Confluent s3 connector

NetApp Solutions

NetApp
October 20, 2023

Table of Contents

Confluent s3 connector

Previous: Performance tests with scalability.

The Amazon S3 Sink connector exports data from Apache Kafka topics to S3 objects in either the Avro, JSON, or Bytes formats. The Amazon S3 sink connector periodically polls data from Kafka and in turn uploads it to S3. A partitioner is used to split the data of every Kafka partition into chunks. Each chunk of data is represented as an S3 object. The key name encodes the topic, the Kafka partition, and the start offset of this data chunk.

In this setup, we show you how to read and write topics in object storage from Kafka directly using the Kafka s3 sink connector. For this test, we used a stand-alone Confluent cluster, but this setup is applicable to a distributed cluster.

1. Download Confluent Kafka from the Confluent website.
2. Unpack the package to a folder on your server.
3. Export two variables.

```
Export CONFLUENT_HOME=/data/confluent/confluent-6.2.0
export PATH=$PATH:/data/confluent/confluent-6.2.0/bin
```

4. For a stand-alone Confluent Kafka setup, the cluster creates a temporary root folder in `/tmp`. It also creates Zookeeper, Kafka, a schema registry, connect, a ksql-server, and control-center folders and copies their respective configuration files from `$CONFLUENT_HOME`. See the following example:

```
root@stlrx2540m1-108:~# ls -ltr /tmp/confluent.406980/
total 28
drwxr-xr-x 4 root root 4096 Oct 29 19:01 zookeeper
drwxr-xr-x 4 root root 4096 Oct 29 19:37 kafka
drwxr-xr-x 4 root root 4096 Oct 29 19:40 schema-registry
drwxr-xr-x 4 root root 4096 Oct 29 19:45 kafka-rest
drwxr-xr-x 4 root root 4096 Oct 29 19:47 connect
drwxr-xr-x 4 root root 4096 Oct 29 19:48 ksql-server
drwxr-xr-x 4 root root 4096 Oct 29 19:53 control-center
root@stlrx2540m1-108:~#
```

5. Configure Zookeeper. You don’t need to change anything if you use the default parameters.

```
root@stlrx2540m1-108:~# cat
/tmp/confluent.406980/zookeeper/zookeeper.properties  | grep -iv ^#
dataDir=/tmp/confluent.406980/zookeeper/data
clientPort=2181
maxClientCnxns=0
admin.enableServer=false
tickTime=2000
initLimit=5
syncLimit=2
server.179=controlcenter:2888:3888
root@stlrx2540m1-108:~#
```

In the above configuration, we updated the `server. xxx` property. By default, you need three Zookeepers for the Kafka leader selection.

6. We created a myid file in `/tmp/confluent.406980/zookeeper/data` with a unique ID:

```
root@stlrx2540m1-108:~# cat /tmp/confluent.406980/zookeeper/data/myid
179
root@stlrx2540m1-108:~#
```

We used the last number of IP addresses for the myid file. We used default values for the Kafka, connect, control-center, Kafka, Kafka-rest, ksql-server, and schema-registry configurations.

7. Start the Kafka services.

```
root@stlrx2540m1-108:/data/confluent/confluent-6.2.0/bin# confluent
local services  start
The local commands are intended for a single-node development
environment only,
NOT for production usage.

Using CONFLUENT_CURRENT: /tmp/confluent.406980
ZooKeeper is [UP]
Kafka is [UP]
Schema Registry is [UP]
Kafka REST is [UP]
Connect is [UP]
ksqlDB Server is [UP]
Control Center is [UP]
root@stlrx2540m1-108:/data/confluent/confluent-6.2.0/bin#
```

There is a log folder for each configuration, which helps troubleshoot issues. In some instances, services take more time to start. Make sure all services are up and running.

8. Install Kafka connect using `confluent-hub`.

```
root@stlrx2540m1-108:/data/confluent/confluent-6.2.0/bin# ./confluent-
hub install confluentinc/kafka-connect-s3:latest
The component can be installed in any of the following Confluent
Platform installations:
  1. /data/confluent/confluent-6.2.0 (based on $CONFLUENT_HOME)
  2. /data/confluent/confluent-6.2.0 (where this tool is installed)
Choose one of these to continue the installation (1-2): 1
Do you want to install this into /data/confluent/confluent-
6.2.0/share/confluent-hub-components? (yN) y

Component's license:
Confluent Community License
http://www.confluent.io/confluent-community-license
I agree to the software license agreement (yN) y
Downloading component Kafka Connect S3 10.0.3, provided by Confluent,
Inc. from Confluent Hub and installing into /data/confluent/confluent-
6.2.0/share/confluent-hub-components
Do you want to uninstall existing version 10.0.3? (yN) y
Detected Worker's configs:
  1. Standard: /data/confluent/confluent-6.2.0/etc/kafka/connect-
distributed.properties
  2. Standard: /data/confluent/confluent-6.2.0/etc/kafka/connect-
standalone.properties
  3. Standard: /data/confluent/confluent-6.2.0/etc/schema-
registry/connect-avro-distributed.properties
  4. Standard: /data/confluent/confluent-6.2.0/etc/schema-
registry/connect-avro-standalone.properties
  5. Based on CONFLUENT_CURRENT:
/tmp/confluent.406980/connect/connect.properties
  6. Used by Connect process with PID 15904:
/tmp/confluent.406980/connect/connect.properties
Do you want to update all detected configs? (yN) y
Adding installation directory to plugin path in the following files:
  /data/confluent/confluent-6.2.0/etc/kafka/connect-
distributed.properties
  /data/confluent/confluent-6.2.0/etc/kafka/connect-
standalone.properties
  /data/confluent/confluent-6.2.0/etc/schema-registry/connect-avro-
distributed.properties
  /data/confluent/confluent-6.2.0/etc/schema-registry/connect-avro-
standalone.properties
  /tmp/confluent.406980/connect/connect.properties
  /tmp/confluent.406980/connect/connect.properties
```

```
Completed
root@stlrx2540m1-108:/data/confluent/confluent-6.2.0/bin#
```

You can also install a specific version by using `confluent-hub install confluentinc/kafka-connect-s3:10.0.3`.

9. By default, `confluentinc-kafka-connect-s3` is installed in `/data/confluent/confluent-6.2.0/share/confluent-hub-components/confluentinc-kafka-connect-s3`.
10. Update the plug-in path with the new `confluentinc-kafka-connect-s3`.

```
root@stlrx2540m1-108:~# cat /data/confluent/confluent-
6.2.0/etc/kafka/connect-distributed.properties | grep plugin.path
#
plugin.path=/usr/local/share/java,/usr/local/share/kafka/plugins,/opt/co
nnectors,
plugin.path=/usr/share/java,/data/zookeeper/confluent/confluent-
6.2.0/share/confluent-hub-components,/data/confluent/confluent-
6.2.0/share/confluent-hub-components,/data/confluent/confluent-
6.2.0/share/confluent-hub-components/confluentinc-kafka-connect-s3
root@stlrx2540m1-108:~#
```

11. Stop the Confluent services and restart them.

```
confluent local services  stop
confluent local services  start
root@stlrx2540m1-108:/data/confluent/confluent-6.2.0/bin# confluent
local services  status
The local commands are intended for a single-node development
environment only,
NOT for production usage.

Using CONFLUENT_CURRENT: /tmp/confluent.406980
Connect is [UP]
Control Center is [UP]
Kafka is [UP]
Kafka REST is [UP]
ksqlDB Server is [UP]
Schema Registry is [UP]
ZooKeeper is [UP]
root@stlrx2540m1-108:/data/confluent/confluent-6.2.0/bin#
```

12. Configure the access ID and secret key in the `/root/.aws/credentials` file.

```
root@stlrx2540m1-108:~# cat /root/.aws/credentials
[default]
aws_access_key_id = xxxxxxxxxxxx
aws_secret_access_key = xxxxxxxxxxxxxxxxxxxxxxxxxx
root@stlrx2540m1-108:~#
```

13. Verify that the bucket is reachable.

```
root@stlrx2540m4-01:~# aws s3 –endpoint-url
http://kafkasgd.rtpppe.netapp.com:10444 ls kafkasgdbucket1-2
2021-10-29 21:04:18       1388 1
2021-10-29 21:04:20       1388 2
2021-10-29 21:04:22       1388 3
root@stlrx2540m4-01:~#
```

14. Configure the s3-sink properties file for s3 and bucket configuration.

```
root@stlrx2540m1-108:~# cat /data/confluent/confluent-
6.2.0/share/confluent-hub-components/confluentinc-kafka-connect-
s3/etc/quickstart-s3.properties | grep -v ^#
name=s3-sink
connector.class=io.confluent.connect.s3.S3SinkConnector
tasks.max=1
topics=s3_testtopic
s3.region=us-west-2
s3.bucket.name=kafkasgdbucket1-2
store.url=http://kafkasgd.rtpppe.netapp.com:10444/
s3.part.size=5242880
flush.size=3
storage.class=io.confluent.connect.s3.storage.S3Storage
format.class=io.confluent.connect.s3.format.avro.AvroFormat
partitioner.class=io.confluent.connect.storage.partitioner.DefaultPartit
ioner
schema.compatibility=NONE
root@stlrx2540m1-108:~#
```

15. Import a few records to the s3 bucket.

```
kafka-avro-console-producer --broker-list localhost:9092 --topic
s3_topic \
--property
value.schema='{"type":"record","name":"myrecord","fields":[{"name":"f1",
"type":"string"}]}'
{"f1": "value1"}
{"f1": "value2"}
{"f1": "value3"}
{"f1": "value4"}
{"f1": "value5"}
{"f1": "value6"}
{"f1": "value7"}
{"f1": "value8"}
{"f1": "value9"}
```

16. Load the s3-sink connector.

```
root@stlrx2540m1-108:~# confluent local services connect connector load
s3-sink  --config /data/confluent/confluent-6.2.0/share/confluent-hub-
components/confluentinc-kafka-connect-s3/etc/quickstart-s3.properties
The local commands are intended for a single-node development
environment only,
NOT for production usage.
https://docs.confluent.io/current/cli/index.html
{
  "name": "s3-sink",
  "config": {
    "connector.class": "io.confluent.connect.s3.S3SinkConnector",
    "flush.size": "3",
    "format.class": "io.confluent.connect.s3.format.avro.AvroFormat",
    "partitioner.class":
"io.confluent.connect.storage.partitioner.DefaultPartitioner",
    "s3.bucket.name": "kafkasgdbucket1-2",
    "s3.part.size": "5242880",
    "s3.region": "us-west-2",
    "schema.compatibility": "NONE",
    "storage.class": "io.confluent.connect.s3.storage.S3Storage",
    "store.url": "http://kafkasgd.rtpppe.netapp.com:10444/",
    "tasks.max": "1",
    "topics": "s3_testtopic",
    "name": "s3-sink"
  },
  "tasks": [],
  "type": "sink"
}
root@stlrx2540m1-108:~#
```

17. Check the s3-sink status.

```
root@stlrx2540m1-108:~# confluent local services connect connector
status s3-sink
The local commands are intended for a single-node development
environment only,
NOT for production usage.
https://docs.confluent.io/current/cli/index.html
{
  "name": "s3-sink",
  "connector": {
    "state": "RUNNING",
    "worker_id": "10.63.150.185:8083"
  },
  "tasks": [
    {
      "id": 0,
      "state": "RUNNING",
      "worker_id": "10.63.150.185:8083"
    }
  ],
  "type": "sink"
}
root@stlrx2540m1-108:~#
```

18. Check the log to make sure that s3-sink is ready to accept topics.

```
root@stlrx2540m1-108:~# confluent local services connect log
```

19. Check the topics in Kafka.

```
kafka-topics --list --bootstrap-server localhost:9092
…
connect-configs
connect-offsets
connect-statuses
default_ksql_processing_log
s3_testtopic
s3_topic
s3_topic_new
root@stlrx2540m1-108:~#
```

20. Check the objects in the s3 bucket.

```
root@stlrx2540m1-108:~# aws s3 --endpoint-url
http://kafkasgd.rtpppe.netapp.com:10444 ls --recursive kafkasgdbucket1-
2/topics/
2021-10-29 21:24:00        213
topics/s3_testtopic/partition=0/s3_testtopic+0+0000000000.avro
2021-10-29 21:24:00        213
topics/s3_testtopic/partition=0/s3_testtopic+0+0000000003.avro
2021-10-29 21:24:00        213
topics/s3_testtopic/partition=0/s3_testtopic+0+0000000006.avro
2021-10-29 21:24:08        213
topics/s3_testtopic/partition=0/s3_testtopic+0+0000000009.avro
2021-10-29 21:24:08        213
topics/s3_testtopic/partition=0/s3_testtopic+0+0000000012.avro
2021-10-29 21:24:09        213
topics/s3_testtopic/partition=0/s3_testtopic+0+0000000015.avro
root@stlrx2540m1-108:~#
```

21. To verify the contents, copy each file from S3 to your local filesystem by running the following command:

```
root@stlrx2540m1-108:~# aws s3 --endpoint-url
http://kafkasgd.rtpppe.netapp.com:10444 cp s3://kafkasgdbucket1-
2/topics/s3_testtopic/partition=0/s3_testtopic+0+0000000000.avro
tes.avro
download: s3://kafkasgdbucket1-
2/topics/s3_testtopic/partition=0/s3_testtopic+0+0000000000.avro to
./tes.avro
root@stlrx2540m1-108:~#
```

22. To print the records, use avro-tools-1.11.0.1.jar (available in the Apache Archives).

```
root@stlrx2540m1-108:~# java -jar /usr/src/avro-tools-1.11.0.1.jar
tojson tes.avro
21/10/30 00:20:24 WARN util.NativeCodeLoader: Unable to load native-
hadoop library for your platform... using builtin-java classes where
applicable
{"f1":"value1"}
{"f1":"value2"}
{"f1":"value3"}
root@stlrx2540m1-108:~#
```

Next: Confluent self-rebalancing clusters.

Copyright information

Trademark information