ONVIF Implementation Conformance Statement for Device
Version 16.03

2017-02-24

Panasonic

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1. Scope

The scope of this document is in accordance with the ONVIF Core Specification Version 16.03. The Implementation Conformance Statement might be used for ONVIF interoperability testing. Thus the scope of this document is, to provide our partners with the fundament for ONVIF end-to-end interoperability testing. Another significant intent of this document is also to be used as a base for discussions with our partners to explore any such requirements that might not be clearly defined in the specifications of ONVIF with respect to interoperability.

2. References

2.1. Normative References

2.1.1. ONVIF Profile Specification

ONVIF Profile A Specification - Release Candidate

https://www.onvif.org/profiles/profile-a-release-candidate/

ONVIF Profile Q Specification

https://www.onvif.org/profiles/profile-q/

[ProfileG]   ONVIF Profile G specification

https://www.onvif.org/profiles/profile-g/

ONVIF Profile C Specification

https://www.onvif.org/profiles/profile-c/

[ProfileS]   ONVIF Profile S Specification

https://www.onvif.org/profiles/profile-s/

2.1.2. ONVIF Network Interface Specification Set, version 16.03

http://www.onvif.org/specs/DocMap-16.03.html

2.1.2.1. Core Specification

[Core]   ONVIF Core Specification

                                http://www.onvif.org/specs/core/ONVIF-Core-Specification-v261.pdf

2.1.2.2. Data Format Specification

[Stream]   ONVIF Streaming Specification

                                http://www.onvif.org/specs/stream/ONVIF-Streaming-Spec-v260.pdf

-                               Export File Format

                                http://www.onvif.org/specs/stream/ONVIF-ExportFileFormat-Spec-v101.pdf

2.1.2.3. Service Specifications

-                               Access Control

                                http://www.onvif.org/specs/srv/access/ONVIF-AccessControl-Service-Spec-v103.pdf

-                               Access Rules

                                http://www.onvif.org/specs/srv/access/ONVIF-AccessRules-Service-Spec-v100.pdf

[Action]   Action Engine

                                http://www.onvif.org/specs/srv/act/ONVIF-ActionEngine-Service-Spec-v100.pdf

-                               Advanced Security

                                http://www.onvif.org/specs/srv/security/ONVIF-AdvancedSecurity-Service-Spec-v130.pdf

[Analytics]   Analytics

                                http://www.onvif.org/specs/srv/analytics/ONVIF-Analytics-Service-Spec-v250.pdf

-                               Credential

                                http://www.onvif.org/specs/srv/access/ONVIF-Credential-Service-Spec-v100.pdf

[DeviceIO]   Device IO

                                http://www.onvif.org/specs/srv/io/ONVIF-DeviceIo-Service-Spec-v261.pdf

[Display]   Display

                                http://www.onvif.org/specs/srv/disp/ONVIF-Display-Service-Spec-v230.pdf

                                Door Control

                                http://www.onvif.org/specs/srv/door/ONVIF-DoorControl-Service-Spec-v102.pdf

[Imaging]   Imaging

                                http://www.onvif.org/specs/srv/img/ONVIF-Imaging-Service-Spec-v261.pdf

[Media]   Media

                                http://www.onvif.org/specs/srv/media/ONVIF-Media-Service-Spec-v261.pdf

[Media2]	Media
	http://www.onvif.org/specs/srv/media/ONVIF-Media2-Service-Spec-v101.pdf
[PTZ]	PTZ
	http://www.onvif.org/specs/srv/ptz/ONVIF-PTZ-Service-Spec-v261.pdf
[Receiver]	Receiver
	http://www.onvif.org/specs/srv/rcv/ONVIF-Receiver-Service-Spec-v221.pdf
[Recording]	Recording Control
	http://www.onvif.org/specs/srv/rec/ONVIF-RecordingControl-Service-Spec-v250.pdf
[Search]	Recording Search
	http://www.onvif.org/specs/srv/rsrch/ONVIF-RecordingSearch-Service-Spec-v261.pdf
[Replay]	Replay Control
	http://www.onvif.org/specs/srv/replay/ONVIF-ReplayControl-Service-Spec-v221.pdf
-	Schedule
	http://www.onvif.org/specs/srv/sched/ONVIF-Scheduler-Service-Spec-v100.pdf
[Analytics Device]	Video Analytics Device
	http://www.onvif.org/specs/srv/analytics/ONVIF-VideoAnalyticsDevice-Service-Spec-v211.pdf

2.2. Informative References

None

3. Terminology and Conventions

3.1. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2. Definitions

None

3.3. Abbreviations

SCR	Static Conformance Requirement
Device-Req	Device Requirement. Device had been called as Network Video transmitter until Core Spec 2.1.
Client-Req	Client Requirement. Client had been called as Network Video Client until Core Spec 2.1.

4. Introduction

This document defines the static conformance requirement for the ONVIF Device-Client Protocol based on the ONVIF core specification. It defines the mandatory and OPTIONAL functionality at the transaction level. In addition, this document identifies the mandatory and OPTIONAL functionalities the various services provide. This document is described based on the requirement of Profile-S which is defined for network camera or encoder. For covering Profile-G (for recording features), it is indicated by adding convention with parenthesis if Profile-G has higher requirement than Profile-S.

The Device-Req / Client-Req column follows the following conventions:

Convention	Description	Key words in [RFC2119]
M	Mandatory requirements for Device or Client	"MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT"
R	Recommended requirements	"SHOULD", "SHOULD NOT", "RECOMMENDED"
O	Optional requirements	"MAY", "OPTIONAL"
N/A	Not Applicable	-
C	Conditional Mandatory requirements which are mandatory IF the pre-requisite optional requirements are supported.	"MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT"
C/R	Conditional Recommended requirements which are recommended IF the pre-requisite optional requirements are supported.	"SHOULD", "SHOULD NOT", "RECOMMENDED"

5. Web Service frame work

5.1. Web Services

Description	Device-Req	Support	Reference
Follow the guidelines in the WS-I Basic Profile 2.0	M	Yes	[Core] 5
Device management	M	Yes	[Core] 5.1.2
Event Service	M	Yes	[Core] 5.1.2
Respond to all commands defined in the corresponding service WDL.	M	Yes	[Core] 5.1.2
Respond to a request with the error codes for not supported command	M	Yes	[Core] 5.1.2

5.2. Error Handling

Description	Device-Req	Support	Reference
use appropriate RTSP and HTTP protocol defined status codes for error reporting and handling	M	Yes	[Core] 5.11.1
SOAP errors shall be reported and handled through SOAP fault messages	M	Yes	[Core] 5.11.2.1
use SOAP 1.2 fault message handling as specified in ONVIF specification	M	Yes	[Core] 5.11.2.1
follow the WS-I Basic Profile 2.0 fault handling recommendations.	M	Yes	[Core] 5.11.2.1
define additional fault subcodes for use by applications.	O	No	[Core] 5.11.2.1
handle all the ONVIF generic fault codes	M	Yes	[Core] 5.11.2.2
If the Device waits for the start of the inbound message and no SOAP message is received, the Device shall NOT generate a SOAP fault and instead sends an HTTP error response.	M	Yes	[Core] 5.11.2.4

5.3. Security

Description	Device-Req	Support	Reference
digest authentication according to [RFC 2617]	O (M)	Yes	[Core] 5.12.1
User name token profile [WS-UsernameToken]	M	Yes	[Core] 5.12.1
X.509 security token profile [WS-X.509Token]	O	No	[Core] 5.12.1
SAML token profile [WS-SAMLToken]	O	No	[Core] 5.12.1
Kerberos token profile [WS-KerberosToken]	O	No	[Core] 5.12.1
Rights Expression Language (REL) Token Profile [WS-RELToken]	O	No	[Core] 5.12.1
For user defined with the user name token profile, digest authentication [RFC 2617] shall be used for RTSP and HTTP.	M	Yes	[Core] 5.12.1
An ONVIF compliant device should authenticate an RTSP request at the RTSP level.	R	Yes	[Core] 5.12.1
If HTTP is used to tunnel the RTSP request the device shall not authenticate at this level.	M	Yes	[Core] 5.12.1
By default, the device should enforce the following default access policy, which gives an acceptable level of security in many systems.	R	Yes	[Core] 5.12.1.1
The default access policy builds upon the access classes that are associated to the services and grants access rights in the following way. A user of level c shall be granted access to a service associated to access class r if and only if an "X" is present in the cell at column c and row r in Table 7.	C	Yes	[Core] 5.12.1.4
A client shall use both nonce and timestamps as defined in [WS-UsernameToken].	N/A	N/A	[Core] 5.12.3
The server shall reject any Username Token not using both nonce and creation timestamps.	M	Yes	[Core] 5.12.3
If server supports both digest authentication as specified in [RFC 2617] and the user name token profile as specified in WS-Security the following behavior (Figure 2: Authentication of a WS request by a server) shall be adapted.	M	Yes	[Core] 5.12.1

6. IP configuration

Description	Device-Req	Support	Reference
have at least one network interface that gives it IP network connectivity.	M	Yes	[Core] 6
IPv4 based network communication	M	Yes	[Core] 6
IPv6 based network communication	R	Yes	[Core] 6
possible to make static IP configuration on the Device using a network or local configuration interface	M	Yes	[Core] 6
dynamic IP configuration of link-local addresses according to [RFC3927]	R	Yes	[Core] 6
stateless IP configuration according to [RFC4862] C: IPv6	C	Yes	[Core] 6
neighbour discovery according to [RFC4861]. C: IPv6	C	Yes	[Core] 6
dynamic IP configuration according to [RFC 2131]. (IPv4)	M	Yes	[Core] 6
Stateful IP configuration according to [RFC3315]. C: IPv6	C	Yes	[Core] 6
any additional IP configuration mechanism	O	No	[Core] 6
Possible to make Device IP configurations through the parameter configuration interface specified in Section 8.2.	M	Yes	[Core] 6
The default Device configuration SHALL be to have both DHCP and dynamic link-local (stateless) address configuration enabled	M	Yes	[Core] 6
Even if the device is configured through a static address configuration it should have the link-local address default enabled	R	No	[Core] 6
When a Device is connected to an IPv4 network, address assignment priorities (link local versus routable address) SHOULD be done as recommended in [RFC3927].	R	No	[Core] 6

7. Device discovery

7.1. General

Description	Device-Req	Support	Reference
Implement the Target Service role as specified in [WS-Discovery]	M	Yes	[Core] 7.1
If necessary Implement the Client role as specified in [WS-Discovery].	N/A	N/A	[Core] 7.1
Discovery Proxy role as described in [WS-Discovery] shall NOT be supported. This specification defines a new Discovery Proxy role.	M	N/A	[Core] 7.1

7.2. Modes of operation

Description	Device-Req	Support	Reference
Device shall be able to operate in *two* modes: Discoverable and Non-Discoverable	M	Yes	[Core] 7.2
Device in discoverable mode sends multicast Hello messages once connected to the network or sends its Status changes according to [WS-Discovery].	M	Yes	[Core] 7.2
A device in non-discoverable shall not listen to [WS-Discovery] messages or send such messages.	M	Yes	[Core] 7.2
Device default behaviour shall be the discoverable mode.	M	Yes	[Core] 7.2

7.3. Discovery definitions

Description	Device-Req	Supprt	Reference
Use a stable, globally unique identifier that is constant across network interfaces as part of the property of its endpoint reference.	M	Yes	[Core] 7.3.1
Support Hello	M	Yes	[Core] 7.3.2
An ONVIF compliant device shall include the device management service port type, i.e. tds:Device, in the <d:Types> declaration	M	Yes	[ProfileS] 9.1
An ONVIF compliant device shall include the scope <d:Scopes> attribute with the scopes of the device in the Hello message.	M	Yes	[Core] 7.3.2.2.1
A device shall include at least one entry of the profile, location, hardware and name categories respectively in the scopes list.	M	Yes	[Core] 7.3.2.2.1
For backward compatibility reason an ONVIF compliant device shall also include dn:NetworkVideoTransmitter in the <d:Types> declaration	M	Yes	[ProfileS] 9.1
Support Probe and Probe Match	M	Yes	[Core] 7.3.3
at least support the http://schemas.xmlsoap.org/ws/2005/04/discovery/rfc3986 scope matching rule.	M	Yes	[Core] 7.3.3
include the <d:XAddrs> element with the addresses for the device service in a matching probe match message.	M	Yes	[Core] 7.3.3

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Device should implement the resolve match response.	R	Yes	[Core] 7.3.4
Device should send a one-way Bye message when it prepares to leave a network	R	Yes	[Core] 7.3.5
If an error exists with the multicast packet, the Device and Client should silently discard and ignore the request.	R	Yes	[Core] 7.3.6
If a device receives a unicast Probe message and it does not support the matching rule, then the device MAY choose not to send a Probe Match, and instead generate a SOAP fault.	O	Yes	[Core] 7.3.6
A device compliant to the Profile S shall include a scope entry with this value in its scope list. **Profile/Streaming**	M	Yes	[ProfileS] 9.1
A device compliant to the Profile G shall include a scope entry with this value in its scope list. **Profile/G**	M	Yes	[ProfileG] 9.3.4

8. Device management

8.1. Capabilities

Description	Device-Req	Support	Reference
GetWsdlUrl	M	Yes	[ProfileS] 7.2.1
GetServices	M	Yes	[ProfileG] 7.2.1
GetServiceCapabilities	M	Yes	[ProfieG] 7.2.1
GetCapabilities	M	Yes	[ProfileS] 7.2.1

8.2. Network

Description	Device-Req	Support	Reference
GetHostname	M	Yes	[ProfileS] 7.4.3
SetHostname	M	Yes	[ProfileS] 7.4.3
SetHostnameFromDHCP C: signalled via the HostnameFromDHCP capability.	C	No	[Core] 8.2.3
GetDNS	M	Yes	[ProfileS] 7.4.3
SetDNS	M	Yes	[ProfileS] 7.4.3
GetNTP C:NTP	C	Yes	[ProfileS] 8.14.3
SetNTP C:NTP	C	Yes	[ProfileS] 8.14.3
GetDynamicDNS C:DynamicDNS as specified in [RFC 2136] and [RFC 4702]	C	Yes	[ProfileS] 8.15.3
SetDynamicDNS C:DynamicDNS as specified in [RFC 2136] and [RFC 4702]	C	Yes	[ProfileS] 8.15.3
GetNetworkInterfaces	M	Yes	[ProfileS] 7.4.3
SetNetworkInterfaces	M	Yes	[ProfileS] 7.4.3
GetNetworkProtocols	M	Yes	[ProfileS] 7.4.3
SetNetworkProtocols	M	Yes	[ProfileS] 7.4.3
GetNetworkDefaultGateway	M	Yes	[ProfileS] 7.4.3
SetNetworkDefaultGateway	M	Yes	[ProfileS] 7.4.3
GetZeroConfiguration C:dynamic IP configuration according to [RFC3927]	C	No	[ProfileS] 8.16.3
SetZeroConfiguration C:dynamic IP configuration according to [RFC3927]	C	No	[ProfileS] 8.16.3
GetIPAddressFilter C:access control based on IP filtering rules	C	No	[ProfileS] 8.17.3
SetIPAddressFilter C:access control based on IP filtering rules	C	No	[ProfileS] 8.17.3

AddIPAddressFilter C:access control based on IP filtering rules	C	No	[ProfileS] 8.17.3
RemoveIPAddressFilter C:access control based on IP filtering rules	C	No	[ProfileS] 8.17.3
IEEE 802.11 configuration C: IEEE 802.11 support,	C	No	[Core] 8.2.22
SSID C: IEEE 802.11 support,	C	No	[Core] 8.2.22.1
Station Mode C: IEEE 802.11 support,	C	No	[Core] 8.2.22.2
The device MAY support the ad-hoc network station mode.	O	No	[Core] 8.2.22.2
Multiple wireless network configuration C: IEEE 802.11 support,	C	No	[Core] 8.2.22.3
Security configuration C: IEEE 802.11 support,	C	No	[Core] 8.2.22.4
the device shall, in accordance with the [IEEE 802.11-2007] specification, support the CCMP algorithm and the device MAY support the TKIP algorithm.	C	No	[Core] 8.2.22.4
The device shall support both the manually and the automatically selected mode.	C	No	[Core] 8.2.22.4
None mode C: IEEE 802.11 support,	C	No	[Core] 8.2.22.4.1
PSK mode C: IEEE 802.11 support,	C	No	[Core] 8.2.22.4.2
IEEE 802.1X-2004 Mode C: IEEE 802.11 support,	C/R	No	[Core] 8.2.22.4.3
GetIEEE802.11Capabilities C:IEEE802.11 support	C	No	[Core] 8.2.22.5
GetDot11Status C:IEEE802.11 support	C	No	[Core] 8.2.22.6
ScanAvailable802.11Networks C: IEEE802.11 support	C/R	No	[Core] 8.2.22.7

8.3. System

Description	Device-Req	Support	Reference
GetDeviceInformation	M	Yes	[ProfileS] 7.5.3
GetSystemUris C: allows retrieval of system logs, support information or system backup data	C	No	[Core] 8.3.2
GetSystemBackup C: indicate **SystemBackup** capability	C	Yes	[Core] 8.3.3
RestoreSystem C: indicate **SystemBackup** capability	C	Yes	[Core] 8.3.4
StartSystemRestore	R	No	[Core] 8.3.5
GetSystemDateAndTime	M	Yes	[ProfileS] 7.5.3

SetSystemDateAndTime	M	Yes	[ProfileS] 7.5.3
SetSystemFactoryDefault	M	Yes	[Core] 8.3.8
UpgradeSystemFirmware C: indicate **FirmwareUpgrade** capability	C	No	[Core] 8.3.9
StartFirmwareUpgrade	R	Yes	[Core] 8.3.10
GetSystemLog	R	No	[Core] 8.3.11
GetSystemSupportInformation	O	No	[Core] 8.3.12
SystemReboot	M	Yes	[ProfileS] 7.5.3
GetScopes	M	Yes	[ProfileS] 7.3.3
SetScopes	M	Yes	[ProfileS] 7.3.3
AddScopes	M	Yes	[ProfileS] 7.3.3
RemoveScopes	M	Yes	[ProfileS] 7.3.3
GetDiscoveryMode	M	Yes	[ProfileS] 7.3.3
SetDiscoveryMode	M	Yes	[ProfileS] 7.3.3
GetRemoteDiscoveryMode C:Remote Discovery	C	No	[Core] 8.3.20
SetRemoteDiscoveryMode C:Remote Discovery	C	No	[Core] 8.3.21
GetDPAddresses C:Remote Discovery	C	No	[Core] 8.3.22
SetDPAddresses C:Remote Discovery	C	No	[Core] 8.3.23

8.4. Security

Description	Device-Req	Support	Reference
GetAccessPolicy C:access policy settings based on WS-Security authentication	C	No	[Core] 8.4.1
SetAccessPolicy C:access policy settings based on WS-Security authentication	C	No	[Core] 8.4.2
GetUsers	M	Yes	[ProfileS] 7.6.3
CreateUsers	M	Yes	[[ProfileS] 7.6.3
DeleteUsers	M	Yes	[ProfileS] 7.6.3
SetUser	M	Yes	[ProfileS] 7.6.3
CreateDot1XConfiguration C: support IEEE 802.1x	C	No	[Core] 8.4.7.1
SetDot1XConfiguration C: support IEEE 802.1x	C	No	[Core] 8.4.7.2
GetDot1XConfiguration C: support IEEE 802.1x	C	No	[Core] 8.4.7.3
GetDot1XConfigurations	C	No	[Core]

Description	Device-Req	Support	Reference
C: support IEEE 802.1x			8.4.7.4
DeleteDot1XConfigurations C: support IEEE 802.1x	C	No	[Core] 8.4.7.5
CreateCertificate C: support TLS C: onboard public key pair generation	C	Yes	[Core] 8.4.8
GetCertificates C: support TLS server certificates and IEEE 802.1X client certificates	C	Yes	[Core] 8.4.9
GetCACertificates C: support either TLS client authentication or IEEE 802.1x	C	No	[Core] 8.4.10
GetCertificatesStatus C: support TLS	C	Yes	[Core] 8.4.11
SetCertificatesStatus C: support TLS	C	Yes	[Core] 8.4.12
GetPkcs10Request C: support onboard key pair generation that supports either TLS or IEEE 802.1X using client certificate	C	Yes	[Core] 8.4.13
GetClientCertificateMode C: support TLS	C	No	[Core] 8.4.14
SetClientCertificateMode C: support TLS	C	No	[Core] 8.4.15
LoadCertificates C: onboard key pair generation that support either TLS or IEEE 802.1X	C	Yes	[Core] 8.4.16
LoadCertificateWithPrivateKey C: a device does not support onboard key pair generation and support either TLS or IEEE 802.1X using client certificate	C	No	[Core] 8.4.17
A device that support onboard keypair generation MAY support this command (LoadCertificateWithPrivateKey).	C	No	[Core] 8.4.17
GetCertificateInformation C: a device supports either TLS or IEEE 802.1X	C/R	No	[Core] 8.4.18
LoadCACertificates C: support either TLS or IEEE 802.1X	C	No	[Core] 8.4.19
A device that support this command shall support at least DER format as supported format type.	C	No	[Core] 8.4.19
DeleteCertificates C: support TLS	C	Yes	[Core] 8.4.20
GetRemoteUser C: supporting remote user handling	C	No	[Core] 8.4.21
SetRemoteUser C: supporting remote user handling	C	No	[Core] 8.4.22
GetEndpointReference	R	Yes	[Core] 8.4.23

8.5. Input/Output (I/O) (if supported)

Description	Device-Req	Support	Reference
GetRelayOutputs	M	Yes	[ProfileS] 8.13.3
SetRelayOutputSettings	M	Yes	[ProfileS] 8.13.3
SetRelayOutputState	M	Yes	[ProfileS] 8.13.3

8.6. Auxiliary operation (if supported)

Description	Device-Req	Support	Reference
SendAuxiliaryCommand C: indicates auxiliary service capability	C	Yes	[Core] 8.6
tt:Wiper|On C: supports wiper	C	No	[Core] 8.6
tt:Wiper|Off C: supports wiper	C	No	[Core] 8.6
tt:Washer|On C: supports washer	C	No	[Core] 8.6
tt:Washer|Off C: supports washer	C	No	[Core] 8.6
tt:WashingProcedure|On C: supports washer	C	No	[Core] 8.6
tt:WashingProcedure|Off C: supports washer	C	No	[Core] 8.6
tt:IRLamp|On C: supports IRLamp	C	No	[Core] 8.6
tt:IRLamp|Off C: supports IRLamp	C	Yes	[Core] 8.6
tt:IRLamp|Auto C: supports IRLamp	C	Yes	[Core] 8.6

8.7. StorageConfiguration

Description	Device-Req	Support	Reference
GetStorageConfigurations C: indicates **StorageConfiguration** capability	C	No	[Core] 8.7.1
CreateStorageConfiguration C: indicates **StorageConfiguration** capability	C	No	[Core] 8.7.2
GetStorageConfiguration C: indicates **StorageConfiguration** capability	C	No	[Core] 8.7.3
SetStorageConfiguration C: indicates **StorageConfiguration** capability	C	No	[Core] 8.7.4
DeleteStorageConfiguration C: indicates **StorageConfiguration** capability	C	No	[Core] 8.7.5

8.8. MonitoringEvents

Description	Device-Req	Support	Reference
Processor Usage C: supports monitoring of processing unit usage	C/R	No	[Core] 8.8.1
Link Status C: supports monitoring of the Link Status	C/R	No	[Core] 8.8.2
Upload Status C: supports monitoring of its upload firmware	C/R	No	[Core] 8.8.3
Operating Time: DefinedLimitReached C: supporting operation time events	C/R	No	[Core] 8.8.4

Operating Time: MeanTimeBetweenFailuresDefaultLimitReached C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: MeanTimeBetweenFailuresOperationLimitReached C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: LastReset C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: LastReboot C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: LastClockSynchronization C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: Maintenance/Last C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: Maintenance/NextScheduled C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: Backup/Last C: supporting operation time events	C/R	No	[Core] 8.8.4
Operating Time: AreaOfOperation/OutsideCertifiedArea C: supporting operation time events	R	No	[Core] 8.8.4
Operating Time: AreaOfOperation/OutsideConfiguredArea C: supporting operation time events	C/R	No	[Core] 8.8.4
Environmental Conditions: EnvironmentalConditions/RelativeHumidity C: measurements of environmental conditions are supported	C/R	No	[Core] 8.8.5
Environmental Conditions: EnvironmentalConditions/Temperature C: measurements of environmental conditions are supported	C/R	No	[Core] 8.8.5
Battery capacity C: measurements of the battery level are supported	C/R	No	[Core] 8.8.6
Asynchronous Operation Status	O	No	[Core] 8.8.7
Device Management tns1:Device/OperationMode/ShutdownInitiated tns1:Device/OperationMode/UploadInitiated	R	No	[Core] 8.8.8
Liquid level C: measurements of the level of the liquid inside a washer tank are supported	C/R	No	[Core] 8.8.9
Mechanical failure: FanFailure	R	No	[Core] 8.8.10
Mechanical failure: PowerSupplyFailure	R	No	[Core] 8.8.10
Mechanical failure: StorageFailure	R	No	[Core] 8.8.10
Mechanical failure: TemperatureCritical	R	No	[Core] 8.8.10

9. DeviceIO Service

9.1. VideoOutputs

Description	Device-Req	Support	Reference
GetVideoOutputs C: the device has one or more physical video outputs	C	No	[DeviceIO] 5.1.1

9.2. VideoOutputConfiguration

Description	Device-Req	Support	Reference
GetVideoOutputConfiguration C: the device has one or more physical video outputs	C	No	[DeviceIO] 5.2.1
SetVideoOutputConfiguration C: the device has one or more physical video outputs	C	No	[DeviceIO] 5.2.2
GetVideoOutputConfigurationOptions C: the device has one or more physical video outputs	C	No	[DeviceIO] 5.2.3

9.3. VideoSources

Description	Device-Req	Support	Reference
GetVideoSources C: the device has one or more video inputs	C	Yes	[DeviceIO] 5.3.1

9.4. VideoSourceConfiguration

Description	Device-Req	Support	Reference
GetVideoSourceConfiguration C: the device has one or more video sources	C	Yes	[DeviceIO] 5.4.1
SetVideoSourceConfiguration C: the device has one or more video sources	C	Yes	[DeviceIO] 5.4.2
GetVideoSourceConfigurationOptions C: the device has one or more video sources	C	Yes	[DeviceIO] 5.4.3

9.5. AudioOutputs

Description	Device-Req	Support	Reference
GetAudioOutputs C: the device has one or more audio outputs	C	Yes	[DeviceIO] 5.5.1

9.6. AudioOutputConfiguration

Description	Device-Req	Support	Reference
GetAudioOutputConfiguration C: the device has one or more audio outputs	C	Yes	[DeviceIO] 5.6.1
SetAudioOutputConfiguration C: the device has one or more audio outputs	C	Yes	[DeviceIO] 5.6.2
GetAudioOutputConfigurationOptions C: the device has one or more audio outputs	C	Yes	[DeviceIO] 5.6.3

9.7. AudioSources

Description	Device-Req	Support	Reference
GetAudioSources C: the device has one or more audio sources	C	Yes	[DeviceIO] 5.7.1

9.8. AudioSourceConfiguration

Description	Device-Req	Support	Reference
GetAudioSourceConfiguration C: the device has one or more audio inputs	C	Yes	[DeviceIO] 5.8.1
SetAudioSourceConfiguration C: the device has one or more audio sources	C	Yes	[DeviceIO] 5.8.2
GetAudioSourceConfigurationOptions C: the device has one or more audio sources	C	Yes	[DeviceIO] 5.8.3

9.9. Relay Outputs

Description	Device-Req	Support	Reference
GetRelayOutputs C: the device has I/O ports	C	Yes	[DeviceIO] 5.9.1
GetRelayOutputOptions C: the device has I/O ports	C	Yes	[DeviceIO] 5.9.2
SetRelayOutputSettings C: the device has I/O ports	C	Yes	[DeviceIO] 5.9.3
SetRelayOutputState C: the device has I/O ports	C	Yes	[DeviceIO] 5.9.4

9.10. Digital Inputs

Description	Device-Req	Support	Reference
GetDigitalInputs C: device signals that it supports Digital input configurations	C	Yes	[DeviceIO] 5.10.1
GetDigitalInputConfigurationOptions C: device signals that it supports Digital input	C	Yes	[DeviceIO] 5.10.2

configurations			
SetDigitalInputConfigurations C: device signals that it supports Digital input configurations	C	Yes	[DeviceIO] 5.10.3

9.11. SerialPorts

Description	Device-Req	Support	Reference
GetSerialPorts C: have physical serial ports	C	No	[DeviceIO] 5.11.1
GetSerialPortConfiguration C: have physical serial ports	O	No	[DeviceIO] 5.11.2
SetSerialPortConfiguration C: have physical serial ports	O	No	[DeviceIO] 5.11.3
GetSerialPortConfigurationOptions C: have physical serial ports	C	No	[DeviceIO] 5.11.4
SendReceiveSerialCommand C: indicates generic serial communication service capability	C	No	[DeviceIO] 5.11.5

9.12. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **VideoSources**	O	Yes	[DeviceIO] 5.12
Capabilities: **VideoOutputs** Support 0 only	O	Yes	[DeviceIO] 5.12
Capabilities: **AudioSources**	O	Yes	[DeviceIO] 5.12
Capabilities: **AudioOutputs**	O	Yes	[DeviceIO] 5.12
Capabilities: **RelayOutputs**	O	Yes	[DeviceIO] 5.12
Capabilities: **DigitalInputs**	O	Yes	[DeviceIO] 5.12
Capabilities: **SerialPorts**	O	No	[DeviceIO] 5.12
Capabilities: **DigitalInputOptions**	O	Yes	[DeviceIO] 5.12
GetServiceCapabilities	O (M)	Yes	[DeviceIO] 5.12

9.13. Events

Description	Device-Req	Support	Reference
DigitalInput State Change **tns1:Device/Trigger/DigitalInput** C:signals support for digital inputs in its capabilities	C	Yes	[DeviceIO] 5.13.1
Relay Output Trigger **tns1:Device/Trigger/Relay** C:signals support for RelayOutput in its capabilities	R/C	Yes	[DeviceIO] 5.13.2

10. Imaging configuration

10.1. Imaging Settings

Description	Device-Req	Support	Reference
BacklightCompensation WideDynamicRange unsupported model only	O	Yes	[Imaging] 5.1
Brightness	O	Yes	[Imaging] 5.1
ColorSaturation	O	Yes	[Imaging] 5.1
Sharpness	O	Yes	[Imaging] 5.1
Contrast	O	Yes	[Imaging] 5.1
Exposure	O	No	[Imaging] 5.1
Focus	O	Yes	[Imaging] 5.1
Ir cut filter	O	Yes	[Imaging] 5.1
IrCutFilterAutoAdjustment	O	Yes	[Imaging] 5.1
Whitebalance	O	Yes	[Imaging] 5.1
WideDynamicRange	O	Yes	[Imaging] 5.1
Image Stabilization	O	No	[Imaging] 5.1
ToneCompenseation	O	Yes	[Imaging] 5.1
Defogging	O	Yes	[Imaging] 5.1
Nose Reduction	O	Yes	[Imaging] 5.1

10.2. Commands

Description	Device-Req	Support	Reference
GetImagingSettings C: implementing the imaging service	C	Yes	[Imaging] 5.1.1
SetImagingSetting C: implementing the imaging service	C	Yes	[Imaging] 5.1.2
GetOptions C: implementing the imaging service	C	Yes	[Imaging] 5.1.3
Move C: support for remote focus control	R	Yes	[Imaging] 5.1.4
GetMoveOptions C: implementing the imaging service	C	Yes	[Imaging] 5.1.5
Stop C: support for focus	R	Yes	[Imaging] 5.1.6
GetStatus C: support for focus move control	C	Yes	[Imaging] 5.1.7

10.3. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **ImageStabilization** C: ImageStabilization support model	C	No	[Imaging] 5.1.8
GetServiceCapabilities	O (M)	Yes	[Imaging] 5.1.8

10.4. Events

Description	Device-Req	Support	Reference
Tampering: ImageTooBlurry C: supports this feature	C/R	No	[Imaging] 5.3.1.1
Tampering: ImageTooDark C: support this feature	C/R	No	[Imaging] 5.3.1.2
Tampering: ImageTooBright C: support this feature	C/R	No	[Imaging] 5.3.1.3
Tampering: GlobalSceneChange C: support this feature	C/R	No	[Imaging] 5.3.1.4
Tampering: SignalLoss C: support this feature	C/R	No	[Imaging] 5.3.1.5
MotionAlarm **tns1:VideoSource/MotionAlarm** C: support motion detection	C/R	Yes	[Imaging] 5.3.2

11. Media configuration

11.1. Media configuration

Description	Device-Req	Support	Reference
JPEG QVGA	M	Yes	[Media] 5.1
G.711µ Law (Simplex-Camera Microphone Only, 1ch) C: Audio	C	Yes	[Media] 5.1
A Device shall provide at least one media profile at boot.	M	Yes	[Media] 5.2
A Device should provide "ready to use" profiles for the most common media configurations that the device offers.	R	Yes	[Media] 5.2
media profile SHALL be persistent (remain after reboot).	M	Yes	[Media] 5.2.1
CreateProfile	M	Yes	[ProfileS] 7.11.3
A created profile shall be deletable	M	Yes	[Media] 5.2.1
and a Device MUSTshall set the "fixed" attribute to false in the returned Profile.	M	Yes	[Media] 5.2.1
GetProfiles	M	Yes	[ProfileS] 7.11.3
A Device MUSTshall include the "fixed" attribute in all the returned Profile elements.	M	Yes	[Media] 5.2.2
GetProfile	M	Yes	[ProfileS] 7.11.3
AddVideoSourceConfiguration	M	Yes	[ProfileS] 7.12.3
AddVideoEncoderConfiguration	M	Yes	[ProfileS] 7.10.3
AddPTZConfiguration (if supported PTZ)	M	Yes	[ProfileS] 8.3.3
RemoveVideoSourceConfiguration	M	Yes	[ProfileS] 7.12.3
Video source configurations should only be removed after removing a VideoEncoderConfiguration from the media profile.	R	N/A	[Media] 5.2.13
RemoveVideoEncoderConfiguration	M	Yes	[ProfileS] 7.10.3
Audio source configurations should only be removed after removing an AudioEncoderConfiguration from the media profile.	R	N/A	[Media] 5.2.15
RemovePTZConfiguration (if supported PTZ)	M	Yes	[ProfileS] 8.3.3
DeleteProfile	M	Yes	[ProfileS] 7.11.3

11.2. Video configuration

Description	Device-Req	Support	Reference
GetVideoSources	M	Yes	[ProfileS] 7.12.3
GetVideoSourceConfigurations	M	Yes	[ProfileS] 7.12.3
GetVideoSourceConfiguration	M	Yes	[ProfileS] 7.12.3

GetCompatibleVideoSourceConfigurations	M	Yes	[ProfileS] 7.12.3
GetVideoSourceConfigurationOptions	M	Yes	[ProfileS] 7.12.3
SetVideoSourceConfiguration	M	Yes	[ProfileS] 7.12.3
GetVideoEncoderConfigurations	M	Yes	[ProfileS] 7.10.3
GetVideoEncoderConfiguration	M	Yes	[ProfileS] 7.10.3
GetCompatibleVideoEncoderConfigurations	M	Yes	[ProfileS] 7.10.3
GetVideoEncoderConfigurationOptions	M	Yes	[ProfileS] 7.10.3
SetVideoEncoderConfiguration	M	Yes	[ProfileS] 7.10.3
GetGuaranteedNumberOfVideoEncoderInstances	M	Yes	[ProfileS] 7.10.3

11.3. Audio configuration

11.3.1. Audio streaming (if supported)

Description	Device-Req	Support	Reference
GetAudioSources	M	Yes	[ProfileS] 8.9.3
GetAudioSourceConfigurations	M	Yes	[ProfileS] 8.9.3
GetAudioSourceConfiguration	M	Yes	[ProfileS] 8.9.3
AddAudioSourceConfiguration	M	Yes	[ProfileS] 8.9.3
RemoveAudioSourceConfiguration	M	Yes	[ProfileS] 8.9.3
GetCompatibleAudioSourceConfigurations	M	Yes	[ProfileS] 8.9.3
GetAudioSourceConfigurationOptions	M	Yes	[ProfileS] 8.9.3
SetAudioSourceConfiguration	M	Yes	[ProfileS] 8.9.3
GetAudioEncoderConfigurations	M	Yes	[ProfileS] 8.9.3
GetAudioEncoderConfiguration	M	Yes	[ProfileS] 8.9.3
AddAudioEncoderConfiguration	M	Yes	[ProfileS] 8.9.3
RemoveAudioEncoderConfiguration	M	Yes	[ProfileS] 8.9.3
GetCompatibleAudioEncoderConfigurations	M	Yes	[ProfileS] 8.9.3
GetAudioEncoderConfigurationOptions	M	Yes	[ProfileS] 8.9.3
SetAudioEncoderConfiguration	M	Yes	[ProfileS] 8.9.3

11.3.2. Audio output (if supported)

Description	Device-Req	Support	Reference
AddAudioOutputConfiguration C: Audio decode	C	Yes	[Media] 5.2.11
AddAudioDecoderConfiguration C: Audio decode	C	Yes	[Media] 5.2.12
RemoveAudioOutputConfiguration C: Audio decode	C	Yes	[Media] 5.2.20
RemoveAudioDecoderConfiguration C: Audio decode	C	Yes	[Media] 5.2.21
GetAudioOutputs C:Audio decode	C	Yes	[Media] 5.11.1
GetAudioOutputConfigurations C:Audio decode	C	Yes	[Media] 5.12.1
GetAudioOutputConfiguration C:Audio decode	C	Yes	[Media] 5.12.2
GetCompatibleAudioOutputConfigurations C:Audio decode	C	Yes	[Media] 5.12.3

Description	Device-Req	Support	Reference
GetAudioOutputConfigurationOptions C:Audio decode	C	Yes	[Media] 5.12.4
SetAudioOutputConfiguration C:Audio decode	C	Yes	[Media] 5.12.5
A decoder shall decode every data it receives (according to its capabilities). C:Audio decode	C	Yes	[Media] 5.13
GetAudioDecoderConfigurations C:Audio decode	C	Yes	[Media] 5.13.1
GetAudioDecoderConfiguration C:Audio decode	C	Yes	[Media] 5.13.2
GetCompatibleAudioDecoderConfigurations C:Audio decode	C	Yes	[Media] 5.13.3
GetAudioDecoderConfigurationOptions C:Audio decode	C	Yes	[Media] 5.13.4
SetAudioDecoderConfiguration C:Audio decode	C	Yes	[Media] 5.13.5
An optional Send-Primacy Parameter inside the AudioOutputConfiguration indicates which direction is currently active. C:Audio decode	O	Yes	[Media] 5.14

11.4. Video analytics configuration

Description	Device-Req	Support	Reference
AddVideoAnalytics C: Analytics	C	No	[Media] 5.2.9
RemoveVideoAnalyticsConfiguration C: Analytics	C	No	[Media] 5.2.18
GetVideoAnalyticsConfigurations C:Analytics	C	No	[Media] 5.9.1
GetVideoAnalyticsConfiguration C:Analytics	C	No	[Media] 5.9.2
GetCompatibleVideoAnalyticsConfigurations C:Analytics	C	No	[Media] 5.9.3
SetVideoAnalyticsConfiguration C:Analytics	C	No	[Media] 5.9.4

11.5. Metadata configuration

Description	Device-Req	Support	Reference
GetMetadataConfigurations	M	Yes	[ProfileS] 7.13.3
GetMetadataConfiguration	M	Yes	[ProfileS] 7.13.3
AddMetadataConfiguration	M	Yes	[ProfileS] 7.13.3
RemoveMetadataConfiguration	M	Yes	[ProfileS] 7.13.3
GetCompatibleMetadataConfigurations	M	Yes	[ProfileS] 7.13.3
GetMetadataConfigurationOptions	M	Yes	[ProfileS] 7.13.3

SetMetadataConfiguration	M	Yes	[ProfileS] 7.13.3

11.6. Other stream configuration

Description	Device-Req	Support	Reference
GetStreamUri	M	Yes	[ProfileS] 7.8.3
The InvalidAfterConnect, InvalidAfterReboot and Timeout Parameter should be set accordingly (InvalidAfterConnect=false, InvalidAfterReboot=false, timeout=PT0S).	R	Yes	[Media] 5.15.1
For full compatibility with other ONVIF services a device should not generate Uris longer than 128 octets.	R	No	[Media] 5.15.1
GetSnapshotUri	R	Yes	[Media] 5.16.1
The ValidUntilConnect, ValidUntilReboot and Timeout Parameter shall be set accordingly (ValidUntilConnect=false, ValidUntilReboot=false, timeout=PT0S).	R	Yes	[Media] 5.16.1
StartMulticastStreaming C: Multicast	C	Yes	[ProfileS] 8.12.3
The streaming shall continue after a reboot of the Device until a StopMulticastStreaming request is received. C: Multicast	C	Yes	[Media] 5.17.1
Multicast streaming may stop when the corresponding profile is deleted or one of its Configurations is altered via one of the set configuration methods.	O	Yes	[Media] 5.17.1
StopMulticastStreaming C: support multicast	C	Yes	[ProfileS] 8.12.3
SetSynchronizationPoint C: support H.264	C	Yes	[ProfileS] 8.2.3
GetVideoSourceMode C: capability of VideoSourceMode	C	Yes	[Media] 5.19.1
SetVideoSourceMode C: capability of VideoSourceMode	C	Yes	[Media] 5.19.2
CreateOSD C: OSD capability	C	Yes	[Media] 5.20.1
DeleteOSD C: OSD capability	C	Yes	[Media] 5.20.2
GetOSDs C: OSD capability	C	Yes	[Media] 5.20.3
GetOSD C: OSD capability	C	Yes	[Media] 5.20.4
SetOSD C: OSD capability	C	Yes	[Media] 5.20.5
GetOSDOptions C: OSD capability	C	Yes	[Media] 5.20.6

11.7. Capabilities

Description	Device-	Support	Reference

	Req		
Capabilities: **RTPMulticast** C: support of UDP multicasting	C	Yes	[Media] 5.21
Capabilities: **RTP_TCP** C: supports for RTP over TCP	C	No	[Media] 5.21
Capabilities: **RTP_RTSP_TCP** C: support for RTP/RTSP/TCP transport	C	Yes	[Media] 5.21
Capabilities: **NonAggregateControl** C: support for non aggregate RTSP control	C	Yes	[Media] 5.21
Capabilities: **NoRTSPStreaming** C: does not support for live media streaming via RTSP	C	Yes	[Media] 5.21
Capabilities: **MaximumNumberOfProfiles**	M	Yes	[Media] 5.21
Capabilities: **SnapshotUri** C: support for GetSnapshotUri	C	Yes	[Media] 5.21
Capabilities: **Rotation** C: support for the Rotation feature	C	Yes	[Media] 5.21
Capabilities: **VideoSourceMode** C: support for changing video source mode	C	Yes	[Media] 5.21
Capabilities: **OSD** C: support for OSD configuration	C	Yes	[Media] 5.21
GetServiceCapabilities	C	Yes	[ProfileG] 7.2.3

11.8. Events

Description	Device-Req	Support	Reference
Configuration: Profile **tns1:Configuration/Profile**	R	No	[Media] 5.22.1.1
Configuration: VideoEncoderConfiguration **tns1:Configuration/VideoEncoderConfiguration**	R	No	[Media] 5.22.1.2
Configuration: VideoSourceConfiguration **tns1:Configuration/VideoSourceConfiguration/MediaService**	R	No	[Media] 5.22.1.3
Configuration: VideoOutputConfiguration **tns1:Configuration/VideoOutputConfiguration/MediaService**	R	No	[Media] 5.22.1.4
Configuration: AudioEncoderConfiguration **tns1:Configuration/AudioEncoderConfiguration**	R	No	[Media] 5.22.1.5
Configuration: AudioSourceConfiguration **tns1:Configuration/AudioSourceConfiguration/MediaService**	R	No	[Media] 5.22.1.6
Configuration: AudioOutputConfiguration **tns1:Configuration/AudioOutputConfiguration/MediaService**	R	No	[Media] 5.22.1.7
Configuration: MetadataConfiguration **tns1:Configuration/MetadataConfiguration**	R	No	[Media] 5.22.1.8
Configuration: PTZConfiguration **tns1:Configuration/PTZConfiguration**	R	No	[Media] 5.22.1.9
Configuration: VideoAnalyticsConfiguration **tns1:Configuration/VideoAnalyticsConfiguration**	R	No	[Media] 5.22.1.10
Active Connections **tns1:Monitoring/Profile/ActiveConnections**	R	No	[Media] 5.22.2

11.9. Service specific data types

Description	Device-Req	Support	Reference
VideoSourceConfigutionExtension Rotate	O	Yes	[Media] 5.23.7
Rotate Mode C:Rotate capability	C	Yes	[Media] 5.23.8
Rotate Degree	O	Yes	[Media] 5.23.8
VideoSourceConfigutionOptionsExtension Rotate C:Rotate capability	O	Yes	[Media] 5.23.10
RotateOptions Mode C:Rotate capability	C	Yes	[Media] 5.23.11
RotateOptions DegreeList	O	Yes	[Media] 5.23.11

12. Media2 Configuration

12.1. Media Profile Methods

Description	Device-Req	Support	Reference
CreateProfile	M	Yes	[Media2] 5.1.1
GetProfiles	M	Yes	[Media2] 5.1.2
AddConfiguration	M	Yes	[Media2] 5.1.3
RemoveConfiguration	M	Yes	[Media2] 5.1.4
DeleteProfile	M	Yes	[Media2] 5.1.5

12.2. Media configuration

Description	Device-Req	Support	Reference
A device shall provide at least one media profile at boot.	M	Yes	[Media2] 5.2.1
A device should provide "ready to use" profiles for the most common media configurations that the device offers.	M	Yes	[Media2] 5.2.1
Video source configuration	M	Yes	[Media2] 5.2.2
Video encoder configuration	M	Yes	[Media2] 5.2.3
Audio source configuration C: Audio	C	Yes	[Media2] 5.2.4
Audio encoder configuration C: Audio	C	Yes	[Media2] 5.2.5
PTZ configuration C: PTZ	C	Yes	[Media2] 5.2.6
Analytics configuration C: Analytics Service	C	No	[Media2] 5.2.7
Metadata configuration	C	Yes	[Media2] 5.2.8
events	O	Yes	[Media2] 5.2.8
PTZ status	O	No	[Media2] 5.2.8
video analytics data	O	No	[Media2] 5.2.8
MetadataCompressionType C: supporting compressed metadata	C	No	[Media2] 5.2.8
Audio output configuration C: Audio	C	Yes	[Media2] 5.2.9
Audio decoder configuration C: Audio	C	Yes	[Media2] 5.2.10

12.3. Media configuration Methods

Description	Device-Req	Support	Reference

	Device-Req	Support	Reference
Get<entity>Configrations C: supported entity	C	Yes	[Media2] 5.3.1
Set<entity>Configuration C: supported entity	C	Yes	[Media2] 5.3.1
Get<entity>ConfigurationOptions C: supported entity	C	Yes	[Media2] 5.3.1
GetVideoEncoderInstances	M	Yes	[Media2] 5.3.5

supported entity list

    <entity> = "VideoSource"

              "VideoEncoder"

              "AudioSource"

              "AudioEncoder"

              "PTZ"

              "Metadata"

              "AudioOutput"

              "AudioDecoder"

12.4. Stream URI

Description	Device-Req	Support	Reference
GetStreamUri C: RTSPStreaming capability	C	Yes	[Media2] 5.4.1

12.5. Snapshot

Description	Device-Req	Support	Reference
GetSnapshotURI C: SnapshotUri capability	C	Yes	[Media2] 5.5.1

12.6. Multicast

Description	Device-Req	Support	Reference
StartMulticastStreaming C: RTPMulticast capability	C	Yes	[Media2] 5.6.1
StopMulticastStreaming C: RTPMulticast capability	C	Yes	[Media2] 5.6.2

12.7. Synchronization Points

Description	Device-Req	Support	Reference
SetSynchronizationPoint C: RTSPStreaming Capbility	C	Yes	[Media2] 5.7.1

12.8. Video source mode

Description	Device-Req	Support	Reference
GetVideoSourceModes C: VideoSourceMode capability	C	Yes	[Media2] 5.8.1
SetVideoSourceMode C: VideoSourceMode capability	C	Yes	[Media2] 5.8.2

12.9. OSD

Description	Device-Req	Support	Reference
CreateOSD C: OSD capability	C	Yes	[Media2] 5.9.2
DeleteOSD C: OSD capability	C	Yes	[Media2] 5.9.3
GetOSDs C: OSD capability	C	Yes	[Media2] 5.9.4
SetOSD C: OSD capability	C	Yes	[Media2] 5.9.5
GetOSDOptions C: OSD capability	C	Yes	[Media2] 5.9.6

12.10. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **RTPMulticast** C: support of UDP multicasting	C	Yes	[Media2] 5.10
Capabilities: **RTP_RTSP_TCP** C: support for RTP/RTSP/TCP transport	C	Yes	[Media2] 5.10
Capabilities: **NonAggregateControl** C: support for non aggregate RTSP control	C	Yes	[Media2] 5.10
Capabilities: **RTSPStreaming** C: support for live media streaming via RTSP	C	Yes	[Media2] 5.10
Capabilities: **MaximumNumberOfProfiles**	M	Yes	[Media2] 5.10
Capabilities: **SnapshotUri** C: support for GetSnapshotUri	C	Yes	[Media2] 5.10
Capabilities: **Rotation** C: support for the Rotation feature	C	Yes	[Media2] 5.10
Capabilities: **VideoSourceMode** C: support for changing video source mode	C	Yes	[Media2] 5.10
Capabilities: **OSD** C: support for OSD configuration	C	Yes	[Media2] 5.10
GetServiceCapabilities	M	Yes	[Media2] 5.10

12.11. Events

Description	Device-Req	Support	Reference

Profile Change: **tns1:Media/ProfileChanged**	M	Yes	[Media2] 5.11.1
Configuration Change: **tns1:Media/ConfigurationChanged**	M	Yes	[Media2] 5.11.2
Active Connections **tns1:Monitoring/Profile/ActiveConnections**	R	No	[Media2] 5.11.3

12.12. Service specific data types

Description	Device-Req	Support	Reference
VideoSourceConfigutionExtension 　Rotate	O	Yes	[Media2] 5.12.5
VideoSourceConfigutionExtension2 　LensDescription	O	No	[Media2] 5.12.6
Rotate 　Mode C:Rotate capability	C	Yes	[Media2] 5.12.10
Roate 　Degree	O	Yes	[Media2] 5.12.11
VideoSourceConfigutionOptionsExtension 　Rotate	O	Yes	[Media2] 5.12.12
RotateOptions 　Mode C:Rotate capability	C	Yes	[Media2] 5.12.13
RotateOptions 　DegreeList	O	Yes	[Media2] 5.12.13

13. Live Streaming

13.1. Media stream protocol

Description	Device-Req	Support	Reference
RTP/UDP unicast	M	Yes	[Stream] 5.1.1.1
RTP/UDP multicasting	R	Yes	[Stream] 5.1.1.1
RTP/TCP	O	No	[Stream] 5.1.1.2
RTP/TCP shall conform to [RFC 4571] (Framing Real-time Transport Protocol and RTP Control Protocol [RTCP] Packets over Connection-Oriented Transport). C: RTP/TCP	C	No	[Stream] 5.1.1.2
Support media streaming transfer using RTP/RTSP to traverse a firewall	R	Yes	[Stream] 5.1.1.3
RTP/RTSP shall conform to [RFC 2326] Section 10.12. C: RTP/RTSP/TCP	C	Yes	[Stream] 5.1.1.3
RTP/RTSP/HTTP/TCP	M	Yes	[Stream] 5.1.1.4
RTP/RTSP/HTTPS/TCP C:TLS 1.0	C	Yes	[Stream] 5.1.1.4
protocol shall conform to [RFC 2326] (RTSP Section 10.12: Embedded [Interleaved] Binary Data). C: RTP/RTSP/TCP	C	Yes	[Stream] 5.1.1.4
Tunnelling method shall conform to QuickTime available from Apple Inc. C: RTP/RTSP/HTTP/TCP	C	Yes	[Stream] 5.1.1.4

13.2. Media Transport

13.2.1. RTP

Description	Device-Req	Support	Reference
All media streams shall conform to [RFC 3550], [RFC 3551] , [RFC 3984], [RFC 3016] and JPEG overRTP(11.1.3)	M	Yes	[Stream] 5.1.2.1

13.2.2. RTP for Metadata stream

Description	Device-Req	Support	Reference
A dynamic payload type (96-127) shall be used for payload type which is assigned in the process of a RTSP session setup.	M	Yes	[Stream] 5.1.2.1.1
RTP marker bit shall be set to "1" when the XML document is closed.	M	Yes	[Stream] 5.1.2.1.1
It is RECOMMENDED to use an RTP timestamp representing the creation time of the RTP packet with a RTP clock rate of 90000 Hz.	R	Yes	[Stream] 5.1.2.1.1
Only UTC timestamps MUST be used within the metadata stream. The synchronization of video and audio data streams is done using RTCP.	M	Yes	[Stream] 5.1.2.1.1
When a synchronization point is requested for the stream, the previous XML document MUST be closed and a new one started.	M	Yes	[Stream] 5.1.2.1.1

Description	Device-Req	Support	Reference
It is RECOMMENDED to start new XML documents after 1 second, at the longest.	R	No	[Stream] 5.1.2.1.1
A device can select which of the Metadata parts SHOULD be multiplexed into the Metadata during the Media Configuration. Each part can appear multiple times in arbitrary order within the document.	R	No	[Stream] 5.1.2.1.1
A Metadata connection can be bi-directional using the backchannel mechanism	O	No	[Stream] 5.1.2.1.1

13.2.3. RTCP

Description	Device-Req	Support	Reference
RTCP protocol shall conform to [RFC 3550].	M	Yes	[Stream] 5.1.2.2
For a feedback request, RFC4585 and RFC 5104 should be supported.	R	No	[Stream] 5.1.2.2
Client MAY receive audio and video streams simultaneously from more than one device.	N/A	N/A	[Stream] 5.1.2.2.1
Support RTCP Sender Report for media synchronization	M	Yes	[Stream] 5.1.2.2.1
Wall clock should be common in the device and each timestamp value should be determined properly.	R	Yes	[Stream] 5.1.2.2.1
In case of multiple devices, the NTP timestamp should be common to all devices, and the NTP server should be required in the system	R	Yes	[Stream] 5.1.2.2.1
Support PLI messages as described in [RFC 4585] to request a SynchronizationPoint.	R	No	[Stream] 5.1.3

13.2.4. JPEG over RTP

Description	Device-Req	Support	Reference
Syntax for transmitting JPEG streams follows [RFC 2435]. The syntax does allow embedding additional data, beyond the limits of RFC 2435, by using an optional RTP header.	M	Yes	[Stream] 5.1.4.1
Transmitter shall use only greyscale and YCbCr colour space	R	Yes	[Stream] 5.1.4.3
Client shall support both greyscale and YCbCr.	N/A	N/A	[Stream] 5.1.4.3
Sampling factord for YCbCr shall correspond to the values supported by [RFC 2435].	M	Yes	[Stream] 5.1.4.3
sampling factor of 4.2.0(preferred)	R	Yes	[Stream]

			5.1.4.3
sampling factor of 4.2.2	R	No	[Stream] 5.1.4.3

13.3. Media control protocol

Description	Device-Req	Support	Reference
Support RTSP (RFC2326) for session initiation and playback control.	M	Yes	[Stream] 5.2.1.1
RTSP shall use TCP	M	Yes	[Stream] 5.2.1.1
SDP (Conform to RFC4566)	M	Yes	[Stream] 5.2.1.1
OPTIONS(R->T)	M	Yes	[Stream] 5.2.1.1
DESCRIBE(R->T)	M	Yes	[Stream] 5.2.1.1
SETUP(R->T)	M	Yes	[Stream] 5.2.1.1
PLAY(R->T)	M	Yes	[Stream] 5.2.1.1
PAUSE(R->T) (LIVE)	O	Yes	[Stream] 5.2.1.1
PAUSE(R->T) (Replay)	M	Yes	[Stream] 5.2.1.1
TEARDOWN(R->T)	M	Yes	[Stream] 5.2.1.1
GET_PARAMETER(R->T)	O	Yes	[Stream] 5.2.1.1
GET_PARAMETER(T->R)	O	No	[Stream] 5.2.1.1
SET_PARAMETER(R->T)	O	Yes	[Stream] 5.2.1.1
SET_PARAMETER(T->R)	O	No	[Stream] 5.2.1.1
Devices shall support aggregate stream control, in which PLAY commands are sent to the control URI for the whole session.	M	Yes	[Stream] 5.2.1.1
Devices may support non aggregate stream control, in which PLAY commands are sent separately to the stream control URIs in the media sections of the SDP file.	O	Yes	[Stream] 5.2.1.1
Set the Timeout parameter (in seconds) using the Set<configurationEntity>EncoderConfiguration command, otherwise a default value of ""60" is used.	O	No	[Stream] 5.2.1.1.1
In all RTSP SETUP responses, transmitter should include the Timeout value according to [RFC 2326] Section 12.37 and the transmitter should use the Timeout value for keep-alive.	R	Yes	[Stream] 5.2.1.1.1
To keep the RTSP Session alive, client shall call the RTSP server using any RTSP method or send RTCP receiver reports.	N/A	N/A	[Stream] 5.2.1.1.1
SET_PARAMETER is the RECOMMENDED	R	Yes	[Stream] 5.2.1.1.1
Include Range field in the RTSP PLAY response	R	Yes	[Stream] 5.2.1.1.2

Description	Device-Req	Support	Reference
Include RTP-info field in the RTSP PLAY response	R	Yes	[Stream] 5.2.1.1.2
Multicast streaming; A device shall include a valid multicast address in the "c=" field of a DESCRIBE response according to RFC 4566.	M	Yes	[Stream] 5.2.1.1.4
Multicast streaming; Chapter 10.7 TEARDOWN of [RFC 2326] states that a device shall stop the stream delivery for the given URI on tear down.	M	Yes	[Stream] 5.2.1.1.4
Multicast streaming; the device shall stop sending packets for a multicast configuration when no more RTSP sessions are using the same multicast configuration nor its AutoStart flag has been set.	M	Yes	[Stream] 5.2.1.1.4
The RTSP over HTTP/HTTPS shall be supported in order to traverse a firewall.	M	Yes	[Stream] 5.2.1.2

13.4. Back Channel Connection

Description	Device-Req	Support	Reference
understand the backchannel tag: www.onvif.org/ver20/backchannel C:backchannel	C	Yes	[Stream] 5.3.1
include the a=sendonly or the a=recvonly attributes in each media section of the SDP file to indicate the direction as configured in its Media Profile. C:backchannel	C	Yes	[Stream] 5.3.2
list all supported decoding codecs as own media section C:backchannel	C	Yes	[Stream] 5.3.2
When the backchannel data stream is sent via RTSP/HTTP/TCP, a client shall use HTTP GET connection which is defined for sending the data stream without base64 encoding	C	Yes	[Stream] 5.3
Multicast streaming; If the client intents to send its data in multicast it uses the transport parameter in the SETUP request to tell the server the multicast address and port.	O	N/A	[Stream] 5.3.3

14. Playback (if supported storage)

Description	Device-Req	Support	Reference
RTP/RTSP/HTTP/TCP shall be supported by the server.	M	Yes	[Stream] 6
The server shall support the unicast RTP/UDP transport for streaming.	M	Yes	[Stream] 6
The server MAY elect not to send RTCP packets during replay.	O	No	[Stream] 6

14.1. RTSP describe

Description	Device-Req	Support	Reference
The SDP returned by the RTSP describe command shall include the TrackReference for each track of the recording to allow a client to map the tracks presented in the SDP to tracks of the recording.	M	Yes	[Stream] 6.1.1
The tag shall use the following format: a:x-onvif-track:<TrackReference>	M	Yes	[Stream] 6.1.1

14.2. RTP header extension

Description	Device-Req	Support	Reference
The replay header extension shall be present in the first packet of every access unit (e.g. video frame). It MAY NOT be present in subsequent packets of an access unit.	M	Yes	[Stream] 6.2
The NTP timestamps in the RTP extension header shall increase monotonically over successive packets within a single RTP stream.	M	Yes	[Stream] 6.2.1
They should correspond to wallclock time as measured at the original transmitter of the stream, adjusted if necessary to preserve monotonicity.	R	Yes	[Stream] 6.2.1
The replay header extension may co-exist with the header extension used by the JPEG RTP profile; this is necessary to allow replay of JPEG streams that use this extension.	O	No	[Stream] 6.2.2

14.3. RTP Feature Tag

Description	Device-Req	Support	Reference
The Replay Server shall accept a SETUP command that includes a Require header containing the onvif-replay feature tag.	M	Yes	[Stream] 6.3

14.4. Initiating Playback

Description	Device-Req	Support	Reference
ONVIF devices MAY support reverse playback. Reverse playback is indicated using the Scale header field with a negative value.	O	No	[Stream] 6.4
If a device supports reverse playback it shall accept a Scale header with a value of –1.0.	C	No	[Stream] 6.4
A device MAY accept other values for the Scale parameter.	O	No	[Stream] 6.4
If Rate-Control is set to "no", the Scale parameter, if it is present, shall be either 1.0 or –1.0, to indicate forward or reverse playback respectively. If it is not present, forward playback is assumed.	M	Yes	[Stream] 6.4
The Range field shall be expressed using absolute times only; the other formats defined by [RFC 2326] shall NOT be used by ONVIF replay clients.	M	Yes	[Stream] 6.4.1
Servers may choose to support other formats also. Absolute times are expressed using the *utc-range* from [RFC 2326].	O	No	[Stream] 6.4.1
Either open or closed ranges may be used.	O	Yes	[Stream] 6.4.1
The direction of the range shall correspond to the value of the Scale header.	M	Yes	[Stream] 6.4.1
When replaying multiple tracks of a single recording, started by a single RTSP PLAY command and not using rate-control, the data from the tracks should be multiplexed in time in the same order as they were recorded.	R	No	[Stream] 6.4.2
An ONVIF compliant RTSP server shall support operation with "Rate-Control=no" for playback.	M	Yes	[Stream] 6.4.2
The Frames header field may be used to reduce the number of frames that are transmitted, for example to lower bandwidth or processing load. Three modes are possible:	O	Yes	[Stream] 6.4.3
Intra frames only.	O	Yes	[Stream] 6.4.3
Intra frames and predicted frames only.	O	No	[Stream] 6.4.3
All frames. This is the default.	M	Yes	[Stream] 6.4.3
The interval argument shall NOT be present unless the Frames option is "intra".	C	No	[Stream] 6.4.3
The server shall support the Frames header field.	M	Yes	[Stream] 6.4.3
The implementation of the Scale header field may vary between different server implementations, as stated by [RFC 2326].	N/A	N/A	[Stream] 6.4.3
An ONVIF compliant RTSP server shall support the Frames parameters "intra" and "all" for playback.	M	Yes	[Stream] 6.4.3
The transmitted video stream shall begin at a synchronization point.	M	Yes	[Stream] 6.4.4

If the requested start time is within a section of recorded footage, the stream starts with the first clean point at or before the requested start time.	M	Yes	[Stream] 6.4.4
If the requested start time is within a gap in recorded footage and playback is being initiated in the forwards direction, the stream starts with the first clean point in the section following the requested start time.	M	Yes	[Stream] 6.4.4
If the requested start time is within a gap in recorded footage and playback is being initiated in the reverse direction, the stream starts with the last clean point in the section preceding the requested start time. C: reverse	C	No	[Stream] 6.4.4

14.5. Reverse replay

Description	Device-Req	Support	Reference
During reverse playback, GOPs shall be sent in reverse order, but packets within a GOP shall be sent in forward order. C: Reverse replay	C	No	[Stream] 6.5.1
The first packet of each GOP shall have the "discontinuity" bit set in its RTP extension header. C: Reverse replay	C	No	[Stream] 6.5.1
The last packet of a GOP immediately following a gap (or the beginning of available footage) shall have the E bit set in its RTP extension header. C: Reverse replay	C	No	[Stream] 6.5.1
In this case the packets within each frame shall be again sent in forward order, while the frames themselves shall be sent in reverse order. C: Reverse replay	C	No	[Stream] 6.5.1
Audio and metadata streams MAY be transmitted in an order mirroring that of the video stream. C: Reverse replay	C	No	[Stream] 6.5.1
The RTP sequence numbers of packets transmitted during reverse playback shall increment monotonically *in the order of delivery*, not in the intended order of playback. C: Reverse replay	C	No	[Stream] 6.5.2
The server MAY use the same RTP timestamps that were originally received when the stream was recorded. C: Reverse replay	O	No	[Stream] 6.5.3
If Rate-Control is "yes", the RTP timestamps of packets transmitted during reverse playback shall indicate the times at which each frame should be rendered at the client. C: Reverse replay	C	No	[Stream] 6.5.3

14.6. RTSP Keepalive

Description	Device-Req	Support	Reference
When rate control is disabled and the RTP stream is tunneled through the RTSP connection (i.e. using the RTP/RTSP/TCP or RTP/RTSP/HTTP/TCP transports), the client must be aware that it may not be able to receive the response to any request if for example replay is paused.	M	N/A	[Stream] 6.6

14.7. Currently recording footage

Description	Device-Req	Support	Reference
If the client commences playback from the current real world time or shortly before it, it can end up playing footage in real time as it is being recorded. In this event the server simply continues to send stream data to the client as it receives it.	O	No	[Stream] 6.7

14.8. End of footage

Description	Device-Req	Support	Reference
If playback reaches a point after which there is no further data in one or more of the streams being sent, it stops transmitting data but does not enter the "paused" state. If the server resumes recording after this has happened, delivery will resume with the new data as it is received.	O	No	[Stream] 6.8

14.9. Go To Time

Description	Device-Req	Support	Reference
If the server receives a PLAY command with the Immediate header set to "yes", it will immediately start playing from the new location, cancelling any existing PLAY command.	M	Yes	[Stream] 6.9
The first packet sent from the new location shall have the D (discontinuity) bit set in its RTP extension header.	M	Yes	[Stream] 6.9
An ONVIF compliant RTSP server shall support the immediate header field for playback.	M	Yes	[Stream] 6.9

14.10. Use of

Description	Device-Req	Support	Reference
If Rate Control is enabled (see section 6.4.2), RTCP packets shall be constructed and transmitted as specified in [RFC 3550]. In particular, the NTP timestamp in a sender report indicates the current wallclock time, and is not related to the NTP timestamps embedded in the RTP extension headers in the data streams. C: send RTCP packets	C	Yes	[Stream] 6.10
If Rate Control is not enabled, both the NTP timestamp and RTP timestamp in each sender report shall be set to zero. C: send RTCP packets	C	Yes	[Stream] 6.10

15. Receiver Configuration

Description	Device-Req	Support	Reference

16. Display Service

Description	Device-Req	Support	Reference

17. Event handling

Description	Device-Req	Support	Reference
A device shall provide an event services as defined in [ONVIF Event WSDL].	M	Yes	[Core] 9
Both a Device and Client shall support [WS-Addressing] for event services.	M	Yes	[Core] 9
basic notification interface	M	Yes	[Core] 9
Real-time Pull-Point Notification Interface	M	Yes	[Core] 9
Notification Streaming Interface	M	Yes	[Core] 9

17.1. Real-time Pull-Point Notification Interface

Description	Device-Req	Support	Reference
CreatePullPointSubscription	M	Yes	[ProfileS] 7.7.3
CreatePullPointSubscription **tev:ChangedOnly**	O	No	[Core] 9.1.1
PullMessages	M	Yes	[ProfileS] 7.7.3
PullMessages at least support a Timeout of one minute.	M	Yes	[Core] 9.1.2
PullMessages In case a device supports retrieval of less messages than requested it shall return these without generating a fault.	M	Yes	[Core] 9.1.2
Renew	M	Yes	[ProfileS] 7.7.3
Unsubscribe	M	Yes	[ProfileS] 7.7.3
Seek C: supporting persistent notification storage	C	No	[Core] 9.2.3

17.2. Notification streaming Interface

Description	Device-Req	Support	Reference
notification RTP streaming The notification streaming via RTP shall be implemented by an ONVIF compliant device.	M	Yes	[Core] 9.2

17.3. Basic Notification Interface (if supported)

Description	Device-Req	Support	Reference
Event Service and the Subscription Manager should be instantiated on a device.	R	Yes	[Core] 9.3.1
NotificationProducer Interface An ONVIF compliant device shall support the NotificationProducer Interface of the [WS-BaseNotification].	M	Yes	[Core] 9.3.2
TopicExpression filters	M	Yes	[Core] 9.3.2
MessageContent filters	M	No	[Core] 9.3.2

	Device-Req	Support	Reference
Notify(WS-BaseNotification) The Device MUST be able to provide notifications using the Notify wrapper of the [WS-BaseNotification] specification.	M	Yes	[Core] 9.3.2
Although the [WS-BaseNotification] has CurrentTime and TerminationTime as optional elements in a SubscribeResponse, an ONVIF compliant device shall list them in SubscribeResponses. (WS-BaseNotification)	M	Yes	[Core] 9.3.2
GetCurrentMessage(WS-BaseNotification)	O	No	[Core] 9.3.2
Pull-Point Interface of the [WS-BaseNotification]	O	No	[Core] 9.3.2
Renew (WS-BaseNotification)	M	Yes	[Core] 9.3.2
Unsubscribe (WS-BaseNotification)	M	Yes	[Core] 9.3.2
Pausable Subscription Manager Interface (WS-BaseNotification)	O	No	[Core] 9.3.2
The implementation of Subscriptions as WS-Resources is OPTIONAL.	O	No	[Core] 9.3.2
An ONVIF compliant device shall support time values in request parameters that are given in utc with the 'Z' indicator and respond all time values as utc including the 'Z' indicator.	M	Yes	[Core] 9.3.2

17.4. Others

Description	Device-Req	Support	Reference
Vendor specific extensions shall express the SimpleItem and ElementItem Name attribute as qname. This avoids potential name clashes between Vendor specific extensions and future ONVIF extensions.	M	Yes	[Core] 9.5.2
Message Content Filter; An ONVIF compliant device shall implement the subset of XPath 1.0.	M	No	[[ProfileS] 7.7.3
SetSynchronizationPoint (ONVIF)	M	Yes	[ProfileS] 7.7.3
Concrete Topic Expressions	M	Yes	[ProfileS] 7.7.3
GetEventProperties (ONVIF)	M	Yes	[ProfileS] 7.7.3
SOAP 1.2 fault message	M	Yes	[Core] 9.10

17.5. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **WSSubscriptionPolicySupport** C: supports the WS Subscription policy	C	No	[Core] 9.9
Capabilities: **WSPullPointSupport** C: supports the WS Pull Point (Not Realtime-PullPointSubscription)	C	No	[Core] 9.9
Capabilities: **WSPausableSubscriptionManagerInterfaceSupport** C: supports the WS Pausable Subscription Manager	C	No	[Core] 9.9

Capabilities: **MaxNotificationProducers**	M	Yes	[Core] 9.9
Capabilities: **MaxPullPoint**	M	Yes	[Core] 9.9
Capabilities: **PersistentNotificationStorage** C: supports persistent notification storage	C	No	[Core] 9.9
GetServiceCapabilities	M	Yes	[ProfileG] 7.2.3

18. PTZ control (if supported)

18.1. PTZ Node

Description	Device-Req	Support	Reference
provide properties - Token - Name - SupportedPTZSpaces - MaximumNumberOfPresets - HomeSupported - AuxiliaryCommands - MaximumNumberOfPresetTours	M	Yes	[PTZ] 5.1
GetNodes	M	Yes	[ProfileS] 8.3.3
GetNode	M	Yes	[ProfileS] 8.3.3

18.2. PTZ Configuration

Description	Device-Req	Support	Reference
GetConfigurations	M	Yes	[ProfileS] 8.3.3
GetConfiguration	M	Yes	[ProfileS] 8.3.3
GetConfigurationOptions	M	Yes	[ProfileS] 8.3.3
SetConfiguration	C	Yes	[ProfileS] 8.3.3
GetCompatibleConfigurations C: GetCompatibleConfigurations capabiliy	C	No	[PTZ] 5.2.5
MoveRamp	O	No	[PTZ] 5.2
PresetRamp	O	No	[PTZ]5.2
PresetTourRamp	O	No	[PTZ]5.2

18.3. Move Operation

Description	Device-Req	Support	Reference
ContinuousMove	M	Yes	[ProfileS] 8.3.3
Stop	M	Yes	[ProfileS] 8.3.3
The Stop operation MAY be filtered to stop a specific movement by setting the corresponding stop argument.	O	Yes	[PTZ] 5.3.4
GetStatus	M	Yes	[ProfileS] 8.3.3
AbsoluteMove (if supported Absolute Position)	M	Yes	[ProfileS] 8.4.3

| RelativeMove (if supported Relative Translation) | M | Yes | [ProfileS] 8.5.3 |

18.4. Preset Operations (if supported)

Description	Device-Req	Support	Reference
SetPreset	M	Yes	[ProfileS] 8.6.3
GetPresets	M	Yes	[ProfileS] 8.6.3
GotoPreset	M	Yes	[ProfileS] 8.6.3
RemovePreset	M	Yes	[ProfileS] 8.6.3

18.5. Home Position Operation (if supported)

Description	Device-Req	Support	Reference
The "home" position MAY be set by the home position	O	Yes	[PTZ] 5.5
The "home" position MAY be a fix position of the PTZ unit	O	No	[PTZ] 5.5
GotoHomePosition	M	Yes	[ProfileS] 8.7.3
SetHomePosition C: home position is not a fix position	C	Yes	[ProfileS] 8.7.3

18.6. Auxiliary Operations (if supported)

Description	Device-Req	Support	Reference
SendAuxiliaryCommand	M	Yes	[ProfileS] 8.8.3

18.7. Preset Tours Operations

Description	Device-Req	Support	Reference
These operations shall be implemented when a PTZ node in the PTZ Service C: indicates support of Preset Tour with MaximumNumberOfPresetTours>0 capability value	C	Yes	[PTZ] 5.8
GetPresetTours C: support Preset Tour	C	Yes	[PTZ] 5.8.1
GetPresetTour C: support Preset Tour	C	Yes	[PTZ] 5.8.2
GetPresetTourOptions C: support Preset Tour	C	Yes	[PTZ] 5.8.3
CreatePresetTour C: support Preset Tour	C	Yes	[PTZ] 5.8.4
ModifyPresetTour C: support Preset Tour	C	Yes	[PTZ] 5.8.5

OperatePresetTour C: support Preset Tour	C	Yes	[PTZ] 5.8.6
RemovePresetTour C: support Preset Tour	C	Yes	[PTZ] 5.8.7

18.8. PT Control Direction Configuration

Description	Device-Req	Support	Reference
E-Flip	O	No	[PTZ] 5.9
Reverse	O	No	[PTZ] 5.9

18.9. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **EFlip** C: E-Flip supported	C	No	[PTZ] 5.10
Capabilities: **Reverse** C: reversing of PT control direction is supported	C	No	[PTZ] 5.10
Capabilities: **GetCompatibleConfigrations** C: support for GetCompalibleConfigurations command	C	No	[PTZ] 5.10
Capabilities: **MoveStatus** C: PTZStatus include MoveStatus information	C	No	[PTZ] 5.10
Capabilities: **StatusPosition** C: PTZStatus include Position information	C	No	[PTZ] 5.10
GetServiceCapabilities C: support PTZ service	C	Yes	[PTZ] 5.10

18.10. Events

Description	Device-Req	Support	Reference
PTZ Presets **tns1:PTZController/PTZPresets/Invoked** **tns1:PTZController/PTZPresets/Reached** **tns1:PTZController/PTZPresets/Aborted** **tns1:PTZController/PTZPresets/Left**	R	No	[PTZ] 5.12.1
PTZ PresetTours **tns1:PTZController/PTZPresetTours/Configuration** C: support Preset Tours	C	Yes	[PTZ] 5.12.2

19. Video Analytics

Description	Device-Req	Support	Reference
An device supporting analytics shall implement the Scene Description and Event Interface	C	No	[Analytics] 4
Device supporting a rule engine, responsible for analytics engine as defined by this standard shall implement the Rules Analytics Modules Interface.	C	No	[Analytics] 4
Ensure that a corresponding analytics engine starts operation when a client subscribes for events produced by the analytics or rule engine or when a client requests the corresponding scene description stream.	C	No	[Analytics] 4

19.1. Scene Description Interface

Description	Device-Req	Support	Reference
use the XML schema to encode Scene Descriptions	C	No	[Analytics] 5.1.1
VideoAnalyticsConfiguration shall be referenced in the Profile.	C	No	[Analytics] 5.1.1
Frame Node contains a UtcTime attribute.	C	No	[Analytics] 5.1.2.1
UtcTime timestamp to map the Frame Node exactly to one video frame.	C	No	[Analytics] 5.1.2.1
regularly sends the Scene Description even if it is empty	C/R	No	[Analytics] 5.1.3
Send a Scene Description if a SynchronizationPoint is requested for the corresponding stream.	C	No	[Analytics] 5.1.3
If an object is detected in a frame, the Shape information should be present in the Appearance description.	C/R	No	[Analytics] 5.1.3.1
When an Object stops moving, either Removed or Idle behaviours shall be listed as Child Nodes of the Behaviour Node.	C	No	[Analytics] 5.1.3.1
An object marked with the Removed Behaviour specifies the place from where the real object was removed. The marker should not be used as the Behaviour of the removed object.	C/R	No	[Analytics] 5.1.3.1
When two objects come too close to each other, an Object Merge should be signalled by adding a Merge Node to the ObjectTree Node of the Frame Node.	C/R	No	[Analytics] 5.1.3.2
If the Video Analytics Algorithm detects that one object is occluding the others and is able to track this object further, the occluding object should be put in the To Node.	C/R	No	[Analytics] 5.1.3.1
If the Video Analytics Algorithm can not decide during a Split operation the identity of an object, it should use a new ObjectId.	C/R	No	[Analytics] 5.1.3.1
A deleted ObjectId shall NOT be reused within the Scene Description until the ObjectId container has wrapped around.	C	No	[Analytics] 5.1.3.1
Shape information shall be placed below the optional Shape Node of in an Object Appearance Node.	C	No	[Analytics] 5.1.3.3
A Shape Node shall at least contain two Nodes representing the Bounding Box and the Center Of Gravity of the detected object.	C	No	[Analytics] 5.1.3.3

Description	Device-Req	Support	Reference
Polygons that describe the shape of an object shall be simple polygons	C	No	[Analytics] 5.1.3.3
The order of the Points shall be chosen such that the enclosed Object region can be found on the left-hand side all line segments. The polyline shall NOT be self-intersecting.	C	No	[Analytics] 5.1.3.3

19.2. Rule Interface

Description	Device-Req	Support	Reference
A device implementing a Rule Engine support two standard Rules	C/R	No	[Analytics] 5.2
Device supporting a Rule Engine shall implement the complete Rule Interface.	C	No	[Analytics] 5.2
The Name attribute of each Item shall be unique within the parameter list.	C	No	[Analytics] 5.2.1
represent as many parameters as possible by SimpleItems.	C/R	No	[Analytics] 5.2.1
In case of the SimpleItemDescription, the Type attribute shall reference a SimpleType schema definition.	C	No	[Analytics] 5.2.2
In case of the ElementItemDescription, the Type attribute shall reference a global element declaration of an XML schema.	C	No	[Analytics] 5.2.2
the MessageDescription shall contain a ParentTopic element	C	No	[Analytics] 5.2.2
Topic shall be specified as a Concrete Topic Expression.	C	No	[Analytics] 5.2.2
In case of a PTZ device, image-based rules should contain an additional ElementItem.	C/R	No	[Analytics] 5.2.3
Device supporting a Rule Engine shall implement the Create/Delete/Modify operations.	C	No	[Analytics] 5.2.4
GetSupportedRules()	C	No	[Analytics] 5.2.4.1
GetRules()	C	No	[Analytics] 5.2.4.2
CreateRules()	C	No	[Analytics] 5.2.4.3
ModifyRules()	C	No	[Analytics] 5.2.4.4
DeleteRules()	C	No	[Analytics] 5.2.4.5

19.3. Analytics modules interface

Description	Device-Req	Support	Reference
Device supporting an Analytics Engine shall implement the complete Analytics Modules Interface.	C	No	[Analytics] 5.3
Device supporting an analytics engine shall support the Create/Delete/Modify operations.	C	No	[Analytics] 5.3.3
GetSupportedAnalyticsModules()	C	No	[Analytics] 5.3.3.1
GetAnalyticsModules()	C	No	[Analytics] 5.3.32
CreateAnalyticsModules()	C	No	[Analytics] 5.3.3.3

ModifyAnalyticsModules()	C	No	[Analytics] 5.3.3.4
DeleteAnalyticsModules()	C	No	[Analytics] 5.3.3.5

19.4. Capabilities

Description	Device-Req	Support	Reference
GetServiceCapabilities	O	No	[Analytics] 5.4

20. Analytics Device

Description	Device-Req	Support	Reference
The analytics device service has to be used for stand alone analytics devices (which perform evaluation processes on media streams or metadata)	C	No	[Analytics Device] 4
analytics devices may be used for other entities as well	O	No	[Analytics Device] 4
Evaluations may involve more than one media stream or metadata enhanced media stream at a time.	O	No	[Analytics Device] 4
analytics device service could comprise decoder capabilities (if analysis is being performed on uncompressed data.)	C	No	[Analytics Device] 4
Backchannel capabilities are not provided by stand alone analytics devices.	N/A	No	[Analytics Device] 4
Mechanisms have to be provided to assign different tracks in the received RTSP stream to the appropriate AnalyticsEngine.	C	No	[Analytics Device] 4
input parameter changes have to be reflected in the AnalyticsEngineInput structure	C	No	[Analytics Device] 4

20.1. Overview

Description	Device-Req	Support	Reference
An AnalyticsEngine could be either a single algorithm or a complete application	C	No	[Analytics Device] 5
Several parameter sets (VideoAnalyticsConfiguration) can exist in parallel for an AnalyticsEngine to allow for switching between e.g. day and night configurations.	C	No	[Analytics Device] 5
All structures have to exist at least once after boot of the NVA entity	C	No	[Analytics Device] 5

20.2. Analytics Engine Input

Description	Device-Req	Support	Reference
GetAnalyticsEngineInputs C: Analytics Device Service	C	No	[Analytics Device] 5.1.1
GetAnalyticsEngineInput C: Analytics Device Service	C	No	[Analytics Device] 5.1.2
SetAnalyticsEngineInput C: Analytics Device Service	C	No	[Analytics Device] 5.1.3
CreateAnalyticsEngineInputs C: Analytics Device Service	C	No	[Analytics Device] 5.1.4
DeleteAnalyticsEngineInputs C: Analytics Device Service	C	No	[Analytics Device] 5.1.5

20.3. Video Analytics Configuration

Description	Device-Req	Support	Reference
GetVideoAnalyticsConfiguration C: Analytics Device Service	C	No	[Analytics Device] 5.2.1
SetVideoAnalyticsConfiguration C: Analytics Device Service	C	No	[Analytics Device] 5.2.2

20.4. Analytics Engines

Description	Device-Req	Support	Reference
GetAnalyticsEngines C: Analytics Device Service	C	No	[Analytics Device] 5.3.1
GetAnalyticsEngine C: Analytics Device Service	C	No	[Analytics Device] 5.3.2

20.5. Analytics Engine Control

Description	Device-Req	Support	Reference
GetAnalyticsEngineControls C: Analytics Device Service	C	No	[Analytics Device] 5.4.1
GetAnalyticsEngineControl C: Analytics Device Service	C	No	[Analytics Device] 5.4.2
SetAnalyticsEngineControl C: Analytics Device Service	C	No	[Analytics Device] 5.4.3
CreateAnalyticsEngineControl C: Analytics Device Service	C	No	[Analytics Device] 5.4.4
DeleteAnalyticsEngineControl C: Analytics Device Service	C	No	[Analytics Device] 5.4.5

20.6. GetAnalyticsState

Description	Device-Req	Support	Reference
GetAnalyticsState C: Analytics Device Service	C	No	[Analytics Device] 5.5

20.7. Output streaming configuration

Description	Device-Req	Support	Reference
GetAnalyticsDeviceStreamUri C: Analytics Device Service	C	No	[Analytics Device] 5.6.1

20.8. Capabilities

Description	Device-Req	Support	Reference
GetServiceCapabilities	O	No	[Analytics Device] 5.4

21. Security

21.1. Transport level security

Description	Device-Req	Support	Reference
TLS 1.0 [RFC 2246]	R	Yes	[Core] 10.1
TLS 1.1 [RFC 4346]	R	Yes	[Core] 10.1
TLS 1.2 [RFC 5246]	O	Yes	[Core] 10.1
Support TLS 1.0 for protection of all of the ONVIF services it provides.	R	Yes	[Core] 10.1
Support TLS 1.0 for protection of media streams for the RTP/RTSP/HTTPS tunnel option as defined in Section 11.	R	Yes	[Core] 10.1
cipher suites [RFC 2246], [RFC 3268]: TLS_RSA_WITH_AES_128_CBC_SHA C:TLS	C	Yes	[Core] 10.1.1
cipher suites [RFC 2246], [RFC 3268]: TLS_RSA_WITH_NULL_SHA C:TLS	C	Yes	[Core] 10.1.1
Support server authentication using TLS C: TLS	C	Yes	[Core] 10.1.2
Support processing of X.509 server certificates C:server authentication using TLS	C	Yes	[Core] 10.1.2
RSA key length (at least 1024 bits) C:server authentication using TLS	C	Yes	[Core] 10.1.2
Support client authentication	R	No	[Core] 10.1.3
Device that supports TLS shall include the RSA certificate type (rsa_sign, for example) in the certificate request [RFC 2246] for client certificates C:client authentication	C	No	[Core] 10.1.3
verification of the RSA client certificate and signature C:client authentication	C	No	[Core] 10.1.3
support RSA client certificate and signature C: client authentication	N/A	No	[Core] 10.1.3
RSA key length of at least 1024 bits C:client authentication	N/A	No	[Core] 10.1.3
adoption of IEEE 802.1X for port based authentication for wireless networks C:Wireless networks	C/R	No	[Core] 10.3
support EAP-PEAP/MSCHAPv2 type as a supported EAP method C:802.1X	C	No	[Core] 10.3
support other EAP methods such as EAP-MD5, EAP-TLS and EAP-TTLS types. C:802.1X	C	No	[Core] 10.3

22. Recording control (if supported storage)

22.1. Dynamic Recording

Description	Device-Req	Support	Reference
CreateRecording C: Support Dynamic Recording	C	No	[ProfileG] 8.1.3
DeleteRecording C: Support Dynamic Recording	C	No	[ProfileG] 8.1.3
CreateTrack C: Support Dynamic Recording	C	No	[ProfileG] 8.1.4
DeleteTrack C: Support Dynamic Recording	C	No	[ProfileG] 8.1.4

22.2. Recording Control Commands

Description	Device-Req	Support	Reference
All the objects created within the recording service shall be persistent – i.e. they shall survive a power cycle. Likewise, all the configuration data in the objects shall be persistent.	M	Yes	[Recording] 5.2
GetRecordings	M	Yes	[ProfileG] 9.1.3
SetRecordingConfiguration	M	Yes	[ProfileG] 9.2.3
GetRecordingConfiguration	M	Yes	[ProfileG] 9.2.3
GetTrackConfiguration	M	Yes	[ProfileG] 9.2.3
SetTrackConfiguration	M	Yes	[ProfileG] 9.2.3
CreateRecordingJob	M	Yes	[ProfileG] 9.1.3
DeleteRecordingJob	M	Yes	[ProfileG] 9.1.3
GetRecordingJobs	M	Yes	[ProfileG] 9.1.3
SetRecordingJobConfiguration	M	Yes	[ProfileG] 9.2.3
GetRecordingJobConfiguration	M	Yes	[ProfileG] 9.2.3
SetRecordingJobMode	M	Yes	[ProfileG] 9.1.3
GetRecordingJobState	M	Yes	[ProfileG] 9.1.3
GetRecordingOptions	M	Yes	[ProfileG] 9.1.3

22.3. Export Recording Data

Description	Device-Req	Support	Reference
ExportRecordedData C: **SupportExportFormats** capability	C	No	[Recording] 5.21
StopExportRecordedData C: **SupportExportFormats** capability	C	No	[Recording] 5.22
GetExportRecordedDataState C: **SupportExportFormats** capability	C	No	[Recording] 5.23

22.4. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **DynamicRecordings** C: supports dynamic creation and deletion of recordings	C	No	[Recording] 5.24
Capabilities: **DynamicTracks** C: supports dynamic creation and deletion of trakcs	C	No	[Recording] 5.24
Capabilities: **Encoding**	N/A	Yes	[Recording] 5.24
Capabilities: **MaxRate**	N/A	Yes	[Recording] 5.24
Capabilities: **MaxTotalRate**	N/A	Yes	[Recording] 5.24
Capabilities: **MaxRecordings**	N/A	Yes	[Recording] 5.24
Capabilities: **MaxRecordingJobs**	N/A	Yes	[Recording] 5.24
Capabilities: **Options** supports the GetRecordingOptions(M)	M	Yes	[Recording] 5.24
Capabilities: **MetadataRecording** C: supports recording metadata	C	No	[Recording] 5.24
Capabilities: **SupportExportFormats** C: supports ExportRecordedData coomand	C	No	[Recording] 5.24
GetServiceCapabilities	M	Yes	[ProfileG] 7.2.3

22.5. Events

Description	Device-Req	Support	Reference
Recording job state changes **tns1:RecordingConfig/JobState**	M	Yes	[ProfileG] 9.1.3
Configuration changes **tns1:RecordingConfig/RecordingConfiguration**	M	Yes	[Recording] 5.25.2
Configuration changes **tns1:RecordingConfig/TrackConfiguration** C:notification of changes to a recording's configuration	C	Yes	[ProfileG] 9.2.3
Configuration changes **tns1:RecordingConfig/RecordingJobConfiguration** C:notification of changes to a recording's configuration	C	Yes	[ProfileG] 9.2.3
Data deletion **tns1:RecordingConfig/DeleteTrackData** C: notification of recording removal is a feature	C	No	[ProfileG] 9.1.3
Recording and track creation and deletion **tns1:RecordingConfig/CreateRecording** C: Support Dynamic Recording	C	No	[ProfileG] 8.1.3

Recording and track creation and deletion **tns1:RecordingConfig/DeleteRecording** C: Support Dynamic Recording	C	No	[ProfileG] 8.1.3
Recording and track creation and deletion **tns1:RecordingConfig/CreateTracks** C: Support Dynamic Recording	C	No	[ProfileG] 8.1.4
Recording and track creation and deletion **tns1:RecordingConfig/DeleteTrack** C: Support Dynamic Recording	C	No	[ProfileG] 8.1.4

23. RecordingSearch (if supported storage)

23.1. Commands

Description	Device-Req	Support	Reference
GetRecordingSummary	M	Yes	[ProfileG] 7.3.3
GetRecordingInformation	M	Yes	[ProfileG] 7.3.3
GetMediaAttributes	M	Yes	[ProfileG] 7.3.3
FindRecordings	M	Yes	[ProfileG] 7.3.3
GetRecordingSearchResults	M	Yes	[[ProfileG] 7.3.3
FindEvents	M	Yes	[ProfileG] 7.3.3
GetEventSearchResults	M	Yes	[ProfileG] 7.3.3
FindPTZPosition C: CanContainPTZ is true for any metadata track	C	No	[Search] 5.11
GetPTZPositionSearchResults C: CanContainPTZ is true for any metadata track	C	No	[Search] 5.12
FindMetadata C: supprots MetadataSearch	C	No	[Search] 5.13
GetMetadataSearchResults C: supprots MetadataSearch	C	No	[Search] 5.14
GetSearchState	O	No	[Search] 5.15
EndSearch	M	Yes	[ProfileG] 7.3.3

23.2. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **MetadataSearch** C: supports generic search of recorded metadata	C	No	[Search] 5.17
GetServiceCapabilities	M	Yes	[ProfileG] 7.2.3

23.3. Events

Description	Device-Req	Support	Reference
A device shall generate the following events with the corresponding event message descriptions.	M	Yes	[Search] 5.19
tns1:RecordingHistory/Recording/State	M	Yes	[ProfileG] 7.3.3
tns1:RecordingHistory/Track/State	M	Yes	[ProfileG] 7.3.3
A device MAY generate the following events. If the device supports these events, it shall always automatically records these notification messages so that clients can always use FindEvent for these messages.	O	No	[Search] 5.19

tns1:RecordingHistory/Track/VideoParameters	O	No	[Search] 5.19
tns1:RecordingHistory/Track/AudioParameters	O	No	[Search] 5.19

24. ONVIF-ReplayControl (if supported storage)

24.1. Commands

Description	Device-Req	Support	Reference
GetReplayUri	M	Yes	[ProfileG] 7.4.3
SetReplayConfiguration	M	Yes	[ProfileG] 7.4.3
GetReplayConfiguration	M	Yes	[ProfileG] 7.4.3

24.2. Capabilities

Description	Device-Req	Support	Reference
Capabilities: **ReversePlayback** Device may support reverse replay	O	No	[ProfileG] 7.4.1
Capabilities: **SessionTimeoutRange** Device shall support the RTSP session timeout	M	No	[ProfileG] 7.4.1
Capabilities: **RTP_RTSP_TCP** C: supports RTP/RTSP/TCP transport	C	Yes	[Replay] 5.4.1
GetServiceCapabilities	M	Yes	[ProfileG] 7.2.3

25. Action Engine Service

Description	Device-Req	Support	Reference