

KNIME Business Hub Installation Guide - Existing OpenShift Cluster

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Introduction

KNIME Business Hub is a customer-managed KNIME Hub instance.

Once you have a license for it and proceed with installation you will have access to Hub resources and will be able to customize specific features, as well as give access to these resources to your employees, organize them into Teams and give them the ability to manage specific resources.

Once you have access to a KNIME Business Hub instance available at your company, you can use KNIME Business Hub to perform a number of tasks such as:

- collaborate with your colleagues,
- test execution of workflows,
- create and share data apps, schedules, and API services
- keep track of changes with versioning.

The following is a guide for installing KNIME Business Hub into an existing cluster.

To administrate a KNIME Business Hub instance please refer instead to the following guide:

- [KNIME Business Hub Administration Guide](#)

Installation planning

KNIME Business Hub supports the following types of installations:

- **Installation by downloading container images from public image registries:** This type of installation requires an environment with externally accessible networks. This is a standard installation process and is documented in the [KNIME Business Hub installation](#) section. Just follow the steps [here](#), after making sure you fulfill the prerequisites in the next section.
- **Airgapped installation:** This type of installation is required for installing into air gap environments, or into an environment that, even though has a network with external access, is not allowed to download container images from public image registries. If your environment does not have access to external networks you can follow the steps in the [airgapped installation](#) section.

Kubernetes

Since KNIME Business Hub is a product based on microservices that are orchestrated and managed via Kubernetes, a Kubernetes cluster is needed when installing KNIME Business Hub.

KNIME Business Hub 1.14 supports the following versions of Kubernetes:

- 1.25
- 1.26
- 1.27
- 1.28
- 1.29
- 1.30

Software prerequisites

- **kubectl**: required if installing into an existing cluster, or when remotely managing a cluster.
- **Helm**: only required if uninstalling KNIME Business Hub.
- **OpenShift**: have an OpenShift kubernetes cluster running.



KNIME Business Hub supports OpenShift versions based on Kubernetes releases that are **compatible with our product**. If your OpenShift version includes a more recent Kubernetes version than those currently supported, unexpected behavior or incompatibilities may occur. You can check the Kubernetes version included in your OpenShift version in the corresponding **OpenShift release notes**.

Hardware prerequisites

Here are some recurrent terms used in the next sections:

- **Hub core:** Refers to Hub core services that are responsible for all functionalities of Business Hub besides execution. Including authentication services, UI, database services, etc.
- **Hub execution:** Refers to executor resources, e.g. executor pod resources.
- **Disk:** The attached storage size requirement for the persistent components of Business Hub. Used to provide storage to databases, store data files for KNIME workflows, etc.



The CPU and Memory requirement amounts shown in the following chapters of this document refer to the “Total Capacity” of the nodes. Hence not all of these resources are allocatable for Kubernetes workloads, some needs to be available or reserved for system-related-services and should not be allocated, or reserved for Kubernetes related workloads. By default usually only some Memory is reserved from the total capacity, therefore if there are no reservation for CPU vCores, it is advised to either reserve or leave some vCores un-reserved by Kubernetes workloads. The reserved Memory for system-related-services is usually 100 MB by default for Kurl installations.



The “vCore” term used in this guide stands for virtual cores. They are a measure of the processing power allocated to a virtual machine (VM) or a computing instance in cloud computing environments. KNIME makes no representation about how the vCores licensed for execution are correlated or mapped onto the physical system where the software is running. The same principle also extends to the vCores necessary for operating core services.



The **CPU** must be **from 2011 or newer**, as older processors may lack required instruction sets such as SSE4.2 (needed by Keycloak) and AVX (needed by the event-dispatcher).

Recommended

- CPU: 26+ vCores total
 - Hub Core: 10 vCores
 - Hub Execution: 16 vCores
- Memory: 64 GB+

- Hub Core: 20 GB
- Hub Execution: 44 GB+ available memory to be allocated for executors
- Disk: 500GB+



If multiple nodes are used to meet the requirements, each node is required to have at least 32GB of memory.

Networking prerequisites

Network Ports:

- 80 (HTTP)
- 443 (HTTPS)
- 22 (SSH) ADMIN USE ONLY
- 6443 (kubectl) ADMIN USE ONLY
- 8800 (KOTS Admin Console) ADMIN USE ONLY

Security Warnings:

- Ports 22, 6443, and 8800 are vulnerable access points for a KNIME Hub installation. If a malicious actor gained access to any of those ports, they would be able to perform destructive actions on the cluster and/or gain access to sensitive configuration. Access to these ports must be restricted to only the IP address(es) of the machine(s) which will administer the installation.
- Security-Enhanced Linux (SELinux) is not currently supported. If enabled, the installer script will notify the user via a prompt and disable SELinux before proceeding.

The following domains need to be accessible from servers performing online installations:

Trusted Host	Domain
KNIME	*.knime.com
Replicated	See the Firewall Openings for Online Installations guide.

Also, in order to be able to pull Docker images the following Docker registries need to be accessible from servers performing online installations:

```
docker.elastic.co
docker.io
ghcr.io
quay.io
registry.k8s.io (for this domain image layers are pulled from the domain below)
*.pkg.dev
registry.opensource.zalan.do
proxy.replicated.com
cr.fluentbit.io
```




Some features in KNIME Business Hub, e.g. the **job viewer**, use websockets. If an external proxy or load balancer is used it needs to be websocket compatible.

OpenShift specific prerequisites



The installation on **existing** Kubernetes clusters is only available for Enterprise edition licenses.

- **Security Context Constraints:** Before installing Hub on OpenShift please ensure the **Security Context Constraints** are configured. Currently supported by KNIME Business Hub for OpenShift clusters most restrictive policy is `nonroot-v2`.
- **OpenShift CLI (oc):** With the OpenShift command-line interface (CLI), the `oc` command, you can create applications and manage OpenShift Container Platform projects from a terminal.
- **Ingress controller:** Before installing Hub on OpenShift please ensure the **Ingress controller** is ready.
- **DNS Entries and TLS Certificates:** Set up DNS Entries/TLS Certificates for your environment.

KNIME Business Hub will be accessed via a base URL, with a number of subdomains also configured for more targeted purposes. The following will use `hub.example.com` as an example base address to highlight how the base address and subdomains are to be configured.

DNS entries will need to be created for the following endpoints:

- `hub.example.com` - root URL also used for the Business Hub UI
- `apps.hub.example.com` - used for exposing workflow-defined Data Apps
- `api.hub.example.com` - exposed the Business Hub API
- `ws.hub.example.com` - used for websocket communication between Browser/AP and Business Hub
 - Currently used for exposing KNIME AI service available in Business Hub Standard or Enterprise 1.8.0 and higher
 - Requires the Loadbalancer in front of the ingress controller supports Layer-4/TCP/TLS (i.e. AWS Application Load Balancer or Network Load Balancer, etc.)
- `auth.hub.example.com` - used for exposing the embedded Keycloak user store
- `storage.hub.example.com` - used for exposing the embedded MinIO object store where workflows and data files are located.

Note that the above domain and subdomains can be either directly set to the relevant Loadbalancer for the ingress controller, or can alternatively be set by

adding the necessary annotations to the Ingress rules below if using an automated DNS provisioner like `External-DNS`.

Additionally, a TLS cert will need to be provisioned either directly or via adding relevant Certificate resources and settings to the Ingress rules below if using an automated Certificate provisioner like `Cert-Manager`.

If creating the cert explicitly, it is typically recommended to create a cert with the common name `hub.example.com`, and listing all domains above as subject alternative names, or using a wildcard for the subject alternative name (i.e. `*.hub.example.com`)

- **Service Mesh Operator:** Provide a Service Mesh Operator running on the OpenShift cluster.

KNIME Business Hub installation on an existing OpenShift cluster



If your environment does not have access to external networks you can follow the steps in the [airgapped installation](#) section.

Once you have prepared your cluster according to the prerequisites you can start the installation steps.

1. Business Hub runs in one namespace to which you can assign a custom name. To create an installation namespace you can use this command:

```
kubectl create namespace <business-hub-namespace>
```

2. Next, create SCC policies on the specified installation namespace.

```
oc adm policy add-scc-to-group nonroot-v2 system:serviceaccounts:<business-hub-namespace>
```

3. Install all Custom Resource Definitions (CRDs), see [this link](#) for the CRD specifications and installation instructions.

4. Setup **Istio**:

When using the Openshift Service Mesh then use the following commands. Note that this is the minimal configuration needed for KNIME Business Hub to work and can be modified as needed. If Hub is being installed into a shared cluster where Service Mesh is already being used then this config will need to be adapted to suit the cluster's setup (e.g. the proxy section of the ServiceMeshControlPlane resource may need to be converted into an Istio ProxyConfig custom resource.)

- You will need a namespace for Istio. E.g.

```
kubectl create namespace <istio-system-namespace>
```

- You will need to replace the <business-hub-namespace> and <istio-system-namespace> placeholders with the namespace KNIME Business Hub and Istio is installed in, for example using sed:

```
sed -i "s/<business-hub-namespace>/knime-business-hub/g" openshift-
servicemesh-config.yaml
sed -i "s/<istio-system-namespace>/knime-business-hub-istio/g" openshift-
servicemesh-config.yaml
```

- After modifying the resources, deploy them to the cluster:

```
kubectl apply -f openshift-servicemesh-config.yaml
```

5. Apply Ingress rules.

In **ingress.yaml** you will find Ingress resources needed for KNIME Business Hub that can be further configured to fit your desired ingress strategy.

- You will need to replace the <business-hub-namespace> and <istio-system-namespace> placeholders with the namespace KNIME Business Hub and Istio is installed in, for example using sed:

```
sed -i "s/<business-hub-namespace>/knime-business-hub/g" ingress.yaml
sed -i "s/<istio-system-namespace>/knime-business-hub-istio/g" ingress.yaml
```

- In each Ingress resource you will also need to replace the <baseurl> placeholder with the Webapp URL configured in the KOTS admin console, for example using sed:

```
sed -i "s/<baseurl>/hub.example.com/g" ingress.yaml
```

- If you are using an ingress controller other than the one recommended here, replace the ingressClassName of each Ingress resource, for example using sed:

```
sed -i "s/<ingressclass>/business-hub/g" ingress.yaml
```

- To use TLS, make sure the TLS certificate Secret exists and replace the certificate placeholder, for example using sed:

```
oc --namespace <business-hub-namespace> create secret tls knime-business-hub-
cert-bundle-secret --cert=hub-fullchain.pem --key=hub-privatekey.pem
oc --namespace <istio-system-namespace> create secret tls knime-business-hub-
cert-bundle-secret --cert=hub-fullchain.pem --key=hub-privatekey.pem
sed -i "s/<cert-secret-name>/knime-business-hub-cert-bundle-secret/g"
ingress.yaml
```

- After modifying the resources, deploy them to the cluster:

```
kubectl apply -f ingress.yaml
```

6. Install KOTS.

- Create minimum RBAC role for KOTS with `minimal-rbac.yaml`

```
kubectl -n <business-hub-namespace> apply -f minimal-rbac.yaml
```

- Install KOTS with `--ensure-rbac=false --skip-rbac-check` to ensure it does not attempt to create its own Role resource (instead, it will reference the minimum RBAC role above).

```
kubectl kots -n <business-hub-namespace> install knime-hub/enterprise  
--ensure-rbac=false --skip-rbac-check
```

- Once installation completes, a port-forward tunnel will be automatically opened to allow the browser to connect to the KOTS UI on <https://localhost:8800>.
 - When installing KOTS into an existing Kubernetes cluster, a tunnel will need to be opened anytime the KOTS UI needs to be accessed for security reasons.
 - The KOTS UI tunnel can be re-established by running:

```
kubectl kots admin-console -n <business-hub-namespace>
```

Alternatively, you can directly establish the port-forward tunnel to kots via:

```
kubectl -n <business-hub-namespace> port-forward service/kotsadm  
8800:3000
```

Next steps in the installation

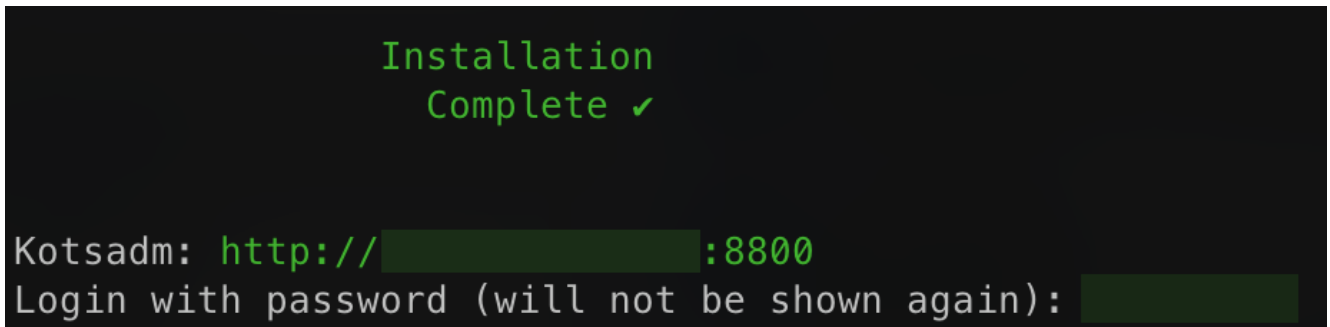
Once the supplemental steps above have been completed, you should be able to proceed with the remainder of the install.

The high-level remaining steps include:

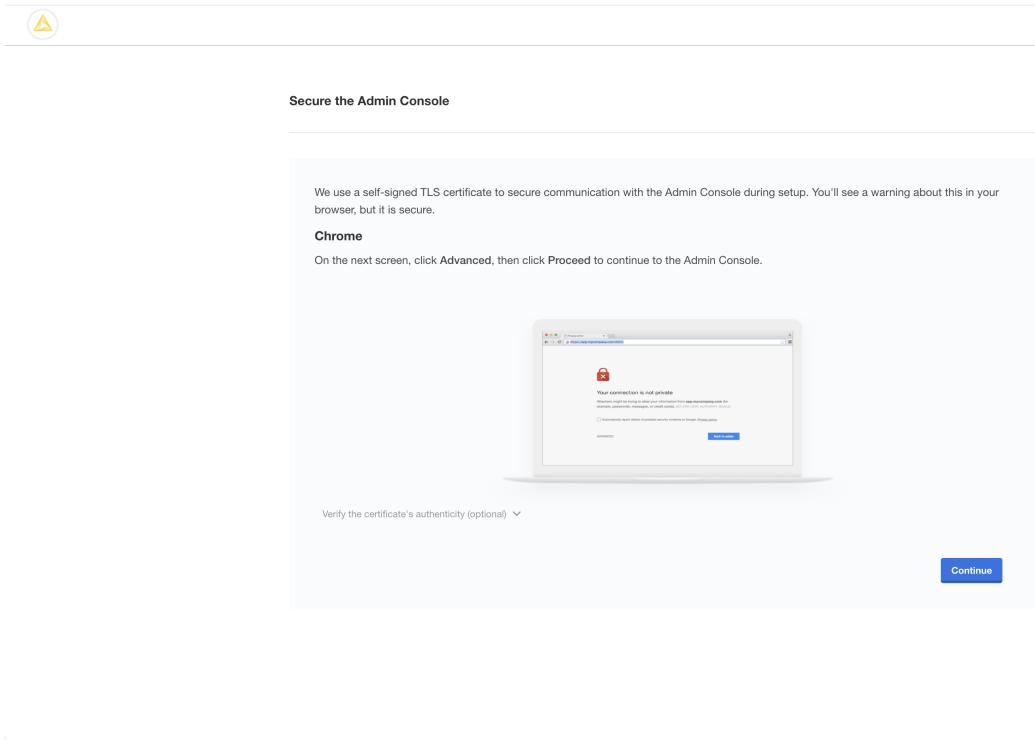
- **Logging into the KOTS Admin UI**
- **Uploading the Replicated license** which will fetch the latest release of Business Hub
- **Enter appropriate configuration parameters** in the KOTS Admin Console
- Save the changes, allow the **pre-flight** checks to run, then click **Deploy** and **Wait for the installation to complete**.

Access the KOTS Admin Console

Navigate to the KOTS Admin Console URL and take note of the password.



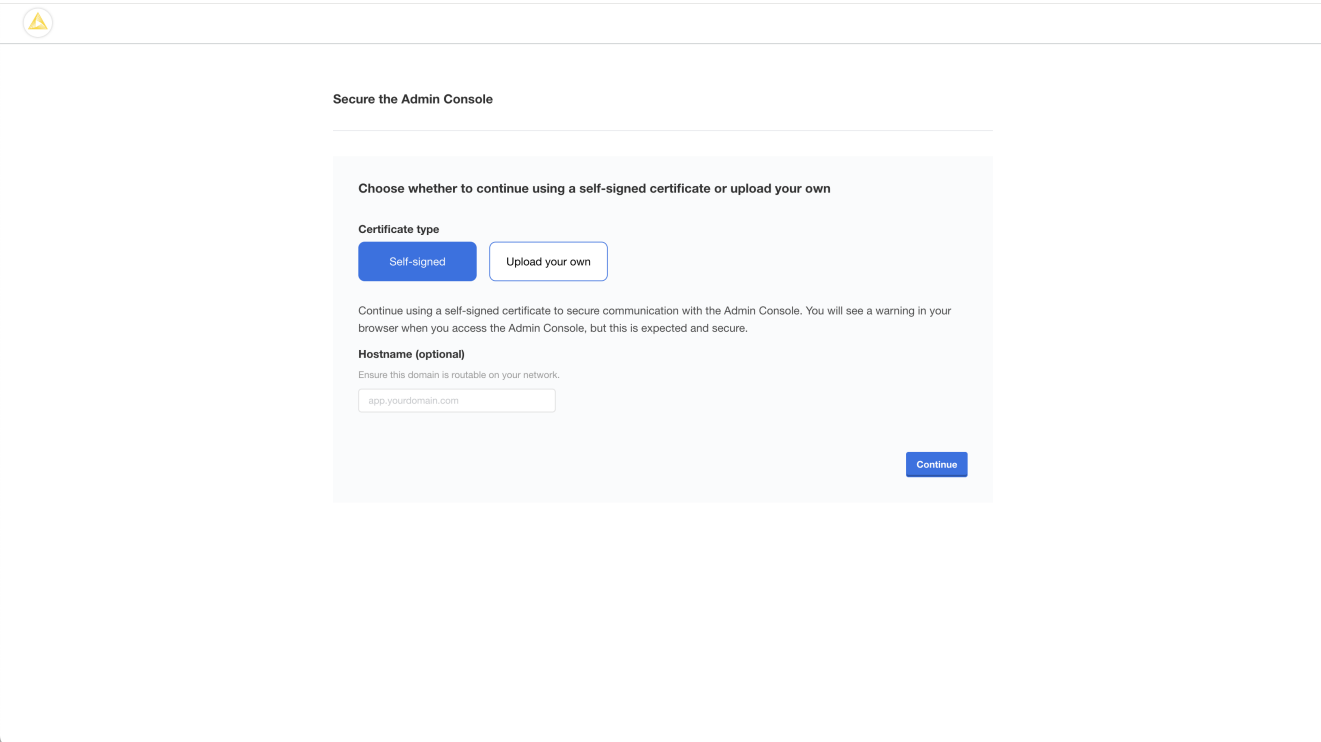
The first page that will display is a warning regarding Transport Layer Security (TLS) configuration. Follow the on-screen instructions to proceed.



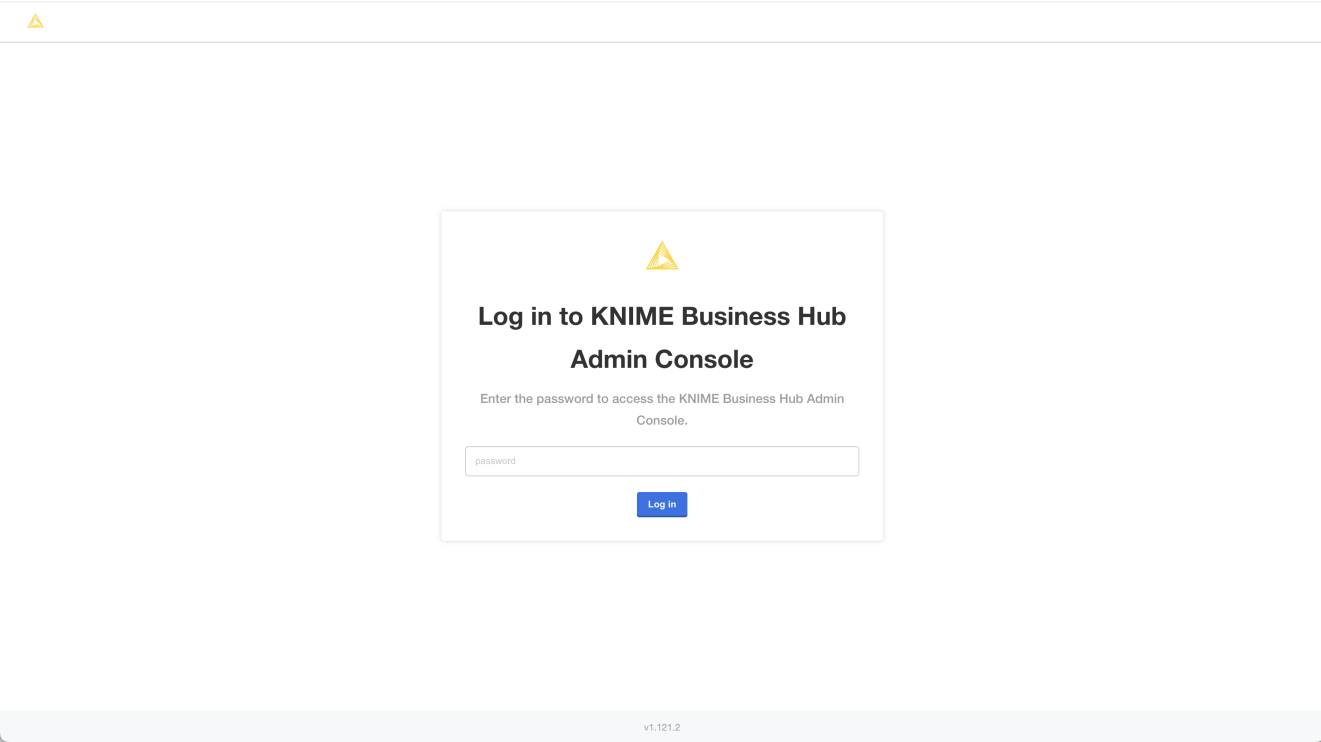
You will then be prompted to provide your own TLS cert to secure traffic to the admin console.



For everything to work correctly and securely, setting up TLS is strongly recommended.

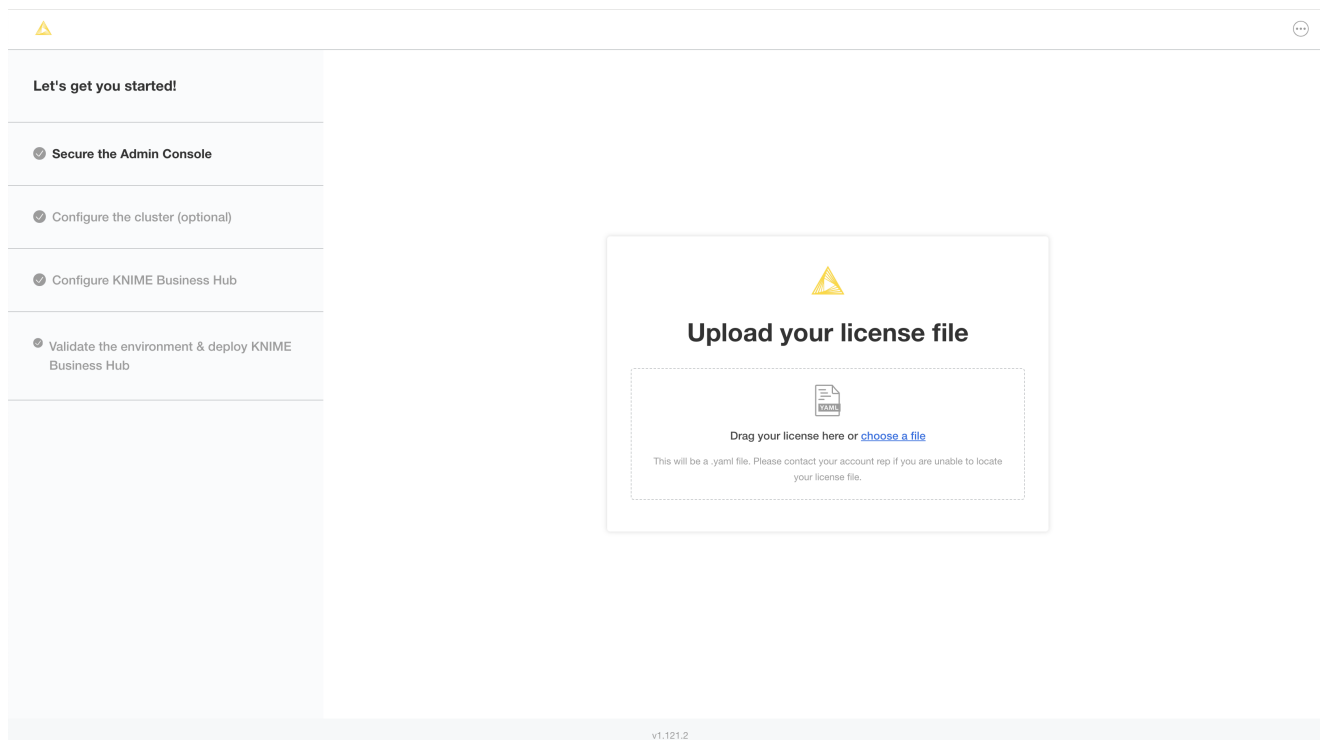


You should then see a prompt for a password. Enter the admin console password to proceed (this password can be changed later).



Provide a Replicated .yaml license file

After logging in, you should be prompted for a license file. This is the Replicated license file that your KNIME customer care representative has provided to you and has a .yaml extension. Please contact your customer care representative if you need assistance with your license.



You may be prompted to install KNIME Business Hub into an “airgapped environment” if airgap installations are enabled on your license. This feature is particularly useful for installing KNIME Hub onto a machine that has no outbound internet access. Follow the instructions in the [KNIME Business Hub airgapped installation](#) section.

In most cases, it is fine to click the **Download KNIME Hub from the Internet** button if this prompt appears.



Let's get you started!

✔ Secure the Admin Console

✔ Configure the cluster (optional)

✔ Configure KNIME Business Hub

● Validate the environment & deploy KNIME Business Hub



Install in airgapped environment

To install on an airgapped network, the images in KNIME Business Hub will be uploaded from the bundle you provide to the cluster.

Drag your airgap bundle here or [choose a bundle to upload](#)

This will be a .airgap file.

Optionally you can [download KNIME Business Hub from the Internet](#)

v1.121.2

Configure the installation

If all prior steps were successful, you should now be prompted to configure your KNIME Business Hub installation. A number of settings will display for you to customize. Please note that all configuration settings in this view can be changed post-installation, except for the settings under “Initialization of KNIME Business Hub”.

Global overview

Global

High-level settings for the KNIME Business Hub deployment.

KNIME Business Hub Deployment Name Required

The KNIME Business Hub deployment name is displayed in several places in the web UI. The value may contain spaces.

Default value: **KNIME Business Hub**

KNIME Business Hub Mountpoint ID Required

Name of the Mountpoint ID when adding this KNIME Business Hub deployment in the KNIME AP. The value may not contain spaces (it is recommended to use dashes `-` instead).

Default value: **knime-business-hub**

KNIME Business Hub License Required

Upload your KNIME Business Hub License `.xml` file. You have received this file from your account manager, in addition to the Replicated License `.yaml` file that you used during a previous step. Contact your KNIME account manager if you have not yet received a `.xml` file containing the KNIME Business Hub License.

Upload a file

 Browse files for KNIME Business Hub License

☐ View Advanced Settings

- KNIME Business Hub Deployment Name - This will be the name of your deployment for KNIME Business Hub
- KNIME Business Hub Mountpoint ID - This is where your KNIME Business Hub Mountpoint ID will be.
- KNIME Business Hub License - You should have received this from your account manager. This is a different file than the Replicated `.yaml` license file. The KNIME

Business Hub license file is a `.xml` file that contains information needed for your installation. Upload it here by clicking *Browse files for KNIME Business Hub License* and navigating to the file on your local machine.

- (OPTIONAL) select *View Advanced Settings*: - This will add additional fields underneath the *Notifications* section. This are explained in the *Advanced* options section.

Initialization of KNIME Business Hub

During the very first installation of KNIME Business Hub a number of one-time initializations are made, like creating an admin user, team, space, and execution context. Changing fields in this section after installation won't have any effect on the deployed application. The admin user can change these after the installation in the browser.

Initialization of KNIME Business Hub

This section contains configuration options that are applied during the initial installation of KNIME Business Hub. These options will be hidden after the installation has completed, and any future changes will require an administrator to manually edit the affected resource(s).

KNIME Business Hub Admin Username Required

The username for the admin user of KNIME Business Hub.

knimeadmin

Default value: **knimeadmin**

KNIME Business Hub Admin Password Required

The initial password for the admin user. This password can be changed in Keycloak post-installation.

Initial Team Name

The name for the initial KNIME Business Hub Team.

Initial Team

Initial Team Description

The description for the initial KNIME Business Hub Team.

Initial Team created by KNIME

Initial Space Name

The name of the initial KNIME Business Hub Space (public) which will be associated with the initial KNIME Business Hub Team.

Initial Space

Initial Execution Context Name

The name for the initial KNIME Business Hub Execution Context. This Execution Context is provisioned with minimal CPU/memory resources, and the resource allocation can be increased post-installation via the KNIME Business Hub REST API.

Initial Execution Context Docker Image Repository

The image repository for the initial Execution Context.

Default value: **registry.hub.knime.com/knime/knime-full**

Initial Execution Context Docker Image Tag

The image tag for the initial Execution Context.

Default value: **r-5.2.3-477**

- KNIME Business Hub Admin Username - Choose a username for the KNIME Business Hub
- KNIME Business Hub Admin Password - Choose a password for the KNIME Business Hub
- Initial Team name - Choose a name for the initial team that KNIME Business Hub will create
- Initial Team description - Give a brief description of the Initial Team name
- Initial Space Name - This will be a public facing space name associated with the Initial Team Name
- Initial Execution Context Name - The name for the initial KNIME Execution Context Name
- Initial Execution Context Docker Image Repository - This is where the docker image link will go
- Initial Execution Context Docker Image Tag - This is where the initial Execution Context will go

Initialization of KNIME Business Hub

This section contains configuration options that are applied during the initial installation of KNIME Business Hub. These options will be hidden after the installation has completed, and any future changes will require an administrator to manually edit the affected resource(s).

KNIME Business Hub Admin Username Required

The username for the admin user of KNIME Business Hub.

Default value: **knimeadmin**

KNIME Business Hub Admin Password Required

The initial password for the admin user. This password can be changed in Keycloak post-installation.

Initial Team Name

The name for the initial KNIME Business Hub Team.

Initial Team Description

The description for the initial KNIME Business Hub Team.

Initial Space Name

The name of the initial KNIME Business Hub Space (public) which will be associated with the initial KNIME Business Hub Team.

Initial Execution Context Name

The name for the initial KNIME Business Hub Execution Context. This Execution Context is provisioned with minimal CPU/memory resources, and the resource allocation can be increased post-installation via the KNIME Business Hub REST API.

Initial Execution Context Docker Image Repository

The image repository for the initial Execution Context.

Default value: **registry.hub.knime.com/knime/knime-full**

Initial Execution Context Docker Image Tag

The image tag for the initial Execution Context.

Default value: **4.7.0**

The execution context has minimal resources (1CPU, 2GB memory) and a default executor provided by KNIME, to enable basic execution. For any production use of execution you should configure the execution context and assign more resources or use a different executor docker image.

Configure KNIME Business Hub URLs



The Hub URLs need to be configured according to the certificate.

URLs for KNIME Business Hub need to have the structure of:

- **Base URL**

- `<base-url>` (e.g. `hub.example.com`).
- The URL scheme (`http://` or `https://`) should not be included in the Base URL.
- The `<base-url>` must include the top-level domain (e.g. `.com`), and cannot be an IP address.
- This is the URL you use to view the KNIME Business Hub in your browser.
- Valid examples:
 - `hub.example.com`
 - `example.com`
- Invalid examples:
 - `https://hub.example.com/`
 - `example.com/hub`
 - `myhub`
 - `12.34.56.78`

- **Subdomains**

- `apps.<base-url>`
- `api.<base-url>`
- `ws.<base-url>`
- `auth.<base-url>`
- `storage.<base-url>`
- `registry.<base-url>`

The Base URL is the only URL that can be customized. The rest of the URLs are generated automatically.

- Webapp URL - The URL to the KNIME Business Hub webapp
- DataApps URL - The URL for the KNIME Business Hub DataApps
- API URL - The URL to the KNIME Business Hub API
- Websocket URL - The URL to the KNIME Business Hub Websocket
- Authentication URL - The URL to the KNIME Business Hub authentication endpoint
- Storage URL - The URL to the KNIME Business Hub persistent storage endpoint
- Registry URL - The URL to the KNIME Business Hub Embedded registry endpoint

Notice that the values in `/etc/hosts` below are for `hub.example.com`. The values must match the config in the URLs section of the **Config** tab in the KOTS Admin Console, as demonstrated above. You can always use `hub.example.com` as the Base URL for local test installations.

```
<public ip> hub.example.com
<public ip> api.hub.example.com
<public ip> auth.hub.example.com
<public ip> storage.hub.example.com
<public ip> apps.hub.example.com
<public ip> registry.hub.example.com
<public ip> ws.hub.example.com
```

On Windows machines you can find the `/etc/hosts` file in `<windows dir>\system32\drivers\etc\hosts`.

Branding

☒ Enable Branding Options

Custom Logo SVG File

The image will be scaled to fit 183px wide and 48px high logo area. Images with significantly more height than width may appear small when displayed.

Upload a file

 Browse files for Custom Logo SVG File

If you would like to have branding options enabled check the *Enable Branding Options* box.

You will now be able to upload your own logo. Click *Browse files for Custom Logo SVG File* and navigate to select the file from your local machine.

If customizing the logo, the file being uploaded must be an .svg file in XML format such as the one below.

example.svg

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<!DOCTYPE svg PUBLIC "-//W3C//DTD SVG 1.1//EN"
"http://www.w3.org/Graphics/SVG/1.1/DTD/svg11.dtd">
<svg width="100%" height="100%" viewBox="0 0 183 48" version="1.1"
xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink"
xml:space="preserve"
xmlns:serif="http://www.serif.com/" style="fill-rule:evenodd;clip-rule:evenodd;stroke-
linejoin:round;stroke-miterlimit:2;">
  <g transform="matrix(0.673983,0,0,0.673983,-2.4399,8.02946)">
    <text x="6.739px" y="43.245px" style="font-family:'Arial-BoldMT', 'Arial', sans-
serif;font-weight:700;font-size:54.619px;">EXAMPLE</text>
  </g>
</svg>
```

Execution Image Builder

Execution Image Builder

Configuration for the Execution Image Builder for building custom execution docker images and pushing them to the embedded registry or an external registry.

☐ **Enable Execution Image Builder**

Enable the use of Execution Image Builder. Note that the container for building an image has elevated privileges.

Here you can configure the Execution Image Builder to build custom execution Docker images and push them to the embedded registry or to an external registry.

If you check the *Enable Execution Image Builder* box, two additional fields will appear.

Execution Image Builder

Configuration for the Execution Image Builder for building custom execution docker images and pushing them to the embedded registry or an external registry.

- ☒ **Enable Execution Image Builder**
Enable the use of Execution Image Builder. Note that the container for building an image has elevated privileges.
- ☒ **Enable Execution Image Builder Cache**
Enable the use of the Execution Image Builder cache. Note that enabling the cache leads to more occupied disk space in the destination repository.
- ☐ **Skip TLS for Execution Image Builder**
Skips the TLS verification for pulling and pushing images.

By default *Enable Execution Image Builder Cache* will be selected. The option *Skip TLS for Execution Image Builder* skips the TLS verification for pulling and pushing images to the registry.

Execution Contexts

Execution Contexts

KNIME Business Hub uses Execution Contexts for hosting and executing KNIME workflows.

- ☐ **Enable Custom Execution Image Pull Secret**
Enable the use of custom execution images that require Docker authentication to pull.

Executor Startup Timeout

The timeout in seconds after which the startup of an executor fails, is aborted and is tried again. Only needs to be changed if an executor image is used that takes a long time to start and never finishes startup within the configured time. Minimum value is 30.

Default value: 60

By default *Enable Custom Execution Image Pull Secret* is unchecked. By checking it you will get another option that will appear:

Execution Image Pull Secret Name

The name of the Kubernetes Secret resource which contains the Docker image pull secret for custom execution image(s). The secret should exist in the namespace defined in the **Execution Context Namespace** config option.

Default value: **regcred**

- **Execution Image Pull Secret Name** - The name of the Kubernetes Secret resource which contains the Docker image pull secret for custom execution image(s).
- **Executor Startup Timeout** - The timeout in seconds after which the startup of an executor fails, is aborted and is tried again

Job Instrumentation Data

Job Instrumentation Data

KNIME Business Hub can collect instrumentation data on workflow executions.

☒ **Do you want to collect job instrumentation data?**

Job Info Expiration

How long instrumentation data about a job is stored, in days.

Default value: **30**

- Select the box *Do you want to collect job instrumentation data?* to allow the KNIME Business Hub instance to collect data about workflows execution.
- **Job Info Expiration** - This number reflects how long the instrumentation data about a job is stored in days

Configure networking

In the section *Networking* of the Admin Console you can deploy an external load balancer and enable and configure the Transport Layer Security (TLS).



It is highly recommended to check the option to *Enable TLS*. It is anyways possible to configure this section in a second step.

To have more information on how to configure the networking section read the [KNIME Business Hub Admin Guide](#).

Networking

Configuration for networking options such as Transport Layer Security (TLS).

☐ **Enable TLS** Recommended

Enable Transport Layer Security (TLS). This option is highly recommended for any KNIME Business Hub deployed in a production environment. A certificate must be created for all URLs configured above, including a wildcard certificate for `hub.example.com` and `*.hub.example.com`.

Advanced networking settings: Ingress and Istio



These settings are only visible if you checked the *View Advanced Settings* box under the *Global* tab.

Networking

Configuration for networking options such as Transport Layer Security (TLS).

Ingress Controller Configuration

Select how `Ingress` is managed for KNIME Business Hub. Use 'Managed' if an Ingress controller should be deployed and managed by KNIME Business Hub (deploys `Ingress-NGINX controller` as a reverse proxy and load balancer for traffic entering the cluster.). Use 'Provided' if you want to deploy and manage your own Ingress controller (all `Ingress` resources will need to be manually created). See the [knime-business-hub-public](#) Bitbucket repository for more information and examples.

- ☐ Managed by KNIME Business Hub ☒ Provided by the cluster

☒ Enable TLS Recommended

Enable Transport Layer Security (TLS). This option is highly recommended for any KNIME Business Hub deployed in a production environment. A certificate must be created for all URLs configured above, including a wildcard certificate for `hubdev-os.cloudops.knime.com` and `*.hubdev-os.cloudops.knime.com`.

☒ Show Advanced Ingress Configuration

Customize the ingress proxy behavior such as read/send/connect timeouts. Changes to these settings require a restart of the `ingress-nginx-controller` pod before taking effect.

☒ Show Advanced Istio Configuration

Customize the `Istio service mesh`.

☐ Enable Custom Certificate Authority (CA) Certificate

Enable the addition of a custom CA certificate. Some organizations may use their own CA, and adding it here will allow certain KNIME Business Hub services to communicate with external resources that require a custom CA.

☐ Istio Outbound Traffic Redirect

Enable the Istio Outbound Traffic Redirect. This re-routes any external calls to KNIME Business Hub endpoints such as `auth.hub.example.com` and `api.hub.example.com` back to the ingress controller. Only disable this option if you have external DNS in place which points at an external load balancer or the host VM.

Networking: Ingress

Advanced configuration for the ingress controller.

Ingress Service URL

The URL of the `Service` resource that is responsible for exposing the ingress controller deployment within the cluster.

`ingress-nginx-controller.knime-hub-openshift.svc.cluster.local`

Default value: `ingress-nginx-controller.knime-hub-openshift.svc.cluster.local`

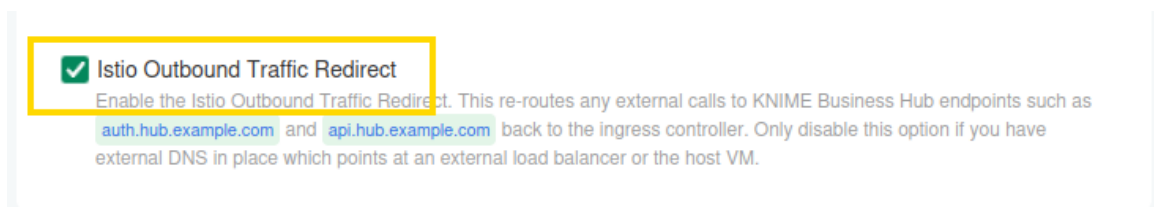
Networking: Istio

Advanced configuration for the `Istio service mesh`.

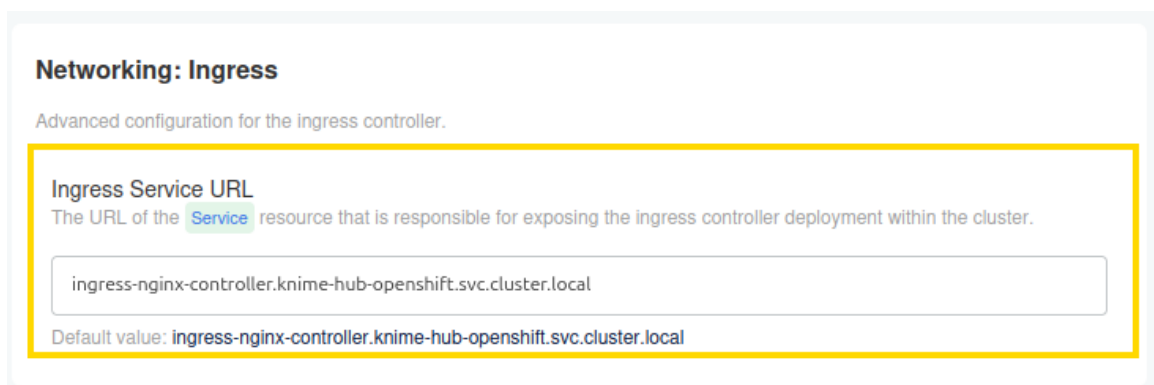
☐ Enable Istio Recommended

The `Istio service mesh` manages network traffic for KNIME Business Hub deployments. Its functionality depends on the ingress controller. Please note: it is highly recommended to leave this option enabled.

- First step is to set the *Ingress Controller Configuration* to the *Provided by the cluster* option.
- Then, **enable** the *Show Advanced Istio Configuration* and **disable** the *Enable Istio* option in the *Networking: Istio* section.
- Finally, if no public external DNS is provided for the Hub URLs:
 - *Istio Outbound Traffic Redirect* needs to be enabled.



- The correct *Ingress Service URL* needs to be specified under *Networking: Ingress*. This URL should point to the fully-qualified domain name of the cluster-internal URL of the Ingress service which should be used by KNIME Business Hub.



Notifications

In this section you can configure the notification service, which notifies for various events.

- ☒ **Enable Notifications** Recommended
Connect KNIME Business Hub to your mail server.
- ☒ **Enable HTML in Email Notifications** Recommended
Enable to allow HTML in email notifications, or disable for plain text.

Mail Server Configuration

Enter configuration properties for the Jakarta Mail library used by the Notification Service below. Consult the KNIME Business Hub Installation Guide, or see the Jakarta Mail API documentation for all possible parameters:
<https://jakarta.ee/specifications/mail/1.6/apidocs/index.html>

```
mail.from=hub.email@example.com (KNIME Business Hub)
mail.smtp.host=<host>
mail.smtp.port=25
```

By enabling the *Enable Notifications* box you get a new option that is checked by default.

- Enable HTML in Email Notifications - allows HTML in email notifications, or disable this option for plain text
- Mail Server Configuration - Enter configuration properties for the Jakarta Mail library



You can consult the Jakarta Mail API documentation for all possible parameters in the [Jakarta Mail API documentation](#).

The default code value is as follows:

Name	Value
Description	mail.from
hub.email@example.com	Address from which all mails are sent, required
mail.smtp.host	<host>
SMTP server host address	mail.smtp.port
25	SMTP port, default 25
mail.smtp.auth	true
Set to true if the mail server requires authentication	mail.smtp.user
<user>	Username for SMTP authentication; optional

Name	Value
mail.password	<password>
Password for authentication; optional	mail.smtp.starttls.enable
false	If true, enables the use of the STARTTLS command (if supported by the server) to switch the connection to a TLS-protected connection before issuing any login commands.
mail.smtp.ssl.enable	false

Kubernetes Cluster Management

Advanced: Kubernetes Cluster Management

This section contains settings for how resources (e.g. Deployments) are scheduled in the Kubernetes cluster.

☐ Mandatory Node Affinity

KNIME Hub has support for scheduling core and execution resources to specific nodes using the `hub.knime.com/role=core` and/or `hub.knime.com/role=execution` node labels. By default, pods will be scheduled to nodes with the appropriate label using a best attempt strategy. If this setting is enabled, pods will fail to be scheduled unless there is a node with the appropriate label.

Execution Context Update Strategy

The `Recreate` strategy involves terminating and recreating execution contexts when they are updated. This may cause downtime but reduces the possibility of resource allocation conflicts during provisioning. On the other hand, the `Rolling Update` strategy brings a new execution context with updated configuration online before terminating the previous version, minimizing downtime. This strategy is often used to prevent misconfigured execution contexts from causing downtime for end users. Although `Rolling Update` is effective for minimizing downtime, `Recreate` is a better strategy for minimizing resource utilization. For more information on deployment strategies, please refer to the [Kubernetes documentation](#).

☐ Rolling Update ☒ Recreate

- **Mandatory Node Affinity** - by default this box is unchecked. KNIME Hub has support for scheduling core and execution resources to specific nodes using `hub.knime.com/role=core` and/or `hub.knime.com/role=execution` node labels.
- **Execution Context Update Strategy** - The *Recreate* strategy involves terminating and recreating execution contexts when they are updated. The *Rolling Update* strategy brings a new execution context with updated configuration online before terminating the previous version, minimizing downtime

Two additional configurations, important for OpenShift clusters, need to be disabled:

- *Automatic Deployment and Updates for Custom Resource Definitions (CRDs)* - this option is checked by default and needs to be **unchecked**. This means that the cluster role will not be created and any new and/or updated CRDs are applied manually, as specified in step 3 of the [KNIME Business Hub installation](#) section of this guide.

☐ **Enable Automatic Deployment and Updates for Custom Resource Definitions (CRDs)** Recommended
 Enable the `crd-updater` job (and corresponding cluster role) which applies the appropriate version of each required CRD to the cluster during initial installation and subsequent upgrades/deployments. If this job is disabled, the cluster role will not be created but any new and/or updated CRDs will have to be applied manually by the customer. See [Kubernetes docs](#) for more information on custom resource definitions.

- *Cluster Role Provisioning* - this option is checked by default and needs to be **unchecked**.

☐ **Enable Cluster Role Provisioning**
 The KNIME Business Hub requires `ClusterRoles` and `ClusterRoleBindings` to operate. By default, the KNIME Business Hub installer provisions these resource. If the installer does not have permissions to create the resources, disable this option and create the resources manually before the KNIME Business Hub installation.

Nodes and Extensions



This setting is only visible if you checked the *View Advanced Settings* box under the *Global* tab.

Advanced: Nodes and Extensions

Configuration for the initial import of nodes and extensions to KNIME Business Hub.

- ☒ **Enable Importing Nodes and Extensions** Recommended
 Enable an initial import of nodes and extensions to the KNIME Business Hub instance upon first installation.
- ☐ **Import from Trusted Update Sites Only**
 Filter the initial import of nodes and extensions to trusted Update Sites only.

- *Enable Importing Nodes and Extensions* - this option is checked by default. It will enable an initial import of nodes and extensions to the KNIME Business Hub instance upon first installation
- *Import from Trusted Update Sites Only* - this option is unchecked by default. It allows you to filter the initial import of nodes and extensions to trusted Update Sites only

Preflight checks

The final step before installing is the preflight checks, which is a set of automated tests to help identify if KNIME Business Hub is ready for installation. It will check the Kubernetes distribution, Kubernetes version, resources available to the cluster, and other mission-critical settings.

It is highly recommended to never skip the pre-flight checks during installation or upgrades.

Preflight checks

Preflight checks validate that your cluster meets the minimum requirements. Required checks must pass in order to deploy the application. Optional checks are recommended to ensure that the application will work as intended.

Results

Re-run

✓

Required Kubernetes Version

Your cluster meets the recommended and required versions of Kubernetes.

✓

KOTS Admin Console Version

Your cluster meets the required version of KOTS.

✓

Container Runtime

Containerd runtime was found.

✓

Check Kubernetes environment.

KURL is a supported distribution.

✓

Total CPU Cores in the cluster is 16 or greater.

There are at least 16 cores in the cluster.

✓

PostgreSQL configuration

PostgreSQL configuration has no syntax errors.

✓

KNIME Business Hub URL validation

URL passes validation for alphanumeric and special characters.

✓

KNIME Business Hub URL validation: IP address

URL is not an IP address.

Deploy

i

If kots does not have permissions to access cluster information, the automatic preflight checks fail and you will be prompted to either run the checks manually or re-run with limited preflights. If you have ensured that the cluster has sufficient hardware resources available to run Hub, it is not necessary to run the preflights manually.

Preflight checks

Preflight checks validate that your cluster meets the minimum requirements. Required checks must pass in order to deploy the application. Optional checks are recommended to ensure that the application will work as intended.



Unable to automatically run preflight checks

The Kubernetes RBAC policy that the Admin Console is running with does not have access to complete the Preflight Checks. It's recommended that you run these manually before proceeding.

There were errors running preflight checks in Admin Console. Preflight checks can be ran manually as an alternative. It's recommended that you run these before proceeding.

[Show details](#)

Run Preflight Checks Manually

Run the commands below from your workstation to complete the Preflight Checks.

```
curl https://krew.sh/preflight | bash
kubectl preflight secret/wombat/kotsadm-knime-hub-preflight
```

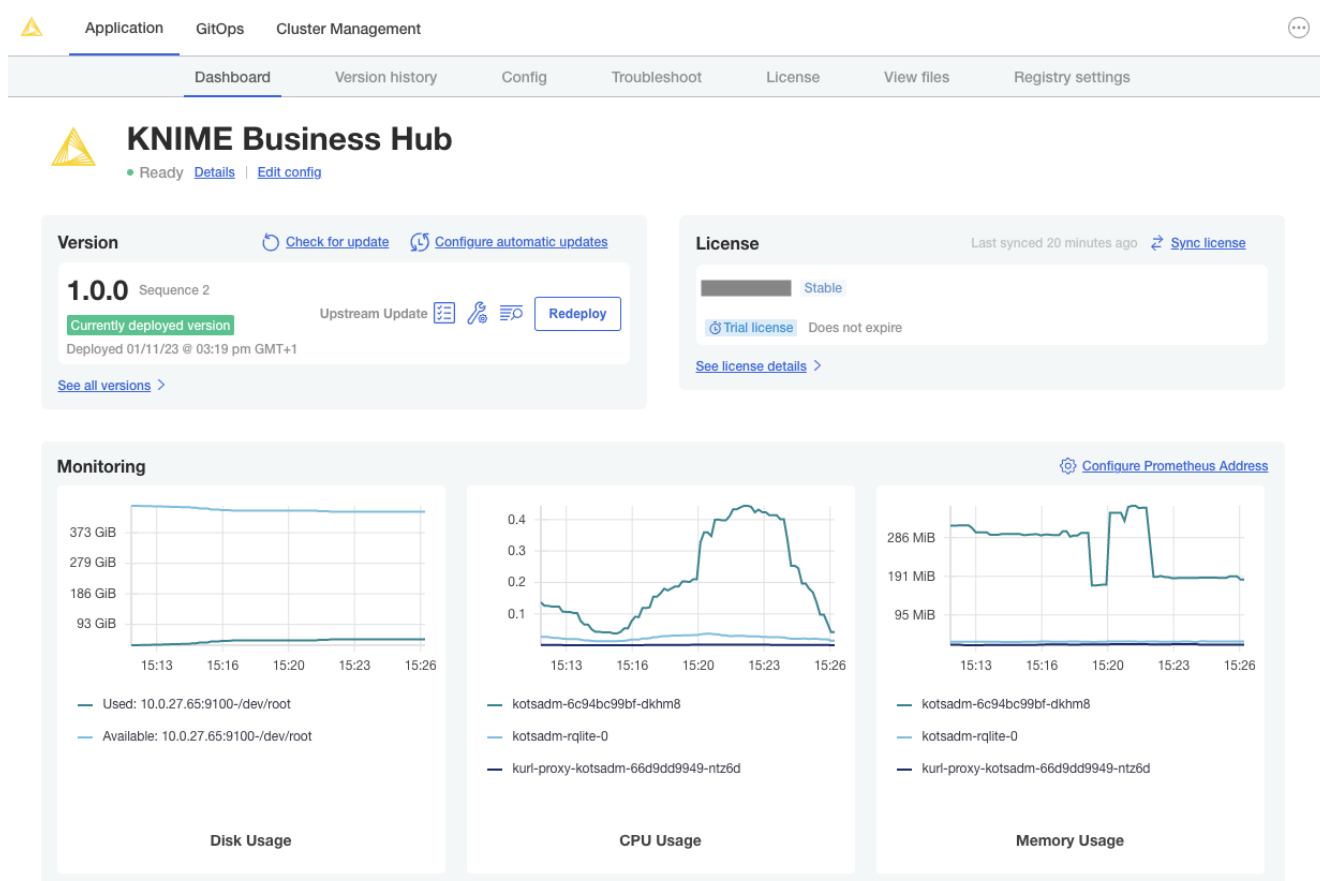
[Copy command](#)

[Re-run with limited Preflights](#)

Wait for the installation to complete

If the preflight checks all passed and you opted to continue, the only thing left to do is wait for a few minutes until KNIME Hub finishes installing! You should see the installation turn the **Ready** status (top left) to green after 15-20 minutes.

If you cannot access the KNIME Business Hub Webapp URL after the **Ready** status has turned green, the first troubleshooting step would be to check the **Config** tab in the KOTS Admin Console and ensure the URLs are configured properly.



Navigating to the Webapp URL should display the KNIME Business Hub landing page.

Welcome to the

KNIME Hub

Solutions for data science: find workflows, nodes and components, and collaborate in spaces.

 Search workflows, nodes and more...

0

Workflows

4 191

Nodes

0

Components

220

Extensions

Advanced settings

The following section explains you how to set up advanced settings for your KNIME Business Hub instance. These settings are only visible if you checked the *View Advanced Settings* box under the *Global* tab.

You can skip to the [Initialization of KNIME Business Hub](#) section if you do not need any of the following settings.

Browser Security

Advanced: Browser Security

This section contains settings for browser security.

☒ Enable Content Security Policy for Data Apps

Enabling this option allows you to set a custom Content Security Policy for Data Apps below. If disabled, no Content Security Policy header is set.

Content Security Policy for Data Apps

Specifies a custom Content Security Policy for Data App execution. It may be necessary to override the default if you are using BIRT report generators or custom JavaScript views that load external resources. The default works for all standard KNIME views. For more information about how to write the CSP statement, please refer to this [resource](#).

```
default-src 'self'; script-src 'unsafe-inline' 'unsafe-eval' 'self'; style-src 'unsafe-inline' 'self'; img-src 'self' data:; font-src 'self'
```

Default value: `default-src 'self'; script-src 'unsafe-inline' 'unsafe-eval' 'self'; style-src 'unsafe-inline' 'self'; img-src 'self' data:; font-src 'self' data;;`

X-Frame-Options Header

Sets the [X-Frame-Options](#) header to the selected option, or doesn't set the header if [none](#) is selected. This header is used to avoid click-jacking attacks, by ensuring that the sites content is not embedded into other sites. See [here](#) for more information.

☒ SAMEORIGIN ☐ DENY ☐ none

Whitelist URLs for Execution REST API

Sets additional URLs as allowed origins for the CORS policy and the CSRF filter. This option is used to allow browser based apps to call execution REST endpoints, e.g. for Service Deployments. Multiple URLs must be either newline or space separated, e.g. `http://localhost:9000 https://example.webapp.com`.

- Enable Context Security Policy for Data Apps - this box is checked by default and gives you access to the following options:

Content Security Policy for Data Apps

Specifies a custom Content Security Policy for Data App execution. It may be necessary to override the default if you are using BIRT report generators or custom JavaScript views that load external resources. The default works for all standard KNIME views. For more information about how to write the CSP statement, please refer to this [resource](#).

```
default-src 'self'; script-src 'unsafe-inline' 'unsafe-eval' 'self'; style-src 'unsafe-inline' 'self'; img-src 'self' data:; font-src 'self'
```

Default value: default-src 'self'; script-src 'unsafe-inline' 'unsafe-eval' 'self'; style-src 'unsafe-inline' 'self'; img-src 'self' data:; font-src 'self' data:;

- Content Security Policy for Data Apps - this specifies a custom Content Security Policy for Data App execution.



For more information on how to write your own CSP statement please refer to this link: [X-Frame-Options](#)

X-Frame-Options Header

Sets the [X-Frame-Options](#) header to the selected option, or doesn't set the header if [none](#) is selected. This header is used to avoid click-jacking attacks, by ensuring that the sites content is not embedded into other sites. See [here](#) for more information.

☒ SAMEORIGIN ☐ DENY ☐ none

- X-Frame-Options Header - Sets the X-Frame-Options header to the selected option, or doesn't set the header if none is selected



To be able to embedd data apps in an iframe, the *X-Frame-Options* must be set to none. Further, make sure that no other part in the infrastructure sets a CSP frame-ancestors rule or make sure it includes the embedding website. Setting frame-ancestors basically overwrites X-Frame-Options.

Whitelist URLs for Execution REST API

Sets additional URLs as allowed origins for the CORS policy and the CSRF filter. This option is used to allow browser based apps to call execution REST endpoints, e.g. for Service Deployments. Multiple URLs must be either newline or space separated, e.g. [http://localhost:9000](#) [https://example.webapp.com](#).

- Whitelist URLs for Executions REST API - Sets additional URLs as allowed origins for the CORS policy and the CSRF filter

PostgreSQL Database

Advanced: PostgreSQL Database

KNIME Business Hub uses [PostgreSQL](#) to store metadata about users, workflows, jobs, and more. You can fine tune PostgreSQL performance below. Changing settings here may trigger a restart of the PostgreSQL instance.

Max Connections

Number of [maximum concurrent connections](#) that PostgreSQL allows.

Default value: **200**

CPU Resources

In millicores, 1000m = 1 CPU core. See [kubernetes documentation](#).

Default value: **1000**

Memory Resources

In megabytes. See [kubernetes documentation](#).

Default value: **1024**

☐ **Enable CDDS database**

Enable the database that can be used by the KNIME Continuous Deployment for Data Science (CDDS) extension. The activation of this option is necessary only if you intend to use the CDDS extension in conjunction with the Hub's internal database. See [installation guide of CDDS](#).

- **Max Connections** - this number represents the number on maximum concurrent connections that PostgreSQL will allow
- **CPU Resources** - this number shows the CPU Resources in millicores (1000m = 1 CPU core).
- **Memory Resources** - this number shows the Memory Resources in megabytes
- **Enable CDDS database** - this value is unchecked by default. This option allows you to enable the database that can be used by the KNIME Continuous Development for Data Science (CDDS) extension

KNIME Business Hub airgapped installation

Airgapped install

The term airgapped is used to indicate a computer network environment that has no external network access. This type of networking environment is useful for securing sensitive data, applications, and computing resources.

An airgapped environment may be completely isolated or have a firewall between it and other networks with wider access. That wider access may be to the external world or within the wider organization.

Installing modern software in an airgapped environment can be challenging. Containerization and public registries for container images work on the assumption that all software installs have access to the public internet. To get around this challenge, software installs have to package all the required artifacts and images into a bundle that can be copied to portable media for transport into the airgapped environment.

The KNIME Business Hub supports installation into environments with externally accessible networks and into airgapped environments. Of course airgapped environments require an airgapped install approach. But even networks with external access may require airgapped installations. For instance, many organizations do not allow downloading container images from public image registries. In this instance, an airgapped install will be required.

Getting started

To get started with an airgapped install you will need the link to the Download Portal of Replicated and a password that you will receive from your KNIME customer care representative.

Enter the Download Portal from a machine that has access to the internet and has also access to the installation machine.

Here, you need to select the type of installation that you need to perform.

Select "Bring my own cluster" option for existing cluster installation of the KNIME Business Hub.



The installation process is different depending on if you have an existing cluster or an embedded cluster on a VM.

☒ **Bring my own cluster**
Existing cluster installation

☐ **Embedded cluster**
Embedded cluster on a VM

1. License

gbanyai-dev Stable

<> Dev license Does not expire

Airgap enabled

Snapshots enabled

GitOps enabled

[Download license](#)

Select application version

Selecting the application version ensures that compatible versions of the KOTS CLI and the KOTS airgap bundle are also selected.

One or more of the application versions available are required. If you are attempting to upgrade past a required version, ensure that you upload the airgap bundle for the required version before uploading a later version.

1.10.1

Sequence 14456

▼

2. KOTS CLI

To be installed on your workstation as a `kubectl` plugin. Provides commands for installation, updates, and more.

v1.109.10

Jun 6, 2024 @ 3:49pm

[Download CLI plugin](#)

3. KOTS Admin Console Bundle

This includes the admin console images, manifests, and dependencies. This can be downloaded to your local workstation and then automatically pushed to your private registry with the KOTS tooling.

v1.109.10

Jun 6, 2024 @ 3:49pm

[Download admin bundle](#)

[Show other bundles](#) ▼

4. KNIME Business Hub App Bundle

This includes the application images, manifests, and dependencies. This can be downloaded to your local workstation and then automatically pushed to your private registry with the KOTS tooling.

1.10.1

Sequence 14456

Jun 4, 2024 @ 7:46pm

[Show Checksum](#)

[Download airgap bundle](#)

Optional

Latest Preflight CLI

To be installed on your workstation as a `kubectl` plugin. Provides commands for validating your system requirements.

v0.93.1

May 31, 2024 @ 9:11am

[Download CLI plugin](#)

Latest Support Bundle CLI

To be installed on your workstation as a `kubectl` plugin. Provides debugging via collectors, analyzers, and redactors.

v0.93.1

May 31, 2024 @ 9:11am

[Download CLI plugin](#)

From the download page you need to download:

- The Replicated license file (`.yaml`) with airgapped install enabled.
- The airgap bundle for the KNIME Business Hub (*knime-hub Airgap Bundle*).

Getting Kubernetes ready

Next step is to install the new Kubernetes cluster.

You will need to install the KNIME Business Hub instance into an existing Kubernetes cluster.

Installing into an existing cluster with air gap

Before installing KNIME Business Hub into an existing cluster, the KOTS extension for Kubernetes must be installed into your Kubernetes cluster. See the above section on how to download artifacts from the KNIME Business Hub download site.

For airgapped installs, download the “KOTS Airgap Bundle” which can be found in the “Bring my own cluster” section of the download site.

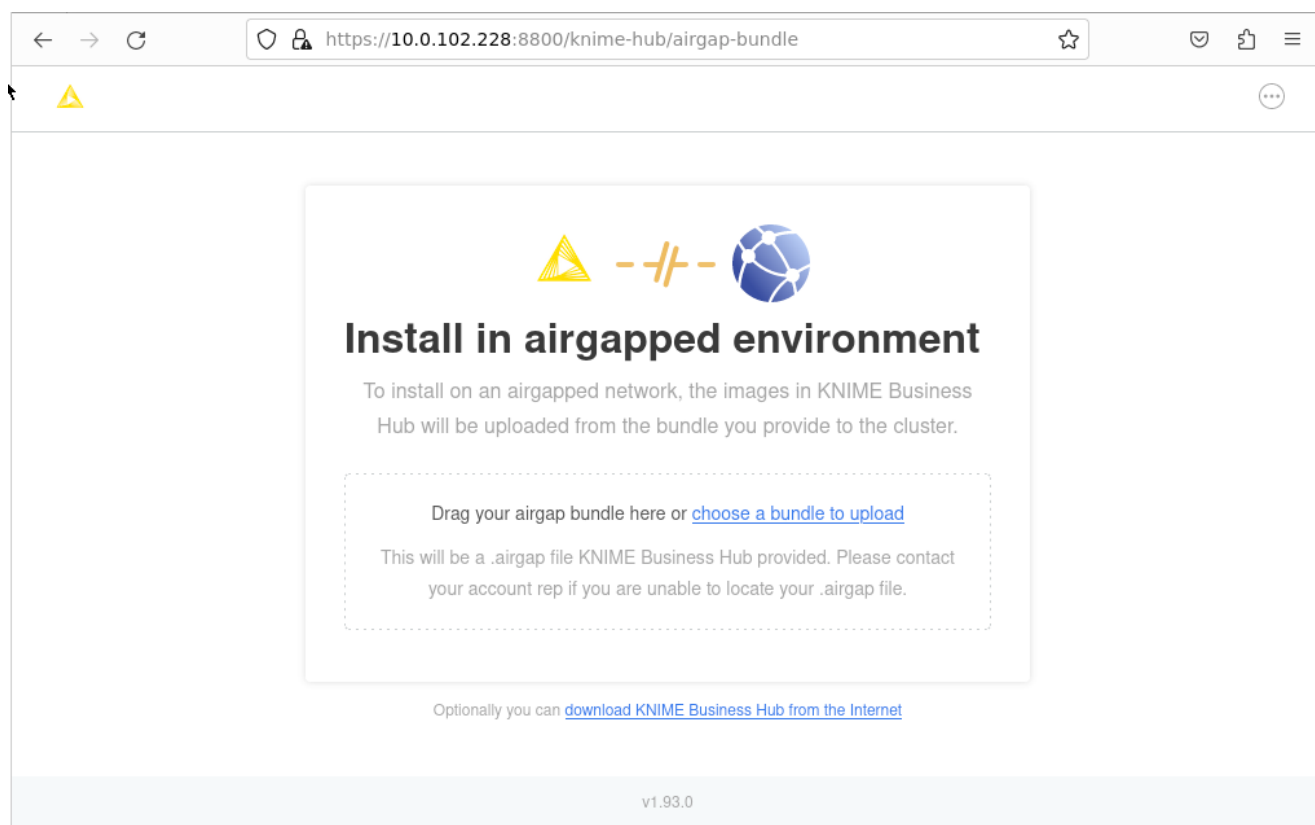
Installing KNIME Business Hub

Once your Kubernetes cluster is configured with the KOTS extension, you are ready to install the KNIME Business Hub.

Now you need to proceed with the airgap install on a machine that:

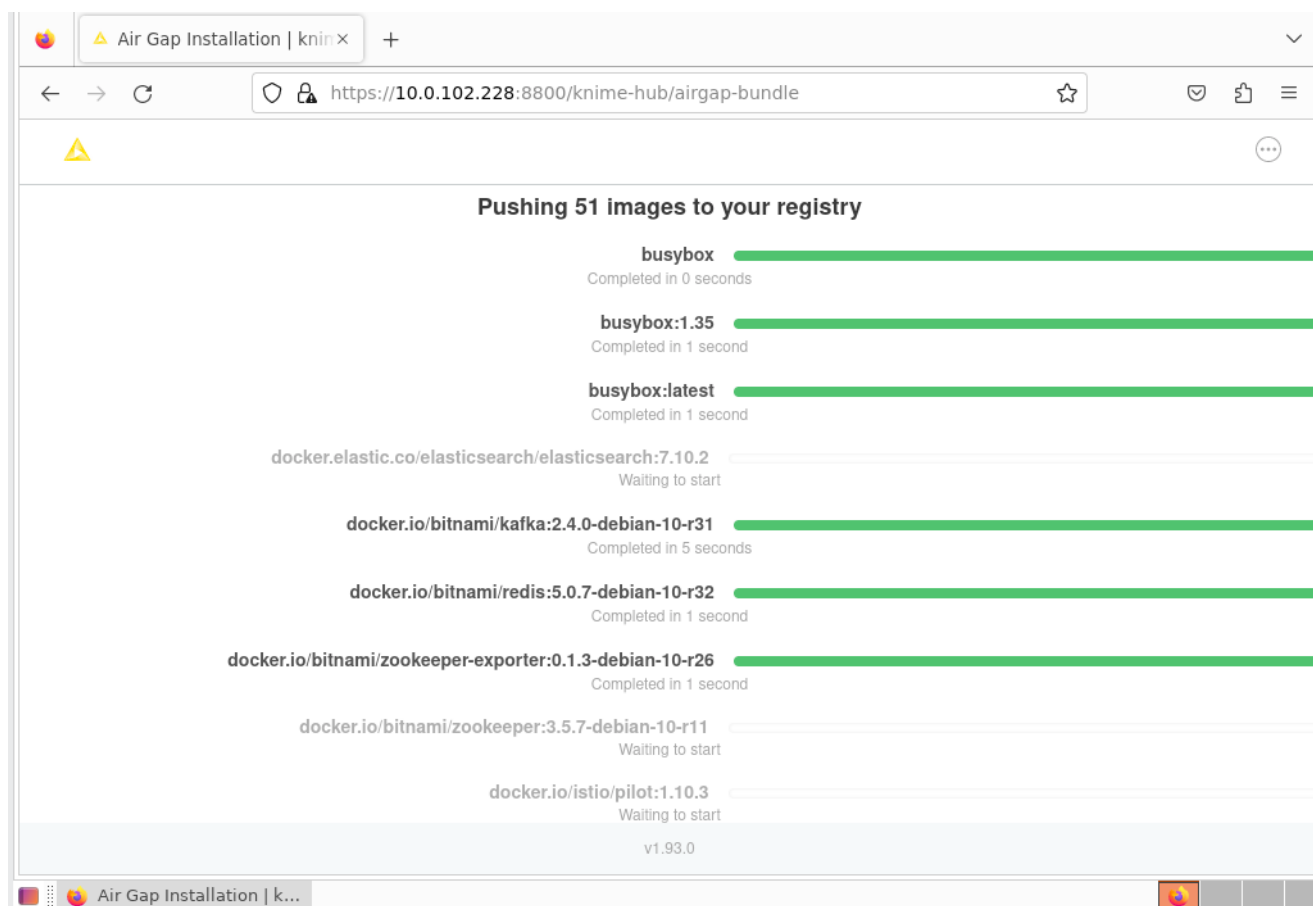
- Hosts the web browser used for the install and has access to the internet
- Has access to the machine into which you are installing your KNIME Business Hub instance

On the machine that can access the installation machine, you can open the KOTS Admin Console URL and enter the kotsadm password. Follow the instructions for installing the KNIME Business via a browser. You will first need to upload the license and then the airgap bundle you downloaded from the Download Portal.



Once you select the KNIME Business Hub airgap bundle to use, the bundle will be uploaded to the install computer. The bundle is large and will take some time to upload.

Once the bundle has completed loading, the installer will extract all the required images from the bundle and store them in a local image registry. Again this will take some time. In your browser, you will see the progress of the extraction and load process. It will look like the screen shot below. Once the load into the registry is complete, the configuration page will be shown. Proceed as normal with the install at this point.



If all prior steps were successful, you should now be prompted to configure your KNIME Business Hub installation.

To do so follow the steps in the [Configure the installation](#) section.

Post-installation steps

Version updates

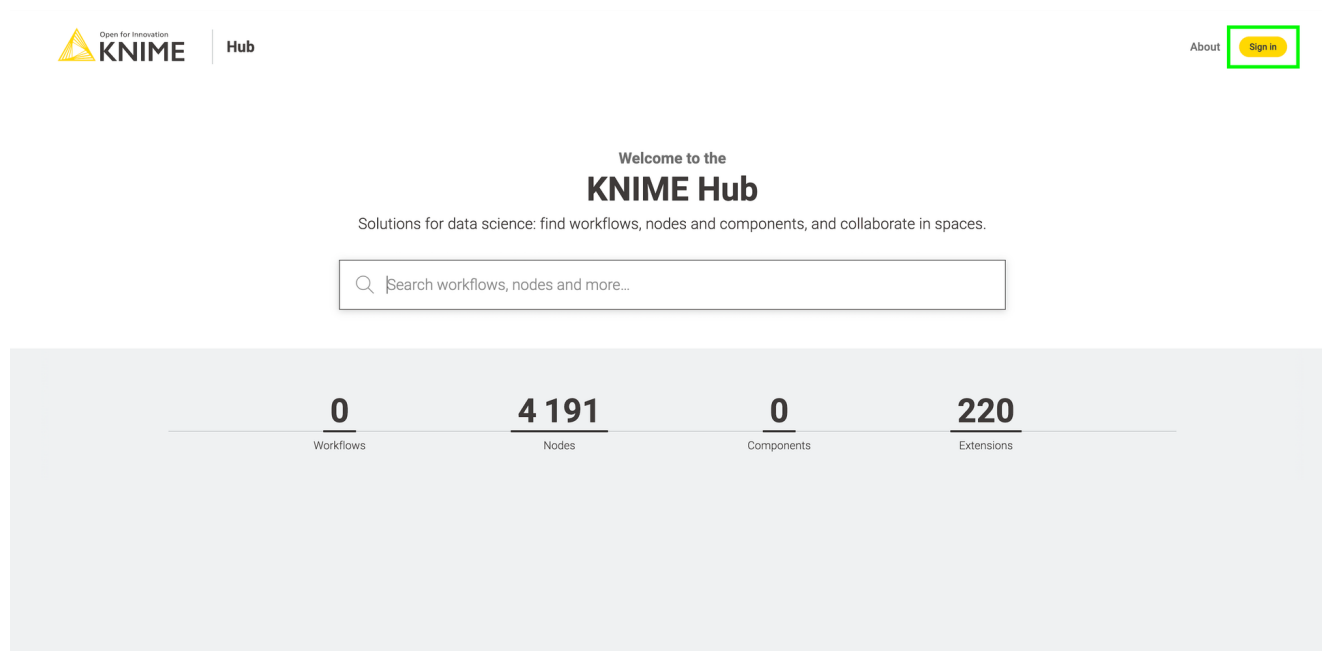
If you save any changes in the **Config** tab of the KNIME Business Hub Admin Console, or check for updates and see a new version that you can upgrade to, then the new version will be visible in the **Version history** tab. New versions of KNIME Business Hub will not be deployed automatically unless automatic updates have been configured. Preflight checks will execute prior to deployment and the deployment itself can be triggered by clicking the **Deploy** button.

The screenshot shows the 'Version history' tab in the KNIME Business Hub Admin Console. The top navigation bar includes 'Dashboard', 'Version history' (active), 'Config', 'Troubleshoot', 'License', 'View files', and 'Registry settings'. The main content area is divided into three sections:

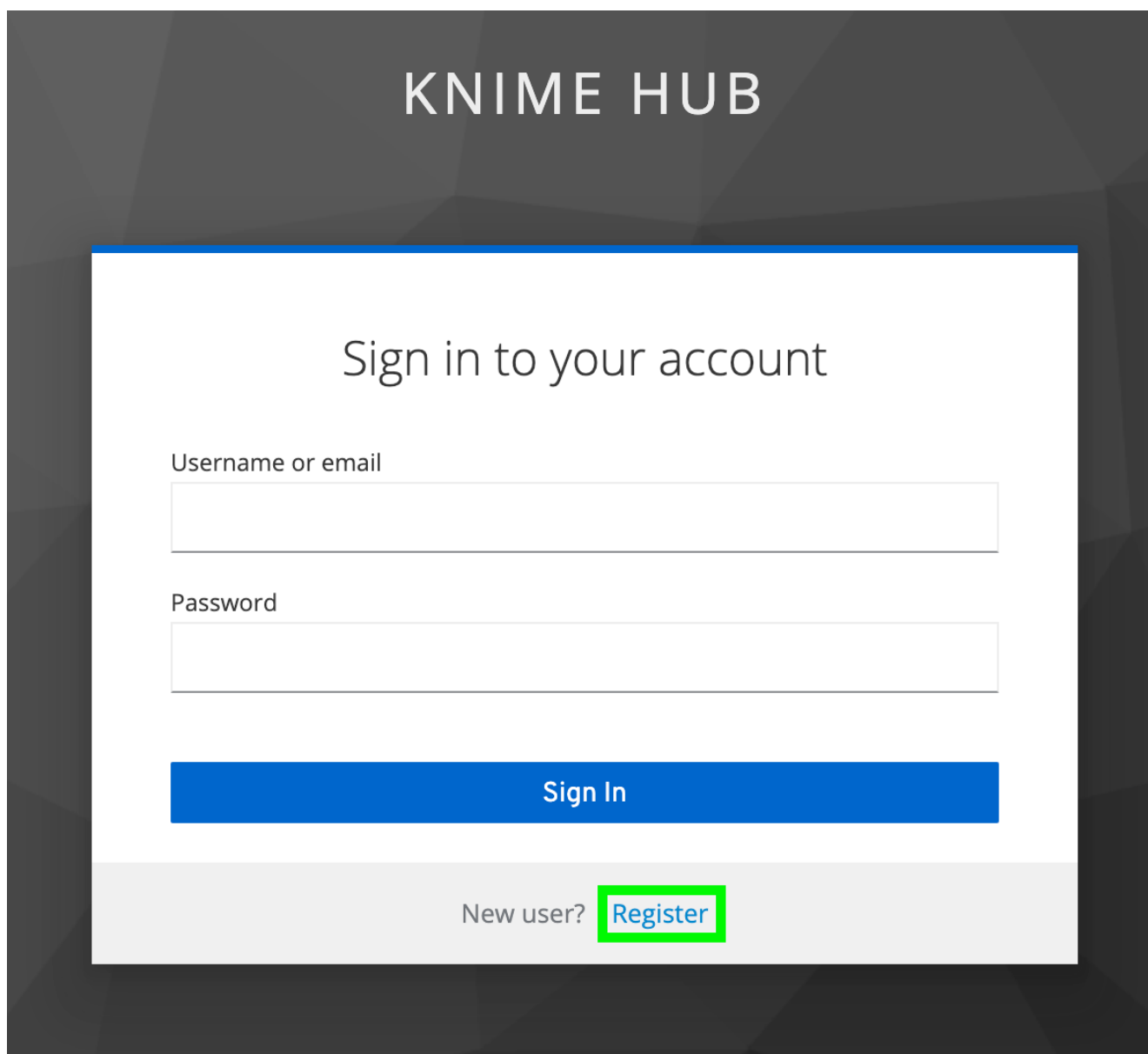
- Currently deployed version:** Shows version 1.0.0, Sequence 2, deployed on 01/11/23 at 03:19 pm GMT+1. It includes icons for a diff view, a refresh icon, and a deployment icon.
- New version available:** Shows version 1.0.0, Sequence 3, with a 'Config Change' label. It indicates '7 files changed' and provides a 'View diff' link. Action buttons include 'Check for update', 'Configure automatic updates', 'Diff versions', and a 'Deploy' button.
- All versions:** A list of versions with a 'Results per page: 20' dropdown. It contains two entries:
 - Version 1.0.0, Sequence 3, 'Config Change', '7 files changed', 'View diff' link, and a 'Deploy' button.
 - Version 1.0.0, Sequence 2, 'Upstream Update', 'Released 12/21/22 @ 07:18 pm GMT+1', '22 files changed', 'View diff' link, a 'Currently deployed version' status, and a 'Redeploy' button.

User registration

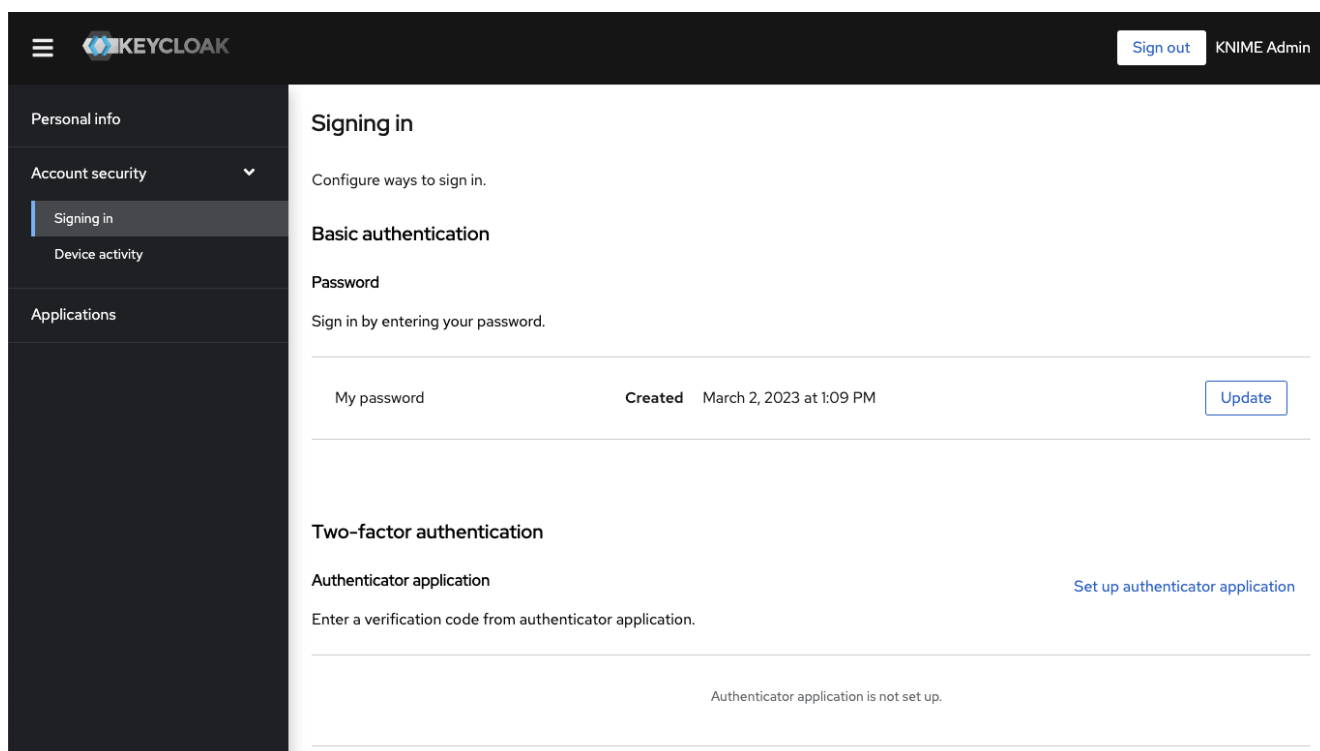
After initial installation, start the process of creating the first user by clicking the **Sign In** button.



Next, click the **Register** button to proceed with creating a new account. You will be prompted for user information and will be logged in automatically.

The image shows the KNIME HUB login interface. At the top, the text "KNIME HUB" is displayed in a large, white, sans-serif font against a dark grey background with a geometric pattern. Below this, a white rectangular box contains the login form. The form has a title "Sign in to your account" in a dark grey font. It includes two input fields: "Username or email" and "Password", both with light grey borders. Below the password field is a solid blue button with the text "Sign In" in white. At the bottom of the white box, there is a link "New user? Register" where "Register" is highlighted with a green rectangular border.

Users can change their password by going to `auth.<base-url>/auth/realms/knime/account` (e.g. `http://auth.hub.example.com/auth/realms/knime/account`) and navigating to **Account Security** → **Signing In**.



Keycloak setup

Keycloak is an open source software product that KNIME Business Hub leverages for authenticating users with Single-Sign On. Keycloak offers Identity Brokering and User Federation to external Identity Providers.

You can manage your Keycloak setup by going to `auth.<base-url>/auth/` (e.g. `http://auth.hub.example.com/auth/`), clicking Administration Console and logging in with the Keycloak admin credentials. These credentials are stored in a kubernetes secret called `credential-knime-keycloak` in the `<business-hub-namespace>` namespace.



The admin user's Keycloak password should **not be changed**. It will be reset on redeployment, so the new password would not work anymore.

You can perform the steps [here](#) to retrieve the Keycloak credentials at any time.



When you first log in to the Keycloak Administration Console you are shown the `master` realm. However, all KNIME Business Hub related configurations are in the `knime` realm. You can select the realm via the dropdown menu in the top left corner.

For configuring your Keycloak setup, e.g. for adding User Federation or an external Identity Providers, consult the [Keycloak Server Administration Guide](#).

Integrating an external Identity Provider (IdP)

While Keycloak itself can be used as the user base, KNIME Business Hub can also federate to an external IdP. To do this the external IdP needs to support a protocol known to Keycloak, such as SAML v2.0, OpenID Connect v1.0, or OAuth v2.0. For configuring Keycloak to use an external IdP please see the [Integrating identity providers section](#) in Keycloak's own documentation on this topic.



If you are using **Microsoft Entra ID** as external Identity Provider you can restrict who can register to your KNIME Business Hub instance by deactivating the option "[Assignment required?](#)" in Microsoft Entra ID to Yes and then allowing only a subset of users or groups to access the KNIME Business Hub instance as explained in the [Microsoft Entra ID documentation](#).

Requirements

Keycloak and KNIME Business Hub have the following requirements for a user or external Identity Provider:

- Usernames can only include letters and numbers as first character. Letters, numbers, underscore, and @ as last character. Letters, numbers, space, dot, underscore, hyphen, and @ for remaining characters. The minimum length is 3 characters, the maximum is 64. Special characters like umlauts (äöü) are not allowed.
 - KNIME Business Hub uses this regex to validate usernames: `^[a-zA-Z0-9][a-zA-Z0-9-_.@ ]{1,62}[a-zA-Z0-9_]$`.
- When a new user is added to keycloak, it needs to have values for the *Username*, *Email*, *First name* and *Last name* fields. If any of those are not filled in automatically you need to create a mapper for it in the Identity Provider settings. Otherwise the user will be prompted to fill in details themselves when they log in for the first time.
- Each user needs to have an email address, even if notifications are not configured in KNIME Business Hub.

Identity Provider Mapper

After adding an external IdP to your Keycloak instance you can create Identity Provider Mappers. These mappers can be used to fill in attributes if they are not getting automatically added, like *Email*. See the [Mapping claims and assertions section](#) in Keycloak's documentation.

In Keycloak, in the `knime` realm, go to the Identity Providers section, click your provider and go

to the Mappers tab. Click the *Add Mapper* button and configure the mapper. Some useful Mapper types:

- *Username Template Importer*: you can use this mapper to generate a username from multiple claims if a username claim is not available. Example template: `${CLAIM.given_name}.${CLAIM.family_name}`. `given_name` and `family_name` are the given claims here. Nesting is possible with e.g. `${CLAIM.user_info.given_name}`.
 - There are three transformers you can use here: lowercase, uppercase, and localpart.
- *Attribute Importer*: map an Identity Provider claim to a Keycloak attribute. Useful target attributes: `email` (*Email*), `given_name` (*First name*), and `family_name` (*Last name*). The Claim field is not a template like above, but accepts the claim name directly, e.g. `family_name`.
- Use the *Hardcoded Attribute* mapper if an attribute can't be constructed from a claim.

For finding available claims see the section below.

Tips for debugging Keycloak when integrating an external IdP

To create appropriate mappers in the IdP configuration one needs to know what the external IdP is actually returning to Keycloak in the token. This can be done by increasing the loglevel of the `org.keycloak.social.user_profile_dump` keycloak logger to debug. To do so you need to modify an instance of the `keycloaks.k8s.keycloak.org` CustomResource. You can get the current yaml definition of it by executing:

```
kubectl get keycloaks.k8s.keycloak.org -n knime knime-keycloak -o yaml
```

You can either save this output to a file, modify the file, and apply the changes to the cluster with:

```
kubectl apply -f <file>
```

Or you can edit it directly in the cluster using `kubectl edit`. This will open the default editor in your current shell. Make the modification, save and exit the editor, and it will automatically be applied to the cluster:

```
kubectl edit keycloaks.k8s.keycloak.org -n knime knime-keycloak
```

The modification that needs to be done is adding an additional configuration option under

spec.additionalOptions:

```
spec:
  additionalOptions:
    - name: log-level
      value: INFO,org.keycloak.social.user_profile_dump:debug
```

Do not remove or change any of the other lines.

After this modification has been applied the keycloak-operator will automatically reconcile the knime-keycloak-0 pod in the <business-hub-namespace> namespace. After the pod is ready again attempt a login with the configured external IdP in the KNIME Business Hub UI (e.g. <http://hub.example.com>) and look at the log output of the knime-keycloak-0 pod. The interesting lines contain org.keycloak.social.user_profile_dump with the full JSON that was received from the external IdP:

```
2024-05-23 08:45:21,103 DEBUG [org.keycloak.social.user_profile_dump] (executor-thread-2) User Profile JSON Data for provider oidc: {"sub":"02aeb3e3-aaba-4e96-86a7-1d12531e8fb2","email":"admin@example.com","email_verified":false,"name":"Admin Admin","preferred_username":"admin","zoneinfo":"Europe/Berlin"}
```

To turn the debug logging off again in Keycloak, remove the additionalOptions item that you added in the earlier step.

Update your KNIME Business Hub license

In order to deploy a new Business Hub license, please go to the Replicated console. There, navigate to the Config tab and find your current license file.

Global

High-level settings for the KNIME Business Hub deployment.

KNIME Business Hub Deployment Name *Required*

The KNIME Business Hub deployment name is displayed in several places in the web UI. The value may contain spaces.

Default value: **KNIME Business Hub**

KNIME Business Hub Mountpoint ID *Required*

Name of the Mountpoint ID when adding this KNIME Business Hub deployment in the KNIME AP. The value may not contain spaces (it is recommended to use dashes `-` instead).

Default value: **knime-business-hub**

KNIME Business Hub License *Required*

Upload your KNIME Business Hub License `.xml` file. You have received this file from your account manager, in addition to the Replicated License `.xml` file that you used during a previous step. Contact your KNIME account manager if you have not yet received a `.xml` file containing the KNIME Business Hub License.

Upload a file

☒ enterprise_license4.xml

[Select a different file](#)

Click “select a different file”, and choose the `.xml` file provided by your KNIME customer care representative. Afterwards, scroll all the way to the bottom to confirm the configuration change. Click “go to updated version” next. This brings you to the “version history”, where you need to click on “deploy” to switch to the new license.

Currently deployed version

67afdd2 Sequence 1613

Deployed 01/31/23 @ 02:04 pm GMT+1

New version available

Check for update Configure automatic updates Diff versions

67afdd2 Sequence 1614

Config Change

5 files changed [View diff](#)

Deploy

Uninstalling KNIME Business Hub

Uninstalling KNIME Business Hub is a **highly destructive action** that can have permanent implications. Please ensure you are connected to the right cluster and 100% sure you want to uninstall all resources related to KNIME Business Hub before proceeding. Please ensure you have retrieved all data or backups from the cluster that you want to preserve.

To completely remove a KNIME Business Hub instance, the following commands can be run from a terminal which has `kubectl` access to the cluster running KNIME Business Hub.

Both `kubectl` and `Helm` must be installed to successfully run the commands. Please confirm that the proper Kubernetes context is set before executing.

```
# Remove the KNIME Business Hub app from the KOTS Admin Console.
kubectl kots remove knime-hub -n <knime-business-hub> --force

# List all helm releases that will be deleted in a later step. This does not delete
anything yet.
# Ensure there are no helm releases that you deployed yourself.
helm ls -a -n <knime-business-hub>

# Delete the knime-hub-keycloak helm release, and wait 10seconds to give the knime-
keycloak-operator time to reconcile.
helm delete -n <knime-business-hub> knime-hub-keycloak; kubectl delete
keycloakrealms.legacy.k8s.keycloak.org knime-realm -n <knime-business-hub>; sleep 10;

# Delete all helm releases
helm ls -a -n <knime-business-hub> | awk 'NR > 1 { print "-n \"$2, $1}" | xargs -L1 helm
delete;

# Finally, delete all namespaces that were created by KNIME Business Hub.
kubectl delete namespace <knime-business-hub>
```

If the commands above run successfully, all KNIME Business Hub resources will be removed from the cluster. You could then re-install KNIME Business Hub into the same cluster by navigating to the KOTS Admin Console in a browser and following this installation guide again.

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