



# **LION CERTIFICATION PROCEDURE**

*THE TECHNICAL REQUIREMENTS AND PROCEDURES FOR  
THE LION VIDEOCONFERENCE PARTICIPATION*



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## 1 Introduction

Section 2 describes the different types of participation of the LION videoconferences. The procedure and conditions for certifying sites for participation of the LION videoconferences are described in sections 3 and 4.





## 2 Types of participation

This section describes the different types of participation of future LION videoconferences. For each type of participation different technical requirements apply.

### 2.1 Surgery room and moderator

#### 2.1.1 Surgery room

The surgery rooms are at the highest level of participation. A surgery room will be broadcasted during part of the event. Furthermore, surgery rooms can interact with each other and with the moderators.

Surgery rooms must have HD videoconferencing equipment working over an IP connection. Network, video and audio must meet high standards. An HD connection to the SURFnet videoconferencing service must be possible at a bandwidth of at least 1.5 Megabit per second without packet loss. Audio and video quality need to be good (subjective) in a multipoint conference.

#### 2.1.2 Moderator

A moderator is a special kind of participant at an equal level of participation as a surgery room. Moderators will be broadcasted during part of the event. They will decide what surgery room will be broadcasted and they can relay questions to the surgeons.

Moderators must have HD videoconferencing equipment working over an IP connection. Network, video and audio must meet high standards. An HD connection to the SURFnet videoconferencing service must be possible at a bandwidth of at least 1.5 Megabit per second without packet loss. Audio and video quality need to be good (subjective) in a multipoint conference. Each moderator will need at least two HD videoconferencing codecs, one to monitor the event and one to interact with the other participants. The above network requirements should be met for all codecs together. This means that per moderator a free usable bandwidth of at least 3 Megabit per second is needed.

### 2.2 Auditorium

The second level of participation is referred to as "Auditorium". Auditoria can watch a channel of the videoconference over an IP connection. Interaction with other auditoria or surgery rooms is only possible if it is approved allowed by the moderators.

Auditoria must have HD videoconferencing equipment working over an IP connection. Network, video and audio must meet high standards. A connection to the SURFnet videoconferencing service must be possible at a bandwidth of at least 1 Megabit per second without packet loss. Audio and video quality need to be good (subjective) in a multipoint conference.

### 2.3 Auditor

The third and last level of participation is referred to as "Auditor". Auditors are viewers that can watch any channel of the videoconference over the Internet. Interaction is only possible by sending questions to the moderators by e-mail.



Auditors need to have a Windows or Macintosh computer and a relatively good Internet connection. For a high quality stream, a 2 Megabit Internet connection is required. This connection is allowed to have a slight packet loss.





### 3 Procedures for registration

Surgery rooms and auditoria that want to participate in a future LION event need to pre-register in order to start the certification process. As the LION videoconferences evolve, for each net LION videoconference a new pre-registration and certification is required.

#### 3.1 Pre-registration through a form on the LION website

A web based form is needed to register the LION participants. Participants need to provide the following information:

- Participant's institution
- Name, e-mail address and phone number of technical contact person
- Name, e-mail address and phone number of scientific contact person
- Videoconferencing system IP address (if known)
- Videoconferencing system brand and model number
- Videoconferencing system firmware
- Videoconferencing system maximal supported bandwidth
- Videoconferencing system maximal supported resolution
- Network maximal supported bandwidth
- The participant's Time Zone

The web based form should generate an e-mail notification to one or more responsible persons within the LION foundation. After authorisation by the LION, the registrant is requested to pay the registration fee<sup>1</sup>. When the registration fee is paid, the certification process can start.

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<sup>1</sup> The certification fee is a fee that is used to cover the expenses of the technical tests that are needed to successfully connect to the LION videoconference. As the technical requirements are only part of the requirements for participation, paying the certification fee does not grant the participant the right to participate in the LION event.



## 4 Procedures for certification

A two phase certification process is applied: in phase I, the network and equipment is certified. A participant that passed phase I certification can connect to the LION videoconference and send and receive a good quality video and sound. This is a necessary condition to enter phase II certification of the LION videoconference. In phase II, a number of rehearsals needed to be attended to adjust the audio levels and to refine the light conditions and the camera placement. A participant that passed phase II certification is ready to participate in the LION videoconference.

### 4.1 Phase I certification

#### 4.1.1 Surgery room

As surgery rooms are at the highest level of participation and have the highest demand for quality, the rules for certification for a surgery room are very strict. The steps for Phase I certifications are as follows:

1. Preparation: a site that wants to participate as a surgery room must have an HD H.323 videoconferencing system, and a good quality Internet connection with sufficient available (free) bandwidth to make a 1.5 Megabit call over Internet **without** packet loss. Until the demands for preparation are met, no appointment can be made for certifying.
2. Call in/call out test: we start certification with a call in/call out test. This test is intended to make sure that a connection can be made from the videoconferencing station to the SURFnet MCU and vice versa. It is important to be able to initiate the connection from **both** sides.
3. Stability and network test: the next step in certification will be a stability and network test. For this test, a connection to the SURFnet MCU is made at the speed of at least 1.5 Megabit per second. This connection must be maintained at last 60 minutes without interruption. During the test, no packet loss on the network will be tolerated<sup>2</sup>.
4. Sound check: if the stability and network test is passed, a sound check of at least 15 minutes will be planned. A sound check is a connection from the videoconferencing system in the same surgery room that will be used in the forthcoming LION videoconference to the SURFnet MCU. The sound check is needed to determine if the cameras, microphones, headsets and speakers all give a satisfactory quality. The second objective of the sound check is to determine if the network connection in the surgery room is reliable.

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<sup>2</sup> With no packet loss, we indicate that the reported packet loss at both sides of the connection is close to 0. A small packet loss during a part of the session of 60 minutes is allowed, but the packet loss must be small enough not to influence the video and audio signals and during most of the session the number of lost packets must stay stable (i.e. does not increase).



#### 4.1.2 Moderator

As moderators together with surgery rooms form the highest level of participation and have the highest demand for quality, the rules for certification for a moderator room are very strict. The steps for Phase I certifications are as follows:

1. Preparation: the site that hosts the moderators must have at least two HD H.323 videoconferencing systems per moderator, and a good quality Internet connection with sufficient available (free) bandwidth to make simultaneous 1.5 Megabit calls with all available codecs over Internet **without** packet loss. Until the demands for preparation are met, no appointment can be made for certifying.
2. Call in/call out test: we start certification with a call in/call out test. This test is intended to make sure that a connection can be made from the videoconferencing station to the SURFnet MCU and vice versa. It is important to be able to initiate the connection from **both** sides.
3. Stability and network test: the next step in certification will be a stability and network test. For this test, simultaneous connections to the SURFnet MCU are made from all available HD codecs at the speed of at least 1.5 Megabit per second. This connection must be maintained at last 60 minutes without interruption. During the test, no packet loss on the network will be tolerated<sup>3</sup>.

Sound check: if the stability and network test is passed, a sound check of at least 15 minutes will be planned. A sound check is a connection from the videoconferencing system in the same room that will be used in the forthcoming LION videoconference to the SURFnet MCU. The sound check is needed to determine if the cameras, microphones, headsets and speakers all give a satisfactory quality. The second objective of the sound check is to determine if the network connection in the room is reliable.

#### 4.1.3 Auditorium

As auditoria form a lower level of participation with only limited interaction, the demand for quality is less then for the surgery rooms. For auditoria, the steps for Phase I certifications are as follows:

1. Preparation: a site that wants to participate as a auditorium must have an H.323 HD videoconferencing system, and a good quality Internet connection with sufficient available (free) bandwidth to make a 1 Megabit call over Internet **without** packet loss.
2. Call in test: we start certification with a call in test. This test is intended to make sure that a connection can be made from the videoconferencing station to the SURFnet MCU. Auditoria will be responsible for setting up the connections during the videoconference.
3. Stability and network test: the next step in certification will be a stability and network test. For this test, a connection to the SURFnet MCU is made at the speed of 1 Megabit per second.

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<sup>3</sup> With no packet loss, we indicate that the reported packet loss at both sides of the connection is close to 0. A small packet loss during a part of the session of 60 minutes is allowed, but the packet loss must be small enough not to influence the video and audio signals and during most of the session the number of lost packets must stay stable (i.e. does not increase).



This connection must be maintained at last 60 minutes without interruption. During the test, no packet loss on the network will be tolerated<sup>4</sup>.

4. Sound check: if the stability and network test is passed, a sound check of at least 15 minutes will be planned. A sound check is a connection from the videoconferencing system in the same auditorium that will be used in the forthcoming LION videoconference to the SURFnet MCU. The sound check is needed to determine if the cameras, microphones, headsets and speakers all give a satisfactory quality. The second objective of the sound check is to determine if the network connection in the auditorium is reliable

#### 4.1.4 Auditor

As Auditors form the lowest level of participation without synchronous communication, the demand for quality is the least. No rules of certification apply for this kind of participants. Although everybody can join at this level, we encourage the auditors to test the live stream towards the facility of the auditor. This way, disappointment at the forthcoming LION event can be prevented. For testing, online recordings from previous videoconferences are available.

## 4.2 Phase II certification

Some weeks before the LION event, a number of rehearsals will be planned. When the rehearsals start, phase I certification will be closed. This means that all sites that did not pass phase I certification at the start of the first rehearsal cannot participate in the LION videoconference.

### 4.2.1 Surgery room

As surgery rooms are at the highest level of participation and have the highest demand for quality, the rules for certification for a surgery room are very strict. Phase II certifications consist of one step:

1. Rehearsal: a rehearsal is similar to a sound check with the difference that in a rehearsal more LION sites are connected to the MCU. The rehearsal is needed to determine if the audio levels of multiple sites are in the same range and if the quality does not deteriorate when more sites are in the conference. A surgery room needs to participate in at least **two** rehearsals with at least **two** other surgery rooms present. Both rehearsals should be attended with a good audio and video quality.

During the rehearsal, the surgeon that will participate in the LION videoconference needs to be present. It is of major importance that the surgeon is present at least one of these rehearsals. Without presence of the surgeon, phase II certification will not be granted.

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<sup>4</sup> With no packet loss, we indicate that the reported packet loss at both sides of the connection is close to 0. A small packet loss during a part of the session of 60 minutes is allowed, but the packet loss must be small enough not to influence the video and audio signals and during most of the session the number of lost packets must stay stable (i.e. does not increase).



#### 4.2.2 Moderator

As moderators together with surgery rooms form the highest level of participation and have the highest demand for quality, the rules for certification for a surgery room are very strict. Phase II certifications consist of one step:

1. Rehearsal: a rehearsal is similar to a sound check with the difference that in a rehearsal more LION sites are connected to the MCU. The rehearsal is needed to determine if the audio levels of multiple sites are in the same range and if the quality does not deteriorate when more sites are in the conference. A moderator needs to participate in at least **two** rehearsals with at least **two** surgery rooms present. Both rehearsals should be attended with a good audio and video quality.

During the rehearsal, at least one moderator that will participate in the LION videoconference needs to be present. It is of major importance that the surgeon is present at least one of these rehearsals. Without presence of a moderator, phase II certification will not be granted.

#### 4.2.3 Auditorium

As auditoria form a lower level of participation with only limited interaction, the demand for quality is less than for the surgery rooms. For auditoria, Phase II certifications consist of one step:

1. Rehearsal: if the stability and network test is passed, rehearsal of at least 15 minutes will be planned. A rehearsal is a connection from the videoconferencing system in the same auditorium that will be used in the forthcoming LION videoconference to the SURFnet MCU. At the time of the rehearsal, at least one surgery room will be participating in the test. The rehearsal check is needed to determine if the cameras, microphones, headsets and speakers all give a satisfactory quality. The second objective of the rehearsal is to determine if the network connection in the auditorium is reliable.

#### 4.2.4 Auditor

There is no phase II certification procedure for Auditors