Cloudera Data Flow

Using custom processors

Date published: 2021-04-06
Date modified: 2025-09-30

https://docs.cloudera.com/

Legal Notice

Contents

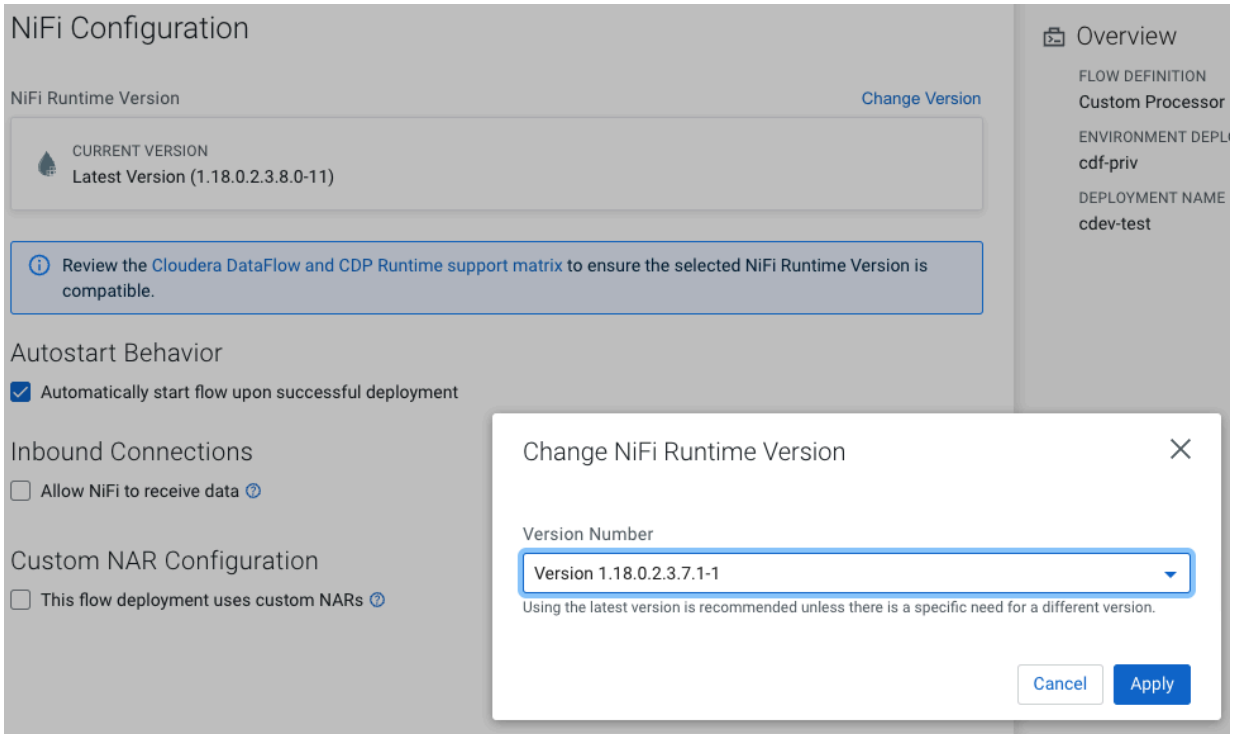
Best practices for building custom components

Learn about general guidelines concerning the creation of custom NiFi archives (NARs).

The goal is to build your code once against a baseline version of Apache NiFi and it can be deployed to any flow you need using any version of Cloudera DataFlow powered by any NiFi deployment equal to or greater than the version it was built against, bar major version changes.

Apache NiFi extensions are packaged in NARs. A NAR allows several components and their dependencies to be packaged together into a single package. NiFi provides Maven archetypes for creating custom processor and controller service bundle project structures. For detailed information, see the Maven Projects for Extensions Apache NiFi wiki page.

- If directly specifying the nifi-nar-maven-plugin, ensure you use the most recent version when compiling your custom code.
- If inheriting the nifi-nar-maven-plugin, Cloudera recommends that the parent version of nifi-nar-bundles has the same major and minor version as the selected NiFi runtime version. For example, If the CFM Version is 1.18.0.2.3.7.1 (NiFi Major Version: 1, NiFi Minor Version: 18) the recommended compilation version is 1.18.0 (The first two version numbers must be equal to, or less than the CFM version).




```
<parent>
       <groupId>org.apache.nifi</groupId>
       <artifactId>nifi-nar-bundles</artifactId>
       <version>1.18.0.2.3.7.1-1</version>
   </parent>
```

- Ensure your NAR pom only depends on another NAR pom for a controller service API NAR. Generally, do not extend from implementation NARs like nifi-standard-nar.
- Ensure your components jar pom marks API dependencies as provided in order to obtain them at runtime through the appropriate NAR dependency.

Best practices for packaging custom Python processors [Technical Preview]

Depending on complexity and possible shared dependencies, you need to decide whether to create your custom processor as a single file or as a package.

This documentation describes your options on packaging your custom Python processor and making it available for flow deployments in Cloudera Data Flow, and is based on the official Apache NiFi 2 documentation. For additional best practices on writing a custom Python processor for a NiFi 2.x flow, consult the official Apache NiFi documentation. Python processors can be packaged either as a single Python file, or as a Python package.

Single Python File

If the processor is simple and does not share dependencies with any other custom processor, it is easiest to have a single Python file named after the processor, like CreateFlowFile.py. In the single Python file format dependencies are specified directly in the processor.

For example:

```
class PandaProcessor(FlowFileTransform)
    class Java:
        implements = ['org.apache.nifi.pythonprocessor.FlowFileTransform']
    class ProcessorDetails:
        version = '0.0.1-SNAPSHOT',
        dependencies = ['pandas', 'numpy==1.20.0']
```

Python package

If more than one custom Python processor uses the same dependencies, or if you have a helper module that you want to use in one or more Python processors, a Python package is required. Structure your code as follows:

```
my-python-package/
#
## __init__.py
#
## ProcessorA.py
#
## ProcessorB.py
#
## HelperModule.py
#
## requirements.txt
```

In this example, all requirements across the processors and helper modules appear in requirements.txt, and both Proc essorA and ProcessorB can reference code in the helper module in a way similar to the following:

```
from HelperModule import my_helper_function
```

When uploading a Python package to cloud storage for use in Cloudera Data Flow, add the package directory (my-python-package in this example) directly inside the cloud storage directory that you are going to specify during deployment.

For example, if you specify s3a://bucket-name/custom-python as your cloud storage directory in the wizard, the following files should exist in cloud storage:

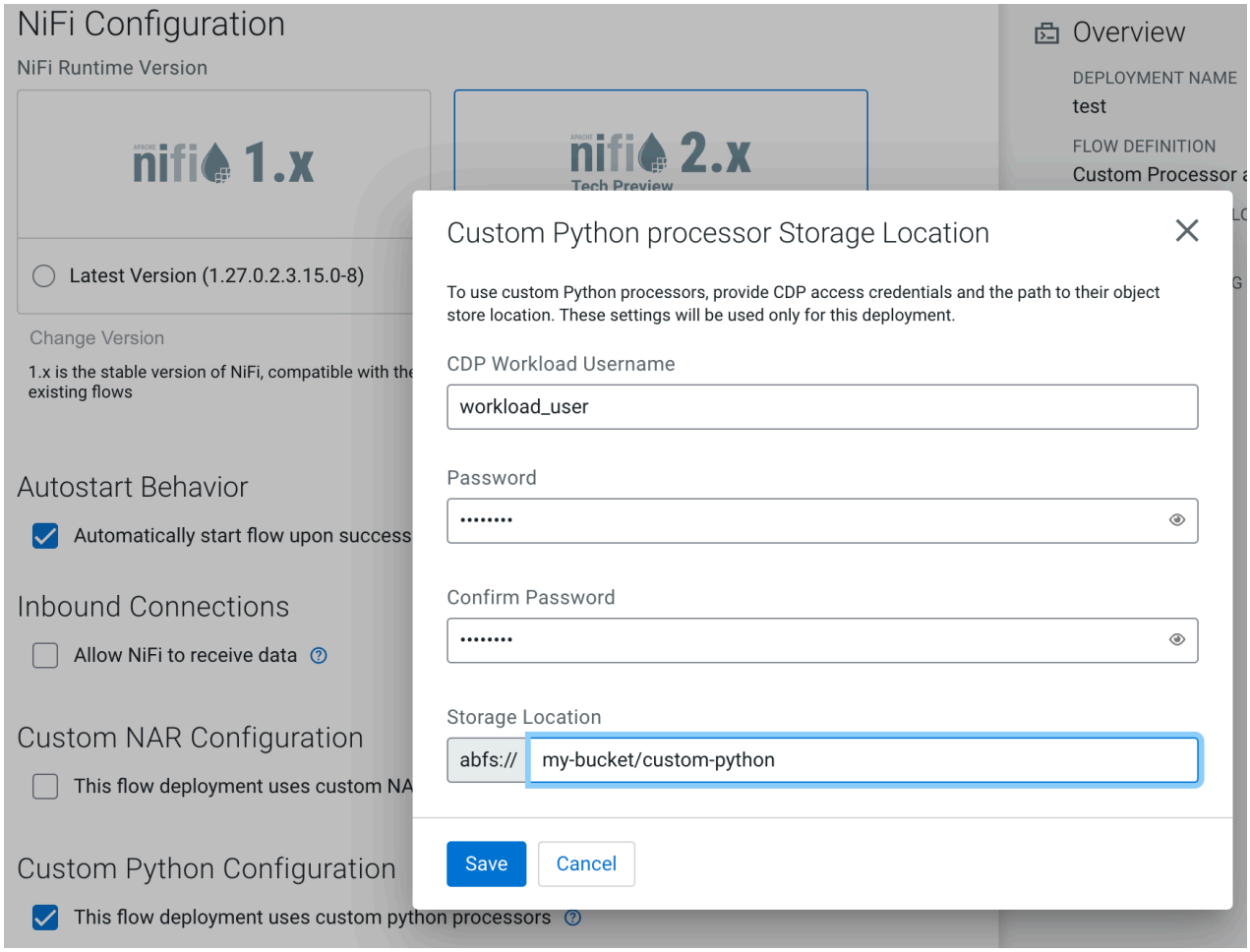
```
s3://my-bucket/custom-python/my-python-package/__init__.py
s3://my-bucket/custom-python/my-python-package/ProcessorA.py
s3://my-bucket/custom-python/my-python-package/ProcessorB.py
s3://my-bucket/custom-python/my-python-package/HelperModule.py
```

```
s3://my-bucket/custom-python/my-python-package/requirements.txt
```

Making the processor available for Cloudera Data Flow

In order to make a custom Python processor available to Cloudera Data Flow, upload it to cloud storage as described in Preparing cloud storage to deploy custom processors.

In the deployment wizard, specify this directory as Custom Python processor Storage Location.



Related Tasks

Preparing cloud storage to deploy custom processors

Related Information

Deploying a flow definition using the wizard

NiFi Python Developer's Guide

Preparing cloud storage to deploy custom processors

To use a custom Apache NiFi processor or controller service in one of your Cloudera DataFlow flow deployments, add the NiFi Archive (NAR), Python file, or Python package containing the custom processor or controller service to a cloud storage location for later use during a flow deployment.

Procedure

1. Create your cloud storage location.
2. Upload your NAR file, Python file, or Python package to the cloud storage location.

3. Configure access to your cloud provider storage in one of two ways:
   - You have configured access to S3 buckets using ID Broker mapping.

     If your environment is not RAZ-enabled, you can configure access to S3 buckets using ID Broker mapping.

     a. Access IDBroker mappings.

        1. To access IDBroker mappings in your environment, click Actions Manage Access .
        2. Choose the IDBroker Mappings tab where you can provide mappings for users or groups and click Edit.

     b. Add your Cloudera Workload User and the corresponding AWS role that provides write access to your folder in your S3 bucket to the Current Mappings section by clicking the blue + sign.

        Note: You can get the AWS IAM role ARN from the Roles Summary page in AWS and can copy it into the IDBroker role field. The selected AWS IAM role must have a trust policy allowing IDBroker to assume this role.

     c. Click Save and Sync.
   - You have configured access to S3 buckets with a RAZ enabled environment.

     It is a best practice to enable RAZ to control access to your object store buckets. This allows you to use your Cloudera credentials to access S3 buckets, increases auditability, and makes object store data ingest workflows portable across cloud providers.

     a. Ensure that Fine-grained access control is enabled for your Cloudera Data Flow environment.
     b. From the Ranger UI, navigate to the S3 repository.
     c. Create a policy to govern access to the S3 bucket and path used in your ingest workflow.

        Tip:

        The Path field must begin with a forward slash (/).

     d. Add the machine user that you have created for your ingest workflow to the policy you just created.

     For more information, see *Creating Ranger policy to use in RAZ-enabled AWS environment*.
4. Note the workload user name and password, and cloud storage location to use in the Deployment Wizard.

   Tip: If you want to provide a machine user as CDP Workload Username during flow deployment, make sure to note the full workload user name including the srv_ prefix.

What to do next

Once you have added the NAR files to a cloud storage location, you are ready to launch the Deployment Wizard and deploy a flow.