MSc. Assignments Lucent Technologies – Bell Labs Europe in Enschede.

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Fixed Mobile Broadcast Convergence

Fixed Mobile convergence is a hot topic nowadays, which essentially re-uses the VoIP infrastructure (e.g. IMS) for both fixed and mobile networks. Broadcast networks and broadcast services are considered in this convergence. Because of the unidirectional nature of broadcast network and its similarity with the nature of (IP) multicast this creates interesting possibilities in future networks.

We have the following research questions for broadcast/multicast convergence
1. how to add external audio/video streams to a multimedia session
2. find generic ways to join to a broadcast/multicast stream.
3. how can users set-up group multicast sessions

The following sections describe background on the different research questions in more detail.

(1) In principle, external streams can become part of a session, at session startup or even in a running session. This assignment specifically addresses how to dynamically add external streams to a session (a previous assignment looked at splitting a session across local devices). External streams can be voice (VoIP) or video streams like broad- or multicasted radio and TV. A typical use case would be telling a friend in a VoIP call that there is an interesting video broadcast and adding this broadcast to this VoIP session, of course this could potentially raise interesting DRM issues. Another use case would be enjoying a multicast/broadcast session and temporary replace the audio/video with personalized audio/video (e.g. targeted news or advertisement).

(2) Currently joining IP multicast, broadcast and MBMS channels is implemented differently. To join a IP multicast stream, you typically have to join the access router specifically using the multicast protocol. In broadcast it is only possible to explicitly join (which may be necessary to get decryption keys) when also a bidirectional (or at least uplink) network connection is available. In MBMS you typically join a channel using a webpage where it is advertised. In this assignment we are looking at merging these and possible other ways of joining multi- and broadcasted streams with an application level protocol like SIP which is commonly available and can easily convey device capabilities. This also opens generic possibilities for mobility across technologies, scheduled join for times when no uplink is available (or to save battery), etc.

(3) Currently most multicast streams are provisioned by the network provider and are 1 to many. In this assignment we want to address how users could set-up group sessions using application level signaling and getting a free-to-use multicast address for this session from the network provider. These sessions could potentially be used by game communities, for (scheduled) audio/video conferences, for giving shared presentations and interactive courses.