A guideline to create a TRC-20 Token on TRON (Nile Testnet)

This comprehensive guide demonstrates how to deploy and interact with an upgradeable TRC-20 token on the TRON Nile testnet using a proxy pattern. The token will feature standard ERC20 capabilities, including minting, burning, and initial supply management.

Project Setup

Prerequisites

- **Node.js (v20+ recommended)**
- **TronBox**
- **TronLink wallet** (configured with Nile testnet)

Installation

Clone the repository and install dependencies:

```
git clone https://github.com/aziz1975/trc20-proxy.git
cd trc20-proxy
npm install
```

Create a .env file in the project root which contains the following:

```
PRIVATE_KEY_NILE=your_private_key
FULL_NODE_NILE=https://nile.trongrid.io
PROXY_ADDRESS=your_deployed_proxy_address (after deployment)
```

Smart Contracts

Proxy.sol

A lightweight proxy contract delegating all calls to a separate implementation contract:

- Stores implementation contract address
- Delegates all calls, enabling upgradeability without losing data

MyToken.sol

Token implementation based on OpenZeppelin’s ERC20Upgradeable:

- **initialize(name, symbol, initialSupply):** Initializes the token

- **mint(to, amount):** Creates new tokens
- **burn(from, amount):** Destroys tokens

Deployment

Deploy the logic and proxy contracts to Nile:

npx tronbox migrate --network nile

This deploys:

- **MyToken.sol** (logic implementation)
- **Proxy.sol** initialized with parameters ("AHM TRC20 Token", "AHM", "1,000,000 tokens")

Testing

Test your deployed token contract using the provided script:

1. Update your .env with your created proxy token address
2. *node testToken.js*

This script performs:

- Token metadata retrieval (name, symbol, decimals)
- Total supply and owner balance verification
- Token transfer, minting, and burning operations

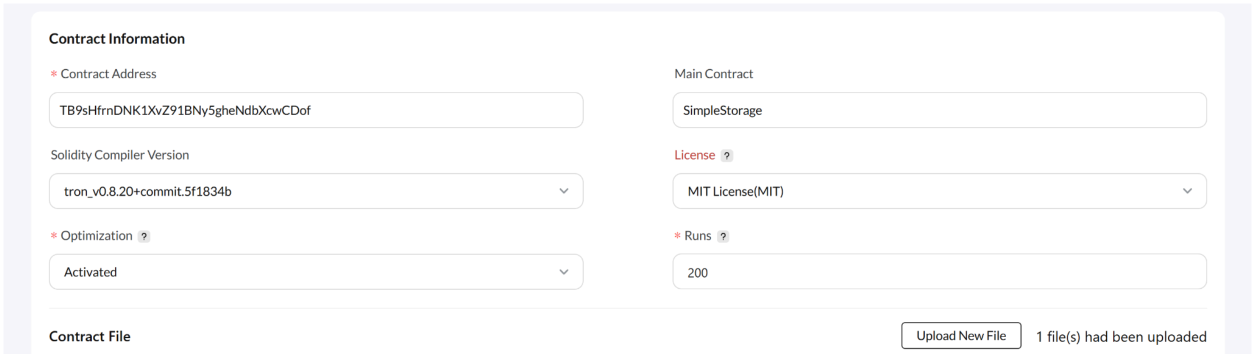
Contract Verification on Tronscan

You need to perform two verifications: one for the proxy contract and another for the token implementation contract.

Go to **Contract Verification** (for nile it is “https://nile.tronscan.org/#/contracts/verify”)

1. **Contract Address**: Enter the deployed contract’s address.
2. **Main Contract**: If the source file contains multiple contracts (e.g., library code), select the **Main Contract** name that matches the deployed contract.
3. **Solidity Compiler Version**: Choose the exact compiler version used to compile your contract (match the version used during deployment).

4. **License**: Select the appropriate SPDX **License** identifier (e.g., MIT, Unlicense) as in your source code.
5. **Optimization**: Set **Optimization** to "Activated" if you enabled it during compilation (and enter the same **Runs** value used); if you did not use optimizer, select "Not Activated" and enter "0" in the **Runs** field.
6. **Upload contract file(s):** Upload (.sol file).
7. **Verify And Publish**: Click the **Verify And Publish** button. TronScan will compile the code with the given parameters and compare it to the on-chain bytecode – if everything matches exactly what was used at deployment, the contract will be marked as verified


Contract Information

* Contract Address: TB9sHfrnDNK1XvZ91BNy5gheNdbXcwCDof	Main Contract: SimpleStorage
Solidity Compiler Version: tron_v0.8.20+commit.5f1834b	License: MIT License(MIT)
* Optimization: Activated	* Runs: 200

Contract File — Upload New File — 1 file(s) had been uploaded

Proxy Contract Verification

- If your contract has any "**import**" statement, you do need to flatten them using the following command:
  npx tronbox flatten contracts/SmartContract.sol > flattened-SmartContract.sol
- **You should absolutely have exactly one SPDX license identifier as the very first line of your *flattened* Solidity file.**
- Then follow the same steps as mentioned above for the standard contract.

When verifying contracts, you might encounter the error:

"verification failed. Please confirm the correct parameters and try again."

Solution:

- Ensure the correct compiler version (v0.8.23) and optimizer settings (200 runs) match exactly.
- **Proxy.sol** requires two constructor parameters:
  - **Implementation address** (MyToken logic contract address)
  - **Initialization data** (encoded ABI data from deployment script)

- **MyToken.sol** has no constructor arguments.
    -

If verification issues persist:

- Visit: Contact Tronscan Support
- Raise a ticket through **Others** or contact the Telegram developer group.

Adding a Logo to Your Token

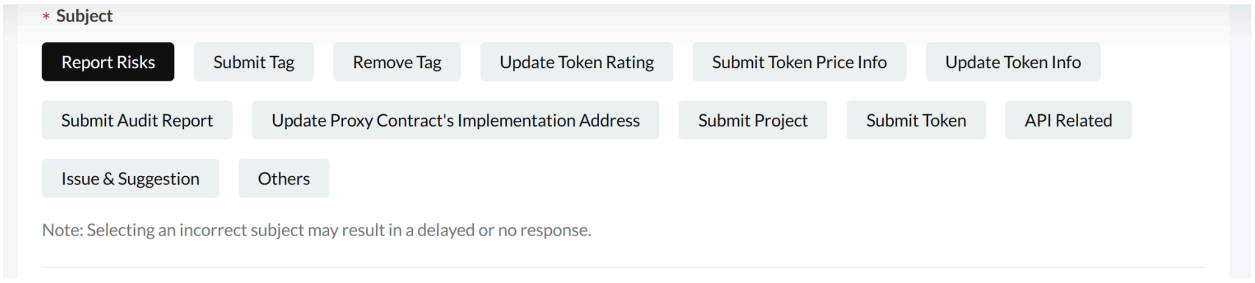
1. Visit Token Update Page
2. Select your token and update your logo.

Updating Token Metadata

Update metadata (name, description, website, etc.):

1. Visit Token Update Page
2. Select your token and update relevant information.

If you encounter any issues while updating the token, raise a ticket in Tronscan and select the appropriate Subject:



Note: Selecting an incorrect subject may result in a delayed or no response.

TronLink Integration

To add the token in TronLink:

- Wait approximately 5–10 minutes for TronLink synchronization.
- If synchronization issues occur, seek help in the Telegram developer group.

Viewing Your Token on Tronscan

To view your token:

- Use the search feature on Tronscan homepage and enter the token name or contract address.

Adding Tokens to Other Wallets (e.g., TrustWallet)

Wallet integration rules vary:

- Contact the specific wallet's customer service or documentation to determine their integration process.

Resources

- TRON Nile Testnet Explorer
- OpenZeppelin Upgradeable Contracts
- TronBox Official Documentation

Troubleshooting

- Verify .env configuration values (private keys, RPC URLs)
- Ensure correct compiler and optimizer settings for contract verification
- Consult TRON's developer Telegram group for ongoing issues

Following these steps, you'll have successfully deployed an upgradeable TRC-20 token on TRON's Nile Testnet, verified your contracts, and integrated your token seamlessly into various platforms.

Explore the full working example in our TRC-20 repository.