### General Tests

#### Malformed Inputs

* Invalid Previous
* Invalid Origin
* Invalid Fee Amount *(NOT IN CURRENT SCOPE)*
* Invalid Work *(NOT IN CURRENT SCOPE)*
* Invalid Sequence
* Invalid Type
* Invalid Signature
* Invalid token\_id for token requests

### 1. Send

#### Malformed Inputs

* Malformed Destination
  + Empty String
  + Public Key instead of address
  + No destination sent at all
* Malformed Amount
  + Empty String
  + No amount sent at all
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
* Malformed Transaction Array
  + Empty Array
  + Array shouldn’t exceed 8 transactions

#### Invalid Requests

* Not enough funds to complete send
* Double Spend

### 2. Issuance

#### Malformed Inputs

* Malformed Symbol
  + Symbol must be <= 8 Bytes
  + Symbol should be alphanumeric
  + Empty string
  + No Symbol
* Malformed Name
  + Name must be <= 32 Bytes
  + Symbol should be alphanumeric
  + Empty string
  + No Name
* Malformed total\_supply
  + Empty String
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + No Amount
* Malformed fee\_type
  + Check case sensitivity both upper and lowercase should work
  + Empty string
  + No fee\_type
* Malformed fee\_rate
  + fee\_type is percentage then fee\_rate must be between 0-100 (Design this should have more granularity)
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No fee\_rate
* Malformed settings
  + Empty array
  + Invalid settings (try ‘distribute’)
  + Duplicate Settings
  + No settings
* Malformed Controllers
  + Empty array
  + No account
  + No privileges should be valid
  + No controllers should be valid
  + Invalid privileges
  + Duplicate privileges
* Malformed issuer\_info
  + New info should only accept a string that is <= 512 Bytes
  + Reject Strings > 512
  + Empty string should be valid
  + No issuer\_info

#### Invalid Requests

* Ensure request is rejected when token\_id already exists as an account’s public key

### 3. Issue Additional

#### Malformed Inputs

* Malformed Amount
  + Empty String
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + No Amount

#### Invalid Requests

* Amount exceeds total\_supply uint128 max
* Ensure request is rejected when Issuance setting is false
* Ensure request is rejected when the controller doesn’t have the issuance privilege

### 4. Change Setting

#### Malformed Inputs

* Malformed setting
  + Distribute
  + Empty String
  + No Setting
  + Check case sensitivity both upper and lowercase should work
* Malformed value
  + 1
  + 0
  + no value
  + Empty String

#### Invalid Requests

* Ensure request is rejected when changing a token setting that has modify\_setting as true
* Ensure request is rejected when the controller doesn’t have the change\_setting privilege
  + issuance
  + revoke
  + freeze
  + adjust\_fee
  + whitelist

### 5. Immute Setting

#### Malformed Inputs

* Malformed setting
  + ‘distribute’
  + ‘modify\_issuance’
  + empty string
  + no setting
  + Check case sensitivity both upper and lowercase should work

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the change\_modify\_setting privilege
  + issuance
  + revoke
  + freeze
  + adjust\_fee
  + whitelist

### 6. Revoke

#### Malformed Inputs

* Malformed Source
  + Empty String
  + Public Key instead of address
  + No destination sent at all
* Malformed Destination
  + Empty String
  + Public Key instead of address
  + No destination sent at all
* Malformed Amount
  + Empty String
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + No Amount

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the revoke privilege
* Ensure request is rejected when the token settings doesn’t have the revoke setting
* Ensure request is rejected when the source doesn’t have the amount to be revoked
* Ensure request is rejected when the source account is a token account.
* Ensure request is rejected when the token settings require whitelisting and the destination is not whitelisted
* Ensure request is rejected when the token settings allow freezing and the destination is frozen
* Ensure you are not able to revoke tokens to a foreign token account
* Ensure you are able to revoke tokens to the native token account - 104

### 7. Adjust User Status

#### Malformed Inputs

* Malformed Account
  + Empty String
  + Public Key instead of address
  + No account sent at all
* Malformed Status
  + No Status
  + Empty String
  + Check case sensitivity both upper and lowercase should work
  + Something other than frozen, unfrozen, whitelisted, not\_whitelisted

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the correct privilege
  + whitelist
  + freeze
* Ensure request is rejected when the token settings do not contain
  + whitelist
  + freeze

### 8. Adjust Fee

#### Malformed Inputs

* Malformed fee\_type must only be flat or percentage
  + Check case sensitivity both upper and lowercase should work
  + Empty string
  + No fee\_type
* Malformed fee\_rate
  + fee\_type is percentage then fee\_rate must be between 0-100 (Design this should have more granularity)
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No fee\_rate

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the adjust\_fee privilege
* Ensure request is rejected when the settings do not contain the adjust\_fee privilege

### 9. Update Issuer Info

#### Malformed Inputs

* Malformed new\_info
  + New info should only accept a string that is <= 512 Bytes
  + Reject Strings > 512
  + Empty string should be valid
  + What happens when new\_info is not sent

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the update\_issuer\_info privilege

### 10. Update Controller

#### Malformed Inputs

* Malformed action
  + Check case sensitivity both upper and lowercase should work
  + Only ‘add’ or ‘remove’
  + Ensure empty string is rejected
  + Ensure action exists
* Malformed Controller
  + Empty array
  + Invalid settings
  + Duplicate Settings

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the update\_controller privilege
* Ensure request is rejected if the token account already has 10 controllers and the request is trying to add an additional controller

### 11. Burn

#### Malformed Inputs

* Malformed Amount
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No amount

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the burn privilege
* Ensure request is rejected if the controller is burning more than the token\_balance of the token account

### 12. Distribute

#### Malformed Inputs

* Malformed Amount
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No amount
* Malformed Destination
  + Empty String
  + Public Key instead of address
  + No destination sent at all

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the distribute privilege
* Ensure request is rejected if the controller is distributing more than the token\_balance of the token account
* Ensure request is rejected when the token settings require whitelisting and the destination is not whitelisted
* Ensure request is rejected when the token settings allow freezing and the destination is frozen
* Ensure you are not able to distribute tokens to a foreign token account
* Ensure you are able to distribute tokens to the native token account? (pointless here but it should work since we can do 0 sum sends) - 104

### 13. Withdraw Fee

#### Malformed Inputs

* Malformed Amount
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No amount
* Malformed Destination
  + Empty String
  + Public Key instead of address
  + No destination sent at all

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the withdraw\_fee privilege
* Ensure request is rejected if the controller is withdrawing more than the token\_fee\_balance of the token account
* Ensure request is rejected when the token settings require whitelisting and the destination is not whitelisted
* Ensure request is rejected when the token settings allow freezing and the destination is frozen
* Ensure you are not able to withdraw the tokens to a foreign token account
* Ensure you are able to withdraw the tokens to the native token account - 104

### 14. Withdraw Logos

#### Malformed Inputs

* Malformed Amount
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No amount
* Malformed Destination
  + Empty String
  + Public Key instead of address
  + No destination sent at all

#### Invalid Requests

* Ensure request is rejected when the controller doesn’t have the withdraw\_logos privilege
* Ensure request is rejected if the controller is withdrawing more than the balance of the token account
* Ensure the request is accepted when the destination is a token account?

### 15. Token Send

#### Malformed Inputs

* Malformed Amount
  + Decimal Value
  + Negative Amounts
  + Value sent as int not string
  + Empty string
  + No amount
* Malformed Destination
  + Empty String
  + Public Key instead of address
  + No destination sent at all
* Malformed Transaction Array
  + Empty Array
  + Array shouldn’t exceed 8 transactions

#### Invalid Requests

* Ensure request is rejected if the account is sending more than the token balance of the account
* Ensure request is rejected when the token settings require whitelisting and the destination is not whitelisted
* Ensure request is rejected when the token settings allow freezing and the destination is frozen
* Ensure request is rejected when token fee is less than the required
* Ensure you are **not** able to send the tokens to a foreign token account
* Ensure you are able to send the tokens to the native token account - 104

Random Thoughts, What if I freeze an account that has never received the token when that account is sent tokens it should be rejected.