**A Feasibility Study on Virtual Presence in Physical Meetings**

Erik Guttman, 14.01.18

3GPP IT Task Force

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**1 Introduction**

We are discussing virtual/remote participation in a physical meeting. There are two clear kinds of meetings:

- **physical meetings** (face to face)
- **virtual meetings** (no face to face, every participant is remote)

To that I think we need to add:

- **hybrid meeting** (some are face to face [F2F], some are remote)

It seems to me we will concentrate hybrid meetings to address the action item from PCG.

**Action PCG41/01:** IT Improvements Ad Hoc Group to study the conditions under which virtual presence in physical meetings/virtual meetings would be practicable and the types of tools that would be required to support them [**3GPP/PCG#41(18)05**].

That is not to say that we couldn’t separately investigate virtual meetings – what is possible today and how this could be improved. But this is not the task at hand.

**2 Roles, Activities, Goals**

Let’s distinguish first between the possible roles for remote participants that we *could* support. This doesn’t mean we should try to support all of them.

1 – remote chairman / session chairman

2 – remote secretary

3 – remote presenter (includes a remote rapporteur): has the floor

4 – active remote participant: may request the floor, raise an objection, join a show of hands, volunteer for an action, may change to a remote presenter

5 passive remote participant: following closely, view the presentation (including active updates), know the document number being discussed, know the outcome of a discussion, change to an active remote participant, change to a remote presenter

6 – remote voter (note we already have a mechanism for proxy voting, this remote role would be ‘direct voting’ virtually)

7 – remote attendee *as checked-in* delegate

I suggest we leave 6 and 7 out of the discussion, since they will be covered by the working procedures task force.

I suggest we rule out 1 since one really needs to see delegates to guide the discussion successfully, to get some benefit from a face to face meeting. If the session chairman is remote, then effectively *everyone* is remote – the on-line meeting becomes virtual not hybrid.

I suggest we assume to start out with that there are no added IT requirements *for the face to face participants themselves* to participate in a hybrid meeting. This may be incorrect, e.g. we may decide that the F2f participants need some display showing ‘who is talking remotely’ or of the queue of remote participants waiting to speak, etc. I ask these questions below and further questions may arise. I propose that we focus on the remote participants’ needs first.

Please find below an initial analysis of what different actors would do and need, with IT functions needed in blue (or omitted if ‘everything will work as it normally does’ as <normal>.) I leave some items FFS.

I proceed optimistically as if ‘everything is possible’ in a hybrid scenario for roles 2-6.

|  |  |  |
| --- | --- | --- |
| **Role** | **Activities** | **Goals** |
| 2) Remote Secretary | * Control the CR, TDOC, etc. databases – issuing new numbers and changing the status of documents.
	+ Communicate changes to these dbs to all participants both remote and physically present.
* Identify who has the floor currently
* Hear **and see** what is said (from the chair and floor) and what is presented
 | 1. intervene if necessary [be heard remotely and in the F2F session; all may identify that it is the secretary who is speaking The identity of the speaker should be represented in text form for the remote participants. The identity of remote participants speaking should be represented for those attending the physical meeting. This information would improve the ability of participants to interpret statements.]
2. report remotely [hear remotely; identify F2F or remote speaker remotely]
3. report on drafting, follow activity [See what is on the session screen remotely]
4. Capture all changes in the tdoc and CR databases <normal>
5. Manage tdoc database (numbers, assignments, etc) so as to keep all participants in the meeting in sync [There should be a remote representation of the current tdoc status for remote participants.]
6. Capture all agreements, actions and state changes on tdocs, comments for the report, objections in the report. <normal>
7. Identify process violations and warn the working group. <normal>
8. Interact with the Liaison officer throughout the meeting <normal>
 |
| 3) Remote Presenter | * **Hear what is said**
	+ Nice to have: feedback who is in the queue to speak, how many hands go up, whose, etc.
	+ Essential: speaker can be interrupted (by the chairman)
* **Present remotely** (Be heard by physical meeting participants)
	+ Nice to have: video of chair and audience when one presents
	+ Nice to have: see what is being presented, in case the presentation is being marked up / edited on-line
	+ Nice to have: remotely visible timer if presenters are time-limited
	+ Nice to have: video of presenter’s face
* **Off-line work** (if revisions are needed on a presented document)
 | 1. Present remotely [be heard remotely and in the F2F session; nice to have: control screen remotely]
2. All may identify the remote speaker [identify the speaker. The identity of the speaker should be represented in text form for the remote (and physical) participants. The identity of remote participants speaking should be represented for those attending the physical meeting. This information would improve the ability of participants to interpret statements.]
3. Draft remotely [nice to have: control screen remotely]
4. Respond to comments [hear remotely]note: the chairman will determine who will comment, so it is not necessary that the remote presenter know whose hands are up but [nice to have: queue seeking the floor visible remotely]
5. Work within time constraints [shall be interruptable by the chairman; the chairman needs the power to ***stop*** a presenter from speaking]
6. Receive follow up instructions [hear the chairman or secretary announce numbers and tdoc status change and next step instructions]
7. Follow the tdoc status [ There should be a remote representation of the current tdoc status for remote participants.]
 |
| 4) Active remote participant | * Be recognized to speak & get the floor
* Identify who has the floor currently
* Hear **and see** what is said and projected in the physical session
	+ Indication which document is currently being presented.
	+ Know the up to date information as to the current state of tdocs,
* Be able to take actions (e.g. request a change, object to an action, propose a procedure/way forward, etc.)
* Provide and access revisions, drafts, as one would as a F2F participant.
* Access to the ‘drafts’ folder (read & upload)
* Participate in a show of hands
* Volunteer for an action (e.g. to take the pen for drafting a document)
 | 1. Gain the floor [remote signalling of a raised hand – allowing the chairman to manage both the remote and F2F participants in one queue.]
2. All may identify the remote on-floor participant [identify the speaker. The identity of the speaker should be represented in text form for the remote (and physical) participants. The identity of remote participants speaking should be represented for those attending the physical meeting. This information would improve the ability of participants to interpret statements.]
3. Follow what is going on in the session [hear remotely; identify speaker remotely; tdoc status There should be a remote representation of the current tdoc status for remote participants.]
4. Ability to take actions (question, comment, object [be heard remotely and in session]
5. Provide and access revisions (inbox), drafts folder, etc., as if F2F) [remote ftp access to local meeting in a timely way; remote ftp upload to meeting]
6. Take remote action, e.g. participate in a show of hands, volunteer to take a document, indicate an objection when asked “are there any objections?”
 |
| 5) Passive remote participant | * view the presentation (including active updates),
* know the document number being discussed,
* know the outcome of a discussion,
* change to an active remote participant, change to a remote presenter
 | As above (1: enter the queue) (3: hear remotely; identify the remote or F2F speaker; follow TDOC status)(5: upload and download docs) |

Let’s discuss the material above before we discuss how to consolidate the IT requirements. Let’s get a set of consolidated IT requirements before we identify and evaluate specific candidate solutions.

**3 Consolidated Requirements**

Candidate Requirements for the Hybrid Scenario:

R1 Audio

R1.1 The speaker who has the floor + Chairman may speak and be heard both locally and remotely.

R1.2 the chairman shall have a means to ***stop*** a remote presenter from speaking

R1.3 the remote speaker shall (if given the floor) have their audio output amplified over the local PA system and audible to other remote participants.

R2 Video

R2.1 See what is on the session screen remotely

R2.2 [This requirement is ‘nice to have.’] A remote presenter may control ‘the screen’ remotely: the view will then be presented on the physical screen at the meeting and be available for view by remote participants.

R3 Audio + Video

R3.1 All (remote+physical participants) may identify who is speaking: The identity of the speaker should be represented in text form for the remote (and physical) participants. The identity of remote participants speaking should be represented for those attending the physical meeting. This information would improve the ability of participants to interpret statements.

R4 Floor Control

R4.1 The chairman shall be able to identify active remote participants who have ‘raised his hand’ to become an active presenter (or to make a comment, etc.)

R4.2 The chairman shall be able to give the floor to a remote active participant, so they can become an active presenter (or just so they can make a comment via audio.)

R4.3 The chairman shall be able to stop a remote speaker or remote presenter from speaking (same as R1.2), effectively *taking the floor away* from the speaker / presenter.

R5 Data

R5.1 There should be a remote representation of the current tdoc status for remote participants.

R5.2 remote signalling of a raised hand – allowing the chairman to manage both the remote and F2F participants in one queue.

R5.3 remote ftp access to local meeting in a timely way; remote ftp upload to meeting

R5.4 Active remote participants shall be able to participate in the following actions (though they cannot be physically seen by the chairman):

* participate in a show of hands
* indicate that they object to any decision (e.g. when asked by the chairman)
* volunteer for an action when asked by the chairman (e.g. to take the pen to draft a reply LS)
* to raise a ‘hand’ to indicate that they wish to speak

NOTE: the management of the queue remains at the discretion of the chairman

FFS: should the remote queue be visible to those in session?

R5.5 there may be a way to remotely ask a question or make a comment without having the floor. This is already done via chat, email, etc. at meetings. Satisfaction of this optional requirement by a particular IT solution is ‘nice to have.’

**4 Scenarios**

This study distinguishes between two environments

* A **fixed location** which may be equipped with some IT support for remote participation, e.g. the ETSI premises
* A **hosted conference location** often in meeting facilities of hotels, etc. This location has infrastructure (audio, visual, network) that must be organized at the location in cooperation with the venue and host.

The resources available in a fixed location may be quite different than those in a hosted conference location. While the same roles need to be supported, it may not be the case that the goals are the same.

This study will identify recommendations that will meet the needs of the different roles primarily in the hosted conference location scenario. In a fixed location, more might be done than meet the requirements we identify for the hosted conference location.

FFS Can we assume that the fixed location IT support will be at least as good, if not better than the hosted conference location?

FFS Should this study seek to identify a single set of IT solutions that will always work? This would make remote participation easier, since you could obtain and learn how to use the remote participation tools… This is a question related to Scenarios because it could be that some fixed locations use different tools (already) than what this study would recommend for hosted conference locations.

**5 Solutions**

**5.1 Solution 1: Chat Moderator for Notifications and Inbound Comments / Questions**

Description:

A chat moderator in a session can provide outbound information via a chat tool, e.g. when a new AI starts, which tdoc is being handled, what the result was, any change to the prior arrangement (e.g. “We are done early with AI 15.3 so we are starting with AI 17.9 even though it is not yet 12:00.”)

The chat moderator can gather comments and questions from the chat session and give voice to them (or a combination of them) at the microphone. This could support remote participants who have limited ability to participate, e.g. no ability to become a ‘remote speaker.’

NOTE: this solution requires a volunteer who is a F2F participant at the meeting session.

Technical Realization:

(a) Skype

(b) IRC

(c) Jabber

(d) App-specific (integrated into WebEx, GotoMeeting, Skype, or web-based)

FFS: Details allowing evaluation

Addresses Requirements:

R3.1 identify who is speaking

R5.1 remote representation of the current tdoc status

R5.5 identify who is speaking

R5.6 make comments or ask questions remotely

**5.2 Solution 2: Live Tdoc status indication**

Description:

The current tdoc under discussion is known remotely. The preceding and next tdocs should also be displayed, as well as their current status (e.g. noted, revised to, postponed, not handled, etc.)

Technical Realization:

(a) ‘live’ or ‘often’ updated web page with status information.

(b) chat transcript includes tdoc status updates (“1455 opened.” “1455 revised to 1732, open.” An up-to-date tdoc list / chairman’s notes should also be available for download via FTP for those who want to know which tdoc is coming next.

FFS: Details allowing evaluation

Addresses Requirements:

R5.1 remote representation of tdoc status

**5.3 Solution 3: Remote Screen Support**

Description:

The session screen is made available to remote participants, so they can view the same display panel as being used in the F2F session. Nice to have: a remote presenter may control the screen.

NOTE: this is not something we support today – the presenter does not control the screen in a F2F meeting.

Technical Realization:

(a) webex

(b) gotomeeting

(c) VNC

FFS: Details allowing evaluation

Addresses Requirements:

R2.1 see what is on the session screen remotely

R2.2 a remote presenter may control ‘the screen’ remotely

**5.4 Solution 4: Remote Participation Tool**

Description:

A remote participant can take action in the meeting.

* Raise a hand to ask the chairman to be given the floor
* Object to an action (e.g. when the chairman asks if there are any objections)
* Volunteer for some action
* Participate in a show of hands

NOTE: for queue management, some tool that manages who raised their hand in what order might be nice.

Technical Realization:

FFS

Addresses Requirements:

R4.1 the chairman identifies remote participants who raise their hand

R5.4 active remote participants participate in actions

**5.5 Solution 5: Controlled Audio Support**

Description:

The audio over the PA system also is sent to remote participants so they can hear.

The audio output of remote speakers allowed to speak by the chairman (‘given the floor’) is audible both over the PA system and the remote participant’s audio output.

Remote speakers may have the floor *taken away* by the chair

Technical Realization:

(a) webex

(b) gotomeeting

(c) skype

FFS: Details allowing evaluation

Addresses Requirements:

R1.1 listen remotely to ‘the floor’

R1.2 chairman may stop a remote speaker

R1.3 a remote participant speaker is audible to other participants

R3.1 remote speaker’s identity should be made known to all participants (remote and at the F2F meeting.)

**5.6 Solution 6: Remote Access to meeting FTP server**

Description:

Technical Realization:

(a) improved mirroring support for FTP, including ‘reverse mirroring’ where remote participants can upload to an internet accessible FTP server (e.g. at ETSI), and the file uploaded will be made available in the INBOX or DRAFTS folder of the meeting server.

FFS: Details allowing evaluation

Addresses Requirements:

R5.3 remote FTP access to a local meeting in a timely way

6 Existing support for Remote Participation & Gaps

Existing Support

1. Register to the meeting (not much use since you can’t check in, although it does indicate /interest/ in the meeting)
2. Read all the emails on the relevant reflector, and respond as needed, including stating company objection to something (which might not be taken into account by the chairman)
3. Send and receive personal emails to a delegate who is present in the room
4. Engage in real-time chat with a delegate who is present in the room using whatever tool is available to both of them
5. Ask a delegate who is present in the room to make an intervention on her behalf.
6. Receive feedback on #5 via real-time chat or personal email or reflector email
7. Download all the documents including from the inbox
8. View semi-live updates to current and next documents depending on the tools in use in the meeting room (I think updates to SYNC are provided every ~20 mins)

Gaps

Remote participant roles

[2] Remote secretary, [3] remote presenter, [4] active remote participant, [5] passive remote participant.

|  |  |  |  |
| --- | --- | --- | --- |
| **Reqt** | **Summary** | **Comment** | **Roles that need this support** |
| R1.1 | The local speaker may be heard locally and remotely. | Not supported. | All |
| R1.2 | The chairman shall be able to stop the remote speaker. | Not supported. | [3], [4] |
| R1.3 | The remote speaker may be heard locally and remotely. | Not supported. | All |
| R2.1 | See what is on the session screen remotely | Not supported. | All |
| R2.2 | Remote control of the session screen (nice to have) | Not supported. | OPTIONAL: [2], [3], [4] |
| R3.1 | Identify who is speaking | Not supported. | All |
| R4.1 | Chairman shall be able to identify remote participants who raise their hand | Not supported. | [2], [5] |
| R4.2 | Chairman shall be able to give the remote participant the floor to speak | Not supported. | [2], [5] |
| R4.3 | The chairman shall be able to stop a remote participant from speaking. | Not supported. | [3], [4] |
| R5.1 | There should be remote representation of the current tdoc status. | Partially supported via periodically synchronized files on the 3gpp server. | All |
| R5.2 | Remote signalling of a raised hand – allowing the chairman to manage the local + remote queue. | Not supported. | All |
| R5.3 | Access documents via the ftp server (local & 3GPP) | Partially supported via download access (only) to the 3GPP server with synchronized content from the meeting. | All |
| R5.4 | Active remote participants can take actions at the meeting (show of hands, object, volunteer) | Not supported. [NOTE: Balazs proposed ‘proxy’ solution, not IT-related] | [3], [4], [5] |
| R5.5 | Ask a question or make a comment without having the floor (nice to have) | Partially supported, e.g. using skype chat or other means to communicate with delegates at the meeting. | [2], [5] |

Other gaps:

Kevin observed that there is no terminology for parallel sessions in a meeting.

7 Evaluation

Observations (from discussion on the 3GPP\_IT mailing list):

1) It would be desirable to select a few attainable goals with potential great benefit and begin experimenting with them at meetings, even if it doesn’t support all goals of all roles.

2) It would be advantageous to choose an integrated tool to simplify adoption and use.

3) Some of the tools discussed would be helpful at the meeting as well as for remote participants as meetings are very busy, meeting rooms are large, etc.

4) Some tool support is easy as there are existing tools that already partially fulfil the requirements and in addition MCC has experience with these tools already.

8 Recommendations

**Change Log:**

15.01.19 Added ‘Existing support for Remote Participation & Gaps’
Added an evaluation section, and some observations to start.

14.01.19 Removed the FFS for remote off-line participation. Add Requirement 5.6 optional / nice to have: ability to ask questions or make comments remotely without the floor.

Added solutions 1-6.

10.01.19 Removed the FFS for the chairman cutting out remote speakers (add this as a
requirement. Change remote manipulation of the ‘screen’ to a MAY (nice to have) per RB’s suggestion.

 Modified the roles per KH’s suggestion. Added Scenarios per SH’s suggestion. Added document structure.

09.01.19 Created this document. Added content (see revision marks)

30.11.18 Posted the basic content on the 3GPP\_IT reflector