Ecological-Claim

## Contributors

|  |  |
| --- | --- |
| Name | Organization |
| Debbie Reed | ESMC |
| Cameron Prell | XPansiv |
| Marley Gray | Microsoft |
| Doug Miller | Energy Web Foundation |
| Michelle Lancaster | Microsoft |
| John Lee | Accenture |
| Robert Greenfield | Emerging Impact Group |
| Conor Svensson | Web3 Labs |
| Martin Wainstein | Open Earth Foundation |
| Meerim Ruslanova | Energy Web Foundation |
| Ken Anderson | Hedera Hashgraph |
| Wes Geisenberger | Hedera Hashgraph |
| Tom Herman | AirCarbon Pte Ltd |
| Tom Baumann | Climate Check |

### Taxonomy Formula: [tN{~d,~t,g,e,PCC}+phCB+phECS+phEC]

# 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: | Reference | This token is a receipt or title to a material item, property or right. The token represents a reference to the value, can be owned or used digitally via its token. Sometimes referred to as a digital twin. |
| 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: | Infinite | Infinite supply indicates that tokens in the class can be created and removed with no cap and also potentially reflect negative supply for certain business cases. |

This is a Variable Supply Whole Non-Fungible where the total supply can vary. The tokens in this class will be of the same series, sharing those properties like their Modular Benefit Project, but also have unique values. It is Whole by setting the Decimals property on the dividable behavior = 0. A token instance can be burned.

### Example

This token represents a claim in a collection of claims from the same Modular Benefit Project, where the claim has a collection of checkpoints from registered sources that are receipts for the raw data and external reference data sources used to make the benefit claim. An Ecological Claim is built over a time period by the Modular Benefit Project's Measurement, Reporting and Verification (MRV) process, which should register the sources of measurement/evidence and issue at least one Ecological Checkpoint that has the links to the raw source and reference data supporting the claim. Using checkpoints allows for a claim to build and show progress over the time period, proving the work of the MRV process periodically over the time period which increases the trust in the claim itself. Once all the checkpoints are added to the claim it can be submitted for verification, then it is then encumbered by the VVB and verified via the Verification Contract process. Once verification is complete a Processed Claim token is issued, which will then retire the Ecological Claim token recording the Processed Claim Id, linking the two tokens together.

### Analogies

|  |  |
| --- | --- |
| Name | Description |
| Insurance Claim | Similar to an Insurance Claim, a MBP can create a claim for removal or reduction of carbon referencing the data to prove their claim. These claims need to be validated and verified, like a claims adjuster, to determine amount the claim will be credited with. |

# Ecological-Claim is:

* Indivisible
* Non-transferable
* Delegable
* Encumberable
* Processable
* Roles
* Mintable

### It includes the following Property Sets:

* Ecological Claim Source
* Ecological Checkpoint
* Co-benefit

# Ecological-Claim Details

## Whole Non-Fungible Token

|  |  |
| --- | --- |
| Type: | Base |
| Name: | Whole Non-Fungible Token |
| Id: | 3c05a856-c901-4c30-917e-df9feed1c8de |
| Visual: | &tau<sub>N</sub>{<i>~d</i>} |
| 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: | Reference |
| 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: | <i>~d</i> |
| 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 Type | File Name | File Content |
| 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

# Non-transferable

### Taxonomy Symbol: ~t

Every token instance has an owner. The Non-transferable behavior prevents the owner of a token from changing.

### Example

A vote token, for a citizen in a public election would be non-transferable.

### Analogies

|  |  |
| --- | --- |
| Name | Description |
| Diploma | A diploma from an educational institution is not transferable to another party that can claim to have earned the diploma. |
| Airline Ticket | Due to security restrictions at airports and airlines, tickets can only be used by the person they were issued to. |

|  |  |
| --- | --- |
| Type: | Behavior |
| Name: | Non-transferable |
| Id: | a4fa4ca8-6afd-452b-91f5-7103b6fee5e5 |
| Visual: | <i>~t</i> |
| Tooling: | ~t |
| Version: | 1.0 |

## Dependencies

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Description |

## Incompatible With

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Id |
| Behavior | t | af119e58-6d84-4ca6-9656-75e8d312f038 |

## Influenced By

|  |  |  |
| --- | --- | --- |
| Description | Symbol | Applies To |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | non-transferable.proto |  |
| Uml | non-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: |  |

## Non-transferable responds to these Invocations

## Specification Behavior

# Delegable

### Taxonomy Symbol: g

A token class that implements this behavior will support the delegation of certain behaviors to another party or account to invoke them on the behalf of the owner. When applied to a token, behaviors that are Delegable will enable delegated request invocations. This is useful to provide another party to automatically be able to perform the behaviors that can be delegated without seeking permission up to a certain allowance.

### Example

### Analogies

|  |  |
| --- | --- |
| Name | Description |
| Broker | You may allow a broker to transfer your tokens as a part of an investment strategy. Setting an allowance can cap the total number of tokens the broker is allowed to perform delegated behaviors, when exceeded a new allowance request will need to be granted. |

### Comments

Applied to behaviors that are Delegable.

|  |  |
| --- | --- |
| Type: | Behavior |
| Name: | Delegable |
| Id: | a3d02076-6009-4a65-9ed4-2deffe5291e1 |
| Visual: | <i>g</i> |
| Tooling: | g |
| 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 | delegable.proto |  |
| Uml | delegable.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: |  |

## Delegable responds to these Invocations

#### Allowance

Id: 2e0fd8e5-2090-4c62-b094-232c32a78022

Description: A Request by a party or account to the owner of a token(s) to have the right to perform a delegated behavior on their behalf.

##### Request Message:

AllowanceRequest

Description: The request

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |
| Quantity | Number of Tokens to be allowed. |

##### Response Message

AllowanceResponse

Description: The response

###### Response Parameters

|  |  |
| --- | --- |
| Name | Value |
| Confirmation | A confirmation receipt or denial be returned to the allowance requestor. |

#### Approve Allowance

Id: 6d5df99d-2f5e-4c7a-aea4-d2d54176abfd

Description: Same control message as the AllowanceRequest. This could allow for an AllowanceRequest to be forwarded to multiple parties needed to Approve and shield this from the requestor. When all Approvals are obtained, an AllowanceResponse could be sent.

##### Request Message:

AllowanceRequest

Description: The request

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |
| Quantity | Number of Tokens to be allowed. |

##### Response Message

ApproveResponse

Description: The response

###### Response Parameters

|  |  |
| --- | --- |
| Name | Value |
| Confirmation | A confirmation response from the owner approving the an allowance request, indicating a allowance quantity the requestor has the option to invoke the Delegable behaviors on the token(s). |

## Specification Behavior

# Encumberable

### Taxonomy Symbol: e

A token class that implements this behavior will have restrictions preventing certain behaviors like transferable, burnable, etc. from working while it is encumbered. The encumbering party should make a request to encumber, the owner should be notified about the request, and accept the request, which will finalize the encumbrance and send the EncumberResponse message to the requestor.

### Example

For example, a property title's owner may have obtained a loan from a bank to purchase the property. The loan represents a contract between the owner of the property and the bank, this loan encumbers the property title preventing the owner from being able to sell the property, transferable, to another party until the loan is paid off. Paying off the loan will remove the encumber, which will allow transferable to be invoked.

### Analogies

|  |  |
| --- | --- |
| Name | Description |
| Loan | A token can represent an asset that the owner took out a loan to obtain. If so, the token will need to be encumbered by the loan contract preventing the owner from selling the asset until the loan is repaid. |

### Comments

The token definition should have a Encumbered property or structure that may allow only one encumber or allow multiple.

|  |  |
| --- | --- |
| Type: | Behavior |
| Name: | Encumberable |
| Id: | dc8d5961-59e8-4a10-8b38-d9e99394d251 |
| Visual: | <i>e</i> |
| Tooling: | e |
| 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 | encumberable.proto |  |
| Uml | encumberable.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: |  |

## Encumberable responds to these Invocations

#### EncumberRequest

Id: bdc69e47-8320-4f54-8a03-0f54c376e113

Description: A Request by a party or account, perhaps a contract or another token, to encumber the token.

##### Request Message:

EncumberRequest

Description: The request

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |
| Name of Encumber | Name of the institution requesting the encumber. |
| Identifier | A public key or address for the requestor. |
| Signature | A digital signature or attestation, optional. |

##### Response Message

EncumberResponse

Description: The response

###### Response Parameters

|  |  |
| --- | --- |
| Name | Value |
| Confirmation | A confirmation response from the token for the encumber request. |

#### AcceptEncumberRequest

Id: efd8bb57-4904-481e-976d-8a20a33df602

Description: A Request by a party or account, perhaps a contract or another token, to encumber the token. Once accepted, the token should add a new entry into the Encumbrances property.

##### Request Message:

AcceptEncumberRequest

Description: The request

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response Message

AcceptEncumberResponse

Description: The response

###### Response Parameters

|  |  |
| --- | --- |
| Name | Value |
| Confirmation | A confirmation response returned to the owner of their acceptance. |

#### RemoveEncumberRequest

Id: 4532c466-bb6d-482a-b2cc-5285ba1f8259

Description: A Request by encumbrancer, perhaps a contract or another token, to remove their encumber or lien from the token. Which should remove any restrictions from behaviors if there are no more encumbers. Only the owner of the encumber can remove their encumber.

##### Request Message:

RemoveEncumberRequest

Description: The request

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response Message

RemoveEncumberResponse

Description: The response

###### Response Parameters

|  |  |
| --- | --- |
| Name | Value |
| Confirmation | A confirmation receipt or denial be returned to the RemoveEncumber requestor. |

### Properties

#### Name: Encumbrances

Value Description: List of Encumbered

Template Value:

### Invocations

#### GetEncumbrancesRequest

Id: 9e39bf6a-74dc-4ca1-a709-5db247aaa31b

Description: The property value.

##### Request

Control Message: GetEncumbrancesRequest

Description:

###### Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response

Control Message: GetEncumbrancesResponse

Description: Return value

###### Parameters

|  |  |
| --- | --- |
| Name | Value |
| Encumbrances | List of Encumbered |

#### GetEncumbrancesRequest

Id: 9e39bf6a-74dc-4ca1-a709-5db247aaa31b

Description: The property value.

##### Request

Control Message: GetEncumbrancesRequest

Description:

###### Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response

Control Message: GetEncumbrancesResponse

Description: Return value

###### Parameters

|  |  |
| --- | --- |
| Name | Value |
| Encumbrances | List of Encumbered |

#### Name: Encumbered

Value Description: True or False

Template Value:

### Invocations

#### GetEncumberedRequest

Id: f35cdfee-d2f4-4a01-bf9b-33774b5df241

Description: The property value.

##### Request

Control Message: GetEncumberedRequest

Description:

###### Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response

Control Message: GetEncumberedResponse

Description: Return value

###### Parameters

|  |  |
| --- | --- |
| Name | Value |
| Encumbered | True or False |

#### GetEncumberedRequest

Id: f35cdfee-d2f4-4a01-bf9b-33774b5df241

Description: The property value.

##### Request

Control Message: GetEncumberedRequest

Description:

###### Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response

Control Message: GetEncumberedResponse

Description: Return value

###### Parameters

|  |  |
| --- | --- |
| Name | Value |
| Encumbered | True or False |

## Specification Behavior

# Processable

### Taxonomy Symbol: pc

A token class that implements this behavior is burned or retired when the processed claim token created after processing. For example, a Carbon Benefit Claim is submitted for validation and verification, once this is done the claim is processed. Once the processed claim is created, the claim token should be processed or retired by passing in the processed claim token id that resulted from the verification. This ensures that the claim cannot be validated and verified again and can no longer be used.

### Example

### Comments

Used in conjunction with ecological benefit claims.

|  |  |
| --- | --- |
| Type: | Behavior |
| Name: | Processable |
| Id: | a5ca8c18-57b9-4907-8bf0-a66712a212c0 |
| Visual: | <i>pc</i> |
| Tooling: | pc |
| Version: | 1.0 |

## Dependencies

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Description |

## Incompatible With

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Id |

## Influenced By

|  |  |  |
| --- | --- | --- |
| Description | Symbol | Applies To |
| This would allow for an owner to allow another party to process on their behalf, like the standard registry. | g | [ ] |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | processable.proto |  |
| Uml | processable.md |  |

## Code Map

|  |  |  |  |
| --- | --- | --- | --- |
| Map Type | Name | Platform | Location |

## Implementation Map

|  |  |  |  |
| --- | --- | --- | --- |
| Map Type | Name | Platform | Location |

## Resource Map

|  |  |  |  |
| --- | --- | --- | --- |
| Map Type | Name | Location | Description |

|  |  |
| --- | --- |
| Is External: | False |
| Constructor: |  |

## Processable responds to these Invocations

#### Process

Id: 2019574d-c8bf-44b6-afb7-cb6eaf74a308

Description: A request to process a token instance(s) in the class by the verifier of the claim to record the processedClaimId and retire or burn this instance.

##### Request Message:

ProcessRequest

Description: The request to process this token.

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |
| ProcessedClaimId | The Id of the processed claim token. |

##### Response Message

ProcessResponse

Description: The response from the request to Process.

###### Response Parameters

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

#### ProcessFrom

Id: 47057767-e0ee-4737-993b-698f7baab3ed

Description: Requires Delegable. A request to process a token instance in the class by a party or account that has allowance to do so. Once the token is Process, invocations of Transfer should be blocked. Requires a From and Quantity fields in the request.

##### Request Message:

ProcessFromRequest

Description: The request to Process tokens.

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |
| From | AccountId from which tokens are processed. |
| ProcessedClaimId | The Id of the processed claim. |

##### Response Message

ProcessFromResponse

Description: The response from the request to process from.

###### Response Parameters

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

### Properties

#### Name: ProcessedClaimId

Value Description: Records the processed claim id that retires the benefit claim.

Template Value:

### Invocations

## 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: | <i>r</i> |
| 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: | False |
| 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: Submitters

### 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. |

#### GetSubmitters

Id:

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

##### Request

Control Message: GetSubmittersRequest

Description: The request

###### Parameters

|  |  |
| --- | --- |
| Name | Value |

##### Response

Control Message: GetSubmittersResponse

Description: The response

###### Parameters

|  |  |
| --- | --- |
| Name | Value |
| Members | Returning the list of accounts in the 'Submitters' 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 | Value is always set to 'Submitters' |
| AccountAddress | Address, name or identifier of the account to be added to the 'Submitters' 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 | Always set to 'Submitters' |
| 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 | Always be bound to 'Submitters' |
| 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

# 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: | <i>m</i> |
| 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 | Open Zeppelin | 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: | False |
| Constructor: |  |

## Mintable responds to these Invocations

Binding Is Influenced by Roles's Invocation RoleCheckRoles's Invocation RoleCheck Intercepts this behavior's invocation.'

#### RoleCheck

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

Description: Check to see if the account is in the Role called 'Submitters'

##### Request Message:

IsInRole

Description: Checking the 'Submitters' role.

###### Request Parameters

|  |  |
| --- | --- |
| Name | Value |
| AccountId | AccountId of the requestor. |

##### Response Message

True/False

Description: Respond true if the account is in the 'Submitters' role.

###### Response Parameters

|  |  |
| --- | --- |
| Name | Value |
| IsInRole | True/False |

#### 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. |

#### 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. |

## Processed Claim Control

|  |  |
| --- | --- |
| Type: | BehaviorGroup |
| Name: | Processed Claim Control |
| Id: | b2648a71-534f-4112-a283-86a1c62e2a1d |
| Visual: | <i>PCC</i> |
| Tooling: | PCC |
| Version: | 1.0 |

## Definition

A token class that implements this behavior will provide controls to increase and decrease supply of tokens within the class. Additionally, it will include the ability to support a role, like Submitters, that will be allowed to invoke the mintable behavior. Accounts can be added to the role and will be able to mint tokens in the class. The owner of an instance can process or delegate processing of the token which burns or retires the token, but requires the the Id of the new processed claim token to be successfully be retired. This provides correlation between the two items and prevents benefit claims from being processed more than once.

## Example

## Analogies

|  |  |
| --- | --- |
| Name | Description |
| Central Bank | Implementing monetary policy for this token. |

## Comments

Define a Submitters role and apply the role to the mintable behavior.

## Dependencies

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Description |

## Incompatible With

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Id |
| Behavior | s | c1189d7a-e142-4504-bf26-44c35b76c9d6 |

## Influenced By

|  |  |  |
| --- | --- | --- |
| Description | Symbol | Applies To |
| Create a Submitters Role and apply it to the Mintable behavior to provide authorization checks for invoking the behavior. | r | [ ] |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | processed-claim-control.proto |  |
| Uml | processed-claim-control.md |  |

## Code Map

|  |  |  |  |
| --- | --- | --- | --- |
| Map Type | Name | Platform | Location |

## Implementation Map

|  |  |  |  |
| --- | --- | --- | --- |
| Map Type | Name | Platform | Location |

## Resource Map

|  |  |  |  |
| --- | --- | --- | --- |
| Map Type | Name | Location | Description |

The behaviors belonging to this group are included in the Behaviors section of this specification.

## Specification Property Set

## Ecological Claim Source

|  |  |
| --- | --- |
| Type: | PropertySet |
| Name: | Ecological Claim Source |
| Id: | 66150c15-9fa0-42f3-8ae6-84592af312b9 |
| Visual: | &phi;<i>ECS</i> |
| Tooling: | phECS |
| Version: | 1.0 |

## Definition

This property set includes the information about the source of evidence that can be included in an Ecological Claim - Checkpoint, a claim is made up of one or more ecological checkpoints that records the time frame of the data, raw source claim or reference data. The provenance of this data will need to be traceable back to a registered source. A source can be a device like IoT, an application hosted on a device like a tablet or reference data like a satellite image source.

## Example

A Modular Benefit Project will register the sources of data that can supply evidence for their claims using this property set. When evidence is checked in via Checkpoint, the identifier of the source along with a proof, like a digital signature, should be provided to the checkpoint ensuring evidence is not being slipped into the claim from an unregistered source.

## Analogies

|  |  |
| --- | --- |
| Name | Description |

## 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 create a Claim Source. | r | [ ] |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | ecological-claim-source.proto |  |
| Uml | ecological-claim-source.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: ClaimSource

Property Value Description: Contains the values for the checkpoint.

Template Value is set to:

## ClaimSource responds to these Invocations

## Properties

### Property Name: ClaimSource

Property Value Description: Contains the values for the ClaimSource.

Template Value is set to:

## ClaimSource responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

### Property Name: ClaimSource

Property Value Description: Contains the values for the ClaimSource.

Template Value is set to:

## ClaimSource responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: ClaimSource

Property Value Description: Contains the values for the ClaimSource.

Template Value is set to:

## ClaimSource responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

### Property Name: ClaimSource

Property Value Description: Contains the values for the ClaimSource.

Template Value is set to:

## ClaimSource responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: The parent ecological claim identifier that the source is registered for.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: ClaimSourceType

Property Value Description: From the standard list of source types found in common.proto

Template Value is set to:

## ClaimSourceType responds to these Invocations

### Property Name: SourceIdentifier

Property Value Description: This can be a unique identifier for a device, a serial number, for an application/user can be the appId and UserId, for reference data it can be the URI for the reference source.

Template Value is set to:

## SourceIdentifier responds to these Invocations

## Specification Property Set

## Ecological Checkpoint

|  |  |
| --- | --- |
| Type: | PropertySet |
| Name: | Ecological Checkpoint |
| Id: | 9bbcac72-ba95-4d73-ad95-d96275a4924f |
| Visual: | &phi;<i>EC</i> |
| Tooling: | phEC |
| Version: | 1.0 |

## Definition

This property set includes the information about a modular benefit project's ecological claim, a claim is made up of one or more ecological checkpoints that records the time frame of the data, raw source claim or reference data. The collection of checkpoints in an Ecological Claim are used to verify the claim.

## Example

A modular benefit project produces a benefit claim for a reporting period that needs to be verified in order to be turned into a credit. A claim is built over a period of time and it can be beneficial for the project to issue periodic checkpoints for the claim during that time period in order to show progress and prove the work for the claim over the duration. An Claim will have at least one checkpoint and can have as many as prescribed by the standard methodology or protocol defines. This property has a unique id, contains the date range for the claim as well as a verified link to the data, raw source and reference, to verify the claim.

## Analogies

|  |  |
| --- | --- |
| Name | Description |

## Dependencies

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Description |
| PropertySet | phVL | The verified link is included in this property set. |
| PropertySet | phDR | The date range is included in this property set. |
| PropertySet | phCB | The co-benefits property set is included in this property set. |

## Incompatible With

|  |  |  |
| --- | --- | --- |
| Artifact Type | Symbol | Id |

## Influenced By

|  |  |  |
| --- | --- | --- |
| Description | Symbol | Applies To |
| Roles should be used to control what accounts can create a Checkpoint. | r | [ ] |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | ecological-checkpoint.proto |  |
| Uml | ecological-checkpoint.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: EcologicalCheckpoint

Property Value Description: Contains the values for the checkpoint.

Template Value is set to:

## EcologicalCheckpoint responds to these Invocations

## Properties

### Property Name: EcologicalCheckpoint

Property Value Description: Contains the values for the EcologicalCheckpoint.

Template Value is set to:

## EcologicalCheckpoint responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

### Property Name: EcologicalCheckpoint

Property Value Description: Contains the values for the EcologicalCheckpoint.

Template Value is set to:

## EcologicalCheckpoint responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: EcologicalCheckpoint

Property Value Description: Contains the values for the EcologicalCheckpoint.

Template Value is set to:

## EcologicalCheckpoint responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

### Property Name: EcologicalCheckpoint

Property Value Description: Contains the values for the EcologicalCheckpoint.

Template Value is set to:

## EcologicalCheckpoint responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

## Properties

### Property Name: Id

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## Id responds to these Invocations

### Property Name: ClaimId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## ClaimId responds to these Invocations

### Property Name: SourceId

Property Value Description: A globally unique id - UUID, GUID, etc.

Template Value is set to:

## SourceId responds to these Invocations

### Property Name: EFBefore

Property Value Description: Environmental Factor before project activities - i.e. soil carbon measurement before.

Template Value is set to:

## EFBefore responds to these Invocations

### Property Name: EFAfter

Property Value Description: Environmental Factor after project activities - i.e. soil carbon measurement after.

Template Value is set to:

## EFAfter responds to these Invocations

### Specification (Sub) Property Set

## Verified Link

|  |  |
| --- | --- |
| Type: | PropertySet |
| Name: | Verified Link |
| Id: | ce1ca787-d018-4eb2-90e7-03b8876197bf |
| Visual: | &phi;<i>VL</i> |
| Tooling: | phVL |
| Version: | 1.0 |

## Definition

A token class that implements this property set will have a verified link or field with a Read/Query and Set control. The verified link can be an embedded signed URL or a traditional 3 part link with a link path (url, etc.) a signed path and a public key to verify the link path.

## Example

Storing an authentic reference to another object or artifact, where the link is digitally signed by it's setter and optionally may include hash values for data at the endpoint.

## Analogies

|  |  |
| --- | --- |
| Name | Description |
| Signed Reference | A token implementing this property set may have multiple types of related data that is stored elsewhere. This data is accessed following the link that is digitally signed by the setter and may include proofs or hash values of the data stored for integrity checks. |

## 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 Link Property. | r | [ ] |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | verified-link.proto |  |
| Uml | verified-link.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: VerifiedLink

Property Value Description: Contains a Verified Link to the project's data.

Template Value is set to:

## VerifiedLink responds to these Invocations

### Specification (Sub) Property Set

## Date Range

|  |  |
| --- | --- |
| Type: | PropertySet |
| Name: | Date Range |
| Id: | d7607f63-5e29-424f-a991-3f05c8f0daf7 |
| Visual: | &phi;<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

## Specification Property Set

## Co-benefit

|  |  |
| --- | --- |
| Type: | PropertySet |
| Name: | Co-benefit |
| Id: | 5a8c69f6-f3c5-4bc8-82d0-d3fbf90b59c7 |
| Visual: | &phi;<i>CB</i> |
| Tooling: | phCB |
| Version: | 1.0 |

## Definition

This property set includes the information about a ecological project's co-benefit claims, Some projects can achieve significant sustainable development outcomes for project participants in addition to the emission reductions. There are examples of projects where it can be argued that the sustainability co-benefits equal or exceed the impact of the emission reduction activity.

## Example

Reliable electricity supplies can enable new economic activities to develop (i.e. tourism, village industries), provide greater access to educational resources and improve village life.

## Analogies

|  |  |
| --- | --- |
| Name | Description |

## 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 create or set a CoBenefit. | r | [ ] |

## Artifact Files

|  |  |  |
| --- | --- | --- |
| Content Type | File Name | File Content |
| Control | co-benefit.proto |  |
| Uml | co-benefit.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: CoBenefit

Property Value Description: Contains the values for the co-benefit.

Template Value is set to:

## CoBenefit responds to these Invocations

## Properties

### Property Name: CoBenefit

Property Value Description: Contains the values for the CoBenefit.

Template Value is set to:

## CoBenefit responds to these Invocations

## Properties

### Property Name: BenefitCategory

Property Value Description: A selection from a list of categories, ex. see the co-benefit.proto enumeration of BenefitCategories.

Template Value is set to:

## BenefitCategory responds to these Invocations

### Property Name: Description

Property Value Description: A description of the co-benefit that is not captured via the category.

Template Value is set to:

## Description responds to these Invocations

### Property Name: RatingScore

Property Value Description: A placeholder for some kind of rating or scoring of the relative co-benefit.

Template Value is set to:

## RatingScore responds to these Invocations

## Properties

### Property Name: BenefitCategory

Property Value Description: A selection from a list of categories, ex. see the co-benefit.proto enumeration of BenefitCategories.

Template Value is set to:

## BenefitCategory responds to these Invocations

### Property Name: Description

Property Value Description: A description of the co-benefit that is not captured via the category.

Template Value is set to:

## Description responds to these Invocations

### Property Name: RatingScore

Property Value Description: A placeholder for some kind of rating or scoring of the relative co-benefit.

Template Value is set to:

## RatingScore responds to these Invocations

## Properties

### Property Name: BenefitCategory

Property Value Description: A selection from a list of categories, ex. see the co-benefit.proto enumeration of BenefitCategories.

Template Value is set to:

## BenefitCategory responds to these Invocations

### Property Name: Description

Property Value Description: A description of the co-benefit that is not captured via the category.

Template Value is set to:

## Description responds to these Invocations

### Property Name: RatingScore

Property Value Description: A placeholder for some kind of rating or scoring of the relative co-benefit.

Template Value is set to:

## RatingScore responds to these Invocations