

Week 6

Laboratory 06

Stellar Technical Academy



Lab Exercise

Create an NFT using the Stellar Laboratory

- **Exercise 1: Create an NFT using Laboratory**
 - Create an NFT using the Laboratory

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- First, you are going to head over to the [Stellar Laboratory](#). As always, make sure you are using the testnet network (right corner and click **test**, if it's not selected).
- Click the tab **Create Account** and select the **Generate Keypair** button to generate the first key pair. Then fund your account with the Friendbot, as you did on Week 1.
- Repeat the process to create the second keypair account.
- Create two public keys for the two accounts and make sure that you don't mix them up. The first key will be your **Distributor** and the second key will be your **Issuer**.

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

Keypair generator

These keypairs can be used on the Stellar network where one is required. For example, it can be used as an account master key, account signer, and/or as a stellar-core node key.

Generate keypair

Public Key	GDXOPG6QG2IYGM3G2OZ3RX7DIHIBQ45V3V
Secret Key	SDIEBBR4NP6ZUZEWQH44ZBUOKTFRNDDABC

[Fund this account on the test network using the friendbot tool below](#)

Keypair generator

These keypairs can be used on the Stellar network where one is required. For example, it can be used as an account master key, account signer, and/or as a stellar-core node key.

Generate keypair

Public Key	GBIWSNP7FFDFWPEYHUL4CRDC7ENH2SINWUF
Secret Key	SBBKEEBAU65MQ3CAZZW3PNDHZUFYOOIPGH

[Fund this account on the test network using the friendbot tool below](#)

Generating the keypairs.

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Now, you are going to fund the Stellar accounts using the Friendbot.
- Please fund **both** accounts with 10,000 XLM on the **test network**.
- Just add the public key for the account you want to fund and click on **"Get test network lumens"**.

Friendbot: Fund a test network account

The friendbot is a horizon API endpoint that will fund an account with 10,000 lumens on the test network.

GDXOPG6QG2IYGM3G2OZ3RX7DIHIBQ45V3VBC

Get test network lumens

Successfully funded GDXOPG6QG2IYGM3G2OZ3RX7DIHIBQ45 on the test network

Friendbot: Fund a test network account

The friendbot is a horizon API endpoint that will fund an account with 10,000 lumens on the test network.

GBIWSNP7FFDFWPEYHUL4CRDC7ENH2SINWUPU

Get test network lumens

Successfully funded GBIWSNP7FFDFWPEYHUL4CRDC7ENH2SIN on the test network

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- In the third step, set up a Trustline between the Issuer and the Distributor.
- A Trustline in Stellar explicitly implies that the distribution account trusts the issuing account with the handling of the assets issued.
- First, we go to the tab Build Transaction. With the transaction builder you build a new Stellar transaction on the Stellar Network.

Introduction

Create Account

Explore Endpoints

Build Transaction

Sign Transaction

Submit Transaction

View XDR

The transaction builder lets you build a new Stellar transaction.

This transaction will start out with no signatures. To make it into the ledger, this transaction will then need to be signed and submitted to the network.

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- First, in the 'Source Account' field type the public key of the Distributor account.
- Then, click on 'Fetch next sequence number...' button.
- In the 'Memo' section, click on 'Text' and type 'MYNFT'.

The screenshot displays the Stellar Laboratory interface with the following fields and actions:

- Source Account:** A text input field containing the public key `GDXOPG6QG2FYGM3G2OZ3RX7DII`. Below the field is a note: "If you don't have an account yet, you can create and fund a test net account with the [account creator](#)".
- Transaction Sequence Number:** A text input field containing the number `5014782339973121`. Below the field is a note: "The transaction sequence number is usually one higher than current account sequence number." A prominent purple button labeled "Fetch next sequence number for account starting with 'GDXOPG6QG2'" is visible, with the text "Fetching from: <https://horizon-testnet.stellar.org>" below it.
- Base Fee:** A text input field containing the value `100`. Below the field is a note: "The network base fee is currently set to 100 stroops (0.00001 lumens). Based on current network activity, we suggest setting it to 100 stroops. Final transaction fee is equal to base fee times number of operations in this transaction."
- Memo (optional):** A section with five tabs: "None", "Text", "ID", "Hash", and "Return". The "Text" tab is selected and highlighted in purple. Below the tabs is a text input field containing the value `MYNFT`.

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Now, you are going to create a Trustline between the Distributor and the Issuer).
- In the 'Operation Type' dropdown button choose the 'Change Trust' option and in the 'Asset' field choose 'Alphanumeric12' and type a code (e.g., MYNFT) that is between 5 and 12 characters long.
- In the 'Issuer Account ID' field just copy and paste the public key of the issuer account)

Operation Type ?	<div>Change Trust ▼</div> <p>Creates, updates, or deletes a trustline. See documentation for Change Trust</p>
Asset	<div>Alphanumeric 4 Alphanumeric 12 Liquidity pool shares</div> <div>MYNFT</div> <div>GBIWSNP7FFDFWPEYHUL4</div>
Trust Limit (optional)	<div></div> <p>Leave empty to default to the max int64. Set to 0 to remove the trust line.</p>
Source Account (optional)	<div>Example: GCEXAMPLE5HWNK4AYSTEQ4UWDKHTCKADVS2AH</div>

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

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

Success! Transaction Envelope XDR:

Network Passphrase:

Test SDF Network ; September 2015

Hash:

cd9dc4ec9e05583dbd77609e4e0b3a947c390b0b76916bc123020e5a85484b6c

XDR:

AAAAAgAAADu55vQNpGDM2bTs7jf40HQGH013UJnxE3r13D7QGqAqQAAAGQAEDrAAAAAQAAAEAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAQAAAVNWU5GVAAAAAAAAAAAAAAAAABgAAAAJNWU5GVAAAAAAAAAAAAAAAA
UWk1/y1GWzyYPRfBRGL5Gn1JDbUfSZ2rIC0JMs4nT4p////////wAAAAAAAAA

In order for the transaction to make it into the ledger, a transaction must be successfully signed and submitted to the network. The laboratory provides the [Transaction Signer](#) for signing a transaction, and the [Post Transaction endpoint](#) for submitting one to the network.

[Sign in Transaction Signer](#)

[View in XDR Viewer](#)

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Then, scroll down again to the 'Signatures' form.
- In the 'Add Signer' field, copy and paste the secret key of the Distributor.
- Scroll down once more and click on 'Submit in Transaction Submitter'.

Signatures ?

Add Signer

0IEB8R4NP6ZUZEWOH44ZBUO

Secret key (starting with S) or hash preimage (in hex)

BIP Path

44'/148'/0'

Sign with Ledger

Sign with Trezor

NOTE: Trezor devices require upper time bounds to be set (non-zero), otherwise the signature will not be verified.

Albedo

Sign with Albedo

Transaction signed!

1 signature(s) added; 1 signature(s) total

```
AAAAAgAAADu55vQNpGDM2bTs7jf40HQGH013UJnxE3r13D7QGqAqQAAAGQAEddrAAAAAQAAAAEAAAAA
AAAAAAAAAAAAAAAAAAAAAAQAAAVNWU5GVAAAAAAAAAAEAAAAAAAAABgAAAAJNWU5GVAAAAAAAAAAAAAAAA
UWk1/y1GWzyYPRfBRGL5Gn1JDbUfSZ2rIC0JMs4nT4p////////wAAAAAAAAABQGqAqQAAAE0YKyb-
Iz3ul0jt19WL08EPVQDDX7VIzJ9BYnrn/w1cjWKT+3FfTqEQFy/qo2cIo1ywjDBHdmz3rUDLTOLCHY4K
```

Now that this transaction is signed, you can submit it to the network. Horizon provides an endpoint called Post Transaction that will relay your transaction to the network and inform you of the result.

[Submit in Transaction Submitter](#)[View in XDR Viewer](#)[Wrap with Fee Bump](#)

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Click on 'Submit Transaction' and, if you followed all the steps correctly, then your transaction is successfully submitted and you have created the Trustline!

Input a base-64 encoded TransactionEnvelope:

```
AAAAAgAAADu55vQNpGDM2bTs7jf40HQGH013UJnxE3r13D7QGqAqQ  
AAAGQAEddrAAAAAQAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAQAA  
AAVNWU5GVAAAAAAAAAAAAAAAAABgAAAAJNWU5GVAAAAAAAAAAAA  
AAAAAUWk1/yIGWzyYPRfBRL5Gn1JDbUfSZ2rCOJMs4nT4p////////wA  
AAAAAABQGqAqQAAAEODOYKyblz3ulOjti9WL08EPVQDDX7VImJ9BYn  
rn/w1cjWKT+3FfTqEQFy/qo2clo1ywjDBHdmz3rUDLTOLCHY4K
```

Submit Transaction

TransactionEnvelope: [envelopeTypeTx]

v1

tx

sourceAccount: [keyTypeEd25519]

ed25519: GDX0PG6QG2IYGM3G20Z3RX7DIHIBQ4

fee: 100

Transaction submitted!

Transaction succeeded with 1 operation(s).

Hash:

cd9dc4ec9e05583dbd77609e4e0b3a947c390b0b76916bc123020e5a85484b6c

Ledger number:

1167853

Paging token:

5015890441539584

Result XDR:

AAAAAAAAAGQAAAAAAAAAAAAAAAAAGAAAAAAAAA=

Result Meta XDR:

AAAAAgAAAAIAAADABHR7QAAAAAAAAA7ueb0DaRgzNm07043+NB0Bhztd1CZ8RN65dw+0BqgKkAAAAAXSI

Fee Meta XDR:

AAAAAgAAAAAAEdDrAAAAAAAAAADu55vQNpGDM2bTs7jf40HQGH013UJnxE3r13D7QGqAqQAAABdIdugAAI

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Now, you are going to head back to the 'Build Transaction' section and click on 'Clear form contents and start over'.
- Then, in the 'Source Account' field, you are going to copy and paste the public key of the Issuer (not the Distributor).
- Then, click again on 'Fetch next sequence number...' and on the 'Memo' field choose once more 'Text' and write the same memo as you did before.

The screenshot shows the 'Build Transaction' form in the Stellar Laboratory. It consists of four main sections:

- Source Account:** A text input field containing the public key 'GBIWSNP7FFDFWPEYHUL4CRDC7ENH2SIN'. Below the field is a note: 'If you don't have an account yet, you can create and fund a test net account with the [account creator](#)'.
- Transaction Sequence Number:** A text input field containing '5014533231869953'. Below the field is a note: 'The transaction sequence number is usually one higher than current account sequence number.' There is a purple button labeled 'Fetch next sequence number for account starting with "GBIWSNP7FF"'. Below the button is the text 'Fetching from: <https://horizon-testnet.stellar.org>'.
- Base Fee:** A text input field containing '100'. Below the field is a note: 'The [network base fee](#) is currently set to 100 stroops (0.00001 lumens). Based on current network activity, we suggest setting it to 100 stroops. Final transaction fee is equal to base fee times number of operations in this transaction.'
- Memo (optional):** A section with five radio buttons: 'None', 'Text', 'ID', 'Hash', and 'Return'. The 'Text' button is selected. Below the buttons is a text input field containing 'MYNFT'.

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Up next, scroll down to the Operation Type form and choose 'Payment'.
- In the destination field type the public key of the **Distributor** account.
- In the 'Asset' field follow the same steps as you did before and in the 'Amount' field type '1'.

Operation Type ?	Payment ▼
Sends an amount in a specific asset to a destination account.	
See documentation for Payment	
Destination	GDXOPG6QG2IYGM3G2OZ3RX7D
Asset	<div>native Alphanumeric 4 Alphanumeric 12</div> <div>MYNFT</div> <div>GBIWSNP7FFDFWPEYHUL4CRDC</div>
Amount	1

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Now, scroll down and click on “+Add Operation”.
- In the ‘Operation Type’ dropdown button choose ‘Manage Data’.
- In the ‘Entry name’ field type the name you want to give to your NFT (e.g., ‘My NFT’) and in the ‘Entry value’ field type the URL of your token (e.g., the URL of a JPEG)
- Once more, click on ‘+Add Operation’.

Operation Type ?	Manage Data ▼
Sets, modifies, or deletes a Data Entry (name/value pair).	
See documentation for Manage Data	
Entry name	My First NFT
Entry value (optional)	https://imgur.com/ohhvJju
If empty, will delete the data entry named in this operation. Note: The laboratory only supports strings.	
Source Account (optional)	Example: GCEXAMPLE5HWNK4AYSTEQ4UWDKHTCKADVS2AH

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- For the last operation, choose the 'Set Options' type.
- In the 'Inflation Destination' field type the public key of the **Issuer** and on the 'Master Weight' type 0, in order to lock your account.
- This will prevent the Issuer from minting more tokens in the future. To issue more NFTs as a native token, just leave it blank.

The screenshot shows the 'Set Options' operation form in the Stellar Laboratory. It includes the following fields and options:

- Operation Type:** Set Options (selected). Description: Sets various configuration options for an account. Link: [See documentation for Set Options](#).
- Inflation Destination:** GBIWSNP7FFDFWPEYHUL4CRDC7E (optional).
- Set Flags:** (optional). Options: Authorization required, Authorization revocable, Authorization immutable, Authorization clawback enabled. Description: Selected flags mean to add selected flags in addition to flags already present on the account.
- Clear Flags:** (optional). Options: Authorization required, Authorization revocable, Authorization clawback enabled. Description: Selected flags mean to remove selected flags already present on the account.
- Master Weight:** 0 (optional). Warning: This can result in a permanently locked account. Are you sure you know what you're doing? Link: [See documentation for multisignature accounts](#).

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Finally, scroll down and click on 'Sign in Transaction Submitter'.

Success! Transaction Envelope XDR:

```
Network Passphrase:  
Test SDF Network ; September 2015  
Hash:  
697a15baca7224dc4a27876c8b98cbad7d871fa41c07e978db1e0e77e875909e  
XDR:  
AAAAAgAAAAABRaTX/KUZbPJg9F8FEYvkafUkNtR9JnasgI4kyzidPigAAASwAEdCxAAAAQAAAAEAAAA  
AAAAAAAAAAAAAAAAAAAAQAAAAVNWU5GVAAAAAAAAAAAAAAAAAAAAQAAADu55vQNpGDM2bTs7j f40HQ  
GH013UJnxE3r13D7QGgAqQAAAAJNWU5GVAAAAAAAAAAAAAAAAAAAAUWk1/y1GWzyYPRfBRGL5Gn1JDbUfSZ2r  
IC0JMs4nT4oAAAAAAJiWgAAAAAAAAAAAAAADE15IEZpcnN0IE5GVAAAAAEAAAAZaHR0cHM6Ly9pbWd1  
ci5jb20vb2hodkpbqdQAAAAAAAAAAAAFAAAAAQAAAAABRaTX/KUZbPJg9F8FEYvkafUkNtR9JnasgI4ky  
zidPigAAAAAAAAAAAAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

In order for the transaction to make it into the ledger, a transaction must be successfully signed and submitted to the network. The laboratory provides the [Transaction Signer](#) for signing a transaction, and the [Post Transaction endpoint](#) for submitting one to the network.

[Sign in Transaction Signer](#)[View in XDR Viewer](#)

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- In the 'Signatures' form sign with the secret key of the **Issuer**.
- Then, click on 'Submit in Transaction Submitter'.

Signatures ?

Add Signer	<input type="text" value="SBBKEEBAU65MQ3CAZZW3PNDHZUFY"/>
	<input type="text" value="Secret key (starting with S) or hash preimage (in hex)"/>

Transaction signed!

1 signature(s) added; 1 signature(s) total

```
AAAAAgAAAABRaTX/KUZbPJg9F8FEYvkafUkNtR9JnasgI4kyzidPigAAASwAEdCxAAAAQAAAAEAAAA
AAAAAAAAAAAAAAAAAAAAQAAAAVNWU5GVAAAAAAAAAAAAAAAAAAAAQAAADu55vQNpGDM2bTs7jf40HQ
GH013UJnxE3r13D7QGqAqQAAAAJNWU5GVAAAAAAAAAAAAAAAAAAUWk1/y1GWzyYPRfBRGL5Gn1JDbUfSZ2r
IC0JMs4nT4oAAAAAJiWgAAAAAAAAAAKAAAAE15IEZpcnN0IE5GVAAAAEAAAAZaHR0cHM6Ly9pbWd1
ci5jb20vb2hodkpqdQAAAAAAAAAAAAFAAAAAQAAAAABRaTX/KUZbPJg9F8FEYvkafUkNtR9JnasgI4ky
zidPigAAAAAAAAAAAAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAABzidPigAAECJ0sAS
HTnJRfEGf6YXcoVzc/Z75uqmSMvK9vTwpYq66PTFF30knX9GvZpSBN8LWE95YIWzI61+ItNzuLfPELsA
```

Now that this transaction is signed, you can submit it to the network. Horizon provides an endpoint called Post Transaction that will relay your transaction to the network and inform you of the result.

[Submit in Transaction Submitter](#)[View in XDR Viewer](#)[Wrap with Fee Bump](#)

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Finally, click on 'Submit Transaction'.

Input a base-64 encoded TransactionEnvelope:

```
AAAAAgAAAABRaTX/KUZbPJg9F8FEYvkafUkNtR9Jnasgl4kyzidPigAA  
ASwAEdCxAAAAAQAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAQAA  
AAVNWU5GVAAAAAAAAAAAAAAAAAAAAAAAAAAAAADu55vQNpGDM2bT  
s7jf40HQGHO13UJnxE3rl3D7QGqAqQAAAAJNWU5GVAAAAAAAAAAAA  
AAAAAUWk1/yIGWzyYPRfBRGL5Gn1JDbUfSZ2rlCOJMs4nT4oAAAAA  
AJiWgAAAAAAAAAKAAAADE15IEZpcnN0IE5GVAAAAEAAAAZaHR  
0cHM6Ly9pbWd1ci5jb20vb2hodkpdQAAAAAAAAAAAAFAAAAAQA  
AAABRaTX/KUZbPJg9F8FEYvkafUkNtR9Jnasgl4kvzidPigAAAAAAAAA
```

Submit Transaction

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Congratulations! You have successfully created your very first Stellar NFT!

Transaction submitted!

Transaction succeeded with 3 operation(s).

Hash:

697a15baca7224dc4a27876c8b98cbad7d871fa41c07e978db1e0e77e875909e

Ledger number:

1168158

Paging token:

5017200406589440

Result XDR:

AAAAAAAAASwAAAAAAAAAwAAAAAAAAABAAAAAAAAAAAAAAAAKAAAAAAAAAAAAAAAAFAAAAAAAAAA=

Result Meta XDR:

AAAAAgAAAAIAAADABHThgAAAAAAAAAUWk1/y1GWzyYPRfBRGL5Gn1JDbUfSZ2rIC0JMs4nT4oAAAAXS

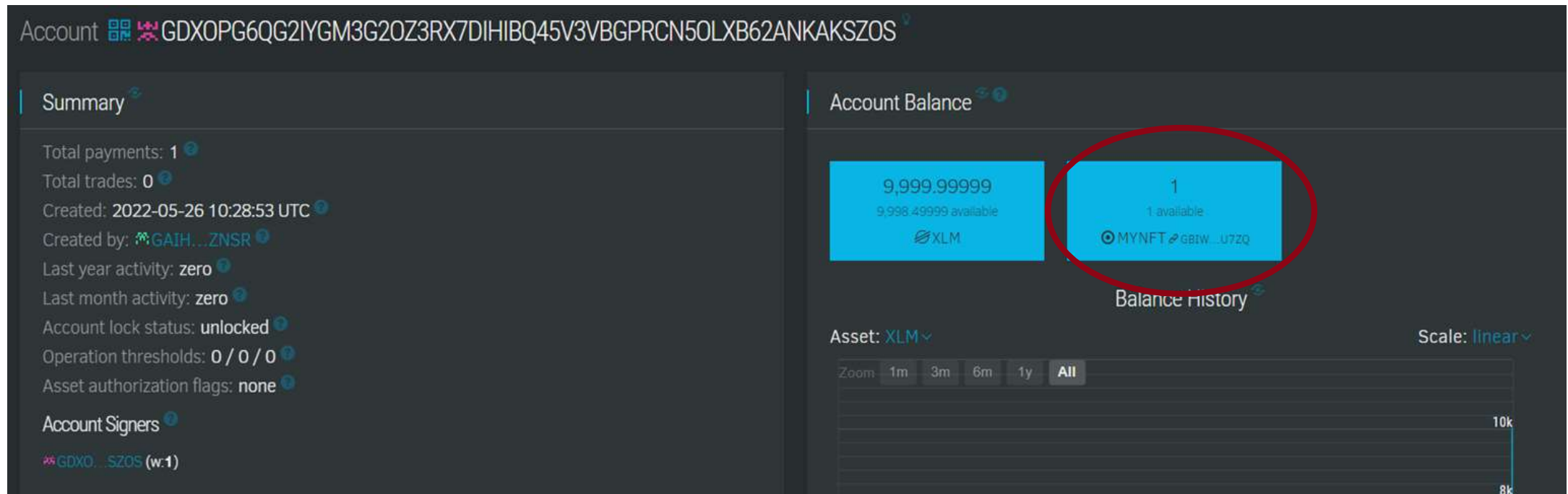
Fee Meta XDR:

AAAAAgAAAAAEdCxAAAAAAAAABRaTX/KUZbPJg9F8FEYvkafUkNtR9JnasgI4kyzidPigAAABdIdugAA

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

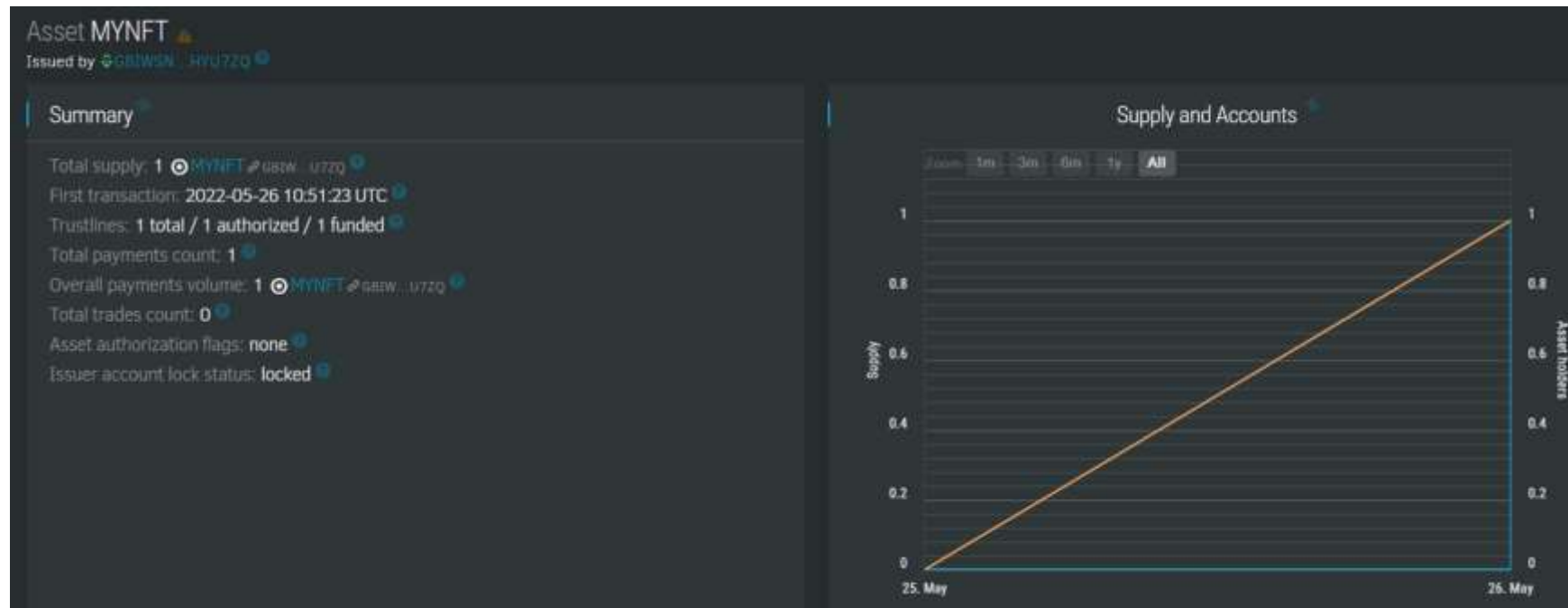
- You can head over to [Stellar.expert](#) (always make sure you are working on the testnet) in order to check the transaction.
- Indeed, in the Distributor account (copy and paste the public key of the Distributor account in the search bar), you can see that the NFT named 'MYNFT' has been successfully issued.



NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- Moreover, if you click on the 'MYNFT' blue box, you will get further information about the NFT.
- Specifically, you will see that it was issued by the Issuer with the public key 'GBIWSNP7FFDFWPEYHU....', that the status of the Issuer account is indeed locked and that the amount of the payment is indeed 1 XLM.




NFTs and the Metaverse

Create an NFT using the Stellar Laboratory



- Accordingly, you can search with the public key of the Issuer.
- In this case, you will get two different search results; one about the Issuer's account and one about the Issuer's NFT.
- The Issuer's NFT information will give you the same exact information as the dashboard we previously saw.

Search results for "GBIWSNP7FFDFWPEYHUL4CRDC7ENH2SINWUPUTHNLEARYSMWOE5HYU7ZQ"

Accounts

[Account](#)  GBIWSN...HYU7ZQ
Created 2022-05-26 | 2 payments, 0 trades
[Operations history](#) [Trades history](#) [Active DEX offers](#)

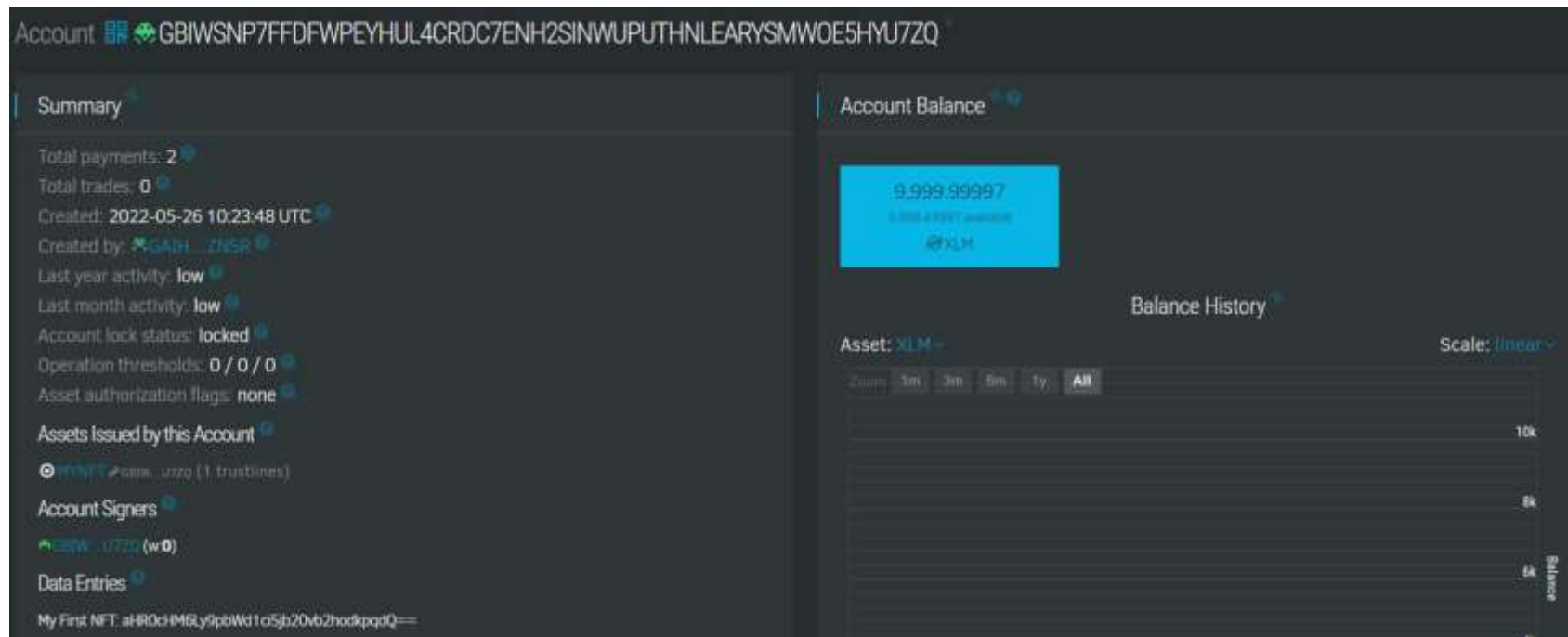
Assets

[Asset](#)  MYNFT  GBIW...U7ZQ
Created 2022-05-26 | 1 funded trustlines, 1 payments, 0 trades
[Operations history](#) [Trades history](#) [Markets](#) [Top holders](#)

NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- However, the Issuer's account dashboard is going to give you information about the balance of the account, which is indeed reduced by 1 XLM due to the issuance of the NFT, the Data Entries with the name of the NFT, the total assets issued by the account etc.



NFTs and the Metaverse

Create an NFT using the Stellar Laboratory

- As always, in order to secure your NFT badge, make sure that you copy and paste the transaction ID into Moodle!

Questions?

Contact Us: [Stellar Developers Discord](#)

Twitter: @StellarOrg

