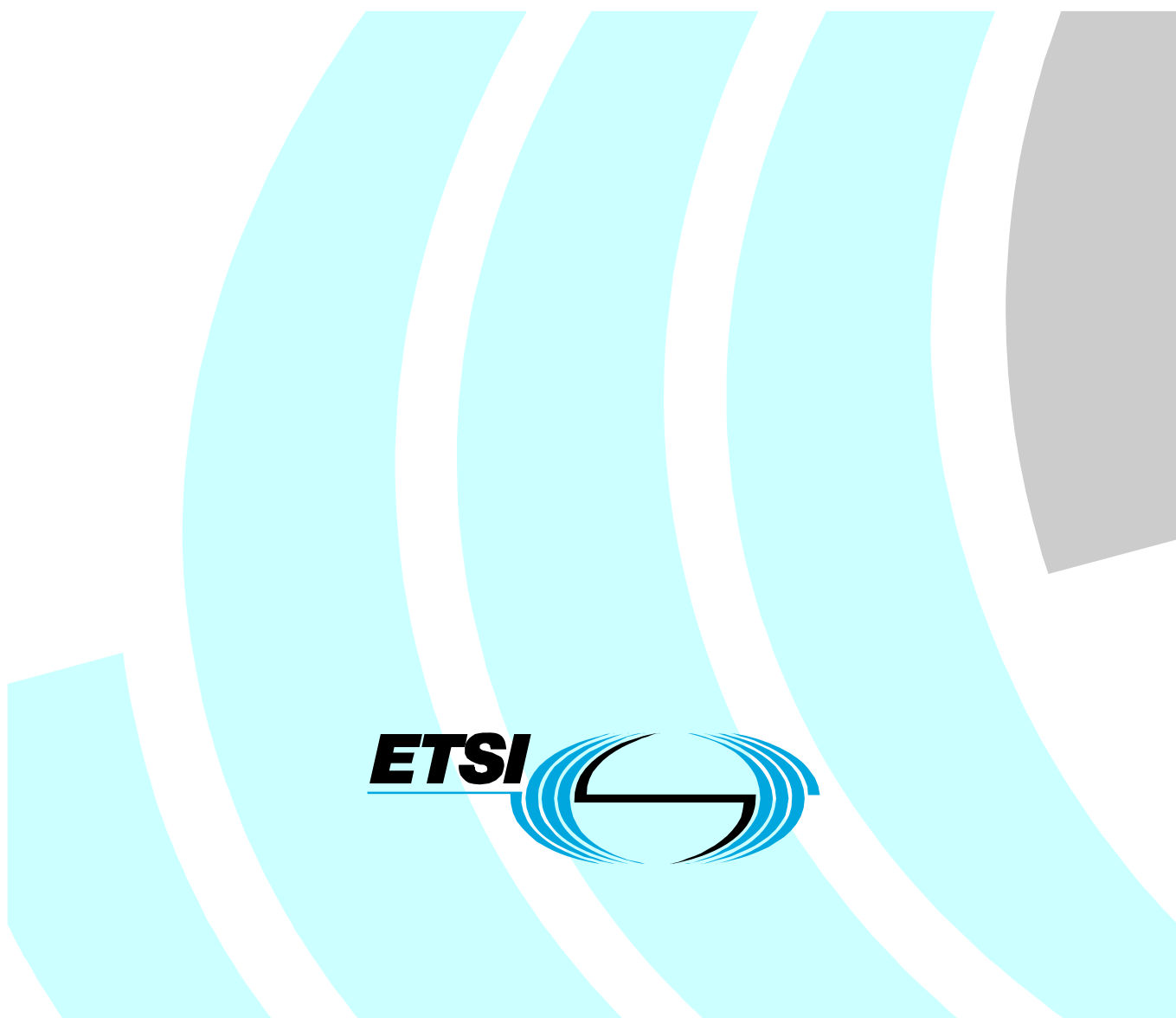


**Electronic Working Tools;
Roadmap including recommendations for the deployment and
usage of electronic working tools
in the ETSI standardization process**



Reference

DSR/BOARD-00010

Keywords

audio, environment, quality, video

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Contents

Intellectual Property Rights	5
Foreword.....	5
Introduction	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	6
3 Definitions and abbreviations.....	7
3.1 Definitions.....	7
3.2 Abbreviations	8
4 Electronic working tools and their usage in the standardization work.....	8
4.1 Electronic working tools	9
4.1.1 Telephone conference	9
4.1.1.1 Terminal equipment (for speech)	9
4.1.1.2 Conference bridges/MCU	9
4.1.1.3 Multimedia terminal equipments (for speech + video)	9
4.1.2 Desktop Sharing.....	10
4.2 Guidelines.....	10
4.2.1 General.....	10
4.2.2 Schedule a meeting	10
4.2.3 Planning of the agenda for an electronic meeting	10
4.2.3.1 Rough planning of the agenda for an electronic meeting	10
4.2.3.2 Detailed planning of the agenda for an electronic meeting	10
4.2.4 Meetings spanning over different time zones	11
4.2.4.1 General.....	11
4.2.4.2 Meetings with participants from North America and Europe	11
4.2.4.3 Meetings with participants from Europe and Asia	11
4.2.4.4 Meetings with participants from North America, Europe and Asia	11
4.2.5 Duration of meetings	12
4.2.6 Desktop sharing	12
4.2.7 Hosting of standardization meetings.....	12
4.2.8 Costs for participants	12
5 Deployment roadmap for collaborative tools	12
5.1 Introduction	12
5.2 Step 1: Audio.....	13
5.2.1 Guidelines	13
5.2.2 Performance criteria.....	13
5.2.3 Timescales for introduction	13
5.2.4 Measured/estimated improvement	14
5.3 Step 2: Desktop sharing.....	14
5.3.1 Performance criteria.....	14
5.3.2 Timescales for introduction	14
5.3.3 Measured/estimated improvement	14
5.4 Step 3: Desktop sharing plus only one participant on video.....	14
5.4.1 Performance criteria.....	14
5.4.2 Timescales for introduction	14
5.4.3 Measured/estimated improvement	15
5.5 Step 4: Desktop sharing plus multiple participants on video.....	15
5.5.1 Performance criteria.....	15
5.5.2 Timescales for introduction	15
5.5.3 Measured/estimated improvement	15
5.6 Step 5: Full videoconference - telepresence	15
5.6.1 Performance criteria.....	15

5.6.2	Timescales for introduction	15
5.6.3	Measured/estimated improvement	16
Annex A: Questionnaires for Quality of Remote meetings		17
A.1	Overall opinion about the quality during the meeting	17
A.1.1	What is your overall opinion about the quality of the tools provided by the meeting's system?	17
A.1.2	Effort required to follow and participate to the discussions	17
A.1.3	Connection (speech quality) you have just been using	17
A.1.4	"How would you assess the sound quality of the other participants voices?"	17
A.1.5	"How well did you understand what the other participants were saying ?"	18
A.1.6	"What level of effort did you need to understand what the other participants were saying ?"	18
A.1.7	"How would you assess your level of effort to converse back and forth during the conversation?"	18
A.1.8	"Did you detect Impairments?"	18
A.1.9	"If yes, how annoying was it?"	18
A.1.10	"How would you qualify the communication?"	19
A.1.11	"Did you experience any echo?"	19
A.1.12	"How would you judge the degradation from echo of your own voice?"	19
A.2	Questions about the connection.....	19
A.2.1	What kind of speech connection did you use?.....	19
A.2.2	"Did you or the other participants have any difficulty in talking or hearing over the connection?	20
A.2.3	How did you find the voices of the other participants?	20
A.2.4	"If there was noise on the connection, how annoying was it?"	20
A.3	Information on the meeting system	20
A.4	Questions related to the user's overall impression of the system	20
A.5	Other questions on the usage of electronic tools	21
A.5.1	Prior to the meeting: - Electronic meeting arrangements: How was the Information about the meeting arrangements?.....	21
A.5.2	During the meeting	21
A.5.3	After meeting.....	21
Annex B: Additional elements to be taken into account.....		22
B.1	Different types of equipment.....	22
B.2	Lip synchronisation	22
B.3	Speech bandwidth	23
B.4	"Chat"	23
B.5	Room acoustics and electroacoustic equipment positioning.....	23
B.6	User experience	24
Annex C: Bibliography		25
C.1	For speech terminals.....	25
C.2	User related QoS	25
C.3	Speech quality (subjective assessment).....	25
C.4	Multimedia quality (subjective assessment).....	26
C.5	Audiovisual QoS for communication over IP networks.....	26
History		27

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Foreword

This Special Report (SR) has been produced by the ETSI Board GREEN AGENDA strategic topic group.

Introduction

The present document describes high level guidance for the use of electronic working tools considering performance, privacy and security with a phased introduction of the collaboration tools necessary for effective remote participation in ETSI. The present document also takes into account the time zone differences to ensure the maximum participation of members to electronic meetings.

1 Scope

The present document describes electronic working tools, and a roadmap for their implementation including guidelines for the deployment and usage in the ETSI standardization process.

Annexes provide additional information on questionnaires to be completed by the users of these tools, concerning technical issues and standards that could help manufacturers to develop such tools.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] EBU Recommendation R37-2007: "The relative timing of the sound and vision components of a television signal".

Speech Terminals

- [i.2] ETSI ES 202 740: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for wideband VoIP loudspeaking and handsfree terminals from a QoS perspective as perceived by the user" .
- [i.3] ETSI ES 202 739: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for wideband VoIP terminals (handset and headset) from a QoS perspective as perceived by the user" .
- [i.4] ETSI ES 202 738: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for narrowband VoIP loudspeaking and handsfree terminals from a QoS perspective as perceived by the user" .
- [i.5] ETSI ES 202 737: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for narrowband VoIP terminals (handset and headset) from a QoS perspective as perceived by the user".

QoS and network performance metrics and measurement methods

- [i.6] ETSI ES 202 765-2: "Speech and multimedia Transmission Quality (STQ); QoS and network performance metrics and measurement methods; Part 2 : Transmission Quality Indicator combining Voice Quality Metrics".

- [i.7] ETSI ES 202 765-4: "Speech and multimedia Transmission Quality (STQ); QoS and network performance metrics and measurement methods; Part 4: Indicators for supervision of Multiplay services".

Specification and measurement of speech transmission quality

- [i.8] ETSI EG 201 377-1: "Speech and multimedia Transmission Quality (STQ); Specification and measurement of speech transmission quality; Part 1: Introduction to objective comparison measurement methods for one-way speech quality across networks".
- [i.9] ETSI ES 201 377-2: "Speech and multimedia Transmission Quality (STQ); Specification and measurement of speech transmission quality; Part 2: Mouth-to-ear speech transmission quality including terminals".
- [i.10] ETSI EG 201 377-3: "Speech Processing, Transmission and Quality Aspects (STQ); Specification and measurement of speech transmission quality; Part 3 : Non-intrusive objective measurement methods applicable to networks and links with classes of services".

Audiovisual QoS for communication over IP networks

- [i.11] ETSI ES 202 667: "Speech and multimedia Transmission Quality (STQ); Audiovisual QoS for communication over IP networks".
- [i.12] ITU-R Recommendation BT.1359-1: "Relative timing of sound and vision for broadcasting".
- [i.13] ETSI ETS 300 807: "Integrated Services Digital Network (ISDN); Audio characteristics of terminals designed to support conference services in the ISDN".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

blog: type of website or part of a website

NOTE: Blogs are usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video. Entries are commonly displayed in reverse-chronological order.

chairman/leader: person who manages the meeting and has the responsibility of drafting the agenda and production of the report

chat: any kind of communication over the Internet, but is primarily meant to refer to direct one-on-one chat or text-based group chat (formally also known as synchronous conferencing), using tools such as instant messengers, Internet Relay Chat, talkers and possibly Multi-User Domains (MUD)s

NOTE: The expression *online chat* comes from the word *chat* which means "informal conversation".

co-located participants: participants located in the same room

conferencing terminals: terminals to be used by co-located participants

desktop sharing: common name for technologies and products that allow remote access and remote collaboration on a person's computer desktop through a graphical terminal emulator.

NOTE: Desktop sharing, when used in conjunction with other components of multimedia communications such as audio and video, creates the notion of virtual space where people can meet, socialize and work together.

electronic mail: most commonly abbreviated to email or e-mail, is a method of exchanging digital messages

host of a physical meeting: when an electronic meeting is organized with co-located participants, the host of the physical meeting has to ensure that the relevant conferencing terminals are available in the room

NOTE: The host also has to ensure that the necessary bandwidth is provided.

organizer: person in charge of the registration to electronic meetings, of the information of the potential participants (prior to the meeting) and in charge of the availability of the electronic tools

remote access: access to a meeting through an electronic tool

remote collaboration: opportunity given to participants to be fully involved through an electronic tool

NOTE: This means that all the participants are able to listen, to talk and to exchange comments on shared documents

remote participants: participants to a meeting through an electronic tool

secretary: person who has similar roles as in a normal physical meeting as a secretary

wiki: website that allows the easy creation and editing of any number of interlinked web pages via a web browser using a simplified markup language or a WYSIWYG text editor

NOTE: Wikis are typically powered by wiki software and are often used to create collaborative websites, to power community websites, for personal note taking, in corporate intranets, and in knowledge management systems.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

MCU	Multipoint Control Unit
MUD	Multi-User Domains
VoIP	Voice over Internet Protocol

4 Electronic working tools and their usage in the standardization work

Several kinds of electronic tools may be used.

Some of them are to be used in real-time and simultaneously by the participants, others do not need the participants to be connected simultaneously.

The priority should be given, as far as possible, by ETSI to the provision and use of open and standardized tools. These tools should avoid as much as possible any intrusion on the Personal computers of the participants. Privacy, security and access for all should be also major criteria to be taken into account.

The ETSI STF 354 website contains guidelines derived from the main known empirical user test results when user experience has been examined for one or more technical parameter. The user experience of an electronic working tool can be expected to vary according to many characteristics of the users, their communication purpose, the communication situation and technical parameters of the communication service. This information is available at: http://portal.etsi.org/stfs/STF_HomePages/STF354/.

Detailed information on these guidelines are available in annex B.

4.1 Electronic working tools

As indicated in the introduction, different types of electronic working tools may be used depending on the types of participations planned:

- Case 1: If all the participants are located in different physical locations and are using individual tools, these tools are mainly implemented on Personal Computers and are using the interfaces available on the Personal Computer (or that may be connected to the PC, e.g. headsets) and may be associated to phone terminals and conference bridges.
- Case 2: If some participants are located in one meeting room, the other participants are using individual tools, special attention should be paid to the equipment in the meeting room: all the participants in the meeting room should be close to the microphones to avoid impairment from background noises and room reverberation. The number of loudspeakers and their locations should be implemented to ensure the best hearing to the local participants and to avoid any howling. The distant users will use equipment similar to case 1. Note that in certain cases (e.g. remote participation to workshops) muting of distant participants will be done during the presentations.
- Case 3: When several groups of participants are located in different locations using group tools, telepresence systems could be used.

4.1.1 Telephone conference

Telephone conference, used alone, or in conjunction with screen sharing is a very powerful tool as long as the speech quality is good enough for all the participants.

4.1.1.1 Terminal equipment (for speech)

The participants to electronic meetings may use different types of terminal equipment. The quality provided by this terminal equipment may have a strong impact on the quality.

References [i.2], [i.3], [i.4] and [i.5] provide requirements for speech terminals providing good speech quality.

Wider speech bandwidth may also improve the quality and, in particular, the intelligibility and the naturalness of the participants speeches.

The different types of terminal equipment may be defined as:

For individual usage:

- Headsets (connected to personal computers or analogue/digital terminal),
- Handset terminals, and
- Handsfree terminals.

For collective usage: several users located in the same room:

- Group Audio Terminals,
- Conferencing systems (e.g. Telepresence systems). These conferencing systems may be audio only but most of them combine audio and video facilities.

4.1.1.2 Conference bridges/MCU

The Multipoint Control Unit (MCU) is a device capable of mixing audio/video from multiple endpoints to create a virtual meeting space. More detailed information is available in annex B.

4.1.1.3 Multimedia terminal equipments (for speech + video)

Multimedia terminals are terminals for multimedia services usually including video and/or audio and/or data.

4.1.2 Desktop Sharing

Desktop sharing, when used in conjunction with other components of multimedia communications such as audio and video, creates the notion of virtual space where people can meet, socialize and work together. On the larger scale, this area is also referred as web conferencing.

4.2 Guidelines

4.2.1 General

The Chair should make sure that all participants are identified.

The Chair should establish proper etiquette for calls:

- ask participants to announce their name each time they speak (if not shown automatically). See note 3 below;
- ask participants to be brief and clear;
- establish ways to ask for the floor.

If the Organizer of the meeting is different to the Chairman of the meeting, if requested, the Organizer should pass the organizer role to the person who will chair the meeting to enable them to manage the meeting efficiently.

NOTE 1: The Chairman should make sure that all participants are identified (some service providers offer tools such as automated roll-call).

NOTE 2: The Chairman should make sure that all participants are included in the attendance list and that proper notices and summaries are distributed (also to give credit to participants).

NOTE 3: The Chairman should frequently restate the current proposal, offer summaries of the discussions and refer to the agenda item under discussion.

NOTE 4: Decisions should be handled very carefully to make sure that everybody on the call is fully aware of what is being adopted. Written text available to all, roll call of delegates or of countries, confirmation by email in the days following the teleconference are possible methods to ensure this. The protocol for making decisions should be established by the group in advance (if they choose to allow them).

4.2.2 Schedule a meeting

Doodle® (<http://www.doodle.com/>) or Meet-O-Matic™ (<http://www.meetomatic.com>) can help with the scheduling of meetings and other appointments. Using these applications, which require no signup for anybody involved, is as simple as picking available dates from the calendar, adding the meeting name and email address, and then sharing the generated URL with participants of the meeting, who will also be prompted to pick a date from the list. Once all the responses are collected, the meeting organizer can view the next available date for everybody, and schedule the meeting from there.

4.2.3 Planning of the agenda for an electronic meeting

4.2.3.1 Rough planning of the agenda for an electronic meeting

The draft agenda should be disseminated by the Chairman to all on the participants well in advance of the meeting. For example, for ETSI Technical Body meetings the agenda shall be disseminated at least 30 days before a meeting.

4.2.3.2 Detailed planning of the agenda for an electronic meeting

The most effective teleconferences have a limited scope, clear objectives and a limited number of participants.

The following can help in the organisation of electronic meetings:

A "Living Agenda" with document allocation to time slots provides the following advantages:

- it serves as a detailed living meeting agenda, which guides participants through the meeting,
- it can be used to show the allocation of received contributions to agenda items,
- it can be used to show the order of treating documents during the meeting sessions,
- it can be used to show decisions taken on the contributions.

Distribution of the 1st draft of the Agenda: this should be performed after the provision document deadline.

Distribution of further drafts: this should be performed 1 hour after end of each meeting day and should:

- Record the meeting day's decisions/results on contributions,
- Update the planning for the next meeting day.

Table 1: Example of "Living Agenda" content per agenda item/time slot

Document number / title of contribution Document status - For information - For discussion - For decision - Available (yes/late/no)	<i>Planning</i>
Document treatment - Treated in meeting (yes/no) - Decision (approved, approved with modifications, postponed, rejected) - New document revision number (if required)	<i>Recording</i>

4.2.4 Meetings spanning over different time zones

4.2.4.1 General

It is recommended that a meeting is scheduled within "waking hours" and therefore meeting times between 24:00 (midnight) and 06:00 (morning) (ideally 23:00 and 07:00, respectively) should be avoided.

For example the **World Clock Meeting Planner**TM, <http://www.timeanddate.com/worldclock/meeting.html>, is a useful tool when arranging meetings spanning over different time zones and taking into account the daylight saving times.

4.2.4.2 Meetings with participants from North America and Europe

For meetings with participants from North America and Europe it is recommended that the meeting is within the time frame 15:00-19:00 CET/CEST.

4.2.4.3 Meetings with participants from Europe and Asia

For meetings with participants from Europe and Asia it is recommended that the meeting is within the time frame 07:00-12:00 CET/CEST.

4.2.4.4 Meetings with participants from North America, Europe and Asia

For meetings with participants from North America, Europe and Asia it is recommended that the meeting is within the time frame in table 2.

Table 2: Electronic meetings in different time zones

14:00 UTC	Asia (e.g. Tokyo)	Asia (e.g. Beijing)	Central Europe (e.g. Paris)	US East Coast (e.g. New York)	US West Coast (e.g. San Francisco)
DST	UTC+9	UTC+8	UTC+2	UTC-4	UTC-7
	22:00	21:00	15:00	09:00	06:00
Standard	UTC+9	UTC+8	UTC+1	UTC-5	UTC-8
	23:00	22:00	15:00	09:00	06:00

4.2.5 Duration of meetings

It is recommended that each meeting session should not be longer than 2 hours before a break occurs.

4.2.6 Desktop sharing

It is recommended that the host opens a Desktop sharing session at least 10 minutes before the meeting is intended to start.

The registration to a meeting is very important. For various reasons (e.g. IPR) it is very important to have a record of who participated in the meeting.

4.2.7 Hosting of standardization meetings

Requirements on hosts for standardization meetings where there is remote participation. For further study.

4.2.8 Costs for participants

There should be an effort to minimize costs to each participant (this may differ from one tool to another; for example through the use of a service provider that offers local calling numbers in all countries considered, call-back service or use VoIP).

5 Deployment roadmap for collaborative tools

5.1 Introduction

The following steps define the roadmap for the deployment and usage of electronic working tools in the ETSI standardization process.

Step 1: Audio.

Step 2: Desktop sharing.

Step 3: Desktop sharing plus limited video.

Step 4: Desktop sharing plus full video.

Step 5: Full videoconference - telepresence.

Before ETSI validates any choice or installation of new collaborative systems it should set up a number of assessment processes such as:

- User tests: to check that all the steps of the use of a new system are fully valid.
- Technical assessment of the quality through objective and subjective measurement methods. These assessments will check the different media implemented, e.g. speech, video and data quality.

Annex A provides a set of questions to be used for such "qualification" tests.

5.2 Step 1: Audio

Any member may participate remotely and submit / present contributions using audio. Contributions may be sent by E-mail or Ftp and displayed by secretary. The Audio connection should be good enough for remote participants to hear all comments / questions.

5.2.1 Guidelines

The Chairman should make sure that all participants are identified.

The Chairman should establish a proper etiquette for calls, e.g.:

- Ask participants to mute their connections if they operate in a noisy environment. (Some lines may impair the global quality, and it is often difficult for the Chair to identify them). The tools should offer the Chairman or the secretary the possibility to mute all the lines and to open the floor when participants are "raising their hand".
- The Chairman should monitor the quality of the connections and should take action if the quality is not acceptable (some service providers offer diagnostics of faulty connections) or if those joining via internet are not managing to maintain adequate connectivity and are consequently disrupting the meeting.

When not speaking the microphone should be muted. If a muting function is not available on the terminal, the muting function of the conference system should be used.

The person who has the meeting organizer role should mute participants whose quality of audio is not acceptable.

5.2.2 Performance criteria

Every word understandable (100 % audible recognition).

Ability to recognize voice of person speaking (if pre-learned or just learned).

A multinational group should successfully share a foreign language (e.g. English).

Any room location of talker at physical meeting should provide adequate volume to remote person(s).

Set-up time < 30 s.

The participants are requested to use terminal equipment fulfilling the ETSI ESs referred to in clause 4.1.1.1.

In particular it is very important for the overall quality:

- that the end-to-end delay should be as low as possible,
- that no echo should be perceptible from any terminal or network equipment.

Prior to the meeting the participants should ensure that the terminal equipment used makes available a muting function.

The participants should also avoid being located in a reverberant or noisy environment.

NOTE 1: There are several ways to assess or to monitor the speech quality of calls. See [i.6] to [i.10].

NOTE 2: It could be relevant to implement monitoring tools to ensure that the participant connections provide adequate levels of Quality. This could be done prior to the acceptance of the connection to the meeting tool.

5.2.3 Timescales for introduction

Available now for narrowband speech.

Wider bandwidth for speech is for further study.

5.2.4 Measured/estimated improvement

Provides an improvement compared to E-mail as a online dialogue can be established.

5.3 Step 2: Desktop sharing

Contributions can be presented using a desktop sharing tool (e.g. GoToMeeting™ or equivalent) visible to all participants and progressive editing of the document displayed. The Audio connection needs to be good enough so that no remote participant is disadvantaged. Speakers need to be identified by name.

5.3.1 Performance criteria

Audio. The same criteria as clause 5.2.2 should be applied.

Data. The user performance requirements for the data part are:

- Legible documents consisting of mainly text and graphics.
- PowerPoint slides containing fonts > 10 pt so that they are by readable by remote participants.
- Set-up time < 1 minute.

5.3.2 Timescales for introduction

Available now for narrowband speech.

Wider bandwidth for speech is for further study.

5.3.3 Measured/estimated improvement

Provides an improvement compared to audio only as documents can be presented and edited online by different authors.

5.4 Step 3: Desktop sharing plus only one participant on video

Documents and remote speaker both visible to all participants. Option: All questioners appear on video. The limitation is that only one person can appear on the video at the same time.

5.4.1 Performance criteria

Audio. The same criteria as clause 5.2.2 should be applied.

Data. The same criteria as clause 5.3.1 should be applied.

Video. User performance requirement for the video part:

- Legible documents consisting of mainly text and graphics.
- PowerPoint slides containing fonts > 10 pt so that they are by readable by remote participants.
- Set-up time < 1 minute.

Additional performance criteria may be found in [i.6] and [i.10].

Note that information on lip synchronization is available in clause 5.5.1. Note also that some systems offer fine lip-synchronisations but this may introduce long end-to-end delays which limit the interactivity between participants.

5.4.2 Timescales for introduction

Timescale for introduction: 2011.

5.4.3 Measured/estimated improvement

Provides an improvement compared to audio as documents can be presented and edited online by different authors.

5.5 Step 4: Desktop sharing plus multiple participants on video

Build on current Webinars to include video as a key element to see the speaker and/or chairman as well as the documents. This includes multiple participants on video.

5.5.1 Performance criteria

Audio. The same criteria as clause 5.2.2 should be applied.

Data. The same criteria as clause 5.3.1 should be applied.

Video. The same basic criteria as clause 5.4.1 should be applied. In addition the User performance requirement for the video part are:

- Remote talker can adequately see any physical meeting talker (e.g. independent of sitting location).
- Remote talker is adequately visible to all meeting participants.
- Talker sees all other participants in 'continual presence' (i.e. not 'voice activated' window configuration).
- Seek to promote perception of a 'round table' not an 'interview panel' (effect on amount of discussion and turn-taking).
- Set-up time < 1 minute.

Lip asynchrony should be less than 200 ms. The detectability thresholds are 125 ms when sound is delayed with respect to the video, and 45 ms when sound is advanced with respect to the video.

5.5.2 Timescales for introduction

Timescales for introduction: End of 2011.

5.5.3 Measured/estimated improvement

For further study.

5.6 Step 5: Full videoconference - telepresence

Teleconference / multimedia telepresence using professional equipment.

No standards are available for the time being. However, ongoing work in ETSI STQ and ITU-T SG12 and SG16 in collaboration with IETF should provide some deliverables by end 2011 or 2012.

5.6.1 Performance criteria

For further study.

NOTE: These systems are intended to provide a high level of quality. In particular the speech/audio bandwidth should be wider than those currently implemented for audio conferences. The size of the screen and the interactivity performance should give to the participants the impression of being in the same room.

5.6.2 Timescales for introduction

Timescales for introduction: after 2011, To be decided later.

5.6.3 Measured/estimated improvement

For further study.

NOTE: The size of the screens and the interactivity performance (for audio and video) should give to the participants the impression of being in the same room.

It could be an effective alternative to physical meetings for a small number of participants.

Annex A: Questionnaires for Quality of Remote meetings

The following questions have been adapted from several ITU-T Recommendations. These recommendations are considered as the references for subjective assessments.

A.1 Overall opinion about the quality during the meeting

A.1.1 What is your overall opinion about the quality of the tools provided by the meeting's system?

Excellent	5
Good	4
Fair	3
Poor	2
Bad	1

Note that for systems providing videoconference, the evaluation should reflect the user's opinion of the overall combined audio and video quality.

A.1.2 Effort required to follow and participate to the discussions

Complete relaxation possible; no effort required	5
Attention necessary; no appreciable effort required	4
Moderate effort required	3
Considerable effort required	2
No meaning understood with any feasible effort	1

A.1.3 Connection (speech quality) you have just been using

Excellent	5
Good	4
Fair	3
Poor	2
Bad	1

A.1.4 "How would you assess the sound quality of the other participants voices?"

The five-point scale descriptors are:

- No distortion at all, natural
- Minimal distortion
- Moderate distortion
- Considerable distortion
- Severe distortion

A.1.5 "How well did you understand what the other participants were saying ?"

The five-point scale descriptors are:

- No loss of understanding
- Minimal loss of understanding
- Moderate loss of understanding
- Considerable loss of understanding
- Severe loss of understanding

A.1.6 "What level of effort did you need to understand what the other participants were saying ?"

The five-point scale descriptors are:

- No special effort required
- Minimal effort required
- Moderate effort required
- Considerable effort required
- Severe effort required

A.1.7 "How would you assess your level of effort to converse back and forth during the conversation?"

The five-point scale descriptors are:

- No special effort required
- Minimal effort required
- Moderate effort required
- Considerable effort required
- Severe effort required

A.1.8 "Did you detect Impairments?"

- Yes
- No

Could you define the impairments detected?

A.1.9 "If yes, how annoying was it?"

The five-point scale descriptors are:

- No annoyance

- Minimal annoyance
- Moderate annoyance
- Considerable annoyance
- Severe annoyance

A.1.10 "How would you qualify the communication?"

- Unacceptable
- Acceptable

A.1.11 "Did you experience any echo?"

- Yes, most of the time
- Yes, sometime
- Yes, one or two times
- No, never

If yes:

- On your own voice
- On another voice

A.1.12 "How would you judge the degradation from echo of your own voice?"

- Imperceptible
- Perceptible but not annoying
- Slightly annoying
- Annoying
- Very annoying

A.2 Questions about the connection

A.2.1 What kind of speech connection did you use?

Headset connected to your PC

Mobile phone

Fixed phone (PSTN or ISDN) Wired wireless(e.g. DECT) Handset or handsfree

Fixed phone (VoIP) Wired wireless(e.g. DECT) Handset or handsfree

A.2.2 "Did you or the other participants have any difficulty in talking or hearing over the connection?"

Yes = 1 No = 0

A.2.3 How did you find the voices of the other participants?

- Unnatural
- Natural

A.2.4 "If there was noise on the connection, how annoying was it?"

- Not noticeable
- Noticeable, but not annoying
- Slightly annoying
- Annoying
- Very annoying

A.3 Information on the meeting system

The meeting system provided the desired information

Strongly agree	agree	Neither agree nor disagree	Disagree	Strongly Disagree

The provided information was

Complete				incomplete
----------	--	--	--	------------

Clear				unclear
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A.4 Questions related to the user's overall impression of the system

Overall, you are satisfied with the meeting system:

Strongly agree	agree	Neither agree nor disagree	Disagree	Strongly Disagree
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You perceived the meeting arrangement as:

Pleasant				unpleasant
Relaxed				stressed

A.5 Other questions on the usage of electronic tools

A.5.1 Prior to the meeting: - Electronic meeting arrangements: How was the Information about the meeting arrangements?

Excellent	5
Good	4
Fair	3
Poor	2
Bad	1

Was it easy to join the electronic meeting?

- No special effort required
- Minimal effort required
- Moderate effort required
- Considerable effort required
- Severe effort required

If you had any difficulty to join the electronic meeting, could you indicate why?

A.5.2 During the meeting

The first parts of the annex A are dedicated to global perception from the user, and to media quality. It should be relevant to add similar questions for:

- Use of chat
- Use of "hand raising"
- Use of mute systems

A.5.3 After meeting

Questions about the access to recorded information, the archives, the report, etc. can be asked.

Annex B: Additional elements to be taken into account

The elements provided in this annex are not detailed but refer to publications in which very detailed information may be found.

B.1 Different types of equipment

The different types of equipment should be considered:

- **Audio listening only (mainly for presentations)**

The participants may only listen the speaker(s). The audio presentation may be associated to screen sharing and video.

This may be used in real time or recorded for a later listening/viewing.

Potential applications are workshops.

- **Real time interactive audio (for meetings)**

All the participants may listen and speak in an interactive way.

This kind of electronic tool may associate other tools such as screen sharing, chat,...

- **Real time interactive Audio/video (for meetings)**

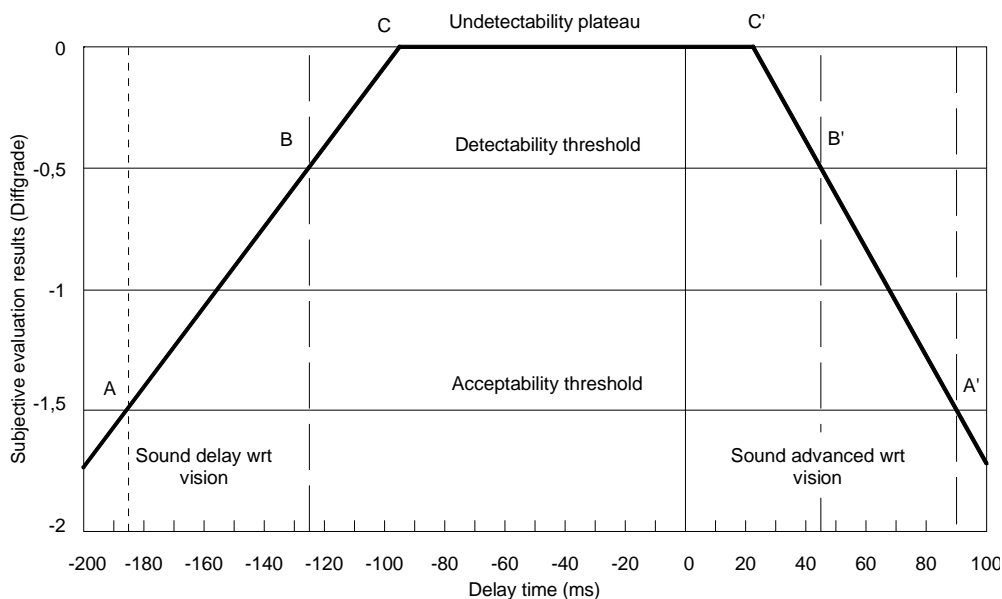
It may be useful to add video to the audio conversation, in particular when it is expected to offer to the participants similar (or as close as possible) conditions as in a physical meeting.

This type of approach is in particular the objective of systems such as Telepresence. For the time being, there is no standards for these types of services but ETSI STQ, ITU-T SG12 and SG16 are currently working on this and in collaboration with IETF.

B.2 Lip synchronisation

The EBU has long recommended that, for the broadcast signal, the relative delay between audio and video signals should be within the range -40 ms to +60 ms (i.e. the sound signal should not arrive more than 40 ms before the picture or later than 60 ms after the picture) [i.1]. Note the excerpt from ES 202 667 [i.11], clause 4.2.4:

"For broadcasting purposes ITU-R Recommendation BT.1359-1 defines detectability and acceptability threshold for lip synchronization. Figure 2 describes these thresholds. The detectability thresholds are 125 ms when sound is delayed with respect to the video, and 45 ms when sound is advanced with respect to the video. The acceptability thresholds are 185 ms when sound is delayed with respect to the video, and 90 ms when sound is advanced with respect to the video."



NOTE: Figure B.1 is corresponds to figure 2 of ES 202 667 [i.11].

Figure B.1: Detectability and acceptability thresholds for lip synchronization"

B.3 Speech bandwidth

Several ETSI Standards and Specifications define requirements to be fulfilled by terminal equipments. A set of these standards are listed in clause 2 of the presnet document, other references are available in annex C. The speech bandwidths:

- Narrow-Band bandwidth: 300 Hz to 3,4 kHz
- Wide-Band bandwidth: 150 Hz to 7 kHz
- Superwideband bandwidth: 50 Hz to 14 kHz
- Fullband bandwidth: 20 Hz to 20 kHz

B.4 "Chat"

A "chat" or instant messaging service among participants can be a very useful tool to keep all participants fully aware of the current stage of ongoing discussions and decisions. No transcription of this will be included in the meeting report. A moderator would be helpful to control the pace and order of conversation.

B.5 Room acoustics and electroacoustic equipment positioning

The positioning of transducers in the acoustic environment can strongly influence their effective performances and suitable installation criteria should be followed in order to maximize the signal-to-noise and signal-to-reverberation ratios.

In particular the main parameters to be taken into account when installing teleconference/videoconference systems are:

- room acoustics (e.g. reverberation);
- background noise;

- sound insulation (privacy), mainly for individual use.

Additional parameters to be taken into account are at least:

- A room suitable for a normal face-to-face conference should be selected.
- Maximum talker to microphone distance should be determined taking into account both the noise and reverberation dependencies.
- The microphones and loudspeakers should be positioned in accordance with both these distances.
- The microphone type should be chosen according to the room environment.

More detailed information are available in ETS 300 807 [i.13]. Audio characteristics of terminals designed to support conference services ITU-T Supplement P16; 16 Guidelines for placement of microphones and loudspeakers in telephone conference rooms and for Group Audio Terminals.

B.6 User experience

STF354 (http://portal.etsi.org/stfs/STF_HomePages/STF354/) has worked for the guidelines give quality of experience results for particular communication situations. They are based on user test results and expressed in QoS terms.

Regarding suggestions on the use of it for the work on "electronic working tools", the website contains guidelines derived from the main known empirical user test results when user experience has been examined for one or more technical parameter (e.g. QoS). The user experience of an electronic working tool can be expected to vary according to many characteristics of the users, their communication purpose, the communication situation and technical parameters of the communication service. For example, it could be that 'audio' is 'excellent' for some 'standards body drafting sessions' but 'fair' or 'poor' for some other 'standards body drafting sessions', depending on different elements of the communication situation (such as whether the users know each other well and already share common understanding) and the technical parameters of the service.

Annex C: Bibliography

ETSI EG 202 534: "Human Factors (HF); Guidelines for real-time person-to-person communication services".

ETSI EG 202 670: "Human Factors (HF); User Experience Guidelines for real-time communication services expressed in Quality of Service terms".

ETSI TC M2M #8 Meeting Tool "DAD".

NOTE: Available at:

[http://webapp.etsi.org/DocumentFinder/LocateFile.asp?file_name=M2M\(10\)0004r6_Meeting_DAD.zip&docID=185782](http://webapp.etsi.org/DocumentFinder/LocateFile.asp?file_name=M2M(10)0004r6_Meeting_DAD.zip&docID=185782)

ETSI TR 102 469: "Digital Video Broadcasting (DVB); IP Datacast over DVB-H: Architecture".

C.1 For speech terminals

ETSI TS 103 740: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for wideband wireless loudspeaking and handsfree terminals from a QoS perspective as perceived by the user".

ETSI TS 103 739: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for wideband wireless terminals (handset and headset) from a QoS perspective as perceived by the user".

ETSI TS 103 738: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for narrowband wireless loudspeaking and handsfree terminals from a QoS perspective as perceived by the user".

ETSI TS 103 737: "Speech and multimedia Transmission Quality (STQ);Transmission requirements for narrowband wireless terminals (handset and headset) from a QoS perspective as perceived by the user".

C.2 User related QoS

ETSI EG 202 057-1: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 1 General".

ETSI EG 202 057-2: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 2: Voice telephony, Group 3 fax, modem data services and SMS".

ETSI EG 202 057-3: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 3: QoS parameters specific to Public Land Mobile Networks (PLMN)".

ETSI EG 202 057-4: "Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 4: Internet access".

C.3 Speech quality (subjective assessment)

ITU-T Recommendation P.800: "Methods for subjective determination of transmission quality".

ITU-T Recommendation P.805: "Subjective evaluation of conversational quality".

ITU-T Recommendation P.851: "Subjective quality evaluation of telephone services based on spoken dialogue systems".

C.4 Multimedia quality (subjective assessment)

ITU-T Recommendation P.911: "Subjective audiovisual quality assessment methods for multimedia applications".

C.5 Audiovisual QoS for communication over IP networks

ISO/IEC JTC 1 N 9476 2009-01-12: "JTC 1 Standing Document 1 (SD 1) Best Practices on Teleconferencing".

History

Document history		
V1.1.1	August 2011	Publication