International Telecommunication Union

# ITU-T Technical Paper

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(25 March 2011)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication procedures

## HSTP-AMSR
## AMS Requirements

ITU-T

International Telecommunication Union

**Summary**

This technical paper contains the requirements of Advanced Multimedia System (AMS or "H.325"), which can be regarded as the initial guidance for the design of the AMS architectures and other related entities.

**Keywords**

AMS, Advanced Multimedia Systems

**Change Log**

This document contains Version 1 of the ITU-T Technical Paper on "*AMS Requirements*" approved at the ITU-T Study Group 16 meeting held in Geneva, 14-25 March 2011.

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# AMS Requirements

## 1 Scope

Advanced Multimedia System（AMS or "H.325") is a new multimedia system driven by the ITU Study Group 16. The goal of AMS is to create a new multimedia terminal and systems architecture that supports distributed and media rich collaboration environments. Earlier interactive multimedia protocols added media to call-based communication establishment protocols enabling multimedia telephony. In contrast, AMS envisions an environment in which a user has many AMS-enabled devices including portable wireless, home entertainment and computer-based devices and is offered many applications and services that are either peer-to-peer or network-provided. The decomposed AMS terminal architecture is illustrated in Figure 1.

This Technical Paper covers the technical requirements for an Advanced Multimedia System for NGN and other packet-switched networks, which includes the general design requirements, NGN Requirements, application requirements, media and content requirements, QoS requirements, OMA requirements, security requirements, address resolution requirements, mobility requirements, accounting, charging and billing requirements, priority services supporting requirements and so on. Figures 2 and 3 give examples of the interfaces among the AMS entities; however the detailed definitions and message flows on those interfaces are out of the scope of this technical paper.

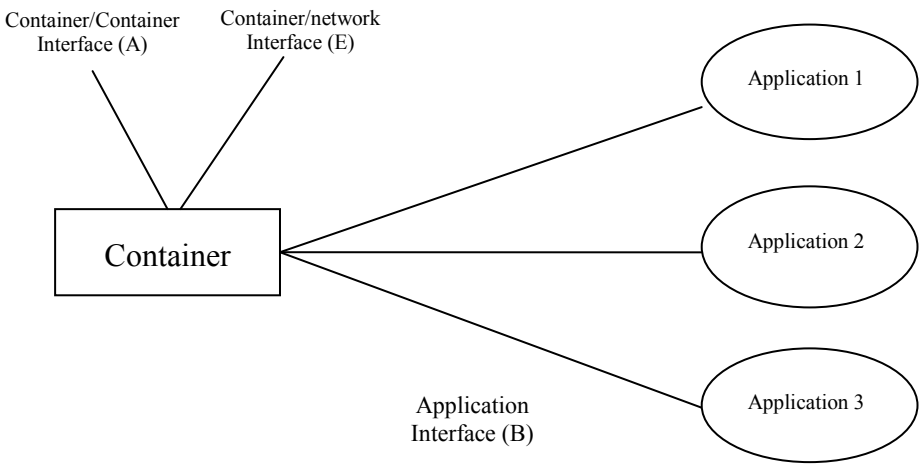


**Figure 1 - Decomposed AMS terminal architecture**

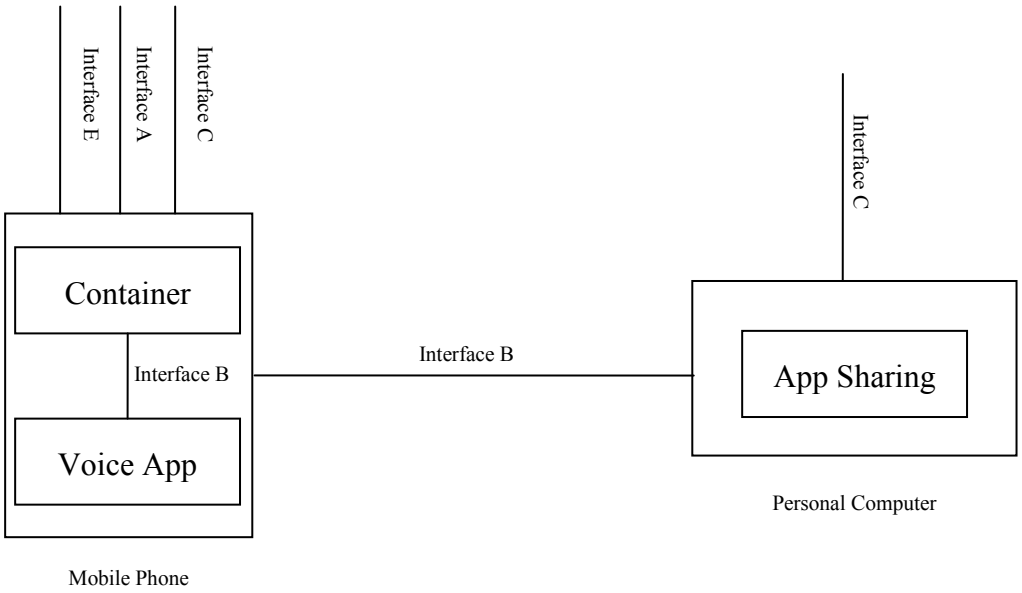


**Figure 2 - Example of voice application co-resident on a mobile phone to show interfaces**

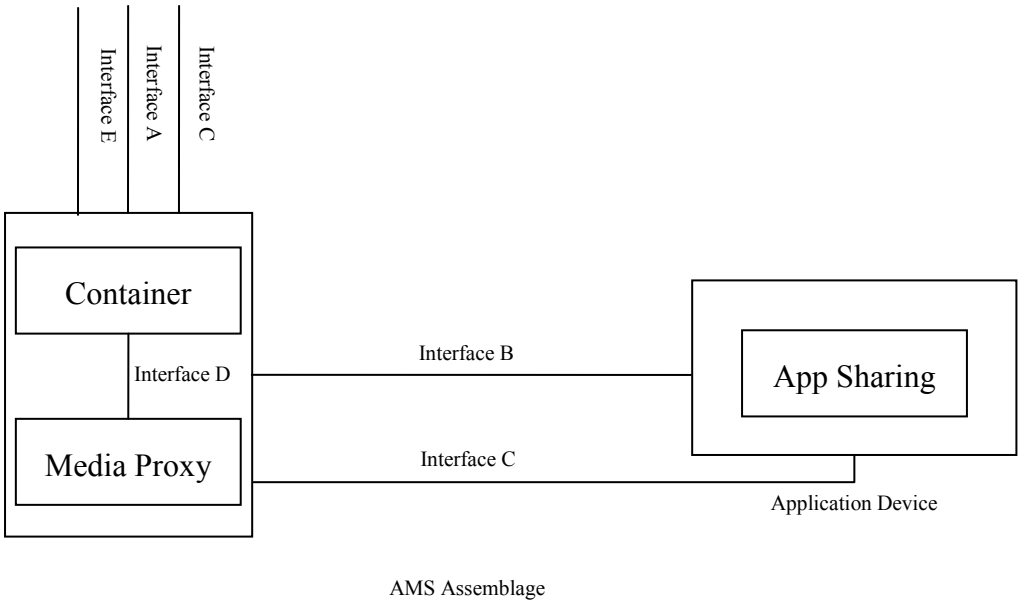


**Figure 3 - Example of a media proxy co-located with the container to show interfaces**

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## 3 Definitions

### 3.1 Terms defined elsewhere

N/A

### 3.2 Terms defined in this document

**3.2.1 assemblage**: the AMS assemblage is the set of AMS elements that represent the logical association between the elements required for the user interaction. For example, an AMS, a video conference consisting of voice and video elements would be referred to as an AMS Assemblage.

**3.2.2 container**: the container is the entity that represents the user to the network, manages applications, and facilitates communication between local and remote applications.

**3.2.3 application**: the application is the element in the AMS environment that represents one aspect of communication, e.g. voice, video.

**3.2.4 application set**: an application set is a group of Applications required to create a complete communication experience. For example, in a user interaction requiring voice, video and text, the three discrete applications would comprise a single Application Set.

## 4 Abbreviations

| | |
|---|---|
| API | Application programming interface |
| AMS | Advanced multimedia system |
| C&I | Control and Indication |
| DRM | Digital rights management |
| FW | Firewall |
| NAT | Network address translation |
| NGN | Next generation network |
| OID | Object identifiers |
| QoE | Quality of experience |
| QoS | Quality of service |
| SSMC | Single source multi-channel [distribution] |
| MMS | Multimedia messaging service |

## 5 General Design Requirements

GEN-100: AMS shall employ a flexible development approach towards a new generation of multimedia terminals and systems, which will allow a step-by-step development, with smaller initial investments.

GEN-101: AMS development should initially concentrate on core features, and enhancements should be brought in over time, as the market requirements and the NGN evolve. This approach should also provide for the protocol to be "future proof", as more sophisticated features need only be introduced when requirements are better understood.

GEN-102: AMS core functions shall comprise of: [simple point-to-point audio and video calls; simple streaming mode; simple broadcast mode]

GEN-103: The AMS architecture should be flexible enough to allow for unanticipated future requirements. Expandability should be flexible so that third-party services can be seamlessly integrated/supported.

GEN-104: AMS shall have the ability to use "plug-in" (downloadable) protocol elements by design. This will allow line protocols to evolve over time without obsolescing devices or locking in limited functions, and represent a sort of "future-proofing" ability for next-generation systems. Such elements may be supplied by servers or from other endpoints. It is up to the implementation to store the protocol elements after downloading or to download it every time.

GEN-105: AMS endpoints should support "converged applications", i.e. converged devices (e.g. smartphones, TV set-top boxes, game consoles, handheld game/entertainment machines, digital cameras, Internet "appliances", networked robots) should be able to "speak" AMS.

GEN-106: AMS should lessen (or remove) dependence on centralized infrastructure.

GEN-107: The Assemblage shall have a decomposed architecture whereby Assemblage may be composed of several physically or logically separate components.

GEN-108: The Assemblage shall be able to support one or more applications/application sets providing video, voice, text and/or data services.

GEN-109: The Assemblage shall be empowered to use resources offered by various AMS components. For example a mobile phone can communicate with a physically separate projector for display.

GEN-110: The Assemblage shall have a component responsible for basic communication establishment, transfer of control, communication tear-down, etc. that shall be shared across applications in the Assemblage.

GEN-111: AMS shall define a Container to network signalling interface (Interface E). Interface E shall be capable of operating over both the NGN and other packet-switched networks. AMS shall support, at a minimum, both IPv4 and IPv6.

GEN-112: AMS shall define an application protocol signalling interface that shall be used for communication between applications and the Container (named Interface B). Applications communicate with remote applications using Interface B via their respective Containers (which use Interface A). Interface B shall be capable of operating over a variety of OSI layer 2 technologies, including, but not limited to, Ethernet, Bluetooth and Visible Light Communication. This requirement does not preclude the possibility of communicating locally between applications via proprietary interfaces.

GEN-113: AMS shall define an Interface C that shall be used by applications to transmit and receive real-time and non-real-time media and other types of application data.

GEN-114: The Container shall serve as the primary clock source for all applications so that they can, for example, provide lip synchronization. The Container shall keep accurate time information. And the clock accuracy among the elements should be at least 10 ms.

GEN-115: AMS shall specify optional network elements that provide a range of services, including registration functionality, address resolution, NAT/FW traversal assistance, proxy/session border controller, and ad-hoc conference servers. The lack of these optional elements shall not hinder communication between two Assemblages.

GEN-116: A layered protocol approach that utilizes concepts of "generic messages" (as in H.225.0 and H.245) shall be used to reduce the number and types of messages that comprise the base protocol, enabling intermediaries to access information they need without decoding every message,

and enabling application-to-application signalling that can be viewed as opaque data to other elements in the system (including the Container).

GEN-117: A protocol shall be defined or specified for communication over Interface A.

GEN-118: A protocol shall be defined or specified for communication over Interface B, the protocol shall share design concepts with the protocol defined for Interface A and Interface E.

GEN-119: AMS terminal and network nodes shall gracefully recover from the failure of any single intermediary device and should be able to gracefully recover from the failure of multiple intermediary devices.

GEN-120: AMS shall support ad-hoc conference expansion to additional remote entities.

GEN-121: AMS shall provide a "centralized conference model," both when utilizing a bridge and when expanding an ad-hoc conference. This should not preclude a device from connecting to a conference bridge and then also conference a third party locally using ad-hoc conferencing.

GEN-122: AMS shall support optional use of conference bridges, with the conference service serving to alleviate complexity and reduce network resource consumption through centralized treatment of media.

GEN-123: When bridging users (either via a dedicated bridge or locally at the Container), the Container should be able to retrieve a list of conference participants and share that list with the relevant applications.

GEN-124: AMS shall define an event notification framework by which applications can communicate with each other when an event occurs. This framework should allow any entity within AMS to subscribe to any other entity within the AMS network to receive notifications and events. This may be communication between entities within the assemblage or outside the assemblage.

GEN-125: Both users and devices shall have an identity on the network, such that each device may have both a device identity and a user identity. This is necessary to allow emergency services personnel to contact a particular device rather than a particular user, for example.

GEN-126: All initiated sessions shall present at least an initiating device identifier and may also include a user identifier.

GEN-127: It shall be possible to remote the user interface of the container or a given application to a requesting application. That is, it shall be possible for the user to "see" the user interface provided by another application and interact with that interface from a physically separate device.

GEN-128: The space for AMS identifiers should be specified. Those identifiers can be assigned to the AMS entities, including the containers, the service nodes, and so on, which can be used to implement some service level functions, for example, to locate the remote AMS entities in communication. Those AMS identifiers can be used to establish some associations or bindings with the bear network addresses

GEN-129: AMS shall define a Container to Container signalling interface (Interface A) that is used for communication control between two Assemblages.

GEN-130: AMS shall define an Application to Application signalling interface (Interface K) that is used for communication control between two Applications.

GEN-131: One or more protocols may be defined or specified by an Application for communication over Interface C.

GEN-132: A protocol shall be defined or specified for communication over Interface E.

GEN-133: A protocol shall be defined or specified for communication over Interface K

## 6 NGN Requirements

NGN-100: AMS is primarily intended for use on the NGN, but should also be able to run in pre-NGN environments for transitional purposes and to interoperate with existing ("legacy") multimedia protocol systems: H.323, H.324 (in particular the mobile version), H.320, and SIP-based networks. [The technical solution designed could incorporate either a specific NGN gateway to perform protocol and media conversion, by terminal based solutions, or by some combination of techniques.]

NGN-101: Some multimedia applications and services provided by the "Core" NGN in Release 1 of NGN that should be leveraged by AMS include Presence, Instant Messaging, and MMS.

NGN-102: AMS should be a "toolbox" type of standard, where the tool elements applied would depend on the architecture and services provided by the underlying network.

– For "native" NGN operation, the AMS protocol should not duplicate any functionality that is already provided by Core NGN functions. If gaps are identified, the development of suitable solutions should be coordinated with ITU-T Study Group 13.

– For "transitional" operation, the necessary NGN Architecture and Service components should be defined by AMS itself, in some minimal form necessary to support the application.

## 7 Application Requirements

APP-100: A number of AMS services/applications shall be supported, including VoIP, video telephony, video on demand, video conferencing, data conferencing, telemedicine, and distance learning.

APP-101: AMS should be flexible and robust enough to support a number of additional services/application sets such as networked robot services (information, security, entertainment, emotional [robot pet], e-learning, health-care [AVD-3140a]) and visual surveillance.

APP-102: AMS shall [seamlessly] support both ITU-T and third-party defined services/application sets through standard APIs.

– To find or define suitable APIs (e.g. Parlay or something else) is a key work item.

– Examples include Interactive Gaming, Electronic Payment, Home Device Control, E-Business Systems, Calendar, and Scheduling.

– With combinations of ITU-defined and 3rd party-defined application sets the NGN Multimedia System would offer a significantly broader, more capable, and more extensible set of applications/services that we have seen so far in Study Group 16 systems.

APP-103: ITU-T Study Group 16 shall define a minimum set of standardized applications for AMS. Each of these applications shall be defined separately from the core AMS specification. The minimum set is agreed to be Voice, Video, Still Image, Application Sharing, File Transfer, Presence and Instant Messaging/ Real Time Text.

APP-104: ITU-T-defined applications shall be assigned a static numeric identifier. Non-standard or third-party applications shall be identified by Object Identifiers (OIDs) that are assigned by the developer of the application. This does not preclude the ITU-T from also using OIDs, though efficiency in protocol encoding should be considered.

APP-105: When registering with the Container, applications shall indicate their ability to transmit, receive, or receive and transmit. AMS shall define the procedures for registering applications, considering the possibility that there may be multiple instances of the same application, and what function these applications perform.

APP-106: The terminal shall advertise the list of registered applications (inclusive of some abilities such as including transmit, receive and transmit/receive) to the remote entity in communication. AMS shall define a means of allowing applications to indicate whether they should be advertised to remote entities.

APP-107: All applications defined by ITU-T Study Group 16 shall be consistent in protocol design. For example, ITU-T should not define an XML-based application protocol for the Voice Application and an ASN.1 PER-encoded application protocol for the Video Application.

APP-108: All applications shall register with the Container using the ITU-T-defined application identifier or a developer-assigned OID value, as well as a pre-defined Unicode text string (in a preferred language indicated by the Container, or a default, if the preferred language is not supported) that allows the terminal to display human-friendly names of registered applications to the end user. The human-friendly name should be user-modifiable on both the Container (and/or a device providing the interface to the end user) and the device hosting the application.

APP-109: The Container shall allow the user to specify a default receiver of an application invocation, as well as the ability to prompt the user whenever a particular application invocation request is received. The Container should have a device preference order for each application which should be user modifiable.

APP-110: The Container shall notify the user if upon receiving an application invocation request all known default applications that can receive are busy. It shall than offer the user available alternate destinations for the application invocation request.

APP-111: Applications shall not be precluded from participating in multiple simultaneous conferences (for example using different instances) on a number of devices. The choice to support multiple, simultaneous conferences and application invocations shall be left to the application designer. When the application has exhausted its ability to accept subsequent application invocation requests, the application shall deliver a "busy" response to any subsequent invocation requests.

APP-112: Applications shall send keep-alive messages at regular intervals to the Container to maintain the registration status with the Container.

APP-113: The Container shall enable a user to perform "application handover", wherein a running application is terminated and another equivalent application is invoked, without requiring the remote user to perform any manual action. Applications capable of "application handover" shall advertise this capability upon registration with the Container.

APP-114: Applications capable of application handover shall have the ability to refuse a handover request made by the Container and shall be given ample time to respond awaiting user confirmation.

APP-115: Applications should have a means of querying the Container for the current time. Consideration should be given to the possibility that the Container's clock is updated during the course of an active conference.

APP-116: AMS systems shall accommodate both conference-dependent and conference-independent applications. As examples of the latter, consider Message Waiting Indication, Presence, and some forms of text messaging.

APP-117: AMS systems shall accommodate both real-time and non-real-time applications, allowing the use of applications like "still image transfer" and instant messaging along with real-time audio, video and text.

APP-118: AMS should allow various application controls to be made available to the user on the Container or another separate device. As an example, consider making video playback controls,

far-end camera control or other application controls available on the Container or a special remote-control device in parallel with those same controls on the video device.

APP-119: Each application should be able to report to the Container the maximum number of remote entities it can communicate with per conference.

APP-120: Each application should have the opportunity to accept or reject additional invocations within the context of a conference and globally across all simultaneous conferences.

APP-121: An Assemblage should be able to indicate to the user the reason that a portion of the communication has changed (for the benefit of the user) in cases of reduction in service quality or capability (see MOBT-100 and MOBA-100).

APP-122: AMS shall allow applications to register for a purpose other than being invoked in the traditional sense, such as a separate flashing light application for extending alerting indications.

APP-123: AMS shall define normatively or informatively a set of standard application sets, including, but not limited to, voice, video, and total conversation.

APP-124: AMS shall describe how applications relate to one another and how that relationship might be conveyed, if necessary.

APP-125: AMS should allow the application registered with the container to be advertised to the service node or other network entities so that necessary network resources may be allocated to those service applications.

APP-126: AMS shall provide definition of a set of control and indication (C&I) signals and their transport method in a systematic and future expandable way.

APP-127: The Assemblage shall reserve resources required locally (e.g. the Applications) before a session setup is transmitted to the remote Assemblage.

## 8 Media and Content Requirements

MED-100: AMS should interwork with "legacy" media coding elements (e.g. to G.711, G.729, AMR, G.722, H.261, H.263, etc.), which should as much as possible be accomplished by use of gateways instead of mandating extra complexity in terminals. This is to allow a dramatic reduction in the number of mandatory media codecs in terminals.

MED-101: Next-generation terminals should have only a minimal set of "built-in" media decoders (e.g. audio, video) for "fall back" purposes. These codecs should be good enough for the applications, but should be simple and inexpensive to realize – not necessarily the latest technology. This could be implemented through middleware elements.

MED-102: It should be investigated if a new generation of media codecs are needed for AMS, or whether some subset of existing standardized codecs (in ITU, in 3GPP, in ISO/IEC, etc.) are adequate.

MED-103: A desirable feature is that codecs to be used in AMS should use scalable [(i.e. layered)] coding techniques. AMS should have a general-purpose, low delay, low complexity, flexible, scalable, error-resilient native [conversational] audio codec that can provide interoperability, avoid transcoding, and offer good performance across a wide variety of applications/application sets, devices, and networks. For still picture codecs the current set of standardized codecs (JPEG-1, JPEG-2000, JBIG1, JBIG2, MR, MMR) plus the already planned extensions of these standards appear to be adequate.

MED-104: AMS shall have the ability to use "plug-in" (downloadable) media decoders by design. Such decoders may be supplied by servers or from other endpoints. It is up to the implementation to store the codec after downloading or to download it every time.

MED-105: For video coding, AMS should support full temporal resolution [(i.e. increased frame rate)] without frame dropping and repetition to provide a "feeling of reality", the ability to perform two-way conversation effectively. The frame rate increase is in addition to improved picture quality. Increased frame rate is fundamental for certain scenarios (e.g. accessibility; telemedicine; etc.).

MED-106: The system should support delivery of a wide range of content structures, from monomedia (e.g. voice only for VoIP) to audio-video-data (e.g. for videoconferencing) to multi-channel (e.g. captioned 5.1 channel audio for home theatre use). DRM functionality should be provided for controlled access to protected content.

MED-107: The AMS architecture should support content syndication and distribution as well as Single Source Multi-Channel (SSMC) streams.

MED-108: The AMS architecture should support media processing in another (network based) device separate from the Assemblage when the Assemblage does not have sufficient media processing capabilities. Examples include facial recognition (and authentication) from a video stream or still image, transcoding, switching and mixing.

MED-109: AMS shall specify an optional Media Proxy function that might not be co-resident with the Container and, to the extent necessary, define the characteristics of said Media Proxy. The Media Proxy shall have the purpose of proxying media from an application to another application when a direct connection might not be possible or desirable. The interface between the Container and the Media Proxy shall be named Interface D and is not subject to standardization. The Media Proxy shall also use Interface C to both applications in the same Assemblage and to other Assemblages.

MED-110: It shall be possible for two applications within the same Assemblage to establish a media flow between them to support such functionality as "picture in a picture." Such application-specific behaviour will be described within the application specification, but the application/container signalling specification shall support such dialog.

MED-111: Media relay or media processing function will reside in an application server or other network based facility that may or may not be co-resident with the service node.

MED-112: AMS applications should be able to utilize both unicast and multicast for media transmission.

## 9 Quality of Service Requirements

QOS-100: Network QoS may be used to guarantee the delivery of media streams. The nearer the media coding layer is to the base layer, the stronger the delivery guarantees would be.

QOS-101: The middleware of NGN multimedia systems should provide a measurement of performance for services, OS, and APIs.

QOS-102: AMS should provide complete "feeling of reality" by capitalizing on NGN's broadband and QoS enabling capabilities. This requires a low end-to-end delay (operating figure: under 150ms) maintaining full lip synchronization, meaning that network transmission delay as well as video processing delay should be minimized. A best coding and decoding practice should be established to achieve the low delay. However, granularity for QoE and QoS levels should be wide to support certain business models with "pay-per-quality" offerings (in which service quality could be limited according to the paying category – e.g. standard, high, premium services).

QOS-103: Specific performance requirements shall be defined for ensuring quality of experience: delay budget in terminal components and network layers, packet arrival jitter, lip synchronization for audiovisual content, etc.

QOS-104: AMS should support customer manageability for QoS/QoE levels (multistage service grade), e.g. to upgrade on the spot for a higher quality broadcast of a musical.

QOS-105: A QoS parameter notification scheme shall be supported, allowing operators, IT staff, or end users to monitor the quality of service. For example monitoring the status of time-varying wireless channels, for each AMS application so that an appropriate action can then be taken for seamless QoS support.

QOS-106: AMS shall provide a codec negotiation mechanism that considers multiple codecs and operates across multiple networks and does not unnecessarily deteriorate end-to-end codec quality.

QOS-107: AMS should support cross-layer QoS, for example conveying information between the application and network levels, to provide the optimal QoS.

QOS-108: An Assemblage should be able to negotiate with the network to provide requested QoS to the users who are appropriately authenticated and authorized.

QOS-109: AMS should be able to improve the QoS by using such techniques as FEC and redundancy when the underlying packet network cannot provide a guaranteed or acceptable level of QoS.

## 10 Operation, Administration, Maintenance and Provisioning Requirements

MAN-100: AMS should provide fault management mechanism to handle exception and propagation of faults.

MAN-101: AMS should provide a remote management mechanism to configure the parameters for both applications and AMS containers.

MAN-102: AMS should provide an orchestration mechanism for remote management both at the terminal side and network side.

MAN-103: AMS should allow the service providers to have some management of the applications, for example, restricting use of certain applications, allocating or freeing resources to accommodate those applications.

## 11 Security Requirements

SEC-100: AMS shall provide end-to-end security for media and signalling.

SEC-101: Security-related functionalities (e.g. privacy, authentication, and DRM) supported by the core NGN services should be exploited by AMS.

SEC-102: When operating on non-NGN networks (transition mode), AMS itself shall specify the provision of security functions.

SEC-103: Some of the security and DRM services should [probably] be standardized at the application level as well (e.g. Message encoding, message integrity, etc).

SEC-104: Support for both standardized and third party DRM and security systems may be necessary to ensure acceptance by consumers and industry.

SEC-105: AMS should be able to improve the session security when the underlying packet network cannot provide an acceptable level of security.

## 12 Address and Address Resolution Requirements

ADD-100: AMS shall support for [federated] directories containing public and private information about users, that would allow not only users to locate each other, but which would allow service and content provider to retrieve information for integrated billing or service offering purposes.

## 13 NAT/Firewall Traversal Requirements

NAT-100: AMS shall be able to operate in environments where NAT and/or Firewall devices are present at one or both ends between two communicating entities.

NAT-101: AMS shall be able to operate in environments where multiple NAT and/or firewall devices are placed between the two communicating entities.

NAT-102: AMS shall provide functionality that facilitates NAT/FW traversal with consideration given to the Container and each of the applications associated with the Container. This functionality shall be able to differentiate applications that are co-located with the Container from those that are physically separate for the purpose of more efficiently providing this capability.

NAT-103: All applications, regardless of their media transmit/receive capabilities, shall have the ability to transmit and receive packets necessary to open NAT/FW pin-holes and to keep those pin-holes open for the duration of the conference, even when the conference is placed on hold.

## 14 Mobility Requirements

### 14.1 General Mobility Requirements

MOB-100: The AMS architecture should support QoS-aware service mobility when the mobile terminal moves in heterogeneous network environments.

### 14.2 Terminal Mobility Requirements

MOBT-100: AMS should support call/conference continuity across heterogeneous networks for devices using AMS.

MOBT-101: Assemblages shall provide a way to make the container/application (as appropriate) aware of link layer QoS parameter modification. The container/ applications should be made aware of such QoS changes.

MOBT-102: Assemblages shall enable applications to have rapid adaption in case of sudden decrement of bandwidth (mitigation of packet loss) and rapid adaption in case of sudden increment of bandwidth (utilization of increased bandwidth).

MOBT-103: AMS shall enable operation in an environment with an unchanging IP address and changing network interfaces.

### 14.3 Application Mobility Requirements

MOBA-100: AMS should support both application maintaining and application handoff/replacement continuity (where a different application takes over from the original, e.g. from multimedia to voice).

MOBA-101: AMS should support (probably through infrastructure) call/conference continuity across a network boundary between an AMS network and a legacy network for a dual mode Assemblage (AMS and legacy). For example, two Assemblages are involved in an AMS multimedia application, one of the terminals is a dual-mode AMS/3G-324M terminal, the dual-mode terminal traverses a network boundary and handoffs to/from a 3G-324M call occurs. The non-traversing Assemblage would still be utilising its AMS multimedia application.

## 15 Accounting, Charging and Billing Requirements

ACB-100: AMS shall provide the capability to allow for the accounting, charging and billing in consideration of the service operation of the telecommunication carriers and/or internet service providers.

ACB-101: AMS shall provide the applicable interfaces which can be used to enable the accounting, charging and billing.

## 16 Requirements for Support of Priority Services

The requirements in this clause are intended for public networks (e.g., managed IP networks). However, other networks (e.g., private enterprise networks) may support these requirements. The support of priority services is expected to primarily effect network-side communications.

PRI-001: AMS shall support priority services, e.g., Emergency Telecommunications Service (ETS). AMS shall include call/session and bearer level capabilities (e.g., preferential schemes) to allow priority services to be supported. Call/session control and bearer traffic of priority services shall receive priority/preferential treatment over other traffic during congestion/failure conditions.

PRI-002: AMS shall provide as necessary the interworking and mapping of priority mechanisms between the various components of AMS.

PRI-003 AMS shall allow interworking and mapping of priority mechanisms between different administrative domains (e.g., between two service provider networks) to allow end-to-end priority services.

PRI-004: AMS shall allow mapping of priority information to facilitate seamless protocol interworking between different network types (e.g., call/session control interworking between two networks).

PRI-005: AMS shall support or provide a similar service for existing PSTN/ISDN and H.323 priority services (i.e., legacy services).

PRI-006: AMS shall enable new priority services applications (i.e., data services such as instant messaging and emails) beyond existing PSTN/ISDN and H.323 priority services to be supported.

PRI-007: AMS shall support functions to authenticate and authorize users of priority services as needed.

PRI-008: AMS shall allow rapid authentication of authorized users of priority services, early in the call/session setup process and indicate (directly or indirectly) as needed in the forward direction to subsequent networks.

PRI-009: AMS shall support authentication and authorization of terminal/device for priority services as needed.

PRI-010: AMS shall enforce applicable policy for priority services support (e.g., QoS, reliability/availability, national or regional regulation requirements).

PRI-011: AMS shall exempt priority services from certain restrictive network management functions.

PRI-012: AMS shall support the necessary OAM&P functions to allow the interchange of critical telecommunications service management information in support of network reprovisioning, repair, and restoration on a priority basis in support of priority services.

PRI-013: AMS shall support functions for security protection of priority services as appropriate. For example, integrity and confidentiality of priority services and authentication of the source (i.e.

mutual authentication of service providers) for handing off and receiving traffic for the priority services communications.

PRI-014: AMS should support the capability to inform the end user about the status of the priority call/session during the set-up or termination process.

PRI-015: AMS shall support and enforce applicable policy for non-traceability.

PRI-016: AMS shall support procedures for restorability. AMS shall support procedures to reconfigure, repair, or restore network services on a priority basis in support of priority services.

PRI-017: AMS shall allow mapping of priority information to facilitate seamless protocol interworking between the different protocols used within a network (e.g., vertical protocol interworking between call/session control and bearer control).

PRI-018: AMS shall allow mapping of priority information to facilitate seamless interworking between the different transport types, i.e. media types.

## 17 Miscellaneous Requirements

MSC-100: AMS shall provide native support for early warning and disaster relief scenarios, location services (e.g. for emergency calls), legal intercept.