

Perspective on Open Source Software Licensing

Open Science Workshop 2022 - ESRIN

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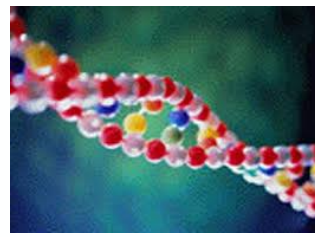
03/11/2022

1. Opportunities and challenges projects across space agencies, industry and academia
2. Guidelines for Open Innovation in space projects, with a focus on EO and open source science
2. Collaboration between space agencies and communities
3. Planning and roadmap of Open Innovation Framework implementation

1. IPR @ ESA
2. ESA licensing process
3. How to safely distribute software/data in compliance
4. How to successfully setup an open source project with ESA
5. Take aways (and references)

Caveat:

this presentation refers to open source software licensing in the ESA context
and less/not to open data, e.g. [science data](#)
and definitely not to [artworks](#)



• Legal Basis



ESA Convention, Article III, INFORMATION AND DATA

- Rules on Information, Data and Intellectual Property (ESA/REG/008), dated 23 April 2014
- ESA Staff Regulations ESA/REG/007, dated 27 February 2014, Chapter II “Duties, Obligations and Privileges”, Regulation 4 “Discretion and IP” (especially relevant for internally generated IP)

• Contractual Basis



ESA General Clauses and Conditions, ESA/REG/002, rev. 3, 5 July 2019

- Contractual conditions vesting IPR in the Contractor (or in ESA where applicable)
- Applicability and regime of Operational Software
- Mention of Open Source licensing option

IPR @ ESA - Specifics



• Programme Boards

e.g. Earth Observation Programme Board

- Rules on Information, Data and Intellectual Property



• Cooperation Agreements

e.g. with the European Commission on Copernicus

- Contractual conditions vesting IPR in the EC (or in ESA where applicable)
- Applicability and regime of Open Source Software, Open Source Data



A word on IPR

- **[Standard regime]** Rights (IPR) granted to ESA by a **licence** to
 - obtain, use and modify source code
 - obtain and use binary code
 - to sub-license modified source code
 - to redistribute embedded binary code

- **[Exception]** Ownership (IP) and **Licensing**
 - E.g. “Operational SW”
 - E.g. Open Source licensing initiated by ESA
 - ESA internally developed SW (see Staff Rules: this case is **not** an exception, but **THE** rule!)



Why does ESA care about IPR?

- To protect European (tax payers) assets
 - Avoid legal court cases
 - ESA/Industry/Academia/Partners image, costs, control
- To enable European Industry's world-wide competitiveness
 - Foster European solutions
 - Avoid monopolistic positions
 - Avoid unacceptable conditions
- To fulfil ESA's mandate to distribute European assets to Industry
 - Control over the assets
 - Allow further development
 - Enable product dissemination
 - Allow new applications and services
- To enable distribution, cooperation, collaboration



Licence – Licensability – Distribution – Licensing

1. Licence

Official document showing that permission has been given to do, own or use something

2. Licensability

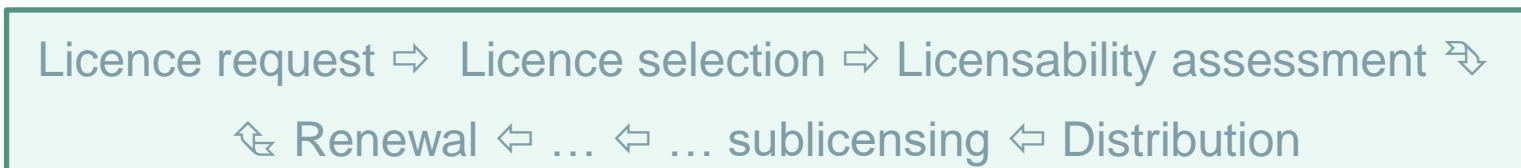
Technical assessment of the compatibility of a software package with its licence

3. Distribution

Act of passing on a software package to any third party to ESA

4. Licensing

Process governing the distribution by ESA of a software package to any third party



Software Distribution requires...

Two distinct Processes:

- Production of a **licensable** product
- Issuance of a **licence** on the product

Performed under the responsibility of two different ESA areas:

- Technical **Initiating Services**: produce a licensable SW
- **Procurement** (with support from Legal): issue a licence

⇒ A **blend of technical, legal and commercial skills** are needed to understand the licensing and usage conditions, such that they do not impede the SW product's intended use and/or the licensing process;

⇒ This blend is an asset at ESA level: **not every TO/CO needs to have all the above skills**

⇒ **AWARENESS IS, HOWEVER, A MUST.**

ESA Software Licensing Board

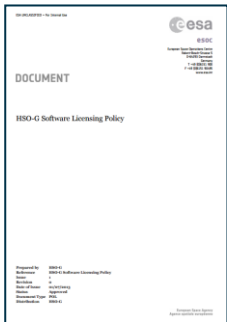
• Governance body



○ ESLAB ADMIN ESA/ADMIN/CTEE(2013)1 of 19/03/2013

- Define general ESA-wide rules and guidelines on ESA SW licensing
 - Monitor the legal implications of software development and licensing
 - Determine whether ESA can safely (sub)license software when it is released for use or further development
- ⇒ Delegation to local boards for day-to-day matters

• ESLB Licensing policy

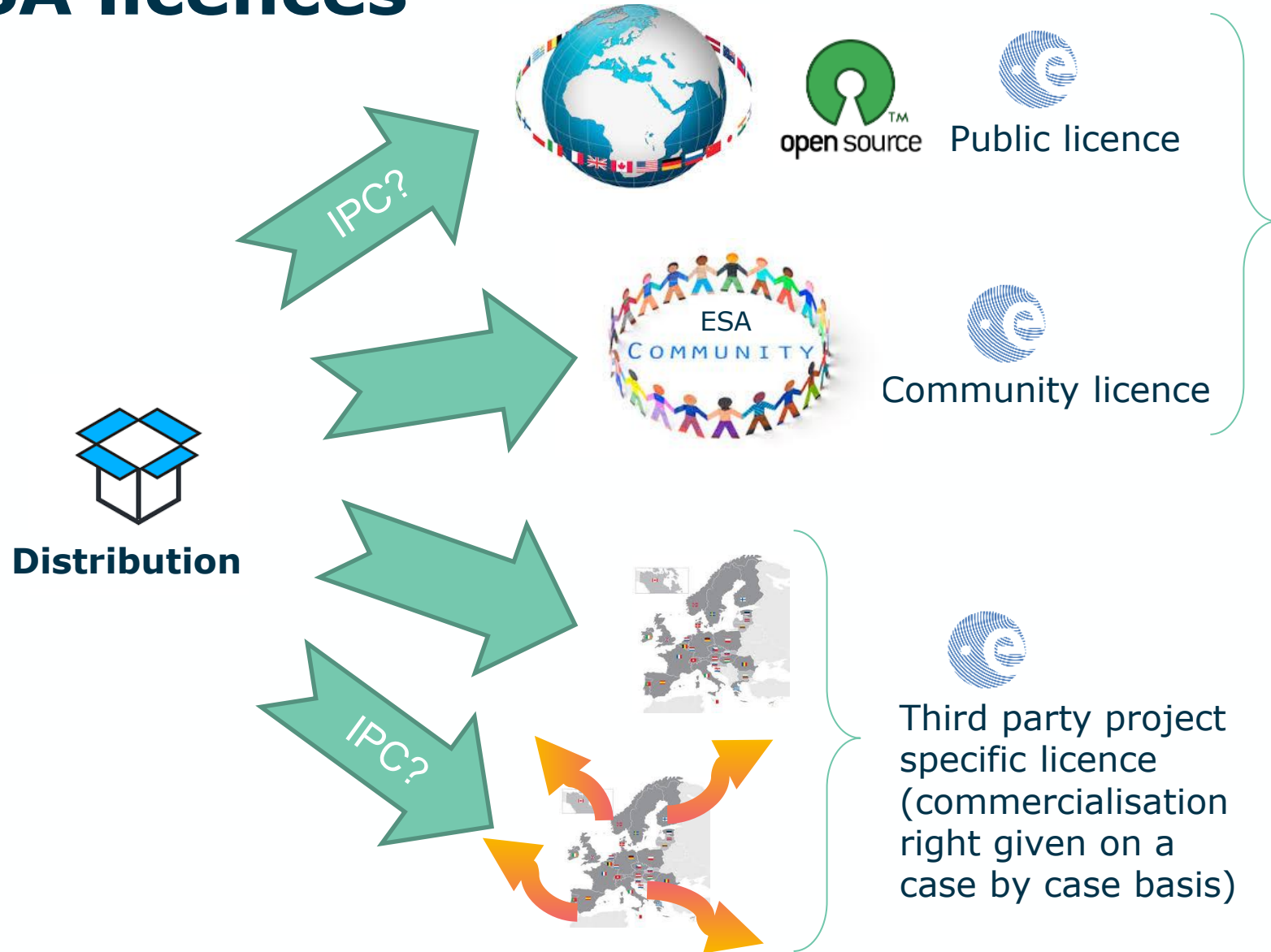


○ Adopts the original OPS-G licensing policy of 01/07/2013

- Definitions (licensability conditions, use of 3PP, licensable SW...)
 - Licensing procedure
 - Distribute licensable SW only (list)
 - Cases in which IPR assignment to ESA is required
 - Library of available ESA (standard) licences
- ⇒ **Programme rules**
- ⇒ **Contractual clauses**
- ⇒ **SoW requirements**

ESA licences

List at <https://license-request.esa.int/ESALicense/>



3 flavours:

- Permissive (~MIT 1.0)
- Weak copyleft (~MPL 1.0)
- Strong copyleft (~GPL 2.0)

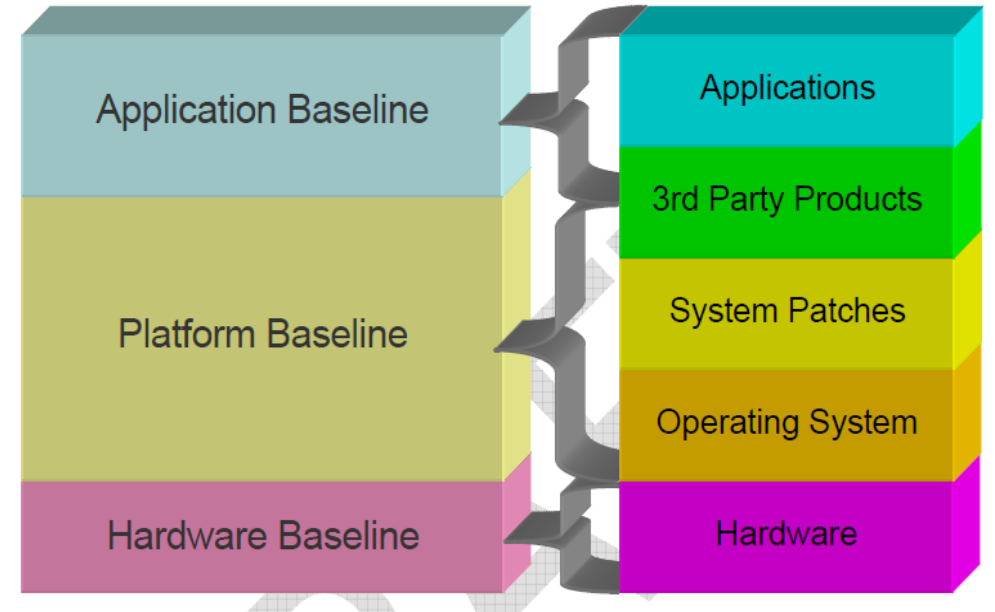


Scope of Licensability

- ❑ Need to know what rights are required on the SW, i.e. to be released by ESA under what terms and conditions

- ❑ Full visibility on the “contents” of the deliverable SW:
 - Bespoke software
 - Any 3rd party code (incl. licensing conditions)
 - Any 3rd party product (incl. licensing conditions)
 - Any 3rd party dependency (incl. licensing conditions)
 - Documentation

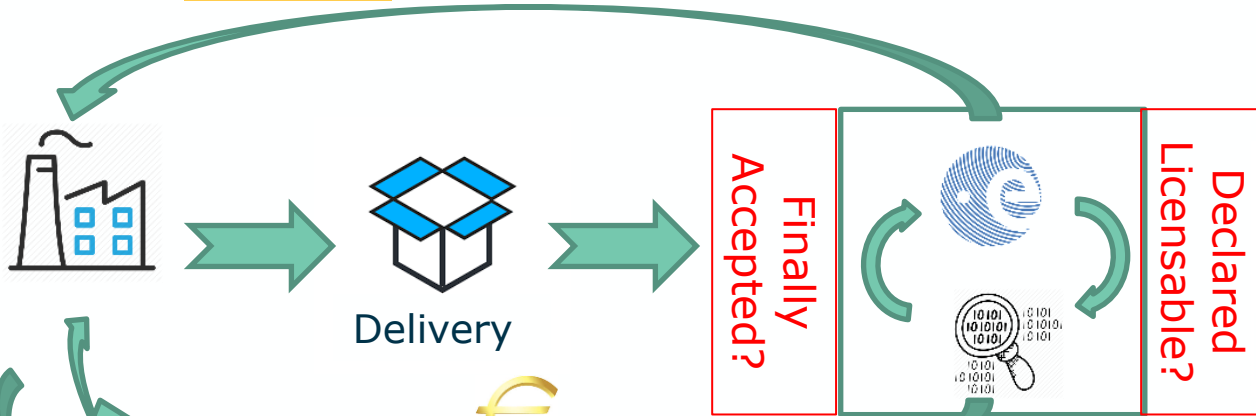
- ❑ Matching the two above aspects



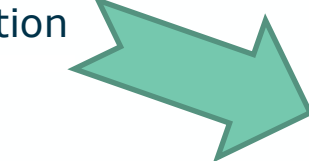
From developer to licensee



- Default GCC: IPR with contractor
- Operational SW clause: ESA IPR
- Open Source clause: ESA IPR



Distribution



<https://license-request.esa.int/ESALicense/>
<https://essr.esa.int/license/list>



Licensability Assessment



Licensability means **demonstration** of:

- no third party copyright infringement
 - at source code level
 - at binary code level

- 3rd party licences compatibility
 - wrt 3rd party code/product implementation
 - with each other 3rd party code/product
 - with the licence covering the distribution



This relies on:

- Software planning, i.e. defining which is the intended distribution before coding
- List all 3rd party products, dependencies and code licences
- Code traceability
- Development guidelines, good practices, technical recipes
- Document all IPR aspects in the Delivery Note

Tools to ensure licensability

1. **TO+CO interaction** (\leq pre-TEB): **discuss and define requirements wrt intended use, IPR, licensing, SW reuse**
2. **Software Reuse File** (SoW and Model Contract)
 - ⇒ Identify/correct any non-compliances wrt licensing objectives throughout the development lifecycle
3. **Bill of Material** consolidation along development process
 - ⇒ Check 3rd party product, dependency and code licence conditions, compatibility and compliancy
 - ⇒ Record justifications of the above
 - ⇒ Take actions if issues
4. **Software Delivery Note** check prior to final acceptance
 - ⇒ SRF, BoM complete and justified
 - ⇒ absence of non approved 3PP or infringing OSS snippets
5. **Get contractual deliverables**
 - ⇒ Statement that only approved 3rd party products are delivered
 - ⇒ List of agreed 3rd party products with implementation and compatibility justifications wrt licences
 - ⇒ Code analysis (based on provided code scan reports) with justifications and actions settlement

ESA Software Licensing Board Process

Principles:

- **Decision** on what is licensable
 - **Applicants** (technical Initiating Services) need to **provide all relevant information** via a standard form (support from responsible CO);
 - A **decision by the ESLB is final** and can only be revoked by the Board itself or, in case of appeal due to disagreement, by DG;
- **ESLB clearance is required prior to any release**
 - No (sub)licence may be issued without prior ESLB/SLB clearance;
 - **ESLB/SLB clearance only valid for one specific SW issue/release.**
 - **New (delta) clearance required in case of modifications / new releases;**
 - Procurement will verify release clearance before issuing any SW licence.

Wow...

Ok

but now...

How to open source?

ESA-PL in a nutshell



• What is ESA-PL

- ESA-PL complies with the ESA Convention: European jurisdiction of law, arbitration and immunity
- It is an Open Source Licence with 3 flavours: permissive, weak and strong copyleft
- They are very similar to, respectively: MIT, MPL and GPL
- They have been submitted to the Open Source Initiative in 2017 and are still to be approved
- **BUT they are already used in several projects (github.com/esa)!!!**

• How to use the ESA-PL

- A **change** of mentality and culture to plan, develop & maintain software
- **Grant IPR** to ESA Members States industry/academia/institution
- **If ESA IPR, use the Open Source Clause and then follow the ESA licensing processes**



EPL 2.0 in a nutshell



- ESA is a Strategic Member of the Eclipse Foundation since July 2021
 - The Eclipse Public Licence **2.0** is compliant with the ESA Convention
 - ESA staff can contribute to Eclipse projects
 - ESA can create Eclipse projects
- How to use the EPL 2.0:
 - Contribute: register as an employee of an Eclipse Member Organisation in <https://www.eclipse.org>
 - Create a project:
 - check if this is IPC/Programme approved
 - If yes, then follow the <https://www.eclipse.org/projects/handbook/#starting>
 - If no, then
 - Either use e.g. EXPRO Contract template, Article 6.2.2. using option 1 – sub-option 2
 - Escalate to the Programme Board ?
 - **Submit a Transfer Request form to IPC or get industry/academia to trigger their delegate**¹⁹



CODEV in a nutshell



- What is CODEV?

- An **idea** how to execute Community Development in ESA context
- **Plain and basic**
- A collaboration **platform** → <https://gitlab.space-codev.org>
- A **community** (governance building blocks and templates)
- **600 users today across ESA Member States, 130+ projects, 30+ project communities**

- How to use CODEV?

- **Change** mentality and culture to plan, develop & maintain software as a community
- **Sign up as contributors** from ESA Members States industry
- **IPC approval of worldwide distribution of ESCL binaries**

- How to apply the ESCL: talk to your CO to e.g. tailor Clause 42.4 of ESA Standard Procurement along

- EXPRO Contract template Art. 6.2.2, using option 1 – sub-option 2, **without any IPC approval!!!!**

Otherwise...

- Grant IPR to the Contracting company/academia/institution
 - agree on the desired licence
 - agree on the desired repository
 - agree on the governance

- The Contracting company/academia/institution:
 - manages any release and contribution
 - manages the resources and assets
 - is the sole responsible for the content

Or...

- Keep ESA IPR and:
 - Comply with ESLB and IPC processes 
 - Cater for time and funding to have ESA distributing ESA SW under ESA-PL or EPL 2.0



Before the Conclusions



Take Away

Our goal: **ENABLE** licensing, distribution and collaboration, but in a controlled way (risk management)

No licence, no use: never use/pass SW to third party without any signed licence

Avoid delays by **planning** and informing prior to coding (i.e get **clear** IPR/Licence in agreements, programmes...)

Get Deliverables including **demonstrated** IPR documentation

ESA staff shall refer to ESLB and use ESLB templates, instructions, guidelines, tools - **ask for support:**

- Technical: Cristiano LOPES
- Procurement: Benjamin JEUSSET

Industry/academia/partners shall refer to the **ESA TO/CO** relevant to their activities.

Industry/academia/partners are invited to **lobby** their delegates to approve worldwide ESCL binary distribution

Recommendation: grant IPR to industry/academia/partners

agree to **preferably** distribute under EPL 2.0 or ESA-PL 2.4

References

- ESA IPC papers: (2002)3, (2006)68, (2009)31, (2009)88, (2010)107, (2012)36, (2012)138
- ESA OSS Policy: <https://essr.esa.int/esa-open-source-policy>
- ESA Licensing Processes: <https://arc.aiaa.org/doi/pdf/10.2514/6.2018-2330>
- Request ESA licence on ESOC products: <https://license-request.esa.int/ESALicense/>
- Access ESA software: <https://essr.esa.int/license/list>
- Access ESA Open Source Software: <https://github.com/esa>
- Access ESA Software Community: <https://www.space-codev.org>
- As a source of inspiration:
 - <https://ospo.zone/ggi/>
 - <https://opensource.com/article/20/5/open-source-program-office>
- Food for thoughts/further developments related to code composition tooling:
 - <https://oss-compliance-tooling.org/>, <https://www.openchainproject.org/>, <https://git.osadl.org/codjinn>
 - CM22 GSTP AI Compendium – CD9 Activity “Artificial Intelligence based Source Code Scanning Open Source Tool (AI-b.CST)”