3G TS 22.135 1.0.0 (1999-04)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects
Service aspects;
Multicall, Stage 1
(3G TS 22.135 version 1.0.0)

Reference
DTS/TSGS-0122135U

Keywords
<keyword[, keyword]>

3GPP

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Contents

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 TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

x   the first digit:

     1   presented to TSG for information;

     2   presented to TSG for approval;

     3   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;

1   Scope

The present document presents multicall scenarios and requirements for UMTS phase 1 release '99.

One or more of the following can achieve multicall:

1. Several Circuit Switched calls share the same Circuit Switched bearer

2. Several Circuit Switched calls where each of the calls is mapped to a separate Circuit Switched bearer

3. Several Packet Switched sessions are multiplexed on the same Packet Switched bearer

4. Several Packet Switched sessions where each of the sessions is mapped to a separate Packet Switched bearer

Packet switched and circuit switched bearers are treated separately in multicall feature.

In Release 99, bullet 2 does not apply for speech teleservice. However, Release 99 Call control should not prohibit a complete set of multiple speech bearer services in future releases. In Release 99, GSM SS Call Wait, Multiparty and Call Hold are used to offer simultaneous speech calls to user.

The case of an individual call with Multiple bearers is out of the scope of this document.

Multicall is an optional feature in both mobile terminal and network.

2   References

[1]   TS 22.00 UMTS Phase 1

[2]   TS 22.29 Handover Requirements between UMTS and GSM or other Radio Systems

3   Definitions, symbols and abbreviations

3.1   Definitions

Multiparty call: GSM Supplementary Service for speech conference service

CS Call: FFS

PS Session: FFS

3.2   Abbreviations

4   Description

4.1   Description of multicall

One or more of the following can achieve multicall:

- Several Circuit Switched calls share the same Circuit Switched bearer

- Several Circuit Switched calls where each of the calls is mapped to a separate Circuit Switched bearer

- Several Packet Switched sessions are multiplexed on the same Packet Switched bearer

- Several Packet Switched sessions where each of the sessions is mapped to a separate Packet Switched bearer

It shall be possible for each CS call / PS session to have independent traffic and performance characteristics.

It is a requirement, that the current GSM supplementary services are preserved when suitable. Support of UMTS-GSM interworking and handovers, GSM evolution, GSM user conventions etc. are reasons for this requirement.

UTRAN shall be designed in a flexible way to support multiple speech bearers.

4.2 Circuit switched shared and dedicated bearers

The protocol architecture in GSM allows several parallel CS calls, the limitation being that there is only one traffic channel, which the different CS calls share. This is facilitated by e.g. the Call Hold, Call Transfer and Multiparty SSs. This is called shared bearer concept.

A basic assumption with CS multicall is that each CS call has one dedicated bearer, i.e. the default is that each new call (MO and MT) may generate a new bearer. However, the shared bearer mode is also required.
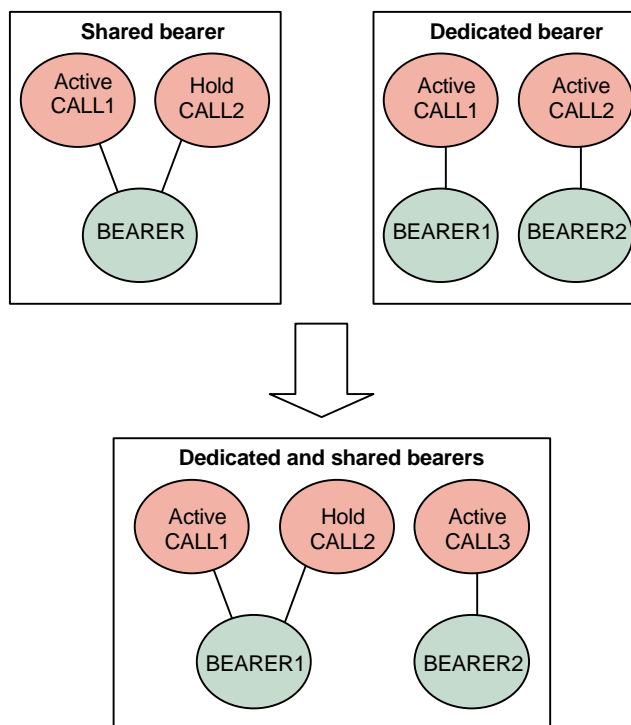

Figure 1:Dedicated and shared bearer concepts

4.3 Multicall service scenarios

4.3.1 Terminating CS call

Terminating speech call

a) Speech bearer has been allocated
-existing bearer shall be shared (Evolution for future releases seen)

b) No speech bearer has been allocated
-allocate a new bearer, if possible

Terminating non-speech call

a) Speech bearer has been allocated
   -allocate a new bearer, if possible, or
   -existing bearer shall be shared

b) No speech bearer has been allocated
   allocate a new bearer, if possible

All terminating CS calls are always indicated to the users to select the action to be taken.

For all terminating cases it shall be possible to release any of the allocated calls/bearers and then accept the incoming call. In all above cases it shall be possible to reject the incoming call.

Note: Limitations pointed out at this section is described in detail at section 5.2.

4.3.2   Originating CS call

Originated speech call

a) speech bearer has been allocated
   -existing bearer shall be shared (Evolution for future releases seen)

b) No speech bearer has been allocated
   -allocate a new bearer, if possible

Originating non-speech call

a) speech bearer has been allocated
   -allocate a new bearer, if possible, or
   -existing bearer shall be shared

b) no speech bearer has been allocated
   -allocate a new bearer, if possible

For all originating cases it shall be possible to release any of the allocated calls/bearers and then set up the call.

Note: Limitations pointed out at this section is described in detail at section 6.

4.3.3   PS sessions

PS sessions shall be handled independently of any CS calls.

   Editors note: GPRS Class A kind of behaviour is assumed. More detailed requirements FFS.

5   Normal procedures

5.1   Provision

The provision of multicall is provided by prior arrangement with home environment.

It shall be possible to set subscriber dependent limits for multicall.

5.2   Limiting the number of multicalls

It should be possible for the number of active calls or sessions supported simultaneously to be restricted and selected by network operator, by the capabilities of the used terminal, the available radio resources, by user subscription and/or user setting. The maximum number of CS calls and PS sessions should be set respectively. It shall be possible to have

one or more CS calls simultaneously with one or more parallel PS sessions.

   Editors Note: More detailed requirements FFS.

5.3   Multicall Reconfiguration

It shall be possible for an active multicall to be re-configured within the limits set by the operator/user and within the capability of the terminal by:

- Adding a new CS calls or PS session

- Subtracting an active CS calls or PS sessions

- Suspending and resume a PS session

- Put an active CS speech call on hold and retrieve it

5.4   Handover

It shall be possible to re-configure the bearers automatically due to a change in the availability of suitable radio resources (Note 1). It shall be possible for the network operator to set the priority of active connections and this priority may influence the automatic re-configuration process. If supported by the terminal, it shall be possible for the user to set the priority of active connections and this priority shall influence the automatic re-configuration process.

Note 1: A change in the availability of suitable radio resources may also occur for other reasons in addition to handover.

For further handover requirements please refer to TS 22.29.

5.5   Multicall Termination

The following options for terminating a multicall shall be provided:

- Termination of active CS calls and PS sessions individually

- FFS

6   Interaction with other services

6.1   General on Supplementary Services

Relation between multicall and supplementary services are considered only in circuit switched connection.

6.2   Line Identification

6.2.1   Calling Line Identification Presentation (CLIP)

No impact, i.e. CLIP shall be provided with all calls.

6.2.2   Calling Line Identification Restriction (CLIR)

No impact, i.e. CLIR shall be provided with all calls.

6.2.3 Connected Line Identification Presentation (COLP)

No impact, i.e. COLP shall be provided with all calls.

6.2.4 Connected Line Identification Restriction (COLR)

No impact, i.e. COLR shall be provided with all calls.

6.3 Call Forwarding

6.3.1 Call Forwarding Unconditional (CFU)

No impact.

6.3.2 Call Forwarding on Busy (CFB)

No impact.

6.3.3 Call Forwarding on No Reply (CFNRy)

No impact.

6.3.4 Call Forwarding on Not Reachable (CFNRc)

No impact.

6.4 Call Completion

6.4.1 Call Hold (CH)

Call hold is applicable to the speech call only.

6.4.2 Call Waiting (CW)

FFS

6.5 Multi Party (MPTY)

Multi Party is applicable to the speech call only.

6.6 Closed User Group (CUG)

No impact.

6.7 Advice of Charge (AoC)

FFS

6.8 Call Barring

No impact.

6.8.1 Barring of all outgoing calls

No impact.

6.8.2 Barring of outgoing international calls

No impact.

6.8.3 Barring of outgoing international calls except those directed to the HPLMN country

No impact.

6.8.4 Barring of all incoming calls

No impact.

6.8.5 Barring of incoming calls when roaming

No impact.

6.9 Explicit Call Transfer (ECT)

ECT is applicable to the speech call only.

6.10 Completion of Call to Busy Subscriber (CCBS)

FFS

6.11 Multiple Subscriber Profile (MSP)

FFS

6.12 Calling Name Presentation (CNAP)

No impact.

6.13 User-to-User Signalling (UUS)

FFS

6.14 enhanced Multi-Level Precedence and Pre-emption service (eMLPP)

FFS

6.15 CAMEL

FFS

Annex A (Informative): Outstanding issues

A.1 Evolution towards several speech bearers

Due to problems foreseen in the interaction of multicall and existing services, the multicall feature is be introduced in a phased manner, meaning that in the first phase, i.e. Release 99.

There is a need to limit the number of parallel circuit switched speech calls to one to avoid potential interactions with supplementary services e.g detection of the user busy condition for supplementary services i.e. CH, CW and MPTY. The need for this limitation needs to be studied further.

UTRAN shall be designed in a flexible way to support multiple speech bearers.

A.2 Busy definition

Main assumption is that it shall be possible to offer all calls to the user. It seen that user may want to set busy status to serving network due to charging or other reasons. This new alternative functionality needs to be further studied. Also the existing Call Waiting SS need to be reviewed.

For GSM busy definition see 02.01 Annex C.

From NTT DoCoMo: The NDUB (Network Determined User Busy) occurs, when a call is about to be offered, if the traffic channel is busy and the maximum number of total calls has been reached. The maximum number of calls depends on the limitation for multicall.

Separation of Speech and Non-speech?

A.2 Charging aspects

tbd

A.3 Security Aspects

tbd

History

Document history		
0.0.1	19 Mar. 1999	First draft by the editor (Tommi Kokkola / Nokia)
0.1.0	30 Mar. 1999	Output from S1 Multicall ad hoc
0.1.0	6 Apr. 1999	Minor modifications by the editor. Proposed version 1.0.0
1.0.0	19 Apr. 1999	For information to 3GPP TSG SA#3