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Agenda Item:

Title: LS on stage 1 for Extended Streaming Service
Source: TSG SA1
To: TSG SA2, TSG SA3, TSG SA4, TSG SA5, TSG T2
cc:
Contact Person:
Name: Linda Werneman, Ericsson
E-mail Address: linda.werneman@ericsson.com
Tel. Number: +4646231646

SA1 would like to inform other 3GPP WGs of the work that has started on a separate stage 1 TS regarding the Extended Streaming Service for release 5.

SA1 intends to do further work on the TS and would like to have comments on the draft TS produced so far.

The intention is to have an ad-hoc session about Streaming before the next SA1 plenary meeting 5-9 November 2001 to be able to produce a TS that can be agreed by SA1.

Attached is the draft stage 1 TS (S1-010836), version 0.2.0.

3G TS 22.XXX 0.[24](#).0 (2001-07)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects
Service aspects;
Stage 1
[Extended](#) Streaming Service
(3G TS 22.xxx Release 5)**



The present document has been developed within the 3rd Generation Partnership Project (3GPP™) and may be further elaborated for the purposes of 3GPP.

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Keywords

UMTS, service, [streamingpush](#)

3GPP

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

<http://www.3gpp.org>

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Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TR, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification.

Introduction

[NOTE : Release 5 service is called : Extended PS Streaming Service \(PSS-E\)](#)

The Streaming service introduces means for an application to play synchronised media streams like audio and video in a continuous way while the streams are being transmitted to the client over the data network.

Streaming services are required whenever instant access to multimedia information needs to be integrated into an interactive media application. This has to be seen in contrast to other multimedia services like for instance MMS where multimedia content is delivered to the user asynchronously by means of a “message”.

Interactive applications that use streaming services can be classified into on-demand and live information delivery applications. Examples of the first category are music, music videos and news-on-demand applications. Live delivery of radio and television programs are examples of the second category, this could e.g. make it possible to listen to domestic radio while abroad.

Besides application focusing on multimedia content delivery only, streaming services can be nicely integrated as an add-on to applications like mobile cinema ticketing where the user gets the possibility to view trailers of films she is interested in.

Background:

A web server works with requests for information, it delivers that particular information as fast as possible, completes the transaction, disconnects and goes on to other requests. A client connects to a web server only when it needs information. The rest of the time the server and client ignore each other. This strategy works well as long as pictures and texts are to be received. If a client wants to watch video or listen to audio, the entire file must be received before it can be played. The problem is that these kinds of files can be very large and the transmitting time with for example a 28.8K modem would be very long. Instead of waiting for the entire media file to be received, the file could be played during the time it arrives. To make this possible a continuous connection would be required between the server and the client. While the client receives the file it plays it as well. Instead of using a web server, special streaming servers are used. These servers have the ability to stream media without disconnecting to the client during a session.

3G mobile telephone systems will thanks to the larger bandwidth offer new possibilities and services. One of these new services will offer the ability to stream sound and movies to mobile devices. Today this possibility exists only for computer users connected to the Internet via a [reasonably](#) fast connection.

The idea of streaming is the ability to watch/listen to media while it is transmitted. This offers many advantages. The user does not have to wait for the entire media content to be received, a client receiving a stream does not have to have enough memory to store the whole media file, i.e. only fractions of the data have to be stored. This is a great advantage when the receiving platform is a mobile phone and the memory is limited. In addition the fact that in the streaming case the content need not to be stored completely on the receiving device is advantageous for content protection purpose

1 Scope

This Technical Specification defines the stage one description of the Streaming Service. Stage one is the set of requirements that shall be supported for the provision of streaming service, seen primarily from the subscriber's and service providers' points of view.

This TS includes information applicable to network operators, service providers, terminal and network manufacturers.

This TS contains the core requirements for the Streaming Service, which are sufficient to provide a complete service.

2 References

The following documents contain provisions that, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 3G TS 22.101: “Service Principles”

[2] 3G TS 21.133: "3G Security; Security Threats and Requirements"

[3] 3G TS 22.105: “Services and Service Capabilities”

[4] [3G TS 26.233: “Transparent End to End Packet Switched Streaming Service \(PSS\) : General Description”](#)

[5] [3G TS 26.234: “Transparent End to End Packet Switched Streaming Service \(PSS\) : Protocol and Codecs”](#)

3 Definitions and abbreviations

3.1 Definitions

Client: in the context of Streaming service the client is a device (or service) that is the subject to receive streamed content from a server.

Server: a device (or service) that passively waits for connection requests from one or more clients. A server may accept or reject a connection to a client as part of a service (streaming).

[Streaming](#) : (tbd)

Terminal Profile: Set of information about the physical capabilities of the terminal.

User Profile: Is the set of information necessary to provide a user with a consistent, personalised service environment, irrespective of the user’s location or the terminal used (within the limitations of the terminal and the serving network).

3.2 Abbreviations

CODEC: COmpression / DECompression

MMS – Multimedia Messaging Service

PS – Packet Switched

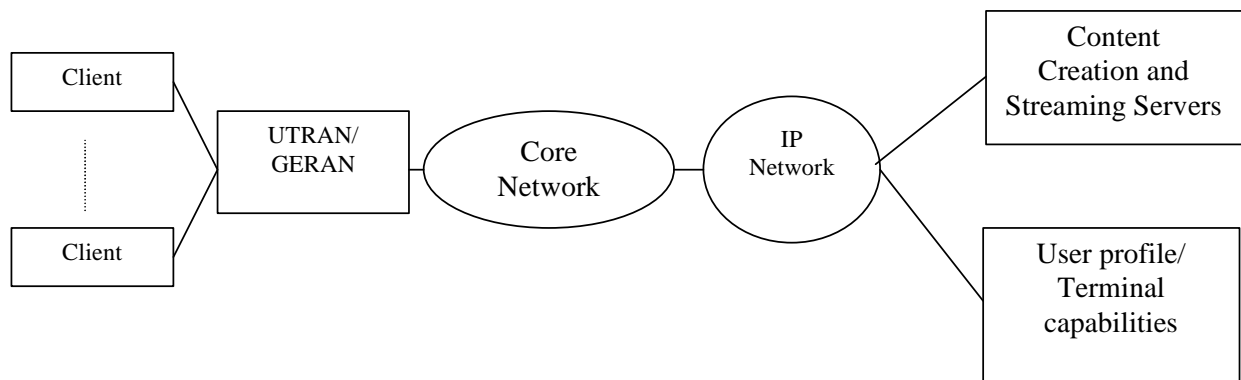
QoS – Quality of Service

UE – User Equipment

4 Entities involved in Streaming service

The figure shows the basic entities involved in the Streaming service and how they connect.

Clients initiate the service and connect to the selected Streaming server. Content creation servers generates live content e.g. video from a concert. User profile and terminal capability data can be stored on a network server and will be contacted at the initial set up. User Profile will provide the Streaming service with the user's preferences. Terminal capabilities will be used by the Streaming service to decide whether or not the client is capable of receiving the streamed content.



NOTE : further work required, see figure 2 in 26.233

5 Requirements

5.1 General

- [The Extended Transparent End-to-End Packet Switched Streaming Service \(PSS-E\) shall add enhanced capabilities to the existing Transparent End-to-End Packet Switched Streaming Service \(PSS\)\[TS26.233 and 26.234\] with considering backward compatibility.](#)
- The Streaming service uses a Client / Server model. The client ~~should be able to~~ controls the server by sending requests to the server, which responds to these commands.
- [The PSS-E shall support downlink and uplink streaming from the PSS-E clients.](#)
- [The Streaming Service should take into account as much as possible on streaming elements \(protocols, formats etc\) already in use in the industry \(e.g. the internet\).](#)
- The Streaming service mechanisms shall:
 - use [existing-open](#) standards where these are available for Streaming service requirements
 - use standard procedures and interfaces to avoid interoperability problems
 - propose extensions to existing standards if needed

5.2 Service Optimisation

- For the purpose of optimized presentation of the media streaming, PSS-E shall include capability exchange and negotiation mechanisms on server/client capabilities and user preferences at the session set up as well as in the communication.

5.25.3 Service Activation and Invocation

An application that wants to access specific content needs a URI address to a streaming server. The address may be typed in by hand, it can come from e.g. a WWW-browser, a WAP-browser or it can be stored in the application itself.

- The client shall initiate the Streaming service.
- The Streaming service shall be gracefully disconnected if the client is not capable of handling the streamed content.
- The end user should be notified if the Streaming service is unavailable.
- The Streaming service should preserve interactivity
- The streaming service should not prevent the user from interacting with the terminal e.g. accepting an incoming call

5.35.4 Transport

- Quality of Service ~~and~~ (e.g. time delay) requirements shall be in accordance with requirements in 22.105 (ref. 3)
- The Streaming service should be able to work over different QoS bearers
- The streaming service transport shall be provided by the PS Domain
- The PSS-E should provide mechanisms for streaming servers and clients to adapt to the network conditions in order to achieve significant improvement in the quality of streaming, e.g. using information on end-to-end transport quality from the network.
- The PSS-E client and the PSS-E server may request appropriate QoS for the session to be activated. QoS shall be set at the beginning of session setup and shall be capable to be changed by either server's/client's request or local operator's policy.

5.45.5 Service Provisioning and Characteristics

- The client shall have the possibility to stop/reject the on-demand and the live Streaming service after it has been invoked.
e.g. if a client has activated the Streaming service and then get a phone call, he/she shall be able to decide whether or not he/she wants the Streaming service to continue. After a stop/reject the client has to activate the service again to continue.
- The client shall have the possibility to pause the on-demand and the live Streaming service after it has been invoked.

When the client decides to continue the on-demand Streaming service, the streamed data shall resume from the pause point, i.e. the point where the streamed data was halted. When the client decides to continue the live Streaming service, the streamed data shall continue from where it is at that moment.

5.5.1 Media Types

- For the purpose of providing improved quality media, the PSS-E clients and servers should support improved and additional new media types such as:
 - graphics (2D and 3D)
 - synthetic audio (e.g. MIDI)
 - enhanced audio and video codecs (e.g. higher levels and profiles and/or new codecs)
 - enhanced scene description (e.g. new features and/or functionality)
 - metadata
 - formatted text (e.g. decorated captions, which synchronize with music, movie and etc.)
- The number of PSS-E media types should be minimum, considering the implementation impact to the terminals, interoperability, contents mobility and backward compatibility.

5.4.15.5.2 Profiles

- The Streaming service should support the ability for the client to have specific preferences described in the user profile.
For example if the user wants to watch a news show the preferred language is specified in the user profile.
- The Streaming service shall support a basic set of physical terminal capabilities.
When the Streaming server is about to set up the streaming session the server needs to know if the client can handle the data which is about to be streamed. These capabilities can for example be stored in the network.

6 Security

The user shall be able to use the Streaming service in a secure manner. Mechanisms shall be provided to ensure that the Streamed data only is sent to and accessed by the intended end-user(s).

The “Security Threats and Requirements” specified in 21.133 [2] shall not be compromised.

The following requirements shall be considered:

- Streaming services may support end-to-end security (e.g. between the Content server and the Streaming client i.e. the UE).

7 Charging

Streaming services should support various charging mechanisms,

It shall be possible to include the following streaming specific data in the CDRs as charging information if available :

~~The following data should be possible to include as charging information if available:~~

- message type, length etc
- ~~delivering~~ [time of start of delivery](#)
- [duration](#)
- Streaming service sender / -recipient
- number of Streaming events sent
- number of Streaming events received.
- media

8 Digital Rights Management

DRM might be desirable depending on content type and value, this chapter is for further study.

- The Streaming service may support different levels of DRM
- The Streaming client should be able to handle content using DRM

9 Interworking

Interworking with conversational multimedia services is important since streaming could be a useful component in many conversational multimedia applications. Interworking with MMS is especially important because there are application scenarios where media delivery via a streaming service could be replaced by media delivery via MMS as a fall back solution.

- The Streaming service shall share media CODECs with other 3G multimedia services to allow easy interworking when needed,

e.g. interworking with MMS

[NOTE : relationship with Multimedia Broadcast/Multicast Service\) MBMS, Push is for further study.](#)

Annex A (informative): Change history

V. 0.1.0	May July 2001	First Draft (Presented at TSG-SA-WG1 #12 and TSG-SA-WG1 #13)
v.0.2.0	July 2001	Second Draft (Presented at TSG-SA-WG1 #13)

Change history										
TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New