

OMA DM: Management Object for Nokia VoIP Implementation

Version 1.2; July 12, 2007

OMA Device
Management

NOKIA

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Contents

1	Introduction.....	6
1.1	Notation	6
2	Nokia VoIP Management Object v1.2 description.....	8
2.1	Graphical representation.....	9
2.2	Node descriptions	10
2.2.1	./VoIP.....	10
2.2.2	./VoIP/<X>/.....	10
2.2.3	./VoIP/<X>/VoIPId	10
2.2.4	./VoIP/<X>/ProviderName.....	10
2.2.5	./VoIP/<X>/SettingsName.....	11
2.2.6	./VoIP/<X>/StartMediaPort.....	11
2.2.7	./VoIP/<X>/EndMediaPort.....	11
2.2.8	./VoIP/<X>/MediaQos.....	11
2.2.9	./VoIP/<X>/InbandDTMF.....	11
2.2.10	./VoIP/<X>/OutbandDTMF.....	12
2.2.11	./VoIP/<X>/SecureCallPref.....	12
2.2.12	./VoIP/<X>/ProfileLockedToIAP	12
2.2.13	./VoIP/<X>/AllowVoIPoverWCDMA.....	13
2.2.14	./VoIP/<X>/RTCP.....	13
2.2.15	./VoIP/<X>/UAHTerminalType	13
2.2.16	./VoIP/<X>/UAHWLANMAC.....	13
2.2.17	./VoIP/<X>/UAHString	14
2.2.18	./VoIP/<X>/VoIPDigits.....	14
2.2.19	./VoIP/<X>/URIDomainIgnoreRule	14
2.3	PreferredCodecs node.....	15
2.3.1	./VoIP/<X>/PreferredCodecs	15
2.3.2	./VoIP/<X>/PreferredCodecs/<x>	15
2.3.3	./VoIP/<X>/PreferredCodecs/<x>/PreferredCodecId.....	15
2.4	CodecSettings node	15
2.4.1	./VoIP/<X>/CodecSettings.....	15
2.4.2	./VoIP/<X>/CodecSettings/<x>.....	15
2.4.3	./VoIP/<X>/CodecSettings/<x>/VoIPCodecId.....	16
2.4.4	./VoIP/<X>/CodecSettings/<x>/MediaSubTypeName.....	16
2.4.5	./VoIP/<X>/CodecSettings/<x>/JitterBufferSize	16
2.4.6	./VoIP/<X>/CodecSettings/<x>/OctetAlign.....	16
2.4.7	./VoIP/<X>/CodecSettings/<x>/Ptime	17

2.4.8	./VoIP/<X>/CodecSettings/<x>/MaxPtime.....	17
2.4.9	./VoIP/<X>/CodecSettings/<x>/VAD	17
2.4.10	./VoIP/<X>/CodecSettings/<x>/AnnexB	17
2.4.11	./VoIP/<X>/CodecSettings/<x>/ModeSet	18
2.4.12	./VoIP/<X>/CodecSettings/<x>/ModeSet/<x>	18
2.4.13	./VoIP/<X>/CodecSettings/<x>/ModeSet/<x>/Mode.....	18
2.4.14	./VoIP/<X>/CodecSettings/<x>/ModeChangePeriod	18
2.4.15	./VoIP/<X>/CodecSettings/<x>/ModeChangeNeighbor	19
2.4.16	./VoIP/<X>/CodecSettings/<X>/MaxRed.....	19
2.5	SettingIds node.....	20
2.5.1	./VoIP/<X>/SettingIds	20
2.5.2	./VoIP/<X>/SettingIds/<x>	20
2.5.3	./VoIP/<X>/SettingIds/<x>/ProfileType	20
2.5.4	./VoIP/<X>/SettingIds/<x>/ProfileId.....	20
2.5.5	./VoIP/<X>/SettingIds/<x>/ProfileSpecificId	21
2.6	SipSpecific node.....	21
2.6.1	./VoIP/<X>/SipSpecific	21
2.6.2	./VoIP/<X>/SipSpecific/<x>.....	21
2.6.3	./VoIP/<X>/SipSpecific/<x>/SipSpecificId	21
2.6.4	./VoIP/<X>/SipSpecific/<x>/IPVoiceMailBoxURI	21
3	Table of codecs.....	22
4	Terms and abbreviations.....	23
5	References	24
6	Evaluate this resource	25

Change history

October 27, 2006	Version 1.0	Initial document release for Nokia VoIP release 2.0.
March 28, 2007	Version 1.1	Nokia VoIP release 2.1 features added. Three new leaf objects: ./VoIP/<x>/SecureCallPref ./VoIP/<x>/VoIPDigits ./VoIP/<x>/URIDomainIgnoreRule
July 12, 2007	Version 1.2	Nokia VoIP release 2.2 features added. Leaf object ./VoIP/<x>/CodecSettings/<x>/MaxRed added. Values for leaf object ./VoIP/<x>/CodecSettings/<x>/ModeChangePeriod changed.

1 Introduction

This document defines the Nokia VoIP implementation settings format for OMA (SyncML) DM usage. The supported VoIP dialect is SIP [1] VoIP. The definition of the parameter settings formats consists of tree structure, instance identifiers, and a detailed description of the management tree. This document also provides a basic example of how the objects can be managed.

This document is a Nokia interpretation of the OMA Device Management specification. The intent of the document is to explain the organization of the parameters associated with this functionality.

Configuring generic, terminal-specific VoIP ("GenVoIP") settings is described in the document [OMA DM: Management Object for Generic VoIP Settings](#) [2].

1.1 Notation

This document uses the notation shown in Figure 1 to describe the DM management object tree model and parameters.

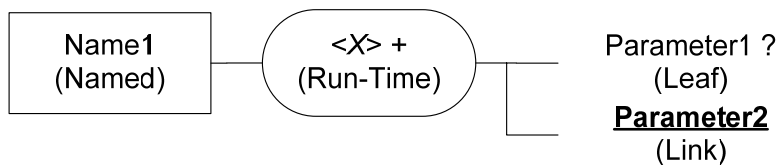


Figure 1: Notation

Named parent object

The name of the parent object is fixed. If the parent object's occurrence is One, the object's scope is permanent and cannot be deleted. If the parent object's occurrence is ZeroOrOne, the object's scope is dynamic and can be created and deleted at run time by the Management Server.

Run-time object

Run-time objects can be created and deleted at run time by the Management Server. Run-time objects' scope is dynamic. Run-time objects in the text are represented by an <X> notation, where <X> represents the node's instance identifier that will be generated dynamically and can have any alphanumeric characters as a value.

Leaf object

Management objects without any children are called leaf objects. The Description Framework Type for leaf objects in this document is *text/plain*.

Link object

Link object is a type of leaf object that has an absolute URI value pointing to another object in the management tree of the same device, that is, always starting from the root node.

The characters listed in Table 1 are used in the management object tree diagram to indicate how many instances of a specific node the management authority is able to configure in the management object tree.

Character	Meaning
+	One or many occurrences; that is, at least one instance of the parameter needs to exist and be configured.
*	Zero or more occurrences.
?	Zero or one occurrence.
(None)	Occurrence is One; that is, the parameter needs to exist and be configured.

Table 1: Characters used in the management object tree diagram

More information about the management tree, object descriptions, and property elements (Occurrence, Scope, Access Type, and Format) can be found from the *OMA Device Management Tree and Description* document [3].

2 Nokia VoIP Management Object v1.2 description

This chapter defines the management object structure and identifiers needed when managing VoIP service using OMA DM.

2.1 Graphical representation

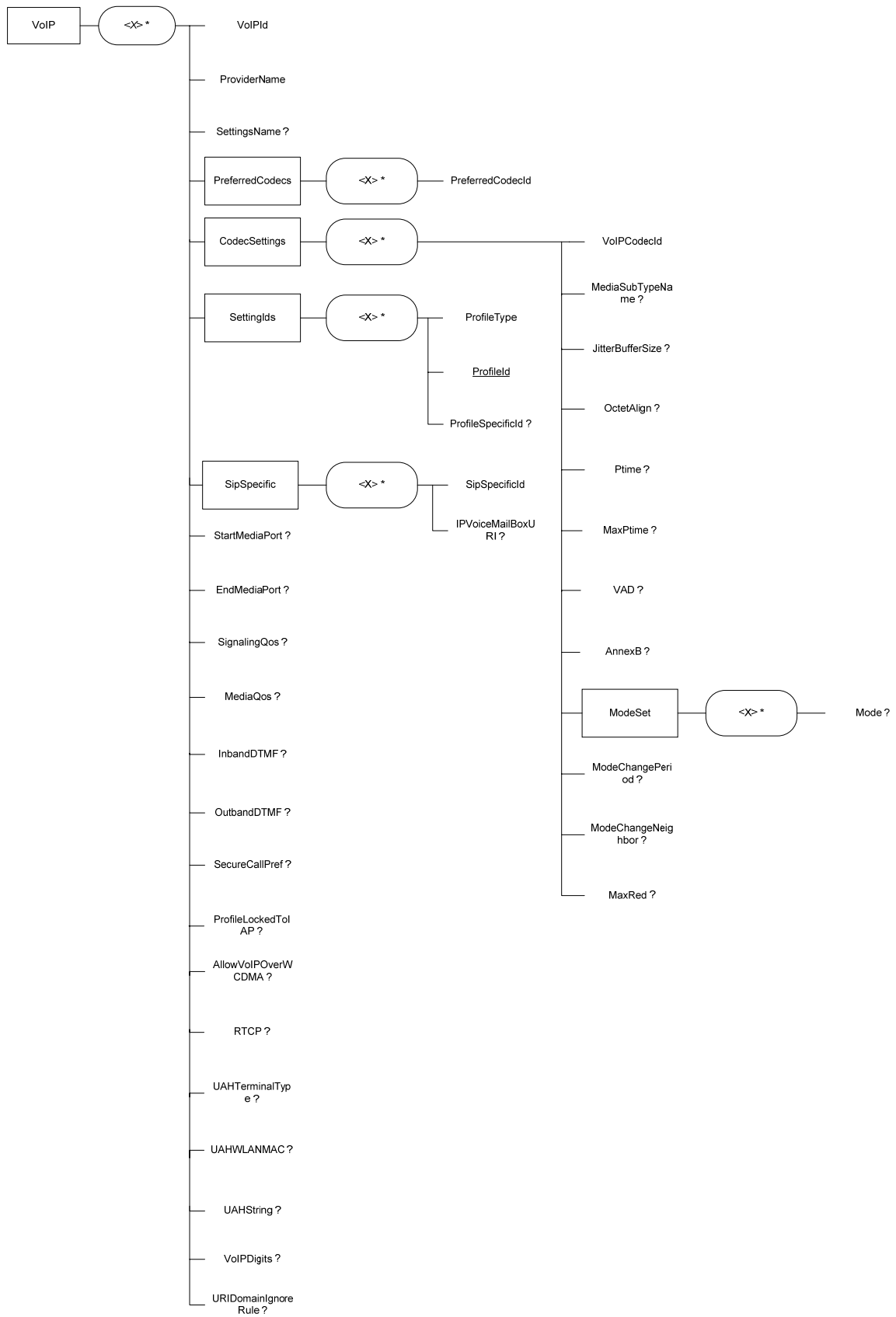


Figure 2: Graphical representation of the VoIP management object

2.2 Node descriptions

2.2.1 ./VoIP

Occurrence	Format	Access type
One	Node	Get, Add

The VoIP node is a parent to all VoIP objects. The scope of this node is permanent.

2.2.2 ./VoIP/<X>/

Occurrence	Format	Access type
ZeroOrMore	Node	Add, Delete, Get, Replace

This run-time node acts as a placeholder for one or more VoIP objects.

Note: The following objects are created as default when creating a new VoIP/<x> run-time node. Codecs also get default settings values used by VoIP. See Table 2.

- Six CodecSettings nodes (“CodecSettingsId001”, “CodecSettingsId002”, etc) for the default codec set (AMR NB, PCMU, PCMA, iLBC, G.729, CN).
- Six PreferredCodecs nodes (“PreferredCodecId001”, “PreferredCodecId002”, etc) for prioritizing the default codec set.
- One SettingsIds node (“SettingId001”) for linking to the SIP profile and SipSpecific settings.
- One SipSpecific settings node (“SipSpecificId001”) for storing SIP-specific settings.

2.2.3 ./VoIP/<X>/VoIPId

Occurrence	Format	Access type
One	Int	Get

The VoIPId leaf defines the ID for the VoIP settings. The value is received from the VoIP profile storage. This can be used for linking to VoIP settings.

2.2.4 ./VoIP/<X>/ProviderName

Occurrence	Format	Access type
One	Chr	Add, Get, Replace

The ProviderName leaf defines the provider name for the VoIP profile.

2.2.5 `./VoIP/<X>/SettingsName`

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

The SettingsName leaf defines the VoIP profile settings name.

2.2.6 `./VoIP/<X>/StartMediaPort`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The StartMediaPort leaf defines the start media port for Real-Time Transport Protocol (RTP).

Values	Description
1024-65535	Port number

2.2.7 `./VoIP/<X>/EndMediaPort`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The EndMediaPort leaf defines the end media port for Real-Time Transport Protocol (RTP).

Values	Description
1024-65535	Port number

2.2.8 `./VoIP/<X>/MediaQos`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The MediaQos leaf defines the Quality of Service for VoIP media. Diffserv Code Point (Diffserv, DSCP bits) QoS values to be used in IP headers (IPv4 TOS and IPv6 TC) Assured Forwarding PHB Group. IETF RFC 2597 [4].

Values	Description
0-63	

2.2.9 `./VoIP/<X>/InbandDTMF`

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

The InbandDTMF leaf defines whether to generate DTMF digits in-band.

Values	Description
True	Enabled. Generate DTMF digits in-band.
False	Disabled. Do not generate DTMF digits in-band.

2.2.10 ./VoIP/<X>/OutbandDTMF

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

The OutbandDTMF leaf defines whether to generate DTMF digits out-of-band.

Values	Description
True	Enabled. Generate DTMF digits out-of-band.
False	Disabled. Do not generate DTMF digits out-of-band.

2.2.11 ./VoIP/<X>/SecureCallPref

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

This leaf is for Secure Call preference. Secure call enables the use of SIP TLS for signalling and Secure RTP for media.

If SecureCallPref is set as preferred or mandatory, Secure RTP for media is used if SIP TLS for signalling is also in use.

This leaf object is supported from Nokia VoIP release 2.1 onwards.

Values	Description
0	Non-secure call is preferred.
1	Secure call is preferred in MO calls.
2	Security is mandatory for call establishment in MO calls.

2.2.12 ./VoIP/<X>/ProfileLockedToIAP

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

This leaf tells if the VoIP profile is locked to a certain IAP; that is, can the VoIP profile only be used from a pre-defined IAP or is dynamic IAP creation and using other IAPs allowed.

Values	Description
True	Profile is locked to referred IAP.
False	Profile is not locked to referred IAP.

2.2.13 `./VoIP/<X>/AllowVoIPoverWCDMA`

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

This leaf tells whether VoIP over WCDMA is allowed or not.

Values	Description
True	VoIP is allowed over WCDMA.
False	VoIP is not allowed over WCDMA.

2.2.14 `./VoIP/<X>/RTCP`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The RTCP leaf is for Real-time Transport Control Protocol reporting.

Values	Description
0	RTCP reporting is disabled.
1	RTCP reporting is enabled.

2.2.15 `./VoIP/<X>/UAHTerminalType`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

This leaf defines the terminal type display for the SIP VoIP User Agent header. For more information about SIP, see IETF RFC 3261 [1].

Values	Description
0	Terminal type is not written to the User Agent header.
1	Terminal type is written to the User Agent header.

2.2.16 `./VoIP/<X>/UAHWLANMAC`

Occurrence	Format	Access Type
ZeroOrOne	Int	Add, Get, Replace

This leaf defines the WLAN MAC address display for the SIP VoIP User Agent header. For more information about SIP, see IETF RFC 3261 [1].

Values	Description
0	WLAN MAC address is not written to the User Agent header.
1	WLAN MAC address is written to the User Agent header.

2.2.17 ./.VoIP/<X>/UAHString

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

This leaf defines the free string used in the SIP VoIP User Agent header. For more information about SIP, see IETF RFC 3261 [1].

Values	Description
E.g. "FreeText"	The text to be written in the SIP VoIP User Agent Header.

2.2.18 ./.VoIP/<X>/VoIPDigits

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

This leaf defines the meaningful count of VoIP digits (that is, VoIP caller ID characters) for caller identification (partial prefix ignoring).

This leaf object is supported from Nokia VoIP release 2.1 onwards.

Values	Description
0	All VoIP digits are meaningful.
3-20	Number of meaningful VoIP digits.

2.2.19 ./.VoIP/<X>/URIDomainIgnoreRule

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

This leaf defines the rule for ignoring the domain part of address (URI) for Internet calls.

This leaf object is supported from Nokia VoIP release 2.1 onwards.

Values	Description
0	Domain part of the URI shall never be ignored.
1	Domain part shall be ignored if only E.164 [5] numbers are used in the user part of the URI.
2	Domain part shall always be ignored.

2.3 PreferredCodecs node

2.3.1 ./VoIP/<X>/PreferredCodecs

Occurrence	Format	Access type
One	Node	Get

The PreferredCodecs node defines the codec order used by the VoIP profile.

2.3.2 ./VoIP/<X>/PreferredCodecs/<x>

Occurrence	Format	Access type
ZeroOrMore	Node	Get

This run-time leaf acts as a placeholder for one or more preferred codec objects.

Note: These nodes are created automatically when new codec settings are added. Automatically created nodes are named “PreferredCodecId001”, “PreferredCodecId002”, etc.

2.3.3 ./VoIP/<X>/PreferredCodecs/<x>/PreferredCodecId

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The PreferredCodecId leaf defines the ID of the codec used in codec settings. The preferred codec order can be changed with this setting.

2.4 CodecSettings node

2.4.1 ./VoIP/<X>/CodecSettings

Occurrence	Format	Access type
One	Chr	Add, Get

The CodecSettings node holds all codec-specific settings.

2.4.2 ./VoIP/<X>/CodecSettings/<x>

Occurrence	Format	Access type
ZeroOrMore	Node	Add, Delete, Get, Replace

This run-time node acts as a placeholder for one or more CodecSettings objects.

Note: The default codec set is created when the VoIP profile is created by adding the VoIP/<x> node. Automatically created nodes are named “CodecSettingsId001”, “CodecSettingsId002”, etc.

2.4.3 `./VoIP/<X>/CodecSettings/<x>/VoIPCodecId`

Occurrence	Format	Access type
One	Int	Get

The `VoIPCodecId` leaf defines the codec ID. This can be used for linking to `CodecSettings` inside the VoIP profile. The value can be used in `PreferredCodecs` node to prioritize codec usage.

2.4.4 `./VoIP/<X>/CodecSettings/<x>/MediaSubTypeName`

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

The `MediaSubTypeName` leaf defines the `MediaSubTypeName` of the codec.

Values	Description
AMR	AMR NB: IETF RFC 3267 [6]
PCMU	G711 μ -law/PCMU: ITU-T G711 [7]
PCMA	G711 A-law/PCMA: ITU-T G711 [7]
iLBC	iLBC: IETF RFC 3952 [8]
G729	G.729: ITU-T G.729 [9]
CN	CN: IETF RFC 3389 [10]

2.4.5 `./VoIP/<X>/CodecSettings/<x>/JitterBufferSize`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The `JitterBufferSize` leaf defines the jitter buffer size of the codec.

Values	Description
Milliseconds (20-200)	Jitter buffer size in milliseconds. The value and its existence depend on the codec.

2.4.6 `./VoIP/<X>/CodecSettings/<x>/OctetAlign`

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

The `OctetAlign` leaf defines if octet-align is used by the codec.

Values	Description
True	Octet-aligned operation shall be used.
False	Bandwidth-efficient operation is employed.

2.4.7 `./VoIP/<X>/CodecSettings/<x>/Ptime`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The Ptime leaf defines the media length of audio data in a packet.

Values	Description
Milliseconds	Audio data media length. The value and its existence depend on the codec.

2.4.8 `./VoIP/<X>/CodecSettings/<x>/MaxPtime`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The MaxPtime leaf defines the maximum packet time of the codec.

Values	Description
Milliseconds (0-200)	Maximum packet time of the codec. The value and its existence depend on the codec.

2.4.9 `./VoIP/<X>/CodecSettings/<x>/VAD`

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

The VAD leaf defines the use of Voice Activation Detection.

Values	Description
True	VAD is enabled
False	VAD is disabled

2.4.10 `./VoIP/<X>/CodecSettings/<x>/AnnexB`

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

The AnnexB leaf defines the use of AnnexB.

Values	Description
True	AnnexB is enabled (as “yes” in IETF RFC 3555 [11]).
False	AnnexB is disabled (as “no” in IETF RFC 3555 [11]).

2.4.11 `./VoIP/<X>/CodecSettings/<x>/ModeSet`

Occurrence	Format	Access type
One	Node	Add, Get

The ModeSet node holds the requested AMD mode set. Restricts the active codec mode set to a subset of all modes.

2.4.12 `./VoIP/<X>/CodecSettings/<x>/ModeSet/<x>`

Occurrence	Format	Access type
ZeroOrMore	Node	Add, Delete, Get, Replace

The ModeSet run-time node is a placeholder for requested AMR modes. See RFC 3267 [6] for more information.

2.4.13 `./VoIP/<X>/CodecSettings/<x>/ModeSet/<x>/Mode`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The Mode leaf defines the requested AMR mode (see RFC 3267 [6] for more information).

Values	Description
0	AMR 4,75 kbit/s
1	AMR 5,15 kbit/s
2	AMR 5,90 kbit/s
3	AMR 6,70 kbit/s (PDC-EFR)
4	AMR 7,40 kbit/s
5	AMR 7,95 kbit/s
6	AMR 10,2 kbit/s
7	AMR 12,2 kbit/s (GSM-EFR)

2.4.14 `./VoIP/<X>/CodecSettings/<x>/ModeChangePeriod`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

From Nokia VoIP release 1.0 to release 2.1 the following description and values apply:

The ModeChangePeriod leaf specifies a number of frame-blocks, N, that is the interval at which codec mode changes are allowed. The initial phase of the interval is arbitrary, but changes must be separated by multiple of N frame-blocks.

Values	Description
0-8	The number of frame-blocks that is the interval at which codec mode changes are allowed.

From Nokia VoIP release 2.2 onwards following description and values apply:

The ModeChangePeriod leaf specifies a number of frame-blocks, N (1 or 2), that is the frame-block period at which codec mode changes are allowed for the sender. The initial phase of the interval is arbitrary, but changes must be separated by a period of N frame-blocks, i.e. a value of two allows the sender to change mode every second frame-block. The value of N SHALL be either 1 or 2. If this parameter is not present, mode changes are allowed at any time during the session, i.e. N=1.

Values	Description
1	Mode changes are allowed at any time during the session.
2	Mode changes are allowed every second frame-block.

2.4.15 `./VoIP/<X>/CodecSettings/<x>/ModeChangeNeighbor`

Occurrence	Format	Access type
ZeroOrOne	Bool	Add, Get, Replace

The ModeChangeNeighbor leaf defines use of mode-change-neighbor.

Values	Description
True	Mode changes SHALL only be made to the neighboring modes in the active codec mode set. Neighboring modes are the ones closest in bit rate to the current mode, either the next higher or next lower rate.
False	Change between any two modes in the active codec mode set is allowed.

2.4.16 `./VoIP/<X>/CodecSettings/<X>/MaxRed`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The MaxRed leaf defines the use of max-red, i.e. the maximum duration in milliseconds that elapse between the primary (first) transmission of a frame and any redundant transmission that the sender will use. This parameter allows a receiver to have a bounded delay when redundancy is used. Allowed values are between 0 (no redundancy will be used) and 100. If the parameter is omitted no limitation on the use of redundancy is present. The value must be a multiple of 20 which is the AMR frame time. For more information about MaxRed, see IETF draft-ietf-avt-rtp-amr-bis-06 [12].

This leaf object is supported from Nokia VoIP release 2.2 onwards.

Values	Description
0	No redundancy will be used.
20-100	The maximum duration in milliseconds that elapse between

	the first transmission of a frame and any redundant transmission that the sender will use.
--	--

2.5 SettingIds node

2.5.1 ./VoIP/<X>/SettingIds

Occurrence	Format	Access type
One	Node	Add, Get

The SettingIds node holds all setting IDs.

2.5.2 ./VoIP/<X>/SettingIds/<x>

Occurrence	Format	Access type
ZeroOrMore	Node	Add, Delete, Get, Replace

This run-time node acts as a placeholder for one or more SettingIds objects.

Note: One SettingIds/<x> node is created when the VoIP profile is created by adding the VoIP/<x> node. The automatically created node is named "SettingIds001". SettingIds are also created when new SipSpecific settings are created.

2.5.3 ./VoIP/<X>/SettingIds/<x>/ProfileType

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

The ProfileType leaf defines the type of the profile (SIP [1]).

Values	Description
SIP	Configuration is for SIP VoIP dialect.

2.5.4 ./VoIP/<X>/SettingIds/<x>/ProfileId

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

The ProfileId leaf defines the identifier of the profile (SIP [1]). The ProfileId link is used to define the logical reference to connectivity information (SIP) stored elsewhere in the management tree (see Value).

Values	Description
SIP/MySIPId1	Configuration is linked to SIP/MySIPId1 SIP profile.

2.5.5 `./VoIP/<X>/SettingIds/<x>/ProfileSpecificId`

Occurrence	Format	Access type
ZeroOrOne	Int	Add, Get, Replace

The ProfileSpecificId leaf defines the identifier of SIP profile-specific settings. Note that this is created automatically if the SipSpecific run-time node is created.

2.6 SipSpecific node

2.6.1 `./VoIP/<X>/SipSpecific`

Occurrence	Format	Access type
One	Node	Add, Get

The SipSpecific node holds all SIP profile-specific VoIP settings.

2.6.2 `./VoIP/<X>/SipSpecific/<x>`

Occurrence	Format	Access Type
ZeroOrMore	Node	Add, Delete, Get, Replace

This run-time node acts as a placeholder for one or more SipSpecific objects.

Note: One SipSpecific/<x> node is created when the VoIP profile is created by adding the VoIP/<x> node. The automatically created node is named "SipSpecificId001". When SipSpecific settings are added, the corresponding SettingsIds node is also created.

2.6.3 `./VoIP/<X>/SipSpecific/<x>/SipSpecificId`

Occurrence	Format	Access type
ZeroOrOne	Chr	Get

The SipSpecificId leaf defines the identifier of the SIP profile-specific settings. This can be used for linking to SipSpecific settings inside VoIP settings.

2.6.4 `./VoIP/<X>/SipSpecific/<x>/IPVoiceMailBoxURI`

Occurrence	Format	Access type
ZeroOrOne	Chr	Add, Get, Replace

The IPVoiceMailBoxURI leaf defines the IP Voice Mail Box address.

Values	Description
SIP URI	SIP URI (IETF RFC 3261 [1])

3 Table of codecs

Table 2 explains codec setting values that are optionally configurable for each codec. These settings apply when the codec is used by VoIP.

- “0” = Optional
- “D” = Default value exists for VoIP usage (NOTE: Default values are set only to default codec set)
- “-“ = Not applicable

Codec/ Param.	AMR NB	G711 μ -law/PCMU	G711 A-law/PCMA	iLBC	G729 B	CN
Jitter buffer size	OD	OD	OD	OD	OD	-
Octet-align	OD	-	-	-	-	-
Ptime	OD	OD	OD	OD	0	-
Maxptime	OD	OD	OD	OD	OD	-
VAD	OD	OD	OD	OD	-	-
Annex B	-	-	-	-	OD	-
Mode-set	0	-	-	-	-	-
Mode-change-period	0	-	-	-	-	-
Mode-change-neighbor	OD	-	-	-	-	-
Max-red	0	-	-	-	-	-

Table 2: Table of codecs

4 Terms and abbreviations

Term or Abbreviation	Meaning
AMR	Adaptive Multi-Rate
CN	Comfort Noise
DDF	Device Description Framework
DM	Device Management
DTMF	Dial Tone Multi-Frequency
EFR	Enhanced Full Rate
GSM	Global System for Mobile Communications
IETF	Internet Engineering Task Force
iLBC	Internet Low Bitrate Codec
ITU	International Telecommunication Union
ITU-T	The ITU Telecommunication Standardization Sector; one of the three Sectors of the International Telecommunication Union (ITU)
MaxPTime	The maximum amount of media, which can be encapsulated in a payload packet.
OMA	Open Mobile Alliance
PCMA	Pulse Code Modulation a-law
PCMU	Pulse Code Modulation μ -law
PDC	Personal Digital Cellular
PTime	Packetization interval
RTP	Real-time Transport Protocol
RTCP	Real-time Transport Control Protocol
SIP	Session Initiation Protocol
SyncML	Synchronization Markup Language
VAD	Voice Activity Detector
VoIP	Voice over IP

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