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| **Keywords:** |  Open, Source |
| **Abstract:** | The purpose of this contribution is to clarify the use of terminology related to open source software. Further it recommends that the ITU-T should raise awareness within the standards community on the use of open source software and methodologies. |

# Introduction

The topic of open source has been recently discussed in TSAG at an Ad hoc group that was formed during the February 2016 meeting of TSAG (R-7 Study Period 2013). The Ad hoc concluded that TSAG should avoid defining any particular engagement models and that contributions are invited to help identify problems and establish the needs associated with open source. The discussion on open source continued at the July 2016 meeting (R-8 Study Period 2013) where it was reinforced that IPR issues should be deferred to the TSB Director’s Ad Hoc on IPR, while continuing to invite contributions on how ITU-T can engage effectively with the open source community. Resolution 90 (Rev. Hammamet, 2016) resolves that TSAG will continue to work on the benefits and disadvantages of implementing open source projects in relation to the work of the ITU-T. In order for a more thorough understanding of how open source relates to the ITU-T and to provide proper guidelines for the use of open source a number of terms need to be defined.

# Discussion

A review of the literature shows that most of the open source definitions point to the Open Source Initiative (OSI) as the most detailed framework to describe open source. The term open source as defined by the Open Source Initiative (<https://opensource.org/osd>) provides a ten-part set of characteristics for software to be considered open source as follows:

The Open Source Definition

Introduction

Open source doesn't just mean access to the source code. The distribution terms of open-source software must comply with the following criteria:

1. Free Redistribution

The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.

1. Source Code

The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost, preferably downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.

1. Derived Works

The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

1. Integrity of The Author's Source Code

The license may restrict source-code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

1. No Discrimination Against Persons or Groups

The license must not discriminate against any person or group of persons.

1. No Discrimination Against Fields of Endeavor

The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

1. Distribution of License

The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.

1. License Must Not Be Specific to a Product

The rights attached to the program must not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

1. License Must Not Restrict Other Software

The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be open-source software.

1. License Must Be Technology-Neutral

No provision of the license may be predicated on any individual technology or style of interface.

Much of the description is about the licensing mechanisms which are under the purview of the TSB Director’s Ad Hoc on IPR so the specifics of licensing are not discussed here. However, there are key points in the definition that help describe how open source can be used by the ITU-T.

* Free Redistribution: This clause is where the “Free” in “Free Open Source Software” comes from. The use of the term Free in this context is about freedom (like freely available), not free as in no-cost or without licensing royalties. One aspect of the Free Redistribution clause is the openness of the distribution, meaning access to the software is completely transparent to anyone without the use of a paywall or user verification/identity (e.g. TIES account).
* Source Code: The code that was used to create the end product (which can be a computer program, part of a computer program, or a reference implementation or part of a reference implementation) is also available without restrictions to access.

There are a number of ways that open source can be leveraged in the ITU-T, however, careful consideration of the impact of integrating an open source methodology with the consensus-based process described in the A.series must be completed.

There are two areas to separate:

1. Use of open source software
2. Development of open source software.

The use of open source software has a number of positives including the fact that the software is freely available and the ability to customize the solution. However, open source software requires an infrastructure to support its use and deployment in solutions.

Developing open source software is another issue. The mechanisms, tools, and working methods are very different to the consensus approach used to develop an ITU-T recommendation. Open source development tools can be used to develop source code in a standard that is then privately held (e.g. the tools could be deployed behind a TIES account). The result is not open source, but would provide a collaborative environment for ITU-T members to collaborate on the development of software. This could be useful when working on reference implementations as discussed in Res 90.

# Conclusion

Open source provides a shift in thinking regarding the development of networking technologies. The ITU-T needs to be active in the standards ecosystem to determine how best to leverage the power of open source while maintaining the architectural constancy and interoperability that traditional standards bring.

**Recommendations**

It is recommended that:

1. The ITU-T should generate a definition of open source.
2. The ITU-T should consider the adoption of the Open Source Initiative (OSI) definition for Open Source.
3. The ITU-T should also raise awareness within the standards community on the use of use open source, open source software, and open source methodologies for solution development and deployment.
4. The ITU-T further investigate the use of open source and contributions to TSAG are invited.

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