

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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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.

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 Proof of Experiences (PoX) 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.

The lab guide provides the following guidance to:

- Provisioning the lab environments
- Creating an assistant and configuring conversational search
- Configuring assistant settings
- Testing conversational search
- Deploying a dedicated instance of OpenSearch for client document ingestion (Optional)
- Importing skills for z/OS automations
- Connecting apps to assistants
- Creating assistant actions
- Creating skill flows and custom-built actions
- Importing pre-packaged z/OS skills
- Publishing and deploying your assistant

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](#)

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](#)
- Email: 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 and 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](#).

🖼 Viewing images

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

Reserve the IBM Technology Zone environment

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

Welcome

Reserve the IBM Technology Zone environment

Pilot setup

Next steps

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.

- a. Optionally, change the **Name** field for the reservation.
- b. Select the **Education** purpose tile.
- c. Enter a **Purpose description**.
- d. Select the region nearest your physical location in the **Preferred Geography** drop-down.
- e. The **End date and time** will be set to 2 days after the current date and time.
- f. Accept the IBM Technology Zone's terms and conditions and security policies.
- g. 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, $\text{[} \wedge \text{Ctrl} \text{]} + \text{[V]}$ 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

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 Z 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 left sidebar, which contains the Table of Contents. The sidebar lists chapters such as 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, and Instructions. The main content area displays the "Welcome" page, which includes an introduction to the course, information about end-user skills, and a note about Velocity Pilot information.

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 sidebar is now collapsed, and the main content area displays the "Welcome" page. The main menu icon is highlighted with a green box.

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, multiple environments are available in IBM Technology Zone (ITZ). The following environments are used for the Watsonx Assistant for Z Velocity lab environment and can be found in the [IBM Watsonx Assistant for Z collection](#):

- **Watsonx Assistant for Z lab – Watsonx Orchestrate:** a dedicated environment with Watsonx Orchestrate on IBM Cloud that is used for creating and configuring the assistant, configuring conversational search, importing skills, and configuring actions.
- **Ansible Automation Platform (AAP) & z/OS:** a pre-configured instance of AAP and Wazi z/OS. The environment includes preinstalled Ansible playbooks that can be imported as skills within Watsonx Orchestrate and connected to your assistant. The environment provides preinstalled templates for various use cases that are covered in a later section. Learn more about AAP [here](#). Learn more about Wazi, [here](#).
- **Single Node OpenShift with NFS storage:** used to provision a single-node Red Hat OpenShift cluster (SNO) on IBM Cloud. The cluster is used to install a dedicated instance of [OpenSearch](#) for Watsonx Assistant for Z. This environment enables ingestion of client-supplied documents.



All activities in this lab guide are required.

While all three environments may not be required for every client pilot, to complete the Level 4 learning plan and earn the IBM Watsonx Assistant for Z Technical Sales Advanced badge, you must provision all three ITZ environments and complete all sections in the lab guide. **Any statements in the ITZ collection regarding optional environments or tasks should be ignored.**

Follow the instructions in 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.

Be sure to follow these steps to create a reservation in ITZ for all three environments.

2. Click **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 four tabs: 'Select a environment/infrastructure', 'Select a reservation type', 'Fill out your reservation', and 'Complete'. Under 'Select a reservation type', there is a section titled 'Single environment reservation options:' with two radio buttons: 'Reserve now' (which is selected and highlighted with a green box) and 'Schedule for later'.

3. Complete the reservation request and 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 actual 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 two days 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**.

Create a reservation

IBM Watsonx Assistant for Z

Name a

Select a reservation type b

Purpose c

Sales Opportunity number d

Preferred Geography e

End date and time f

Notes

I agree to IBM Technology Zone's [Terms & Conditions](#) and [End User Security Policies](#) g

Submit

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

Enter date and time Select a date 11/01/2024 Select a time 11:51 AM 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.

OCP/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

I agree to IBM Technology Zone's [Terms & Conditions](#) and [End User Security Policies](#)

Submit

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 may 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.

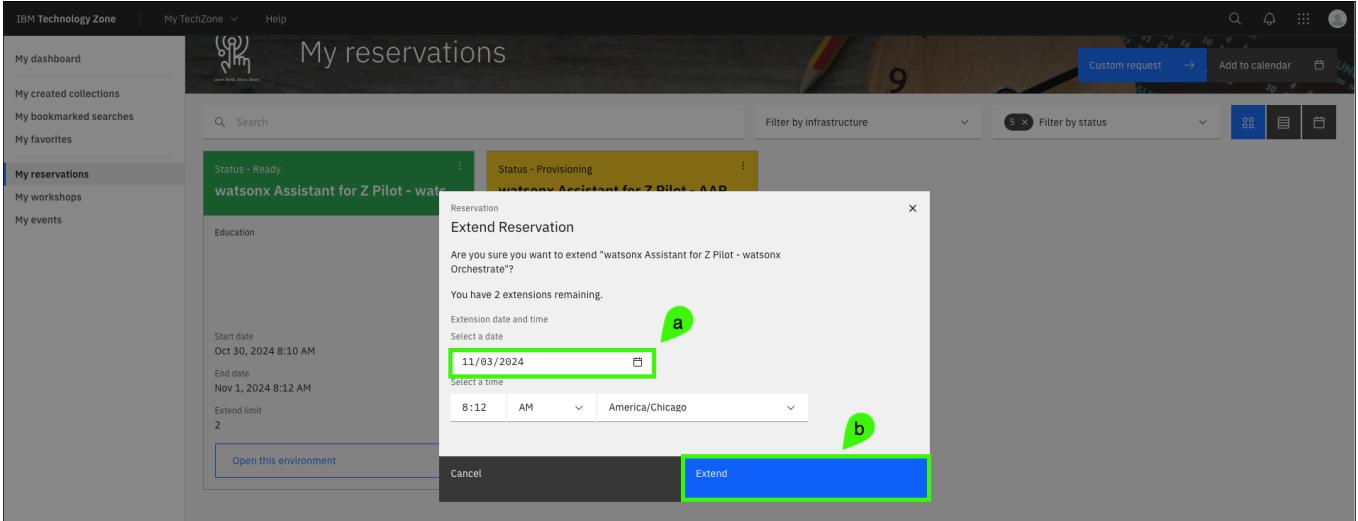
Extend the reservation

When the reservations are in the **Ready** state, you can extend each reservation to a total of six days.

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

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

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

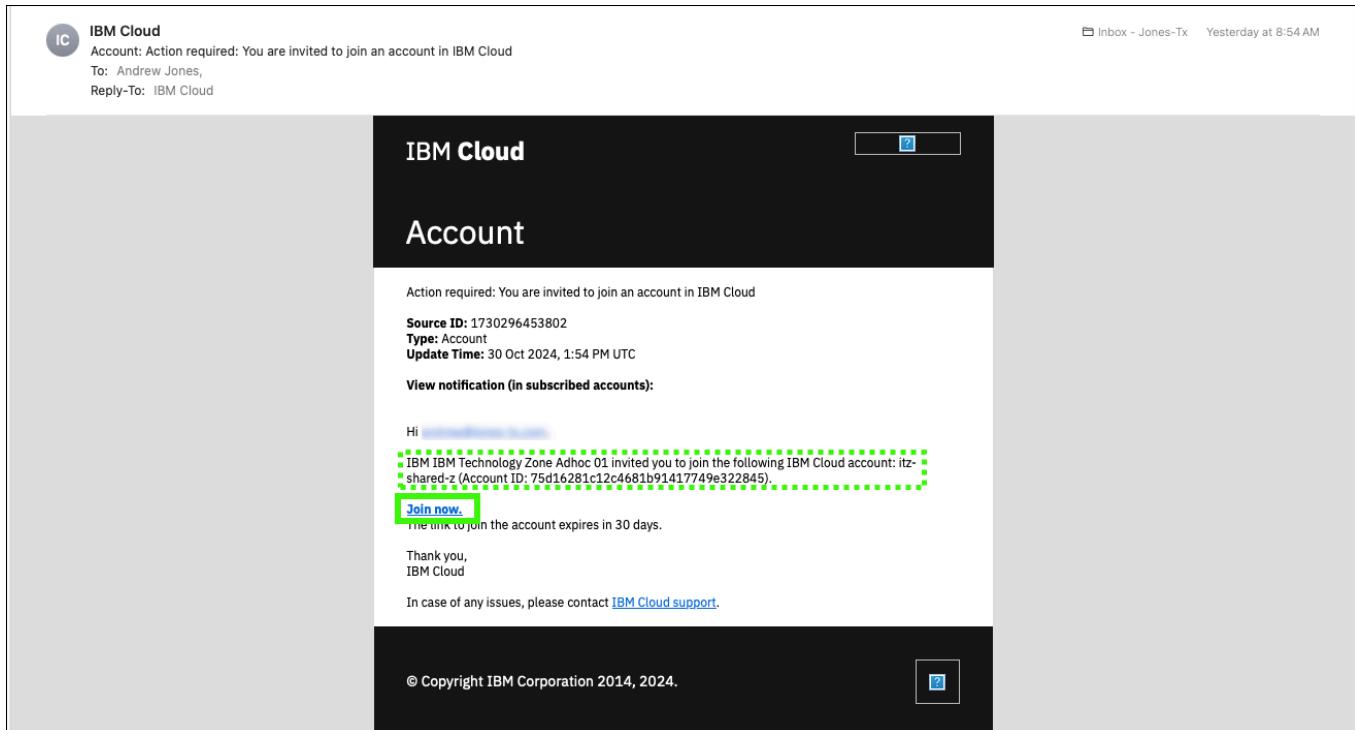


If you anticipate needing more time, repeat Steps 5-6 to extend the reservation to the maximum of six days. Repeat these steps for the other two reservations.

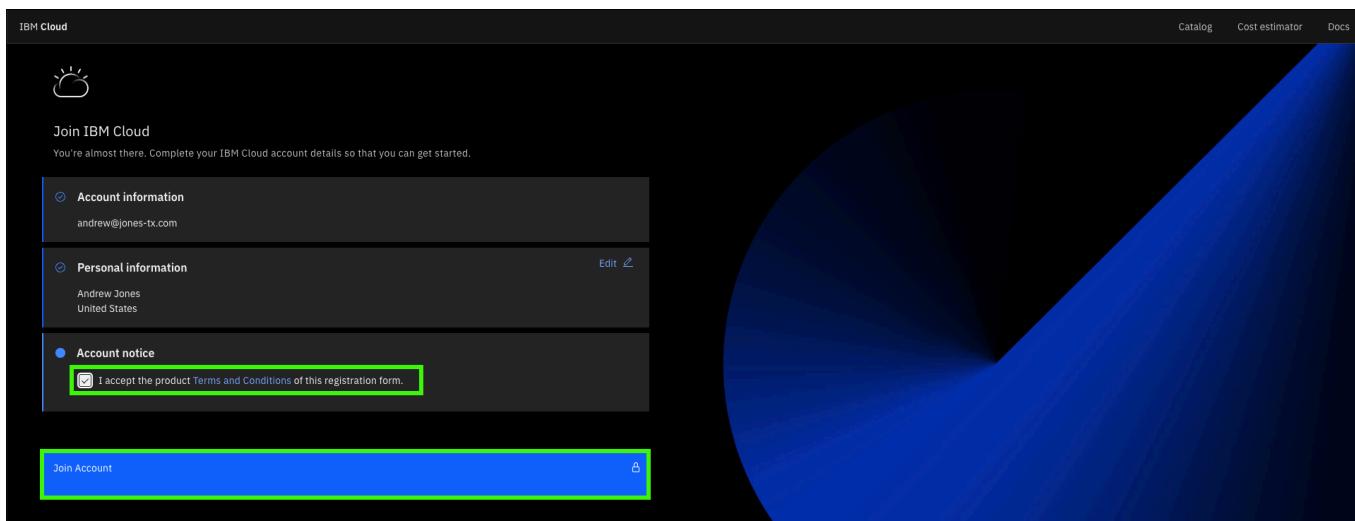
Join the ITZ IBM Cloud accounts

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. To access the environment, you must first accept the invitations to join both of the IBM Cloud accounts.

7. Open the emails from **IBM Cloud** and click the **Join now** links.



8. 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**.



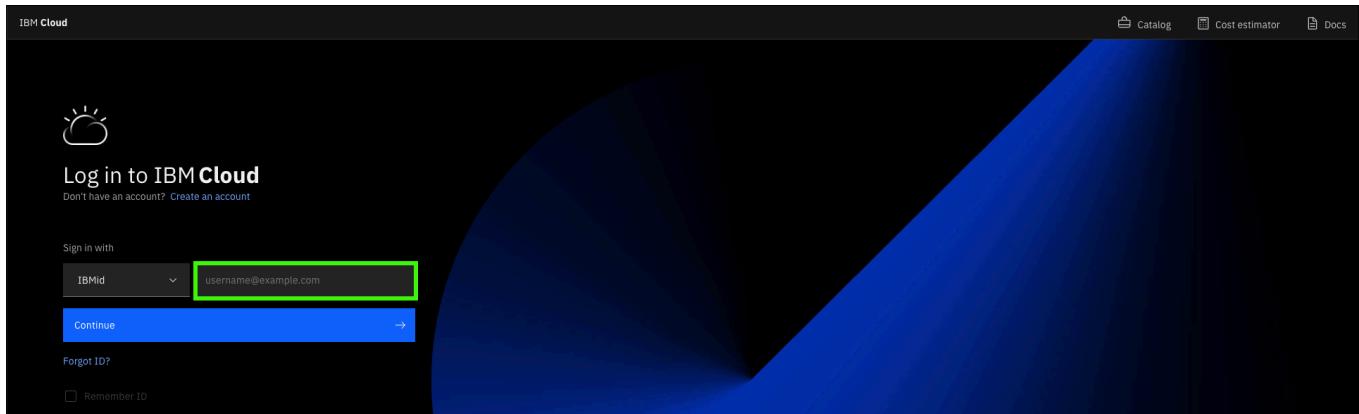
Repeat Steps 7-8 for the second invitation.

After joining both accounts, verify that both accounts appear 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 two IBM Cloud accounts listed in your ITZ reservations.

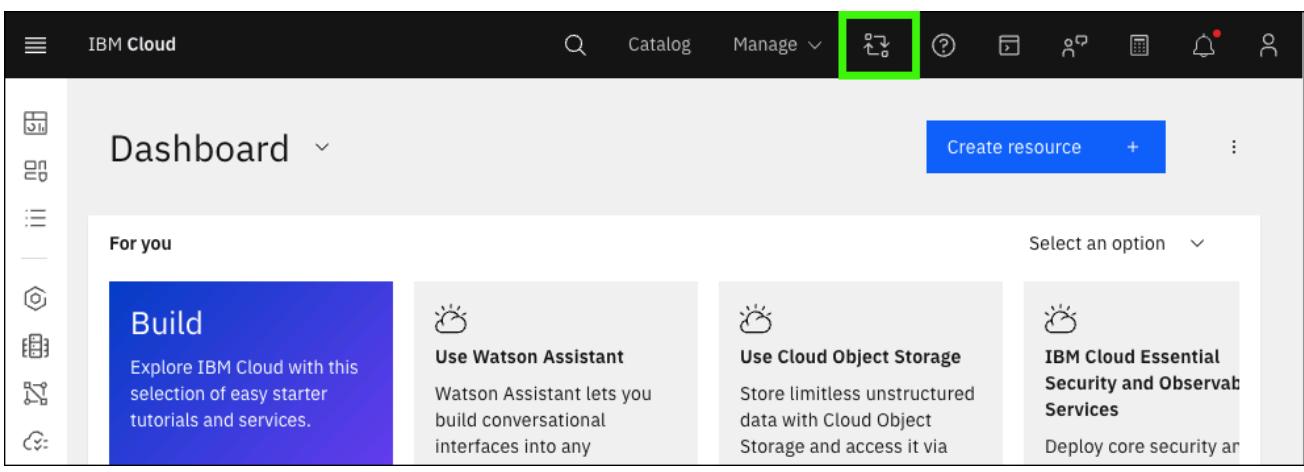


These accounts may change within ITZ.

Over time, the accounts may change for the environments. The accounts names should align with the accounts named in the invitation emails 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**.

Pilot setup

Creating an assistant and configuring conversational search

To create your watsonx Assistant for Z, use [watsonx Orchestrate](#) to create the assistant and configure conversational search. You can configure your assistant to use conversational search by using a hosted [OpenSearch](#) instance. The pre-configured instance in IBM Technology Zone (ITZ) has over 220 knowledge sources and supports Retrieval Augmented Generation (RAG). The large language model (LLM) providing the conversational AI augments this knowledge based on IBM Z documentation. All of these elements create IBM Z context-aware responses to queries with its content-grounded knowledge.

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

Single destination for our go-to-market teams and IBM business partners to find and live environments to learn, build, show, and share the value of IBM Z. Additionally, they can extend our certified base images and further customize them for development, test, and pilot activities.

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	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.

Purpose

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

Environment

Reservation ID	Type
672a09a1a8f85062f891e081	IBM Cloud
Request method	Transaction ID
watsonx-orchestrate	115897c9-58a1-4f17-af9c-b16dc2a97590
ITZ-WATSONX-036	Geo
Region	americas
us-south	Datacenter
Customer data	dal10
false	Environment
Idle runtime limit	watsonx-orchestrate-wusdf
10800	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)
- Customer(s)

Environment

Reservation ID	Type
672a09a1a8f85062f891e081	IBM Cloud
Request method	Transaction ID
watsonx-orchestrate	115897c9-58a1-4f17-af9c-b16dc2a97590
Cloud Account	Geo
ITZ-WATSONX-036	americas
Region	Datacenter
us-south	dal10
Customer data	Environment
false	watsonx-orchestrate-wusdf
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.

5. 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
<input type="text"/> Filter by name or IP address...	<input type="text"/> Filter by group or org...	<input type="text"/> Filter...	<input type="text"/> Filter...	<input type="text"/> Filter...	<input type="text"/> Filter...
<ul style="list-style-type: none"> ▼ 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 (🌐).

Resource list

Name	Group	Location	Product	Status	Tags
<input type="text"/> Filter by name or IP address...	<input type="text"/> Filter by group or org...	<input type="text"/> Filter...	<input type="text"/> Filter...	<input type="text"/> Filter...	<input type="text"/> Filter...
<ul style="list-style-type: none"> ▼ Compute (0) ▼ Containers (0) ▼ Networking (0) ▼ Storage (0) ▼ Converged infrastructure (0) 					

Create your Assistant

6. Click the **Resources** icon (☰).

Dashboard

For you

Build

Explore IBM Cloud with this selection of easy starter tutorials and services.

Use Watson Assistant

Watson Assistant lets you build conversational interfaces into any application, device, or channel.

IBM Cloud Essential Security and Observability Services

Deploy core security and other supporting services to get set up to manage the security compliance of the resources in your account.

Use Cloud Object Storage

Store limitless unstructured data with Cloud Object Storage and access it via self serve portal or S3 API.

Maximo Application Suite

Deploy an IBM Maximo Application Suite instance in a Red Hat OpenShift cluster.

Build with Watson

Chatbots, insights, recognizers, and more. Explore the AI platform for business.

Use Watson Studio

Watson Studio provides a suite of tools and a collaborative environment for data scientists, developers and domain experts.

Get Started with Studio

Get started with Watson Studio 15 minutes.

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

Resource list

Name	Group	Location	Product	Status	Tags
itzwxo-2700039nft-erspw	watsonx-orchestrate-erspw	Dallas	watsonx Orchestrate	Active	-

8. Click Launch watsonx Orchestrate.

itzwxo-2700039nft-erspw Active Add tags

Manage Service credentials

Start by launching the tool

Launch watsonx Orchestrate

Credentials

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

URL: <https://api.us-south.assistant-builder.watson.cloud.ibm.com/instances/a7675d8e-e885-489f>

Plan Essentials Plan

9. 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 →

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.

Automate how your business works

Standard plan | Skill studio

Learn more →

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

Welcome to AI assistant builder

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

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

Assistant language: English (US)

Next

11. 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
Where do you plan on deploying your assistant?

a. Web

Tell us about yourself
Which industry do you work in?

b. Software

What is your role on the team building the assistant?

c. Developer

Which statement describes your needs best?

d. I want to automate common tasks in a natural way

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...

Next

12. 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

Create Personalize Customize Preview

Customize your chat UI

Update the style to match your brand and your website. You can change these settings later. A developer can also add more advanced styling changes with code. [Learn more](#)

Assistant's name as known by customers: **Zeeves**

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

Choose a theme: Light Dark

Primary color: #FFFFFF Secondary color: #30303D Chat header: User message bubble:

Accent color: #035AE9 Significant and interactive objects:

Size: The size of the web chat on this page will not change by updating these fields.
Width: 380px Height: 640px

IBM Watermark: Off Shade IBM Watermark

Streaming: Enable Streaming Off

Zeeves

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

Type something...

Powered by IBM Watsonx

13. Preview your assistant and then click **Create**.

Welcome to AI assistant builder

Create Personalize Customize Preview

Preview your assistant

See what your assistant will look like as a chatbot on your website. Certain settings do not work on this page and are disabled.

Sample website

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

Type something...

Powered by IBM Watsonx

The assistant is now created.

Configure conversational search

The next step will be to configure **conversational search** for your assistant that uses a hosted instance of OpenSearch.

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

15. Review the base large language model (LLM) settings.

Notice the other LLM models available. For most pilots, the **granite-3-8b-instruct** model is appropriate.

16. 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](#).

17. Click Custom service.

18. Complete the **Custom service form and then click **Next**.**

- Select **By providing credentials**.
- Enter the following value in the **URL** field (use the copy icon to avoid typographical errors).

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

- Select **None** in the **Choose an authentication type** drop-down list.

19. Enable **conversational search and then click **Save**.**

20. 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 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.

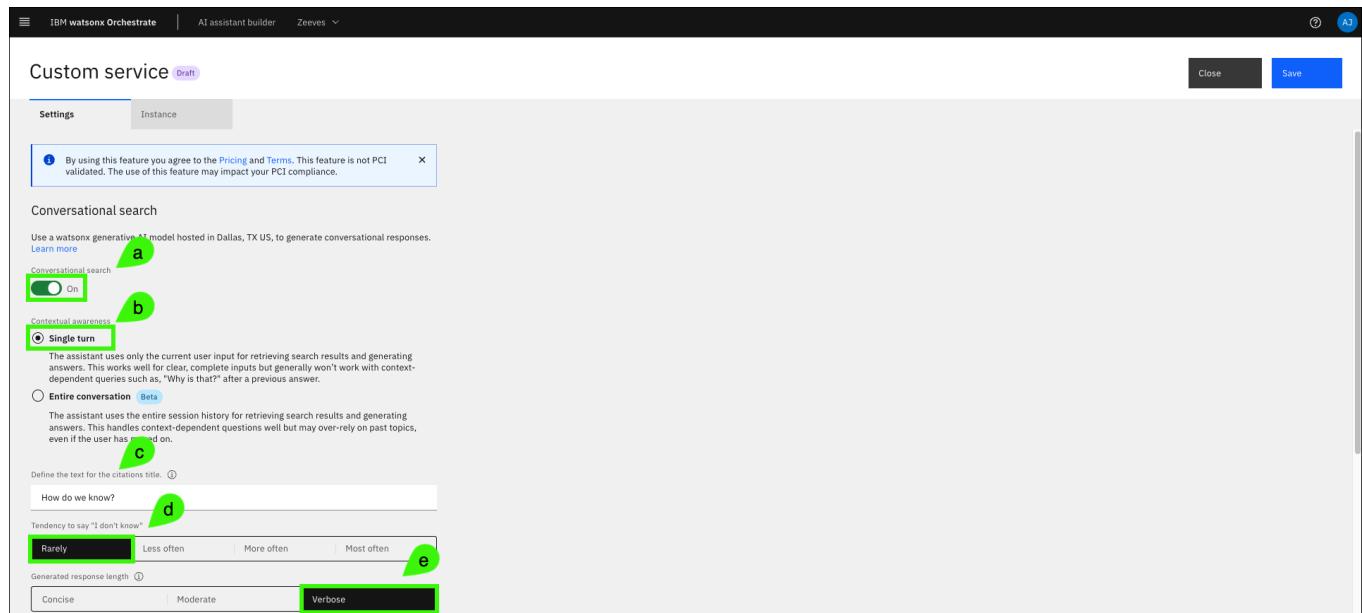
b. Select Single turn. Enabling multi-turn conversation (by selecting Entire conversation) is not yet supported for the solution on-premises. Be mindful in using this option and help ensure that the client understands what is supported in the solution.

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 Rarely for the tendency to say "I don't know" setting.

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

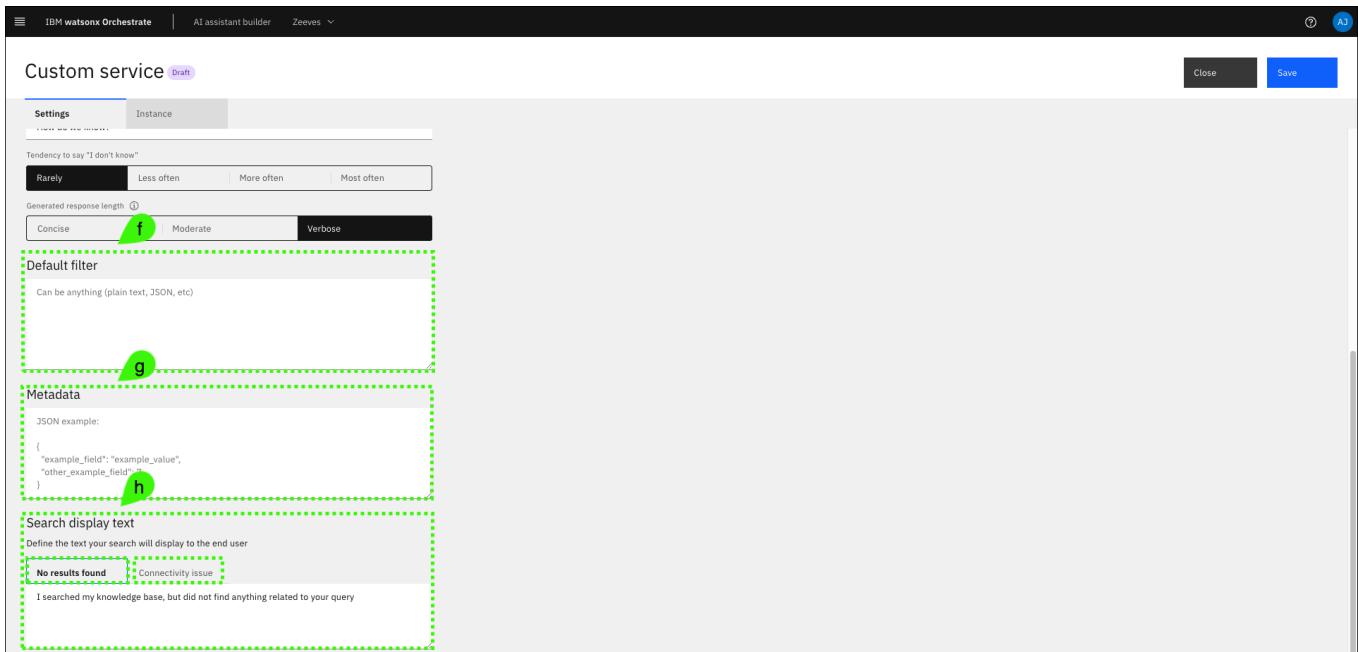
Depending on user input, variations from the selected length can occur.



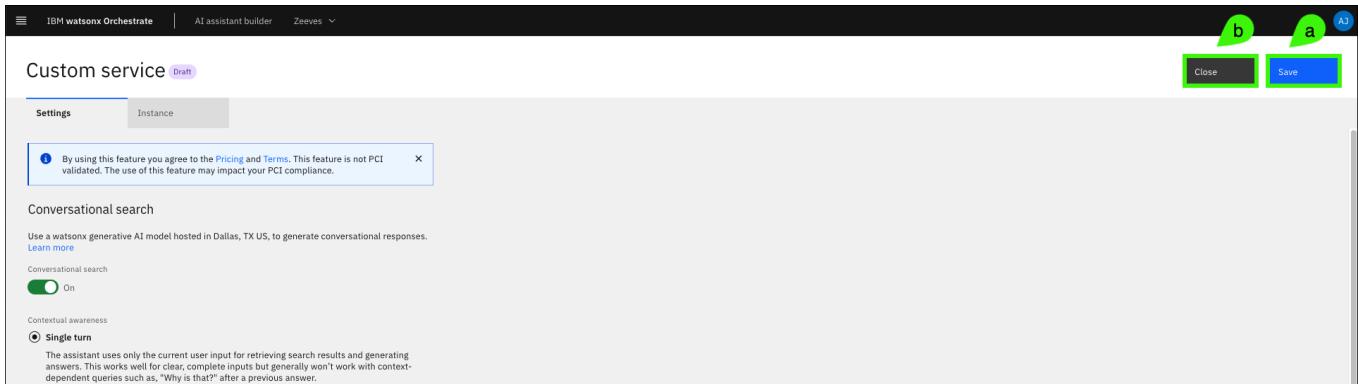
f. Leave the Default filter field empty.

g. 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.

h. 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.



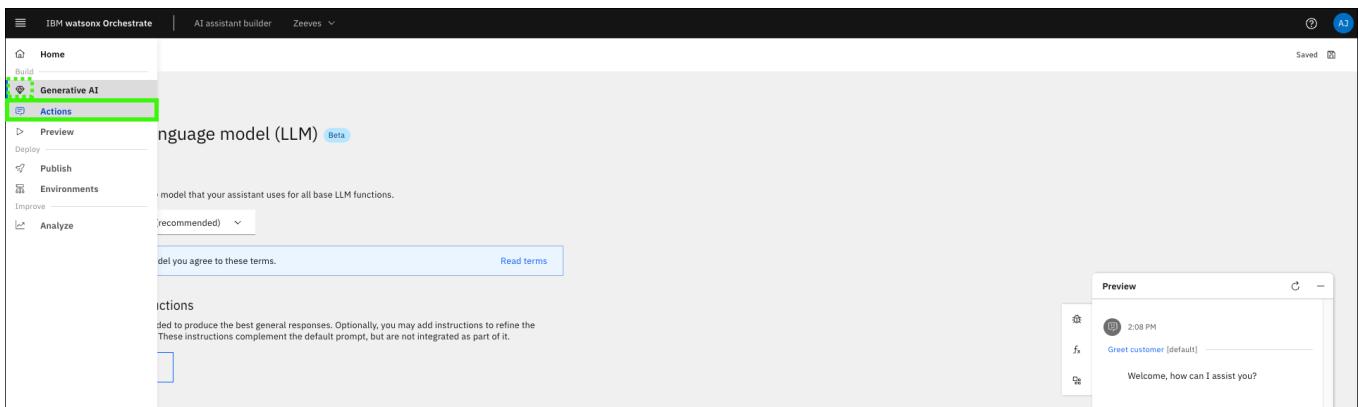
21. Click (a) **Save** and then click (b) **Close**.



More configurations

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](#).

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



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

24. Click No matches.

25. Click Step 1 under Conversation steps.

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

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

27. Delete the default text in the Assistant says entry field.

The screenshot shows the AI assistant builder interface. On the left, there's a sidebar with 'Conversation steps'. Step 1 is highlighted with a green dashed border. It contains the text 'This step has no content' and 'Action complete'. Step 2 is below it with the text 'This step has no content' and 'Go to subaction: Fallback'. In the main panel, under 'Step 1', 'Is taken' is set to 'without conditions'. Under 'Assistant says', there's a text area with placeholder text 'For example: Please select from the following options:' and a 'Define customer response' button. Under 'And then', there's a 'End the action' button.

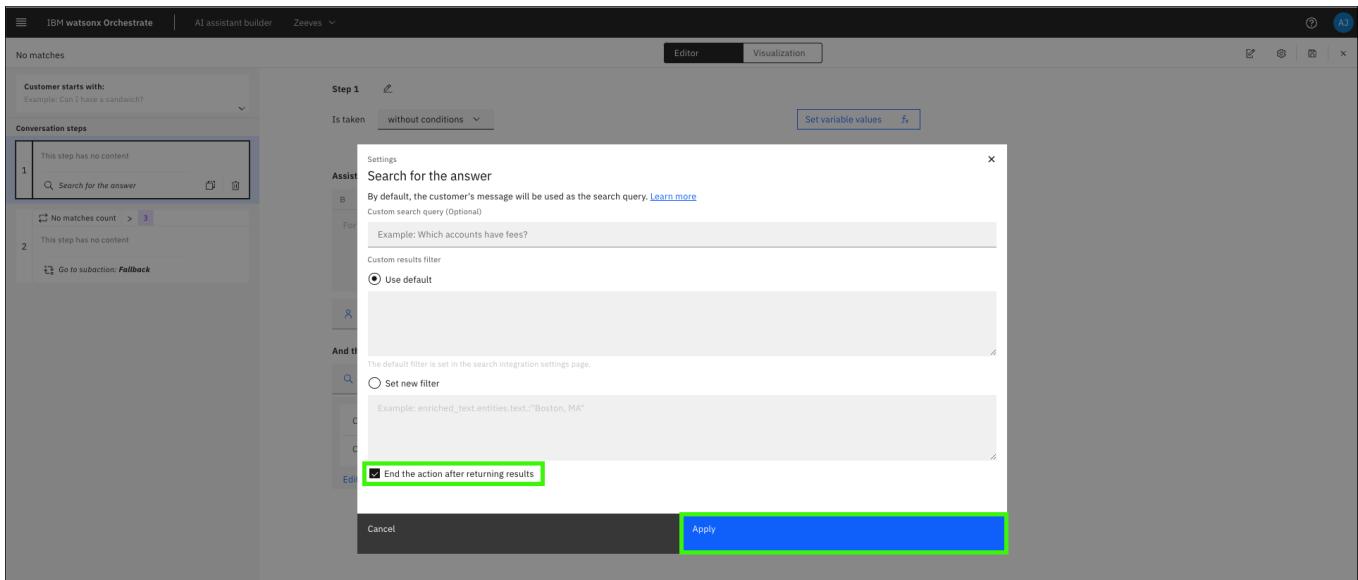
28. Select **Search for the answer** in the **And then** drop-down menu.

This screenshot is similar to the previous one, but the 'And then' section is expanded. The 'End the action' button is still visible, but the dropdown menu is open, showing several options: 'Continue to next step', 'Re-ask previous step(s)', 'Go to a subaction', 'Use an extension', 'Search for the answer' (which is highlighted with a green box), 'Connect to agent', and 'End the action'. The 'Search for the answer' option is described as returning results from a search integration and requiring a search integration.

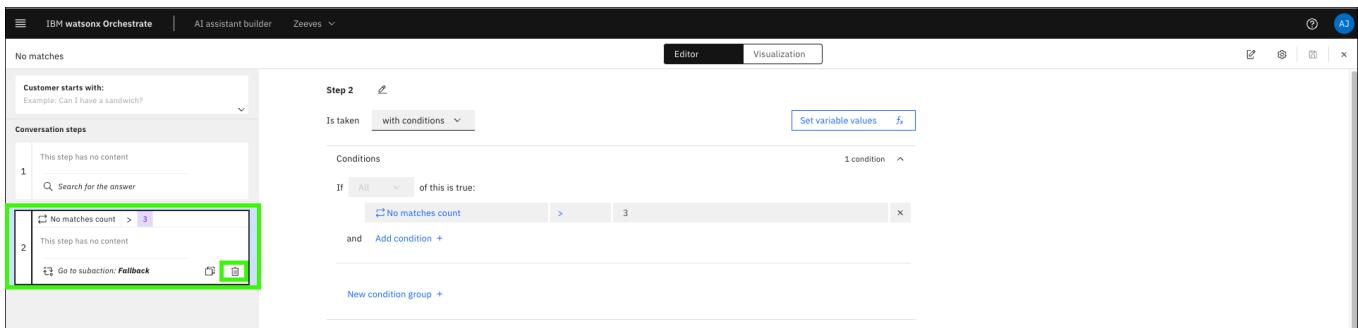
29. Click **Edit settings**.

This screenshot shows the 'And then' dropdown again, but the 'Edit settings' button at the bottom of the dropdown menu is highlighted with a green box. The other options in the dropdown are: 'Continue to next step', 'Re-ask previous step(s)', 'Go to a subaction', 'Use an extension', 'Search for the answer', 'Connect to agent', and 'End the action'. The 'Search for the answer' option is described as returning results from a search integration and requiring a search integration.

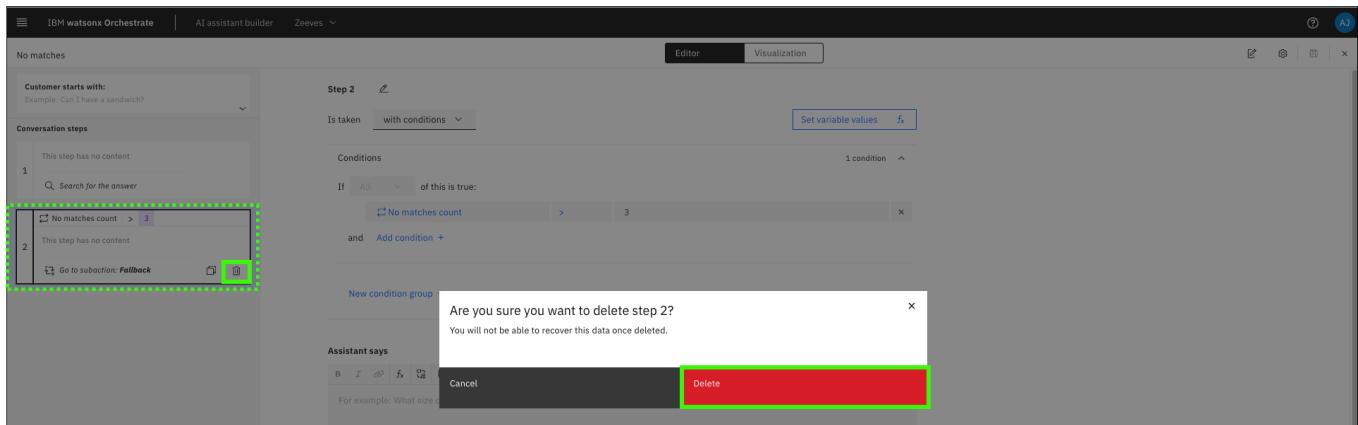
30. Select **End the actions after returning results** and then click **Apply**.



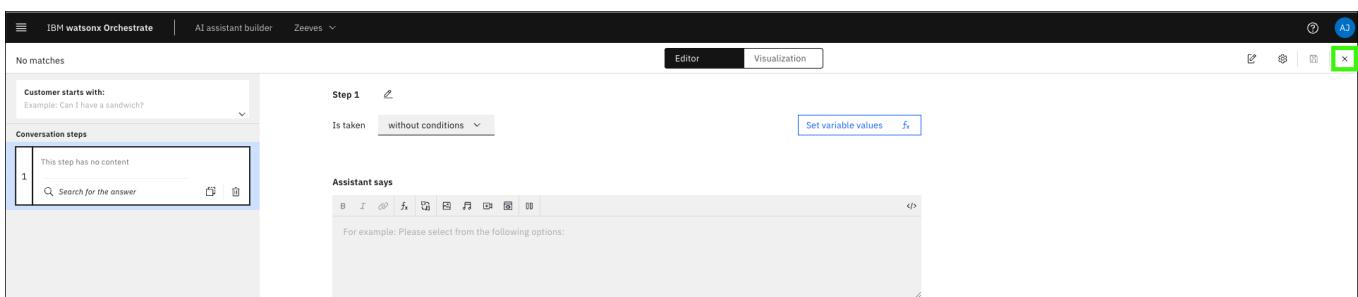
31. Select Step 2 (No matches count) under **Conversation steps** and click the delete icon (>Delete).



32. Click **Delete** in the confirmation dialog to delete step 2.



33. Click the **x** to close the **Editor** window.



34. Click Fallback in the Actions table.

Name	Last edited	Examples Count	Status
Greet customer	3 hours ago	1	Green
Trigger word detected	3 hours ago	1	Green
No matches	a minute ago	1	Green
Fallback	3 hours ago	1	Green

35. Delete all of the Conversation steps.

Note: the following image is edited. Only 5 steps are shown, but all 6 need to be deleted. You need to select each step individually, click the delete icon (trash), and confirm the deletion.

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

37. Click the global settings (⚙️).

Name	Last edited	Examples Count	Status
Greet customer	4 days ago	1	Green
Trigger word detected	4 days ago	1	Green
No matches	4 days ago	1	Green
Fallback	4 days ago	1	Green

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

The screenshot shows the 'Global settings' page with the 'Conversation routing' tab selected. In the 'No matches' section, there is a note about handling user input when no matches are found. A toggle switch labeled 'Enable disambiguation' is set to 'On'. Below it, a text box contains the placeholder 'Did you mean:'. Another text box below it contains 'None of the above'. To the right, there is an example of a 'Bank Bot' interaction where a user asks 'open an account' and the bot responds with 'Did you mean: Open a new savings account, Open a new checking account, I want to apply for a mortgage loan, None of the above'. The 'Save' button is visible in the top right corner.

39. 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.

The screenshot shows the 'Global settings' page with the 'Conversation routing' tab selected. The 'No matches' section is highlighted with a green box. A slider is shown with a green box around its current position at 'More often'. The 'Save' button is visible in the top right corner.

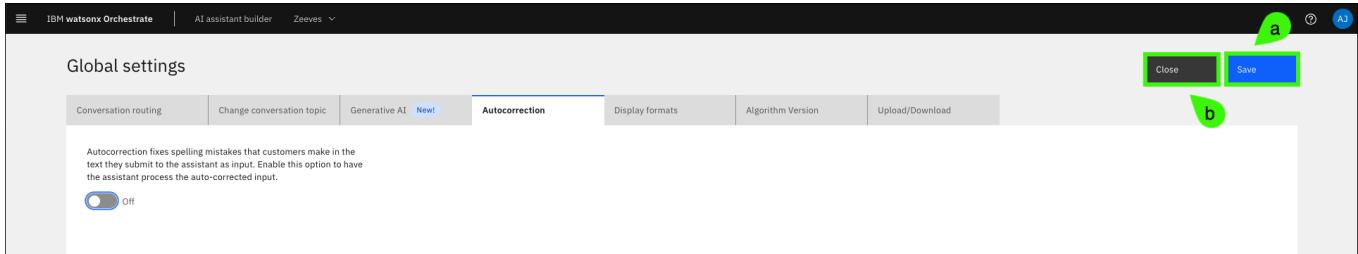
40. Click **Autocorrection**.

The screenshot shows the 'Global settings' page with the 'Autocorrection' tab selected. There is a note about fixing spelling mistakes. A toggle switch labeled 'Off' is shown with a green box around it. The 'Save' button is visible in the top right corner.

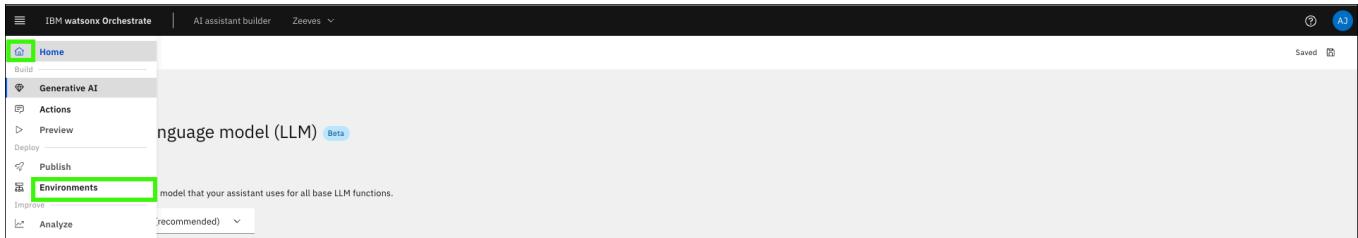
41. Click the **autocorrection** toggle to turn the feature **off**.

The screenshot shows the 'Global settings' page with the 'Autocorrection' tab selected. A note about autocorrection is present. A toggle switch labeled 'Off' is shown with a green box around it. The 'Save' button is visible in the top right corner.

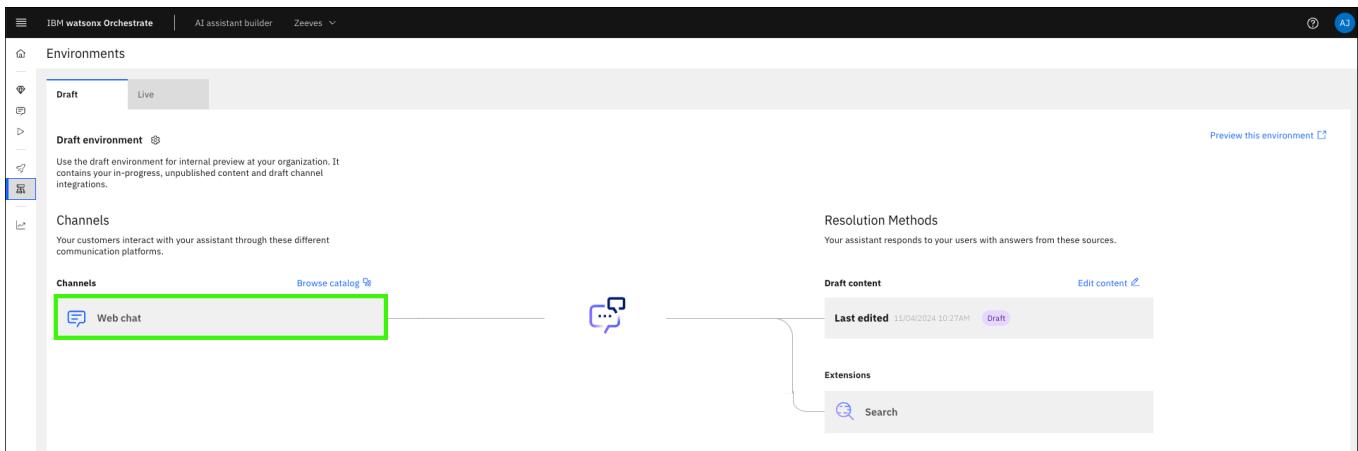
42. Click (a) **Save** and then (b) **Close**.



43. Hover over the **home** (🏠) and click **Environments**.



44. Click **Web chat**.



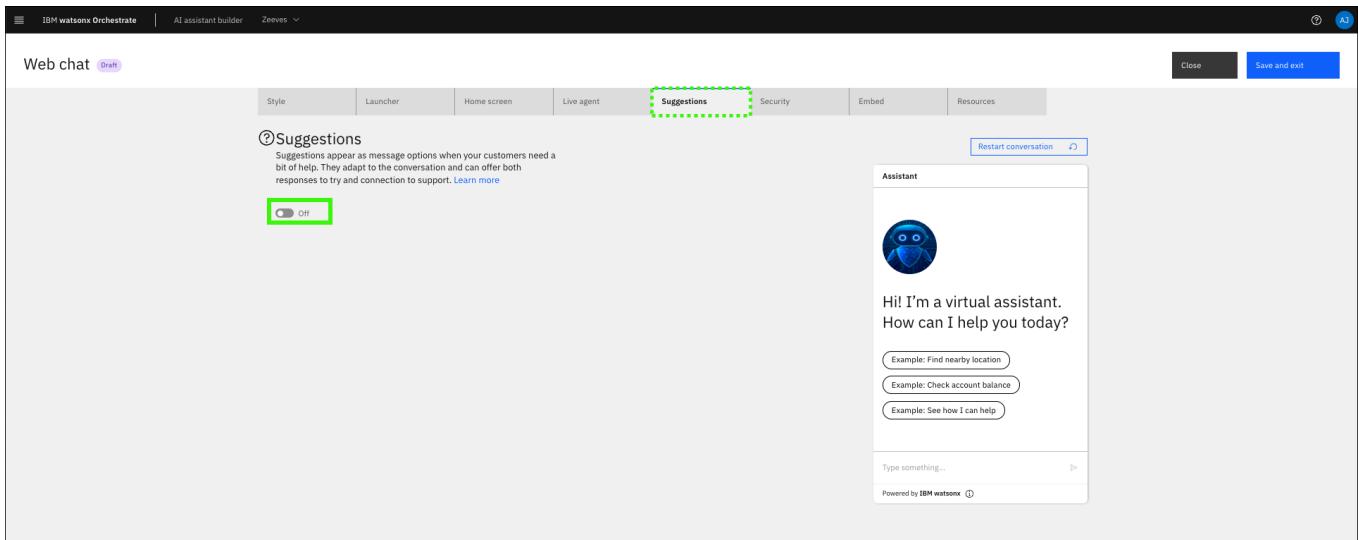
45. On the **Style** tab, click the **Streaming** toggle to enable streaming.

The screenshot shows the 'Style' tab selected in the top navigation bar. On the left, there's a configuration panel for 'Customize your chat UI'. It includes fields for 'Assistant's name known by customers' (set to 'Assistant'), 'Intended purpose' (radio button selected for 'Standard: For virtual agents and customer support experiences.'), 'Choose a theme' (radio button selected for 'Light'), and color swatches for 'Primary color' (#FFFFFF) and 'Secondary color' (#3D3D3D). Below this is a preview window showing a blue owl-like assistant with the message 'Hi! I'm a virtual assistant. How can I help you today?'. At the bottom of the configuration panel, the 'Suggestions' toggle switch is shown in its off position (green outline).

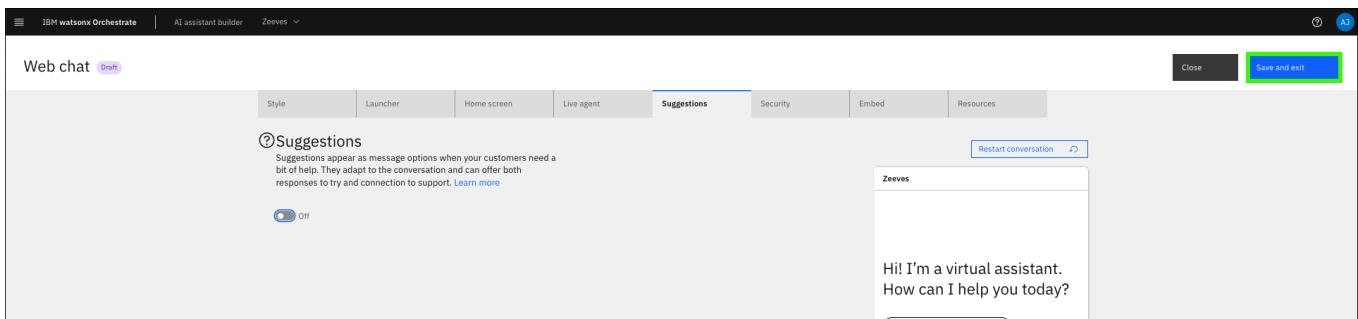
46. Click Suggestions.

This screenshot shows the 'Suggestions' tab selected in the top navigation bar. The configuration panel on the left remains the same as in the previous screenshot. The preview window now shows a grey square placeholder where the owl icon was previously located, with the message 'Add an avatar image' below it. The 'Suggestions' toggle switch is now in its on position (red outline).

47. Click the Suggestions toggle to turn this feature off.



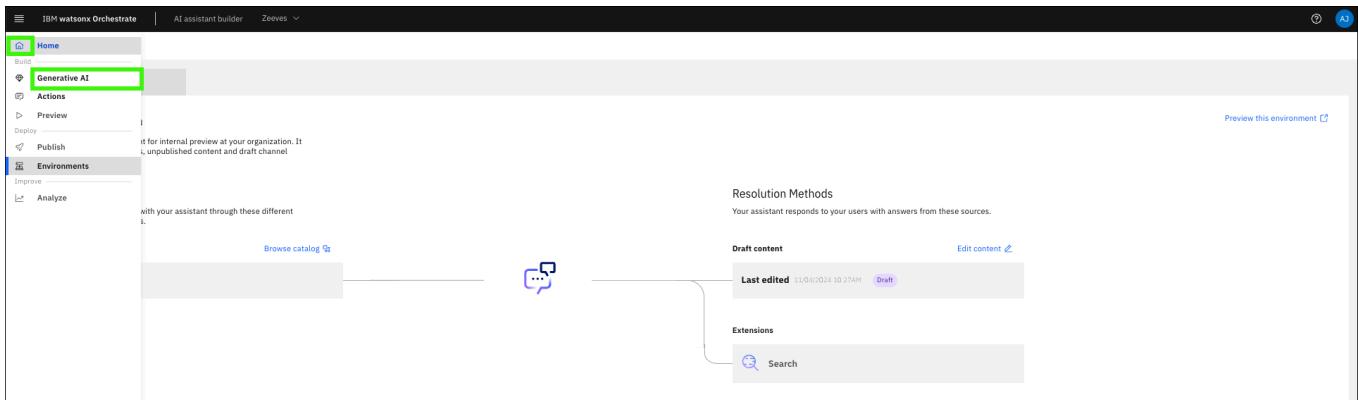
48. Click Save and exit.



Configure the base large language model

After the preceding steps are completed, there are enhancements that can be made to configure how the large language model (LLM) responds to your queries. Including adding prompt instructions and configuring the LLM's answer behavior. These options can be summarized [here](#).

1. Hover over the home () and click Generative AI.



2. Click Add instructions.

3. Enter a prompt instruction.

This option instructs the LLM in your assistant to give refined responses by adding prompt instructions. The instructions help the LLM guide the conversations with clarity and specifically to achieve the end-goal of an action.

Enter the 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.

4. Toggle General-purpose answering to off.

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 as well as Conversational search, the Conversational search answering takes precedence over General-purpose answering.

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 in the IBM Watsonx Assistant builder. In the 'Answer behavior' section, the 'General-purpose answering' toggle switch is off (indicated by a greyed-out appearance), while the 'Conversational search' toggle switch is on (indicated by a green outline). To the right, a 'Preview' window displays a sample interaction where the assistant greets a customer and asks for assistance. The overall interface includes sections for selecting a model, adding prompt instructions, and viewing the status of the LLM.

Testing conversational search

Now, you can begin issuing queries to test the assistant's responses.

It is important to keep in mind that many of the settings configured earlier can be iteratively modified based on your assessment of the quality of responses. The settings can be reviewed and changed at any time. For example, adding extra prompt instructions, changing the verbosity of the responses, and modifying the indexes used for OpenSearch.

53. Hover over the **home** (🏠) and click **Preview**.

The screenshot shows the main 'Home' page of the IBM Watsonx Assistant builder. The 'Preview' button in the top navigation bar is highlighted with a green box. The left sidebar shows navigation links like 'Home', 'Generative AI', 'Actions', and 'Environments'. The main content area shows the 'Base large language model (LLM)' configuration, including a model selection dropdown and a 'Read terms' button. The overall interface is clean and modern, designed for easy navigation and configuration.

54. Experiment with different prompts and validate 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 the APF list in z/OS? Provide a detailed explanation?

Example output:

The screenshot shows the IBM Watson Assistant interface. At the top, there are tabs for "IBM Watsonx Orchestrate", "AI assistant builder", and "Zeeves". Below the tabs, a sidebar on the left has icons for "Preview assistant", "Sample website", and other settings. The main area is titled "Sample website". On the right, there is a "Zeeves" chat window. A message from the user is highlighted with a green border: "What is the APF list in z/OS? Provide a detailed explanation?". The AI's response follows, also with a green border: "The APF (Authorized Program Facility) list in z/OS is a security mechanism that controls which libraries and data sets are authorized to run in privileged mode. It is used to ensure system security and integrity by restricting access to sensitive system resources. The APF list is defined in the system's parmlib (parameter library) and can be managed using various system commands and macros. The APF list contains a list of libraries and data sets that are authorized to run in privileged mode. These libraries and data sets are typically system-critical programs and utilities that require elevated privileges to function correctly. By authorizing these commands and macros." Below the AI's response is a text input field with "Type something..." and a "Powered by IBM Watsonx" link.

Prompt:

Why is Db2 different than other database systems?

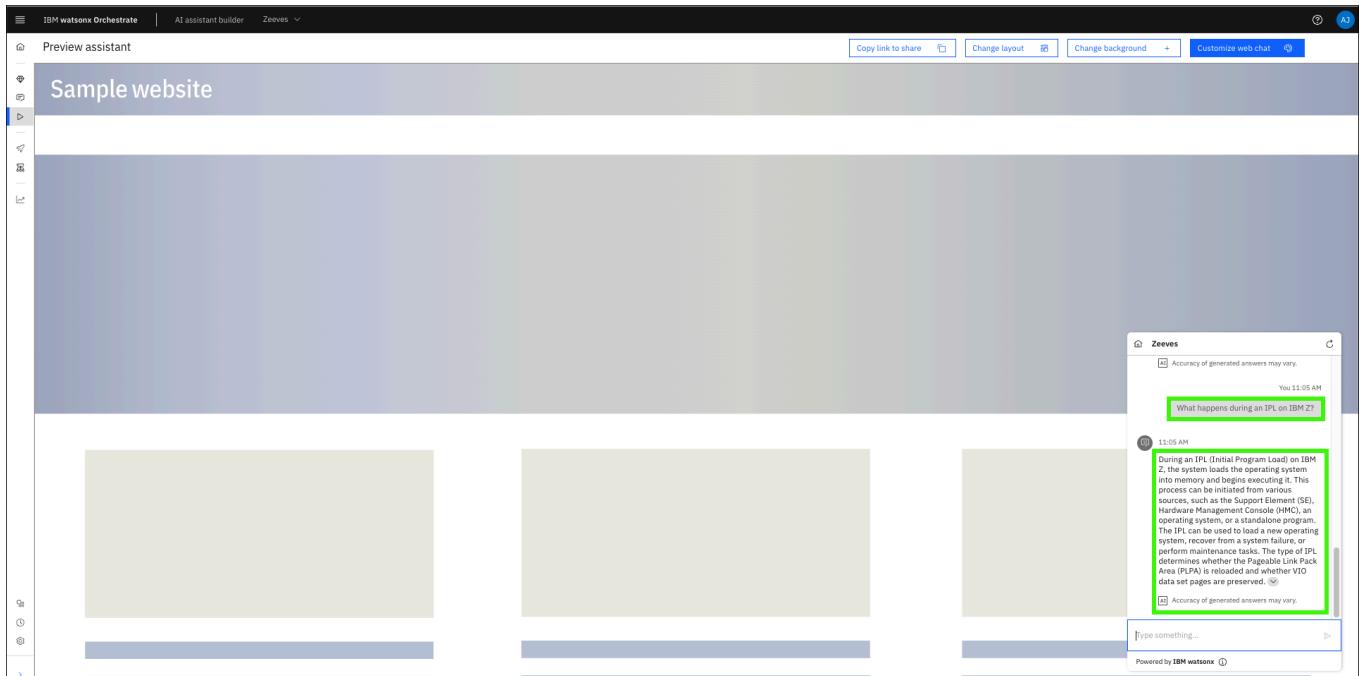
Example output:

The screenshot shows the IBM Watson Assistant interface. At the top, there are tabs for "IBM Watsonx Orchestrate", "AI assistant builder", and "Zeeves". Below the tabs, a sidebar on the left has icons for "Preview assistant", "Sample website", and other settings. The main area is titled "Sample website". On the right, there is a "Zeeves" chat window. A message from the user is highlighted with a green border: "Why is Db2 different than other databases?". The AI's response follows, also with a green border: "Db2 is a relational database management system (DBMS) that runs under the z/OS operating system, which is specific to mainframe computers. Other database systems run on other operating systems like Windows, Linux, or Unix. Additionally, Db2 provides a higher level of data management and security features compared to other DBMSs. For example, it manages data stored in databases and controls access to the data. Accuracy of generated answers may vary." Below the AI's response is a text input field with "Type something..." and a "Powered by IBM Watsonx" link.

Prompt:

What happens during an IPL on IBM Z?

Example output:



You now have a working assistant that uses IBM watsonx Assistant for Z. Take time to explore different prompt instructions and settings. If you encounter any issues, the Troubleshooting section that follows can help resolve them.

Continue to the [Creating a stand-alone OpenSearch instance for document ingestion](#) 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.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.

Ingesting client documents

Creating a stand-alone OpenSearch instance for document ingestion

Next, learn to enable a client to ingest their own documentation into the Retrieval Augmented Generation (RAG) used by IBM Watsonx Assistant for Z. The first step is to deploy a dedicated [OpenSearch](#) instance. The dedicated search instance will be referred to as bring-your-own-search (BYOS).

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 interface. On the left, a sidebar lists 'My dashboard', 'My created collections', 'My bookmarked searches', 'My favorites', and 'My reservations'. The 'My reservations' item is selected and highlighted with a blue background. The main area displays three environment tiles:

- Single Node OpenShift (VMware on IBM Cloud)**: Status - Ready. This tile is highlighted with a green border around its title and the 'Open this environment' button at the bottom.
- watsonx Assistant for Z Pilot - AAP & z/OS**: Status - Ready. This tile has a standard grey border.
- watsonx Assistant for Z Pilot - watsonx O...**: Status - Ready. This tile has a standard grey border.

Each tile provides details like start date, end date, and extend limit, along with an 'Open this environment' button.

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

The screenshot shows the IBM Technology Zone interface. At the top, there are three cluster nodes listed:

- 672371d38376796fb96a6c4d-master-1: Red Hat Enterprise Linux 8 (64-bit), IP 192.168.252.11, Running, with a 'Console' button.
- 672371d38376796fb96a6c4d-nfs: Red Hat Enterprise Linux 8 (64-bit), IP 192.168.252.17, Running, with a 'Console' button.

Below the nodes is a section titled "Reservation Details" containing the following information:

- API URL: <https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:6443>
- 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: <https://console.openshift-console.apps.672371d38376796fb96a6c4d.ocp.techzone.ibm.com> (highlighted in a green box)
- OCP Version: 4.14
- vCenter: itzeu-vc.eu.cloud.techzone.ibm.com

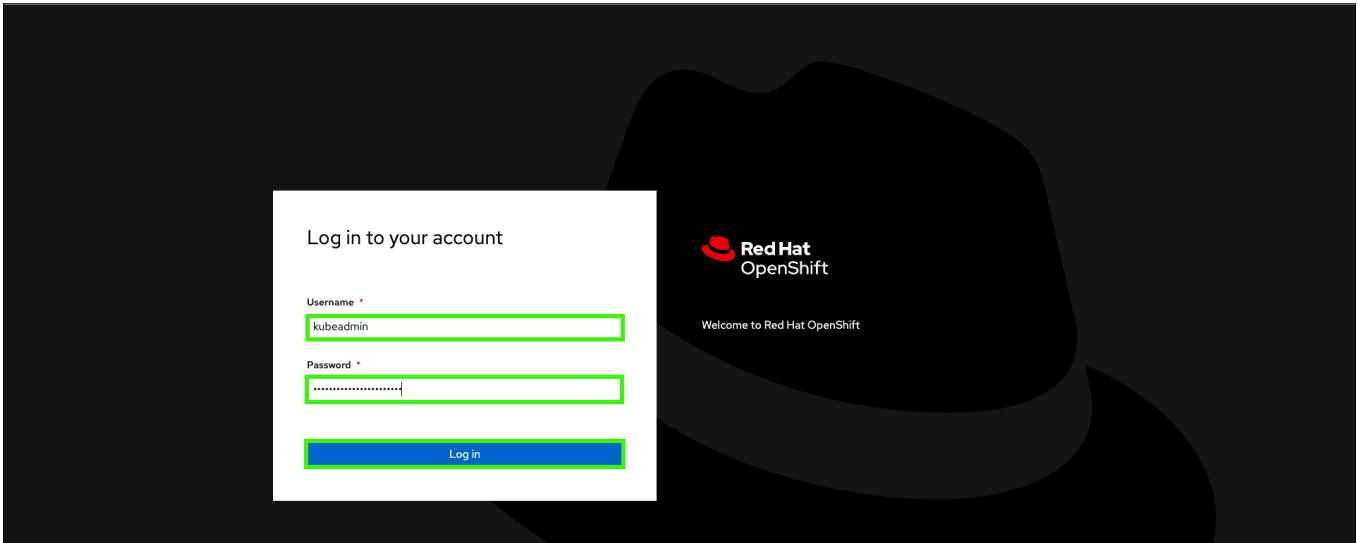
A blue "Download kubeconfig" button is at the bottom.

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

Note, OCP stands for OpenShift Container Platform.

This screenshot is identical to the one above, showing the IBM Technology Zone interface with the same cluster nodes and reservation details. The OCP Console URL is again highlighted in a green box.

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



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

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

Clicking the preceding link automatically downloads either a **.zip** or **.tar** file specific to your operating system. Unzip or untar the file and place the **oc** binary in a directory that is in your default PATH. The PATH will vary by operating system and individual settings, detailed instructions are not provided.

After properly installed, 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
```

Prepare to ingest documents

Before ingesting documents, a few setup steps must be taken.

Login to the OpenShift cluster from your local terminal

Note: if you just installed the **oc** utility, you can 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.

Reservation Details
Status - Ready
Start date: Oct 31, 2024 7:02 AM
End date: Nov 6, 2024 6:49 AM
Extend limit: 0
Open this environment

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

The screenshot shows the IBM Technology Zone interface. At the top, there are navigation links for 'IBM Technology Zone', 'My TechZone', and 'Help'. Below this, a search bar and a user icon are visible.

Two cluster entries are listed:

- Cluster 1: ID 672371d38376796fb96a6c4d-master-1, Red Hat Enterprise Linux 8 (64-bit), IP 192.168.252.11, Status Running. A 'Console' button is shown.
- Cluster 2: ID 672371d38376796fb96a6c4d-nfs, Red Hat Enterprise Linux 8 (64-bit), IP 192.168.252.17, Status Running. A 'Console' button is shown.

Reservation Details

API URL: <https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:6443>

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: <https://console.openshift-console.apps.672371d38376796fb96a6c4d.ocp.techzone.ibm.com>

OCP Version: 4.14

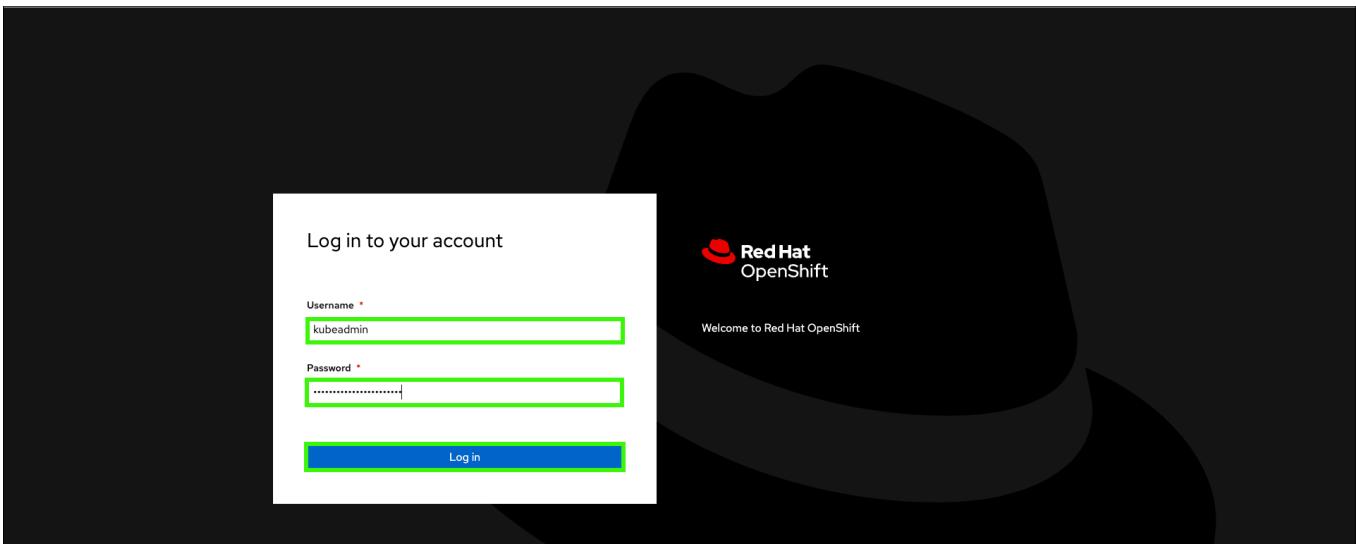
vCenter: itzeu-vc.eu.cloud.techzone.ibm.com

Download kubeconfig

4. Click the OCP Console link.

This screenshot is identical to the previous one, showing the same two clusters and reservation details. The 'OCP Console' link is highlighted with a green box.

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



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

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

- Administrator**
- [Home](#)
- [Operators](#)
- [Workloads](#)
- [Networking](#)
- [Storage](#)

Command Line Tools

[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.

- Download oc for Linux for x86_64

[User Preferences](#)

[Log out](#)

7. Click **Display Token**.

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

The steps to select and copy the value may differ by operating system, but for most, you can double-click the value and then right click and select **Copy**.

Your API token is
sha256~zuwR0KDnkYniIY0m8g8iKoUXPdFFFmou-o4s5FsrDNA

Log in with this token

```
oc login --token=sha256~zuwR0KDnkYniIY0m8g8iKoUXPdFFFmou-o4s5FsrDNA --server=https://api.672b79320c7a71b728e523b4.ocp.techzone.ir
```

Use this token directly against the API

```
curl -H "Authorization: Bearer sha256~zuwR0KDnkYniIY0m8g8iKoUXPdFFFmou-o4s5FsrDNA" "https://api.672b79320c7a71b728e523b4.ocp.techzone.ir/v1/users/~"
```

Request another token

[Logout](#)

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~mJ4L8K6cUMyNyk2Z69KMm3vbP1sWc8SW0eeOdVqtA94 --server=https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:6443
Logged into "https://api.672371d38376796fb96a6c4d.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

11. Create a directory that will be used to store the configuration files that will be created 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
```

12. Change to the new directory.

```
cd watsonxAssistant
```

```
watsonxAssistant ~ cecuser@p1365-pvmt:~ - zsh - 135x37
andrewjones@Andrews-MBP ~ % oc login --token=sha256~mJ4L8K6cUMyNyk2Z69KMm3vbP1sWc8SW0eeOdVqtA94 --server=https://api.672371d38376796fb96a6c4d.ocp.techzone.ibm.com:6443
Logged into "https://api.672371d38376796fb96a6c4d.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

13. Create a file that is named **catalogCertManager.yaml** using a text editor and paste the following text into 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

```

14. 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.

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

The screenshot shows the Red Hat OpenShift web console interface. The left sidebar has a navigation menu with items like Home, Operators, Workloads, and Networking. The Operators item is expanded, and its sub-item OperatorHub is selected and highlighted with a green box. The main content area displays information about the 'oc' command-line tool, including download links for various platforms. A blue bar at the top indicates the user is logged in as a temporary administrative user.

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

This screenshot shows the same Red Hat OpenShift web console interface as the previous one, but with a different focus. The Project dropdown menu is open, and the 'Show default projects' toggle switch is turned on, indicated by a green box around it. The main content area shows a list of projects: All Projects, default, kube-node-lease, and kube-public. A note at the bottom right of the content area says '624 items'. The top bar remains the same, showing the user is a temporary administrative user.

17. Scroll down and select **openshift-marketplace**.

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

Project: All Projects

openshift-kube-controller-manager-operator
openshift-kube-scheduler
openshift-kube-scheduler-operator
openshift-kube-storage-version-migrator
openshift-kube-storage-version-migrator-operator
openshift-machine-api
openshift-machine-config-operator
openshift-marketplace
openshift-monitoring
openshift-multus
openshift-network-diagnostics
openshift-network-node-identity
openshift-network-operator
openshift-node
openshift-nutanix-infra
openshift-oauth-apiserver

Community Community Marketplace Community

[DEPRECATED] CrowdStrike Operator
[DEPRECATED] Use the CrowdStrike Falcon Operator from the certified channel instead

[DEPRECATED] CrowdStrike Operator
[DEPRECATED] Use the CrowdStrike Falcon Operator from the certified channel instead

[DEPRECATED] Hazelcast Platform Operator
[DEPRECATED] Use the certified Hazelcast Operator instead

ABot
Abot Operator-v3.0.0
provided by Rehaca Technologies

Certified
Accuknox Operator
provided by Accuknox Inc.

Red Hat
Advanced Cluster Management for Kubernetes

624 items

Create Project

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

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

Project: openshift-marketplace

Discover Operators from the Kubernetes community and Red Hat 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.

All Items All Items

Q IBM Cert Manager X

ibm-cert-manager-4.2.7

IBM Cert Manager
provided by IBM
Operator for managing deployment of cert-manager service.

1 items

19. Click Install.

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

Project: openshift-marketplace

Discover Operators from the Kubernetes community and Red Hat 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.

All Items All Items

Q IBM Cert Manager X

ibm-cert-manager-4.2.7

IBM Cert Manager
provided by IBM
Operator for managing deployment of cert-manager service.

IBM Cert Manager
4.2.7 provided by IBM

Install

Channel: v4.2

Version: 4.2.7

Capability level:
 Basic Install
 Seamless Upgrades
 Full Lifecycle
 Deep Insights
 Auto Pilot

Source: ibm-cert-manager-4.2.7

20. Keep the default settings and click Install.

You are logged in as a temporary administrative user. Update the [cluster OAuth configuration](#) to allow others to log in.

Install Operator

Install your Operator by subscribing to one of the update channels to keep the Operator up to date. The strategy determines either manual or automatic updates.

Update channel *

v4.2

Version *

4.2.7

Installation mode *

All namespaces on the cluster (default)
Operator will be available in all Namespaces.

A specific namespace on the cluster
This mode is not supported by this Operator

Installed Namespace *

Operator recommended Namespace: ibm-cert-manager

Select a Namespace

Namespace creation
Namespace ibm-cert-manager does not exist and will be created.

Update approval *

Automatic

Manual

Provided APIs

- IBM Cert Manager** provided by IBM
- CR CertificateRequest** Not available
- C Certificate** A Certificate resource should be created to ensure an up to date and signed x509 certificate is stored in the Kubernetes Secret resource named in `spec.secretName`. Documentation For additional details regarding install parameters check...
- CMC Cert Manager Config** CertManagerConfig is the Schema for the certmanagerconfigs API. Documentation For additional details regarding install parameters check: <https://ibm.biz/icpf39install>. License By installing this product you accept the license terms...
- Challenge** Not available
- ClusterIssuer** Not available
- Issuer** An issuer represents a certificate issuing authority which can be referenced as

Install **Cancel**

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

You are logged in as a temporary administrative user. Update the [cluster OAuth configuration](#) to allow others to log in.

Installed operator: ready for use

View Operator [View installed Operators in Namespace ibm-cert-manager](#)

Install the watsonx Assistant for Z Operator (for OpenSearch)

- 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
```

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

After locating your existing key or creating a new key, continue to the next step.

23. Copy the **production entitlement key**.

The screenshot shows the IBM Container Software and Cloud Pak Access Management interface. On the left, there's a sidebar with 'Entitlement keys' selected. The main area is titled 'Entitlement keys (1)'. It contains a section for 'Access your container software' and a note about entitlement keys. Below that is a 'Active entitlement keys' section with a note about using active keys to log in. A specific entitlement key is listed with an issue date of 'October 17, 2022'. At the bottom right of this key entry, there are 'Copy', 'Edit', and 'Delete' buttons, with 'Copy' being highlighted by a green box.

24. Using the following command in your command prompt or terminal window, set an environment variable with your **production entitlement key** and then create a pull secret for the Container Registry.

Substitute your **production entitlement key** for the <entitlement key> string.

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

```
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 commands and their 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 %
```

25. Create a file called **catalogSource.yaml** with the following content.

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:2.0.2@sha256:d457aa24af07c23d7b36727a9cff95995ca1c4ed49fb980ef4f386fd09a29b4
  publisher: 'IBM'
  sourceType: grpc
  secrets:
    - icr-pull-secret

```

26. 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=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpXXQiOjE2NjYwMTk1ODAsImp0aSI6IjNKOWUyMzzjZTAzMDQzMzVhNTJhYTkzMWNmOTcyMDR1In0.4M3XRD4XzkHMS0kFNJ4uKvcWZ6SnEA0Z03eL_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 %

```

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

The screenshot shows the Red Hat OpenShift web console interface. The left sidebar is collapsed. The main navigation bar has 'Administrator' selected. The 'OperatorHub' menu item is highlighted with a green box. The search bar at the top right shows 'Project: openshift-marketplace'. The main content area displays a list of operators categorized by provider. A search bar at the bottom of the list shows 'wxa4z-byos'. The 'wxa4z-byos' entry is highlighted with a green box. To its right, there are four cards: 'Community' (CrowdStrike Operator), 'Marketplace' (CrowdStrike Operator), 'Community' (Hazelcast Platform Operator), and 'Marketplace' (Advanced Cluster Management for Kubernetes).

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

Note, it may take a few minutes for the operator to appear. If the operator is not found initially, refresh the browser page and try the search again.

The screenshot shows the Red Hat OpenShift OperatorHub interface. The left sidebar has 'OperatorHub' selected under 'Operators'. The main area shows search results for 'ibm watsonx'. A green box highlights the search bar and the resulting card for 'IBM watsonx Assistant for Z Operator Catalog'.

29. Click Install.

The screenshot shows the 'Install' dialog for the 'IBM watsonx Assistant for Z' operator. The dialog includes fields for 'Channel' (set to 'stable'), 'Version' (set to '2.0.1'), 'Capability level' (set to 'Basic Install'), 'Source' (set to 'IBM watsonx Assistant for Z Operator Catalog'), 'Provider' (set to 'IBM'), 'Repository' (set to 'N/A'), 'Container Image' (set to 'N/A'), and 'Created at' (set to 'Oct 4, 2024, 1:31 PM'). A green box highlights the 'Install' button.

30. Select A specific namespace on the cluster under Installation mode and wxa4z-byos for the Installed Namespace, then click Install.

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

OperatorHub > Operator Installation

Install Operator

Install your Operator by subscribing to one of the update channels to keep the Operator up to date. The strategy determines either manual or automatic updates.

Update channel *: stable

Version *: 2.0.1

Installation mode *:

- All namespaces on the cluster (default)
Operator will be available in all Namespaces
- A specific namespace on the cluster
Operator will be available in a single Namespace only.

Installed Namespace *: `wxa4z-byos`

Update approval *:

- Automatic
- Manual

Install **Cancel**

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

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

OperatorHub

ibm-wxa4z-operator:v2.0.1 provided by IBM

Installed operator: ready for use

View Operator **View installed Operators in Namespace `wxa4z-byos`**

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

```
oc project wxa4z-byos
```

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

```
watsonxAssistant -- cecuser@p1365-pvm1:~ -zsh - 135x37
andrewjones@Andrews-MBP watsonxAssistant % oc create namespace wxa4z-byos
namespace/wxa4z-byos created
andrewjones@Andrews-MBP watsonxAssistant % export IBM_CS_ENT_KEY=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpYXQiOjE2NjYwMTk1ODAsImp0aS16IjNkOWUyMzjZTAzMDQzMzVhNTJhYTkzMWNmOTcyMDR1In0.4M3XRD4XzkHMS0kFNJ4uKVcwZ6SnEAZO3eL_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 %
```

32. In the Red Hat OpenShift web console, click **Workloads** and select the **Pods**.

The screenshot shows the Red Hat OpenShift web console interface. On the left, the navigation sidebar is open, showing the 'OperatorHub' under 'Operators' is selected. The main content area displays a card for 'IBM watsonx Assistant for Z' with a status of 'Ready'. Below this, the 'Workloads' section is selected, and the 'Pods' sub-section is also selected. The table lists three pods:

Name	Status	Ready	Restarts	Owner	Memory	CPU	Created
ld126367b1ca53dcf2b0c93acd733e33875cd4b6c382dd5eb412032ac2h6	Completed	0/1	0	ld126367b1ca53dcf2b0c93acd733e33875cd4b6c382dd5eb412032ac42b38	-	-	Nov 4, 2024, 4:44 PM
ibm-wxa4z-operator-catalog-n9m5m	Running	1/1	0	ibm-wxa4z-operator-catalog	19.0 MiB	0.003 cores	Nov 4, 2024, 4:32 PM
ibm-wxa4z-operator-controller-manager-7c7898d7d4-87hmt	Running	2/2	0	ibm-wxa4z-operator-controller-manager-7c7898d7d4	31.0 MiB	0.001 cores	Nov 4, 2024, 4:44 PM

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

The screenshot shows the Red Hat OpenShift web console interface. The navigation sidebar shows the 'Workloads' section is selected, and the 'Pods' sub-section is also selected. The main content area displays a table of pods. Two specific pods are highlighted with green dashed boxes: 'ibm-wxa4z-operator-catalog-n9m5m' and 'ibm-wxa4z-operator-controller-manager-7c7898d7d4-87hmt'. Both are listed as 'Running'.

Name	Status	Ready	Restarts	Owner	Memory	CPU	Created
ld126367b1ca53dcf2b0c93acd733e33875cd4b6c382dd5eb412032ac2h6	Completed	0/1	0	ld126367b1ca53dcf2b0c93acd733e33875cd4b6c382dd5eb412032ac42b38	-	-	Nov 4, 2024, 4:44 PM
ibm-wxa4z-operator-catalog-n9m5m	Running	1/1	0	ibm-wxa4z-operator-catalog	19.0 MiB	0.003 cores	Nov 4, 2024, 4:32 PM
ibm-wxa4z-operator-controller-manager-7c7898d7d4-87hmt	Running	2/2	0	ibm-wxa4z-operator-controller-manager-7c7898d7d4	31.0 MiB	0.001 cores	Nov 4, 2024, 4:44 PM

34. 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@Andrews-MBP watsonxAssistant % oc create namespace wxa4z-byos
namespace/wxa4z-byos created
andrewjones@Andrews-MBP watsonxAssistant % export IBM_CS_ENT_KEY=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpYXQiOjE2NjYwMTk1ODAsImp0aSI6ijNkOWUyMzZjTAzMDQzMzvhNTJhYTkzMWNmOTcyMDR1In0.4M3XRD4XzkHMS0kFNJ4uKVcWZ6SnEA0Z03eL_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.operators.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) resource

35. Create a file called **os-secret.yaml** with the following content.

File name:

```
os-secret.yaml
```

Substitute a secure password of your choosing for the string <OPENSEARCH_PASSWORD>.

File contents:

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

36. Create the secret by running the following command.

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

37. Create a file called **client-ingestion-secret.yaml** with the following content.

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.

File contents:

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

37. Create the secret by running the following command.

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

38. 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"
```



Remove the trailing % from the cluster domain name.

The value returned for the cluster domain may include a % character at the end. Do not include the % in the next step!

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

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

39. Create a file called **byos.yaml** with the following content.

File name:

```
byos.yaml
```

Substitute the domain name recorded in the previous step for the string <YOUR_CLUSTER_DOMAIN>. Do not include the % at the end of the domain name.

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: 4
        memory: "500Mi"
      limits:
        cpu: 4
        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

```

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

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

The BYOS deployment begins and might take up to 20 minutes or more for the images to download and the deployment to complete. You can check the status by looking at the Pods view in the OCP console.

Verify all the required pods are running

42. Verify that all pods have the status of **Running** or **Completed**.

Name	Status	Ready	Restarts	Owner	Memory	CPU	Created
da80909aab1563ff0c15b7c6d	Completed	0/1	0	da80909aab1563ff0c15b7c6da81 a8befabaa605065bb6c6b490e87 0e87f0k96l	-	-	Nov 6, 2024, 9:26 AM
ibm-wxa4z-operator-catalog-cfsv	Running	1/1	0	ibm-wxa4z-operator-catalog	25.0 MiB	0.004 cores	Nov 6, 2024, 9:25 AM
ibm-wxa4z-operator-controller-manager-556fcf98bb-4bhmk	Running	2/2	0	ibm-wxa4z-operator-controller-manager-556fcf98bb	142.8 MiB	0.023 cores	Nov 6, 2024, 9:26 AM
wxa4z-byos-cluster-0	Running	1/1	0	wxa4z-byos-cluster	1,095.8 MiB	0.017 cores	Nov 6, 2024, 10:22 AM
wxa4z-byos-cluster-1	Running	1/1	0	wxa4z-byos-cluster	1,169.1 MiB	0.016 cores	Nov 6, 2024, 10:22 AM
wxa4z-byos-cluster-2	Running	1/1	0	wxa4z-byos-cluster	1,113.3 MiB	0.015 cores	Nov 6, 2024, 10:22 AM
wxa4z-client-ingestion-7f9b8d6c58-9bzth	Running	1/1	0	wxa4z-client-ingestion-7f9b8d6c58	501.8 MiB	0.071 cores	Nov 6, 2024, 12:18 PM
wxa4z-opensearch-wrapper-5cb879f5fb-qw7qt	Running	1/1	0	wxa4z-opensearch-wrapper-5cb879f5fb	547.1 MiB	0.031 cores	Nov 6, 2024, 10:22 AM
wxa4z-snapshot-setup-job-nsqtz	Completed	0/1	0	wxa4z-snapshot-setup-job	-	-	Nov 6, 2024, 10:22 AM

When deployment completes and all the pods have a status of "Ready", "Running", or "Completed", the next step is to retrieve your BYOS endpoint URL.

43. In the OCP console, click **Networking** and then **Routes**.

Name	Status	Ready	Restarts	Owner	Memory	CPU	Created
da80909aab1563ff0c15b7c6d	Completed	0/1	0	da80909aab1563ff0c15b7c6da81 a8befabaa605065bb6c6b490e87 0e87f0k96l	-	-	Nov 6, 2024, 9:26 AM
ibm-wxa4z-operator-catalog-cfsv	Running	1/1	0	ibm-wxa4z-operator-catalog	25.0 MiB	0.004 cores	Nov 6, 2024, 9:25 AM
ibm-wxa4z-operator-controller-manager-556fcf98bb-4bhmk	Running	2/2	0	ibm-wxa4z-operator-controller-manager-556fcf98bb	141.2 MiB	0.022 cores	Nov 6, 2024, 9:26 AM
wxa4z-byos-cluster-0	Running	1/1	0	wxa4z-byos-cluster	1,095.8 MiB	0.016 cores	Nov 6, 2024, 10:22 AM
wxa4z-byos-cluster-1	Running	1/1	0	wxa4z-byos-cluster	1,169.1 MiB	0.016 cores	Nov 6, 2024, 10:22 AM
wxa4z-byos-cluster-2	Running	1/1	0	wxa4z-byos-cluster	1,113.3 MiB	0.015 cores	Nov 6, 2024, 10:22 AM
wxa4z-client-ingestion-7f9b8d6c58-9bzth	Running	1/1	0	wxa4z-client-ingestion-7f9b8d6c58	534.6 MiB	0.087 cores	Nov 6, 2024, 12:18 PM
wxa4z-opensearch-wrapper-5cb879f5fb-qw7qt	Running	1/1	0	wxa4z-opensearch-wrapper-5cb879f5fb	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	-	-	Nov 6, 2024, 10:22 AM

44. 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 search instance

45. Configure your assistant with the route recorded in the previous step.

First, 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**
```

Note, the above URL will not work for you. Use the value of your specific OpenSearch instance that is recorded in the previous step.

Next, you need to return to your assistant in the watsonx Orchestrate AI assistant builder and update the custom search integration URL. The steps to update the URL are illustrated in the animated gif that follows. You can see the steps [here](creatingAssistant-configuringConvoSearch.md#configureCustomSearchURL).

??? Tip "How to set the custom search integration URL."

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

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

A version of zassist is available for download for IBMers and Business Partners for conducting pilots. Follow the steps that follow to download and install **zassist**.

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

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

The screenshot shows a file browser interface for Box@IBM. At the top, there's a header with 'Box@IBM' and a search bar. Below the header, a folder named 'zassist.zip' is displayed. Inside this folder, there is a single item named 'zassist'. In the top right corner of the browser, there are several buttons: three dots, 'Download' (which is highlighted with a green box), and 'Account'. The main area shows a table with columns for Name, Modified, and Size.

Name	Modified	Size
zassist	Sep 5 at 9:15 AM	--

2. Extract the **zassist.zip** file.

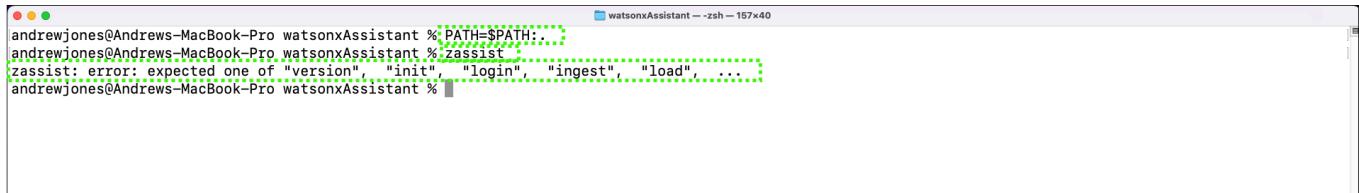
3. Locate the appropriate file for your local workstation's operating system.

The screenshot shows a file browser interface for Watsonx Assistant. The title bar says 'watsonxAssistant'. The main area displays a file tree under a folder named 'zassist'. The 'zassist' folder is highlighted with a green dashed selection box. Inside 'zassist', there are sub-folders for 'linux', 'mac', and 'windows', and a file named 'zassist'. Each item in the tree has a small preview icon to its left. The file tree is organized into sections: 'byos.yaml', 'ca.crt', 'catalogCertManager.yaml', 'catalogSource.yaml', 'client-ingestion-secret.yaml', 'os-secret.yaml', 'zassist' (the selected folder), and 'zassist.zip'.

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

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

5. Verify that the **zassist** utility is working.



```
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 %
```

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 are provided in the IBM watsonx Assistant for Z documentation. In the directions, when running the log in command in step 7, use the **CLIENT_INGESTION_AUTHKEY** you created in the [previous section](#).

6. Follow the directions [here](#) to ingest documents using zassist.

These steps are not repeated in this lab guide. The following video illustrates the steps to ingest a single document. This video has no audio.

Don't see the video in the PDF version of the lab guide?



If you are viewing the [PDF](#) of the lab guide, you can access the video [here](#).

The document that is ingested in the video is a compressed [PDF](#) of the **IBM z/OS Continuous Delivery** Red Piece. You can download a copy of this document [here](#).

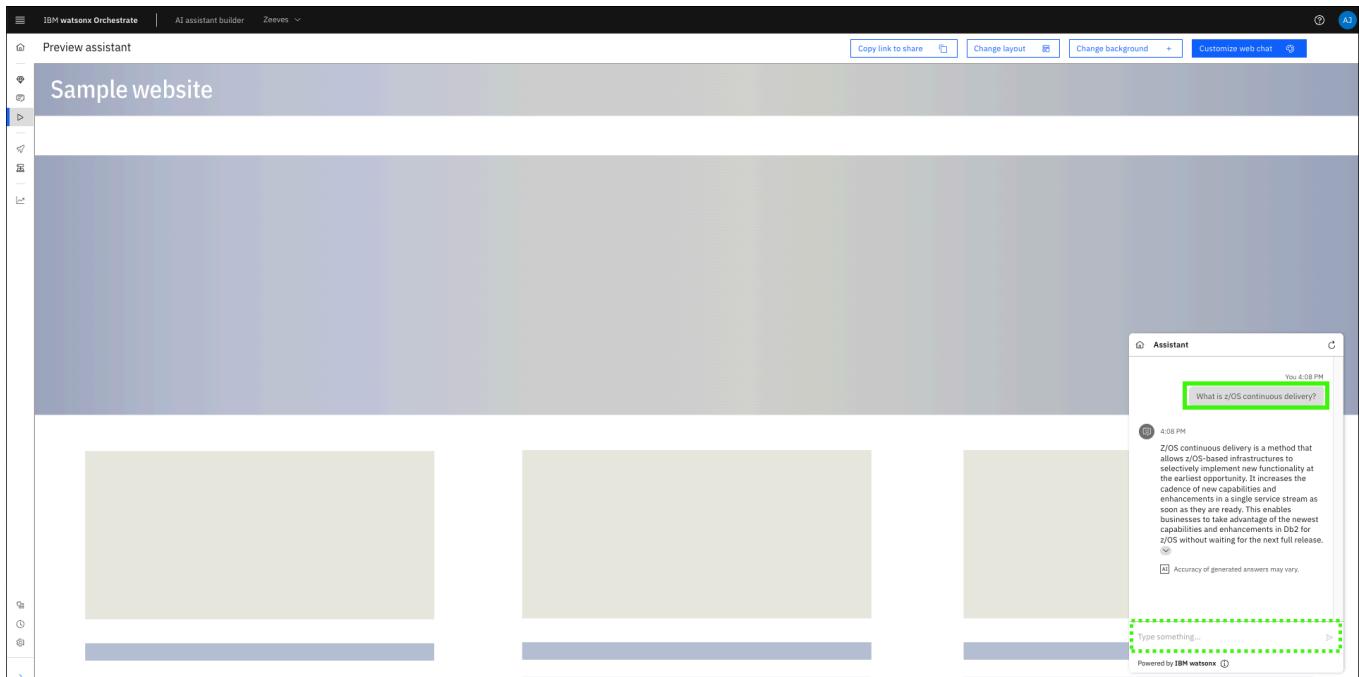
Verify the document that is ingested is now returned as a source file for a query.

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

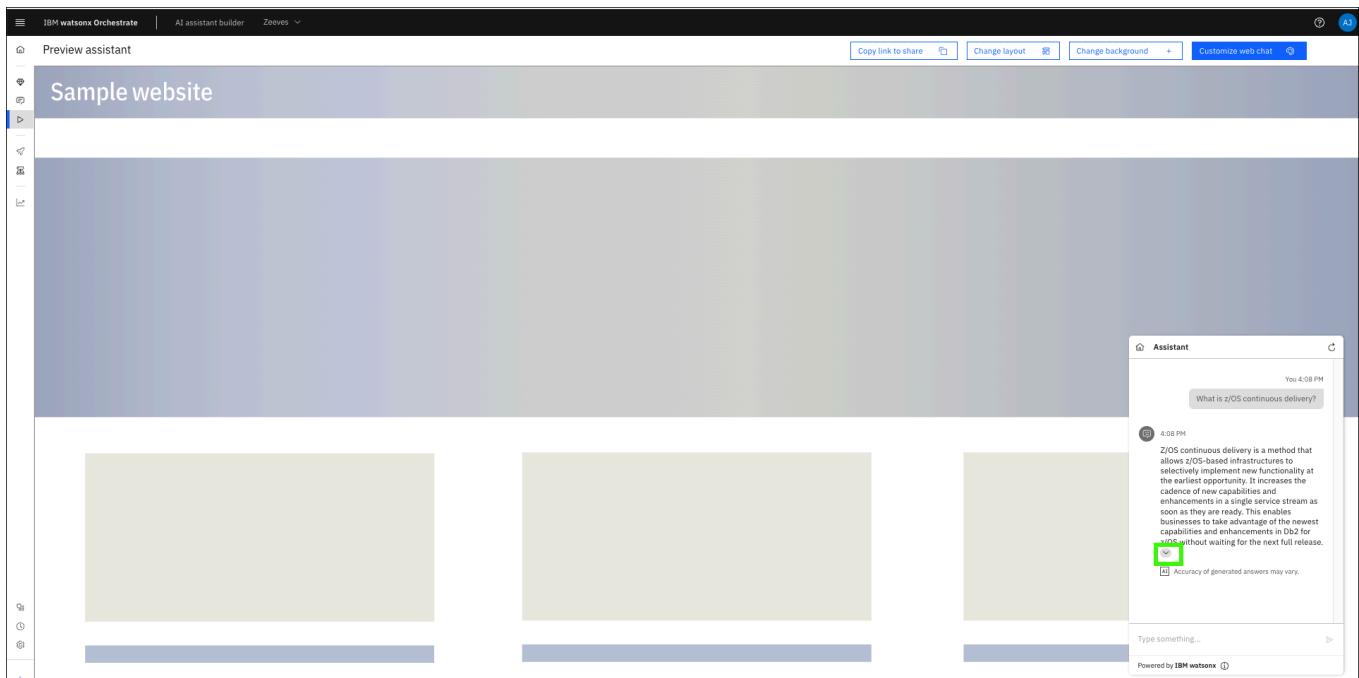
7. Hover over the home () icon and click **Preview**.

8. Enter the following prompt in your assistant.

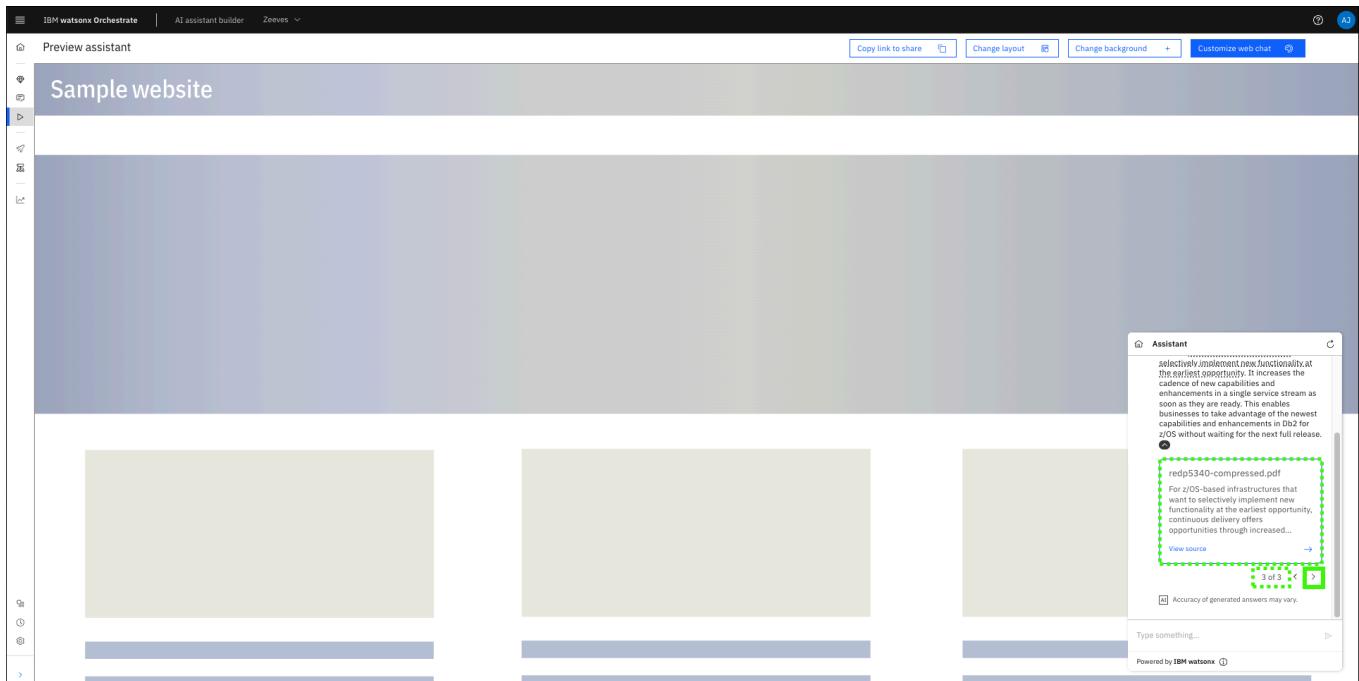
What is z/OS continuous delivery?



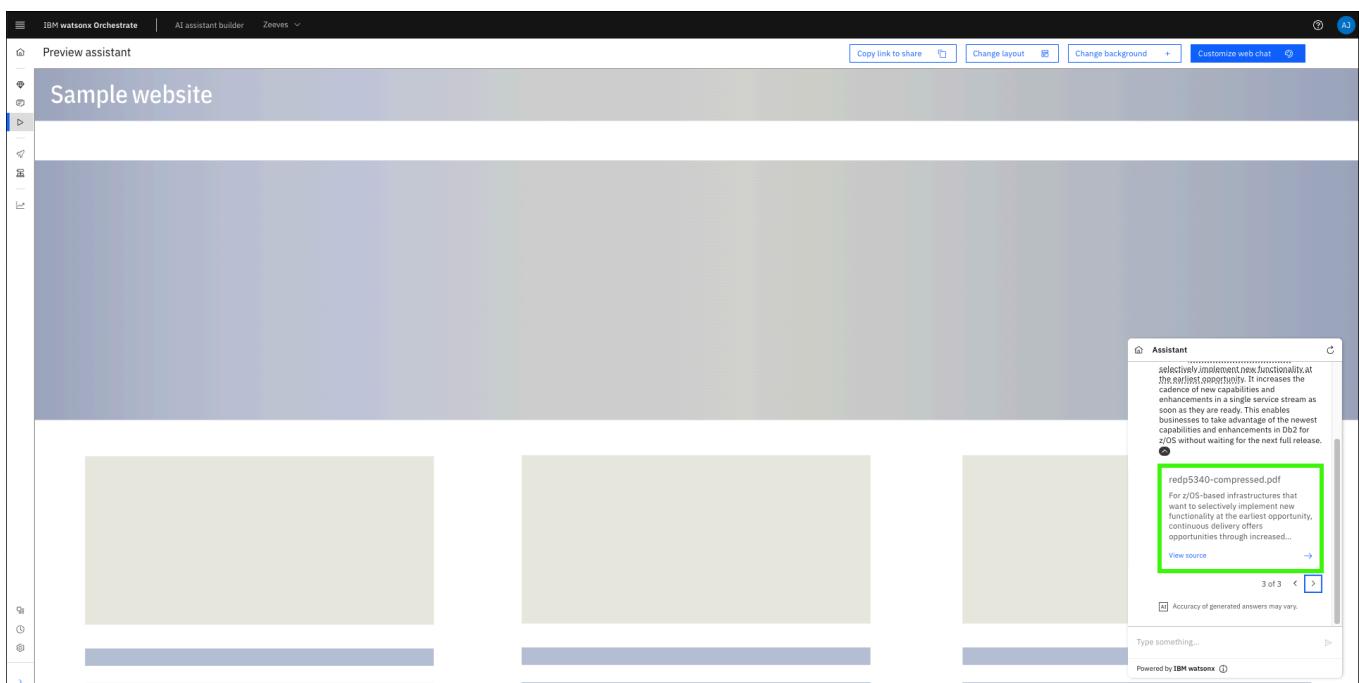
9. Expand the sources section by clicking the (▼).



10. Click through the list of resources and find the reference to the Red Piece document you ingested.

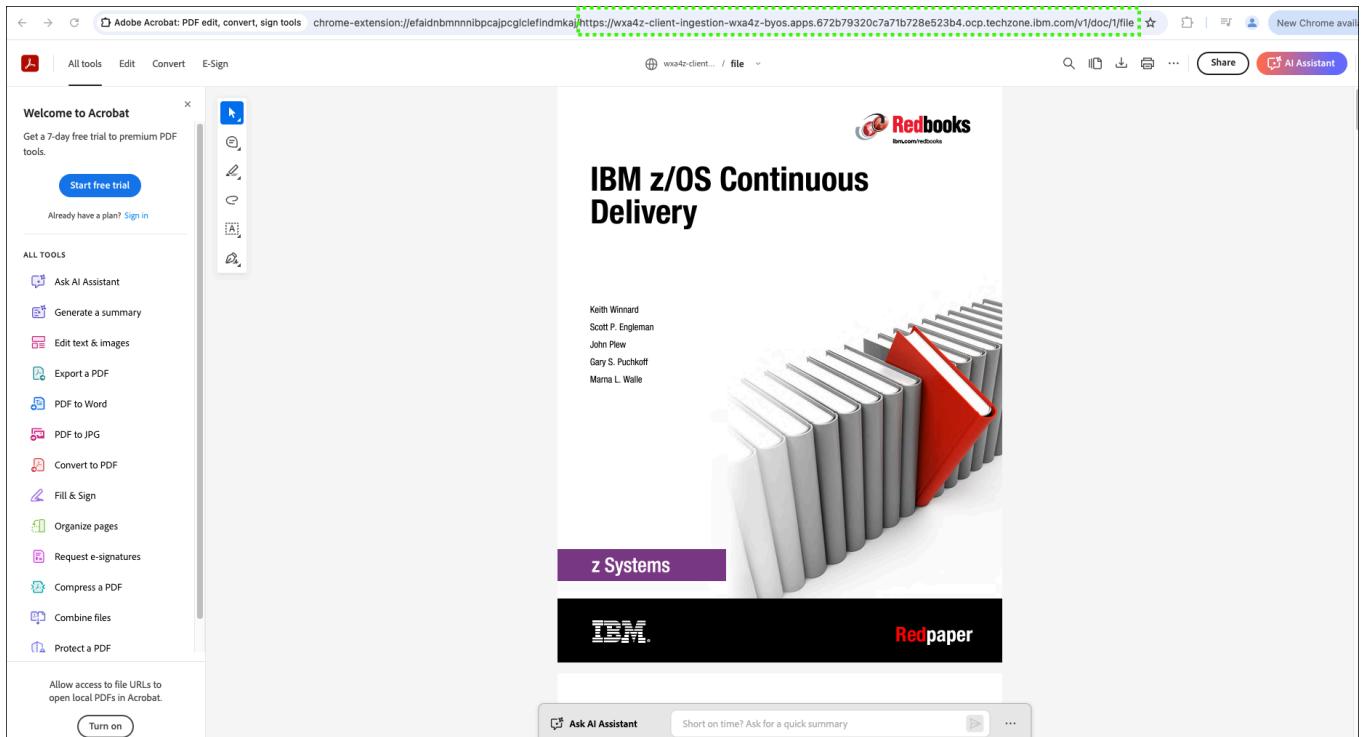


11. Click the ingested document reference.



12. Accept the security risk to view the source document.

The steps to accept the security risk for the document are not shown. 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.



Adjusting the search behavior

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

Custom service Draft

Settings Instance

even if the user has moved on.

Define the text for the citations title. ⓘ

How do we know?

Tendency to say "I don't know".

Rarely	Less often	More often	Most often
--------	------------	------------	------------

Generated response length. ⓘ

Concise	Moderate	Verbose
---------	----------	---------

Default filter

Can be anything (plain text, JSON, etc)

Metadata

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

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

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. This replaces having to paste a complicated search string. By default (without any string in the Metadata field), it searches all the default IBM provided documentation and all ingested customer documentation using the following value:

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

Replacing the wildcard string with an explicit list of indices allows 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. Out of the box 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 only want your assistant to 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 only want your assistant to reference 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",
"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”.

After you have configured all the settings for Conversational Search on the page, click “Save” in the upper-right of the page.

For more information on customizing the metadata field for conversational search, refer to this supplemental video found [here](#).

You are encouraged to experiment with the metadata field!

Try setting the metadata field to the following, which weights ingested docs higher than the product docs:

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

Now, repeat steps 6 through 8 (make sure you start a fresh preview of the assistant). Notice that the ingested Red Piece document is now the first sited reference!

Guidance for the pilot environment

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:

- Greater than 15,000 documents is not supported.
- Individual documents should be less than 10 megabytes (MB).
- Larger documents greater than 50 MB should work if the document contains mostly images.
- 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
```

After ingesting all the your additional documents, proceed to the next section to learn about adding skills to your assistant.

Adding skills to the assistant

Getting started with skills and actions

Watsonx Assistant for Z can import skills to automate a range of IBM Z related tasks through assistant interactions. Each skill is a pre-defined automation that runs tasks to accomplish some unit or units of work. For example, you can use a skill to view z/OS IPL information, or work with z/OS datasets.

IBM Watsonx Assistant for Z provides an extension within Watsonx Orchestrate to build new skills from Ansible Automation platform or z/OS Management Facility (z/OSMF). The Z Skills Accelerator extension connects Ansible and z/OS application programming interfaces (APIs) and can import automation as Ansible Playbooks, JCL, or REXX as skills. Learn more importing and building skills [here](#).

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.

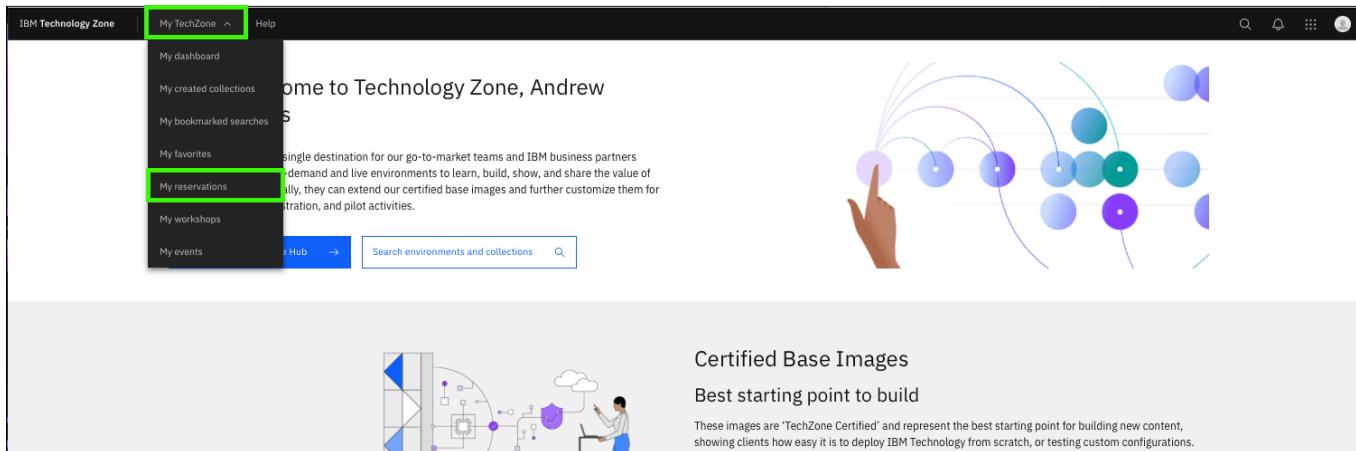
Access the AAP and Wazi as a Service environment

Be sure to record the information as instructed

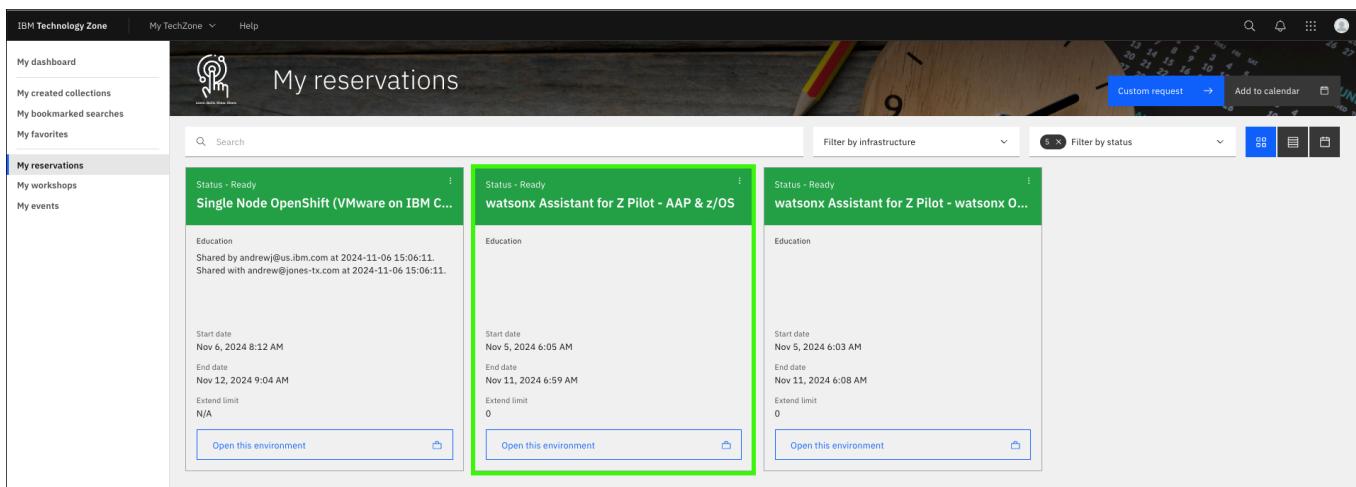
Several of the steps below instruct you to record values from your ITZ reservation. Be sure to do this as they will not only be used in this section, but also in later sections of the lab guide.

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.

The screenshot shows the IBM Technology Zone interface with the following details:

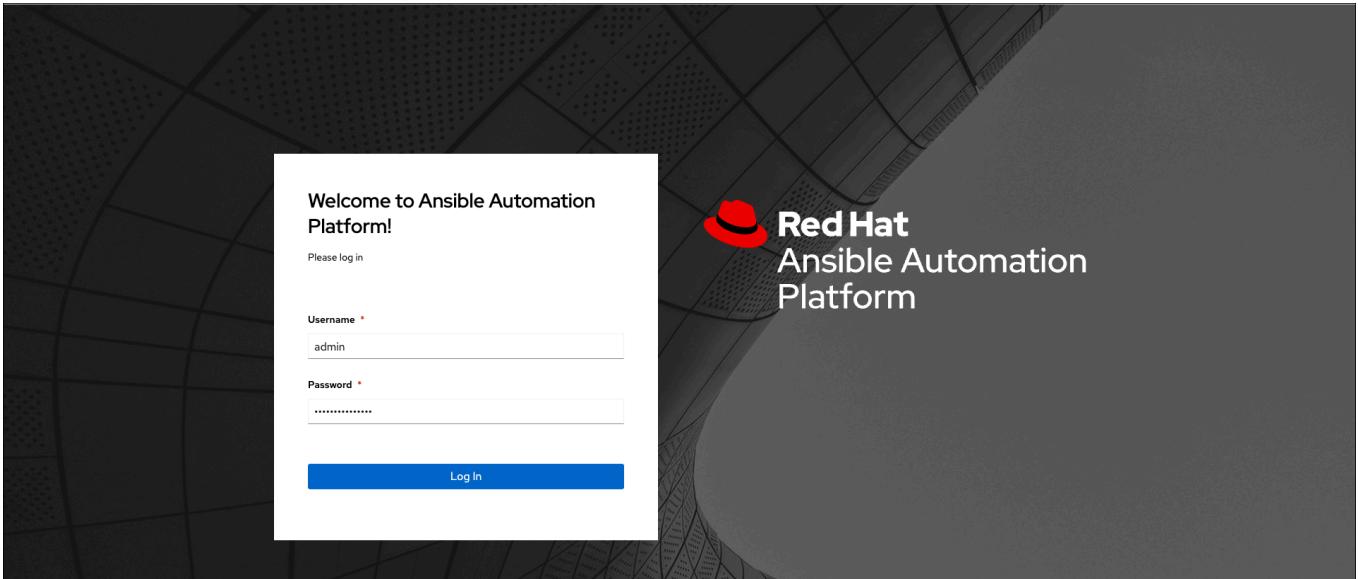
- Idle runtime limit:** 10800
- Reservation Details:**
 - Ansbile Automation Platform Cockpit UI: <https://itvsi-aap-phdhuz4.techzone.ibm.com:9090>
 - Ansbile Automation Platform Private IP: 10.241.0.6
 - Ansbile Automation Platform Public IP: 150.239.83.37
 - Ansbile Automation Platform UI: <https://itvsi-aap-phdhuz4.techzone.ibm.com>
 - AAP User Name (For SSH access): U6VO7N3
 - AAP User Name (For UI access): admin
 - AAP User Password: 39hQc-NiS458:Wa
 - AAP VSI Management: https://cloud.ibm.com/vpc-ext/compute/vs/us-east-0757_d038c79d-2fc8-45fd-8429-5bc642623771?view=edit&bs_account=7fd16281c12c4681b91417749e322845
 - z/OS Private IP: 10.241.0.7
 - z/OS Public IP: 169.63.103.211
 - z/OS User Name (Use SSH key to login, not password): IBMUSER
 - z/OS VSI Management: https://cloud.ibm.com/vpc-ext/compute/vs/us-east-0757_d729cb11-98ff-4453-8f74-acc6c595be1?view=edit&bs_account=7fd16281c12c4681b91417749e322845
 - User SSH key: [dropdown menu]

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

The screenshot shows the IBM Technology Zone interface with the following details, identical to the previous one except for the highlighted UI link:

- Idle runtime limit:** 10800
- Reservation Details:**
 - Ansbile Automation Platform Cockpit UI: <https://itvsi-aap-phdhuz4.techzone.ibm.com:9090>
 - Ansbile Automation Platform Private IP: 10.241.0.6
 - Ansbile Automation Platform Public IP: 150.239.83.37
 - Ansbile Automation Platform UI: <https://itvsi-aap-phdhuz4.techzone.ibm.com>
 - AAP User Name (For SSH access): U6VO7N3
 - AAP User Name (For UI access): admin
 - AAP User Password: 39hQc-NiS458:Wa
 - AAP VSI Management: https://cloud.ibm.com/vpc-ext/compute/vs/us-east-0757_d038c79d-2fc8-45fd-8429-5bc642623771?view=edit&bs_account=7fd16281c12c4681b91417749e322845
 - z/OS Private IP: 10.241.0.7
 - z/OS Public IP: 169.63.103.211
 - z/OS User Name (Use SSH key to login, not password): IBMUSER
 - z/OS VSI Management: https://cloud.ibm.com/vpc-ext/compute/vs/us-east-0757_d729cb11-98ff-4453-8f74-acc6c595be1?view=edit&bs_account=7fd16281c12c4681b91417749e322845
 - User SSH key: [dropdown menu]

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



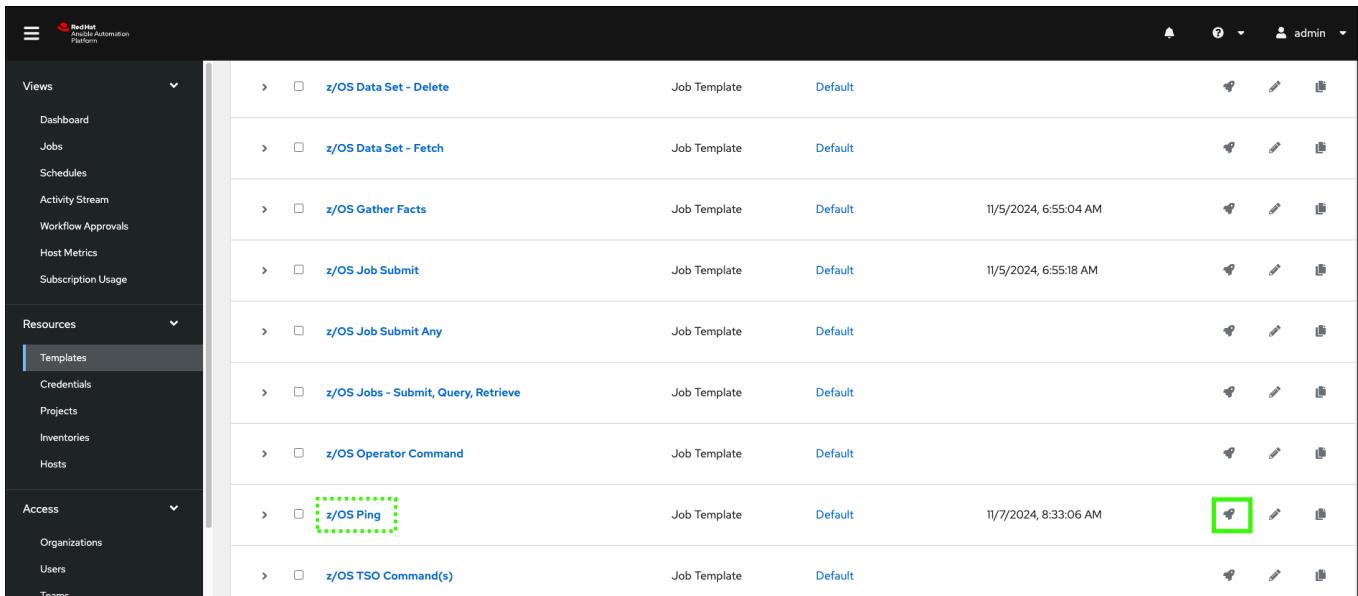
6. Click **Templates** under the **Resources** section.



The AAP instance is preconfigured to the Wazi aaS instance

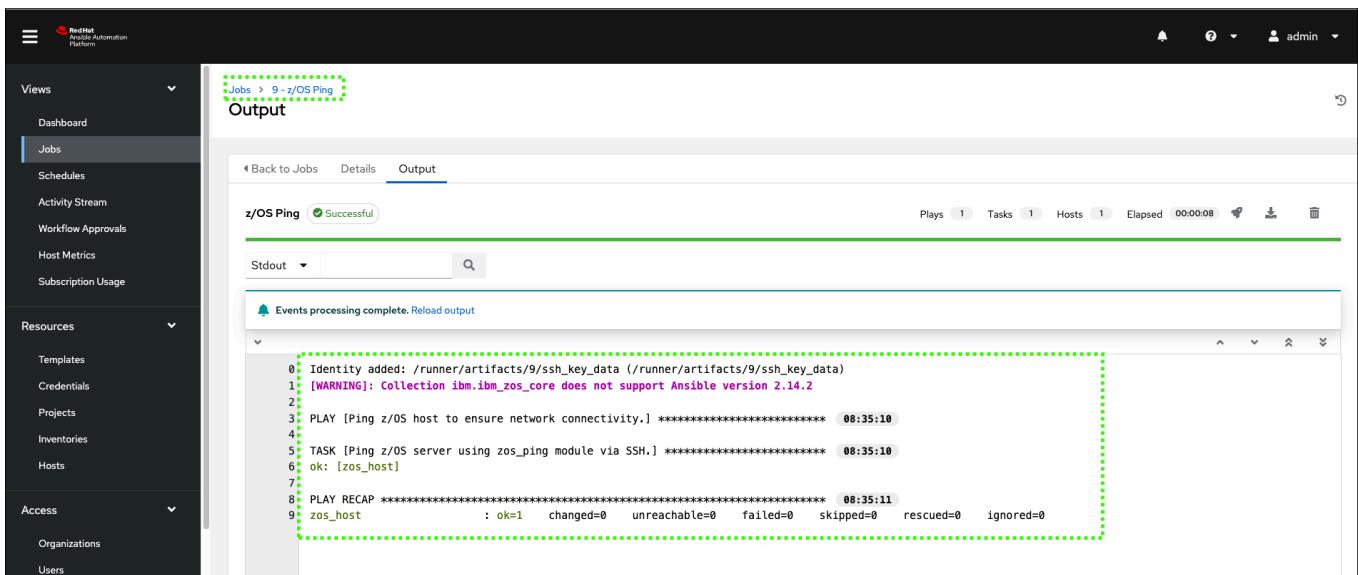
Note that because the AAP instance and the back-end z/OS system are preconfigured, no changes are needed to execute the templates and they will target your provisioned z/OS system by default.

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



Views	z/OS Data Set - Delete	Job Template	Default			
Dashboard	z/OS Data Set - Fetch	Job Template	Default			
Schedules	z/OS Gather Facts	Job Template	Default	1/5/2024, 6:55:04 AM		
Activity Stream	z/OS Job Submit	Job Template	Default	1/5/2024, 6:55:18 AM		
Workflow Approvals	z/OS Job Submit Any	Job Template	Default			
Host Metrics	z/OS Jobs - Submit, Query, Retrieve	Job Template	Default			
Subscription Usage	z/OS Operator Command	Job Template	Default			
Resources	z/OS Ping	Job Template	Default	1/7/2024, 8:33:06 AM		
Templates	z/OS TSO Command(s)	Job Template	Default			
Credentials						
Projects						
Inventories						
Hosts						
Access						
Organizations						
Users						
Teams						

8. Observe the z/OS Ping job run.



The screenshot shows the 'Jobs' section of the Red Hat Ansible Automation Platform. A specific job named 'z/OS Ping' is selected and its output is displayed. The output window shows the following log entries:

```

Events processing complete. Reload output
-----
0 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.] **** 08:35:10
4
5 TASK [Ping z/OS server using zos_ping module via SSH.] **** 08:35:10
6 ok: [zos_host]
7
8 PLAY RECAP **** 08:35:11
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](#).

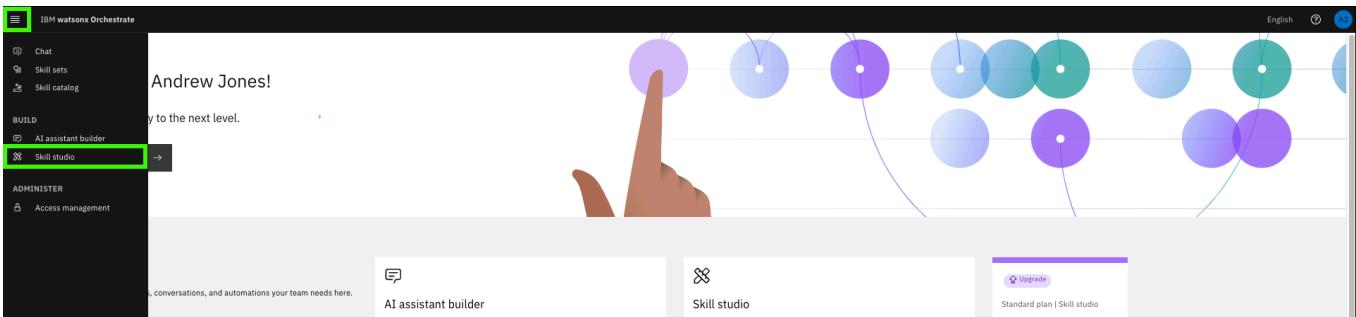
1. Click the **resources** icon (☰).

The screenshot shows the IBM Cloud dashboard with a green box highlighting the 'Build' card under the 'For you' section. The 'Build' card has a blue background and text: 'Explore IBM Cloud with this selection of easy starter tutorials and services.' Other cards include 'Use Watson Assistant', 'IBM Cloud Essential Security and Observability Services', 'Use Cloud Object Storage', 'Maximo Application Suite', 'Build with Watson', 'Use Watson Studio', and 'Get Started with Watson Studio'.

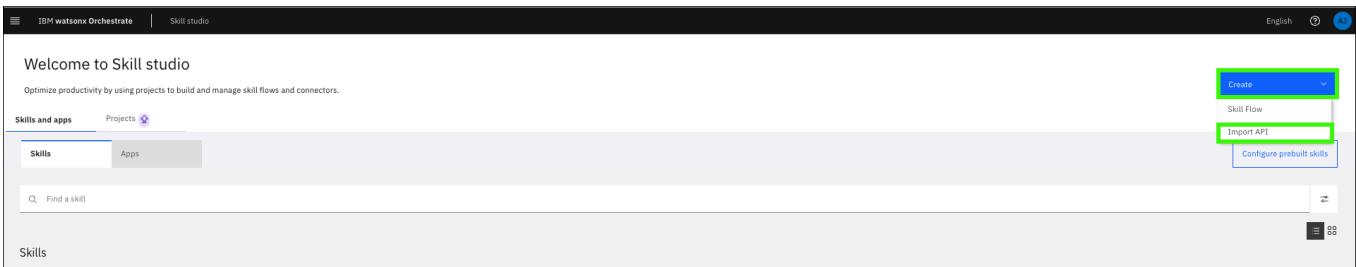
2. Click **Launch watsonx Orchestrate**.

The screenshot shows the watsonx Orchestrate resource list page. The 'Manage' tab is selected. A green box highlights the 'Launch watsonx Orchestrate' button. The page displays a 'Start by launching the tool' section with a 'Launch watsonx Orchestrate' button and a 'Getting started tutorial' link. Below this is a 'Credentials' section showing an API key and URL, with download and show credential links. To the right is a 'Plan' section titled 'Essentials Plan'.

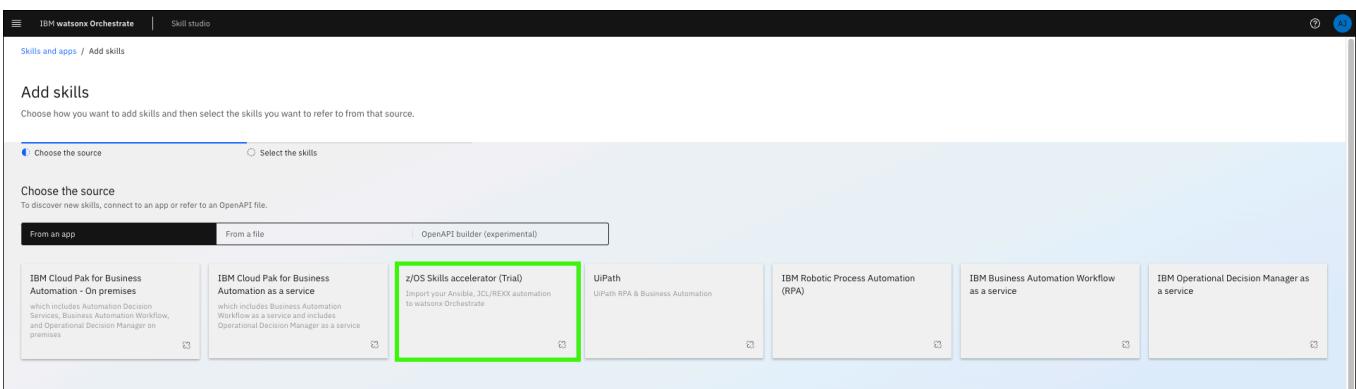
3. Click the main menu (☰) and then click **Skill studio**.



4. Expand Create and click Import API.



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



6. 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](exploreAAP.md) section earlier.

a: Connection Type: **ansible**

b: Application Name: <enter a meaningful name for the skills that you will import> - *be sure to remember 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)>

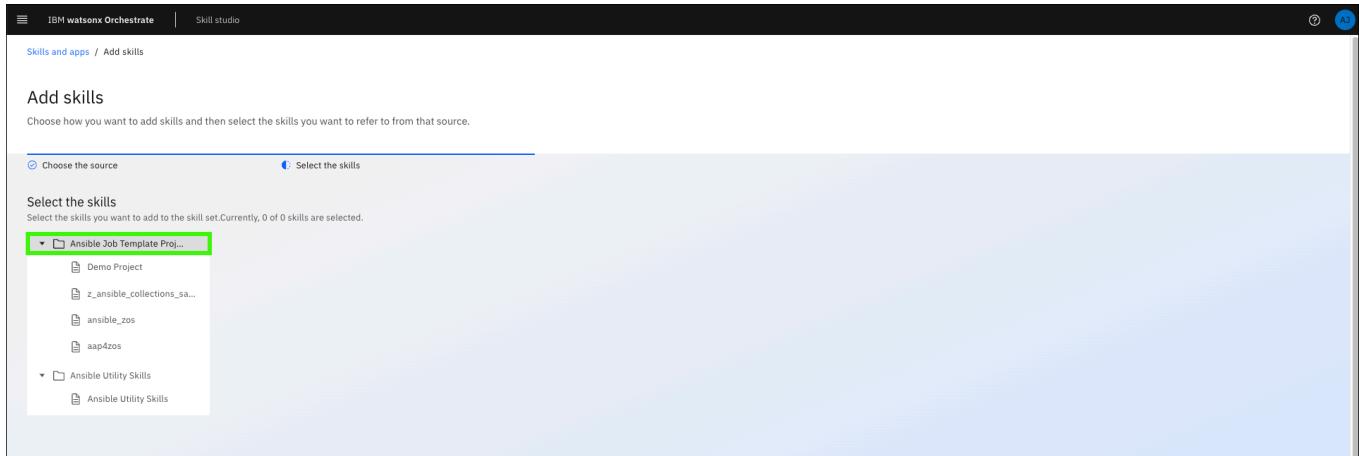
e: Password: <enter the AAP User Password>

f: Search Pattern: *****

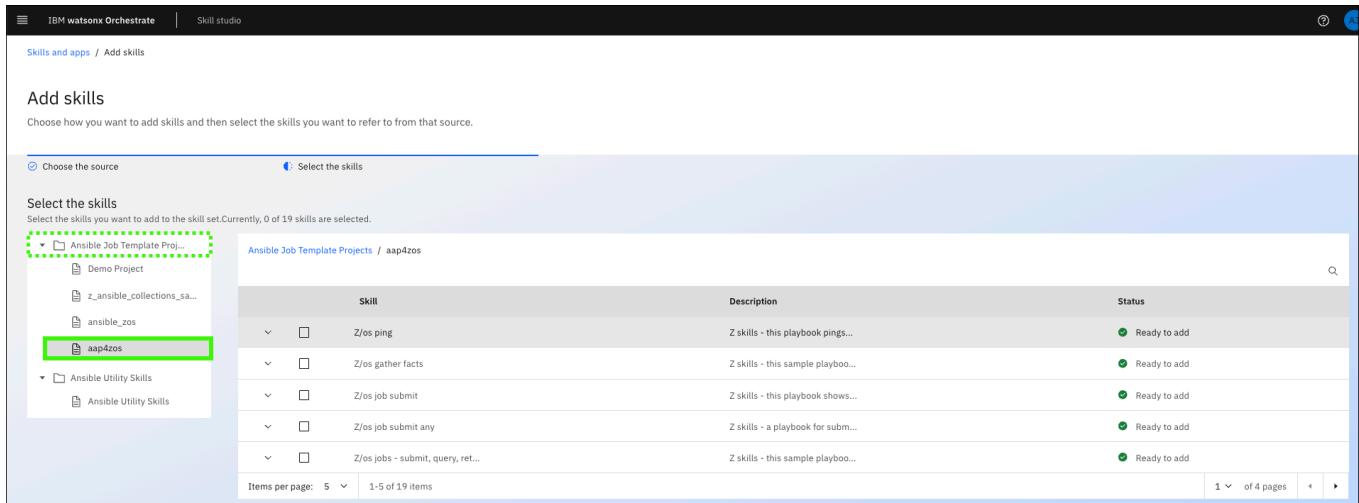
7. Expand the Ansible Job Template Proj... folder.

Browse the other available skills

There are also 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 (i.e. “Retrieve job output”). You should also import these utility skills to enable more complete automation execution flows.



8. 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
Z/os job submit	Z skills - this playbook shows...	Ready to add
Z/os job submit any	Z skills - a playbook for subm...	Ready to add
Z/os jobs - submit, query, ret...	Z skills - this sample playboo...	Ready to add

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

10. Click the ellipses (![]_attachments/ellipsesIcon.png) for the first skill and select **Enhance this skill.**

11. 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.

The screenshot shows the 'Skill studio' interface for enhancing a skill. The skill being enhanced is 'z/OS Gather Facts'. The 'Name' field contains 'z/OS Gather Facts'. The 'Description' field contains a sample playbook demonstrating the z/OS gather facts module. The 'API version*' field is set to '1.0'. Under 'Categories', there is an 'Add categories' button. Under 'App', there is a link to 'Ansible Controller Skills - z skills'. On the right side, there are two preview sections: one for the catalog showing the skill card, and another for the skill set showing a single skill card. At the bottom right are buttons for 'Cancel', 'Publish' (which is highlighted with a green box), and 'Save as draft'.

12. Repeat steps 10 and 11 for each skill you imported.

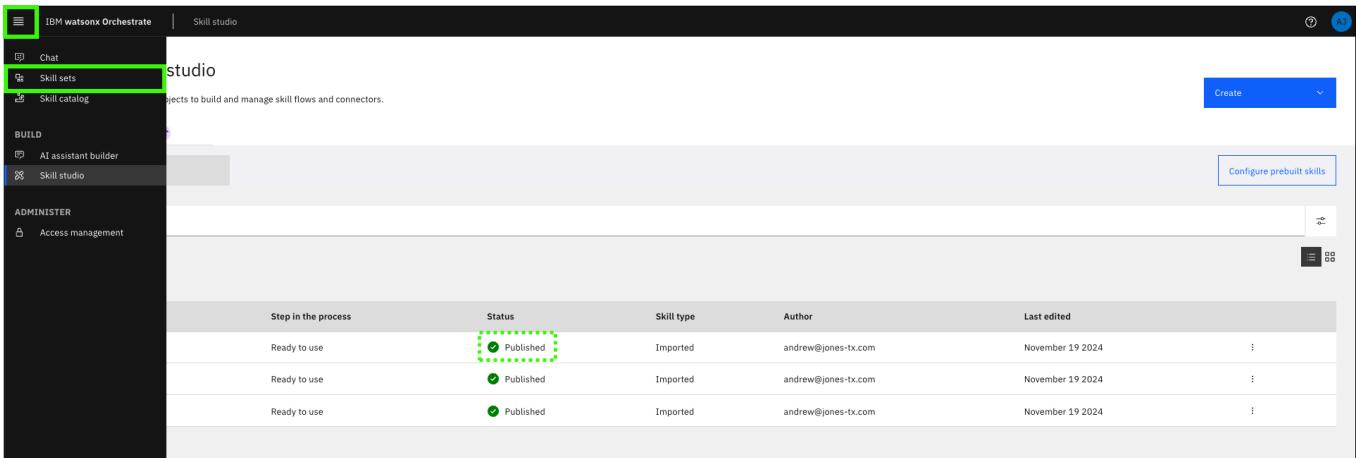
The screenshot shows the 'Skills' tab in the Skill studio. It lists two skills: 'z/OS Gather Facts' and 'z/OS Ping'. The 'z/OS Gather Facts' skill is listed as 'Published' (highlighted with a green box) and 'Ready to use'. The 'z/OS Ping' skill is listed as 'Ready to publish'. Other tabs include 'Skills and apps' (selected) and 'Projects'. A search bar at the top allows for finding a skill. A 'Create' button is located at the top right. A 'Configure prebuilt skills' button is also visible.

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 published, the application you created can be connected to your assistant.

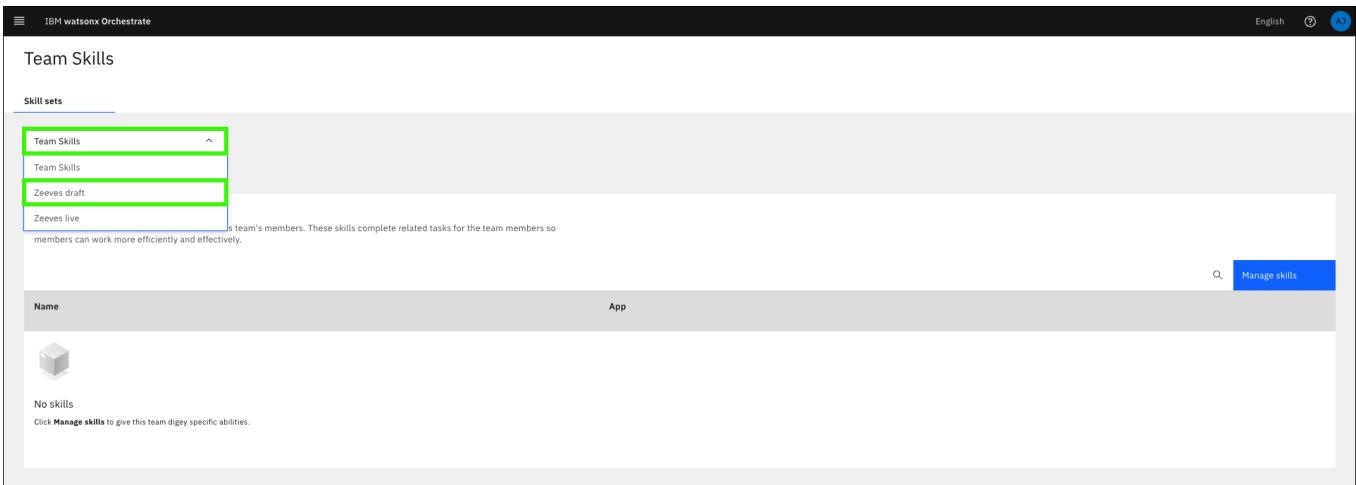
1. Expand the main menu and select **Skill sets**.



The screenshot shows the IBM Watsonx Orchestrate interface with the 'Skill studio' tab selected. The left sidebar has 'Skill sets' highlighted with a green box. The main area displays a table of published skills:

Step in the process	Status	Skill type	Author	Last edited
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

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

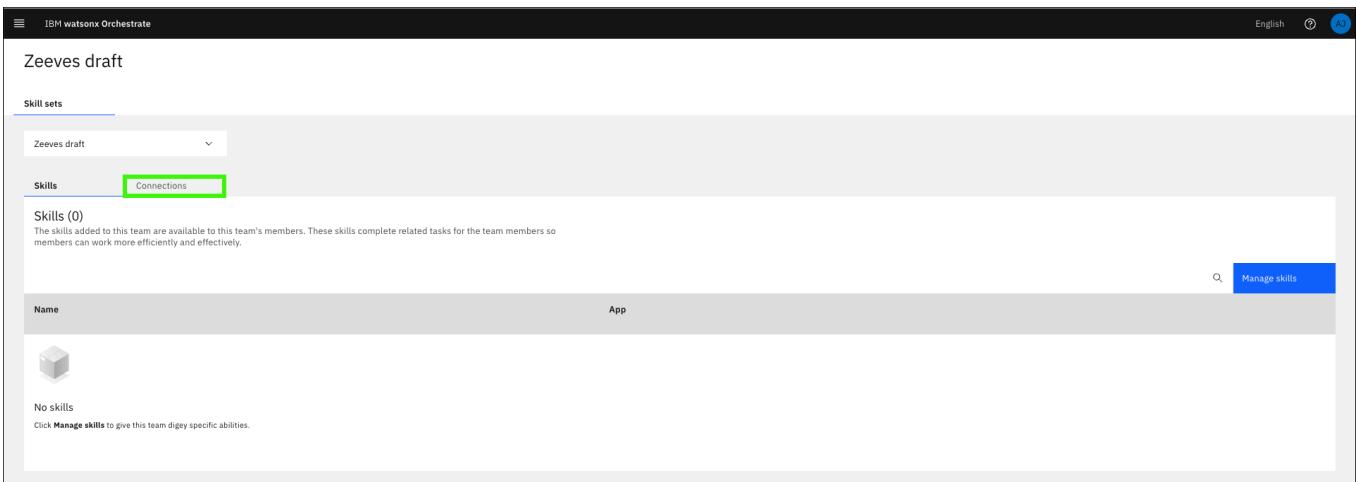


The screenshot shows the 'Team Skills' page. The 'Skill sets' dropdown is open, showing 'Team Skills' and 'Zeeves draft' (which is highlighted with a green box). The main area shows a table with one row:

Name	App

Below the table, it says 'No skills' and 'Click Manage skills to give this team digest specific abilities.'

3. Click the **Connections** tab.



The screenshot shows the 'Connections' tab for the 'Zeeves draft' team skill. The 'Skills' tab is selected (highlighted with a green box), while 'Connections' is the active tab. The main area shows a table with one row:

Name	App

Below the table, it says 'No skills' and 'Click Manage skills to give this team digest specific abilities.'

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 - z skills	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 - z skills	2	⚠️ Not specified	-	⋮

Items per page: 5 | 1-1 of 1 items | Connect app | 1 ⚏ of 1 page | < >

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

The screenshot shows the IBM Watsonx Orchestrate interface. On the left, there's a sidebar with 'Skill sets' and a dropdown menu showing 'Zeeves draft'. Below it are tabs for 'Skills' and 'Connections'. The main area displays a table of skills, with one row for 'Ansible Controller Skills - z skills' showing 'Number of skills: 2' and 'Credential type: Not specified'. At the bottom, there are pagination controls for 'Items per page: 5' and '1-1 of 1 items'. On the right, a modal window titled 'Connect to Ansible Controller Skills - z skills' is open. It has two radio button options: 'Member credentials' (unselected) and 'Team credentials' (selected). A note below says 'You selected Team credentials for the credential type. Click Connect app to provide the credentials your team will use to connect to the app.' A 'Connect app' button is at the bottom of the modal, which is highlighted with a green box.

8. 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**.

This screenshot is similar to the previous one, showing the 'Zeeves draft' skill set in the IBM Watsonx Orchestrate interface. The modal window 'Connect to Ansible Controller Skills - z skills' is still open, with the 'Team credentials' option selected. The 'Connect app' button is highlighted with a green box. In this version, the input fields for 'username' (containing 'admin') and 'password' (containing a redacted value) are circled with green circles labeled 'a' and 'b' respectively. The note at the bottom of the modal is visible, and the 'Connect app' button is also circled with a green box.

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

This screenshot shows the 'Zeeves draft' skill set in the IBM Watsonx Orchestrate interface. The 'Ansible Controller Skills - z skills' row in the table is highlighted with a green dashed box. In the 'Connected by' column for this row, the email 'andrew@jones-tx.com' is listed. The 'Action' column for this row has a three-dot menu icon. The rest of the interface is similar to the previous screenshots, showing the skill set details and connection modal.

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

Creating actions for your assistant

Once the skills in your application are connected to your assistant, you're ready to begin creating actions tied to those skills. Learn more about building actions [here](#)

Configure the number of input fields

Before configuring actions, it's 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 IBM Watsonx Orchestrate web interface. At the top, there's a navigation bar with a profile icon and some settings. Below it, the main area is titled 'Zeeves draft' under 'Skill sets'. There are tabs for 'Skills' and 'Connections', with 'Skills' being active. A sidebar on the right shows user information (Andrew Jones, andrew@jones-tx.com), region (US-SOUTH), plan (Essentials), and links for 'Settings', 'Provide feedback', 'Privacy', 'About', and 'Log out'. A green box labeled 'a' highlights the user profile icon in the top right. A green box labeled 'b' highlights the 'Settings' link in the sidebar.

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

The screenshot shows the 'Settings' page in IBM Watsonx Orchestrate. The 'Skill configurations' tab is active, highlighted by a green box. Other tabs include 'Data Retention' and 'Platform languages'. Under 'Skill configurations', there's a section for 'Data Retention Policy' with an 'Active' radio button selected. A note says: 'The chat history for the users in the tenant are saved for 30 days. After 30 days, the chat history is deleted permanently. Deleting the chat history doesn't affect the connected apps or the added skills.' A green box highlights the 'Skill configurations' tab.

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

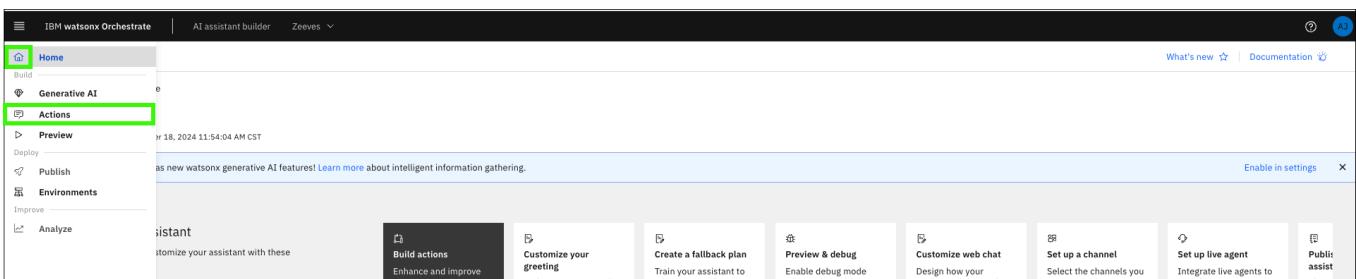
The screenshot shows the 'Skill configurations' page in IBM Watsonx Orchestrate. At the top, there are tabs for 'Data Retention', 'Skill configurations' (which is active and highlighted by a green box), and 'Platform languages'. Below the tabs, there's a section for 'Skill configurations' with a note: 'Set default for maximum number of fields to consider a skill to be conversational'. A large input field labeled 'Number of form fields' contains the value '0', which is highlighted by a green box. There are minus and plus buttons next to the input field.

Create actions

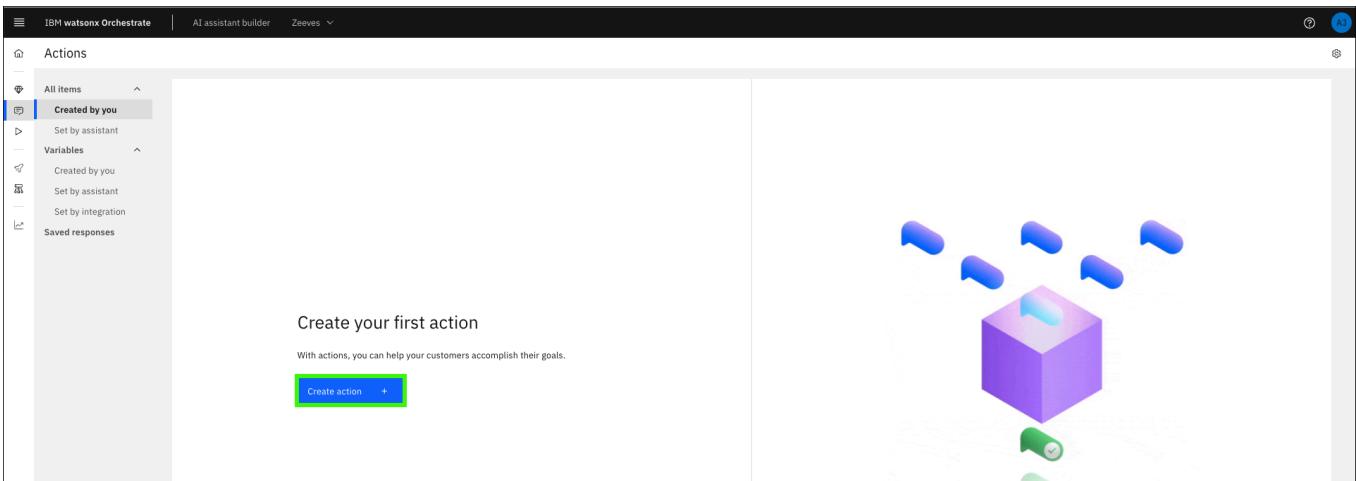
4. Click the main menu and select **AI assistant builder**.



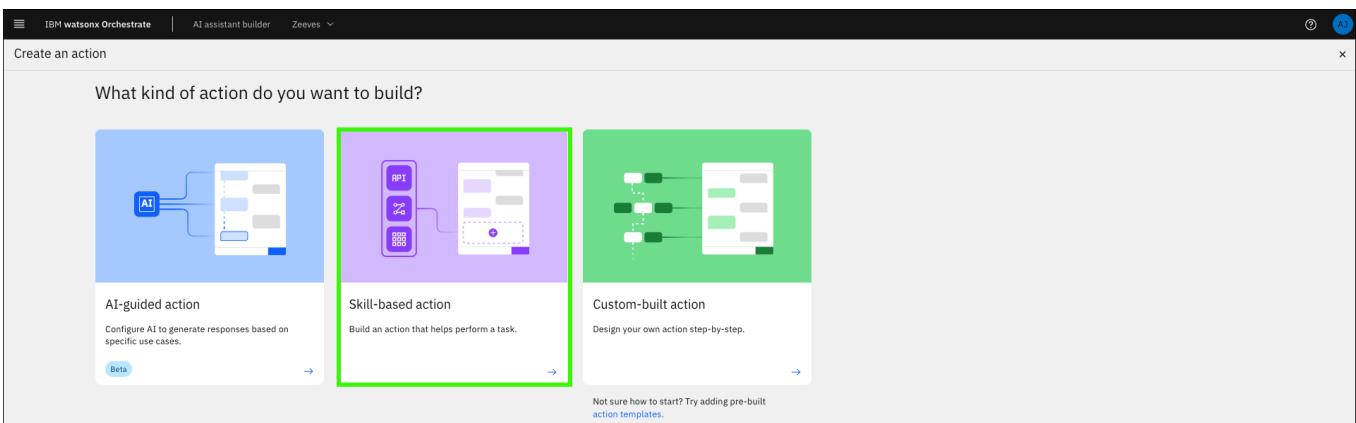
5. Hover over the **Home** icon (🏠) and click **Actions**.



6. Click **Create action**.



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



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

Note, the date shown in the tile should reflect when you add the skill to your application.

The screenshot shows a list of skills under the heading "Build an action from a skill". The "Select a skill" section says "Choose a conversational skill published as a foundation of your action." A search bar is present. The skills listed are:

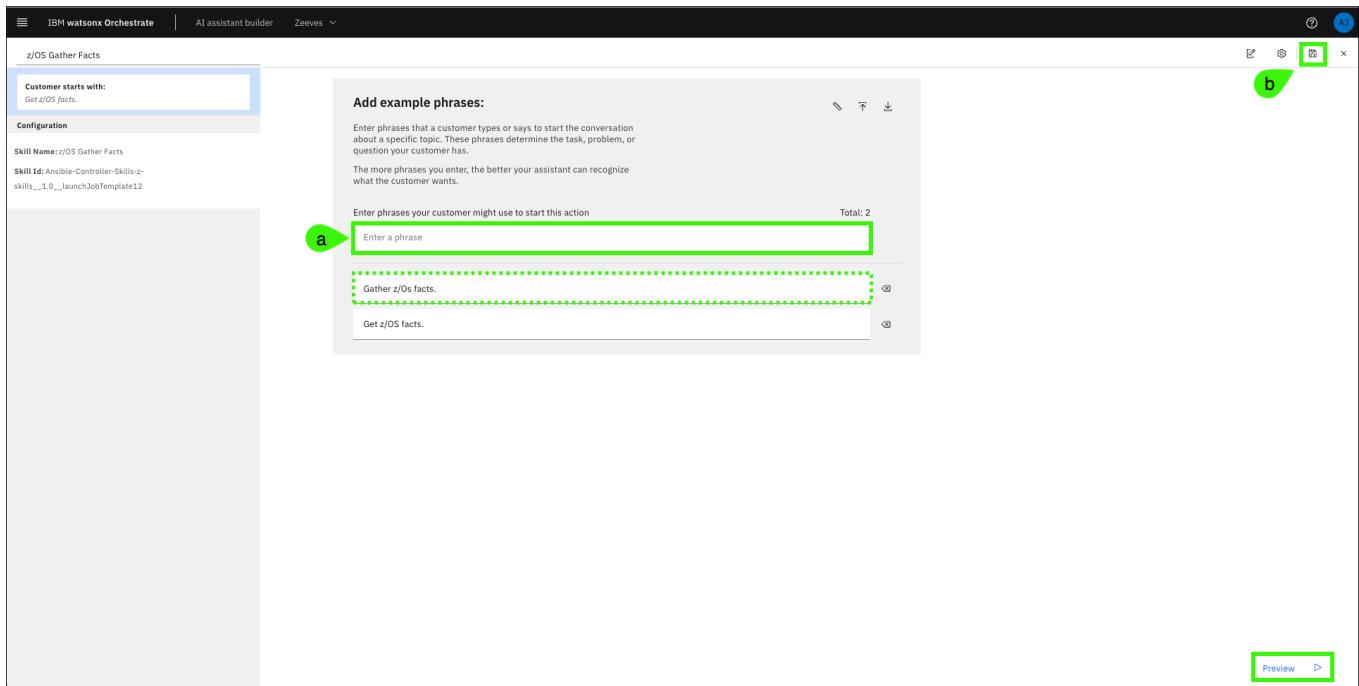
- z/OS Ping**: z skills - This playbook pings the z/OS host to test connectivity. Last updated: 2024-11-19T15:58:20.567Z
- z/OS Gather Facts**: z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls z/OS-specific information from the z/OS host. Last updated: 2024-11-19T15:56:26.843Z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

9. 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**.

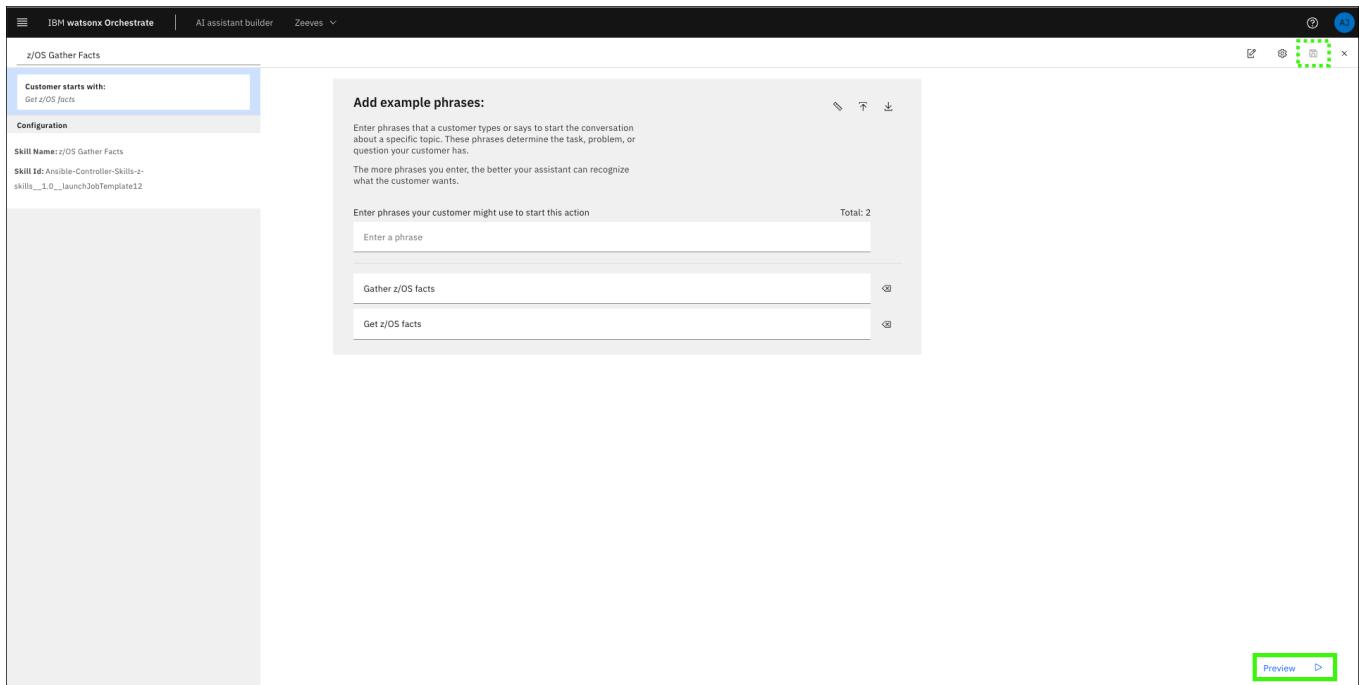
Sample prompts:

The screenshot shows the "Add example phrases" dialog. It includes fields for "Customer starts with:" (Example: I want to pay my credit card bill), "Configuration" (Skill Name: z/OS Gather Facts, Skill Id: Ansible-Controller-Skills-z-skills_1.0._launchJobTemplate12), and "Add example phrases:". The "Add example phrases:" section has a text input field containing "Get z/OS facts." Below it is a "New action" dialog with the same phrase entered. The "Save" button in the "New action" dialog is highlighted with a green box.

10. Add any (a) additional prompts and then (b) click the save ().



11. Click Preview.



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

Prompt:

Get z/OS facts

Customer starts with:
Get z/OS facts

Configuration

Skill Name: z/OS Gather Facts
Skill Id: Ansible-Controller-Skills-z-skills_1.0._launchJobTemplate12

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: 2

Enter a phrase

Gather z/OS facts
Get z/OS facts

Preview

12:55 PM
Greet customer [default]
Welcome, how can I assist you?

Get z/OS facts

13. Review the returned results.

Customer starts with:
Get z/OS facts

Configuration

Skill Name: z/OS Gather Facts
Skill Id: Ansible-Controller-Skills-z-skills_1.0._launchJobTemplate12

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: 2

Enter a phrase

Gather z/OS facts
Get z/OS facts

Preview

12:55 PM
Greet customer [default]
Welcome, how can I assist you?

You 1:04 PM
Conversational skill called
z/OS Gather Facts recognized

job : 12
status : pending

There are no additional steps for this action. Add a new step or end the action.

Use the up arrow for prior messages

In the execution of this skill-based action, the skill executed properly and the output is the job id. Learn more about building actions [here](#).

Verify the job in the Ansible Automation Platform console

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

14. Click **Jobs** and expand the ## - z/OS Gather Facts job.

The screenshot shows the Red Hat Ansible Automation Platform interface. The left sidebar has 'Views' expanded, with 'Jobs' selected and highlighted by a green box. Other options in 'Views' include Dashboard, Schedules, Activity Stream, Workflow Approvals, Host Metrics, and Subscription Usage. The 'Resources' section includes Templates, Credentials, Projects, and Inventories. The main content area is titled 'Jobs' and displays a list of 12 jobs. A specific job entry, '12 - z/OS Gather Facts', is highlighted with a green dashed box. The job details shown are:

Name	Status	Type	Start Time	Finish Time	Actions
12 - z/OS Gather Facts	Successful	Playbook Run	11/19/2024, 1:05:00 PM	11/19/2024, 1:05:11 PM	
Launched By	admin	Job Template	z/OS Gather Facts	Inventory	AAP z/OS
Project	aap4zos	Execution Environment	aap4zos EE		
Credentials	SSH: z/OS Host SSH ...				
Job Slice	0/1				

As seen in the assistant, the actual contents of the output aren't displayed. The utility skills are used 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, in order to view the output within the assistant. Creating a skill flow is covered in the next section.

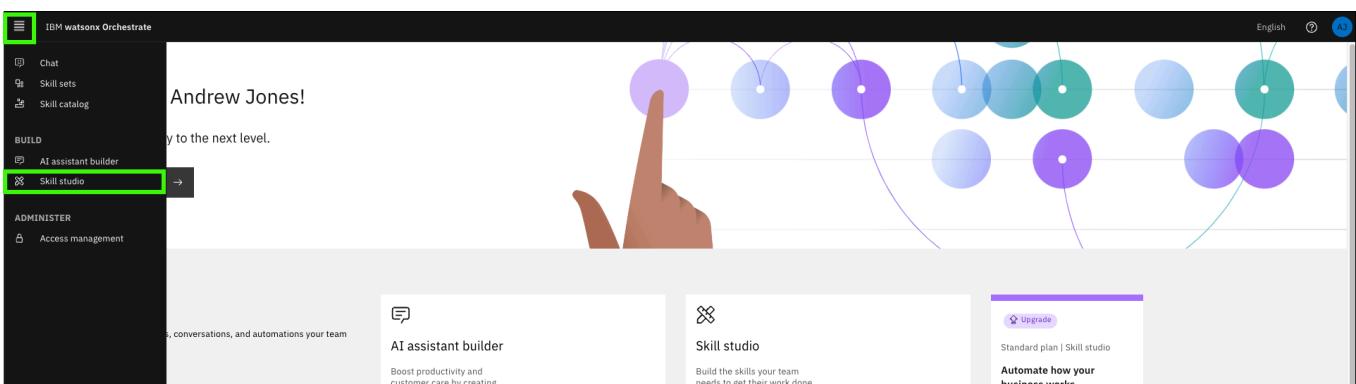
Creating skill flows

As seen in the previous section, running the Ansible skill to **Gather z/OS facts**, the skill executed successfully and was verified within the Ansible Automation Platform (AAP) console by viewing the job output. However, the output wasn't displayed by the assistant. To enable this scenario, 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, there are some default utility skills that are provided out of the box with the "Z Skills Accelerator" which are leveraged to return the output of a skill. To accomplish this, we will import the Ansible Utility skill called **Retrieve job output**.

Add the utility skill

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



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

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

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

The screenshot shows the 'Add skills' interface in IBM Watsonx Orchestrate. At the top, there are two tabs: 'Choose the source' (selected) and 'Select the skills'. Below this, a section titled 'Choose the source' with the sub-instruction 'To discover new skills, connect to an app or refer to an OpenAPI file.' contains three buttons: 'From an app' (selected), 'From a file', and 'OpenAPI builder (experimental)'. A list of skill sources is shown below, with the 'z/OS Skills accelerator (Trial)' option highlighted by a green box. Other options 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 the list is a note: '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: <use the same application name as in 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 configuration dialog for connecting to the 'z/OS Skills accelerator (Trial)'. The right side of the dialog has several input fields and instructions:

- Connection Type:** ansible (highlighted with a green box)
- Application Name:** z (highlighted with a green box)
- Connection URL:** https://itzvi-aap-phdhuzza.techzone.ibm.com (highlighted with a green box)
- User name:** admin (highlighted with a green box)
- Password:** (highlighted with a green box)
- Search Pattern:** * (highlighted with a green box)

Instructions on the right side of the dialog provide details for each field:

- Connection Type: 'Either "ansible" or "zosm"'
- Application Name: 'Short application name that uniquely identifies the connection or. Use the same name you previously used if you are importing additional skills from the same connection. Must contain only alphanumeric characters, spaces, and underscores.'
- Connection URL: 'For example https://www.example.com'
- User name: 'admin'
- Password: '*****'
- Search Pattern: 'Necessary for "zosm" connections. Pattern cannot be "*" or "?"'

At the bottom right are 'Cancel' and 'Connect' buttons, with 'Connect' highlighted with a green box.

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

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

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

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

Name: Retrieve job output
Input: 0/100
Output: 0/100
Security: None
Phrases: None
Next best skills: None
API version: 1.0

Preview

The skill will look like this in the catalog.

Retrieve job output
z skills - Retrieve job output by job Id

The skill will look like this in the skill set.

Retrieve job output

Cancel **Publish** **Save as draft**

9. Select Skill sets from the main menu.

Step in the process	Status	Skill type	Author	Last edited
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

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

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

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	-	⋮
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 | ⌂ ⌃

12. Search for the application name you specified earlier.

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

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

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

Application	Number of skills	Credential type	Connected by ⓘ	Action
Ansible Controller Skills - z skills	3	⚠️ Team	andrew@jones-tx.com	⋮

a
b
Edit connection
Delete connection

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

14. Verify the application is (a) **Connected** and then (b) click the x to close the dialog.

Zeeves draft

Skill sets

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	3	Team

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

Edit the Ansible Controller Skills - z skills connection **b**

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** **a** below.

Connected **a**

Add the skills to your Personal skills

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

Chat

Skill sets

Skill catalog

AI assistant builder

Skill studio

Administrations

Access management

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

1 of 1 items

16. 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	ZoomInfo	HubSpot CRM	Apptio Targetprocess	Salesforce	Zendesk Service
Calendly	Square	Oracle E-Business Suite	GitLab	Toggl Track	Microsoft Teams

17. 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

Q z skills X

Ansible Controller Skills - z ... 3 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
- Cognos 8 skills
- Salessoft 47 skills
- Ansible Controller Skills - z ... 3 skills**

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

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

Personal skills

Q Search skills

Ansible Controller Skills - z skills

- Retrieve job output
z skills - Retrieve job output by job Id
- Add skill +**
- z/OS Gather Facts
z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls...
- Add skill +**
- z/OS Ping
z skills - This playbook pings the z/OS host to test connectivity.
- Add skill +**

Connect app ⚙

Create the skill flow

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

IBM Watsonx Orchestrate

English ⚙

- Chat
- Skill sets
- Skill catalog
- Skill studio**
- AI assistant builder
- Access management

Skills - z skills (3)

z skills

- Added ✓**
- Added ✓**
- Added ✓**

z/OS Gather Facts
z skills - This sample playbook demonstrates the z/OS gather facts module, which pulls...

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

Connect app ⚙

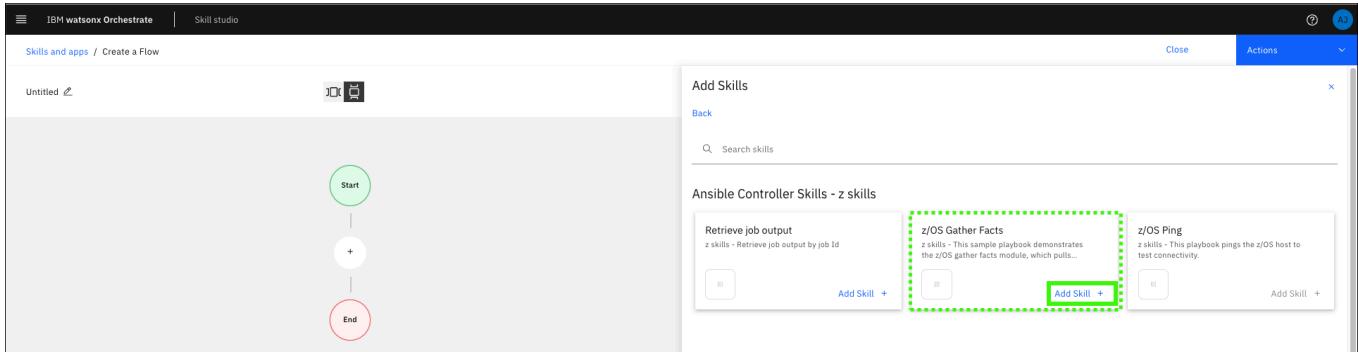
20. Expand the **Create** drop-down menu and click on **Skill flow**.

21. Click the + icon.

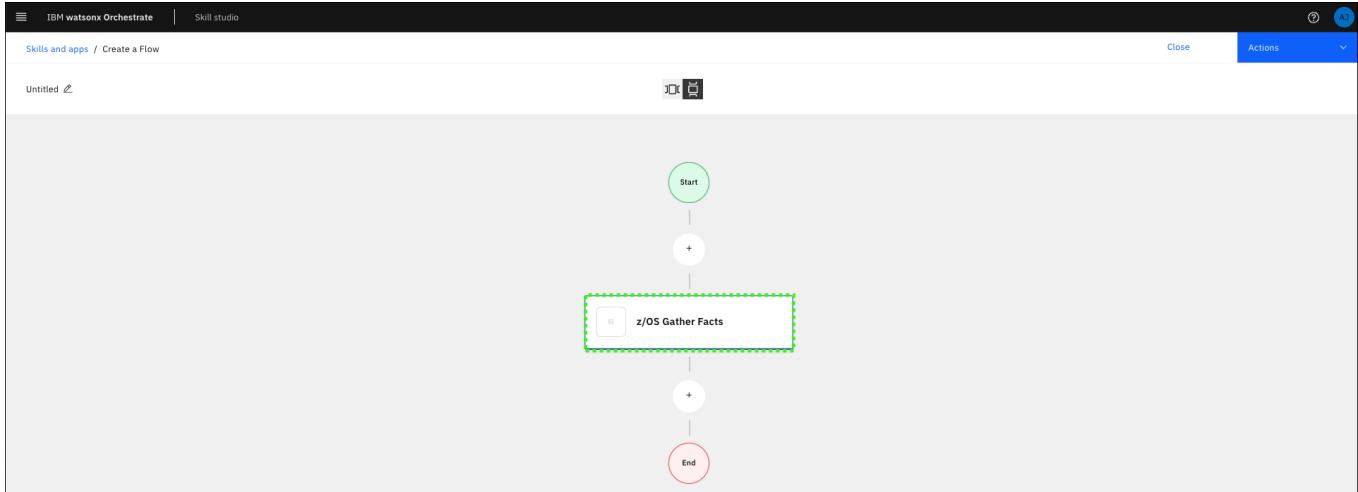
Next, you need to add the **z/OS Gather Facts** skill and the **Retrieve job output** skill to the skill flow. Use the **Search apps** function to locate the skills.

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

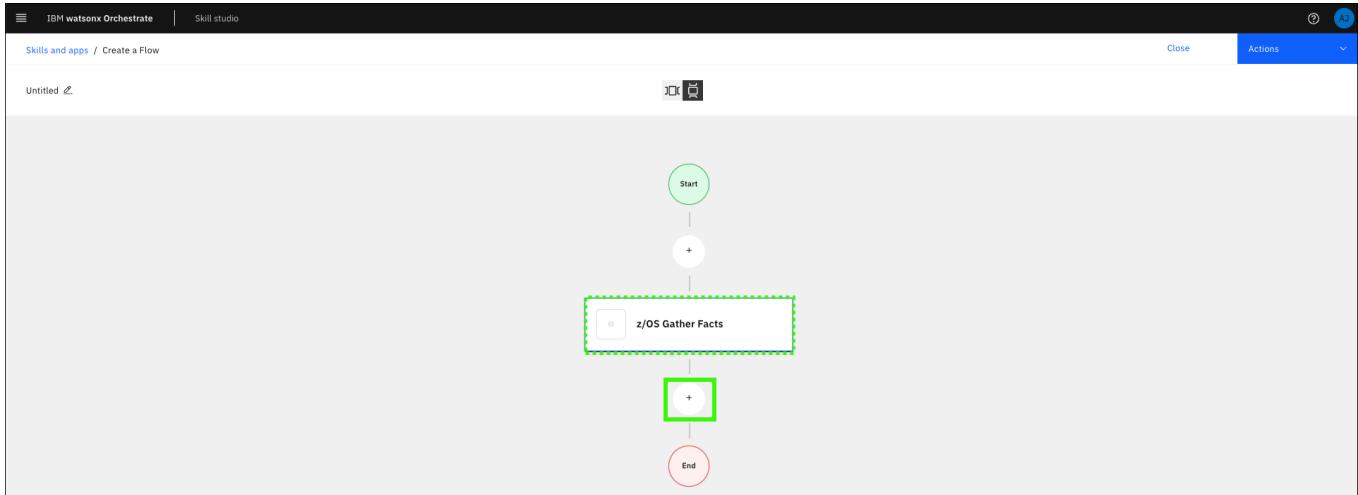
23. Click Add Skill in the **z/OS Gather Facts** tile.



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

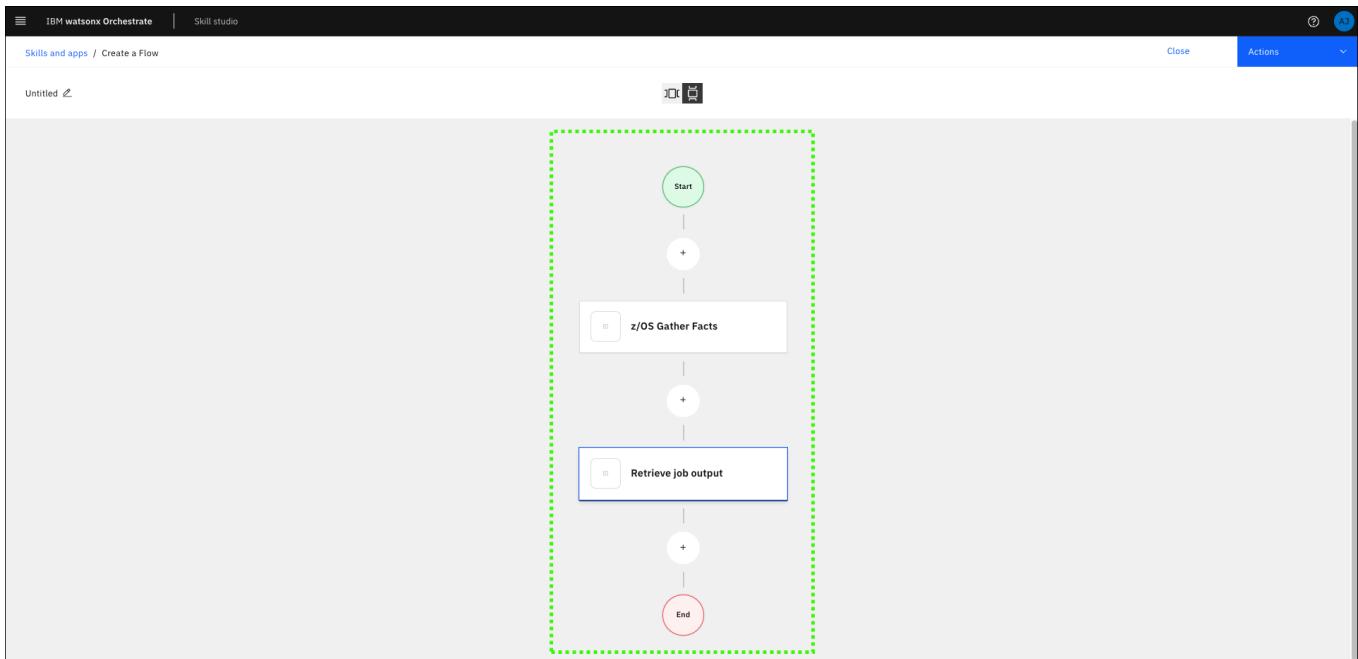


25. Click the **+** icon after the **z/OS Gather Facts** tile.



26. Repeat steps 22 and 23 for the **Retrieve job output** skill.

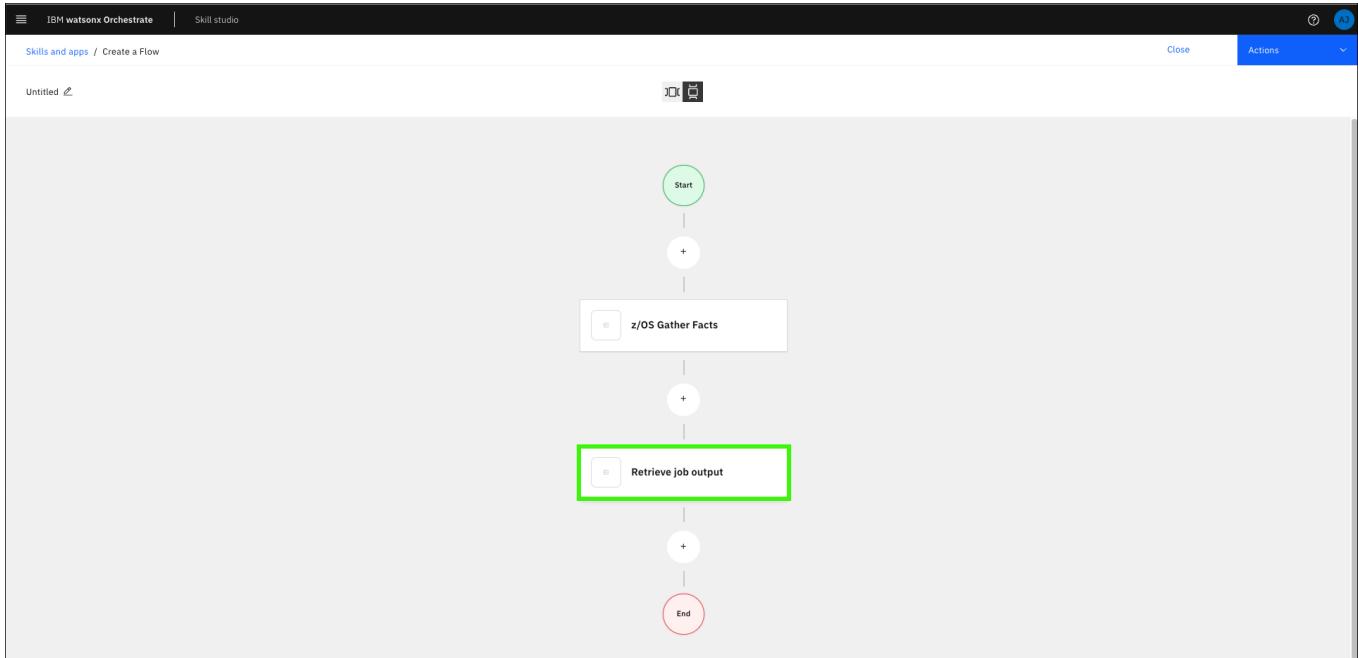
After adding the **Retrieve job output** skill, your skill flow should look like:



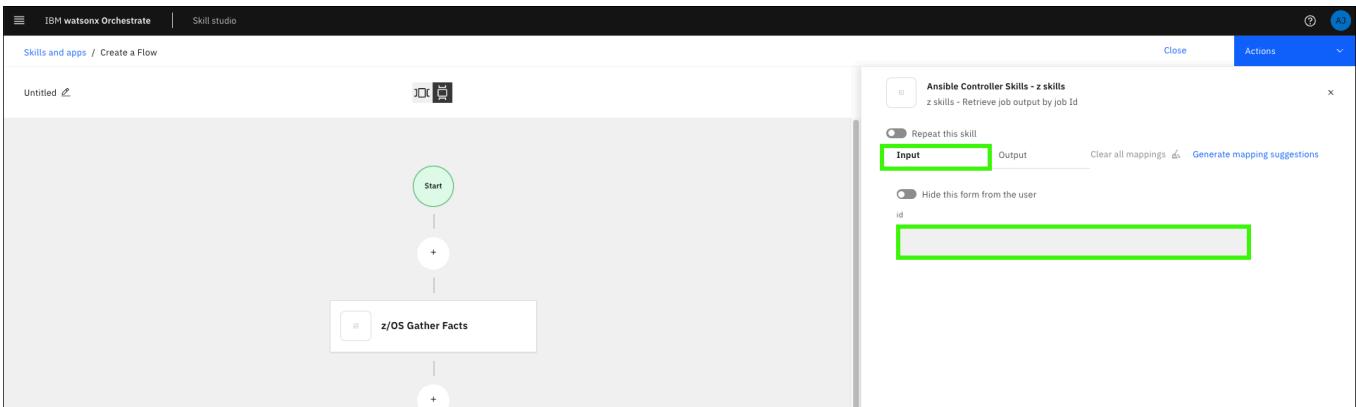
Map the outputs and inputs of the skills

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**.

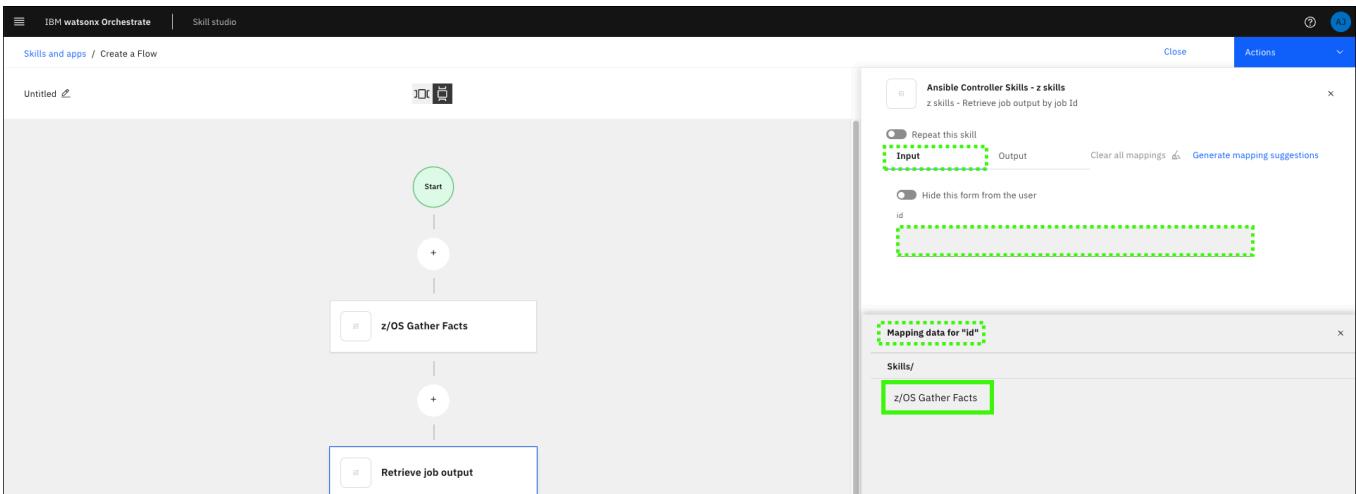
27. Click the **Retrieve job output** tile.



28. Select the **Input** tab and click in the **id** field.

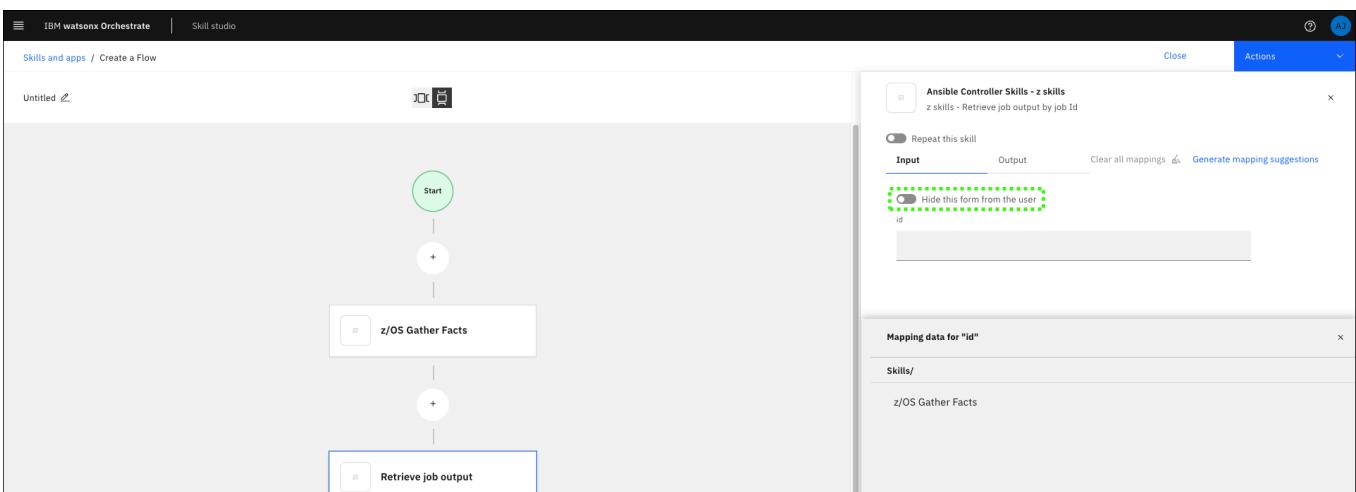


29. Click the **z/OS Gather Facts** skill in the **Mapping data for "id"** section.

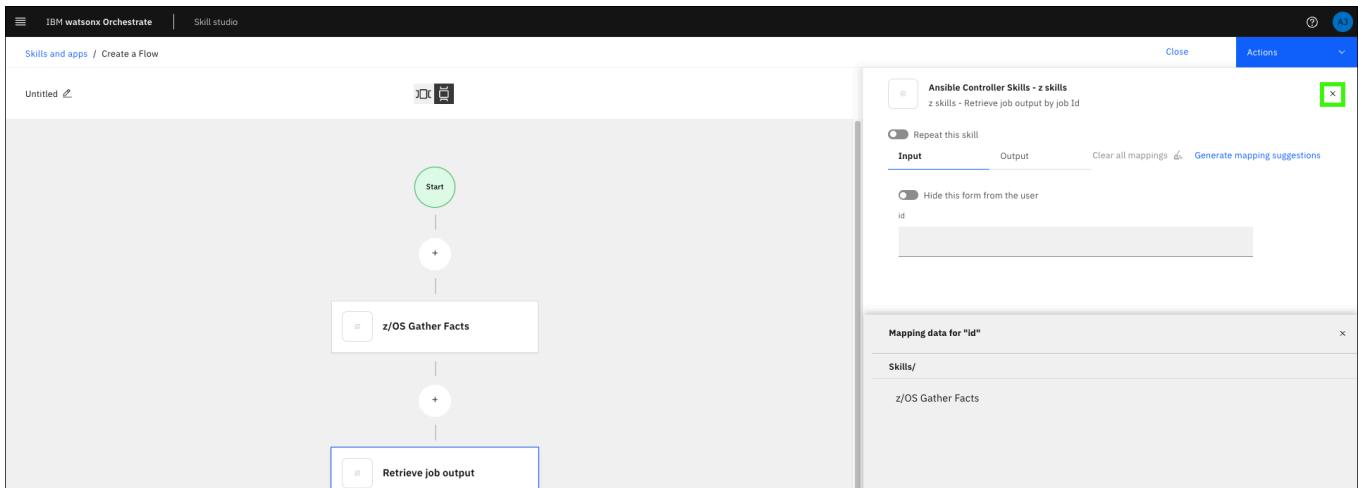


30. Optionally, toggle the **Hide this from from the user** setting.

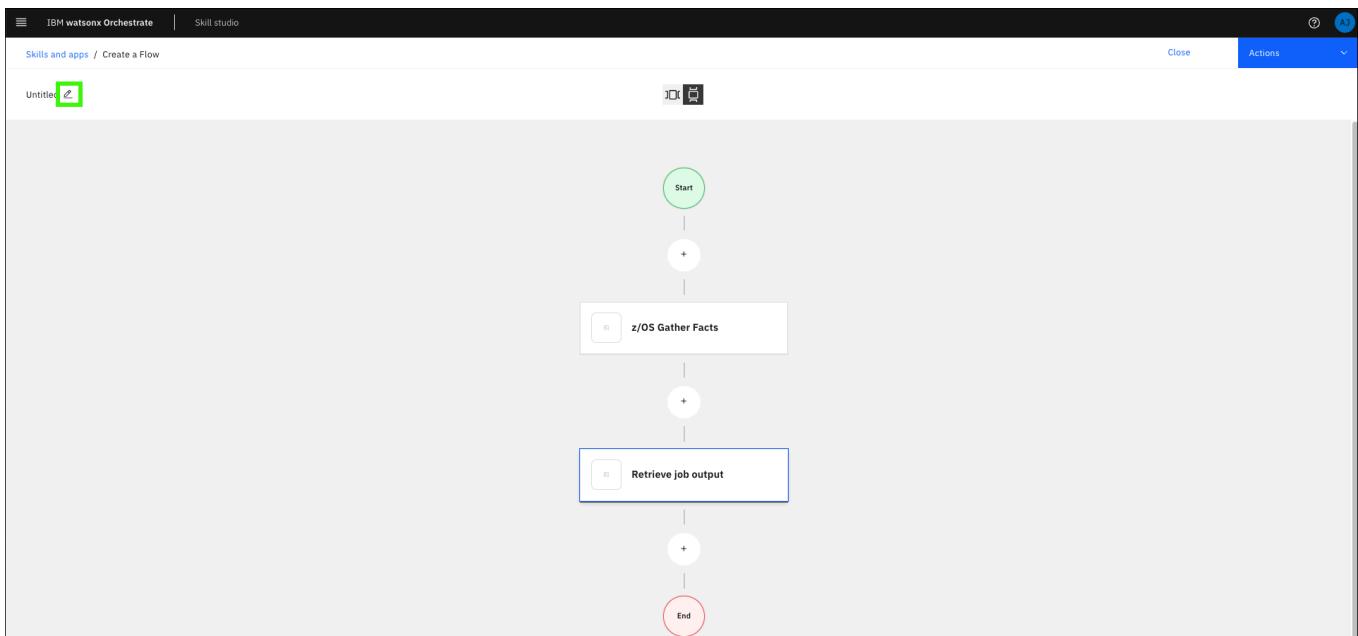
For this lab guide, this option is left disabled. Learn more about this option [here](#).



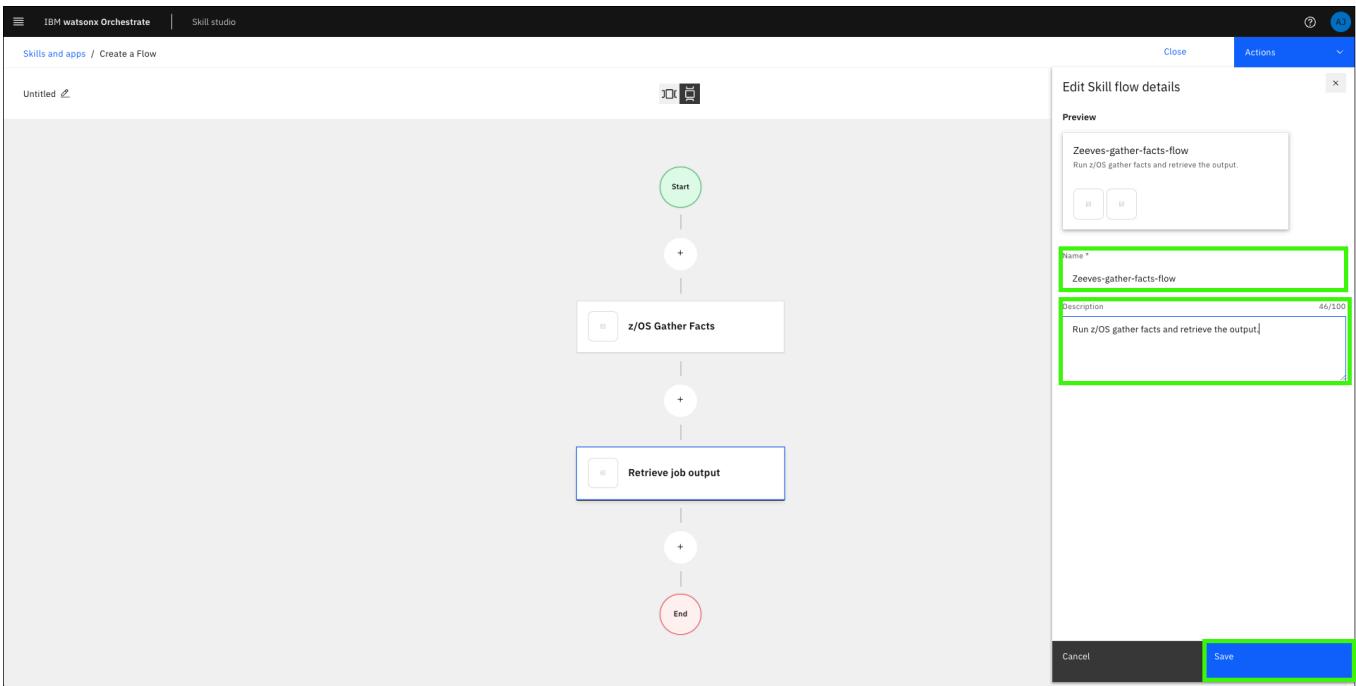
31. Click the **x** to close mapping window.



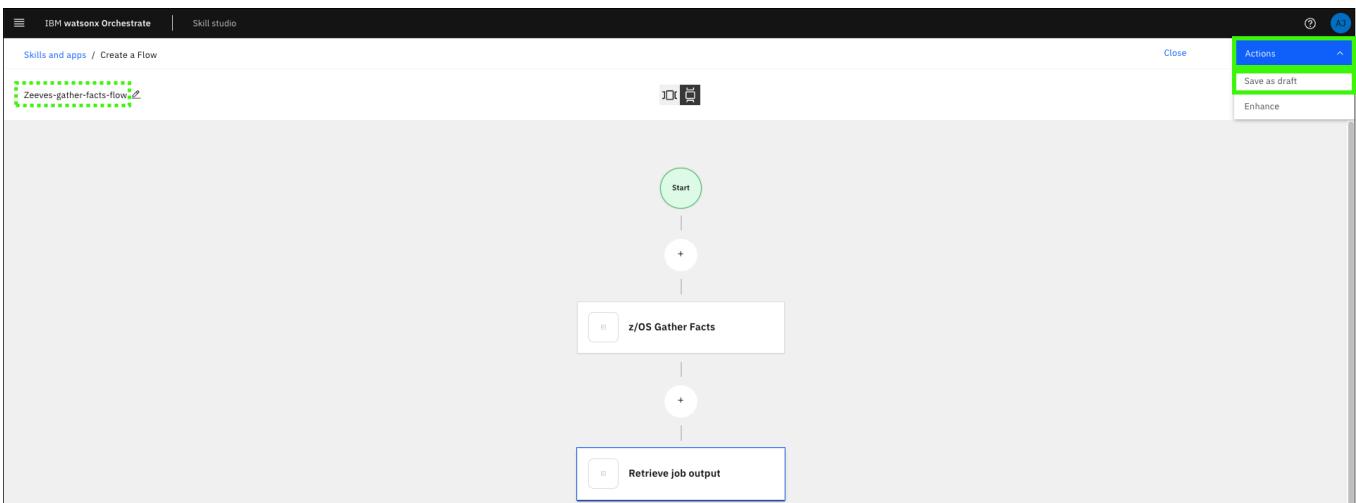
32. Click the pencil (✍).



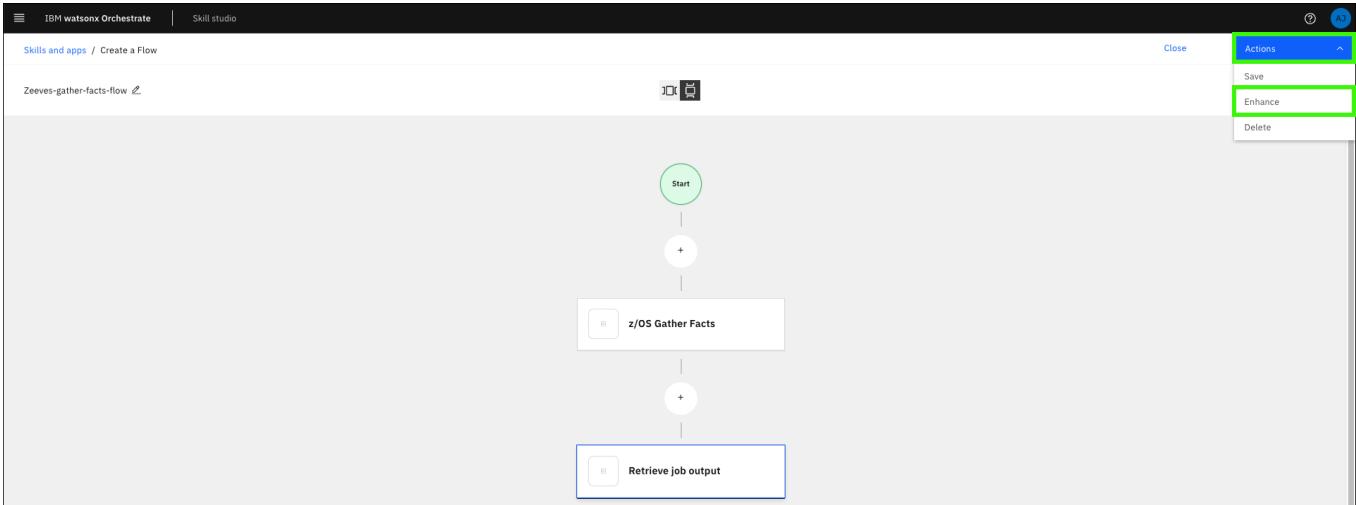
33. Enter a (a) **Name** and (b) **Description** for your skill flow and then (c) click **Save**.



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



35. Expand the **Actions** pull-down list and click **Enhance**.



Enhancing the skill flow

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 -

36. Click the **Phrases** tab.

37. Enter new **phrases** (prompts) for your skill flow and then click **Publish**.

Notice the default prompts are either not very intuitive (the skill flow name) or a bit verbose. Add a couple of other prompts that you anticipate users will enter.

Example prompts:

Show me z/OS facts

Gather and display z/OS facts

Enable the skill flow in your assistant

38. 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 highlighted), ADMINISTER, and ACCESS MANAGEMENT. The main area is titled "Skill studio" and contains a message: "Welcome to the skill studio. This is where you can build and manage skill flows and connectors." Below this is a table listing four skill flows:

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 box highlights the "AI assistant builder" option in the sidebar.

39. Hover over the **Home ()** and click **Actions**.

The screenshot shows the "Actions" section of the AI assistant builder. The left sidebar has sections: Home (highlighted with a green box), Build, Generative AI, and Actions (also highlighted with a green box). The main area displays a series of cards with actions:

- 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 cards is a diagram showing a "Default behavior" node branching into "General purpose" and "Conversational search" nodes, which then lead to a "Search" node.

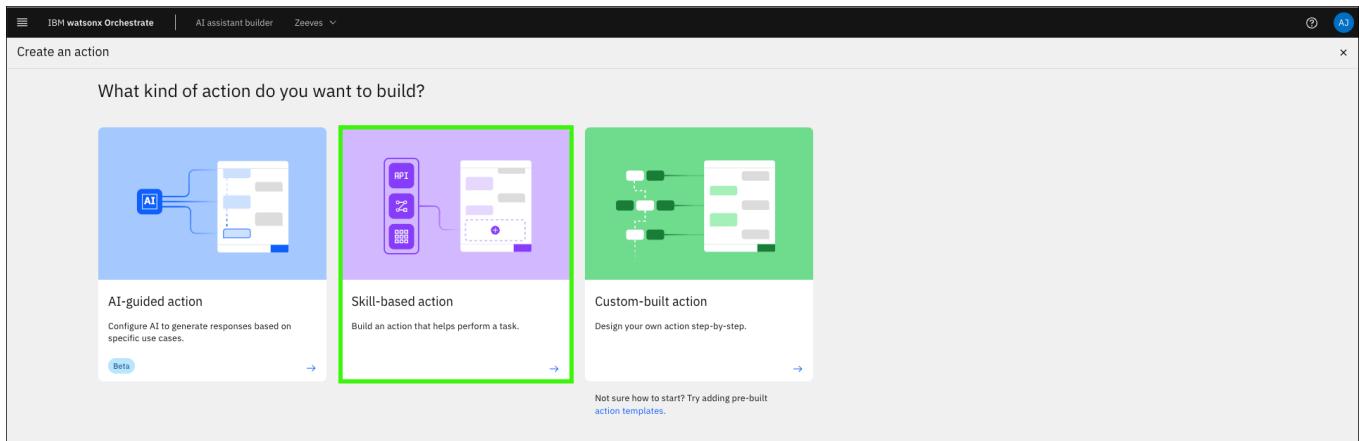
40. Click **New action.**

The screenshot shows the "Actions" management interface. The left sidebar has sections: Actions (highlighted with a green box), All items, Created by you (highlighted with a green box), Variables, and Saved responses. The main area lists actions under "Created by you /":

Name	Last edited	Examples count	Steps count	Status
z/OS Gather Facts	2 hours ago	2	0	Green circle (indicating success)

A green box highlights the "New action" button in the top right corner of the main area.

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



42. Click the skill flow you created earlier and then click **Next**.

The screenshot shows the 'Build an action from a skill' screen. A specific skill, 'Zeeves-gather-facts-flow', is selected and highlighted with a green border. The 'Next' button is also highlighted with a green border.

Skill Name	Description	Last Updated
Zeeves-gather-facts-flow	Run z/OS gather facts and retrieve the output.	2024-11-19T21:18:31.793Z
Retrieve job output	z skills - Retrieve job output by job Id	2024-11-19T20:08:59.538Z
z/OS Ping	z skills - This playbook pings the z/OS host to test connectivity.	2024-11-19T15:58:20.567Z
z/OS Gather Facts	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		
Salesforce case summarization		
Salesforce case sentiment analyze		
Outlook email summary		
Github issue summarization		

43. Enter an example prompt for the skill and click **Save**.

You can use one of the prompts you used earlier for the skill flow.

The screenshot shows the 'Add example phrases' screen for the skill flow. An example phrase, 'Show me z/OS facts', is entered in the input field. A modal window titled 'New action' is open, showing the same phrase entered in the 'What does your customer say to start this interaction?' field.

44. Enter any additional phrases (prompts) and then click the **save** (💾).

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

Show me z/OS facts

45. Click Preview.

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

Show me z/OS facts

Preview ▶

46. Enter one of the prompts you specified into the assistant preview.

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

Show me z/OS facts

Preview

3:24 PM
Greet customer [default]

Welcome, how can I assist you?

Show me z/OS facts ▶

47. Click **Apply** when the first form is returned.

48. Review the results from the skill flow.

Use both scroll bars in the assistant preview to review all of the returned information.

The scenario shown above may or may not be relevant for your client's use case. It is intended to show how you to sequence skills together in a skill flow to create an action that your assistant triggers based on prompts using the pre-configured Ansible automation templates. You are encouraged to experiment with your own skill flows and prompts using other skills available within the [AAP instance](#).

Next, learn about custom-built actions.

Creating custom-built actions

To this point, you have learned how to: - import skills into Watson Assistant - add applications with those skills to your assistant - create skill-based actions for your assistant - combine skills in a skill flow

There is also the ability to create **custom-built** actions. Creating custom-built actions allows you to create a new action with different steps to take in the conversation, forming a sequence of prompts that define the conversation experience. The steps can be defined with or without conditions, which help you control the customer responses. Steps within the custom action can end with routing to conversational search, triggering another existing sub-action, and other actions. This is a powerful way of customizing the end-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 which can be 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. In the case of the Ansible Automation Platform (AAP) & Wazi z/OS environment provisioned in IBM Technology Zone (ITZ), the z/OS system is not currently using CA signed certificates and therefore won't be able to execute the pre-packaged skills on your own z/OS system. For demo purposes, it is still recommended to import them so that the pre-packaged skills can be shown.

Work is in progress to modify the ITZ environments so that they are enabled for skill execution using these pre-packaged skills. In the meantime, the underlying automation for these pre-packaged skills can still be demonstrated using the Ansible skill 'z/OS Operator Command' which is available to import. This works because the pre-packaged skills are executing console commands directly using OSMF APIs which can also be run using the Ansible template skill 'z/OS Operator command'. For example, here are the console commands being 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 into your sandbox environment by downloading the .zip file from [here](#) and following [these instructions](#).

You must extract the imbedded 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 have built out the assistant, configured conversational search, and added skills and automations. While doing so, you have been testing your assistant using the **preview** capability of AI Assistant Builder. The **preview** capability is a closed environment for experimenting with prompts.

Once your assistant is finalized, you are able to publish it to make it available to end-users. Each assistant you create comes with two **environments**: *draft* and *live*. At this point, you have likely been configuring your assistant in the draft environment. Each environment has its own set of IDs, URLs, and service credentials that can be referenced by external services.

The **Environments** page in the AI assistant builder has tabs for managing 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. On the left, there's a sidebar with icons for environments, channels, and extensions. The main area has sections for 'Draft environment', 'Channels' (listing 'Web chat'), and 'Resolution Methods'. In the 'Draft content' section, a box highlights the 'Last edited' timestamp ('11/19/2024 03:32PM') and the word 'Draft'. A callout box points to this 'Draft' label.

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. The layout is similar to the Draft environment page, with sections for 'Live environment', 'Channels' (listing 'Web chat'), and 'Resolution Methods'. In the 'Content' section, a box highlights the message 'No published version'. A callout box points to this message.

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 you use (i.e. channels) 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 you should be giving access to the end-user.

Follow these steps to publish the first version of your assistant using Assistant Builder:

1. Hover over the **Home** icon () and click **Publish**.

The screenshot shows the IBM Watsonx Orchestrate interface. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', and 'Zeeves'. A sidebar on the left has sections for 'Generative AI', 'Actions', 'Preview', and 'Publish' (which is highlighted with a green box). Below the sidebar, there's a 'Build' section with 'Build actions' and 'Customize your greeting'. To the right, there's a flowchart titled 'Default behavior' with nodes for 'General purpose', 'Conversational search', and 'Search'. The bottom right corner shows a progress bar at 1/2.

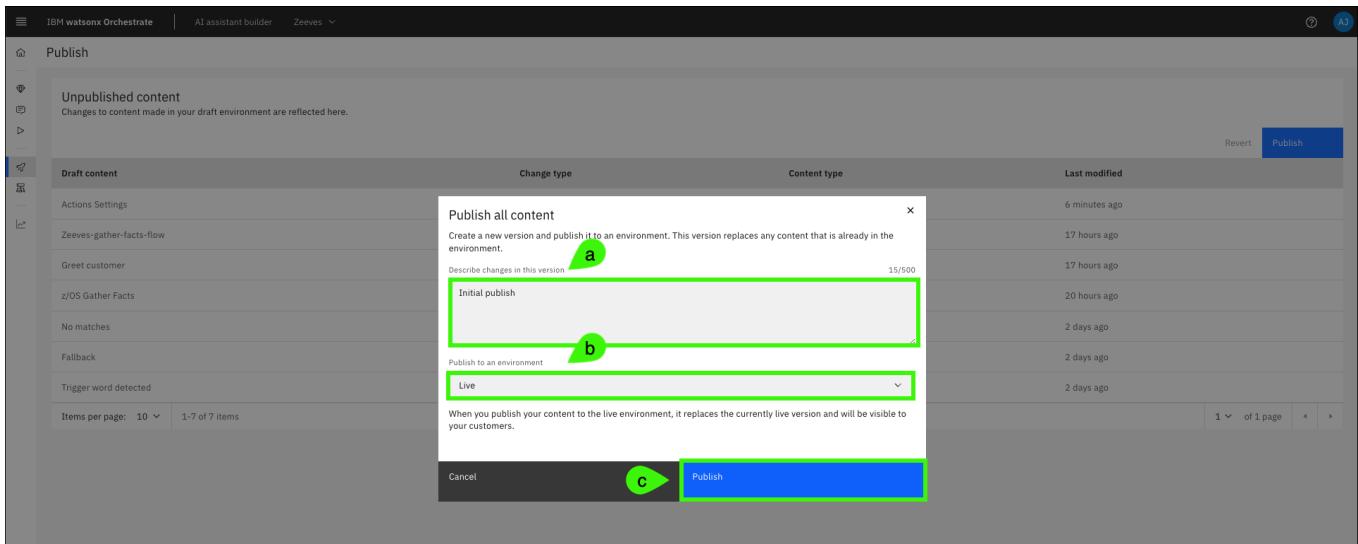
2. Click **Publish**.

The screenshot shows the 'Publish' step in the AI assistant builder. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', and 'Zeeves'. The left sidebar shows 'Draft content' with items like 'Actions Settings', 'Zeeves-gather-facts-flow', 'Greet customer', etc. The main area displays a table of changes:

Draft content	Change type	Content type	Last modified
Actions Settings	Updated	Settings	3 minutes ago
Zeeves-gather-facts-flow	Updated	Actions	17 hours ago
Greet customer	Updated	Actions	17 hours ago
z/OS Gather Facts	Updated	Actions	20 hours ago
No matches	Updated	Actions	2 days ago
Fallback	Updated	Actions	2 days ago
Trigger word detected	Updated	Actions	2 days ago

At the bottom, there are pagination controls and a 'Revert' button.

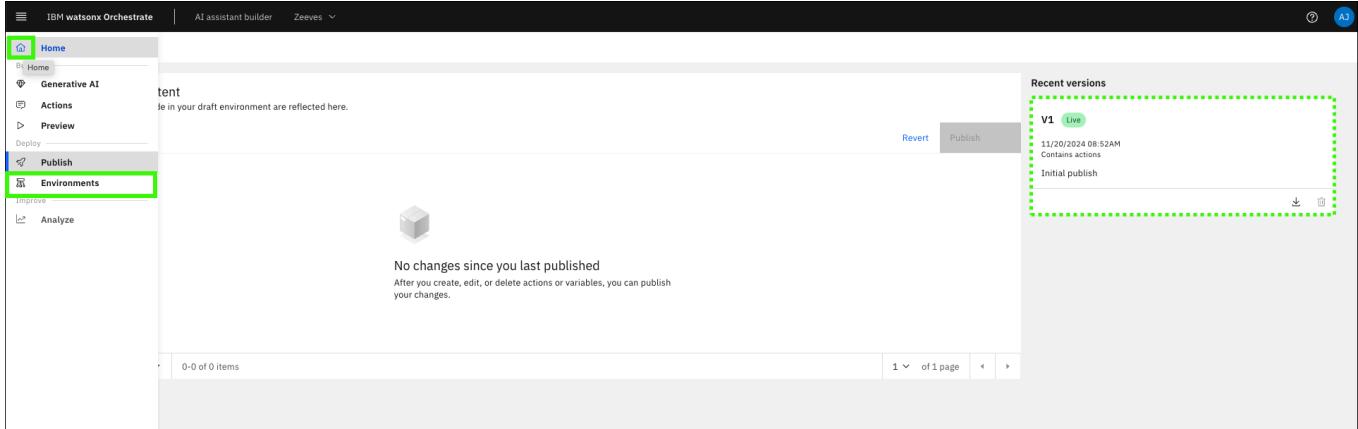
3. Enter a (a) description of the changes, set the (b) environment to **Live**, and then (c) click **Publish**.



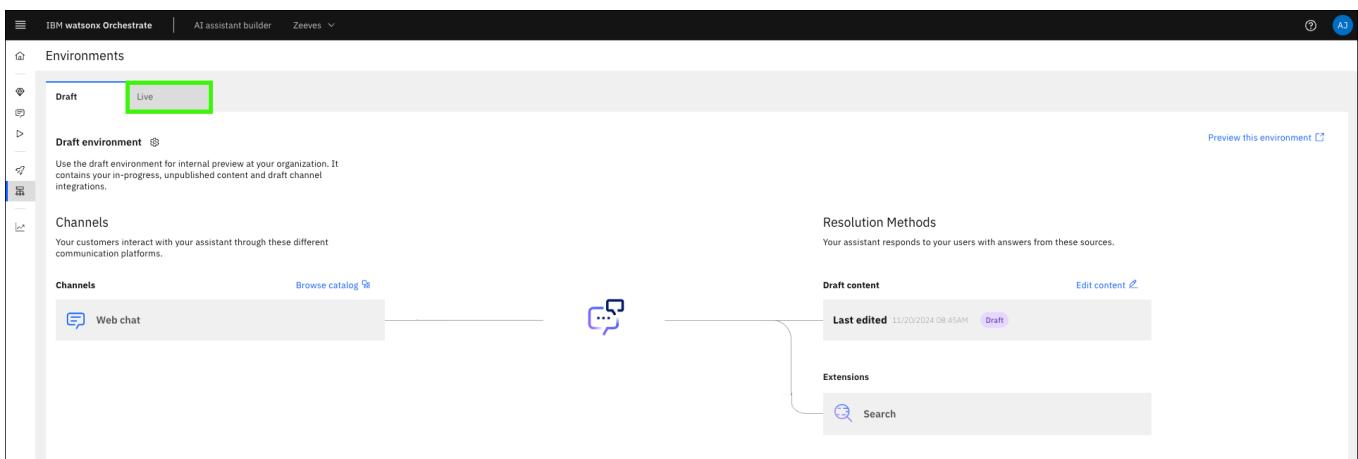
Configure the **Live** environment

When the live environment is created, the environment settings from the draft environment are not carried over (for example the configuration of the OpenSearch instance used for conversational search).

4. Hover over the **Home** icon (🏡) and click **Environments**.



5. Click **Live**.



6. Click Web chat.

7. Customize the Live assistant as you see fit.

On the Style tab, you're able to set the Assistant name which will be displayed at the top of the chat window when end-users are interacting with the assistant. For pilots or demos, you may want to personalize this name for the client. Also in the Style tab, you have the ability set the themes and display settings of the chat windows, including the ability to enable the IBM Watermark and enable streaming (recommended).

On the Home screen tab, you enable and customize a default greeting message from the assistant when the user accesses the assistant chat. You're also able to set Conversation starters that will be displayed in the chat window. When selected by the end-user, the text of these conversation starters are sent as prompts, so it is important that your assistant is trained and tested to answer appropriately. It is highly recommended to remove these default conversation starters and to consider creating your own as long as they're able to be executed as actions and provide value to the end-user. At the bottom of the Home screen tab, you will also see the ability to add a Background style for the assistant chat window.

Explore all the other tabs.

8. Click Save and exit.

The screenshot shows the 'Style' tab of the 'Web chat' configuration. It includes settings for the assistant's name, intended purpose (Standard), theme (Light selected), colors (primary: #FFFFFF, secondary: #3D3D3D), and size (width: 380px, height: 640px). On the right, a preview window shows a dark-themed web chat interface with a blue owl icon and sample messages. The 'Save and exit' button at the top right is highlighted with a green box.

9. Click Add in the Search tile.

The screenshot shows the 'Environments' page with the 'Live' environment selected. In the 'Extensions' section, there is a 'Search' tile with the text 'Extend what your assistant can answer by searching your existing documents'. An 'Add +' button at the bottom right of the tile is highlighted with a green box.

10. Click Custom service.

The screenshot shows a modal dialog titled 'Set up a new search integration'. It lists two options: 'Elasticsearch' (selected) and 'Custom service'. The 'Custom service' option is highlighted with a green box. Below it, there is descriptive text: 'Connect to an existing service that will retrieve documents from your content management service.' A 'RECOMMENDED' label is visible at the bottom left of the dialog.

11. Enter the (a) URL for your bring-your-own-search (BYOS) engine, (b) select **None** for the **authentication type**, and (c) click **Next**.



Use the correct URL!

Be sure to use the URL for your BYOS OpenSearch engine created earlier [here](#).

Custom service Live

Connect service Conversational search (optional)

Choose your search provider

By providing credentials Through your client

URL
https://wx4z-opensearch-wrapper-wxa4z-byos.apps.673cb83f0fe21364200dcb7.ocp.techz1

Choose an authentication type
None

Next

12. Verify conversational search is enabled and click **Save**.

Custom service Live

Enable conversational search (optional)

By enabling conversational search, your assistant can generate responses from supplied documents.

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

On

By using this feature you agree to the [Pricing](#) and [Terms](#). This feature is not PCI validated. The use of this feature may impact your PCI compliance.

What's different?

When your assistant receives a message, the default search behavior returns short excerpts of the best search results. When conversational search is enabled, your assistant will instead generate a conversational response grounded in those search results.

Default search behavior (conversational search off)

Welcome, how can I assist you?
Can I use my points on airfare?

I searched my knowledge base and found this information which might be useful

We offer credit cards offer perks liability to our clients, protecting you from having to pay for unauthorized purchases. Can I use my points on airfare? Using points and miles to book your flights is a great option. Not only do you save money, but you can use your points to book...

IBM watsonx Lendy Demo Site

Save

13. Update the (a) conversational search settings, (b) click **Close**, and then (c) click **Save**.



Feel free to 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.

Custom service [Zeeves](#)

Settings **Instance**

By using this feature you agree to the [Pricing](#) and [Terms](#). This feature is not PCI validated. The use of this feature may impact your PCI compliance.

Conversational search

Use a watsonx generative AI model hosted in Dallas, TX US, to generate conversational responses.

Conversation search On

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 questions like, "Why is that?" after a previous answer.

Entire conversation
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 creation title. [?](#)

How do we know?

Tendency to say "I don't know": **Rarely** Less often More often Most often

Generated response length: [?](#)

Concise Moderate **Verbose**

Default filter

Can be anything (plain text, JSON, etc.)

Metadata

```
[{"id": "id_1", "value": "{'doc_weight': 1, "product_docs": 0.2, "customer_docs": 0.8, "base_indexing_doc_idn_docs_state": "customer_indexed"}"}]
```

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.

There are several options for deploying your assistant through channels and integrations to satisfy the use cases that you might address. Learn more about all the deployment options [here](#).

For this lab, you will deploy the assistant using the web chat integration. The web chat integration provides an assistant interface that can integrate with your website and there's a lot of flexibility with how you may want to integrate it. Learn more about the web chat integration [here](#).

14. Click Web chat for the Live environment.

Environments

Draft **Live**

Live environment [?](#)

Use the live environment for deployment to customers. It contains your published content and channel integrations where customers interact with your assistant.

Channels

Your customers interact with your assistant through these different communication platforms.

Channels [Browse catalog](#) [?](#)

Web chat

Resolution Methods

Your assistant responds to your users with answers from these sources.

Content [Switch version](#) [?](#)

V1 11/20/2024 08:52AM **Live**

Extensions

Search

15. Click the **Embed** tab.

The screenshot shows the 'Web chat' configuration page. The 'Embed' tab is selected and highlighted with a green border. On the right side, there is a preview window titled 'Zeeves 1.0' showing a dark-themed chat interface with a blue owl icon and sample messages. The configuration options include:

- Style:** Set to 'Light'.
- Assistant's name as known by customers:** 'Zeeves 1.0'.
- Intended purpose:** Standard (selected) for virtual agents and customer support experiences.
- Choose a theme:** Set to 'Light'.
- Primary color:** #FFFFFF.
- Secondary color:** #3D3D3D.
- Chat header:** #0354E9.
- Accent color:** #0354E9.
- Significant and interactive objects:** #0354E9.
- Size:** Width: 380px, Height: 640px.
- IBM Watermark:** Enabled (On).

16. Copy and record the **integrationID**, **region**, and **serviceInstanceId** values.

The screenshot shows the 'Web chat' configuration page. The 'Embed' tab is selected and highlighted with a green border. A code snippet for embedding the chat is displayed in a code editor-like area:

```
<script>
  window.watsonAssistantChatOptions = {
    integrationID: '8b4ad299-e6b9-434c-8c8c-2754d9272fe5', // The ID of this integration.
    region: 'wco-us-south', // The region your integration is hosted in.
    serviceInstanceId: '7c1e3381-8dcf-476b-bdf2-319f531087ba', // The ID of your service instance.
    onLoad: async (instance) => { await instance.render(); }
  };
  setTimeout(function() {
    const t=document.createElement('script');
    t.src='https://web-chat.global.assistant.watson.appdomain.cloud/versions/' + (window.watsonAssistantChatOptions.version || 'latest') + '/index.js';
    document.head.appendChild(t);
  });
</script>
```

17. Click the link to download a sample web chat hyper text markup language (HTML) page.

[Watson Assistant Chat.html](#)

```

<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();
}
</script>

</div>
</body>
</html>

```

18. Edit the Watson Assistant Chat.html file and set the values for your assistant you copied in step 16.

```

<html lang="en">
<head>
<title>Watson Assistant Chat</title>
<meta name="viewport" content="width=device-width, initial-scale=1">
</head>
<body>

<script>
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();
}
</script>

</body>
</html>

```

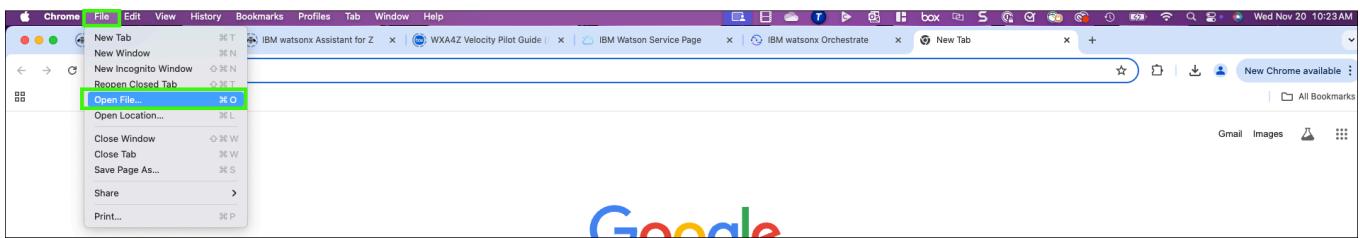
19. Save the changes to the Watson Assistant Chat.html file.

```

Users > andrewjones > Downloads > Watson Assistant Chat.html > html > body > script > layout
 1  <html lang="en">
 2  <head>
 6   <style>
 7     .WebChatContainer {
11    top: 0;
12    bottom: 0;
13  }
14  </style>
15  </head>
16  <body>
17
18  <div class="WebChatContainer"/>
19
20  <script>
21  const element = document.querySelector('.WebChatContainer');
22
23  window.watsonAssistantChatOptions = {
24    integrationID: "8b4ad299-e6b9-434c-8c8c-2754d9272fe5", // The ID of this integration.
25    region: "wxo-us-south", // The region your integration is hosted in.
26    serviceInstanceId: "c163381-8dcf-476b-bdf2-319f531087be", // The ID of your service instance.
27    element,
28
29    openChatByDefault: true,
30    hideCloseButton: true,
31
32    layout: {
33      showFrame: false,
34      hasContentMaxWidth: true,
35    },
36
37    onLoad: async (instance) => {
38      window.WACInstance = instance;
39      await instance.render();
40    }
}

```

20. Open the Watson Assistant Chat.html file in a web browser.



Your assistant is now live. Explore some of the earlier prompts to verify the assistant is accessing the ingested documents and your skills and skill flows are active.

Prompts to try:

What is z/OS continuous delivery?

Get z/OS facts

Show me z/OS facts

Gather and display z/OS facts

Adding other integrations

Other integrations can be added to your assistant to allow you to publish your assistant to the channels where your end-users are likely to interact with the assistant.

To do so, channel integrations must be added. By default, a web chat integration is created, allowing an assistant to be embedded in a website. Other channel integrations are available in the Integrations catalog inside the AI assistant builder interface. Learn more about adding integrations [here](#).

Within the AI assistant builder, click on the Integrations page:

Scroll down to **Channels** to view the integration deployment options for your assistant.

Clicking on any of the available channels will provide guidance on how to configure the integration.

Next steps

This IBM watsonx Assistant for Z for Technical Sales Level 4 demonstrated several of the IBM watsonx Assistant for Z capabilities. However, there is still more to learn about IBM watsonx Assistant for Z. Be sure to check out the [offering landing page](#) and the [product documentation](#).

Also, the focus of the IBM watsonx Assistant for Z for Technical Sales Level 4 Lab Guide was the *end-user* use of IBM watsonx Assistant for Z. To learn more about deploying, configuring, and customizing IBM watsonx Assistant for Z explore the other capabilities that are included in the [ITZ collection](#) [here](#). Included are guidance for running client pilots and the ability to manage an IBM watsonx Assistant for Z deployment. In the Velocity Pilot environment, you can explore all the capabilities of the offering like creating an assistant, importing documents, and adding automation skills.

Earn the badge

Finally, remember to complete the IBM watsonx Assistant for Z for Technical Sales Level 4 learning plan to earn the IBM watsonx Assistant for Z Technical Sales Advanced badge.

IBM technical sellers must complete a Stand and Deliver exercise to validate their ability to demonstrate IBM watsonx Assistant for Z to potential clients. Refer to the evaluation checklist in the [YourLearning learning plan](#) for the Stand and Deliver.

Business Partners must pass the IBM watsonx Assistant for Z for Technical Sales Level 4 quiz that is located in the [IBM Training learning plan](#). The Business Partner quiz verifies use of the demonstration environment and click-through demonstrations, and not one's general knowledge of the offering.