Red Hat AMQ Streams 2.6

Using the AMQ Streams Kafka Bridge

Use the AMQ Streams Kafka Bridge to connect with a Kafka cluster

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Legal Notice

Abstract

The AMQ Streams Kafka Bridge provides a RESTful interface for HTTP-based clients to interact with a Kafka cluster.

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MAKING OPEN SOURCE MORE INCLUSIVE

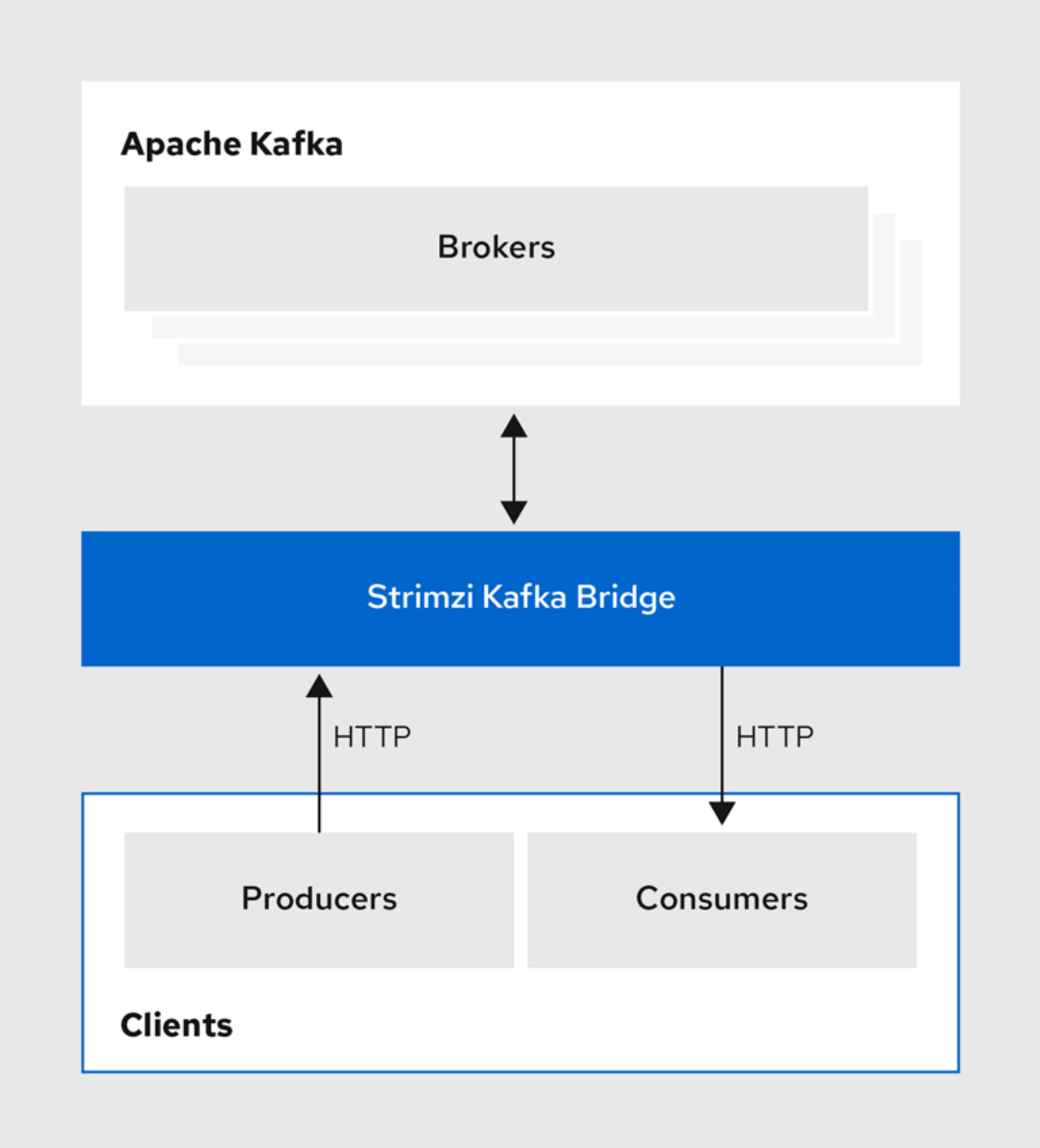
Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see our CTO Chris Wright's message.

CHAPTER 1. KAFKA BRIDGE OVERVIEW

Use the AMQ Streams Kafka Bridge to make HTTP requests to a Kafka cluster.

You can use the Kafka Bridge to integrate HTTP client applications with your Kafka cluster.

HTTP client integration



1.1. RUNNING THE KAFKA BRIDGE

Install the AMQ Streams Kafka Bridge to run in the same environment as your Kafka cluster.

You can download and add the Kafka Bridge installation artifacts to your host machine. To try out the Kafka Bridge in your local environment, see the Kafka Bridge quickstart.

It's important to note that each instance of the Kafka Bridge maintains its own set of in-memory consumers (and subscriptions) that connect to the Kafka Brokers on behalf of the HTTP clients. This means that each HTTP client must maintain affinity to the same Kafka Bridge instance in order to access any subscriptions that are created. Additionally, when an instance of the Kafka Bridge restarts, the in-memory consumers and subscriptions are lost. **It is the responsibility of the HTTP client to recreate any consumers and subscriptions if the Kafka Bridge restarts.**

1.1.1. Running the Kafka Bridge on OpenShift

If you deployed AMQ Streams on OpenShift, you can use the AMQ Streams Cluster Operator to deploy the Kafka Bridge to the OpenShift cluster. Configure and deploy the Kafka Bridge as a **KafkaBridge** resource. You'll need a running Kafka cluster that was deployed by the Cluster Operator in an OpenShift namespace. You can configure your deployment to access the Kafka Bridge outside the OpenShift cluster.

HTTP clients must maintain affinity to the same instance of the Kafka Bridge to access any consumers or subscriptions that they create. Hence, running multiple replicas of the Kafka Bridge per OpenShift Deployment is not recommended. If the Kafka Bridge pod restarts (for instance, due to OpenShift relocating the workload to another node), the HTTP client must recreate any consumers or subscriptions.

For information on deploying and configuring the Kafka Bridge as a **KafkaBridge** resource, see the AMQ Streams documentation.

1.2. KAFKA BRIDGE INTERFACE

The Kafka Bridge provides a RESTful interface that allows HTTP-based clients to interact with a Kafka cluster. It offers the advantages of a web API connection to AMQ Streams, without the need for client applications to interpret the Kafka protocol.

The API has two main resources — **consumers** and **topics** — that are exposed and made accessible through endpoints to interact with consumers and producers in your Kafka cluster. The resources relate only to the Kafka Bridge, not the consumers and producers connected directly to Kafka.

1.2.1. HTTP requests

The Kafka Bridge supports HTTP requests to a Kafka cluster, with methods to:

- Send messages to a topic.
- Retrieve messages from topics.
- Retrieve a list of partitions for a topic.
- Create and delete consumers.
- Subscribe consumers to topics, so that they start receiving messages from those topics.
- Retrieve a list of topics that a consumer is subscribed to.
- Unsubscribe consumers from topics.

- Assign partitions to consumers.
- Commit a list of consumer offsets.
- Seek on a partition, so that a consumer starts receiving messages from the first or last offset position, or a given offset position.

The methods provide JSON responses and HTTP response code error handling. Messages can be sent in JSON or binary formats.

Clients can produce and consume messages without the requirement to use the native Kafka protocol.

Additional resources

- AMQ Streams Kafka Bridge API reference

1.3. KAFKA BRIDGE OPENAPI SPECIFICATION

Kafka Bridge APIs use the OpenAPI Specification (OAS). OAS provides a standard framework for describing and implementing HTTP APIs.

The Kafka Bridge OpenAPI specification is in JSON format. You can find the OpenAPI JSON files in the **src/main/resources/** folder of the Kafka Bridge source download files. The download files are available from the Customer Portal.

You can also use the **GET /openapi** method to retrieve the OpenAPI v2 specification in JSON format.

Additional resources

- OpenAPI initiative

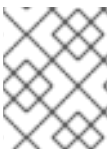
1.4. SECURING CONNECTIVITY TO THE KAFKA CLUSTER

You can configure the following between the Kafka Bridge and your Kafka cluster:

- TLS or SASL-based authentication
- A TLS-encrypted connection

You configure the Kafka Bridge for authentication through its properties file.

You can also use ACLs in Kafka brokers to restrict the topics that can be consumed and produced using the Kafka Bridge.



NOTE

Use the **KafkaBridge** resource to configure authentication when you are running the Kafka Bridge on OpenShift.

1.5. SECURING THE KAFKA BRIDGE HTTP INTERFACE

Authentication and encryption between HTTP clients and the Kafka Bridge is not supported directly by the Kafka Bridge. Requests sent from clients to the Kafka Bridge are sent without authentication or encryption. Requests must use HTTP rather than HTTPS.

You can combine the Kafka Bridge with the following tools to secure it:

- Network policies and firewalls that define which pods can access the Kafka Bridge
- Reverse proxies (for example, OAuth 2.0)
- API gateways

1.6. REQUESTS TO THE KAFKA BRIDGE

Specify data formats and HTTP headers to ensure valid requests are submitted to the Kafka Bridge.

1.6.1. Content Type headers

API request and response bodies are always encoded as JSON.

- When performing consumer operations, **POST** requests must provide the following **Content-Type** header if there is a non-empty body:

```
Content-Type: application/vnd.kafka.v2+json
```

- When performing producer operations, **POST** requests must provide **Content-Type** headers specifying the *embedded data format* of the messages produced. This can be either **json** or **binary**.

Embedded data format	Content-Type header
JSON	**Content-Type: application/vnd.kafka.json.v2+json**
Binary	**Content-Type: application/vnd.kafka.binary.v2+json**

The embedded data format is set per consumer, as described in the next section.

The **Content-Type** must *not* be set if the **POST** request has an empty body. An empty body can be used to create a consumer with the default values.

1.6.2. Embedded data format

The embedded data format is the format of the Kafka messages that are transmitted, over HTTP, from a producer to a consumer using the Kafka Bridge. Two embedded data formats are supported: JSON and binary.

When creating a consumer using the /**consumers**/***groupid*** endpoint, the **POST** request body must specify an embedded data format of either JSON or binary. This is specified in the **format** field, for example:

```
{
  "name": "my-consumer",
  "format": "binary", (1)
  # ...
}
```

(1) A binary embedded data format.

The embedded data format specified when creating a consumer must match the data format of the Kafka messages it will consume.

If you choose to specify a binary embedded data format, subsequent producer requests must provide the binary data in the request body as Base64-encoded strings. For example, when sending messages using the **/topics/*topicname*** endpoint, **records.value** must be encoded in Base64:

```
{
  "records": [
    {
      "key": "my-key",
      "value": "ZWR3YXJkdGhldGhyZWVsZWdnZWRjYXQ="
    },
  ]
}
```

Producer requests must also provide a **Content-Type** header that corresponds to the embedded data format, for example, **Content-Type: application/vnd.kafka.binary.v2+json**.

1.6.3. Message format

When sending messages using the **/topics** endpoint, you enter the message payload in the request body, in the **records** parameter.

The **records** parameter can contain any of these optional fields:

- Message **headers**
- Message **key**
- Message **value**
- Destination **partition**

Example POST request to /topics

```
curl -X POST \
  http://localhost:8080/topics/my-topic \
  -H 'content-type: application/vnd.kafka.json.v2+json' \
  -d '{
    "records": [
        {
            "key": "my-key",
            "value": "sales-lead-0001",
            "partition": 2,
            "headers": [
              {
                "key": "key1",
                "value": "QXBhY2hlIEthZmthIGlzIHRoZSBib21iIQ==" (1)
              }
            ]
        }
    ]
}'
```

1 The header value in binary format and encoded as Base64.

1.6.4. Accept headers

After creating a consumer, all subsequent GET requests must provide an **Accept** header in the following format:

```
Accept: application/vnd.kafka.EMBEDDED-DATA-FORMAT.v2+json
```

The **EMBEDDED-DATA-FORMAT** is either **json** or **binary**.

For example, when retrieving records for a subscribed consumer using an embedded data format of JSON, include this Accept header:

```
Accept: application/vnd.kafka.json.v2+json
```

1.7. CORS

In general, it is not possible for an HTTP client to issue requests across different domains.

For example, suppose the Kafka Bridge you deployed alongside a Kafka cluster is accessible using the **http://my-bridge.io** domain. HTTP clients can use the URL to interact with the Kafka Bridge and exchange messages through the Kafka cluster. However, your client is running as a web application in the **http://my-web-application.io** domain. The client (source) domain is different from the Kafka Bridge (target) domain. Because of same-origin policy restrictions, requests from the client fail. You can avoid this situation by using Cross-Origin Resource Sharing (CORS).

CORS allows for *simple* and *preflighted* requests between origin sources on different domains.

Simple requests are suitable for standard requests using **GET**, **HEAD**, **POST** methods.

A preflighted request sends a *HTTP OPTIONS* request as an initial check that the actual request is safe to send. On confirmation, the actual request is sent. Preflight requests are suitable for methods that require greater safeguards, such as **PUT** and **DELETE**, and use non-standard headers.

All requests require an *origins* value in their header, which is the source of the HTTP request.

CORS allows you to specify allowed methods and originating URLs for accessing the Kafka cluster in your Kafka Bridge HTTP configuration.

Example CORS configuration for Kafka Bridge

```
# ...
http.cors.enabled=true
http.cors.allowedOrigins=http://my-web-application.io
http.cors.allowedMethods=GET,POST,PUT,DELETE,OPTIONS,PATCH
```

1.7.1. Simple request

For example, this simple request header specifies the origin as **http://my-web-application.io**.

```
Origin: http://my-web-application.io
```

The header information is added to the request to consume records.

```
curl -v -X GET HTTP-BRIDGE-ADDRESS/consumers/my-group/instances/my-consumer/records \
-H 'Origin: http://my-web-application.io'\
-H 'content-type: application/vnd.kafka.v2+json'
```

In the response from the Kafka Bridge, an **Access-Control-Allow-Origin** header is returned. It contains the list of domains from where HTTP requests can be issued to the bridge.

```
HTTP/1.1 200 OK
Access-Control-Allow-Origin: * (1)
```

(1) Returning an asterisk (*) shows the resource can be accessed by any domain.

1.7.2. Preflighted request

An initial preflight request is sent to Kafka Bridge using an **OPTIONS** method. The *HTTP OPTIONS* request sends header information to check that Kafka Bridge will allow the actual request.

Here the preflight request checks that a **POST** request is valid from **http://my-web-application.io**.

```
OPTIONS /my-group/instances/my-consumer/subscription HTTP/1.1
Origin: http://my-web-application.io
Access-Control-Request-Method: POST (1)
Access-Control-Request-Headers: Content-Type (2)
```

(1) Kafka Bridge is alerted that the actual request is a **POST** request.

(2) The actual request will be sent with a **Content-Type** header.

OPTIONS is added to the header information of the preflight request.

```
curl -v -X OPTIONS -H 'Origin: http://my-web-application.io' \
-H 'Access-Control-Request-Method: POST' \
-H 'content-type: application/vnd.kafka.v2+json'
```

Kafka Bridge responds to the initial request to confirm that the request will be accepted. The response header returns allowed origins, methods and headers.

```
HTTP/1.1 200 OK
Access-Control-Allow-Origin: http://my-web-application.io
Access-Control-Allow-Methods: GET,POST,PUT,DELETE,OPTIONS,PATCH
Access-Control-Allow-Headers: content-type
```

If the origin or method is rejected, an error message is returned.

The actual request does not require **Access-Control-Request-Method** header, as it was confirmed in the preflight request, but it does require the origin header.

```
curl -v -X POST HTTP-BRIDGE-ADDRESS/topics/bridge-topic \
-H 'Origin: http://my-web-application.io' \
-H 'content-type: application/vnd.kafka.v2+json'
```

The response shows the originating URL is allowed.

```
HTTP/1.1 200 OK
Access-Control-Allow-Origin: http://my-web-application.io
```

Additional resources

- Fetch CORS specification

1.8. CONFIGURING LOGGERS FOR THE KAFKA BRIDGE

You can set a different log level for each operation that is defined by the Kafka Bridge OpenAPI specification.

Each operation has a corresponding API endpoint through which the bridge receives requests from HTTP clients. You can change the log level on each endpoint to produce more or less fine-grained logging information about the incoming and outgoing HTTP requests.

Loggers are defined in the **log4j2.properties** file, which has the following default configuration for **healthy** and **ready** endpoints:

```
logger.healthy.name = http.openapi.operation.healthy
logger.healthy.level = WARN
logger.ready.name = http.openapi.operation.ready
logger.ready.level = WARN
```

The log level of all other operations is set to **INFO** by default. Loggers are formatted as follows:

```
logger.<operation_id>.name = http.openapi.operation.<operation_id>
logger.<operation_id>_level = _<LOG_LEVEL>
```

Where ***<operation_id>*** is the identifier of the specific operation.

List of operations defined by the OpenAPI specification

- **createConsumer**
- **deleteConsumer**
- **subscribe**
- **unsubscribe**
- **poll**
- **assign**
- **commit**
- **send**

- **sendToPartition**
- **seekToBeginning**
- **seekToEnd**
- **seek**
- **healthy**
- **ready**
- **openapi**

Where *<LOG_LEVEL>* is the logging level as defined by log4j2 (i.e. **INFO**, **DEBUG**, ...).

CHAPTER 2. KAFKA BRIDGE QUICKSTART

Use this quickstart to try out the AMQ Streams Kafka Bridge in your local development environment.

You will learn how to do the following:

- Produce messages to topics and partitions in your Kafka cluster
- Create a Kafka Bridge consumer
- Perform basic consumer operations, such as subscribing the consumer to topics and retrieving the messages that you produced

In this quickstart, HTTP requests are formatted as curl commands that you can copy and paste to your terminal.

Ensure you have the prerequisites and then follow the tasks in the order provided in this chapter.

In this quickstart, you will produce and consume messages in JSON format.

Prerequisites for the quickstart

- A Kafka cluster is running on the host machine.

2.1. DOWNLOADING A KAFKA BRIDGE ARCHIVE

A zipped distribution of the AMQ Streams Kafka Bridge is available for download.

Procedure

- Download the latest version of the AMQ Streams Kafka Bridge archive from the Customer Portal.

2.2. INSTALLING THE KAFKA BRIDGE

Use the script provided with the Kafka Bridge archive to install the Kafka Bridge. The **application.properties** file provided with the installation archive provides default configuration settings.

The following default property values configure the Kafka Bridge to listen for requests on port 8080.

Default configuration properties

```
http.host=0.0.0.0
http.port=8080
```

Prerequisites

- The Kafka Bridge installation archive is downloaded

Procedure

1. If you have not already done so, unzip the Kafka Bridge installation archive to any directory.

2. Run the Kafka Bridge script using the configuration properties as a parameter:
For example:

```
./bin/kafka_bridge_run.sh --config-file=<path>/application.properties
```

3. Check to see that the installation was successful in the log.

```
HTTP-Kafka Bridge started and listening on port 8080
HTTP-Kafka Bridge bootstrap servers localhost:9092
```

What to do next

- Produce messages to topics and partitions .

2.3. PRODUCING MESSAGES TO TOPICS AND PARTITIONS

Use the Kafka Bridge to produce messages to a Kafka topic in JSON format by using the topics endpoint.

You can produce messages to topics in JSON format by using the topics endpoint. You can specify destination partitions for messages in the request body. The partitions endpoint provides an alternative method for specifying a single destination partition for all messages as a path parameter.

In this procedure, messages are produced to a topic called **bridge-quickstart-topic**.

Prerequisites

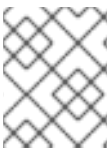
- The Kafka cluster has a topic with three partitions.
You can use the **kafka-topics.sh** utility to create topics.

  Example topic creation with three partitions

```
bin/kafka-topics.sh --bootstrap-server localhost:9092 --create --topic bridge-quickstart-topic --partitions 3 --replication-factor 1
```

  Verifying the topic was created

```
bin/kafka-topics.sh --bootstrap-server localhost:9092 --describe --topic bridge-quickstart-topic
```



NOTE

If you deployed AMQ Streams on OpenShift, you can create a topic using the **KafkaTopic** custom resource.

Procedure

1. Using the Kafka Bridge, produce three messages to the topic you created:

```
curl -X POST \
  http://localhost:8080/topics/bridge-quickstart-topic \
  -H 'content-type: application/vnd.kafka.json.v2+json' \
```

```
 -d '{
   "records": [
      {
         "key": "my-key",
         "value": "sales-lead-0001"
      },
      {
         "value": "sales-lead-0002",
         "partition": 2
      },
      {
         "value": "sales-lead-0003"
      }
   ]
}'
```

- **sales-lead-0001** is sent to a partition based on the hash of the key.
- **sales-lead-0002** is sent directly to partition 2.
- **sales-lead-0003** is sent to a partition in the **bridge-quickstart-topic** topic using a round-robin method.

2. If the request is successful, the Kafka Bridge returns an **offsets** array, along with a **200** code and a **content-type** header of **application/vnd.kafka.v2+json**. For each message, the **offsets** array describes:
   - The partition that the message was sent to
   - The current message offset of the partition

   Example response

```
#...
{
  "offsets":[
    {
      "partition":0,
      "offset":0
    },
    {
      "partition":2,
      "offset":0
    },
    {
      "partition":0,
      "offset":1
    }
  ]
}
```

Additional topic requests

Make other curl requests to find information on topics and partitions.

List topics

-

```
curl -X GET \
  http://localhost:8080/topics
```

Example response

```
[
  "__strimzi_store_topic",
  "__strimzi-topic-operator-kstreams-topic-store-changelog",
  "bridge-quickstart-topic",
  "my-topic"
]
```

Get topic configuration and partition details

```
curl -X GET \
  http://localhost:8080/topics/bridge-quickstart-topic
```

Example response

```
{
  "name": "bridge-quickstart-topic",
  "configs": {
    "compression.type": "producer",
    "leader.replication.throttled.replicas": "",
    "min.insync.replicas": "1",
    "message.downconversion.enable": "true",
    "segment.jitter.ms": "0",
    "cleanup.policy": "delete",
    "flush.ms": "9223372036854775807",
    "follower.replication.throttled.replicas": "",
    "segment.bytes": "1073741824",
    "retention.ms": "604800000",
    "flush.messages": "9223372036854775807",
    "message.format.version": "2.8-IV1",
    "max.compaction.lag.ms": "9223372036854775807",
    "file.delete.delay.ms": "60000",
    "max.message.bytes": "1048588",
    "min.compaction.lag.ms": "0",
    "message.timestamp.type": "CreateTime",
    "preallocate": "false",
    "index.interval.bytes": "4096",
    "min.cleanable.dirty.ratio": "0.5",
    "unclean.leader.election.enable": "false",
    "retention.bytes": "-1",
    "delete.retention.ms": "86400000",
    "segment.ms": "604800000",
    "message.timestamp.difference.max.ms": "9223372036854775807",
    "segment.index.bytes": "10485760"
  },
  "partitions": [
    {
      "partition": 0,
      "leader": 0,
      "replicas": [
```

```
      {
        "broker": 0,
        "leader": true,
        "in_sync": true
      },
      {
        "broker": 1,
        "leader": false,
        "in_sync": true
      },
      {
        "broker": 2,
        "leader": false,
        "in_sync": true
      }
    ]
  },
  {
    "partition": 1,
    "leader": 2,
    "replicas": [
      {
        "broker": 2,
        "leader": true,
        "in_sync": true
      },
      {
        "broker": 0,
        "leader": false,
        "in_sync": true
      },
      {
        "broker": 1,
        "leader": false,
        "in_sync": true
      }
    ]
  },
  {
    "partition": 2,
    "leader": 1,
    "replicas": [
      {
        "broker": 1,
        "leader": true,
        "in_sync": true
      },
      {
        "broker": 2,
        "leader": false,
        "in_sync": true
      },
      {
        "broker": 0,
        "leader": false,
        "in_sync": true
```

```
        }
      ]
    }
  ]
}
```

List the partitions of a specific topic

```
curl -X GET \
  http://localhost:8080/topics/bridge-quickstart-topic/partitions
```

Example response

```
[
  {
    "partition": 0,
    "leader": 0,
    "replicas": [
      {
        "broker": 0,
        "leader": true,
        "in_sync": true
      },
      {
        "broker": 1,
        "leader": false,
        "in_sync": true
      },
      {
        "broker": 2,
        "leader": false,
        "in_sync": true
      }
    ]
  },
  {
    "partition": 1,
    "leader": 2,
    "replicas": [
      {
        "broker": 2,
        "leader": true,
        "in_sync": true
      },
      {
        "broker": 0,
        "leader": false,
        "in_sync": true
      },
      {
        "broker": 1,
        "leader": false,
        "in_sync": true
      }
    ]
```

```
  },
  {
    "partition": 2,
    "leader": 1,
    "replicas": [
      {
        "broker": 1,
        "leader": true,
        "in_sync": true
      },
      {
        "broker": 2,
        "leader": false,
        "in_sync": true
      },
      {
        "broker": 0,
        "leader": false,
        "in_sync": true
      }
    ]
  }
]
```

List the details of a specific topic partition

```
curl -X GET \
  http://localhost:8080/topics/bridge-quickstart-topic/partitions/0
```

Example response

```
{
  "partition": 0,
  "leader": 0,
  "replicas": [
    {
      "broker": 0,
      "leader": true,
      "in_sync": true
    },
    {
      "broker": 1,
      "leader": false,
      "in_sync": true
    },
    {
      "broker": 2,
      "leader": false,
      "in_sync": true
    }
  ]
}
```

List the offsets of a specific topic partition

```
curl -X GET \
  http://localhost:8080/topics/bridge-quickstart-topic/partitions/0/offsets
```

Example response

```
{
  "beginning_offset": 0,
  "end_offset": 1
}
```

What to do next

After producing messages to topics and partitions, create a Kafka Bridge consumer .

Additional resources

- POST /topics/{topicname}
- POST /topics/{topicname}/partitions/{partitionid}

2.4. CREATING A KAFKA BRIDGE CONSUMER

Before you can perform any consumer operations in the Kafka cluster, you must first create a consumer by using the consumers endpoint. The consumer is referred to as a *Kafka Bridge consumer*.

Procedure

1. Create a Kafka Bridge consumer in a new consumer group named **bridge-quickstart-consumer-group**:

```
curl -X POST http://localhost:8080/consumers/bridge-quickstart-consumer-group \
  -H 'content-type: application/vnd.kafka.v2+json' \
  -d '{
    "name": "bridge-quickstart-consumer",
    "auto.offset.reset": "earliest",
    "format": "json",
    "enable.auto.commit": false,
    "fetch.min.bytes": 512,
    "consumer.request.timeout.ms": 30000
  }'
```

   - The consumer is named **bridge-quickstart-consumer** and the embedded data format is set as **json**.
   - Some basic configuration settings are defined.
   - The consumer will not commit offsets to the log automatically because the **enable.auto.commit** setting is **false**. You will commit the offsets manually later in this quickstart.
     If the request is successful, the Kafka Bridge returns the consumer ID (**instance_id**) and base URL (**base_uri**) in the response body, along with a **200** code.

     Example response

```
#...
{
  "instance_id": "bridge-quickstart-consumer",
  "base_uri":"http://<bridge_id>-bridge-service:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer"
}
```

2. Copy the base URL (**base_uri**) to use in the other consumer operations in this quickstart.

What to do next

Now that you have created a Kafka Bridge consumer, you can subscribe it to topics .

Additional resources

- POST /consumers/{groupid}

2.5. SUBSCRIBING A KAFKA BRIDGE CONSUMER TO TOPICS

After you have created a Kafka Bridge consumer, subscribe it to one or more topics by using the subscription endpoint. When subscribed, the consumer starts receiving all messages that are produced to the topic.

Procedure

- Subscribe the consumer to the **bridge-quickstart-topic** topic that you created earlier, in Producing messages to topics and partitions :

```
curl -X POST http://localhost:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer/subscription \
  -H 'content-type: application/vnd.kafka.v2+json' \
  -d '{
    "topics": [
        "bridge-quickstart-topic"
    ]
}'
```

The **topics** array can contain a single topic (as shown here) or multiple topics. If you want to subscribe the consumer to multiple topics that match a regular expression, you can use the **topic_pattern** string instead of the **topics** array.

If the request is successful, the Kafka Bridge returns a **204** (No Content) code only.

When using an Apache Kafka client, the HTTP subscribe operation adds topics to the local consumer's subscriptions. Joining a consumer group and obtaining partition assignments occur after running multiple HTTP poll operations, starting the partition rebalance and join-group process. It's important to note that the initial HTTP poll operations may not return any records.

What to do next

After subscribing a Kafka Bridge consumer to topics, you can retrieve messages from the consumer .

Additional resources

- POST /consumers/{groupid}/instances/{name}/subscription

2.6. RETRIEVING THE LATEST MESSAGES FROM A KAFKA BRIDGE CONSUMER

Retrieve the latest messages from the Kafka Bridge consumer by requesting data from the records endpoint. In production, HTTP clients can call this endpoint repeatedly (in a loop).

Procedure

1. Produce additional messages to the Kafka Bridge consumer, as described in Producing messages to topics and partitions.
2. Submit a **GET** request to the **records** endpoint:

```
curl -X GET http://localhost:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer/records \
  -H 'accept: application/vnd.kafka.json.v2+json'
```

   After creating and subscribing to a Kafka Bridge consumer, a first GET request will return an empty response because the poll operation starts a rebalancing process to assign partitions.
3. Repeat step two to retrieve messages from the Kafka Bridge consumer.
   The Kafka Bridge returns an array of messages — describing the topic name, key, value, partition, and offset — in the response body, along with a **200** code. Messages are retrieved from the latest offset by default.

```
HTTP/1.1 200 OK
content-type: application/vnd.kafka.json.v2+json
#...
[
  {
    "topic":"bridge-quickstart-topic",
    "key":"my-key",
    "value":"sales-lead-0001",
    "partition":0,
    "offset":0
  },
  {
    "topic":"bridge-quickstart-topic",
    "key":null,
    "value":"sales-lead-0003",
    "partition":0,
    "offset":1
  },
#...
```

NOTE

If an empty response is returned, produce more records to the consumer as described in Producing messages to topics and partitions , and then try retrieving messages again.

What to do next

After retrieving messages from a Kafka Bridge consumer, try committing offsets to the log .

Additional resources

- GET /consumers/{groupid}/instances/{name}/records

2.7. COMMITING OFFSETS TO THE LOG

Use the offsets endpoint to manually commit offsets to the log for all messages received by the Kafka Bridge consumer. This is required because the Kafka Bridge consumer that you created earlier, in Creating a Kafka Bridge consumer , was configured with the **enable.auto.commit** setting as **false**.

Procedure

- Commit offsets to the log for the **bridge-quickstart-consumer**:

```
curl -X POST http://localhost:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer/offsets
```

Because no request body is submitted, offsets are committed for all the records that have been received by the consumer. Alternatively, the request body can contain an array (OffsetCommitSeekList) that specifies the topics and partitions that you want to commit offsets for.

If the request is successful, the Kafka Bridge returns a **204** code only.

What to do next

After committing offsets to the log, try out the endpoints for seeking to offsets.

Additional resources

- POST /consumers/{groupid}/instances/{name}/offsets

2.8. SEEKING TO OFFSETS FOR A PARTITION

Use the positions endpoints to configure the Kafka Bridge consumer to retrieve messages for a partition from a specific offset, and then from the latest offset. This is referred to in Apache Kafka as a seek operation.

Procedure

1. Seek to a specific offset for partition 0 of the **quickstart-bridge-topic** topic:

```
curl -X POST http://localhost:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer/positions \
  -H 'content-type: application/vnd.kafka.v2+json' \
  -d '{
    "offsets": [
        {
            "topic": "bridge-quickstart-topic",
            "partition": 0,
            "offset": 2
        }
    ]
}'
```

If the request is successful, the Kafka Bridge returns a **204** code only.

2. Submit a **GET** request to the **records** endpoint:

```
curl -X GET http://localhost:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer/records \
  -H 'accept: application/vnd.kafka.json.v2+json'
```

The Kafka Bridge returns messages from the offset that you seeked to.

3. Restore the default message retrieval behavior by seeking to the last offset for the same partition. This time, use the positions/end endpoint.

```
curl -X POST http://localhost:8080/consumers/bridge-quickstart-consumer-group/instances/bridge-quickstart-consumer/positions/end \
  -H 'content-type: application/vnd.kafka.v2+json' \
  -d '{
    "partitions": [
      {
        "topic": "bridge-quickstart-topic",
        "partition": 0
      }
    ]
}'
```

If the request is successful, the Kafka Bridge returns another **204** code.

NOTE

You can also use the positions/beginning endpoint to seek to the first offset for one or more partitions.

What to do next

In this quickstart, you have used the AMQ Streams Kafka Bridge to perform several common operations on a Kafka cluster. You can now delete the Kafka Bridge consumer that you created earlier.

Additional resources

- POST /consumers/{groupid}/instances/{name}/positions
- POST /consumers/{groupid}/instances/{name}/positions/beginning
- POST /consumers/{groupid}/instances/{name}/positions/end

2.9. DELETING A KAFKA BRIDGE CONSUMER

Delete the Kafka Bridge consumer that you used throughout this quickstart.

Procedure

- Delete the Kafka Bridge consumer by sending a **DELETE** request to the instances endpoint.

```
curl -X DELETE http://localhost:8080/consumers/bridge-quickstart-consumer-
group/instances/bridge-quickstart-consumer
```

If the request is successful, the Kafka Bridge returns a **204** code.

Additional resources

- DELETE /consumers/{groupid}/instances/{name}

CHAPTER 3. KAFKA BRIDGE CONFIGURATION

Configure a deployment of the Kafka Bridge using configuration properties. Configure Kafka and specify the HTTP connection details needed to be able to interact with Kafka. You can also use configuration properties to enable and use distributed tracing with the Kafka Bridge. Distributed tracing allows you to track the progress of transactions between applications in a distributed system.

NOTE

Use the **KafkaBridge** resource to configure properties when you are running the Kafka Bridge on OpenShift.

3.1. CONFIGURING KAFKA BRIDGE PROPERTIES

This procedure describes how to configure the Kafka and HTTP connection properties used by the Kafka Bridge.

You configure the Kafka Bridge, as any other Kafka client, using appropriate prefixes for Kafka-related properties.

- **kafka.** for general configuration that applies to producers and consumers, such as server connection and security.
- **kafka.consumer.** for consumer-specific configuration passed only to the consumer.
- **kafka.producer.** for producer-specific configuration passed only to the producer.

As well as enabling HTTP access to a Kafka cluster, HTTP properties provide the capability to enable and define access control for the Kafka Bridge through Cross-Origin Resource Sharing (CORS). CORS is a HTTP mechanism that allows browser access to selected resources from more than one origin. To configure CORS, you define a list of allowed resource origins and HTTP methods to access them. Additional HTTP headers in requests describe the CORS origins that are permitted access to the Kafka cluster.

Prerequisites

- The Kafka Bridge installation archive is downloaded

Procedure

1. Edit the **application.properties** file provided with the Kafka Bridge installation archive.
   Use the properties file to specify Kafka and HTTP-related properties.

   a. Configure standard Kafka-related properties, including properties specific to the Kafka consumers and producers.
      Use:

      - **kafka.bootstrap.servers** to define the host/port connections to the Kafka cluster
      - **kafka.producer.acks** to provide acknowledgments to the HTTP client
      - **kafka.consumer.auto.offset.reset** to determine how to manage reset of the offset in Kafka
        For more information on configuration of Kafka properties, see the Apache Kafka website

b. Configure HTTP-related properties to enable HTTP access to the Kafka cluster. For example:

```
bridge.id=my-bridge
http.host=0.0.0.0
http.port=8080 1
http.cors.enabled=true 2
http.cors.allowedOrigins=https://strimzi.io 3
http.cors.allowedMethods=GET,POST,PUT,DELETE,OPTIONS,PATCH 4
```

1. The default HTTP configuration for the Kafka Bridge to listen on port 8080.
2. Set to **true** to enable CORS.
3. Comma-separated list of allowed CORS origins. You can use a URL or a Java regular expression.
4. Comma-separated list of allowed HTTP methods for CORS.

2. Save the configuration file.

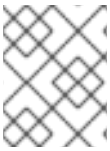
3.2. CONFIGURING DISTRIBUTED TRACING

Enable distributed tracing to trace messages consumed and produced by the Kafka Bridge, and HTTP requests from client applications.

Properties to enable tracing are present in the **application.properties** file. To enable distributed tracing, do the following:

- Set the **bridge.tracing** property value to enable the tracing you want to use. The only possible value is **opentelemetry**.
- Set environment variables for tracing.

With the default configuration, OpenTelemetry tracing uses OTLP as the exporter protocol. By configuring the OTLP endpoint, you can still use a Jaeger backend instance to get traces.



NOTE

Jaeger has supported the OTLP protocol since version 1.35. Older Jaeger versions cannot get traces using the OTLP protocol.

OpenTelemetry defines an API specification for collecting tracing data as *spans* of metrics data. Spans represent a specific operation. A trace is a collection of one or more spans.

Traces are generated when the Kafka Bridge does the following:

- Sends messages from Kafka to consumer HTTP clients
- Receives messages from producer HTTP clients to send to Kafka

Jaeger implements the required APIs and presents visualizations of the trace data in its user interface for analysis.

To have end-to-end tracing, you must configure tracing in your HTTP clients.

CAUTION

AMQ Streams no longer supports OpenTracing. If you were previously using OpenTracing with the **bridge.tracing=jaeger** option, we encourage you to transition to using OpenTelemetry instead.

Prerequisites

- The Kafka Bridge installation archive is downloaded .

Procedure

1. Edit the **application.properties** file provided with the Kafka Bridge installation archive. Use the **bridge.tracing** property to enable the tracing you want to use.

   Example configuration to enable OpenTelemetry

   ```
   bridge.tracing=opentelemetry 1
   ```

   1 The property for enabling OpenTelemetry is uncommented by removing the **#** at the beginning of the line.

   With tracing enabled, you initialize tracing when you run the Kafka Bridge script.

2. Save the configuration file.

3. Set the environment variables for tracing.

   Environment variables for OpenTelemetry

   ```
   OTEL_SERVICE_NAME=my-tracing-service 1
   OTEL_EXPORTER_OTLP_ENDPOINT=http://localhost:4317 2
   ```

   1 The name of the OpenTelemetry tracer service.

   2 The gRPC-based OTLP endpoint that listens for spans on port 4317.

4. Run the Kafka Bridge script with the property enabled for tracing:

   Running the Kafka Bridge with OpenTelemetry enabled

   ```
   ./bin/kafka_bridge_run.sh --config-file=<path>/application.properties
   ```

   The internal consumers and producers of the Kafka Bridge are now enabled for tracing.

3.2.1. Specifying tracing systems with OpenTelemetry

Instead of the default OTLP tracing system, you can specify other tracing systems that are supported by OpenTelemetry.

If you want to use another tracing system with OpenTelemetry, do the following:

1. Add the library of the tracing system to the Kafka classpath.
2. Add the name of the tracing system as an additional exporter environment variable.

Additional environment variable when not using OTLP

```
OTEL_SERVICE_NAME=my-tracing-service
OTEL_TRACES_EXPORTER=zipkin (1)
OTEL_EXPORTER_ZIPKIN_ENDPOINT=http://localhost:9411/api/v2/spans (2)
```

(1) The name of the tracing system. In this example, Zipkin is specified.

(2) The endpoint of the specific selected exporter that listens for spans. In this example, a Zipkin endpoint is specified.

Additional resources

- OpenTelemetry exporter values

CHAPTER 4. AMQ STREAMS KAFKA BRIDGE API REFERENCE

4.1. OVERVIEW

The AMQ Streams Kafka Bridge provides a REST API for integrating HTTP based client applications with a Kafka cluster. You can use the API to create and manage consumers and send and receive records over HTTP rather than the native Kafka protocol.

4.1.1. Version information

Version : 0.1.0

4.1.2. Tags

- Consumers : Consumer operations to create consumers in your Kafka cluster and perform common actions, such as subscribing to topics, retrieving processed records, and committing offsets.
- Producer : Producer operations to send records to a specified topic or topic partition.
- Seek : Seek operations that enable a consumer to begin receiving messages from a given offset position.
- Topics : Topic operations to send messages to a specified topic or topic partition, optionally including message keys in requests. You can also retrieve topics and topic metadata.

4.1.3. Consumes

- **application/json**

4.1.4. Produces

- **application/json**

4.2. DEFINITIONS

4.2.1. AssignedTopicPartitions

Type : < string, < integer (int32) > array > map

4.2.2. BridgeInfo

Information about Kafka Bridge instance.

Name	Schema
bridge_version *optional*	string

4.2.3. Consumer

Name	Description	Schema
auto.offset.reset *optional*	Resets the offset position for the consumer. If set to **latest** (default), messages are read from the latest offset. If set to **earliest**, messages are read from the first offset.	string
consumer.request.timeout.ms *optional*	Sets the maximum amount of time, in milliseconds, for the consumer to wait for messages for a request. If the timeout period is reached without a response, an error is returned. Default is **30000** (30 seconds).	integer
enable.auto.commit *optional*	If set to **true** (default), message offsets are committed automatically for the consumer. If set to **false**, message offsets must be committed manually.	boolean
fetch.min.bytes *optional*	Sets the minimum amount of data, in bytes, for the consumer to receive. The broker waits until the data to send exceeds this amount. Default is **1** byte.	integer
format *optional*	The allowable message format for the consumer, which can be **binary** (default) or **json**. The messages are converted into a JSON format.	string
isolation.level *optional*	If set to **read_uncommitted** (default), all transaction records are retrieved, indpendent of any transaction outcome. If set to **read_committed**, the records from committed transactions are retrieved.	string
name *optional*	The unique name for the consumer instance. The name is unique within the scope of the consumer group. The name is used in URLs. If a name is not specified, a randomly generated name is assigned.	string

4.2.4. ConsumerRecord

Name	Schema
headers *optional*	KafkaHeaderList
offset *optional*	integer (int64)
partition *optional*	integer (int32)
topic *optional*	string

4.2.5. ConsumerRecordList

Type : < ConsumerRecord > array

4.2.6. CreatedConsumer

Name	Description	Schema
base_uri *optional*	Base URI used to construct URIs for subsequent requests against this consumer instance.	string
instance_id *optional*	Unique ID for the consumer instance in the group.	string

4.2.7. Error

Name	Schema
error_code *optional*	integer (int32)
message *optional*	string

4.2.8. KafkaHeader

Name	Description	Schema
key *required*		string
value *required*	The header value in binary format, base64-encoded **Pattern** : **"^(?:[A-Za-z0-9+/]{4})*(?:[A-Za-z0-9+/]{2}==|[A-Za-z0-9+/]{3}=)?$"**	string (byte)

4.2.9. KafkaHeaderList

Type : < KafkaHeader > array

4.2.10. OffsetCommitSeek

Name	Schema
offset *required*	integer (int64)

Name	Schema
partition *required*	integer (int32)
topic *required*	string

4.2.11. OffsetCommitSeekList

Name	Schema
offsets *optional*	< OffsetCommitSeek > array

4.2.12. OffsetRecordSent

Name	Schema
offset *optional*	integer (int64)
partition *optional*	integer (int32)

4.2.13. OffsetRecordSentList

Name	Schema
offsets *optional*	< OffsetRecordSent > array

4.2.14. OffsetsSummary

Name	Schema
beginning_offset *optional*	integer (int64)
end_offset *optional*	integer (int64)

4.2.15. Partition

Name	Schema
partition *optional*	integer (int32)
topic *optional*	string

4.2.16. PartitionMetadata

Name	Schema
leader *optional*	integer (int32)
partition *optional*	integer (int32)
replicas *optional*	< Replica > array

4.2.17. Partitions

Name	Schema
partitions *optional*	< Partition > array

4.2.18. ProducerRecord

Name	Schema
headers *optional*	KafkaHeaderList
partition *optional*	integer (int32)

4.2.19. ProducerRecordList

Name	Schema
records *optional*	< ProducerRecord > array

4.2.20. ProducerRecordToPartition

Name	Schema
headers *optional*	KafkaHeaderList

4.2.21. ProducerRecordToPartitionList

Name	Schema
records *optional*	< ProducerRecordToPartition > array

4.2.22. Replica

Name	Schema
broker *optional*	integer (int32)
in_sync *optional*	boolean
leader *optional*	boolean

4.2.23. SubscribedTopicList

Name	Schema
partitions *optional*	< AssignedTopicPartitions > array
topics *optional*	Topics

4.2.24. TopicMetadata

Name	Description	Schema
configs *optional*	Per-topic configuration overrides	< string, string > map

Name	Description	Schema
name *optional*	Name of the topic	string
partitions *optional*		< PartitionMetadata > array

4.2.25. Topics

Name	Description	Schema
topic_pattern *optional*	A regex topic pattern for matching multiple topics	string
topics *optional*		< string > array

4.3. PATHS

4.3.1. GET /

4.3.1.1. Description

Retrieves information about the Kafka Bridge instance, in JSON format.

4.3.1.2. Responses

HTTP Code	Description	Schema
200	Information about Kafka Bridge instance.	BridgeInfo

4.3.1.3. Produces

- **application/json**

4.3.1.4. Example HTTP response

4.3.1.4.1. Response 200

```
{
  "bridge_version" : "0.16.0"
}
```

4.3.2. POST /consumers/{groupid}

4.3.2.1. Description

Creates a consumer instance in the given consumer group. You can optionally specify a consumer name and supported configuration options. It returns a base URI which must be used to construct URLs for subsequent requests against this consumer instance.

4.3.2.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group in which to create the consumer.	string
Body	**body** *required*	Name and configuration of the consumer. The name is unique within the scope of the consumer group. If a name is not specified, a randomly generated name is assigned. All parameters are optional. The supported configuration options are shown in the following example.	Consumer

4.3.2.3. Responses

HTTP Code	Description	Schema
200	Consumer created successfully.	CreatedConsumer
409	A consumer instance with the specified name already exists in the Kafka Bridge.	Error
422	One or more consumer configuration options have invalid values.	Error

4.3.2.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.2.5. Produces

- **application/vnd.kafka.v2+json**

4.3.2.6. Tags

- Consumers

4.3.2.7. Example HTTP request

4.3.2.7.1. Request body

```
{
  "name" : "consumer1",
  "format" : "binary",
  "auto.offset.reset" : "earliest",
  "enable.auto.commit" : false,
  "fetch.min.bytes" : 512,
  "consumer.request.timeout.ms" : 30000,
  "isolation.level" : "read_committed"
}
```

4.3.2.8. Example HTTP response

4.3.2.8.1. Response 200

```
{
  "instance_id" : "consumer1",
  "base_uri" : "http://localhost:8080/consumers/my-group/instances/consumer1"
}
```

4.3.2.8.2. Response 409

```
{
  "error_code" : 409,
  "message" : "A consumer instance with the specified name already exists in the Kafka Bridge."
}
```

4.3.2.8.3. Response 422

```
{
  "error_code" : 422,
  "message" : "One or more consumer configuration options have invalid values."
}
```

4.3.3. DELETE /consumers/{groupid}/instances/{name}

4.3.3.1. Description

Deletes a specified consumer instance. The request for this operation MUST use the base URL (including the host and port) returned in the response from the **POST** request to **/consumers/{groupid}** that was used to create this consumer.

4.3.3.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the consumer belongs.	string

Type	Name	Description	Schema
Path	**name** *required*	Name of the consumer to delete.	string

4.3.3.3. Responses

HTTP Code	Description	Schema
204	Consumer removed successfully.	No Content
404	The specified consumer instance was not found.	Error

4.3.3.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.3.5. Produces

- **application/vnd.kafka.v2+json**

4.3.3.6. Tags

- Consumers

4.3.3.7. Example HTTP response

4.3.3.7.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.4. POST /consumers/{groupid}/instances/{name}/assignments

4.3.4.1. Description

Assigns one or more topic partitions to a consumer.

4.3.4.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the consumer belongs.	string

Type	Name	Description	Schema
Path	**name** *required*	Name of the consumer to assign topic partitions to.	string
Body	**body** *required*	List of topic partitions to assign to the consumer.	Partitions

4.3.4.3. Responses

HTTP Code	Description	Schema
204	Partitions assigned successfully.	No Content
404	The specified consumer instance was not found.	Error
409	Subscriptions to topics, partitions, and patterns are mutually exclusive.	Error

4.3.4.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.4.5. Produces

- **application/vnd.kafka.v2+json**

4.3.4.6. Tags

- Consumers

4.3.4.7. Example HTTP request

4.3.4.7.1. Request body

```
{
  "partitions" : [ {
    "topic" : "topic",
    "partition" : 0
  }, {
    "topic" : "topic",
    "partition" : 1
  } ]
}
```

4.3.4.8. Example HTTP response

4.3.4.8.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.4.8.2. Response 409

```
{
  "error_code" : 409,
  "message" : "Subscriptions to topics, partitions, and patterns are mutually exclusive."
}
```

4.3.5. POST /consumers/{groupid}/instances/{name}/offsets

4.3.5.1. Description

Commits a list of consumer offsets. To commit offsets for all records fetched by the consumer, leave the request body empty.

4.3.5.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the consumer belongs.	string
Path	**name** *required*	Name of the consumer.	string
Body	**body** *optional*	List of consumer offsets to commit to the consumer offsets commit log. You can specify one or more topic partitions to commit offsets for.	OffsetCommitSeekList

4.3.5.3. Responses

HTTP Code	Description	Schema
204	Commit made successfully.	No Content
404	The specified consumer instance was not found.	Error

4.3.5.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.5.5. Produces

- **application/vnd.kafka.v2+json**

4.3.5.6. Tags

- Consumers

4.3.5.7. Example HTTP request

4.3.5.7.1. Request body

```
{
  "offsets" : [ {
    "topic" : "topic",
    "partition" : 0,
    "offset" : 15
  }, {
    "topic" : "topic",
    "partition" : 1,
    "offset" : 42
  } ]
}
```

4.3.5.8. Example HTTP response

4.3.5.8.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.6. POST /consumers/{groupid}/instances/{name}/positions

4.3.6.1. Description

Configures a subscribed consumer to fetch offsets from a particular offset the next time it fetches a set of records from a given topic partition. This overrides the default fetch behavior for consumers. You can specify one or more topic partitions.

4.3.6.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the consumer belongs.	string
Path	**name** *required*	Name of the subscribed consumer.	string

Type	Name	Description	Schema
Body	**body** *required*	List of partition offsets from which the subscribed consumer will next fetch records.	OffsetCommitSeekList

4.3.6.3. Responses

HTTP Code	Description	Schema
204	Seek performed successfully.	No Content
404	The specified consumer instance was not found, or the specified consumer instance did not have one of the specified partitions assigned.	Error

4.3.6.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.6.5. Produces

- **application/vnd.kafka.v2+json**

4.3.6.6. Tags

- Consumers
- Seek

4.3.6.7. Example HTTP request

4.3.6.7.1. Request body

```
{
  "offsets" : [ {
    "topic" : "topic",
    "partition" : 0,
    "offset" : 15
  }, {
    "topic" : "topic",
    "partition" : 1,
    "offset" : 42
  } ]
}
```

4.3.6.8. Example HTTP response

4.3.6.8.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.7. POST /consumers/{groupid}/instances/{name}/positions/beginning

4.3.7.1. Description

Configures a subscribed consumer to seek (and subsequently read from) the first offset in one or more given topic partitions.

4.3.7.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the subscribed consumer belongs.	string
Path	**name** *required*	Name of the subscribed consumer.	string
Body	**body** *required*	List of topic partitions to which the consumer is subscribed. The consumer will seek the first offset in the specified partitions.	Partitions

4.3.7.3. Responses

HTTP Code	Description	Schema
204	Seek to the beginning performed successfully.	No Content
404	The specified consumer instance was not found, or the specified consumer instance did not have one of the specified partitions assigned.	Error

4.3.7.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.7.5. Produces

- **application/vnd.kafka.v2+json**

4.3.7.6. Tags

- Consumers
- Seek

4.3.7.7. Example HTTP request

4.3.7.7.1. Request body

```
{
  "partitions" : [ {
    "topic" : "topic",
    "partition" : 0
  }, {
    "topic" : "topic",
    "partition" : 1
  } ]
}
```

4.3.7.8. Example HTTP response

4.3.7.8.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.8. POST /consumers/{groupid}/instances/{name}/positions/end

4.3.8.1. Description

Configures a subscribed consumer to seek (and subsequently read from) the offset at the end of one or more of the given topic partitions.

4.3.8.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the subscribed consumer belongs.	string
Path	**name** *required*	Name of the subscribed consumer.	string
Body	**body** *optional*	List of topic partitions to which the consumer is subscribed. The consumer will seek the last offset in the specified partitions.	Partitions

4.3.8.3. Responses

HTTP Code	Description	Schema
204	Seek to the end performed successfully.	No Content
404	The specified consumer instance was not found, or the specified consumer instance did not have one of the specified partitions assigned.	Error

4.3.8.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.8.5. Produces

- **application/vnd.kafka.v2+json**

4.3.8.6. Tags

- Consumers
- Seek

4.3.8.7. Example HTTP request

4.3.8.7.1. Request body

```
{
  "partitions" : [ {
    "topic" : "topic",
    "partition" : 0
  }, {
    "topic" : "topic",
    "partition" : 1
  } ]
}
```

4.3.8.8. Example HTTP response

4.3.8.8.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.9. GET /consumers/{groupid}/instances/{name}/records

4.3.9.1. Description

Retrieves records for a subscribed consumer, including message values, topics, and partitions. The request for this operation MUST use the base URL (including the host and port) returned in the response from the **POST** request to **/consumers/{groupid}** that was used to create this consumer.

4.3.9.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the subscribed consumer belongs.	string
Path	**name** *required*	Name of the subscribed consumer to retrieve records from.	string
Query	**max_bytes** *optional*	The maximum size, in bytes, of unencoded keys and values that can be included in the response. Otherwise, an error response with code 422 is returned.	integer
Query	**timeout** *optional*	The maximum amount of time, in milliseconds, that the HTTP Bridge spends retrieving records before timing out the request.	integer

4.3.9.3. Responses

HTTP Code	Description	Schema
200	Poll request executed successfully.	ConsumerRecordList
404	The specified consumer instance was not found.	Error
406	The **format** used in the consumer creation request does not match the embedded format in the Accept header of this request or the bridge got a message from the topic which is not JSON encoded.	Error
422	Response exceeds the maximum number of bytes the consumer can receive	Error

4.3.9.4. Produces

- **application/vnd.kafka.json.v2+json**
- **application/vnd.kafka.binary.v2+json**
- **application/vnd.kafka.v2+json**

4.3.9.5. Tags

- Consumers

4.3.9.6. Example HTTP response

4.3.9.6.1. Response 200

```
[ {
  "topic" : "topic",
  "key" : "key1",
  "value" : {
    "foo" : "bar"
  },
  "partition" : 0,
  "offset" : 2
}, {
  "topic" : "topic",
  "key" : "key2",
  "value" : [ "foo2", "bar2" ],
  "partition" : 1,
  "offset" : 3
} ]
```

```
[
  {
    "topic": "test",
    "key": "a2V5",
    "value": "Y29uZmx1ZW50",
    "partition": 1,
    "offset": 100,
  },
  {
    "topic": "test",
    "key": "a2V5",
    "value": "a2Fma2E=",
    "partition": 2,
    "offset": 101,
  }
]
```

4.3.9.6.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.9.6.3. Response 406

```
{
  "error_code" : 406,
  "message" : "The `format` used in the consumer creation request does not match the embedded format in the Accept header of this request."
}
```

4.3.9.6.4. Response 422

```
{
  "error_code" : 422,
  "message" : "Response exceeds the maximum number of bytes the consumer can receive"
}
```

4.3.10. POST /consumers/{groupid}/instances/{name}/subscription

4.3.10.1. Description

Subscribes a consumer to one or more topics. You can describe the topics to which the consumer will subscribe in a list (of **Topics** type) or as a **topic_pattern** field. Each call replaces the subscriptions for the subscriber.

4.3.10.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the subscribed consumer belongs.	string
Path	**name** *required*	Name of the consumer to subscribe to topics.	string
Body	**body** *required*	List of topics to which the consumer will subscribe.	Topics

4.3.10.3. Responses

HTTP Code	Description	Schema
204	Consumer subscribed successfully.	No Content
404	The specified consumer instance was not found.	Error
409	Subscriptions to topics, partitions, and patterns are mutually exclusive.	Error
422	A list (of **Topics** type) or a**topic_pattern** must be specified.	Error

4.3.10.4. Consumes

- **application/vnd.kafka.v2+json**

4.3.10.5. Produces

- **application/vnd.kafka.v2+json**

4.3.10.6. Tags

- Consumers

4.3.10.7. Example HTTP request

4.3.10.7.1. Request body

```
{
  "topics" : [ "topic1", "topic2" ]
}
```

4.3.10.8. Example HTTP response

4.3.10.8.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.10.8.2. Response 409

```
{
  "error_code" : 409,
  "message" : "Subscriptions to topics, partitions, and patterns are mutually exclusive."
}
```

4.3.10.8.3. Response 422

```
{
  "error_code" : 422,
  "message" : "A list (of Topics type) or a topic_pattern must be specified."
}
```

4.3.11. GET /consumers/{groupid}/instances/{name}/subscription

4.3.11.1. Description

Retrieves a list of the topics to which the consumer is subscribed.

4.3.11.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the subscribed consumer belongs.	string

Type	Name	Description	Schema
Path	**name** *required*	Name of the subscribed consumer.	string

4.3.11.3. Responses

HTTP Code	Description	Schema
200	List of subscribed topics and partitions.	SubscribedTopicList
404	The specified consumer instance was not found.	Error

4.3.11.4. Produces

- **application/vnd.kafka.v2+json**

4.3.11.5. Tags

- Consumers

4.3.11.6. Example HTTP response

4.3.11.6.1. Response 200

```
{
  "topics" : [ "my-topic1", "my-topic2" ],
  "partitions" : [ {
    "my-topic1" : [ 1, 2, 3 ]
  }, {
    "my-topic2" : [ 1 ]
  } ]
}
```

4.3.11.6.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.12. DELETE /consumers/{groupid}/instances/{name}/subscription

4.3.12.1. Description

Unsubscribes a consumer from all topics.

4.3.12.2. Parameters

Type	Name	Description	Schema
Path	**groupid** *required*	ID of the consumer group to which the subscribed consumer belongs.	string
Path	**name** *required*	Name of the consumer to unsubscribe from topics.	string

4.3.12.3. Responses

HTTP Code	Description	Schema
204	Consumer unsubscribed successfully.	No Content
404	The specified consumer instance was not found.	Error

4.3.12.4. Tags

- Consumers

4.3.12.5. Example HTTP response

4.3.12.5.1. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified consumer instance was not found."
}
```

4.3.13. GET /healthy

4.3.13.1. Description

Check if the bridge is running. This does not necessarily imply that it is ready to accept requests.

4.3.13.2. Responses

HTTP Code	Description	Schema
204	The bridge is healthy	No Content
500	The bridge is not healthy	No Content

4.3.14. GET /metrics

4.3.14.1. Description

Retrieves the bridge metrics in Prometheus format.

4.3.14.2. Responses

HTTP Code	Description	Schema
200	Metrics in Prometheus format retrieved successfully.	string

4.3.14.3. Produces

- **text/plain**

4.3.15. GET /openapi

4.3.15.1. Description

Retrieves the OpenAPI v2 specification in JSON format.

4.3.15.2. Responses

HTTP Code	Description	Schema
204	OpenAPI v2 specification in JSON format retrieved successfully.	string

4.3.15.3. Produces

- **application/json**

4.3.16. GET /ready

4.3.16.1. Description

Check if the bridge is ready and can accept requests.

4.3.16.2. Responses

HTTP Code	Description	Schema
204	The bridge is ready	No Content

HTTP Code	Description	Schema
500	The bridge is not ready	No Content

4.3.17. GET /topics

4.3.17.1. Description

Retrieves a list of all topics.

4.3.17.2. Responses

HTTP Code	Description	Schema
200	List of topics.	< string > array

4.3.17.3. Produces

- **application/vnd.kafka.v2+json**

4.3.17.4. Tags

- Topics

4.3.17.5. Example HTTP response

4.3.17.5.1. Response 200

```
[ "topic1", "topic2" ]
```

4.3.18. POST /topics/{topicname}

4.3.18.1. Description

Sends one or more records to a given topic, optionally specifying a partition, key, or both.

4.3.18.2. Parameters

Type	Name	Description	Schema
Path	**topicname** *required*	Name of the topic to send records to or retrieve metadata from.	string

Type	Name	Description	Schema
Query	**async** *optional*	Whether to return immediately upon sending records, instead of waiting for metadata. No offsets will be returned if specified. Defaults to false.	boolean
Body	**body** *required*		ProducerRecordList

4.3.18.3. Responses

HTTP Code	Description	Schema
200	Records sent successfully.	OffsetRecordSentList
404	The specified topic was not found.	Error
422	The record list is not valid.	Error

4.3.18.4. Consumes

- **application/vnd.kafka.json.v2+json**
- **application/vnd.kafka.binary.v2+json**

4.3.18.5. Produces

- **application/vnd.kafka.v2+json**

4.3.18.6. Tags

- Producer
- Topics

4.3.18.7. Example HTTP request

4.3.18.7.1. Request body

```
{
  "records" : [ {
    "key" : "key1",
    "value" : "value1"
  }, {
    "value" : "value2",
    "partition" : 1
  }, {
```

```
    "value" : "value3"
  } ]
}
```

4.3.18.8. Example HTTP response

4.3.18.8.1. Response 200

```
{
  "offsets" : [ {
    "partition" : 2,
    "offset" : 0
  }, {
    "partition" : 1,
    "offset" : 1
  }, {
    "partition" : 2,
    "offset" : 2
  } ]
}
```

4.3.18.8.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified topic was not found."
}
```

4.3.18.8.3. Response 422

```
{
  "error_code" : 422,
  "message" : "The record list contains invalid records."
}
```

4.3.19. GET /topics/{topicname}

4.3.19.1. Description

Retrieves the metadata about a given topic.

4.3.19.2. Parameters

Type	Name	Description	Schema
Path	**topicname** *required*	Name of the topic to send records to or retrieve metadata from.	string

4.3.19.3. Responses

HTTP Code	Description	Schema
200	Topic metadata	TopicMetadata

4.3.19.4. Produces

- **application/vnd.kafka.v2+json**

4.3.19.5. Tags

- Topics

4.3.19.6. Example HTTP response

4.3.19.6.1. Response 200

```
{
  "name" : "topic",
  "offset" : 2,
  "configs" : {
    "cleanup.policy" : "compact"
  },
  "partitions" : [ {
    "partition" : 1,
    "leader" : 1,
    "replicas" : [ {
      "broker" : 1,
      "leader" : true,
      "in_sync" : true
    }, {
      "broker" : 2,
      "leader" : false,
      "in_sync" : true
    } ]
  }, {
    "partition" : 2,
    "leader" : 2,
    "replicas" : [ {
      "broker" : 1,
      "leader" : false,
      "in_sync" : true
    }, {
      "broker" : 2,
      "leader" : true,
      "in_sync" : true
    } ]
  } ]
}
```

4.3.20. GET /topics/{topicname}/partitions

4.3.20.1. Description

Retrieves a list of partitions for the topic.

4.3.20.2. Parameters

Type	Name	Description	Schema
Path	**topicname** *required*	Name of the topic to send records to or retrieve metadata from.	string

4.3.20.3. Responses

HTTP Code	Description	Schema
200	List of partitions	< PartitionMetadata > array
404	The specified topic was not found.	Error

4.3.20.4. Produces

- **application/vnd.kafka.v2+json**

4.3.20.5. Tags

- Topics

4.3.20.6. Example HTTP response

4.3.20.6.1. Response 200

```
[ {
  "partition" : 1,
  "leader" : 1,
  "replicas" : [ {
    "broker" : 1,
    "leader" : true,
    "in_sync" : true
  }, {
    "broker" : 2,
    "leader" : false,
    "in_sync" : true
  } ]
}, {
  "partition" : 2,
  "leader" : 2,
  "replicas" : [ {
```

```
    "broker" : 1,
    "leader" : false,
    "in_sync" : true
  }, {
    "broker" : 2,
    "leader" : true,
    "in_sync" : true
  } ]
} ]
```

4.3.20.6.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified topic was not found."
}
```

4.3.21. POST /topics/{topicname}/partitions/{partitionid}

4.3.21.1. Description

Sends one or more records to a given topic partition, optionally specifying a key.

4.3.21.2. Parameters

Type	Name	Description	Schema
Path	**partitionid** *required*	ID of the partition to send records to or retrieve metadata from.	integer
Path	**topicname** *required*	Name of the topic to send records to or retrieve metadata from.	string
Query	**async** *optional*	Whether to return immediately upon sending records, instead of waiting for metadata. No offsets will be returned if specified. Defaults to false.	boolean
Body	**body** *required*	List of records to send to a given topic partition, including a value (required) and a key (optional).	ProducerRecordToPartitionList

4.3.21.3. Responses

HTTP Code	Description	Schema
200	Records sent successfully.	OffsetRecordSentList
404	The specified topic partition was not found.	Error

HTTP Code	Description	Schema
422	The record is not valid.	Error

4.3.21.4. Consumes

- **application/vnd.kafka.json.v2+json**
- **application/vnd.kafka.binary.v2+json**

4.3.21.5. Produces

- **application/vnd.kafka.v2+json**

4.3.21.6. Tags

- Producer
- Topics

4.3.21.7. Example HTTP request

4.3.21.7.1. Request body

```
{
  "records" : [ {
    "key" : "key1",
    "value" : "value1"
  }, {
    "value" : "value2"
  } ]
}
```

4.3.21.8. Example HTTP response

4.3.21.8.1. Response 200

```
{
  "offsets" : [ {
    "partition" : 2,
    "offset" : 0
  }, {
    "partition" : 1,
    "offset" : 1
  }, {
    "partition" : 2,
    "offset" : 2
  } ]
}
```

4.3.21.8.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified topic partition was not found."
}
```

4.3.21.8.3. Response 422

```
{
  "error_code" : 422,
  "message" : "The record is not valid."
}
```

4.3.22. GET /topics/{topicname}/partitions/{partitionid}

4.3.22.1. Description

Retrieves partition metadata for the topic partition.

4.3.22.2. Parameters

Type	Name	Description	Schema
Path	**partitionid** *required*	ID of the partition to send records to or retrieve metadata from.	integer
Path	**topicname** *required*	Name of the topic to send records to or retrieve metadata from.	string

4.3.22.3. Responses

HTTP Code	Description	Schema
200	Partition metadata	PartitionMetadata
404	The specified topic partition was not found.	Error

4.3.22.4. Produces

- **application/vnd.kafka.v2+json**

4.3.22.5. Tags

- Topics

4.3.22.6. Example HTTP response

4.3.22.6.1. Response 200

```
{
  "partition" : 1,
  "leader" : 1,
  "replicas" : [ {
    "broker" : 1,
    "leader" : true,
    "in_sync" : true
  }, {
    "broker" : 2,
    "leader" : false,
    "in_sync" : true
  } ]
}
```

4.3.22.6.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified topic partition was not found."
}
```

4.3.23. GET /topics/{topicname}/partitions/{partitionid}/offsets

4.3.23.1. Description

Retrieves a summary of the offsets for the topic partition.

4.3.23.2. Parameters

Type	Name	Description	Schema
Path	**partitionid** *required*	ID of the partition.	integer
Path	**topicname** *required*	Name of the topic containing the partition.	string

4.3.23.3. Responses

HTTP Code	Description	Schema
200	A summary of the offsets for the topic partition.	OffsetsSummary
404	The specified topic partition was not found.	Error

4.3.23.4. Produces

- **application/vnd.kafka.v2+json**

4.3.23.5. Tags

- Topics

4.3.23.6. Example HTTP response

4.3.23.6.1. Response 200

```
{
  "beginning_offset" : 10,
  "end_offset" : 50
}
```

4.3.23.6.2. Response 404

```
{
  "error_code" : 404,
  "message" : "The specified topic partition was not found."
}
```

APPENDIX A. USING YOUR SUBSCRIPTION

AMQ Streams is provided through a software subscription. To manage your subscriptions, access your account at the Red Hat Customer Portal.

Accessing Your Account

1. Go to access.redhat.com.
2. If you do not already have an account, create one.
3. Log in to your account.

Activating a Subscription

1. Go to access.redhat.com.
2. Navigate to **My Subscriptions**.
3. Navigate to **Activate a subscription** and enter your 16-digit activation number.

Downloading Zip and Tar Files

To access zip or tar files, use the customer portal to find the relevant files for download. If you are using RPM packages, this step is not required.

1. Open a browser and log in to the Red Hat Customer Portal **Product Downloads** page at access.redhat.com/downloads.
2. Locate the **AMQ Streams for Apache Kafka** entries in the **INTEGRATION AND AUTOMATION** category.
3. Select the desired AMQ Streams product. The **Software Downloads** page opens.
4. Click the **Download** link for your component.

Installing packages with DNF

To install a package and all the package dependencies, use:

```
dnf install <package_name>
```

To install a previously-downloaded package from a local directory, use:

```
dnf install <path_to_download_package>
```

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