Legal Notice

© Cloudera Inc. 2022. All rights reserved.

The documentation is and contains Cloudera proprietary information protected by copyright and other intellectual property rights. No license under copyright or any other intellectual property right is granted herein.

Copyright information for Cloudera software may be found within the documentation accompanying each component in a particular release.

Cloudera software includes software from various open source or other third party projects, and may be released under the Apache Software License 2.0 ("ASLv2"), the Affero General Public License version 3 (AGPLv3), or other license terms.

Other software included may be released under the terms of alternative open source licenses. Please review the license and notice files accompanying the software for additional licensing information.

Please visit the Cloudera software product page for more information on Cloudera software. For more information on Cloudera support services, please visit either the Support or Sales page. Feel free to contact us directly to discuss your specific needs.

Cloudera reserves the right to change any products at any time, and without notice. Cloudera assumes no responsibility nor liability arising from the use of products, except as expressly agreed to in writing by Cloudera.

Cloudera, Cloudera Altus, HUE, Impala, Cloudera Impala, and other Cloudera marks are registered or unregistered trademarks in the United States and other countries. All other trademarks are the property of their respective owners.

Disclaimer: EXCEPT AS EXPRESSLY PROVIDED IN A WRITTEN AGREEMENT WITH CLOUDERA, CLOUDERA DOES NOT MAKE NOR GIVE ANY REPRESENTATION, WARRANTY, NOR COVENANT OF ANY KIND, WHETHER EXPRESS OR IMPLIED, IN CONNECTION WITH CLOUDERA TECHNOLOGY OR RELATED SUPPORT PROVIDED IN CONNECTION THEREWITH. CLOUDERA DOES NOT WARRANT THAT CLOUDERA PRODUCTS NOR SOFTWARE WILL OPERATE UNINTERRUPTED NOR THAT IT WILL BE FREE FROM DEFECTS NOR ERRORS, THAT IT WILL PROTECT YOUR DATA FROM LOSS, CORRUPTION NOR UNAVAILABILITY, NOR THAT IT WILL MEET ALL OF CUSTOMER'S BUSINESS REQUIREMENTS. WITHOUT LIMITING THE FOREGOING, AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, CLOUDERA EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, QUALITY, NON-INFRINGEMENT, TITLE, AND FITNESS FOR A PARTICULAR PURPOSE AND ANY REPRESENTATION, WARRANTY, OR COVENANT BASED ON COURSE OF DEALING OR USAGE IN TRADE.

This document has been released as part of a technical preview for features described herein. Technical preview components are provided as a convenience to our customers for their evaluation and trial usage. These components are provided 'as is' without warranty or support. Further, Cloudera assumes no liability for the usage of technical preview components, which should be used by customers at their own risk.
Contents

PBJ Workbench 4
Accessing the PBJ Workbench 4
Constructing a PBJ Workbench runtime image 4
Limitations 7

This document has been released as part of a technical preview for features described herein. Technical preview components are provided as a convenience to our customers for their evaluation and trial usage. These components are provided ‘as is’ without warranty or support. Further, Cloudera assumes no liability for the usage of technical preview components, which should be used by customers at their own risk.
PBJ Workbench

The PBJ Workbench features the classic workbench UI backed by the open-source Jupyter protocol pre-packaged in a runtime image. Users can easily choose this runtime image when launching a session. The open-source Jupyter infrastructure eliminates the dependency on proprietary CML code when building a Docker image, allowing runtime images to be built more quickly.

Note: Before constructing a new PBJ Workbench runtime image, make sure to upgrade your workspace to CDSW-2.0.29-b61 or higher.

Accessing the PBJ Workbench

The PBJ Workbench is available by default, but you have to select it when you launch a session.

1. Click **New Session**.
2. In **Runtime > Editor**, select **PBJ Workbench**.
3. Click **Start Session**.

Now you can use the PBJ Workbench as you would the normal workbench.

Constructing a PBJ Workbench runtime image

You can also construct a custom runtime image that includes the PBJ Workbench, by starting from any base image (including arbitrary non-Cloudera base images) and to use them with the CDSW/CML workbench.

This guide documents the requirements for such an image to be compatible with the workbench and the wider Cloudera data platform.

Install Jupyter dependencies

First, the Jupyter kernel gateway, version 2.5.1 must be installed into the Docker image. This example command may need to be modified depending on the filename and path of the pip executable in the image.

This document has been released as part of a technical preview for features described herein. Technical preview components are provided as a convenience to our customers for their evaluation and trial usage. These components are provided ‘as is’ without warranty or support. Further, Cloudera assumes no liability for the usage of technical preview components, which should be used by customers at their own risk.
RUN pip3 install "jupyter-kernel-gateway==2.5.1"

The path to the jupyter executable installed by pip should be noted, and the command to run the Jupyter kernel gateway on IP address 127.0.0.1 and port 8888

```
/path/to/jupyter kernelgateway --ip='127.0.0.1' --port=8888 --debug
```

should be incorporated into the runtime metadata.

Each instance of the PBJ workbench communicates with a Jupyter kernel via the Jupyter protocol. Kernels are available for a wide variety of languages and versions. Install the kernel of your choice to the image by following its installation instructions. Then, note the name of the kernel, ie its directory name under Jupyter's kernel spec path. For example, if the kernel is installed to jupyter/kernels/python3 then its name, for CML's purposes, is python3. The name should be incorporated into the runtime metadata under the field kernel.

Add the cdsw user (recommended)

User code will be run in the image under user and group 8536.8536. To enhance the readability of file ownership data and shell output, we recommend associating these id's with the name cdsw in the image by adding the following command to the dockerfile:

```
RUN groupadd --gid 8536 cdsw && 
   useradd -c "CDSW User" --uid 8536 -g cdsw -m -s /bin/bash cdsw
```

Relax permissions so that Cloudera client config can be written

All code in the runtime container, including initial setup, will be run as the cdsw user. The initial setup includes linking client files for Cloudera data services out to their standard paths. To facilitate this, permissions to the following paths should be set so that user 8536 can write to them:

- /etc
- /usr/share/java

Full example Dockerfile

This Dockerfile produces a runtime image that is compatible with the PBJ workbench from a third-party base image.

FROM jupyter/datascience-notebook
# Install the Jupyter kernel gateway.
# The IPython kernel is automatically installed to
# /opt/conda/share/jupyter/kernels/python3
# so below we set the kernel name to python3.
#
# Note that this base image has python3 and pip3
# preinstalled. If it did not, we would need to
# add steps to install them.
RUN pip3 install "jupyter-kernel-gateway==2.5.1"

# Associate uid and gid 8536 with username cdsw
RUN \
    addgroup --gid 8536 cdsw && \
    adduser --disabled-password --gecos "CDSW User" --uid 8536 --gid
8536 cdsw

# Relax permissions to facilitate installation of Cloudera
# client files at startup
RUN chown -R 8536.8536 /etc && chown -R 8536.8536 /usr/share/java

# Configure the Kernel Gateway CommandLabel the image
LABEL com.cloudera.ml.runtime.editor=PBJWorkbench
LABEL com.cloudera.ml.runtime.kernel=python3
LABEL com.cloudera.ml.runtime.kernel-gateway-command="/opt/conda/bin/jupyter
kernelgateway --debug --ip='127.0.0.1' --port=8888"

# Set Runtime label and environment variables metadata
ENV ML/Runtime EDITOR="PBJ Workbench" \
    ML/Runtime KERNEL="Python 3.7" \
    ML/Runtime EDITION="Custom" \
    ML/Runtime SHORT_VERSION="1.0" \
    ML/Runtime MAINTENANCE_VERSION="1" \
    ML/Runtime FULL_VERSION="$ML/Runtime SHORT_VERSION.$ML/Runtime MAINTENANCE_VERSION" \

This document has been released as part of a technical preview for features described herein. Technical preview components are provided as a convenience to our customers for their evaluation and trial usage. These components are provided ‘as is’ without warranty or support. Further, Cloudera assumes no liability for the usage of technical preview components, which should be used by customers at their own risk.
ML_RUNTIME_DESCRIPTION="This runtime includes telnet and sklearn and upgraded packages" \\
ML_RUNTIME_METADATA_VERSION="2"

LABEL com.cloudera.ml.runtime.editor=$ML_RUNTIME_EDITOR \\
    com.cloudera.ml.runtime.kernel=$ML_RUNTIME_EDITOR \\
    com.cloudera.ml.runtime.edition=$ML_RUNTIME_EDITOR \\
    com.cloudera.ml.runtime.full-version=$ML_RUNTIME_FULL_VERSION \\
    com.cloudera.ml.runtime.short-version=$ML_RUNTIME_SHORT_VERSION \\
    com.cloudera.ml.runtime.maintenance-version=$ML_RUNTIME_MAINTENANCE_VERSION \\
    com.cloudera.ml.runtime.description=$ML_RUNTIME_DESCRIPTION \\
    com.cloudera.ml.runtime.runtime-metadata-version=$ML_RUNTIME_METADATA_VERSION

Limitations

Workers are not supported by the PBJ Workbench.