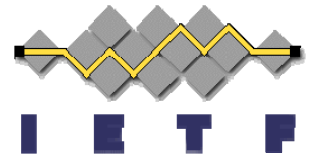# CLUE REQUIREMENTS IETF 80

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- **ASMP-1: Endpoints sending spatially related streams send them disjoint and arranged as announced.**

- **ASMP-2: Endpoints rendering spatially related streams render them according to the source description of the streams.**

- **ASMP-3: Different systems may do layout differently - either locally, remotely, or by a combination of the two.**

- **ASMP-4: Layout decisions can be made by various mechanisms, such as an algorithm, administratively determined, or local user-based.**

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- **ASMP-5: Layout can be static, fixed at call setup, or dynamic, changing during runtime, or both.**

- **ASMP-6: Different systems do things differently. It is not the intention of CLUE to dictate Telepresence architectural and implementation choices. Rather CLUE enables different systems to interwork by exchanging information that systems can use to be interoperable.**

  * **CLUE provides information and the receiver will display it to best advantage. What the receiver does is up to it, not specified by the standard. The sender can give a hint but it is primarily up to receiver how it renders the stream.**

- **ASMP-7: It is not mandatory to support all of the features that can be negotiated.**

- **ASMP-8: Mechanisms and features necessary for interoperability that do not concern handling multiple RTP media streams are not considered in this standard, although they may be considered by the working group. For example any call setup issues might be discussed in CLUE and handled by an appropriate SIP WG, not here.**

- **REQMT-1:   Provide a means of describing the relationship of one stream to another stream. This includes exchanging appropriate information to enable:**
  - **Layout to be accomplished, such as relevant spatial ordering information**
  - **Sender and/or receiver capabilities and preferences, such as resolution, bandwidth, video frame rate**

Note: A middle box needs to indicate spatial relationships between multiple video composite streams, or mixed audio streams which it constructs out of streams coming from multiple endpoints.

- **REQMT-2: Support dynamic behavior of media streams, including:**
  - **Media streams being added or removed or modified throughout the course of the session.**
  - **Changes in stream characteristics, such as video resolution, that may take place during a conference.**
  - **Layout changes throughout the conference.**

- **REQMT-3:   Specify a mechanism for the receiver to tell the sender (endpoint or middlebox) which streams it wants to receive. This includes specifying a way for the receiver to know what the sender can send; and a way of designating streams.**

- **REQMT-4:   Support synchronization of multiple audio streams with multiple video streams, including when there is not an equivalent number of audio and video streams.**

- **REQMT-5:   CLUE needs to support interoperability between an arbitrary number of media capture devices (e. g., microphones and cameras) and an arbitrary number of media rendering devices (e. g., screens and loudspeakers).**

- **REQMT-6:   Must support a mechanism for negotiation and re- negotiation during a call. In some cases, interaction is necessary, not just a one way flow of information.**

- **REQMT-7: Heterogeneous devices must be supported in the same conference. For example, this includes large screens, software applications for multi-window conferencing, handheld devices, audio only devices.**

- **REQMT-8:   A range of video resolutions need to be accommodated in the same conference to work with endpoints that have different capabilities. Similarly, endpoints with a range of audio qualities must be allowed.**

- **REQMT-9:   CLUE must support different models of where layout decisions are made - local and remote.**

  *   **Local does the placement**

  +   **Remote tells local what streams it has content type, anything else?? What exactly? [to be filled in]**

  +   **Local tells the remote which streams it wants**

  *   **Remote does the placement**
  +   **Local tells the remote what its displays are, what its receive positions are, how many streams**
  it can receive

  +   **Remote specifies the placement for the local**

REQMT-10: Support is necessary for video source selection policies, or specified sets of rules, that decide layout. Examples of such sets of rules for selection include:

- administrative determination
- user choice, loudest speaker
- former speaker
- PIP or not
- continuous presence
- room switched, segment switched

- **REQMT-11: Support for dynamic management of choosing which audio captures should be rendered.**
    - **Must support various methods of speaker selection - such as Voice Activity Detection (VAD)**

- **REQMT-12: Responsiveness - CLUE must not add latency such that it goes over the bounds for a good user experience.**