ANASTASIA LABS

HOW TO USE

Payment Subscription Smart Contract

Project Number   1100025
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Contents

How to Use the Payment Subscription Smart Contract via Maestro

1. Introduction

The Payment Subscription smart contract is designed to manage recurring payments on the Cardano blockchain. It automates subscriber-to-merchant interactions such as service creation, account registration, subscription initiation, extension, cancellation, and fund withdrawals. This guide assists developers in integrating these functions into their applications via Maestro's API endpoints.

Key features include:

· Initiating subscriptions with customizable terms

· Extending or terminating subscriptions

· Automated recurring payments

· Secure withdrawal of funds for both merchants and subscribers

· Seamless integration with popular wallet applications

2. Prerequisites

Before you begin, ensure that you have:

- **Access Credentials:**
  - ‣ Maestro API Key (Get from **Maestro Getting Started**)
  - ‣ Cardano wallet address with sufficient funds
- **Environment Setup:** Basic familiarity with REST APIs and JSON data formats.

3. Smart Contract Overview

The Payment Subscription smart contract comprises three main components:

1. **Service Contract:**
   - Initiates services by minting service NFTs.
   - Manages updates and deactivation of services.
2. **Account Contract:**
   - Registers a subscriber account by minting a CIP-68 compliant Account NFT.
   - Facilitates metadata updates or account removal.
3. **Payment Contract:** Handles the core functionality, including:
   - Prepaid subscription fee management.
   - Subscription renewal, extension, or cancellation.
   - Gradual fund release with linear vesting.

Each function is accompanied by detailed onchain and offchain documentation. This guide focuses on how each API endpoint maps to these smart contract functionalities.

4. Merchant Operations

4.1. Create a Service

Merchants use this to define subscription terms and effectively create a new Service.

· Uses the Service Validator to mint a Service NFT and its corresponding reference NFT.

· Validates the service fee, penalty fee, interval length, and activation status.

Endpoint:

```
POST https://mainnet.gomaestro-api.org/v1/contracts/subscription/createService
```

Required Parameters:

· `merchant_address`: Address of the merchant.

· `selected_out_ref`: Object containing tx_hash and output_index used to derive token names.

· `service_fee_policyid`, `service_fee_assetname`, `service_fee`: Define the fee for the service.

· `penalty_fee_policyid`, `penalty_fee_assetname`, `penalty_fee`: Define the penalty fee.

· `interval_length`: Subscription interval duration (in milliseconds).

· `num_intervals`: Total number of intervals.

· `is_active`: Boolean flag indicating the service's active state.

cURL Example:

```
# subscription: create service
curl --location 'https://mainnet.gomaestro-api.org/v1/contracts/subscription/
createService' \
--header 'Content-Type: application/json' \
--header 'api-key: ${API_KEY}' \
--data '{
    "merchant_address":
"addr1qxccwptmx6r523vxcrplvfhtrpdut8s0hht0fyt9f8vy8385chtg2dupkyqu7pgqawju7awrwfg94skstmaves6hwaks6qlg
    "selected_out_ref": {
        "tx_hash": "f68f85ee40866144f52d8087414cfb11ec22539b3772882440bf0adfea105513",
        "output_index": 1
    },
    "service_fee_policyid": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec",
    "service_fee_assetname": "54616c6f73",
    "service_fee": 1000,
    "penalty_fee_policyid": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec",
    "penalty_fee_assetname": "54616c6f73",
    "penalty_fee": 10,
    "interval_length": 2592000000,
    "num_intervals": 1,
    "is_active": true
}'
```

4.2. Withdraw Fees

Allows the merchant to withdraw the accumulated subscription fees. Uses the Payment Validator's *MerchantWithdraw* redeemer and enforces linear vesting rules as specified.

Endpoint:

```
POST https://mainnet.gomaestro-api.org/v1/contracts/subscription/withdrawFees
```

Required Parameters:

· `merchant_address`: Address of the merchant.

- **service_nft_tn**: The token name for the Service NFT.

- **subscriber_nft_tn**: The token name for the Subscriber NFT.

- **merchant_nft_tn**: The token name proving merchant ownership.

- **payment_nft_tn**: The Payment NFT token involved.

- **current_time**: Current Unix timestamp to validate withdrawal timing.

cURL Example:

```
# subscription: merchant withdrawal
curl --location 'https://mainnet.gomaestro-api.org/v1/contracts/subscription/withdrawFees'
\
--header 'Content-Type: application/json' \
--header 'api-key ${API_KEY}' \
--data '{
    "merchant_address":
"addr1qxccwptmx6r523vxcrplvfhtrpdut8s0hht0fyt9f8vy8385chtg2dupkyqu7pgqawju7awrwfg94skstmaves6hwaks6qlg
    "service_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "subscriber_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "merchant_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "payment_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "current_time": 1696320000
}'
```

5. Subscriber Operations

5.1. Create User Account

Subscribers create an account to manage subscriptions.

· Uses the Account Validator to mint an Account NFT and its reference NFT.

· Registers a subscriber's account with either an email hash or a phone hash.

Endpoint:

```
POST https://mainnet.gomaestro-api.org/v1/contracts/subscription/createUserAccount
```

Required Parameters:

· `subscriber_address`: Address of the subscriber.

· `selected_out_ref`: UTxO with `tx_hash` and `output_index`.

· `email` and `phone`: Credentials as a string.

cURL Example:

```
# subscription: create user account
curl --location 'https://mainnet.gomaestro-api.org/v1/contracts/subscription/
createUserAccount' \
--header 'Content-Type: application/json' \
--header 'api-key ${API_KEY}' \
--data '{
    "subscriber_address":
"addr1qxccwptmx6r523vxcrplvfhtrpdut8s0hht0fyt9f8vy8385chtg2dupkyqu7pgqawju7awrwfg94skstmaves6hwaks6qlg
    "selected_out_ref": {
        "tx_hash": "f68f85ee40866144f52d8087414cfb11ec22539b3772882440bf0adfea105513",
        "output_index": 1
    },
    "email": "",
    "phone": ""
}'
```

5.2. Initiate Subscription

Locks funds by minting a Payment NFT and setting up a Payment datum that includes the subscription start time, service reference token, and subscriber reference token. This action creates a unique Payment Token that signifies the start of a subscription.

Endpoint:

```
POST https://mainnet.gomaestro-api.org/v1/contracts/subscription/initSubscription
```

Required Parameters:

- **service_nft_tn**: Combined token string for the service NFT.
- **subscriber_nft_tn**: Combined token string for the subscriber NFT.
- **subscription_start**: Unix timestamp marking the start of the subscription.

cURL Example:

```
# subscription: initiate subscription
curl --location 'https://mainnet.gomaestro-api.org/v1/contracts/subscription/
initSubscription' \
--header 'Content-Type: application/json' \
--header 'api-key ${API_KEY}' \
--data '{
    "service_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "subscriber_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "subscription_start": 1696320000
}'
```

5.3. Unsubscribe

Allows a subscriber to cancel their active subscription.

Endpoint:

POST https://mainnet.gomaestro-api.org/v1/contracts/subscription/unsubscribe

Required Parameters:

· `subscriber_address`: Address of the subscriber initiating the unsubscription.

· `service_nft_tn`: The token string for the Service NFT.

· `subscriber_nft_tn`: The token string for the Subscriber NFT.

· `current_time`: Unix timestamp used for validating penalty application.

cURL Example:

```
# subscription: unsubscribe
curl --location 'https://mainnet.gomaestro-api.org/v1/contracts/subscription/unsubscribe'
\
--header 'Content-Type: application/json' \
--header 'api-key ${API_KEY}' \
--data '{
    "subscriber_address":
"addr1qxccwptmx6r523vxcrplvfhtrpdut8s0hht0fyt9f8vy8385chtg2dupkyqu7pgqawju7awrwfg94skstmaves6hwaks6qlg
    "service_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "subscriber_nft_tn": "97bbb7db0baef89caefce61b8107ac74c7a7340166b39d906f174bec54616c",
    "current_time": 1696320000
}'
```

Note: Early termination may incur penalties if defined in the service contract.