Template	Default	1/17/2025, 10:09:29 AM	
z/OS Certs - Create Cert	Job Template	Default	1/19/2025, 1:16:45 PM	

2. On the **Survey** screen, modify the fields that follow with the values specified and then click **Next**.

**a: Certificate Label**

DEMOCERT

**b: Type**

SITE

**c: Sign with**

CERTAUTH

**d: Sign Label**

TESTCA

**e: Common Name**

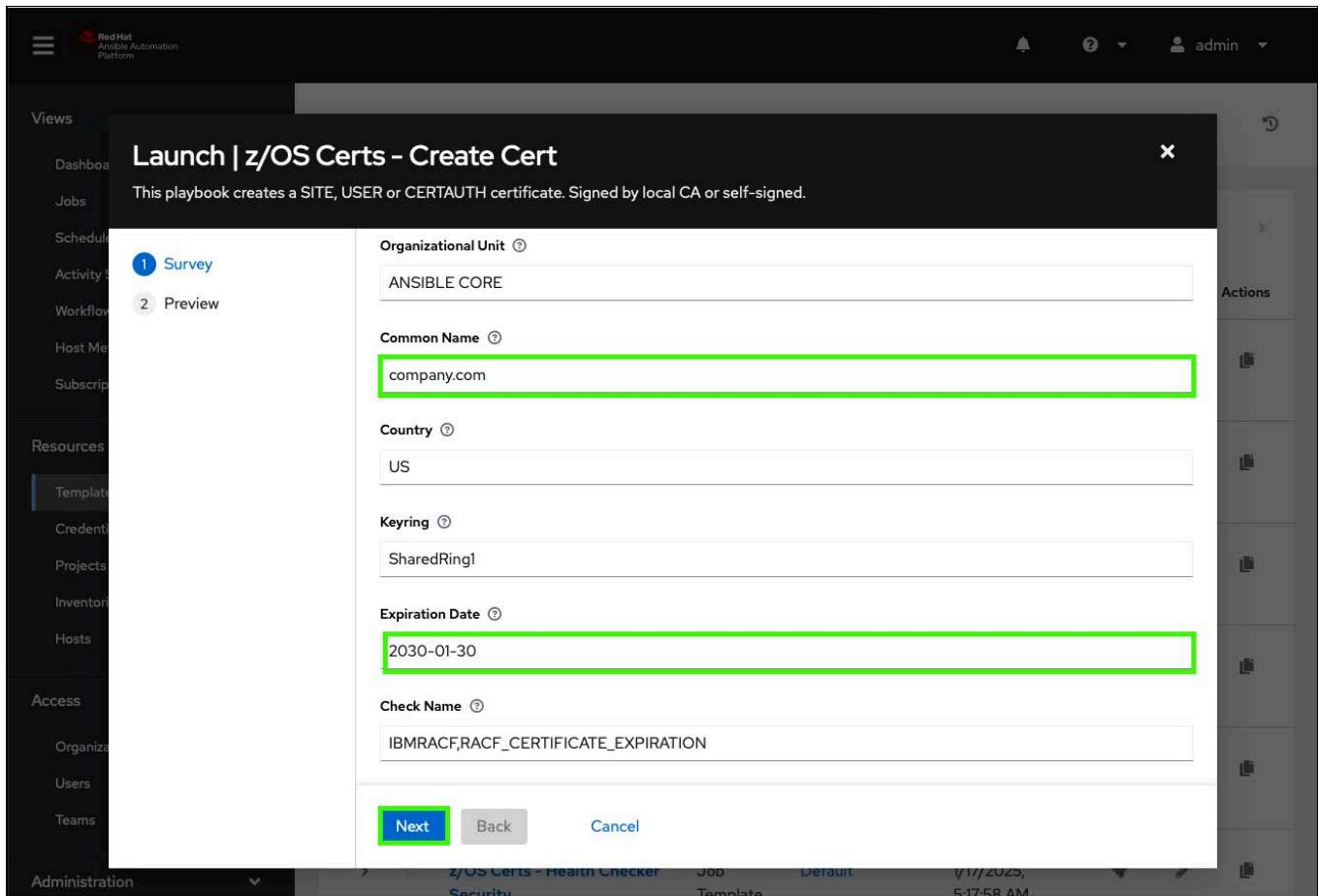
company.com

**f: Expiration Date**

Enter a date that falls within the next 30 days in the format YYYY-MM-DD.



The following image does not highlight all the fields that need to be modified!



3. Click **Launch**.

The screenshot shows the Red Hat Ansible Automation Platform interface. A modal window titled "Launch | z/OS Certs - Create Cert" is open. The window describes the playbook as creating a SITE, USER or CERTAUTH certificate. It shows the execution environment as "aap4zos EE", the playbook as "zos\_concepts/certificate\_management/create\_cert.yml", and other parameters like Verbosity (0 Normal), Show Changes (Off), Forks (0), and Job Slicing (1). A credential "SSH: z/OS Host SSH ..." is selected. The "Created" and "Last Modified" times are both "1/17/2025, 5:17:37 AM by admin". Below this, a section titled "Prompted Values" shows variables in YAML format:

```
1 owner_id_survey: IBMUSER
2 cert_label_survey: DEMOCERT
3 cert_type_survey: SITE
4 sign_with_survey: CERTAUTH
```

At the bottom of the modal are three buttons: "Launch" (highlighted with a green box), "Back", and "Cancel". The background shows a navigation bar with links like Views, Dashboard, Jobs, etc., and a sidebar with Resources, Access, and Administration sections.

4. Verify that the **DEMOCERT** was successfully created.

The screenshot shows the Red Hat Ansible Automation Platform interface. The left sidebar has sections for Views (Dashboard, Jobs, Schedules, Activity Stream, Workflow Approvals, Host Metrics, Subscription Usage), Resources (Templates, Credentials, Projects, Inventories, Hosts), Access (Organizations, Users, Teams), and Administration (Credential Types). The main area shows a job named '19 - z/OS Certs - Create Cert' with a status of 'Successful'. The 'Output' tab is selected, showing the command logs. The logs include:

```

15: Skipping: [zos_host]
16:
17: TASK [Check if certificate to be created already exists.] *****
18: ok: [zos_host]
19:
20: TASK [Debug command output.] *****
21: ok: [zos_host] => {
22:   "msg": "4"
23: }
24:
25: TASK [Debug.] *****
26: ok: [zos_host] => {
27:   "cert_not_found": true
28: }
29:
30: TASK [Generate new certificate.] *****
31: changed: [zos_host]
32:
33: TASK [List chain for new certificate.] *****
34: changed: [zos_host]
35:

```

## Import the Ansible automations into watsonx Orchestrate

For this use case, configure the assistant to guide the user through the process of identifying their SSL certificate's expiration date and automate the certificate renewal process. To do so, import the needed AAP templates into watsonx Orchestrate as skills.

For this use case, the ansible templates you import are:

- z/OS Certs – List Cert
- z/OS Certs – Search and Renew
- Retrieve job output (utility skill)

1. Open **Skill studio** in watsonx Orchestrate.

The screenshot shows the IBM Watsonx Orchestrate web interface. On the left, there's a sidebar with sections for Chat, Skill sets, Skill catalog, BUILD (with AI assistant builder and Skill studio selected), and ADMINISTER (Access management). The main area is titled "AssistantZeeves". At the top right, there are buttons for "Copy link to share", "Change layout", "Change background", and "Customize web chat".

## 2. Click **Create** and then click **Import API**.

The screenshot shows the "Welcome to Skill studio" page. It features a search bar at the top with the placeholder "Find a skill". Below it is a table titled "Skills" with columns for Name, Step in the process, Status, Skill type, Author, and Last edited. Two entries are listed: "z/OS IPL Information" and "Zeeves-gather-facts-flow". To the right, there's a sidebar with buttons for "Create" (highlighted with a green box), "Skill Flow", "Import API" (highlighted with a green box), and "Configure prebuilt skills".

## 3. Click the **z/OS Skills accelerator (Trial)** tile.

The screenshot shows the "Add skills" page. It has tabs for "Choose the source" and "Select the skills". Under "Choose the source", there are several tiles: "IBM Cloud Pak for Business Automation - On premises", "IBM Cloud Pak for Business Automation as a service", "z/OS Skills accelerator (Trial)" (which is highlighted with a green box), "IBM Robotic Process Automation (RPA)", "IBM Business Automation Workflow as a service", and "IBM Operational Decision Manager as a service".

## 4. Enter the following values in the **z/OS Skills accelerator** form and then click **Connect**.

Use the **URL**, **User Name**, and **Password** values recorded in the [Explore Ansible Automation Platform](#) section earlier.

**a:** Connection Type:

ansible

**b:** Application Name:

certs

**c:** Connection URL:

<Enter the URL for your AAP UI>

**d:** User Name:

<Enter the AAP User Name (for UI access)>

**e:** Password:

<Enter the AAP User Password>

**f:** Search Pattern:

\*

Add skills

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source  Select the skills

Choose the source

To discover new skills, connect to an app or refer to an OpenAPI file.

From an app  From a file OpenAPI builder (experimental)

IBM Cloud Pak for Business Automation - On premises  
which includes Automation Decision Services, Business Automation Workflow, and Operational Decision Manager on premises

IBM Cloud Pak for Business Automation as a service  
which includes Business Automation Workflow as a service and includes Operational Decision Manager as a service

**z/OS Skills accelerator (Trial)**  
Import your Ansible, JCL/REXX automation to watsonx Orchestrate

IBM Robotic Process Automation (RPA)

IBM Business Automation Workflow as a service

IBM Operational Decision Manager as a service

Connection Type: ansible

Application Name: certs

Connection URL: https://itzvsi-aap-pwgabob.techzone.ibm.com

User name: admin

Password: .....@

Search Pattern: \*

Cancel Connect

## 5. Expand the Ansible Job Template Proj... folder and then click aap4zos.

Add skills

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source  Select the skills

Select the skills

Select the skills you want to add to the skill set. Currently, 0 of 0 skills are selected.

- Ansible Job Template Proj...
  - Ansible Job Template Proj...
  - Demo Project
  - z\_ansible\_collections\_sa...
  - ansible\_zos
  - aap4zos**
- Ansible Utility Skills

## 6. Select Z/os certs - list cert and Z/os certs - search and renew and then click Save as draft.



Scroll through the table of skills to find the required skills.

Choose how you want to add skills and then select the skills you want to refer to from that source.

Choose the source Select the skills

Select the skills

Select the skills you want to add to the skill set. Currently, 2 of 20 skills are selected.

Skill	Description	Status
<input type="checkbox"/> Z/os certs - delete cert	Certs - this playbook deletes ...	Ready to add
<input checked="" type="checkbox"/> Z/os certs - list cert	Certs - this playbook displays...	Ready to add
<input checked="" type="checkbox"/> Z/os certs - search and renew	Certs - this playbook searches...	Ready to add
<input type="checkbox"/> Z/os tso command(s)	Certs - a playbook to execute ...	Ready to add
<input type="checkbox"/> Z/os operator command	Certs - a playbook to execute ...	Ready to add

Items per page: 5 | 16-20 of 20 items | 4 of 4 pages

Cancel Save as draft

7. Click the ellipses (⋮) for the **z/OS Certs - List Cert** skill and select **Enhance this skill**.

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

Create

Skills and apps Projects

Skills Apps

Find a skill

Skills

Name	Step in the process	Status	Skill type	Author	Last edited	⋮
z/OS Certs - Search and Renew	Just 1 step away to be ready	Ready to publish	Imported	andrew@jones-tx.com	January 19 2025	⋮
z/OS Certs - List Cert	Just 1 step away to be ready	Ready to publish	Imported	andrew@jones-tx.com	January 19 2025	⋮
z/OS IPL Information	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	⋮
Zeeves-gather-facts-flow	Ready to use	Published	Skill flow	andrew@jones-tx.com	January 17 2025	⋮
Retrieve job output	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	⋮
z/OS Ping	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	⋮
z/OS Gather Facts	Ready to use	Published	Imported	andrew@jones-tx.com	January 17 2025	⋮

8. Review the skill enhancement options and then click **Publish**.

The screenshot shows the 'Skill studio' interface in IBM Watsonx Orchestrate. The top navigation bar includes 'IBM Watsonx Orchestrate', 'Skill studio', 'English', and a help icon. The main title is 'Enhance the “z/OS Certs - List Cert” skill'. Below the title, a sub-header says 'Add details that will make people want to use this skill.' The skill details section includes fields for Name, Input, Output, Security, Phrases, and Next best skills. The 'Name' field is filled with 'z/OS Certs - List Cert'. The 'Input' field contains the description: 'certs - This playbook displays a certificate's details.' The 'Output' field shows '55/100'. The 'Security' field is empty. The 'Phrases' and 'Next best skills' sections are also empty. To the right, there is a 'Preview' section showing how the skill will look in the catalog and skill set. The catalog preview shows the skill name 'z/OS Certs - List Cert' and a brief description: 'certs - This playbook displays a certificate's details.' The skill set preview shows the skill name 'z/OS Certs - List Cert' and 'Cert'. At the bottom right are buttons for 'Cancel', 'Publish' (which is highlighted with a green border), and 'Save as draft'.

9. Repeat steps 7 and 8 for the **z/OS Certs - Search and Renew** skill.

10. **Challenge:** You also need to add the **Retrieve job output** utility to your **certs** app just like you did when creating the **Gather Facts** skill flow. Repeat steps 2 - 8 to add the **Retrieve job output** utility skill to your **certs** app.

Verify all the skills are successfully imported and create the app connection.

1. Open **Skill catalog** in watsonx Orchestrate.

Step in the process	Status	Skill type	Author	Last edited
Ready to use	Published	Imported	andrew@jones-tx.com	January 19 2025
Ready to use	Published	Imported	andrew@jones-tx.com	January 19 2025
Ready to use	Published	Imported	andrew@jones-tx.com	January 19 2025

2. Enter certs in the search bar.

3. Click the certs tile.

4. Click Add skill + for each of the 3 skills in the certs app.

Skill catalog /

## Ansible Controller Skills - certs (3)

[Connect app](#)

Personal skills

Search skills

Ansible Controller Skills - certs

- Retrieve job output  
certs - Retrieve job output by job Id
- z/OS Certs - List Cert  
certs - This playbook displays a certificate's details.
- z/OS Certs - Search and Renew  
certs - This playbook searches for certificates with the details specified in the AAP survey and renew...

Add skill + Add skill + Add skill +

### 5. Click Connect app.

Skill catalog /

## Ansible Controller Skills - certs (3)

[Connect app](#)

Personal skills

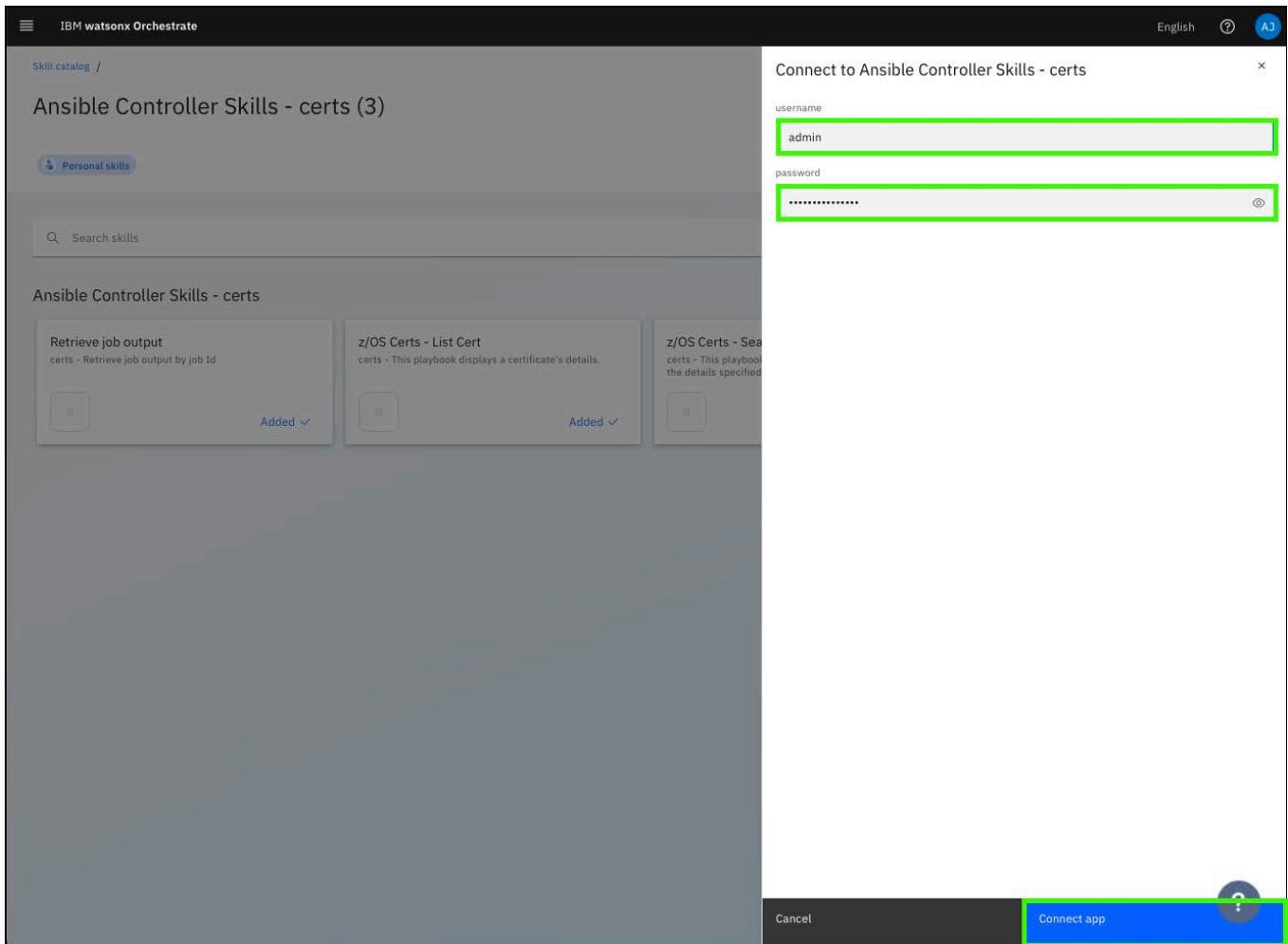
Search skills

Ansible Controller Skills - certs

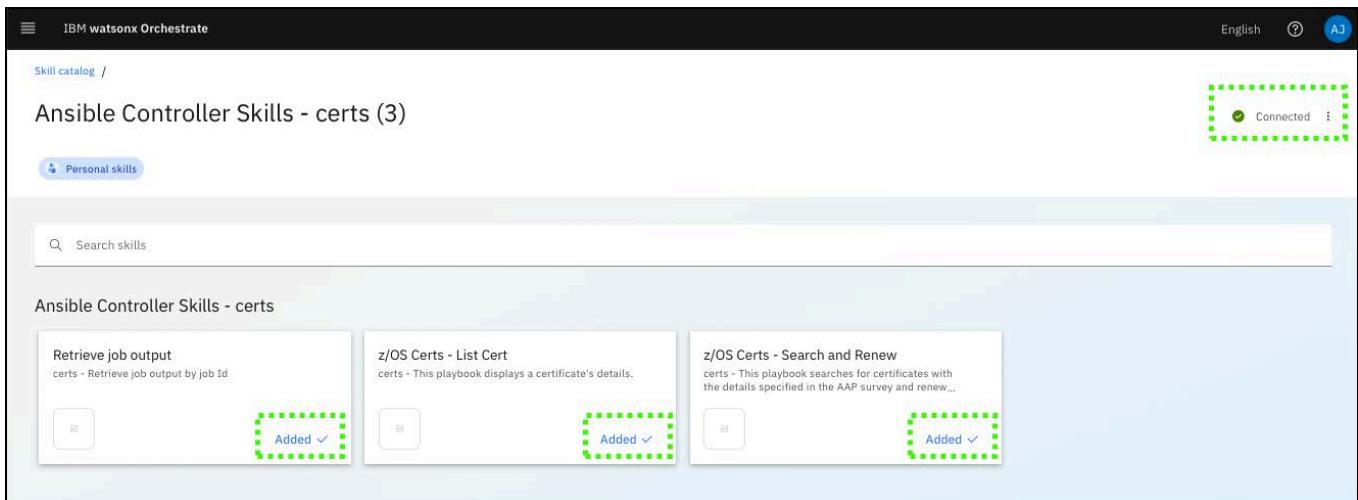
- Retrieve job output  
certs - Retrieve job output by job Id
- z/OS Certs - List Cert  
certs - This playbook displays a certificate's details.
- z/OS Certs - Search and Renew  
certs - This playbook searches for certificates with the details specified in the AAP survey and renew...

Added ✓ Added ✓ Added ✓

### 6. Enter your **AAP Username** and **AAP Password** and then click **Connect app**.



## 7. Verify that the app is connected.



Connect the app to the assistant.

## 1. Open **Skill catalog** in watsonx Orchestrate.

Skills - certs (3)

certs

<a href="#">z/OS Certs - List Cert</a>	<a href="#">z/OS Certs - Search and Renew</a>
certs - This playbook displays a certificate's details.	certs - This playbook searches for certificates with the details specified in the AAP survey and renew...
Added ✓	Added ✓

## 2. Select the **Draft** version of your assistant and click **Connections**.

Zeeves draft

Skill sets

Zeeves draft
--------------

Skills      Connections

Skills (3)

The skills added to this team are available to this team's members. These skills complete related tasks for the team members so members can work more efficiently and effectively.

Name      App

z/OS IPL Information	[Icon]
Zeeves-gather-facts-flow	[Icon]
Retrieve job output	[Icon]

Items per page: 10    1-3 of 3 items

Manage skills

## 3. Enter **certs** in the search bar.

Zeeves draft

Skill sets

Zeeves draft
--------------

Skills      Connections

These are the applications that are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to enable skills to either use personal or team credentials.

certs

Application	Number of skills	Credential type	Connected by	Action
Ansible Controller Skills - certs	3	⚠ Not specified	-	[More]

Items per page: 5    1-1 of 1 items

4. Click the ellipses (⋮) for the certs app and select Connect app\*.

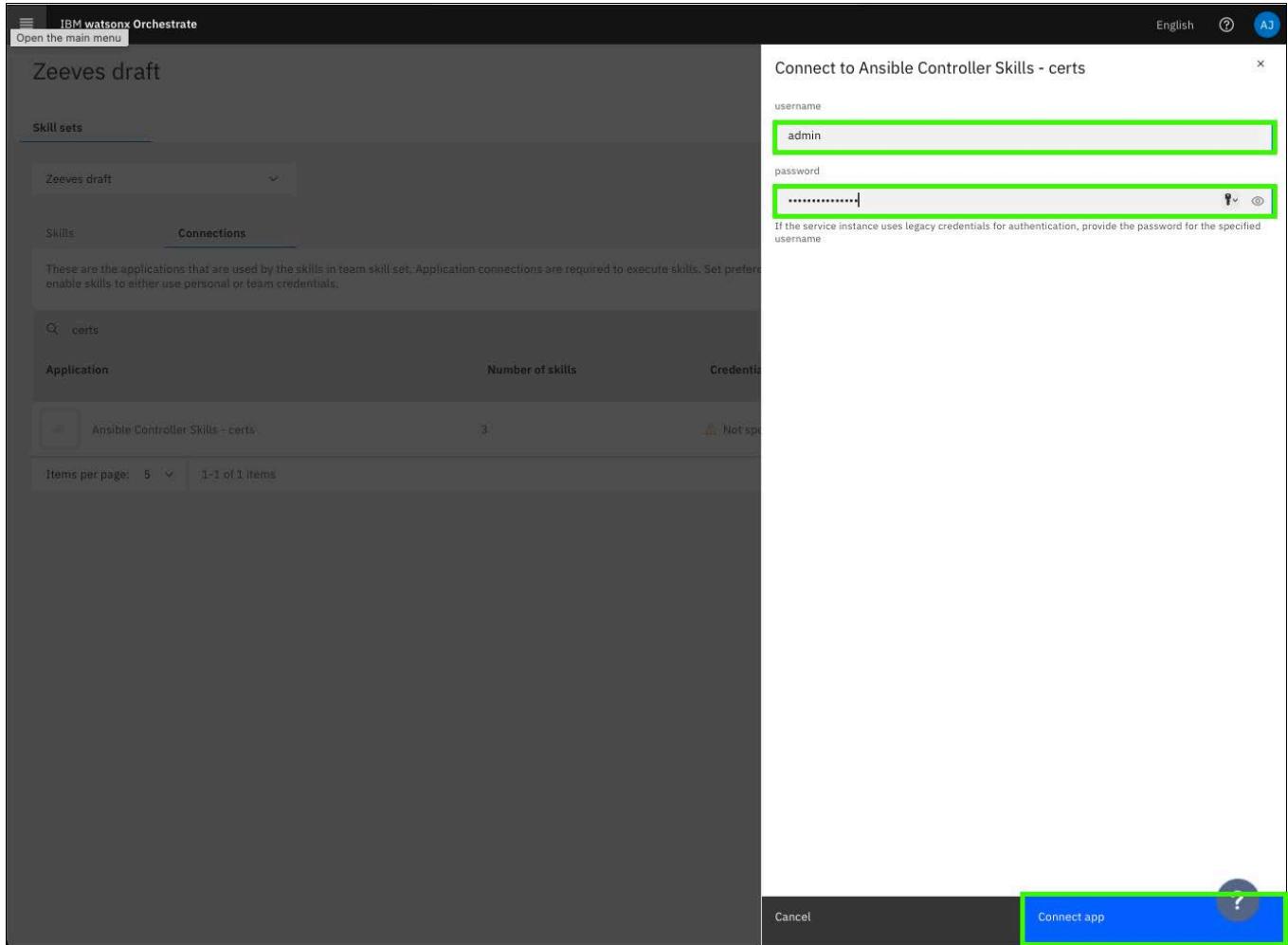
The screenshot shows the 'Skill sets' section for 'Zeeves draft'. Under the 'Connections' tab, there is a table listing applications used by skills. One row for 'Ansible Controller Skills - certs' is selected and highlighted with a green dotted border. In the 'Action' column for this row, a button labeled 'Connect app' is also highlighted with a green box.

Application	Number of skills	Credential type	Connected by ⓘ	Action
Ansible Controller Skills - certs	3	⚠️ Not specified	-	<span>⋮</span> <span>Connect app</span>

5. Click Connect app.

The screenshot shows a modal dialog titled 'Connect to Ansible Controller Skills - certs'. It contains two radio button options: 'Member credentials' and 'Team credentials'. The 'Team credentials' option is selected and highlighted with a green circle. Below the radio buttons, a note states: 'You selected Team credentials for the credential type. Click Connect app to provide the credentials your team will use and to connect to the app.' At the bottom right of the dialog, a button labeled 'Connect app' is also highlighted with a green box.

6. Enter your AAP Username and AAP Password and then click Connect app.



## Create a skill flow to retrieve certificate expiration dates.

The goal of this scenario is to configure the assistant to automate the certificate renewal process for the client. The first step in that process is to help the SA identify the expiration date of their z/OS certificate. You have imported the **z/OS Certs – List Cert** skill from Ansible Automation Platform. Next, create a new skill flow that uses the **z/OS Certs – List Cert** skill that can later be used in a natural conversation through assistant actions.

First, create a skill flow to retrieve and display the expiration date of a z/OS certificate based on the certificate label the user provides.

1. Open **Skill studio** in watsonx Orchestrate.

The screenshot shows the IBM Watsonx Orchestrate dashboard. The left sidebar has sections for Chat, Skill sets (which is highlighted with a green box), Skill catalog, BUILD (AI assistant builder, Skill studio), and ADMINISTER (Access management). The main content area displays a table with columns: Number of skills, Credential type, Connected by (with a help icon), and Action. A tooltip above the table states: "Skills are used by the skills in team skill set. Application connections are required to execute skills. Set preference at an application level to use global or team credentials." The top right corner shows language settings (English) and a help icon.

## 2. Click **Create** and then click **Skill flow**.

The screenshot shows the Skill studio interface. The top navigation bar includes IBM Watsonx Orchestrate, Skill studio, English, and a help icon. Below the navigation is a welcome message: "Welcome to Skill studio. Optimize productivity by using projects to build and manage skill flows and connectors." A "Skills and apps" tab is active, showing "Skills" and "Apps" tabs. A search bar contains "Find a skill". On the right, a "Create" dropdown menu is open, with "Skill Flow" selected (highlighted with a green box). Other options in the menu are Import API and Configure prebuilt skills. The bottom of the screen shows a "Skills" section.

## 3. Click the **+** icon.

The screenshot shows the "Create a Flow" interface. The top navigation bar includes Skills and apps / Create a Flow, English, and a help icon. The main area shows a workflow diagram with three nodes: a green circle labeled "Start", a yellow square labeled "+", and a red circle labeled "End". Arrows connect "Start" to the "+", and the "+" to "End". There are also small icons for closing the window and switching between tabs.

## 4. Click the **certs** app.



Search on certs if you do not see the tile for your app.

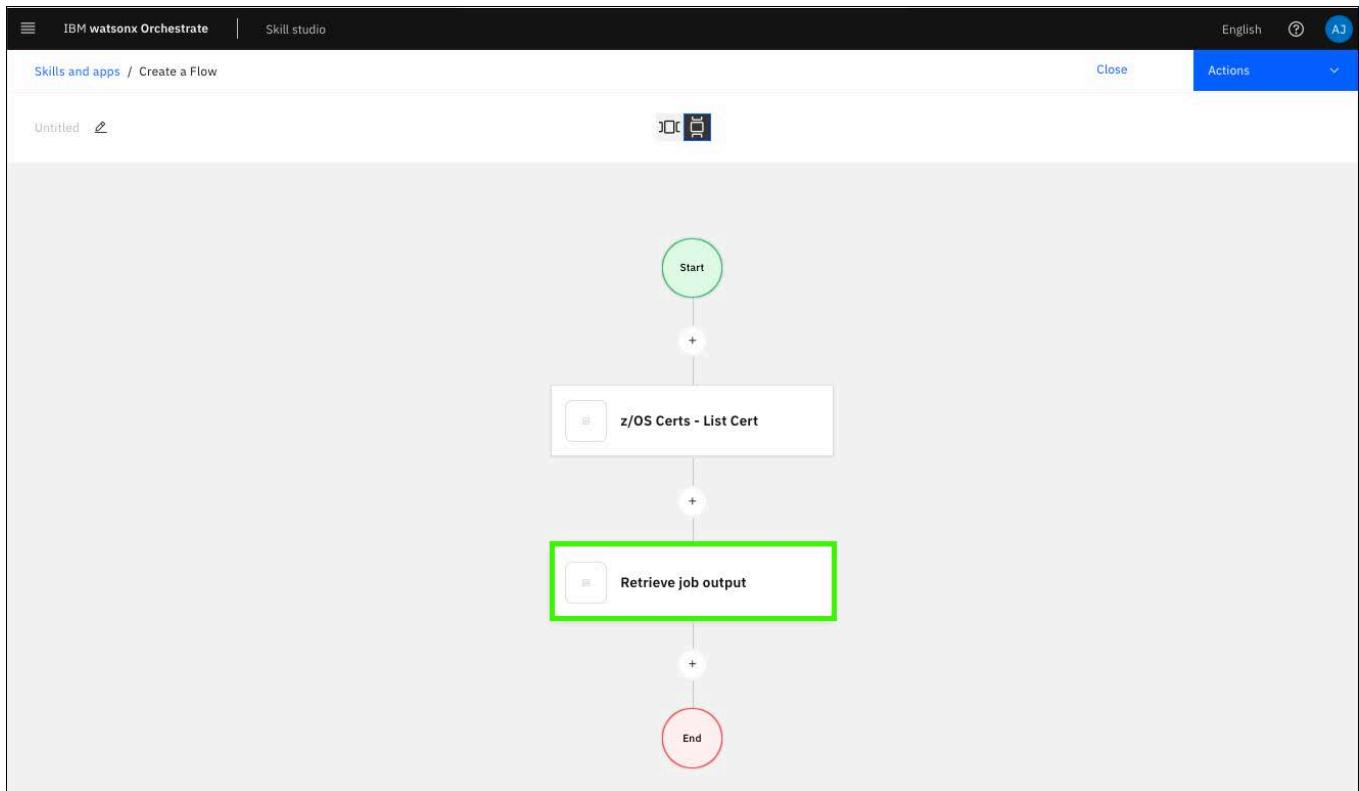
The screenshot shows the 'Skill studio' interface in IBM Watsonx Orchestrator. On the left, there's a flow diagram with a green 'Start' node and a red 'End' node. On the right, a modal window titled 'Add Skills' displays a grid of skill categories. One category, 'Ansible Controller Skills - certs', is highlighted with a green border. The grid includes other categories like 'Flow controls', 'Custom forms', 'z/OS operations', 'HubSpot CRM', 'Apptio Targetprocess', 'Salesforce', 'Zendesk Service', 'Calendly', and 'Square'. A search bar at the top of the modal says 'Search apps'. At the bottom of the modal, it says 'Total apps: 84. Viewing section 1 of 2'.

5. Click Add Skill + in the z/OS Certs - List Cert tile.

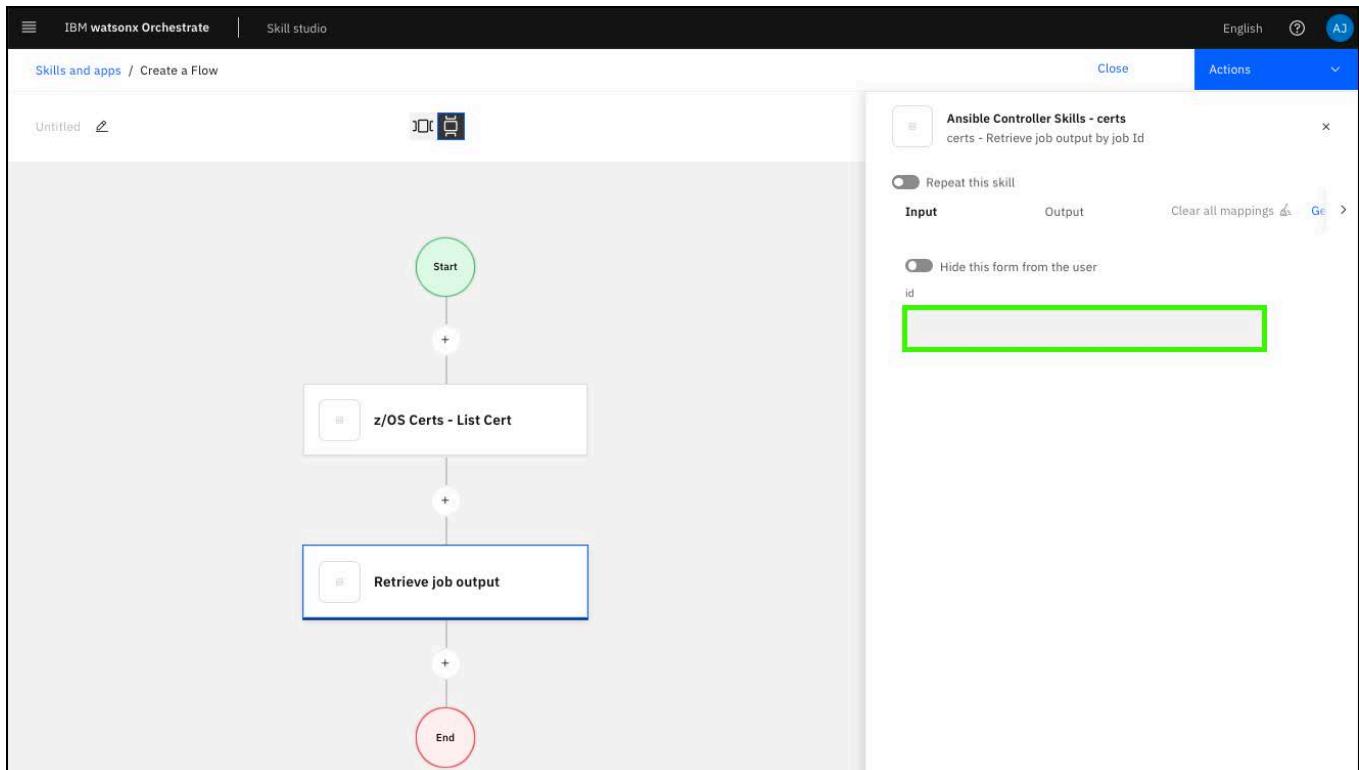
This screenshot shows the 'Ansible Controller Skills - certs' tile expanded. It contains two skill cards: 'Retrieve job output' and 'z/OS Certs - List Cert'. Below each card is an 'Add Skill +' button. The 'z/OS Certs - List Cert' card has its 'Add Skill +' button highlighted with a green border.

6. Click the + icon **below** the z/OS Certs - List Cert skill and repeat steps 4 and 5 to add the **Retrieve job output** skill.

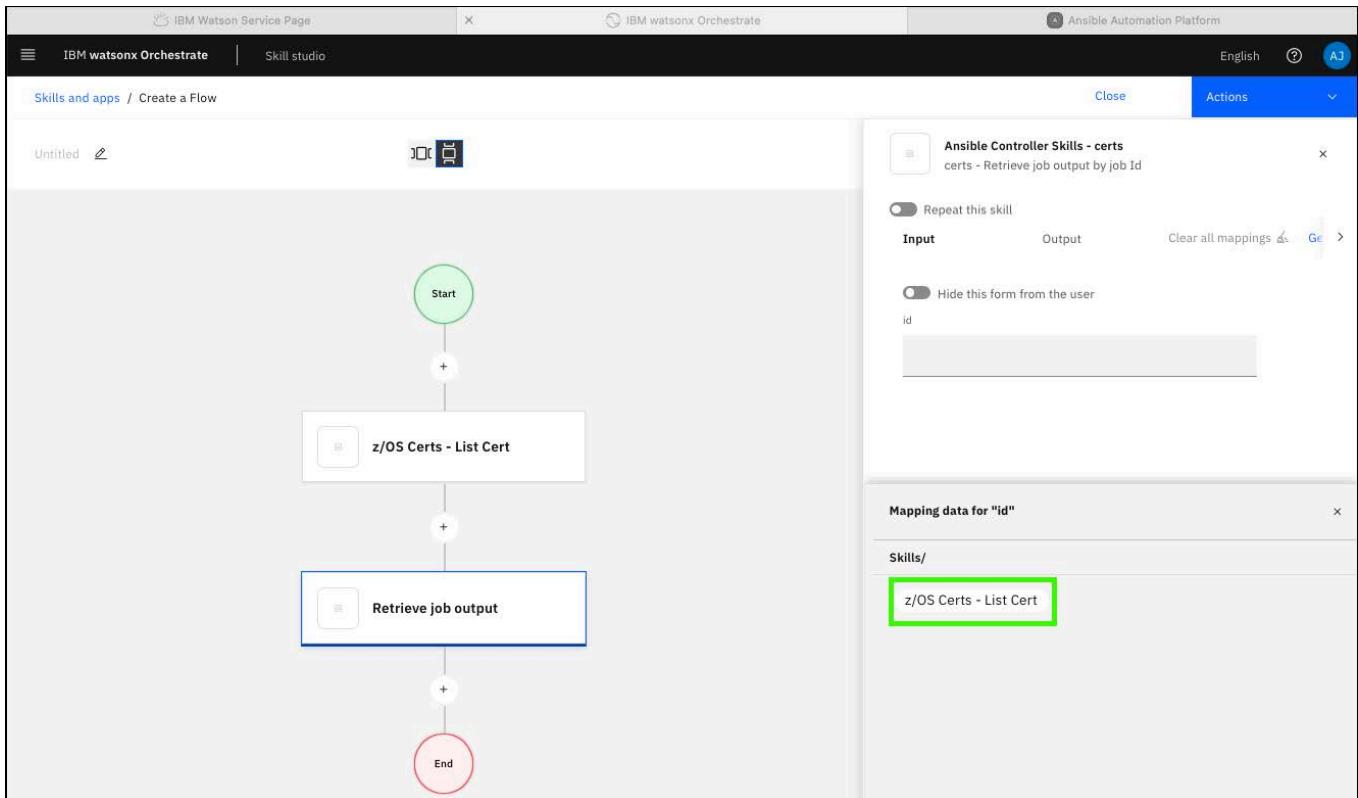
7. Click the **Retrieve job output** skill.



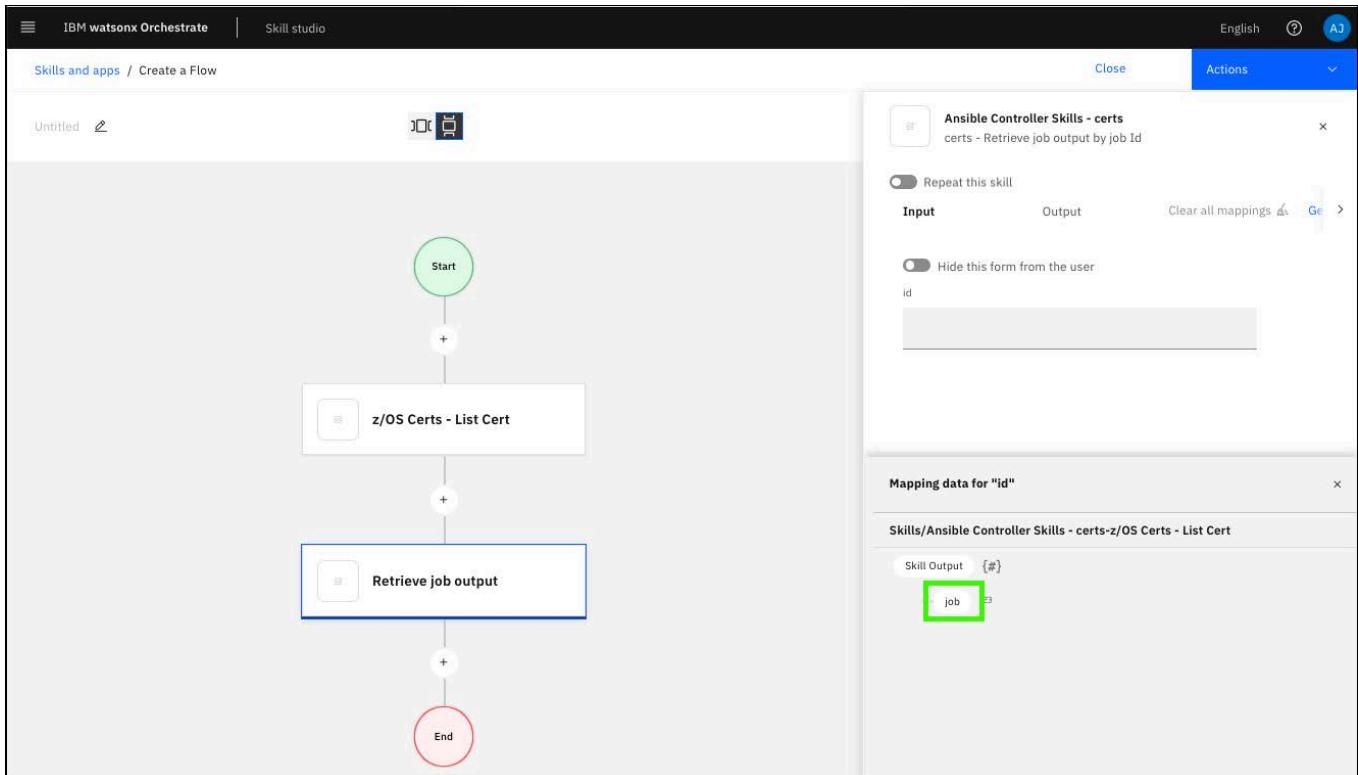
8. Click the **id** field.



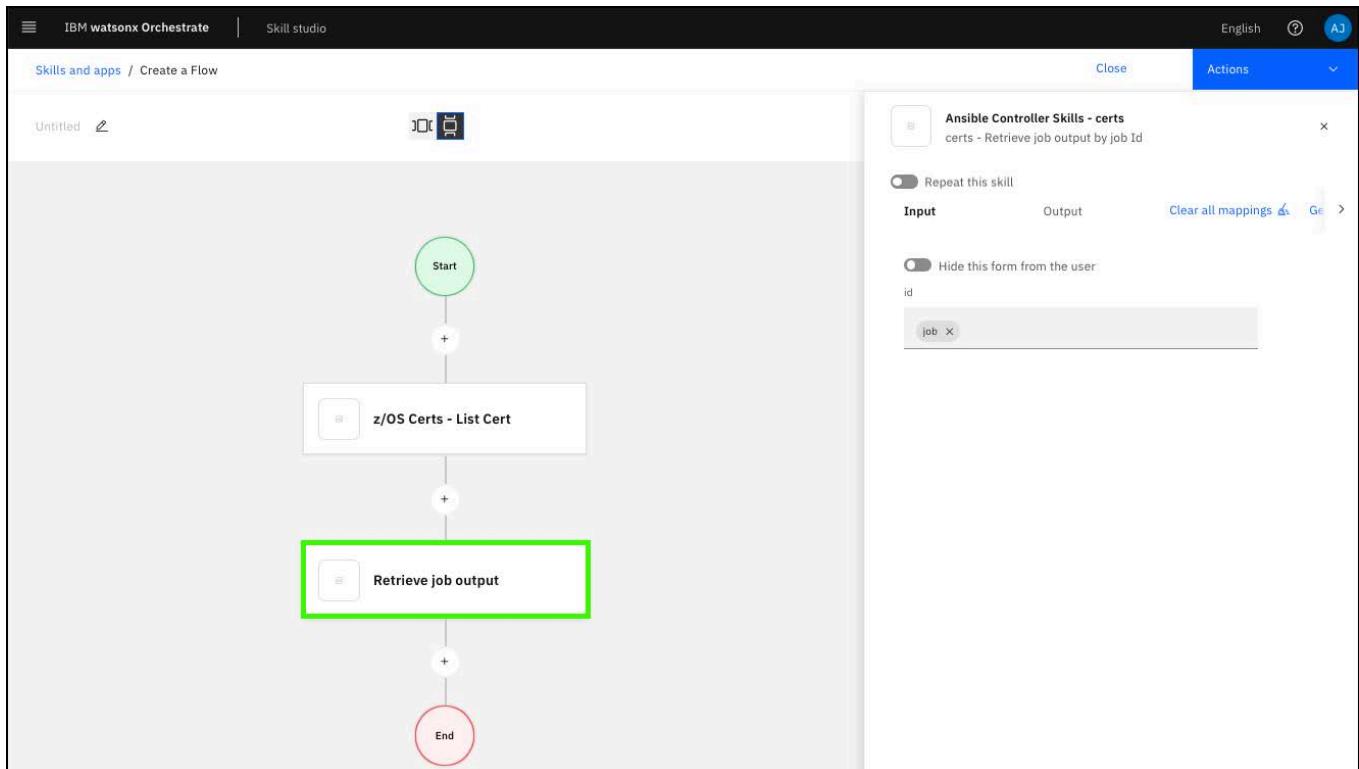
9. Click **z/OS certs - List Cert**.



## 10. Click job.

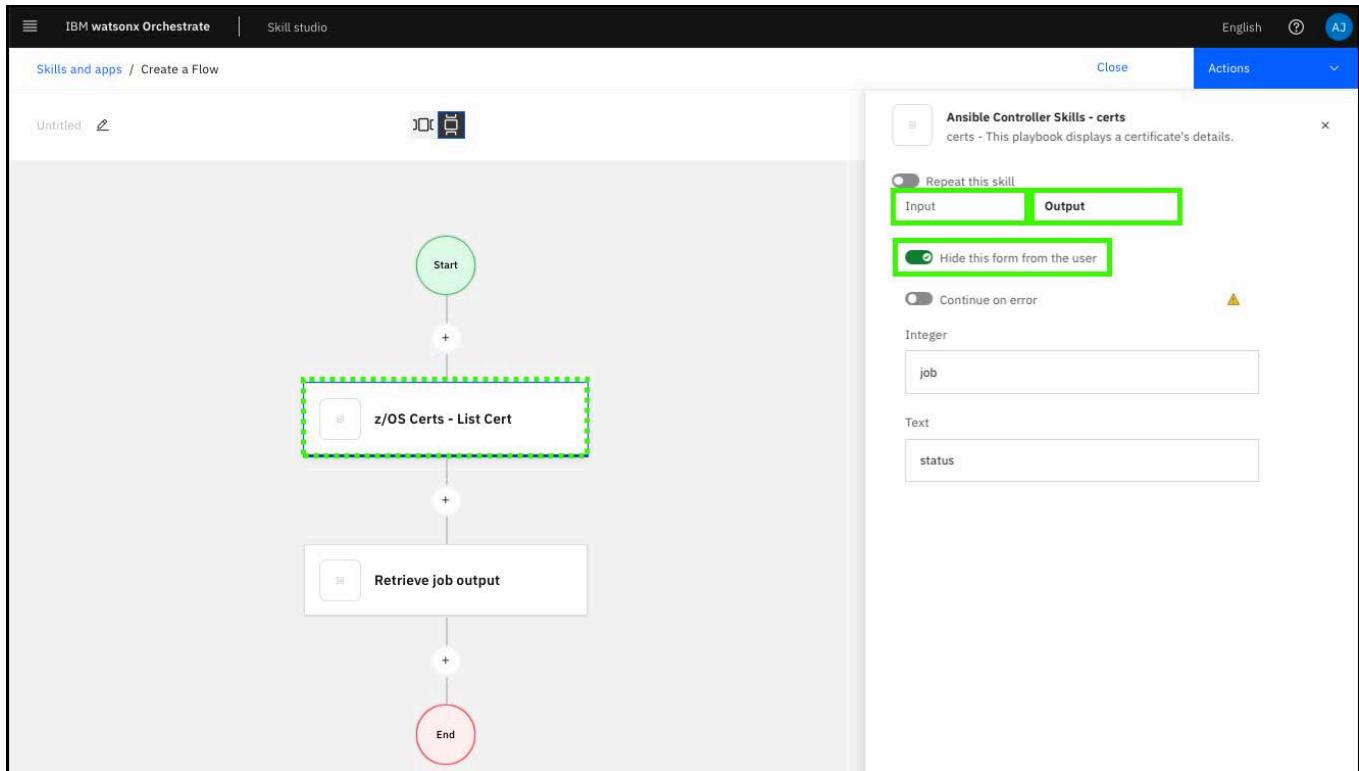


## 11. Click the z/OS Certs - List Cert tile.

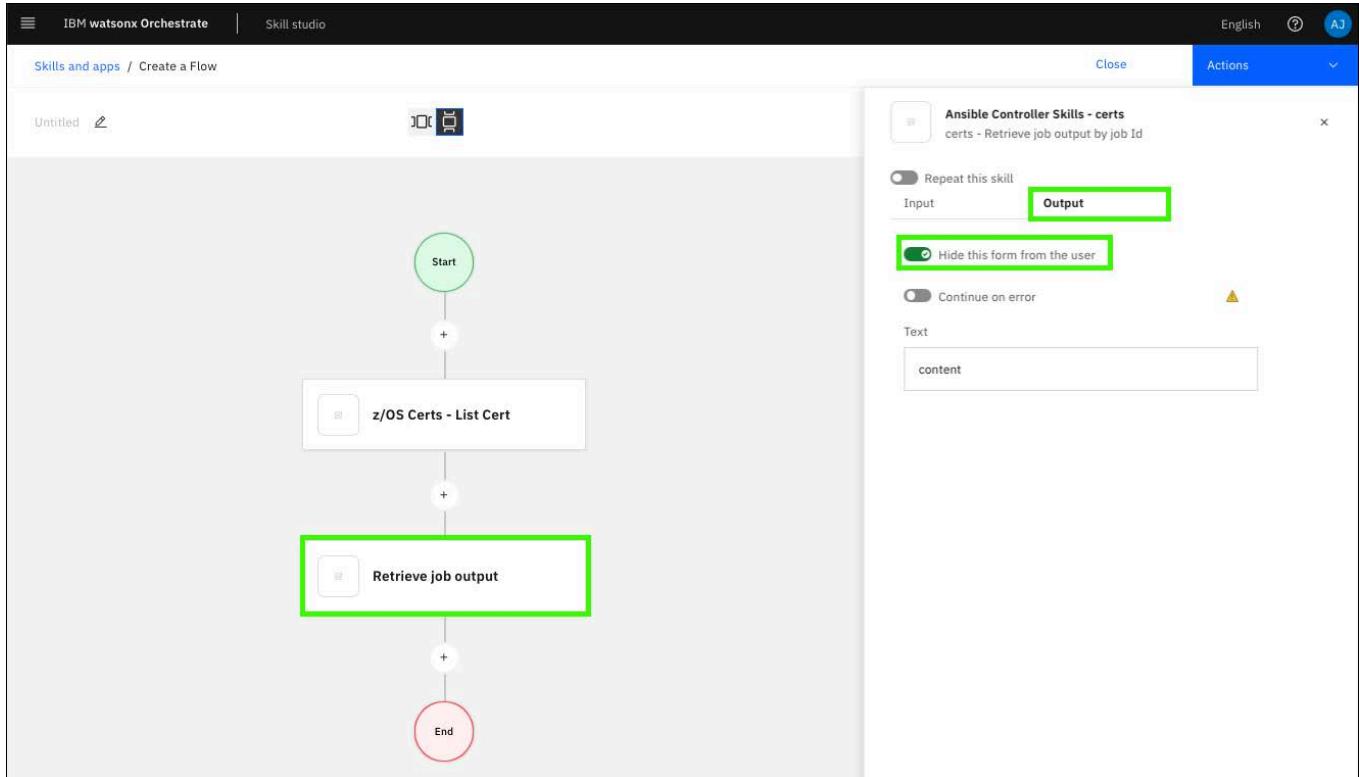


12. On both the **Input** and **Output** tabs for the **z/OS Certs - List Cert** skill, enable the **Hide this form from the user** options.

To enhance the user experience, hide the input and output forms from the user. This disables the List Cert skill form from being displayed. Rather than the user entering in their certificate details as input to the skill form, those details can be gathered into the skill through user prompts when creating an assistant action. This enables a more natural conversation flow when interacting with the assistant.

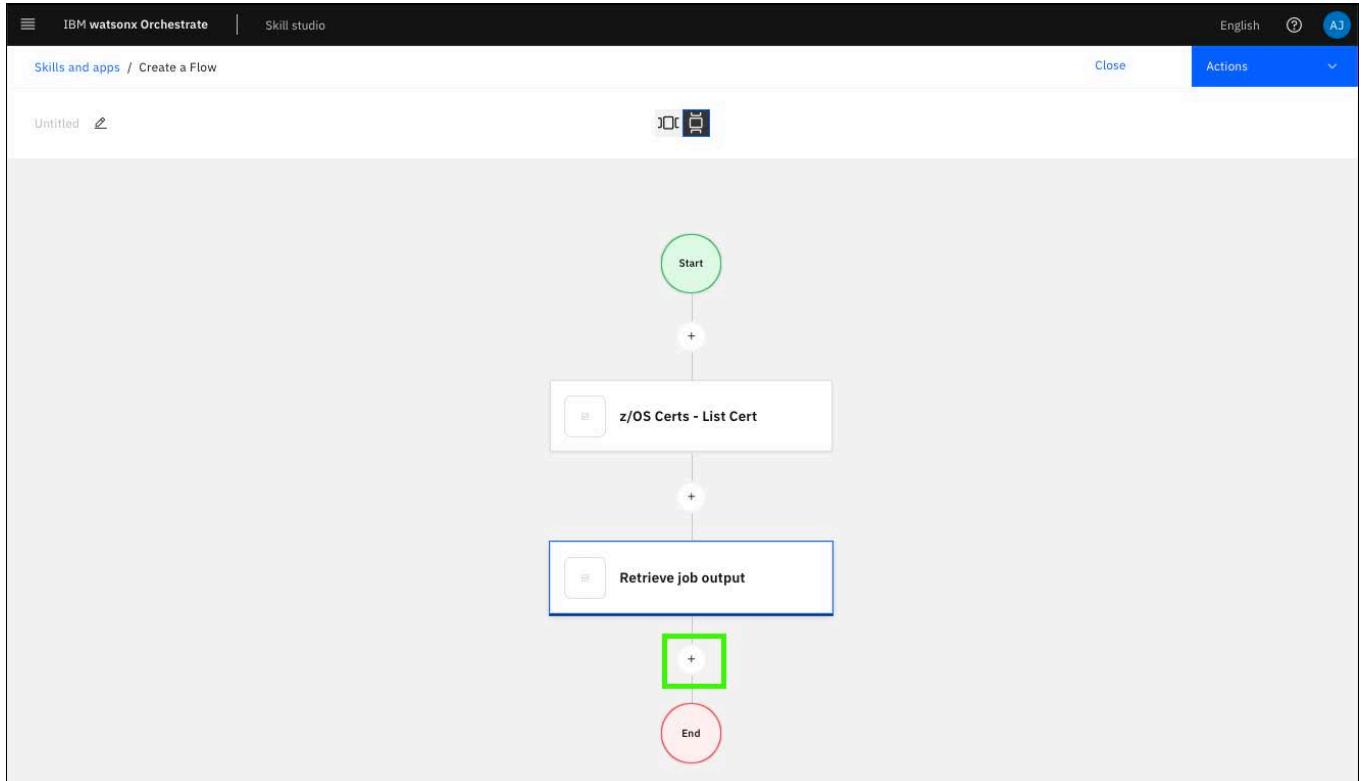


13. Repeat step 12 for the **Output** of the **Retrieve job output** skill.



The output of the **List Cert** skill includes a large amount of data. In the assistant, only the **certificate expiration date** is needed. In the next steps, transform the output to return only the **certificate expiration date**.

14. Click the **+** icon **below** the **Retrieve job output** skill.



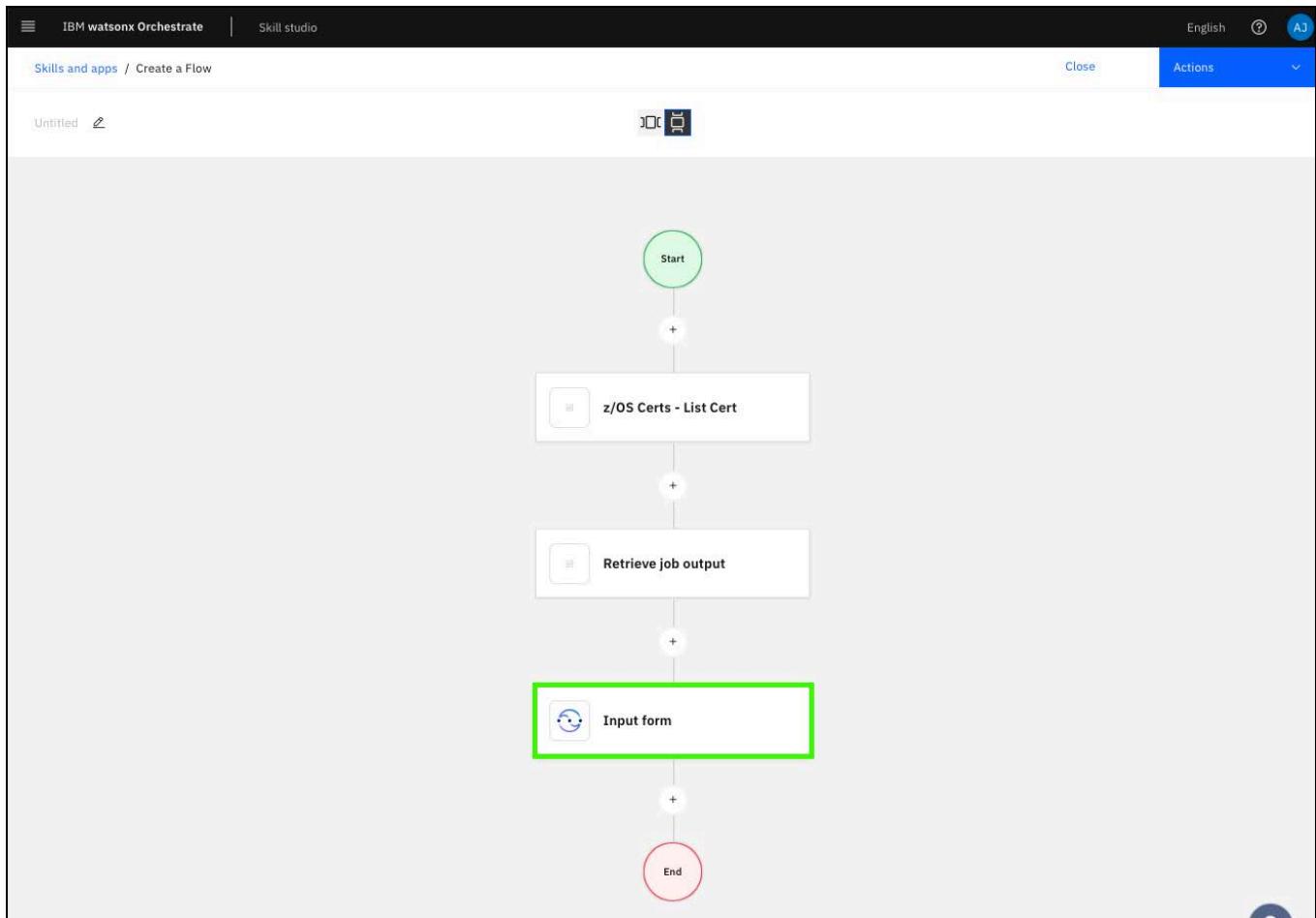
15. Click the **Custom forms**.

The screenshot shows the IBM Watsonx Orchestrate interface. On the left, a flow diagram titled 'Untitled' is displayed. It starts with a 'Start' node, followed by a 'z/OS Certs - List Cert' action, then a 'Retrieve job output' action (which is currently selected), and finally an 'End' node. On the right, a modal window titled 'Add Skills' is open, showing a grid of skill categories. The 'Custom forms' category, which contains 2 skills, is highlighted with a green border.

16. Click Add skill + in the Input form.

The screenshot shows the 'Add Skills' modal from the previous step. The 'Custom Forms' section is expanded, showing two options: 'Input form' and 'Output form'. The 'Input form' option is highlighted with a green dashed border. To its right, there is a button labeled 'Add Skill +' with a green border around it.

17. Click the **Input form** skill.



18. Click Add input field +.

**Custom forms**  
Display a form to input data

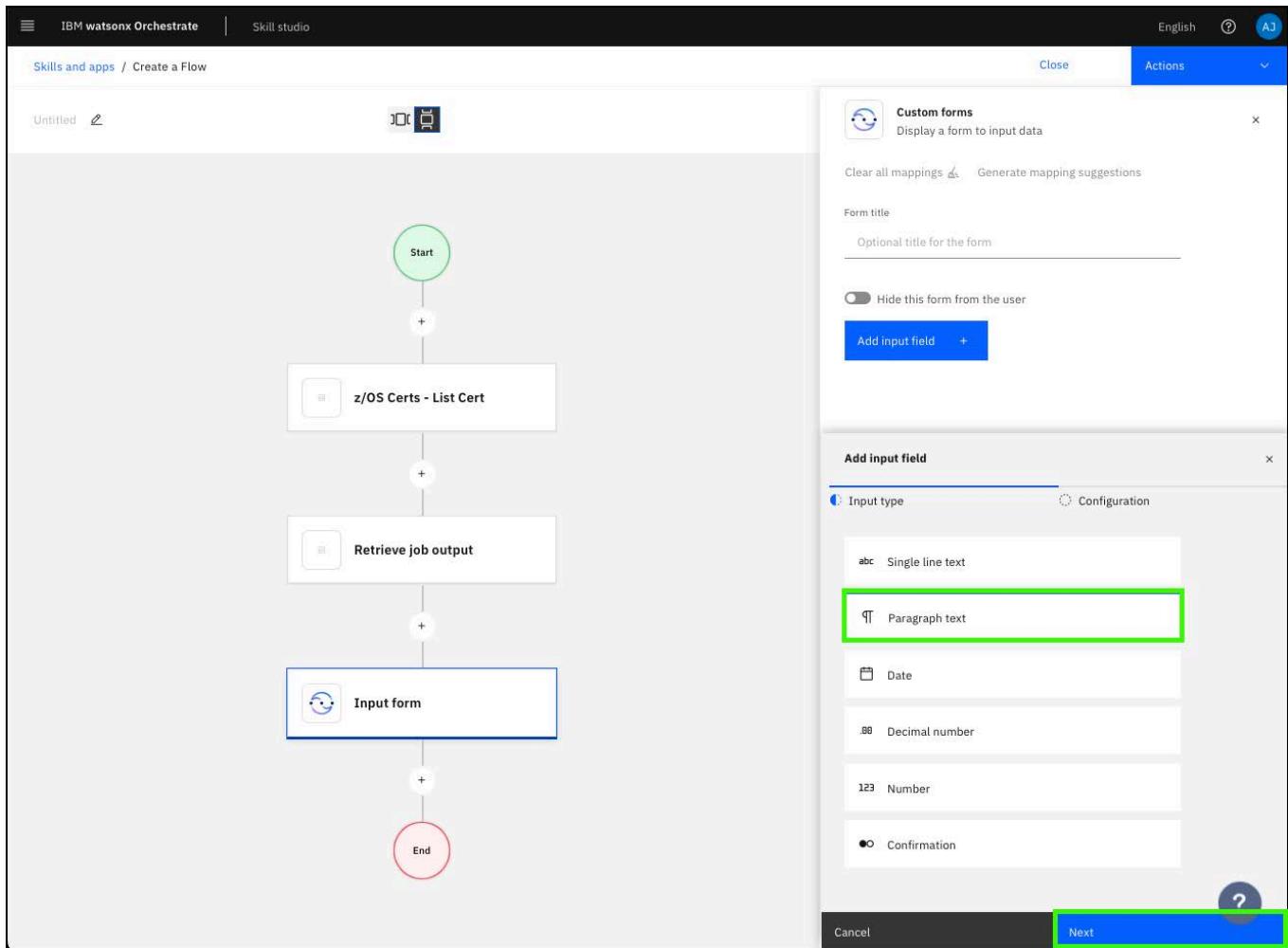
Clear all mappings Generate mapping suggestions

Form title

Hide this form from the user

**Add input field +**

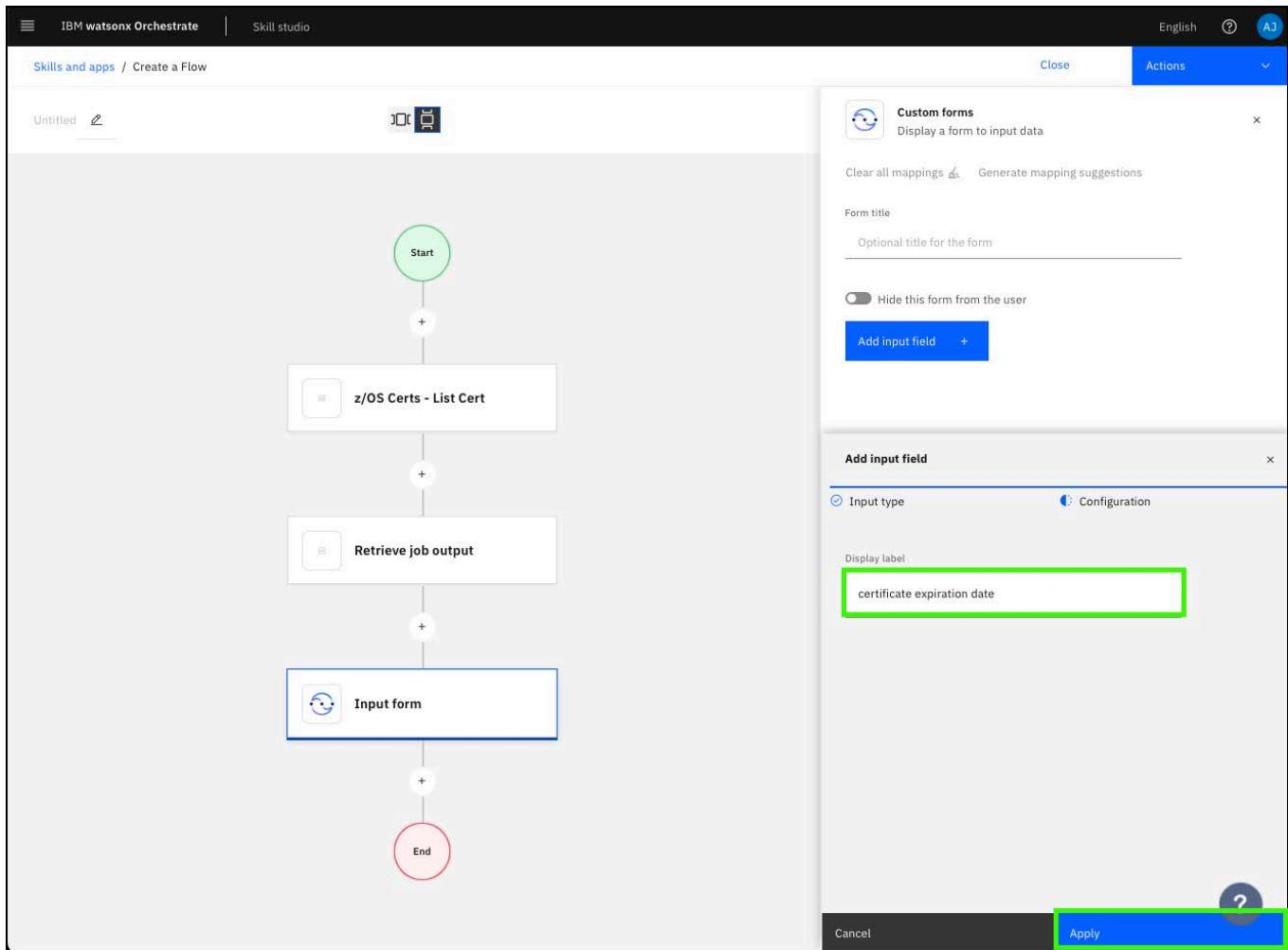
19. Click Paragraph text and then click Next.



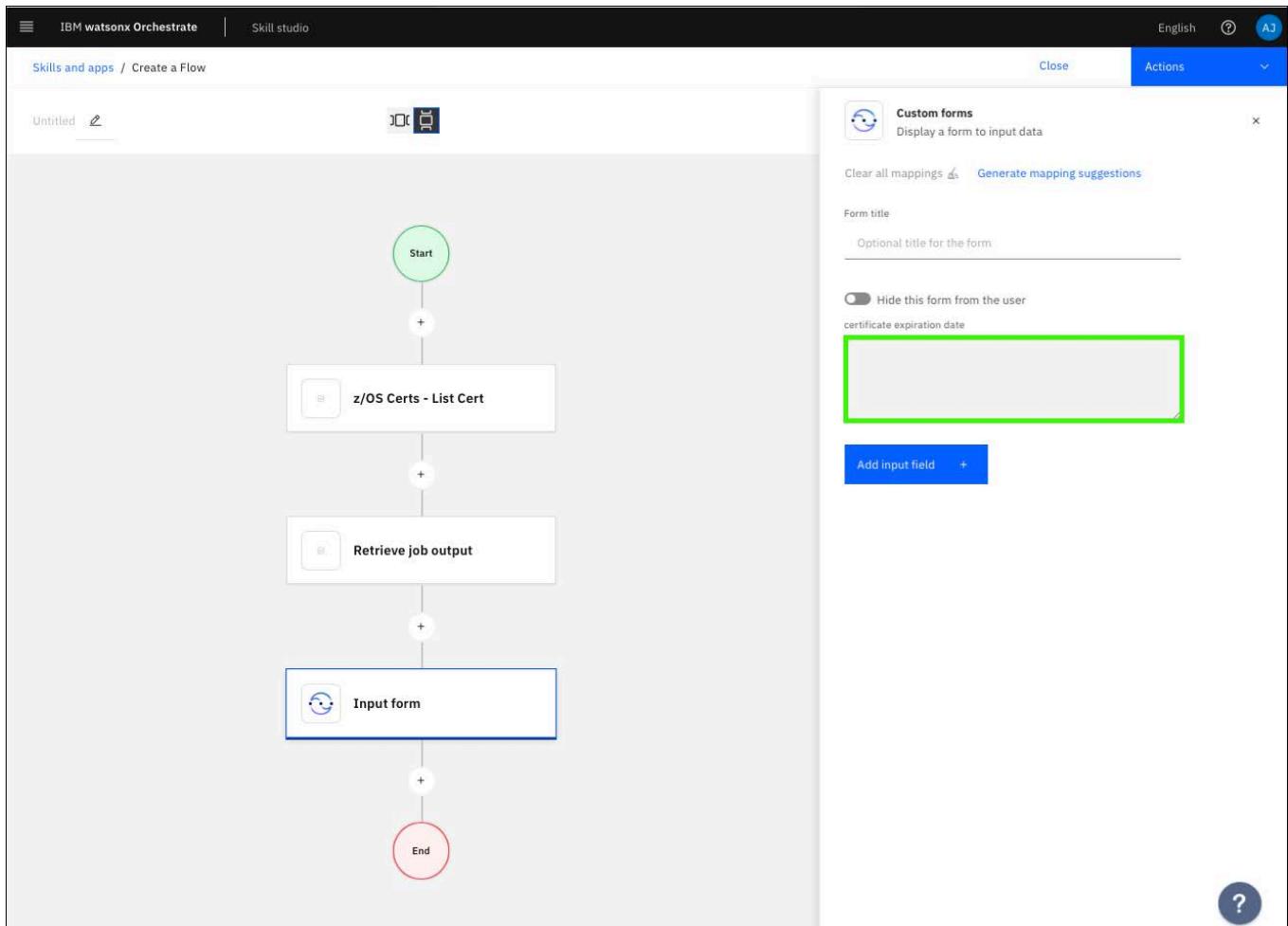
20. Enter certificate expiration date in the **Display label** field and click **Apply**.

**Display label:**

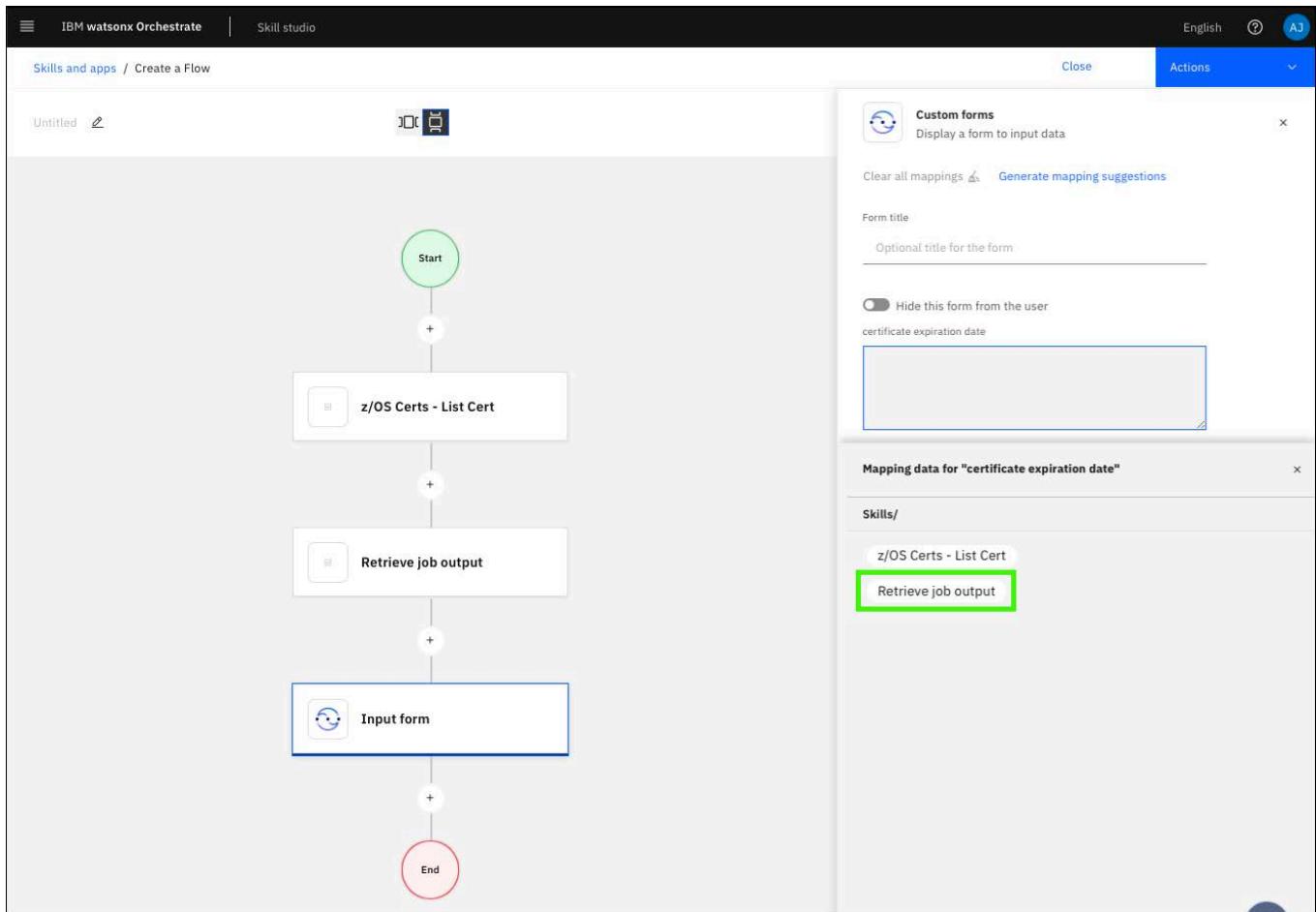
certificate expiration date



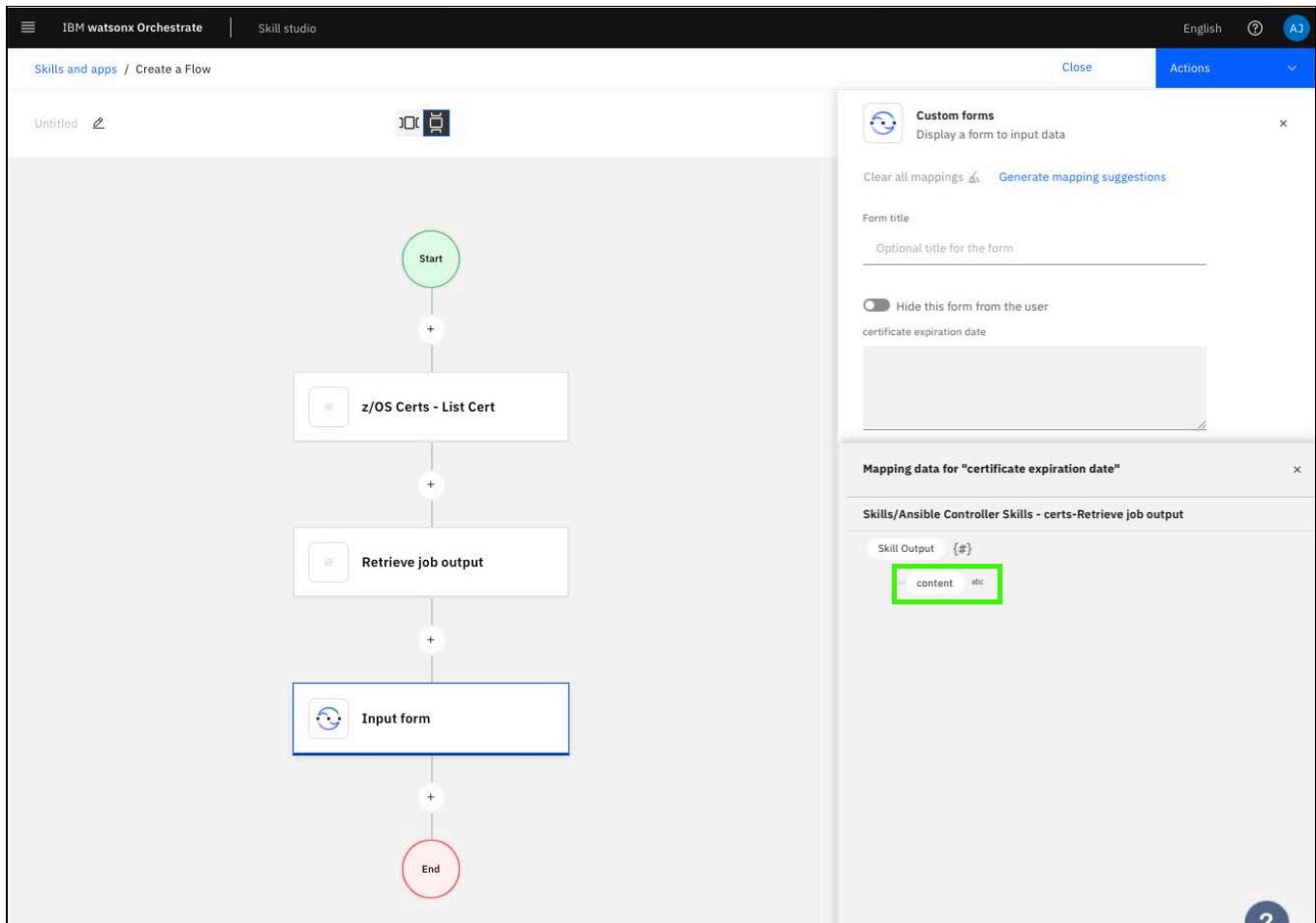
21. Click the **certificate expiration date** entry field.



22. In the **Mapping data for "certificate expiration data"** section, click **Retrieve job output**.

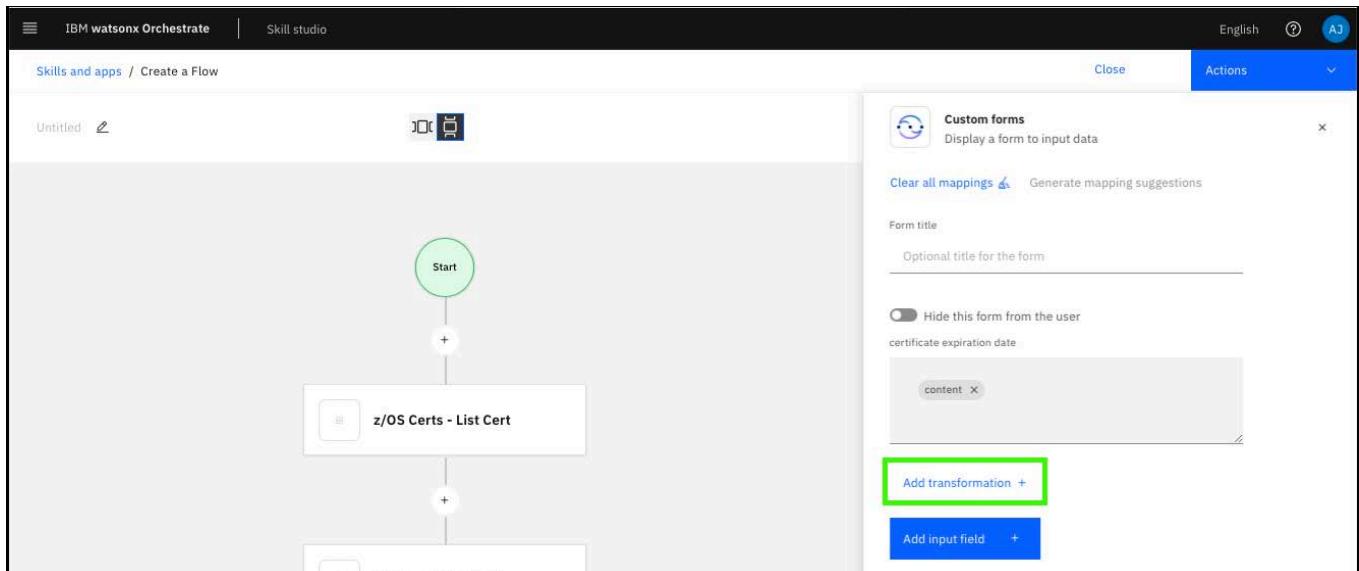


23. Click **content**.

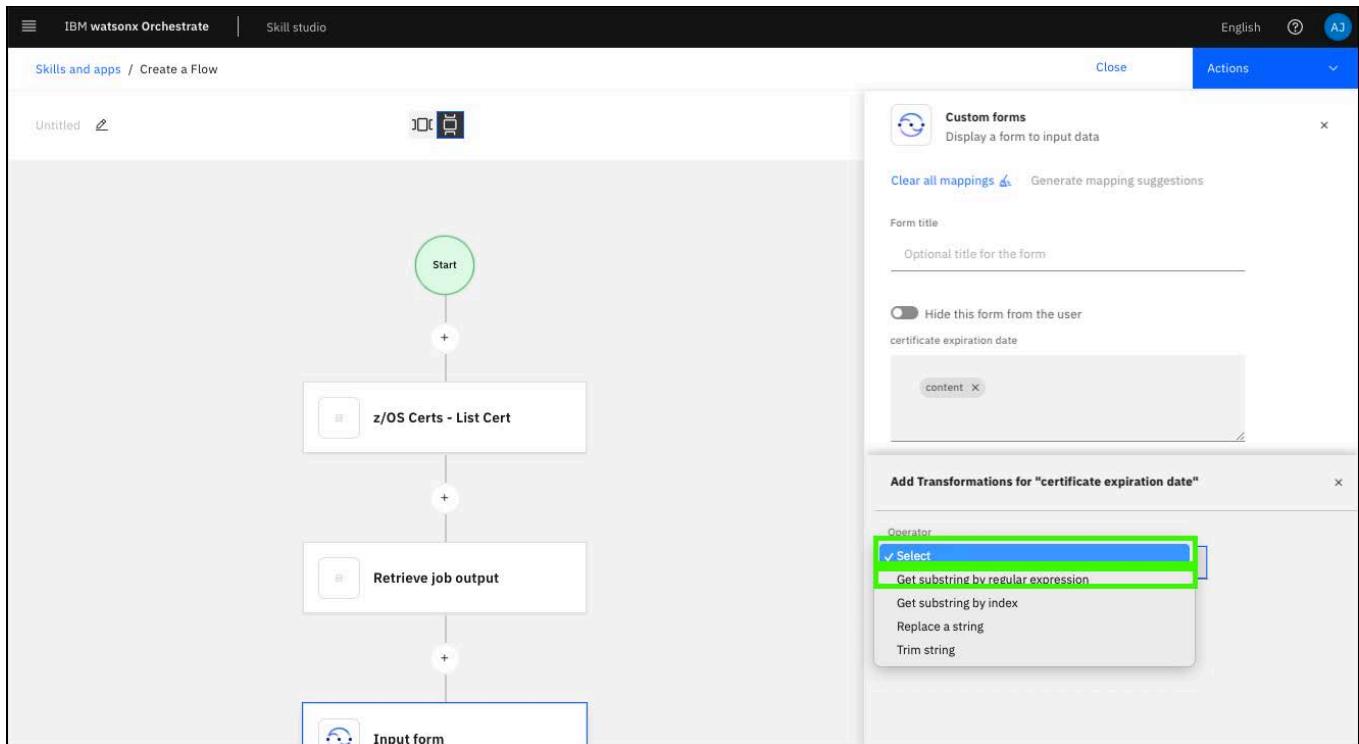


#### 24. Click Add transformation +.

A transformation is used to extract the **certificate expiration date** from all the job output data.



#### 25. Click the Select drop-down and select Get substring by regular expression.



26. Cut and paste the *regular express* that follows to extract the certificate end date and then click **Add**.

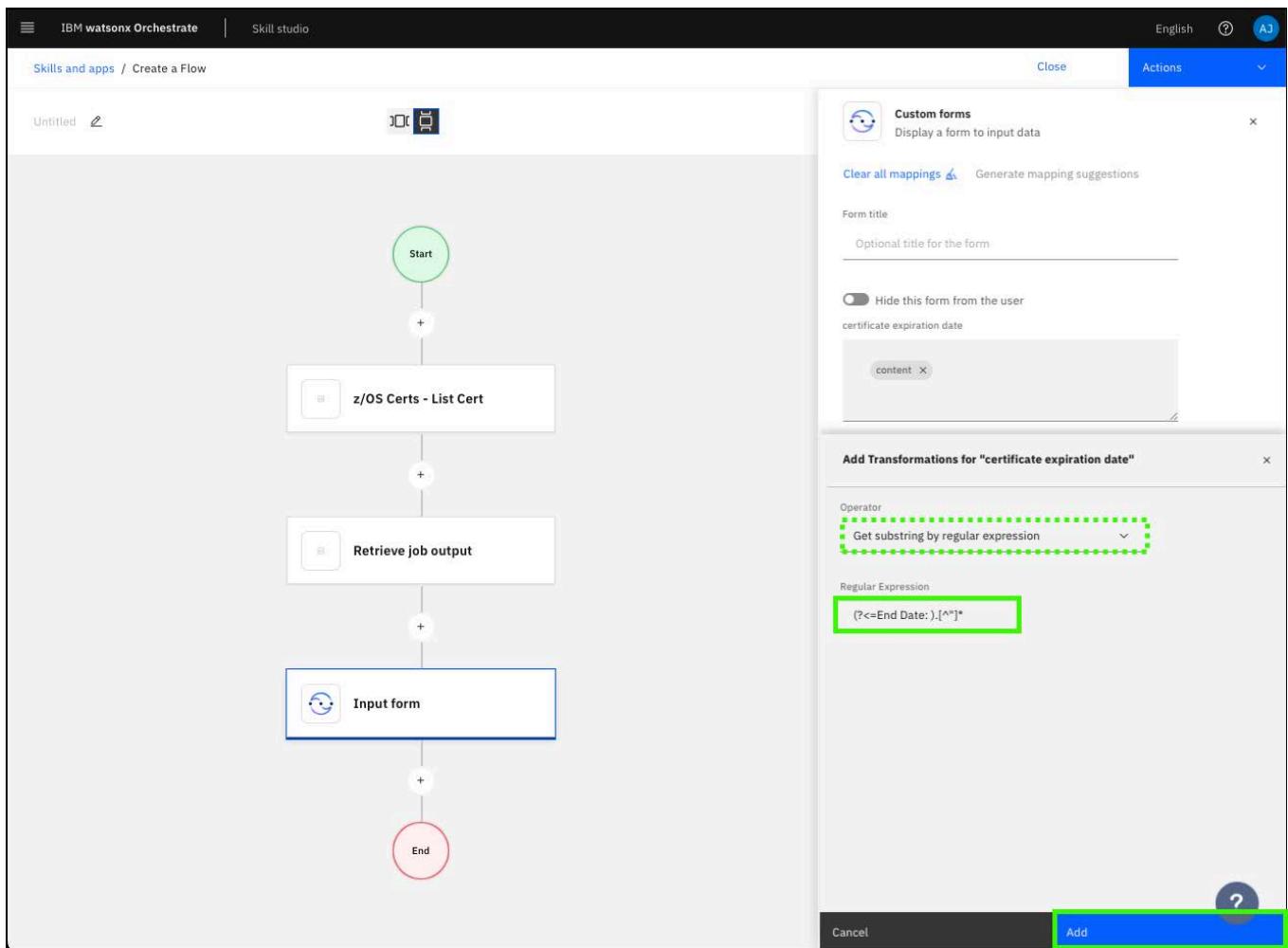
#### Regular Expression:

```
(?<=End Date: ) .[^"]*
```

#### Note

There are several ways to transform data to match the type of output you need. In the above example, regular expression is used to get the needed output (the certificate expiration date). This regular expression was tested against the output of the z/OS Certs – List Cert Ansible job to extract the value assigned to the 'End Date' field in the job's output. After completing this use case, you can experiment with other regular expressions to extract additional information from the job's output.

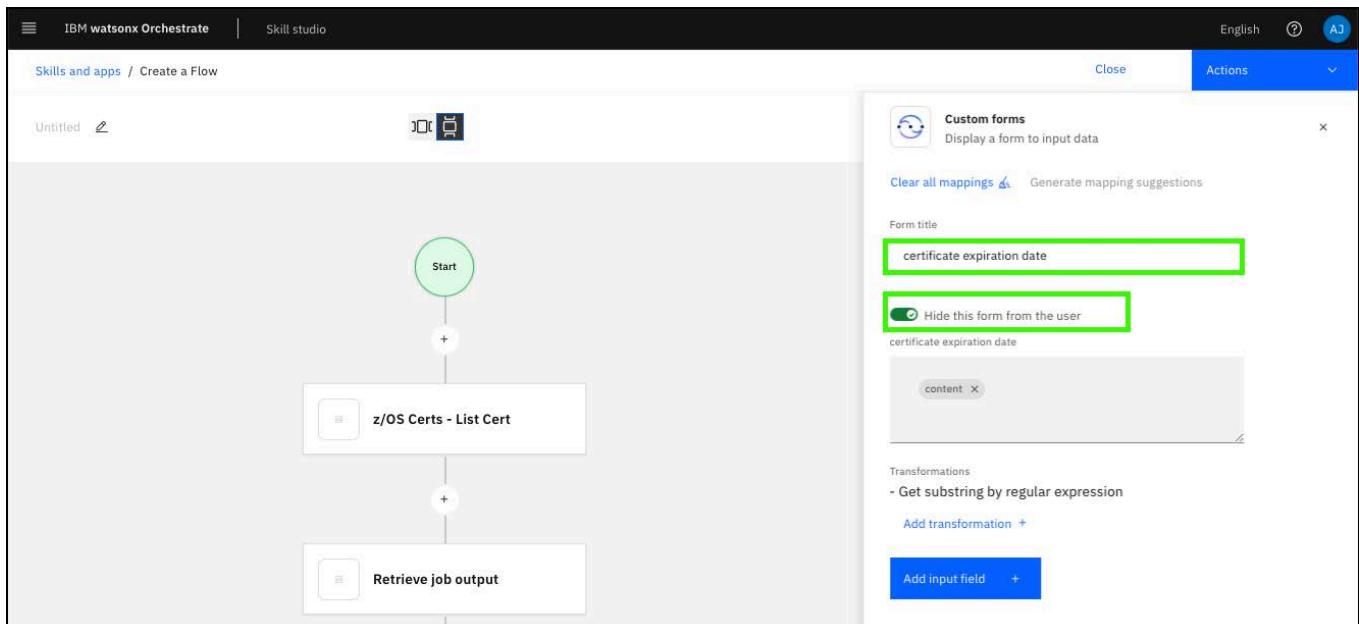
For more information on transforming data within Watsonx Orchestrate, review the documentation found [here](#).



27. Enter **certificate expiration date** in the form title and toggle the **Hide this form from the user** option.

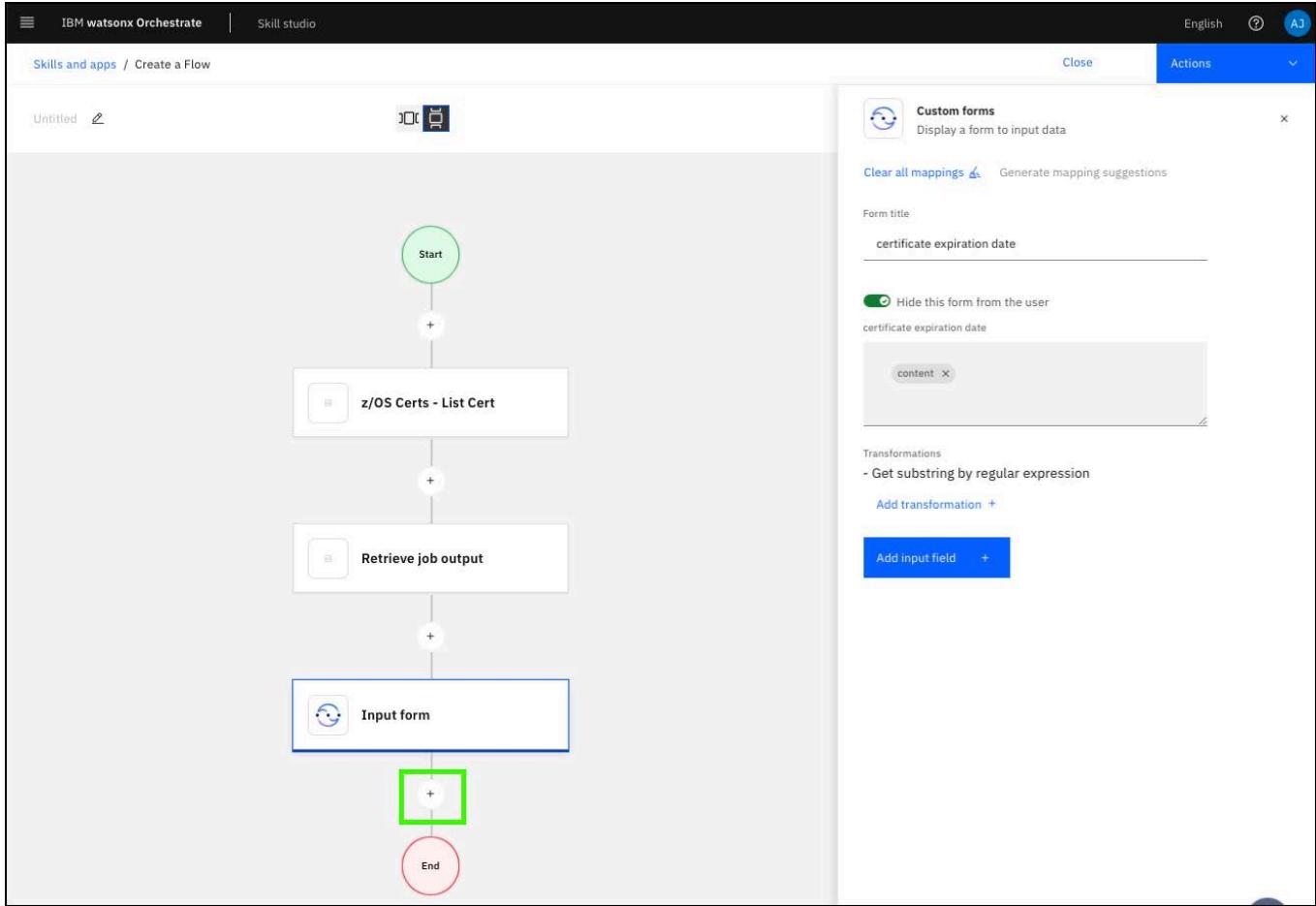
#### Form title:

certificate expiration date

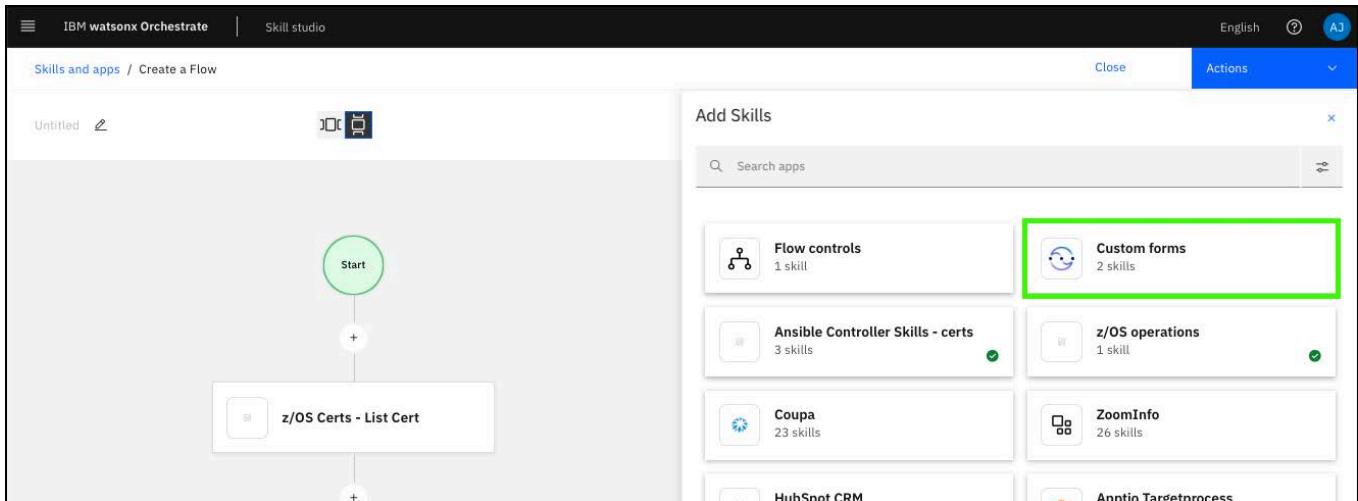


Next, create an output for to return the transformed data from the input skill.

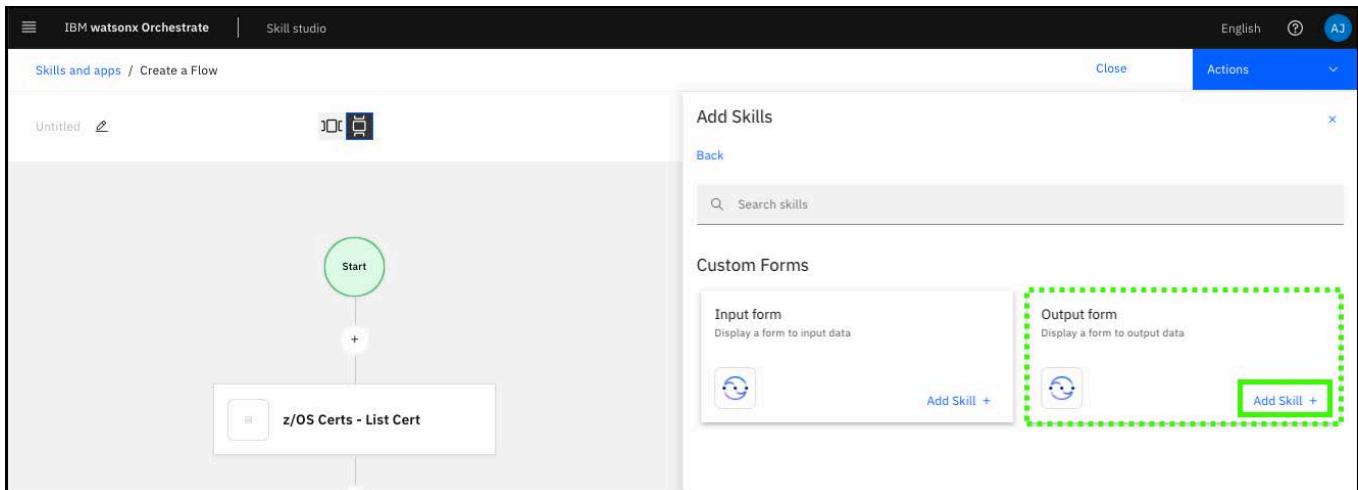
28. Click the **+** icon below the Input form.



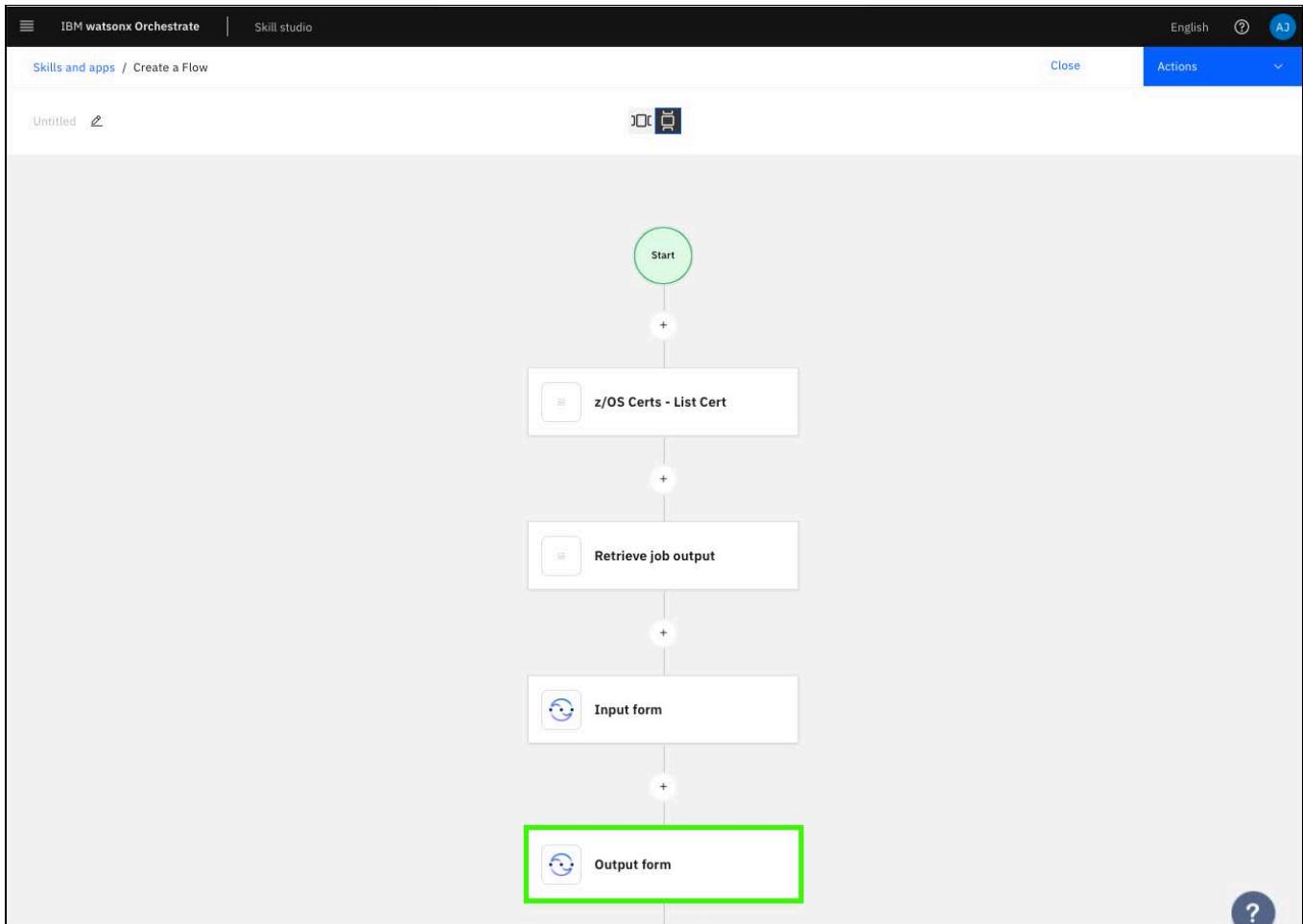
29. Click **Custom forms**.



30. Click **Add Skill +** in the **Output form** tile.

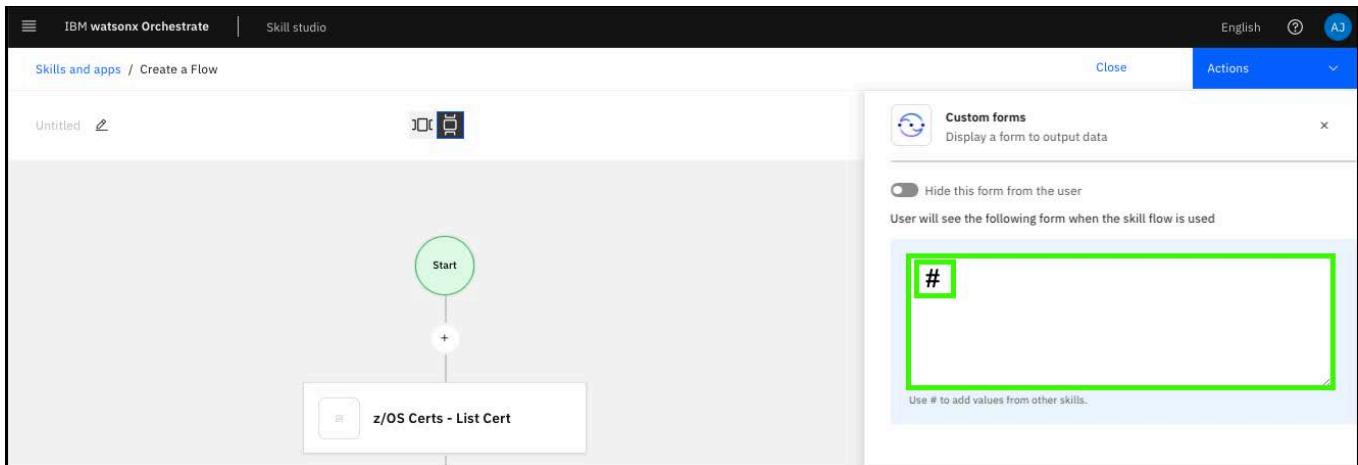


31. Click the **Output form** skill.

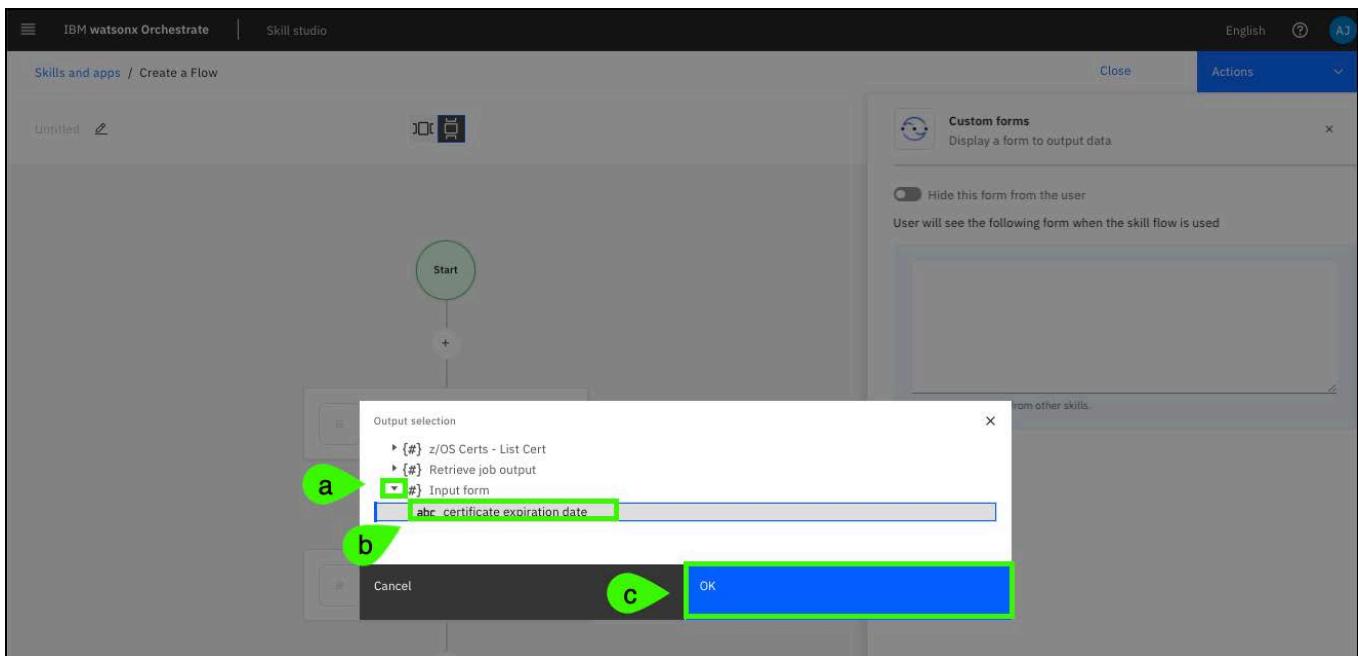


32. Click in the **Custom forms** field and enter `#` (the pound key, also known as the number sign or hash key).

Typing the `#` opens a new dialog window.



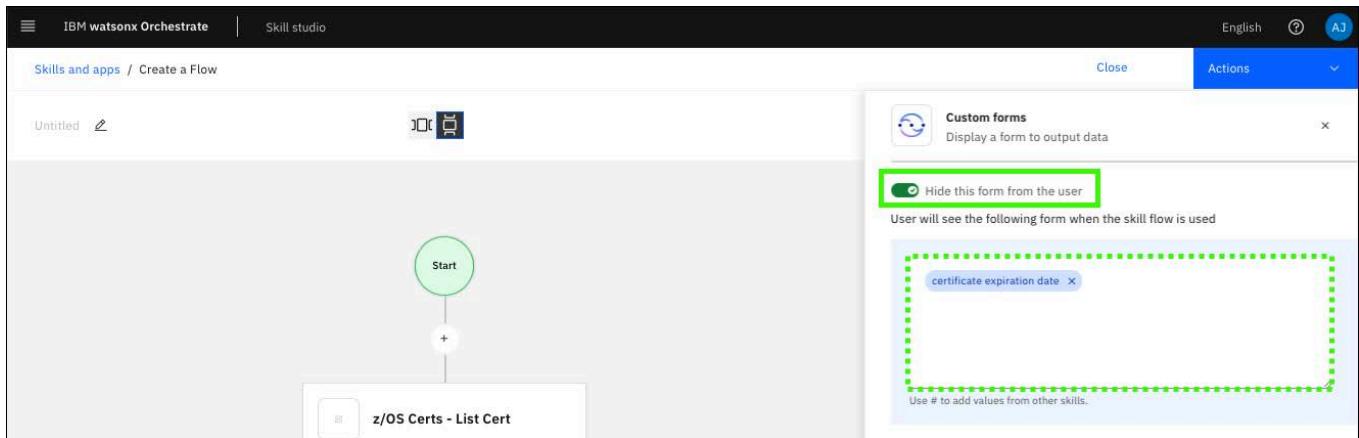
33. Expand (a) **Input form**, select (b) **certificate expiration date**, and then click (c) **OK**.



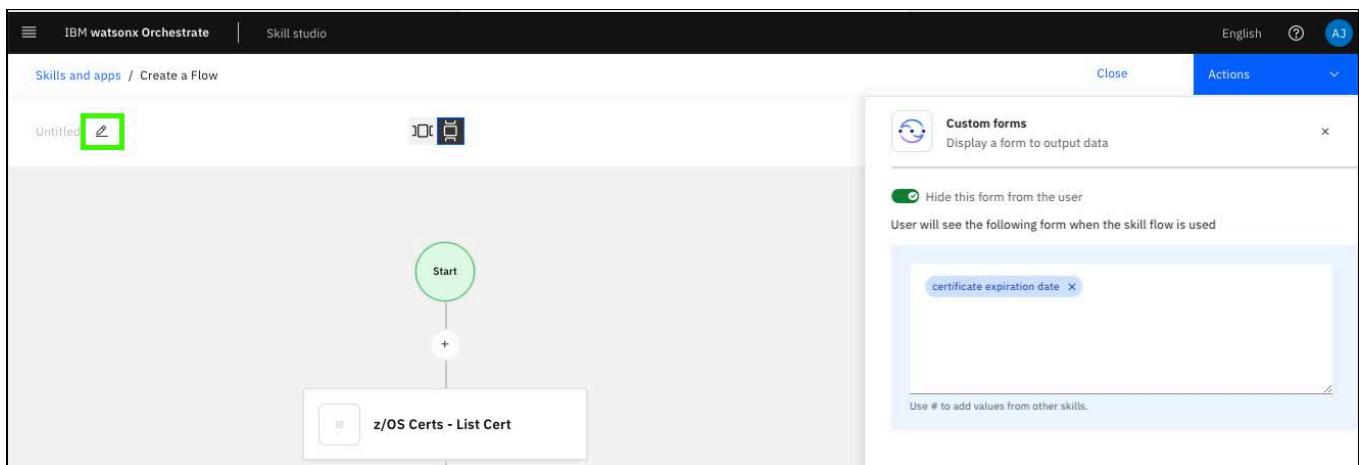
34. Enable the **Hide this form from the user** option.

### Why hide some of the forms?

You may be wondering why hide the input and output forms for the skills in the skill flow. This is done to execute the automation based on user prompts for the inputs of the skills. This is done through natural conversation with the assistant when the skill flow is configured as an assistant 'action' (you will do this soon). Although the final output is hidden, it is accessible as a variable in a custom-built action. The value can be displayed exactly at the point it is expected in the conversation.



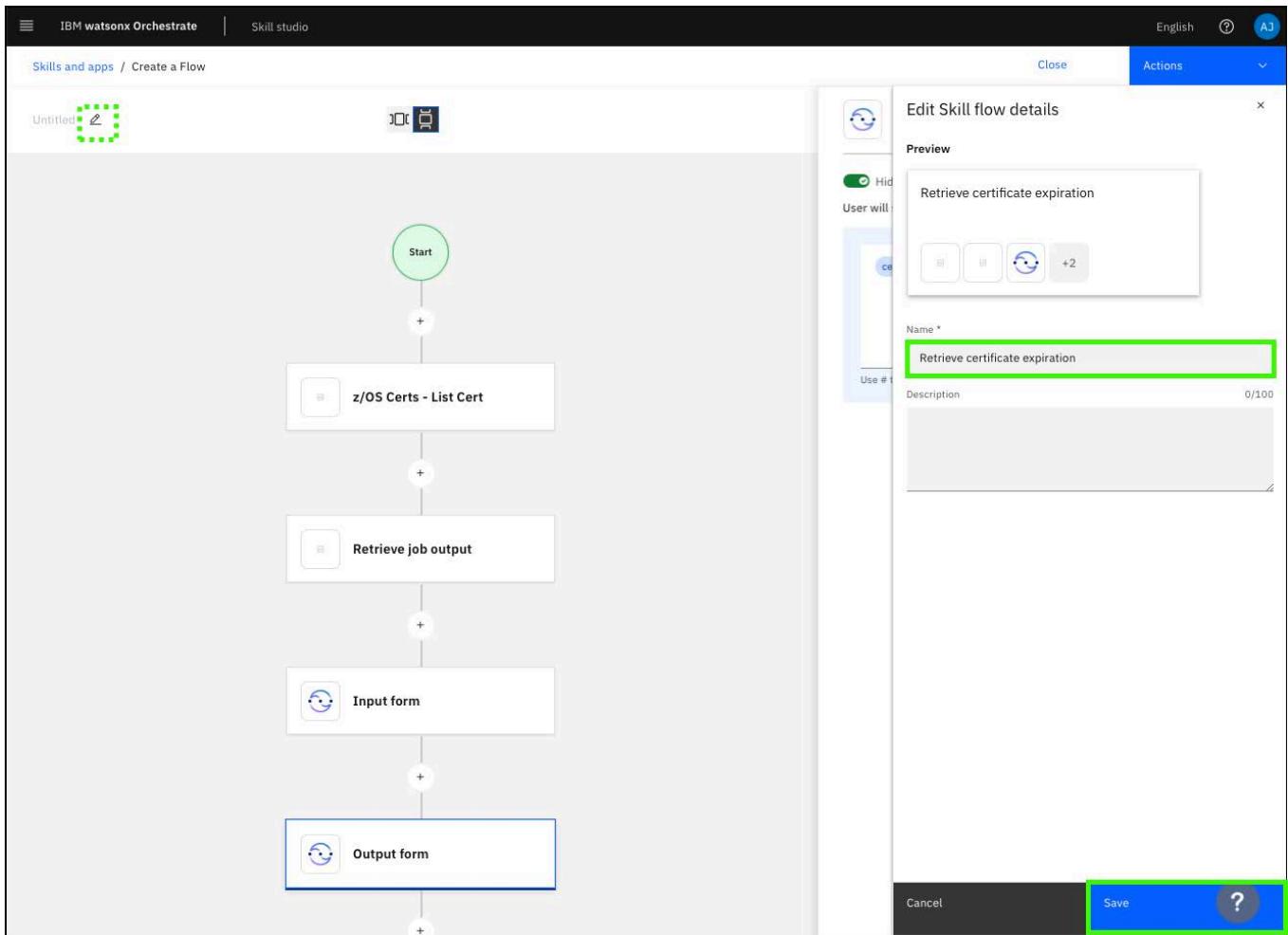
35. Click the **pencil** icon (✍).



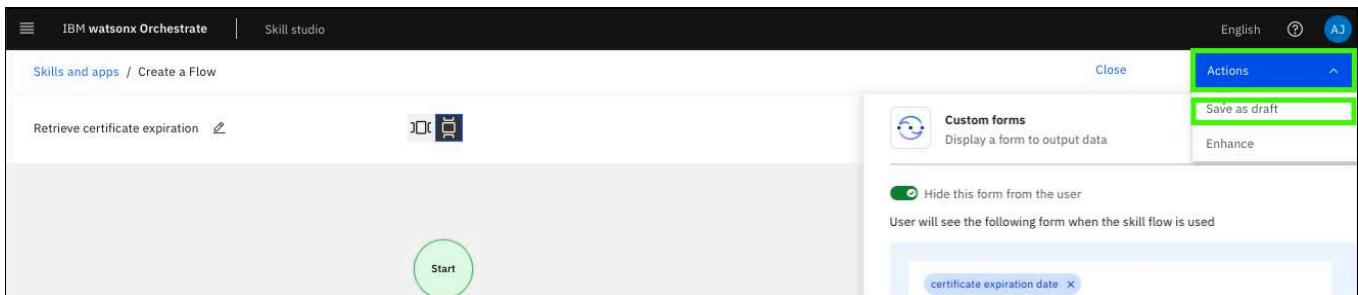
36. Enter **Retrieve certificate expiration** in the **Name** field and click **Save**.

**Name:**

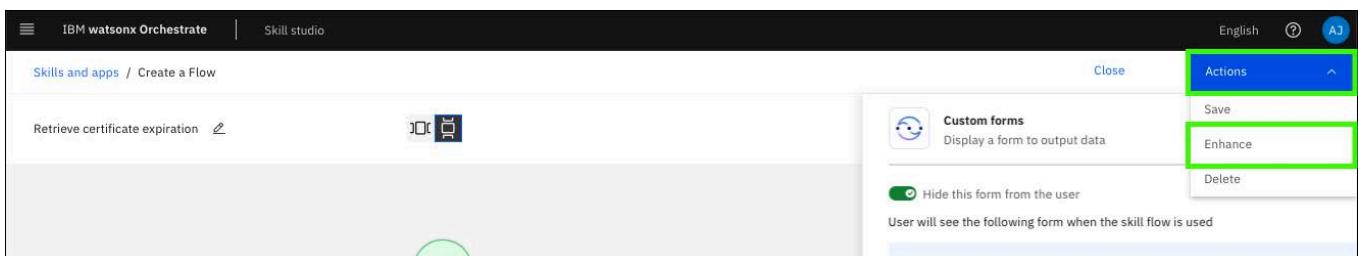
Retrieve certificate expiration



37. Click **Actions** and then click **Save as draft**.



38. Click **Actions** and then click **Enhance**.



39. Review the skill flow settings and click **Publish**.

The screenshot shows the 'Skill studio' interface for enhancing a skill. The skill name is 'Retrieve certificate expiration'. The 'Name' field is filled with 'Retrieve certificate expiration'. The 'Description' field is empty. The 'API version\*' field is set to '1.0.0'. The 'Categories' and 'App' fields are also empty. On the right, there are two preview sections: 'Preview' (showing how the skill will look in the catalog) and 'The skill will look like this in the skill set.' (showing how it will appear within a skill set). At the bottom right, there are three buttons: 'Cancel', 'Publish' (which is highlighted with a green border), and 'Save as draft'.

You created a new skill flow that accomplishes part of the use case – retrieving and displaying the expiration date of a z/OS certificate based on the certificate label the user provides.

In the next section, you will create a simpler skill flow for the z/OS Certs – Search and Renew skill that you previously imported. After this additional skill flow is created, add both skill flows as skill-based actions to be called in a custom-built action that maps inputs to the skill flows through natural conversation.

## Create a skill flow for certificate renewal

The final step before configuring the assistant with actions is to create a skill flow for renewing certificates. Recall the z/OS Certs – Search and Renew automation imported from Ansible Automation Platform earlier. The skill flow that you create next is composed of that single skill. There is no need to return the output. After the automation is triggered, the user can verify the new expiration date by running the retrieve certificate expiration date flow.

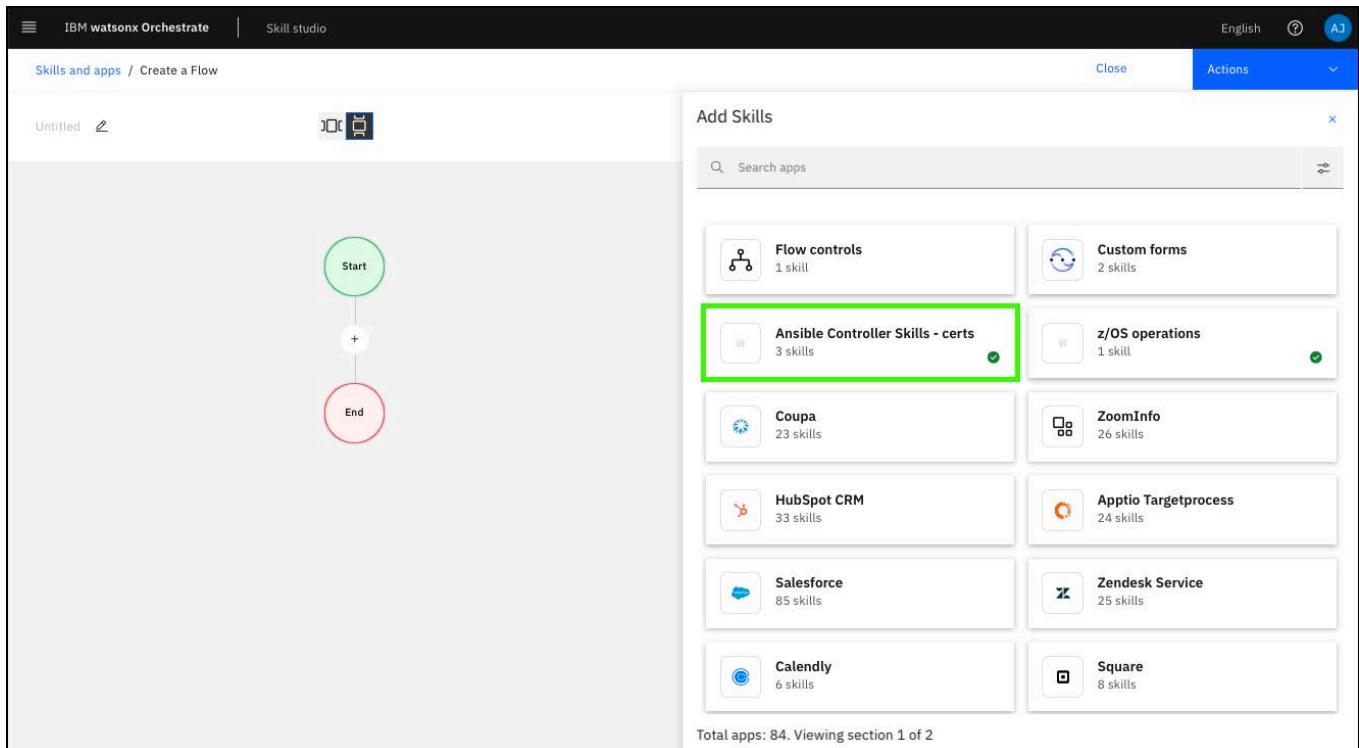
1. In **Skill studio**, click **Create** and then click **Skill flow**.

2. Click the + icon.

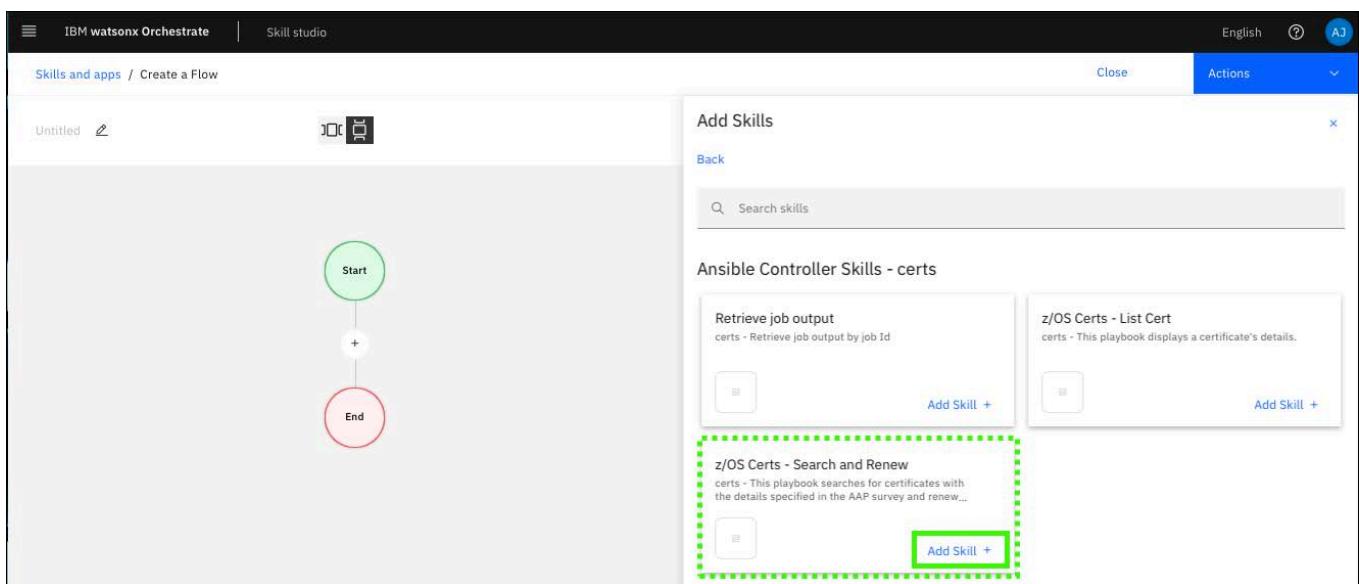
3. Click the certs app.



Search on certs if you do not see the tile for your app.

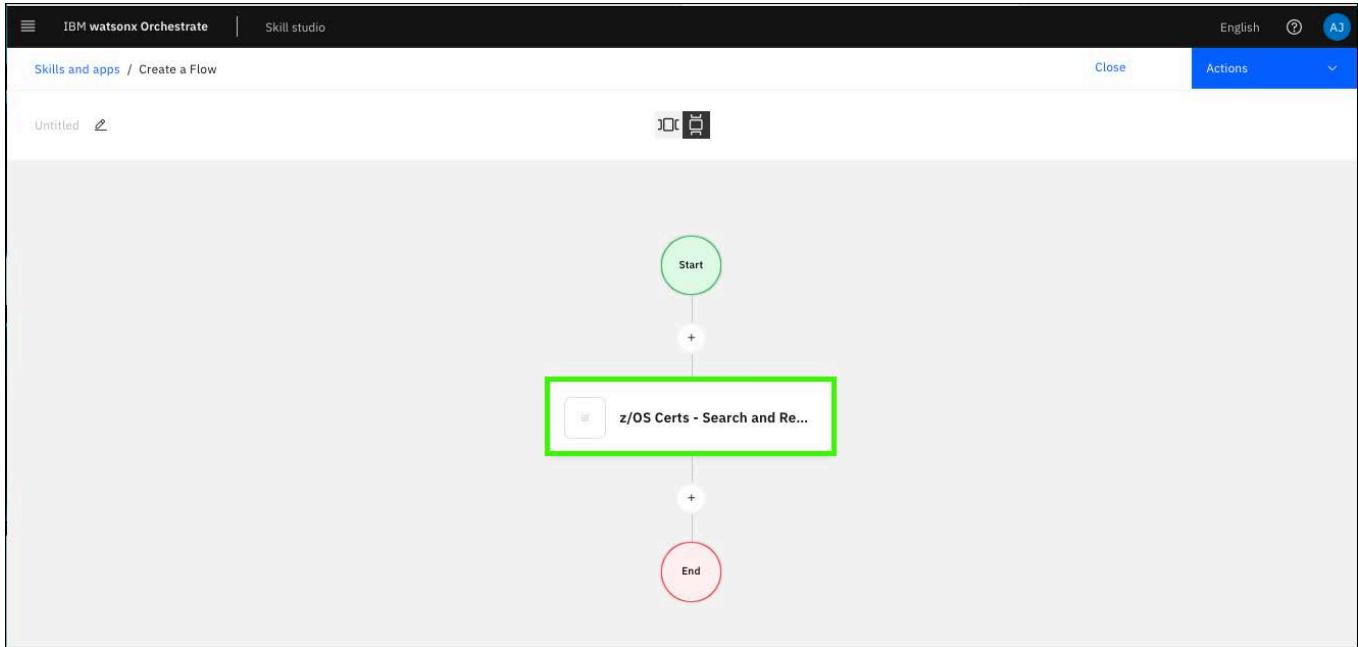


#### 4. Click Add Skill + in the z/OS Certs - Search and Renew tile.



As mentioned, there is no need to return the Ansible job output of this skill when it is run. The **z/OS Certs - Search and Renew** is used to set default values for some of the inputs. In this use case, assume that the SA will be renewing their SITE certificates that are signed with a previously generated certificate authority.

#### 5. Click the z/OS Certs - Search and Renew skill.



## 6. Click Input.

**Ansible Controller Skills - certs**  
certs - This playbook searches for certificates with the details specified in the AAP survey and renews them.

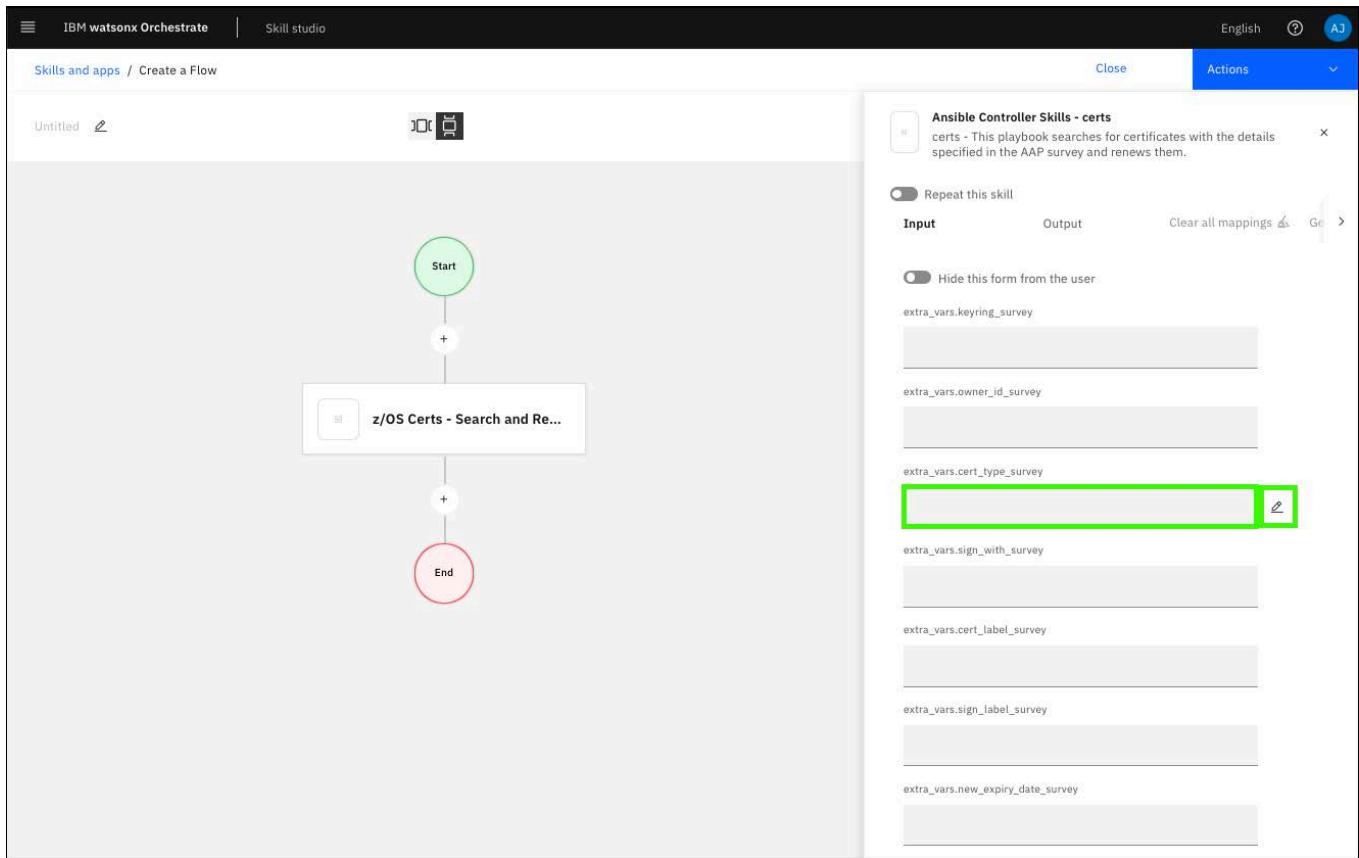
Repeat this skill

**Input**

Hide this form from the user

extra_vars.keyring_survey
extra_vars.owner_id_survey
extra_vars.cert_type_survey
extra_vars.sign_with_survey
extra_vars.cert_label_survey
extra_vars.sign_label_survey
extra_vars.new_expiry_date_survey

## 7. Hover over the **extra\_vars.cert\_type\_survey** input field and click the pencil icon (✉).



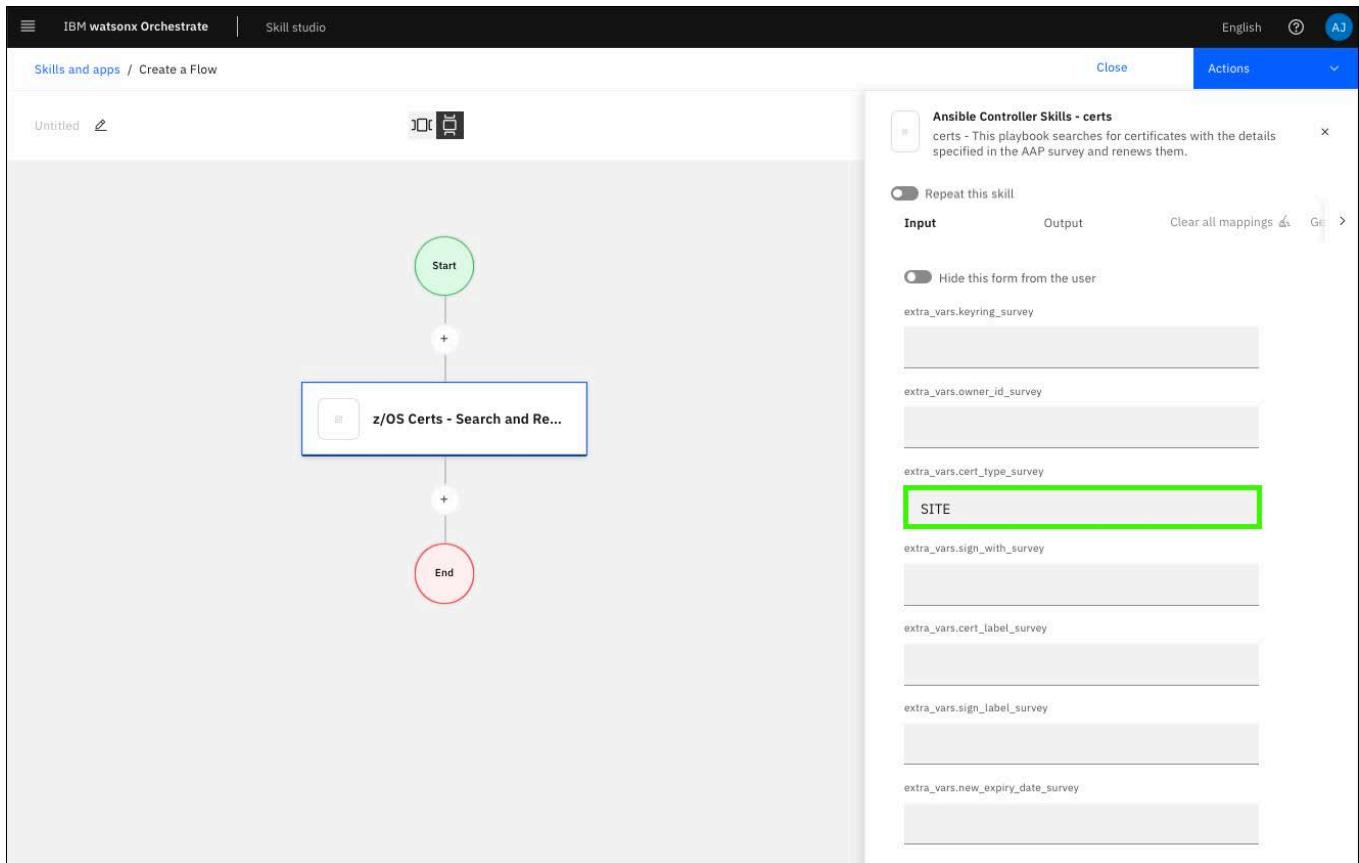
- Click in the **extra\_vars.cert\_type\_survey** input field and enter **SITE**.

**extra\_vars.cert\_type\_survey:**

SITE



**Do not enter spaces before or after the word SITE.**



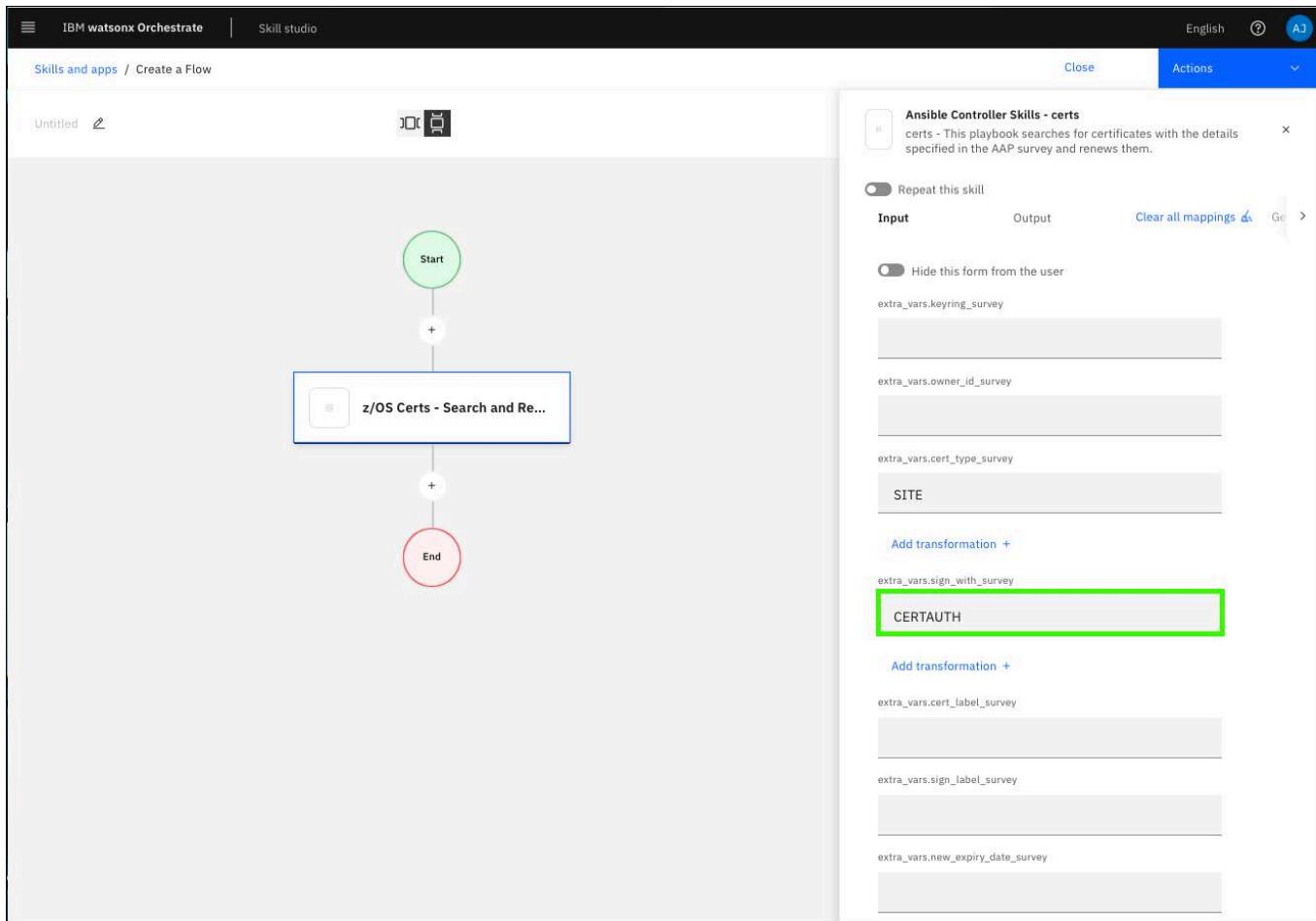
9. Repeat 7 and 8 for the **extra\_vars.sign\_with\_survey** field and enter the word **CERTAUTH**.

**extra\_vars.sign\_with\_survey:**

CERTAUTH



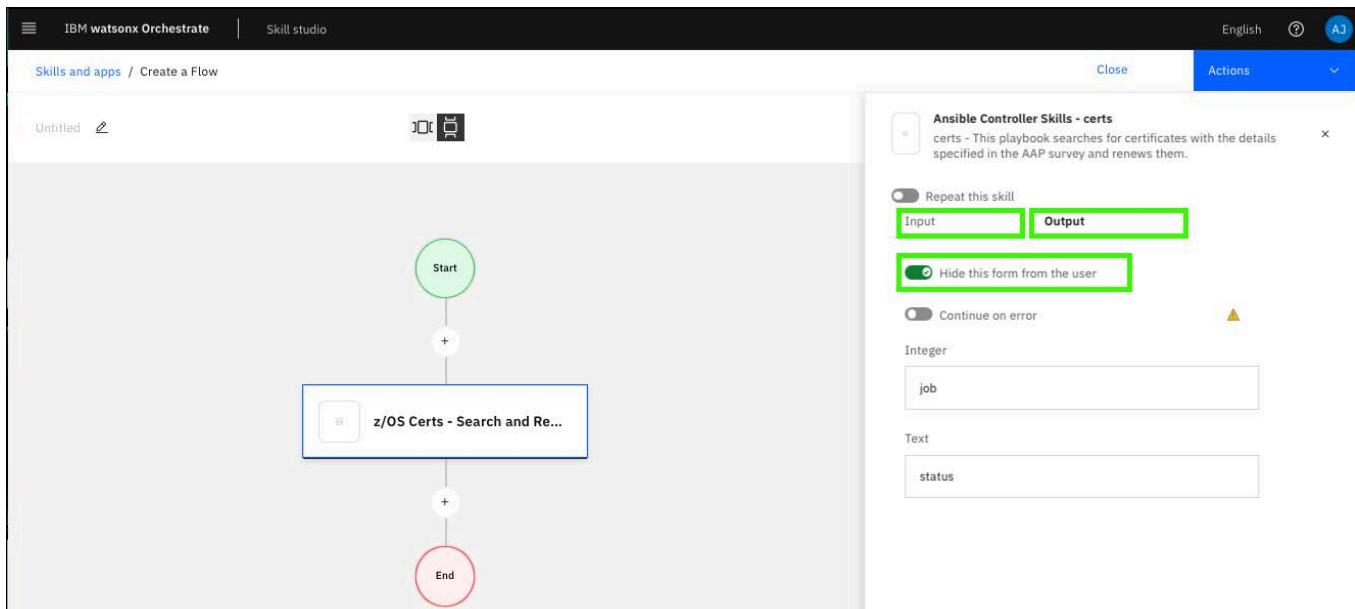
**Do not enter spaces before or after the word CERTAUTH.**



10. Enable the **Hide this form from the user** option for both the **Input** and **Output** forms.



**The image that follows only shows the Output form, but enable the option for both forms.**



11. Click **(a)** the pencil icon ( for the skill flow, enter **(b)** Cert Renewal skill flow in the **Name** field, and click **(c) Save**.

Name:

Cert Renewal skill flow

IBMWatsonx Orchestrate | Skill studio English ⓘ AJ

Skills and apps / Create a Flow

Untitled ↗ a

Close Actions

Edit Skill flow details

Preview

Cert Renewal skill flow

Name \* Cert Renewal skill flow

Description 0/100

Cancel C Save

12. Click **Actions** and then click **Save as draft**.

IBMWatsonx Orchestrate | Skill studio English ⓘ AJ

Skills and apps / Create a Flow

Cert Renewal skill flow ↗

Close Actions

Save as draft

Enhance

Start

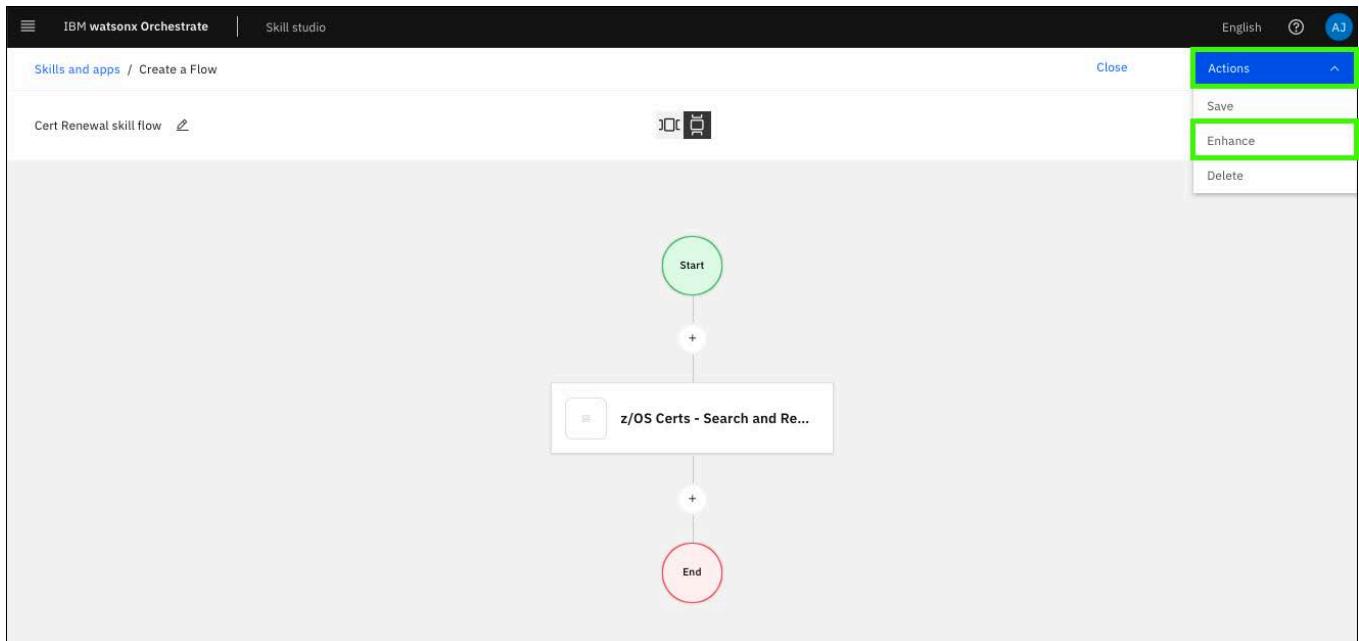
+

z/OS Certs - Search and Re...

+

End

13. Click **Actions** and then click **Enhance**.



#### 14. Review the skill flow settings and click **Publish**.

**Name**

Cert Renewal skill flow

**Description**

Enter the description

**API version\***

1.0.0

**Categories**

Add categories

**App**

Skill flows

**Preview**

The skill will look like this in the catalog.

Cert Renewal skill flow

The skill will look like this in the skill set.

Cert Renewal skill flow

**Publish**

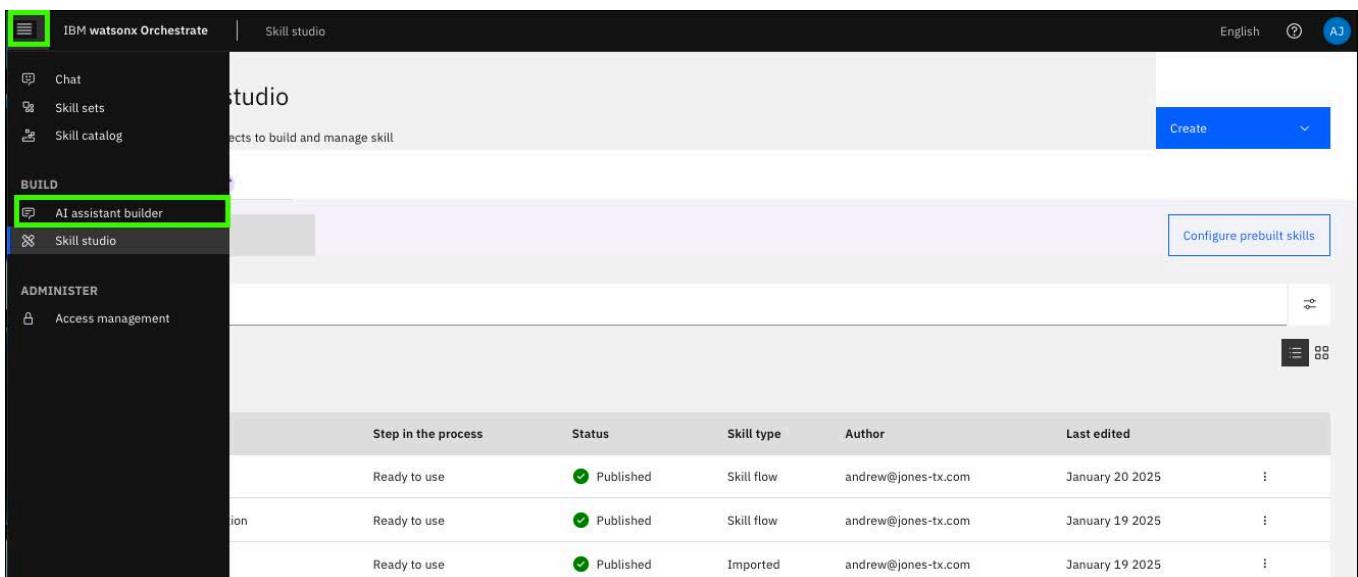
Add the skill flows to the assistant

Next, create 2 skill-based actions that use the skill flows. The skill-based actions enable the ability to call the skill flow as a subaction within a new custom-built action. For this use case, create two skill-based actions that use the previously created skill flows:

- Retrieve certificate expiration – maps the user prompted certificate label as input and extracts the certificate expiration date from the Ansible job's output.
- Cert Renewal skill flow – maps the user prompted certificate label and new expiration date as input and runs the Search and Renew Ansible job to extend the expiration date of the certificate.

After the 2 skill flows are added as skill-based actions, integrate the actions into a custom-built action that defines the entire conversation flow. The flow assists the SA with the certificate renewal process.

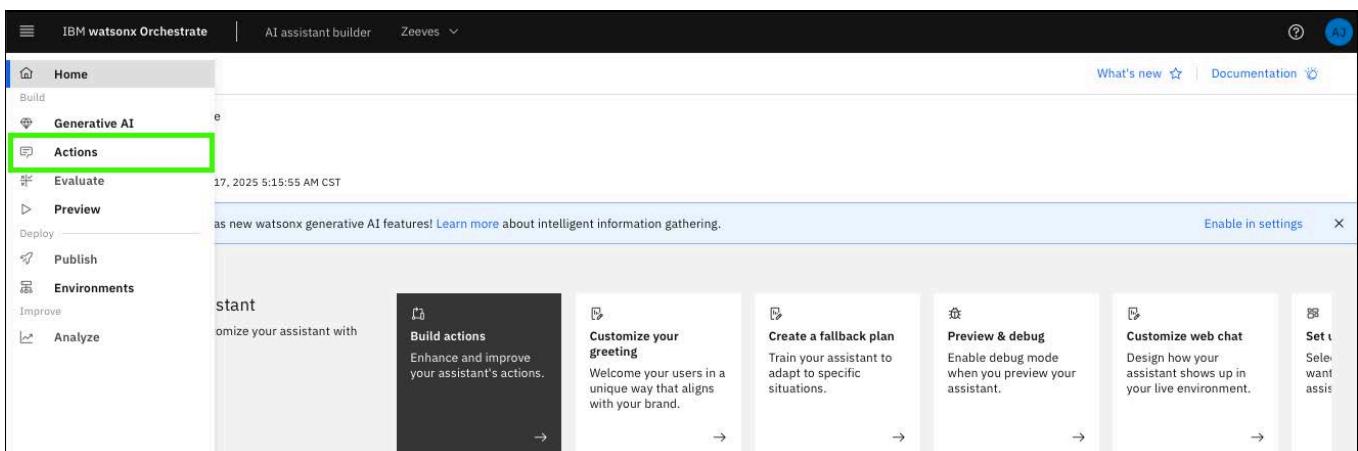
### 1. Open AI assistant builder in watsonx Orchestrate.



The screenshot shows the IBM Watsonx Orchestrate interface. The left sidebar has sections for Chat, Skill sets, Skill catalog, BUILD (with AI assistant builder selected and highlighted with a green box), and ADMINISTER (Access management). The main area is titled "Skill studio" and contains a sub-header "Selects to build and manage skill". A "Create" button is at the top right. Below it is a "Configure prebuilt skills" button. A table lists three skill flows:
 

Step in the process	Status	Skill type	Author	Last edited
Ready to use	<span>✓ Published</span>	Skill flow	andrew@jones-tx.com	January 20 2025
Ready to use	<span>✓ Published</span>	Skill flow	andrew@jones-tx.com	January 19 2025
Ready to use	<span>✓ Published</span>	Imported	andrew@jones-tx.com	January 19 2025

### 2. Click Actions.



The screenshot shows the AI assistant builder interface. The left sidebar has sections for Home, Build (with Generative AI selected and highlighted with a green box), Actions (selected and highlighted with a green box), Evaluate, Preview, Publish, Environments, Improve, and Analyze. The main area has a message: "as new watsonx generative AI features! Learn more about intelligent information gathering." with an "Enable in settings" button. Below are several cards:
 

- Build actions**: Enhance and improve your assistant's actions.
- Customize your greeting**: Welcome your users in a unique way that aligns with your brand.
- Create a fallback plan**: Train your assistant to adapt to specific situations.
- Preview & debug**: Enable debug mode when you preview your assistant.
- Customize web chat**: Design how your assistant shows up in your live environment.
- Set up**: Select what assistant you want to use.

### 3. Click New action+.

The screenshot shows the 'Actions' section of the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with filters for 'All items', 'Created by you', 'Variables', and 'Saved responses'. The main area lists three actions: 'z/OS IPL Information', 'Zeeves-gather-facts-flow', and 'Retrieve IPL information'. Each row includes columns for 'Name', 'Last edited', 'Examples count', 'Steps count', and 'Status'. A green box highlights the 'New action' button in the top right corner of the list.

#### 4. Click Skill-based action.

The screenshot shows the 'Create an action' dialog. It asks 'What kind of action do you want to build?' and offers three options: 'AI-guided action', 'Skill-based action', and 'Custom-built action'. The 'Skill-based action' option is highlighted with a green box. Below each option is a brief description and a 'Beta' button.

#### 5. Click the Retrieve certificate expiration tile and then click Next.

The screenshot shows the 'Build an action from a skill' dialog. It asks 'Select a skill' and lists several options. The 'Retrieve certificate expiration' tile is highlighted with a green box. The other tiles are: 'Cert Renewal skill flow', 'Retrieve job output', and 'z/OS Certs - Search and Renew'. At the bottom right, there are 'Cancel' and 'Next' buttons, with 'Next' being highlighted with a green box.

#### 6. Click Cancel on the New action dialog.



**For this use case, the action is triggered from a custom-built action. To prevent the skill flow from being run as the skill-based action, do not enter any example phrases.**

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action Total: 0

Example: I want to pay my credit card bill.

New action

What does your customer say to start this interaction?

Example: I want to pay my credit card bill.

Cancel Save

7. Click **x** to close the **Retrieve certificate expiration** skill.

**Add example phrases:**

Enter phrases that a customer types or says to start the conversation about a specific topic. These phrases determine the task, problem, or question your customer has.

The more phrases you enter, the better your assistant can recognize what the customer wants.

Enter phrases your customer might use to start this action Total: 0

Example: I want to pay my credit card bill.

8. Repeat steps 3 - 7 to create a skill-based action for the **Cert Renewal skill flow**.



This action is also triggered from a custom-built action. Do not enter any example phrases.

9. Verify that both skill-based actions are available.

Name	Last edited	Examples count	Steps count	Status
z/OS IPL Information	a day ago	0	3	OK
Zeeves-gather-facts-flow	3 days ago	1	0	OK
Retrieve IPL information	a day ago	1	3	OK
Retrieve certificate expiration	13 minutes ago	0	3	OK
Cert Renewal skill flow	a few seconds ago	0	7	OK

## Create a custom-built action for SSL Certificate Renewal

Next, create a custom-built action that runs the new skill-based actions as subactions. Configure the custom-built action to enable a natural conversation with the assistant, gather relevant details from the user, and map those details to the action inputs.

### 1. Click **New action +**.

The screenshot shows the 'Actions' section in the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with categories like 'All items', 'Created by you' (which is selected and highlighted in blue), 'Set by assistant', 'Variables', 'Created by you', 'Set by assistant', 'Set by integration', and 'Saved responses'. The main area lists actions under 'Created by you'. A green dashed box highlights the last two actions in the list:

Name	Last edited	Examples count	Steps count	Status
Retrieve certificate expiration	13 minutes ago	0	3	<span style="color: green;">Green circle</span>
Cert Renewal skill flow	a few seconds ago	0	7	<span style="color: green;">Green circle</span>

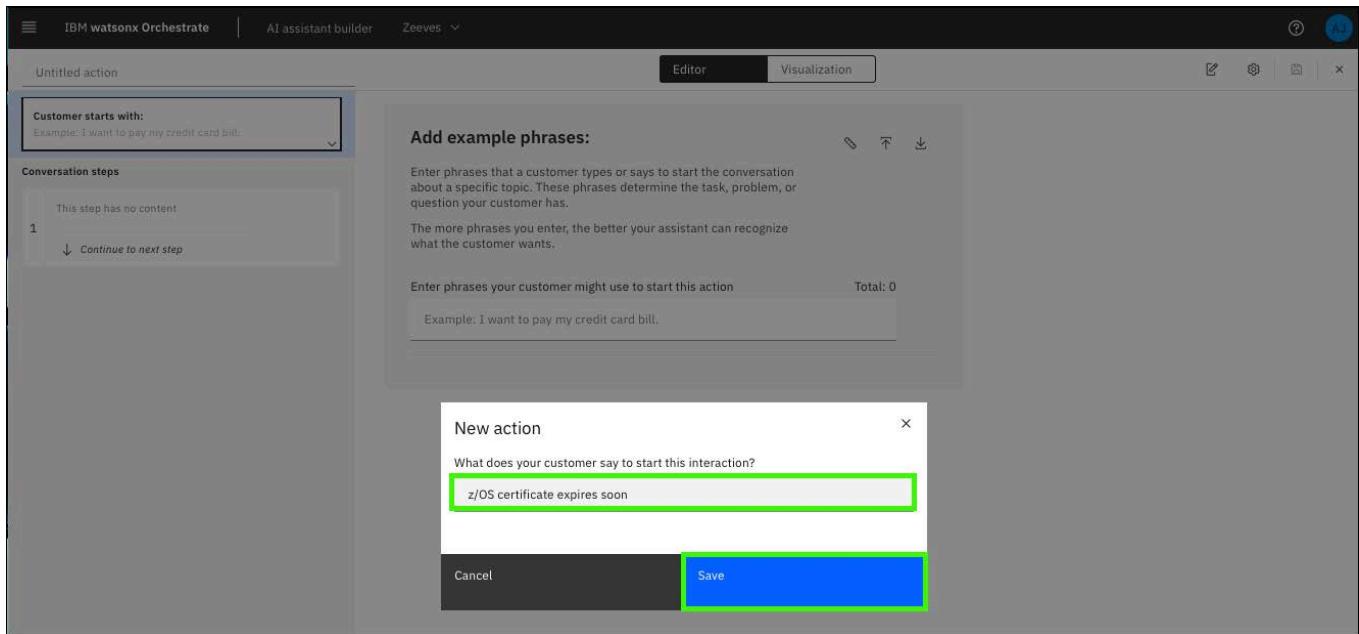
### 2. Click **Custom-built-action**.

The screenshot shows the 'Create an action' dialog. It asks 'What kind of action do you want to build?'. Three options are shown: 'AI-guided action' (blue box), 'Skill-based action' (purple box), and 'Custom-built action' (green box). The 'Custom-built action' box is highlighted with a green border. Below it, a note says 'Not sure how to start? Try adding pre-built action templates.'.

### 3. Enter `z/OS certificate expires soon` and then click **Save**.

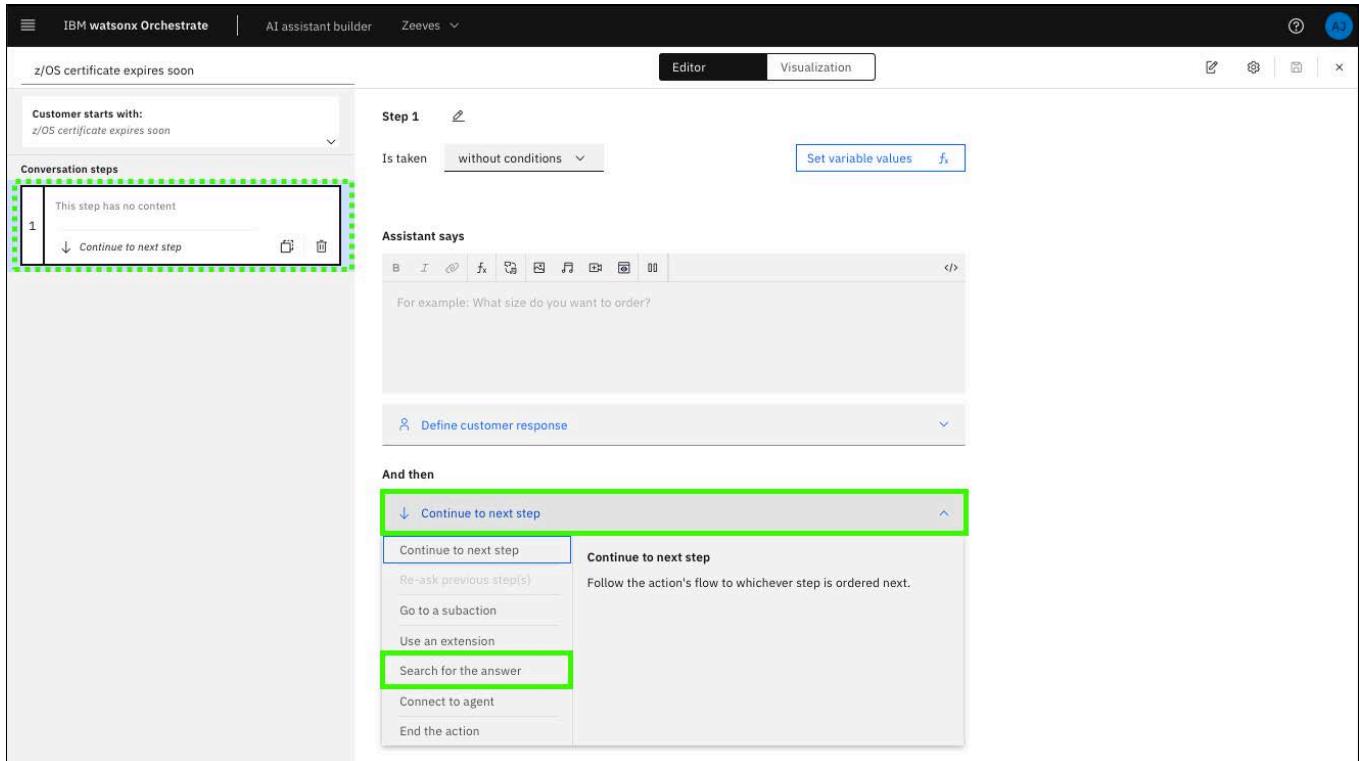
**What does your customer say to start this interaction:**

```
z/OS certificate expires soon
```



The conversational search capability that is provided by Watsonx Assistant for Z can provide step-by-step guidance for determining certificate expiration and renewing certificates, and is grounded on Z domain-specific knowledge. In the first step to be taken when the user prompts the assistant with `z/OS certificate expires soon`, configure the assistant to use conversational search to provide a response on the process and the ability to automate the process.

#### 4. Click the **And then** drop down and select **Search for the answer**.



The result is that anytime the user input matches the example phrase `z/OS certificate expires soon`, the first step that is taken is for the assistant to use conversational search and provide a response to their original question.

Like in the IPL Information scenario, add a custom search query so when conversational search is run in the first conversation step, the query used is hardcoded and not what the user input.

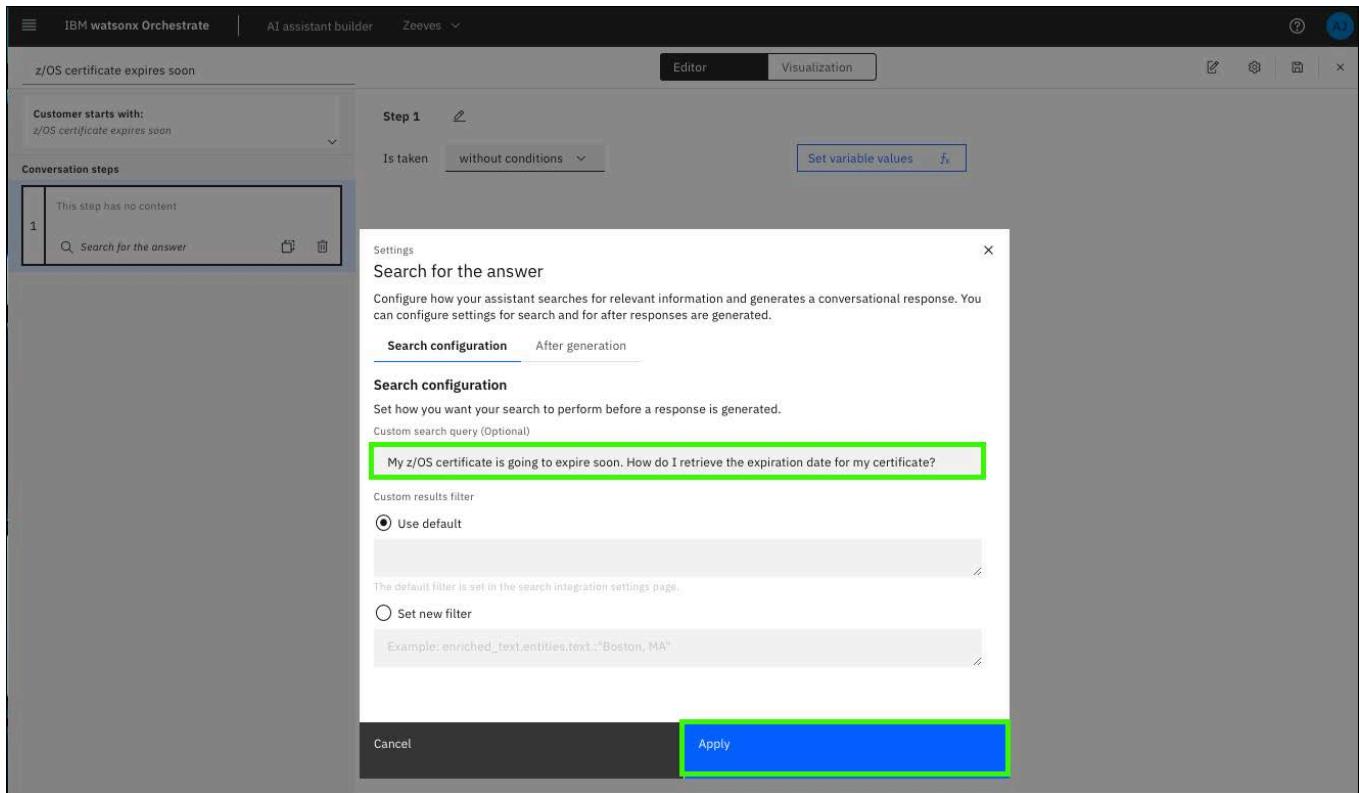
### 5. Click **Edit settings**.

The screenshot shows the AI assistant builder interface with the 'Editor' tab selected. In the 'Conversation steps' section, there is one step labeled 'Step 1'. The 'Assistant says' field contains the placeholder text 'For example: What size do you want to order?'. Below it, under 'And then', there is a dropdown menu set to 'Search for the answer'. Underneath this dropdown, there are two options: 'Custom query' (set to 'None (Customer's message will be the query)') and 'Custom filter' (set to 'None (Optional)'). At the bottom of this section, a button labeled 'Edit settings' is highlighted with a green box.

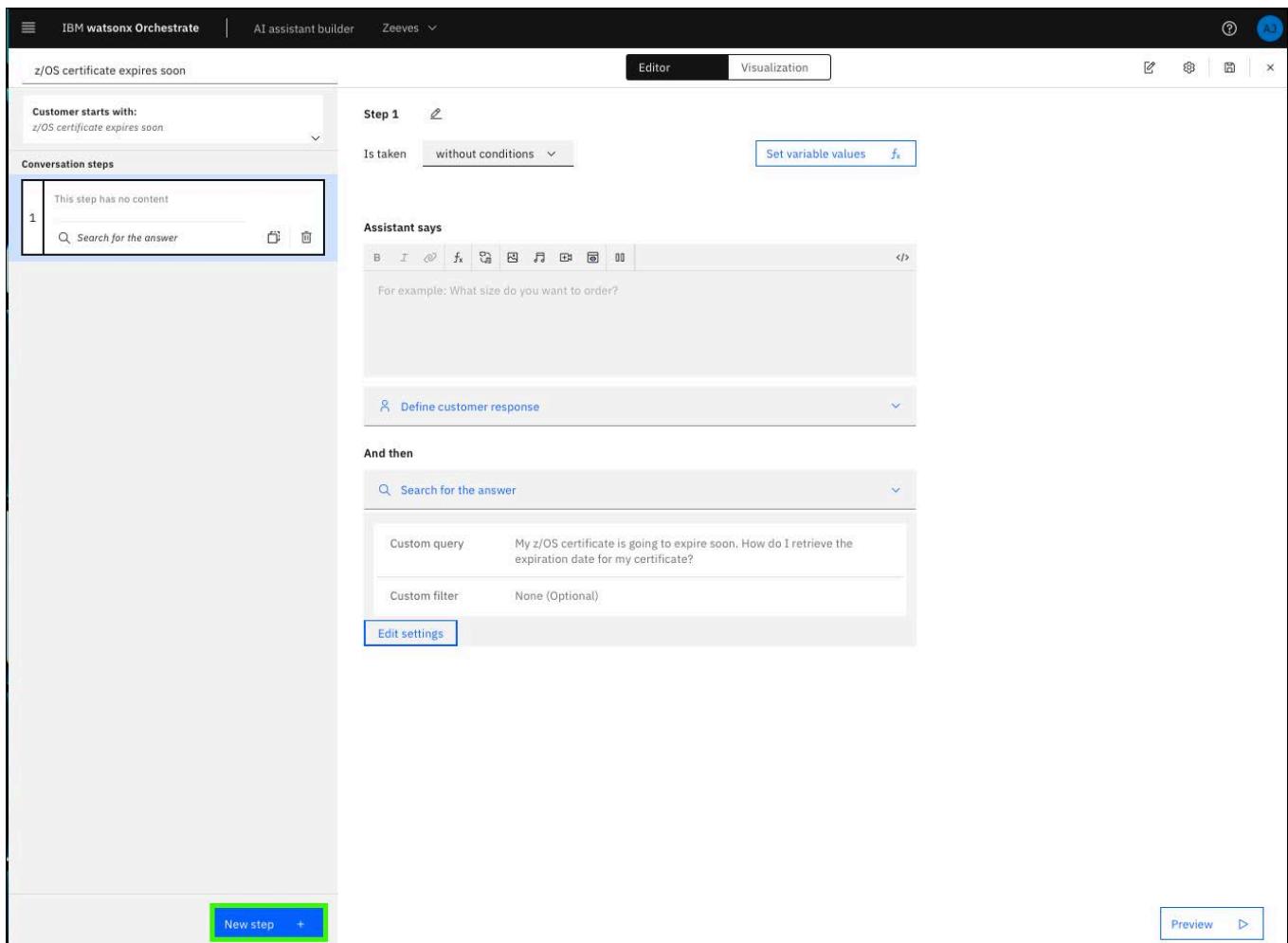
### 6. Enter the following prompt to be used in the **Custom search query** field and then click **Apply**.

#### **Custom search query:**

```
My z/OS certificate is going to expire soon. How do I retrieve the expiration date for my certificate?
```



## 7. Click Next step+.



8. Enter the following response in the **Assistant says** field.

**Assistant says:**

The screenshot shows the IBM Watsonx Orchestrate interface with the 'AI assistant builder' tab selected. In the 'Conversation steps' section, step 1 has a placeholder message 'This step has no content'. Step 2 contains the message 'Would you like to run the skill to retrieve your certificate's expiration date?'. Below the conversation steps, the 'Step 2' configuration panel is visible, showing 'Is taken' set to 'without conditions' and the 'Assistant says' field containing the same question. A green box highlights the 'Assistant says' field.

9. Click the **Define customer response** option list and select **Confirmation**.

The **Confirmation** option prompts the user to select **Yes** or **No**.

The screenshot shows the 'Define customer response' dropdown open in the 'Assistant says' configuration area. The 'Confirmation' option is highlighted with a green box. The description for 'Confirmation' states: 'Enable customers to select from Yes or No response.' Below it, under 'As buttons', there are 'Yes' and 'No' buttons. Other options in the dropdown include 'System', 'Free text', 'Regex', 'Number', 'Date', 'Time', and 'Saved'.

10. Click **Next step +**.

The screenshot shows the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with 'z/OS certificate expires soon' under 'Customer starts with'. Below it is a 'Conversation steps' section with two steps: Step 1 (empty) and Step 2. Step 2 has a message 'Would you like to run the skill to retrieve your certificate's expiration date?' followed by a 'Confirmation' button and a 'Continue to next step' link. The 'Is taken' dropdown in the top right is set to 'without conditions'. The 'Assistant says' field contains the message. Below it, there are 'Yes' and 'No' buttons, 'View response', and 'Edit validation' options. A green dashed box highlights the 'View response' and 'Edit validation' buttons. The 'And then' section below has a 'Continue to next step' link. At the bottom, there's a 'New step +' button and a 'Preview' button.

## 11. Click the **Is taken** option list and select **with conditions**.

This step handles the flow when the user selects **Yes** in the previous step, indicating that they want to run the skill to retrieve the certificate's expiration date. To run the **Retrieve certificate expiration action** created earlier, the assistant needs the certificate label. This label is mapped as input to the skill.

The screenshot shows the configuration for Step 3. The 'Is taken' dropdown now has three options: 'without conditions' (selected), 'without conditions' (disabled), and 'with conditions' (highlighted with a green box). The 'Assistant says' field contains the placeholder 'For example: Please select from the following options:' and a 'Define customer response' dropdown. The 'And then' section has a 'Continue to next step' link. The 'New step +' button and 'Preview' button are at the bottom.

## 12. Enter the following text in the **Assistant says** field.

**Assistant says:**

What is your certificate label?

The screenshot shows the IBM Watsonx Orchestrate interface with the following details:

- Conversation steps:**
  - Step 1: "This step has no content".
  - Step 2: "Would you like to run the skill to retrieve your certificate's expiration date?". It includes a "Confirmation" button and a "Continue to next step" link.
  - Step 3: "What is your certificate label?". It includes a "Continue to next step" link.
- Step 3 Configuration:**
  - Is taken:** "with conditions" (highlighted with a green dashed box).
  - Conditions:** "If All of this is true:"  
- Condition 1: "2. Would you like to r... is Yes" (highlighted with a green dashed box).
    - "and Add condition +"
  - Assistant says:** "What is your certificate label?" (highlighted with a green box).
  - Define customer response:** "Free text" (highlighted with a green box).
  - And then:** "Continue to next step" (highlighted with a green box).

13. Click the **Define customer response** drop-down list and select **Free text**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a sidebar displays 'z/OS certificate expires soon' and 'Customer starts with: z/OS certificate expires soon'. Below this is a 'Conversation steps' section with three numbered steps:

1. This step has no content. A search bar says 'Search for the answer'.
2. Would you like to run the skill to retrieve your certificate's expiration date? A 'Confirmation' button is shown.
3. A step with a dashed green border containing the text 'z is Yes' and 'What is your certificate label?' with a 'Continue to next step' button.

**Step 3 Configuration:**

- Condition:** Is taken with conditions
- Set variable values:** Set variable values (fx) button
- Conditions:** 1 condition
  - If All of this is true:
  - 2. Would you like to r... is Yes
  - and Add condition +
- New condition group +**
- Assistant says:** A text input field containing 'What is your certificate label?' with various rich text and media icons.
- Define customer response:** A modal window with a green border.
  - System:** Options (highlighted)
  - Free text:** Enable customers to write out any response using text input
    - As text: My street is Main Street
  - Other options:** Confirmation, Free text (highlighted), Regex, Number, Date, Time, Saved

14. Click **Next step+**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, there's a sidebar titled "Conversation steps" with three steps numbered 1, 2, and 3. Step 1 has a note "This step has no content". Step 2 has a note "Would you like to run the skill to retrieve your certificate's expiration date?". Step 3 has a note "What is your certificate label?". Step 3 also includes a "New condition group" button.

**Step 3:**

- Is taken:** with conditions
- Conditions:** If All of this is true:
  - 2. Would you like to r... is Yes
- and:** Add condition +
- Assistant says:**
  - What is your certificate label?
  - User enters free text
  - Edit response
  - Edit validation
- And then:** Continue to next step

15. Click the **Is taken** option list and select **with conditions**.

After the user enters the certificate label as free text, the next step is to run the **Retrieve certificate expiration** skill-based action created earlier. To do so, map the user input to the skill flow and retrieve the expiration date for that certificate.

z/OS certificate expires soon

Customer starts with: z/OS certificate expires soon

**Conversation steps**

- This step has no content
- Would you like to run the skill to retrieve your certificate's expiration date? (Confirmation)
- 2 is Yes  
What is your certificate label? (Free text)
- This step has no content

**Step 4**

Is taken: without conditions

Set variable values

Assistant says:

For example: What type of transfer would you like to make?

Define customer response

And then:

Continue to next step

## 16. Click the **And then** option list and click **Go to a subaction**.

Notice that the default condition validates the free text is defined from the previous step.

z/OS certificate expires soon

Customer starts with: z/OS certificate expires soon

**Conversation steps**

- This step has no content
- Would you like to run the skill to retrieve your certificate's expiration date? (Confirmation)
- 2 is Yes  
What is your certificate label? (Free text)
- This step has no content

**Step 4**

Is taken: with conditions

Set variable values

**Conditions**

If All of this is true:

- 3. What is your certifi... is defined

and Add condition +

New condition group +

**Assistant says**

For example: What type of transfer would you like to make?

Define customer response

**And then**

Continue to next step

Re-ask previous step(s)

Go to a subaction

Switch conversation flow to another action to perform a certain task

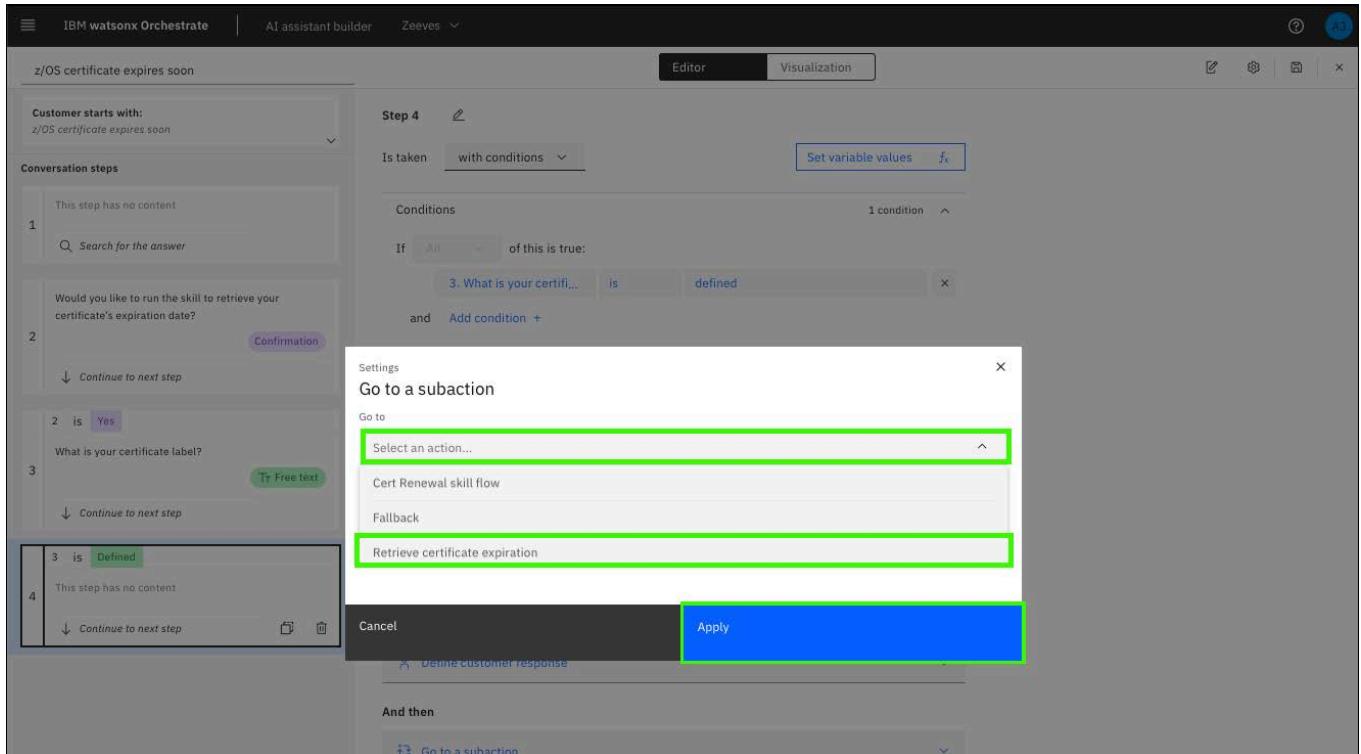
Use an extension

Search for the answer

Connect to agent

End the action

17. Click the (a) Go to option list, select the (b) Retrieve certificate expiration skill-based action, and then click (c) Apply.



18. Click Edit passed values.

To run the **Retrieve certificate expiration** subaction that uses the users certificate label, the passed value needs to be modified.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The main area displays a conversation flow with four steps:

- Customer starts with: z/OS certificate expires soon
- Conversation steps: This step has no content.
- Q: Search for the answer
- Would you like to run the skill to retrieve your certificate's expiration date?

Step 4 configuration:

- Is taken:** with conditions
- Conditions:**
  - If All of this is true:
    - 3. What is your certifi... is defined
    - and Add condition +
  - New condition group +
- Assistant says:** (Text input field: For example: What type of transfer would you like to make?)
- Define customer response:**
- And then:**
  - Go to a subaction: Go to subaction: Retrieve certificate expiration
  - Goes to action: Retrieve certificate expiration
  - Pass values
  - Upon return: Continue

Buttons at the bottom include **New step +** and **Preview**.

#### 19. Click **Set new value +** and then select **extra\_vars.cert\_label\_survey**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface with the 'Edit passed values' dialog open over the conversation steps.

The 'Edit passed values' dialog contains the following information:

- Passed values:** Edit passed values
- Edit variable values:** Response behavior
- Set new value +** (highlighted)
- Variables selected:**
  - 1. extra\_vars.cert\_label\_survey (highlighted)
  - 2. extra\_vars.cert\_type\_survey
  - 3. extra\_vars.owner\_id\_survey

Buttons at the bottom of the dialog are **Cancel** and **Apply**.

20. In the To field, select **Action step variables**, and then select **What is your certificate label?**.

The screenshot shows the IBM Watsonx Assistant Editor interface. A modal window titled "Edit variable values" is open over the main conversation steps. The "To" field dropdown is expanded, showing several options: "Set new value" (selected), "Enter text", "Expression", "Action step variables" (highlighted with a yellow circle), and "Assistant variables". Below the dropdown, the variable "extra\_vars.cert\_label\_survey" is assigned to "3. What is your certificate label?". The "Apply" button at the bottom of the modal is visible.

21. Click **Apply**.

The screenshot shows the same interface after the "Apply" button was clicked. The "To" field dropdown is now closed, and the "Action step variables" option is highlighted with a green dashed border. The variable "extra\_vars.cert\_label\_survey" is still assigned to "3. What is your certificate label?". The "Apply" button is no longer visible as it has been clicked.

22. Click **Next step +**.

**Step 4**

Is taken **with conditions**

Conditions

If All of this is true:

- 3. What is your certifi... is defined
- and Add condition +

New condition group +

Assistant says

For example: What type of transfer would you like to make?

Define customer response

And then

Go to a subaction

Goes to action: Retrieve certificate expiration

Pass values: 1. extra\_vars.cert\_label\_survey

Upon return: Continue

Edit settings Edit passed values

New step +

### 23. Click the **Is taken** option list and select **with conditions**.

In the previous step, you configured the assistant to run the **Retrieve certificate expiration** subaction you created, passing the certificate label the user inputted to the skills inputs. Recall when the **Retrieve certificate expiration** skill flow was created, the output form at the end of the skill flow was hidden. That form contained the expiration date. As a result, nothing is returned when running the subaction in the previous step. Now, configure the custom-action to provide that output as a response.

The screenshot shows the IBM Watsonx Orchestrate interface. On the left, there's a sidebar titled "Conversation steps" with five steps numbered 1 to 5. Step 1: "Search for the answer". Step 2: "Confirmation" with a "Continue to next step" button. Step 3: "What is your certificate label?" with a "Try Free text" button. Step 4: "This step has no content". Step 5: "This step has no content" with a "Continue to next step" button. The main panel on the right is titled "Step 5". Under "Is taken", the dropdown menu is open, showing "without conditions" (highlighted with a green box), "with conditions" (highlighted with a green box), and "Set variable values" (disabled). Below this is a text input field with placeholder text "For example: What size do you want to order?". Under "Assistant says", there's a rich text editor with a toolbar. A dropdown menu is open, showing "Define customer response" (highlighted with a green box). Under "And then", there's another dropdown menu with "Continue to next step" (highlighted with a green box).

24. Enter the following text in the **Assistant says** field.

**Assistant says:**

Below is your certificate's expiration date:

The screenshot shows the IBM Watsonx Orchestrate interface. The "Conditions" section under "Step 5" is expanded, showing a condition: "If All of this is true:". Inside the condition block, there is a sub-condition: "3. What is your certifi... is defined" (highlighted with a green box). Below this, there is a "New condition group +" button. The "Assistant says" section contains the text "Below is your certificate's expiration date:" (highlighted with a green box). The rich text editor toolbar is visible above the text area.

25. While still in the **Assistant says** field, press **return** and then type **\$**.



The **\$** is a special key that lists available functions. The following image is edited to show that you must type the **\$**, but it is not displayed on your screen.

The screenshot shows the IBM Watsonx Orchestrator AI assistant builder interface. The main area is titled "Step 5". Under "Is taken", it is set to "with conditions". A "Conditions" section shows one condition: "If All of this is true: 3. What is your certifi... is defined". The "Assistant says" field contains the text "Below is your certificate's expiration date: \$". The "\$" character is highlighted with a green box. The "Conditions" section also includes a "New condition group +". Below the "Assistant says" field, there are sections for "Action step variables", "Retrieve certificate expiration (step 4)", "Assistant variables", and "Integration variables". The "Action step variables" section has "Retrieve certificate expiration (step 4)" selected. The "Conditions" section also includes a "New condition group +". The left sidebar shows "Conversation steps" with five steps numbered 1 through 5. Step 1: "Customer starts with: z/OS certificate expires soon". Step 2: "Would you like to run the skill to retrieve your certificate's expiration date?". Step 3: "What is your certificate label?". Step 4: "This step has no content". Step 5: "Below is your certificate's expiration date: <br />".

26. Click **Retrieve certificate expiration (step 4)** and then click **Retrieve certificate expiration result variable**.

The screenshot shows the AI assistant builder interface with the 'Editor' tab selected. On the left, the 'Conversation steps' pane displays five steps: 1. 'Search for the answer', 2. 'Confirmation', 3. 'Free text', 4. 'Defined', and 5. 'Defined' (containing the variable '3'). The 'Assistant says' section contains the text: 'Below is your certificate's expiration date:' followed by a placeholder for 'Action step variables'. A yellow circle highlights the 'Action step variables' dropdown.

27. Review the **Assistant says** field and then click **Save** (💾).

The screenshot shows the AI assistant builder interface after saving. The 'Assistant says' section now contains the complete text: 'Below is your certificate's expiration date: 1+3.4. Retrieve certificate expiration ret'. The entire text area is enclosed in a green dashed box, and the 'Save' button in the top right corner is highlighted with a green square.

Test the **z/OS certificate expires soon** custom-built skill

Before completing the use case, test the **z/OS certificate expires soon** custom-built skill that uses the **DEMOCERT** certificate created earlier.

## 1. Click **Preview**.

## 2. Enter the following prompt in the preview.

### **Prompt:**

My z/OS certificate is going to expire soon. How do I retrieve the expiration date for my certificate?

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, there's a sidebar titled "z/OS certificate expires soon" under "Conversation steps". The steps are numbered 1 through 5:

- Step 1:** "Customer starts with: z/OS certificate expires soon". It has a note "This step has no content".
- Step 2:** "Would you like to run the skill to retrieve your certificate's expiration date?". It has a note "This step has no content" and a "Confirmation" button.
- Step 3:** "What is your certificate label?". It has a note "This step has no content" and a "Free text" input field.
- Step 4:** "3 is Defined". It has a note "This step has no content" and a link "Go to subaction: Retrieve certificate...".
- Step 5:** "Is taken with conditions". It has a condition: "If All of this is true: 3. What is your certifi... is defined".

In the center, there's a "Preview" window showing a conversation:

```

    7:55 AM
    Greet customer [default]
    Welcome, how can I assist you?

    My z/OS certificate is going to expire soon. How do I retrieve the expiration date for my certificate?
  
```

### 3. Review the response and click Yes.

The assistant responds by calling Conversational search and returns a response by using the Z RAG, displaying the RACDCERT command that can be used. The assistant then prompts Would you like to run the skill to retrieve?.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and tabs for 'Editor' (selected) and 'Visualization'. A sidebar on the left displays 'Conversation steps' numbered 1 through 5. Step 1: 'Customer starts with: z/OS certificate expires soon'. Step 2: 'Would you like to run the skill to retrieve your certificate's expiration date?' with a 'Confirmation' button. Step 3: 'What is your certificate label?' with a 'Free text' input field. Step 4: 'This step has no content' with a link to 'Go to subsection: Retrieve certificate...'. Step 5: 'Below is your certificate's expiration date: 1 2 3 4. Retrieve certificate expiration ret'. The main panel shows 'Step 5' configuration under 'Is taken with conditions'. A condition is defined: 'If All of this is true: 3. What is your certifi... is defined' and 'and Add condition +'. Below this, there are sections for 'Assistant says' (containing a rich text editor and preview of a message from '10:06 AM' with a link to '4. Retrieve certificate expiration ret') and 'Define customer response' (with a dropdown menu). To the right, a 'Preview' window shows a simulated conversation where the user asks about retrieving a certificate's expiration date, and the AI assistant responds with the retrieved information and asks if they want to run a skill to confirm it.

#### 4. Review the response and enter DEMOCERT .

**Prompt:**

DEMOCERT

The screenshot shows the IBM Watsonx Orchestrate interface with the following details:

- Title Bar:** IBM Watsonx Orchestrate, AI assistant builder, Zeeves.
- Toolbar:** Editor (selected), Visualization, and other icons.
- Conversation Steps:**
  - z/OS certificate expires soon
  - This step has no content
  - Would you like to run the skill to retrieve your certificate's expiration date?
  - This step has no content
  - Below is your certificate's expiration date: 10/10/2024
- Step 5 Configuration:**
  - Is taken: with conditions
  - Conditions: If All of this is true:
    - 3. What is your certifi... is defined
    - and Add condition +
  - New condition group +
- Assistant says:**
  - Below is your certificate's expiration date: 10/10/2024
  - Define customer response: Would you like to run the skill to retrieve your certificate's expiration date?
  - And then: Continue to next step
- Preview:**
  - Text: "z/OS certificate expires soon recognized"
  - Question: "What is your certificate label?" (highlighted with a green dashed box)
  - Answer: "DEMOCERT" (highlighted with a green box)
  - Timestamp: You 10:07 AM
  - Accuracy note: Accuracy of generated answers may vary.

## 5. Click Apply.

The screenshot shows the IBM Watsonx Orchestrate interface. At the top, it says "z/OS certificate expires soon". Below this, there's a "Conversation steps" section with five numbered steps:

- This step has no content
- Would you like to run the skill to retrieve your certificate's expiration date? (with a "Confirmation" button)
- What is your certificate label? (with a "Try Free text" button)
- This step has no content
- Below is your certificate's expiration date: (with a "Step 4" link)

On the right, the "Step 5" configuration is shown under "Is taken with conditions". It has a condition: "If All of this is true: 3. What is your certifi... is defined". Below this, there's an "Assistant says" section with a preview of a user message "What is your certificate label?" and a bot response "You 10:17 AM DEMOCERT". There's also a "Define customer response" section and a "And then" step with a "Continue to next step" link.

## 6. Review the response.

If you see the following response (the date may differ), the custom-built skill ran successfully. The output of the skill flow was not the entire output of the z/OS Certs – List Cert Ansible job, but rather the certificate expiration date that was extracted from the full job output by using the Regular Expression transformation.

## Complete the custom-built skill to renew the certificate

Now that the custom-built action is working, add steps to include the certificate renewal process. After retrieving and displaying the user's certificate expiration date, ask the user if they want to renew the certificate, and if so, prompt for the new date and renew the certificate.

### 1. Click **Next step +**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'z/OS certificate expires soon'. The 'Editor' tab is selected. On the left, there's a 'Conversation steps' panel with five numbered steps:

- This step has no content.
- Would you like to run the skill to retrieve your certificate's expiration date? (Confirmation)
- What is your certificate label?
- This step has no content.
- Below is your certificate's expiration date: 1 2 3 Step 4

Step 5 is titled 'Step 5' and has the condition 'Is taken with conditions'. A condition is defined: 'If All of this is true: 3. What is your certifi... is defined'. Below this, there's an 'Assistant says' section with a preview of the response: 'Below is your certificate's expiration date: 1 2 3 4. Retrieve certificate expiration res'. The 'Define customer response' dropdown is set to 'Define customer response'. The 'And then' section contains a 'Continue to next step' button. The bottom right corner of the screen shows a preview window with the title 'Preview' and a message: 'Ug Conversational skill called go to Retrieve certificate expiration'.

2. Click the **Is taken** option list and select **with conditions**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a conversation flow titled 'z/OS certificate expires soon'. The flow consists of six steps:

- Customer starts with:** z/OS certificate expires soon
- Conversation steps:**
  - Step 1:** 'Is taken' dropdown menu is open, showing options: 'without conditions' (selected), 'with conditions', and 'Set variable values'.
  - Assistant says:** 'Would you like to run the skill to retrieve your certificate's expiration date?' with a 'Confirmation' button.
  - Step 2:** '2 is Yes' (highlighted in green).
  - Step 3:** 'What is your certificate label?' with a 'Free text' input field.
  - Step 4:** 'This step has no content'.
  - Step 5:** 'Go to subaction: Retrieve certifica...' (highlighted in green).
  - Step 6:** 'This step has no content'.

3. Enter the following text in the **Assistant says** field.

**Assistant says:**

Would you like to renew your certificate?

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a conversation steps pane displays a sequence of steps:

- z/OS certificate expires soon**: Customer starts with: z/OS certificate expires soon.
- Conversation steps**:
  - 1**: 4 is Defined. Would you like to renew your certificate? (Confirmation)
  - 2**: Would you like to run the skill to retrieve your certificate's expiration date? (Confirmation)
  - 3**: 2 is Yes. What is your certificate label? (Free text)
  - 4**: 3 is Defined. This step has no content. Go to subaction: Retrieve certificate...
  - 5**: Below is your certificate's expiration date: 1 is Step 4. (Confirmation)
  - 6**: 4 is Defined. Would you like to renew your certificate? (Confirmation)

**Step 1** configuration:

- Is taken: with conditions
- Conditions: If All of this is true:
  - 1 Retrieve certificate... is defined
- And then: Continue to next step

**Assistant says** (highlighted with a green box):
   
Would you like to renew your certificate?
   
  
**Define customer response** dropdown: Confirmation
   
  
**And then**: Continue to next step

- Click the **Define customer response** option list and select **Confirmation**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, the conversation steps are listed:

- 1 Would you like to renew your certificate? (Condition: 4 is Defined)
- 2 Would you like to run the skill to retrieve your certificate's expiration date? (Confirmation: Yes)
- 3 What is your certificate label? (Free text)
- 4 This step has no content.
- 5 Below is your certificate's expiration date: Step 4 (Confirmation: Yes)
- 6 Would you like to renew your certificate? (Condition: 4 is Defined)

In the center, the "Step 1" configuration is shown:

- Is taken:** with conditions
- Conditions:**
  - If All of this is true:
    - 1 Retrieve certificate is defined
  - and Add condition +
- Assistant says:** Would you like to renew your certificate?
- Define customer response:**
  - System:** Confirmation
  - Options:** Confirmation
  - As buttons:** Yes, No

5. Click **Next step +**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'z/OS certificate expires soon'. It displays a conversation flow with six steps:

- Step 1:** 'Customer starts with: z/OS certificate expires soon' (highlighted with a green box). The 'Is taken' dropdown is set to 'with conditions'. A condition is defined: 'If 1 is Retrieve certificate... is defined'.
- Step 2:** 'Would you like to renew your certificate?' (Confirmation). The response 'Yes' is highlighted with a green box.
- Step 3:** 'What is your certificate label?' (Try free text).
- Step 4:** 'This step has no content' (Confirmation). A link 'Go to subaction: Retrieve certificate...' is shown.
- Step 5:** 'Below is your certificate's expiration date: 1 Step 4' (Confirmation). The response 'Yes' is highlighted with a green box.
- Step 6:** 'Would you like to renew your certificate?' (Confirmation). The response 'Yes' is highlighted with a green box. A 'New step +' button is visible at the bottom right of this step.

The 'Assistant says' section contains the prompt 'Would you like to renew your certificate?'. Below it is a conditional block with 'Yes' and 'No' options, and buttons for 'View response' and 'Edit validation'. The entire conditional block is highlighted with a green dashed box.

#### 6. Click the **Is taken** option list and select **with conditions**.

This step handles the flow in which the user selects **Yes** in the previous step indicating they want to renew their expiring certificate. Before initiating the Cert Renewal skill flow action to automate this, the assistant first needs the new expiration date for the certificate.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a vertical list of steps is shown:

- 1 Would you like to renew your certificate? Confirmation
- 2 This step has no content
- 3 Would you like to run the skill to retrieve your certificate's expiration date? Confirmation
- 4 What is your certificate label? Try Free text
- 5 This step has no content
- 6 Below is your certificate's expiration date: Step 5
- 7 Would you like to renew your certificate? Confirmation

On the right, the "Step 1" configuration panel is displayed. It shows the condition "Is taken with conditions" selected. A condition is defined: "1 Retrieve certific..." is defined. The "Assistant says" field contains the text "Would you like to renew your certificate?". Below it, there are "Yes" and "No" buttons, and "View response" and "Edit validation" buttons.

## 7. Enter the following text in the **Assistant says** field.

**Assistant says:**

What date would you like to set the renewed certificate's expiration date to? Please enter in the form of YYYY-MM-DD.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a sidebar displays a sequence of steps:

- z/OS certificate expires soon
- Would you like to run the skill to retrieve your certificate's expiration date?
- What is your certificate label?
- This step has no content
- Go to subaction: Retrieve certificate...
- Below is your certificate's expiration date:  
11-12-2024 Step 4
- Would you like to renew your certificate?
- What date would you like to set the renewed certificate's expiration date to? Please enter in the...  
6. Would you like to r... is Yes

Step 7 is currently selected in the editor area. The condition for Step 7 is defined as "Is taken with conditions". The condition details are as follows:

If All of this is true:

- 6. Would you like to r... is Yes

And then:

↓ Continue to next step

Assistant says:

What date would you like to set the renewed certificate's expiration date to? Please enter in the form of YYYY-MM-DD.

Define customer response

And then:

↓ Continue to next step

Preview ▶

8. Click the **Define customer response** option list and select **Free text**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. A workflow is displayed on the left, and the current step being edited is Step 7 on the right.

**Workflow Steps:**

- z/OS certificate expires soon
- Would you like to run the skill to retrieve your certificate's expiration date?
- Confirmation
- Continue to next step
- What is your certificate label?
- Free text
- Continue to next step
- is Defined
- This step has no content
- Go to subsection: Retrieve certificate...
- is Defined
- Below is your certificate's expiration date:
- Step 4
- Continue to next step
- is Defined
- Would you like to renew your certificate?
- Confirmation
- Continue to next step
- is Yes
- What date would you like to set the renewed certificate's expiration date to? Please enter in the...
- Continue to next step

**Step 7 Editor:**

**Condition:** Is taken with conditions

**Conditions:**

- If All of this is true:
  - 6. Would you like to r... is Yes
- and Add condition +

**Assistant says:**

What date would you like to set the renewed certificate's expiration date to? Please enter in the form of YYYY-MM-DD.

**Define customer response:**

**System:**

- Options
- Confirmation
- Free text
- Regex
- Number
- Date
- Time

**Free text:**

Enable customers to write out any response using text input

**As text:**

My street is Main Street

9. Click New step +.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'z/OS certificate expires soon'. On the left, a vertical stack of steps is visible: Step 1 (z/OS certificate expires soon), Step 2 (Would you like to run the skill to retrieve your certificate's expiration date?), Step 3 (What is your certificate label?), Step 4 (This step has no content), Step 5 (Below is your certificate's expiration date: 11-Step 4), Step 6 (Would you like to renew your certificate?), and Step 7 (What date would you like to set the renewed certificate's expiration date to? Please enter in the...). Step 7 is currently selected and expanded. The configuration pane on the right shows 'Step 7' with the condition 'Is taken with conditions'. A dropdown menu is open, showing 'with conditions' as the selected option. Below this, a 'Conditions' section shows a single condition: 'If All of this is true: 6. Would you like to r... is Yes'. There is also a 'New condition group +' button. Further down, the 'Assistant says' section contains a text input field with placeholder text 'What date would you like to set the renewed certificate's expiration date to? Please enter in the form of YYYY-MM-DD.' and a 'User enters free text' label. Below the input field are 'Edit response' and 'Edit validation' buttons. The 'And then' section contains a 'Continue to next step' button. At the bottom right of the configuration pane are 'Preview' and 'Next' buttons.

#### 10. Click the **Is taken** option list and select **with conditions**.

With the new expiration date entered by the user, the next step is to run the Cert Renewal skill flow action as a subaction. Next, trigger the renewal skill flow and pass the user provided details as input to the action to renew the certificate and extend the certificates expiration date.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a vertical list of steps is visible, numbered 2 through 8. Step 2 is titled "z/OS certificate expires soon" and includes a "Confirmation" button. Step 3 asks "What is your certificate label?" with a "Free text" input field. Step 4 indicates "This step has no content". Step 5 contains a link "Go to subaction: Retrieve certificate...". Step 6 asks "Would you like to renew your certificate?" with a "Confirmation" button. Step 7 asks "What date would you like to set the renewed certificate's expiration date to? Please enter in the..." with a "Free text" input field. Step 8 is highlighted with a green border and is titled "Step 8". It has two main sections: "Is taken" (with dropdown options "without conditions" checked, "without conditions", and "with conditions") and "Assistant says" (with a "Define customer response" button). Below these sections is a "And then" section with a "Continue to next step" button.

## 11. Enter the following text in the **Assistant says** field.

This assistant first responds with the message that follows before triggering the certificate renewal skill-flow. When performing a demo of this use case, mention the [z/OS Certs – Search and Renew](#) Ansible playbook typically takes a minute or so to complete.

### **Assistant says:**

Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an option below.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and various icons. The main area displays a workflow titled 'z/OS certificate expires soon'. The steps are numbered 2 through 8:

- Step 2:** Confirmation. Question: 'What is your certificate label?' Response: '2 is Yes'.
- Step 3:** Free text. Question: 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...' Response: '3 is Defined'.
- Step 4:** Confirmation. Question: 'Would you like to renew your certificate?' Response: '4 is Yes'.
- Step 5:** Step 4. Below is your certificate's expiration date: '11 Step 4'.
- Step 6:** Confirmation. Question: 'Would you like to renew your certificate?' Response: '6 is Yes'.
- Step 7:** Free text. Question: 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...' Response: '7 is Defined'.
- Step 8:** Conditions. The condition is 'Is taken with conditions'. The condition details are: If All of this is true: '7. What date would y... is defined'.

The 'Assistant says' section contains the message: 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an option below.' The 'And then' section has a 'Continue to next step' button.

12. Click the **And then** option list and select **Go to a subaction**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a vertical stack of steps is displayed, each with a condition and a response. Step 2: '2 is Yes' leads to 'What is your certificate label?'. Step 3: '3 is Defined' leads to 'This step has no content'. Step 4: '4 Go to subaction: Retrieve certificate...' leads to '3 is Defined'. Step 5: '5 Step 4' leads to '6 is Yes'. Step 6: '6 is Yes' leads to 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...'. Step 7: '7 is Defined' leads to 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...'. Step 8: '8 is Defined' leads to 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...'. A green dashed box highlights the '7 is Defined' step. On the right, the 'Step 8' configuration panel is shown, with 'Conditions' set to 'with conditions' and a condition '7. What date would y... is defined'. Below it, the 'Assistant says' section contains a message: 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an option below.' The 'And then' dropdown menu is open, showing options: 'Continue to next step' (highlighted in green), 'Re-ask previous step(s)', 'Go to a subaction' (highlighted in green), 'Use an extension', 'Search for the answer', 'Connect to agent', and 'End the action'. A blue 'New step +' button is at the bottom of the step list.

13. Click the **Go to** option list and select the **Cert Renewal skill flow**.

The screenshot shows the IBM Watsonx Orchestrator Editor interface. On the left, a vertical list of steps is visible, each with a number, a condition, and a description. Step 8 is currently selected, showing its configuration details on the right. The configuration panel includes tabs for 'Step 8' (selected), 'Confirmation', and 'with conditions'. Under 'with conditions', there is a 'Set variable values' button and a 'Conditions' section. The 'Conditions' section contains an 'If' clause: 'If All of this is true:' followed by a condition: '7. What date would you like to renew your certificate? is defined'. Below this, there is a 'and' button and a 'Add condition' button. A modal window titled 'Go to a subaction' is open over the configuration panel. This modal has sections for 'Go to', 'And then', and 'Privacy'. In the 'Go to' section, 'Cert Renewal skill flow' is selected. In the 'And then' section, there is a 'Goes to action' row with 'Missing action. Edit settings.' and a red error icon. Below it are 'Pass values', 'Upon return', and 'Edit settings' sections. At the bottom of the modal are 'Cancel' and 'Apply' buttons. The 'Apply' button is highlighted with a green border.

#### 14. Click **Apply**.

This screenshot shows the same workflow editor as the previous one, but the modal window from step 14 has been closed. The 'Apply' button is now highlighted with a blue border, indicating it has been clicked. The rest of the interface remains the same, with the workflow steps listed on the left and their configuration on the right.

#### 15. Click **Edit passed values**.

Edit the passed values to use them in the **Cert Renewal** skill flow subaction.

z/OS certificate expires soon

**Step 8**

Is taken with conditions

Conditions

If All of this is true:

7. What date would you like to set the renewed certificate's expiration date? is defined

and Add condition +

New condition group +

**Assistant says**

Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an option below.

**And then**

Go to a subaction

Goes to action Cert Renewal skill flow

Pass values

Upon return Continue

Edit settings Edit passed values

16. Click **Set new value +** and then select **extra\_vars.cert\_label\_survey**.

z/OS certificate expires soon

**Step 8**

Is taken with conditions

Conditions

Passed values

Edit passed values

Configure how your skill-based action leverages and stores information in assistant variables. [Learn more](#)

Variables are not private if they are shared with Skill Studio.

**Edit variable values** Response behavior

The values you select from this action will be passed to "Cert Renewal skill flow".

Set new value +

< All variables

1. extra\_vars.cert\_label\_survey

2. extra\_vars.cert\_type\_survey

3. extra\_vars.keyring\_survey

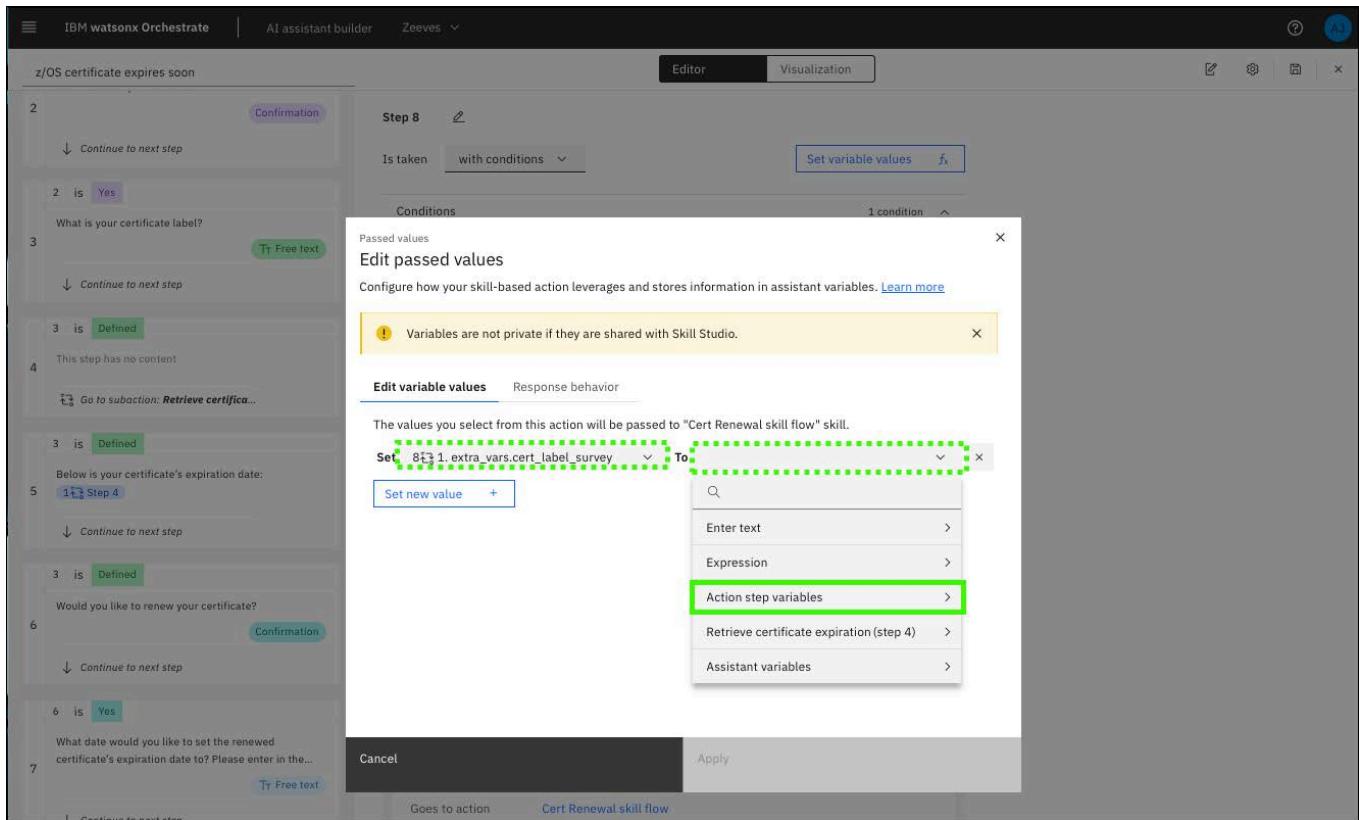
4. extra\_vars.new\_expiry\_date\_survey

5. extra\_vars.owner\_id\_survey

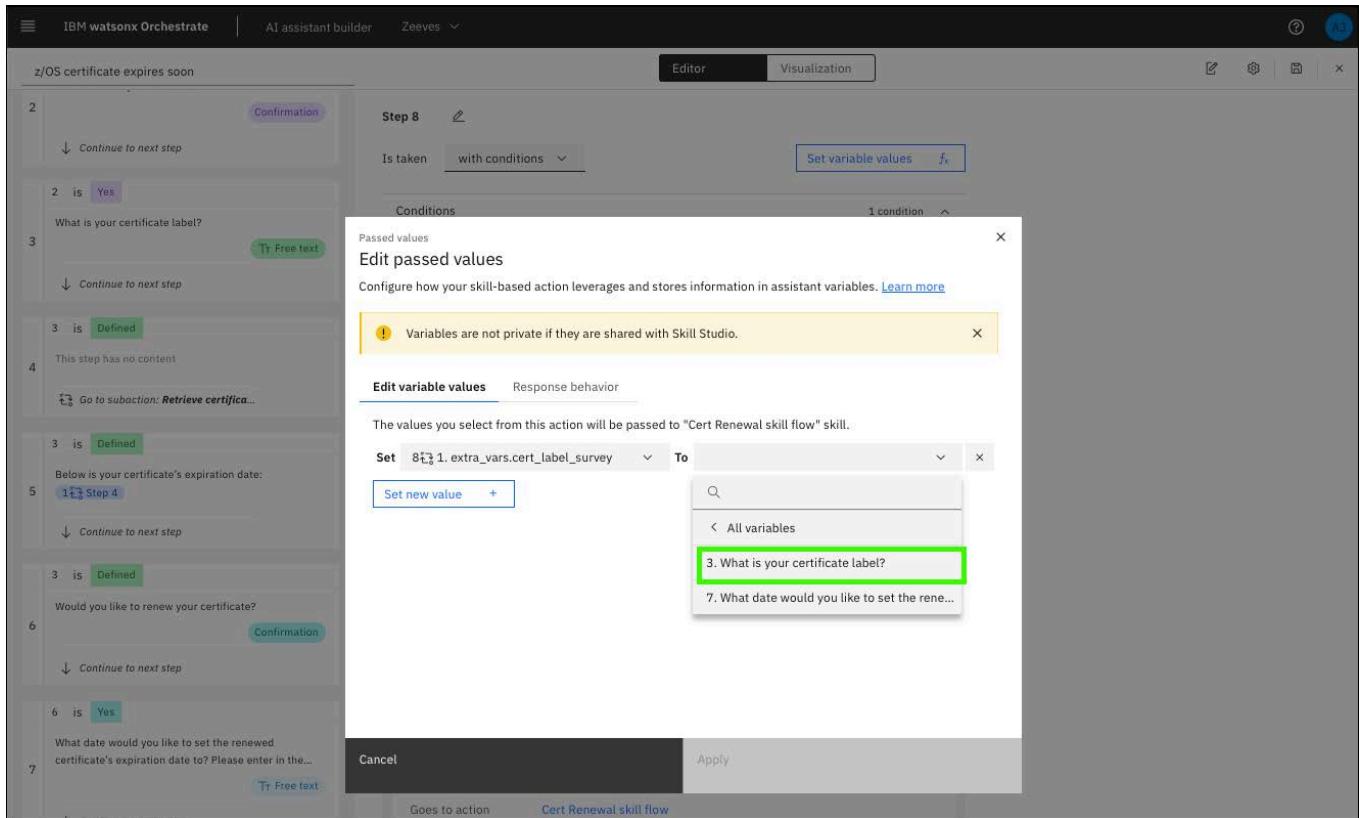
Cancel Apply

Goes to action Cert Renewal skill flow

17. In the **To** field, select **Action step variables**.



### 18. Click What is your certificate label?



### 19. Repeat steps 16 - 18 adding the extra\_vars.new\_expiry\_date\_survey input variable and What date would you like to set the... in the To field.

The screenshot shows the IBM Watsonx Orchestrator interface. A modal window titled "Edit passed values" is open over the main workflow editor. The workflow consists of seven steps (2-8) and a confirmation step. Step 8 is currently selected. The "Set variable values" section contains two entries:

- Set 8[1].extra\_vars.cert\_label\_survey To 3. What is your certificate label?
- Set 8[4].extra\_vars.new\_expiry\_date\_su... To 7. What date would you like to set the ...

A tooltip message states: "Variables are not private if they are shared with Skill Studio." The "Apply" button at the bottom of the modal is highlighted.

20. Click **Set new value +** and then select **extra\_vars.sign\_label\_survey**.

The screenshot shows the same workflow and modal window as the previous one, but the "Set new value +" button is highlighted with a green box. The dropdown menu below it lists several survey variables, with "6. extra\_vars.sign\_label\_survey" highlighted with a green box.

21. In the **To** option list, select **Enter text**.

The screenshot shows the IBM Watsonx Orchestrate Editor interface. On the left, there's a flowchart with steps numbered 2 through 7. Step 2 is a confirmation step. Step 3 asks 'What is your certificate label?' and has a 'Free text' input field. Step 4 is a placeholder step. Step 5 is a subaction for 'Retrieve certificate...'. Step 6 asks 'Would you like to renew your certificate?' and has a 'Yes' button. Step 7 is a confirmation step. In the center, 'Step 8' is configured with 'Is taken with conditions'. A modal window titled 'Edit passed values' is open over the flowchart, showing three 'Set' actions mapping variables from Step 3 to Step 7. The third set has its 'To' dropdown open, revealing options like 'Enter text', 'Expression', and 'Action step variables'. The 'Enter text' option is highlighted with a green box.

22. Enter TESTCA in the **Enter text** field and click **Apply** for the **To** option list.

**Enter text:**

TESTCA

For this passed value, hardcode TESTCA in the skill flow's input for the sign\_label variable. This is the CA certificate created earlier for demo purposes in the AAP web console.

The screenshot shows the IBM Watsonx Orchestrate interface. A modal window titled "Edit passed values" is open over the main workflow editor. Inside the modal, there are three "Set" actions mapped to variables:

- Set 8t3 1. extra\_vars.cert\_label\_survey To 3. What is your certificate label?
- Set 8t3 4. extra\_vars.new\_expiry\_date\_su... To 7. What date would you like to set the ...
- Set 8t3 6. extra\_vars.sign\_label\_survey To TESTCA

The "TESTCA" value is highlighted with a green box. At the bottom of the modal, there are "Cancel" and "Apply" buttons, with "Apply" being highlighted with a green box.

## 23. Review the **Edit passed values** and then click **Apply**.

Review all 3 variables are set correctly.

The screenshot shows the IBM Watsonx Orchestrate interface. A modal window titled "Edit passed values" is open over the main workflow editor. Inside the modal, there are three "Set" actions mapped to variables:

- Set 8t3 1. extra\_vars.cert\_label\_survey To 3. What is your certificate label?
- Set 8t3 4. extra\_vars.new\_expiry\_date\_su... To 7. What date would you like to set the ...
- Set 8t3 6. extra\_vars.sign\_label\_survey To TESTCA

A yellow warning message at the top of the modal reads: "Variables are not private if they are shared with Skill Studio." The "TESTCA" value is highlighted with a green box. At the bottom of the modal, there are "Cancel" and "Apply" buttons, with "Apply" being highlighted with a green box.

## 24. Click **Next step +**

The screenshot shows the IBM Watson Assistant AI assistant builder interface. The top navigation bar includes 'IBM Watson Assistant', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a flow titled 'z/OS certificate expires soon'. The flow consists of several steps:

- Step 1:** 'Continue to next step' (Free text)
- Step 2:** '2 is Yes' (Free text)
- Step 3:** 'What is your certificate label?' (Free text)
- Step 4:** 'This step has no content' (Free text)
- Step 5:** 'Go to subaction: Retrieve certifica...' (Free text)
- Step 6:** '3 is Defined' (Free text)
- Step 7:** 'Below is your certificate's expiration date: 11/3 Step 4' (Free text)
- Step 8:** 'Would you like to renew your certificate?' (Confirmation)
- Step 9:** '6 is Yes' (Free text)
- Step 10:** 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...' (Free text)
- Step 11:** 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...' (Free text)
- Step 12:** 'Go to subaction: Cert Renewal ski...' (Free text)

**Step 8 (Editor View):**

**Is taken:** with conditions

**Conditions:**

If All of this is true:

- 7. What date would y... is defined
- and Add condition +

**Assistant says:**

Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an option below.

**And then:**

Go to a subaction

Goes to action	Cert Renewal skill flow
Pass values	1. extra_vars.cert_label_survey 4. extra_vars.new_expiry_date_survey 6. extra_vars.sign_label_survey
Upon return	Continue

**Buttons:**

- New step +
- Preview ▶

25. Click the **Is taken** option list and select **with conditions**.

To complete the flow, ask the user if they want to verify the new expiration date.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a vertical list of steps is visible, each with a number, a condition, and a status (e.g., 'Defined'). Step 3: '3 is Defined'. Step 4: 'This step has no content'. Step 5: '11 Step 4'. Step 6: '3 is Defined'. Step 7: '6 is Yes'. Step 8: 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...'. Step 9: 'This step has no content'. At the top right, there are tabs for 'Editor' and 'Visualization'. Below the tabs, the 'Step 9' configuration is shown. It includes a dropdown menu for 'Is taken' with options: 'without conditions' (selected), 'without conditions' (disabled), and 'with conditions'. A 'Set variable values' button is also present. The 'Assistant says' section contains placeholder text: 'For example: Please select from the following options:' followed by a rich text editor toolbar. The 'And then' section contains a 'Continue to next step' button.

26. Enter the text that follows in the **Assistant says** field.

**Assistant says:**

Would you like to verify the new expiration date for your certificate?

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a flowchart titled 'z/OS certificate expires soon'. The flowchart consists of several steps:

- Step 1:** 'Continue to next step' (numbered 1)
- Step 2:** '3 is Defined' (numbered 2)
- Step 3:** 'This step has no content' (numbered 3)
- Step 4:** 'Go to subaction: Retrieve certifica...' (numbered 4)
- Step 5:** '3 is Defined' (numbered 5)
- Step 6:** 'Below is your certificate's expiration date:  
1. Step 4' (numbered 6)
- Step 7:** 'Continue to next step' (numbered 7)
- Step 8:** 'Would you like to renew your certificate?' (numbered 8)
- Step 9:** 'Confirmation' (numbered 9)
- Step 10:** 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...  
T Free text' (numbered 10)
- Step 11:** 'Continue to next step' (numbered 11)
- Step 12:** 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...  
Go to subaction: Cert Renewal ski...' (numbered 12)
- Step 13:** '7 is Defined' (numbered 13)
- Step 14:** 'Would you like to verify the new expiration date for your certificate?' (numbered 14)
- Step 15:** 'Continue to next step' (numbered 15)

**Step 9 Configuration:**

- Condition:** Is taken with conditions
- Set variable values:** Set variable values
- Conditions:**
  - If All of this is true:
  - 7. What date would y... is defined
  - and Add condition +
- New condition group +**
- Assistant says:** Would you like to verify the new expiration date for your certificate?
- Define customer response:** Confirmation
- And then:** Continue to next step

27. Click the **Define customer response** option list and select **Confirmation**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a workflow titled 'z/OS certificate expires soon'. The steps are numbered 1 through 9:

- Step 1:** 'Continue to next step' (greyed out)
- Step 2:** '3 is Defined' (greyed out)
- Step 3:** 'This step has no content'
- Step 4:** 'Go to subaction: Retrieve certifica...' (greyed out)
- Step 5:** '3 is Defined' (greyed out)
- Step 6:** 'Below is your certificate's expiration date:  
1 Step 4' (greyed out)
- Step 7:** 'Continue to next step' (greyed out)
- Step 8:** 'Would you like to renew your certificate?' (greyed out)
- Step 9:** 'Confirmation' (greyed out)

**Step 9 Configuration:**

- Condition:** 'Is taken with conditions' (highlighted with a green dashed box)
- Set variable values:** 'Set variable values' button
- Conditions:** '1 condition' (highlighted with a green dashed box)
  - If **All** of this is true:
    - 7. What date would y... is defined (highlighted with a green dashed box)
  - and **Add condition +**
- New condition group +**

**Assistant says:**

Would you like to verify the new expiration date for your certificate?

**Define customer response:**

**System:** Confirmation

Enable customers to select from Yes or No response.

**Confirmation:** As buttons

Yes No

Tr Free text  
Regex  
Number  
Date  
Time  
Saved

Preview ▶

28. Click **Next step +**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a vertical stack of cards represents a workflow:

- Step 3:** "is Defined". Subaction: "Go to subaction: Retrieve certifica..."
- Step 4:** "This step has no content". Subaction: "Go to subaction: Step 4"
- Step 5:** "is Defined". Below is your certificate's expiration date: "11. Step 4". Subaction: "Continue to next step"
- Step 6:** "is Defined". Would you like to renew your certificate? Subaction: "Confirmation". Subaction: "Continue to next step"
- Step 7:** "is Yes". What date would you like to set the renewed certificate's expiration date to? Please enter in the... Subaction: "Free text". Subaction: "Continue to next step"
- Step 8:** "is Defined". Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an... Subaction: "Go to subaction: Cert Renewal ski..."
- Step 9 (highlighted):** "Is taken with conditions". Conditions: If All of this is true:  
7. What date would y... is defined  
and Add condition +

The right side of the interface shows the configuration for Step 9:

- Step 9:** "Is taken with conditions".  
Conditions: If All of this is true:  
7. What date would y... is defined  
and Add condition +
- Assistant says:** "Would you like to verify the new expiration date for your certificate?"  
Buttons: Yes, No.  
Actions: View response, Edit validation.
- And then:** "Continue to next step".
- Buttons at the bottom:** New step +, Preview, >.

29. Click the **Is taken** option list and select **with conditions**.

On the condition that the user selected **Yes** in the previous step, configure a step to run the **Retrieve certificate expiration** skill-flow again to retrieve and display the new expiration date of the renewed certificate.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'z/OS certificate expires soon'. The 'Editor' tab is selected. Step 10 is currently being configured. The configuration pane shows the condition 'Is taken' set to 'without conditions'. Below this, there are two options: 'without conditions' (selected) and 'with conditions'. The 'with conditions' option is highlighted with a green box. The 'Assistant says' section contains the text 'For example: What type of transfer would you like to make?'. The 'Define customer response' section has a dropdown menu. The 'And then' section is collapsed. Step 10 itself is labeled 'This step has no content.' and includes a 'Continue to next step' button.

30. Click the **And then** option list and select **Go to a subaction**.

z/OS certificate expires soon

Step 10

Is taken with conditions

Conditions

If All of this is true:

9. Would you like to v... is Yes

and Add condition +

New condition group +

Assistant says

For example: What type of transfer would you like to make?

Define customer response

And then

- Continue to next step
- Go to a subaction
- Re-ask previous step(s)
- Use an extension
- Search for the answer
- Connect to agent
- End the action

Preview ▶

31. Click the (a) Go to option list, select (b) Retrieve certificate expiration, and then click (c) Apply.

z/OS certificate expires soon

Step 10

Is taken with conditions

Conditions

If All of this is true:

9. Would you like to v... is Yes

and Add condition +

Settings

Go to a subaction

Go to

Select an action...

Cert Renewal skill flow

Fallback

Retrieve certificate expiration

Cancel Apply

And then

32. Click Edit passed values.

The screenshot shows the IBM Watsonx Orchestrate Editor interface. On the left, a vertical stack of cards represents a workflow:

- Card 3: "z/OS certificate expires soon" - "Is taken with conditions".
- Card 5: "Step 4" (highlighted in blue).
- Card 6: "Would you like to renew your certificate?" - "Confirmation".
- Card 7: "What date would you like to set the renewed certificate's expiration date to? Please enter in the..." - "Free text".
- Card 8: "Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an..." - "Confirmation".
- Card 9: "Would you like to verify the new expiration date for your certificate?" - "Confirmation".
- Card 10: "This step has no content." (highlighted in blue).

**Step 10:**

Condition: If All of this is true:

- 9. Would you like to v... is Yes
- and Add condition +

New condition group +

**Assistant says:**

For example: What type of transfer would you like to make?

**Define customer response:**

**And then:**

Action: Go to a subaction "Retrieve certificate expiration".

Pass values:

Upon return Continue

Edit settings Edit passed values

### 33. Click Set new value + and then select extra\_vars.cert\_label\_survey.

The screenshot shows the IBM Watsonx Orchestrate Editor interface with the "Edit passed values" dialog open over the workflow.

**Passed values:**

**Edit variable values:**

Configure how your skill-based action leverages and stores information in assistant variables. [Learn more](#)

Variables are not private if they are shared with Skill Studio.

**Edit variable values Response behavior:**

The values you select from this action will be passed to "Retrieve certificate expiration" skill.

**Set new value +** (highlighted in green)

< All variables

1. extra\_vars.cert\_label\_survey (highlighted in green)

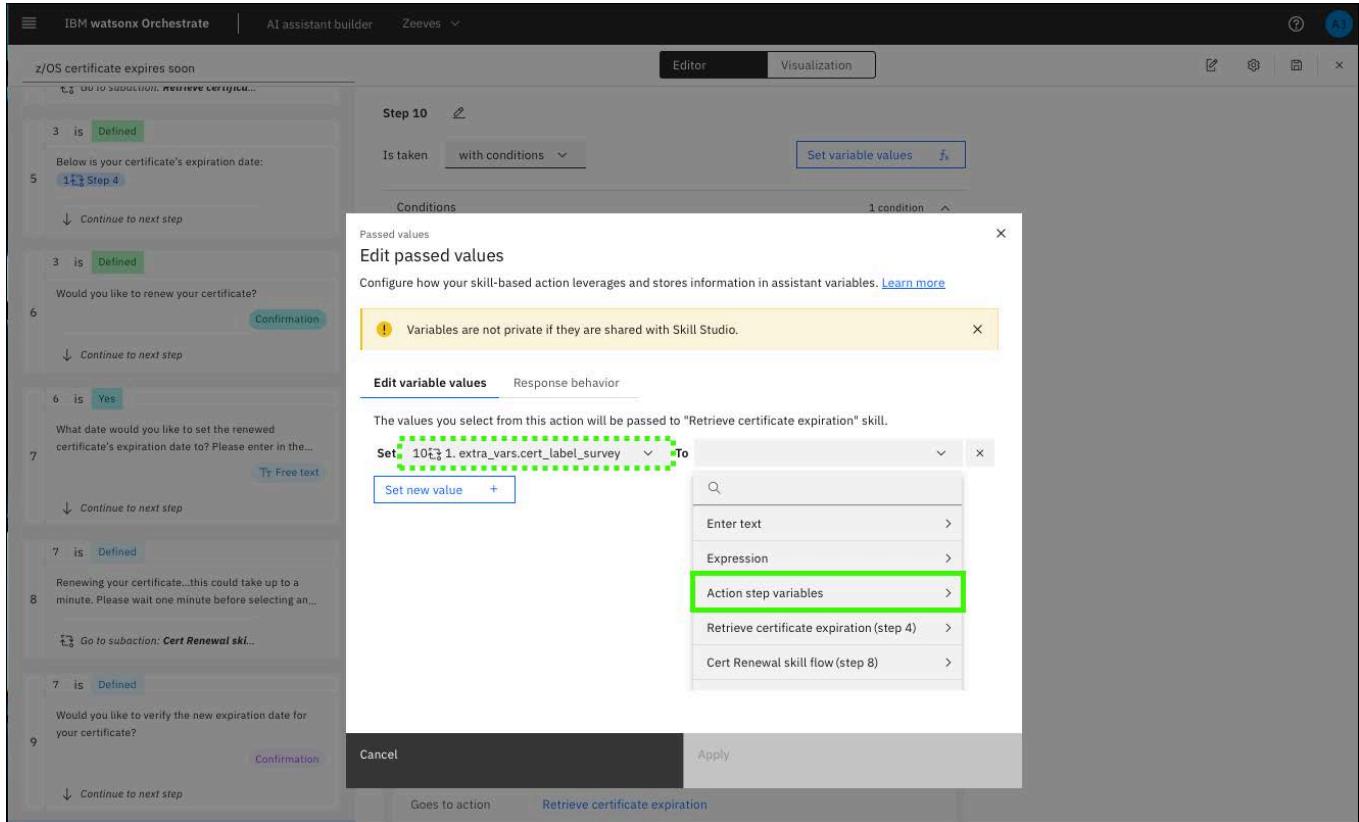
2. extra\_vars.cert\_type\_survey

3. extra\_vars.owner\_id\_survey

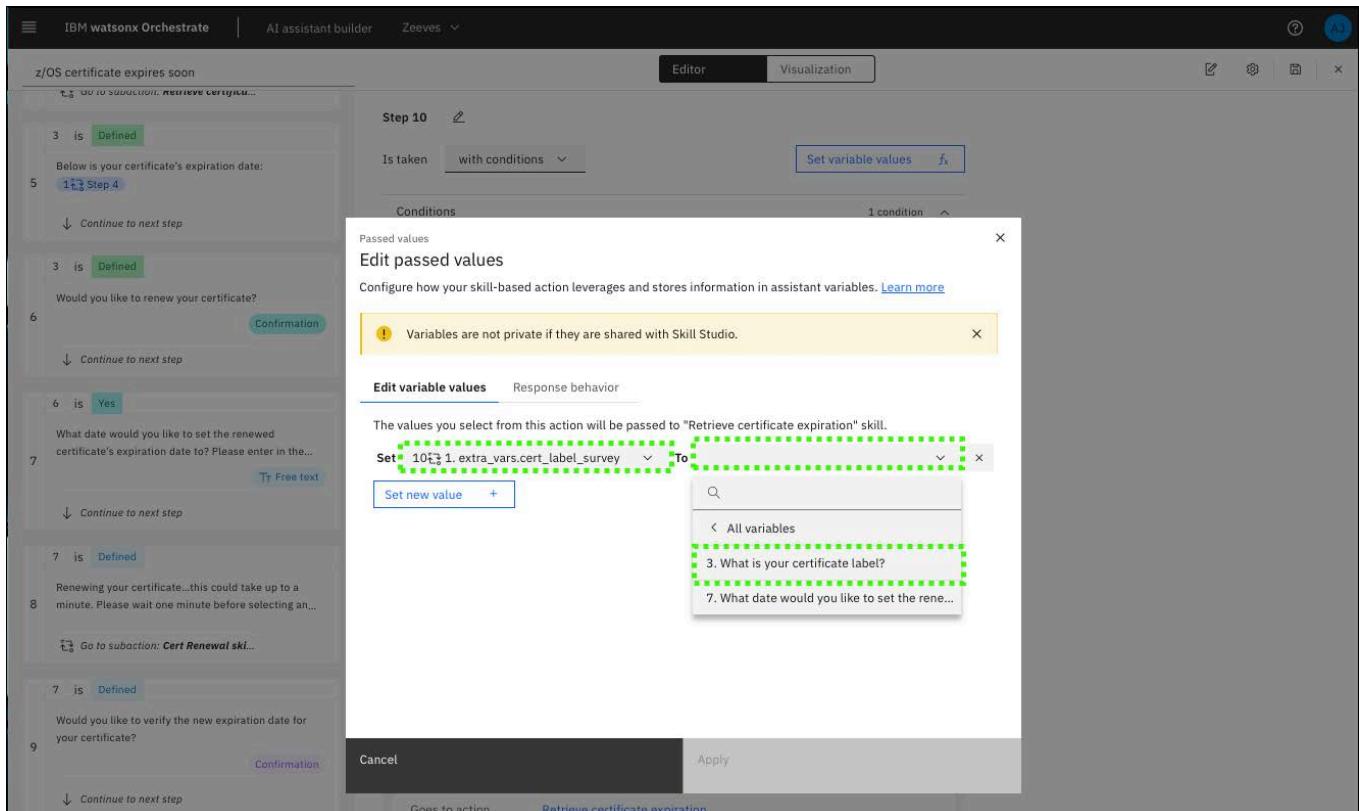
**Cancel Apply**

**Goes to action:** Retrieve certificate expiration

34. In the To option list, click Action step variables.



35. Click What is your certificate label?.



36. Review the Edit variable values and click Apply.

The screenshot shows the IBM Watsonx Assistant Editor interface. On the left, a flowchart of steps 1 through 10 is visible. Step 10 is currently selected. A modal window titled "Edit passed values" is open over the editor, containing a warning message: "Variables are not private if they are shared with Skill Studio." Below this, there are tabs for "Edit variable values" and "Response behavior". Under "Edit variable values", a configuration is shown: "Set 10: 3.1.extra\_vars.cert\_label\_survey To 3. What is your certificate label?". The "Apply" button at the bottom of the modal is highlighted with a blue rectangle.

### 37. Click Next step +.

The screenshot shows the IBM Watsonx Assistant Editor interface after performing step 37. The modal window from the previous screenshot is no longer present. The configuration for Step 10 has been applied. The "New step +" button at the bottom of the editor is highlighted with a green rectangle.

38. Click the **Is taken** option list and select **with conditions**.

The final step is to display new expiration date of the certificate. Nothing is returned in the previous step when running the Retrieve certificate expiration skill flow - this was because the output form was hidden when the skill was created. In this step, provide the output as an assistant response to the user, with only the expiration date extracted from the full job output.

The screenshot shows the IBM Watsonx Orchestrator AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a workflow titled 'z/OS certificate expires soon'. Step 11 is currently selected, indicated by a blue border. The configuration for Step 11 includes:

- Is taken:** A dropdown menu with three options: 'without conditions' (selected), 'without conditions', and 'with conditions'. The 'with conditions' option is highlighted with a green box.
- Assistant says:** A text input field containing placeholder text: 'For example: What type of transfer would you like to make?'. Below this is a 'Define customer response' dropdown.
- And then:** A section with a 'Continue to next step' button.

The left sidebar lists other steps in the workflow, numbered 3 through 11. Step 11 is explicitly noted as having 'This step has no content'.

39. Enter the following text in the **Assistant says** field.

**Assistant says:**

Below is the new expiration date of your renewed certificate:

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a workflow titled 'z/OS certificate expires soon'. The workflow consists of several steps:

- Step 11:** A conditional step where the variable 'Is taken' is checked with conditions. The condition is set to 'If All of this is true:' followed by a condition group containing step 9 ('Would you like to v... is Yes').
- Assistant says:** A text box containing the message 'Below is the new expiration date of your renewed certificate:'.
- And then:** A continuation of the workflow with a 'Continue to next step' button.
- Step 11 (continued):** A step where the variable '9' is checked with conditions. The condition is set to 'If All of this is true:' followed by a condition group containing step 9 ('Would you like to v... is Yes').
- Assistant says:** A text box containing the message 'Below is the new expiration date of your renewed certificate:'.
- And then:** A continuation of the workflow with a 'Continue to next step' button.

40. While still in the **Assistant says** field, press **return** and then type **\$**.



The **\$** is a special key that lists available functions. The following image is edited to show that you must type the **\$**, but it is not displayed on your screen.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a workflow titled 'z/OS certificate expires soon'. The steps are numbered 3 through 11. Step 3 is 'Defined' and asks if you want to renew your certificate. Step 6 is 'Yes' and asks for the expiration date. Step 7 is 'Defined' and shows a message about certificate renewal. Step 9 is 'Yes' and asks if you want to verify the new expiration date. Step 11 is also 'Yes' and displays the new expiration date. On the right side, under 'Step 11', there is a configuration panel for conditions. It shows a condition where step 9 ('Would you like to v...') is 'Yes'. Below this, there is a 'New condition group +' button. Under 'Assistant says', there is a rich text editor with a '\$' placeholder, and a dropdown menu showing options like 'Action step variables', 'Retrieve certificate expiration (step 4)', 'Cert Renewal skill flow (step 8)', 'Retrieve certificate expiration (step 10)', 'Assistant variables', and 'Integration variables'.

#### 41. Click **Retrieve certificate expiration (step 10)**.



**Be sure to select the output from step 10 and not step 4.**

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'z/OS certificate expires soon'.

**Step 11:** Configuration details for 'Is taken with conditions'.

- Conditions:** 1 condition
  - If All of this is true:
    - 9. Would you like to v... is Yes
    - and Add condition +
- New condition group +**
- Assistant says:**
  - Action step variables >
  - Retrieve certificate expiration (step 4) >
  - Cert Renewal skill flow (step 8) > (dropdown menu)
  - Retrieve certificate expiration (step 10) >** (highlighted with a green border)
  - Assistant variables >
  - Integration variables >

The left sidebar lists steps 3 through 11, each with a status indicator (e.g., 'Defined', 'Yes') and a 'Confirmation' button. Step 11 is highlighted with a blue box.

42. Click **Retrieve certificate expiration result variable**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area is titled 'z/OS certificate expires soon'.

**Step 11:** This step is set to 'Is taken with conditions'. A condition is defined: 'If All of this is true:' with one condition: '9. Would you like to v... is Yes'. There is also an option to 'Add condition +'.

**Assistant says:** Below is the new expiration date of your renewed certificate. A code block is shown: < All variables > 1. Retrieve certificate expiration result var... Define customer response.

**And then:** An option to 'Continue to next step' is available.

**Workflow Summary:**

- Step 3: 'Would you like to renew your certificate?' (Confirmation)
- Step 6: 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...' (Free text)
- Step 7: 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...' (Confirmation)
- Step 9: 'Would you like to verify the new expiration date for your certificate?' (Confirmation)
- Step 10: 'This step has no content' (Free text)
- Step 11: 'Below is the new expiration date of your renewed certificate: <br />' (Text)

43. Click the **And then** option list and select **End the action**.

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', and a user icon. The main area displays a workflow titled 'z/OS certificate expires soon'.

**Workflow Steps:**

- Step 3: 'Would you like to renew your certificate?' (Is taken with conditions)
- Step 6: 'Confirmation' (Confirmation step)
- Step 7: 'What date would you like to set the renewed certificate's expiration date to? Please enter in the...' (Free text step)
- Step 8: 'Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an...' (Text step)
- Step 9: 'Would you like to verify the new expiration date for your certificate?' (Confirmation step)
- Step 10: 'This step has no content' (Text step)
- Step 11: 'Below is the new expiration date of your renewed certificate: 11 Step 10' (Text step)

**Step 11 Configuration:**

- Condition:** Is taken with conditions
- Conditions:**
  - If All of this is true:
    - 9. Would you like to v... is Yes
    - and Add condition +
- Assistant says:** Below is the new expiration date of your renewed certificate: 11 Step 10.
- And then:**
  - Continue to next step (highlighted with a green box)
  - End the action (highlighted with a green box)

44. Review the (a) final step, click (b) Save (), and then click (c) x.

**a**

**b**

**c**

**Step 11**

Is taken with conditions

Conditions

If All of this is true:

9. Would you like to v... is Yes

and Add condition +

New condition group +

**Assistant says**

Below is the new expiration date of your renewed certificate:  
1 10. Retrieve certificate expiration

Define customer response

**And then**

End the action

**Step 12**

9 is Yes

Below is the new expiration date of your renewed certificate: 1 Step 10

Action complete

**Step 13**

**Step 14**

**Step 15**

**Preview**

## Run the complete custom-built action

The custom-built action is now complete and can be demonstrated to the SA for this use case. In demonstrating the ability to infuse Ansible automations into a natural conversation, the SA is able to see the value that Watsonx Assistant for Z can provide in helping them improve productivity and remove the need to go to their senior colleagues for assistance.

1. Open **Preview** in the **Ai assistant builder**.

The screenshot shows the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with options like Home, Build, Generative AI, Actions (which is selected and highlighted with a green border), Evaluate, Preview, Deploy, Publish, Environments, Improve, and Analyze. The main area is titled 'Created by you /' and contains a table of AI actions. The columns are Name, Last edited, Examples count, Steps count, and Status. There are six rows listed:

Name	Last edited	Examples count	Steps count	Status
<a href="#">z/OS IPL Information</a>	a day ago	0	3	Green checkmark
<a href="#">Zeeves-gather-facts-flow</a>	3 days ago	1	0	Green checkmark
<a href="#">Retrieve IPL information</a>	a day ago	1	3	Green checkmark
<a href="#">Retrieve certificate expiration</a>	4 hours ago	0	3	Green checkmark
<a href="#">Cert Renewal skill flow</a>	4 hours ago	0	7	Green checkmark
<a href="#">z/OS certificate expires soon</a>	a few seconds ago	1	11	Green checkmark

2. Enter the following text in the assistant.

**Prompt:**

How do I check the expiration date for my certificate that's expiring soon?



Use the Change layout option to open a full page view of the assistant.

The screenshot shows the AI assistant preview interface. The top navigation bar includes 'Preview assistant', 'Copy link to share', 'Change layout' (which is highlighted with a green border), 'Change background', and 'Customize web chat'. Below this, the interface displays a message from 'AssistantZeeves':

Hi! I'm Zeeves. How can I help you today?

At the bottom, there's a text input field containing the prompt: "How do I check the expiration date for my certificate that's expiring soon?". A green arrow icon is positioned to the right of the input field.

3. Review the response and click Yes.

The assistant responds with conversational search, providing a content-grounded answer based on IBM Z documentation. The response includes a RACF command that the SA might use to determine their certificate's expiration date.

Following the response, the assistant prompts the user if they want to run the skill to retrieve a certificate's expiration date.

IBM Watson Assistant

Preview assistant

AssistantZeeves

You 12:37 PM

How do I check the expiration date for my certificate that's expiring soon?

12:37 PM

To retrieve the expiration date of your z/OS certificate, you would typically check the certificate itself or consult the system logs. However, based on the provided documents, there isn't a direct command or utility mentioned for this purpose. You may need to contact your system administrator or refer to your specific system's documentation for precise instructions. Generally, you can use commands like 'ODTE' or 'RACDCERT' to list and inspect certificates.

[AI] Accuracy of generated answers may vary.

Would you like to run the skill to retrieve your certificate's expiration date?

Yes No

Type something... ▶

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4. Enter DEMOCERT after the assistant responds with **What is your certificate label?**

**Prompt:**

DEMOCERT

The screenshot shows the IBM Watsonx Orchestrate interface with the 'AI assistant builder' tab selected. A sidebar on the left contains icons for preview, AI skills, and system status. The main area is titled 'Preview assistant' and shows a conversation with 'AssistantZeeves'. The user asks, 'How do I check the expiration date for my certificate that's expiring soon?'. The AI responds with instructions on how to check the expiration date of a z/OS certificate. It then asks, 'Would you like to run the skill to retrieve your certificate's expiration date?'. The user selects 'Yes'. The AI then asks, 'What is your certificate label?'. A green dashed box highlights the input field where the user typed 'DEMOCERT'. The bottom right corner of the input field has a blue arrow icon.

5. Wait 10 seconds and then click **Apply**.

The screenshot shows the IBM Watsonx Orchestrate interface. At the top, there are tabs for 'IBM Watsonx Orchestrate', 'AI assistant builder', and 'Zeeves'. On the left, there's a sidebar with various icons. The main area is titled 'Preview assistant' and shows a conversation with 'AssistantZeeves'. The user asks, 'How do I check the expiration date for my certificate that's expiring soon?'. AssistantZeeves responds with instructions: 'To retrieve the expiration date of your z/OS certificate, you would typically check the certificate itself or consult the system logs. However, based on the provided documents, there isn't a direct command or utility mentioned for this purpose. You may need to contact your system administrator or refer to your specific system's documentation for precise instructions. Generally, you can use commands like 'ODTE' or 'RACDCERT' to list and inspect certificates.' Below this, there's a note: 'Accuracy of generated answers may vary.' The user then asks, 'Would you like to run the skill to retrieve your certificate's expiration date?'. AssistantZeeves offers two options: 'Yes' and 'No'. The user selects 'Yes'. AssistantZeeves then suggests the skill 'DEMOCERT'. A modal window is open, showing the skill configuration for 'Retrieve certificate expiration'. It has an icon of a globe with a gear, a title 'Retrieve certificate expiration', an input field 'id \*' with the value '21', and two buttons at the bottom: 'Cancel' and 'Apply', with 'Apply' highlighted.

#### 6. Review the response and then click Yes.

By providing the automation within the assistant conversation, it makes it very quick for the SA to identify the certificate's expiration date. In addition to providing this valuable information, the assistant is configured with another automation to renew the certificate if they choose to do so.



**The expiration date you see may differ from the image that follows.**

The screenshot shows the IBM Watsonx Assistant interface. At the top, there are tabs for "IBM Watsonx Orchestrate", "AI assistant builder", and "Zeeves". On the right, there are buttons for "Copy link to share", "Change layout", "Change background", and "Customize web chat". The main area is titled "Preview assistant" and shows a conversation with "AssistantZeeves". The conversation starts with the AI asking if the user wants to run a skill to retrieve their certificate's expiration date. The user replies "Yes". The AI then asks for the certificate label, and the user replies "DEMOCERT". A modal window titled "Retrieve certificate expiration" shows the ID "26" and buttons for "- | +". Below the modal, the AI displays the certificate's expiration date as "2025/01/30 23:59:59". The user is then asked if they would like to renew their certificate, with "Yes" highlighted in green. At the bottom, there is a text input field with "Type something..." and a send button.

7. Enter a date in the future in the format **YYYY-MM-DD**.

Preview assistant

AssistantZeeves

12:40 PM

What is your certificate label?

You 12:42 PM

DEMOCERT

12:42 PM

Retrieve certificate expiration

id \*

21

12:44 PM

Below is your certificate's expiration date:  
{"certificate\_expiration\_date": "2025/01/30 23:59:59"}

Would you like to renew your certificate?

Yes No

12:48 PM

Yes

12:48 PM

What date would you like to set the renewed certificate's expiration date to? Please enter in the form of YYYY-MM-DD.

2025-06-30

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8. Review the response, wait 30 seconds to a minute, and then click **Yes**.



**It is crucial that you wait 30 seconds to a minute before selecting Yes.**

This is because in the background, your z/OS Certs – Search and Renew automation is running within AAP (which you can verify within the [AAP Web console](#)). This is mapping the user-inputted expiration date as well as the original certificate label provided by the end-user to the inputs of this AAP automation."

The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. At the top, there are tabs for 'IBM Watsonx Orchestrate', 'AI assistant builder', and 'Zeeves'. On the right, there are buttons for 'Copy link to share', 'Change layout', 'Change background', and 'Customize web chat'. The main area is titled 'Preview assistant' and shows a conversation with an AI named 'AssistantZeeves'. The AI has asked for the user's certificate expiration date, which is shown as '2025/01/30 23:59:59'. It then asks if the user wants to renew the certificate, with 'Yes' and 'No' buttons. The user has responded with 'Yes'. The AI then asks for a new expiration date, with the user entering '2025-06-30'. Finally, the AI is shown renewing the certificate, with a message indicating it could take up to a minute and a question about verifying the new expiration date, with 'Yes' and 'No' buttons. A text input field at the bottom is labeled 'Type something...'. On the left side of the interface, there is a sidebar with various icons.

9. Wait 10 seconds and then click **Apply**.

The screenshot shows a conversation in the 'Preview assistant' tab of the IBM Watsonx Orchestrate interface. The user sends a message asking for the renewal date. The AI assistant responds with a placeholder message and then asks if the user wants to verify the new expiration date. The user replies with 'Yes'. Finally, the AI assistant performs an action to retrieve the certificate expiration date, which is then displayed in a modal window.

AssistantZeeves

You 1:05 PM  
What date would you like to set the renewed certificate's expiration date to? Please enter in the form of YYYY-MM-DD.

You 1:05 PM  
2025-06-30

Renewing your certificate...this could take up to a minute. Please wait one minute before selecting an option below.

Would you like to verify the new expiration date for your certificate?

Yes No

You 1:07 PM  
Yes

1:07 PM

Retrieve certificate expiration

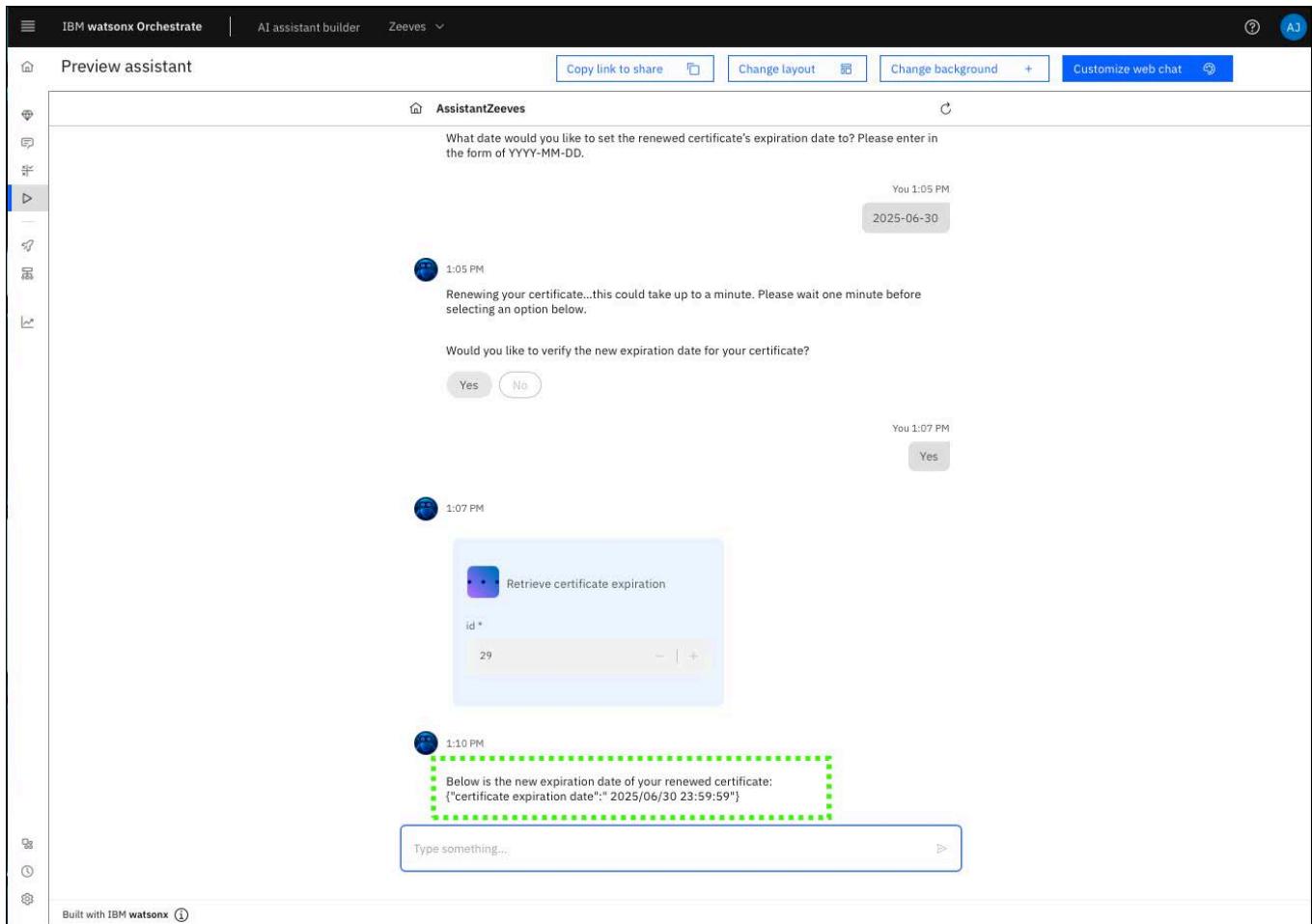
id \*

29 - +

Cancel Apply

#### 10. Review the response.

The response should match the date that is entered in step 7.



In the demo, the SA receives immediate guidance on identifying the certificate expiration date via RACF commands. The SA runs automation that is proposed by the assistant to retrieve the certificate information. Also, because the assistant is configured with step-by-step conversation flows, it is possible to add other prompts within the conversation. For example, proposing the automation of renewing the certificate on their behalf. By doing so, the SA is able to reduce the time it takes to complete this routine task.

Recall how many steps were involved in the Ansible template for **z/OS Certs – Search and Renew**. By automating these tasks with Ansible, the System Administrator streamlines the entire process and ensures that their critical certificates are up to date and reduce the risk of expired certificates disrupting their business services.

# Use case: RACF administration support



This is a **challenge** use case.

In this use case, step-by-step directions are not provided. Use the knowledge gained from previous sections of the lab guide to complete updates to the assistant to meet the use case requirements. Several help tips are provided and a sample demonstrate flow is included.

This use case explores the ability of watsonx Assistant for Z to provide self-service support for activities related to Resource Access Control Facility RACF (RACF) Administration support. The client mentioned that their RACF Administrators are often inundated with requests to help reset user's Time Sharing Option (TSO) passwords. Also, requests to grant users certain authorizations to RACF profiles required for the users to complete their jobs are numerous.

Creating a custom-built action for the assistant that provides self-service options to users requesting RACF assistance. Depending on the assistance being requested, the assistant will trigger automations that complete tasks on their behalf without intervention from the RACF Administrator.



The actions and configuration that follow are meant purely for demonstration purposes.

The actions and configuration that follow are meant purely for demonstration purposes to show the art of the possible with watsonx Assistant for Z. There are security considerations to keep in mind when configuring assistants for this purpose, including user authentication and the ability to authorize users to execute certain automations. However, by following the steps in this section, you will show the level of customization that is possible with watsonx Assistant for Z and different an assistant can improve productivity.

1. Create an app with the required TSO skills.



Use Skills studio to create the app.

**App name:**

TSO Command

Skills to include: z/OS TSO COMMAND(s) Retrieve job output (utility skill)

Welcome to Skill studio

Optimize productivity by using projects to build and manage skill flows and connectors.

**Create**

**Skills and apps** Projects

**Skills** Apps

Find a skill

Configure prebuilt skills

**Skills**

Name	Step in the process	Status	Skill type	Author	Last edited
Retrieve job output	Ready to use	Published	Imported	andrew@jones-tx.com	January 20 2025
z/OS TSO Command(s)	Ready to use	Published	Imported	andrew@jones-tx.com	January 20 2025

## 2. Create a connection for the app.



Use Skills catalog to create the app.

Ansible Controller Skills - TSO Command (2)

Personal skills

Search skills

Ansible Controller Skills - TSO Command

Retrieve job output TSO Command - Retrieve job output by job Id	z/OS TSO Command(s) TSO Command - A playbook to execute one or multiple TSO commands on the target z/OS system.
--	--

Connected

## 3. Create a skill flow to get the output of the **TSO Command**.

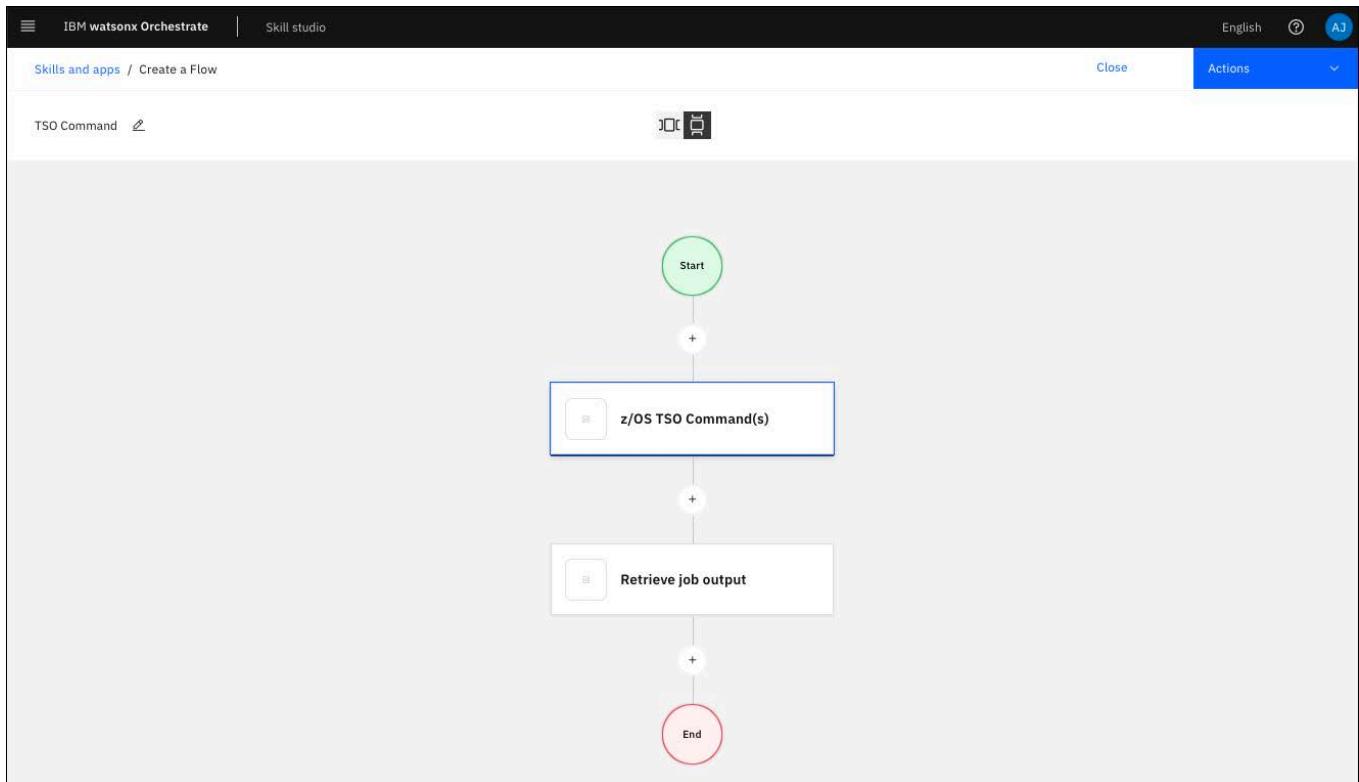


Use Skills studio to create the skill flow.

The skill flow should run the **TSO Command** skill and then the **Retrieve job output** utility skill. The output from the **TSO Command** should be mapped to the input of the **Retrieve job output** utility skill. Hide both the input and output forms for the **TSO Command** skill.

**Skill flow name:**

TSO COMMAND



#### 4. Add the skills to the **draft** version of the assistant.



**Use Skill sets to add the skills to the assistant.**

Application	Number of skills	Credential type	Connected by	Action
Ansible Controller Skills - TSO Command	2	Team	andrew@jones-tx.com	[Edit]

#### 5. Create a skill-based action that uses the skill flow.

Create an action that triggers the skill flow to execute TSO commands on z/OS and then display the output of those commands.



**Use AI Assistant builder to create the action.**



**Do not add example phrases to the skill-based action.**

Name	Last edited	Examples count	Steps count	Status
⊗ TSO Command	a few seconds ago	0	1	Green checkmark
⊗ z/OS certificate expires soon	3 hours ago	1	11	Green checkmark
⊗ Cert Renewal skill flow	7 hours ago	0	7	Green checkmark
⊗ Retrieve certificate expiration	7 hours ago	0	3	Green checkmark
⊗ Retrieve IPL information	a day ago	1	3	Green checkmark
⊗ z/OS IPL Information	a day ago	0	3	Green checkmark
⊗ Zeeves-gather-facts-flow	3 days ago	1	0	Green checkmark

## 6. Create a custom-built action for RACF administration support.



**Use AI Assistant builder to create the action.**

**Phrase to start the interaction:**

RACF assistance

The steps for the custom-built action follow:

**Step 1.** Without conditions, prompt the user for their RACF User ID as free text.

**Assistant says:**

What is your RACF User ID?

The step should look like the following image:

The screenshot shows the IBM watsonx Orchestrate interface. On the left, under 'Conversation steps', there is a step labeled '1' with the prompt 'What is your RACF User ID?'. A green dashed box highlights this step. To the right, under 'Step 1', it says 'Is taken without conditions' and has a 'Set variable values' button. Below that is the 'Assistant says' section, which contains the text 'What is your RACF User ID?' and a 'User enters free text' placeholder. At the bottom, there is an 'And then' section with a 'Continue to next step' button.



### Use the following guidance when entering prompts and expressions in the following custom-built action steps.

Do NOT use the copy and paste icon if the string contains a \$. Type each string manually.

When \$ appears in the string to enter, type the \$ character and then select the variable specified in the <>. For example: User passphrase changed to \$<7. Please enter your new RACF passphrase>

Use the single quote character ' for all single quotes shown.

**Step 2.** Without conditions, use provided user ID and display a message that the assistant is checking the current privileges.

#### Assistant says:

```
Checking user privileges for $<1. What is your RACF User ID>
```

Include in the **Assistant says** the provided user ID by including the function 1. *What is your RACF User ID*.

Add an **And then** option to run the **TSO Command** as a subaction.

Edit the **passed values** for the subaction and add a new passed value for 1. *extra\_vars.zos\_tso\_command*. The **To** of the variable will be an **Expression** and include the string:

```
'LIST USER ' + $<1. What is your RACF User ID>
```

After the +, enter a \$ and select **Action step variables** and then select 1. *What is your RACF User ID*.

The screenshot shows the AI assistant builder interface with the 'Editor' tab selected. A conversation step is being configured:

- Customer starts with:** RACF assistance
- Conversation steps:**
  - What is your RACF User ID?
  - Checking user privileges for Step 1
  - Do you need RACF assistance?
  - Is Privileges Issues
  - This step has no content
- Step 2:** Is taken without conditions
- Passed values:** Edit passed values (Modal window open)

The modal window 'Edit passed values' contains the expression editor with the expression: 'LIST USER ' + 1. What is your RACF User ID?'. The 'Apply' button at the bottom right is highlighted in blue.

The step should look like the following image:

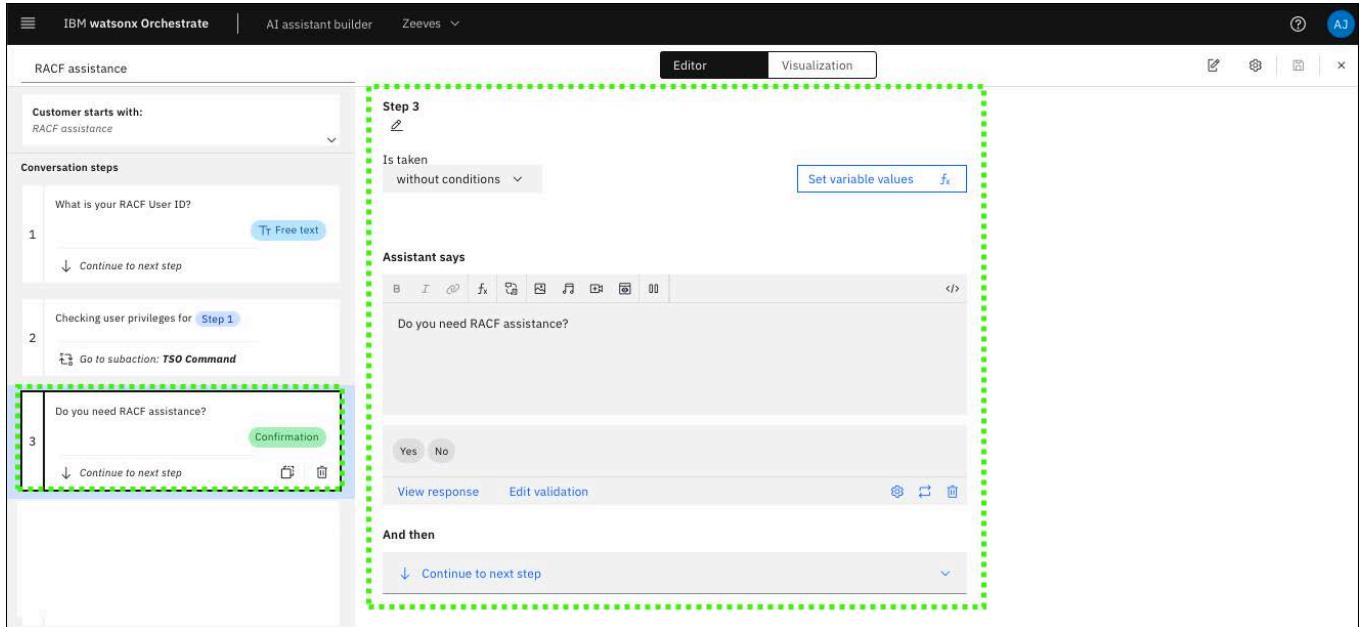
The screenshot shows the AI assistant builder interface with the 'Editor' tab selected. The conversation steps and Step 2 configuration are identical to the previous screenshot, but the entire configuration area is highlighted with a green dashed border.

**Step 3.** Without conditions, prompt the user if they want RACF assistance and get a Yes or No confirmation.

**Assistant says:**

Do you need RACF assistance?

The step should look like the following image:



**Step 4.** With conditions, prompt the user what type of assistance they need.

**Assistant says:**

What type of assistance?

Create a **Options** type **Customer response** with two options:

Changing my RACF password

and

Privileges issue

Change the **Customer response** settings to **Always ask for this information, regardless of previous messages**.

The screenshot shows the IBM Watsonx Assistant Editor interface. On the left, there's a sidebar titled "Conversation steps" with four numbered steps:

- What is your RACF User ID?
- Checking user privileges for Step 1  
Go to subaction: TSO Command
- Do you need RACF assistance?  
Confirmation
- 3 is Yes  
What type of assistance?  
Changing my ... Privileges iss...

Step 4 is highlighted with a blue border. To the right of the steps, under "Step 4", it says "Is taken with conditions". A condition is defined: "If All of this is true:" followed by "3. Do you need RACF ... is Yes". Below this, there's a "Conditions" section with a "New condition group" button. Under "Assistant says", there's a text input field with "What type of assistance?" and a suggestion "Changing my RACF password". At the bottom, there's an "And then" section with a "Continue to next step" button.

The step should look like the following image:

This screenshot is identical to the one above, but the entire content of Step 4 is enclosed in a thick green dotted border. This highlights the specific step for modification.

**Step 5. With conditions, change the condition Step 4. What type of assistance? and the value of Privilege issue.**

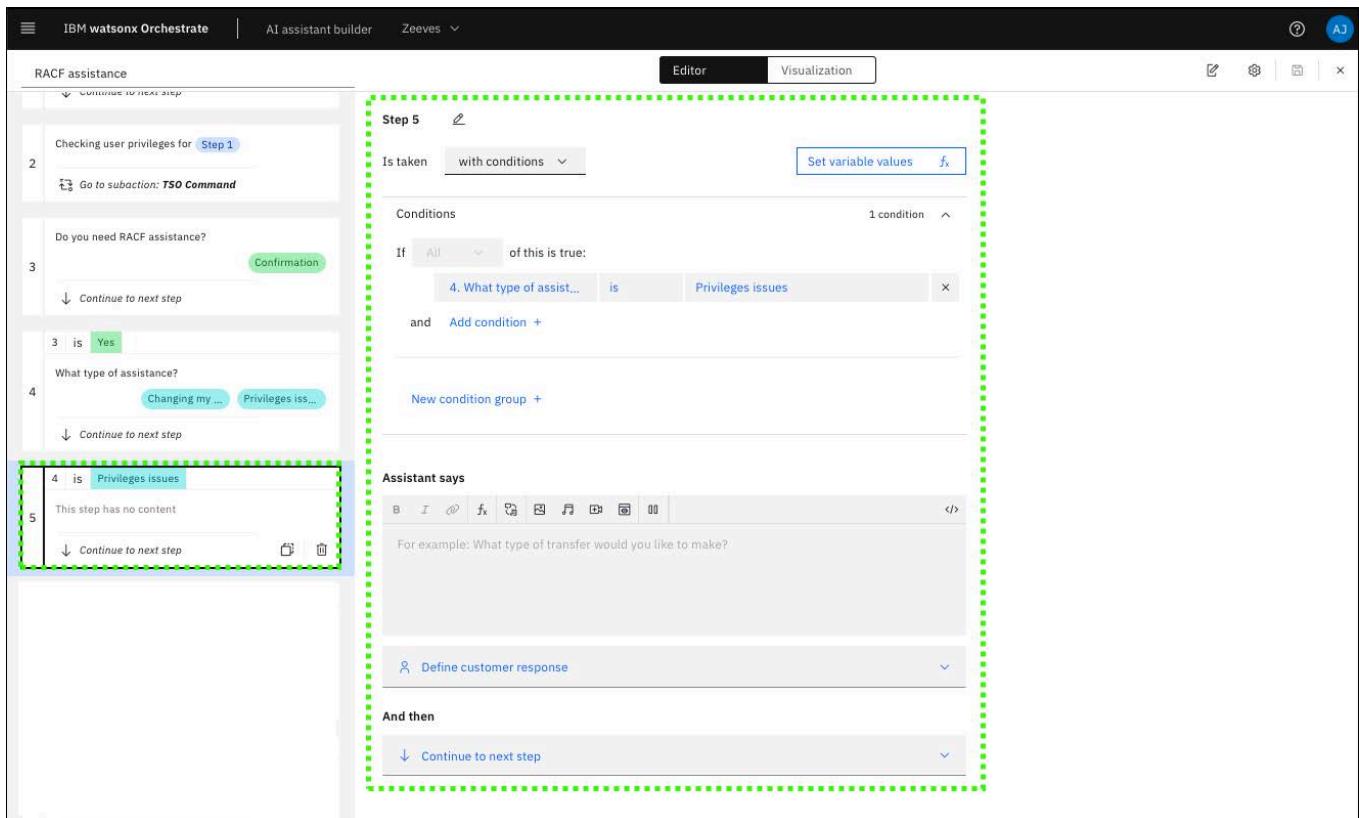
**Assistant says:**

Notifying the RACF Administrator.

 **Other options exist.**

There are alternative actions that can be taken if the user selects 'Privileges issue'. For example, the assistant can trigger an automated email to the [RACF administrator](#). At the time of writing this documentation, Orchestrate does not allow Outlook integrations to IBM's Outlook organization, so this action cannot be demonstrated. But for the purpose of the flow, simply have the assistant respond with 'Notifying the [RACF Administrator](#)' for demonstration purposes.

The step should look like the following image:



The screenshot shows the IBM Watsonx Orchestrate AI assistant builder interface. On the left, a vertical list of steps is visible: Step 1 (Checking user privileges for Step 1), Step 2 (Go to subsection: TSO Command), Step 3 (Do you need RACF assistance? with a 'Confirmation' button), Step 4 (What type of assistance? with 'Changing my ...' and 'Privileges iss...', and a 'Continue to next step' button), and Step 5 (This step has no content with a 'Continue to next step' button). The main panel is titled 'Step 5' and contains a 'Conditions' section. A condition is defined: 'If All of this is true: 4. What type of assistance... is Privileges issues'. Below this, there is an 'Assistant says' section containing the text 'Notifying the RACF Administrator.' and a 'Define customer response' dropdown. The 'And then' section contains a 'Continue to next step' button.

**Step 6. With conditions, change the condition Step 4. What type of assistance? and the value of [Changing my RACF password](#), and add a Yes or No confirmation.**

**Assistant says:**

Would you like to change your user ID's RACF passphrase?

The step should look like the following image:

**Step 6**

Is taken with conditions

Conditions

If All of this is true:

- 4. What type of assistance is Changing my RACF password

and Add condition +

New condition group +

**Assistant says**

Would you like to change your user ID's RACF passphrase?

View response Edit validation

**And then**

Continue to next step

**Step 7.** With conditions, prompt the user to enter their new password as free text.

**Assistant says:**

Please enter your new RACF passphrase.

The step should look like the following image:

**Step 8. With conditions, change the condition to Step 6. Would you like to change your user ID's passphrase equals Yes, inform the user the password is being changed, and create a TSO Command subaction to change the passphrase.**

**Assistant says:**

Issuing RACF command ...



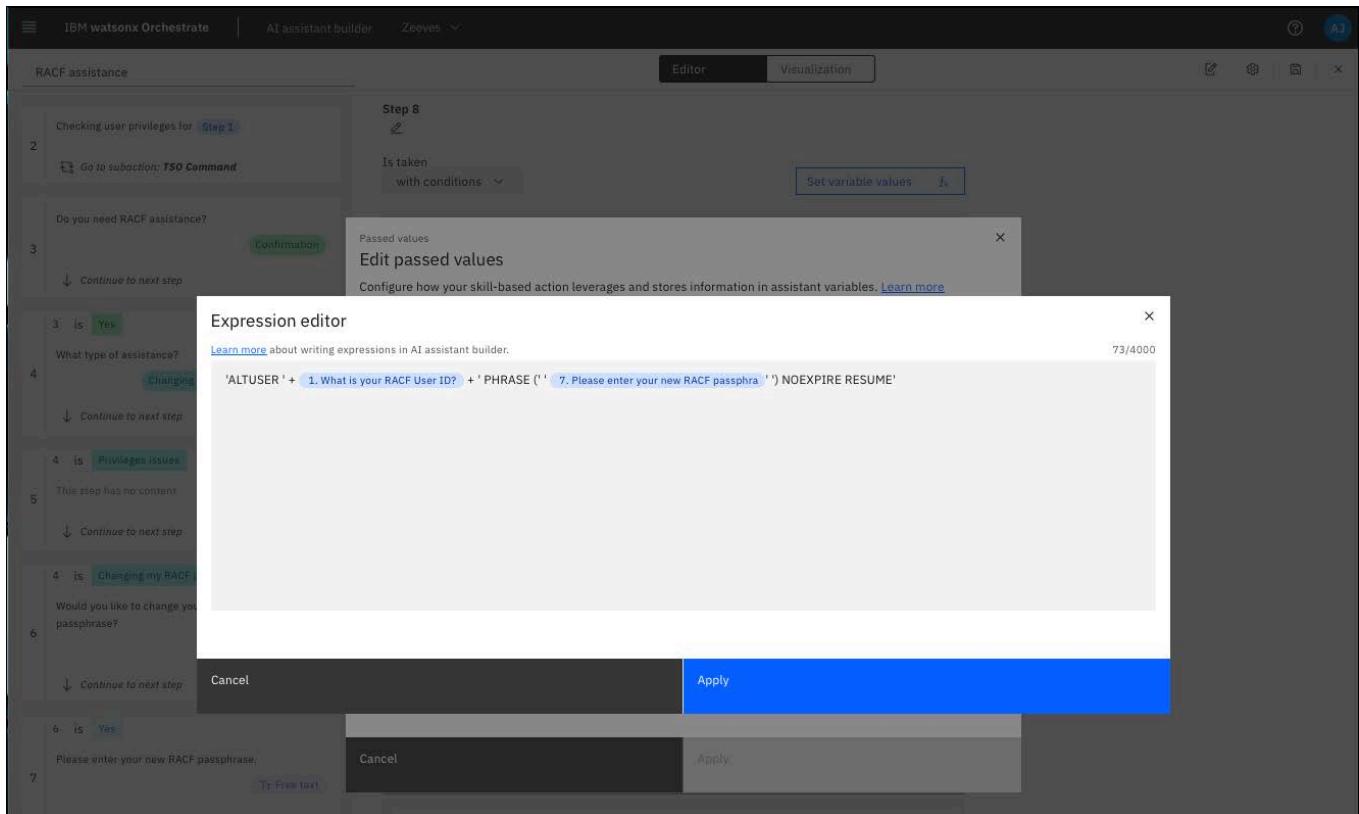
**The formatting of the values that follow is important.**

When creating the **To** expression for the passed values, be very careful with typing the expression. Do NOT cut & paste this value. Type each character. All quotes are single-quotes. The `$<>` denotes typing \$ and then selecting the appropriate **action step variable**.

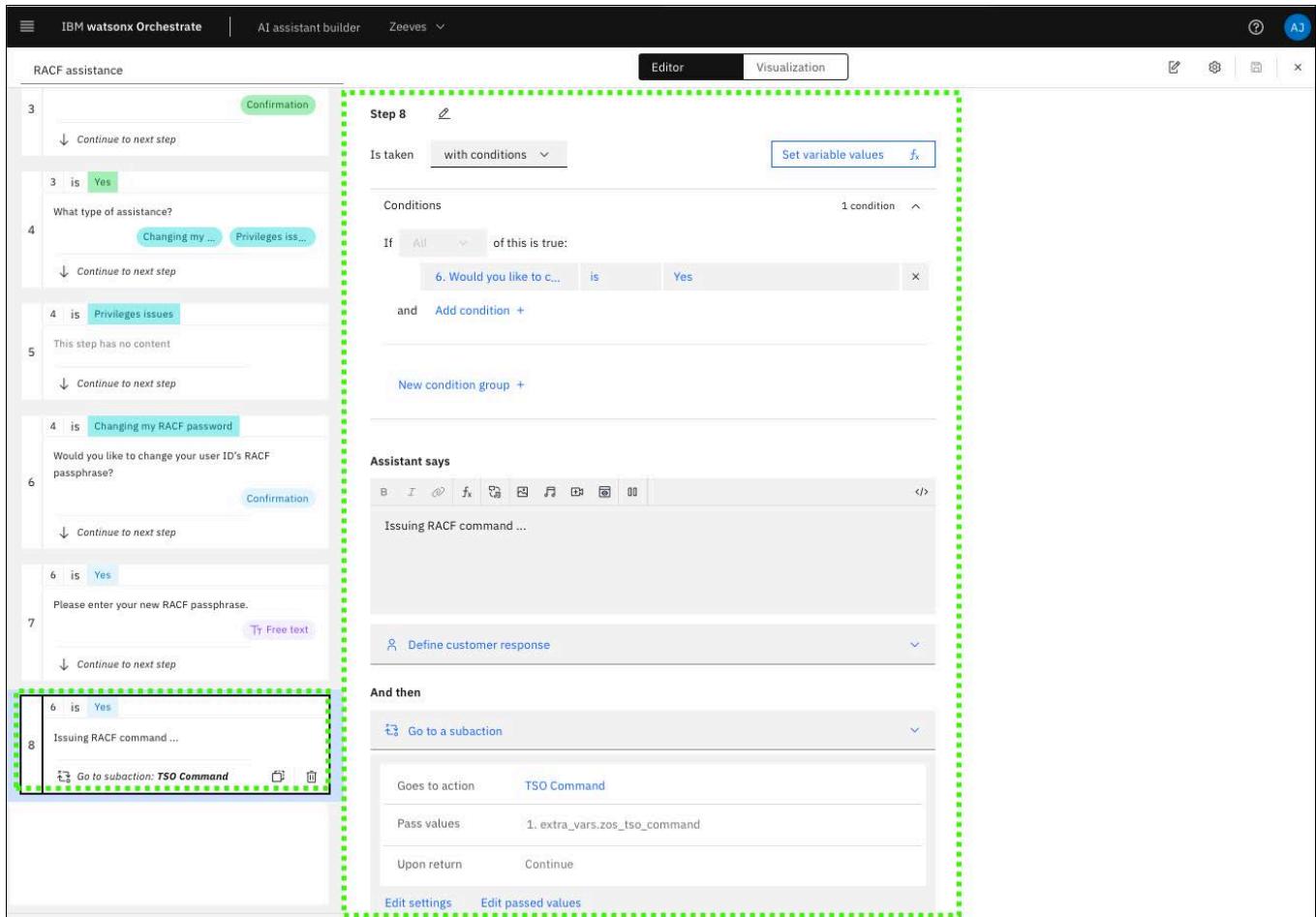
Edit the passed values for the **TSO Command** subaction to include the **1. extra\_vars.zos\_tso\_command** variable with a **To** expression with the value of:

```
'ALTUSER ' + $<1. What is your RACF User ID?> + ' PHRASE(''$<7. Please enter your new RACF
passphrase>'') NOEXPIRE RESUME'
```

The expression should look like the following image:



The step should look like the following image:



**Step 9.: With conditions, change the condition to Step 6. Would you like to change your user ID's passphrase equals Yes , and inform the user the passphrase has been changed. Change the And then option to End the action.**

**Assistant says:**

User passphrase changed to \$<7. Please enter your new RACF passphrase.>

When entering the above string, after typing \$ select the **7. Please enter your new RACF passphrase**.

The step should look like the following image:

The screenshot shows the AI Assistant builder interface with a green dashed box highlighting the 'With conditions' section of Step 9. Inside this box, a condition is defined: 'If All of this is true: 6. Would you like to c... is Yes'. Below this, the 'And then' section is set to 'End the action'. The main workflow on the left shows steps 3 through 9. Step 3 is a confirmation message. Step 4 asks 'What type of assistance?' with options 'Changing my ...' and 'Privileges iss...'. Step 5 is a placeholder. Step 6 asks 'Would you like to change your user ID's RACF passphrase?' with a 'Confirmation' button. Step 7 is a free text input field. Step 8 issues a RACF command. Step 9 is the final step, showing the message 'User passphrase changed to Step 7' and an 'Action complete' button.

7. Be sure to save your custom-built action.

8. Demonstrate the custom-built action.

Using the **AI Assistant builder** preview, run the custom-built action. Use the APP web console to verify the passphrase was changed.

The following video shows how the demonstration should work. The video does not have audio.

## 404 - Not found

This use case demonstrates the value watsonx Assistant for Z can provide to offload common, manual tasks from subject matter experts like RACF Administrators. The use case shows the level of customization offered with infusing automations into natural conversations. Watsonx Assistant for Z improves employee productivity and reduces effort needed by individuals to completing manual tasks.

# Adding other integrations

IBM watsonx Assistant for Z can integrate with other delivery channels beyond a web page. Other channels include Slack, Microsoft teams, WhatsApp, and many others. Integrating with these and other channels are not covered in the lab guide. However, follow the steps to find the current channels that are supported and where to get more information.

1. Hover over the **Home** ( ) and click **Integrations**.

The screenshot shows the IBM Watsonx Orchestrate interface. The left sidebar has sections like Home, Generative AI, Actions, Evaluate, Preview, Publish, Environments, and Analyze. The 'Integrations' section is highlighted with a green border. The main area displays various customization options: Build actions, Customize your greeting, Create a fallback plan, Preview & debug, Customize web chat, Set up a channel, Set up live agent, and Check. Below this is a diagram titled 'Assistant structure' showing the flow from 'Default behavior' through 'Zeeves' to 'Actions' (which includes AI-guided, Skill-based, and Custom-built) and 'Fallback' to 'Live agent'. A note says 'Structure depicts the structure of your assistant.'

2. Explore the **Essential channels** and **Channels** sections.

The screenshot shows the 'Integrations' page. The 'Essential channels' section is highlighted with a green dotted box. It contains a 'Web chat' tile with a phone icon and a 'Get started' button. Below it is a 'Connect center integrations' section with icons for HUB, Zendesk, and Twilio. The 'Channels' section is also highlighted with a green dotted box. It contains a 'Deploy your assistant to third-party channels to expand your reach.' note and a row of tiles for SMS, Facebook messenger, Genesys Bot Connector, Slack, Microsoft teams, and WhatsApp with Twilio. Each tile has an 'Add' button.

3. Click **Add** on the **Slack** tile.

**Integrations**  
Add different channels and extensions to easily configure and deploy your assistant.

**Essential channels**  
Add our most utilized methods of deploying assistants. These channels support additional customization and advanced integration.

**Channels**  
Deploy your assistant to third-party channels to expand your reach.

**Extensions**

#### 4. Click Add.

**Integrations**  
Add different channels and extensions to easily configure and deploy your assistant.

**Essential channels**  
Add our most utilized methods of deploying assistants. These channels support additional customization and advanced integration.

**Channels**  
Deploy your assistant to third-party channels to expand your reach.

**Extensions**

#### 5. Review the step-by-step instructions and additional information available for adding a Slack integration.

**Note:** Most regular users do not have permissions to integrate with your enterprise slack deployment as doing so requires administrative rights.

**Slack Draft**

**Get started**  
Through Slack, your assistant is ready to join the collaboration hub that brings the right people, information, and tools together to get work done. [Learn more](#)

Steps to setting up Slack

1. Set up your Slack bot
2. Connect AI assistant builder to Slack
3. Configure your Slack bot
4. Connect your assistant

**Close** **Next**

Take time to further explore the next steps for adding a Slack integration channel and the other supported integration channels.

Learn more about adding integrations [here](#).

# Next steps

This lab guide covered many of the IBM Watsonx Assistant for Z capabilities and provides a good base for conducting basic client pilots. However, there is still more to learn about IBM Watsonx Assistant for Z. Updates and new releases of the offering and the underlying offerings like Watsonx Orchestrate rollout regularly. Be sure to stay informed by bookmarking and regularly reviewing the [offering landing page](#) and the [product documentation](#).

## Other resources

The following resources are also available; however, not all are available to Business Partners:

Slack channel: [#watsonx-assistant-z-technical](#)

Wiki: [Development team's wiki](#)

Box: [wxa4z Q&A - questions with high-quality responses.](#)

## Earn the badge

Finally, remember to earn the [IBM Watsonx Assistant for Z Technical Sales Advanced badge](#) you must complete the IBM Watsonx Assistant for Z for Technical Sales Level 4 learning plan.

**IBM technical sellers:** [Your Learning learning plan](#)

**Business Partners** [IBM Training learning plan](#)