



ESCHER Tool Repository

Tool Qualification Criteria

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Introduction

This report presents the criteria that will be used to qualify and monitor embedded systems tools for inclusion in the ESCHER Repository.

The criteria presented herein are preliminary and are expected to evolve through feedback from industry, government and research organizations.

Repository Principles

The goal of ESCHER is to promote the creation and transition of open, integrated tools and technologies that enable the predictable and controllable development of mission critical embedded systems. Towards this goal, ESCHER will host a quality controlled Repository for hybrid and embedded systems tools based on the following principle:

1. Tools in the ESCHER Repository are controlled at the Developers' site. This means that the primary source for obtaining a tool, reporting bugs, etc., is the developer itself and the developer is responsible for maintaining, upgrading and versioning the tool
2. Although ESCHER sets certain requirements for the licensing model used by a tool, participation in the ESCHER Repository does not change the IP status of the tool.

Tool Qualification Criteria

Intellectual Property (IP) Rules

Tools in ESCHER Repository satisfy the following IP baseline:

1. Unrestricted use (in research and/or in product development) company wide.
2. Open source licensing model

In general, the licensing model chosen by the tools must satisfy the following requirements:

1. Disclaim liability for other's use of OSS
2. Free redistribution of OSS as part of aggregate
3. Source code made available
4. Derived work allowed and freely distributable subject to Trademark restrictions
5. Derived works may be required to have different name than the original OSS
6. Costs of distribution may be charged
7. Access without discrimination
8. OSS license must not restrict software distributed by licensee along with OSS

A tool developer may choose from one of the accepted open source software (OSS) licensing models as recommended by Open Source (www.opensource.org). Examples for these models are the following:

1. Academic Free License
2. BSD
3. Common Public License (CPL)

However, a tool using a licensing model that is a viroid, such as the GNU General Public License (GPL), will be excluded from the Repository.

Tool Dependencies

Tools should explicitly disclose all dependencies on other tools, software and platforms. This disclosure should contain enough information to enable the user to determine implications of using a tool vis-à-vis:

1. The user should be fully informed of any copyright issues involved in using a tool because of its dependencies. Also, usage of a tool should not change the user's rights to the system that the user is developing.
2. If a tool uses proprietary software, user should be made aware of any licensing costs associated with that software.
3. The user should be made aware of any platform compatibility issues.
4. The number of other tools that will need to be installed and the effort and skills required.
5. The hardware, networking, etc. configuration and resources needed.

Functional Integrity

A tool must demonstrate its functionality and claimed features. For this, the tools developers must make available:

1. Functional specifications (or logical design) and any other documents that clearly outline the features and expected behavior of the tool and its interfaces.
2. Test suites for the tool. The test suites may consist of automated test scripts/executables and manual test scripts.
3. The developer will be responsible for testing the system and generating reports about features tested/passed.

ESCHER, or anyone else, should be able to use the test suites to verify the developer's claims. Feedback from the user community will be used to assess functional integrity.

Integratability

Tools in the Repository will be required to contain interfaces that conform to the following tool integration frameworks:

1. **OTIF:** The Open Tool Integration Framework (OTIF) (<http://www.isis.vanderbilt.edu/Projects/WOTIF/default.html>) is software infrastructure for building tool integration solutions. OTIF provides a meta-model driven infrastructure for design tool integration, which facilitates the semantic interoperability across the elements of a tool chain. OTIF is based on open standards such as OMG's MOF and CORBA/IDL and is itself an open standard.
2. **Eclipse:** Eclipse (www.eclipse.org) is an open source software development project dedicated to providing a robust, full-featured, commercial-quality, industry platform for the development of highly integrated tools. It provides a focal point for diverse tool builders to ensure the creation of best of breed tools for the Eclipse Platform and provides new channels for open source developers, researchers, academics and educators to participate in the on-going evolution of Eclipse.

The tools must also include test suites, as for Functional Integrity criteria, to determine compliance. The developers should

1. Clearly state the specific interfaces that the tool conforms to. A tool may conform to only a subset of the interfaces that OTIF and Eclipse define. The tool will be evaluated for successful implementation of these interfaces only¹.
2. Provide test suites for the interfaces. The test suites may consist of automated test scripts/executables and manual test scripts.
3. The developer will be responsible for testing the interfaces and generating reports about the test results.

¹ However, ESCHER will editorialize about the missing interfaces and how the absence of some interfaces may or may not have an effect on the tool's usability and integratability.

ESCHER, or anyone else, should be able to use the test suites to verify the developer's claims. Feedback from the user community will be used to adjust the rating.

Documentation

This is a **Compliance** criterion.

The tools in the Repository must provide the following documentation:

1. User Manuals
2. Reference Manuals

The above two artifacts should be made available in paper, electronic and online forms.

User Support Criteria

This is a **Compliance** criterion.

A tool should provide artifacts that aid the user, such as:

1. Download and versioning facilities, such as a CVS Repository for the tool.
2. Discussion boards/ mailing lists with active participation by the tool developers.
3. Bug Reporting mechanisms, e.g., Bugzilla. The bug reports must be monitored and responded to by the developer. The developers must publish plans for addressing the bugs and incorporate the bug fixes in periodic, scheduled releases and hotfix releases as needed.
4. Mechanisms for submitting features requests (could be part of the bug reporting system). Feature requests should be handled in the same manner as bug reports, with possibly lower priority.
5. Tutorials (print media, electronic and/or web-based)
6. Training
7. FAQs
8. Online Help

Development QA Processes

This is a **Compliance** criterion.

The development processes used for tool development must be transparent and must employ some commonly used QA procedures and mechanisms, such as:

1. A well defined process for requirements gathering, design, development, testing and stabilization of the tool, with specific milestones for each stage.
2. Clear separation of conceptual, logical and physical design.
3. Coding standards.
4. Code reviews.
5. Daily builds.
6. Testing and stabilization.

Conclusion

In this report we have presented certain criteria that will be used to qualify embedded systems tools for inclusion in ESCHER's Repository. The criteria cover many aspects of a tool that determine how successfully the tool may be used for developing embedded systems. And have varying degree of rigor associated with them. The criteria are expected to evolve as the feedback from embedded systems community is received over the next few months.