

Node: Metered-Notary

Erstellung von Belegen für den Strombezug basierend auf Zählerstandsgängen (Abfrage von Zählerständen eines Stromzählers).



Im Gegensatz zum Node "[Event-Notary](#)", werden beim Metered-Notary die Zählerstände von Ablesungen regelmäßig (zum Beispiel stündlich) in Wattstunden als Eingabenachricht erwartet. Das Ergebnis ist ein digital signierter Beleg, des [Zertifizierungsdienstes](#), welcher in der Ausgabenachricht bereitgestellt wird. Zusätzlich wird eine Kopie des Beleges in die [GHG Wallet](#) gespeichert.

Beispiel Flow

Download: [simple_metered-notary.flow.json.json](#)



Dem Metered-Notar Node wird als `msg.payload` die aktuellen Millisekunden übergeben, durch wiederholten Inject (Aufruf) entsteht so ein künstlicher Zählerstandsgang in Wattstunden (Wh). Durch die Differenz von zwei Zählerständen wird eine bezogene Strommenge ermittelt. Der Node sendet in einem ersten Schritt diese Daten an den Zertifizierungsdienst. Optional kann in der Konfiguration des Nodes eine Postleitzahl (Postal Code) angegeben werden, um dem Zertifizierungsdienst einen Hinweis über den Ort des Strombezuges mitzugeben. In einem zweiten Schritt erhält der Node ein Intermediate (=vorläufiger Beleg); überprüft das Intermediate; unterschreibt es und sendet es zum Zertifizierungsdienst. Die Rückantwort des Zertifizierungsdienst wird auf der Ausgabe als `msg.payload` zurückgegeben.

Eine detaillierte Beschreibung der Belegerstellung kann der [TyDIDs Blockchain basierte Nachweisführung der THG-Emission und Minderung](#) entnommen werden. Der Node Event-Notary implementiert diesen Prozess.

Eingabe (`msg.payload`)

Node 'inject' bearbeiten

Löschen

Abbrechen

Fertig

Eigenschaften

Name

Aktuelle Millisekunden

msg. payload

=

timestamp

×

msg. topic

=

a_z

×

Ausgabe

```
{
  "hash": {

    "signature": "0x85f7460870ca348caf60a94a766521c697b60b5c0a80da10a96b9fe6129903056b62aa5b940788523357974a3adc5e50abf2b690d03c12fe26a517dd7924c3681c",
    "payload": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
  },
  "owner": {

    "signature": "0xd73098704a6c8dfed4e6c2977f4b70f2591314fcee1ecbc733466a06788e8e84050a5f03c9fbe11be5b655219d5fcaa0692aead9e6e6d2d4bbb492c302b0e25a1b",
    "payload": {
      "owner": "0x48a2F735c6BC140C15109f5a8AFF8010715D9ddb",
      "issuer": "0xE7Fe0626D7B8e3F2e5ECD146F9b11daac1DBE447",
      "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
    }
  },
  "context": {

    "signature": "0xafdb01935aae5a2da5af49db2f723c1649dc8ce92913cc8521a5b587df9e8ba24a9cdd3f54514b1"
```

```
868b15580d0ed21d9530cca623c532c874d4addfdd5934be51c",
  "payload": ""
},
"did": {

"signature": "0xa9becd0fc1c99a0b03360f60705c831bc305c1487687aff9925116be71072f386e0c9e89855e133
6534081b6d5e74d6970d4a70836737968944ba9d2dea43dae1c",
  "payload": {

"url": "did: ethr: 6226: 0x3bFCf4Fe3b7D2E2fd079b5Dd546Aa30300D8fBE1: 0xf21548440474afb51053CEEb3101
1d9E4a168D2D",
  "registry": "0x3bFCf4Fe3b7D2E2fd079b5Dd546Aa30300D8fBE1",
  "uid": "0xf21548440474afb51053CEEb31011d9E4a168D2D",
  "schema": "did",
  "method": "ethr: 6226",
  "ghgtoken": {
    "address": "0x36AbF05ac533D9Bb2024A2fb00c9e3F52e4F6a50",
    "certificates": "0x65297AFaf11eeAd5258A46e969c2341708e9CC59",
    "savings": "0xc475EcB54601C676Ad008A7857A385a52c445244",
    "emissions": "0xd37B668Ad0417EcD22472ca555a431e84afB40BB"
  },
  "nft": {

"signature": "0x92923d135c6e4bc15bf8d20cd985f990f98fae8ac5ee3b3fc13785c75667b48239c5f888e9fa9cc
8f30d775c2f2da97da36d725a77ed81eabdf919657d6bdfbb1c",
  "payload": {
    "address": "0x65297AFaf11eeAd5258A46e969c2341708e9CC59",
    "tx": {
      "nonce": 2199,
      "gasPrice": {
        "type": "BigNumber",
        "hex": "0x03e8"
      },
      "gasLimit": {
        "type": "BigNumber",
        "hex": "0x039a6c"
      },
      "to": "0x36AbF05ac533D9Bb2024A2fb00c9e3F52e4F6a50",
      "value": {
        "type": "BigNumber",
```

$\},$

```
"chainId": 6226,
```

```
"r": "0x35722641759b62ec2879dd41db2736e2c833fa1ab771ce7c57ead9238c1f8e03",
```

```
"s": "0x15041ad76a387bd30fb3206551ddbfff6310a311215bf2b1d04d14b912c0099b",
```

```
"from": "0xE7Fe0626D7B8e3F2e5ECD146F9b11daac1DBE447",
```

```
"hash": "0xb48af4752575241931521fabce913ee2f38814b79037af3bbf2ce6bd4e658736",
```

```
"type": null,
```

```
"confirmations": 0
```

 $\},$

```
"receipt": {
```

```
"to": "0x36AbF05ac533D9Bb2024A2fb00c9e3F52e4F6a50",
```

```
"from": "0xE7Fe0626D7B8e3F2e5ECD146F9b11daac1DBE447",
```

```
"contractAddress": null,
```

```
"transactionIndex": 0,
```

```
"gasUsed": {
```

```
"type": "BigNumber",
```

```
"hex": "0x038340"
```

 $\}$ [illegible]

```
"blockHash": "0x33ddbecb4fe87e13e1b9556aaf92afee7f45b6fa36ab30c5c33b0b7098ba8558",
```

```
"transactionHash": "0xb48af4752575241931521fabce913ee2f38814b79037af3bbf2ce6bd4e658736",
```

```
"logs": [
```

```

{
  "transactionIndex": 0,
  "blockNumber": 648343,

"transactionHash": "0xb48af4752575241931521fabce913ee2f38814b79037af3bbf2ce6bd4e658736",
  "address": "0x65297AFaf11eeAd5258A46e969c2341708e9CC59",
  "topics": [

"0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",

"0x0000000000000000000000000000000000000000000000000000000000000000",

"0x0000000000000000000000000000000000000000000000000000000000000000",

"0x00000000000000000000000000000000000000000000000000000000000000457"
    ],
  "data": "0x",
  "logIndex": 0,

"blockHash": "0x33ddbecb4fe87e13e1b9556aaf92afee7f45b6fa36ab30c5c33b0b7098ba8558"
  },
  {
    "transactionIndex": 0,
    "blockNumber": 648343,

"transactionHash": "0xb48af4752575241931521fabce913ee2f38814b79037af3bbf2ce6bd4e658736",
    "address": "0xc475EcB54601C676Ad008A7857A385a52c445244",
    "topics": [

"0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",

"0x0000000000000000000000000000000000000000000000000000000000000000",

"0x00000000000000000000000000000000000000000000000000000000000000f21548440474afb51053ceeb31011d9e4a168d2d"
    ],

"data": "0x0000000000000000000000000000000000000000000000000000000000000013a",
    "logIndex": 1,

"blockHash": "0x33ddbecb4fe87e13e1b9556aaf92afee7f45b6fa36ab30c5c33b0b7098ba8558"
  }
}

```

[illegible]

```
    }
  },
  "metering": {

"signature": "0xff554124da0b612bf4826f9fff3472b5e8636fb3f35cbdac20e2989b0fcbbc6ba5012bcfb20f7e91
b21c9135ce328aa45ffb189106197151621ceab90e8b77bb81b",

    "payload": {
      "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
    }
  },
  "presentations": {
    "type": {

"signature": "0xa6c27697b4f526292c5728d12f28d3f41d4dd278a1e134193332b5b1f25a133b42c94d06911a81a
250df0c3c11a5ed0454f6a9ede14807eb967b563ea2c1e94f1b",

      "payload": "electricity consumption from public grid",
      "$schema": "https://schema.corrently.io/tydids/type"
    },
    "context": {

"signature": "0xafdb01935aae5a2da5af49db2f723c1649dc8ce92913cc8521a5b587df9e8ba24a9cdd3f54514b1
868b15580d0ed21d9530cca623c532c874d4addfdd5934be51c",

      "payload": "",
      "$schema": "https://schema.corrently.io/tydids/context"
    },
    "location": {

"signature": "0xdb8491a4dc3a9e2d90821f5de30781c744e568386ba0732a7fec6d2c75e6f308216c2c30b82b3a6
301c06a1b7eb780c7447bf80152febef0ab361f6975428db11c",

      "payload": {
        "zip": "00000",
        "city": "Landesweit (national)",
        "country": "Germany",
        "meloid": "DETESTSD133713371337133713371337",
        "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
      },
      "$schema": "https://schema.corrently.io/tydids/location"
    },
    "metering": {
```

```
"signature": "0x5a886ea9e67e4dc0c06de165e11428c819b5aee5c1673569af094d58489494565576e78b3a2efd9
2e2415aafa17df54b6bdccdc4e16b57853c2381638ca55b211b",
  "payload": {
    "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
  },
  "$schema": "https://schema.corrently.io/tydids/metering"
},
"consumption": {
```

```
"signature": "0x6dbebebc5aaeeb93cb9684b975f034d051e88669d7ce429237b75f3ee3b1de06c5ed3a2d3eca37
5f8338eff5cb0e8d14f1dc24faf2cf787d04b65993286cb1c1b",
  "payload": {
    "unit": "wh",
    "actual": 1337,
    "time": 1673220421200,
    "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
  },
  "$schema": "https://schema.corrently.io/tydids/consumption"
},
"ghg": {
```

```
"signature": "0x7b7636b91814e44a859eeac0d2a891d5d007d5930ee01f416607ce5da39fd925248d2b24649ad22
cc6a2d496023b1fc04e06198fa901fa200696fa7664333b911c",
  "payload": {
    "factors": {
      "unit": "g co2eq per wh",
      "actual": {
        "grid": 0.201,
        "eco": 0.201
      },
      "base": {
        "grid": 0.436
      }
    },
    "base": {
      "unit": "g co2eq",
      "grid": 583
    },
    "actual": {
      "unit": "g co2eq",
```



```

      "grid": 269,
      "eco": 269
    },
    "saving": {
      "unit": "g co2eq",
      "grid": 314
    },
    "scope": 2,
    "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
  },
  "$schema": "https://schema.corrently.io/tydids/ghg"
},
"did": {

```

```

"signature": "0x71a06d3cc23a2f7821d56ccce01d7ff3a7a30c73bf568cf9eb998f5dd4c55bb575e9321df08edf6
b13c4548a38d95f9e50c6ed075d87f87a8a8cbf8957d229191c",
  "payload": {

```

```

"url": "did: ethr: 6226: 0x3bFCf4Fe3b7D2E2fd079b5Dd546Aa30300D8fBE1: 0xf21548440474afb51053CEEb3101
1d9E4a168D2D",
  "registry": "0x3bFCf4Fe3b7D2E2fd079b5Dd546Aa30300D8fBE1",
  "uid": "0xf21548440474afb51053CEEb31011d9E4a168D2D",
  "schema": "did",
  "method": "ethr: 6226",
  "ghgtoken": {
    "address": "0x36AbF05ac533D9Bb2024A2fb00c9e3F52e4F6a50",
    "certificates": "0x65297AFaf11eeAd5258A46e969c2341708e9CC59",
    "savings": "0xc475EcB54601C676Ad008A7857A385a52c445244",
    "emissions": "0xd37B668Ad0417EcD22472ca555a431e84afB40BB"
  },
  "nft": {

```

```

"signature": "0x92923d135c6e4bc15bf8d20cd985f990f98fae8ac5ee3b3fc13785c75667b48239c5f888e9fa9cc
8f30d775c2f2da97da36d725a77ed81eabdf919657d6bdfbb1c",
  "payload": {
    "address": "0x65297AFaf11eeAd5258A46e969c2341708e9CC59",
    "tx": {
      "nonce": 2199,
      "gasPrice": {
        "type": "BigNumber",

```

[illegible]

```
"hash": "0xb48af4752575241931521fabce913ee2f38814b79037af3bbf2ce6bd4e658736",
    "type": null,
    "confirmations": 0
```

```
"logsBloom": "0x0000000000008000000000000000000000000000000020000000000000000000000000000000000000000000000"
```



```

"0x0000000000000000000000000000000000000000000000000000000000000000",

"0x000000000000000000000000f21548440474afb51053ceeb31011d9e4a168d2d"
    ],

"data": "0x00000000000000000000000000000000000000000000000000000000000013a",
    "logIndex": 1,

"blockHash": "0x33ddbecb4fe87e13e1b9556aaf92afee7f45b6fa36ab30c5c33b0b7098ba8558"
    },
    {
        "transactionIndex": 0,
        "blockNumber": 648343,

"transactionHash": "0xb48af4752575241931521fabce913ee2f38814b79037af3bbf2ce6bd4e658736",
        "address": "0xd37B668Ad0417EcD22472ca555a431e84afB40BB",
        "topics": [

"0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",

"0x0000000000000000000000000000000000000000000000000000000000000000",

"0x000000000000000000000000f21548440474afb51053ceeb31011d9e4a168d2d"
    ],

"data": "0x00000000000000000000000000000000000000000000000000000000000010d",
    "logIndex": 2,

"blockHash": "0x33ddbecb4fe87e13e1b9556aaf92afee7f45b6fa36ab30c5c33b0b7098ba8558"
    }
    ],
    "blockNumber": 648343,
    "confirmations": 1,
    "cumulativeGasUsed": {
        "type": "BigNumber",
        "hex": "0x038340"
    },
    "effectiveGasPrice": {
        "type": "BigNumber",

```

```
        "hex": "0x03e8"
      },
      "status": 1,
      "type": 0,
      "byzantium": true
    },

    "tokenId": "0x00000000000000000000000000000000000000000000000000000000000000457"
  },
  {
    "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
  },
  {
    "$schema": "https://schema.corrently.io/tydids/did"
  },
  {
    "_all": {

      "signature": "0x8999c3c3c95f8d010691499f336243cc076af36385ed72af331099363bd6717438b845c8db6c9cbf5940490e884dbba8af602c9b46be86c12af4aeeld25e5a1e1b",
      "payload": {
        "type": "electricity consumption from public grid",
        "context": "",
        "location": {
          "zip": "00000",
          "city": "Landesweit (national)",
          "country": "Germany",
          "meloid": "DETESTSD133713371337133713371337",
          "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
        },
        "metering": {
          "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
        },
        "consumption": {
          "unit": "wh",
          "actual": 1337,
          "time": 1673220421200,
          "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
        },
        "ghg": {
          "factors": {
            "unit": "g co2eq per wh",
```

```

    "actual": {
      "grid": 0. 201,
      "eco": 0. 201
    },
    "base": {
      "grid": 0. 436
    }
  },
  "base": {
    "unit": "g co2eq",
    "grid": 583
  },
  "actual": {
    "unit": "g co2eq",
    "grid": 269,
    "eco": 269
  },
  "saving": {
    "unit": "g co2eq",
    "grid": 314
  },
  "scope": 2,
  "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"
},
"_iat": 1673220421256,
"_iss": "0xE7Fe0626D7B8e3F2e5ECD146F9b11daac1DBE447",
"_jti": "0xf21548440474afb51053CEEb31011d9E4a168D2D",
"did": {
  "url": "did: ethr: 6226: 0x3bFCf4Fe3b7D2E2fd079b5Dd546Aa30300D8fBE1: 0xf21548440474afb51053CEEb31011d9E4a168D2D",
  "registry": "0x3bFCf4Fe3b7D2E2fd079b5Dd546Aa30300D8fBE1",
  "uid": "0xf21548440474afb51053CEEb31011d9E4a168D2D",
  "schema": "did",
  "method": "ethr: 6226",
  "ghgtoken": {
    "address": "0x36AbF05ac533D9Bb2024A2fb00c9e3F52e4F6a50",
    "certificates": "0x65297AFaf11eeAd5258A46e969c2341708e9CC59",
    "savings": "0xc475EcB54601C676Ad008A7857A385a52c445244",
    "emissions": "0xd37B668Ad0417EcD22472ca555a431e84afB40BB"
  }
}

```

[illegible]

[illegible]

[illegible]

```

      "logIndex": 2,

      "blockHash": "0x33ddbecb4fe87e13e1b9556aaf92afee7f45b6fa36ab30c5c33b0b7098ba8558"

    },

    ],

    "blockNumber": 648343,

    "confirmations": 1,

    "cumulativeGasUsed": {

      "type": "BigNumber",

      "hex": "0x038340"

    },

    "effectiveGasPrice": {

      "type": "BigNumber",

      "hex": "0x03e8"

    },

    "status": 1,

    "type": 0,

    "byzantium": true

  },

  "tokenId": "0x00000000000000000000000000000000000000000000000000000000000000457"

},

{

  "hash": "0xd90d0978039c34f955e0813af6c3f853ab43a891e508a3517a1c7c3929531be6"

},

{

  "$schema": "https://schema.corrently.io/tydids/_all"

}

}

}

```

Quellcode der Implementierung

Revision #3

Created 8 January 2023 23:56:15 by Thorsten Zoerner

Updated 17 February 2023 10:02:44 by Thorsten Zoerner