

# [MS-QoE]: Quality of Experience Monitoring Server Protocol Specification

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## Revision Summary

Date	Revision History	Revision Class	Comments
04/04/2008	0.1		Initial version
04/25/2008	0.2		Updated based on feedback
06/27/2008	1.0		Updated and revised the technical content.
08/15/2008	1.01		Revised and edited the technical content.
12/12/2008	2.0		Updated and revised the technical content.
02/13/2009	2.01		Revised and edited the technical content.
03/13/2009	2.02		Revised and edited the technical content.
07/13/2009	2.03	Major	Revised and edited the technical content
08/28/2009	2.04	Editorial	Revised and edited the technical content
11/06/2009	2.05	Editorial	Revised and edited the technical content
02/19/2010	2.06	Editorial	Revised and edited the technical content
03/31/2010	2.07	Major	Updated and revised the technical content
04/30/2010	2.08	Editorial	Revised and edited the technical content
06/07/2010	2.09	Minor	Updated the technical content
06/29/2010	2.10	Editorial	Changed language and formatting in the technical content.
07/23/2010	2.10	No change	No changes to the meaning, language, or formatting of the technical content.
09/27/2010	3.0	Major	Significantly changed the technical content.
11/15/2010	3.0	No change	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	3.0	No change	No changes to the meaning, language, or formatting of the technical content.
03/18/2011	3.0	No change	No changes to the meaning, language, or formatting of the technical content.
06/10/2011	3.0	No change	No changes to the meaning, language, or formatting of the technical content.

# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>6</b>
1.1	Glossary .....	6
1.2	References.....	7
1.2.1	Normative References.....	7
1.2.2	Informative References .....	7
1.3	Protocol Overview (Synopsis) .....	8
1.4	Relationship to Other Protocols.....	9
1.5	Prerequisites/Preconditions .....	9
1.6	Applicability Statement.....	9
1.7	Versioning and Capability Negotiation.....	9
1.8	Vendor-Extensible Fields.....	9
1.9	Standards Assignments .....	9
<b>2</b>	<b>Messages.....</b>	<b>10</b>
2.1	Transport.....	10
2.2	Message Syntax .....	10
2.2.1	application/vq-rtcpxr+xml .....	10
2.2.1.1	VQReportEvent Element .....	10
2.2.1.1.1	Child Elements.....	11
2.2.1.2	VQSessionReport Element.....	11
2.2.1.2.1	Child Elements.....	12
2.2.1.3	Endpoint Element .....	13
2.2.1.3.1	Child Elements.....	14
2.2.1.4	DialogInfo Element .....	14
2.2.1.4.1	Child Elements.....	15
2.2.1.5	MediaLine Element.....	17
2.2.1.5.1	Child Elements.....	18
2.2.1.6	MediaLineDescription Element .....	20
2.2.1.6.1	Child Elements.....	20
2.2.1.7	Connectivity Element .....	21
2.2.1.7.1	Child Elements.....	22
2.2.1.8	NetworkConnectivityInfo Element .....	24
2.2.1.8.1	Child Elements.....	24
2.2.1.9	LocalAddr, RemoteAddr, and RelayAddr Elements.....	25
2.2.1.9.1	Child Elements.....	25
2.2.1.10	CaptureDev and RenderDev Elements .....	26
2.2.1.10.1	Child Elements.....	26
2.2.1.11	InboundStream and OutboundStream Elements.....	27
2.2.1.11.1	Child Elements .....	27
2.2.1.12	Network Element .....	27
2.2.1.12.1	Child Elements .....	28
2.2.1.13	Payload Elements.....	29
2.2.1.13.1	Child Elements .....	29
2.2.1.14	Payload.Audio Elements.....	29
2.2.1.14.1	Child Elements .....	31
2.2.1.15	Payload.Video Elements.....	31
2.2.1.15.1	Child Elements .....	33
2.2.1.16	VideoResolutionDistribution Elements .....	39
2.2.1.16.1	Child Elements .....	39
2.2.1.17	VideoRateMatchingLevelDistribution .....	40

2.2.1.17.1	Child Elements .....	40
2.2.1.18	QualityEstimates Elements .....	41
2.2.1.18.1	Child Elements .....	41
2.2.1.19	QualityEstimates.Audio Elements .....	41
2.2.1.19.1	Child Elements .....	42
2.2.1.20	NetworkAudioMOS Elements .....	42
2.2.1.20.1	Child Elements .....	43
2.2.1.21	Utilization Elements .....	44
2.2.1.21.1	Child Elements .....	44
2.2.1.22	PacketLoss Elements .....	44
2.2.1.22.1	Child Elements .....	45
2.2.1.23	BurstGapLoss Elements .....	45
2.2.1.23.1	Child Elements .....	45
2.2.1.24	Delay Elements .....	46
2.2.1.24.1	Child Elements .....	46
2.2.1.25	Jitter Elements .....	46
2.2.1.25.1	Child Elements .....	47
2.2.1.26	Signal Elements .....	47
2.2.1.26.1	Child Elements .....	48
2.2.1.27	ClientEventType Elements .....	51
2.2.1.27.1	Child Elements .....	52
<b>3</b>	<b>Protocol Details .....</b>	<b>56</b>
3.1	SIP UAC .....	56
3.1.1	Abstract Data Model .....	56
3.1.2	Timers .....	56
3.1.3	Initialization .....	56
3.1.4	Higher-Layer Triggered Events .....	56
3.1.5	Message Processing Events and Sequencing Rules .....	56
3.1.6	Timer Events .....	56
3.1.7	Other Local Events .....	56
3.2	SIP UAS .....	56
3.2.1	Abstract Data Model .....	57
3.2.2	Timers .....	57
3.2.3	Initialization .....	57
3.2.4	Higher-Layer Triggered Events .....	57
3.2.5	Message Processing Events and Sequencing Rules .....	57
3.2.6	Timer Events .....	57
3.2.7	Other Local Events .....	57
3.3	SIP Proxy .....	57
3.3.1	Abstract Data Model .....	57
3.3.2	Timers .....	57
3.3.3	Initialization .....	57
3.3.4	Higher-Layer Triggered Events .....	57
3.3.5	Message Processing Events and Sequencing Rules .....	58
3.3.6	Timer Events .....	58
3.3.7	Other Local Events .....	58
<b>4</b>	<b>Protocol Examples .....</b>	<b>59</b>
<b>5</b>	<b>Security .....</b>	<b>64</b>
5.1	Security Considerations for Implementers .....	64
5.2	Index of Security Parameters .....	64

<b>6</b>	<b>Appendix A: ms-rtcp-metrics.....</b>	<b>65</b>
6.1	Office Communications Server 2007 Schema.....	65
6.2	Office Communications Server 2007 R2 Schema.....	73
6.3	Microsoft Lync Server 2010 Schema.....	82
<b>7</b>	<b>Appendix B: Product Behavior.....</b>	<b>96</b>
<b>8</b>	<b>Change Tracking.....</b>	<b>104</b>
<b>9</b>	<b>Index .....</b>	<b>105</b>

# 1 Introduction

This document specifies the Quality of Experience Monitoring Server Protocol. It is a proprietary protocol used for publishing audio and video Quality of Experience (QoE) metrics. A client calculates QoE metrics and then sends them to a server for monitoring and diagnostics purposes.

## 1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

**Coordinated Universal Time (UTC)**  
**fully qualified domain name (FQDN)**  
**Internet Protocol version 4 (IPv4)**  
**network address translation (NAT)**  
**Transmission Control Protocol (TCP)**  
**User Datagram Protocol (UDP)**

The following terms are defined in [\[MS-OFCGLOS\]](#):

**202 Accepted**  
**Audio/Video Edge Server (A/V Edge Server)**  
**call**  
**candidate**  
**codec**  
**Common Intermediate Format (CIF)**  
**conference**  
**connectivity check**  
**dialog**  
**endpoint**  
**Interactive Connectivity Establishment (ICE)**  
**jitter**  
**proxy**  
**public switched telephone network (PSTN)**  
**QoE Monitoring Server**  
**Real-Time Transport Protocol (RTP)**  
**remote endpoint**  
**RTP packet**  
**RTVideo**  
**SERVICE**  
**Session Description Protocol (SDP)**  
**Session Initiation Protocol (SIP)**  
**SIP message**  
**SIP transaction**  
**stream**  
**Synchronization Source (SSRC)**  
**TURN server**  
**Uniform Resource Identifier (URI)**  
**user agent client (UAC)**  
**user agent server (UAS)**  
**XML schema**  
**XML schema definition (XSD)**

The following terms are specific to this document:

**mean opinion score (MOS):** A numerical indication of the perceived quality of media. It is expressed as a single number in the range of 1 to 5, where 1 is the lowest perceived quality and 5 is the highest perceived quality.

**QMS:** The previous name of the QoE Monitoring Server.

**reporting endpoint:** A protocol client that sends Quality of Experience (QoE) metrics to a QoE Monitoring Server.

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## 1.2 References

### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[IETF DRAFT-SIP SOAP-00] Deason, N., "SIP and SOAP", draft-deason-sip-soap-00, June 30 2000, <http://www.softarmor.com/wgdb/docs/draft-deason-sip-soap-00.txt>

[MS-RTP] Microsoft Corporation, "[Real-time Transport Protocol \(RTP\) Extensions](#)"

[MS-SDPEXT] Microsoft Corporation, "[Session Description Protocol \(SDP\) Version 2.0 Extensions](#)"

[MS-TURN] Microsoft Corporation, "[Traversal Using Relay NAT \(TURN\) Extensions](#)"

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.rfc-editor.org/rfc/rfc2119.txt>

[RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and Jacobson, V., "RTP: A Transport Protocol for Real-Time Applications", STD 64, RFC 3550, July 2003, <http://www.ietf.org/rfc/rfc3550.txt>

[RFC3551] Schulzrinne, H., and Casner, S., "RTP Profile for Audio and Video Conferences with Minimal Control", STD 65, RFC 3551, July 2003, <http://www.ietf.org/rfc/rfc3551.txt>

[RFC3611] Friedman, T., Ed., Caceres, R., Ed and Clark, A., Ed., "RTP Control Protocol Extended Reports (RTCP XR)", RFC 3611, November 2003, <http://www.ietf.org/rfc/rfc3611.txt>

### 1.2.2 Informative References

[ITU-P.562] ITU-T, "P.562 : Analysis and interpretation of INMD voice-service measurements", Recommendation P.562, May 2004, <http://www.itu.int/rec/T-REC-P.562-200405-I/en>

[ITU-P.800.1] ITU-T, "P.800.1 : Mean Opinion Score (MOS) terminology", Recommendation P.800.1, July 2006, <http://www.itu.int/rec/T-REC-P.800.1-200607-I/en>

[MS-CONFPRO] Microsoft Corporation, "[Centralized Conference Control Protocol: Provisioning Specification](#)"

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)".

[MS-OFCGLOS] Microsoft Corporation, "[Microsoft Office Master Glossary](#)".

[MS-RTVPF] Microsoft Corporation, "[RTP Payload Format for RT Video Streams Extensions](#)".

[MS-SIPRE] Microsoft Corporation, "[Session Initiation Protocol \(SIP\) Routing Extensions](#)".

### 1.3 Protocol Overview (Synopsis)

This protocol is a proprietary protocol for publishing audio and video QoE metrics from a protocol client to a **QoE Monitoring Server**.

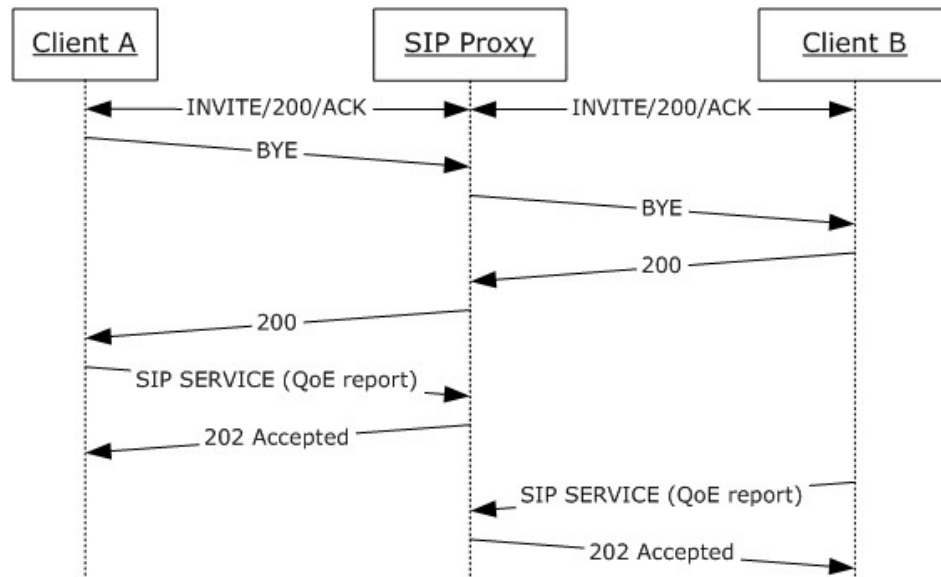
A protocol client publishes audio and video QoE metrics at the end of each **Session Initiation Protocol (SIP)** session after a SIP BYE transaction. It encodes QoE metrics to conform to the **XML schema** that is specified in section 2, and then publishes the metrics in the form of a SIP **SERVICE** message that the protocol client sends to the QoE Monitoring Server through a SIP **proxy**.

**Note:** The routing behavior of the SIP proxy is based on the SIP routing rules that are described in [\[MS-SIPRE\]](#) section 3.

The QoE Monitoring Server validates the SIP SERVICE message and returns a final SIP SERVICE response. The response is based on standard SIP rules and is either response code **202 Accepted**, or an error code.

**Note:** A SIP 202 response indicates that the QoE Monitoring Server has accepted the report, but not that it has processed the report.

This sequence of events is illustrated in the following figure in which, at the end of a session between two protocol clients, each protocol client publishes QoE metrics to the QoE Monitoring Server (**QMS**) through the SIP Proxy that mediated the session, and the QoE Monitoring Server returns a SIP 202 response to each protocol client.



**Figure 1: SIP message sequence from protocol client session end through QoE reporting**



The QoE Monitoring Server can use QoE metrics for:

- Generating alerts regarding abnormal media quality conditions.
- Generating media quality and resource utilization reports.
- Building a history database for advanced diagnostics and analytic applications.

#### **1.4 Relationship to Other Protocols**

This protocol depends on SIP. More specifically, this protocol depends on the SIP SERVICE method.

#### **1.5 Prerequisites/Preconditions**

A QoE Monitoring Server is required to collect and aggregate QoE metrics. Protocol clients that publish QoE metrics data are required to be provisioned with the SIP URI (Uniform Resource Identifier) of a QoE Monitoring Server, as described in [\[MS-CONFPRO\]](#) section 3.1.

#### **1.6 Applicability Statement**

Use this protocol in scenarios that require monitoring audio and video quality of SIP sessions.

#### **1.7 Versioning and Capability Negotiation**

None.

#### **1.8 Vendor-Extensible Fields**

None.

#### **1.9 Standards Assignments**

None.

## 2 Messages

### 2.1 Transport

This protocol relies on SIP transport.

### 2.2 Message Syntax

The SIP SERVICE message and response message syntax are specified in [\[IETF-DRAFT-SIPSOAP-001\]](#) section 4.0. The SIP SERVICE message that is used for this protocol MUST include an **application/vq-rtcp+xml content** header. The content is formatted as a MIME (Multipurpose Internet Mail Extensions) type SIP SERVICE message.

If the **From** and **To** address are the same and the **contentType** is "application/vq-rtcp+xml" in the SIP SERVICE message, the SIP proxy routes the request to the QoE Monitoring Server [<1>](#).

#### 2.2.1 application/vq-rtcp+xml

This section follows the product behavior specified in footnote [<2>](#).

This section contains a detailed specification of the XML schema to which QoE payloads MUST conform. Each element is described in a subsection, along with the child elements and attributes for that element. For each element, the following information is listed:

- **Element information:** Element type and a description of the element.
- **Child elements:** Name, type, availability, and description. If a child element is marked as not available, it is shown in the XML schema, but not populated by the protocol client. This protocol only includes descriptions for elements that are published by protocol clients. If a child element is marked as not supported for a specific product version, the QoE Monitoring Server will return an error code as described in section [3.2](#).
- **Attributes (if any):** Element ID, type, required, availability, description, and unit. If an attribute is marked as required, it MUST be present in the XML document. If an attribute is marked as not available, it is shown in the XML schema, but not populated by the protocol client. This protocol only includes descriptions for attributes that are published by protocol clients.

All string types defined within this section are encoded in Unicode. Unless otherwise stated, if the string exceeds the number of characters specified within [], the value will be truncated.

The XML schema in this section uses two namespaces:

- ms-rtcp-metrics
- ms-rtcp-metrics.v2

Elements defined in the **ms-rtcp-metrics.v2** namespace are named with a "v2" prefix. Elements that are not named with a "v2" prefix are defined in the **ms-rtcp-metrics** namespace.

##### 2.2.1.1 VQReportEvent Element

A **VQReportEvent** element is an audio and video quality report envelope. The type of this element is **VQReportEventType**.

The following example is a **VQReportEvent** element. [<3>](#)

```

<xs:element name="VQReportEvent" type="tns:VQReportEventType"/>
<xs:complexType name="VQReportEventType">
  <xs:choice>
    <xs:element name="VQSessionReport" type="tns:SessionReportType"
      maxOccurs="unbounded"/>
    <xs:element name="VQSessionIntervalReport"
      type="tns:SessionReportType" maxOccurs="unbounded"/>
    <xs:any namespace="##other" processContents="lax"
      maxOccurs="unbounded"/>
  </xs:choice>
  <xs:attribute name="Version" type="xs:string" use="optional" />
  <xs:attribute ref="v2:SchemaVersion" use="optional"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:attribute name="SchemaVersion" type="xs:string"/>

```

### 2.2.1.1.1 Child Elements

The following table lists the child elements of the **VQReportEvent** element.

Element	Type	Available	Description
<b>VQSessionReport</b>	SessionReportType	Yes	Audio and video quality report for a session (SIP <b>dialog</b> ).
<b>VQSessionIntervalReport</b>	SessionReportType	No	
<b>Version</b>	xs:string [128]	Yes	Describes version number of the reporting schema. <a href="#">&lt;4&gt;</a>
<b>v2:SchemaVersion</b>	xs:string [128]	Yes	Describes version number of the reporting schema and replaces the <b>Version</b> element. <a href="#">&lt;5&gt;</a>

### 2.2.1.1.2 VQSessionReport Element

A **VQSessionReport** element is an audio and video quality report for a session, or SIP dialog. The type of this element is **SessionReportType**.

The following table lists the attributes of the **VQSessionReport** element.

Element	Type	Required	Available	Description
<b>SessionId</b>	xs:string [775]	Yes	Yes	SIP dialog ID of the reported session. If maximum string length is exceeded, the report is rejected.

The following example is a **VQSessionReport** element.[<6>](#)

```

<xs:complexType name="SessionReportType">
  <xs:sequence>
    <xs:element name="LocationProfile" type="xs:string"
      minOccurs="0"/>
    <xs:element name="Pool" type="xs:string" minOccurs="0"/>
    <xs:element name="Endpoint" type="tns:EndpointType"/>
    <xs:element name="DialogInfo" type="tns:DialogInfoType"/>
  </xs:sequence>
</xs:complexType>

```

```

<xs:element name="MediaLine" type="tns:MediaLineType"
  maxOccurs="unbounded"/>
<xs:element ref="v2:OpaqueClientPlatformData" minOccurs="0" />
<xs:element ref="v2:OpaqueServerPlatformData" minOccurs="0" />
<xs:element ref="v2:OpaqueConferenceData" minOccurs="0" />
<xs:sequence minOccurs="0">
  <xs:element ref="v2:Separator" />
  <xs:any namespace="##other" processContents="lax"
    minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:sequence>
<xs:attribute name="SessionId" type="xs:string" use="required"/>
<xs:anyAttribute namespace="##other" processContents="lax"/> </xs:complexType>

<xs:complexType name="OpaqueClientPlatformDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>
<xs:complexType name="OpaqueServerPlatformDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>
<xs:complexType name="OpaqueConferenceDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element>

```

### 2.2.1.2.1 Child Elements

The following table lists the child elements of the **VQSessionReport** element.

Element	Type	Available	Description
<b>LocationProfile</b>	xs:string	No	
<b>Pool</b>	xs:string	No	
<b>Endpoint</b>	EndpointType	Yes	Information about the <b>endpoint (5)</b> that created the report.
<b>DialogInfo</b>	DialogInfoType	Yes	Information regarding the SIP dialog.
<b>MediaLine</b>	MediaLineType	Yes	A Media Line is the logical equivalent to

Element	Type	Available	Description
			an m-line in <b>Session Description Protocol (SDP)</b> .
<b>v2:OpaqueClientPlatformData</b>	OpaqueClientPlatformDataType	No	<a href="#">&lt;7&gt;</a>
<b>v2:OpaqueServerPlatformData</b>	OpaqueServerPlatformDataType	No	<a href="#">&lt;8&gt;</a>
<b>v2:OpaqueConferenceData</b>	OpaqueConferenceDataType	No	<a href="#">&lt;9&gt;</a>
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;10&gt;</a>

### 2.2.1.3 Endpoint Element

An **Endpoint** element contains information about the endpoint (5) that created the report. The type of this element is **EndpointType**.

The following table lists the attributes of the **Endpoint** element.

Element	Type	Required	Available	Description
<b>Name</b>	xs:string [256]	Yes	Yes	Computer name of the device that created the report. If maximum string length is exceeded, the report is rejected.
<b>ProfileID</b>	xs:string	No	No	
<b>v2:OS</b>	xs:string [128]	No	Yes	The operating system used for the <b>reporting endpoint</b> . <a href="#">&lt;11&gt;</a>
<b>v2:CPUName</b>	xs:string [128]	No	Yes	The name of the CPU used for the reporting endpoint. <a href="#">&lt;12&gt;</a>
<b>v2:CPUNumberOfCores</b>	xs:short	No	Yes	The number of processor CPU cores used for the reporting endpoint. <a href="#">&lt;13&gt;</a>
<b>v2:CPUProcessorSpeed</b>	xs:int	No	Yes	The speed in megahertz of the CPU used for the reporting endpoint. <a href="#">&lt;14&gt;</a>
<b>v2:VirtualizationFlag</b>	xs:byte	No	Yes	Flag indicated the type of virtualization environment: <a href="#">&lt;15&gt;</a> 0x00 - None 0x01 - HyperV 0x02 - VMWare 0x04 - Virtual PC 0x08 - Xen PC

The following example is an **Endpoint** element. [<16>](#)

```

<xs:complexType name="EndpointType">
  <xs:sequence>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="Name" type="xs:string" use="required"/>
  <xs:attribute name="ProfileId" type="xs:string"/>
  <xs:attribute ref="v2:OS" use="optional"/>
  <xs:attribute ref="v2:CPUName" use="optional"/>
  <xs:attribute ref="v2:CPUNumberOfCores" use="optional"/>
  <xs:attribute ref="v2:CPUProcessorSpeed" use="optional"/>
  <xs:attribute ref="v2:VirtualizationFlag" use="optional"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

```

### 2.2.1.3.1 Child Elements

None.

### 2.2.1.4 DialogInfo Element

A **DialogInfo** element contains information regarding the SIP dialog. The type of this element is **DialogInfoType**.

The following table lists the attributes of the **DialogInfo** element.

Element	Type	Required	Available	Description	Units
<b>CallId</b>	xs:string [450]	Yes	Yes	SIP Call-ID of the dialog. If maximum string length is exceeded, the report is rejected.	Not applicable
<b>FromTag</b>	xs:string [450]	No	Yes	SIP from-tag of the dialog.	Not applicable
<b>ToTag</b>	xs:string [450]	No	Yes	SIP to-tag of the dialog.	Not applicable
<b>Start</b>	xs:dateTime	Yes	Yes	Start time of the dialog.	<b>Coordinated Universal Time (UTC)</b>
<b>End</b>	xs:dateTime	Yes	Yes	End time of the dialog.	<b>UTC</b>

The following example is a **DialogInfo** element. [<17>](#)

```

<xs:complexType name="DialogInfoType">
  <xs:sequence>
    <xs:element name="DialogCategory" type="tns:DialogCategoryType"
      minOccurs="0"/>
    <xs:element name="CorrelationID" type="xs:string" minOccurs="0"/>
    <xs:element name="FromURI" type="xs:anyURI"/>
    <xs:element name="ToURI" type="xs:anyURI"/>
    <xs:element name="Caller" type="xs:boolean"/>
    <xs:element name="LocalContactURI" type="xs:anyURI"/>
    <xs:element ref="v2:CallPriority" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

```

```

<xs:element ref="v2:MediationServerBypassFlag" minOccurs="0"/>
<xs:element ref="v2:TrunkingPeer" minOccurs="0"/>
<xs:element ref="v2:MediaBypassWarningFlag" minOccurs="0"/>
  <xs:sequence minOccurs="0">
    <xs:element ref="v2:Separator" />
    <xs:element ref="v2:RegisteredInside" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
</xs:sequence>
<xs:element name="RemoteContactURI" type="xs:anyURI"/>
<xs:element name="LocalUserAgent" type="xs:string"/>
<xs:element name="RemoteUserAgent" type="xs:string"/>
<xs:element name="LocalPAI" type="xs:anyURI" minOccurs="0"/>
<xs:element name="RemotePAI" type="xs:anyURI" minOccurs="0"/>
<xs:element name="ConfURI" type="xs:anyURI" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="CallId" type="xs:string" use="required"/>
<xs:attribute name="FromTag" type="xs:string"/>
<xs:attribute name="ToTag" type="xs:string"/>
<xs:attribute name="Start" type="xs:dateTime" use="required"/>
<xs:attribute name="End" type="xs:dateTime" use="required"/>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:simpleType name="DialogCategoryType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="OCS" />
    <xs:enumeration value="TRUNK" />
  </xs:restriction>
</xs:simpleType>
<xs:element name="CallPriority" type="xs:short"/>
<xs:element name="MediationServerBypassFlag" type="xs:boolean"/>
<xs:element name="TrunkingPeer" type="xs:string"/>
<xs:element name="BSSID" type="xs:string"/>
<xs:element name="MediaBypassWarningFlag" type="xs:int"/>
<xs:element name="RegisteredInside" type="xs:boolean"/>

```

### 2.2.1.4.1 Child Elements

The following table lists the child elements of the **DialogInfo** element.

Element	Type	Available	Description
<b>DialogCategory</b>	DialogCategoryType	Yes	Information about the QoE Report leg type, which is either a UC or Mediation Server-GW trunk. For more information, see <a href="#">ENUMs in section 2.2.1.4.1.&lt;18&gt;</a>
<b>CorrelationID</b>	xs:string [775]	Yes	A unique alphanumeric key that is included by reporting endpoints (5) for <b>calls</b> that

Element	Type	Available	Description
			involve multiple SIP legs. <19>
<b>FromURI</b>	xs:anyURI	Yes	SIP <b>URI</b> in the SIP <b>From</b> header that the reporting endpoint would use if it made a <b>SIP transaction</b> using the reported SIP dialog.
<b>ToURI</b>	xs:anyURI	Yes	SIP URI in the SIP <b>To</b> header that the reporting endpoint would use if it made a SIP transaction using the reported SIP dialog.
<b>Caller</b>	xs:boolean	Yes	"True" if the reporter was the caller of the SIP dialog. "False" if the reporter was not the caller of the SIP dialog.
<b>LocalContactURI</b>	xs:anyURI	Yes	SIP URI in the SIP <b>Contact</b> header of the reported SIP dialog that was sent from the reporting endpoint.
<b>RemoteContactURI</b>	xs:anyURI	Yes	SIP URI in the <b>Contact</b> header of the reported SIP dialog that was sent from the remote endpoint.
<b>LocalUserAgent</b>	xs:string [450]	Yes	SIP <b>User-Agent</b> or <b>Server</b> header content of the reported SIP dialog that was sent from the reporting endpoint.
<b>RemoteUserAgent</b>	xs:string [450]	Yes	SIP <b>User-Agent</b> or <b>Server</b> header content of the reported SIP dialog that was sent from the remote endpoint.
<b>LocalPAI</b>	xs:anyURI	Yes	SIP URI in the SIP <b>p-asserted-identity</b> (PAI) header of the reported dialog that was sent from the reporting endpoint.
<b>RemotePAI</b>	xs:anyURI	Yes	The SIP URI in the SIP <b>p-asserted-identity</b> (PAI) header of the reported dialog that was sent from the remote endpoint.
<b>ConfURI</b>	xs:anyURI	Yes	The SIP URI of a <b>conference</b> bridge that hosted a conference and terminated this dialog. This URI is unique to each conference and common to all the dialogs that participated in the same conference. <b>ConfURI</b> is available for conferences only.
<b>v2:CallPriority</b>	xs:short	Yes	The SIP <b>Priority</b> header that



Element	Type	Available	Description
			indicates the priority selected for the call. <a href="#">&lt;20&gt;</a>
<b>v2:MediationServerBypassFlag</b>	xs:boolean	Yes	"True" if the reporting endpoint (5) selected the bypass SDP. <a href="#">&lt;21&gt;</a>
<b>v2:TrunkingPeer</b>	xs:string [256]	Yes	The SIP <b>ms-trunking-peer</b> header that reports the <b>fully qualified domain name (FQDN)</b> of the <b>public switched telephone network (PSTN)</b> gateway. <a href="#">&lt;22&gt;</a>
<b>v2:MediaBypassWarningFlag</b>	xs:unsigned int	Yes	Warning flags to indicate failures that prevent the bypass of the mediation server in a PSTN call. The following values are defined: <a href="#">&lt;23&gt;</a> 0x0000 – No error 0x0001 – Unable to determine bypass ID for the network interface used for the call
<b>v2:RegisteredInside</b>	xs:boolean	No	"True" if the listening address is registered within the enterprise. This replaces the <b>Inside</b> element in the <b>AddrType</b> . <a href="#">&lt;24&gt;</a>
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;25&gt;</a>

### 2.2.1.5 MediaLine Element

A **MediaLine** element is the logical equivalent to an **m-line** in SDP. The type of this element is **MediaLineType**.

The following table lists the attributes of the **MediaLine** element.

Element	Type	Required	Available	Description
<b>Label</b>	xs:string	Yes	Yes	Identifies the Media Line. Currently supported values: <ul style="list-style-type: none"> <li>▪ "main-audio"</li> <li>▪ "main-video"</li> <li>▪ "panoramic-video"</li> </ul> If the value does not match one of these listed strings, the report is rejected.

The following example is a **MediaLine** element. [<26>](#)

```
<xs:complexType name="MediaLineType">
```

```

<xs:sequence>
  <xs:element name="Description"
    type="tns:MediaLineDescriptionType"/>
  <xs:element name="InboundStream" type="tns:StreamType"
    minOccurs="0"/>
  <xs:element name="OutboundStream" type="tns:StreamType"
    minOccurs="0"/>
  <xs:element name="LocalConversationalMOS" type="xs:float"
    minOccurs="0"/>
  <xs:element name="RemoteConversationalMOS" type="xs:float"
    minOccurs="0"/>
  <xs:element name="LocalConversationalMOSAlg" type="xs:string"
    minOccurs="0"/>
  <xs:element name="RemoteConversationalMOSAlg" type="xs:string"
    minOccurs="0"/>
  <xs:element ref="v2:AppliedBandwidthLimit" minOccurs="0" />
  <xs:element ref="v2:AppliedBandwidthSource" minOccurs="0" />
  <xs:element ref="v2:LocalClientEvent" minOccurs="0"/>
  <xs:element ref="v2:RemoteClientEvent" minOccurs="0"/>
  <xs:element ref="v2:OpaqueCoreEndpointData" minOccurs="0" />
  <xs:element ref="v2:OpaqueChannelData" minOccurs="0" />
  <xs:sequence minOccurs="0">
    <xs:element ref="v2:Separator" />
    <xs:any namespace="##other" processContents="lax"
      minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:sequence>
<xs:attribute name="Label" type="xs:string" use="required"/>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:element name="AppliedBandwidthLimit" type="xs:int"/>
<xs:element name="AppliedBandwidthSource" type="xs:string"/>

<xs:complexType name="OpaqueChannelDataType" >
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<xs:complexType name="OpaqueCoreEndpointDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element>

```

### 2.2.1.5.1 Child Elements

The following table lists the child elements of the **MediaLine** element.

Element	Type	Available	Description	Units
<b>Description</b>	MediaLineDescriptionType	Yes	Media Line context information.	Not applicable
<b>InboundStream</b>	StreamType	Yes	Information regarding the inbound media <b>stream (2)</b> .	Not applicable
<b>OutboundStream</b>	StreamType	Yes	Information regarding the outbound media stream (2).	Not applicable
<b>LocalConversationalMOS</b>	xs:float	Yes	Conversational Clarity Index for remote party, as described in <a href="#">[ITUP.562]</a> section 6.3.	<b>mean opinion score (MOS)</b>
<b>RemoteConversationalMOS</b>	xs:float	No		
<b>LocalConversationalMOSAlg</b>	xs:string	No		
<b>RemoteConversationalMOSAlg</b>	xs:string	No		
<b>v2:AppliedBandwidthLimit</b>	xs:int	Yes	The bandwidth limit applied for sending media. <a href="#">&lt;27&gt;</a>	bits per second
<b>v2:AppliedBandwidthSource</b>	xs:string [256]	Yes	The source of the bandwidth limit policy that was applied for the sending of media. <a href="#">&lt;28&gt;</a>	Not applicable
<b>v2:LocalClientEvent</b>	ClientEventType	Yes	Information about quality events detected by the reporting endpoint. <a href="#">&lt;29&gt;</a>	Not applicable
<b>v2:RemoteClientEvent</b>	ClientEventType	Yes	Information about quality events detected by the <b>remote</b>	Not applicable

Element	Type	Available	Description	Units
			<a href="#">endpoint.&lt;30&gt;</a>	
<b>v2:OpaqueCoreEndpointData</b>	OpaqueCoreEndpointType	No	<a href="#">&lt;31&gt;</a>	
<b>v2:OpaqueChannelData</b>	v2:OpaqueChannelData	No	<a href="#">&lt;32&gt;</a>	
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;33&gt;</a>	Not applicable

### 2.2.1.6 MediaLineDescription Element

A **MediaLineDescription** element contains **MediaLine** context information. The type of this element is **MediaLineDescriptionType**.

The following example is a **MediaLineDescription** element.[<34>](#)

```
<xs:complexType name="MediaLineDescriptionType">
  <xs:sequence>
    <xs:element name="Connectivity" type="tns:ConnectivityType"
      minOccurs="0"/>
    <xs:element name="Security" type="xs:string" minOccurs="0"/>
    <xs:element name="Offerer" type="xs:boolean" minOccurs="0"/>
    <xs:element name="Transport" type="tns:TransportType"
      minOccurs="0"/>
    <xs:element name="NetworkConnectivityInfo"
      type="tns:NetworkConnectivityInfoType" minOccurs="0" />
    <xs:element name="LocalAddr" type="tns:AddrType"/>
    <xs:element name="RemoteAddr" type="tns:AddrType"/>
    <xs:element name="CaptureDev" type="tns:DeviceType" minOccurs="0"/>
    <xs:element name="RenderDev" type="tns:DeviceType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<xs:simpleType name="TransportType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="UDP"/>
    <xs:enumeration value="TCP"/>
  </xs:restriction>
</xs:simpleType>
```

#### 2.2.1.6.1 Child Elements

The following table lists the child elements of the **MediaLineDescription** element.

Element	Type	Available	Description
<b>Connectivity</b>	ConnectivityType	Yes	<b>Interactive Connectivity Establishment (ICE)</b> connectivity information.
<b>Security</b>	xs:string [128]	Yes	The security profile in use. Currently supported values are "SRTP" and "None".
<b>Offerer</b>	xs:boolean	Yes <sup>&lt;35&gt;</sup>	"True" if the reporting endpoint offered the Media Line; otherwise, "False".
<b>Transport</b>	TransportType	Yes	The type of transport in use. Currently supported values are <b>TCP</b> and <b>UDP</b> .
<b>NetworkConnectivityInfo</b>	NetworkConnectivityInfoType	Yes	Information about network connectivity of the endpoint (5). <sup>&lt;36&gt;</sup>
<b>LocalAddr</b>	AddrType	Yes	<b>Internet Protocol version 4 (IPv4)</b> address related information for the reporting endpoint.
<b>RemoteAddr</b>	AddrType	Yes	IPv4 address related information for the remote endpoint.
<b>CaptureDev</b>	DeviceType	Yes	A device that is used to capture audio and video media, such as a microphone, a USB phone or a camera.
<b>RenderDev</b>	DeviceType	Yes	A device that is used to render audio and video media, such as speakers, a headset, or a USB phone.

### 2.2.1.7 Connectivity Element

A **Connectivity** element contains ICE connectivity information. The type of this element is **ConnectivityType**.

The following example is a **Connectivity** element.

```
<xs:complexType name="ConnectivityType">
  <xs:sequence>
    <xs:element name="Ice" type="tns:IceStatusType" minOccurs="0"/>
    <xs:element name="IceWarningFlags" type="xs:unsignedInt"
      minOccurs="0"/>
    <xs:element name="RelayAddress" type="tns:AddrType" minOccurs="0"
      maxOccurs="unbounded"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

```

    <xs:anyAttribute namespace="##other" processContents="lax"/>
  </xs:complexType>

  <xs:simpleType name="IceStatusType">
    <xs:restriction base="xs:string">
      <xs:enumeration value="FAILED"/>
      <xs:enumeration value="DIRECT"/>
      <xs:enumeration value="RELAY"/>
      <xs:enumeration value="HTTP-PROXY"/>
    </xs:restriction>
  </xs:simpleType>

```

### 2.2.1.7.1 Child Elements

The following table lists the child elements of the **Connectivity** element.

Element	Type	Available	Description
<b>Ice</b>	tns:iceStatusType	Yes	Information about the media path, such as direct or relayed. For more information, see ENUM types in section <a href="#">2.2.1.7</a> .
<b>IceWarningFlags</b>	xs:unsignedInt	Yes	Information about ICE process described in bits flags. For more information, see the following table.
<b>RelayAddress</b>	tns:AddrType	Yes	IPv4 address related information of the <b>Audio/Video Edge Server (A/V Edge Server)</b> .

The following table shows the possible values and descriptions for the **IceWarningFlags** applicable to footnote [<37>](#).

Value	Description
0x000	There were no failures or ICE was not used.
0x0010	<b>TURN server</b> is unreachable.
0x0020	Shared secret with TURN server failed.
0x0040	An attempt to allocate a <b>User Datagram Protocol (UDP)</b> port on the TURN server failed.
0x0200	An attempt to allocate a <b>Transmission Control Protocol (TCP)</b> port on the TURN server failed.
0x4000	UDP local connectivity failed.
0x8000	UDP <b>network address translation (NAT)</b> connectivity failed.
0x10000	UDP TURN server connectivity failed.
0x40000	TCP NAT connectivity failed.
0x80000	TCP TURN server connectivity failed.
0x100000	Message Integrity failed in <b>connectivity check</b> request.
0x200000	Message Integrity failed in connectivity check response.

Value	Description
0x400000	<b>Candidate</b> lookup failed upon receiving the connectivity check request.
0x800000	Candidate lookup failed upon receiving the connectivity check response.
0x1000000	Connectivity Check request failed because of memory problem or other reasons that prevent sending packets.
0x2000000	Connectivity Check response failed because of memory problem or other reasons that prevent sending packets.
0x4000000	TURN server FQDN has not been resolved.
0x8000000	TURN server credentials are unknown.

The following table shows the possible values and descriptions for the **IceWarningFlags** applicable to footnote [<38>](#).

Value	Description
0x0000000	There were no failures or ICE was not used.
0x0000001	TURN server is unreachable.
0x0000002	An attempt to allocate a UDP port on the TURN server failed.
0x0000004	An attempt to send UDP on the TURN server failed.
0x0000008	An attempt to allocate a TCP port on the TURN server failed.
0x0000010	An attempt to send TCP on the TURN server failed.
0x0000020	UDP local connectivity failed.
0x0000040	UDP NAT connectivity failed.
0x0000080	UDP TURN server connectivity failed.
0x0000100	TCP NAT connectivity failed.
0x0000200	TCP TURN server connectivity failed.
0x0000400	Message integrity failed in connectivity check request.
0x0000800	The message integrity on Response message was incorrect.
0x0001000	A bandwidth policy server is configured
0x0002000	Connectivity check request failed because of memory problem or other reasons that prevent sending packets.
0x0004000	TURN server credentials have expired or are unknown.
0x0008000	Bandwidth policy restrictions removed candidates.
0x0010000	Bandwidth policy restrictions reduced bandwidth for some candidates.
0x0020000	Bandwidth policy keepalive failed

Value	Description
0x0040000	Bandwidth policy allocation failure.
0x0080000	No TURN server configured.
0x0100000	Multiple TURN servers were attempted for the allocation.
0x0200000	Port range exhausted.
0x0400000	Received alternate TURN server.
0x0800000	Pseudo-TLS failure. See <a href="#">[MS-TURN]</a> section 2.1.1.
0x1000000	HTTP proxy is configured.
0x2000000	HTTP proxy authentication failed.
0x4000000	TCP-TCP connectivity checks failed over TURN server.
0x8000000	Use candidates check failed.

### 2.2.1.8 NetworkConnectivityInfo Element

A **NetworkConnectivityInfo** element contains information specific to the network connection. The type of this element is **NetworkConnectivityInfoType**.

The following example is a **NetworkConnectivityInfo** element.[<39>](#)

```
<xs:complexType name="NetworkConnectivityInfoType">
  <xs:sequence>
    <xs:element name="NetworkConnection"
      type="tns:NetworkConnectionType" minOccurs="0"/>
    <xs:element name="VPN" type="xs:boolean" minOccurs="0"/>
    <xs:element name="LinkSpeed" type="xs:float" minOccurs="0"/>
    <xs:element ref="v2:BSSID" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:element name="BSSID" type="xs:string"/>
<xs:element name="Separator">
  <xs:complexType/></xs:complexType>
</xs:element />
```

#### 2.2.1.8.1 Child Elements

This section follows the product behavior described in footnote [<40>](#).

The following table lists the child elements of the **NetworkConnectivityInfo** element.



Element	Type	Available	Description	Units
<b>NetworkConnection</b>	NetworkConnectionType	Yes	Information about the Network Connection type. See ENUM types in section <a href="#">2.2.1.8</a> .	Not applicable
<b>VPN</b>	xs:boolean	Yes	"True" if user is on VPN, "False" if not.	True/False
<b>LinkSpeed</b>	xs:float	Yes	The link speed of the network interface of the endpoint (5).	bits per second
<b>v2:BSSID</b>	xs:string [32]	Yes	Wireless LAN Basic Service Set Identifier. <a href="#">&lt;41&gt;</a>	Not applicable
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;42&gt;</a>	Not applicable

### 2.2.1.9 LocalAddr, RemoteAddr, and RelayAddr Elements

**LocalAddr**, **RemoteAddr**, and **RelayAddr** elements contain IP address-related information for an endpoint (5) in the dialog. The type for these elements is **AddrType**.

The following example is an **AddrType** element. [<43>](#)

```
<xs:complexType name="AddrType">
  <xs:sequence>
    <xs:element name="IPAddr" type="xs:string"/>
    <xs:element name="Port" type="xs:unsignedShort" minOccurs="0"/>
    <xs:element name="Inside" type="xs:boolean" minOccurs="0"/>
    <xs:element name="SubnetMask" type="xs:string" minOccurs="0"/>
    <xs:element ref="v2:MACAddr" minOccurs="0" />
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator"/></xs:element>
      <xs:any namespace="##other" processContents="lax"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence> </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
  </xs:complexType>

  <xs:element name="MACAddr" type="xs:string"/>
  <xs:element name="Separator">
    <xs:complexType></xs:complexType>
  </xs:element />
```

#### 2.2.1.9.1 Child Elements

The following table lists the child elements of **LocalAddr**, **RemoteAddr**, and **RelayAddr** elements.

Element	Type	Available	Description	Units
<b>IPAddr</b>	xs:string	Yes	The IPv4 listening address for the	IPv4

Element	Type	Available	Description	Units
			stream (2) in dotted notation.	
<b>Port</b>	xs:unsignedShort	Yes*	The listening port for the stream (2).	Not applicable
<b>Inside</b>	xs:boolean	Yes**	"True" if the listening address is inside the OCS Enterprise, otherwise "False". <a href="#">&lt;44&gt;</a>	Not applicable
<b>SubnetMask</b>	xs:string	Yes**	The subnet masks of the listing address for the stream (2), in dotted notation.	IPv4
<b>v2:MACAddr</b>	xs:string [32]	Yes**	The media access control address of the network interface adapter associated with the <b>IPAddr</b> . <a href="#">&lt;45&gt;</a>	Hexadecimal string
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;46&gt;</a>	Not applicable

\* Only available for the **LocalAddr** and **RemoteAddr** elements.

\*\* Only available for **LocalAddr**.

### 2.2.1.10 CaptureDev and RenderDev Elements

**CaptureDev** and **RenderDev** elements contain microphone, USB phone, or camera device type information. The type for these elements is **DeviceType**.

The following example is a **DeviceType** element.

```
<xs:complexType name="DeviceType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0"/>
    <xs:element name="Driver" type="xs:string" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
```

#### 2.2.1.10.1 Child Elements

The following table lists the child elements of **CaptureDev** and **RenderDev** elements.

Element	Type	Available	Description
Name	xs:string [256]	Yes	Media capture or render device name. For more information, see section <a href="#">6</a> .
Driver	xs:string [256]	Yes <a href="#">&lt;47&gt;</a>	Manufacturer and version information about the device driver used for the device.

### 2.2.1.11 InboundStream and OutboundStream Elements

**InboundStream** and **OutboundStream** elements contain information regarding a media stream. The type for these elements is **StreamType**.

The following table lists the attributes of **InboundStream** and **OutboundStream** elements.

Element	Type	Required	Available	Description
<b>Id</b>	xs:unsignedInt	Yes	Yes	<b>Synchronization Source (SSRC)</b> identifier as specified in <a href="#">[RFC3550]</a> section 8.
<b>Start</b>	xs:dateTime	No	No	
<b>End</b>	xs:dateTime	No	No	

The following example is a **StreamType** element.

```
<xs:complexType name="StreamType">
  <xs:sequence>
    <xs:element name="Network" type="tns:NetworkMetricsType"
      minOccurs="0"/>
    <xs:element name="Payload" type="tns:PayloadMetricsType"/>
    <xs:element name="QualityEstimates" type="tns:QualityEstimatesType"
      minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="Id" type="xs:unsignedInt" use="required"/>
  <xs:attribute name="Start" type="xs:dateTime"/>
  <xs:attribute name="End" type="xs:dateTime"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
```

#### 2.2.1.11.1 Child Elements

The following table lists the child elements of **InboundStream** and **OutboundStream** elements.

Element	Type	Available	Description
<b>Network</b>	NetworkMetricsType	Yes	Network-based metrics.
<b>Payload</b>	PayloadMetricsType	Yes	Payload-based metrics.
<b>QualityEstimates</b>	QualityEstimatesType	Yes	Metrics estimating the quality of the media.

#### 2.2.1.12 Network Element

A **Network** element contains network-based metrics. The type of this element is **NetworkMetricsType**.

The following example is a **Network** element.[<48>](#)

```
<xs:complexType name="NetworkMetricsType">
  <xs:sequence>
```

```

<xs:element name="DSCP" type="xs:byte" minOccurs="0"/>
<xs:element name="VLAN" type="xs:int" minOccurs="0"/>
<xs:element name="Jitter" type="tns:JitterType" minOccurs="0"/>
<xs:element name="PacketLoss" type="tns:PacketLossType"
  minOccurs="0"/>
<xs:element name="BurstGapLoss" type="tns:BurstGapLossType"
  minOccurs="0"/>
<xs:element name="Delay" type="tns:DelayType" minOccurs="0"/>
<xs:element name="Utilization" type="tns:NetworkUtilizationType"
  minOccurs="0"/>
<xs:element ref="v2:RatioConcealedSamplesAvg" minOccurs="0"/>
<xs:element ref="v2:RatioStretchedSamplesAvg" minOccurs="0"/>
<xs:element ref="v2:RatioCompressedSamplesAvg" minOccurs="0"/>
<xs:sequence minOccurs="0">
  <xs:element ref="v2:Separator" />
  <xs:any namespace="##other" processContents="lax"
    minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<xs:element name="RatioConcealedSamplesAvg" type="xs:float"/>
<xs:element name="RatioStretchedSamplesAvg" type="xs:float"/>
<xs:element name="RatioCompressedSamplesAvg" type="xs:float"/>

<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element />

```

### 2.2.1.12.1 Child Elements

The following table lists the child elements of the **Network** element.

Element	Type	Available	Description
<b>DSCP</b>	xs:byte	No	
<b>VLAN</b>	xs:byte	No	
<b>Jitter</b>	JitterType	Yes	<b>Jitter</b> related metrics.
<b>PacketLoss</b>	PacketLossType	Yes	Packet loss related metrics.
<b>BurstGapLoss</b>	BurstGapLossType	Yes**	Burst related metrics.
<b>Delay</b>	DelayType	Yes*	Delay related metrics.
<b>Utilization</b>	NetworkUtilizationType	Yes	Utilization related metrics.
<b>v2:RatioConcealedSamplesAvg</b>	xs:float	Yes**	Ratio of the number of audio frames with samples generated by packet loss concealment to the total number of audio frames.
<b>v2:RatioStretchedSamplesAvg</b>	xs:float	Yes**	Ratio of the number of audio frames that with

Element	Type	Available	Description
			samples that have been stretched to compensate for jitter or loss to the total number of audio frames. <a href="#">&lt;49&gt;</a>
<b>v2:RatioCompressedSamplesAvg</b>	xs:float	Yes**	Ratio of the number of audio frames with samples that have been compressed to compensate for jitter or loss to the total number of audio frames. <a href="#">&lt;50&gt;</a>
<b>v2:Separator</b>	default	Yes	Separator element used for future schema extensions. <a href="#">&lt;51&gt;</a>

\*Available for Outbound stream only

\*\* Available for Inbound stream only

### 2.2.1.13 Payload Elements

A **Payload** element contains payload-based metrics. The type of this element is **PayloadMetricsType**.

The following example is a **Payload** element.

```
<xs:complexType name="PayloadMetricsType">
  <xs:choice>
    <xs:element name="Audio" type="tns:AudioPayloadMetricsType"/>
    <xs:element name="Video" type="tns:VideoPayloadMetricsType"/>
    <xs:any namespace="##other" processContents="lax"
      maxOccurs="unbounded"/>
  </xs:choice>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
```

#### 2.2.1.13.1 Child Elements

The following table lists the child elements of the **Payload** element.

Element	Type	Available	Description
<b>Audio</b>	AudioPayloadMetricsType	Yes	Audio-based payload metrics.
<b>Video</b>	VideoPayloadMetricsType	Yes	Video-based payload metrics.

#### 2.2.1.14 Payload.Audio Elements

A **Payload.Audio** element contains audio-based payload metrics. The type of this element is **AudioPayloadMetricsType**.

The following example is a **Payload.Audio** element. [<52>](#)

```

<xs:complexType name="AudioPayloadMetricsType">
  <xs:sequence>
    <xs:element name="PayloadType" type="xs:int" minOccurs="0"/>
    <xs:element name="PayloadDescription" type="xs:string"
      minOccurs="0"/>
    <xs:element name="SampleRate" type="xs:int" minOccurs="0"/>
    <xs:element name="FrameDuration" type="xs:int" minOccurs="0"/>
    <xs:element name="FrameOctets" type="xs:int" minOccurs="0"/>
    <xs:element name="FramesPerPacket" type="xs:int" minOccurs="0"/>
    <xs:element name="PacketsPerSecond" type="xs:int" minOccurs="0"/>
    <xs:element name="FMTP" type="xs:string" minOccurs="0"/>
    <xs:element name="Signal" type="tns:SignalType" minOccurs="0"/>
    <xs:element name="JitterBuffer" type="tns:JitterBufferType"
      minOccurs="0"/>
    <xs:element name="SilenceSupress"
      type="tns:SilenceSuppressionStateType" minOccurs="0"/>
    <xs:element ref="v2:AudioFECUsed" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
</xs:complexType>

<xs:element name="AudioFECUsed" type="xs:boolean"/>

<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element />
<xs:simpleType name="SilenceSuppressionStateType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="ON" />
    <xs:enumeration value="OFF" />
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="JitterBufferType">
  <xs:sequence>
    <xs:element name="Type" type="tns:JitterBufferAdaptiveType"
      minOccurs="0" />
    <xs:element name="Rate" type="xs:int" minOccurs="0" />
    <xs:element name="Nominal" type="xs:int" minOccurs="0" />
    <xs:element name="Max" type="xs:int" minOccurs="0" />
    <xs:element name="AbsMax" type="xs:int" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded" />
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>

<xs:simpleType name="JitterBufferAdaptiveType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="UNKNOWN" />
    <xs:enumeration value="RESERVED" />
    <xs:enumeration value="NON-ADAPTIVE" />
    <xs:enumeration value="ADAPTIVE" />
  </xs:restriction>
</xs:simpleType>

```

### 2.2.1.14.1 Child Elements

The following table lists the child elements of the **Payload.Audio** element.

Element	Type	Available	Description	Units
<b>PayloadType</b>	xs:int	Yes<53>	Payload number used for the <b>codec</b> , as specified in <a href="#">[MS-RTP]</a> section 2.2.1.	Integer
<b>PayloadDescription</b>	xs:string [256]	Yes	Codec name, as specified in <a href="#">[MS-SDPEXT]</a> section 3.1.5.3 or <a href="#">[RFC3551]</a> section 6.	Not applicable
<b>SampleRate</b>	xs:int	Yes	Audio sample rate.	Samples per second
<b>FrameDuration</b>	xs:int	No		
<b>FrameOctets</b>	xs:int	No		
<b>FramesPerSecond</b>	xs:int	No		
<b>PacketsPerSecond</b>	xs:int	No		
<b>FMT</b>	xs:string	No		
<b>Signal</b>	SignalType	Yes	Metrics regarding signal level and noise.	Not applicable
<b>JitterBuffer</b>	JitterBufferType	No		
<b>SilenceSuppress</b>	SilenceSuppressionStateType	No		
<b>v2:AudioFECUsed</b>	xs:boolean	Yes	"True" indicates that audio FEC was used at some point during the call. "False" indicates that no audio FEC was used during the call.<54>	Not applicable
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions.<55>	Not applicable

### 2.2.1.15 Payload.Video Elements

A **Payload.Video** element contains video-based payload metrics. The type of this element is **VideoPayloadMetricsType**.

The following example is a **Payload.Video** element. [<56>](#56)

```
<xs:complexType name="VideoPayloadMetricsType">
  <xs:sequence>
    <xs:element name="PayloadType" type="xs:int" minOccurs="0"/>
    <xs:element name="PayloadDescription" type="xs:string"
      minOccurs="0"/>
    <xs:element name="Resolution" type="xs:string" minOccurs="0"/>
    <xs:element name="VideoBitRateAvg" type="xs:int" minOccurs="0"/>
    <xs:element name="VideoBitRateMax" type="xs:int" minOccurs="0"/>
    <xs:element name="VideoFrameRateAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="VideoPacketLossRate" type="xs:float"
      minOccurs="0"/>
    <xs:element name="VideoFrameLossRate" type="xs:float"
      minOccurs="0"/>
    <xs:element name="VideoFrameEncodingTime" type="xs:float"
      minOccurs="0"/>
    <xs:element name="VideoFrameDecodingTime" type="xs:float"
      minOccurs="0"/>
    <xs:element name="VideoFEC" type="xs:boolean" minOccurs="0"/>
    <xs:element name="FrozenVideoFreq" type="xs:float" minOccurs="0"/>
    <xs:element name="FrozenPeriodPercentAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="ConsecutivePacketLossAvg" type="xs:float"
      minOccurs="0"/>
    <xs:element name="RateMatchLevel" type="xs:float" minOccurs="0"/>
    <xs:element ref="v2:VideoAllocateBWAvg" minOccurs="0"/>
```

<xs:element ref="v2:VideoLocalFrameLossPercentageAvg" minOccurs="0"/>

```
  <xs:sequence minOccurs="0">
    <xs:element ref="v2:Separator" />
    <xs:element ref="v2:VideoResolutionDistribution" minOccurs="0" />
    <xs:element ref="v2:VideoRateMatchingLevelDistribution" minOccurs="0" />
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
```

</xs:sequence>

</xs:sequence>

</xs:complexType>

```
<xs:element name="VideoAllocateBWAvg" type="xs:int"/>

<xs:element name="VideoLocalFrameLossPercentageAvg" type="xs:float"/>
<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element />
```



### 2.2.1.15.1 Child Elements

The following table lists the child elements of the **Payload.Video** element.

Element	Type	Available	Description	Units
<b>PayloadType</b>	xs:int	Yes< <a href="#">57</a> >	Payload number used for the codec, as specified in <a href="#">[MS-RTP]</a> section 2.2.1.	Integer
<b>PayloadDescription</b>	xs:string [256]	Yes	Codec name, as specified in <a href="#">[MS-SDPEXT]</a> section 3.1.5.3 or <a href="#">[RFC3551]</a> section 6.	Not applicable
<b>Resolution</b>	xs:string [9]	Yes	Report video resolution in pixels, in the string format of Width x Height without spaces, for example "640x480".	Pixels
<b>VideoBitRateAvg</b>	xs:int	Yes	Average bit rate, or bits per second, sent or received for a video stream, compute	Bits per second

Element	Type	Available	Description	Units
			d over the duration of the session. This includes raw video and transport bits.	
<b>VideoBitRateMax</b>	xs:int	Yes	Maximum bit rate, or bits per second, sent or received for a video stream, computed over the duration of the session.	Bits per second
<b>VideoFrameRateAvg</b>	xs:float	Yes	Average frames per second sent or received for a video stream, computed over the duration of the session.	Frames per second
<b>VideoPacketLossRate</b>	xs:float	Outbound	The average fraction lost, as specified in <a href="#">[RFC3550]</a> section 6.4.1 computed over	Fraction

Element	Type	Available	Description	Units
			the duration of the session.	
<b>VideoFrameLossRate</b>	xs:float	Inbound	The average fraction of frames lost on the video receiver side, computed over the duration of the session.	Fraction
<b>VideoFrameEncodingTime</b>	xs:float	Outbound	Average frame encoding time. This is the time difference between encoding start and encoding finish, computed over the duration of the session.	Milliseconds
<b>VideoFrameDecodingTime</b>	xs:float	Inbound	Average frame decoding time. This is the time difference between decoding start and decoding finish, computed over the	Milliseconds

Element	Type	Available	Description	Units
			duration of the session.	
<b>VideoFEC</b>	xs:boolean	No		
<b>FrozenVideoFreq</b>	xs:float	Inbound	Frequency of occurrence of long duration frozen video, where "long duration" is defined as no video frames displayed for more than 1 second. Equal to the ratio of total occurrence over session duration.	Fraction
<b>FrozenPeriodPercentAvg</b>	xs:float	Inbound	Percentage of total call duration for which frozen video was observed.	Percentage <a href="#">&lt;58&gt;</a>
<b>ConsecutivePacketLossAvg</b>	xs:float	Inbound	Average number of consecutive packets lost during a video session. <a href="#">&lt;59&gt;</a>	Packets

Element	Type	Available	Description	Units
<b>RateMatchLevel</b>	xs:float	Outbound	Describe s the level of frame rate matchin g in video sessions This is the average of the level values encount ered in the <b>RTVideo</b> o bit stream. 0 correspo nds to the case where all frame types (I, SP, P, and B) are transmit ted. 1 correspo nds to the case where I, SP, and P frames are transmit ted. 2 correspo nds to the case where I and SP frames are transmit ted. 3 correspo nds to the case where only I frames are	Not applicable

Element	Type	Available	Description	Units
			transmitted. <a href="#">&lt;60&gt;</a>	
<b>v2:VideoAllocateBWAvg</b>	xs:int	Outbound	The bandwidth allocated for sending video. <a href="#">&lt;61&gt;</a>	Bits per second
<b>v2:VideoLocalFrameLossPercentageAvg</b>	xs:float	Inbound	The average percentage of video frames lost as displayed to the user. This includes frames recovered from network losses. <a href="#">&lt;62&gt;</a>	Percentage
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;63&gt;</a>	Not applicable
<b>v2:VideoResolutionDistribution</b>	VideoResolutionDistributionType	Inbound/Outbound	The distribution of received or sent video resolution. <a href="#">&lt;64&gt;</a>	Not applicable
<b>v2:VideoRateMatchingLevelDistribution</b>	VideoRateMatchingLevelDistributionType	Inbound	The distribution of received video rate matching	Not applicable

Element	Type	Available	Description	Units
			g level. <a href="#">65</a>	

### 2.2.1.16 VideoResolutionDistribution Elements

A **VideoResolutionDistribution** element contains metrics representing a distribution of video resolutions. The type of this element is **VideoResolutionDistributionType**. [66](#)

The following example is a **VideoResolutionDistribution** element.

```
<xs:complexType name="VideoResolutionDistributionType">
  <xs:sequence>
    <xs:element name="CIFQuality" type="xs:unsignedByte" />
    <xs:element name="VGAQuality" type="xs:unsignedByte" />
    <xs:element name="HD720Quality" type="xs:unsignedByte" />
    <xs:sequence minOccurs="0">
      <xs:element ref="tns:Separator"/>
      <xs:any namespace="##any" processContents="lax"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
</xs:complexType>
```

#### 2.2.1.16.1 Child Elements

The following table lists the child elements of the **VideoResolutionDistribution** element. [67](#)

Element	Type	Available	Description	Units
<b>v2:CIFQuality</b>	xs:unsigned byte	Yes	The percentage of the duration of a call that is using <b>CIF</b> resolution as defined in the following table. <a href="#">68</a>	Percentage (0-100)
<b>v2:VGAQuality</b>	xs:unsigned byte	Yes	The percentage of the duration of a call that is using the VGA resolution as defined in the following table. <a href="#">69</a>	Percentage (0-100)
<b>v2:HD720Quality</b>	xs:unsigned byte	Yes	The percentage of the duration of a call that is using the HD720 resolution as defined in the following table. <a href="#">70</a>	Percentage (0-100)
<b>v2:Separator</b>	default	no	Separator element used for future schema extensions. <a href="#">71</a>	Percentage (0-100)

The following table lists the values of height and width in pixels of the resolution used by elements within the **VideoResolutionDistribution** element.

Resolution	Width	Height
CIF	240 ≤ width < 480	height ≥ 180

Resolution	Width	Height
CIF	width ≥ 240	180 ≤ height < 360
VGA	480 ≤ width < 960	height ≥ 360
VGA	width ≥ 480	360 ≤ height < 600
HD720	width ≥ 960	height ≥ 600

### 2.2.1.17 VideoRateMatchingLevelDistribution

A **VideoRateMatchingLevelDistribution** element contains metrics describing the portion of the call where video frames are discarded to reduce bandwidth. The type of this element is **VideoRateMatchingLevelDistribution**. [<72>](#)

The following example is a **VideoRateMatchingLevelDistribution** element.

```
<xs:complexType name="VideoRateMatchingLevelDistributionType">
  <xs:sequence>
    <xs:element name="None_Drop" type="xs:unsignedByte" />
    <xs:element name="B_Drop" type="xs:unsignedByte" />
    <xs:element name="BP_Drop" type="xs:unsignedByte" />
    <xs:element name="BPSP_Drop" type="xs:unsignedByte" />
    <xs:element name="BPSP_I_Drop" type="xs:unsignedByte" />
    <xs:sequence minOccurs="0">
      <xs:element ref="tns:Separator"/>
      <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
```

#### 2.2.1.17.1 Child Elements

The following table lists the child elements of the **VideoRateMatchingLevelDistribution** element. [<73>](#)

Element	Type	Available	Description	Units
<b>v2:None_Drop</b>	xs:unsigned byte	Yes	The percentage of the duration of a call where no frame types were dropped to reduce bandwidth. <a href="#">&lt;74&gt;</a>	Percentage (0-100)
<b>v2:B_Drop</b>	xs:unsigned byte	Yes	The percentage of the duration of a call where only B frames were dropped to reduce bandwidth. <a href="#">&lt;75&gt;</a> Refer to <a href="#">[MS-RTVPE]</a> section 1.1 for details about frame types.	Percentage (0-100)
<b>v2:BP_Drop</b>	xs:unsigned byte	Yes	The percentage of the duration of a call where B and P frames were dropped to reduce bandwidth. <a href="#">&lt;76&gt;</a> Refer to <a href="#">[MS-RTVPE]</a> section 1.1 for details about frame types.	Percentage (0-100)



Element	Type	Available	Description	Units
<b>v2:BPSP_Drop</b>	xs:unsigned byte	Yes	The percentage of the duration of a call where B, P, and SP frames were dropped to reduce bandwidth.<77> Refer to [MS-RTVPE] section 1.1 for details about frame types.	Percentage (0-100)
<b>v2:BPSPI_Drop</b>	xs:unsigned byte	Yes	The percentage of the duration of a call where B, P, SP and I frames were dropped to reduce bandwidth.<78> Refer to [MS-RTVPE] section 1.1 for details about frame types.	Percentage (0-100)
<b>v2:Separator</b>	default	no	Separator element used for future schema extensions. <79>	Not applicable

### 2.2.1.18 QualityEstimates Elements

A **QualityEstimates** element contains metrics estimating the quality of the media. The type of this element is **QualityEstimatesType**.

The following example is a **QualityEstimates** element.

```
<xs:complexType name="QualityEstimatesType">
  <xs:choice>
    <xs:element name="Audio" type="tns:AudioQualityEstimatesType"/>
    <xs:element name="Video" type="tns:VideoQualityEstimatesType"/>
    <xs:any namespace="##other" processContents="lax"
      maxOccurs="unbounded"/>
  </xs:choice>
</xs:complexType>
```

#### 2.2.1.18.1 Child Elements

The following table lists the child elements of the **QualityEstimates** element.

Element	Type	Available	Description
<b>Audio</b>	AudioQualityEstimatesType	Yes	Audio metrics estimating quality of the media.
<b>Video</b>	VideoQualityEstimatesType	No	

### 2.2.1.19 QualityEstimates.Audio Elements

A **QualityEstimates.Audio** element contains audio metrics estimating the quality of the media. The type of this element is **AudioQualityEstimatesType**.

The following example is a **QualityEstimates.Audio** element.

```
<xs:complexType name="AudioQualityEstimatesType">
  <xs:sequence>
    <xs:element name="RecvListenMOS" type="xs:float" minOccurs="0"/>
    <xs:element name="RecvListenMOSMin" type="xs:float" minOccurs="0"/>
    <xs:element name="RecvListenMOSAlg" type="xs:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

```

<xs:element name="SendListenMOS" type="xs:float" minOccurs="0"/>
<xs:element name="SendListenMOSMin" type="xs:float" minOccurs="0"/>
<xs:element name="SendListenMOSAlg" type="xs:string" minOccurs="0"/>
<xs:element name="NetworkMOS" type="tns:NetworkAudioMOSType"
  minOccurs="0"/>
<xs:any namespace="##other" processContents="lax" minOccurs="0"
  maxOccurs="unbounded"/>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

```

### 2.2.1.19.1 Child Elements

The following table lists the child elements of the **QualityEstimates.Audio** element.

Element	Type	Available	Description	Units
<b>RecvListenMOS</b>	xs: float	Inbound	The MOS-LQO wideband, as specified by <a href="#">[ITU.800.1]</a> section 2.1.2, for decoded audio received by the reporting entity during the session.	MOS
<b>RecvListenMOSMin</b>	xs: float	Inbound	Minimum of the <b>RecvListenMOS</b> for the stream (2) during the session.	MOS
<b>RecvListenMOSAlg</b>	xs: float	No		
<b>SendListenMOS</b>	xs: float	Outbound	The MOS-LQO wideband, as specified by <a href="#">[ITU.800.1]</a> section 2.1.2 for pre-encoded audio sent by the reporting entity during the session.	MOS
<b>SendListenMOSMin</b>	xs: float	Outbound	Minimum of the <b>SendListenMOS</b> for the stream over the duration of the session.	MOS
<b>SendListenMOSAlg</b>	xs: float	No		
<b>NetworkMOS</b>	NetworkAudioMOSType	Inbound	Predictive metrics based on network factors alone.	MOS

### 2.2.1.20 NetworkAudioMOS Elements

A **NetworkAudioMOS** element contains predictive metrics based on network factors alone. The type of this element is **NetworkAudioMOSType**.

The following example is a **NetworkAudioMOS** element. [<80>](#)

```

<xs:complexType name="NetworkAudioMOSType">
  <xs:sequence>
    <xs:element name="OverallAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="OverallMin" type="xs:float" minOccurs="0"/>
    <xs:element name="DegradationAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="DegradationMax" type="xs:float" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

```

```

<xs:element name="DegradationJitterAvg" type="xs:float"
  minOccurs="0"/>
<xs:element name="DegradationPacketLossAvg" type="xs:float"
  minOccurs="0"/>
<xs:element ref="v2:NetworkMOSAlg" minOccurs="0"/>
<xs:sequence minOccurs="0">
  <xs:element ref="v2:Separator" />
  <xs:any namespace="##other" processContents="lax"
    minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax"/></xs:complexType>

<xs:element name="NetworkMOSAlg" type="xs:string"/>

<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element />

```

### 2.2.1.20.1 Child Elements

The following table lists the child elements of the **NetworkAudioMOS** element.

Element	Type	Available	Description	Units
<b>OverallAvg</b>	xs:float	Inbound	The average of MOS-LQO wideband, as specified by <a href="#">[ITUP.800.1]</a> section 2.1.2, based on the audio codec used and the observed packet loss and inter-arrival packet jitter.	MOS
<b>OverallMin</b>	xs:float	Inbound	The minimum of MOS-LQO wideband, as specified by <a href="#">[ITUP.800.1]</a> section 2.1.2, based on the audio codec used and the observed packet loss and inter-arrival packet jitter.	MOS
<b>DegradationAvg</b>	xs:float	Inbound	The difference between the <b>OverallAvg</b> and the maximum possible MOS-LQO for the audio codec used in the session.	MOS
<b>DegradationMax</b>	xs:float	Inbound	The difference between the <b>OverallMin</b> and the maximum possible MOS-LQO for the audio codec used in the session.	MOS
<b>DegradationJitterAvg</b>	xs: float	Inbound	The average fraction of the <b>DegradationAvg</b> that was caused by inter-arrival packet jitter.	Fraction
<b>DegradationPacketLossAvg</b>	xs:float	Inbound	The average fraction of the <b>DegradationAvg</b> that was caused by packet loss.	Fraction

Element	Type	Available	Description	Units
<b>v2:NetworkMOSAlg</b>	xs:string	No	The algorithm used for computing the <b>OverallAvg</b> , <b>OverallMin</b> , <b>DegradationAvg</b> , <b>DegradationMax</b> , <b>DegradationJitterAvg</b> and <b>DegradationPacketLossAvg</b> values. <a href="#">&lt;81&gt;</a>	Not applicable
<b>v2:Separator</b>	default	No	Separator element used for future schema extensions. <a href="#">&lt;82&gt;</a>	Not applicable

### 2.2.1.21 Utilization Elements

A **Utilization** element contains metrics related to network utilization. The type of this element is **NetworkUtilizationType**.

The following example is a **Utilization** element.

```
<xs:complexType name="NetworkUtilizationType">
  <xs:sequence>
    <xs:element name="Packets" type="xs:int" minOccurs="0"/>
    <xs:element name="BandwidthEst" type="xs:int" minOccurs="0"/>
    <xs:element name="BandwidthAlloc" type="xs:int" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
```

#### 2.2.1.21.1 Child Elements

The following table lists the child elements of the **Utilization** element.

Element	Type	Available	Description	Units
<b>Packets</b>	xs:int	Yes	Number of <b>Real-Time Transport Protocol (RTP)</b> packets sent in the session.	Packets
<b>BandwidthEst</b>	xs:int	Outbound	Estimated one way available bandwidth of the stream at the end of the session.	Bits per second
<b>BandwidthAlloc</b>	xs:int	No		

### 2.2.1.22 PacketLoss Elements

A **PacketLoss** element contains metrics related to packet loss. The type of this element is **PacketLossType**.

The following example is a **PacketLoss** element.

```
<xs:complexType name="PacketLossType">
  <xs:sequence>
    <xs:element name="LossRate" type="xs:float" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

```

<xs:element name="LossRateMax" type="xs:float" minOccurs="0"/>
<xs:element name="DiscardRate" type="xs:float" minOccurs="0"/>
<xs:any namespace="##other" processContents="lax" minOccurs="0"
  maxOccurs="unbounded"/>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

```

### 2.2.1.22.1 Child Elements

The following table lists the child elements of the **PacketLoss** element.

Element	Type	Available	Description	Units
<b>LossRate</b>	xs:float	Yes	The average fraction lost, as specified in <a href="#">[RFC3550]</a> section 6.4.1, computed over the duration of the session.	Fraction
<b>LossRateMax</b>	xs:float	Yes	The maximum fraction lost, as specified in <a href="#">[RFC3550]</a> section 6.4.1, computed over the duration of the session.	Fraction
<b>DiscardRate</b>	xs:float	No		

### 2.2.1.23 BurstGapLoss Elements

A **BurstGapLoss** element contains metrics related to Burst and Gap. The type of this element is **BurstGapLossType**.

The following example is a **BurstGapLoss** element.

```

<xs:complexType name="BurstGapLossType">
  <xs:sequence>
    <xs:element name="BurstDensity" type="xs:float" minOccurs="0"/>
    <xs:element name="BurstDuration" type="xs:int" minOccurs="0"/>
    <xs:element name="GapDensity" type="xs:float" minOccurs="0"/>
    <xs:element name="GapDuration" type="xs:int" minOccurs="0"/>
    <xs:element name="MinGapThreshold" type="xs:int" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

```

#### 2.2.1.23.1 Child Elements

The following table lists the child elements of the **BurstGapLoss** element.

Element	Type	Available	Description	Units
<b>BurstDensity</b>	xs:float	Inbound	The average burst density, as specified in <a href="#">[RFC3611]</a> section 4.7.1, computed with a Gmin=16 for the <b>RTP packets</b> received.	Percentage * 100

Element	Type	Available	Description	Units
<b>BurstDuration</b>	xs:int	Inbound	The average burst duration, as specified in <a href="#">[RFC3611]</a> section 4.7.1, computed with a Gmin=16 for the RTP packets received.	Milliseconds
<b>GapDensity</b>	xs:float	Inbound	The average gap density, as specified in <a href="#">[RFC3611]</a> section 4.7.1, computed with a Gmin=16 for the RTP packets received.	Percentage * 100
<b>GapDuration</b>	xs:int	Inbound	The average gap duration, as specified in <a href="#">[RFC3611]</a> section 4.7.1, computed with a Gmin=16 for the RTP packets received.	Milliseconds
<b>MinGapThreshold</b>	xs:int	No		

### 2.2.1.24 Delay Elements

A **Delay** element contains metrics related to delays. The type of this element is **DelayType**.

The following example is a **Delay** element.

```
<xs:complexType name="DelayType">
  <xs:sequence>
    <xs:element name="RoundTrip" type="xs:int" minOccurs="0"/>
    <xs:element name="RoundTripMax" type="xs:int" minOccurs="0"/>
    <xs:element name="EndSystem" type="xs:int" minOccurs="0"/>
    <xs:element name="OneWay" type="xs:int" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
```

#### 2.2.1.24.1 Child Elements

The following table lists the child elements of the **Delay** element.

Element	Type	Available	Description	Units
<b>RoundTrip</b>	xs:int	Outbound	The average network propagation round-trip time computed as specified in <a href="#">[RFC3550]</a> section 6.4.1.	Milliseconds
<b>RoundTripMax</b>	xs:int	Outbound	The maximum network propagation round-trip time computed as specified in <a href="#">[RFC3550]</a> section 6.4.1.	Milliseconds
<b>EndSystem</b>	xs:int	No		
<b>OneWay</b>	xs:int	No		

### 2.2.1.25 Jitter Elements

A **Jitter** element contains metrics related to jitter. The type of this element is **JitterType**.

The following example is a **Jitter** element.

```
<xs:complexType name="JitterType">
  <xs:sequence>
    <xs:element name="InterArrival" type="xs:int" minOccurs="0"/>
    <xs:element name="InterArrivalMax" type="xs:int" minOccurs="0"/>
    <xs:element name="MeanAbs" type="xs:int" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
```

### 2.2.1.25.1 Child Elements

The following table lists the child elements of the **Jitter** element.

Element	Type	Available	Description	Units
<b>InterArrival</b>	xs:int	Yes	The average inter-arrival jitter, as specified in <a href="#">RFC3550</a> section 6.4.1.	Milliseconds
<b>InterArrivalMax</b>	xs:int	Yes	The maximum inter-arrival jitter, as specified in <a href="#">RFC3550</a> section 6.4.1.	Milliseconds
<b>MeanAbs</b>	xs:int	No		

### 2.2.1.26 Signal Elements

A **Signal** element contains metrics related to the signal. The type of this element is **SignalType**.

The following example is a **Signal** element.[<83>](#)

```
<xs:complexType name="SignalType">
  <xs:sequence>
    <xs:element name="SignalLevel" type="xs:int" minOccurs="0" />
    <xs:element name="NoiseLevel" type="xs:int" minOccurs="0" />
    <xs:element name="EchoReturn" type="xs:int" minOccurs="0" />
    <xs:element name="SpeakerFeedbackMicIn" type="xs:int" minOccurs="0"/>
    <xs:element name="SpeechLevelMicIn" type="xs:int" minOccurs="0"/>
    <xs:element name="SpeechLevelPostProcess" type="xs:int" minOccurs="0"/>
    <xs:element name="SignalLevelLoudSpeaker" type="xs:int" minOccurs="0"/>
    <xs:element name="BackGroundNoiseMicIn" type="xs:int" minOccurs="0"/>
    <xs:element name="BackGroundNoiseSent" type="xs:int" minOccurs="0" />
    <xs:element name="LocalSpeechToEcho" type="xs:int" minOccurs="0" />
    <xs:element name="SpeakerGlitchRate" type="xs:int" minOccurs="0" />
    <xs:element name="MicGlitchRate" type="xs:int" minOccurs="0" />
    <xs:element name="SpeakerClipRate" type="xs:int" minOccurs="0" />
    <xs:element name="MicClipRate" type="xs:int" minOccurs="0" />
    <xs:element name="RxAGCSignalLevel" type="xs:int" minOccurs="0" />
    <xs:element name="RxAGCNoiseLevel" type="xs:int" minOccurs="0" />
    <xs:element ref="v2:InitialSignalLevelRMS" minOccurs="0"/>
    <xs:element ref="v2:AudioTimestampDriftRateMic" minOccurs="0"/>
    <xs:element ref="v2:AudioTimestampDriftRateSpk" minOccurs="0"/>
    <xs:element ref="v2:AudioTimestampErrorMicMs" minOccurs="0"/>
    <xs:element ref="v2:AudioTimestampErrorSpkMs" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

```

<xs:element ref="v2:VsEntryCauses" minOccurs="0"/>
<xs:element ref="v2:EchoEventCauses" minOccurs="0"/>
<xs:element ref="v2:EchoPercentMicIn" minOccurs="0"/>
<xs:element ref="v2:EchoPercentSend" minOccurs="0"/>
<xs:element ref="v2:RxAvgAGCGain" minOccurs="0"/>
<xs:sequence minOccurs="0">
  <xs:element ref="v2:Separator" />
  <xs:any namespace="##other" processContents="lax"
    minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>

```

### 2.2.1.26.1 Child Elements

The following table lists the child elements of the **Signal** element.

Element	Type	Available	Description	Units
<b>SignalLevel</b>	xs:int	Yes	The average energy level of received or sent audio classified as speech.	dB
<b>NoiseLevel</b>	xs:int	Yes	The average energy level of received or sent audio classified as noise.	dB
<b>EchoReturn</b>	xs:int	No		
<b>SpeakerFeedbackMicIn</b>	xs:int	Yes	Signal level of the leakage of Loudspeaker/ Headphone output into the microphone input. <a href="#">&lt;84&gt;</a>	dBoV
<b>SpeechLevelMicIn</b>	xs:int	Yes	This is the Speech Level into the microphone at a given endpoint (5). <a href="#">&lt;85&gt;</a>	dBoV
<b>SpeechLevelPostProcess</b>	xs:int	Yes	Overall average speech level sent from an endpoint (5) after all processing. <a href="#">&lt;86&gt;</a>	dBoV
<b>SignalLevelLoudSpeaker</b>	xs:int	Yes	Input level to the Loudspeaker/Headphone input. <a href="#">&lt;87&gt;</a>	dBoV
<b>BackGroundNoiseMicIn</b>	xs:int	Yes	Background noise input to the microphone. <a href="#">&lt;88&gt;</a>	dBoV



Element	Type	Available	Description	Units
<b>BackGroundNoiseSent</b>	xs:int	Yes	Background noise left over after all processing. <a href="#">.&lt;89&gt;</a>	dBoV
<b>LocalSpeechToEcho</b>	xs:int	Yes	If less than 10dB, speech level is too low compared to echo level, and distorted speech might occur. <a href="#">.&lt;90&gt;</a>	dB
<b>SpeakerGlitchRate</b>	xs:int	Yes	Average glitches per 5 minutes for the loudspeaker rendering. <a href="#">.&lt;91&gt;</a>	Glitch count
<b>MicGlitchRate</b>	xs:int	Yes	Average glitches per 5 minutes for the microphone capture. <a href="#">.&lt;92&gt;</a>	Glitch count
<b>SpeakerClipRate</b>	xs:int	Yes	Average clips per 5 minutes during the call for the loudspeaker rendering. <a href="#">.&lt;93&gt;</a>	Glitch count
<b>MicClipRate</b>	xs:int	Yes	Average clips per 5 minutes during the call for the microphone capture. <a href="#">.&lt;94&gt;</a>	Glitch count
<b>RxAGCSignalLevel</b>	xs:int	Yes	Signal level received at the automatic gain control for the inbound audio stream. <a href="#">.&lt;95&gt;</a>	dBoV
<b>RxAGCNoiseLevel</b>	xs:int	Yes	Noise Level received at the automatic gain control for the inbound audio stream. <a href="#">.&lt;96&gt;</a>	dBoV
<b>v2:InitialSignalLevelRMS</b>	xs:float	Yes	The root-mean-square of the received signal for the first 30 seconds of the call. <a href="#">.&lt;97&gt;</a>	sample level
<b>v2:AudioTimestampDriftRateMic</b>	xs:float	Yes	Microphone/capture device clock drift rate. <a href="#">.&lt;98&gt;</a>	percent
<b>v2:AudioTimestampDriftRateSpk</b>	xs:float	Yes	Speaker/render device clock drift rate. <a href="#">.&lt;99&gt;</a>	percent
<b>v2:AudioTimestampErrorMicMs</b>	xs:float	Yes	Noise in timestamp information from microphone/capture device. <a href="#">.&lt;100&gt;</a>	milliseconds
<b>v2:AudioTimestampErrorSpkMs</b>	xs:float	Yes	Noise in timestamp	millisecond

Element	Type	Available	Description	Units
			information from speaker/render device. <a href="#">&lt;101&gt;</a>	s
<b>v2:VsEntryCauses</b>	xs:unsignedByte	Yes	The bit flag indicating the reason(s) the AEC entered half-duplex mode: <a href="#">&lt;102&gt;</a> 0x01 – Sample timestamps from capture or render device were poor quality. 0x02 – High level of echo remained after echo cancellation. 0x04 – Policy forced echo canceller into half-duplex mode. 0x10 – Echo canceller placed into half-duplex mode to reduce CPU consumption. 0x20 – Severe quality degradation because of sample timestamp issues from capture or render device.	unsigned byte
<b>v2:EchoEventCauses</b>	xs:unsignedByte	Yes	The bit flag indicating the reasons the <b>DeviceEchoEvent</b> was detected: <a href="#">&lt;103&gt;</a> 0x01 – Sample timestamps from capture or render device were poor quality. 0x04 – High level of echo remained after echo cancellation. 0x10 – Signal from capture device had significant instances of maximum signal level.	flag
<b>v2:EchoPercentMicIn</b>	xs:float	Yes	Percentage of time when echo is detected in the audio from the capture/microphone device prior to echo cancellation. <a href="#">&lt;104&gt;</a>	Percentage
<b>v2:EchoPercentSend</b>	xs:float	Yes	Percentage of time when echo is detected in the audio from the	Percentage

Element	Type	Available	Description	Units
			capture/microphone device after echo cancellation. <a href="#">&lt;105&gt;</a>	
<b>v2:RxAvgAGCGain</b>	xs:float	Yes	The gain level applied to the received signal. <a href="#">&lt;106&gt;</a>	dB
<b>v2:Separator</b>	default	Yes	Separator element used for future schema extensions. <a href="#">&lt;107&gt;</a>	Not applicable

### 2.2.1.27 ClientEventType Elements

A **ClientEventType** element contains information about the quality events detected by the endpoints (5). The type of this element is **ClientEventType**. [<108>](#)

The following example is a **ClientEventType** element.

```
<xs:complexType name="ClientEventType">
  <xs:sequence>
    <xs:element name="NetworkSendQualityEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="NetworkReceiveQualityEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="NetworkDelayEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="NetworkBandwidthLowEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="CPUInsufficientEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceHalfDuplexAECEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceRenderNotFunctioningEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceCaptureNotFunctioningEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceGlitchesEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceLowSNREventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceLowSpeechLevelEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceClippingEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceEchoEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceNearEndToEchoRatioEventRatio"
      type="xs:float" minOccurs="0"/>
    <xs:element name="DeviceMultipleEndpointsEventCount"
      type="xs:short" minOccurs="0"/>
    <xs:element name="DeviceHowlingEventCount"
      type="xs:short" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="tns:Separator"/>
    
```

```

        <xs:any namespace="##any" processContents="lax"
            minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

```

### 2.2.1.27.1 Child Elements

The following table lists the child elements of the **ClientEventType** element.

Element	Type	Available	Description	Units
<b>v2:NetworkSendQualityEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the network was causing poor quality of the audio sent. <a href="#">&lt;109&gt;</a>	Fraction
<b>v2:NetworkReceiveQualityEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the network was causing poor quality of the audio received. <a href="#">&lt;110&gt;</a>	Fraction
<b>v2:NetworkDelayEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the network delay was significant enough to impact the ability to have real-time two-way communication. <a href="#">&lt;111&gt;</a>	Fraction
<b>v2:NetworkBandwidthLowEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the available bandwidth or bandwidth policy was low enough to cause poor quality of the audio sent. <a href="#">&lt;112&gt;</a>	Fraction

Element	Type	Available	Description	Units
<b>v2:CPUInsufficientEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the CPU resources available was insufficient and caused poor quality of the audio sent and received. <a href="#">&lt;113&gt;</a>	Fraction
<b>v2:DeviceHalfDuplexAECEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected issues and operated the acoustic echo canceller in half-duplex mode which impacted the ability to have real-time two-way communication. <a href="#">&lt;114&gt;</a>	Fraction
<b>v2:DeviceRenderNotFunctioningEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the render device was not working properly. <a href="#">&lt;115&gt;</a>	Fraction
<b>v2:DeviceCaptureNotFunctioningEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected the capture device was not working properly. <a href="#">&lt;116&gt;</a>	Fraction
<b>v2:DeviceGlitchesEventRatio</b>	xs:float	Yes	Fraction of call that the reporting endpoint (5) detected glitches or gaps in the audio played or captured that causes poor quality of the audio being sent or received. <a href="#">&lt;117&gt;</a>	Fraction
<b>v2:DeviceLowSNREventRatio</b>	xs:float	Yes	Fraction of call the reporting endpoint (5) detected low	Fraction

Element	Type	Available	Description	Units
			speech to noise level that caused poor quality of the audio being sent. <a href="#">&lt;118&gt;</a>	
<b>v2:DeviceLowSpeechLevelEventRatio</b>	xs:float	Yes	Fraction of call the reporting endpoint (5) detected low speech level that caused poor quality of the audio being sent. <a href="#">&lt;119&gt;</a>	Fraction
<b>v2:DeviceClippingEventRatio</b>	xs:float	Yes	Fraction of call the reporting endpoint (5) detected clipping in the captured audio that caused poor quality of the audio being sent. <a href="#">&lt;120&gt;</a>	Fraction
<b>v2:DeviceEchoEventRatio</b>	xs:float	Yes	Fraction of call the reporting endpoint (5) detected echo that caused poor quality of the audio being sent. <a href="#">&lt;121&gt;</a>	Fraction
<b>v2:DeviceNearEndToEchoRatioEventRatio</b>	xs:float	Yes	Fraction of call the reporting endpoint (5) detected the ratio of the near end signal level to the echo level that caused poor quality of the audio being sent. <a href="#">&lt;122&gt;</a>	Fraction
<b>v2:DeviceMultipleEndpointsEventCount</b>	xs:short	Yes	Number of times during the call the reporting endpoint (5) detected multiple endpoints (5) in the same room or acoustic environment. <a href="#">&lt;123&gt;</a>	Not applicable
<b>v2:DeviceHowlingEventCount</b>	xs:short	Yes	Number of times	Not

Element	Type	Available	Description	Units
			during the call the reporting endpoint (5) detected two or more endpoints (5) in the same room or acoustic environment that caused poor quality audio in the form of howling or screeching audio. <a href="#">&lt;124&gt;</a>	applicable
<b>v2:Separator</b>	default	Yes	Separator element used for future schema extensions. <a href="#">&lt;125&gt;</a>	Not applicable

## 3 Protocol Details

### 3.1 SIP UAC

A protocol client performs the role of a SIP **user agent client (UAC)**. A SIP user agent client initiates a SIP SERVICE transaction by sending a SIP SERVICE message to the SIP URI of a SIP **user agent server (UAS)**. Upon receiving an error, a protocol client can retry to send the report.

#### 3.1.1 Abstract Data Model

None.

#### 3.1.2 Timers

None.

#### 3.1.3 Initialization

None.

#### 3.1.4 Higher-Layer Triggered Events

None.

#### 3.1.5 Message Processing Events and Sequencing Rules

None.

#### 3.1.6 Timer Events

None.

#### 3.1.7 Other Local Events

None.

### 3.2 SIP UAS

A QoE Monitoring Server performs the role of a SIP UAS. The SIP UAS accepts the SERVICE message and responds with a SERVICE response code 202 or a SIP SERVICE response error code. The SIP SERVICE response error code that is returned depends on the issue. The following table lists the error codes that are returned depending on the content of the SIP SERVICE request.

Error code	Reason
606	If version of <b>VQReportEvent</b> is not supported by the QoE Monitoring Server.
400	If one or more metric values in the report contain an invalid value.
400	If metric report was rejected because of a schema validation failure.
415	If metric report exceeds the maximum size limit of 300 kilobytes allowed by the QoE



Error code	Reason
	Monitoring Server.

### 3.2.1 Abstract Data Model

None.

### 3.2.2 Timers

None.

### 3.2.3 Initialization

None.

### 3.2.4 Higher-Layer Triggered Events

None.

### 3.2.5 Message Processing Events and Sequencing Rules

None.

### 3.2.6 Timer Events

None.

### 3.2.7 Other Local Events

None.

## 3.3 SIP Proxy

A SIP proxy routes the **SIP messages** from the UAC to the UAS and vice versa.

### 3.3.1 Abstract Data Model

None.

### 3.3.2 Timers

None.

### 3.3.3 Initialization

None.

### 3.3.4 Higher-Layer Triggered Events

None.

### **3.3.5 Message Processing Events and Sequencing Rules**

None.

### **3.3.6 Timer Events**

None.

### **3.3.7 Other Local Events**

None.

## 4 Protocol Examples

The following example illustrates a QoE metrics message payload that adheres to the XML schema described in section 2. In the following example, domain names, server names, email aliases, phone numbers, and IP addresses have been changed to fictitious values.

```
SERVICE sip:server1@contoso.com;gruu;opaque=srvr:QoS:jcH1fn2RSB6uyC59R-IH8QAA SIP/2.0
Via: SIP/2.0/TLS 123.45.67.890:1263
Max-Forwards: 70
From: <sip:alice@contoso.com>;tag=3d26651a97;epid=782abb8f70
To: <sip:server1@contoso.com;gruu;opaque=srvr:QoS:jcH1fn2RSB6uyC59R-IH8QAA>
Call-ID: f86d23b698b34a70a2d23772e7391d94
CSeq: 1 SERVICE
Contact: <sip:alice@contoso.com;opaque=user:epid:reTyjuqAaVmcCIO4qlA4vwAA;gruu>
User-Agent: UCCP/2.0.6362.0 OC/2.0.6362.0 (Microsoft Office Communicator)
Proxy-Authorization: NTLM qop="auth", realm="SIP Communications Service", opaque="7B435440",
crand="40171178", cnum="178", targetname="location-server-01.exchange.corp.contoso.com",
response="010000003a516f532e969c311f676e47"
Content-Type: application/vq-rtcp+xml
Content-Length: 3283
<?xml version="1.0"?>
<VQReportEvent xmlns="ms-rtcp-metrics">
  <VQSessionReport SessionId="ab323818af644dleab6bacd6d66d03a7;from-tag=e957a6c0d5;to-
tag=313433a5ba">
    <Endpoint Name="alice.example.corp.contoso.com" />
    <DialogInfo CallId="ab323818af644dleab6bacd6d66d03a7" FromTag="e957a6c0d5"
ToTag="313433a5ba" Start="2008-01-07T19:47:06.0082Z" End="2008-01-07T19:55:11.0742Z">
      <FromURI>sip:alice@contoso.com</FromURI>
      <ToURI>sip:5550100@contoso.com;user=phone</ToURI>
      <Caller>true</Caller>

      <LocalContactURI>sip:alice@contoso.com;opaque=user:epid:reTyjuqAaVmcCIO4qlA4vwAA;gruu</
LocalContactURI>

      <RemoteContactURI>sip:server1@contoso.com;gruu;opaque=srvr:MediationServer:WftfTuTVQCSA
B0ZJi-j7qAAA;grid=f684305ffb3a4a8184e8cd16846a983c</RemoteContactURI>
      <LocalUserAgent>UCCP/2.0.6362.0 OC/2.0.6362.0 (Microsoft Office
Communicator)</LocalUserAgent>
      <RemoteUserAgent>RTCC/3.0.0.0 MediationServer</RemoteUserAgent>
    </DialogInfo>
    <MediaLine Label="main-audio">
      <Description>
        <Connectivity>
          <Ice>DIRECT</Ice>
          <IceWarningFlags>327680</IceWarningFlags>
        </Connectivity>
        <Security>SRTP</Security>
        <Offerer>true</Offerer>
        <Transport>UDP</Transport>
      </Description>
      <NetworkConnectivityInfo>
        <VPN>true</VPN>
        <LinkSpeed>11000000.000000</LinkSpeed>
      </NetworkConnectivityInfo>
      <LocalAddr>
        <IPAddr>123.45.67.890</IPAddr>
        <Port>50004</Port>
        <Inside>true</Inside>
        <SubnetMask>255.255.254.0</SubnetMask>
      </LocalAddr>
    </MediaLine>
  </VQSessionReport>
</VQReportEvent>
```

```

    <RemoteAddr>
      <IPAddr>123.12.34.567</IPAddr>
      <Port>63284</Port>
    </RemoteAddr>
    <CaptureDev>
      <Name>Catalina-V263</Name>
    </CaptureDev>
    <RenderDev>
      <Name>Catalina-V263</Name>
    </RenderDev>
  </Description>
  <InboundStream Id="1536632130">
    <Network>
      <Jitter>
        <InterArrival>2</InterArrival>
        <InterArrivalMax>3</InterArrivalMax>
      </Jitter>
      <PacketLoss>
        <LossRate>0.000000</LossRate>
        <LossRateMax>0.009259</LossRateMax>
      </PacketLoss>
      <BurstGapLoss>
        <BurstDensity>0</BurstDensity>
        <BurstDuration>0</BurstDuration>
        <GapDensity>0</GapDensity>
        <GapDuration>461660</GapDuration>
      </BurstGapLoss>
      <Utilization>
        <Packets>23148</Packets>
      </Utilization>
    </Network>
    <Payload>
      <Audio>
        <Signal>
          <SignalLevel>2434</SignalLevel>
          <NoiseLevel>4861</NoiseLevel>
          <SignalLevelLoudSpeaker>2502</SignalLevelLoudSpeaker>
        </Signal>
        <SpeakerGlitchRate>7</SpeakerGlitchRate>
        <SpeakerClipRate>0</SpeakerClipRate>
      </Audio>
    </Payload>
    <QualityEstimates>
      <Audio>
        <RecvListenMOS>1.880000</RecvListenMOS>
        <RecvListenMOSMin>1.000000</RecvListenMOSMin>
        <NetworkMOS>
          <OverallAvg>2.950000</OverallAvg>
          <OverallMin>2.940000</OverallMin>
          <DegradationAvg>0.000000</DegradationAvg>
          <DegradationMax>0.010000</DegradationMax>
          <DegradationJitterAvg>0.000000</DegradationJitterAvg>
          <DegradationPacketLossAvg>0.000000</DegradationPacketLossAvg>
        </NetworkMOS>
      </Audio>
    </QualityEstimates>
  </InboundStream>
  <OutboundStream Id="1869098562">
    <Network>

```

```

<Jitter>
  <InterArrival>2</InterArrival>
  <InterArrivalMax>2</InterArrivalMax>
</Jitter>
<PacketLoss>
  <LossRate>0.000000</LossRate>
  <LossRateMax>0.000000</LossRateMax>
</PacketLoss>
<Delay>
  <RoundTrip>1</RoundTrip>
  <RoundTripMax>2</RoundTripMax>
</Delay>
<Utilization>
  <Packets>7497</Packets>
  <BandwidthEst>23872930</BandwidthEst>
</Utilization>
</Network>
<Payload>
  <Audio>
    <PayloadDescription>x-msrta</PayloadDescription>
    <SampleRate>8000</SampleRate>
    <Signal>
      <SignalLevel>1834</SignalLevel>
      <NoiseLevel>5987</NoiseLevel>
      <SpeakerFeedbackMicIn>5000</SpeakerFeedbackMicIn>
      <SpeechLevelMicIn>2404</SpeechLevelMicIn>
      <SpeechLevelPostProcess>2500</SpeechLevelPostProcess>
      <BackGroundNoiseMicIn>7000</BackGroundNoiseMicIn>
      <BackGroundNoiseSent>8100</BackGroundNoiseSent>
      <LocalSpeechToEcho>-2600</LocalSpeechToEcho>
      <MicGlitchRate>7</MicGlitchRate>
      <MicClipRate>10</MicClipRate>
    </Signal>
  </Audio>
</Payload>
<QualityEstimates>
  <Audio>
    <SendListenMOS>3.440000</SendListenMOS>
    <SendListenMOSMin>1.100000</SendListenMOSMin>
  </Audio>
</QualityEstimates>
</OutboundStream>
<LocalConversationalMOS>3.010000</LocalConversationalMOS>
</MediaLine>
</VQSessionReport>
</VQReportEvent>

```

The following example illustrates the SERVICE request sent to the SIP proxy where the **From** and **To** addresses are the same and the **Content-Type** is "application/vq-rtcp+xml". The QoE metrics are published to the QoE Monitoring Server specified in the **To** field. The SIP proxy routes the SERVICE request to the home pool of the user targeted by the request. However, if the **Content-Type** is "application/vq-rtcp+xml", the SIP proxy uses this specified rule and retargets the SIP request to the QoE Monitoring Server in lieu of the user.

```

SERVICE sip:user1@contoso.com SIP/2.0
FROM: <sip:user1@contoso.com>;epid=F78F7928A5;tag=bf74c7d2be
TO: <sip:user1@contoso.com>

```

```

CSEQ: 1 SERVICE
CALL-ID: 228a93bd56474de3aec46e3ec69071e9
MAX-FORWARDS: 70
VIA: SIP/2.0/TLS 192.168.0.244:51797;branch=z9hG4bKa9dff2c3
CONTENT-LENGTH: 7031
USER-AGENT: RTCC/4.0.0.0 CallUserAgent
CONTENT-TYPE: application/vq-rtcp+xml

<?xml version="1.0"?>
<VQReportEvent xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" Version="1.1" xmlns="ms-rtcp-metrics">
  <VQSessionReport SessionId="102ec1bf-dc49-4358-bc27-dc90b2ff28da;from-tag=87d2dd1bd;to-
tag=8d1a2adc">
    <Endpoint Name="CLIENT" d3p1:OS="6.0.6002 SP: 2.0 Type: 3 (Server) Suite:
CCCCCCCC00000112 Arch: x64 WOW64: False" d3p1:CPUName="CPU Brand GenuineIntel Family 0x6
Model 0xf EM64T MaxFunc 0xa MaxFuncExt 0x80000008" d3p1:CPUNumberOfCores="4"
d3p1:CPUProcessorSpeed="2327" d3p1:VirtualizationFlag="1" xmlns:d3p1="ms-rtcp-metrics.v2" />
    <DialogInfo CallId="102ec1bf-dc49-4358-bc27-dc90b2ff28da" FromTag="8d1a2adc"
ToTag="87d2dd1bd" Start="2010-02-01T18:57:11.1214002-08:00" End="2010-02-01T18:57:15.0473322-
08:00">
      <FromURI>sip:myexum@invalid.com</FromURI>
      <ToURI>sip:samplegateway@invalid.com</ToURI>
      <Caller>false</Caller>
      <LocalContactURI>sip:Client.Vdomain.com:51792;transport=Tls</LocalContactURI>
      <RemoteContactURI>sip:Client.Vdomain.com:51793;transport=Tls;ms-
opaque=ec5cf4663ba20650</RemoteContactURI>
      <LocalUserAgent>RTCC/4.0.0.0 CallUserAgent</LocalUserAgent>
      <RemoteUserAgent>RTCC/4.0.0.0 CallUserAgent</RemoteUserAgent>
      <LocalPAI>sip:carol@vdomain.com</LocalPAI>
    </DialogInfo>
    <MediaLine Label="main-audio">
      <Description>
        <Connectivity>
          <Ice>FAILED</Ice>
          <IceWarningFlags>524288</IceWarningFlags>
        </Connectivity>
        <Security>SRTP</Security>
        <NetworkConnectivityInfo>
          <NetworkConnection>wired</NetworkConnection>
          <VPN>false</VPN>
          <LinkSpeed>0</LinkSpeed>
        </NetworkConnectivityInfo>
        <LocalAddr>
          <IPAddr>192.168.0.244</IPAddr>
          <Port>21330</Port>
          <SubnetMask>255.255.255.0</SubnetMask>
          <MACAddr xmlns="ms-rtcp-metrics.v2" />
        </LocalAddr>
        <RemoteAddr>
          <IPAddr>192.168.0.244</IPAddr>
          <Port>30026</Port>
        </RemoteAddr>
      </Description>
      <InboundStream Id="1779484467">
        <Network>
          <Utilization>
            <Packets>0</Packets>
          </Utilization>
        </Network>
        <Payload>

```

```

    <Audio>
      <PayloadType>112</PayloadType>
      <PayloadDescription>g7221</PayloadDescription>
      <Signal>
        <InitialSignalLevelRMS xmlns="ms-rtcp-metrics.v2">0</InitialSignalLevelRMS>
      </Signal>
    </Audio>
  </Payload>
</InboundStream>
<OutboundStream Id="1779493771">
  <Network>
    <Utilization>
      <Packets>0</Packets>
    </Utilization>
  </Network>
  <Payload>
    <Audio>
      <PayloadType>112</PayloadType>
      <PayloadDescription>g7221</PayloadDescription>
      <SampleRate>16000</SampleRate>
      <AudioFECUsed xmlns="ms-rtcp-metrics.v2">false</AudioFECUsed>
    </Audio>
  </Payload>
</OutboundStream>
<AppliedBandwidthLimit xmlns="ms-rtcp-metrics.v2">70800</AppliedBandwidthLimit>
<AppliedBandwidthSource xmlns="ms-rtcp-
metrics.v2">APIServiceQuality</AppliedBandwidthSource>
<LocalClientEvent xmlns="ms-rtcp-metrics.v2">
  <NetworkSendQualityEventRatio>0</NetworkSendQualityEventRatio>
  <NetworkReceiveQualityEventRatio>0</N$$$SplitMessageSegmentEnd$$$
TL_INFO (TF_PROTOCOL) [2]1774.1614::02/02/2010-02:57:15.134.00006d41
(S4,SipMessage.DataLoggingHelper:sipmessage.cs (531)) $$$SplitMessageSegmentBegin$$$networkRecei
veQualityEventRatio>
  <NetworkDelayEventRatio>0</NetworkDelayEventRatio>
  <NetworkBandwidthLowEventRatio>0</NetworkBandwidthLowEventRatio>
  <CPUInsufficientEventRatio>0</CPUInsufficientEventRatio>
  <DeviceHalfDuplexAECEventRatio>0</DeviceHalfDuplexAECEventRatio>
  <DeviceRenderNotFunctioningEventRatio>0</DeviceRenderNotFunctioningEventRatio>
  <DeviceCaptureNotFunctioningEventRatio>0</DeviceCaptureNotFunctioningEventRatio>
  <DeviceGlitchesEventRatio>0</DeviceGlitchesEventRatio>
  <DeviceLowSNREventRatio>0</DeviceLowSNREventRatio>
  <DeviceLowSpeechLevelEventRatio>0</DeviceLowSpeechLevelEventRatio>
  <DeviceClippingEventRatio>0</DeviceClippingEventRatio>
  <DeviceEchoEventRatio>0</DeviceEchoEventRatio>
  <DeviceNearEndToEchoRatioEventRatio>0</DeviceNearEndToEchoRatioEventRatio>
  <DeviceMultipleEndpointsEventCount>0</DeviceMultipleEndpointsEventCount>
  <DeviceHowlingEventCount>0</DeviceHowlingEventCount>
</LocalClientEvent>
<OpaqueCoreEndpointData xmlns="ms-rtcp-metrics.v2">

  </MediaLine>
</VQSessionReport>
</VQReportEvent>

```

## 5 Security

### 5.1 Security Considerations for Implementers

This protocol has no additional security considerations beyond those described in [\[MS-SIPRE\]](#) section 5.

### 5.2 Index of Security Parameters

None.



## 6 Appendix A: ms-rtcp-metrics

This section provides the detailed **XSD** schema specification of the XML schema used for constructing QoE metrics payload.

### 6.1 Office Communications Server 2007 Schema

This section follows the product behavior described in footnote [<126>](#).

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema xmlns:tns="ms-rtcp-metrics" xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="ms-rtcp-metrics" elementFormDefault="qualified"
attributeFormDefault="unqualified">
<!--
    RTCP METRICS STATEMENT

-->
<xs:element name="VQReportEvent" type="tns:VQReportEventType" />
<!--
    RTCP REPORT TYPE

-->
<xs:complexType name="VQReportEventType">
<xs:choice>
  <xs:element name="VQSessionReport" type="tns:SessionReportType" maxOccurs="unbounded" />
  <xs:element name="VQSessionIntervalReport" type="tns:SessionReportType"
maxOccurs="unbounded" />
  <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
</xs:choice>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    VQ SESSION REPORT TYPE

-->
<xs:complexType name="SessionReportType">
<xs:sequence>
  <xs:element name="LocationProfile" type="xs:string" minOccurs="0" />
  <xs:element name="Pool" type="xs:string" minOccurs="0" />
  <xs:element name="Endpoint" type="tns:EndpointType" />
  <xs:element name="DialogInfo" type="tns:DialogInfoType" />
  <xs:element name="MediaLine" type="tns:MediaLineType" maxOccurs="unbounded" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:attribute name="SessionId" type="xs:string" use="required" />
  <xs:anyAttribute namespace="##other" processContents="lax" />
<!--
    SessionId = DialogID
-->
</xs:complexType>
<!--
    DIALOG INFO TYPE

-->
<xs:complexType name="DialogInfoType">
<xs:sequence>
  <xs:element name="FromURI" type="xs:anyURI" />

```

```

<xs:element name="ToURI" type="xs:anyURI" />
<xs:element name="Caller" type="xs:boolean" />
<xs:element name="LocalContactURI" type="xs:anyURI" />
<xs:element name="RemoteContactURI" type="xs:anyURI" />
<xs:element name="LocalUserAgent" type="xs:string" />
<xs:element name="RemoteUserAgent" type="xs:string" />
<!--
    PAI = P-Asserted-Identity
-->
<xs:element name="LocalPAI" type="xs:anyURI" minOccurs="0" />
<xs:element name="RemotePAI" type="xs:anyURI" minOccurs="0" />
<xs:element name="ConfURI" type="xs:anyURI" minOccurs="0" />
<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:attribute name="CallId" type="xs:string" use="required" />
<xs:attribute name="FromTag" type="xs:string" />
<xs:attribute name="ToTag" type="xs:string" />
<xs:attribute name="Start" type="xs:dateTime" use="required" />
<xs:attribute name="End" type="xs:dateTime" use="required" />
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    ENDPOINT TYPE
-->
<xs:complexType name="EndpointType">
<xs:sequence>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:attribute name="Name" type="xs:string" use="required" />
<xs:attribute name="ProfileId" type="xs:string" />
<xs:anyAttribute namespace="##other" processContents="lax" />
<!--
    Name = Computer Name
-->
<!--
    ProfileId = Endpoint Report GUID - Note: this attribute is optional
-->
</xs:complexType>
<!--
    MEDIA LINE REPORT TYPE
-->
<xs:complexType name="MediaLineType">
<xs:sequence>
    <xs:element name="Description" type="tns:MediaLineDescriptionType" />
    <xs:element name="InboundStream" type="tns:StreamType" minOccurs="0" />
    <xs:element name="OutboundStream" type="tns:StreamType" minOccurs="0" />
    <xs:element name="LocalConversationalMOS" type="xs:float" minOccurs="0" />
    <xs:element name="RemoteConversationalMOS" type="xs:float" minOccurs="0" />
    <xs:element name="LocalConversationalMOSAlg" type="xs:string" minOccurs="0" />
    <xs:element name="RemoteConversationalMOSAlg" type="xs:string" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<!--
    Label values : "main-audio", "main-video", "panoramic-video"
-->
<xs:attribute name="Label" type="xs:string" use="required" />
<xs:anyAttribute namespace="##other" processContents="lax" />

```

```

    </xs:complexType>
<!--
    MEDIA LINE TYPE

-->
<xs:complexType name="MediaLineDescriptionType">
<xs:sequence>
    <xs:element name="Connectivity" type="tns:ConnectivityType" minOccurs="0" />
<!--
    Security values : "None", "SRTP", "V1"
-->
    <xs:element name="Security" type="xs:string" minOccurs="0" />
    <xs:element name="Offerer" type="xs:boolean" minOccurs="0" />
    <xs:element name="Transport" type="tns:TransportType" minOccurs="0" />
    <xs:element name="LocalAddr" type="tns:AddrType" />
    <xs:element name="RemoteAddr" type="tns:AddrType" />
<!--
    Microphone or USB Phone or Camera device name
-->
    <xs:element name="CaptureDev" type="tns:DeviceType" minOccurs="0" />
<!--
    Speakers or USB Phone device name
-->
    <xs:element name="RenderDev" type="tns:DeviceType" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    Device TYPE

-->
<xs:complexType name="DeviceType">
<xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" />
    <xs:element name="Driver" type="xs:string" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    STREAM DIRECTIONAL METRICS TYPE

-->
<xs:complexType name="StreamType">
<xs:sequence>
    <xs:element name="Network" type="tns:NetworkMetricsType" minOccurs="0" />
    <xs:element name="Payload" type="tns:PayloadMetricsType" />
    <xs:element name="QualityEstimates" type="tns:QualityEstimatesType" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
    <xs:attribute name="Id" type="xs:unsignedInt" use="required" />
    <xs:attribute name="Start" type="xs:dateTime" />
    <xs:attribute name="End" type="xs:dateTime" />
    <xs:anyAttribute namespace="##other" processContents="lax" />
<!--
    Id = SSRC
-->
</xs:complexType>

```

```

<!--
    NETWORK METRICS

-->
<xs:complexType name="NetworkMetricsType">
<xs:sequence>
<!--
    DiffServ CodePoint
-->
    <xs:element name="DSCP" type="xs:byte" minOccurs="0" />
<!--
    VLAN is described via 12 bits
-->
    <xs:element name="VLAN" type="xs:int" minOccurs="0" />
    <xs:element name="Jitter" type="tns:JitterType" minOccurs="0" />
    <xs:element name="PacketLoss" type="tns:PacketLossType" minOccurs="0" />
    <xs:element name="BurstGapLoss" type="tns:BurstGapLossType" minOccurs="0" />
    <xs:element name="Delay" type="tns:DelayType" minOccurs="0" />
    <xs:element name="Utilization" type="tns:NetworkUtilizationType" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    ICE TYPE

-->
<xs:complexType name="ConnectivityType">
<xs:sequence>
    <xs:element name="Ice" type="tns:IceStatusType" minOccurs="0" />
    <xs:element name="IceWarningFlags" type="xs:unsignedInt" minOccurs="0" />
    <xs:element name="RelayAddress" type="tns:AddrType" minOccurs="0" maxOccurs="unbounded" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    ICE CONECTIVITY TYPE

-->
<xs:simpleType name="IceStatusType">
<xs:restriction base="xs:string">
    <xs:enumeration value="FAILED" />
    <xs:enumeration value="DIRECT" />
    <xs:enumeration value="RELAY" />
    <xs:enumeration value="HTTP-PROXY" />
</xs:restriction>
</xs:simpleType>
<!--
    NETWORK UTILIZATION TYPE

-->
<xs:complexType name="NetworkUtilizationType">
<xs:sequence>
    <xs:element name="Packets" type="xs:int" minOccurs="0" />
    <xs:element name="BandwidthEst" type="xs:int" minOccurs="0" />
    <xs:element name="BandwidthAlloc" type="xs:int" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>

```

```

        <xs:anyAttribute namespace="##other" processContents="lax" />
    </xs:complexType>
<!--
    PAYLOAD METRICS TYPE

-->
<xs:complexType name="PayloadMetricsType">
<xs:choice>
    <xs:element name="Audio" type="tns:AudioPayloadMetricsType" />
    <xs:element name="Video" type="tns:VideoPayloadMetricsType" />
    <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
</xs:choice>
    <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    AUDIO METRICS TYPE

-->
<xs:complexType name="AudioPayloadMetricsType">
<xs:sequence>
    <xs:element name="PayloadType" type="xs:int" minOccurs="0" />
    <xs:element name="PayloadDescription" type="xs:string" minOccurs="0" />
    <xs:element name="SampleRate" type="xs:int" minOccurs="0" />
    <xs:element name="FrameDuration" type="xs:int" minOccurs="0" />
    <xs:element name="FrameOctets" type="xs:int" minOccurs="0" />
    <xs:element name="FramesPerPacket" type="xs:int" minOccurs="0" />
    <xs:element name="PacketsPerSecond" type="xs:int" minOccurs="0" />
    <xs:element name="FMTP" type="xs:string" minOccurs="0" />
    <xs:element name="Signal" type="tns:SignalType" minOccurs="0" />
    <xs:element name="JitterBuffer" type="tns:JitterBufferType" minOccurs="0" />
    <xs:element name="SilenceSupress" type="tns:SilenceSuppressionStateType" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
<!--
    VIDEO METRICS TYPE

-->
<xs:complexType name="VideoPayloadMetricsType">
<xs:sequence>
    <xs:element name="PayloadType" type="xs:int" minOccurs="0" />
    <xs:element name="PayloadDescription" type="xs:string" minOccurs="0" />
    <xs:element name="Resolution" type="xs:string" minOccurs="0" />
    <xs:element name="VideoBitRateAvg" type="xs:int" minOccurs="0" />
    <xs:element name="VideoBitRateMax" type="xs:int" minOccurs="0" />
    <xs:element name="VideoFrameRateAvg" type="xs:float" minOccurs="0" />
    <xs:element name="VideoPacketLossRate" type="xs:float" minOccurs="0" />
    <xs:element name="VideoFrameLossRate" type="xs:float" minOccurs="0" />
    <xs:element name="VideoFrameEncodingTime" type="xs:float" minOccurs="0" />
    <xs:element name="VideoFrameDecodingTime" type="xs:float" minOccurs="0" />
    <xs:element name="VideoFEC" type="xs:boolean" minOccurs="0" />
    <xs:element name="FrozenVideoFreq" type="xs:float" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
<!--
    PACKET LOSS CONCEALMENT TYPE

-->

```

```

<xs:simpleType name="PacketLossConcealmentType">
<xs:restriction base="xs:string">
  <xs:enumeration value="UNSPECIFIED" />
  <xs:enumeration value="DISABLED" />
  <xs:enumeration value="ENHANCED" />
  <xs:enumeration value="STANDARD" />
</xs:restriction>
</xs:simpleType>
<!--
    SILENCE SUPPRESSION STATE TYPE

-->
<xs:simpleType name="SilenceSuppressionStateType">
<xs:restriction base="xs:string">
  <xs:enumeration value="ON" />
  <xs:enumeration value="OFF" />
</xs:restriction>
</xs:simpleType>
<!--
    ADDR TYPE

-->
<xs:complexType name="AddrType">
<xs:sequence>
  <xs:element name="IPAddr" type="xs:string" />
  <xs:element name="Port" type="xs:unsignedShort" minOccurs="0" />
  <xs:element name="Inside" type="xs:boolean" minOccurs="0" />
  <xs:element name="SubnetMask" type="xs:string" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    JITTER BUFFER TYPE

-->
<xs:complexType name="JitterBufferType">
<xs:sequence>
  <xs:element name="Type" type="tns:JitterBufferAdaptiveType" minOccurs="0" />
  <xs:element name="Rate" type="xs:int" minOccurs="0" />
  <xs:element name="Nominal" type="xs:int" minOccurs="0" />
  <xs:element name="Max" type="xs:int" minOccurs="0" />
  <xs:element name="AbsMax" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    JITTER BUFFER ADAPTIVE TYPE

-->
<xs:simpleType name="JitterBufferAdaptiveType">
<xs:restriction base="xs:string">
  <xs:enumeration value="UNKNOWN" />
  <xs:enumeration value="RESERVED" />
  <xs:enumeration value="NON-ADAPTIVE" />
  <xs:enumeration value="ADAPTIVE" />
</xs:restriction>
</xs:simpleType>

```

```

<!--
    PACKET LOSS TYPE

-->
<xs:complexType name="PacketLossType">
<xs:sequence>
  <xs:element name="LossRate" type="xs:float" minOccurs="0" />
  <xs:element name="LossRateMax" type="xs:float" minOccurs="0" />
  <xs:element name="DiscardRate" type="xs:float" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--

    BURST GAP LOSS TYPE

-->
<xs:complexType name="BurstGapLossType">
<xs:sequence>
  <xs:element name="BurstDensity" type="xs:float" minOccurs="0" />
  <xs:element name="BurstDuration" type="xs:int" minOccurs="0" />
  <xs:element name="GapDensity" type="xs:float" minOccurs="0" />
  <xs:element name="GapDuration" type="xs:int" minOccurs="0" />
  <xs:element name="MinGapThreshold" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--

    DELAY TYPE

-->
<xs:complexType name="DelayType">
<xs:sequence>
  <xs:element name="RoundTrip" type="xs:int" minOccurs="0" />
  <xs:element name="RoundTripMax" type="xs:int" minOccurs="0" />
  <xs:element name="EndSystem" type="xs:int" minOccurs="0" />
  <xs:element name="OneWay" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--

    JITTER TYPE

-->
<xs:complexType name="JitterType">
<xs:sequence>
  <xs:element name="InterArrival" type="xs:int" minOccurs="0" />
  <xs:element name="InterArrivalMax" type="xs:int" minOccurs="0" />
  <xs:element name="MeanAbs" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--

    SIGNAL TYPE

-->

```

```

<xs:complexType name="SignalType">
<xs:sequence>
  <xs:element name="SignalLevel" type="xs:int" minOccurs="0" />
  <xs:element name="NoiseLevel" type="xs:int" minOccurs="0" />
  <xs:element name="EchoReturn" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    QUALITY ESTIMATES TYPE

-->

<xs:complexType name="QualityEstimatesType">
<xs:choice>
  <xs:element name="Audio" type="tns:AudioQualityEstimatesType" />
  <xs:element name="Video" type="tns:VideoQualityEstimatesType" />
  <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
</xs:choice>
</xs:complexType>
<!--
    AUDIO QUALITY ESTIMATES TYPE

-->

<xs:complexType name="AudioQualityEstimatesType">
<xs:sequence>
  <xs:element name="RecvListenMOS" type="xs:float" minOccurs="0" />
  <xs:element name="RecvListenMOSMin" type="xs:float" minOccurs="0" />
  <xs:element name="RecvListenMOSAlg" type="xs:string" minOccurs="0" />
  <xs:element name="SendListenMOS" type="xs:float" minOccurs="0" />
  <xs:element name="SendListenMOSMin" type="xs:float" minOccurs="0" />
  <xs:element name="SendListenMOSAlg" type="xs:string" minOccurs="0" />
  <xs:element name="NetworkMOS" type="tns:NetworkAudioMOSType" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    NETWORK AUDIO MOS FACTOR TYPE

-->

<xs:complexType name="NetworkAudioMOSType">
<xs:sequence>
  <xs:element name="OverallAvg" type="xs:float" minOccurs="0" />
  <xs:element name="OverallMin" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationAvg" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationMax" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationJitterAvg" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationPacketLossAvg" type="xs:float" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    VIDEO QUALITY ESTIMATES TYPE

-->

<xs:complexType name="VideoQualityEstimatesType">

```



```

<xs:sequence>
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  TRANSPORT TYPE

-->
<xs:simpleType name="TransportType">
<xs:restriction base="xs:string">
  <xs:enumeration value="UDP" />
  <xs:enumeration value="TCP" />
</xs:restriction>
</xs:simpleType>
</xs:schema>

```

## 6.2 Office Communications Server 2007 R2 Schema

This section follows the product behavior described in footnote [<127>](#).

```

<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema xmlns:tns="ms-rtcp-metrics" xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="ms-rtcp-metrics" elementFormDefault="qualified"
attributeFormDefault="unqualified" version="2.0">
<!--

  RTCP METRICS STATEMENT

-->
<xs:element name="VQReportEvent" type="tns:VQReportEventType" />
<!--

  RTCP REPORT TYPE

-->
<xs:complexType name="VQReportEventType">
<xs:choice>
  <xs:element name="VQSessionReport" type="tns:SessionReportType" maxOccurs="unbounded" />
  <xs:element name="VQSessionIntervalReport" type="tns:SessionReportType"
maxOccurs="unbounded" />
  <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
</xs:choice>
  <xs:attribute name="Version" type="xs:string" use="optional" />
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--

  VQ SESSION REPORT TYPE

-->
<xs:complexType name="SessionReportType">
<xs:sequence>
  <xs:element name="LocationProfile" type="xs:string" minOccurs="0" />
  <xs:element name="Pool" type="xs:string" minOccurs="0" />
  <xs:element name="Endpoint" type="tns:EndpointType" />
  <xs:element name="DialogInfo" type="tns:DialogInfoType" />
  <xs:element name="MediaLine" type="tns:MediaLineType" maxOccurs="unbounded" />

```

```

    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
  <xs:attribute name="SessionId" type="xs:string" use="required" />
  <xs:anyAttribute namespace="##other" processContents="lax" />
<!--
  SessionId = DialogID
-->
</xs:complexType>
<!--
  DIALOG INFO TYPE

-->
<xs:complexType name="DialogInfoType">
<xs:sequence>
  <xs:element name="DialogCategory" type="tns:DialogCategoryType" minOccurs="0" />
  <xs:element name="CorrelationID" type="xs:string" minOccurs="0" />
  <xs:element name="FromURI" type="xs:anyURI" />
  <xs:element name="ToURI" type="xs:anyURI" />
  <xs:element name="Caller" type="xs:boolean" />
  <xs:element name="LocalContactURI" type="xs:anyURI" />
  <xs:element name="RemoteContactURI" type="xs:anyURI" />
  <xs:element name="LocalUserAgent" type="xs:string" />
  <xs:element name="RemoteUserAgent" type="xs:string" />
<!--
PAI = P-Asserted-Identity
-->
  <xs:element name="LocalPAI" type="xs:anyURI" minOccurs="0" />
  <xs:element name="RemotePAI" type="xs:anyURI" minOccurs="0" />
  <xs:element name="ConfURI" type="xs:anyURI" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:attribute name="CallId" type="xs:string" use="required" />
  <xs:attribute name="FromTag" type="xs:string" />
  <xs:attribute name="ToTag" type="xs:string" />
  <xs:attribute name="Start" type="xs:dateTime" use="required" />
  <xs:attribute name="End" type="xs:dateTime" use="required" />
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  ENDPOINT TYPE

-->
<xs:complexType name="EndpointType">
<xs:sequence>
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:attribute name="Name" type="xs:string" use="required" />
  <xs:attribute name="ProfileId" type="xs:string" />
  <xs:anyAttribute namespace="##other" processContents="lax" />
<!--
  Name = Computer Name
-->
<!--
  ProfileId = Endpoint Report GUID - Note: this attribute is optional
-->
</xs:complexType>
<!--
  MEDIA LINE REPORT TYPE

```

```

-->
<xs:complexType name="MediaLineType">
<xs:sequence>
  <xs:element name="Description" type="tns:MediaLineDescriptionType" />
  <xs:element name="InboundStream" type="tns:StreamType" minOccurs="0" />
  <xs:element name="OutboundStream" type="tns:StreamType" minOccurs="0" />
  <xs:element name="LocalConversationalMOS" type="xs:float" minOccurs="0" />
  <xs:element name="RemoteConversationalMOS" type="xs:float" minOccurs="0" />
  <xs:element name="LocalConversationalMOSAlg" type="xs:string" minOccurs="0" />
  <xs:element name="RemoteConversationalMOSAlg" type="xs:string" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<!--
Label values : "main-audio", "main-video", "panoramic-video"
-->
<xs:attribute name="Label" type="xs:string" use="required" />
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    MEDIA LINE TYPE

-->
<xs:complexType name="MediaLineDescriptionType">
<xs:sequence>
  <xs:element name="Connectivity" type="tns:ConnectivityType" minOccurs="0" />
<!--
Security values : "None", "SRTP", "V1"
-->
  <xs:element name="Security" type="xs:string" minOccurs="0" />
  <xs:element name="Offerer" type="xs:boolean" minOccurs="0" />
  <xs:element name="Transport" type="tns:TransportType" minOccurs="0" />
  <xs:element name="NetworkConnectivityInfo" type="tns:NetworkConnectivityInfoType"
minOccurs="0" />
  <xs:element name="LocalAddr" type="tns:AddrType" />
  <xs:element name="RemoteAddr" type="tns:AddrType" />
<!--
Microphone or USB Phone or Camera device name
-->
  <xs:element name="CaptureDev" type="tns:DeviceType" minOccurs="0" />
<!--
Speakers or USB Phone device name
-->
  <xs:element name="RenderDev" type="tns:DeviceType" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    Device TYPE

-->
<xs:complexType name="DeviceType">
<xs:sequence>
  <xs:element name="Name" type="xs:string" minOccurs="0" />
  <xs:element name="Driver" type="xs:string" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>

```

```

<!--
    STREAM DIRECTIONAL METRICS TYPE

-->
<xs:complexType name="StreamType">
<xs:sequence>
  <xs:element name="Network" type="tns:NetworkMetricsType" minOccurs="0" />
  <xs:element name="Payload" type="tns:PayloadMetricsType" />
  <xs:element name="QualityEstimates" type="tns:QualityEstimatesType" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:attribute name="Id" type="xs:unsignedInt" use="required" />
  <xs:attribute name="Start" type="xs:dateTime" />
  <xs:attribute name="End" type="xs:dateTime" />
  <xs:anyAttribute namespace="##other" processContents="lax" />
<!--
    Id = SSRC
-->
</xs:complexType>
<!--
    NETWORK METRICS

-->
<xs:complexType name="NetworkMetricsType">
<xs:sequence>
<!--
    DiffServ CodePoint
-->
  <xs:element name="DSCP" type="xs:byte" minOccurs="0" />
<!--
    VLAN is described via 12 bits
-->
  <xs:element name="VLAN" type="xs:int" minOccurs="0" />
  <xs:element name="Jitter" type="tns:JitterType" minOccurs="0" />
  <xs:element name="PacketLoss" type="tns:PacketLossType" minOccurs="0" />
  <xs:element name="BurstGapLoss" type="tns:BurstGapLossType" minOccurs="0" />
  <xs:element name="Delay" type="tns:DelayType" minOccurs="0" />
  <xs:element name="Utilization" type="tns:NetworkUtilizationType" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    ICE TYPE

-->
<xs:complexType name="ConnectivityType">
<xs:sequence>
  <xs:element name="Ice" type="tns:IceStatusType" minOccurs="0" />
  <xs:element name="IceWarningFlags" type="xs:unsignedInt" minOccurs="0" />
  <xs:element name="RelayAddress" type="tns:AddrType" minOccurs="0" maxOccurs="unbounded" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    ICE CONECTIVITY TYPE

-->

```

```

<xs:simpleType name="IceStatusType">
<xs:restriction base="xs:string">
  <xs:enumeration value="FAILED" />
  <xs:enumeration value="DIRECT" />
  <xs:enumeration value="RELAY" />
  <xs:enumeration value="HTTP-PROXY" />
</xs:restriction>
</xs:simpleType>
<!--
    NETWORK UTILIZATION TYPE

-->
<xs:complexType name="NetworkUtilizationType">
<xs:sequence>
  <xs:element name="Packets" type="xs:int" minOccurs="0" />
  <xs:element name="BandwidthEst" type="xs:int" minOccurs="0" />
  <xs:element name="BandwidthAlloc" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    PAYLOAD METRICS TYPE

-->
<xs:complexType name="PayloadMetricsType">
<xs:choice>
  <xs:element name="Audio" type="tns:AudioPayloadMetricsType" />
  <xs:element name="Video" type="tns:VideoPayloadMetricsType" />
  <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
</xs:choice>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    AUDIO METRICS TYPE

-->
<xs:complexType name="AudioPayloadMetricsType">
<xs:sequence>
  <xs:element name="PayloadType" type="xs:int" minOccurs="0" />
  <xs:element name="PayloadDescription" type="xs:string" minOccurs="0" />
  <xs:element name="SampleRate" type="xs:int" minOccurs="0" />
  <xs:element name="FrameDuration" type="xs:int" minOccurs="0" />
  <xs:element name="FrameOctets" type="xs:int" minOccurs="0" />
  <xs:element name="FramesPerPacket" type="xs:int" minOccurs="0" />
  <xs:element name="PacketsPerSecond" type="xs:int" minOccurs="0" />
  <xs:element name="FMTP" type="xs:string" minOccurs="0" />
  <xs:element name="Signal" type="tns:SignalType" minOccurs="0" />
  <xs:element name="JitterBuffer" type="tns:JitterBufferType" minOccurs="0" />
  <xs:element name="SilenceSupress" type="tns:SilenceSuppressionStateType" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
<!--
    VIDEO METRICS TYPE

-->
<xs:complexType name="VideoPayloadMetricsType">
<xs:sequence>

```

```

<xs:element name="PayloadType" type="xs:int" minOccurs="0" />
<xs:element name="PayloadDescription" type="xs:string" minOccurs="0" />
<xs:element name="Resolution" type="xs:string" minOccurs="0" />
<xs:element name="VideoBitRateAvg" type="xs:int" minOccurs="0" />
<xs:element name="VideoBitRateMax" type="xs:int" minOccurs="0" />
<xs:element name="VideoFrameRateAvg" type="xs:float" minOccurs="0" />
<xs:element name="VideoPacketLossRate" type="xs:float" minOccurs="0" />
<xs:element name="VideoFrameLossRate" type="xs:float" minOccurs="0" />
<xs:element name="VideoFrameEncodingTime" type="xs:float" minOccurs="0" />
<xs:element name="VideoFrameDecodingTime" type="xs:float" minOccurs="0" />
<xs:element name="VideoFEC" type="xs:boolean" minOccurs="0" />
<xs:element name="FrozenVideoFreq" type="xs:float" minOccurs="0" />
<xs:element name="FrozenPeriodPercentAvg" type="xs:float" minOccurs="0" />
<xs:element name="ConsecutivePacketLossAvg" type="xs:float" minOccurs="0" />
<xs:element name="RateMatchLevel" type="xs:float" minOccurs="0" />
<xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
</xs:complexType>
<!--
    PACKET LOSS CONCEALMENT TYPE
-->
<xs:simpleType name="PacketLossConcealmentType">
<xs:restriction base="xs:string">
    <xs:enumeration value="UNSPECIFIED" />
    <xs:enumeration value="DISABLED" />
    <xs:enumeration value="ENHANCED" />
    <xs:enumeration value="STANDARD" />
</xs:restriction>
</xs:simpleType>
<!--
    SILENCE SUPPRESSION STATE TYPE
-->
<xs:simpleType name="SilenceSuppressionStateType">
<xs:restriction base="xs:string">
    <xs:enumeration value="ON" />
    <xs:enumeration value="OFF" />
</xs:restriction>
</xs:simpleType>
<!--
    ADDR TYPE
-->
<xs:complexType name="AddrType">
<xs:sequence>
    <xs:element name="IPAddr" type="xs:string" />
    <xs:element name="Port" type="xs:unsignedShort" minOccurs="0" />
    <xs:element name="Inside" type="xs:boolean" minOccurs="0" />
    <xs:element name="SubnetMask" type="xs:string" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    JITTER BUFFER TYPE
-->
<xs:complexType name="JitterBufferType">

```

```

<xs:sequence>
  <xs:element name="Type" type="tns:JitterBufferAdaptiveType" minOccurs="0" />
  <xs:element name="Rate" type="xs:int" minOccurs="0" />
  <xs:element name="Nominal" type="xs:int" minOccurs="0" />
  <xs:element name="Max" type="xs:int" minOccurs="0" />
  <xs:element name="AbsMax" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  JITTER BUFFER ADAPTIVE TYPE

-->
<xs:simpleType name="JitterBufferAdaptiveType">
<xs:restriction base="xs:string">
  <xs:enumeration value="UNKNOWN" />
  <xs:enumeration value="RESERVED" />
  <xs:enumeration value="NON-ADAPTIVE" />
  <xs:enumeration value="ADAPTIVE" />
</xs:restriction>
</xs:simpleType>
<!--
  PACKET LOSS TYPE

-->
<xs:complexType name="PacketLossType">
<xs:sequence>
  <xs:element name="LossRate" type="xs:float" minOccurs="0" />
  <xs:element name="LossRateMax" type="xs:float" minOccurs="0" />
  <xs:element name="DiscardRate" type="xs:float" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  BURST GAP LOSS TYPE

-->
<xs:complexType name="BurstGapLossType">
<xs:sequence>
  <xs:element name="BurstDensity" type="xs:float" minOccurs="0" />
  <xs:element name="BurstDuration" type="xs:int" minOccurs="0" />
  <xs:element name="GapDensity" type="xs:float" minOccurs="0" />
  <xs:element name="GapDuration" type="xs:int" minOccurs="0" />
  <xs:element name="MinGapThreshold" type="xs:int" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  DELAY TYPE

-->
<xs:complexType name="DelayType">
<xs:sequence>
  <xs:element name="RoundTrip" type="xs:int" minOccurs="0" />
  <xs:element name="RoundTripMax" type="xs:int" minOccurs="0" />
  <xs:element name="EndSystem" type="xs:int" minOccurs="0" />

```

```

    <xs:element name="OneWay" type="xs:int" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    JITTER TYPE

-->
<xs:complexType name="JitterType">
  <xs:sequence>
    <xs:element name="InterArrival" type="xs:int" minOccurs="0" />
    <xs:element name="InterArrivalMax" type="xs:int" minOccurs="0" />
    <xs:element name="MeanAbs" type="xs:int" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    SIGNAL TYPE

-->
<xs:complexType name="SignalType">
  <xs:sequence>
    <xs:element name="SignalLevel" type="xs:int" minOccurs="0" />
    <xs:element name="NoiseLevel" type="xs:int" minOccurs="0" />
    <xs:element name="EchoReturn" type="xs:int" minOccurs="0" />
    <xs:element name="SpeakerFeedbackMicIn" type="xs:int" minOccurs="0" />
    <xs:element name="SpeechLevelMicIn" type="xs:int" minOccurs="0" />
    <xs:element name="SpeechLevelPostProcess" type="xs:int" minOccurs="0" />
    <xs:element name="SignalLevelLoudSpeaker" type="xs:int" minOccurs="0" />
    <xs:element name="BackGroundNoiseMicIn" type="xs:int" minOccurs="0" />
    <xs:element name="BackGroundNoiseSent" type="xs:int" minOccurs="0" />
    <xs:element name="LocalSpeechToEcho" type="xs:int" minOccurs="0" />
    <xs:element name="SpeakerGlitchRate" type="xs:int" minOccurs="0" />
    <xs:element name="MicGlitchRate" type="xs:int" minOccurs="0" />
    <xs:element name="SpeakerClipRate" type="xs:int" minOccurs="0" />
    <xs:element name="MicClipRate" type="xs:int" minOccurs="0" />
    <xs:element name="RxAGCSignalLevel" type="xs:int" minOccurs="0" />
    <xs:element name="RxAGCNoiseLevel" type="xs:int" minOccurs="0" />
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
    QUALITY ESTIMATES TYPE

-->
<xs:complexType name="QualityEstimatesType">
  <xs:choice>
    <xs:element name="Audio" type="tns:AudioQualityEstimatesType" />
    <xs:element name="Video" type="tns:VideoQualityEstimatesType" />
    <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded" />
  </xs:choice>
</xs:complexType>
<!--
    AUDIO QUALITY ESTIMATES TYPE

-->

```



```

<xs:complexType name="AudioQualityEstimatesType">
<xs:sequence>
  <xs:element name="RecvListenMOS" type="xs:float" minOccurs="0" />
  <xs:element name="RecvListenMOSMin" type="xs:float" minOccurs="0" />
  <xs:element name="RecvListenMOSAlg" type="xs:string" minOccurs="0" />
  <xs:element name="SendListenMOS" type="xs:float" minOccurs="0" />
  <xs:element name="SendListenMOSMin" type="xs:float" minOccurs="0" />
  <xs:element name="SendListenMOSAlg" type="xs:string" minOccurs="0" />
  <xs:element name="NetworkMOS" type="tns:NetworkAudioMOSType" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  NETWORK AUDIO MOS FACTOR TYPE

-->
<xs:complexType name="NetworkAudioMOSType">
<xs:sequence>
  <xs:element name="OverallAvg" type="xs:float" minOccurs="0" />
  <xs:element name="OverallMin" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationAvg" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationMax" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationJitterAvg" type="xs:float" minOccurs="0" />
  <xs:element name="DegradationPacketLossAvg" type="xs:float" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  VIDEO QUALITY ESTIMATES TYPE

-->
<xs:complexType name="VideoQualityEstimatesType">
<xs:sequence>
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />
</xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax" />
</xs:complexType>
<!--
  TRANSPORT TYPE

-->
<xs:simpleType name="TransportType">
<xs:restriction base="xs:string">
  <xs:enumeration value="UDP" />
  <xs:enumeration value="TCP" />
</xs:restriction>
</xs:simpleType>
<!--
  NETWORK CONNECTIVITY TYPE

-->
<xs:complexType name="NetworkConnectivityInfoType">
<xs:sequence>
  <xs:element name="NetworkConnection" type="tns:NetworkConnectionType" minOccurs="0" />
  <xs:element name="VPN" type="xs:boolean" minOccurs="0" />
  <xs:element name="LinkSpeed" type="xs:float" minOccurs="0" />
  <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded" />

```

```

    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax" />
  </xs:complexType>
<!--
    ETHERNET CONNECTION TYPE

-->

<xs:simpleType name="NetworkConnectionType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="wired" />
    <xs:enumeration value="wifi" />
  </xs:restriction>
</xs:simpleType>
<!--
    DIALOG CATEGORY

-->

<xs:simpleType name="DialogCategoryType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="OCS" />
    <xs:enumeration value="TRUNK" />
  </xs:restriction>
</xs:simpleType>
</xs:schema>

```

### 6.3 Microsoft Lync Server 2010 Schema

This section follows the product behavior described in footnote [<128>](#). The schema has been split into three related schema definition files:

- ms-rtcp-metrics.xsd
- ms-rtcp-metrics.medialine.xsd
- ms-rtcp-metrics.v2.xsd

The schema for **ms-rtcp-metrics.xsd** is as follows:

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:tns="ms-rtcp-metrics" xmlns:v2="ms-rtcp-metrics.v2"
  xmlns:xs="http://www.w3.org/2001/XMLSchema" targetNamespace="ms-rtcp-metrics"
  elementFormDefault="qualified" version="1.2" attributeFormDefault="unqualified">
  <xs:import namespace="ms-rtcp-metrics.v2"></xs:import>
  <xs:include schemaLocation="ms-rtcp-metrics.medialine.xsd"></xs:include>
  <!--
    RTCP METRICS STATEMENT
  -->
  <xs:element name="VQReportEvent" type="tns:VQReportEventType"/>
  <!--
    RTCP REPORT TYPE
  -->
  <xs:complexType name="VQReportEventType">
    <xs:choice>
      <xs:element name="VQSessionReport" type="tns:SessionReportType" maxOccurs="unbounded"/>
      <xs:element name="VQSessionIntervalReport" type="tns:SessionReportType"
maxOccurs="unbounded"/>
      <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded"/>
    </xs:choice>
  </xs:complexType>

```

```

</xs:choice>
<xs:attribute name="Version" type="xs:string" use="optional"/>
<xs:attribute ref="v2:SchemaVersion" use="optional"/>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    VQ SESSION REPORT TYPE
-->
<xs:complexType name="SessionReportType">
  <xs:sequence>
    <xs:element name="LocationProfile" type="xs:string" minOccurs="0"/>
    <xs:element name="Pool" type="xs:string" minOccurs="0"/>
    <xs:element name="Endpoint" type="tns:EndpointType"/>
    <xs:element name="DialogInfo" type="tns:DialogInfoType"/>
    <xs:element name="MediaLine" type="tns:MediaLineType" maxOccurs="unbounded"/>
    <xs:element ref="v2:OpaqueClientPlatformData" minOccurs="0" />
    <xs:element ref="v2:OpaqueServerPlatformData" minOccurs="0" />
    <xs:element ref="v2:OpaqueConferenceData" minOccurs="0" />
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
  <xs:attribute name="SessionId" type="xs:string" use="required"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
  <!-- SessionId = DialogID -->
</xs:complexType>
<!--
    DIALOG INFO TYPE
-->
<xs:complexType name="DialogInfoType">
  <xs:sequence>
    <xs:element name="DialogCategory" type="tns:DialogCategoryType" minOccurs="0"/>
    <xs:element name="CorrelationID" type="xs:string" minOccurs="0"/>
    <xs:element name="FromURI" type="xs:anyURI"/>
    <xs:element name="ToURI" type="xs:anyURI"/>
    <xs:element name="Caller" type="xs:boolean"/>
    <xs:element name="LocalContactURI" type="xs:anyURI"/>
    <xs:element name="RemoteContactURI" type="xs:anyURI"/>
    <xs:element name="LocalUserAgent" type="xs:string"/>
    <xs:element name="RemoteUserAgent" type="xs:string"/>
    <!-- PAI = P-Asserted-Identity -->
    <xs:element name="LocalPAI" type="xs:anyURI" minOccurs="0"/>
    <xs:element name="RemotePAI" type="xs:anyURI" minOccurs="0"/>
    <xs:element name="ConfURI" type="xs:anyURI" minOccurs="0"/>
    <xs:element ref="v2:CallPriority" minOccurs="0"/>
    <xs:element ref="v2:MediationServerBypassFlag" minOccurs="0"/>
    <xs:element ref="v2:TrunkingPeer" minOccurs="0"/>
    <xs:element ref="v2:MediaBypassWarningFlag" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:element ref="v2:RegisteredInside" minOccurs="0"/>
      <xs:sequence minOccurs="0">
        <xs:element ref="v2:Separator" />
        <xs:any namespace="##other" processContents="lax"
minOccurs="0" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:sequence>
  </xs:sequence>

```

```

        </xs:sequence>
        <xs:attribute name="CallId" type="xs:string" use="required"/>
        <xs:attribute name="FromTag" type="xs:string" use="required"/>
        <xs:attribute name="ToTag" type="xs:string" use="required"/>
        <xs:attribute name="Start" type="xs:dateTime" use="required"/>
        <xs:attribute name="End" type="xs:dateTime" use="required"/>
        <xs:anyAttribute namespace="##other" processContents="lax"/>
    </xs:complexType>

<!--
    DIALOG CATEGORY
-->
<xs:simpleType name="DialogCategoryType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="OCS"/>
        <xs:enumeration value="TRUNK"/>
    </xs:restriction>
</xs:simpleType>
</xs:schema>

```

The schema for **ms-rtcp-metrics.medialine.xsd** is as follows:

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:tns="ms-rtcp-metrics" xmlns:v2="ms-rtcp-metrics.v2"
  xmlns:xs="http://www.w3.org/2001/XMLSchema" targetNamespace="ms-rtcp-metrics"
  elementFormDefault="qualified" version="2.0" attributeFormDefault="unqualified">
    <xs:import namespace="ms-rtcp-metrics.v2"></xs:import>
    <!--
        MEDIA LINE REPORT TYPE
    -->
    <xs:complexType name="MediaLineType">
        <xs:sequence>
            <xs:element name="Description" type="tns:MediaLineDescriptionType"/>
            <xs:element name="InboundStream" type="tns:StreamType" minOccurs="0"/>
            <xs:element name="OutboundStream" type="tns:StreamType" minOccurs="0"/>
            <xs:element name="LocalConversationalMOS" type="xs:float" minOccurs="0"/>
            <xs:element name="RemoteConversationalMOS" type="xs:float" minOccurs="0"/>
            <xs:element name="LocalConversationalMOSAlg" type="xs:string" minOccurs="0"/>
            <xs:element name="RemoteConversationalMOSAlg" type="xs:string" minOccurs="0"/>
            <xs:element ref="v2:AppliedBandwidthLimit" minOccurs="0" />
            <xs:element ref="v2:AppliedBandwidthSource" minOccurs="0" />
            <xs:element ref="v2:LocalClientEvent" minOccurs="0"/>
            <xs:element ref="v2:RemoteClientEvent" minOccurs="0"/>
            <xs:element ref="v2:OpaqueCoreEndpointData" minOccurs="0" />
            <xs:element ref="v2:OpaqueChannelData" minOccurs="0" />
            <xs:sequence minOccurs="0">
                <xs:element ref="v2:Separator" />
                <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
            </xs:sequence>
        </xs:sequence>
        <!-- Label values : "main-audio", "main-video", "panoramic-video" -->
        <xs:attribute name="Label" type="xs:string" use="required"/>
        <xs:anyAttribute namespace="##other" processContents="lax"/>
    </xs:complexType>
    <!--
        MEDIA LINE TYPE
    -->

```

```

<xs:complexType name="MediaLineDescriptionType">
  <xs:sequence>
    <xs:element name="Connectivity" type="tns:ConnectivityType" minOccurs="0"/>
    <!-- Security values : "None", "SRTP", "V1" -->
    <xs:element name="Security" type="xs:string" minOccurs="0"/>
    <xs:element name="Offerer" type="xs:boolean" minOccurs="0"/>
    <xs:element name="Transport" type="tns:TransportType" minOccurs="0"/>
    <xs:element name="NetworkConnectivityInfo" type="tns:NetworkConnectivityInfoType"
minOccurs="0"/>
    <xs:element name="LocalAddr" type="tns:AddrType"/>
    <xs:element name="RemoteAddr" type="tns:AddrType"/>
    <!-- Microphone or USB Phone or Camera device name -->
    <xs:element name="CaptureDev" type="tns:DeviceType" minOccurs="0"/>
    <!-- Speakers or USB Phone device name -->
    <xs:element name="RenderDev" type="tns:DeviceType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
  Device TYPE
-->
<xs:complexType name="DeviceType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0"/>
    <xs:element name="Driver" type="xs:string" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
  STREAM DIRECTIONAL METRICS TYPE
-->
<xs:complexType name="StreamType">
  <xs:sequence>
    <xs:element name="Network" type="tns:NetworkMetricsType" minOccurs="0"/>
    <xs:element name="Payload" type="tns:PayloadMetricsType"/>
    <xs:element name="QualityEstimates" type="tns:QualityEstimatesType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="Id" type="xs:unsignedInt" use="required"/>
  <xs:attribute name="Start" type="xs:dateTime"/>
  <xs:attribute name="End" type="xs:dateTime"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
  <!--Id = SSRC -->
</xs:complexType>

<xs:complexType name="NetworkMetricsType">
  <xs:sequence>
    <!-- DiffServ CodePoint -->
    <xs:element name="DSCP" type="xs:byte" minOccurs="0"/>
    <!-- VLAN is described via 12 bits -->
    <xs:element name="VLAN" type="xs:int" minOccurs="0"/>
    <xs:element name="Jitter" type="tns:JitterType" minOccurs="0"/>
    <xs:element name="PacketLoss" type="tns:PacketLossType" minOccurs="0"/>
    <xs:element name="BurstGapLoss" type="tns:BurstGapLossType" minOccurs="0"/>
    <xs:element name="Delay" type="tns:DelayType" minOccurs="0"/>
    <xs:element name="Utilization" type="tns:NetworkUtilizationType" minOccurs="0"/>
    <xs:element ref="v2:RatioConcealedSamplesAvg" minOccurs="0"/>
  </xs:sequence>

```

```

        <xs:element ref="v2:RatioStretchedSamplesAvg" minOccurs="0"/>
        <xs:element ref="v2:RatioCompressedSamplesAvg" minOccurs="0"/>
        <xs:sequence minOccurs="0">
            <xs:element ref="v2:Separator" />
            <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    ICE TYPE
-->
<xs:complexType name="ConnectivityType">
    <xs:sequence>
        <xs:element name="Ice" type="tns:IceStatusType" minOccurs="0"/>
        <xs:element name="IceWarningFlags" type="xs:unsignedInt" minOccurs="0"/>
        <xs:element name="RelayAddress" type="tns:AddrType" minOccurs="0"
maxOccurs="unbounded"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    ICE CONECTIVITY TYPE
-->
<xs:simpleType name="IceStatusType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="FAILED"/>
        <xs:enumeration value="DIRECT"/>
        <xs:enumeration value="RELAY"/>
        <xs:enumeration value="HTTP-PROXY"/>
    </xs:restriction>
</xs:simpleType>
<!--
    NETWORK UTILIZATION TYPE
-->
<xs:complexType name="NetworkUtilizationType">
    <xs:sequence>
        <xs:element name="Packets" type="xs:int" minOccurs="0"/>
        <xs:element name="BandwidthEst" type="xs:int" minOccurs="0"/>
        <xs:element name="BandwidthAlloc" type="xs:int" minOccurs="0"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    PAYLOAD METRICS TYPE
-->
<xs:complexType name="PayloadMetricsType">
    <xs:choice>
        <xs:element name="Audio" type="tns:AudioPayloadMetricsType"/>
        <xs:element name="Video" type="tns:VideoPayloadMetricsType"/>
        <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded"/>
    </xs:choice>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    AUDIO METRICS TYPE
-->

```

```

-->
<xs:complexType name="AudioPayloadMetricsType">
  <xs:sequence>
    <xs:element name="PayloadType" type="xs:int" minOccurs="0"/>
    <xs:element name="PayloadDescription" type="xs:string" minOccurs="0"/>
    <xs:element name="SampleRate" type="xs:int" minOccurs="0"/>
    <xs:element name="FrameDuration" type="xs:int" minOccurs="0"/>
    <xs:element name="FrameOctets" type="xs:int" minOccurs="0"/>
    <xs:element name="FramesPerPacket" type="xs:int" minOccurs="0"/>
    <xs:element name="PacketsPerSecond" type="xs:int" minOccurs="0"/>
    <xs:element name="FMTP" type="xs:string" minOccurs="0"/>
    <xs:element name="Signal" type="tns:SignalType" minOccurs="0"/>
    <xs:element name="JitterBuffer" type="tns:JitterBufferType" minOccurs="0"/>
    <xs:element name="SilenceSupress" type="tns:SilenceSuppressionStateType"
minOccurs="0"/>
    <xs:element ref="v2:AudioFECUsed" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
</xs:complexType>
<!--
  VIDEO METRICS TYPE
-->
<xs:complexType name="VideoPayloadMetricsType">
  <xs:sequence>
    <xs:element name="PayloadType" type="xs:int" minOccurs="0"/>
    <xs:element name="PayloadDescription" type="xs:string" minOccurs="0"/>
    <xs:element name="Resolution" type="xs:string" minOccurs="0"/>
    <xs:element name="VideoBitRateAvg" type="xs:int" minOccurs="0"/>
    <xs:element name="VideoBitRateMax" type="xs:int" minOccurs="0"/>
    <xs:element name="VideoFrameRateAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="VideoPacketLossRate" type="xs:float" minOccurs="0"/>
    <xs:element name="VideoFrameLossRate" type="xs:float" minOccurs="0"/>
    <xs:element name="VideoFrameEncodingTime" type="xs:float" minOccurs="0"/>
    <xs:element name="VideoFrameDecodingTime" type="xs:float" minOccurs="0"/>
    <xs:element name="VideoFEC" type="xs:boolean" minOccurs="0"/>
    <xs:element name="FrozenVideoFreq" type="xs:float" minOccurs="0"/>
    <xs:element name="FrozenPeriodPercentAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="ConsecutivePacketLossAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="RateMatchLevel" type="xs:float" minOccurs="0"/>
    <xs:element ref="v2:VideoAllocateBWAvg" minOccurs="0"/>
    <xs:element ref="v2:VideoLocalFrameLossPercentageAvg" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:element ref="v2:VideoResolutionDistribution" minOccurs="0" />
      <xs:element ref="v2:VideoRateMatchingLevelDistribution" minOccurs="0" />
      <xs:sequence minOccurs="0">
        <xs:element ref="v2:Separator" />
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:sequence>
  </xs:sequence>
</xs:complexType>
</xs:sequence>

```

```

    </xs:sequence>
</xs:complexType>
<!--
    SILENCE SUPPRESSION STATE TYPE
-->
<xs:simpleType name="SilenceSuppressionStateType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="ON"/>
        <xs:enumeration value="OFF"/>
    </xs:restriction>
</xs:simpleType>
<!--
    ADDR TYPE
-->
<xs:complexType name="AddrType">
    <xs:sequence>
        <xs:element name="IPAddr" type="xs:string"/>
        <xs:element name="Port" type="xs:unsignedShort" minOccurs="0"/>
        <xs:element name="Inside" type="xs:boolean" minOccurs="0"/>
        <xs:element name="SubnetMask" type="xs:string" minOccurs="0"/>
        <xs:element ref="v2:MACAddr" minOccurs="0"/></xs:element>
        <xs:sequence minOccurs="0">
            <xs:element ref="v2:Separator"/></xs:element>
            <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    JITTER BUFFER TYPE
-->
<xs:complexType name="JitterBufferType">
    <xs:sequence>
        <xs:element name="Type" type="tns:JitterBufferAdaptiveType" minOccurs="0"/>
        <xs:element name="Rate" type="xs:int" minOccurs="0"/>
        <xs:element name="Nominal" type="xs:int" minOccurs="0"/>
        <xs:element name="Max" type="xs:int" minOccurs="0"/>
        <xs:element name="AbsMax" type="xs:int" minOccurs="0"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    JITTER BUFFER ADAPTIVE TYPE
-->
<xs:simpleType name="JitterBufferAdaptiveType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="UNKNOWN"/>
        <xs:enumeration value="RESERVED"/>
        <xs:enumeration value="NON-ADAPTIVE"/>
        <xs:enumeration value="ADAPTIVE"/>
    </xs:restriction>
</xs:simpleType>
<!--
    PACKET LOSS TYPE
-->
<xs:complexType name="PacketLossType">
    <xs:sequence>

```



```

        <xs:element name="LossRate" type="xs:float" minOccurs="0"/>
        <xs:element name="LossRateMax" type="xs:float" minOccurs="0"/>
        <xs:element name="DiscardRate" type="xs:float" minOccurs="0"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    BURST GAP LOSS TYPE
-->
<xs:complexType name="BurstGapLossType">
    <xs:sequence>
        <xs:element name="BurstDensity" type="xs:float" minOccurs="0"/>
        <xs:element name="BurstDuration" type="xs:int" minOccurs="0"/>
        <xs:element name="GapDensity" type="xs:float" minOccurs="0"/>
        <xs:element name="GapDuration" type="xs:int" minOccurs="0"/>
        <xs:element name="MinGapThreshold" type="xs:int" minOccurs="0"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    DELAY TYPE
-->
<xs:complexType name="DelayType">
    <xs:sequence>
        <xs:element name="RoundTrip" type="xs:int" minOccurs="0"/>
        <xs:element name="RoundTripMax" type="xs:int" minOccurs="0"/>
        <xs:element name="EndSystem" type="xs:int" minOccurs="0"/>
        <xs:element name="OneWay" type="xs:int" minOccurs="0"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    JITTER TYPE
-->
<xs:complexType name="JitterType">
    <xs:sequence>
        <xs:element name="InterArrival" type="xs:int" minOccurs="0"/>
        <xs:element name="InterArrivalMax" type="xs:int" minOccurs="0"/>
        <xs:element name="MeanAbs" type="xs:int" minOccurs="0"/>
        <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
    SIGNAL TYPE
-->
<xs:complexType name="SignalType">
    <xs:sequence>
        <xs:element name="SignalLevel" type="xs:int" minOccurs="0" />
        <xs:element name="NoiseLevel" type="xs:int" minOccurs="0" />
        <xs:element name="EchoReturn" type="xs:int" minOccurs="0" />
        <xs:element name="SpeakerFeedbackMicIn" type="xs:int" minOccurs="0"/>
        <xs:element name="SpeechLevelMicIn" type="xs:int" minOccurs="0"/>
        <xs:element name="SpeechLevelPostProcess" type="xs:int" minOccurs="0"/>
        <xs:element name="SignalLevelLoudSpeaker" type="xs:int" minOccurs="0"/>
        <xs:element name="BackGroundNoiseMicIn" type="xs:int" minOccurs="0"/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

```

```

<xs:element name="BackGroundNoiseSent" type="xs:int" minOccurs="0"/>
<xs:element name="LocalSpeechToEcho" type="xs:int" minOccurs="0"/>
<xs:element name="SpeakerGlitchRate" type="xs:int" minOccurs="0"/>
<xs:element name="MicGlitchRate" type="xs:int" minOccurs="0"/>
<xs:element name="SpeakerClipRate" type="xs:int" minOccurs="0"/>
<xs:element name="MicClipRate" type="xs:int" minOccurs="0"/>
<xs:element name="RxAGCSignalLevel" type="xs:int" minOccurs="0"/>
<xs:element name="RxAGCNoiseLevel" type="xs:int" minOccurs="0"/>
<xs:element ref="v2:InitialSignalLevelRMS" minOccurs="0"/>
<xs:element ref="v2:AudioTimestampDriftRateMic" minOccurs="0"/>
<xs:element ref="v2:AudioTimestampDriftRateSpk" minOccurs="0"/>
<xs:element ref="v2:AudioTimestampErrorMicMs" minOccurs="0"/>
<xs:element ref="v2:AudioTimestampErrorSpkMs" minOccurs="0"/>
<xs:element ref="v2:VsEntryCauses" minOccurs="0"/>
<xs:element ref="v2:EchoEventCauses" minOccurs="0"/>
<xs:element ref="v2:EchoPercentMicIn" minOccurs="0"/>
<xs:element ref="v2:EchoPercentSend" minOccurs="0"/>
<xs:element ref="v2:RxAvgAGCGain" minOccurs="0"/>
<xs:sequence minOccurs="0">
  <xs:element ref="v2:Separator"></xs:element>
  <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
</xs:sequence>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
  QUALITY ESTIMATES TYPE
-->
<xs:complexType name="QualityEstimatesType">
  <xs:choice>
    <xs:element name="Audio" type="tns:AudioQualityEstimatesType"/>
    <xs:element name="Video" type="tns:VideoQualityEstimatesType"/>
    <xs:any namespace="##other" processContents="lax" maxOccurs="unbounded"/>
  </xs:choice>
</xs:complexType>
<!--
  AUDIO QUALITY ESTIMATES TYPE
-->
<xs:complexType name="AudioQualityEstimatesType">
  <xs:sequence>
    <xs:element name="RecvListenMOS" type="xs:float" minOccurs="0"/>
    <xs:element name="RecvListenMOSMin" type="xs:float" minOccurs="0"/>
    <xs:element name="RecvListenMOSAlg" type="xs:string" minOccurs="0"/>
    <xs:element name="SendListenMOS" type="xs:float" minOccurs="0"/>
    <xs:element name="SendListenMOSMin" type="xs:float" minOccurs="0"/>
    <xs:element name="SendListenMOSAlg" type="xs:string" minOccurs="0"/>
    <xs:element name="NetworkMOS" type="tns:NetworkAudioMOSType" minOccurs="0"/>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
  NETWORK AUDIO MOS FACTOR TYPE
-->
<xs:complexType name="NetworkAudioMOSType">
  <xs:sequence>
    <xs:element name="OverallAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="OverallMin" type="xs:float" minOccurs="0"/>

```

```

    <xs:element name="DegradationAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="DegradationMax" type="xs:float" minOccurs="0"/>
    <xs:element name="DegradationJitterAvg" type="xs:float" minOccurs="0"/>
    <xs:element name="DegradationPacketLossAvg" type="xs:float" minOccurs="0"/>
    <xs:element ref="v2:NetworkMOSAlg" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator" />
      <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
  VIDEO QUALITY ESTIMATES TYPE
-->
<xs:complexType name="VideoQualityEstimatesType">
  <xs:sequence>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>
<!--
  TRANSPORT TYPE
-->
<xs:simpleType name="TransportType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="UDP"/>
    <xs:enumeration value="TCP"/>
  </xs:restriction>
</xs:simpleType>

<!--
  NETWORK CONNECTIVITY TYPE
-->
<xs:complexType name="NetworkConnectivityInfoType">
  <xs:sequence>
    <xs:element name="NetworkConnection" type="tns:NetworkConnectionType" minOccurs="0"/>
    <xs:element name="VPN" type="xs:boolean" minOccurs="0"/>
    <xs:element name="LinkSpeed" type="xs:float" minOccurs="0"/>
    <xs:element ref="v2:BSSID" minOccurs="0"/>
    <xs:sequence minOccurs="0">
      <xs:element ref="v2:Separator"/></xs:sequence>
      <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
</xs:complexType>

<!--
  ETHERNET CONNECTION TYPE
-->
<xs:simpleType name="NetworkConnectionType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="wired"/>
    <xs:enumeration value="wifi"/>
  </xs:restriction>
</xs:simpleType>

```

```

<!--
    ENDPOINT TYPE
-->
<xs:complexType name="EndpointType">
  <xs:sequence>
    <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="Name" type="xs:string" use="required"/>
  <xs:attribute name="ProfileId" type="xs:string" use="optional"/>
  <xs:attribute ref="v2:OS" use="optional"/>
  <xs:attribute ref="v2:CPUName" use="optional"/>
  <xs:attribute ref="v2:CPUNumberOfCores" use="optional"/>
  <xs:attribute ref="v2:CPUProcessorSpeed" use="optional"/>
  <xs:attribute ref="v2:VirtualizationFlag" use="optional"/>
  <xs:anyAttribute namespace="##other" processContents="lax"/>
  <!-- Name = Computer Name-->
  <!-- ProfileId = Endpoint Report GUID - Note: this attribute is optional-->
</xs:complexType>
</xs:schema>

```

The schema for **ms-rtcp-metrics.v2.xsd** is as follows:

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:tns="ms-rtcp-metrics.v2" xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="ms-rtcp-metrics.v2" elementFormDefault="qualified" version="1.2"
  attributeFormDefault="unqualified">

  <!--Schema version-->
  <xs:attribute name="SchemaVersion" type="xs:string"/>

  <!--The following are part of dialog info-->

  <xs:element name="CallPriority" type="xs:short"/>
  <xs:element name="MediationServerBypassFlag" type="xs:boolean"/>
  <xs:element name="TrunkingPeer" type="xs:string"/>
  <xs:element name="BSSID" type="xs:string"/>
  <xs:element name="MediaBypassWarningFlag" type="xs:int"/>
  <xs:element name="RegisteredInside" type="xs:boolean"/>

  <!--The following are media metrics-->

  <xs:element name="AppliedBandwidthLimit" type="xs:int"/>
  <xs:element name="AppliedBandwidthSource" type="xs:string"/>
  <xs:element name="InitialSignalLevelRMS" type="xs:float"/>
  <xs:element name="AudioFECUsed" type="xs:boolean"/>
  <xs:element name="VideoAllocateBWAvg" type="xs:int"/>
  <xs:element name="VideoLocalFrameLossPercentageAvg" type="xs:float"/>

  <!--The following are AEC metrics-->
  <xs:element name="AudioTimestampDriftRateMic" type="xs:float"/>
  <xs:element name="AudioTimestampDriftRateSpk" type="xs:float"/>
  <xs:element name="AudioTimestampErrorMicMs" type="xs:float"/>
  <xs:element name="AudioTimestampErrorSpkMs" type="xs:float"/>
  <xs:element name="VsEntryCauses" type="xs:unsignedByte"/>
  <xs:element name="EchoEventCauses" type="xs:unsignedByte"/>

```

```

<xs:element name="EchoPercentMicIn" type="xs:float"/>
<xs:element name="EchoPercentSend" type="xs:float"/>
<xs:element name="RxAvgAGCGain" type="xs:int"/>

<!--The following are healer metrics-->
<xs:element name="RatioConcealedSamplesAvg" type="xs:float"/>
<xs:element name="RatioStretchedSamplesAvg" type="xs:float"/>
<xs:element name="RatioCompressedSamplesAvg" type="xs:float"/>

<!--The following are Network MOS related-->
<xs:element name="NetworkMOSAlg" type="xs:string"/>

<!--The following are endpoint information-->
<xs:attribute name="OS" type="xs:string"/>
<!--
Bit flag indicate if the system is running in a virtualized environment:
    0x0000: None
    0x0001: HyperV
    0x0002: VMWare
    0x0004: Virtual PC
    0x0008: Xen PC
-->
<xs:attribute name="VirtualizationFlag" type="xs:byte"/>
<xs:attribute name="CPUNumberOfCores" type="xs:short"/>
<xs:attribute name="CPUProcessorSpeed" type="xs:int"/>
<xs:attribute name="CPUName" type="xs:string"/>
<xs:element name="MACAddr" type="xs:string"/>

<!--The following are client event count-->
<xs:element name="LocalClientEvent" type="tns:ClientEventType"/>
<xs:element name="RemoteClientEvent" type="tns:ClientEventType"/>
<xs:complexType name="ClientEventType">
    <xs:sequence>
        <xs:element name="NetworkSendQualityEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="NetworkReceiveQualityEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="NetworkDelayEventRatio" type="xs:float" minOccurs="0"/>
        <xs:element name="NetworkBandwidthLowEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="CPUInsufficientEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceHalfDuplexAECEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceRenderNotFunctioningEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceCaptureNotFunctioningEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceGlitchesEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceLowSNREventRatio" type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceLowSpeechLevelEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceClippingEventRatio"
            type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceEchoEventRatio" type="xs:float" minOccurs="0"/>
        <xs:element name="DeviceNearEndToEchoRatioEventRatio"

```

```

        type="xs:float" minOccurs="0"/>
<xs:element name="DeviceMultipleEndpointsEventCount"
    type="xs:short" minOccurs="0"/>
<xs:element name="DeviceHowlingEventCount"
    type="xs:short" minOccurs="0"/>
<xs:sequence minOccurs="0">
    <xs:element ref="tns:Separator"/>
    <xs:any namespace="##any" processContents="lax" minOccurs="0"
        maxOccurs="unbounded"/>
</xs:sequence>
</xs:sequence>
<xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<xs:element name="VideoResolutionDistribution"
    type="tns:VideoResolutionDistributionType"/>

<xs:complexType name="VideoResolutionDistributionType">
    <xs:sequence>
        <xs:element name="CIFQuality" type="xs:unsignedByte" />
        <xs:element name="VGAQuality" type="xs:unsignedByte" />
        <xs:element name="HD720Quality" type="xs:unsignedByte" />
        <xs:sequence minOccurs="0">
            <xs:element ref="tns:Separator"/>
            <xs:any namespace="##any" processContents="lax" minOccurs="0"
                maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:element name="VideoRateMatchingLevelDistribution"
    type="tns:VideoRateMatchingLevelDistributionType"/>

<xs:complexType name="VideoRateMatchingLevelDistributionType">
    <xs:sequence>
        <xs:element name="None_Drop" type="xs:unsignedByte" />
        <xs:element name="B_Drop" type="xs:unsignedByte" />
        <xs:element name="BP_Drop" type="xs:unsignedByte" />
        <xs:element name="BPSP_Drop" type="xs:unsignedByte" />
        <xs:element name="BPSPPI_Drop" type="xs:unsignedByte" />
        <xs:sequence minOccurs="0">
            <xs:element ref="tns:Separator"/>
            <xs:any namespace="##any" processContents="lax" minOccurs="0"
                maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:sequence>
    <xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>

<xs:element name="OpaqueClientPlatformData"
    type="tns:OpaqueClientPlatformDataType" />
<xs:element name="OpaqueServerPlatformData"
    type="tns:OpaqueServerPlatformDataType" />
<xs:element name="OpaqueCoreEndpointData"
    type="tns:OpaqueCoreEndpointDataType" />
<xs:element name="OpaqueConferenceData"
    type="tns:OpaqueConferenceDataType" />
<xs:element name="OpaqueChannelData" type="tns:OpaqueChannelDataType" />

```

```

<!--OPAQUE MEDIALINE DATA TYPE-->
<xs:complexType name="OpaqueCoreEndpointDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<!--OPAQUE CHANNEL DATA TYPE-->
<xs:complexType name="OpaqueChannelDataType" >
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<!--OPAQUE CLIENT PLATFORM DATA TYPE-->
<xs:complexType name="OpaqueClientPlatformDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<!--OPAQUE SERVER PLATFORM DATA TYPE-->
<xs:complexType name="OpaqueServerPlatformDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<!--OPAQUE CONFERENCE DATA TYPE-->
<xs:complexType name="OpaqueConferenceDataType">
  <xs:sequence>
    <xs:element name="OpaqueData" type="xs:string" minOccurs="0" />
  </xs:sequence>
  <xs:anyAttribute namespace="##any" processContents="lax" />
</xs:complexType>

<!--Separator is used for forward/backward compatibility-->
<xs:element name="Separator">
  <xs:complexType></xs:complexType>
</xs:element>

</xs:schema>

```

## 7 Appendix B: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft® Office Communications Server 2007
- Microsoft® Office Communicator 2007
- Microsoft® Office Communications Server 2007 R2
- Microsoft® Office Communicator 2007 R2
- Microsoft® Lync™ Server 2010
- Microsoft® Lync™ 2010

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.

[<1> Section 2.2:](#) Office Communications Server 2007, Office Communicator 2007: This behavior is not supported.

[<2> Section 2.2.1:](#) Office Communications Server 2007, Office Communicator 2007: This behavior is not supported.

[<3> Section 2.2.1.1:](#) Office Communications Server 2007, Office Communicator 2007: The Version attribute and the v2:SchemaVersion attribute are not supported. Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:SchemaVersion attribute is not supported.

[<4> Section 2.2.1.1.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<5> Section 2.2.1.1.1.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<6> Section 2.2.1.2:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:OpaqueClientPlatformData, v2:OpaqueServerPlatformData, v2:OpaqueConferenceData, and v2:Separator elements are not supported.

[<7> Section 2.2.1.2.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<8> Section 2.2.1.2.1.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<9> Section 2.2.1.2.1.1.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.



[<10> Section 2.2.1.2.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<11> Section 2.2.1.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This attribute is not supported.

[<12> Section 2.2.1.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This attribute is not supported.

[<13> Section 2.2.1.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This attribute is not supported.

[<14> Section 2.2.1.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This attribute is not supported.

[<15> Section 2.2.1.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This attribute is not supported.

[<16> Section 2.2.1.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:OS, v2:CPUName, v2:CUNumberOfCores, v2:CPUProcessorSpeed, v2:VirtualizationFlag, and namespace="#other" attributes are not supported.

[<17> Section 2.2.1.4:](#) Office Communications Server 2007, Office Communicator 2007: The DialogCategory, CorrelationID, v2:CallPriority, v2:MediationServerBypassFlag, v2:TrunkingPeer, and v2:MediaBypassWarningFlag elements are not supported. The DialogCategoryType is also not supported. Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:CallPriority, v2:MediationServerBypassFlag, v2:TrunkingPeer, and v2:MediaBypassWarningFlag elements are not supported.

[<18> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007: This behavior is not supported.

[<19> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007: This behavior is not supported.

[<20> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<21> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<22> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<23> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<24> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<25> Section 2.2.1.4.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<26> Section 2.2.1.5:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:AppliedBandwidthLimit, v2:AppliedBandwidthSource, v2:LocalClientEvent, v2:RemoteClientEvent,

v2:OpaqueCoreEndpointData, v2:OpaqueChannelData, and v2:Separator elements are not supported.

<27> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<28> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<29> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<30> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<31> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<32> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<33> [Section 2.2.1.5.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<34> [Section 2.2.1.6:](#) Office Communications Server 2007, Office Communicator 2007: The NetworkConnectivityInfo element is not supported.

<35> [Section 2.2.1.6.1:](#) Supported in Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2 only.

<36> [Section 2.2.1.6.1:](#) Office Communications Server 2007, Office Communicator 2007: This behavior is not supported.

<37> [Section 2.2.1.7.1:](#) The values in this table are supported in Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, and Office Communicator 2007 R2 only.

<38> [Section 2.2.1.7.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The values in this table are not used.

<39> [Section 2.2.1.8:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:BSSID and v2:Separator elements are not supported.

<40> [Section 2.2.1.8.1:](#) Office Communications Server 2007, Office Communicator 2007: The NetworkConnectivityInfoType type is not supported.

<41> [Section 2.2.1.8.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<42> [Section 2.2.1.8.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<43> [Section 2.2.1.9:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:MACAddr and v2:Separator elements are not supported.

<44> [Section 2.2.1.9.1:](#) Supported in Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2 only.

<45> [Section 2.2.1.9.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<46> [Section 2.2.1.9.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<47> [Section 2.2.1.10.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<48> [Section 2.2.1.12:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:RatioConcealedSamplesAvg, v2:RatioStretchedSamplesAvg, v2:RatioCompressSamplesAvg, and v2:Separator elements are not supported.

<49> [Section 2.2.1.12.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<50> [Section 2.2.1.12.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<51> [Section 2.2.1.12.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<52> [Section 2.2.1.14:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:AudioFECUsed and v2:Separator elements are not supported.

<53> [Section 2.2.1.14.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<54> [Section 2.2.1.14.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<55> [Section 2.2.1.14.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

<56> [Section 2.2.1.15:](#) Office Communications Server 2007, Office Communicator 2007: The FrozenPeriodPercentAvg, ConsecutivePacketLossAvg, RateMatchLevel, v2:VideoAllocateBWAvg, and v2:VideoLocalFrameLossPercentageAvg elements are not supported. Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2VideoAllocateBWAvg and v2:VideoLocalFrameLossPercentageAvg elements are not supported.

<57> [Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

<58> [Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007: This behavior is not supported.

<59> [Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

<60> [Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<61> Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<62> Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<63> Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<64> Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<65> Section 2.2.1.15.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<66> Section 2.2.1.16:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The VideoResolutionDistribution element is not supported.

[<67> Section 2.2.1.16.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The VideoResolutionDistribution element is not supported.

[<68> Section 2.2.1.16.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<69> Section 2.2.1.16.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<70> Section 2.2.1.16.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<71> Section 2.2.1.16.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<72> Section 2.2.1.17:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The VideoRateMatchingLevelDistribution element is not supported.

[<73> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The VideoRateMatchingLevelDistribution element is not supported.

[<74> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<75> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<76> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<77> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<78> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<79> Section 2.2.1.17.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<80> Section 2.2.1.20:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:NetworkMOSA1g and v2:Separator elements are not supported.

[<81> Section 2.2.1.20.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<82> Section 2.2.1.20.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<83> Section 2.2.1.26:](#) Office Communications Server 2007, Office Communicator 2007: The SpeakerFeedbackMicIn, SpeechLevelMicIn, SpeechLevelPostProcess, SignalLevelLoudSpeaker, BackGroundNoiseMicIn, BackGroundNoiseSent, LocalSpeechToEcho, SpeakerGlitchRate, MicGlitchRate, SpeakerClipRate, MicGlitchRate, SpeakerClipRate, MicClipRate, RxAGCSignalLevel, and RxAGCNoiseLevel elements are not supported.

Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The v2:InitialSignalLevelRMS, v2:AudioTimestampDriftRateMic, v2:AudioTimestampDriftRateSpk, v2:AudioTimestampErrorMicMs, v2:AudioTimestampErrorMicMs, v2:AudioTimestampErrorSpkMs, v2:VsEntryCauses, v2:EchoEventCauses, v2:EchoPercentMicIn, v2:EchoPercentSend, v2:RxAvgAGCGain, and v2:Separator elements are not supported.

[<84> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<85> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<86> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<87> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<88> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<89> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<90> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<91> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<92> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<93> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<94> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<95> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<96> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<97> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007: This element is not supported.

[<98> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<99> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<100> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<101> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<102> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<103> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<104> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<105> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<106> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<107> Section 2.2.1.26.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<108> Section 2.2.1.27:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: The **ClientEventType** element is not supported.

[<109> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<110> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<111> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<112> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.



[<113> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<114> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<115> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<116> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<117> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<118> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<119> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<120> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<121> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<122> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<123> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<124> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<125> Section 2.2.1.27.1:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This element is not supported.

[<126> Section 6.1:](#) This schema is supported in Office Communications Server 2007 and Office Communicator 2007 only.

[<127> Section 6.2:](#) This schema is supported in Office Communications Server 2007 R2 and Office Communicator 2007 R2 only.

[<128> Section 6.3:](#) Office Communications Server 2007, Office Communicator 2007, Office Communications Server 2007 R2, Office Communicator 2007 R2: This schema is not supported.

## 8 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.



## 9 Index

### A

Abstract data model

[client](#) 56

[proxy](#) 57

[server](#) 57

[Applicability](#) 9

[application/vq-rtcp+xml message](#) 10

[BurstGapLoss element](#) 45

[CaptureDev element](#) 26

[ClientEventType element](#) 51

[connectivity element](#) 21

[delay element](#) 46

[DialogInfo element](#) 14

[endpoint element](#) 13

[InboundStream element](#) 27

[jitter element](#) 46

[LocalAddr element](#) 25

[MediaLine element](#) 17

[MediaLineDescription element](#) 20

[network element](#) 27

[NetworkAudioMOS element](#) 42

[NetworkConnectivityInfo element](#) 24

[OutboundStream element](#) 27

[PacketLoss element](#) 44

[payload element](#) 29

[Payload.Audio element](#) 29

[Payload.Video element](#) 31

[QualityEstimates element](#) 41

[QualityEstimates.Audio element](#) 41

[RelayAddr element](#) 25

[RemoteAddr element](#) 25

[RenderDev element](#) 26

[signal element](#) 47

[utilization element](#) 44

[VideoRateMatchingLevelDistribution element](#) 40

[VideoResolutionDistribution element](#) 39

[VQReportEvent element](#) 10

[VQSessionReport element](#) 11

### C

[Capability negotiation](#) 9

[Change tracking](#) 104

Client

[abstract data model](#) 56

[higher-layer triggered events](#) 56

[initialization](#) 56

[local events](#) 56

[message processing](#) 56

[overview](#) 56

[sequencing rules](#) 56

[timer events](#) 56

[timers](#) 56

### D

Data model - abstract

[client](#) 56

[proxy](#) 57

[server](#) 57

### E

[Examples](#) 59

### F

[Fields - vendor-extensible](#) 9

### G

[Glossary](#) 6

### H

Higher-layer triggered events

[client](#) 56

[proxy](#) 57

[server](#) 57

### I

[Implementer - security considerations](#) 64

[Index of security parameters](#) 64

[Informative references](#) 7

Initialization

[client](#) 56

[proxy](#) 57

[server](#) 57

[Introduction](#) 6

### L

Local events

[client](#) 56

[proxy](#) 58

[server](#) 57

### M

Message processing

[proxy](#) 58

[server](#) 57

[Messages](#) 10

[application/vq-rtcp+xml](#) 10

[BurstGapLoss element](#) 45

[CaptureDev element](#) 26

[ClientEventType element](#) 51

[connectivity element](#) 21

[delay element](#) 46

[DialogInfo element](#) 14

[endpoint element](#) 13

[InboundStream element](#) 27

[jitter element](#) 46

[LocalAddr element](#) 25

[MediaLine element](#) 17

[MediaLineDescription element](#) 20

- [network element](#) 27
- [NetworkAudioMOS element](#) 42
- [NetworkConnectivityInfo element](#) 24
- [OutboundStream element](#) 27
- [PacketLoss element](#) 44
- [payload element](#) 29
- [Payload.Audio element](#) 29
- [Payload.Video element](#) 31
- [QualityEstimates element](#) 41
- [QualityEstimates.Audio element](#) 41
- [RelayAddr element](#) 25
- [RemoteAddr element](#) 25
- [RenderDev element](#) 26
- [signal element](#) 47
- [utilization element](#) 44
- [VideoRateMatchingLevelDistribution element](#) 40
- [VideoResolutionDistribution element](#) 39
- [VQReportEvent element](#) 10
- [VQSessionReport element](#) 11
- [transport](#) 10
- ms-rtcp-metrics
  - [schema](#) 65
  - [Microsoft Communications Server 2010](#) 82
  - [Office Communications Server 2007](#) 65
  - [Office Communications Server 2007 R2](#) 73

## N

- [Normative references](#) 7

## O

- [Overview \(synopsis\)](#) 8

## P

- [Parameters - security index](#) 64
- [Preconditions](#) 9
- [Prerequisites](#) 9
- [Product behavior](#) 96
- Proxy
  - [abstract data model](#) 57
  - [higher-layer triggered events](#) 57
  - [initialization](#) 57
  - [local events](#) 58
  - [message processing](#) 58
  - [overview](#) 57
  - [sequencing rules](#) 58
  - [timer events](#) 58
  - [timers](#) 57

## R

- References
  - [informative](#) 7
  - [normative](#) 7
- [Relationship to other protocols](#) 9

## S

- Schemas
  - [ms-rtcp-metrics](#) 65

- [Microsoft Communications Server 2010](#) 82
- [Office Communications Server 2007](#) 65
- [Office Communications Server 2007 R2](#) 73

- Security
  - [implementer considerations](#) 64
  - [parameter index](#) 64

- Sequencing rules
  - [client](#) 56
  - [proxy](#) 58
  - [server](#) 57

- Server
  - [abstract data model](#) 57
  - [higher-layer triggered events](#) 57
  - [initialization](#) 57
  - [local events](#) 57
  - [message processing](#) 57
  - [overview](#) 56
  - [sequencing rules](#) 57
  - [timer events](#) 57
  - [timers](#) 57
- [Standards assignments](#) 9

## T

- Timer events
  - [client](#) 56
  - [proxy](#) 58
  - [server](#) 57

- Timers
  - [client](#) 56
  - [proxy](#) 57
  - [server](#) 57
- [Tracking changes](#) 104
- [Transport](#) 10

- Triggered events
  - [client](#) 56
  - [proxy](#) 57
  - [server](#) 57

## V

- [Vendor-extensible fields](#) 9
- [Versioning](#) 9