

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

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|-------------|---|
| 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 leverages the [IBM watsonx Assistant for Z Velocity collection](#) and the 3 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 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 like a site or service not 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 related to the software as a service (SaaS) instance of watsonx Orchestrate
- Email: andrewj@us.ibm.com

Business Partners should 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



Search

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, enjoy using 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 Demonstration Guide table of contents

This **Demonstration Guide** uses a responsive browser-based interface to ensure a 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 button, 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 several sections: Welcome, Guidance for delivering a demonstration, Reserve the IBM Technology Zone environment, Demonstration scenarios (with sub-sections like 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). To the right of the sidebar, the "Welcome" page is displayed, featuring an introduction to the course, information about end-user skills, and a note about Velocity Pilot. Below the welcome page, there is a section titled "Obtaining the IBM watsonx Assistant for Z Technical Sales Intermediate badge".

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

The screenshot shows the same browser window after the main menu icon (≡) was clicked, causing the sidebar to expand and reveal the full Table of Contents. The sidebar now displays all the listed sections from the previous screenshot. The main content area remains the same, showing the "Welcome" page and the badge obtaining section.

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 obtaining the IBM watsonx Assistant for Z Technical Sales Advanced badge.

IBM Technology Zone environment

To enable sellers to both learn how to perform client pilots of IBM Watsonx Assistant for Z, multiple environments have been created in IBM Technology Zone (ITZ). The environments leveraged for the Watsonx Assistant for Z Velocity lab environment can be found in the [IBM Watsonx Assistant for Z](#) collection and consist of:

- **Watsonx Assistant for Z lab – Watsonx Orchestrate** – a dedicated tenant of Watsonx Orchestrate on IBM Cloud and is leveraged for creating and configuring the assistant, configuring conversational search, importing skills, and configuring assistant actions.
- **Ansible Automation Platform (AAP) & z/OS** – a pattern used to deploy a pre-configured instance of AAP and Wazi z/OS with pre-loaded Ansible playbooks that can be imported as skills within Watsonx Orchestrate and connected to your assistant. Provides pre-loaded templates for various use cases which will be 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 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 learning.

While all 3 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 this section 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](#)

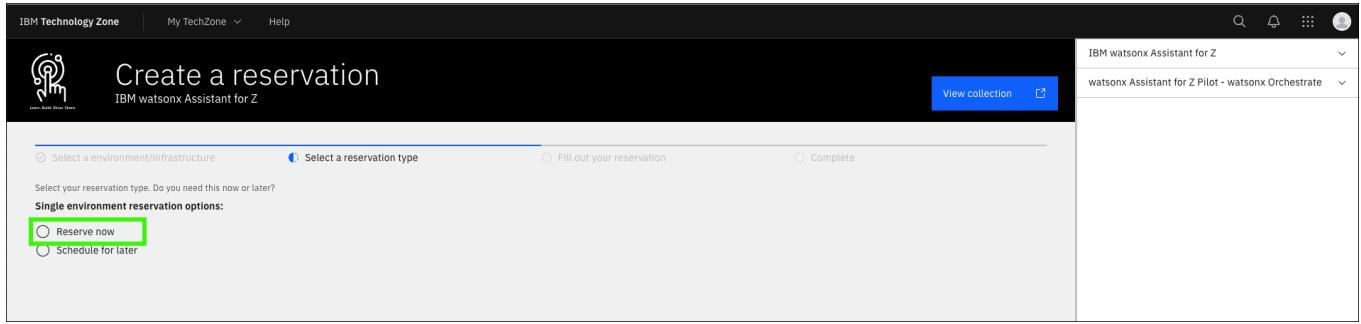
Single Node OpenShift with NFS storage - reservation page

 Images below are for 1 of the 3 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 will be at your client's office to start a pilot.



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. Name: specify a name for the reservation (optional).
- b. Purpose: select the **Education** purpose tile.
- c. Purpose description: enter a description, for example: Level 4 education.
- d. Preferred geography: select the region nearest your physical location for improved performance and reduced network latency.
- e. End date and time: the initial maximum will be set to 2 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. When satisfied with the parameters, click **Submit**.

a. Name: watsonx Assistant for Z Pilot - watsonx Orchestrate

b. Purpose: Education (Gaining experience with specific technology, product, or solutions)

c. Sales Opportunity number: Enter an opportunity number (e.g., [IBM Sales Cloud opportunity ID](#), [Project ID](#), or [Project Work ID](#))

d. Preferred Geography: ITZ-watsonx-2 - AMERICAS - us-south region - dat10 datacenter

e. End date and time: 11/01/2024 at 11:51 AM America/Chicago

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

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

In addition to the above fields, the reservation for the **Single Node OpenShift with NFS storage** will have 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**.

h. OCP/Kubernetes Cluster Network: 10.128.0.0/14

i. Enable FIPS Security: No

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

k. OpenShift Version: 4.14

l. OCP/Kubernetes Service Network: 172.30.0.0/16

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

n. 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 below. If issues continue, open an ITZ support ticket using the methods mentioned in the [Support](#) section of this guide.

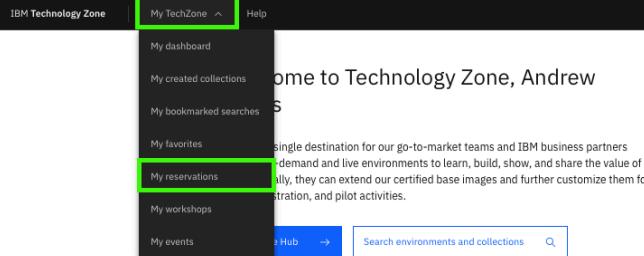
Extend the reservation

When the reservations are in the **Ready** state, you can extend each reservation to a total of 6 days. Remember, IBM sellers need the environment to record their Stand and Deliver and Business Partners need an environment to answer quiz questions. Plan your time accordingly.

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.

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



The screenshot shows the IBM Technology Zone portal interface. At the top left is the 'IBM Technology Zone' logo. To its right is a dropdown menu labeled 'My TechZone ▾' which is currently expanded, showing a list of options: 'My dashboard', 'My created collections', 'My bookmarked searches', 'My favorites', 'My reservations' (which is highlighted with a green box), 'My workshops', and 'My events'. Below this is a search bar with the placeholder 'Search environments and collections' and a magnifying glass icon. To the right of the search bar is a decorative graphic of overlapping circles in shades of blue and purple. Further down the page, there's a section titled 'Certified Base Images' featuring an illustration of a person working on a computer and a diagram of a network or system architecture. Text in this section includes 'Best starting point to build' and a note about 'TechZone Certified' images.

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

IBM Technology Zone | My TechZone | Help

My reservations

Search Filter by infrastructure Filter by status

Custom request Add to calendar

My dashboard My created collections My bookmarked searches My favorites My reservations My workshops My events

Status - Ready watsonx Assistant

Reservation details

View collection Support Extend Share Transfer Re-reserve Delete

Start date Oct 30, 2024 8:10 AM End date Nov 1, 2024 8:12 AM Extend limit 2

Status - Provisioning watsonx Assistant for Z Pilot - AAP ...

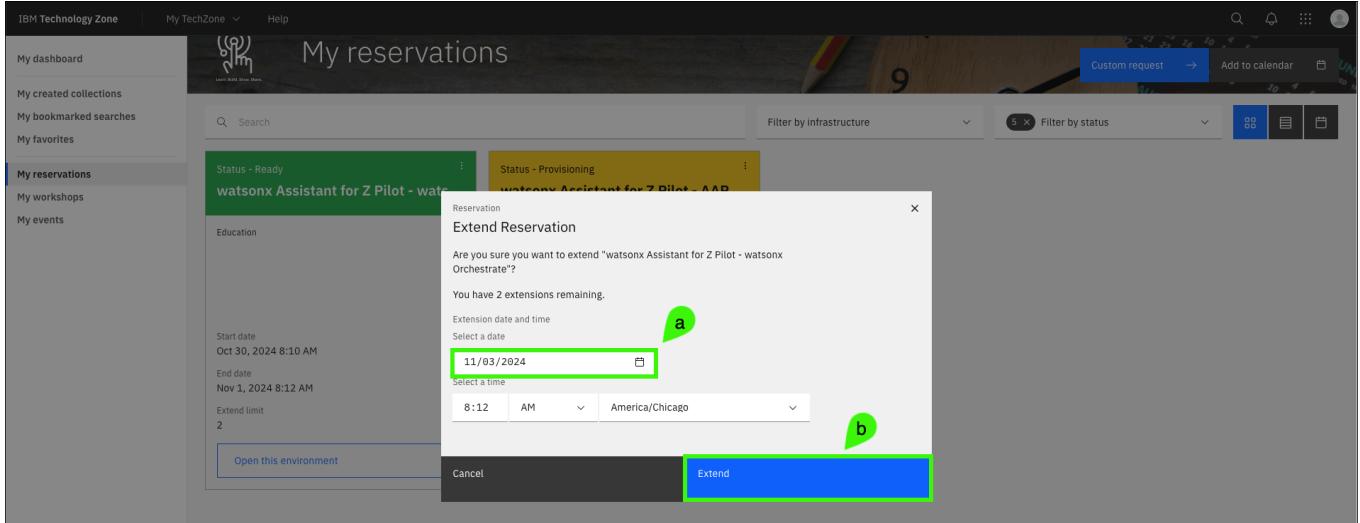
Education

Start date Oct 30, 2024 8:12 AM End date Nov 1, 2024 8:10 AM Extend limit N/A

Open this environment

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

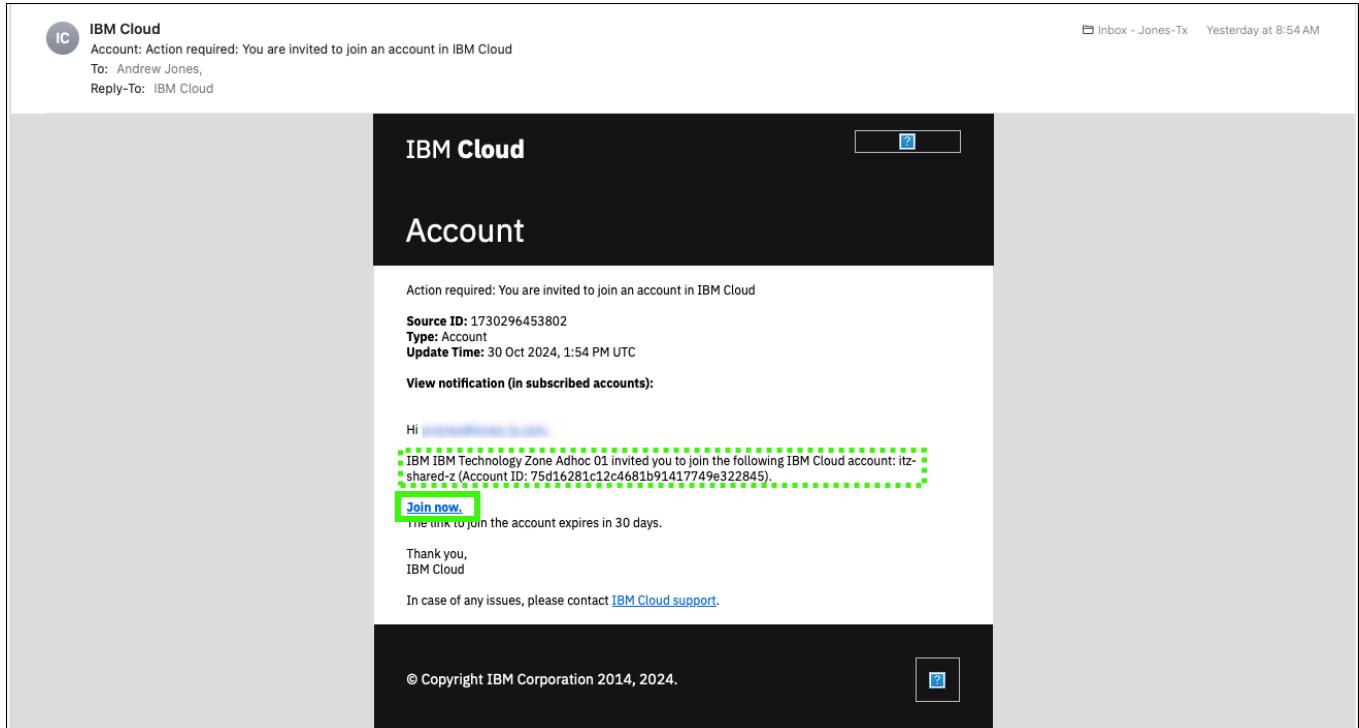


If you anticipate needing more time, repeat Steps 5 and 6 to extend the reservation to the maximum of 6 days. Repeat these steps for the other two reservations.

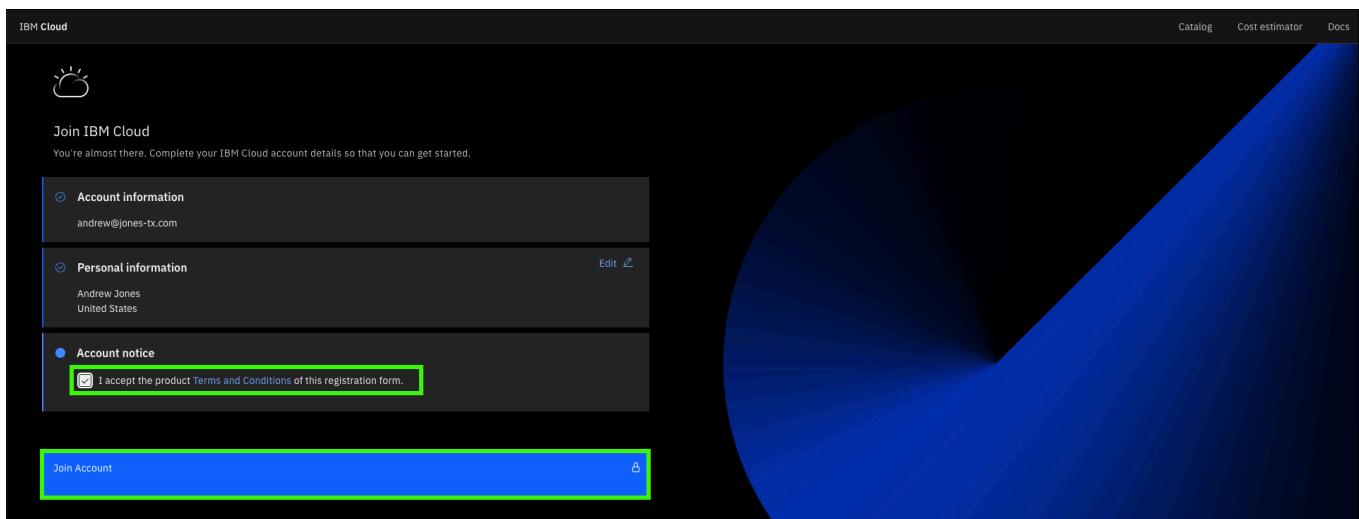
Join the ITZ IBM Cloud accounts

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 should receive two emails from IBM Cloud. In order 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 windows that open, select the **I accept the product Terms and Conditions of this registration form**, and then click **Join Account****.



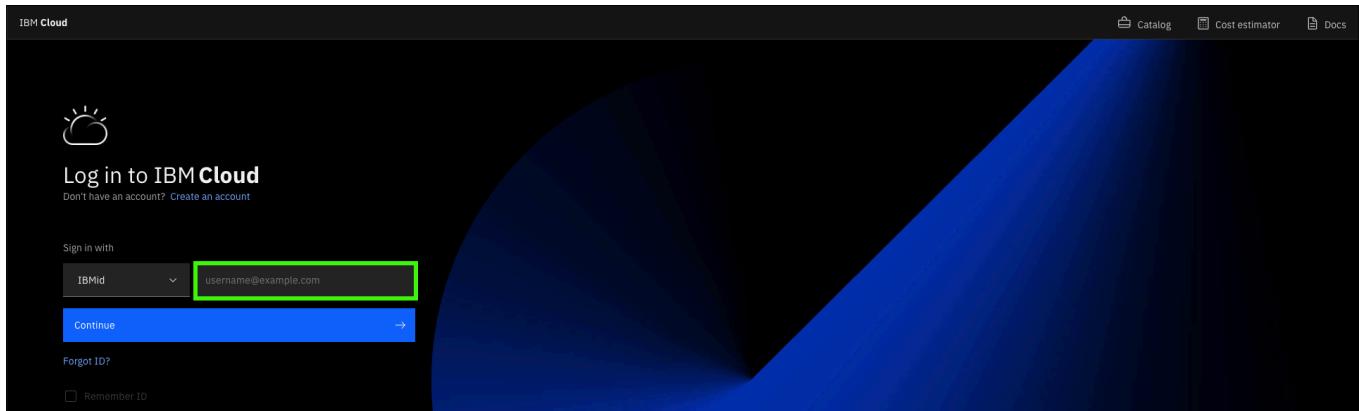
Repeat steps 7 and 8 for the second invitation.

After joining both accounts, verify both accounts appear in your available account list in the IBM Cloud portal.

9. Click the link below to open a browser to the IBM Cloud Portal.

[IBM Cloud portal](#)

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



11. Click the **account** menu and verify access to the two IBM Cloud accounts listed in your ITZ reservations.

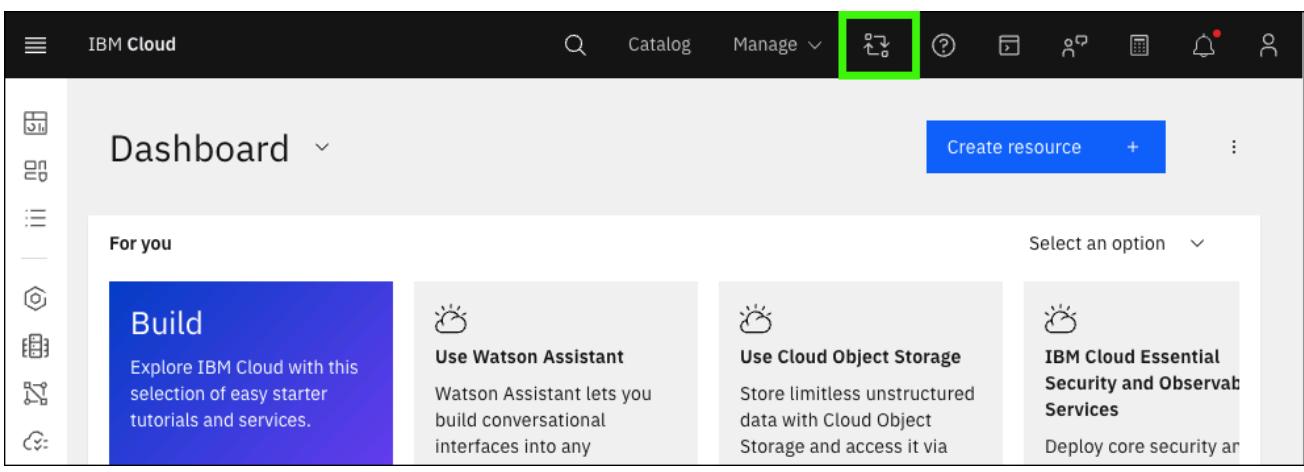


These accounts may change within ITZ.

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 done 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.

Once all three reservations are in the **Ready** state and you have accepted 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 & configuring conversational search

This section will cover how to begin using [watsonx Orchestrate](#) to create a new assistant for watsonx Assistant for Z and configure conversational search. You will be able to configure your assistant to use conversational search using a hosted [OpenSearch](#) instance. The pre-configured instance in IBM Technology Zone (ITZ) has over 220 knowledge sources and supports the Retrieval Augmented Generation (RAG) in which the Large Language Model (LLM) providing the conversational AI is augmented by this knowledge based on IBM Z documentation. All of which helps 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** at the top and select **My Reservations**, or click the link below.

ITZ My reservations

Welcome to Technology Zone, Andrew

Certified Base Images

Best starting point to build

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

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

| Status | Name | Start Date | End Date | Extend Limit |
|----------------|--|----------------------|----------------------|--------------|
| Status - Ready | watsonx Assistant for Z Pilot - watsonx O... | Nov 5, 2024 6:05 AM | Nov 11, 2024 6:59 AM | 0 |
| Status - Ready | watsonx Assistant for Z Pilot - AAP & z/OS | Nov 5, 2024 6:03 AM | Nov 11, 2024 6:08 AM | 0 |
| Status - Ready | Single Node OpenShift (VMware on IBM C... | Nov 5, 2024 12:58 PM | Nov 7, 2024 5:39 PM | 2 |

3. Record the ITZ IBM Cloud account name/number 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 the current IBM Cloud account is the same as the account name/number recorded in step 3, if not the same, switch to the proper account.

Note: the formatting of the name may appear differently than what was shown in the ITZ reservation.

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 may be depicted with the switch account icon (🕒).

Create your Assistant

6. Click the **resources** icon (☰).

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

Resource list

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

8. Click Launch watsonx Orchestrate.

itwxo-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. When 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

c. Developer

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: #303030

Chat header: User message bubble

Accent color: #035AE9

Significant and interactive objects: On Off

Size: Width: 380px Height: 640px

IBM Watermark: Shade IBM Watermark Off

Streaming: Enable Streaming Off

Zeeves

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

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

Type something...

Powered by IBM 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?

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

Type something...

Powered by IBM watsonx

At this point, the assistant has been created.

The screenshot shows the IBM Watsonx Orchestrate interface for the 'Zeeves' assistant. The top navigation bar includes 'IBM Watsonx Orchestrate', 'AI assistant builder', 'Zeeves', 'View all assistants', 'What's new', and 'Documentation'. The main content area is titled 'Assistant architecture' with the sub-instruction 'Here's an overview that depicts the structure of your assistant.' Below this is a detailed diagram of the assistant's architecture:

```

graph TD
    Zeeves((Zeeves)) --- Actions[Actions]
    Actions --- DefaultBehavior[Default behavior]
    Actions --- Fallback[Fallback]
    Actions --- LiveAgent[Live agent]
    DefaultBehavior --- GeneralPurpose[General purpose  
granite-3-8b-instruct]
    DefaultBehavior --- ConversationalSearch[Conversational search  
No content]
    ConversationalSearch --- Search[Search]
    Fallback --- AIguided[AI-guided  
0 actions]
    Fallback --- Skillbased[Skill-based  
0 actions]
    Fallback --- Custombuilt[Custom-built  
0 actions]
    LiveAgent --- NoAgent[No agent]
  
```

The diagram illustrates how the 'Zeeves' assistant is structured. It starts with the 'Actions' block, which branches into 'Default behavior', 'Fallback', and 'Live agent'. 'Default behavior' leads to 'General purpose' (using the 'granite-3-8b-instruct' model) and 'Conversational search' (which currently has 'No content'). 'Fallback' leads to three types of actions: 'AI-guided', 'Skill-based', and 'Custom-built', each with 0 actions added. 'Live agent' leads to 'No agent'.

Configure conversational search

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

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

This screenshot is identical to the previous one, but the 'Generative AI' menu item in the left navigation bar is highlighted with a green border. The rest of the interface and the architecture diagram remain the same.

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.

Generative AI

Base large language model (LLM) (Beta)

Select a model

granite-3-8b-instruct (recommended)

By using the model you agree to these terms.

Add prompt instructions

Answer behavior

General-purpose answering

Conversational search

Preview

1:03 PM Greet customer [default] Welcome, how can I assist you?

16. Click Set up your Search Integration.

By default, conversational search is not enabled when an assistant is created. Conversational search will take priority over general-purpose answering if both are enabled. Learn more about conversational search in watsonx here.

Generative AI

Base large language model (LLM) (Beta)

Select a model

granite-3-8b-instruct (recommended)

By using the model you agree to these terms.

Add prompt instructions

Answer behavior

General-purpose answering

Conversational search

Preview

1:03 PM Greet customer [default] Welcome, how can I assist you?

17. Click Custom service.

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

a. Select **By providing credentials**.

b. 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

c. 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 upon your requirements.**

Note: the **Settings** page is divided into two sections in the images below to enhance the visibility of the screen captures. Learn more about these settings [here](#).

The following settings have 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.

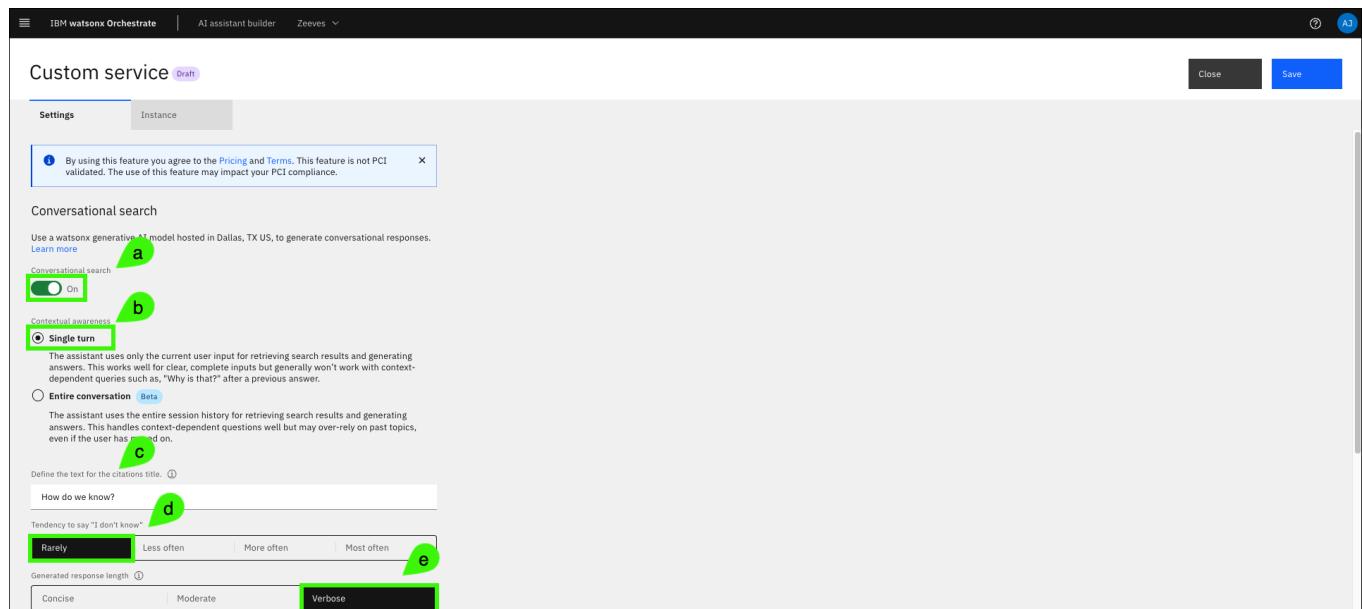
b. Select Single turn. Enabling multi-turn conversation (by selecting Entire conversation) is not yet supported for the solution on-prem. Please be mindful in using this option and ensure the client understands what is currently supported today by the solution.

c. Specify the text appears 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 may 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 will be 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 there are connectivity issues to the backend search service. You can keep the defaults or customize.

Custom service Draft

Settings Instance

Tendency to say "I don't know"

Rarely Less often More often Most often

Generated response length

Concise **f** Moderate Verbose

Default filter

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

g

Metadata

JSON example:

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

h

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

21. Click **Save** and then click **Close**.

Custom service Draft

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. X

Conversational search

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

Conversational search On

Contextual awareness

Single turn

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

Additional configuration

Once you have saved and closed the **Conversational search** configuration page, there are a few more configurations 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 left navigation and click **Actions**.

Generative AI

Actions

Language model (LLM) Beta

model that your assistant uses for all base LLM functions.

recommended)

Read terms

Instructions

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

Preview

2:08 PM Greet customer [default]

Welcome, how can I assist you?

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

Create your first action
With actions, you can help your customers accomplish their goals.
Create action +

24. Click **no matches**.

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

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' and two items: '1 This step has no content' and '2 This step has no content'. Item 1 has a green dashed border around it. In the main area, under 'Step 1', the condition 'Is taken' is set to 'without conditions'. The 'Assistant says' section contains the text 'For example: Please select from the following options:'.

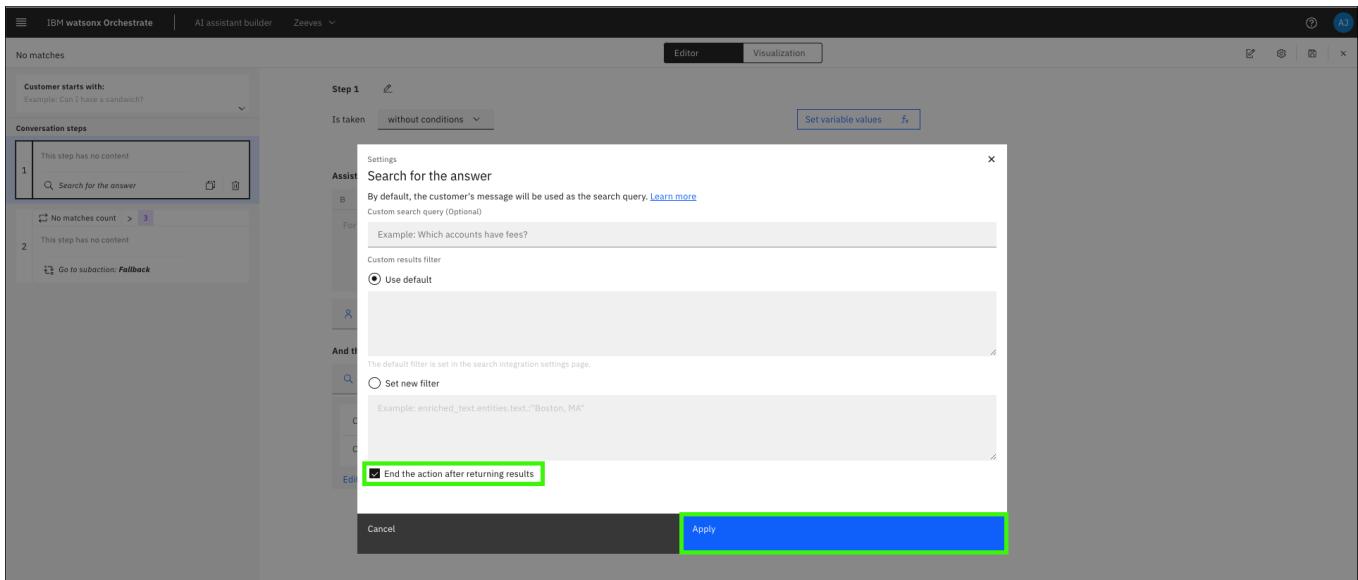
28. Select **Search for the answer** in the **And then** drop-down menu.

The screenshot shows the AI assistant builder interface with the 'And then' dropdown menu open. The 'Search for the answer' option is highlighted with a green box. Other options in the menu include 'Continue to next step', 'Re-ask previous step(s)', 'Go to a subaction', 'Use an extension', 'Connect to agent', and 'End the action'.

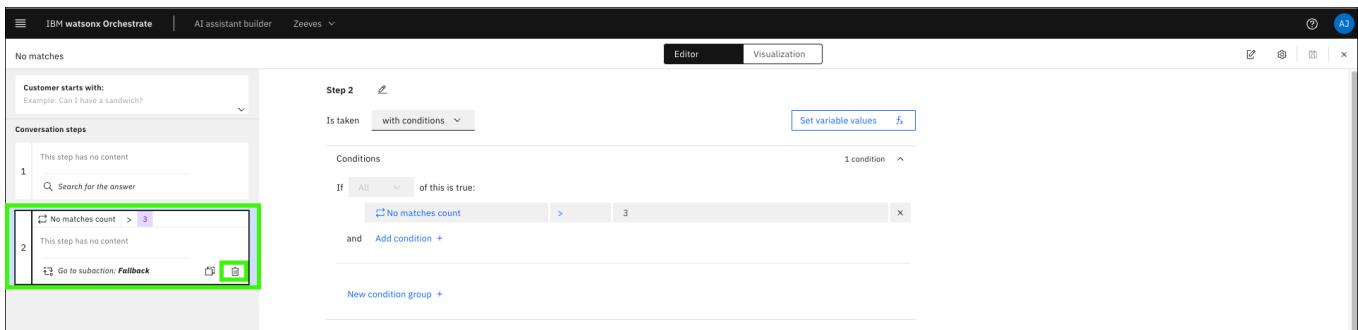
29. Click **Edit settings**.

The screenshot shows the AI assistant builder interface with the 'And then' dropdown menu open. The 'Search for the answer' option is highlighted with a green box. Below it, the 'Edit settings' button is also highlighted with a green box.

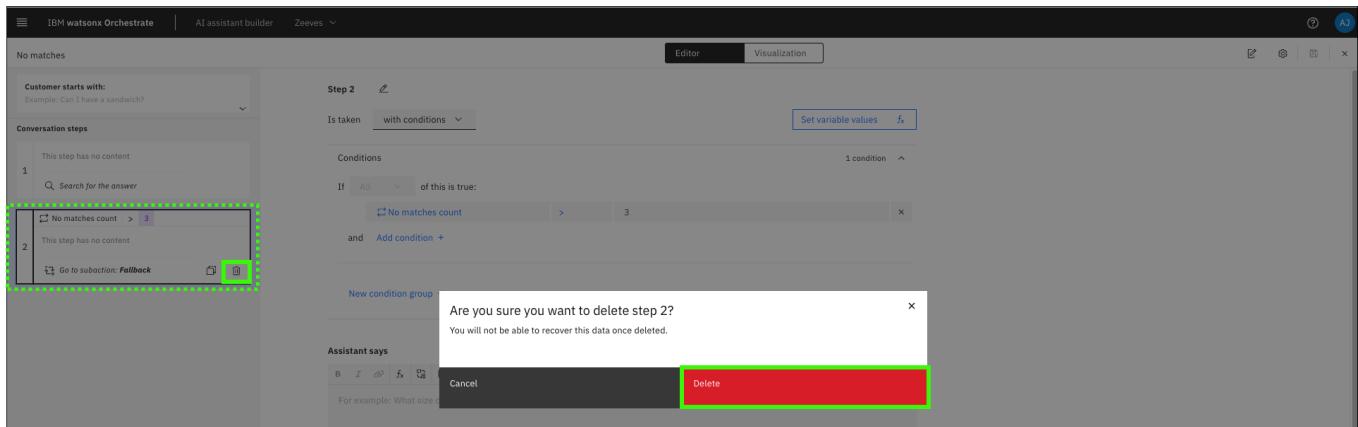
30. Select **End the actions after returning results** and then click **Apply**.



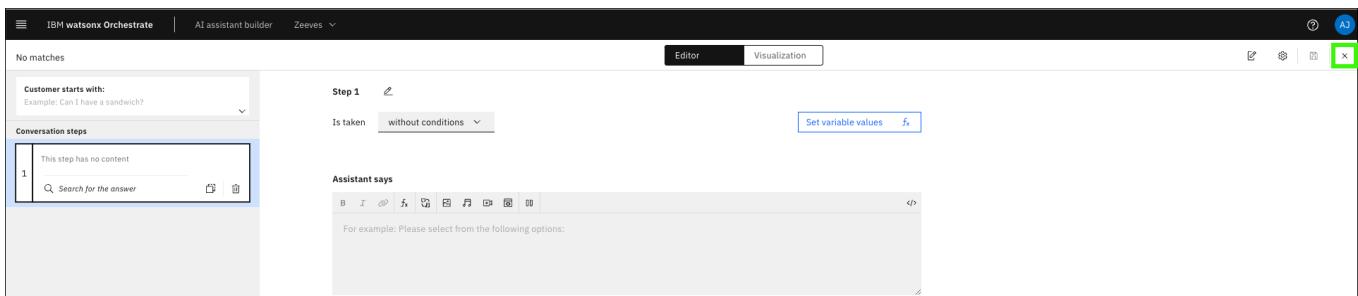
31. Select Step 2 (No matches count) under **Conversation steps** and click the delete icon (>Delete).



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 image below has been edited. Only 5 steps are shown, but all 6 need to be deleted. You will need to select each step individually, click the delete icon (trash), and confirm the deletion.

The screenshot shows the 'Editor' tab of the AI assistant builder. The 'Conversation steps' section contains five steps:

1. Fallback reason is Failed to confirm topic. Step validation failed. Step validation failed. Step validation failed.
2. I'm afraid I don't understand. I can connect you to an agent. Step validation failed.
3. Sorry I couldn't assist you. I will connect you to an agent right away. Step validation failed.
4. I am afraid I do not understand what you are asking. Let me connect you to an agent. Step validation failed.
5. It seems this conversation would be best managed by a human agent. Let me connect you to one of our agents. Step validation failed.

Each step has a small trash icon in the bottom right corner. The first four steps are highlighted with a green box.

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

The screenshot shows the 'Editor' tab of the AI assistant builder. The 'Conversation steps' section is empty, indicated by a dashed green box. The 'Action starts' and 'Additional training examples for connecting to an agent' sections are visible.

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 relevant options are found. A toggle switch labeled 'Enable disambiguation' is set to 'On'. Below it, a text box contains the placeholder 'Did you mean:'. A dropdown menu lists 'None of the above', 'Something else', and 'Connect to support'. To the right, there is an example of a 'Bank Bot' interaction where a user types 'open an account' and the bot asks 'Did you mean:' followed by a list of suggestions: 'Open a new savings account', 'Open a new checking account', 'I want to apply for a mortgage loan', and 'None of the above'.

39. Move the slider to More often (or select More often in the drop-down).

This will 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 includes a note about triggering the 'No matches' action for unrecognized input. A slider is shown with a green box around its track, and the dropdown menu next to it is also highlighted with a green box. The option 'More often' is selected. The slider itself is positioned towards the right end of the track.

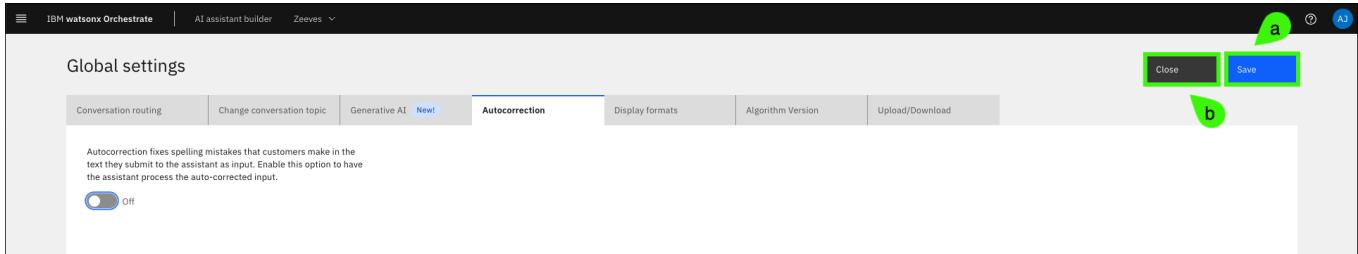
40. Click Autocorrection.

The screenshot shows the 'Global settings' page with the 'Autocorrection' tab selected. The 'Autocorrection' section has a note about fixing spelling mistakes. A toggle switch labeled 'Off' is highlighted with a green box. The slider and dropdown menu next to it are also highlighted with a green box. The 'More often' option is selected.

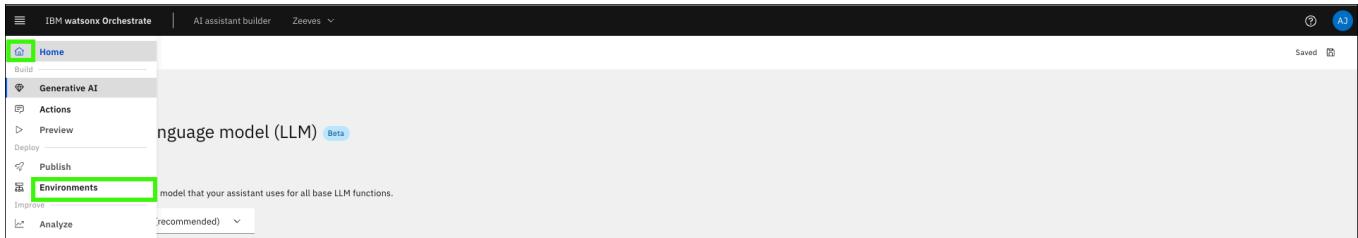
41. Click the autocorrection toggle to turn the feature off.

The screenshot shows the 'Global settings' page with the 'Autocorrection' tab selected. The 'Autocorrection' section has a note about fixing spelling mistakes. A toggle switch labeled 'Off' is highlighted with a green box, indicating that autocorrection is disabled.

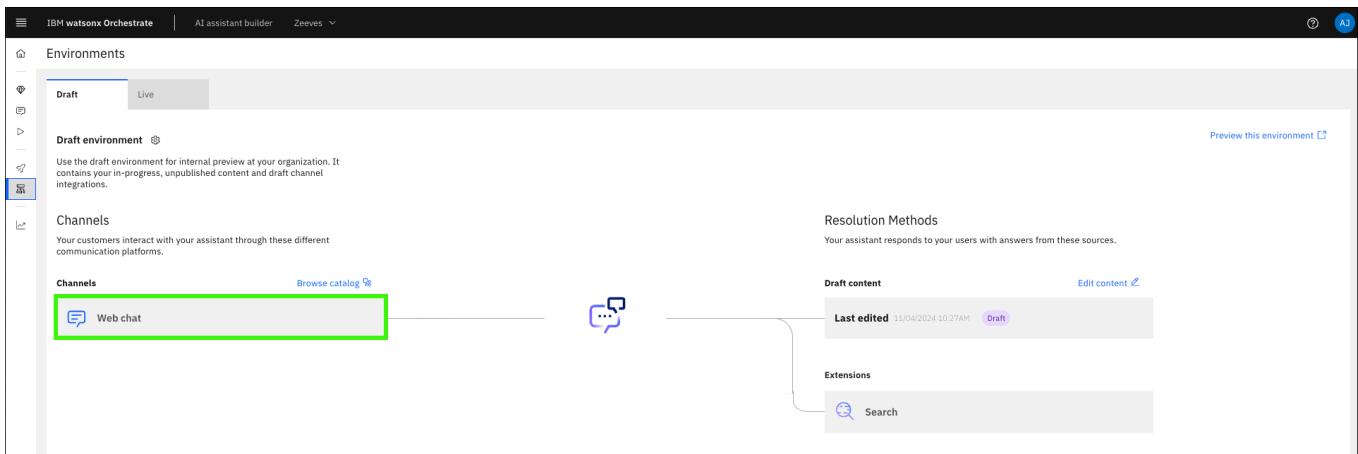
42. Click (a) **Save** and then (b) **Close**.



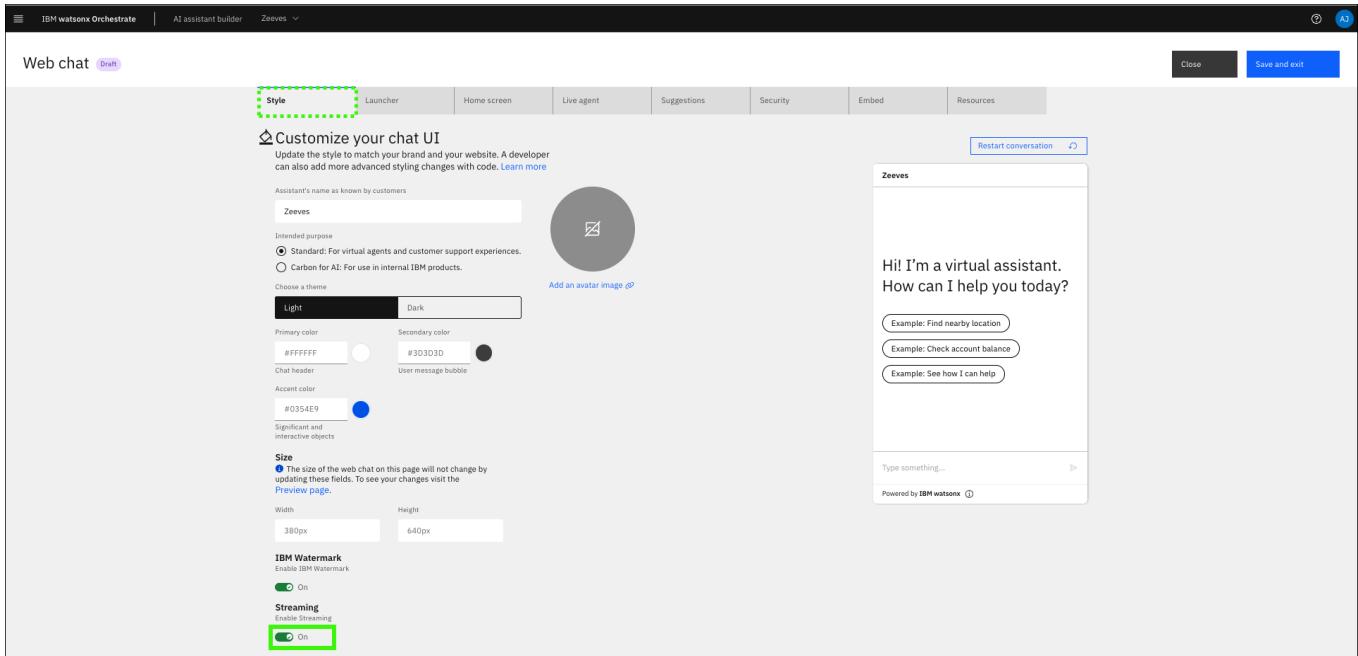
43. Hover over the **home** (🏠) and click **Environments**.



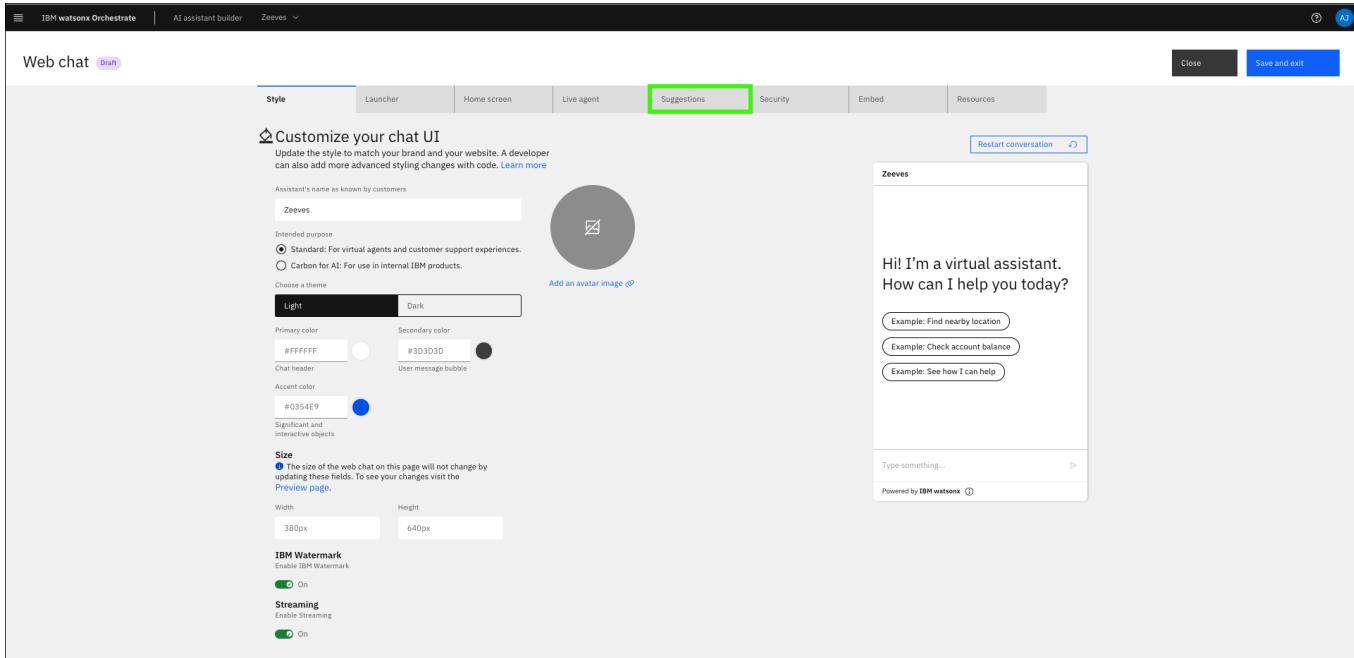
44. Click **Web chat**.



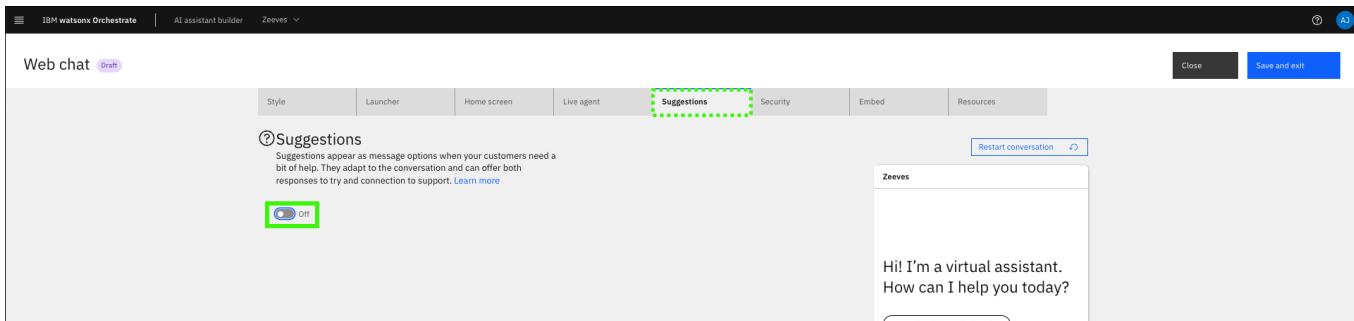
45. On the **Style** tab, click the **Streaming** toggle to enable streaming.



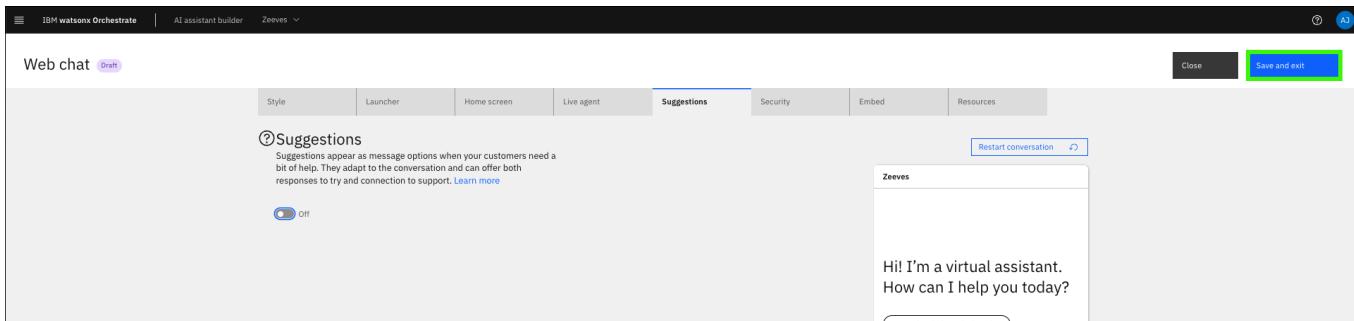
46. Click **Suggestions**.



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



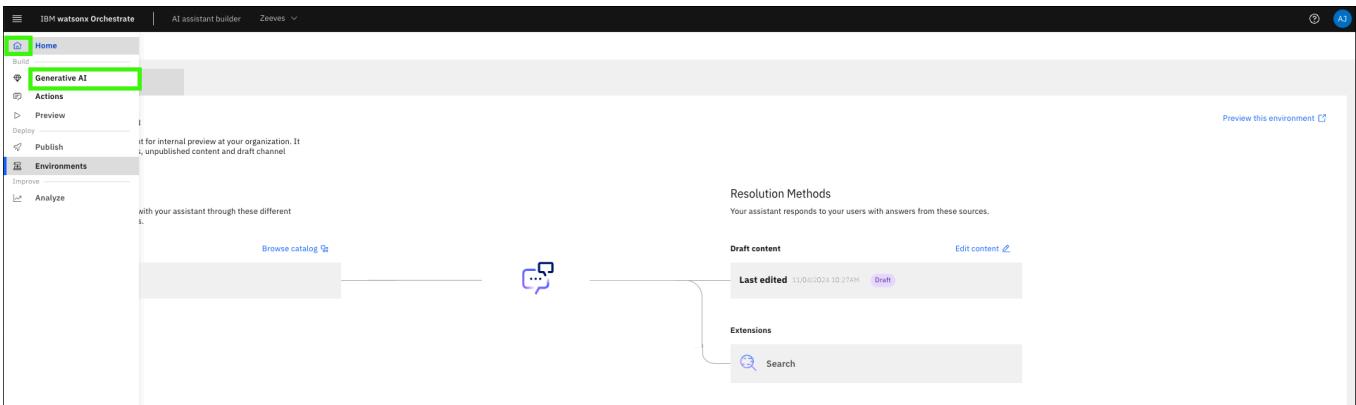
48. Click **Save and exit**.



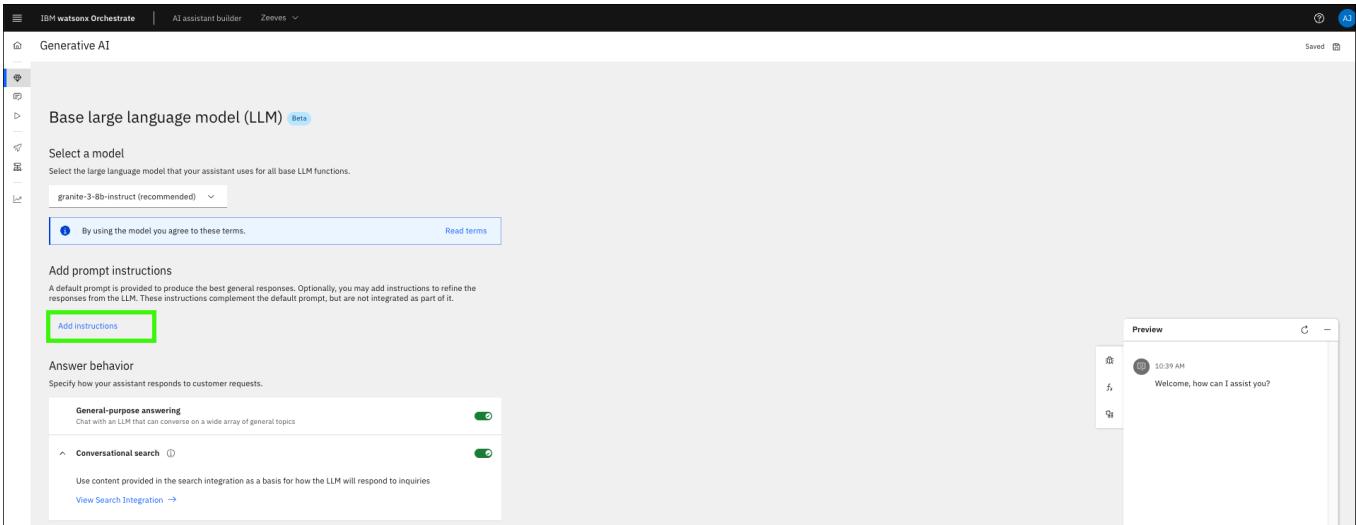
Configure the base Large Language Model (LLM)

Once the above steps have been completed, there are some final enhancements that can be made to configure how the LLM will respond to your queries. This includes Adding prompt instructions as well as configuring the LLM's answer behavior. These options can be summarized [here](#).

49. Hover over the **home** (🏠) and click **Generative AI**.



50. Click Add instructions.



51. 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.

Below is an example prompt instruction that has worked well. Feel free to explore using your own 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: Once the instructions are typed in, they are automatically saved and the LLM is immediately trained on them.

52. Toggle General-purpose answering to off.

There is also the ability to configure the answering behavior of your assistant to provide responses that are based on the preloaded content or general content.

At the bottom of the Generative AI page (under Prompt Instructions), you will see the Answer behavior section. Once you've configured Conversational search, you will now see that it is enabled (toggled on) with the search integration you added previously.

If you enable both General-purpose answering as well as Conversational search, the Conversational search answering takes precedence over General-purpose answering.

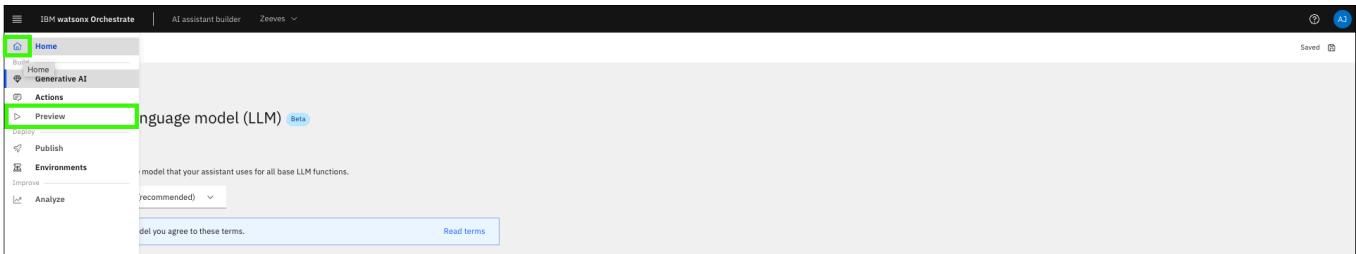
For purposes of retrieving Z specific answers and responses, it is recommended that you turn off General-purpose answering and only leave Conversational search turned on.

Testing conversational search

Now that all of your assistant settings have been made and you have enabled conversational search, you can begin issuing queries to test the responses.

It is important to keep in mind that many of the settings configured above can be iteratively modified based on your assessment of the quality of responses. These can be revisited and changed at any point (for example, adding additional prompt instructions, changing verbosity of the responses, and modifying the indexes used for OpenSearch).

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



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

Here are a few prompts and responses. Note: the responses you receive may vary from those shown below.

Prompt:

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

Example output:

Prompt:

Why is Db2 different than other database systems?

Example output:

The screenshot shows the IBM Watsonx Assistant for Z interface. On the left, there's a sidebar with icons for preview, AI assistant builder, and Zeeves. The main area has a title 'Sample website' and a large, mostly blank content area. At the top right, there are buttons for 'Copy link to share', 'Change layout', 'Change background', and 'Customize web chat'. A small A3 icon is also present. On the far right, a chat window titled 'Zeeves' is open. It shows a message from 'You' at 11:03 AM asking 'Why is DB2 different than other database systems?'. Below it, a response from 'Zeeves' at 11:03 AM explains that DB2 is a relational database management system (RDBMS) that runs under the z/OS operating system, which is specific to mainframe computers. Other database systems run on various operating systems like Windows, Linux, or Unix. Additionally, DB2 provides a higher level of data management and security features compared to other database systems, as it manages data stored in databases and controls access to the data.

Prompt:

What happens during an IPL on IBM Z?

Example output:

The screenshot shows the same interface as the previous one. The main area is a 'Sample website' placeholder. The chat window on the right shows a message from 'You' at 11:05 AM asking 'What happens during an IPL on IBM Z?'. Below it, a response from 'Zeeves' at 11:05 AM explains that during an IPL (Initial Program Load) on IBM Z, the system reloads the operating system into memory and begins executing it. This process can be initiated from various sources, such as the Support Element (SE), Hardware Management Console (HMC), an Open Systems Port, or a console terminal. The IPL can be used to load a new operating system, recover from a system failure, or perform maintenance tasks. The type of IPL determines whether the Primary Link Pack Area (PLPA) is reloaded and whether VTO data set pages are preserved.

You should now have a working assistant using IBM Watsonx Assistant for Z. Feel free to explore with different prompt instructions and settings. If you encounter any issues, the Troubleshooting section that follows may help resolve them.

Continue to the [Creating a standalone 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 you may encounter. If the provided resolutions do not work, contact support using the methods mentioned in the [Support](#) section of this guide.

 **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 standalone OpenSearch instance for document ingestion

This section will cover how to enable a client to ingest their own documentation into the Retrieval Augmented Generation (RAG) used by IBM watsonx Assistant for Z. This requires deploying a dedicated [OpenSearch](#) instance.

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 already 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, known as **oc**, must be installed on your local machine. If you already have the **oc** utility installed, you can proceed to [Log into the SNO cluster](#).

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

[ITZ My reservations](#)

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

| Environment Tile | Status | Category | Start Date | End Date | Extend Limit | Action |
|--|--------|-----------|----------------------|---------------------|--------------|---------------------------------------|
| Single Node OpenShift (VMware on IBM C...) | Ready | Education | Oct 31, 2024 7:02 AM | Nov 6, 2024 6:49 AM | 0 | Open this environment |
| watsonx Assistant for Z Pilot - AAP & z/OS | Ready | Education | Oct 30, 2024 8:12 AM | Nov 5, 2024 7:53 AM | 0 | Open this environment |
| watsonx Assistant for Z Pilot - watsonx O... | Ready | Education | Oct 30, 2024 8:10 AM | Nov 5, 2024 7:12 AM | 0 | Open this environment |

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

Reservation Details

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

Bastion Password

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

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.

Reservation Details

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

Bastion Password

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

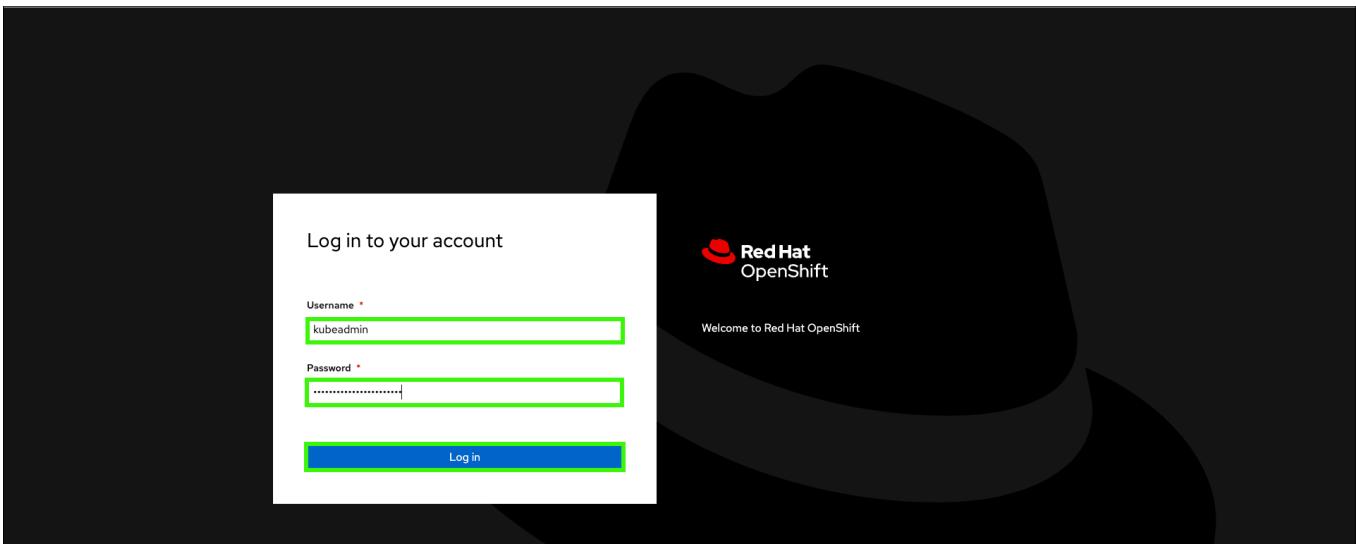
OCP Console
<https://console.openshift-console.apps.672371d38376796fb96a6c4d.ocp.techzone.ibm.com>

OCP Version
4.14

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

Download kubeconfig

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 above link will automatically download either a **zip** or **tar** file specific to your operating system. You should unzip or un-tar the file and place the **oc** binary in a directory that is in your default PATH. Since this will vary by operating system and individual settings, details for doing this are not provided.

Once properly installed, verify the installation by running the **oc** command in a terminal on your local machine.

```
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

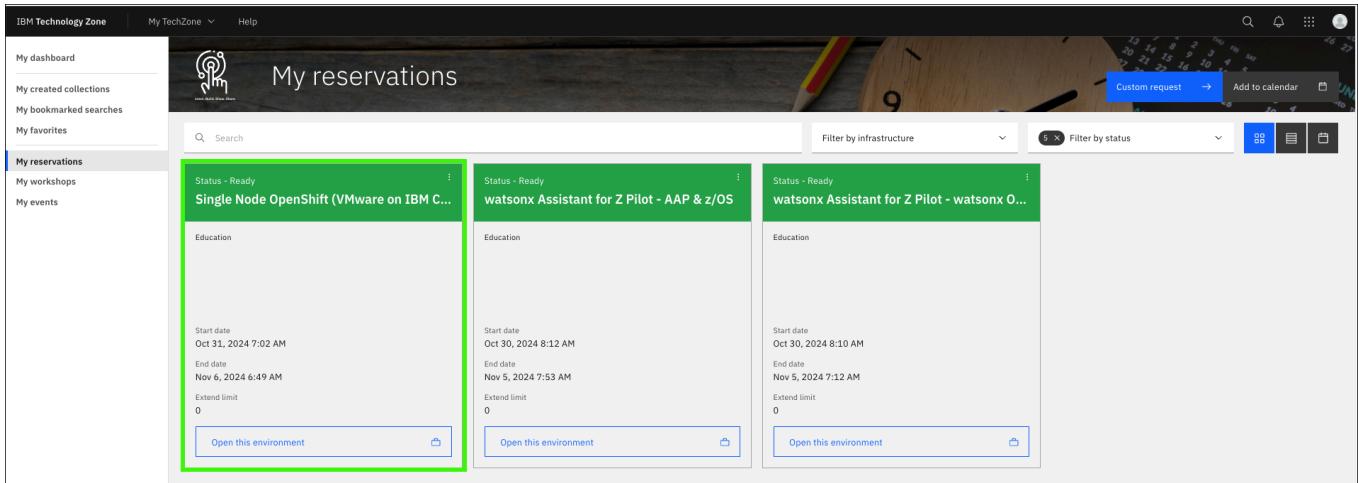
Before ingesting documents, a few setup steps must be taken.

Login to the OpenShift cluster from your local machine

Note: if you just installed the **oc** utility, you should be able to skip the next 5 steps. 1. Click the link below to open a browser window to your ITZ reservations.

```
<a href="https://techzone.ibm.com/my/reservations" target="_blank">ITZ My reservations</a>
```

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



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

Reservation Details

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

Bastion Password

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

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.

Reservation Details

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

Bastion Password

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

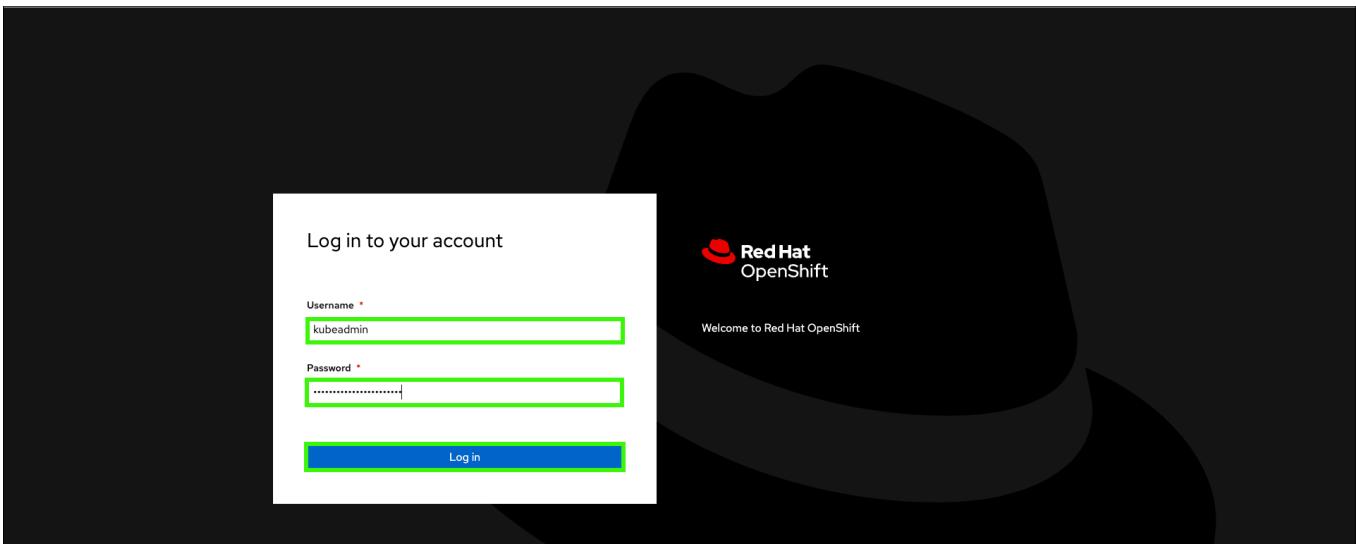
OCP Console
<https://console.openshift-console.apps.672371d38376796fb96a6c4d.ocp.techzone.ibm.com>

OCP Version
4.14

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

Download kubeconfig

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**.

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 should be able to double-click the value and then right click and select **Copy**.

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

10. Paste the login command line in the terminal window 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 may vary by your local machines 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 ~ % 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 OpenShift

13. Create a file 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.

```

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 OpenShift cluster.

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

The above command should return a message stating the **ibm-cert-manager-catalog** was created.

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

The screenshot shows the OpenShift web console interface. The left sidebar has a 'Operators' dropdown with 'OperatorHub' selected, highlighted with a green box. The main content area displays information about the 'oc' command-line tool, including download links for various platforms. The top navigation bar shows the user is logged in as 'kube:admin'.

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

The screenshot shows the OpenShift web console with the 'OperatorHub' page open. A green box highlights the 'Project: All Projects' dropdown menu. Another green box highlights the 'Show default projects' toggle switch, which is currently turned on. The main content area lists several projects: 'All Projects', 'default', 'kube-node-lease', and 'kube-public'. At the bottom, there are tabs for 'Community', 'Marketplace', and 'Community' again. A note at the bottom right indicates there are 624 items.

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

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

Marketplace

- [DEPRECATED] Hazelcast Platform Operator provided by Hazelcast, Inc.
- [DEPRECATED] Use the certified Hazelcast Operator instead

Community

- Abot Operator-v3.0.0 provided by Rehaca Technologies

Marketplace

- Certified
- Accuknox Operator provided by Accuknox Inc.

Red Hat

- Advanced Cluster Management for Kubernetes

Create Project

624 items

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

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

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)
- 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 <code>spec.secretName</code> . 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 | Issuer An Issuer represents a certificate issuing authority which can be referenced as |
| ClusterIssuer Not available | | |

Install **Cancel**

The install process will take 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 Cert Manager
ibm-cert-manager-operator:v4.2.7 provided by IBM

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 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.

Once you locate your existing key or create 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 says 'Access your container software' and provides a brief description of what an entitlement key is. Below that, it lists 'Active entitlement keys' with a note about having a maximum of 5 keys. A specific key is shown with its issue date as 'October 17, 2022'. To the right of the key details are 'Copy' and 'Delete' buttons, with 'Copy' highlighted by a green box.

24. Using the command below 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 being run:

```
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 %
```

The entire command line for creating the secret is highlighted with a green box.

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

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.

```

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 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 OpenShift web console, click **OperatorHub** and select the **wxa4z-byos** project.

The screenshot shows the Red Hat OpenShift web console interface. The left sidebar has a dropdown for 'Administrator' and a 'Project: openshift-marketplace' dropdown. The 'OperatorHub' option is highlighted with a green box. The main content area displays a list of operators categorized by provider: Community, Marketplace, and Red Hat. The 'wxa4z-byos' project is listed under the 'Community' section. A green box highlights the 'wxa4z-byos' entry. Other visible operators include 'openshift-node', 'openshift-nutanix-infra', 'openshift-oauth-apiserver', 'openshift-openstack-infra', 'openshift-operator-lifecycle-manager', 'openshift-operators', 'openshift-ovirt-infra', 'openshift-ovn-kubernetes', 'openshift-route-controller-manager', 'openshift-service-ca', 'openshift-service-ca-operator', 'openshift-user-workload-monitoring', 'openshift-vsphere-infra', 'techzone-infra', '[DEPRECATED] CrowdStrike Operator', '[DEPRECATED] Use the CrowdStrike Falcon Operator from the certified channel instead', 'Abot Operator-v3.0.0', 'Accuknox Operator', and '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.

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

Project: wxa4z-byos

OperatorHub

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

Search: ibm watsonx

1 items

| |
|--|
| IBM watsonx Assistant for Z Operator Catalog |
| IBM watsonx Assistant for Z provided by IBM |
| IBM watsonx Assistant for Z Operator |

29. Click Install.

You are logged in as a temporary administrator.

Project: wxa4z-byos

OperatorHub

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

Search: ibm watsonx

IBM watsonx Assistant for Z

2.0.1 provided by IBM

Install

Channel: stable

Version: 2.0.1

Capability level:

- Basic Install
- Seamless Upgrades
- Full Lifecycle
- Deep Insights
- Auto Pilot

Source: IBM watsonx Assistant for Z Operator Catalog

Provider: IBM

Repository: N/A

Container Image: N/A

Created at: Oct 4, 2024, 1:31 PM

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 install process will take 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.eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiLCJpYXQiOjE2NjYwMTk1ODAsImp0aS16IjNkOWUyMzjZTAzMDQzMzVhNTJhYTkzMWNmOTcyMDR1In0.4M3XRD4XzkHMSOkFNJ4uKVcwZ6SnEAZO3eL_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 OpenShift web console, click **Workloads** and select the **Pods**.

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

IBM watsonx Assistant for Z
ibm-wxa4z-operator/v2.0.1 provided by IBM

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

| 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-7c7898d7d4-87htm | 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 - 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=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9eyJpc3MiOiJJQk0gTWFya2V0cGxhY2UiCJpYXQiOjE2NjYwMTk1ODAsImp0aSI6ijNkOWUyMzZjTAzM0gMzVhNTJhYTkzMWNmOTcyMDR1In0.4M3XRD4XzkHMS0kFNJ4uKVcWZ6SnEA0Z03el_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.

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

```
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.

Substitute a secure authentication key of your choosing for the string <CLIENT_INGESTION_AUTHKEY>. The authentication key can just be a random password.

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

38. Create the secret by running the following command.

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

39. Obtain and record your cluster domain 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

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

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.

```

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

```

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

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

The BYOS deployment will begin and could 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 all pods are either have the status of **Running** or **Completed**.

| Name | Status | Ready | Restarts | Owner | Memory | CPU | Created |
|--|-----------|-------|----------|--|-------------|-------------|-----------------------|
| da80909aab1563ff0c15b7c6d | Completed | 0/1 | 0 | da80909aab1563ff0c15b7c6da81 belefabaa605065bb6c6b490e87 f067f45 | - | - | Nov 6, 2024, 9:26 AM |
| ibm-wxa4z-operator-catalog-cfvw | 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-719b8d6c58-9bzth | Running | 1/1 | 0 | wxa4z-client-ingestion-719b8d6c58 | 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 |

Once finished deploying and all the pods have a status of "Ready" or "Running", you must retrieve your BYOS endpoint URL.

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

| Name | Status | Ready | Restarts | Owner | Memory | CPU | Created |
|--|-----------|-------|----------|--|-------------|-------------|-----------------------|
| da80909aab1563ff0c15b7c6d | Completed | 0/1 | 0 | da80909aab1563ff0c15b7c6da81 belefabaa605065bb6c6b490e87 f067f45 | - | - | Nov 6, 2024, 9:26 AM |
| ibm-wxa4z-operator-catalog-cfvw | 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-719b8d6c58-9bzth | Running | 1/1 | 0 | wxa4z-client-ingestion-719b8d6c58 | 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 previous step.

First, append the string **/v1/query** to complete the URL endpoint. The URL should look similar to the following:

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

Note, the above URL will not work for you. You must use the value of your specific OpenSearch instance 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 do this is illustrated in the animated gif below. You can revisit this step in the prior section [here](#).

The screenshot shows the 'Routes' section of the Red Hat OpenShift interface. The left sidebar shows 'Networking' selected under 'Routes'. The main area lists two routes:

| Name | Status | Location | Service |
|--------------------------|----------|---|--------------------------|
| wxa4z-client-ingestion | Accepted | https://wxa4z-client-ingestion-wxa4z-byos.apps.67b79320c7a7b728e523b4.ocp.techzone.ibm.com | wxa4z-client-ingestion |
| wxa4z-opensearch-wrapper | Accepted | https://wxa4z-opensearch-wrapper-wxa4z-byos.apps.67b79320c7a7b728e523b4.ocp.techzone.ibm.com | wxa4z-opensearch-wrapper |

Install the `zassist` command

Troubleshooting

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

✖ Pods have a status of ErrImagePull or ImagePullBackoff

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

✖ The wxa4z-client-ingestion pod does not start

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

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

Installing and using zassist to ingest client documents

With Bring Your Own Search (BYOS) installed and configured in your assistant, you can now prepare for document ingestion. Currently, only PDF, HTML, and DOCX file formats are supported for ingestion.

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

Install the zassist utility

The **zassist** utility is an executable program that automates the ingestion of client documentation into the RAG for Watson 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 below to download and install **zassist**.

1. Click the link below 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 file icon, followed by 'zassist.zip'. To the right are buttons for 'Download' (which is highlighted with a green box) and 'Account'. Below the header is a search bar labeled 'Search files and folders'. The main area displays a single item: 'zassist.zip' under the 'zassist' folder. The table has columns for 'Name', 'Modified', and 'Size'. The 'Modified' column shows 'Sep 5 at 9:15 AM' and the 'Size' column shows '--'.

2. Unzip the **zassist.zip** file.
3. Locate the appropriate executable for your local machines operating system.

The screenshot shows a file explorer window titled 'watsonxAssistant'. The left pane shows a tree view with several YAML files and a 'zassist' folder. The 'zassist' folder is expanded, showing subfolders 'linux', 'mac', 'windows', and an 'os-secret.yaml' file. Inside the 'mac' folder, there is a file named 'zassist' which is highlighted with a green box. The right pane is a detailed list view with columns for 'Name', 'Date Modified', 'Size', and 'Kind'. The 'zassist' file in the 'mac' folder is listed with a modified date of 'Sep 5, 2024 at 11:15 AM', a size of '10.2 MB', and a kind of 'Unix Executable File'. Other items in the list include 'byos.yaml', 'ca.crt', and various YAML files.

4. Either copy the appropriate **zassist** executable to a directory in your command prompt or terminal window's PATH, or copy it to a directory and add that directory PATH to your PATH environment variable.

Additional information for performing the above tasks can be found [here](#).

5. Verify 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 executable ready, 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 [here](#).

These steps are not repeated in this lab guide, rather the video below illustrates all of the steps to ingest a single document. This video has no audio.

404 - Not found

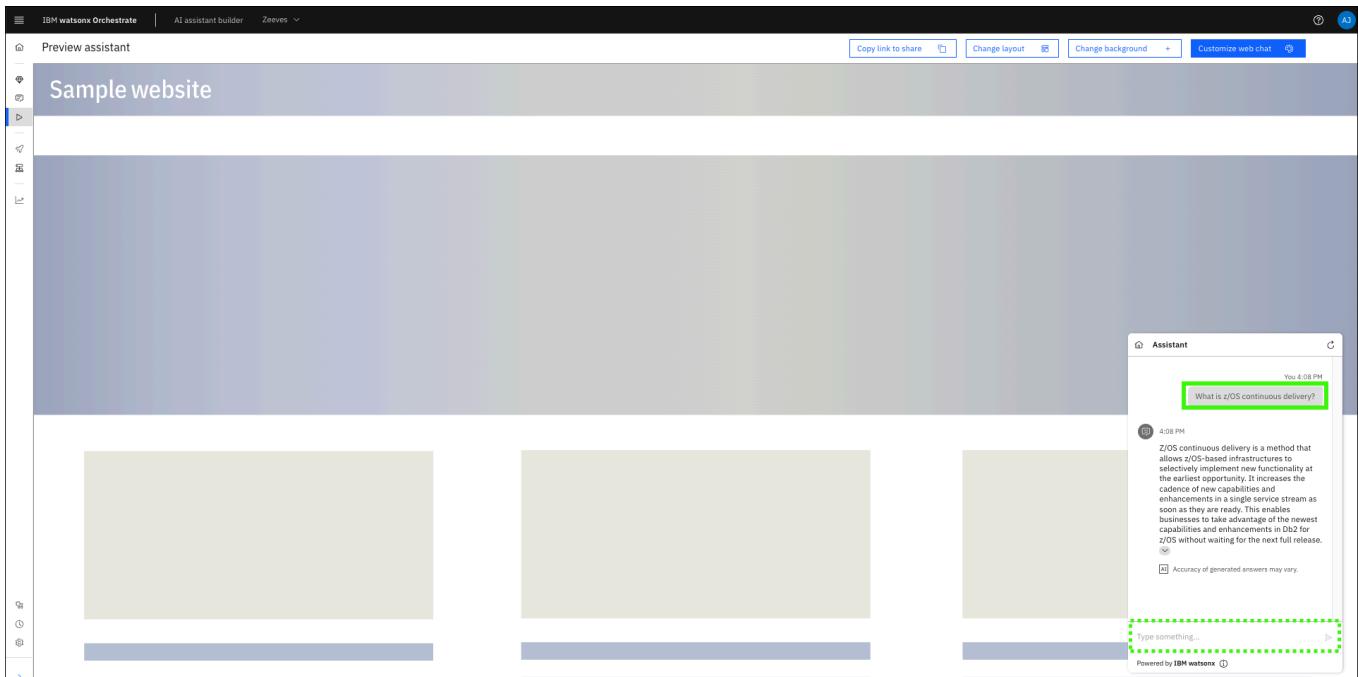
The document ingested in the video is a compressed PDF version of the [IBM z/OS Continuous Delivery Red Piece](#). You can download a copy of this document [here](#).

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

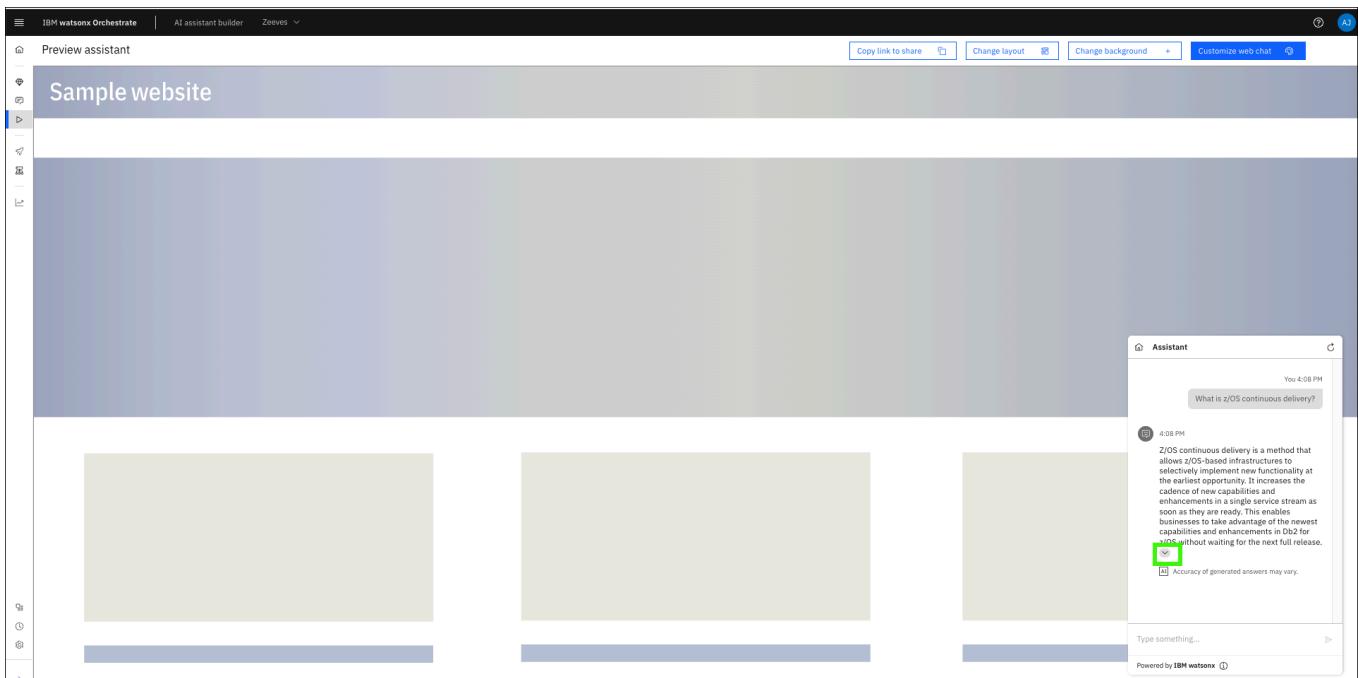
Use the watsonx Orchestrate AI assistant builder to verify your document ingestion.

6. Hover over the home () icon and click **Preview**.
7. Enter the following prompt in your assistant.

```
What is z/OS continuous delivery?
```



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



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

The screenshot shows the IBM Watsonx AI assistant builder interface. On the left, there's a sidebar with icons for file operations like preview, edit, and delete. The main area is titled "Sample website" and displays a blurred preview of a web page. To the right, there's a "Assistant" panel with a summary of a document. The summary includes a title, a detailed description of the document's content, and a "View source" button. Below the summary, there's a note about accuracy and a "Type something..." search bar.

10. Click the ingested document reference.

This screenshot is similar to the previous one, but the "View source" button in the AI-generated document summary is highlighted with a green box. This indicates that the user has interacted with the reference to view the source document.

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

The steps to accept the security risk for the document are not shown. This occurs as the certificate for the connection to the SNO instance is not secure. Notice the URL contains the a path to your SNO instance route.

```

```

Adjusting your assistant's search behavior
Do you recall the **Metadata** field when you were configuring your assistant?

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 ingested for conversational search, you can set the metadata field for your assistant to use those documents in it's content-grounded search. If you leave the metadata field empty, then it defaults to settings found to perform well experimentally. This replaces having to paste a complicated search string. By default (without any string in the Metadata field), it will search all the default IBM provided documentation and all ingested customer documentation using the following:

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

Replacing the wildcard string with an explicit list of indices allows personalization. This is where you could 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 which the OpenSearch instance has IBM documentation for. You can find those indices and products [here](#).

You have the ability to input a subset of indices into the "Metadata" field in cases where you only want your assistant gathering 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 could 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 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 assigned to “ibm_indices” and “customer_docs” is the weight assigned to “customer_indices”.

Once you’ve configured all the above settings for Conversational Search on that page, you can click “Save” in the top-right of the page.

For more information on customizing the metadata field for conversational search, please 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 redo steps 6 through 8 above. Notice the ingested Red Piece document is now the first sited reference!

The screenshot shows the IBM Watsonx Assistant interface. At the top, there's a navigation bar with 'IBM Watsonx Orchestrate' and 'AI assistant builder' tabs, and a dropdown for 'Zeeves'. Below the navigation is a toolbar with 'Copy link to share', 'Change layout', 'Change background', and 'Customize web chat'. The main area is titled 'Sample website' and contains three large, blurred rectangular cards. In the bottom right corner, there's a sidebar titled 'Assistant' with a timestamp '4:30 PM'. It displays a list of search results for 'red piece', with the top result being 'redp5340-compressed.pdf'. This result has a green dotted border around it. Below the list, there's a 'View source' button and a footer with 'Type something...' and 'Powered by IBM watsonx'.

Adding skills to the assistant

Getting started with skills and actions

Watsonx Assistant for Z provides the ability to import skills to automate a range of IBM Z related tasks through assistant interactions. Each skill is a pre-defined automation that performs a different task to accomplish some 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 that allows you to build new skills from Ansible Automation platform or z/OS Management Facility (z/OSMF). This extension, Z Skills Accelerator, allows you to connect to Ansible and z/OS application programming interfaces (APIs) and enables you to import automation as Ansible Playbooks, JCL, or REXX as skills. Learn more importing and building skills [here](#).

Environments

watsonx Orchestrate

The extension for Watsonx Assistant for Z that allows for importing skills from Ansible Automation platform (AAP) or z/OSMF is called the 'z/OS Skills Accelerator' which is already configured in your Watsonx Orchestrate IBM Technology Zone (ITZ) environment. You will be using this component when it comes to importing new skills.

Ansible Automation Platform (AAP) and Wazi as a Service (aaS)

To import skills for automations, you will be using Ansible Automation Platform (AAP) and 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 you reserved earlier. This environment will enable the ability to manage and automate z/OS tasks and subsystems with a variety of pre-loaded ansible playbooks ready for immediate use, as well as z/OS installed with all prerequisites needed (no additional setup required).

The playbooks provided cover a variety of simple 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 pre-loaded in the AAP instance. These are mostly tasks from the 'IBM z/OS core collection'. Leveraging this environment will accelerate the ability to showcase the value of Watsonx Assistant for Z when it comes to automation, 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 will be imported into Watsonx Orchestrate as skills and connected to your assistant.

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

The playbook templates pre-loaded into AAP cover various use cases which you will be able to explore, including:

- z/OS Certificate Management (create, delete, list and renew certificates)
- dataset management (create, delete, fetch datasets)

- Submit JCL
- Execute Operator commands
- Execute TSO commands
- And more

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

Explore Ansible Automation Platform (AAP)

Once you have provisioned the AAP & Wazi z/OS environments in ITZ and the reservation is in the **Ready** state, follow these steps to explore AAP.

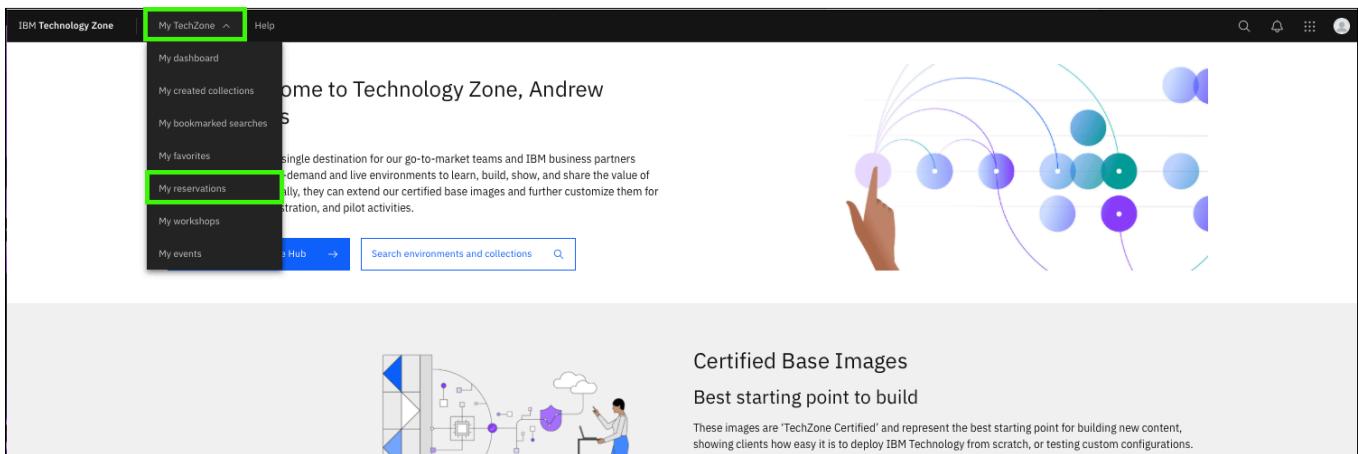
Access the AAP and Wazi as a Service environment

Be sure to record the information as instructed

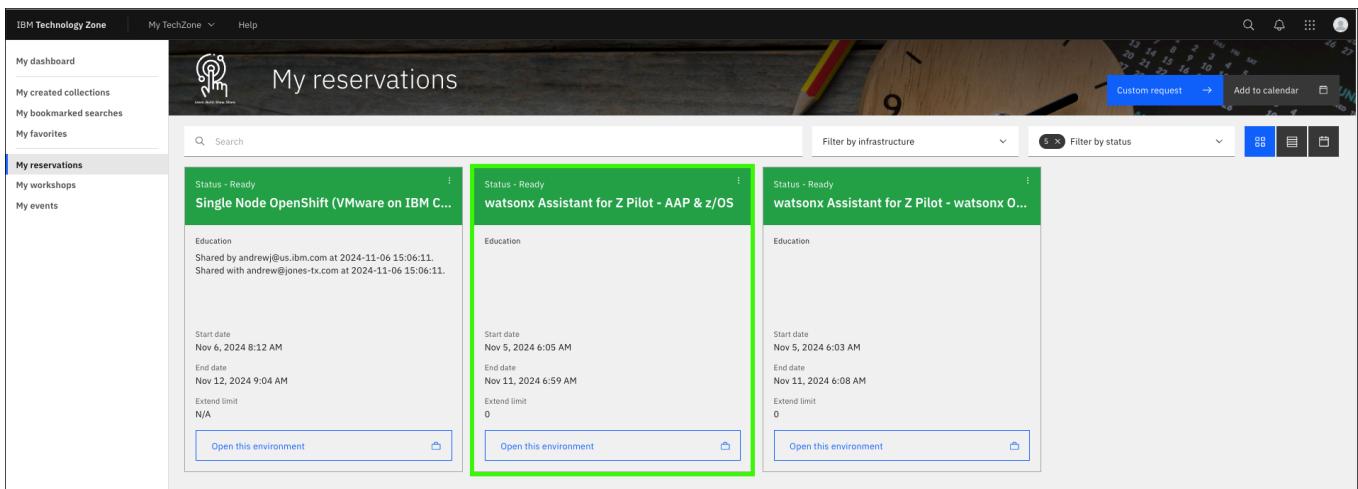
Several of the steps below instruct you to record values from your ITZ reservation. Be sure to do this as they will not only be used in this section, but also in later sections of the lab guide.

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

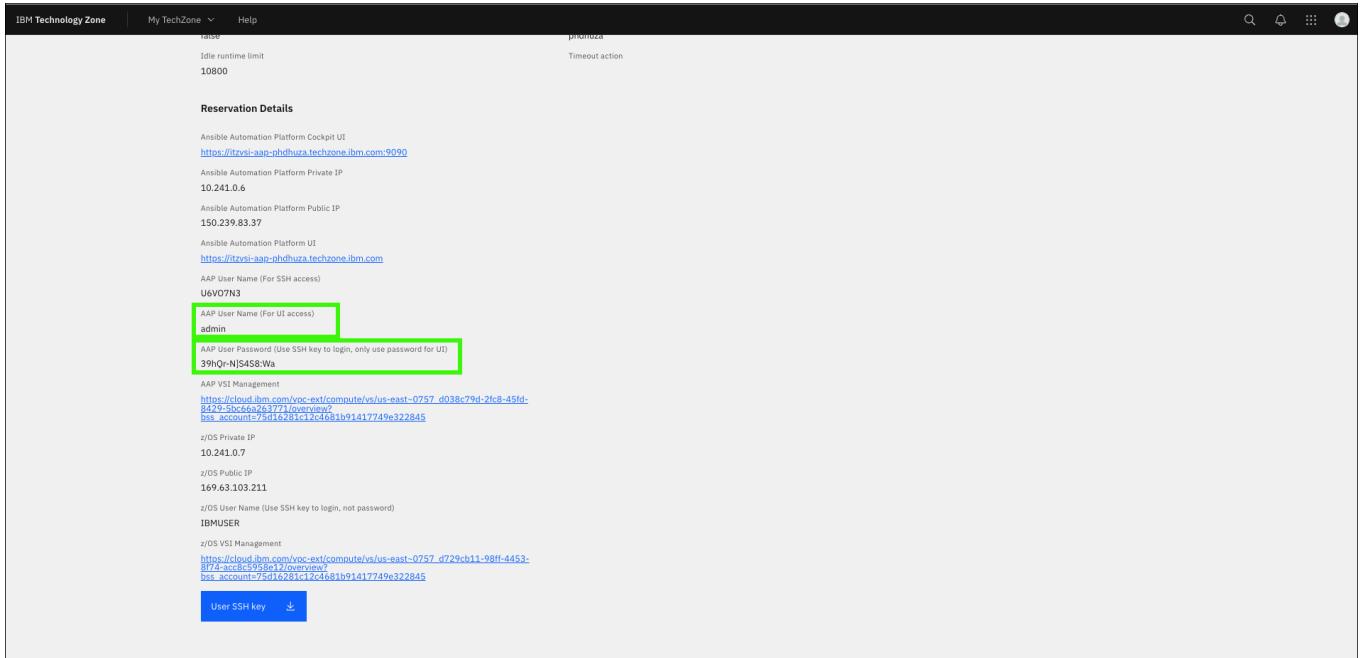
ITZ My reservations



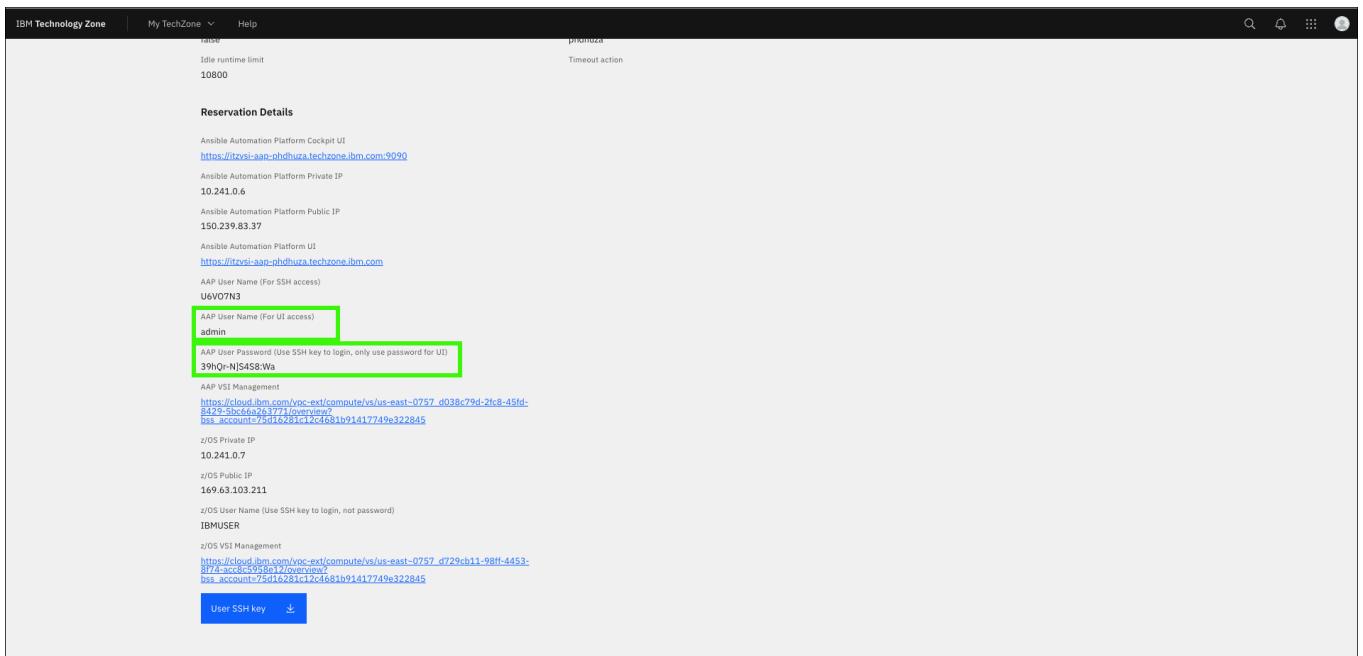
2. Click the **watsonx Assistant for Z Pilot - AAP & z/OS** tile.



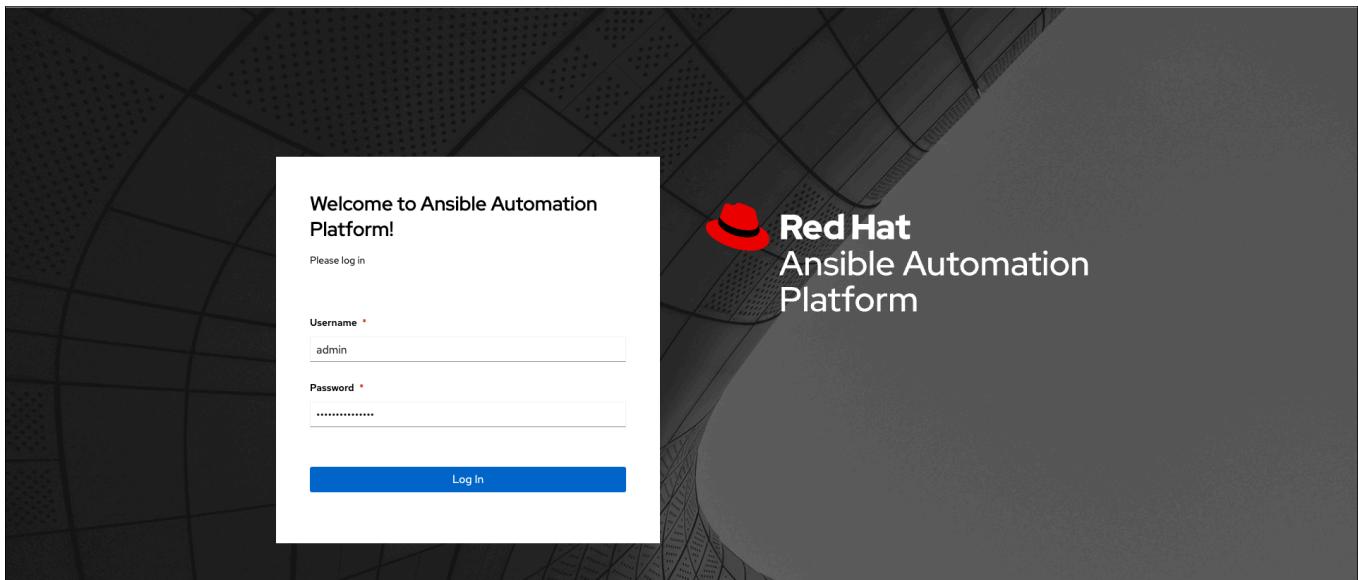
3. Locate and record the **AAP User Name (For UI access)** and **AAP User Password** fields.



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



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

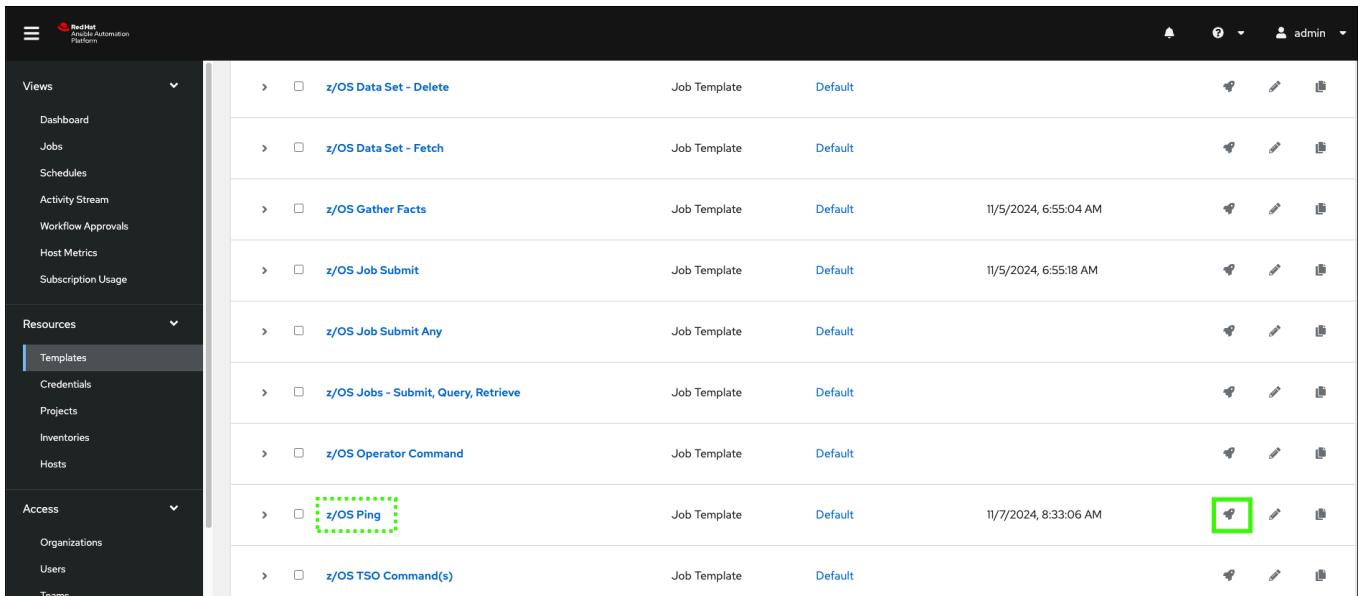


6. Click **Templates** under the **Resources** section.

i The AAP instances is preconfigured to the Wazi aaaS instance

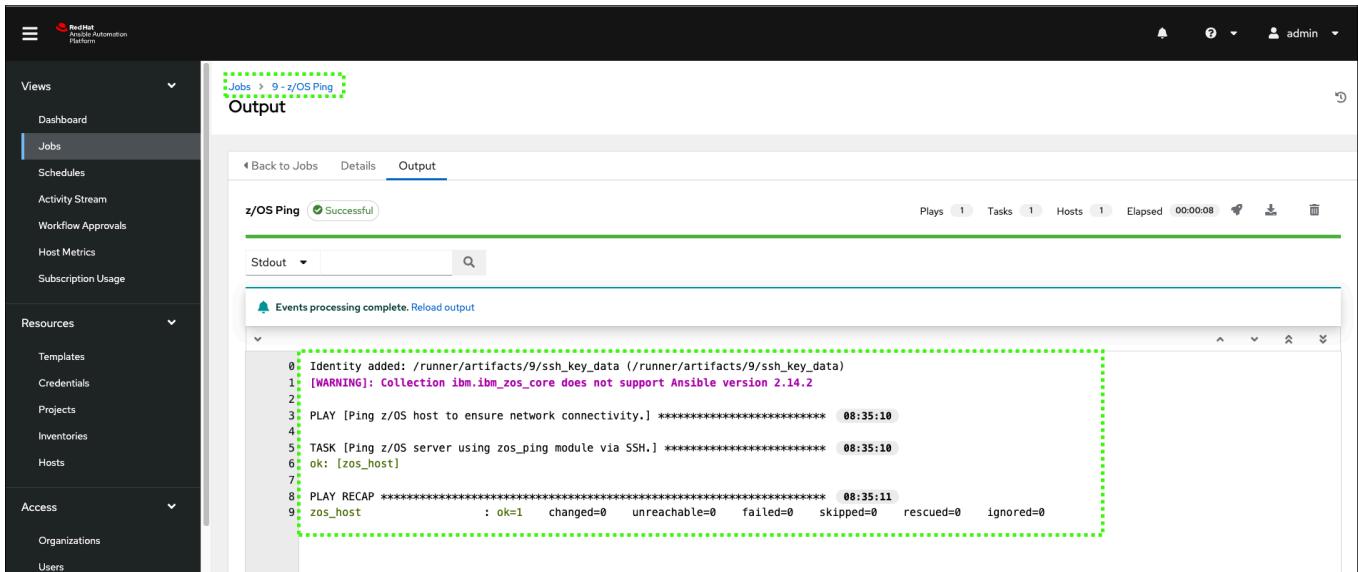
Note that because the AAP instance and the back-end z/OS system are preconfigured, no changes are needed to execute the templates and they will target your provisioned z/OS system by default.

7. Locate the **z/OS Ping** template and Click the rocket () icon to launch the template.



| | | | | | | |
|--------------------|---|--------------|---------|----------------------|--|--|
| Views | z/OS Data Set - Delete | Job Template | Default | | | |
| Dashboard | z/OS Data Set - Fetch | Job Template | Default | | | |
| Jobs | z/OS Gather Facts | Job Template | Default | 1/5/2024, 6:55:04 AM | | |
| Schedules | z/OS Job Submit | Job Template | Default | 1/5/2024, 6:55:18 AM | | |
| Activity Stream | z/OS Job Submit Any | Job Template | Default | | | |
| Workflow Approvals | z/OS Jobs - Submit, Query, Retrieve | Job Template | Default | | | |
| Host Metrics | z/OS Operator Command | Job Template | Default | | | |
| Subscription Usage | z/OS Ping | Job Template | Default | 1/7/2024, 8:33:06 AM | | |
| Resources | z/OS TSO Command(s) | Job Template | Default | | | |
| Templates | | | | | | |
| 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 details are displayed. The 'Output' tab is active, showing the terminal session. The log output is as follows:

```

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
-----
```

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

Importing skills from Ansible Automation Platform

Once you have a better understanding of AAP and the pre-loaded automations available, you can begin to import them as skills into your watsonx Orchestrate instance which will ultimately be used for assistant guided actions.

Import skills into your assistant

The next steps assume 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](#).

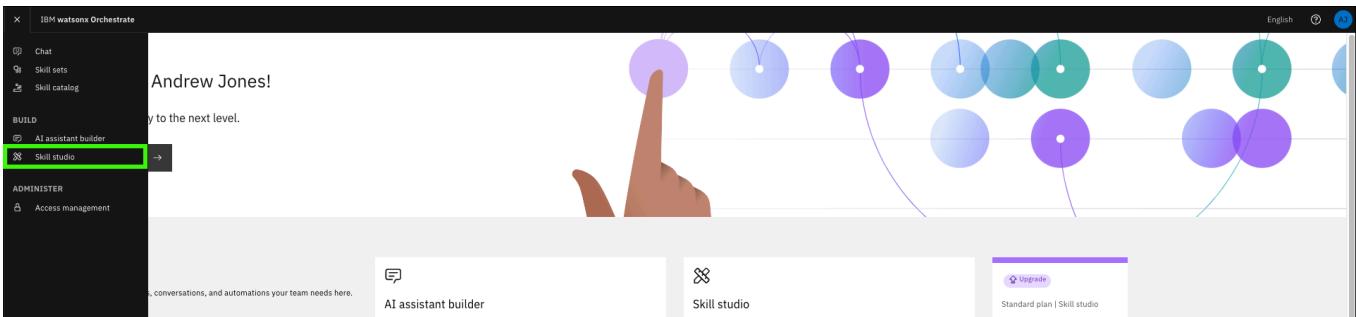
1. Click the **resources** icon (☰).

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.' Below it are several other cards: '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'. Each card includes a small icon, a title, a brief description, and a status indicator like 'Popular' or 'Recommended'.

2. Click **Launch watsonx Orchestrate**.

The screenshot shows the watsonx Orchestrate Resource list page. A green box highlights the 'Launch watsonx Orchestrate' button in the 'Start by launching the tool' section. To the right, there's a 'Plan' section titled 'Essentials Plan'. On the left, there's a sidebar with 'Manage' and 'Service credentials' options. The main area also contains sections for 'Getting started tutorial' and 'Credentials' (with download and show credential links) and a URL field containing a specific API endpoint.

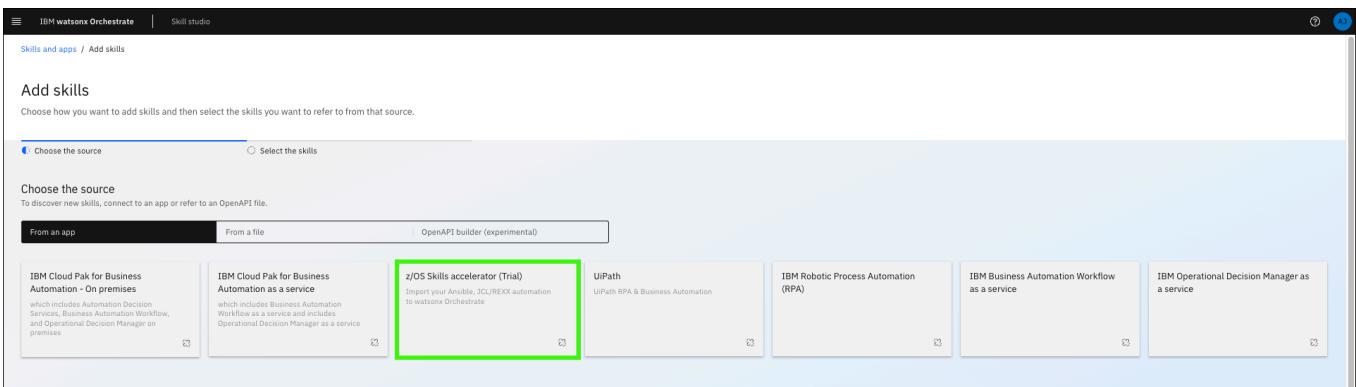
3. Click the main menu (☰) and then click **Skill studio**.



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](#) section earlier.

a: Connection Type: **ansible** **b:** Application Name: **c:** Connection URL: **d:** User Name: **e:** Password: **f:** Search Pattern: *

TBD

TBD

TBD

TBD

TBD

TBD

TBD

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.