LEARNINGTOKEN2

Taxonomy Formula: [tF{~d,m,a,r,b,t,q}+phDR+phGL]

Token Specification Summary

Token Classification

Template Type:	SingleToken	This token has no sub or child tokens.
Token Type:	NonFungible	This token is not interchangeable with other tokens of the same type as they have different values.
Token Unit:	Whole	There can be many instances of this token, but they cannot be divided.
Value Type:	Intrinsic	This token is purely a digital token represents value directly, it represents no external physical form and cannot be a receipt or title for a material item or property.
Representation Type:	Common	This token is simply represented as a balance or quantity attributed to an owner address where all the balances are recorded on the same balance sheet, like a bank account. All instances can easily share common properties and locating them is simple.
Supply:	Fixed	This token may issue an initial quantity upon creation, tokens cannot be removed or added to the supply.

This is a Fixed Supply Fungible where the total supply is set at creation using the Quantity property of the Base token. It is not fractional by setting the Decimals property has initialize for that. A token instance can be burned.

Example

Typically used to represent an Initial Token To all the learner for creating an reward based helping community.

Analogies

Name	Description
Helping Token	Helping Token that will be distributed to all the learner within a course. This will create a reward based helping community among learner.

LearningToken2 is:

- Indivisible
- Mintable
- Attestable
- Roles
- Burnable
- Transferable
- Redeemable

It includes the following Property Sets:

- Date Range
- Geographic Location

LearningToken2 Details

Whole Non-Fungible Token

Type:	Base
Name:	Whole Non-Fungible Token
Id:	3c05a856-c901-4c30-917e-df9feed1c8de
Visual:	&tau_N{~d}
Tooling:	tN{~d}
Version:	1.0

Definition

Every non-fungible token is unique, but the class of a non-fungible token may be of the same type. A class of non-fungible tokens can be used to represent many tokens that share the same properties, but have different values for them. Meaning a non-fungible token is not interchangeable with other tokens of the same class but can have some shared properties and values while also having unique property values between token instances in the class. These tokens are whole tokens and can have quantities greater than 1 and also could support variable supply.

Example

CryptoKitties, Art, Reserved Seat for an event.

Analogies

Name	Description
Property Title	The physical property title, land for example, have the identical look and feel from the paper, colors and seal. The difference between them are the values like property address, plot numbers, etc. These values make the title unique. There are some properties on a class of titles that are the same, like the county or jurisdiction the property is in. For titles that have some shared values and unique values, it may make more sense to define them in the same class.
An Artists Collection	An artist may want to represent all their art in a single class of non-fungible tokens, where each token represents a unique piece of art what shared information about the artist between art works, but unique properties between tokens in the class.

Comments

Non-fungible tokens require additional thought about how these tokens may or may not be grouped together in the same class.

Dependencies

Artifact Type	Symbol	Description
Base	t	Base Token Definition

Incompatible With

Artifact Type	Symbol	Id
Behavior	d	6e3501dc-5800-4c71-b59e-ad11418a998c

Influenced By

Description	Symbol	Applies To

Artifact Files

Content Type	File Name	File Content

Code Map

Map Type	Name	Platform	Location

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Base Details

Token Name:	
Token Type:	NonFungible
Representation Type:	Common
Value Type:	Intrinsic
Token Unit:	Whole
Symbol:	
Owner:	
Quantity:	0
Decimals:	0
Constructor Name:	Constructor

Behaviors

Specification Behavior

Indivisible

Taxonomy Symbol: ~d

An ability or restriction on the token where it cannot be divided from a single whole token into fractions. Sets the base token Decimals property to 0 which

will make the token indivisible and a whole token is the smallest ownable unit of the token.

Example

Indivisible is common for items where division does not make sense, like a property title, inventory item or invoice.

Analogies

Name	Description
Non-Fractional	It is not possible to own a fraction of this token.
Barrel of Oil	Barrels of Oil don't make sense to divide.

Type:	Behavior
Name:	Indivisible
Id:	d5807a8e-879b-4885-95fa-f09ba2a22172
Visual:	~d
Tooling:	~d
Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id
Behavior	d	6e3501dc-5800-4c71-b59e-ad11418a998c

Influenced By

Description	Symbol	Applies To

Artifact Files

Content	File Name	File Content

Type		
Control	indivisible.proto	
Uml	indivisible.md	

Code Map

Map Type	Name	Platform	Location

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Is External:	True
Constructor:	

Indivisible responds to these Invocations

Properties

Name: Decimals

Value Description: Set to Zero, not allowing any division, usually this is applied to the base token.

Template Value: 0

Invocations

GetDecimals

Id: 2ca7fbb2-ce98-4dda-a6ae-e4ac2527bb33

Description: Should return 0

Request

Control Message: GetDecimalsRequest

Description:

Parameters

Name	Value

Response

Control Message: GetDecimalsResponse

Description: Return 0

Parameters

Name	Value
Decimals	0

GetDecimals

Id: 2ca7fbb2-ce98-4dda-a6ae-e4ac2527bb33

Description: Should return 0

Request

Control Message: GetDecimalsRequest

Description:

Parameters

Name	Value

Response

Control Message: GetDecimalsResponse

Description: Return 0

Parameters

Name	Value
Decimals	0

Specification Behavior

Mintable

Taxonomy Symbol: m

A token class that implements this behavior will support the minting or issuing of new token instances in the class. These new tokens can be minted and belong to the owner or minted to another account. This behavior may be invalidated by a restrictive behavior like Singleton, where only a single instance of the token can exist. Mintable is technically delegable, but it's delegation should be controlled by a behavior like Roles.

Example

A consortium of oil producers needs to create tokens for each barrel of oil they are putting on the market to trade. There are separate classes of tokens for each grade of oil. Producers of barrels will need be have the ability to mint new tokens in order to facilitate the trading of them in the supply chain.

Analogies

Name	Description
SKU	A token class can represent a particular item SKU, where the manufacturer of the item has the ability to mint or issue new inventory of the SKU into the supply chain.

Type:	Behavior
Name:	Mintable
Id:	f9224e90-3cab-45bf-b5dc-0175121e2ead
Visual:	m
Tooling:	m
Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id

Influenced By

Description	Symbol	Applies To
Roles is common to implement to provide authorization checks for invoking the behavior. Highly Recommended that Role restrictions be applied to MintTo invocations.	r	[ ]
If Compliance is present, a CheckMintAllowed request has to be made and verified before a Mint request or a MintTo request.	c	[ ]

Artifact Files

Content Type	File Name	File Content
Control	mintable.proto	
Uml	mintable.md	

Code Map

Map Type	Name	Platform	Location
SourceCode	OpenZeppelin	EthereumSolidity	https://github.com/OpenZeppelin/openzeppelin-contracts/blob/master/contracts/token/ERC20/ERC20Mintable.sol

Implementation Map

Map Type	Name	Platform	Location
Implementation	Implementation 1	ChaincodeGo	

Resource Map

Map Type	Name	Location	Description
Resource	Regulation		

	Reference 1		

Is External:	**True**
Constructor:	

Mintable responds to these Invocations

Mint

Id: 3ddf15db-c919-4f72-a57b-d089931bc901

Description: A request to create new token instances in the class by the owner or a party or account in a role that is granted this permission. Minted tokens using this invocation will be owned by the owner or token pool account. Requires a Quantity field in the request.

Request Message:

MintRequest

Description: The request

Request Parameters

Name	Value
Quantity	Number of new tokens to create.

Response Message

MintResponse

Description: The response

Response Parameters

Name	Value
Confirmation	A confirmation receipt or error may be returned to the invoker based on the outcome of the mint request.

MintTo

Id: 70499b23-a1dd-4c87-90d6-6e45400f28b5

Description: A request to create new token instances in the class by the owner or a party or account in a role that is granted this permission to another party or account. Requires a To and Quantity fields in the request.

Request Message:

MintToRequest

Description: The request

Request Parameters

Name	Value
ToAccount	Account Id to mint the tokens to.
Quantity	Number of new tokens to create.

Response Message

MintToResponse

Description: The response

Response Parameters

Name	Value
Confirmation	A confirmation receipt or error may be returned to the invoker based on the outcome of the MintTo request.

Specification Behavior

Attestable

Taxonomy Symbol: a

> *A token class that implements this behavior will support a basic attestation request returning a true or false and if true it will return a cryptographic proof the requester may store for future validations. Attestable will accept a simple ownership query to validate that an account is the owner of the token or a attestation proof and validate it.*

Example

Certain tokens will want to prove something like ownership or validation of an issued proof from the token for applications wanting to check attestations.

Analogies

Name	Description
Diploma	Check to see if an account is the owner or holder of a diploma token. This can be done by the Account Id or a stored attestation issued by the Diploma Token.

Type:	Behavior
Name:	Attestable
Id:	189b1589-a93a-4aa6-8d9d-0d9237ab5b42
Visual:	a
Tooling:	a
Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id

Influenced By

Description	Symbol	Applies To

Artifact Files

Content Type	File Name	File Content
Control	attestable.proto	
Uml	attestable.md	

Code Map

Map Type	Name	Platform	Location

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Is External:	True
Constructor:	

Attestable responds to these Invocations

Attest

Id: f404f43f-c922-475d-9a0c-b4a0bdca6029

Description: A request to validate a rule or attestation.

Request Message:

AttestRequest

Description: The request to Attest an attestation.

Request Parameters

Name	Value
Attestation	Value of the attestation to validate

Response Message

AttestResponse

Description: The response from the AttestRequest.

Response Parameters

Name	Value
Confirmation	A true or false result

AttestByAccount

Id: c573dc98-d669-4e24-a06d-70a7c1d29078

Description: A request to validate a rule or attestation.

Request Message:

AttestByAccountRequest

Description: The request to Attest by an account id.

Request Parameters

Name	Value
AccountId	The Id of the account to validate.

Response Message

AttestByAccountResponse

Description: The response from the AttestByAccountRequest, if true can include a Attestation for the caller to use in subsequent attestation checks.

Response Parameters

Name	Value
Confirmation	A true or false result
Attestation	A cryptographic signature that can be validated with AttestRequest.

Specification Behavior

Roles

Taxonomy Symbol: r

A token can have behaviors that the class will restrict invocations to a select set of parties or accounts that are members of a role or group. This is a generic behavior that can apply to a token many times to represent many role definitions within the template. This behavior will allow you to define what role(s) to create and what behavior(s) to apply the role to in the TemplateDefinition.

Example

Analogies

Name	Description
Minters	A role called 'Minters' for a token can have accounts in the role. The MintTo behavior invocation will be bound to the role check to ensure only account in the 'Minters' role are allowed to mint new instances in the class.
Burners	A role called 'Burners' for a token can have accounts in the role. The BurnFrom behavior invocation will be bound to the role check to ensure only account in the 'Burners' role are allowed to mint new instances in the class.

Comments

Roles has a constructor control that creates roles and applies them to certain behaviors of the token at creation of the class from the template.

Type:	Behavior
Name:	Roles
Id:	c32726da-9787-4dd8-8de3-d07d1733d0f6
Visual:	r
Tooling:	r
Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id

Influenced By

Description	Symbol	Applies To

Artifact Files

Content Type	File Name	File Content
Control	roles.proto	
Uml	roles.md	

Code Map

Map Type	Name	Platform	Location
SourceCode	Open Zeppelin - Roles	EthereumSolidity	https://github.com/OpenZeppelin/openzeppelin-contracts/blob/master/contracts/access/Roles.sol

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Is External:	True
Constructor:	

Roles responds to these Invocations

RoleCheck

Id: 00a665e3-1dda-441e-8262-5750435c153c

Description: Internal invocation when the applied behavior is called to check if the requestor is a member of the role.

Request Message:

IsInRole

Description: The request

Request Parameters

Name	Value
AccountId	AccountId of the requestor.

Response Message

True/False

Description: The response

Response Parameters

Name	Value
IsInRole	True/False

Properties

Name: Role

Value Description: A group or list an account can be a member or be in.

Template Value:

Invocations

GetRoleMembers

Id:

Description: Request the the list of member accounts in the role.

Request

Control Message: GetRoleMembersRequest

Description: The request

Parameters

Name	Value

Response

Control Message: GetRoleMembersResponse

Description: The response

Parameters

Name	Value
Members	Returning the list of accounts in the role.

AddRoleMember

Id: 600357f8-0499-47f8-87a5-eedf4ad034af

Description: Add a member to the group or role property.

Request

Control Message: AddRoleMemberRequest

Description: The request

Parameters

Name	Value
RoleName	Name of the role you are adding a member to. Optional parameter if there is only one role.
AccountAddress	Address, name or identifier of the account to be added to the role.

Response

Control Message: AddRoleMemberResponse

Description: The response

Parameters

Name	Value
Added	True or False.

RemoveRoleMember

Id: 97e160bb-6c60-4f1d-923b-813b07b89638

Description: Remove a member to the group or role property.

Request

Control Message: RemoveRoleMemberRequest

Description: The request

Parameters

Name	Value
RoleName	Name of the role you are adding a member to. Optional parameter if there is only one role.
AccountAddress	Address, name or identifier of the account to be removed from the role.

Response

Control Message: RemoveRoleMemberResponse

Description: The response

Parameters

Name	Value
Added	True or False.

IsInRole

Id: e42b1b16-074a-4d7d-b9f9-f69a2397a21b

Description: Check to see if an account is in the role.

Request

Control Message: IsInRoleRequest

Description: The request may be internal only and not exposed externally.

Parameters

Name	Value
RoleName	Name of the role you are checking membership of. Optional parameter if there is only one role.
AccountAddress	Address, name or identifier of the account to be checked.

Response

Control Message: IsInRoleRequestResponse

Description: The response

Parameters

Name	Value
InRole	True or False.

GetRoleMembers

Id:

Description: Request the the list of member accounts in the role.

Request

Control Message: GetRoleMembersRequest

Description: The request

Parameters

Name	Value

Response

Control Message: GetRoleMembersResponse

Description: The response

Parameters

Name	Value
Members	Returning the list of accounts in the role.

AddRoleMember

Id: 600357f8-0499-47f8-87a5-eedf4ad034af

Description: Add a member to the group or role property.

Request

Control Message: AddRoleMemberRequest

Description: The request

Parameters

Name	Value
RoleName	Name of the role you are adding a member to. Optional parameter if there is only one role.

AccountAddress	Address, name or identifier of the account to be added to the role.

Response

Control Message: AddRoleMemberResponse

Description: The response

Parameters

Name	Value
Added	True or False.

RemoveRoleMember

Id: 97e160bb-6c60-4f1d-923b-813b07b89638

Description: Remove a member to the group or role property.

Request

Control Message: RemoveRoleMemberRequest

Description: The request

Parameters

Name	Value
RoleName	Name of the role you are adding a member to. Optional parameter if there is only one role.
AccountAddress	Address, name or identifier of the account to be removed from the role.

Response

Control Message: RemoveRoleMemberResponse

Description: The response

Parameters

Name	Value
Added	True or False.

IsInRole

Id: e42b1b16-074a-4d7d-b9f9-f69a2397a21b

Description: Check to see if an account is in the role.

Request

Control Message: IsInRoleRequest

Description: The request may be internal only and not exposed externally.

Parameters

Name	Value
RoleName	Name of the role you are checking membership of. Optional parameter if there is only one role.
AccountAddress	Address, name or identifier of the account to be checked.

Response

Control Message: IsInRoleRequestResponse

Description: The response

Parameters

Name	Value
InRole	True or False.

Specification Behavior

Burnable

Taxonomy Symbol: b

A token class that implements this behavior will support the burning or decommissioning of token instances of the class. This does not delete a token, but rather places it in a permanent non-use state. Burning is a one way operation and cannot be reversed. This behavior is Delegable. If the token definition is Delegable, BurnFrom will be available.

Example

When a token is used in a certain way, you may want to remove it from circulation or from being used again. Since the ledger doesn't allow for deletions, burning a token essentially 'deletes' the token from being used, but not from history.

Analogies

Name	Description
Oil Barrels	If you mint a new token for each barrel of oil created, you may transfer ownership several times until the barrel is refined. The refining process should burn the barrel of oil to remove it from circulation.
Redeem	A token that is a coupon or single use ticket, should be burned when it is redeemed.

Type:	Behavior
Name:	Burnable
Id:	803297a1-c0f9-4898-9d44-29c9d41cca97
Visual:	b
Tooling:	b
Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id

Influenced By

Description	Symbol	Applies To
Roles is common to implement to provide authorization checks for invoking the behavior. Highly Recommended that Role restrictions be applied to BurnFrom invocations.	r	[ ]

Delegable or not, will determine if the BurnFrom Control will be available in the implementation.	g	[ ]
If Compliance is present, a CheckBurnAllowed request has to be made and verified before a Burn request or a BurnFrom request.	c	[ ]

Artifact Files

Content Type	File Name	File Content
Control	burnable.proto	
Uml	burnable.md	

Code Map

Map Type	Name	Platform	Location
SourceCode	OpenZeppelin	EthereumSolidity	https://github.com/OpenZeppelin/openzeppelin-contracts/blob/master/contracts/token/ERC20/ERC20Burnable.sol

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Is External:	**True**
Constructor:	

Burnable responds to these Invocations

Burn

Id: f063dcaa-49f9-4c49-bf0f-2766301e1033

Description: A request to burn a token instance(s) in the class by the owner of the token instance(s). Optional Quantity field in the request.

Request Message:

BurnRequest

Description: The request to Burn or Retire tokens.

Request Parameters

Name	Value
Quantity	The number of tokens to burn, might not apply to the implementation.

Response Message

BurnResponse

Description: The response from the request to burn.

Response Parameters

Name	Value
Confirmation	A confirmation receipt or error may be returned to the invoker based on the outcome of the burn request

BurnFrom

Id: 49b53152-3360-426f-9e0a-24a0b4e7c881

Description: Requires Delegable. A request to burn token instance(s) in the class by a party or account that has allowance to do so. Requires a From and Quantity fields in the request.

Request Message:

BurnFromRequest

Description: The request to Burn or Retire tokens.

Request Parameters

Name	Value
From	AccountId from which tokens are burnt
Quantity	The number of tokens to burn, might not apply to the implementation.

Response Message

BurnFromResponse

Description: The response from the request to burn.

Response Parameters

Name	Value
Confirmation	A confirmation receipt or error may be returned to the invoker based on the outcome of the burn from request

Specification Behavior

Transferable

Taxonomy Symbol: t

Every token instance has an owner. The Transferable behavior provides the owner the ability to transfer the ownership to another party or account. This behavior is often inferred by other behaviors that might exist like Redeem, Sell, etc. This behavior is Delegable. If the token definition is Delegable, TransferFrom will be available.

Example

Analogies

Name	Description
Analogy 1	transferable analogy 1 description

Type:	Behavior
Name:	Transferable
Id:	af119e58-6d84-4ca6-9656-75e8d312f038
Visual:	t
Tooling:	t

Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id
Behavior	~t	a4fa4ca8-6afd-452b-91f5-7103b6fee5e5

Influenced By

Description	Symbol	Applies To
Roles is common to implement to provide authorization checks for invoking the behavior. Highly Recommended that Role restrictions be applied to Transfer and TransferFrom invocations in situations where the recipient has to meet certain criteria (e.g. Beneficiaries).	r	[ ]
If the token is Delegable, TransferFrom should be enabled.	g	[ ]
If Compliance is present, a CheckTransferAllowed request has to be made and verified before a Transfer request or a TransferFrom request.	c	[ ]
If issuable is present, an AcceptTokenRequest from the token issuer, in response to a RequestTokens, has to be made and verified before a Transfer request.	i	[ ]
If offsetable is present, an check on if the token has been offset must be made and if it has, transfer should be denied.	off	[ ]

Artifact Files

Content Type	File Name	File Content
Control	transferable.proto	
Uml	transferable.md	

Code Map

Map Type	Name	Platform	Location

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Is External:	True
Constructor:	

Transferable responds to these Invocations

Transfer

Id: 5d4b8f10-7857-4a2f-9b8c-d61e367a6bcc

Description: >A transfer request will invoke a transfer from the owner of the token to the party or account provided in the To field of the request. For fungible or dividable non-fungible tokens, this request may also include value in the Amount field of the request to transfer more than one token of the class in a single request.

Request Message:

TransferRequest

Description: The request

Request Parameters

Name	Value
To	AccountId to transfer ownership to.
Quantity	Number of tokens to transfer.

Response Message

TransferResponse

Description: The response

Response Parameters

Name	Value

Confirmation	A confirmation receipt or error may be returned to the owner based on the outcome of the transfer request.

TransferFrom

Id: 516b4e2f-4a14-4c4f-a6f2-1419d4af35c6

Description: >A transfer request will invoke a transfer from the owner of the token to the party or account provided in the To field of the request. For fungible or dividable non-fungible tokens, this request may also include value in the Amount field of the request to transfer more than one token of the class in a single request.

Request Message:

TransferFromRequest

Description: The request

Request Parameters

Name	Value
From	AccountId to transfer ownership from.
To	AccountId to transfer ownership to.
Quantity	Number of tokens to transfer.

Response Message

TransferFromResponse

Description: The response

Response Parameters

Name	Value
Confirmation	A confirmation receipt or error may be returned to the owner based on the outcome of the transfer from request.

Specification Behavior

Redeemable

Taxonomy Symbol: q

This behavior only applies to unique tokens. Redeemed tokens can no longer be spent. Redeeming a token removes an asset from the business network and guarantees that it can no longer be transferred or changed. You redeem a quantity represented in a token or tokens you own. If the redemption amount is less that the quantity represented in your token submitted, the remaining quantity after redemption is deposited into a new token and returned to you as the owner. For example, if you have a token representing 100 dollars, and want to redeem 50, the redeem transaction will create a new token worth 50 dollars, and transfer another 50 to a restricted account without an owner.

Example

If an item in a supply chain reaches its final destination, or a financial asset reaches its term, the token representing the asset can be redeemed since the asset no longer needs to be used.

Analogies

Name	Description
Oil Barrels	If you receive a token for each barrel of oil as a refiner, you will redeem the barrel when it is refined to remove it from circulation.
Admission Ticket	A token that is a coupon or single use ticket, should be marked or torn when it is redeemed so it cannot be used again.

Type:	Behavior
Name:	Redeemable
Id:	51a62eba-0e84-433a-a3f1-9b3e7f72d928
Visual:	q
Tooling:	q
Version:	1.0

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id
Base	tF{d}	89ca6daf-5585-469e-abd1-19bc44e7a012
Base	tN{d}	8314a797-df3c-409b-835c-0e80af92714f
Base	tF{~d}	b1eacdf8-35d8-454a-b1af-92eb0b6f45d4
Base	tN{~d}	3c05a856-c901-4c30-917e-df9feed1c8de

Influenced By

Description	Symbol	Applies To
If Compliance is present, a CheckBurnAllowed request has to be made and verified before a Burn request or a BurnFrom request.	c	[ ]

Artifact Files

Content Type	File Name	File Content
Control	redeemable.proto	
Uml	burnable.md	

Code Map

Map Type	Name	Platform	Location
SourceCode	FabToken	ChaincodeGo	https://github.com/hyperledger/fabric/blob/v2.0.0-alpha/token/cmd/redeem.go

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Is External:	True
Constructor:	

Redeemable responds to these Invocations

Redeem

Id: c6a0ef93-0d7d-4c68-a3b4-8f5d0bbadcbe

Description: A redeem request will redeem a quantity transfer from tokens provided to an account that has no owner, removing them permanently from circulation, as long as tokens being redeemed need to belong to the transaction initiator and are unspent. Any remaining quantity will be returned as a new unspent quantity to the invoker/owner.

Request Message:

RedeemRequest

Description: The request includes an asset quantity to redeem and a list of tokens that have quantities that equal or exceed the quantity to redeem. Any remaining balance will be deposited into a new token with the invoker as the owner.

Request Parameters

Name	Value
TokenIds	List of Token Identifiers submitted to draw the quantity to redeem from. This data type is defined at implementation.
Quantity	Number of tokens to transfer.
Recipient	Always null, empty or to a know account that has no owner.

Response Message

RedeemResponse

Description: The response

Response Parameters

Name	Value
Confirmation	A confirmation receipt or error may be returned to the invoker based on the outcome of the fabricate request.

Specification Property Set

Date Range

Type:	PropertySet
Name:	Date Range
Id:	d7607f63-5e29-424f-a991-3f05c8f0daf7
Visual:	φ<i>DR</i>
Tooling:	phDR
Version:	1.0

Definition

A token class that implements this property set will have a time period defined using a start and stop date and time. The Date Range includes a simple date and a granular timestamp for both the start and stop points defining the time period.

Example

A token may represent value of a byproduct our output of some activity that occurred during a certain time period. In the case of ecological tokens, it can be the time period in which some benefit is measured and verified that would represent the benefit's value.

Analogies

Name	Description
GHG/Carbon Benefit	A token implementing this property set can represent the avoidance or removal or GHG/Carbon for a certain time period.

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id

Influenced By

Description	Symbol	Applies To
Roles should be used to control what accounts can set the Date Range.	r	[ ]

Artifact Files

Content Type	File Name	File Content
Control	date-range.proto	
Uml	date-range.md	

Code Map

Map Type	Name	Platform	Location

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Property Set Representation Type	Description
Common	This property set's value is common or shared for all token instances in the class. Meaning all tokens in the class will share the same value of the property set.

Properties

Property Name: DateRange

Property Value Description: Contains the date range.

Template Value is set to:

DateRange responds to these Invocations

Properties

Property Name: DateRange
Property Value Description: Contains the values for the Date Range.

Template Value is set to:

DateRange responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Property Name: DateRange
Property Value Description: Contains the values for the Date Range.

Template Value is set to:

DateRange responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: DateRange
Property Value Description: Contains the values for the Date Range.

Template Value is set to:

DateRange responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Property Name: DateRange
Property Value Description: Contains the values for the Date Range.

Template Value is set to:

DateRange responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate
Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate
Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp
Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Properties

Property Name: StartDate

Property Value Description: A simple date format.

Template Value is set to:

StartDate responds to these Invocations

Property Name: StartTimeStamp

Property Value Description: A granular timestamp.

Template Value is set to:

StartTimeStamp responds to these Invocations

Property Name: EndDate

Property Value Description: A simple date format.

Template Value is set to:

EndDate responds to these Invocations

Property Name: EndTimeStamp

Property Value Description: A granular timestamp.

Template Value is set to:

EndTimeStamp responds to these Invocations

Specification Property Set

Geographic Location

Type:	PropertySet
Name:	Geographic Location
Id:	7a768ba8-b87f-4ffe-aed6-ce0121617baf
Visual:	φGL
Tooling:	phGL
Version:	1.0

Definition

A token class that implements this property set will have geographic data indicating the tokens or token related location. It contains a GNSS point value for simple location and a collection of Geographic Areas for more complex projects that may have multiple parcels of land involved in the same project.

Example

A climate project that can generate climate benefit claims, like a carbon credit, is based of land use, i.e. forestry or agricultural practices, the project's geographic location will need to be recorded. A token should expose this property to allow for the verification of geographic uniqueness for the project to prevent the creation of a geographic parcel from being defined twice.

Analogies

Name	Description
Great Southern Forest	Big forest with lots of new trees being planted.

Comments

Not all climate project will require geographic data, or only require a simple GNSS point instead of an area defined.

Dependencies

Artifact Type	Symbol	Description

Incompatible With

Artifact Type	Symbol	Id

Influenced By

Description	Symbol	Applies To
Roles should be used to control what accounts can set the Geolocation Property.	r	[ ]

Artifact Files

Content Type	File Name	File Content

Control	geolocation.proto	
Uml	geolocation.md	

Code Map

Map Type	Name	Platform	Location

Implementation Map

Map Type	Name	Platform	Location

Resource Map

Map Type	Name	Location	Description

Property Set Representation Type	Description
Common	This property set's value is common or shared for all token instances in the class. Meaning all tokens in the class will share the same value of the property set.

Properties

Property Name: GNSS

Property Value Description: Contains a simple GNSS location, for an area this may be a center point or just one of the area points.

Template Value is set to:

GNSS responds to these Invocations

Properties

Property Name: GNSS

Property Value Description: Contains a single GNSS coordinate for simple location.

Template Value is set to:

GNSS responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Property Name: GNSS
Property Value Description: Contains a single GNSS coordinate for simple location.

Template Value is set to:

GNSS responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: GNSS
Property Value Description: Contains a single GNSS coordinate for simple location.

Template Value is set to:

GNSS responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Property Name: GNSS
Property Value Description: Contains a single GNSS coordinate for simple location.

Template Value is set to:

GNSS responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Properties

Property Name: Longitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Longitude responds to these Invocations

Property Name: Latitude
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Latitude responds to these Invocations

Property Name: Timing
Property Value Description: A string of text or possibly numeric value.

Template Value is set to:

Timing responds to these Invocations

Property Name: GeographicAreas
Property Value Description: Contains the reported emission scope and it's category from pick list, see ggbsc.proto.

Template Value is set to:

GeographicAreas responds to these Invocations

Properties

Property Name: GeographicLocations
Property Value Description: Contains the Geographic Areas as GeoJSON.

Template Value is set to:

GeographicLocations responds to these Invocations

Properties

Property Name: GeographicArea
Property Value Description: A complex type described in the as GeoJSON.

Template Value is set to:

GeographicArea responds to these Invocations

Property Name: GeographicLocations
Property Value Description: Contains the Geographic Areas as GeoJSON.

Template Value is set to:

GeographicLocations responds to these Invocations

Properties

Property Name: GeographicArea
Property Value Description: A complex type described in the as GeoJSON.

Template Value is set to:

GeographicArea responds to these Invocations

Properties

Property Name: GeographicLocations
Property Value Description: Contains the Geographic Areas as GeoJSON.

Template Value is set to:

GeographicLocations responds to these Invocations

Properties

Property Name: GeographicArea
Property Value Description: A complex type described in the as GeoJSON.

Template Value is set to:

GeographicArea responds to these Invocations

Property Name: GeographicLocations
Property Value Description: Contains the Geographic Areas as GeoJSON.

Template Value is set to:

GeographicLocations responds to these Invocations

Properties

Property Name: GeographicArea
Property Value Description: A complex type described in the as GeoJSON.

Template Value is set to:

GeographicArea responds to these Invocations