

Certification Framework

Open Source Software

A certification framework for determining the suitability of open source software and their projects for production and enterprise deployments.

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1 Introduction

1.1 Overview

The **Instaclustr Certification Framework for Open Source Software (ICF-OSS)** provides an analytical basis for selecting and recommending various open source technologies for production usage. This is achieved by:

- a) assessing various open source projects to gain a level of assurance that the project has the foundation and capability to build and sustain production-grade software, and
- b) testing specific versions of open source technologies for function, performance, and interoperability.

1.2 Document Organization

The ICF-OSS is presented as the following major parts:

- **Part 1: General Certification Model.** Describes the general model, including defining key concepts, the certification process, aims and results.
- **Part 2: Project Assessment Methodology.** Describes the methodology used to make an assessment of an open source project and its suitability for developing and managing an enterprise-grade software solution.
- **Part 3: Technology Testing Methodology.** Describes the methodology used to test specific versions of released open source software for suitability as an enterprise-grade production deployment.

1.3 Copyright Statement

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2 Part 1: General Certification Model

2.1 Introduction

The Instaclustr Managed Platform provides a fully managed environment for open source technologies. Our mission is to deliver an integrated and seamless managed environment for the most scalable, secure and performant open source technologies that enable the effective and efficient management of data for next generation applications.

With this in mind, we are continually evaluating the best open source technologies to integrate into our managed platform solution. The ICF-OSS has been developed to formalize and expose our decision-making process for offering these open source technologies providing our customers and others in the community increased assurance in their suitability for production use.

2.2 Purpose

The ICF-OSS has been developed to provide a structured methodology for:

- a) continually assessing the current state of open source projects with the aim of determining whether the project is suitable for developing and managing technology solutions that can be deployed at scale and in production environments, and
- b) performing a suite of tests on released versions of open source software for function, performance and interoperability as a precursor to deploying the software on the Instaclustr Managed Platform.

The results of the certification process are published and made widely available to provide transparency in our decision-making process and to help other organizations and engineers make informed decisions about deploying open source software for production environments.

2.3 Scope

The ICF-OSS has two main areas of focus:

- a) assessment of the quality and effectiveness of the project's governance, licensing and community management, and
- b) testing of specific releases of software for performance, integration and security standards.

2.4 Process

The ICF-OSS has the following four distinct phases:

- Phase 1: Target of Certification Identification
- Phase 2: Project Assessment
- Phase 3: Testing Planning
- Phase 4: Technology Testing

The following diagram depicts the process flow and each phase is described in more detail below.

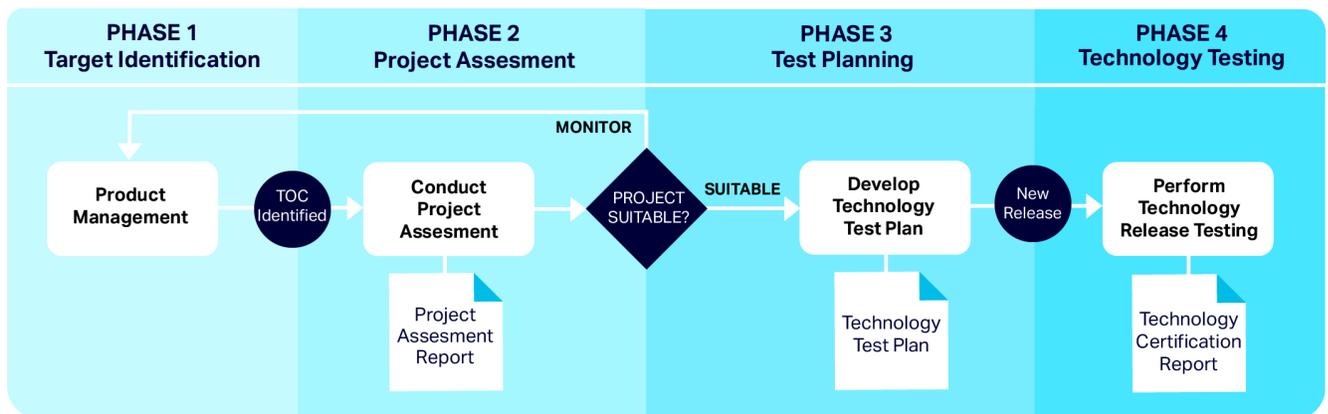


Figure 1: Instaclustr Certification Framework Process

2.4.1 Phase 1: Target of Certification Identification

The Target of Certification (TOC) is any open source project and associated technology solution that can be used to deploy applications at global scale. These products can be configured and installed in many different ways, with different options enabled and various values for specific variables. For all certifications the underlying configuration and infrastructure will be clearly defined, including testing tools and capabilities.

Instaclustr will periodically identify possible new projects and related technology for inclusion on the Instaclustr Managed Platform. Alternatively, Instaclustr may be approached by a member of an open source project for consideration of their technology on the platform.

2.4.2 Phase 2: Project Assessment

A decision will be made on progressing identified projects to becoming a TOC. This decision takes into account a number of factors, but any project that is considered will be developing open source software for highly scalable solutions.

Once a new TOC has been identified, the first step is to conduct an Open Source Project Assessment. This assessment will deliver a series of findings that will result in the TOC emerging with one of the following statuses:

- **SUITABLE.** The project and associated technology are considered suitable for inclusion and deployment on the Instacluster Managed Platform.
- **MONITOR.** A project receiving this status has been considered suitable in some areas, but some components may need maturity, additional capability or alignment with the technical vision of the Instacluster Managed Platform. Projects given this status will be reviewed regularly.
- **UNSUITABLE.** The project and resulting technology are not aligned with the principles and technology vision for the Instacluster Managed Platform.

2.4.3 Phase 3: Test Planning

Once a TOC has been assessed as SUITABLE the Instacluster Open Source Engineering Team will develop a Technology Test Plan (TTP) that is suitable for the related technology, providing specific guidance for the testing team. The TTP provides the foundation for all future testing efforts, outlining specific details that are considered suitable for the related technology.

2.4.4 Phase 4: Technology Testing

Once a TTP has been developed and published for an accepted project, specific releases of the technology will be subjected to testing in accordance with the TTP. A Technology Certification Report (TCR) is generated for each version of the software that is tested and used as the basis for deployment on the Instacluster Managed Platform.

The TCR will be published on the Instacluster website with specific details on configuration or use of the technology as it pertains to the Instacluster Managed Platform.

3 Part 2: Project Assessment Methodology

3.1 Introduction

The project assessment phase of the ICF-OSS focuses on the overarching governance and management of the project as a whole. This phase assesses the non-technical characteristics of the project rather than individual technology releases.

The intent is to ensure that all open source technologies that are integrated into the Instaclustr Managed Platform are being effectively managed and controlled, that risks associated with licensing and use are suitable and that there are strong indications the project will enjoy ongoing, open community support in the foreseeable future.

Each project assessment will be judged against the following broad criteria:

- project maturity
- development and maintenance
- community
- licensing model
- governance

3.2 Project Maturity

The project maturity assessment criterion focuses on how widely the technology has been adopted. This provides an indication of both how proven the software is in production and breadth of organizations with a stake in ongoing maintenance and continual improvement.

This criterion will assess key indicators such as project duration, well known adopters and public acknowledgements of use of the software.

3.3 Development and Maintenance

The development and maintenance assessment criterion are used to determine the level of activity with regard to new feature development and continued maintenance.

This criterion is assessed through measures such as the level of activity on the project GitHub repository. Our assessment looks for regular cadence of change and release rather than any absolute level of change, as rates of change may reduce even in a very healthy project as it matures.

3.4 Community

The community assessment looks at activity beyond direct contributions to the code base. This is important both as a secondary indicator of the level of adoption of the software and

for understanding whether adopters will be able to obtain community assistance for using software—and even the availability of experienced people in the labor market.

This criterion is assessed by reviewing key indicators such as mailing list activity and technology-specific meet-ups.

3.5 Licensing Model

The licensing model assessment checks that the project is licensed under a well-known open source license agreement unencumbered by proprietary modifications.

Instaclustr does not perform a legal review of the licensing model for assessment purposes; rather, we assess the project's ability to freely use and deploy the software and identify any possible restrictions.

3.6 Governance

The governance assessment reviews the overarching management, policy and governance arrangements for the project and the parties that have direct influence on the project.

Typically, the assessment will favor merit-based decision-making approaches such as the Apache Way and will flag governance models and check that multiple parties are involved in the governance of a project, so it is not unduly influenced by a single party's interests.

3.7 Results

If the open source project is found to be **SUITABLE**, then the next step is to develop a Technology Testing Plan (TTP) as per the methodology defined in Part 3.

If the project is found to be **UNSUITABLE**, then the report will either provide a recommendation on revisiting at a future date or will conclude that this type of project and associated technology do not align with the objectives of the ICF-OSS.

If the project is assessed as **MONITOR** the Director of Product Engineering will continue to actively monitor and assess and continued progress of the project. If any significant changes have been made or milestones are met, a new assessment will be performed.

All projects deemed **SUITABLE** will be continually reviewed to ensure that the current state of each is monitored.

The results of a project assessment are published as a Project Assessment Report (PAR).

4 Part 3: Technology Testing Methodology

4.1 Introduction

Once an open source project has been assessed as SUITABLE for inclusion in the Instaclustr Managed Platform, a specific technical testing process will be implemented with the aim of certifying individual releases as a being of an appropriate standard for production usage.

This testing process will generally build on the testing undertaken by the project itself (for example unit tests) and supplement that testing with additional production readiness tests. Where practical, Instaclustr will contribute these additional tests back to the source project.

An overarching technology-specific test plan, namely the Technology Test Plan (TTP), will be developed for a project. Testing and certification will be performed for specific releases of the technology from the project. These results will be published in a Technology Certification Report (TCR).

Technology testing covers the following key areas:

- functional testing
- performance testing
- integration testing

4.2 Functional Testing

Functional testing verifies the correct functionality of the system. We will generally use a project's existing artefacts such as unit tests and automated system tests.

If the Instaclustr Certification Team identifies a need to extend functional testing, then the aim is to contribute new tests to the project rather than develop our own additional test suites.

4.3 Performance Testing

Performance testing is designed to verify that there is no performance regression from one version of the software to the next in terms of throughput, latency or other performance metrics.

The Instaclustr Certification Team will test a range of use cases over a number of different time frames. This approach will provide a reasonable indication of performance characteristics for broad use-cases.

4.4 Integration Testing

Integration testing can include drivers and various other methods used to engage with other complementary technologies that are often used together in a production-grade deployment.

Integration testing will generally be basic shakedown testing of the integrated component rather than full functional/performance regression testing.

4.5 Results

The results of specific technology release tests are published in a Technology Certification Report (TCR). This report contains the results of individual tests and also provides any specific configuration detail and infrastructure requirements.