MPEGIF Logo Qualification Program

Qualification Procedures Document

Version 0.5

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1. Scope

This document describes the MPEG Industry Forum Logo Qualification Program, and defines the procedures which participating member companies must follow in order to qualify products to carry the MPEGIF Qualified Product logo.

The latest version of this document, and updated information on the Logo Qualification Program may be found on the Qualified Products Program web site.

2. Introduction

Simply stated, the MPEGIF Logo Qualification Program, provides a procedure by which companies may qualify encoder & decoder products, and hence earn the right to label their products with a logo provided by MPEGIF. The program is designed to meet the following goals:

- Promote "MPEG-4 Brand Awareness"

- Provide marketing value for MPEGIF members who participate in the program.

- Encourage participation in MPEGIF Interoperability WG, and in the forum in general.

- Provide an environment for companies to discover and resolve interoperability problems.

- Encourage growth of the industry by building confidence that products will interoperate.

The Logo Qualification Program is tightly linked to the MPEGIF Interoperability Testing program, and in fact participating companies are required to complete at least one round of testing in the Interoperability WG before submitting their product for qualification. An additional verification step is also required:

- Decoder companies must verify that the product correctly decodes all streams in the relevant Qualification Stream Set. This set is a combination of published conformance streams and streams posted to and tested within the Interoperability WG.

- Encoder companies must obtain Qualification Endorsements from three other companies with qualified decoder products.   The endorsement is a statement from the decoder company that a relevant stream set generated by the encoder company was decodable without problems.

Note that this is essentially a Self-Qualification process. In order to complete the qualification procedure, a company will sign a legal agreement stating that the testing criteria have been met. The program stops short of full "Certification," which normally would require an independent third party to administer certification tests and make judgments on whether the product passes or fails. In this way MPEGIF is providing a framework and encouraging a base level of testing,

however the details of testing and verification are the responsibility of the individual company, not that of MPEGIF.

The program will initially focus on MPEG-4 Audio and Video encoders/decoders, but may eventually be expanded to include other MPEG standards. Support for Profile/Level combinations is designed to be flexible in that new combinations may be added at any time based on interest from the membership, and also based on the evolution of testing in the Interoperability WG. Initial support will include at least AVC Baseline Visual and High Efficiency AAC Audio profiles.

3. Logo Qualification Program Rules and Requirements

This section lists the rules and requirements for the establishment and operation of the Logo Qualification Program. The current section is to be taken as the formal description of the program, with additional informative descriptions provided in the later sections of this document.

- The Logo Qualification Program is managed by a Logo Qualification Program Administrator. This is a paid position which may be filled either by MPEGIF's management service company, or by an outside consultant. Responsibilities of the Program Administrator are summarized in Section 6.

- Technical support for establishment and maintenance of the program is provided by the Logo Committee. These are volunteers selected to cover the spectrum of required technical expertise. Responsibilities of the Logo Committee are summarized in Section 7.

- A Logo Procedures Document is to be written and maintained jointly by the Program Administrator and the Logo Committee. This is the current document.

- A public web site is to be established for the following purposes:

    o Advertise/publicize the Logo Qualification Program; explain what the program is and what it is not; provide a FAQ list.

    o Provide links to the latest version of the Logo Procedures Document, the Self-Qualification Mark License Agreement, and any other relevant documentation and forms.

    o Provide contact information for any companies that have questions about the program.

    o Provide online registration for participation in the Logo Qualification Program.

    o Provide online submission of details of specific products which have completed the qualification procedure.

    o Provide detailed information about companies and products which have been qualified through the program.

- Companies testing/qualifying decoders will obtain the streams for testing from the Logo website site by FTP. Access to the file site will be provided to all companies who are registered for participation in the program.

- To qualify for participation in the Logo Qualification Program, a company must be an MPEGIF member in good standing, and must be capable of active participation (i.e. have an encoder or decoder product ready for qualification testing). Diagnostic products such as bitstream analyzers are also eligible for qualification, and are treated as decoders for the remainder of this document.

- The following steps must be taken in order to qualify a product:

  o Register for participation in the program; an online form for this purpose is provided on the <u>Logo Qualification Program web site</u>.

  o Complete the **Requirements for Qualification** which apply to the product in question; see details below.

  o Complete the online submission form in order to provide the details on the specific product which will carry the logo.

  o Complete the written Qualified Product Test Certification and Registration Checklist, which is essentially a statement by the company that the Requirements for Qualification have been met.

  o Return the signed/dated agreement along with the qualification fee.

- The **Requirements for Qualification** for a **decoder** product are as follows:

  o The company must participate in one complete round of MPEGIF Interoperability Testing, and during this round must test and report results for all posted streams relevant to the Codec/Profile/Level combinations for which the company wishes to qualify its decoder product.

  o The company must successfully decode all streams in the Qualification Stream Sets which are relevant to the Codec/Profile/Level combinations for which the company wishes to qualify its decoder product. Note that the company typically obtains the Qualification Streams from the website and tests them privately, attesting to the results by signing the Test Certification and Registration Checklist.

- The **Requirements for Qualification** for an **encoder** product are as follows:

  o The company must participate in one complete round of MPEGIF Interoperability Testing, and during this round must post bitstreams for testing which exercise all tools/features relevant to the qualification. A tool/feature is considered **relevant to qualification** if it meets both of the following criteria:

    1. The tool/feature is included in one or more of the Codec/Profile/Level combinations for which the company will qualify its encoder product.

2. The tool/feature is implemented in the product and is available for use in generating bitstreams. (e.g. a 'dormant feature' which is never used in the encoding product would not have to be exercised during the interoperability test round.)

Note that a legal encoder might not support every tool or feature included in a particular Codec/Profile/Level combination. The purpose of the above criteria is to state that this is acceptable, as long as all supported tools are exercised in the generated bitstreams.

o The company must obtain Qualification Endorsements from three companies which have already qualified decoders for the Codec/Profile/Level combinations in question. Such an endorsement is a statement by the decoder company that it has successfully decoded the stream set provided by the encoder company. The streams tested during this step are not required to match the streams posted during the interoperability test round, but must meet the following criteria:

▪ They must be produced by the specific product (e.g. identical codebase) for which qualification is sought.

▪ They must exercise the full set of features relevant to qualification (see definition above).

▪ The streams may be based on any reasonable source material. In other words, it is not required to use the default content provided for testing within the Interoperability WG.

A few additional notes about the endorsement process:

▪ Companies providing Qualification Endorsements must complete the appropriate sub-sections of the Qualified Encoder Product Test Certification and Registration Checklist.

▪ In case an encoder company is unable to find three decoder companies willing to test their stream set, they may contact the Logo Qualification Program Administrator who will provide assistance in matching encoder and decoder companies.

- In order to satisfy the requirement to participate in a round of Interoperability Testing, the company must follow the current rules and practices used in MPEGIF Interoperability WG. In other words, the Logo Qualification Program will not impose any additional rules or restrictions.

- The amount of the qualification fee will be set to a reasonable level in order to cover the administrative and legal costs of creating and operating the Logo Qualification Program. Special reduced fees may be available as an incentive for early participation in the program. Additional details as well as the current fee schedule can be found on the Logo Qualification Program web site.

- A 3-year budget shall be drawn up by the Program Administrator in order to plan the costs of the program. The budget shall cover administrative and legal costs of the program, and will be used to determine reasonable values for the qualification fees.

- Once a product has been qualified, that qualification (and hence the right to use the logo) is granted for the life of the product. If later testing or peer review should reveal conformance problems in the product, the submitting company agrees to make a reasonable effort to fix such problems in current and/or future products. However, MPEGIF will not revoke permission to use the logo in such cases.

- If a company ceases to be an MPEGIF member, the company may not use the logo until the company is again a member in good standing.

4. Logo Qualification Program operation (informative)

4.1   Testing process

The MPEGIF Logo Qualification Program bases qualification on two steps:

1. Participation in a round of testing in MPEGIF Interoperability WG.

2. Verification step:

   a. For decoders, this means successfully test the streams in the relevant subset of the Qualification Stream Set provided by the Logo Qualification Program

   b. For encoders, it means generating a relevant stream set and providing this set to three qualified decoder companies, who then provide Qualification Endorsement statements upon successful testing of the streams.

When a company has completed these two steps for their encoder or decoder product, they are then allowed to complete the process by signing the Qualified Encoder Product Test Certification and Registration Checklist and submitting the request to carry the logo. We now discuss the two testing steps in greater detail.

4.1.1   Interoperability Testing Requirement

In order to qualify a product to carry the Logo, the company is required to participate in one complete round of MPEGIF Interoperability Testing using some version of the product. Before describing this process further, it is important to clarify the difference between interoperability testing and product qualification:

- Interoperability testing provides an environment by which companies can test their implementations collaboratively in order to discover and resolve problems which would prevent interoperability between the end products. Such testing is often done while the products are still in development (e.g. changing), with the intent of resolving the problems and immediately re-testing in order to verify the solution.

Because the implementations can change in this way, there is usually no mapping to specific products / versions made during an interoperability test round.

- Product Qualification testing is done in order to qualify a product to carry the logo. Such verification must be done using the specific product and version to be qualified. This is essentially the second step of the verification process, which will be described in Section 4.1.2.

The Interoperability Testing requirement is thus satisfied when the company joins the MPEGIF Interoperability WG activities, and participates in a test round. The exact rules and practices are determined by the Interoperability WG, and such procedures may evolve with time. However, we will summarize a 'typical' interop test round based on past experience.

At the beginning of the test round, the membership discusses and defines the scope of the tests. A schedule is set, and the relevant Codec/Profile/Level combinations are selected. A deadline is typically set by which encoder companies should post bitstreams for test. Such streams are posted on a password-protected file access site maintained for use by the Interoperability WG. Decoder companies are then asked to download and test the posted bitstreams, and to report either specific problems or "success" as the result of decoding each stream. Result reports are collected in a database or spreadsheet, so that the overall progress and success level of the test round can be determined.

In order to pass the Interoperability Testing requirement for qualification, a company must effectively 'complete' one test round. For a decoder, this means testing and reporting on all relevant streams posted during the test round. For an encoder, it means posting a set of streams which exercises all features **relevant to qualification** (see definition in Section 3), and doing so early enough that decoder companies are able to test and report on all the streams.

Note that companies are expected to make full use of the Interoperability Testing experience to discover and correct any problems in their implementation. However, it is the responsibility of the individual company to check the implementation; the Logo Qualification Program itself will not perform detailed verification of results collected during Interoperability Testing rounds. Such information would be inconclusive at best, since a mapping to specific products and versions is generally not known during an Interoperability Testing round.

The following link provides information about MPEGIF Interoperability WG activities:

http://www.mpegif.org/public/interop/description.php

To inquire further, or to join the Interop WG, please contact:

Jae-Seob Shin
Chair, MPEGIF Interoperability WG
jsshin (at) pixtree.com

4.1.2   Verification Step

Once the Interoperability Testing requirement has been met, a company seeking qualification will complete a Logo-Program specific verification step.

In the case of **decoder qualification**, this step involves obtaining and testing the relevant streams from the Qualification Stream Set. The stream set is assembled and maintained by the Logo Committee, and is made available on a password-protected part of the Logo Qualification Program website. A company-specific password is provided when a company registers for participation in the Logo Qualification Program. The streams on the site will be organized so that it is easy to determine which streams must be tested for any supported Codec/Profile/Level combination. The necessary mapping is created and maintained by the Logo Committee, and must be updated whenever new streams are added.

The streams themselves are expected to come from two sources:

- The published conformance stream set (e.g. ISO/IEC 14496-4)

- Additional streams posted to and verified in previous MPEGIF Interoperability test rounds

Both sources of streams are seen as valuable to the verification step. The published set is created by MPEG with the goal of exercising all of the tools and features for specific profile and level combinations. This makes it possible to construct a stream set which is essentially feature-complete, and designed for the conformance verification task. The streams collected from previous Interoperability Test rounds reflect the output of current and near-future encoder products, and so provide a sampling of the streams which the decoder is likely to encounter in a real deployment. Interoperability streams are also likely to introduce legal syntax variations that may not be present in the published streams.

Note that an informal success criterion is considered to be sufficient when testing streams during the decoder verification step. For visual bitstreams, this means that the stream is decoded without perceivable error (in terms of syntax or visible artifacts), and so the decoded image sequence is recovered with reasonable visual quality. Similarly for audio bitstreams, the decoded audio is recovered and can be played back with reasonable audio quality, and no syntax problems or audible artifacts are detected.   There is no requirement to follow the more strict test procedure defined in the published conformance specifications, although companies are encouraged to take this additional step for their own benefit.

In the case of **encoder qualification**, the verification step requires the encoder company to generate a set of streams which exercises all tools and features **relevant to qualification**. This term is defined in Section 3, and it essentially means that all of the tools included in the Codec/Profile/Level combination(s) for which the encoder is to be qualified, and which the encoder product will use in practice, must be exercised in the set.

Note that the encoder company has by this point already generated a similar set of streams for posting to MPEGIF Interoperability WG in order to meet the interoperability testing requirement. The new stream set generated for the verification step might not match what was posted for interoperability testing, because the streams generated for interoperability testing

were not mapped to any specific encoder product / version. However, the streams used in the verification step are required to match the exact product / version of the encoder which is to be submitted for qualification.

Once the stream set for verification has been generated, the encoder company provides the streams to three independent decoder companies which already have qualified decoder products for the Codec/Profile/Level combination for which the encoder company is seeking qualification. The decoder companies verify that the streams are decodable and that no problems can be found. At this point they fill out the appropriate sub-section of the Qualified Encoder Product Test Certification and Registration Checklist available on the Logo Qualification Program website, as testimony that the streams have been verified. When the encoder company has collected three completed endorsements, it has passed the verification step, and is ready to complete the qualification submission process.

Note that encoder verification testing is normally conducted privately by the companies involved, with no scheduling or intervention necessary from the Logo Qualification Program or the Interoperability WG. In the case where an encoder company is unable to find three qualified decoder companies willing to participate in verification testing, then the encoder company is asked to contact the Logo Qualification Program Administrator for help. The administrator (with assistance from the Logo Committee, if needed) will then match companies for verification testing. In extreme cases where qualified decoder companies cannot be found, then other arrangements for encoder qualification may be made. Such procedures must be agreed jointly by the Program Administrator and the Logo Committee.

4.2   Legal and administrative details

In addition to the testing requirements described in the previous section, a company seeking qualification must complete several administrative steps. The resources for completing these steps can be found on the Logo Qualification Program website, and each step typically involves completing either an electronic or paper form on the site.

The first step is to register for participation in the Logo Qualification Program. Note that participation is limited to MPEGIF member companies in good standing. Eligible companies can learn about the program by browsing the public portions of the Logo Qualification Program Web Site, and contact information is provided there in case there are further questions about the program. Once a member company decides to participate in the program, they register via an online form. At this point only generic company information is requested (e.g. company name and contact information). Once registration is approved, the company is notified and some additional instructions for participation are provided, along with access information for the participant-only portion of the Logo Qualification Program Site. The company may then work to satisfy the testing/verification requirements, as presented in Section 4.1.

Once the testing requirements have been completed, the company is ready to complete the qualification procedure for the product of interest. The first step in this process is to fill out the specific product qualification online application form. This form is located in the participant-only section of the web site. The company is asked to provide product-specific information, such as the product name, version, and the codec/profile/level combinations for which the

product is to be qualified. Note that the information entered at this stage will be viewable on the public portion of the web site, in a section which provides details on all products which have been qualified through the program.

At this point, the company downloads and completes the Qualified Product Test Certification and Registration Checklist. This is a paper document which must be signed and returned to the Program Administrator, along with the qualification fee. In signing the legal agreement, the company seeking qualification states that they have met the testing/verification requirements defined by the program.

Note that the Self-Qualification Mark License Agreement, Qualified Product Test Certification and Registration Checklist, and the current fee schedule can all be found on the Logo Qualification Program web site.

Upon receiving a completed Qualified Product Test Certification and Registration Checklist, the administrator checks that the required steps have been completed. If any errors are found, the administrator will contact the company in order to resolve them. When this step is completed, the submission is approved, and the right to carry the logo is granted.   A package of logo materials is then provided to the company, including the logo graphics and the rules for displaying them. Also, the records on the public part of the Logo Qualification Program web site will be updated to include information about the newly qualified product.

Note that the fee schedule will be set to cover the costs of setting up and maintaining the program. The details of these costs are not presented in the current document, but may be found in the Logo Qualification Program Budget Plan. This document is generated by the Logo Qualification Program Administrator, and can be found on the program web site.

The budget will include some provision for legal counsel, since it is expected that some legal services will be needed during the ongoing operation of the program. One example is legal enforcement of the right to use the logo. For example, if a company displays the logo or a close copy of it without MPEGIF's permission, then MPEGIF may choose to take legal action against that company.   Such enforcement is seen as necessary in order to preserve the value of the program and prevent confusion in the marketplace.

5. Supported Profile/level combinations (informative)

As a practical matter, the Logo Qualification Program cannot support all possible profile/level combinations defined within the MPEG-4 standard. The expectation is that the program will initially support a small set of "popular" profile/level combinations which have already been well tested in the MPEGIF Interoperability working group. The following combinations are the initial candidates for support, listed in roughly increasing order of likelihood:

- Audio

  - High Efficiency AAC Profile (Levels 1,2)

  - AAC Profile (Levels 1,2)

- o   High Quality Audio Profile (Levels 1,2)

- Visual

  - o   AVC Baseline Profile (Levels 1, 1.1, 1.2, 1.3)

  - o   Simple Profile (Levels 0,1,2,3)

  - o   Advanced Simple Profile (Levels 1,2,3)

- Systems

  - o   The program will initially concentrate on qualification of Audio and Visual profiles only. Systems profiles may be added later based on interest. The likely candidate profiles are Simple 2D and Advanced 2D, since these have been previously included in the MPEGIF Interoperability tests.

The set of supported Codec/Profile/Level combinations is expected to grow in time based on the needs of the industry. To provide feedback into the process, the Logo Qualification Program website will provide a mechanism where companies may suggest profile/level combinations which they would like to add to the Interoperability and Qualification programs. The decision of when to add a new combination will be made jointly by the Interoperability WG and the Logo Committee. An updated list of supported Codec/Profile/Level combinations will be maintained on the Logo Qualification Program website.

6. The   Logo   Qualification   Program   Administrator (informative)

The Logo Qualification Program Administrator is a paid position which may be filled either by MPEGIF's management company or by an outside consultant. The administrator oversees day-to-day operation of the program, and serves as the main contact person. The administrator's responsibilities are as follows:

- Serve as contact person, and answer any questions about the program.

- Process and approve applications for participation and for qualification.

- Maintain program web site content and documentation (jointly with Logo Committee)

- Prepare Logo Qualification Program Budget and set fee schedule (to be approved by MPEGIF BoD)

- Provide assistance to match up encoder companies with qualified decoder companies who are willing to do Qualification Endorsement testing.

- Bring any reported technical issues to the attention of the Logo Committee.

7. The Logo Committee (informative)

The MPEGIF Logo Qualification Committee is a small group of technical experts who help to establish and maintain the Logo Qualification Program on a volunteer basis. The committee is constructed so that it has a mix of expertise in Audio, Video, Systems/File Format, and any other relevant technologies. The following is a list of responsibilities of the Logo Qualification Committee:

- Maintain program web site content and documentation (jointly with Program Administrator)

- Select and maintain the Qualification Stream Set.

- Track tool sets exercised by qualification streams, and provide the mapping from each supported Codec/Profile/Level combination to the relevant subset of streams.

- Make decisions on when new Codec/Profile/Level combinations may be supported (jointly with Interoperability WG leadership)

- Assist program administrator in matching up encoder companies with qualified decoder companies, as needed.

8. Contact Information

For the latest information on the MPEGIF Logo Qualification Program, including the latest version of this document, please go to the MPEGIF Logo Qualification Program web site:

http://logo.mpegif.org/

If you have additional questions about the program, please contact:

Alison Ward, MPEGIF
+1.510.744.4025 phone
award@mpegif.org
logo.mpegif.org