Revelation of an Idea of a "Mixed Reality Group Call"

Combining the Functions of an R'4 GSM-R Network with SIP Dispatcher VR Equipment

Defining a Mixed Reality "Theatre" with the Help of a VGCS Group Call

1 Background

Some use cases of GSM-R networks **might imply the usage of computer 3D graphics (or generally spoken of some "VR Equipment") in combination with SIP Dispatcher equipment.**

In such an application of GSM-R networks, the likenesses of selected Real Life Objects (RLOs, e.g. drones) might be displayed in a real time VR display of a "Theatre".

All these are not really new ideas, but **the special application of a VGCS group call for the definition of the "Theatre"** seems to be something that should be made public to **avoid poisoning patent applications**.

The present paper tries to give a short overview about the whole application of GSM-R networks for this purpose, in particuar we try to describe the application of a VGCS group call for the definition of a Mixed Reality "Theatre".

2 Overview

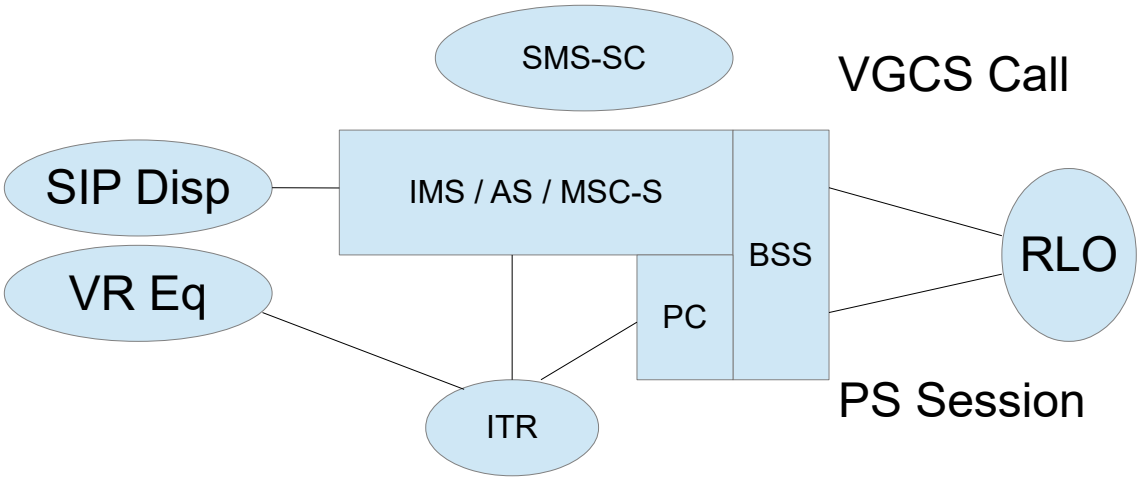

Abbildung 1: Mixed Reality GC - necessary hardware parts

New Hardware Parts

VR Equipment (VR Eq), Interface to Reality (ITR), Real Life Object (RLO)

Existing Hardware Parts

SIP Dispatcher, IP Multimedia Subsystem (IMS), Application Server (AS), Mobile Switching Center – Server (MSC-S), Packet Core (PC), Base Station Subsystem (BSS), Short Message Service – Service Center (SMS-SC)

3 Short Description of the Application

1. The **"Theatre"** is defined by a geographical area – i.e. **by a group call area GCA** – and by an additional modifier – i.e. **by a group id GID**.
2. The ITR has got all the information to compile and/or distribute the 3D infrastructure for the "Model of the Theatre", when it receives the GCRef = GCA + GID
3. The ITR has all the information to create and/or distribute 3D models of all affected RLOs
4. The "VR Equipment" is integrated with the "SIP Dispatcher" as far as useful and possible
5. **Scenario 1 "Initiating a Mixed Reality Group Call"**
   a) A SIP Dispatcher initiates a VGCS in order to define a "Theatre" for the VR Equipment that is integrated with this SIP Dispatcher.
   b) This VGCS is established via "IMS/AS/MSC-S" and "BSS"
   c) The ITR acts as a special SIP Dispatcher and terminates the VGCS.
   d) From the VGCS, **the ITR takes the GCRef and prepares the "Model of the Theatre"** in its memory or database
   e) When the "Model of the Theatre" has been successfully prepared by the ITR, then the **ITR starts to continuously**
      - inform all SIP Dispatchers connected via this VGCS about the address of the "Model of the Theatre" and to continuously
      - inform all RLOs that feel addressed by this VGCS about how to connect to the ITR via the "PC".
   f) The VR Equipment receives the address of the "Model of the Theatre" from the SIP Dispatcher and downloads the "Model of the Theatre" from the ITR.
   g) Now all addressed RLOs establish a packet switched session via the "PC" and start to continuously inform the ITR about their status. The status could be, e.g., the position, the velocity, some orientation or other states like alerting conditions.
   h) The ITR adds or removes models of RLOs dynamically to and from the "Model of the Theatre", as they join or leave the "Theatre"
   i) The "Model of the Theatre" is accessible via the VR Equipment until the VGCS is killed

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