Request for Quotation (RfQ)

For ONVIF Technical Services Committee

Cloud Client Test Tool

Table of Contents

1. Introduction

ONVIF™ is an open industry forum for the development of a global standard for the interface of IP-based physical security products. Information about ONVIF, its objectives and members can be found on https://www.onvif.org/.

The current ONVIF Client and Device Test Tools are used by the members of ONVIF to test conformance of IP- based physical security products in an on-premises environment with the ONVIF Test Specification, which in turn is based on the ONVIFProfile Specifications and ONVIF Network Interface Specifications, and WSDL and XML schemas.

ONVIF is currently expanding its offerings into the cloud domain, with an initial Profile targeting Camera to Cloud VMS systems.

2. Abbreviations

CTT	ONVIF Client Test Tool, (on-premises oriented)
CCTT	ONVIF Cloud Client Test Tool, (initially cloud-only oriented)
DTT	ONVIF Device Test Tool, (cloud and on-premises oriented)
TTWG	ONVIF Testing Working Group
ODP	ONVIF Developer Plugfest
WG	Working Group
TSC	ONVIF Technical Services Committee
VMS	Video Management System

3. Project Purpose

Because of ONVIFs expansion into cloud domain, the current implementation of the ONVIF Client Test Tool is not suitable for operation in a cloud environment. The purpose of this project is to close the testing gap and allow for conformance testing of cloud-based VMS. The project name is referred to Cloud Client Test Tool or "**CCTT**" for short.

The project shall allow for easy expansion of test cases and scenarios in future releases.
Development of ONVIF Test Specifications is out of scope for this RfQ.

4. Background

ONVIF Test Specifications are written in XML based DocBook format and published twice a year. Sources are publicly available at github.com/onvif/testspecs.
ONVIF Test Tools are applications that are run by members to test whether their devices or clients conform to the test specifications. The current test tools have been developed using Microsoft Visual Studio. The main logic is coded in C# with some parts like streaming in unmanaged C++ code.

In so called conformance mode tools autonomously run large number of test cases and produce conformance documents as output. Additionally, a so-called diagnostic mode with a rich user interface allows ONVIF members to analyze individual test cases.

5. Service Requested

- Preparation of documents and tool for first release of CCTT.
- Coordinate the development efforts with ONVIF working groups in weekly telcos. Participate in ONVIF face-to-face working group meetings.
- Participate once or twice a year at relevant ONVIF Developers' Plugfests (ODP) for the purpose of a practical field test, to collect member feedback and improvement suggestions and member training.

6. Description of Requested Service

1. The projects MUST be developed in accordance with the schedule outlined in Appendix A.
2. Any deviations from the schedule outlined in Appendix A MUST be approved by ONVIF.
3. Response to RFQ shall contain effort estimates and associated costs for each development phase according to Appendix B
4. All development MUST take place in ONVIF GitHub repository provided by ONVIF.
5. The projects MUST deliver ONVIF Cloud Client Test Tool as outlined in Appendix B and Appendix C.
6. The projects MUST follow the technical requirements outlined in Appendix G during development.
7. The projects MUST respect the style and structure of the ONVIF Test Specification when updating the documents.
8. The final deliverables MUST pass a review before the service is considered delivered; up to 30 days might be required to complete the review. If the workgroup exceeds the 30-day period, the service will automatically be considered delivered for all payment purposes.
9. Any further maintenance and expansion work done to the ONVIF Cloud Client Test Tool is subject to further quotations and separate contracts. A renewed cooperation of the Contractor and ONVIF for these tasks over many development steps is possible and where possible appreciated, however not guaranteed.

7. Execution of Service

The execution of the service must fulfill the following requirements:

- The service must be conducted by capable and qualified employees or sub-contractors under thesame rules.
- The Contractor MUST provide a weekly progress report to the ***TTWG*** and ***WG*** outlining the tasks performed and the issues encountered. The report must be done on GitHub for each project. It must be maintained and show what tasks have been completed, what the next tasks for next week will be and remaining time available to approve new tasks.
- The Contractor must detail all risks, mitigation plan approached, and support required in weekly progress report.
- The contractor must provide the results of the regression tests executed for every release of a prototype.
- Interpretation issues encountered during development or test case writing MUST be forwarded to and handled by the corresponding working group based on the responsibilities listed in Appendix C.
- Throughout the projects, the ***WG*** or ***TTWG*** may call for telephone conferences and/or face-to-face meetings with the Contractor to address any possible open questions and to review the progress. The Contractor MUST attend those requested telephone conferences and face-to-face meetings.
    a. The Contractor may be requested to attend the ONVIF Face-to-Face Meeting.
    b. The Contractor may be requested to participate in the 2 ONVIF Developers' Plugfest (ODP) in RFQ time frame and shall run the ‘Test Tool Cloud Clinic'.
    c. The working group MUST give the Contractor notice of at least two months in advance if participation is required.
    d. At least one technical resource and one manager assigned to the projects MUST be legally authorized to travel outside of their home country and must be able to obtain travel documents to planned locations listed in section 10 Quotation.
    e. In the event of any cancellation of face-to-face meetings and/or Developers’ Plugfest due to unforeseen circumstances the Contractor may be requested to participate in the events through a combination of telephone conferences and remote testing sessions.

8. Protective Rights

1. ONVIF will hold all rights to the ***CCTT*** software (the development results), its source (test tool and internal tools), documentation, and related inventions, achieved by employees and sub-contractors of the Contractor. Contractors will be required to enter into a development agreement related to the rights to ONVIF Cloud Client Test Tool software.
2. ONVIF will obtain exclusive and discretional rights of use without any territorial restrictions or time limits.
3. The Contractor notifies ONVIF if and where it intends to use material in the ***CCTT*** which is affecting rights of a third party.
4. The Contractor will ensure in an appropriate way that ONVIF can claim inventions made by employees and sub-contractors of the Contractor.

9. Confidentiality

1. The Contractor MUST sign a non-disclosure agreement (NDA) with ONVIF prior to the initiation of the project. This NDA is for ONVIF to share draft technical specifications and other necessary non-public information of ONVIF, needed to fulfil this requested service.
2. The Contractor MUST keep all development results and related documents strictly confidential and must release them only to the ONVIF office and the assigned technical contacts of ONVIF.

10. Quotation

The quotation MUST at least contain the following information:

- Information about the Contractor, including but not limited to; Ownership structure, country of location and previous experience with projects involving test tools, standardization or similar.
- Cost of requested service and all other related costs.
- Cost of travel expenses for two representatives of the Contractor at the ONVIF Face-to-face meetings and/or Developers' Plugfest. Possible travel requests for projects:
    i. June 4-6, 2025 (Italy) for first prototype testing
    ii. September 8-12, 2025 (Canada, TBD)
    iii. November 10-14, 2025 (Asia, TBD)
    iv. March 2026 (TBD, TBD)
    v. June 2026 (TBD, TBD)

  An additional representative(s) of the Contractor at the meetings is subject to approval from ONVIF. Travel arrangements should be consolidated where possible in case the Contractor is working on parallel projects for ONVIF. Travel costs will not be applicable if the meetings are

cancelled. Meeting locations are tentative and are subject to change.

11. References

The following ONVIF documents MUST be used as a reference for the project:

- Profile Specifications (https://www.onvif.org/profiles)
- Network Interface Specifications (https://www.onvif.org/profiles/specifications/)
- Device Test Specifications (https://www.onvif.org/profiles/conformance/device-test/)
- Client Test Specifications (https://www.onvif.org/profiles/conformance/client-test/)
- Conformance Process Specification (https://www.onvif.org/profiles/conformance/)
- ONVIF Technical Specification Development (https://github.com/onvif/specs)
- ONVIF Cloud Profile Development (https://github.com/onvif/wg_profile_cloud)

Documents not publicly available are provided upon request.

These documents MAY be replaced with newer versions after the start of the project. In such a case the ***TTWG*** or ***WG*** will inform the Contractor and discuss appropriate actions.

12. Contacts

General contact:

ONVIF

Kevin A. Schader, Executive Director

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San Ramon, CA 94583

Phone: +1.925.275.6672

Fax: +1.925.275.6691

www.onvif.org

Technical Contact:

Technical issues and questions concerning the ONVIF specifications, schemas, and this Request for Quotation MUST be addressed to:

ONVIF TSC

Todd Johnson, TSC Chair

Phone: 559-214-5449

E-mail: todd.johnson@pelco.com

Srivikraman Murahari, TSC Member
Phone: +91 9880517655
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ONVIF TSC Testing WG

Madhu Rao, TTWG Chair

Phone: +91 9840921405

E-mail: madhu.rao@developer.onvif.org

Appendix A - Timeline for Service

Due dates correspond to end of day at UTC time. See Appendix B for definition of deliverables.

20 Jan 2025	Circulation of this Request for Quotation
21 Feb 2025	Quotation must be received by the ***ONVIF Office*** and ***TTWG*** by e-mail.
14 Mar 2025	Contractor selected & agreement signed.

Project CCTT

04 Apr 2025	Delivery of Phase 1 (System design proposal)
Jun 2025	Technical F2F Meetings (Italy)
1 Jul 2025	Delivery of Phase 2 (Device Management Service)
Sep 2025	All Committee F2F Meetings (America, TBD)
1 Nov 2025	Delivery of Phase 3 (Cloud Uplink & Authentication)
Nov 2025	Technical F2F Meetings & Developers' Plugfest (Asia, TBD)
1 Feb 2026	Delivery of Phase 4 (WebRTC)
Mar 2026	All Committee F2F Meetings & Developers' Plugfest (TBD)
1 May 2026	Delivery of Phase 5 (Cloud Profile)
Jun 2026	Technical F2F Meetings & Developers' Plugfest (TBD)
20 Jun 2026	Delivery of CCTT 26.06 (Phase 5 delivery w. fixes)

Appendix B - Definition of Deliverables and acceptance criteria

These phases outline delivery process. Next phase in the process shall not be started until acceptance criteria for the previous phase is fulfilled and delivery is accepted.

Name	Description	Acceptance Criteria
Phase 1 - CCTT system design proposal and development decisions	Delivery according to Annex E.	Review and approval
Phase 2 – CCTT Prototype v1 (device simulator prototype – proof of concept)	Delivery according to Annex E.	The implemented services shall pass the corresponding test cases in ONVIF DTT.
Phase 3 – CCTT Prototype v2 (device simulator – Cloud Uplink spec)	Delivery according to Annex E.	The implemented services shall pass the corresponding test cases in ONVIF DTT.
Phase 4 – CCTT Prototype v3 (device simulator – WebRTC)	Delivery according to Annex E.	The implemented services shall pass the corresponding test cases in ONVIF DTT.
Phase 5 – CCTT First Release (device simulator – Cloud Profile)	Delivery according to Annex E.	The implemented services shall pass the corresponding test cases in ONVIF DTT.
CCTT 26.06	Phase 5 delivery including bugfixes	The delivery shall be accepted at ONVIF Developers' Plugfest.

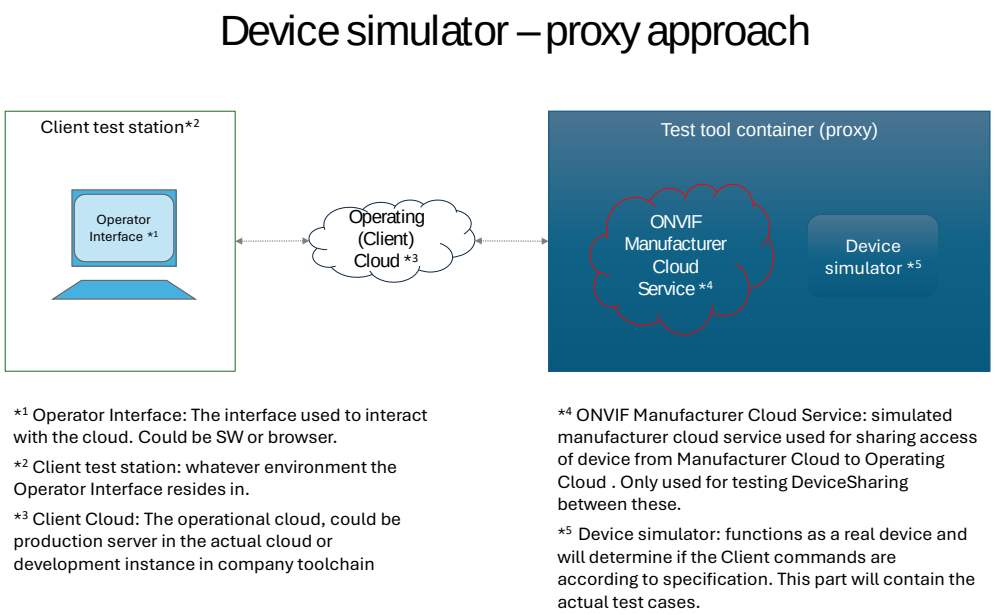
Appendix C - Delivery Packages and Responsibilities

Delivery Package	Item	Target	Editing Responsibility	Review Responsibility
CCTT	Phase 1	Workgroup	Contractor	TSC, TC, TTWG Chair
	Phase 2	Workgroup	Contractor	TTWG Members
	Phase 3	Workgroup	Contractor	TTWG Members
	Phase 4	Workgroup	Contractor	TTWG Members
	Phase 5	ONVIF Members	Contractor	All WGs
	26.06	ONVIF Members	Contractor	TTWG Members

Appendix D - Tools and Documentation

Documentation

- Agreed approach for CCTT development (Normative)



*1 Operator Interface: The interface used to interact with the cloud. Could be SW or browser.

*2 Client test station: whatever environment the Operator Interface resides in.

*3 Client Cloud: The operational cloud, could be production server in the actual cloud or development instance in company toolchain

*4 ONVIF Manufacturer Cloud Service: simulated manufacturer cloud service used for sharing access of device from Manufacturer Cloud to Operating Cloud . Only used for testing DeviceSharing between these.

*5 Device simulator: functions as a real device and will determine if the Client commands are according to specification. This part will contain the actual test cases.

- Discussion paper on Cloud Client testing options presented at Krakow F2F (Informative)

Cloud Profile Client Test Strategy_onvif_

Appendix E - Project requirements (delivery based)

This appendix lists project requirements that shall be implemented and delivered as part of this project.

All project requirements shall be tracked in designated repository in GitHub.

Requirement	Target phase	Task Description	Reference
R.SEC.001	1	Test tool shall be developed according to security guidelines, such as those provided by OpenSSF.	https://openssf.org/
R.ENV.001	1	Test tool shall run in containerized environment for inclusion into members toolchains.	
R.ENV.002	1	Test tool shall be able to run in a cloud instance to enable testing of cloud deployed VMS.	
R.FUN.002	1	Test tool shall act as a simulated device in interactions with Cloud Clients.	
R.FUN.005	1	Test tool shall not require manual intervention apart from initial setup configuration.	
R.DEV.006	1	System design document outlining the proposed design and selection of programming language(s).	
R.DEV.001	2	GitHub shall be used for development to work with: · Source code · Documentation · Task tracking	
R.DEV.002	2	The development environment shall be containerized	
R.DEV.003	2	Development environment shall include code debugging functionalities for all languages used.	
R.DEV.004	2	Test code shall be developed together with test tool for automatic regression testing before releases.	
R.FUN.003	2	Test tool shall provide conformance documents according to ONVIF Conformance Process Specification conformance	https://www.onvif.org/profiles/conformance/ · Correctness of documents generated by the Tool. · Correctness of test procedure. · Execute Test Tool with sample inputs provided

		requirements	by members of ONVIF.
			· Generation of document only after a completely successful run.
R.FUN.006	2	Test tool shall be able to include Errata process in generated conformance documents	Erratum is a confirmed bug or other issue in an officially released test tool version that causes conformance testing to unfairly fail a client or Device under test. It shall be possible for a Client under test to refer to an errata number and provide a description for each failed test case(s) to be included in the generated conformance documents.
R.FUN.004	2	Test tool shall be able to provide test case debug information when conformance tests fail (e.g. what part of the test case is failing).	
R.DEV.007	2	Prototype shall implement authentication over HTTP & HTTPS	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			5.9.1 Authentication over HTTP and HTTPS
R.DEV.008	2	Prototype shall implement Device Management Service - Capabilities	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			8.1.1 - GetWsdlUrl
			8.1.2.2 - GetServices
			8.1.2.3 - GetServiceCapabilities
R.DEV.009	2	Prototype shall implement Device Management Service - Discovery	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			7 - Device Discovery (WS-Discovery)
			8.3.14 - GetScopes
			8.3.15 - SetScopes
			8.3.16 - AddScopes
			8.3.17 - RemoveScopes
			8.3.18 - GetDiscoveryMode
			8.3.19 - SetDiscoveryMode
R.DEV.010	2	Prototype shall implement Device Management Service – Network Configuration	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			8.2.1 - GetHostname
			8.2.2 - SetHostname
			8.2.4 - GetDNS
			8.2.5 - SetDNS
			8.2.6 - GetNTP
			8.2.7 - SetNTP
			8.2.10 - GetNetworkInterfaces
			8.2.11 - SetNetworkInterfaces
			8.2.12 - GetNetworkProtocols
			8.2.13 - SetNetworkProtocols
			8.2.14 - GetNetworkDefaultGateway
			8.2.15 - SetNetworkDefaultGateway
R.DEV.011	2	Prototype shall implement	https://www.onvif.org/specs/core/ONVIF-Core-

		Device Management Service – System	Specification.pdf:
			8.3.1 - GetDeviceInformation
			8.3.6 - GetSystemDateAndTime
			8.3.7 - SetSystemDateAndTime
			8.3.8 - SetSystemFactoryDefault
			8.3.13 - SystemReboot
R.DEV.012	2	Prototype shall implement Device Management Service – Security	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			8.4.3 - Get users
			8.4.4 - Create users
			8.4.5 - Delete users
			8.4.6 - SetUser
R.DEV.013	3	Prototype shall implement Device Management Service – Auxiliary commands	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			8.7 – SendAuxiliaryCommand (tt: IRLamp|Auto)
R.DEV.019	2	UI running as an API-driven webservice	Look and feel shall be similar to current CTT. Vendor to provide UX proposal for ONVIF review. API's must be automatable to allow client vendors to run as part of dev ops pipeline
R.DEV.005	2	Test tool shall be designed is such a way as to be able to incorporate existing ONVIF Profiles (on-premises technologies)	
R.DEV.014	3	Prototype shall implement Cloud Uplink Service	https://www.onvif.org/specs/srv/uplink/ONVIF-Uplink-Spec.pdf
R.DEV.017	3	Prototype shall implement Authentication Service	https://www.onvif.org/specs/srv/security/ONVIF-Security-Service-Spec.pdf
			5.2.6.2.1 - CreateRSAKeyPair
			5.2.6.2.2 - CreateECCKeyPair
			5.2.6.2.4 - GetKeyStatus
			5.2.6.2.6 - GetAllKeys
			5.2.6.2.7 - DeleteKey
			5.2.6.3.5 - GetCertificate
			5.2.6.3.6 - GetAllCertificates
			5.2.6.3.7 - DeleteCertificate
			5.2.6.3.3 - UploadCertificate
			5.2.6.3.1 - CreatePKCS10CSR
			5.2.6.5.1 - CreateCertPathValidationPolicy
			5.2.6.5.2 - GetCertPathValidationPolicy
			5.2.6.5.3 - GetAllCertPathValidationPolicies
			5.2.6.5.4 - DeleteCertPathValidationPolicy
			5.5.1 - GetAuthorizationServerConfigurations
			5.5.2 - CreateAuthorizationServerConfiguration
			5.5.3 - SetAuthorizationServerConfiguration
			5.5.4 - DeleteAuthorizationServerConfiguration
R.DEV.015	4	Prototype shall implement WebRTC Service	https://www.onvif.org/specs/stream/ONVIF-WebRTC-Spec.pdf
R.SEC.002	5	Threat modelling shall be	https://owasp.org/www-project-threat-model/

		performed on relevant interfaces that can be exposed to the internet.	
R.FUN.001	5	Test tool shall be able to evaluate correctness of Cloud Clients interactions with test tool according to ONVIF Test Specifications derived from ONVIF Network Interface Specifications and ONVIF Profile “Cloud” (name TBD)	https://www.onvif.org/profiles/specifications/
R.DEV.016	5	Prototype shall implement ONVIF Profile “Cloud” (name TBD)	https://github.com/onvif/wg_profile_cloud
R.DEV.019	5	Prototype shall include a help file for operating instructions and trouble shooting	
R.DEV.018	5	Prototype shall implement Object Store Recording	https://www.onvif.org/specs/core/ONVIF-Core-Specification.pdf:
			8.8.2 - GetStorageConfigurations
			8.8.3 - CreateStorageConfiguration
			8.8.4 - GetStorageConfiguration
			8.8.5 - SetStorageConfiguration
			8.8.6 - DeleteStorageConfiguration
			https://www.onvif.org/specs/srv/rec/ONVIF-RecordingControl-Service-Spec.pdf
			5.4 - CreateRecording
			5.5 - DeleteRecording
			5.6 - GetRecordings
			5.7 - SetRecordingConfiguration
			5.8 - GetRecordingConfiguration
			5.9 - CreateTrack
			5.10 - DeleteTrack
			5.16 - SetRecordingJobConfiguration
			5.17 - GetRecordingJobConfiguration

Appendix F - Technical Requirements for the ONVIF Cloud Client Test Tool

1. **The software source code MUST be documented in good practice in English** in the standard source code comments scheme. Documentation MUST at least cover classes, methods, parameters, return values, and exceptions. The level of details of the documentation must be such that ONVIF, or a knowledgeable third party requested by ONVIF, can further develop and/or amend the software.
    a. The structure and coding practice MUST adhere to the best practices recommended for the chosen programming language.
    b. Implementation must be done in programming language that can be containerized.
2. **The software source code MUST be developed using the workgroup-provided Version Control System**.
    a. The executable application, the source code and the accompanying documentation MUST be delivered in electronic form to the workgroups, on the GitHub release platform or as decided by theworking group, before the project's closure or on request by the working group.
3. **All external frameworks used MUST be approved by the workgroup** and MUST be actively maintained.
    a. Use of open-source components in the test tool MUST follow the Guidelines for use of Open-Source Software in the ONVIF organization as outlined in Annex G
4. **Development and validation of the tool MUST be done** using:
    a. Ordinary Intel x86 architecture-based platform
    b. Graphical User interface in American English language
5. **The test specifications and test tools MUST follow best practices established by ONVIF**, including, but not limited to:
    a. All configuration changes made by a test case in a Device Under Test MUST be. reverted before the test case terminates.
    b. Test case definitions MUST support sequential execution of test cases as well as execution of individual test cases.
    c. User interaction during execution of tests SHOULD be avoided where possible. Introduction of user interaction MUST be approved by the work group.
    d. Help pages must include images and text describing the operations of the tool.

Appendix G - Guidelines for the use of Open-Source Software in the ONVIF organization

Scope

This annex is an informative guideline for the use of Open-Source Software (OSS) in software development projects done within the ONVIF organization. This includes, but is not limited to, projects within the Technical Services Committee (TSC) such as ONVIF Test Tools.

External OSS used in ONVIF software projects.

Choosing licenses

When choosing OSS, the obligations that the license imposes shall be considered. The guideline for ONVIF projects is to prefer licenses that are permissive, as these are easier to comply with.

- Permissive licenses should always be preferred. This includes, but is not limited to, BSD, MIT and Apache 2.0 licenses.
    - Note on BSD licenses: OSS under the BSD 4-clause license (a.k.a. “Original”) is to be avoided. OSS under the BSD 2-clause (a.k.a. “Simplified”) and BSD 3-clause licenses (a.k.a. “Modified”) can be used.
- Weakly protective licenses (weak copyleft), such as LGPL, should only be used after careful consideration. An especially important aspect when considering OSS under such a license is how linking between the OSS and any ONVIF developed software will be handled.
- Strong protective licenses (strong copyleft), such as GPL and AGPL, shall be avoided.

Complying with licenses

Each OSS license includes a description of what is needed to comply with the license. It is the responsibility of the development project to make sure that ONVIF complies with licenses used. Two common requirements are attribution and provisioning of modified code.

Attribution

The purpose of attribution is to credit the creator of the OSS used. This is a common obligation in OSS licenses. It is also the right thing to do, so ONVIF projects using OSS should make sure that attribution notices are easy to find and easy to understand.

- In source code: Keep License/Note/Copyright? notices in code in accordance with the license.
- In software: Attribute the OSS used in the software in an appropriate place.

Provisioning of modified source code

An OSS license requires that any modified code is provided. In the case where an ONVIF project is using OSS where this is required and the ONVIF project modifies the code, the ONVIF project must ensure that the modified code can be provided upon request. Releasing source code developed by ONVIF as OSS Source code released by ONVIF as OSS shall have a copyright notice and an appropriate license. Which license to choose will be decided on a case-by-case basis. A permissive license is appropriate for code where ONVIF wants users of the code to be free to use it as they choose. A protective license is appropriate when ONVIF wants to place copyleft restrictions on the use of the code. The recommendations below are made for the sake of consistency between ONVIF projects:

- Where a permissive license is the preferred option, then the MIT license should be used, unless there are reasons for choosing a different license.
- Where a protective license is the preferred option, then the GPLv2 license should be used, unless there are reasons for choosing a different license.

Note that all creative works, including source code, are under exclusive copyright unless otherwise stated. Therefore, for the sake of clarity, the above recommendation should be considered for all source code, including sample code, released by ONVIF.