Week3

Laboratory 03

Stellar Technical Academy

UNIC | DLRC Stellar

Self-Assessment Exercises

Objectives

- The purpose of this Week 3 exercise is to acquaint you with the token economics and dynamics of Stellar.
- In order to do so, you are going to learn how to issue an asset on the Stellar network.
- In this exercise you will:
  - Use the Albedo wallet that you created in the Week 1 Laboratory as the Distributor and the xBull wallet you created in the Week 2 Laboratory as the Issuer
- If you have issued the asset successfully, you are finished and you can receive your badge NFT certificate for Week 3!

Create a Stellar-network token

Introduction

- In Stellar network, any account can issue an asset and as we saw previously, and anyone can set up a Stellar account.
- To do it, Stellar provides built-in mechanisms that allow you to tune your asset to specific use cases.
- This is the first exercise that helps you see how Stellar can be of valuable help in real-world use cases.

Self-Assessment Exercises

Exercise 3 – Issue a custom asset using the Stellar Laboratory

1. You are going to create a Stellar-network token using the Stellar SDK.
2. The exercise is divided into issuing an asset and then publishing information about the asset.

   The first part is split into 3 steps

   - Create an Issuing and Distribution account
   - Create a Trustline
   - Create a Payment transaction

   The second part shows how the information is created and stored in an asset.

Self-Assessment Exercises

Exercise 3 – Issue a custom asset using the Stellar Laboratory

- In the first part, familiarize yourself with the Stellar Laboratory tools presented in the previous slides, specifically the Stellar Laboratory and the Stellar Expert tools.
- More specifically, as it was described in the Theory part, you will:
  - Get to know the anatomy of an asset
  - Start to issue an asset
  - Learn why two accounts are necessary
  - Get to know the importance of a Trustline
  - Executing a payment transaction
- Then, you will check on the Stellar Expert to verify that the transaction was successfully made.
- In the second part, you will learn how to publish information about your network token.

Create a Stellar-network token

Exercise 3 – Issue a custom asset using the Stellar Laboratory - Anatomy of an Asset

Stellar assets have two characteristics.

- The asset code
- The asset issuer

And, currently, there are two supported formats:

- Alphanumeric 4-character maximum.
- Alphanumeric 12-character maximum.

Further, although you can choose any asset code you like, to allow Stellar users to easily identify what a token represents, there are recommendations as follows:

- For currencies, use the ISO 4217 code standard.
- For stocks or bonds, use the ISIN number standard.

Create a Stellar-network token

Exercise 3 – Issue a custom asset using the Stellar Laboratory - How is an asset created?

There is no reliable operation to create an asset on Stellar. Instead, assets are created with a payment operation using two accounts.

The first account will be the **issuing account** that makes a payment using the asset it's issuing and creates the asset through that payment. Also, the public key or address of the issuing account will be the one linked on the ledger to the asset. It has control over the asset (issuing control, meta-data about the asset and authorization flags).

The second account is the **base or distribution account**, which is the one that transacts with other Stellar accounts. It holds the asset balance issued by the issuing account since the creation of the asset is done like a payment transaction, from the issuing account to the base account.

Create a Stellar-network token

Exercise 3 – Issue a custom asset using the Stellar Laboratory!

To create the asset with a payment operation four steps are required:

- Create an Issuing account
- Create a Distribution account
- Establish a Trustline
- Make a payment

After asset issuance, it is necessary to provide a clear representation about what the asset represents and publish that information using tools in the Stellar Laboratory.

The process can be done in two ways:

- Using the Stellar laboratory
- Or by code.

We are going to utilize the Albedo wallet and the xBull wallet we have created in the previous weeks as Distributor and Issuer, respectively.

Create a Stellar-network token

Exercise 3 – Issue a custom asset using the Stellar Laboratory - Why have two accounts?

Why have separate accounts for issuing and distribution?

- Security:
  - Some web services have access to sign transactions on the distribution account. If a bad actor gains access to the account you use to distribute your asset and it is also the issuing account, the malicious actor can now issue as much of your asset as they like

    But if the two accounts are different, when a compromised account is identified, the issuer account can essentially freeze the asset amount of the compromised account and start over with a new distribution account. This can be done without having to change the issuing account.
- Auditing
  - The issuing account is unable to maintain a balance in its own asset. It's easier to keep track of your personal assets if you keep track of them in a separate account. This is a pattern that can be found in a variety of ledgering solutions.

    Distribution accounts also isolate our ecosystem standards from issuance, which is a nice plus. This enables ecosystem players to produce novel ideas such as non-issuing Anchors without having to change protocol.

Create a Stellar-network token

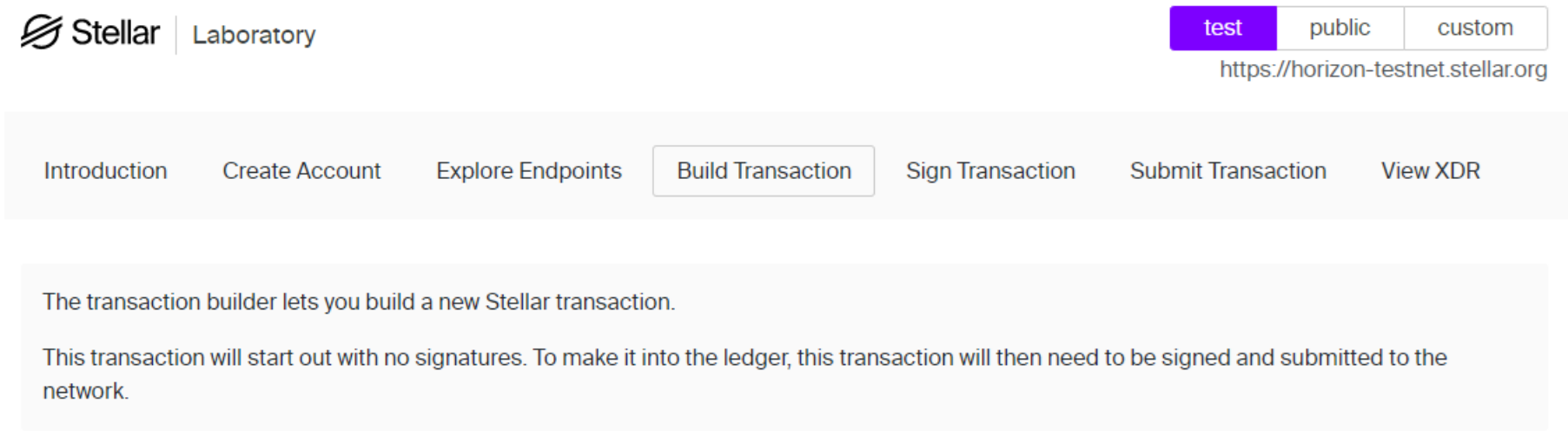
Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

- As previously mentioned, you are going to use the Albedo wallet you created on Week 1 as the Distributor and the xBull wallet you created on Week 2 as the Issuer.
- In case that the wallets are not activated, you are going to follow the next steps:
- In order to activate the xBull wallet, which is the issuer account, you are going to send 5 XLM from the Albedo wallet with the memo ‘Activate Issuer Account’.
- In order to activate the Albedo wallet, which is the distributor account, you are going to send 10 XLM from the xBull wallet with the memo ‘Activate Distributor Account’.

Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

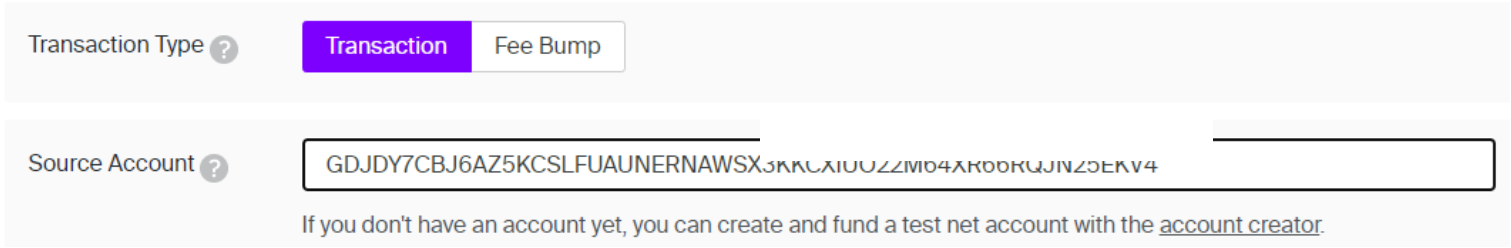
- Then, we are going to utilize the Stellar Laboratory and choose the ‘Build Transaction’ tab, in order to establish Trustline between the Distributor and the Issuer.
- Always make sure that you are working on the testnet of the Stellar Laboratory!



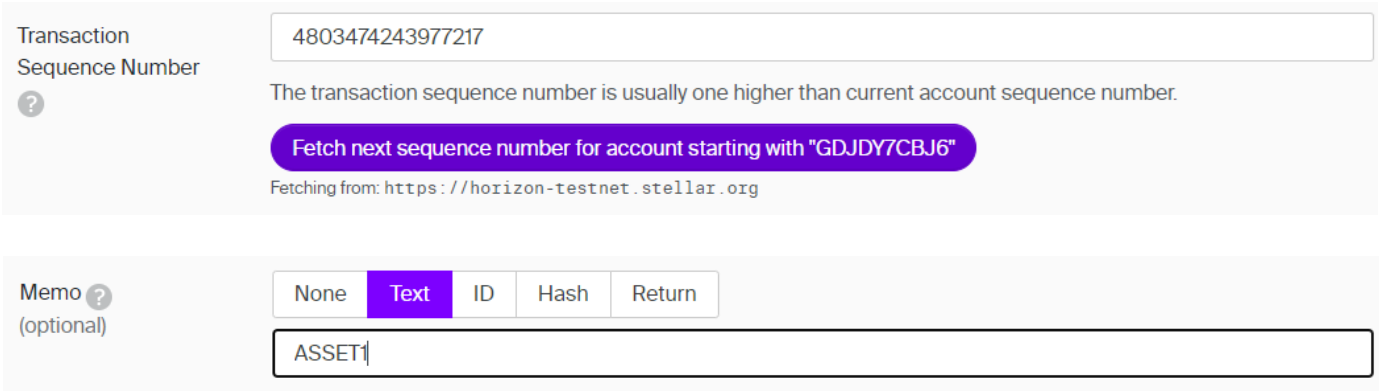
Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

- As the first step, you are going to copy and paste the public key of the distributor account in the ‘Source Account’ field, which in this case is the public key of the Albedo account (Distributor).



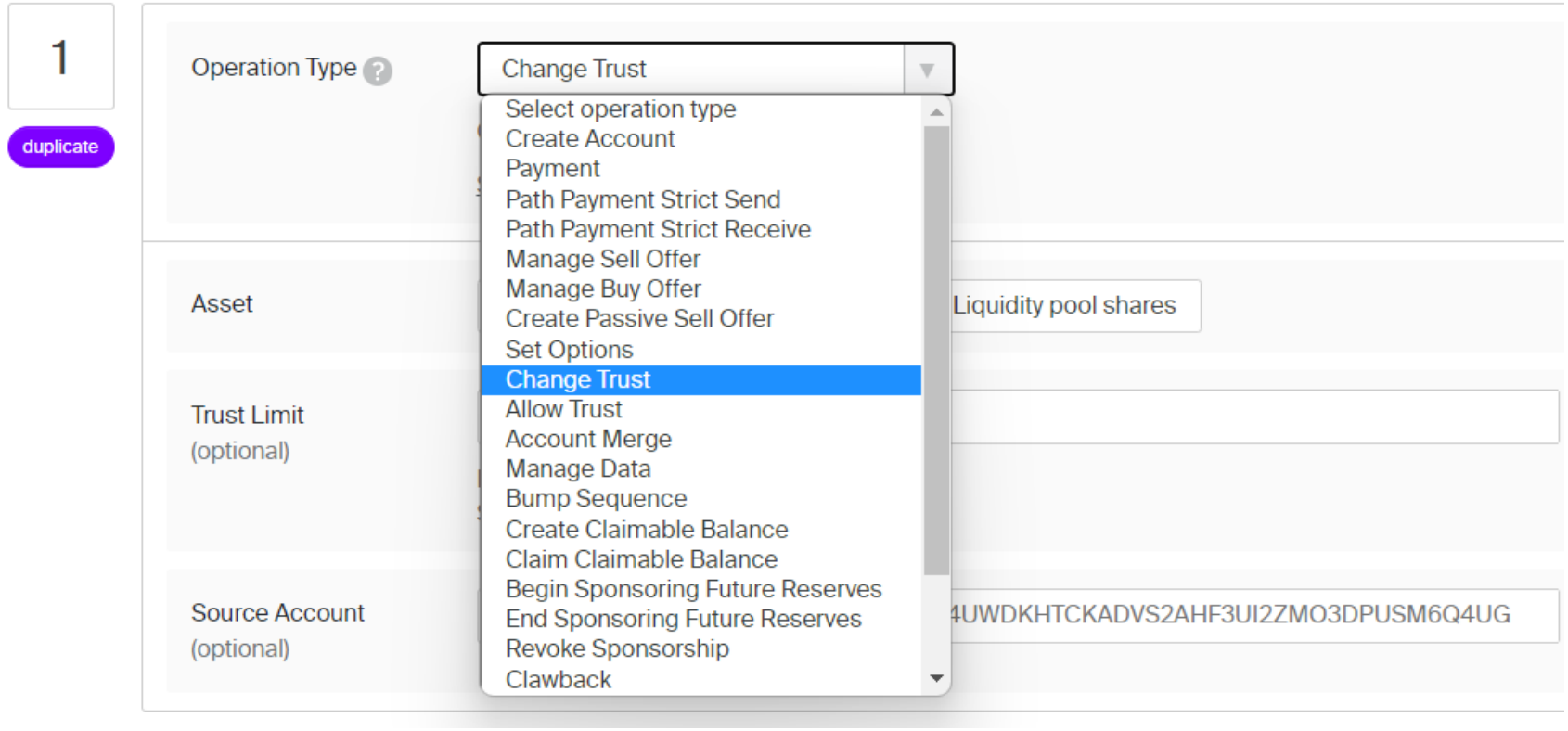
- Up next, click on ‘Fetch next sequence number for account starting with ‘…….’ and in the memo add ‘ASSET1’ as a text.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

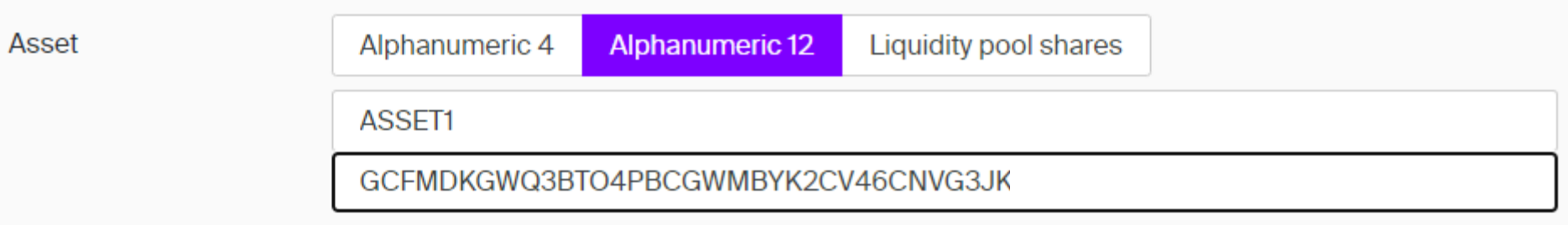
- Then, scroll down to the ‘Operation Type’ form and choose ‘Change Trust’.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

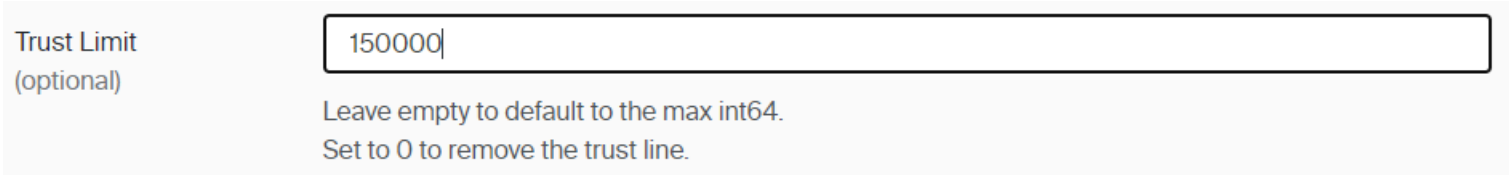
- In the ‘Asset’ field choose between ‘Alphanumeric 4’ or ‘Alphanumeric 12’. This defines the possible length of your Asset Code.
- Then, enter your Asset Code, which is your token’s name, in the corresponding field (e.g. STAC), and write it down.
- In the ‘Issuer Account ID’ field, copy and paste the public key of the issuer account, which, in this case, is the public key of the xBull wallet (issuer).



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

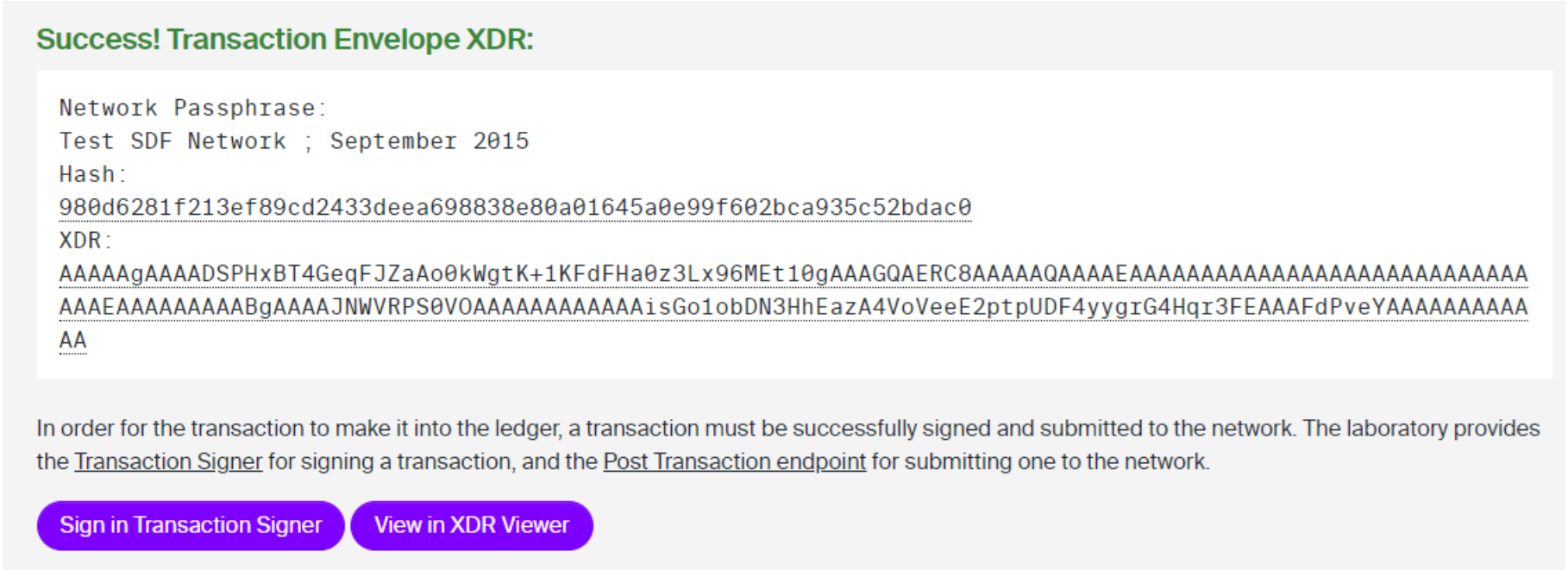
- After that, enter the amount of tokens you want to generate into the ‘Trust Limit’ field (e.g. 150,000).



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

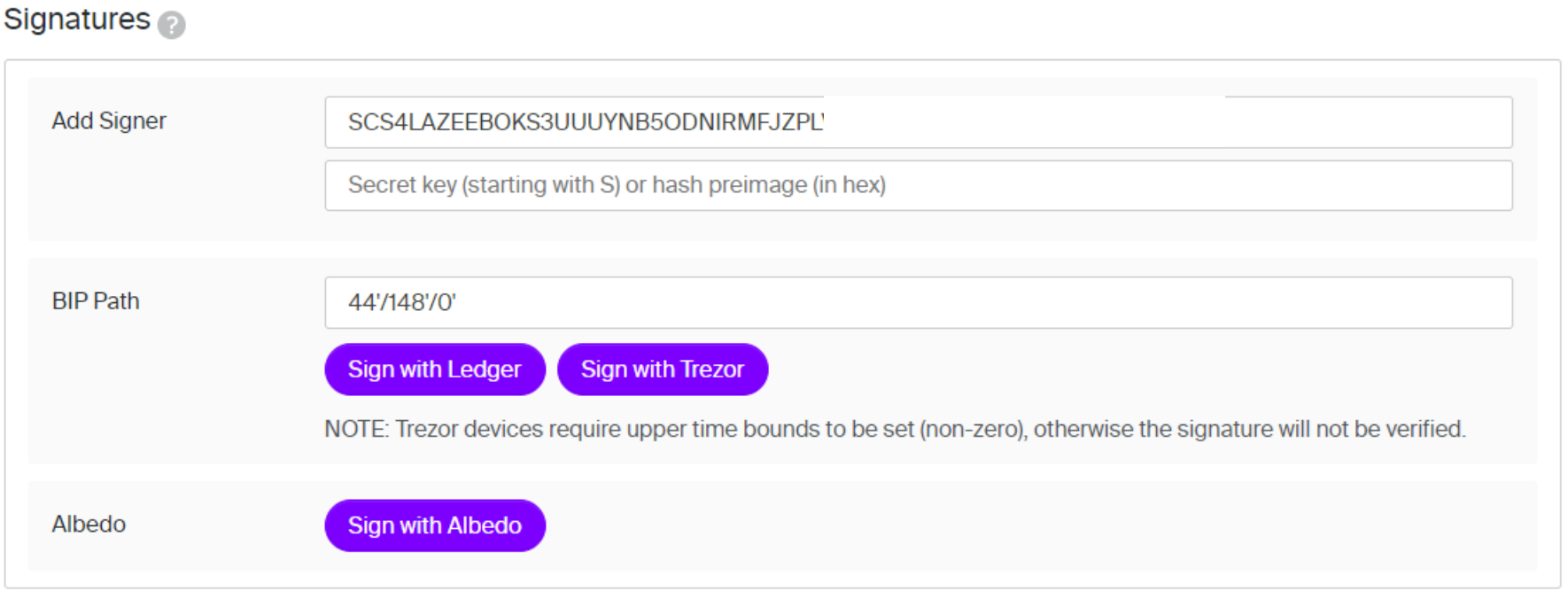
- Then, scroll down and click on ‘Sign in Transaction Signer’.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

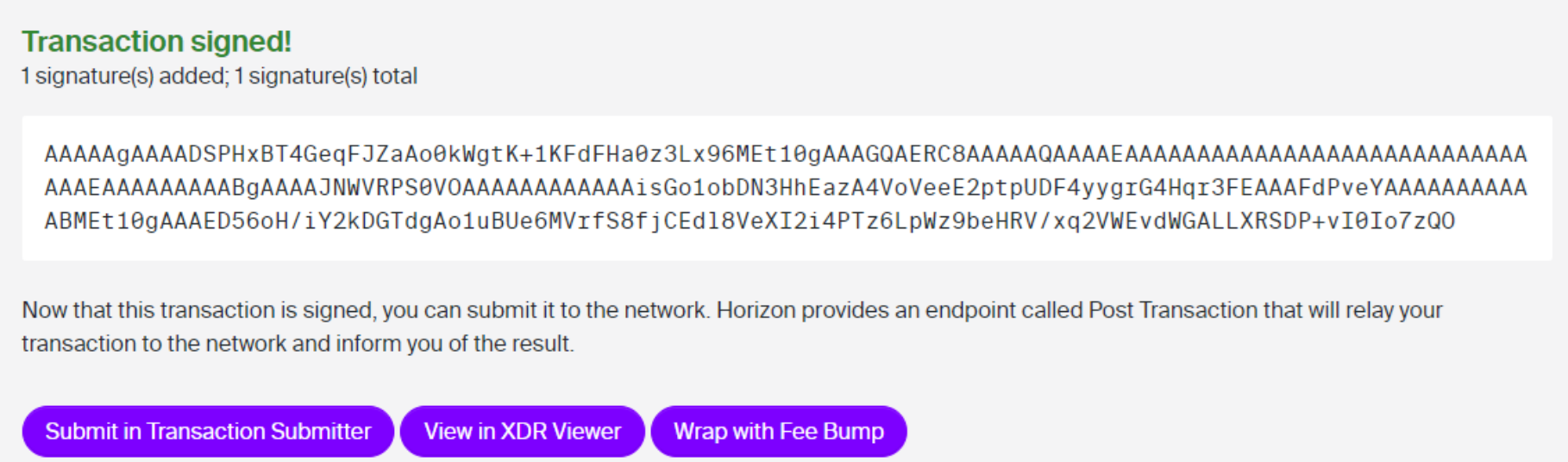
- Now, copy and paste the secret key of the Distributor (the Albedo wallet) to the ‘Add Signer’ field.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

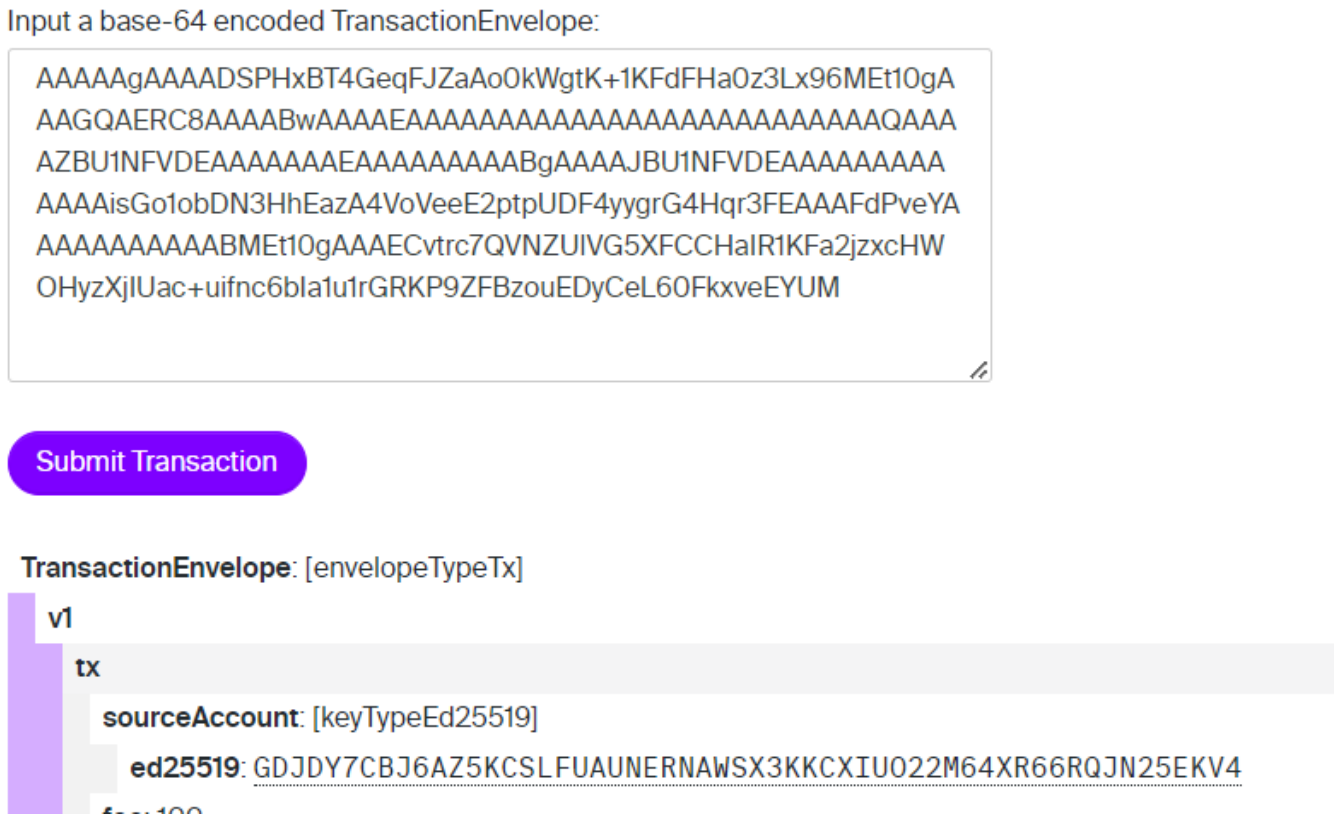
- Afterwards, scroll down and click on ‘Submit in Transaction Submitter’.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

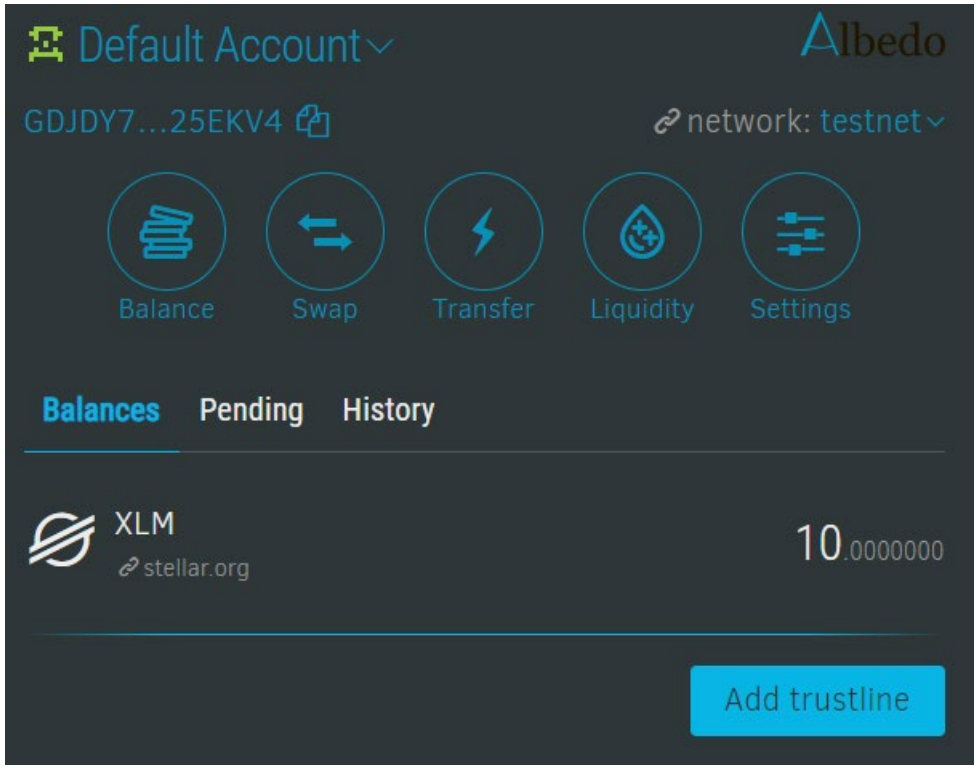
- Then, click on ‘Submit Transaction’.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

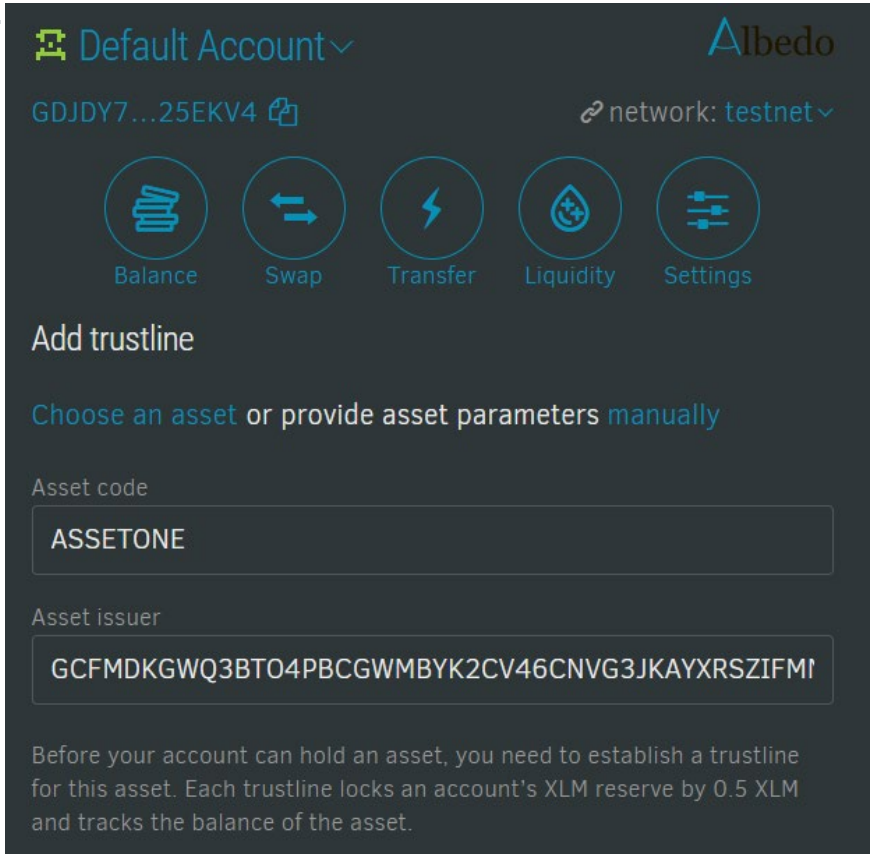
- As an **alternative** choice, instead of establishing a Trustline via the Stellar Laboratory, you can choose to establish a Trustline via the Albedo interface:
- In order to do so, you can open your Distributor wallet, e.g., the Albedo wallet, and click on ‘Add Trustline’.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

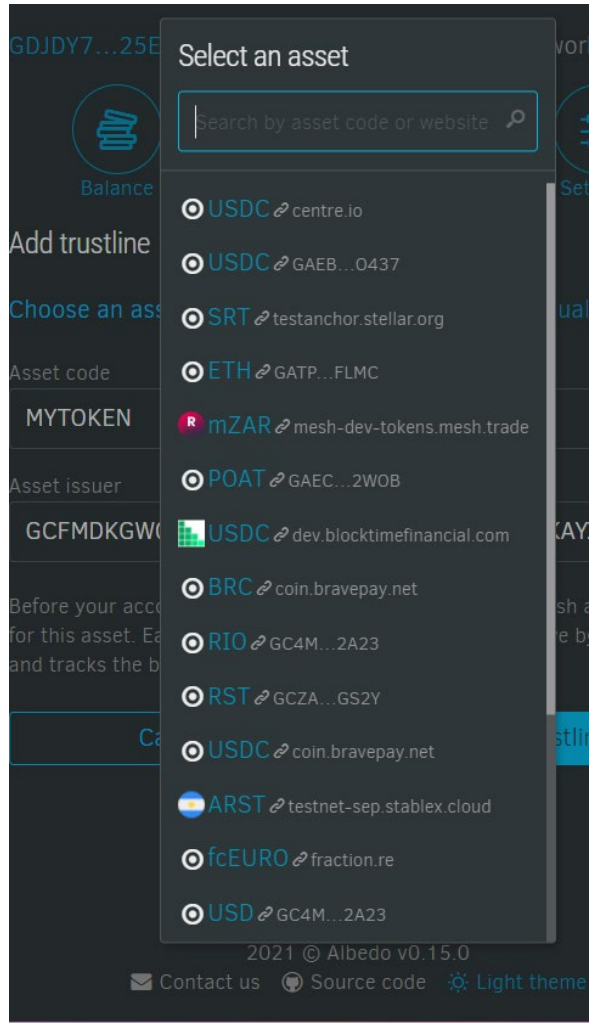
- Then, fill in the ‘Asset code’ and ‘Asset issuer’ fields with the same values you used in the Laboratory and click on ‘Add trustline’.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

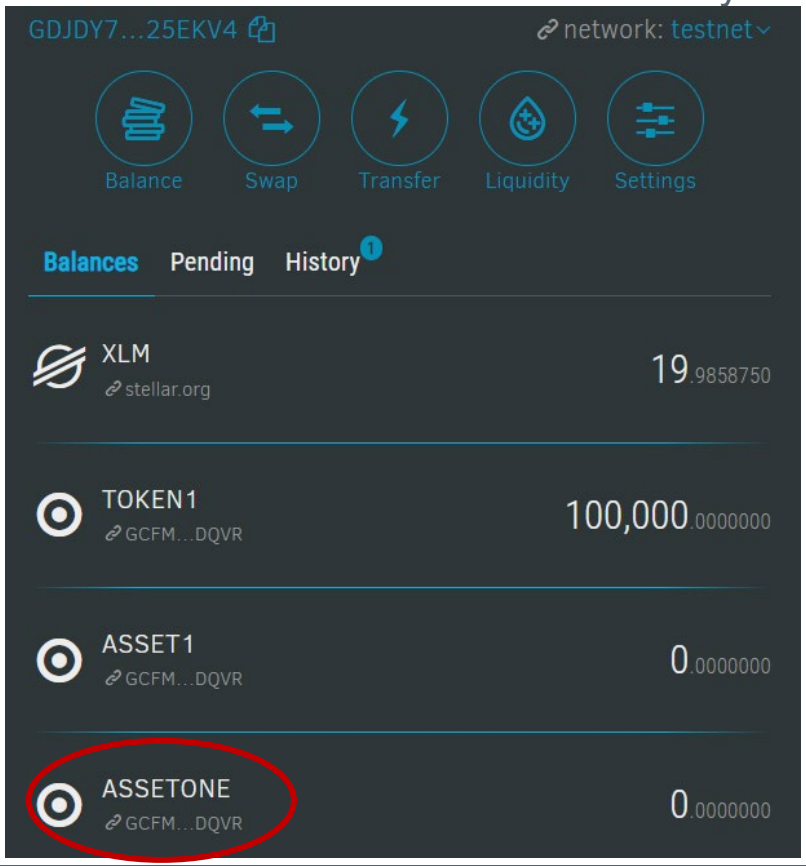
- Alternatively, you could click on ‘Choose an asset’ and select the asset that you prefer.
- However, in this example you will proceed with XLM.



Create a Stellar-network token

Exercise 3.1 – Establish a Trustline between the Distributor and the Issuer

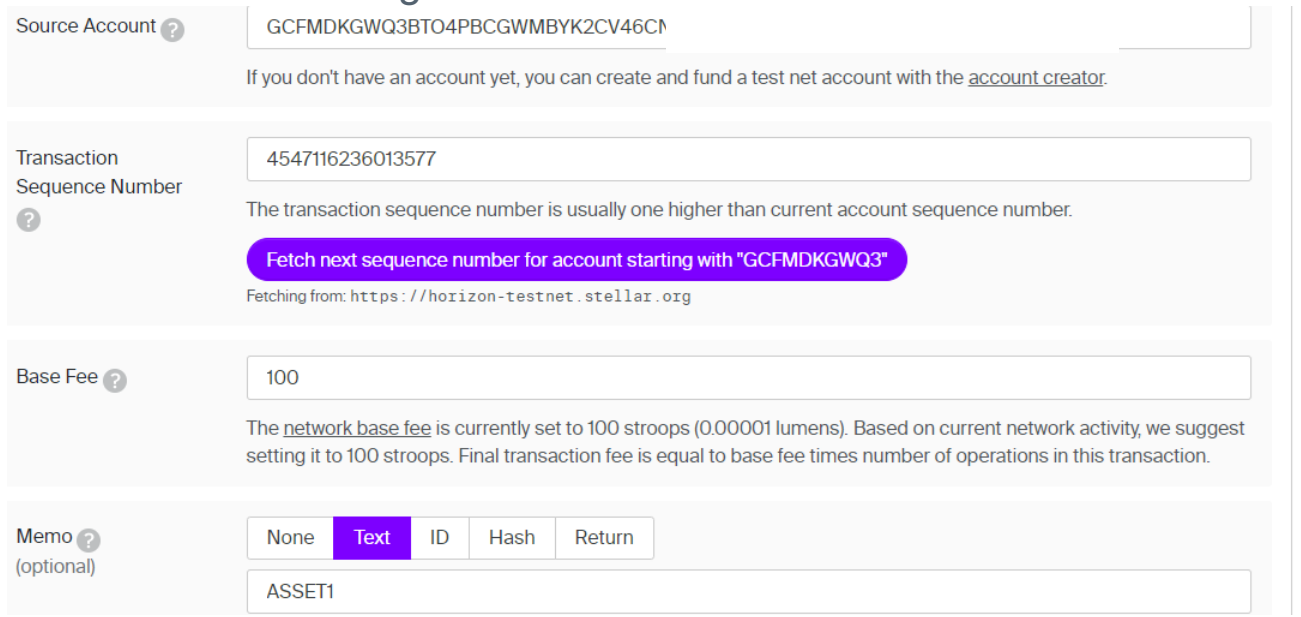
- After you are requested to type your password in order to confirm the Trustline, you will be directed to your landing page and see that the Trustline has been successfully created.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

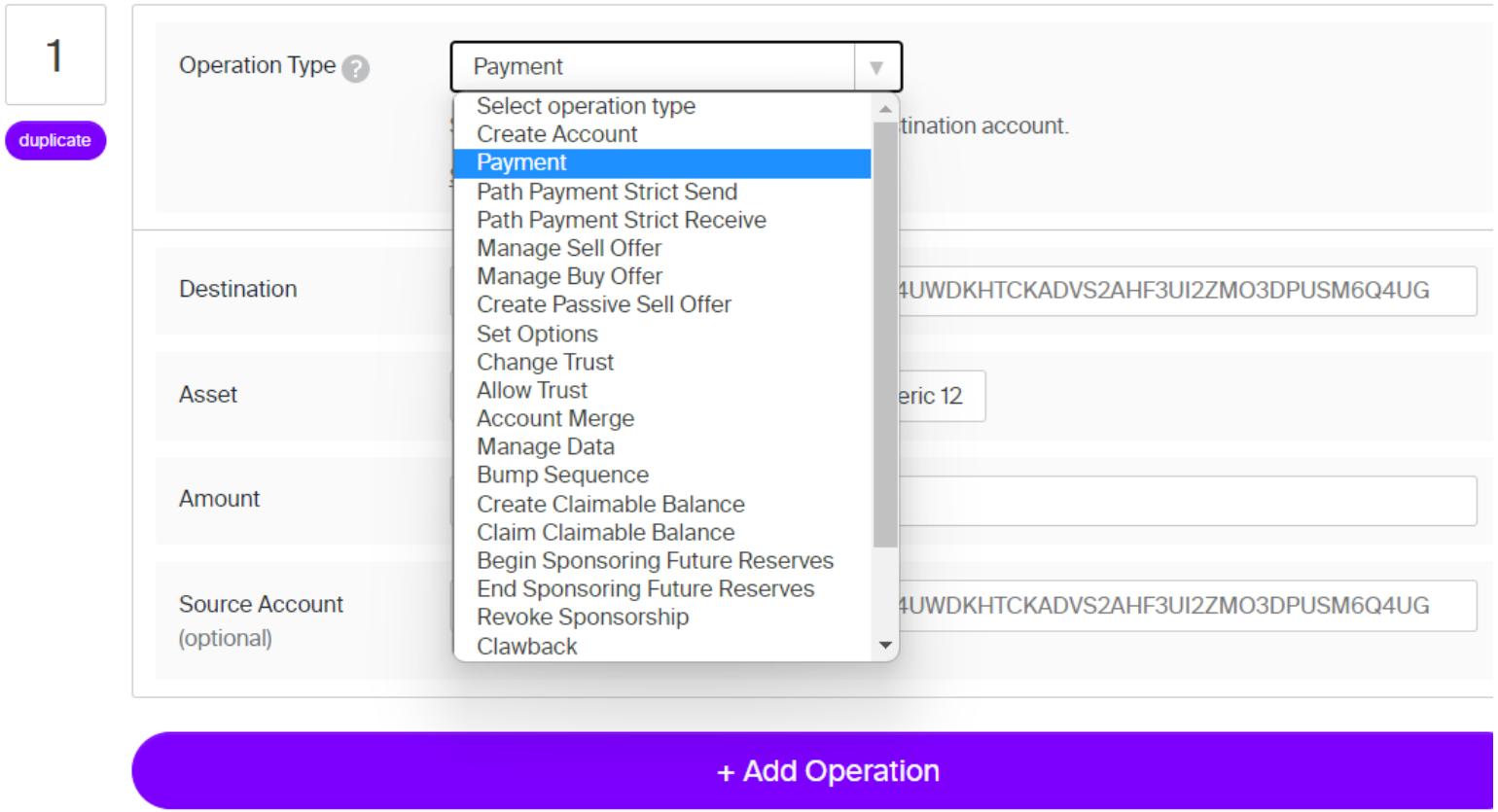
- The first steps are pretty similar to the ones you followed on exercise 3.1.
- After you have cleared all previously entered data, head over to the ‘Build a transaction’ tab of the Stellar Laboratory again.
- However, now you are going to copy and paste the public key of the ISSUER account in the ‘Source Account’ field, which in this case is the public key of the xBull account (issuer) and click on ‘Fetch next sequence number for account starting with ‘…….’ and fill in the memo.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

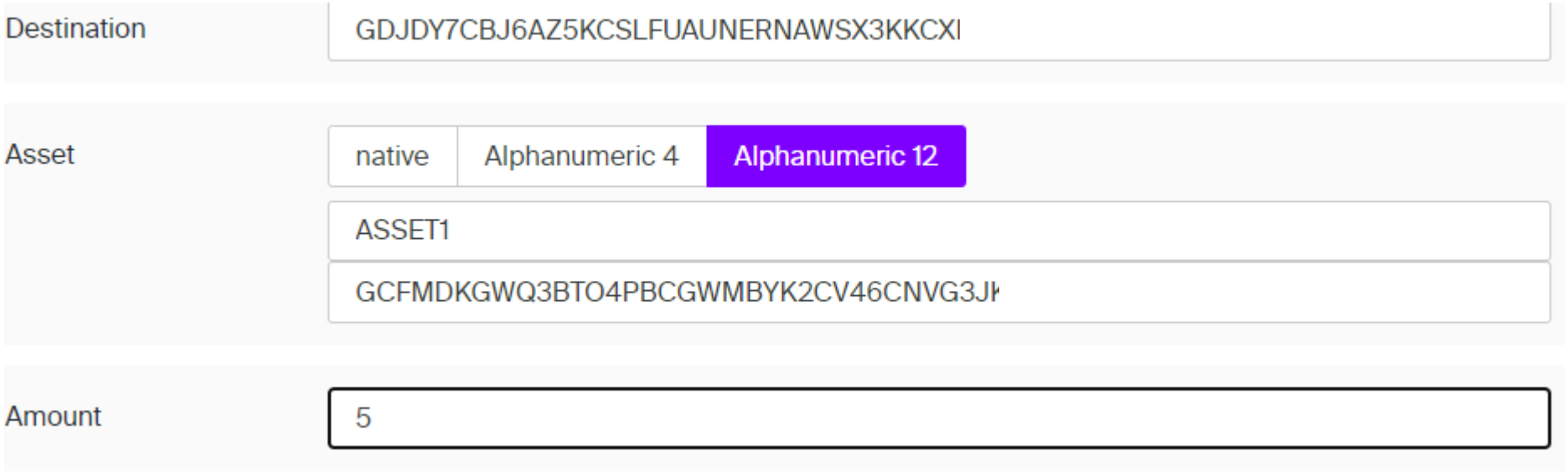
- Then, scroll down to the ‘Operation Type’ form and select ‘Payment’.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

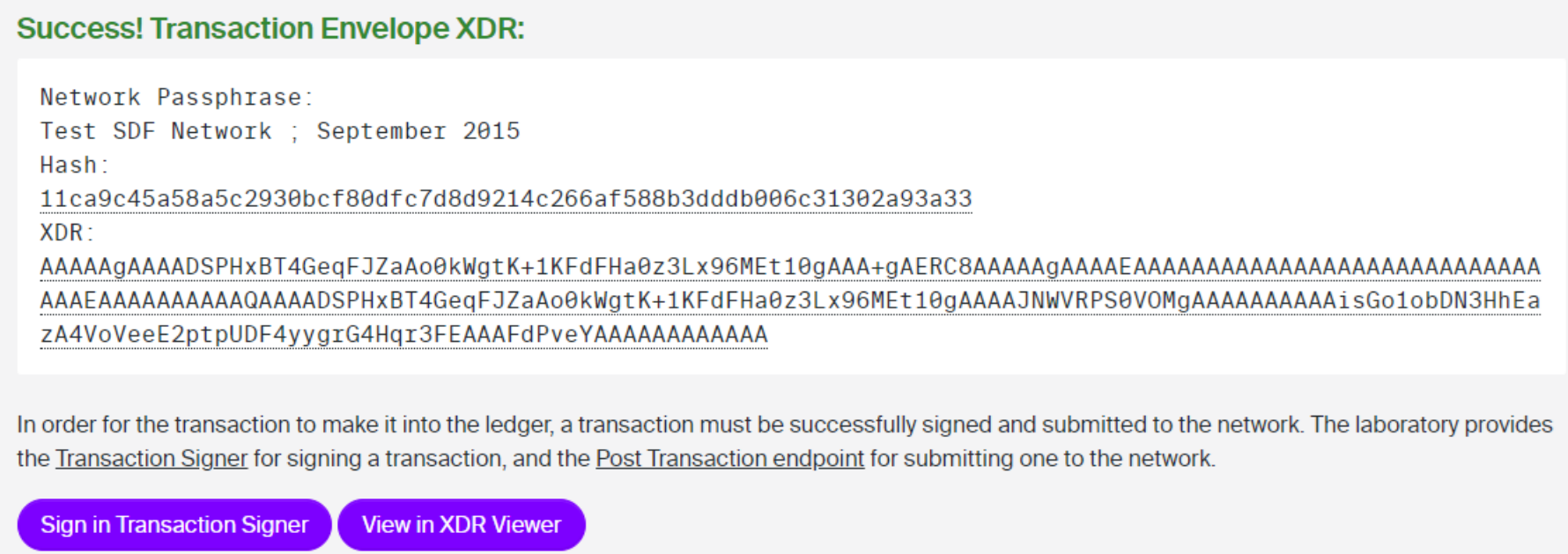
- Then, paste the distributor's public key in the 'Destination' field and in the 'Asset' field choose between Alphanumeric 4 or Alphanumeric 12 as the length for your Asset Code which you picked earlier.
- After that, enter your Asset Code (e.g. MYTOKEN2) and the issuer's public key.
- Choose the amount of your token you want to send to the distributor (e.g. 150,000 for all token which you created earlier) in the 'Amount' field.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

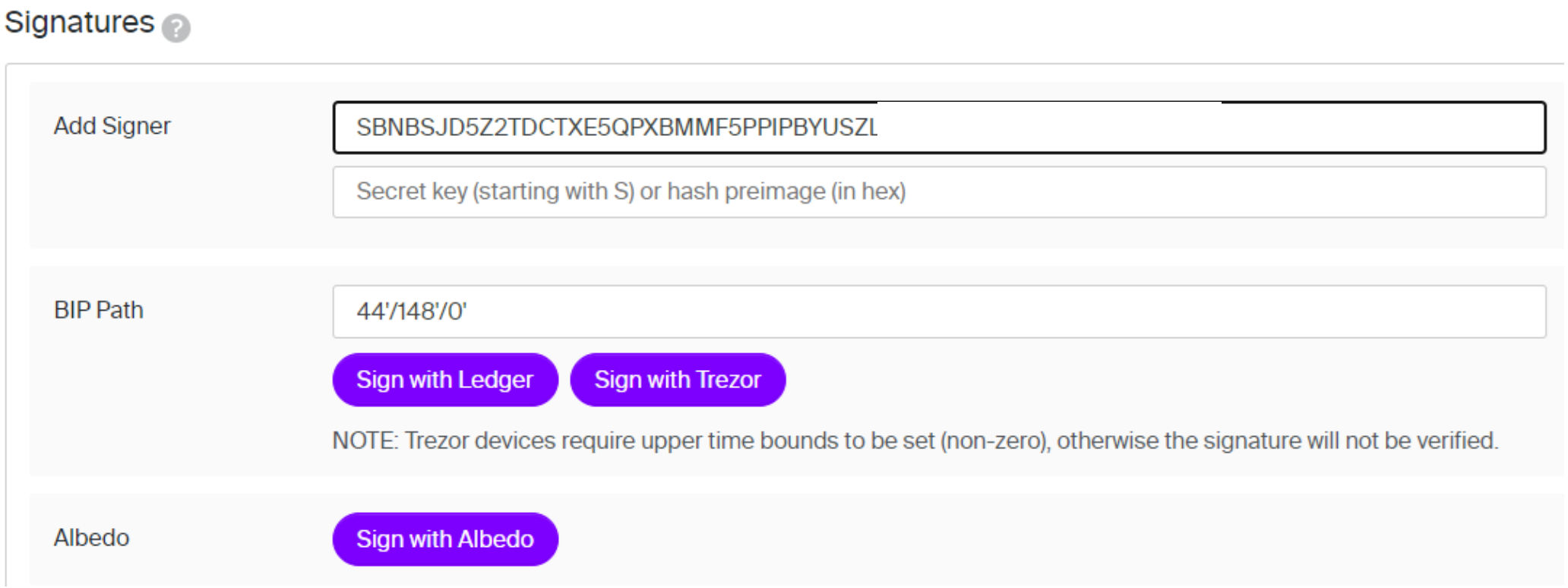
- Next, scroll down to ‘Sign in Transaction Signer’ and click it.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

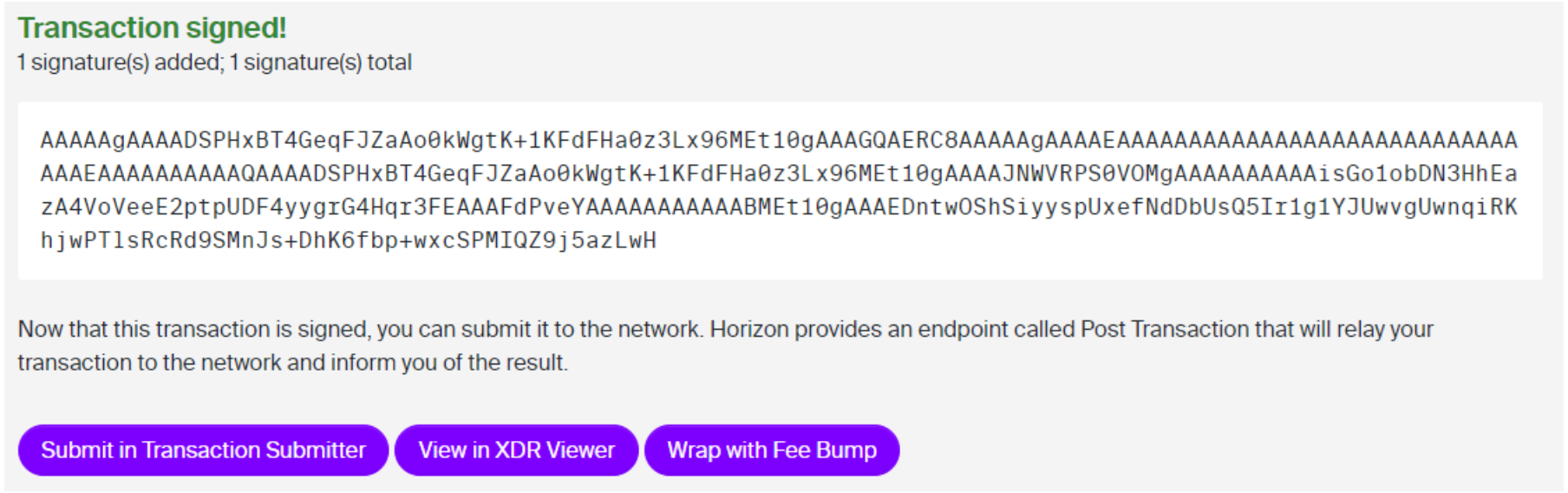
- Next, copy and paste the secret key of the Distributor (the Albedo wallet) to the "Add Signer" field.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

- Once more, scroll down and click on ‘Submit in Transaction Submitter’ and then ‘Submit Transaction’.



Create a Stellar-network token

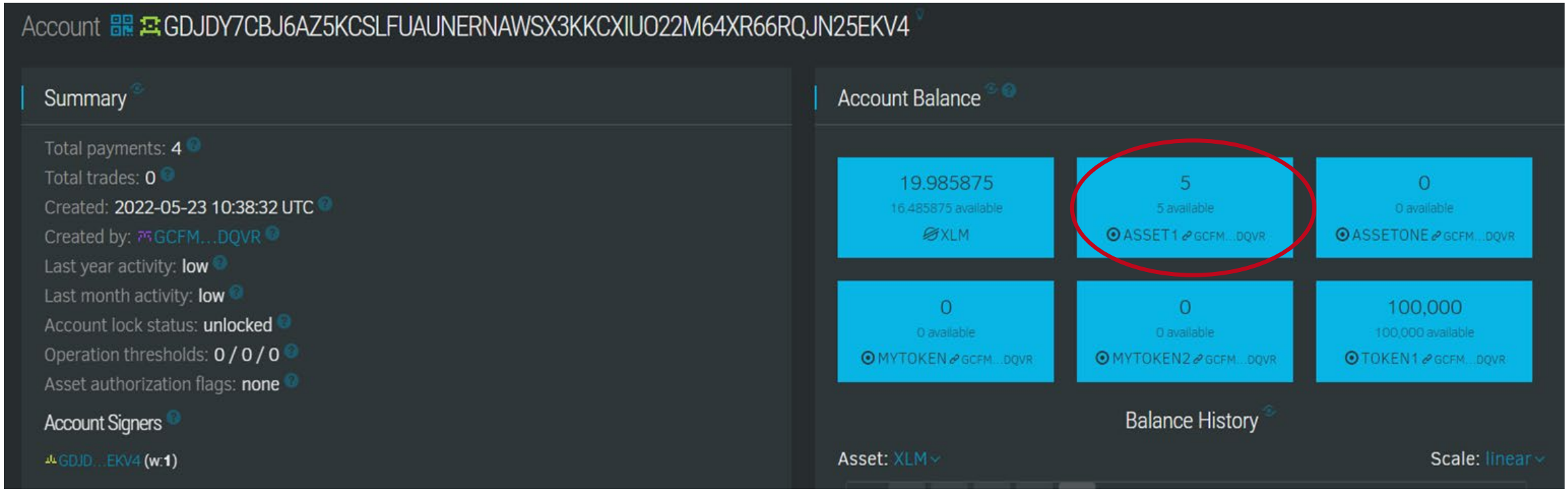
Exercise 3.2 – Send a new token from the Issuer to the Distributor

- Once more, scroll down and click on ‘Submit in Transaction Submitter’ and then ‘Submit Transaction’.

Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

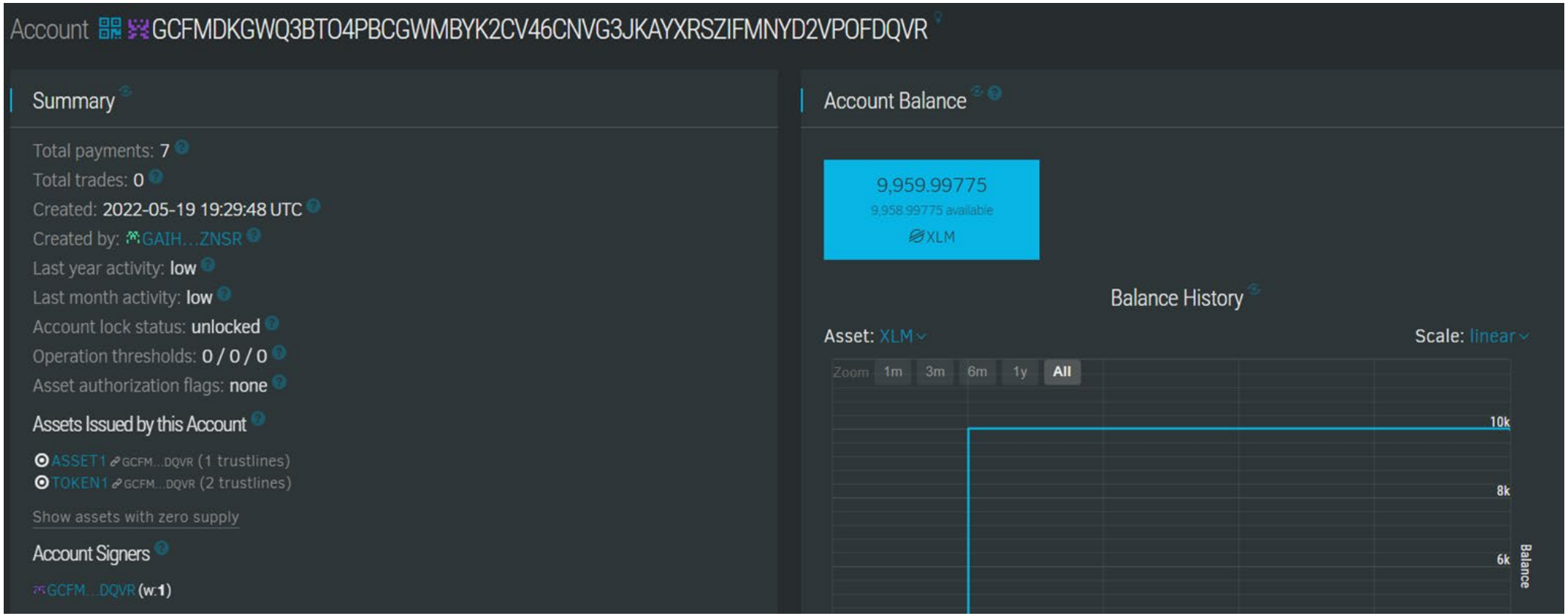
- Give it a minute, then check both accounts on Stellar.expert . Both accounts should present the amount of XLM, plus the amount of your new token (e.g. ASSET1) on the DISTRIBUTOR account.
- Stellar.expert is a tool provided by Stellar and it serves as an explorer for every Stellar account.
- You can search each account using its public key and gain access to many useful analytics.



Create a Stellar-network token

Exercise 3.2 – Send a new token from the Issuer to the Distributor

- Make sure you are on the testnet!



Create a Stellar-network token

Exercise 3.2 – Issue and distribute your own custom asset

- After, successfully completing all the tasks above, take the same steps in order to issue and distribute another custom asset of your choice, e.g., ASSET2
- Once you are done, copy the transaction ID of the transaction of the 1st custom asset to the corresponding moodle field and repeat for the 2nd custom asset as well.
- Remember, the transaction ID is the hash number of the transaction.

Questions?

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