Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

3GPP May Highlights

General

- TSG RAN-36 meeting, held in Busan 29 May - 01 June 2007. Reports will follow in the next newsletter.
- TSG SA-36 meeting, held in Busan 04 - 08 June 2007. Highlights to follow below.

SA

- TSG-SA reached agreement on how to proceed with both Common IMS and Openness of IMS Requirements. SA1 will be closed and re-opened with a new charter which emphasizes the development of generic service descriptions.
- At SA#36 in June 2007, almost all of the work, which had exceptions at SA#35 was completed. Rel-7 is considered frozen after SA#36.
- It was agreed that the target for Rel-8, stage 1 freezing is December 2007.
- In response to LS's received from 3GPP2, WiMax Forum, IEEE 802.16, and IEEE 802.21, CRs were approved adding requirements for several interworking scenarios with non-3GPP accesses. This interworking assumes the existence of a 3GPP evolved packet core (SAE → see April newsletter).
- The SAE and eCall data transfer studies were moved to Rel-8. Since these are only studies, this move has no impact on the schedule of the actual normative work.
- New TSs approved at SA#36:
  - TS 22.182 Customized Alerting Tone,
  - TS 26.142 Dynamic and Interactive Multimedia Scenes (DIMS),
  - TS 33.259 Key Establishment between a UICC Hosting Device and a Remote Device.
- The following new TRs were approved at SA#36
  - TR 22.908 Paging Permission Access Control
  - TR 23.919 Direct Tunnel Deployment Guideline,
  - TR 26.902 Video Codec Performance,
  - TR 32.808 Telecommunications Management, Study of CPS Framework of User Data for Network Services and Management,
  - TR 32.811 Telecommunications Management, Itf-N Performance Criteria: Requirements,
  - TR 33.803 Coexistence between TISPAN and 3GPP Authentication Schemes.
- Several new work items (WIDs) were approved or updated:
  - SMS Online Charging
  - A large number of O&M WIDs,
  - System Enhancements for Interconnection Interfaces between two IMS CN subsystem networks,
  - IMS System Enhancements for Corporate Network Access,
  - Security Enhancements for IMS,
  - Paging Permission with Access Control Requirements.
  - Requirements for seamless roaming and service continuity between mobile and WLAN Networks
  - Support of Service Level Interworking for Messaging Services.
- Several new study items (SIDs) were approved or updated:
  - Multimedia Session Continuity
  - Study on CS Domain Services over Evolved PS Access.
  - IMS Centralized Study.

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

3GPP SA4

Terms of Reference

The responsibilities of WG4 (Codec) include the following items:

- Development and maintenance of specifications for speech, audio, video, and multimedia codecs, as required to enable services specified for 3G terminals and systems.
- Guidance to other 3GPP groups concerning required QoS parameters and other system implications, including channel coding requirements, imposed by different multimedia codecs in both circuit-switched and packet-switched environments.
- Speech, audio, video, and multimedia quality evaluation (including new evaluation methods, testing, verification, characterisation, selection criteria)
- End-to-end performance, including terminal characteristics, of speech, audio, video, and multimedia services.
- Interoperability aspects with existing mobile and fixed networks from the codec point of view.

In conducting its work, the Codec WG will strive to specify the best possible technical solutions at the same time as considering the planned global use of the codecs and the flexibility needs imposed by different regional requirements and preferences, including possible differences in quality/capacity trade-offs.

3GPP SA4 Organization

Chairman: Kari Järvinen (Nokia)
Organized in plenary sessions and four subworking groups:

- Speech Quality (SQ) Subworking Group
- Packet-Switched Multimedia (PSM) subworking group
- Video ad-hoc group (VAG)
- Multimedia Telephony Service for IMS (MTSI) Subworking Group

The standardization is organized by

- E-mail exchange on official reflector 3GPP_TSG_SA_WG4@LIST.ETSI.ORG.
- 4-5 regular meetings per year with about 200 documents and 50 delegates.
- Adhoc meetings related to specific work items.

The driving companies for the Release-7 WIs were

- Ericsson
- Nokia
- Qualcomm
- Vodafone
- Smaller technology companies for individual work Items

Regular Dependencies, Communication, Liaison mainly with RAN2, SA1, SA2, and external bodies:

- ISO/IEC JTC1/SC29/WG11 (MPEG)
- IETF AVT/MMUSIC/RMT
- IMTC IMS Activity Group
- ITU-T SG 12, SG 15
- ISMA
- DVB
- 3GPP2
- W3C SVG WG
- JCP - JSR 287 Experts Group
- OMA BT MAE, BAC BCAST

SA4 generally produces technical specifications TS 26.xxx and technical reports TR 26.xxx.

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

3GPP SA4 Rel-7 Work

Overview

3GPP SA4 has worked on 11 work items within the Release 7. With the recent SA plenary, SA#36, in June 2007, SA4 has completed 9 out of these 11 work items. Three work items were completed some time ago, namely

- Stage 3 Specification of Combining CS and IMS services: SA4 has defined guidelines on how to combine CS calls with IMS sessions for typical CSI use cases.
- 3G-324M Video Telephony Call Setup Times Improvements: ITU-T, IMTC and 3GPP SA4 have worked jointly on a solution on call setup improvement for video telephony. The ITU WP2/16 Plenary approved a new Annex K to H.324, referred to as Media Oriented Negotiation Acceleration (MONA), and SA4 endorsed the changes provided by the ITU-T SG16 in Release 7 for Call Setup Acceleration. The updates are integrated in TS26.111.
- Optimizations for Multimedia Telephony over IMS: This work item prepared the MTSI work.

Two work items are still to be completed, namely,

- Performance Characterization of VoIMS over HSDPA\EUL channels: Conversational and Listening-Only Tests to be performed for three AMR modes using a real-time testbed from Alcatel-Lucent. Test results will be integrated into TS 26.935 "PS conversational multimedia applications; Performance characterization of default codecs".
- 3GPP TR 26.967 evaluates solutions for "eCall Data Transfer - in-band modem solution". Likely CTM (see TS26.226) will be used for this purpose.

The recently completed work items are detailed more in the following. They also represent the core work in 3GPP SA4 in Release 7.

3GPP TS 26.114 MTSI

Summary

- The SA4 work item on IMS Multimedia Telephony; Media Handling and Interaction was a building block of the SA1 work item on Multimedia Telephony Service for IMS.
- TS 26.114 "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction" was approved in March 2007.
- Specifies a client for MTSI supporting conversational speech, video and text transported over RTP with the scope to deliver a user experience equivalent to or better than that of CS conversational services using the same amount of network resources.
- Defines media handling (e.g., signaling, transport, jitter buffer management, packet-loss handling, adaptation) and interactivity (e.g., adding or dropping media during call).
- PSC services as defined in 3GPP TS 26.235 and 3GPP TS 26.236 do not include the specification of an MTSI client, although they include conversational multimedia applications.
- TS26.114 was started as a conclusion from the study in 3GPP TR 26.914 on optimization opportunities in Multimedia Telephony for IMS (3GPP TR 22.973).

Drivers and active companies:

- Ericsson was the lead in this activity and was heavily supported by both terminal/platform as well as network divisions. Main goal was the enabling of packet-

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

switched telephony services to be prepared for packet-only networks such as HSPA and/or LTE/SAE to be expected in the future.

- Nokia and Qualcomm provided also technical input.
- Almost no work from any other company.

Main content

- Media codecs (to be supported for each media type)
- Media configuration (session setup and control procedures including bandwidth negotiation, QoS parameter negotiation and media synchronization)
- Data transport (RTP profiles, RTCP usage, RTP payload formats, media flow)
- Jitter buffer management (functional and minimum performance requirements)
- Packet-loss handling (recommended ways to handle severe packet loss conditions using transmission of redundant frames)
- Adaptation (definition of adaptive mechanisms to optimize session quality: RTCP-APP for speech; RTCP reports and TMMBR messages for video)
- Front-end handling (terminal acoustic characteristics requirements and their testing conforming to TSs 26.131 and 26.132)
- Inter-working (requirements and recommendations for ensuring MTSI interworking with 3G-324 CS, GERAN/UTRAN CS, PSTN and TISPAN)
- Supplementary services (conform to overall MTSI requirements, recommendations made for media handling in HOLD procedures)

Highlights:

- The high-level architecture showing the nodes involved in an MTSI call set-up is provided in the Annex, Figure 1. An MTSI call uses the Call Session Control Function (CSCF) mechanisms to route control plane signalling between the UEs involved in the call. In the control plane, Application Servers (AS) provide supplementary services such as call hold/resume, call forwarding and multi party calls, etc. The scope of TS26.114 is to specify the media path.
- User-plane protocol stack is shown in figure 2. The basic MTSI client specifies media codecs for speech, video and text. All media components are transported over RTP with each respective payload format mapped onto the RTP (RFC3550) streams.
- MTSI terminals:
  - shall support AMR speech codec + RFC4867,
  - shall support AMR wideband codec + RFC4867 if wideband is supported,
  - may support/send redundant speech frames,
  - shall support H.263 Profile 0 Level 45 + RFC4629,
  - should support H.263 Profile 3 Level 45 + RFC4629,
  - should support MPEG-4 Simple Profile Level 3 + RFC3016,
  - should support H.264/AVC Baseline Profile Level 1.1 + RFC3984,
  - shall support T.140 +RFC4103 for text,
  - shall support RTP Profile for Audio and Video Conferences with Minimal Control (RFC3551), also called RTP/AVP;
  - Shall support extended RTP Profile for RTCP-based Feedback (RTP/AVPF) (RFC4585), also called RTP/AVPF,

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

  - Shall support RTCP messages.

- MTSI uses SIP and SDP for media negotiation and configuration.
- QoS negotiation: Examples of SDP using negotiated QoS are given in TS26.114.
- Packetization guidelines for different RANs are provided in TS26.114.
- Minimum performance requirements for Jitter Buffer Management defined. They consist of objective criteria for delay and jitter-induced concealment operations.
- For packet loss handling in speech the use of simple application layer redundancy is recommended using redundant frames. For video no packet loss handling is defined.
- For adaptation to changing conditions the use of RTCP-APP for speech and TMMBR for video is recommended. Use cases are provided.
- TS26.114 provides also Examples of SDP offers and answers.
- QoS profiles for Bi-directional voice, video, and text.

3GPP TS 26.142 DIMS

Summary:

TS 26.142 "Dynamic and Interactive Multimedia Scenes (DIMS)" was approved at SA#36 in June 2007.

- DIMS is a dynamic, interactive, scene-based media system which enables display and interactive control of multimedia data such as audio, video, graphics, images and text. It ranges from a movie enriched with vector graphics overlays and interactivity, to complex multi-step services with fluid interaction/interactivity and different media types at each step.
- DIMS provides a convenient way to browse rich-media services, a web-like access, a permanent refresh of content through dynamic updates available on the fly and decreasing latency by allowing the visualisation of data as soon as possible.
- DIMS media type can be used as a generic media type, allowing creating dynamic interactive rich-media services, and also in association with other media types.
- Main driving companies are Nokia, Ericsson, France Telecom, and Streamezzo.
- Related standardization bodies and work:
  - OMA BAC-MAE work on RME,
  - 3GPP2 TSG-C,
  - MPEG LASeR,
  - W3C SVG
  - Attempt to align specifications in different groups.
- DIMS basically selects key content and technology components from two proposals:
  - MPEG LASeR (Lightweight Application Scene Representation) with SAF (Simple Aggregation Format) proposed by Streamezzo, France Telecom, and others
  - MORE (The Mobile Open Rich media Environment) based on W3C, OMA, 3GPP and IETF technologies combined proposed by Nokia, Ericsson, and others.
- Competes with proprietary solutions such as Macromedia Flash.

TS 26.142 Content Overview:

An outline of the content of TS 26.142 is provided below:

- Overview and architecture
- Media-type definition

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

  - Media type components
  - Namespace
  - Scene description
  - Scene Commands
  - DIMS Unit Definition
  - Timing model
  - Processing Mode
  - Random Access, Tune-in and Error Recovery
- Interaction and Scripting
  - Local interaction
  - Remote interaction
  - Scripting
- Transport
  - Storage in ISO Base Media File Format Files
  - RTP Payload format for DIMS Streams
- Profiles and Levels
  - Profiles
  - Levels
- Content usage guidelines
- Security and Content Protection Considerations
- Registered Types
  - RTP Payload format MIME Type
  - 'Codecs' Parameter for 3GP files

Some Highlights:

- Rich media system is as client-server architecture (Annex, Figure 3), comprising of
  - rich media server taking as input, rich media content comprised of scene description, discrete (e.g. images) and continuous (e.g. audio, video) media. Scene description can be dynamically updated through scene updates. The rich media content can be encapsulated into a container format.
  - The system then utilizes various transport mechanisms for 1-to-1 and 1-to-many protocols for download, progressive download and streaming scenarios.
  - The content is played on the client, allowing for local and remote interactivity of feedback and data requests.
- For a client supporting DIMS media type the following common base shall be supported:
  - Scene description: The full SVG Tiny 1.2 specification shall be supported
  - Scripting: ECMAScript shall be supported, uDOM shall be supported
  - Compression: XML and GZIP shall be supported
  - Scene extensions shall be supported (RectClip from LASeR, Fullscreen video from LASeR, Fullscreen svg from MORE)
  - Scene update mechanism: The following LASeR commands in LASeR ML format shall be supported: Insert, Delete, Replace, Add, Save, Restore, Delete
  - Tune-in and resynchronization: DRAP shall be supported
  - For error resilience, priority and recovery points shall be supported
- DIMS is introduced as a media type to MBMS (TS 26.346), PSS (TS 26.234), MMS (TS 26.140), and 3GP file format (TS 26.244).
- Changes by Change Requests are still expected to the approved specification.

3GPP TS 26.346 MBMS Enhancements

For MBMS Release 6, one limiting UE capability for MBMS release 6 was that the UE should avoid using interactive bearer resources or any other uplink bearer resources while receiving an MBMS transmission. A number of useful service functions become possible, if

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

MBMS UEs starts using an uplink communication channel in parallel with an MBMS reception channel.

The main aim in the MBMSUSE WI is to extend the MBMS User Service to allow the provision (of MBMS User Service) on existing UMTS bearers with interactive and/or streaming traffic classes (i.e. unicast bearers) without affecting MBMS Release 6 UEs. Among others, the following changes to TS26.346 were introduced:

- Inclusion of the MBMS Counting Indication to the MBMS bearer mode description to indicate whether the RAN level counting procedures are applicable or not for the MBMS broadcast mode
- Caching Directive in MBMS to define the lifetime of files for download services
- MBMS Download in Roaming Condition: Procedures to provide MBMS download over unicast bearers using OMA Push protocol are completed.
- Hybrid PSS/MBMS Streaming services
  - Optimization to allow smooth transition between MBMS and PSS: Synchronization time between MBMS bearers and unicast bearers is reduced.
  - Signaling of initial buffering period: The same mechanism used in PSS for signaling of initial buffering period is included to MBMS.
- FLUTE session set-up with RTSP
- Scalability extensions for unicast delivery of MBMS services: More than one entry point (server) is enabled for unicast delivery of MBMS to avoid problems with scalability (temporal high number of users).
- Improved video support for MBMS: Optional video support is raised from level 1.b to level 1.2 for H.264.

3GPP TS 26.234 PSS Enhancements

Furthermore, the Packet-switched Streaming Service (PSS) feature was enhanced to allow provision of MBMS User Service using PSS where MBMS Bearer Service is not available or desirable. In this context the switching time between channels ("channel surfing") and the ability to provide feedback (interactivity such as voting, etc) was improved in PSS to support Mobile (Interactive) TV services. PSS user services (TS 26.234) have been enhanced by

- PSS Fast Content Switching and Start-up for PSS and MBMS reusing parts (pipelining concept) of RTSP2.0. This reduces the client/server interactions to a minimum.
- Content switch time QoE metric: A new QoE (Quality of Experience) metric for reporting content switching time is added.

3GPP TR 26.902 Video Performance

Work Item initiated by Qualcomm, Siemens, Vodafone, and Three to benchmark the performance of H.264/AVC for 3GPP services. The work item produced TR 26.902 "Video Codec Performance" which

- gives guidance for preparing high quality implementations of H.263 and H.264 video codecs for PS multimedia services. Defines a set of performance metrics and related target figures and explains methods for performance assessment,
- covers the most challenging service scenario of PS conversational / MTSI (which involves UE based encoding, erasure prone transport, low latency requirements, and application layer transport quality feedback). Performance assessment of both encoder and decoder is covered,
- defines and includes test cases, test materials and software tools for the assessment are defined and included in the TR. (TR contains video test sequences, their encodings, error masks, description of error con-

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

cealment techniques, and software to enable the running of tests on codecs.)

An overview of the testing procedure and components is provided in Figure 4.

3GPP TR 26.944 E2E Metrics

Work Item initiated by China Telecom. Output is TR 26.944 "End-to-End Multimedia Services Performance Metrics"

- TR identifies several end-to-end multimedia performance metrics and discusses their relationship, e.g. what features the end users care the most and how these are mapped to QoS parameters measured from the network.
- The metrics are classified into Quality of Experience (QoE) and Quality of Service (QoS) metrics. The QoE metrics quantify performance from the user's point of view and the QoS metrics from the operator's or service provider's point of view.
- Two classes of QoS metrics are distinguished:
  1. End-to-end Service QoS (ESQoS): measure end-to-end quality of the whole service or network. ESQoS include metrics such as service non-availability, service failure ratio, initial connecting time, initial buffering time, audio quality, intra/inter-frame video quality, and audio/video synchronisation error time
  2. System QoS (SQoS): measure point-to-point QoS related to system parts. dedicated to specific system parts and typically have very little meaning to the end user. They include metrics such as bandwidth, transfer delay, jitter, packet loss ratio, frame loss ratio, frame error ratio, frame discard ratio, and residual bit error ratio
- The TR is complementary to work ongoing in ETSI STQ and ITU-T. Relevant parts of the existing/ongoing ETSI STQ and ITU-T work are referred to and used in the TR.

3GPP SA4 Beyond Rel-7 Work

SA4 does not yet have any specific WIs targeting for Rel-8.

Some LSs on Rel-8 work (foremost SAE/LTE) exchanged, e.g., on "rate-adaptive realtime media".

Other potential topics are:

- Continuation and Enhancements of MTSI: Video Performance Enhancements, Characterization, additional codecs and services.
- Integration of Scalable Video Coding and/or Multiview Coding in 3GPP services.
- 3GPP services for Mobile TV applications: PSS, MBMS, interactivity with DIMS, etc.
- Support for gaming applications
- others

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

The next newsletter ...

We will, among others, look at:

- Report from RAN#36 plenary
- Completion of RAN Release 7 Work Items
- Updates on RAN Long Term Evolution

Nomor Research GmbH

Tel.: **+49 (0)89 97898 000**

Fax: **+49 (0)89 97898 010**

Email: **standard@nomor.de**

Web: **www.nomor.de**

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

Annex

List of Key Abbreviations

AMR	**Adaptive Multi Rate (Narrowband)**
AMR-WB	**Adaptive Multi Rate – Wideband**
CTM	**Cellular Text Telephone Modem**
DIMS	**Dynamic and Interactive Multimedia Scenes (SA4 WI)**
DRAP	**Distributed Random Access Point**
DTMF	**Dual Tone Multi Frequency**
eCall	**Emergency Call**
GAL	**Global Analysis Laboratory**
HTTP	**Hypertext Transfer Protocol**
JBM	**Jitter Buffer Management**
LASeR	**Lightweight Application Scene Representation**
MBMSUSE	**MBMS User Service Extensions (SA4 WI)**
MORE	**The Mobile Open Rich media Environment**
MPEG	**Moving Picture Experts Group (of ISO/IEC)**
MSD	**Minimum Set of Data**
MTSI	**Multimedia Telephony Service for IMS**
PSC	**Packet-Switched Conversational**
PSM	**Packet Switched Multimedia (SA4 SWG)**
PSSe	**Packet Switched Streaming Enhancements (SA4 WI)**
QoE	**Quality of Experience**
QoS	**Quality of Service**
RME	**Rich Media Engine**
SQ	**Speech Quality (SA4 SWG)**
SAF	**Simple Aggregation Format**
SVG	**Scalable Vector Graphics**
TFO	**Tandem Free Operation**
TMMBN	**Temporary Maximum Media Bit-rate Notification**
TMMBR	**Temporary Maximum Media Bit-rate Request**
uDOM	**micro Document Object Model**
W3C	**The World Wide Web Consortium**
XML	**Extensible Markup Language**

Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

Figure 1: High-level architecture showing the nodes involved in an MTSI call set-up

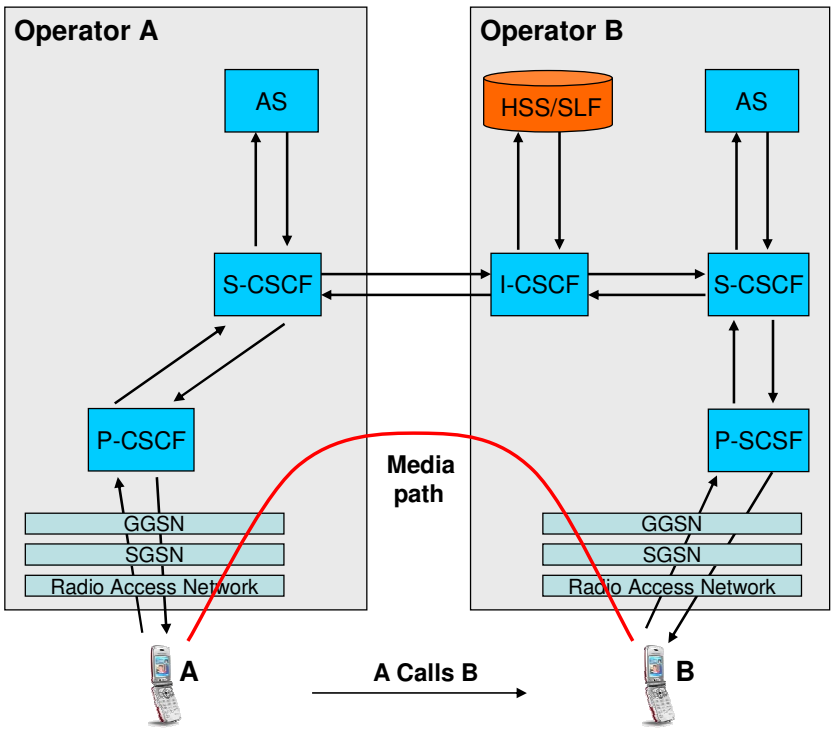
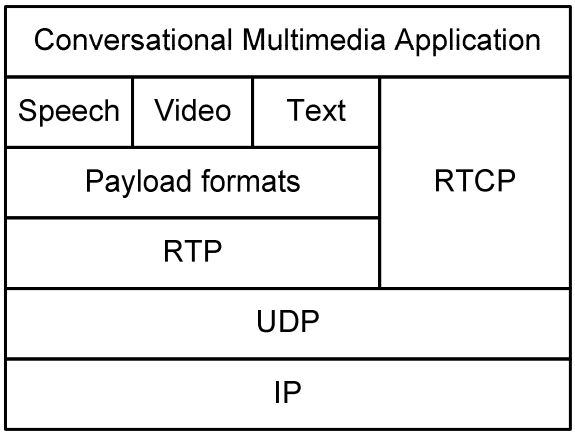


Figure 2: User Plane Protocol Stack for MTSI



Nomor 3GPP Newsletter – May 2007

3GPP SA4 Release 7 Work

Authors: Thomas Stockhammer, Eiko Seidel

Figure 3: DIMS - General architecture of the rich media system

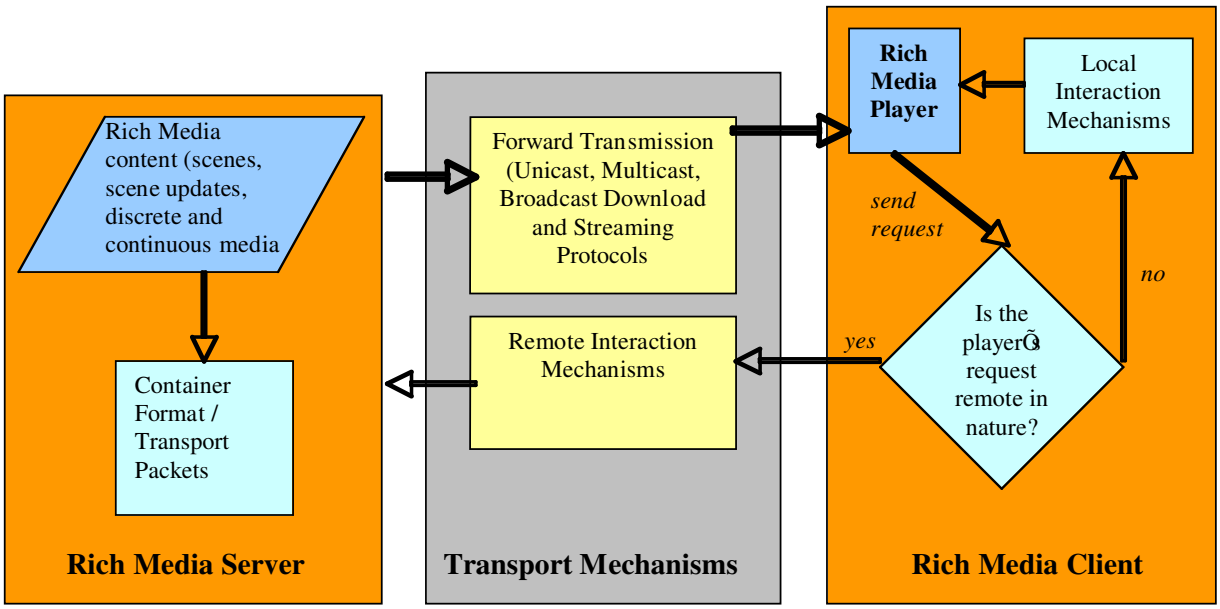


Figure 4: Video Codec Performance – Setup for Generation of Performance Figures