



Red Hat Integration 2021.Q3

Installing Debezium on RHEL

For use with Debezium 1.5 on Red Hat Enterprise Linux (RHEL)

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Abstract

This guide describes how to install Red Hat Debezium on RHEL with AMQ Streams.

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PREFACE

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. DEBEZIUM OVERVIEW

Red Hat Debezium is a distributed platform that captures database operations, creates data change event records for row-level operations, and streams change event records to Kafka topics. Red Hat Debezium is built on Apache Kafka and is deployed and integrated with AMQ Streams.

Debezium captures row-level changes to a database table and passes corresponding change events to AMQ Streams. Applications can read these *change event streams* and access the change events in the order in which they occurred.

Debezium has multiple uses, including:

- Data replication
- Updating caches and search indexes
- Simplifying monolithic applications
- Data integration
- Enabling streaming queries

Debezium provides connectors (based on Kafka Connect) for the following common databases:

- [Db2](#)
- [MySQL](#)
- [MongoDB](#)
- [Oracle](#) (Developer Preview)
- [PostgreSQL](#)
- [SQL Server](#)

[Debezium](#) is the upstream community project for Red Hat Debezium.

CHAPTER 2. INSTALLING DEBEZIUM CONNECTORS ON RHEL

Install Debezium connectors through AMQ Streams by extending Kafka Connect with connector plugins. Following a deployment of AMQ Streams, you can deploy Debezium as a connector configuration through Kafka Connect.

2.1. PREREQUISITES

A Debezium installation requires the following:

- Red Hat Enterprise Linux version 7.x or 8.x with an x86_64 architecture.
- Administrative privileges (**sudo** access).
- AMQ Streams 2021.q3 on Red Hat Enterprise Linux is installed on the host computer.
 - AMQ Streams must be running in one of the [supported JVM versions](#).
- Credentials for the **kafka** user that was created when AMQ Streams was installed.
- An AMQ Streams cluster is running.
 - For instructions on running a basic, non-production AMQ Streams cluster that contains a single ZooKeeper node, and a single Kafka node, see [Running a single node AMQ Streams cluster](#).



NOTE

If you have an earlier version of AMQ Streams, you must first upgrade to AMQ Streams 2021.q3. For upgrade instructions, see [AMQ Streams and Kafka upgrades](#).

Additional resources

- For more information about how to install AMQ Streams, see [Installing AMQ Streams](#).

2.2. KAFKA TOPIC CREATION RECOMMENDATIONS

Debezium stores data in multiple Kafka topics. The topics must either be created in advance by an administrator, or you can configure Kafka Connect to [configure topics automatically](#).

The following list describes limitations and recommendations to consider when creating topics:

Database history topics for MySQL, SQL Server, Db2, and Oracle connectors

- Infinite or very long retention.
- Replication factor of at least three in production environments.
- Single partition.

Other topics

- When you enable [Kafka log compaction](#) so that only the *last* change event for a given record is saved, set the following topic properties in Apache Kafka:

- [min.compaction.lag.ms](#)

- [delete.retention.ms](#)

To ensure that consumers have enough time to receive all events and delete markers, specify values for the preceding properties that are larger than the maximum downtime that you expect for your sink connectors. For example, consider the downtime that might occur when you apply updates to sink connectors.

- Replicated in production.

- Single partition.

You can relax the single partition rule, but your application must handle out-of-order events for different rows in the database. Events for a single row are still totally ordered. If you use multiple partitions, the default behavior is that Kafka determines the partition by hashing the key. Other partition strategies require the use of single message transformations (SMTs) to set the partition number for each record.

2.3. DEPLOYING DEBEZIUM WITH AMQ STREAMS ON RHEL

This procedure describes how to set up connectors for Debezium on Red Hat Enterprise Linux. Connectors are deployed to an AMQ Streams cluster using Kafka Connect, a framework for streaming data between Apache Kafka and external systems. Kafka Connect must be run in distributed mode rather than standalone mode.

This procedure assumes that AMQ Streams is installed and ZooKeeper and Kafka are running.

Procedure

1. Visit the [Red Hat Integration download site](#) on the Red Hat Customer Portal and download the Debezium connector or connectors that you want to use. For example, download the **Debezium 1.5.0 MySQL Connector** to use Debezium with a MySQL database.
2. In `/opt/kafka`, create the **connector-plugins** directory if not already created for other Kafka Connect plugins:

```
$ sudo mkdir /opt/kafka/connector-plugins
```

3. Extract the contents of the Debezium connector archive to the `/opt/kafka/connector-plugins` directory.

This example extracts the contents of the MySQL connector:

```
$ sudo unzip debezium-connector-mysql-1.5.0-plugin.zip -d /opt/kafka/connector-plugins
```

4. Repeat the above step for each connector that you want to install.
5. Switch to the **kafka** user:

```
$ su - kafka
$ Password:
```

6. Check whether Kafka Connect is already running in distributed mode. If it is running, stop the associated process on all Kafka Connect worker nodes. For example:

```
$ jcmd | grep ConnectDistributed
18514 org.apache.kafka.connect.cli.ConnectDistributed /opt/kafka/config/connect-
distributed.properties
$ kill 18514
```

7. Edit the **connect-distributed.properties** file in **/opt/kafka/config/** and specify the location of the Debezium connector:

```
plugin.path=/opt/kafka/connector-plugins
```

8. Run Kafka Connect in distributed mode:

```
$ /opt/kafka/bin/connect-distributed.sh /opt/kafka/config/connect-distributed.properties
```

Kafka Connect runs. During startup, Debezium connectors are loaded from the **connector-plugins** directory.

9. Repeat steps 6–8 for each Kafka Connect worker node.

Additional resources

- [Kafka Connect in distributed mode](#)
- [Adding connector plugins](#)

Updating Kafka Connect

If you need to update your deployment, amend the Debezium connector JAR files in the **/opt/kafka/connector-plugins** directory, and then restart Kafka Connect.

Next Steps

The *Debezium User Guide* describes how to configure each connector and its source database for change data capture. Once configured, a connector will connect to the source database and produce events for each inserted, updated, and deleted row or document.

APPENDIX A. USING YOUR SUBSCRIPTION

Integration 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. Scroll down to **INTEGRATION AND AUTOMATION**.
3. Click **Red Hat Integration** to display the Red Hat Integration downloads page.
4. Click the **Download** link for your component.

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