ITU-T / ATIS Workshop
"Next Generation Technology and Standardization"

Las Vegas, 19-20 March 2006

Next Generation of Multimedia Terminals

—from a Standards and technical perspective

Noah Luo,Ph.D.
Huawei Technologies, Ltd.
Rapporteur, Q.22/SG16 ITU-T

ITU-T

Alliance for Telecommunications Industry Solutions

Contents

- Requirements— a powerful engine
- A vision of NG MM terminals
- Capabilities to be supported
- Technologies as a strong driving force
- Philosophy of NGN MM standardization
- H.325-Build a Standard for NGN MM
- Open issues

Requirements— a powerful engine

- Telco operators' views
  - Generate revenue by selling attractive services.
  - Stimulate the use of abundant bandwidth by selling content.
  - Provide a wide variety of terminals for different end users ranging from top corporate executives to home-makers.
- End users' views
  - Need a large number of services from which to choose really needed and useful ones.
  - Need terminals, even of the most unsophisticated types, which can be easily upgraded to use up-to-date services and contents.
- Equipment vendors' views
  - Build more features into their equipment to attract both telco operators and end users.
  - Develop new products based on new requirements which are really needed in the market.

A vision of NG MM terminals

- Everything you want is in it.
  - Media rich in a true sense.
  - audio, video, 3DAV, CG and animation.
- There is really a lot for you to enjoy.
  - Easy services and applications fusion.
  - Videophony, video-and data-conferencing, IPTV/VOD, podcasting.
  - Presence, IM, MMS, gaming.
  - e-payment and home device control.
- Enjoy it anywhere and anytime.
  - Seamless fixed and mobile convergence.
- It has not only muscles, but also a brain.
  - High intelligence.
  - Downloadable features such as user interfaces and media processing modules determined by application contexts.
  - Ability to know your needs and do things for you at the right time.

Capabilities to be supported

- Capability of providing and consuming high quality media contents compressed in different Standards such as the MPEG family, H.264, and popular de facto Standards.
- Capability of performing intensive media processing, two typical examples are:
  - Transcoding
  - ASR, TTS, TTVS, etc.
- Capability of offering error-resilience for media tranport.
- Capability of supporting NGN inherent MM services and 3rd-party-defined MM services.
- Capability of supporting interworking with legacy MM protocol systems such as H.300 series out of transitional considerations.
- Capabilities of supporting downloadable service features.

Technologies as a strong driving force

- Media compression
  - H.264/AVS is in its golden age while research on H.265 is well advanced.
  - A general-purpose audio codec can be expected.
- Media transcoding
  - It enables contents compressed using different standards to be consumed.
  - Non-tandem transcoding techniques provide higher efficiency and better quality.
  - Intra-Standard (homogeneous) transcoding is a useful way to provide premium service features such as transmission protection and advertisement insertion.
- Error-resilient media transport
  - Great success of Skype is to a great degree due to its superb performance over error-prone networks.
  - Technology advances can provide satisfactory E2E QoS and user experiences and thus a "feeling of reality".
- 3DAV
  - It can greatly enhance user experience and attract more content consumers. FreeTV can be a star feature of NG DTV/IPTV.
- HD display for handheld devices
  - Handheld display is not necessarily limited to LCD, optical projection display technologies at reasonable power consumption are also being developed.

Technologies as a strong driving force

- Wireless
  - B3G and 4G's power to be fully unleashed.
  - Combination of OFDM and MIMO means high bitrates, high mobility and large coverage.
- Multi-modal man-machine interfaces
  - Much of the high intelligence of NG MM terminal is embodied by its ability to communicate with human beings in natural ways - visual, aural, verbal/body language, haptical and even olfactory.

Philosophy of NGN MM standardization

- Far-sightedness — Long-term considerations are needed to cover not only the near-future, so that the resulting Standards can be future-proof.
- Protection of legacy investments by supporting compatibility with existing multimedia Standards.
- Make more room for using developing technologies and meeting emerging market demands.
- Standardization of mature existing technologies.
- Make best use of COTS technologies and available Standards developed by other SDOs such as MPEG, IETF,DLNA and OSGi.

H.325 - Build a Standard for NG MM

- ITU-T SG 16 is now developing H.325 and a requirements document is available.
- H.325 is designed for NGN use, but it also takes care of pre-NGN use and a transitional phase.
- A broad and extensible set of services/applications can be derived from the combination of ITU-defined ones and 3rd-party-defined ones.
- Inherent NGN operations are left to IMS to take care of as much as possible.
- Interoperation with existing multimedia protocol systems: H.323, H.324, H.320, and SIP-based networks.
- An evolutionary approach is to be followed.
  - Build core features first.
  - Add enhancements over time.

H.325 - Build a Standard for NG MM

- A “toolbox” type of Standard, where the tool elements applied would depend on the architecture and services provided by the underlying network.
- Support for interworking with “legacy” media coding elements, which should as much as possible be accomplished by use of NGN Gateways instead of mandating extra complexity in terminals.
- H.325 is expected to provide complete “feeling of reality” by capitalizing on NGN's broadband and QoS enabling capabilities.
- Network QoS may be used to guarantee the delivery of media streams.
- Granularity for QoE and QoS levels should be wide to support certain business models with “pay-per-quality” offerings.
- Scalability is supported so that the nearer the media coding layer is to the base layer, the stronger the delivery guarantees would be.
- Security-related functionalities (e.g. privacy, authentication, and DRM) supported by the core NGN services should be exploited by H.325.

H.325 - Build a Standard for NG MM

- Some key areas
  - Streaming media based services-IPTV
    - Architecture design.
    - A management platform for telco operation.
  - Enhancement of H.248
    - More types of GW are to emerge.
    - MGW will have more functions to be controlled.
    - Resource management and control at a MGW level.
  - Error resilient media transport
    - Mature technologies to be standardized.
    - Other SDO's output can be borrowed.
  - End2End QoS and QoE
    - Application level (server-driven and client-driven) technologies to be standardized.
  - Audio codec convergence
    - Relation with G.729EV and G.VBR?
    - MPEG, 3GPP's work is needed to be taken into consideration.

Open Issues

- What is the relation between IMS and H.325?
- Will those non-session-based services defined by H.325 like VOD/IPTV be based on IMS or not?
- How can P2P mechanisms be introduced to H.325 to use its power, and meanwhile to avoid its problems?
- How can grid computing be useful to multimedia communication in NGN framework?

Questions and comments?

Thank you very much!