



IFC R2.0 CERTIFICATION OF FACILITATED APPROVAL

1 Origin and authority

Certification of Facilitated Approval for computer software using IFC Release 2.0 [1] is carried out under the authority of International Council of International Alliance for Interoperability (IAI). The Certification of Facilitated Approval is facilitated by a member of the Modelling Support Group (MSG) of IAI.

Facilitated Approval is a practical approach for certification taking into account IAI's limited resources. The IFC R2.0 Certification is following basically the same principles as those of IFC R1.5.1 Certification of Facilitated Approval.

2 Scope and responsibility

For Certification of Facilitated Approval an implementer has to demonstrate with the candidate software a high quality IFC R2.0 interface.

However, it is still and remains always the responsibility of the implementer to ensure the quality of the IFC interface. Furthermore, it is the responsibility of the end users to determine how they use the software and its IFC interface.

3 Disclaimer

IAI and its representatives are providing the services for the certification and are facilitating the approval, but are not responsible for the quality of the implementation of the IFC interface or how it is used.

4 Certification candidate software

The candidate software seeking for the certification can be categorised into three categories with regard to the nature of their IFC interface and functionality:

- **Read/Write software**, which is software that both reads and writes, and uses IFC product data.
- **Read-Only software**, which is software that only reads and uses IFC product data, but doesn't write out IFC data.
- **Write-Only software**, which is software that only writes out IFC product data, but doesn't read in IFC product data.

- **Toolkits and Servers**, which are software libraries or components, and server applications that read and write IFC product data and provide some form of data access interface, and data management functions for the IFC product data. The Toolkits and Servers are used by other software developers in developing IFC implementations.

5 Methodology

5.1 *Open Certification Workshop*

The certification is based on a demonstration of successful IFC data exchange during an open Certification Workshop.

The intention to hold a Certification Workshop should be preannounced at least six weeks in advance and the precise date at least two weeks in advance. The invitation will be done via e-mail over the exploders of the International Council, the International Technical Management Committee (ITM), the Implementers Support Group (ISG) and the Technical Advisory Group (TAG). Chapters are encouraged to send the invitation to a wider audience by e-mails, letters and fax to their members.

At least some IAI officials are expected to visit certification workshops, such as members of IC, Executive Committee (ExCom), ITM, the Project Managers and the Group Leaders.

The Certification Workshops are public.

5.2 *IFC R2.0 schema refinement*

A refined IFC R2.0 Object model schema has been defined for the purposes of certification. The schema refinement resolves some issues in the functions and constraints of the IFC R2.0 schema. The principle of the schema refinement is that the changes made do not change the representation of the IFC R2.0 product data in ISO 10303-21 exchange format.

The schema refinement is documented [3], and is together with the refined schema made available.

5.3 *IFC Views and certification*

A View is a subset of the IFC Object Model that a number of implementors have agreed to support in their software. Views are documented by the implementors possibly with support from the Modelling Support Group; the View documentation is then published.

IFC certification happens against a defined View, with the exception of IFC Toolkits and Servers that may support the whole IFC Object Model.

5.4 Test Cases

A set of appropriate Test Cases has to be generated for use during the certification. A Test Case consist of an IFC Object Model instantiation in the form of an IFC file and Test Case data content description. The Test Cases are to be based on one or more Views of IFCs. Test Cases will be used in IFC quality assurance of the candidate software, and in the open Certification Workshop in the data exchange demonstration.

The certification Test Cases to be used in the quality assurance work towards, and in the demonstration of the Certification Workshop are available to implementers who are pursuing certification. The Test Cases will also be made freely available on the Web for anybody to use.

5.5 Certification procedures

The different nature of the before mentioned software candidate categories also require different certification approach:

- Read/Write software are tested in advance, and shall demonstrate in the Certification workshop for ability to correctly use IFC product data, and to export IFC R2.0 conformant IFC data. The demonstration of the IFC data usage by the software can be done by e.g. visual and manual inspection; the conformance of the IFC Model export with IFC R2.0 can be tested with a constraint checking tool.
- Read-Only software are tested in advance, and shall demonstrate in the Certification workshop for ability to correctly use IFC product data. The demonstration of the IFC data usage by the software can be done by e.g. visual and manual inspection.
- Write-Only software are tested in advance, and shall demonstrate in the Certification workshop for ability to export IFC R2.0 conformant IFC data. The conformance of the IFC Model export with IFC R2.0 can be tested with constraint checking tool.
- Toolkits and Servers are tested in advance, and shall demonstrate in the Certification workshop for ability to correctly read and write IFC Model data, and to provide a data access interface for IFC product data. This may be demonstrated by client software using the Toolkits and Servers. The conformance of the IFC Model export with IFC R2.0 can be tested with constraint checking tool.

5.6 Certification support tools

A number of tools supporting the certification may be used in the development of the Test Cases, in quality assurance work preceding the Certification Workshop, and in the Certification Workshop:

- Checking tools for IFC Model file syntax and constraint checking
- View checking tools for population of the IFC Model according to the View definitions
- IFC Model difference checking tool for comparing differences between IFC Model import and exports.

6 Conduct of the certification workshop

The open Certification workshop is facilitated by a Facilitator, who shall be a member of the IAI's Modelling Support Group. The Facilitator of a Certification Workshop may not be employed by an implementor that is seeking certification in that Workshop.

The implementers who seek certification have to prepare for the Certification Workshop and have to test carefully their candidate software. The Certification Workshop is preceded by quality assurance process of the implementors, and IFC conformance and software interoperability testing between the candidate software.

The open Certification Workshop includes the following elements:

- Introduction to the basics of the certification.
- Demonstration of the certification methodology.
- Introduction of the certification candidate software.
- Demonstration of IFC product data exchanges between the candidate software, and demonstration of the correctness of the IFC interfaces.
- Session for the audience to challenge the candidate software to demonstrate any IFC data exchanges, that are within the scope of the Views against which the candidate seeks certification.
- Recording of the certification outcome.

Minutes of the Certification Workshop will be recorded, and made publicly available.

7 Conditions of Certification

To be certified in the Certification Workshop, an implementer has to demonstrate with the candidate software a high quality IFC interface and that IFC data exchange is working properly.

It is in the Facilitators responsibility to assess when the IFC data exchange has been sufficiently demonstrated by the candidate software. Any dissenting Views will be recorded into the minutes.

If a problem should occur during the workshop, it will be documented by the Facilitator to the Certification Workshop minutes. The Facilitator will then suggest a procedure for resolving the problem. Any certification given will specify limitations attributable to the problem. As soon as the implementer is able to demonstrate, for example in a future Certification Workshop, that the problem is solved, the full certification will be given.

8 IAI Certification logo and its usage

Implementors who's candidate software passes the certification are entitled to use the IAI R2.0 certification logo in their marketing and packages of the certified software.

The certification of a Toolkit or Server doesn't automatically certify the software that uses the Toolkit or Server in IFC implementation. Each software has to be certified separately for the use of IAI certification logo.

9 Further development

The Certification and its Test Cases can be developed and improved further. If new Test Cases will be developed for the Certification the implementors are strongly encouraged to use the expanded Test Cases in their ongoing quality assurance process for the already certified software.

The certification will always be done using the most comprehensive Test Cases available.

References

1. IFC Release 2.0 specification. 1999. IAI Member CD, International Alliance for Interoperability. 1999-03-15.
2. IFC 1.5.1. Certification of facilitated approval. IAI, 2000. 4 p.
3. IFC Release 2.0 Certification testing – Schema refinement. 2001. 33 p.
4. BLIS View definitions for IFC R2.0. <http://www.blis-project.org>
5. Test cases for IFC R2.0. <http://www.blis-project.org>

Appendix 1. IFC R2.0 Certification Workshop on 23rd of May 2001, at CSTB, Sophia Antipolis, France, for BLIS defined Views.

The IFC R2.0 Certification Workshop to be held at CSTB, Sophia Antipolis, France on 23rd of May 2001 is the first certification organised for IFC R2.0 candidate software. This certification is endorsed by IAI as an official IAI certification, see Appendix 2.

Certification process and Test Case development

IFC R2.0 Certification and Test Case development for this Certification Workshop has been done by the contributed resources from the Building Life-cycle Interoperable Software (BLIS) implementation project.

BLIS defined Views for IFC R2.0

The Views currently defined for the IFC R2.0 by the BLIS-project are:

- Architectural design → Quantities take off
- HVAC system design → Quantities take off
- Architectural design → Thermal load calculations / HVAC system design
- CAD / Visualisation.

The detailed description of these View definitions can be found from the BLIS web-site [4].

Test cases

The Test Cases are freely available on the Web at the BLIS web-site [5].

Appendix 2. IAI International Council's resolution on the IFC R2.0 certification of the Facilitated Approval.

In the IAI Summit meeting April 2001, in Seoul, Korea IAI's International Technical Management committee approved the following resolution which was further confirmed by International Council:

'The process proposed by the BLIS group for certification of IFC R2.0 compliant applications follows the program established for the R1.5.1 certification. The ITM approves the proposal and acknowledges BLIS for the important work in IFC R2.0 implementation.

Before the first certification the Views defined by the BLIS group will be published and endorsed as IFC R2.0 Views and will not be altered to ensure that the following certifications can work against the same standard. The documentation of the Views and all test cases will be public and free for use to any IAI certification.'

