Navigating the ESA Licensing Process: Best Practices and Key Considerations

(with a twist!)

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Introduction

The software licensing process defined by the European Space Agency (ESA) in the Science Operation Departments is a crucial activity, which relies on the technical support from the Product Assurance function

But it's also kind of boring. So, let’s *space* things up !

ESA Software Licensing Process

Its aim is to ensure that all software developed for space science operations meets the necessary legal requirements for licensing and IPR compatibility with other software before it is distributed outside the Agency.
No line of code can be distributed outside without the proper license in place

Type of operational software developed here:
Mission planning software:
This software is used to plan the trajectory of the spacecraft, the operations of its instruments, and the data downlink

Telemetry processing software:
This software is used to collect, store, and process the data that is transmitted from the spacecraft

Data analysis software:
This software is used to analyse the data collected by the spacecraft's instruments

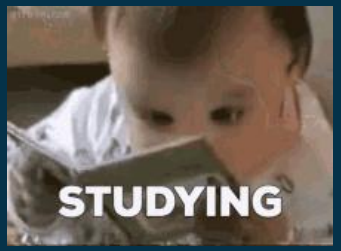
Archive Software, Calibration Software..

Open Source Software (OSS)

- Open source software (OSS) is software whose source code is made available to the public under a license that allows anyone to use, study, change, and improve it
- OSS has become increasingly popular in recent years due to its many benefits, including lower development and maintenance costs, increased software quality, and avoidance of vendor lock-in
- The European Space Agency (ESA) has been increasingly using OSS in recent years, and has developed a clear strategy on OSS that opens up opportunities for industry in a global market
- When distributing OSS outside of ESA, it is important to obtain authorization from the ESA Software Licensing Board
- There are two main schemes for distributing OSS outside of ESA:
  - **ESA Community Software:** For software that is only used within the ESA Member States
  - **World-wide OSS:** For software that is used outside of the ESA Member States, or that supports the implementation of open standards or the processing of mission data

ESA Licenses

First thing they make you study when entering this business:



Here is a brief description of the **European Space Agency (ESA) Community License (ESA-CL)** and the **European Space Agency Public License (ESA-PL)**

- The ESA-CL and ESA-PL are open source software licenses developed by the European Space Agency
- They are designed to promote the sharing and reuse of space software
- The ESA-CL has three versions: weak copyleft (Type 2), strong copyleft (Type 1), and permissive (Type 3)
- The ESA-PL also has three versions, with the same copyleft strengths as the ESA-CL

ESA Licenses

- The **ESA-CL weak copyleft** (Type 2) allows for commercial use and redistribution of the software, but any modifications must also be released under the ESA-CL
- The **ESA-CL strong copyleft** (Type 1) is similar to the weak copyleft version, but it also requires that any software that uses the ESA-CL software must also be released under the ESA-CL
- The **ESA-CL permissive** (Type 3) is the least restrictive version of the ESA-CL. It allows for commercial use, redistribution, and modification of the software without any restrictions
- The **ESA-PL** is similar to the ESCL, but it is to be used if world-wide licensing is needed

The ESA Software Licensing Process #1

The ESA Software Licensing process consists of the following steps:

- The Requester (usually managers from the various space missions) send an email to the ESA Software Licensing Board (ESLB) with the filled-in ESAC SW Licensing Authorisation Form
- The Requester provides information on the product and purpose of the SW
- The Requester provides 3rd party product analysis and source code access
- The ESA Software Licensing Board (ESLB) reviews the form and provides comments to the Requester (e.g. which type of ESA license they should ask)

The ESA Software Licensing Process #2

- The Request is added to the ESLB Jira and Confluence projects and a Jira ticket is created
- The Requester performs the analysis of the source code and dependencies and submits it to PA Transversal
- PA Transversal reviews the access to the source code and dependencies analysis and provides feedback to the Requester and ESLB (through FOSSID software)
- A ticket is created in the PA Jira instance to track this activity by the PA Transversal service
- A decision is taken by ESLB on whether to go ahead with the Copyright and Licensing Analysis

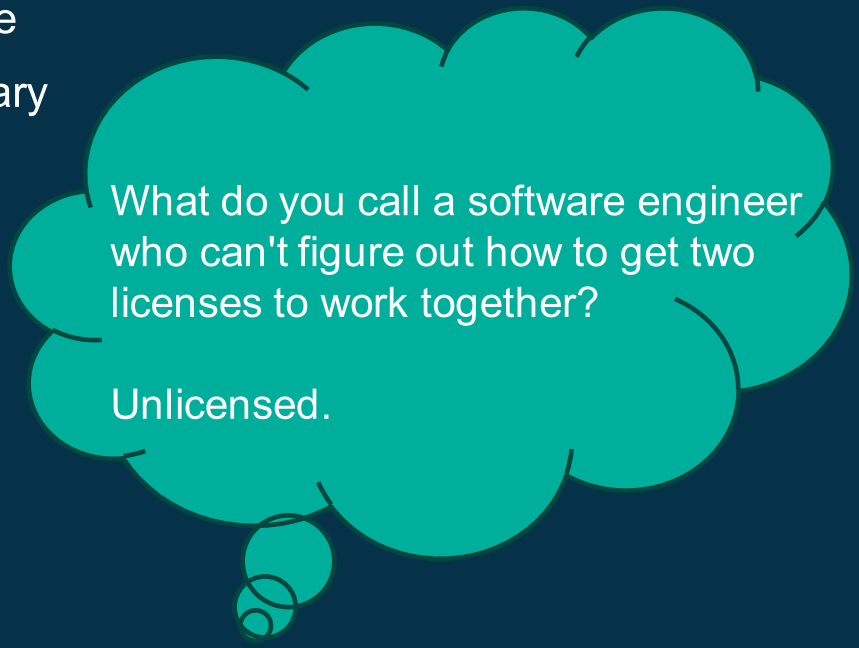
PA Transversal Role in Software Licensing Process

PA Transversal Team is committed to making the process faster and more efficient by:

- **Defining procedures**
- **Configuring tools (Jira Board, Confluence..)**
- **Providing support to missions to fill out the form and perform the license analysis**
- **Discussing with ESLB and acting as a bridge to missions**
- **Discussing with developers about potential conflicts in source code/dependencies**

The ESA Software Licensing Process - Considerations

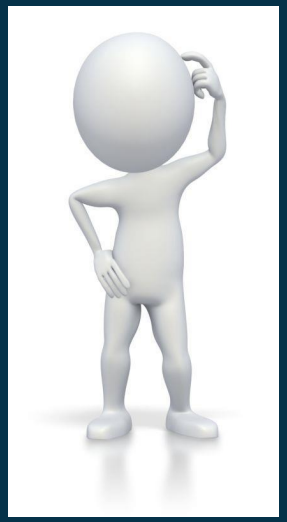
- The process can take several weeks (months) to complete
- The Requester is responsible for providing all the necessary information and documentation
- The ESLB may require additional information or clarifications
- The Requester may be required to make changes to the software
- The final decision on the license request is made by the ESLB
- PA Transversal Team is key to facilitate a smooth overall process



Case Study: BepiColombo Software Module

Why did the software developer get a GPL license for his new software?

He wanted to make sure that everyone could use it, even his enemies



A BepiColombo software module encountered complications during the process of obtaining an ESA license due to an apparent incompatibility with the GPL license

Tricky problem found with the use of mysql-connector-java 8.0.23 component (compatibility issue between GPL v2 and LGPL v3). In the end, way forward proposed based on the so-called "FOSS exception" that comes together with the MySQL license for some components

Due to this exception it was possible to grant LGPL v3 as requested

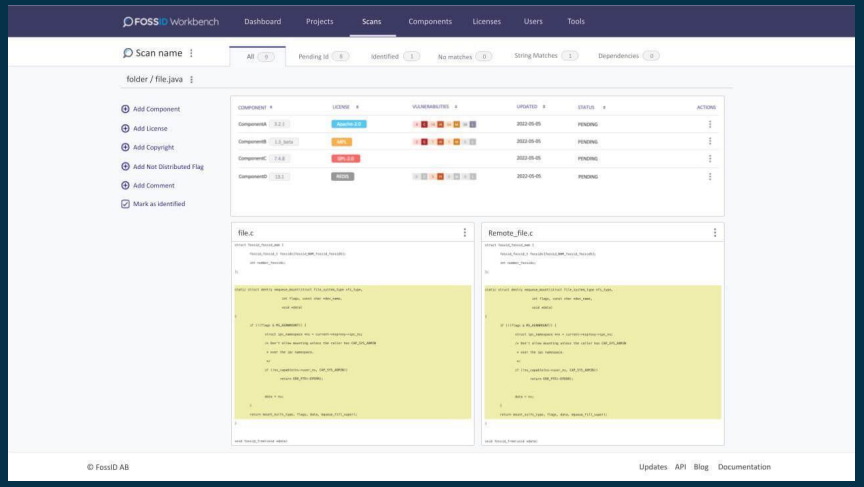
(L)GPL = (Lesser) General Public License | FOOS - Free and Open-Source SW

Importance of FOSSID Licensing Tool

The FOSSID licensing tool can be used to automate the analysis of third-party software and identify potential licensing issues.

FOSSID provides a range of capabilities, including a Command Line Interface (CLI) and a user-friendly web interface

By integrating FOSSID into the development pipeline, software developers can gain the advantage of early identification of problematic third-party software or suspicious code snippets



Best Practices for Navigating the ESA Licensing Process

The following are some best practices for navigating the ESA licensing process:

- Early identification of all software components used by the projects that may potentially be subjected to distribution to external parties
- Careful analysis of the licenses of these software components to determine their compatibility with the ESA license
- Development of clear guidelines for software development and integration that take into account the licensing requirements
- Regular review of the licensing status of all software components used in the project
- In the context of licensing risks mitigation and management:
  Risk identification, Risk assessment, Risk mitigation, Risk monitoring

Conclusion

The ESA software licensing process is a complex and challenging task, it needs expertise and experience, but it is essential to ensure the compliance of all software developed for space science operations

By following the best practices and key considerations outlined in this presentation, software developers can navigate the ESA licensing process successfully and mitigate the risk of licensing violations

Useful Links & Questions?

ECSS website: https://ecss.nl/standards/

ESA License: **https://essr.esa.int/license/list**