

Introduction to the ISCC International Standard Content Code

INFRA II Tekniikka (2/3)

Sebastian Posth
ISCC Foundation

Sebastian Posth

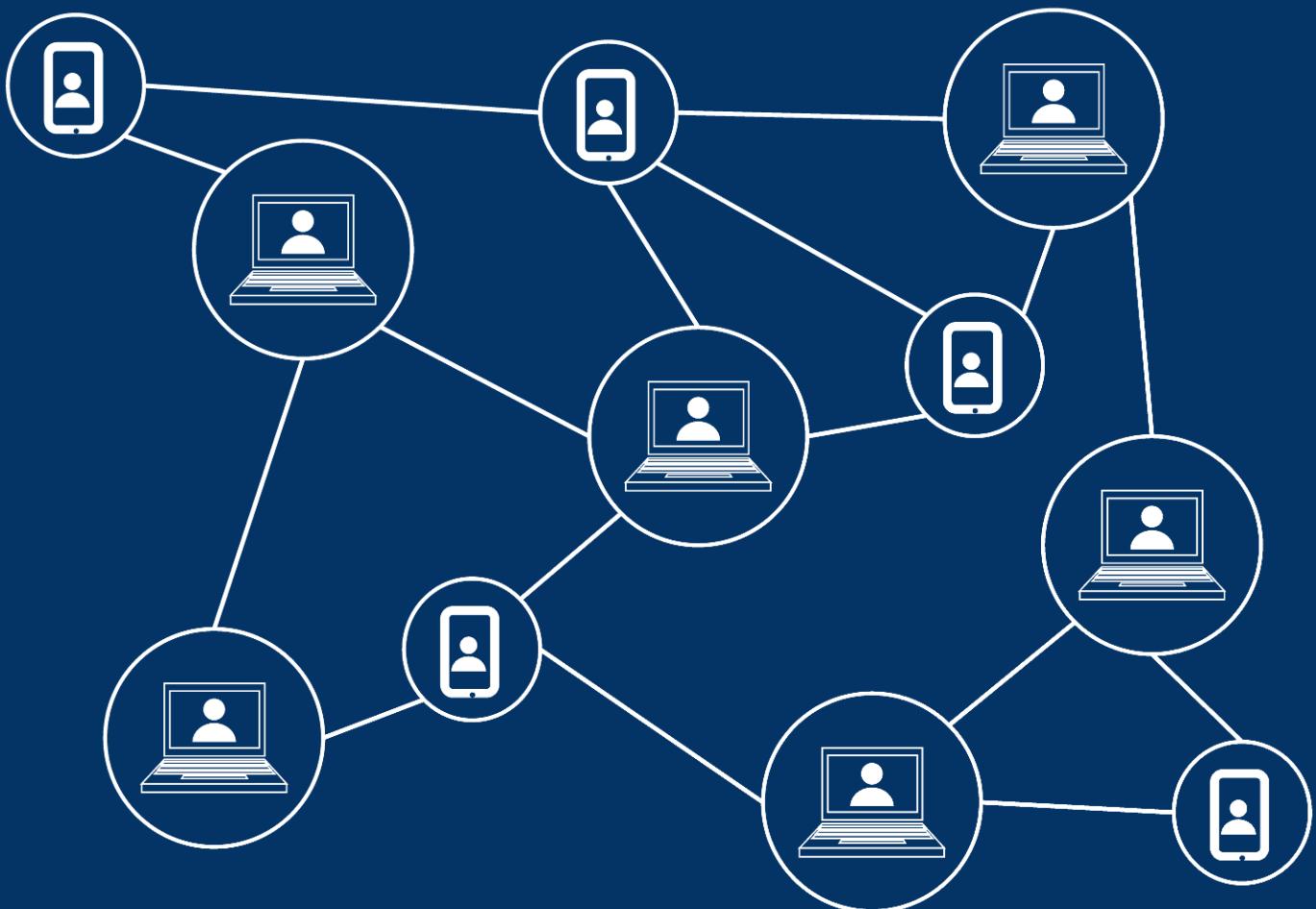
- Background in digital book publishing – entrepreneur and consultant on digital distribution, data analytics, digital innovation and DLT
- CEO Posth Werk BV*
- Director ISCC Foundation*



“The problems relating to licensing markets in Europe are caused by the fact that works and rightholders are often not being properly identified in the digital environment.”

“Investing in the copyright data infrastructure ... can/ would improve the efficiency of licensing, and allow automated processes for distribution of revenue streams”

Developing the Copyright Infrastructure – Stocktaking of work and progress under the Finnish EU Presidency





What effect will blockchain technology have on global media distribution and licensing business?



Goal of the Project

Developing open standards, technologies and applications that establish media content as the subject of transactions* on blockchains

** No content is stored on the blockchain*



NGI



BLOCKCHAINS FOR SOCIAL GOOD

Suggestion for an Open Layered Blockchain Ecosystem

Applications
Open Innovation



INTERFACES

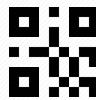


SHOPS



BUSINESS
MODELS

Building Blocks
Chain Agnostic Standards



CONTENT
IDENTIFIERS



ATTRIBUTION



SMART
LICENSES

Blockchain
Protocol-Layer Services



DATA
STREAMS

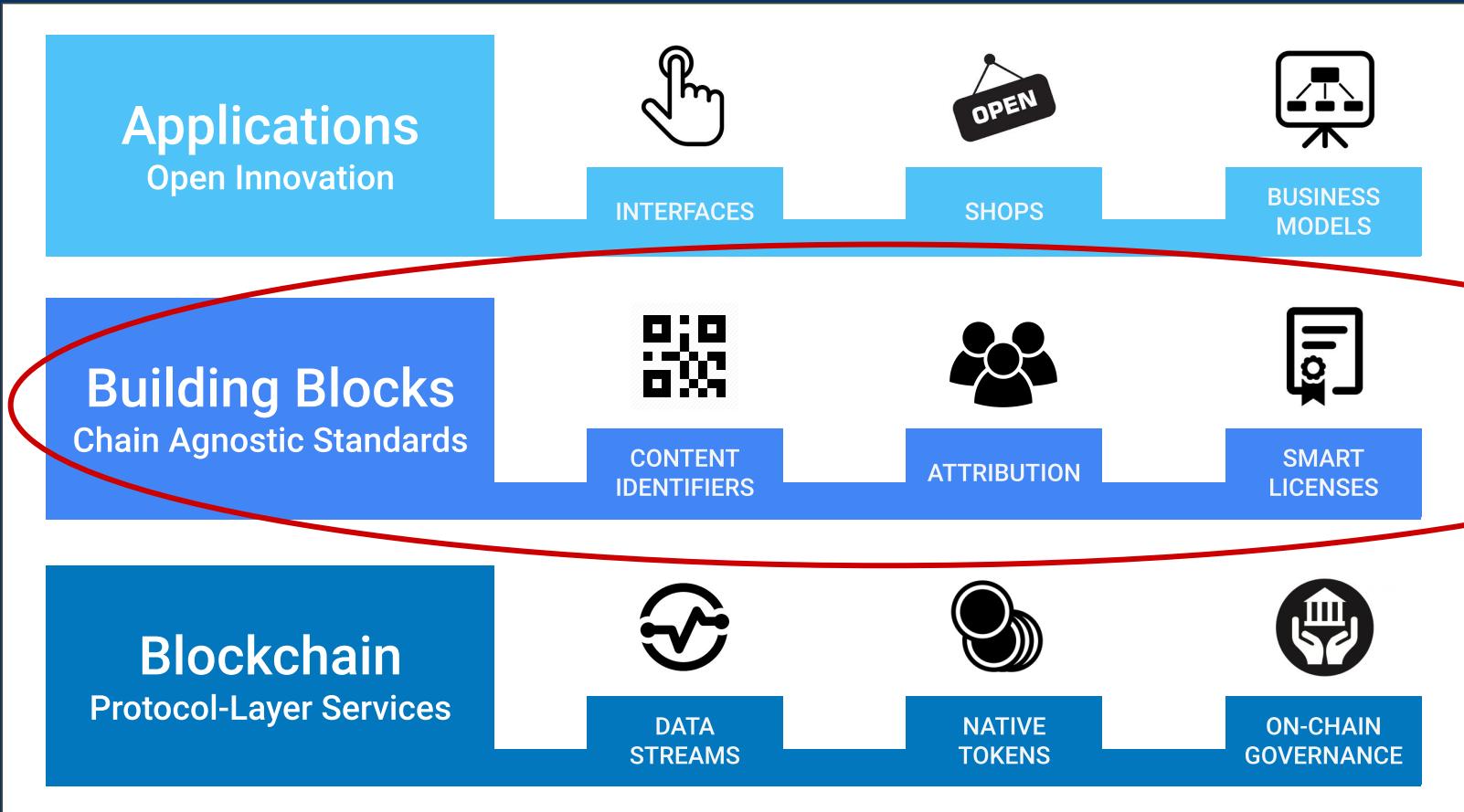


NATIVE
TOKENS

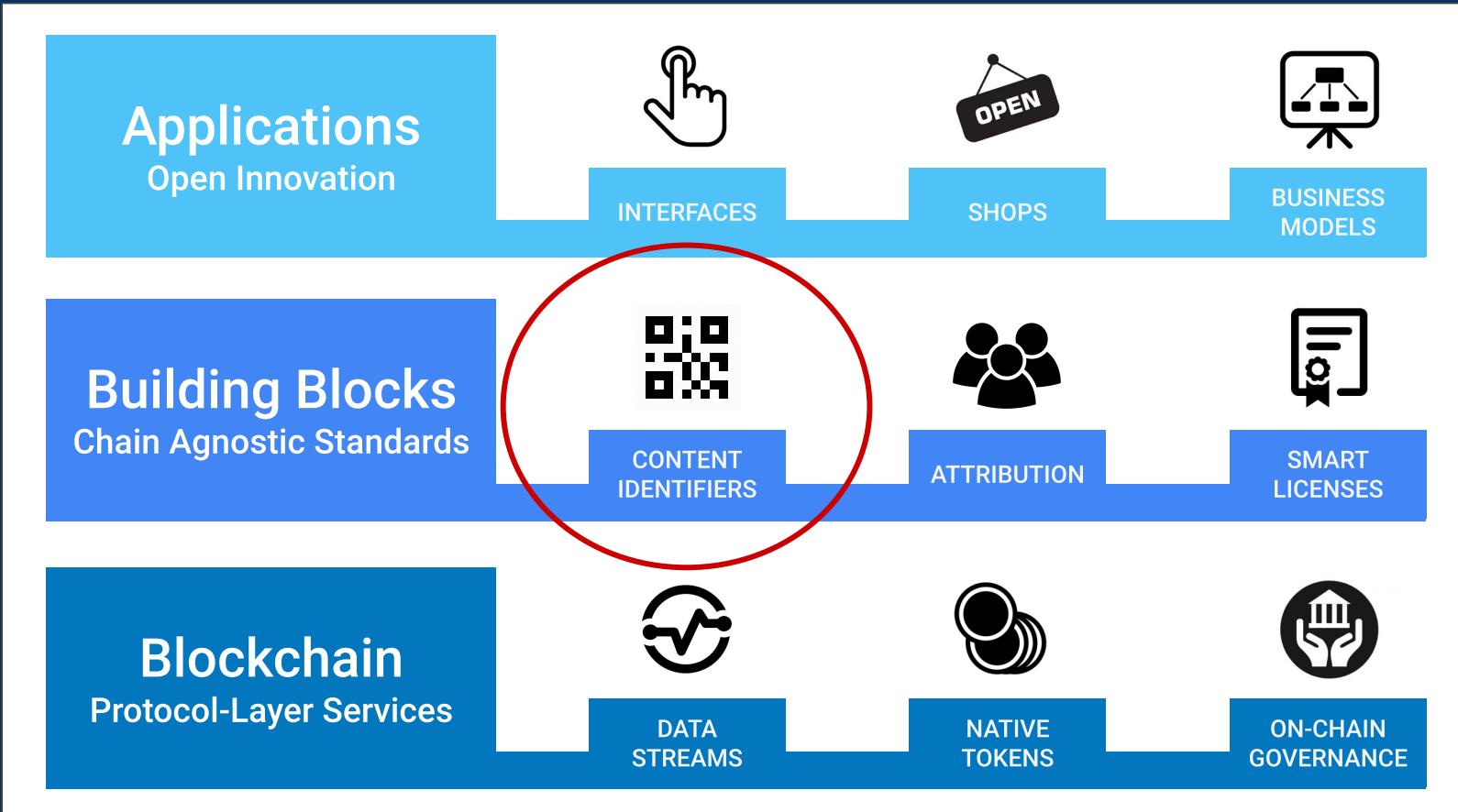


ON-CHAIN
GOVERNANCE

Suggestion for an Open Layered Blockchain Ecosystem



Suggestion for an Open Layered Blockchain Ecosystem





International Standard Content Code

iscc.codes

CCdC1A9SZjsST

CYNHivFsfNjAL

CDXESuyPYvF7P

CRMLazWx3C72w

- The ISCC is an open and decentralized identifier for digital assets that uses fingerprinting technology for advanced and automated content identification
- Universal standard identifier for digital content files in all media formats (text, image, audio, video)
- Suggested cross-industry standard for all media sectors



International Standard Content Code

iscc.codes

CCdC1A9SZjsST

CYNHivFsfNjAL

CDXESuyPYvF7P

CRMLazWx3C72w

- **Anyone with access to the content** can generate the ISCC, decentrally, without metadata or manual effort
- Rightsowners can connect metadata, rights management information and other content-related information to the ISCC
- With the ISCC, **anyone can find the metadata and licensing terms** provided by the rightsowner



International Standard Content Code

iscc.codes

CCdC1A9SZjsST

CYNHivFsfNjAL

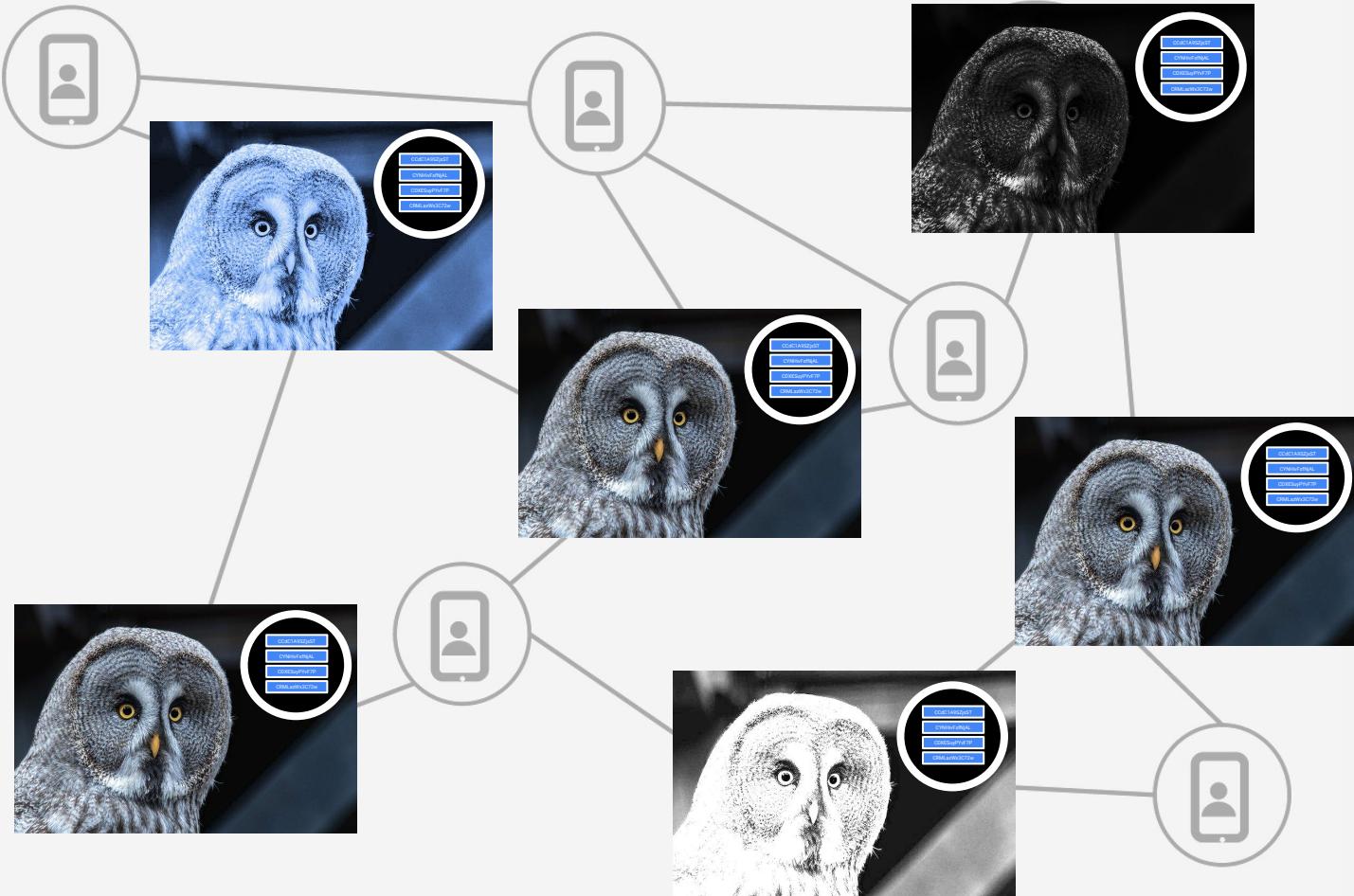
CDXESuyPYvF7P

CRMLazWx3C72w

- As an open, interoperable ISO standard the ISCC will ensure **transparency of digital content identification**
- Open specification (<https://iscc.codes/>) and open source development (<https://github.com/iscc/>) are maintained by a not-for-profit foundation
- The ISCC has been developed as a **blockchain-agnostic standard**, but it can also be used off-chain, even offline





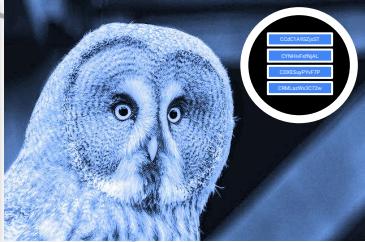




Smart License ID:
1737700a-3048-4498-a949-17f2f1fd633a

Rights Modules:

- ✓ ADAPT (grant)
- ✓ ATTRIBUTION (obligation)
- ✓ INDICATE_ADAPTIONS (obligation)
- ✓ NON_COMMERCIAL (restriction)
- ✓ NO_INDUSTRIAL_PROPERTY
- ✓ REPRODUCE (grant)
- ✓ RESALE (grant)
- ✓ SHARE (grant)



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1737700a-3048-4498-a949-17f2f1fd633a

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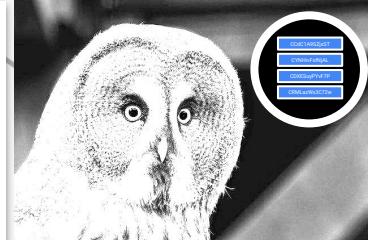
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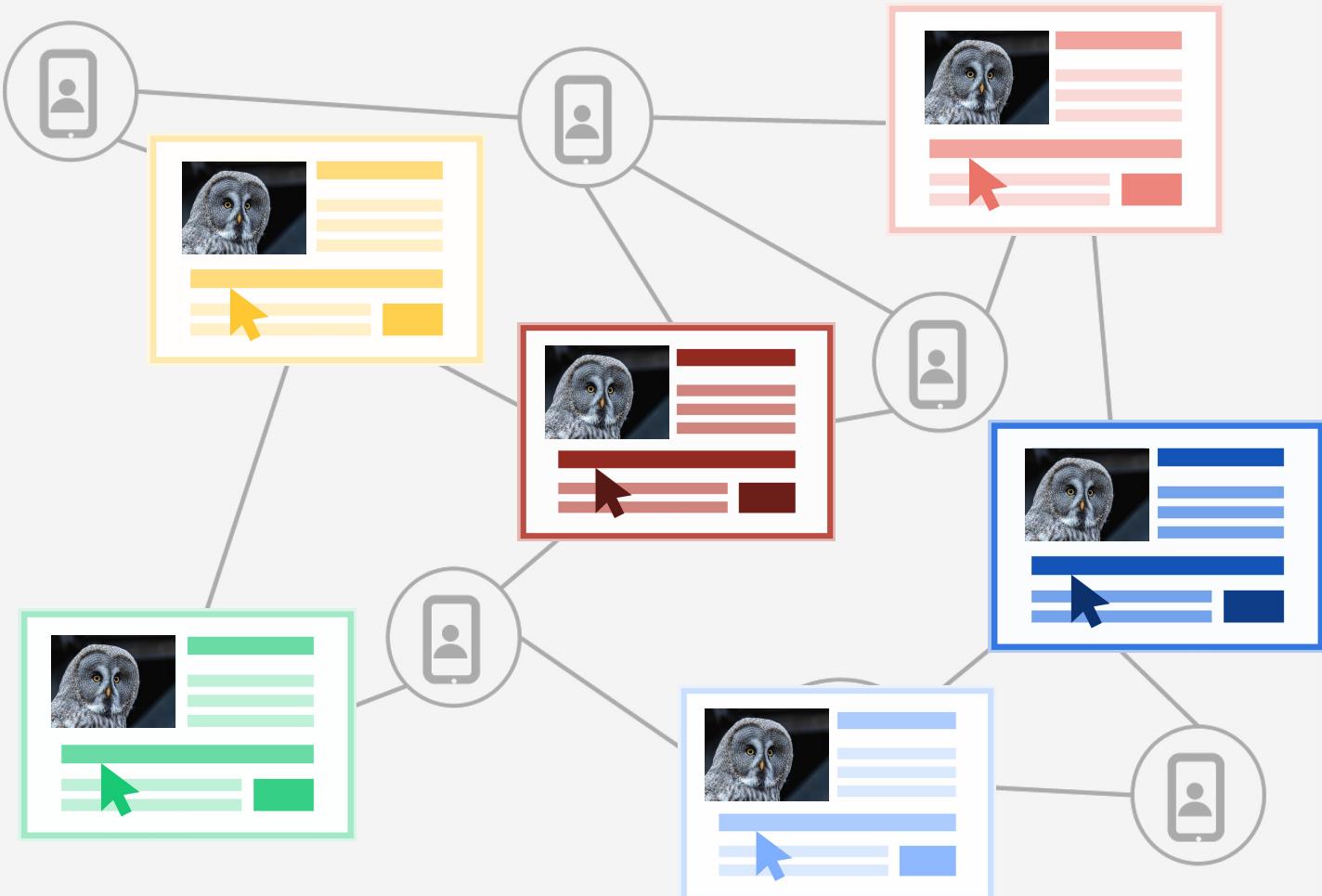


Smart License ID:
1737700a-3048-4498-a949-17f2f1fd633a

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- ✓ ADAPT (grant)
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- ✓ RESALE (grant)
- ✓ SHARE (grant)







Startseite

Entdecken

Mitteilungen

Nachrichten

Lesezeichen

Listen

Profil

Mehr

Twittern

← Twittern



Sebastian Posth
@posth

This is a test tweet, there is nothing to see here, please proceed to the cat videos.

Tweet übersetzen



9:54 nachm. · 7. Feb. 2020 · Twitter Web App

Example <https://twitter.com/posth/status/1225885596410941440>

ISCC Web Demo v1.0.5

Creating ISCC identifiers for media files and web pages.

Content

Generate from File Generate from URL

2-IMG_OWL Image

Upload file

Meta-Data

Title ? 2-IMG_OWL Image

Regenerate Meta ID

Extra ?

Meta-ID ?	Content-ID ?	Data-ID ?	Instance-ID ?
ISCC	CCdCoXvtR21XC	CYNHivFsfNjAL	CDXESuyPYvF7P
CRMLazWx3C72w			

Matches ?

2020-02-07 12:47:19

Transaction: 8239a2e95d3d80e9320f4ea2addfe9aad2acb78db017ff92c94330ae3d8eb3

CC5dAy3jEaa4K-CYNHivFsfNjAL-CDXESuyPYvF7P-CRMLazWx3C72w

Meta-ID 00010101101010011001100001010111010110010010111010100101110001
Content-ID 1100100000000001000110111001111101110100111100100111100101100001
Data-ID 101101001100011100111100110011000111101010101000110101000110101000
Instance-ID 100100111000001000000001111001100000001011110100110011000110001

Title: owl-4819550_640

Log ?

2020-09-03 20:12:02

CCdCoXvtR21XC - CYNHivFsfNjAL - CDXESuyPYvF7P - CRMLazWx3C72w

Meta-ID 110101110101010000000000011111101101111101011111010111110011110000
Content-ID 1100100000000001000110111001111101111010011110010011110010110000
Data-ID 101101001100011100111100110011000111101010101000110101000110101000
Instance-ID 100100111000000100000001111001100000001011110100110011000110001

2020-09-03 20:11:59

CCdCoWRpG7j6V - CYNHivFsfNjAL - CDm8nrGtJBaxW - CRibqsJt3nppv

Meta-ID 11010111010101000000000110110101111011111101011111010011110010110000
Content-ID 1100100000000001000110111001111101111010011110010011110010110000
Data-ID 100110110010001000101110101000010111000110101001101010011001000111
Instance-ID 011101010010111110101000111101010000001000001010111001111100001



ISCC://CC5dAy3jEaa4K-CYNHivFsfNjAL-CDXESuyPYvF7P-CRMLazWx3C72w

Metadata

```
{  
  "title": "owl-4819550_640",  
  "extra": "Pixabay",  
  "tophash": "93c080f180bc9988a708de749ba09a146009d174b89ef51277f836d00d78666a"  
}
```

TXID: 8239a2e95d3d80e9320f4ea2addfe9aad2acb78db017ff92c94330ae3d8eb3e3 OUTPUT: 0

Matching SmartLicenses

LicenseID	Rights	ISCC	TM	Details
c7f020...	['ADAPT', 'ATTRIBUTION', 'REPRODUCE', 'SHARE']	CC5dAy3jEaa4K-CYNHivFsfNjAL-CDXESuyPYvF7P-CRMLazWx3C72w	ATTESTATION	Read

Example: <https://explorer.coblo.net/stream/iscc/8239a2e95d3d80e9320f4ea2addfe9aad2acb78db017ff92c94330ae3d8eb3e3:0/>

SMART-LICENSE://c7f02087-a324-4698-b1d4-23b58e89c8aa-CC5dAy3jEaa4K-CYNHivFsfNjAL-CDXESuyPYvF7P-CRMLazWx3C72w

Metadata

```
{  
  "rights_modules": [  
    "ADAPT",  
    "ATTRIBUTION",  
    "REPRODUCE",  
    "SHARE"  
  ],  
  "template": "42bc3fd823c9d6bf53752b0ce879ea16763c3eda34fa4a2d036883b0c9f32dba",  
  "transaction_models": [  
    "ATTESTATION"  
  ]  
}
```

TXID: 966cbf63dc5420dc8eb37b147558bb667dd05d9e019619a754429e8caa8fd96f OUTPUT: 0

Smart License ID	1737700a-3048-4498-a949-17f2fffd633a
Licensor Wallet-ID	2QRP7wJp3NPVq3tQqfEX7M7JoQFcvaM8Zkd
Licensed Material ISCC	CCiHRpEZ7GVG-CYKVxCRLxX550-CDgFuQLAA18Q-CRdzV9XegePTi
Transaction Model	ATTESTATION

This Content Blockchain Smart License is dedicated to the public domain under the [CC0 Public Domain Dedication](#).

Content Blockchain B2C Smart License

AD-AT-IA-RS-Experimental Version 1.0

Preface

Today, professional and commercial digital content licensing is a complex issue mostly dealt with by specialized lawyers. The idea behind smart licenses is to provide an easy-to-use license construction kit that even legal laypersons can handle. In our smart license generator any interested rights owner (licensor) can choose from a limited number of rights modules. Their combination, supplemented by some standard terms and conditions form the content of the smart license, i.e. the use rights, that the licensor wants to grant You (the licensee).

The smart licenses, alongside with basic metadata are publicly registered on the Content Blockchain in a secure and reliable, open and transparent, automated and machine-readable way.

For the avoidance of doubt, this smart license does not apply where a license is not needed (e.g. where limitations of copyrights apply like the quotation right). Nothing in this license shall be construed as excluding or limiting statutory freedoms allowed for by exceptions and limitations, fair use, fair dealing and related doctrines.

Subject to the terms and conditions of this smart license, the Licensor hereby offers You a non-exclusive worldwide license for the duration of the copyright to use the licensed material under its terms and conditions. By performing the act that the licensor has defined as a declaration of acceptance to his offer, You accept and agree to be bound by the terms and conditions of this smart license.

Example: <https://smartlicense.coblo.net/smartlicense/c7f02087-a324-4698-b1d4-23b58e89c8aa/>

Licensed material: The artistic, scientific or literary work, database, or other copyright protected material to which the licensor applied this smart license. The licensed material is identified by a unique **ISCC**.

Licensor: The individual(s) or entity(ies) granting rights under this license. The licensor can be the **creator** or another copyright owner (like e.g. a publisher).

Rights Module: A standardized section of the **smart license** that describes a certain kind of use. The **licensor** can choose from a number of rights modules to define the scope of his/her **smart license**.

Rights Profile: The combination of **rights modules** the **licensor** chose for his smart license. **Smart license:** The sum of rules that apply for the use of the **licensed material**.

2. Licensing conditions

You may use the **licensed material** to the extend and under the conditions defined hereafter:

2.1. Licensed Rights (**rights modules**)

Adapt: You may modify, alter or change the licensed material in any way (e.g. remixing, transforming, shortening, translating, synchronizing, combining with other material). Adaptations may also be **shared**.

Resale: You may permanently transfer the **smart license** to a third party against compensation. The **smart license** can only be resold once and in its entirety. By reselling it you automatically lose your own rights to use the **licensed material**. Also, you are obliged to delete your copy(ies) of the **licensed material**. The **resale** transaction will be registered on the blockchain.

All rights that are not mentioned above are reserved.

2.2 Restrictions

2.3 Obligations

Attribution: You have to pertain notices that are supplied with the **licensed material** when you **share** or **distribute** it. Under this obligation you have to:

- Retain credits to the **creator** and/or the copyright owner;
- Retain copyright notices;
- If so stipulated by the **licensor** retain an URL or hyperlink to an online source of the **licensed material**.

Transaction Details:

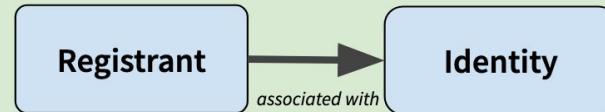
Hash	f96bd9d459a04bb861b5182113a5c9ddbb91a98708811853c330c1069328c68c
Blockhash	2c8a58d44072b35aa46af3a090eda03632f190d4ddaa4f9a3a126141cbc97e69
Blocktime	2018-04-06 11:09
Confirmations	122213

Inputs / Outputs Raw Transaction

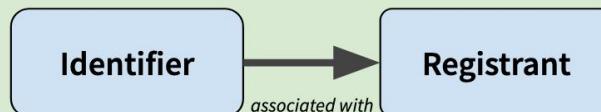
```
{
  "txid": "f96bd9d459a04bb861b5182113a5c9ddbb91a98708811853c330c1069328c68c",
  "time": 1523012988,
  "blocktime": 1523012988,
  "blockhash": "2c8a58d44072b35aa46af3a090eda03632f190d4ddaa4f9a3a126141cbc97e69",
  "confirmations": 122213,
  "vin": [
    {
      "vout": 2
      "scriptSig": {"hex":
        "4730440220096e2a59361279f298e9b179480b16670154
        ea2cd7bbd101210314f052f13463fe8e27696c48145b7261
        3044022009662a59351279f298e9b179480b1667015461
        2cd7bbd1010314fa052f13463fe8e27696c48145b7261caba
        "txid": "9d7267819eb0e0f254146299dcda670d2c4b41612
        "sequence": 4294967295
      }
    },
    "vout": [
      {
        "value": 0
        "scriptPubKey": {
          "hex":
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            53b73706b6b43436948527270455a375647562d4355
            37076b6b602756a4cb97b69127472616e7361637469616
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            269676874735f6d6f64756c65735b24532369046905
            553414c457d
          "type": nullData
          "asm": "73706b6527d4d8e03e3871dfa4fc47c396e89af
          73706b6b319733373030612d3303434393
          73706b6b43436948527270455a375647562d43594b
          73706b6602_OP_RETURN
          "hex": "76a91458f0e46ea38064595a7bf055577c5f9905c77b3d OP_EQUALVERIFY OP_CHECKSIG
          "reqSigs": 1
          "type": pubkeyhash
          "addresses": ["2QRP7wJp3NPVq3tQqfEX7M7JoQFcvaM8Zkd"]
        }
      },
      {
        "item": [
          {"name": "smart", "createtxid": "fc9ae896c347ca
          ["2QRP7wJp3NPVq3tQqfEX7M7JoQFcvaM8Zkd"], "type": "42bc3fd823c9d6b5f3752b0ce879ea16763c3eds34fa
          "ATTRIBUTION", "INDICATE_ADAPTIONS", "RESALE"]}, keys: [{"17377008-3048-4498-8849-172f166334", "CC1HrpEz7VGV-C1KXCRXX550-CDgF0QSCA918Q
          CRd2V9XegePTI"}]
      },
      "n": 0
    ]
  ],
  "items": [
    {
      "type": "stream", "name": "iscc", "createtxid": "9dc120f0f3ba1bf3cc53010a0af74f164961f37535bdd9a89b5064e60304c070", "streamref": "22580-300-448565", "publishers": ["[2QRP7wJp3NPVq3tQqfEX7M7JoQFcvaM8Zkd]"], "keys": ["[C5dAy3jEaa4K', 'CYNHivFsfNjAL',
      'CDXESuyPYvF7P', 'CRMLazWxC372w"], "offchain": False, "data": {"json": {"extra": "Pixabay", "tophash": "93c080f180bc9988a708de749ba09a146009d174b89ef51277f836d00d78666a", "title": "owl-4819550_640'}}}
  ]
}
```

Example: <https://explorer.coblo.net/tx/8239a2e95d3d80e9320f4ea2addfe9aad2acb78db017ff92c94330ae3d8ebbe3?raw>

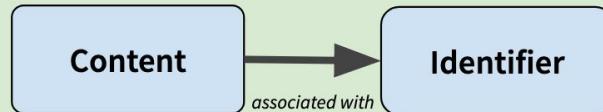
Layer 3: Open Content Certification Protocol (OCCP)



Layer 2: Decentralised Cross-Chain Registry Protocol



Layer 1: International Standard Content Code (ISCC)





International Standard
Content Code

iscc.codes



NID - Normenausschuss
Information und Dokumentation
AA - Arbeitsausschuss 09

Normungsantrag ✓



TC 46/SC 9/WG 18
International Standard Content Code

Preliminary Work Item ✓



What is needed to speed up ISCC-development?

- More support for the ISCC!
- More testing and feedback from various (industry) sectors
- More use cases and implementations in user applications and services
- More funding to pay developers (= faster development of open source tools for users of the ISCC system)



Get familiar with the ISCC on:
iscc.codes

Sebastian Posth
posth@iscc.foundation
+31 6 12676726



JPG File 20161227_160824.jpg



PNG File 20161227_160824.png

	Meta-ID	Content-ID	Data-ID	Instance-ID
20161227_160824.jpg	CCDsTERz4UQV5	CYHsLweYPdvgD	CDMqKBaJ6GcN6	CRWSywYJsmuV1
20161227_160824.png	CCDsTERz4UQV5	CYHsLweYPdvgD	CD8Nq2riHZYFA	CRmPuPvEuwNQ9
Similarity	100%	100%	56.25 %	Unique



Print-Produkt PDF File 9783570103555.pdf



Digitales Produkt EPUB File 9783641231286.epub

	Meta-ID	Content-ID	Data-ID	Instance-ID
9783570103555.pdf	CCYFzp5fuCZ5i	CTW146jkamPhi	CDCXUMP3sG7un	CR2qg9diUSbip
9783641231286.epub	CCYFzp5fuCZ5i	CTW13poWoxkoK	CDiCwHnxCc27y	CRLzb24dPde2w
Similarity	100%	96,88%	56,25 %	Unique



PNG File 20161227_160824_sw.png



PNG File 20161227_160824.png

	Meta-ID	Content-ID	Data-ID	Instance-ID
20161227_160824_sw.png	CCDsTERz4UQV5	CYHsLQeDFvakh	CDZs13sf5HjQr	CRUMpeM9jZNQP
20161227_160824.png	CCDsTERz4UQV5	CYHsLweYPdvgD	CD8Nq2riHZYFA	CRmPuPvEuwNQ9
Similarity	100%	96,88%	53.12 %	Unique



JPG File joppe_filter.jpg



JPG File joppe_filter_cut.jpg

	Meta-ID	Content-ID	Data-ID	Instance-ID
joppe_filter.jpg	CCYeVMGkgsJRS	CYUAFZjTR95Ey	CDKJxBjnFHiwn	CRKuX1M9K3dYH
joppe_filter_cut.jpg	CCYeVMGkgsJRS	CYUaVrrK4wunw	CDDjgNZYjcrJ6	CRdAd4Q4z1H2k
Similarity	100%	81,25%	59.38 %	Unique



JPG File joppe_filter.jpg



JPG File joppe_filter_supercut.jpg

	Meta-ID	Content-ID	Data-ID	Instance-ID
joppe_filter.jpg	CCYeVMGkgsJRS	CYUAFZjTR95Ey	CDKJxBjnFHiwn	CRKuX1M9K3dYH
joppe_filter_supercut.jpg	CCYeVMGkgsJRS	CYU418zoLurfG	CDdL3CCU5Pd7z	CRHTLiGfKJfqe
Similarity	100%	75,00%	51.56 %	Unique

ISCC codes create an emergent overlay structure of content relations.

	Meta-ID	Content-ID	Data-ID	Instance-ID	Explanation
1	=	=	=	=*	Totally identical file (same metadata, content structure, file encoding and file)
2	= =	=	=	=*	Different metadata, same content, file encoding and identical file > e.g. a special edition or inconsistent metadata
3	= =	= =	= =	= =	Totally different file (different metadata, content structure, file encoding and file)
4	= or ~	= =	= =	= =	Same/similar metadata, but different content and file encoding and file, e.g. manual clustering
5	= or ~	= or ~	= =	= =	Same/similar metadata, same/similar content but in a different file encoding, e.g. related product
6	= or ~	= or ~	= or ~	= =	Same/similar metadata, same/similar content in same/similar file encoding
7	= =	= or ~	= =	= =	Different metadata, same/similar content but in a different file encoding
8	= =	= or ~	= or ~	= =	Different metadata, but same/similar content and file encoding, e.g. a special edition

* = compare top-hash of both files to be sure there is no accidental Instance-ID collision.

Multiple ISBN versus multiple ISCC



Book: Kaiserschmarrn - A Royal Dish

File	ISBN	ISCC
a_royal_dish.pdf	9783957180445	CCC12vsSARAYZ-CTdStuQ575fpU-CDY1DYok84nDK-CRBdkJsoSN9oh
a_royal_dish.epub	9783957180421	CCC12vsSARAYZ-CTdStuQ575fpU-CDa9kNBqNrX4a-CRvqE5FwDmgQw
a_royal_dish.ibooks	9783957180414	CCC12vsSARAYZ-CTj8AsPBafnN1-CDASjLzG8X7Pa-CRBGhC93y8AH2
a_royal_dish.mobi	9783957180438	CCC12vsSARAYZ-CTdStuQ575fpU-CDMXxzVp63Mpt-CRZ5iRuFkENb7

Estimated Similarity of Meta-ID: 100.00 %

Estimated Similarity of Content-ID Text: 90.62 %

Estimated Similarity of Data-ID: 45.31 %

One DOI multiple ISCC



Paper: Neural Computation of Surface Border Ownership and Relative Surface Depth from Ambiguous Contrast Inputs

Host	DOI	ISCC
hal.archives-ouvertes.fr	10.3389/fpsyg.2016.01102	CCDyud5ZWAkDR-CTTq25WFQTWaU-CDbUZg6v3qzzM-CRrx fuPk2nP3Q
arxiv.org	10.3389/fpsyg.2016.01102	CCDyud5ZWAkDR-CTTRs5cQY1D11-CDPqUxrqN7YRx-CRcUmq2SmgN18
hal.archives-ouvertes.fr	10.3389/fpsyg.2016.01102	CCDyud5ZWAkDR-CTfNotD3KMMd1-CD481J7LDBQPH-CR8rZ9QzTzJRL
frontiersin.org	10.3389/fpsyg.2016.01102	CCDyud5ZWAkDR-CTfNotD3KMMd1-CDMXxzVp63Mpt-CRZ5iRuFkENb7

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