Source:TSG-SA WG4
Title: Signaling of codecs (reply to SA#23)
Document for: Information

Signaling of Codecs: Background

- At TSG-SA#22, SA4 was requested to investigate whether signalling capabilities would be needed to allow the setting-up of connections with other codecs than the chosen Default Video Codec.

- As a response to the request, SA4 would like to clarify extensibility, signaling and usage of codecs defined in 3GPP SA4 multimedia service specifications (TSs 26.234 for PSS, 26.140 for MMS, 26.235 for IMS conversational applications and 26.110 for CS multimedia).

- During TSG-SA#22 it was already explained that the selection of Default Video Codec does not exclude the use of other Video Codecs.

- This means that an extension mechanism to add new codecs to the framework exists, if found necessary by an external actor, like a mobile operator.

- Use of a Codec, Audio or Video or other media type, is never implied, but defined by required framework, such as registration of corresponding MIME type, or the codec four-character-code in the 3GP file format.

Signaling of Codecs: 3GPP codecs vs. others

- It is possible in all SA4-controlled multimedia services/applications to signal both 3GPP-endorsed codecs and other codecs:

  - 3GPP-endorsed codecs
    - ✓ These are basically defined as "shall be supported", "should be supported" or "may be supported" for 3GPP services
    - ✓ The codec definitions and their signaling details (such as MIME type, payload/container format, and codec mode/profile/level indicators) are explained in the corresponding TSs (e.g., 26.234, 26.140, 26.235, 26.110).

  - Other codecs
    - ✓ The signaling protocols used for 3GPP-endorsed codecs allow for the use of other codecs in 3GPP multimedia services.
    - ✓ However, the use of other codecs is outside the scope of 3GPP specifications and is considered as a proprietary extension from the 3GPP service perspective. Therefore, for such extensions the exact details, formats and behavior of the signaling need to be defined outside of 3GPP specifications.
    - ✓ Extensions can be used in 3GPP compliant implementations, provided that they can utilize the signaling protocols and structures of the base 3GPP service.

Signaling of Codecs: MIME parameters & container format registration of codecs

- MIME (Multi-purpose Internet Mail Extension) parameters provide the key component in signaling codecs
  - MIME tyhhopes are used for codec indication in packet switched services (PSS, IMS, MMS)
  - Manufacturers can apply for a vendor-specific MIME type from IANA (Internet Assigned Numbers Authority). This way any proprietary codec can be used if its MIME type is defined and understood by both client and server
- A media type/codec used by MMS or equivalent store-and-forward delivery requires either a codec specific four-character code (4CC) registration or a MIME registration of its native file format
  - Codec-specific 4CC registration to 3GPP file format is possible via ISO
  - Other file formats have similar registration mechanisms, like OMA DLDRM file format specific 4CC registrations via OMNA - OMA Naming Authority

Background material

Appendix

Signaling of Codecs: Application level details

- **Packet-switched Streaming Service (PSS) (TS 26.234, TR 26.937)**
  - A server announces the available coding formats with SDP protocol. MIME parameters of a codec are mapped directly to SDP
  - Terminal may use UAProf for static capability exchange – to indicate what is the "media decoder portfolio" supported by the PSS client. This helps servers to adapt session offering per client type

- **IMS Conversational Services (TS 26.235)**
  - Terminal codec capability exchange, codec mode requests, and responses to mode requests happen via peer-to-peer signaling (SDP-inside-SIP)
  - Same dependency to MIME type existence for used coded as in PSS

- **Multimedia Messaging Service (MMS) (TS 26.140, TS 23.140)**
  - No end-to-end capability or mode signaling takes place (store-and-forward service)
  - Information on the used codec is included in the metadata of the .3gp file that is included in the message as an object
  - Only the codecs specified for the MMS are required to be supported. Other codecs that can be included in ISO base media file format structures could be included in MMS.

- **CS multimedia telephony service (3G-324M) (TS 26.110, TR 26.911)**
  - Codec capability exchange, mode requests, and responses to mode requests happen via H.245 (or H.241 in MPEG-4 AVC case)
  - ITU-T specifies the syntax, semantics, and required operation for new codecs in new annexes of H.245 (or new specs as H.241 in MPEG-4 AVC case)
  - H.245 generic capabilities can be used such that external bodies could specify how to use a new codec in H.32x systems