Hedera Hashgraph Training Materials

**Interactive Exercise 11 - Hedera Consensus Service**

Module 6 – Lesson 10

Note: All Prerequisites must be completed.

Interactive Exercise 11 - The Hedera Consensus Service

Module 6 - Lesson 10

Use code in:
https://github.com/theblockchainacademy/Hedera/tree/main/Hedera_5_ConsensusServiceExercise5
and complete the exercise using the code in the repository. Iteratively complete the exercise using files
HederaConsensusService_part1.txt to HederaConsensusService_part5.txt.
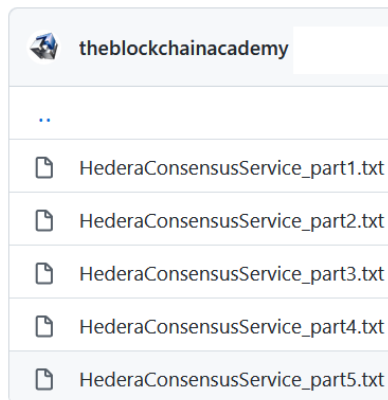
Start ItelliJ and click New Project called ConsensusService

Follow the IntelliJ Steps 1 – 7, from assignment 1, or the previous exercise. Make sure the .env and
build.gradle files are updated. You may copy paste in the .env file and build.gradle files from the previous
exercises. The same .env and build.gradle files are required.
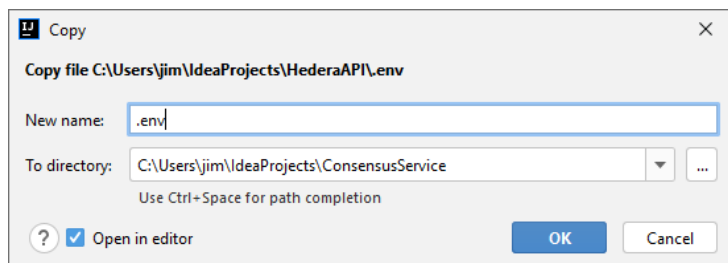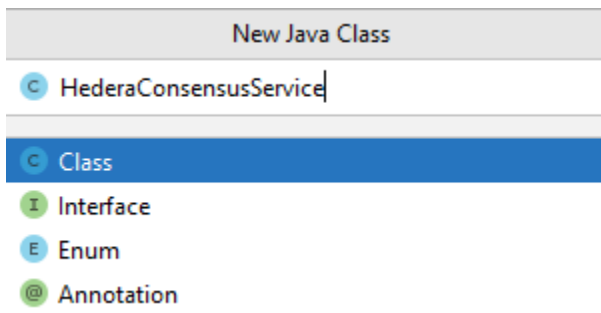

Create a new class called HederaConsensusService
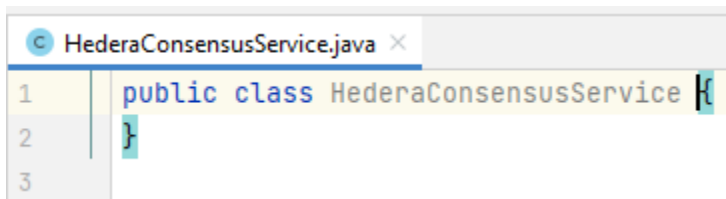
In the project expand \src\main

Right click on \src\main\java, and click New -> Java Class
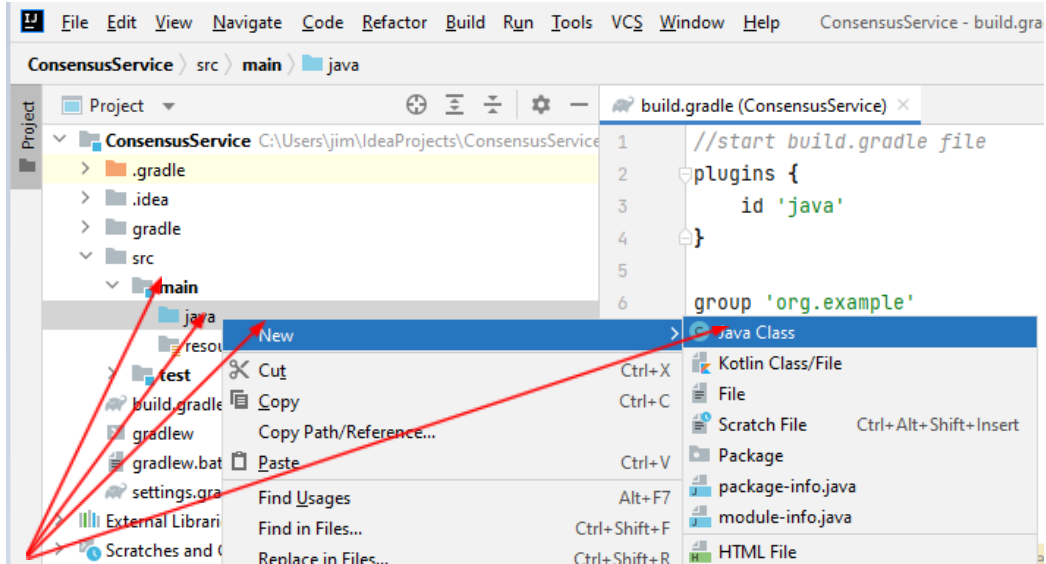
Enter HederaConsensusService and tap the enter key.

The HederaConsensusService class file will open.

Validate project configurations, see **IntelliJ step 9**. Project configurations will resemble the image below.
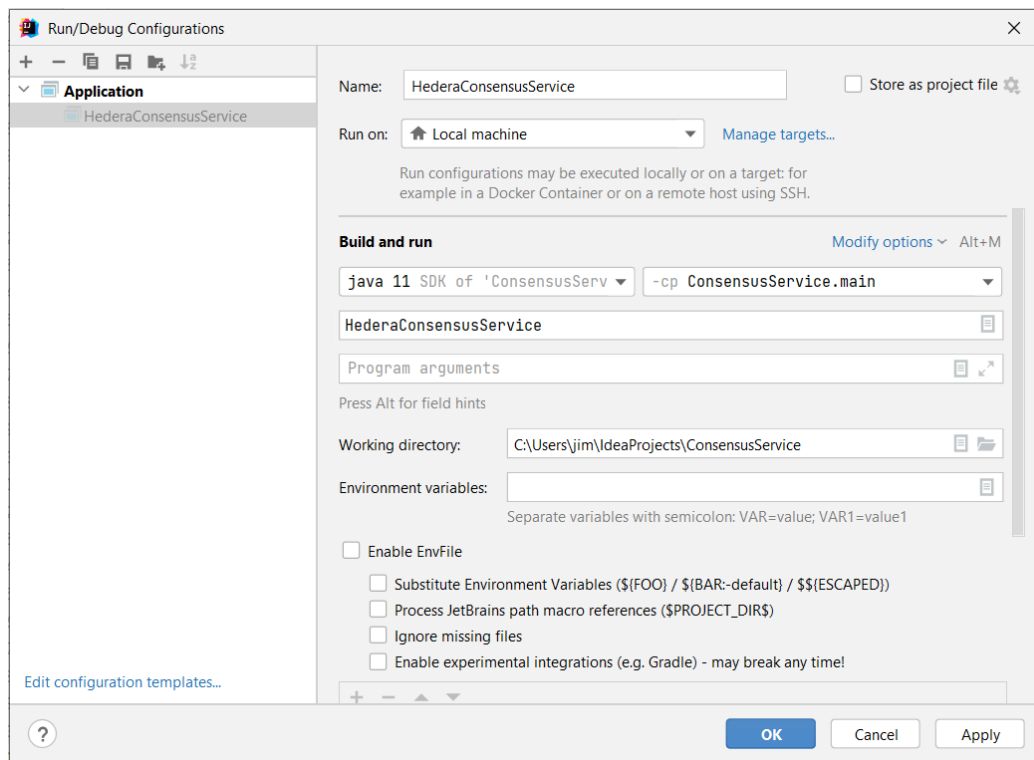

```java
import com.hedera.hashgraph.sdk.*;
import com.google.protobuf.ByteString;
import io.github.cdimascio.dotenv.Dotenv;
import java.util.concurrent.TimeoutException;
```

Create the main method as shown below.

```java
public static void main(String[] args) throws TimeoutException,
PrecheckStatusException, ReceiptStatusException {


}
```

Update the Gradle dependencies.

Click the Gradle button in the upper right corner. Click the **Refresh Gradle Project** button.

Close the Gradle tools, click the button in the upper right corner.

The class file should look similar to the image below.

```java
import com.hedera.hashgraph.sdk.*;
import com.google.protobuf.ByteString;
import io.github.cdimascio.dotenv.Dotenv;
import java.util.concurrent.TimeoutException;

public class HederaConsensusService {

    public static void main(String[] args) throws TimeoutException, PrecheckStatusException, ReceiptStatusException {


    }

}
```
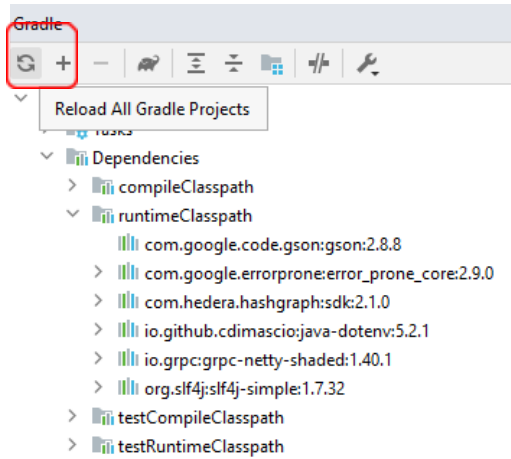
1. Obtain your account ID and private key form the .env file
2. Create a client from the Hedera testnet,
3. Set your account ID and private for the testnet client.
4. Use TopicCreateTransaction to create a transaction object and call setSubmitKey, setTopicMemo, and setAdminKey
5. On the transaction object, call execute client. This creates a transaction response object.
6. Get a transaction receipt. Call the getReceipt method on the transaction response object.
7. To return the topic ID, call the topicID method on the receipt object and output it to the console.

Refer to the solution on GitHub: HederaConsensusService_part1.txt,
https://github.com/theblockchainacademy/Hedera/blob/main/Hedera_5_ConsensusServiceExercise5/HederaConsensusService_part1.txt

The output will appear similar to below

```
3:33:09 PM: Executing task ':HederaConsensusService.main()'...

> Task :compileJava
> Task :processResources NO-SOURCE
> Task :classes

> Task :HederaConsensusService.main()
[hedera-sdk-6] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 250 ms after failure during attempt #1: OK
[hedera-sdk-0] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 500 ms after failure during attempt #2: OK
[hedera-sdk-4] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 1000 ms after failure during attempt #3: OK

The new topic ID is 0.0.2908164

Deprecated Gradle features were used in this build, making it incompatible with Gradle 8.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

See https://docs.gradle.org/7.1/userguide/command_line_interface.html#sec:command_line_warnings

BUILD SUCCESSFUL in 4s
2 actionable tasks: 2 executed
3:33:14 PM: Task execution finished ':HederaConsensusService.main()'.
```

8. Set a message for the topic ID. Use TopicMessageSubmitTransaction set the topic ID to the newly generated topic ID using the setTopicID method. Set the message using the setMessage method.
9. This will create a TopicMessageSubmitTransaction object.
10. Use the TopicMessageSubmitTransaction object and call the getMessage method.
11. Output the message to the console and confirm it was the message passed in.
12. Sign in with the client and start to submit transaction to a Hedera network, transaction consensus status.
13. Create and submit an account info query to the network. Output the results to the console.
14. Use TopicInfoQuery to query all topic metadata. Pass in t to the console.

Refer to the solution on GitHub: HederaConsensusService_part2.txt, https://github.com/theblockchainacademy/Hedera/blob/main/Hedera_5_ConsensusServiceExercise5/HederaConsensusService_part2.txt

The output will appear similar to below

```
3:37:59 PM: Executing task ':HederaConsensusService.main()'...

> Task :compileJava
> Task :processResources NO-SOURCE
> Task :classes

> Task :HederaConsensusService.main()
[hedera-sdk-6] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 250 ms after failure during attempt #1: OK
[hedera-sdk-0] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 500 ms after failure during attempt #2: OK
[hedera-sdk-4] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 1000 ms after failure during attempt #3: OK


The new topic ID is 0.0.2908212

The first msg:  <ByteString@1755e85b size=48 contents="Good Day and welcome to Hedera Consensus Service">
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.6 in 250 ms after failure during attempt #1: OK
[hedera-sdk-3] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.6 in 500 ms after failure during attempt #2: OK
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.6 in 1000 ms after failure during attempt #3: OK

The transaction consensus status is SUCCESS
TopicInfo{topicId=0.0.2908212, topicMemo=First Message, runningHash=[-128, -56, 91, -14, 66, -10, -68, 127, -124, -37, -60, 113, -124, -69, -65, -27, -25, 123, 59,

Deprecated Gradle features were used in this build, making it incompatible with Gradle 8.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

See https://docs.gradle.org/7.1/userguide/command_line_interface.html#sec:command_line_warnings

BUILD SUCCESSFUL in 7s
2 actionable tasks: 2 executed
3:38:07 PM: Task execution finished ':HederaConsensusService.main()'.
```

15. Use TopicUpdateTransaction set the topic ID, the submit and admin keys using the same keys from the previous part.
16. Get the receipt, status and return the status to the console.
17. Use TopicInfoQuery to output the updated metadata to the console.

Refer to the solution on GitHub: HederaConsensusService_part3.txt, https://github.com/theblockchainacademy/Hedera/blob/main/Hedera_5_ConsensusServiceExercise5/HederaConsensusService_part3.txt

The output will appear similar to below

```
> Task :classes

> Task :HederaConsensusService.main()
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.7 in 250 ms after failure during attempt #1: OK
[hedera-sdk-2] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.7 in 500 ms after failure during attempt #2: OK
[hedera-sdk-6] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.7 in 1000 ms after failure during attempt #3: OK


The new topic ID is 0.0.2908257


The first msg:  <ByteString@1755e85b size=48 contents="Good Day and welcome to Hedera Consensus Service">
[hedera-sdk-1] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 250 ms after failure during attempt #1: OK
[hedera-sdk-2] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 500 ms after failure during attempt #2: OK
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 1000 ms after failure during attempt #3: OK


The transaction consensus status is SUCCESS
TopicInfo{topicId=0.0.2908257, topicMemo=First Message, runningHash=[-72, 91, 100, 51, -118, -52, -53, 54, -104, 91, -50, 51, 16, -22, -115, 119, -10, 22, 100, -34,


Update Topic --------------------------------------------------


[hedera-sdk-0] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.5 in 250 ms after failure during attempt #1: OK
[hedera-sdk-2] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.5 in 500 ms after failure during attempt #2: OK
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.5 in 1000 ms after failure during attempt #3: OK


The transaction consensus status is SUCCESS


The message after the update:  <ByteString@1755e85b size=48 contents="Good Day and welcome to Hedera Consensus Service">
TopicInfo{topicId=0.0.2908257, topicMemo=New message memo update, runningHash=[-72, 91, 100, 51, -118, -52, -53, 54, -104, 91, -50, 51, 16, -22, -115, 119, -10, 22,


Deprecated Gradle features were used in this build, making it incompatible with Gradle 8.0.


You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.


See https://docs.gradle.org/7.1/userguide/command_line_interface.html#sec:command_line_warnings


BUILD SUCCESSFUL in 9s
2 actionable tasks: 2 executed
3:41:34 PM: Task execution finished ':HederaConsensusService.main()'.
```

18. Use the TopicMessageSubmitTransaction to submit a new message a to the same topic ID .
19. Get the new message for the topic ID and return the new message and metadata to the console.

Refer to the solution on GitHub: HederaConsensusService_part4.txt,
https://github.com/theblockchainacademy/Hedera/blob/main/Hedera_5_ConsensusServiceExercise5/HederaConsensusService_part4.txt

The output will appear similar to below

```
[hedera-sdk-0] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 500 ms after failure during attempt #2: OK
[hedera-sdk-5] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 1000 ms after failure during attempt #3: OK


The new topic ID is 0.0.2908270


The first msg:  <ByteString@3f6db3fb size=48 contents="Good Day and welcome to Hedera Consensus Service">
[hedera-sdk-1] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.6 in 250 ms after failure during attempt #1: OK
[hedera-sdk-3] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.6 in 500 ms after failure during attempt #2: OK


The transaction consensus status is SUCCESS
TopicInfo{topicId=0.0.2908270, topicMemo=First Message, runningHash=[76, 90, -18, 97, -64, -116, 22, -46, -30, 107, 60, 68, -72, -97, 111, -48, -98, -87, -84, -28,


Update Topic --------------------------------------------------


[hedera-sdk-5] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 250 ms after failure during attempt #1: OK
[hedera-sdk-0] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 500 ms after failure during attempt #2: OK
[hedera-sdk-4] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 1000 ms after failure during attempt #3: OK


The transaction consensus status is SUCCESS


The message after the update:  <ByteString@3f6db3fb size=48 contents="Good Day and welcome to Hedera Consensus Service">
TopicInfo{topicId=0.0.2908270, topicMemo=New message memo update, runningHash=[76, 90, -18, 97, -64, -116, 22, -46, -30, 107, 60, 68, -72, -97, 111, -48, -98, -87,


New message for the same topic ----------------------------------------------


The new msg:  <ByteString@2a2c13a8 size=46 contents="Time to work with the Hedera Consensus Service">
TopicInfo{topicId=0.0.2908270, topicMemo=New message memo update, runningHash=[76, 90, -18, 97, -64, -116, 22, -46, -30, 107, 60, 68, -72, -97, 111, -48, -98, -87,


Deprecated Gradle features were used in this build, making it incompatible with Gradle 8.0.


You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.


See https://docs.gradle.org/7.1/userguide/command_line_interface.html#sec:command_line_warnings


BUILD SUCCESSFUL in 8s
2 actionable tasks: 2 executed
3:43:48 PM: Task execution finished ':HederaConsensusService.main()'.
```

20. Delete the topic from the Hedera Network. Use TopicDeleteTransaction and call the setTopicId method with the current topic ID passed into it.
21. Get the TransactionResponse and TransactionReceipt.
22. Return the transaction receipt and the transaction status.

Refer to the solution on GitHub: HederaConsensusService_part5.txt, https://github.com/theblockchainacademy/Hedera/blob/main/Hedera_5_ConsensusServiceExercise5/HederaConsensusService_part5.txt

The output will appear similar to below.

```
> Task :HederaConsensusService.main()
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 250 ms after failure during attempt #1: OK
[hedera-sdk-3] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 500 ms after failure during attempt #2: OK
[hedera-sdk-7] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.4 in 1000 ms after failure during attempt #3: OK


The new topic ID is 0.0.2908271


The first msg:  <ByteString@3f6db3fb size=48 contents="Good Day and welcome to Hedera Consensus Service">
[hedera-sdk-3] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.7 in 250 ms after failure during attempt #1: OK
[hedera-sdk-6] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.7 in 500 ms after failure during attempt #2: OK
[hedera-sdk-2] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.7 in 1000 ms after failure during attempt #3: OK


The transaction consensus status is SUCCESS
TopicInfo{topicId=0.0.2908271, topicMemo=First Message, runningHash=[94, -25, 118, -118, -9, 10, -103, 119, 45, -90, -18, -61, 120, -107, 26, -80, -96, 61, -67, 120,


Update Topic --------------------------------------------------


[hedera-sdk-5] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 250 ms after failure during attempt #1: OK
[hedera-sdk-0] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 500 ms after failure during attempt #2: OK
[hedera-sdk-3] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.3 in 1000 ms after failure during attempt #3: OK


The transaction consensus status is SUCCESS


The message after the update:  <ByteString@3f6db3fb size=48 contents="Good Day and welcome to Hedera Consensus Service">
TopicInfo{topicId=0.0.2908271, topicMemo=New message memo update, runningHash=[94, -25, 118, -118, -9, 10, -103, 119, 45, -90, -18, -61, 120, -107, 26, -80, -96, 61,


New message for the same topic --------------------------------------------


The new msg:  <ByteString@b6b1987 size=46 contents="Time to work with the Hedera Consensus Service">
TopicInfo{topicId=0.0.2908271, topicMemo=New message memo update, runningHash=[94, -25, 118, -118, -9, 10, -103, 119, 45, -90, -18, -61, 120, -107, 26, -80, -96, 61,


Delete a topic from the network ---------------------------------------------


[hedera-sdk-1] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.5 in 250 ms after failure during attempt #1: OK
[hedera-sdk-3] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.5 in 500 ms after failure during attempt #2: OK
[hedera-sdk-6] WARN com.hedera.hashgraph.sdk.TransactionReceiptQuery - Retrying node 0.0.5 in 1000 ms after failure during attempt #3: OK
The delete consensus: SUCCESS

Deprecated Gradle features were used in this build, making it incompatible with Gradle 8.0.
```