



**BITKOM AK Open Source, June 12 & July 3, 2024, Online**

# License Clearance made easy with the Open DALICC Framework

[www.dalicc.net](http://www.dalicc.net)

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**Website:** [www.dalicc.net](http://www.dalicc.net)  
[www.github.com/dalicc](https://www.github.com/dalicc)

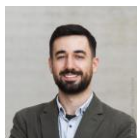
Slides available under CC-BY (Tassilo Pellegrini / DALICC)

## In Brief ...

- DALICC = Data Licenses Clearance Center
- open source project - non-profit association
- Code and data available under open licenses (MIT, CC-BY) @ [www.github.com/dalicc](https://www.github.com/dalicc)
- Founded: 2022; spin off from a cooperative research project conducted by UAS St. Pölten
- Team: <https://www.dalicc.net/dalicc-association/team/>



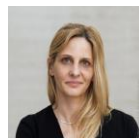
Tassilo  
Pellegrini  
CEO



Giray  
Havur  
CTO



Sebastian  
Neumaier  
CCO



Susanne  
Roiser  
CFO



Markus  
Dörfler  
CLO

## Goals ...

- Increase awareness about licencing
- Provide tools for license and policy management
- Engage in community activities

## Awards ...

- 2017 ... Winner of IMAGINE ICT Idea Contest
- 2019 ... Lower Austrian Innovation Award
- 2021 ... AWS Prototype Grant
- 2022 ... netidee Data Understanding Award

# Daily routine of a developer ...

Is it  
feasible?

Is it  
allowed?!

In the event of a lack of rights clearance ...

- Warning notice
- Restraining order
- Cease and desist
- Claims for damages
- Lawyers' fees & court costs



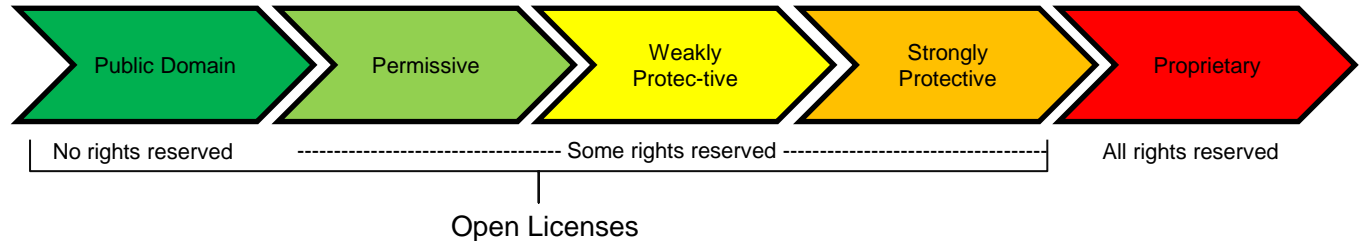
# Open Licensing ... not that straight forward!

## Openness: normative approach

“Open means **anyone** can **freely access, use, modify, and share** for **any purpose** (subject, at most, to requirements that preserve provenance and openness).”

<http://opendefinition.org/>

## Openness: pragmatic approach



### (Not so) Simple examples that require clearing ...:

- Can I use a picture licensed under CC-BY-NC in my OA publication available under CC-BY?
- I have created a new software containing some APACHE-licensed components? Can I publish this software under a GPL license?
- My dataset is compiled of three sources licensed under MIT, APACHE and ODBL? Can I derive a new dataset from this?
- What is the license for republishing?
- Do I need to attribute and how do I do it correctly?
- Can I impose conditional access obligations to this work?

# License Compatibility Matrix

## Creative Commons

	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✓	✗	✓	✗
	✓	✓	✓	✓	✗	✗	✗	✗
	✓	✓	✓	✗	✓	✗	✓	✗
	✗	✗	✗	✗	✗	✗	✗	✗
	✗	✗	✗	✗	✗	✗	✗	✗

## Open Source

Public Domain	Permissive	Weakly Protective	Strongly Protective	Network Protective
comp. -> with				
CC0-1.0	Y	Y	Y	Y
DDO-1.0	Y	Y	Y	Y
SAX-1.0	Y	Y	Y	Y
MIT	Y	Y	Y	Y
WTFPL	Y	Y	Y	Y
X11	Y	Y	Y	Y
GPL-1.0	Y	Y	Y	Y
GPL-2.0	Y	Y	Y	Y
GPL-2.1	Y	Y	Y	Y
GPL-2.1+	Y	Y	Y	Y
GPL-3.0	Y	Y	Y	Y
GPL-3.0+	Y	Y	Y	Y
MPL-1.1	Y	Y	Y	Y
MPL-2.0	Y	Y	Y	Y
GPL-2.0	Y	Y	Y	Y
GPL-2.0+	Y	Y	Y	Y
GPL-3.0	Y	Y	Y	Y
GPL-3.0+	Y	Y	Y	Y
MS-RL	Y	Y	Y	Y
ODbL-1.0	Y	Y	Y	Y
ODbL-1.1	Y	Y	Y	Y
ODbL-2.0	Y	Y	Y	Y
ODbL-2.1	Y	Y	Y	Y
ODbL-3.0	Y	Y	Y	Y
RPL-1.1	Y	Y	Y	Y
RPL-1.5	Y	Y	Y	Y
AGPL-1.0	Y	Y	Y	Y
AGPL-3.0	Y	Y	Y	Y

We must do better!

## ... and the plot thickens ...



# Who is DALICC for?



# DALICC: Framework & Resources

[www.dalicc.net](http://www.dalicc.net)



# Service UIs at dalicc.net

GET /licenselibrary/list

dalicc  
LICENSE LIBRARY

DALICC API

GET /licenselibrary/license/{license\_id} Get License By Id

GET /licenselibrary/list List Licenses In The License Library

POST /licenselibrary/facetedsearch Faceted Search

POST /licenselibrary/composer [UNDER DEVELOPMENT]

dependencygraph

GET /dependencygraph/list Get Dependency Graph

compatibilitycheck

POST /compatibilitycheck/ Compatibility

GET /licenselibrary/license/{license\_id}

dalicc  
APACHE LICENSE, VERSION 2.0

INFO

- Target
  - Creative work (i.e. text, picture, sound, movie)
  - Dataset
  - Software
- Region: Worldwide
- Validity period: Perpetual
- Source: <http://www.apache.org/licenses/LICENSE-2.0>
- Legal code: <http://www.apache.org/licenses/LICENSE-2.0>
- Publisher: The Apache Software Foundation
- DALICC URI: <http://dalicc.net/licenselibrary/Apache-2.0>
- SPDX ID (WIP): Apache-2.0

PERMISSIONS

- Display
- Present

PROHIBITIONS

- Promote

POST /licenselibrary/facetedsearch

dalicc

PROVENANCE INFORMATION

☒ ☐

 Creative work (i.e. text, picture, sound, movie)

☒ ☐

 Dataset

☒ ☐

 Software

PERMISSIONS & DUTIES

☒ ☐

 Reproduce: Do you allow to copy the work?

☒ ☐

 Distribute: Do you allow others to distribute the work?

☒ ☐

 Modify: Do you allow others to modify the work?

☒ ☐

 Derive: Do you allow to create derivatives from your work under these conditions?

☒ ☐

 Commercial Use: Do you allow commercial use?

☒ ☐

 Charge Distribution Fee: Do you allow third parties to charge a distribution fee?

☒ ☐

 ChangeLicense: Shall others be able to change the license?

LICENSE-WIDE DUTIES

☒ ☐

 Share Alike: Do you want to apply a share-alike clause?

SUBMIT

POST /licenselibrary/composer

dalicc  
LICENSE COMPOSER

Provenance Information

What kind of asset do you want to license?

☐ Creative work (i.e. text, picture, sound, movie)

☒ Dataset

☐ Software

CLEAR

What is the title of your license?

What is the name of the license's creator?

What is the name of the licensor?

What is the name of the licensee?

What is the validity period of the license?

☐ Perpetual

☐ Specify the start and end date

☐ Specify the validity period in months

CLEAR

To which region shall the license apply?

☐ Worldwide

☐ Specify region by country

CLEAR

Under which license do you provide your license?

Enter license name

Permissions & Duties

License wide Duties

Disclaimer

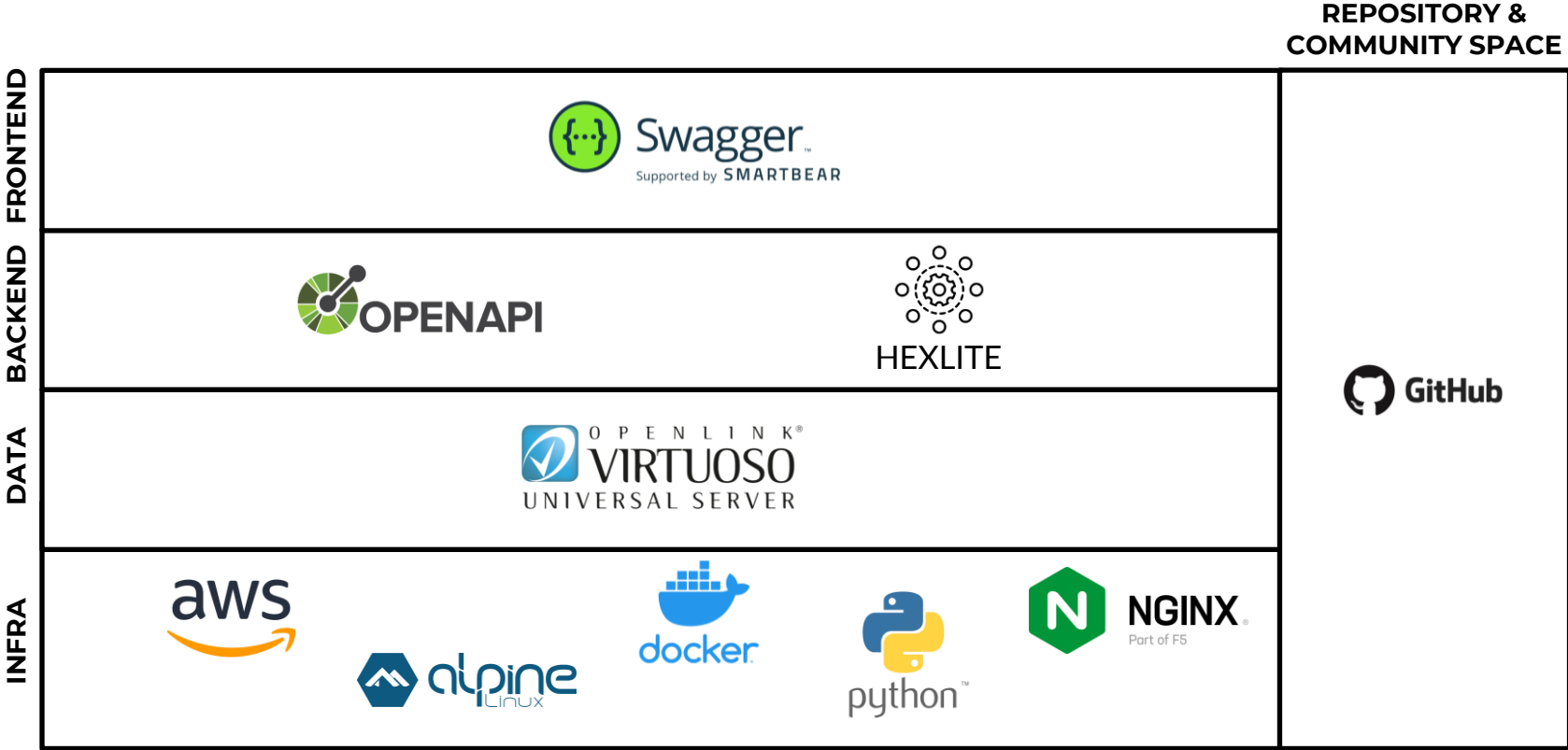
MY RESULTING LICENSE

Here you can find the human-readable and machine-readable version of the license you created. You can download and/or save it to your own dashboard.

DOWNLOAD PDF

<https://api.dalicc.net/docs>

# Technology Stack



# Data Model

## License Representation

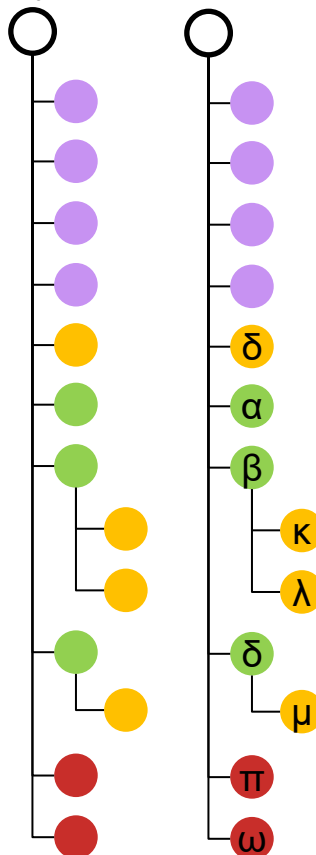


My license



URI: <https://api.dalicc.net/web/license/Apache-2.0>

My license



Vocabulary

### ODRL

odrl: <http://www.w3.org/ns/odrl/2/>

### CCRel

cc: <http://creativecommons.org/ns#>

### Dublin Core

dcmitype: <http://purl.org/dc/dcmitype/>

dct: <http://purl.org/dc/terms/>

### Schema.org

scho: <http://schema.org/>

### opensource.org

osl: <http://opensource.org/licenses/>

### FOAF

foaf: <http://xmlns.com/foaf/0.1/>

### DALICC

dalicc: <http://dalicc.net/ns#>

dalicclib: <http://dalicc.net/licenselibrary/>

**Semantic Interoperability!**

# Data Model

## License Representation

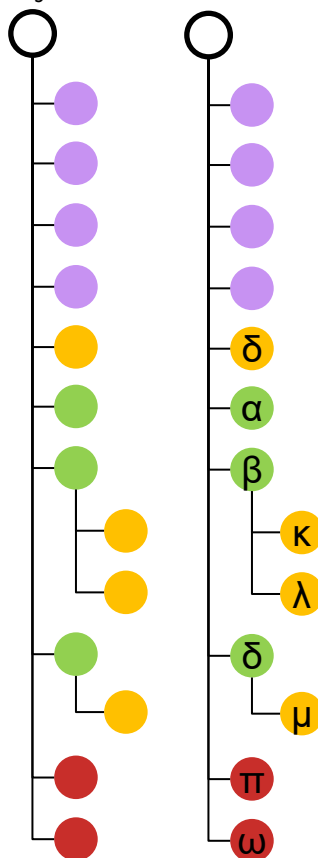


My license



URI: <https://api.dalicc.net/web/license/Apache-2.0>

My license



```
dalicclib:myLicense a odrl:Set ;
dct:title "My License" ;
cc:jurisdiction dalicc:worldwide ;
cc:license dalicclib:CC-BY_v4 ;
dalicc:validityType dalicc:perpetual ;
odrl:duty [ a odrl:Duty;
            odrl:action  $\delta$  ],
odrl:permission [ a odrl:Permission ;
                  odrl:action  $\alpha$  ],
odrl:permission [ a odrl:Permission ;
                  odrl:action  $\beta$  ;
                  odrl:duty [ a odrl:Duty ;
                              odrl:action  $\kappa$  ],
                  odrl:duty [ a odrl:Duty ;
                              odrl:action  $\lambda$  ] ],
odrl:permission [ a odrl:Permission ;
                  odrl:action  $\delta$  ;
                  odrl:duty [ a odrl:Duty ;
                              odrl:action  $\mu$  ] ];
odrl:prohibition [ a odrl:Prohibition ;
                  odrl:action  $\pi$  ],
                  [ a odrl:Prohibition ;
                    odrl:action  $\omega$  ] .
```

**Semantic Interoperability!**

# Data Model

## License Representation



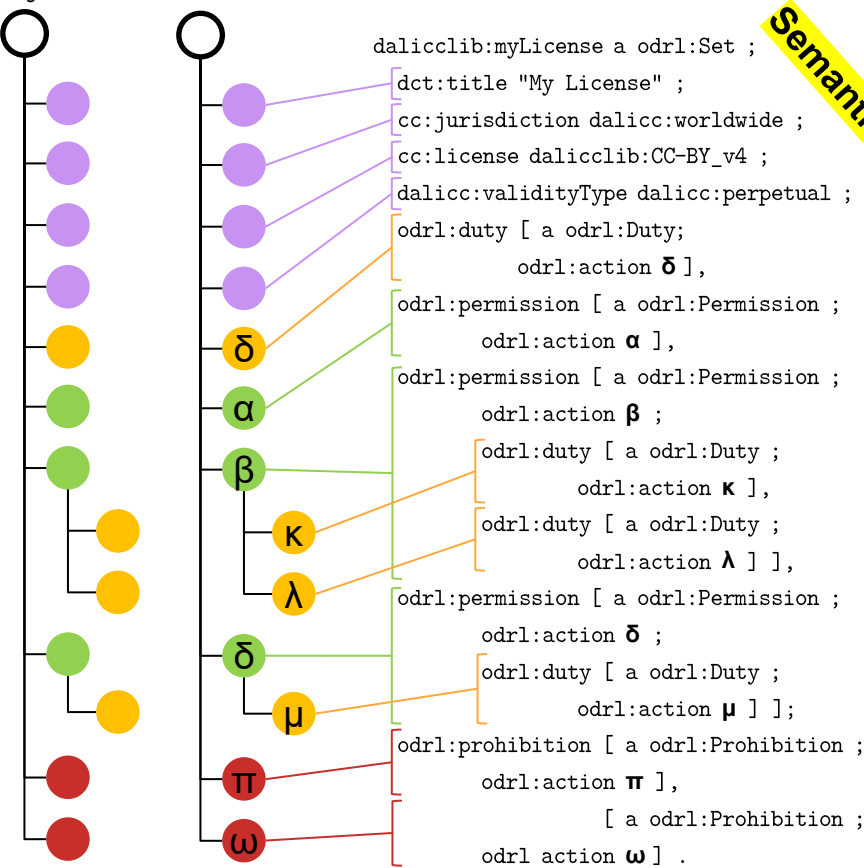
My license

- Permissions
- Prohibitions
- Duties
- Other data (e.g., provenance)



URI: <https://api.dalicc.net/web/license/Apache-2.0>

My license



**Semantic Interoperability!**

# Data Model

## License Representation



My license

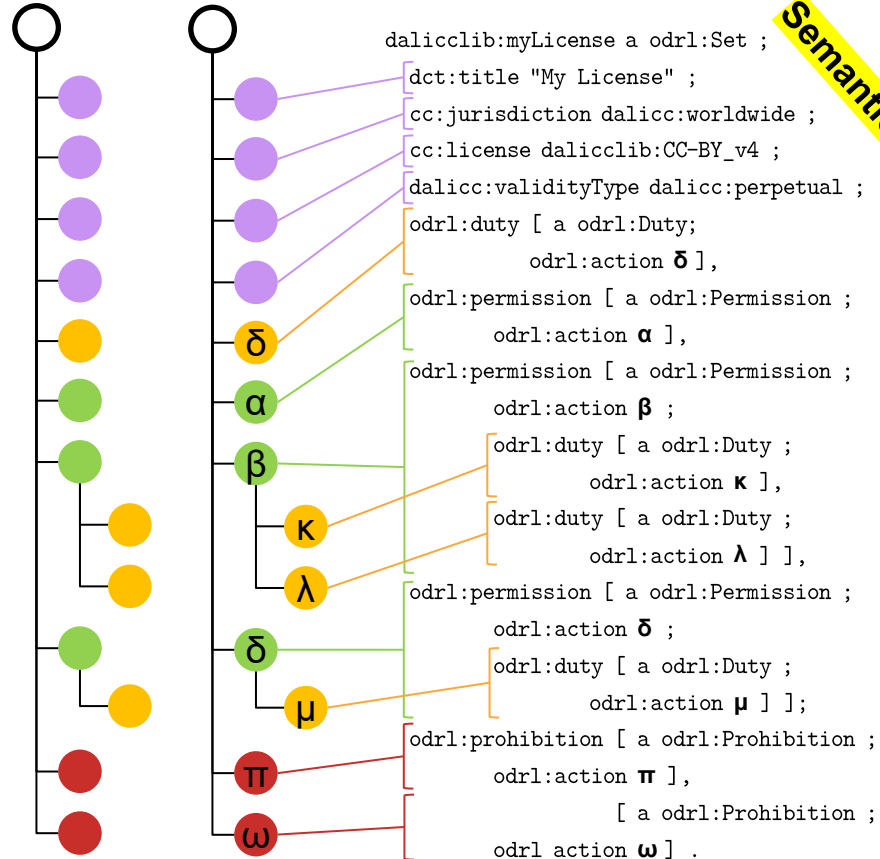


URI: <https://api.dalicc.net/web/license/Apache-2.0>



**DALICC Vocabulary  
Documentation @**  
<https://docs.dalicc.net/>

My license



**Semantic Interoperability!**

Legend:

- odrl:includedIn (solid black arrow)
- odrl:implies (solid blue arrow)
- owl:sameAs (solid green arrow)
- dalicc:contradicts (dashed red arrow)

Encoding the explicit and implicit semantic relationships between defined actions

### 1. *hierarchical relationships between action*

- $\alpha$  odrl:includedIn  $\beta$  : all Rules defined for  $\beta$  must also hold for  $\alpha$ , but not necessarily vice versa.
- e.g., odrl:display odrl:includedIn odrl:present.

### 2. *implications derived from a specific action*

- $\alpha$  odrl:implies  $\beta$  : a Prohibition of  $\beta$  conflicts a Permission of  $\alpha$ , but not necessarily vice versa.
- e.g., cc:Attribution odrl:implies cc:Notice.

### 3. *equalities*

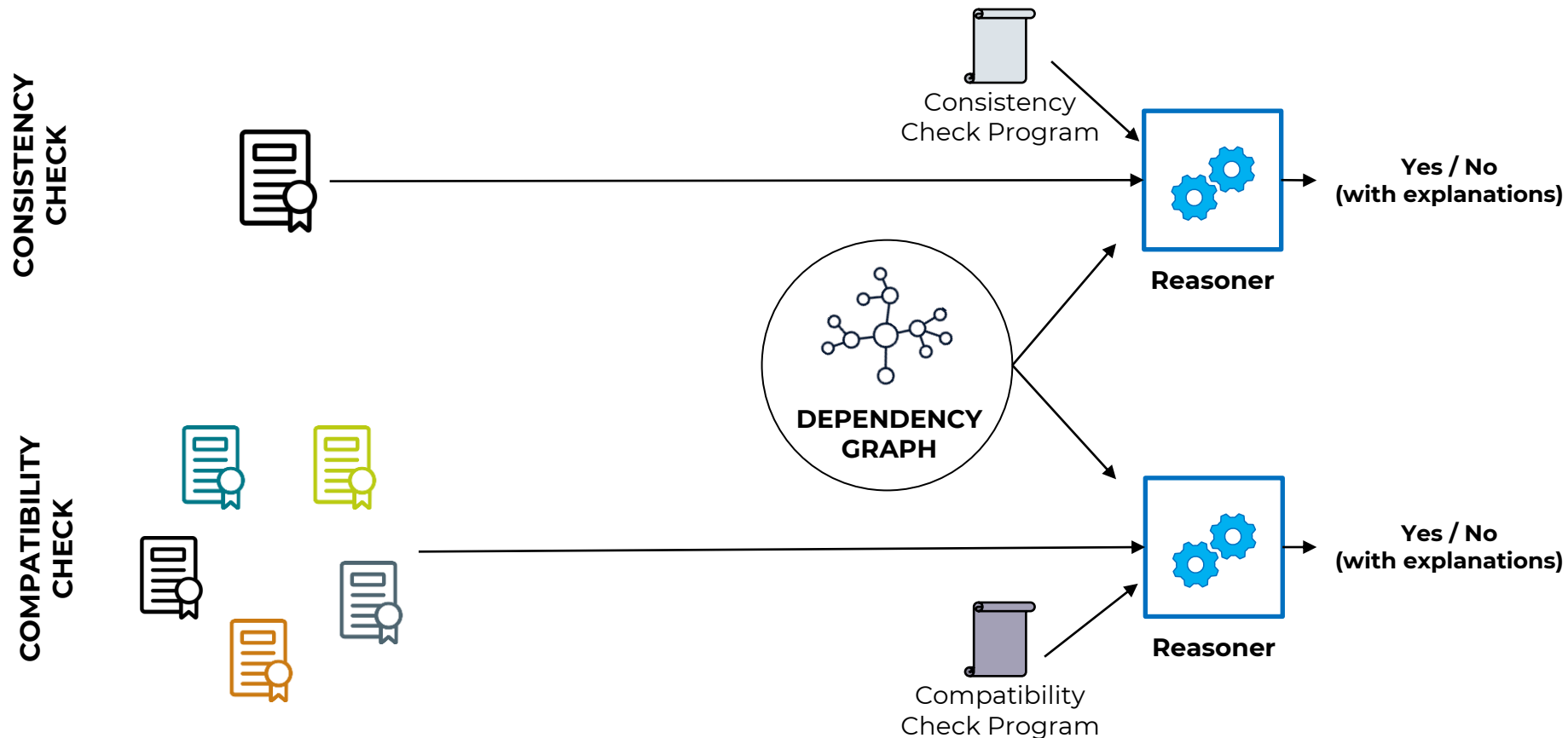
- $\alpha$  owl:sameAs  $\beta$  : all Rules defined for  $\beta$  must also hold for  $\alpha$ , and vice versa.
- e.g., odrl:copy owl:sameAs odrl:reproduce.

### 4. *contradictions between specific actions*

- $\alpha$  dalicc:contradicts  $\beta$  : a Permission of  $\beta$  conflicts a Permission of  $\alpha$ , and vice versa.
- e.g., cc:ShareAlike dalicc:contradicts dalicc:addStatement.



# Reasoning Tasks Overview



# DALICC: The road ahead ...

[www.dalicc.net](http://www.dalicc.net)

## Status Quo:

- Currently 344 (legally approved) open licenses in the library
- <https://www.dalicc.net/license-library/>

## Next steps:

- Which licenses shall be added? (i.e. DANS / Dataverse)
- How can the process of license composition be eased, under special consideration of customized licenses?
- Shall non-IPR usage restrictions (i.e. GDPR, AI Act) become part of the licensing policy or should they be modelled and processed separately?

### Status Quo:

- No user management currently available

### Next steps:

- What end user functionalities are necessary and required for end user license management (i.e. attribution support service; geo-, time- & behaviour-related clauses)?
- What mechanisms can be applied to prevent fraudulent licensing and/or vandalising the system?
- What system can we build upon to combine conditional access with open licensing?

## Status Quo:

- Reasoner is in place & running
- [https://api.dalicc.net/docs#/compatibilitycheck/compatibility\\_compatibilitycheck\\_\\_post](https://api.dalicc.net/docs#/compatibilitycheck/compatibility_compatibilitycheck__post)

## Next steps:

- What can be done to improve / increase the expressivity of the license checking?
- Which (additional) integration scenarios shall we cover that address licensing issues?
- Is there a need for a rule editor for compatibility checks?
- What is the reasoner's potential beyond licensing policies?
- What could be an appropriate end user interface for the service and its output?

## Discussion Point 3

# Visualizing Licenses for better Literacy

### Status Quo:

- Existing visualizations are nice, but expressivity is limited.
- <https://www.dalicc.net/license-library/>

### Next steps:

- What are new and appropriate visualization to display licensing information in a user friendly manner --- especially to stimulate learning about licensing?
- What public awareness and story telling techniques can be applied to illustrate the practical relevance of automated license processing (i.e. in related areas such as sustainability data)?

# Conclusion

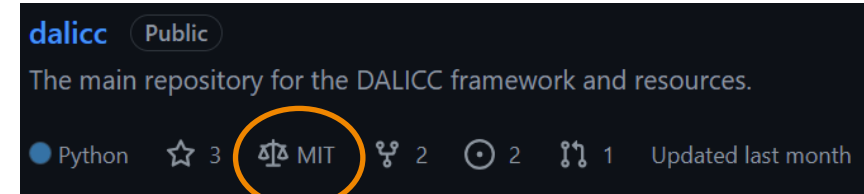
[www.dalicc.net](http://www.dalicc.net)

(Hybrid) Licensing (open + closed) is a **strategic key competence** in digital business management – but it is still perceived as an orchid theme.

Due to **lack of machine-readability** existing license support systems fail to **close the gap between IPR management and access management** – fulfilling the (unholy) promises of DRM.

Improving on **semantic interoperability** is a key requisite to cater for truly **policy-aware systems** – a critical building block for industrial automation.

Machine-processable licenses allow to **integrate usage rights into the broader context of distributed data management** – a precondition for connected dataspace and large scale data infrastructures.



Let there be URIs:

<https://api.dalicc.net/web/license/MIT>



# Thank you for your attention!

**Contact:** [tassilo.pellegrini@fhstp.ac.at](mailto:tassilo.pellegrini@fhstp.ac.at)  
[giray.havur@fhstp.ac.at](mailto:giray.havur@fhstp.ac.at)

**Website:** [www.dalicc.net](http://www.dalicc.net)

## Acknowledgments:

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In 2021 DALICC is funded by the Austria Wirtschaftsservice Gesellschaft mbH (aws), the promotional bank of the Austrian federal government.

Since 01.01.2022 DALICC is funded by netidee Internet Stiftung.

## Awards:

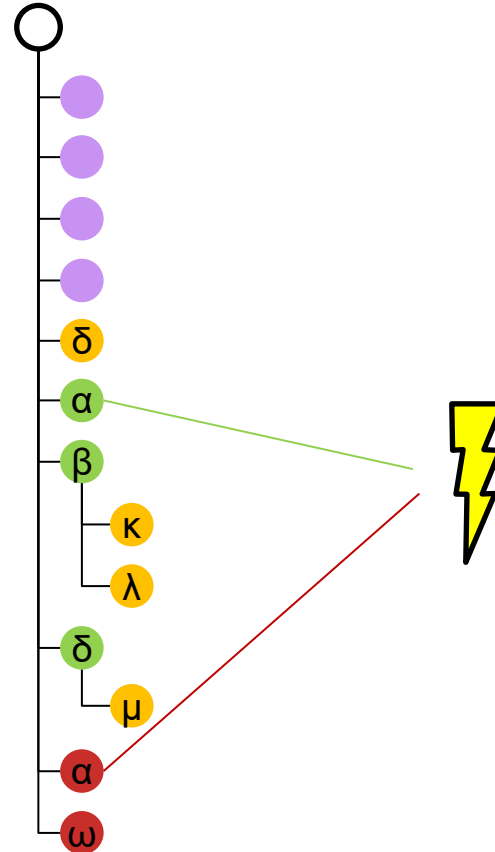
- 2017 ... Winner of IMAGINE ICT Idea Contest
- 2019 ... Lower Austrian Innovation Award
- 2021 ... AWS Prototype Grant
- 2022 ... netidee Data Understanding Award

# Backup slides

# Reasoning Tasks

## Consistency Check

My license v2



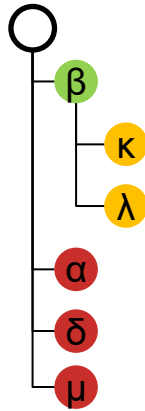
# Reasoning Tasks

## Compatibility Check

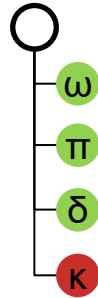
License-1



License-2



License-3

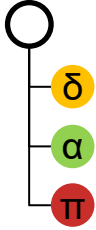


### DERIVED CONFLICTS

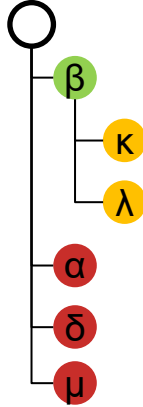
# Reasoning Tasks

## Compatibility Check

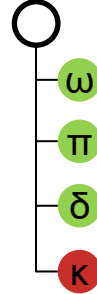
License-1



License-2



License-3



### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited



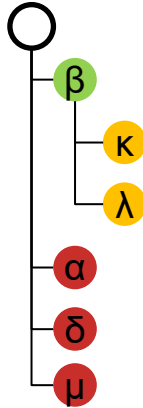
# Reasoning Tasks

## Compatibility Check

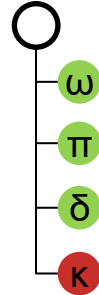
License-1



License-2



License-3

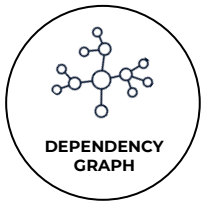


### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited

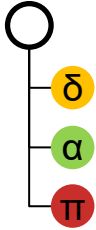


$\kappa$  owl:sameAs  $\beta$

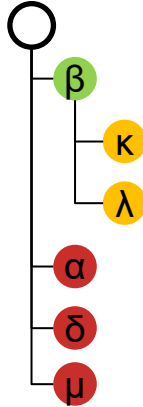
# Reasoning Tasks

## Compatibility Check

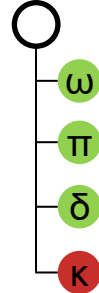
License-1



License-2



License-3



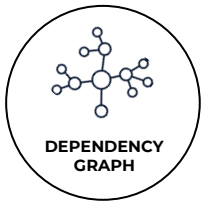
### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited

L2,  $\beta$  permitted **x** L3,  $\kappa$  prohibited



$\kappa$  owl:sameAs  $\beta$

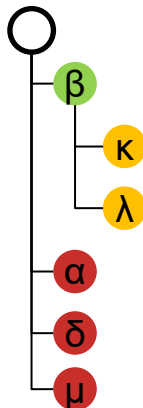
# Reasoning Tasks

## Compatibility Check

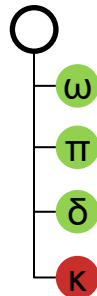
License-1



License-2



License-3



### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

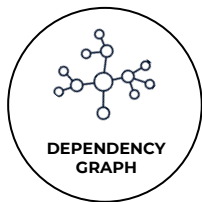
L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited

L2,  $\beta$  permitted **x** L3,  $\kappa$  prohibited

*hierarchical relationships between action*

- $\alpha$  odrl:includedIn  $\beta$  : all Rules defined for  $\beta$  must also hold for  $\alpha$ , but not necessarily vice versa.
- e.g., odrl:display odrl:includedIn odrl:present.



$\kappa$  owl:sameAs  $\beta$

$\omega$  odrl:includedIn  $\alpha$



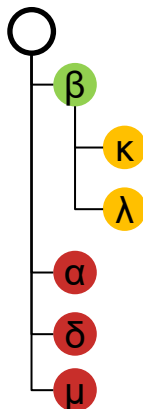
# Reasoning Tasks

## Compatibility Check

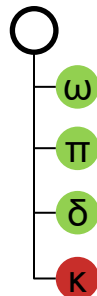
License-1



License-2

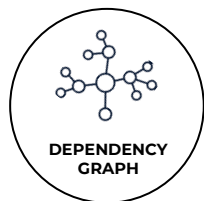


License-3



### DERIVED CONFLICTS

L1, α permitted <b>x</b> L2, α prohibited
L1, δ obliged <b>x</b> L2, δ prohibited
L3, π permitted <b>x</b> L1, π prohibited
L2, β permitted <b>x</b> L3, κ prohibited
L3, ω permitted <b>x</b> L2, α prohibited



κ owl:sameAs β

ω odrl:includedIn α

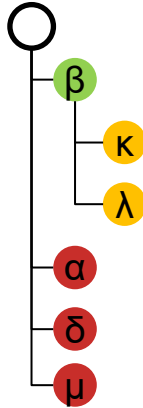
# Reasoning Tasks

## Compatibility Check

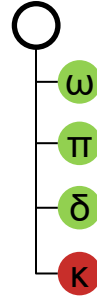
License-1



License-2



License-3



### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

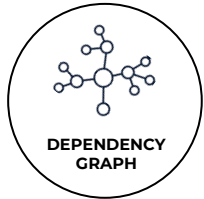
L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited

L2,  $\beta$  permitted **x** L3,  $\kappa$  prohibited

*hierarchical relationships between action*

- $\alpha$  odrl:includedIn  $\beta$  : all Rules defined for  $\beta$  must also hold for  $\alpha$ , but not necessarily vice versa.
- e.g., odrl:display odrl:includedIn odrl:present.



$\kappa$  owl:sameAs  $\beta$

$\alpha$  odrl:includedIn  $\omega$

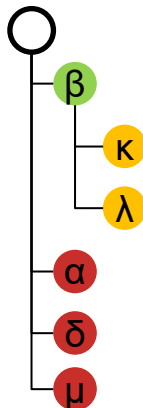
# Reasoning Tasks

## Compatibility Check

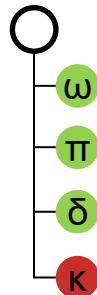
License-1



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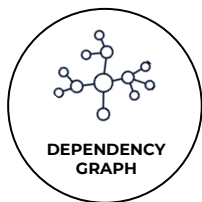
### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited

L2,  $\beta$  permitted **x** L3,  $\kappa$  prohibited



$\kappa$  owl:sameAs  $\beta$

$\alpha$  odrl:includedIn  $\omega$

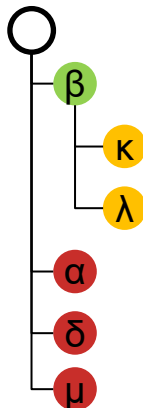
# Reasoning Tasks

## Compatibility Check

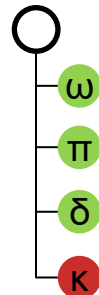
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### DERIVED CONFLICTS

L1,  $\alpha$  permitted **x** L2,  $\alpha$  prohibited

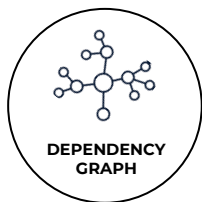
L1,  $\delta$  obliged **x** L2,  $\delta$  prohibited

L3,  $\pi$  permitted **x** L1,  $\pi$  prohibited

L2,  $\beta$  permitted **x** L3,  $\kappa$  prohibited

*implications derived from a specific action*

- $\alpha$  odrl:implies  $\beta$ : a Prohibition of  $\beta$  conflicts a Permission of  $\alpha$ , but not necessarily vice versa.
- i.e., a Prohibition of  $\alpha$  is not in conflict with a Permission of  $\beta$
- e.g., `cc:Attribution` odrl:implies `cc:Notice`.



$\kappa$  owl:sameAs  $\beta$

$\omega$  odrl:implies  $\alpha$

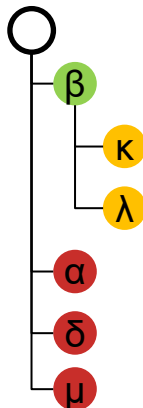
# Reasoning Tasks

## Compatibility Check

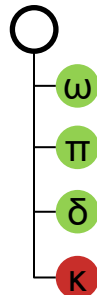
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### DERIVED CONFLICTS

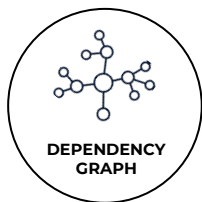
L1, α permitted **x** L2, α prohibited

L1, δ obliged **x** L2, δ prohibited

L3, π permitted **x** L1, π prohibited

L2, β permitted **x** L3, κ prohibited

L3, ω permitted **x** L2, α prohibited

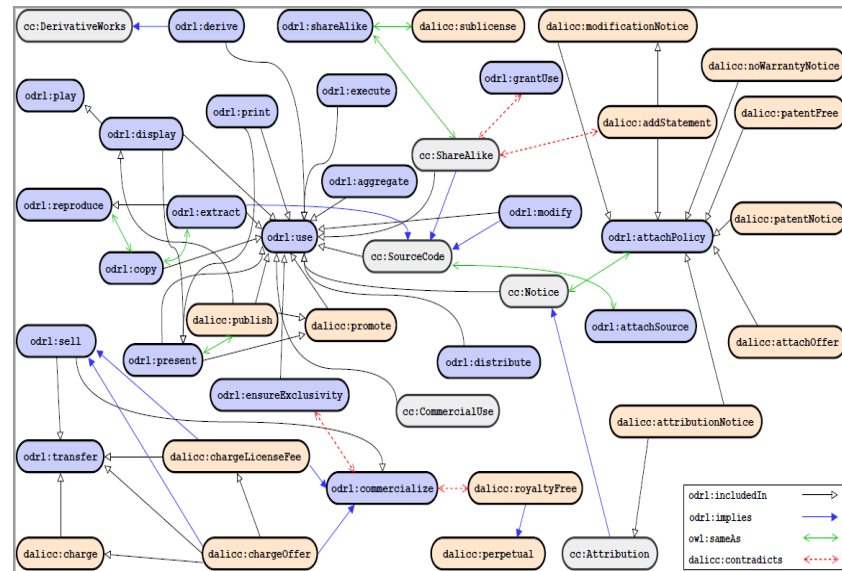
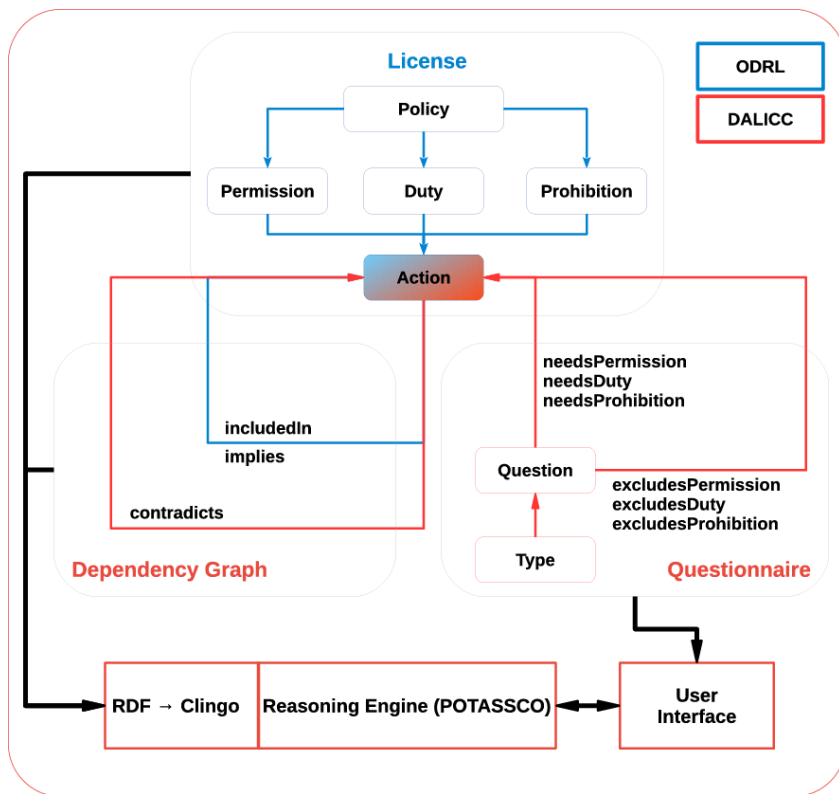


κ owl:sameAs β

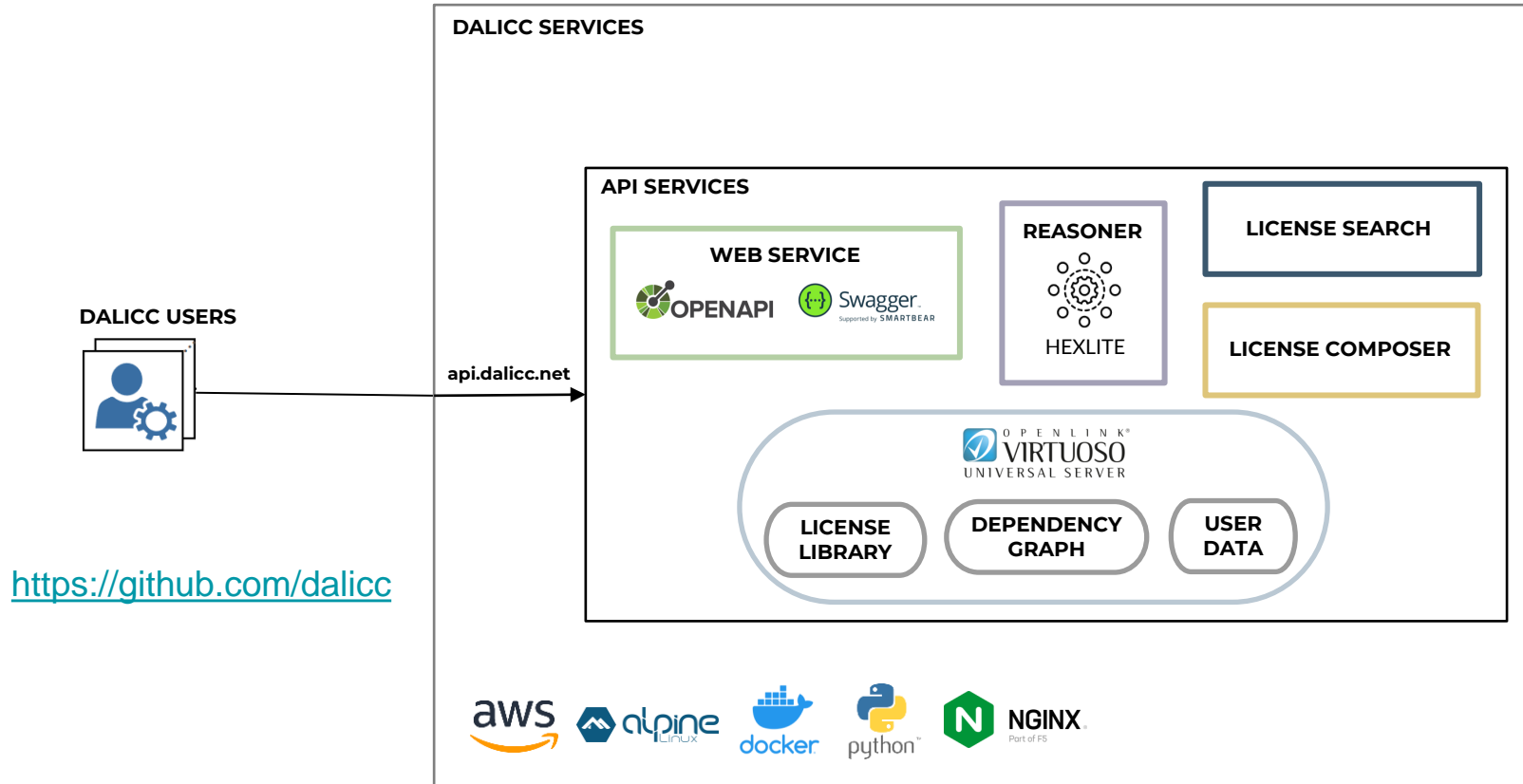
ω odrl:implies α

# DALICC Knowledge Graph & Architecture

## License „Ontology“



## Dependency Graph



<https://github.com/dalicc>



**License Library (incl. Search):** Allows a user to find and select from available licenses.



**License Composer:** Allows a user to create customized licenses.



**License Negotiator:** Checks compatibility, detects conflicts and supports conflict resolution.



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**Legal Audits:** Get a legal audit of your licensing project!



**Maintenance:** New features, updates, performance improvements & security



**Developer Community:** Extensions and PlugIns



**Knowledge Base:** Learning material and educational resources