JORNADAS TECNICAS INDUSTRIAL TRACK 4.0 2022

EL POTENCIAL PARA LA INDUSTRIA DEL USO DE PORTALES ABIERTOS DE DATOS COMPARTIDOS: MVG GAIA-X

Sara Madariaga, Head of Arsys Lab, Arsys Internet

ESPACIO DE DATOS

- Los datos son un activo fundamental para las empresas.
- Muchas organizaciones se muestren recelosas al compartir sus datos, a pesar de ser conscientes de las ventajas:
  - Eficiencia en la cadena de suministro.
  - Enriquecimiento de analíticas internas.
  - Entrenamiento de sistemas de machine learning / IA.
  - Nuevas oportunidades de negocio.
  - Optimización de tiempo y costes.
- PROBLEMA: confianza.

ESPACIO DE DATOS (2)

- Ecosistema donde diversos actores comparten datos de manera voluntaria y segura, con mecanismos comunes de gobernanza, organizativos, normativos y técnicos.
  - Cada participante mantiene control sobre sus datos.
  - Habilita políticas de acceso y uso de la información.
  - Asegura la identidad de los participantes.
  - Permite crear roles: productor / consumidor de datos, proveedor de servicios, desarrollador de componentes, operador de servicios esenciales, …
  - Puede certificar los componentes software empleados.
  - Estandariza descripciones y taxonomías.

GAIA-X WEB3 ECOSYSTEM

- Portal web de intercambio de datasets y algoritmos
  - Basado en blockchain (Ocean Protocol).
    - Asegura disponibilidad, transparencia, integridad y autenticidad por diseño.
    - Integra el paradigma “compute-to-data”.
  - Integra el Trust Framework definido por Gaia-X.
    - Self-descriptions.
    - Validación.

- Veamos cómo funciona: desafiando el efecto demo ;)

REFERENCIAS

- Este portal está siendo utilizado por varios proyectos del ecosistema de Gaia-X, incluyendo:
  - Minimal Viable Gaia-X demonstrator (MVG).
  - European Production Giganet (EuProGigant).
  - Gaia-X 4 MoveID, parte de la familia Gaia-X 4 Future Mobility.
  - Portal de investigación de la Universitat de Lleida.

- Ha sido desarrollado por la empresa alemana deltaDAO y liberado como código abierto, disponible en GitHub.

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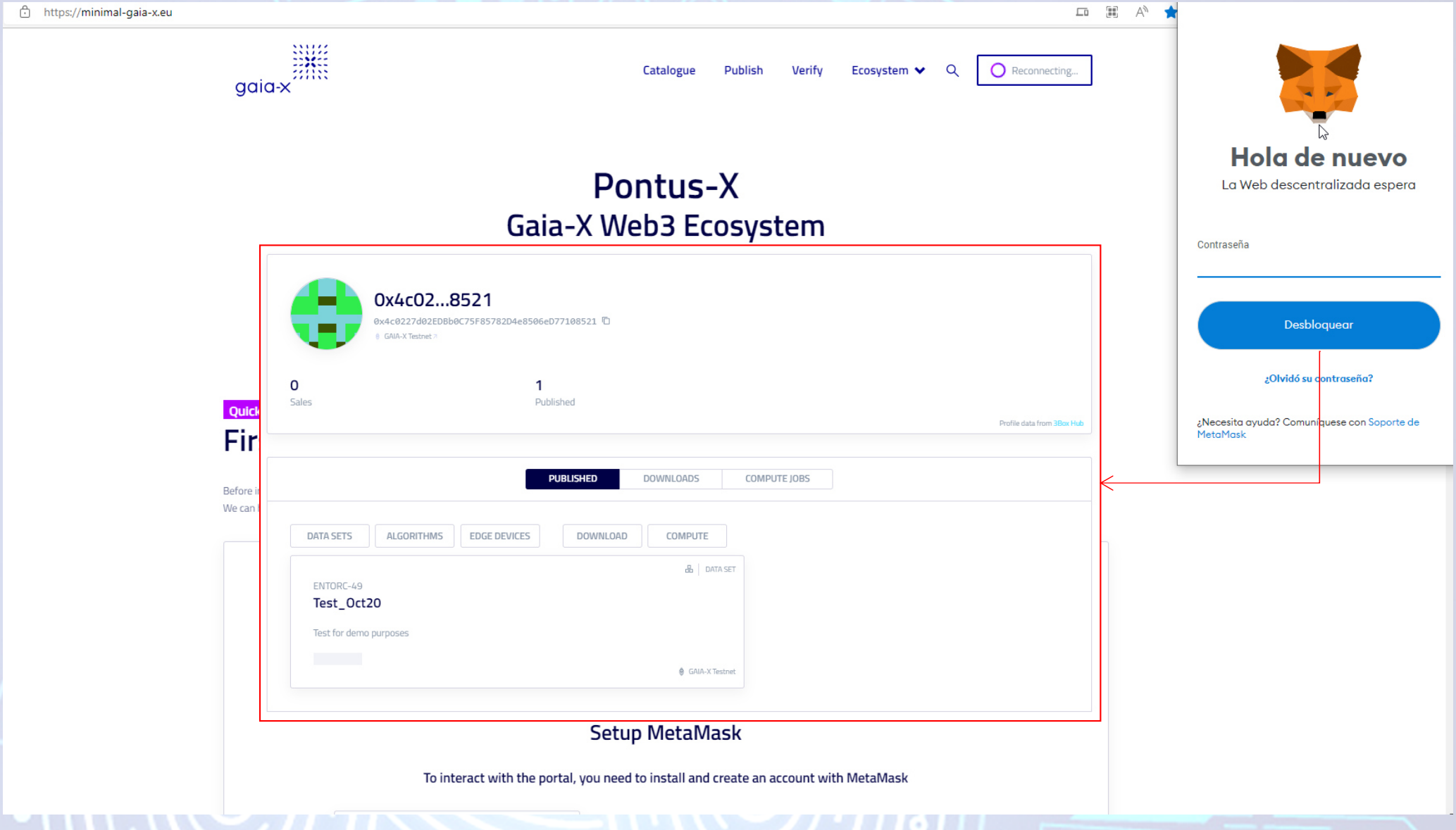
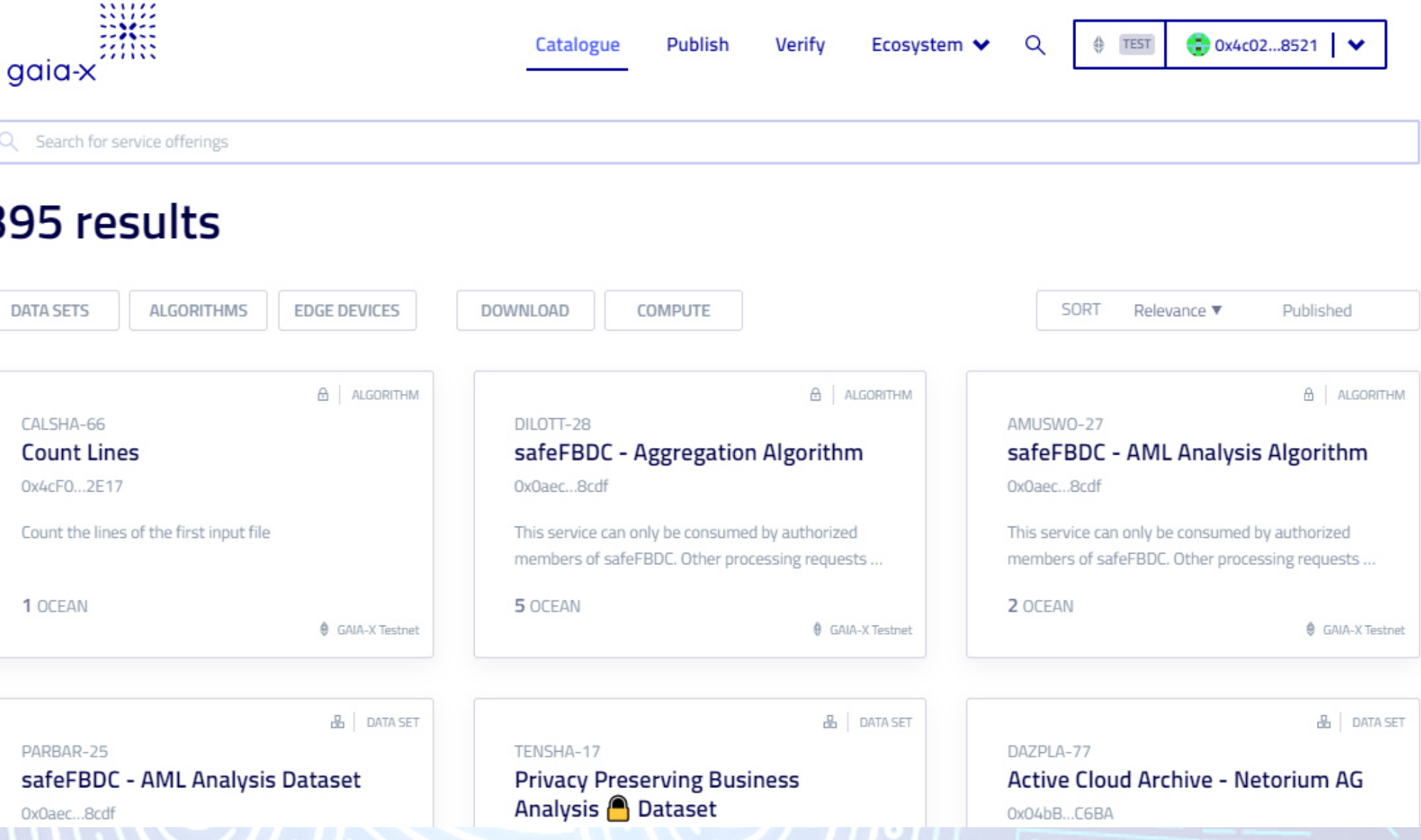
ACCESO


https://minimal-gaia-x.eu
gaia-x
Catalogue
Publish
Verify
Ecosystem
Reconnecting...
Pontus-X
Gaia-X Web3 Ecosystem
0x4c02...8521
0x4c0227d02EDBb0C75F85782D4e8506eD7108521
GAIA-X Testnet
0
Sales
1
Published
Profile data from 3Box Hub
PUBLISHED
DOWNLOADS
COMPUTE JOBS
DATA SETS
ALGORITHMS
EDGE DEVICES
DOWNLOAD
COMPUTE
DATA SET
ENTORC-49
Test_Oct20
Test for demo purposes
GAIA-X Testnet
Setup MetaMask
To interact with the portal, you need to install and create an account with MetaMask
Hola de nuevo
La Web descentralizada espera
Contraseña
Desbloquear
¿Olvidó su contraseña?
¿Necesita ayuda? Comuníquese con Soporte de MetaMask

CATÁLOGO


gaia-x
Catalogue
Publish
Verify
Ecosystem
TEST
0x4c02...8521
Search for service offerings
395 results
DATA SETS
ALGORITHMS
EDGE DEVICES
DOWNLOAD
COMPUTE
SORT
Relevance
Published
ALGORITHM
CALSHA-66
Count Lines
0x4cF0...2E17
Count the lines of the first input file
1 OCEAN
GAIA-X Testnet
ALGORITHM
DILOTT-28
safeFBDC - Aggregation Algorithm
0x0aec...8cdf
This service can only be consumed by authorized members of safeFBDC. Other processing requests ...
5 OCEAN
GAIA-X Testnet
ALGORITHM
AMUSWO-27
safeFBDC - AML Analysis Algorithm
0x0aec...8cdf
This service can only be consumed by authorized members of safeFBDC. Other processing requests ...
2 OCEAN
GAIA-X Testnet
DATA SET
PARBAR-25
safeFBDC - AML Analysis Dataset
0x0aec...8cdf
DATA SET
TENSHA-17
Privacy Preserving Business Analysis Dataset
DATA SET
DAZPLA-77
Active Cloud Archive - Netorium AG
0x04bB...C6BA

DESCRIPCIÓN DE UN SERVICIO (GAIA-X)

Mobility: Mobile Road Damage Detection EDGE

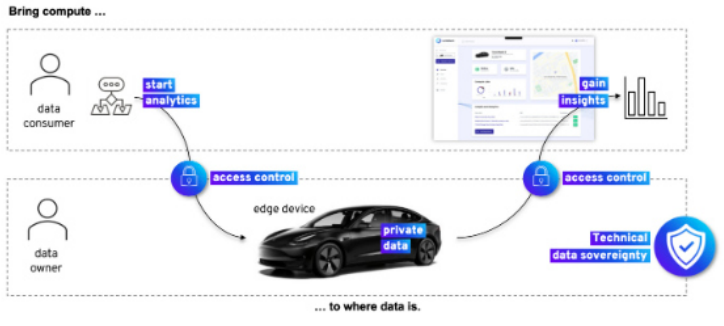
GAIA-X Testnet

DATA SET | Empowered Prawn Token — EMPPRA-30

Published By deltaDAO AG
about 1 month ago — updated 22 days ago

Service Self-Description
version: 22.06
last check: less than a minute ago

About the use case



This use case demonstrates how algorithm and data providers can train and monetize their machine learning scripts by making them available in Gaia-X. At the same time consumers in Gaia-X can use existing and well-trained models for classification, analysis and forecasting without the need to share their data and/or acquire personnel or expensive services. The product can be used directly from the Gaia-X market.

Object detection is considered to be one of the most challenging tasks in the computer vision field. The algorithm YOLOv5 is a Convolutional Neural Network (CNN) for performing object detection in real-time. CNNs are classifier-based systems that can process input images as structured arrays of data and identify patterns between them (view image below). YOLO has the advantage of being much faster than other networks and still maintains accuracy.

Data providers approve AI algorithms to run on their data and then Compute-to-Data orchestrates remote computation and execution on data to train AI models while preserving the privacy of the data. Compute-to-Data (CtD) allows for privacy-preserving data-sharing, remote computation and data monetization and is a core feature and strong advantage of Ocean Protocol. CtD keeps the data on-premises and allows data consumers to run remote compute jobs on the data. Data owners keep full control as the data never leaves their premises and is only ever accessed by algorithms. CtD resolves the tradeoff between using private data and the risks of exposing it. Newly monetized data creates new revenue streams for data publishers. CtD is directly integrated into the Minimal Viable Gaia-X and third-

USE

plain
95.55 KB

1 OCEAN
≈ 0,17 €

Select an algorithm to start a compute job

Search by title, datatoken, or DID...

Mobility: Mobile Road Damage Detection Algorithm ↗ 1
INVSHA-19 | did:op:4b42dfc40Ae829968De8142eb35f38a8bD46D5FA

You will pay 2 OCEAN ⓘ

BUY COMPUTE JOB

For using this dataset, you will buy 1 EMPPRA-30 and immediately spend it back to the publisher and pool. Additionally, you will buy 1 INVSHA-19 for the algorithm and spend it back to its publisher and pool.

Compute to data is not available because the edge device is not online.

Your Compute Jobs HIDE

No results found

Service Self-Description


```
{
  "selfDescriptionCredential": {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://registry.lab.gaia-x.eu/v2206/api/shape"
    ],
    "type": [
      "VerifiableCredential",
      "ServiceOfferingExperimental"
    ],
    "id": "https://delta-dao.com/.well-known/serviceRoadData.json",
    "credentialSubject": {
      "id": "did:op:00dd3550532A6dA0d0427E8ECbE4f40F315C1F3B",
      "gx-service-offering:providedBy": "https://delta-dao.com/.well-known/participantDeltaDAO.json",
      "gx-service-offering:name": "EMPPRA-30 Data for Road Damage Detection",
      "gx-service-offering:description": "This data service offering consists of imnage data for object detection and annotation.",
      "gx-service-offering:serviceModel": "subscription",
      "gx-service-offering:servicePrice": [
        {
          "gx-service-offering:servicePriceCurrency": "Ocean",
          "gx-service-offering:servicePriceValue": "1"
        }
      ],
      "gx-service-offering:subscriptionDuration": "86400",
      "gx-service-offering:Policies": "computeToDataOnly",
      "gx-service-offering:whitelistedUsage": [
        {
          "gx-service-offering:whitelistedUsageAlgorithm":
"did:op:4b42dfc40Ae829968De8142eb35f38a8bD46D5FA"
        }
      ],
      "gx-service-offering:webAddress":
"https://portal.moveid.eu/asset/did:op:00dd3550532A6dA0d0427E8ECbE4f40F315C1F3B",
      "gx-service-offering:termsAndConditions": [
```


delta-dao | tesla-model-3

OWNER
0x68C2...246B

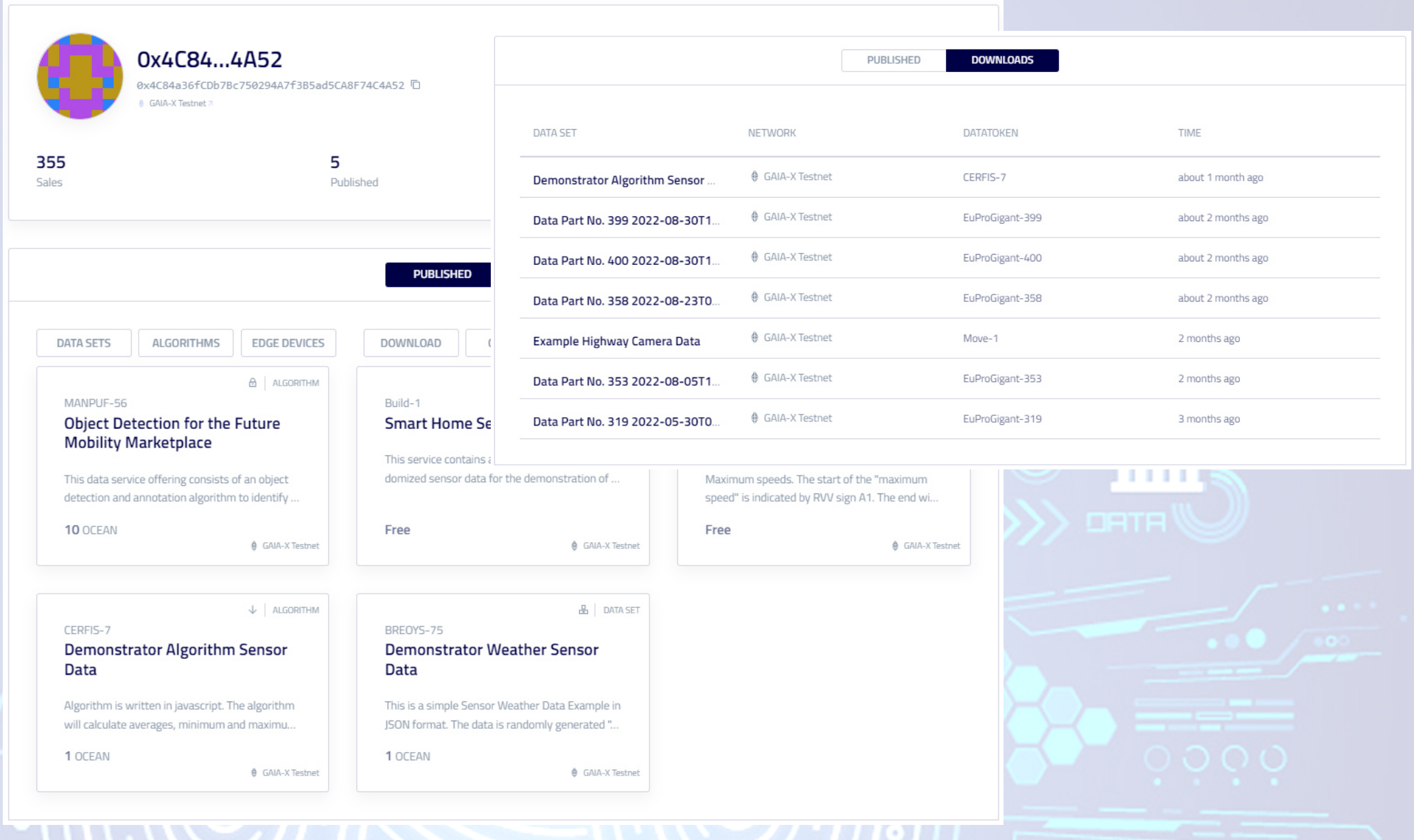
DID
did:op:00dd3550532A6dA0d0427E8ECbE4f40F315C1F3B

METADATA HISTORY
1 edited 22 days ago

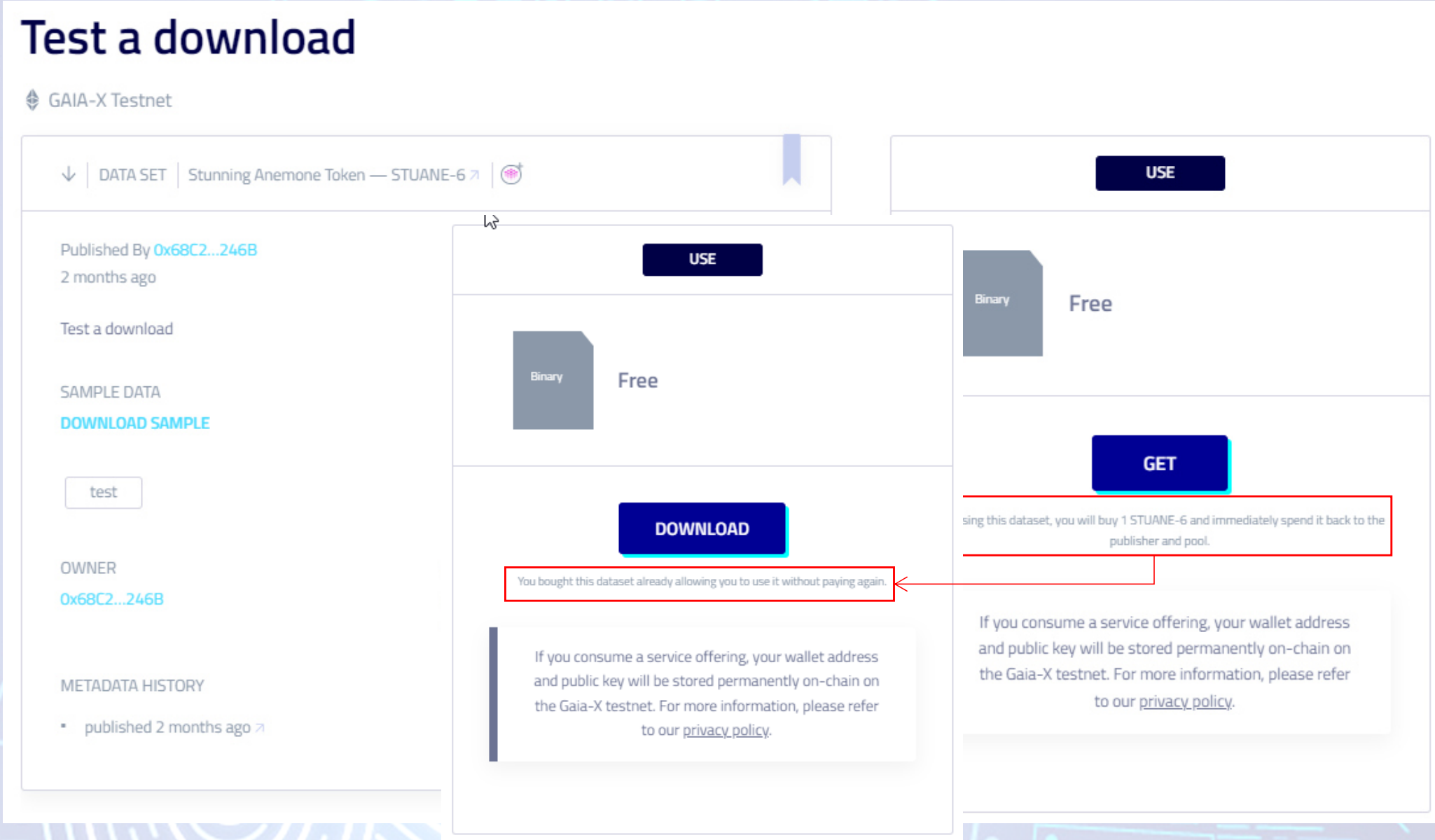
DESCRIPCIÓN DE UN PARTICIPANTE (GAIA-X)


```
{
  "selfDescriptionCredential": {
    "@context": [
      "https://www.w3.org/2018/credentials/v1",
      "https://registry.gaia-x.eu/v2206/api/shape"
    ],
    "type": [
      "VerifiableCredential",
      "LegalPerson"
    ],
    "id": "https://delta-dao.com/.well-known/participantDeltaDAO.json",
    "issuer": "did:web:delta-dao.com",
    "issuanceDate": "2022-09-23T23:23:23.235Z",
    "credentialSubject": {
      "id": "did:web:delta-dao.com",
      "gx-participant:legalName": "deltaDAO AG",
      "gx-participant:website": "https://delta-dao.com",
      "gx-participant:registrationNumber": [
        {
          "gx-participant:registrationNumberType": "leiCode",
          "gx-participant:registrationNumberNumber": "391200FJBNU0YW987L26"
        },
        {
          "gx-participant:registrationNumberType": "EUID",
          "gx-participant:registrationNumberNumber": "DEK1101R.HRB170364"
        }
      ],
      "gx-participant:blockchainAccountId": [
        {
          "gx-participant:blockchainAccountId": "0x4C84a36fCDb7Bc750294A7f3B5ad5CA8F74C4A52"
        },
        {
          "gx-participant:blockchainAccountId": "0x2859d961a6dBa6e7d30b2d383Af468edb4E7F4f6"
        },
        {
          "gx-participant:blockchainAccountId": "0xaBaf56FC1bB6b4FF9fA4378C3C8723d2B2444324"
        },
        {
          "gx-participant:blockchainAccountId": "0x68C24FA5b2319C81b34f248d1f928601D2E5246B"
        },
        {
          "gx-participant:blockchainAccountId": "0xa76Fa6837A6ffc9F123F2193717A5965c68B0cbA"
        }
      ],
      "gx-participant:headquarterAddress": {
        "gx-participant:addressCountryCode": "DE",
        "gx-participant:addressCode": "DE-HH",
        "gx-participant:streetAddress": "Geibelstraße 46b",
        "gx-participant:postalCode": "22303",
        "gx-participant:locality": "Hamburg"
      },
      "gx-participant:legalAddress": {
        "gx-participant:addressCountryCode": "DE",
        "gx-participant:addressCode": "DE-HH",
        "gx-participant:streetAddress": "Geibelstraße 46b",
        "gx-participant:postalCode": "22303",
        "gx-participant:locality": "Hamburg"
      },
      "gx-participant:termsAndConditions": "70c1d713215f95191a11d38fe2341faed27d19e083917bc8732ca4fea4976700"
    },
    "proof": {
      "type": "JsonWebSignature2020",
      "created": "2022-09-30T07:50:34.636Z",
      "proofPurpose": "assertionMethod",
      "verificationMethod": "did:web:delta-dao.com",
      "jws": "eyJhbGciOiJSUzI1NiIsImI2NCI6ZmFsc2UsImNyaXQiOlsiYjY0Il19..ahaxRhIT280-ln4v5qnQdrSwwFnvU94Mxw941UDetSoEv_vFVdziN1mJwr1iH91Tn8Ng_oG2r0SDOmrs-B6EzXS8J3MsT9oMUBH5mT-G_a77_48xde3CtsQ"
    }
  },
  "complianceCredential": {
    "@context": [
      "https://www.w3.org/2018/credentials/v1"
    ],
    "type": [
      "VerifiableCredential",
      "ParticipantCredential"
    ],
    "id": "https://catalogue.gaia-x.eu/credentials/ParticipantCredential/1664524239500",
    "issuer": "did:web:compliance.gaia-x.eu",
    "issuanceDate": "2022-09-30T07:50:39.500Z",
    "credentialSubject": {
      "id": "did:web:delta-dao.com",
      "hash": "8137ae4abc9b860813aae14330e3ba5b8231de330ae4c3b196b8b786a6c18f38"
    },
    "proof": {
      "type": "JsonWebSignature2020",
      "created": "2022-09-30T07:50:39.500Z",
      "proofPurpose": "assertionMethod",
      "jws": "eyJhbGciOiJQUzI1NiIsImI2NCI6ZmFsc2UsImNyaXQiOlsiYjY0Il19..ccEnrtSFolCDEKT4O8inCnZVlCNH9O2eJBSShEhT7yoVl6VPPvJCUaSUijGhU4hZjGmvBVr-LdWoDduQnsdsIHC7uLXC3wOSqgVX6RuUofngydYODNQe4_9m80rp_GTloTRQWQyP8j5ToyuixiRFvqDR5BBhPZzopD3nJj7YfvLgfby2MfCFKQ",
      "verificationMethod": "did:web:compliance.gaia-x.eu"
    }
  }
}
```

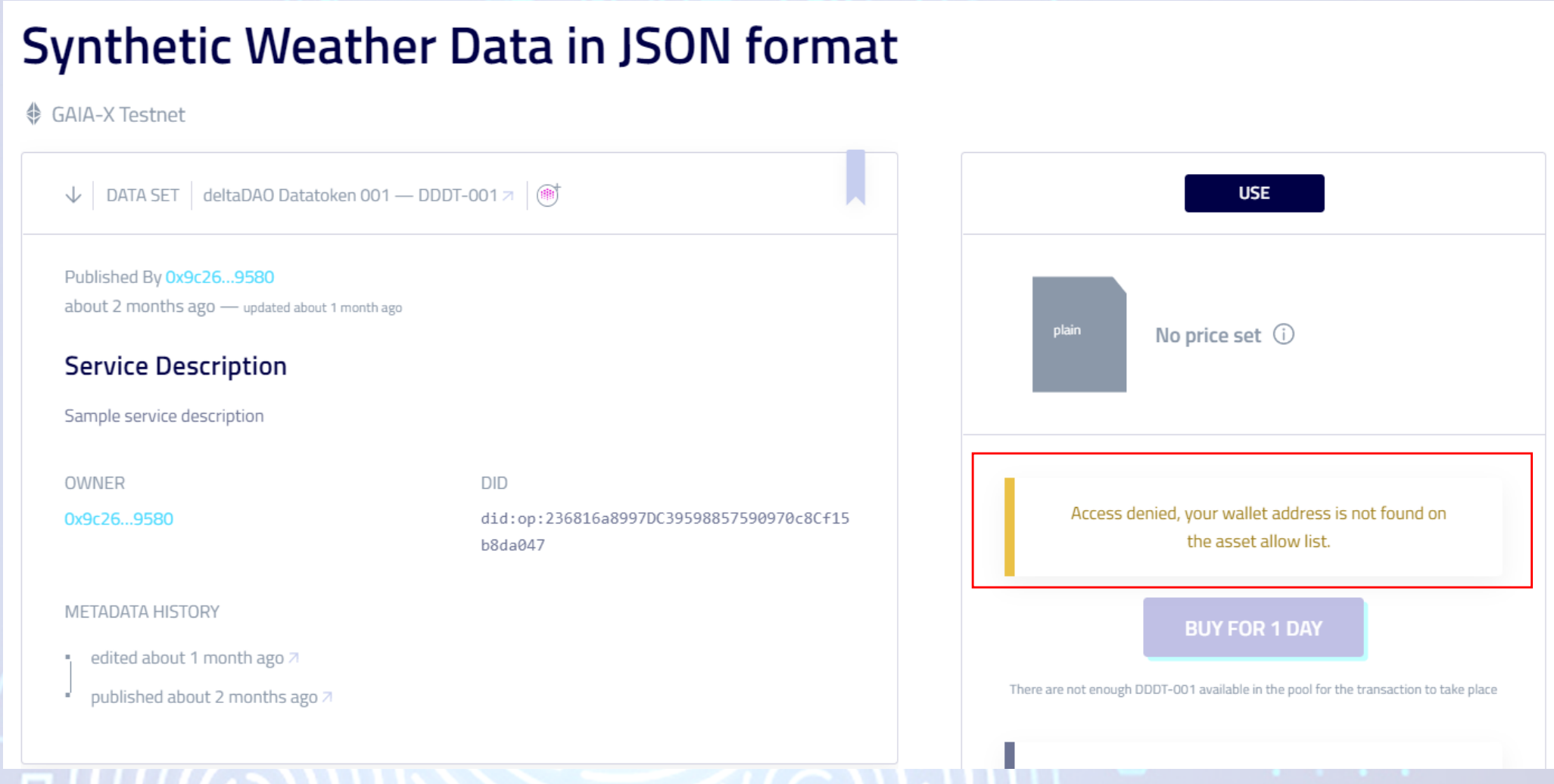
ACTIVIDAD DE UNA WALLET



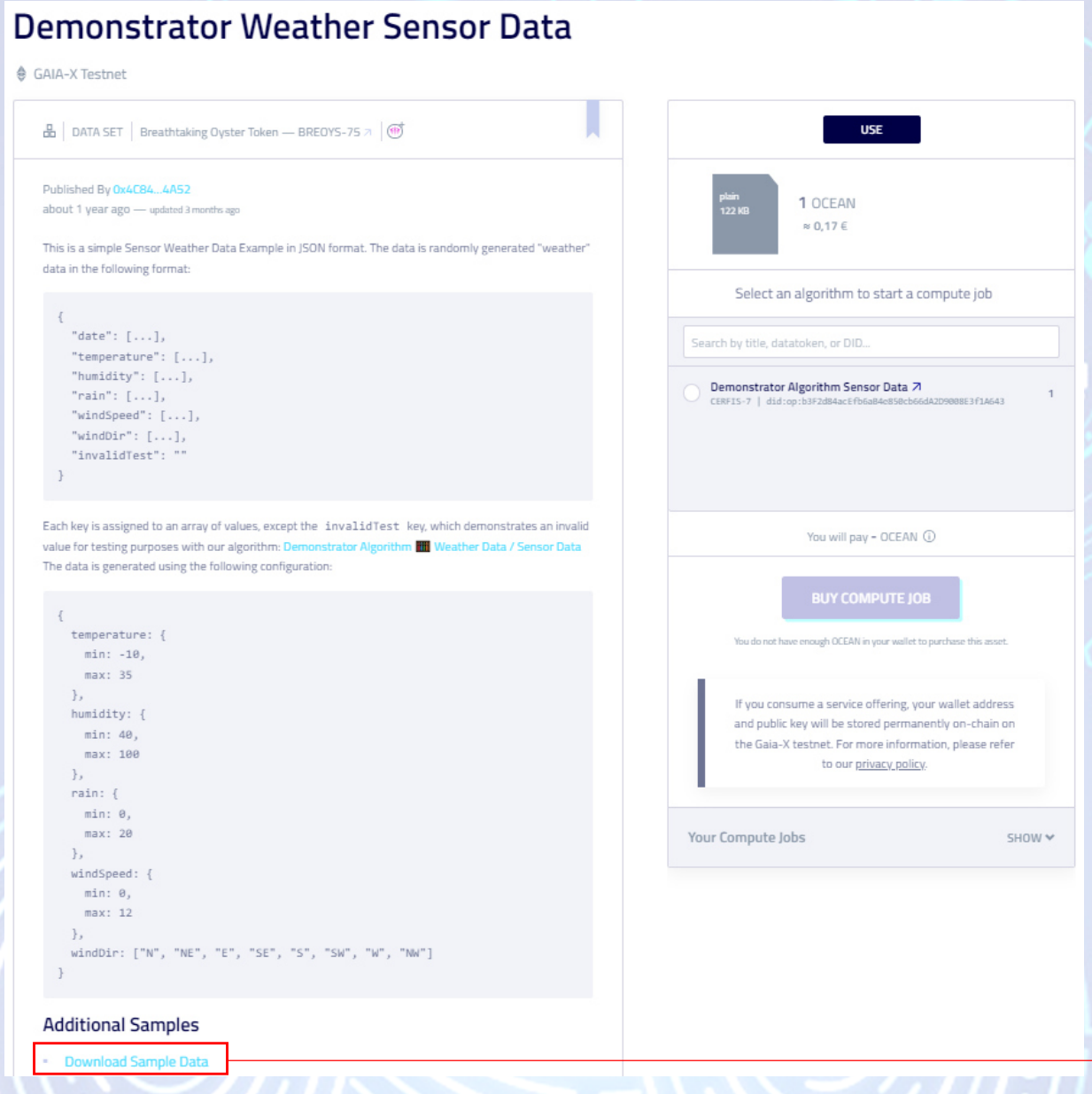
DESCARGAR UN CONJUNTO DE DATOS (1)



DESCARGAR UN CONJUNTO DE DATOS (2)



CONSUMIR UN CONJUNTO DE DATOS (CtD) (1)



Demonstrator Weather Sensor Data

GAIA-X Testnet

DATA SET | Breathtaking Oyster Token — BREOYS-75

Published By 0x4C84...4A52
about 1 year ago — updated 3 months ago

This is a simple Sensor Weather Data Example in JSON format. The data is randomly generated "weather" data in the following format:

```
{
  "date": [...],
  "temperature": [...],
  "humidity": [...],
  "rain": [...],
  "windSpeed": [...],
  "windDir": [...],
  "invalidTest": ""
}
```

Each key is assigned to an array of values, except the `invalidTest` key, which demonstrates an invalid value for testing purposes with our algorithm: Demonstrator Algorithm Weather Data / Sensor Data
The data is generated using the following configuration:

```
{
  temperature: {
    min: -10,
    max: 35
  },
  humidity: {
    min: 40,
    max: 100
  },
  rain: {
    min: 0,
    max: 20
  },
  windSpeed: {
    min: 0,
    max: 12
  },
  windDir: ["N", "NE", "E", "SE", "S", "SW", "W", "NW"]
}
```

Additional Samples

Download Sample Data

USE

plain 122 KB — 1 OCEAN ≈ 0,17 €

Select an algorithm to start a compute job

Search by title, datatoken, or DID...

Demonstrator Algorithm Sensor Data
CERFIS-7 | did:op:b3F2d84acEfb6aB4e858cb66dA2D9088E3f1A643 — 1

You will pay - OCEAN

BUY COMPUTE JOB

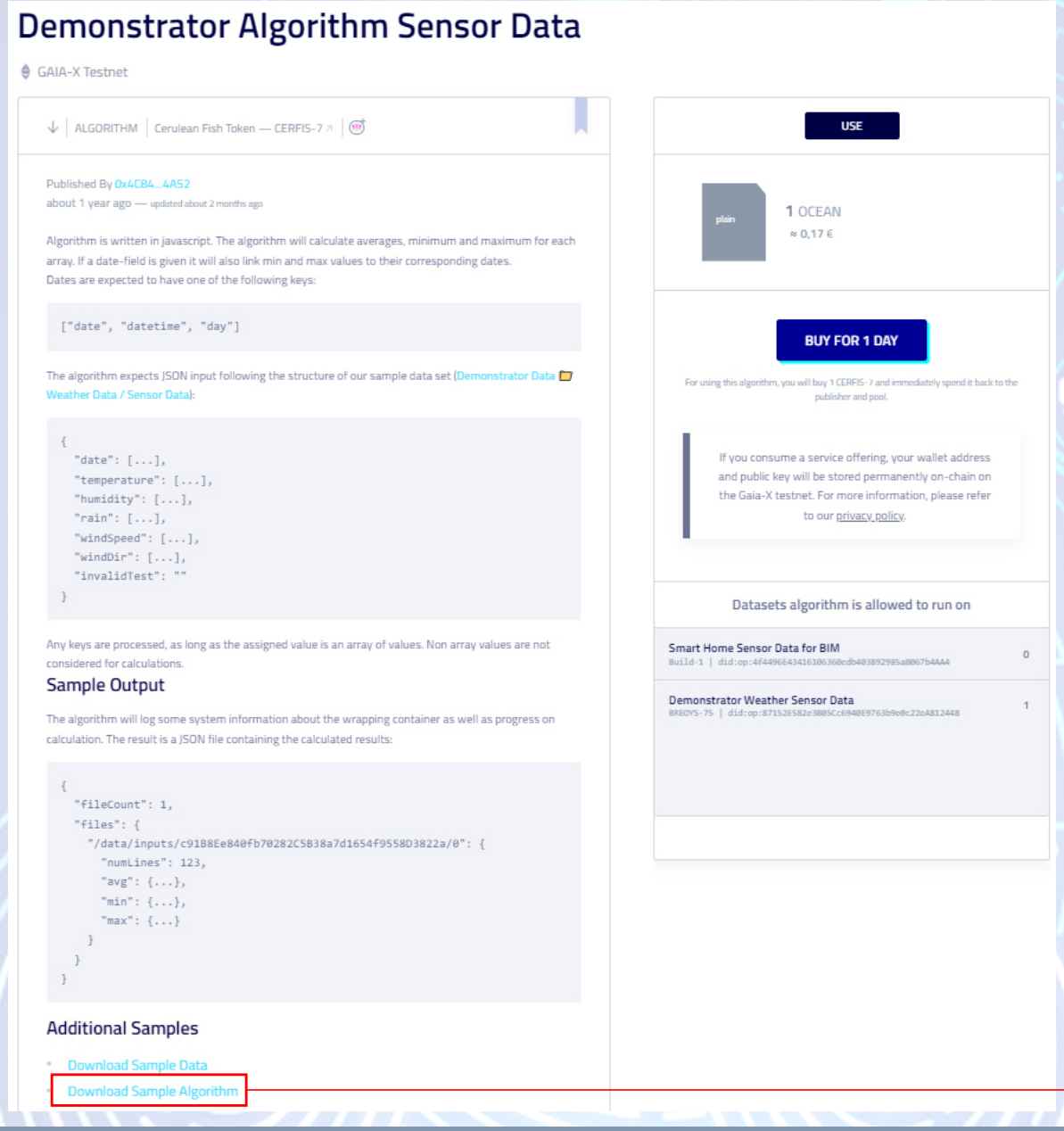
You do not have enough OCEAN in your wallet to purchase this asset.

If you consume a service offering, your wallet address and public key will be stored permanently on-chain on the Gaia-X testnet. For more information, please refer to our privacy policy.

Your Compute Jobs — SHOW


```
{
  "date": [
    "1/1/2010",
    "1/2/2010",
    "1/3/2010",
    "1/4/2010",
    "1/5/2010"
  ],
  "temperature": [
    33.38,
    -6.5,
    22.4,
    29.29,
    -0.97
  ],
  "humidity": [
    59.45,
    48.41,
    78.84,
    45,
    89.82
  ],
  "rain": [
    4.15,
    1.07,
    0.98,
    5.46,
    19.35
  ],
  "windSpeed": [
    6.54,
    1.09,
    8.39,
    11.48,
    6.51
  ],
  "windDir": [
    "W",
    "S",
    "SW",
    "N",
    "E"
  ],
  "invalidTest": ""
}
```

CONSUMIR UN CONJUNTO DE DATOS (CtD) (2)



Demonstrator Algorithm Sensor Data

GAIA-X Testnet

ALGORITHM | Cerulean Fish Token — CERFIS-7

Published By 0x4C84...4A52
about 1 year ago — updated about 2 months ago

Algorithm is written in javascript. The algorithm will calculate averages, minimum and maximum for each array. If a date-field is given it will also link min and max values to their corresponding dates.
Dates are expected to have one of the following keys:

```
["date", "datetime", "day"]
```

The algorithm expects JSON input following the structure of our sample data set (Demonstrator Data / Weather Data / Sensor Data):

```
{
  "date": [...],
  "temperature": [...],
  "humidity": [...],
  "rain": [...],
  "windSpeed": [...],
  "windDir": [...],
  "invalidTest": ""
}
```

Any keys are processed, as long as the assigned value is an array of values. Non array values are not considered for calculations.

Sample Output

The algorithm will log some system information about the wrapping container as well as progress on calculation. The result is a JSON file containing the calculated results:

```
{
  "fileCount": 1,
  "files": {
    "/data/inputs/c9188Ee840fb70282C5B38a7d1654f9558D3822a/0": {
      "numLines": 123,
      "avg": {...},
      "min": {...},
      "max": {...}
    }
  }
}
```

Additional Samples

- Download Sample Data
- Download Sample Algorithm

USE

plain

1 OCEAN
≈ 0,17 €

BUY FOR 1 DAY

For using this algorithm, you will buy 1 CERFIS-7 and immediately spend it back to the publisher and pool.

If you consume a service offering, your wallet address and public key will be stored permanently on-chain on the Gaia-X testnet. For more information, please refer to our privacy policy.

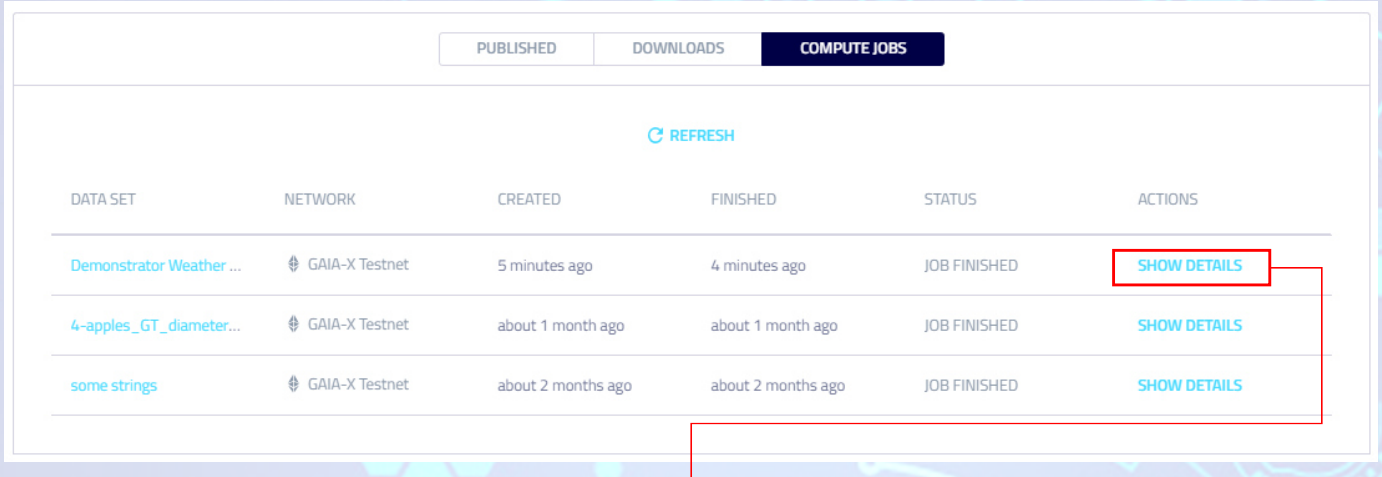
Datasets algorithm is allowed to run on

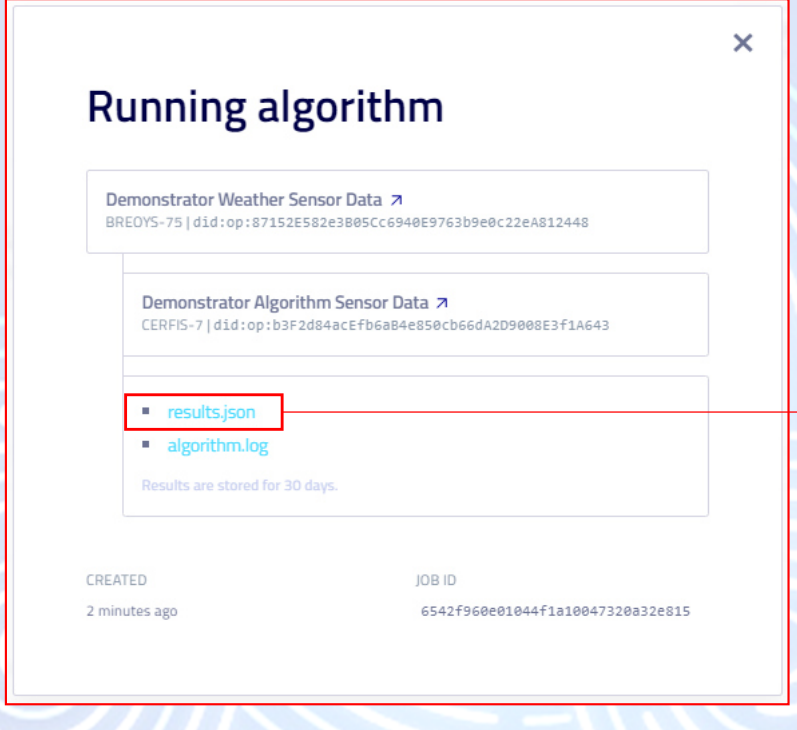
Smart Home Sensor Data for BIM
Build-1 | did:op:4f44966434161063 60edb403892985a8067b4AA4 0

Demonstrator Weather Sensor Data
BREOYS-75 | did:op:87152E582e3805Cc6940E9763b9e0c22eA812448 1

```
    try {
      result.files[filepath].length[key] = array.length
      result.files[filepath].sum[key] = 0
      result.files[filepath].avg[key] = 0
      result.files[filepath].min[key] = { ...ranges }
      result.files[filepath].max[key] = { ...ranges }

      array.forEach((value, i) => {
          //Calculate sums
          result.files[filepath].sum[key] += parseFloat(value)
          //Calc min
          const min = result.files[filepath].min[key].value
          if(value < min || min === null) {
            result.files[filepath].min[key].value = value
            if(dateField !== null)
              result.files[filepath].min[key].date = data[dateField][i] || 'N/A'
          }
          //Calc max
          const max = result.files[filepath].max[key].value
          if(value > max || max === null) {
            result.files[filepath].max[key].value = value
            if(dateField !== null)
              result.files[filepath].max[key].date = data[dateField][i] || 'N/A'
          }

      })

      //Calculate avgs
      for (const [key, sum] of Object.entries(result.files[filepath].sum)) {
        result.files[filepath].avg[key] = sum / result.files[filepath].length[key]
      }
    } catch (err) {
      console.error(err)
    }
  }
  delete result.files[filepath].sum
  delete result.files[filepath].length

  console.log(`Results calculated.`)
}
```

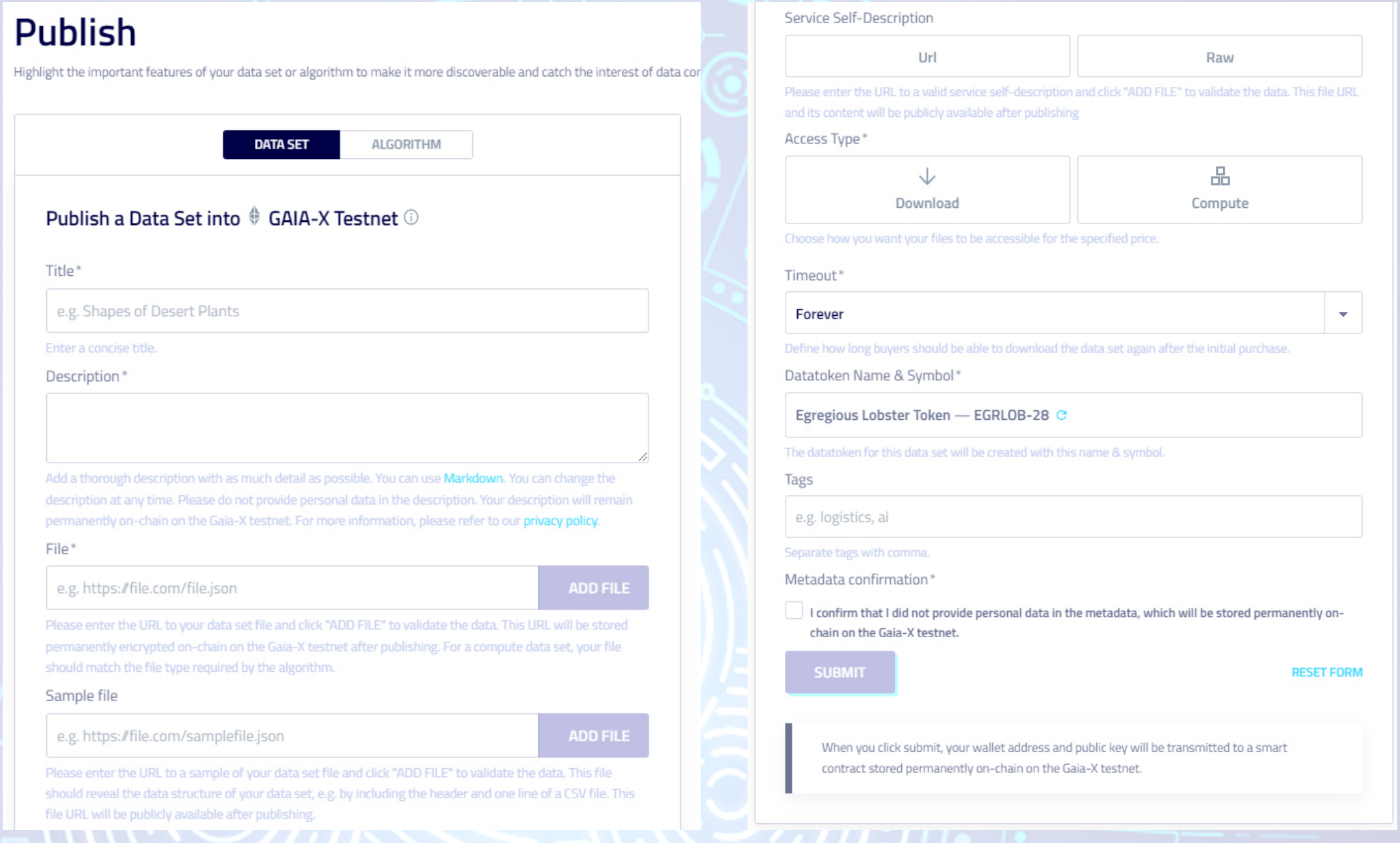
CONSUMIR UN CONJUNTO DE DATOS (CtD) (3)



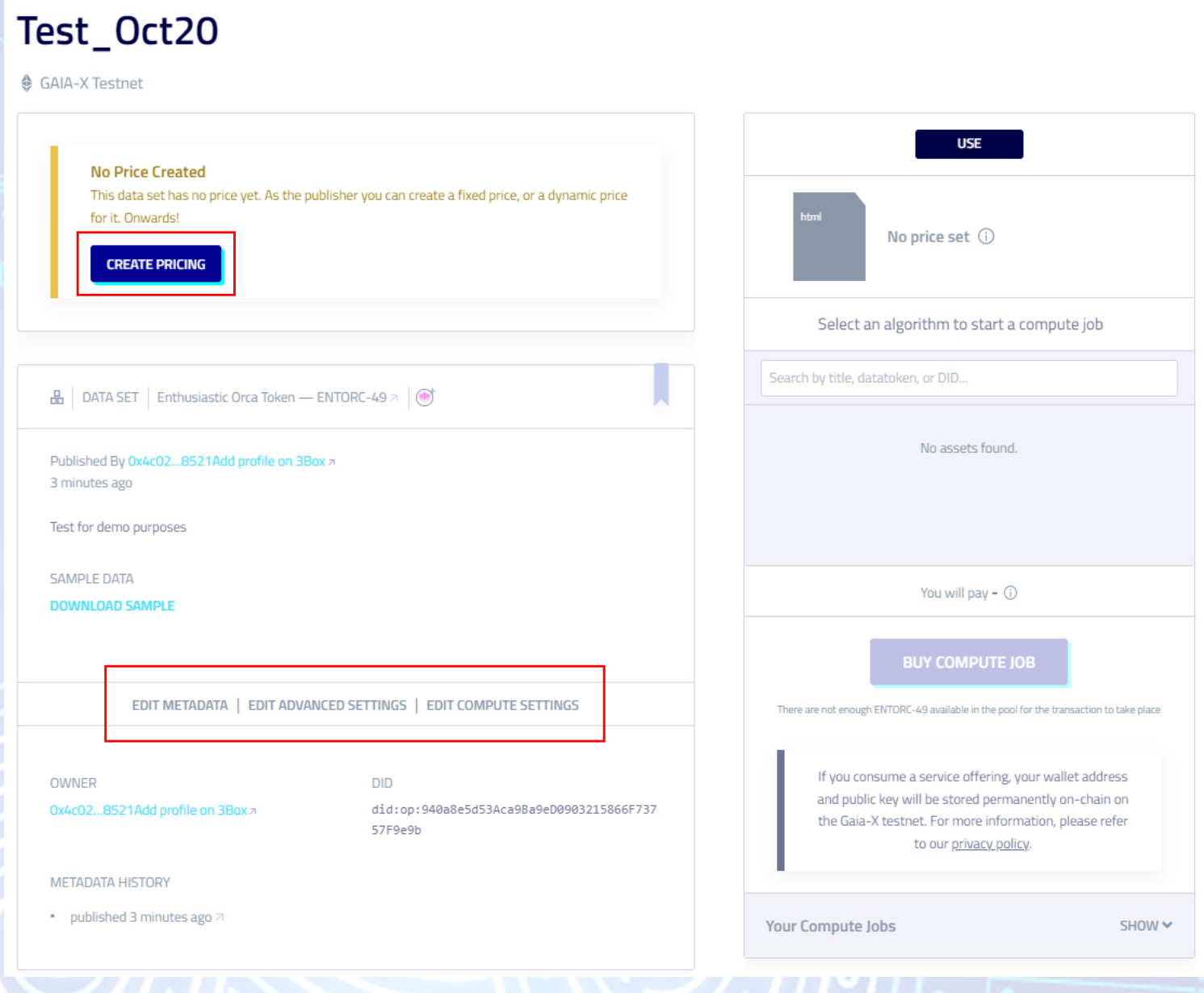



```
"numLines": 10970,
"avg": {
  "temperature": 13.029282584885,
  "humidity": 69.88985213581596,
  "rain": 10.116653888280377,
  "windspeed": 5.93285323110624,
  "winddir": null
},
"min": {
  "temperature": {
    "value": -9.91,
    "date": "5/13/2014"
  },
  "humidity": {
    "value": 40.03,
    "date": "5/30/2011"
  },
  "rain": {
    "value": 0,
    "date": "11/13/2012"
  },
  "windspeed": {
    "value": 0.01,
    "date": "7/24/2010"
  },
  "winddir": {
    "value": "E",
    "date": "1/3/2010"
  }
},
"max": {
  "temperature": {
    "value": 34.99,
    "date": "3/22/2011"
  },
  "humidity": {
    "value": 99.99,
    "date": "2/24/2013"
  },
  "rain": {
    "value": 19.97,
    "date": "3/30/2013"
  },
  "windspeed": {
    "value": 12,
    "date": "9/12/2012"
  },
  "winddir": {
    "value": "W",
    "date": "1/20/2010"
  }
```

PUBLICAR UN CONJUNTO DE DATOS (1)



PUBLICAR UN CONJUNTO DE DATOS (2)



PUBLICAR UN CONJUNTO DE DATOS (3)